Report on the FCC and IC Testing of the

RMs Legic SM-6300 (BLE)

In accordance with FCC 47 CFR Part 15C and ISED RSS-247 and ISED RSS-GEN

Prepared for: dormakaba EAD GmbH
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Germany

FCC ID: NVI-LEGBLE
IC: 11038A-LEGBLE

Product Service

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Date: 2020-06-05
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RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Martin Steindl	2020-06-05	Steindl Martin *SIGN-ID 366240*
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Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT
The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C and Industry Canada RSS-247 and Industry Canada RSS-GEN. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Martin Steindl	2020-06-05	Steindl Martin *SIGN-ID 366242*

Laboratory Accreditation
DAkkS Reg. No. D-PL-11321-11-02
DAkkS Reg. No. D-PL-11321-11-03

Laboratory recognition
Registration No. BNetzA-CAB-16/21-15

Industry Canada test site registration
3050A-2

EXECUTIVE SUMMARY
A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C:2019, ISED RSS-247:2017 and ISED RSS-GEN:2019

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Product Service

Contents

1 Report Summary 2

1.1 Report Modification Record 2
1.2 Introduction 2
1.3 Brief Summary of Results 3
1.4 Product Information 4
1.5 Deviations from the Standard 4
1.6 EUT Modification Record 4
1.7 Test Location 5

2 Test Details 6

2.1 Maximum Conducted Output Power 6
2.2 Spurious Emissions 8
2.3 Band Edges 16
2.4 Exposure of Humans to RF Fields 19
2.5 Emission Bandwidth 25
2.6 Power Spectral Density 30

Measurement Uncertainty 33

Product Service

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	2019-12-03
2	Added 6 dBc and 99 % bandwidth and spectral power density tests Updated to RSS-GEN Issue 5 Altered estimation for RF Exposure to head and body estimation	2020-06-05

Table 1

1.2 Introduction

Applicant	dormakaba EAD GmbH
Manufacturer	dormakaba EAD GmbH
Model Number(s)	RMs Legic SM-6300
Serial Number(s)	04047503
Hardware Version(s)	---
Software Version(s)	---
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15C, Industry Canada RSS-247 and Industry Canada RSS-GEN:2016 and Issue 2 (2017-02) and Issue 5 (2019-03)
Test Plan/Issue/Date	NA
Order Number Date	200323 2019-10-14
Date of Receipt of EUT	2019-10-14
Start of Test	2019-10-14
Finish of Test	2019-10-15
Name of Engineer(s)	Martin Steindl
Related Document(s)	ANSI C63.10 (2013) KDB 662911 D01 v02r02

Product Service

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C and Industry Canada RSS-247 and Industry Canada RSS-GEN is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: Test Mode, Continuous Transmission				
2.1	15.247 (b), 5.4 and 6.12	Maximum Conducted Output Power	Pass	ANSI C63.10 (2013)
2.2	15.247 (d), 15.205, 5.5 and 6.13	Spurious Radiated Emissions	Pass	ANSI C63.10 (2013)
2.3	15.247 (d), 5.5 and N/A	Authorised Band Edges	Pass	ANSI C63.10 (2013)
2.4	N/A, 3.2 and N/A	Exposure of Humans to RF Fields	Pass	ANSI C63.10 (2013) KDB 447498 D01 IC-RSS-102, Issue 5
2.5	15.247(a)(2), 5.2 a and 6.7	Emission Bandwidth (6 dB, 99 %)	Pass	ANSI C63.10 (2013)
2.6	15.247(e), 5.2 b and N/A	Peak Power Spectral Density	Pass	ANSI C63.10 (2013)

Table 2

Product Service

1.4 Product Information

1.4.1 Technical Description

RFID and BLE reader module connected to the Terminal 97 00 with a 80 cm reader flatcable (Terminal in shielded metal box), HR30 or TP application running, waiting for tag.

Supply voltage: 207 V AC to 253 V AC

Temperature range: 0°C to 50°C

Carrier frequency: 13,56 MHz (RFID) and 2402 MHz to 2480 MHz (BLE)

1.5 Deviations from the Standard

None

1.6 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Model: RMs Legic SM-6300- Serial Number: 04047503			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

Product Service

1.7 Test Location

TÜV SÜD Product Service conducted the following tests at our Straubing Test Laboratory.

Test Name	Name of Engineer(s)
Configuration and Mode: Test Mode, Continuous Transmission	
Maximum Conducted Output Power	Martin Steindl
Spurious Radiated Emissions	Martin Steindl
Restricted Band Edges	Martin Steindl
Authorised Band Edges	Martin Steindl
Exposure of Humans to RF Fields	Martin Steindl
Emission Bandwidth	Martin Steindl
Peak Power Spectral Density	Martin Steindl

Table 4

Office Address:

Äußere Frühlingstraße 45
94315 Straubing
Germany

Product Service

2 Test Details

2.1 Maximum Conducted Output Power

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-247 and Industry Canada RSS-GEN, Clause 15.247 (b), 5.4 and 6.12

2.1.2 Equipment Under Test and Modification State

RMs Legic SM-6300, Serial Number: 04047503, Modification State: 0

2.1.3 Date of Test

2019-10-14

2.1.4 Test Method

This test was performed in accordance with ANSI C63.10, clause 11.9.1.1.
Conducted test was carried out in Non-shielded room with Test system TS8997.

2.1.5 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	51.0 %

2.1.6 Test Results

Test Mode with Continuous Transmission

Frequency (MHz)	dBm	mW	Limit (mW)
2402	12.7	18.62	1000
2440	12.7	18.62	1000
2480	13	19.95	1000

Table 5

Product Service

FCC 47 CFR Part 15, Limit Clause 15.247 (b)(3)

For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

Industry Canada RSS-247, Limit Clause 5.4 (d)

For DTSs employing digital modulation techniques operating in the bands 902-928 MHz and 2400-2483.5 MHz, the maximum peak conducted output power shall not exceed 1 W. The e.i.r.p. shall not exceed 4 W, except as provided in section 5.4(e) of the specification.

2.1.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde&Schwarz	FSV40	20219	12	2020-01-31
Vector Signal Generator	Rohde&Schwarz	SMBV100A	20238	24	2022-11-30
Signal Generator	Rohde&Schwarz	SMB100A	20215	36	2021-03-31
Switching Device	Rohde&Schwarz	OSP120 I	20248	24	2020-01-31
Switching Device	Rohde&Schwarz	OSP120 II	38807	24	2020-09-30
Radio Communication Tester	Rohde&Schwarz	CMW500	38845	24	2020-09-30
EMC Measurement Software	Rohde&Schwarz	EMC32	19719	---	---

Table 6

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.2 Spurious Emissions

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-247 and Industry Canada RSS-GEN, Clause 15.247 (d), 15.205, 5.5 and 6.13

2.2.2 Equipment Under Test and Modification State

RMs Legic SM-6300, Serial Number: 04047503, Modification State: 0

2.2.3 Date of Test

2019-10-14 to 2019-10-15

2.2.4 Test Method

Testing was performed in accordance with ANSI C63.10-2013 clause 6.3, 6.5 and 6.6.

Plots for average measurements were taken in accordance with ANSI C63.10-2013 clause 4.1.4.2.3 to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10-2013 clause 4.1.4.2.2.

The plots shown are the characterization of the EUT. The limits on the plots represent the most stringent case for restricted bands, (54/74 dBuV/m) when compared to 20 dBc outside restricted bands. The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBµV/m to µV/m:
10^(Field Strength in dBµV/m/20).

2.2.5 Environmental Conditions

Conducted Emissions

Ambient Temperature	23.0 °C
Relative Humidity	51.0 %

Radiated Emissions

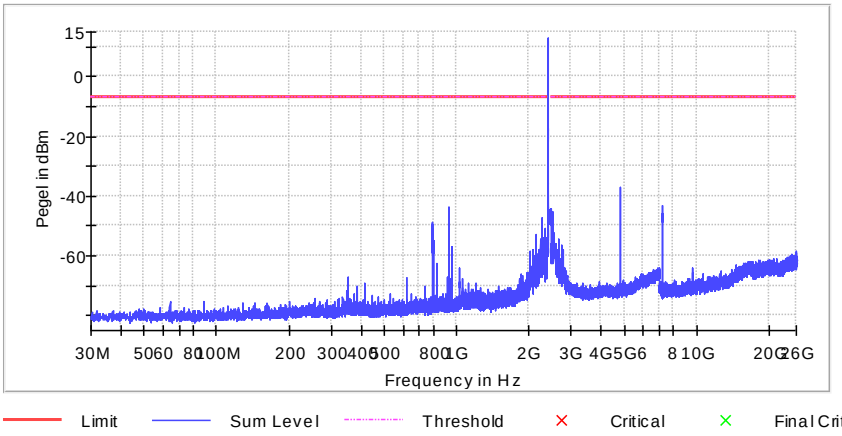
Ambient Temperature	23.0 °C
Relative Humidity	43.0 %

Product Service

2.2.6 Test Results

2.2.6.1 Conducted Emissions

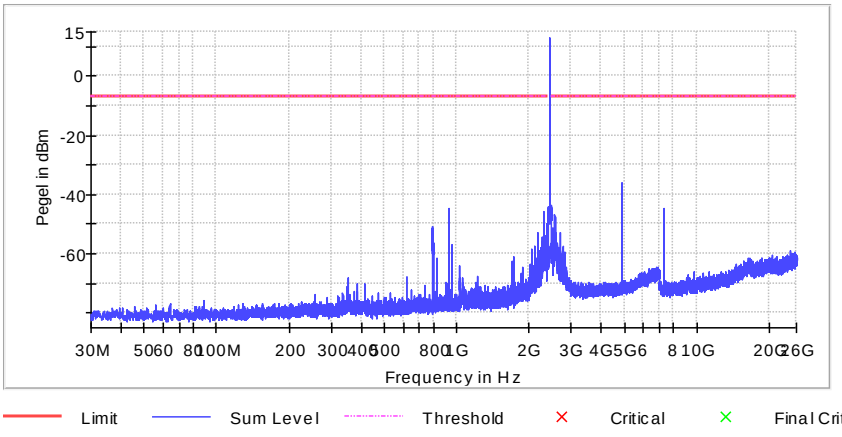
Test Mode with Continuous Transmission Channel 0 (2402 MHz)



Final Results:

DUT Frequency (MHz)	Result
2402.000000	PASS

Test Mode with Continuous Transmission Channel 19 (2440 MHz)

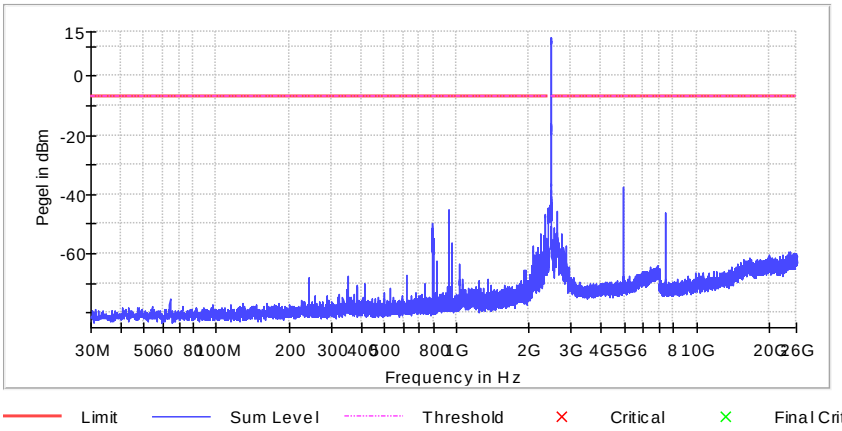


Final Results:

DUT Frequency (MHz)	Result
2440.000000	PASS

Product Service

Test Mode with Continuous Transmission Channel 19 (2480 MHz)



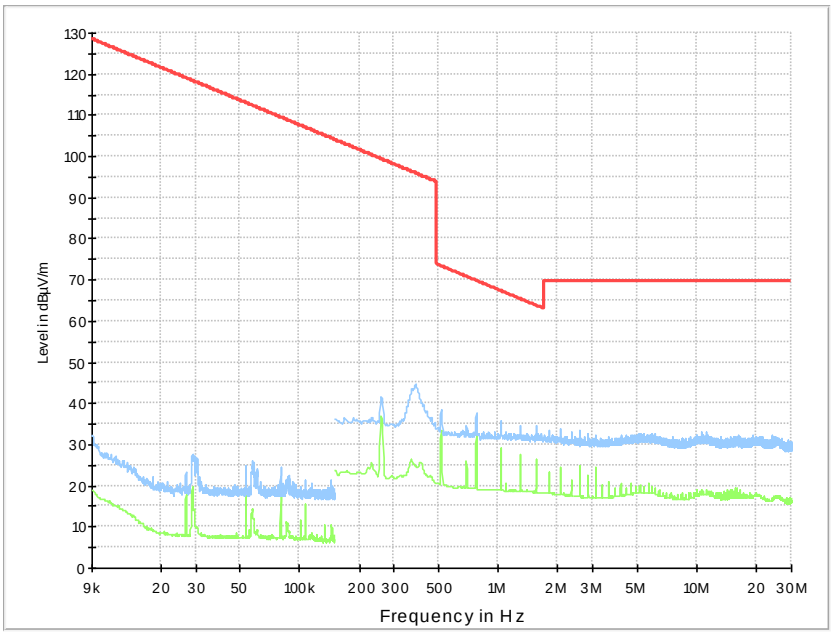
Final Results:

DUT Frequency (MHz)	Result
2480.000000	PASS

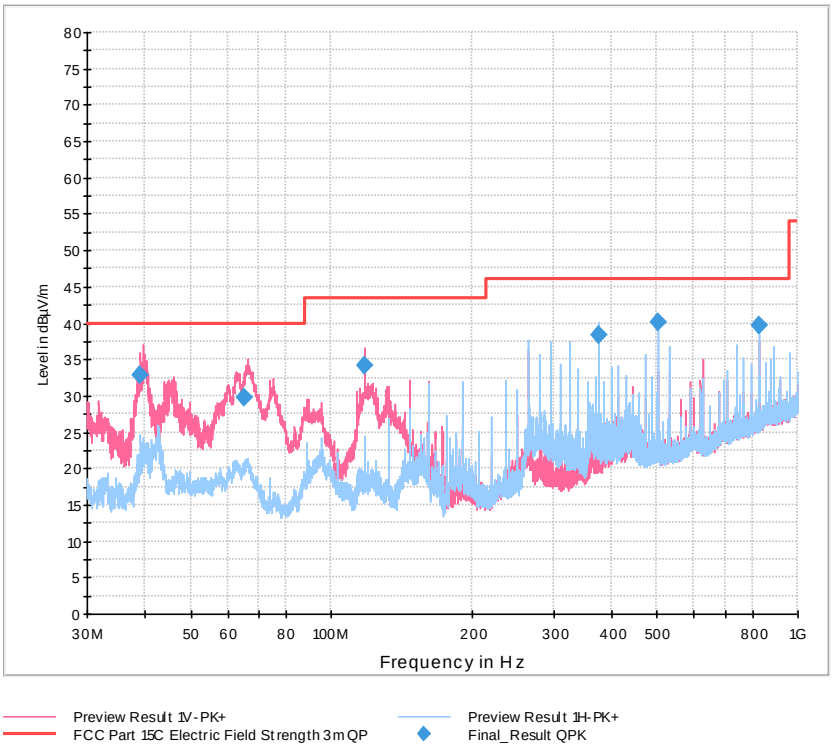
Product Service

2.2.6.2 Radiated Emissions

Radiated Emission Measurement was performed only on one channel.



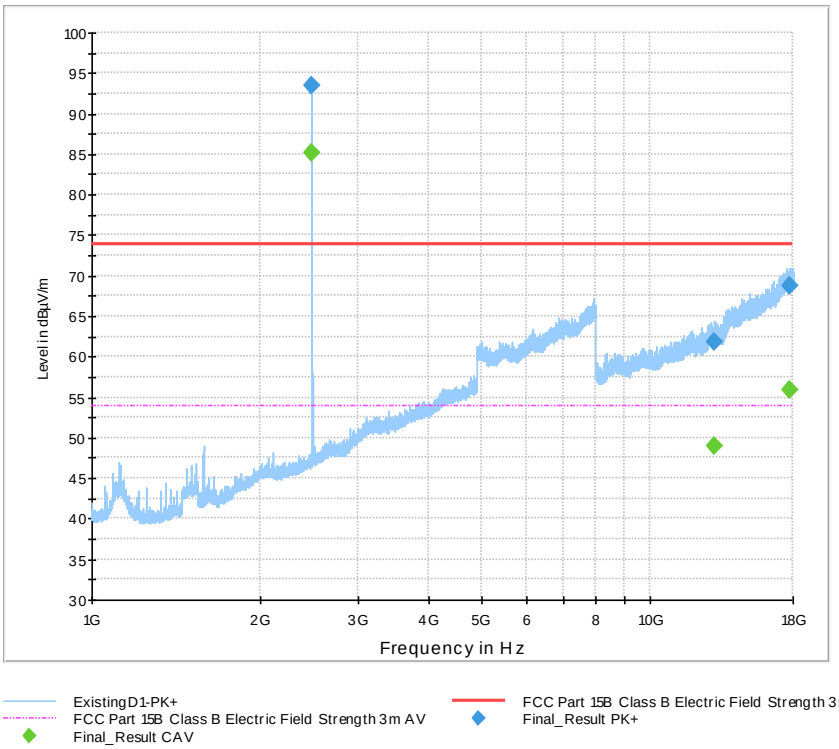
Preview Result 2-AVG
Preview Result 1-PK+
FCC Part 15C Electric Field Strength 3m QP+AV (9k-30M)
Final_Result QPK
Final_Result CAV



Final Results:

Frequency *MHz*	*QuasiPeak* *dBµV/m*	*Limit* *dBµV/m*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Height* *cm*	*Pol*	*Azimuth* *deg*	*Corr.* *dB*
39.060000	32.81	40.00	7.19	1000.0	120.000	113.0	V	-153.0	12.6
65.190000	29.65	40.00	10.35	1000.0	120.000	128.0	V	185.0	12.1
117.990000	34.06	43.50	9.44	1000.0	120.000	104.0	V	-11.0	10.6
375.000000	38.30	46.02	7.72	1000.0	120.000	103.0	H	-127.0	16.3
501.480000	40.09	46.02	5.93	1000.0	120.000	186.0	H	24.0	18.9
825.960000	39.64	46.02	6.38	1000.0	120.000	100.0	H	99.0	23.7

Product Service



Final Results:

Frequency *MHz*	*MaxPeak* *dBµV/m*	*CAverage* *dBµV/m*	*Limit* *dBµV/m*	*Margin* *dB*	*Meas. Time* *ms*	*Bandwidth* *kHz*	*Height* *cm*	*Pol*	*Azimuth* *deg*	*Corr.* *dB*
2479.750000	---	85.19	53.98	-31.21#1	1000.0	1000.000	125.0	H	32.0	32.9
2479.750000	93.47	---	73.98	-19.49#1	1000.0	1000.000	125.0	H	32.0	32.9
12985.250000	61.79	---	73.98	12.19	1000.0	1000.000	100.0	V	265.0	47.7
12985.250000	---	48.99	53.98	4.99	1000.0	1000.000	100.0	V	265.0	47.7
17705.000000	68.83	---	73.98	5.15	1000.0	1000.000	395.0	V	-24.0	54.6
17705.000000	---	55.81	53.98	-1.83	1000.0	1000.000	395.0	V	-24.0	54.6

Note:
#1 intentional radiation

Product Service

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

Attenuation below the general limits specified in § 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in 15.209(a)

Industry Canada RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

2.2.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde&Schwarz	FSV40	20219	12	2020-01-31
Vector Signal Generator	Rohde&Schwarz	SMBV100A	20238	24	2022-11-30
Signal Generator	Rohde&Schwarz	SMB100A	20215	36	2021-03-31
Switching Device	Rohde&Schwarz	OSP120 I	20248	24	2020-01-31
Switching Device	Rohde&Schwarz	OSP120 II	38807	24	2020-09-30
Radio Communication Tester	Rohde&Schwarz	CMW500	38845	12	2020-09-30
EMC Measurement Software	Rohde&Schwarz	EMC32	19719	---	---

Table 7

Product Service

Radiated test was carried out in Semi anechoic room - cabin no. 11.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Loop antenna	Rohde & Schwarz	HFH2-Z2	18876	36	2022-08-31
TRILOG Broadband Antenna	Schwarzbeck Mess-Elektronik	VULB 9163	19918	36	2022-09-30
EMI test receiver	Rohde & Schwarz	ESW44	39897	12	2020-02-29

Table 8

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.3 Band Edges

2.3.1 Specification Reference

FCC 47 CFR Part 15C, Industry Canada RSS-247 and Industry Canada RSS-GEN, Clause 15.247 (d), 5.5 and N/A

2.3.2 Equipment Under Test and Modification State

RMs Legic SM-6300, Serial Number: 04047503, Modification State: 0

2.3.3 Date of Test

2019-10-14

2.3.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.10.4.

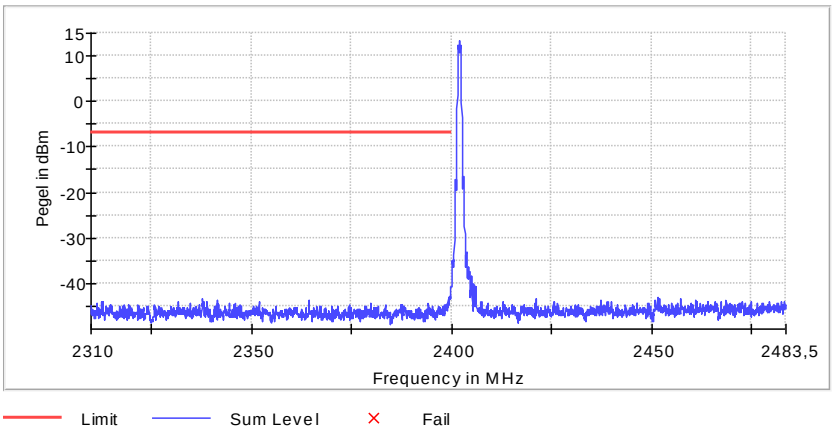
2.3.5 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	51.0 %

Product Service

2.3.6 Test Results

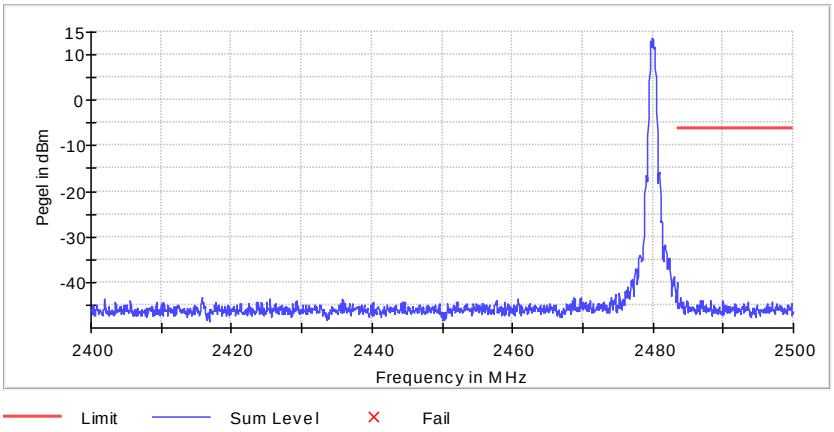
Test Mode with Continuous Transmission Channel 0 (2402 MHz) – Lower Band Edge



Final Results:

DUT Frequency (MHz)	Result
2402.000000	PASS

Test Mode with Continuous Transmission Channel 39 (2480 MHz) – Upper Band Edge



Final Results:

DUT Frequency (MHz)	Result
2480.000000	PASS

Product Service

FCC 47 CFR Part 15, Limit Clause 15.247 (d)

20 dB below the fundamental measured in a 100 kHz bandwidth using a peak detector. If the transmitter complies with the conducted power limits, based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB below the fundamental instead of 20 dB.

Industry Canada RSS-247, Limit Clause 5.5

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the RF power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided that the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of root-mean-square averaging over a time interval, as permitted under Section 5.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general field strength limits specified in RSS-Gen is not required.

2.3.7 Test Location and Test Equipment Used

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde&Schwarz	FSV40	20219	12	2020-01-31
Vector Signal Generator	Rohde&Schwarz	SMBV100A	20238	24	2022-11-30
Signal Generator	Rohde&Schwarz	SMB100A	20215	36	2021-03-31
Switching Device	Rohde&Schwarz	OSP120 I	20248	24	2020-01-31
Switching Device	Rohde&Schwarz	OSP120 II	38807	24	2020-09-30
Radio Communication Tester	Rohde&Schwarz	CMW500	38845	12	2020-09-30
EMC Measurement Software	Rohde&Schwarz	EMC32	19719	---	---

Table 9

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.4 Exposure of Humans to RF Fields

2.4.1 Specification Reference

IC RSS-GEN Issue 5, section 3.3 and
IC RSS-102, Issue 5, section 2.5
KDB 447498 D01 General RF Exposure Guidance v06, chapter 4.3.1

2.4.2 Equipment Under Test and Modification State

RMs Legic SM-6300, Serial Number: 04047503, Modification State: 0

2.4.3 Date of Test

2019-10-14

2.4.4 Test Method

Tests were performed with test software Rohde & Schwarz EMC 32, Version V10.40.00.

2.4.5 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	51.0 %

Product Service

2.4.6 Test Results

acc to KDB 447498 D01:

Maximum Radiated Power (EIRP) P_{max}:	13.0 dBm = 19.95 mW (acc. chapter 2.1.6)
Compliance Boundary d:	20 mm
Frequency f:	2480 MHz = 2.480 GHz
Numeric Threshold (P_{max} / d) $(f)^{0.5}$	1.5709
Numeric Threshold Limit (1 g head or body SAR):	≤ 3.0

Product Service

IC RSS-GEN Issue 5, section 3.3 and IC RSS-102, Issue 5, section 2.5:

Exposure of Humans to RF Fields	Applicable	Declared by applicant	Measured	Exemption
The antenna is				
☐ detachable				
The conducted output power (CP in watts) is measured at the antenna connector: CP = ---			☐	
The effective isotropic radiated power (EIRP in watts) is calculated using				
☐ the numerical antenna gain: G = dBi; $EIRP = G \cdot CP \Rightarrow EIRP$ = mW		☐		
☐ the field strength[1] in V/m: FS =V/m; $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ = ... W			☐	
with: Distance between the antennas in m: D = m			☐	
☐ not detachable				
A field strength measurement is used to determine the effective isotropic radiated power (EIRP in watts) given by: $EIRP = \frac{(FS \cdot D)^2}{30} \Rightarrow EIRP$ =13 dBm = 19.95 mW #2				
with: Field strength in V/m: FS = ---			☒	
Distance between the two antennas in m: D = ---			☒	
Selection of output power				
The output power TP is the higher of the conducted or effective isotropic radiated power (e.i.r.p.): TP = 19.95 mW				

Note:
#2 acc. to chapter 2.2 Spurious Radiated Emissions

[1] The conversion formula is valid only for properly matched antennas. In other cases the transmitter output power may have to be measured by a terminated measurement when applying the exemption clauses.
If an open area test site is used for field strength measurement, the effect due to the metal ground reflecting plane should be subtracted from the maximum field strength value in order to reference it to free space, before calculating TP.

Product Service

Exposure of Humans to RF Fields (continued)		Applicable	Declared by applicant	Measured	Exemption
Separation distance between the user and the transmitting device is					
☒ less than or equal to 20 cm	☐ greater than 20 cm		☒		
Transmitting device is					
☐ in the vicinity of the human head	☐ body-worn		☒		

Product Service

SAR evaluation				

SAR evaluation is required if the separation distance between the user and/or bystander and the antenna and/or radiating element of the device is less than or equal to 20 cm, except when the device operates at or below the applicable output power level (adjusted for tune-up tolerance) for the specified separation distance defined in the table.

For controlled use devices where the 8 W/kg for 1 gram of tissue applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 5. For limb-worn devices where the 10 gram value applies, the exemption limits for routine evaluation in the table are multiplied by a factor of 2.5. If the operating frequency of the device is between two frequencies located in the table, linear interpolation shall be applied for the applicable separation distance. For test separation distance less than 5 mm, the exemption limits for a separation distance of 5 mm can be applied to determine if a routine evaluation is required.

For medical implants devices, the exemption limit for routine evaluation is set at 1 mW. The output power of a medical implants device is defined as the higher of the conducted or e.i.r.p to determine whether the device is exempt from the SAR evaluation.

Frequency (MHz)	Exemption limits (mW)[2] at separation distance of									
	≤5 mm	10 mm	15 mm	20 mm	25 mm	30 mm	35 mm	40 mm	45 mm	≥50 mm
≤300 [3]	71	101	132	162	193	223	254	284	315	345
450	52	70	88	106	123	141	159	177	195	213
835	17	30	42	55	67	80	92	105	117	130
1900	7	10	18	34	60	99	153	225	316	431
2450	4	7	15	30	52	83	123	173	235	309
3500	2	6	16	32	55	86	124	170	225	290
5800	1	6	15	27	41	56	71	85	97	106

Carrier frequency:	f	=	2480 MHz	
Distance:	d	=	20 mm	☒
Transmitter output power:	TP	=	19.95 mW	
Limit:	TP_{limit}	=	30 mW	☒

☐ SAR evaluation is documented in test report no. .....

[2] The excemption limit in the table are based on measurements and simulations on half-wave dipole antennas at separaton distances of 5 mm to 25 mm from a flat phantom, providing a SAR value of approximately 0.4 W/kg for 1 g of tissue. For low frequencies (300 MHz to 835 MHz), the exemption limits are derived from a linear fit. For high frequencies (1900 MHz and above), the exemption limits are derived from a third order polynomial fit.

[3] Transmitters operating between 3 kHz and 10 MHz, meeting the exemption from routine SAR evaluation, shall demonstrate compliance to the instantaneous limits in IC RSS-102, issue 5, section 4.

Product Service

Exposure of Humans to RF Fields (continued)	Applicable	Declared by applicant	Measured	Exemption
RF exposure evaluation				
RF exposure evaluation is required if the separation distance between the user and/or bystander and the device's radiating element is greater than 20 cm, except when the device operates as follows: ☐ below 20 MHz[4] and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1 W (adjusted for tune-up tolerance). ☐ between 3 kHz and 10 MHz exposure limits apply as following: ☐ In a uncontrolled environment the basic restriction for the instantaneous internal electric field strength is equal to or less than 2.7 · 10-4 *f* V/m_{rms} at any part of the body where *f* is in Hz. The instantaneous RF field strength is equal or less than 83 V/m_{rms} and equal or less than 90 A/m_{rms}. ☐ In a controlled environment the basic restriction for the instantaneous internal electric field strength is equal to or less than 1.35 · 10-4 *f* V/m_{rms} at any part of the body where *f* is in Hz. The instantaneous RF field strength is equal or less than 170 V/m_{rms} and equal or less than 180 A/m_{rms}. ☐ at or above 20 MHz and below 48 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 4,49/$f^{0.5}$ W (adjusted for tune-up tolerance, where *f* is in MHz. ☐ at or above 48 MHz and below 300 MHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 0.6 W (adjusted for tune-up tolerance). ☐ at or above 300 MHz and below 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 1.31 · $10^{-2}f^{0.6834}$ W (adjusted for tune-up tolerance), where *f* is in MHz. ☐ at or above 6 GHz and the source-based, time-averaged maximum e.i.r.p. of the device is equal to or less than 5 W (adjusted for tune-up tolerance). In these cases, the information contained in the RF exposure technical brief may be limited to information that demonstrates how the e.i.r.p. was derived.				
Carrier frequency: f = **..... MHz** Transmitter output power: TP = **..... mW** Limit: TP_{limit} = **..... mW**				☐
☐ RF exposure evaluation is documented in test report no.				

[4] Transmitters operating between 3 kHz and 10 MHz, meeting the exemption from routine RF Exposure evaluation, shall demostrate compilance to the instanteneous limits in IC RSS-102, issue 5, section 4.

Product Service

2.5 Emission Bandwidth

2.5.1 Specification Reference

FCC 47 CFR Part 15 C, Clause 15.247(a)(2)
ISED RSS-247, Clause 5.2 a.
ISED RSS-Gen, Clause 6.7

2.5.2 Equipment under Test and Modification State

RMs Legic SM-6300, Serial Number: 04047503, Modification State: 0

2.5.3 Date of Test

2019-10-14

2.5.4 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	51.0 %

2.5.5 Specification Limits

For systems using digital modulation techniques, operating in the 902 MHz – 928 MHz, 2400 MHz – 2483.5 MHz and/or 5725 MHz – 5850 MHz bands, the minimum 6 dB bandwidth shall be at least 500 kHz

ISED RSS-GEN:
The occupied (99 %) bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSS.

2.5.6 Test Method

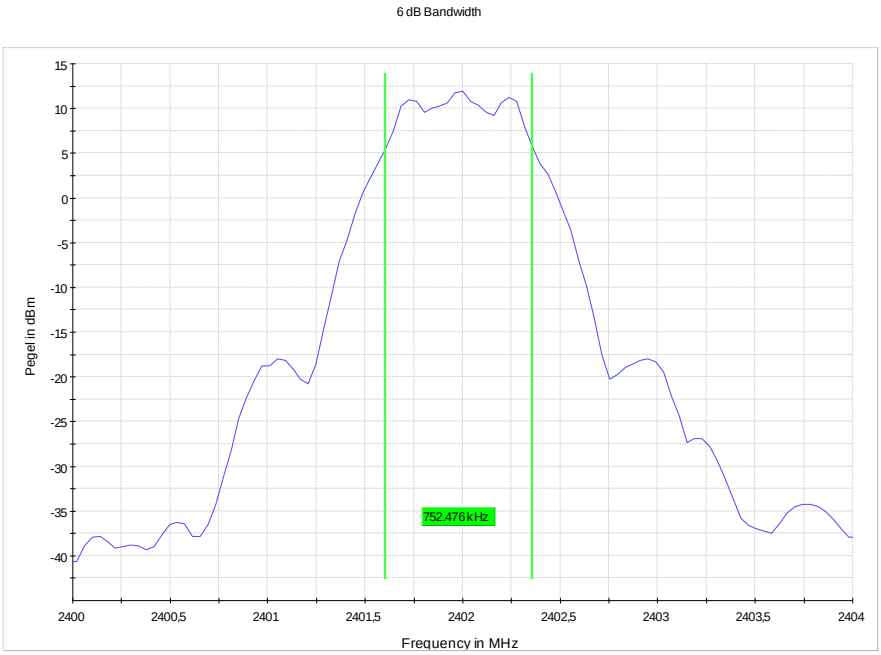
The test was performed according to ANSI C63.10, clauses 6.9.3 and 11.8.1

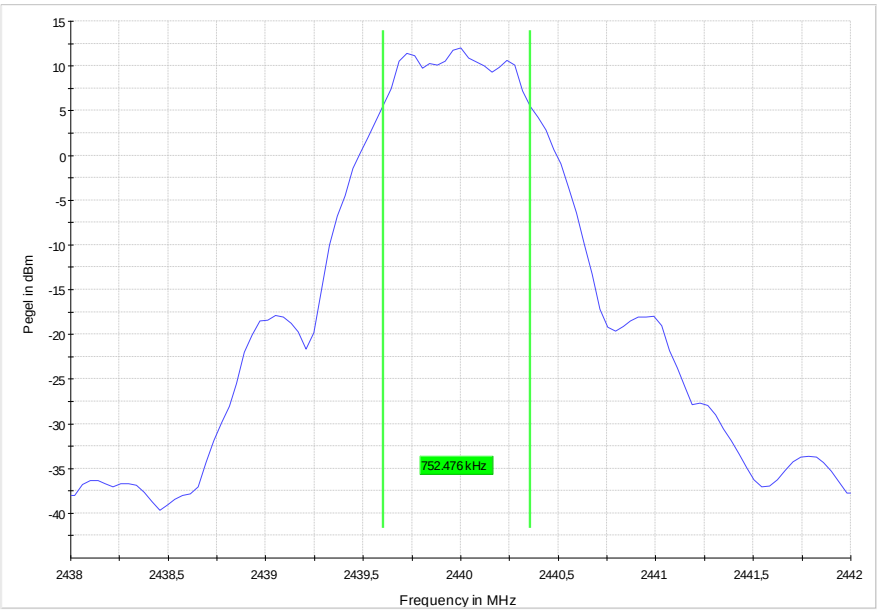
Product Service

2.5.7 Test Results

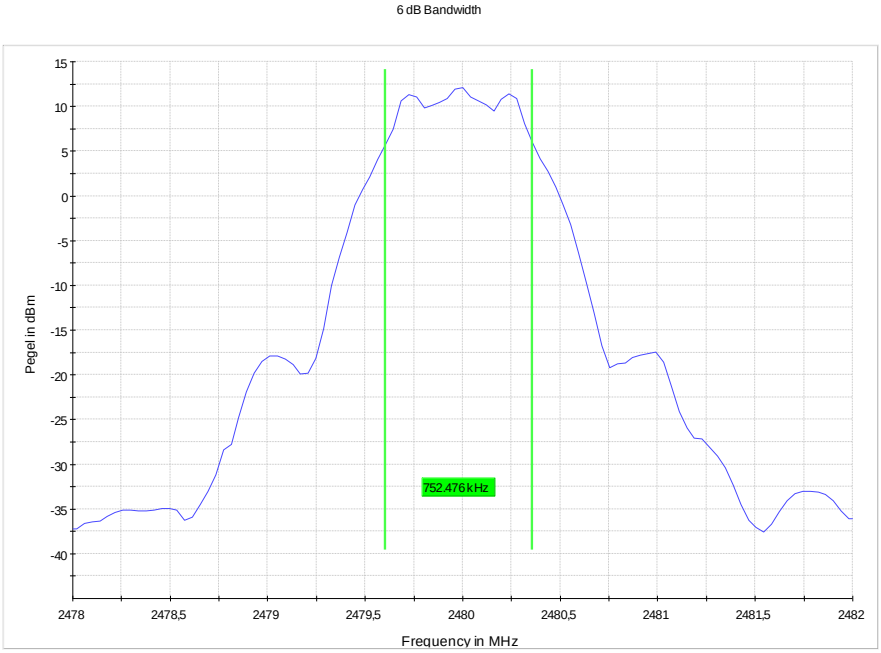
Frequency Channel	6 dB Bandwidth (MHz)	Limit (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402 MHz	0.752476	0.500	2401.603960	2402.356436
2440 MHz	0.752476	0.500	2439.603960	2440.356536
2480 MHz	0.752476	0.500	2479.603960	2480.356436

Table 10: 6 dB bandwidth



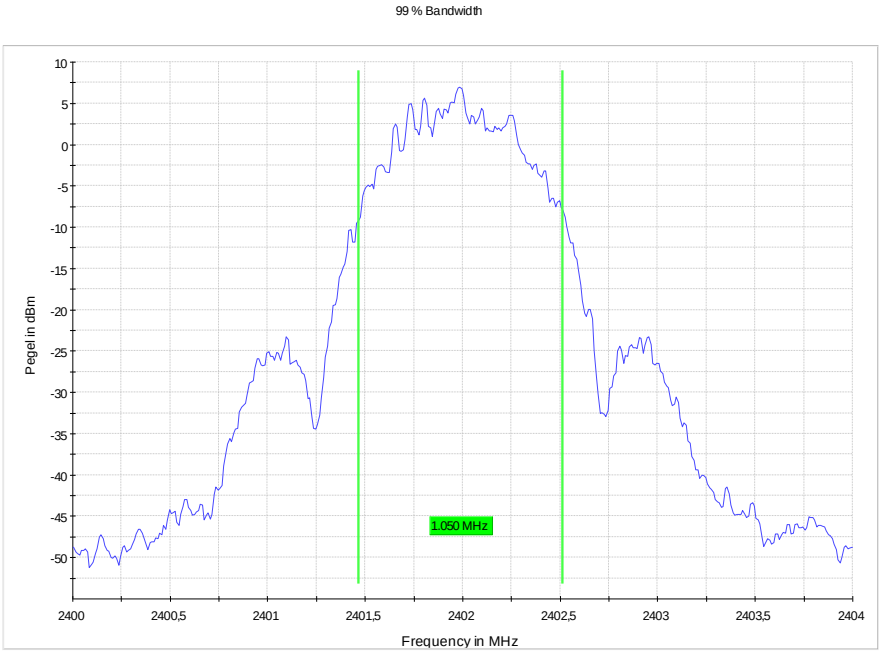


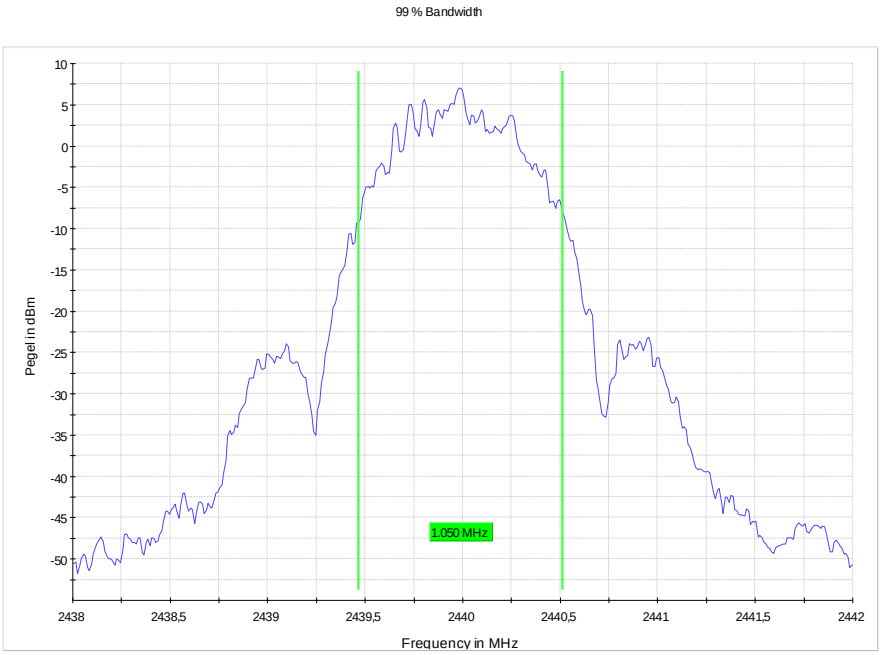
Product Service

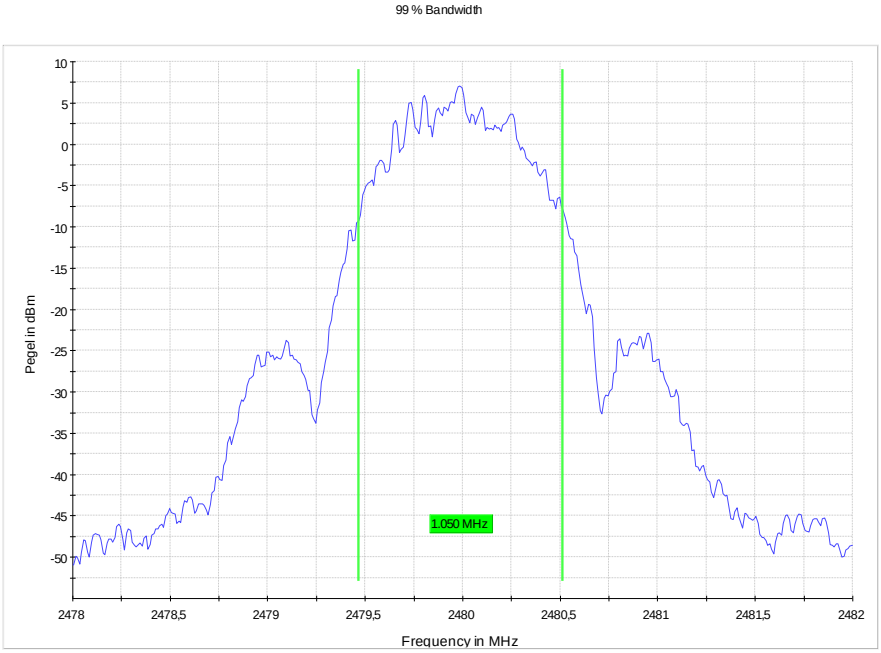


Frequency Channel	99% Bandwidth (MHz)	Band Edge Left (MHz)	Band Edge Right (MHz)
2402 MHz	1.050	2401.465	2402.515
2440 MHz	1.050	2439.465	2440.515
2480 MHz	1.050	2479.465	2480.515

Table 11: 99% bandwidth







2.5.8 Test Location and Test Equipment

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde&Schwarz	FSV40	20219	12	2020-01-31
Vector Signal Generator	Rohde&Schwarz	SMBV100A	20238	24	2022-11-30
Signal Generator	Rohde&Schwarz	SMB100A	20215	36	2021-03-31
Switching Device	Rohde&Schwarz	OSP120 I	20248	24	2020-01-31
Switching Device	Rohde&Schwarz	OSP120 II	38807	24	2020-09-30
Radio Communication Tester	Rohde&Schwarz	CMW500	38845	12	2020-09-30
EMC Measurement Software	Rohde&Schwarz	EMC32	19719	---	---

Table 12

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

2.6 Power Spectral Density

2.6.1 Specification Reference

FCC 47 CFR Part 15 C, Clause 15.247(e)
ISED RSS-247, Clause 5.2 b.

2.6.2 Equipment under Test and Modification State

RMs Legic SM-6300, Serial Number: 04047503, Modification State: 0

2.6.3 Date of Test

2019-10-14

2.6.4 Environmental Conditions

Ambient Temperature	23.0 °C
Relative Humidity	51.0 %

2.6.5 Specification Limits

FCC 47 CFR, section 15.257(e)
ISED RSS-247, Clause 5.2.(b)
The power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.
The same method (detector) of determining the conducted output power shall be used to determine the power spectral density.

2.6.6 Test Method

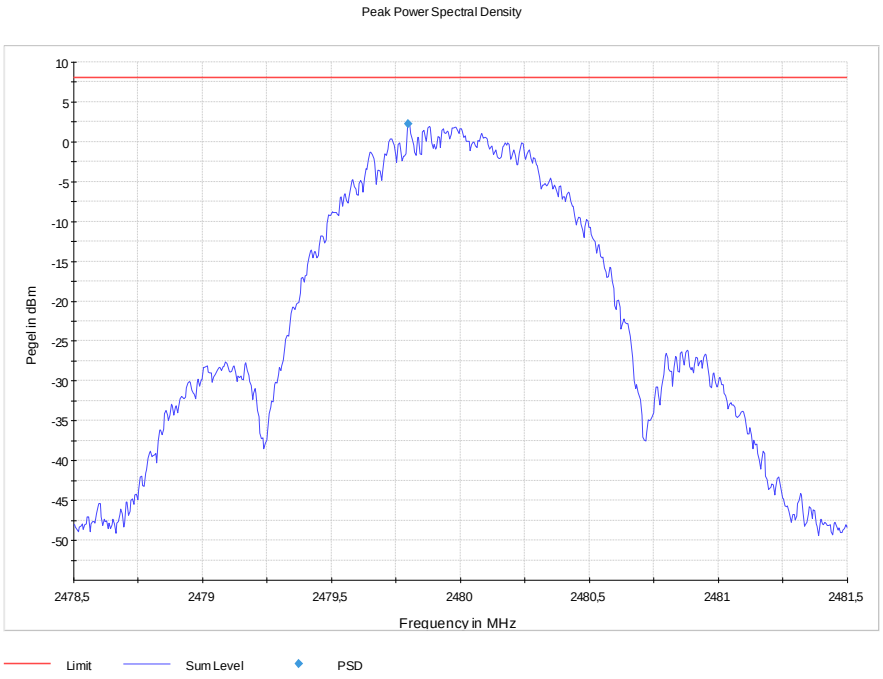
The test was performed according to ANSI C63.10, section 11.10

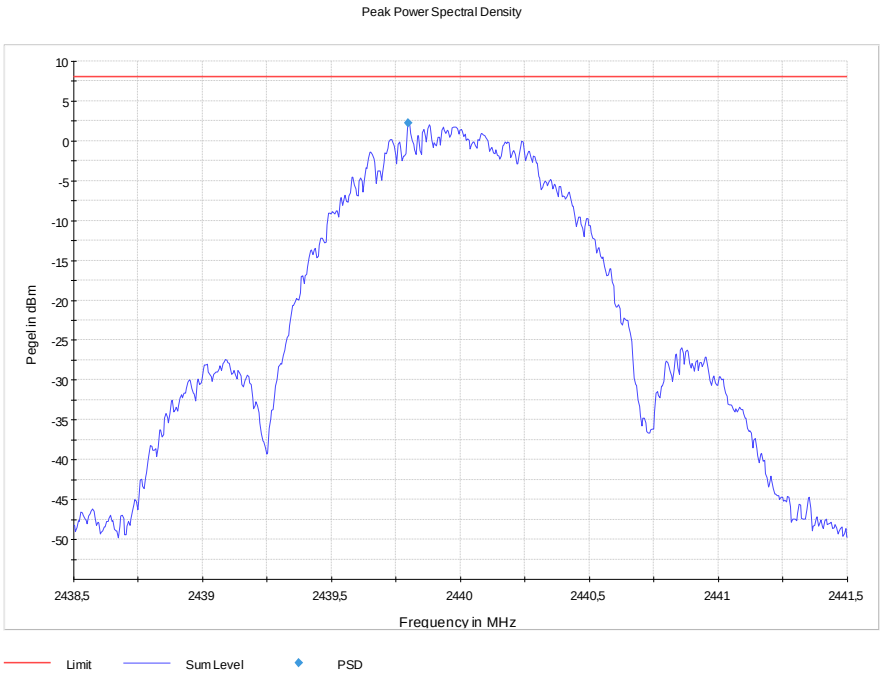
Product Service

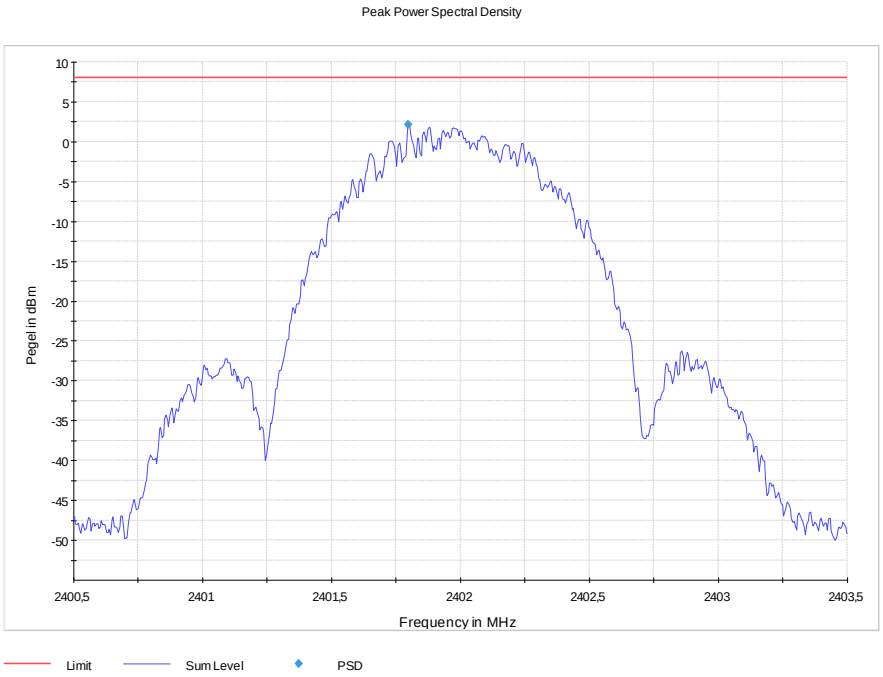
2.6.7 Test Results

Frequency Channel	Detector	Spectral Power Density (dBm)	Limit (dBm)
2402 MHz	PK	2.119	8.0
2440 MHz	PK	2.204	8.0
2480 MHz	PK	2.239	8.0

Table 13: Spectral Power Density







2.6.8 Test Location and Test Equipment

Conducted test was carried out in Non-shielded room with Test system TS8997.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Spectrum Analyzer	Rohde&Schwarz	FSV40	20219	12	2020-01-31
Vector Signal Generator	Rohde&Schwarz	SMBV100A	20238	24	2022-11-30
Signal Generator	Rohde&Schwarz	SMB100A	20215	36	2021-03-31
Switching Device	Rohde&Schwarz	OSP120 I	20248	24	2020-01-31
Switching Device	Rohde&Schwarz	OSP120 II	38807	24	2020-09-30
Radio Communication Tester	Rohde&Schwarz	CMW500	38845	12	2020-09-30
EMC Measurement Software	Rohde&Schwarz	EMC32	19719	---	---

Table 14

TU - Traceability Unscheduled
O/P Mon – Output Monitored using calibrated equipment
N/A - Not Applicable

Product Service

Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Radio Testing			
Test Name	kp	Expanded Uncertainty	Note
Occupied Bandwidth	2.0	±1.14 %	2
RF-Frequency error	1.96	±1 · 10-7	7
RF-Power, conducted carrier	2	±0.079 dB	2
RF-Power uncertainty for given BER	1.96	+0.94 dB / -1.05	7
RF power, conducted, spurious emissions	1.96	+1.4 dB / -1.6 dB	7
RF power, radiated			
25 MHz – 4 GHz	1.96	+3.6 dB / -5.2 dB	8
1 GHz – 18 GHz	1.96	+3.8 dB / -5.6 dB	8
18 GHz – 26.5 GHz	1.96	+3.4 dB / -4.5 dB	8
40 GHz – 170 GHz	1.96	+4.2 dB / -7.1 dB	8
Spectral Power Density, conducted	2.0	±0.53 dB	2
Maximum frequency deviation			
300 Hz – 6 kHz	2	±2,89 %	2
6 kHz – 25 kHz	2	±0.2 dB	2
Maximum frequency deviation for FM	2	±2,89 %	2
Adjacent channel power 25 MHz – 1 GHz	2	±2.31 %	2
Temperature	2	±0.39 K	4
(Relative) Humidity	2	±2.28 %	2
DC- and low frequency AC voltage			
DC voltage	2	±0.01 %	2
AC voltage up to 1 kHz	2	±1.2 %	2
Time	2	±0.6 %	2

Table 15

Radio Interference Emission Testing			
Test Name	kp	Expanded Uncertainty	Note
Conducted Voltage Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
100 kHz to 200 MHz (50Ω/5µH AMN)	2	± 3.6 dB	1
Discontinuous Conducted Emission			
9 kHz to 150 kHz (50Ω/50µH AMN)	2	± 3.8 dB	1
150 kHz to 30 MHz (50Ω/50µH AMN)	2	± 3.4 dB	1
Conducted Current Emission			
9 kHz to 200 MHz	2	± 3.5 dB	1
Magnetic Fieldstrength			
9 kHz to 30 MHz (with loop antenna)	2	± 3.9 dB	1
9 kHz to 30 MHz (large-loop antenna 2 m)	2	± 3.5 dB	1
Radiated Emission			
Test distance 1 m (ALSE)			
9 kHz to 150 kHz	2	± 4.6 dB	1
150 kHz to 30 MHz	2	± 4.1 dB	1
30 MHz to 200 MHz	2	± 5.2 dB	1
200 MHz to 2 GHz	2	± 4.4 dB	1
2 GHz to 3 GHz	2	± 4.6 dB	1
Test distance 3 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 5.0 dB	1
1 GHz to 6 GHz	2	± 4.6 dB	1
Test distance 10 m			
30 MHz to 300 MHz	2	± 4.9 dB	1
300 MHz to 1 GHz	2	± 4.9 dB	1
Radio Interference Power			
30 MHz to 300 MHz	2	± 3.5 dB	1
Harmonic Current Emissions			4
Voltage Changes, Voltage Fluctuations and Flicker			4

Table 16

Product Service

Immunity Testing			
Test Name	kp	Expanded Uncertainty	Note
Electrostatic Discharges			4
Radiated RF-Field			
Pre-calibrated field level	2	+32.2 / -24.3 %	5
Dynamic feedback field level	2.05	+21.2 / -17.5 %	3
Electrical Fast Transients (EFT) / Bursts			4
Surges			4
Conducted Disturbances, induced by RF-Fields			
via CDN	2	+15.1 / -13.1 %	6
via EM clamp	2	+42.6 / -29.9 %	6
via current clamp	2	+43.9 / -30.5 %	6
Power Frequency Magnetic Field	2	+20.7 / -17.1 %	2
Pulse Magnetic Field			4
Voltage Dips, Short Interruptions and Voltage Variations			4
Oscillatory Waves			4
Conducted Low Frequency Disturbances			
Voltage setting	2	± 0.9 %	2
Frequency setting	2	± 0.1 %	2
Electrical Transient Transmission in Road Vehicles			4

Table 17

Note 1:
The expanded uncertainty reported according to CISPR 16-4-2:2003-11 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 2:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 3:
The expanded uncertainty reported according to UKAS Lab 34 (Edition 1, 2002-08) is based on a standard uncertainty multiplied by a coverage factor of kp = 2.05, providing a level of confidence of p = 95.45%
Note 4:
It has been demonstrated that the used test equipment meets the specified requirements in the standard with at least a 95%confidence.
Note 5:
The expanded uncertainty reported according to IEC 61000-4-3 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 6:
The expanded uncertainty reported according to IEC 61000-4-6 is based on a standard uncertainty multiplied by a coverage factor of kp = 2, providing a level of confidence of p = 95.45%
Note 7:
The expanded uncertainty reported according ETSI TR 100 028 V1.4.1 (all parts) to is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45%

Product Service

Note 8:
The expanded uncertainty reported according to ETSI TR 102 273 V1.2.1 (all parts) is based on a standard uncertainty multiplied by a coverage factor of kp = 1.96, providing a level of confidence of p = 95.45