

SAR Test exemption documentation according to CFR 47 §1.1307

Report identification number: 1-2724/21-01-04 Exemption / MPE (FCC)

contains the module with the following certification numbers	
FCC ID	ZP9-13246830-999

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:

SAR based exempted technologies:

Technologies	Max. measured power [dBm]		Max. declared EIRP [dBm]	Max. declared ERP [dBm]	#
	conducted	EIRP			
Proprietary 915 MHz	--	-22.10 (Peak)	-20.0 (=0.01mW)	-17.85 (=0.016mW)	A
BT LE 2450 MHz	-1.6	6.3	7.0 (=5.0mW)	4.85 (=3.05mW)	B

Details and origins of the measurements shown in the table above:

#	Results from:	Additional information
A	1-2724/21-01-02 CTC Advanced GmbH	Max. meas. field strength: 73.13 dBµV @3m (page 19) This equals an EIRP of -22.10 dBm. Duty cycle correction -26.71 dB (page 20)
B	1-2724/21-01-03 CTC Advanced GmbH	Max. meas. Conducted power -1.6 dB (page 25) Max. antenna gain 7.9 dBi (page 21)

Declared minimum safety distance: 20cm

According the manual a safety distance of 20cm shall be applied between the user (and/or bystanders) to the EUT antenna whilst active transmitting.

SAR-Based Exemption following 47 CFR 1.1307 amendment:

The SAR-based exemption formula of § 1.1307(b)(3)(i)(B), repeated here as Formula (B.2), applies for single fixed, mobile, and portable RF sources with available maximum time-averaged power or effective radiated power (ERP), whichever is greater, of less than or equal to the threshold P_{th} (mW). This method shall only be used at separation distances from 0.5 cm to 40 cm and at frequencies from 0.3 GHz to 6 GHz (inclusive). P_{th} is given by Formula (B.2).

$$P_{th}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm}\right)^x & d \leq 20cm \\ ERP_{20cm} & 20cm \leq d \leq 40cm \end{cases} \quad (B.2)$$

where

$$x = -\log_{10} \left(\frac{60}{ERP_{20cm} \sqrt{f}} \right)$$

and f is in GHz, d is the separation distance (cm), and ERP_{20cm} is per Formula (B.1).

$$P_{th}(mW) = ERP_{20cm}(mW) = \begin{cases} ERP_{20cm} \left(\frac{d}{20cm}\right)^x & d \leq 20cm \\ ERP_{20cm} & 20cm \leq d \leq 40cm \end{cases} \quad (B.1)$$

Technology	Transmitter frequency (MHz)	Max. decl. ERP (mW)	Threshold ERP		Minimal Safety (mm)	Verdict
			(mW)	(dBm)		
Proprietary	915	0.02	1866.60	32.7	200	EXCEMPTED
BT LE	2450	3.05	3060.00	34.8	200	EXCEMPTED

Collocation:**Overview:**

Technology, [MHz]	Proprietary, 915	BT LE, 2450
Exemption for 200mm distance based on	SAR	SAR
Limit ERP [mW]:	1866.6	3060.0
Result ERP [mW]:	0.02	3.05
Limit-Exhaustion [%]	0.001	0.100

Collocation:

Proprietary + BT LE = 0.101 % of Limit

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.