

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 includes evaluation of output power levels for individual or multiple triggering mechanisms.

Only operations relevant to this permissive change were evaluated for compliance. Please see the original compliance evaluation in RF Exposure Technical Report S/N: 1M2303170032-19-R1.A3L for complete evaluation of all other operating modes. The operation description includes a description of all changed items.

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.

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F.2 WIFI Verification Summary

Table F-1
Power Measurement Verification WIFI Antenna 1

Mechanism(s)	Mode/Band	Conducted Power (dBm)			
1st		Un-triggered (Max)	Mechanism #1 NR Active (Reduced)	Mechanism #2 RCV Active (Reduced)	Mechanism #3 RCV Active + NR Active (Reduced)
Held-to-Ear	802.11b	17.85	12.20	7.62	7.89
Held-to-Ear	802.11g	16.59	12.18	8.02	8.10
Held-to-Ear	802.11n (2.4GHz)	16.38	12.27	7.48	8.25
Held-to-Ear	802.11ac (2.4 GHz)	15.37	12.11	7.62	8.09
Held-to-Ear	802.11ax (2.4 GHz)	15.47	12.36	7.55	8.17

Mechanism(s)	Mode/Band	Conducted Power (dBm)		
1st		Un-triggered (Max)	Mechanism #1 NR Active (Reduced)	Mechanism #2 RCV Active (Reduced)
Held-to-Ear	802.11a	15.99	11.11	11.96
Held-to-Ear	802.11n (5GHz, 20MHz BW)	16.00	11.26	11.99
Held-to-Ear	802.11n (5GHz, 40MHz BW)	14.91	10.95	11.97
Held-to-Ear	802.11ac (20MHz BW)	15.93	11.39	11.89
Held-to-Ear	802.11ac (40MHz BW)	15.00	11.29	11.98
Held-to-Ear	802.11ac (80MHz BW)	13.99	11.24	11.86
Held-to-Ear	802.11ac (160MHz BW)	12.52	11.06	12.00
Held-to-Ear	802.11ax (20 MHz BW)	15.99	11.08	11.96
Held-to-Ear	802.11ax (40 MHz BW)	15.00	11.34	11.93
Held-to-Ear	802.11ax (80 MHz BW)	13.89	11.29	11.95
Held-to-Ear	802.11ax (160MHz BW)	11.99	11.10	11.76

*Note: MIMO WIFI modes were not evaluated due to equipment limitations. All SISO powers were taken during MIMO conditions.

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Table F-2
Power Measurement Verification WIFI Antenna 2

Mechanism(s)	Mode/Band	Conducted Power (dBm)			
1st		Un-triggered (Max)	Mechanism #1 NR Active (Reduced)	Mechanism #2 RCV Active (Reduced)	Mechanism #3 RCV Active + NR Active (Reduced)
Held-to-Ear	802.11b	18.34	12.15	8.48	8.33
Held-to-Ear	802.11g	17.00	12.20	8.15	8.27
Held-to-Ear	802.11n (2.4GHz)	16.64	12.24	7.69	8.00
Held-to-Ear	802.11ac (2.4 GHz)	15.81	12.18	8.01	8.15
Held-to-Ear	802.11ax (2.4 GHz)	15.93	12.23	8.14	8.11

Mechanism(s)	Mode/Band	Conducted Power (dBm)		
1st		Un-triggered (Max)	Mechanism #1 NR Active (Reduced)	Mechanism #2 RCV Active (Reduced)
Held-to-Ear	802.11a	15.98	10.99	11.88
Held-to-Ear	802.11n (5GHz, 20MHz BW)	15.97	11.11	11.86
Held-to-Ear	802.11n (5GHz, 40MHz BW)	14.98	11.23	11.99
Held-to-Ear	802.11ac (20MHz BW)	15.99	11.07	11.94
Held-to-Ear	802.11ac (40MHz BW)	14.99	10.92	12.00
Held-to-Ear	802.11ac (80MHz BW)	13.63	11.17	11.61
Held-to-Ear	802.11ac (160MHz BW)	12.00	11.36	11.91
Held-to-Ear	802.11ax (20 MHz BW)	15.96	11.33	11.92
Held-to-Ear	802.11ax (40 MHz BW)	14.99	11.15	11.86
Held-to-Ear	802.11ax (80 MHz BW)	13.97	11.08	11.94
Held-to-Ear	802.11ax (160MHz BW)	11.99	11.30	11.88

*Note: MIMO WIFI modes were not evaluated due to equipment limitations. All SISO powers were taken during MIMO conditions.

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F.3 Bluetooth Verification Summary

Table F-3
Power Measurement Verification Bluetooth

Mechanism(s)	Mode/Band	Conducted Power (dBm)	
1st		Un-triggered (Max)	Mechanism #1 (Reduced)
Held-to-Ear	Bluetooth Ant 1	15.77	6.60
Held-to-Ear	Bluetooth Ant 2	16.45	9.22