



Appendix A

Transmitter Output Power According to FCC Part 2.1046 & Part22.913



Conducted Power of Transmitter

Table 1 Measurement Results(CDMA)

TEST CONDITIONS (TN/VN)	RF Output Power					
	Channel 1013(B) 824.7MHz		Channel 384(M) 836.52MHz		Channel 777(T) 848.31MHz	
	dBm		dBm		dBm	
	Measured	Limit	Measured	Limit	Measured	Limit
TM1	23.92	38.5	23.96	38.5	23.86	38.5
TM3	23.97	38.5	24.05	38.5	23.99	38.5
Subtype 0	23.71	38.5	23.77	38.5	23.52	38.5
Subtype 2	23.65	38.5	23.67	38.5	23.54	38.5



Table 2 Measurement Results(LTE) Band 5

TM4 & TM5 RF Output Power(Conducted)				
Test Mode	TN/VN			
	Modulation	RB	Measured (dBm)	Limit (dBm)
Channel (B) 1.4MHz(BW)	QPSK	1 RB/#0	23.11	38.5
		1 RB/#max	23.14	38.5
		3 RB/#2	22.97	38.5
		Full	22.05	38.5
	16QAM	1 RB/#0	22.33	38.5
		1 RB/#max	22.26	38.5
		3 RB/#2	21.89	38.5
		Full	21.21	38.5
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	23.02	38.5
		1 RB/#max	23.09	38.5
		8 RB/#4	22.05	38.5
		Full	22.07	38.5
	16QAM	1 RB/#0	22.04	38.5
		1 RB/#max	22.07	38.5
		8 RB/#4	21.38	38.5
		Full	21.16	38.5
Channel (B) 5MHz(BW)	QPSK	1 RB/#0	23.15	38.5
		1 RB/#max	23.18	38.5
		12 RB/#6	22.03	38.5
		Full	22.14	38.5
	16QAM	1 RB/#0	22.02	38.5
		1 RB/#max	22.07	38.5



		12 RB/#6	21.23	38.5
		Full	20.77	38.5
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	23.05	38.5
		1 RB/#max	22.86	38.5
		25 RB/#13	22.18	38.5
		Full	21.81	38.5
	16QAM	1 RB/#0	22.14	38.5
		1 RB/#max	22.01	38.5
		25 RB/#13	21.42	38.5
		Full	21.01	38.5
Channel (M) 1.4MHz(BW)	QPSK	1 RB/#0	23.17	38.5
		1 RB/#max	23.14	38.5
		3 RB/#2	23.02	38.5
		Full	22.21	38.5
	16QAM	1 RB/#0	21.85	38.5
		1 RB/#max	21.74	38.5
		3 RB/#2	22.35	38.5
		Full	21.37	38.5
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	23.06	38.5
		1 RB/#max	22.89	38.5
		8 RB/#4	22.03	38.5
		Full	21.98	38.5
	16QAM	1 RB/#0	22.25	38.5
		1 RB/#max	22.16	38.5
		8 RB/#4	21.04	38.5
		Full	20.92	38.5



Channel (M) 5MHz(BW)	QPSK	1 RB/#0	23.27	38.5
		1 RB/#max	23.05	38.5
		12 RB/#6	22.02	38.5
		Full	22.12	38.5
	16QAM	1 RB/#0	21.91	38.5
		1 RB/#max	22.05	38.5
		12 RB/#6	20.97	38.5
		Full	20.69	38.5
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	23.13	38.5
		1 RB/#max	22.97	38.5
		25 RB/#13	22.13	38.5
		Full	21.98	38.5
	16QAM	1 RB/#0	22.06	38.5
		1 RB/#max	21.85	38.5
		25 RB/#13	21.12	38.5
		Full	21.22	38.5
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	23.05	38.5
		1 RB/#max	23.11	38.5
		3 RB/#2	22.82	38.5
		Full	21.91	38.5
	16QAM	1 RB/#0	21.76	38.5
		1 RB/#max	21.72	38.5
		3 RB/#2	22.41	38.5
		Full	21.37	38.5
Channel (T) 3MHz(BW)	QPSK	1 RB/#0	22.97	38.5
		1 RB/#max	23.03	38.5



		8 RB/#4	22.01	38.5
		Full	21.88	38.5
	16QAM	1 RB/#0	21.92	38.5
		1 RB/#max	22.04	38.5
		8 RB/#4	21.08	38.5
		Full	20.87	38.5
Channel (T) 5MHz(BW)	QPSK	1 RB/#0	23.08	38.5
		1 RB/#max	23.12	38.5
		12 RB/#6	22.01	38.5
		Full	22.05	38.5
	16QAM	1 RB/#0	21.78	38.5
		1 RB/#max	21.79	38.5
		12 RB/#6	21.04	38.5
		Full	20.72	38.5
Channel (T) 10MHz(BW)	QPSK	1 RB/#0	22.94	38.5
		1 RB/#max	22.78	38.5
		25 RB/#13	21.93	38.5
		Full	21.95	38.5
	16QAM	1 RB/#0	21.92	38.5
		1 RB/#max	21.77	38.5
		25 RB/#13	21.11	38.5
		Full	21.14	38.5



Effective Radiated Power of Transmitter (ERP)

Table 3 Substitution Results(CDMA)

Test Mode	Freq. [MHz]	Meas. Level [dBm]	Substitution Antenna Type	SGP [dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	Limit [dBm]	Result
TM1	824.7	23.87	Dipole Ant.	27.45	-2.95	0.6	23.90	38.5	Pass
TM1	836.52	23.91	Dipole Ant.	27.59	-3.02	0.6	23.97	38.5	Pass
TM1	848.31	23.81	Dipole Ant.	27.55	-3.11	0.6	23.84	38.5	Pass
TM3	824.7	23.92	Dipole Ant.	27.51	-2.95	0.6	23.96	38.5	Pass
TM3	836.52	24.00	Dipole Ant.	27.65	-3.02	0.6	24.03	38.5	Pass
TM3	848.31	23.94	Dipole Ant.	27.72	-3.11	0.6	24.01	38.5	Pass
Subtype 0	824.7	23.66	Dipole Ant.	27.18	-2.95	0.6	23.63	38.5	Pass
Subtype 0	836.52	23.72	Dipole Ant.	27.30	-3.02	0.6	23.68	38.5	Pass
Subtype 0	848.31	23.47	Dipole Ant.	27.28	-3.11	0.6	23.57	38.5	Pass
Subtype 2	824.7	23.60	Dipole Ant.	27.15	-2.95	0.6	23.60	38.5	Pass
Subtype 2	836.52	23.62	Dipole Ant.	27.24	-3.02	0.6	23.62	38.5	Pass
Subtype 2	848.31	23.49	Dipole Ant.	27.20	-3.11	0.6	23.49	38.5	Pass



Table 4 Substitution Results (LTE) Band 5

Test Mode			Meas. Level [dBm]	Substitution Antenna Type	SGP[dBm]	Substitution Gain [dBd]	Cable Loss [dB]	Substitution Level (ERP) [dBm]	FCC limit [dBm]	Result
Channel	Modulation	RB								
Channel (B) 1.4MHz(BW)	QPSK	1 RB/#0	23.06	Dipole Ant.	26.67	-2.95	0.6	23.12	38.5	Pass
		1 RB/#max	23.09	Dipole Ant.	26.69	-2.95	0.6	23.14	38.5	Pass
		3 RB/#2	22.92	Dipole Ant.	26.53	-2.95	0.6	22.98	38.5	Pass
		Full	22.00	Dipole Ant.	25.60	-2.95	0.6	22.05	38.5	Pass
	16QAM	1 RB/#0	22.28	Dipole Ant.	25.79	-2.95	0.6	22.24	38.5	Pass
		1 RB/#max	22.21	Dipole Ant.	25.81	-2.95	0.6	22.26	38.5	Pass
		3 RB/#2	21.84	Dipole Ant.	25.44	-2.95	0.6	21.89	38.5	Pass
		Full	21.16	Dipole Ant.	24.66	-2.95	0.6	21.11	38.5	Pass
Channel (B) 3MHz(BW)	QPSK	1 RB/#0	22.97	Dipole Ant.	26.54	-2.95	0.6	22.99	38.5	Pass
		1 RB/#max	23.04	Dipole Ant.	26.57	-2.95	0.6	23.02	38.5	Pass
		8 RB/#4	22.00	Dipole Ant.	25.60	-2.95	0.6	22.05	38.5	Pass
		Full	22.02	Dipole Ant.	25.56	-2.95	0.6	22.01	38.5	Pass
	16QAM	1 RB/#0	21.99	Dipole Ant.	25.52	-2.95	0.6	21.97	38.5	Pass
		1 RB/#max	22.02	Dipole Ant.	25.58	-2.95	0.6	22.03	38.5	Pass
		8 RB/#4	21.33	Dipole Ant.	24.80	-2.95	0.6	21.25	38.5	Pass



		Full	21.11	Dipole Ant.	24.73	-2.95	0.6	21.18	38.5	Pass
Channel (B) 5MHz(BW)	QPSK	1 RB/#0	23.10	Dipole Ant.	26.71	-2.95	0.6	23.16	38.5	Pass
		1 RB/#max	23.13	Dipole Ant.	26.66	-2.95	0.6	23.11	38.5	Pass
		12 RB/#6	21.98	Dipole Ant.	25.51	-2.95	0.6	21.96	38.5	Pass
		Full	22.09	Dipole Ant.	25.58	-2.95	0.6	22.03	38.5	Pass
	16QAM	1 RB/#0	21.97	Dipole Ant.	25.54	-2.95	0.6	21.99	38.5	Pass
		1 RB/#max	22.02	Dipole Ant.	25.61	-2.95	0.6	22.06	38.5	Pass
		12 RB/#6	21.18	Dipole Ant.	24.66	-2.95	0.6	21.11	38.5	Pass
		Full	20.72	Dipole Ant.	24.34	-2.95	0.6	20.79	38.5	Pass
Channel (B) 10MHz(BW)	QPSK	1 RB/#0	23.00	Dipole Ant.	26.57	-2.95	0.6	23.02	38.5	Pass
		1 RB/#max	22.81	Dipole Ant.	26.44	-2.95	0.6	22.89	38.5	Pass
		25 RB/#13	22.13	Dipole Ant.	25.65	-2.95	0.6	22.10	38.5	Pass
		Full	21.76	Dipole Ant.	25.38	-2.95	0.6	21.83	38.5	Pass
	16QAM	1 RB/#0	22.09	Dipole Ant.	25.56	-2.95	0.6	22.01	38.5	Pass
		1 RB/#max	21.96	Dipole Ant.	25.53	-2.95	0.6	21.98	38.5	Pass
		25 RB/#13	21.37	Dipole Ant.	24.83	-2.95	0.6	21.28	38.5	Pass
		Full	20.96	Dipole Ant.	24.54	-2.95	0.6	20.99	38.5	Pass
Channel (M)	QPSK	1 RB/#0	23.12	Dipole Ant.	26.72	-3.02	0.6	23.10	38.5	Pass



1.4MHz(BW)		1 RB/#max	23.09	Dipole Ant.	26.65	-3.02	0.6	23.03	38.5	Pass
		3 RB/#2	22.97	Dipole Ant.	26.57	-3.02	0.6	22.95	38.5	Pass
		Full	22.16	Dipole Ant.	25.74	-3.02	0.6	22.12	38.5	Pass
	16QAM	1 RB/#0	21.80	Dipole Ant.	25.49	-3.02	0.6	21.87	38.5	Pass
		1 RB/#max	21.69	Dipole Ant.	25.35	-3.02	0.6	21.73	38.5	Pass
		3 RB/#2	22.30	Dipole Ant.	25.80	-3.02	0.6	22.18	38.5	Pass
		Full	21.32	Dipole Ant.	24.97	-3.02	0.6	21.35	38.5	Pass
Channel (M) 3MHz(BW)	QPSK	1 RB/#0	23.01	Dipole Ant.	26.68	-3.02	0.6	23.06	38.5	Pass
		1 RB/#max	22.84	Dipole Ant.	26.51	-3.02	0.6	22.89	38.5	Pass
		8 RB/#4	21.98	Dipole Ant.	25.57	-3.02	0.6	21.95	38.5	Pass
		Full	21.93	Dipole Ant.	25.61	-3.02	0.6	21.99	38.5	Pass
	16QAM	1 RB/#0	22.20	Dipole Ant.	25.88	-3.02	0.6	22.26	38.5	Pass
		1 RB/#max	22.11	Dipole Ant.	25.75	-3.02	0.6	22.13	38.5	Pass
		8 RB/#4	20.99	Dipole Ant.	24.60	-3.02	0.6	20.98	38.5	Pass
		Full	20.87	Dipole Ant.	24.51	-3.02	0.6	20.89	38.5	Pass
Channel (M) 5MHz(BW)	QPSK	1 RB/#0	23.22	Dipole Ant.	26.75	-3.02	0.6	23.13	38.5	Pass
		1 RB/#max	23.00	Dipole Ant.	26.67	-3.02	0.6	23.05	38.5	Pass
		12 RB/#6	21.97	Dipole Ant.	25.57	-3.02	0.6	21.95	38.5	Pass



		Full	22.07	Dipole Ant.	25.64	-3.02	0.6	22.02	38.5	Pass
	16QAM	1 RB/#0	21.86	Dipole Ant.	25.51	-3.02	0.6	21.89	38.5	Pass
		1 RB/#max	22.00	Dipole Ant.	25.65	-3.02	0.6	22.03	38.5	Pass
		12 RB/#6	20.92	Dipole Ant.	24.60	-3.02	0.6	20.98	38.5	Pass
		Full	20.64	Dipole Ant.	24.35	-3.02	0.6	20.73	38.5	Pass
Channel (M) 10MHz(BW)	QPSK	1 RB/#0	23.08	Dipole Ant.	26.65	-3.02	0.6	23.03	38.5	Pass
		1 RB/#max	22.92	Dipole Ant.	26.60	-3.02	0.6	22.98	38.5	Pass
		25 RB/#13	22.08	Dipole Ant.	25.65	-3.02	0.6	22.03	38.5	Pass
		Full	21.93	Dipole Ant.	25.59	-3.02	0.6	21.97	38.5	Pass
	16QAM	1 RB/#0	22.01	Dipole Ant.	25.65	-3.02	0.6	22.03	38.5	Pass
		1 RB/#max	21.80	Dipole Ant.	25.50	-3.02	0.6	21.88	38.5	Pass
		25 RB/#13	21.07	Dipole Ant.	24.63	-3.02	0.6	21.01	38.5	Pass
		Full	21.17	Dipole Ant.	24.75	-3.02	0.6	21.13	38.5	Pass
Channel (T) 1.4MHz(BW)	QPSK	1 RB/#0	23.00	Dipole Ant.	26.75	-3.11	0.6	23.04	38.5	Pass
		1 RB/#max	23.06	Dipole Ant.	26.79	-3.11	0.6	23.08	38.5	Pass
		3 RB/#2	22.77	Dipole Ant.	26.50	-3.11	0.6	22.79	38.5	Pass
		Full	21.86	Dipole Ant.	25.59	-3.11	0.6	21.88	38.5	Pass
	16QAM	1 RB/#0	21.71	Dipole Ant.	25.49	-3.11	0.6	21.78	38.5	Pass



		1 RB/#max	21.67	Dipole Ant.	25.44	-3.11	0.6	21.73	38.5	Pass
		3 RB/#2	22.36	Dipole Ant.	25.93	-3.11	0.6	22.22	38.5	Pass
		Full	21.32	Dipole Ant.	24.96	-3.11	0.6	21.25	38.5	Pass
Channel (T) 3MHz(BW)	QPSK	1 RB/#0	22.92	Dipole Ant.	26.69	-3.11	0.6	22.98	38.5	Pass
		1 RB/#max	22.98	Dipole Ant.	26.67	-3.11	0.6	22.96	38.5	Pass
		8 RB/#4	21.96	Dipole Ant.	25.65	-3.11	0.6	21.94	38.5	Pass
		Full	21.83	Dipole Ant.	25.60	-3.11	0.6	21.89	38.5	Pass
	16QAM	1 RB/#0	21.87	Dipole Ant.	25.59	-3.11	0.6	21.88	38.5	Pass
		1 RB/#max	21.99	Dipole Ant.	25.63	-3.11	0.6	21.92	38.5	Pass
		8 RB/#4	21.03	Dipole Ant.	24.72	-3.11	0.6	21.01	38.5	Pass
		Full	20.82	Dipole Ant.	24.59	-3.11	0.6	20.88	38.5	Pass
Channel (T) 5MHz(BW)	QPSK	1 RB/#0	23.03	Dipole Ant.	26.72	-3.11	0.6	23.01	38.5	Pass
		1 RB/#max	23.07	Dipole Ant.	26.76	-3.11	0.6	23.05	38.5	Pass
		12 RB/#6	21.96	Dipole Ant.	25.69	-3.11	0.6	21.98	38.5	Pass
		Full	22.00	Dipole Ant.	25.76	-3.11	0.6	22.05	38.5	Pass
	16QAM	1 RB/#0	21.73	Dipole Ant.	25.50	-3.11	0.6	21.79	38.5	Pass
		1 RB/#max	21.74	Dipole Ant.	25.53	-3.11	0.6	21.82	38.5	Pass
		12 RB/#6	20.99	Dipole Ant.	24.69	-3.11	0.6	20.98	38.5	Pass



		Full	20.67	Dipole Ant.	24.44	-3.11	0.6	20.73	38.5	Pass
Channel (T) 10MHz(BW)	QPSK	1 RB/#0	22.89	Dipole Ant.	26.56	-3.11	0.6	22.85	38.5	Pass
		1 RB/#max	22.73	Dipole Ant.	26.49	-3.11	0.6	22.78	38.5	Pass
		25 RB/#13	21.88	Dipole Ant.	25.53	-3.11	0.6	21.82	38.5	Pass
		Full	21.90	Dipole Ant.	25.66	-3.11	0.6	21.95	38.5	Pass
	16QAM	1 RB/#0	21.87	Dipole Ant.	25.60	-3.11	0.6	21.89	38.5	Pass
		1 RB/#max	21.72	Dipole Ant.	25.48	-3.11	0.6	21.77	38.5	Pass
		25 RB/#13	21.06	Dipole Ant.	24.74	-3.11	0.6	21.03	38.5	Pass
		Full	21.09	Dipole Ant.	24.83	-3.11	0.6	21.12	38.5	Pass

Note: a, For getting the ERP (Efficient Radiated Power) in substitution method, the following formula should take to calculate it,

$$ERP [dBm] = SGP [dBm] - Cable Loss [dB] + Gain [dBd]$$

b, SGP=Signal Generator Level

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