Maximum Permissible Exposure

LoRaWAN 86x/9xx Expansion card CG2132

FCC ID: NCM-CG2132
IC: 2734A-CG2132

Test Report Reference: MDE_OPTION_2101_MPEb

To whom it may concern,

please find our Maximum Permissible Exposure calculations for LoRaWAN receiver.

Best Regards

i.A.

Abdellah Ahakki

Administrative Data:

Testing Laboratory

Company Name:	7layers GmbH
Address:	Borsigstr. 11 40880 Ratingen Germany

Project Data

Responsible for report:	Mr. Abdellah Ahakki
Date of Report:	2022-07-22
Testing Period:	2022-06-10 to 2202-06-24

Applicant Data

Company Name:	Option (Crescent NV)
Address:	Gaston Geenslaan 14 3001 Leuven Belgium
Contact Person:	Jasna Papuga

Manufacturer Data

Company Name:	please see Applicant data
Address:	- - -
Contact Person:	-

Test object Data

General Description of Radio Device

Kind of Device product description	LoRaWAN receiver
Product name	LoRaWAN 86x/9xx Expansion card
Type	CG2132
Declared EUT data by the supplier	
Voltage Type	DC (Powered by Host Device)
Voltage Level	DC: 3.4 V
Antenna / Gain	External / 1 dBi
Tested Modulation Type	FSK
General product description	LoRaWAN 86x/9xx Expansion card is a member of the CloudGate family expansion cards providing LoRaWAN capabilities to the gateways. The EUT is attached to the host device (CloudGate LTE WW - CG0124) via a Card Edge Connector with 36 pins.
Specific product description for the EUT	The EUT is a LoRaWAN receiver in the 900 MHz band. Relevant for this report is the HYBRID mode with 125 kHz bandwidth and as Downstream with only 8 channels starting at 903.9 MHz to 905.3 MHz during established communication. A typical application is a Smart Metering use case where the sensor data are sent to the gateway via LoRa link.
EUT ports (connected cables during testing):	Enclosure, antenna, AC from host device, LAN from host device
Tested datarates	Data rate settings SF 5 to 12 are supported by the test software, but only SF 9 is applicable for the tested HYBRID mode.
Special software used for testing	The local TX test modes were set using the “LoraGateway_SX1302_Testprogram” software provided by the applicant. For the hopping mode the application “LuvitRED”, on the web-interface of the host device, was used.

RF Exposure evaluation

RF Exposure Evaluation

Standards
OET Bulletin 65 Edition 97-01 August 1997
FCC 47 CFR §1.1307
FCC 47 CFR §1.1310

Test limits

As specified in Table 1B of 47 CFR 1.1310 – Limits for Maximum Permissible Exposure (MPE), Limits for General Population/Uncontrolled Exposure.

Frequency range (MHz)	*Power density (mW/cm²)*
300 – 1,500	f/1500
1,500 – 100,000	1.0

Equation OET bulletin 65, page 18, edition 97-01: $S = \frac{PG}{4\pi R^2} = \frac{EIRP}{4\pi R^2}$

Where:

S = power density
P = power input to the antenna
G = power gain of the antenna in the direction of interest relative to an isotropic radiator
R = distance to the center of radiation of the antenna

Band	Frequency (MHz)	Antenna Gain (dBi)	Antenna Gain -numeric- (mW/cm²)	Output Power -conducted- (dBm)	Output Power -conducted- (mW)	IC Limit (mW/cm²)	FCC Limit (mW/cm²)	Power Density value (mW/cm²)	Margin to FCC Limit (mW/cm²)	Margin to IC Limit (mW/cm²)
900 MHz	923.3	1	1.2589	19.20	83.18	0.2784	1.0000	**0.0208**	**0.9792**	**0.2576**