



Radiated Power (EIRP) for LTE Band 66 /5M										
BW (MHz)	UL Channel	RB Size	RB offset	Modulation	Conduction AVG Power(dBm)	Ant Gain (dBi)	EIRP (dBm)	EIRP Limit(W)	EIRP Limit(dBm)	Verdict
5	Lowest	1	0	QPSK	22.88	3.12	26.00	1.00	30.00	PASS
		1	12		23.08	3.12	26.20	1.00	30.00	PASS
		1	24		23.13	3.12	26.25	1.00	30.00	PASS
		12	0		22.07	3.12	25.19	1.00	30.00	PASS
		12	6		22.16	3.12	25.28	1.00	30.00	PASS
		12	11		22.19	3.12	25.31	1.00	30.00	PASS
		25	0		22.09	3.12	25.21	1.00	30.00	PASS
		1	0	16QAM	22.03	3.12	25.15	1.00	30.00	PASS
		1	12		22.25	3.12	25.37	1.00	30.00	PASS
		1	24		22.11	3.12	25.23	1.00	30.00	PASS
		12	0		20.92	3.12	24.04	1.00	30.00	PASS
		12	6		20.93	3.12	24.05	1.00	30.00	PASS
		12	11		20.95	3.12	24.07	1.00	30.00	PASS
		25	0		20.99	3.12	24.11	1.00	30.00	PASS
	Middle	1	0	QPSK	22.70	3.12	25.82	1.00	30.00	PASS
		1	12		22.78	3.12	25.90	1.00	30.00	PASS
		1	24		22.86	3.12	25.98	1.00	30.00	PASS
		12	0		22.10	3.12	25.22	1.00	30.00	PASS
		12	6		22.12	3.12	25.24	1.00	30.00	PASS
		12	11		22.18	3.12	25.30	1.00	30.00	PASS
		25	0		22.14	3.12	25.26	1.00	30.00	PASS
		1	0	16QAM	21.74	3.12	24.86	1.00	30.00	PASS
		1	12		21.94	3.12	25.06	1.00	30.00	PASS
		1	24		22.01	3.12	25.13	1.00	30.00	PASS
		12	0		21.02	3.12	24.14	1.00	30.00	PASS
		12	6		21.09	3.12	24.21	1.00	30.00	PASS
		12	11		21.16	3.12	24.28	1.00	30.00	PASS
		25	0		21.10	3.12	24.22	1.00	30.00	PASS
	Highest	1	0	QPSK	23.03	3.12	26.15	1.00	30.00	PASS
		1	12		23.12	3.12	26.24	1.00	30.00	PASS
		1	24		23.05	3.12	26.17	1.00	30.00	PASS
		12	0		22.29	3.12	25.41	1.00	30.00	PASS
		12	6		22.25	3.12	25.37	1.00	30.00	PASS
		12	11		22.23	3.12	25.35	1.00	30.00	PASS
		25	0		22.29	3.12	25.41	1.00	30.00	PASS
		1	0	16QAM	21.83	3.12	24.95	1.00	30.00	PASS
		1	12		21.90	3.12	25.02	1.00	30.00	PASS
		1	24		21.62	3.12	24.74	1.00	30.00	PASS
		12	0		21.23	3.12	24.35	1.00	30.00	PASS
		12	6		21.24	3.12	24.36	1.00	30.00	PASS
		12	11		21.14	3.12	24.26	1.00	30.00	PASS
		25	0		21.26	3.12	24.38	1.00	30.00	PASS



Radiated Power (EIRP) for LTE Band 66 /10M										
BW (MHz)	UL Channel	RB Size	RB offset	Modulation	Conduction AVG Power(dBm)	Ant Gain (dBi)	EIRP (dBm)	EIRP Limit(W)	EIRP Limit(dBm)	Verdict
10	Lowest	1	0	QPSK	23.10	3.12	26.22	1.00	30.00	PASS
		1	24		23.40	3.12	26.52	1.00	30.00	PASS
		1	49		23.10	3.12	26.22	1.00	30.00	PASS
		25	0		22.16	3.12	25.28	1.00	30.00	PASS
		25	12		22.23	3.12	25.35	1.00	30.00	PASS
		25	24		22.17	3.12	25.29	1.00	30.00	PASS
		50	0		22.18	3.12	25.30	1.00	30.00	PASS
		1	0	16QAM	21.87	3.12	24.99	1.00	30.00	PASS
		1	24		22.13	3.12	25.25	1.00	30.00	PASS
		1	49		21.84	3.12	24.96	1.00	30.00	PASS
		25	0		21.26	3.12	24.38	1.00	30.00	PASS
		25	12		21.35	3.12	24.47	1.00	30.00	PASS
		25	24		21.22	3.12	24.34	1.00	30.00	PASS
		50	0		21.24	3.12	24.36	1.00	30.00	PASS
	Middle	1	0	QPSK	22.86	3.12	25.98	1.00	30.00	PASS
		1	24		23.28	3.12	26.40	1.00	30.00	PASS
		1	49		23.03	3.12	26.15	1.00	30.00	PASS
		25	0		22.06	3.12	25.18	1.00	30.00	PASS
		25	12		22.12	3.12	25.24	1.00	30.00	PASS
		25	24		22.03	3.12	25.15	1.00	30.00	PASS
		50	0		22.05	3.12	25.17	1.00	30.00	PASS
		1	0	16QAM	22.13	3.12	25.25	1.00	30.00	PASS
		1	24		22.11	3.12	25.23	1.00	30.00	PASS
		1	49		22.08	3.12	25.20	1.00	30.00	PASS
		25	0		20.89	3.12	24.01	1.00	30.00	PASS
		25	12		21.05	3.12	24.17	1.00	30.00	PASS
		25	24		20.95	3.12	24.07	1.00	30.00	PASS
		50	0		21.07	3.12	24.19	1.00	30.00	PASS
	Highest	1	0	QPSK	23.14	3.12	26.26	1.00	30.00	PASS
		1	24		23.26	3.12	26.38	1.00	30.00	PASS
		1	49		23.10	3.12	26.22	1.00	30.00	PASS
		25	0		22.28	3.12	25.40	1.00	30.00	PASS
		25	12		22.30	3.12	25.42	1.00	30.00	PASS
		25	24		22.23	3.12	25.35	1.00	30.00	PASS
		50	0		22.33	3.12	25.45	1.00	30.00	PASS
		1	0	16QAM	22.46	3.12	25.58	1.00	30.00	PASS
		1	24		22.50	3.12	25.62	1.00	30.00	PASS
		1	49		21.92	3.12	25.04	1.00	30.00	PASS
		25	0		21.05	3.12	24.17	1.00	30.00	PASS
		25	12		21.05	3.12	24.17	1.00	30.00	PASS
		25	24		20.96	3.12	24.08	1.00	30.00	PASS
		50	0		21.14	3.12	24.26	1.00	30.00	PASS



Radiated Power (EIRP) for LTE Band 66 /15M										
BW (MHz)	UL Channel	RB Size	RB offset	Modulation	Conduction AVG Power(dBm)	Ant Gain (dBi)	EIRP (dBm)	EIRP Limit(W)	EIRP Limit(dBm)	Verdict
15	Lowest	1	0	QPSK	23.01	3.12	26.13	1.00	30.00	PASS
		1	37		23.41	3.12	26.53	1.00	30.00	PASS
		1	74		23.11	3.12	26.23	1.00	30.00	PASS
		36	0		22.03	3.12	25.15	1.00	30.00	PASS
		36	18		22.03	3.12	25.15	1.00	30.00	PASS
		36	39		21.93	3.12	25.05	1.00	30.00	PASS
		75	0		22.10	3.12	25.22	1.00	30.00	PASS
		1	0	16QAM	21.88	3.12	25.00	1.00	30.00	PASS
		1	37		21.87	3.12	24.99	1.00	30.00	PASS
		1	74		21.73	3.12	24.85	1.00	30.00	PASS
		36	0		21.19	3.12	24.31	1.00	30.00	PASS
		36	18		21.20	3.12	24.32	1.00	30.00	PASS
		36	39		21.01	3.12	24.13	1.00	30.00	PASS
		75	0		21.16	3.12	24.28	1.00	30.00	PASS
	Middle	1	0	QPSK	22.89	3.12	26.01	1.00	30.00	PASS
		1	37		23.08	3.12	26.20	1.00	30.00	PASS
		1	74		22.93	3.12	26.05	1.00	30.00	PASS
		36	0		22.07	3.12	25.19	1.00	30.00	PASS
		36	18		22.09	3.12	25.21	1.00	30.00	PASS
		36	39		21.99	3.12	25.11	1.00	30.00	PASS
		75	0		21.98	3.12	25.10	1.00	30.00	PASS
		1	0	16QAM	22.05	3.12	25.17	1.00	30.00	PASS
		1	37		22.10	3.12	25.22	1.00	30.00	PASS
		1	74		22.00	3.12	25.12	1.00	30.00	PASS
		36	0		21.07	3.12	24.19	1.00	30.00	PASS
		36	18		21.19	3.12	24.31	1.00	30.00	PASS
		36	39		21.09	3.12	24.21	1.00	30.00	PASS
		75	0		21.06	3.12	24.18	1.00	30.00	PASS
	Highest	1	0	QPSK	23.06	3.12	26.18	1.00	30.00	PASS
		1	37		23.20	3.12	26.32	1.00	30.00	PASS
		1	74		23.07	3.12	26.19	1.00	30.00	PASS
		36	0		22.20	3.12	25.32	1.00	30.00	PASS
		36	18		22.18	3.12	25.30	1.00	30.00	PASS
		36	39		22.09	3.12	25.21	1.00	30.00	PASS
		75	0		22.23	3.12	25.35	1.00	30.00	PASS
		1	0	16QAM	22.25	3.12	25.37	1.00	30.00	PASS
		1	37		22.47	3.12	25.59	1.00	30.00	PASS
		1	74		21.64	3.12	24.76	1.00	30.00	PASS
		36	0		20.97	3.12	24.09	1.00	30.00	PASS
		36	18		20.97	3.12	24.09	1.00	30.00	PASS
		36	39		20.97	3.12	24.09	1.00	30.00	PASS
		75	0		21.22	3.12	24.34	1.00	30.00	PASS



Radiated Power (EIRP) for LTE Band 66 /20M										
BW (MHz)	UL Channel	RB Size	RB offset	Modulation	Conduction AVG Power(dBm)	Ant Gain (dBi)	EIRP (dBm)	EIRP Limit(W)	EIRP Limit(dBm)	Verdict
20	Lowest	1	0	QPSK	22.75	3.12	25.87	1.00	30.00	PASS
		1	49		22.97	3.12	26.09	1.00	30.00	PASS
		1	99		22.65	3.12	25.77	1.00	30.00	PASS
		50	0		22.15	3.12	25.27	1.00	30.00	PASS
		50	24		22.00	3.12	25.12	1.00	30.00	PASS
		50	49		22.13	3.12	25.25	1.00	30.00	PASS
		100	0		22.14	3.12	25.26	1.00	30.00	PASS
		1	0	16QAM	21.75	3.12	24.87	1.00	30.00	PASS
		1	49		22.00	3.12	25.12	1.00	30.00	PASS
		1	99		21.79	3.12	24.91	1.00	30.00	PASS
		50	0		21.22	3.12	24.34	1.00	30.00	PASS
		50	24		21.08	3.12	24.20	1.00	30.00	PASS
		50	49		21.03	3.12	24.15	1.00	30.00	PASS
		100	0		21.03	3.12	24.15	1.00	30.00	PASS
	Middle	1	0	QPSK	23.25	3.12	26.37	1.00	30.00	PASS
		1	49		23.45	3.12	26.57	1.00	30.00	PASS
		1	99		23.18	3.12	26.30	1.00	30.00	PASS
		50	0		22.07	3.12	25.19	1.00	30.00	PASS
		50	24		22.11	3.12	25.23	1.00	30.00	PASS
		50	49		22.04	3.12	25.16	1.00	30.00	PASS
		100	0		21.93	3.12	25.05	1.00	30.00	PASS
		1	0	16QAM	22.61	3.12	25.73	1.00	30.00	PASS
		1	49		22.75	3.12	25.87	1.00	30.00	PASS
		1	99		22.54	3.12	25.66	1.00	30.00	PASS
		50	0		21.17	3.12	24.29	1.00	30.00	PASS
		50	24		21.12	3.12	24.24	1.00	30.00	PASS
		50	49		21.13	3.12	24.25	1.00	30.00	PASS
		100	0		21.03	3.12	24.15	1.00	30.00	PASS
	Highest	1	0	QPSK	22.87	3.12	25.99	1.00	30.00	PASS
		1	49		23.16	3.12	26.28	1.00	30.00	PASS
		1	99		22.94	3.12	26.06	1.00	30.00	PASS
		50	0		22.20	3.12	25.32	1.00	30.00	PASS
		50	24		22.12	3.12	25.24	1.00	30.00	PASS
		50	49		22.09	3.12	25.21	1.00	30.00	PASS
		100	0		22.06	3.12	25.18	1.00	30.00	PASS
		1	0	16QAM	22.02	3.12	25.14	1.00	30.00	PASS
		1	49		22.46	3.12	25.58	1.00	30.00	PASS
		1	99		21.51	3.12	24.63	1.00	30.00	PASS
		50	0		21.21	3.12	24.33	1.00	30.00	PASS
		50	24		21.24	3.12	24.36	1.00	30.00	PASS
		50	49		21.12	3.12	24.24	1.00	30.00	PASS
		100	0		21.08	3.12	24.20	1.00	30.00	PASS

5.2 PEAK TO AVERAGE RATIO

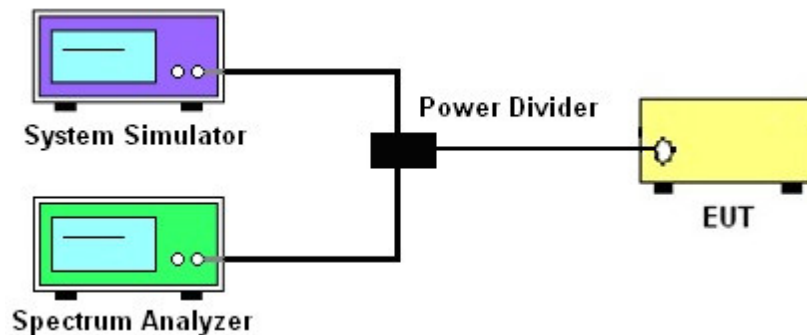
TEST OVERVIEW

According to §24.232(d), power measurements for transmissions by stations authorized under this section may be made either in accordance with a commission-approved average power technique or in compliance with paragraph (e) of this section. In both instances, equipment employed must be authorized in accordance with the provisions of §24.51. In measuring transmissions in this band using an average power technique, the peak-to-average ratio (PAR) of the transmission may not exceed 13 db.

TEST PROCEDURES

1. The testing follows FCC KDB 971168 v03r01 section.
2. The eut was connected to the peak and av system simulator& spectrum analyzer.
3. Select lowest, middle, and highest channels for each band and different modulation.
4. Set the test probe and measure average power of the spectrum analysis,

TEST SETUP



TEST RESULT

Note: The test data please reference to attachment “STS2502058W01_Appendix GSM” , “STS2502058W01_Appendix WCDMA” and “STS2502058W01_Appendix LTE”.

5.3 OCCUPIED BANDWIDTH

TEST OVERVIEW

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission shall be measured.

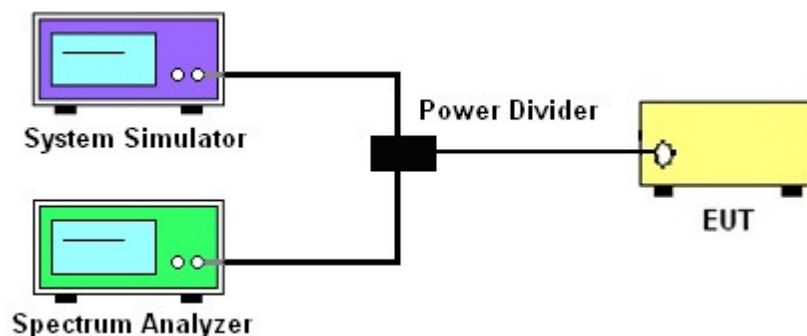
The 26 dB emission bandwidth is defined as the frequency range between two points, one above and one below the carrier frequency, at which the spectral density of the emission is attenuated 26 dB below the maximum in-band spectral density of the modulated signal. Spectral density (power per unit bandwidth) is to be measured with a detector of resolution bandwidth equal to approximately 1.0% of the emission bandwidth.

All modes of operation were investigated and the worst case configuration results are reported in this section.

TEST PROCEDURE

1. The signal analyzer's automatic bandwidth measurement capability was used to perform the 99% occupied bandwidth and the 26dB bandwidth. The bandwidth measurement was not influenced by any intermediate power nulls in the fundamental emission.
2. RBW = 1 – 5% of the expected OBW
3. VBW $\geq 3 \times$ RBW
4. Detector = Peak
5. Trace mode = max hold
6. Sweep = auto couple
7. The trace was allowed to stabilize
8. If necessary, steps 2 – 7 were repeated after changing the RBW such that it would be within 1 – 5% of the 99% occupied bandwidth observed in Step 7

TEST SETUP



TEST RESULT

Note: The test data please reference to attachment “STS2502058W01_Appendix GSM” , “STS2502058W01_Appendix WCDMA” and “STS2502058W01_Appendix LTE”.

5.4 FREQUENCY STABILITY

TEST OVERVIEW

Frequency stability testing is performed in accordance with the guidelines of ANSI C63.26 2015.

The frequency stability of the transmitter is measured by:

- a.) Temperature: The temperature is varied from -30°C to +50°C in 10°C increments using an environmental chamber.
- b.) Primary Supply Voltage: The primary supply voltage is varied from 85% to 115% of the nominal value for non hand-carried battery and AC powered equipment. For hand-carried, battery-powered equipment, primary supply voltage is reduced to the battery operating end point which shall be specified by the manufacturer.

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency. For Part 24 the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

TEST PROCEDURE

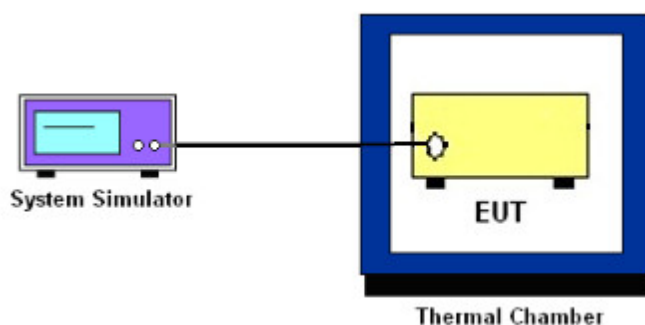
Temperature Variation

1. The testing follows FCC KDB 971168 D01 section 9.0
2. The EUT was set up in the thermal chamber and connected with the system simulator.
3. With power OFF, the temperature was decreased to -30°C and the EUT was stabilized before testing. Power was applied and the maximum change in frequency was recorded within one minute.
4. With power OFF, the temperature was raised in 10°C steps up to 50°C. The EUT was stabilized at each step for at least half an hour. Power was applied and the maximum frequency change was recorded within one minute.

Voltage Variation

1. The testing follows FCC KDB 971168 D01 Section 9.0.
2. The EUT was placed in a temperature chamber at $25 \pm 5^\circ \text{C}$ and connected with the system simulator.
3. The power supply voltage to the EUT was varied from 85% to 115% of the nominal value measured at the input to the EUT.
4. The variation in frequency was measured for the worst case.

TEST SETUP



TEST RESULT

GSM 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	12.63	0.015	2.5ppm	PASS
40		14.02	0.017		
30		12.72	0.015		
20		29.39	0.035		
10		31.79	0.038		
0		21.64	0.026		
-10		22.00	0.026		
-20		24.18	0.029		
-30		20.10	0.024		
20	Maximum Voltage	24.49	0.029		
20	BEP	13.33	0.016		

GPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	31.49	0.038	2.5ppm	PASS
40		15.17	0.018		
30		31.48	0.038		
20		35.14	0.042		
10		12.95	0.015		
0		31.69	0.038		
-10		13.86	0.017		
-20		33.19	0.040		
-30		28.87	0.035		
20	Maximum Voltage	24.09	0.029		
20	BEP	33.00	0.039		

EGPRS 850 /836.6MHz					
Temperature (°C)	Voltage (Volt)	Freq. Dev. (Hz)	Freq. Dev. (ppm)	Limit	Result
50	Normal Voltage	25.84	0.031	2.5ppm	PASS
40		17.53	0.021		
30		17.72	0.021		
20		19.67	0.024		
10		17.09	0.020		
0		16.21	0.019		
-10		17.17	0.021		
-20		28.20	0.034		
-30		21.08	0.025		
20	Maximum Voltage	30.93	0.037		
20	BEP	20.14	0.024		



GSM 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	22.02	0.012	Within Authorized Band	PASS
40		15.51	0.008		
30		20.15	0.011		
20		27.43	0.015		
10		27.03	0.014		
0		17.68	0.009		
-10		17.91	0.010		
-20		19.10	0.010		
-30		29.05	0.015		
20	Maximum Voltage	29.54	0.016		
20	BEP	23.79	0.013		

GPRS 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	16.68	0.009	Within Authorized Band	PASS
40		23.62	0.013		
30		27.58	0.015		
20		16.97	0.009		
10		28.25	0.015		
0		14.06	0.007		
-10		26.09	0.014		
-20		25.40	0.014		
-30		32.19	0.017		
20	Maximum Voltage	27.65	0.015		
20	BEP	29.33	0.016		

EGPRS 1900 / 1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	14.53	0.008	Within Authorized Band	PASS
40		31.51	0.017		
30		23.13	0.012		
20		25.97	0.014		
10		15.21	0.008		
0		28.30	0.015		
-10		23.96	0.013		
-20		35.08	0.019		
-30		15.09	0.008		
20	Maximum Voltage	12.86	0.007		
20	BEP	20.69	0.011		



UMTS Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	25.38	0.014	Within Authorized Band	PASS
40		28.24	0.015		
30		29.92	0.016		
20		32.95	0.018		
10		13.60	0.007		
0		30.53	0.016		
-10		27.85	0.015		
-20		26.39	0.014		
-30		29.94	0.016		
20	Maximum Voltage	27.40	0.015		
20	BEP	32.96	0.018		

HSDPA Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	17.27	0.009	Within Authorized Band	PASS
40		30.75	0.016		
30		14.09	0.007		
20		23.20	0.012		
10		27.58	0.015		
0		11.94	0.006		
-10		22.32	0.012		
-20		33.87	0.018		
-30		33.07	0.018		
20	Maximum Voltage	11.99	0.006		
20	BEP	29.56	0.016		

HSUPA Band 2 /1880MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	34.37	0.018	Within Authorized Band	PASS
40		25.02	0.013		
30		23.52	0.013		
20		25.64	0.014		
10		13.68	0.007		
0		22.85	0.012		
-10		22.64	0.012		
-20		27.42	0.015		
-30		15.00	0.008		
20	Maximum Voltage	28.59	0.015		
20	BEP	22.36	0.012		



UMTS Band 5 / 836.4MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	27.53	0.033	2.5ppm	PASS
40		13.80	0.016		
30		31.42	0.038		
20		25.34	0.030		
10		34.44	0.041		
0		35.89	0.043		
-10		35.92	0.043		
-20		22.99	0.027		
-30		27.82	0.033		
20	Maximum Voltage	35.85	0.043		
20	BEP	34.05	0.041		

HSDPA Band 5 / 836.4MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)		(ppm)		
50	Normal Voltage	25.60	0.031	2.5ppm	PASS
40		28.73	0.034		
30		27.22	0.033		
20		17.04	0.020		
10		32.48	0.039		
0		22.48	0.027		
-10		30.61	0.037		
-20		25.62	0.031		
-30		27.92	0.033		
20	Maximum Voltage	19.51	0.023		
20	BEP	32.66	0.039		

HSUPA Band 5 / 836.4MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	16.18	0.019	2.5ppm	PASS
40		31.22	0.037		
30		17.62	0.021		
20		22.86	0.027		
10		14.03	0.017		
0		36.42	0.044		
-10		29.80	0.036		
-20		34.64	0.041		
-30		30.12	0.036		
20	Maximum Voltage	22.83	0.027		
20	BEP	27.71	0.033		



UMTS Band 4 /1740MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	18.60	0.010	Within Authorized Band	PASS
40		35.65	0.019		
30		20.00	0.011		
20		17.85	0.009		
10		29.30	0.016		
0		20.14	0.011		
-10		35.39	0.019		
-20		31.01	0.016		
-30		22.55	0.012		
20	Maximum Voltage	23.63	0.013		
20	BEP	21.78	0.012		

HSDPA Band 4 /1740MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	20.93	0.011	Within Authorized Band	PASS
40		23.20	0.012		
30		21.64	0.012		
20		16.67	0.009		
10		13.33	0.007		
0		35.53	0.019		
-10		21.08	0.011		
-20		16.26	0.009		
-30		21.94	0.012		
20	Maximum Voltage	24.72	0.013		
20	BEP	15.49	0.008		

HSUPA Band 4 /1740MHz					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	21.54	0.011	Within Authorized Band	PASS
40		17.08	0.009		
30		20.35	0.011		
20		12.83	0.007		
10		32.89	0.017		
0		35.12	0.019		
-10		32.61	0.017		
-20		12.86	0.007		
-30		15.78	0.008		
20	Maximum Voltage	19.53	0.010		
20	BEP	17.38	0.009		



LTE Band 2 (QPSK) / 1880MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	28.40	0.015	2.5ppm	PASS
40		25.60	0.014		
30		24.54	0.013		
20		19.12	0.010		
10		26.91	0.014		
0		28.28	0.015		
-10		24.59	0.013		
-20		20.21	0.011		
-30		21.90	0.012		
20	Maximum Voltage	12.38	0.007		
20	BEP	30.10	0.016		

LTE Band 2 (QPSK) / 1880MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	29.02	0.015	2.5ppm	PASS
40		16.51	0.009		
30		23.52	0.013		
20		32.11	0.017		
10		32.05	0.017		
0		16.71	0.009		
-10		25.20	0.013		
-20		16.35	0.009		
-30		12.06	0.006		
20	Maximum Voltage	25.02	0.013		
20	BEP	33.90	0.018		

LTE Band 4 (QPSK) / 1733MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	20.88	0.012	2.5ppm	PASS
40		34.90	0.020		
30		35.64	0.021		
20		16.47	0.010		
10		26.63	0.015		
0		18.13	0.010		
-10		33.92	0.020		
-20		27.86	0.016		
-30		26.96	0.016		
20	Maximum Voltage	31.22	0.018		
20	BEP	36.12	0.021		



LTE Band 4 (QPSK) / 1733MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	33.50	0.019	2.5ppm	PASS
40		36.41	0.021		
30		29.03	0.017		
20		17.28	0.010		
10		18.66	0.011		
0		35.38	0.020		
-10		16.89	0.010		
-20		17.70	0.010		
-30		36.11	0.021		
20	Maximum Voltage	33.62	0.019		
20	BEP	13.02	0.008		

LTE Band 5 (QPSK) / 836.5MHz / BW5M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	18.57	0.026	2.5ppm	PASS
40		21.60	0.030		
30		35.78	0.050		
20		31.34	0.044		
10		35.82	0.050		
0		32.42	0.046		
-10		25.81	0.004		
-20		35.70	0.050		
-30		25.14	0.035		
20	Maximum Voltage	30.78	0.043		
20	BEP	18.50	0.026		

LTE Band 5 (QPSK) / 836.5MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	21.31	0.030	2.5ppm	PASS
40		34.38	0.048		
30		35.18	0.050		
20		29.19	0.041		
10		35.86	0.051		
0		30.21	0.043		
-10		18.03	0.003		
-20		16.14	0.023		
-30		26.62	0.037		
20	Maximum Voltage	21.22	0.030		
20	BEP	33.91	0.048		



LTE Band 7 (QPSK) / 2535MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	30.55	0.012	2.5ppm	PASS
40		22.06	0.009		
30		22.96	0.009		
20		12.51	0.005		
10		17.91	0.007		
0		12.43	0.005		
-10		16.42	0.006		
-20		31.69	0.013		
-30		31.84	0.013		
20	Maximum Voltage	19.26	0.008		
20	BEP	26.46	0.010		

LTE Band 7 (QPSK) / 2535MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	14.49	0.006	2.5ppm	PASS
40		12.69	0.005		
30		22.73	0.009		
20		23.81	0.009		
10		14.03	0.006		
0		24.32	0.010		
-10		33.88	0.013		
-20		30.39	0.012		
-30		17.17	0.007		
20	Maximum Voltage	25.32	0.010		
20	BEP	28.20	0.011		

LTE Band 12 (QPSK) / 707.5MHz / BW5M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	28.93	0.041	2.5ppm	PASS
40		23.03	0.032		
30		24.17	0.034		
20		33.60	0.047		
10		17.06	0.024		
0		17.74	0.025		
-10		23.99	0.003		
-20		14.14	0.020		
-30		17.97	0.025		
20	Maximum Voltage	14.60	0.021		
20	BEP	34.06	0.048		



LTE Band 12 (QPSK) / 707.5MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	27.04	0.038	2.5ppm	PASS
40		14.30	0.020		
30		35.02	0.049		
20		17.18	0.024		
10		32.43	0.046		
0		22.74	0.032		
-10		24.00	0.003		
-20		21.04	0.030		
-30		36.09	0.051		
20	Maximum Voltage	16.41	0.023		
20	BEP	21.85	0.031		

LTE Band 13 (QPSK) / 782MHz / BW5M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	18.93	0.027	2.5ppm	PASS
40		33.92	0.048		
30		31.90	0.045		
20		13.56	0.019		
10		23.52	0.033		
0		25.64	0.036		
-10		14.29	0.002		
-20		11.76	0.017		
-30		13.68	0.019		
20	Maximum Voltage	15.36	0.022		
20	BEP	35.54	0.050		

LTE Band 13 (QPSK) / 782MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	N/A	0.000	2.5ppm	PASS
40		N/A	0.000		
30		N/A	0.000		
20		N/A	0.000		
10		N/A	0.000		
0		N/A	0.000		
-10		N/A	0.000		
-20		N/A	0.000		
-30		N/A	0.000		
20	Maximum Voltage	N/A	0.000		
20	BEP	N/A	0.000		



LTE Band 25 (QPSK) / 1882.5MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	17.11	0.009	2.5ppm	PASS
40		17.12	0.009		
30		24.15	0.013		
20		28.27	0.015		
10		16.52	0.009		
0		15.65	0.008		
-10		25.80	0.014		
-20		26.51	0.014		
-30		16.98	0.009		
20	Maximum Voltage	33.66	0.018		
20	BEP	26.48	0.014		

LTE Band 25 (QPSK) / 1882.5MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	14.17	0.008	2.5ppm	PASS
40		27.93	0.015		
30		17.24	0.009		
20		33.50	0.018		
10		36.38	0.019		
0		33.06	0.018		
-10		12.55	0.007		
-20		30.38	0.016		
-30		30.49	0.016		
20	Maximum Voltage	13.95	0.007		
20	BEP	27.46	0.015		

LTE Band 26-Part22 (QPSK) / 836.5MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	32.71	0.019	2.5ppm	PASS
40		20.88	0.012		
30		27.88	0.016		
20		34.44	0.020		
10		16.54	0.010		
0		16.63	0.010		
-10		16.66	0.010		
-20		19.37	0.011		
-30		25.47	0.015		
20	Maximum Voltage	17.27	0.010		
20	BEP	20.86	0.012		



LTE Band 26–Part22 (QPSK) / 836.5MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	15.46	0.009	2.5ppm	PASS
40		25.49	0.015		
30		16.26	0.009		
20		20.01	0.012		
10		11.75	0.007		
0		30.07	0.017		
-10		23.44	0.014		
-20		34.65	0.020		
-30		33.84	0.020		
20	Maximum Voltage	36.13	0.021		
20	BEP	20.57	0.012		

LTE Band 26–Part90 (QPSK) / 819MHz / BW5M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	27.87	0.016	2.5ppm	PASS
40		32.68	0.019		
30		18.29	0.011		
20		35.48	0.020		
10		35.31	0.020		
0		24.32	0.014		
-10		12.54	0.007		
-20		34.47	0.020		
-30		12.52	0.007		
20	Maximum Voltage	25.03	0.014		
20	BEP	20.13	0.012		

LTE Band 26–Part90 (QPSK) / 819MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	18.48	0.011	2.5ppm	PASS
40		13.76	0.008		
30		28.10	0.016		
20		17.13	0.010		
10		28.56	0.016		
0		13.52	0.008		
-10		26.95	0.016		
-20		32.35	0.019		
-30		34.17	0.020		
20	Maximum Voltage	28.80	0.017		
20	BEP	33.33	0.019		



LTE Band 38 (QPSK) / 2595MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	23.92	0.009	2.5ppm	PASS
40		33.54	0.013		
30		19.01	0.007		
20		21.38	0.008		
10		26.99	0.011		
0		15.35	0.006		
-10		13.77	0.005		
-20		16.91	0.007		
-30		28.68	0.011		
20	Maximum Voltage	23.83	0.009		
20	BEP	23.58	0.009		

LTE Band 38 (QPSK) / 2595MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	30.66	0.012	2.5ppm	PASS
40		15.79	0.006		
30		18.27	0.007		
20		31.64	0.012		
10		23.62	0.009		
0		16.99	0.007		
-10		34.14	0.013		
-20		14.87	0.006		
-30		15.40	0.006		
20	Maximum Voltage	35.79	0.014		
20	BEP	32.43	0.013		

LTE Band 41 (QPSK) / 2593MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	35.70	0.014	2.5ppm	PASS
40		13.91	0.005		
30		31.08	0.012		
20		15.13	0.006		
10		22.98	0.009		
0		34.37	0.014		
-10		17.49	0.007		
-20		35.26	0.014		
-30		27.75	0.011		
20	Maximum Voltage	18.84	0.007		
20	BEP	30.55	0.012		



LTE Band 41 (QPSK) / 2593MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	12.59	0.005	2.5ppm	PASS
40		31.85	0.013		
30		14.93	0.006		
20		32.22	0.013		
10		35.07	0.014		
0		14.14	0.006		
-10		35.09	0.014		
-20		20.69	0.008		
-30		23.65	0.009		
20	Maximum Voltage	16.28	0.006		
20	BEP	27.85	0.011		

LTE Band 66 (QPSK) / 1745MHz / BW10M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	32.03	0.018	2.5ppm	PASS
40		23.57	0.014		
30		22.49	0.013		
20		28.03	0.016		
10		17.92	0.010		
0		29.61	0.017		
-10		23.83	0.014		
-20		26.37	0.015		
-30		24.82	0.014		
20	Maximum Voltage	19.24	0.011		
20	BEP	15.27	0.009		

LTE Band 66 (QPSK) / 1745MHz / BW20M					
Temperature (°C)	Voltage	Freq. Dev.	Freq. Dev.	Limit	Result
	(Volt)	(Hz)	(ppm)		
50	Normal Voltage	12.30	0.007	2.5ppm	PASS
40		19.96	0.012		
30		19.27	0.011		
20		29.74	0.017		
10		35.88	0.021		
0		35.02	0.020		
-10		11.56	0.007		
-20		14.06	0.008		
-30		22.99	0.013		
20	Maximum Voltage	19.49	0.011		
20	BEP	20.34	0.012		

5.5 SPURIOUS EMISSIONS AT ANTENNA TERMINALS

TEST OVERVIEW

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $43 + 10 \log (P)$ dB.

For Band 7:

The power of any emission outside of the authorized operating frequency ranges must be lower than the transmitter power (P) by a factor of at least $55 + 10 \log (P)$ dB.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

TEST PROCEDURE

1. The testing FCC KDB 971168 D01 v03r01 Section 6.0. and ANSI C63.26-2015-Section 5.7.
2. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
3. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator. The path loss was compensated to the results for each measurement.
4. The middle channel for the highest RF power within the transmitting frequency was measured.
5. The conducted spurious emission for the whole frequency range was taken.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

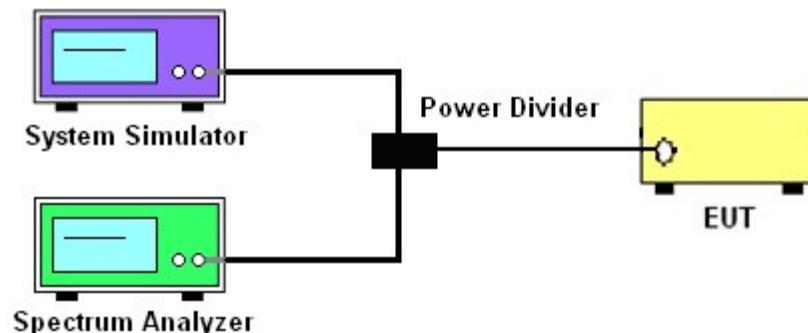
7. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm}.$$

TEST SETUP



TEST RESULT

Note: The test data please reference to attachment “STS2502058W01_Appendix GSM”, “STS2502058W01_Appendix WCDMA” and “STS2502058W01_Appendix LTE”.



5.6 BAND EDGE

TEST OVERVIEW

1. §22.917(a)

For operations in the 824 – 849 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100kHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

2. §24.238 (a)

For operations in the 1850-1910 and 1930-1990 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1MHz bandwidth. However, in the 1 MHz bands immediately outside and adjacent to the frequency block a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed

3. §27.53 (h)

For operations in the 1710 – 1755 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 1 MHz bandwidth. However, in the 1MHz bands immediately outside and adjacent to the licensee's frequency block, a resolution bandwidth of at least one percent of the emission bandwidth of the fundamental emission of the transmitter may be employed.

4. §27.53(m)(4)

For operations in the 2500 MHz ~ 2570 MHz band this section, the attenuation factor shall be not less than $40 + 10 \log (P)$ dB on all frequencies between the channel edge and 5 megahertz from the channel edge, $43 + 10 \log (P)$ dB on all frequencies between 5 megahertz and X megahertz from the channel edge, and $55 + 10 \log (P)$ dB on all frequencies more than X megahertz from the channel edge, where X is the greater of 6 megahertz or the actual emission bandwidth as defined in paragraph (m)(6) of this section. In addition, the attenuation factor shall not be less than $43 + 10 \log (P)$ dB on all frequencies between 2490.5 MHz and 2496 MHz and $55 + 10 \log (P)$ dB at or below 2490.5 MHz. Mobile Satellite Service licensees operating on frequencies below 2495 MHz may also submit a documented interference complaint against BRS licensees operating on channel BRS Channel 1 on the same terms and conditions as adjacent channel BRS or EBS licensees.

5. §27.53 (g)

For operations in the 698 -746 MHz band, the FCC limit is $43 + 10\log_{10}(P[\text{Watts}])$ dB below the transmitter power $P(\text{Watts})$ in a 100 kHz bandwidth. However, in the 100 kilohertz bands immediately outside and adjacent to a licensee's frequency block, a resolution bandwidth of at least 30 kHz may be employed.

TEST PROCEDURE

1. The testing FCC KDB 971168 D01 v03r01 Section 6.0 and ANSI C63.26-2015-Section 5.7
 2. Start and stop frequency were set such that the band edge would be placed in the center of the Plot.
 3. The EUT was connected to the spectrum analyzer and system simulator via a power divider.
 4. The RF output of EUT was connected to the spectrum analyzer by an RF cable and attenuator.
- The path loss was compensated to the results for each measurement.
5. The band edges of low and high channels for the highest RF powers were measured.
 6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

7. The limit line is derived from $43 + 10\log(P)$ dB below the transmitter power P(Watts)

$$= P(W) - [43 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [43 + 10\log(P)] \text{ (dB)}$$

$$= -13\text{dBm}.$$

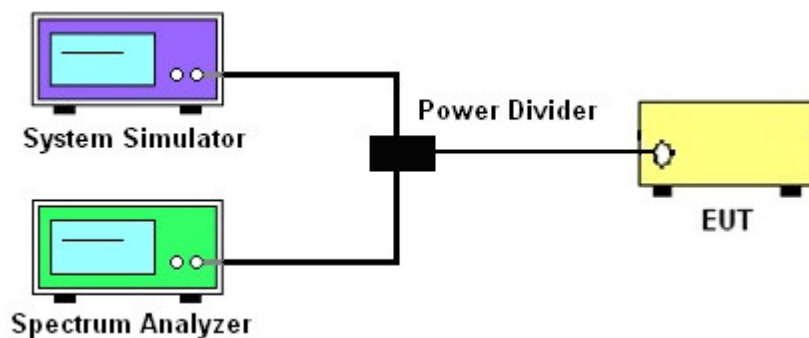
Band 7:

$$= P(W) - [55 + 10\log(P)] \text{ (dB)}$$

$$= [30 + 10\log(P)] \text{ (dBm)} - [55 + 10\log(P)] \text{ (dB)}$$

$$= -25\text{dBm}.$$

TEST SETUP



TEST RESULT

Note: The test data please reference to attachment “STS2502058W01_Appendix GSM” , “STS2502058W01_Appendix WCDMA” and “STS2502058W01_Appendix LTE”.



5.7 FIELD STRENGTH OF SPURIOUS RADIATION MEASUREMENT

TEST OVERVIEW

Radiated spurious emissions measurements are performed using the substitution method described in ANSI C63.26-2015 with the EUT transmitting into an integral antenna. Measurements on signals operating below 1GHz are performed using horizontally and vertically polarized tuned dipole antennas. Measurements on signals operating above 1GHz are performed using vertically and horizontally polarized horn antennas. All measurements are performed as peak measurements while the EUT is operating at maximum power and at the appropriate frequencies.

It is measured by means of a calibrated spectrum analyzer and scanned from 30 MHz up to a frequency including its 10th harmonic.

TEST PROCEDURE

1. The testing FCC KDB 971168 D01 Section 5.8 and ANSI C63.26-2015-Section 5.5.
2. RBW = 100kHz for emissions below 1GHz and 1MHz for emissions above 1GHz
3. VBW $\geq 3 \times$ RBW
4. Span = 1.5 times the OBW
5. No. of sweep points $> 2 \times$ span/RBW
6. Detector = Peak
7. Trace mode = max hold
8. The trace was allowed to stabilize
9. Effective Isotropic Spurious Radiation was measured by substitution method according to TIA/EIA-603-D. The EUT was replaced by the substitution antenna at same location, and then a known power from S.G. was applied into the dipole antenna through a Tx cable, and then recorded the maximum Analyzer reading through raised and lowered the test antenna.
 $P_{Mea} = S.G \text{ Level} + \text{Ant-Cable loss}$; $\text{Margin} = P_{Mea} - \text{Limit}$.