
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 Proximity sensors detect/hotspot mode mechanism to configure different time averaged power levels based on certain exposure scenarios. Hotspot on represents the case where the device is in hotspot exposure condition and the hotspot mode is active. Sensor on represents the case where the device is in body worn/extremity exposure condition and the P-sensor is active. Sensor off represents the case where the device is in body worn/extremity exposure condition and the P-sensor is not active.
2. Select the bands with the largest power reduction for power verification:
 - a. Establish data connection monitor hotspot power state.
 - LTE Band 66 is set at 'highest BW, 1RB, RB Offset = 0, QPSK', WCDMA IV is set RMC 12.2Kbps, 5G FR1 n66 is set at highest BW, 1RB, RB offset = 1.
 - b. Establish data connection monitor body worn power state.
 - LTE Band 66 is set at 'highest BW, 1RB, RB Offset = 0, QPSK' WCDMA IV is set RMC 12.2Kbps, 5G FR1 n66 is set at highest BW, 1RB, RB offset = 1, WLAN5GHz is set 802.11n-HT40 MCS0.
 - Body Detect mechanism was performed for the in-hand and on a stationary object (placed on a table)
 - c. Establish data connection monitor extremity power state.
 - WLAN5GHz is set 802.11n-HT40 MCS0.
 - Body Detect mechanism was performed for the in-hand and on a stationary object (placed on a table).
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

Hotspot exposure condition

Power state		Hotspot on		Hotspot off	
Wireless Technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
WCDMA IV	Ant 0	21.41	22.5	22.84	24.0
LTE Band 66	Ant 0	12.73	13.5	23.16	24.0
FR1 n66	Ant 0	15.78	17.0	22.73	24.0

Body worn exposure condition

Body Worn exposure condition		Output Power (data connection)			
		Sensor on		Sensor off	
Wireless Technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
WCDMA IV	Ant 0	21.41	22.5	22.84	24.0
LTE Band 66	Ant 0	12.73	13.5	23.16	24.0
FR1 n66	Ant 0	15.78	17.0	22.73	24.0
WLAN 5G 802.11n-HT40 MCS0 Ch 54	Ant 2	18.63	19.5	18.99	20.0

Extremity exposure condition

Extremity exposure condition		Output Power (data connection)			
		Sensor on		Sensor off	
Wireless Technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
WLAN 5G 802.11n-HT40 MCS0 Ch 54	Ant 2	18.63	19.5	18.99	20.0