

KCTL Inc.

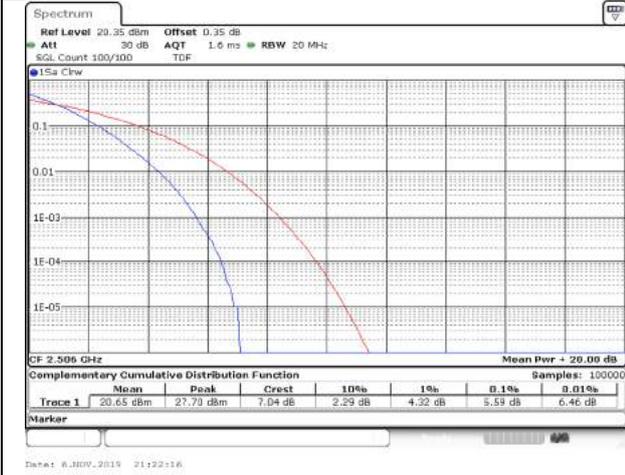
65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
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Report No.:
KR19-SRF0183-B

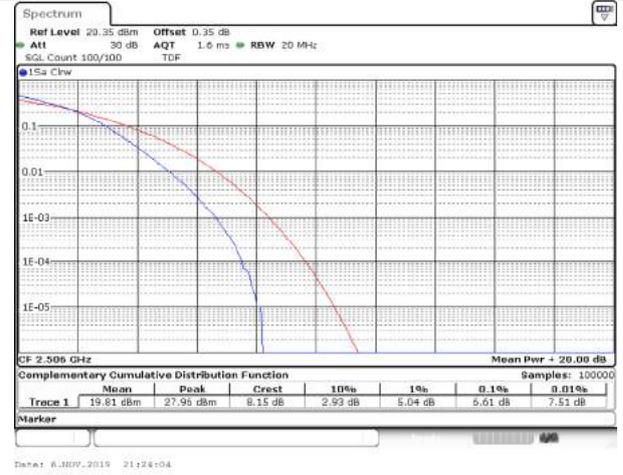
Page (170) of (216)



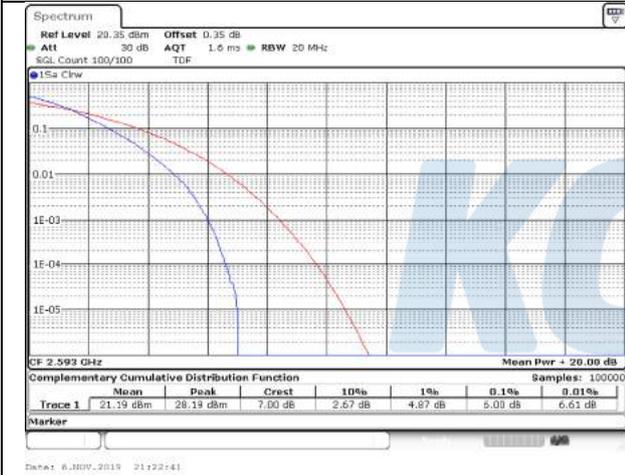
20M BW / QPSK / Low ch.



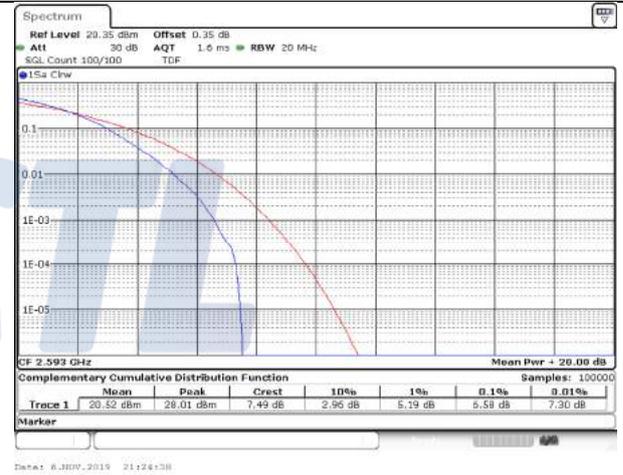
20M BW / 16QAM / Low ch.



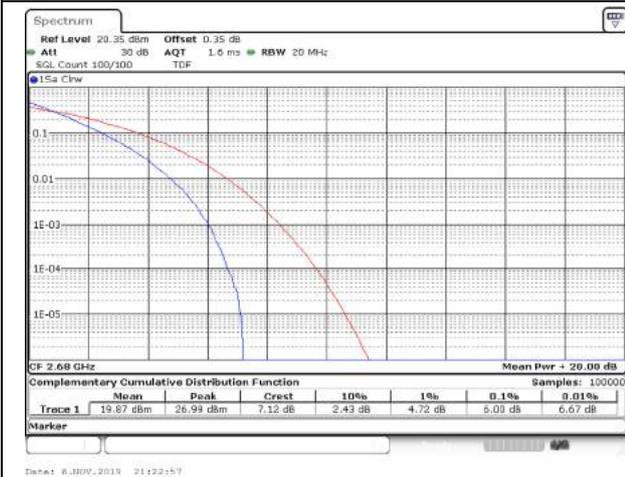
20M BW / QPSK / Mid ch.



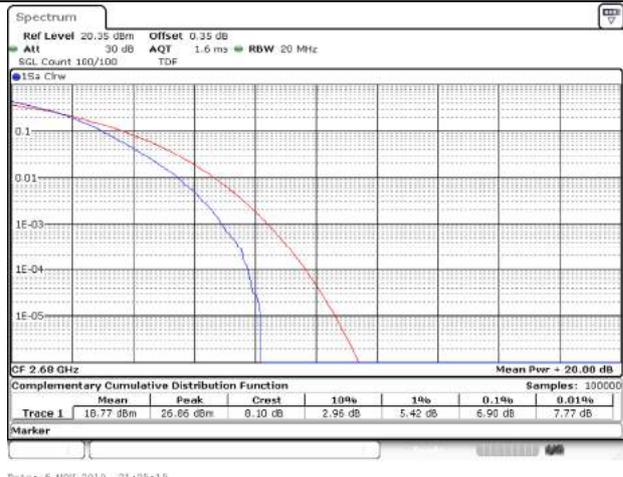
20M BW / 16QAM / Mid ch.



20M BW / QPSK / High ch.

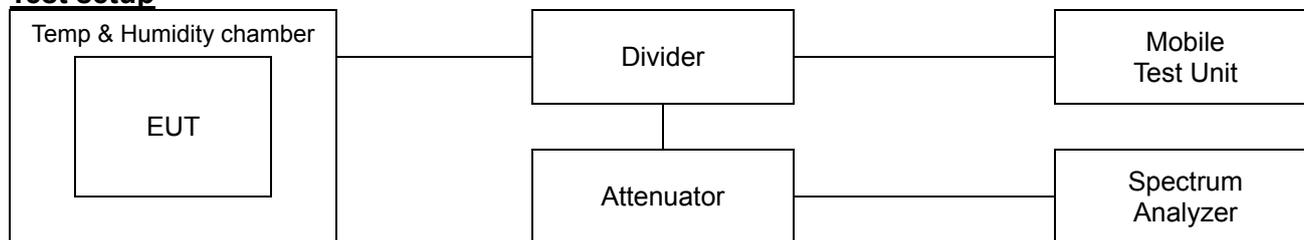


20M BW / 16QAM / High ch.



7.6. Frequency stability

Test setup



Limit

According to §2.1055(a),

The frequency stability shall be measured with variation of ambient temperature as follows:

- 1) From -30° to $+50^{\circ}$ centigrade for all equipment except that specified in paragraphs (a) (2) and (3) of this section.
- 2) From -20° to $+50^{\circ}$ centigrade for equipment to be licensed for use in the maritime services under part 80 of this chapter, except for class A, B, and S emergency position indicating radiobeacons (EPIRBS), and equipment to be licensed for use above 952 MHz at operational fixed stations in all services, stations in the local television transmission service and point-to-point microwave radio service under part 21 of this chapter, equipment licensed for use aboard aircraft in the aviation services under part 87 of this chapter, and equipment authorized for use in the family radio service under part 95 of this chapter.
- 3) From 0° to $+50^{\circ}$ centigrade for equipment to be licensed for use in the radio broadcast Services under part 73 of this chapter.

According to §2.1055(d),

The frequency stability shall be measured with variation of primary supply Voltage as follows:

- 1) Vary primary supply voltage from 85 to 115 percent of the nominal value for other than hand carried battery equipment.
- 2) For hand carried, battery powered equipment, reduce primary supply voltage to the battery operating and point which shall be specified by the manufacturer.
- 3) The supply voltage shall be measured at the input to the cable normally provided with the equipment, or at the power supply terminals if cables are not normally provided. Effects on frequency of transmitter keying (except for broadcast transmitters) and any heating element cycling at the nominal supply voltage and at each extreme also shall be shown.

According to §24.235,

The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

According to §27.54,

The frequency stability shall be sufficient to ensure that the fundamental emissions stay within the Authorized bands of operation.

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Report No.:
KR19-SRF0183-B

Page (172) of (216)

KCTL**Test procedure**

ANSI 63.26-2015 – Section 5.6

Test settings

- 1) The carrier frequency of the transmitter is measured at room temperature. (20°C to provide a reference)
- 2) The equipment is turned on in a “standby” condition for one minute before applying power to the transmitter. Measurement of the carrier frequency of the transmitter is made within one minute after applying power to the transmitter.
- 3) Frequency measurements are made at 10°C intervals ranging from -30°C to +50°C. A period of at least one half-hour is provided to allow stabilization of the equipment at each Temperature level.

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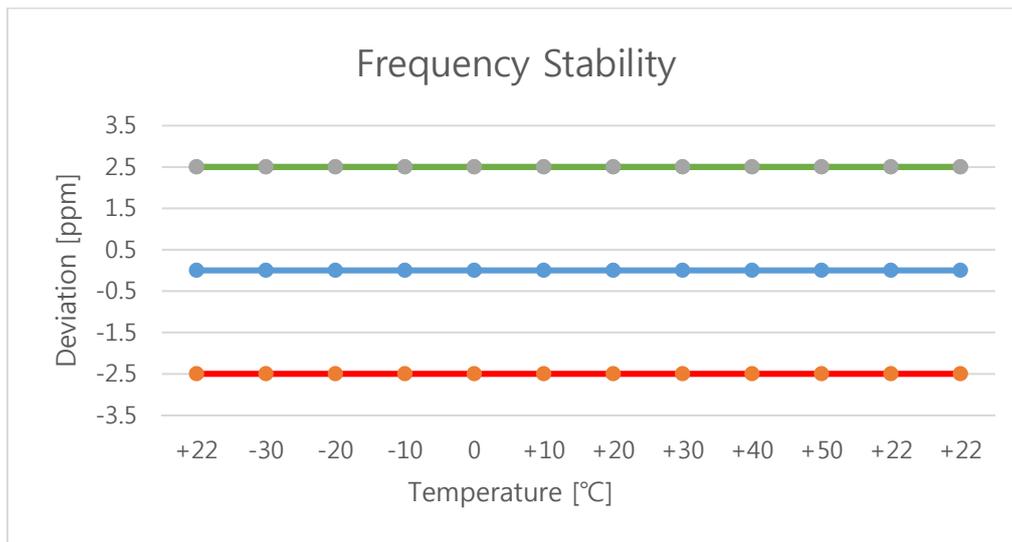
Report No.:
KR19-SRF0183-B

Page (173) of (216)

**Test results**

Test mode : LTE Band 2
Frequency (Hz) : 1 880 000 000
Channel : 18900
Deviation limit : ±0.00025% or 2.5ppm

| Voltage (%) | Power (V) | Temp. (°C) | Frequency (Hz) | Frequency error (Hz) | Deviation | |
|-------------|-----------|------------|----------------|----------------------|-----------|----------|
| | | | | | (ppm) | (%) |
| 100% | 3.85 | +22(Ref) | 1,879,999,999 | -1.44 | 0.0 | 0.000000 |
| | | -30 | 1,879,999,997 | -3.00 | 0.0 | 0.000000 |
| | | -20 | 1,879,999,998 | -2.33 | 0.0 | 0.000000 |
| | | -10 | 1,879,999,999 | -1.11 | 0.0 | 0.000000 |
| | | 0 | 1,880,000,001 | 0.74 | 0.0 | 0.000000 |
| | | +10 | 1,880,000,000 | -0.39 | 0.0 | 0.000000 |
| | | +20 | 1,880,000,000 | -0.20 | 0.0 | 0.000000 |
| | | +30 | 1,879,999,998 | -1.70 | 0.0 | 0.000000 |
| | | +40 | 1,879,999,997 | -3.34 | 0.0 | 0.000000 |
| | | +50 | 1,879,999,995 | -5.04 | 0.0 | 0.000000 |
| 115% | 4.43 | +22 | 1,879,999,998 | -1.95 | 0.0 | 0.000000 |
| End point | 2.55 | +22 | 1,879,999,999 | -1.30 | 0.0 | 0.000000 |



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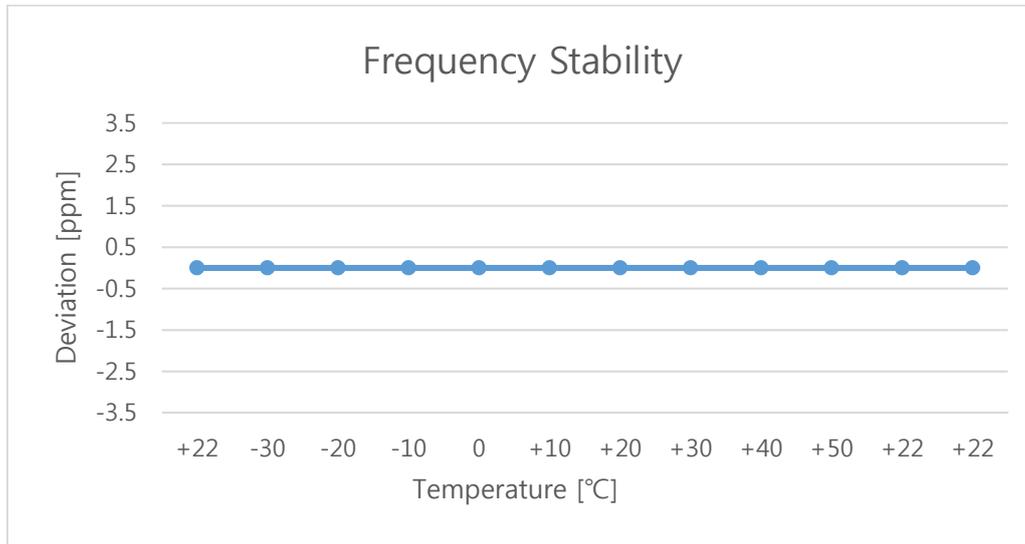
Report No.:
KR19-SRF0183-B

Page (174) of (216)



Test mode : LTE Band 4/66
 Frequency (Hz) : 1 745 000 000
 Channel : 132322
 Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Voltage (%) | Power (V) | Temp. (°C) | Frequency (Hz) | Frequency error (Hz) | Deviation | |
|-------------|-----------|------------|----------------|----------------------|-----------|----------|
| | | | | | (ppm) | (%) |
| 100% | 3.85 | +22(Ref) | 1,745,000,002 | 1.54 | 0.0 | 0.000000 |
| | | -30 | 1,744,999,997 | -2.95 | 0.0 | 0.000000 |
| | | -20 | 1,744,999,997 | -2.66 | 0.0 | 0.000000 |
| | | -10 | 1,744,999,998 | -1.58 | 0.0 | 0.000000 |
| | | 0 | 1,744,999,998 | -1.58 | 0.0 | 0.000000 |
| | | +10 | 1,744,999,999 | -0.58 | 0.0 | 0.000000 |
| | | +20 | 1,745,000,001 | 0.97 | 0.0 | 0.000000 |
| | | +30 | 1,745,000,000 | 0.36 | 0.0 | 0.000000 |
| | | +40 | 1,744,999,999 | -1.18 | 0.0 | 0.000000 |
| | | +50 | 1,744,999,998 | -1.93 | 0.0 | 0.000000 |
| 115% | 4.43 | +22 | 1,745,000,001 | 1.47 | 0.0 | 0.000000 |
| End point | 2.55 | +22 | 1,745,000,001 | 1.26 | 0.0 | 0.000000 |



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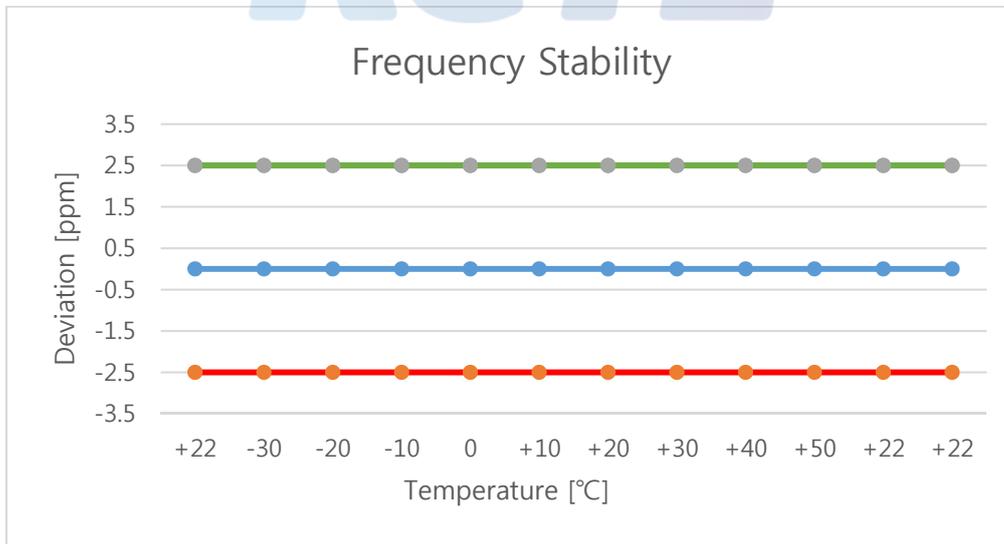
Report No.:
KR19-SRF0183-B

Page (175) of (216)



Test mode : LTE Band 5
Frequency (Hz) : 836 500 000
Channel : 20525
Deviation limit : ±0.00025% or 2.5ppm

| Voltage (%) | Power (V) | Temp. (°C) | Frequency (Hz) | Frequency error (Hz) | Deviation | |
|-------------|-----------|------------|----------------|----------------------|-----------|----------|
| | | | | | (ppm) | (%) |
| 100% | 3.85 | +22(Ref) | 836,500,001.24 | 1.24 | 0.0 | 0.000000 |
| | | -30 | 836,499,998.43 | -1.57 | 0.0 | 0.000000 |
| | | -20 | 836,499,997.99 | -2.01 | 0.0 | 0.000000 |
| | | -10 | 836,499,998.56 | -1.44 | 0.0 | 0.000000 |
| | | 0 | 836,500,000.59 | 0.59 | 0.0 | 0.000000 |
| | | +10 | 836,500,001.17 | 1.17 | 0.0 | 0.000000 |
| | | +20 | 836,500,002.16 | 2.16 | 0.0 | 0.000000 |
| | | +30 | 836,499,998.06 | -1.94 | 0.0 | 0.000000 |
| | | +40 | 836,499,996.57 | -3.43 | 0.0 | 0.000000 |
| | | +50 | 836,499,997.97 | -2.03 | 0.0 | 0.000000 |
| 115% | 4.43 | +22 | 836,500,001.83 | 1.83 | 0.0 | 0.000000 |
| End point | 2.55 | +22 | 836,500,001.30 | 1.30 | 0.0 | 0.000000 |



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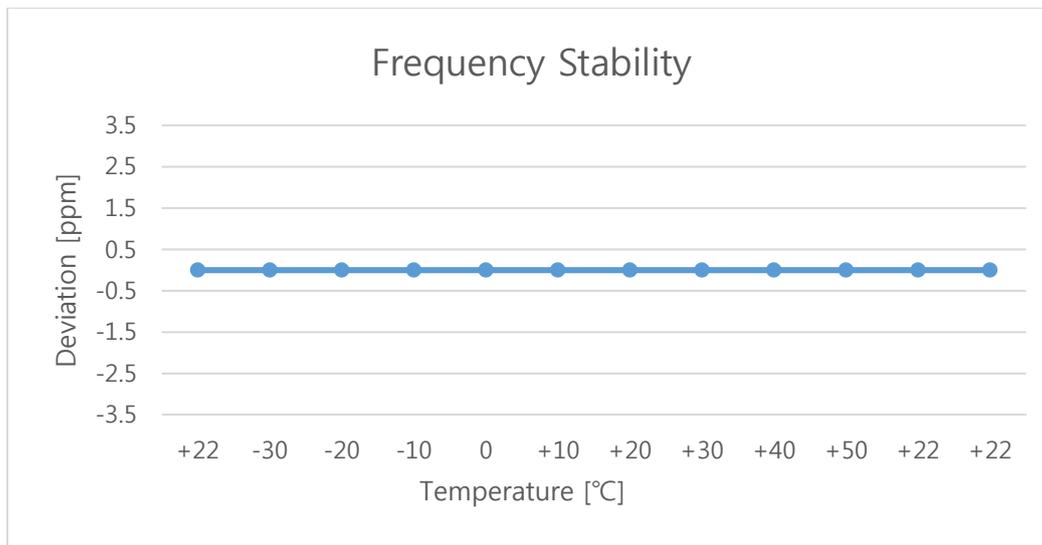
Report No.:
KR19-SRF0183-B

Page (176) of (216)



Test mode : LTE Band 12/17
 Frequency (Hz) : 707 500 000
 Channel : 23095
 Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

| Voltage (%) | Power (V) | Temp. (°C) | Frequency (Hz) | Frequency error (Hz) | Deviation | |
|-------------|-----------|------------|----------------|----------------------|-----------|----------|
| | | | | | (ppm) | (%) |
| 100% | 3.85 | +22(Ref) | 707,500,001 | 1.00 | 0.0 | 0.000000 |
| | | -30 | 707,499,999 | -1.06 | 0.0 | 0.000000 |
| | | -20 | 707,499,999 | -1.34 | 0.0 | 0.000000 |
| | | -10 | 707,499,998 | -2.01 | 0.0 | 0.000000 |
| | | 0 | 707,499,998 | -1.90 | 0.0 | 0.000000 |
| | | +10 | 707,500,001 | 0.55 | 0.0 | 0.000000 |
| | | +20 | 707,500,001 | 1.31 | 0.0 | 0.000000 |
| | | +30 | 707,500,000 | 0.29 | 0.0 | 0.000000 |
| | | +40 | 707,499,998 | -1.66 | 0.0 | 0.000000 |
| | | +50 | 707,499,998 | -1.86 | 0.0 | 0.000000 |
| 115% | 4.43 | +22 | 707,500,002 | 1.67 | 0.0 | 0.000000 |
| End point | 2.55 | +22 | 707,500,002 | 1.66 | 0.0 | 0.000000 |



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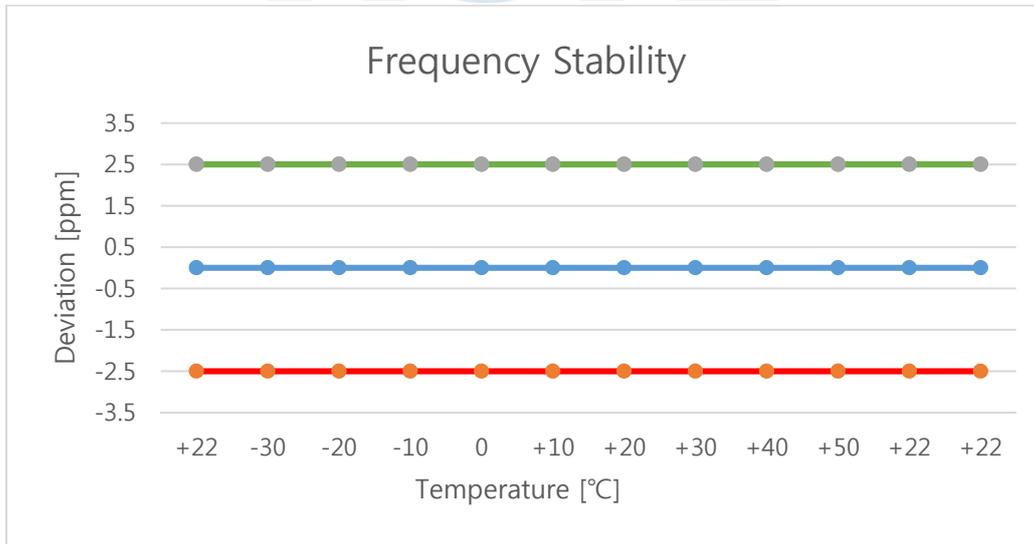
Report No.:
KR19-SRF0183-B

Page (177) of (216)



Test mode : LTE Band 13
Frequency (Hz) : 782 000 000
Channel : 23230
Deviation limit : ±0.00025% or 2.5ppm

| Voltage (%) | Power (V) | Temp. (°C) | Frequency (Hz) | Frequency error (Hz) | Deviation | |
|-------------|-----------|------------|----------------|----------------------|-----------|----------|
| | | | | | (ppm) | (%) |
| 100% | 3.85 | +22(Ref) | 782,000,002 | 2.22 | 0.0 | 0.000000 |
| | | -30 | 782,000,002 | 1.60 | 0.0 | 0.000000 |
| | | -20 | 782,000,002 | 1.93 | 0.0 | 0.000000 |
| | | -10 | 781,999,997 | -2.55 | 0.0 | 0.000000 |
| | | 0 | 781,999,999 | -0.91 | 0.0 | 0.000000 |
| | | +10 | 782,000,000 | 0.26 | 0.0 | 0.000000 |
| | | +20 | 782,000,001 | 0.88 | 0.0 | 0.000000 |
| | | +30 | 781,999,999 | -1.34 | 0.0 | 0.000000 |
| | | +40 | 781,999,997 | -2.64 | 0.0 | 0.000000 |
| | | +50 | 781,999,996 | -3.55 | 0.0 | 0.000000 |
| 115% | 4.43 | +22 | 782,000,002 | 2.06 | 0.0 | 0.000000 |
| End point | 2.55 | +22 | 782,000,002 | 1.59 | 0.0 | 0.000000 |



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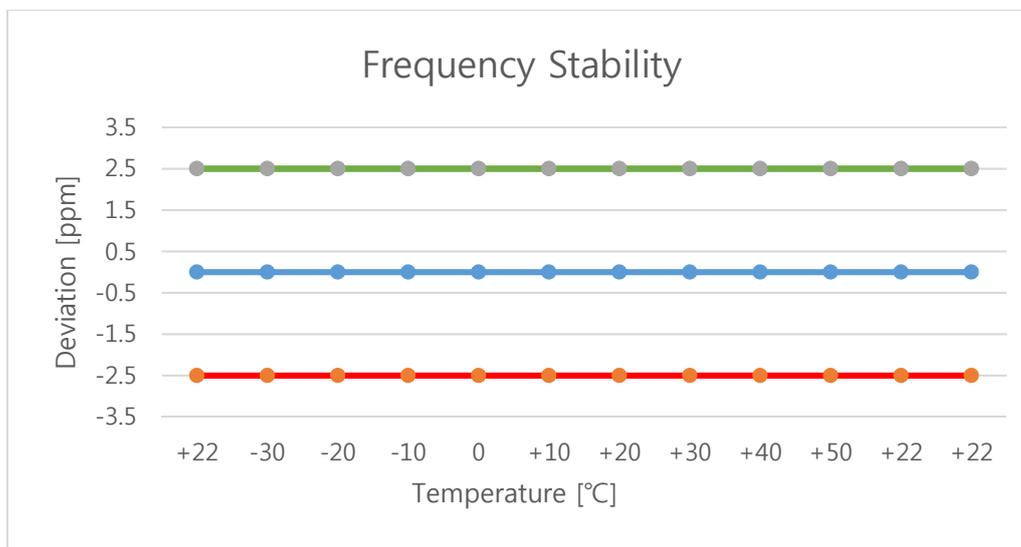
Report No.:
KR19-SRF0183-B

Page (178) of (216)



Test mode : LTE Band 41
 Frequency (Hz) : 2 593 000 000
 Channel : 40620
 Deviation limit : The frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

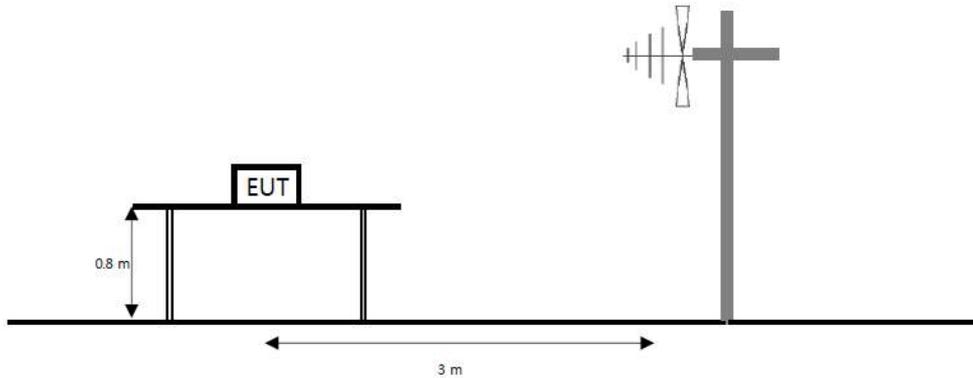
| Voltage (%) | Power (V) | Temp. (°C) | Frequency (Hz) | Frequency error (Hz) | Deviation | |
|-------------|-----------|------------|----------------|----------------------|-----------|----------|
| | | | | | (ppm) | (%) |
| 100% | 3.85 | +22(Ref) | 2,592,999,993 | -6.81 | 0.0 | 0.000000 |
| | | -30 | 2,592,999,994 | -6.34 | 0.0 | 0.000000 |
| | | -20 | 2,592,999,993 | -7.11 | 0.0 | 0.000000 |
| | | -10 | 2,592,999,992 | -7.64 | 0.0 | 0.000000 |
| | | 0 | 2,592,999,995 | -4.84 | 0.0 | 0.000000 |
| | | +10 | 2,592,999,997 | -3.33 | 0.0 | 0.000000 |
| | | +20 | 2,592,999,994 | -5.99 | 0.0 | 0.000000 |
| | | +30 | 2,593,000,001 | 0.67 | 0.0 | 0.000000 |
| | | +40 | 2,593,000,001 | 1.19 | 0.0 | 0.000000 |
| | | +50 | 2,593,000,002 | 2.07 | 0.0 | 0.000000 |
| 115% | 4.43 | +22 | 2,592,999,993 | -7.40 | 0.0 | 0.000000 |
| End point | 2.55 | +22 | 2,592,999,991 | -8.83 | 0.0 | 0.000000 |



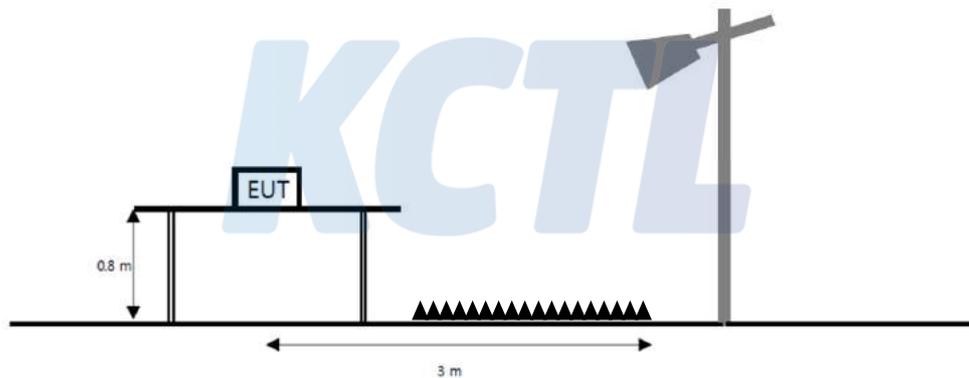
7.7. Radiated Power (ERP/EIRP)

Test setup

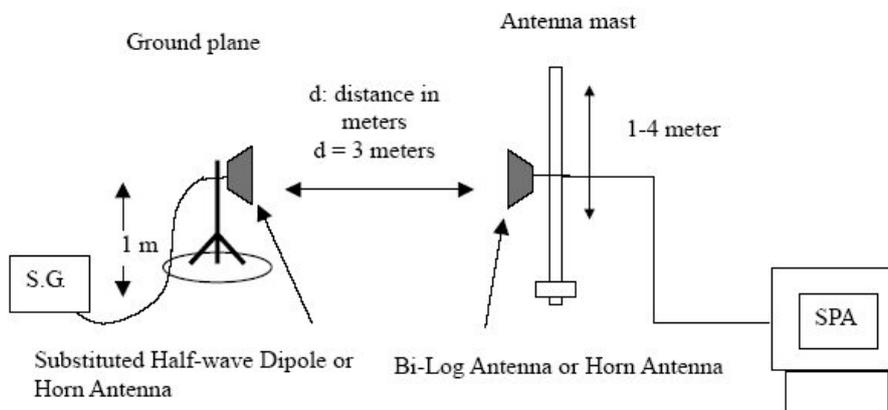
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



The diagram below shows the test setup that is utilized to make the measurements for emission from 1 GHz to the tenth harmonic of the highest fundamental frequency or to 40 GHz 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 §24.232(c), 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), Portable stations (hand-held devices) in the 698 -746MHz, 746-757MHz, 776-788MHz, and 805-806 MHz bands are limited 3 watts ERP.

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

According to §27.50(h)(2), Mobile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

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 $\geq 3 \times$ RBW.
- 3) SPAN = 2 \times to 3 \times the OBW.
- 4) Number of measurement points in sweep $\geq 2 \times$ span / RBW.
- 5) Sweep time :
 - 1) Auto couple, or
 - 2) $\geq [10 \times (\text{number of points in sweep}) \times (\text{transmission period})]$ 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 GHz below) or horn antenna (1 GHz above) connected to a signal generator.
The power is calculated by the following formula;
$$Pd(\text{dBm}) = Pg(\text{dBm}) - \text{Cable loss (dB)} + \text{Antenna gain (dB)}$$

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 dBm, 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**Test mode: LTE Band 2**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | EIRP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 1.4 M | QPSK | 1 850.7 | H | 6.18 | 5.74 | 18.66 | 19.10 | 0.081 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.80 | 19.16 | 0.082 |
| | | 1 909.3 | H | 6.11 | 5.81 | 20.22 | 20.52 | 0.113 |
| | 16QAM | 1 850.7 | H | 6.18 | 5.74 | 17.43 | 17.87 | 0.061 |
| | | 1 880.0 | H | 6.14 | 5.78 | 17.66 | 18.02 | 0.063 |
| | | 1 909.3 | H | 6.11 | 5.81 | 19.23 | 19.53 | 0.090 |
| 3 M | QPSK | 1 851.5 | H | 6.18 | 5.74 | 18.28 | 18.72 | 0.074 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.96 | 19.32 | 0.086 |
| | | 1 908.5 | H | 6.11 | 5.81 | 19.79 | 20.09 | 0.102 |
| | 16QAM | 1 851.5 | H | 6.18 | 5.74 | 17.20 | 17.64 | 0.058 |
| | | 1 880.0 | H | 6.14 | 5.78 | 17.92 | 18.28 | 0.067 |
| | | 1 908.5 | H | 6.11 | 5.81 | 18.77 | 19.07 | 0.081 |
| 5 M | QPSK | 1 852.5 | H | 6.18 | 5.74 | 18.45 | 18.89 | 0.077 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.85 | 19.21 | 0.083 |
| | | 1 907.5 | H | 6.11 | 5.80 | 20.13 | 20.44 | 0.111 |
| | 16QAM | 1 852.5 | H | 6.18 | 5.74 | 17.64 | 18.08 | 0.064 |
| | | 1 880.0 | H | 6.14 | 5.78 | 17.95 | 18.31 | 0.068 |
| | | 1 907.5 | H | 6.11 | 5.80 | 18.71 | 19.02 | 0.080 |
| 10 M | QPSK | 1 855.0 | H | 6.17 | 5.75 | 18.79 | 19.21 | 0.083 |
| | | 1 880.0 | H | 6.14 | 5.78 | 19.04 | 19.40 | 0.087 |
| | | 1 905.0 | H | 6.11 | 5.79 | 19.96 | 20.28 | 0.107 |
| | 16QAM | 1 855.0 | H | 6.17 | 5.75 | 17.62 | 18.04 | 0.064 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.03 | 18.39 | 0.069 |
| | | 1 905.0 | H | 6.11 | 5.79 | 18.68 | 19.00 | 0.079 |
| 15 M | QPSK | 1 857.5 | H | 6.17 | 5.75 | 18.82 | 19.24 | 0.084 |
| | | 1 880.0 | H | 6.14 | 5.78 | 19.00 | 19.36 | 0.086 |
| | | 1 902.5 | H | 6.12 | 5.79 | 19.99 | 20.32 | 0.108 |
| | 16QAM | 1 857.5 | H | 6.17 | 5.75 | 17.50 | 17.92 | 0.062 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.15 | 18.51 | 0.071 |
| | | 1 902.5 | H | 6.12 | 5.79 | 18.88 | 19.21 | 0.083 |
| 20 M | QPSK | 1 860.0 | H | 6.17 | 5.75 | 18.61 | 19.03 | 0.080 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.98 | 19.34 | 0.086 |
| | | 1 900.0 | H | 6.12 | 5.79 | 19.71 | 20.04 | 0.101 |
| | 16QAM | 1 860.0 | H | 6.17 | 5.75 | 17.66 | 18.08 | 0.064 |
| | | 1 880.0 | H | 6.14 | 5.78 | 18.06 | 18.42 | 0.070 |
| | | 1 900.0 | H | 6.12 | 5.79 | 19.09 | 19.42 | 0.087 |

Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

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Report No.:
KR19-SRF0183-B

Page (183) of (216)

**Test mode: LTE Band 4**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | EIRP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 1.4 M | QPSK | 1 710.7 | H | 6.35 | 5.48 | 19.32 | 20.19 | 0.104 |
| | | 1 732.5 | H | 6.32 | 5.52 | 18.75 | 19.55 | 0.090 |
| | | 1 754.3 | H | 6.29 | 5.56 | 20.17 | 20.90 | 0.123 |
| | 16QAM | 1 710.7 | H | 6.35 | 5.48 | 18.27 | 19.14 | 0.082 |
| | | 1 732.5 | H | 6.32 | 5.52 | 17.32 | 18.12 | 0.065 |
| | | 1 754.3 | H | 6.29 | 5.56 | 19.12 | 19.85 | 0.097 |
| 3 M | QPSK | 1 711.5 | H | 6.35 | 5.48 | 19.12 | 19.99 | 0.100 |
| | | 1 732.5 | H | 6.32 | 5.52 | 18.55 | 19.35 | 0.086 |
| | | 1 753.5 | H | 6.30 | 5.56 | 19.99 | 20.73 | 0.118 |
| | 16QAM | 1 711.5 | H | 6.35 | 5.48 | 17.98 | 18.85 | 0.077 |
| | | 1 732.5 | H | 6.32 | 5.52 | 17.27 | 18.07 | 0.064 |
| | | 1 753.5 | H | 6.30 | 5.56 | 18.86 | 19.60 | 0.091 |
| 5 M | QPSK | 1 712.5 | H | 6.35 | 5.49 | 19.23 | 20.08 | 0.102 |
| | | 1 732.5 | H | 6.32 | 5.52 | 18.56 | 19.36 | 0.086 |
| | | 1 752.5 | H | 6.30 | 5.55 | 19.83 | 20.58 | 0.114 |
| | 16QAM | 1 712.5 | H | 6.35 | 5.49 | 18.34 | 19.19 | 0.083 |
| | | 1 732.5 | H | 6.32 | 5.52 | 17.43 | 18.23 | 0.067 |
| | | 1 752.5 | H | 6.30 | 5.55 | 18.76 | 19.51 | 0.089 |
| 10 M | QPSK | 1 715.0 | H | 6.34 | 5.50 | 20.04 | 20.88 | 0.122 |
| | | 1 732.5 | H | 6.32 | 5.52 | 18.98 | 19.78 | 0.095 |
| | | 1 750.0 | H | 6.30 | 5.54 | 18.63 | 19.39 | 0.087 |
| | 16QAM | 1 715.0 | H | 6.34 | 5.50 | 18.79 | 19.63 | 0.092 |
| | | 1 732.5 | H | 6.32 | 5.52 | 18.24 | 19.04 | 0.080 |
| | | 1 750.0 | H | 6.30 | 5.54 | 17.52 | 18.28 | 0.067 |
| 15 M | QPSK | 1 717.5 | H | 6.34 | 5.49 | 20.12 | 20.97 | 0.125 |
| | | 1 732.5 | H | 6.32 | 5.52 | 19.14 | 19.94 | 0.099 |
| | | 1 747.5 | H | 6.30 | 5.54 | 18.50 | 19.26 | 0.084 |
| | 16QAM | 1 717.5 | H | 6.34 | 5.49 | 19.09 | 19.94 | 0.099 |
| | | 1 732.5 | H | 6.32 | 5.52 | 17.94 | 18.74 | 0.075 |
| | | 1 747.5 | H | 6.30 | 5.54 | 17.49 | 18.25 | 0.067 |
| 20 M | QPSK | 1 720.0 | H | 6.34 | 5.50 | 20.38 | 21.22 | 0.132 |
| | | 1 732.5 | H | 6.32 | 5.52 | 19.12 | 19.92 | 0.098 |
| | | 1 745.0 | H | 6.31 | 5.56 | 18.18 | 18.93 | 0.078 |
| | 16QAM | 1 720.0 | H | 6.34 | 5.50 | 19.38 | 20.22 | 0.105 |
| | | 1 732.5 | H | 6.32 | 5.52 | 18.35 | 19.15 | 0.082 |
| | | 1 745.0 | H | 6.31 | 5.56 | 17.02 | 17.77 | 0.060 |

Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

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Report No.:
KR19-SRF0183-B

Page (184) of (216)

**Test mode: LTE Band 5**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | ERP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 1.4 M | QPSK | 824.7 | H | -0.60 | 3.69 | 23.25 | 18.96 | 0.079 |
| | | 836.5 | H | -0.50 | 3.72 | 22.56 | 18.34 | 0.068 |
| | | 848.3 | H | -0.50 | 3.74 | 22.87 | 18.63 | 0.073 |
| | 16QAM | 824.7 | H | -0.60 | 3.69 | 21.96 | 17.67 | 0.058 |
| | | 836.5 | H | -0.50 | 3.72 | 21.54 | 17.32 | 0.054 |
| | | 848.3 | H | -0.50 | 3.74 | 21.80 | 17.56 | 0.057 |
| 3 M | QPSK | 825.5 | H | -0.60 | 3.70 | 23.44 | 19.14 | 0.082 |
| | | 836.5 | H | -0.50 | 3.72 | 23.02 | 18.80 | 0.076 |
| | | 847.5 | H | -0.50 | 3.74 | 22.99 | 18.75 | 0.075 |
| | 16QAM | 825.5 | H | -0.60 | 3.70 | 21.59 | 17.29 | 0.054 |
| | | 836.5 | H | -0.50 | 3.72 | 21.80 | 17.58 | 0.057 |
| | | 847.5 | H | -0.50 | 3.74 | 21.93 | 17.69 | 0.059 |
| 5 M | QPSK | 826.5 | H | -0.60 | 3.71 | 23.41 | 19.10 | 0.081 |
| | | 836.5 | H | -0.50 | 3.72 | 22.84 | 18.62 | 0.073 |
| | | 846.5 | H | -0.50 | 3.73 | 23.11 | 18.88 | 0.077 |
| | 16QAM | 826.5 | H | -0.60 | 3.71 | 22.39 | 18.08 | 0.064 |
| | | 836.5 | H | -0.50 | 3.72 | 21.93 | 17.71 | 0.059 |
| | | 846.5 | H | -0.50 | 3.73 | 21.83 | 17.60 | 0.058 |
| 10 M | QPSK | 829.0 | H | -0.60 | 3.71 | 23.68 | 19.37 | 0.086 |
| | | 836.5 | H | -0.50 | 3.72 | 22.79 | 18.57 | 0.072 |
| | | 844.0 | H | -0.50 | 3.73 | 22.98 | 18.75 | 0.075 |
| | 16QAM | 829.0 | H | -0.60 | 3.71 | 22.56 | 18.25 | 0.067 |
| | | 836.5 | H | -0.50 | 3.72 | 22.13 | 17.91 | 0.062 |
| | | 844.0 | H | -0.50 | 3.73 | 21.87 | 17.64 | 0.058 |

Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

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Report No.:
KR19-SRF0183-B

Page (185) of (216)

**Test mode: LTE Band 12**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | ERP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 1.4 M | QPSK | 699.7 | H | -0.60 | 3.40 | 21.54 | 17.54 | 0.057 |
| | | 707.5 | H | -0.70 | 3.42 | 22.22 | 18.10 | 0.065 |
| | | 715.3 | H | -0.80 | 3.44 | 23.30 | 19.06 | 0.081 |
| | 16QAM | 699.7 | H | -0.60 | 3.40 | 20.41 | 16.41 | 0.044 |
| | | 707.5 | H | -0.70 | 3.42 | 21.33 | 17.21 | 0.053 |
| | | 715.3 | H | -0.80 | 3.44 | 22.49 | 18.25 | 0.067 |
| 3 M | QPSK | 700.5 | H | -0.70 | 3.40 | 21.76 | 17.66 | 0.058 |
| | | 707.5 | H | -0.70 | 3.42 | 22.28 | 18.16 | 0.065 |
| | | 714.5 | H | -0.80 | 3.44 | 23.30 | 19.06 | 0.081 |
| | 16QAM | 700.5 | H | -0.70 | 3.40 | 21.31 | 17.21 | 0.053 |
| | | 707.5 | H | -0.70 | 3.42 | 21.09 | 16.97 | 0.050 |
| | | 714.5 | H | -0.80 | 3.44 | 21.89 | 17.65 | 0.058 |
| 5 M | QPSK | 701.5 | H | -0.70 | 3.40 | 21.88 | 17.78 | 0.060 |
| | | 707.5 | H | -0.70 | 3.44 | 22.26 | 18.12 | 0.065 |
| | | 713.5 | H | -0.80 | 3.44 | 23.13 | 18.89 | 0.077 |
| | 16QAM | 701.5 | H | -0.70 | 3.40 | 21.04 | 16.94 | 0.049 |
| | | 707.5 | H | -0.70 | 3.44 | 21.17 | 17.03 | 0.050 |
| | | 713.5 | H | -0.80 | 3.44 | 21.50 | 17.26 | 0.053 |
| 10 M | QPSK | 704.0 | H | -0.70 | 3.40 | 22.19 | 18.09 | 0.064 |
| | | 707.5 | H | -0.70 | 3.44 | 22.31 | 18.17 | 0.066 |
| | | 711.0 | H | -0.80 | 3.42 | 23.07 | 18.85 | 0.077 |
| | 16QAM | 704.0 | H | -0.70 | 3.40 | 21.14 | 17.04 | 0.051 |
| | | 707.5 | H | -0.70 | 3.44 | 21.45 | 17.31 | 0.054 |
| | | 711.0 | H | -0.80 | 3.42 | 21.80 | 17.58 | 0.057 |

Test mode: LTE Band 13

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | ERP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 5 M | QPSK | 779.5 | H | 0.00 | 3.59 | 22.42 | 18.83 | 0.076 |
| | | 782.0 | H | 0.10 | 3.62 | 22.05 | 18.53 | 0.071 |
| | | 784.5 | H | 0.10 | 3.62 | 22.08 | 18.56 | 0.072 |
| | 16QAM | 779.5 | H | 0.00 | 3.59 | 21.03 | 17.44 | 0.055 |
| | | 782.0 | H | 0.10 | 3.62 | 21.06 | 17.54 | 0.057 |
| | | 784.5 | H | 0.10 | 6.62 | 23.75 | 17.23 | 0.053 |
| 10 M | QPSK | 782.0 | H | 0.10 | 3.62 | 22.08 | 18.56 | 0.072 |
| | 16QAM | 782.0 | H | 0.10 | 3.62 | 20.87 | 17.35 | 0.054 |

Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

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Report No.:
KR19-SRF0183-B

Page (186) of (216)

KCTL**Test mode: LTE Band 17**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | ERP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 5 M | QPSK | 706.5 | H | -0.70 | 3.40 | 22.29 | 18.19 | 0.066 |
| | | 710.0 | H | -0.80 | 3.42 | 22.82 | 18.60 | 0.072 |
| | | 713.5 | H | -0.80 | 3.44 | 23.20 | 18.96 | 0.079 |
| | 16QAM | 706.5 | H | -0.70 | 3.40 | 21.22 | 17.12 | 0.052 |
| | | 710.0 | H | -0.80 | 3.42 | 21.68 | 17.46 | 0.056 |
| | | 713.5 | H | -0.80 | 3.44 | 21.95 | 17.71 | 0.059 |
| 10 M | QPSK | 709.0 | H | -0.70 | 3.42 | 22.60 | 18.48 | 0.070 |
| | | 710.0 | H | -0.80 | 3.42 | 22.92 | 18.70 | 0.074 |
| | | 711.0 | H | -0.80 | 3.42 | 22.98 | 18.76 | 0.075 |
| | 16QAM | 709.0 | H | -0.70 | 3.42 | 21.70 | 17.58 | 0.057 |
| | | 710.0 | H | -0.80 | 3.42 | 21.81 | 17.59 | 0.057 |
| | | 711.0 | H | -0.80 | 3.42 | 22.26 | 18.04 | 0.064 |

Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

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Report No.:
KR19-SRF0183-B

Page (187) of (216)

**Test mode: LTE Band 41**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | EIRP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 5 M | QPSK | 2 498.5 | H | 6.00 | 6.62 | 21.70 | 21.08 | 0.128 |
| | | 2 593.0 | H | 6.13 | 6.78 | 20.38 | 19.73 | 0.094 |
| | | 2 687.5 | H | 6.26 | 6.92 | 18.48 | 17.82 | 0.061 |
| | 16QAM | 2 498.5 | H | 6.00 | 6.62 | 20.55 | 19.93 | 0.098 |
| | | 2 593.0 | H | 6.13 | 6.78 | 19.16 | 18.51 | 0.071 |
| | | 2 687.5 | H | 6.26 | 6.92 | 18.26 | 17.60 | 0.058 |
| 10 M | QPSK | 2 501.0 | H | 6.00 | 6.62 | 23.72 | 23.10 | 0.204 |
| | | 2 593.0 | H | 6.13 | 6.78 | 24.39 | 23.74 | 0.237 |
| | | 2 685.0 | H | 6.26 | 6.92 | 21.95 | 21.29 | 0.135 |
| | 16QAM | 2 501.0 | H | 6.00 | 6.62 | 22.20 | 21.58 | 0.144 |
| | | 2 593.0 | H | 6.13 | 6.78 | 21.81 | 21.16 | 0.131 |
| | | 2 685.0 | H | 6.26 | 6.92 | 19.22 | 18.56 | 0.072 |
| 15 M | QPSK | 2 503.5 | H | 6.00 | 6.63 | 23.24 | 22.61 | 0.182 |
| | | 2 593.0 | H | 6.13 | 6.78 | 24.17 | 23.52 | 0.225 |
| | | 2 682.5 | H | 6.26 | 6.94 | 21.37 | 20.69 | 0.117 |
| | 16QAM | 2 503.5 | H | 6.00 | 6.63 | 23.20 | 22.57 | 0.181 |
| | | 2 593.0 | H | 6.13 | 6.78 | 21.69 | 21.04 | 0.127 |
| | | 2 682.5 | H | 6.26 | 6.94 | 19.19 | 18.51 | 0.071 |
| 20 M | QPSK | 2 506.0 | H | 6.01 | 6.63 | 23.15 | 22.53 | 0.179 |
| | | 2 593.0 | H | 6.13 | 6.78 | 24.52 | 23.87 | 0.244 |
| | | 2 680.0 | H | 6.25 | 6.94 | 21.03 | 20.34 | 0.108 |
| | 16QAM | 2 506.0 | H | 6.01 | 6.63 | 21.84 | 21.22 | 0.132 |
| | | 2 593.0 | H | 6.13 | 6.78 | 21.23 | 20.58 | 0.114 |
| | | 2 680.0 | H | 6.25 | 6.94 | 20.41 | 19.72 | 0.094 |

Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

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Report No.:
KR19-SRF0183-B

Page (188) of (216)

**Test mode: LTE Band 66**

| Bandwidth | Modulation | Frequency | Pol. | Antenna Gain | C.L | Substitute Level | EIRP | |
|-----------|------------|-----------|-------|--------------|------|------------------|-------|-------|
| | | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [W] |
| 1.4 M | QPSK | 1 710.7 | H | 6.35 | 5.48 | 20.63 | 21.50 | 0.141 |
| | | 1 745.0 | H | 6.31 | 5.56 | 19.46 | 20.21 | 0.105 |
| | | 1 779.3 | H | 6.26 | 5.58 | 21.62 | 22.30 | 0.170 |
| | 16QAM | 1 710.7 | H | 6.35 | 5.48 | 19.50 | 20.37 | 0.109 |
| | | 1 745.0 | H | 6.31 | 5.56 | 18.42 | 19.17 | 0.083 |
| | | 1 779.3 | H | 6.26 | 5.58 | 20.60 | 21.28 | 0.134 |
| 3 M | QPSK | 1 711.5 | H | 6.35 | 5.48 | 19.99 | 20.86 | 0.122 |
| | | 1 745.0 | H | 6.31 | 5.56 | 19.78 | 20.53 | 0.113 |
| | | 1 778.5 | H | 6.27 | 5.58 | 21.97 | 22.66 | 0.185 |
| | 16QAM | 1 711.5 | H | 6.35 | 5.48 | 18.82 | 19.69 | 0.093 |
| | | 1 745.0 | H | 6.31 | 5.56 | 19.01 | 19.76 | 0.095 |
| | | 1 778.5 | H | 6.27 | 5.58 | 20.86 | 21.55 | 0.143 |
| 5 M | QPSK | 1 712.5 | H | 6.35 | 5.49 | 20.14 | 20.99 | 0.126 |
| | | 1 745.0 | H | 6.31 | 5.56 | 19.89 | 20.64 | 0.116 |
| | | 1 777.5 | H | 6.27 | 5.58 | 21.51 | 22.20 | 0.166 |
| | 16QAM | 1 712.5 | H | 6.35 | 5.49 | 19.09 | 19.94 | 0.099 |
| | | 1 745.0 | H | 6.31 | 5.56 | 18.71 | 19.46 | 0.088 |
| | | 1 777.5 | H | 6.27 | 5.58 | 20.23 | 20.92 | 0.124 |
| 10 M | QPSK | 1 715.0 | H | 6.34 | 5.50 | 20.79 | 21.63 | 0.146 |
| | | 1 745.0 | H | 6.31 | 5.56 | 19.17 | 19.92 | 0.098 |
| | | 1 775.0 | H | 6.27 | 5.57 | 21.55 | 22.25 | 0.168 |
| | 16QAM | 1 715.0 | H | 6.34 | 5.50 | 19.57 | 20.41 | 0.110 |
| | | 1 745.0 | H | 6.31 | 5.56 | 18.12 | 18.87 | 0.077 |
| | | 1 775.0 | H | 6.27 | 5.57 | 20.31 | 21.01 | 0.126 |
| 15 M | QPSK | 1 717.5 | H | 6.34 | 5.49 | 20.99 | 21.84 | 0.153 |
| | | 1 745.0 | H | 6.31 | 5.56 | 17.55 | 18.30 | 0.068 |
| | | 1 772.5 | H | 6.27 | 5.57 | 19.69 | 20.39 | 0.109 |
| | 16QAM | 1 717.5 | H | 6.34 | 5.49 | 19.97 | 20.82 | 0.121 |
| | | 1 745.0 | H | 6.31 | 5.56 | 17.00 | 17.75 | 0.060 |
| | | 1 772.5 | H | 6.27 | 5.57 | 19.56 | 20.26 | 0.106 |
| 20 M | QPSK | 1 720.0 | H | 6.34 | 5.50 | 19.13 | 19.97 | 0.099 |
| | | 1 745.0 | H | 6.31 | 5.56 | 17.13 | 17.88 | 0.061 |
| | | 1 770.0 | H | 6.28 | 5.57 | 19.26 | 19.97 | 0.099 |
| | 16QAM | 1 720.0 | H | 6.34 | 5.50 | 18.76 | 19.60 | 0.091 |
| | | 1 745.0 | H | 6.31 | 5.56 | 16.97 | 17.72 | 0.059 |
| | | 1 770.0 | H | 6.28 | 5.57 | 18.95 | 19.66 | 0.092 |

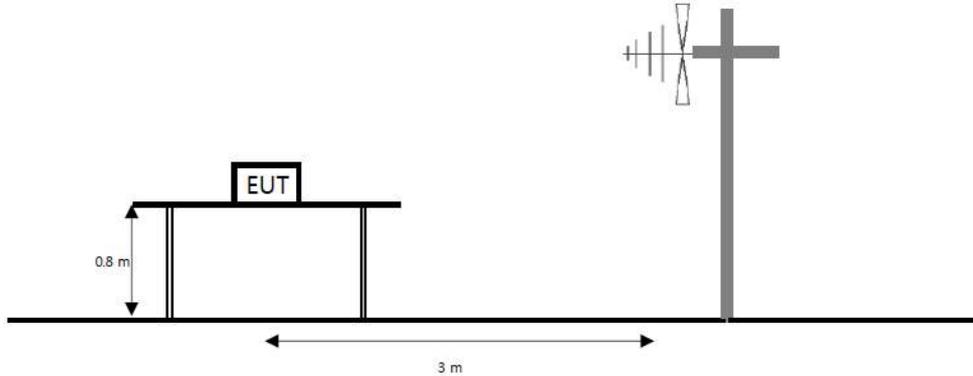
Note.

1. E.R.P & E.I.R.P(dBm) = Substitute Level(dB) + Antenna gain(dBi) - C.L(Cable loss) (dB)

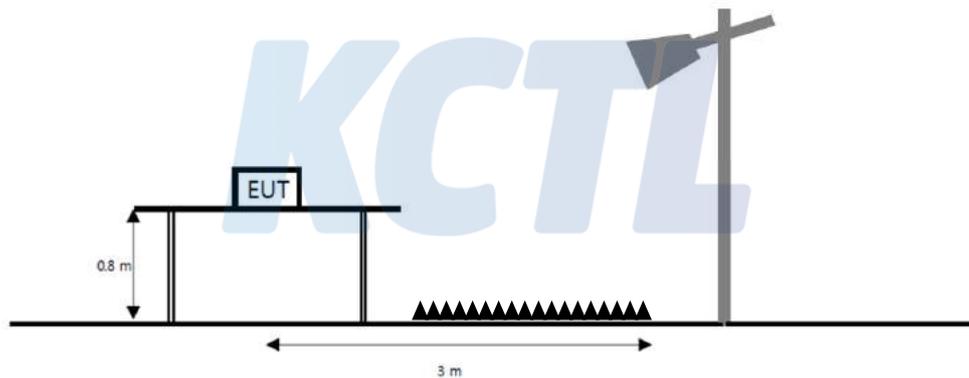
7.8. Radiated Spurious Emissions

Test setup

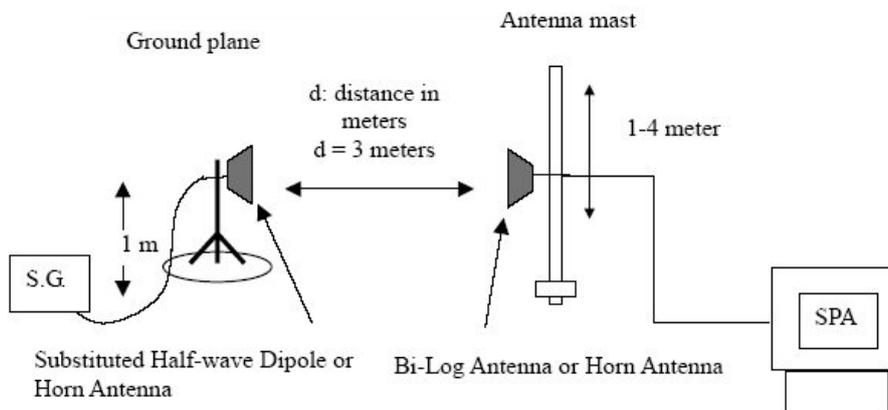
The diagram below shows the test setup that is utilized to make the measurements for emission from 30 MHz to 1 GHz emissions.



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



The diagram below shows the test setup for substituted method.



Limit

According to §22.917(a) and §24.238(a), 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 $43 + 10\log(P_{\text{Watts}})$ dB.

According to §27.53(c)(2), on any frequency outside the 776-788 MHz band, the power of any emission shall be attenuated outside the band below the transmitter power (P) by at least $43 + 10\log(P_{\text{Watts}})$ dB and 27.53(f), for operations in the 746-758 MHz, 775-788 MHz, and 805-806 MHz bands, emissions in the band 1559-1610 MHz shall be limited to -70 dBW/MHz equivalent isotropically radiated power (EIRP) for wideband signals, and -80 dBW EIRP for discrete emissions of less than 700 Hz 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), for operations in the 600 MHz band and the 698-746 MHz 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 $43 + 10\log(P_{\text{Watts}})$ dB.

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

According to §27.53(m)(4), the minimum permissible attenuation level of any spurious emission is $53 + 10\log(P_{\text{Watts}})$ dB.

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

For the narrowband spurious settings:

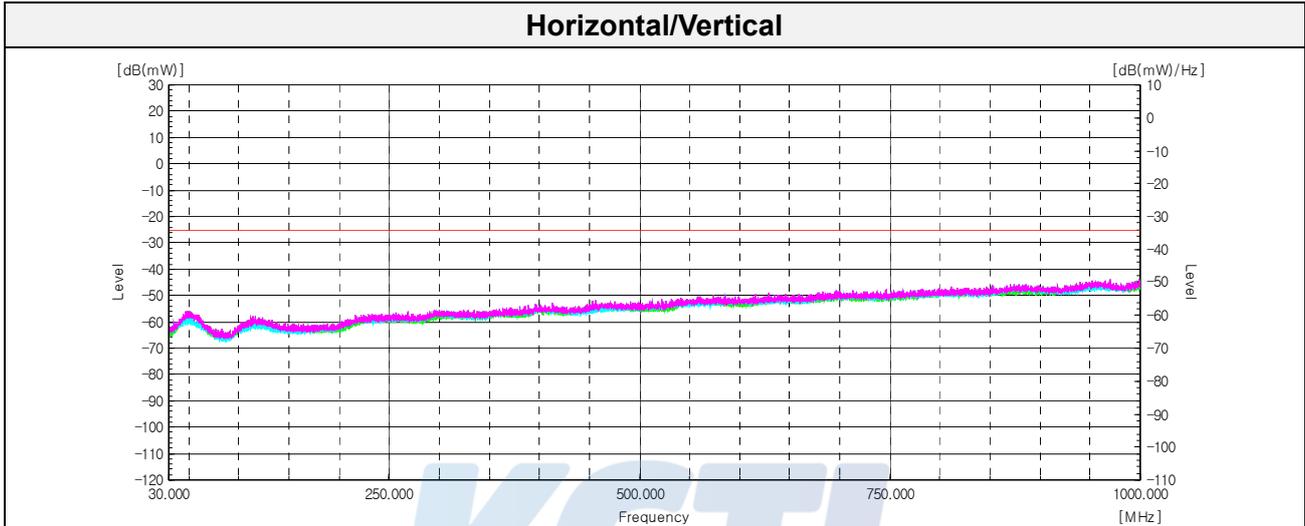
- 1) RBW = 1 kHz
- 2) VBW = 3 kHz
- 3) Detector = RMS
- 4) Trace mode = Max hold
- 5) Sweep speed slow enough to maintain measurement calibration.

Notes:

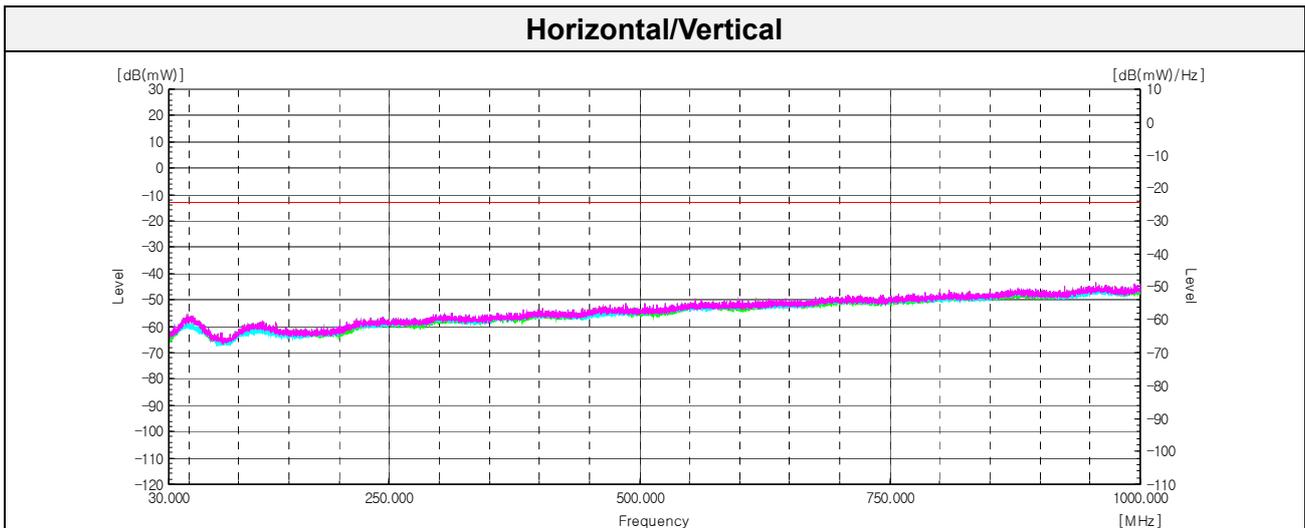
1. On a test site, the EUT shall be placed at 80 cm height on a turn table, and in the position close to normal use as declared by the applicant.
2. The test antenna shall be oriented initially for vertical polarization located 3 m from EUT to correspond to the fundamental frequency of the transmitter.
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 GHz below) or horn antenna (1 GHz 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 dBm, 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. This EUT was tested under all configurations and the highest power is reported in QPSK modulation.

Test results (Below 1 000 MHz) – Worst case

Test mode : LTE Band 2
Frequency (MHz) : 1 909.3
Channel : 19193
Bandwidth (MHz) : 1.4

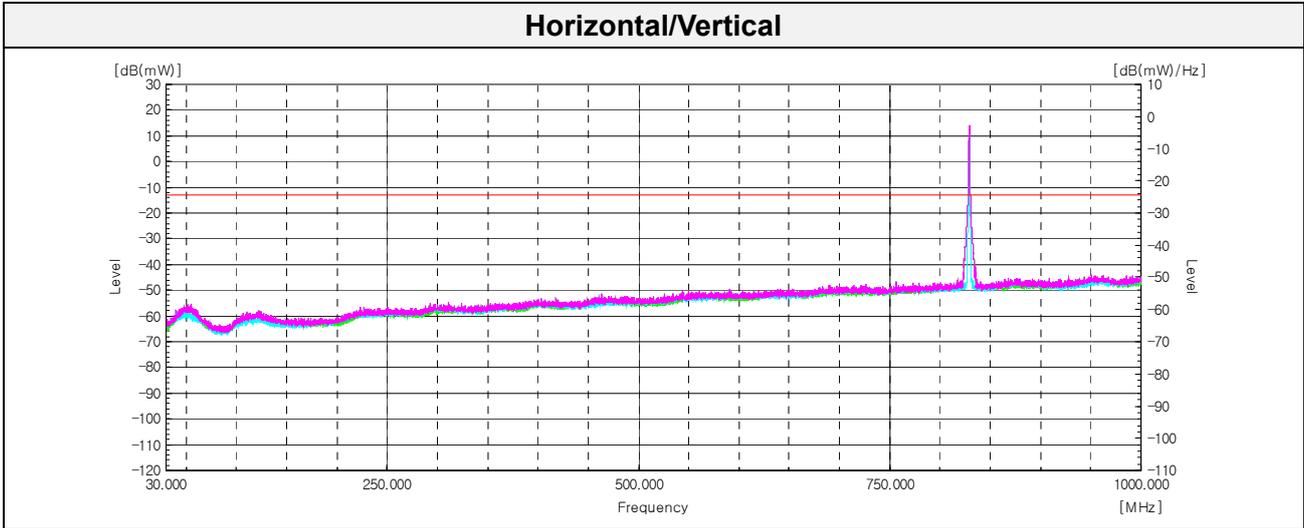


Test mode : LTE Band 4/66
Frequency (MHz) : 1 778.5
Channel : 132657
Bandwidth (MHz) : 3



Test mode : LTE Band 5
Frequency (MHz) : 829.0
Channel : 20450
Bandwidth (MHz) : 10

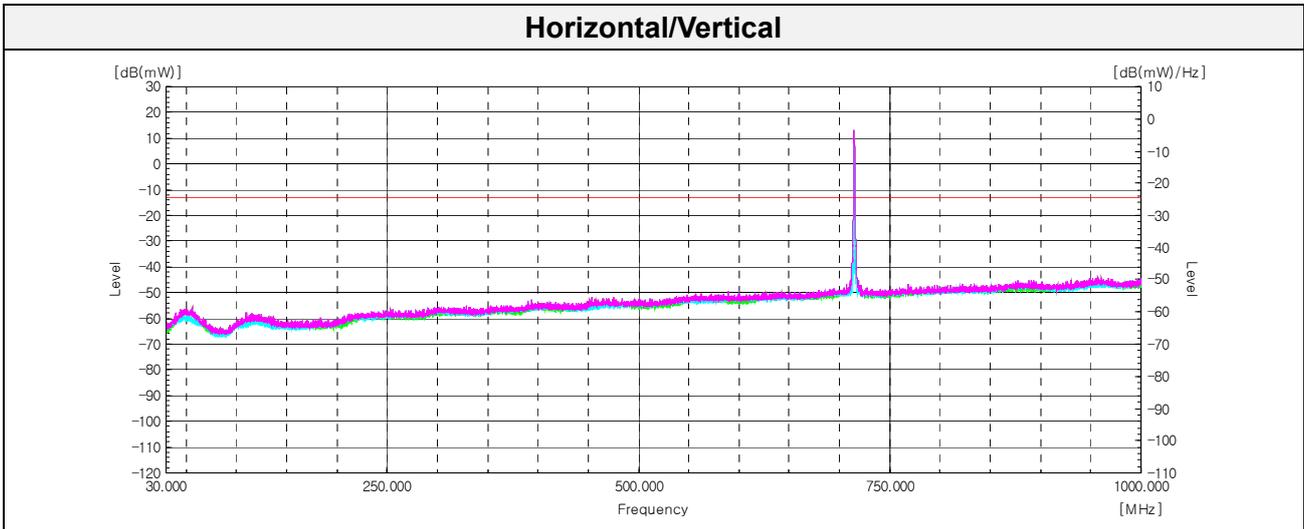
Horizontal/Vertical



Test mode : LTE Band 12/17
Frequency (MHz) : 714.5
Channel : 23165
Bandwidth (MHz) : 3



Horizontal/Vertical



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65, Sinwon-ro, Yeongtong-gu,
Suwon-si, Gyeonggi-do, 16677, Korea
TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

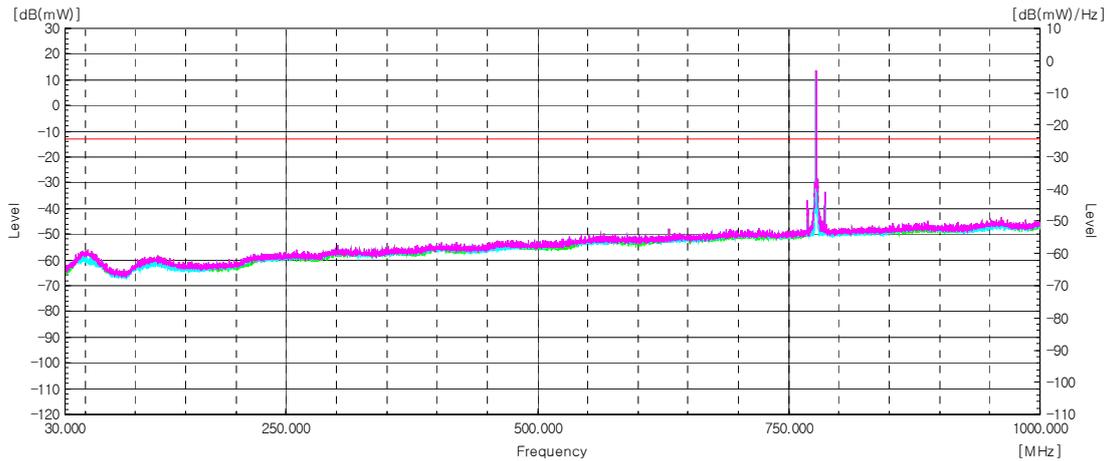
Report No.:
KR19-SRF0183-B

Page (194) of (216)



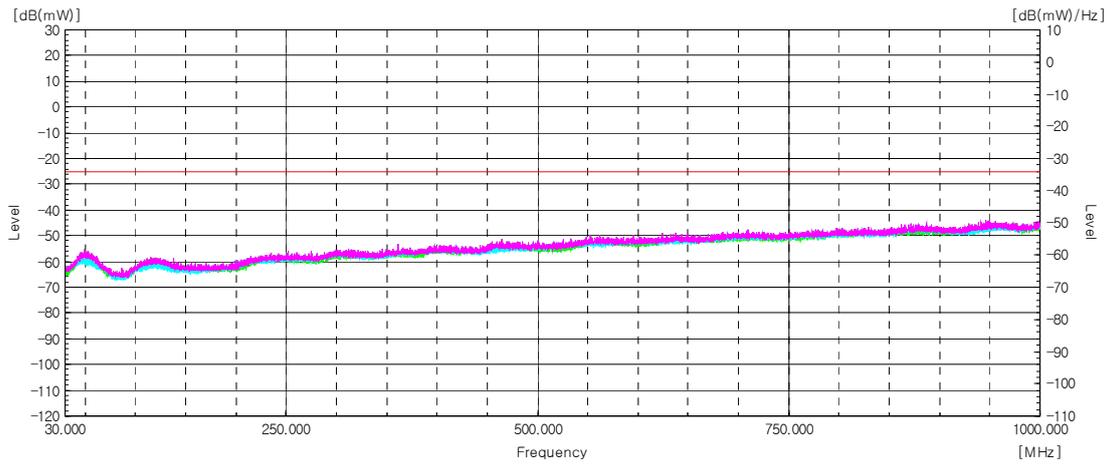
Test mode : LTE Band 13
Frequency (MHz) : 779.5
Channel : 23205
Bandwidth (MHz) : 5

Horizontal/Vertical



Test mode : LTE Band 41
Frequency (MHz) : 2 593.0
Channel : 40620
Bandwidth (MHz) : 20

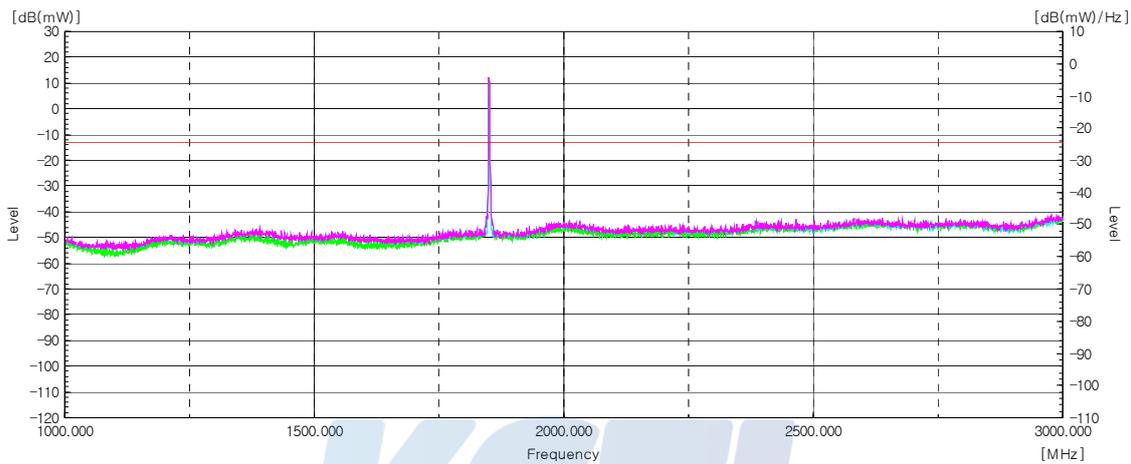
Horizontal/Vertical



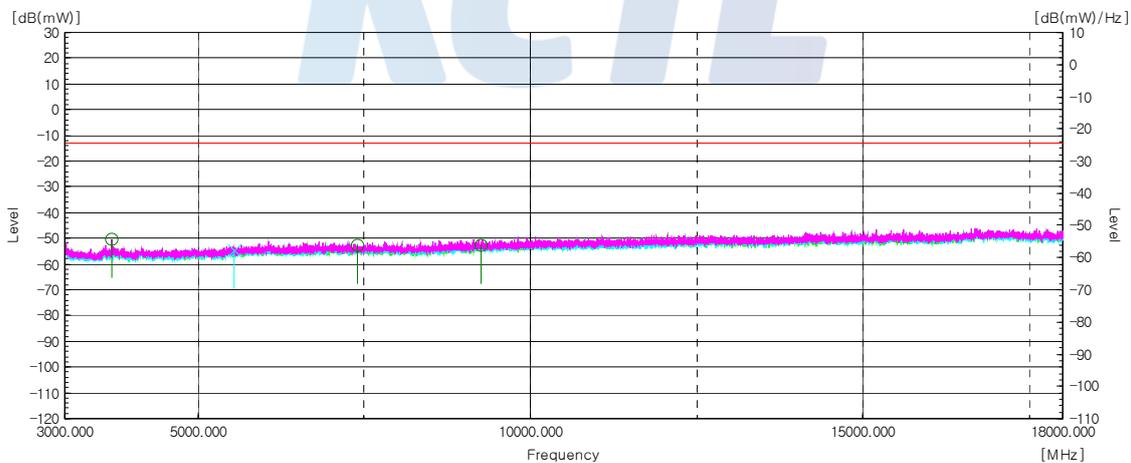
Test results (Above 1 000 MHz)

Test mode : LTE Band 2
 Frequency(MHz) : 1 850.7
 Channel : 18607
 Bandwidth(MHz) : 1.4

Horizontal/Vertical for 1 GHz ~ 3 GHz



Horizontal/Vertical for 3 GHz ~ 18 GHz



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 3 701.05 | H | 8.12 | 8.15 | -50.37 | -50.40 | -13.00 | 37.40 |
| | 5 551.17 | V | 10.60 | 10.05 | -54.95 | -54.40 | -13.00 | 41.40 |
| | 7 405.29 | H | 11.83 | 11.62 | -52.81 | -52.60 | -13.00 | 39.60 |
| | 9 251.42 | H | 12.95 | 13.13 | -52.72 | -52.90 | -13.00 | 39.90 |

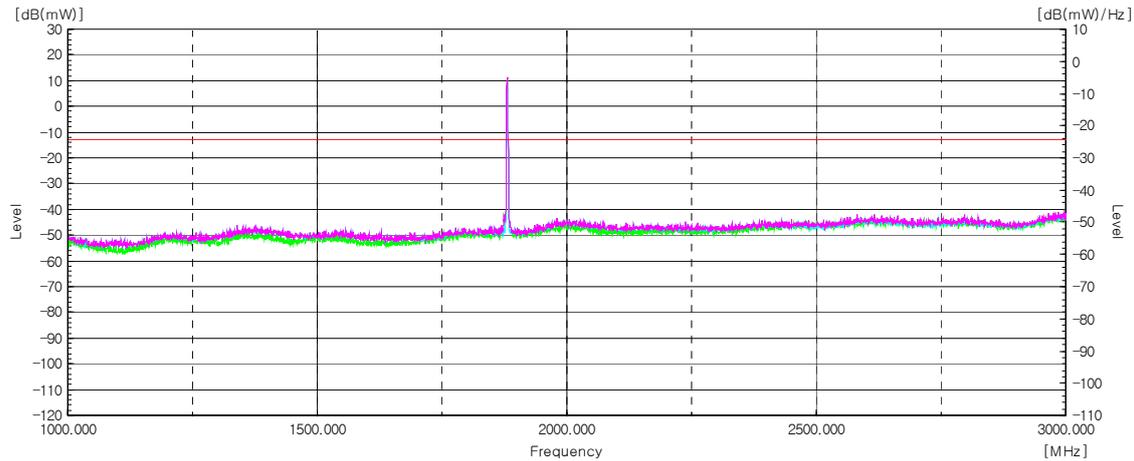
Note.

- Limit Calculation(dBm)= 43 + 10log(P_{Watts})
- ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

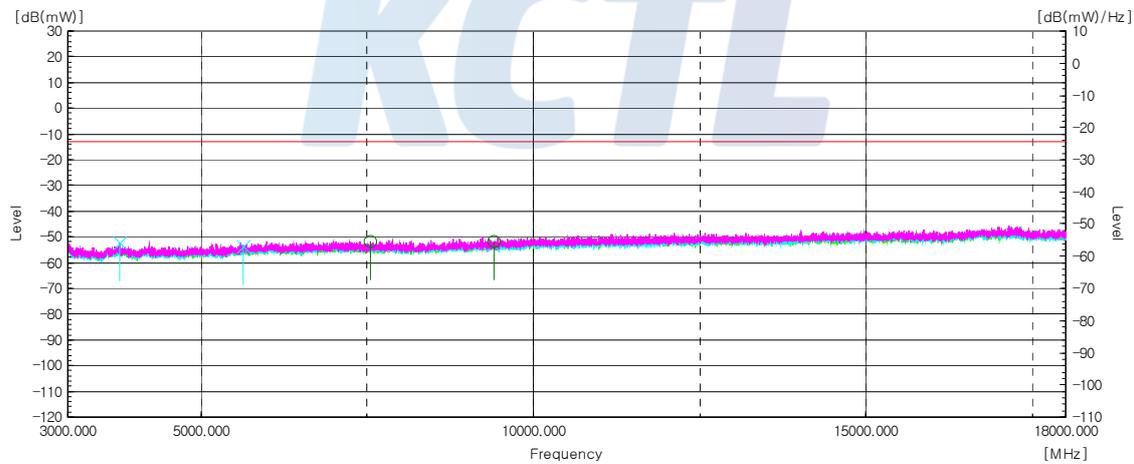
This test report shall not be reproduced, except in full, without the written approval

Test mode : LTE Band 2
 Frequency(MHz) : 1 880.0
 Channel : 18900
 Bandwidth(MHz) : 1.4

Horizontal/Vertical for 1 GHz ~ 3 GHz



Horizontal/Vertical for 3 GHz ~ 18 GHz



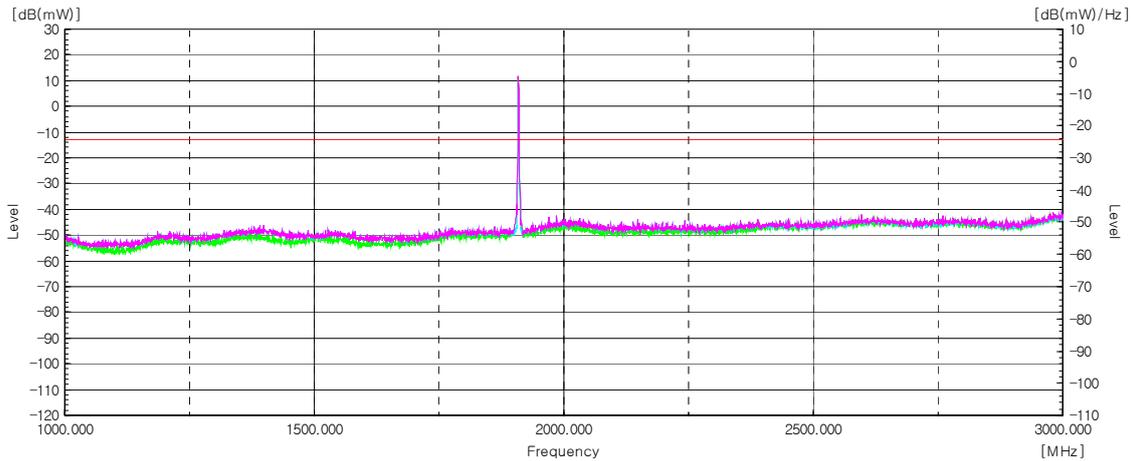
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 3 777.05 | V | 8.24 | 8.26 | -52.08 | -52.10 | -13.00 | 39.10 |
| | 5 639.18 | V | 10.60 | 10.18 | -54.12 | -53.70 | -13.00 | 40.70 |
| | 7 553.30 | H | 12.05 | 11.85 | -52.20 | -52.00 | -13.00 | 39.00 |
| | 9 404.43 | H | 13.04 | 13.31 | -51.43 | -51.70 | -13.00 | 38.70 |

Note.

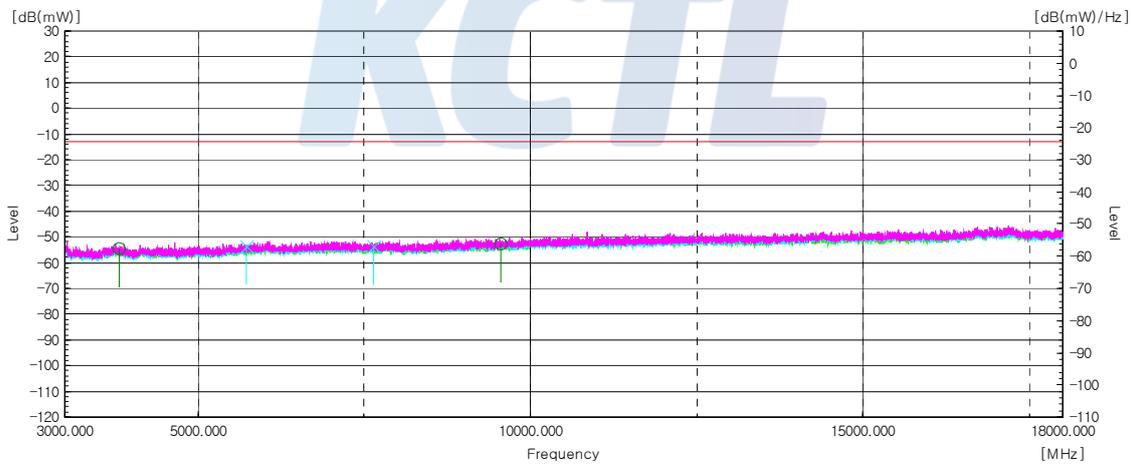
1. Limit Calculation(dBm)= 43 + 10log(P_[Watts])
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 2
 Frequency(MHz) : 1 9090.3
 Channel : 19193
 Bandwidth(MHz) : 1.4

Horizontal/Vertical for 1 GHz ~ 3 GHz



Horizontal/Vertical for 3 GHz ~ 18 GHz



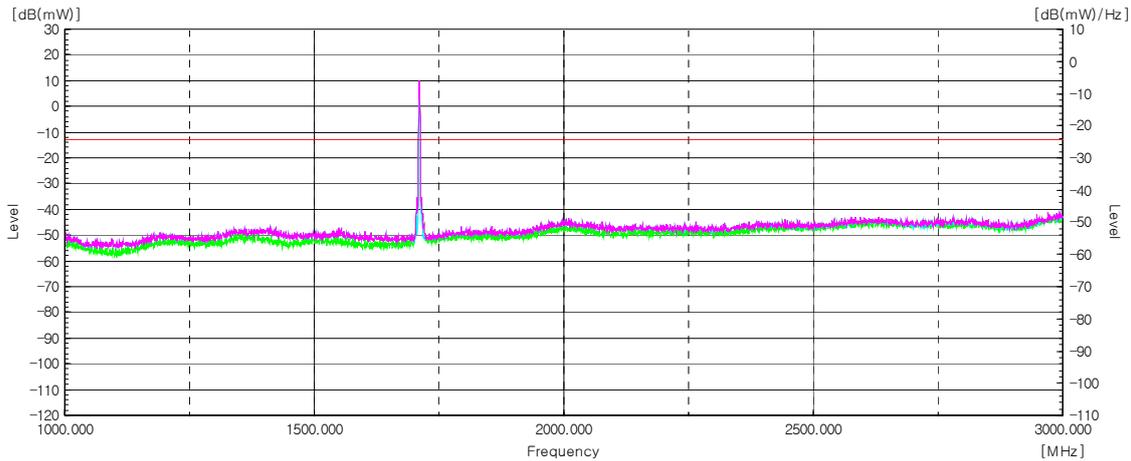
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 3 818.06 | H | 8.31 | 8.21 | -54.70 | -54.60 | -13.00 | 41.60 |
| | 5 729.18 | V | 10.60 | 10.45 | -53.95 | -53.80 | -13.00 | 40.80 |
| | 7 638.31 | V | 12.14 | 11.92 | -53.92 | -53.70 | -13.00 | 40.70 |
| | 9 546.44 | H | 13.06 | 13.32 | -52.54 | -52.80 | -13.00 | 39.80 |

Note.

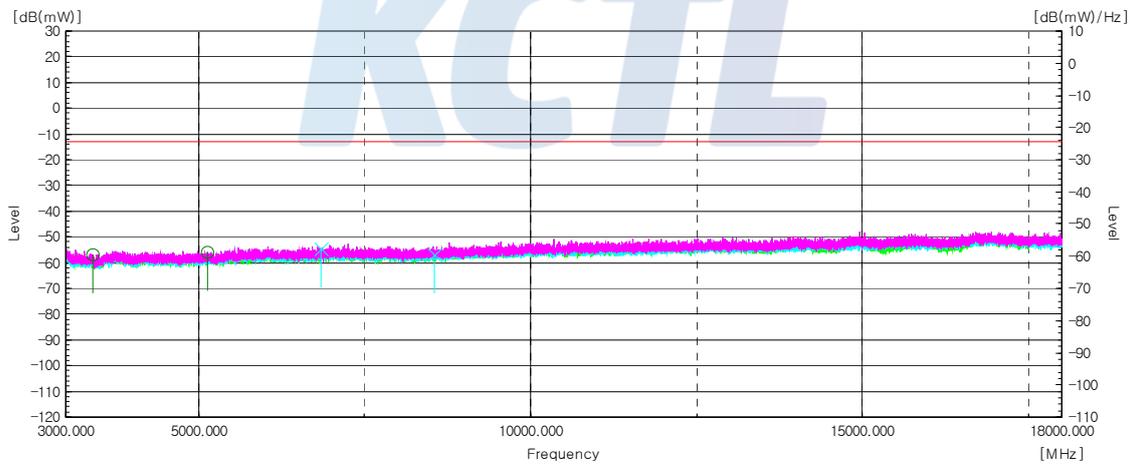
- Limit Calculation(dBm)= 43 + 10log(P_{Watts})
- ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 4/66
Frequency(MHz) : 1 711.5
Channel : 131987
Bandwidth(MHz) : 3

Horizontal/Vertical for 1 GHz ~ 3 GHz



Horizontal/Vertical for 3 GHz ~ 18 GHz



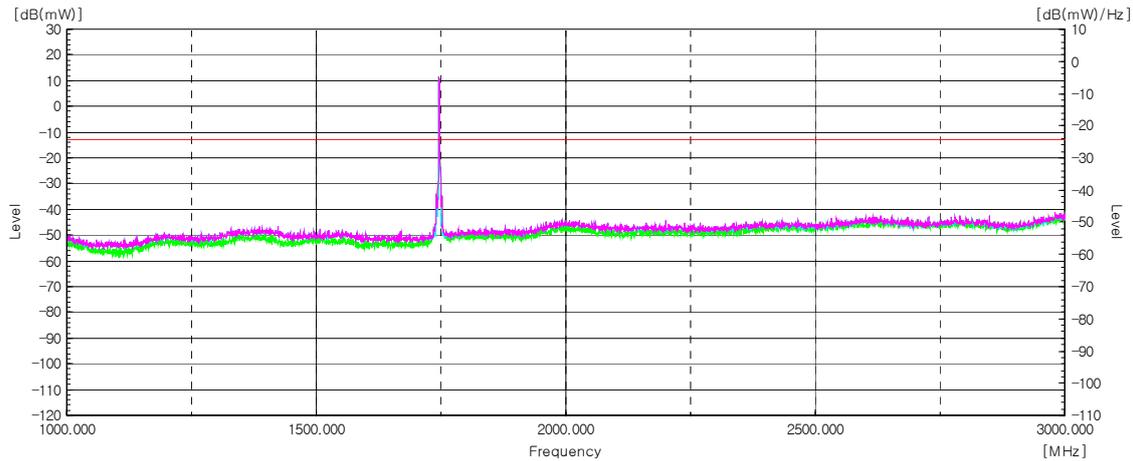
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 3 416.50 | H | 7.62 | 7.81 | -56.51 | -56.70 | -13.00 | 43.70 |
| | 5 133.50 | H | 10.09 | 9.67 | -56.42 | -56.00 | -13.00 | 43.00 |
| | 6 846.50 | V | 11.04 | 11.28 | -54.56 | -54.80 | -13.00 | 41.80 |
| | 8 550.00 | V | 12.98 | 12.61 | -57.07 | -56.70 | -13.00 | 43.70 |

Note.

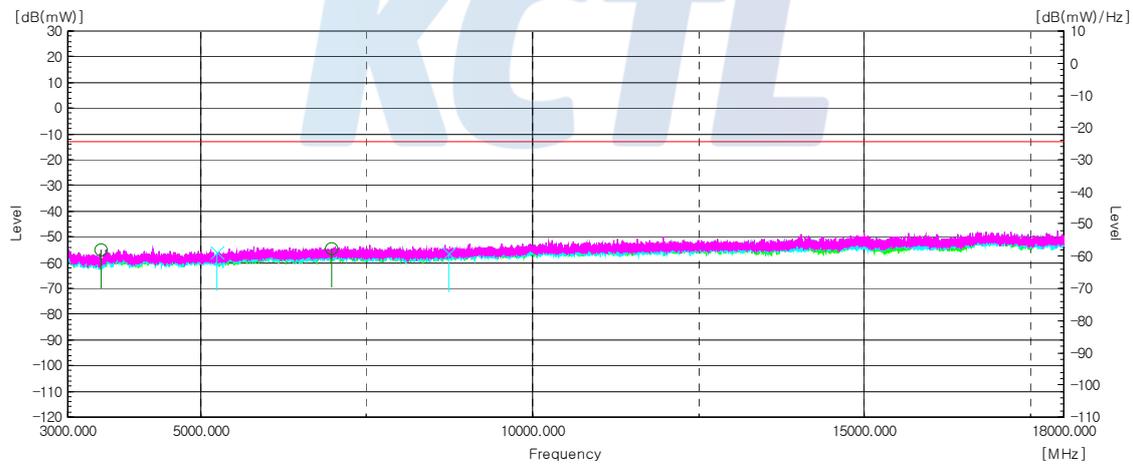
- Limit Calculation(dBm)= 43 + 10log(P_{Watts})
- ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 4/66
 Frequency(MHz) : 1 745.0
 Channel : 132322
 Bandwidth(MHz) : 3

Horizontal/Vertical for 1 GHz ~ 3 GHz



Horizontal/Vertical for 3 GHz ~ 18 GHz



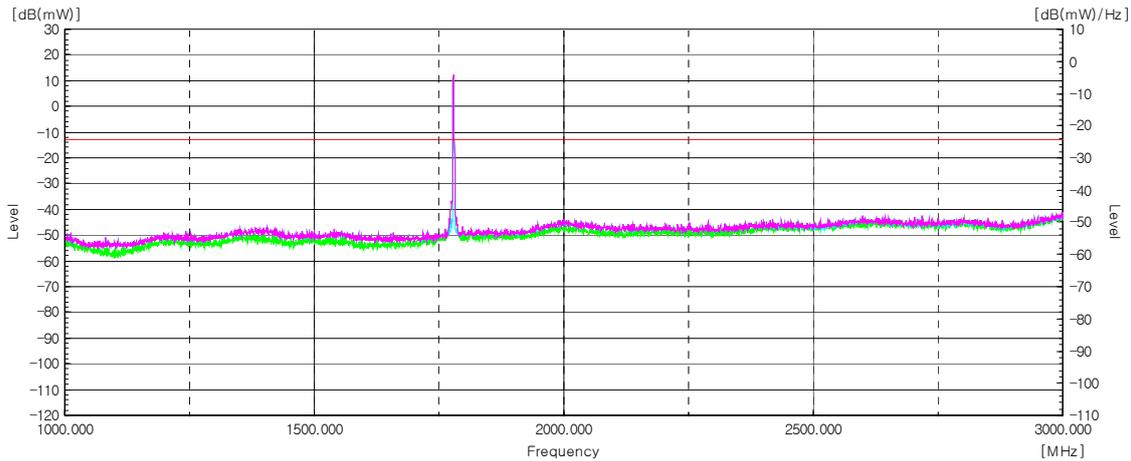
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 3 492.50 | H | 7.78 | 7.90 | -54.78 | -54.90 | -13.00 | 41.90 |
| | 5 238.00 | V | 10.23 | 9.66 | -56.67 | -56.10 | -13.00 | 43.10 |
| | 6 980.50 | H | 11.09 | 11.43 | -54.06 | -54.40 | -13.00 | 41.40 |
| | 8 735.50 | V | 12.91 | 12.88 | -56.33 | -56.30 | -13.00 | 43.30 |

Note.

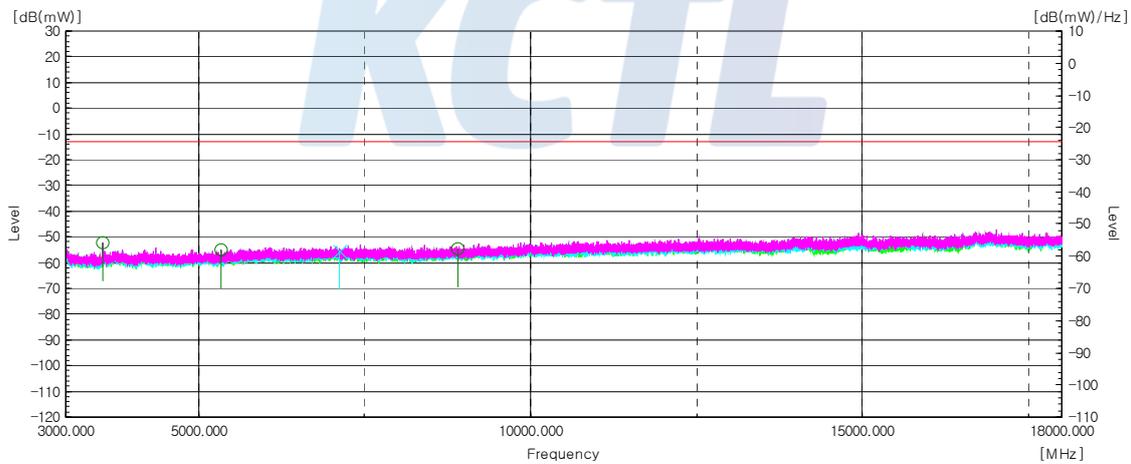
1. Limit Calculation(dBm)= 43 + 10log(P_{Watts})
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

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

Horizontal/Vertical for 1 GHz ~ 3 GHz



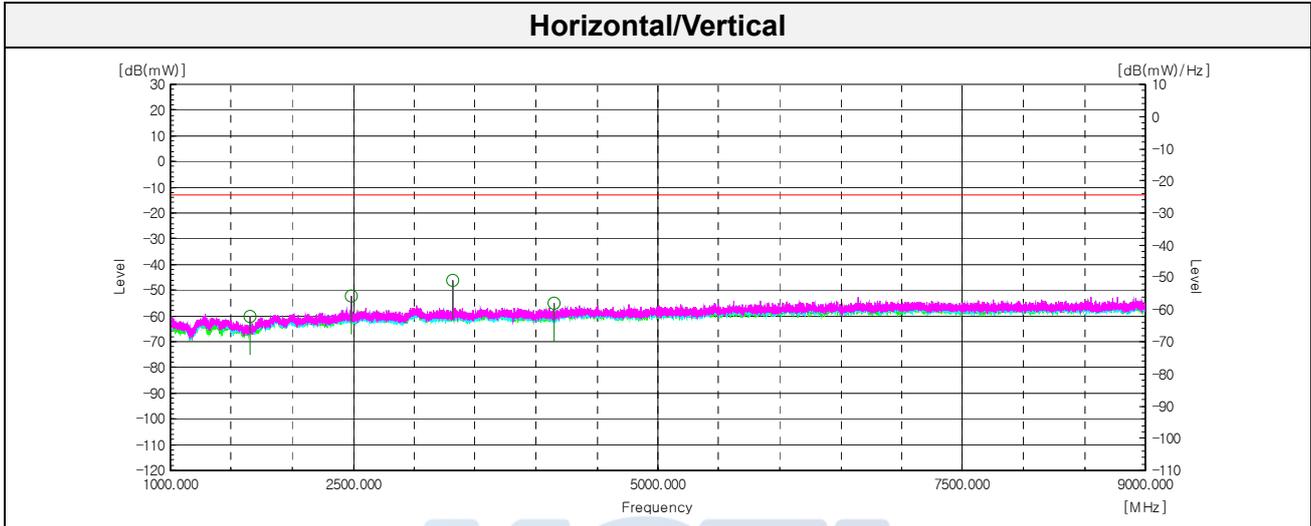
Horizontal/Vertical for 3 GHz ~ 18 GHz



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 3 557.00 | H | 7.89 | 7.95 | -52.24 | -52.30 | -13.00 | 39.30 |
| | 5 336.00 | H | 10.37 | 9.86 | -55.61 | -55.10 | -13.00 | 42.10 |
| | 7 114.00 | V | 11.31 | 11.43 | -55.28 | -55.40 | -13.00 | 42.40 |
| | 8 896.50 | H | 12.84 | 12.84 | -54.60 | -54.60 | -13.00 | 41.60 |

Note.

- Limit Calculation(dBm)= 43 + 10log(P_{Watts})
- ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 5Frequency(MHz) : 829.0Channel : 20450Bandwidth(MHz) : 10**Horizontal/Vertical**

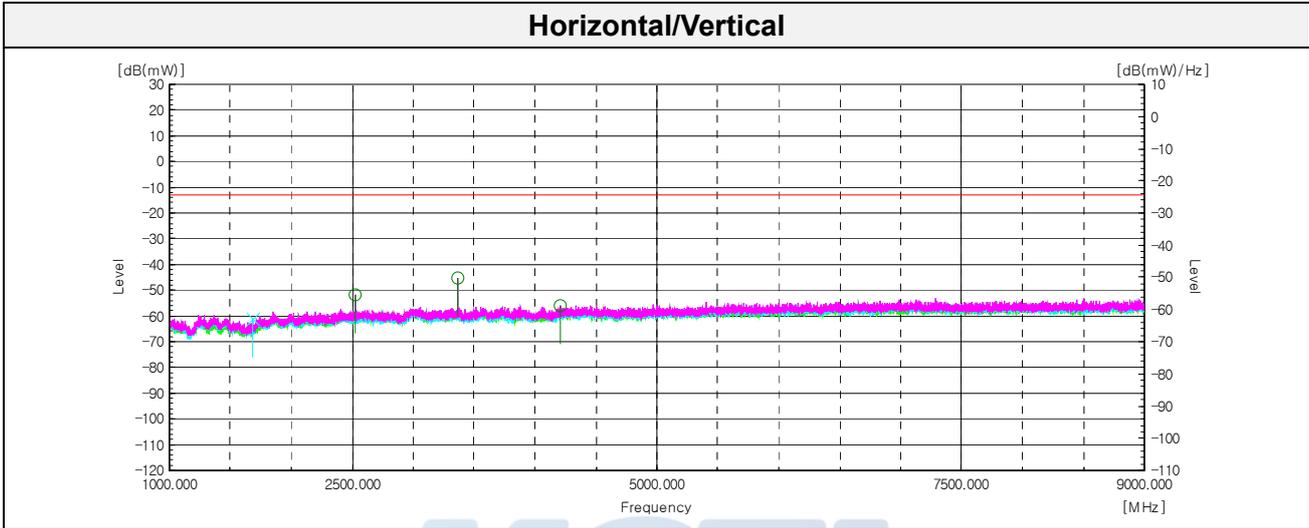
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 658.04 | H | 6.41 | 5.37 | -61.04 | -60.00 | -13.00 | 47.00 |
| | 2 487.09 | H | 6.00 | 6.65 | -51.55 | -52.20 | -13.00 | 39.20 |
| | 3 316.15 | H | 7.40 | 7.68 | -45.82 | -46.10 | -13.00 | 33.10 |
| | 4 145.20 | H | 8.75 | 8.61 | -55.24 | -55.10 | -13.00 | 42.10 |

Note.

- Limit Calculation(dBm)= 43 + 10log(P_{Watts})
- ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 5
 Frequency(MHz) : 836.5
 Channel : 20525
 Bandwidth(MHz) : 10

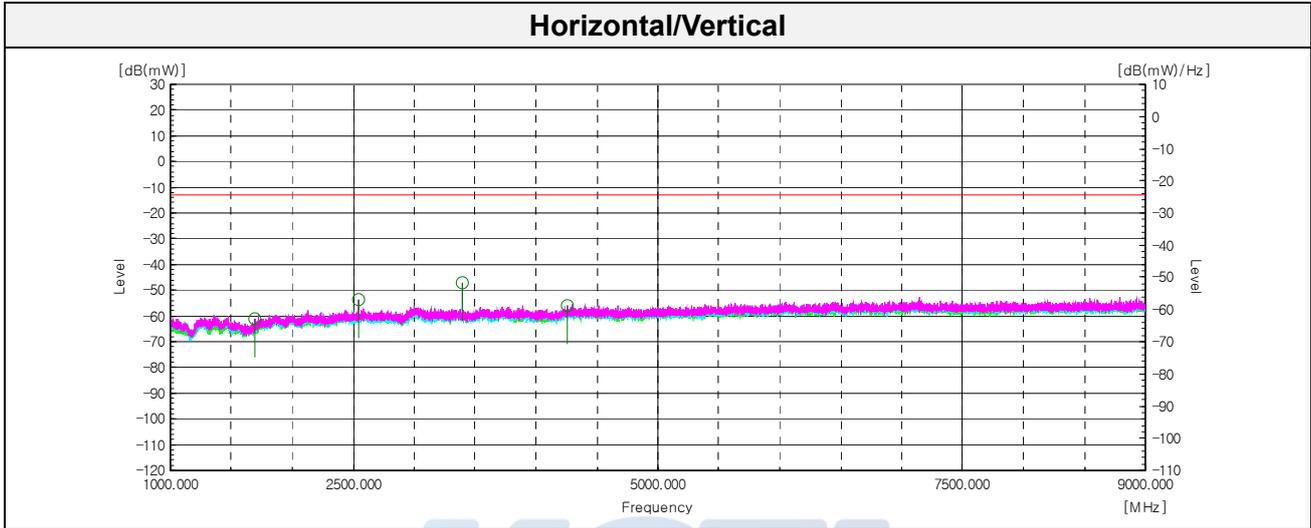
Horizontal/Vertical



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 682.04 | V | 6.38 | 5.42 | -62.16 | -61.20 | -13.00 | 48.20 |
| | 2 522.60 | H | 6.03 | 6.69 | -51.04 | -51.70 | -13.00 | 38.70 |
| | 3 363.65 | H | 7.50 | 7.74 | -44.86 | -45.10 | -13.00 | 32.10 |
| | 4 204.20 | H | 8.80 | 8.66 | -56.14 | -56.00 | -13.00 | 43.00 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_[Watts])
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 5Frequency(MHz) : 844.0Channel : 20600Bandwidth(MHz) : 10**Horizontal/Vertical**

| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | | | | | | | |
| QPSK | 1 696.54 | H | 6.36 | 5.45 | -61.91 | -61.00 | -13.00 | 48.00 |
| | 2 545.10 | H | 6.06 | 6.73 | -53.03 | -53.70 | -13.00 | 40.70 |
| | 3 393.65 | H | 7.57 | 7.78 | -46.99 | -47.20 | -13.00 | 34.20 |
| | 4 256.20 | H | 8.86 | 8.74 | -56.02 | -55.90 | -13.00 | 42.90 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_{Watts})

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

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TEL: 82-31-285-0894 FAX: 82-505-299-8311
www.kctl.co.kr

Report No.:
KR19-SRF0183-B

Page (204) of (216)



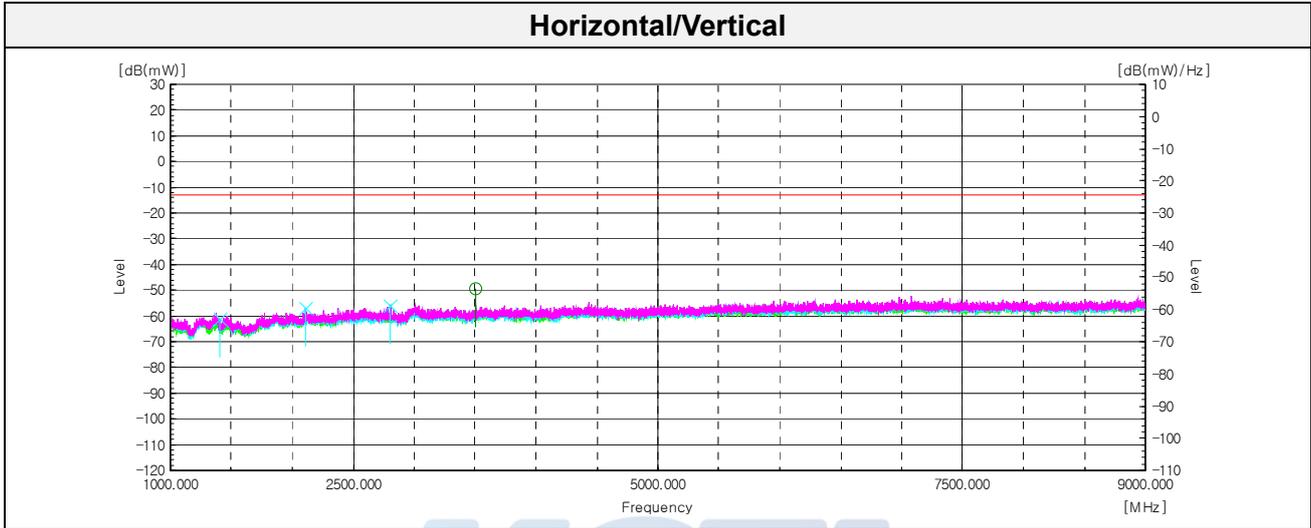
Test mode : LTE Band 12/17

Frequency(MHz) : 700.5

Channel : 23025

Bandwidth(MHz) : 3

Horizontal/Vertical



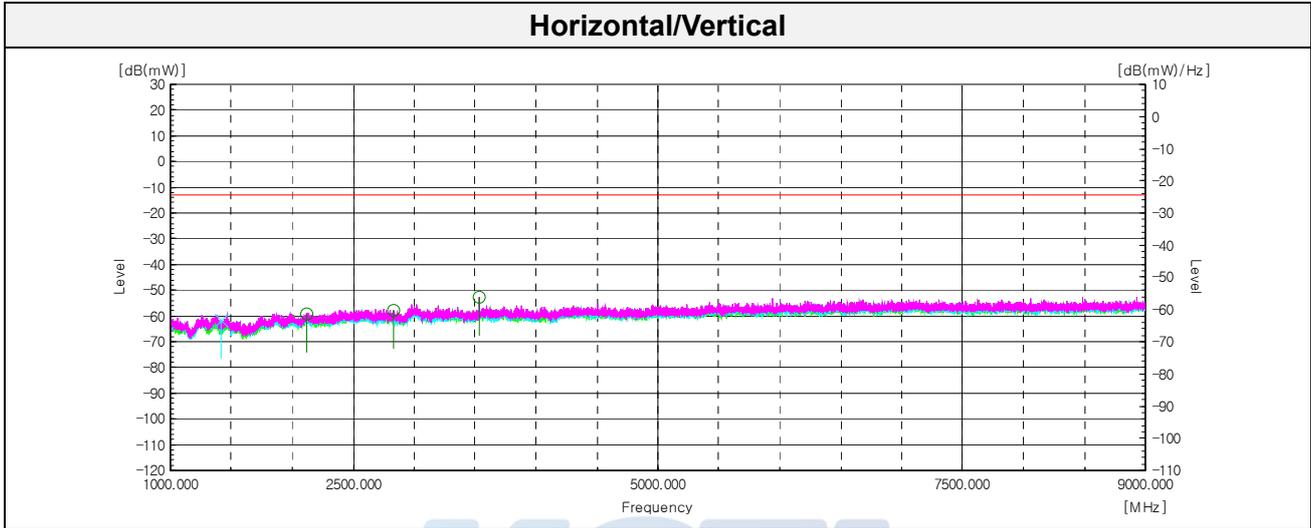
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 403.53 | V | 5.67 | 4.94 | -61.83 | -61.10 | -13.00 | 48.10 |
| | 2 105.07 | V | 6.00 | 6.09 | -56.71 | -56.80 | -13.00 | 43.80 |
| | 2 806.61 | V | 6.43 | 7.06 | -55.47 | -56.10 | -13.00 | 43.10 |
| | 3 508.66 | H | 7.81 | 7.92 | -49.29 | -49.40 | -13.00 | 36.40 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_[Watts])

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

Test mode : LTE Band 12/17
 Frequency(MHz) : 707.5
 Channel : 23095
 Bandwidth(MHz) : 3

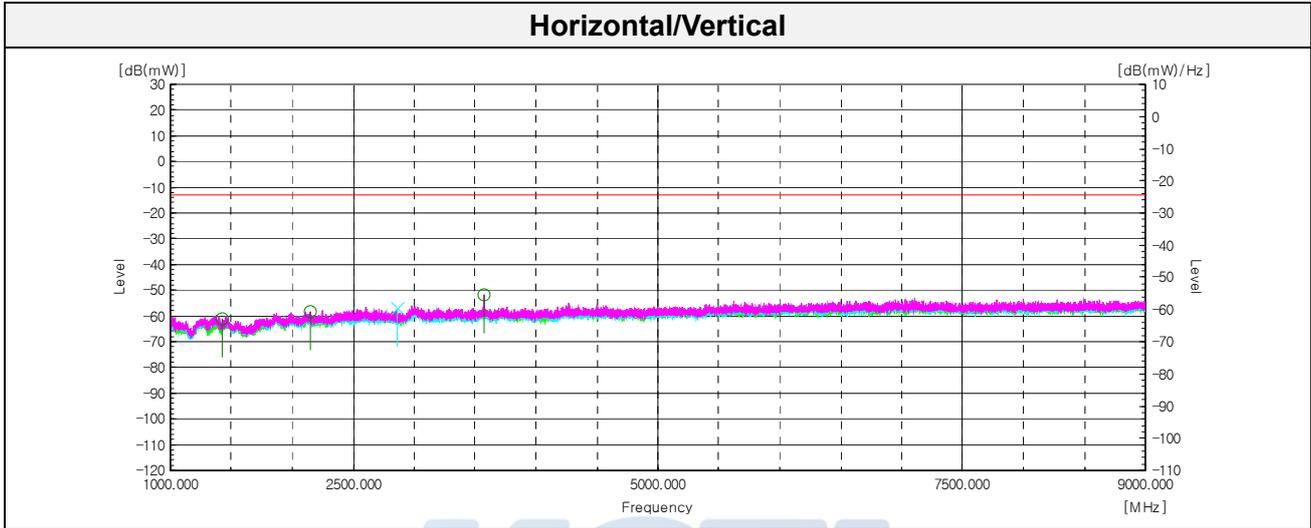


| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 415.53 | V | 5.79 | 4.96 | -62.33 | -61.50 | -13.00 | 48.50 |
| | 2 121.07 | H | 6.00 | 6.11 | -59.09 | -59.20 | -13.00 | 46.20 |
| | 2 830.61 | H | 6.46 | 7.09 | -57.07 | -57.70 | -13.00 | 44.70 |
| | 3 538.16 | H | 7.86 | 7.95 | -52.61 | -52.70 | -13.00 | 39.70 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_[Watts])
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

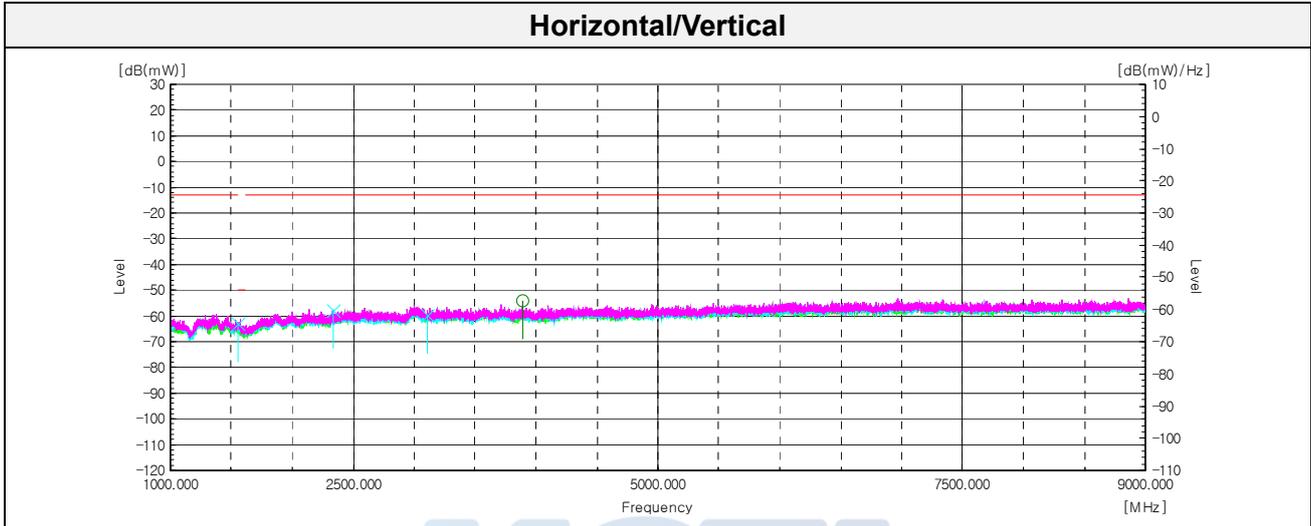
Test mode : LTE Band 12/17
 Frequency(MHz) : 714.5
 Channel : 23165
 Bandwidth(MHz) : 3



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 429.03 | H | 5.92 | 4.98 | -61.84 | -60.90 | -13.00 | 47.90 |
| | 2 143.57 | H | 6.00 | 6.14 | -58.16 | -58.30 | -13.00 | 45.30 |
| | 2 858.62 | V | 6.50 | 7.13 | -56.27 | -56.90 | -13.00 | 43.90 |
| | 3 573.16 | H | 7.92 | 7.96 | -51.86 | -51.90 | -13.00 | 38.90 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_[Watts])
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 13Frequency(MHz) : 779.5Channel : 23025Bandwidth(MHz) : 5**Horizontal/Vertical**

| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 554.04 | V | 6.54 | 5.20 | -64.54 | -63.20 | -13.00 | 50.20 |
| | 2 332.08 | V | 6.00 | 6.44 | -57.36 | -57.80 | -13.00 | 44.80 |
| | 3 108.13 | V | 6.94 | 7.43 | -59.21 | -59.70 | -13.00 | 46.70 |
| | 3 886.68 | H | 8.42 | 8.35 | -54.17 | -54.10 | -13.00 | 41.10 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_{Watts})

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

KCTL Inc.

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www.kctl.co.kr

Report No.:
 KR19-SRF0183-B

Page (208) of (216)



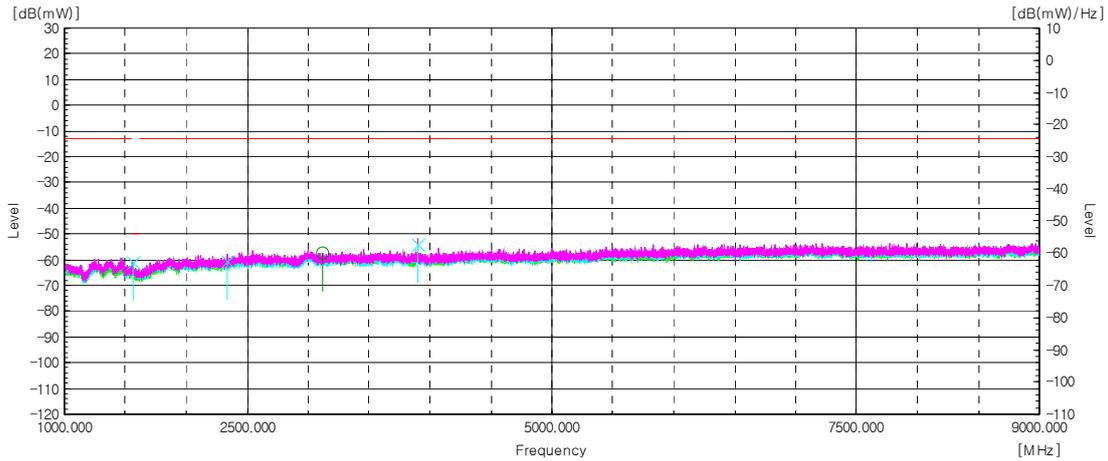
Test mode : LTE Band 13

Frequency(MHz) : 782.0

Channel : 23230

Bandwidth(MHz) : 5

Horizontal/Vertical



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 559.54 | V | 6.53 | 5.21 | -62.62 | -61.30 | -50.00 | 11.30 |
| | 2 338.58 | V | 6.00 | 6.45 | -60.25 | -60.70 | -13.00 | 47.70 |
| | 3 119.63 | H | 6.96 | 7.44 | -57.02 | -57.50 | -13.00 | 44.50 |
| | 3 899.18 | V | 8.44 | 8.36 | -54.08 | -54.00 | -13.00 | 41.00 |

Note.

1. Limit Calculation(dBm)= 43 + 10log(P_{Watts})

Limit Calculation of narrow-band (dBm) = -80dBW (-50dBm)

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

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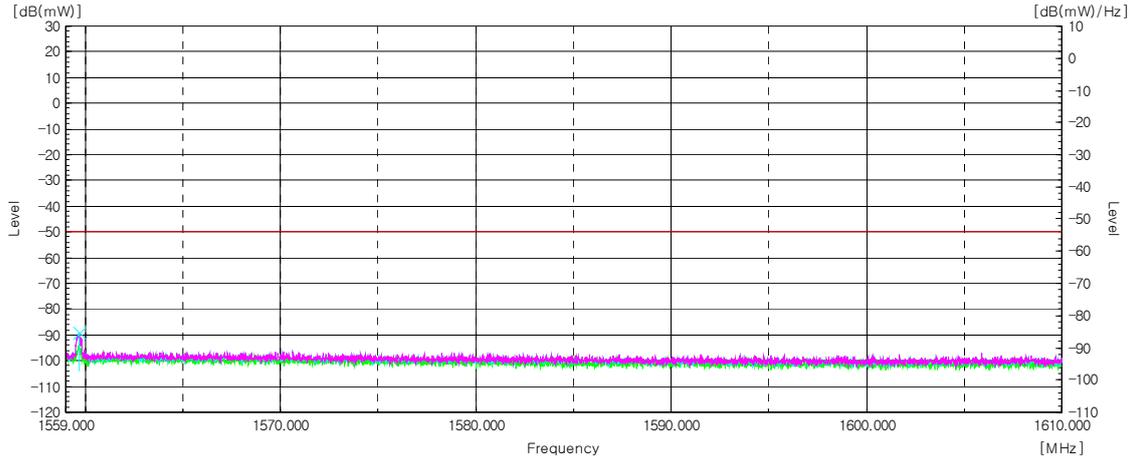
Report No.:
 KR19-SRF0183-B

Page (209) of (216)



Test mode : LTE Band 13
Frequency(MHz) : 782.0 (1 559 – 1 610 MHz)
Channel : 23230
Bandwidth(MHz) : 5

Horizontal/Vertical



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 559.69 | V | 6.53 | 5.21 | -90.62 | -89.30 | -50.00 | 39.30 |

Note.

1. Limit Calculation of wide-band (dBm/MHz) = -70dBW/MHz (-40 dBm/MHz)
2. Limit Calculation of narrow-band (dBm) = -80dBW (-50dBm)

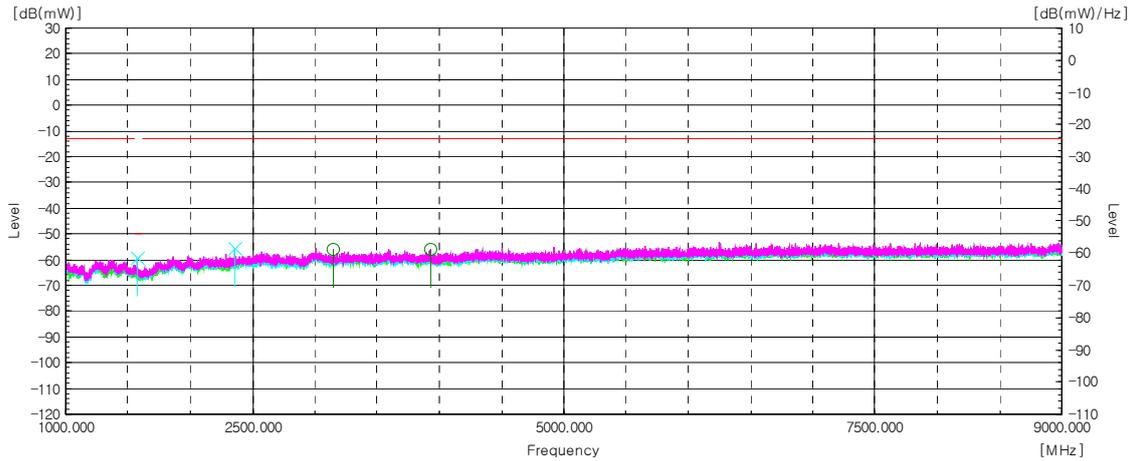
Test mode : LTE Band 13

Frequency(MHz) : 784.5

Channel : 23255

Bandwidth(MHz) : 5

Horizontal/Vertical



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 573.04 | V | 6.51 | 5.23 | -60.68 | -59.40 | -50.00 | 9.40 |
| | 2 360.09 | V | 6.00 | 6.48 | -54.92 | -55.40 | -13.00 | 42.40 |
| | 3 146.63 | H | 7.02 | 7.48 | -55.34 | -55.80 | -13.00 | 42.80 |
| | 3 933.18 | H | 8.49 | 8.39 | -56.20 | -56.10 | -13.00 | 43.10 |

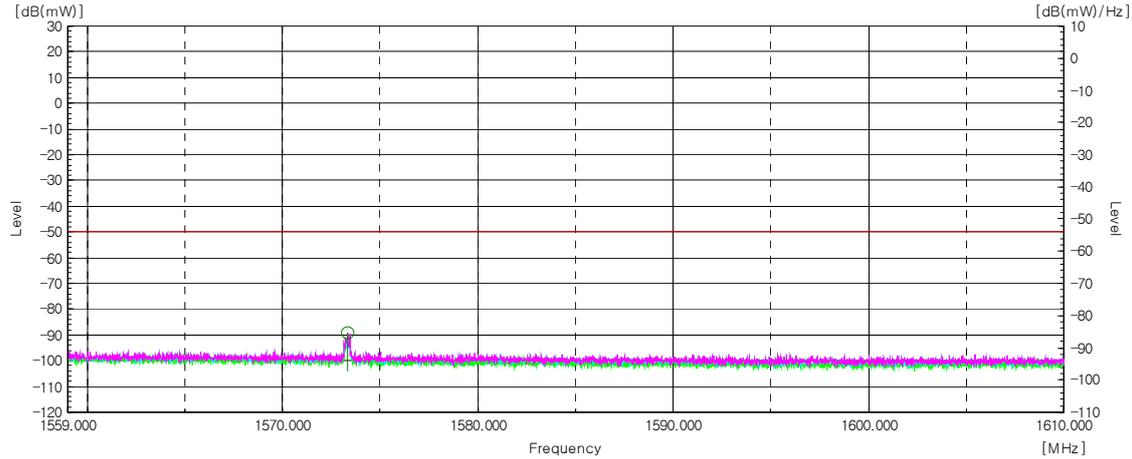
Note.

1. Limit Calculation(dBm)= 43 + 10log(P_{Watts})

Limit Calculation of narrow-band (dBm) = -80dBW (-50dBm)

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

Test mode : LTE Band 13
 Frequency(MHz) : 784.5 (1 559 – 1 610 MHz)
 Channel : 23255
 Bandwidth(MHz) : 5

Horizontal/Vertical

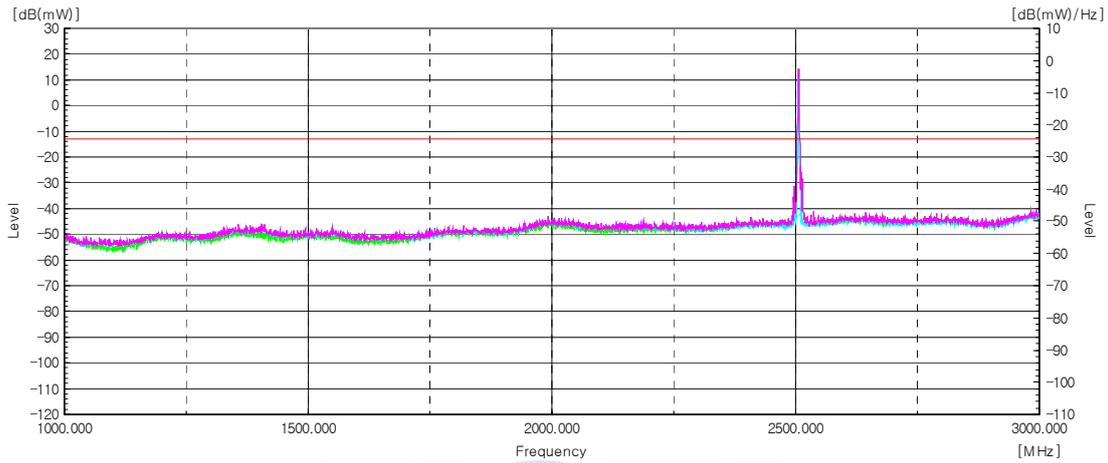
| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 1 573.32 | H | 6.51 | 5.23 | -90.48 | -89.20 | -50.00 | 39.20 |

Note.

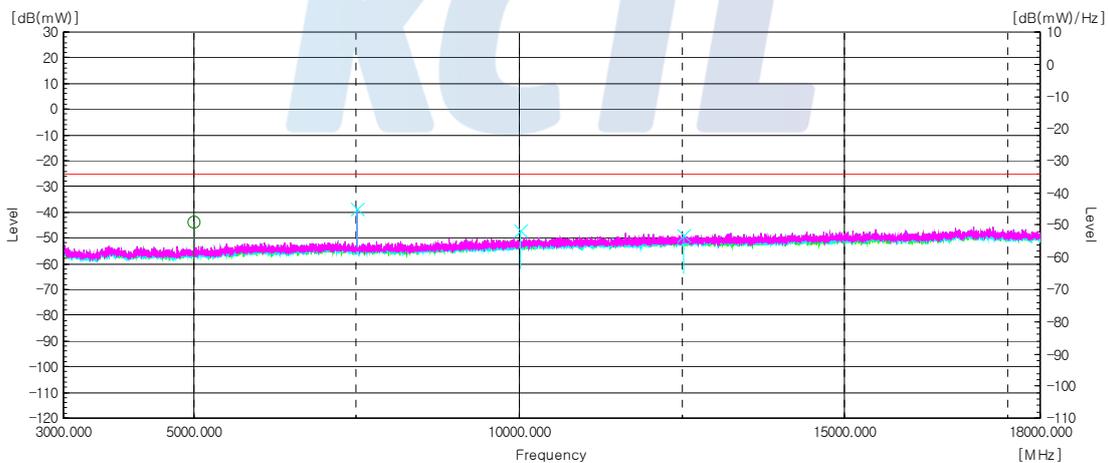
1. Limit Calculation of wide-band (dBm/MHz) = -70dBW/MHz (-40 dBm/MHz)
2. Limit Calculation of narrow-band (dBm) = -80dBW (-50dBm)

Test mode : LTE Band 41
 Frequency(MHz) : 2 506
 Channel : 39750
 Bandwidth(MHz) : 20

Horizontal/Vertical for 1 GHz ~ 3 GHz



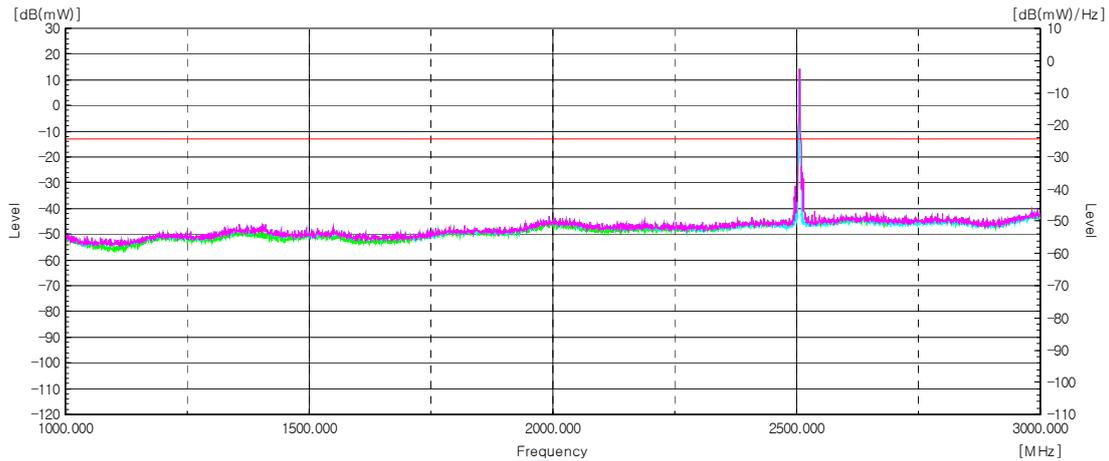
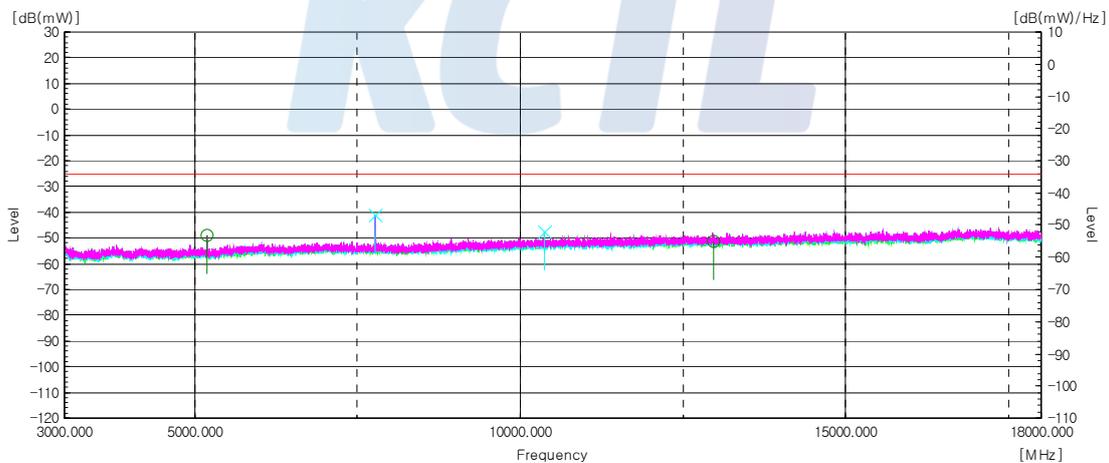
Horizontal/Vertical for 3 GHz ~ 18 GHz



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 5 012.13 | H | 9.92 | 9.61 | -44.31 | -44.00 | -25.00 | 19.00 |
| | 7 518.30 | V | 12.02 | 11.82 | -39.00 | -38.80 | -25.00 | 13.80 |
| | 10 024.47 | V | 12.71 | 13.71 | -46.00 | -47.00 | -25.00 | 22.00 |
| | 12 530.63 | V | 13.32 | 15.38 | -46.74 | -48.80 | -25.00 | 23.80 |

Note.

1. Limit Calculation(dBm)= 55 + 10log(P_[Watts])
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test mode : LTE Band 41Frequency(MHz) : 2 593.0Channel : 40620Bandwidth(MHz) : 20**Horizontal/Vertical for 1 GHz ~ 3 GHz****Horizontal/Vertical for 3 GHz ~ 18 GHz**

| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 5 186.15 | H | 10.16 | 9.72 | -49.24 | -48.80 | -25.00 | 23.80 |
| | 7 779.32 | V | 12.28 | 11.98 | -41.40 | -41.10 | -25.00 | 16.10 |
| | 10 372.49 | V | 12.85 | 13.92 | -46.63 | -47.70 | -25.00 | 22.70 |
| | 12 965.66 | H | 13.67 | 15.65 | -49.42 | -51.40 | -25.00 | 26.40 |

Note.

1. Limit Calculation(dBm)= 55 + 10log(P_[Watts])

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

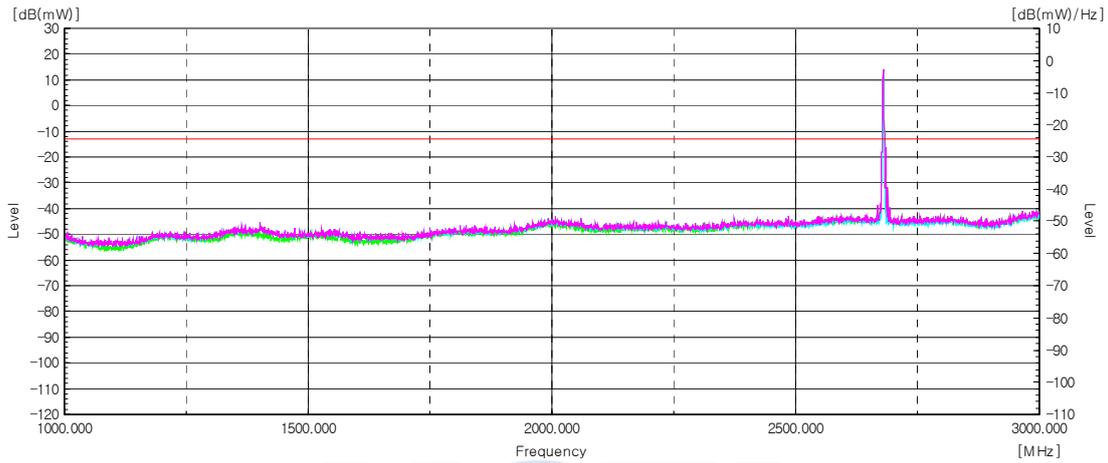
Test mode : LTE Band 41

Frequency(MHz) : 2 680.0

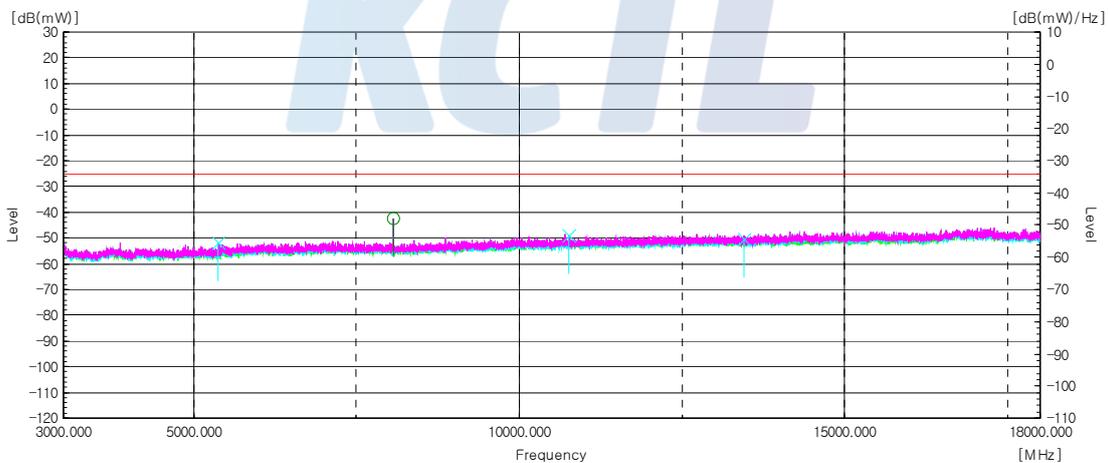
Channel : 41490

Bandwidth(MHz) : 20

Horizontal/Vertical for 1 GHz ~ 3 GHz



Horizontal/Vertical for 3 GHz ~ 18 GHz



| Mode | Frequency | Pol. | Antenna Gain | Cable loss | Substitute Level | Level | Limit | Margin |
|------|-----------|-------|--------------|------------|------------------|--------|--------|--------|
| | [MHz] | [V/H] | [dBi] | [dB] | [dBm] | [dBm] | [dBm] | [dB] |
| QPSK | 5 377.16 | V | 10.43 | 9.90 | -52.43 | -51.90 | -25.00 | 26.90 |
| | 8 066.34 | H | 12.57 | 12.36 | -42.51 | -42.30 | -25.00 | 17.30 |
| | 10 755.52 | V | 12.90 | 14.23 | -47.57 | -48.90 | -25.00 | 23.90 |
| | 13 442.70 | V | 13.79 | 15.94 | -48.35 | -50.50 | -25.00 | 25.50 |

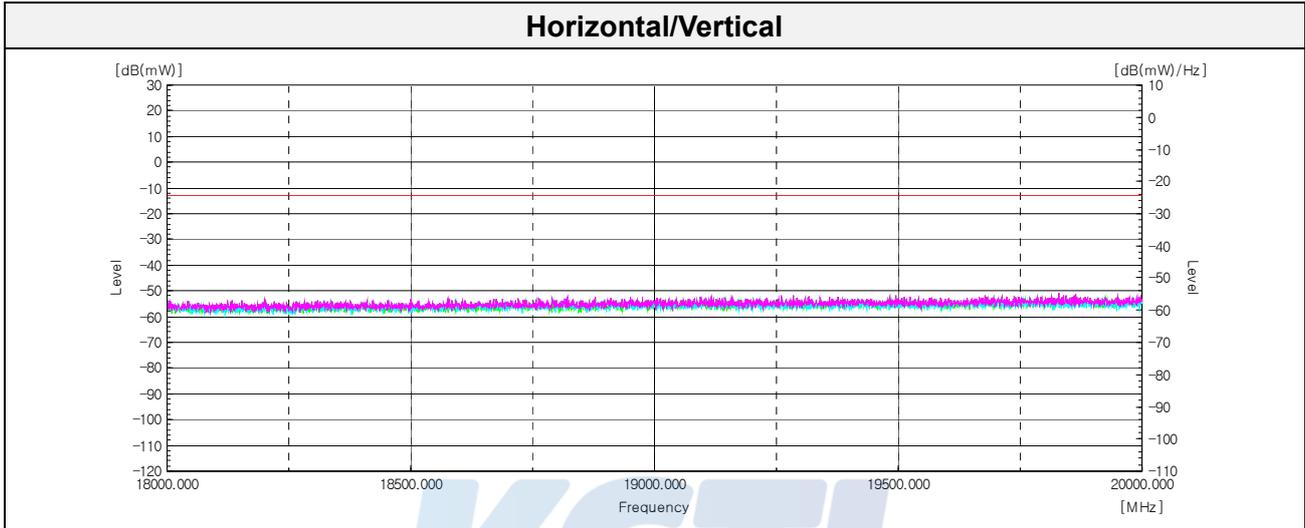
Note.

1. Limit Calculation(dBm)= 55 + 10log(P_{Watts})

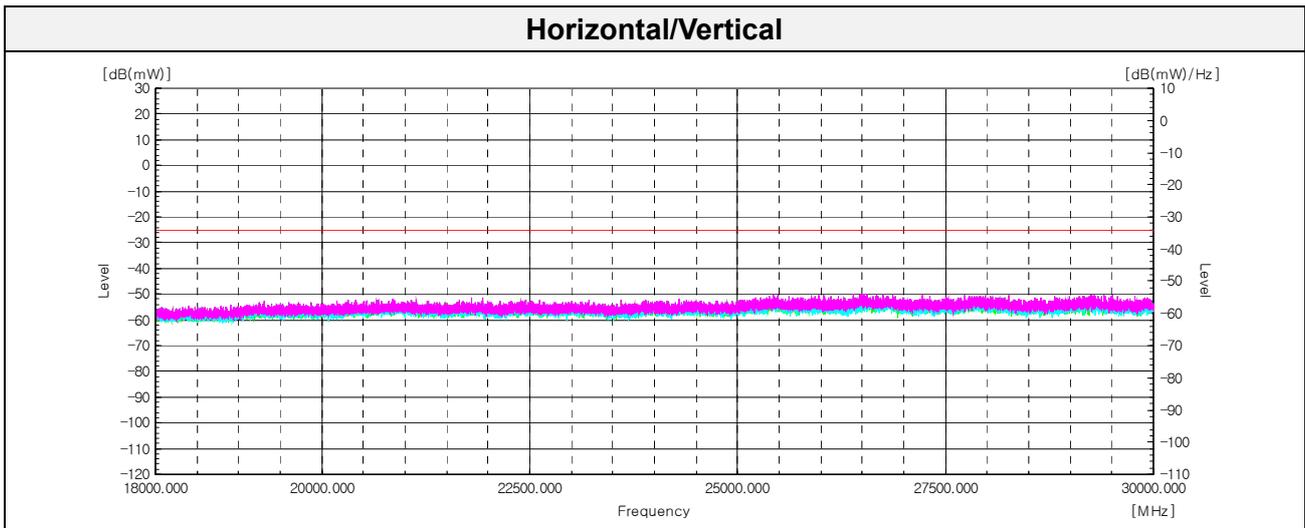
2. ERP & E.I.R.P(dB m)= Substitute Level(dB) + Antenna gain(dBi) – Cable Loss(dB)

Test results (Above 18 GHz) – Worst case

Test mode : LTE Band 2
Frequency (MHz) : 1 909.3
Channel : 19193
Bandwidth(MHz) : 1.4



Test mode : LTE Band 41
Frequency (MHz) : 2 593.0
Channel : 40620
Bandwidth(MHz) : 5



Note.

1. No spurious emissions were detected above 18GHz.

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Report No.:
KR19-SRF0183-B

Page (216) of (216)



8. Measurement equipment

| Equipment Name | Manufacturer | Model No. | Serial No. | Next Cal. Date |
|--|--------------------------------|----------------------------|-------------|----------------|
| Spectrum Analyzer | R & S | FSV30 | 100914 | 20.10.14 |
| Spectrum Analyzer | AGILENT | N9040B | MY57010132 | 20.07.31 |
| Signal Generator | R&S | SMB100A | 176206 | 20.01.25 |
| Power Divider | Aeroflex /Weinschel, Inc. | 1580-1 | SC571 | 20.08.01 |
| Attenuator | API Inmet | 40AH2W-10 | 16 | 20.05.15 |
| Attenuator | API Inmet | 40AH2W-10 | 12 | 20.05.15 |
| Attenuator | Weinschel ENGINEERING | 10 | AJ1239 | 20.05.14 |
| DC Power Supply | Agilent | E3632A | KR94907664 | 20.05.13 |
| Temp & Humid Chamber | ESPEC CORP. | SH-641 | 92004785 | 20.05.13 |
| Wideband Radio Communication Tester | R & S | CMW500 | 132120 | 20.07.17 |
| Wideband Radio Communication Tester | R & S | CMW500 | 141780 | 20.04.18 |
| High pass Filter | Wainwright Instruments GmbH | WHKX3.0/18G- 12SS | 44 | 20.01.25 |
| High pass Filter | Wainwright Instruments GmbH | WHKX1.0/1.5S- 10SS | 14 | 20.01.25 |
| Biconical VHF-UHF Broadband Antenna | SCHWARZBECK | VUBA9117 | 275 | 20.04.13 |
| Bilog Antenna | Teseq GmbH | CBL 6143A | 35039 | 21.05.21 |
| Horn Antenna | ETS.lindgren | 3117 | 00161083 | 20.09.18 |
| Horn Antenna | ETS.lindgren | 3117 | 161225 | 20.05.22 |
| Horn Antenna | ETS.lindgren | 3116 | 00086632 | 20.02.15 |
| Horn Antenna | ETS.lindgren | 3116 | 00086635 | 20.05.09 |
| Amplifier | SONOMA INSTRUMENT | 310N | 186402 | 20.01.04 |
| Amplifier | L-3 Narda-MITEQ | AMF-7D-01001800- 22-10P | 2031196 | 20.02.21 |
| Amplifier | L-3 Narda-MITEQ | JS44-18004000-33- 8P | 2000997 | 20.08.01 |
| 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

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