VERIFICATION OF FCC PART 15 COMPLIANCE

KES hereby verify *that the subject product complies with all the electromagnetic emission specified in the FCC Rule Part 15*

Product Description:	NETWORK CAMERA
Model/Brand Name:	SNO-8081RN
Variant Model:	-
FCC Rule Part(s):	FCC 47CFR Part 15 Subpart B Class A Part 15.107(b) & Part 15.109(b)
FCC Procedure:	Verification
Applicant Name:	Samsung Techwin Co., Ltd.
Applicant Address:	84, Jeongdong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea
Manufacturer Name:	TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD.
Manufacturer Address:	No.11 Weiliu Rd,Micro-Electronic Industrial Park,TEDA,Tianjin,300385,People's Republic of China
Test Report Reference No.:	KES-E1-15T0132

NETWORK CAMERA, Model SNO-8081RN has been tested in accordance with the measurement procedures specified in FCC 47CFR Part 15 Subpart B class A and has been shown to be complied with the electromagnetic emission limits specified in FCC Rule Part 15 Subpart B class A. A testing of the sample product has been valid for the sample tested based on the reference test report, KES-E1-15T0132

Date of Issue: 04. 28. 2015

Dong Hun, Jang
Technical Manager
Signature:

KES.Co., Ltd.
C-3701, 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do,431-716, Korea
Tel: +82-31-425-6200 //Fax: +82-31-424-0450

EMI Test Report for FCC

DoC / Verification

Test Report No.	: KES-E1-15T0132
Date of Issue	: 04.28.2015
Description of Product	: NETWORK CAMERA
Model No.	: SNO-8081RN
Variant Model	: -
Applicant	: Samsung Techwin Co., Ltd.
Applicant's Address	: 84, Jeongdong-ro, Seongsan-gu, Changwon-si, Gyeongsangnam-do, Korea
Manufacturer	: TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD.
Manufacturer's Address	: No.11 Weiliu Rd,Micro-Electronic Industrial Park,TEDA,Tianjin,300385,People's Republic of China
Standards	: FCC Part 15 Subpart B - Part 15.107(b) : Conducted Emission - Part 15.109(b) : Radiated Emission
Date of Receipt	: 04. 02. 2015
Test Date	: 04. 15. 2015 - 04. 17. 2015
Test Results	: ■ Pass □ Fail

The test results relate only to the items tested.

Tested by: Hyo Jin, Kim
Test Engineer

Reviewed by: Dong Hun, Jang
Technical Manager

Testing Laboratories for Safety and RF Compliance
C-3701 40, Simin-daero 365beon-gil, Dongan-gu, Anyang-si, Gyeonggi-do, 431-716, Korea
Tel: +82-31-425-6200 / Fax: +82-31-424-0450

Testing Laboratories for EMC Compliance
473-29, Gayeoro, Yeoju-si, Gyeonggi-do,469-803, Korea
Tel : +82-31-883-5092 / Fax: +82-31-883-5169

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1. General Information

1.1 Introduction

The EMI Test Report of Information Technology Equipment is prepared on behalf of named applicant in accordance with the ANSI C63.4-2009. The test results reported in this document relate only to the item that was tested.

The detailed description of the measurement facility was found to be in compliance with the requirement of Section 2.948 of the FCC Rules. The Federal Communications Commission has the reports on file and is listed under Registration Number. The scope of the accreditation covers the FCC Method - 47 CFR Part 15 or 18 of the Commission's Rules.

All measurements contained in this report were conducted in accordance with ANSI C63.4-2009. The instrumentation utilized for the measurements conforms with CISPR16 Specification for Radio Disturbance and Immunity Measuring Apparatus and Methods. Some accessories are used to increase sensitivity and prevent overloading of the measuring instrument. Calibration checks are performed yearly on the instruments by a local calibration laboratories.

All radiated and conducted emission measurements are performed manually at KES Co., Ltd. (hereinafter referred to as "KES"), 473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, 469-803 Korea

The radiated emission measurements required by the FCC Rules were performed on 3 meter or 10 meter, Open Area Test Site, test range maintained by KES. Complete ANSI 63.4-2009 description and site attenuation measurement data records are maintained at the test facility and have been placed on file with the Federal Communications Commission. The power line conducted emission measurements were performed in a shielded enclosure also located at the same facility.

The KES EMC test facilities in Yeoju-si are designated testing laboratory according to ISO/IEC 17025 by Radio Research Agency(RRA), Korea Communications Commission.

1.2 Geographic location

KES Office Latitude : 37°23'54.59"N, Longitude : 126°58'14.66"E

KES OATS Latitude : 37°13'58.03"N, Longitude : 127°37'21.95"E

1.3 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	**FCC**	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	
KOREA	**KCC**	EMC (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site)	KR0100
Canada	**IC**	3 & 10 meter Open Area Test Sites and one conducted site	4769B-1
Europe	**TUV_SUD**	EMC EN 55011, EN 55022, EN 61000-3-2,EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 61000-6-3, EN 61000-6-4, EN 55014-1, EN 61326 EN 50130-4, EN 55024, EN 55014-2 EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	

1.4 Product Description

Samsung Techwin Co., Ltd., NETWORK CAMERA, Model No: SNO-8081RN or the "E.U.T".

Main Specifications of EUT are

Video	
Imaging Device	1/1.8"6MCMOS
Total Pixels	3096(H) x 2094(V)
Effective Pixels	2616(H)x1976(V)
Scanning System	Progressive Scan
Min. Illumination	5MMode Color:0.3Lux(1/30sec,F1.3,50IRE),0.005Lux(2sec,F1.3,50IRE) Color:0.12Lux(1/30sec,F1.3,30IRE),0.002Lux(2sec,F1.3,30IRE) 2MMode Color:0.30Lux(1/30sec,F1.3,50IRE),0.005Lux(2sec,F1.3,50IRE) Color:0.12Lux(1/30sec,F1.3,30IRE),0.002Lux(2sec,F1.3,30IRE) 0Lux(IRLEDOn)
S / N Ratio	50dB
Video Out	CVBS:1.0Vp-p/75Ωcomposite,704x480(N),704x576(P),forinstallation -DIPconnectortype
Lens	
Focal Length (Zoom Ratio)	3.93~9.4mm (2.4x) Motorized Varifocal
Max. Aperture Ratio	F1.3
Angular Field of View	H:93.4˚(Wide)~39.2˚(Tele) / V : 68.1˚(Wide)~29.3˚(Tele)
Min. Object Distance	0.5m(1.64ft)
Focus Control	SimpleFocus(MotorizedV/F)/Manual - Remote control via network (Manual, Simple Focus)
Lens Type	DC Auto Iris, support P-Iris mode
Mount Type	Board-in type
LDC(Lens Distortion Correction)	Off/On (Level Adjustment : 1 ~ 5)
Pan / Tilt / Rotate	
Pan Range	-
Pan Speed	-
Tilt Range	-
Tilt Speed	-
Rotate Range	-
Sequence	-
Preset Accuracy	-
Azimuth	-
Auto Tracking	-
Operational	
IR LED	2 ea
Viewable Length	30m, SmartIR
Camera Title	Off / On (Displayed up to 15 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off/BLC/WDR
Wide Dynamic Range	120dB
Contrast Enhancement	SSDR(SamsungSuperDynamicRange) (Off / On)
Digital Noise Reduction	SSNR (2D+3D Noise Filter) (Off / On)
Digital Image Stabilization	미지원

Defog	미지원
Motion Detection	Off / On(4ea, Rectangle)
Privacy Masking	Off/On(6ea,Rectangle) - Color : Gray, Green, Red, Blue, Black, White
Gain Control	Off / Low / Medium / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor (included Mercury & Sodium)
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (2 ~ 1/12,000sec)
Digital Zoom	미지원
Rotate Image	Flip:On/Off Mirror: On/Off Hallway:90°/270°
Intelligent Video Analytics	Tampering,AudioDetection - with Metadata
Alarm I/O	Input1ea/Output1ea
Remote Control Interface	미지원
RS-485 Protocol	미지원
Alarm Triggers	AlarmInput,MotionDetection,Tampering,AudioDetection, NetworkDisconnect
Alarm events	•FileuploadviaFTP,E-Mail •NotificationviaE-Mail •localstorage(SD/SDHC)recordingatNetwork disconnected •Externaloutput
Audio In	Selectable(MicIN/LineIN), Supplyvoltage:2.5VDC(4mA),Inputimpedance:approx.2KOhm
Audio out	Lineout(3.5mmstereominijack), Max output level: 1 Vrms
Network	
Ethernet	RJ-45(10/100BASE-T)
Video Compression Format	H.265:Main H.264(MPEG-4Part10/AVC):Main/Baseline MotionJPEG
Resolution	5MMode 2592x1944/1920x1080/1600x1200/1280x1024/1280x960/1280x720/1024x768/800x600/720x576/720x480/640x480/320x240 2MMode 1920x1080/1280x1024/1280x960/1280x720/1024x768/800x600/720x576/720x480/640x480/320x240 ※Mode변경시재부팅사양
Max. Framerate	5MMode H.264/H.265:30fpsinallresolutions MJPEG:morethan800x600 : 1 fps, equal or less than 800x600 : 15fps 2MMode H.264/H.265:60fpsinallresolutions MJPEG:morethan800x600 : 1 fps, equal or less than 800x600 : 15fps
Smart Codec	Manual Mode (area-based : 4EA)
Video Quality Adjustment	H.264/H.265:CompressionLevel,TargetBitrateLevelControl MJPEG:QualityLevelControl
Bitrate Control Method	H.264/H.265:CBRorVBR, MotionJPEG:VBR
Streaming Capability	MultipleStreaming(Upto3Profiles) - Total 3 Stream at the same time (including Recording Stream) * H.264 & H.265프로파일동시전송
Audio Compression Format	G.711u-law/G.726Selectable G.726(ADPCM)8KHz,G.7118KHz G.726:16Kbps,24Kbps,32Kbps,40Kbps
Audio Communication	Bi-dierctional (2-Way)
IP	IPv4, IPv6
Protocol	TCP/IP,UDP/IP,RTP(UDP),RTP(TCP),RTCP,RTSP,NTP,HTTP,HTTPS,SSL,DHCP,PPPoE,FTP,SMTP,IC

	MP,IGMP,SNMPv1/v2c/v3(MIB-2),ARP,DNS,DDNS,QoS,PIM-SM,UPnP,Bonjour
Security	HTTPS(SSL)LoginAuthentication DigestLoginAuthentication IPAddressFiltering UseraccessLog 802.1XAuthentication(EAP-TLS,EAP-LEAP)
Streaming Method	Unicast / Multicast
Max. User Access	10 users at Unicast Mode
Edge Storage	SD/SDHC/SDXC(upto128G) -motionImagesrecordedintheSD/SDHC/SDXCmemorycardcanbedownloaded. -cameracandetectautomaticallywhenthememoryisconnected -memorystatusdisplay(normal/error/active/formatting/lock) NAS(NetworkAttachedStorage) LocalPCforInstantRecording
Application Programming Interface	ONVIFProfileS SUNAPI(HTTPAPI) SVNP SAMSUNGTECHWINOpenPlatform
Webpage Language	English,French,German,Spanish,Italian,Chinese, Russian,Japanese,Swedish,Denish,Portuguese,Turkish,Polish,Czech,Rumanian,Serbian,Dutch,Croatia,Hungary,Greek
Web Viewer	SupportedOS:WindowsXP/VISTA/7/8/8.1orHigher,MACOSX10.7orHigher SupportedBrowser:MicrosoftInternetExplorer(Ver.8~11)orHigher Mozilla Firefox (Ver. 9~19) or Higher , Google Chrome (Ver. 15~25) or Higher, Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) * Mac OS X only
Central Management Software	SmartViewer, SSM
Pixel Counter	support
Image Logo	미지원
Web Viewer Help	support(영문only)
Environmental	
Operating Temperature / Humidity	-40°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH * Start up should be done at above -35°C
Storage Temperature / Humidity	-30°C ~ +60°C (-22°F ~ +140°F) / Less than 90% RH
Ingress Protection	IP66
Vandal Resistance	IK10
Electrical	
Input Voltage / Current	24V AC, 12V DC, PoE(IEEE802.3af class3)
Power Consumption	최대10W/11.5W(12VDC,히터미사용시/사용시) 최대11.5W/12.95W(PoE,히터미사용시/사용시) 최대12W/13.5W(24VAC,히터미사용시/사용시)
Mechanical	
Color / Material	DARK GRAY / ALUMINIUM
Dimension (WxHxD)	82.4*87*312.6(withbracket) 82.4*87*178(withoutbracket)
Weight	1500g

1.5 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	SNO-8081RN	-	TIANJIN SAMSUNG TECHWIN OPTO-ELECTRONIC CO., LTD.	EUT

1.6 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
PoE Adapter	FSD-804PS(V3)	-	PLANET Technology Corp.	-
Notebook	LG15N54	410NZET022292	LG Electronics Inc.,	-
AC/DC Adapter	ADP-90WH B	84ZW19F1557	DELTA ELECTRONICS(JIANGSU) LTD.	-
ALARM ZIG	-	-	-	-
Headset	RHS-2000	-	ROYCHE	-

1.7 External I/O Cabling

- AC, DC Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
NETWORK CAMERA	Audio In	Headset	Audio Out	1.8	Unshielded
	Audio Out	Headset	Audio In	1.8	Unshielded
	RJ-45	Notebook	RJ-45	3.0	Unshielded
	ALARM	ALARM ZIG	ALARM	3.0	Unshielded

- POE Mode

Start		END		Cable Spec.	
Description	**I/O Port**	**Description**	**I/O Port**	**Length**	**Shield**
NETWORK CAMERA	Audio In	Headset	Audio Out	1.8	Unshielded
	Audio Out	Headset	Audio In	1.8	Unshielded
	RJ-45	POE Adapter	RJ-45	3.0	Unshielded
	ALARM	ALARM ZIG	ALARM	3.0	Unshielded
POE Adapter	RJ-45	Notebook	RJ-45	1.0	Unshielded

1.8 Special Accessories

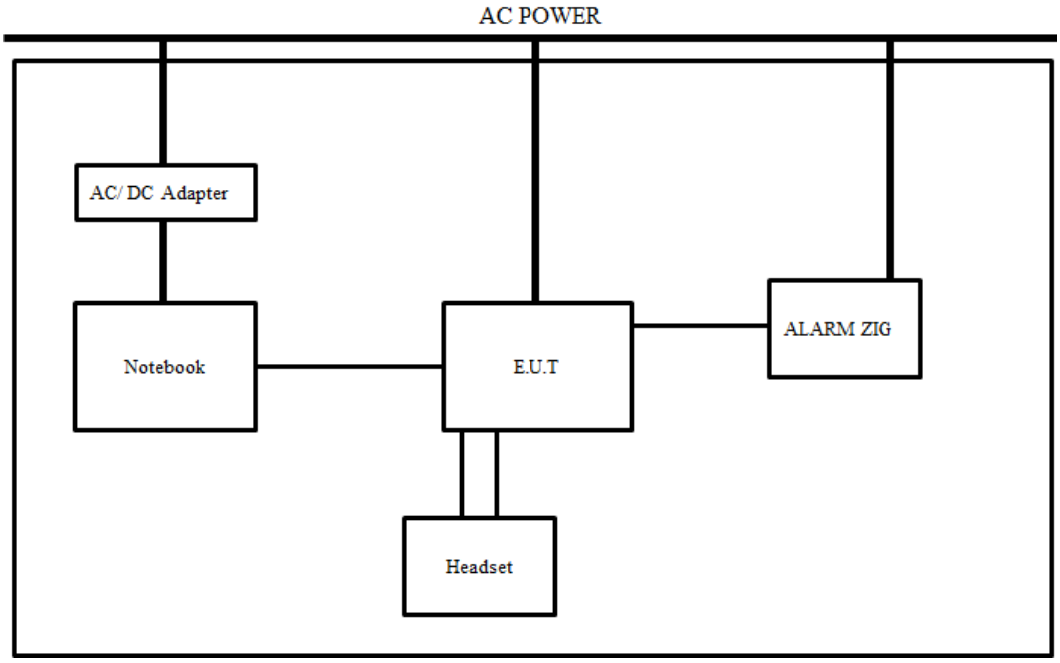
As shown in section 1.10, all interface cables used for compliance testing are shielded as normally supplied or by use respective component manufacturers.

1.9 E.U.T Modifications

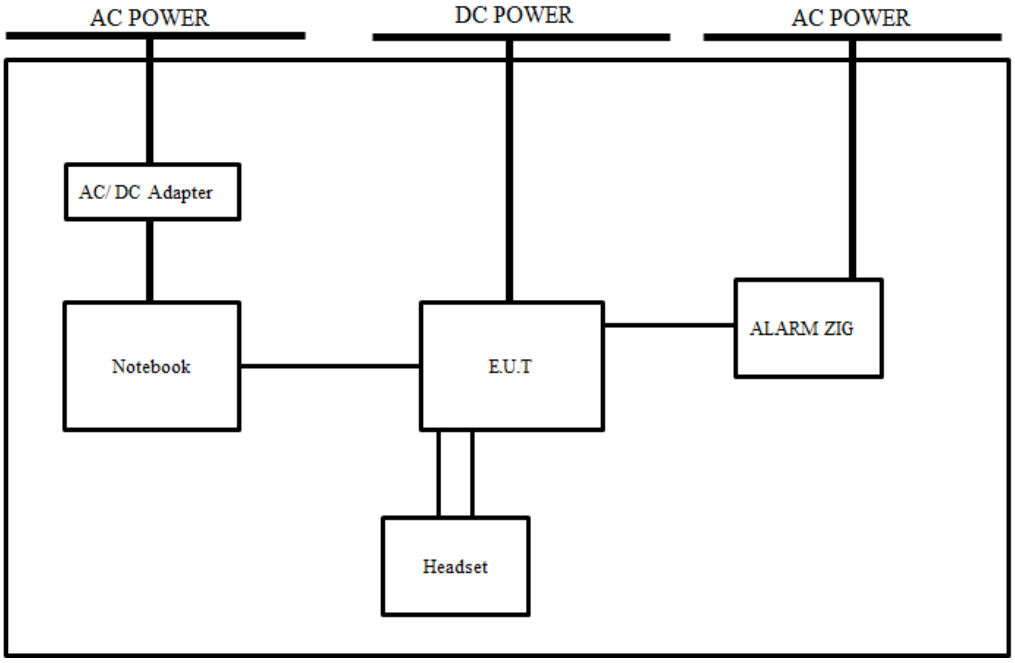
No modifications were made to the E.U.T in order to achieve and maintain compliance to the standards described in this report.

1.10 Configuration of Test System

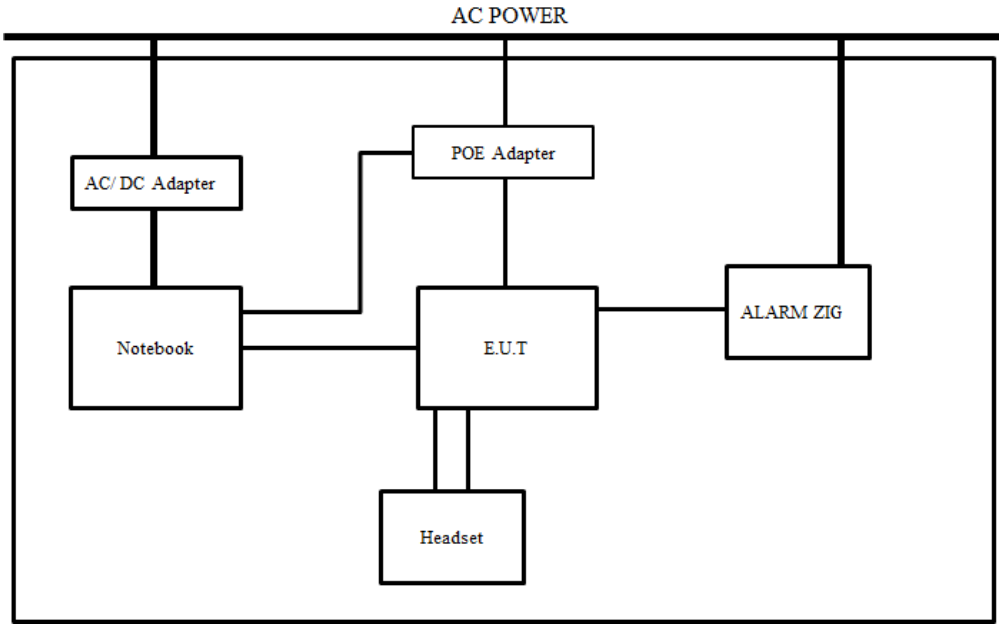
- AC Mode



- DC Mode



- POE Mode



※ Test Operating Mode

- Ping test
- web view monitoring
- Alarm test

2. Summary of Tests

FCC Part Section(s)	Parameter	Test Condition	Status (note 1)
15.109(b)	Emission limits	Radiated	C
15.107(b)	Conducted limits	Conducted	C

Note 1 : C=Complies N/C=Not Complies N/T=Not Tested N/A=Not Applicable

2.1 Conducted Emission Measurements

2.1.1 Test Methods

The power line conducted emission measurements were performed in a shielded enclosure, using the setup in accordance with ANSI C63.4-2009 conducted emission measurement procedure.

2.1.2 Test Equipments

Description	Manufacturer	Model Number	Serial Number	Cal. Due
EMI Receiver/Signal Analyzer	Narda S.T.S / PMM	PMM 9010F	020WW31006	04. 01. 2016
LISN	R&S	ENV216	101137	02. 10. 2016
LISN	EMCO	3810/2	2228	-
Electro wave Shieldroom	SEMITEC	-	-	-

2.1.3 Test Environments

Ambient Temperatures	Relative Humidity
see the data	see the data

2.1.4 Test Limits

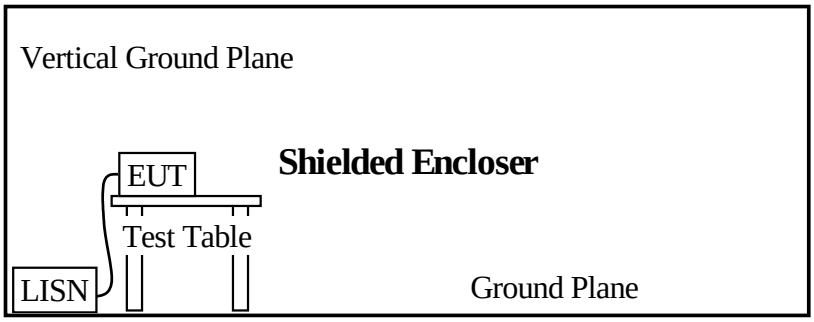
Frequency (㎒)	15.107 Conducted limits			
	Class B (dB㎶)		Class A (dB㎶)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	66.0 to 56.0	56.0 to 46.0	79.0	66.0
0.50 to 5.00	56.0	46.0	73.0	60.0
5.00 to 30.00	60.0	50.0	73.0	60.0

2.1.5 Test Procedure

Conducted emission levels were measured on each current-carrying line with the EMI TEST Receiver operating in the CISPR quasi-peak mode (or peak mode if applicable). The Receiver's 6 dB bandwidth was set to 9 kHz. The initial step in collecting conducted data is a EMI TEST Receiver peak scan of the measurement range. If the conducted emission exceed the average limit with the instrument set to the quasi-peak mode, the measurements are made in the average mode. The emission spectrum was scanned from 150 kHz to 30 MHz. The highest emission amplitudes relative to the appropriate limits were measured and have been recorded. Quasi-peak readings are distinguished with a "QP".

The conducted emission test was performed with the E.U.T exercise program loaded, and the emissions were scanned between 150 kHz to 30 MHz on the HOT side and NEUTRAL side, herein referred to as H and N, respectively.

2.1.6 Test Configuration



2.1.7 Test Results

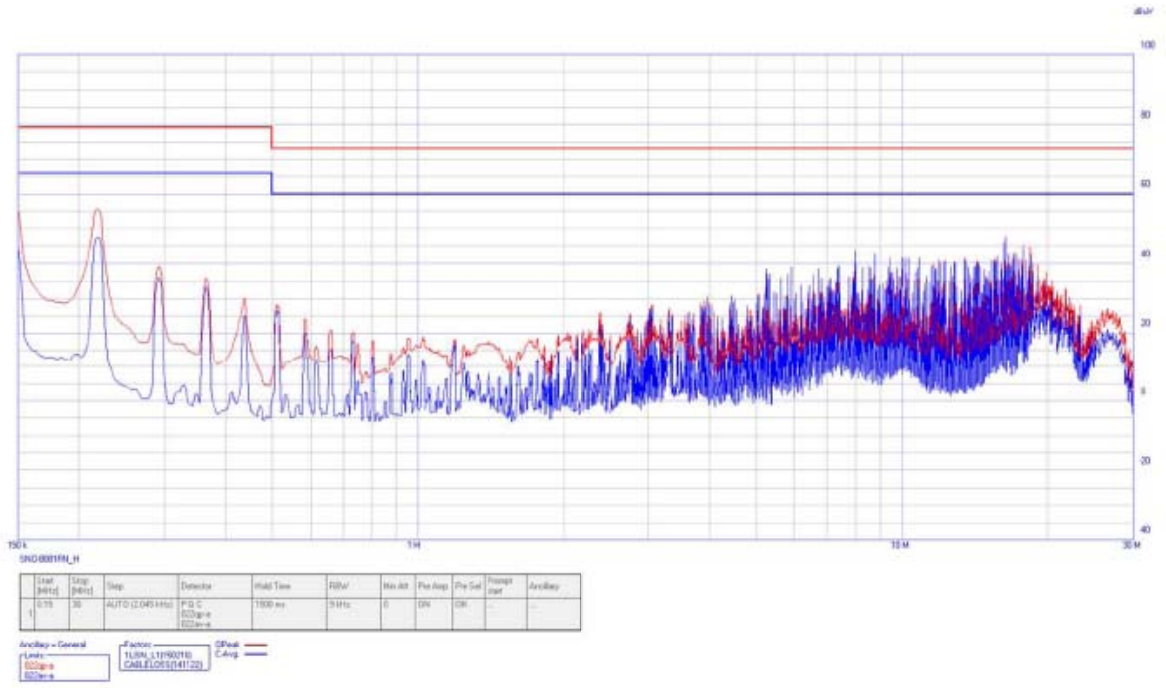
- According to the data in section 5.1.7, the EUT complied with the FCC Part 15 standards.

2.1.8 Test Data

Temperature: 18.1 ℃ Humidity: 42.5 % R.H. Test Date: 04. 06. 2015 Tested by: Hyo Jin, Kim

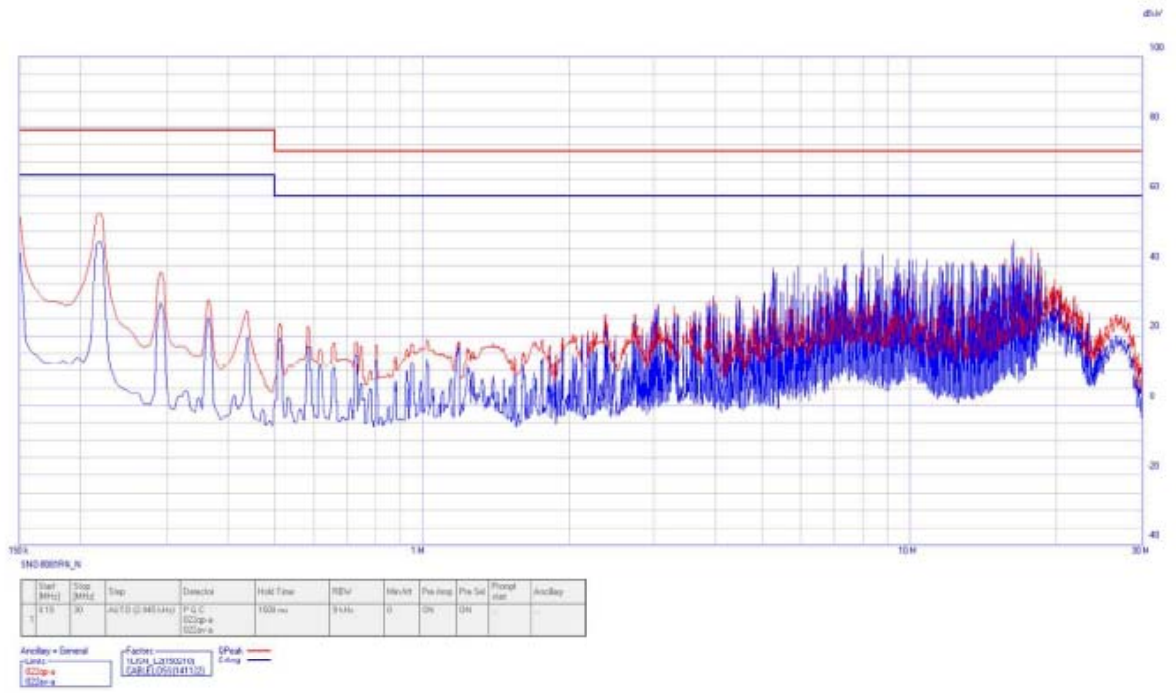
- AC Mode

Polarization: HOT



Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.150	56.100	79.000	-22.900	56.100	66.000	-9.900	9.650	0.020
0.154	40.090	79.000	-38.910	40.090	66.000	-25.910	9.650	0.020
0.217	55.660	79.000	-23.340	55.660	66.000	-10.340	9.650	0.030
0.291	39.110	79.000	-39.890	39.110	66.000	-26.890	9.650	0.030
7.958	43.850	73.000	-29.150	43.850	60.000	-16.150	9.710	0.260
16.269	47.700	73.000	-25.300	47.700	60.000	-12.300	9.900	0.270
17.708	45.360	73.000	-27.640	45.360	60.000	-14.640	9.940	0.240
18.281	44.630	73.000	-28.370	44.630	60.000	-15.370	9.950	0.230

Polarization: NEUTRAL



Frequency [MHz]	Q-Peak [dBμV]	Limit [dBμV]	Margin [dB]	C-Avg [dBμV]	Limit [dBμV]	Margin [dB]	Factor (LISN) [dB]	Factor (Cable Loss) [dB]
0.150	55.020	79.000	-23.980	55.020	66.000	-10.980	9.650	0.020
0.154	40.190	79.000	-38.810	40.190	66.000	-25.810	9.650	0.020
0.217	55.350	79.000	-23.650	55.350	66.000	-10.650	9.650	0.030
0.291	38.230	79.000	-40.770	38.230	66.000	-27.770	9.650	0.030
7.958	44.590	73.000	-28.410	44.590	60.000	-15.410	9.710	0.260
16.269	47.370	73.000	-25.630	47.370	60.000	-12.630	9.900	0.270
17.708	44.910	73.000	-28.090	44.910	60.000	-15.090	9.940	0.240
18.281	43.800	73.000	-29.200	43.800	60.000	-16.200	9.950	0.230

2.2 Radiated Emission Measurements

2.2.1 Test Methods

The radiated emission measurements were performed in a Open Area Test Site (OATS) and 3 m full chamber, using the setup in accordance with ANSI C63.4-2009 radiated emission measurement procedure.

2.2.2 Test Equipments

Description	Manufacturer	Model Number	Serial Number	Cal. Due
EMI TEST Receiver	R & S	ESVS10	826008/014	04. 01. 2016
Trilog-Broadband Antenna	SCHWARZBECK	VULB 9168	9168-385	05. 09. 2015
OATS	KES	-	-	-
Antenna Mast	DAEIL EMC	-	-	-
Turn Table	DAEIL EMC	-	-	-
EMI TEST Receiver	R & S	ESR7	101190	08. 13. 2015
PREAMPLIFIER	8449B	H.P	3008A00538	07. 23. 2015
Double Ridged Horn Antenna	A-H-SYSTEM,INC	SAS-571	781	05. 13. 2015
RS Chamber (EMI 18GHz)	SEMITEC	-	-	-
Antenna Mast	AUDIX	-	-	-
Turn Table	AUDIX	-	-	-

2.2.3 Test Environments

Ambient Temperatures	Relative Humidity
see the data	see the data

2.2.4 Test Limits

Frequency (㎒)	15.109 Radiated emission limits			
	Class B @ 3 m		Class A @ 10 m	
	(dB㎶/m)	(㎶/m)	(dB㎶/m)	(㎶/m)
30 to 88	40.0	100	39.0	90
88 to 216	43.5	150	43.5	150
216 to 960	46.0	200	46.4	210
above 960	54.0	500	49.5	300

Frequency (㎒)	CISPR Publication 22			
	Class B @ 3 m (dB㎶/m)		Class A @ 3 m (dB㎶/m)	
	PK	AV	PK	AV
above 1 000	74	54	80	60

2.2.5 Test Procedure

Before final measurements of radiated emission were made at the OATS, the E.U.T was scanned in semi-anechoic chamber in order to determine its emission spectrum signature. The physical arrangement of the test system and associated cabling was varied in order to determine the effect on the E.U.T's emission in amplitude, direction and frequency. This process was repeated during final radiated emission measurements at the OATS range, at each frequency, in order to ensure that maximum emissions amplitudes were attained.

The radiated emission test was performed with E.U.T exercise program loaded, and the emissions were scanned between 30 ㎒ to 1 000 ㎒ using a R&S ESVS10 EMI TEST Receiver and 1 000 ㎒ to 6 000 ㎒ using a spectrum analyzer. The EMI TEST Receiver's 6 ㏈ bandwidth was set to 120 ㎑ and 1 ㎒, and EMI TEST Receiver was operated in the CISPR quasi-peak detection mode.

At each frequency, the E.U.T was rotated 360 degrees, and the antenna was raised and lowered from 1 to 4 meters in order to determine the maximum emission levels. Measurements were taken using both HORIZONTAL and VERTICAL antenna polarization, herein referred to as H and V, respectively.

- above 1 GHz : Antenna height is fixed to 1.00 m

2.2.6 Field Strength Calculation

F.S = Field Strength

M.R = Meter Reading

A.F = Antenna Factor

C.L = Cable Loss

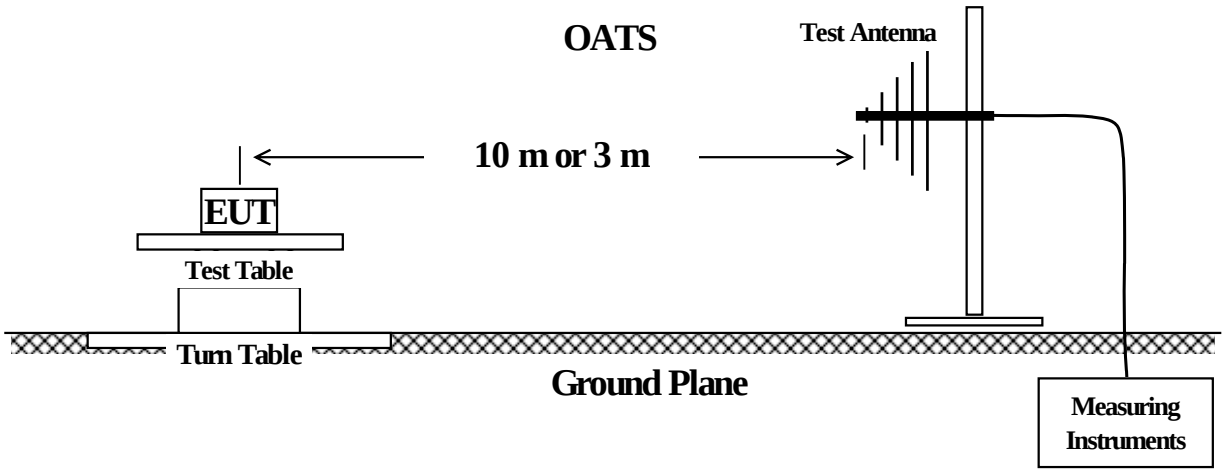
A.G= Amplifier Gain

* Below 1 ㎓ : F.S(㏈㎶/m) = M.R(㏈㎶) + [A.F(㏈/m) + C.L(㏈)]

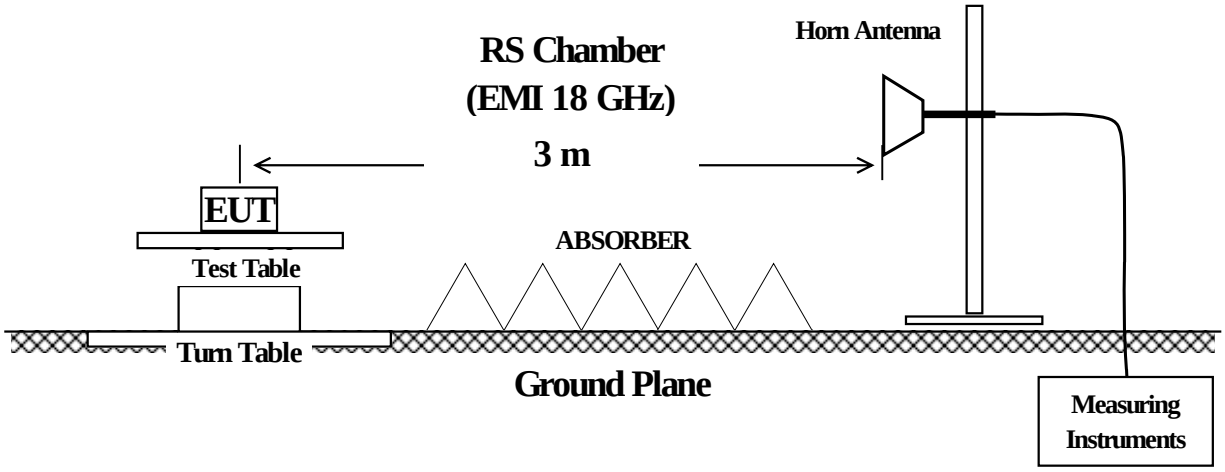
* Above 1 ㎓ : F.S(㏈㎶/m) = M.R(㏈㎶) + [A.F(㏈/m) + C.L(㏈)] - A.G(㏈)

2.2.7 Test Configuration

*** Below 1 GHz**



*** Above 1 GHz**



2.2.8 Test Results

Below 1 ㎓: According to the data in section 2.2.9, the E.U.T complied with the FCC 15.109 limits.

Above 1 ㎓ :According to the data in section 2.2.9, the E.U.T complied with the CISPR22 standards.

2.2.9 Test Data

*** Below 1 ㎓**

- AC Mode

Temperature: 11.0 ℃ Humidity: 64.0 % R.H. Test Date: 04. 16. 2015 Tested by: Hyo Jin, Kim

Frequency (㎒)	Amplitude (dB㎶/m)	Antenna		Correction Factor		Corrected Amplitude (dB㎶/m)	Applicable Limit (dB㎶/m)	Margin (dB)
		Polar. (H/V)	Height (m)	Ant. (dB)	Cable (dB)			
51.327	17.500	V	1.000	13.570	1.640	32.710	39.000	6.290
61.043	16.800	V	1.000	12.970	1.820	31.590	39.000	7.410
74.621	14.000	V	1.000	10.470	2.030	26.500	39.000	12.500
189.080	12.700	H	3.050	10.880	3.320	26.900	43.500	16.600
243.407	15.200	H	2.880	11.500	3.810	30.510	46.400	15.890
297.723	17.300	H	2.510	13.320	4.360	34.980	46.400	11.420

- DC Mode

Temperature: 11.0 ℃ Humidity: 64.0 % R.H. Test Date: 04. 16. 2015 Tested by: Hyo Jin, Kim

Frequency (㎒)	Amplitude (dB㎶/m)	Antenna		Correction Factor		Corrected Amplitude (dB㎶/m)	Applicable Limit (dB㎶/m)	Margin (dB)
		Polar. (H/V)	Height (m)	Ant. (dB)	Cable (dB)			
52.310	14.300	V	1.000	13.520	1.660	29.480	39.000	9.520
74.622	14.700	V	1.000	10.470	2.030	27.200	39.000	11.800
189.082	12.800	H	3.100	10.880	3.320	27.000	43.500	16.500
270.562	14.100	H	2.650	12.430	4.080	30.610	46.400	15.790
297.727	14.400	H	2.370	13.320	4.360	32.080	46.400	14.320
513.067	12.600	V	2.050	17.990	5.990	36.580	46.400	9.820

- POE Mode

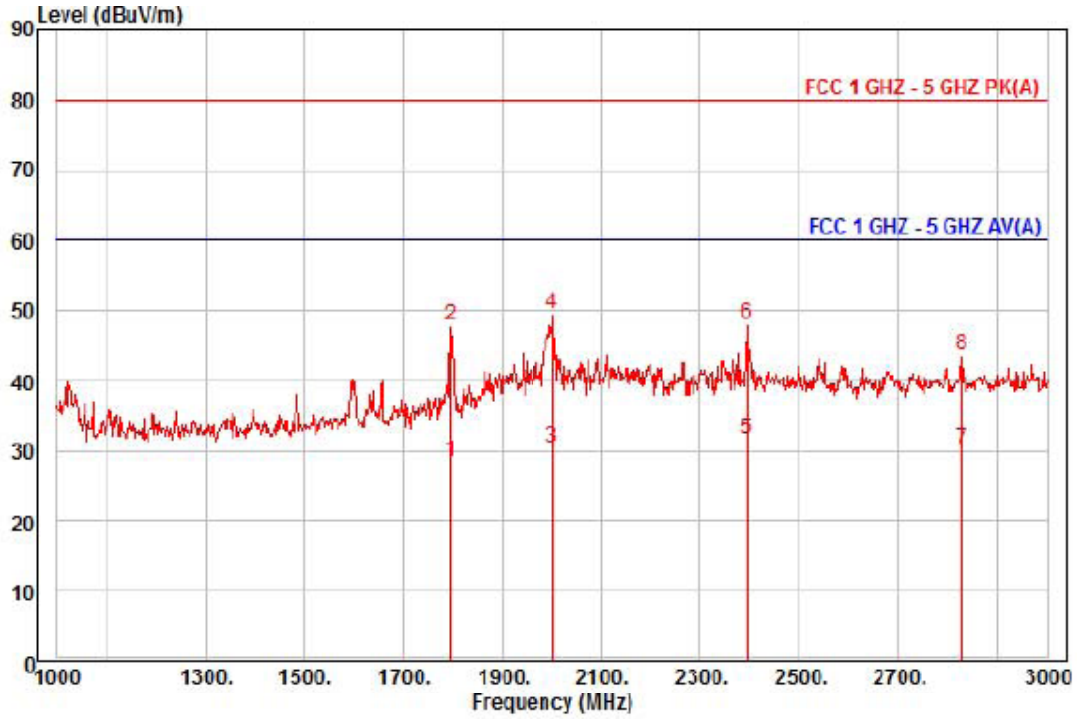
Temperature: 11.0 ℃ Humidity: 64.0 % R.H. Test Date: 04. 16. 2015 Tested by: Hyo Jin, Kim

Frequency (㎒)	Amplitude (dB㎶/m)	Antenna		Correction Factor		Corrected Amplitude (dB㎶/m)	Applicable Limit (dB㎶/m)	Margin (dB)
		Polar. (H/V)	Height (m)	Ant. (dB)	Cable (dB)			
51.343	19.700	V	1.000	13.570	1.640	34.910	40.000	5.090
189.081	11.800	H	4.000	10.880	3.320	26.000	40.000	14.000
243.401	12.900	H	3.210	11.500	3.810	28.210	47.000	18.790
270.560	14.100	H	3.030	12.430	4.080	30.610	47.000	16.390
297.725	17.500	H	2.870	13.320	4.360	35.180	47.000	11.820
513.063	12.900	V	2.530	17.990	5.990	36.880	47.000	10.120

* Above 1 ㎓

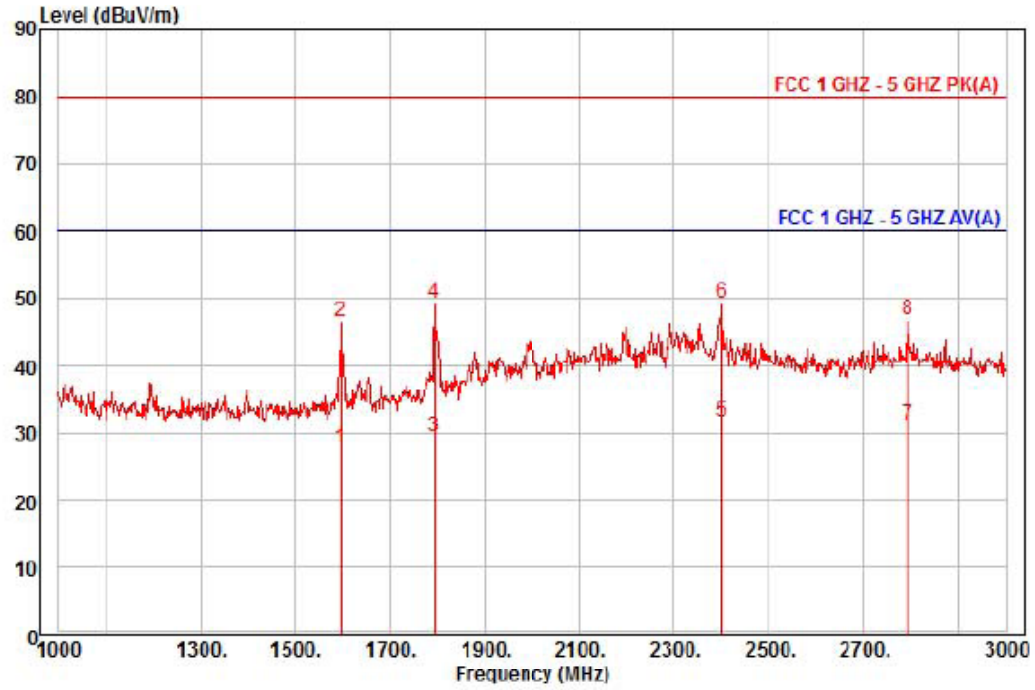
Temperature: 18.5 ℃ Humidity: 43.7 % R.H. Test Date: 04. 16. 2015 Tested by: Hyo Jin, Kim

- AC Mode



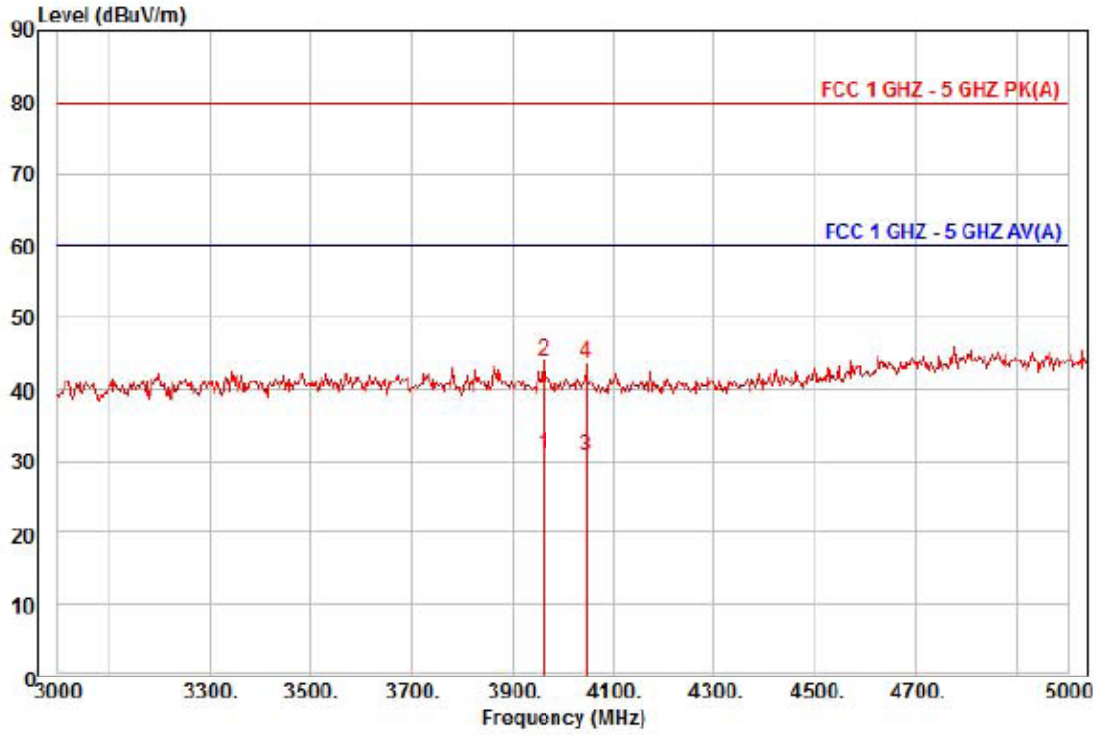
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : AC
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1796.00	29.08	26.88	7.37	34.87	4	60.00	-31.54	horizontal	Average
2	1796.00	48.46	26.88	7.37	34.87	4	80.00	-32.16	horizontal	Peak
3	2002.00	28.80	28.16	7.86	34.53	176	60.00	-29.71	horizontal	Average
4 pk	2002.00	48.00	28.16	7.86	34.53	176	80.00	-30.51	horizontal	Peak
5 pp	2396.00	27.96	29.31	8.69	34.26	217	60.00	-28.30	horizontal	Average
6	2396.00	44.29	29.31	8.69	34.26	217	80.00	-31.97	horizontal	Peak
7	2828.00	24.49	30.13	9.60	33.96	348	60.00	-29.74	horizontal	Average
8	2828.00	37.80	30.13	9.60	33.96	348	80.00	-36.43	horizontal	Peak



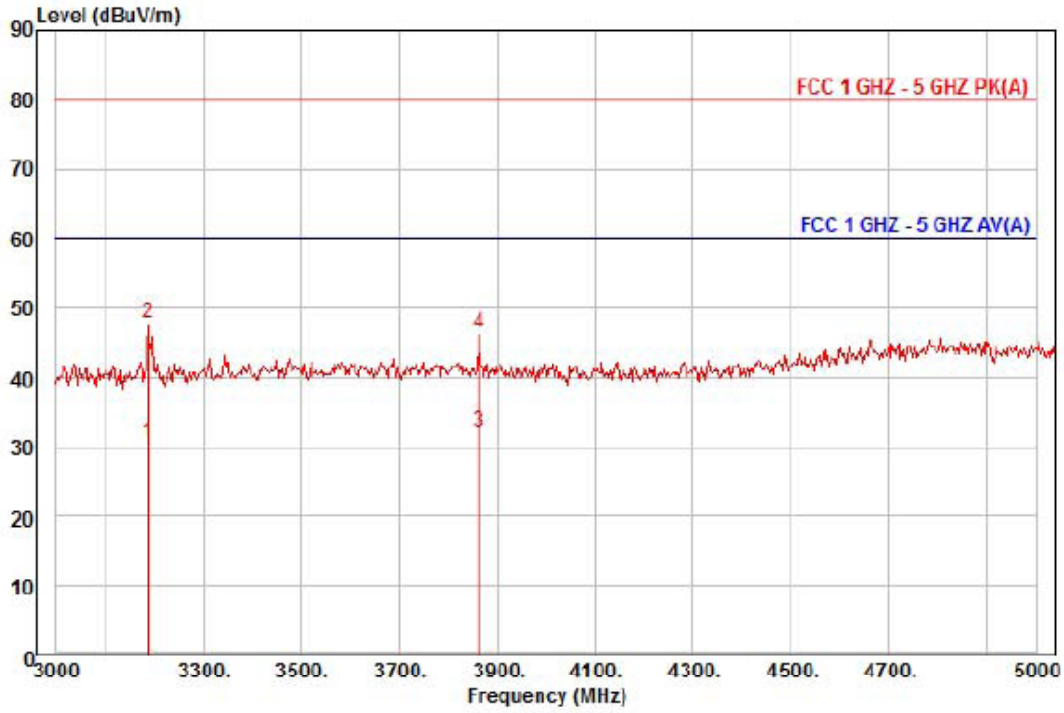
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : AC
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1596.00	30.28	25.63	6.88	35.20	203	60.00	-32.41	vertical	Average
2	1596.00	49.37	25.63	6.88	35.20	203	80.00	-33.32	vertical	Peak
3	1794.00	30.12	26.86	7.36	34.87	171	60.00	-30.53	vertical	Average
4 pk	1794.00	50.00	26.86	7.36	34.87	171	80.00	-30.65	vertical	Peak
5 pp	2400.00	27.77	29.33	8.70	34.25	108	60.00	-28.45	vertical	Average
6	2400.00	45.40	29.33	8.70	34.25	108	80.00	-30.82	vertical	Peak
7	2794.00	25.45	30.08	9.53	33.98	166	60.00	-28.92	vertical	Average
8	2794.00	41.21	30.08	9.53	33.98	166	80.00	-33.16	vertical	Peak



Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : AC
Memo : 3 ~ 5 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3963.00	22.60	31.83	11.46	34.93	151	60.00	-29.04	horizontal	Average
2	3963.00	35.65	31.83	11.46	34.93	151	80.00	-35.99	horizontal	Peak
3	4047.00	22.07	31.92	11.60	34.89	153	60.00	-29.30	horizontal	Average
4	4047.00	34.96	31.92	11.60	34.89	153	80.00	-36.41	horizontal	Peak
5 pp	5859.00	19.88	34.71	17.01	33.33	53	60.00	-21.73	horizontal	Average
6 pk	5859.00	33.41	34.71	17.01	33.33	53	80.00	-28.20	horizontal	Peak

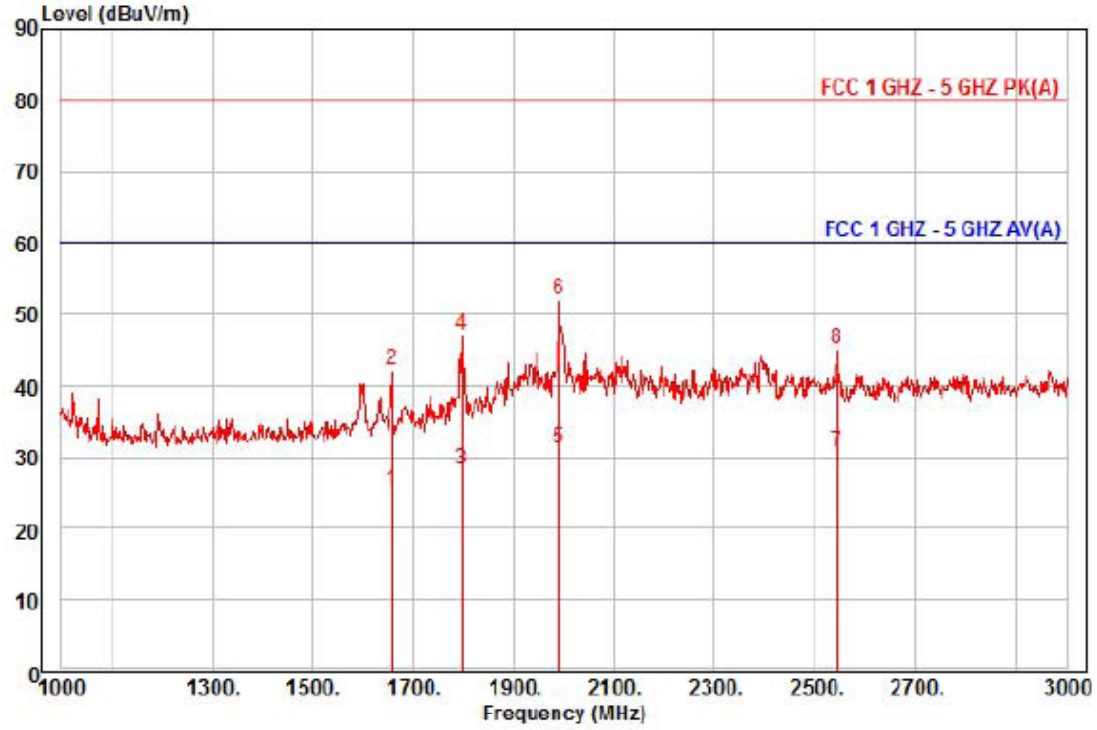


Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : AC
Memo : 3 ~ 5 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3189.00	23.92	30.62	10.25	34.05	118	60.00	-29.26	vertical	Average
2	3189.00	40.94	30.62	10.25	34.05	118	80.00	-32.24	vertical	Peak
3	3861.00	23.90	31.65	11.30	34.81	207	60.00	-27.96	vertical	Average
4	3861.00	38.29	31.65	11.30	34.81	207	80.00	-33.57	vertical	Peak
5 pp	5646.00	20.82	34.08	16.06	33.30	306	60.00	-22.34	vertical	Average
6 pk	5646.00	34.70	34.08	16.06	33.30	306	80.00	-28.46	vertical	Peak

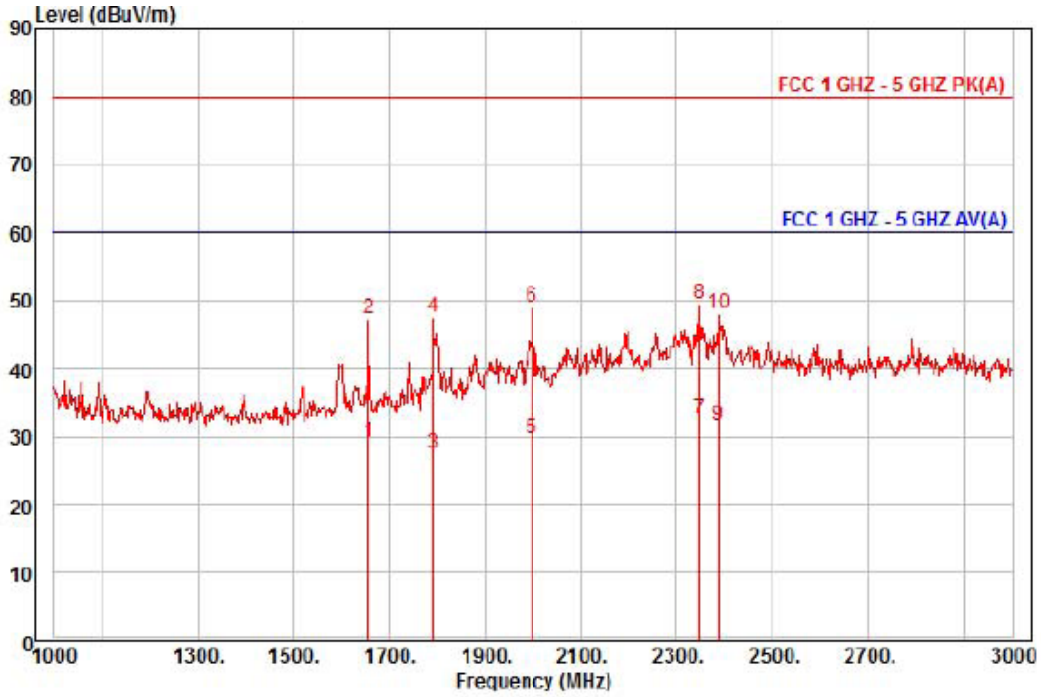
- DC Mode

Temperature: 18.5 ℃ Humidity: 43.7 % R.H. Test Date: 04.16. 2015 Tested by: Hyo Jin, Kim



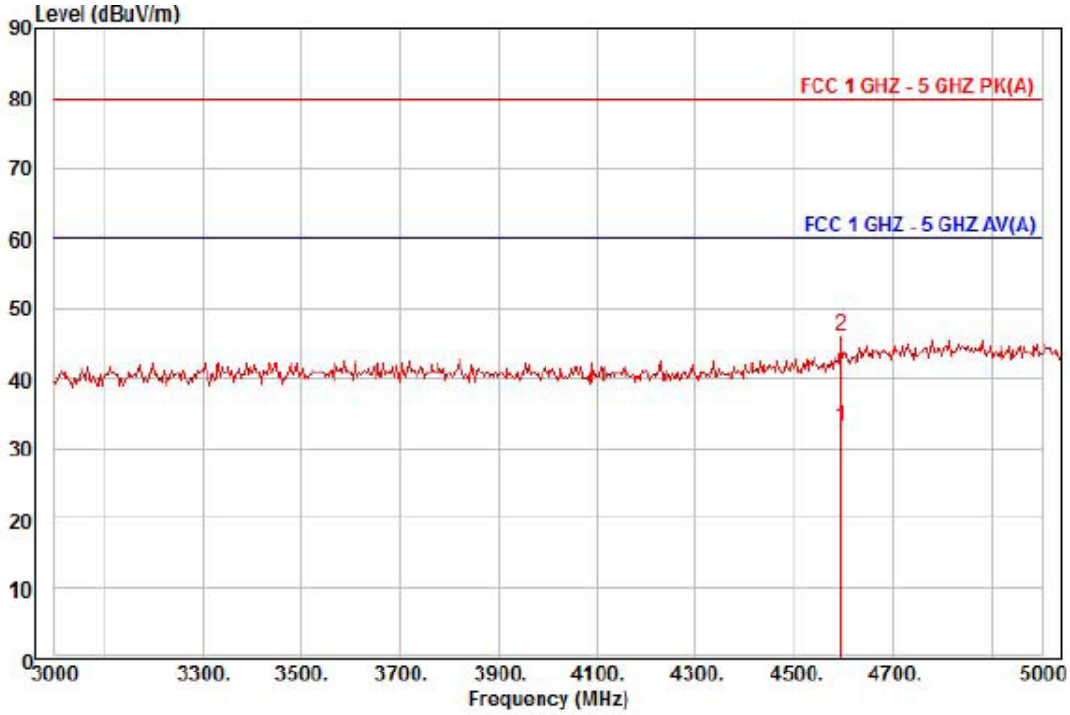
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : DC
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1658.00	27.26	26.02	7.03	35.10	309	60.00	-34.79	horizontal	Average
2	1658.00	44.25	26.02	7.03	35.10	309	80.00	-37.80	horizontal	Peak
3	1798.00	28.78	26.89	7.37	34.87	240	60.00	-31.83	horizontal	Average
4	1798.00	47.66	26.89	7.37	34.87	240	80.00	-32.95	horizontal	Peak
5 av	1992.00	29.80	28.10	7.84	34.54	147	60.00	-28.80	horizontal	Average
6 pp	1992.00	50.63	28.10	7.84	34.54	147	80.00	-27.97	horizontal	Peak
7	2546.00	25.99	29.69	9.01	34.15	166	60.00	-29.46	horizontal	Average
8	2546.00	40.66	29.69	9.01	34.15	166	80.00	-34.79	horizontal	Peak



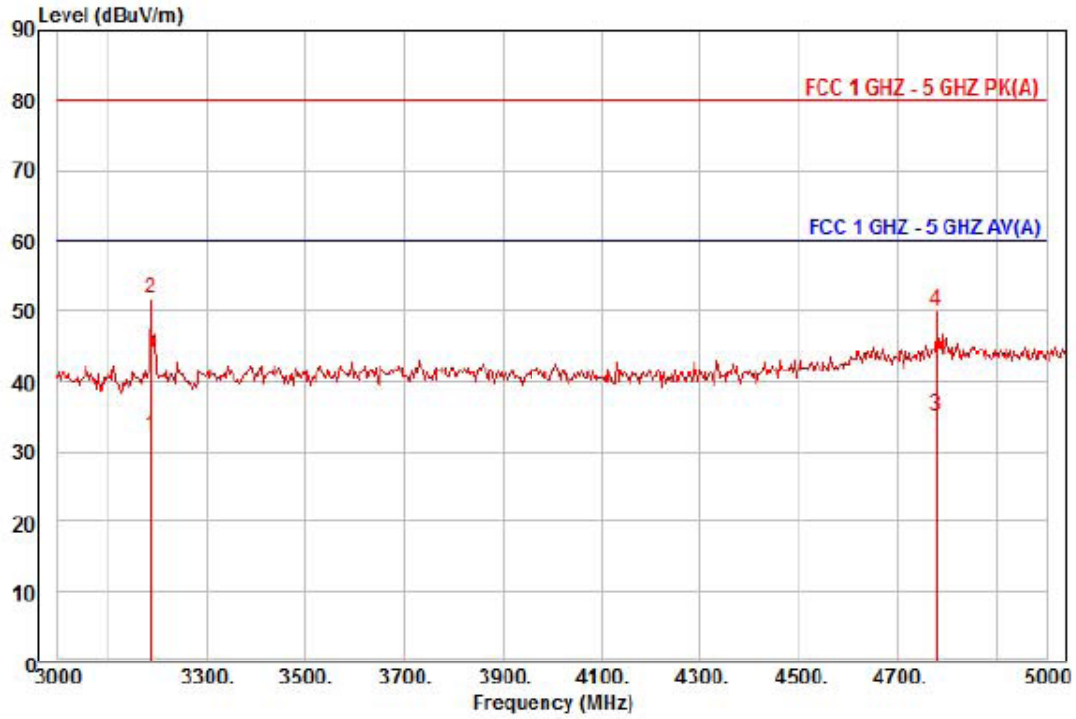
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : DC
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1656.00	31.26	26.00	7.03	35.10	250	60.00	-30.81	vertical	Average
2	1656.00	49.50	26.00	7.03	35.10	250	80.00	-32.57	vertical	Peak
3	1792.00	28.10	26.85	7.36	34.88	154	60.00	-32.57	vertical	Average
4	1792.00	48.35	26.85	7.36	34.88	154	80.00	-32.32	vertical	Peak
5	2000.00	28.17	28.15	7.86	34.53	28	60.00	-30.35	vertical	Average
6	2000.00	47.61	28.15	7.86	34.53	28	80.00	-30.91	vertical	Peak
7 pp	2348.00	29.03	29.17	8.59	34.29	118	60.00	-27.50	vertical	Average
8 pk	2348.00	46.11	29.17	8.59	34.29	118	80.00	-30.42	vertical	Peak
9	2388.00	27.90	29.29	8.67	34.26	123	60.00	-28.40	vertical	Average
10	2388.00	44.47	29.29	8.67	34.26	123	80.00	-31.83	vertical	Peak



Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : DC
Memo : 3 ~ 5 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	4596.00	22.22	32.42	12.50	33.92	51	60.00	-26.78	horizontal	Average
2	4596.00	35.02	32.42	12.50	33.92	51	80.00	-33.98	horizontal	Peak
3	5460.00	20.09	33.67	15.23	33.27	14	60.00	-24.28	horizontal	Average
4	5460.00	33.39	33.67	15.23	33.27	14	80.00	-30.98	horizontal	Peak
5 pp	5796.00	20.17	34.52	16.73	33.32	266	60.00	-21.90	horizontal	Average
6 pk	5796.00	33.00	34.52	16.73	33.32	266	80.00	-29.07	horizontal	Peak

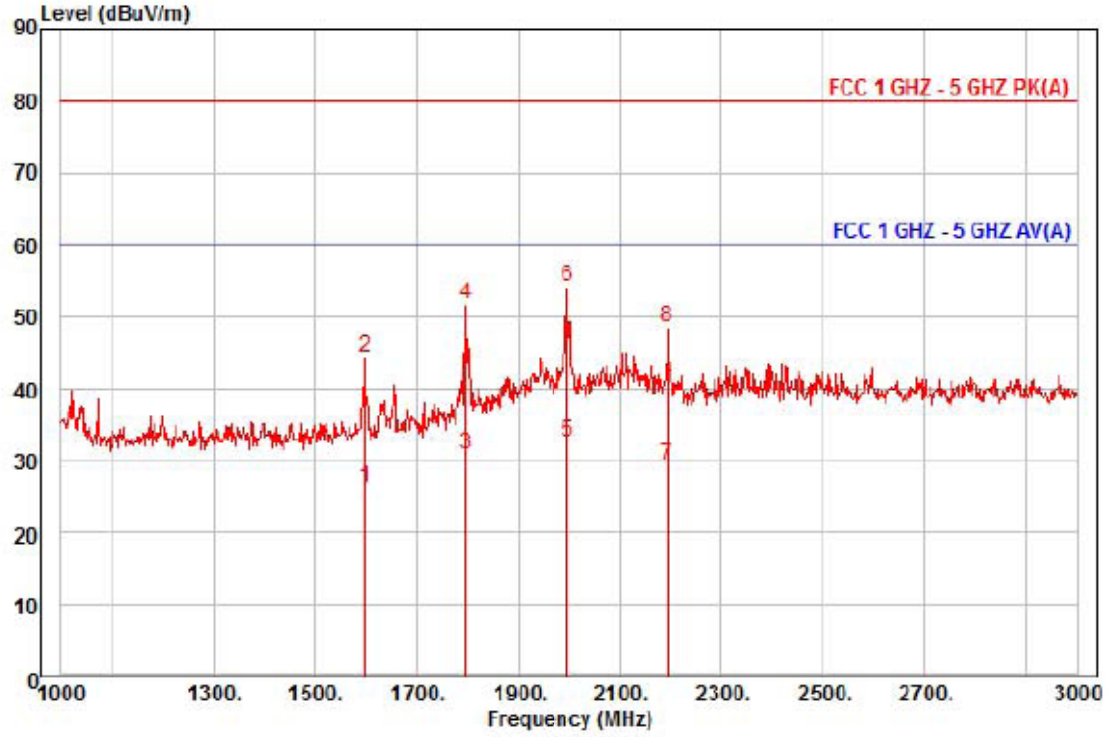


Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : DC
Memo : 3 ~ 5 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3189.00	25.28	30.62	10.25	34.05	209	60.00	-27.90	vertical	Average
2 pk	3189.00	45.03	30.62	10.25	34.05	209	80.00	-28.15	vertical	Peak
3	4779.00	22.75	33.10	12.81	33.60	171	60.00	-24.94	vertical	Average
4	4779.00	37.70	33.10	12.81	33.60	171	80.00	-29.99	vertical	Peak
5 pp	5772.00	20.19	34.45	16.62	33.32	306	60.00	-22.06	vertical	Average
6	5772.00	33.18	34.45	16.62	33.32	306	80.00	-29.07	vertical	Peak

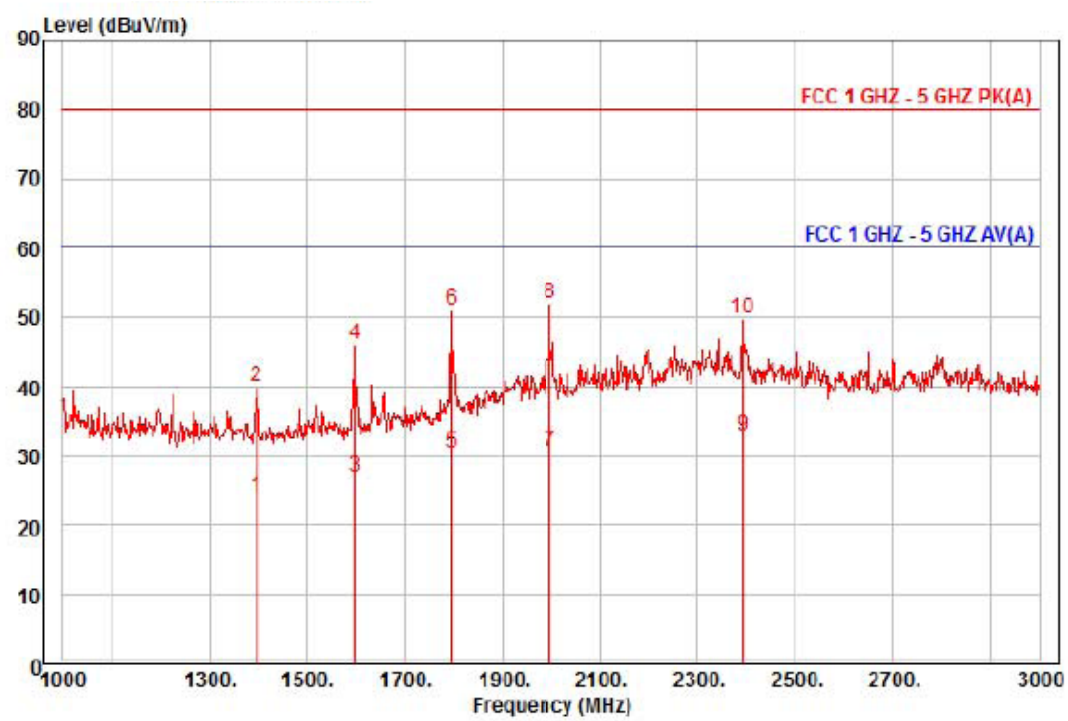
- PoE Mode

Temperature: 18.5 ℃ Humidity: 43.7 % R.H. Test Date: 04.16. 2015 Tested by: Hyo Jin, Kim



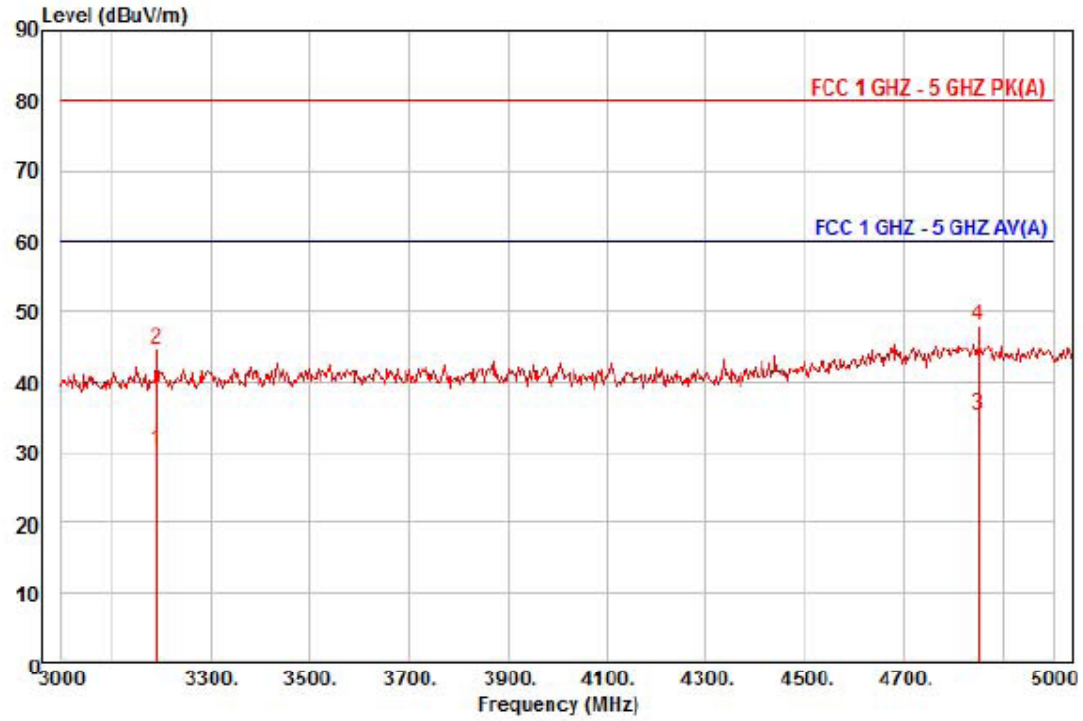
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : POE
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1598.00	29.01	25.64	6.89	35.20	360	60.00	-33.66	horizontal	Average
2	1598.00	47.06	25.64	6.89	35.20	360	80.00	-35.61	horizontal	Peak
3	1796.00	31.58	26.88	7.37	34.87	219	60.00	-29.04	horizontal	Average
4	1796.00	52.26	26.88	7.37	34.87	219	80.00	-28.36	horizontal	Peak
5 av	1998.00	31.05	28.14	7.86	34.53	216	60.00	-27.48	horizontal	Average
6 pp	1998.00	52.62	28.14	7.86	34.53	216	80.00	-25.91	horizontal	Peak
7	2194.00	26.84	28.72	8.27	34.40	137	60.00	-30.57	horizontal	Average



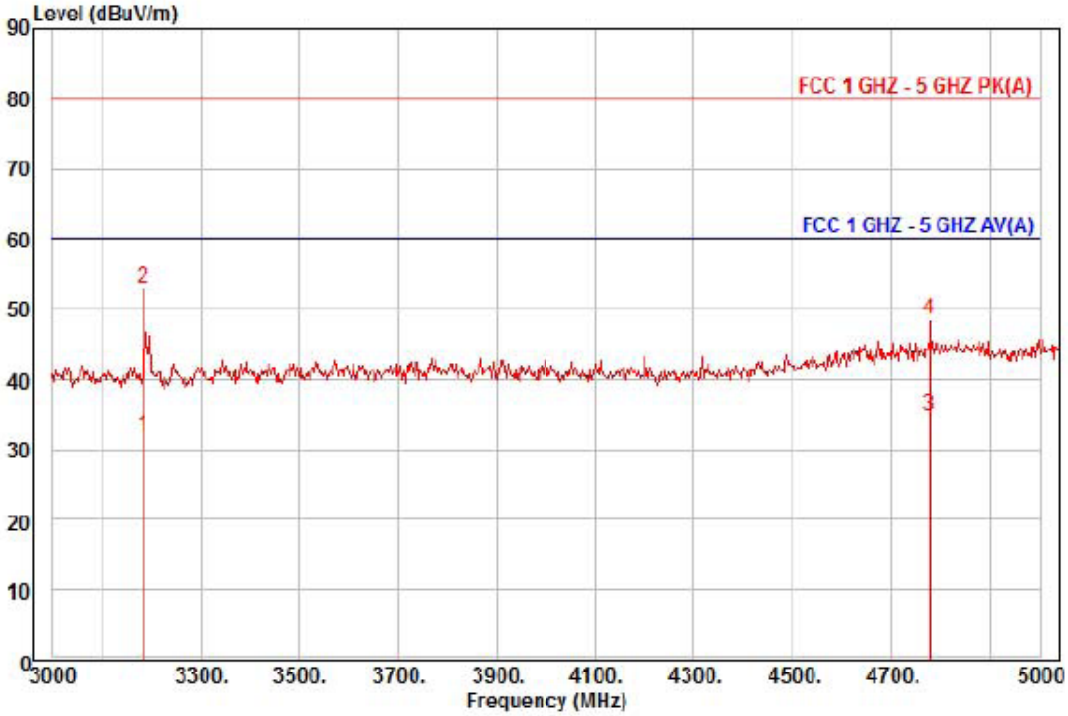
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : POE
Memo : 1 ~ 3 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	1398.00	28.30	24.79	6.40	35.54	271	60.00	-36.05	vertical	Average
2	1398.00	44.28	24.79	6.40	35.54	271	80.00	-40.07	vertical	Peak
3	1598.00	29.69	25.64	6.89	35.20	205	60.00	-32.98	vertical	Average
4	1598.00	48.71	25.64	6.89	35.20	205	80.00	-33.96	vertical	Peak
5	1796.00	31.12	26.88	7.37	34.87	170	60.00	-29.50	vertical	Average
6	1796.00	51.53	26.88	7.37	34.87	170	80.00	-29.09	vertical	Peak
7	1998.00	29.13	28.14	7.86	34.53	197	60.00	-29.40	vertical	Average
8 pk	1998.00	50.48	28.14	7.86	34.53	197	80.00	-28.05	vertical	Peak
9 pp	2394.00	29.17	29.31	8.69	34.26	101	60.00	-27.09	vertical	Average



Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : POE
Memo : 3 ~ 5 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3192.00	23.35	30.63	10.26	34.06	186	60.00	-29.82	horizontal	Average
2	3192.00	37.92	30.63	10.26	34.06	186	80.00	-35.25	horizontal	Peak
3	4851.00	22.45	33.36	12.92	33.47	152	60.00	-24.74	horizontal	Average
4	4851.00	35.17	33.36	12.92	33.47	152	80.00	-32.02	horizontal	Peak
5 pp	5652.00	20.80	34.10	16.08	33.30	134	60.00	-22.32	horizontal	Average
6 pk	5652.00	33.95	34.10	16.08	33.30	134	80.00	-29.17	horizontal	Peak



Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project : NETWORK CAMERA
Model : SNO-8081RN
Mode : POE
Memo : 3 ~ 5 GHz

	Freq	Read Level	Ant Factor	Cable Loss	Preamp Factor	TPos	Limit Line	Over Limit	Pol/Phase	Remark
	MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	3186.00	25.10	30.62	10.25	34.05	223	60.00	-28.08	vertical	Average
2 pk	3186.00	46.23	30.62	10.25	34.05	223	80.00	-26.95	vertical	Peak
3	4779.00	22.59	33.10	12.81	33.60	338	60.00	-25.10	vertical	Average
4	4779.00	36.28	33.10	12.81	33.60	338	80.00	-31.41	vertical	Peak
5 pp	5859.00	19.87	34.71	17.01	33.33	161	60.00	-21.74	vertical	Average
6	5859.00	32.39	34.71	17.01	33.33	161	80.00	-29.22	vertical	Peak

3. Product Labelling Requirements

3.1 FCC Statement

Product shall be labelled the following statement on the user's manual:

> This device complies with part 15 of the FCC Rules. Operation in subject to the fol-lowing two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference re-ceived, including interference that may cause undesired operation.

Note : When the device is so small or for such use that it is not practicable to place the statement on it, the information shall be placed in prominent location in the instruction manual or pamphlet supplied to the user. However, the FCC identifier or unique identifier, as appropriate, must be displayed on the device.

4. Test Setup Photographs

4.1 Conducted Emission

- AC Mode

4.2 Radiated Emission

- Below 1 GHz

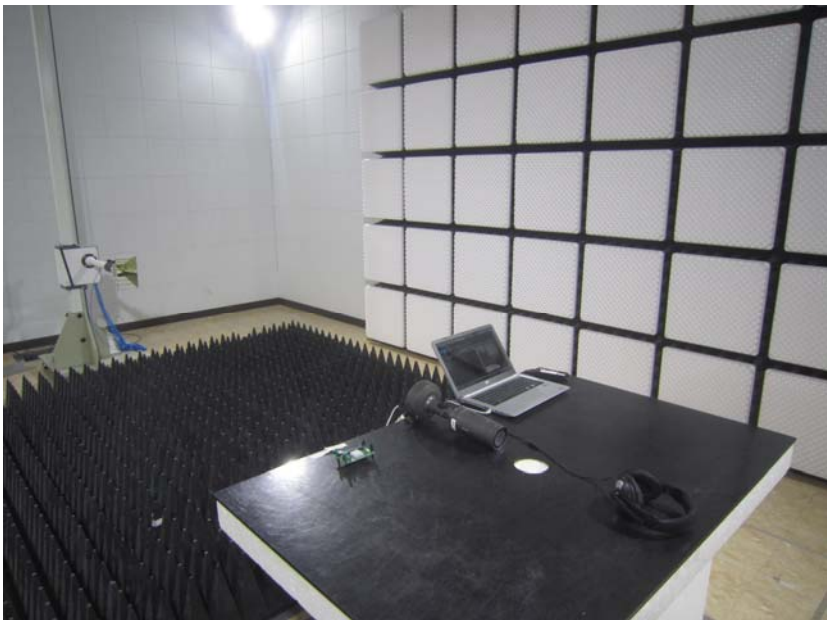
- AC Mode

- DC Mode

- POE Mode

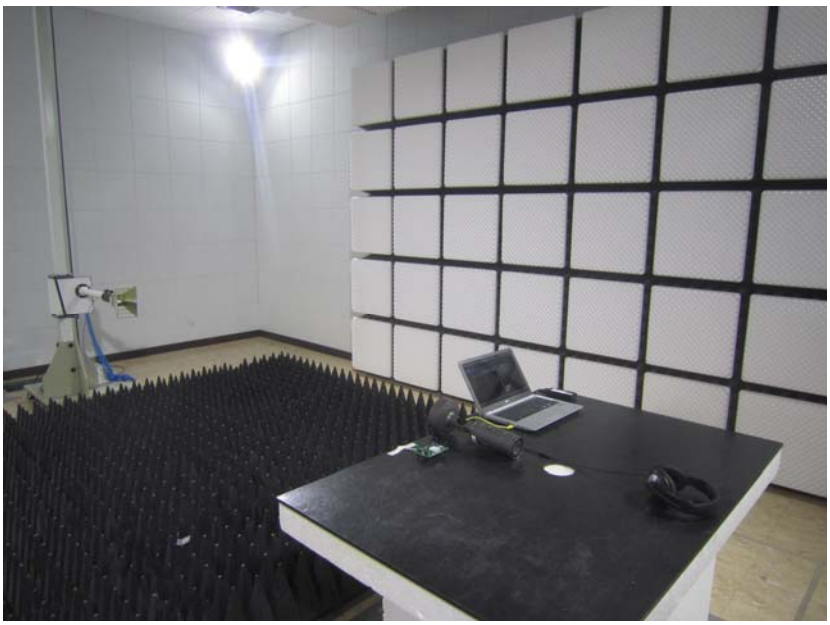
- Above 1 GHz

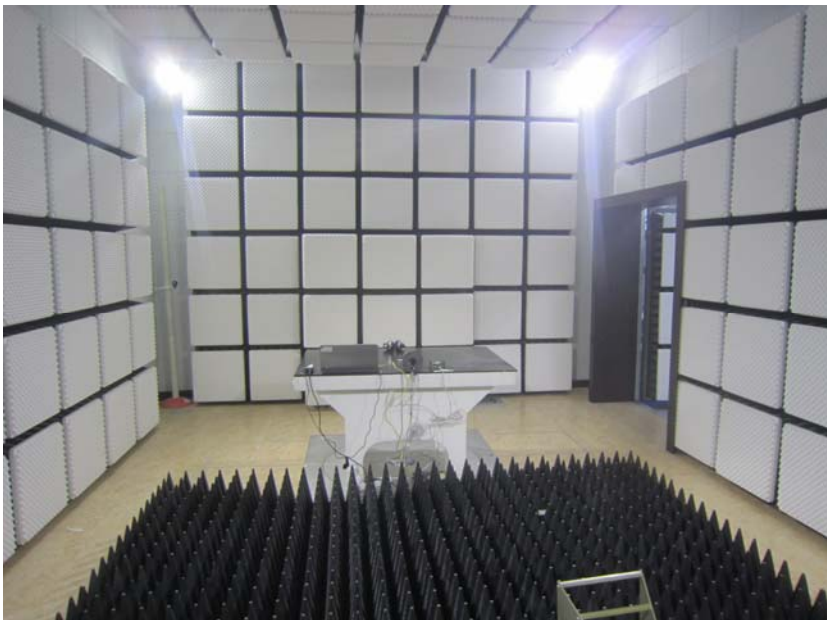
-AC Mode



- DC Mode

- POE Mode



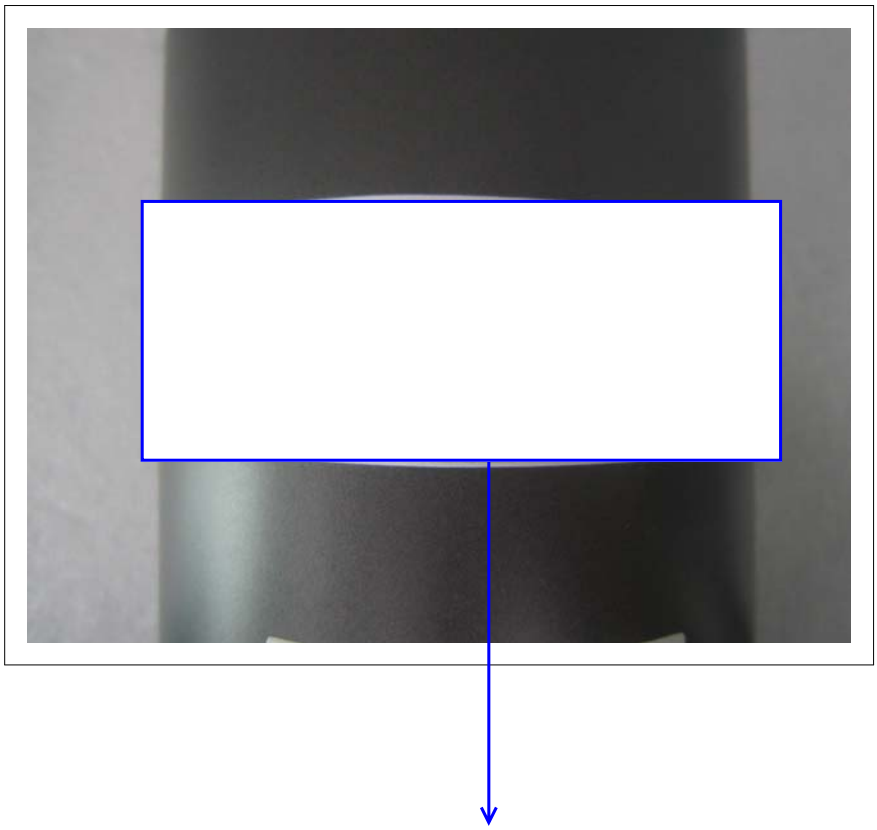


5. External Photographs

5.1 E.U.T: Front View

5.2 E.U.T: Rear View

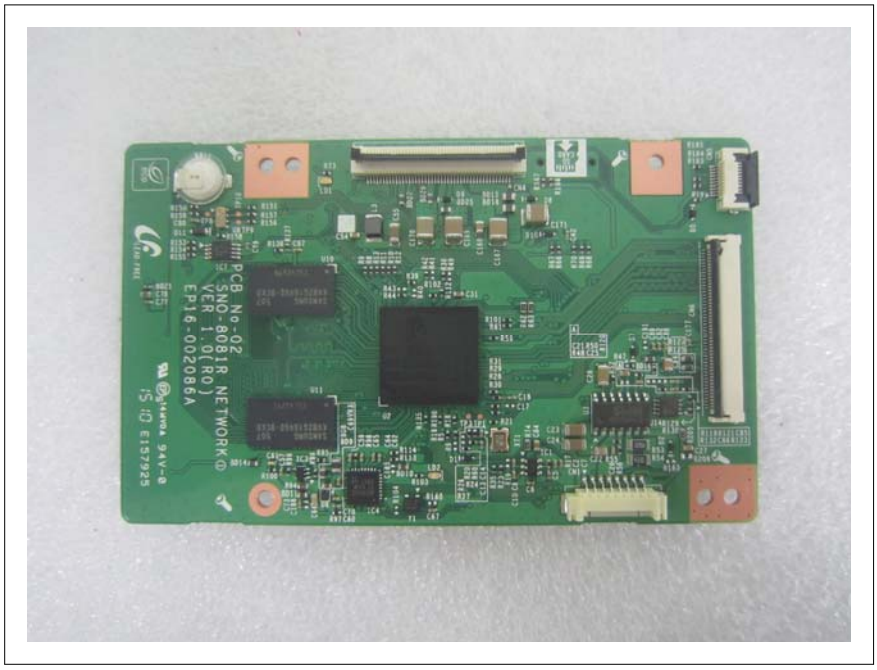
5.3 E.U.T: Label View (Location)



6. Internal Photographs

6.1 E.U.T: Internal View

6.2 E.U.T: Internal View(Top) - Main Board



E.U.T: Internal View(Bottom) - Main Board

6.3 E.U.T: Internal View(Top) - Power Board

E.U.T: Internal View(Bottom) - Power Board

6.4 E.U.T: Internal View(Top) - Lens Board

E.U.T: Internal View(Bottom) - Lens Board

Appendix A - Schematics/Block Diagram

Please see attached document(s).

Appendix B - User's Manual

Please see attached document(s).