

Appendix G: Power Reduction Verification

Per May 2017 TCBC Workshop Notes, demonstration of proper functioning of the power reduction mechanisms is required to support the corresponding SAR configurations. The verification process includes: 1) evaluation of output power levels for individual or multiple triggering mechanisms and 2) evaluation of the triggering distances for proximity-based sensors.

G.1. Power Verification Procedure

The power verification was performed according to the following procedure:

1. A base-station simulator was used to establish a conducted RF connection, and the output power was monitored. The power measurements were confirmed to be within the expected tolerances for all states before and after a power reduction mechanism was triggered.
2. Step 1 was repeated for all relevant modes and frequency bands for the mechanism being investigated.
3. Steps 1 and 2 were repeated for all individual power reduction mechanisms and combinations thereof. For the combination cases, one mechanism was switched to a “triggered” state at a time; powers were confirmed to be within tolerances after each additional mechanism was activated.

G.2. Distance Verification Procedure

The distance verification procedure was performed according to the following procedure:

1. A base-station simulator was used to establish a RF connection and to monitor the output power levels. The device being tested was placed below the relevant section of the phantom with the relevant side or edge of the device facing toward the phantom.
2. Per KDB Publication 616217 D04v01r02 and FCC Guidance, the device was moved toward and away from the phantom to determine the distance at which the mechanism triggers and the output power is reduced. Each applicable test position was evaluated. The distances were confirmed to be the same or larger (more conservative) than the minimum distances provided by the manufacturer.
3. Step 1 and 2 were repeated for relevant WWAN and WLAN modes and frequency bands, as appropriate.
4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

G.3. Power Measurement Verification Results

Table G-1 WWAN Verification Summary

Mechanism(s)	Un-triggered	Receiver	Hotspot	Grip	Receiver and Hotspot	Receiver and Grip	Hotspot and Grip	Receiver and Hotspot and Grip
Band/Mode	Conducted Powers [dBm]							
UMTS Band 4	23.63	N/A	20.13	20.11	N/A	N/A	20.12	N/A
UMTS Band 2	23.88	N/A	21.85	21.84	N/A	N/A	21.88	N/A
LTE Band 4/66	23.47	22.41	20.94	20.95	22.48	22.49	20.98	22.44
LTE Band 2	22.75	21.71	21.75	21.69	21.75	21.72	21.67	21.74
LTE Band 41	23.02	N/A	22.48	22.45	N/A	N/A	22.46	N/A
GPRS 850	32.51	N/A	31.65	31.66	N/A	N/A	31.64	N/A
GPRS 1900	30.12	N/A	28.71	28.73	N/A	N/A	28.71	N/A

Table G-2 WLAN Verification Summary

Mechanism(s)		Un-triggered	Receiver	Grip	Receiver and Grip
Band/Mode	Bandwidth	Conducted Powers [dBm]			
2.4 GHz 802.11b	22	19.85	16.95	16.82	16.88
2.4 GHz 802.11g	20	17.66	16.74	16.84	16.78
2.4 GHz 802.11n	20	17.59	16.81	16.79	16.83
5 GHz 802.11a	20	14.68	12.22	11.89	11.76
5 GHz 802.11n	20	14.56	12.24	11.77	11.71
5 GHz 802.11ac	20	14.27	12.21	11.58	11.51
5 GHz 802.11n	40	13.52	12.29	11.64	11.69
5 GHz 802.11ac	40	13.67	12.32	11.59	11.71
5 GHz 802.11ac	80	12.58	11.98	11.14	11.23

G.4. Distance Measurement Verification Results

Table G-3 Distance Verification Summary

Band/Mode	Test Position	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
		Moving Towards	Moving Away	
WWAN	Back	18	21	18
WWAN	Bottom	15	17	15
WLAN	Back	17	21	14
WLAN	Top	15	19	12