

RAPPORTO DI PROVA

TEST REPORT

Rif. / Ref. n.	MPETR_174134-1	Data / Date:	23/11/2018	Pagine / Pages:	6
Scopo delle prove Test object	Prove di tipo in accordo alla Norma Type test according to standards 47 CFR FCC part 15.247				
Richiedente Applicant	Paradox Engineering SA Via Passeggiata 7 – 6883 Novazzano – CH Tel.: +41912330100				
Marchio commerciale Trade mark					
Fabbricante Manufacturer	MinabeaMitsumi Inc. 3-9-6 Mita, Minato-ku, Tokyo 108-8330 Tel.: 81-3-6758-6711				
Prodotto Product	Gateway for wireless IoT integrated network solution for smart urban networks				
Modello testato Testing model	AR41004 US (PE Smart Gateway Neptune US)				
Identificativo FCC FCC ID	2AKPQAR41004				
Data ricevimento campioni Date of test samples receipt	10/07/2018				
Campioni verificati No. of tested samples	1 – Sample by the applicant				
Data verifiche Testing date	10-23/07/2018				
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.

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0. RELEASE CONTROL RECORD


TEST REPORT NUMBER	REASON OF CHANGE	DATE OF ISSUE
MPETR_174134-0	Original Release	01/10/2018
MPETR_174134-1	Editorial Change	23/11/2018

1. TECHNICAL INFORMATION OF EQUIPMENT UNDER TEST (EUT)

1.1 EUT Identification

DESCRIPTION	Gateway for wireless IoT integrated network solution for smart urban networks
MODEL NAME	AR41004 US (PE Smart Gateway Neptune US)
SERIAL NO.	Prototype
TRADEMARK	 <i>Passion to Create Value through Difference</i>
MANUFACTURER	MinabeaMitsumi Inc.
COUNTRY OF MANUFACTURER	Japan
SINGLE UNIT OR SYSTEM	Single
POWER SOURCE	AC mains
SUPPLY VOLTAGE	115Vac ~ 60Hz
MAX POWER or ABSORBED CURRENT	80-130mA
OPERATING TEMPERATURE	-25°C ~ +50°C
DIMENSIONS	269mm x 239mm x 82mm
EUT STANDING	Fixed (Pole mounting)

1.1 RADIO module technical data

RADIO PROTOCOL	802.15.4g – 6LoWPAN
WORKING FREQUENCY BAND	902.42 – 927.58MHz
CHANNELS	75
CHANNEL SPACING	340kHz
TRANSFER RATE	100kbps
TYPE OF MODULATION	GFSK
SENSITIVITY	-99dBm
ANTENNA	Outdoor Rubber Antenna
ANTENNA GAIN	2.15dBi
ANTENNA TYPE	MEGWX-1551SAAX-920
ANTENNA MANUFACTURER	

1.2 Ports identification

PORT	DESCRIPTION	CONNECTION	NOTES
<input checked="" type="checkbox"/> Enclosure	Metallic	Screws	---
<input checked="" type="checkbox"/> AC Power input	115V ~ 60Hz	Plug	>3mt
<input type="checkbox"/> DC Power input	Port not present	---	---
<input type="checkbox"/> Signal / Control port	Port not present	---	---
<input checked="" type="checkbox"/> Telecomm. port	ETH	Standard RJ45 cable	>3mt
<input checked="" type="checkbox"/> Antenna port	External x4	N x 3 SMA x 1	---

Note:

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

1.3 Modifications incorporated in E.U.T.

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

- None

1.4 Auxiliary equipment

- None

2. REFERENCE STANDARDS

REFERENCE STANDARD	
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	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

3. MEASUREMENTS AND CALCULATION RESULTS

3.1 RF Exposure Conditions

The device is intended for use in fixed position.

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

3.2 EUT composition

- Mikrotiks SIA - FCC ID: TV7RB953GS5HNTM with 5GHz 18dBi Panel Antenna, mti-485001
- Compex Systems Pte Ltd – FCC ID: TK4WLE600VX with 2,4GHz 5dBi Omni-antenna OM24580703 and 5GHz 18dBi Panel Antenna, mti-485001
- Paradox Engineering SA – FCC ID: 2AKPQAR41004 with 920MHz 2.15dBi $\lambda/2$ antenna MEGWX-1551SAAX-920

3.3 Calculation method, results and limits

FCC ID	Frequency	Power	Power	Antenna	EIRP	EIRP	Distance	Power	Limit
	MHz	dBm	W	Gain	dBm	mW	Cm	Density	mW/cm ²
TV7RB953GS5HNTM	5745	24,6	0,288	18	42,6	18172	50	0,578	1,0
TK4WLE600VX	2412	23,86	0,243	5	28,9	769	50	0,024	1,0
TK4WLE600VX	5745	22,8	0,191	18	40,8	12020	50	0,383	1,0
2AKPQAR41004	902	22,4	0,174	2	24,4	275	50	0,008	0,6

3.4 Result

FCC ID	Power	Limit	PD/Limit
	Density	mW/cm ²	
	mW/m ²	mW/cm ²	
TV7RB953GS5HNTM	0,578	1,0	0,578
TK4WLE600VX	0,024	1,0	0,024
TK4WLE600VX	0,383	1,0	0,383
2AKPQAR41004	0,008	0,6	0,013
		$\Sigma=$	0,998