

Appendix for LTE Band 4

Product Name: Smart Phone

Model No: Black S

Appendix A: Average Power Output Data

Test Result

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
1.4MHz	19957	1710.7	QPSK	1	0	22.82	22.5±1	/
				1	2	22.73	22.5±1	/
				1	5	22.83	22.5±1	/
				3	0	22.54	22.5±1	/
				3	1	22.57	22.5±1	/
				3	2	22.52	22.5±1	/
				6	0	21.54	22.5±1	1.0
			16QAM	1	0	22.04	22.0±1	1.0
				1	2	22.01	22.0±1	1.0
				1	5	22.08	22.0±1	1.0
				3	0	21.69	21.0±1	1.0
				3	1	21.71	21.0±1	1.0
				3	2	21.7	21.0±1	1.0
				6	0	20.81	21.0±1	1.0
	20175	1732.5	QPSK	1	0	22.62	22.5±1	/
				1	2	22.59	22.5±1	/
				1	5	22.65	22.5±1	/
				3	0	22.65	22.5±1	/
				3	1	22.62	22.5±1	/
				3	2	22.64	22.5±1	/
				6	0	21.62	22.5±1	1.0
			16QAM	1	0	22.07	22.0±1	1.0
				1	2	22.06	22.0±1	1.0
				1	5	21.95	22.0±1	1.0
				3	0	21.6	21.0±1	1.0
				3	1	21.66	21.0±1	1.0
				3	2	21.63	21.0±1	1.0
				6	0	20.3	21.0±1	1.0
	20393	1754.3	QPSK	1	0	22.88	23.0±1	/
				1	2	22.88	23.0±1	/
				1	5	22.89	23.0±1	/
				3	0	22.72	23.0±1	/
				3	1	22.71	23.0±1	/
				3	2	22.69	23.0±1	/
				6	0	21.65	22.0±1	1.0

			16QAM	1	0	21.88	22.0±1	1.0
				1	2	21.74	22.0±1	1.0
				1	5	21.77	22.0±1	1.0
				3	0	22.09	22.0±1	1.0
				3	1	22.05	22.0±1	1.0
				3	2	22.05	22.0±1	1.0
				6	0	20.88	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
3MHz	19965	1711.5	QPSK	1	0	22.59	22.5±1	/
				1	8	22.62	22.5±1	/
				1	14	22.46	22.5±1	/
				6	0	21.56	21.5±1	1.0
				6	4	21.5	21.5±1	1.0
				6	9	21.47	21.5±1	1.0
				15	0	21.5	21.5±1	1.0
			16QAM	1	0	21.72	21.5±1	1.0
				1	8	21.63	21.5±1	1.0
				1	14	21.73	21.5±1	1.0
				8	0	20.59	21.0±1	1.0
				8	4	20.5	21.0±1	1.0
				8	9	20.47	21.0±1	1.0
				15	0	20.67	21.0±1	1.0
	20175	1732.5	QPSK	1	0	22.64	22.5±1	/
				1	8	22.63	22.5±1	/
				1	14	22.65	22.5±1	/
				6	0	21.63	22.5±1	1.0
				6	4	21.56	22.5±1	1.0
				6	9	21.54	22.5±1	1.0
				15	0	21.51	22.5±1	1.0
			16QAM	1	0	22	22.0±1	1.0
				1	8	21.97	22.0±1	1.0
				1	14	21.96	22.0±1	1.0
				6	0	20.96	21.0±1	1.0
				6	4	20.93	21.0±1	1.0
				6	9	20.92	21.0±1	1.0
				15	0	20.74	21.0±1	1.0
	20385	1753.5	QPSK	1	0	22.9	23.0±1	/
				1	8	22.9	23.0±1	/
				1	14	22.91	23.0±1	/

				6	0	21.61	22.5±1	1.0
				6	4	21.62	22.5±1	1.0
				6	9	21.63	22.5±1	1.0
				15	0	21.69	22.5±1	1.0
			16QAM	1	0	21.73	21.5±1	1.0
				1	8	21.79	21.5±1	1.0
				1	14	21.75	21.5±1	1.0
				8	0	20.8	21.5±1	1.0
				8	4	20.82	21.5±1	1.0
				8	9	20.84	21.5±1	1.0
				15	0	20.63	21.5±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
5MHz	19975	1712.5	QPSK	1	0	22.55	22.0±1	/
				1	49	22.32	22.0±1	/
				1	99	22.43	22.0±1	/
				12	0	21.45	22.0±1	1.0
				12	24	21.43	22.0±1	1.0
				12	49	21.53	22.0±1	1.0
				25	0	21.44	22.0±1	1.0
			16QAM	1	0	20.82	21.0±1	1.0
				1	49	20.81	21.0±1	1.0
				1	99	20.82	21.0±1	1.0
				12	0	20.49	21.0±1	1.0
				12	24	20.48	21.0±1	1.0
				12	49	20.57	21.0±1	1.0
				25	0	20.64	21.0±1	1.0
	20175	1732.5	QPSK	1	0	22.68	22.5±1	/
				1	49	22.71	22.5±1	/
				1	99	22.76	22.5±1	/
				12	0	21.5	21.5±1	1.0
				12	24	21.44	21.5±1	1.0
				12	49	21.45	21.5±1	1.0
				25	0	21.53	21.5±1	1.0
			16QAM	1	0	20.89	21.0±1	1.0
				1	49	20.88	21.0±1	1.0
				1	99	20.97	21.0±1	1.0
				12	0	20.66	21.0±1	1.0
				12	24	20.7	21.0±1	1.0
				12	49	20.65	21.0±1	1.0

	20375	1752.5	QPSK	25	0	20.78	21.0±1	1.0
				1	0	22.59	22.5±1	/
				1	49	22.54	22.5±1	/
				1	99	22.57	22.5±1	/
				12	0	21.65	22.5±1	1.0
				12	24	21.73	22.5±1	1.0
				12	49	21.69	22.5±1	1.0
			16QAM	25	0	21.68	22.5±1	1.0
				1	0	21.12	21.0±1	1.0
				1	49	21.16	21.0±1	1.0
				1	99	21.16	21.0±1	1.0
				12	0	20.72	21.0±1	1.0
				12	24	20.77	21.0±1	1.0
				12	49	20.68	21.0±1	1.0
				25	0	20.69	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
10MHz	20000	1715	QPSK	1	0	22.53	22.5±1	/
				1	49	22.5	22.5±1	/
				1	99	22.58	22.5±1	/
				25	0	21.4	22.0±1	1.0
				25	24	21.59	22.0±1	1.0
				25	49	21.59	22.0±1	1.0
				50	0	21.56	22.0±1	1.0
			16QAM	1	0	21.56	21.5±1	1.0
				1	49	21.69	21.5±1	1.0
				1	99	21.7	21.5±1	1.0
				25	0	20.61	21.5±1	1.0
				25	24	20.63	21.5±1	1.0
				25	49	20.59	21.5±1	1.0
				50	0	20.67	21.5±1	1.0
	20175	1732.5	QPSK	1	0	22.61	22.5±1	/
				1	49	22.66	22.5±1	/
				1	99	22.63	22.5±1	/
				25	0	21.51	21.5±1	1.0
				25	24	21.5	21.5±1	1.0
				25	49	21.69	21.5±1	1.0
				50	0	21.47	21.5±1	1.0
			16QAM	1	0	21.27	21.0±1	1.0
				1	49	21.22	21.0±1	1.0

				1	99	21.4	21.0±1	1.0
				25	0	20.7	21.0±1	1.0
				25	24	20.67	21.0±1	1.0
				25	49	20.74	21.0±1	1.0
				50	0	20.7	21.0±1	1.0
	20350	1750	QPSK	1	0	22.87	23.0±1	/
				1	49	22.86	23.0±1	/
				1	99	22.88	23.0±1	/
				25	0	21.61	22.0±1	1.0
				25	24	21.58	22.0±1	1.0
				25	49	21.6	22.0±1	1.0
				50	0	21.59	22.0±1	1.0
			16QAM	1	0	22.11	22.0±1	1.0
				1	49	22.21	22.0±1	1.0
				1	99	22.17	22.0±1	1.0
				25	0	20.78	21.0±1	1.0
				25	24	20.86	21.0±1	1.0
				25	49	20.9	21.0±1	1.0
				50	0	20.71	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
15MHz	20025	1717.5	QPSK	1	0	22.66	22.0±1	/
				1	49	22.59	22.0±1	/
				1	99	22.57	22.0±1	/
				36	0	21.53	22.0±1	1.0
				36	24	21.58	22.0±1	1.0
				36	49	21.54	22.0±1	1.0
				75	0	21.48	22.0±1	1.0
			16QAM	1	0	21.47	21.5±1	1.0
				1	49	21.61	21.5±1	1.0
				1	99	21.76	21.5±1	1.0
				36	0	20.68	21.0±1	1.0
				36	24	20.59	21.0±1	1.0
				36	49	20.72	21.0±1	1.0
				75	0	20.58	21.0±1	1.0
	20175	1732.5	QPSK	1	0	22.58	22.5±1	/
				1	49	22.67	22.5±1	/
				1	99	22.72	22.5±1	/
				36	0	21.68	22.0±1	1.0
				36	24	21.47	22.0±1	1.0

				36	49	21.55	22.0±1	1.0
				75	0	21.63	22.0±1	1.0
			16QAM	1	0	21.28	21.0±1	1.0
				1	49	21.22	21.0±1	1.0
				1	99	21.31	21.0±1	1.0
				36	0	20.73	21.0±1	1.0
				36	24	20.81	21.0±1	1.0
				36	49	20.78	21.0±1	1.0
				75	0	20.73	21.0±1	1.0
	20325	1747.5	QPSK	1	0	22.69	22.5±1	/
				1	49	22.7	22.5±1	/
				1	99	22.73	22.5±1	/
				36	0	21.64	22.0±1	1.0
				36	24	21.74	22.0±1	1.0
				36	49	21.62	22.0±1	1.0
				75	0	21.67	22.0±1	1.0
			16QAM	1	0	22.12	21.0±1	1.0
				1	49	22.07	21.0±1	1.0
				1	99	22.11	21.0±1	1.0
				36	0	20.77	21.0±1	1.0
				36	24	20.68	21.0±1	1.0
				36	49	20.79	21.0±1	1.0
				75	0	20.75	21.0±1	1.0

BW(MHz)	Ch	Freq(MHz)	Mode	UL RB Allocation	UL RB Offset	Average Power (dbm)	Tune up limited(dBm)	MPR (dB)
20MHz	20050	1720	QPSK	1	0	22.66	22.5±1	/
				1	49	22.69	22.5±1	/
				1	99	22.85	22.5±1	/
				50	0	21.5	21.5±1	1.0
				50	24	21.57	21.5±1	1.0
				50	49	21.61	21.5±1	1.0
				100	0	21.6	21.5±1	1.0
			16QAM	1	0	20.82	21.0±1	1.0
				1	49	20.93	21.0±1	1.0
				1	99	21.08	21.0±1	1.0
				50	0	20.76	21.0±1	1.0
				50	24	20.68	21.0±1	1.0
				50	49	20.71	21.0±1	1.0
				100	0	20.66	21.0±1	1.0
	20175	1732.5	QPSK	1	0	22.38	22.5±1	/

				1	49	22.49	22.5±1	/
				1	99	22.59	22.5±1	/
				50	0	21.58	21.5±1	1.0
				50	24	21.56	21.5±1	1.0
				50	49	21.65	21.5±1	1.0
				100	0	21.65	21.5±1	1.0
			16QAM	1	0	21.39	21.5±1	1.0
				1	49	21.44	21.5±1	1.0
				1	99	21.58	21.5±1	1.0
				50	0	20.73	21.5±1	1.0
				50	24	20.75	21.5±1	1.0
				50	49	20.74	21.5±1	1.0
				100	0	20.68	21.5±1	1.0
	20300	1745	QPSK	1	0	22.56	22.5±1	/
				1	49	22.54	22.5±1	/
				1	99	22.64	22.5±1	/
				50	0	21.58	21.5±1	1.0
				50	24	21.72	21.5±1	1.0
				50	49	21.74	21.5±1	1.0
				100	0	21.7	21.5±1	1.0
			16QAM	1	0	21.5	21.5±1	1.0
				1	49	21.42	21.5±1	1.0
				1	99	21.51	21.5±1	1.0
				50	0	20.63	21.0±1	1.0
				50	24	20.63	21.0±1	1.0
				50	49	20.7	21.0±1	1.0
				100	0	20.68	21.0±1	1.0

Appendix B: Peak-to-Average Ratio(CCDF)

Test Result

Band	Bandwidth	Modulation	Channel	RB Configuration	Result(dB)	Limit(dB)	Verdict
Band4	1.4MHz	QPSK	19957	1RB#0	4.06	13	PASS
Band4	1.4MHz	QPSK	19957	6RB#0	4.90	13	PASS
Band4	1.4MHz	16QAM	19957	1RB#0	5.28	13	PASS
Band4	1.4MHz	16QAM	19957	6RB#0	5.65	13	PASS
Band4	1.4MHz	QPSK	20175	1RB#0	5.04	13	PASS
Band4	1.4MHz	QPSK	20175	6RB#0	5.54	13	PASS
Band4	1.4MHz	16QAM	20175	1RB#0	6.20	13	PASS
Band4	1.4MHz	16QAM	20175	6RB#0	6.23	13	PASS
Band4	1.4MHz	QPSK	20393	1RB#0	3.86	13	PASS
Band4	1.4MHz	QPSK	20393	6RB#0	4.87	13	PASS
Band4	1.4MHz	16QAM	20393	1RB#0	4.99	13	PASS
Band4	1.4MHz	16QAM	20393	6RB#0	5.68	13	PASS
Band4	3MHz	QPSK	19965	1RB#0	4.06	13	PASS
Band4	3MHz	QPSK	19965	15RB#0	4.99	13	PASS
Band4	3MHz	16QAM	19965	1RB#0	5.42	13	PASS
Band4	3MHz	16QAM	19965	15RB#0	5.80	13	PASS
Band4	3MHz	QPSK	20175	1RB#0	5.01	13	PASS
Band4	3MHz	QPSK	20175	15RB#0	5.57	13	PASS
Band4	3MHz	16QAM	20175	1RB#0	6.38	13	PASS
Band4	3MHz	16QAM	20175	15RB#0	6.38	13	PASS
Band4	3MHz	QPSK	20385	1RB#0	3.80	13	PASS
Band4	3MHz	QPSK	20385	15RB#0	4.81	13	PASS
Band4	3MHz	16QAM	20385	1RB#0	5.48	13	PASS
Band4	3MHz	16QAM	20385	15RB#0	5.68	13	PASS
Band4	5MHz	QPSK	19975	1RB#0	4.00	13	PASS
Band4	5MHz	QPSK	19975	25RB#0	4.93	13	PASS
Band4	5MHz	16QAM	19975	1RB#0	5.48	13	PASS
Band4	5MHz	16QAM	19975	25RB#0	5.88	13	PASS
Band4	5MHz	QPSK	20175	1RB#0	5.10	13	PASS
Band4	5MHz	QPSK	20175	25RB#0	5.54	13	PASS
Band4	5MHz	16QAM	20175	1RB#0	6.17	13	PASS
Band4	5MHz	16QAM	20175	25RB#0	6.26	13	PASS
Band4	5MHz	QPSK	20375	1RB#0	3.80	13	PASS
Band4	5MHz	QPSK	20375	25RB#0	4.70	13	PASS
Band4	5MHz	16QAM	20375	1RB#0	5.54	13	PASS
Band4	5MHz	16QAM	20375	25RB#0	5.62	13	PASS

Band4	10MHz	QPSK	20000	1RB#0	3.94	13	PASS
Band4	10MHz	QPSK	20000	50RB#0	5.19	13	PASS
Band4	10MHz	16QAM	20000	1RB#0	5.19	13	PASS
Band4	10MHz	16QAM	20000	50RB#0	6.00	13	PASS
Band4	10MHz	QPSK	20175	1RB#0	5.13	13	PASS
Band4	10MHz	QPSK	20175	50RB#0	5.51	13	PASS
Band4	10MHz	16QAM	20175	1RB#0	6.32	13	PASS
Band4	10MHz	16QAM	20175	50RB#0	6.26	13	PASS
Band4	10MHz	QPSK	20350	1RB#0	3.77	13	PASS
Band4	10MHz	QPSK	20350	50RB#0	4.75	13	PASS
Band4	10MHz	16QAM	20350	1RB#0	5.19	13	PASS
Band4	10MHz	16QAM	20350	50RB#0	5.62	13	PASS
Band4	15MHz	QPSK	20025	1RB#0	3.83	13	PASS
Band4	15MHz	QPSK	20025	75RB#0	5.48	13	PASS
Band4	15MHz	16QAM	20025	1RB#0	5.16	13	PASS
Band4	15MHz	16QAM	20025	75RB#0	6.23	13	PASS
Band4	15MHz	QPSK	20175	1RB#0	5.07	13	PASS
Band4	15MHz	QPSK	20175	75RB#0	5.65	13	PASS
Band4	15MHz	16QAM	20175	1RB#0	6.26	13	PASS
Band4	15MHz	16QAM	20175	75RB#0	6.23	13	PASS
Band4	15MHz	QPSK	20325	1RB#0	3.94	13	PASS
Band4	15MHz	QPSK	20325	75RB#0	4.93	13	PASS
Band4	15MHz	16QAM	20325	1RB#0	5.48	13	PASS
Band4	15MHz	16QAM	20325	75RB#0	5.71	13	PASS
Band4	20MHz	QPSK	20050	1RB#0	3.42	13	PASS
Band4	20MHz	QPSK	20050	100RB#0	5.28	13	PASS
Band4	20MHz	16QAM	20050	1RB#0	4.93	13	PASS
Band4	20MHz	16QAM	20050	100RB#0	6.17	13	PASS
Band4	20MHz	QPSK	20175	1RB#0	4.78	13	PASS
Band4	20MHz	QPSK	20175	100RB#0	5.25	13	PASS
Band4	20MHz	16QAM	20175	1RB#0	5.91	13	PASS
Band4	20MHz	16QAM	20175	100RB#0	6.03	13	PASS
Band4	20MHz	QPSK	20300	1RB#0	4.00	13	PASS
Band4	20MHz	QPSK	20300	100RB#0	4.72	13	PASS
Band4	20MHz	16QAM	20300	1RB#0	5.71	13	PASS
Band4	20MHz	16QAM	20300	100RB#0	5.62	13	PASS

Test Graphs



















