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TEST REPORT

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KCTL

1. Client

- Name : Samsung Electronics Co., Ltd.
- Address : 129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
- Date of Receipt : 2020-12-03

2. Use of Report : Certification

3. Name of Product / Model : Mobile Phone / SM-G525F/DS

4. Manufacturer / Country of Origin : Samsung Electronics Co., Ltd. / Vietnam

5. FCC ID : A3LSMG525F

6. Date of Test : 2020-12-11 to 2021-01-11

7. Location of Test : ■ Permanent Testing Lab ☐ On Site Testing (Address: Address of testing location)

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 : Taeyoung Kim (Signature)	Technical Manager Name : Seungyong Kim (Signature)

2021-01-14

KCTL Inc.

As a test result of the sample which was submitted from the client, this report does not guarantee the whole product quality. This test report should not be used and copied without a written agreement by KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2021-01-14	Originally issued	-

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General remarks for test reports

Nothing significant to report.

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1. General information

Client	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Manufacturer	:	Samsung Electronics Co., Ltd.
Address	:	129, Samsung-ro, Yeongtong-gu, Suwon-si, Gyeonggi-do, 16677, Rep. of Korea
Factory	:	Samsung Electronics Vietnam Thai Nguyen Co., Ltd.
Address	:	KCN Yen Binh I, Pho Yen, Thai Nguyen, VNM, Thai Nguyen Thai Nguyen, VNM
Laboratory	:	KCTL Inc.
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 Industry Canada Registration No. : 8035A KOLAS No.: KT231

2. Device information

Equipment under test	:	Mobile Phone
Model	:	SM-G525F/DS
Derivative model	:	SM-G525F
Modulation technique	:	Bluetooth(BDR/EDR)_GFSK, π/4DQPSK, 8DPSK Bluetooth(BLE)_GFSK WIFI(802.11a/b/g/n/ac)_DSSS, OFDM LTE_QPSK, 16QAM WCDMA_QPSK GSM_GMSK, 8-PSK NFC_ASK
Number of channels	:	Bluetooth(BDR/EDR)_79 ch / Bluetooth(BLE)_40 ch 802.11b/g/n_HT20 : 13 ch UNII-1: 4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) UNII-2A: 4 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) UNII-2C: 12 ch (20 ㎒), 6 ch (40 ㎒), 3 ch (80 ㎒) UNII-3: 5 ch (20 ㎒), 2 ch (40 ㎒), 1 ch (80 ㎒) NFC: 1 ch
Power source	:	DC 3.85 ㏸
Antenna specification	:	LTE/WCDMA/GSM_SCI Antenna WIFI/Bluetooth(BDR/EDR/BLE)_SCI Antenna NFC_FPCB Antenna

Antenna gain	:	WIFI/Bluetooth(BDR/EDR/BLE)_-4.00 dBi
		UNII-1 : -4.30 dBi
		UNII-2A : -4.50 dBi
		UNII-2C : -4.30 dBi
		UNII-3 : -4.70 dBi
Frequency range	:	Bluetooth(BDR/EDR/BLE)_2 402 ㎒ ~ 2 480 ㎒
		2 412 ㎒ ~ 2 472 ㎒ (802.11b/g/n_HT20)
		UNII-1: 5 180 ㎒ ~ 5 240 ㎒ (802.11a/n/ac_HT20/VHT20)
		UNII-1: 5 190 ㎒ ~ 5 230 ㎒ (802.11n/ac_HT40/VHT40)
		UNII-1: 5 210 ㎒ (802.11ac_VHT80)
		UNII-2A: 5 260 ㎒ ~ 5 320 ㎒ (802.11a/n/ac_HT20/VHT20)
		UNII-2A: 5 270 ㎒ ~ 5 310 ㎒ (802.11n/ac_HT40/VHT40)
		UNII-2A: 5 290 ㎒ (802.11ac_VHT80)
		UNII-2C: 5 500 ㎒ ~ 5 720 ㎒ (802.11a/n/ac_HT20/VHT20)
		UNII-2C: 5 510 ㎒ ~ 5 710 ㎒ (802.11n/ac_HT40/VHT40)
		UNII-2C: 5 530 ㎒ ~ 5 690 ㎒ (802.11ac_VHT80)
		UNII-3: 5 745 ㎒ ~ 5 825 ㎒ (802.11a/n/ac_HT20/VHT20)
		UNII-3: 5 755 ㎒ ~ 5 795 ㎒ (802.11n/ac_HT40/VHT40)
		UNII-3: 5 775 ㎒ (802.11ac_VHT80)
		LTE Band 2_1 850.7 ㎒ ~ 1 909.3 ㎒
		LTE Band 4_1 710.7 ㎒ ~ 1 754.3 ㎒
		LTE Band 5_824.7 ㎒ ~ 848.3 ㎒
		LTE Band 12_699.7 ㎒ ~ 715.3 ㎒
		LTE Band 17_706.5 ㎒ ~ 713.5 ㎒
		LTE Band 26_824.7 ㎒ ~ 848.3 ㎒, 814.7 ㎒ ~ 823.3 ㎒
		LTE Band 41_2 498.5 ㎒ ~ 2 687.5 ㎒
		LTE Band 66_1 710.7 ㎒ ~ 1 779.3 ㎒
		GSM 850_824.2 ㎒ ~ 848.8 ㎒
		GSM 1900_1 850.2 ㎒ ~ 1 909.8 ㎒
		WCDMA 850_826.4 ㎒ ~ 846.6 ㎒
		WCDMA 1700_1 712.4 ㎒ ~ 1 752.6 ㎒
		WCDMA 1900_1 852.4 ㎒ ~ 1 907.6 ㎒
		NFC_13.56 ㎒
Software version	:	G525F.001
Hardware version	:	REV0.1
Test device serial No.	:	Conducted(R38NB03HNYF. R38NB03HNBK) Radiated(R38NB03HNMW)
Operation temperature	:	-30 ℃ ~ 50 ℃

Note. The Product equality letter includes detailed information about the differences between basic and derivative model.

2.1. Frequency/channel operations

This device contains the following capabilities:
WiFi (802.11a/b/g/n/ac), Bluetooth (BDR/EDR/BLE), NFC
LTE Band 2, LTE Band 4, LTE Band 5, LTE Band 12, LTE Band 17, LTE Band 26, LTE Band 41, LTE Band 66, GSM 850, GSM 1900, WCDMA 850, WCDMA 1700, WCDMA 1900

Ch.	Frequency (㎒)
01	13.56

Table 2.1.1. NFC

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 FPCB 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)	In-band Spurious Emission		Pass
15.225(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:

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 **Z** orientation was worst-case orientation. Therefore, all final radiated testing was performed with the EUT in **Z** orientation
4. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.10-2013
5. All the radiated tests have been performed several case.
   (Stand-alone, with TA, with Earphone)
   Worst case: Stand-alone
6. Radiated(fundamental level and spurious emissions) tests were performed both without reading a passive tag condition[test mode] and with reading a passive tag condition
   - Worst case : Without passive tag

5. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.10-2013.

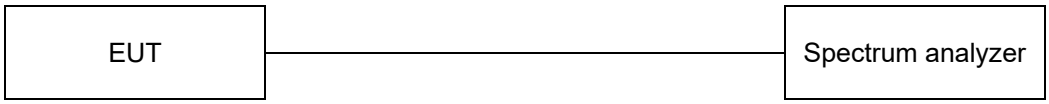
All measurement uncertainty values are shown with a coverage factor of *k*=2 to indicated a 95 % level of confidence. The measurement data shown herein meets of exceeds the U_{CISPR} measurement uncertainty values specified in CISPR 16-4-2 and thus, can be compared directly to specified limits to determine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

Parameter	Expanded uncertainty (±)	
Radiated spurious emissions	9 ㎑ ~ 30 ㎒:	2.3 dB
	30 ㎒ ~ 300 ㎒	5.4 dB
	300 ㎒ ~ 1 000 ㎒	5.5 dB
Conducted emissions	9 ㎑ ~ 150 ㎑	3.7 dB
	150 ㎑ ~ 30 ㎒	3.3 dB

6. Test results

6.1. 20 dB Bandwidth & 99% 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 - Section 6.9.2

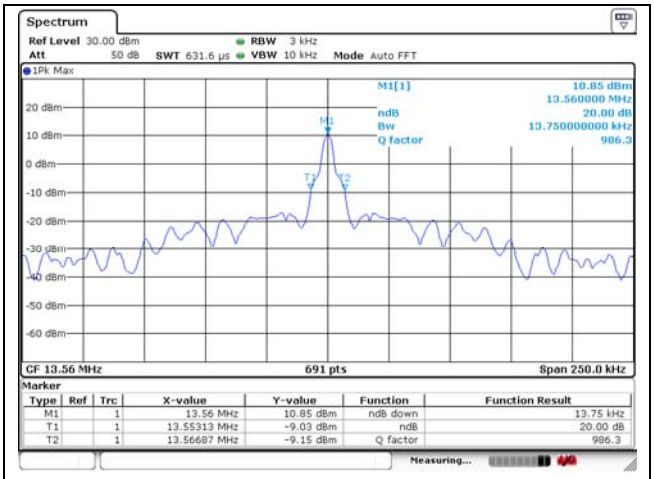
Test settings

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.

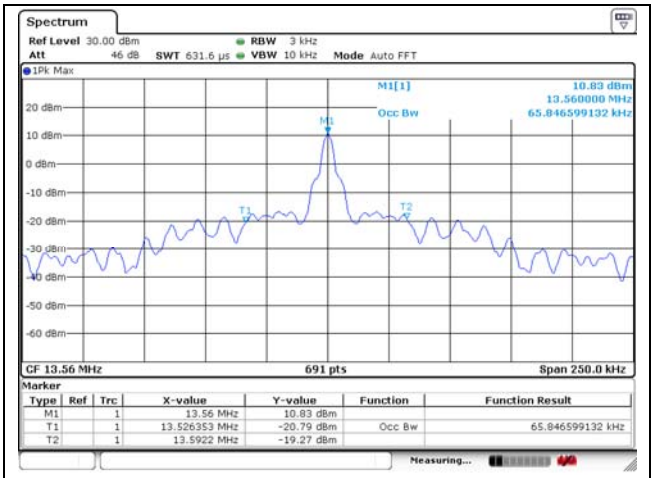
a) The spectrum analyzer center frequency is set to the nominal EUT channel center frequency.
b) Span: Two times and five times the OBW.
c) RBW = 1 % to 5 % of the OBW and VBW ≥ 3 x RBW
d) Set the reference level of the instrument as required, keeping the signal from exceeding the maximum input mixer 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 [MHz]	20 dB Bandwidth [MHz]		Limit [MHz]	20 dB Bandwidth [MHz]	Occupied Bandwidth (99 % BW) [MHz]
13.56	Lowest Frequency	13.553	13.110	0.014	0.066
	Highest Frequency	13.567	14.010		



20 dB Bandwidth

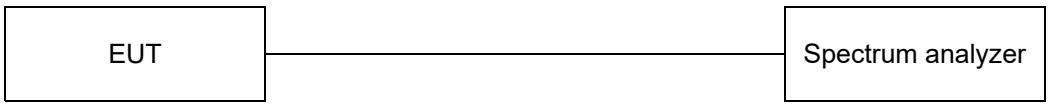


Occupied Bandwidth

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

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 C63.10-2013 - Section 6.8.1

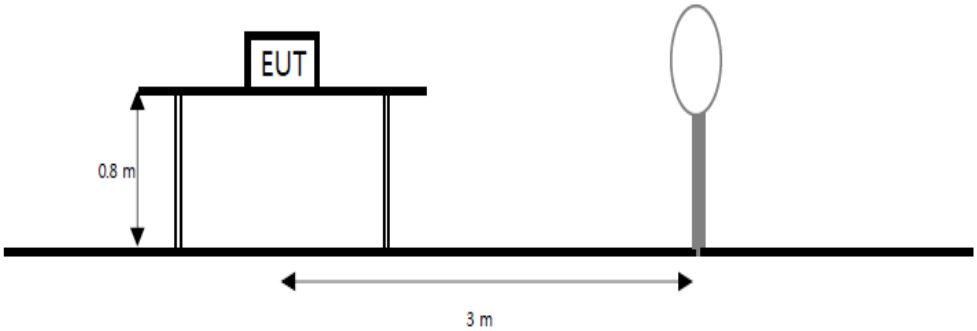
Test results

Voltage	Voltage	TEMP	Maintaining time	Measure frequency	Frequency deviation	Deviation
[%]	[V]	[℃]		[㎐]	[㎐]	[%]
100	3.85	20(Ref.)	Startup	13 560 005	-5.0	0.000 04
			2 minutes	13 560 005	-5.0	0.000 04
			5 minutes	13 560 005	-5.0	0.000 04
			10 minutes	13 560 004	-4.0	0.000 03
		-30	Startup	13 560 002	-2.0	0.000 02
			2 minutes	13 560 002	-2.0	0.000 02
			5 minutes	13 560 002	-2.0	0.000 02
			10 minutes	13 560 002	-2.0	0.000 02
		-20	Startup	13 560 003	-3.0	0.000 02
			2 minutes	13 560 003	-3.0	0.000 02
			5 minutes	13 560 003	-3.0	0.000 02
			10 minutes	13 560 004	-4.0	0.000 03
		-10	Startup	13 560 006	-6.0	0.000 04
			2 minutes	13 560 006	-6.0	0.000 04
			5 minutes	13 560 006	-6.0	0.000 04
			10 minutes	13 560 006	-6.0	0.000 04
		0	Startup	13 560 006	-6.0	0.000 04
			2 minutes	13 560 006	-6.0	0.000 04
			5 minutes	13 560 006	-6.0	0.000 04
			10 minutes	13 560 006	-6.0	0.000 04
		10	Startup	13 560 006	-6.0	0.000 04
			2 minutes	13 560 006	-6.0	0.000 04
			5 minutes	13 560 006	-6.0	0.000 04
			10 minutes	13 560 006	-6.0	0.000 04
		30	Startup	13 560 004	-4.0	0.000 03
			2 minutes	13 560 004	-4.0	0.000 03
			5 minutes	13 560 004	-4.0	0.000 03
			10 minutes	13 560 004	-4.0	0.000 03
		40	Startup	13 560 005	-5.0	0.000 04
			2 minutes	13 560 005	-5.0	0.000 04
			5 minutes	13 560 005	-5.0	0.000 04
			10 minutes	13 560 005	-5.0	0.000 04
		50	Startup	13 560 004	-4.0	0.000 03
			2 minutes	13 560 004	-4.0	0.000 03
			5 minutes	13 560 003	-3.0	0.000 02
			10 minutes	13 560 004	-4.0	0.000 03
85	3.27	20	Startup	13 560 005	-5.0	0.000 04
			2 minutes	13 560 005	-5.0	0.000 04
			5 minutes	13 560 004	-4.0	0.000 03
			10 minutes	13 560 005	-5.0	0.000 04
115	4.43	20	Startup	13 560 004	-4.0	0.000 03
			2 minutes	13 560 005	-5.0	0.000 04
			5 minutes	13 560 005	-5.0	0.000 04
			10 minutes	13 560 004	-4.0	0.000 03

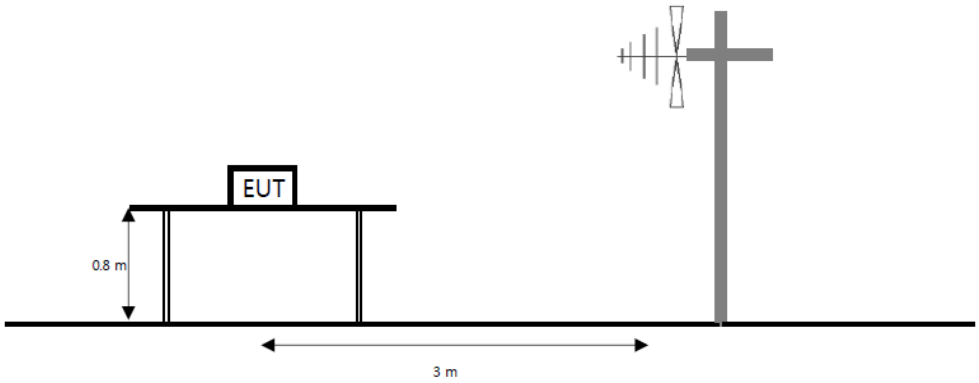
6.3. Radiated spurious emissions

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 ㏈㎶/m)	30
30.0-88.0	100(40 ㏈㎶/m)	3
88-216	150(43.5 ㏈㎶/m)	3
216-960	200 (46 ㏈㎶/m)	3
Above 960	500 (53.98 ㏈㎶/m)	3

Test procedure
ANSI C63.10-2013 - 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 = auto couple
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 ㏈/decade of distance. $F_d = 40\log(D_m/Ds)$
   f ≥30 ㎒, extrapolation factor of 20 ㏈/decade of distance. $F_d = 20\log(D_m/Ds)$
   Where:
   F_d= Distance factor in ㏈
   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 ㏈/decade) as specified in § 15.31(f)(2). Extrapolation Factor = 40 log10(30/3) = 40 ㏈.
3. Factors(㏈) = Antenna factor(㏈/m) + Cable loss(㏈) + or Amp. gain(㏈) + or F_d(㏈)
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 ㏈ 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

Test results for fundamental

15.225 (a) 13.553-13.567 MHz

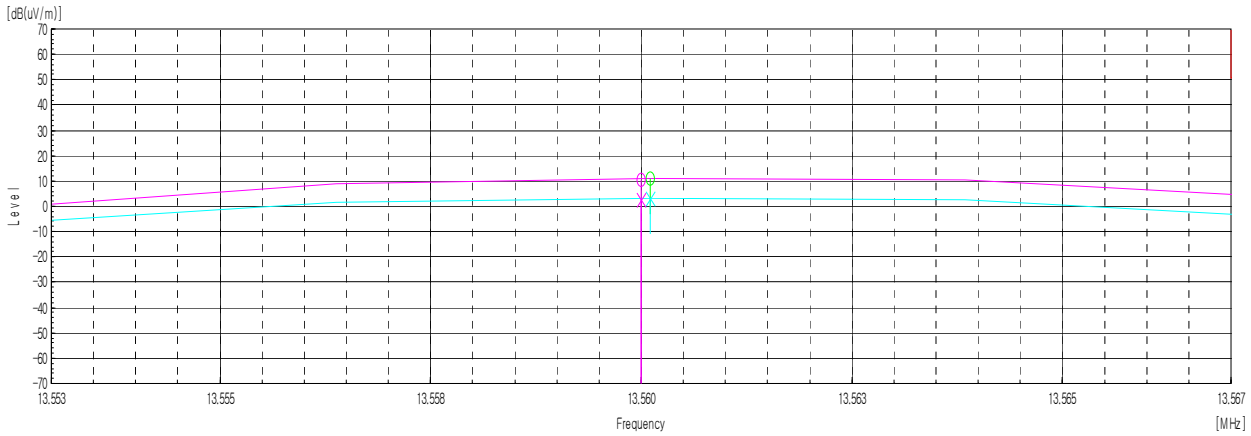
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(MHz)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Quasi peak data							
13.56	61.60	20.20	-31.33	40.00	10.47	84.00	73.53

[Face-off]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(MHz)	(dB(μV))	(dB)	(dB)	(dB)	(dB(μV/m))	(dB(μV/m))	(dB)
Quasi peak data							
13.56	53.80	20.20	-31.33	40.00	2.67	84.00	81.33

Face-on/Face-off



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

15.225 (b,c) 13.110-14.010 ㎒

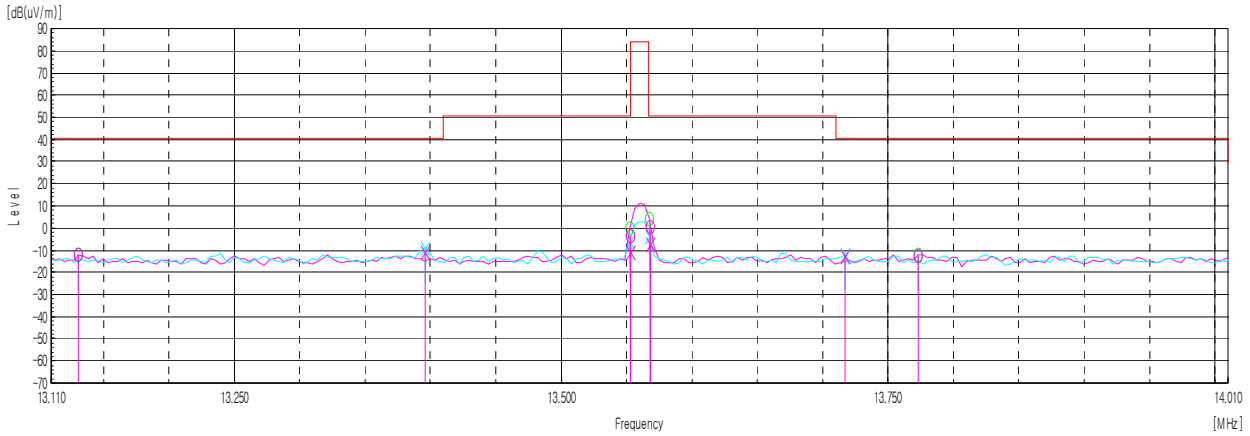
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
13.13	39.00	20.20	-31.34	40.00	-12.14	40.50	52.64
13.55	47.40	20.20	-31.33	40.00	-3.73	50.50	54.23
13.57	51.70	20.20	-31.33	40.00	0.57	50.50	49.93
13.77	38.60	20.20	-31.32	40.00	-12.52	40.50	53.02

[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							
13.40	40.40	20.20	-31.33	40.00	-10.73	40.50	51.23
13.55	40.50	20.20	-31.33	40.00	-10.63	50.50	61.13
13.57	43.80	20.20	-31.33	40.00	-7.33	50.50	57.83
13.72	38.70	20.20	-31.33	40.00	-12.43	40.50	52.93

Face-on/Face-off



Test results (9 ㎑ to 30 ㎒)

15.225 (d) 0.009-30 ㎒

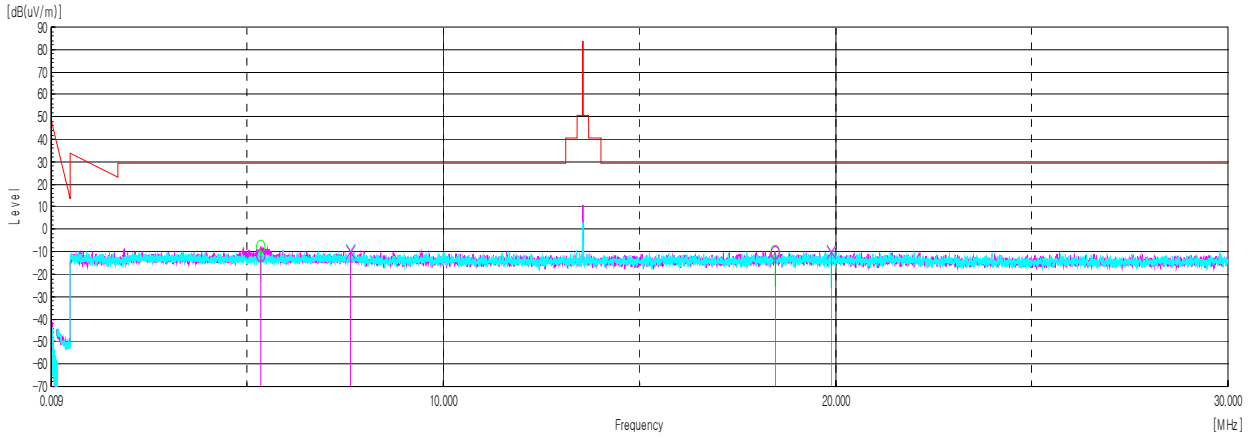
[Face-on]

Frequency	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data							
5.35	40.20	20.11	-31.80	40.00	-11.49	29.50	40.99
18.45	40.40	20.48	-31.09	40.00	-10.21	29.50	39.71

[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							
7.64	41.40	20.15	-31.67	40.00	-10.12	29.50	39.62
19.88	40.70	20.59	-31.00	40.00	-9.71	29.50	39.21

Face-on/Face-off

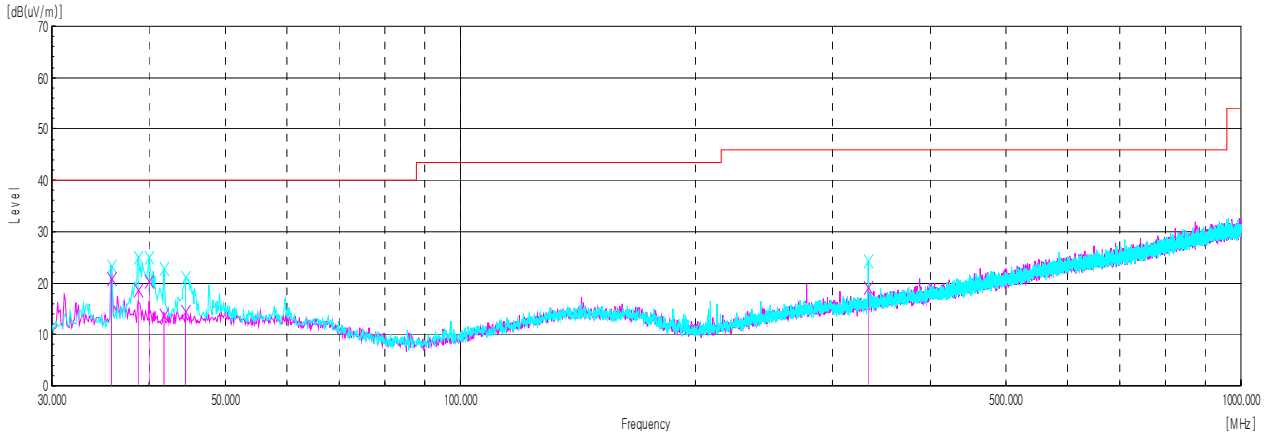


Test results (Below 1 000 ㎒)

15.225 (d) 30-1000 ㎒

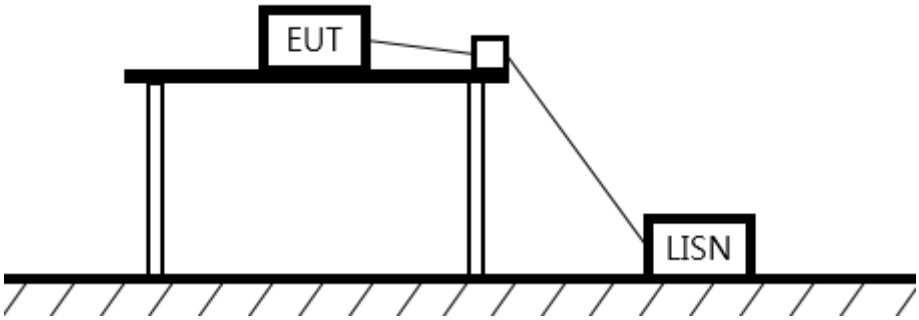
Frequency	Pol.	Reading	Antenna Factor	Amp. + Cable	Distance Factor	Result	Limit	Margin
(㎒)	(V/H)	(dB(㎶))	(dB)	(dB)	(dB)	(dB(㎶/m))	(dB(㎶/m))	(dB)
Quasi peak data								
35.82	V	33.90	17.58	-30.66	-	20.82	40.00	19.18
38.73	V	31.70	17.53	-30.53	-	18.70	40.00	21.30
39.94	V	33.30	17.50	-30.47	-	20.33	40.00	19.67
41.76	V	26.40	17.78	-30.45	-	13.73	40.00	26.27
44.55	V	26.70	18.23	-30.42	-	14.51	40.00	25.49
333.37[1)]	V	25.70	20.03	-26.54	-	19.19	46.00	26.81

Horizontal/Vertical



6.4. AC Conducted emission

Test setup



Limit

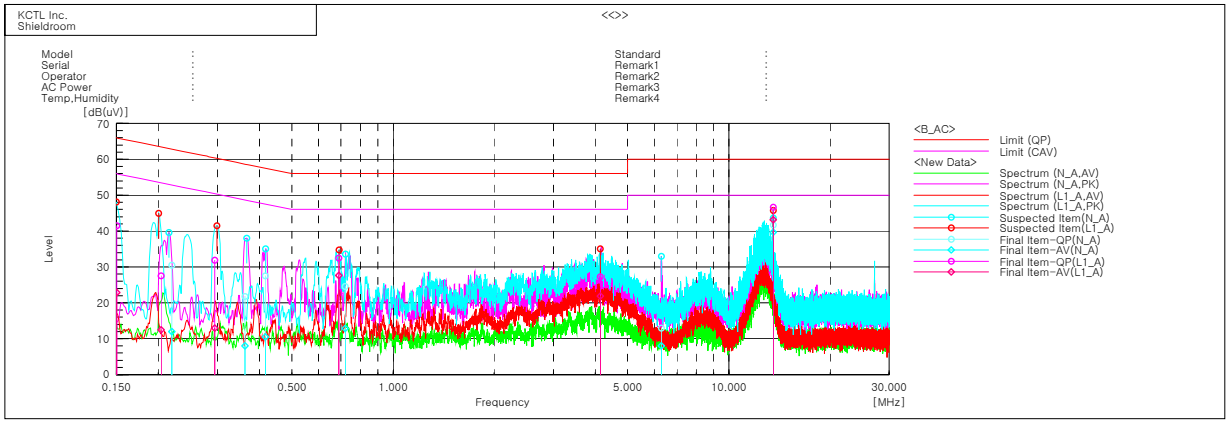
According to 15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following 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 (dBμV/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 ㅡ 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



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	0.21926	20.6	2.0	9.9	30.5	11.9	62.8	52.8	32.3	40.9
2	0.36201	11.9	-1.9	9.9	21.8	8.0	58.7	48.7	36.9	40.7
3	0.41666	17.5	0.4	10.0	27.5	10.4	57.5	47.5	30.0	37.1
4	0.71935	14.7	3.0	9.9	24.6	12.9	56.0	46.0	31.4	33.1
5	6.29845	3.0	-2.0	10.0	13.0	8.0	60.0	50.0	47.0	42.0
6	13.55995	31.4	29.4	10.3	41.7	39.7	60.0	50.0	18.3	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	0.15025	31.6	13.0	9.9	41.5	22.9	66.0	56.0	24.5	33.1
2	0.20408	17.5	2.5	10.0	27.5	12.5	63.4	53.4	35.9	40.9
3	0.29424	22.0	3.1	9.8	31.8	12.9	60.4	50.4	28.6	37.5
4	0.68936	22.6	17.7	9.9	32.5	27.6	56.0	46.0	23.5	18.4
5	4.13849	17.2	11.9	10.0	27.2	21.9	56.0	46.0	28.8	24.1
6	13.55991	36.3	32.8	10.4	46.7	43.2	60.0	50.0	13.3	6.8

7. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
EMI TEST RECEIVER	R&S	ESCI7	100732	21.03.04
Bi-Log Antenna	SCHWARZBECK	VULB9168	583	22.04.23
Amplifier	SONOMA INSTRUMENT	310N	284608	21.08.20
COAXIAL FIXED ATTENUATOR	Agilent	8491B-003	2708A18758	21.04.23
LOOP Antenna	R&S	HFH2-Z2	100355	22.08.21
Antenna Mast	Innco Systems	MA4640-XP-ET	-	-
Turn Table	Innco Systems	DT2000	79	-
TWO-LINE V - NETWORK	R&S	ENV216	101358	21.09.29
EMI TEST RECEIVER	R&S	ESCI	100001	21.08.20
Spectrum Analyzer	R&S	FSV30	100807	21.07.29
Signal Generator	R&S	SMB100A	176206	21.01.21
Vector Signal Generator	R&S	SMBV100A	257566	21.07.13
Temp & Humid Chamber	Myeongseong R&P	CTHC-50P-DT	20150824-2	21.07.28

End of test report

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