

POWER REDUCTION VERIFICATION

This device supports manufacturer’s proprietary power reduction mechanism called, ‘Detect mode’ for the cellular, Wi-Fi and Bluetooth transmitters. There are additional power reduction mechanisms for the Wi-Fi and Bluetooth transmitters based on the operating state of the cellular and (for Bluetooth) Wi-Fi transmitters. Details of these mechanisms can be found in the Operational Description.

The verification plan consists of measuring the power levels of the cellular, Bluetooth and Wi-Fi transmitters under different operating conditions related to the power reduction mechanisms.

A. Verification of Body Detect mechanism was performed for the following test cases for cellular, Wi-Fi and Bluetooth transmitters. For voice calls (when audio is routed to the earpiece) this mechanism is disabled and so all measurements are made using data calls.

- In-hand
- On a stationary object (placed on a table)

B. Verification of power reduction levels for Wi-Fi was performed with cellular transmitter on and off.

C. Verification of power reduction levels for Bluetooth and Wi-Fi was performed with different combinations of cellular transmitter on and off and Wi-Fi transmitter on and off.

For testing purposes the device was loaded with a power table¹ for each transmitter that had different power settings for each of the operating states. The target / expected power level and measured power levels are detailed in the following tables and clearly show that mechanisms operate as expected.

Table 1 –Body detect validation for cellular

| Air Transport | Band | Measured Power | |
|---------------|---------------|----------------|-----------|
| | | Stationary | In Hand |
| GSM | 1900 (2Slots) | 28 dBm | 28 dBm |
| CDMA | BC1 | 20.75 dBm | 20.75 dBm |
| WCDMA | B4 | 22.7 dBm | 22.7 dBm |
| | B2 | 14.5 dBm | 14.5 dBm |
| LTE FDD | B25 | 22.7 dBm | 22.7 dBm |
| | B30 | 15.5 dBm | 15.5 dBm |
| | B7 | 22.7 dBm | 22.7 dBm |
| LTE TDD | B41 | 14.5 dBm | 14.5 dBm |

All measured values were within the expected tolerances of the target / expected power levels programmed into the power table for the head versus body states. Mechanism of body detect was verified.

¹ The power tables used for the mechanism validation may not match the production power tables detailed in the main SAR report because production power levels are not established at the time these measurements were made.

Table 2 –Body detect and Cellular State validation for Wi-Fi

| Body detect | Head (device stationary on table) | | Body (device in hand) | |
|---|-----------------------------------|--------------------|-----------------------|----------------------|
| Cellular State | ON | OFF | ON | OFF |
| 2.4 GHz 11n HT20 Ch6 SISO | E: 14.5 M: 14.1 | E: 19.0 M: 18.7 | E: 16.75 M: 16.4 | E: 19.75 M: 19.50 |
| 5.0 GHz 802.11n HT20 Ch40 SISO Ant6 | E: 11.0 M: 10.6 | E: 17.0 M: 16.6 | E: 13.0 M: 12.6 | E: 16.75 M: 16.3 |
| All measured power values (M) were within the expected tolerances of the target / expected power levels (E) programmed into the power table for the head versus body and cellular on/off states. Mechanism of body detect and cellular state was verified | | | | |

Table 3 –Body detect and Cellular State validation for Wi-Fi

| Body detect | Head (device on table) | | | | Body (device in hand) | | | |
|--|---|--|--|---|---|--|--|---|
| Cellular State | ON | | OFF | | ON | | OFF | |
| 5GHz Wi-Fi state | ON | OFF | ON | OFF | ON | OFF | ON | OFF |
| Expected power condition | P _{low mode A} BT Table P ₁ | P _{High mode A} BT Table P ₃ | P _{High mode A} BT Table P ₅ | P _{Standalone} BT Table P ₇ | P _{low mode B} BT Table P ₂ | P _{High mode B} BT Table P ₄ | P _{High mode B} BT Table P ₆ | P _{Standalone} BT Table P ₈ |
| Power (dBm) | E: 8.0 M: 7.6 | E: 14.0 M:13.6 | E: 14.0 M:13.5 | E: 14.5 M:14.0 | E: 8.5 M:8.3 | E: 14.5 M:14.0 | E: 14.5 M:14.3 | E: 14.5 M:14.2 |
| Bluetooth transmitter set for channel 39 in EDR mode. All measured power values (M) were within the expected tolerances of the target / expected power levels (E) programmed into the power table for the head versus body, cellular on/off and Wi-Fi on/off states. Mechanism of body detect and cellular state and Wi-Fi state was verified | | | | | | | | |