EMC TEST REPORT For RCM

Test Report No.	:	KES-E1-17T0650
Date of Issue	:	Sep. 21, 2017
Product name	:	PoE Switch
Model/Type No.	:	SPN-10080PM
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.

REPORT REVISION HISTORY

Date	Test Report No.	Revision History
Sep. 21, 2017	KES-E1-17T0650	Issued

TABLE OF CONTENTS

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	-40 ~ 70°C
Operation/Storage Humidity	0% - 95% RH
Maximum Power Consumption	TBD
Power Input	9 ~ 36 VDC (Fanless)
Color/Material	Black / Al
Imgression	X

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-10080PM	-	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

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

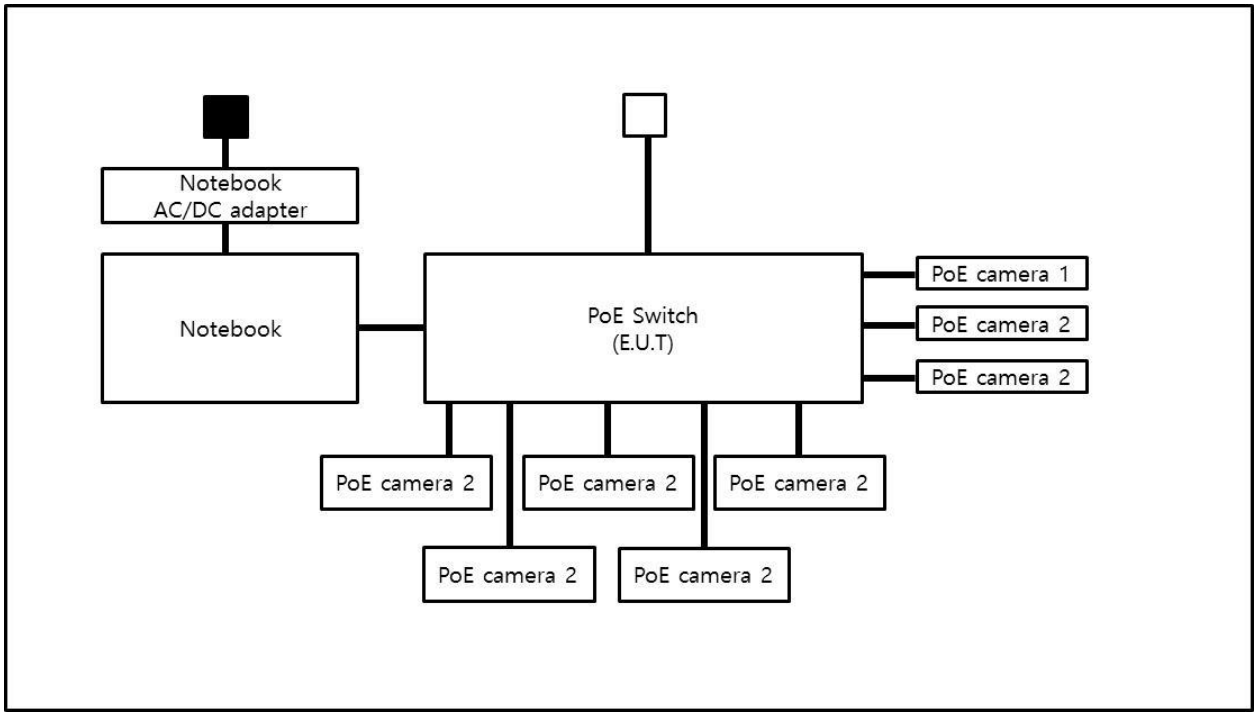
1.7 EUT Operating Mode(s)

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
-	-	-

1.8 Configuration

■ AC Main
□ DC Main



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, Yeoju-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)	KOREA LABORATORY ACCREDITATION SCHEME KOLAS TESTING NO. 489

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 ☐ Class A ☐ Group 2 ☐ 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

☐ VCCI V-3 / 2015.04 ☐ Class A ☐ Class B

☒ AS/NZS CISPR 32:2013 ☒ Class A ☐ Class B

☐ 47 CFR Part 15, Subpart B

- ☐ CISPR 22:2009 +A1:2010 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2009

☐ IC Regulation ICES-003 : 2016

- ☐ CAN/CSA CISPR 22-10 ☐ Class A ☐ Class B
- ☐ ANSI C63.4-2014

☐ RE– Directive 2014/53/EU

☐ EN 301 489-1 V1.9.2

- ☐ Equipment for fixed use
- ☐ Equipment for vehicular use
- ☐ Equipment for portable use

☐ EN 301 489-3 V1.6.1

☐ EN 301 489-17 V2.2.1

☐ EN 60945:2002

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
☐	EMI Test S/W	EMC32	R & S	9.12.00	-
☐	EMI TEST RECEIVER	ESR3	R & S	101783	04, 27, 2018
☐	LISN	ENV216	R & S	101137	02, 03, 2018
☐	LISN	ENV216	R & S	101786	04, 27, 2018
☐	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017

Test Conditions
Temperature: ℃
Relative Humidity: %

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

Test Results
The requirements are:

☐ PASS
☐ NOT PASS
☒ NOT APPLICABLE

Remarks
N/A

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
☒	EMI Test S/W	EMC32	R & S	9.12.00	-
☒	EMI TEST RECEIVER	ESR3	R & S	101783	04, 27, 2018
☒	LISN	ENV216	R & S	101137	02, 03, 2018
☒	LISN	ENV216	R & S	101786	04, 27, 2018
☒	PULSE LIMITER	ESH3-Z2	R & S	101914	12, 13, 2017
☒	ISN	ISN S8	SCHWARZBECK	ISN-S8-0019	05, 12, 2018

Test Conditions
Temperature: 23,0 ℃
Relative Humidity: 52,1 %

Frequency Range of Measurement
150 ㎑ to 30 ㎒

Instrument Settings
IF Band Width: 9 ㎑

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 ㎓)

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
☒	EMI Test S/W	EP5/RE	TOYO Corporation	6.0.0	-
☒	EMI TEST RECEIVER	ESU26	R & S	100551	04, 18, 2018
☒	AMPLIFIER	SCU 01	R & S	100603	12, 13, 2017
☒	TRILOG-BROADBAND ANTENNA	VULB9163	Schwarzbeck	716	11, 28, 2018

Test Conditions
Temperature: 23,6 ℃
Relative Humidity: 52,3 %

Frequency Range of Measurement
30 ㎒ to 1 ㎓

Instrument Settings
IF Band Width: 120 ㎑

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 ㎓)

Test Date
Sep. 16, 2017

Test Location
SEMI ANECHOIC CHAMBER #2

Test Equipment

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

Test Conditions
Temperature: 23,0 ℃
Relative Humidity: 52,1 %

Frequency Range of Measurement
1 ㎓ to 6 ㎓

Instrument Settings
IF Band Width: 1 ㎒

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

[HOT]

N/A

[NEUTRAL]

N/A

♦ Calculation

QuasiPeak[㏈uV] / CAverage [㏈uV] = Reading Value[㏈uV] + Corr. [㏈]
QuasiPeak / CAverage : The Final Value
Reading Value : Not shown in the table.
Corr. : Correction values (LISN FACTOR + (Cable Loss + Pulse Limiter FACTOR))

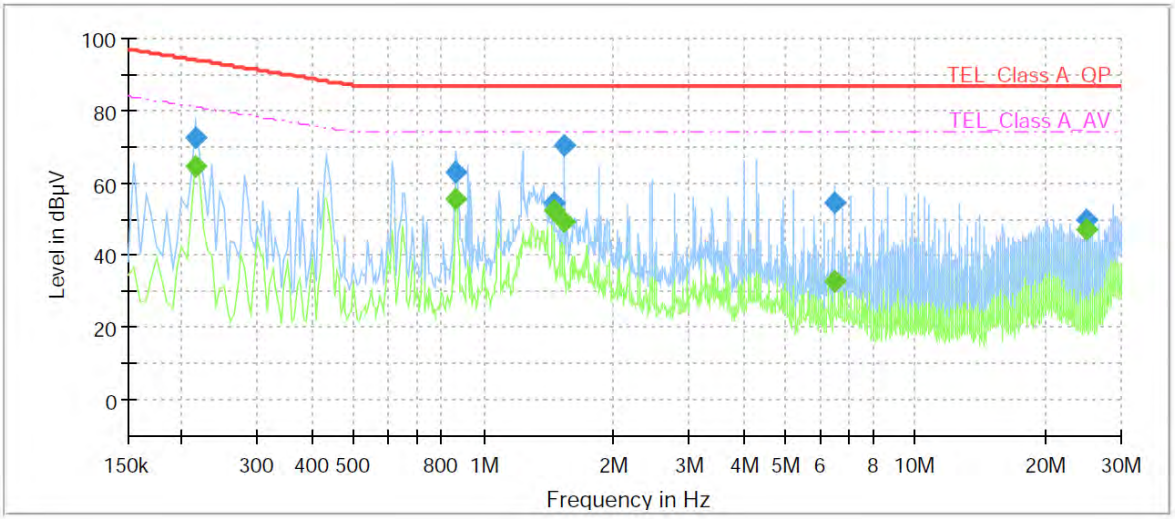
Conducted Emissions at Telecommunication Ports

- LAN Mode

[10 Mbps]

Common Information

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



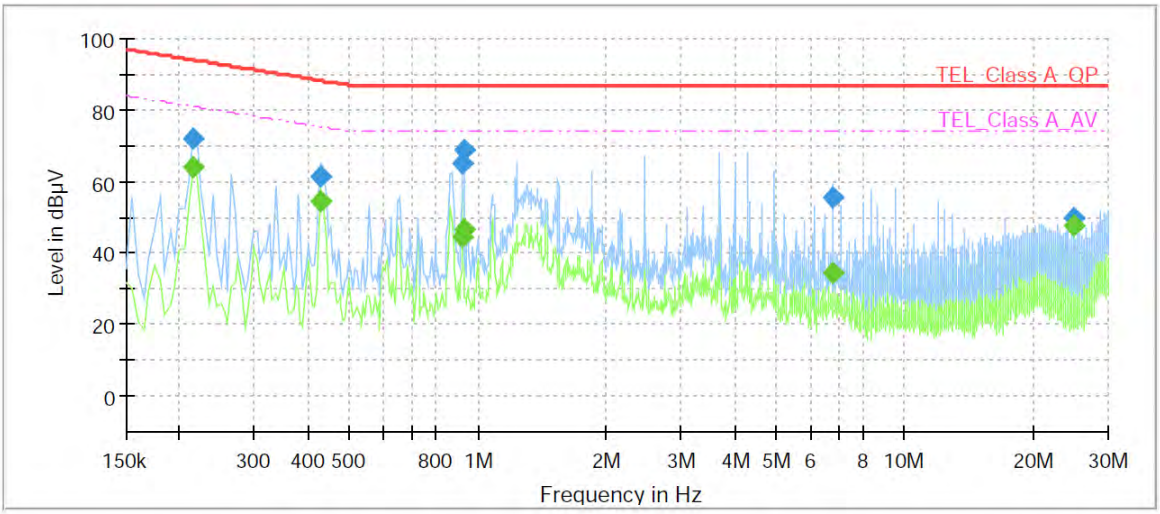
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.215000	---	64.79	81.01	16.22	1000.0	9.000	Single Line	19.4
0.215000	72.67	---	94.01	21.34	1000.0	9.000	Single Line	19.4
0.865000	---	55.46	74.00	18.54	1000.0	9.000	Single Line	19.6
0.865000	63.23	---	87.00	23.77	1000.0	9.000	Single Line	19.6
1.450000	---	52.51	74.00	21.49	1000.0	9.000	Single Line	19.7
1.450000	54.44	---	87.00	32.56	1000.0	9.000	Single Line	19.7
1.540000	---	49.09	74.00	24.91	1000.0	9.000	Single Line	19.7
1.540000	70.45	---	87.00	16.55	1000.0	9.000	Single Line	19.7
6.470000	---	33.10	74.00	40.90	1000.0	9.000	Single Line	19.7
6.470000	54.33	---	87.00	32.67	1000.0	9.000	Single Line	19.7
25.000000	---	46.96	74.00	27.04	1000.0	9.000	Single Line	19.9
25.000000	49.59	---	87.00	37.41	1000.0	9.000	Single Line	19.9

[100 Mbps]

Common Information

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



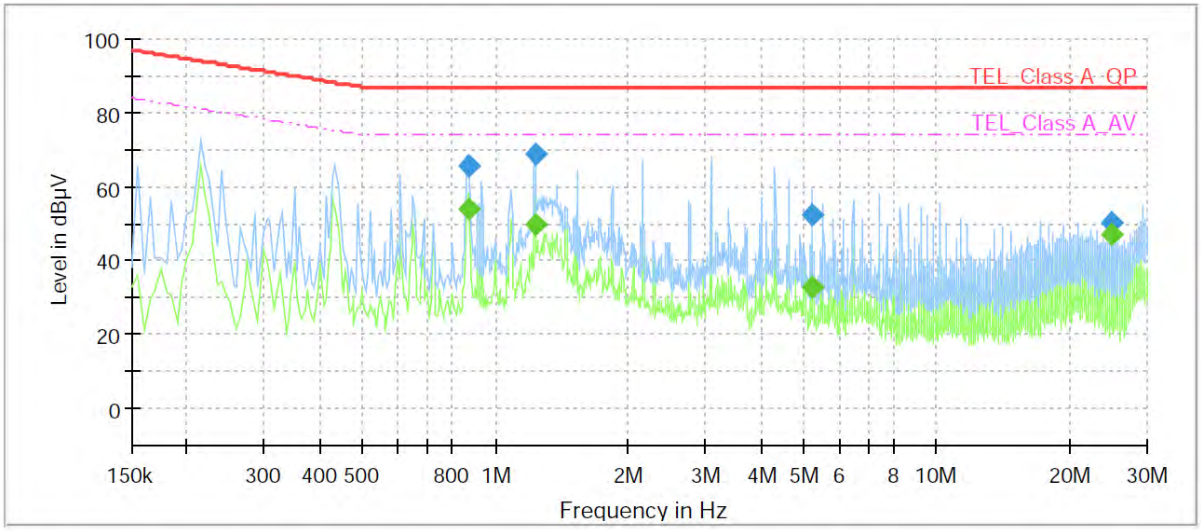
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.215000	---	63.96	81.01	17.05	1000.0	9.000	Single Line	19.4
0.215000	71.76	---	94.01	22.25	1000.0	9.000	Single Line	19.4
0.430000	---	54.75	75.25	20.50	1000.0	9.000	Single Line	19.5
0.430000	61.29	---	88.25	26.96	1000.0	9.000	Single Line	19.5
0.920000	---	44.33	74.00	29.67	1000.0	9.000	Single Line	19.7
0.920000	64.85	---	87.00	22.15	1000.0	9.000	Single Line	19.7
0.925000	---	46.79	74.00	27.21	1000.0	9.000	Single Line	19.7
0.925000	68.73	---	87.00	18.27	1000.0	9.000	Single Line	19.7
6.775000	---	34.36	74.00	39.64	1000.0	9.000	Single Line	19.7
6.775000	55.61	---	87.00	31.39	1000.0	9.000	Single Line	19.7
25.000000	---	47.67	74.00	26.33	1000.0	9.000	Single Line	19.9
25.000000	49.90	---	87.00	37.10	1000.0	9.000	Single Line	19.9

[1 000 Mbps]

Common Information

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



Final_Result

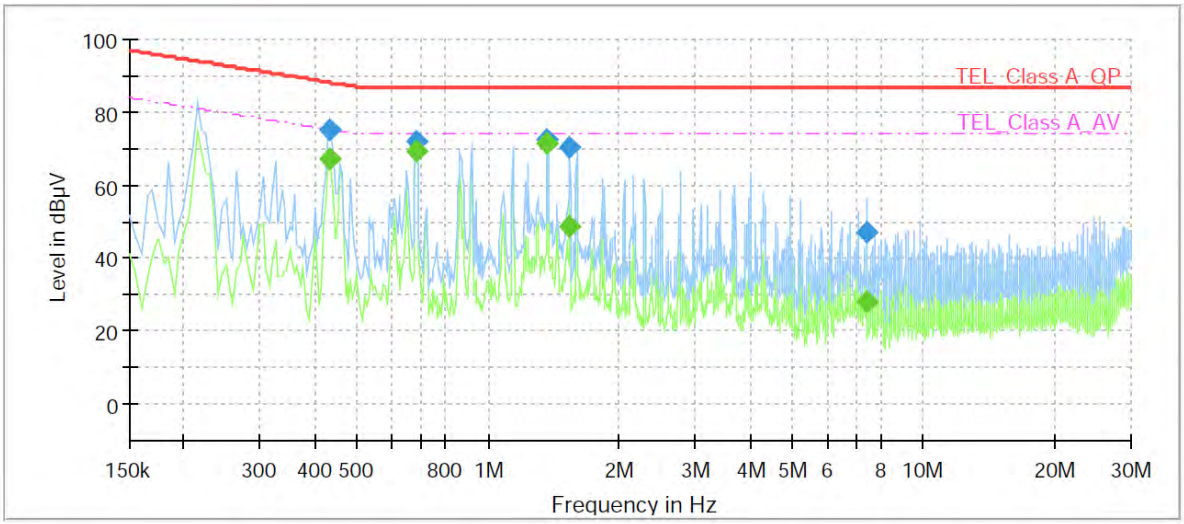
Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.870000	---	53.82	74.00	20.18	1000.0	9.000	Single Line	19.6
0.870000	65.40	---	87.00	21.60	1000.0	9.000	Single Line	19.6
1.230000	---	49.71	74.00	24.29	1000.0	9.000	Single Line	19.7
1.230000	69.05	---	87.00	17.95	1000.0	9.000	Single Line	19.7
5.230000	---	33.04	74.00	40.96	1000.0	9.000	Single Line	19.7
5.230000	52.25	---	87.00	34.75	1000.0	9.000	Single Line	19.7
25.000000	---	47.33	74.00	26.67	1000.0	9.000	Single Line	19.9
25.000000	50.13	---	87.00	36.87	1000.0	9.000	Single Line	19.9

- PoE Mode

[10 Mbps]

Common Information

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



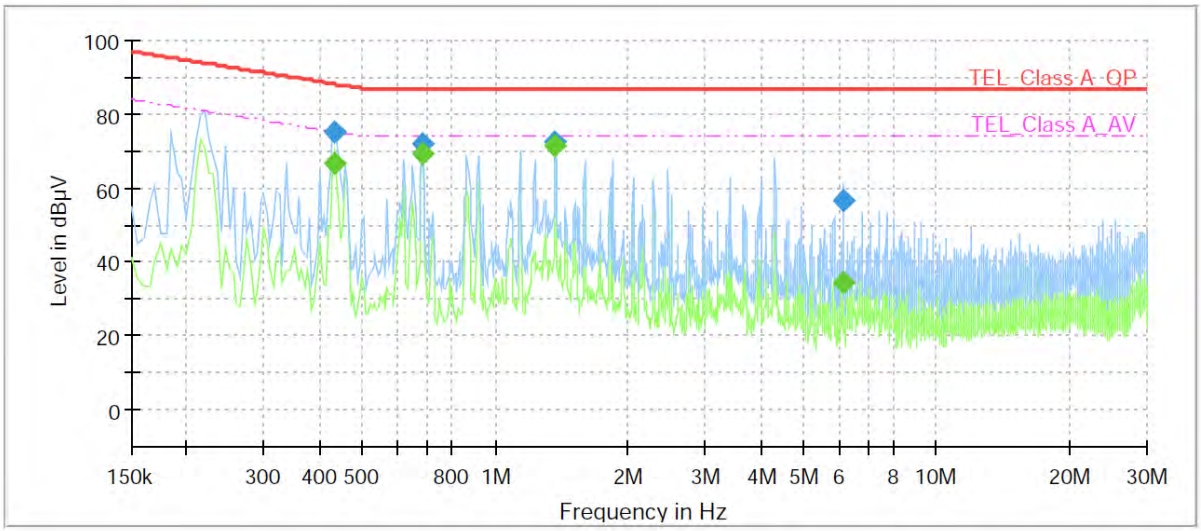
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.435000	---	66.97	75.16	8.19	1000.0	9.000	Single Line	19.5
0.435000	75.24	---	88.16	12.92	1000.0	9.000	Single Line	19.5
0.685000	---	69.54	74.00	4.46	1000.0	9.000	Single Line	19.6
0.685000	72.06	---	87.00	14.94	1000.0	9.000	Single Line	19.6
1.370000	---	71.63	74.00	2.37	1000.0	9.000	Single Line	19.7
1.370000	72.28	---	87.00	14.72	1000.0	9.000	Single Line	19.7
1.540000	---	48.63	74.00	25.37	1000.0	9.000	Single Line	19.7
1.540000	70.35	---	87.00	16.65	1000.0	9.000	Single Line	19.7
7.400000	---	28.16	74.00	45.84	1000.0	9.000	Single Line	19.6
7.400000	47.19	---	87.00	39.81	1000.0	9.000	Single Line	19.6

[100 Mbps]

Common Information

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



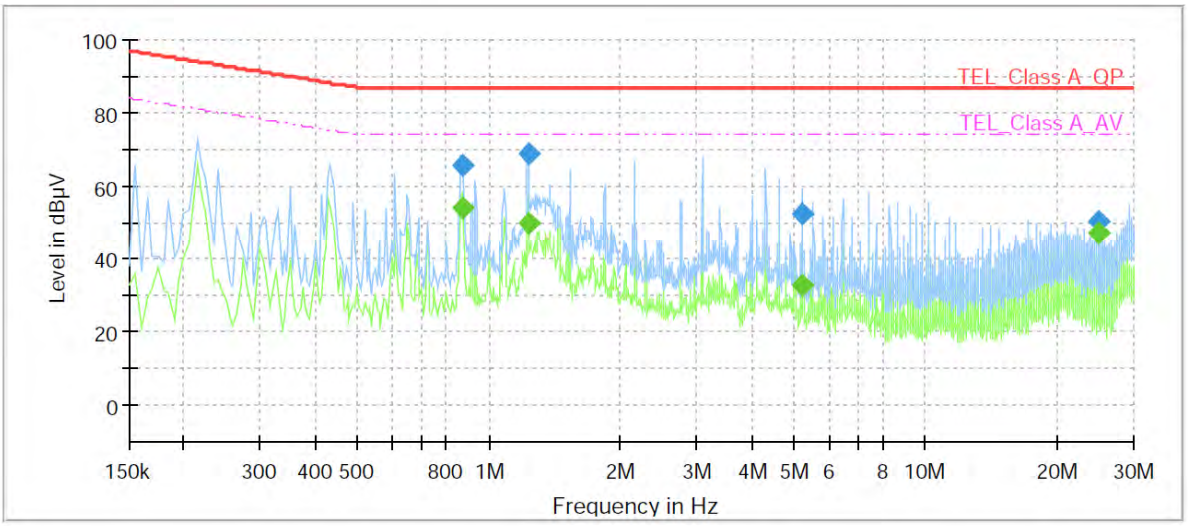
Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.435000	---	66.83	75.16	8.33	1000.0	9.000	Single Line	19.5
0.435000	75.17	---	88.16	12.99	1000.0	9.000	Single Line	19.5
0.685000	---	69.43	74.00	4.57	1000.0	9.000	Single Line	19.6
0.685000	72.07	---	87.00	14.93	1000.0	9.000	Single Line	19.6
1.370000	---	71.60	74.00	2.40	1000.0	9.000	Single Line	19.7
1.370000	72.29	---	87.00	14.71	1000.0	9.000	Single Line	19.7
6.160000	---	34.60	74.00	39.40	1000.0	9.000	Single Line	19.7
6.160000	56.58	---	87.00	30.42	1000.0	9.000	Single Line	19.7

[1 000 Mbps]

Common Information

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

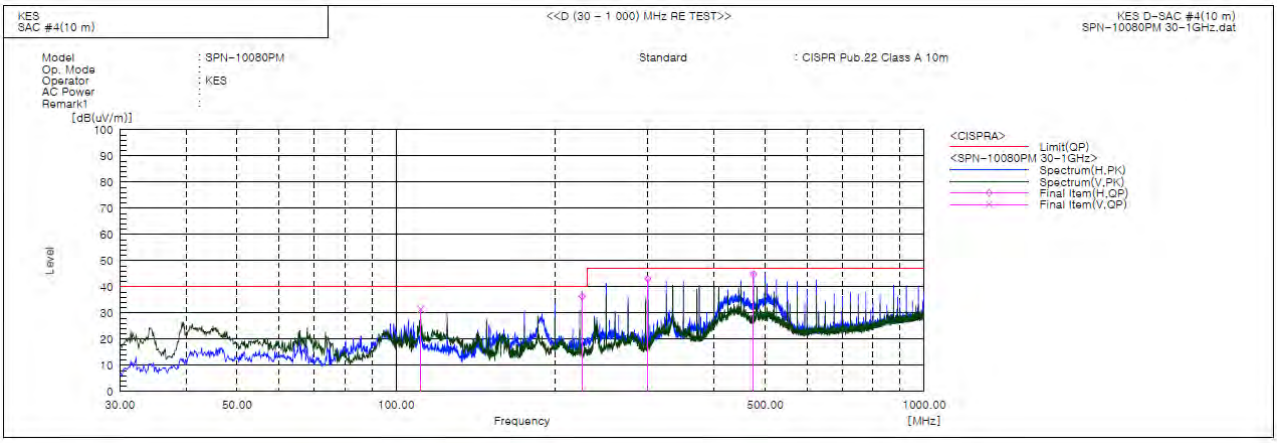


Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	CAverage (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
0.870000	---	53.82	74.00	20.18	1000.0	9.000	Single Line	19.6
0.870000	65.40	---	87.00	21.60	1000.0	9.000	Single Line	19.6
1.230000	---	49.71	74.00	24.29	1000.0	9.000	Single Line	19.7
1.230000	69.05	---	87.00	17.95	1000.0	9.000	Single Line	19.7
5.230000	---	33.04	74.00	40.96	1000.0	9.000	Single Line	19.7
5.230000	52.25	---	87.00	34.75	1000.0	9.000	Single Line	19.7
25.000000	---	47.33	74.00	26.67	1000.0	9.000	Single Line	19.9
25.000000	50.13	---	87.00	36.87	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))

Radiated Electric Field Emissions(Below 1 ㎓)

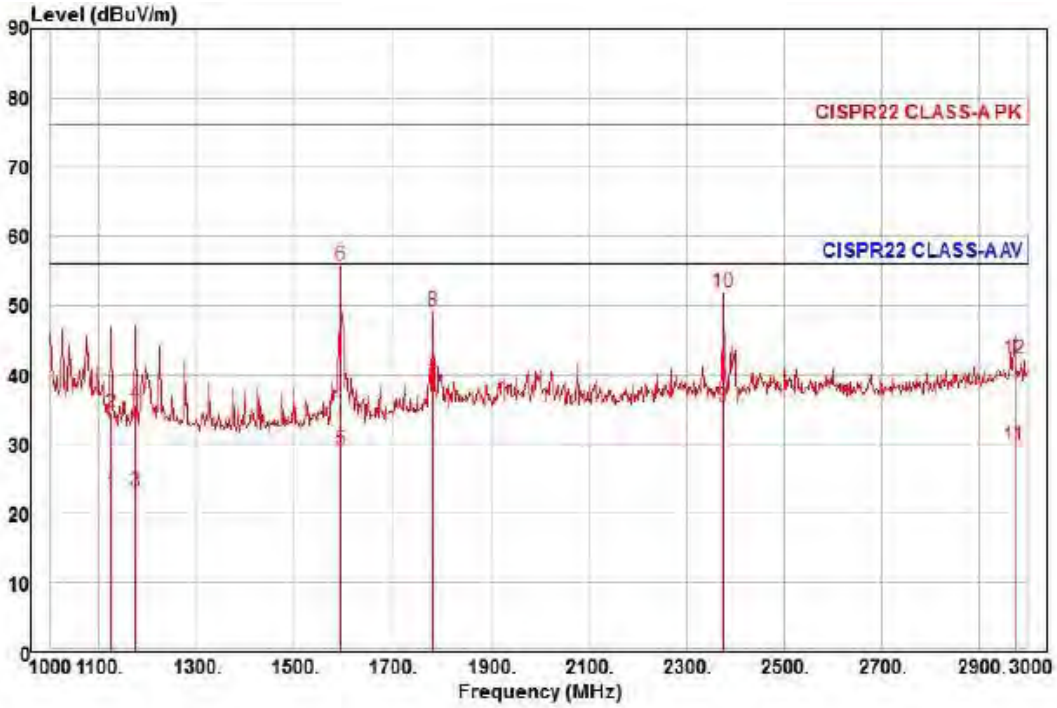


Final Result

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	111.375	V	60.9	-29.4	31.5	40.0	8.5	114.0	105.0	
2	225.009	H	62.5	-26.1	36.4	40.0	3.6	386.0	134.0	
3	300.018	H	66.8	-23.8	43.0	47.0	4.0	260.0	260.0	
4	475.031	H	63.2	-18.3	44.9	47.0	2.1	191.0	196.0	

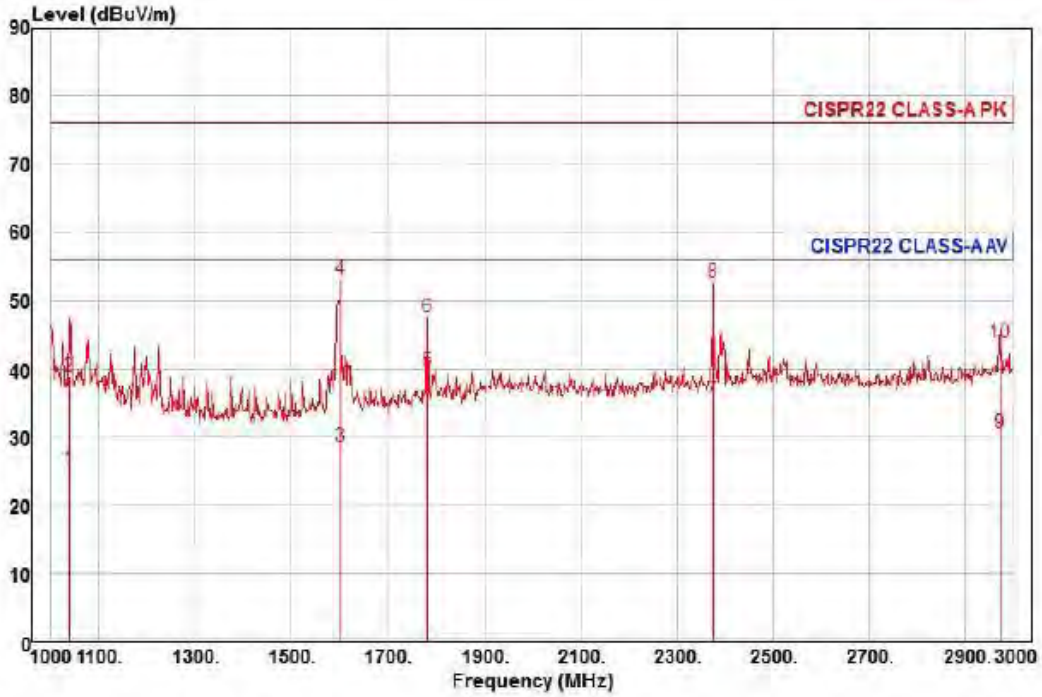
♦ Calculation – SAC #4(10 m)
Result(QP) [㏈(㎶/m)] = (Reading(QP)[㏈(㎶)] + c.f[㏈(1/m)]
Margin(QP)[㏈] = Limit[㏈(㎶/m)] - Result(QP) [㏈(㎶/m)]
Reading(QP) : Reading value, Result(QP) : Reading value + Factor value
Limit(QP) : Limit value, c.f : (ANT Factor + Cable Loss - Preamp Factor), Margin: Margin value

Radiated Electric Field Emissions(Above 1 GHz)



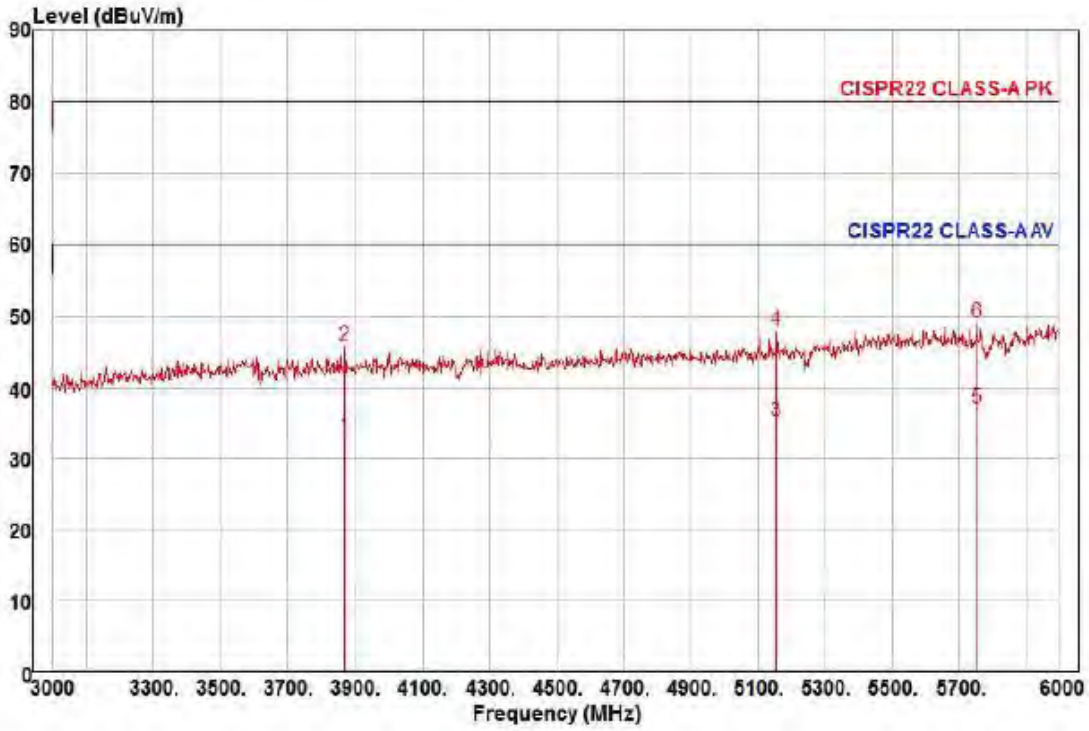
Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) horizontal
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPN-10080PM
Mode :
Memo : 1 - 3 GHz

	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	1124.00	28.87	22.88	7.04	35.95	69	56.00	-33.16	horizontal	Average
2	1124.00	40.53	22.88	7.04	35.95	69	76.00	-41.50	horizontal	Peak
3	1174.00	28.86	23.03	7.20	35.91	226	56.00	-32.82	horizontal	Average
4	1174.00	41.44	23.03	7.20	35.91	226	76.00	-40.24	horizontal	Peak
5	1594.00	31.83	24.39	8.49	35.53	283	56.00	-26.82	horizontal	Average
6 pk	1594.00	58.59	24.39	8.49	35.53	283	76.00	-20.06	horizontal	Peak
7 pp	1782.00	39.80	25.14	9.04	35.36	102	56.00	-17.38	horizontal	Average
8	1782.00	50.39	25.14	9.04	35.36	102	76.00	-26.79	horizontal	Peak
9	2376.00	33.22	27.15	10.54	35.32	60	56.00	-20.41	horizontal	Average
10	2376.00	49.61	27.15	10.54	35.32	60	76.00	-24.02	horizontal	Peak
11	2972.00	23.72	29.62	12.07	35.55	84	56.00	-26.14	horizontal	Average
12	2972.00	36.29	29.62	12.07	35.55	84	76.00	-33.57	horizontal	Peak



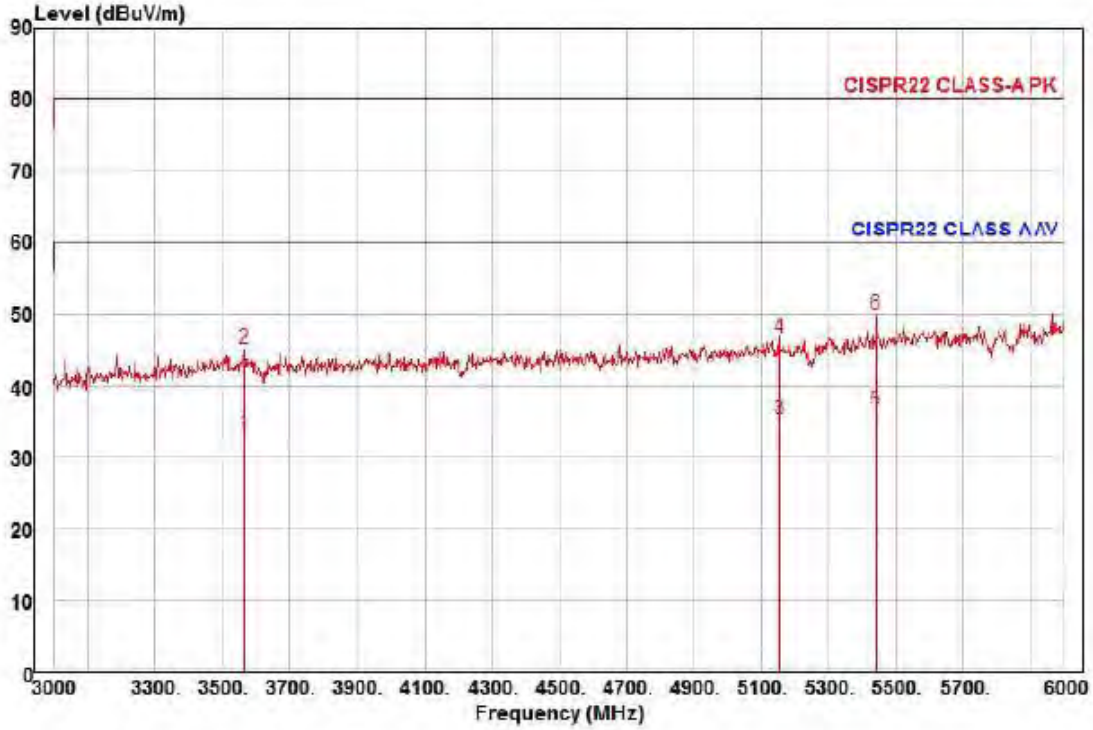
Site : YEOJU_C 3 m SAC
Condition: CISPR22 CLASS-A PK 3m STLP9149(RRA CAL 2017-05-18) vertical
: RBW:1000.000kHz VBW:1000.000kHz SWT:Auto
Project :
Model : SPN-10080PM
Mode :
Memo : 1 - 3 GHz

	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	1038.00	32.00	22.62	6.76	36.03	149	56.00	-30.65	vertical	Average
2	1038.00	45.71	22.62	6.76	36.03	149	76.00	-36.94	vertical	Peak
3	1600.00	31.15	24.42	8.51	35.53	234	56.00	-27.45	vertical	Average
4 pk	1600.00	55.75	24.42	8.51	35.53	234	76.00	-22.85	vertical	Peak
5 pp	1782.00	41.01	25.14	9.04	35.36	25	56.00	-16.17	vertical	Average
6	1782.00	48.84	25.14	9.04	35.36	25	76.00	-28.34	vertical	Peak
7	2376.00	33.38	27.15	10.54	35.32	71	56.00	-20.25	vertical	Average
8	2376.00	50.39	27.15	10.54	35.32	71	76.00	-23.24	vertical	Peak
9	2972.00	24.39	29.62	12.07	35.55	89	56.00	-25.47	vertical	Average
10	2972.00	37.73	29.62	12.07	35.55	89	76.00	-32.13	vertical	Peak



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-10080PM
Mode :
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	3870.00	22.29	32.15	13.79	35.32	305	60.00	-27.09	horizontal	Average
2	3870.00	35.33	32.15	13.79	35.32	305	80.00	-34.05	horizontal	Peak
3	5157.00	21.00	34.03	16.00	35.64	104	60.00	-24.61	horizontal	Average
4	5157.00	33.63	34.03	16.00	35.64	104	80.00	-31.98	horizontal	Peak
5 pp	5754.00	20.24	35.75	16.98	35.68	68	60.00	-22.71	horizontal	Average
6 pk	5754.00	32.14	35.75	16.98	35.68	68	80.00	-30.81	horizontal	Peak



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-10080PM
Mode :
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	3564.00	23.96	31.32	13.23	35.40	70	60.00	-26.89	vertical	Average
2	3564.00	36.23	31.32	13.23	35.40	70	80.00	-34.62	vertical	Peak
3	5154.00	21.01	34.01	15.99	35.64	148	60.00	-24.63	vertical	Average
4	5154.00	32.38	34.01	15.99	35.64	148	80.00	-33.26	vertical	Peak
5 pp	5445.00	20.70	35.15	16.52	35.66	171	60.00	-23.29	vertical	Average
6 pk	5445.00	33.92	35.15	16.52	35.66	171	80.00	-30.07	vertical	Peak

♦ Calculation
Over Limit [dB] = (Read Level[dBμV] + Ant Factor[dB/m] + Cable Loss [dB] − Preamp Factor [dB]) − Limit Line[dBμV]
Over Limit : Margin, Read Level : Reading value, Ant Factor : ANT Factor, Cable Loss : Cable loss, Preamp Factor : Preamp Factor

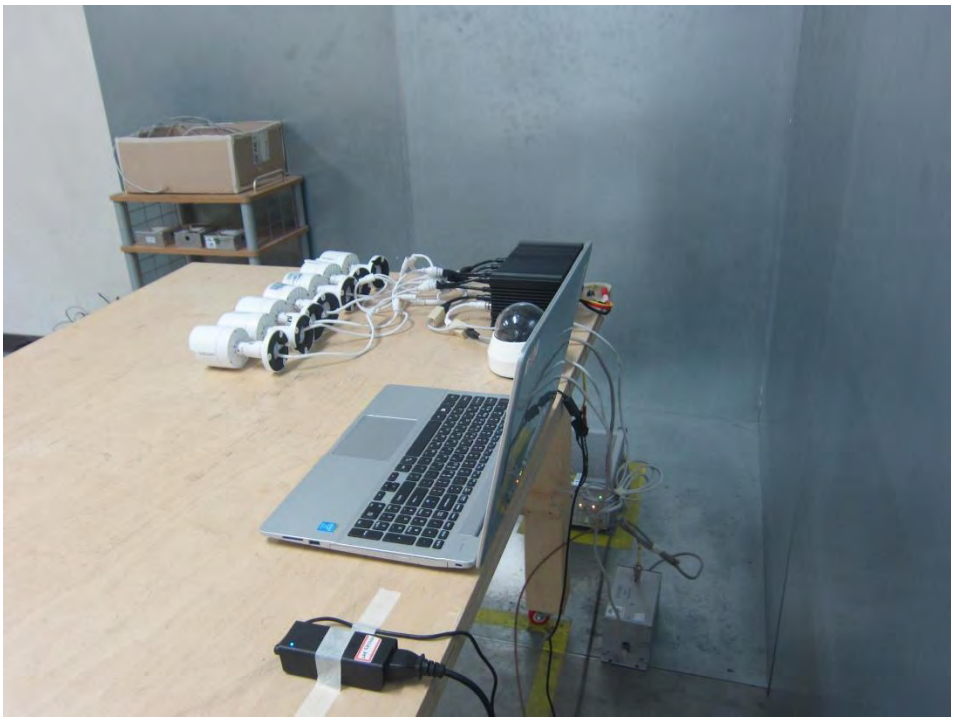
Test Setup Photos and Configuration

Conducted Voltage Emissions

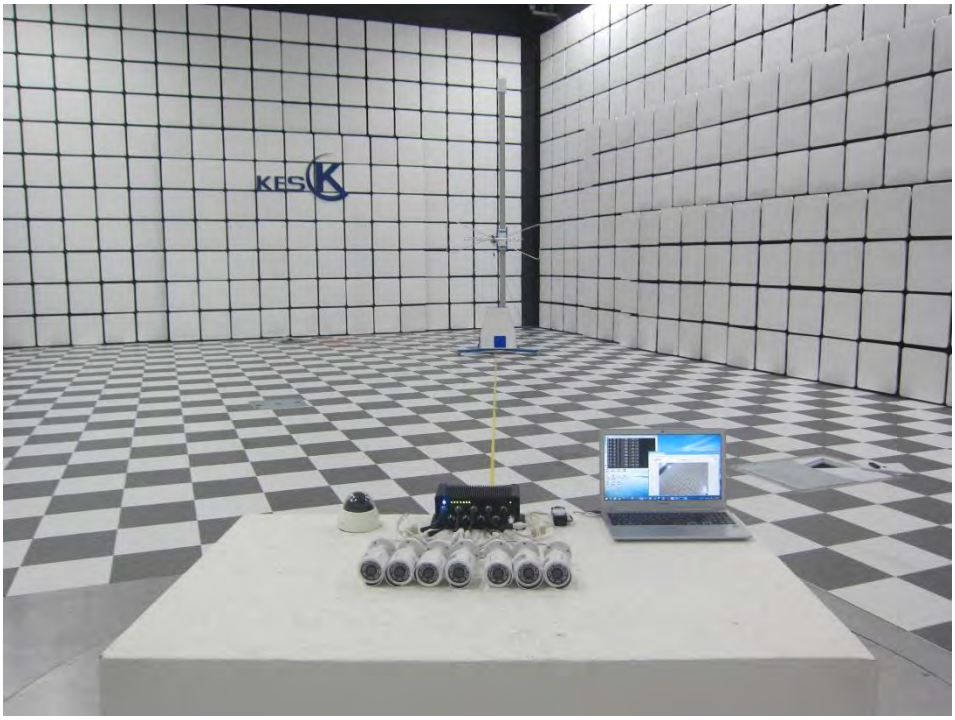
N/A

N/A

Conducted Telecommunication Emissions



Radiated Electric Field Emissions(Below 1 GHz)



Radiated Electric Field Emissions(Above 1 ㎓)

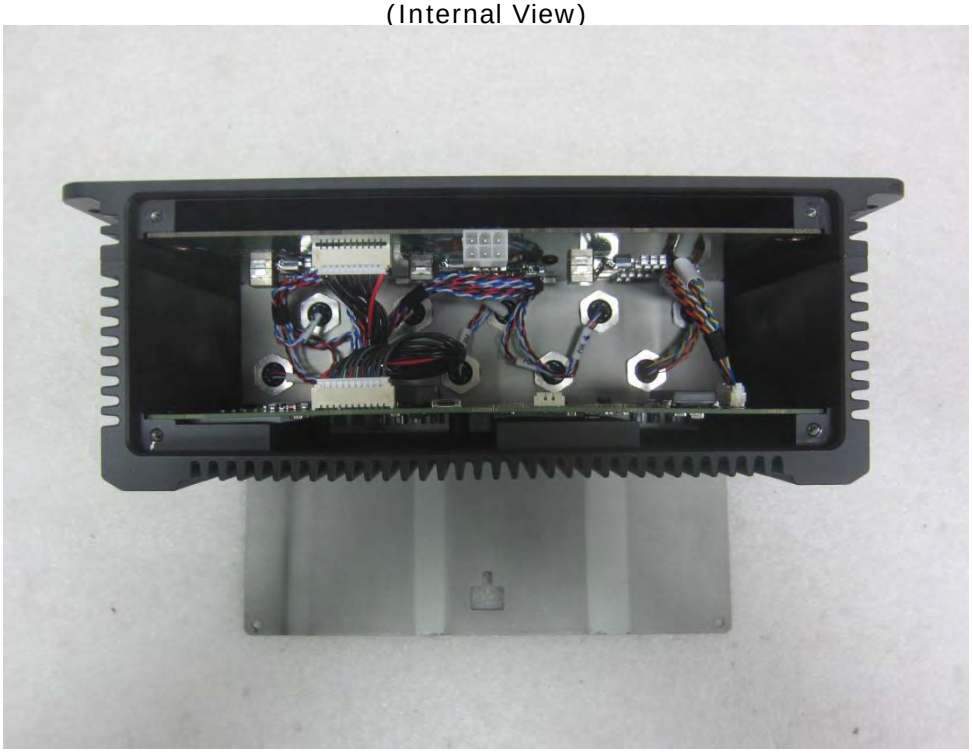
EUT External Photographs

(Top)

(Bottom)

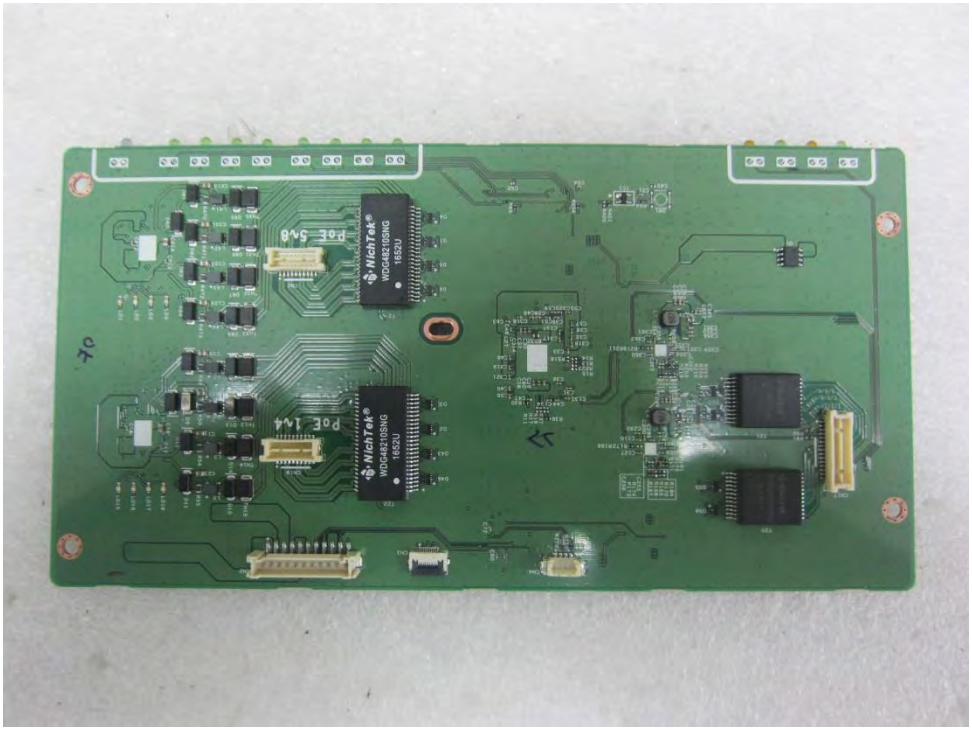
EUT Internal Photographs

(Internal View)

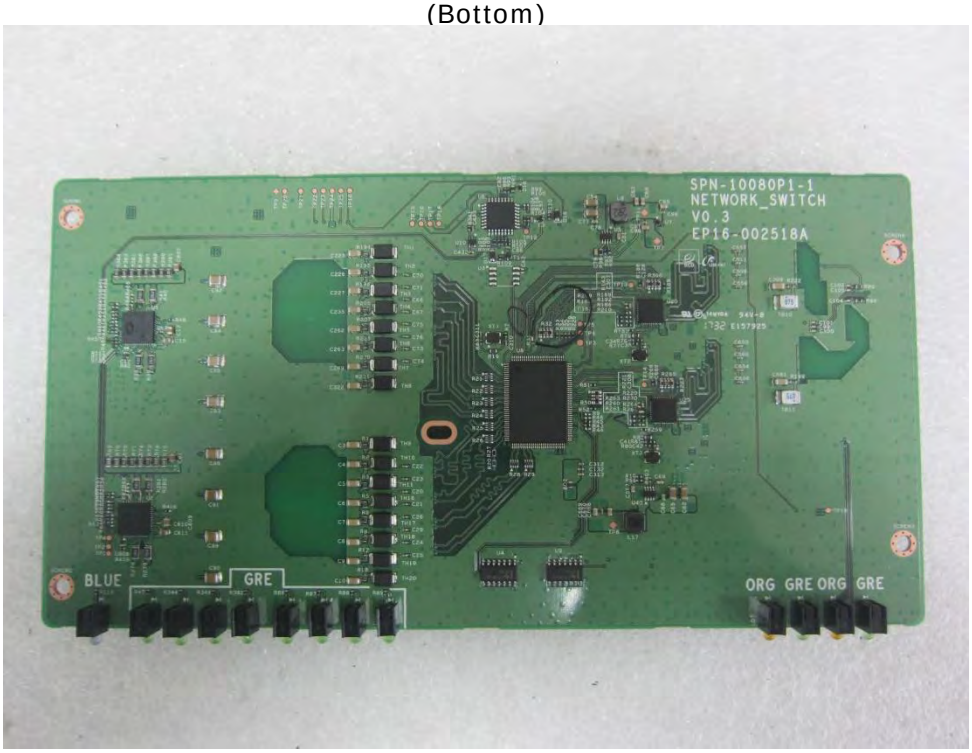


EUT Internal View – Main Board

(Top)

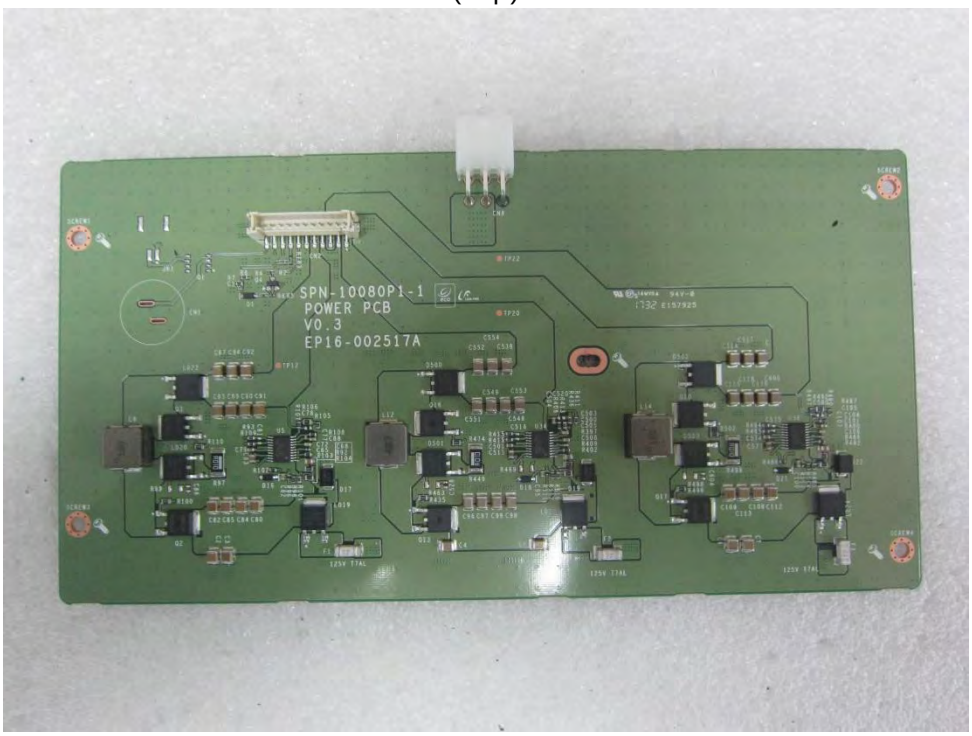


(Bottom)



EUT Internal View – Power Board

(Top)



(Bottom)