

EMC TEST REPORT For RCM

Test Report No. : KES-E1-17T0645
Date of Issue : Sep. 21, 2017
Product name : PoE Switch
Model/Type No. : SPN-10080P
Variant Model : -
Applicant : Hanwha Techwin Co., Ltd.
Applicant Address : 1204, Changwon-daero, Seongsan-gu Changwon-si,
Gyeongsangnam-do, Korea
Manufacturer : Hanwha Techwin (Tianjin) Co.,Ltd.
Manufacturer Address : No.11 Weiliu Rd, Micro-Electronic Industrial
Park, TEDA, Tianjin, 300385, People's Republic of China
Equipment authorization : Declaration of Conformity
 Verification
 Certification
Date of Receipt : Sep. 06, 2017
Test date : Sep. 16, 2017
Test Results : In Compliance Not in Compliance

Tested by



Young Jun, Jo
EMC Test Engineer

Reviewed by



Dong-Hun, Jang
EMC Technical Manager

This test report is not related to KOLAS.

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Test report No.:
KES-E1-17T0645
Page (2) of (36)

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 21, 2017	KES-E1-17T0645	Issued

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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)	6
1.8	Configuration.....	7
1.9	Remarks when standards applied	8
1.10	Calibration Details of Equipment Used for Measurement	8
1.11	Test Facility	8
1.12	Laboratory Accreditations and Listings	8
2.0	Test Regulations.....	9
2.1	Conducted Emissions at Mains Power Ports	11
2.2	Conducted Emissions at Telecommunication Ports.....	12
2.3	Radiated Electric Field Emissions(Below 1 GHz)	13
2.4	Radiated Electric Field Emissions(Above 1 GHz)	14
APPENDIX A – TEST DATA.....		15
	Conducted Emissions at Mains Power Ports.....	15
	Conducted Emissions at Telecommunication Ports	17
	Radiated Electric Field Emissions(Below 1 GHz)	23
	Radiated Electric Field Emissions(Above 1 GHz)	24
	Test Setup Photos and Configuration	28
	Conducted Voltage Emissions	28
	Conducted Telecommunication Emissions	29
	Radiated Electric Field Emissions(Below 1 GHz)	30
	Radiated Electric Field Emissions(Above 1 GHz)	31
	EUT External Photographs.....	32
	EUT Internal Photographs	33



1.0 General Product Description

Main Specifications of EUT are:

PoE	
Maximum PoE Budget	64W
PoE Standard	IEEE 802.3af / 802.3at
PoE/PoE+ Ports	Port 1 ~ 8 : PoE/PoE+
Compatible Devices	
Network CCTV Devices	WiseNet Network Cameras, TRM NVR Series
Interface	
1000Base-T Interface	2 (M12, A-Code, 8P Female)
100Base-T PoE Interface	8 (M12, D-Code, 4P Female)
MDI/MDIX adjustable	Yes
Power Input	Molex 6P -> 6P Gender Included
Indicator	
LED	Power Status : 1 -> 0 Ethernet : Link 10-> 2, ACT 10 ->2 PoE Status : 8 -> PoE Link: 8
General	
Dimension (W x D x H)	270 x 134 x 93mm
Weight	TBD
Operation Temperature	-20 ~ 55°C
Operation/Storage Humidity	0% - 95% RH
Maximum Power Consumption	TBD
Power Input	9 ~ 36 VDC (Fanless)
Color/Material	Black / AI
Imgression	X

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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.

Voltage 240 Vac 100 Vac 24 Vac 12 Vdc PoE

Frequency 50 Hz 60 Hz 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
PoE Switch	SPN-10080P	-	Hanwha Techwin (Tianjin) Co.,Ltd.	E.U.T

1.5 Support Equipments

Description	Model Number	Serial Number	Manufacturer	Remarks
Notebook	NT63025J	JK9091EF400432X	SAMSUNG Electronics Co., Ltd.	-
Notebook AC/DC adapter	A13-040N2A	-	Chicony Power Technbology Co., Ltd.	-
PoE Camera 1	-	-	SAMSUNG	-
PoE Camera 2	RS-CH292H3C-36P-ST	-	SAMSUNG	7 EA

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1.6 External I/O Cabling

Start		END		Cable Spec.	
Description	I/O Port	Description	I/O Port	Length	Shield
PoE Switch (E.U.T)	RJ-45	Notebook	RJ-45	3.5	S
	RJ-45	PoE Camera 1	RJ-45	3.5	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S
	RJ-45	PoE Camera 2	RJ-45	5.0	S

* Unshielded=U, Shielded=S

1.7 EUT Operating Mode(s)

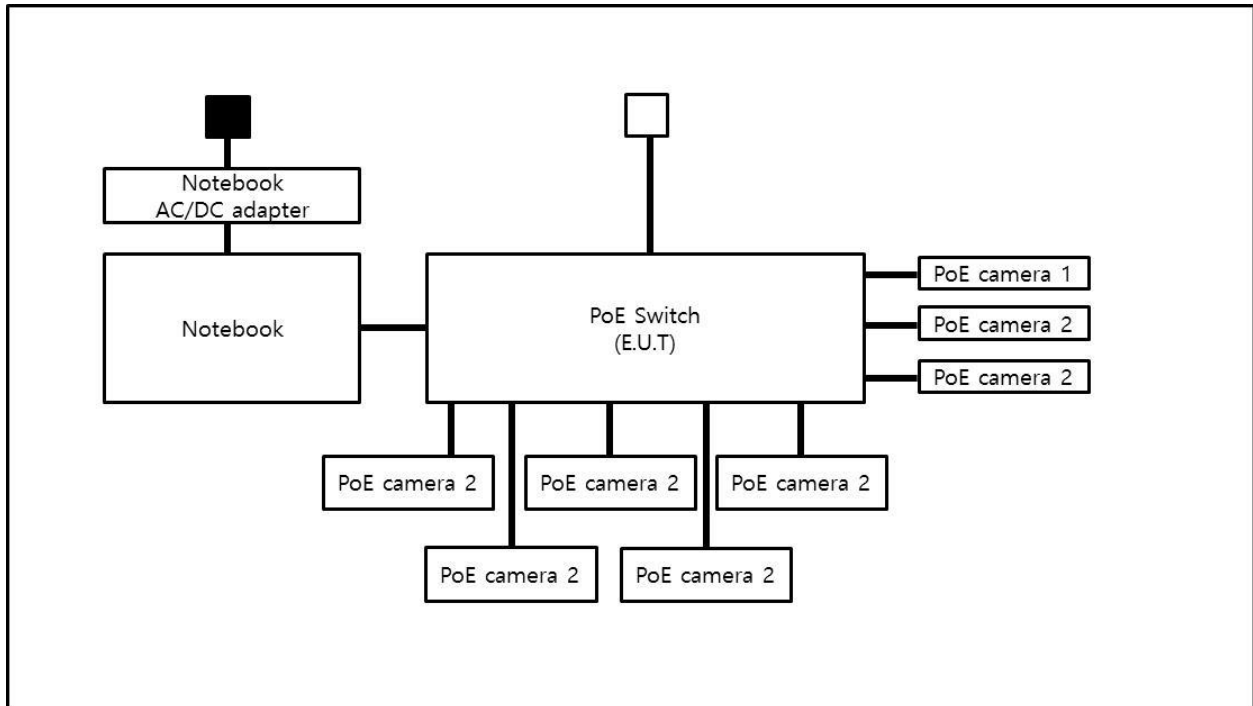
Test mode	operating
Normal Operating	Check the video output of the camera & Ping test

E.U.T Test operating S/W		
Name	Version	Manufacture Company
-	-	-

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1.8 Configuration

■ AC Main
□ DC Main



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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. The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR Publication 32.

1.12 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.	
JAPAN	VCCI	Mains Ports Conducted Interference Measurement, Telecommunication Ports Conducted Disturbance Measurement and Radiation 10 meter site, Facility for measuring radiated disturbance above 1 GHz	 R-4308, C-4798, T-2311, G-914
KOREA	MSIP	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 KR0100
Canada	IC	3 & 10 meter Open Area Test Sites and one conducted site	 4769B-1
Europe	CE	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	
International	KOLAS	EMI (10 meter Open Area Test Site and two conducted sites) Radio(3 & 10 meter Open Area Test Sites and one conducted site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	

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2.0 Test Regulations

The emissions tests were performed according to following regulations:

- EMC – Directive 2014/30/EU

- EN 61000-6-3: 2011
- EN 61000-6-1: 2007
- EN 61000-6-4: 2007 +A1: 2011
- EN 61000-6-2: 2005
- EN 55011: 2007 +A1: 2010 Group 1 Group 2
 Class A Class B
- EN 55014-1: 2006 +A2: 2011
- EN 55014-2: 1997 +A2: 2008
- EN 55015: 2013
- EN 55032: 2015 Class A Class B
- EN 55024: 2010
- EN 50130-4: 2011 +A1: 2014
- EN 61000-3-2: 2014
- EN 61000-3-3: 2013
- EN 61326-1: 2013



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Test report No.:
KES-E1-17T0645
Page (10) of (36)

-
- | | | |
|--|---|----------------------------------|
| <input type="checkbox"/> VCCI V-3 / 2015.04 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input checked="" type="checkbox"/> AS/NZS CISPR 32:2013 | <input checked="" type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> 47 CFR Part 15, Subpart B | | |
| <input type="checkbox"/> CISPR 22:2009 +A1:2010 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2009 | | |
| <input type="checkbox"/> IC Regulation ICES-003 : 2016 | | |
| <input type="checkbox"/> CAN/CSA CISPR 22-10 | <input type="checkbox"/> Class A | <input type="checkbox"/> Class B |
| <input type="checkbox"/> ANSI C63.4-2014 | | |
|
 | | |
| <input type="checkbox"/> RE- Directive 2014/53/EU | | |
|
 | | |
| <input type="checkbox"/> EN 301 489-1 V1.9.2 | | |
| <input type="checkbox"/> Equipment for fixed use | | |
| <input type="checkbox"/> Equipment for vehicular use | | |
| <input type="checkbox"/> Equipment for portable use | | |
|
 | | |
| <input type="checkbox"/> EN 301 489-3 V1.6.1 | | |
| <input type="checkbox"/> EN 301 489-17 V2.2.1 | | |
| <input type="checkbox"/> EN 60945:2002 | | |

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2.1 Conducted Emissions at Mains Power Ports

Test Date
N/A

Test Location
Electro wave Shieldroom

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input type="checkbox"/>	EMI Test S/W	EMC32	R & S	9.12.00	-
<input type="checkbox"/>	EMI TEST RECEIVER	ESR3	R & S	101783	04, 27, 2018
<input type="checkbox"/>	LISN	ENV216	R & S	101137	02, 03, 2018
<input type="checkbox"/>	LISN	ENV216	R & S	101786	04, 27, 2018
<input type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017

Test Conditions

Temperature: °C
Relative Humidity: %

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

N/A

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2.2 Conducted Emissions at Telecommunication Ports

Test Date
Sep. 16, 2017

Test Location
Electro wave Shieldroom

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	04, 27, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101137	02, 03, 2018
<input checked="" type="checkbox"/>	LISN	ENV216	R & S	101786	04, 27, 2018
<input checked="" type="checkbox"/>	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017
<input checked="" type="checkbox"/>	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	05, 12, 2018

Test Conditions

Temperature: 23,0 °C
Relative Humidity: 52,1 %

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.



2.3 Radiated Electric Field Emissions(Below 1 GHz)

Test Date
Sep. 16, 2017

Test Location
 OPEN AREA TEST SITE #2 SAC #4(10 m)

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, 18, 2018
<input checked="" type="checkbox"/>	AMPLIFIER	SCU 01	R & S	100603	12, 13, 2017
<input checked="" type="checkbox"/>	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions

Temperature: 23,6 °C
Relative Humidity: 52,3 %

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.

2.4 Radiated Electric Field Emissions(Above 1 GHz)

Test Date
Sep. 16, 2017

Test Location
SEMI ANECHOIC CHAMBER #2

Test Equipment

Used	Description	Model Number	Manufacturer	Serial Number	Cal. Due
<input checked="" type="checkbox"/>	EMI Test S/W	e3	AUDIX	8.083b	-
<input checked="" type="checkbox"/>	EMI TEST RECEIVER	ESU26	R & S	100552	2018.04.19
<input checked="" type="checkbox"/>	PREAMPLIFIER	8449B	AGILENT	3008A01729	2018.05.31
<input type="checkbox"/>	ATTENUATOR	8491A	HP	35496	2018.03.24
<input checked="" type="checkbox"/>	LOG-PERIODIC ANTENNA	STLP 9149	SCHWARZBECK	9149-255	2018.05.17

Test Conditions

Temperature: 23,0 °C
Relative Humidity: 52,1 %

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.



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Test report No.:
KES-E1-17T0645
Page (15) of (36)

APPENDIX A – TEST DATA

Conducted Emissions at Mains Power Ports

[HOT]

N/A

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Test report No.:
KES-E1-17T0645
Page (16) of (36)

[NEUTRAL]

N/A

◆ 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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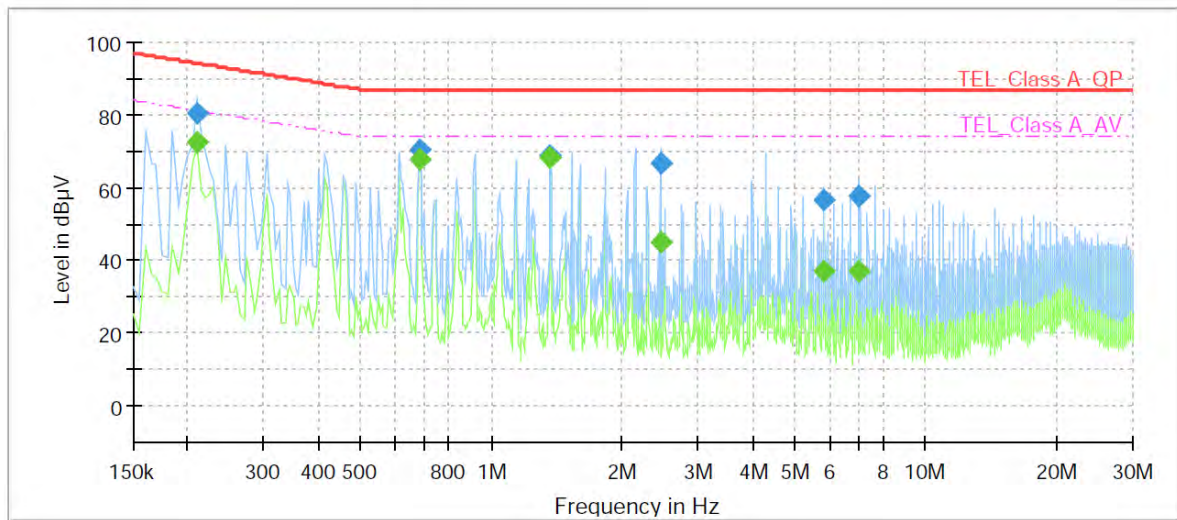
Conducted Emissions at Telecommunication Ports

- LAN Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPN-10080P
Mode	LAN 10 Mbps
Operator Name:	KES



Final Result

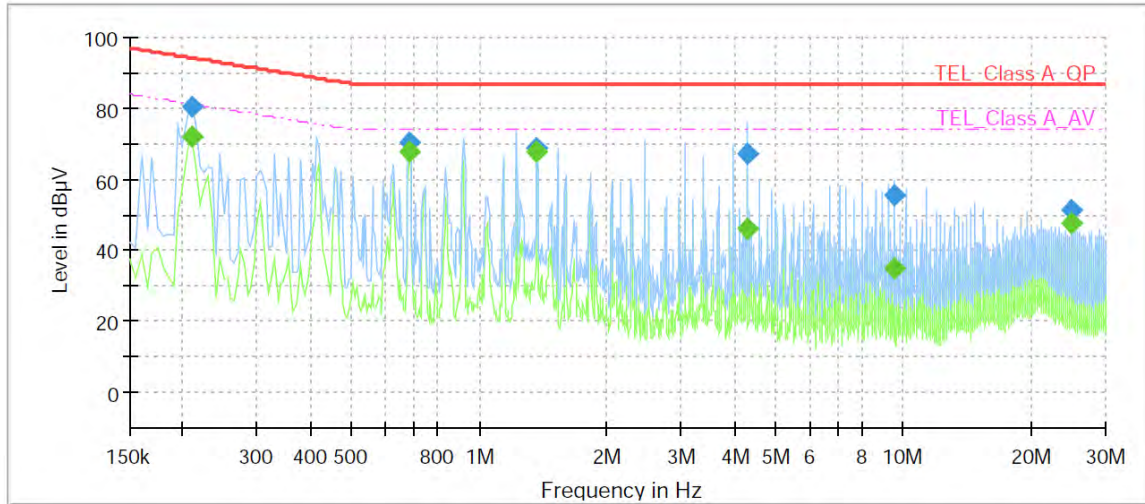
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	72.31	81.21	8.90	1000.0	9.000	Single Line	19.4
0.210000	80.54	---	94.21	13.67	1000.0	9.000	Single Line	19.4
0.685000	---	67.60	74.00	6.40	1000.0	9.000	Single Line	19.6
0.685000	70.31	---	87.00	16.69	1000.0	9.000	Single Line	19.6
1.370000	---	68.12	74.00	5.88	1000.0	9.000	Single Line	19.7
1.370000	68.89	---	87.00	18.11	1000.0	9.000	Single Line	19.7
2.450000	---	45.26	74.00	28.74	1000.0	9.000	Single Line	19.8
2.450000	66.92	---	87.00	20.08	1000.0	9.000	Single Line	19.8
5.820000	---	36.99	74.00	37.01	1000.0	9.000	Single Line	19.7
5.820000	56.81	---	87.00	30.19	1000.0	9.000	Single Line	19.7
7.050000	---	36.93	74.00	37.07	1000.0	9.000	Single Line	19.6
7.050000	57.55	---	87.00	29.45	1000.0	9.000	Single Line	19.6

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[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPN-10080P
Mode	LAN 100 Mbps
Operator Name:	KES



Final Result

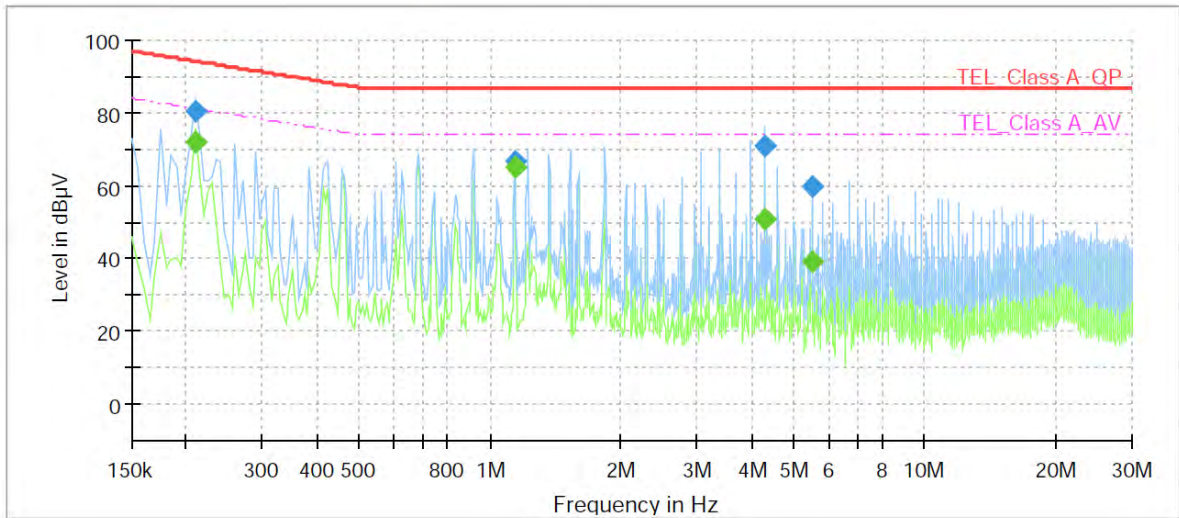
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	71.95	81.21	9.26	1000.0	9.000	Single Line	19.4
0.210000	80.65	---	94.21	13.56	1000.0	9.000	Single Line	19.4
0.685000	---	67.54	74.00	6.46	1000.0	9.000	Single Line	19.6
0.685000	70.24	---	87.00	16.76	1000.0	9.000	Single Line	19.6
1.370000	---	67.94	74.00	6.06	1000.0	9.000	Single Line	19.7
1.370000	68.81	---	87.00	18.19	1000.0	9.000	Single Line	19.7
4.295000	---	46.00	74.00	28.00	1000.0	9.000	Single Line	19.7
4.295000	67.43	---	87.00	19.57	1000.0	9.000	Single Line	19.7
9.500000	---	35.09	74.00	38.91	1000.0	9.000	Single Line	19.6
9.500000	55.43	---	87.00	31.57	1000.0	9.000	Single Line	19.6
25.000000	---	47.90	74.00	26.10	1000.0	9.000	Single Line	19.9
25.000000	51.13	---	87.00	35.87	1000.0	9.000	Single Line	19.9

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[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPN-10080P
Mode	LAN 1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	71.89	81.21	9.32	1000.0	9.000	Single Line	19.4
0.210000	80.56	---	94.21	13.65	1000.0	9.000	Single Line	19.4
1.140000	---	65.10	74.00	8.90	1000.0	9.000	Single Line	19.7
1.140000	66.83	---	87.00	20.17	1000.0	9.000	Single Line	19.7
4.290000	---	50.88	74.00	23.12	1000.0	9.000	Single Line	19.7
4.290000	70.76	---	87.00	16.24	1000.0	9.000	Single Line	19.7
5.515000	---	39.18	74.00	34.82	1000.0	9.000	Single Line	19.7
5.515000	60.01	---	87.00	26.99	1000.0	9.000	Single Line	19.7

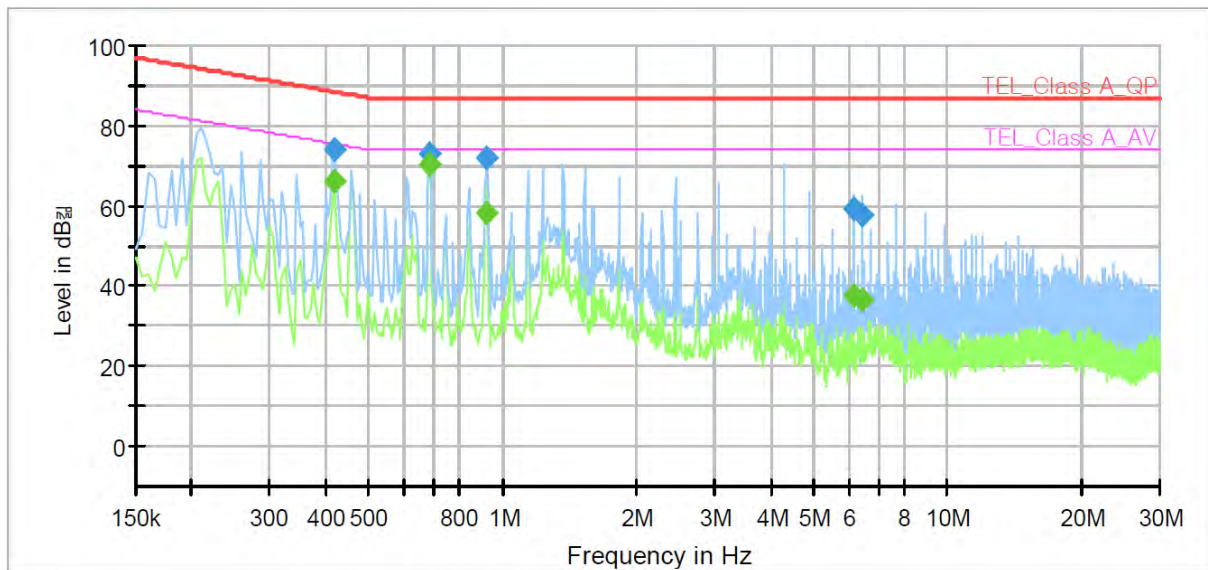
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- PoE Mode

[10 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPN-10080P
Mode	POE 10 Mbps
Operator Name:	KES



Final Result

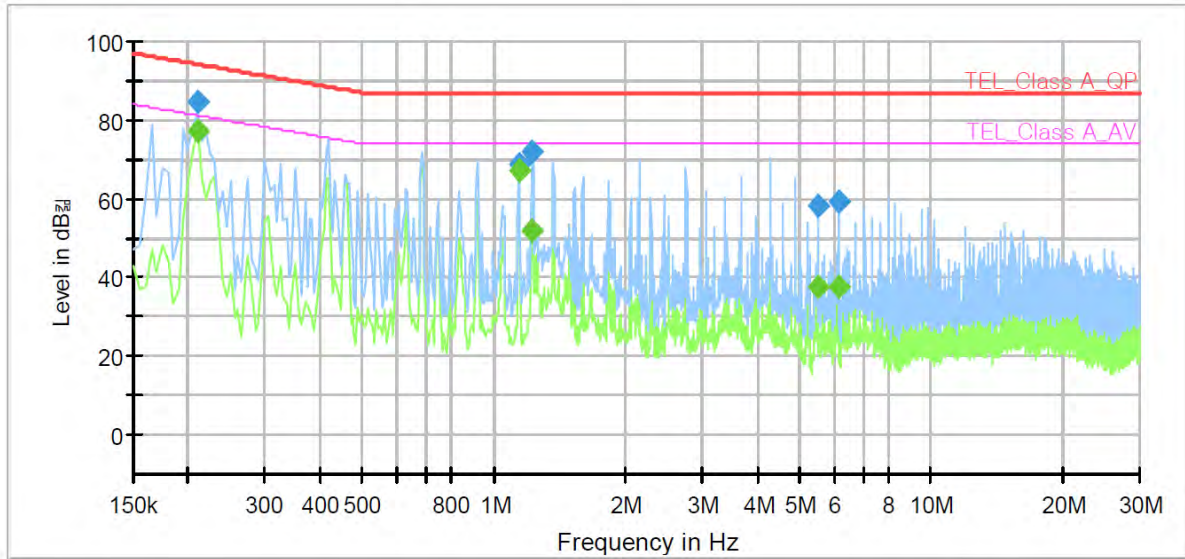
Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.420000	---	66.32	75.45	9.13	1000.0	9.000	Single Line	19.5
0.420000	74.19	---	88.45	14.26	1000.0	9.000	Single Line	19.5
0.685000	---	70.52	74.00	3.48	1000.0	9.000	Single Line	19.6
0.685000	73.15	---	87.00	13.85	1000.0	9.000	Single Line	19.6
0.920000	---	58.12	74.00	15.88	1000.0	9.000	Single Line	19.7
0.920000	71.82	---	87.00	15.18	1000.0	9.000	Single Line	19.7
6.130000	---	37.76	74.00	36.24	1000.0	9.000	Single Line	19.7
6.130000	59.34	---	87.00	27.66	1000.0	9.000	Single Line	19.7
6.435000	---	36.65	74.00	37.35	1000.0	9.000	Single Line	19.7
6.435000	57.90	---	87.00	29.10	1000.0	9.000	Single Line	19.7

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[100 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPN-10080P
Mode	POE 100 Mbps
Operator Name:	KES



Final Result

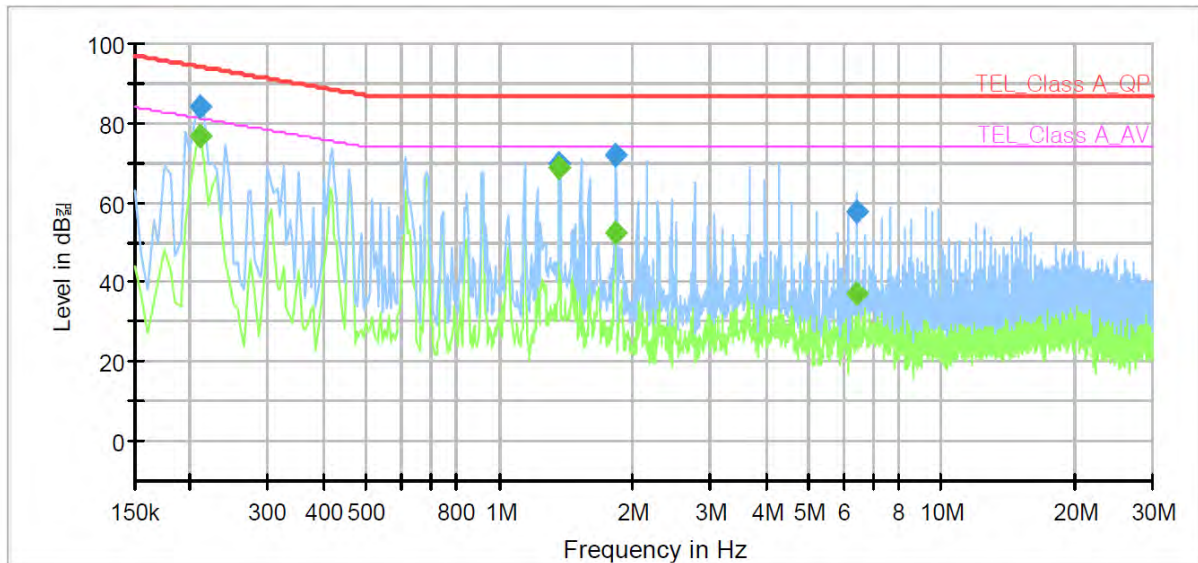
Frequency (MHz)	QuasiPeak (dB μ V)	CAverage (dB μ V)	Limit (dB μ V)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	77.01	81.21	4.20	1000.0	9.000	Single Line	19.4
0.210000	84.42	---	94.21	9.79	1000.0	9.000	Single Line	19.4
1.140000	---	67.07	74.00	6.93	1000.0	9.000	Single Line	19.7
1.140000	68.69	---	87.00	18.31	1000.0	9.000	Single Line	19.7
1.225000	---	52.03	74.00	21.97	1000.0	9.000	Single Line	19.7
1.225000	71.93	---	87.00	15.07	1000.0	9.000	Single Line	19.7
5.515000	---	37.70	74.00	36.30	1000.0	9.000	Single Line	19.7
5.515000	58.10	---	87.00	28.90	1000.0	9.000	Single Line	19.7
6.130000	---	37.44	74.00	36.56	1000.0	9.000	Single Line	19.7
6.130000	59.25	---	87.00	27.75	1000.0	9.000	Single Line	19.7

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[1 000 Mbps]

Common Information

Test Description:	Telecommunication Emission
Model No.:	SPN-10080P
Mode	POE 1 000 Mbps
Operator Name:	KES



Final Result

Frequency (MHz)	QuasiPeak (dBμV)	CAverage (dBμV)	Limit (dBμV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.210000	---	76.80	81.21	4.41	1000.0	9.000	Single Line	19.4
0.210000	84.27	---	94.21	9.94	1000.0	9.000	Single Line	19.4
1.370000	---	69.01	74.00	4.99	1000.0	9.000	Single Line	19.7
1.370000	70.09	---	87.00	16.91	1000.0	9.000	Single Line	19.7
1.840000	---	52.18	74.00	21.82	1000.0	9.000	Single Line	19.8
1.840000	71.87	---	87.00	15.13	1000.0	9.000	Single Line	19.8
6.435000	---	37.32	74.00	36.68	1000.0	9.000	Single Line	19.7
6.435000	57.76	---	87.00	29.24	1000.0	9.000	Single Line	19.7

◆ Calculation

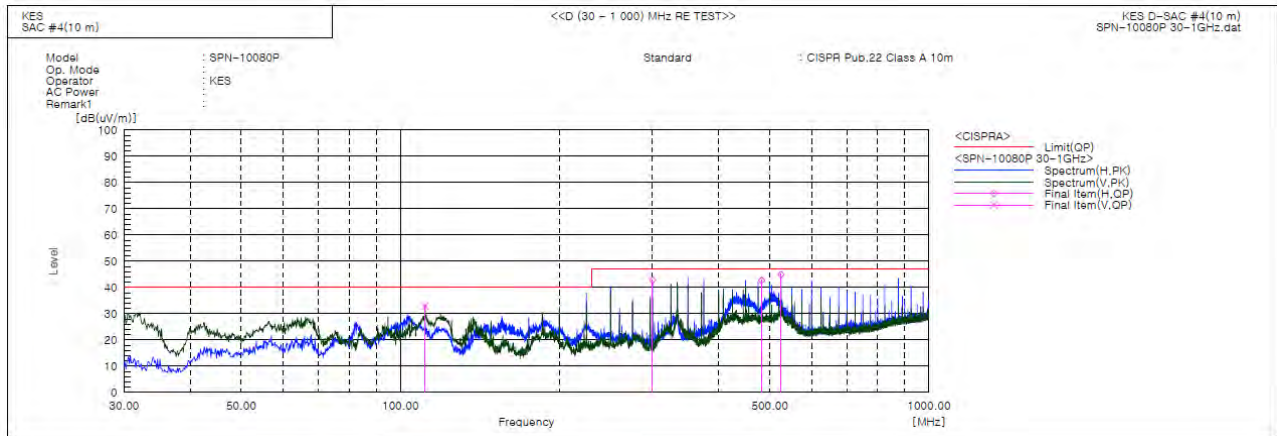
QuasiPeak [dBuV] / CAverage [dBuV] = Reading Value [dBuV] + Corr. [dB]

QuasiPeak / CAverage : The Final Value

Reading Value : Not shown in the table.

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

Radiated Electric Field Emissions(Below 1 GHz)



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	111.364	V	62.3	-29.4	32.9	40.0	7.1	106.0	100.0	
2	299.987	H	66.6	-23.8	42.8	47.0	4.2	291.0	199.0	
3	482.621	H	60.8	-18.1	42.7	47.0	4.3	191.0	89.0	
4	525.007	H	61.6	-16.6	45.0	47.0	2.0	182.0	239.0	

◆ Calculation – SAC #4(10 m)

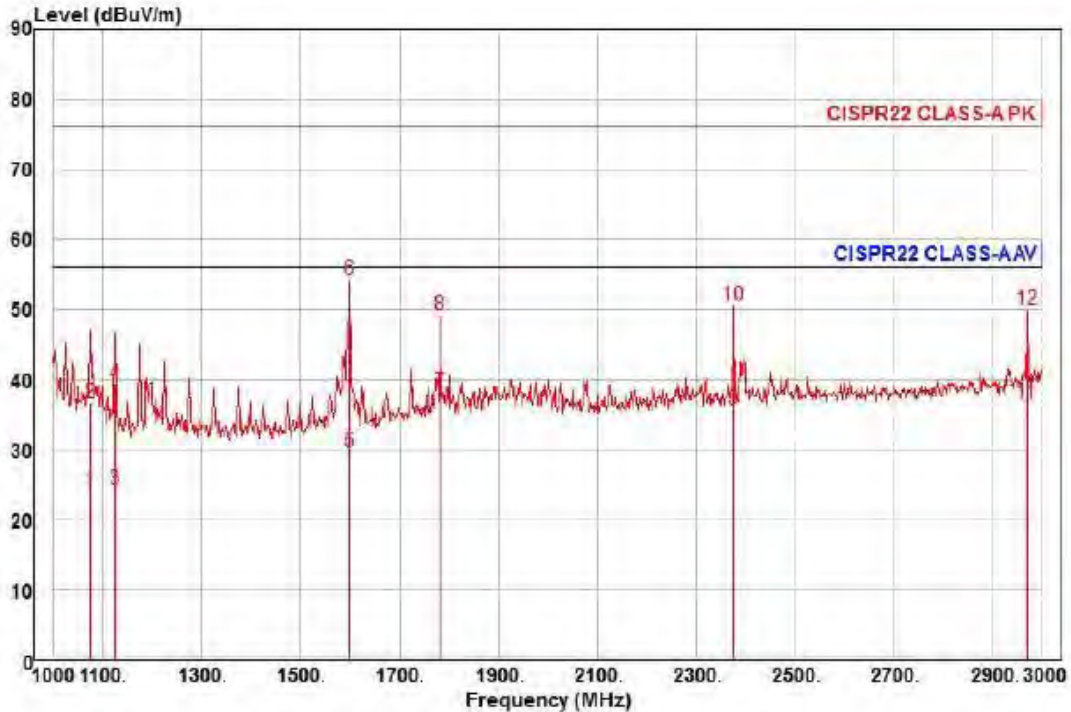
Result(QP) [dB(μV/m)] = (Reading(QP)[dB(μV)] + c.f[dB(1/m)])

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

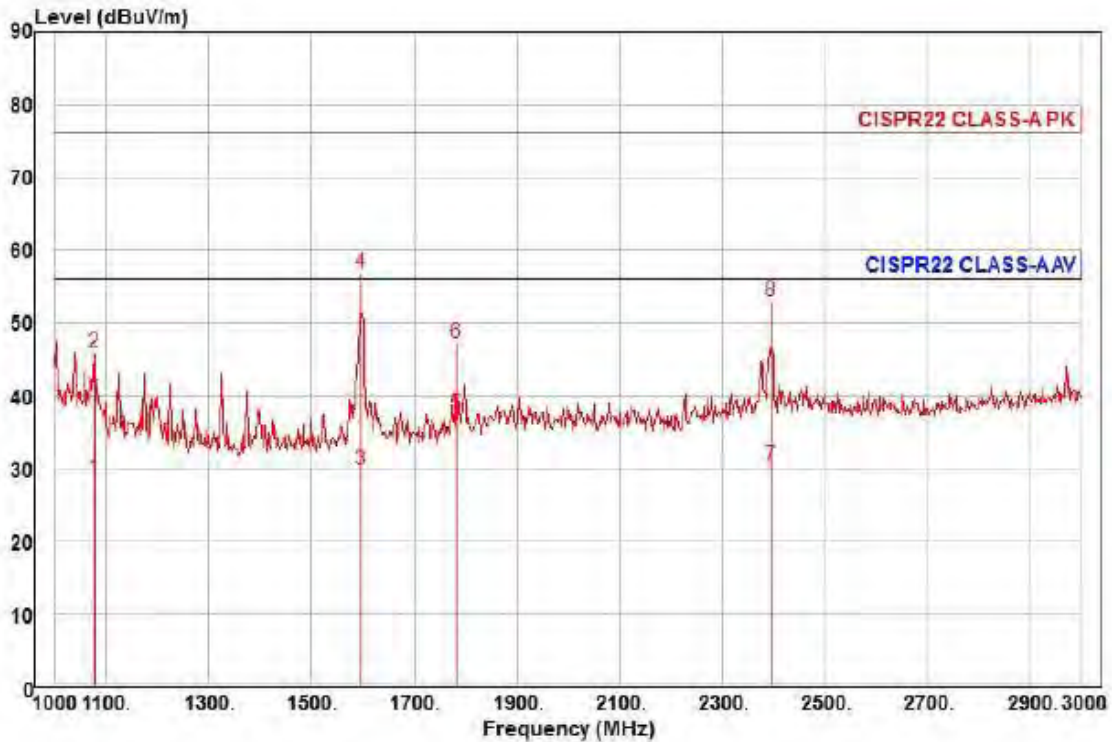
Radiated Electric Field Emissions(Above 1 GHz)



Site : YEOJU_C 3 m SAC
 Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
 : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
 Project :
 Model : SPN-10080P
 Mode :
 Memo : 1 - 3 GHz

	Read Freq	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	1074.00	30.53	22.72	6.88	35.99	196	56.00	-31.86	horizontal	Average
2	1074.00	43.81	22.72	6.88	35.99	196	76.00	-39.38	horizontal	Peak
3	1124.00	30.26	22.88	7.04	35.95	151	56.00	-31.77	horizontal	Average
4	1124.00	45.40	22.88	7.04	35.95	151	76.00	-36.63	horizontal	Peak
5	1598.00	32.31	24.41	8.50	35.53	286	56.00	-26.31	horizontal	Average
6 pk	1598.00	56.93	24.41	8.50	35.53	286	76.00	-21.69	horizontal	Peak
7 pp	1782.00	39.47	25.14	9.04	35.36	254	56.00	-17.71	horizontal	Average
8	1782.00	50.38	25.14	9.04	35.36	254	76.00	-26.80	horizontal	Peak
9	2376.00	33.28	27.15	10.54	35.32	136	56.00	-20.35	horizontal	Average
10	2376.00	48.18	27.15	10.54	35.32	136	76.00	-25.45	horizontal	Peak
11	2970.00	30.46	29.61	12.06	35.55	67	56.00	-19.42	horizontal	Average
12	2970.00	43.85	29.61	12.06	35.55	67	76.00	-26.03	horizontal	Peak

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Site : YEOJU_C 3 m SAC
 Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
 : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
 Project :
 Model : SPN-10080P
 Mode :
 Memo : 1 - 3 GHz

	Read Freq	Ant 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	1076.00	35.04	22.73	6.88	35.99	68	56.00	-27.34	vertical	Average
2	1076.00	52.36	22.73	6.88	35.99	68	76.00	-30.02	vertical	Peak
3	1596.00	32.51	24.40	8.49	35.53	4	56.00	-26.13	vertical	Average
4 pk	1596.00	59.43	24.40	8.49	35.53	4	76.00	-19.21	vertical	Peak
5 pp	1782.00	38.61	25.14	9.04	35.36	80	56.00	-18.57	vertical	Average
6	1782.00	48.51	25.14	9.04	35.36	80	76.00	-28.67	vertical	Peak
7	2396.00	27.84	27.21	10.58	35.32	96	56.00	-25.69	vertical	Average
8	2396.00	50.54	27.21	10.58	35.32	96	76.00	-22.99	vertical	Peak

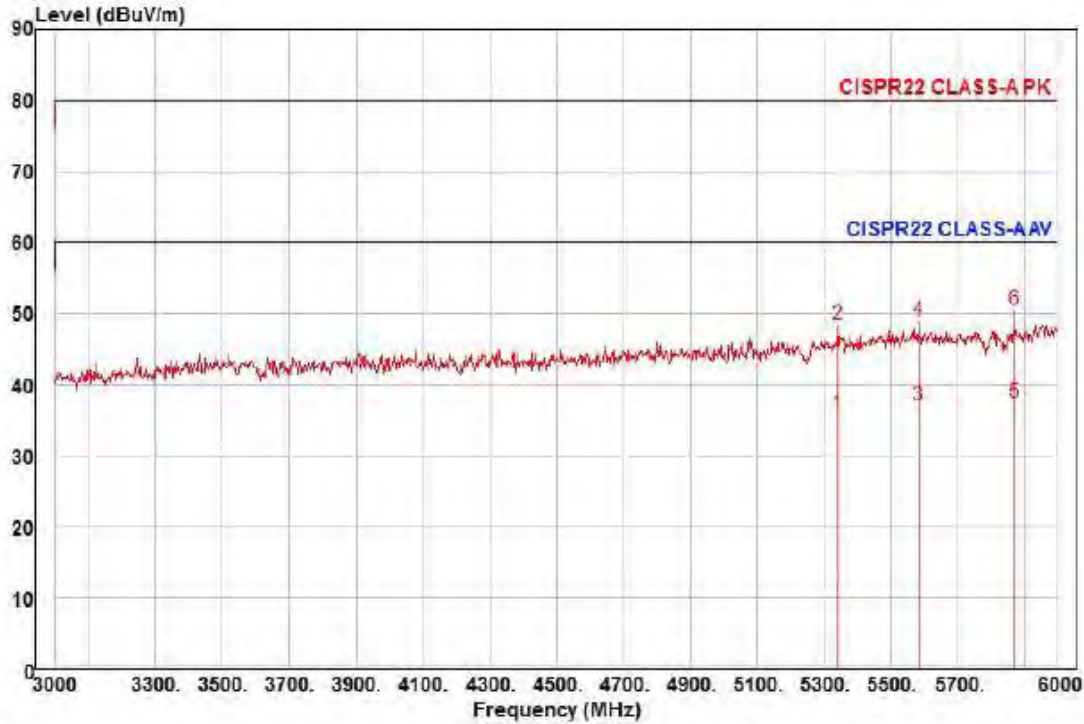
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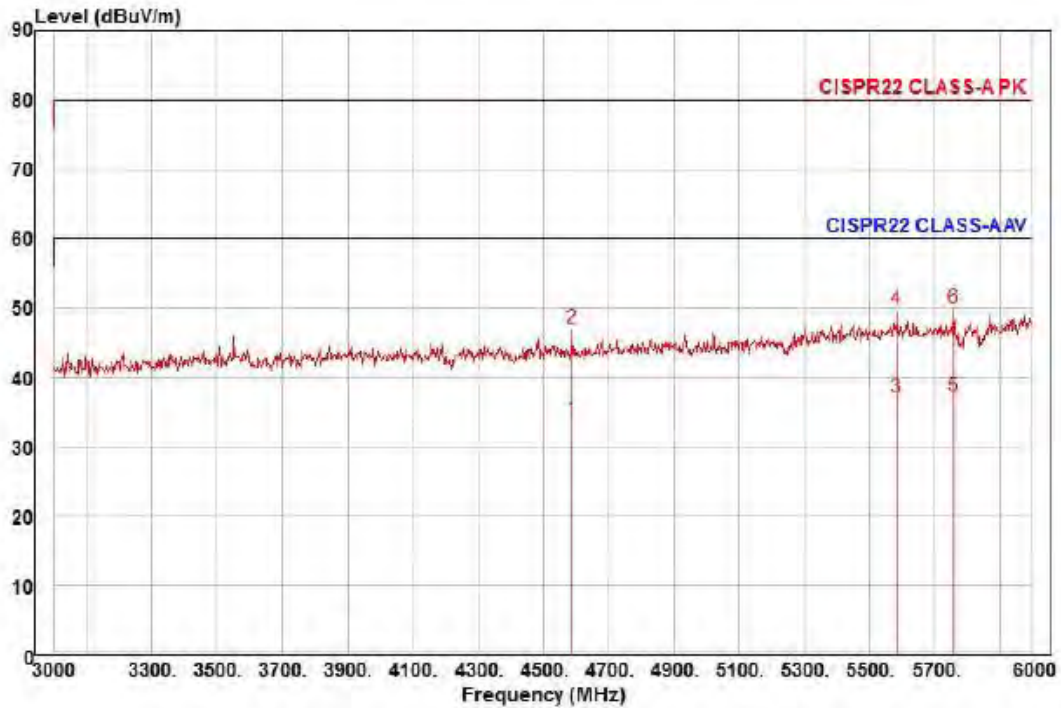
Test report No.:
 KES-E1-17T0645
 Page (26) of (36)



Site : YEOJU_C 3 m SAC
 Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
 : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
 Project :
 Model : SPN-10080P
 Mode :
 Memo : 3 - 6 GHz

	Read	Ant	Cable	Preamp	TPos	Limit	Over		
Freq	Level	Factor	Loss	Factor	deg	Line	Limit	Pol/Phase	Remark
MHz	dBuV	dB/m	dB	dB	deg	dBuV/m	dB		
1	5343.00	20.50	34.75	16.34	35.65	290	60.00	-24.06	horizontal Average
2	5343.00	32.92	34.75	16.34	35.65	290	80.00	-31.64	horizontal Peak
3	5583.00	20.49	35.49	16.74	35.66	68	60.00	-22.94	horizontal Average
4	5583.00	32.40	35.49	16.74	35.66	68	80.00	-31.03	horizontal Peak
5 pp	5874.00	19.04	35.93	17.27	35.68	32	60.00	-22.54	horizontal Average
6 pk	5874.00	33.09	35.93	17.27	35.68	32	80.00	-29.39	horizontal Peak

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Site : YEOJU_C 3 m SAC
 Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
 : RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
 Project :
 Model : SPN-10080P
 Mode :
 Memo : 3 - 6 GHz

	Read Freq	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	4590.00	21.73	32.55	15.11	35.49	19	60.00	-26.10	vertical	Average
2	4590.00	34.87	32.55	15.11	35.49	19	80.00	-32.96	vertical	Peak
3	5586.00	20.49	35.50	16.74	35.67	159	60.00	-22.94	vertical	Average
4	5586.00	33.31	35.50	16.74	35.67	159	80.00	-30.12	vertical	Peak
5 pp	5760.00	20.14	35.76	16.99	35.68	57	60.00	-22.79	vertical	Average
6 pk	5760.00	33.01	35.76	16.99	35.68	57	80.00	-29.92	vertical	Peak

◆ Calculation

$$\text{Over Limit [dB]} = (\text{Read Level [dB}\mu\text{V]} + \text{Ant Factor [dB/m]} + \text{Cable Loss [dB]} - \text{Preamp Factor [dB]}) - \text{Limit Line [dB}\mu\text{V]}$$

Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor

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Test report No.:
KES-E1-17T0645
Page (28) of (36)

Test Setup Photos and Configuration

Conducted Voltage Emissions

N/A

N/A

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Conducted Telecommunication Emissions



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Radiated Electric Field Emissions(Below 1 GHz)



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Radiated Electric Field Emissions(Above 1 GHz)



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EUT External Photographs

(Top)



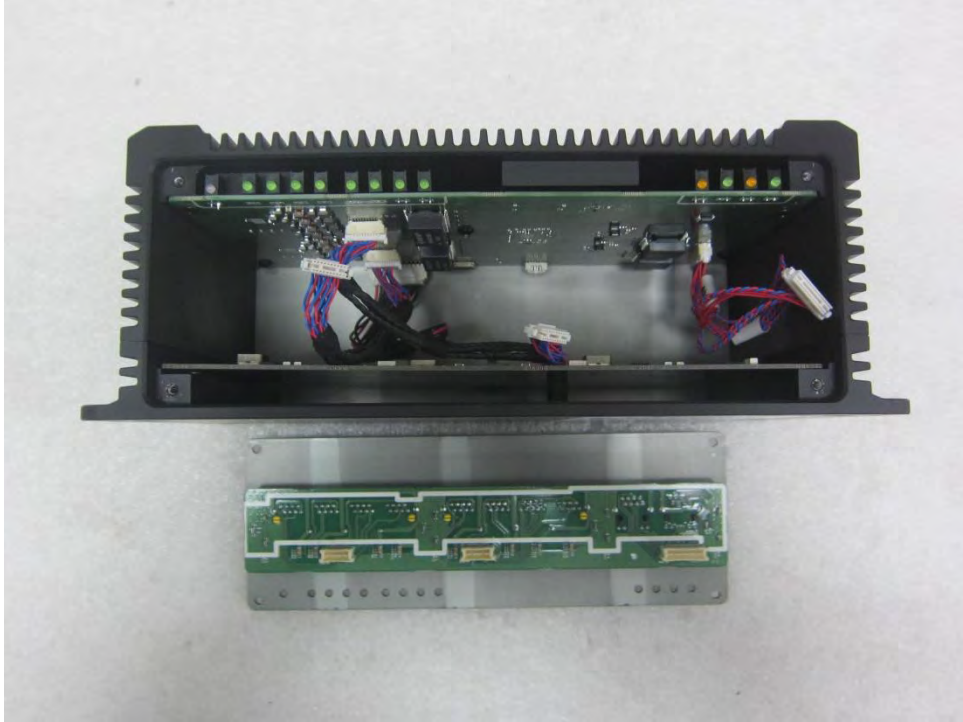
(Bottom)



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EUT Internal Photographs

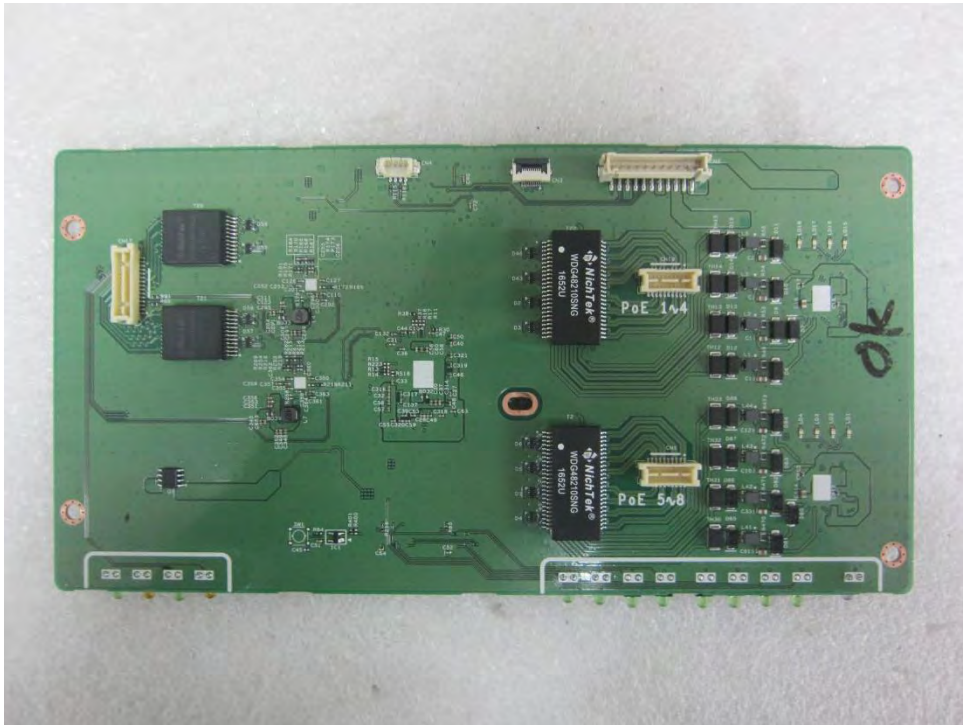
(Internal View)



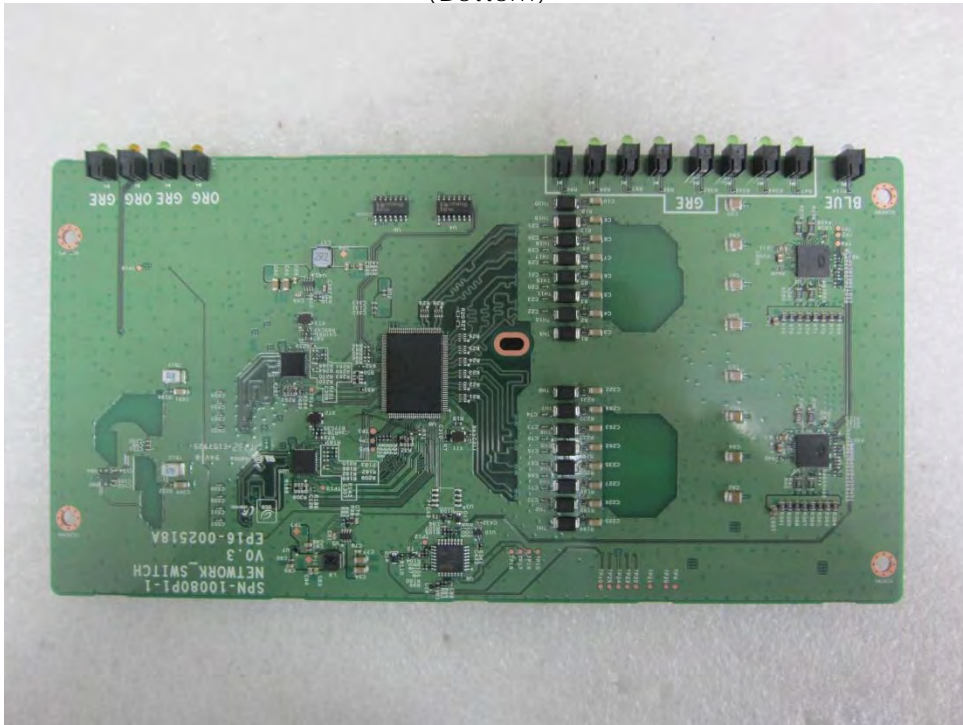
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EUT Internal View – Main Board

(Top)



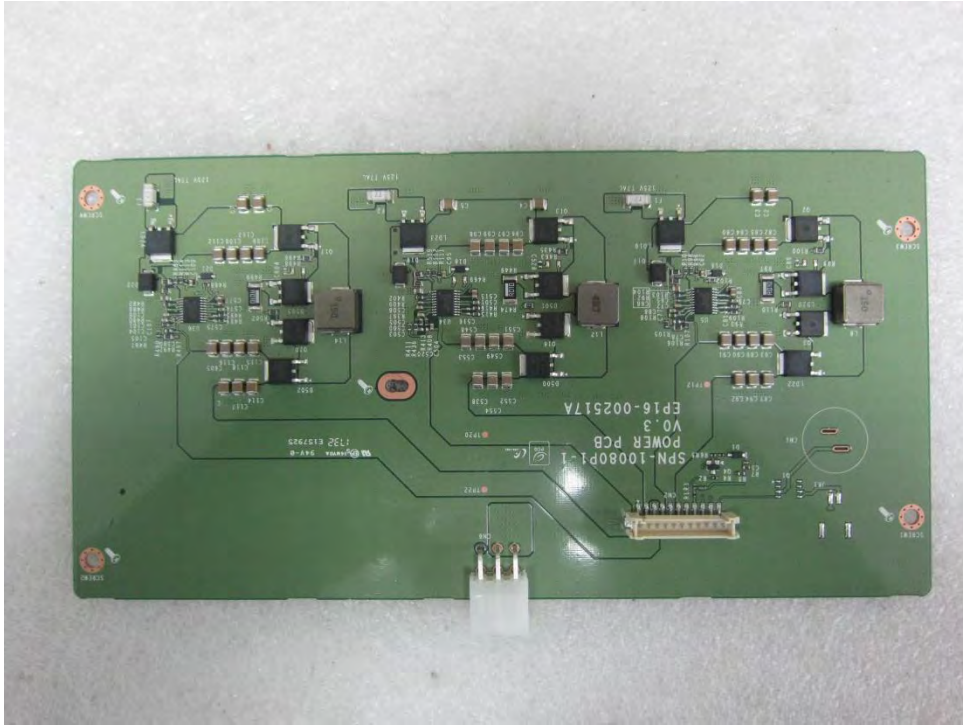
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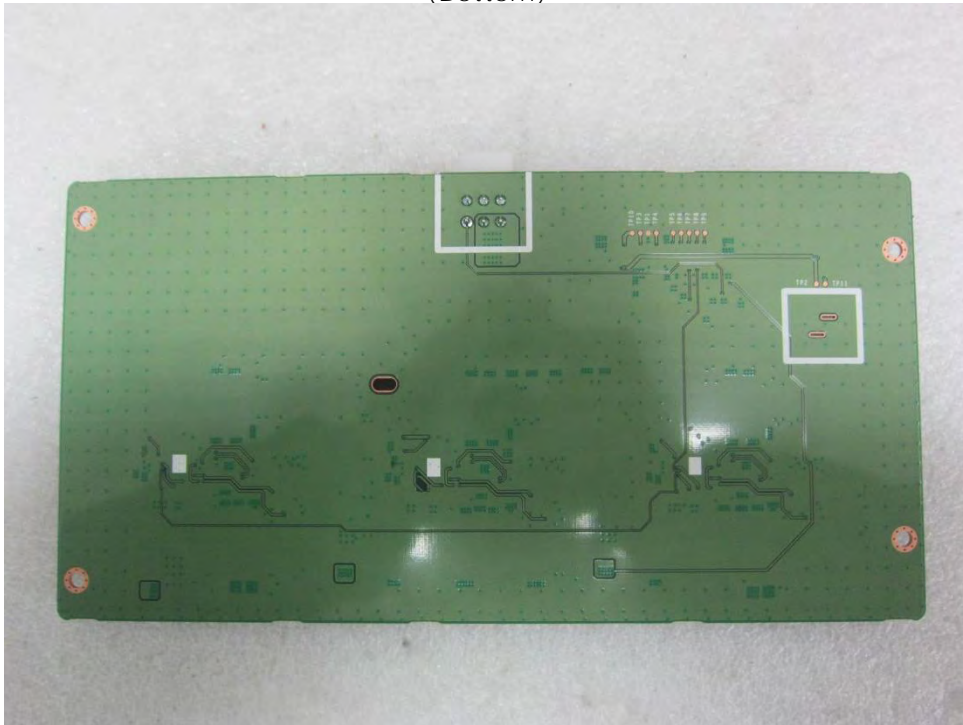
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EUT Internal View – Power Board

(Top)



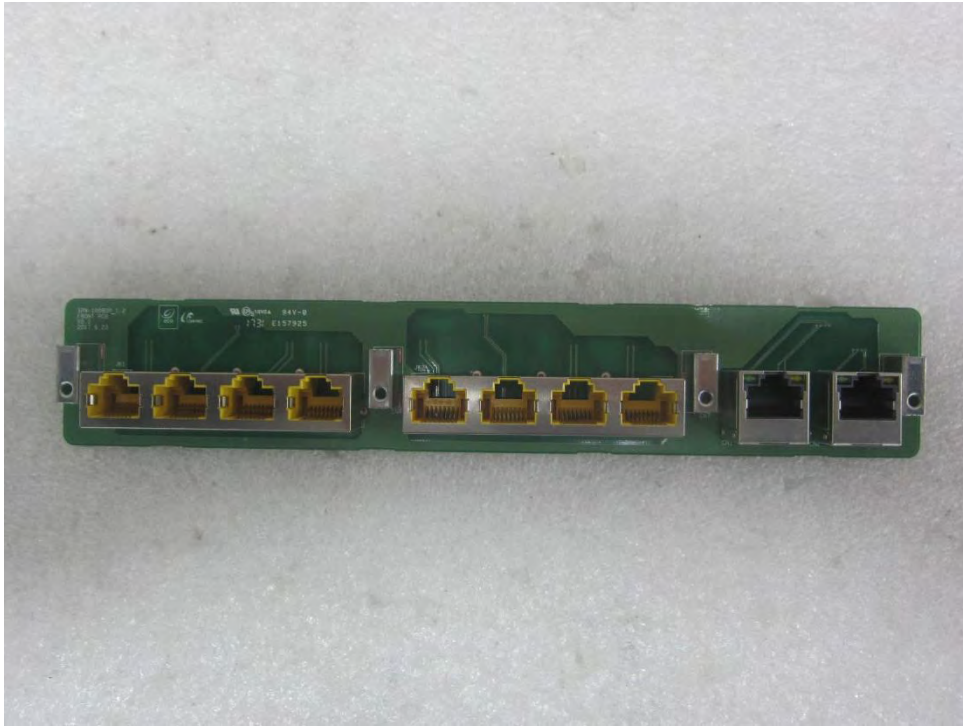
(Bottom)



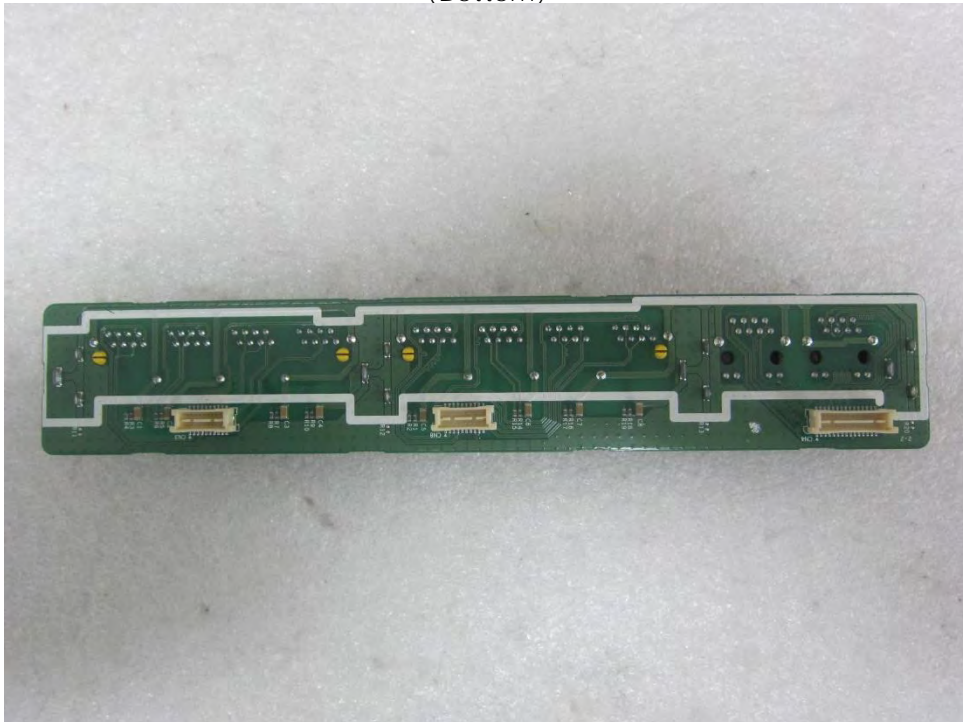
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EUT Internal View – Slot Board

Top)



(Bottom)



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