

APPENDIX F: 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.

F.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.

F.2 Main Antenna Verification Summary

- Low band refers to: GSM850, UMTS B5, LTE B5/12/13/17/26, NR n5; Mid band refers to: GSM1900, UMTS B2/4, LTE B2/4/25/66, NR n66; High band refers to: LTE B41, NR 41; Ultra High band refers to: NR n77
- This device uses different Radio State Indices (RSI) to configure different time averaged power levels based on certain exposure scenarios. For this device RSI = 4 represents the case where the device is held to ear. RSI = 0 is configured when the device cannot detect the use conditions.

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

Mechanism(s)	Mode/Band	Radio State Index (RSI)	
		Free Space	Mechanism #1
1st			
Held-to-Ear	Low Band Ant A	0	4
Held-to-Ear	Mid Band Ant B	0	4
Held-to-Ear	Mid Band Ant F	0	4
Held-to-Ear	High Band Ant B	0	4
Held-to-Ear	High Band Ant F	0	4
Held-to-Ear	High Band Ant I	0	4
Held-to-Ear	High Band Ant E	0	4
Held-to-Ear	Ultra High Band Ant G	0	4

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F.3 WIFI Verification Summary

**Table F-2
Power Measurement Verification WIFI Antenna I**

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (RCV)
Held-to-Ear	802.11b	18.54	12.87
Held-to-Ear	802.11g	16.41	11.49
Held-to-Ear	802.11n (2.4GHz)	16.61	11.60
Held-to-Ear	802.11ax (2.4 GHz)	13.50	11.73
Held-to-Ear	802.11a	16.45	10.90
Held-to-Ear	802.11n (5GHz, 20MHz BW)	16.24	10.95
Held-to-Ear	802.11n (5GHz, 40MHz BW)	15.42	10.09
Held-to-Ear	802.11ac (20MHz BW)	16.94	10.47
Held-to-Ear	802.11ac (40MHz BW)	15.50	10.07
Held-to-Ear	802.11ax (20 MHz BW)	15.90	11.88
Held-to-Ear	802.11ax (40 MHz BW)	15.00	11.80

*Note: MIMO WIFI modes were not evaluated due to equipment limitations.

**Table F-3
Power Measurement Verification WIFI Antenna M**

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (RCV)
Held-to-Ear	802.11b	18.50	12.50
Held-to-Ear	802.11g	13.01	9.65
Held-to-Ear	802.11n (2.4GHz)	13.25	9.71
Held-to-Ear	802.11ax (2.4 GHz)	15.14	12.01
Held-to-Ear	802.11a	16.48	11.33
Held-to-Ear	802.11n (5GHz, 20MHz BW)	16.62	10.83
Held-to-Ear	802.11n (5GHz, 40MHz BW)	15.67	10.60
Held-to-Ear	802.11ac (20MHz BW)	16.60	10.40
Held-to-Ear	802.11ac (40MHz BW)	15.78	10.37
Held-to-Ear	802.11ax (20 MHz BW)	14.40	11.75
Held-to-Ear	802.11ax (40 MHz BW)	14.19	11.60

*Note: MIMO WIFI modes were not evaluated due to equipment limitations.

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