TEST REPORT

Eurofins KCTL Co.,Ltd. 65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea TEL: 82-70-4904-0113 FAX: 82-505-299-8311 www.kctl.co.kr	Report No.: KR26-SRF0021 Page (1) of (26)	eurofins | KCTL

1. Client

- Name : IDP Corp., Ltd.
- Address : 601, Byucksan digital valley 7, 50, Digital-ro 33-gil, Guro-gu, Seoul, Republic of Korea
- Date of Receipt : 2025-09-15

2. Use of Report : Certification

3. Name of Product / Model : Card Printer / SMART-32

4. Manufacturer / Country of Origin : IDP Corp., Ltd. / Korea

5. FCC ID : VU2-SMART-32

6. Date of Test : 2025-10-21 to 2026-03-10

7. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing
(Address:65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea)

8. Test method used : FCC Part 15 Subpart C, 15.225

9. Test Result : Refer to the test result in the test report

Affirmation	Tested by Name : Donghun Lee (Signature)	Technical Manager Name : Euijung Kim (Signature)

2026-03-17

Eurofins KCTL Co.,Ltd.

REPORT REVISION HISTORY

Date	Revision	Page No
2026-03-17	Originally issued	-

General remarks for test reports

Statement concerning the uncertainty of the measurement systems used for the tests

(may be required by the product standard or client)

☐ **Internal procedure used for type testing through which traceability of the measuring uncertainty has been established:**

Procedure number, issue date and title:

Calculations leading to the reported values are on file with the testing laboratory that conducted the testing.

☒ **Statement not required by the standard or client used for type testing**

CONTENTS

1. General information

Client	:	IDP Corp., Ltd.
Address	:	601, Byucksan digital valley 7, 50, Digital-ro 33-gil, Guro-gu, Seoul, Republic of Korea
Manufacturer	:	IDP Corp., Ltd.
Address	:	601, Byucksan digital valley 7, 50, Digital-ro 33-gil, Guro-gu, Seoul, Republic of Korea
Factory	:	EVERINT Co., Ltd.
Address	:	129, Chungjusandan 1-ro, Chungju-si, Chungcheongbuk-do, Republic of Korea
Laboratory	:	Eurofins KCTL Co.,Ltd.
Address	:	65, Sinwon-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Korea
Accreditations	:	FCC Site Designation No: KR0040, FCC Site Registration No: 687132 VCCI Registration No. : R-20080, G-20078, C-20059, T-20056 CAB Identifier: KR0040, ISED Number: 8035A KOLAS No.: KT231

2. Device information

Equipment under test	:	Card Printer
Model	:	SMART-32
Derivative model	:	SMART-32D, SOLID-320D, N260W, MCP-350D, QUALICA-RD 302D, ID-32D, CP-32D, P-32D, IDZ-32D, SOLID-320D(SE), SOLID-320D(OC), SOLID-320D(LX), SOLID-320D(SL), SOLID-320D(UX), SICURIX-320D, SOLID-320D(DL), SOLID-320D(DX), SOLID-320D(LE), SOLID-320D(PAC), SOLID-320D(SRX), SOLID-320D(EB), SMART-32S, SOLID-320S, N260, MCP-350S, QUALICA-RD 302S, ID-32S, CP-32S, P-32S, IDZ-32S, SOLID-320S(SE), SOLID-320S(OC), SOLID-320S(LX), SOLID-320S(SL), SOLID-320S(UX), SICURIX-320S, SOLID-320S(DL), SOLID-320S(DX), SOLID-320S(LE), SOLID-320S(PAC), SOLID-320S(SRX), SOLID-320S(EB), SMART-32R, SOLID-320R, N260R, MCP-350R, QUALICA-RD 302R, ID-32R, CP-32R, P-32R, IDZ-32R, SOLID-320R(SE), SOLID-320R(OC), SOLID-320R(LX), SOLID-320R(SL), SOLID-320R(UX), SICURIX-320R, SOLID-320R(DL), SOLID-320R(DX), SOLID-320R(LE), SOLID-320R(PAC), SOLID-320R(SRX), SOLID-320R(EB)
Frequency range	:	13.560 2 ㎒ (NFC)
Modulation technique	:	ASK
Number of channels	:	1ch
Power source	:	AC 110 V
Antenna specification	:	PCB Loop antenna
Antenna gain	:	N/A
Software version	:	smart_x2_v0.02.22.bin
Hardware version	:	MAIN_52_PRT_V0.2
Test device serial No.	:	3BID000000591904
Operation temperature	:	-20 ℃ ~ 50 ℃

2.1. Information about derivative model

The difference between basic model and derivative models is:

1) Except for the model name, everything is the same.
SMART-32D, SOLID-320D, N260W, MCP-350D, QUALICA-RD 302D, ID-32D, CP-32D, P-32D, IDZ-32D, SOLID-320D(SE), SOLID-320D(OC), SOLID-320D(LX), SOLID-320D(SL), SOLID-320D(UX), SICURIX-320D, SOLID-320D(DL), SOLID-320D(DX), SOLID-320D(LE), SOLID-320D(PAC), SOLID-320D(SRX), SOLID-320D(EB)

2) It is the same except for the presence or absence of FLIPPER.
SMART-32S, SOLID-320S, N260, MCP-350S, QUALICA-RD 302S, ID-32S, CP-32S, P-32S, IDZ-32S, SOLID-320S(SE), SOLID-320S(OC), SOLID-320S(LX), SOLID-320S(SL), SOLID-320S(UX), SICURIX-320S, SOLID-320S(DL), SOLID-320S(DX), SOLID-320S(LE), SOLID-320S(PAC), SOLID-320S(SRX), SOLID-320S(EB), SMART-32R, SOLID-320R, N260R, MCP-350R, QUALICA-RD 302R, ID-32R, CP-32R, P-32R, IDZ-32R, SOLID-320R(SE), SOLID-320R(OC), SOLID-320R(LX), SOLID-320R(SL), SOLID-320R(UX), SICURIX-320R, SOLID-320R(DL), SOLID-320R(DX), SOLID-320R(LE), SOLID-320R(PAC), SOLID-320R(SRX), SOLID-320R(EB)

2.2. Frequency/channel operations

This device contains the following capabilities:
NFC

Frequency (㎒)
13.560 2

Table 2.2.1. NFC mode

3. Antenna requirement

Requirement of FCC part section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

-The transmitter has permanently attached PCB Loop antenna (internal antenna) on board.

4. Summary of tests

FCC Part section(s)	Parameter	Test Condition	Test results
15.225(a)	In-band Fundamental Emission	Radiated	Pass
15.225(b), (c)	In-band Spurious Emission		Pass
15.225(d) 15.209	Out-of–band Spurious Emission		Pass
15.225(e)	Frequency Stability Tolerance	Conducted	Pass
15.215(c)	20 dB Bandwidth		Pass
15.207(a)	AC Conducted emissions		Pass

Notes: (N/T: Not Tested, N/A: Not Applicable)

1. All modes of operation and data rates were investigated. The test results shown in the following sections represent the worst case emissions.
2. These tests were performed other than open field site, adequate comparison measurements were confirmed against 30 m open field site. Therefore sufficient tests were made to demonstrate that the alternative site produces results that correlate with the ones of tests made in an open field based on KDB 414788.
3. The fundamental of the EUT was investigated in three orthogonal orientations X, Y and Z. It was determined that **X** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **X** orientation
4. The radiated test was performed with and without passive tag. The test results shown in the following sections represent the worst case emissions.
   - Worst Case : Without passive tag
5. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.10 2020

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10 2020.

All measurement uncertainty values are shown with a coverage factor of k=2 to indicated a 95 % level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine compliance.

Parameter	Expanded uncertainty (±)	
Channel Bandwidth	0.1 %	
Occupied Bandwidth	0.1 %	
Radiated Emissions	Below 30 ㎒	2.3 ㏈
	30 ㎒ ~ 1 000 ㎒	2.6 ㏈
	1 000 ㎒ ~ 18 000 ㎒	4.8 ㏈
	Above 18 000 ㎒	4.8 ㏈
Conducted Emissions	150 ㎑ to 30 ㎒	2.9 ㏈

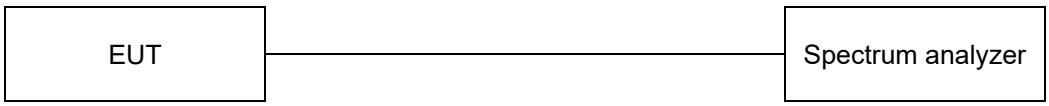
From 2026.02.10

Parameter	Expanded uncertainty (±)	
Channel Bandwidth	0.9 %	
Occupied Bandwidth	0.9 %	
Radiated Emissions	Below 30 ㎒	2.4 ㏈
	30 ㎒ ~ 1 000 ㎒	2.6 ㏈
	1 000 ㎒ ~ 18 000 ㎒	4.7 ㏈
	Above 18 000 ㎒	4.8 ㏈
Conducted Emissions	150 ㎑ to 30 ㎒	2.8 ㏈

6. Test results

6.1. 20 dB Bandwidth

Test setup



Limit

According to §15.215(c), Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated.

Test procedure

ANSI C63.10-2020 - Clause 6.9.2

Test settings

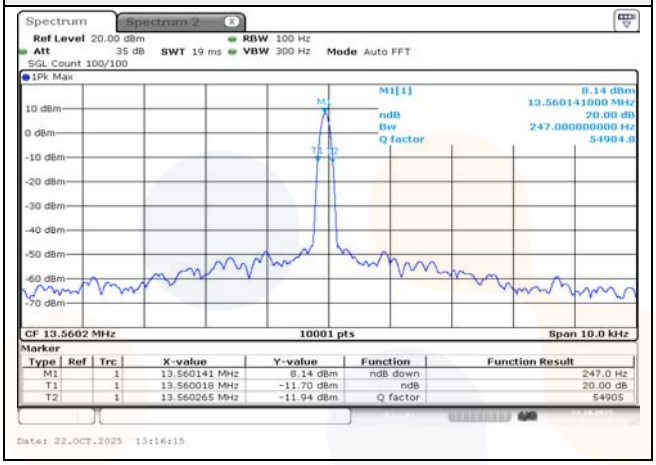
The occupied bandwidth is measured as the width of the spectral envelope of the modulated signal, at an amplitude level reduced from a reference value by a specified ratio (or in decibels, a specified number of dB down from the reference value). Typical ratios, expressed in dB, are −6 dB, −20 dB, and −26 dB, corresponding to 6 dB BW, 20 dB BW, and 26 dB BW, respectively. In this subclause, the ratio is designated by "−xx dB." The reference value is either the level of the unmodulated carrier or the highest level of the spectral envelope of the modulated signal, as stated by the applicable requirement. Some requirements might specify a specific maximum or minimum value for the "−xx dB" bandwidth; other requirements might specify that the "−xx dB" bandwidth be entirely contained within the authorized or designated frequency band.

a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
b) Span: Two times and five times the OBW.
c) RBW = 1 % to 5 % of the OBW and VBW ≥ 3 x RBW
d) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer level for linear operation.
e) The dynamic range of the instrument at the selected RBW shall be more than 10 dB below the target "−xx dB down" requirement; that is, if the requirement calls for measuring the −20 dB OBW, the instrument noise floor at the selected RBW shall be at least 30 dB below the reference value.
f) Detector: peak
g) Trace mode: max hold.
h) Allow the trace to stabilize.
i) Determine the "−xx dB down amplitude" using ((reference value) − xx). Alternatively, this calculation may be made by using the marker-delta function of the instrument.
j) If the reference value is determined by an unmodulated carrier, then turn the EUT modulation ON, and either clear the existing trace or start a new trace on the spectrum analyzer and allow the new trace to stabilize. Otherwise, the trace from step g) shall be used for step j).
k) Place two markers, one at the lowest frequency and the other at the highest frequency of the envelope of the spectral display, such that each marker is at or slightly below the "−xx dB down amplitude" determined in step h). If a marker is below this "−xx dB down amplitude" value, then it shall be as close as possible to this value. The occupied bandwidth is the frequency difference between the two markers. Alternatively, set a marker at the lowest frequency of the envelope of the spectral display, such that the marker is at or slightly below the "−xx dB down amplitude" determined in step h). Reset the marker-delta function and move the marker to the other side of the emission until the delta marker amplitude is at the same level as the reference marker amplitude. The marker-delta frequency reading at this point is the specified emission bandwidth.

Test results

Frequency [㎒]	20 ㏈ Bandwidth [㎒]		Limit [㎒]	20 ㏈ Bandwidth [㎑]
13.560 2	Lowest Frequency	13.560 0	13.110 0	0.25
	Highest Frequency	13.560 3	14.010 0	

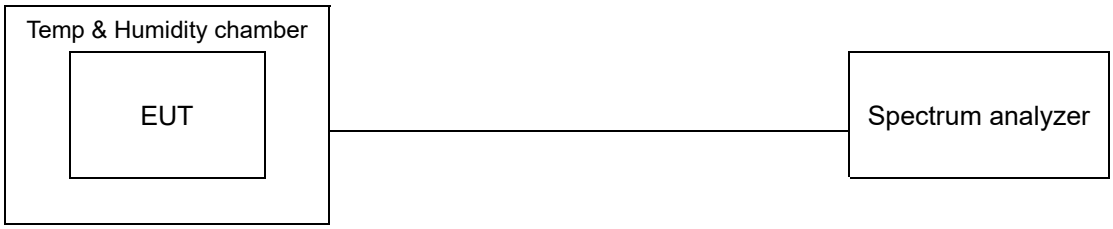
20㏈ Bandwidth



Note:
Because the measured signal is CW/CW-like, adjusting the RBW per C63.10 would not be practical since measured bandwidth will always follow the RBW and the result will be approximately twice the RBW

6.2. Frequency tolerance

Test setup



Limit

According to 15.225 (e), The frequency tolerance of the carrier signal shall be maintained within ±0.01 % of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 degrees C. For battery operated equipment, the equipment tests shall be performed using a new battery.

Test procedure

ANSI C63.10-2020 - Clause 6.8.1

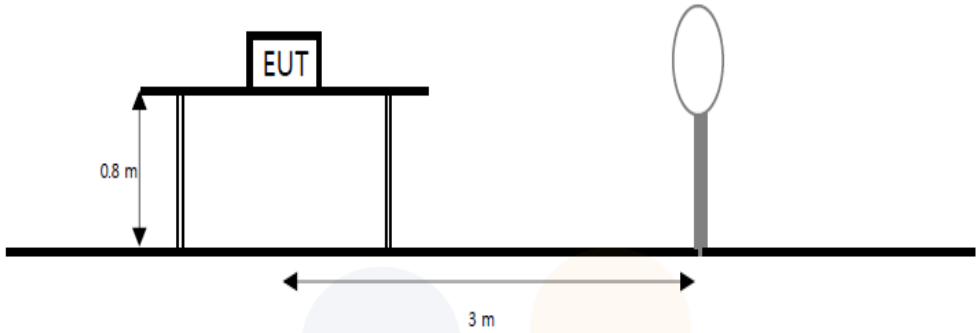
Test results

Voltage	Voltage	TEMP	Maintaining time	Measure frequency	Frequency deviation	Deviation
[%]	[V]	[℃]		[㎐]	[㎐]	[%]
100	110.00	20(Ref.)	Startup	13 560 186	14.0	-0.000 10
			2 minutes	13 560 160	40.0	-0.000 30
			5 minutes	13 560 150	50.0	-0.000 37
			10 minutes	13 560 140	60.0	-0.000 44
		-20	Startup	13 560 285	-85.0	0.000 63
			2 minutes	13 560 292	-92.0	0.000 68
			5 minutes	13 560 287	-87.0	0.000 64
			10 minutes	13 560 280	-80.0	0.000 59
		-10	Startup	13 560 294	-94.0	0.000 69
			2 minutes	13 560 286	-86.0	0.000 63
			5 minutes	13 560 277	-77.0	0.000 57
			10 minutes	13 560 266	-66.0	0.000 49
		0	Startup	13 560 284	-84.0	0.000 62
			2 minutes	13 560 267	-67.0	0.000 49
			5 minutes	13 560 253	-53.0	0.000 39
			10 minutes	13 560 239	-39.0	0.000 29
		10	Startup	13 560 268	-68.0	0.000 50
			2 minutes	13 560 250	-50.0	0.000 37
			5 minutes	13 560 236	-36.0	0.000 27
			10 minutes	13 560 220	-20.0	0.000 15
		20	Startup	13 560 186	14.0	-0.000 10
			2 minutes	13 560 160	40.0	-0.000 30
			5 minutes	13 560 150	50.0	-0.000 37
			10 minutes	13 560 140	60.0	-0.000 44
		30	Startup	13 560 192	8.0	-0.000 06
			2 minutes	13 560 186	14.0	-0.000 10
			5 minutes	13 560 175	25.0	-0.000 18
			10 minutes	13 560 168	32.0	-0.000 24
		40	Startup	13 560 121	79.0	-0.000 58
			2 minutes	13 560 109	91.0	-0.000 67
			5 minutes	13 560 106	94.0	-0.000 69
			10 minutes	13 560 100	100.0	-0.000 74
		50	Startup	13 560 092	108.0	-0.000 80
			2 minutes	13 560 076	124.0	-0.000 91
			5 minutes	13 560 078	122.0	-0.000 90
			10 minutes	13 560 081	119.0	-0.000 88
85	93.50	20	Startup	13 560 174	26.0	-0.000 19
			2 minutes	13 560 159	41.0	-0.000 30
			5 minutes	13 560 149	51.0	-0.000 38
			10 minutes	13 560 139	61.0	-0.000 45
115	126.50	20	Startup	13 560 168	32.0	-0.000 24
			2 minutes	13 560 158	42.0	-0.000 31
			5 minutes	13 560 148	52.0	-0.000 38
			10 minutes	13 560 141	59.0	-0.000 44

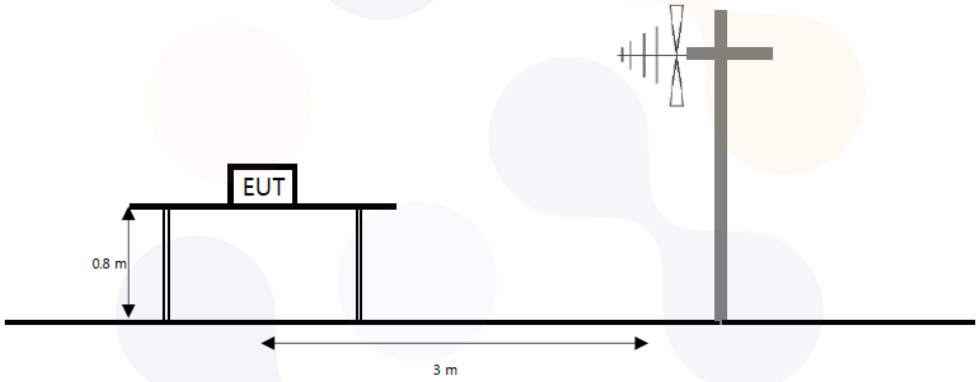
6.3. Radiated spurious emissions

Test setup

The diagram below shows the test setup that is utilized to make the measurements for emission from 9 ㎑ to 30 ㎒ Emissions



The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



Limit

15.225 (a), The field strength of any emission within the band 13.553-13.567 ㎒ shall not exceed 15, 848 microvolts/meter at 30 meters.

15.225 (b), With in the bands 13.410-13.553 ㎒ and 13.567-13.710 ㎒, the field strength of any emissions shall not exceed 334 microvolts/meter at 30 meters.

15.225 (c), With in the bands 13.110-13.410 ㎒ and 13.710-14.010 ㎒, the field strength of any emissions shall not exceed 106 microvolts/meter at 30 meters.

15.225 (d), The Field Strength of any emissions appearing outside of the 13.110-14.010 ㎒ band shall not exceed the general radiated emission limits in 15.209.

Frequency (㎒)	Field Strength (㎶/m)	Measurement distance (meters)
0.009-0.490	2400/F(㎑)	300
0.490-1.705	24000/F(㎑)	30
1.705-30.0	30(29.54 dB㎶/m)	30
30.0-88.0	100(40 dB㎶/m)	3
88-216	150(43.5 dB㎶/m)	3
216-960	200 (46 dB㎶/m)	3
Above 960	500 (53.98 dB㎶/m)	3

Test procedure

ANSI C63.10-2020 - Section 6.4, 6.5

Test settings

1. Analyzer center frequency was set to the frequency of the radiated spurious emission of interest
2. RBW = as specified in table
3. VBW ≥ 3 x RBW
4. Detector = peak
5. Sweep time = No faster than coupled (auto) time
6. Trace mode = max hold
7. Trace was allowed to stabilize

Table. RBW as a function of frequency

Frequency	RBW
9 ㎑ to 150 ㎑	200 ㎐ to 300 ㎐
0.15 ㎒ to 30 ㎒	9 ㎑ to 10 ㎑
30 ㎒ to 1 000 ㎒	100 ㎑ to 120 ㎑
> 1 000 ㎒	1 ㎒

Notes:

1. *f* <30 ㎒, extrapolation factor of 40 dB/decade of distance. $F_d = 40\log(D_m/D_s)$
   f ≥30 ㎒, extrapolation factor of 20 dB/decade of distance. $F_d = 20\log(D_m/D_s)$
   Where:
   F_d= Distance factor in dB
   D_m= Measurement distance in meters
   D_s= Specification distance in meters
2. Measurements were performed at 3m and the data was extrapolated to the specified measurement distance of 30m using the square of an inverse linear distance extrapolation factor (40 dB/decade) as specified in § 15.31(f)(2). Extrapolation Factor = 40 log10(30/3) = 40 dB.
3. (dB) = Antenna factor(dB/m) + Cable loss(dB) + or Amp. gain(dB) - or F_d(dB)
4. Result = Reading + Cable loss + Amp gain + Ant. factor - Distance factor
5. The worst-case emissions are reported however emissions whose levels were not within 20 dB of respective limits were not reported.
6. All measurements were recorded using a spectrum analyzer employing a quasi-peak detector.
7. Below 30 ㎒ frequency range, all orientations about parallel, perpendicular, and ground-parallel were investigated then reported and the worse orientations of Face-on and Face-off were set for final test.
8. Face-on = Parallel, Face-off = Perpendicular
9. [1)] means restricted band

[SMART-32]

Test results for fundamental

15.225 (a) 13.553-13.567 ㎒

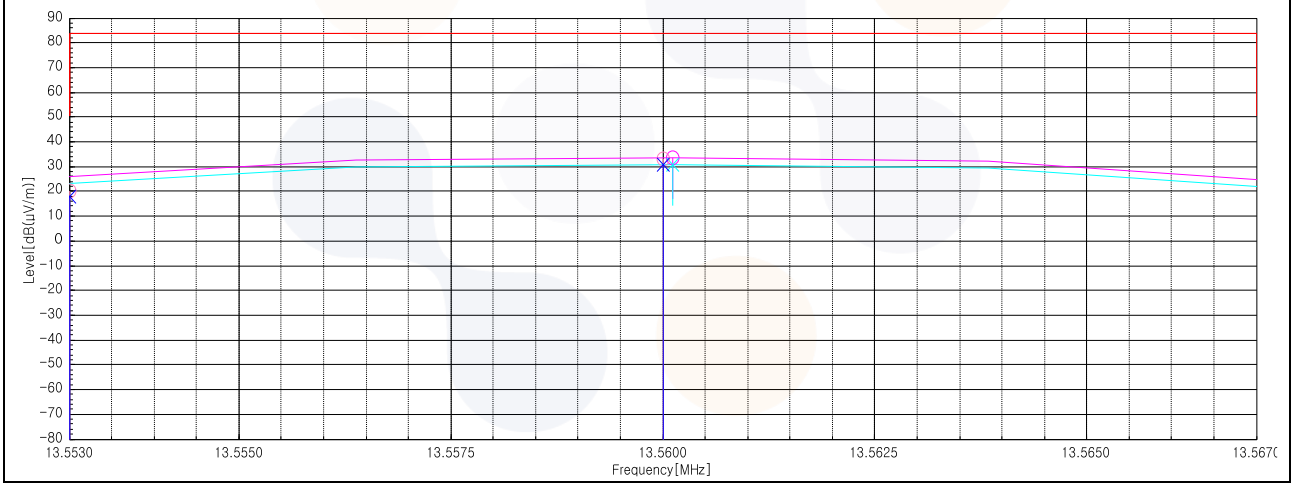
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.56	85.10	20.57	-32.49	40.00	33.18	84.00	50.82

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.56	82.60	20.57	-32.49	40.00	30.68	84.00	53.32

Face-on/Face-off



Test results for in-band & out-band (9 ㎑ to 30 ㎒)

15.225 (b,c) 13.110-14.010 ㎒

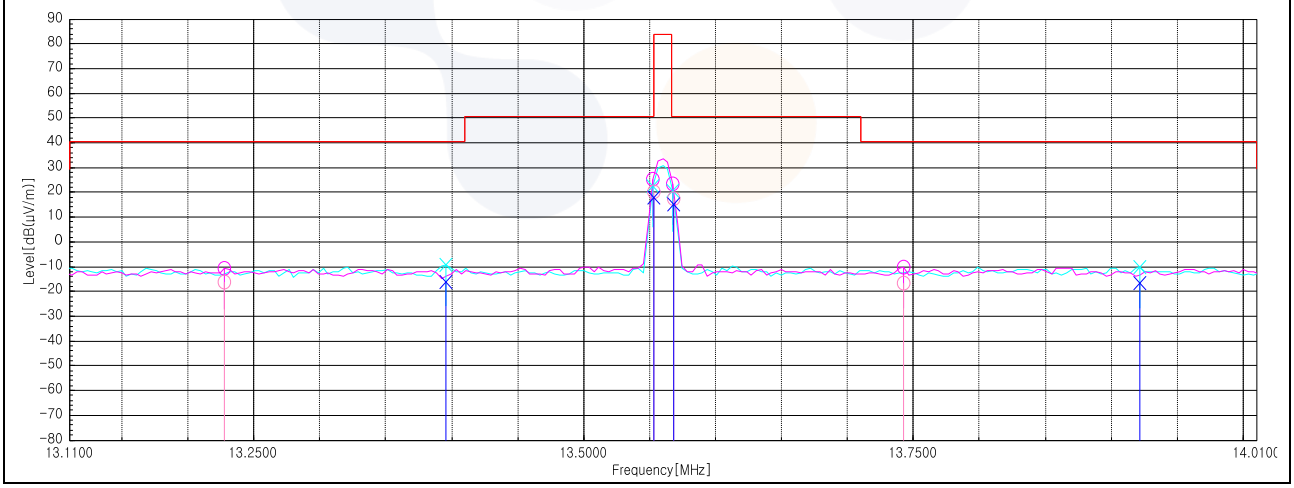
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.228	35.60	20.56	-32.51	40.00	-16.35	40.50	56.85
13.553	72.10	20.57	-32.49	40.00	20.18	50.50	30.32
13.568	69.50	20.57	-32.49	40.00	17.58	50.50	32.92
13.743	35.40	20.57	-32.48	40.00	-16.51	40.50	57.01

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.396	35.90	20.57	-32.50	40.00	-16.03	40.50	56.53
13.553	69.70	20.57	-32.49	40.00	17.78	50.50	32.72
13.568	66.90	20.57	-32.49	40.00	14.98	50.50	35.52
13.922	35.20	20.58	-32.46	40.00	-16.68	40.50	57.18

Face-on/Face-off



Test results (9 ㎑ to 30 ㎒)

15.225 (d) 0.009-30 ㎒

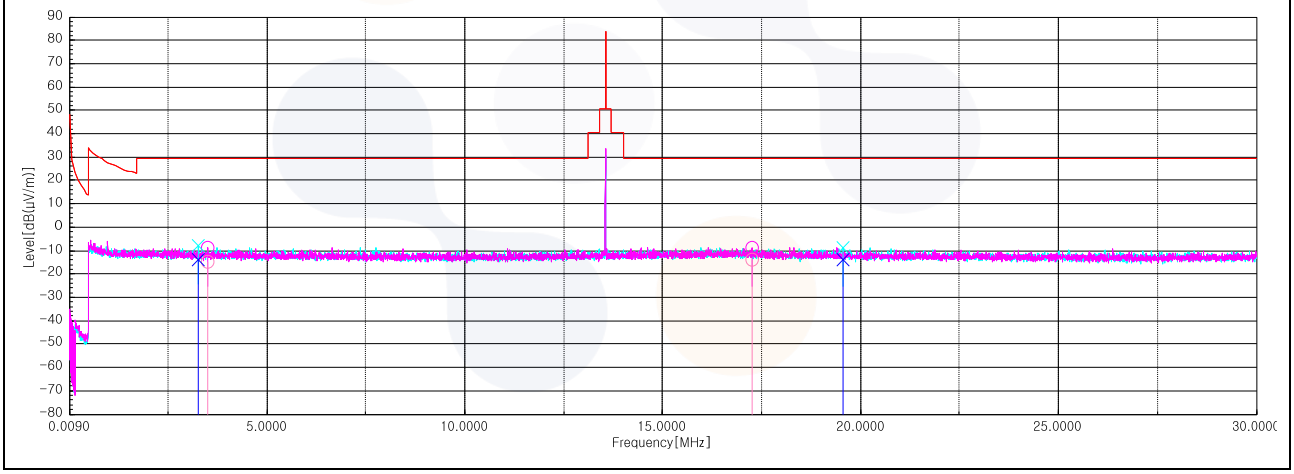
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
3.52	37.20	20.43	-32.41	40.00	-14.78	29.54	44.32
17.25	37.70	20.74	-32.45	40.00	-14.01	29.54	43.55

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
3.28	38.10	20.41	-32.39	40.00	-13.88	29.54	43.42
19.57	37.60	20.87	-32.50	40.00	-14.03	29.54	43.57

Face-on/Face-off

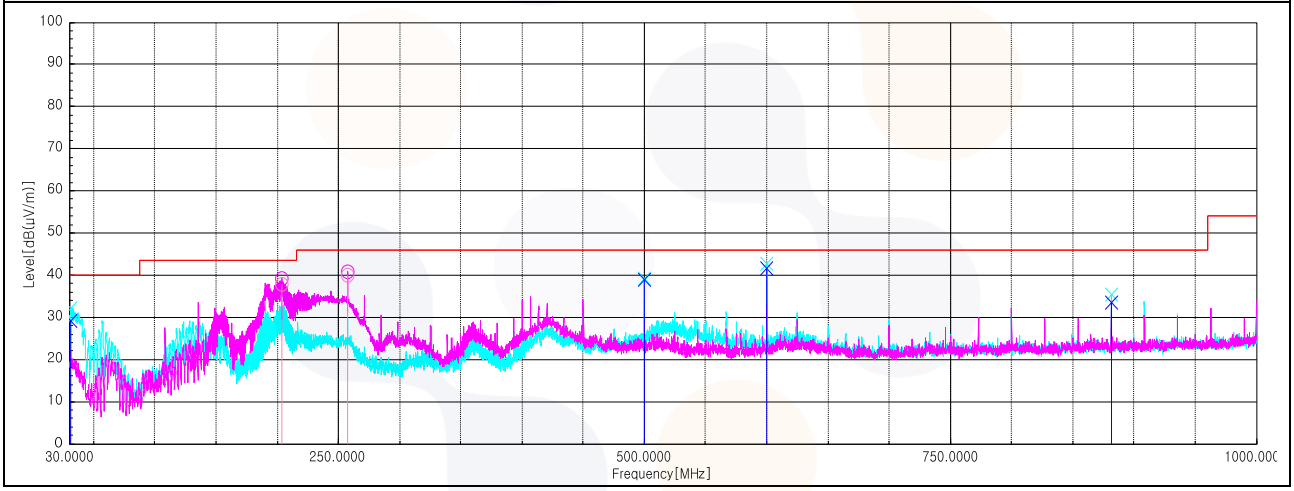


Test results (Below 1 000 ㎒)

15.225 (d) 30-1 000 ㎒

Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
36.91	V	40.10	21.23	-32.26	-	29.07	40.00	10.93
161.19	H	54.10	15.90	-31.62	-	38.38	43.50	5.12
271.17[1)]	H	47.50	18.70	-30.90	-	35.30	46.00	10.70
499.97	V	47.60	23.50	-30.75	-	40.35	46.00	5.65
525.06	V	42.10	23.30	-30.32	-	35.08	46.00	10.92
908.58	H	36.80	26.50	-28.63	-	34.67	46.00	11.33

Horizontal/Vertical



[Derivative model: SMART-32S]

Test results for fundamental

15.225 (a) 13.553-13.567 ㎒

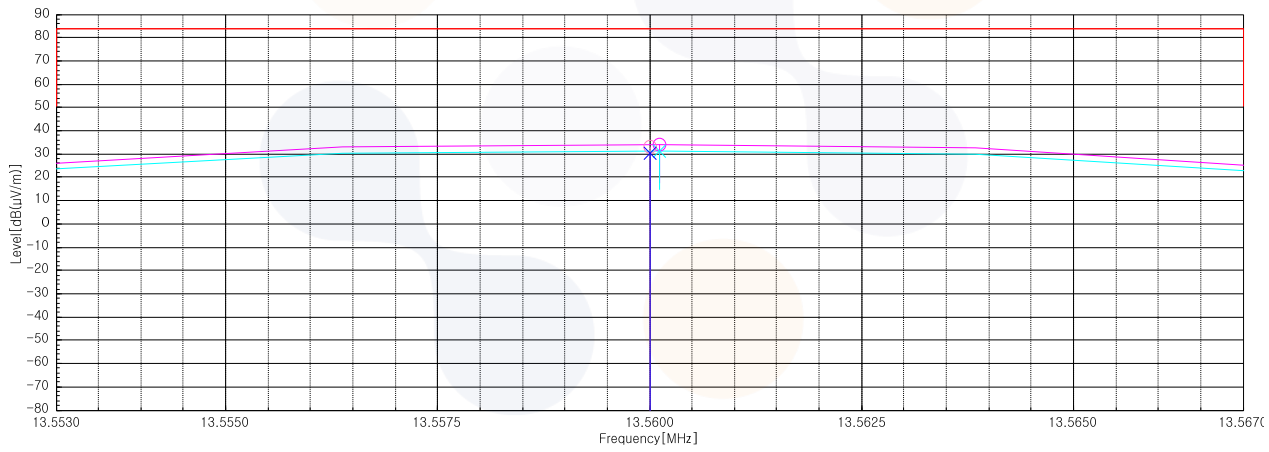
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.56	84.90	20.57	-32.49	40.00	32.98	84.00	51.02

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.56	82.30	20.57	-32.49	40.00	30.38	84.00	53.62

Face-on/Face-off



Test results for in-band & out-band (9 ㎑ to 30 ㎒)

15.225 (b,c) 13.110-14.010 ㎒

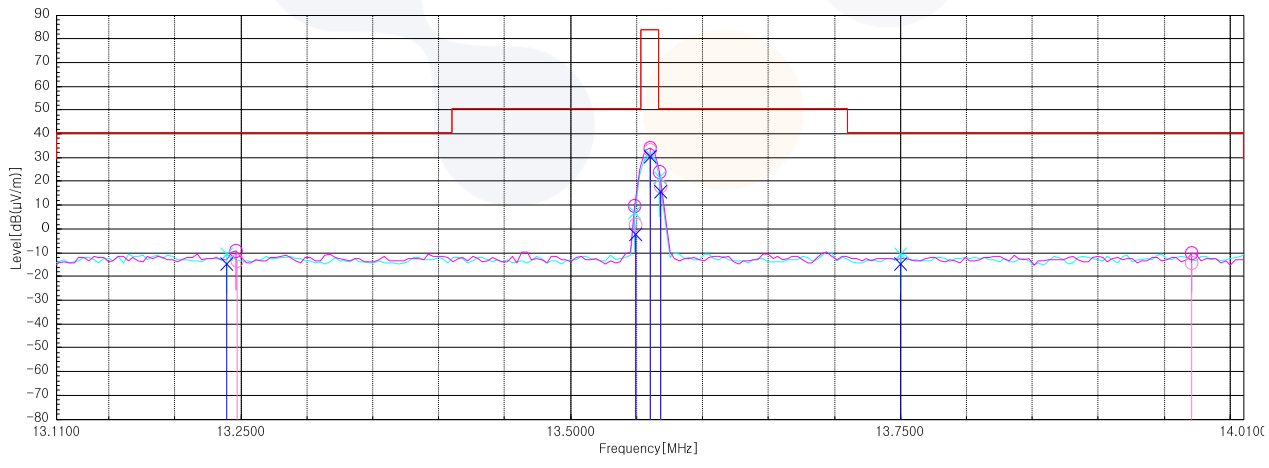
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.247	38.40	20.56	-32.51	40.00	-13.55	40.50	54.05
13.549	53.60	20.57	-32.49	40.00	1.68	50.50	48.82
13.568	69.90	20.57	-32.49	40.00	17.98	50.50	32.52
13.971	37.50	20.58	-32.46	40.00	-14.38	40.50	54.88

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.239	36.90	20.56	-32.51	40.00	-15.05	40.50	55.55
13.549	49.50	20.57	-32.49	40.00	-2.42	50.50	52.92
13.568	67.30	20.57	-32.49	40.00	15.38	50.50	35.12
13.750	37.00	20.58	-32.48	40.00	-14.90	40.50	55.40

Face-on/Face-off



Test results (9 ㎑ to 30 ㎒)

15.225 (d) 0.009-30 ㎒

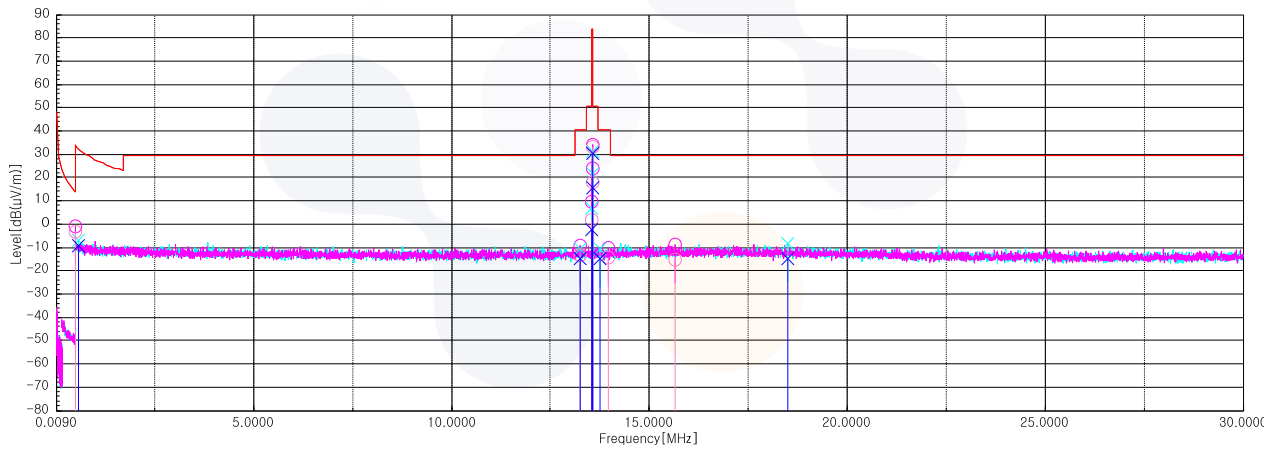
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
0.50	49.30	20.20	-32.69	40.00	-3.19	33.60	36.79
15.66	37.50	20.64	-32.41	40.00	-14.27	29.54	43.81

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
0.58	43.30	20.22	-32.69	40.00	-9.17	32.40	41.57
18.50	36.60	20.81	-32.48	40.00	-15.07	29.54	44.61

Face-on/Face-off

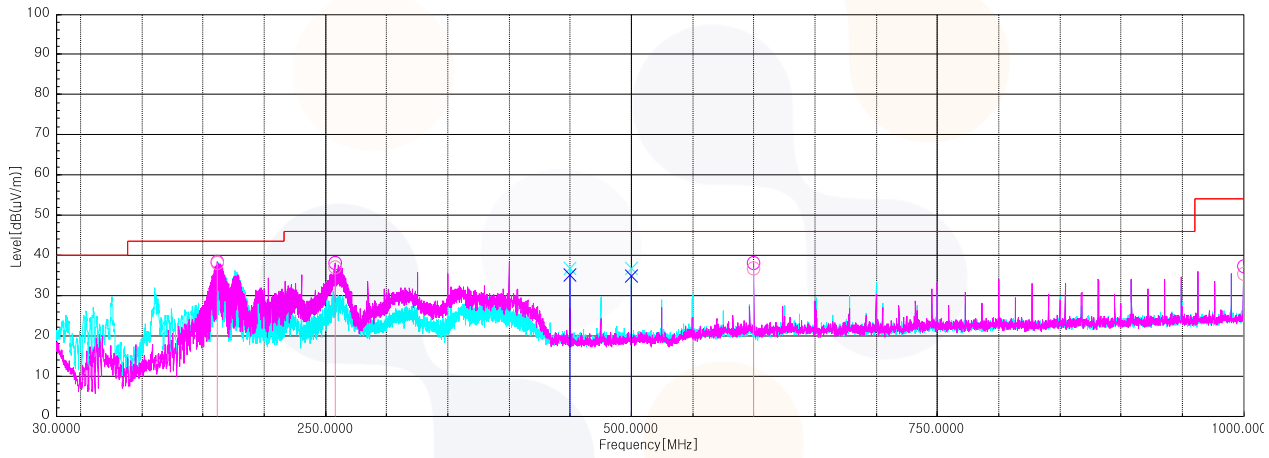


Test results (Below 1 000 ㎒)

15.225 (d) 30-1 000 ㎒

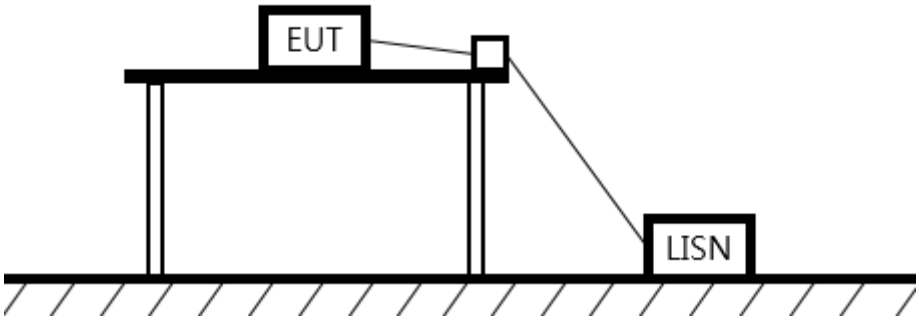
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
161.80	H	53.70	15.90	-31.61	-	37.99	43.52	5.53
257.59[1)]	H	48.70	19.34	-30.98	-	37.06	46.02	8.96
450.01	V	43.20	22.70	-30.80	-	35.10	46.02	10.92
499.97	V	42.10	23.50	-30.75	-	34.85	46.02	11.17
600.00	H	42.60	24.50	-30.43	-	36.67	46.02	9.35
1000.00[1)]	H	35.40	27.30	-27.41	-	35.29	54.00	18.71

Horizontal/Vertical



6.4. AC Conducted emission

Test setup



Limit

According to 15.207(a),

for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50uH/50 ohm line impedance stabilization network (LISN). Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequencies ranges.

Frequency of Emission (㎒)	Conducted limit (dB㎶/m)	
	Quasi-peak	Average
0.15 – 0.50	66 - 56*	56 - 46*
0.50 – 5.00	56	46
5.00 – 30.0	60	50

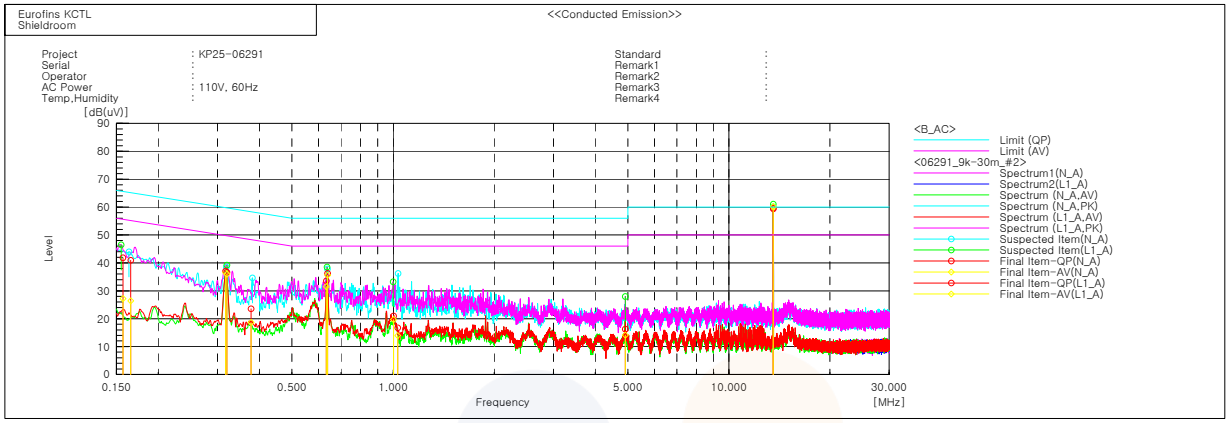
Measurement procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 ㎝ in which is located 40 ㎝ away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a spectrum analyzer or an EMI/Field Intensity Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 ㎒ to 30 ㎒.
5. The measurements were made with the detector set to peak amplitude within a bandwidth of 10 ㎑ or to quasi-peak and average within a bandwidth of 9 ㎑. The EUT was in transmitting mode during the measurements.

Test results

[SMART-32]

[Tests with the antenna connected]



Final Result

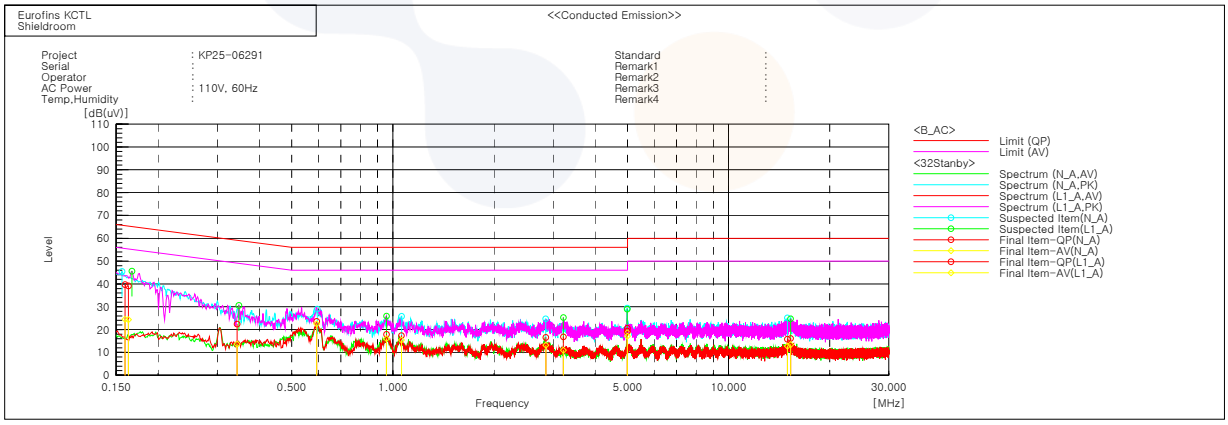
--- N_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.16546	30.6	16.1	10.3	40.9	26.4	65.2	55.2	24.3	28.8
2	0.3174	27.0	26.5	10.0	37.0	36.5	59.8	49.8	22.8	13.3
3	0.3776	13.5	8.5	10.1	23.6	18.6	58.3	48.3	34.7	29.7
4	0.63268	23.4	21.4	10.1	33.5	31.5	56.0	46.0	22.5	14.5
5	1.03293	6.7	3.9	10.1	16.8	14.0	56.0	46.0	39.2	32.0
6	13.56015	48.8	49.2	10.6	59.4	59.8	60.0	50.0	0.6	-9.8

--- L1_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15695	31.7	17.0	10.1	41.8	27.1	65.6	55.6	23.8	28.5
2	0.32013	26.6	26.0	10.0	36.6	36.0	59.7	49.7	23.1	13.7
3	0.638	26.1	25.5	10.1	36.2	35.6	56.0	46.0	19.8	10.4
4	1.00246	10.8	9.6	10.1	20.9	19.7	56.0	46.0	35.1	26.3
5	4.91422	6.3	4.1	10.0	16.3	14.1	56.0	46.0	39.7	31.9
6	13.56009	48.9	49.5	10.7	59.6	60.2	60.0	50.0	0.4	-10.2

[Retest with a dummy load]



Final Result

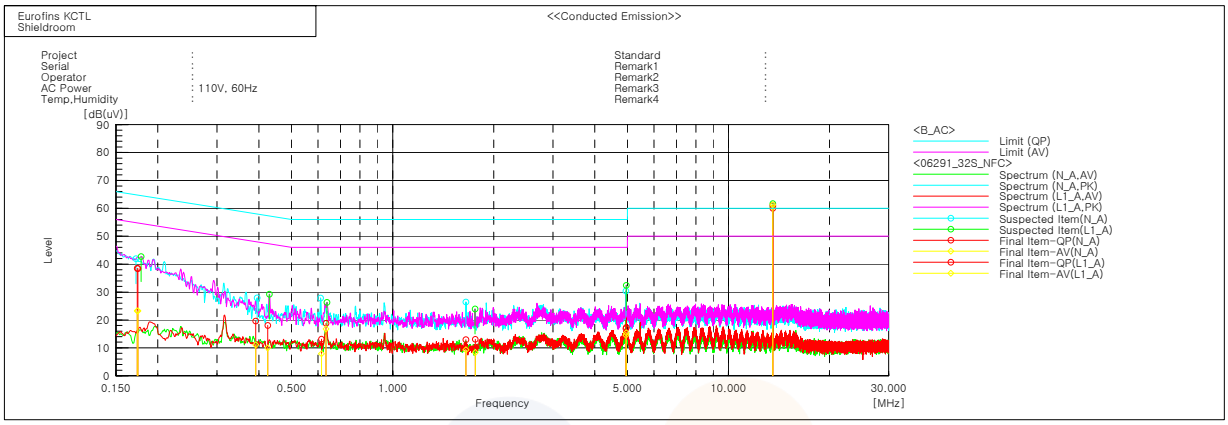
--- N_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.15946	29.5	14.4	10.1	39.6	24.5	65.5	55.5	25.9	31.0
2	0.59353	13.5	12.5	10.0	23.5	22.5	56.0	46.0	32.5	23.5
3	1.06113	7.5	5.5	9.9	17.4	15.4	56.0	46.0	38.6	30.6
4	2.85551	6.6	3.2	10.0	16.6	13.2	56.0	46.0	39.4	32.8
5	4.99279	10.4	8.5	10.1	20.5	18.6	56.0	46.0	35.5	27.4
6	14.95864	5.2	2.2	10.6	15.8	12.8	60.0	50.0	44.2	37.2

--- L1_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.16322	29.0	14.2	10.1	39.1	24.3	65.3	55.3	26.2	31.0
2	0.34375	12.5	3.7	9.9	22.4	13.6	59.1	49.1	36.7	35.5
3	0.95731	8.0	6.1	9.9	17.9	16.0	56.0	46.0	38.1	30.0
4	3.22179	6.8	1.0	10.0	16.8	11.0	56.0	46.0	39.2	35.0
5	4.99478	9.2	7.0	10.1	19.3	17.1	56.0	46.0	36.7	28.9
6	15.29408	5.4	2.7	10.7	16.1	13.4	60.0	50.0	43.9	36.6

[Derivative model: SMART-32S]
[Tests with the antenna connected]



Final Result

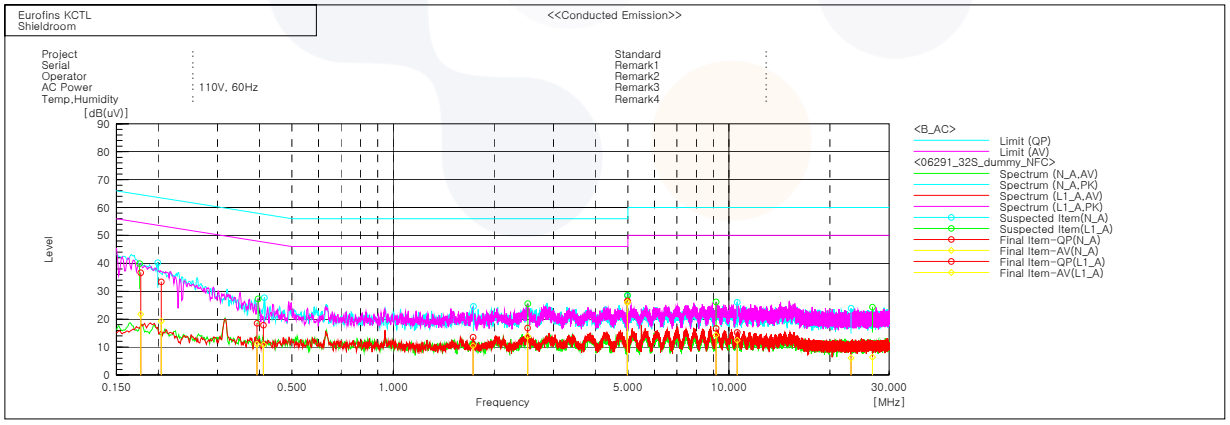
--- N_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17445	27.8	12.6	10.6	38.4	23.2	64.7	54.7	26.3	31.5
2	0.39124	9.1	0.6	10.5	19.6	11.1	58.0	48.0	38.4	36.9
3	0.61359	2.6	-2.6	10.5	13.1	7.9	56.0	46.0	42.9	38.1
4	1.65208	2.6	-1.0	10.3	12.9	9.3	56.0	46.0	43.1	36.7
5	4.95001	6.7	4.3	10.2	16.9	14.5	56.0	46.0	39.1	31.5
6	13.56006	49.0	49.3	11.0	60.0	60.3	60.0	50.0	0.0	-10.3

--- L1_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.1736	27.9	12.6	10.6	38.5	23.2	64.8	54.8	26.3	31.6
2	0.42475	7.5	-0.5	10.5	18.0	10.0	57.4	47.4	39.4	37.4
3	0.63387	8.3	6.2	10.5	18.8	16.7	56.0	46.0	37.2	29.3
4	1.7635	2.8	-1.9	10.2	13.0	8.3	56.0	46.0	43.0	37.7
5	4.96168	7.1	5.2	10.2	17.3	15.4	56.0	46.0	38.7	30.6
6	13.56006	49.9	50.2	11.1	61.0	61.3	60.0	50.0	-1.0	-11.3

[Retest with a dummy load]



Final Result

--- N_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.20417	23.0	8.9	10.4	33.4	19.3	63.4	53.4	30.0	34.1
2	0.41135	7.3	0.3	10.5	17.8	10.8	57.6	47.6	39.8	36.8
3	1.73118	3.3	0.3	10.2	13.5	10.5	56.0	46.0	42.5	35.5
4	4.98793	16.1	15.8	10.2	26.3	26.0	56.0	46.0	29.7	20.0
5	10.58249	4.3	1.5	10.9	15.2	12.4	60.0	50.0	44.8	37.6
6	23.10504	-0.9	-5.3	11.4	10.5	6.1	60.0	50.0	49.5	43.9

--- L1_A Phase ---

No.	Frequency [MHz]	Reading QP [dB(uV)]	Reading CAV [dB(uV)]	c.f [dB]	Result QP [dB(uV)]	Result CAV [dB(uV)]	Limit QP [dB(uV)]	Limit AV [dB(uV)]	Margin QP [dB]	Margin CAV [dB]
1	0.17734	26.0	11.2	10.6	36.6	21.8	64.6	54.6	28.0	32.8
2	0.39357	8.0	0.5	10.5	18.5	11.0	58.0	48.0	39.5	37.0
3	2.51488	6.6	3.6	10.2	16.8	13.8	56.0	46.0	39.2	32.2
4	4.98767	16.3	15.9	10.2	26.5	26.1	56.0	46.0	29.5	19.9
5	9.15742	5.9	3.5	10.8	16.7	14.3	60.0	50.0	43.3	35.7
6	26.75446	-0.6	-5.1	11.5	10.9	6.4	60.0	50.0	49.1	43.6

7. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Spectrum Analyzer	R&S	FSV40	100988	26.04.24
Amplifier	SONOMA INSTRUMENT	310N	421910	26.07.01
Bilog Antenna	Teseq GmbH	CBL 6112D	61521	26.12.11
Loop Antenna	R&S	HFH2-Z2	100355	26.06.25
AC/DC Power Supply	KIKUSUI	PCR2000W	GB001619	26.06.30
Vector Signal Generator	R&S	SMBV100A	257566	26.07.01
Controller	INNCO SYSTEMS	CO3000	1442/54370322/P	-
Antenna Mast	INNCO SYSTEMS	MA4640-XP-ET	AM002	-
Turn Device	INNCO SYSTEMS	DS1200-S-1t	1	-
Spectrum Analyzer	R&S	FSV30	100807	26.07.01
Temp & Humid Chamber	Myeongseong R&P	CTHC-50P-DT	20150824-1	26.09.29
TWO-LINE V-NETWORK	R&S	ENV216	101358	26.04.22
EMI TEST RECEIVER	R&S	ESCI3	101408	26.08.11

End of test report