

Appendix E. Power reduction mechanism verification

1. Power verification introduction

- This device supports the manufacturer's proprietary power reduction mechanisms for cellular and Wi-Fi transmitters. Further details of the specific mechanisms for the power reduction mechanism can be found in the Operational Description
- Demonstration of proper functioning of the detection and triggering mechanisms to support the corresponding RF exposure conditions, the verification plan consists of measuring the power levels of the cellular and Wi-Fi transmitters at each wireless technology under different operating conditions related to the power reduction mechanisms.
- This device incorporates the WWAN algorithm feature and through under varying Tx power transmission scenarios in real-time to maintain the time-averaged Tx power compliant with FCC RF exposure requirement. In this power validation purpose is to demonstrate of proper functioning of the detection and triggering mechanisms to support the corresponding RF exposure conditions. In order to avoid real-time TX power varying may affect monitor output power related to the power reduction mechanisms, therefore WWAN real-time TX power varying was disabled and keep in static output power for power reduction mechanism validation.
- For testing purposes, the device was measured against each Index supported for the cellular and Wi-Fi technologies. The target power level and measured power levels are detailed in the following table and clearly shows that each power reduction mechanism operates as expected.

2. Power verification procedure

- The verification is through a base station simulator is used to establish a conducted RF connection and record output power under different operating conditions related to the power reduction mechanisms.
- Verification of power reduction levels for Wi-Fi is performed with cellular transmitters on and off, for cellular is performed with Wi-Fi transmitters on and off.
- Verification of RCV mechanism is via establish voice call and audio routed through the earpiece to record output power under head power states.
- Verification of Hotspot power reduction is via establish data connection and enable hotspot feature to record output power under hotspot power state.

3. Test setup for conducted power measurement

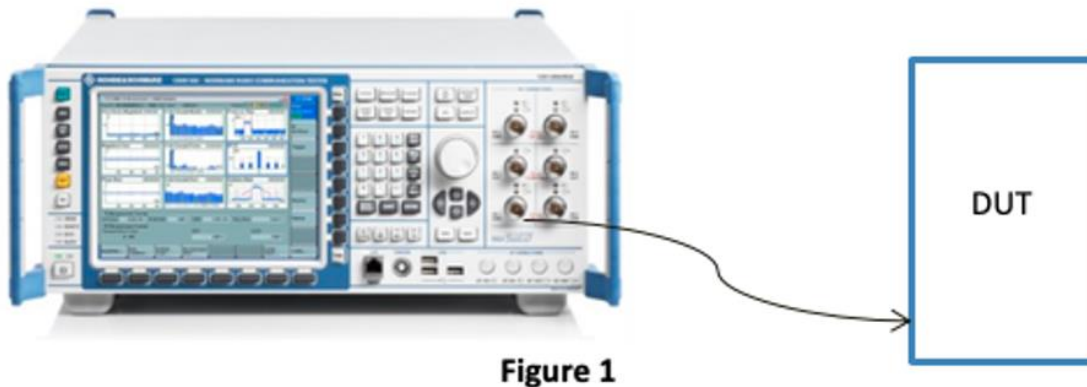


Figure 1

4. Verification output Power Results

Head Exposure condition		Output Power for Voice Call			
Ear acoustic output Status:		ON		ON	
WiFi Status:		OFF		ON	
Power state		WWAN ECI 2		WWAN ECI 3	
Wireless technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
GSM850 (1TX)	Ant 0	31.96	33.5	31.96	33.5
	Ant 1	31.58	33.1	30.76	32.3
UMTS Band 5	Ant 0	23.65	25.2	23.65	25.2
	Ant 1	22.17	23.7	22.17	23.7
LTE Band 7 (FDD)	Ant 2	22.24	23.8	21.06	22.6
	Ant 0	23.43	25	23.43	25
LTE Band 26 (FDD)	Ant 0	23.59	25.1	23.59	25.1
	Ant 1	20.73	22.3	19.93	21.5
LTE Band 41 (TDD) PC3	Ant 2	23.42	25	22.96	24.5
	Ant 0	23.33	24.9	23.33	24.9
NR SA n7	Ant 2	22.54	24.1	21.86	23.4
	Ant 0	23.48	25	23.48	25

Head Exposure condition		Output Power for Voice Call			
Ear acoustic output Status:		ON		ON	
WWAN Status:		OFF		ON	
Power state		WIFI Index 1		WIFI Index 3	
Wireless technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
802.11g 6Mbps CH6	(Ant4+3)Ant 4	14.43	16	9.96	11.5
	(Ant4+3)Ant 3	14.46	16	9.97	11.5
802.11a 6Mbps CH52	(Ant4+3)Ant 4	13.95	15.5	9.92	11.5
	(Ant4+3)Ant 3	13.92	15.5	9.96	11.5

Hotspot exposure condition

Hotspot exposure condition		Output Power for data connection			
Wifi Hotspot Status		WIFI Index 7		OFF	
BT Hotspot Status		OFF		ON	
Power state		WWAN ECI 6		WWAN ECI 6	
Wireless Technology	Antenna	Measured (dBm)	Max. Tune-up (dBm)	Measured (dBm)	Max. Tune-up (dBm)
GSM1900 (4TX)	Ant 2	20.95	22.5	20.95	22.5
	Ant 0	18.55	20.1	18.55	20.1
UMTS Band 2	Ant 2	18.11	19.7	18.11	19.7
	Ant 0	12.35	13.9	12.35	13.9
LTE Band 7 (FDD)	Ant 2	15.36	16.9	15.36	16.9
	Ant 0	13.43	15	13.43	15
LTE Band 25 (FDD)	Ant 2	17.75	19.3	17.75	19.3
	Ant 0	12.56	14.1	12.56	14.1
LTE Band 41 (TDD) PC3	Ant 2	17.63	19.2	17.63	19.2
	Ant 0	16.06	17.6	16.06	17.6
NR SA n25	Ant 2	18.96	20.5	18.96	20.5
	Ant 0	13.77	15.3	13.77	15.3
802.11g 6Mbps CH6	(Ant4+3)Ant 4	11.95	13.5		
	(Ant4+3)Ant 3	11.9	13.5		
WiFi 802.11a CH157	(Ant4+3)Ant 4	12.43	14		
	(Ant4+3)Ant 3	12.39	14		