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Test report

FCC 15.225 and RSS-210 B.6 13.56 MHz #313133

Date of issue: September 5, 2017

Applicant: Stryker Instruments

Product: 13.56MHz RFID Module

Model: 5400-052-020

FCC ID: Q9R-5400052020 IC Registration number: 4919A-5400052020

Specifications:

FCC 47 CFR Part 15 Subpart C, §15.225

Operation within the band 13.110-14.010 MHz.

RSS-210 Issue 9 B.6

Licence-Exempt Radio Apparatus (All Frequency Bands): Category I Equipment

Test location

Company name	Nemko USA Inc.
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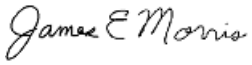
City	Carlsbad
Province	CA
Postal code	92008-7226
Country	USA
Telephone	+1 858-755-5525
Website	www.nemko.com
Site number	FCC: US5058; IC: 2040B

Tested by	Feng You, Senior Wireless Engineer
Reviewed by	James Morris, EMC and Wireless Divisions Manager
Date	September 5, 2017
Signature	

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.

Copyright notification

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Section 1. Report summary

1.1 Applicant and manufacturer

Company name	Stryker Instruments
Address	4100 E. Milham Road
City	Kalamazoo
Province/State	MI
Postal/Zip code	49001
Country	U.S.A.

1.2 Test specifications

FCC 47 CFR Part 15, Subpart C, Clause 15.225	Operation in the 13.110–14.010 MHz
RSS-210 Issue 9, August 2016, Annex B.6	Band 13.110-14.010 MHz

1.3 Statement of compliance

In the configuration tested, the EUT was found compliant.

Testing was completed against all relevant requirements of the test standard. Results obtained indicate that the product under test complies in full with the requirements tested. The test results relate only to the items tested.

See “Summary of test results” for full details.

1.4 Exclusions

None

1.5 Test report revision history

Revision #	Details of changes made to test report
	Original report issued
1	Revised according to review comment

Section 2. Summary of test results

2.1 FCC Part 15 Subpart C, general requirements test results

Part	Test description	Verdict
§15.31(e)	Variation of power source	Pass[1]
§15.203	Antenna requirement	Pass[2]
§15.207(a)	Conducted limits	Pass
§15.215(c)	20 dB bandwidth	Pass

Notes: [1] Measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, was performed with the supply voltage varied between 85% of 100VAC to 115% of 240VAC (rated by manufacturer). No noticeable output power variation was observed.

[2] The Antenna is internal to device or with unique antenna coupling.

2.2 FCC Part 15 Subpart C, intentional radiators test results

Part	Test description	Verdict
§15.225(a)	Field strength within 13.553–13.567 MHz band	Pass
§15.225(b)	Field strength within 13.410–13.553 MHz and 13.567–13.710 MHz bands	Pass
§15.225(c)	Field strength within 13.110–13.410 MHz and 13.710–14.010 MHz bands	Pass
§15.225(d)	Field strength outside 13.110–14.010 MHz band	Pass
§15.225(e)	Frequency tolerance of carrier signal[1]	Pass

2.3 IC RSS-GEN, Issue 4, test results

Part	Test description	Verdict
6.6	Occupied bandwidth	Pass
6.11	Transmitter frequency stability	Pass [1]
7.1.2	Receiver spurious emissions limits (radiated)	Not applicable
7.1.3	Receiver spurious emissions limits (antenna conducted)	Not applicable
8.8	AC power lines conducted emission limits	Pass

Notes: [1] Frequency stability covered in RSS-210.

2.4 IC RSS-210, Issue 9, test results

Part	Test description	Verdict
B.6 (a)	The field strength within the band 13.553–13.567 MHz.	Pass
B.6 (b)	The field strength within the bands 13.410–13.553 MHz and 13.567–13.710 MHz	Pass
B.6 (c)	The field strength within the bands 13.110–13.410 MHz and 13.710–14.010 MHz.	Pass
B.6 (d)	The field strength outside the band 13.110–14.010 MHz.	Pass
B.6	Carrier frequency stability shall be maintained to ±0.01% (±100 ppm) [1]	Pass

Section 3. Equipment under test (EUT) details

3.1 Sample information

Receipt date	January 25, 2017
Nemko sample ID number	1

3.2 EUT information

Product name	13.56MHz RFID Module
Model	5400-052-020
Serial number	N/A
FCC ID	Q9R-5400052020
IC Registration Number	4919A-5400052020

3.3 Technical information

Operating band	13.553–13.567 MHz
Operating frequency	13.56 MHz
Modulation type	ASK
Occupied bandwidth (99 %)	1.48KHz
Power requirements	100-240VAC, 50/60Hz
Emission designator	A1D
Antenna information	The EUT uses a unique antenna coupling/ non-detachable antenna to the intentional radiator. Unique antenna coupling.

Stryker antenna models:
Antenna 1 5400-052-092 REV (Internal antenna for Cassette): Highest gain (relative), tested.
Antenna 2 105-198-687 REV G (Handpiece antenna): tested with antenna 1.
Antenna 3 5500-050-165 Rev1
Antenna 4 5500-255-100 Rev1

3.4 Product description and theory of operation

EUT is 13.56MHz RFID reader module for Stryker medical devices.

3.5 EUT exercise details

RFID reader is set to constant transmit. Modulation applies when ID Tag presents.

3.6 EUT setup diagram

Please refer to separate photo exhibit

Figure 3.6-1: *Radiated Emissions Setup*

Please refer to separate photo exhibit

Figure 3.6-2: *AC Powerline Conducted Emissions Setup*

3.7 EUT sub assemblies

Table 3.7-1: *EUT sub assemblies*

Description	Brand name	Model/Part number	Serial number
13.56MHz RFID Module	Stryker	5400-052-020	N/A
Core 2.0 Console (including the module)	Stryker	5400-052-000	1632500049
Pump Cassette (with RFID Tag)	Stryker	5400-050-002	N/A
Handpiece (with RFID Antenna)	Stryker	0375-704-500	16J003354
Blade for Handpiece (with RFID Tag)	Stryker	0375-534-000	N/A

Section 4. Engineering considerations

4.1 Modifications incorporated in the EUT

1. Replaced the following caps on board 5400-052-030 Main Controller. C3, C4, C5, C6 replaced with GA352QR7GF152KW01L. C208, C209 replaced with GA342DR7GF102KW02L.
2. Changed the ferrites that are on the power lines that are used for the handpieces.
3. Updated the power button PCBA
4. Installed a newer software revision 1.0.4

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 ±5 %, for which the equipment was designed.
120VAC (Rated Range 100-240VAC)

Section 6. Measurement uncertainty

6.1 Uncertainty of measurement

Nemko USA Inc. has calculated measurement uncertainty and is documented in EMC/MUC/001 “Uncertainty in EMC measurements.” Measurement uncertainty was calculated using the methods described in CISPR 16-4 Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC measurements; as well as described in UKAS LAB34: The expression of Uncertainty in EMC Testing. Measurement uncertainty calculations assume a coverage factor of K=2 with 95% certainty.
Radiated spurious emissions Uncertainty <=4.9dB
AC power line conducted emissions Uncertainty <=4.0dB
Frequency/Time Uncertainty <=0.2ms
RF Amplitude Uncertainty <=1.7dB

Section 7. Test equipment

7.1 Test equipment list

Table 7.1-1: *Equipment list*

Asset Tag	Description	Manufacturer	Model	Serial #	Next Cal
815	Multimeter	Fluke	111	78130066	22-Feb-2018
E1019	Two Line V-Network	Rohde & Schwarz	ENV216	101045	15-Jun-2017
E1026	EMI Test Receiver 9kHz to 7GHz	Rohde & Schwarz	ESCI 7	100800	17-Apr-2017
S1043	Variac (Variable Transformer) 3kVA, Input 110/220VAC @ 4.8/12A	Shanghai China	TDGC	N/A	VOU
1480	Antenna, Bilog	Schaffner-Chase	CBL6111C	2572	21-Jul-2017
1733	Antenna, Active Loop	EMCO	6507	45939	19-Jan-2019
S1179	Environmental Chamber	Cincinnati Sub-Zero	ZPH-32-2-2-H/AC	ZP1615026	21-Mar-2018
E1120	Signal and Spectrum Analyzer	Rohde & Schwarz	FSV40	101395	25-May-2017
E1121	EMI Test Receiver	Rohde & Schwarz	ESU 40	100064	28-Apr-2017

Note: NCR - no calibration required, VOU - verify on use

Section 8. Testing data

8.1 FCC 15.215(c) 20 dB bandwidth

8.1.1 Definitions and limits

Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in Subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, or whatever bandwidth may otherwise be specified in the specific rule section under which the equipment operates, is contained within the frequency band designated in the rule section under which the equipment is operated. The requirement to contain the designated bandwidth of the emission within the specified frequency band includes the effects from frequency sweeping, frequency hopping and other modulation techniques that may be employed as well as the frequency stability of the transmitter over expected variations in temperature and supply voltage.

8.1.2 Test summary

Test date	April 5, 2017	Temperature	22 °C
Test engineer	Feng You	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	50 %

8.1.3 Observations, settings and special notes

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	≥1 % of span
Video bandwidth	RBW × 3
Trace mode	Max Hold

8.1.4 Test data

Table 8.1-1: *Lower 20 dBc frequency cross result*

Fundamental frequency, MHz	Lower 20 dBc frequency cross, MHz	Limit, MHz	Margin, kHz
13.560	**13.56000**	13.553	**7**

Table 8.1-2: *Upper 20 dBc frequency cross result*

Fundamental frequency, MHz	Upper 20 dBc frequency cross, MHz	Limit, MHz	Margin, kHz
13.560	**13.56055**	13.567	**6.45**

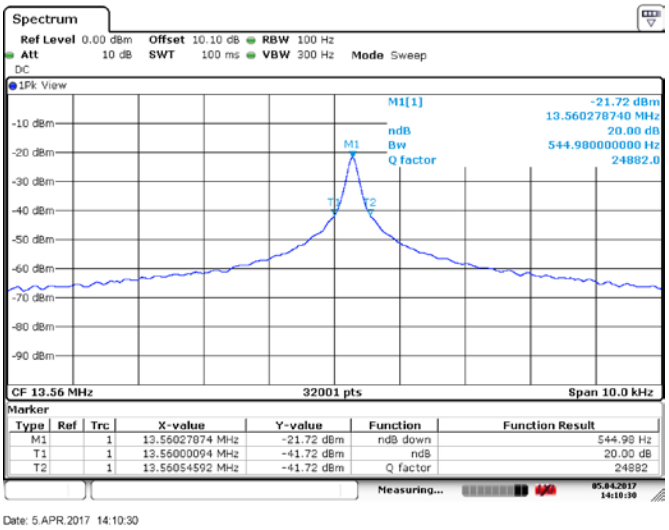


Figure 8.1-1: *20dB occupied bandwidth*

8.2 RSS-Gen 6.6 Occupied bandwidth

8.2.1 Definitions and limits

When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99 percent emission bandwidth, as calculated or measured.
The transmitter shall be operated at its maximum carrier power measured under normal test conditions.
The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set to as close to 1 percent of the selected span as is possible without being below 1 percent. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used since a peak or, peak hold, may produce a wider bandwidth than actual.
The trace data points are recovered and are directly summed in linear terms. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 percent of the total is reached and that frequency recorded. The process is repeated for the highest frequency data points. This frequency is recorded.
The span between the two recorded frequencies is the occupied bandwidth.

8.2.2 Test summary

Test date	April 5, 2017	Temperature	22 °C
Test engineer	Feng You	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	50 %

8.2.3 Observations, settings and special notes

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	≥1 % of span
Video bandwidth	RBW × 3
Trace mode	Max Hold

8.2.4 Test data

Table 8.2-1: *99 % occupied bandwidth result*

Fundamental frequency, MHz	99 % occupied bandwidth, kHz
13.560	**1.48**

8.2.4 Test data, continued

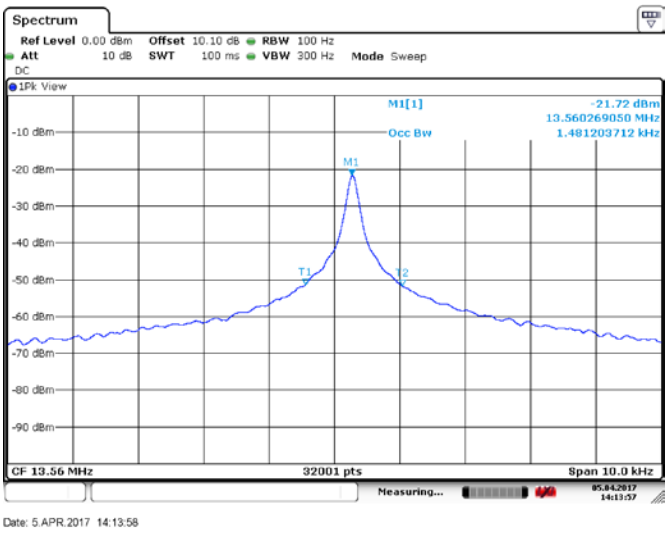


Figure 8.2-1: *99 % occupied bandwidth*

8.3 FCC 15.225(a–c) and RSS-210 B.6 (a–c) Field strength within the 13.110–14.010 MHz band

8.3.1 Definitions and limits

a) The field strength of any emissions within the band 13.553–13.567 MHz shall not exceed 15848 µV/m (84 dBµV/m) at 30 m.
b) Within the bands 13.410–13.553 MHz and 13.567–13.710 MHz, the field strength of any emissions shall not exceed 334 µV/m (50.5 dBµV/m) at 30 m.
c) Within the bands 13.110–13.410 MHz and 13.710–14.010 MHz the field strength of any emissions shall not exceed 106 µV/m (40.5 dBµV/m) at 30 m.

15.31(e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

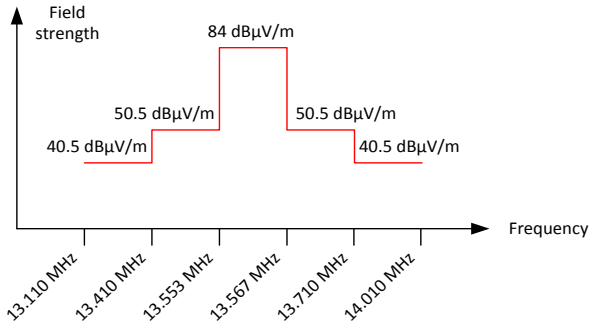


Figure 8.3-1: *In-band spurious emissions limit*

8.3.2 Test summary

Test date	March 29, 2017	Temperature	19 °C
Test engineer	Feng You	Air pressure	1006 mbar
Verdict	Pass	Relative humidity	45 %

8.3.3 Observations/special notes

The measurements were performed at the distance of 3 m. 40 dB distance correction factor* was applied to the measurement result in order to comply with 30 m limits.
* 30 m to 3 m distance correction factor calculation (for 13 MHz band):

$$40 \times \mathrm{Log}_{10}\,(3\ \mathrm{m}/30\ \mathrm{m}) = 40 \times \mathrm{Log}_{10}\,(0.1) = -40\ \mathrm{dB}$$

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	10 kHz
Video bandwidth	30 kHz
Trace mode	Max Hold

8.3.4 Test data

Table 8.3-1: *Field strength measurements results*

Frequency range, MHz	Frequency, MHz	Field strength at 3 m, dBµV/m	Calculated field strength at 30 m, dBµV/m	Limit, dBµV/m	Margin, dB
13.553–13.567	13.56	66.5	26.5	84.00	57.5
13.410–13.553	13.54	34.1	-5.9	50.50	56.1
13.567–13.710	13.68	32.9	-7.1	50.50	57.6
13.110–13.410	13.14	34.3	-5.7	40.50	46.2
13.710–14.010	13.93	33.7	-6.3	40.50	46.8

Note: Calculated field strength at 30 m = Measured field strength at 3 m − 40 dB

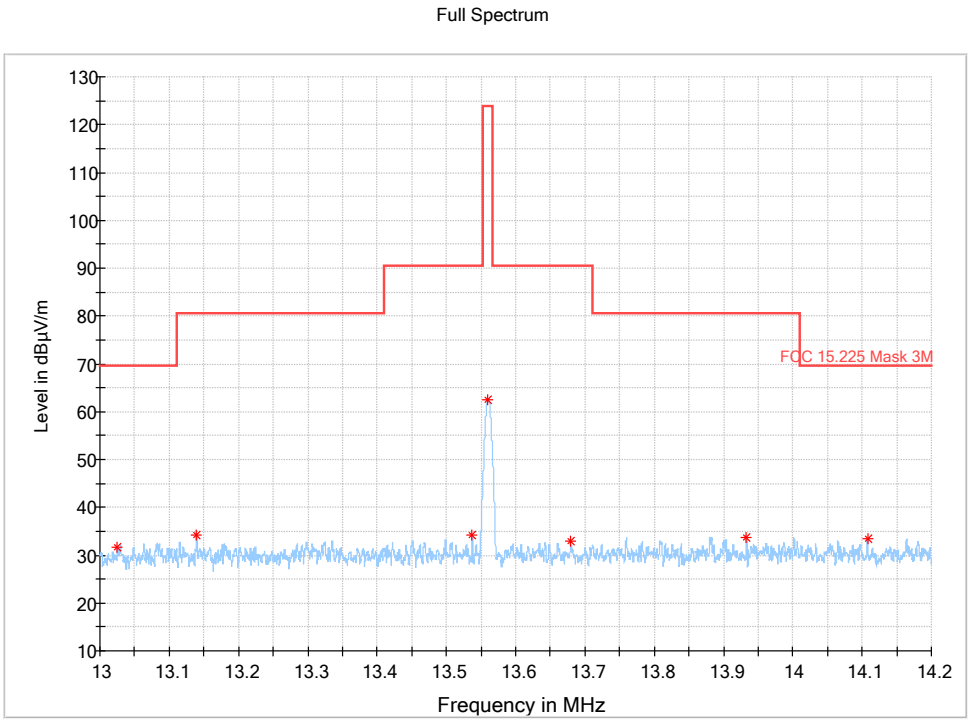


Figure 8.3-2: *Field strength within 13.11–14.010 MHz band – 120V*

Table 8.3-2: *Field strength measurements of fundamental*

Supply Voltage(V)	Frequency, MHz	Field strength at 3 m, dBµV/m	Calculated field strength at 30 m, dBµV/m	Limit, dBµV/m	Margin, dB
120	13.56	66.48	26.48	84.00	57.52
85	13.56	67.92	27.92	84.00	56.08
276	13.56	67.5	27.5	84.00	56.5

8.4 FCC 15.225(d) and RSS-210 B.6(d) Field strength of emissions outside 13.110–14.010 MHz band

8.4.1 Definitions and limits

FCC: The field strength of any emissions appearing outside of the 13.110–14.010 MHz band shall not exceed the general radiated emission limits in §15.209
The field strength of emissions appearing within restricted bands (as specified in §15.205) shall not exceed the limits from §15.209.
IC: The field strength of any emission outside the band 13.110–14.010 MHz shall not exceed the 30 µV/m (29.5 dBµV/m) limit.

Table 8.4-1: *FCC §15.209 – Radiated emission limits*

Frequency, MHz	Field strength of emissions µV/m	dBµV/m	Measurement distance, 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 8.4-2: *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			

8.4.2 Test summary

Test date	March 27, 2017	Temperature	17 °C
Test engineer	Feng You	Air pressure	1002 mbar
Verdict	Pass	Relative humidity	70 %

8.4.3 Observations, settings and special notes

The spectrum was searched from 9 kHz to 1 GHz.
Radiated measurements were performed at a distance of 3 m.

Spectrum analyzer settings for frequencies below 30 MHz:

Detector mode	Quasi-Peak
Resolution bandwidth	9 kHz
Video bandwidth	30 kHz
Trace mode	Max Hold
Measurement time	100 ms

Spectrum analyzer settings for frequencies above 30 MHz:

Detector mode	Peak
Resolution bandwidth	100 kHz
Video bandwidth	300 kHz
Trace mode	Max Hold
Measurement time	100 ms

8.4.4 Test data

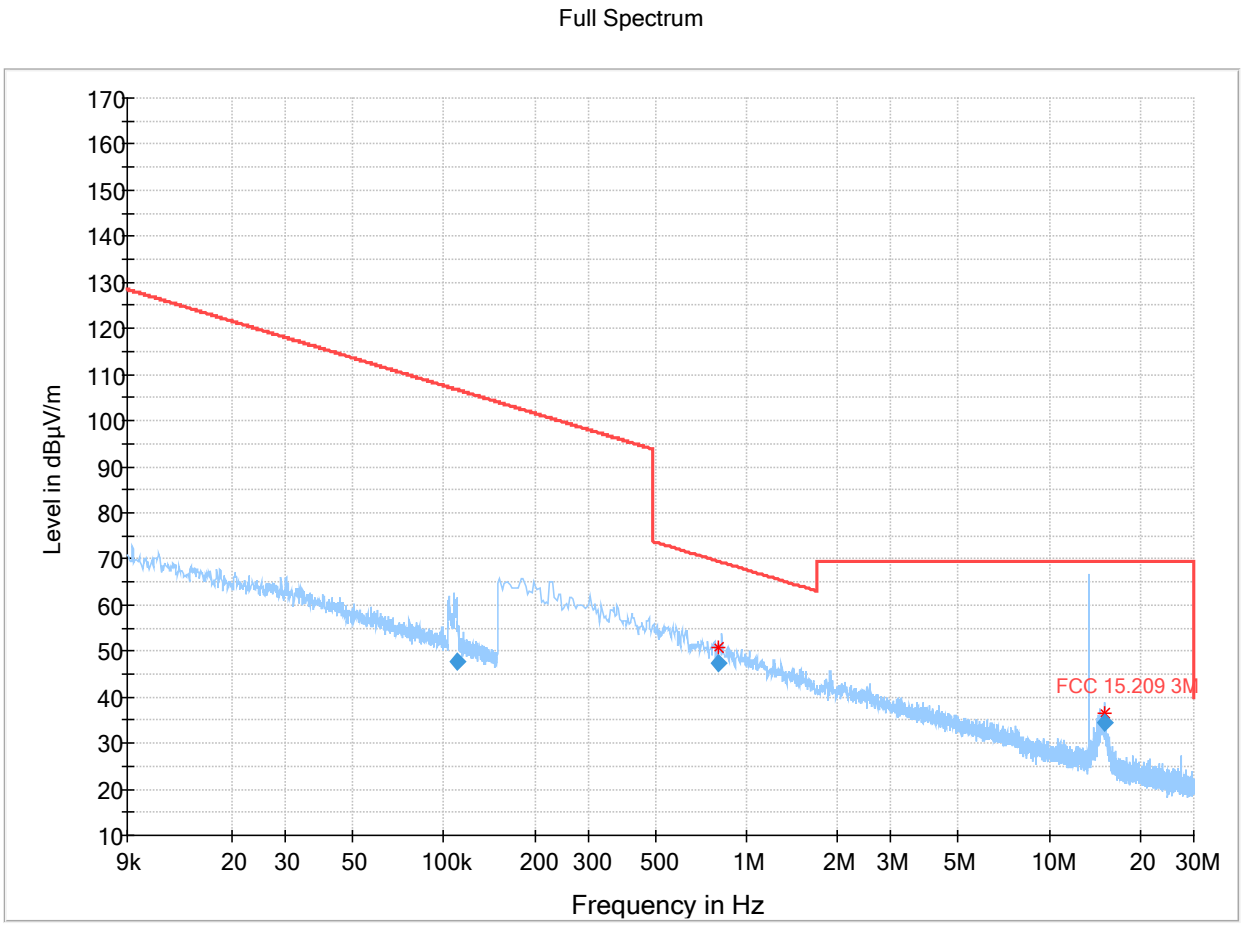


Figure 8.4-1: *Field strength of spurious emissions below 30 MHz*

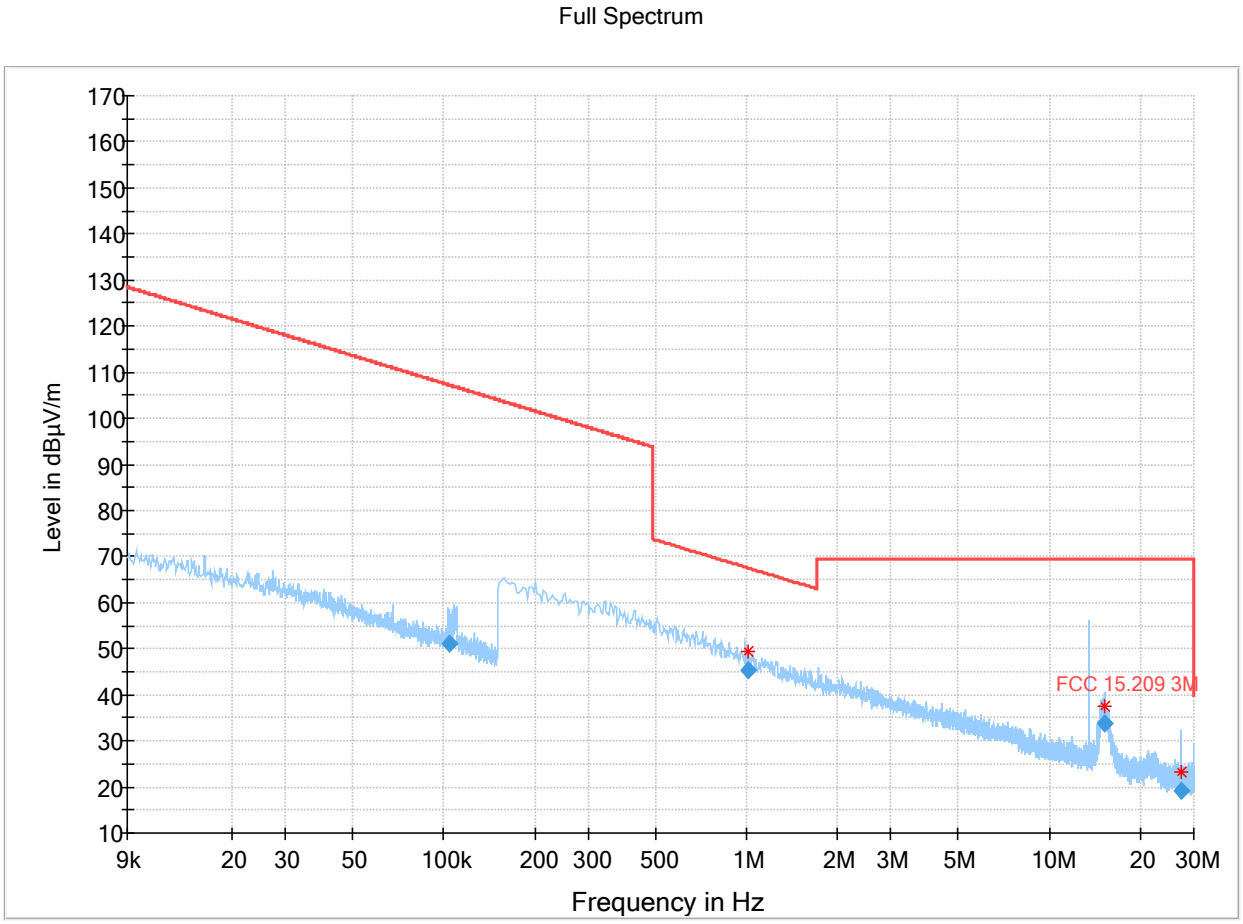


Figure 8.4-2: *Field strength of spurious emissions below 30 MHz – 90 Degree*

Peak at 13.56MHz is the fundamental signal.

8.4.4 Test data, continued

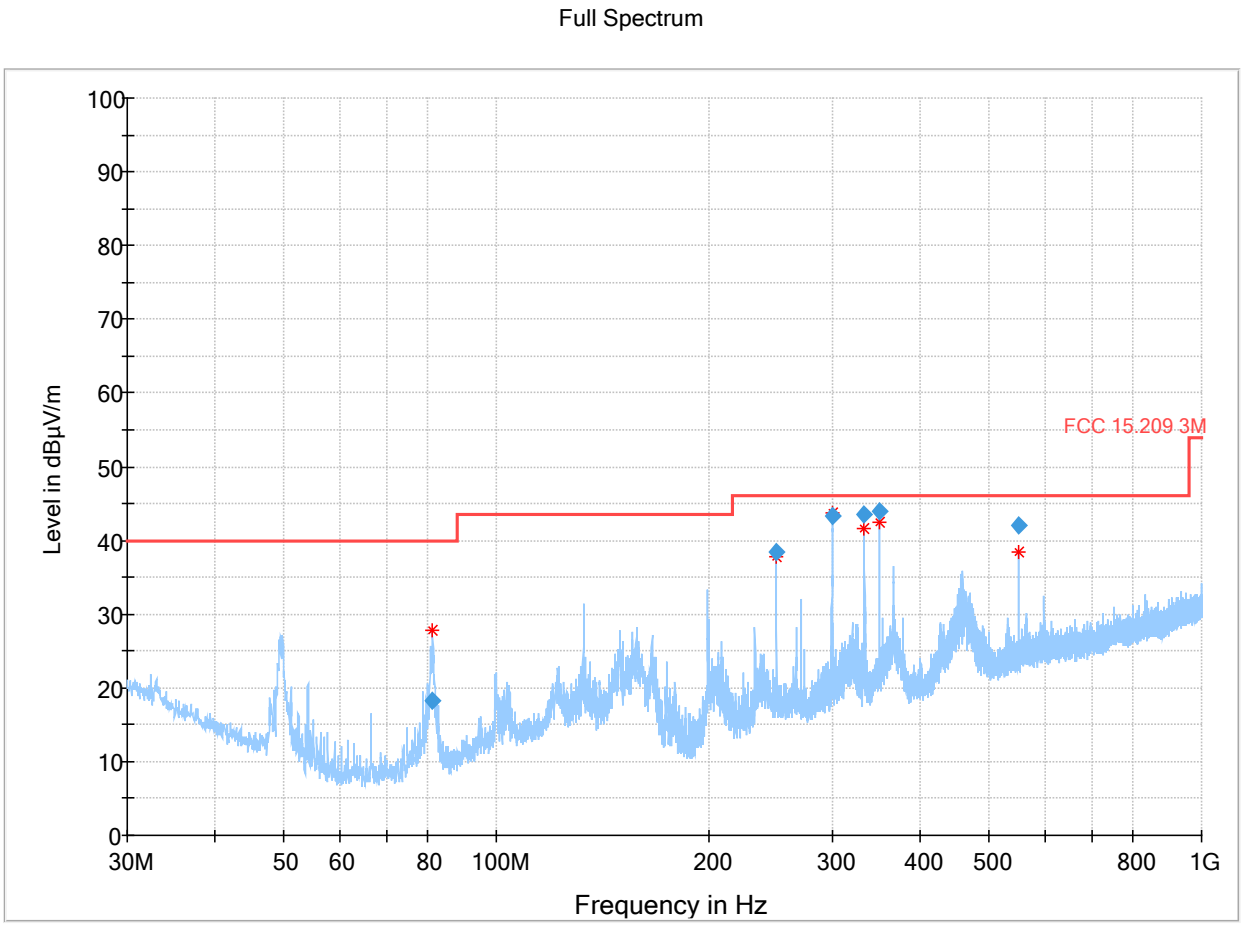


Figure 8.4-3: *Field strength of spurious emissions 30-1000 MHz*

Table 8.4-3: *Final Measurement Results*

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Azimuth (deg)
0.110559	47.59	106.73	59.13	10000.0	0.200	17.0
0.805580	47.51	69.49	21.98	10000.0	9.000	60.0
15.159610	34.42	69.50	35.08	10000.0	9.000	0.0
0.104422	51.27	107.22	55.95	10000.0	0.200	0.0
1.014770	45.30	67.49	22.19	10000.0	9.000	272.0
15.223070	33.86	69.50	35.64	10000.0	9.000	54.0
27.141460	19.02	69.50	50.48	10000.0	9.000	148.0

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)
81.373000	18.35	40.00	21.65	5000.0	120.000	309.3	H	248.0
250.016000	38.45	46.00	7.55	5000.0	120.000	118.4	H	87.0
299.349000	43.32	46.00	2.68	5000.0	120.000	101.9	H	237.0
332.603000	43.54	46.00	2.46	5000.0	120.000	111.2	H	213.0
349.983000	43.90	46.00	2.10	5000.0	120.000	107.2	H	292.0
549.997000	42.07	46.00	3.93	5000.0	120.000	157.1	H	290.0

8.5 FCC 15.225(e) and RSS-210 B.6 Frequency tolerance of the carrier signal

8.5.1 Definitions and limits

The frequency tolerance of the carrier signal shall be maintained within ±0.01 % (±100 ppm) of the operating frequency over a temperature variation of −20 °C to +50 °C at normal supply voltage, and for a variation in the primary supply voltage from 85 % to 115 % of the rated supply voltage at a temperature of 20 °C. For battery operated equipment, the equipment tests shall be performed using a new battery.

8.5.2 Test summary

Test date	January 26, 2017	Temperature	19 °C
Test engineer	Feng You	Air pressure	1003 mbar
Verdict	Pass	Relative humidity	41 %

8.5.3 Observations, settings and special notes

Spectrum analyzer settings:

Detector mode	Peak
Resolution bandwidth	≥1 % of emission bandwidth
Video bandwidth	RBW × 3
Trace mode	Max Hold
Special Condition	Because the EUT is module for medical equipment used in operating room, the temperature range tested is extended according to the manufacturer declared operation range to 70°C. The module is supplied with 36V DC nominal voltage. Declared voltage range is 17-41V DC.

8.5.4 Test data

Table 8.5-1: *Frequency drift measurements results*

Test conditions	Frequency, MHz	Frequency drift, ±ppm	Limit, ±ppm	Margin, ppm
+20 °C, Nominal 120V AC	13.560219	*Reference*	***Reference***	***Reference***
+20 °C, 85V AC	13.560219	0	**100**	**100**
+20 °C, 276V AC	13.560219	0	**100**	**100**
-20 °C	13.560305	6.3	**100**	**93.7**
-10 °C	13.560305	6.3	**100**	**93.7**
0 °C	13.560305	6.3	**100**	**93.7**
+10 °C	13.560300	3.2	**100**	**96.8**
+30 °C	13.560219	0	**100**	**100**
+40 °C	13.560219	0	**100**	**100**
+50 °C	13.560219	0	**100**	**100**

Note: frequency drift was calculated as follows:

Frequency drift (ppm) = $((F_{measured} - F_{reference}) \div F_{reference}) \times 1 \times 10^6$

8.6 FCC 15.207(a) AC power line conducted emissions limits

8.6.1 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 µH/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 µH line impedance stabilization network (LISN).

Table 8.6-1: *Conducted emissions limit*

Frequency of emission (MHz)	Conducted limit (dBµV)	
	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.

8.6.2 Test summary

Test date	March 28, 2017	Temperature	21 °C
Test engineer	Feng You	Air pressure	1004 mbar
Verdict	Pass	Relative humidity	48 %

8.6.3 Observations, settings and special notes

The module is tested inside host device Stryker Core 2.0.

The EUT was set up as floor standing configuration.

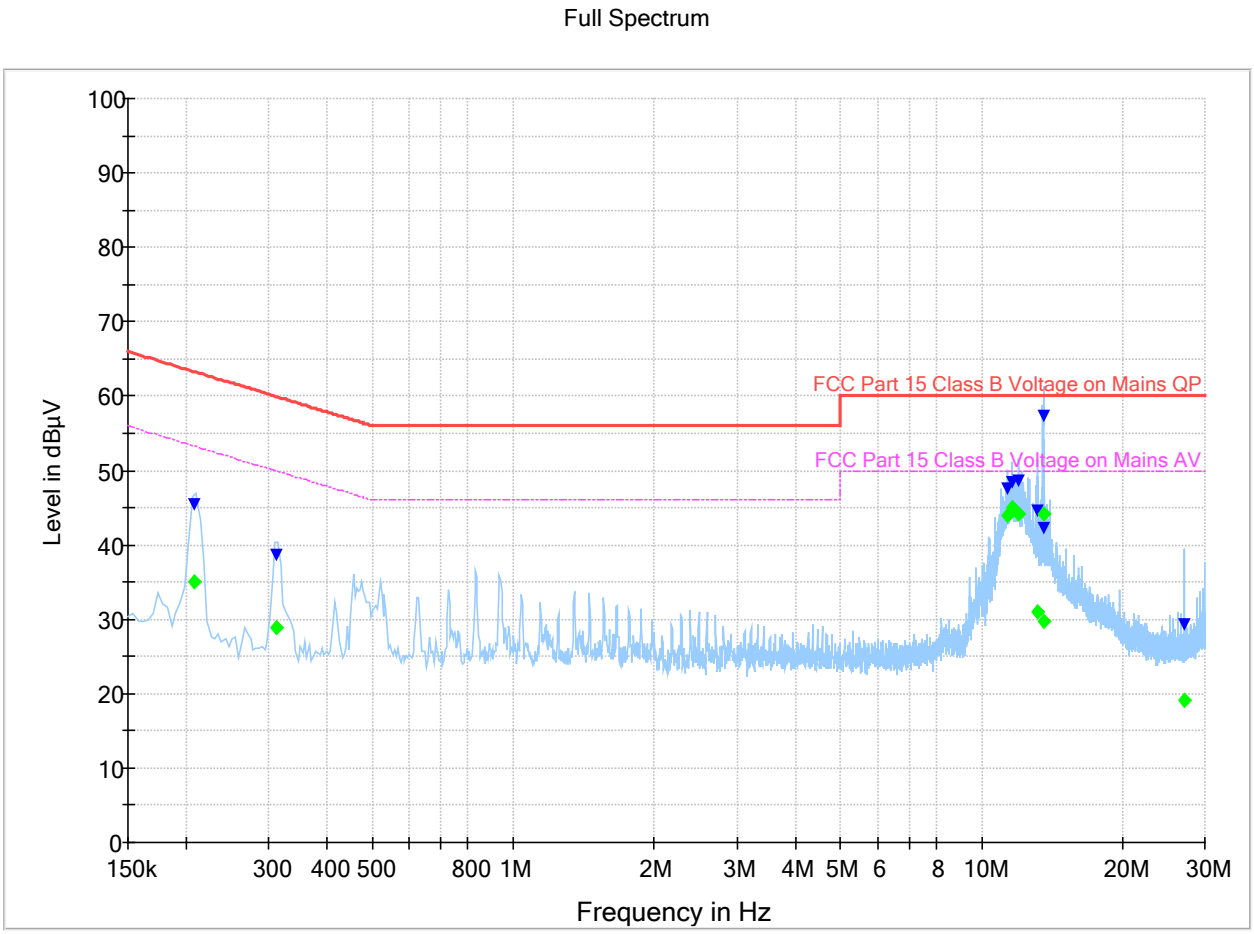
The spectral scan has been corrected with transducer factors (i.e. cable loss, LISN factors, and attenuators) for determination of compliance.

A preview measurement was generated with the receiver in continuous scan mode. Emissions detected within 6 dB or above limit were re-measured with the appropriate detector against the correlating limit and recorded as the final measurement.

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

8.6.4 Test data



Plot 8.6-1: *Conducted emissions*

Table 8.6-2: *Quasi-Peak and Average conducted emissions results*

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Filter
0.208500	---	34.97	53.27	18.30	5000.0	9.000	L1	ON
0.208500	45.47	---	63.27	17.80	5000.0	9.000	L1	ON
0.312500	---	28.88	49.90	21.02	5000.0	9.000	L1	ON
0.312500	38.73	---	59.90	21.18	5000.0	9.000	L1	ON
11.344500	47.52	---	60.00	12.48	5000.0	9.000	N	ON
11.344500	---	43.95	50.00	6.05	5000.0	9.000	N	ON
11.660500	---	44.93	50.00	5.07	5000.0	9.000	N	ON
11.660500	48.31	---	60.00	11.69	5000.0	9.000	N	ON
11.975500	---	44.11	50.00	5.89	5000.0	9.000	N	ON
11.975500	48.64	---	60.00	11.36	5000.0	9.000	N	ON
13.136500	44.56	---	60.00	15.44	5000.0	9.000	L1	ON
13.136500	---	31.06	50.00	18.94	5000.0	9.000	L1	ON
13.551500	---	44.20	50.00	5.80	5000.0	9.000	L1	ON
13.551500	57.39	---	60.00	2.61	5000.0	9.000	L1	ON
13.608500	42.35	---	60.00	17.65	5000.0	9.000	N	ON
13.608500	---	29.69	50.00	20.31	5000.0	9.000	N	ON
27.124500	29.40	---	60.00	30.60	5000.0	9.000	L1	ON
27.124500	---	19.09	50.00	30.91	5000.0	9.000	L1	ON

Section 9. Block diagrams of test set-ups

9.1 Radiated emissions set-up