APPENDIX G: POWER REDUCTION VERIFICATION

© 2022 Element

The device supports manufacturer's proprietary power reduction mechanism called "Detect Mode" for the Main Cellular Antenna. Details of this mechanism can be found in the Operational Description. When the device is being used "on-body" or "held in hand" by the user, the device will detect motion and reduce the power of the main antenna. Per the manufacturer, the mechanism is agnostic to different cellular air interfaces. Detect Mode operation was verified for two test cases, on-body and held in hand, for each supported cellular band. The power reduction verification results are below.

1.1 Main Antenna Power Verification Summary

Table G-1
Main Antenna Power Verification

Mode/Band	Antenna	Maximum Scenario Maximum Allowed Target Power [dBm]	Mode			
			Free Body Space	Test Case 1	Test Case 2	Verdict
WCDMA B5	Antenna 1	23.20 (+0.7/-1.0)	23.90*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.36*	DSI1^	DSI1^	PASS
WCDMA B4	Antenna 1	22.00 (+0.7/-1.0)	22.63*	DSI1^	DSI1^	PASS
	Antenna 2b	22.00 (+0.7/-1.0)	22.22*	DSI1^	DSI1^	PASS
	Antenna 3	25.70 (+0.7/-1.0)	25.07*	DSI1^	DSI1^	PASS
	Antenna 4b	25.20 (+0.7/-1.0)	25.67*	DSI1^	DSI1^	PASS
WCDMA B2	Antenna 1	22.00 (+0.7/-1.0)	22.52*	DSI1^	DSI1^	PASS
	Antenna 2b	22.00 (+0.7/-1.0)	22.43*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	25.00*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	25.70*	DSI1^	DSI1^	PASS
LTE Band 71	Antenna 1	23.20 (+0.7/-1.0)	23.86*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.67*	DSI1^	DSI1^	PASS
LTE Band 12	Antenna 1	23.20 (+0.7/-1.0)	23.24*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.69*	DSI1^	DSI1^	PASS
LTE Band 17	Antenna 1	23.20 (+0.7/-1.0)	23.67*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.56*	DSI1^	DSI1^	PASS
LTE Band 13	Antenna 1	23.20 (+0.7/-1.0)	23.77*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.65*	DSI1^	DSI1^	PASS
LTE Band 14	Antenna 1	23.20 (+0.7/-1.0)	23.84*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.68*	DSI1^	DSI1^	PASS
LTE Band 5	Antenna 1	23.20 (+0.7/-1.0)	23.85*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.61*	DSI1^	DSI1^	PASS
LTE Band 4	Antenna 1	25.00 (+0.7/-1.0)	25.64*	DSI1^	DSI1^	PASS
	Antenna 2b	24.50 (+0.7/-1.0)	25.16*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.90*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.63*	DSI1^	DSI1^	PASS
LTE Band 66	Antenna 1	25.00 (+0.7/-1.0)	25.56*	DSI1^	DSI1^	PASS
	Antenna 2b	24.50 (+0.7/-1.0)	25.04*	DSI1^	DSI1^	PASS
	Antenna 3	23.50 (+0.7/-1.0)	24.03*	DSI1^	DSI1^	PASS
	Antenna 4b	24.00 (+0.7/-1.0)	24.65*	DSI1^	DSI1^	PASS
LTE Band 2	Antenna 1	22.00 (+0.7/-1.0)	22.61*	DSI1^	DSI1^	PASS
	Antenna 2b	22.00 (+0.7/-1.0)	22.64*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.93*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	25.30*	DSI1^	DSI1^	PASS
LTE Band 25	Antenna 1	22.00 (+0.7/-1.0)	22.63*	DSI1^	DSI1^	PASS
	Antenna 2b	22.00 (+0.7/-1.0)	22.51*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.94*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	25.65*	DSI1^	DSI1^	PASS
LTE Band 30	Antenna 1	21.50 (+0.7/-1.0)	22.20*	DSI1^	DSI1^	PASS
	Antenna 2b	21.50 (+0.7/-1.0)	21.89*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	25.09*	DSI1^	DSI1^	PASS
	Antenna 4b	21.80 (+0.7/-1.0)	22.31*	DSI1^	DSI1^	PASS
LTE Band 7	Antenna 1	21.50 (+0.7/-1.0)	21.40*	DSI1^	DSI1^	PASS
	Antenna 2b	21.50 (+0.7/-1.0)	21.68*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.01*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	25.12*	DSI1^	DSI1^	PASS
LTE Band 41 (PC3)	Antenna 1	25.00 (+0.7/-1.0)	25.13*	DSI1^	DSI1^	PASS
	Antenna 2b	25.00 (+0.7/-1.0)	25.18*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.07*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	25.10*	DSI1^	DSI1^	PASS
LTE Band 41 (PC2)	Antenna 1	28.00 (+0.7/-1.0)	28.36*	DSI1^	DSI1^	PASS
	Antenna 2b	27.50 (+0.7/-1.0)	27.78*	DSI1^	DSI1^	PASS
	Antenna 3	26.50 (+0.7/-1.0)	26.71*	DSI1^	DSI1^	PASS
	Antenna 4b	27.00 (+0.7/-1.0)	27.39*	DSI1^	DSI1^	PASS
LTE Band 48	Antenna 1	19.60 (+1.0/-1.0)	19.26*	DSI1^	DSI1^	PASS
	Antenna 2a	20.00 (+1.0/-1.0)	19.67*	DSI1^	DSI1^	PASS
	Antenna 3	18.70 (+1.0/-1.0)	18.65*	DSI1^	DSI1^	PASS
	Antenna 4b	21.00 (+1.0/-1.0)	21.22*	DSI1^	DSI1^	PASS
LTE B5 Intra-Band ULCA	Antenna 1	23.20 (+0.7/-1.0)	22.91*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	24.74*	DSI1^	DSI1^	PASS
LTE B7 Intra-Band ULCA	Antenna 1	21.50 (+0.7/-1.0)	20.93*	DSI1^	DSI1^	PASS
	Antenna 2b	21.50 (+0.7/-1.0)	21.11*	DSI1^	DSI1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	23.95*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.00*	DSI1^	DSI1^	PASS
LTE B41 (PC3) Intra-Band ULCA	Antenna 1	25.00 (+0.7/-1.0)	24.54*	DSI1^	DSI1^	PASS
	Antenna 2b	25.00 (+0.7/-1.0)	24.68*	DSI1^	DSI1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	24.28*	DSI1^	DSI1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.50*	DSI1^	DSI1^	PASS
LTE B41 (PC2) Intra-Band ULCA	Antenna 1	28.00 (+0.7/-1.0)	28.66*	DSI1^	DSI1^	PASS
	Antenna 2b	27.50 (+0.7/-1.0)	27.63*	DSI1^	DSI1^	PASS
	Antenna 3	26.50 (+0.7/-1.0)	26.28*	DSI1^	DSI1^	PASS
	Antenna 4b	27.00 (+0.7/-1.0)	27.52*	DSI1^	DSI1^	PASS
LTE B48 Intra-Band ULCA	Antenna 1	19.60 (+1.0/-1.0)	18.63*	DSI1^	DSI1^	PASS
	Antenna 2a	20.00 (+1.0/-1.0)	20.98*	DSI1^	DSI1^	PASS
	Antenna 3	18.70 (+1.0/-1.0)	19.69*	DSI1^	DSI1^	PASS
	Antenna 4b	21.00 (+1.0/-1.0)	20.90*	DSI1^	DSI1^	PASS

© 2022 Element

Table G-2
Main Antenna Power Verification (Cont.)

Mode/Band	Antenna	Maximum Scenario Maximum Allowed Target Power [dBm]	Mode			
			Free Body Space	Test Case 1	Test Case 2	Verdict
NR n71	Antenna 1	23.20 (+0.7/-1.0)	22.28*	DSI 1^	DSI 1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.51*	DSI 1^	DSI 1^	PASS
NR n12	Antenna 1	23.20 (+0.7/-1.0)	23.41*	DSI 1^	DSI 1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.25*	DSI 1^	DSI 1^	PASS
NR n14	Antenna 1	23.20 (+0.7/-1.0)	23.45*	DSI 1^	DSI 1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	24.34*	DSI 1^	DSI 1^	PASS
NR n5	Antenna 1	23.20 (+0.7/-1.0)	22.43*	DSI 1^	DSI 1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	24.67*	DSI 1^	DSI 1^	PASS
NR n26	Antenna 1	23.20 (+0.7/-1.0)	22.60*	DSI 1^	DSI 1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.58*	DSI 1^	DSI 1^	PASS
NR n66	Antenna 1	25.00 (+0.7/-1.0)	25.48*	DSI 1^	DSI 1^	PASS
	Antenna 2b	24.50 (+0.7/-1.0)	24.89*	DSI 1^	DSI 1^	PASS
	Antenna 3	23.50 (+0.7/-1.0)	23.98*	DSI 1^	DSI 1^	PASS
	Antenna 4b	24.00 (+0.7/-1.0)	24.55*	DSI 1^	DSI 1^	PASS
NR n70	Antenna 1	25.00 (+0.7/-1.0)	24.87*	DSI 1^	DSI 1^	PASS
	Antenna 2b	24.50 (+0.7/-1.0)	23.51*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	23.78*	DSI 1^	DSI 1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.26*	DSI 1^	DSI 1^	PASS
NR n2	Antenna 1	22.00 (+0.7/-1.0)	22.51*	DSI 1^	DSI 1^	PASS
	Antenna 2b	22.00 (+0.7/-1.0)	21.85*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.19*	DSI 1^	DSI 1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.79*	DSI 1^	DSI 1^	PASS
NR n25	Antenna 1	22.00 (+0.7/-1.0)	22.53*	DSI 1^	DSI 1^	PASS
	Antenna 2b	22.00 (+0.7/-1.0)	21.26*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	23.58*	DSI 1^	DSI 1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.38*	DSI 1^	DSI 1^	PASS
NR n30	Antenna 1	21.50 (+0.7/-1.0)	20.87*	DSI 1^	DSI 1^	PASS
	Antenna 2b	21.50 (+0.7/-1.0)	21.03*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.13*	DSI 1^	DSI 1^	PASS
	Antenna 4b	21.80 (+0.7/-1.0)	22.41*	DSI 1^	DSI 1^	PASS
NR n7	Antenna 1	21.50 (+0.7/-1.0)	22.08*	DSI 1^	DSI 1^	PASS
	Antenna 2b	21.50 (+0.7/-1.0)	21.87*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.50 (+0.7/-1.0)	24.84*	DSI 1^	DSI 1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	25.13*	DSI 1^	DSI 1^	PASS
NR n41(PC3)	Antenna 1	25.00 (+0.7/-1.0)	25.38*	DSI 1^	DSI 1^	PASS
	Antenna 2b	25.00 (+0.7/-1.0)	25.66*	DSI 1^	DSI 1^	PASS
	Antenna 3	25.00 (+0.7/-1.0)	25.14*	DSI 1^	DSI 1^	PASS
	Antenna 4b	25.00 (+0.7/-1.0)	24.87*	DSI 1^	DSI 1^	PASS
NR n41(PC2)	Antenna 1	28.00 (+0.7/-1.0)	27.02*	DSI 1^	DSI 1^	PASS
	Antenna 2b	27.50 (+0.7/-1.0)	26.52*	DSI 1^	DSI 1^	PASS
	Antenna 3	26.50 (+0.7/-1.0)	27.06*	DSI 1^	DSI 1^	PASS
	Antenna 4b	27.00 (+0.7/-1.0)	27.09*	DSI 1^	DSI 1^	PASS
NR n77(PC3) DOD	Antenna 1	22.50 (+1.0/-1.0)	22.10*	DSI 1^	DSI 1^	PASS
	Antenna 2a	22.50 (+1.0/-1.0)	21.85*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.70 (+1.0/-1.0)	25.54*	DSI 1^	DSI 1^	PASS
	Antenna 4b	24.70 (+1.0/-1.0)	25.63*	DSI 1^	DSI 1^	PASS
NR n77(PC3) Band C	Antenna 1	22.50 (+1.0/-1.0)	21.89*	DSI 1^	DSI 1^	PASS
	Antenna 2a	22.50 (+1.0/-1.0)	22.03*	DSI 1^	DSI 1^	PASS
	Antenna 3	24.70 (+1.0/-1.0)	25.08*	DSI 1^	DSI 1^	PASS
	Antenna 4b	24.70 (+1.0/-1.0)	25.58*	DSI 1^	DSI 1^	PASS
NR n77(PC2) DOD	Antenna 1	22.50 (+1.0/-1.0)	22.19*	DSI 1^	DSI 1^	PASS
	Antenna 2a	22.50 (+1.0/-1.0)	21.93*	DSI 1^	DSI 1^	PASS
	Antenna 3	26.50 (+1.0/-1.0)	25.89*	DSI 1^	DSI 1^	PASS
	Antenna 4b	26.50 (+1.0/-1.0)	26.73*	DSI 1^	DSI 1^	PASS
NR n77(PC2) Band C	Antenna 1	22.50 (+1.0/-1.0)	21.92*	DSI 1^	DSI 1^	PASS
	Antenna 2a	22.50 (+1.0/-1.0)	22.11*	DSI 1^	DSI 1^	PASS
	Antenna 3	26.50 (+1.0/-1.0)	25.89*	DSI 1^	DSI 1^	PASS
	Antenna 4b	26.50 (+1.0/-1.0)	25.92*	DSI 1^	DSI 1^	PASS
NR n78(PC3)	Antenna 1	20.20 (+1.0/-1.0)	21.08*	DSI 1^	DSI 1^	PASS
	Antenna 2a	20.20 (+1.0/-1.0)	21.06*	DSI 1^	DSI 1^	PASS
	Antenna 3	21.50 (+1.0/-1.0)	22.26*	DSI 1^	DSI 1^	PASS
	Antenna 4b	22.10 (+1.0/-1.0)	22.53*	DSI 1^	DSI 1^	PASS
NR n78(PC2)	Antenna 1	20.20 (+1.0/-1.0)	21.03*	DSI 1^	DSI 1^	PASS
	Antenna 2a	20.20 (+1.0/-1.0)	20.89*	DSI 1^	DSI 1^	PASS
	Antenna 3	21.50 (+1.0/-1.0)	21.87*	DSI 1^	DSI 1^	PASS
	Antenna 4b	22.10 (+1.0/-1.0)	22.61*	DSI 1^	DSI 1^	PASS

Test Case 1: Device Held in Hand

Test Case 2: Device Resting on Lap

* No Smart Transmission behavior was observed during the measurement.

^ Smart Transmission behavior was observed during the measurement.

Test Cases represent typical scenarios in which the device power would be reduced. In these scenarios detect mode has been verified to identify typical on-body use-cases including when thin objects, such as a magazine or newspaper are placed between the body and the device. In the absence of detect mode output, the device defaults to the most conservative power.

© 2022 Element