



Appendix A

Transmitter Output Power

According to FCC Part 2.1046 & Part 27 Subpart C&L



Conducted Power of Transmitter

Table 1 Measurement Results (LTE) BAND 4

TM6 & TM7 RF Output Power(Conducted) BAND 4			
Test Mode	TN/VN		
	Modulation	RB	Measured (dBm)
Channel (L) 5MHz(BW)	QPSK	1RB#0	22.67
		1RB#max	22.79
		12RB#6	22.56
		Full	22.44
	16QAM	1RB#0	22.49
		1RB#max	22.62
		12RB#6	21.74
		Full	21.61
Channel (L) 10MHz(BW)	QPSK	1RB#0	22.46
		1RB#max	22.81
		25RB#13	22.49
		Full	22.38
	16QAM	1RB#0	22.63
		1RB#max	22.93
		25RB#13	21.78
		Full	21.53
Channel (L) 15MHz(BW)	QPSK	1RB#0	22.70
		1RB#max	22.92
		36RB#18	22.40
		Full	22.27
	16QAM	1RB#0	22.69
		1RB#max	22.92
		36RB#18	21.57
		Full	21.41
Channel (L) 20MHz(BW)	QPSK	1RB#0	22.73
		1RB#max	22.90
		50RB#25	22.33
		Full	22.29
	16QAM	1RB#0	22.74
		1RB#max	22.94



		50RB#25	21.50
		Full	21.45
Channel (M) 5MHz(BW)	QPSK	1RB#0	22.71
		1RB#max	22.66
		12RB#6	22.31
		Full	22.10
	16QAM	1RB#0	22.60
		1RB#max	22.55
		12RB#6	21.67
		Full	21.47
Channel (M) 10MHz(BW)	QPSK	1RB#0	22.42
		1RB#max	22.59
		25RB#13	22.01
		Full	21.80
	16QAM	1RB#0	22.53
		1RB#max	22.71
		25RB#13	21.50
		Full	21.28
Channel (M) 15MHz(BW)	QPSK	1RB#0	22.48
		1RB#max	22.64
		36RB#18	22.07
		Full	22.00
	16QAM	1RB#0	22.75
		1RB#max	22.95
		36RB#18	21.49
		Full	21.37
Channel (M) 20MHz(BW)	QPSK	1RB#0	22.64
		1RB#max	22.72
		50RB#25	21.98
		Full	21.91
	16QAM	1RB#0	22.64
		1RB#max	22.72
		50RB#25	21.35
		Full	21.29
Channel (H) 5MHz(BW)	QPSK	1RB#0	22.32
		1RB#max	22.11
		12RB#6	22.07



	16QAM	Full	21.95
		1RB#0	22.16
		1RB#max	21.92
		12RB#6	21.45
		Full	21.33
Channel (H) 10MHz(BW)	QPSK	1RB#0	22.38
		1RB#max	22.31
		25RB#13	21.98
		Full	21.77
	16QAM	1RB#0	22.48
		1RB#max	22.43
		25RB#13	21.37
		Full	21.13
Channel (H) 15MHz(BW)	QPSK	1RB#0	22.48
		1RB#max	22.31
		36RB#18	22.01
		Full	21.96
	16QAM	1RB#0	22.54
		1RB#max	22.38
		36RB#18	21.41
		Full	21.32
Channel (H) 20MHz(BW)	QPSK	1RB#0	22.53
		1RB#max	22.34
		50RB#25	22.09
		Full	21.96
	16QAM	1RB#0	22.58
		1RB#max	22.38
		50RB#25	21.47
		Full	21.31



Peak-to-Average Ratio

Table 2 Measurement Results (LTE) BAND 4

Peak-to-Average Ratio				
Test Mode	TN/VN			
	Modulation	RB	Measured (dB)	Limit (dB)
Channel (L) 5MHz(BW)	QPSK	1RB#0	5.58	13
		1RB#max	5.61	13
		12RB#6	5.59	13
		Full	5.63	13
	16QAM	1RB#0	6.43	13
		1RB#max	6.41	13
		12RB#6	6.40	13
		Full	6.48	13
Channel (L) 10MHz(BW)	QPSK	1RB#0	5.40	13
		1RB#max	5.39	13
		25RB#13	5.38	13
		Full	5.41	13
	16QAM	1RB#0	6.30	13
		1RB#max	6.28	13
		25RB#13	6.29	13
		Full	6.32	13
Channel (L) 15MHz(BW)	QPSK	1RB#0	5.80	13
		1RB#max	5.82	13
		36RB#18	5.81	13
		Full	5.86	13
	16QAM	1RB#0	6.26	13
		1RB#max	6.26	13
		36RB#18	6.29	13
		Full	6.30	13
Channel (L) 20MHz(BW)	QPSK	1RB#0	5.58	13
		1RB#max	5.57	13
		50RB#25	5.60	13
		Full	5.62	13
	16QAM	1RB#0	6.33	13
		1RB#max	6.30	13



		50RB#25	6.33	13
		Full	6.35	13
Channel (M) 5MHz(BW)	QPSK	1RB#0	5.60	13
		1RB#max	5.62	13
		12RB#6	5.65	13
		Full	5.66	13
	16QAM	1RB#0	6.48	13
		1RB#max	6.45	13
		12RB#6	6.42	13
		Full	6.50	13
Channel (M) 10MHz(BW)	QPSK	1RB#0	5.40	13
		1RB#max	5.43	13
		25RB#13	5.38	13
		Full	5.42	13
	16QAM	1RB#0	6.30	13
		1RB#max	6.28	13
		25RB#13	6.27	13
		Full	6.32	13
Channel (M) 15MHz(BW)	QPSK	1RB#0	5.85	13
		1RB#max	5.83	13
		36RB#18	5.76	13
		Full	5.87	13
	16QAM	1RB#0	6.31	13
		1RB#max	6.26	13
		36RB#18	6.27	13
		Full	6.32	13
Channel (M) 20MHz(BW)	QPSK	1RB#0	5.58	13
		1RB#max	5.54	13
		50RB#25	5.59	13
		Full	5.64	13
	16QAM	1RB#0	6.31	13
		1RB#max	6.30	13
		50RB#25	6.33	13
		Full	6.35	13
Channel (H) 5MHz(BW)	QPSK	1RB#0	5.59	13
		1RB#max	5.59	13
		12RB#6	5.58	13
		Full	5.61	13



	16QAM	1RB#0	6.39	13
		1RB#max	6.44	13
		12RB#6	6.38	13
		Full	6.45	13
Channel (H) 10MHz(BW)	QPSK	1RB#0	5.38	13
		1RB#max	5.39	13
		25RB#13	5.37	13
		Full	5.40	13
	16QAM	1RB#0	6.31	13
		1RB#max	6.33	13
		25RB#13	6.28	13
		Full	6.33	13
Channel (H) 15MHz(BW)	QPSK	1RB#0	5.78	13
		1RB#max	5.80	13
		36RB#18	5.75	13
		Full	5.84	13
	16QAM	1RB#0	6.27	13
		1RB#max	6.25	13
		36RB#18	6.24	13
		Full	6.28	13
Channel (H) 20MHz(BW)	QPSK	1RB#0	5.60	13
		1RB#max	5.54	13
		50RB#25	5.58	13
		Full	5.61	13
	16QAM	1RB#0	6.28	13
		1RB#max	6.30	13
		50RB#25	6.29	13
		Full	6.32	13



Effective Isotropic Radiated Power of Transmitter (EIRP)

Table 3 Substitution Results (LTE) BAND 4

Test Mode			Meas. Level [dBm]	Substitution Antenna Type	SGP[dBm]	Substitution Gain [dBi]	Cable Loss [dB]	Substitution Level (EIRP) [dBm]	FCC limit [dBm]	Result
Channel	Modulation	RB								
Channel (L) 5MHz(BW)	QPSK	1 RB/#0	25.77	Horn Ant.	22.29	4.5	1	25.79	30	Pass
		1 RB/#max	25.89	Horn Ant.	22.41	4.5	1	25.91	30	Pass
		12 RB/#6	25.66	Horn Ant.	22.18	4.5	1	25.68	30	Pass
		Full	25.54	Horn Ant.	22.06	4.5	1	25.56	30	Pass
	16QAM	1 RB/#0	25.59	Horn Ant.	22.11	4.5	1	25.61	30	Pass
		1 RB/#max	25.72	Horn Ant.	22.24	4.5	1	25.74	30	Pass
		12 RB/#6	24.84	Horn Ant.	21.36	4.5	1	24.86	30	Pass
		Full	24.71	Horn Ant.	21.23	4.5	1	24.73	30	Pass
Channel (L) 10MHz(BW)	QPSK	1 RB/#0	25.56	Horn Ant.	22.08	4.5	1	25.58	30	Pass
		1 RB/#max	25.91	Horn Ant.	22.43	4.5	1	25.93	30	Pass
		25 RB/#13	25.59	Horn Ant.	22.11	4.5	1	25.61	30	Pass
		Full	25.48	Horn Ant.	22.00	4.5	1	25.50	30	Pass
	16QAM	1 RB/#0	25.73	Horn Ant.	22.25	4.5	1	25.75	30	Pass
		1 RB/#max	26.03	Horn Ant.	22.55	4.5	1	26.05	30	Pass
		25 RB/#13	24.88	Horn	21.40	4.5	1	24.90	30	Pass



				Ant.						
		Full	24.63	Horn Ant.	21.15	4.5	1	24.65	30	Pass
Channel (L) 15MHz(BW)	QPSK	1 RB/#0	25.80	Horn Ant.	22.32	4.5	1	25.82	30	Pass
		1 RB/#max	26.02	Horn Ant.	22.54	4.5	1	26.04	30	Pass
		36 RB/#18	25.50	Horn Ant.	22.02	4.5	1	25.52	30	Pass
		Full	25.37	Horn Ant.	21.89	4.5	1	25.39	30	Pass
	16QAM	1 RB/#0	25.79	Horn Ant.	22.31	4.5	1	25.81	30	Pass
		1 RB/#max	26.02	Horn Ant.	22.54	4.5	1	26.04	30	Pass
		36 RB/#18	24.67	Horn Ant.	21.19	4.5	1	24.69	30	Pass
		Full	24.51	Horn Ant.	21.03	4.5	1	24.53	30	Pass
Channel (L) 20MHz(BW)	QPSK	1 RB/#0	25.83	Horn Ant.	22.35	4.5	1	25.85	30	Pass
		1 RB/#max	26.00	Horn Ant.	22.52	4.5	1	26.02	30	Pass
		50 RB/#25	25.43	Horn Ant.	21.95	4.5	1	25.45	30	Pass
		Full	25.39	Horn Ant.	21.91	4.5	1	25.41	30	Pass
	16QAM	1 RB/#0	25.84	Horn Ant.	22.36	4.5	1	25.86	30	Pass
		1 RB/#max	26.04	Horn Ant.	22.56	4.5	1	26.06	30	Pass
		50 RB/#25	24.60	Horn Ant.	21.12	4.5	1	24.62	30	Pass
		Full	24.55	Horn Ant.	21.07	4.5	1	24.57	30	Pass
Channel (M)	QPSK	1 RB/#0	25.81	Horn Ant.	22.33	4.5	1	25.83	30	Pass



5MHz(B W)		1 RB/#max	25.76	Horn Ant.	22.28	4.5	1	25.78	30	Pass
		12 RB/#6	25.41	Horn Ant.	21.93	4.5	1	25.43	30	Pass
		Full	25.20	Horn Ant.	21.72	4.5	1	25.22	30	Pass
	16QA M	1 RB/#0	25.70	Horn Ant.	22.22	4.5	1	25.72	30	Pass
		1 RB/#max	25.65	Horn Ant.	22.17	4.5	1	25.67	30	Pass
		12 RB/#6	24.77	Horn Ant.	21.29	4.5	1	24.79	30	Pass
		Full	24.57	Horn Ant.	21.09	4.5	1	24.59	30	Pass
Channel (M) 10MHz(B W)	QPSK	1 RB/#0	25.52	Horn Ant.	22.04	4.5	1	25.54	30	Pass
		1 RB/#max	25.69	Horn Ant.	22.21	4.5	1	25.71	30	Pass
		25 RB/#13	25.11	Horn Ant.	21.63	4.5	1	25.13	30	Pass
		Full	24.90	Horn Ant.	21.42	4.5	1	24.92	30	Pass
	16QA M	1 RB/#0	25.63	Horn Ant.	22.15	4.5	1	25.65	30	Pass
		1 RB/#max	25.81	Horn Ant.	22.33	4.5	1	25.83	30	Pass
		25 RB/#13	24.60	Horn Ant.	21.12	4.5	1	24.62	30	Pass
		Full	24.38	Horn Ant.	20.90	4.5	1	24.40	30	Pass
Channel (M) 15MHz(B W)	QPSK	1 RB/#0	25.58	Horn Ant.	22.10	4.5	1	25.60	30	Pass
		1 RB/#max	25.74	Horn Ant.	22.26	4.5	1	25.76	30	Pass
		36 RB/#18	25.17	Horn Ant.	21.69	4.5	1	25.19	30	Pass
		Full	25.10	Horn Ant.	21.62	4.5	1	25.12	30	Pass



	16QAM	1 RB/#0	25.85	Horn Ant.	22.37	4.5	1	25.87	30	Pass
		1 RB/#max	26.05	Horn Ant.	22.57	4.5	1	26.07	30	Pass
		36 RB/#18	24.59	Horn Ant.	21.11	4.5	1	24.61	30	Pass
		Full	24.47	Horn Ant.	20.99	4.5	1	24.49	30	Pass
Channel (M) 20MHz(BW)	QPSK	1 RB/#0	25.74	Horn Ant.	22.26	4.5	1	25.76	30	Pass
		1 RB/#max	25.82	Horn Ant.	22.34	4.5	1	25.84	30	Pass
		50 RB/#25	25.08	Horn Ant.	21.60	4.5	1	25.10	30	Pass
		Full	25.01	Horn Ant.	21.53	4.5	1	25.03	30	Pass
	16QAM	1 RB/#0	25.74	Horn Ant.	22.26	4.5	1	25.76	30	Pass
		1 RB/#max	25.82	Horn Ant.	22.34	4.5	1	25.84	30	Pass
		50 RB/#25	24.45	Horn Ant.	20.97	4.5	1	24.47	30	Pass
		Full	24.39	Horn Ant.	20.91	4.5	1	24.41	30	Pass
Channel (H) 5MHz(BW)	QPSK	1 RB/#0	25.42	Horn Ant.	21.64	4.8	1	25.44	30	Pass
		1 RB/#max	25.21	Horn Ant.	21.43	4.8	1	25.23	30	Pass
		12 RB/#6	25.17	Horn Ant.	21.39	4.8	1	25.19	30	Pass
		Full	25.05	Horn Ant.	21.27	4.8	1	25.07	30	Pass
	16QAM	1 RB/#0	25.26	Horn Ant.	21.48	4.8	1	25.28	30	Pass
		1 RB/#max	25.02	Horn Ant.	21.24	4.8	1	25.04	30	Pass
		12 RB/#6	24.55	Horn Ant.	20.77	4.8	1	24.57	30	Pass



		Full	24.43	Horn Ant.	20.65	4.8	1	24.45	30	Pass
Channel (H) 10MHz(BW)	QPSK	1 RB/#0	25.48	Horn Ant.	21.70	4.8	1	25.50	30	Pass
		1 RB/#max	25.41	Horn Ant.	21.63	4.8	1	25.43	30	Pass
		25 RB/#13	25.08	Horn Ant.	21.30	4.8	1	25.10	30	Pass
		Full	24.87	Horn Ant.	21.09	4.8	1	24.89	30	Pass
	16QAM	1 RB/#0	25.58	Horn Ant.	21.80	4.8	1	25.6	30	Pass
		1 RB/#max	25.53	Horn Ant.	21.75	4.8	1	25.55	30	Pass
		25 RB/#13	24.47	Horn Ant.	20.69	4.8	1	24.49	30	Pass
		Full	24.23	Horn Ant.	20.44	4.8	1	24.24	30	Pass
Channel (H) 15MHz(BW)	QPSK	1 RB/#0	25.58	Horn Ant.	21.79	4.8	1	25.59	30	Pass
		1 RB/#max	25.41	Horn Ant.	21.62	4.8	1	25.42	30	Pass
		36 RB/#18	25.11	Horn Ant.	21.32	4.8	1	25.12	30	Pass
		Full	25.06	Horn Ant.	21.27	4.8	1	25.07	30	Pass
	16QAM	1 RB/#0	25.64	Horn Ant.	21.85	4.8	1	25.65	30	Pass
		1 RB/#max	25.48	Horn Ant.	21.69	4.8	1	25.49	30	Pass
		36 RB/#18	24.51	Horn Ant.	20.72	4.8	1	24.52	30	Pass
		Full	24.42	Horn Ant.	20.63	4.8	1	24.43	30	Pass
Channel (H) 20MHz(BW)	QPSK	1 RB/#0	25.63	Horn Ant.	21.84	4.8	1	25.64	30	Pass
		1 RB/#max	25.44	Horn Ant.	21.65	4.8	1	25.45	30	Pass



		50 RB/#25	25.19	Horn Ant.	21.40	4.8	1	25.20	30	Pass
		Full	25.06	Horn Ant.	21.27	4.8	1	25.07	30	Pass
	16QA M	1 RB/#0	25.68	Horn Ant.	21.89	4.8	1	25.69	30	Pass
		1 RB/#max	25.48	Horn Ant.	21.69	4.8	1	25.49	30	Pass
		50 RB/#25	24.57	Horn Ant.	20.78	4.8	1	24.58	30	Pass
		Full	24.41	Horn Ant.	20.62	4.8	1	24.42	30	Pass

Note: a, For getting the EIRP (Efficient Isotropic Radiated Power) in substitution method, the following formula should be taken to calculate it,

$$\text{EIRP [dBm]} = \text{SGP [dBm]} - \text{Cable Loss [dB]} + \text{Gain [dBi]}$$

b, SGP=Signal Generator Level

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