

Limited Test report

341244-4TRFWL

Date of issue: April 2, 2018

Applicant:

MEPS Real-Time, Inc.

Product:

RS2000-1 Module

Model: IG-RS2000-1

Model variant: N/A

FCC ID: SOA-RS2000

IC Registration number: 22150-RS2000

Specifications:

◆ **FCC 47 CFR Part 15 Subpart C, §15.247**

Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz

◆ **RSS-247, Issue 2, February 2017**

Digital Transmission Systems (DTSSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

Test location

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State	California
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Country	USA
Telephone	+1 760 444 3500
Website	www.nemko.com
FCC Site Number	Test Firm Registration Number: 392943 Designation Number: US5058
ISED Test Site	2040B-3

Tested by	Juan Manuel Gonzalez
Reviewed by	James Morris
Review date	April 2, 2018
Reviewer signature	<i>James E Morris</i>

Limits of responsibility

Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025. All results contain in this report are within Nemko USA's ISO/IEC 17025 accreditation.

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name	MEPS Real-Time Inc.
Address	6451 El Camino Real Suite C
City	Carlsbad
State	CA
Postal/Zip code	92009
Country	U.S.A.

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.247	Operation in the 902–928 MHz, 2400–2483.5 MHz, 5725–5850 MHz
RSS-247, Issue 2, February 2017	Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices

1.3 Test methods

ANSI C64.3-2014	American National Standard for Methods of Measurement of Radio- Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
ANSI C63.10-2013	American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

1.4 Statement of compliance

In the configuration tested, the EUT was found compliant .

Limited testing was completed against some relevant requirements of the test standard due to new bent monopole RFID antennas designed by MEPS. Results obtained indicate that the product under test complies with the requirements tested. The test results relate only to the items tested and the full radio test data can be find in Impinj's RS2000 original certification (FCC ID: TWYIPJRS2000 IC ID:6324A-IPJRS2000)

See "Summary of test results" for full details.

1.5 Exclusions

None

1.6 Test report revision history

Revision #	Details of changes made to test report
TRF	Original report issued
1TRF	Update FCC/IC ID's and description.
2TRF	Add 99% OBW
3TRF	Added FCC/ISED #, Corrected Section 2.2,2.3, P7 listed Spurious from new antenna/2.2dBi antenna gain, P12 revise equipment list to add >18GHz horn antenna.
4TRF	P8 section 3.7, Table 3.7-1: Antenna gain corrected from 2.3 dBi to 2.2dBi

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.207(a)	Conducted limits ¹	Pass
§15.31(e)	Variation of power source	Not tested
§15.203	Antenna requirement	Pass ¹
§15.205	Restricted bands of operation	Pass

Notes: ¹ The module utilizes four bent monopole RFID antennas positioned to provide complete coverage in the final host. The transmission is performed sequentially (no more than one antenna transmitting at the time).

2.2 FCC Part 15 Subpart C, intentional radiators test results

Part	Test description	Verdict
§15.247(a)(1)	20 dB bandwidth of the hopping channel	Not tested
§15.247(a)(1)(i)	Frequency hopping systems operating in the 902–928 MHz band	Not tested
§15.247(a)(1)(ii)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
§15.247(a)(1)(iii)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
§15.247(a)(2)	Minimum 6 dB bandwidth for systems using digital modulation techniques	Not applicable
§15.247(b)(1)	Maximum peak output power of frequency hopping systems operating in the 2400–2483.5 MHz band and 5725–5850 MHz band	Not tested
§15.247(b)(2)	Maximum peak output power of Frequency hopping systems operating in the 902–928 MHz band	Not tested
§15.247(b)(3)	Maximum peak output power of systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands	Not applicable
§15.247(c)(1)	Fixed point-to-point operation with directional antenna gains greater than 6 dBi	Not applicable
§15.247(c)(2)	Transmitters operating in the 2400–2483.5 MHz band that emit multiple directional beams	Not applicable
§15.247(d)	Spurious emissions	Pass
§15.247(e)	Power spectral density for digitally modulated devices	Not applicable
§15.247(f)	Time of occupancy for hybrid systems	Not applicable

2.3 IC RSS-GEN, Issue 4, test results

Part	Test description	Verdict
7.1.2	Receiver radiated emission limits ¹	Not applicable
7.1.3	Receiver conducted emission limits ¹	Not applicable
8.8	Power Line Conducted Emissions Limits for Licence-Exempt Radio Apparatus	Pass
8.10	Restricted Frequency Bands	Pass

Notes: ¹ According to sections 5.2 and 5.3 of RSS-Gen, Issue 4 the EUT does not have a stand-alone receiver neither scanner receiver, therefore exempt from receiver requirements.

EUT is a FHSS module in the 902-928 MHz band previously certified by Impinj's as model: RS2000 with original certifications: FCC ID: TWYIPJRS2000
IC ID:6324A-IPJRS2000.

2.4 IC RSS-247, Issue 2, test results

Part	Test description	Verdict
5.1	Frequency hopping systems (FHSs)	
5.1 (1)	Bandwidth of a frequency hopping channel	Not tested
5.1 (2)	Minimum channel spacing for frequency hopping systems	Not tested
5.1 (3)	Frequency hopping systems operating in the 902–928 MHz band	Not tested
5.1 (4)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
5.1 (5)	Frequency hopping systems operating in the 5725–5850 MHz band	Not applicable
5.2	Digital modulation systems	
5.2 (1)	Minimum 6 dB bandwidth	Not applicable
5.2 (2)	Maximum power spectral density	Not applicable
5.3	Hybrid systems	
5.3 (1)	Digital modulation turned off	Not applicable
5.3 (2)	Frequency hopping turned off	Not applicable
5.4	Transmitter output power and e.i.r.p. requirements	
5.4 (1)	Frequency hopping systems operating in the 902–928 MHz band	Not tested
5.4 (2)	Frequency hopping systems operating in the 2400–2483.5 MHz band	Not applicable
5.4 (3)	Frequency hopping systems operating in the 5725–5850 MHz	Not applicable
5.4 (4)	Systems employing digital modulation techniques	Not applicable
5.4 (5)	Point-to-point systems in 2400–2483.5 MHz and 5725–5850 MHz band	Not applicable
5.4 (6)	Transmitters which operate in the 2400–2483.5 MHz band with multiple directional beams	Not applicable
5.5	Unwanted Emissions	Pass

Notes: EUT is a FHSS module in the 902-928 MHz band previously certified by Impinj's as model: RS2000 with original certifications: FCC ID: TWYIPJRS2000
IC ID:6324A-IPJRS2000.

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	November 8, 2017
Nemko sample ID number	340899#1

3.2 EUT information

Product name	RS2000-1 Module
Model	IG-RS2000-1
Model variant	N/A
Serial number	Eng. Sample

3.3 Technical information

Applicant IC company number	22150
IC UPN number	-RS2000
All used IC test site(s) Reg. number	2040B-3
RSS number and Issue number	RSS-247, Issue 2
Frequency band	902-928 MHz
Frequency Min (MHz)	902.75
Frequency Max (MHz)	927.25
RF power Min (W), Conducted/ERP/EIRP	N/A
RF power Max (W), Conducted /ERP/EIRP	0.968278 W
Field strength, Units @ distance	N/A
Measured BW (kHz) (99%)	400 kHz
Calculated BW (kHz), as per TRC-43	N/A
Type of modulation	ASK
Emission classification (F1D, G1D, D1D)	D1D
Transmitter spurious, Units @ distance	f=479.98 MHz Level= 44.98dBμV/m @ 3 m Margin=1.02 dB
Power requirements	100-240VAC, 50/60Hz and provides 19 VDC to the system.
Antenna information	The EUT is professionally installed.
Antennas	2.2 dBi (ethertronics, four bent monopole)

3.4 Product description and theory of operation

The EUT is a 902.75-927.25MHz FHSS radio module.

3.5 EUT exercise details

Depends on test cases, the EUT is set either to fixed channel (L/M/H) at max power. The IG-RS2000-1 module was tested with the new 4 bent monopole antennas (2.2dBi gain).

3.6 EUT setup diagram

Please refer to separate photo exhibit for details.

3.7 EUT sub assemblies

Table 3.7-1: EUT sub assemblies

Description	Brand name	Model/Part number	Serial number
Antenna 2.2 dBi bent monopole	Ethertronics	RFID0900-ANT-5	N/A

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

N/A

4.2 Technical judgment

None

4.3 Deviations from laboratory tests procedures

No deviations were made from laboratory procedures.

Section 5. Test conditions

5.1 Atmospheric conditions

Temperature	15–30 °C
Relative humidity	20–75 %
Air pressure	860–1060 mbar

When it is impracticable to carry out tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests shall be recorded and stated.

5.2 Power supply range

The normal test voltage for equipment to be connected to the mains shall be the nominal mains voltage. For the purpose of the present document, the nominal voltage shall be the declared voltage, or any of the declared voltages $\pm 5\%$, for which the equipment was designed.

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

Measurement uncertainty budgets for the tests are detailed below. Measurement uncertainty calculations assume a coverage factor of $K = 2$ with 95% certainty.

Test name	Measurement uncertainty, dB
All antenna port measurements	0.55
Conducted spurious emissions	1.13
Radiated spurious emissions	3.78
AC power line conducted emissions	3.55

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: Radiated disturbance equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMC Test Receiver	Rohde & Schwarz	ESU 40	E1121	1 yr.	4-28-2018
Antenna, Bilog	Schaffner-Chase	CBL6111C	1480	1 yr.	11-28-2017
Antenna, Horn	EMCO	3115	1033	1 yr.	7-27-2018
Antenna, Horn	EMCO	3116	E1013	2yr	02-18-2018

Notes: None

Table 7.1-2: Conducted disturbance at mains port equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.
EMI Test Receiver 9kHz to 7GHz	Rohde & Schwarz	ESCI 7	E1026	5/23/2017	5/23/2018
Two Line V-Network	Rohde & Schwarz	ENV216	E1019	6/27/2017	6/27/2018

Notes: None

Table 7.1-3: Antenna conducted port equipment list

Equipment	Manufacturer	Model no.	Asset no.	Cal cycle	Next cal.

Notes: None

Table 7.1-4: Radiated/Conducted disturbance test software details

Manufacturer of Software	Details
Rohde-Schwarz	EMC 32 V10.0

Notes: None

Section 8. Testing data

8.1 FCC 15.247(d) and RSS-247 5.5 Spurious (out-of-band) emissions

8.1.1 Definitions and limits

FCC:

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) (see §15.205(c)).

IC:

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.

(a) Fundamental components of modulation of licence-exempt radio apparatus shall not fall within the restricted bands except for apparatus complying under RSS-287;

(b) Unwanted emissions that fall into restricted bands shall comply with the limits specified in RSS-Gen; and

(c) Unwanted emissions that do not fall within the restricted frequency bands shall comply either with the limits specified in the applicable RSS or with those specified in this RSS-Gen.

Table 8.1-1: FCC §15.209 and RSS-Gen – Radiated emission limits

Frequency, MHz	Field strength of emissions		Measurement distance, m
	µV/m	dBµV/m	
0.009–0.490	2400/F	$67.6 - 20 \times \log_{10}(F)$	300
0.490–1.705	24000/F	$87.6 - 20 \times \log_{10}(F)$	30
1.705–30.0	30	29.5	30
30–88	100	40.0	3
88–216	150	43.5	3
216–960	200	46.0	3
above 960	500	54.0	3

Notes: In the emission table above, the tighter limit applies at the band edges.

For frequencies above 1 GHz the limit on peak RF emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test

Table 8.1-2: IC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	12.51975–12.52025	399.9–410	5.35–5.46
2.1735–2.1905	12.57675–12.57725	608–614	7.25–7.75
3.020–3.026	13.36–13.41	960–1427	8.025–8.5
4.125–4.128	16.42–16.423	1435–1626.5	9.0–9.2
4.17725–4.17775	16.69475–16.69525	1645.5–1646.5	9.3–9.5
4.20725–4.20775	16.80425–16.80475	1660–1710	10.6–12.7
5.677–5.683	25.5–25.67	1718.8–1722.2	13.25–13.4
6.215–6.218	37.5–38.25	2200–2300	14.47–14.5
6.26775–6.26825	73–74.6	2310–2390	15.35–16.2
6.31175–6.31225	74.8–75.2	2655–2900	17.7–21.4
8.291–8.294	108–138	3260–3267	22.01–23.12
8.362–8.366	156.52475–156.52525	3332–3339	23.6–24.0
8.37625–8.38675	156.7–156.9	3345.8–3358	31.2–31.8

8.41425–8.41475	240–285	3500–4400	36.43–36.5
12.29–12.293	322–335.4	4500–5150	Above 38.6

Note: Certain frequency bands listed in Table 8.1-2 and above 38.6 GHz are designated for low-power licence-exempt applications. These frequency bands and the requirements that apply to the devices are set out in this Standard

Table 8.1-3: FCC restricted frequency bands

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2690–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	Above 38.6
13.36–13.41			

8.1.2 Test summary

Test date	November 14, 2017	Temperature	21 °C
Test engineer	Juan Manuel Gonzalez	Air pressure	1007 mbar
Verdict	Pass	Relative humidity	61%

8.1.3 Observations, settings and special notes

The spectrum was searched from 30 MHz to the 10th harmonic.
EUT was set to transmit continuously.
Radiated measurements were performed at a distance of 3 m.
Since fundamental power was tested using average method, the spurious emissions limit is –30 dBc/100 kHz

Spectrum analyser settings for radiated measurements within restricted bands below 1 GHz:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for peak radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	3 MHz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyser settings for average radiated measurements within restricted bands above 1 GHz:

Resolution bandwidth:	1 MHz
Video bandwidth:	10 Hz
Detector mode:	Peak
Trace mode:	Max Hold

Spectrum analyzer settings for conducted spurious emissions measurements:

Resolution bandwidth:	100 kHz
Video bandwidth:	300 kHz
Detector mode:	Peak
Trace mode:	Max Hold

8.1.4 Test data

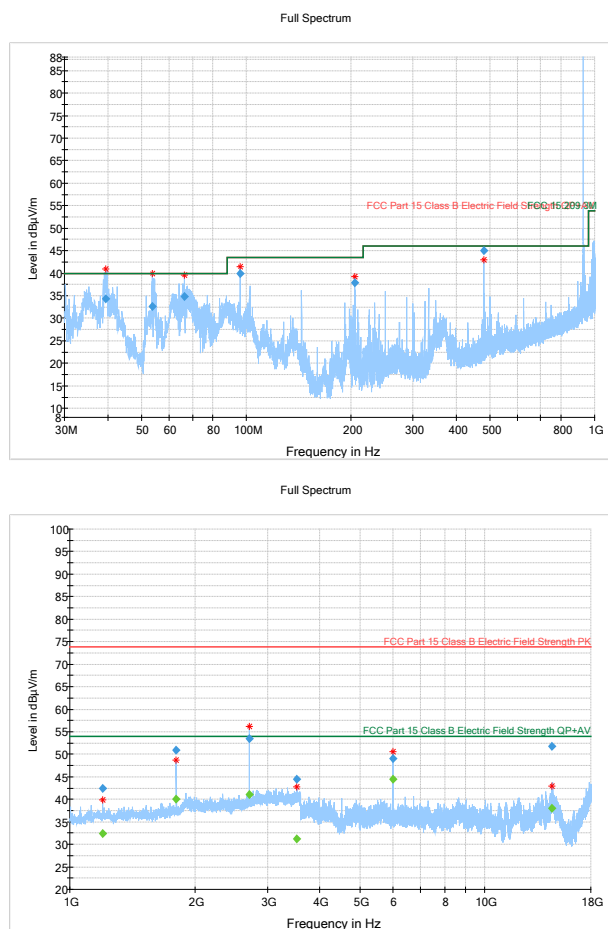


Figure 8.1.1: Radiated spurious emissions, low channel.

Note.- Peaks within 902-928MHz are transmitter fundamentals.

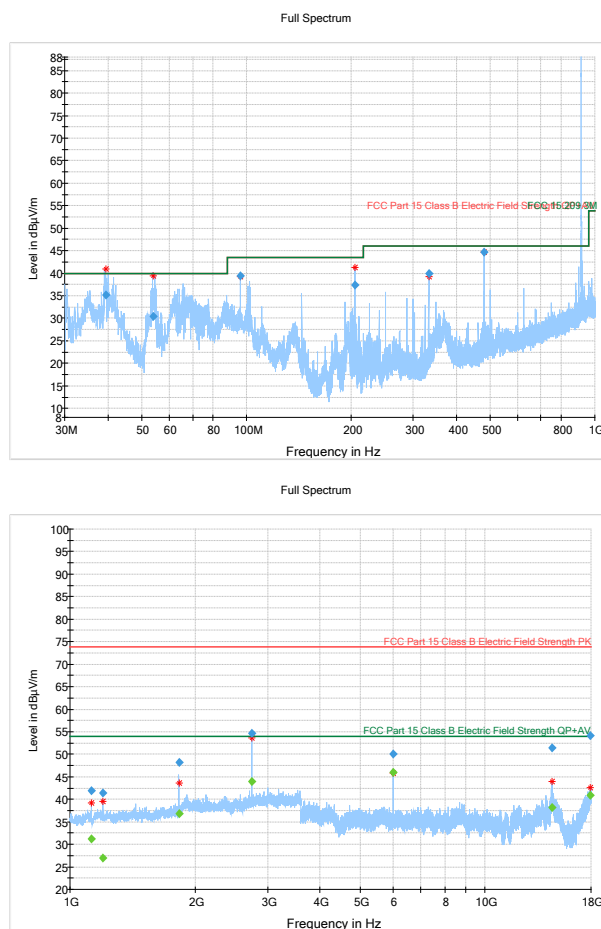


Figure 8.1.2: Radiated spurious emissions, mid channel.

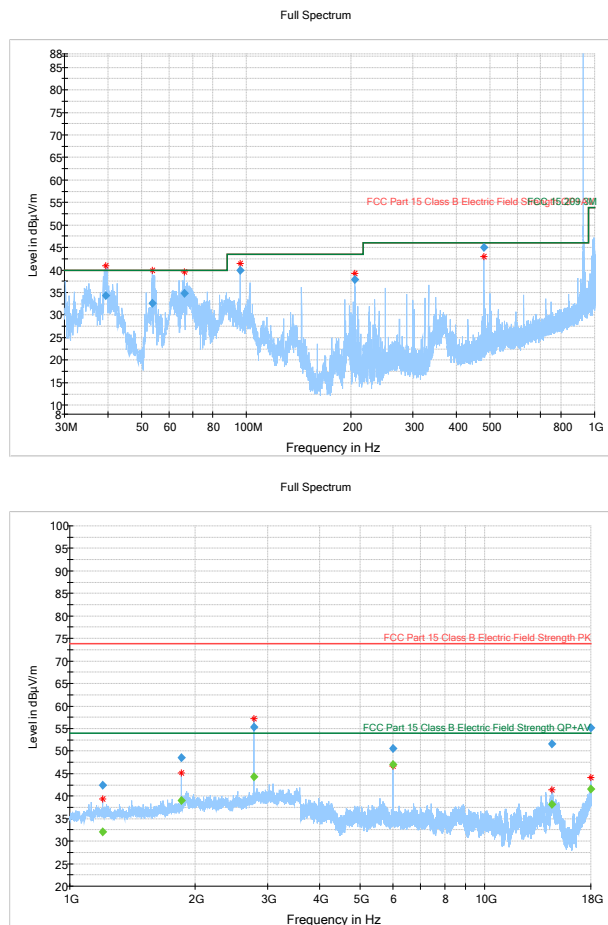


Figure 8.1.3: Radiated spurious emissions, high channel.

Note.- Peaks within 902-928MHz are transmitter fundamentals.

Table 8.1-4: Radiated field strength measurement results for low channel.

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.371500	34.25	40.00	5.75	5000.0	120.000	187.3	V	336.0	15.9
53.571000	32.67	40.00	7.33	5000.0	120.000	126.1	V	0.0	8.6
66.455000	34.77	40.00	5.23	5000.0	120.000	126.3	V	0.0	7.5
96.000000	39.86	43.50	3.64	5000.0	120.000	126.2	V	0.0	11.6
204.614500	37.82	43.50	5.68	5000.0	120.000	100.0	V	0.0	12.9
479.983000	44.98	46.00	1.02	5000.0	120.000	99.9	V	34.0	22.6

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1200.166667	42.48	---	73.90	31.42	5000.0	1000.000	198.0	V	352.0	-0.4
1200.166667	---	32.43	53.90	21.47	5000.0	1000.000	198.0	V	352.0	-0.4
1805.533333	50.90	---	73.90	23.00	5000.0	1000.000	109.3	V	356.0	1.2
1805.533333	---	40.10	53.90	13.80	5000.0	1000.000	109.3	V	356.0	1.2
2708.233333	---	41.06	53.90	12.84	5000.0	1000.000	137.1	H	222.0	4.0
2708.233333	53.39	---	73.90	20.51	5000.0	1000.000	137.1	H	222.0	4.0
3518.866667	44.51	---	73.90	29.39	5000.0	1000.000	410.0	H	17.0	6.3
3518.866667	---	31.15	53.90	22.75	5000.0	1000.000	410.0	H	17.0	6.3
6000.000000	---	44.51	53.90	9.39	5000.0	1000.000	109.3	H	175.0	14.7
6000.000000	49.05	---	73.90	24.85	5000.0	1000.000	109.3	H	175.0	14.7
14526.900000	51.72	---	73.90	22.18	5000.0	1000.000	173.0	V	0.0	28.9
14526.900000	---	38.08	53.90	15.82	5000.0	1000.000	173.0	V	0.0	28.9

Table 8.1-5: Radiated field strength measurement results for Mid channel.

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.461000	35.21	40.00	4.79	5000.0	120.000	186.1	V	34.0	15.9
54.012500	30.37	40.00	9.63	5000.0	120.000	155.7	V	34.0	8.4
96.000000	39.39	43.50	4.11	5000.0	120.000	134.2	V	0.0	11.6
204.600000	37.37	43.50	6.13	5000.0	120.000	109.5	V	352.0	12.9
333.270500	39.97	46.00	6.03	5000.0	120.000	109.5	V	24.0	18.4
479.991500	44.68	46.00	1.32	5000.0	120.000	109.6	V	40.0	22.6

Frequency (MHz)	MaxPeak (dBµV/m)	Average (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1124.966667	41.97	---	73.90	31.93	5000.0	1000.000	151.7	V	-1.0	-0.5
1124.966667	---	31.29	53.90	22.61	5000.0	1000.000	151.7	V	-1.0	-0.5
1199.766667	41.42	---	73.90	32.48	5000.0	1000.000	237.0	V	17.0	-0.4
1199.766667	---	26.90	53.90	27.00	5000.0	1000.000	237.0	V	17.0	-0.4
1829.500000	---	36.82	53.90	17.08	5000.0	1000.000	149.0	V	356.0	1.5
1829.500000	48.12	---	73.90	25.78	5000.0	1000.000	149.0	V	356.0	1.5
2744.333333	54.69	---	73.90	19.21	5000.0	1000.000	113.1	H	202.0	4.2
2744.333333	---	44.01	53.90	9.89	5000.0	1000.000	113.1	H	202.0	4.2
5999.766667	50.15	---	73.90	23.75	5000.0	1000.000	137.1	H	325.0	14.7
5999.766667	---	45.90	53.90	8.00	5000.0	1000.000	137.1	H	325.0	14.7
14516.500000	51.49	---	73.90	22.41	5000.0	1000.000	307.0	V	97.0	28.9
14516.500000	---	38.14	53.90	15.76	5000.0	1000.000	307.0	V	97.0	28.9
17900.233333	54.14	---	73.90	19.76	5000.0	1000.000	172.9	V	295.0	31.6
17900.233333	---	40.96	53.90	12.94	5000.0	1000.000	172.9	V	295.0	31.6

Table 8.1-6: Radiated field strength measurement results for High channel.

Frequency (MHz)	QuasiPeak (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
39.371500	34.25	40.00	5.75	5000.0	120.000	187.3	V	336.0	15.9
53.571000	32.67	40.00	7.33	5000.0	120.000	126.1	V	0.0	8.6
66.455000	34.77	40.00	5.23	5000.0	120.000	126.3	V	0.0	7.5
96.000000	39.86	43.50	3.64	5000.0	120.000	126.2	V	0.0	11.6
204.614500	37.82	43.50	5.68	5000.0	120.000	100.0	V	0.0	12.9
479.983000	44.98	46.00	1.02	5000.0	120.000	99.9	V	34.0	22.6
39.371500	34.25	40.00	5.75	5000.0	120.000	187.3	V	336.0	15.9

Frequency (MHz)	MaxPeak (dBμV/m)	Average (dBμV/m)	Limit (dBμV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
1200.166667	42.41	---	73.90	31.49	5000.0	1000.000	245.0	V	16.0	-0.4
1200.166667	---	32.00	53.90	21.90	5000.0	1000.000	245.0	V	16.0	-0.4
1854.266667	48.48	---	73.90	25.42	5000.0	1000.000	111.5	V	332.0	1.9
1854.266667	---	39.00	53.90	14.90	5000.0	1000.000	111.5	V	332.0	1.9
2781.100000	---	44.26	53.90	9.64	5000.0	1000.000	206.3	H	34.0	4.5
2781.100000	55.41	---	73.90	18.49	5000.0	1000.000	206.3	H	34.0	4.5
6000.000000	---	47.00	53.90	6.90	5000.0	1000.000	100.0	H	55.0	14.7
6000.000000	50.56	---	73.90	23.34	5000.0	1000.000	100.0	H	55.0	14.7
14487.466667	51.61	---	73.90	22.29	5000.0	1000.000	125.0	V	282.0	29.0
14487.466667	---	38.18	53.90	15.72	5000.0	1000.000	125.0	V	282.0	29.0
17995.066667	55.15	---	73.90	18.75	5000.0	1000.000	327.4	H	110.0	32.0
17995.066667	---	41.51	53.90	12.39	5000.0	1000.000	327.4	H	110.0	32.0

Table 8.1-7: Radiated Band Edges and power verification for Low and High channel.

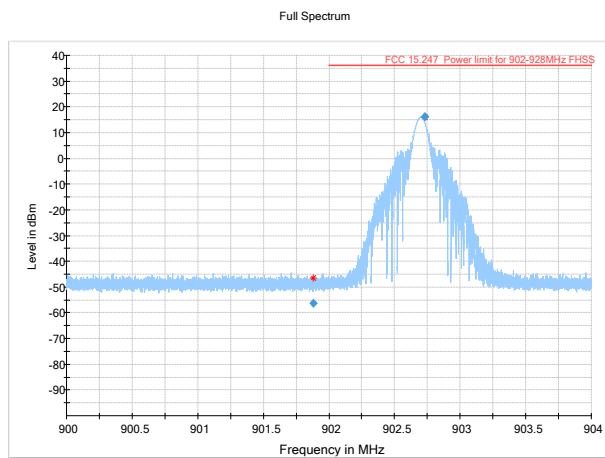


Figure 8.1.4: Low Band Edge Measurement

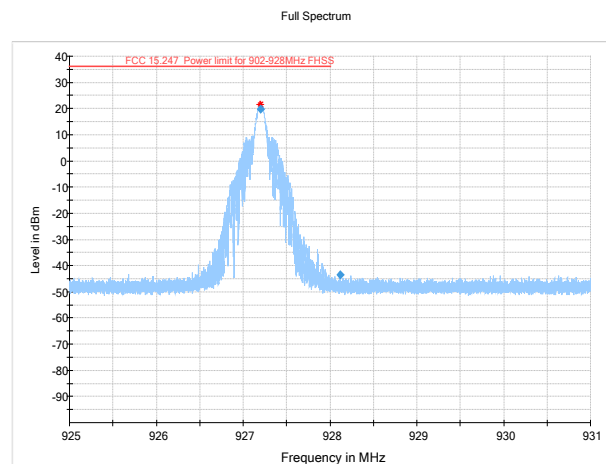


Figure 8.1.5: High Band Edge Measurement

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
901.879400	-56.16	-3.65	52.51	100.000	312.4	V	-1.0	-47.0
902.732000	16.35	36.00	19.65	100.000	100.0	V	-1.0	-46.9

Frequency (MHz)	RMS (dBm)	Limit (dBm)	Margin (dB)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
927.205200	19.89	36.00	16.11	100.000	103.6	V	0.0	-46.2
928.121600	-43.46	-0.11	43.35	100.000	106.3	V	0.0	-46.2

8.2 15.207(a) AC power line conducted emissions limits

8.2.1 Definitions and limits

Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

The conducted emissions shall be measured with a 50 Ω /50 μ H line impedance stabilization network (LISN).

Table 8.2-1: Conducted emissions limit

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

Note: * - Decreases with the logarithm of the frequency.

8.2.2 Test summary

Test date	November 14, 2017	Temperature	21 °C
Test engineer	Enrique Hernandez	Air pressure	1007 mbar
Verdict	Pass	Relative humidity	61%

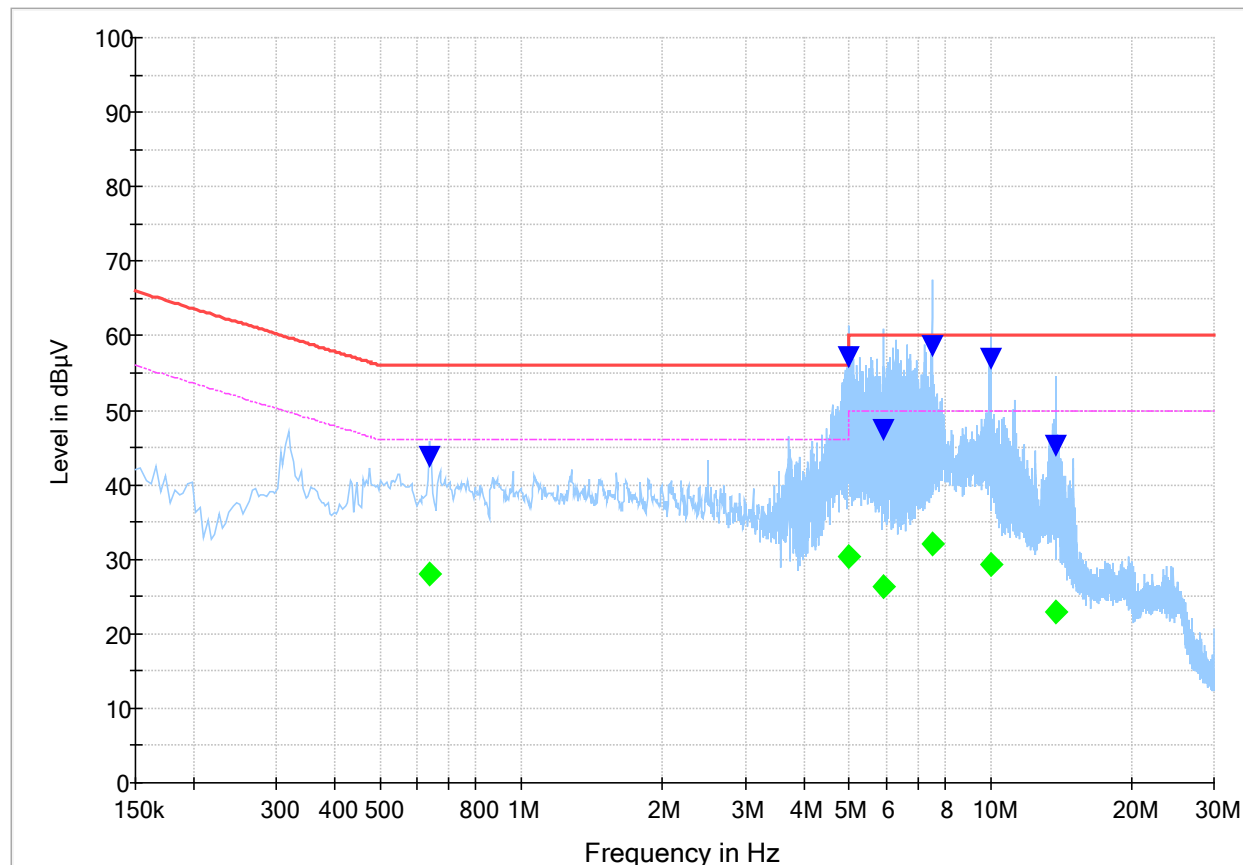
8.2.3 Observations, settings and special notes

EUT tested in worst case configuration and transmitting in High Channel (927.25MHz).

Test receiver settings:

Frequency span	150 kHz to 30 MHz
Detector mode	Peak and Average (preview mode); Quasi-Peak (final measurements)
Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Trace mode	Max Hold
Measurement time	1000 ms

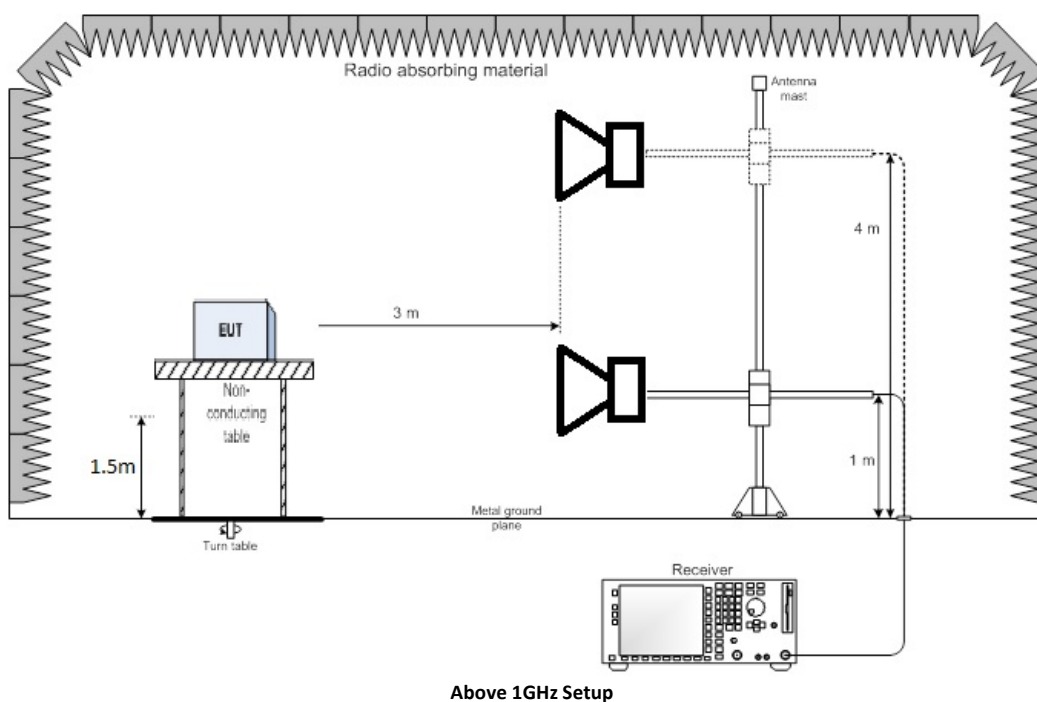
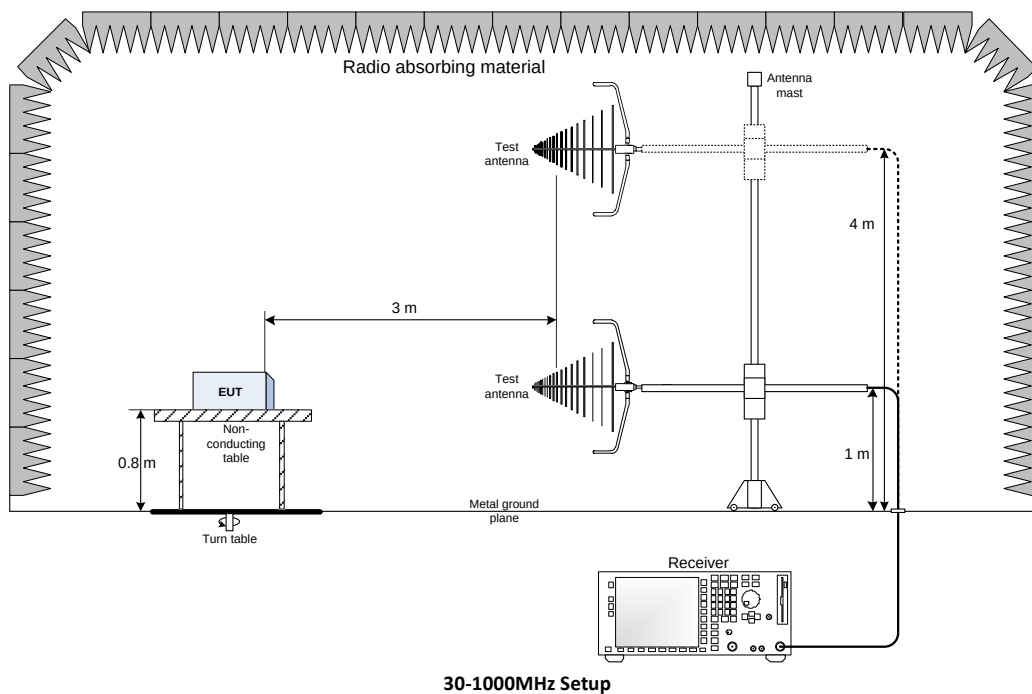
Full Spectrum



Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter	Corr. (dB)
0.636500	---	27.97	46.00	18.03	5000.0	9.000	L1	ON	10.1
0.636500	43.63	---	56.00	12.37	5000.0	9.000	L1	ON	10.1
5.000500	---	30.39	50.00	19.61	5000.0	9.000	L1	ON	10.2
5.000500	57.04	---	60.00	2.96	5000.0	9.000	L1	ON	10.2
5.896500	---	26.42	50.00	23.58	5000.0	9.000	L1	ON	10.2
5.896500	47.45	---	60.00	12.55	5000.0	9.000	L1	ON	10.2
7.500500	---	32.11	50.00	17.89	5000.0	9.000	N	ON	10.2
7.500500	58.62	---	60.00	1.38	5000.0	9.000	N	ON	10.2
10.000500	---	29.38	50.00	20.62	5000.0	9.000	N	ON	10.2
10.000500	56.97	---	60.00	3.03	5000.0	9.000	N	ON	10.2
13.748500	---	22.89	50.00	27.11	5000.0	9.000	N	ON	10.2
13.748500	45.29	---	60.00	14.71	5000.0	9.000	N	ON	10.2

Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up



End of Report