

SAR Test exclusion documentation according to FCC KDB 447498

Report identification number: 1-5147/22-01-07 Exclusion (FCC)

contains the module with the following certification numbers	
FCC ID	2AXDT-RFM008

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

Document authorised:



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EUT technologies:

Technologies:	Max. declared cond. AVG Power	Max. measured EIRP	Antenna gain
NI coupling 3.27 MHz	-9.47 dBm ³⁾ (=0.113 mW)	9.7 dB μ V _{@30m} (Peak) ¹⁾ = -65.6 dBm	< 0 dBi
BT LE ²⁾ 2450	6.8 dBm (peak) -2.9 dBm (AVG)	-4.0 dBm (Peak)	-10.4 dBi

NOTE:

The measured PEAK EIRP @30m proofs that the EUT antenna gain is far below 0dBi and that considering the max. declared output power is by far larger than the EIRP. Conducted values will be used for the RF exposure calculation. EIRP values are for information only.

¹⁾ Test results taken from CTC advanced GmbH report 1-5147/22-01-04 (page 20):

9.7 dB μ V/m @30m → -41.8 dB μ A/m @30m

Duty cycle is 48% according customer data.

²⁾ Duty cycle from CTC advanced GmbH test report 1-1607/20-01-06 (-9.7 dB)

Radiated and conducted output power taken from test report 1-5147/22-01-05.

³⁾ Max declared conducted output power according customer declaration

Collocation:

<div>Active scenario:</div> <div>Technology</div>	1	2	3
NI coupling 3.27 MHz	x		x
BT LE 2450 MHz	x	x	

SAR test exclusion according to KDB447498 (General RF Exposure Guidance v06)

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

BT LE:

(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

$\text{Threshold}_{1\text{-g};10\text{-g}}$ is 3 for 1-g; 7.5 for 10-g

$d_{\text{separation}}$ 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.

frequency [MHz]	$d_{\text{separation}}$ [mm]	$\text{Threshold}_{1\text{-g}}$	Powerlimit [mW]	$P_{\text{max-declared}}$		Exclusion
				[dBm]	[mW]	
2450.00	5	3	9.58	-3.10	0.49	yes

NFC:

(c) (2) Standalone SAR test exclusion below 100 MHz < 50mm

$$0.5 \times (\text{Threshold}_{100\text{MHz}}) \times (1 + \log(100/f))$$

where

$\text{Threshold}_{1\text{-g};10\text{-g}}$ is 3 for 1-g; 7.5 for 10-g

f is the RF channel transmit frequency

$\text{Threshold}_{100\text{MHz},50\text{mm}}$ is $\text{Threshold}_{1\text{-g};10\text{-g}} \times d / f^{0.5}$; with $f = 100\text{MHz}$ and $d=50\text{mm}$

The table below gives the calculated maximal power that could be used for source based time averaged conducted power, adjusted for tune up tolerance. If this is below the calculated value SAR testing is excluded.

frequency [MHz]	$\text{Threshold}_{1\text{-g};10\text{-g}}$	$\text{Threshold}_{100\text{MHz},50\text{mm}}$	Powerlimit [mW]	$P_{\text{max-declared}}$		Exclusion
				[dBm]	[mW]	
3.270	3	474.34	589.48	-9.47	0.113	yes

Collocation:**Overview:**

Technology , [MHz]	Proprietary, 120 kHz	BT LE , 2450 MHz
Exemption based on	SAR exclusion	
Limit EIRP [mW]:	589.48	9.58
Result EIRP [mW]:	0.113	0.49
Limit-Exhaustion [%]	0.0	5.1
Collocated percentage [%] [NI coupling 3.27 MHz + BT LE]	5.1	
Verdict:	Pass	

This prediction demonstrates the following:

The power density levels for FCC that are larger than the minimum safety-distances stated above, are below the maximum levels allowed by regulations.