



## Power reduction mechanism verification

According to the May 2017 TCBC Workshop, Demonstration of proper functioning of the detection and triggering mechanisms is required to support the corresponding RF exposure conditions. The verification is through a base station simulator is used to establish a conducted RF connection and monitor output power under different operating conditions related to the power reduction mechanisms. Detail of power reduction mechanisms referring to Operational Description

### 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.

#### General Note:

1. This device uses different Device State Indices (DSI) to configure different time averaged power levels based on certain exposure scenarios and the detailed DSI descriptions of below table.

DSI	Trigger Conditions	Antenna No.	Exposure conditions	
DSI2	Receiver on	All ant	Head Standalone	Head all Position
DSI3	Receiver on+WLAN	All ant	Head Simultaneous	Head all Position
DSI4	Receiver off/Sensor on	ant 13	Body-worn/Extremity Standalone	See by section 5
DSI5	Receiver off/Sensor on+WLAN	ant 13	Body-worn/Extremity Simultaneous	See by section 5
DSI6	Receiver off/Sensor off+WLAN	ant 13	Body-worn/Extremity Simultaneous	No Sensor Position
	Receiver off/Sensor off+WLAN	ant 31	Body-worn/Extremity Simultaneous	Body all Position
	Hotspot	All ant	Hotspot Standalone/ Simultaneous	Body all Position
DSI7	Receiver off/Sensor off	ant 13	Sensor Trigger Distance -1mm	See by section 5
	Receiver off/Sensor off	ant 13	Body-worn/Extremity Standalone	No Sensor Position
	Receiver off/Sensor off	Ant 31	Body-worn/Extremity Standalone	Body all Position

2. Select the bands with the largest power reduction for power verification:
  - a. Establish voice call and audio routed through the earpiece to monitor output power under head with simultaneous transmitting power states.
    - Tradition voice call for WCDMA, voice over IP CMRS operations for LTE
    - LTE Band 26 is set at 'highest BW, 1RB, RB Offset = 0, QPSK', WCDMA V is set AMR 12.2Kbps.
  - b. Establish data connection monitor hotspot power state.
    - LTE Band 41 is set at 'highest BW, 1RB, RB Offset = 0, QPSK', WCDMA II is set RMC 12.2Kbps.
3. In this power validation purpose is to demonstrate of proper functioning of the detection and triggering mechanisms to support the corresponding RF exposure conditions.
4. Verification performed for one technology/Band to demonstrate that the power reduction applies for same technology/band and call origination.



## 2. Verification output Power Results

### Head exposure conditions

Head Exposure condition		Output Power for Voice Call			
Ear acoustic output Status:		ON		OFF	
Power state		WWAN DSI2		WWAN DSI7	
Wireless technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
WCDMA V	Ant 13	21.35	22.50	23.81	25.00
LTE Band 26	Ant 13	21.68	22.80	23.65	24.80

### Hotspot exposure condition

Hotspot exposure condition		Output Power for data connection			
Wifi Hotspot Status		OFF		ON	
Power state		WWAN DSI7		WWAN DSI6	
		WiFi Standalone		WiFi Simultaneous	
Wireless Technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
WCDMA II	Ant 13	23.55	24.70	18.56	19.70
LTE Band 41	Ant 13	23.98	24.80	18.04	18.80