



JEISOON KANG  
HANWHA TECHWIN CO LTD  
1204 CHANGWON-DAERO SEONGSAN-GU  
CHANGWON-SI GYEONGSANGNAM-DO 51542  
KOREA

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The following material resulting from the investigation under the above numbers is enclosed.

**Issue**

| <u>Date</u> | <u>Vol</u> | <u>Sec</u> | <u>Pages</u>             | <u>Revised Date</u> |
|-------------|------------|------------|--------------------------|---------------------|
|             | X1         |            | Index Page(s)            |                     |
| 2018/02/09  | X1         | A207       | Cert of Compliance       |                     |
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|         |       |        |      |            |
|---------|-------|--------|------|------------|
| File    |       | Volume | Page | Date:      |
| E158873 | Index | X1     | 1    | 2018-02-08 |

## Index

| Product Type            | Model/Type Reference                                                                                                                                                                                                                                                                                                       | Report Reference # | Status    |
|-------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------|
| Digital Video Recorder  | SVR-430                                                                                                                                                                                                                                                                                                                    | E158873-A2-UL      |           |
| Video Presenter         | UF-80, UF-80DX, UF-80ST                                                                                                                                                                                                                                                                                                    | E158873-A4-UL      |           |
| Video Presenter         | SDP-900DXAN, SDP-950DXAN, SDP-950STAN                                                                                                                                                                                                                                                                                      | E158873-A6-UL      |           |
| Video Presenter         | SDP-850, SDP-850DX                                                                                                                                                                                                                                                                                                         | E158873-A9-UL      |           |
| Video Presenter         | SDP-6500DXA                                                                                                                                                                                                                                                                                                                | E158873-A12-UL     |           |
| Video Presenter         | UF-130DX                                                                                                                                                                                                                                                                                                                   | E158873-A14-UL     |           |
| Video Presenter         | UF-130ST                                                                                                                                                                                                                                                                                                                   | E158873-A15-UL     |           |
| Network Video Recorder  | SNR-6400, SNR-3200, SRN-3250, SRN-6450                                                                                                                                                                                                                                                                                     | E158873-A16-UL     |           |
| Video Presenter         | SDP-860                                                                                                                                                                                                                                                                                                                    | E158873-A18-UL     |           |
| Digital Video Recorder. | SVR-1670                                                                                                                                                                                                                                                                                                                   | E158873-A19-UL     |           |
| UTP Power Supply Unit   | SPU-400                                                                                                                                                                                                                                                                                                                    | E158873-A20-UL     | Withdrawn |
| Digital Video Recorder. | SRD-1630D, SRD-1630, SRD-1610D, SRD-1610, SRD-830D, SRD-830, SRD-1670D, SRD-1670DC, SRD-1670, SRD-1671, SRD-870D, SRD-870DC, SRD-870, SRD-871, SRD-1650D, SRD-1650DC, SRD-1650, SRD-1651, SRD-850D, SRD-850DC, SRD-850, SRD-851, SRD-1630DCP, SRD-1630DCN, SRD-1610DCP, SRD-1610DCN, SRD-830DCP, SRD-830DCN, SRD-#####\$&@ | E158873-A24-UL     |           |
| Digital Presenter       | SDP-760                                                                                                                                                                                                                                                                                                                    | E158873-A44-UL     |           |
| Network Camera          | SNP-5300H*, SNP-6201H* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                                                      | E158873-A45-UL     |           |
| Network Camera          | SND-7011*, SND-5011*, SND-5061*, SND-7061*, SNV-5010*, SNZ-5200* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                            | E158873-A46-UL     |           |
| Network Camera          | SNP-5300*, SNP-6201* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                                                        | E158873-A47-UL     |           |
| Digital Color Camera    | SCP-3371H*, SCP-2371H*, SCP-2271H*, SCP-2373H*, SCP-2273H* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                  | E158873-A48-UL     |           |
| Digital Color Camera    | SCP-3371*, SCP-2371*, SCP-2271*, SCP-2373*, SCP-2273* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                       | E158873-A49-UL     |           |
| Network Camera          | SND-7082*, SND-7082F*, SNV-7082* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                                            | E158873-A50-UL     |           |
| Network Camera          | SNB-7001*, SNB-5001*, SNB-3002* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                                             | E158873-A51-UL     |           |
| Network Camera          | SNO-7082R* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                                                                  | E158873-A52-UL     |           |
| Network Camera          | SNB-7002* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                                                                                   | E158873-A53-UL     |           |
| DIGITAL COLOR CAMERA    | SCV-2010F*, SCD-1020R*, SCD-2080R*, SCD-2020R*, SCD-2010*, SCD-2010B*, SCD-2010F*, SCB-3020*, SCB-3021*, SCB-2010*, SCO-1020R* (* is N or P: N=NTSC, P=PAL)                                                                                                                                                                | E158873-A54-UL     |           |
| Network Camera          | SNB-6004*, SNB-6003*, SNB-5004*, SNB-5003*, SNB-7004*, SNB-6005* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                                                            | E158873-A55-UL     |           |

| File    |       | Volume | Page | Date:      |
|---------|-------|--------|------|------------|
| E158873 | Index | X1     | 2    | 2018-02-08 |

|                        |                                                                                                                                |                |  |
|------------------------|--------------------------------------------------------------------------------------------------------------------------------|----------------|--|
| Network Camera         | SND-6084*, SND-6083*, SND-5084*, SND-5083*, SND-7084* (* is N or P: N = NTSC, P=PAL)                                           | E158873-A56-UL |  |
| DIGITAL COLOR CAMERA   | SCD-2022*, SCD-2022R*, SCD-2042R* (* is N or P: N = NTSC, P=PAL)                                                               | E158873-A58-UL |  |
| Digital Color Camera   | SCB-2004*, SCB-2005* (* is N or P: N = NTSC, P=PAL);                                                                           | E158873-A59-UL |  |
| Digital Color Camera   | SCD-2082*, SCV-2082R*, SCV-3083*, SCD-3083* (* is N or P: N = NTSC, P=PAL)                                                     | E158873-A60-UL |  |
| Network Camera         | SND-6084R*, SND-7084R*, SND-5084R* (* is N or P: N = NTSC, P=PAL)                                                              | E158873-A61-UL |  |
| NETWORK CAMERA         | SNO-6084R*. SNO-7084R* (* is N or P: N = NTSC, P=PAL)                                                                          | E158873-A62-UL |  |
| Network Camera         | SNV-6084R*, SNV-6084*, SNV-5084*, SNV-7084*, SNV-7084R*, SNV-5084R*, SNV-6084T* (* is N or P: N = NTSC, P=PAL)                 | E158873-A63-UL |  |
| Digital Color Camera   | SCO-2081R* (* is N or P: N = NTSC, P=PAL)                                                                                      | E158873-A64-UL |  |
| DIGITAL COLOR CAMERA   | SCB-2004*D, SCB-2005*D (* is N or P: N = NTSC, P=PAL)                                                                          | E158873-A65-UL |  |
| DIGITAL VIDEO RECORDER | SRD-1673D*, SRD-1654D*, SRD-854D*, SRD-852D*, SRD-1673*, SRD-1653*, SRD-873*, SRD-1640*, SRD-840*(* is N or P, N=NTSC / P=PAL) | E158873-A66-UL |  |
| Network Camera         | SNP-6200RH*, SCP-2370RH* (* is N or P: N=NTSC,P=PAL )                                                                          | E158873-A67-UL |  |
| Network Camera         | SNV-6012M* (* is N or P: N = NTSC, P=PAL)                                                                                      | E158873-A68-UL |  |
| Network Camera         | SNF-7010*, SNF-7010V*, SNF-7010VM* (* is N or P: N = NTSC, P=PAL)                                                              | E158873-A69-UL |  |
| Network Camera         | SNO-6011R* (* is N or P: N = NTSC, P=PAL)                                                                                      | E158873-A72-UL |  |
| Network Camera         | SND-6011R* (* is N or P: N = NTSC, P=PAL)                                                                                      | E158873-A73-UL |  |
| Digital Video Recorder | SRD-1680D*, SRD-880D* (*is N:NTSC / P:PAL)                                                                                     | E158873-A74-UL |  |
| DIGITAL COLOR CAMERA   | SCZ-2373*, SCZ-2273* (* is N or P: N = NTSC, P=PAL)                                                                            | E158873-A75-UL |  |
| NETWORK CAMERA         | SCO-6081R* (* is N or P: N = NTSC, P=PAL)                                                                                      | E158873-A76-UL |  |
| DIGITAL COLOR CAMERA   | SCV-6081R* and SCD-6081R* (* is N or P: N = NTSC, P=PAL)                                                                       | E158873-A77-UL |  |
| NETWORK VIDEO RECORDER | SRN-4000                                                                                                                       | E158873-A78-UL |  |
| DIGITAL COLOR CAMERA   | SCD-6021* (* is N or P: N = NTSC, P=PAL)                                                                                       | E158873-A81-UL |  |
| NETWORK CAMERA         | SNV-6013* (* is N or P: N = NTSC, P=PAL)                                                                                       | E158873-A83-UL |  |
| NETWORK CAMERA         | SNB-6010*, SNB-6010A*, SNB-6011*, SNB-6010B*, SNB-6011B* (* is N or P: N = NTSC, P=PAL)                                        | E158873-A85-UL |  |
| NETWORK CAMERA         | SNP-6320H*, SNP-5430H* (* is N or P: N = NTSC, P=PAL)                                                                          | E158873-A86-UL |  |
| NETWORK CAMERA         | SNP-6320*, SNP-5430* (* is N or P: N = NTSC, P=PAL)                                                                            | E158873-A87-UL |  |
| Network Video Recorder | SRN-472S, XRN-810S* (* is N or P: N = NTSC, P=PAL)                                                                             | E158873-A88-UL |  |
| Digital Video Recorder | SRD-1676D*, SRD-1656D*, SRD-876D* (* is N or P, N=NTSC/ P=PAL)                                                                 | E158873-A89-UL |  |
| DIGITAL COLOR          | SCB-5000* (* is N or P: N = NTSC, P=PAL)                                                                                       | E158873-A90-UL |  |

| File    |       | Volume | Page | Date:      |
|---------|-------|--------|------|------------|
| E158873 | Index | X1     | 3    | 2018-02-08 |

|                        |                                                                                                                                    |                 |  |
|------------------------|------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|
| CAMERA                 |                                                                                                                                    |                 |  |
| DIGITAL COLOR CAMERA   | SCB-5000*D (* is N or P: N = NTSC, P=PAL)                                                                                          | E158873-A91-UL  |  |
| DIGITAL COLOR CAMERA   | SCD-5080* (* is N or P: N = NTSC, P=PAL)                                                                                           | E158873-A92-UL  |  |
| DIGITAL COLOR CAMERA   | SCB-5003*, SCB-5005*, HCB-6001* (* is N or P: N = NTSC, P=PAL)                                                                     | E158873-A94-UL  |  |
| DIGITAL COLOR CAMERA   | SCV-5082* (* is N or P: N = NTSC, P=PAL)                                                                                           | E158873-A95-UL  |  |
| DIGITAL COLOR CAMERA   | SCD-5083*, SCD-5083R*, SCD-5082*, SCD-5083B*, SCD-5081R* (* is N or P: N = NTSC, P=PAL)                                            | E158873-A96-UL  |  |
| DIGITAL COLOR CAMERA   | SCV-5083* (* is N or P: N = NTSC, P=PAL)<br>SCV-5083R* (* is N or P: N = NTSC, P=PAL)<br>SCV-5081R* (* is N or P: N = NTSC, P=PAL) | E158873-A97-UL  |  |
| NETWORK CAMERA         | SNF-8010VM*, SNF-8010* (* is N or P: N = NTSC, P=PAL)                                                                              | E158873-A98-UL  |  |
| DIGITAL COLOR CAMERA   | SCD-5030*, SCD-5020* (* is N or P: N = NTSC, P=PAL)                                                                                | E158873-A99-UL  |  |
| NETWORK CAMERA         | SNO-5084R* (* is N or P: N = NTSC, P=PAL)                                                                                          | E158873-A100-UL |  |
| DIGITAL COLOR CAMERA   | SCO-5083R*, SCO-5081R* (* is N or P: N = NTSC, P=PAL)                                                                              | E158873-A101-UL |  |
| NETWORK CAMERA         | SNP-6321*, SNP-L6233* (* is N or P: N = NTSC, P=PAL)                                                                               | E158873-A102-UL |  |
| NETWORK CAMERA         | SNP-6321H*, SNP-L6233H* (* is N or P: N = NTSC, P=PAL)                                                                             | E158873-A103-UL |  |
| DIGITAL COLOR CAMERA   | SCV-5085* (* is N or P: N = NTSC, P=PAL)                                                                                           | E158873-A104-UL |  |
| NETWORK CAMERA         | SNB-8000* (* is N or P: N = NTSC, P=PAL)                                                                                           | E158873-A105-UL |  |
| NETWORK CAMERA         | SNV-8080* (* is N or P: N = NTSC, P=PAL)                                                                                           | E158873-A106-UL |  |
| NETWORK CAMERA         | SNZ-6320                                                                                                                           | E158873-A107-UL |  |
| NETWORK CAMERA         | SNP-6320RH*, SNP-L6233RH* (* is N or P: N=NTSC,P=PAL)                                                                              | E158873-A108-UL |  |
| NETWORK CAMERA         | SNP-5321H*, SNP-L5233H* (* is N or P: N = NTSC, P=PAL)                                                                             | E158873-A109-UL |  |
| NETWORK CAMERA         | SNP-5321*, SNP-L5233* (* N: NTSC / P:PAL)                                                                                          | E158873-A110-UL |  |
| NETWORK CAMERA         | SND-L6013R*, SND-L6013*, SND-L6012*, SND-L5013* (* is N or P: N:NTSC/ P:PAL)                                                       | E158873-A111-UL |  |
| NETWORK CAMERA         | SNO-L6083R*, SNO-L5083R* (* is N or P: N = NTSC, P=PAL)                                                                            | E158873-A113-UL |  |
| Network Video Recorder | SRN-1673S*(* is N or P)                                                                                                            | E158873-A115-UL |  |
| NETWORK CAMERA         | SNO-L6013R* (* is N or P: N = NTSC, P=PAL)                                                                                         | E158873-A118-UL |  |
| NETWORK CAMERA         | SND-L6083R*, SND-L5083R* (* is N or P: N = NTSC, P=PAL)                                                                            | E158873-A119-UL |  |
| Network Video Recorder | SRN-873S* (* is N or P: N = NTSC, P=PAL)                                                                                           | E158873-A120-UL |  |
| NETWORK CAMERA         | SNV-L6083R*, SNV-L5083R* (* is N or P: N = NTSC, P=PAL)                                                                            | E158873-A121-UL |  |

| File    |       | Volume | Page | Date:      |
|---------|-------|--------|------|------------|
| E158873 | Index | X1     | 4    | 2018-02-08 |

|                              |                                                                                                                                           |                 |  |
|------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|
| NETWORK CAMERA               | SNB-9000* (* is N or P: N = NTSC, P=PAL)                                                                                                  | E158873-A122-UL |  |
| Optical PTZ Accessary        | SBP-301HF, SBP-302HF                                                                                                                      | E158873-A125-UL |  |
| Optical PTZ Accessary        | SBP-300HF                                                                                                                                 | E158873-A126-UL |  |
| NETWORK CAMERA               | SNV-8081R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A127-UL |  |
| NETWORK CAMERA               | SNO-8081R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A128-UL |  |
| NETWORK CAMERA               | SNV-6085R* (* is N or P: N = NTSC, P=PAL)<br>SNV-6085* (* is N or P: N = NTSC, P=PAL)                                                     | E158873-A129-UL |  |
| DIGITAL COLOR CAMERA         | SCB-6003* (* is N or P: N = NTSC, P=PAL)                                                                                                  | E158873-A130-UL |  |
| DIGITAL COLOR CAMERA         | SCO-6023R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A132-UL |  |
| DIGITAL COLOR CAMERA         | SCV-6083R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A133-UL |  |
| DIGITAL COLOR CAMERA         | SCV-6023R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A135-UL |  |
| DIGITAL COLOR CAMERA         | SCD-6023R*, SCD-6013* (* is N or P: N = NTSC, P=PAL)                                                                                      | E158873-A136-UL |  |
| DIGITAL COLOR CAMERA         | SCD-6083R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A137-UL |  |
| DIGITAL COLOR CAMERA         | SCO-6083R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A138-UL |  |
| NETWORK CAMERA               | SNV-L6014RM*, SNV-L6013R* (* is N or P: N = NTSC, P=PAL)                                                                                  | E158873-A139-UL |  |
| DIGITAL COLOR CAMERA         | PNO-9080R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A140-UL |  |
| NETWORK CAMERA               | PNV-9080R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A141-UL |  |
| NETWORK CAMERA               | PND-9080R* (* is N or P: N = NTSC, P=PAL)                                                                                                 | E158873-A142-UL |  |
| Digital Video Recorder       | SRD-1685*, SRD-894*, HRD-842* (* is N or P, N=NTSC/ P=PAL)                                                                                | E158873-A143-UL |  |
| Digital Video Recorder       | SRD-1694*, HRD-1642* (* is N or P, N=NTSC/ P=PAL)                                                                                         | E158873-A144-UL |  |
| Network Video Recorder (NVR) | XRN-2011*, XRN-2010*, XRN-3010*, XRN-1610* (* is N or P: N=NTSC, P=PAL)                                                                   | E158873-A146-UL |  |
| NETWORK CAMERA               | QNO-7030R*, QNO-7020R*, QNO-7010R*, QNO-6030R*, QNO-6020R*, QNO-6010R*, QNO-6070R*, QNO-7080R*, QNO-6071R* (* is N or P: N = NTSC, P=PAL) | E158873-A147-UL |  |
| NETWORK CAMERA               | QND-7030R*, QND-7020R*, QND-7010R*, QND-6030R*, QND-6020R*, QND-6010R*, QND-6070R*, QND-7080R* (* is N or P: N = NTSC, P=PAL)             | E158873-A148-UL |  |
| NETWORK CAMERA               | QNV-7030R*, QNV-7020R*, QNV-7010R*, QNV-6030R*, QNV-6020R*, QNV-6010R*, QNV-6070R*, QNV-7080R* (* is N or P: N = NTSC, P=PAL)             | E158873-A149-UL |  |
| Network Video Recorder       | XRN-1610S* (* is N or P: N=NTSC, P=PAL)                                                                                                   | E158873-A150-UL |  |
| NETWORK                      | PNF-9010RV*, PNF-9010R*, PNF-9010RVM* (* is                                                                                               | E158873-A151-UL |  |

| File    |       | Volume | Page | Date:      |
|---------|-------|--------|------|------------|
| E158873 | Index | X1     | 5    | 2018-02-08 |

|                              |                                                                                                                                                                                                                             |                 |  |
|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--|
| CAMERA                       | N or P: N = NTSC, P=PAL)                                                                                                                                                                                                    |                 |  |
| NETWORK CAMERA               | PNM-9020V* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                   | E158873-A152-UL |  |
| Network Video Recorder       | PRN-4011* (* is N or P: N=NTSC, P=PAL)                                                                                                                                                                                      | E158873-A153-UL |  |
| DIGITAL COLOR CAMERA         | HCP-6320*, HCP-6320A*, HCP-6230* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                             | E158873-A154-UL |  |
| DIGITAL COLOR CAMERA         | HCP-6320H*, HCP-6320HA*, HCP-6230H* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                          | E158873-A155-UL |  |
| NETWORK CAMERA               | PNP-9200RH*, XNP-6370RH*, XNP-6330RH* (* is N or P: N=NT, P=PAL)                                                                                                                                                            | E158873-A156-UL |  |
| NETWORK CAMERA               | XNB-8000*, XNB-6000* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                         | E158873-A157-UL |  |
| NETWORK CAMERA               | XNO-8080R*, XNO-6080R*, XNO-6120R* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                           | E158873-A158-UL |  |
| NETWORK CAMERA               | XNV-8040R*, XNV-8030R*, XNV-8020R*, XNV-6020*, XNV-6010*, XNV-6020R* (* is N or P: N = NTSC, P=PAL)                                                                                                                         | E158873-A159-UL |  |
| NETWORK CAMERA               | XND-8040R*, XND-8030R*, XND-8020R*, XND-6020*, XND-6010*, XND-6020R* (* is N or P: N = NTSC, P=PAL)                                                                                                                         | E158873-A160-UL |  |
| NETWORK CAMERA               | XNV-8080R* (* is N or P: N = NTSC, P=PAL)<br>XNV-6080R* (* is N or P: N = NTSC, P=PAL)<br>XNV-6080* (* is N or P: N = NTSC, P=PAL)<br>XNV-6120R* (* is N or P: N = NTSC, P=PAL)<br>XNV-6120* (* is N or P: N = NTSC, P=PAL) | E158873-A161-UL |  |
| NETWORK CAMERA               | XND-8080RV*, XND-8080R*, XND-6080RV*, XND-6080R*, XND-6080V*, XND-6080* (* is N or P: N = NTSC, P=PAL)                                                                                                                      | E158873-A162-UL |  |
| AHD Multi Directional Camera | HCM-9020VQ* ( is N or P: N = NTSC, P=PAL)                                                                                                                                                                                   | E158873-A163-UL |  |
| NETWORK CAMERA               | XNO-8020R*, XNO-8030R*, XNO-8040R*, XNO-6010R*, XNO-6020R* (* is N or P: N = NTSC, P=PAL)                                                                                                                                   | E158873-A164-UL |  |
| NETWORK CAMERA               | XNV-6011* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                    | E158873-A165-UL |  |
| DIGITAL COLOR CAMERA         | HCD-6080R*, HCD-6070R* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                       | E158873-A167-UL |  |
| DIGITAL COLOR CAMERA         | HCV-6080R*, HCV-6070R* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                       | E158873-A168-UL |  |
| NETWORK CAMERA               | XNP-6120H* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                   | E158873-A169-UL |  |
| NETWORK CAMERA               | XND-8020F*, XND-6011F* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                       | E158873-A170-UL |  |
| NETWORK CAMERA               | PNM-9080VQ* (* is N or P: N = NTSC, P = PAL)                                                                                                                                                                                | E158873-A172-UL |  |
| Network Storage              | SRB-160S                                                                                                                                                                                                                    | E158873-A173-UL |  |
| NETWORK CAMERA               | TNB-6030* (* is N or P: N = NTSC, P = PAL)                                                                                                                                                                                  | E158873-A174-UL |  |
| NETWORK CAMERA               | PNM-9081VQ* (* is N or P: N = NTSC, P = PAL)                                                                                                                                                                                | E158873-A176-UL |  |
| NETWORK CAMERA               | XNO-6085R* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                   | E158873-A177-UL |  |
| NETWORK CAMERA               | XNB-6005* (* is N or P: N = NTSC, P=PAL)                                                                                                                                                                                    | E158873-A178-UL |  |

| File    |       | Volume | Page | Date:      |
|---------|-------|--------|------|------------|
| E158873 | Index | X1     | 6    | 2018-02-08 |

|                        |                                                                                 |                 |  |
|------------------------|---------------------------------------------------------------------------------|-----------------|--|
| NETWORK VIDEO RECORDER | SNR-D5401N                                                                      | E158873-A179-UL |  |
| NETWORK CAMERA         | XND-6085*, XND-6085V* (* is N or P: N = NTSC, P=PAL)                            | E158873-A180-UL |  |
| NETWORK CAMERA         | XNV-6085* (* is N or P: N = NTSC, P=PAL)                                        | E158873-A181-UL |  |
| NETWORK CAMERA         | XNP-6040H* (* is N or P: N = NTSC, P=PAL)                                       | E158873-A182-UL |  |
| NETWORK VIDEO DECODER  | SPD-150* (* is N or P: N = NTSC, P=PAL)                                         | E158873-A184-UL |  |
| DIGITAL COLOR CAMERA   | HCB-6000*, HCB-7000* (* is N or P: N = NTSC, P=PAL)                             | E158873-A185-UL |  |
| DIGITAL COLOR CAMERA   | HCZ-6320* (* is N or P: N = NTSC, P=PAL)                                        | E158873-A186-UL |  |
| NETWORK CAMERA         | XNF-8010RVM*, XNF-8010RV*, XNF-8010R* (* is N or P: N = NTSC, P=PAL)            | E158873-A187-UL |  |
| DIGITAL COLOR CAMERA   | HCO-6070R*, HCO-6080R* (* is N or P: N = NTSC, P=PAL)                           | E158873-A188-UL |  |
| NETWORK CAMERA         | XNB-6001* (* is N or P: N = NTSC, P=PAL)                                        | E158873-A189-UL |  |
| DIGITAL COLOR CAMERA   | HCO-7070R* (* is N or P: N = NTSC, P=PAL)                                       | E158873-A190-UL |  |
| LENS MODULE            | SLA-T2480*, SLA-T2480V*, SLA-T4680*, SLA-T4680V* (* is N or P: N = NTSC, P=PAL) | E158873-A191-UL |  |
| DIGITAL COLOR CAMERA   | HCD-7070R* (* is N or P: N = NTSC, P=PAL)                                       | E158873-A192-UL |  |
| DIGITAL COLOR CAMERA   | HCV-7070R* (* is N or P: N = NTSC, P=PAL)                                       | E158873-A193-UL |  |
| NETWORK VIDEO RECORDER | TRM-1610S                                                                       | E158873-A194-UL |  |
| LENS MODULE            | SLA-T1080F* (* is N or P: N = NTSC, P=PAL)                                      | E158873-A195-UL |  |
| NETWORK SWITCH         | SPN-10080P, SPN-10080PM                                                         | E158873-A196-UL |  |
| ANALOG CAMERA          | HCV-7010R*, HCV-7020R*, HCV-7030R* (* is N or P: N = NTSC, P=PAL)               | E158873-A197-UL |  |
| DIGITAL COLOR CAMERA   | HCD-7010R*, HCD-7020R*, HCD-7030R* (* is N or P: N = NTSC, P=PAL)               | E158873-A198-UL |  |
| DIGITAL COLOR CAMERA   | HCO-7010R*, HCO-7020R* , HCO-7030R* (* is N or P: N = NTSC, P=PAL)              | E158873-A199-UL |  |
| NETWORK CAMERA         | XNP-6320, QNP-6230                                                              | E158873-A200-UL |  |
| NETWORK CAMERA         | XNP-6320H, XNP-6320HS, QNP-6230H                                                | E158873-A201-UL |  |
| NETWORK CAMERA         | XNV-6013M                                                                       | E158873-A205-UL |  |
| NETWORK CAMERA         | XNV-6012M, XNV-6012                                                             | E158873-A206-UL |  |
| NETWORK CAMERA         | XNV-6022R, XNV-6022RM                                                           | E158873-A207-UL |  |

# CERTIFICATE OF COMPLIANCE

**Certificate Number** 20180209-E158873  
**Report Reference** E158873-A207-UL  
**Issue Date** 2018-FEBRUARY-09

**Issued to:** Hanwha Techwin Co Ltd  
1204 Changwon-daero Seongsan-gu,  
Changwon-si Gyeongsangnam-do 51542 KOREA

**This is to certify that  
representative samples of** INFORMATION TECHNOLOGY EQUIPMENT INCLUDING  
ELECTRICAL BUSINESS EQUIPMENT  
NETWORK CAMERA  
XNV-6022R, XNV-6022RM

Have been investigated by UL in accordance with the  
Standard(s) indicated on this Certificate.

**Standard(s) for Safety:** UL 60950-1 and CAN/CSA C22.2 No. 60950-1-07 -  
Information Technology Equipment - Safety - Part 1:  
General Requirements

**Additional Information:** See the UL Online Certifications Directory at  
[www.ul.com/database](http://www.ul.com/database) for additional information

Only those products bearing the UL Certification Mark should be considered as being covered by UL's  
Certification and Follow-Up Service.

Look for the UL Certification Mark on the product.



Bruce Mahrenholz, Director North American Certification Program

UL LLC

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL. For questions, please  
contact a local UL Customer Service Representative at <http://ul.com/aboutul/locations/>



## UL TEST REPORT AND PROCEDURE

|                                    |                                                                                                                                                                                                                                                 |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Standard:</b>                   | UL 60950-1, 2nd Edition, 2014-10-14 (Information Technology Equipment - Safety - Part 1: General Requirements)<br>CAN/CSA C22.2 No. 60950-1-07, 2nd Edition, 2014-10 (Information Technology Equipment - Safety - Part 1: General Requirements) |
| <b>Certification Type:</b>         | Listing                                                                                                                                                                                                                                         |
| <b>CCN:</b>                        | NWGQ, NWGQ7 (Information Technology Equipment Including Electrical Business Equipment)                                                                                                                                                          |
| <b>Product:</b>                    | NETWORK CAMERA                                                                                                                                                                                                                                  |
| <b>Model:</b>                      | XNV-6022R, XNV-6022RM                                                                                                                                                                                                                           |
| <b>Rating:</b>                     | Rated Input: PoE (37-57 Vdc), 0.19 A                                                                                                                                                                                                            |
| <b>Applicant Name and Address:</b> | HANWHA TECHWIN CO LTD<br>1204 CHANGWON-DAERO SEONGSAN-GU<br>CHANGWON-SI GYEONGSANGNAM-DO 51542<br>KOREA                                                                                                                                         |

This is to certify that representative samples of the products covered by this Test Report have been investigated in accordance with the above referenced Standards. The products have been found to comply with the requirements covering the category and the products are judged to be eligible for Follow-Up Service under the indicated Test Procedure. The manufacturer is authorized to use the UL Mark on such products which comply with this Test Report and any other applicable requirements of UL LLC ('UL') in accordance with the Follow-Up Service Agreement. Only those products which properly bear the UL Mark are considered as being covered by UL's Follow-Up Service under the indicated Test Procedure.

The applicant is authorized to reproduce the referenced Test Report provided it is reproduced in its entirety.

Any information and documentation involving UL Mark services are provided on behalf of UL LLC (UL) or any authorized licensee of UL.

Prepared by: Sungil Kim

Reviewed by: Seungtae Kim

**Supporting Documentation**

The following documents located at the beginning of this Procedure supplement the requirements of this Test Report:

- A. Authorization - The Authorization page may include additional Factory Identification Code markings.
- B. Generic Inspection Instructions -
  - i. Part AC details important information which may be applicable to products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of this Test Report.
  - ii. Part AE details any requirements which may be applicable to all products covered by this Procedure. Products described in this Test Report must comply with any applicable items listed unless otherwise stated in the body of each Test Report.
  - iii. Part AF details the requirements for the UL Certification Mark which is not controlled by the technical standard used to investigate these products. Products are permitted to bear only the Certification Mark(s) corresponding to the countries for which it is certified, as indicated in each Test Report.

**Product Description**

NETWORK CAMERA with IR LED for indoor use.

**Model Differences**

- Basic Model is XNV-6022R
- Model XNV-6022RM is identical to basic model XNV-6022R except for M12 cable and model designation.

**Technical Considerations**

- Equipment mobility : stationary
- Connection to the mains : No direct connection
- Operating condition : continuous
- Access location : operator accessible
- Over voltage category (OVC) : OVC I
- Mains supply tolerance (%) or absolute mains supply values : No direct connection
- Tested for IT power systems : No
- IT testing, phase-phase voltage (V) : N/A
- Class of equipment : Class III (supplied by SELV)
- Considered current rating of protective device as part of the building installation (A) : N/A
- Pollution degree (PD) : N/A
- IP protection class : IP X0
- Altitude of operation (m) : Up to 2 000
- Altitude of test laboratory (m) : Less than 2 000
- Mass of equipment (kg) : 0.29
- The product was submitted and evaluated for use at the maximum ambient temperature (Tma) permitted by the manufacturer's specification of: 55 °C
- The product was investigated to the following additional standards: IEC 62471-1
- The following are available from the Applicant upon request: Installation (Safety) Instructions / Manual

**Additional Information**

Original (4788307259)

- Maximum normal load: Continuous operation with IR LED on.

**Additional Standards**

The product fulfills the requirements of: IEC 62471-1

**Markings and instructions**

| Clause Title                                     | Marking or Instruction Details                                                                                                                                                                                                                                                   |
|--------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Power rating - Ratings                           | Ratings (voltage, frequency/dc, current)                                                                                                                                                                                                                                         |
| Power rating - Company identification            | Listee's or Recognized company's name, Trade Name, Trademark or File Number                                                                                                                                                                                                      |
| Power rating - Model                             | Model Number                                                                                                                                                                                                                                                                     |
| Replaceable batteries                            | "CAUTION: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions."                                                                                                                                               |
| Installation Manual - Network Environment        | The following statement or similar shall be included in the User Manual:<br>"Unit is intended for installation in a Network Environment 0 as defined in IEC TR 62102. As such, associated Ethernet wiring shall be limited to inside the building."                              |
| Installation Manual - UL Listed PoE Source       | The following statement or similar shall be included in the User Manual:<br>"The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802-3af shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1." |
| Installation Manual - Selection of Power Supply  | The Users Manual should provide simple instructions for the correct selection of a suitable Listed Class 2 Power Units, including a statement such as "This product is intended to be supplied by Power Unit marked "Class 2" or "LPS" and rated PoE(37 V - 57 V), 0.19 A."      |
| <b>Special Instructions to UL Representative</b> |                                                                                                                                                                                                                                                                                  |
| N/A                                              |                                                                                                                                                                                                                                                                                  |

**Production-Line Testing Requirements**

**Electric Strength Test Special Constructions - Refer to Generic Inspection Instructions, Part AC for further information.**

| Model | Component | Removable<br>Parts | Test probe location | V<br>rms | V dc | Test Time,<br>s |
|-------|-----------|--------------------|---------------------|----------|------|-----------------|
| N/A   |           |                    |                     |          |      |                 |

**Earthing Continuity Test Exemptions - This test is not required for the following models:**

All models

**Electric Strength Test Exemptions - This test is not required for the following models:**

All models

**Electric Strength Test Component Exemptions - The following solid-state components may be disconnected from the remainder of the circuitry during the performance of this test:**

**Sample and Test Specifics for Follow-Up Tests at UL**

| Model | Component | Material | Test | Sample(s) | Test<br>Specifics |
|-------|-----------|----------|------|-----------|-------------------|
| N/A   |           |          |      |           |                   |

| 1.5.1                                           | TABLE: list of critical components                |                  |                                                                              |                            |                                    | Pass          |
|-------------------------------------------------|---------------------------------------------------|------------------|------------------------------------------------------------------------------|----------------------------|------------------------------------|---------------|
| Object/part or Description                      | Manufacturer/<br>trademark                        | type/model       | technical data                                                               | Product Category<br>CCN(s) | Required<br>Marks of<br>Conformity | Supplement ID |
| Camera Window Enclosure (Glass)                 | Interchangeable                                   | Interchangeable  | Glass, See enclosure for dimension.                                          | -                          | -                                  |               |
| External Enclosure (Metal)                      | Interchangeable                                   | Interchangeable  | Aluminium, Min. 1.0 mm thickness, See enclosure for dimension.               | -                          | -                                  |               |
| Transformer(T1)                                 | SHENZHEN GROUP-TEK ELECTRONICS TECHNOLOGY CO.,LTD | PDT2431SR        | 130 deg.C, See enclosure for more detail.                                    | -                          | -                                  |               |
| Opto-coupler (LS1)                              | LITE-ON TECHNOLOGY CORP                           | LTV-816          | Isolation Voltage: 5 300. Max. Operation Temperature: 110 deg.C              | FPQU2/8                    | UL (E113898)                       |               |
| Rechargeable button cell battery (BAT1)         | SEIKO INSTRUMENTS INC MICRO-ENERGY DIV            | MS621T           | Lithium (Coin), Rechargeable, 3 Vdc, 3.0 mAh, Max Charging current: 10 mA    | BBCV2                      | UL (MH15628)                       |               |
| Connectors and Receptacles (Secondary circuits) | Interchangeable                                   | Interchangeable  | -                                                                            | ECBT2 or RTRT2             | UL                                 |               |
| (Alternate)                                     | Interchangeable                                   | Interchangeable  | Copper alloy pins housed in bodies of plastic rated Min. V-2                 | QMFZ2                      | UL                                 |               |
| Internal Wiring (Secondary)                     | Interchangeable                                   | Interchangeable  | FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1; Min. 30 V, 80 deg.C | AVLV2                      | UL                                 |               |
| LED                                             | New Light Semiconductor Co., Ltd.                 | NLN1249KN-L8530P | Max. IF = 100 mA                                                             | -                          | -                                  |               |
| Thermal Pad                                     | KOMOTECH CO LTD                                   | GP-1             | Min. 0.35 mm thickness, rated V-0, 150 deg.C                                 | QMFZ2                      | USR (E245303)                      |               |
| Cable                                           | Interchangeable                                   | Interchangeable  | FEP, PTFE, PVC, TFE, neoprene, polyimide or marked VW-1; Min. 30 V, 80 deg.C | AVLV2                      | UL                                 |               |

|       |                 |                 |                                                         |                |    |  |
|-------|-----------------|-----------------|---------------------------------------------------------|----------------|----|--|
| PWB   | Interchangeable | Interchangeable | Min. V-1, 105 deg.C.                                    | ZPMV2          | UL |  |
| Label | Interchangeable | Interchangeable | Min.70 deg.C if max. surface temperature not specified. | PGDQ2 or PGJ12 | UL |  |

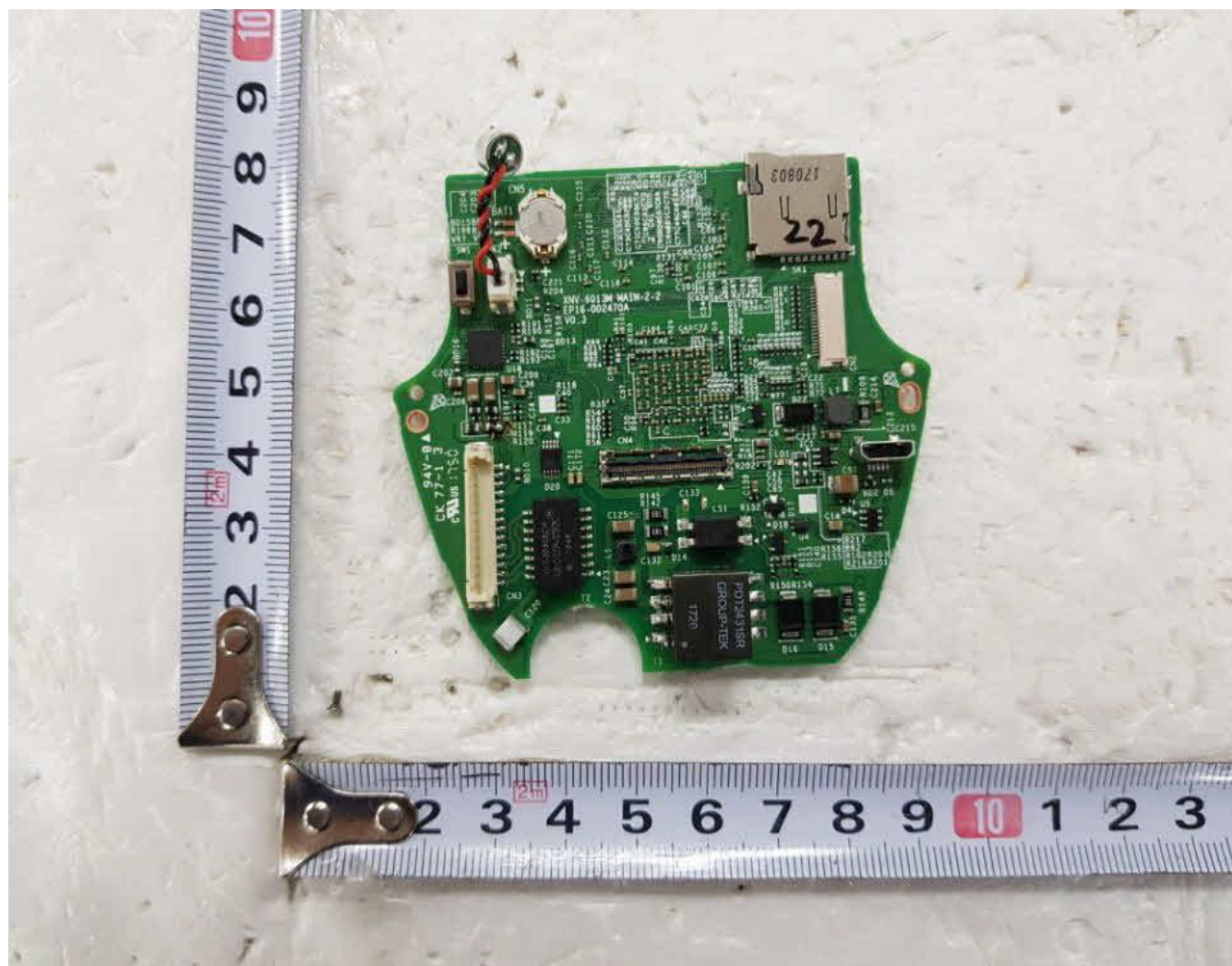
## **Enclosures**

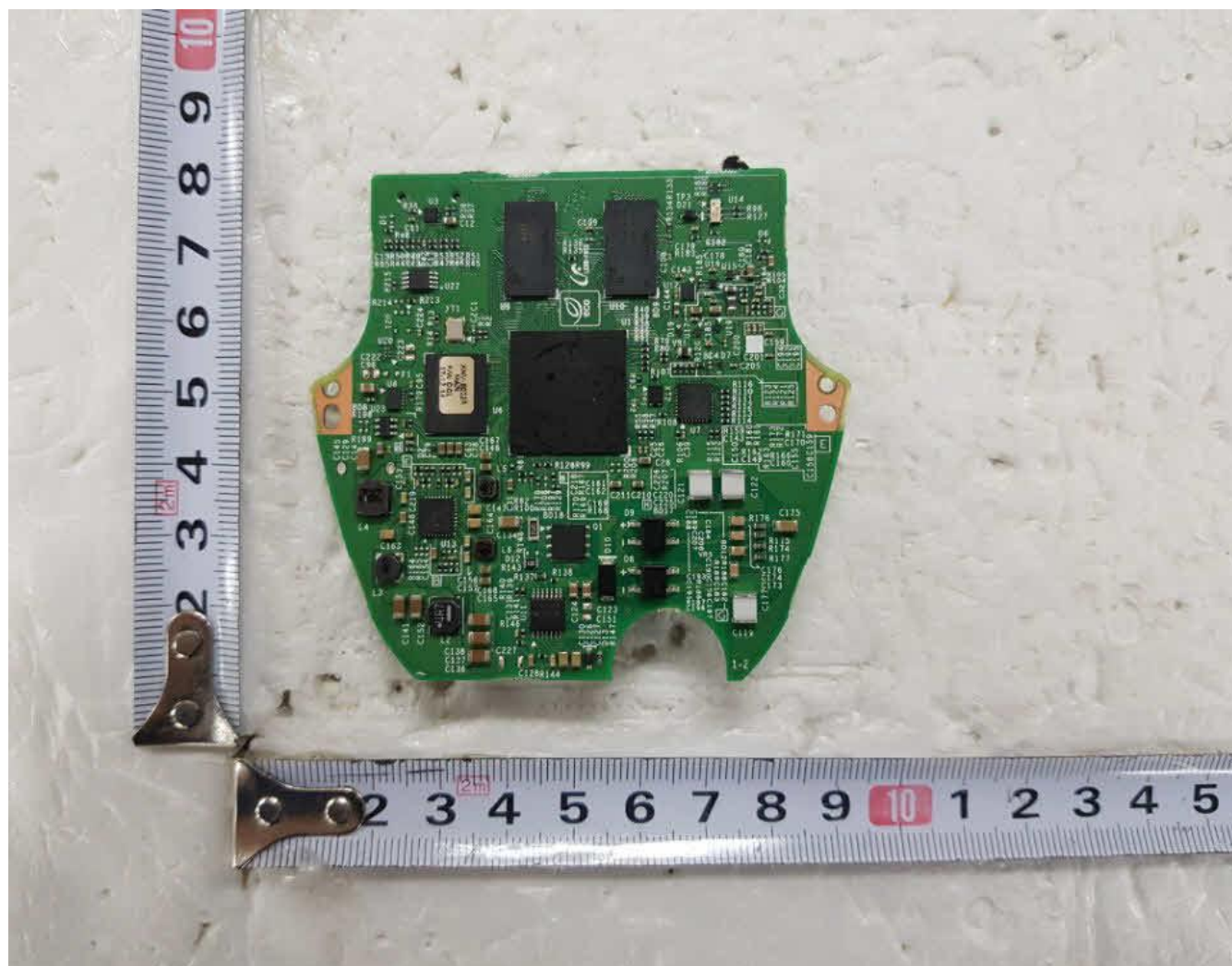
| <u>Type</u>   | <u>Supplement Id</u> | <u>Description</u>                |
|---------------|----------------------|-----------------------------------|
| Photographs   | 3-01                 | Front view                        |
| Photographs   | 3-02                 | Rear view                         |
| Photographs   | 3-03                 | Internal view                     |
| Photographs   | 3-04                 | Main board Top                    |
| Photographs   | 3-05                 | Main board bottom                 |
| Photographs   | 3-06                 | LED board Top                     |
| Photographs   | 3-07                 | LED board bottom                  |
| Manuals       | 6-01                 | Manual                            |
| Miscellaneous | 7-01                 | Transformer (T1) spec             |
| Miscellaneous | 7-02                 | Enclosure dimension               |
| Miscellaneous | 7-03                 | Dual language safety labeling CRD |
| Miscellaneous | 7-04                 | Label                             |
| Miscellaneous | 7-05                 | IEC 62471 report                  |















## overview

**IMPORTANT SAFETY INSTRUCTIONS**

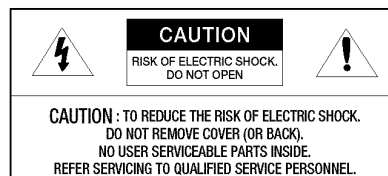
1. Read these instructions.
2. Keep these instructions.
3. Heed all warnings.
4. Follow all instructions.
5. Do not use this apparatus near water.
6. Clean the contaminated area on the product surface with a soft, dry cloth or a damp cloth.  
(Do not use a detergent or cosmetic products that contain alcohol, solvents or surfactants or oil constituents as they may deform or cause damage to the product.)
7. Do not block any ventilation openings. Install in accordance with the manufacturer's instructions.
8. Do not install near any heat sources such as radiators, heat registers, stoves, or other apparatus (including amplifiers) that produce heat.
9. Do not defeat the safety purpose of the polarized or grounding-type plug. A polarized plug has two blades with one wider than the other. A grounding type plug has two blades and a third grounding prong. The wide blade or the third prong are provided for your safety. If the provided plug does not fit into your outlet, consult an electrician for replacement of the obsolete outlet.
10. Protect the power cord from being walked on or pinched particularly at plugs, convenience receptacles, and the point where they exit from the apparatus.
11. Only use attachments/ accessories specified by the manufacturer.
12. Use only with the cart, stand, tripod, bracket, or table specified by the manufacturer, or sold with the apparatus. When a cart is used, use caution when moving the cart/ apparatus combination to avoid injury from tip-over.
13. Unplug this apparatus during lightning storms or when unused for long periods of time.
14. Refer all servicing to qualified service personnel. Servicing is required when the apparatus has been damaged in any way, such as power-supply cord or plug is damaged, liquid has been spilled or objects have fallen into the apparatus, the apparatus has been exposed to rain or moisture, does not operate normally, or has been dropped.
15. This product is intended to be supplied by a Listed Power Supply Unit marked "Class 2" or "LPS" and rated from PoE( 37 - 57 Vdc), 0.18A (XNV-6012/6012M), 0.19A (XNV-6022R/6022RM), 0.2A (XNV-6013M).
16. If you use excessive force when installing the product, the camera may be damaged and malfunction. If you forcibly install the product using non-compliant tools, the product may be damaged.
17. Do not install the product in a place where chemical substances or oil mist exists or may be generated. As edible oils such as soybean oil may damage or warp the product, do not install the product in the kitchen or near the kitchen table.  
This may cause damage to the product.
18. When installing the product, be careful not to allow the surface of the product to be stained with chemical substance.  
Some chemical solvents such as cleaner or adhesives may cause serious damage to the product's surface.
19. If you install/disassemble the product in a manner that has not been recommended, the production functions/ performance may not be guaranteed.  
Install the product by referring to "Installation & connection" in the user manual.
20. Installing or using the product in water can cause serious damage to the product.

**WARNING**

TO REDUCE THE RISK OF FIRE OR ELECTRIC SHOCK, DO NOT EXPOSE THIS PRODUCT TO RAIN OR MOISTURE. DO NOT INSERT ANY METALLIC OBJECT THROUGH THE VENTILATION GRILLS OR OTHER OPENINGS ON THE EQUIPMENT.

Apparatus shall not be exposed to dripping or splashing and that no objects filled with liquids, such as vases, shall be placed on the apparatus.

To prevent injury, this apparatus must be securely attached to the Wall/ceiling in accordance with the installation instructions.

**CAUTION****EXPLANATION OF GRAPHICAL SYMBOLS**

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.



The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the product.

## overview

---

### Class I construction

An apparatus with CLASS I construction shall be connected to a MAINS socket outlet with a protective earthing connection.

### Battery

Batteries (battery pack or batteries installed) shall not be exposed to excessive heat such as sunshine, fire or the like.

### Disconnection Device

Disconnect the main plug from the apparatus, if it's defected. And please call a repair man in your location.

**When used outside of the U.S., it may be used HAR code with fittings of an approved agency is employed.**

### CAUTION

RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.  
DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS.

### ATTENTION

IL Y A RISQUE D'EXPLOSION SI LA BATTERIE EST REMPLACÉE PAR UNE BATTERIE DE TYPE INCORRECT.

METTRE AU REBUT LES BATTERIES USAGÉES CONFORMÉMENT AUX INSTRUCTIONS.

These servicing instructions are for use by qualified service personnel only.

To reduce the risk of electric shock do not perform any servicing other than that contained in the operating instructions unless you are qualified to do so.

Please use the input power with just one camera and other devices must not be connected.

**The ITE is to be connected only to PoE networks without routing to the outside plant.**

**The wired LAN hub providing power over the Ethernet (PoE) in accordance with IEEE 802-3af shall be a UL Listed device with the output evaluated as a Limited Power Source as defined in UL60950-1.**

**Unit is intended for installation in a Network Environment 0 as defined in IEC TR 62102. As such, associated Ethernet wiring shall be limited to inside the building.**

Please read the following recommended safety precautions carefully.

- Do not place this apparatus on an uneven surface.
- Do not install on a surface where it is exposed to direct sunlight, near heating equipment or heavy cold area.
- Do not place this apparatus near conductive material.
- Do not attempt to service this apparatus yourself.
- Do not place a glass of water on the product.
- Do not install near any magnetic sources.
- Do not block any ventilation openings.
- Do not place heavy items on the product.
- Please wear protective gloves when installing/removing the camera.  
The high temperature of the product surface may cause a burn.

User's Manual is a guidance book for how to use the products.

The meaning of the symbols are shown below.

- Reference : In case of providing information for helping of product's usages
- Notice : If there's any possibility to occur any damages for the goods and human caused by not following the instruction

※ Please read this manual for the safety before using of goods and keep it in the safe place.

**GROUP-TEK<sup>®</sup>**

# 承认书

## SPECIFICATION FOR APPROVAL

|                           |                                                                                                         |                                                                                                             |                                                                                                               |
|---------------------------|---------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|
| 客户名称<br>CUSTOMER          |                                                                                                         |                                                                                                             |                                                                                                               |
| 客户料号<br>MODEL NO.         |                                                                                                         |                                                                                                             |                                                                                                               |
| 产品名称<br>PART NAME         | POWER TRANSFORMER                                                                                       |                                                                                                             |                                                                                                               |
| 产品型号<br>PART TYPE         | PDT2431SR                                                                                               |                                                                                                             |                                                                                                               |
| 版本<br>REV                 | X2                                                                                                      |                                                                                                             |                                                                                                               |
| 签名<br>SIGNATURE           | 制图: <br>Drawn by 黄春梅 | 审核: <br>Checked by 杨时启 | 批准: <br>Approved by 欧阳佰萍 |
| 客户承认<br>CUSTOMER APPROVAL | 承认印: _____<br>SIGNET                                                                                    |                                                                                                             |                                                                                                               |
|                           | 签名: _____<br>SIGNATURE                                                                                  |                                                                                                             |                                                                                                               |

**深圳市联泰兴电子科技有限公司****SHENZHEN GROUP-TEK ELECTRONICS TECHNOLOGY CO., LTD**

地址: 深圳市宝安区石岩街道应人石工业区伟泰路 1 栋 (P. C: 518108)

ADD: No.1 Block, WeiTai Rd. Ying Ren Shi Industry Park, Shi Yan Sub-District, Bao'An ShenZhen.

TEL: +86-755-29810619 29810976 FAX: +86-755-29810159

Http://www.group-tek.com E-mail:sale1@group-tek.com

PDT2431SR

### 1.Revision History:

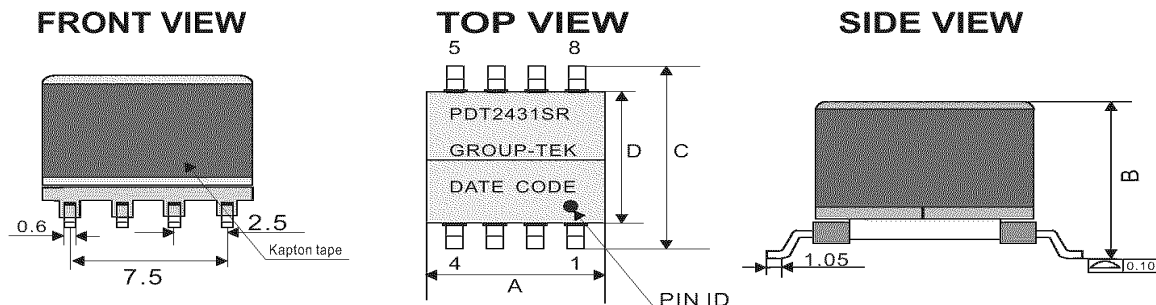
[illegible]

# GROUP-TEK<sup>®</sup>

A Leading Supplier of Magnetic Components

## PDT2431SR

### 2. Mechanical Dimensions:



Note:

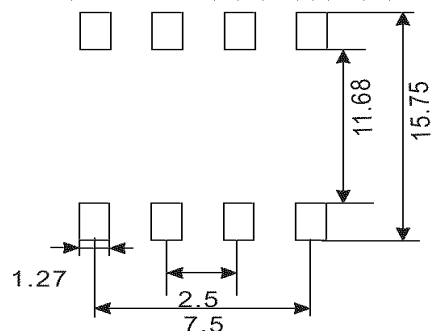
1.Wrap 2Ts of 6mm tape around the finished part.

Unit: mm

| A<br>MAX | B<br>MAX | C<br>MAX | D<br>TYP |
|----------|----------|----------|----------|
| 12.7     | 11.43    | 15.24    | 10.60    |

### SUGGESTED PAD LAYOUT

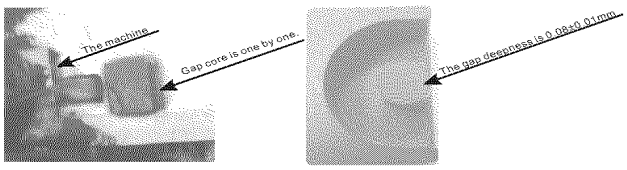
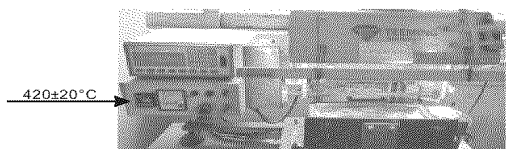
Unit: mm Tolerances: +/-0.2



### 3. Electrical Characteristics :

| Specifications Test: at 25 °C. Operating Temperature: -40 to +105°C |                    |                                       |                   |
|---------------------------------------------------------------------|--------------------|---------------------------------------|-------------------|
| NO.                                                                 | ITEM               | TEST CONDITION                        | SPECIFICATION     |
| 1                                                                   | Inductance         | (3-4)@200kHz, 0.1v                    | 155uH+/-10%.      |
| 2                                                                   | Inductance         | (2-1)@200kHz, 0.1v                    | 30uH+/-15%.       |
| 3                                                                   | Inductance         | (7-5)/(8-6)@200kHz, 0.1v              | 5.3uH+/-15%.      |
| 4                                                                   | Leakage Inductance | (3-4) with shorted other@200kHz, 0.1v | 3.6uH MAX.        |
| 5                                                                   | DCR                | (3-4) @ 25°C                          | 0.414 Ω Max.      |
| 6                                                                   |                    | (7+8)-(5+6) @ 25°C                    | 0.06Ω Max.        |
| 7                                                                   |                    | (2-1) @ 25°C                          | 0.822Ω Max.       |
| 8                                                                   | HI-POT             | PRI TO SEC                            | 1500Vac 1mA 3Sec. |
| 9                                                                   | T/R                | (3-4):(9+10-7+8):(2-1)                | 33:6:14±2%.       |

## 4.Overhauling List.

| NO. | ITEM                        | SPECIFICATION                                                                                                                                                                                                                                     |
|-----|-----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1   | Tape turns                  | 2T                                                                                                                                                                                                                                                |
| 2   | Margin tape thickness       | 0.15mm                                                                                                                                                                                                                                            |
| 3   | Winding turns               | N1:33T N2:6T N3:14T                                                                                                                                                                                                                               |
| 4   | Pins order/Pin connection . | 1T                                                                                                                                                                                                                                                |
| 5   | Marking Information         | <div style="border: 1px solid black; padding: 5px; display: inline-block;">           PDT2431SR<br/>           GROUP-TEK<br/>           DATE CODE<br/>  </div> |
| 6   | Gap the center leg          |                                                                                                                                                                 |
| 7   | Solder Temperature          |                                                                                                                                                                |

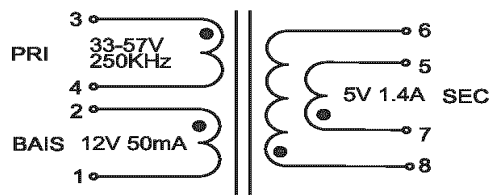
### 5. Winding Information:

| WINDING SEQ. | ST-FN        | WIRE/FOIL                      | TURNS | WRAP INSUL. | MARGIN TAPE | SLEEVE | NOTE |
|--------------|--------------|--------------------------------|-------|-------------|-------------|--------|------|
| 1            | 3--4         | 0.30mm 2UEW                    | 33    | 2T w6.0mm   | N/A         | N/A    | 1    |
| 2            | 8--6<br>7--5 | 0.30mm 2UEW R<br>0.30mm 2UEW N | 6     | 2T w6.0mm   | 2T W0.80mm  | N/A    | 1    |
| 3            | 2--1         | 0.23mm 2UEW                    | 14    | 2T w6.0mm   | 2T W0.80mm  | N/A    | 1    |

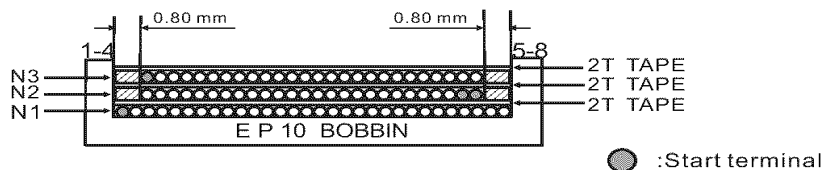
NOTE :

1. -Place the bobbin pin 1 right side of operator.

### 6. Schematic:



### 7. Winding construction



**8. Material List**

| NO. | ITEM.  | MATERIALS                                                                                                          | SUPPLIERS/MANUFACTURES                           | UL FILE NO.  |
|-----|--------|--------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------|
| 1   | BOBBIN | PHENOLIC T375J<br>UL RATING: 94V-0<br>THERMAL RATING: 150°C                                                        | CHANG CHUN PLASTIC CO LTD.                       | QMFZ2.E59481 |
| 2   | CORE   | Ep10 PG232A                                                                                                        | High-tech Electronics Co.,Ltd.                   | N/A          |
| 3   | WIRE   | POLYURETHANE ENAMELED<br>TYPE NO.: 2UEW 0.23mm 0.30mm<br>THERMAL RATING: 180°C                                     | Shing Shun Magnet wire(HuiZhou) Co.,Ltd          | E255839      |
| 4   | TAPE   | ADHESIVE POLYESTER TAPE<br>TYPE NO.: W-001<br>THERMAL RATING: 130°C<br>yellow tape: for inner coils                | Shen zhen Weichuangda Packing material Co.,Ltd   | E333581      |
| 5   | TAPE   | ADHESIVE POLYESTER TAPE<br>TYPE NO.: 519(kapton tape)<br>THERMAL RATING: 200°C<br>Kapton tape: for outside of core | Shen zhen yanda electronic Technology Co.,Ltd    | E309332      |
| 6   | SOLDER | SN/CU: 99.3/0.7                                                                                                    | Gao Xin stannum industry Co.,Ltd                 | N/A          |
| 7   | Glue   | E-500(xx) E-504H-1<br>THERMAL RATING: 130°C                                                                        | Dong Guan city eatto electronic material Co.,Ltd | E218090      |
| 8   | INK    | VIC-120                                                                                                            | Shenshen Huarui samwo group Co.,Ltd              | N/A          |

**9. PACKING INFORMATION:**

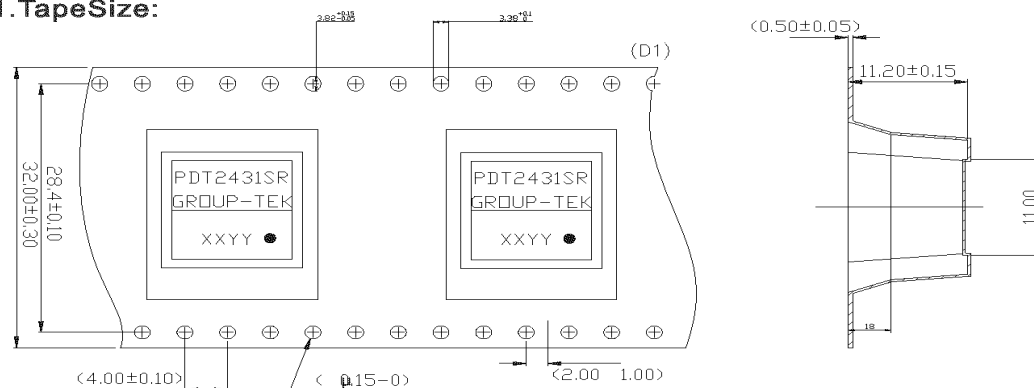
| DESCRIPTION              | QTY |
|--------------------------|-----|
| PIECES PER REEL          | 250 |
| PIECES PER POCKET        | 1   |
| PIECES PER BOX           | 750 |
| REEL PER BOX             | 3   |
| GROSS WEIGHT PER BOX(KG) | TBD |
| NET WEIGHT PER BOX(KG)   | TBD |

## A Leading Supplier of Magnetic Components

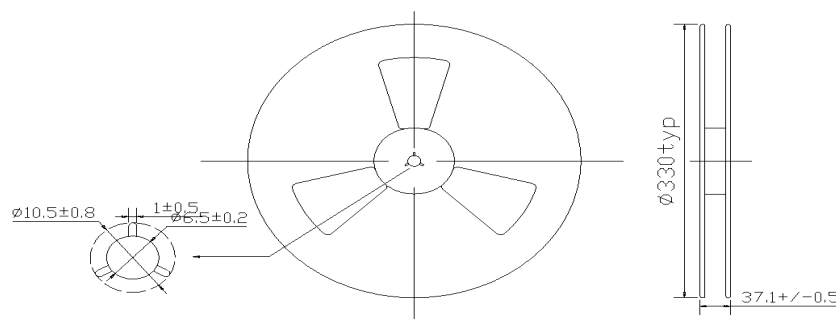
PDT2431SR

Tape and Reel Package (包装图)

1.TapeSize:



## 2. Reel Size:



### 3.Packaging:

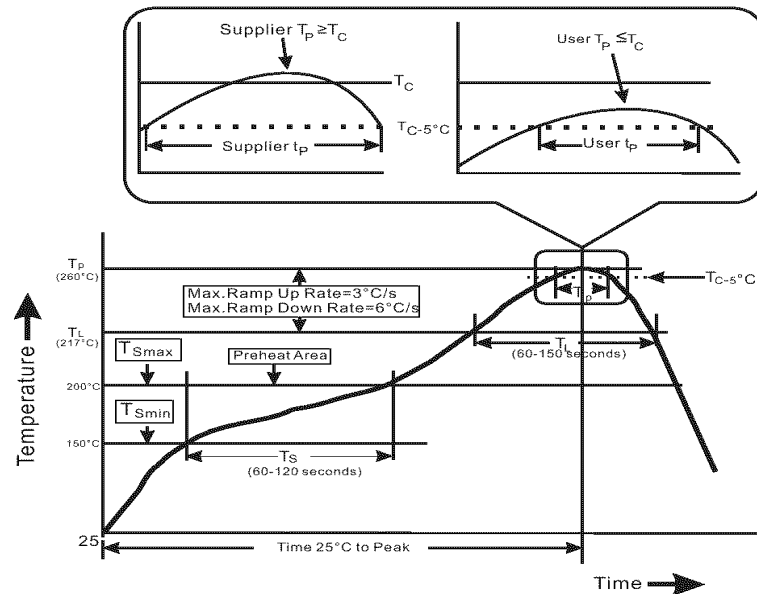
- 3.1 Quantity per reel: 250pcs.  
3.2 Quantity per carton: 750pcs.  
3.3 Carton size: 37.3\*37.3\*21CM3.  
3.4 Unit weight: 3.95g.  
3.5 Carton weight: 5.11kg.

# GROUP-TEK®

A Leading Supplier of Magnetic Components

PDT2431SR

## 1. Recommended Lead Free IR Reflow Curve



| Item | Profile Feature                                                                                                                                          | Sn-Pb Eutectic Assembly                                                                                                                                                                             | Pb-Free Assembly                   |
|------|----------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|
| 1    | Preheat/Soak<br>Temperature Min (T <sub>Smin</sub> )<br>Temperature Max (T <sub>Smax</sub> )<br>Time (ts) from (T <sub>Smin</sub> to T <sub>Smax</sub> ) | 100 °C<br>150 °C<br>60-120 seconds                                                                                                                                                                  | 150 °C<br>200 °C<br>60-120 seconds |
| 2    | Ramp-up rate (TL to Tp)                                                                                                                                  | 3 °C/second max.                                                                                                                                                                                    | 3 °C/second max.                   |
| 3    | Liquidous temperature (TL)<br>Time (tL) maintained above TL                                                                                              | 183 °C<br>60-150 seconds                                                                                                                                                                            | 217 °C<br>60-150 seconds           |
| 4    | Peak package body temperature (Tp)                                                                                                                       | For users Tp must not exceed the Classification temp in Table 4-1 (IPC/JEDEC J-STD-020D.1).<br>For suppliers Tp must equal or exceed the Classification temp in Table 4-1 (IPC/JEDEC J-STD-020D.1). |                                    |
| 5    | Time (tp)* within 5 °C of the specified classification temperature (Tc), see Figure 5-1 (IPC/JEDEC J-STD-020D.1).                                        | 20* seconds                                                                                                                                                                                         | 30* seconds                        |
| 6    | Ramp-down rate (Tp to TL)                                                                                                                                | 6 °C/second max.                                                                                                                                                                                    | 6 °C/second max.                   |
| 7    | Time 25 °C to peak temperature                                                                                                                           | 6 minutes max.                                                                                                                                                                                      | 8 minutes max.                     |

\* Tolerance for peak profile temperature (Tp) is defined as a supplier minimum and a user maximum.

**Note:**

- 1: All temperatures refer to the center of the package, measured on the package body surface that is facing up during assembly reflow (e.g., live-bug). If parts are reflowed in other than the normal live-bug assembly reflow orientation (i.e., dead-bug),  $T_p$  shall be within  $\pm 2^\circ\text{C}$  of the live-bug  $T_p$  and still to accurately measure actual peak package body temperatures refer to JEP140 for recommended thermocouple use. meet the  $T_c$  requirements, otherwise, the profile shall be adjusted to achieve the latter.
- 2: Reflow profiles in this document are for classification/preconditioning and are not meant to specify board assembly profiles. Actual board assembly profiles should be developed based on specific process needs and board designs and should not exceed the parameters in Table 5-2. For example, if  $T_c$  is  $260^\circ\text{C}$  and time  $t_p$  is 30 seconds, this means the following for the supplier and the user. For a supplier: The peak temperature must be at least  $260^\circ\text{C}$ . The time above  $255^\circ\text{C}$  must be at least 30 seconds. For a user: The peak temperature must not exceed  $260^\circ\text{C}$ . The time above  $255^\circ\text{C}$  must not exceed 30 seconds.
- 3: All components in the test load shall meet the classification profile requirements.
- 4: SMD packages classified to a given moisture sensitivity level by using Procedures or Criteria defined within any previous version of J-STD-020, JESD22-A112 (rescinded), IPC-SM-786 (rescinded) do not need to be reclassified to the current revision unless a change in classification level or a higher peak classification temperature is desired.

**2. Reliability Test Criteria.**

- 2.1 Operating temperature range:  $0^\circ\text{C}$  to  $70^\circ\text{C}$
- 2.2 Terminal strength: Pull test withstand  $9.8\text{N } 60\pm 0.5\text{S}$  no looseness or movement.
- 2.3 Solderability: Dipped in  $245^\circ\text{C} \pm 5^\circ\text{C}$  molten solder for  $3\pm 0.5$  seconds, 95% min shall be smooth any and bright
- 2.4 Resistance to soldering heat: Convection reflow condition setting: peak temperature at  $260^\circ\text{C} \pm 5^\circ\text{C}$  above  $217^\circ\text{C}$  for 60-150 seconds, ramp-up rate  $2-3^\circ\text{C/s}$ . Ramp-down rate  $6^\circ\text{C/s}$  Max. No mechanical problem found. No electrical failure found per our specification.
- 2.5 Vibration: 1.5mm amplitude total excursion 10-55-10 Hz traversed in 1 minute, x.y.z, axis for 2 hours. Shall not be any abnormality.
- 2.6 Random drop (Packing condition): Height 60cm, 3 times on the wood floorboard, shall not be any abnormality.
- 2.7 Damp Heat:  $60\pm 2^\circ\text{C}$ ,  $93\pm 3\%$  RH 96 hours.
- 2.8 Change of temperature: exposed 5 cycle; each consisting of 30 minutes at  $-20\pm 2^\circ\text{C}$ , 2-3 minutes at  $20\pm 2^\circ\text{C}$ , 30 minutes at  $85\pm 2^\circ\text{C}$ , 2-3 minutes at  $20\pm 2^\circ\text{C}$ .

**Remarks:**

After reliability test per item 7,8,9,10 in prior to the test as specified, the transformer / coil would be exposed to the room temperature for 1-2 hours, the component meets all requirements according to this specification.

This parts should not contain any substances which are specified in AH60-0033K

| NO | PART NAME                 | CODE NO. | MATERIAL | Q'TY | REMARK |
|----|---------------------------|----------|----------|------|--------|
| 1  | ASSY-XNV-6012(M)/6022R(M) | 058056   | MATERIAL | 1    | REMARK |

STANDARD TOLERANCE

| DIV      | tol 1 | tol 2 | tol 3 | tol 4 | tol 5 |
|----------|-------|-------|-------|-------|-------|
| 0-16     | ±0.05 | ±0.1  | ±0.1  | ±0.2  | ±0.3  |
| 16-63    | ±0.05 | ±0.1  | ±0.2  | ±0.3  | ±0.4  |
| 63-250   | ±0.1  | ±0.2  | ±0.3  | ±0.4  | ±0.4  |
| 250-1000 | ±0.2  | ±0.3  | ±0.4  | ±0.5  | ±0.6  |

|        |  |       |       |          |          |          |            |                           |
|--------|--|-------|-------|----------|----------|----------|------------|---------------------------|
| CHANGE |  | UNIT  | mm    | DESIGN   | CHECK    | APPROVAL | PART NAME  | ASSY-XNV-6012(M)/6022R(M) |
|        |  | SCALE | 1 / 1 | Design   | Check    | Approval | MODEL NAME | XNV-6012(M)/6022R(M)      |
|        |  |       |       | 15.08.01 | 15.08.01 | 15.08.01 |            |                           |
|        |  |       |       |          |          |          |            |                           |

Project No. 4788307259  
 Compliance  
 Review  
 Conducted by: \_\_\_\_\_

File E158873

Page 1

Printed Name

Signature

Date \_\_\_\_\_

Standard SCC Requirements and Guidance - Product Certification Body Accreditation Program Edition/ Revision Date 2016-04-06

| Clause/Par. Reference and Construction Requirement                                                                                                                                                                                                                                                                                                            | Comply |    |     | Comments/Measurements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Inst. ID No. |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|                                                                                                                                                                                                                                                                                                                                                               | Yes    | No | N/A |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |
| 9.2.3 CBs shall include dual language safety labeling within their product certification requirements, if so required by the standard or by the authority having jurisdiction.                                                                                                                                                                                |        |    |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |              |
| The manufacturer has confirmed they have the ability to include English and French safety labeling exactly as specified in the product standard; or, if NOT specified in the product standard, the ability to include English and French safety labelling consisting of markings associated with the signal words DANGER, WARNING, and CAUTION when required. | X      |    |     | The ability of the manufacturer to include these markings was verified by either (1) visual inspection of the markings on the actual product or (2) draft of labels that will be applied to the product or (3) written confirmation from the customer of the markings that will appear on the product. If the product standard provides the exact translation, the evidence must match the exact translation. If the product standard does NOT provide the exact translation, the evidence must simply include both the English and French text (no verification of translation is required). | N/A          |

Project No. 4788307259

File E158873

Page 2

Compliance

Review

Conducted by:

Printed Name

Signature

Date

| Clause/Par. Reference and Construction Requirement                                                                                                             | Comply |    |     | Comments/Measurements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Inst. ID No. |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|----|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|
|                                                                                                                                                                | Yes    | No | N/A |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |              |
| Manufacturer has a method to manage distribution of products, IF all products with the Canadian certification mark are NOT going to include the dual language. | X      |    |     | <p>Evaluation staff are to only verify that the manufacturer has a method to control distribution.</p> <p>Evaluation staff do not have to record the method of control nor are the evaluation staff expected to verify the effectiveness of the method of control. This requirement to verify that a method exists will be noted in the FUS Procedure. The UL Field Engineer will verify the method during surveillance.</p> <p>If the manufacturer is going to include the dual language on all products with the Canadian certification mark, then this item is N/A; no further action required.</p> | N/A          |

NETWORK CAMERA, XNV-6022R  
PoE 37-57V  0.19A  
M/C:XXXXXXXXXX Fac. ID : T  
  
Jan 2018 S/N:XXXXXXXXXXXXXX  
MAC ADDRESS: XX-XX-XX-XX-XX-XX  
HANWHA TECHWIN CO., LTD. MADE IN CHINA

 **ITE LISTED**  
9T96 E158873   
  

NETWORK CAMERA, XNV-6022RM  
PoE 37-57V  0.19A  
M/C:XXXXXXXXXX Fac. ID : T  
  
Jan 2018 S/N:XXXXXXXXXXXXXX  
MAC ADDRESS: XX-XX-XX-XX-XX-XX  
HANWHA TECHWIN CO., LTD. MADE IN CHINA

 **ITE LISTED**  
9T96 E158873   
  

Test Report issued under the responsibility of:



| <b>TEST REPORT</b><br><b>IEC 62471</b><br><b>Photobiological safety of lamps and lamp systems</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| Report Reference No. ....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 16-009081-01                                                                        |
| Date of issue .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | 2016-03-14                                                                          |
| Total number of pages .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 20 pages                                                                            |
| CB Testing Laboratory .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | KTL (Korea Testing Laboratory)                                                      |
| Address .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 87, Digital-ro 26-gil, Guro-gu, Seoul, 08389, Rep. of Korea                         |
| Applicant's name .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Hanwha Techwin Co., Ltd.                                                            |
| Address .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 1204, Changwondae-ro, Sungsan-gu, Changwon-si, Gyeongsangnam-do, Korea              |
| <b>Test specification:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                     |
| Standard .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | IEC 62471:2006 (First Edition) + European Group Difference and National Differences |
| Test procedure .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | N/A                                                                                 |
| Non-standard test method .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | N/A                                                                                 |
| Test Report Form No. ....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | IEC62471A                                                                           |
| TRF Originator .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | VDE Testing and Certification Institute                                             |
| Master TRF .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Dated 2009-05                                                                       |
| Copyright © 2009 IEC System for Conformity Testing and Certification of Electrical Equipment (IECEE), Geneva, Switzerland. All rights reserved.<br>This publication may be reproduced in whole or in part for non-commercial purposes as long as the IECEE is acknowledged as copyright owner and source of the material. IECEE takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.<br>If this Test Report Form is used by non-IECEE members, the IECEE/IEC logo and the reference to the CB Scheme procedure shall be removed. |                                                                                     |
| <b>This report is not valid as a CB Test Report unless signed by an approved CB Testing Laboratory and appended to a CB Test Certificate issued by an NCB in accordance with IECEE 02.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                     |
| Test item description .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ANALOG CAMERA                                                                       |
| Trade Mark .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | -                                                                                   |
| Manufacturer .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Same as applicant                                                                   |
| Model/Type reference .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | SNV-L6013RN                                                                         |
| Ratings .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | POE, Exempt Group                                                                   |

TRF No. IEC62471A



\* 위 마크는 추후 전자확인증 대조 프로그램에서 원본대조시 사용되는 2D코드입니다.



|                                                                   |                                                                                                   |
|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------|
| <b>Testing procedure and testing location:</b>                    |                                                                                                   |
| <input checked="" type="checkbox"/> <b>CB Testing Laboratory:</b> | <b>CTL (Korea Testing Laboratory)</b>                                                             |
| Testing location/ address .....                                   | 87, Digital-ro 26-gil, Guro-gu, Seoul, 08389, Rep. of Korea                                       |
| <input type="checkbox"/> <b>Associated CB Laboratory:</b>         |                                                                                                   |
| Testing location/ address .....                                   |                                                                                                   |
| Tested by (name + signature) .....                                | JinWook Kwon   |
| Approved by (+ signature) .....                                   | Jae-Hoon Jung  |
| <input type="checkbox"/> Testing procedure: TMP                   |                                                                                                   |
| Tested by (name + signature) .....                                |                                                                                                   |
| Approved by (+ signature) .....                                   |                                                                                                   |
| Testing location/ address .....                                   |                                                                                                   |
| <input type="checkbox"/> Testing procedure: WMT                   |                                                                                                   |
| Tested by (name + signature) .....                                |                                                                                                   |
| Witnessed by (+ signature) .....                                  |                                                                                                   |
| Approved by (+ signature) .....                                   |                                                                                                   |
| Testing location/ address .....                                   |                                                                                                   |
| <input type="checkbox"/> Testing procedure: SMT                   |                                                                                                   |
| Tested by (name + signature) .....                                |                                                                                                   |
| Approved by (+ signature) .....                                   |                                                                                                   |
| Supervised by (+ signature) .....                                 |                                                                                                   |
| Testing location/ address .....                                   |                                                                                                   |
| <input type="checkbox"/> Testing procedure: RMT                   |                                                                                                   |
| Tested by (name + signature) .....                                |                                                                                                   |
| Approved by (+ signature) .....                                   |                                                                                                   |
| Supervised by (+ signature) .....                                 |                                                                                                   |
| Testing location/ address .....                                   |                                                                                                   |

TRF No. IEC62471A



※ 위 마크는 추후 전자확인용 대조 프로그램에서 원본대조시 사용되는 2D코드입니다.



|                                                                                                                                                                                                                                                      |                                                                                                                           |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| <b>Summary of testing:</b>                                                                                                                                                                                                                           |                                                                                                                           |
| <b>Tests performed (name of test and test clause):</b><br>- All clauses<br>- by supplying power to the model SNV-L6013RN with PoE.                                                                                                                   | <b>Testing location:</b><br>KTL (Korea Testing Laboratory)<br>87, Digital-ro 26-gil, Guro-gu, Seoul, 08389, Rep. of Korea |
| <b>Summary of compliance with National Differences:</b><br>The sample(s) tested complies with the requirements of EN 62471:2008.<br>See Attachment at the end of this report for compliance with European Group Difference and National Differences. |                                                                                                                           |
| <b>Copy of marking plate:</b><br><br>                                                                                                                                                                                                                |                                                                                                                           |
| <b>Item covered</b><br>Model SNV-L6014RM *( * mean N: NT & P: PAL) are identical to the tested model SNV-L6013RN except only model name.                                                                                                             |                                                                                                                           |

TRF No. IEC62471A



\* 위 마크는 추후 전자확인증 대조 프로그램에서 원본대조시 사용되는 2D코드입니다.



| <b>Test item particulars</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------|------------|--------------|-------|--------|------------|-----------|------------------|--------------------------------------------------|---|
| Tested lamp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <input checked="" type="checkbox"/> continuous wave lamps <input type="checkbox"/> pulsed lamps                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Tested lamp system                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | -                                                                                                                                          |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Lamp classification group                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input checked="" type="checkbox"/> exempt <input type="checkbox"/> risk 1 <input type="checkbox"/> risk 2 <input type="checkbox"/> risk 3 |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Lamp cap                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | -                                                                                                                                          |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Bulb                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | LED                                                                                                                                        |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Rated of the lamp                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | -                                                                                                                                          |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Furthermore marking on the lamp                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | -                                                                                                                                          |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Seasoning of lamps according IEC standard                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                                                                                                                          |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Used measurement instrument                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | See page 15                                                                                                                                |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Temperature by measurement                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 23.1 °C                                                                                                                                    |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Information for safety use                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Not required                                                                                                                               |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| <b>Possible test case verdicts:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| - test case does not apply to the test object : N/A                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| - test object does meet the requirement : P (Pass)                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| - test object does not meet the requirement : F (Fail)                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| <b>Testing:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Date of receipt of test item : 2016-02-18                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| Date (s) of performance of tests : 2016-02-18~ 03-14                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| <b>General remarks:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| The test results presented in this report relate only to the object tested.<br>This report shall not be reproduced, except in full, without the written approval of the Issuing testing laboratory.<br>"(See Enclosure #)" refers to additional information appended to the report.<br>"(See appended table)" refers to a table appended to the report.<br>Throughout this report a comma (point) is used as the decimal separator.<br>List of test equipment must be kept on file and available for review. |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| <b>General product information:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| - LED Package                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                            |                                                  |            |              |       |        |            |           |                  |                                                  |   |
| <table border="1"> <thead> <tr> <th>Manufacturer</th> <th>Model</th> <th>Rating</th> <th>Color Rank</th> </tr> </thead> <tbody> <tr> <td>New-light</td> <td>NLN1249KN-I8530P</td> <td>V<sub>F</sub>= 1.45V<br/>I<sub>F</sub>=100 mA</td> <td>-</td> </tr> </tbody> </table>                                                                                                                                                                                                                                  |                                                                                                                                            |                                                  |            | Manufacturer | Model | Rating | Color Rank | New-light | NLN1249KN-I8530P | V <sub>F</sub> = 1.45V<br>I <sub>F</sub> =100 mA | - |
| Manufacturer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Model                                                                                                                                      | Rating                                           | Color Rank |              |       |        |            |           |                  |                                                  |   |
| New-light                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | NLN1249KN-I8530P                                                                                                                           | V <sub>F</sub> = 1.45V<br>I <sub>F</sub> =100 mA | -          |              |       |        |            |           |                  |                                                  |   |

TRF No. IEC62471A



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| IEC 62471 |                                                                                                                                                                                                                                                                                                                                                                |                 |         |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                                                                                                                                                                                             | Result – Remark | Verdict |
| <b>4</b>  | <b>EXPOSURE LIMITS</b>                                                                                                                                                                                                                                                                                                                                         |                 |         |
| 4.1       | General                                                                                                                                                                                                                                                                                                                                                        |                 | P       |
|           | The exposure limits in this standard is not less than 0,01 ms and not more than any 8-hour period and should be used as guides in the control of exposure                                                                                                                                                                                                      |                 | P       |
|           | Detailed spectral data of a light source are generally required only if the luminance of the source exceeds $10^4 \text{ cd/m}^2$                                                                                                                                                                                                                              | see clause 4.3  | P       |
| 4.3       | Hazard exposure limits                                                                                                                                                                                                                                                                                                                                         |                 | P       |
| 4.3.1     | Actinic UV hazard exposure limit for the skin and eye                                                                                                                                                                                                                                                                                                          |                 | P       |
|           | The exposure limit for effective radiant exposure is $30 \text{ J}\cdot\text{m}^{-2}$ within any 8-hour period                                                                                                                                                                                                                                                 |                 | P       |
|           | To protect against injury of the eye or skin from ultraviolet radiation exposure produced by a broadband source, the effective integrated spectral irradiance, $E_s$ , of the light source shall not exceed the levels defined by:                                                                                                                             |                 | P       |
|           | $E_s \cdot t = \sum_{200}^{400} \sum_t E_{\lambda}(\lambda, t) \cdot S_{UV}(\lambda) \cdot \Delta t \cdot \Delta \lambda \leq 30 \quad \text{J}\cdot\text{m}^{-2}$                                                                                                                                                                                             |                 | P       |
|           | The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye or skin shall be computed by:                                                                                                                                                                                                                                     |                 | P       |
|           | $t_{\max} = \frac{30}{E_s} \quad \text{s}$                                                                                                                                                                                                                                                                                                                     |                 | P       |
| 4.3.2     | Near-UV hazard exposure limit for eye                                                                                                                                                                                                                                                                                                                          |                 | P       |
|           | For the spectral region 315 nm to 400 nm (UV-A) the total radiant exposure to the eye shall not exceed $10000 \text{ J}\cdot\text{m}^{-2}$ for exposure times less than 1000 s. For exposure times greater than 1000 s (approximately 16 minutes) the UV-A irradiance for the unprotected eye, $E_{UVA}$ , shall not exceed $10 \text{ W}\cdot\text{m}^{-2}$ . |                 | P       |
|           | The permissible time for exposure to ultraviolet radiation incident upon the unprotected eye for time less than 1000 s, shall be computed by:                                                                                                                                                                                                                  |                 | P       |
|           | $t_{\max} \leq \frac{10\,000}{E_{UVA}} \quad \text{s}$                                                                                                                                                                                                                                                                                                         |                 | P       |
| 4.3.3     | Retinal blue light hazard exposure limit                                                                                                                                                                                                                                                                                                                       |                 | P       |
|           | To protect against retinal photochemical injury from chronic blue-light exposure, the integrated spectral radiance of the light source weighted against the blue-light hazard function, $B(\lambda)$ , i.e., the blue-light weighted radiance, $L_B$ , shall not exceed the levels defined by:                                                                 |                 | P       |

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| IEC 62471 |                                                                                                                                                                                                                                                                                                |                                                           |         |
|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                                                                                                                             | Result – Remark                                           | Verdict |
|           | $L_B \cdot t = \sum_{300}^{700} \sum_i L_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 10^6 \quad \text{J} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                         | for $t \leq 10^4 \text{ s}$ $t_{\max} = \frac{10^6}{L_B}$ | P       |
|           | $L_B = \sum_{300}^{700} L_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                                                     | for $t > 10^4 \text{ s}$                                  | P       |
| 4.3.4     | Retinal blue light hazard exposure limit - small source                                                                                                                                                                                                                                        |                                                           | P       |
|           | Thus the spectral irradiance at the eye $E_{\lambda}$ , weighted against the blue-light hazard function $B(\lambda)$ shall not exceed the levels defined by:                                                                                                                                   | see table 4.2                                             | P       |
|           | $E_B \cdot t = \sum_{300}^{700} \sum_i E_{\lambda}(\lambda, t) \cdot B(\lambda) \cdot \Delta\lambda \leq 100 \quad \text{J} \cdot \text{m}^{-2}$                                                                                                                                               |                                                           | P       |
|           | $E_B = \sum_{300}^{700} E_{\lambda} \cdot B(\lambda) \cdot \Delta\lambda \leq 1 \quad \text{W} \cdot \text{m}^{-2}$                                                                                                                                                                            |                                                           | P       |
| 4.3.5     | Retinal thermal hazard exposure limit                                                                                                                                                                                                                                                          |                                                           | P       |
|           | To protect against retinal thermal injury, the integrated spectral radiance of the light source, $L_{\lambda}$ , weighted by the burn hazard weighting function $R(\lambda)$ (from Figure 4.2 and Table 4.2), i.e., the burn hazard weighted radiance, shall not exceed the levels defined by: | see table 4.2                                             | P       |
|           | $L_R = \sum_{380}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{50\,000}{\alpha \cdot t^{0.25}} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                  | ( $10 \mu\text{s} \leq t \leq 10 \text{ s}$ )             | P       |
| 4.3.6     | Retinal thermal hazard exposure limit – weak visual stimulus                                                                                                                                                                                                                                   |                                                           | N/A     |
|           | For an infrared heat lamp or any near-infrared source where a weak visual stimulus is inadequate to activate the aversion response, the near infrared (780 nm to 1400 nm) radiance, $L_{IR}$ , as viewed by the eye for exposure times greater than 10 s shall be limited to:                  |                                                           | N/A     |
|           | $L_{IR} = \sum_{780}^{1400} L_{\lambda} \cdot R(\lambda) \cdot \Delta\lambda \leq \frac{6\,000}{\alpha} \quad \text{W} \cdot \text{m}^{-2} \cdot \text{sr}^{-1}$                                                                                                                               |                                                           | N/A     |
| 4.3.7     | Infrared radiation hazard exposure limits for the eye                                                                                                                                                                                                                                          |                                                           | P       |
|           | The avoid thermal injury of the cornea and possible delayed effects upon the lens of the eye (cataractogenesis), ocular exposure to infrared radiation, $E_{IR}$ , over the wavelength range 780 nm to 3000 nm, for times less than 1000 s, shall not exceed:                                  |                                                           | P       |
|           | $E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 18\,000 \cdot t^{-0.75} \quad \text{W} \cdot \text{m}^{-2}$                                                                                                                                                                   |                                                           | P       |
|           | For times greater than 1000 s the limit becomes:                                                                                                                                                                                                                                               |                                                           | P       |

TRF No. IEC62471A



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| IEC 62471 |                                                                                                                                                                            |                                 |         |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|---------|
| Clause    | Requirement + Test                                                                                                                                                         | Result – Remark                 | Verdict |
|           | $E_{IR} = \sum_{780}^{3000} E_{\lambda} \cdot \Delta\lambda \leq 100 \quad W \cdot m^{-2}$                                                                                 |                                 | P       |
| 4.3.8     | Thermal hazard exposure limit for the skin                                                                                                                                 |                                 | N/A     |
|           | Visible and infrared radiant exposure (380 nm to 3000 nm) of the skin shall be limited to:                                                                                 |                                 | N/A     |
|           | $E_{H,T} = \sum_{380}^{3000} \sum_t E_{\lambda}(\lambda,t) \cdot \Delta t \cdot \Delta\lambda \leq 20\,000 \cdot t^{0.25} \quad J \cdot m^{-2}$                            |                                 | N/A     |
| <b>5</b>  | <b>MEASUREMENT OF LAMPS AND LAMP SYSTEMS</b>                                                                                                                               |                                 | P       |
| 5.1       | Measurement conditions                                                                                                                                                     |                                 | P       |
|           | Measurement conditions shall be reported as part of the evaluation against the exposure limits and the assignment of risk classification.                                  |                                 | P       |
| 5.1.1     | Lamp ageing (seasoning)                                                                                                                                                    |                                 | P       |
|           | Seasoning of lamps shall be done as stated in the appropriate IEC lamp standard.                                                                                           |                                 | P       |
| 5.1.2     | Test environment                                                                                                                                                           |                                 | P       |
|           | For specific test conditions, see the appropriate IEC lamp standard or in absence of such standards, the appropriate national standards or manufacturer's recommendations. | manufacturer's recommendations. | P       |
| 5.1.3     | Extraneous radiation                                                                                                                                                       | No extraneous radiation         | P       |
|           | Careful checks should be made to ensure that extraneous sources of radiation and reflections do not add significantly to the measurement results.                          |                                 | P       |
| 5.1.4     | Lamp operation                                                                                                                                                             |                                 | P       |
|           | Operation of the test lamp shall be provided in accordance with:                                                                                                           |                                 | P       |
|           | – the appropriate IEC lamp standard, or                                                                                                                                    |                                 | N/A     |
|           | – the manufacturer's recommendation                                                                                                                                        |                                 | P       |
| 5.1.5     | Lamp system operation                                                                                                                                                      |                                 | P       |
|           | The power source for operation of the test lamp shall be provided in accordance with:                                                                                      |                                 | N/A     |
|           | – the appropriate IEC standard, or                                                                                                                                         |                                 | N/A     |
|           | – the manufacturer's recommendation                                                                                                                                        |                                 | P       |
| 5.2       | Measurement procedure                                                                                                                                                      |                                 | P       |
| 5.2.1     | Irradiance measurements                                                                                                                                                    |                                 | P       |
|           | Minimum aperture diameter 7mm.                                                                                                                                             |                                 | P       |
|           | Maximum aperture diameter 50 mm.                                                                                                                                           |                                 | P       |

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| IEC 62471 |                                                                                                                                                                                        |                    |         |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                     | Result – Remark    | Verdict |
|           | The measurement shall be made in that position of the beam giving the maximum reading.                                                                                                 |                    | P       |
|           | The measurement instrument is adequate calibrated.                                                                                                                                     |                    | P       |
| 5.2.2     | Radiance measurements                                                                                                                                                                  |                    | P       |
| 5.2.2.1   | Standard method                                                                                                                                                                        |                    | P       |
|           | The measurements made with an optical system.                                                                                                                                          |                    | P       |
|           | The instrument shall be calibrated to read in absolute radiant power per unit receiving area and per unit solid angle to acceptance averaged over the field of view of the instrument. |                    | P       |
| 5.2.2.2   | Alternative method                                                                                                                                                                     |                    | N/A     |
|           | Alternatively to an imaging radiance set-up, an irradiance measurement set-up with a circular field stop placed at the source can be used to perform radiance measurements.            |                    | N/A     |
| 5.2.3     | Measurement of source size                                                                                                                                                             | 14.9 mrad          | P       |
|           | The determination of $\alpha$ , the angle subtended by a source, requires the determination of the 50% emission points of the source.                                                  |                    | P       |
| 5.2.4     | Pulse width measurement for pulsed sources                                                                                                                                             | Continuous sources | N/A     |
|           | The determination of $\Delta t$ , the nominal pulse duration of a source, requires the determination of the time during which the emission is > 50% of its peak value.                 |                    | N/A     |
| 5.3       | Analysis methods                                                                                                                                                                       |                    | P       |
| 5.3.1     | Weighting curve interpolations                                                                                                                                                         |                    | P       |
|           | To standardize interpolated values, use linear interpolation on the log of given values to obtain intermediate points at the wavelength intervals desired.                             | see table 4.1      | P       |
| 5.3.2     | Calculations                                                                                                                                                                           |                    | P       |
|           | The calculation of source hazard values shall be performed by weighting the spectral scan by the appropriate function and calculating the total weighted energy.                       |                    | P       |
| 5.3.3     | Measurement uncertainty                                                                                                                                                                |                    | N/A     |
|           | The quality of all measurement results must be quantified by an analysis of the uncertainty.                                                                                           |                    | N/A     |
| <b>6</b>  | <b>LAMP CLASSIFICATION</b>                                                                                                                                                             |                    |         |
|           | For the purposes of this standard it was decided that the values shall be reported as follows:                                                                                         | see table 6.1      | P       |

TRF No. IEC62471A



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| IEC 62471 |                                                                                                                                                                                                                               |                 |         |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                                                            | Result – Remark | Verdict |
|           | – for lamps intended for general lighting service, the hazard values shall be reported as either irradiance or radiance values at a distance which produces an illuminance of 500 lux, but not at a distance less than 200 mm |                 | N/A     |
|           | – for all other light sources, including pulsed lamp sources, the hazard values shall be reported at a distance of 200 mm                                                                                                     |                 | P       |
| 6.1       | Continuous wave lamps                                                                                                                                                                                                         |                 | P       |
| 6.1.1     | Except Group                                                                                                                                                                                                                  |                 | P       |
|           | In the except group are lamps, which does not pose any photobiological hazard. The requirement is met by any lamp that does not pose:                                                                                         | See table 6.1   | P       |
|           | – an actinic ultraviolet hazard ( $E_S$ ) within 8-hours exposure (30000 s), nor                                                                                                                                              |                 | P       |
|           | – a near-UV hazard ( $E_{UVA}$ ) within 1000 s, (about 16 min), nor                                                                                                                                                           |                 | P       |
|           | – a retinal blue-light hazard ( $L_B$ ) within 10000 s (about 2.8 h), nor                                                                                                                                                     |                 | P       |
|           | – a retinal thermal hazard ( $L_R$ ) within 10 s, nor                                                                                                                                                                         |                 | P       |
|           | – an infrared radiation hazard for the eye ( $E_{IR}$ ) within 1000 s                                                                                                                                                         |                 | P       |
| 6.1.2     | Risk Group 1 (Low-Risk)                                                                                                                                                                                                       |                 | N/A     |
|           | In this group are lamps, which exceeds the limits for the except group but that does not pose:                                                                                                                                |                 | N/A     |
|           | – an actinic ultraviolet hazard ( $E_S$ ) within 10000 s, nor                                                                                                                                                                 |                 | N/A     |
|           | – a near ultraviolet hazard ( $E_{UVA}$ ) within 300 s, nor                                                                                                                                                                   |                 | N/A     |
|           | – a retinal blue-light hazard ( $L_B$ ) within 100 s, nor                                                                                                                                                                     |                 | N/A     |
|           | – a retinal thermal hazard ( $L_R$ ) within 10 s, nor                                                                                                                                                                         |                 | N/A     |
|           | – an infrared radiation hazard for the eye ( $E_{IR}$ ) within 100 s                                                                                                                                                          |                 | N/A     |
|           | Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard ( $L_{IR}$ ), within 100 s are in Risk Group 1.                                                            |                 | N/A     |
| 6.1.3     | Risk Group 2 (Moderate-Risk)                                                                                                                                                                                                  |                 | N/A     |
|           | This requirement is met by any lamp that exceeds the limits for Risk Group 1, but that does not pose:                                                                                                                         |                 | N/A     |
|           | – an actinic ultraviolet hazard ( $E_S$ ) within 1000 s exposure, nor                                                                                                                                                         |                 | N/A     |
|           | – a near ultraviolet hazard ( $E_{UVA}$ ) within 100 s, nor                                                                                                                                                                   |                 | N/A     |
|           | – a retinal blue-light hazard ( $L_B$ ) within 0,25 s                                                                                                                                                                         |                 | N/A     |

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| IEC 62471 |                                                                                                                                                                                                                                                          |                 |         |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|---------|
| Clause    | Requirement + Test                                                                                                                                                                                                                                       | Result – Remark | Verdict |
|           | (aversion response), nor                                                                                                                                                                                                                                 |                 |         |
|           | – a retinal thermal hazard ( $L_R$ ) within 0,25 s (aversion response), nor                                                                                                                                                                              |                 | N/A     |
|           | – an infrared radiation hazard for the eye ( $E_{IR}$ ) within 10 s                                                                                                                                                                                      |                 | N/A     |
|           | Lamps that emit infrared radiation without a strong visual stimulus and do not pose a near-infrared retinal hazard ( $L_{IR}$ ), within 10 s are in Risk Group 2.                                                                                        |                 | N/A     |
| 6.1.4     | Risk Group 3 (High-Risk)                                                                                                                                                                                                                                 |                 | N/A     |
|           | Lamps which exceed the limits for Risk Group 2 are in Group 3.                                                                                                                                                                                           |                 | N/A     |
| 6.2       | Pulsed lamps                                                                                                                                                                                                                                             |                 | N/A     |
|           | Pulse lamp criteria shall apply to a single pulse and to any group of pulses within 0,25 s.                                                                                                                                                              |                 | N/A     |
|           | A pulsed lamp shall be evaluated at the highest nominal energy loading as specified by the manufacturer.                                                                                                                                                 |                 | N/A     |
|           | The risk group determination of the lamp being tested shall be made as follows:                                                                                                                                                                          |                 | N/A     |
|           | – a lamp that exceeds the exposure limit shall be classified as belonging to Risk Group 3 (High-Risk)                                                                                                                                                    |                 | N/A     |
|           | – for single pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL shall be classified as belonging to the Exempt Group                                                                                         |                 | N/A     |
|           | – for repetitively pulsed lamps, a lamp whose weighted radiant exposure or weighted radiance dose is below the EL, shall be evaluated using the continuous wave risk criteria discussed in clause 6.1, using time averaged values of the pulsed emission |                 | N/A     |
|           |                                                                                                                                                                                                                                                          |                 |         |

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| IEC 62471 |                    |                 |         |
|-----------|--------------------|-----------------|---------|
| Clause    | Requirement + Test | Result - Remark | Verdict |

| Table 4.1 Spectral weighting function for assessing ultraviolet hazards for skin and eye                                                                                                           |                                      |                              | N/A                                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------|--------------------------------------|
| Wavelength<br>$\lambda$ , nm                                                                                                                                                                       | UV hazard function<br>$S_w(\lambda)$ | Wavelength<br>$\lambda$ , nm | UV hazard function<br>$S_w(\lambda)$ |
| 200                                                                                                                                                                                                | 0,030                                | 313*                         | 0,006                                |
| 205                                                                                                                                                                                                | 0,051                                | 315                          | 0,003                                |
| 210                                                                                                                                                                                                | 0,075                                | 316                          | 0,0024                               |
| 215                                                                                                                                                                                                | 0,095                                | 317                          | 0,0020                               |
| 220                                                                                                                                                                                                | 0,120                                | 318                          | 0,0016                               |
| 225                                                                                                                                                                                                | 0,150                                | 319                          | 0,0012                               |
| 230                                                                                                                                                                                                | 0,190                                | 320                          | 0,0010                               |
| 235                                                                                                                                                                                                | 0,240                                | 322                          | 0,00067                              |
| 240                                                                                                                                                                                                | 0,300                                | 323                          | 0,00054                              |
| 245                                                                                                                                                                                                | 0,360                                | 325                          | 0,00050                              |
| 250                                                                                                                                                                                                | 0,430                                | 328                          | 0,00044                              |
| 254*                                                                                                                                                                                               | 0,500                                | 330                          | 0,00041                              |
| 255                                                                                                                                                                                                | 0,520                                | 333*                         | 0,00037                              |
| 260                                                                                                                                                                                                | 0,650                                | 335                          | 0,00034                              |
| 265                                                                                                                                                                                                | 0,810                                | 340                          | 0,00028                              |
| 270                                                                                                                                                                                                | 1,000                                | 345                          | 0,00024                              |
| 275                                                                                                                                                                                                | 0,960                                | 350                          | 0,00020                              |
| 280*                                                                                                                                                                                               | 0,880                                | 355                          | 0,00016                              |
| 285                                                                                                                                                                                                | 0,770                                | 360                          | 0,00013                              |
| 290                                                                                                                                                                                                | 0,640                                | 365*                         | 0,00011                              |
| 295                                                                                                                                                                                                | 0,540                                | 370                          | 0,000093                             |
| 297*                                                                                                                                                                                               | 0,460                                | 375                          | 0,000077                             |
| 300                                                                                                                                                                                                | 0,300                                | 380                          | 0,000064                             |
| 303*                                                                                                                                                                                               | 0,120                                | 385                          | 0,000053                             |
| 305                                                                                                                                                                                                | 0,060                                | 390                          | 0,000044                             |
| 308                                                                                                                                                                                                | 0,026                                | 395                          | 0,000036                             |
| 310                                                                                                                                                                                                | 0,015                                | 400                          | 0,000030                             |
| <sup>1</sup> Wavelengths chosen are representative: other values should be obtained by logarithmic interpolation at intermediate wavelengths.<br>* Emission lines of a mercury discharge spectrum. |                                      |                              |                                      |

TRF No. IEC62471A



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| IEC 62471        |                                                                                                  |                                            |          |
|------------------|--------------------------------------------------------------------------------------------------|--------------------------------------------|----------|
| Clause           | Requirement + Test                                                                               | Result - Remark                            | Verdict  |
| <b>Table 4.2</b> | <b>Spectral weighting functions for assessing retinal hazards from broadband optical sources</b> |                                            | <b>P</b> |
| Wavelength<br>nm | Blue-light hazard function<br>B ( $\lambda$ )                                                    | Burn hazard function<br>R ( $\lambda$ )    |          |
| 300              | 0,01                                                                                             |                                            |          |
| 305              | 0,01                                                                                             |                                            |          |
| 310              | 0,01                                                                                             |                                            |          |
| 315              | 0,01                                                                                             |                                            |          |
| 320              | 0,01                                                                                             |                                            |          |
| 325              | 0,01                                                                                             |                                            |          |
| 330              | 0,01                                                                                             |                                            |          |
| 335              | 0,01                                                                                             |                                            |          |
| 340              | 0,01                                                                                             |                                            |          |
| 345              | 0,01                                                                                             |                                            |          |
| 350              | 0,01                                                                                             |                                            |          |
| 355              | 0,01                                                                                             |                                            |          |
| 360              | 0,01                                                                                             |                                            |          |
| 365              | 0,01                                                                                             |                                            |          |
| 370              | 0,01                                                                                             |                                            |          |
| 375              | 0,01                                                                                             |                                            |          |
| 380              | 0,01                                                                                             | 0,1                                        |          |
| 385              | 0,013                                                                                            | 0,13                                       |          |
| 390              | 0,025                                                                                            | 0,25                                       |          |
| 395              | 0,05                                                                                             | 0,5                                        |          |
| 400              | 0,10                                                                                             | 1,0                                        |          |
| 405              | 0,20                                                                                             | 2,0                                        |          |
| 410              | 0,40                                                                                             | 4,0                                        |          |
| 415              | 0,80                                                                                             | 8,0                                        |          |
| 420              | 0,90                                                                                             | 9,0                                        |          |
| 425              | 0,95                                                                                             | 9,5                                        |          |
| 430              | 0,98                                                                                             | 9,8                                        |          |
| 435              | 1,00                                                                                             | 10,0                                       |          |
| 440              | 1,00                                                                                             | 10,0                                       |          |
| 445              | 0,97                                                                                             | 9,7                                        |          |
| 450              | 0,94                                                                                             | 9,4                                        |          |
| 455              | 0,90                                                                                             | 9,0                                        |          |
| 460              | 0,80                                                                                             | 8,0                                        |          |
| 465              | 0,70                                                                                             | 7,0                                        |          |
| 470              | 0,62                                                                                             | 6,2                                        |          |
| 475              | 0,55                                                                                             | 5,5                                        |          |
| 480              | 0,45                                                                                             | 4,5                                        |          |
| 485              | 0,40                                                                                             | 4,0                                        |          |
| 490              | 0,22                                                                                             | 2,2                                        |          |
| 495              | 0,16                                                                                             | 1,6                                        |          |
| 500-600          | $10^{[(450-\lambda)/50]}$                                                                        | 1,0                                        |          |
| 600-700          | 0,001                                                                                            | 1,0                                        |          |
| 700-1050         |                                                                                                  | $10^{[(700-\lambda)/50]}$                  |          |
| 1050-1150        |                                                                                                  | 0,2                                        |          |
| 1150-1200        |                                                                                                  | $0,2 \cdot 10^{0,02 \cdot (1150-\lambda)}$ |          |
| 1200-1400        |                                                                                                  | 0,02                                       |          |

TRF No. IEC62471A



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|-----------|--------------------|-----------------|---------|
| Clause    | Requirement + Test | Result - Remark | Verdict |

| Table 5.4 Summary of the ELs for the surface of the skin or cornea (irradiance based values) |                                                             |                     |                       |                             | N/A                                                 |
|----------------------------------------------------------------------------------------------|-------------------------------------------------------------|---------------------|-----------------------|-----------------------------|-----------------------------------------------------|
| Hazard Name                                                                                  | Relevant equation                                           | Wavelength range nm | Exposure duration sec | Limiting aperture rad (deg) | EL in terms of constant irradiance $W \cdot m^{-2}$ |
| Actinic UV skin & eye                                                                        | $E_S = \sum E_\lambda \cdot S(\lambda) \cdot \Delta\lambda$ | 200 – 400           | < 30000               | 1,4 (80)                    | 30/t                                                |
| Eye UV-A                                                                                     | $E_{UVA} = \sum E_\lambda \cdot \Delta\lambda$              | 315 – 400           | $\leq 1000$<br>> 1000 | 1,4 (80)                    | 10000/t<br>10                                       |
| Blue-light small source                                                                      | $E_B = \sum E_\lambda \cdot B(\lambda) \cdot \Delta\lambda$ | 300 – 700           | $\leq 100$<br>> 100   | < 0,011                     | 100/t<br>1,0                                        |
| Eye IR                                                                                       | $E_{IR} = \sum E_\lambda \cdot \Delta\lambda$               | 780 – 3000          | $\leq 1000$<br>> 1000 | 1,4 (80)                    | 18000/t <sup>0,75</sup><br>100                      |
| Skin thermal                                                                                 | $E_H = \sum E_\lambda \cdot \Delta\lambda$                  | 380 – 3000          | < 10                  | 2π sr                       | 20000/t <sup>0,75</sup>                             |

| Table 5.5 Summary of the ELs for the retina (radiance based values) |                                                                |                     |                                                  |                                                                       | P                                                                      |
|---------------------------------------------------------------------|----------------------------------------------------------------|---------------------|--------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------------|
| Hazard Name                                                         | Relevant equation                                              | Wavelength range nm | Exposure duration sec                            | Field of view radians                                                 | EL in terms of constant radiance $W \cdot m^{-2} \cdot sr^{-1}$        |
| Blue light                                                          | $L_B = \sum L_\lambda \cdot B(\lambda) \cdot \Delta\lambda$    | 300 – 700           | 0,25 – 10<br>10–100<br>100–10000<br>$\geq 10000$ | 0,011 $\cdot\sqrt{(t/10)}$<br>0,011<br>0,0011 $\cdot\sqrt{t}$<br>0,11 | 10 <sup>6</sup> /t<br>10 <sup>6</sup> /t<br>10 <sup>6</sup> /t<br>100  |
| Retinal thermal                                                     | $L_R = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$    | 380 – 1400          | < 0,25<br>0,25 – 10                              | 0,0017<br>0,011 $\cdot\sqrt{(t/10)}$                                  | 50000/( $\alpha \cdot t^{0,25}$ )<br>50000/( $\alpha \cdot t^{0,25}$ ) |
| Retinal thermal (weak visual stimulus)                              | $L_{IR} = \sum L_\lambda \cdot R(\lambda) \cdot \Delta\lambda$ | 780 – 1400          | > 10                                             | 0,011                                                                 | 6000/α                                                                 |

TRF No. IEC62471A



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| IEC 62471 |                    |                 |         |
|-----------|--------------------|-----------------|---------|
| Clause    | Requirement + Test | Result - Remark | Verdict |

| Table 6.1 Emission limits for risk groups of continuous wave lamps                                                                                        |                   |           |                                |                             |          |                             |        |                             | P      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-----------|--------------------------------|-----------------------------|----------|-----------------------------|--------|-----------------------------|--------|
| Risk                                                                                                                                                      | Action spectrum   | Symbol    | Units                          | Emission Measurement        |          |                             |        |                             |        |
|                                                                                                                                                           |                   |           |                                | Exempt                      |          | Low risk                    |        | Mod risk                    |        |
|                                                                                                                                                           |                   |           |                                | Limit                       | Result   | Limit                       | Result | Limit                       | Result |
| Actinic UV                                                                                                                                                | $S_{UV}(\lambda)$ | $E_s$     | $W \cdot m^{-2}$               | 0,001                       | 4.44E-06 | 0,003                       | n/a    | 0,03                        | n/a    |
| Near UV                                                                                                                                                   |                   | $E_{UVA}$ | $W \cdot m^{-2}$               | 10                          | 9.04E-05 | 33                          | n/a    | 100                         | n/a    |
| Blue light                                                                                                                                                | $B(\lambda)$      | $L_B$     | $W \cdot m^{-2} \cdot sr^{-1}$ | 100                         | 0.0014   | 10000                       | n/a    | 4000000                     | n/a    |
| Blue light, small source                                                                                                                                  | $B(\lambda)$      | $E_B$     | $W \cdot m^{-2}$               | 1,0*                        | 0E+00    | 1,0                         | 0E+00  | 400                         | n/a    |
| Retinal thermal                                                                                                                                           | $R(\lambda)$      | $L_R$     | $W \cdot m^{-2} \cdot sr^{-1}$ | $28000/\alpha = 1872944.58$ | 4.46E+03 | $28000/\alpha = 1944478.04$ | n/a    | $71000/\alpha = 4930640.75$ | n/a    |
| Retinal thermal, weak visual stimulus**                                                                                                                   | $R(\lambda)$      | $L_{IR}$  | $W \cdot m^{-2} \cdot sr^{-1}$ | $6000/\alpha = 401345.27$   | n/a      | $6000/\alpha = 416673.87$   | n/a    | $6000/\alpha = 416673.87$   | n/a    |
| IR radiation, eye                                                                                                                                         |                   | $E_{IR}$  | $W \cdot m^{-2}$               | 100                         | 3.6464   | 570                         | n/a    | 3200                        | n/a    |
| * Small source defined as one with $\alpha < 0,011$ radian. Averaging field of view at 10000 s is 0,1 radian.<br>** Involves evaluation of non-GLS source |                   |           |                                |                             |          |                             |        |                             |        |

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**Furthermore remarks:**  
- Measuring Instrument

| Name                     | Maker           | Model No.           |
|--------------------------|-----------------|---------------------|
| Spectrometer             | Bentham         | IDR300              |
| Telescope                | Bentham         | TEL309              |
| Cosine response diffuser | Bentham         | D7                  |
| Quartz fiber bundle      | Bentham         | FOP-UV-1            |
| Source profiler          | Bentham         | PSL-Source Profiler |
| Illuminance meter        | Gigahertz-optik | X1                  |

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| IEC62471A - ATTACHMENT |                    |                 |         |
|------------------------|--------------------|-----------------|---------|
| Clause                 | Requirement + Test | Result - Remark | Verdict |

| ATTACHMENT TO TEST REPORT IEC 62471<br>EUROPEAN GROUP DIFFERENCES AND NATIONAL DIFFERENCES<br>Photobiological safety of lamps and lamps systems |                 |
|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|
| Differences according to .....                                                                                                                  | EN62471:2008    |
| Attachment Form No. ....                                                                                                                        | EU_GD_IEC62471A |
| Attachment Originator .....                                                                                                                     | IMQ S.p.A.      |
| Master Attachment .....                                                                                                                         | 2009-07         |
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| CENELEC COMMON MODIFICATIONS (EN) |                                                                                                                              |                        |   |
|-----------------------------------|------------------------------------------------------------------------------------------------------------------------------|------------------------|---|
| <b>4 EXPOSURE LIMITS</b>          |                                                                                                                              |                        |   |
|                                   | Contents of the whole Clause 4 of IEC 62471:2006 moved into a new informative Annex ZB                                       |                        | — |
|                                   | Clause 4 replaced by the following:                                                                                          |                        |   |
|                                   | Limits of the Artificial Optical Radiation Directive (2006/25/EC) have been applied instead of those fixed in IEC 62471:2006 | See appended Table 6.1 | P |
| 4.1                               | General                                                                                                                      |                        |   |
|                                   | First paragraph deleted                                                                                                      | Noted                  | — |

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| IEC62471A - ATTACHMENT |                    |                 |         |
|------------------------|--------------------|-----------------|---------|
| Clause                 | Requirement + Test | Result - Remark | Verdict |

| Table 6.1 Emission limits for risk groups of continuous wave lamps (based on EU Directive 2006/25/EC) |                   |           |                                |                                               |          |                |        |                | P      |
|-------------------------------------------------------------------------------------------------------|-------------------|-----------|--------------------------------|-----------------------------------------------|----------|----------------|--------|----------------|--------|
| Risk                                                                                                  | Action spectrum   | Symbol    | Units                          | Emission Measurement                          |          |                |        |                |        |
|                                                                                                       |                   |           |                                | Exempt                                        |          | Low risk       |        | Mod risk       |        |
|                                                                                                       |                   |           |                                | Limit                                         | Result   | Limit          | Result | Limit          | Result |
| Actinic UV                                                                                            | $S_{UV}(\lambda)$ | $E_s$     | $W \cdot m^{-2}$               | 0,001                                         | 4.44E-06 | -              | -      | -              | -      |
| Near UV                                                                                               |                   | $E_{UVA}$ | $W \cdot m^{-2}$               | 0,33                                          | 9.04E-05 | -              | -      | -              | -      |
| Blue light                                                                                            | $B(\lambda)$      | $L_B$     | $W \cdot m^{-2} \cdot sr^{-1}$ | 100                                           | 0.0014   | 10000          | -      | 4000000        | -      |
| Blue light, small source                                                                              | $B(\lambda)$      | $E_B$     | $W \cdot m^{-2}$               | 0,01*                                         | 0E+00    | 1,0            | -      | 400            | -      |
| Retinal thermal                                                                                       | $R(\lambda)$      | $L_R$     | $W \cdot m^{-2} \cdot sr^{-1}$ | $28000/\alpha = 1872944.58$                   | 4.46E+03 | $28000/\alpha$ | -      | $71000/\alpha$ | -      |
| Retinal thermal, weak visual stimulus**                                                               | $R(\lambda)$      | $L_{IR}$  | $W \cdot m^{-2} \cdot sr^{-1}$ | 545000<br>$0,0017 \leq \alpha \leq 0,011$     | -        |                |        |                |        |
|                                                                                                       |                   |           |                                | $6000/\alpha$<br>$0,011 \leq \alpha \leq 0,1$ | -        |                |        |                |        |
| IR radiation, eye                                                                                     |                   | $E_{IR}$  | $W \cdot m^{-2}$               | 100                                           | 3.6464   | 570            | -      | 3200           | -      |

TRF No. IEC62471A



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Page 18 of 20

Report No. : 16-009081-01

| IEC62471A - ATTACHMENT |                    |                 |         |
|------------------------|--------------------|-----------------|---------|
| Clause                 | Requirement + Test | Result - Remark | Verdict |

- \* Small source defined as one with  $\alpha < 0,011$  radian. Averaging field of view at 10000 s is 0,1 radian.  
\*\* Involves evaluation of non-GLS source

NOTE The action functions: see Table 4.1 and Table 4.2

The applicable aperture diameters: see 4.2.1

The limitations for the angular subtenses: see 4.2.2

The related measurement condition 5.2.3 and the range of acceptance angles: see Table 5.5.

TRF No. IEC62471A



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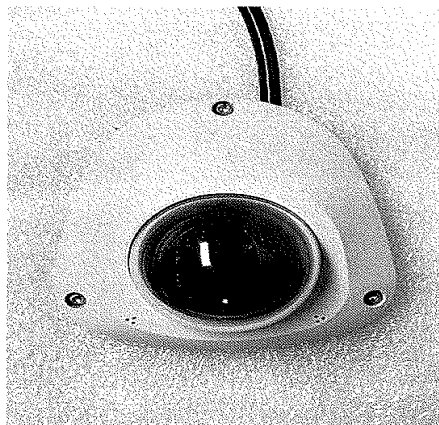


Page 19 of 20

Report No. : 16-009081-01

## Photographs

<Fig. 1>



<Fig. 2>

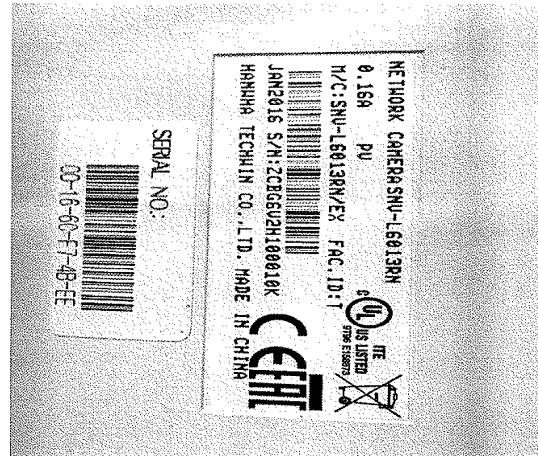


TRF No. IEC62471A

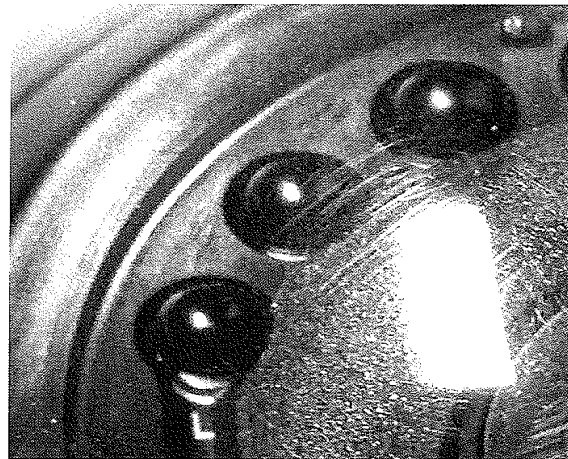


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&lt;Fig. 3&gt;



&lt;Fig. 4&gt;



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## Test Record

**Test Record No. 1**

1. Test result relate only to the items tested.

2. The manufacturer submitted representative production samples of NETWORK CAMERA, XNV-6022R.

3. Only the test listed were considered necessary.

The following tests were conducted:

| Test                                                                                              | Testing Location/Comments |
|---------------------------------------------------------------------------------------------------|---------------------------|
| End Product Reference Page                                                                        |                           |
| General Guidelines                                                                                |                           |
| Input: Single-Phase (1.6.2)                                                                       |                           |
| SELV Reliability Test Including Hazardous Voltage Measurements (2.2.2, 2.2.3, 2.2.4, Part 22 6.1) |                           |
| Determination of Working Voltage; Working Voltage Measurement (2.10.2)                            |                           |
| Loading - Wall and Ceiling Mounted Equipment (4.2.10)                                             |                           |
| Heating (4.5.1, 1.4.12, 1.4.13)                                                                   |                           |
| Component Failure (5.3.1, 5.3.4, 5.3.7)                                                           |                           |

Test results are valid only for the tested equipment. These tests are considered representative of the products covered by this Test Report. The test methods and results of the above tests have been reviewed and found to be in accordance with the requirements in the Standard(s) referenced at the beginning of this Test Report.

The following supplements are provided as a part of this Test Record. NOTE: These supplements are only available to the Applicant via the CDA system.

| Type      | Supplement Id | Description |
|-----------|---------------|-------------|
| Datasheet | 2-01          | Datasheet   |