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ACCREDIA
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RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	**MPETR_178523-1**	Data Emissione /Issue Date:	**19/05/2021**	Pagine / Pages:	**9**

Scopo delle prove *Test object*	Prove di tipo in accordo alla Norma *Type test according to standards* **FCC Cfr 47 part 2 - §2.1093**
Richiedente *Applicant*	**Paradox Engineering SA** Via Passeggiata 7 – 6883 Novazzano – CH Tel.: +41 912330100
Marchio commerciale *Trade mark*	MinebeaMitsumi Passion to Create Value through Difference
Fabbricante *Manufacturer*	**MinebeaMitsumi Inc.** 3-9-6 Mita, Minato-ku, Tokyo 108-8330 Tel.: 81-3-6758-6711
Prodotto *Product*	Multi radio gateway
Modello testato *Testing model*	**GWWG001US (PE Mini IoT Gateway)**
Identificativo FCC *FCC ID*	**2AKPQGWWG001**
Data ricevimento campioni *Date of test samples receipt*	24/02/2021
Campioni verificati *No. of tested samples*	1 – Sampled by the manufacturer
Data verifiche *Testing date*	24/02/2021
Sito di prova *Testing site*	PRSLAB S.r.l. Unipersonale - Via Campagna 92 - 22020 Faloppio - Como - Italy
Esito delle valutazioni *Assessment results*	**CONFORME / COMPLIANT**
Verifiche effettuate da *Verifications carried out by*	**Daniele AOSANI** Tecnico laboratorio EMC & RADIO *EMC & RADIO Test Engineer*
Approvato *Approved by*	**Riccardo PFEIFFER** Responsabile laboratori EMC & RADIO EMC & RADIO *Laboratory manager*

I risultati delle prove riportati nel presente rapporto di prova si riferiscono solo ai campioni esaminati.
The test results reported in this test report shall refer only to the samples tested
Il campione è stato fornito dal cliente ed i risultati si riferiscono al campione così come ricevuto
The sample has been provided by the customer and the results apply to the sample as received

CONTENUTO

TABLE OF CONTENTS

0. RELEASE CONTROL RECORD

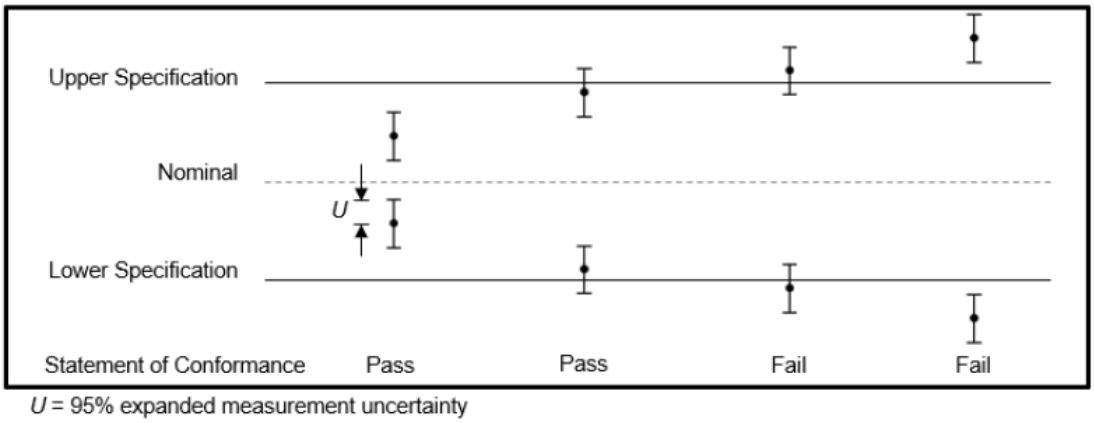
TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_178523-0	Original release	05/03/2021
MPETR_178523-1	Updated Reference standard List Added Sample calculation at pag.8	19/05/2021

This document is valid in last revision that deletes and replaces the previous one

1. DECISION RULE

PRS LAB specifies that, if the decision rules of conformity of the test results are not indicated in detail in the standard/s object of tests, it takes as a decision rule for the declaration of conformity the simple binary system (w = 0) stated in the ILAC-G8-09:2019 document.

The decision rule is applicable for all parts of standard



U = 95% expanded measurement uncertainty

Statements of conformity are reported as:

- Pass: the measured value is below the acceptance limit, $AL{=}TL$.
- Fail: the measured value is above the acceptance limit, $AL{=}TL$.

Definitions

- Guard Band (w): interval between a tolerance limit and a corresponding acceptance limit where length $w{=}|TL{-}AL|$.
- Tolerance Limit (TL) (Specification Limit): specified upper or lower bound of permissible values of a property.
- Acceptance Limit (AL): specified upper or lower bound of permissible measured quantity values.

2. INFORMATION PROVIDED BY CUSTOMER

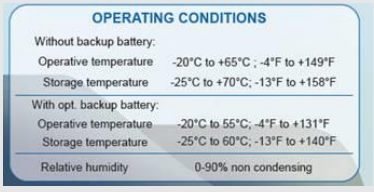
- None

3. GENERAL REMARKS

- The EUT has been tested with the internal welding (on the radio module screen) done in spots, the complete welding of the screen has the same results.

4. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

4.1 EUT Identification

DESCRIPTION	Multi radio gateway
MODEL NAME	GWWG001US (PE Mini IoT Gateway)
FCC ID	2AKPQGWWG001
SERIAL NO.	N/A
PRSLAB IDENTIFICATION	BC 68/2021 1/1
TRADEMARK	MinebeaMitsumi Passion to Create Value through Difference
MANUFACTURER	MinebeaMitsumi Inc.
COUNTRY OF MANUFACTURER	Japan
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	AC main
	PoE supply
SUPPLY VOLTAGE	115V ~ 60Hz
	48 Vdc from PoE
MAX POWER or MAX ABSORBED CURRENT	30 W
HW VERSION	ELB-PED-0145-04
FW VERSION	3.14
OPERATING TEMPERATURE	
DIMENSIONS	See photographic documentation
EUT STANDING	Wall or pole mounting

4.2 Radio module technical data

CHIP MANUFACTURER	life.augmented
CHIP MODEL	**S2-LP_ST (ELC-ICS-0157)**
RADIO CATEGORY	Short Range Device
FREQUENCY BAND	902.42 ÷ 927.58MHz FHSS
NUMBER OF CHANNELS	75
CHANNELS SPACING	340kHz
OCW	200kHz
TYPE OF MODULATION	GFSK
DATA RATE	100kbps
SENSITIVITY	-99dBm @ BER<1%
ANTENNA TYPE	Chip antenna
ANTENNA GAIN	1.59dBi
ANTENNA MODEL	**ANT1204F005R0915A (ELC-OTH-0150)**
ANTENNA MANUFACTURER	YAGEO

4.3 Ports identification

	PORT	DESCRIPTION	CONNECTION	NOTES
☒	Enclosure	Plastic	Screws	---
☒	AC Power input	115V ~ 60Hz	Plug	---
☒	DC Power input	PoE	RJ45	>3mt
☒	Signal / Control port	Environmental sensor	cable	>3mt
☒	Telecomm. port	2x Ethernet port	RJ45	>3mt
☒	Antenna port:	1x Dipole antenna 3x Chip antenna	SMA ---	---

Note:
During the tests all cables must be what provided the manufacturer or the same that used in the real employment of the EUT.

4.4 Modifications incorporated in E.U.T.

The following items are the modifications introduced in the equipment under test:

- None.

4.5 Auxiliary equipment

- None.

5. REFERENCE STANDARDS

REFERENCE STANDARD	DESCRIPTION
Title 47 Part 1 Subpart I § 1.1310	Procedures Implementing the National Environmental Policy Act of 1969. Radiofrequency radiation exposure limits.
Title 47 Part 2 Subpart J § 2.1091	Radiofrequency radiation exposure evaluation: mobile devices.
ANSI C63.4: 2014	American National Standard for Methods of Measuring of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz – 40 GHz
FCC KDB 447498 D01	General RF Exposure Guidance v06

6. MEASUREMENTS AND CALCULATION RESULTS

6.1 RF Exposure Conditions

The device is intended for use in fixed position.
According to "FCC KDB publication 447498 D01 General RF Exposure Guidance v06" sections 7.1 and 7.2 have been applied.
Transmitters used in mobile device exposure conditions for simultaneous transmission operations.
Simultaneous transmission MPE test exclusion applies when the sum of the MPE ratios for all simultaneously transmitting antennas incorporated in a host device is *≤ 1.0*

6.2 EUT composition

- Wi-Fi module **STERLING-LWB** (FCC ID: TFB-1003) with 2.4GHz 5.05dBi Chip Antenna
- LTE module **RC7611** (FCC ID: N7NRC76B) with 831.5MHz 3.8dBi Chip Antenna
- Paradox Engineering SA (FCC ID: 2AKPQGWWG001) with 920MHz 1.59dBi Chip antenna

6.3 Calculation method, results and limits

FCC ID	Frequency	Power	Power	Antenna Gain	EIRP	EIRP	Distance	Power Density	Limit
	MHz	dBm	W	dBi	dBm	mW	cm	mW/cm^2	mW/cm^2
TFB-1003	2412	24.00	0.25	5.05	29.05	800	50	0.026	1,0
N7NRC76B	830	23.64	0.23	3.80	27.44	550	50	0.018	1,0
2AKPQGWWG001	915	24.39	0.27	1.59	25.98	400	50	0.013	0,6

TFB-1003 Power Density = EIRP/($4\pi r^2$) = 800mW/(4π*2500cm^2) = 0.026 mW/cm^2
N7NRC76B Power Density = EIRP/($4\pi r^2$) = 550mW/(4π*2500cm^2) = 0.018 mW/cm^2
2AKPQGWWG001 Power Density = EIRP/($4\pi r^2$) = 400mW/(4π*2500cm^2) = 0.013 mW/cm^2

6.4 Result

FCC ID	Power Density	Limit	PD/Limit
	mW/m^2	mW/cm^2	
TFB-1003	0.026	1,0	0.026
N7NRC76B	0.018	1,0	0.018
2AKPQGWWG001	0.013	0,6	0.022
		∑=	0.066

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END OF TEST REPORT