



# RF Exposure Evaluation

## FCC ID: 2AGUT-NRF52810-X5

### 1. Client Information

<b>Applicant</b>	:	SHENZHEN RADIOLAND TECHNOLOGY CO.,LTD
<b>Address</b>	:	5F, Block A2, Chentian Hangcheng Industry Zone Xixiang Town, Bao'an District Shenzhen, China
<b>Manufacturer</b>	:	SHENZHEN RADIOLAND TECHNOLOGY CO.,LTD
<b>Address</b>	:	5F, Block A2, Chentian Hangcheng Industry Zone Xixiang Town, Bao'an District Shenzhen, China

### 2. General Description of EUT

<b>EUT Name</b>	:	NRF52180 BLE Tag, BLE module	
<b>Model(s) No.</b>	:	NRF52810-X5, X5, X6, X7, C3, C4, C5, B4, B5, B6, A1, S1	
<b>Model Different</b>	:	All these models are identical in the same PCB, layout and electrical circuit, The only difference is model name.	
<b>Product Description</b>	:	Operation Frequency:	Bluetooth LE4.2: 2402MHz~2480MHz
		Number of Channel:	40 channels
		Antenna Gain:	2.5 dBi PCB Antenna
		Modulation Type:	GFSK
		Bit Rate of Transmitter:	Bluetooth LE:1/2Mbps
<b>Power Supply</b>	:	Input: DC CR2477T 3V Battery.	
<b>Software Version</b>	:	V1.1	
<b>Hardware Version</b>	:	V1.1	
<b>Remark:</b> The antenna gain provided by the applicant, the adapter and verified for the RF conduction test and adapter provided by TOBY test lab.			

**Note:** More test information about the EUT please refer the RF Test Report.

## SAR Test Exclusion Calculations

1. FCC: According to KDB 447498 D01 Mobile and Portable Devices RF Exposure Procedures and Equipment Authorization Policies v06.

(1) Clause 4.3: General SAR test reduction and exclusion guidance

Sub clause 4.31: Standalone SAR test exclusion considerations

1) The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6GHz at test separation distance  $\leq 5$  mm are determined by:

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}]}{\leq 3.0 \text{ for 1-g SAR}}$$

$$\frac{[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}]}{\leq 7.5.0 \text{ for 10-g SAR}}$$

**2. Calculation:**

Bluetooth LE Mode(1Mbps)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.40	-1±1	0	1.000	0.310	3.0
2.440	-1.71	-1±1	0	1.000	0.312	3.0
2.480	-1.65	-1±1	0	1.000	0.315	3.0
Bluetooth LE Mode(2Mbps)						
Frequency (GHz)	Conducted Power (dBm)	Turn-up Power Tolerance (dB)	Max power of tune up tolerance (dBm)	Max power of tune up tolerance (mw)	Calculation Value	Threshold Value
2.402	-1.41	-1±1	0	1.000	0.310	3.0
2.440	-1.72	-1±1	0	1.000	0.312	3.0
2.480	-1.65	-1±1	0	1.000	0.315	3.0

**Conclusion:**

The measurement results comply with the FCC Limit per 47 CFR 2.1093 for the uncontrolled RF Exposure and SAR Exclusion Threshold per KDB 447498 v06.

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