

RF Exposure Evaluation

FCC ID: 2AGUT-NRF52810

1. Client Information

Applicant	:	SHENZHEN RADIOLAND TECHNOLOGY CO.,LTD
Address	:	5F, Block A2, ChenTian Hangcheng Industry Zone, XiXiang Town, Bao'an district, Shenzhen, China
Manufacturer	:	SHENZHEN RADIOLAND TECHNOLOGY CO.,LTD
Address	:	5F, Block A2, ChenTian Hangcheng Industry Zone, XiXiang Town, Bao'an district, Shenzhen, China

2. General Description of EUT

EUT Name	:	NRF52180 BLE Tag	
Models No.	:	NRF52810B3, B1, B2, B3, X1, X2, X4, C1, C2, A1, S1	
Model Different	:	All these models are the same PCB, layout and electrical circuit, the only difference is Size and battery	
Product Description	Operation Frequency:	Bluetooth V4.2: 2402MHz~2480MHz	
	RF Output Power:	BLE:4.169dBm (Max)	
	Antenna Gain:	2.5dBi PCB Antenna	
Power Rating	:	DC 3V 220mAh by button cell	
Software Version	:	V1.1	
Hardware Version	:	V1.1	
Connecting I/O Port(S)	:	Please refer to the User's Manual	
Remark		The antenna gain provided by the applicant, the verified for the RF conduction test 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 ≤ 5 mm are determined by:

$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}] \leq 3.0 \text{ for 1-g SAR}$$
$$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation, mm})] * [\sqrt{f_{(\text{GHz})}}] \leq 7.5.0 \text{ for 10-g SAR}$$

2. Calculation:

Test separation: 5mm						
BLE Mode (GFSK)						
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	4.169	4±1	5	3.162	0.980	3.0
2.442	3.929	4±1	5	3.162	0.988	3.0
2.480	4.031	4±1	5	3.162	0.996	3.0

So standalone SAR measurements are not required.

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