

SAR Test exclusion documentation according to FCC KDB 447498, RSS-102 and EN 62479

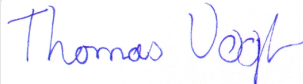
Report identification number: 1-5687/17-01-11-A

Certification numbers and labeling requirements	
Product description	Bluetooth 5 LE Module
FCC ID	RFR-S50
IC number	4957A-S50
HVIN (Hardware Version Identification Number)	BlueMod+S50
PMN (Product Marketing Name)	BlueMod+S50/AI BlueMod+S50/AP
FVIN (Firmware Version Identification Number)	-/-
HMN (Host Marketing Name)	-/-

Version –A: SAR exclusion with both body worn and hands/wrists/limbs.

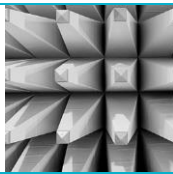
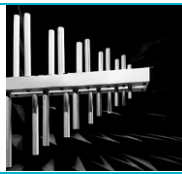
This test report is electronically signed and valid without handwriting signature. For verification of the electronic signatures, the public keys can be requested at the testing laboratory.

Document authorized:



DN: cn=Thomas Vogler, o=CTC advanced GmbH, ou=VOG-161125, email=thomas.vogler@ctcadvanced.com, c=DE
Datum: 2018.04.03 11:48:29 +02'00'

Thomas Vogler
Project Manager
Radio Communications & EMC



EUT technologies:

Technologies:	Max. power conducted: (AVG)	Max. antenna gain:	Min. pathloss:
Bluetooth 2.4 GHz	Declared 4 dBm	Declared max. 3 dBi)*	--

)* for internal and external antenna.

SAR test exclusion according to KDB447498 (General RF Exposure Guidance)

Equation from Chapter 4.3.1: Standalone SAR test exclusion considerations page 11 and ff.

(1) Standalone SAR test exclusion for 100 MHz to 6 GHz at test separation distances $\leq 50\text{mm}$

$$(\text{Threshold}_{1\text{-g};10\text{-g}}) \times d_{\text{separation}} / f^{0.5}$$

where

Threshold_{1-g;10-g} is 3 for 1-g; 7.5 for 10-g

d_{separation} is the min. test separation distance; 5mm is used if the distance is less

f is the RF channel transmit frequency

The table below gives the calculated maximal power that could be used for source based time averaged conducted or radiated power, adjusted for tune up tolerance. If this is at or below the calculated value the DUT is exempted from SAR evaluation.

f in [MHz]	d _{separation} [mm]	Threshold _{1-g/10-g}	Powerlimit [mW]	P _{max-declared} [mW]	Exclusion
2450.00	5	3	9.58	5.00	yes
2450.00	5	7.5	23.96	5.00	yes
				5	

SAR test exclusion according to RSS-102 Issue 5 Section 2.5.1/Table 1

The table below gives the calculated maximal power that could be used for source based time averaged conducted or radiated power, adjusted for tune up tolerance. If this is at or below the calculated value the DUT is exempted from SAR evaluation.

f in [MHz]	d _{separation} [mm]	tissue volume	Powerlimit [mW]	P _{max-declared} [mW]	Exclusion
2450.00	10	1 g	7.00	5.00	yes
2450.00	5	10 g	10.00	5.00	yes
			(factor 2.5 for hands/wrists/limbs applied)		

For limb-worn devices where the 10 gram SAR value applies, the device is exempted from routine evaluation (test exclusion).

For body-worn devices where the 1 gram SAR value applies, the device is exempted from routine evaluation (test exclusion) for FCC approval.

It is exempted from routine evaluation acc. to RSS-102, if the final host justify a min. separation distance of **1cm** from the radiating elements to the human body.

SAR test exclusion according to EN 62479

Compliance is given according to EN 62479 because the output power of the DUT is smaller than 20 mW.