Appendix H. – Power reduction verification

Per the May 2017 TCBC Workshop notes, demonstration of proper functioning of the power reduction mechanism is required to support the corresponding SAR Configurations.

A Base station simulator was used to establish a conducted RF connection and output power was monitored. The power measurements were confirmed to be within expected tolerance for all RSI. before and after a power reduction mechanism was triggered. 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

1. Power Reduction Verification for Main ANT

This device uses different Radio SAR Index [RSI] to configure different time averaged power levels based on certain exposure scenarios. For this device RSI = 1 is configured when receiver mode on Head SAR configuration. And RSI = 0 is configured when the device is not activated RCV-ON[Non-Head]

Table 1.1 Power Reduction Verification for Antenna A

Mechanism		Band	Radio SAR Index (RSI)		
Mechanism 1st	Mechanism 2nd		FREE	1st	2nd
RCV ON	Hotspot On	GSM 850 Voice	0	1	0
Hotspot On	RCV ON	GSM 850 Voice	0	0	1
RCV ON	Hotspot On	GSM 850 1Tx	0	1	0
Hotspot On	RCV ON	GSM 850 1Tx	0	0	1
RCV ON	Hotspot On	GSM 850 2Tx	0	1	0
Hotspot On	RCV ON	GSM 850 2Tx	0	0	1
RCV ON	Hotspot On	GSM 850 3Tx	0	1	0
Hotspot On	RCV ON	GSM 850 3Tx	0	0	1
RCV ON	Hotspot On	GSM 850 4Tx	0	1	0
Hotspot On	RCV ON	GSM 850 4Tx	0	0	1
RCV ON	Hotspot On	UMTS Band 5	0	1	0
Hotspot On	RCV ON	UMTS Band 5	0	0	1
RCV ON	Hotspot On	LTE Band 5	0	1	0
Hotspot On	RCV ON	LTE Band 5	0	0	1
RCV ON	Hotspot On	LTE Band 12	0	1	0
Hotspot On	RCV ON	LTE Band 12	0	0	1
RCV ON	Hotspot On	LTE Band 13	0	1	0
Hotspot On	RCV ON	LTE Band 13	0	0	1
RCV ON	Hotspot On	LTE Band 26	0	1	0
Hotspot On	RCV ON	LTE Band 26	0	0	1
RCV ON	Hotspot On	NR Band n5	0	1	0
Hotspot On	RCV ON	NR Band n5	0	0	1

Table 1.2 Power Reduction Verification for Antenna B

Mechanism		Band	Radio SAR Index (RSI)		
Mechanism 1st	Mechanism 2nd		FREE	1st	2nd
RCV ON	Hotspot On	GSM 1900 Voice	0	1	0
Hotspot On	RCV ON	GSM 1900 Voice	0	0	1
RCV ON	Hotspot On	GSM 1900 1Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 1Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 2Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 2Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 3Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 3Tx	0	0	1
RCV ON	Hotspot On	GSM 1900 4Tx	0	1	0
Hotspot On	RCV ON	GSM 1900 4Tx	0	0	1
RCV ON	Hotspot On	UMTS Band 2	0	1	0
Hotspot On	RCV ON	UMTS Band 2	0	0	1
RCV ON	Hotspot On	UMTS Band 4	0	1	0
Hotspot On	RCV ON	UMTS Band 4	0	0	1
RCV ON	Hotspot On	LTE Band 2	0	1	0
Hotspot On	RCV ON	LTE Band 2	0	0	1
RCV ON	Hotspot On	LTE Band 4	0	1	0
Hotspot On	RCV ON	LTE Band 4	0	0	1
RCV ON	Hotspot On	LTE Band 41 PC3	0	1	0
Hotspot On	RCV ON	LTE Band 41 PC3	0	0	1
RCV ON	Hotspot On	LTE Band 66	0	1	0
Hotspot On	RCV ON	LTE Band 66	0	0	1
RCV ON	Hotspot On	NR Band 66	0	1	0
Hotspot On	RCV ON	NR Band 66	0	0	1

Table 1.3 Power Reduction Verification for Antenna D

Mechanism		Band	Radio SAR Index (RSI)		
Mechanism 1st	Mechanism 2nd		FREE	1st	2nd
RCV ON	Hotspot On	LTE Band 2	0	1	0
Hotspot On	RCV ON	LTE Band 2	0	0	1
RCV ON	Hotspot On	NR Band 66	0	1	0
Hotspot On	RCV ON	NR Band 66	0	0	1

2. Power reduction Verification for WiFi Ant.F, Ant.E

This device uses a power reduction mechanism for SAR compliance for WLAN operations during voice or VoIP held to ear scenarios. When a user makes or receives a WLAN voice or WLAN VOIP call for WLAN Ant the audio of the call is sent through the Receiver at the top of the device will trigger the Power reduction for WLAN Ant.F, Ant.E (i.e. reducing output power for Head SAR compliance). Detailed descriptions of the power reduction mechanism are included in the WLAN operational description document.

Power Measurement Verification for WiFi Ant.

Condition for power reduction	Wireless technologies	Conducted power[dBm]	
		Un-Triggered (Max Power)	Triggered (Reduced Power)
RCV-on	2.4GHz 802.11b	16.75	15.12
RCV-on	2.4GHz 802.11g	15.52	14.61
RCV-on	2.4GHz 802.11n	15.84	14.88
RCV-on	5GHz 802.11a	17.77	13.14
RCV-on	5GHz 802.11n 20MHz	17.71	13.21
RCV-on	5GHz 802.11n 40MHz	14.81	13.31
RCV-on	5GHz 802.11ac 20MHz	17.87	13.06
RCV-on	5GHz 802.11ac 40MHz	14.57	13.09
RCV-on	5GHz 802.11ac 80MHz	13.45	13.25