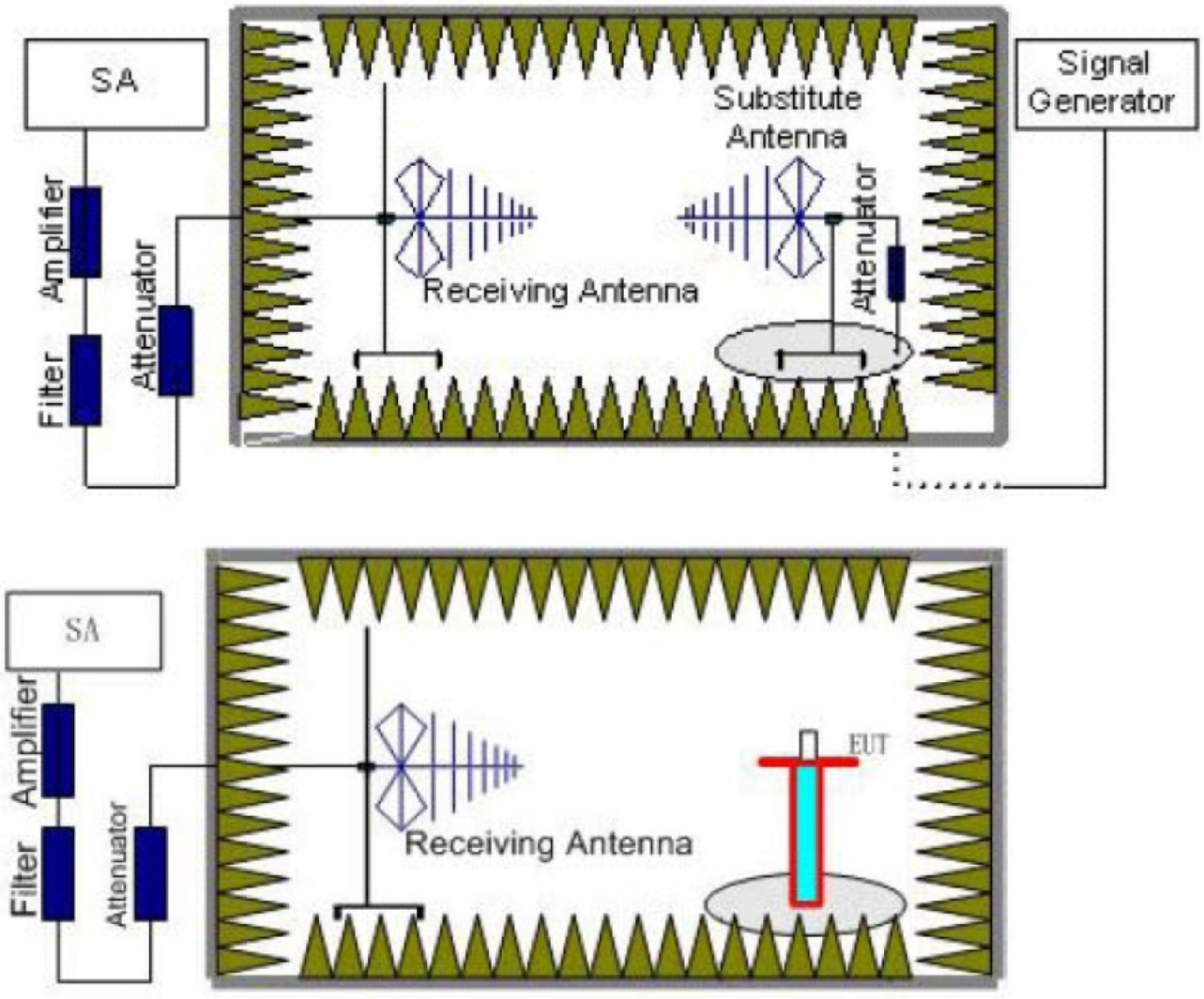
3.6. Radiated Power Measurement

LIMIT

According to §27.50 (d) (4): Fixed, mobile, and portable (hand- held) stations operating in the 1710–1755 MHz band are limited to 1 watt EIRP.
According to §27.50 (h) (2): Mobile and other user stations. Mo-bile stations are limited to 2.0 watts EIRP. All user stations are limited to 2.0 watts transmitter output power.

TEST CONFIGURATION



TEST PROCEDURE

1. EUT was placed on a 0.80 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 0.80m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious

emissions can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (Pr).
4. The EUT shall be replaced by a substitution antenna. In the chamber, an substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (PMea) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (Pr). The power of signal source (PMea) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (Pcl), the Substitution Antenna Gain (Ga) and the Amplifier Gain (PAg) should be recorded after test.
6. The measurement results are obtained as described below:
   Power(EIRP)=PMea- PAg - Pcl + Ga
   We used SMF100A micowave signal generator which signal level can up to 33dBm,so we not used power Amplifier for substituation test; The measurement results are amend as described below:
   Power(EIRP)=PMea- Pcl + Ga
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
   ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST RESULTS

1. We were tested all RB Configuration for each Channel Bandwidth of LTE FDD Band 4 and FDD Band 7; recorded worst case for each Channel Bandwidth of LTE FDD Band 4 and FDD Band 7.

LTE FDD Band 4_Channel Bandwidth 1.4MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
19957	1710.7	22.61	30.00	H	Pass
19957	1710.7	18.74	30.00	V	Pass
20175	1732.5	**24.62**	30.00	H	Pass
20175	1732.5	20.41	30.00	V	Pass
20393	1754.3	24.39	30.00	H	Pass
20393	1754.3	20.29	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 3MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
19965	1711.5	22.86	30.00	H	Pass
19965	1711.5	19.04	30.00	V	Pass
20175	1732.5	**24.59**	30.00	H	Pass
20175	1732.5	20.37	30.00	V	Pass
20385	1753.5	24.18	30.00	H	Pass
20385	1753.5	20.02	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 5MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20000	1717.5	22.91	30.00	H	Pass
20000	1717.5	19.08	30.00	V	Pass
20175	1732.5	**24.55**	30.00	H	Pass
20175	1732.5	20.31	30.00	V	Pass
20350	1750.0	24.24	30.00	H	Pass
20350	1750.0	20.07	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 10MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
19975	1712.5	23.06	30.00	H	Pass
19975	1712.5	19.13	30.00	V	Pass
20175	1732.5	**24.49**	30.00	H	Pass
20175	1732.5	20.26	30.00	V	Pass
20375	1752.5	24.29	30.00	H	Pass
20375	1752.5	20.11	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 15MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20025	1717.5	23.66	30.00	H	Pass
20025	1717.5	19.70	30.00	V	Pass
20175	1732.5	**24.41**	30.00	H	Pass
20175	1732.5	20.18	30.00	V	Pass
20325	1747.5	24.33	30.00	H	Pass
20325	1747.5	20.15	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 20MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20000	1720.0	23.96	30.00	H	Pass
20000	1720.0	20.01	30.00	V	Pass
20175	1732.5	**24.39**	30.00	H	Pass
20175	1732.5	20.16	30.00	V	Pass
20300	1745.0	24.35	30.00	H	Pass
20300	1745.0	20.15	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 1.4MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
19957	1710.7	20.91	30.00	H	Pass
19957	1710.7	16.88	30.00	V	Pass
20175	1732.5	**23.79**	30.00	H	Pass
20175	1732.5	19.81	30.00	V	Pass
20393	1754.3	22.07	30.00	H	Pass
20393	1754.3	18.83	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 3MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
19965	1711.5	20.99	30.00	H	Pass
19965	1711.5	17.00	30.00	V	Pass
20175	1732.5	**23.72**	30.00	H	Pass
20175	1732.5	19.77	30.00	V	Pass
20385	1753.5	21.86	30.00	H	Pass
20385	1753.5	18.64	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 5MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20000	1717.5	21.25	30.00	H	Pass
20000	1717.5	17.19	30.00	V	Pass
20175	1732.5	**22.67**	30.00	H	Pass
20175	1732.5	19.73	30.00	V	Pass
20350	1750.0	21.95	30.00	H	Pass
20350	1750.0	18.69	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 10MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
19975	1712.5	21.51	30.00	H	Pass
19975	1712.5	17.34	30.00	V	Pass
20175	1732.5	**22.58**	30.00	H	Pass
20175	1732.5	19.66	30.00	V	Pass
20375	1752.5	22.04	30.00	H	Pass
20375	1752.5	18.78	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 15MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20025	1717.5	21.76	30.00	H	Pass
20025	1717.5	17.51	30.00	V	Pass
20175	1732.5	**22.50**	30.00	H	Pass
20175	1732.5	19.57	30.00	V	Pass
20325	1747.5	22.24	30.00	H	Pass
20325	1747.5	18.93	30.00	V	Pass

LTE FDD Band 4_Channel Bandwidth 20MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20000	1720.0	22.03	30.00	H	Pass
20000	1720.0	17.88	30.00	V	Pass
20175	1732.5	**22.42**	30.00	H	Pass
20175	1732.5	19.50	30.00	V	Pass
20300	1745.0	22.39	30.00	H	Pass
20300	1745.0	19.17	30.00	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20775	2502.5	20.62	33.01	H	Pass
20775	2502.5	16.85	33.01	V	Pass
21100	2535.0	**21.15**	33.01	H	Pass
21100	2535.0	17.36	33.01	V	Pass
21425	2567.5	19.59	33.01	H	Pass
21425	2567.5	15.91	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 10MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20800	2505.0	20.44	33.01	H	Pass
20800	2505.0	16.61	33.01	V	Pass
21100	2535.0	**21.12**	33.01	H	Pass
21100	2535.0	17.30	33.01	V	Pass
21400	2565.0	19.94	33.01	H	Pass
21400	2565.0	16.35	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 15MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20825	2507.5	20.97	33.01	H	Pass
20825	2507.5	17.15	33.01	V	Pass
21100	2535.0	**21.57**	33.01	H	Pass
21100	2535.0	17.89	33.01	V	Pass
21375	2562.5	20.03	33.01	H	Pass
21375	2562.5	16.79	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 20MHz_QPSK

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20850	2510.0	21.14	33.01	H	Pass
20850	2510.0	17.66	33.01	V	Pass
21100	2535.0	**22.06**	33.01	H	Pass
21100	2535.0	18.71	33.01	V	Pass
21350	2560.0	20.45	33.01	H	Pass
21350	2560.0	17.08	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20775	2502.5	19.22	33.01	H	Pass
20775	2502.5	15.17	33.01	V	Pass
21100	2535.0	**20.06**	33.01	H	Pass
21100	2535.0	16.79	33.01	V	Pass
21425	2567.5	18.44	33.01	H	Pass
21425	2567.5	14.86	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 10MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20800	2505.0	19.49	33.01	H	Pass
20800	2505.0	15.50	33.01	V	Pass
21100	2535.0	**20.09**	33.01	H	Pass
21100	2535.0	16.82	33.01	V	Pass
21400	2565.0	18.58	33.01	H	Pass
21400	2565.0	14.91	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 15MHz_16QAM

Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20825	2507.5	19.77	33.01	H	Pass
20825	2507.5	15.82	33.01	V	Pass
21100	2535.0	**20.33**	33.01	H	Pass
21100	2535.0	17.01	33.01	V	Pass
21375	2562.5	18.90	33.01	H	Pass
21375	2562.5	15.43	33.01	V	Pass

LTE FDD Band 7_Channel Bandwidth 20MHz_16QAM

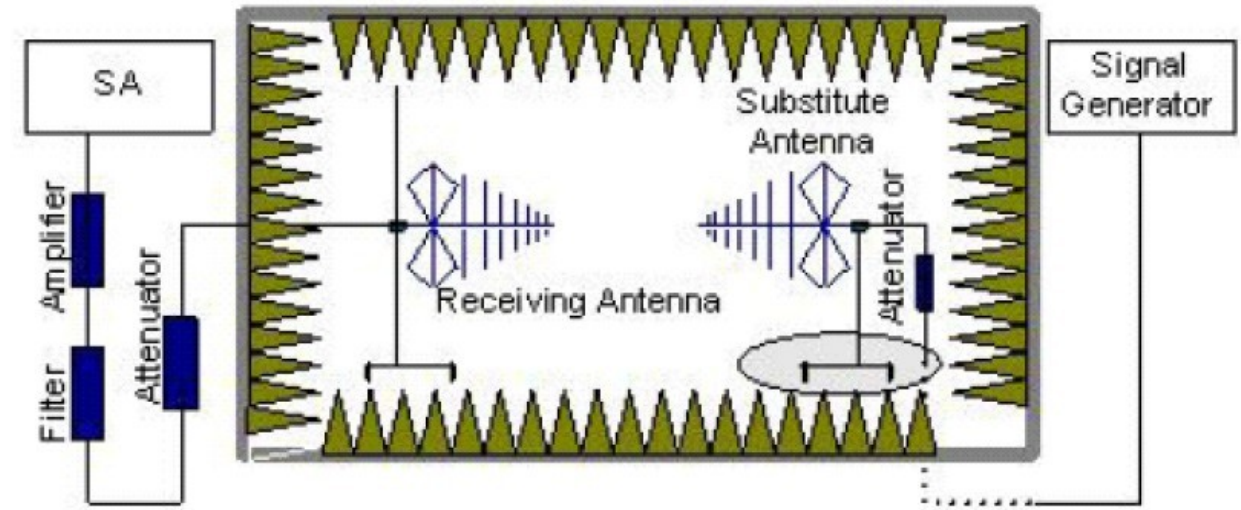
Channel	Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Antenna Pol.	Results
20850	2510.0	20.43	33.01	H	Pass
20850	2510.0	17.89	33.01	V	Pass
21100	2535.0	**20.94**	33.01	H	Pass
21100	2535.0	17.68	33.01	V	Pass
21350	2560.0	19.39	33.01	H	Pass
21350	2560.0	15.86	33.01	V	Pass

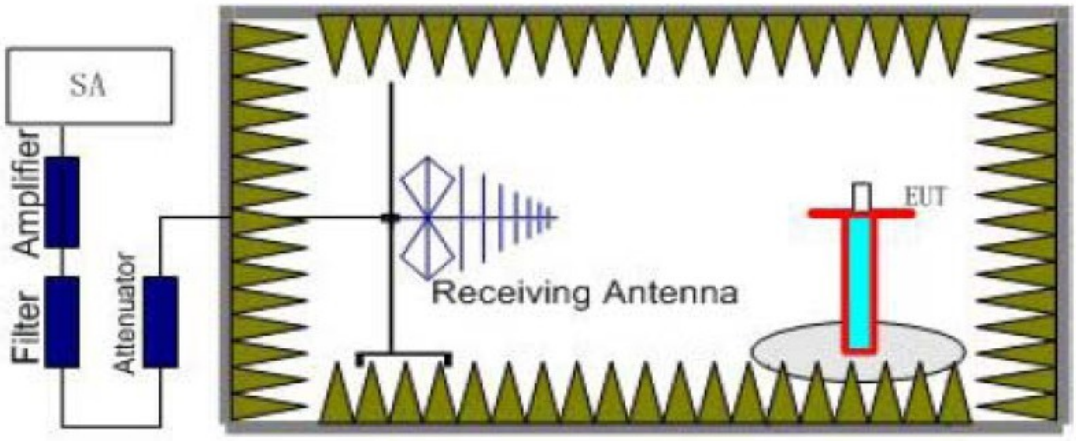
3.7. Radiated Spurious Emission

LIMIT

According to §27.53 (h): For operations in the 1710–1755 MHz and 2110–2155 MHz bands, the power of any emission outside a licensee's frequency block shall be attenuated below the transmitter power (P) by at least 43 + 10 log10(P) dB.
According to §27.53 (m) (4): For mobile digital stations, the attenuation factor shall be not less than 43 + 10 log (P) dB at the channel edge and 55 + 10 log (P) dB at 5.5 mega-hertz from the channel edges. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensee's operating on BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

TEST CONFIGURATION





TEST RESULTS

1. EUT was placed on a 0.80 meter high non-conductive stand at a 3 meter test distance from the receive antenna. A receiving antenna was placed on the antenna mast 3 meters from the EUT for emission measurements. The height of receiving antenna is 0.80m. Detected emissions were maximized at each frequency by rotating the EUT through 360° and adjusting the receiving antenna polarization. The radiated emission measurements of all transmit frequencies in three channels (High, Middle, Low) were measured with peak detector.
2. A log-periodic antenna or double-ridged waveguide horn antenna shall be substituted in place of the EUT. The log-periodic antenna will be driven by a signal generator and the level will be adjusted till the same power value on the spectrum analyzer or receiver. The level of the spurious emissions

can be calculated through the level of the signal generator, cable loss, the gain of the substitution antenna and the reading of the spectrum analyzer or receiver.

3. The EUT is then put into continuously transmitting mode at its maximum power level during the test. Set Test Receiver or Spectrum RBW=1MHz, VBW=3MHz, and the maximum value of the receiver should be recorded as (P_r).
4. The EUT shall be replaced by a substitution antenna. In the chamber, a substitution antenna for the frequency band of interest is placed at the reference point of the chamber. An RF Signal source for the frequency band of interest is connected to the substitution antenna with a cable that has been constructed to not interfere with the radiation pattern of the antenna. A power (P_{Mea}) is applied to the input of the substitution antenna, and adjusts the level of the signal generator output until the value of the receiver reach the previously recorded (P_r). The power of signal source (P_{Mea}) is recorded. The test should be performed by rotating the test item and adjusting the receiving antenna polarization.
5. An amplifier should be connected to the Signal Source output port. And the cable should be connecting between the Amplifier and the Substitution Antenna. The cable loss (P_{cl}), the Substitution Antenna Gain (G_a) and the Amplifier Gain (P_{Ag}) should be recorded after test.
6. The measurement results are obtained as described below:
   Power(EIRP)=P_{Mea}- P_{Ag} - P_{cl} + G_a
7. This value is EIRP since the measurement is calibrated using an antenna of known gain (2.15 dBi) and known input power.
   ERP can be calculated from EIRP by subtracting the gain of the dipole, ERP = EIRP-2.15dBi.

TEST RESULTS

1. We were tested all RB Configuration for each Channel Bandwidth of LTE FDD Band 4 and FDD Band 7; recorded worst case for LTE FDD Band 4 and FDD Band 7.

Working Frequency	Sub range (GHz)	RBW	VBW	Sweep time (s)
LTE FDD Band 4	0.000009~0.000015	1KHz	3KHz	10
	0.000015~0.03	10KHz	30KHz	10
	0.03~1	1 MHz	3 MHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
LTE FDD Band 7	0.000009~0.000015	1KHz	3KHz	10
	0.000015~0.03	10KHz	30KHz	10
	0.03~1	1 MHz	3 MHz	10
	1-2	1 MHz	3 MHz	2
	2~5	1 MHz	3 MHz	3
	5~8	1 MHz	3 MHz	3
	8~11	1 MHz	3 MHz	3
	11~14	1 MHz	3 MHz	3
	14~18	1 MHz	3 MHz	3
	18~22	1 MHz	3 MHz	3
	22~26	1 MHz	3 MHz	3

LTE FDD Band 4_Channel Bandwidth 1.4MHz_Channel 19957_QPSK (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
3421.4	-45.91	-13.00	32.91	H	Pass
5132.1	-43.66	-13.00	30.66	H	Pass
6842.8	-48.45	-13.00	35.45	H	Pass
3421.4	-48.22	-13.00	35.22	V	Pass
5132.1	-46.01	-13.00	33.01	V	Pass
6842.8	-50.24	-13.00	37.24	V	Pass

LTE FDD Band 4_Channel Bandwidth 1.4MHz_Channel 19957_16QAM (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
3421.4	-47.47	-13.00	34.47	H	Pass
5132.1	-45.69	-13.00	32.69	H	Pass
6842.8	-49.82	-13.00	36.82	H	Pass
3421.4	-50.03	-13.00	37.03	V	Pass
5132.1	-49.14	-13.00	36.14	V	Pass
6842.8	-51.46	-13.00	38.46	V	Pass

LTE FDD Band 4_Channel Bandwidth 1.4MHz_Channel 20175_QPSK (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
3465.0	-44.56	-13.00	31.56	H	Pass
5197.5	-41.04	-13.00	28.04	H	Pass
6930.0	-47.25	-13.00	34.25	H	Pass
3465.0	-47.06	-13.00	34.06	V	Pass
5197.5	-43.97	-13.00	30.97	V	Pass
6930.0	-49.49	-13.00	36.49	V	Pass

LTE FDD Band 4_Channel Bandwidth 1.4MHz_Channel 20175_16QAM (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
3465.0	-46.24	-13.00	33.24	H	Pass
5197.5	-43.30	-13.00	30.30	H	Pass
6930.0	-46.88	-13.00	33.88	H	Pass
3465.0	-48.49	-13.00	35.49	V	Pass
5197.5	-45.07	-13.00	32.07	V	Pass
6930.0	-50.63	-13.00	37.63	V	Pass

LTE FDD Band 4_Channel Bandwidth 1.4MHz_Channel 20393_QPSK (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
3508.6	-45.55	-13.00	32.55	H	Pass
5262.9	-44.06	-13.00	31.06	H	Pass
7017.2	-48.97	-13.00	35.97	H	Pass
3508.6	-48.65	-13.00	35.65	V	Pass
5262.9	-46.71	-13.00	33.71	V	Pass
7017.2	-50.98	-13.00	37.98	V	Pass

LTE FDD Band 4_Channel Bandwidth 1.4MHz_Channel 20393_16QAM (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
3508.6	-47.99	-13.00	34.99	H	Pass
5262.9	-46.42	-13.00	33.42	H	Pass
7017.2	-49.53	-13.00	36.53	H	Pass
3508.6	-50.62	-13.00	37.62	V	Pass
5262.9	-48.77	-13.00	35.77	V	Pass
7017.2	-51.52	-13.00	38.52	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 20775_QPSK (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
5005.0	-47.05	-13.00	34.05	H	Pass
7507.5	-50.52	-13.00	37.52	H	Pass
10010.0	-57.50	-13.00	44.50	H	Pass
5005.0	-51.46	-13.00	38.46	V	Pass
7507.5	-54.89	-13.00	41.89	V	Pass
10010.0	-58.75	-13.00	45.75	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 20775_16QAM (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
5005.0	-48.62	-13.00	35.62	H	Pass
7507.5	-51.25	-13.00	38.25	H	Pass
10010.0	-57.91	-13.00	44.91	H	Pass
5005.0	-52.88	-13.00	39.88	V	Pass
7507.5	-55.46	-13.00	42.46	V	Pass
10010.0	-58.86	-13.00	45.86	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 21100_QPSK (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
5070.0	-43.84	-13.00	30.84	H	Pass
7605.0	-46.99	-13.00	33.99	H	Pass
10140.0	-49.03	-13.00	36.03	H	Pass
5070.0	-45.47	-13.00	32.47	V	Pass
7605.0	-49.00	-13.00	36.00	V	Pass
10140.0	-52.34	-13.00	39.34	V	Pass

LTE FDD Band 7_Channel Bandwidth 3MHz_Channel 21100_16QAM (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
5070.0	-44.58	-13.00	31.58	H	Pass
7605.0	-47.41	-13.00	34.41	H	Pass
10140.0	-49.69	-13.00	36.69	H	Pass
5070.0	-46.97	-13.00	33.97	V	Pass
7605.0	-50.18	-13.00	37.18	V	Pass
10140.0	-52.86	-13.00	39.86	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 21425_QPSK (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
5135.0	-48.99	-13.00	35.99	H	Pass
7702.5	-51.28	-13.00	38.28	H	Pass
10270.0	-58.62	-13.00	45.62	H	Pass
5135.0	-53.13	-13.00	40.13	V	Pass
7702.5	-55.74	-13.00	42.74	V	Pass
10270.0	-58.86	-13.00	45.86	V	Pass

LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 21425_16QAM (Worst case of all Bandwidths)

Frequency (MHz)	EIRP (dBm)	Limit (dBm)	Margin (dB)	Antenna Pol.	Results
5135.0	-50.08	-13.00	37.08	H	Pass
7702.5	-53.34	-13.00	40.34	H	Pass
10270.0	-59.05	-13.00	46.05	H	Pass
5135.0	-54.91	-13.00	41.91	V	Pass
7702.5	-56.57	-13.00	43.57	V	Pass
10270.0	-59.55	-13.00	46.55	V	Pass

Remark：

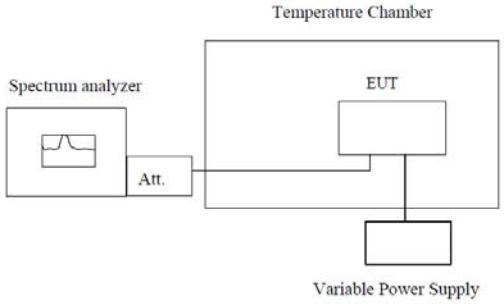
1. The emission behavior belongs to narrowband spurious emission.
2. Remark”---“ means that the emission level is too low to be measured
3. The emission levels of below 1 GHz are very lower than the limit and not show in test report.

3.8. Frequency stability

LIMIT

According to §27.54, §2.1055 requirement, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation and should not exceed 2.5ppm.

TEST CONFIGURATION



Note : Measurement setup for testing on Antenna connector

TEST PROCEDURE

1. The equipment under test was connected to an external DC power supply and input rated voltage.
2. RF output was connected to a frequency counter or spectrum analyzer via feed through attenuators.
3. The EUT was placed inside the temperature chamber.
4. Set the spectrum analyzer RBW low enough to obtain the desired frequency resolution and measure EUT 25℃ operating frequency as reference frequency.
5. Turn EUT off and set the chamber temperature to –30℃. After the temperature stabilized for approximately 30 minutes recorded the frequency.
6. Repeat step measure with 10℃ increased per stage until the highest temperature of +50℃ reached.
7. Reduce the input voltage to specify extreme voltage variation (+/- 15%) and endpoint, record the maximum frequency change.

TEST RESULTS

1. We were tested all RB Configuration for each Channel Bandwidth of LTE FDD Band 4 and FDD Band 7 at middle channel; recorded worst case for LTE FDD Band 4 and FDD Band 7.

LTE FDD Band 4_Channel Bandwidth 20MHz_Channel 20175_QPSK (Worst case of all Bandwidths)

Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	0.97	0.001	2.50	Pass
	-20	-3.99	0.002		
	-10	-5.78	0.003		
	0	-10.28	0.005		
	10	1.14	0.001		
	20	-3.19	0.002		
	30	-9.59	0.006		
	40	-0.80	0.001		
	50	-6.49	0.003		
4.35	25	14.97	0.009		
End point 3.60	25	5.38	0.003		

LTE FDD Band 4_Channel Bandwidth 20MHz_Channel 20175_16QAM (Worst case of all Bandwidths)

Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-5.14	0.004	2.50	Pass
	-20	3.33	0.002		
	-10	0.28	0.001		
	0	1.03	0.001		
	10	-7.91	0.005		
	20	9.19	0.004		
	30	5.35	0.003		
	40	5.25	0.003		
	50	7.00	0.003		
4.35	25	-2.76	0.002		
End point 3.60	25	-0.44	0.001		

LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 21425_QPSK (Worst case of all Bandwidths)

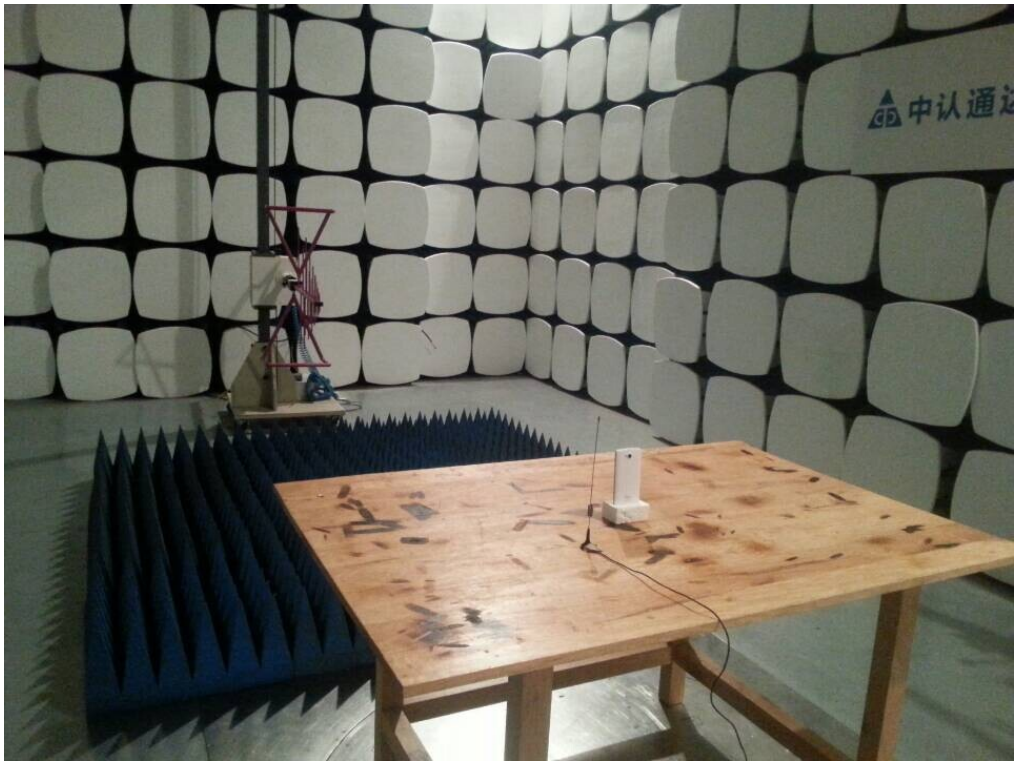
Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-0.42	0.001	2.50	Pass
	-20	-8.53	0.005		
	-10	-8.55	0.005		
	0	-5.39	0.003		
	10	-0.09	0.000		
	20	-4.86	0.003		
	30	-8.03	0.005		
	40	0.66	0.001		
	50	-8.31	0.005		
4.35	25	6.29	0.004		
End point 3.60	25	20.71	0.012		

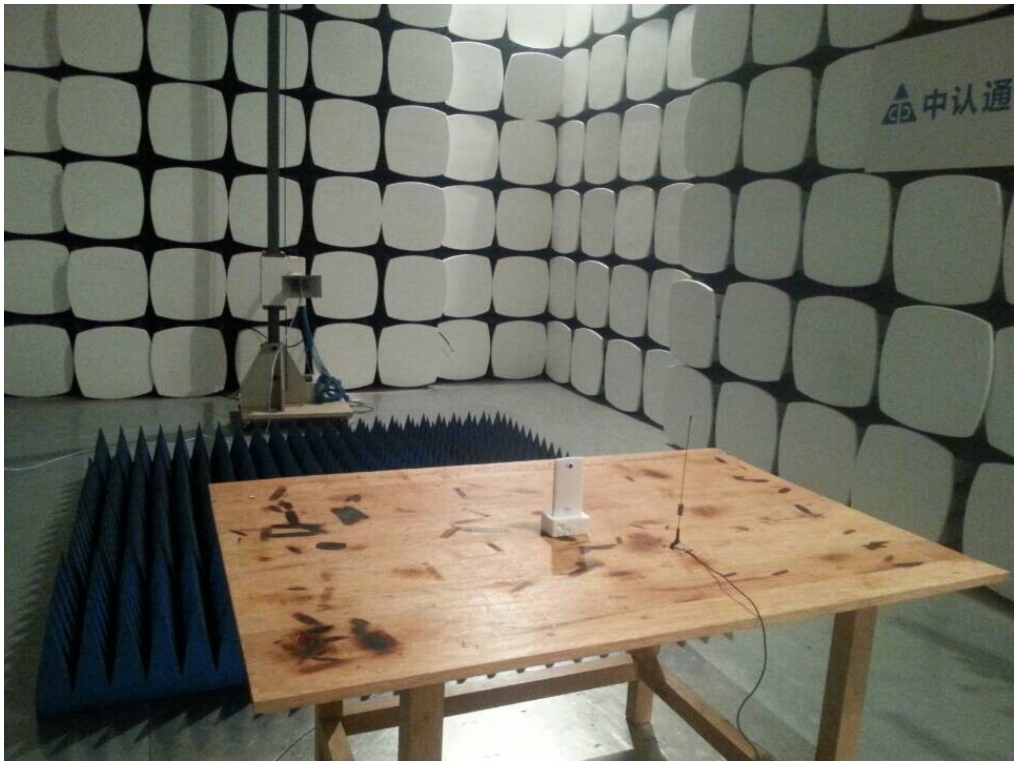
LTE FDD Band 7_Channel Bandwidth 5MHz_Channel 21425_16QAM (Worst case of all Bandwidths)

Voltage (V)	Temperature (℃)	Frequency error		Limit (ppm)	Result
		Hz	ppm		
3.80	-30	-5.56	0.002	2.50	Pass
	-20	4.32	0.002		
	-10	1.16	0.001		
	0	1.54	0.000		
	10	-8.63	0.003		
	20	8.35	0.003		
	30	5.31	0.002		
	40	5.48	0.002		
	50	6.19	0.002		
4.35	25	0.31	0.000		
End point 3.60	25	-1.90	0.001		

4. EUT TEST PHOTO

Radiated Emission





5. PHOTOGRAPHS OF EUT CONSTRUCTIONAL

Please reference to the test report No.: GTI20140444F-1

**************************THE END**************************