

Maximum Permissible Exposure

EN 62311:2008

WT500

Water and Temperature Sensor

FCC ID: NCM-WT500

IC: 2734A-WT500

Test Report Reference: MDE_OPTION_2009_MPEa

To whom it may concern,

please find our Maximum Permissible Exposure calculations for LoRa Sensor.

Best Regards



i.A.

Abdellah Ahakki

MDE_OPTION_2009_MPEa

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: 2021-05-25
Testing Period: 2021-01-12 to 2021-04-08

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	LoRa Sensor
Product name	Water and Temperature Sensor
Type	WT500
Declared EUT data by the supplier	
Voltage Type	DC (Battery powered)
Voltage Level	3V
Antenna / Gain	Integral / -2 dBi
Tested Modulation Type	FSK
General product description	The EUT is a water and Temperature sensor with LoRa technology
Specific product description for the EUT	The EUT is a LoRaWAN transceiver in the 900 MHz band. Relevant for this report is the 125 kHz hopping mode which is implemented as FHSS for link setup and as hybrid with only 8 channels during established communication.
EUT ports (connected cables during testing):	Enclosure
Tested datarates	Data rate settings LS5 to 12 are supported by the test software, the worst case of the modes was tested for each test case (see test results).
Special software used for testing	The local TX test modes were set using "LoraNode" software provided by applicant (non-hopping mode tests). Tera Term was used to send commands for hopping mode tests. Tera Term together with Macros and prepared templates in the Option CloudGate LORA gateway, which were provided by the applicant, were used for dwell time tests.

MDE_OPTION_2009_MPEa

Maximum Permissible Exposure

(as specified in Table 2 in EN 1999/519-EC)

<i>Frequency range (MHz)</i>	<i>Power density (mW/cm²)</i>
400 – 2000	f/2000
2000 - 300000	1 mW/cm ²

Calculations 900 MHZ band

Equation OET bulletin 65, page 18, edition 97-01: $S = P * G / (4\pi R^2)$

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 centre of radiation of the antenna

Operational Bands	Frequency	Antenna Gain (dBi)	G			P			S	
			Antenna Gain -numeric- (mW/cm ²)	Output Power -measured- (dBm)	Duty Cycle correction factor	Max. mean output power (dBm)	Max. mean output power (mW)	Limit (mW/cm ²)	Power Density value (mW/cm ²)	Margin to Limit (mW/cm ²)
900 MHz Band	902.3 MHz	-2	0.6310	19.70	0.00	19.70	93.33	1.0000	0.0001	0.9999
Distance to Antenna (R) in cm:		20								

Remark:

- only worst-case values are listed in the table above.

Conclusion: all results are within the MPE Limit