
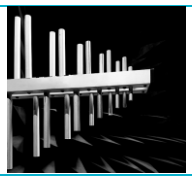
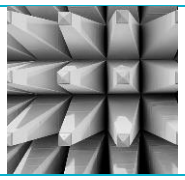

CTC advanced
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Bundesnetzagentur

BNetzA-CAB-02/21-102

ilac-MRA DAkkS Deutsche Akkreditierungsstelle D-PL-12076-01-04

Maximum Permissible Exposure (MPE) & Exposure evaluation

Report identification number: 1-0037/20-01-04 MPE (FCC)

Certification numbers and labeling requirements	
FCC ID	**2A4L8-FKA8X8V1**

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.

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EUT technologies:

Technologies:	Max. power		Antenna gain max.: [dBi] *	Max average EIRP Declared by customer	#
	conducted	EIRP			
KA Band 28.35 – 28.6GHz	--	27.505 GHz: 49.4 dBm 28.750 GHz: 49.3 dBm (peak values)	--	36.28 dBm (=4.24 W)	A
KA Band 29.25 – 30.0 GHz	--	29.995 GHz: 46.1 dBm (peak values)	--	36.28 dBm (=4.24 mW)	A
WLAN 2450 MHz	--	--	--	18.5 dBm (= 70.8 mW)	B
BT EDR / LE	--	--	--	11.7 dBm (= 14.8 mW)	B

)* worst case of all antenna types, channels and modulations (overrated)

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

#	Results from:	Additional information
A	1-0037/20-01-02 CTC advanced GmbH	Max PEAK-EIRP page 21 Duty Cycle correction of 3.37% (See Annex A of this document)
B	Module Datasheet: wl1387mod	

Collocation overview:

Technology \ Active scenario:	1	2	3	4
KA Band	x		x	x
WLAN 2450 MHz	x	x		x
BT EDR / LE 2450 MHz		x	x	x

Prediction of MPE limit at given distance - FCC

Equation from page 18 of OET Bulletin 65, Edition 97-01

$S = PG / 4\pi R^2$

where: S = Power density
P = Power input to the antenna
G = Antenna gain
R = Distance to the center of radiation of the antenna
PG = Output Power including antenna gain

The table below is excerpted from Table 1B of 47 CFR 1.1310 titled “Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure”

Frequency Range (MHz)	Power Density (mW/cm^2)	Averaging Time (minutes)
300-1500	f/1500	30
1500 - 100000	1.0	30

where f = Frequency (MHz)

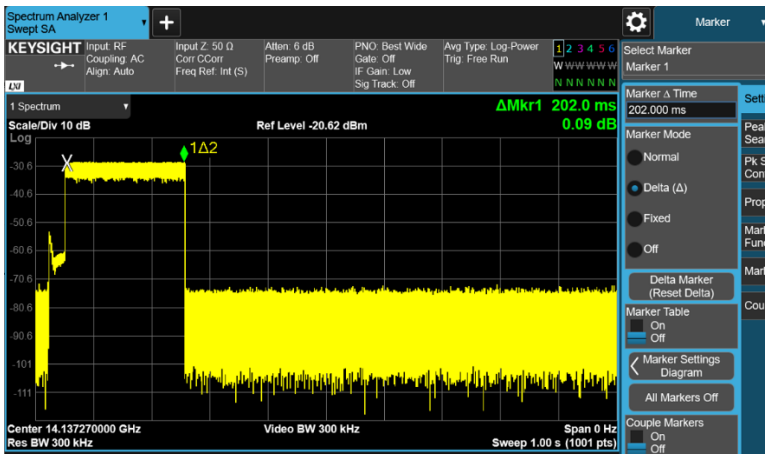
Prediction: worst case

	Technologies:	Wlan	BT	KA Band	
	Frequency (MHz)	2450	2450	27505	
PG	Declared max power (EIRP)	18.5	11.7	36.28	dBm
R	Distance	20	20	20	cm
S	MPE limit for uncontrolled exposure	1	1	1	mW/cm^2
	Calculated Power density:	0.0141	0.0029	0.8452	mW/cm^2
	Calculated percentage of Limit:	1.41%	0.29%	84.52%	
	Collocation:				
	Scenario 4: ALL ACTIVE Calculated percentage of Limit:	86.22%			

This prediction demonstrates the following:

The power density levels for FCC at a distance of 20 cm are below the maximum levels allowed by regulations.

Annex A: Duty cycle of the EUT (KA Band):



Duty Cycle 3.37%

Plot data:
Transmission Period: 6s
Pulse Duration: 202 ms
Number of pulses in 360 Seconds = 60
Total Transmission time in 360 Seconds: 60 · 202ms = 12.12s