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:	SNB-6005N
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-E1-15T0167

NETWORK CAMERA, Model SNB-6005N 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-E1-15T0167

Date of Issue: 05. 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-E1-15T0167
Date of Issue	: 05. 28. 2015
Description of Product	: NETWORK CAMERA
Model No.	: SNB-6005N
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	: 05. 17. 2015
Test Date	: 05. 18. 2015 - 05. 19. 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

TABLE OF CONTENTS

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.

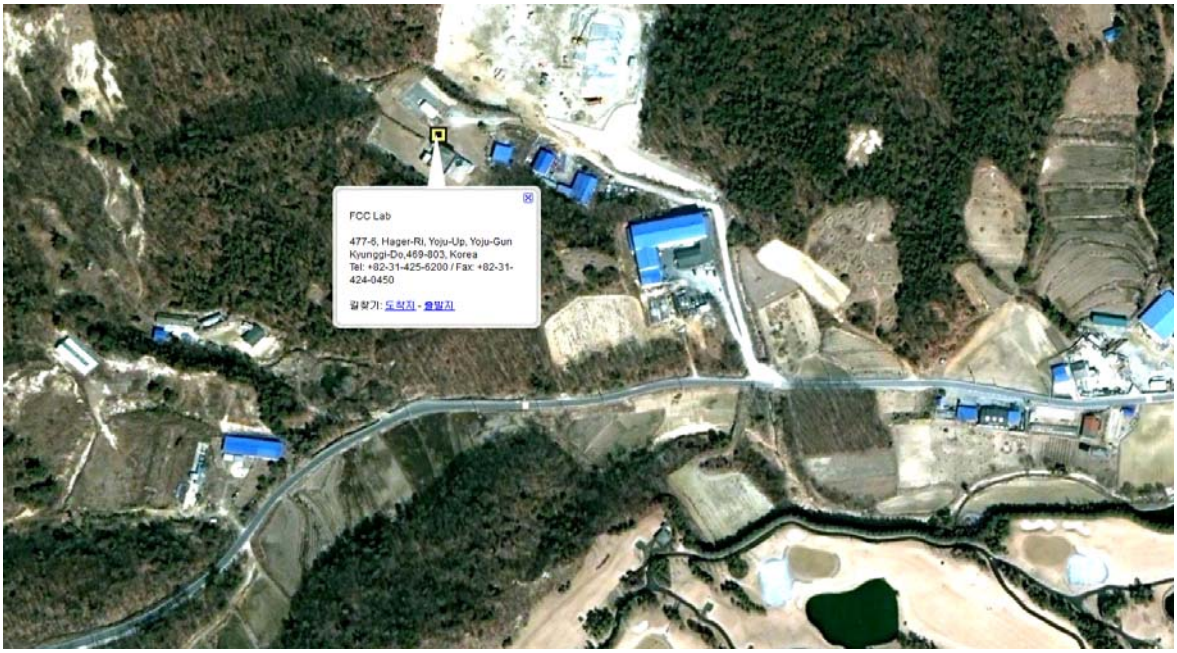
All radiated and conducted emission measurements are performed manually at KES Co., Ltd. (hereinafter referred to as "KES"), 473-29, Gayeo-ro, Yeoju-si, Gyeonggi-do, 469-803 Korea

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: SNB-6005N or the "E.U.T".

Main Specifications of EUT are

	DIA	PIA
Video		
Imaging Device	1/1.9" PS 2.42M CMOS	1/1.9" PS 2.42M CMOS
Total Pixels	1952(H)X1241(V) approx 2.42M pixels	1952(H)X1241(V) approx 2.42M pixels
Effective Pixels	1937(H)X1097(V) approx 2.12M pixels	1937(H)X1097(V) approx 2.12M pixels
Scanning System	Progressive	Progressive
Min. Illumination	Color:0.03Lux(1/30sec,F1.2,50IRE), TBD B/W:0.003Lux(1/30sec,F1.2,50IRE), TBD Color:0.015Lux(1/30sec,F1.2,30IRE), TBD B/W:0.0015Lux(1/30sec,F1.2,30IRE), TBD	Color:0.015Lux(1/30sec,F1.2,30IRE) B/W:0.0015Lux(1/30sec,F1.2,30IRE)
S / N Ratio	50dB	50dB
Video Out	CVBS:1.0Vp-p/75Ω composite,720x480(N),720x576(P),forinstallation -DIPconnectortype	CVBS:1.0Vp-p/75Ω composite,720x480(N),720x576(P),forinstallation -DIPconnectortype
Lens		
Focus Control	SimpleFocus/Manual - Remote control via network (Manual, Simple Focus, Day&Night)	SimpleFocus/Manual - Remote control via network (Manual, Simple Focus, Day&Night)
Lens Type	Manual / DC Auto Iris, P-Iris	Manual / DC Auto Iris, P-Iris
Mount Type	C/CS-Mount	C/CS-Mount
Operational		
Camera Title	Off / On (Displayed up to 45 characters)	Off / On (Displayed up to 45 characters)
Day & Night	Auto (ICR) / Color / B/W / External / Schedule	Auto (ICR) / Color / B/W / External / Schedule
Backlight Compensation	Off / BLC / WDR	Off / BLC / WDR
Wide Dynamic Range	Max. 120dB	Max. 120dB
Contrast Enhancement	SSDR(SamsungSuperDynamicRange) (Off / On)	SSDR(SamsungSuperDynamicRange) (Off / On)
Digital Noise Reduction	SSNRIII(2D+3DNoiseFilter) (Off / On)	SSNRIII(2D+3DNoiseFilter) (Off / On)
Digital Image Stabilization	Off / On	Off / On
Defog	Auto/Manual/Off	Auto/Manual/Off
Motion Detection	Off/On(4zoneswith 4 points Polygon)	Off/On(4zoneswith 4 points Polygon)
Privacy Masking	Off / On (32 zones with 4 points of polygon)	Off / On (32 zones with 4 points of polygon)
Gain Control	Off / Low / Middle / High	Off / Low / Middle / High
White Balance	ATW / AWC / Manual / Indoor / Outdoor	ATW / AWC / Manual / Indoor / Outdoor
Electronic Shutter Speed	Minimum / Maximum / Anti flicker (1 ~ 1/12,000sec)	Minimum / Maximum / Anti flicker (1 ~ 1/12,000sec)
Flip / Mirror	Off / On	Off / On
Intelligent Video Analytics	Tampering,VirtualLine,Enter/Exit,Appear/Disappear,AudioDetection,FaceDetection withMetadata	Tampering,VirtualLine,Enter/Exit,Appear/Disappear,AudioDetection,FaceDetection withMetadata
Alarm I/O	Input1ea/Output1ea	Input1ea/Output1ea
Serial Interface	RS-485 (Protocol:Samsung-T/E,Pelco-D/P,Sungjin,Panasonic,Honeywell,AD,Vicon,GE,BOSCH)	RS-485 (Protocol:Samsung-T/E,Pelco-D/P,Sungjin,Panasonic,Honeywell,AD,Vicon,GE,BOSCH)

Alarm Triggers	Motion detection, Tampering Detection, Audio Detection, Face Detecton, Network disconnection, Video analytics, Alarm input	Motion detection, Tampering Detection, Audio Detection, Face Detecton, Network disconnection, Video analytics, Alarm input
Alarm events	FileuploadviaFTPandE-Mail NotificationviaE-Mail,TCPandHTTP localstorage(SD/SDHC/SDXC)recordingatNetworkdisconnected&Event(AlarmTriggers) Externaloutput,LocalPC(Manual)	FileuploadviaFTPandE-Mail NotificationviaE-Mail,TCPandHTTP localstorage(SD/SDHC/SDXC)recordingatNetworkdisconnected&Event(AlarmTriggers) Externaloutput,LocalPC(Manual)
Network		
Ethernet	RJ-45 (10/100BASE-T)	RJ-45 (10/100BASE-T)
Video Compression Format	H.264 (MPEG-4 Part 10/AVC), Motion JPEG	H.264 (MPEG-4 Part 10/AVC), Motion JPEG
Resolution	1920x1080//1280x1024/1280x960/1280x720/ 1024x768/800x600/720x576/800x450/640x480/640x360/320x240/320x180	1920x1080//1280x1024/1280x960/1280x720/ 1024x768/800x600/720x576/800x450/640x480/640x360/320x240/320x180
Max. Framerate	[H.264] Max 60fps at all resolutions [MJPEG] Max 15fps@1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 Max 30fps@800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180	[H.264] Max 60fps at all resolutions [MJPEG] Max 15fps@1920x1080 / 1280x1024 / 1280x960 / 1280x720 / 1024x768 Max 30fps@800x600 / 800x450 / 640x480 / 640x360 / 320x240 / 320x180
Smart Codec	Manualmode(Area-based:5ea) Facedetectionmode	Manualmode(Area-based:5ea) Facedetectionmode
Video Quality Adjustment	H.264:CompressionLevel,TargetBitrateLevelControl MJPEG:QualityLevelControl	H.264:CompressionLevel,TargetBitrateLevelControl MJPEG:QualityLevelControl
Bitrate Control Method	H.264:CBRorVBR, MJPEG:VBR	H.264:CBRorVBR, MJPEG:VBR
Streaming Capability	Multiple Streaming (Up to 10 Profiles)	Multiple Streaming (Up to 10 Profiles)
Audio I/O	Mic(Line)-in/Built-inMicSelectableviaUI,Line-out(Mono,1Vrms) 2.5VDC(4mA)powered2KOhm	Mic(Line)-in/Built-inMicSelectableviaUI,Line-out(Mono,1Vrms) 2.5VDC(4mA)powered2KOhm
Audio Compression Format	G.711u-law/G.726Selectable G.726(ADPCM)8KHz,G.7118KHz G.726:16Kbps,24Kbps,32Kbps,40Kbps	G.711u-law/G.726Selectable G.726(ADPCM)8KHz,G.7118KHz G.726:16Kbps,24Kbps,32Kbps,40Kbps
Audio Communication	Bi-directional	Bi-directional
IP	IPv4, IPv6	IPv4, IPv6
Protocol	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour	TCP/IP, UDP/IP, RTP(UDP), RTP(TCP), RTCP,RTSP, NTP, HTTP, HTTPS, SSL, DHCP, PPPoE, FTP, SMTP, ICMP, IGMP, SNMPv1/v2c/v3(MIB-2), ARP, DNS, DDNS, QoS, PIM-SM, UPnP, Bonjour
Security	HTTPS(SSL)LoginAuthentication DigestLoginAuthentication IPAddressFiltering UseraccessLog 802.1xAuthentication	HTTPS(SSL)LoginAuthentication DigestLoginAuthentication IPAddressFiltering UseraccessLog 802.1xAuthentication
Streaming Method	Unicast / Multicast	Unicast / Multicast
Max. User Access	15 users at Unicast Mode	15 users at Unicast Mode
Memory Slot	microSD/SDHC/SDXC -motionImagesrecordedintheSDX/SDHC/SDmemorycardcanbedownloaded.	microSD/SDHC/SDXC -motionImagesrecordedintheSDX/SDHC/SDmemorycardcanbedownloaded.
Application Programming	ONVIFProfileS&G SUNAPI(HTTPAPI)	ONVIFProfileS&G SUNAPI(HTTPAPI)

Interface		
Webpage Language	English,French,German,Spanish,Italian,Chinese,Korean,Russian,Japanese, Swedish,Danish,Portuguese,Turkish,Polish,Czech,Rumanian,Serbian, Dutch, Croatian,Hungarian,Greek,Norwegian,Finnish	English,French,German,Spanish,Italian,Chinese,Korean,Russian,Japanese, Swedish,Danish,Portuguese,Turkish,Polish,Czech,Rumanian,Serbian,Dutch, Croatian,Hungarian,Greek,Norwegian,Finnish
Web Viewer	SupportedOS:WindowsXP/VISTA/7/8,MACOSX10.7 SupportedBrowser:MicrosoftInternetExplorer(Ver.10,9,8), Mozilla Firefox (Ver. 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9), Google Chrome (Ver. 25, 24, 23, 22, 21, 20, 19, 18, 17,16, 15), Apple Safari (Ver. 6.0.2(Mac OS X 10.8, 10.7 only), 5.1.7) * Mac OS X only	SupportedOS:WindowsXP/VISTA/7/8,MACOSX10.7 SupportedBrowser:MicrosoftInternetExplorer(Ver.10,9,8), Mozilla Firefox (Ver. 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9), Google Chrome (Ver. 25, 24, 23, 22, 21, 20, 19, 18, 17,16, 15), 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	SmartViewer
Environmental		
Operating Temperature / Humidity	-10°C ~ +55°C(+14°F ~ +131°F) / Less than 90% RH	-30°C~+55°C(+14°F~+131°F)/Lessthan90%RH※ -10°C~+55°C(+14°F~+131°F)/Lessthan90%RH(기존사양)
Storage Temperature / Humidity	-30°C~+60°C(-22°F~+140°F)/ Less than 90% RH	-30°C~+60°C(-22°F~+140°F)/ Less than 90% RH
Electrical		
Input Voltage / Current	AC24V, DC 12V, PoE (IEEE802.3af class 3)	AC24V, DC 12V, PoE (IEEE802.3af class 3)
Power Consumption	TBD	Max.11.44W(AC24V,50~60Hz) Max.10.1W(DC12V) Max.11.1W(PoE,Class3)
Mechanical		
Color / Material	FRONT (BLACK) , BODY (IVORY) / FRONT(Aluminium), BODY(Plastic)	FRONT (BLACK) , BODY (IVORY) / FRONT(Aluminium), BODY(Plastic)
Dimension (WxHxD)	W73.1 x H66.6 x D147.8	W73.1 x H66.6 x D147.8
Weight	TBD	430g

1.5 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
NETWORK CAMERA	SNB-6005N	-	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.	-
PTZ Controller	SPC-1010	-	SAMSUNG TECHWIN CO., LTD	-
Headset	RHS-2000	-	ROYCHE	-
Monitor	SMT-2232	C95V67VF900015Y	Weihai Daewoo Electronics Co., Ltd.	-
Micro SD	-	-	Sandisk	-
ALARM ZIG	-	-	-	-

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
	BNC	Monitor	BNC	5.0	Shielded
	RJ-45	Notebook	RJ-45	3.0	Unshielded
	RS-485	PTZ Controller	RS-485	3.0	Unshielded
	Micro SD SLOT	Micro SD	Micro SD SLOT	-	-
	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
	BNC	Monitor	BNC	5.0	Shielded
	RJ-45	POE Adapter	RJ-45	3.0	Unshielded
	RS-485	PTZ Controller	RS-485	3.0	Unshielded
	Micro SD SLOT	Micro SD	Micro SD SLOT	-	-
	ALARM	ALARM ZIG	ALARM	3.0	Unshielded
POE Adapter	RJ-45	Notebook	RJ-45	1.0	Unshielded

1.8 Special Accessories

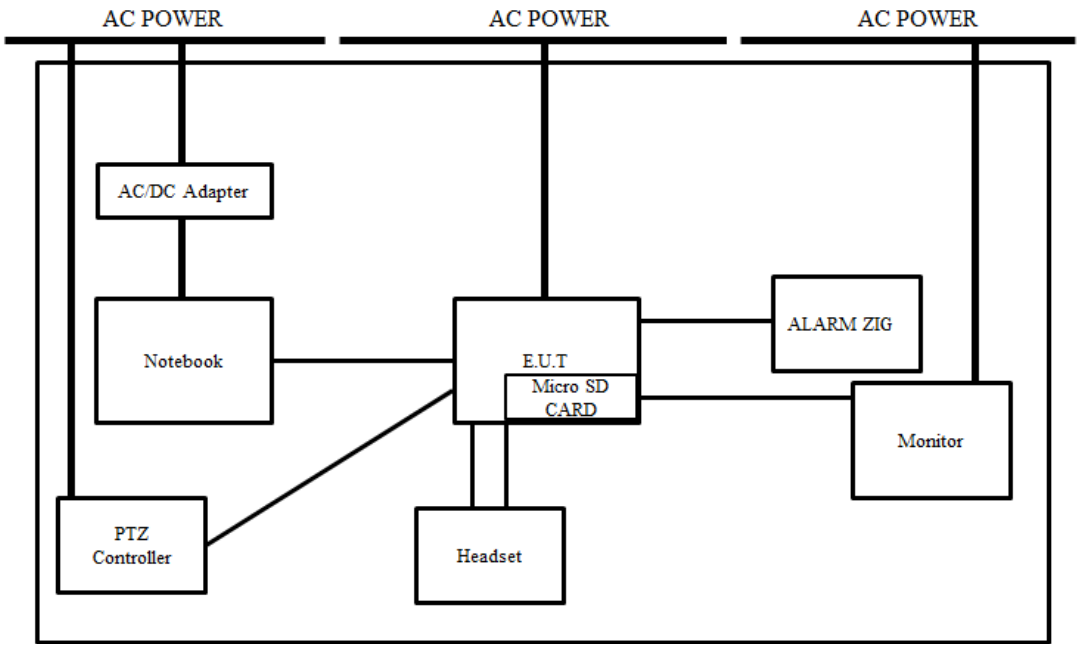
As shown in section 1.10, all interface cables used for compliance testing are shielded as normally supplied or by use respective component manufacturers.

1.9 E.U.T Modifications

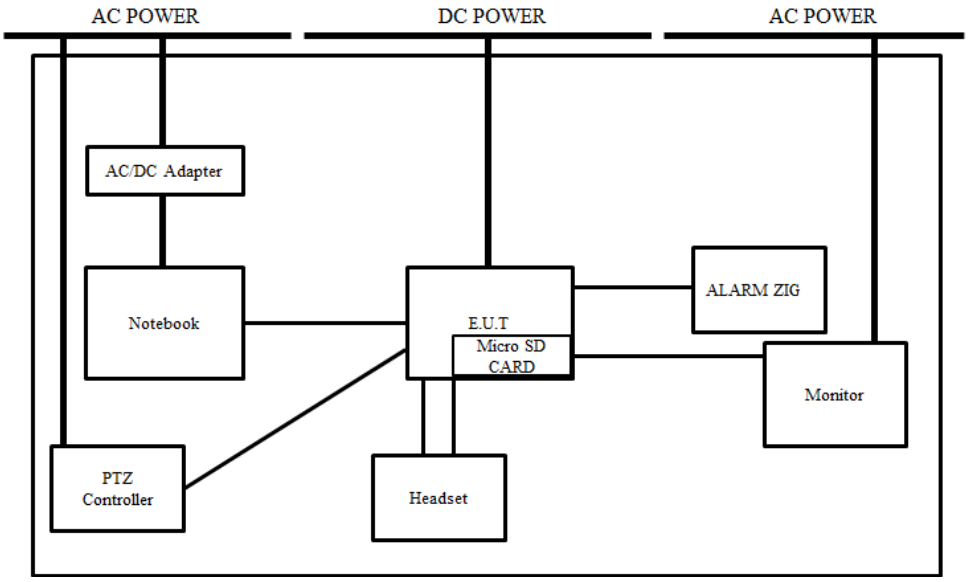
No modifications were made to the E.U.T in order to achieve and maintain compliance to the standards described in this report.

1.10 Configuration of Test System

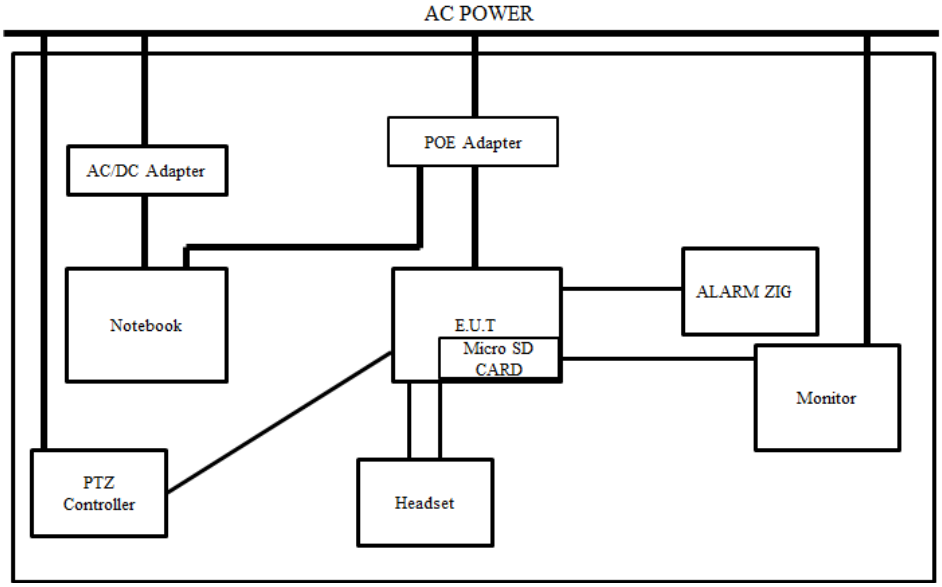
- AC Mode



- 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

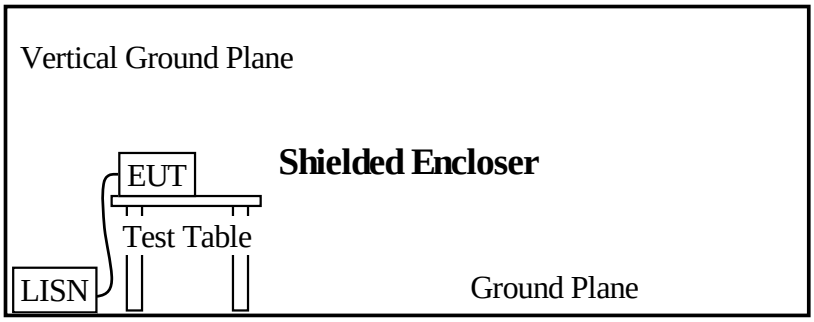
Frequency (㎒)	15.107 Conducted limits			
	Class B (dB㎶)		Class A (dB㎶)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 to 0.50	66.0 to 56.0	56.0 to 46.0	79.0	66.0
0.50 to 5.00	56.0	46.0	73.0	60.0
5.00 to 30.00	60.0	50.0	73.0	60.0

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

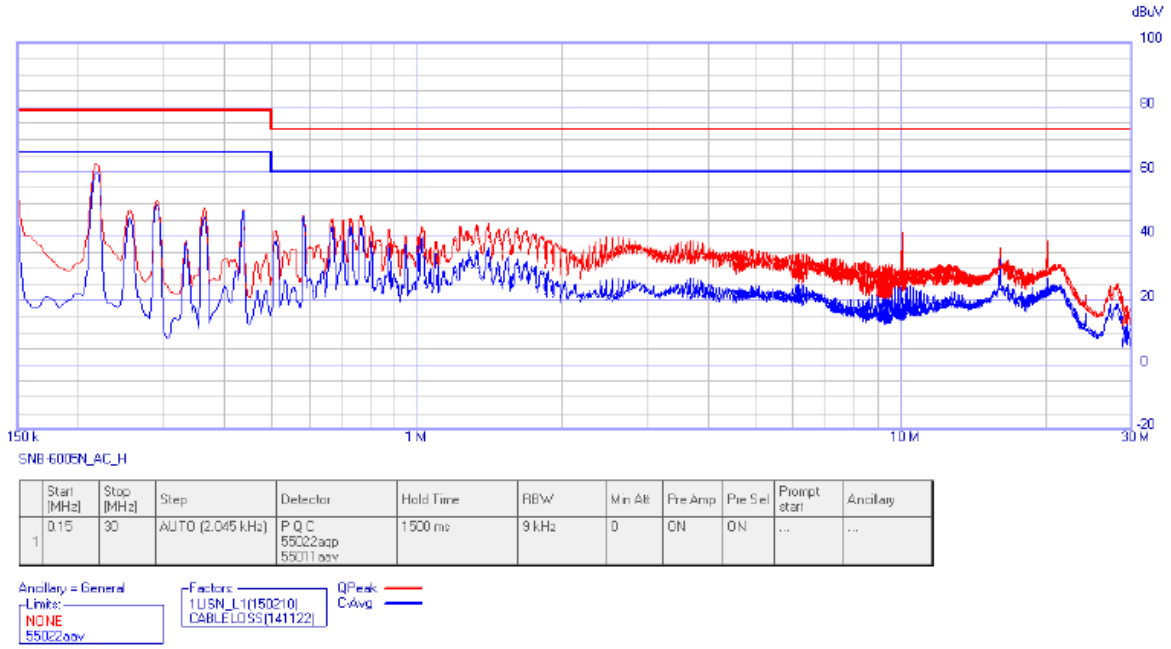
- According to the data in section 5.1.7, the EUT complied with the FCC Part 15 standards.

2.1.8 Test Data

Temperature: 23.2 ℃ Humidity: 40.1 % R.H. Test Date: 05. 18. 2015 Tested by: Hyo Jin, Kim

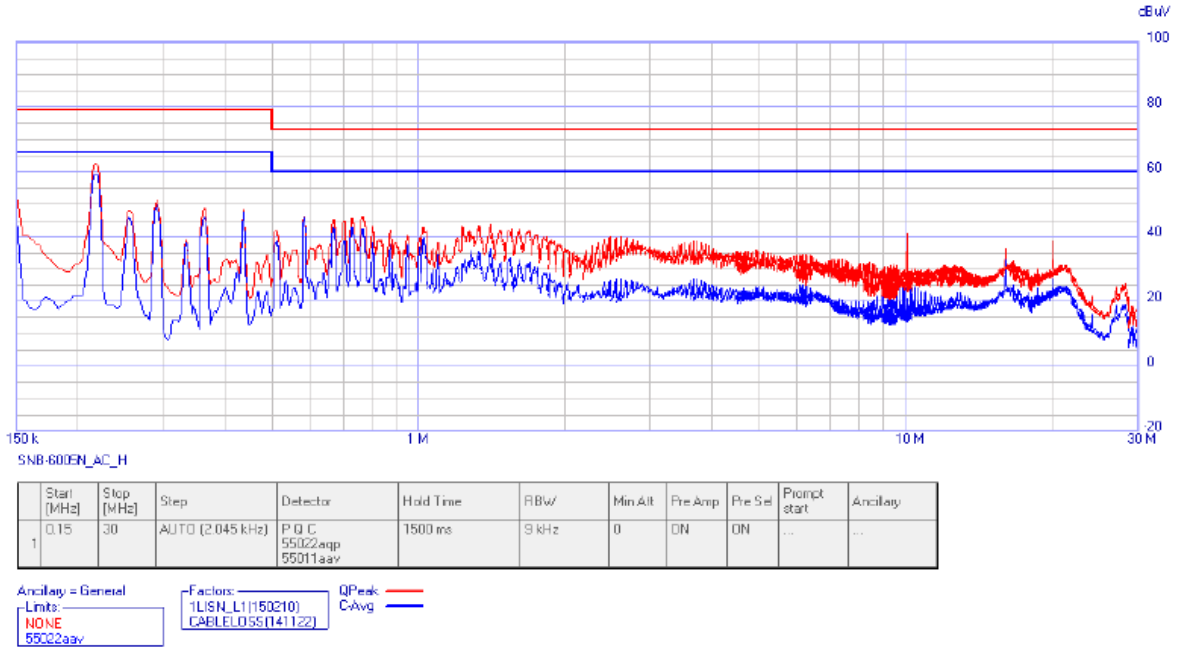
- AC Mode

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	52.940	79.000	-26.060	45.990	66.000	-20.010	9.650	0.020
0.217	62.310	79.000	-16.690	59.200	66.000	-6.800	9.650	0.030
0.291	51.320	79.000	-27.680	49.940	66.000	-16.060	9.650	0.030
0.363	48.680	79.000	-30.320	46.000	66.000	-20.000	9.650	0.030
0.584	46.240	73.000	-26.760	45.870	60.000	-14.130	9.650	0.030
0.669	45.050	73.000	-27.950	42.870	60.000	-17.130	9.650	0.040
0.731	45.520	73.000	-27.480	42.790	60.000	-17.210	9.650	0.040
0.768	46.180	73.000	-26.820	42.350	60.000	-17.650	9.650	0.050

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	50.130	79.000	-28.870	44.000	66.000	-22.000	9.630	0.020
0.217	59.090	79.000	-19.910	55.530	66.000	-10.470	9.640	0.030
0.291	53.750	79.000	-25.250	52.160	66.000	-13.840	9.640	0.030
0.436	48.850	79.000	-30.150	48.320	66.000	-17.680	9.640	0.030
0.584	46.110	73.000	-26.890	45.770	60.000	-14.230	9.650	0.030
0.702	44.810	73.000	-28.190	39.150	60.000	-20.850	9.650	0.040
0.731	45.140	73.000	-27.860	42.430	60.000	-17.570	9.650	0.040
0.768	46.540	73.000	-26.460	42.680	60.000	-17.320	9.650	0.050

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	ESU	100532	05. 06. 2015
PREAMPLIFIER	8449B	H.P	3008A00538	07. 23. 2015
Double Ridged Horn Antenna	A-H-SYSTEM,INC	SAS-571	414	02. 09. 2017
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

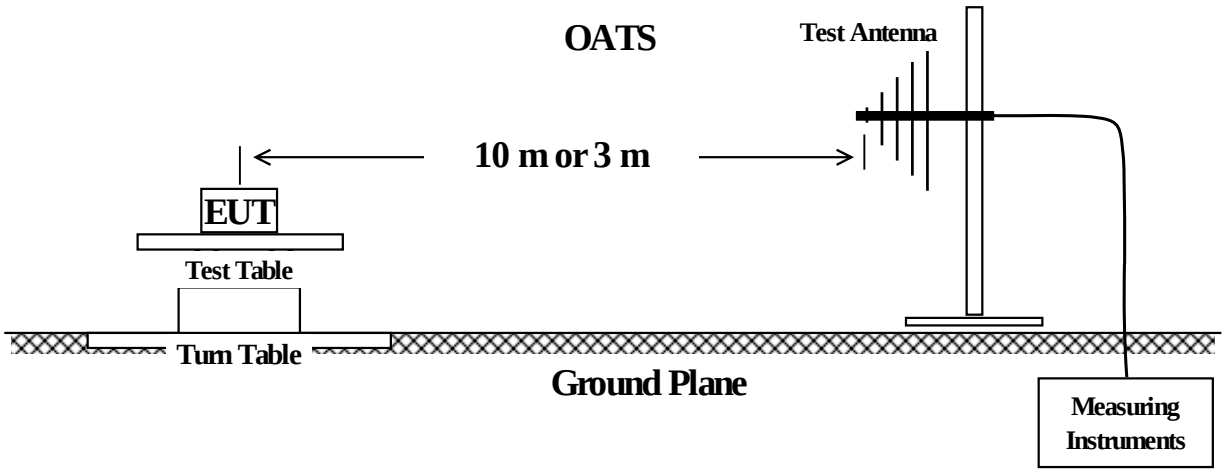
A.G= Amplifier Gain

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

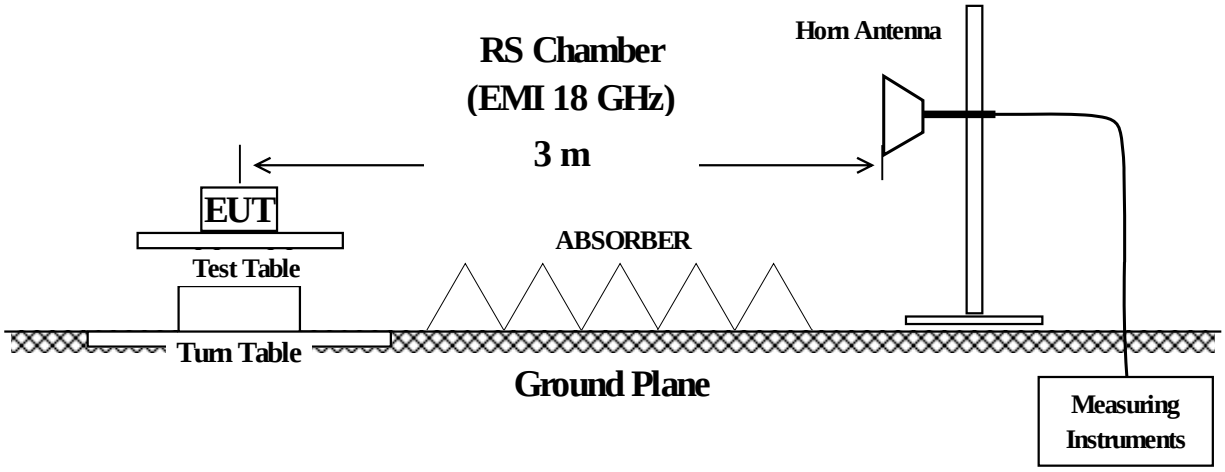
* Above 1 ㎓ : F.S(㏈㎶/m) = M.R(㏈㎶) + [A.F(㏈/m) + C.L(㏈)] - A.G(㏈)

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: 20.1 ℃ Humidity: 60.0 % R.H. Test Date: 05. 19. 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)			
51.341	12.600	V	1.000	13.780	1.640	28.020	39.000	10.980
61.045	12.300	V	1.000	13.020	1.820	27.140	39.000	11.860
71.713	10.800	V	1.000	11.150	1.990	23.940	39.000	15.060
250.195	12.100	V	2.810	11.820	3.870	27.790	46.500	18.710
641.100	12.500	H	2.230	20.310	6.860	39.670	46.500	6.830
727.423	13.100	H	2.150	21.320	7.480	41.900	46.500	4.600

- DC Mode

Temperature: 20.1 ℃ Humidity: 60.0 % R.H. Test Date: 05. 19. 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)			
52.318	9.700	V	1.000	13.710	1.660	25.070	39.000	13.930
77.533	9.600	V	1.000	9.870	2.060	21.530	39.000	17.470
200.735	9.100	H	2.980	9.970	3.460	22.530	43.500	20.970
250.190	10.100	V	2.350	11.820	3.870	25.790	46.500	20.710
597.453	10.900	H	2.310	19.840	6.540	37.280	46.500	9.220
612.970	10.300	H	2.560	20.020	6.660	36.980	46.500	9.520

- POE Mode

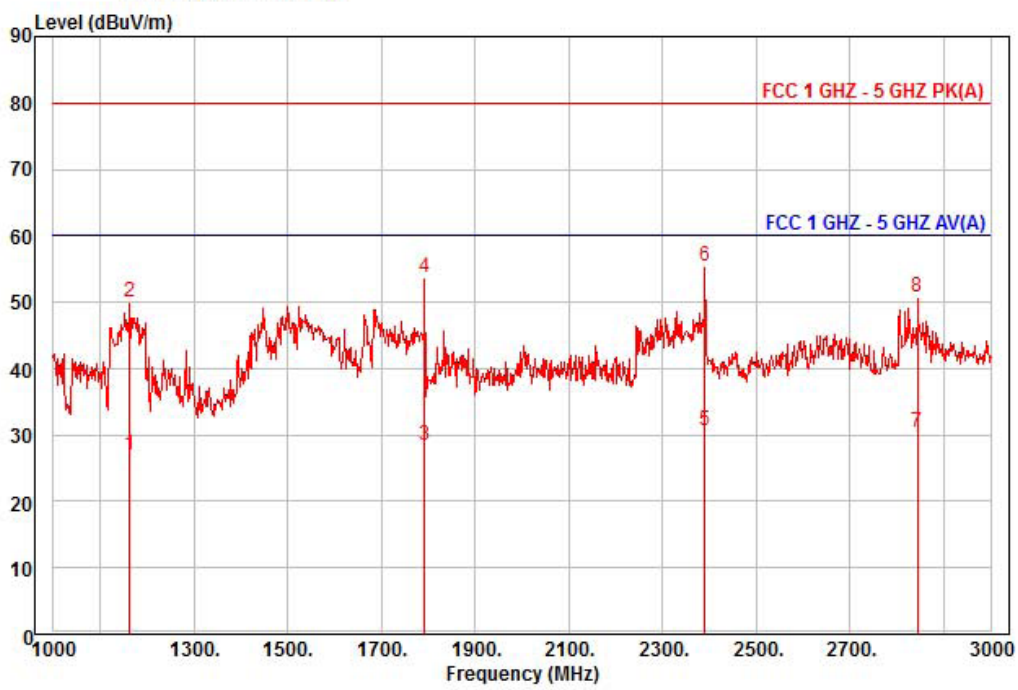
Temperature: 20.1 ℃ Humidity: 60.0 % R.H. Test Date: 05. 19. 2015 Tested by: Hyo Jin, Kim

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)			
39.702	11.600	V	1.000	13.340	1.410	26.350	39.000	12.650
61.040	12.800	V	1.000	13.020	1.820	27.640	39.000	11.360
69.772	12.700	V	1.000	11.570	1.970	26.240	39.000	12.760
200.718	10.700	H	2.370	9.970	3.460	24.130	43.500	19.370
597.450	12.100	H	2.820	19.840	6.540	38.480	46.500	8.020
737.132	11.000	H	2.210	21.460	7.550	40.010	46.500	6.490

* Above 1 ㎓

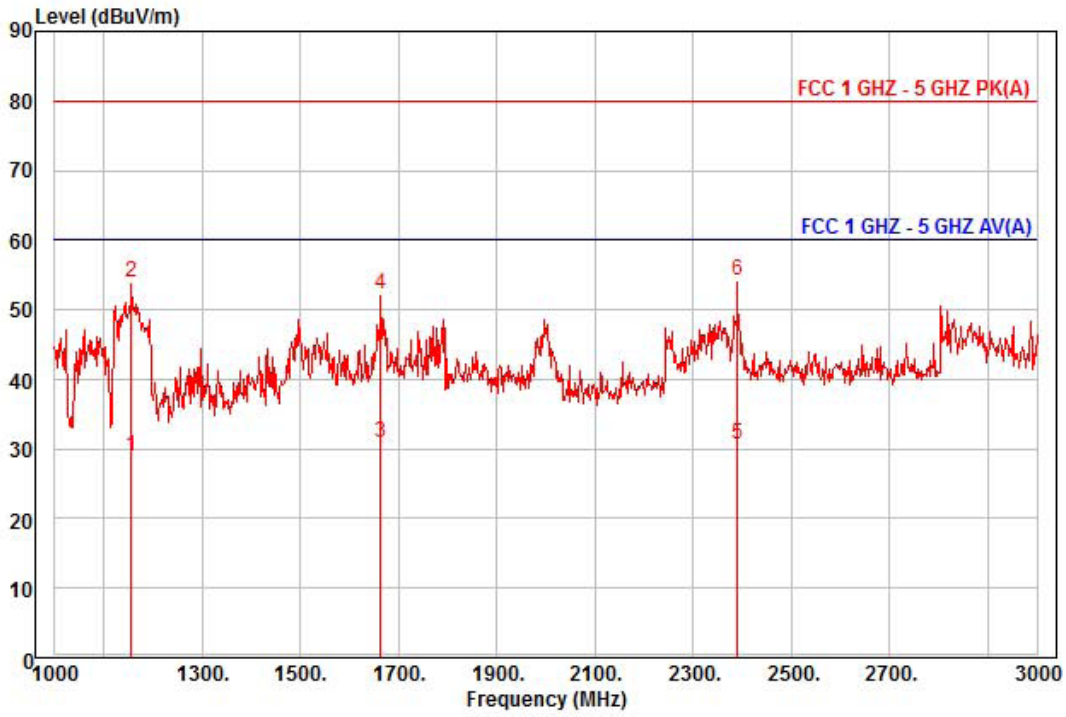
Temperature: 22.9 ℃ Humidity: 46.5 % R.H. Test Date: 05. 19. 2015 Tested by: Hyo Jin, Kim

- AC Mode



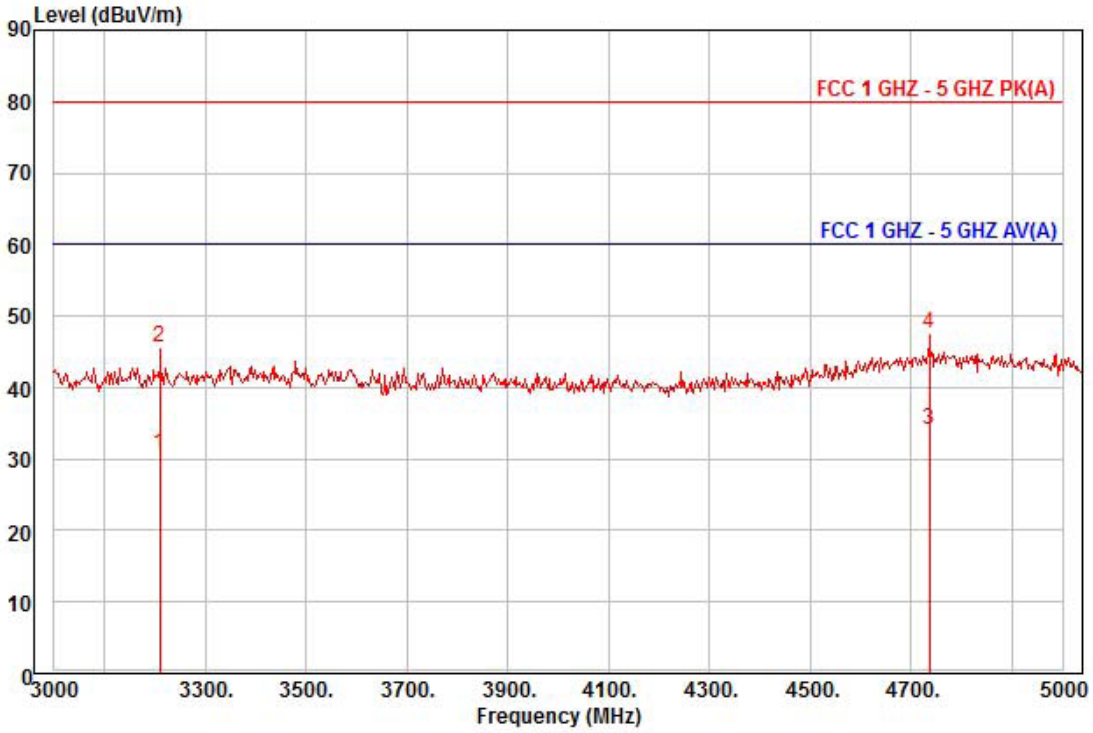
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : AC
Memo : 1 - 3 GHz

	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	1162.00	32.95	24.24	5.83	35.93	45	60.00	-32.91	horizontal	Average
2	1162.00	55.97	24.24	5.83	35.93	45	80.00	-29.89	horizontal	Peak
3	1792.00	29.02	26.85	7.36	34.88	72	60.00	-31.65	horizontal	Average
4	1792.00	54.26	26.85	7.36	34.88	72	80.00	-26.41	horizontal	Peak
5 av	2390.00	26.98	29.30	8.68	34.26	39	60.00	-29.30	horizontal	Average
6 pp	2390.00	51.80	29.30	8.68	34.26	39	80.00	-24.48	horizontal	Peak
7	2844.00	24.64	30.16	9.63	33.95	60	60.00	-29.52	horizontal	Average
8	2844.00	44.99	30.16	9.63	33.95	60	80.00	-29.17	horizontal	Peak



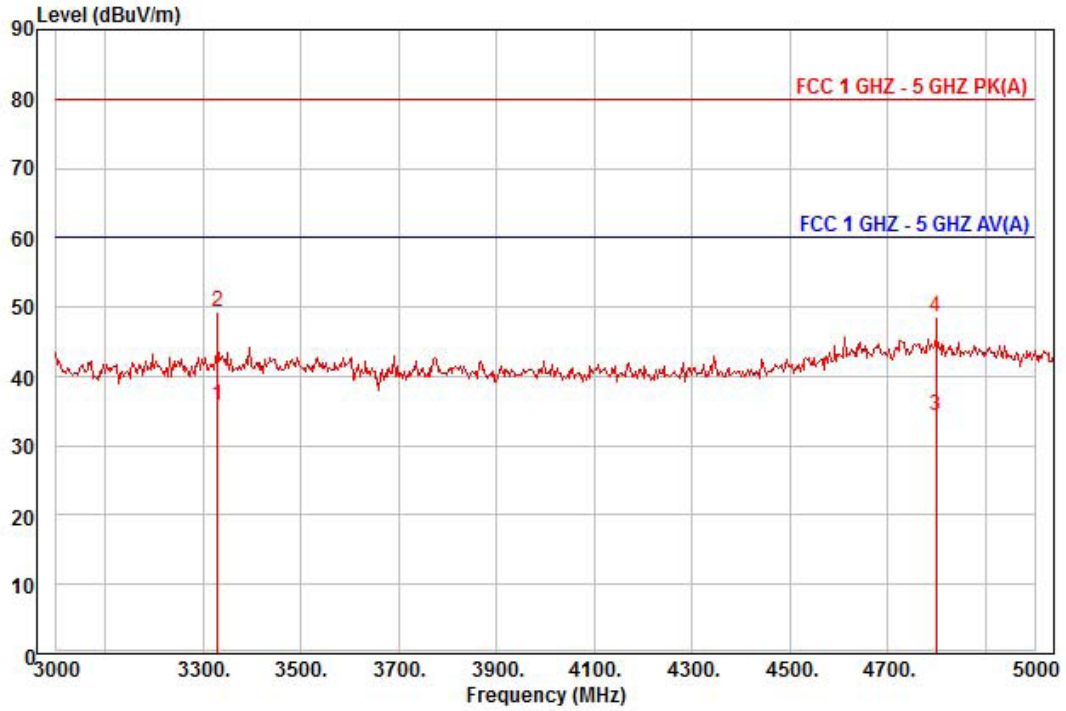
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : AC
Memo : 1 - 3 GHz

	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	1156.00	34.80	24.23	5.82	35.94	11	60.00	-31.09	vertical	Average
2	1156.00	59.92	24.23	5.82	35.94	11	80.00	-25.97	vertical	Peak
3 av	1664.00	32.92	26.05	7.05	35.09	35	60.00	-29.07	vertical	Average
4	1664.00	54.23	26.05	7.05	35.09	35	80.00	-27.76	vertical	Peak
5	2390.00	26.99	29.30	8.68	34.26	29	60.00	-29.29	vertical	Average
6 pp	2390.00	50.41	29.30	8.68	34.26	29	80.00	-25.87	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 :
Model : SNB-6005N
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	3210.00	23.76	30.65	10.29	34.08	59	60.00	-29.38	horizontal	Average
2	3210.00	38.73	30.65	10.29	34.08	59	80.00	-34.41	horizontal	Peak
3 pp	4737.00	22.02	32.94	12.74	33.67	76	60.00	-25.97	horizontal	Average
4 pk	4737.00	35.59	32.94	12.74	33.67	76	80.00	-32.40	horizontal	Peak

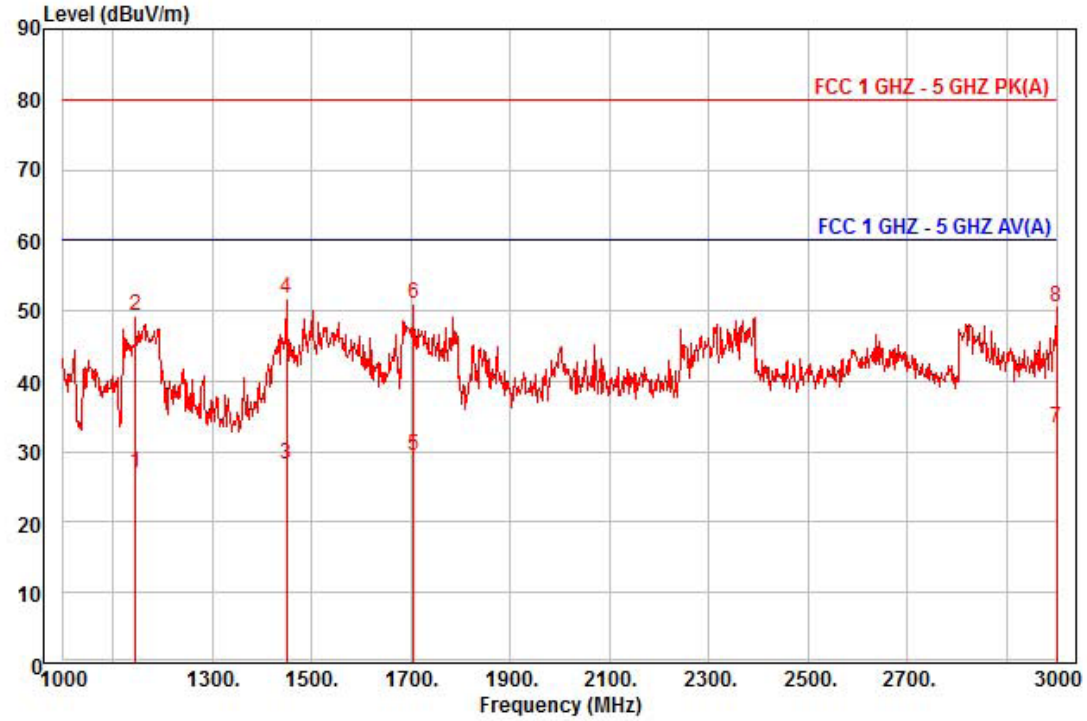


Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : AC
Memo : 3 - 5 GHz

	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 pp	3330.00	28.73	30.79	10.47	34.21	342	60.00	-24.22	vertical	Average
2 pk	3330.00	42.20	30.79	10.47	34.21	342	80.00	-30.75	vertical	Peak
3	4800.00	21.85	33.17	12.84	33.56	242	60.00	-25.70	vertical	Average
4	4800.00	36.05	33.17	12.84	33.56	242	80.00	-31.50	vertical	Peak

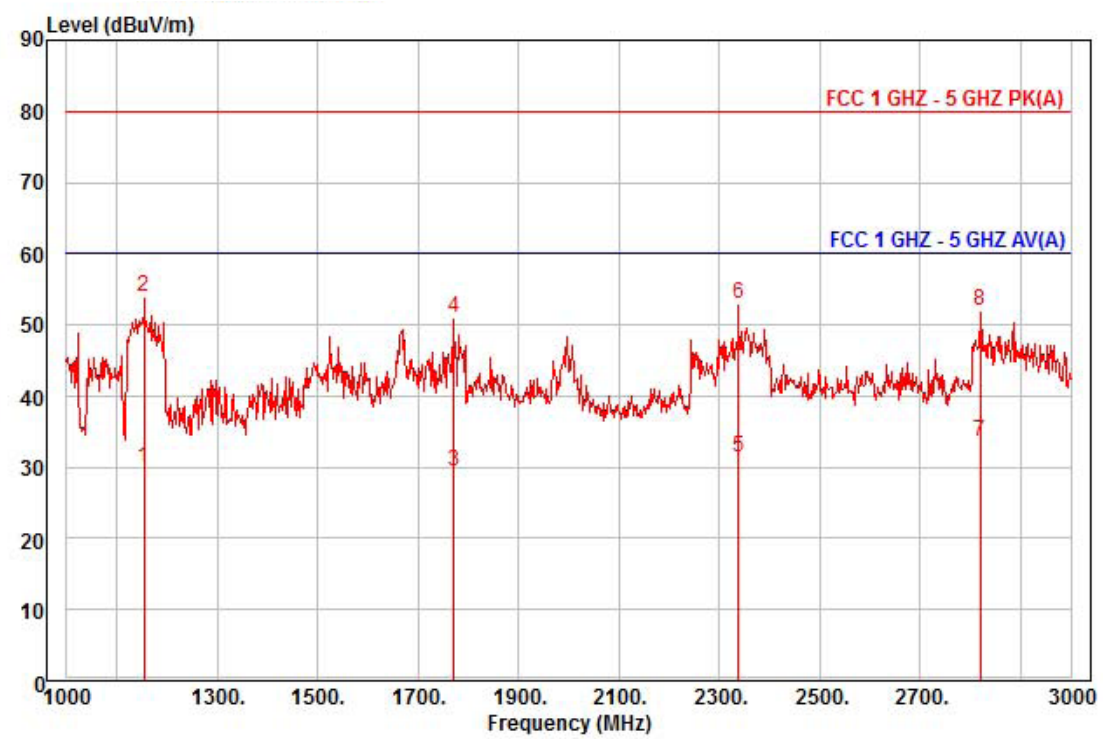
- DC Mode

Temperature: 18.5 ℃ Humidity: 43.7 % R.H. Test Date: 05.16. 2015 Tested by: Hyo Jin, Kim



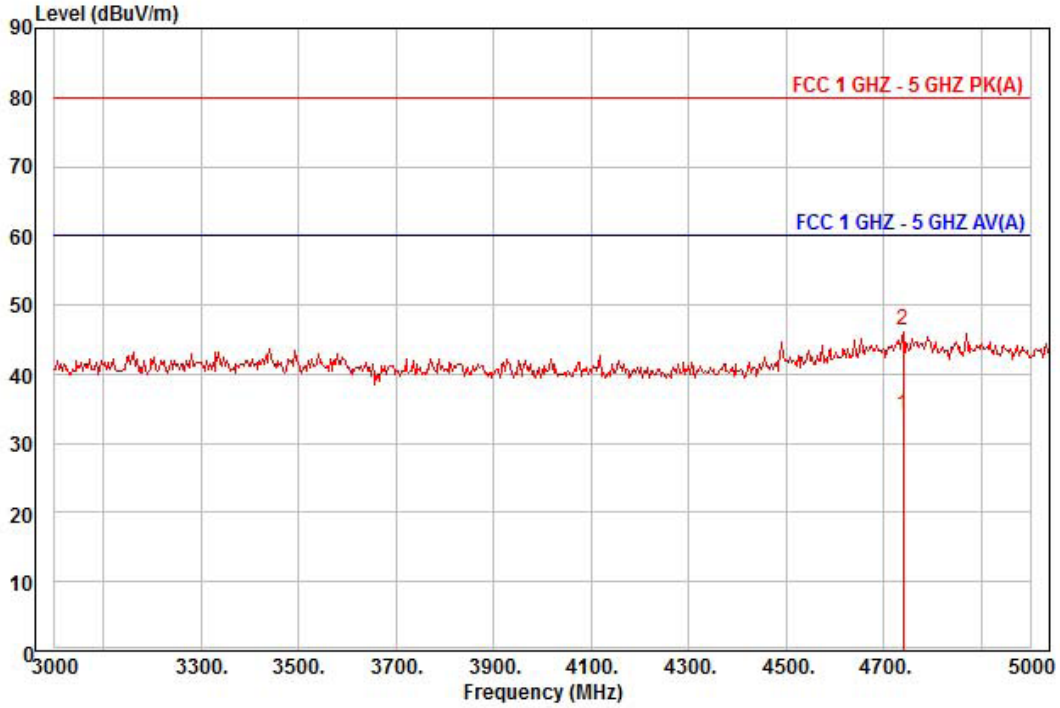
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : DC
Memo : 1 - 3 GHz

	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	1146.00	32.90	24.20	5.79	35.96	38	60.00	-33.07	horizontal	Average
2	1146.00	55.15	24.20	5.79	35.96	38	80.00	-30.82	horizontal	Peak
3	1450.00	32.20	24.91	6.53	35.45	7	60.00	-31.81	horizontal	Average
4 pk	1450.00	55.63	24.91	6.53	35.45	7	80.00	-28.38	horizontal	Peak
5	1706.00	30.90	26.32	7.15	35.02	13	60.00	-30.65	horizontal	Average
6	1706.00	52.60	26.32	7.15	35.02	13	80.00	-28.95	horizontal	Peak
7 pp	3000.00	26.72	30.40	9.96	33.84	254	60.00	-26.76	horizontal	Average
8	3000.00	44.05	30.40	9.96	33.84	254	80.00	-29.43	horizontal	Peak



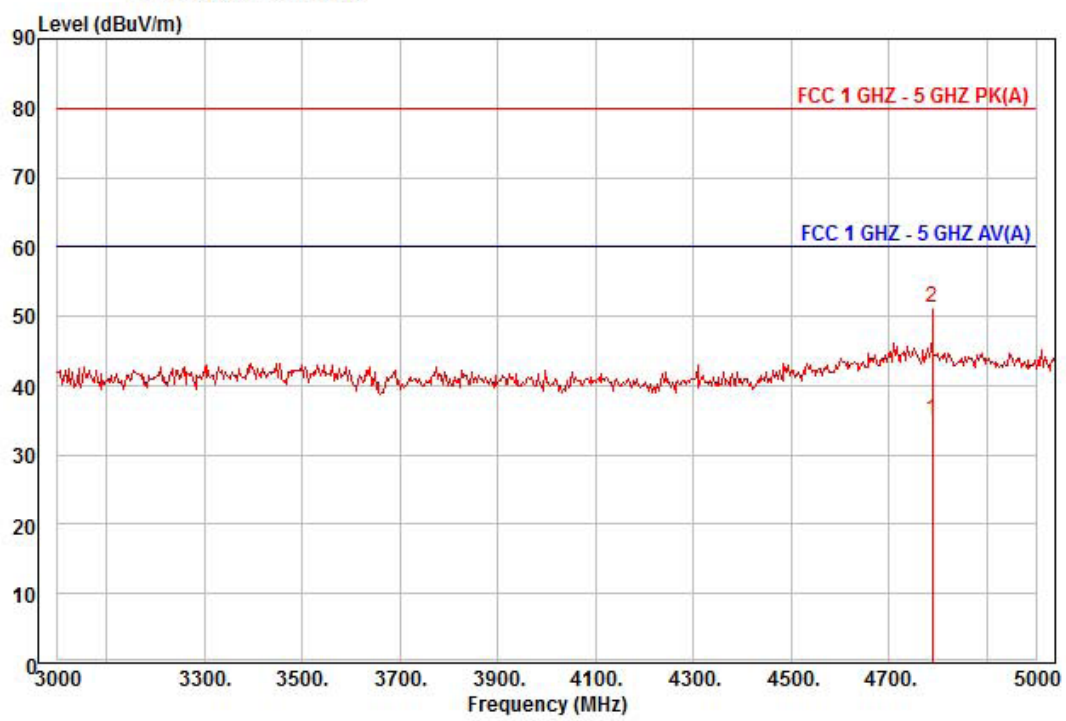
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : DC
Memo : 1 - 3 GHz

	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	1154.00	35.81	24.22	5.81	35.94	11	60.00	-30.10	vertical	Average
2 pp	1154.00	59.83	24.22	5.81	35.94	11	80.00	-26.08	vertical	Peak
3	1772.00	30.26	26.73	7.31	34.91	43	60.00	-30.61	vertical	Average
4	1772.00	51.86	26.73	7.31	34.91	43	80.00	-29.01	vertical	Peak
5	2338.00	27.87	29.14	8.57	34.30	37	60.00	-28.72	vertical	Average
6	2338.00	49.66	29.14	8.57	34.30	37	80.00	-26.93	vertical	Peak
7 av	2820.00	27.97	30.12	9.58	33.96	3	60.00	-26.29	vertical	Average
8	2820.00	46.26	30.12	9.58	33.96	3	80.00	-28.00	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 :
Model : SNB-6005N
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 pp	4740.00	21.99	32.95	12.74	33.67	123	60.00	-25.99	horizontal	Average
2 pk	4740.00	34.44	32.95	12.74	33.67	123	80.00	-33.54	horizontal	Peak

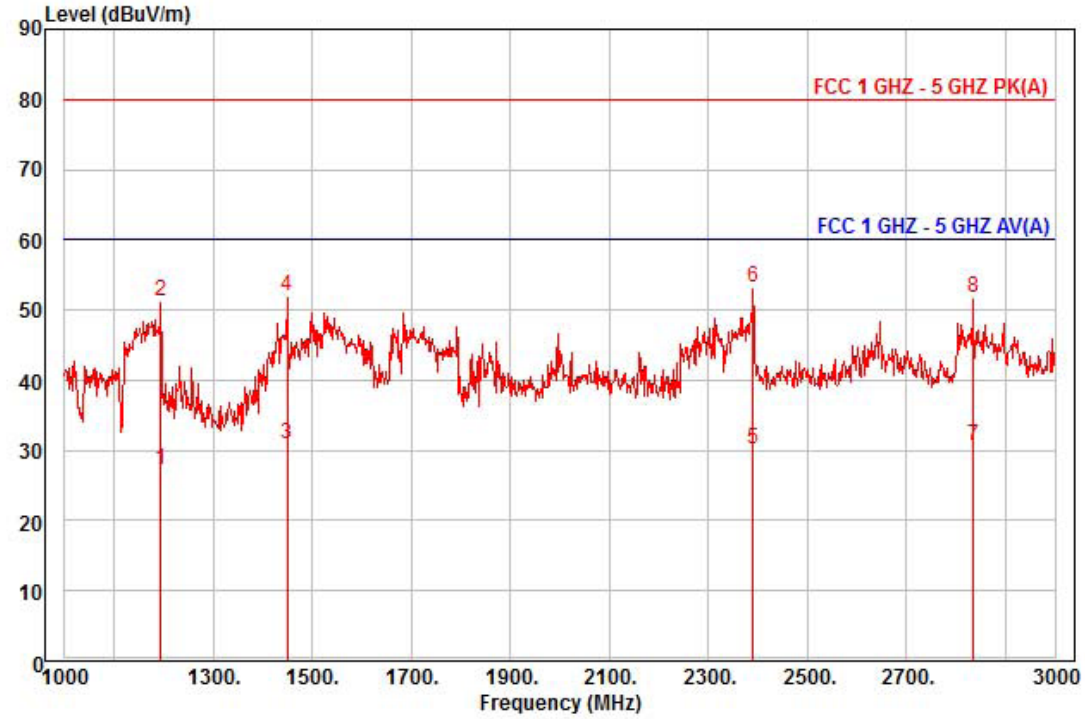


Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : DC
Memo : 3 - 5 GHz

	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 pp	4788.00	22.71	33.13	12.82	33.58	194	60.00	-24.92	vertical	Average
2 pk	4788.00	38.78	33.13	12.82	33.58	194	80.00	-28.85	vertical	Peak

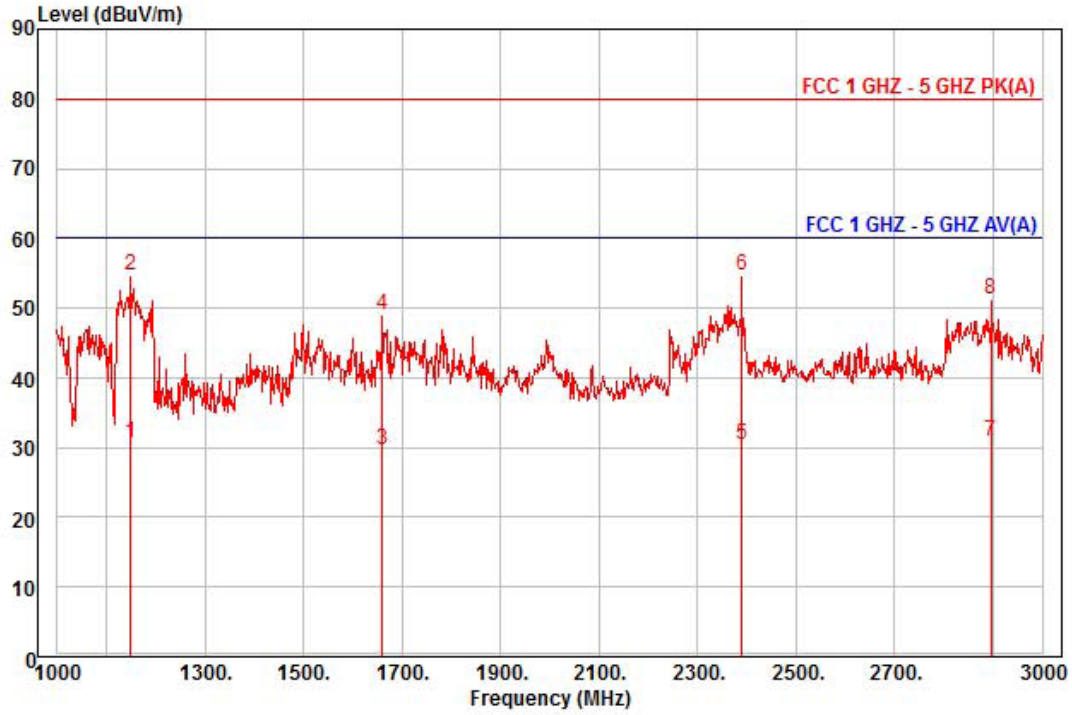
- PoE Mode

Temperature: 18.5 ℃ Humidity: 43.7 % R.H. Test Date: 05.16. 2015 Tested by: Hyo Jin, Kim



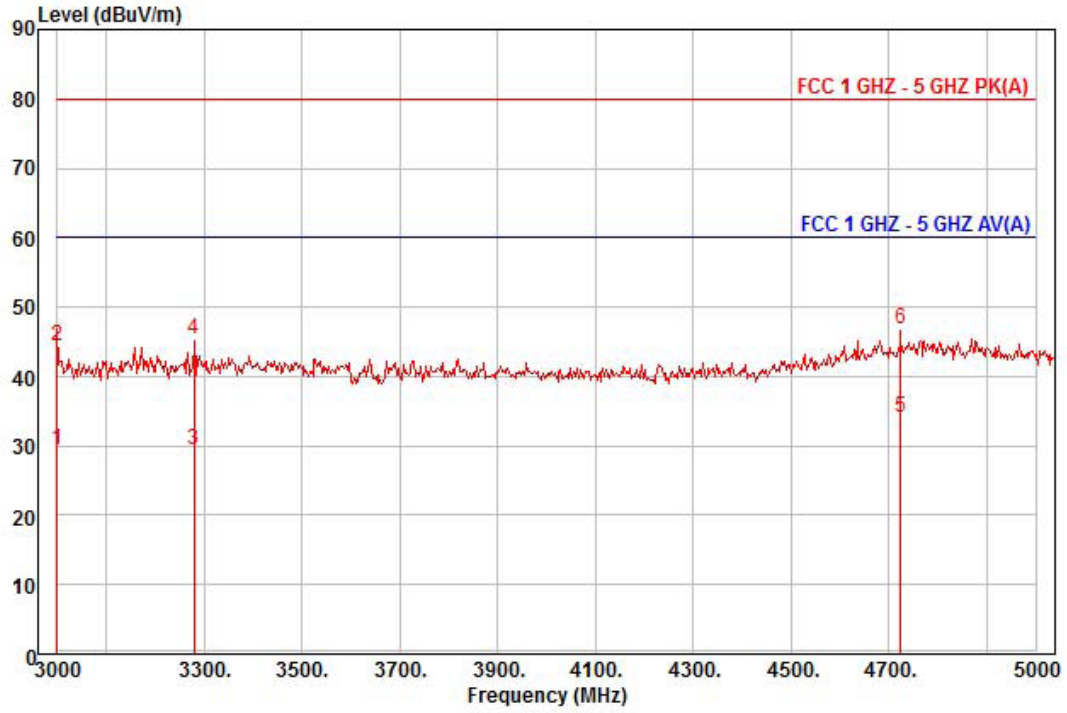
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : POE
Memo : 1 - 3 Ghz

	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	1194.00	32.78	24.31	5.91	35.88	36	60.00	-32.88	horizontal	Average
2	1194.00	56.92	24.31	5.91	35.88	36	80.00	-28.74	horizontal	Peak
3 av	1450.00	35.01	24.91	6.53	35.45	63	60.00	-29.00	horizontal	Average
4	1450.00	55.88	24.91	6.53	35.45	63	80.00	-28.13	horizontal	Peak
5	2390.00	26.50	29.30	8.68	34.26	30	60.00	-29.78	horizontal	Average
6 pp	2390.00	49.44	29.30	8.68	34.26	30	80.00	-26.84	horizontal	Peak
7	2836.00	24.94	30.14	9.62	33.95	53	60.00	-29.25	horizontal	Average
8	2836.00	45.86	30.14	9.62	33.95	53	80.00	-28.33	horizontal	Peak



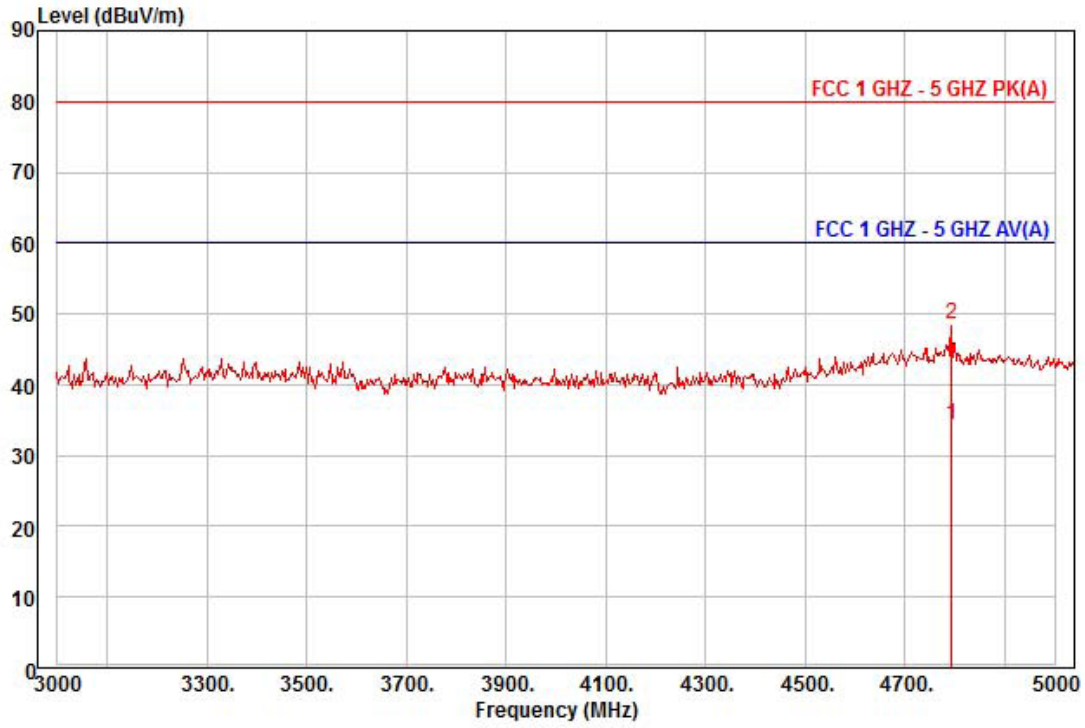
Site : chamber
Condition: FCC 1 GHZ - 5 GHZ PK(A) 3m HORN-414(15.02.09) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SNB-6005N
Mode : POE
Memo : 1 - 3 Ghz

	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	1148.00	36.51	24.21	5.80	35.95	7	60.00	-29.43	vertical	Average
2 pp	1148.00	60.72	24.21	5.80	35.95	7	80.00	-25.22	vertical	Peak
3	1660.00	31.59	26.03	7.04	35.10	255	60.00	-30.44	vertical	Average
4	1660.00	51.00	26.03	7.04	35.10	255	80.00	-31.03	vertical	Peak
5	2390.00	26.69	29.30	8.68	34.26	45	60.00	-29.59	vertical	Average
6	2390.00	50.97	29.30	8.68	34.26	45	80.00	-25.31	vertical	Peak
7 av	2896.00	24.76	30.24	9.74	33.91	340	60.00	-29.17	vertical	Average
8	2896.00	45.30	30.24	9.74	33.91	340	80.00	-28.63	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 :
Model : SNB-6005N
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	3000.00	22.81	30.40	9.96	33.84	242	60.00	-30.67	horizontal	Average
2	3000.00	37.86	30.40	9.96	33.84	242	80.00	-35.62	horizontal	Peak
3	3279.00	22.52	30.73	10.40	34.16	73	60.00	-30.51	horizontal	Average
4	3279.00	38.30	30.73	10.40	34.16	73	80.00	-34.73	horizontal	Peak
5	4725.00	22.16	32.90	12.72	33.69	38	60.00	-25.91	horizontal	Average
6	4725.00	34.89	32.90	12.72	33.69	38	80.00	-33.18	horizontal	Peak
7 pp	5622.00	20.18	34.01	15.95	33.30	81	60.00	-23.16	horizontal	Average
8 pk	5622.00	32.96	34.01	15.95	33.30	81	80.00	-30.38	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 :
Model : SNB-6005N
Mode : POE
Memo : 3 - 6 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	4794.00	21.87	33.15	12.83	33.57	235	60.00	-25.72	vertical	Average
2	4794.00	36.03	33.15	12.83	33.57	235	80.00	-31.56	vertical	Peak
3 pp	5883.00	25.20	34.78	17.12	33.33	124	60.00	-16.23	vertical	Average
4 pk	5883.00	34.89	34.78	17.12	33.33	124	80.00	-26.54	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

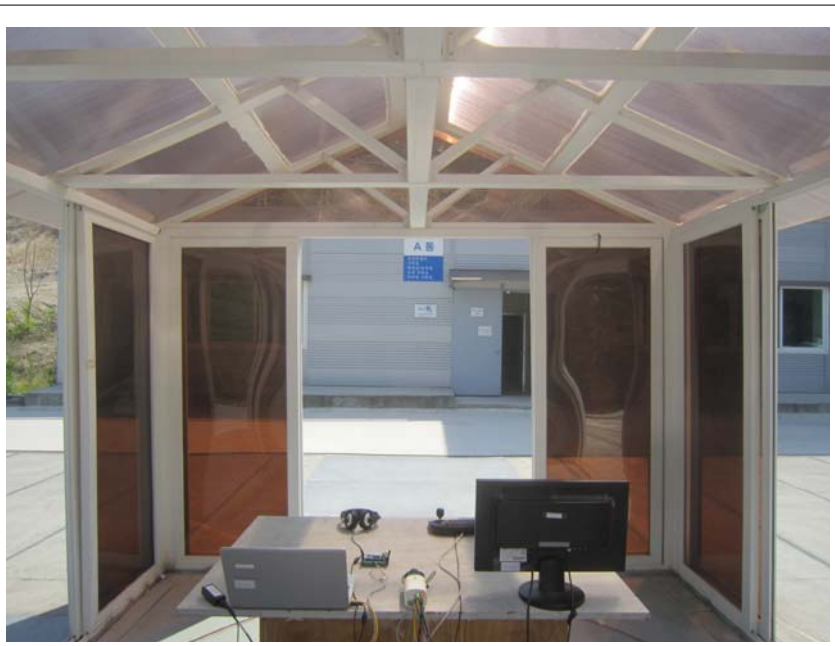
4.1 Conducted Emission

- AC Mode

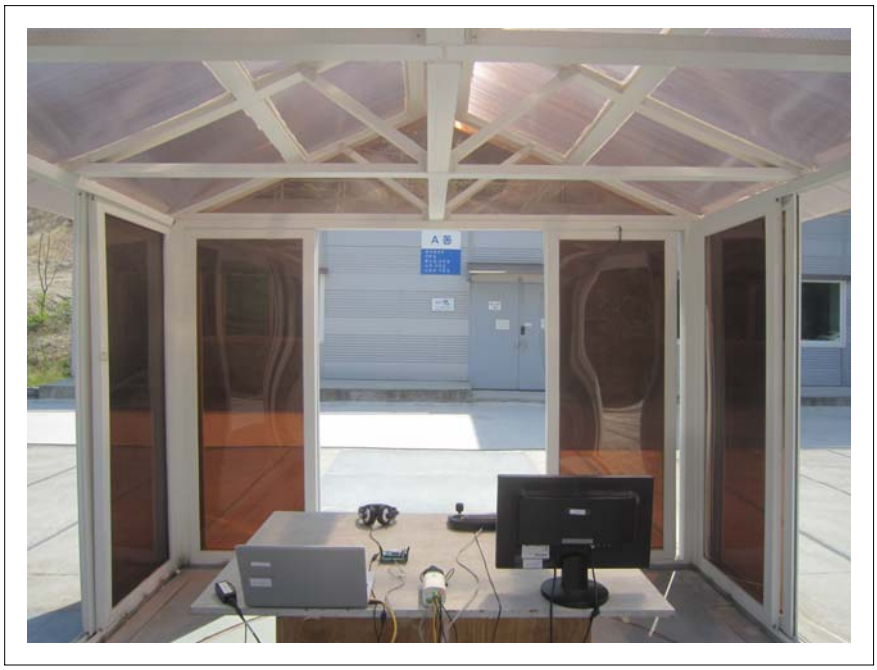
4.2 Radiated Emission

- Below 1 GHz

- AC Mode



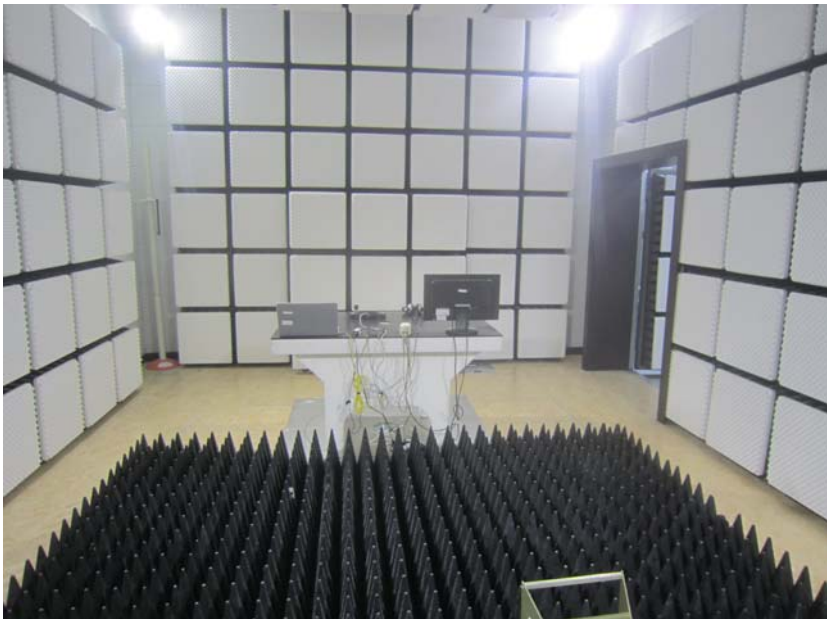
- DC Mode



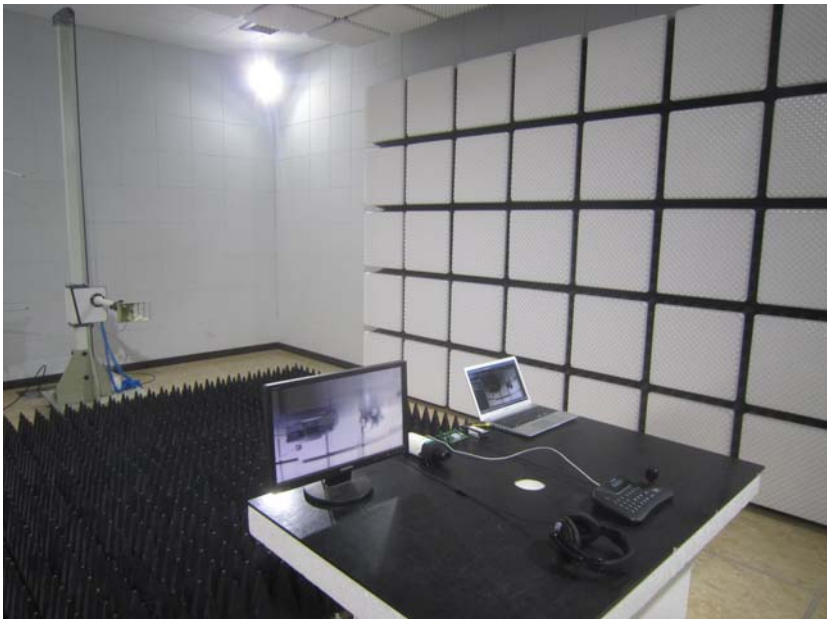
- POE Mode

- Above 1 GHz

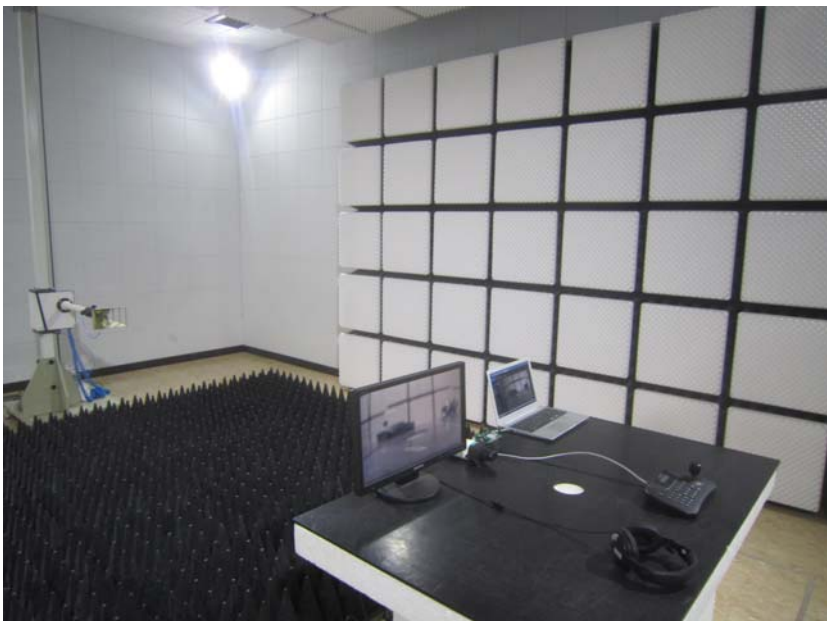
-AC Mode



- DC Mode



- POE Mode

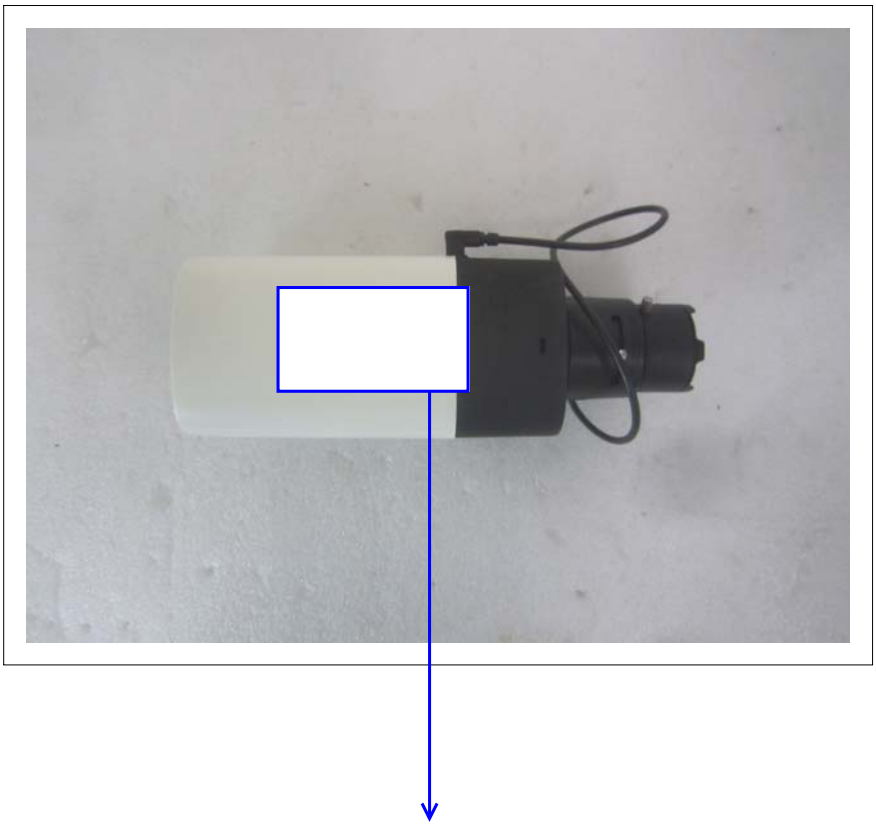


5. External Photographs

5.1 E.U.T: Front View

5.2 E.U.T: Rear View

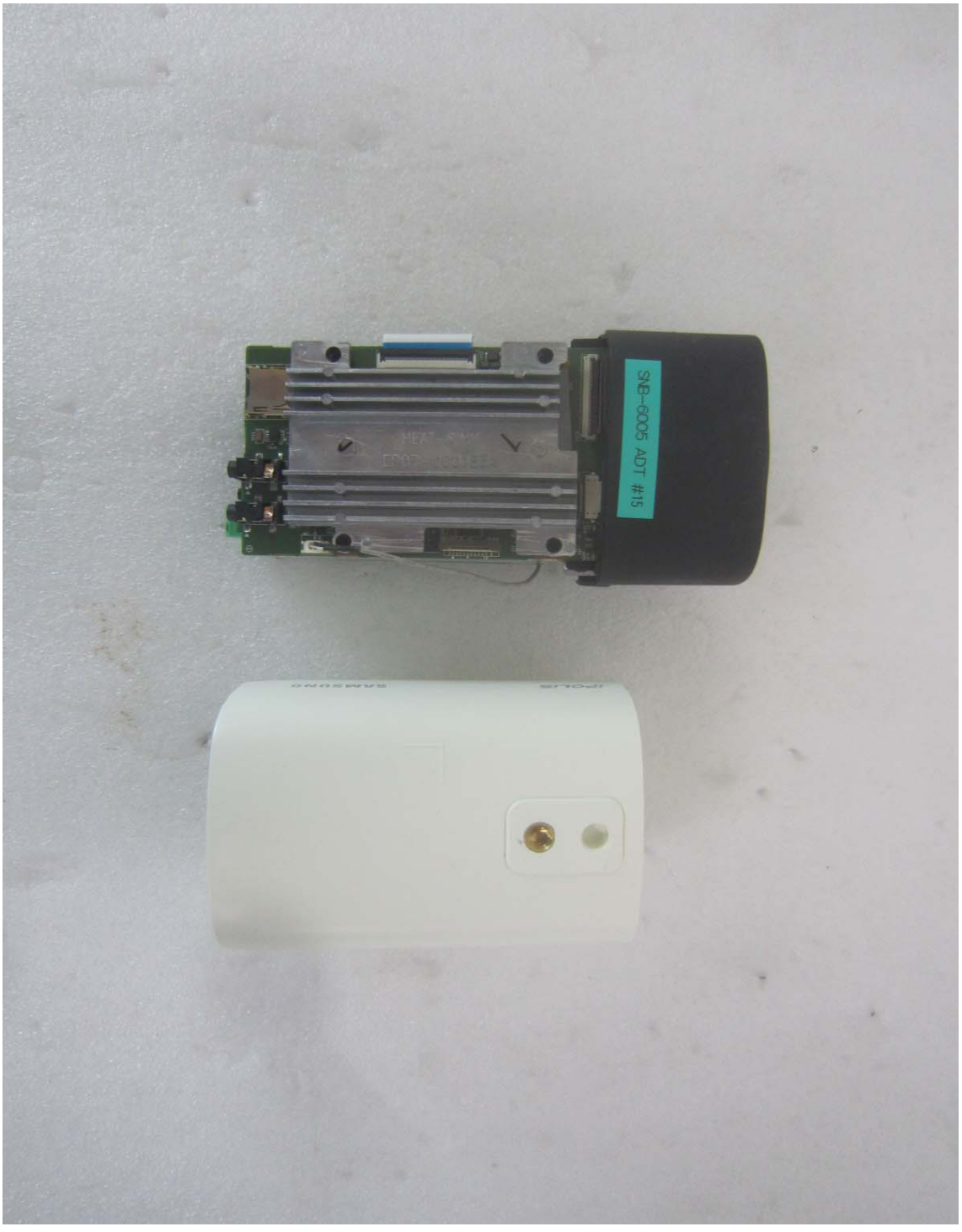
5.3 E.U.T: Label View (Location)



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.

6. Internal Photographs

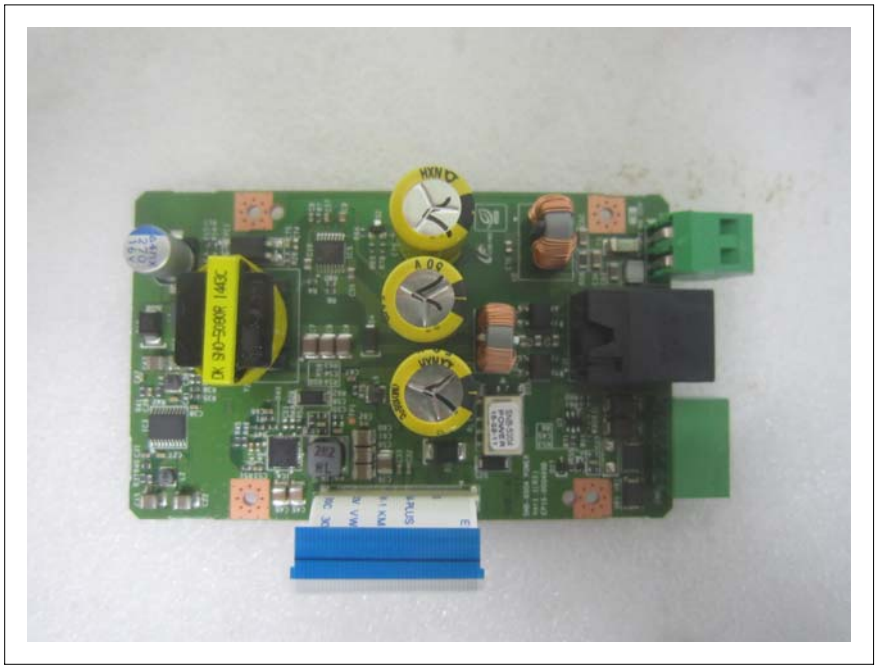
6.1 E.U.T: Internal View



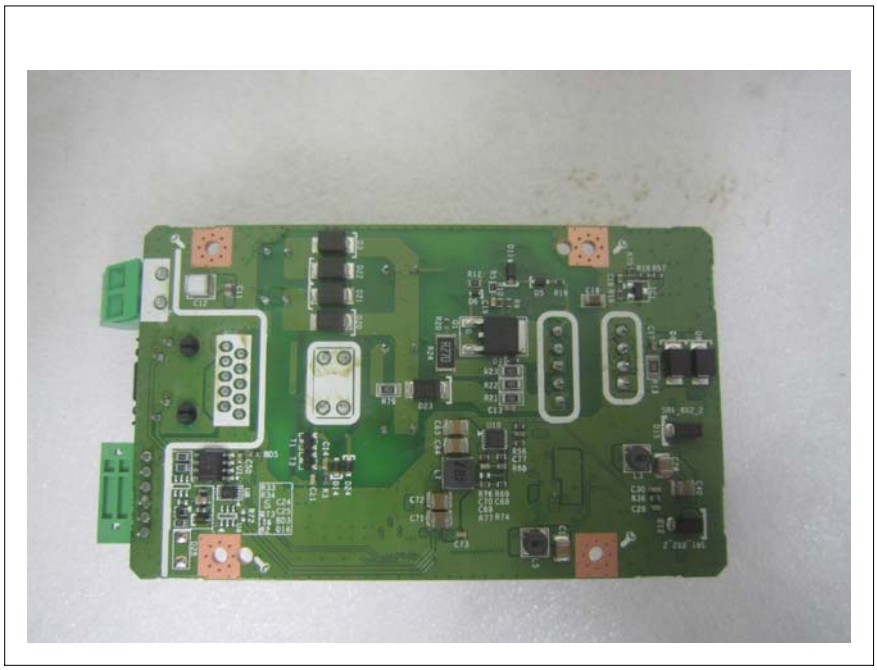
6.2 E.U.T: Internal View(Top) - Main Board

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).