

**KES Co., Ltd.**

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Report No.:

KES-EM-21T1243-R2

Page (1) of (36)

EMC TEST REPORT

Test Report No. : KES-EM-21T1243-R2
Date of Issue : Feb. 24, 2023
Product name : NETWORK MICROPHONE
Model/Type No. : SPA-M1000
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
Equipment authorization : **Supplier's Declaration of Conformity**
Date of Receipt : Dec. 07, 2021
Test date : Dec. 23, 2021 ~ Dec. 25, 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-21T1243-R2

Page (2) of (36)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Dec. 30, 2021	KES-EM-21T1243	Issued
Jan. 27, 2023	KES-EM-21T1243-R1	Change Manufacturer
Feb. 24, 2023	KES-EM-21T1243-R2	Change the Applicant at the request of the customer

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Report No.:

KES-EM-21T1243-R2

Page (3) of (36)

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	5
1.6	External I/O Cabling	6
1.7	EUT Operating Mode(s)	7
1.8	Configuration.....	8
1.9	Remarks when standards applied	9
1.10	Calibration Details of Equipment Used for Measurement	9
1.11	Test Facility	9
1.12	Laboratory Accreditations and Listings	9
2.0	Test Regulations.....	10
2.1	Conducted Emissions at Mains Power Ports	11
2.2	Radiated Electric Field Emissions(Below 1 GHz)	12
2.3	Radiated Electric Field Emissions(Above 1 GHz)	13
APPENDIX A – TEST DATA.....		14
Conducted Emissions at Mains Power Ports.....		14
Radiated Electric Field Emissions(Below 1 GHz)		18
Radiated Electric Field Emissions(Above 1 GHz)		22
Test Setup Photos and Configuration		24
Conducted Emissions at Mains Power Ports.....		24
Radiated Electric Field Emissions(Below 1 GHz)		26
Radiated Electric Field Emissions(Above 1 GHz)		28
EUT External Photographs		30
EUT Internal Photographs		31

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Report No.:

KES-EM-21T1243-R2

Page (4) of (36)

1.0 General Product Description

Main Specifications of EUT are:

WISEnET AMS	Specification	SPA-M1000
Product	Type	SIP Microphone
MIC Input	Input Sensitivity	-50dBV \pm 3dB
	Frequency Response	100Hz ~ 18kHz
Line Output	Output Level	0dBV \pm 3dB
	Frequency Response	100Hz ~ 18kHz
	THD + N Ratio	less than 0.1%
	S/N Ratio (20Hz HPF, 20kHz LPF)	greater than 75dB
Power Amp	Output Power (8 Ω , 1kHz Sine wave)	-
	Frequency Response (1W, 8 Ω)	-
	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	1.29Kg
	Size	200(W) x 73(H) x 206(D)mm
	Color	Black & Gray
	Certificate	EMC : KN 32/ 35, EN 55032/ 55035, FCC Part 15, Subpart B
Power	PoE	Max.10W, DC24V
	PoE+	PoE (IEEE 802.3 af type 1 Class 3)
Audio	Built-in microphone	-
	Audio Streaming	-
	Audio Compression	-
Speaker	Speaker Component	-
	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	-
	Supported Protocols	IPv4, HTTP, SIP, Bonjour, DNS, NTP, TCP, UDP, DHCP, ARP, SSH, ICMP, Network Bonding
System Integration	API (Application Programming Interface)	-
	Multi-source Dynamic PA control	-
	Voice Announcement	-
	VoIP	-
	TTS	-
	Intelligent Audio	-
	Event Triggers	-
	Functional Monitoring	-
	Supported OS	Windows : Windows 10 MAC : Catalina 10.15.4 ↑, Big Sur 11.1 ↑
	Supported Web viewer	Chrome Version : 91.0.4472.114 ↑

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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 120 V, 60 Hz ☒ PoE

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
NETWORK MICROPHONE	SPA-M1000	-	Inter-M Corporation	EUT

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
AC / DC Adapter	KPL-060M-VI	-	Channel Well Technology (Guangzhou) Co.,Ltd.	-
WALL SPEAKER	SPA-W100B	-	Inter-M Corporation	-
AUDIO MODULE	SPA-D1000	-	Inter-M Corporation	-
Notebook	P98F004	21599158359	DELL INC.	-
Notebook Adapter	LA240PM190	-	LITE-ON TECHNOLOGY (CHANGZHOU)CO.,LTD.	-
PoE Switch	GS728TPP	3AR3595700005	NETGEAR®	-
Smartphone 1	SM-N960N	0364287	SAMSUNG	-
Smartphone 2	G8441	-	SONY	-

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Report No.:

KES-EM-21T1243-R2

Page (6) of (36)

1.6 External I/O Cabling

■ DC 24 V Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK MICROPHONE (EUT)	DC jack	AC / DC Adapter	Line out	1.5	U
	AUX IN	Smartphone 1	3.5 mm	1.2	U
	-	Smartphone 2	-	-	-
PoE Switch	RJ-45	NETWORK MICROPHONE (EUT)	RJ-45	20.0	U
	RJ-45	WALL SPEAKER	RJ-45	4.0	U
	RJ-45	AUDIO MODULE	RJ-45	4.0	U
Notebook	DC Jack	Notebook Adapter	Line out	1.5	U

* Unshielded=U, Shielded=S

■ PoE Mode

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
NETWORK MICROPHONE (EUT)	AUX IN	Smartphone 1	3.5 mm	1.2	U
	-	Smartphone 2	-	-	-
PoE Switch	RJ-45	NETWORK MICROPHONE (EUT)	RJ-45	20.0	U
	RJ-45	WALL SPEAKER	RJ-45	4.0	U
	RJ-45	AUDIO MODULE	RJ-45	4.0	U
Notebook	DC Jack	Notebook Adapter	Line out	1.5	U

* Unshielded=U, Shielded=S

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Report No.:

KES-EM-21T1243-R2

Page (7) of (36)

1.7 EUT Operating Mode(s)

Test Mode	operating
DC 24 V, PoE	<ol style="list-style-type: none">1. Run a PING test on the laptop to check if the EUT is connected normally, access the web page of the AUDIO MODULE, and check whether the EUT is activated.2. We checked whether the 1 kHz tone sound played on smartphone 1 connected to EUT and the 1 kHz tone sound played on smartphone 2 are normally output to EUT's speakers and WALL SPEAKER.

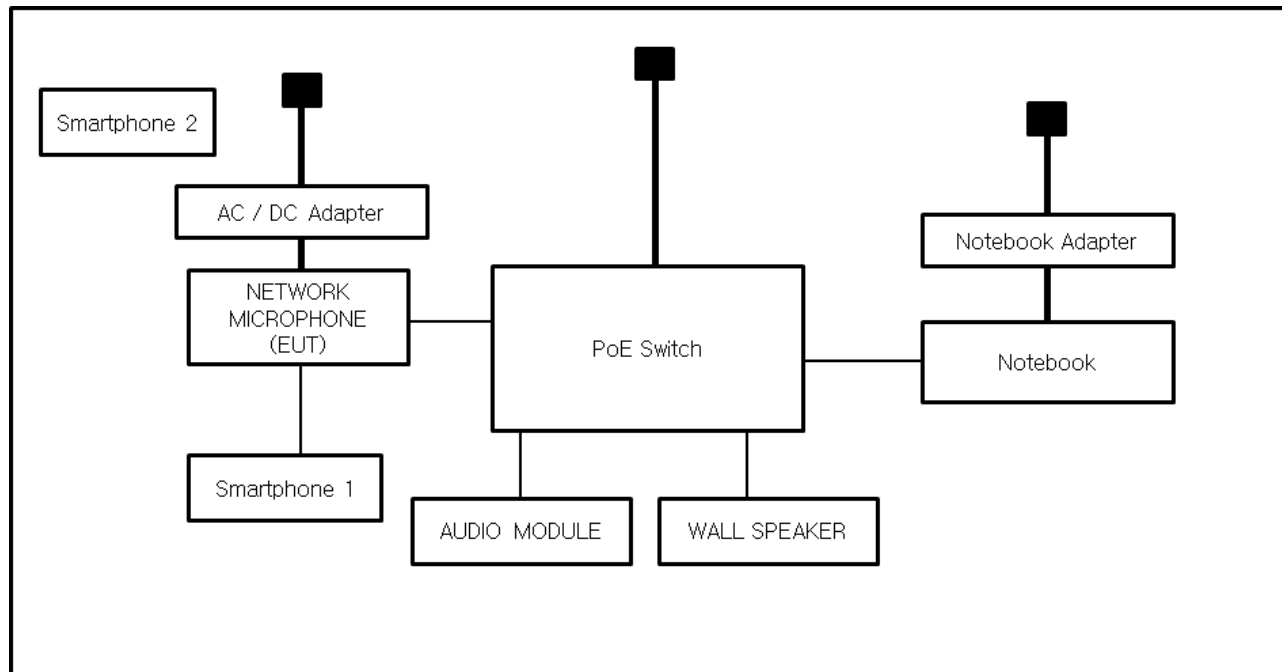
EUT Test operating S/W		
Name	Version	Manufacture Company
Web Viewer	-	Hanwha Vision Co., Ltd

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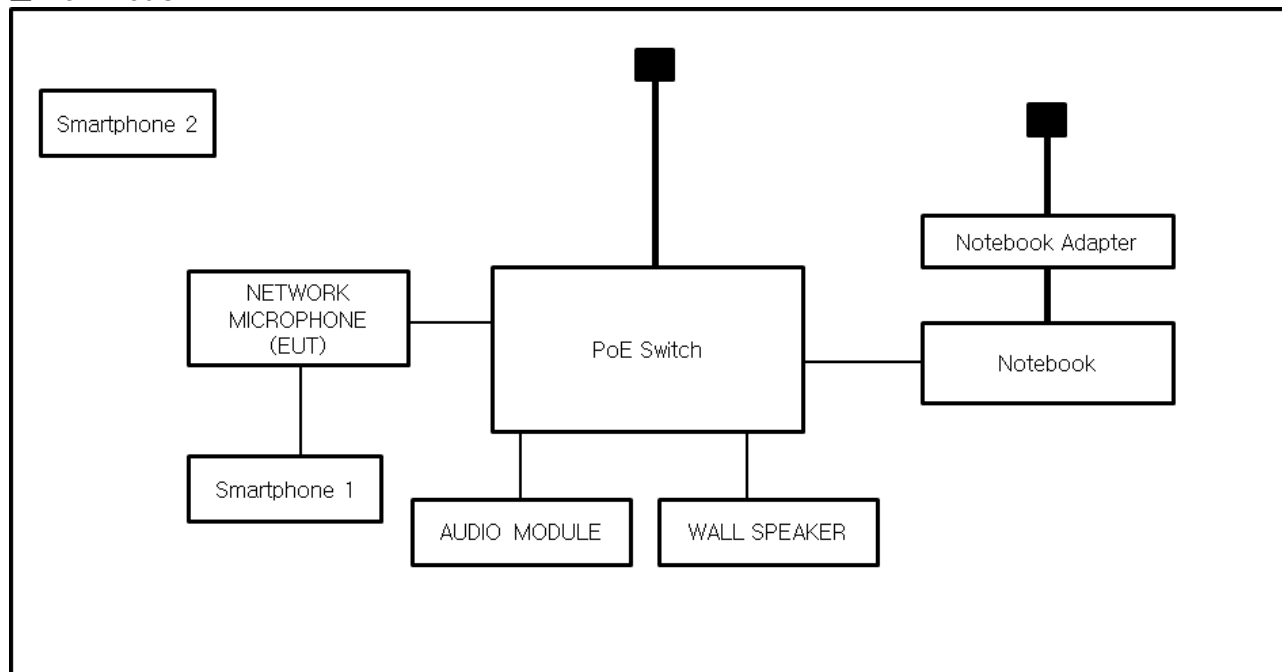
1.8 Configuration

■ AC Main
 □ DC Main

■ DC 24 V Mode



■ PoE 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



2.0 Test Regulations

The emissions tests were performed according to following regulations:

☒ **47 CFR Part 15, Subpart B**

☐ CISPR 22:2009 +A1:2010

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B

☒ **IC Regulation ICES-003 Issue 7**

☐ CAN/CSA-CISPR 32:17

☐ Class A

☐ Class B

☒ ANSI C63.4a-2017

☒ Class A

☐ Class B

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Report No.:

KES-EM-21T1243-R2

Page (11) of (36)

2.1 Conducted Emissions at Mains Power Ports

Test Date

Dec. 23, 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: (22,7 ± 0,1) °C

Relative Humidity: (43,0 ± 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

RemarksSee Appendix A for test data.

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2.2 Radiated Electric Field Emissions(Below 1 GHz)

Test Date

Dec. 23, 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, 24, 2022
<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: (22,7 ± 0,1) °C

Relative Humidity: (43,0 ± 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.

2.3 Radiated Electric Field Emissions(Above 1 GHz)

Test Date

Dec. 25, 2021

Test Location

SEMI ANECHOIC CHAMBER #5

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.120	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	Rohde & Schwarz	100552	04, 01, 2022
<input checked="" type="checkbox"/>	HORN ANTENNA	BBHA 9120D	SCHWARZBECK	9120D-1802	12, 16, 2022
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	HP	3008A00538	06, 21, 2022

Test Conditions

Temperature: (22,0 ± 0,1) °C

Relative Humidity: (43,1 ± 0,1) % R.H.

Frequency Range of Measurement

1 GHz to 5 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.



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Report No.:

KES-EM-21T1243-R2

Page (14) of (36)

APPENDIX A – TEST DATA

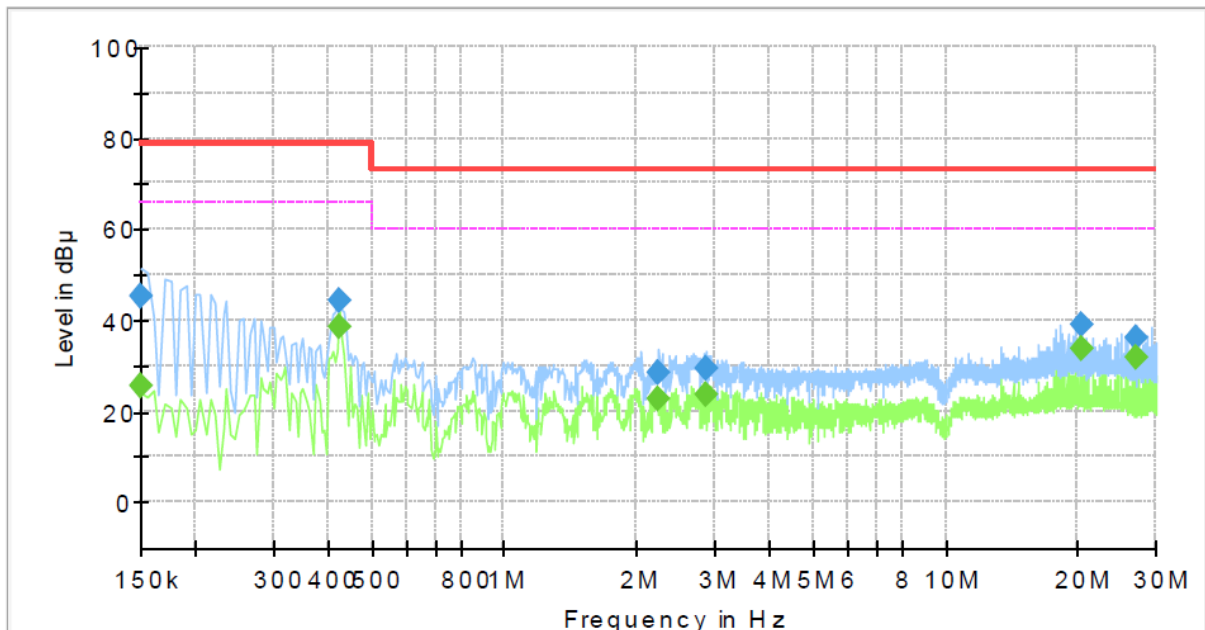
Conducted Emissions at Mains Power Ports

■ DC 24 V Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPA-M1000
Phase:	L1
Mode:	DC 24 V
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.150000	---	25.46	66.00	40.54	1000.0	9.000	L1	19.4
0.150000	45.04	---	79.00	33.96	1000.0	9.000	L1	19.4
0.425000	---	38.71	66.00	27.29	1000.0	9.000	L1	19.7
0.425000	44.08	---	79.00	34.92	1000.0	9.000	L1	19.7
2.245000	---	22.43	60.00	37.57	1000.0	9.000	L1	20.3
2.245000	28.58	---	73.00	44.42	1000.0	9.000	L1	20.3
2.875000	---	23.65	60.00	36.35	1000.0	9.000	L1	20.2
2.875000	29.18	---	73.00	43.82	1000.0	9.000	L1	20.2
20.260000	---	33.95	60.00	26.05	1000.0	9.000	L1	20.2
20.260000	38.77	---	73.00	34.23	1000.0	9.000	L1	20.2
27.160000	---	31.67	60.00	28.33	1000.0	9.000	L1	20.3
27.160000	36.17	---	73.00	36.83	1000.0	9.000	L1	20.3

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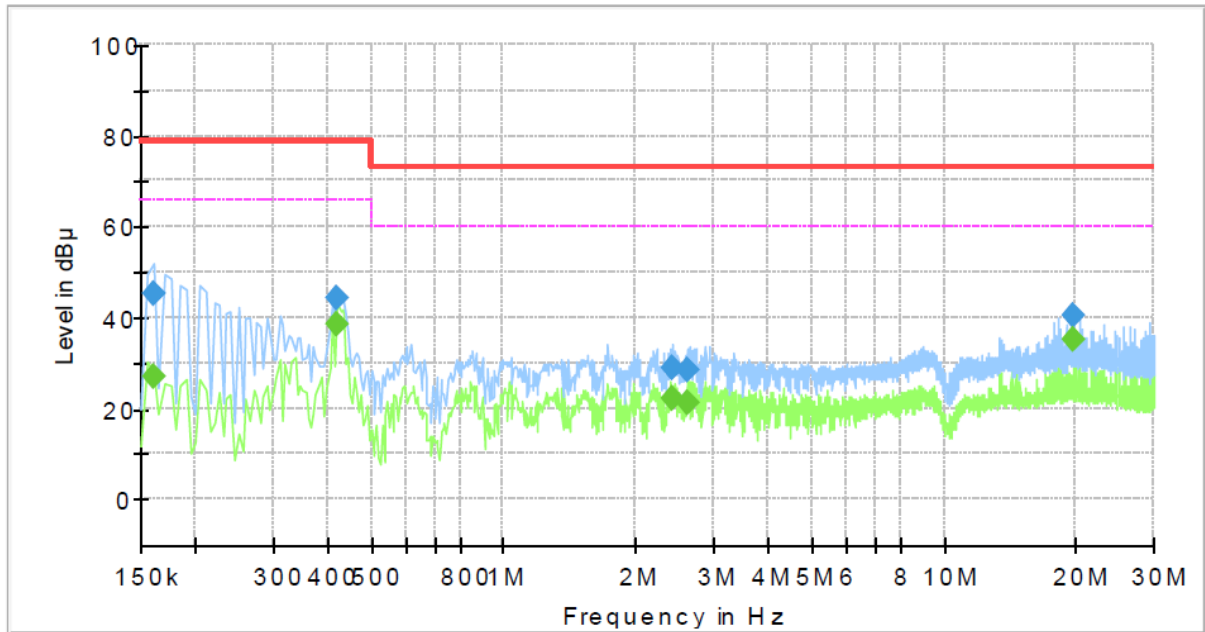
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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPA-M1000
Phase:	N
Mode:	DC 24 V
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	---	27.04	66.00	38.96	1000.0	9.000	N	19.4
0.160000	45.11	---	79.00	33.89	1000.0	9.000	N	19.4
0.420000	---	38.28	66.00	27.72	1000.0	9.000	N	19.7
0.420000	44.14	---	79.00	34.86	1000.0	9.000	N	19.7
2.415000	---	22.42	60.00	37.58	1000.0	9.000	N	20.3
2.415000	28.83	---	73.00	44.17	1000.0	9.000	N	20.3
2.605000	---	21.32	60.00	38.68	1000.0	9.000	N	20.2
2.605000	28.22	---	73.00	44.78	1000.0	9.000	N	20.2
19.710000	---	35.27	60.00	24.73	1000.0	9.000	N	20.2
19.710000	40.36	---	73.00	32.64	1000.0	9.000	N	20.2

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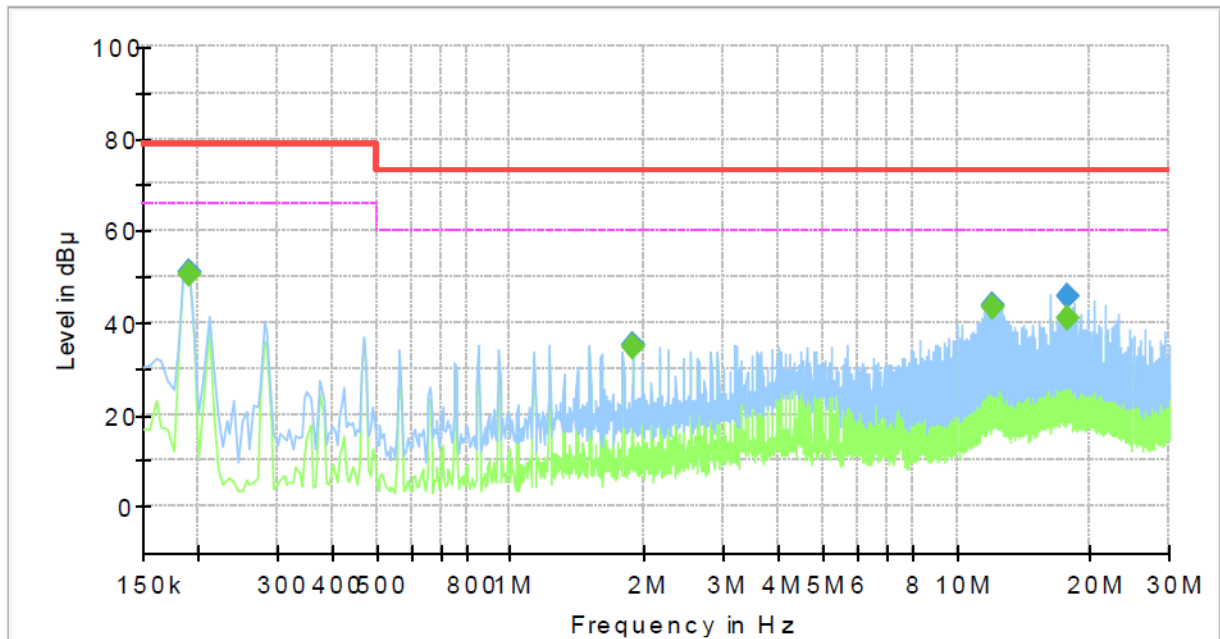
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■ PoE Mode

HOT LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPA-M1000
Phase:	PoE
Mode:	L1
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.190000	---	50.65	66.00	15.35	1000.0	9.000	L1	19.5
0.190000	51.05	---	79.00	27.95	1000.0	9.000	L1	19.5
1.880000	---	34.84	60.00	25.16	1000.0	9.000	L1	20.3
1.880000	35.02	---	73.00	37.98	1000.0	9.000	L1	20.3
12.125000	---	43.31	60.00	16.69	1000.0	9.000	L1	20.0
12.125000	43.73	---	73.00	29.27	1000.0	9.000	L1	20.0
17.695000	---	41.03	60.00	18.97	1000.0	9.000	L1	20.0
17.695000	45.70	---	73.00	27.30	1000.0	9.000	L1	20.0

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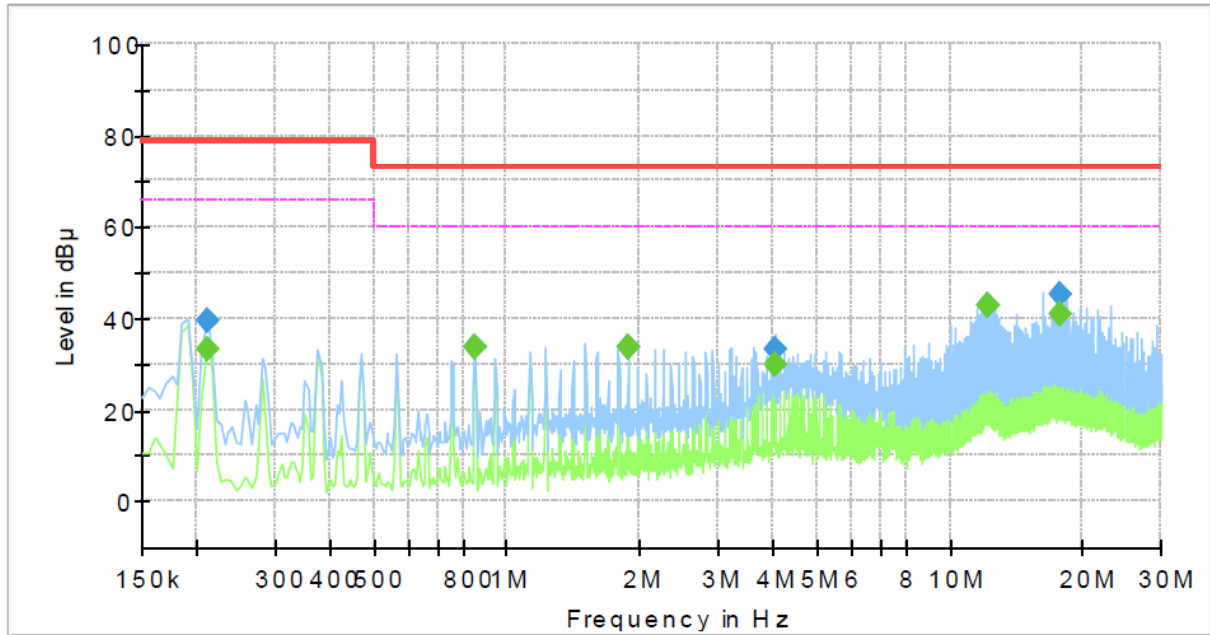
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NEUTRAL LINE

Common Information

Test Description:	Conducted Emission
Model No.:	SPA-M1000
Phase:	PoE
Mode:	N
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	33.32	66.00	32.68	1000.0	9.000	N	19.5
0.210000	39.60	---	79.00	39.40	1000.0	9.000	N	19.5
0.845000	---	33.50	60.00	26.50	1000.0	9.000	N	20.1
0.845000	33.49	---	73.00	39.51	1000.0	9.000	N	20.1
1.880000	---	33.75	60.00	26.25	1000.0	9.000	N	20.3
1.880000	33.87	---	73.00	39.13	1000.0	9.000	N	20.3
4.045000	---	30.10	60.00	29.90	1000.0	9.000	N	19.9
4.045000	33.11	---	73.00	39.89	1000.0	9.000	N	19.9
12.220000	---	42.61	60.00	17.39	1000.0	9.000	N	20.0
12.220000	42.89	---	73.00	30.11	1000.0	9.000	N	20.0
17.695000	---	40.83	60.00	19.17	1000.0	9.000	N	20.0
17.695000	45.44	---	73.00	27.56	1000.0	9.000	N	20.0

◆ 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 (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

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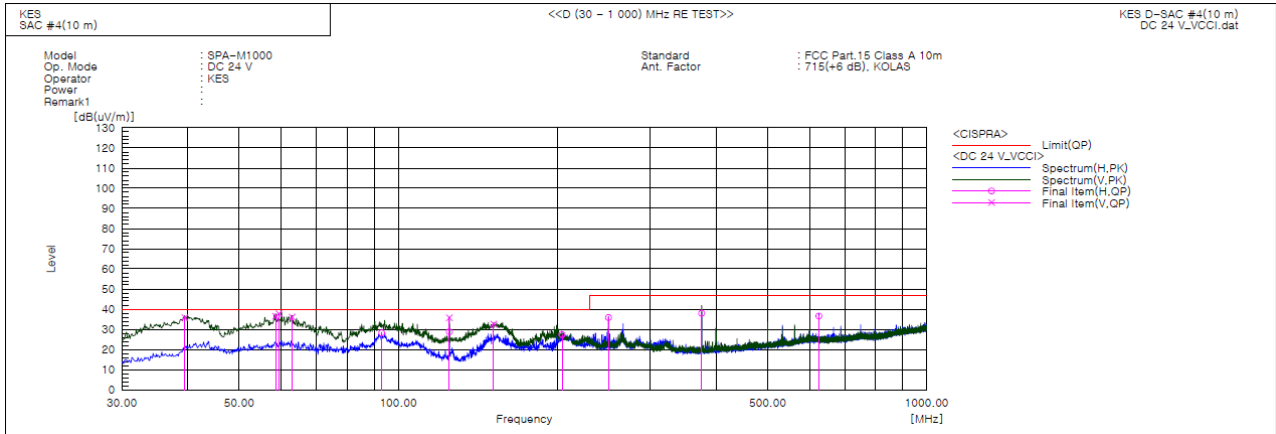
KES-EM-21T1243-R2

Page (18) of (36)

Radiated Electric Field Emissions(Below 1 GHz)

- 47 CFR Part 15, Subpart B

■ DC 24 V 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	39.458	V	58.6	-22.7	35.9	40.0	4.1	108.0	269.0	
2	58.615	V	58.1	-21.6	36.5	40.0	3.5	102.0	79.0	
3	59.500	V	59.5	-21.7	37.8	40.0	2.2	100.0	90.0	
4	62.980	V	58.6	-22.5	36.1	40.0	3.9	100.0	83.0	
5	93.050	H	51.8	-23.6	28.2	40.0	11.8	391.0	230.0	
6	124.939	V	60.6	-24.8	35.8	40.0	4.2	104.0	284.0	
7	124.942	H	53.6	-24.8	28.8	40.0	11.2	392.0	287.0	
8	151.493	V	57.7	-25.1	32.6	40.0	7.4	100.0	206.0	
9	204.115	H	48.1	-20.7	27.4	40.0	12.6	390.0	272.0	
10	249.948	H	55.0	-19.1	35.9	47.0	11.1	400.0	182.0	
11	374.956	H	52.6	-14.6	38.0	47.0	9.0	377.0	340.0	
12	625.095	H	44.8	-8.2	36.6	47.0	10.4	398.0	148.0	

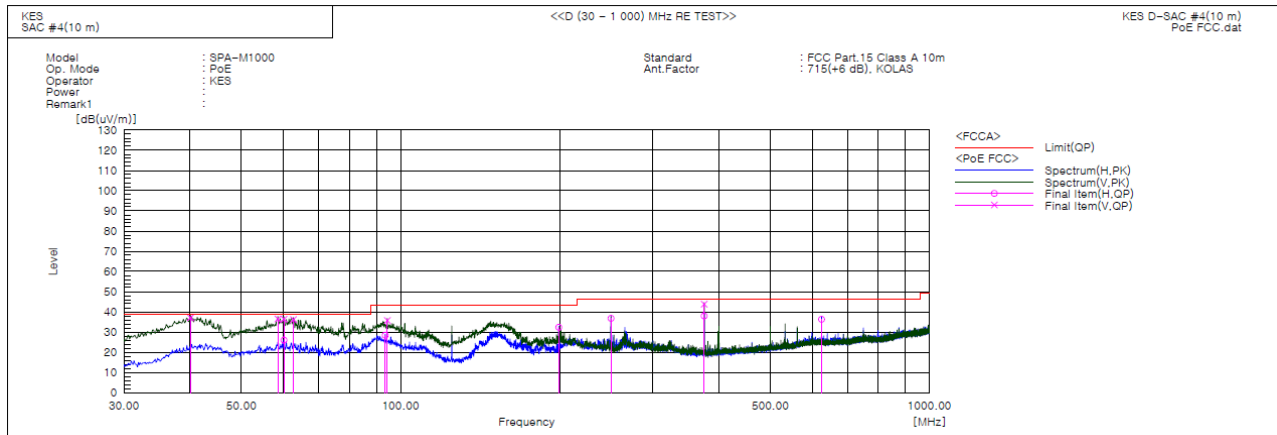
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PoE Mode



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	40.064	V	59.5	-22.4	37.1	39.0	1.9	100.0	227.0	
2	58.615	V	58.1	-21.6	36.5	39.0	2.5	109.0	50.0	
3	60.191	V	58.3	-21.9	36.4	39.0	2.6	116.0	43.0	
4	60.193	H	47.9	-21.9	26.0	39.0	13.0	391.0	99.0	
5	62.738	V	58.7	-22.5	36.2	39.0	2.8	102.0	329.0	
6	93.535	H	52.0	-23.6	28.4	43.5	15.1	400.0	53.0	
7	94.384	V	59.3	-23.5	35.8	43.5	7.7	105.0	186.0	
8	199.144	H	53.2	-20.8	32.4	43.5	11.1	355.0	148.0	
9	249.948	H	55.9	-19.1	36.8	46.5	9.7	400.0	182.0	
10	374.956	V	58.5	-14.6	43.9	46.5	2.6	122.0	126.0	
11	374.956	H	52.6	-14.6	38.0	46.5	8.5	394.0	92.0	
12	625.095	H	44.5	-8.2	36.3	46.5	10.2	398.0	121.0	



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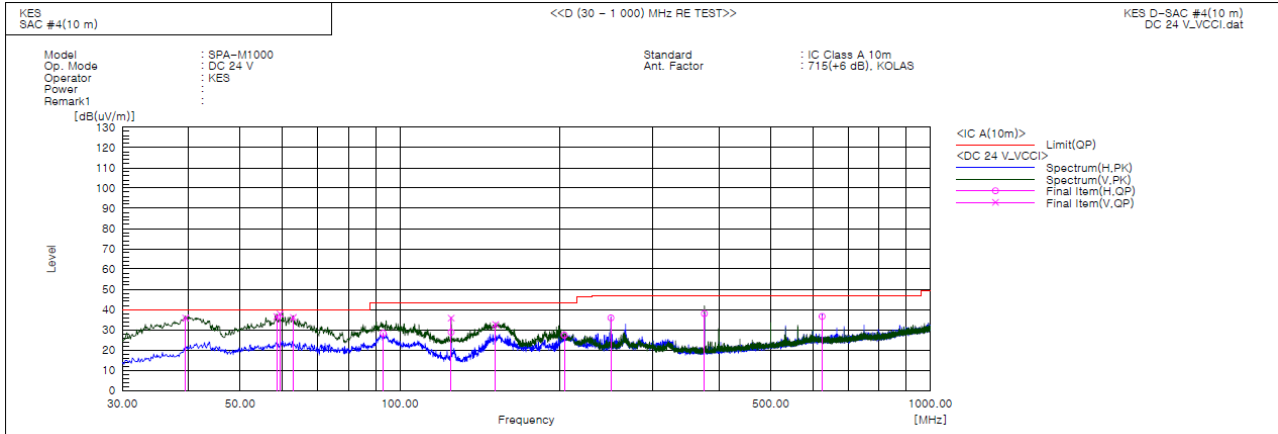
Report No.:

KES-EM-21T1243-R2

Page (20) of (36)

- IC Regulation ICES-003 Issue 7

■ DC 24 V 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	39.458	V	58.6	-22.7	35.9	40.0	4.1	108.0	269.0	
2	58.615	V	58.1	-21.6	36.5	40.0	3.5	102.0	79.0	
3	59.500	V	59.5	-21.7	37.8	40.0	2.2	100.0	90.0	
4	62.980	V	58.6	-22.5	36.1	40.0	3.9	100.0	83.0	
5	93.050	H	51.8	-23.6	28.2	43.5	15.3	391.0	230.0	
6	124.939	V	60.6	-24.8	35.8	43.5	7.7	104.0	284.0	
7	124.942	H	53.6	-24.8	28.8	43.5	14.7	392.0	287.0	
8	151.493	V	57.7	-25.1	32.6	43.5	10.9	100.0	206.0	
9	204.115	H	48.1	-20.7	27.4	43.5	16.1	390.0	272.0	
10	249.948	H	55.0	-19.1	35.9	47.0	11.1	400.0	182.0	
11	374.956	H	52.6	-14.6	38.0	47.0	9.0	377.0	340.0	
12	625.095	H	44.8	-8.2	36.6	47.0	10.4	398.0	148.0	

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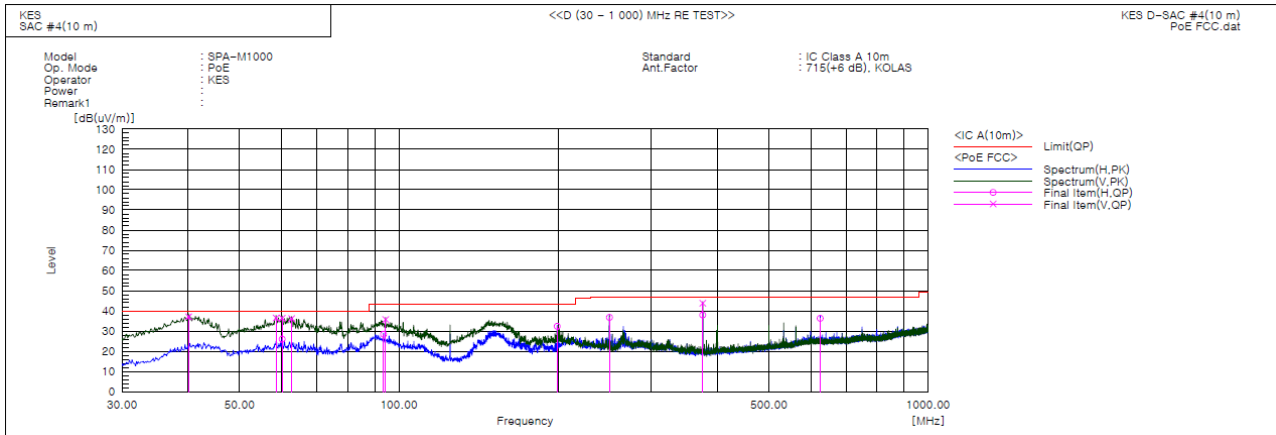
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Page (21) of (36)

PoE Mode



Final Result

No.	Frequency	(P)	Reading	c.f	Result	Limit	Margin	Height	Angle	Remark
	[MHz]		QP		QP	QP	QP			
			[dB(uV)]	[dB(1/m)]	[dB(uV/m)]	[dB(uV/m)]	[dB]	[cm]	[deg]	
1	40.064	V	59.5	-22.4	37.1	40.0	2.9	100.0	227.0	
2	58.615	V	58.1	-21.6	36.5	40.0	3.5	109.0	50.0	
3	60.191	V	58.3	-21.9	36.4	40.0	3.6	116.0	43.0	
4	60.193	H	47.9	-21.9	26.0	40.0	14.0	391.0	99.0	
5	62.738	V	58.7	-22.5	36.2	40.0	3.8	102.0	329.0	
6	93.535	H	52.0	-23.6	28.4	43.5	15.1	400.0	53.0	
7	94.384	V	59.3	-23.5	35.8	43.5	7.7	105.0	186.0	
8	199.144	H	53.2	-20.8	32.4	43.5	11.1	355.0	148.0	
9	249.948	H	55.9	-19.1	36.8	47.0	10.2	400.0	182.0	
10	374.956	V	58.5	-14.6	43.9	47.0	3.1	122.0	126.0	
11	374.956	H	52.6	-14.6	38.0	47.0	9.0	394.0	92.0	
12	625.095	H	44.5	-8.2	36.3	47.0	10.7	398.0	121.0	

◆ Calculation – SAC #4(10 m)

Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

Margin(QP)[dB] = Limit[dB(μV/m)] - Result(QP) [dB(μV/m)]

Reading(QP) : Reading value, Result(QP) : Reading value + Factor value

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

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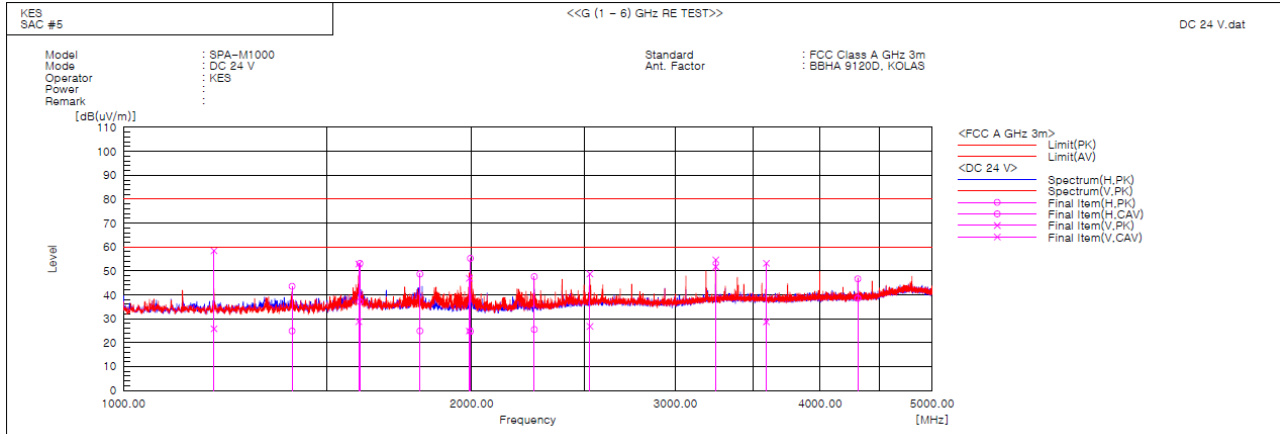
Report No.:

KES-EM-21T1243-R2

Page (22) of (36)

Radiated Electric Field Emissions(Above 1 GHz)

■ DC 24 V 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	1197.586	V	65.3	32.7	-6.9	58.4	25.8	80.0	60.0	21.6	34.2	109.0	253.8	
2	1398.943	H	49.4	30.7	-5.8	43.6	24.9	80.0	60.0	36.4	35.1	386.0	145.6	
3	1597.358	V	57.9	33.8	-5.0	52.9	28.8	80.0	60.0	27.1	31.2	133.0	272.4	
4	1600.839	H	58.0	42.0	-4.9	53.1	37.1	80.0	60.0	26.9	22.9	400.0	47.8	
5	1803.892	H	52.8	29.0	-4.1	48.7	24.9	80.0	60.0	31.3	35.1	389.0	229.7	
6	1990.167	V	50.5	28.5	-3.6	46.9	24.9	80.0	60.0	33.1	35.1	105.0	288.1	
7	1994.752	H	58.7	28.2	-3.5	55.2	24.7	80.0	60.0	24.8	35.3	353.0	215.4	
8	2265.168	H	50.1	28.0	-2.5	47.6	25.5	80.0	60.0	32.4	34.5	397.0	7.0	
9	2530.296	V	50.2	28.2	-1.4	48.8	26.8	80.0	60.0	31.2	33.2	109.0	259.7	
10	3250.225	V	54.0	51.1	0.6	54.6	51.7	80.0	60.0	25.4	8.3	114.0	173.5	
11	3594.754	V	52.3	27.8	0.9	53.2	28.7	80.0	60.0	26.8	31.3	103.0	271.1	
12	4312.211	H	43.4	35.2	3.3	46.7	38.5	80.0	60.0	33.3	21.5	347.0	130.2	

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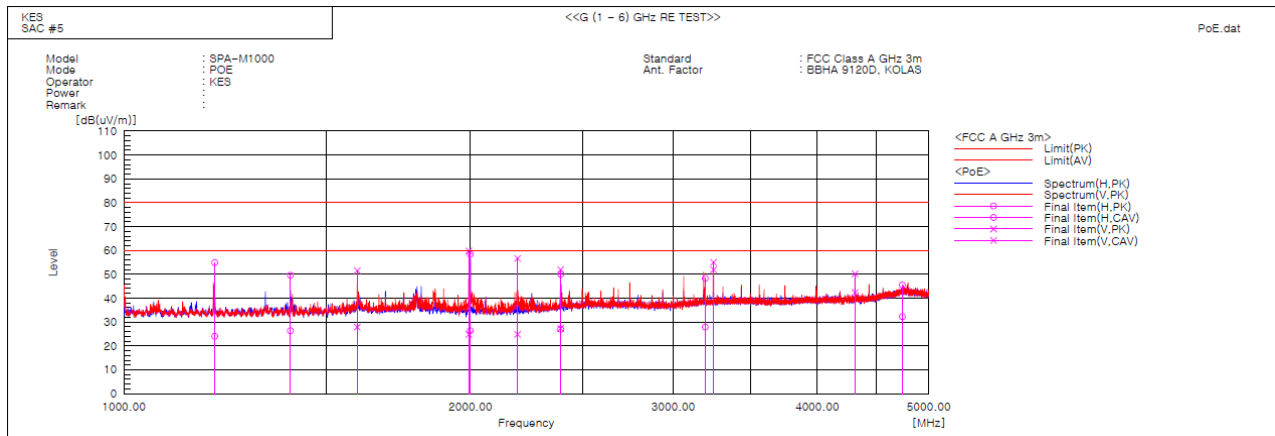
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KES-EM-21T1243-R2

Page (23) of (36)

PoE Mode



Final Result

No.	Frequency [MHz]	(P)	Reading PK [dB(μV)]	Reading CAV [dB(μV)]	c.f [dB(1/m)]	Result PK [dB(μV/m)]	Result CAV [dB(μV/m)]	Limit PK [dB(μV/m)]	Limit AV [dB(μV/m)]	Margin PK [dB]	Margin CAV [dB]	Height [cm]	Angle [deg]	Remark
1	1199.428	H	61.8	30.9	-6.9	54.9	24.0	80.0	60.0	25.1	36.0	327.0	157.9	
2	1395.237	H	55.5	32.3	-5.9	49.6	26.4	80.0	60.0	30.4	33.6	389.0	228.9	
3	1594.441	V	56.6	32.9	-5.0	51.6	27.9	80.0	60.0	28.4	32.1	126.0	274.7	
4	1992.997	V	63.4	28.4	-3.6	59.8	24.8	80.0	60.0	20.2	35.2	109.0	201.8	
5	1999.095	H	61.9	29.9	-3.5	58.4	26.4	80.0	60.0	21.6	33.6	329.0	278.3	
6	2196.987	V	59.5	27.7	-2.8	56.7	24.9	80.0	60.0	23.3	35.1	117.0	209.1	
7	2394.391	V	54.0	29.4	-2.0	52.0	27.4	80.0	60.0	28.0	32.6	100.0	202.9	
8	2395.371	H	52.0	29.0	-2.0	50.0	27.0	80.0	60.0	30.0	33.0	399.0	297.1	
9	3198.182	H	47.8	27.4	0.5	48.3	27.9	80.0	60.0	31.7	32.1	386.0	46.1	
10	3250.364	V	54.5	51.4	0.6	55.1	52.0	80.0	60.0	24.9	8.0	102.0	170.9	
11	4313.646	V	46.9	39.1	3.3	50.2	42.4	80.0	60.0	29.8	17.6	155.0	176.5	
12	4743.118	H	40.5	27.3	5.0	45.5	32.3	80.0	60.0	34.5	27.7	392.0	20.3	

◆ Calculation

Result(PK/CAV) [dB(μV/m)] = (Reading(PK/CAV)[dB(μV)] + c.f[dB(1/m)]

Margin(PK/CAV)[dB] = Limit[dB(μV/m)] - Result(PK/CAV) [dB(μV/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

■ DC 24 V Mode



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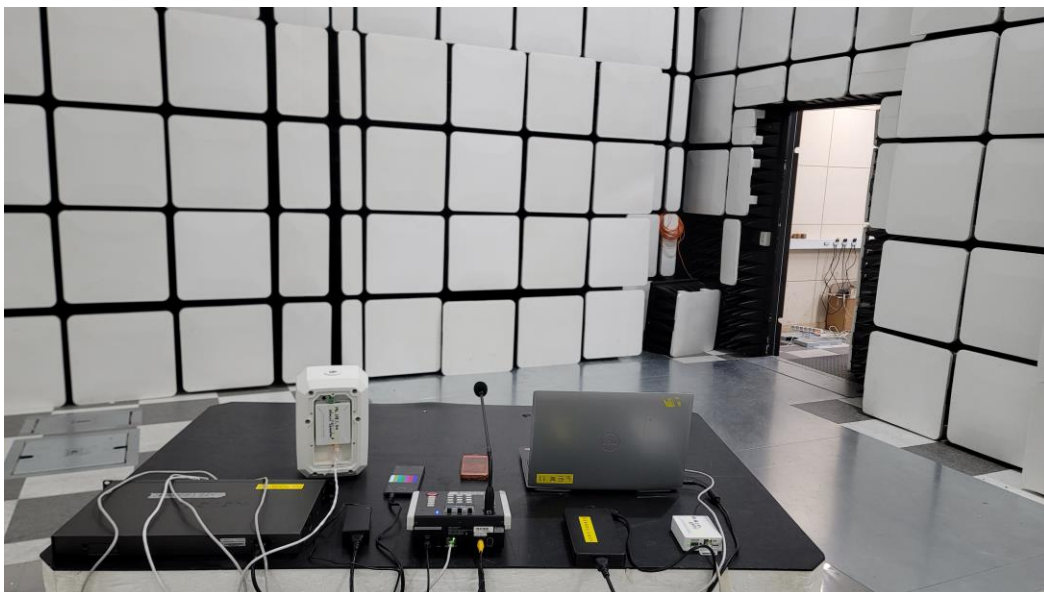
- PoE Mode



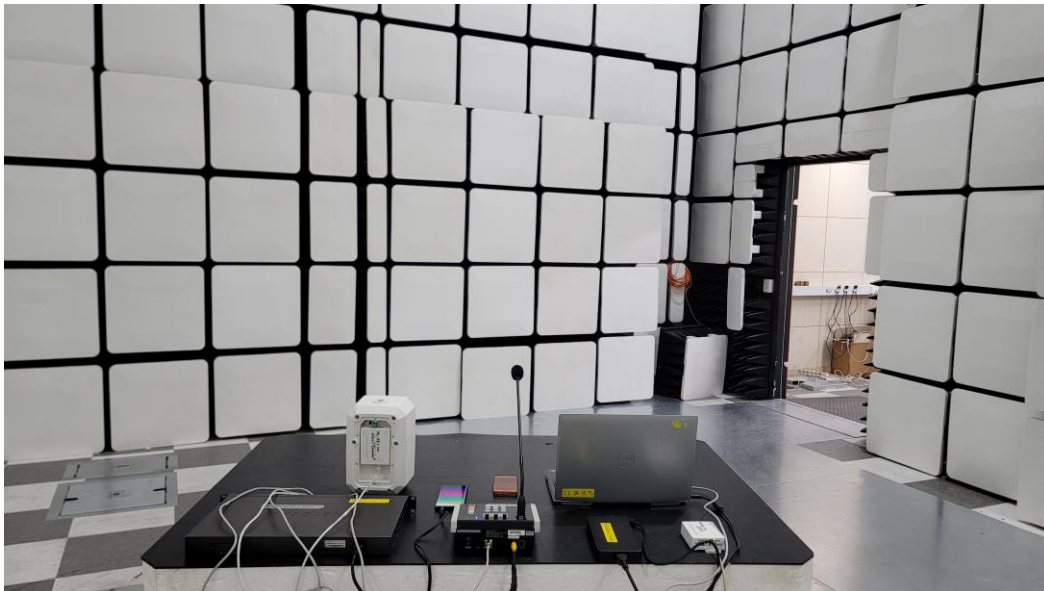
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Radiated Electric Field Emissions(Below 1 GHz)

■ DC 24 V Mode



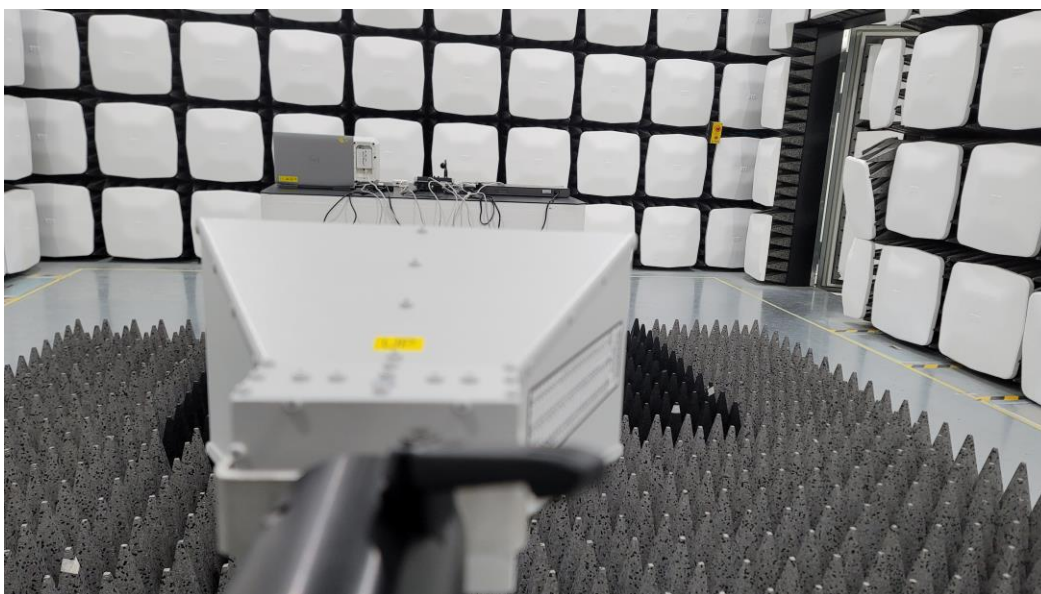
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■ PoE Mode

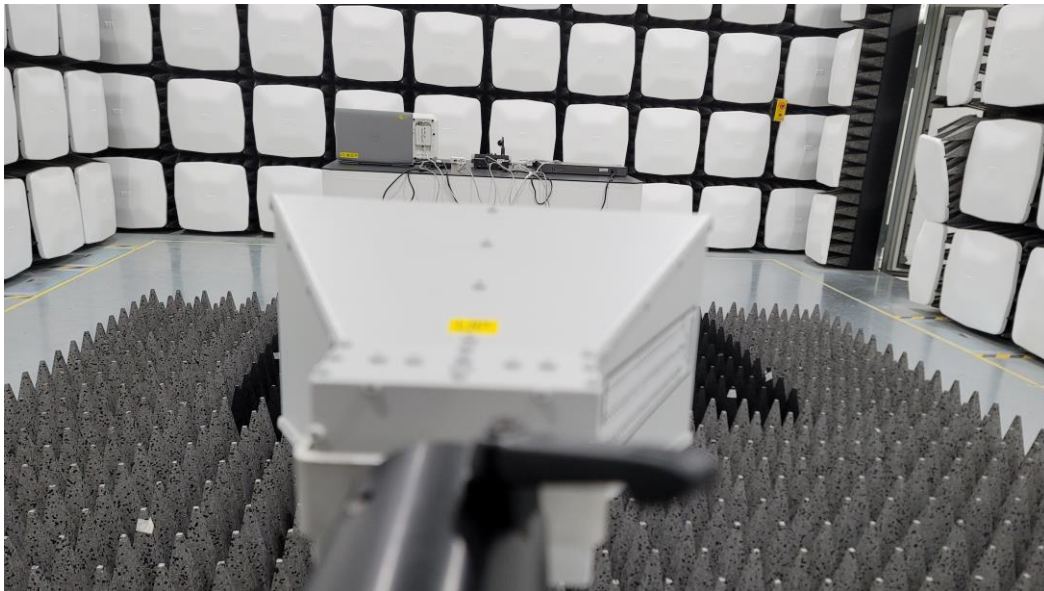
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Radiated Electric Field Emissions(Above 1 GHz)

■ DC 24 V Mode



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EUT External Photographs

(Top)

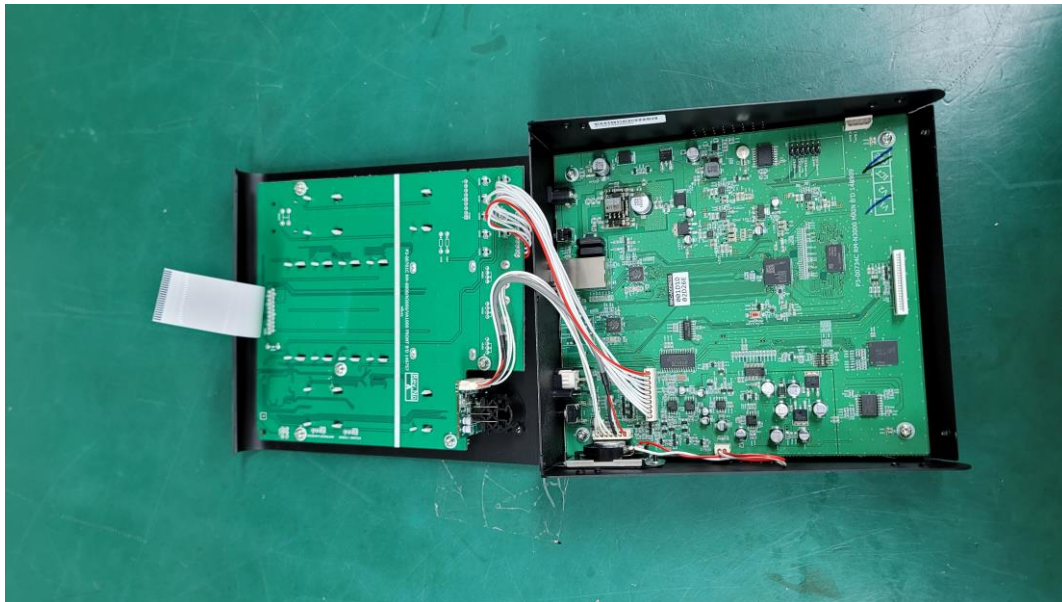


(Bottom)



EUT Internal Photographs

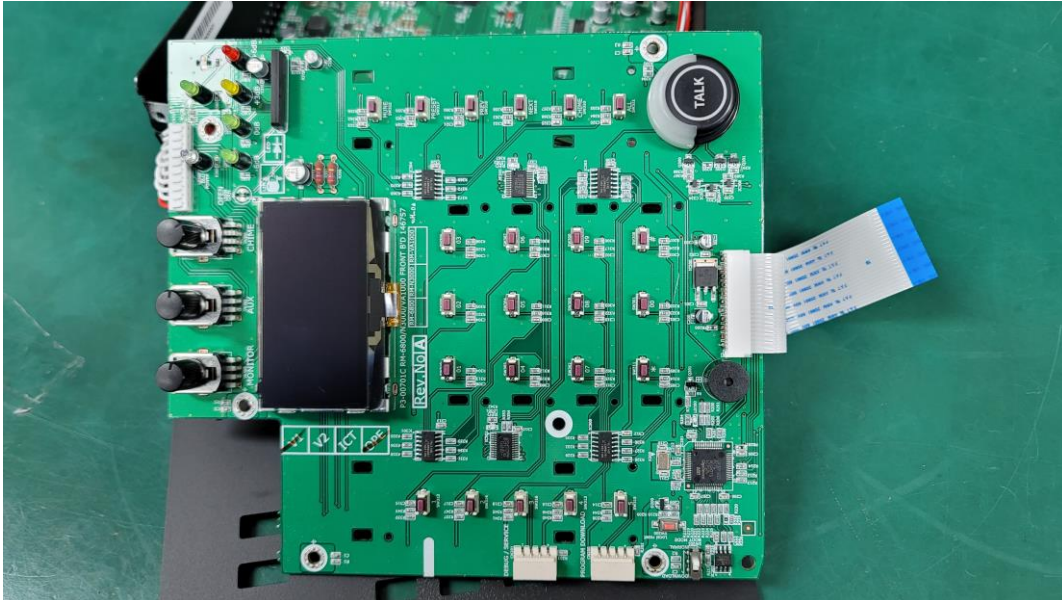
(Internal View)



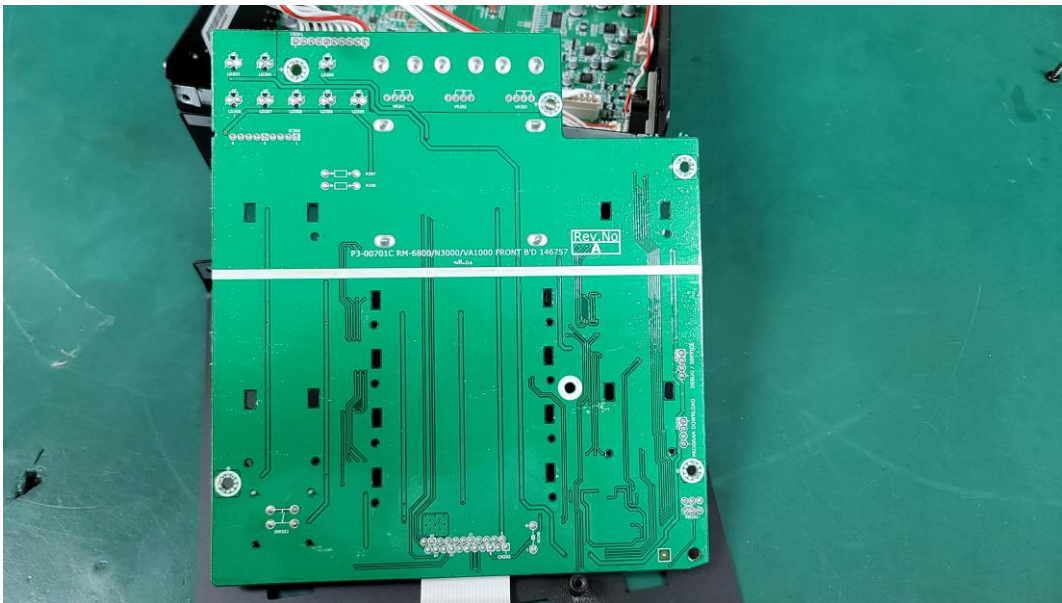
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EUT Internal View – Board 1

(Top)

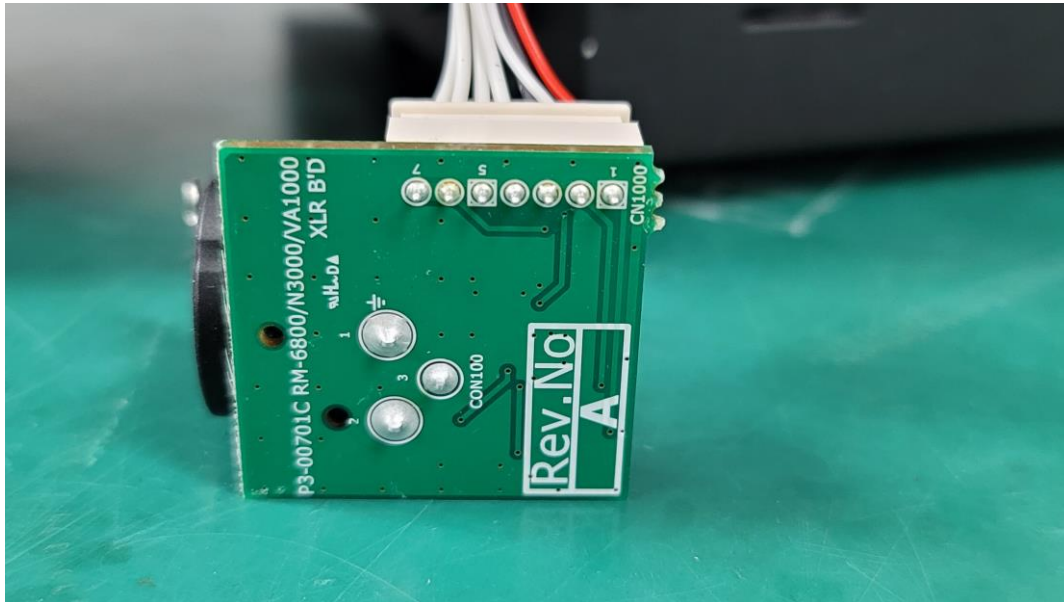


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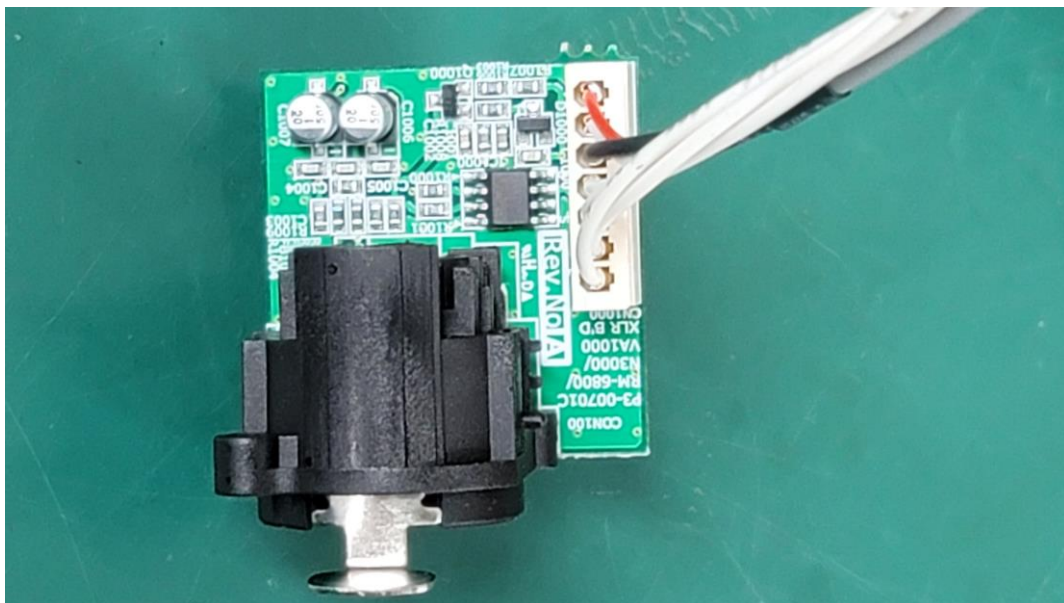


EUT Internal View – Board 2

(Top)

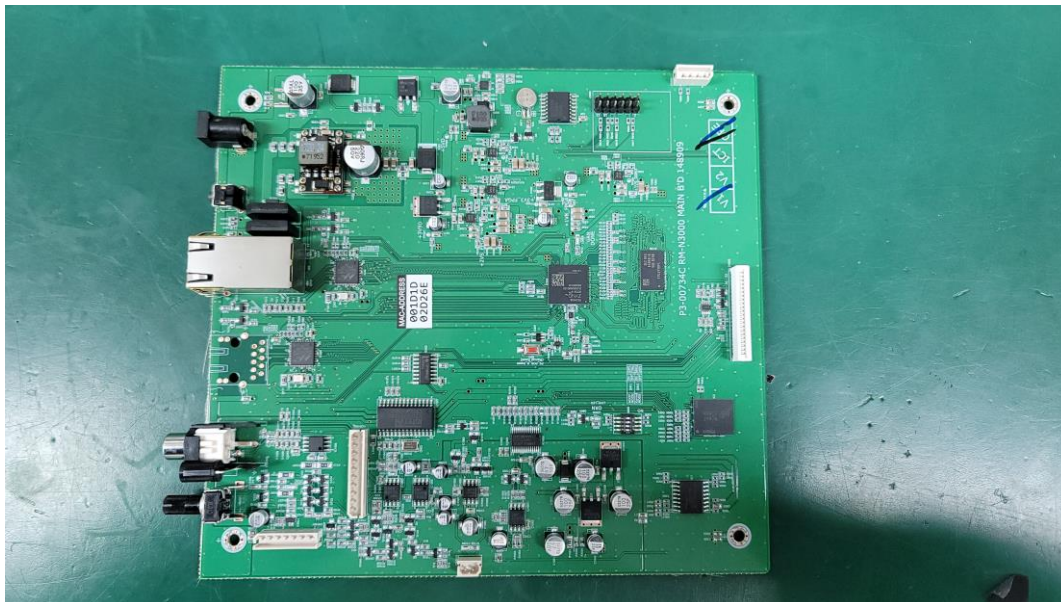


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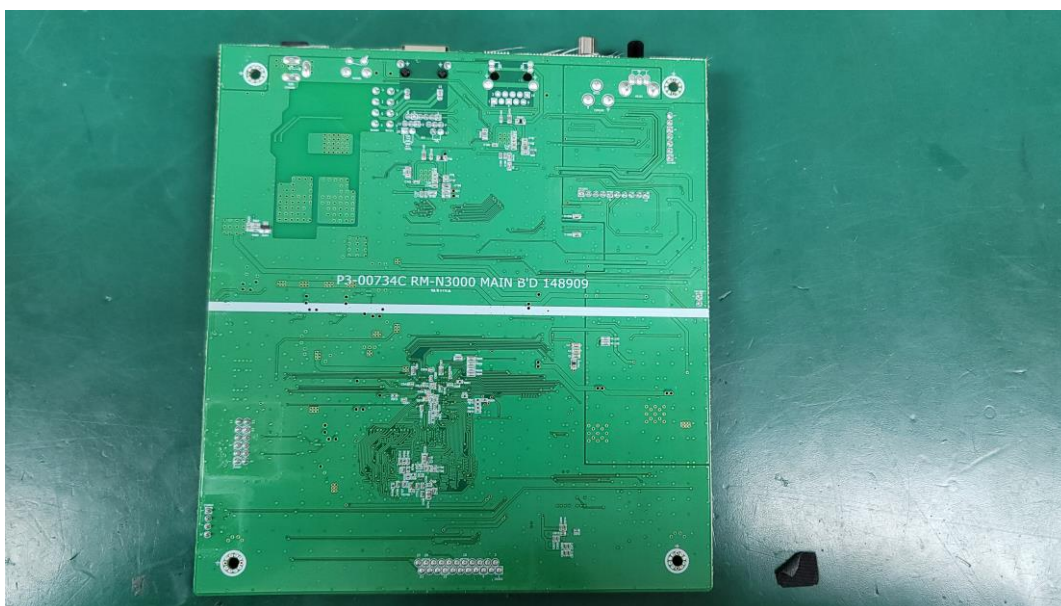


EUT Internal View – Board 3

(Top)



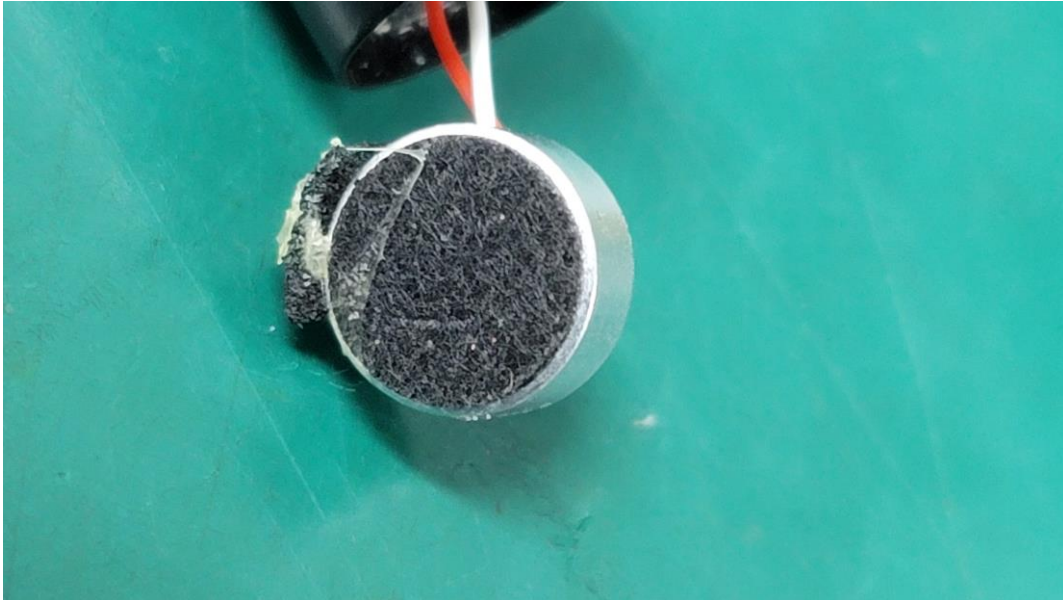
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EUT Internal View – Board 4

(Top)



(Bottom)



Label Photographs



CAN ICES-3(A) / NMB-3(A)

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.