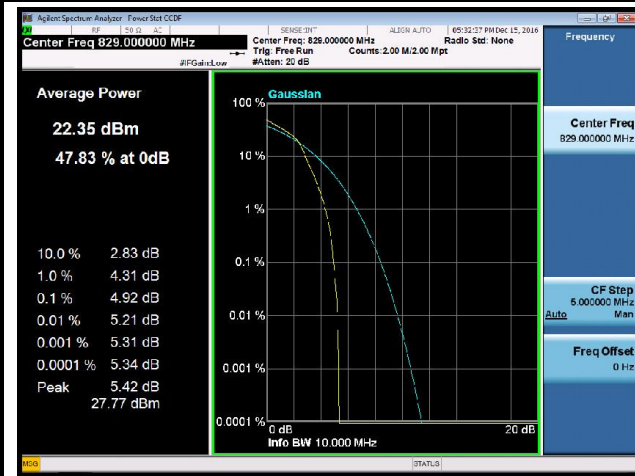
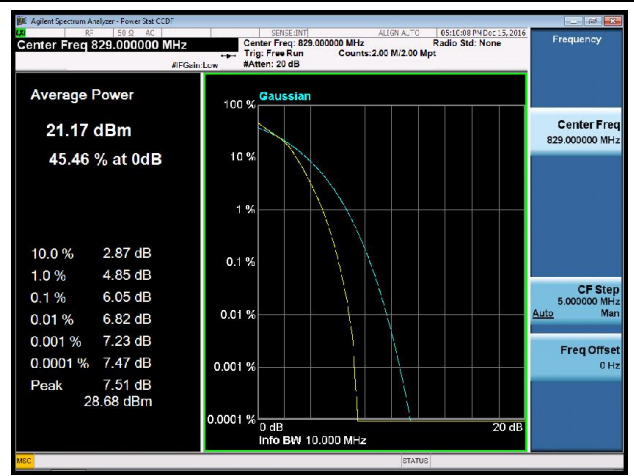


LTE Band 5 / 10MHz / 16-QAM

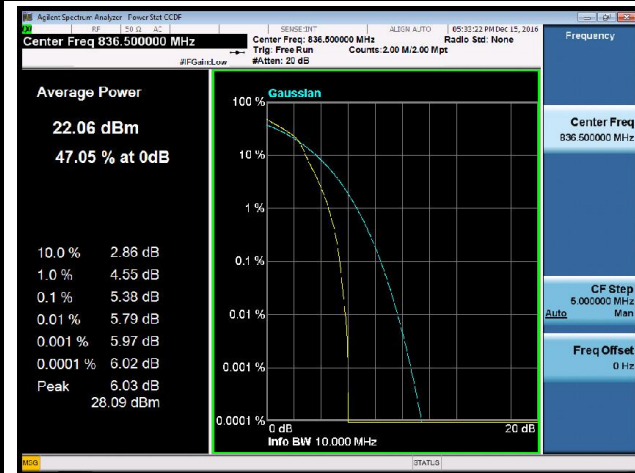
Low CH / 1RB



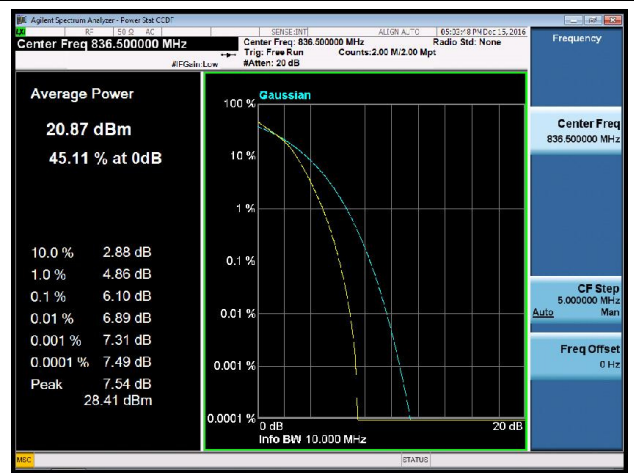
Low CH Full RB



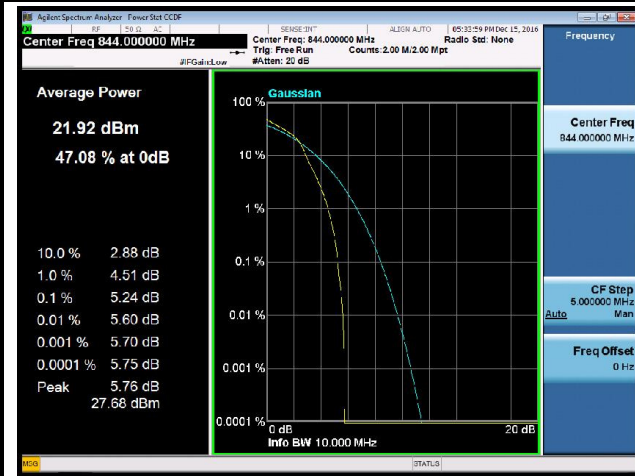
Mid CH / 1RB



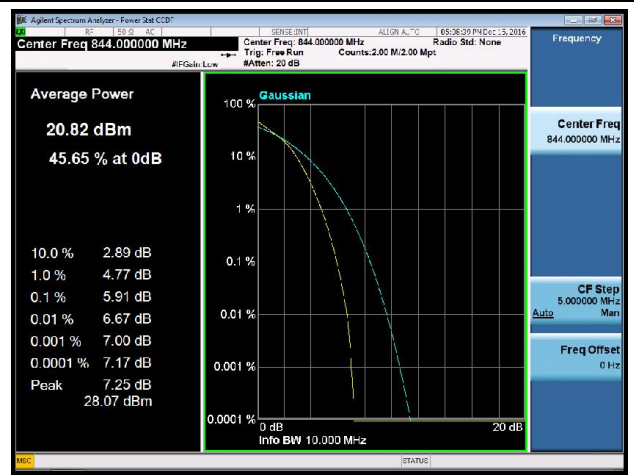
Mid CH Full RB



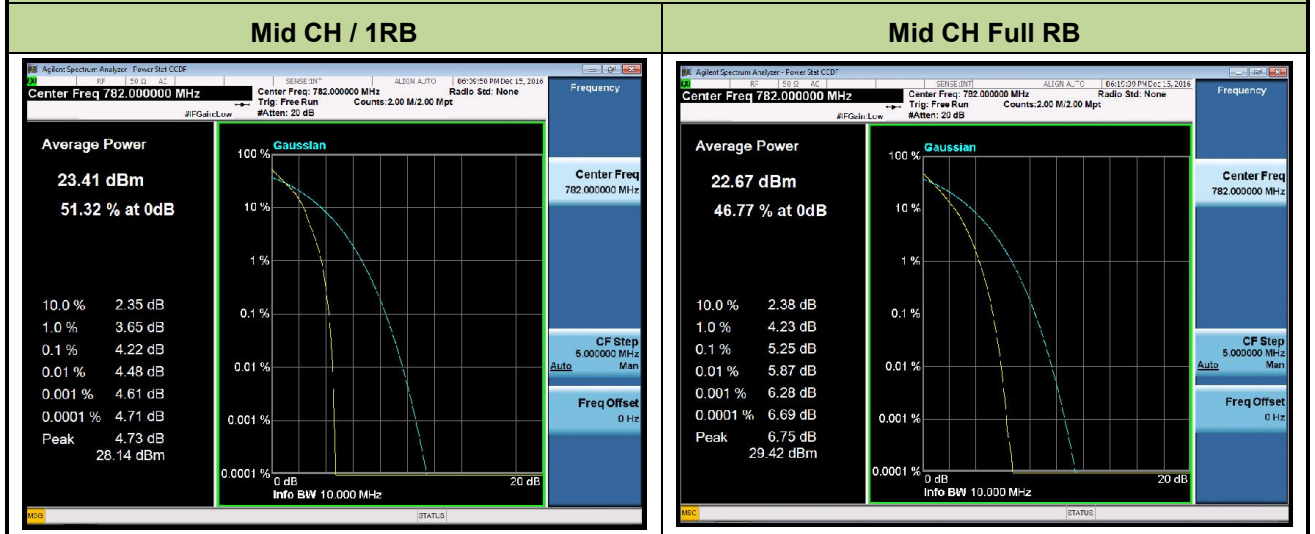
High CH / 1RB



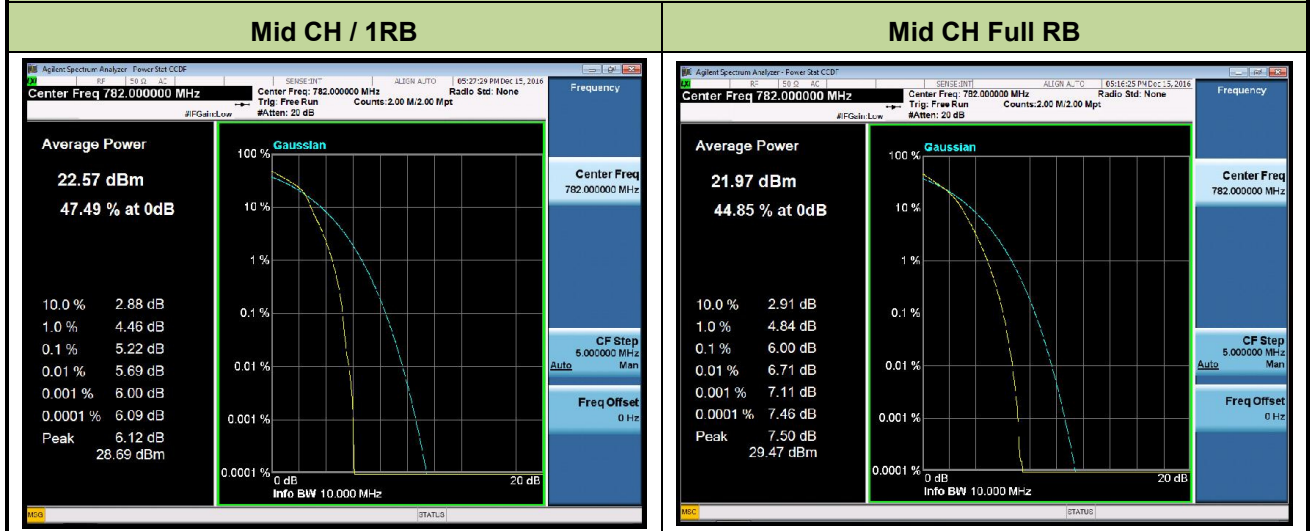
High CH Full RB

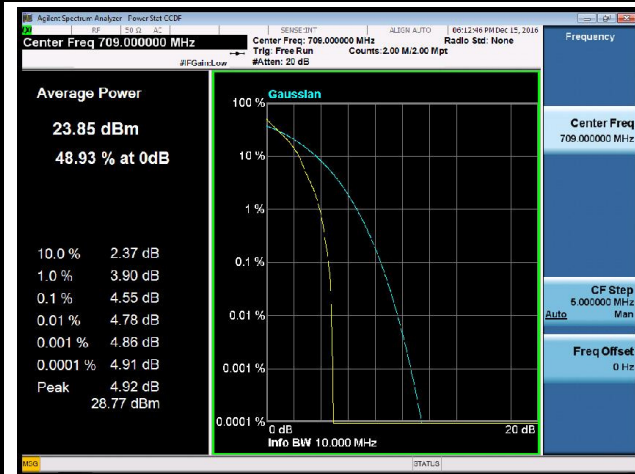
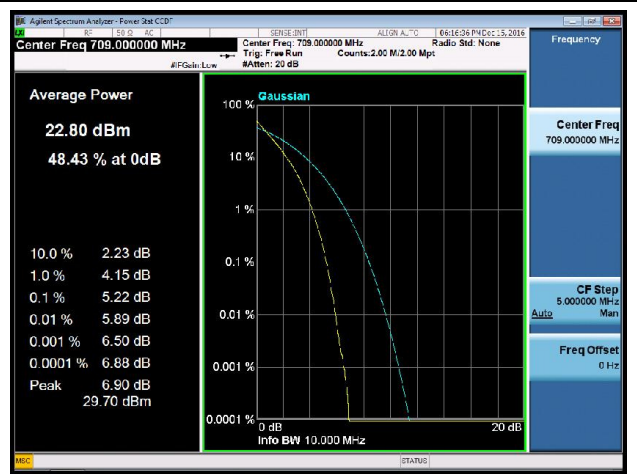
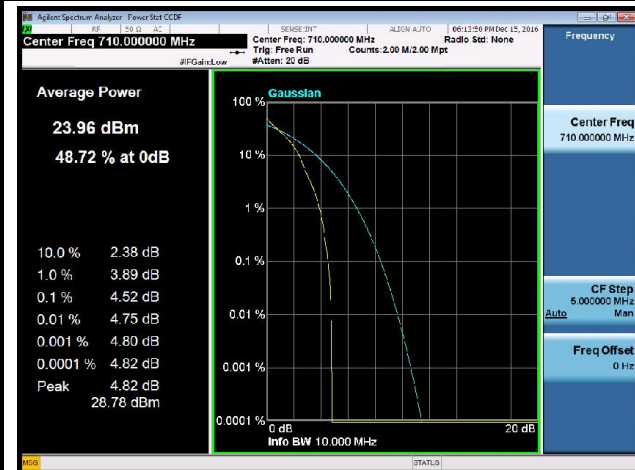
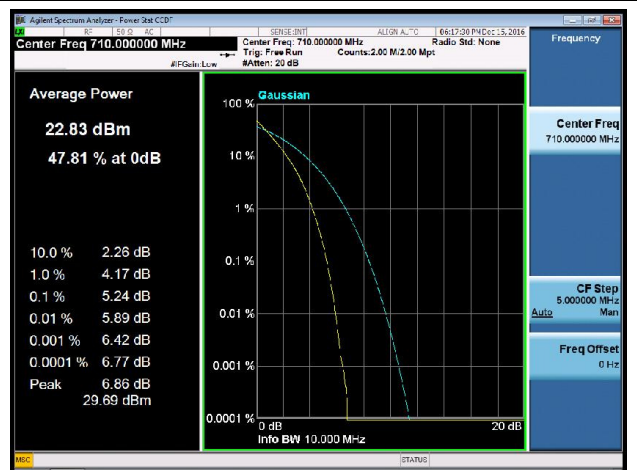
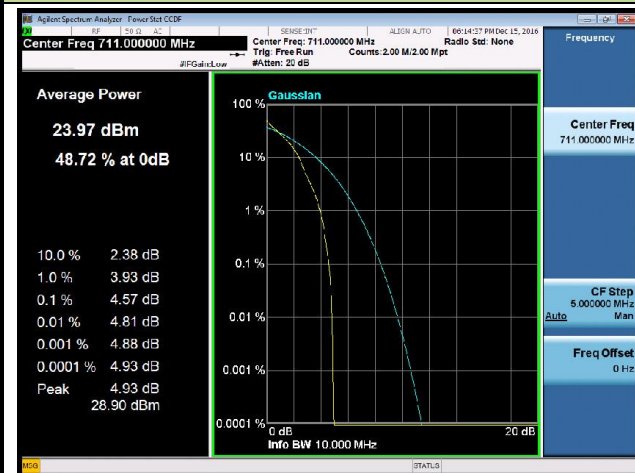
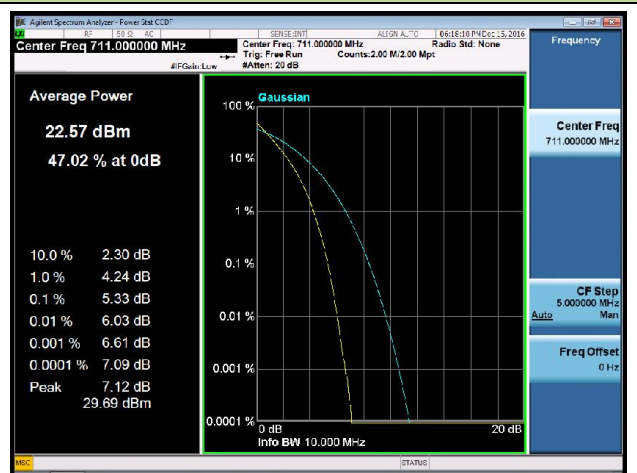


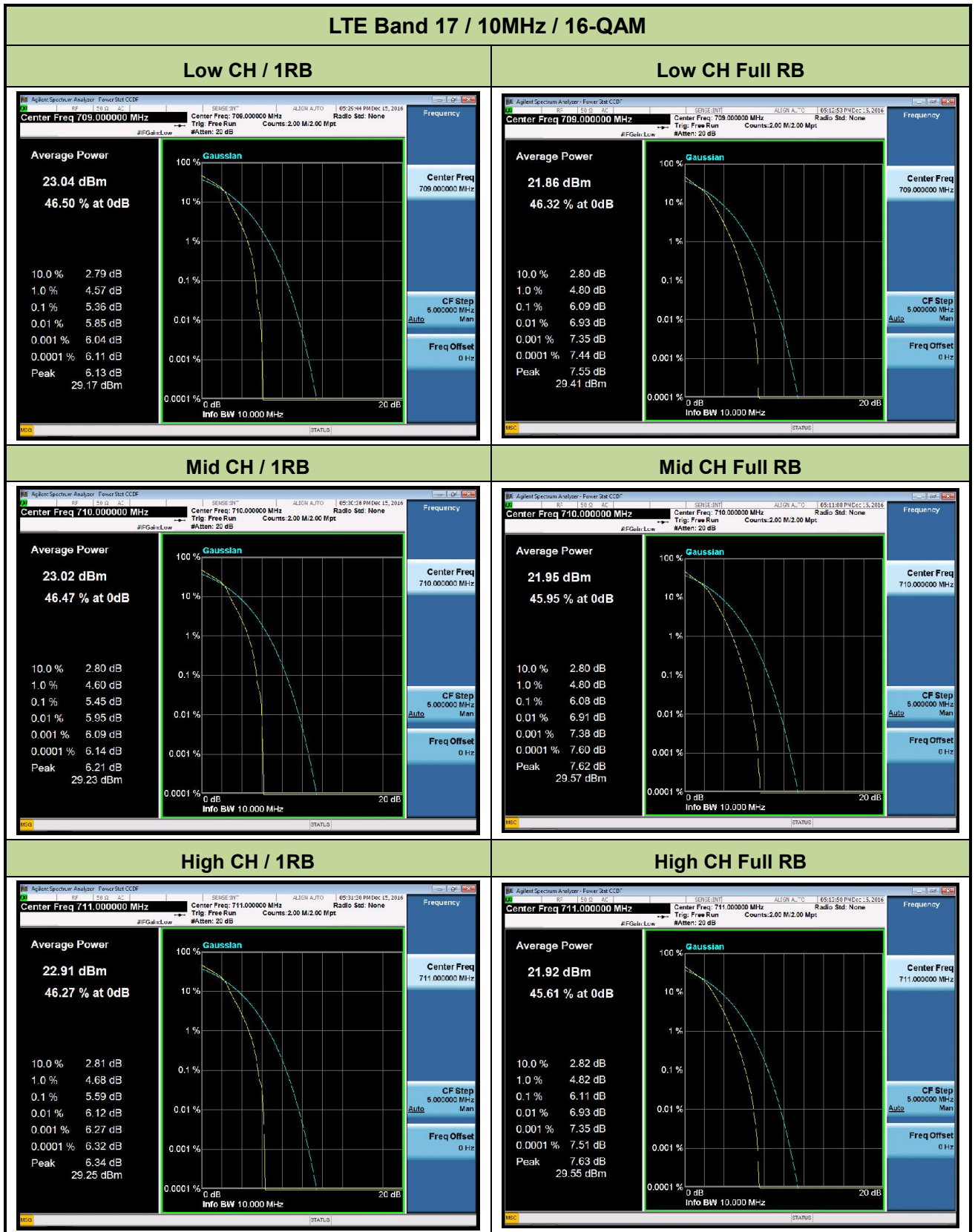
LTE Band 13 / 10MHz / QPSK



LTE Band 13 / 10MHz / 16-QAM



LTE Band 17 / 10MHz / QPSK
Low CH / 1RB

Low CH Full RB

Mid CH / 1RB

Mid CH Full RB

High CH / 1RB

High CH Full RB




7.6. Radiated Power (ERP/EIRP)

7.6.1. Test Limit

Radiated Power

For FCC Part 22.913(a.2): LTE Band 5

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 7 Watts.

For FCC Part 24.232(c): LTE Band 13

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 3 Watts.

For FCC Part 27.50(c): LTE Band 17

The ERP of mobile transmitters and auxiliary test transmitters must not exceed 3 Watts.

For FCC Part 27.50(h): LTE Band 2

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 2 Watts.

For FCC Part 27.50(d): LTE Band 4

The EIRP of mobile transmitters and auxiliary test transmitters must not exceed 1 Watts.

7.6.2. Test Procedure Used

KDB 971168 D01v02r02 - Section 7.0 & ANSI/TIA-603-D-2010

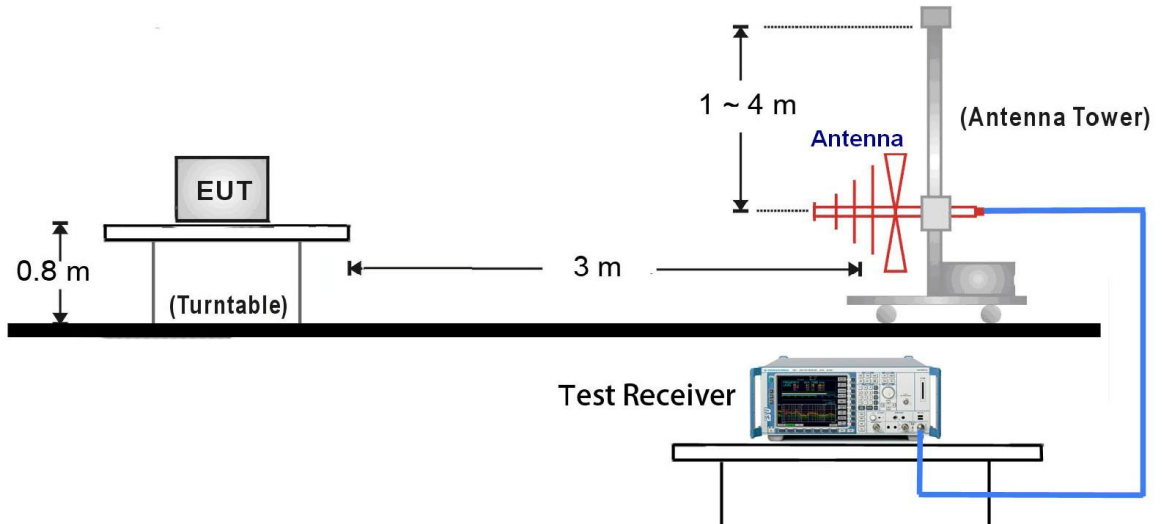
7.6.3. Test Setting

1. The EUT shall be placed at the specified height on a support, and in the position closest to normal use as declared by provider.
2. The test antenna shall be oriented initially for vertical polarization and shall be chosen to correspond to the frequency of the transmitter
3. The output of the test antenna shall be connected to the measuring receiver.
4. The transmitter shall be switched on and the measuring receiver shall be tuned to the frequency of the transmitter under test.
5. The test antenna shall be raised and lowered through the specified range of height until a maximum signal level is detected by the measuring receiver.

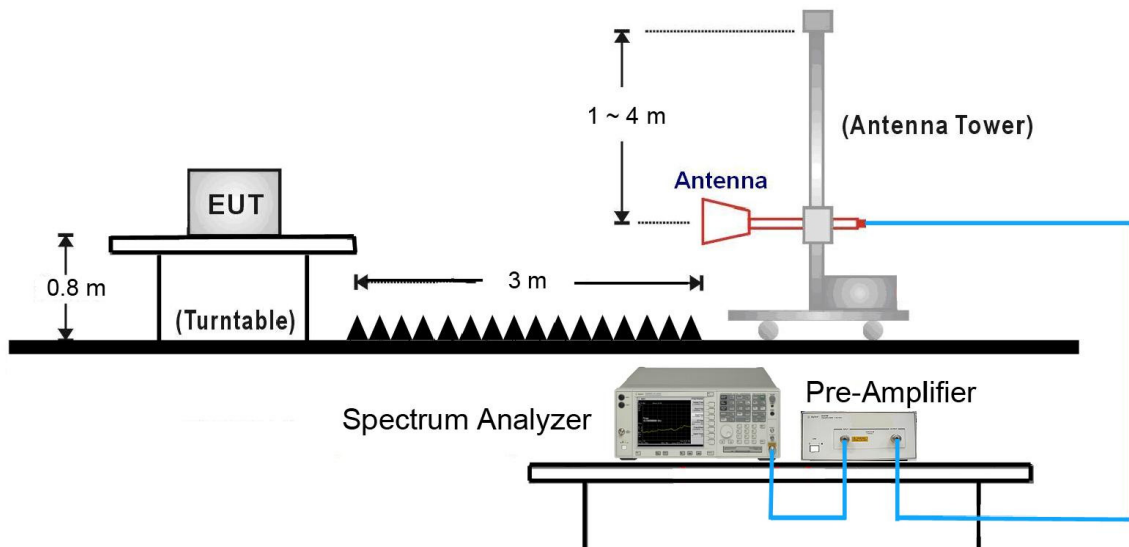
6. The transmitter shall then be rotated through 360° in the horizontal plane, until the maximum signal level is detected by the measuring receiver.
7. The test antenna shall be raised and lowered again through the specified range of height until a maximum signal level is detected by the measuring receiver.
8. The maximum signal level detected by the measuring receiver shall be noted.
9. The transmitter shall be replaced by a substitution antenna.
10. The substitution antenna shall be orientated for vertical polarization and the length of the substitution antenna shall be adjusted to correspond to the frequency of the transmitter.
11. The substitution antenna shall be connected to a calibrated signal generator.
12. If necessary, the input attenuator setting of the measuring receiver shall be adjusted in order to increase the sensitivity of the measuring receiver.
13. The test antenna shall be raised and lowered through the specified range of height to ensure that the maximum signal is received.
14. The input signal to the substitution antenna shall be adjusted to the level that produces a level detected by the measuring receiver, that is equal to the level noted while the transmitter radiated power was measured, corrected for the change of input attenuator setting of the measuring receiver.
15. The measurement shall be repeated with the test antenna and the substitution antenna orientated for horizontal polarization.
16. The measure of the effective radiated power is the larger of the two levels recorded at the input to the substitution antenna, corrected for gain of the substitution antenna if necessary.
17. Test site anechoic chamber refer to ANSI C63.4: 2014.

7.6.4. Test Setup

30MHz ~ 1GHz Test Setup:



1GHz ~ 20GHz Test Setup:



7.6.5. Test Result

LTE Band 2 / 1.4MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	6	0	24.45	0.28	20.99	0.13	2	Pass
Mid.		3	2	23.82	0.24	19.21	0.08		
High		3	2	24.07	0.26	20.90	0.12		
Low	16-QAM	1	5	24.08	0.26	20.67	0.12		
Mid.		1	5	24.91	0.31	21.38	0.14		
High		1	2	24.89	0.31	21.36	0.14		

LTE Band 2 / 3MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	8	7	21.69	0.15	19.45	0.09	2	Pass
Mid.		1	0	25.00	0.32	22.40	0.17		
High		8	7	22.79	0.19	20.43	0.11		
Low	16-QAM	1	14	24.46	0.28	21.92	0.16		
Mid.		8	4	24.24	0.27	21.72	0.15		
High		8	4	23.80	0.24	21.33	0.14		

LTE Band 2 / 5MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	12	11	22.21	0.17	19.92	0.10	2	Pass
Mid.		1	24	22.68	0.19	20.33	0.11		
High		12	11	23.79	0.24	21.32	0.14		
Low	16-QAM	12	0	24.52	0.28	21.97	0.16		
Mid.		1	0	25.00	0.32	22.40	0.17		
High		25	0	24.62	0.29	22.06	0.16		

LTE Band 2 / 10MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	24	24.13	0.26	21.62	0.15	2	Pass
Mid.		25	0	24.72	0.30	22.15	0.16		
High		25	24	23.72	0.24	21.26	0.13		
Low	16-QAM	50	0	24.45	0.28	21.91	0.16		
Mid.		1	0	23.65	0.23	21.20	0.13		
High		1	0	24.55	0.29	22.00	0.16		

LTE Band 2 / 15MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	36	18	23.62	0.23	21.17	0.13	2	Pass
Mid.		1	0	24.03	0.25	21.54	0.14		
High		75	0	23.08	0.20	20.69	0.12		
Low	16-QAM	1	37	22.72	0.19	20.37	0.11		
Mid.		36	18	23.90	0.25	21.42	0.14		
High		75	0	24.24	0.27	21.72	0.15		

LTE Band 2 / 20MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	50	49	23.80	0.24	21.33	0.14	2	Pass
Mid.		50	0	22.80	0.19	20.44	0.11		
High		100	0	23.78	0.24	21.31	0.14		
Low	16-QAM	50	49	22.96	0.20	20.58	0.11		
Mid.		50	49	24.00	0.25	21.51	0.14		
High		50	0	22.99	0.20	20.61	0.12		

LTE Band 4 / 1.4MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	2	22.65	0.18	18.73	0.07	1	Pass
Mid.		1	0	20.27	0.11	16.76	0.05		
High		3	2	22.35	0.17	18.48	0.07		
Low	16-QAM	6	0	22.67	0.18	18.75	0.07		
Mid.		3	1	22.45	0.18	18.56	0.07		
High		3	2	22.35	0.17	18.48	0.07		

LTE Band 4 / 3MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	7	22.07	0.16	18.25	0.07	1	Pass
Mid.		15	0	22.65	0.18	18.73	0.07		
High		1	14	21.45	0.14	17.73	0.06		
Low	16-QAM	1	0	21.84	0.15	18.06	0.06		
Mid.		8	0	20.79	0.12	17.19	0.05		
High		15	0	22.95	0.20	18.98	0.08		

LTE Band 4 / 5MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	12	0	22.26	0.17	18.41	0.07	1	Pass
Mid.		1	12	22.66	0.18	18.74	0.07		
High		12	6	22.42	0.17	18.54	0.07		
Low	16-QAM	1	24	22.78	0.19	18.84	0.08		
Mid.		12	0	22.66	0.18	18.74	0.07		
High		12	6	21.14	0.13	17.48	0.06		

LTE Band 4 / 10MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	50	0	20.57	0.11	17.00	0.05	1	Pass
Mid.		25	0	21.63	0.15	17.88	0.06		
High		1	0	21.54	0.14	17.81	0.06		
Low	16-QAM	1	49	21.77	0.15	18.00	0.06		
Mid.		1	0	20.71	0.12	17.12	0.05		
High		1	49	21.74	0.15	17.97	0.06		

LTE Band 4 / 15MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	75	0	20.45	0.11	16.90	0.05	1	Pass
Mid.		36	0	22.64	0.18	18.72	0.07		
High		75	0	20.00	0.10	16.53	0.04		
Low	16-QAM	1	0	21.13	0.13	17.47	0.06		
Mid.		1	0	20.05	0.10	16.57	0.05		
High		1	37	21.56	0.14	17.83	0.06		

LTE Band 4 / 20MHz									
Ch.	Mod.	RB		EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	99	20.58	0.11	17.01	0.05	1	Pass
Mid.		1	49	21.61	0.15	17.87	0.06		
High		1	99	20.82	0.12	17.21	0.05		
Low	16-QAM	1	0	20.58	0.11	17.01	0.05		
Mid.		1	49	21.32	0.14	17.62	0.06		
High		50	24	21.37	0.14	17.67	0.06		

LTE Band 5 / 1.4MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	3	1	20.58	0.11	18.44	0.07	7	Pass
Mid.		3	0	19.99	0.10	17.91	0.06		
High		6	0	21.02	0.13	18.84	0.08		
Low	16-QAM	1	5	20.05	0.10	17.97	0.06		
Mid.		3	2	20.56	0.11	18.43	0.07		
High		3	0	21.24	0.13	19.04	0.08		

LTE Band 5 / 3MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	8	0	20.82	0.12	18.66	0.07	7	Pass
Mid.		1	0	19.83	0.10	17.77	0.06		
High		1	14	20.62	0.12	18.48	0.07		
Low	16-QAM	8	7	20.81	0.12	18.65	0.07		
Mid.		8	0	21.78	0.15	19.53	0.09		
High		1	14	21.67	0.15	19.43	0.09		

LTE Band 5 / 5MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	0	19.83	0.10	17.77	0.06	7	Pass
Mid.		1	24	20.58	0.11	18.44	0.07		
High		1	0	19.98	0.10	17.90	0.06		
Low	16-QAM	12	0	21.78	0.15	19.53	0.09		
Mid.		1	0	20.01	0.10	17.93	0.06		
High		1	24	20.44	0.11	18.32	0.07		

LTE Band 5 / 10MHz									
Ch.	Mod.	RB		ERP/EIRP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	24	20.09	0.10	18.00	0.06	7	Pass
Mid.		25	24	19.90	0.10	17.83	0.06		
High		1	24	20.24	0.11	18.14	0.07		
Low	16-QAM	1	0	20.42	0.11	18.30	0.07		
Mid.		50	0	19.92	0.10	17.85	0.06		
High		1	24	20.24	0.11	18.14	0.07		

LTE Band 13 / 5MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	12	11	20.52	0.11	20.08	0.10	3	Pass
Mid.		1	24	20.14	0.10	19.70	0.09		
High		12	0	20.72	0.12	20.27	0.11		
Low	16-QAM	12	6	20.65	0.12	20.20	0.10		
Mid.		12	11	21.77	0.15	21.30	0.13		
High		1	24	21.59	0.14	21.12	0.13		

LTE Band 13 / 10MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
	QPSK							3	Pass
Mid.		25	24	21.39	0.14	20.93	0.12		
	16-QAM								
Mid.		25	24	21.11	0.13	20.65	0.12		

LTE Band 17 / 5MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	12	6	21.77	0.15	19.43	0.09	3	Pass
Mid.		12	11	21.19	0.13	18.91	0.08		
High		12	0	20.63	0.12	18.40	0.07		
Low	16-QAM	12	11	20.82	0.12	18.58	0.07		
Mid.		12	11	21.55	0.14	19.23	0.08		
High		1	24	21.45	0.14	19.14	0.08		

LTE Band 17 / 10MHz									
Ch.	Mod.	RB		ERP				Limit (W)	Result
		Size	Offset	H(dBm)	H(W)	V(dBm)	V(W)		
Low	QPSK	1	0	20.56	0.11	18.34	0.07	3	Pass
Mid.		25	24	21.17	0.13	18.89	0.08		
High		25	24	21.36	0.14	19.06	0.08		
Low	16-QAM	1	49	21.35	0.14	19.05	0.08		
Mid.		25	12	20.38	0.11	18.18	0.07		
High		25	24	20.98	0.13	18.72	0.07		

7.7. Radiated Spurious Emissions Measurements

7.7.1. Test Limit

Out of band emissions. 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 $43 + 10 \log(P)$ dB.

7.7.2. Test Procedure Used

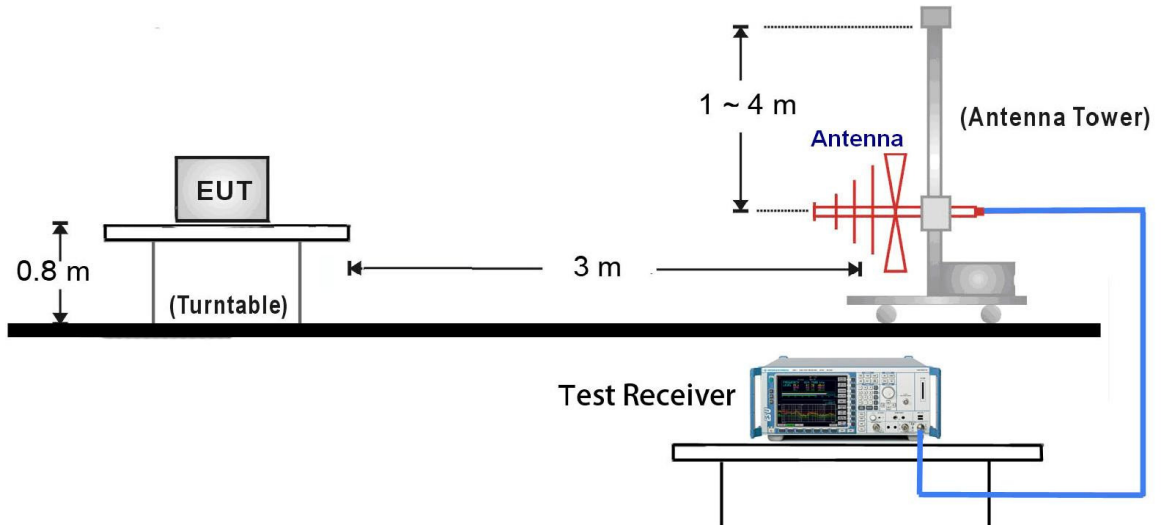
KDB 971168 D01 v02r02 – Section 5.8 & ANSI/TIA-603-D-2010 – Section 2.2.12

7.7.3. Test Setting

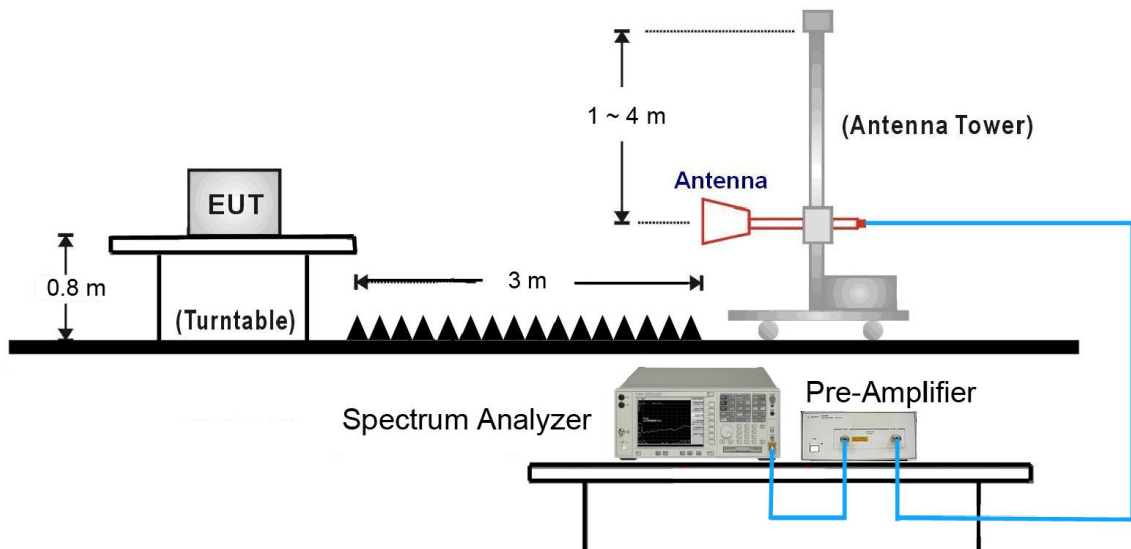
1. RBW = 100kHz for emissions below
2. VBW $\geq 3 \times$ RBW
3. Span = 1.5 times the OBW
4. No. of sweep points $> 2 \times$ span / RB
5. Detector = RMS
6. Trace mode = Average (Max Hold for pulsed emissions)
7. The trace was allowed to stabilize

7.7.4. Test Setup

30MHz ~ 1GHz Test Setup:



1GHz ~ 25GHz Test Setup:



7.7.5. Test Result

LTE Band 2 / QPSK							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 18900 (1860MHz) BW=1.4MHz							
5556.00	V	-48.21	1.25	13.15	-36.32	-13	-23.32
9253.50	V	-54.61	1.72	11.70	-44.63	-13	-31.63
5556.00	H	-48.59	1.25	13.15	-36.69	-13	-23.69
9253.50	H	-52.17	1.72	11.70	-42.19	-13	-29.19
Mid. CH 18900 (1880MHz) BW=1.4MHz							
5641.00	V	-48.56	1.27	13.14	-36.69	-13	-23.69
9398.00	V	-52.08	1.70	11.59	-42.19	-13	-29.19
5641.00	H	-48.56	1.27	13.14	-36.69	-13	-23.69
9398.00	H	-52.08	1.70	11.59	-42.19	-13	-29.19
High CH 18900 (1900MHz) BW=1.4MHz							
5726.00	V	-46.21	1.29	13.11	-34.39	-13	-21.39
7638.50	V	-57.32	1.52	11.46	-47.38	-13	-34.38
5726.00	H	-50.91	1.29	13.11	-39.09	-13	-26.09
9355.50	H	-53.47	1.72	11.62	-43.57	-13	-30.57
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 18625 (1852.5MHz) BW=5MHz							
5556.00	V	-51.33	1.25	13.15	-39.44	-13	-26.44
7409.00	V	-57.47	1.45	11.03	-47.89	-13	-34.89
5556.00	H	-54.52	1.25	13.15	-42.62	-13	-29.62
9279.00	H	-54.16	1.72	11.68	-44.20	-13	-31.20
Mid. CH 18900 (1880MHz) BW=5MHz							
5641.00	V	-53.38	1.27	13.14	-41.51	-13	-28.51
8667.00	V	-55.40	1.67	11.67	-45.40	-13	-32.40
5641.00	H	-57.37	1.27	13.14	-45.50	-13	-32.50
9347.00	H	-53.70	1.72	11.63	-43.79	-13	-30.79

High CH 18900 (1907.5MHz) BW=5MHz							
5726.00	V	-54.45	1.29	13.11	-42.62	-13	-29.62
7638.50	V	-57.80	1.52	11.46	-47.86	-13	-34.86
5726.00	H	-57.35	1.29	13.11	-45.53	-13	-32.53
7630.00	H	-58.15	1.50	11.46	-48.19	-13	-35.19
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 18700 (1860MHz) BW=20MHz							
5590.00	V	-57.93	1.29	13.15	-46.07	-13	-33.07
13410.00	V	-49.90	3.05	12.90	-40.05	-13	-27.05
7145.50	H	-58.75	1.45	11.06	-49.14	-13	-36.14
9347.00	H	-54.41	1.72	11.63	-44.50	-13	-31.50
Mid. CH 18900 (1880MHz) BW=20MHz							
5615.50	V	-58.60	1.25	13.15	-46.70	-13	-33.70
10851.50	V	-51.44	2.03	11.56	-41.90	-13	-28.90
5641.00	H	-62.33	1.27	13.14	-50.46	-13	-37.46
10962.00	H	-51.32	2.12	11.53	-41.91	-13	-28.91
High CH 19100 (1910MHz) BW=20MHz							
5692.00	V	-59.00	1.30	13.12	-47.18	-13	-34.18
9440.50	V	-54.68	1.72	11.66	-44.74	-13	-31.74
5700.50	H	-61.88	1.30	13.12	-50.05	-13	-37.05
10146.00	H	-53.24	1.95	11.96	-43.23	-13	-30.23

Notes:

1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
2. $ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBd)}$

LTE Band 4 / QPSK							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 19957 (1710.7MHz) BW=1.4MHz							
5131.00	V	-48.17	1.20	12.79	-36.58	-13	-23.58
6839.50	V	-54.18	1.41	12.20	-43.39	-13	-30.39
5131.00	H	-54.30	1.20	12.79	-42.72	-13	-29.72
11004.50	H	-51.90	2.17	11.53	-42.54	-13	-29.54
Mid. CH 20175(1732.5) BW=1.4MHz							
5199.00	V	-47.33	1.20	12.86	-35.66	-13	-22.66
6933.00	V	-52.30	1.43	11.88	-41.85	-13	-28.85
5199.00	H	-50.87	1.20	12.86	-39.21	-13	-26.21
9355.50	H	-55.43	1.72	11.62	-45.53	-13	-32.53
High CH 20393 (1754.3MHz) BW=1.4MHz							
5267.00	V	-47.37	1.25	12.95	-35.66	-13	-22.66
7018.00	V	-51.97	1.45	11.58	-41.85	-13	-28.85
5267.00	H	-38.12	1.25	12.95	-26.42	-13	-13.42
7018.00	H	-55.65	1.45	11.58	-45.53	-13	-32.53
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 19975 (1712.5MHz) BW=5MHz							
5139.50	V	-53.30	1.22	12.80	-41.72	-13	-28.72
9321.50	V	-54.46	1.71	11.65	-44.52	-13	-31.52
5139.50	H	-60.65	1.22	12.80	-49.07	-13	-36.07
9347.00	H	-54.07	1.72	11.62	-44.16	-13	-31.16
Mid. CH 20175(1732.5MHz) BW=5MHz							
5199.00	V	-56.08	1.20	12.86	-44.42	-13	-31.42
6933.00	V	-56.39	1.43	11.88	-45.93	-13	-32.93
5199.00	H	-62.67	1.20	12.86	-51.01	-13	-38.01
10877.00	H	-50.97	2.07	11.55	-41.48	-13	-28.48

High CH 20375 (1752.5MHz) BW=5MHz							
5250.00	V	-55.25	1.19	12.93	-43.51	-13	-30.51
7001.00	V	-54.83	1.44	11.65	-44.62	-13	-31.62
5250.00	H	-62.26	1.19	12.93	-50.53	-13	-37.53
7001.00	H	-59.30	1.44	11.65	-49.09	-13	-36.09
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 20050 (1720MHz) BW=20MHz							
5156.50	V	-55.78	1.22	12.81	-44.18	-13	-31.18
9347.00	V	-52.73	1.72	11.66	-42.79	-13	-29.79
9313.00	H	-58.96	1.72	11.66	-49.02	-13	-36.02
11004.50	H	-53.69	2.17	11.53	-44.33	-13	-31.33
Mid. CH 20175(1732.5MHz) BW=20MHz							
5207.50	V	-61.64	1.20	12.87	-49.97	-13	-36.97
9296.00	V	-55.29	1.73	11.67	-45.35	-13	-32.35
6984.00	H	-59.87	1.43	11.70	-49.60	-13	-36.60
10996.00	H	-52.67	1.95	11.52	-43.10	-13	-30.10
High CH 20300 (1747MHz) BW=20MHz							
5224.50	V	-57.43	1.21	12.89	-45.75	-13	-32.75
9287.50	V	-53.42	1.73	12.89	-42.25	-13	-29.25
8641.50	H	-58.23	1.66	11.69	-48.20	-13	-35.20
10996.00	H	-53.92	1.95	11.52	-44.35	-13	-31.35

Notes:

1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
2. $ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBd)}$

LTE Band 5 / QPSK							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 20407(824.7MHz) BW=1.4MHz							
1646.00	V	-61.34	0.65	9.76	-52.23	-13	-39.23
3295.00	V	-68.58	0.93	12.75	-56.75	-13	-43.75
1646.00	H	-68.04	0.65	9.76	-58.93	-13	-45.93
2479.00	H	-65.18	0.80	10.52	-55.45	-13	-42.45
Mid. CH 20525(836.5) BW=1.4MHz							
1671.50	V	-58.29	0.66	9.93	-49.01	-13	-36.01
3346.00	V	-59.78	0.91	12.86	-47.83	-13	-34.83
1671.50	H	-62.10	0.66	9.93	-52.82	-13	-39.82
3346.00	H	-62.27	0.91	12.86	-50.32	-13	-37.32
High CH 20643 (848.3MHz) BW=1.4MHz							
1697.00	V	-60.35	0.66	10.11	-50.90	-13	-37.90
3397.00	V	-62.53	0.92	12.96	-50.50	-13	-37.50
1697.00	H	-59.56	0.66	10.11	-50.11	-13	-37.11
3397.00	H	-61.26	0.92	12.96	-49.22	-13	-36.22
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 20425(826.5MHz) BW=5MHz							
1654.50	V	-60.61	0.65	9.82	-51.45	-13	-38.45
3312.00	V	-64.42	0.93	12.80	-52.54	-13	-39.54
1654.50	H	-64.35	0.65	9.82	-55.19	-13	-42.19
3303.50	H	-65.39	0.93	12.77	-53.54	-13	-40.54
Mid. CH 20525(836.5) BW=5MHz							
1671.50	V	-63.36	0.66	9.93	-54.08	-13	-41.08
3346.00	V	-61.74	0.91	12.86	-49.79	-13	-36.79
2241.00	H	-62.75	0.74	9.41	-54.08	-13	-41.08
5896.00	H	-61.55	1.29	13.05	-49.79	-13	-36.79

High CH 20625 (846.5MHz) BW=5MHz							
1697.00	V	-63.28	0.66	10.11	-53.83	-13	-40.83
3388.50	V	-63.23	0.93	12.94	-51.22	-13	-38.22
1697.00	H	-65.17	0.66	10.11	-55.72	-13	-42.72
3388.50	H	-65.62	0.93	12.94	-53.61	-13	-40.61
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 20450(829MHz) BW=10MHz							
1654.50	V	-56.79	0.49	9.82	-47.46	-13	-34.46
3312.00	V	-67.21	0.93	12.80	-55.34	-13	-42.34
1663.00	H	-62.15	0.66	9.88	-52.93	-13	-39.93
3329.00	H	-62.23	0.92	12.83	-50.32	-13	-37.32
Mid. CH 20525(836.5) BW=10MHz							
1671.50	V	-68.68	0.66	9.93	-59.41	-13	-46.41
1892.50	V	-56.29	0.68	10.44	-46.53	-13	-33.53
1671.50	H	-62.50	0.66	9.93	-53.23	-13	-40.23
3346.00	H	-67.26	0.91	12.86	-55.31	-13	-42.31
High CH 20600 (844MHz) BW=10MHz							
1688.50	V	-65.00	0.66	10.05	-55.61	-13	-42.61
3380.00	V	-63.93	0.93	12.89	-51.98	-13	-38.98
1688.50	H	-67.46	0.66	10.05	-58.07	-13	-45.07
3380.00	H	-67.35	0.93	12.89	-55.39	-13	-42.39

Notes:

1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
2. $ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBd)}$

LTE Band 13 / QPSK							
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Low CH 23205(779.5MHz) BW=5MHz							
1561.00	V	-64.58	0.64	12.35	-52.87	-13	-39.87
3116.50	V	-64.08	0.89	11.74	-53.23	-13	-40.23
1561.00	H	-68.87	0.64	12.35	-57.16	-13	-44.16
2343.00	H	-65.40	0.77	9.89	-56.27	-13	-43.27
Mid. CH 23230(782MHz) BW=5MHz							
1561.00	V	-64.31	0.64	12.35	-52.59	-13	-39.59
1901.00	V	-62.00	0.69	10.45	-52.23	-13	-39.23
1569.50	H	-65.38	0.63	9.26	-56.75	-13	-43.75
2343.00	H	-60.23	0.77	9.89	-51.11	-13	-38.11
High CH 23255 (784.5MHz) BW=5MHz							
1569.50	V	-61.10	0.63	9.26	-52.48	-13	-39.48
2360.00	V	-62.36	0.77	9.98	-53.15	-13	-40.15
1569.50	H	-67.55	0.63	9.26	-58.93	-13	-45.93
2351.50	H	-64.62	0.77	9.93	-55.45	-13	-42.45

Notes:

1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
2. $ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBd)}$

LTE Band 17 / QPSK															
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)								
Low CH 23755(706.5MHz) BW=5MHz															
2122.00	V	-67.11	0.73	9.47	-58.37	-13	-45.37								
2827.50	V	-66.54	0.85	11.31	-56.08	-13	-43.08								
2292.00	H	-64.24	0.75	9.62	-55.37	-13	-42.37								
5649.50	H	-66.50	1.29	13.14	-54.65	-13	-41.65								
Mid. CH 23790(710MHz) BW=5MHz															
1450.50	V	-67.22	0.59	8.43	-59.39	-13	-46.39								
2836.00	V	-66.26	0.86	11.33	-55.79	-13	-42.79								
2241.00	H	-67.50	0.74	9.41	-58.83	-13	-45.83								
5122.50	H	-66.64	1.19	12.78	-55.05	-13	-42.05								
High CH 23825 (713.5MHz) BW=5MHz															
2147.50	V	-66.70	0.73	9.39	-58.04	-13	-45.04								
2853.00	V	-66.21	0.86	11.36	-55.70	-13	-42.70								
2266.50	H	-64.55	0.75	9.51	-55.79	-13	-42.79								
4859.00	H	-70.26	1.17	12.60	-58.83	-13	-45.83								
<table border="1"> <thead> <tr> <th>Frequency (MHz)</th> <th>Ant. Pol. (H/V)</th> <th>SG Reading (dBm)</th> <th>Cable Loss (dB)</th> <th>Substitute Antenna Gain (dBd)</th> <th>ERP (dBm)</th> <th>Limit (dBm)</th> <th>Margin (dB)</th> </tr> </thead> </table>								Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)
Frequency (MHz)	Ant. Pol. (H/V)	SG Reading (dBm)	Cable Loss (dB)	Substitute Antenna Gain (dBd)	ERP (dBm)	Limit (dBm)	Margin (dB)								
Low CH 23780(709MHz) BW=10MHz															
1569.50	V	-63.99	0.63	9.26	-55.37	-13	-42.37								
3125.00	V	-65.54	0.89	11.78	-54.65	-13	-41.65								
2224.00	H	-66.53	0.73	9.34	-57.92	-13	-44.92								
4689.00	H	-57.06	1.13	2.57	-55.61	-13	-42.61								
Mid. CH 23790(710MHz) BW=10MHz															
2122.00	V	-67.11	0.73	9.47	-58.37	-13	-45.37								
2827.50	V	-66.54	0.85	11.31	-56.08	-13	-43.08								
2292.00	H	-67.14	0.75	9.62	-58.27	-13	-45.27								
5649.50	H	-66.13	1.29	13.14	-54.28	-13	-41.28								

High CH 23800 (711MHz) BW=10MHz							
1450.50	V	-67.22	0.59	8.43	-59.39	-13	-46.39
2836.00	V	-66.26	0.86	11.33	-55.79	-13	-42.79
2241.00	H	-67.50	0.74	9.41	-58.83	-13	-45.83
5122.50	H	-66.64	1.19	12.78	-55.05	-13	-42.05

Notes:

1. Spurious emissions within 30-1000MHz were found more than 20dB below limit line.
2. $ERP \text{ (dBm)} = SG \text{ Reading (dBm)} - Cable \text{ Loss (dB)} + Substitute \text{ Antenna Gain (dBd)}$

7.8. Frequency Stability Under Temperature & Voltage Variations

7.8.1. Test Limit

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

For Part 22, the frequency stability of the transmitter shall be maintained within $\pm 0.00025\%$ (± 2.5 ppm) of the center frequency.

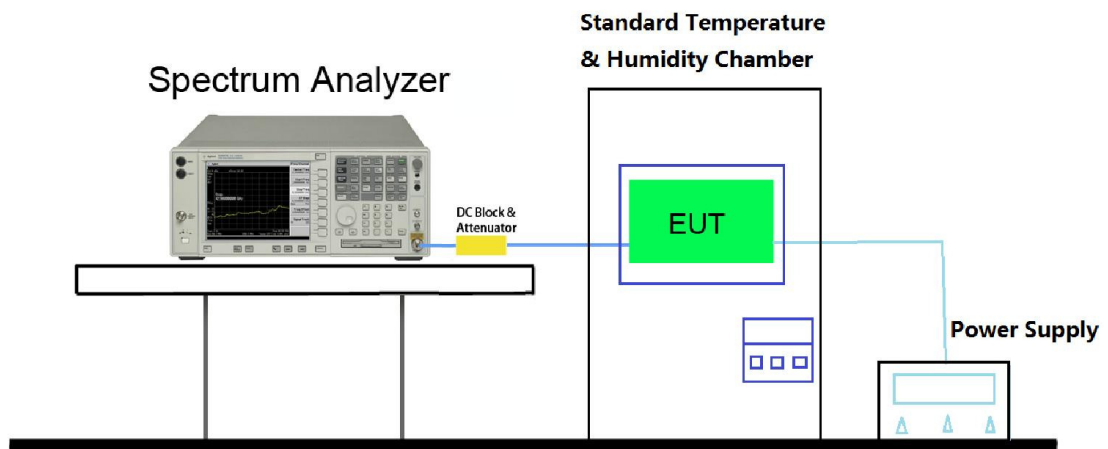
For Part 24, the frequency stability shall be sufficient to ensure that the fundamental emission stays within the authorized frequency block.

For Part 27, the frequency stability shall be sufficient to ensure that the fundamental emissions stay within the authorized bands of operation.

7.8.2. Test Procedure

KDB 971168 D01v02r02 - Section 9.0 & ANSI/TIA-603-D-2010

7.8.3. Test Setup



7.8.4. Test Result

Operating Frequency	1,880,000,000 Hz
Channel	18900
Test Mode	LTE Band 2 / 5MHz
Reference Voltage	3.7 VDC
Deviation Limit	±0.00025% or 2.5ppm

Voltage (%)	Power (VDC)	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	1,880,000,000	26	0.00000138
100%		-30	1,880,000,000	68	0.00000362
100%		-20	1,880,000,000	73	0.00000388
100%		-10	1,880,000,000	-41	-0.00000218
100%		0	1,880,000,000	-64	-0.00000340
100%		+10	1,880,000,000	69	0.00000367
100%		+20	1,880,000,000	35	0.00000186
100%		+30	1,880,000,000	-63	-0.00000335
100%		+40	1,880,000,000	-54	-0.00000287
100%		+50	1,880,000,000	53	0.00000282
115%		4.2	+20	1,880,000,000	69
BAT.ENDPOINT	3.6	+20	1,880,000,000	-61	-0.00000324

Operating Frequency	1732,500,000Hz
Channel	20175
Test Mode	LTE Band 4 / 5MHz
Reference Voltage	3.7 VDC
Deviation Limit	±0.00025% or 2.5ppm

Voltage (%)	Power (VDC)	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	1732,500,000	76	0.00000439
100%		-30	1732,500,000	69	0.00000398
100%		-20	1732,500,000	-63	-0.00000364
100%		-10	1732,500,000	-57	-0.00000329
100%		0	1732,500,000	69	0.00000398
100%		+10	1732,500,000	71	0.00000410
100%		+20	1732,500,000	68	0.00000392
100%		+30	1732,500,000	-62	-0.00000358
100%		+40	1732,500,000	-47	-0.00000271
100%		+50	1732,500,000	68	0.00000392
115%		4.2	+20	1732,500,000	-71
BAT.ENDPOINT	3.6	+20	1732,500,000	-48	-0.00000277

Operating Frequency	836,500,000Hz
Channel	20525
Test Mode	LTE Band 5 / 5MHz
Reference Voltage	3.7 VDC
Deviation Limit	±0.00025% or 2.5ppm

Voltage (%)	Power (VDC)	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	836,500,000	54	0.00000646
100%		-30	836,500,000	-71	-0.00000849
100%		-20	836,500,000	46	0.00000550
100%		-10	836,500,000	54	0.00000646
100%		0	836,500,000	68	0.00000813
100%		+10	836,500,000	-49	-0.00000586
100%		+20	836,500,000	51	0.00000610
100%		+30	836,500,000	74	0.00000885
100%		+40	836,500,000	63	0.00000753
100%		+50	836,500,000	43	0.00000514
115%		4.2	+20	836,500,000	-37
BAT.ENDPOINT	3.6	+20	836,500,000	74	0.00000885

Operating Frequency	782,000,000Hz
Channel	20230
Test Mode	LTE Band 13 / 5MHz
Reference Voltage	3.7 VDC
Deviation Limit	±0.00025% or 2.5ppm

Voltage (%)	Power (VDC)	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	782,000,000	62	0.00000793
100%		-30	782,000,000	74	0.00000946
100%		-20	782,000,000	-63	-0.00000806
100%		-10	782,000,000	69	0.00000882
100%		0	782,000,000	-68	-0.00000870
100%		+10	782,000,000	72	0.00000921
100%		+20	782,000,000	69	0.00000882
100%		+30	782,000,000	69	0.00000882
100%		+40	782,000,000	-53	-0.00000678
100%		+50	782,000,000	61	0.00000780
115%		4.2	+20	782,000,000	68
BAT.ENDPOINT	3.6	+20	782,000,000	-73	-0.00000934

Operating Frequency	710,000,000Hz
Channel	23790
Test Mode	LTE Band 17 / 5MHz
Reference Voltage	3.7 VDC
Deviation Limit	±0.00025% or 2.5ppm

Voltage (%)	Power (VDC)	TEMP (%)	Frequency (Hz)	Freq. Dev. (Hz)	Deviation (%)
100%	3.7	+20(Ref)	710,000,000	-59	-0.00000831
100%		-30	710,000,000	47	0.00000662
100%		-20	710,000,000	53	0.00000746
100%		-10	710,000,000	76	0.00001070
100%		0	710,000,000	43	0.00000606
100%		+10	710,000,000	69	0.00000972
100%		+20	710,000,000	-57	-0.00000803
100%		+30	710,000,000	46	0.00000648
100%		+40	710,000,000	52	0.00000732
100%		+50	710,000,000	69	0.00000972
115%		4.2	+20	710,000,000	-72
BAT.ENDPOINT	3.6	+20	710,000,000	-68	-0.00000958

8. CONCLUSION

The data collected relate only the item(s) tested and show that the **MID** compliance with all the requirements of Parts 2, 22, 24, 27 of the FCC Rules.

_____ The End _____