

## APPENDIX G: POWER REDUCTION VERIFICATION

Per the 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 was divided into two parts: (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 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 an RF connection and to monitor the 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. 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, per KDB Publication 616217 D04v01r02 and FCC Guidance. 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. Steps 1 and 2 were repeated for low, mid, and high bands, as appropriate (see note below Table G-2 for more details).
4. Steps 1 through 3 were repeated for all distance-based power reduction mechanisms.

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### G.3 Main Antenna Verification Summary

**Table G-1  
Power Measurement Verification for Main Antenna**

Mechanism(s)			Mode/Band	Conducted Power (dBm)			
1st	2nd	3rd		Un-triggered (Max)	Mechanism #1 (Reduced)	Mechanism #2 (Reduced)	Mechanism #3 (Reduced)
Hotspot On			GPRS 1900 1 Tx Slot	30.32	28.38		
Grip			GPRS 1900 1 Tx Slot	30.29	28.23		
Hotspot On	Grip		GPRS 1900 1 Tx Slot	30.51	28.31	28.22	
Grip	Hotspot On		GPRS 1900 1 Tx Slot	30.32	28.30	28.24	
Hotspot On			UMTS 1750	23.81	21.87		
Grip			UMTS 1750	23.80	21.88		
Held-to-Ear			UMTS 1750	23.82	21.28		
Hotspot On	Grip	Held-to-Ear	UMTS 1750	23.86	21.86	21.86	21.22
Hotspot On	Held-to-Ear	Grip	UMTS 1750	23.79	21.85	21.26	21.27
Grip	Hotspot On	Held-to-Ear	UMTS 1750	23.81	21.83	21.86	21.28
Grip	Held-to-Ear	Hotspot On	UMTS 1750	23.83	21.84	21.26	21.24
Held-to-Ear	Grip	Hotspot On	UMTS 1750	23.81	21.28	21.26	21.22
Held-to-Ear	Hotspot On	Grip	UMTS 1750	23.87	21.26	21.23	21.24
Hotspot On			UMTS 1900	23.61	21.61		
Grip			UMTS 1900	23.64	21.62		
Held-to-Ear			UMTS 1900	23.63	21.13		
Hotspot On	Grip	Held-to-Ear	UMTS 1900	23.66	21.61	21.66	21.11
Hotspot On	Held-to-Ear	Grip	UMTS 1900	23.61	21.66	21.14	21.10
Grip	Hotspot On	Held-to-Ear	UMTS 1900	23.62	21.63	21.62	21.14
Grip	Held-to-Ear	Hotspot On	UMTS 1900	23.65	21.63	21.13	21.13
Held-to-Ear	Grip	Hotspot On	UMTS 1900	23.66	21.12	21.11	21.16
Held-to-Ear	Hotspot On	Grip	UMTS 1900	23.64	21.11	21.14	21.14
Hotspot On			LTE Band 4	23.74	20.65		
Grip			LTE Band 4	23.71	20.71		
Hotspot On	Grip		LTE Band 4	23.63	20.53	20.66	
Grip	Hotspot On		LTE Band 4	23.55	20.47	20.51	
Hotspot On			LTE Band 66	23.68	20.63		
Grip			LTE Band 66	23.63	20.74		
Hotspot On	Grip		LTE Band 66	23.67	20.61	20.68	
Grip	Hotspot On		LTE Band 66	23.61	20.59	20.51	
Hotspot On			LTE Band 2	23.44	20.47		
Grip			LTE Band 2	23.59	20.55		
Hotspot On	Grip		LTE Band 2	23.29	20.42	20.68	
Grip	Hotspot On		LTE Band 2	23.28	20.45	20.51	
Hotspot On			LTE Band 41	23.21	20.25		
Grip			LTE Band 41	23.22	20.24		
Hotspot On	Grip		LTE Band 41	23.19	20.21	20.16	
Grip	Hotspot On		LTE Band 41	23.22	20.24	20.22	
Hotspot On			NR FDD Band n66	22.98	20.12		
Grip			NR FDD Band n66	23.17	20.15		
Hotspot On	Grip		NR FDD Band n66	23.14	20.17	20.13	
Grip	Hotspot On		NR FDD Band n66	23.16	20.11	20.13	

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**Table G-2**  
**Distance Measurement Verification for Main Antenna**



Mechanism(s)	Test Condition	Band	Distance Measurements (mm)		Minimum Distance per Manufacturer (mm)
			Moving Toward	Moving Away	
Grip	Phablet - Back Side	Mid	13	17	12
Grip	Phablet - Back Side	High	14	18	12
Grip	Phablet - Bottom Edge	Mid	7	10	6
Grip	Phablet - Bottom Edge	High	7	10	6
Grip	Phablet - Left Edge	Mid	8	9	7
Grip	Phablet - Left Edge	High	7	9	7

\*Note: Mid band refers to: GSM1900, UMTS B2/4, LTE B2/4/66, NR Band n66; High band refers to: LTE B41

## G.4 WIFI Verification Summary

**Table G-3**  
**Power Measurement Verification WIFI**

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
		Un-triggered (Max)	Mechanism #1 (Reduced)
1st			
Held-to-Ear	802.11b	17.31	13.13
Held-to-Ear	802.11g	15.55	12.57
Held-to-Ear	802.11n (2.4GHz)	15.36	12.50
Held-to-Ear	802.11a	12.60	9.67
Held-to-Ear	802.11n (5GHz, 20MHz BW)	12.21	9.12
Held-to-Ear	802.11ac (20MHz BW)	12.37	9.55
Held-to-Ear	802.11n (5GHz, 40MHz BW)	14.03	10.12
Held-to-Ear	802.11ac (40MHz BW)	14.14	9.96
Held-to-Ear	802.11ac (80MHz BW)	13.23	10.33

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