



## EMC TEST REPORT For VCCI

Test Report No. : KES-EM-21T1080-R2  
Date of Issue : Feb. 24, 2023  
Product name : AUDIO SERVER  
Model/Type No. : SPA-S1000  
Variant Model : -  
Applicant : Hanwha Vision Co., Ltd  
Applicant Address : 6, Pangyo-ro 319Beon-gil, Bundang-gu, Seongnam-si,  
Gyeonggi-do, Republic of Korea  
Manufacturer : Inter-M Corporation  
Manufacturer Address : 73, Hwahap-ro 1402beon-gil, Yangju-si, Gyeonggi-do  
Date of Receipt : May. 25, 2021  
Test date : Jul. 04, 2021 ~ Jul. 06, 2021  
Test Results : ☒ **In Compliance** ☐ **Not in Compliance**

Tested by

Jun Soo, Jung  
EMC Test Engineer

Reviewed by

Dong-Hun, Jang  
EMC Technical Manager

This test report is not related to KS Q ISO/IEC 17025 and KOLAS.

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Report No.:  
KES-EM-21T1080-R2  
Page (2) of (40)

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**REPORT REVISION HISTORY**

Date	Test Report No.	Revision History
Nov. 10, 2021	KES-EM-21T1080	Issued
Jan. 27, 2023	KES-EM-21T1080-R1	Change Manufacturer
Feb. 24, 2023	KES-EM-21T1080-R2	Change the Applicant at the request of the customer

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Report No.:  
KES-EM-21T1080-R2  
Page (3) of (40)

## TABLE OF CONTENTS

1.0	General Product Description.....	4
1.1	Test Voltage & Frequency .....	5
1.2	Variant Model Differences .....	5
1.3	Device Modifications .....	5
1.4	Equipment Under Test.....	5
1.5	Support Equipments .....	6
1.6	External I/O Cabling .....	6
1.7	EUT Operating Mode(s) .....	9
1.8	Configuration.....	10
1.9	Remarks when standards applied .....	11
1.10	Calibration Details of Equipment Used for Measurement .....	11
1.11	Test Facility .....	11
1.12	Laboratory Accreditations and Listings .....	11
2.0	Test Regulations.....	12
2.1	Conducted Emissions Mains Power Ports.....	13
2.2	Conducted Emissions at Telecommunication Ports.....	14
2.3	Radiated Electric Field Emissions(Below 1 GHz) .....	14
2.4	Radiated Electric Field Emissions(Above 1 GHz) .....	16
APPENDIX A – TEST DATA.....		17
Conducted Emissions at Mains Power Ports.....		17
Conducted Emissions at Telecommunication Ports .....		21
Radiated Electric Field Emissions(Below 1 GHz) .....		23
Radiated Electric Field Emissions(Above 1 GHz).....		25
Test Setup Photos and Configuration .....		27
Conducted Emissions at Mains Power Ports.....		27
Conducted Emissions at Telecommunication Ports .....		28
Radiated Electric Field Emissions(Below 1 GHz) .....		31
Radiated Electric Field Emissions(Above 1 GHz).....		33
EUT External Photographs .....		35
EUT Internal Photographs .....		36

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## 1.0 General Product Description

### Main Specifications of EUT are:

WISNET AMS	Specification	SPA-S1000
Product	Type	Network Audio Server
MIC Input	Input Sensitivity	
	Frequency Response	
	Output Level	
Line Output	Frequency Response	
	THD + N Ratio	-
	S/N Ratio (20Hz HPF, 20kHz LPF)	-
Power Amp	Output Power (8Ω, 1kHz Sine wave)	-
	Frequency Response (1W, 8Ω)	-
	S/N Ratio (20Hz HPF, 20kHz LPF)	-
Network	Ethernet	100/1000 Base-T
Memory	External Memory (Micro SD)	-
Contact	Contact Input	-
	Contact Output	-
	(Rating : 1A DC 30V, 0.3A AC 125V)	-
General	Operating Temperature	-10 ~ 40°C (14°F ~ 104°F)
	Operating Humidity	10~100% RH Non-condensing
	IP code	-
	Weight	3.02kg
	Size	482(W)×44(H)×280(D)mm
	Color	Black
	Certificate	EMC : KN 32/ 35, EN 55032/ 55035, FCC Part 15, Subpart B Safety : K 60950-1, EN 60950-1, CSA/UL 60950-1
Power	PoE	120-240V, 50/60Hz, 10W
	PoE+	DC 24V, 350mA
Audio	Built-in microphone	-
	Audio Compression	-
	Speaker Component	-
Speaker	Max. Sound Pressure Level (PoE : 7 Watt)	-
	Max. Sound Pressure Level (PoE+ : 15 Watt)	-
	Max. Power (Peak)	-
	Frequency Response	-
	Sensitivity (1Watt)	-
	Coverage Pattern	-
Amplifier	Amplifier	-
Network	Security	Password protection : admin,setup,user,guest (sha-2, Digest authentication, User access log) Digest authentication, User access log
	Supported Protocols	IPv4, HTTP, Bonjour, DNS, NTP, TCP, UDP, DHCP, ARP, SSH, ICMP, Network Bonding
System Integration	API (Application Programming Interface)	Web Rest API
	Multi-source Dynamic PA control	TBD
	Voice Announcement	-
	VoIP	-
	TTS	-
	Intelligent Audio	-
	Event Triggers	-
	Functional Monitoring	Connection verification, Built-in system logging
	Supported OS	Windows : Windows 10 MAC : Catalina 10.15.4 ↑ , Big Sur 11.1 ↑
	Supported Web viewer	Chrome Version : 91.0.4472.114 ↑



## 1.1 Test Voltage & Frequency

Unless indicated otherwise on the individual data sheet or test results, the test voltage and frequency was as indicated below.

☒ AC 100 V, 60 Hz

## 1.2 Variant Model Differences

Not applicable

## 1.3 Device Modifications

Not applicable

## 1.4 Equipment Under Test

Description	Model Number	Serial Number	Manufacturer	Remarks
AUDIO SERVER	SPA-S1000	-	Inter-M Corporation	EUT

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Report No.:

KES-EM-21T1080-R2

Page (6) of (40)

## 1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC / DC Adapter	RQ-12024Fb	RQ6-43390	LOADUS	-
Notebook	P95G001	9JM8HT2	WINSTRON CORPORATION.	-
Notebook Adapter	LA65NS2-01	-	LITE-ON TECHNOLOGY(CHANGZHOU)CO.,LTD.	-
PoE Switch	-	-	REPOTEC CO., LTD.	-
CEILING SPEAKER	SPA-C110B	-	Inter-M Corporation	-
CEILING SPEAKER	SPA-C100B	-	Inter-M Corporation	-
WALL SPEAKER	SPA-W100B	-	Inter-M Corporation	-
Speaker	E5	-	PreSonus®	-
Alarm	SIP-1201DD D0	-	SAMSUNG TECHWIN CO., LTD.	-
Alarm button	-	-	-	-

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Report No.:  
KES-EM-21T1080-R2  
Page (7) of (40)

### 1.6 External I/O Cabling

#### ■ AC MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
AUDIO SERVER (EUT)	RJ-45	PoE Switch	RJ-45	20.0	U
PoE Switch	RJ-45	Notebook	RJ-45	3.0	U
	RJ-45	CEILING SPEAKER	RJ-45	20.0	U
	RJ-45	CEILING SPEAKER	RJ-45	20.0	U
	RJ-45	WALL SPEAKER	RJ-45	20.0	U
CEILING SPEAKER	Alarm	Alarm	Alarm	3.0	U
	Alarm	Alarm button	Alarm	3.0	U
	2 pin	Speaker	XLR	3.0	U
Notebook	DC Jack	Notebook Adapter	Line Out	1.5	U

\* Unshielded=U, Shielded=S

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Report No.:

KES-EM-21T1080-R2

Page (8) of (40)

## ■ AC / DC Adapter MODE

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
AUDIO SERVER (EUT)	DC IN	AC / DC Adapter	Line OUT	1.5	U
	RJ-45	PoE Switch	RJ-45	20.0	U
PoE Switch	RJ-45	Notebook	RJ-45	3.0	U
	RJ-45	CEILING SPEAKER	RJ-45	20.0	U
	RJ-45	CEILING SPEAKER	RJ-45	20.0	U
	RJ-45	WALL SPEAKER	RJ-45	20.0	U
CEILING SPEAKER	Alarm	Alarm	Alarm	3.0	U
	Alarm	Alarm button	Alarm	3.0	U
	2 pin	Speaker	XLR	3.0	U
Notebook	DC Jack	Notebook Adapter	Line Out	1.5	U

\* Unshielded=U, Shielded=S

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Report No.:

KES-EM-21T1080-R2

Page (9) of (40)

## 1.7 EUT Operating Mode(s)

Test Mode	operating
AC, AC / DC Adapter MODE	1. After placing the EUT and peripheral devices as shown in the layout below, run a PING test on a laptop connected to the EUT to check if it is connected normally. 2. After accessing the EUT's web page from the laptop, 1 kHz tone source was entered to verify that the speakers' sound was output properly.

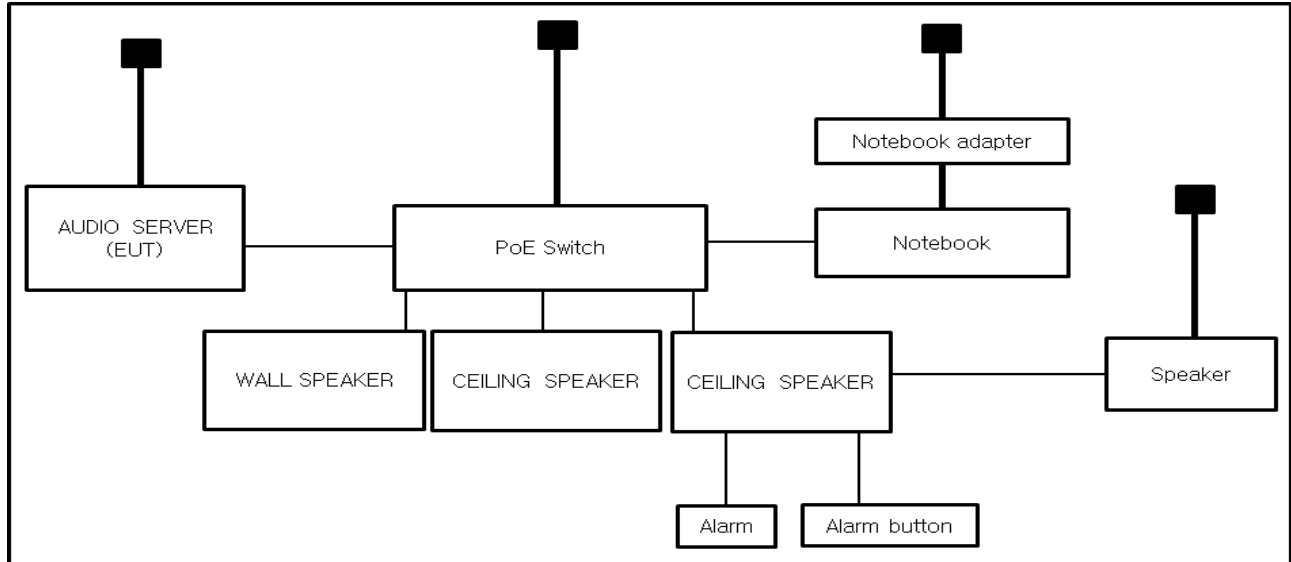
EUT Test operating S/W		
Name	Version	Manufacture Company
-	-	-

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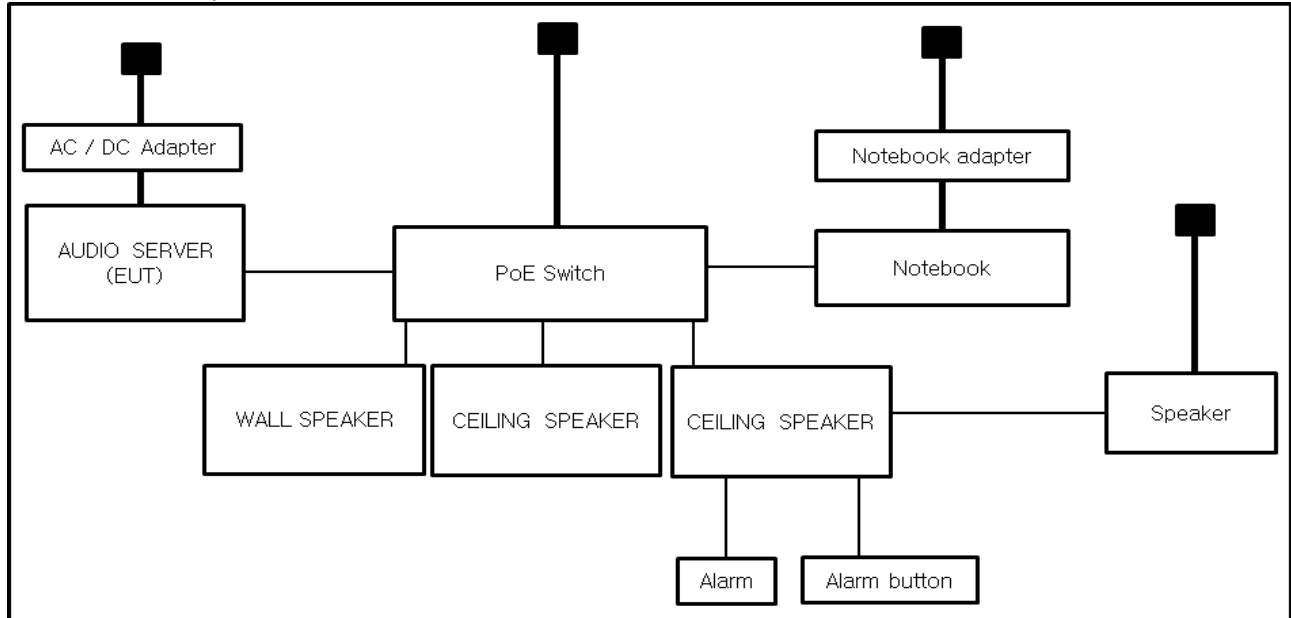
## 1.8 Configuration

■ AC Main  
 □ DC Main

### ■ AC MODE



### ■ AC / DC Adapter MODE



## 1.9 Remarks when standards applied

N/A







## 1.10 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less.

## 1.11 Test Facility

The measurement facility is located at 473-21, Gayeo-ro, Yeosu-si, Gyeonggi-do, 12658, Korea, Republic of. The sites are constructed in conformance with the requirements of ANSI C63.4a-2017 and CISPR 16-1-4:2019

## 1.12 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
KOREA	RRA	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
International	KOLAS	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KT489
USA	FCC	3 m & 10 m Semi-Anechoic Chamber Conducted test site to perform FCC Part 15/18 measurements.	 KR0100
Canada	ISED	3 m & 10 m Semi-Anechoic Chamber and Conducted test site	 23298
JAPAN	VCCI	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site)	 C-20136, T-20137, R-20181, G-20176
Europe	TÜV SÜD	EMI (3 m & 10 m Semi-Anechoic Chamber and conducted test site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 CARAT 001633 0004



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Report No.:

KES-EM-21T1080-R2

Page (12) of (40)

## 2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **VCCI-CISPR 32:2016**

☒ Class A

☐ Class B

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Report No.:

KES-EM-21T1080-R2

Page (13) of (40)

## 2.1 Conducted Emissions Mains Power Ports

**Test Date**

Jul. 04, 2021

**Test Location**

Electro wave Shieldroom #6

**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	01, 15, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 29, 2021
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021

**Test Conditions**

Temperature: (24,9 ± 0,1) °C

Relative Humidity: (46,8 ± 0,1) % R.H.

**Frequency Range of Measurement**

150 kHz to 30 MHz

**Instrument Settings**

IF Band Width: 9 kHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.

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## 2.2 Conducted Emissions at Telecommunication Ports

### Test Date

Jul. 04, 2021

### Test Location

Electro wave Shieldroom #6

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	01, 15, 2022
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101787	12, 29, 2021
<input checked="" type="checkbox"/>	LISN	ESH2-Z5	R & S	100450	12, 29, 2021
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101915	12, 29, 2021
<input checked="" type="checkbox"/>	8-WIRE ISN CAT3,5	ENY81	R & S	100174	12, 30, 2021
<input type="checkbox"/>	8-WIRE ISN CAT6	ENY81-CAT6	R & S	101665	12, 30, 2021
<input type="checkbox"/>	CDN	CDNS502A	TESEQ	40431	12, 29, 2021

### Test Conditions

Temperature: (24,9 ± 0,1) °C

Relative Humidity: (46,8 ± 0,1) % R.H.

### Frequency Range of Measurement

150 kHz to 30 MHz

### Instrument Settings

IF Band Width: 9 kHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

- See Appendix A for test data.
- For Ethernet interfaces, measurements are required at the highest data rate supported by the interface.

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KES-EM-21T1080-R2

Page (15) of (40)

## 2.3 Radiated Electric Field Emissions(Below 1 GHz)

**Test Date**

Jul. 04, 2021

**Test Location**☐ OPEN AREA TEST SITE #2☒ SEMI ANECHOIC CHAMBER #4(10m)**Test Equipment**

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100551	04, 01, 2022
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	11, 25, 2021
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	715	12, 08, 2022
<input checked="" type="checkbox"/>	ATTENUATOR	8491A	HP	32173	03, 10, 2022

**Test Conditions**

Temperature: (24,6 ± 0,1) °C

Relative Humidity: (47,2 ± 0,1) % R.H.

**Frequency Range of Measurement**

30 MHz to 1 GHz

**Instrument Settings**

IF Band Width: 120 kHz

**Test Results**

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

**Remarks**See Appendix A for test data.

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## 2.4 Radiated Electric Field Emissions(Above 1 GHz)

### Test Date

Jul. 06, 2021

### Test Location

SEMI ANECHOIC CHAMBER #3

### Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESR7	R & S	101190	08, 03, 2022
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01967	04, 07, 2022
<input type="checkbox"/>	ATTENUATOR	8491A	HP	35496	03, 10, 2022
<input checked="" type="checkbox"/>	DOUBLE RIDGED HORN ANTENNA	SAS-571	A.H.SYSTEM,INC	781	03, 11, 2022

### Test Conditions

Temperature: (24,7 ± 0,2) °C

Relative Humidity: (46,9 ± 0,1) % R.H.

### Frequency Range of Measurement

1 GHz to 6 GHz

### Instrument Settings

IF Band Width: 1 MHz

### Test Results

The requirements are:

- ☒ PASS  
☐ NOT PASS  
☐ NOT APPLICABLE

### Remarks

See Appendix A for test data.



## APPENDIX A – TEST DATA

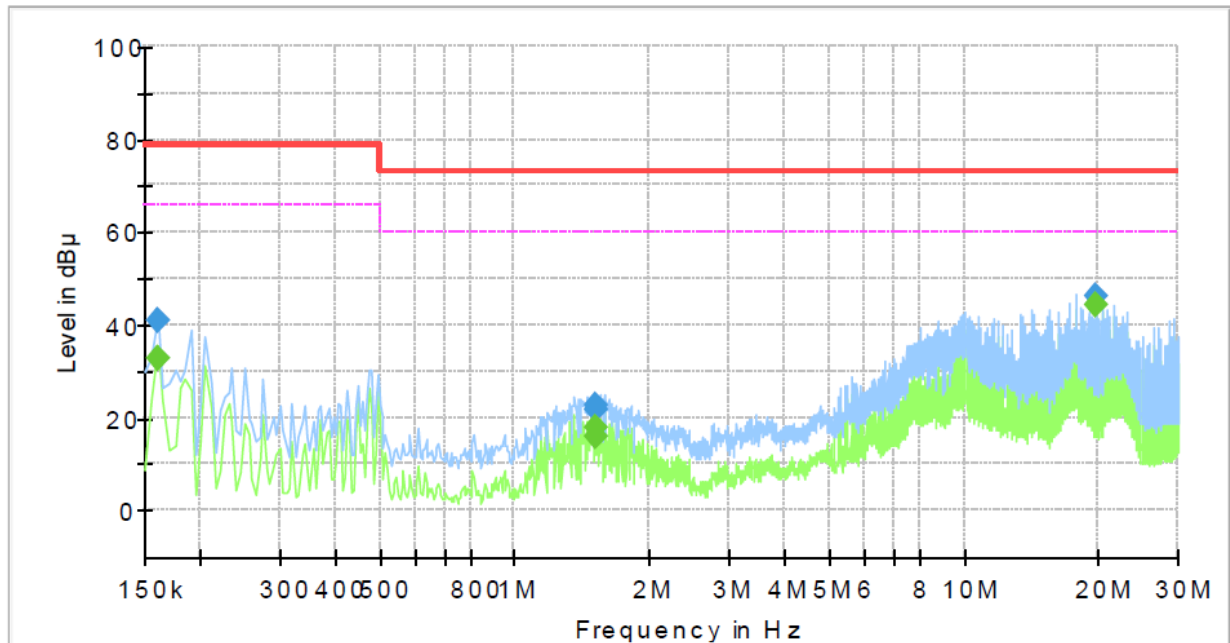
### Conducted Emissions at Mains Power Ports

■ AC MODE

HOT LINE

### Common Information

Test Description:	Conducted Emission
Model No.:	SPA-S1000
Phase:	L1
Mode:	AC
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.160000	---	32.78	66.00	33.22	1000.0	9.000	L1	19.4
0.160000	40.84	---	79.00	38.16	1000.0	9.000	L1	19.4
1.510000	---	18.00	60.00	42.00	1000.0	9.000	L1	20.2
1.510000	22.47	---	73.00	50.53	1000.0	9.000	L1	20.2
1.515000	---	15.98	60.00	44.02	1000.0	9.000	L1	20.2
1.515000	21.92	---	73.00	51.08	1000.0	9.000	L1	20.2
19.710000	---	44.09	60.00	15.91	1000.0	9.000	L1	20.1
19.710000	46.21	---	73.00	26.79	1000.0	9.000	L1	20.1



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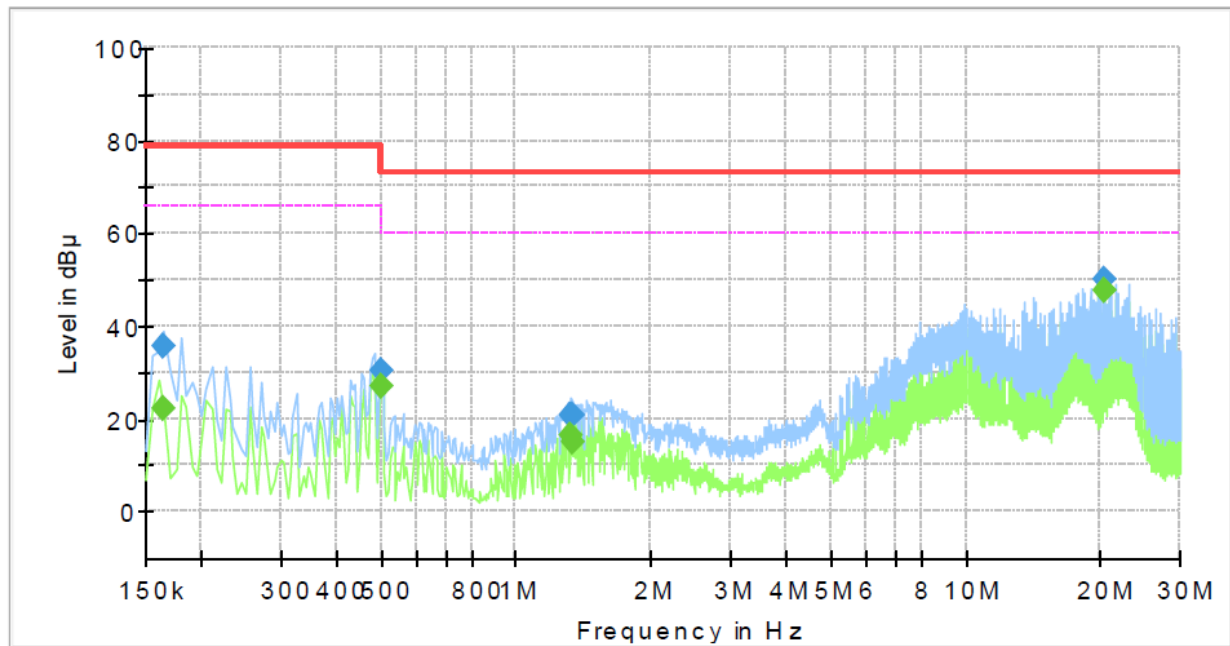
KES-EM-21T1080-R2

Page (18) of (40)

### NEUTRAL LINE

## Common Information

Test Description: Conducted Emission  
Model No.: SPA-S1000  
Phase: N  
Mode: AC  
Operator Name: KES



## Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.165000	---	22.08	66.00	43.92	1000.0	9.000	N	19.4
0.165000	35.58	---	79.00	43.42	1000.0	9.000	N	19.4
0.500000	---	27.07	66.00	38.93	1000.0	9.000	N	19.7
0.500000	30.18	---	73.00	42.82	1000.0	9.000	N	19.7
1.325000	---	16.39	60.00	43.61	1000.0	9.000	N	20.1
1.325000	20.73	---	73.00	52.27	1000.0	9.000	N	20.1
1.330000	---	14.75	60.00	45.25	1000.0	9.000	N	20.1
1.330000	20.53	---	73.00	52.47	1000.0	9.000	N	20.1
20.260000	---	47.72	60.00	12.28	1000.0	9.000	N	20.1
20.260000	50.04	---	73.00	22.96	1000.0	9.000	N	20.1

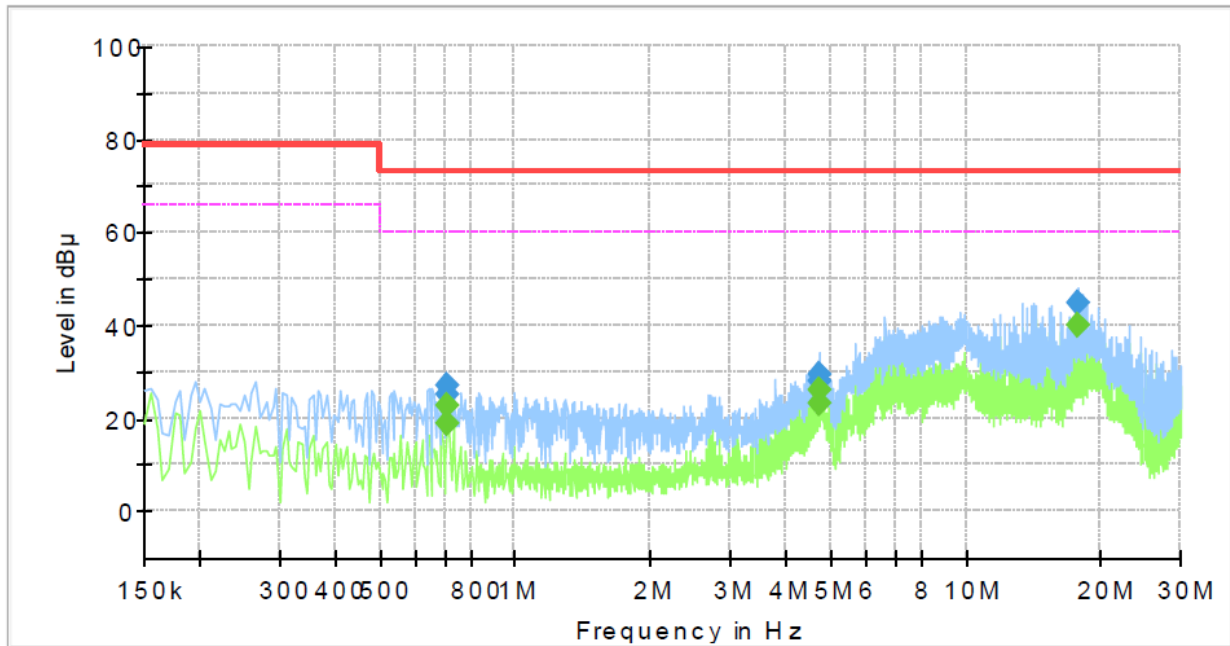
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■ AC / DC Adapter MODE

HOT LINE

**Common Information**

Test Description: Conducted Emission  
 Model No.: SPA-S1000  
 Phase: L1  
 Mode: AC / DC Adapter  
 Operator Name: KES



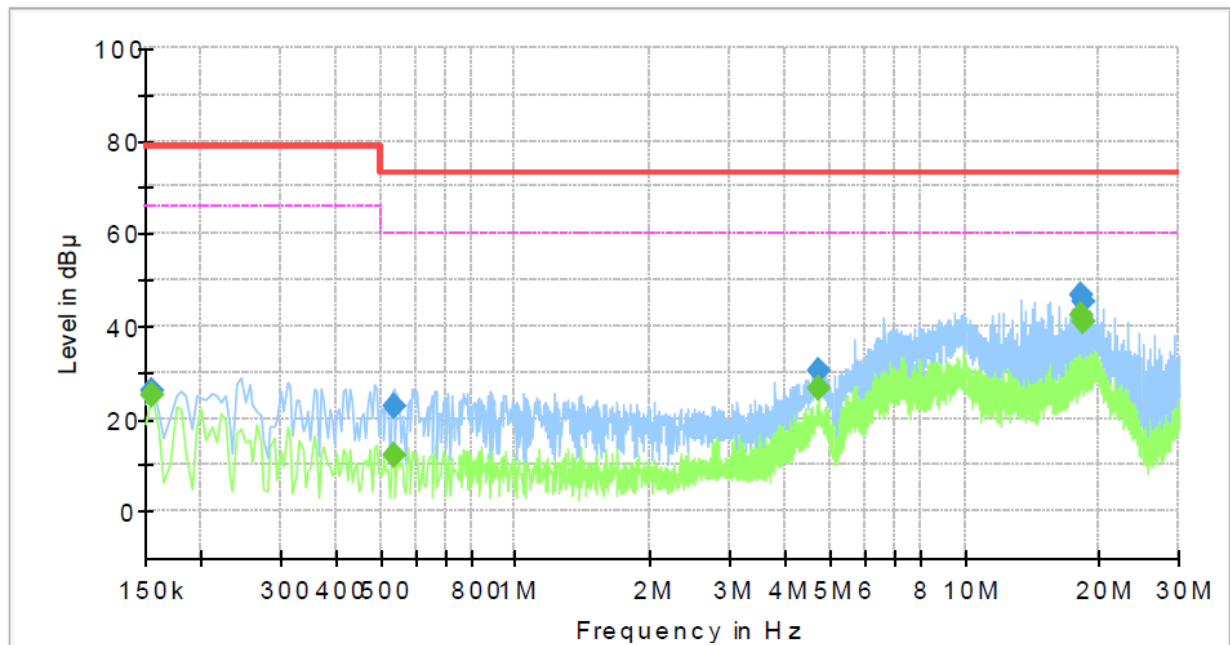
**Final\_Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.705000	---	18.62	60.00	41.38	1000.0	9.000	L1	19.9
0.705000	24.85	---	73.00	48.15	1000.0	9.000	L1	19.9
0.710000	---	22.68	60.00	37.32	1000.0	9.000	L1	19.9
0.710000	26.89	---	73.00	46.11	1000.0	9.000	L1	19.9
4.730000	---	25.91	60.00	34.09	1000.0	9.000	L1	19.7
4.730000	29.58	---	73.00	43.42	1000.0	9.000	L1	19.7
4.740000	---	23.04	60.00	36.96	1000.0	9.000	L1	19.7
4.740000	28.00	---	73.00	45.00	1000.0	9.000	L1	19.7
17.695000	---	39.91	60.00	20.09	1000.0	9.000	L1	20.0
17.695000	44.78	---	73.00	28.22	1000.0	9.000	L1	20.0

## NEUTRAL LINE

## Common Information

Test Description:	Conducted Emission
Model No.:	SPA-S1000
Phase:	N
Mode:	AC / DC Adapter
Operator Name:	KES



## Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.155000	---	25.16	66.00	40.84	1000.0	9.000	N	19.4
0.155000	25.86	---	79.00	53.14	1000.0	9.000	N	19.4
0.535000	---	11.95	60.00	48.05	1000.0	9.000	N	19.7
0.535000	22.51	---	73.00	50.49	1000.0	9.000	N	19.7
4.730000	---	26.59	60.00	33.41	1000.0	9.000	N	19.7
4.730000	30.26	---	73.00	42.74	1000.0	9.000	N	19.7
18.245000	---	42.36	60.00	17.64	1000.0	9.000	N	20.0
18.245000	46.53	---	73.00	26.47	1000.0	9.000	N	20.0
18.365000	---	40.93	60.00	19.07	1000.0	9.000	N	20.0
18.365000	45.19	---	73.00	27.81	1000.0	9.000	N	20.0

### ◆ Calculation

$$\text{QuasiPeak [dBuV]} / \text{CAverage [dBuV]} = \text{Reading Value [dBuV]} + \text{Corr. [dB]}$$

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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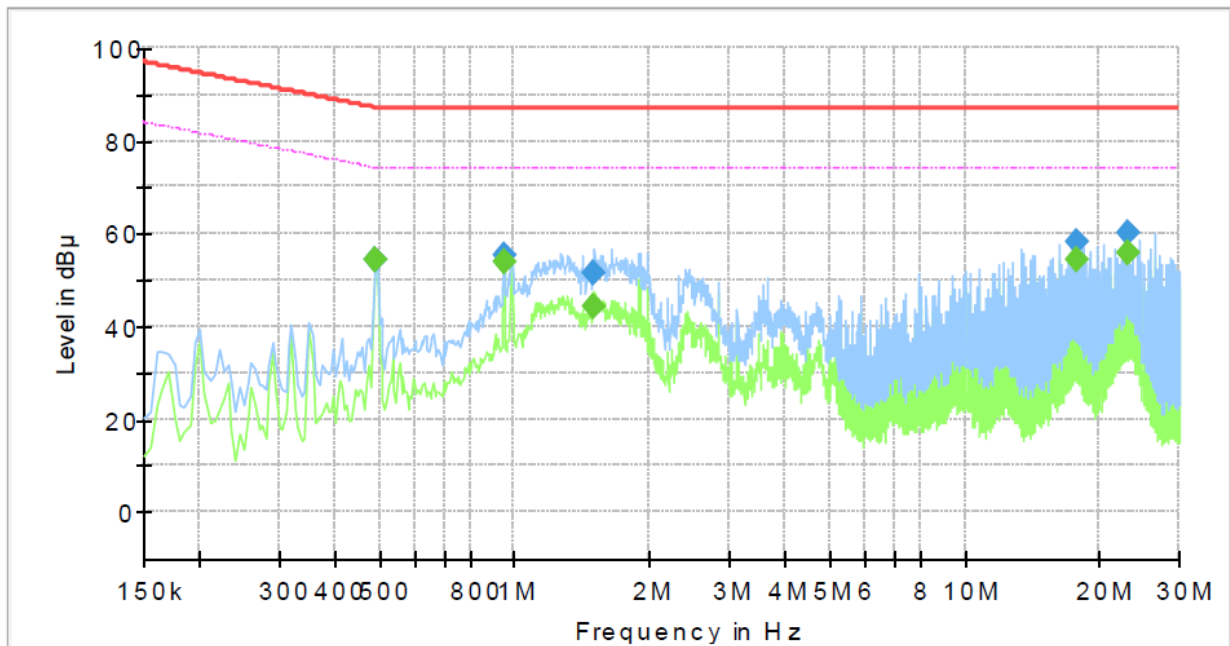
## Conducted Emissions at Telecommunication Ports

■ AC MODE

[100 Mbps]

### Common Information

Test Description:	Telecommunication Emission
Model No.:	SPA-S1000
Mode :	AC 100 V
Speed :	100 Mbps
Operator Name:	KES



### Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.490000	---	54.37	74.17	19.80	1000.0	9.000	Single Line	19.8
0.490000	54.47	---	87.17	32.70	1000.0	9.000	Single Line	19.8
0.945000	---	54.06	74.00	19.94	1000.0	9.000	Single Line	20.0
0.945000	55.17	---	87.00	31.83	1000.0	9.000	Single Line	20.0
1.505000	---	44.12	74.00	29.88	1000.0	9.000	Single Line	20.1
1.505000	51.37	---	87.00	35.63	1000.0	9.000	Single Line	20.1
17.695000	---	54.15	74.00	19.85	1000.0	9.000	Single Line	19.8
17.695000	58.15	---	87.00	28.85	1000.0	9.000	Single Line	19.8
23.130000	---	55.90	74.00	18.10	1000.0	9.000	Single Line	20.1
23.130000	59.91	---	87.00	27.09	1000.0	9.000	Single Line	20.1

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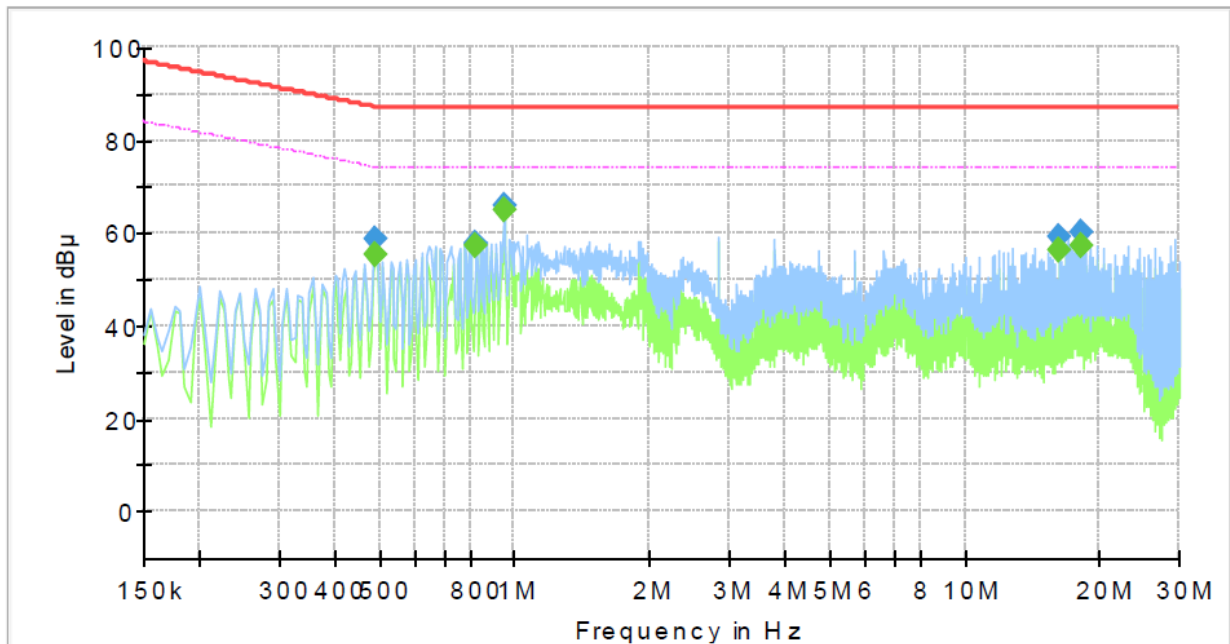
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■ AC / DC Adapter MODE

[100 Mbps]

**Common Information**

Test Description: Telecommunication Emission  
 Model No.: SPA-S1000  
 Mode : AC / DC Adapter  
 Speed : 100 Mbps  
 Operator Name: KES



**Final Result**

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.490000	---	55.40	74.17	18.77	1000.0	9.000	Single Line	19.8
0.490000	58.46	---	87.17	28.71	1000.0	9.000	Single Line	19.8
0.820000	---	57.33	74.00	16.67	1000.0	9.000	Single Line	20.0
0.820000	57.82	---	87.00	29.18	1000.0	9.000	Single Line	20.0
0.945000	---	64.86	74.00	9.14	1000.0	9.000	Single Line	20.0
0.945000	65.71	---	87.00	21.29	1000.0	9.000	Single Line	20.0
16.230000	---	56.46	74.00	17.54	1000.0	9.000	Single Line	19.7
16.230000	59.36	---	87.00	27.64	1000.0	9.000	Single Line	19.7
18.245000	---	57.23	74.00	16.77	1000.0	9.000	Single Line	19.9
18.245000	60.06	---	87.00	26.94	1000.0	9.000	Single Line	19.9

◆ Calculation

QuasiPeak[dBuV] / CAverage [dBuV] = Reading Value[dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

Corr. : Correction values (ISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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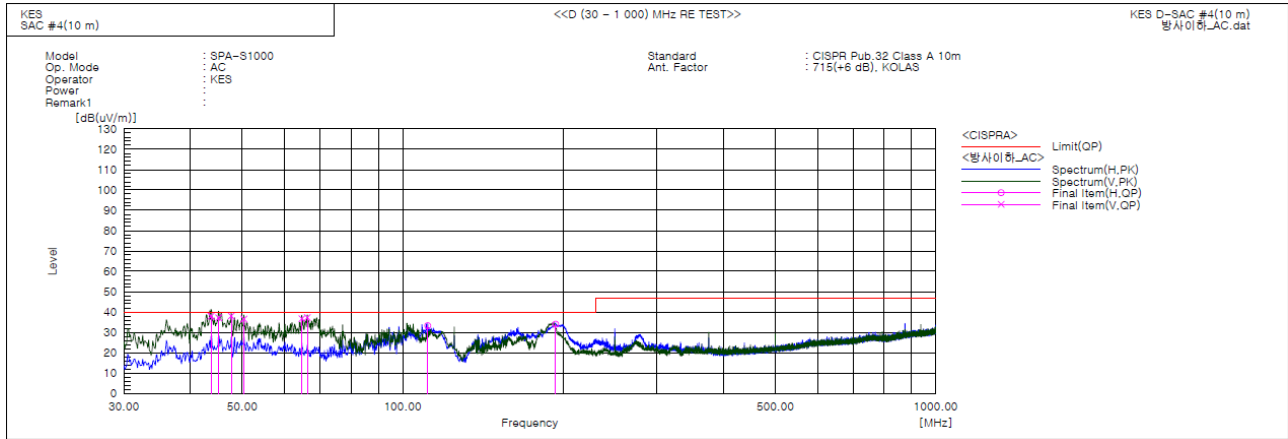
# KES Co., Ltd.

3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
Tel: +82-31-425-6200 / Fax: +82-31-424-0450  
www.kes.co.kr

Report No.:  
KES-EM-21T1080-R2  
Page (23) of (40)

## Radiated Electric Field Emissions(Below 1 GHz)

### ■ AC MODE



### Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	43.701	V	59.6	-21.6	38.0	40.0	2.0	107.0	55.0	
2	45.156	V	58.7	-21.5	37.2	40.0	2.8	154.0	66.0	
3	47.703	V	59.3	-21.2	38.1	40.0	1.9	100.0	73.0	
4	50.370	V	57.6	-21.0	36.6	40.0	3.4	100.0	25.0	
5	64.678	V	60.0	-23.2	36.8	40.0	3.2	106.0	115.0	
6	66.254	V	60.9	-23.6	37.3	40.0	2.7	101.0	157.0	
7	111.480	H	55.7	-22.4	33.3	40.0	6.7	400.0	24.0	
8	193.566	H	55.4	-21.4	34.0	40.0	6.0	399.0	157.0	

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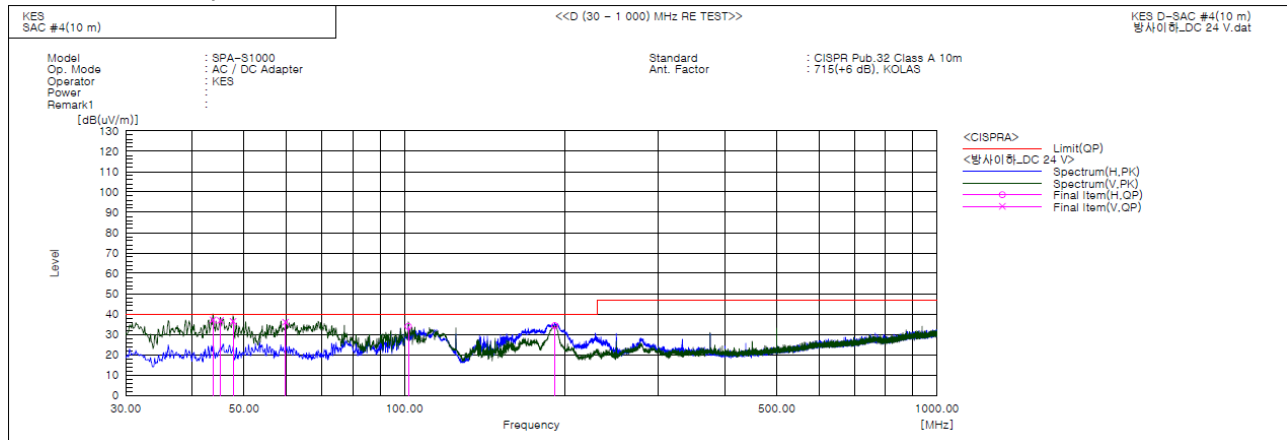


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Report No.:  
KES-EM-21T1080-R2  
Page (24) of (40)

## ■ AC / DC Adapter MODE



## Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]	Remark
1	43.701	V	58.7	-21.6	37.1	40.0	2.9	108.0	299.0	
2	45.156	V	58.4	-21.5	36.9	40.0	3.1	100.0	142.0	
3	47.703	V	57.6	-21.2	36.4	40.0	3.6	109.0	138.0	
4	59.828	V	57.9	-21.9	36.0	40.0	4.0	100.0	108.0	
5	101.780	H	56.4	-22.5	33.9	40.0	6.1	375.0	299.0	
6	191.505	H	56.0	-21.7	34.3	40.0	5.7	400.0	359.0	

## ◆ Calculation

Corrected Amplitude [dBuV] = Amplitude[dBuV] + Correction Factor [dB]

Corrected Amplitude : The Final Value, Amplitude : Reading Value,

Correction Factor : ANT FACTOR + Cable loss

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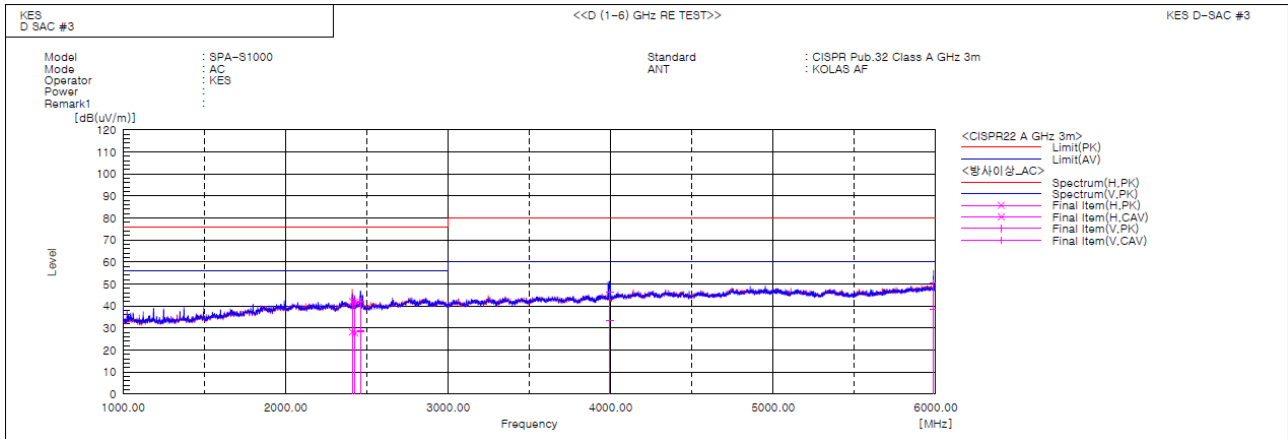
Report No.:

KES-EM-21T1080-R2

Page (25) of (40)

## Radiated Electric Field Emissions(Above 1 GHz)

### ■ AC MODE



### Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	2410.902	H	41.9	28.0	0.2	42.1	28.2	76.0	56.0	33.9	27.8	100.0	184.8	
2	2428.446	H	41.7	27.5	0.2	41.9	27.7	76.0	56.0	34.1	28.3	100.0	306.3	
3	2459.680	V	41.4	28.2	0.2	41.6	28.4	76.0	56.0	34.4	27.6	100.0	87.7	
4	2461.392	V	42.1	28.7	0.2	42.3	28.9	76.0	56.0	33.7	27.1	100.0	196.6	
5	3994.554	V	40.8	27.6	5.6	46.4	33.2	80.0	60.0	33.6	26.8	100.0	172.7	
6	5986.484	V	39.7	27.7	10.8	50.5	38.5	80.0	60.0	29.5	21.5	100.0	76.9	

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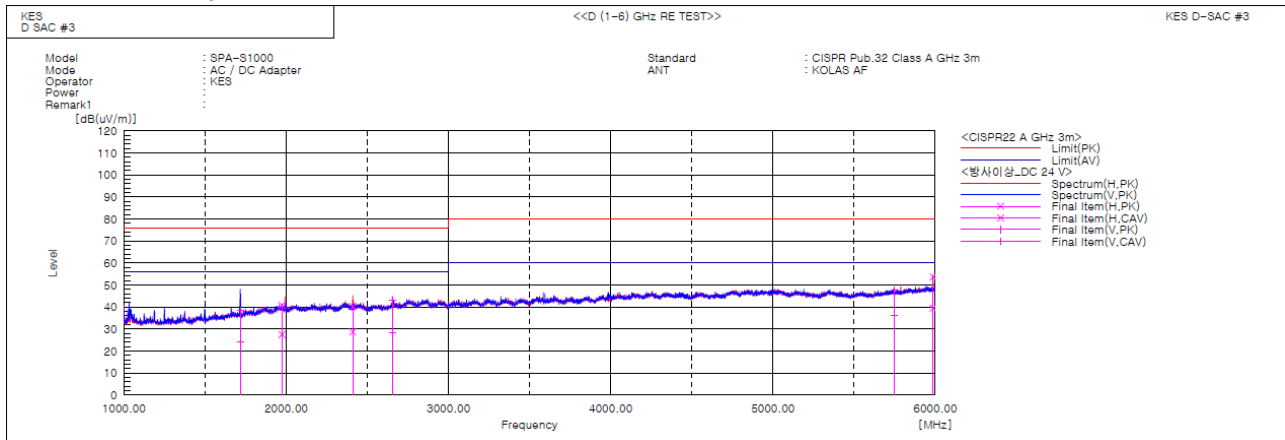
3701, 40, Simin-daero 365beon-gil,  
Dongan-gu, Anyang-si, Gyeonggi-do, 14057, Korea  
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Report No.:

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Page (26) of (40)

### ■ AC / DC Adapter MODE



#### Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB(1/m)]	Result PK [dB(uV/m)]	Result CAV [dB(uV/m)]	Limit PK [dB(uV/m)]	Limit AV [dB(uV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1718.416	V	42.3	28.3	-3.9	38.4	24.4	76.0	56.0	37.6	31.6	100.0	42.6	
2	1974.643	H	41.8	28.5	-1.0	40.8	27.5	76.0	56.0	35.2	28.5	100.0	71.0	
3	2410.482	H	40.0	28.5	0.2	40.2	28.7	76.0	56.0	35.8	27.3	100.0	47.6	
4	2655.485	V	42.2	27.5	0.7	42.9	28.2	76.0	56.0	33.1	27.8	100.0	226.6	
5	5749.122	V	38.3	27.0	9.4	47.7	36.4	80.0	60.0	32.3	23.6	100.0	164.9	
6	5987.069	H	42.9	28.7	10.8	53.7	39.5	80.0	60.0	26.3	20.5	100.0	94.8	

#### ◆ Calculation

Result(PK/CAV) [dB( $\mu$ V/m)] = (Reading(PK/CAV)[dB( $\mu$ V)] + c.f[dB(1/m)])

Margin(PK/CAV)[dB] = Limit[dB( $\mu$ V/m)] - Result(PK/CAV) [dB( $\mu$ V/m)]

Reading(PK/CAV) : Reading value, Result(PK/CAV) : Reading value + Factor value

Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

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## Test Setup Photos and Configuration

### Conducted Emissions at Mains Power Ports

#### ■ AC MODE



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**■ AC / DC Adapter MODE**



## Conducted Emissions at Telecommunication Ports

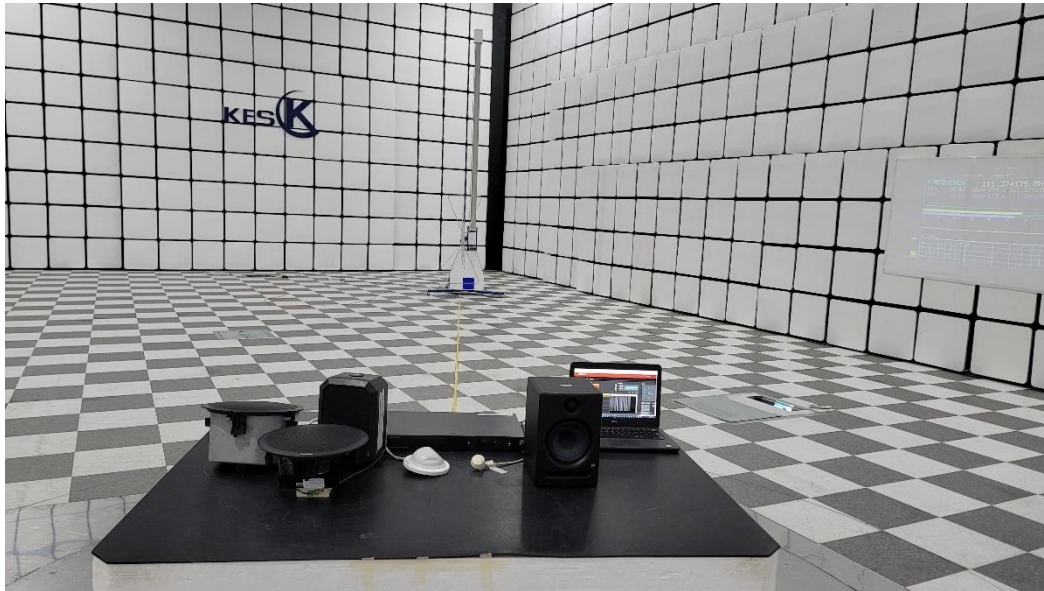
### ■ AC MODE



**■ AC / DC Adapter MODE**

## Radiated Electric Field Emissions(Below 1 GHz)

### ■ AC MODE



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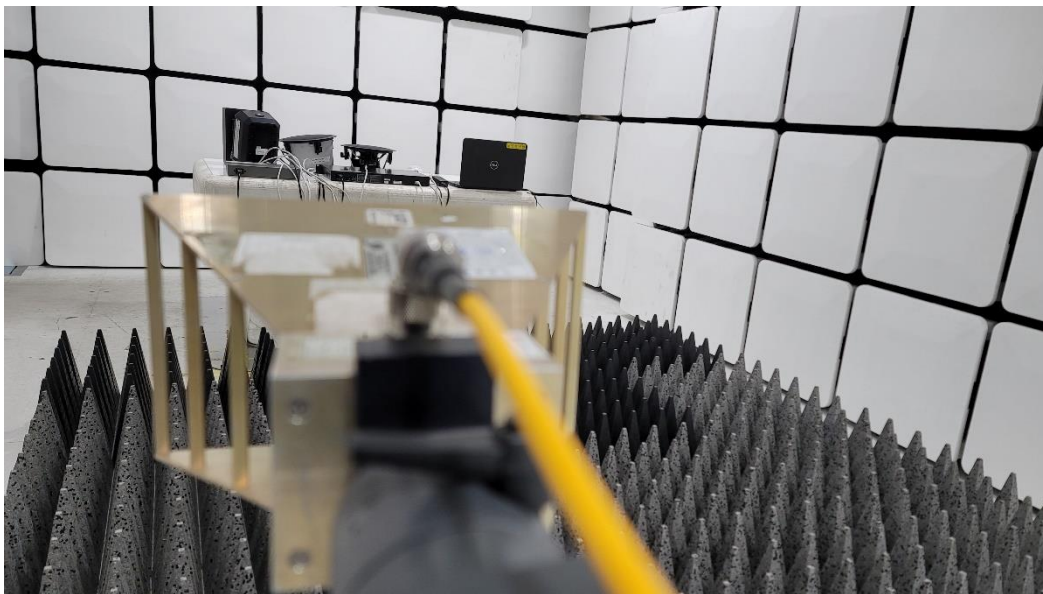


**■ AC / DC Adapter MODE**



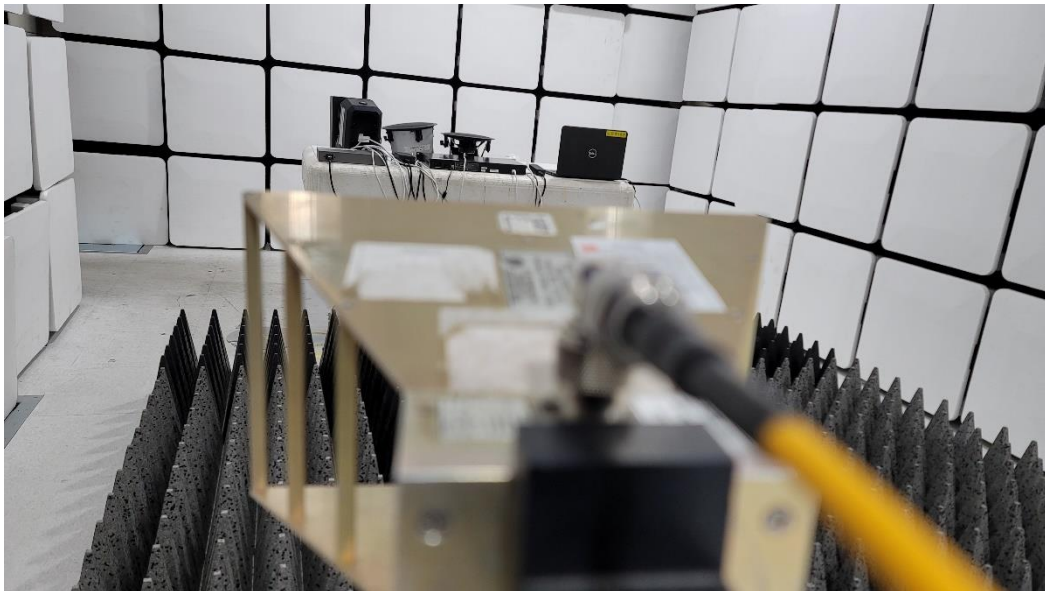
## Radiated Electric Field Emissions(Above 1 GHz)

### ■ AC MODE



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■ AC / DC Adapter MODE



## EUT External Photographs

(Top)



(Bottom)

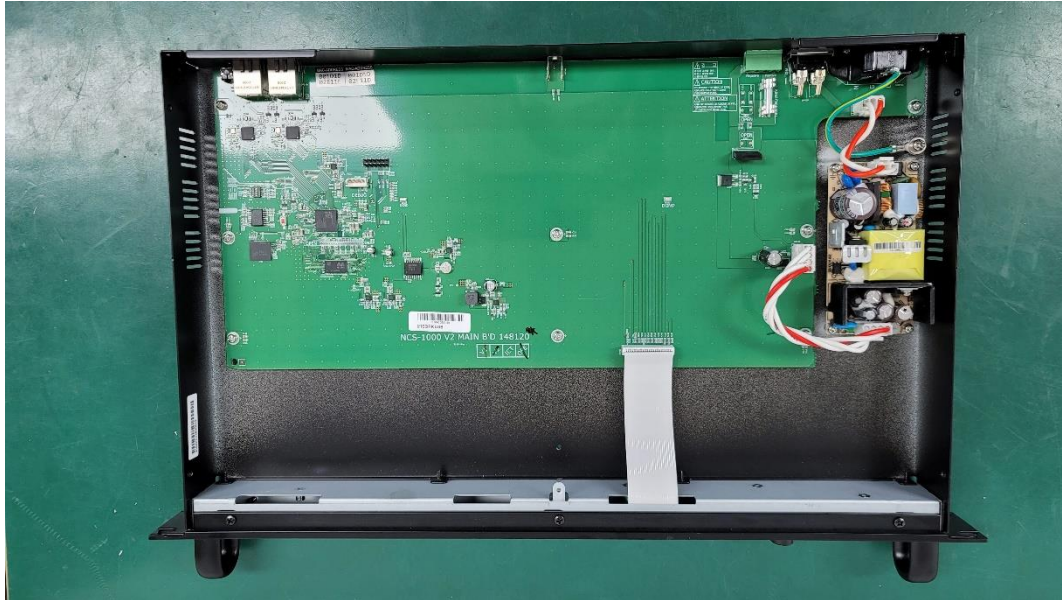


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## **EUT Internal Photographs**

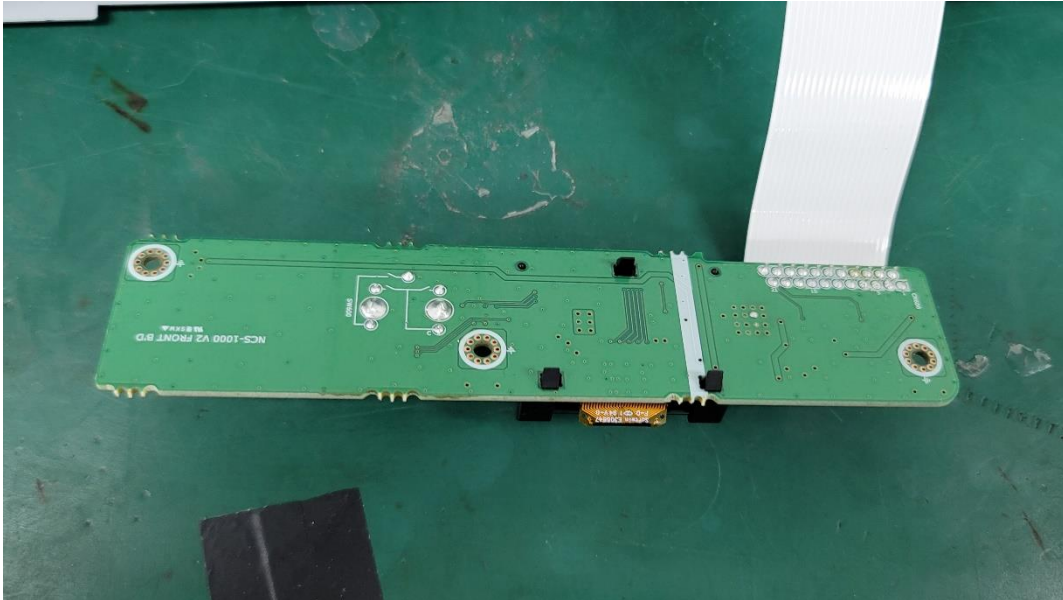
(Internal View)



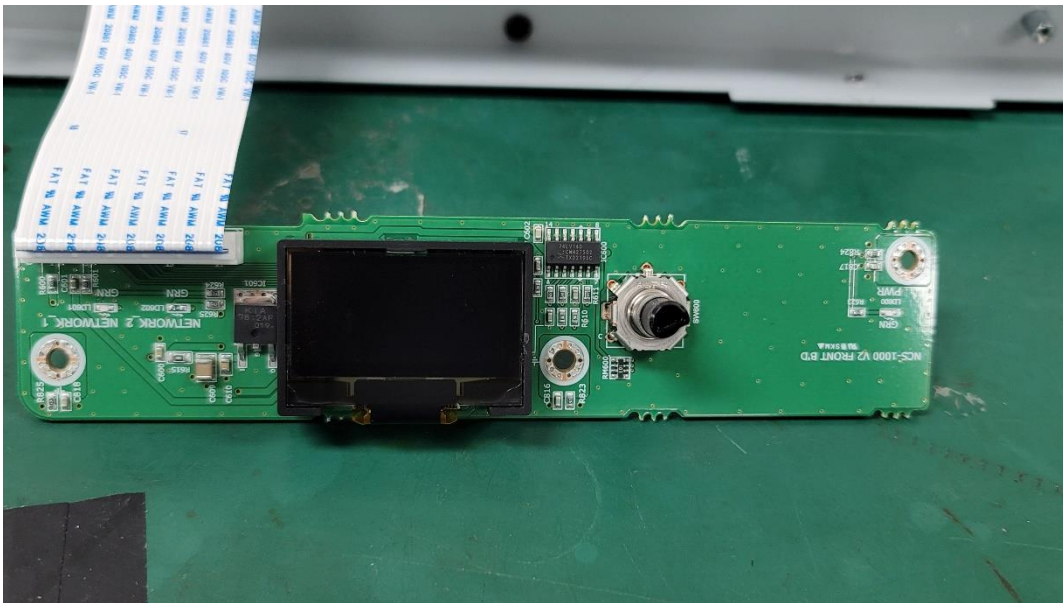
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## EUT Internal View – Board 1

(Top)



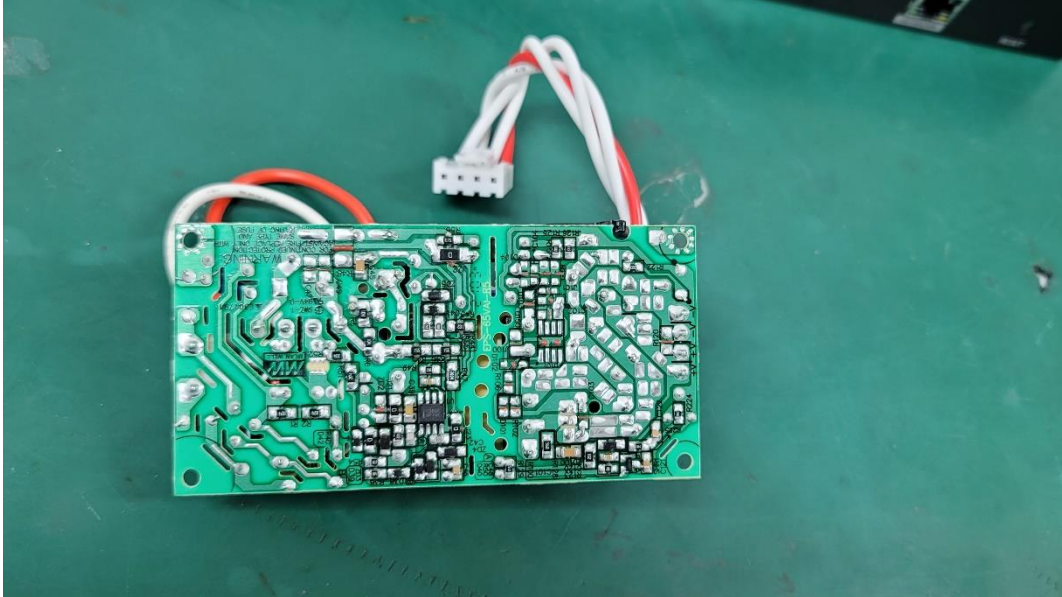
(Bottom)



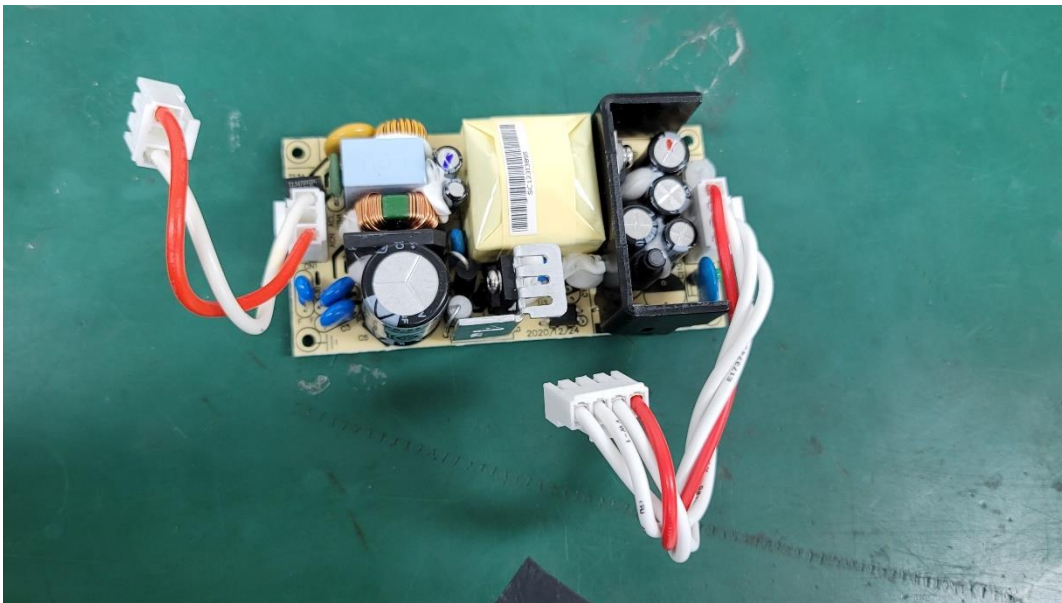
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## EUT Internal View – Board 2

(Top)



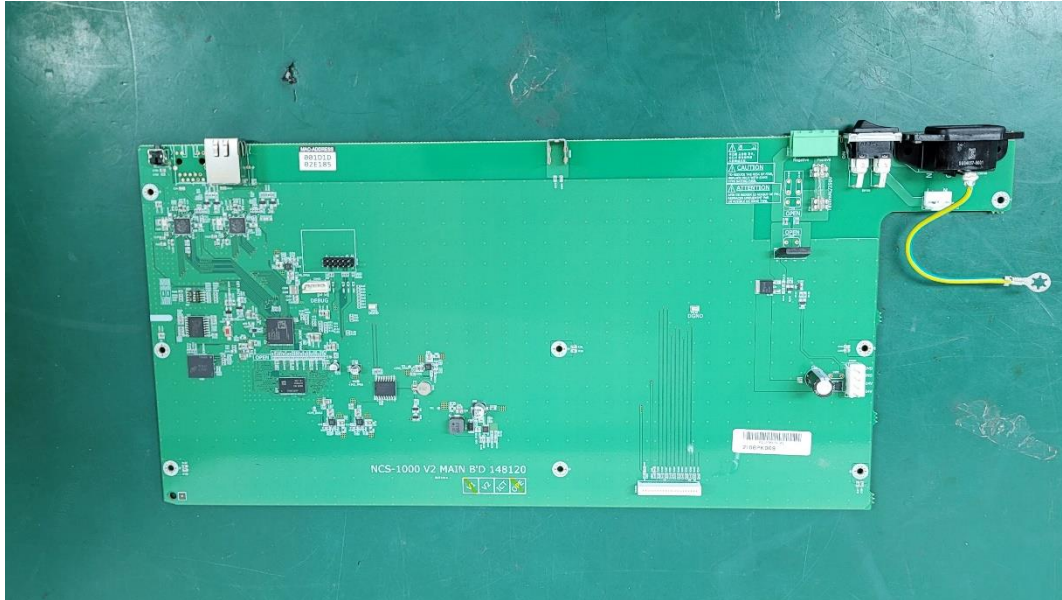
(Bottom)



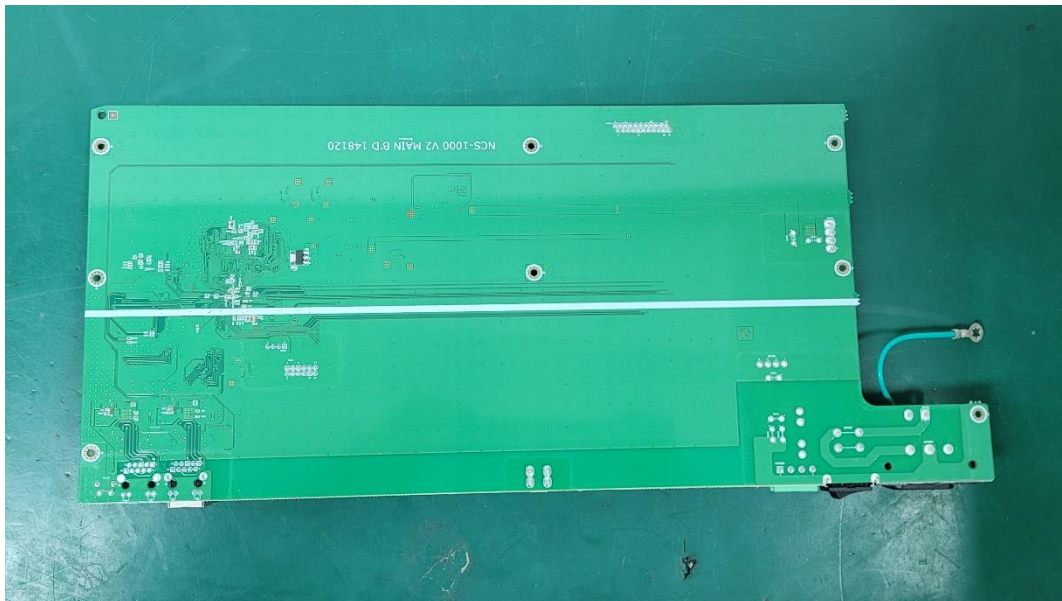


## EUT Internal View – Board 3

(Top)



(Bottom)



## Label Photographs



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