

FCC - TEST REPORT

Report Number : **60.790.18.037.01R01** Date of Issue : July 20, 2018

Model : LunaR

Product Type : BLE SMART WATCH

Applicant : DAYTON INDUSTRIAL CO. LTD

Address : 11A, 2-12 KWAI FAT ROAD, KWAI CHUNG, NEW TERRITORIES, HONGKONG

Production Facility : Kendy Electronics (Dongguan) Co. Ltd

Address : Xingsi Huangtang Village, Hengli Town, Dongguan City, Guangdong Province, P. R. China

Test Result : Positive Negative

Total pages including Appendices : 40

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2 Description of Equipment Under Test

Description of the Equipment Under Test

Product: BLE SMART WATCH

Model no.: LunaR

FCC ID: O4GLUNAR

Rating: 1. 3.7VDC (1 x 3.7VDC internal rechargeable battery)
2. 5.0VDC (USB cable provided by client & adaptor provided by laboratory)

Frequency: 2402MHz-2480MHz

Antenna gain: 0 dBi

Number of operated channel: 40

Modulation: GFSK

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Adapter	Apple	A1357	---

3 Summary of Test Standards

Test Standards
FCC Part 15 Subpart C 10-1-17 Edition Federal Communications Commission, PART 15 — Radio Frequency Devices, Subpart C — Unintentional Radiators

All the test methods for BLE were according to 558074 D01 DTS Meas Guidance v04 DTS Measurement Guidance and ANSI C63.10 (2013).

4 Details about the Test Laboratory

Site 1

Company name: TÜV SÜD Hong Kong Ltd.
 3/F, West Wing, Lakeside 2,
 10 Science Park West Avenue,
 Science Park, Shatin, Hong Kong

Site 2

Company name: TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch
 Building 12&13 Zhiheng Wisdomland Business Park,
 Nantou Checkpoint Road 2,
 Shenzhen 518052, P.R.China
 FCC Registration Number: 514049

Emission Tests	
Test Item	Test Site
FCC Part 15 Subpart C	
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	Site 2
FCC Title 47 Part 15.207 Conduct Emission	Site 2
FCC Title 47 Part 15.247 Bandedge Emission	Site 2
FCC Title 47 Part 15.247(a)(1) 6dB & 99% Bandwidth	Site 2
FCC Title 47 Part 15.247(b) Peak Output Power	Site 2
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	Site 2
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	Site 2
FCC Title 47 Part 15.247(e) Power Spectral Density	Site 2
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	Site 2

4.1 Test Equipment Site List

Radiated emission Test – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
EMI Test Receiver	Rohde & Schwarz	ESR 26	101269	2018-7-14
Trilog Super Broadband Test Antenna	Schwarzbeck	VULB 9163	707	2018-7-14
Horn Antenna	Rohde & Schwarz	HF907	102294	2018-7-14
Pre-amplifier	Rohde & Schwarz	SCU 18	102230	2018-7-14
Signal Generator	Rohde & Schwarz	SMY01	839369/005	2018-7-7
Attenuator	Agilent	8491A	MY39264334	2018-7-7
3m Semi-anechoic chamber	TDK	9X6X6	----	2020-7-7
Test software	Rohde & Schwarz	EMC32	Version 9.15.00	N/A

Bandwidth, Peak Output Power, Spurious Emissions at Antenna Terminals, 100kHz Bandwidth of band edges, Power Spectral Density – Site 2

DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	CAL. DUE DATE
Signal Generator	Rohde & Schwarz	SMB100A	108272	2018-7-7
Signal Analyzer	Rohde & Schwarz	FSV40	101030	2018-7-7
Vector Signal Generator	Rohde & Schwarz	SMU 200A	105324	2018-7-7
RF Switch Module	Rohde & Schwarz	OSP120/OSP-B157	101226/100851	2018-7-7

4.2 Measurement System Uncertainty

Measurement System Uncertainty Emissions

System Measurement Uncertainty	
Items	Extended Uncertainty
Uncertainty for Radiated Emission in 3m chamber 9kHz-30MHz	4.54dB
Uncertainty for Radiated Emission in 3m chamber 30MHz-1000MHz	Horizontal: 4.83dB; Vertical: 4.91dB;
Uncertainty for Radiated Emission in 3m chamber 1000MHz-25000MHz	Horizontal: 4.89dB; Vertical: 4.88dB;
Uncertainty for Conducted RF test	2.04dB

5 Summary of Test Results

Emission Tests				
FCC Part 15 Subpart C				
Test Condition	Pages	Test Result		
		Pass	Fail	N/A
FCC Title 47 Part 15.205, 15.209 & 15.247(d) Spurious Radiated Emission	10-15	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.207 Conduct Emission	NIL	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247Bandedge Emission	16-17	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(a)(2) 6dB & 99% Bandwidth	18-20	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(b) Peak Output Power	21-23	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 2.1051 & 15.247(d) Spurious Emissions at Antenna Terminals	24-26	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(d) 100kHz Bandwidth of band edges	27-28	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.247(e) Power Spectral Density	29-31	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FCC Title 47 Part 15.203 & 15.247(b) Antenna Requirement	32	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

6 General Remarks

Remarks

NIL

SUMMARY:

- All tests according to the regulations cited on page 5 were

- Performed

- **Not** Performed

- The Equipment Under Test

- **Fulfills** the general approval requirements.

- **Does not** fulfill the general approval requirements.

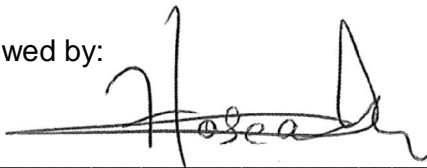
Sample Received Date: June 15, 2018

Testing Start Date: June 18, 2018

Testing End Date: July 6, 2018

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch -

Reviewed by:



Hosea CHAN
EMC Project Engineer

Prepared by:



Eric LI
EMC Senior Project Engineer

7 Emission Test Results

7.1 Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (worst case)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.7VDC
 Remark: 9kHz to 1GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
49.777	15.00	40.00	-25.00	Quasi Peak
57.968	14.79	40.00	-25.21	Quasi Peak
181.536	11.46	43.50	-32.04	Quasi Peak
280.368	18.18	46.00	-27.82	Quasi Peak
445.645	19.88	46.00	-26.12	Quasi Peak
877.187	32.43	46.00	-13.57	Quasi Peak

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (worst case)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.7VDC
 Remark: 9kHz to 1GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
32.102	23.72	40.00	-16.28	Quasi Peak
38.892	20.43	40.00	-19.57	Quasi Peak
63.519	17.40	40.00	-22.60	Quasi Peak
280.152	18.79	46.00	-27.21	Quasi Peak
437.885	18.78	46.00	-27.22	Quasi Peak
888.989	30.98	46.00	-15.02	Quasi Peak

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.7VDC
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dB μ V/m	Limit dB μ V/m	Margin dB	Detector
1255.84	26.14*	54.00	-27.86	Peak
2290.08	39.15*	54.00	-14.85	Average
4121.25	36.40*	54.00	-17.60	Peak
4804.00	37.52*	54.00	-16.48	Peak
7540.78	40.36*	54.00	-13.64	Peak

Remark*: As the peak value were below the average limit, so average value no need to be measured.

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.7VDC
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
1286.25	25.74*	54.00	-28.26	Peak
2290.37	38.36*	54.00	-15.64	Peak
4185.00	34.56*	54.00	-19.44	Peak
4804.00	39.65*	54.00	-14.35	Peak
9989.06	42.15*	54.00	-11.85	Peak

Remark*: As the peak value were below the average limit, so average value no need to be measured.

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.7VDC
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
1250.81	26.38*	54.00	-27.62	Peak
2312.06	40.37*	54.00	-13.63	Peak
2559.81	36.37*	54.00	-17.63	Peak
4880.00	38.83*	54.00	-15.17	Peak
7982.34	41.10*	54.00	-12.90	Peak

Remark*: As the peak value were below the average limit, so average value no need to be measured.

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.7VDC
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
1253.31	25.26*	54.00	-28.74	Peak
2312.12	36.39*	54.00	-17.61	Peak
4880.00	38.62*	54.00	-15.38	Peak
6221.25	38.65*	54.00	-15.35	Peak

Remark*: As the peak value were below the average limit, so average value no need to be measured.

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Horizontal
 Comment: 3.7VDC
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
1445.00	26.10*	54.00	-27.90	Peak
2352.12	40.87*	54.00	-13.13	Peak
4121.25	36.40*	54.00	-17.60	Peak
4960.00	40.12*	54.00	-13.88	Peak
7540.78	40.26*	54.00	-13.74	Peak

Remark*: As the peak value were below the average limit, so average value no need to be measured.

Spurious Radiated Emission

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.205, 15.209 & 15.247(d) Antenna: Vertical
 Comment: 3.7VDC
 Remark: 1GHz to 25GHz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

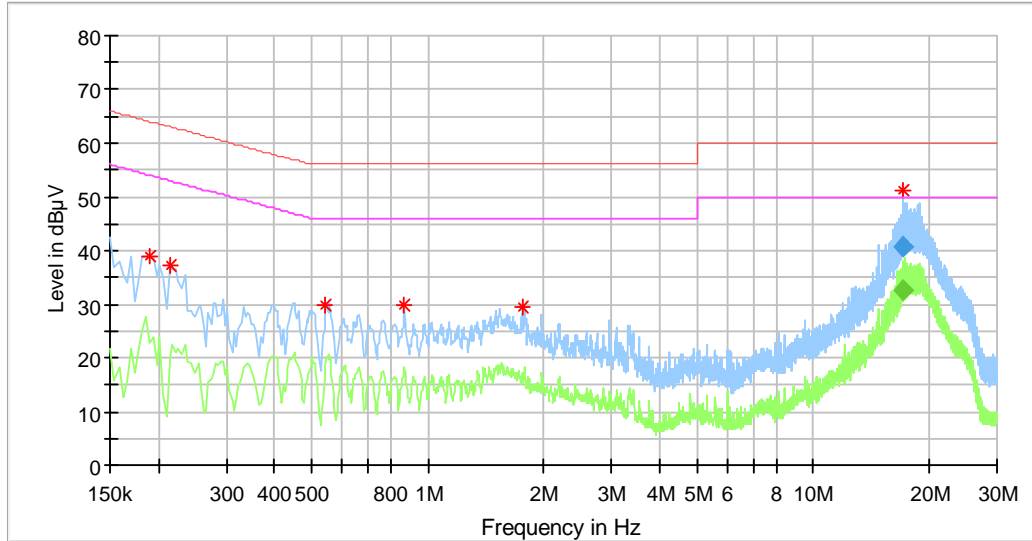
Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector
1245.31	24.41*	54.00	-29.59	Peak
1768.44	29.52*	54.00	-24.48	Peak
2360.63	38.87*	54.00	-15.13	Peak
4960.00	39.46*	54.00	-14.54	Peak
9486.56	43.17*	54.00	-10.83	Peak

Remark*: As the peak value were below the average limit, so average value no need to be measured.

7.2 Conducted Emission

EUT: LunaR
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.207, Conducted Emission, L Line
 Comment: 120VAC, 60Hz

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



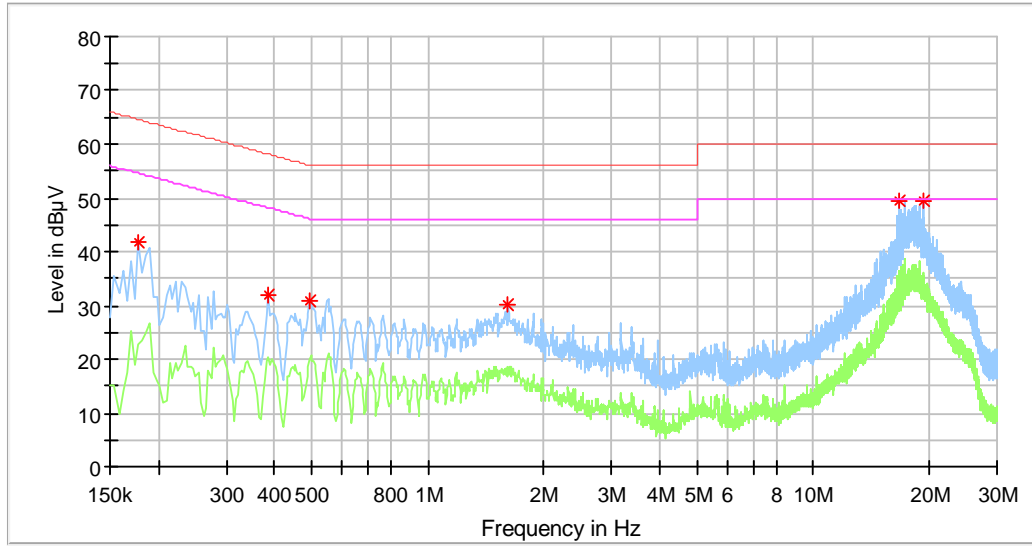
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.190000	38.95	---	64.04	-25.08
0.214000	37.33	---	63.05	-25.72
0.542000	29.82	---	56.00	-26.18
0.870000	29.67	---	56.00	-26.33
1.758000	29.47	---	56.00	-26.53
17.073500	51.20	---	60.00	-8.80

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
17.073500	---	32.77	50.00	-17.23
17.073500	40.78	---	60.00	-19.22

Conducted Emission

EUT: LunaR
 Op Condition: Operated, TX Mode
 Test Specification: FCC15.207, Conducted Emission, N Line
 Comment: 120VAC, 60Hz

Test Result
 Passed
 Not Passed

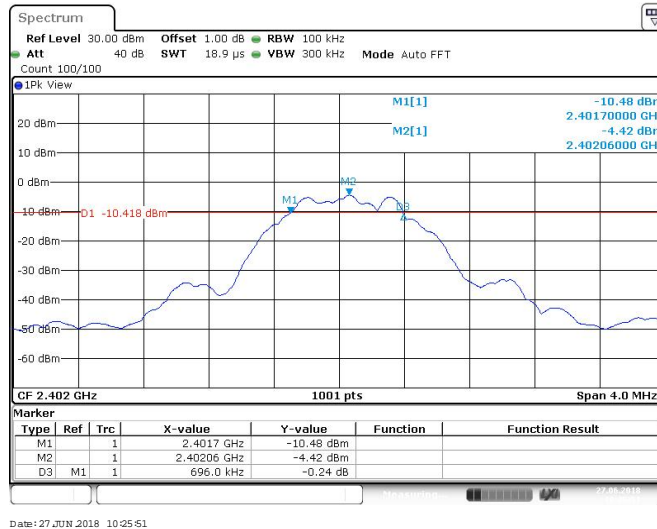


Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)
0.178000	41.58	---	64.58	-23.00
0.386000	32.00	---	58.15	-26.15
0.494000	31.04	---	56.10	-25.06
1.618000	30.15	---	56.00	-25.85
16.698000	49.31	---	60.00	-10.69
19.278000	49.43	---	60.00	-10.57

7.3 6dB & 99% Bandwidth

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth & 99% Bandwidth
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

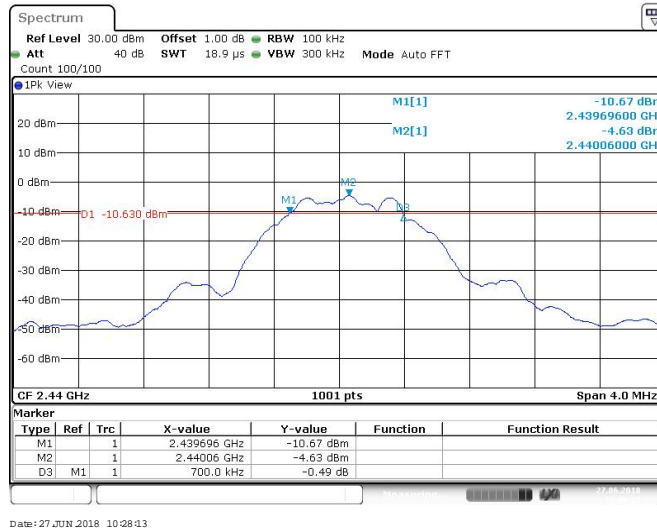


Bandwidth	Measured Value	Limit
6dB bandwidth	696.000 kHz	> 500 kHz
99% OCB	1050.949 kHz	NA

6dB & 99% Bandwidth

EUT: LunaR
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth & 99% Bandwidth
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

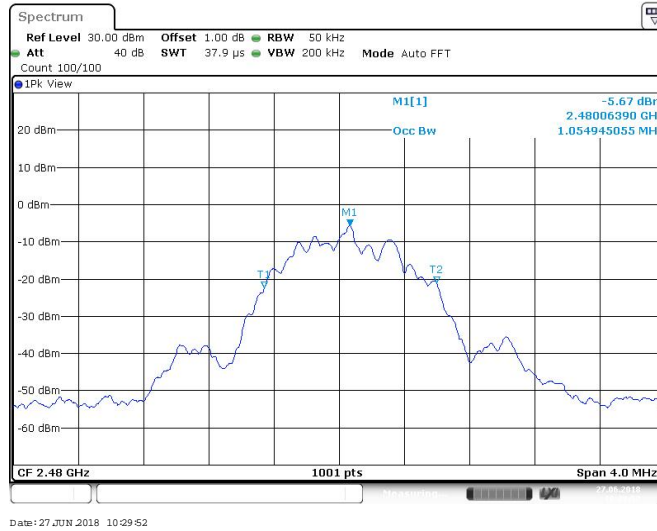
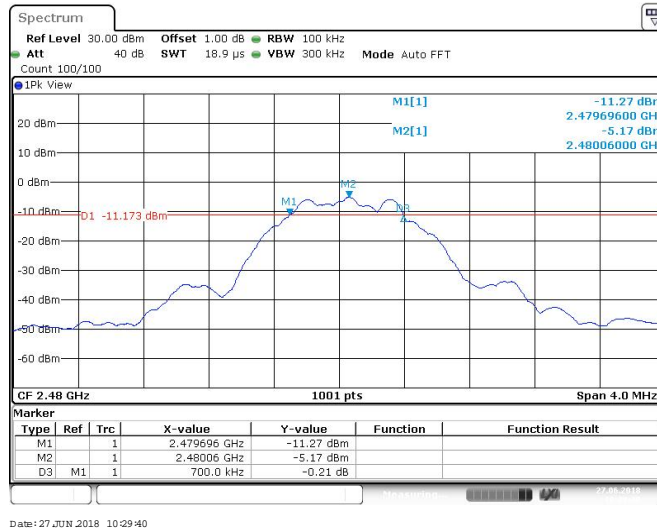


Bandwidth	Measured Value	Limit
6dB bandwidth	700.000 kHz	> 500 kHz
99% OCB	1054.945 kHz	NA

6dB & 99% Bandwidth

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(a)(2), 6dB Bandwidth & 99% Bandwidth
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

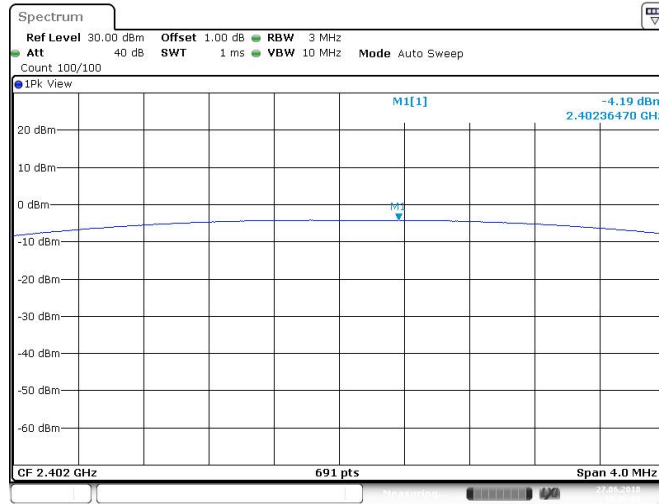


Bandwidth	Measured Value	Limit
6dB bandwidth	700.000 kHz	> 500 kHz
99% OCB	1054.945 kHz	NA

7.4 Peak Output Power

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(b)
 Comment: 3.7VDC, Antenna gain: 0 dBi,

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



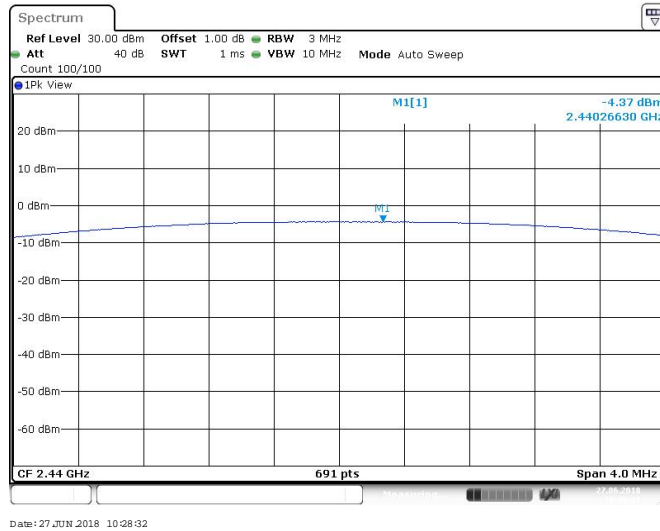
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Conducted Output Power	Limit
-4.19dBm	< 30dBm

Peak Output Power

EUT: LunaR
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.247(b)
 Comment: 3.7VDC, Antenna gain: 0 dBi,

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

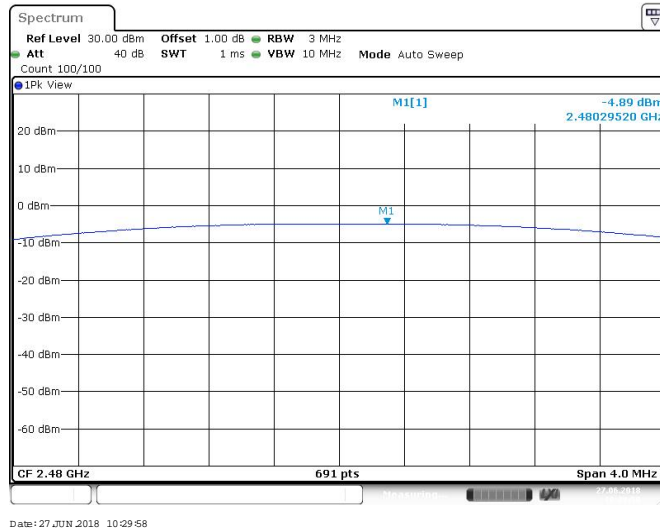


Conducted Output Power	Limit
-4.37 dBm	< 30dBm

Peak Output Power

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(b)
 Comment: 3.7VDC, Antenna gain: 0 dBi,

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Conducted Output Power	Limit
-4.89 dBm	< 30dBm

7.5 Spurious Emissions at Antenna Terminals

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Channel	FreqRange	RefLevel	Result	Limit	Verdict
2402	Reference	-4.54	-4.54	---	PASS
2402	30~1000	-4.54	-69.23	-24.54	PASS
2402	1000~26500	-4.54	-50.48	-24.54	PASS

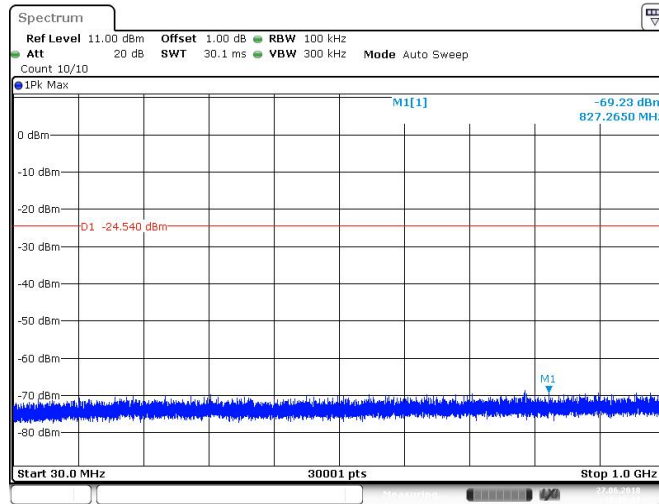


Date: 27 JUN 2018 10:26:33

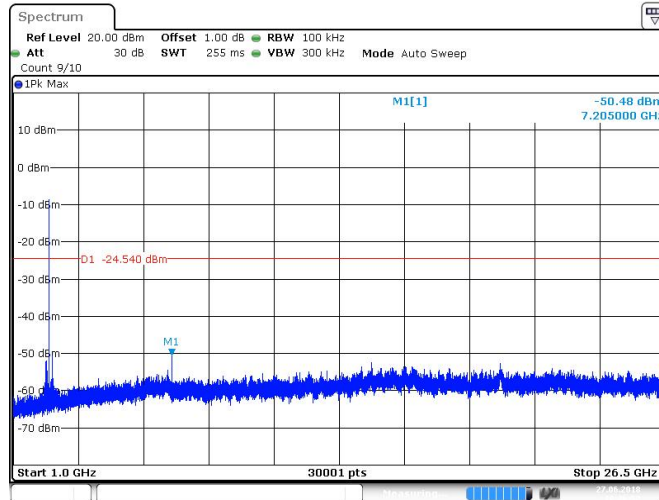
Spurious Emissions at Antenna Terminals

EUT: LunaR
Op Condition: Operated, TX Mode (2402MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 27 JUN 2018 10:26:41



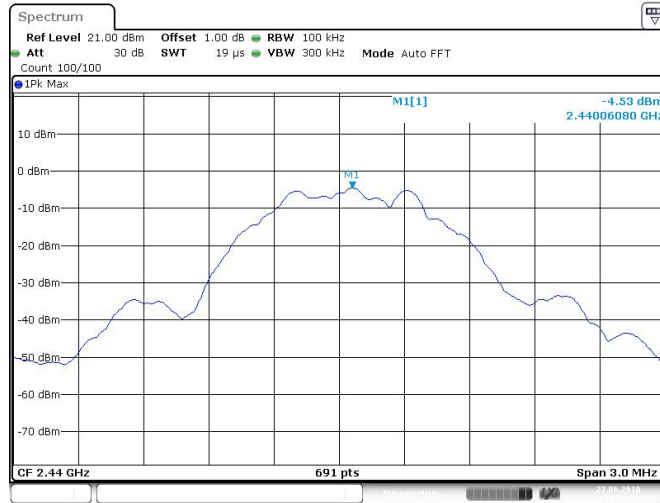
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Spurious Emissions at Antenna Terminals

EUT: LunaR
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Channel	FreqRange	RefLevel	Result	Limit	Verdict
2440	Reference	-4.53	-4.53	---	PASS
2440	30~1000	-4.53	-68.57	-24.53	PASS
2440	1000~26500	-4.53	-50.26	-24.53	PASS

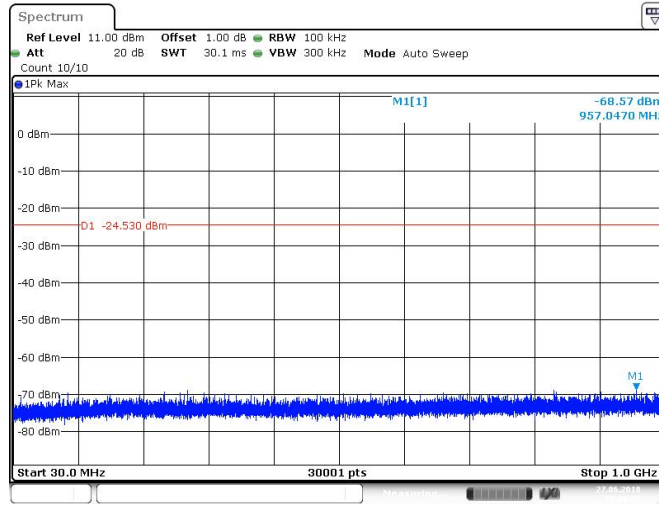


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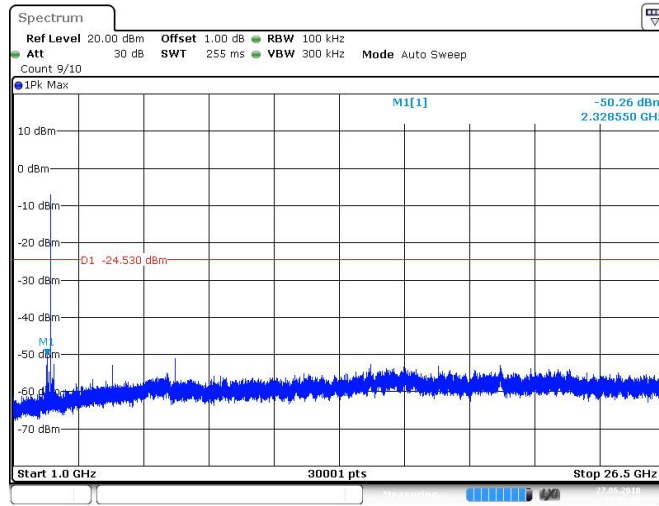
Spurious Emissions at Antenna Terminals

EUT: LunaR
Op Condition: Operated, TX Mode (2440MHz)
Test Specification: FCC2.1051 & 15.247(d)
Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 27 JUN 2018 10:28:55



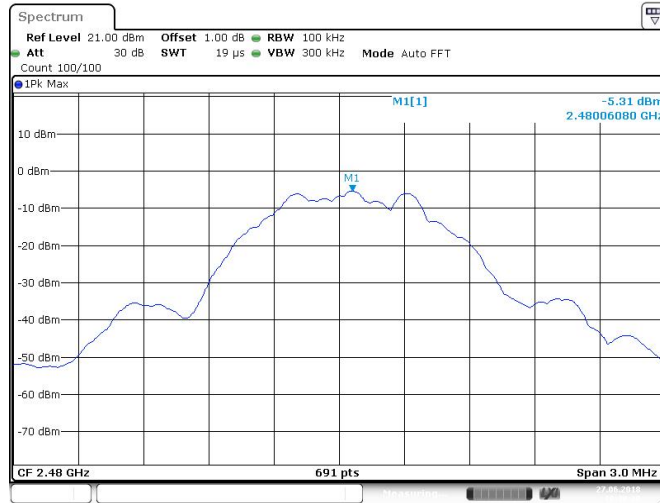
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Spurious Emissions at Antenna Terminals

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Channel	FreqRange	RefLevel	Result	Limit	Verdict
2480	Reference	-5.31	-5.31	---	PASS
2480	30~1000	-5.31	-68.95	-25.31	PASS
2480	1000~26500	-5.31	-49.04	-25.31	PASS

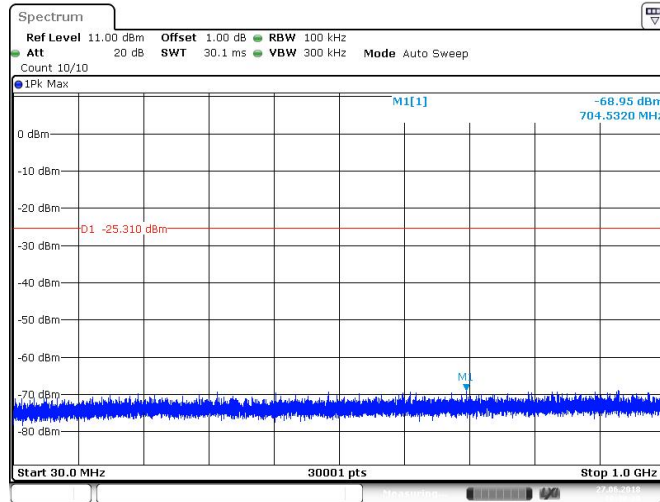


Date: 27 JUN 2018 10:30:20

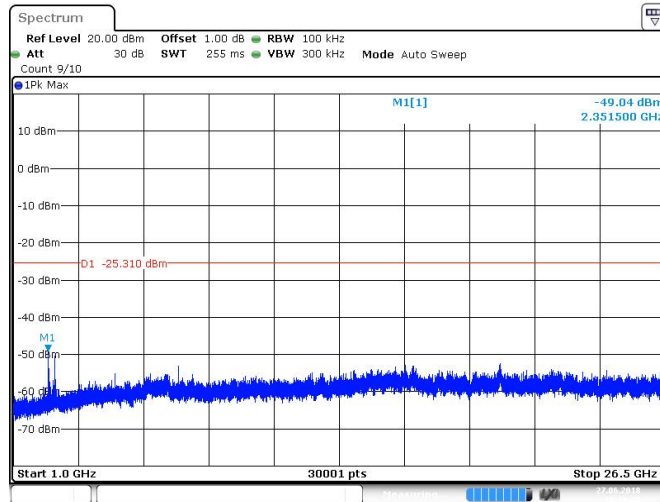
Spurious Emissions at Antenna Terminals

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC2.1051 & 15.247(d)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 27 JUN 2018 10:30:29

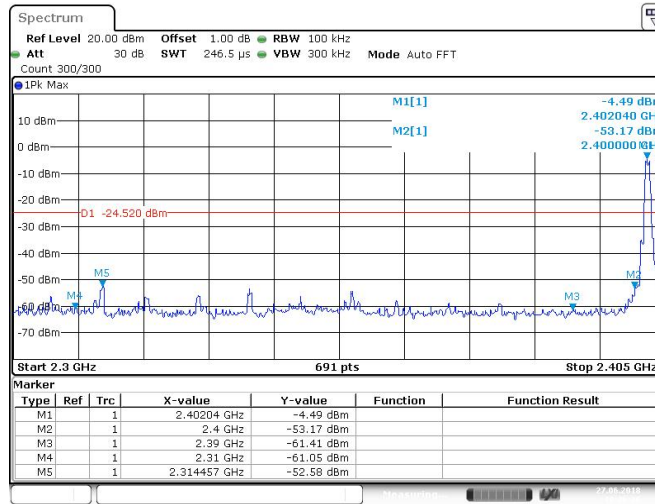


Date: 27 JUN 2018 10:30:40

7.6 100kHz Bandwidth of band edges

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(d), Conducted
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 27 JUN 2018 10:26:26

Band edges	Limit
48.68 dB	> 20dB

100kHz Bandwidth of band edges BLE

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(d), Radiated
 Comment: 3.7VDC

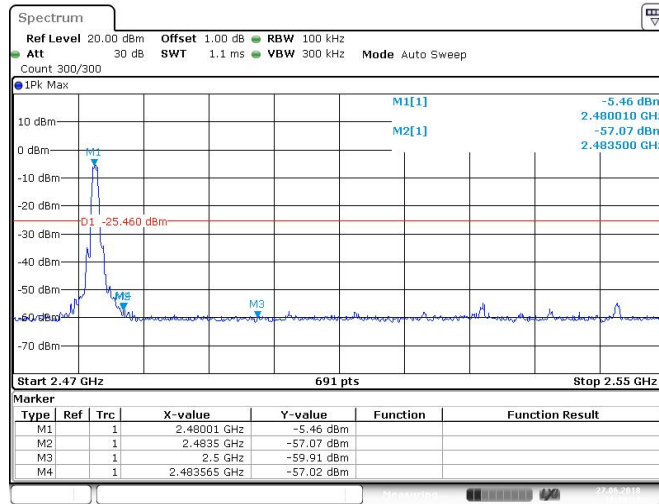
Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector	Polarity
2400.000	44.72	74	-29.28	Peak	H
2400.000	35.85	54	-18.15	Average	H
2400.000	43.68	74	-30.32	Peak	V
2400.000	36.21	54	-17.79	Average	V

100kHz Bandwidth of band edges

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(d), Conducted
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 27 JUN 2018 10:30:14

Band edges	Limit
51.61 dB	> 20dB

100kHz Bandwidth of band edges BLE

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(d), Radiated
 Comment: 3.7VDC

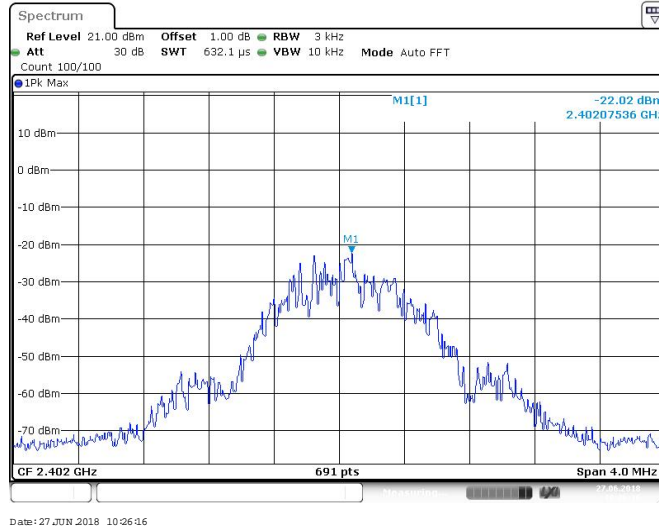
Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Frequency MHz	Result dBµV/m	Limit dBµV/m	Margin dB	Detector	Polarity
2483.500	43.87	74	-30.13	Peak	H
2483.500	35.23	54	-18.77	Average	H
2483.500	42.12	74	-31.88	Peak	V
2483.500	34.68	54	-19.32	Average	V

7.7 Power Spectral Density

EUT: LunaR
 Op Condition: Operated, TX Mode (2402MHz)
 Test Specification: FCC15.247(e)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

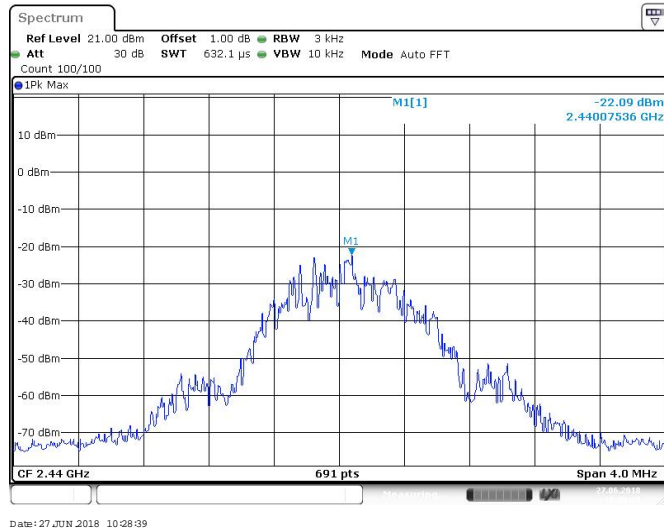


PSD	Limit
-22.02dBm	< 8 dBm

Power Spectral Density

EUT: LunaR
 Op Condition: Operated, TX Mode (2440MHz)
 Test Specification: FCC15.247(e)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

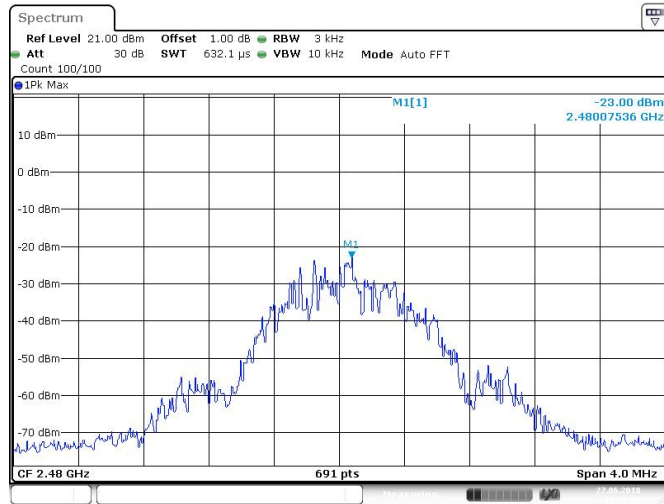


PSD	Limit
-22.09 dBm	< 8 dBm

Power Spectral Density

EUT: LunaR
 Op Condition: Operated, TX Mode (2480MHz)
 Test Specification: FCC15.247(e)
 Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed



Date: 27 JUN 2018 10:30:05

PSD	Limit
-23.00 dBm	< 8 dBm

7.8 Antenna Requirement

EUT: LunaR
Op Condition: Operated, TX Mode
Test Specification: FCC15.203 & 15.247(b)
Comment: 3.7VDC

Test Result	
<input checked="" type="checkbox"/>	Passed
<input type="checkbox"/>	Not Passed

Limit

For intentional device, according to FCC Title 47 Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC Title 47 Part 15.247(b), if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The antenna used in this product is a Copper rod assembled on PCB, and the maximum gain of this antenna is 0.0 dBi. (Antenna Type: on-board antenna)

8 Appendix A - General Product Information

Radiofrequency radiation exposure evaluation

According to KDB 447498 D01v06 section 4.3.1, For frequencies between 100 MHz to 6GHz and test separation distances ≤ 50 mm, the Numeric threshold is determined as:

Step a)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

Step a)

$[(\text{max. power of channel, including tune-up tolerance, mW}) / (\text{min. test separation distance, mm})] \cdot [\sqrt{f(\text{GHz})}] \leq 3.0$ for 1-g SAR

>> The fundamental frequency of the EUT is 2402-2480MHz,
the test separation distance is ≤ 50 mm.
(Manufacturer specified the separation distance is: 5mm)

Step a)

>> Numeric threshold (2402MHz), $\text{mW} / 5\text{mm} \cdot \sqrt{2.402\text{GHz}} \leq 3.0$
Numeric threshold (2402MHz) $\leq 9.678\text{mW}$

>> Numeric threshold (2440MHz), $\text{mW} / 5\text{mm} \cdot \sqrt{2.441\text{GHz}} \leq 3.0$
Numeric threshold (2440MHz) $\leq 9.601\text{mW}$

>> Numeric threshold (2480MHz), $\text{mW} / 5\text{mm} \cdot \sqrt{2.480\text{GHz}} \leq 3.0$
Numeric threshold (2480MHz) $\leq 9.525\text{mW}$

>> The power of EUT measured (2402MHz) is: $-4.19\text{dBm} = 0.381\text{mW}$
The power of EUT measured (2440MHz) is: $-4.37\text{dBm} = 0.366\text{mW}$
The power of EUT measured (2480MHz) is: $-4.89\text{dBm} = 0.324\text{mW}$

Which is smaller than the Numeric threshold.

Therefore, the device is exempt from stand-alone SAR test requirements.