

RF Exposure Requirements

1.1 General Information

Client Information

Applicant : Casambi Technologies Oy
Address of applicant : Bertel Jungin Aukio 1 C, 02600 Espoo, Finland
Manufacturer : TEPCOMP Oü
Address of manufacturer : Pihlta tee 43, 93815 Kuressaare, Saaremaa, Estonia

General Description of E.U.T

FCC ID : 2ALA3-PWM44LR
Product Name : 4ch PWM Controller
Model No. : CBU-PWM4-4-LR
Model Description : ---
Rated Voltage : Input: 12-24VDC, 4.0A, <0.3W (No-load Standby power)
Output: 12-24VDC, Max. 96W@24VDC, Max. 48W@12VDC
Battery Capacity : ---
Power Adapter : ---

Technical Characteristics of EUT

Bluetooth Version : V5.3 (BLE mode)
Frequency Range : 2402-2480MHz
RF Output Power : 7.842dBm (Conducted)@125kbps
Modulation : GFSK
Data Rate : 1Mbps, 2Mbps, 500kbps, 125kbps
Quantity of Channels : 40
Channel Separation : 2MHz
Type of Antenna : PCB Antenna
Antenna Gain : 0.12dBi

2 Applicable Standard

According to §1.1307(b)(1) and KDB 447498 D01 General RF Exposure Guidance v06, system operating under the provisions of this section shall be operating in a manner that the public is not exposed to radio frequency energy level in excess limit for maximum permissible exposure.

(a) Limits for Occupational / Controlled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	(900/f)*	6
30-300	61.4	0.163	1.0	6
300-1500	/	/	F/300	6
1500-100000	/	/	5	6

(b) Limits for General Population / Uncontrolled Exposure

Frequency range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (H) (A/m)	Power Density (S) (mW/cm ²)	Averaging Times E ² , H ² or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	(180/f)*	30
30-300	27.5	0.073	0.2	30
300-1500	/	/	F/1500	30
1500-100000	/	/	1	30

Note: f = frequency in MHz; * = Plane-wave equivalents power density

3 Calculation Method

$$S = (30 \cdot P \cdot G) / (377 \cdot R^2)$$

S = power density (in appropriate units, e.g., mW/cm²)

P = power input to the antenna (in appropriate units, e.g., mW)

G = power gain of the antenna in the direction of interest relative to an isotropic radiator, the power gain factor is normally numeric gain.

R = distance to the center of radiation of the antenna (in appropriate units, e.g., cm), R=20cm.

4 MPE Calculation Result

Frequency (MHz)	Antenna Gain (dBi)	Numeric gain	Conducted Power (dBm)	Maximum Tune-up output power		PD (mW/cm ²)	Limit (mW/cm ²)
				(dBm)	(mW)		
2480	0.12	1.03	7.842	8.00	6.31	0.00129	1

Result: Pass

=====End of Report=====