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 : 2020-10-08

2. Use of Report : Class II Permissive change

3. Name of Product / Model : Smart Wearable / SM-R835U

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

5. FCC ID : A3LSMR835

6. IC Certificate No. : 649E-SMR835

7. Date of Test : 2020-10-21 to 2020-11-23

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

9. Test method used : FCC Part 2 / RSS-Gen Issue 5
FCC Part 22 subpart H / RSS-132 Issue 3
FCC Part 24 subpart E / RSS-133 Issue 6
FCC Part 27 subpart C / RSS-130 Issue 2, RSS-139 Issue 3

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

	Tested by	Technical Manager
Affirmation	Name : Kwonse Kim (Signature)	Name : Seungyong Kim (Signature)

2020-12-07

KCTL Inc.

REPORT REVISION HISTORY

Date	Revision	Page No
2020-11-25	Originally issued	-
2020-12-07	Updated	9

Note. The report No. KR20-SRF0311 is superseded by the report No. KR20-SRF0311-A.

General remarks for test reports

Nothing significant to report.

CONTENTS

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 Co., Ltd.
Address	:	Yenphong1-I.P Yentrung Commune, Yenphong Dist., Bac Ninh Province, Vietnam
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-3327, G-198, C-3706, T-1849
		Industry Canada Registration No. : 8035A
		KOLAS No.: KT231

2. Device information

Equipment under test	:	Smart Wearable
Model	:	SM-R835U
Derivative model	:	SM-R835F
Frequency range	:	Bluetooth(BDR/EDR/BLE)_2 402 ㎒ ~ 2 480 ㎒
		WIFI(802.11b/g/n20)_2 412 ㎒ ~ 2 472 ㎒
		LTE Band 12_699.7 ㎒ ~ 715.3 ㎒
		LTE Band 13_779.5 ㎒ ~ 784.5 ㎒
		LTE Band 5_824.7 ㎒ ~ 848.3 ㎒
		LTE Band 26_824.7 ㎒ ~ 848.3 ㎒, 814.7 ㎒ ~ 823.3 ㎒
		LTE Band 4_1 710.7 ㎒ ~ 1 754.3 ㎒
		LTE Band 66_1 710.7 ㎒ ~ 1 779.3 ㎒
		LTE Band 2_1 850.7 ㎒ ~ 1 909.3 ㎒
		LTE Band 25_1 850.7 ㎒ ~ 1 914.3 ㎒
		WCDMA 850_826.4 ㎒ ~ 846.6 ㎒
		WCDMA 1700_1 712.4 ㎒ ~ 1 752.6 ㎒
		WCDMA 1900_1 852.4 ㎒ ~ 1 907.6 ㎒
Modulation technique	:	Bluetooth(BDR/EDR)_ GFSK, π/4DQPSK, 8DPSK
		Bluetooth(BLE)_GFSK
		WIFI(802.11b/g/n20)_DSSS, OFDM
		LTE_QPSK, 16QAM
		WCDMA_QPSK
Number of channels	:	Bluetooth(BDR/EDR)_79 ch
		Bluetooth(BLE)_40 ch
		WIFI(802.11b/g/n20)_13 ch

Power source	:	DC 3.85 V
Antenna specification	:	LTE/WCDMA_PIFA (Housing metal) Antenna
		WIFI/Bluetooth(BDR/EDR/BLE)_LDS Antenna
Antenna gain	:	WIFI/Bluetooth(BDR/EDR/BLE) : -6.4 dBi
Software version	:	R835U.001
Hardware version	:	REV1.0
Test device serial No.	:	Conducted(R3AM8001MVZ)
		Radiated(R3AM8002B0R)
Operation temperature	:	-30 ℃ ~ 50 ℃

2.1. Accessory information

Equipment	Manufacturer	Model	Serial No.	Power source	FCC ID & IC
Wireless charger	Samsung Electronics Co., Ltd.	EP-OR825	-	DC 5.0 V, 1.0 A	A3LEPOR825 / 649E-EPOR825

2.2. Information about derivative model

The difference between basic model and derivative models is:

Hardware is identical with the basic model and software is as follows.
a. For the model SM-R835U:
- 3G(B2,B4,B5), 4G(B2,B4,B5,B12,B13,B25,B26,B66) are enabled by software.

b. For the model SM-R835F:
- 3G(B2,B4), 4G(B2,B4,B12,B13,B25,B26,B66) are disabled by software.
- 3G(B1,B8), 4G(B1,B3,B7,B8,B20) are enabled by software.

c. In USA, 4G(B7) disabled by MCC code. Because device doesn't support B7 roaming in USA.
d. All other protocol part is same and all other features of Volte, SUPL is same.

2.3. Frequency/channel operations

This device contains the following capabilities:
Bluetooth(BDR/EDR/BLE), WIFI(802.11b/g/n20),
LTE Band 12, LTE Band 13, LTE Band 5, LTE Band 26, LTE Band 4, LTE Band 66, LTE Band 2
LTE Band 25, WCDMA 850, WCDMA 1700, WCDMA 1900

LTE Band 26(814 - 849 ㎒) overlaps the entire frequency range of LTE Band 5(824 - 849 ㎒).
Therefore, test data provided in this report covers Band 5 and the portion of Band 26 subpart to Part22.

LTE Band 66(1 710 - 1 780 ㎒) overlaps the entire frequency range of LTE Band 4(1 710 - 1 755 ㎒).
Therefore, test data provided in this report covers Band 4 as well as Band 66.

LTE Band 25(1 850 - 1 915 ㎒) overlaps the entire frequency range of LTE Band 2(1 850 - 1 910 ㎒).
Therefore, test data provided in this report covers Band 2 as well as Band 25.

LTE Band 12

Ch.	Frequency (MHz)
23017	699.7
23095	707.5
23173	715.3

Table 2.3.1. 1.4M BW

Ch.	Frequency (MHz)
23025	700.5
23095	707.5
23165	714.5

Table 2.3.2. 3M BW

Ch.	Frequency (MHz)
23035	701.5
23095	707.5
23155	713.5

Table 2.3.3. 5M BW

Ch.	Frequency (MHz)
23060	704.0
23095	707.5
23130	711.0

Table 2.3.4. 10M BW

LTE Band 13

Ch.	Frequency (MHz)
23205	779.5
23230	782.0
23255	784.5

Table 2.3.5. 5M BW

Ch.	Frequency (MHz)
-	-
23230	782.0
-	-

Table 2.3.6. 10M BW

LTE Band 5

Ch.	Frequency (MHz)
20407	824.7
20525	836.5
20643	848.3

Table 2.3.7. 1.4M BW

Ch.	Frequency (MHz)
20415	825.5
20525	836.5
20635	847.5

Table 2.3.8. 3M BW

Ch.	Frequency (MHz)
20425	826.5
20525	836.5
20625	846.5

Table 2.3.9. 5M BW

Ch.	Frequency (MHz)
20450	829.0
20525	836.5
20600	844.0

Table 2.3.10. 10M BW

LTE Band 26

Ch.	Frequency (MHz)
26797	824.7
26915	836.5
27033	848.3

Table 2.3.11. 1.4M BW

Ch.	Frequency (MHz)
26805	825.5
26915	836.5
27025	847.5

Table 2.3.12. 3M BW

Ch.	Frequency (MHz)
26815	826.5
26915	836.5
27015	846.5

Table 2.3.13. 5M BW

Ch.	Frequency (MHz)
26840	829.0
26915	836.5
26990	844.0

Table 2.3.14. 10M BW

Ch.	Frequency (MHz)
26865	831.5
-	-
26965	841.5

Table 2.3.15. 15M BW

LTE Band 4

Ch.	Frequency (㎒)
19957	1 710.7
20175	1 732.5
20393	1 754.3

Table 2.3.16. 1.4M BW

Ch.	Frequency (㎒)
19965	1 711.5
20175	1 732.5
20385	1 753.5

Table 2.3.17. 3M BW

Ch.	Frequency (㎒)
19975	1 712.5
20175	1 732.5
20375	1 752.5

Table 2.3.18. 5M BW

Ch.	Frequency (㎒)
20000	1 715.0
20175	1 732.5
20350	1 750.0

Table 2.3.19. 10M BW

Ch.	Frequency (㎒)
20025	1 717.5
20175	1 732.5
20325	1 747.5

Table 2.3.20. 15M BW

Ch.	Frequency (㎒)
20050	1 720.0
20175	1 732.5
20300	1 745.0

Table 2.3.21. 20M BW

LTE Band 66

Ch.	Frequency (㎒)
131979	1 710.7
132322	1 745.0
132665	1 779.3

Table 2.3.22. 1.4M BW

Ch.	Frequency (㎒)
131987	1 711.5
132322	1 745.0
132657	1 778.5

Table 2.3.23. 3M BW

Ch.	Frequency (㎒)
131997	1 712.5
132322	1 745.0
132647	1 777.5

Table 2.3.24. 5M BW

Ch.	Frequency (㎒)
132022	1 715.0
132322	1 745.0
132622	1 775.0

Table 2.3.25. 10M BW

Ch.	Frequency (㎒)
132047	1 717.5
132322	1 745.0
132597	1 772.5

Table 2.3.26. 15M BW

Ch.	Frequency (㎒)
132072	1 720.0
132322	1 745.0
132572	1 770.0

Table 2.3.27. 20M BW

LTE Band 2

Ch.	Frequency (㎒)
18607	1 850.7
18900	1 880.0
19193	1 909.3

Table 2.3.28. 1.4M BW

Ch.	Frequency (㎒)
18615	1 851.5
18900	1 880.0
19185	1 908.5

Table 2.3.29. 3M BW

Ch.	Frequency (㎒)
18625	1 852.5
18900	1 880.0
19175	1 907.5

Table 2.3.30. 5M BW

Ch.	Frequency (㎒)
18650	1 855.0
18900	1 880.0
19150	1 905.0

Table 2.3.31. 10M BW

Ch.	Frequency (㎒)
18675	1 857.5
18900	1 880.0
19125	1 902.5

Table 2.3.32. 15M BW

Ch.	Frequency (㎒)
18700	1 860.0
18900	1 880.0
19100	1 900.0

Table 2.3.33. 20M BW

LTE Band 25

Ch.	Frequency (MHz)
26047	1 850.7
26365	1 882.5
26683	1 914.3

Table 2.3.34. 1.4M BW

Ch.	Frequency (MHz)
26055	1 851.5
26365	1 882.5
26675	1 913.5

Table 2.3.35. 3M BW

Ch.	Frequency (MHz)
26065	1 852.5
26365	1 882.5
26665	1 912.5

Table 2.3.36. 5M BW

Ch.	Frequency (MHz)
26090	1 855.0
26365	1 882.5
26640	1 910.0

Table 2.3.37. 10M BW

Ch.	Frequency (MHz)
26115	1 857.5
26365	1 882.5
26615	1 907.5

Table 2.3.38. 15M BW

Ch.	Frequency (MHz)
26140	1 860.0
26365	1 882.5
26590	1 905.0

Table 2.3.39. 20M BW

3. Summary of tests

FCC Part section(s)	RSS Section(s)	Parameter	Test results
22.913(a)(5) 24.232(c) 27.50(b)(10) 27.50(c)(10) 27.50(d)(4)	RSS-130(4.6) RSS-132(5.4) RSS-133(6.4) RSS-139(6.5)	Effective Radiated Power & Equivalent Isotropic Radiated Power	Pass
2.1053 22.917(a) 24.238(a) 27.53(c)(2)(4) 27.53(f),(g),(h)	RSS-130(4.7) RSS-132(5.5) RSS-133(6.5) RSS-139(6.6)	Radiated Spurious Emissions	Pass

Notes:

1. All modes of operation were investigated and the worst case emissions are reported with the EUT positioning, modulations, RB sizes and offsets, and channel bandwidth configurations in the test data.
2. All the radiated tests have been performed two modes (with charger and without charger)
3. For LTE Band 12, Band 13, Band 5, Band 26, 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.
   For ERP/EIRP tests, these bands were performed with charger for evaluation of worst case mode.
4. For LTE Band 4, Band 66, Band 2, Band 25, 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.
   For ERP/EIRP tests, these bands were performed without charger for evaluation of worst case mode.
5. The test procedure(s) in this report were performed in accordance as following.
   - ANSI C63.26-2015
   - ANSI/TIA-603-E-2016
   - KDB 971168 D01 v03r01
6. The test mode and channel set for this C2PC filing test was based on the worst case condition raised in original report, KR19-SRF0097-B.
7. The maximum production power and tolerance are not impacted by the change stated in the C2PC letter.

4. Measurement uncertainty

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI C63.4-2014.

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.

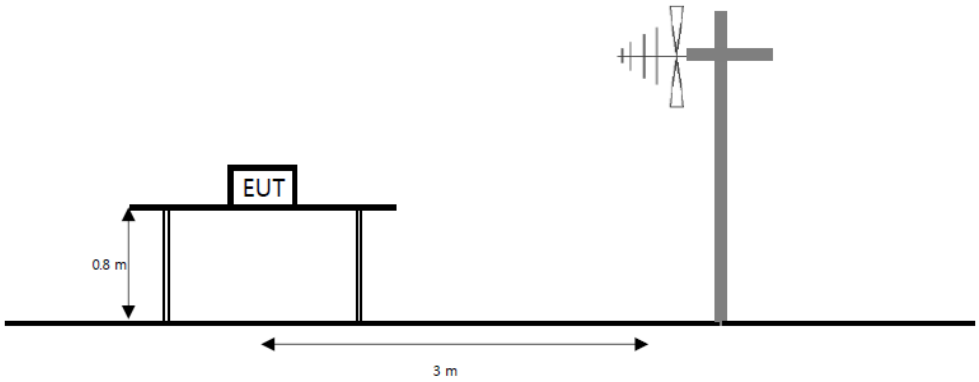
Parameter	Expanded uncertainty (±)	
Radiated spurious emissions	9 ㎑ ~ 30 ㎒:	2.28 ㏈
	30 ㎒ ~ 1 ㎓	3.68 ㏈
	Above 1 ㎓	5.72 ㏈

5. Test results

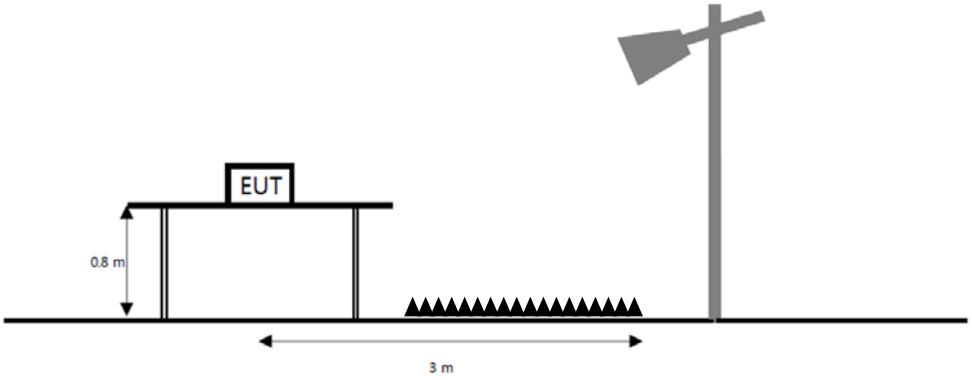
5.1. Radiated Power (ERP/EIRP)

Test setup

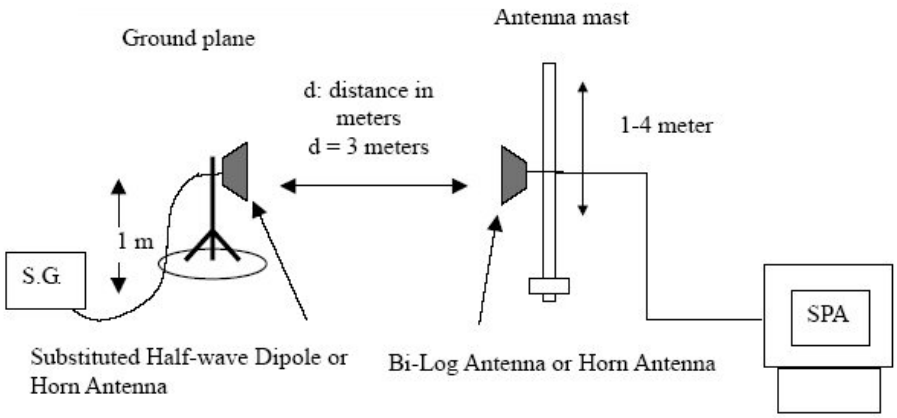
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



The diagram below shows the test setup for substituted method.



Limit

According to §22.913(a)(5), the ERP of transmitters in the cellular radiotelephone service must not exceed the limits in this section. The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 watts.
According to RSS-132(5.4), the equivalent isotropically radiated power (e.i.r.p) for mobile equipment shall not exceed 11.5 watts. Refer to SRSP-503 for base stations e.i.r.p limits.

According to §24.232(c) and RSS-133(6.4), mobile and portable stations are limited to 2 watts EIRP and the equipment must employ a means for limiting power to the minimum necessary for successful communications.

According to §27.50(b)(10), 27.50(c)(10) and RSS-130(6.5), Portable stations (hand-held devices) in the 698 -746㎒, 746-757㎒, 776-788㎒, and 805-806 ㎒ bands are limited 3 watts ERP.

According to §27.50(d)(4) and RSS-139(6.5), fixed, mobile, and portable (hand-held) stations operating in the 1710~1755 ㎒ band and mobile and portable stations operating in the 1695~1710 ㎒ and 1755~1780 ㎒ bands are 1 watt EIRP.

Test procedure

971168 D01 v03r01 - Section 5.2 and 5.8, 412172 D01 v01r01
ANSI 63.26-2015 – Section 5.2
ANSI/TIA-603-E-2016 - Section 2.2.17

Test settings

1) RBW = 1 % to 5 % of the OBW.
2) VBW ≥ 3 × RBW.
3) SPAN = 2 × to 3 × the OBW.
4) Number of measurement points in sweep ≥ 2 × span / RBW.
5) Sweep time :
   1) Auto couple, or
   2) ≥ [10 × (number of points in sweep) × (transmission period)] for single sweep (automation-compatible) measurement. Transmission period is the on and off time of the transmitter.
6) Detector = RMS
7) If the EUT can be configured to transmit continuously, then set the trigger to free run.
8) If the EUT cannot be configured to transmit continuously, then use a sweep trigger with the level set to enable triggering only on full power bursts and configure the EUT to transmit at full power for the entire duration of each sweep. Verify that the sweep time is less than or equal to the transmission burst duration. Time gating can also be used under similar constraints (i.e., configured such that measurement data is collected only during active full -power transmissions).
9) Trace mode = trace averaging (RMS) over 100 sweeps.
10) Compute the power by integrating the spectrum across the OBW of the signal using the instrument's band or channel power measurement function, with the band/channel limits set equal to the OBW band edges. If the instrument does not have a band or channel power function, then sum the spectrum levels (in linear power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.
11) Allow trace to fully stabilize.

Notes:

1. On a test site, the EUT shall be placed at 80 cm height on a turn table, and in the position close To normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to Correspond to the fundamental frequency of the transmitter.
3. The turntable is rotated through 360°, and the receiving antenna scans in order to determine the Level of the maximized emission.
4. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
5. The maximum signal level detected by the measuring receiver shall be noted.
6. The EUT was replaced by half-wave dipole (1 ㎓ below) or horn antenna (1 ㎓ above) connected to a signal generator.
   The power is calculated by the following formula;
   Pd(㏈m) = Pg(㏈m) – Cable loss (㏈) + Antenna gain (㏈)
   Note. Pd is the dipole equivalent power and Pg is the generator output power into the substitution antenna.
7. The test antenna shall be raised and lowered through the specified range of height to ensure that The maximum signal is received.
8. The input signal to the substitution antenna shall be adjusted to the level that produces a level Detected by the measuring corrected for the change of input attenuator setting of the measuring Receiver.
9. The input level to the substitution antenna shall be recorded as power level in ㏈m, corrected for Any change of input attenuator setting of the measuring receiver.
10. The measurement shall be repeated with the test antenna and the substitution antenna Orientated for horizontal polarization.
11. The relevant equation for determining the ERP or EIRP from the co

Test results

Test mode: LTE Band 12

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
5 M	QPSK	713.5	H	-0.30	3.47	13.02	9.25	0.008

Test mode: LTE Band 13

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
10 M	QPSK	782.0	H	0.60	3.65	10.16	7.11	0.005

Test mode: LTE Band 5

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP		EIRP Note.1	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]	[dBm]	[W]
1.4 M	QPSK	824.7	H	-0.30	3.75	10.41	6.36	0.004	8.51	0.007

Test mode: LTE Band 26

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	ERP		EIRP Note.1	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]	[dBm]	[W]
1.4 M	QPSK	824.7	H	-0.30	3.75	10.44	6.39	0.004	8.54	0.007

Test mode: LTE Band 4

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
3 M	QPSK	1 711.5	V	5.79	5.36	14.79	15.22	0.033

Test mode: LTE Band 66

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
5 M	QPSK	1 712.5	V	5.79	5.38	14.35	14.76	0.030

Test mode: LTE Band 2

Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
1.4 M	QPSK	1 909.3	H	5.32	5.78	16.07	15.61	0.036

Test mode: LTE Band 25

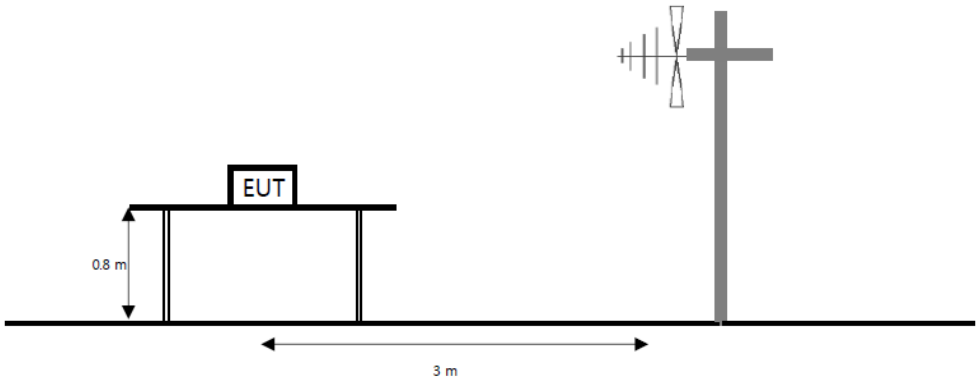
Bandwidth	Modulation	Frequency	Pol.	Antenna Gain	C.L	Substitute Level	EIRP	
		[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[W]
20 M	QPSK	1 905.0	H	5.33	5.77	15.29	14.85	0.031

Note.
1. The E.I.R.P conversion formula for IC : E.I.R.P result(dBm)
= E.R.P result (dBm) + 2.15 (dB)
2. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

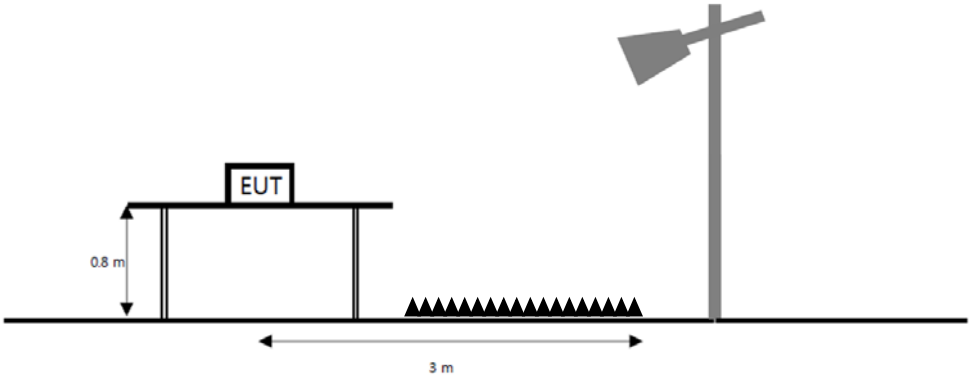
5.2. Radiated Spurious Emissions

Test setup

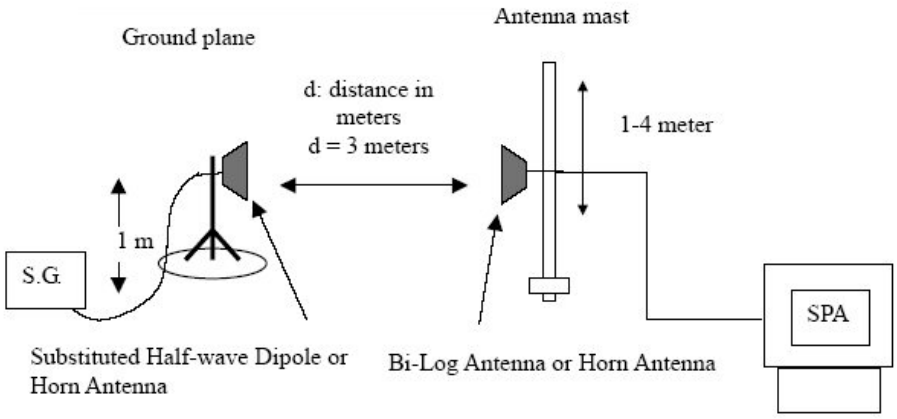
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 ㎒ to 1 ㎓ emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 ㎓ to the tenth harmonic of the highest fundamental frequency or to 40 ㎓ emissions, whichever is lower.



The diagram below shows the test setup for substituted method.



Limit

According to §22.917(a), §24.238(a) and RSS-132(5.5), RSS-133(6.5), the power of any emission outside of the authorized operating frequency ranges must be attenuated below the transmitting power (P) by a factor of at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(c)(2) and RSS-130(4.7), on any frequency outside the 776-788 ㎒ band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least 43 + 10log($P_{[Watts]}$) ㏈ and 27.53(f), for operations in the 746-758 ㎒, 775-788 ㎒, and 805-806 ㎒ bands, emissions in the band 1559-1610 ㎒ shall be limited to -70 ㏈W/㎒ equivalent isotropically radiated power (EIRP) for wideband signals, and -80 ㏈W EIRP for discrete emissions of less than 700 ㎐ bandwidth. For the purpose of equipment authorization, a transmitter shall be tested with an antenna that is representative of the type that will be used with the equipment in normal operation.

According to §27.53(g) and RSS-130(4.7), for operations in the 600 ㎒ band and the 698-746 ㎒ band, the power of any emission outside a licensee's frequency band(s) of operation shall be attenuated below the transmitter power (P) within the licensed band(s) of operation, measured in watts, by at least 43 + 10log($P_{[Watts]}$) ㏈.

According to §27.53(h) and RSS-139(6.6), the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) in watts by at least 43 + 10log($P_{[Watts]}$) ㏈.

Test procedure

971168 D01 v03r01 - Section 6.2
ANSI 63.26-2015 – Section 5.5
ANSI/TIA-603-E-2016 - Section 2.2.12

Test settings

1) RBW = 100 ㎑ for below 1 ㎓ and 1 ㎒ for above 1 ㎓.
2) VBW ≥ 3 × RBW.
3) Detector = RMS
4) Trace mode = Max hold
5) Sweep time = Auto couple
6) Number of sweep points ≥ 2 × span / RBW
7) Allow trace to fully stabilize.

For the narrowband spurious settings:

1) RBW = 1 ㎑
2) VBW = 3 ㎑
3) Detector = RMS
4) Trace mode = Max hold
5) Sweep speed slow enough to maintain measurement calibration.

Notes:

1. On a test site, the EUT shall be placed at 80 ㎝ height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
3. The turntable is rotated through 360°, and the receiving antenna scans in order to determine the level of the maximized emission.
4. The test antenna shall be raised and lowered again through the specified range of height until the maximum signal level is detected by the measuring receiver.
5. The maximum signal level detected by the measuring receiver shall be noted.
6. The EUT was replaced by half-wave dipole (1 ㎓ below) or horn antenna (1 ㎓ above) connected to a signal generator.
7. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
8. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring corrected for the change of input attenuator setting of the measuring receiver.
9. The input level to the substitution antenna shall be recorded as power level in ㏈m, corrected for any change of input attenuator setting of the measuring receiver.
10. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.

Test results (Above 1 000 ㎒)

Test mode : LTE Band 12
Frequency(㎒) : 707.5
Channel : 23095
Bandwidth(㎒) : 5

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 411.00	H	5.71	4.86	-44.35	-43.50	-13.00	30.50

Test mode : LTE Band 13
Frequency(㎒) : 782.0 (1 559 - 1 610 ㎒)
Channel : 23230
Bandwidth(㎒) : 10

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	1 572.83	H	6.13	5.11	-75.52	-74.50	-50.00	24.50

Test mode : LTE Band 5/26
Frequency(㎒) : 836.5
Channel : 26915
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	2 474.00	V	6.14	6.50	-51.94	-52.30	-13.00	39.30

Test mode : LTE Band 4/66
Frequency(㎒) : 1 778.5
Channel : 132657
Bandwidth(㎒) : 3

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	5 335.89	H	10.37	11.57	-47.20	-48.40	-13.00	35.40

Note.
1. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 2/25
Frequency(㎒) : 1 914.3
Channel : 26683
Bandwidth(㎒) : 1.4

Mode	Frequency	Pol.	Antenna Gain	Cable loss	Substitute Level	Level	Limit	Margin
	[㎒]	[V/H]	[dBi]	[dB]	[dBm]	[dBm]	[dBm]	[dB]
QPSK	5 725.91	V	10.55	12.23	-41.32	-43.00	-13.00	30.00

Note.
1. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

6. Measurement equipment

Equipment Name	Manufacturer	Model No.	Serial No.	Next Cal. Date
Biconical VHF-UHF Broadband Antenna	SCHWARZBECK	VUBA9117	275	22.04.09
Bilog Antenna	Teseq GmbH	CBL 6143A	35039	21.05.21
Horn Antenna	ETS.lindgren	3117	00227509	21.09.23
Horn Antenna	ETS.lindgren	3117	161225	21.05.12
Horn Antenna	ETS.lindgren	3116	00086632	21.02.17
Horn Antenna	ETS.lindgren	3116	00086635	21.05.12
High pass Filter	Wainwright Instruments GmbH	WHKX3.0/18G-12SS	44	21.01.21
High pass Filter	Wainwright Instruments GmbH	WHKX10-900-1000-15000-40SS	11	21.08.20
Attenuator	Weinschel ENGINEERING	10	AJ1239	21.05.15
Broadband Amplifier	SONOMA INSTRUMENT	310N	185799	21.01.21
Amplifier	L-3 Narda-MITEQ	AFS5-00101800-25-S-5	2054570	21.05.22
Amplifier	L-3 Narda-MITEQ	JS44-18004000-33-8P	2000996	21.01.22
Spectrum Analyzer	AGILENT	N9040B	MY57010132	21.07.29
Signal Generator	R&S	SMB100A	176206	21.01.21
Widebnad Radio Communication Tester	R&S	CMW500	141780	21.04.16
Antenna Mast	MATURO	EAS 1.5	042/8941211	N/A
Antenna Mast	MATURO	EAS 1.5	043/8941211	N/A
Turn Table	MATURO	TT 0.8 PF	041/8941211	N/A
Cable Assembly	Radiall	R286303620	1649.241	N/A
Cable Assembly	Radiall	TESTPRO 3	N/A	N/A

End of test report