

EMC Test Report**Application for FCC Grant of Equipment Authorization
Canada Certification****Innovation, Science and Economic Development Canada
RSS-Gen Issue 5 / RSS-247 Issue 2
FCC Part 15 Subpart C****Model: A0001707**

IC CERTIFICATION #: 24335-A0001707
FCC ID: 2AQ9D-A0001707

APPLICANT: Enovate Medical
1152 Park Avenue
Murfreesboro, TN 37129

TEST SITE(S): National Technical Systems
41039 Boyce Road.
Fremont, CA. 94538-2435

IC SITE REGISTRATION #: 2845B-3; 2845B-4, 2845B-5, 2845B-7

PROJECT NUMBER: PR095459

REPORT DATE: October 18, 2019

FINAL TEST DATES: May 21 and 22, 2019

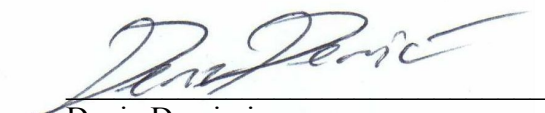
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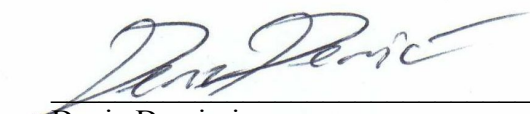
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VALIDATING SIGNATORIES

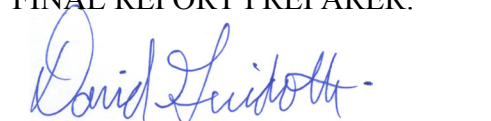
PROGRAM MGR


Deniz Demirci
Senior Wireless / EMC Engineer

TECHNICAL REVIEWER:


Deniz Demirci
Senior Wireless / EMC Engineer

FINAL REPORT PREPARER:


David Guidotti
Senior Technical Writer

QUALITY ASSURANCE DELEGATE


Jesse Reel
Technical Writer



REVISION HISTORY

Rev#	Date	Comments	Modified By
-	October 18, 2019	First release	

TABLE OF CONTENTS

VALIDATING SIGNATORIES	2
REVISION HISTORY	3
TABLE OF CONTENTS	4
SCOPE.....	5
OBJECTIVE	5
STATEMENT OF COMPLIANCE	6
DEVIATIONS FROM THE STANDARDS.....	6
TEST RESULTS SUMMARY	7
DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHZ)	7
MEASUREMENT UNCERTAINTIES	8
EQUIPMENT UNDER TEST (EUT) DETAILS.....	9
GENERAL.....	9
ANTENNA SYSTEM	9
ENCLOSURE	9
MODIFICATIONS	9
SUPPORT EQUIPMENT	9
EUT INTERFACE PORTS	9
EUT OPERATION	9
TEST SITE.....	10
GENERAL INFORMATION	10
RADIATED EMISSIONS CONSIDERATIONS	10
MEASUREMENT INSTRUMENTATION	11
RECEIVER SYSTEM	11
INSTRUMENT CONTROL COMPUTER	11
FILTERS/ATTENUATORS	11
ANTENNAS.....	11
ANTENNA MAST AND EQUIPMENT TURNTABLE	12
INSTRUMENT CALIBRATION.....	12
TEST PROCEDURES	13
EUT AND CABLE PLACEMENT	13
RADIATED EMISSIONS	13
BANDWIDTH MEASUREMENTS	16
SPECIFICATION LIMITS AND SAMPLE CALCULATIONS	16
GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS	17
OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS	18
TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS AND DTS SYSTEMS.....	18
SAMPLE CALCULATIONS - RADIATED EMISSIONS.....	19
APPENDIX A TEST EQUIPMENT CALIBRATION DATA	20
APPENDIX B TEST DATA	21
END OF REPORT	50

SCOPE

An electromagnetic emissions test has been performed on the Enovate Medical model A0001707, pursuant to the following rules:

RSS-Gen Issue 5 “General Requirements for Compliance of Radio Apparatus”

RSS 247 Issue 2 “Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices”

FCC Part 15 Subpart C

Conducted and radiated emissions data has been collected, reduced, and analyzed within this report in accordance with measurement guidelines set forth in the following reference standards and as outlined in National Technical Systems test procedures:

ANSI C63.10-2013

FCC DTS Measurement Guidance KDB558074

The intentional radiator above has been tested in a simulated typical installation to demonstrate compliance with the relevant Industry Canada performance and procedural standards.

Final system data was gathered in a mode that tended to maximize emissions by varying orientation of EUT, orientation of power and I/O cabling, antenna search height, and antenna polarization.

Every practical effort was made to perform an impartial test using appropriate test equipment of known calibration. All pertinent factors have been applied to reach the determination of compliance.

National Technical Systems is accredited by the A2LA, certificate number 0214.26, to perform the test(s) listed in this report, except where noted otherwise.

OBJECTIVE

The primary objective of the manufacturer is compliance with the regulations outlined in the previous section.

Prior to marketing in the USA, all unlicensed transmitters and transceivers require certification. Receive-only devices operating between 30 MHz and 960 MHz are subject to either certification or a manufacturer’s declaration of conformity, with all other receive-only devices exempt from the technical requirements.

Prior to marketing in Canada, Class I transmitters, receivers and transceivers require certification. Class II devices are required to meet the appropriate technical requirements but are exempt from certification requirements.

Certification is a procedure where the manufacturer submits test data and technical information to a certification body and receives a certificate or grant of equipment authorization upon successful completion of the certification body's review of the submitted documents. Once the equipment authorization has been obtained, the label indicating compliance must be attached to all identical units, which are subsequently manufactured.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product which may result in increased emissions should be checked to ensure compliance has been maintained (i.e., printed circuit board layout changes, different line filter, different power supply, harnessing or I/O cable changes, etc.).

STATEMENT OF COMPLIANCE

The tested sample of Enovate Medical model A0001707 complied with the requirements of the following regulations:

RSS-Gen Issue 5 "General Requirements for Compliance of Radio Apparatus"

RSS 247 Issue 2 "Digital Transmission Systems (DTSS), Frequency Hopping Systems (FHSS) and Licence-Exempt Local Area Network (LE-LAN) Devices"

FCC Part 15 Subpart C

Maintenance of compliance is the responsibility of the manufacturer. Any modifications to the product should be assessed to determine their potential impact on the compliance status of the device with respect to the standards detailed in this test report.

The test results recorded herein are based on a single type test of Enovate Medical model A0001707 and therefore apply only to the tested sample. The sample was selected and prepared by Steven Godbey of Enovate Medical.

DEVIATIONS FROM THE STANDARDS

No deviations were made from the published requirements listed in the scope of this report.

TEST RESULTS SUMMARY

DIGITAL TRANSMISSION SYSTEMS (2400 – 2483.5MHz)

FCC Rule Part	RSS Rule Part	Description	Measured Value / Comments	Limit / Requirement	Result
15.247(a)	RSS 247 5.2	Digital Modulation	Systems uses GFSK modulation	System must utilize a digital transmission technology	Complies
15.247 (a) (2)	RSS 247 5.2 (1)	6 dB Bandwidth	0.717 MHz	>500 kHz	Complies
15.247 (b) (3)	RSS 247 5.4 (4)	Output Power (multipoint systems)	4.5 dBm (0.0028 Watts) EIRP = 0.002 W Note 1	1 Watt, EIRP limited to 4 Watts.	Complies
15.247(e)	RSS 247 5.2 (2)	Power Spectral Density	-0.6 dBm/30 kHz	8 dBm/3 kHz	Complies
15.247(d)	RSS 247 5.5	Antenna Port Spurious Emissions	margin >20 dBc	< -20 dBc	Complies
15.247(d) / 15.209	RSS 247 5.5	Radiated Spurious Emissions 9 kHz – 25 GHz	53.9 dBμV/m @ 2312.2 MHz (-0.1 dB)	Refer to the limits section (p17) for restricted bands, all others < -20 dBc	Complies
Note 1: EIRP calculated using antenna gains of -1.5 dBi for the highest EIRP system.					

GENERAL REQUIREMENTS APPLICABLE TO ALL BANDS

FCC Rule Part	RSS Rule part	Description	Measured Value / Comments	Limit / Requirement	Result (margin)
15.203	-	RF Connector	Integral antenna	Unique or integral antenna required	Complies
15.407 (b) (6)	RSS-Gen Table 4	AC Conducted Emissions	Testing was not performed as the EUT is battery powered.		
15.247 (i) 15.407 (f)	RSS 102	RF Exposure Requirements	Refer to MPE calculations in separate exhibit, RSS 102 declaration and User Manual statements.	Refer to OET 65, FCC Part 1 and RSS 102	Complies
-	RSS-Gen 6.8	User Manual		Statement for products with detachable antenna	Complies
-	RSS-Gen 8.4	User Manual		Statement for all products	Complies
-	RSP-100 RSS-Gen 6.7	Occupied Bandwidth		Information only	N/A

MEASUREMENT UNCERTAINTIES

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level and were calculated in accordance with UKAS document LAB 34.

Measurement Type	Measurement Unit	Frequency Range	Expanded Uncertainty
RF power, conducted (power meter)	dBm	25 to 7000 MHz	± 0.5 dB
RF power, conducted (Spectrum analyzer)	dBm	25 to 7000 MHz	± 0.7 dB
Conducted emission of transmitter	dBm	25 to 26500 MHz	± 0.7 dB
Radiated emission (substitution method)	dBm	25 to 26500 MHz	± 2.5 dB
Radiated emission (field strength)	dB μ V/m	9 kHz to 1000 MHz	± 3.6 dB
		1000 to 40000 MHz	± 6.0 dB

EQUIPMENT UNDER TEST (EUT) DETAILS**GENERAL**

The Enovate Medical model A0001707 is a coin cell powered bluetooth low energy transceiver. EUT was treated as tabletop equipment during testing to simulate the end-user environment. The electrical rating of the EUT is 3 Volts (CR2477 battery).

The sample was received on May 21, 2019 and tested on May 21 and 22, 2019. The EUT consisted of the following component(s):

Company	Model	Description	Serial Number	FCC ID
Enovate Medical	A0001707	BLE transceiver	B823730001	2AQ9D-A0001707
Enovate Medical	A0001707	BLE transceiver	B823730007	2AQ9D-A0001707

ANTENNA SYSTEM

PCB trace antenna

ENCLOSURE

The EUT enclosure is primarily constructed of non-coated plastic. It measures approximately 2.0 cm height by 4.0 cm diameter.

MODIFICATIONS

No modifications were made to the EUT during the time the product was at NTS Silicon Valley.

SUPPORT EQUIPMENT

No local support equipment was used during testing.

The following equipment was used as remote support equipment for testing:

Company	Model	Description	Serial Number
Agilent	E3610A	AC/DC power supply	-
Raspberry PI	PI 3	Support computer	

EUT INTERFACE PORTS

The I/O cabling configuration during testing was as follows:

Port	Connected To	Cable(s)		
		Description	Shielded or Unshielded	Length(m)
None	-	-	-	-

EUT OPERATION

During testing, the EUT was continuously transmitting at the rated RF power and the frequencies required.

TEST SITE**GENERAL INFORMATION**

Final test measurements were taken at the test sites listed below. Pursuant to section 2.948 of the FCC's Rules and section 6.2 of RSS-GEN, NTS has been recognized as an accredited test laboratory by the Commission and Innovation, Science and Economic Development Canada. A description of the facilities employed for testing is maintained by NTS.

Site	Designation / Registration Numbers		Location
	FCC	Canada	
Chamber 4	US1031	US0027	41039 Boyce Road Fremont, CA 94538-2435

ANSI C63.4 recommends that ambient noise at the test site be at least 6 dB below the allowable limits. Ambient levels are below this requirement. The test site(s) contain separate areas for radiated and conducted emissions testing. Results from testing performed in this chamber have been correlated with results from an open area test site. Considerable engineering effort has been expended to ensure that the facilities conform to all pertinent requirements of ANSI C63.4.

RADIATED EMISSIONS CONSIDERATIONS

The FCC has determined that radiation measurements made in a shielded enclosure are not suitable for determining levels of radiated emissions. Radiated measurements are performed in an open field environment or in a semi-anechoic chamber. The test sites are maintained free of conductive objects within the CISPR defined elliptical area incorporated in ANSI C63.4 guidelines and meet the Normalized Site Attenuation (NSA) requirements of ANSI C63.4.

MEASUREMENT INSTRUMENTATION

RECEIVER SYSTEM

An EMI receiver as specified in CISPR 16-1-1 is used for emissions measurements. The receivers used can measure over the frequency range of 9 kHz up to 2000 MHz. These receivers allow both ease of measurement and high accuracy to be achieved. The receivers have Peak, Average, and CISPR (Quasi-peak) detectors built into their design so no external adapters are necessary. The receiver automatically sets the required bandwidth for the CISPR detector used during measurements. If the repetition frequency of the signal being measured is below 20 Hz, peak measurements are made in lieu of Quasi-Peak measurements.

For measurements above the frequency range of the receivers, a spectrum analyzer is utilized because it provides visibility of the entire spectrum along with the precision and versatility required to support engineering analysis. Average measurements above 1000 MHz are performed on the spectrum analyzer using the linear-average method with a resolution bandwidth of 1 MHz and a video bandwidth of 10 Hz, unless the signal is pulsed in which case the average (or video) bandwidth of the measuring instrument is reduced to onset of pulse desensitization and then increased.

INSTRUMENT CONTROL COMPUTER

Software is used to view and convert receiver measurements to the field strength at an antenna or voltage developed at the LISN measurement port, which is then compared directly with the appropriate specification limit. This provides faster, more accurate readings by performing the conversions described under Sample Calculations within the Test Procedures section of this report. Results are printed in a graphic and/or tabular format, as appropriate. A personal computer is used to record all measurements made with the receivers. The software used for radiated and conducted emissions measurements is NTS EMI Test Software (rev 2.10)

FILTERS/ATTENUATORS

External filters and precision attenuators are often connected between the receiving antenna or LISN and the receiver. This eliminates saturation effects and non-linear operation due to high amplitude transient events.

ANTENNAS

A loop antenna is used below 30 MHz. For the measurement range 30 MHz to 1000 MHz either a combination of a biconical antenna and a log periodic or a bi-log antenna is used. Above 1000 MHz, horn antennas are used. The antenna calibration factors to convert the received voltage to an electric field strength are included with appropriate cable loss and amplifier gain factors to determine an overall site factor, which is then programmed into the test receivers or incorporated into the test software.

ANTENNA MAST AND EQUIPMENT TURNTABLE

The antennas used to measure the radiated electric field strength are mounted on a non-conductive antenna mast equipped with a motor-drive to vary the antenna height. Measurements below 30 MHz are made with the loop antenna at a fixed height of 1m above the ground plane.

ANSI C63.10 specifies that the test height above ground for table mounted devices shall be 80 cm for testing below 1 GHz and 1.5 m for testing above 1 GHz. During radiated measurements, the EUT is positioned on a motorized turntable in conformance with this requirement.

INSTRUMENT CALIBRATION

All test equipment is regularly checked to ensure that performance is maintained in accordance with the manufacturer's specifications. All antennas are calibrated at regular intervals with respect to tuned half-wave dipoles. An exhibit of this report contains the list of test equipment used and calibration information.

TEST PROCEDURES

EUT AND CABLE PLACEMENT

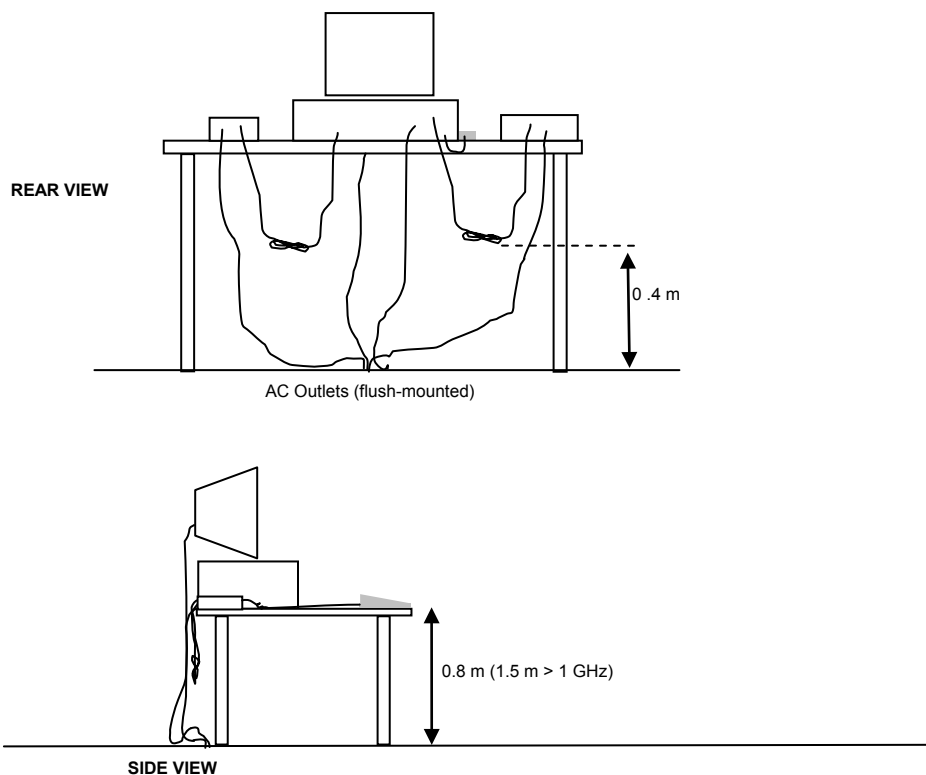
The regulations require that interconnecting cables be connected to the available ports of the unit and that the placement of the unit and the attached cables simulate the worst case orientation that can be expected from a typical installation, so far as practicable. To this end, the position of the unit and associated cabling is varied within the guidelines of ANSI C63.10, and the worst-case orientation is used for final measurements.

RADIATED EMISSIONS

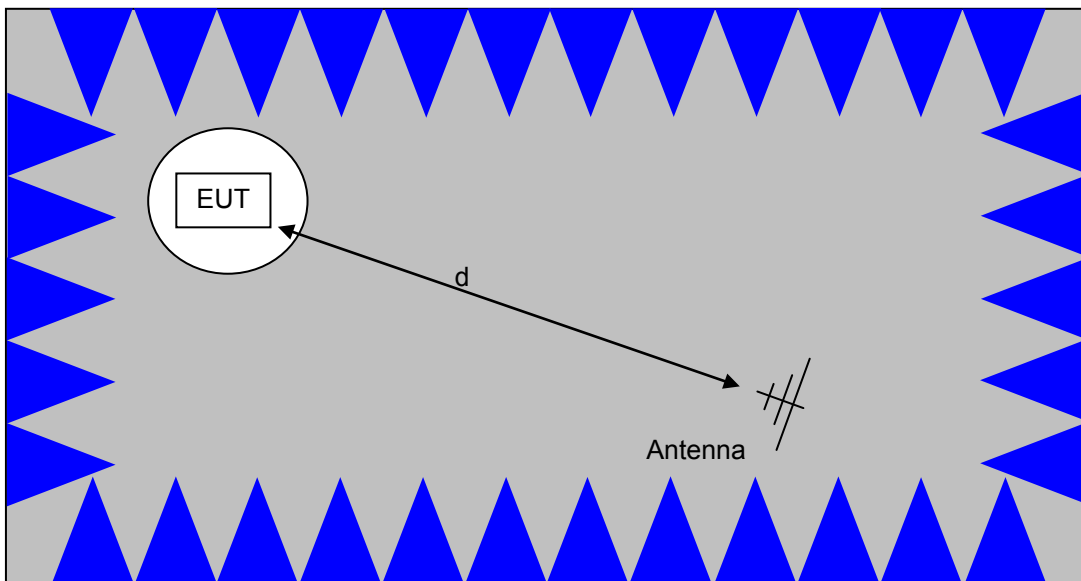
A preliminary scan of the radiated emissions is performed in which all significant EUT frequencies are identified with the system in a nominal configuration. At least two scans are performed, one scan for each antenna polarization (horizontal and vertical; loop parallel and perpendicular to the EUT). During the preliminary scans, the EUT is rotated through 360°, the antenna height is varied (for measurements above 30 MHz) and cable positions are varied to determine the highest emission relative to the limit. Preliminary scans may be performed in a fully anechoic chamber for the purposes of identifying the frequencies of the highest emissions from the EUT.

A speaker is provided in the receiver to aid in discriminating between EUT and ambient emissions. Other methods used during the preliminary scan for EUT emissions involve scanning with near field magnetic loops, monitoring I/O cables with RF current clamps, and cycling power to the EUT.

Final maximization is a phase in which the highest amplitude emissions identified in the spectral search are viewed while the EUT azimuth angle is varied from 0 to 360 degrees relative to the receiving antenna. The azimuth, which results in the highest emission is then maintained while varying the antenna height from one to four meters (for measurements above 30 MHz, measurements below 30 MHz are made with the loop antenna at a fixed height of 1 m). The result is the identification of the highest amplitude for each of the highest peaks. Each recorded level is corrected in the receiver using appropriate factors for cables, connectors, antennas, and preamplifier gain.

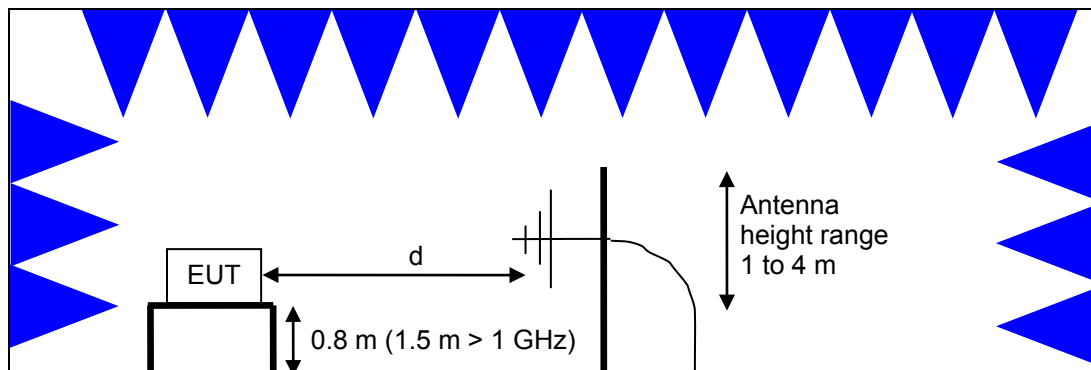


Typical Test Configuration for Radiated Field Strength Measurements



The anechoic materials on the walls and ceiling ensure compliance with the normalized site attenuation requirements of CISPR 16 / CISPR 22 / ANSI C63.4 for an alternate test site at the measurement distances used.

Floor-standing equipment is placed on the floor with insulating supports between the unit and the ground plane.



Test Configuration for Radiated Field Strength Measurements
Semi-Anechoic Chamber, Plan and Side Views

BANDWIDTH MEASUREMENTS

The 6 dB, 20 dB, 26 dB and/or 99% signal bandwidth are measured using the bandwidths recommended by ANSI C63.10 and RSS GEN.

SPECIFICATION LIMITS AND SAMPLE CALCULATIONS

The limits for conducted emissions are given in units of microvolts, and the limits for radiated emissions are given in units of microvolts per meter at a specified test distance. Data is measured in the logarithmic form of decibels relative to one microvolt, or dB microvolts (dB μ V). For radiated emissions, the measured data is converted to the field strength at the antenna in dB microvolts per meter (dB μ V/m). The results are then converted to the linear forms of μ V and μ V/m for comparison to published specifications.

For reference, converting the specification limits from linear to decibel form is accomplished by taking the base ten logarithm, then multiplying by 20. These limits in both linear and logarithmic form are as follows:

GENERAL TRANSMITTER RADIATED EMISSIONS SPECIFICATION LIMITS

The table below shows the limits for the spurious emissions from transmitters that fall in restricted bands¹.

Frequency Range (MHz)	Limit ($\mu\text{V/m}$)	Limit ($\text{dB}\mu\text{V/m @ 3m}$)
0.009-0.490	$2400/F_{\text{kHz}} @ 300 \text{ m}$	$67.6-20*\log_{10}(F_{\text{kHz}}) @ 300 \text{ m}$
0.490-1.705	$24000/F_{\text{kHz}} @ 30 \text{ m}$	$87.6-20*\log_{10}(F_{\text{kHz}}) @ 30 \text{ m}$
1.705 to 30	$30 @ 30 \text{ m}$	$29.5 @ 30 \text{ m}$
30 to 88	$100 @ 3 \text{ m}$	$40 @ 3 \text{ m}$
88 to 216	$150 @ 3 \text{ m}$	$43.5 @ 3 \text{ m}$
216 to 960	$200 @ 3 \text{ m}$	$46.0 @ 3 \text{ m}$
Above 960	$500 @ 3 \text{ m}$	$54.0 @ 3 \text{ m}$

¹ The restricted bands are detailed in FCC 15.205 and RSS-Gen Table 7

OUTPUT POWER LIMITS – DIGITAL TRANSMISSION SYSTEMS

The table below shows the limits for output power and output power density. Where the signal bandwidth is less than 20 MHz the maximum output power is reduced to the power spectral density limit plus 10 times the log of the bandwidth (in MHz).

Operating Frequency (MHz)	Output Power	Power Spectral Density
902 – 928	1 Watt (30 dBm)	8 dBm/3 kHz
2400 – 2483.5	1 Watt (30 dBm)	8 dBm/3 kHz
5725 – 5850	1 Watt (30 dBm)	8 dBm/3 kHz

The maximum permitted output power is reduced by 1 dB for every dB the antenna gain exceeds 6 dBi. Fixed point-to-point applications using the 5725 – 5850 MHz band are not subject to this restriction.

TRANSMIT MODE SPURIOUS RADIATED EMISSIONS LIMITS – FHSS and DTS SYSTEMS

The limits for unwanted (spurious) emissions from the transmitter falling in the restricted bands are those specified in the general limits sections of FCC Part 15 and RSS 210. All other unwanted (spurious) emissions shall be at least 20 dB below the level of the highest in-band signal level (30 dB if the power is measured using the sample detector/power averaging method).

SAMPLE CALCULATIONS - RADIATED EMISSIONS

Receiver readings are compared directly to the specification limit (decibel form). The receiver internally corrects for cable loss, preamplifier gain, and antenna factor. The calculations are in the reverse direction of the actual signal flow, thus cable loss is added and the amplifier gain is subtracted. The Antenna Factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

A distance factor, when used for electric field measurements above 30MHz, is calculated by using the following formula:

$$F_d = 20 * \text{LOG}_{10} (D_m/D_s)$$

where:

F_d = Distance Factor in dB

D_m = Measurement Distance in meters

D_s = Specification Distance in meters

For electric field measurements below 30MHz the extrapolation factor is either determined by making measurements at multiple distances or a theoretical value is calculated using the formula:

$$F_d = 40 * \text{LOG}_{10} (D_m/D_s)$$

Measurement Distance is the distance at which the measurements were taken and Specification Distance is the distance at which the specification limits are based. The antenna factor converts the voltage at the antenna coaxial connector to the field strength at the antenna elements.

The margin of a given emission peak relative to the limit is calculated as follows:

$$R_c = R_r + F_d$$

and

$$M = R_c - L_s$$

where:

R_r = Receiver Reading in dB μ V/m

F_d = Distance Factor in dB

R_c = Corrected Reading in dB μ V/m

L_s = Specification Limit in dB μ V/m

M = Margin in dB Relative to Spec

Appendix A Test Equipment Calibration Data

Radiated Emissions, 0.009 - 1,000 MHz, 21-May-19

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/9/2019	2/9/2020
Sunol Sciences	Biconilog, 30-3000 MHz	JB3	1548	10/24/2018	1/9/2021
Com-Power	Preamplifier, 1-1000 MHz	PAM-103	2885	8/21/2018	8/21/2019
Rhode & Schwarz	Magnetic Loop Antenna, 9 kHz-30 MHz	HFH2-Z2	WC062 457	1/5/2018	1/5/2020

Radiated Emissions, 1,000 - 25,000 MHz, 22-May-19

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
National Technical Systems	NTS EMI Software (rev 2.10)	N/A	0		N/A
Hewlett Packard	Microwave Preamplifier, 1-26.5GHz	8449B	785	9/5/2018	9/5/2019
EMCO	Antenna, Horn, 1-18GHz	3115	868	7/9/2018	7/9/2020
Hewlett Packard	Spectrum Analyzer (SA40) Red 30 Hz -40 GHz	8564E (84125C)	1148	9/27/2018	9/27/2019
Rohde & Schwarz	EMI Test Receiver, 20 Hz-7 GHz	ESIB 7	1538	2/9/2019	2/9/2020
A. H. Systems	Spare System Horn, 18-40 GHz	SAS-574, p/n: 2581	2162	8/4/2017	8/4/2019
Micro-Tronics	High Pass Filter 2700 MHz	HPM50111	2326	12/20/2018	12/20/2019

Antenna port measurements 28-May-19

<u>Manufacturer</u>	<u>Description</u>	<u>Model</u>	<u>Asset #</u>	<u>Calibrated</u>	<u>Cal Due</u>
Rohde & Schwarz	Power Meter, Dual Channel	NRVD	1071	4/10/2019	4/10/2020
Rohde & Schwarz	Poweer sensor, 1 nW-20 mW, 10 MHz-18 GHz, 50 Ohms	NRV-Z1	2114	11/7/2019	11/7/2020
Agilent Technologies	PSA, Spectrum Analyzer, (installed options, 111, 115, 123, 1SS, B7J, HYX	E4446A	2139	7/27/2018	7/27/2019

Appendix B Test Data

TL095459-RA Pages 22 – 49



EMC Test Data

Client:	Enovate Medical	PR Number:	PR095459
Product	A0001707	T-Log Number:	TL095459-RA
System Configuration:		Project Manager:	Deepa Shetty
Contact:	Cameron Boone	Project Engineer:	Deniz Demirci
Emissions Standard(s):	FCC 15.247, RSS-247	Class:	B
Immunity Standard(s):	-	Environment:	-

EMC Test Data

For The

Enovate Medical

Product

A0001707

Date of Last Test: 5/22/2019



EMC Test Data

Client:	Enovate Medical	PR Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Engineer:	Deniz Demirci
		Class:	B

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 5/21/2019
Test Engineer: M. Birgani
Test Location: FT Chamber #4

Config. Used: 1
Config Change: None
EUT Voltage: 3 Vdc battery powered.

General Test Configuration

The EUT was located on the turntable for radiated emissions testing. No support equipment was used
The test distance and extrapolation factor (if used) are detailed under each run description.

Ambient Conditions:

Temperature: 19-21 °C
Rel. Humidity: 38-42 %

Summary of Results

Run #		Test Performed			Limit	Result	Margin
Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	BLE EUT Flat	17- 2440 MHz	Max	Max	Radiated Emissions, 9 kHz - 1 GHz	FCC Part 15.209	16.4 dBµV/m @ 30.54 MHz (-23.6 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.

Sample Notes

Sample S/N: B823730007
Driver: Minicom
Antenna: Integral



EMC Test Data

Client:	Enovate Medical	PR Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Engineer:	Deniz Demirci
		Class:	B

Run #1: Radiated Emissions, 9 kHz - 1000 MHz, FCC 15.209

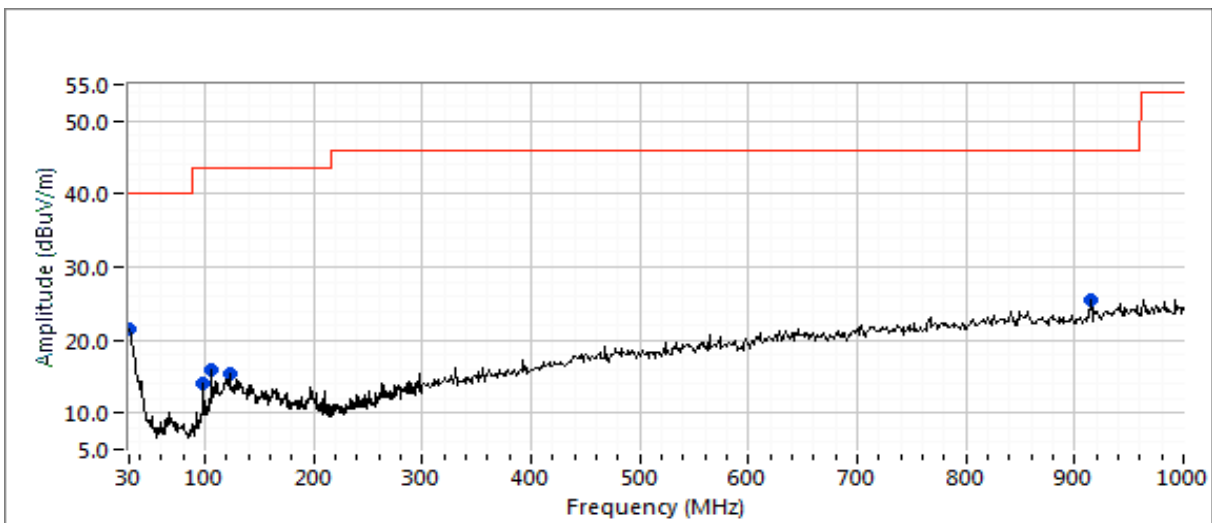
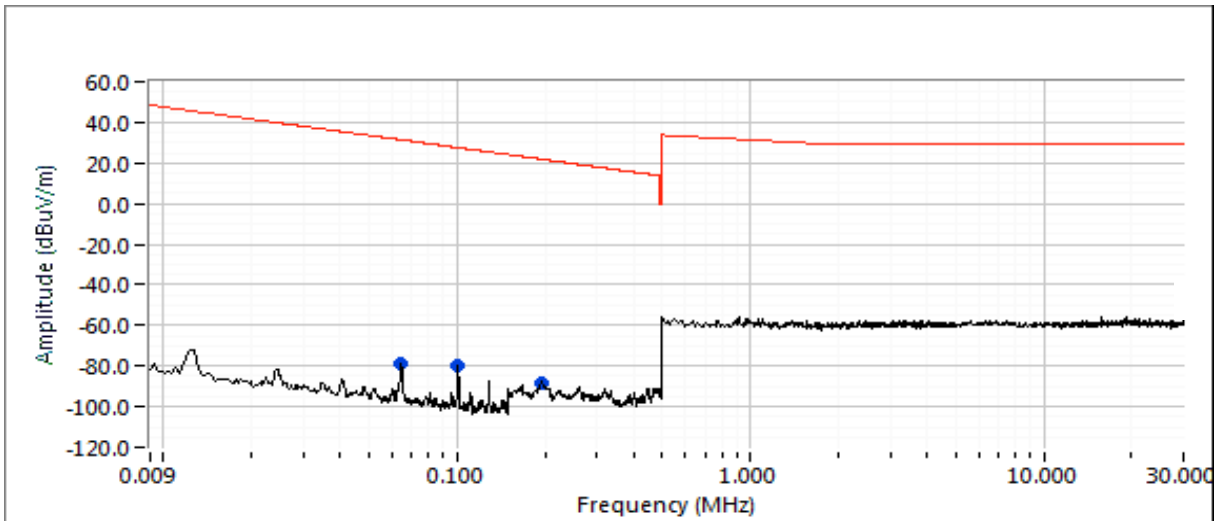
Frequency Range	Test Distance	Limit Distance	Extrapolation Factor
0.009 - 0.490 MHz	3	300	-80.0
0.490 - 1.705 MHz	3	30	-40.0
1.705 - 30.0 MHz	3	30	-40.0
30 - 1000 MHz	3	3	0.0

Frequency	Level	Pol	FCC 15.209		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
30.541	16.4	H	40.0	-23.6	QP	354	3.5	QP (1.00s)
914.429	19.3	V	46.0	-26.7	QP	260	1.0	QP (1.00s)
122.525	15.1	H	43.5	-28.4	QP	199	1.4	QP (1.00s)
97.635	10.2	H	43.5	-33.3	QP	109	4.0	QP (1.00s)
105.752	9.7	V	43.5	-33.8	QP	291	1.9	QP (1.00s)
0.101	-79.7	V	27.5	-107.2	Peak	109	1.0	Peak reading with QP limit
0.064	-78.4	V	31.4	-109.8	Peak	109	1.0	Peak reading with QP limit
0.196	-88.2	V	21.8	-110.0	Peak	109	1.0	Peak reading with QP limit



EMC Test Data

Client:	Enovate Medical	PR Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Engineer:	Deniz Demirci
		Class:	B





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Radiated Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

General Test Configuration

The EUT and all local support equipment were located on the turntable for radiated spurious emissions testing.

For radiated emissions testing the measurement antenna was located 3 meters from the EUT, unless otherwise noted.

Ambient Conditions:

Temperature: 19-22 °C

Rel. Humidity: 38-41 %

Summary of Results - Device Operating in the 2400-2483.5 MHz Band

Run #	Mode	Channel	Target Power	Power Setting	Test Performed	Limit	Result / Margin
1	BLE EUT Flat	17 2440 MHz	Max	Max	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	53.9 dBµV/m @ 2312.2 MHz (-0.1 dB)
	BLE EUT Side1						51.9 dBµV/m @ 2312.0 MHz (-2.1 dB)
	BLE EUT Side2						53.2 dBµV/m @ 2312.0 MHz (-0.8 dB)
Scans on low and high channel on the worst case EUT orientation.							
2	BLE EUT Flat	37 2402 MHz	Max	Max	Radiated Emissions, 1 - 25 GHz	FCC Part 15.209 / 15.247(c)	51.6 dBµV/m @ 2530.0 MHz (-2.4 dB)
	BLE EUT Flat	39 2480 MHz					52.6 dBµV/m @ 2352.1 MHz (-1.4 dB)
3	BLE EUT Flat	37 2402 MHz	Max	Max	Band Edge 2390 - 2483.5 MHz	15.247(c)	39.7 dBµV/m @ 2353.8 MHz (-14.3 dB)
	BLE EUT Flat	39 2480 MHz					61.0 dBµV/m @ 2483.5 MHz (-13.0 dB)

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Sample Notes

Sample S/N: B823730007

Driver: Minicom

Antenna: Integral

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074

Peak measurements performed with: RBW=1MHz, VBW=3MHz, peak detector, max hold, auto sweep time

Unless otherwise stated/noted, emission has duty cycle $\geq 98\%$ and was measured using RBW=1MHz, VBW=10Hz, peak detector, linear average mode, auto sweep time, max hold.

2.4GHz band reject filter used

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	1 Mb/s	95.3%	Yes	2.12	0.2	0.4	472

Measurement Specific Notes:

Note 1:	Emission in non-restricted band, but limit of 15.209 used.
Note 2:	Emission in non-restricted band, the limit was set 30dB below the level of the fundamental and measured in 100kHz.
Note 6:	Emission has non constant duty cycle $< 98\%$, average measurement performed: RBW=1MHz, VBW $> 1/T$, peak detector, linear average mode, sweep time auto, max hold. Max hold for $50 \cdot (1/DC)$ traces



EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #1a: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: BLE

Date of Test: 5/22/2019

Config. Used: 1

Test Engineer: D. Demirci & M. Birgani

Config Change: none

Test Location: FT Ch #4

EUT Voltage: 3.0 VDC

Run #1a: Center Channel, EUT Flat

Channel: 17

Mode: BLE

Power Setting: Max

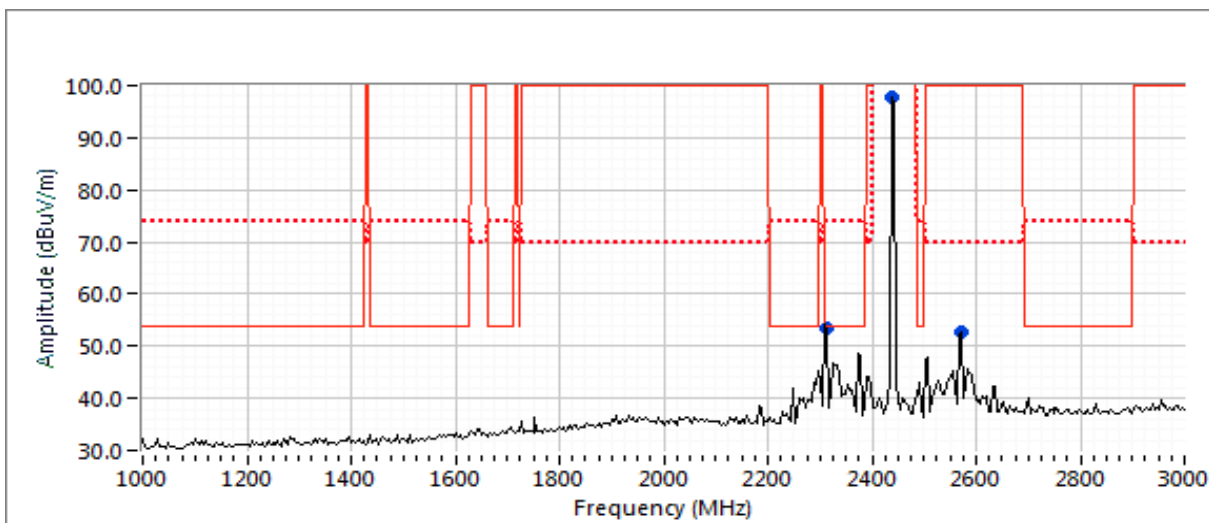
Tx Chain: Main

Data Rate: 1 Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2312.150	53.9	H	54.0	-0.1	AVG	332	1.5	Note 6; RB 1 MHz; VB: 500 Hz
2312.300	56.7	H	74.0	-17.3	PK	332	1.5	RB 1 MHz; VB: 3 MHz
2568.070	49.8	H	54.0	-4.2	AVG	232	1.52	Note 1&6; RB 1 MHz; VB: 500 Hz
2567.810	54.4	H	74.0	-19.6	PK	232	1.52	Note 1; RB 1 MHz; VB: 3 MHz
7320.500	45.1	V	54.0	-8.9	Avg	94	1.05	Note 6, RB 1 MHz; VB 1 kHz
7320.710	54.9	V	74.0	-19.1	PK	94	1.05	RB 1 MHz; VB 3 MHz
4880.100	34.6	H	54.0	-19.4	Avg	131	1.92	Note 6, RB 1 MHz; VB 1 kHz
4878.680	47.7	H	74.0	-26.3	PK	131	1.92	RB 1 MHz; VB 3 MHz
5131.550	34.0	V	54.0	-20.0	Avg	347	1.95	Note 6, RB 1 MHz; VB 1 kHz
5123.800	47.4	V	74.0	-26.6	PK	347	1.95	RB 1 MHz; VB 3 MHz
12199.070	34.0	V	54.0	-20.0	AVG	331	1.78	Note 6, RB 1 MHz; VB 1 kHz
12198.860	46.0	V	74.0	-28.0	PK	331	1.78	RB 1 MHz; VB 3 MHz

Note:

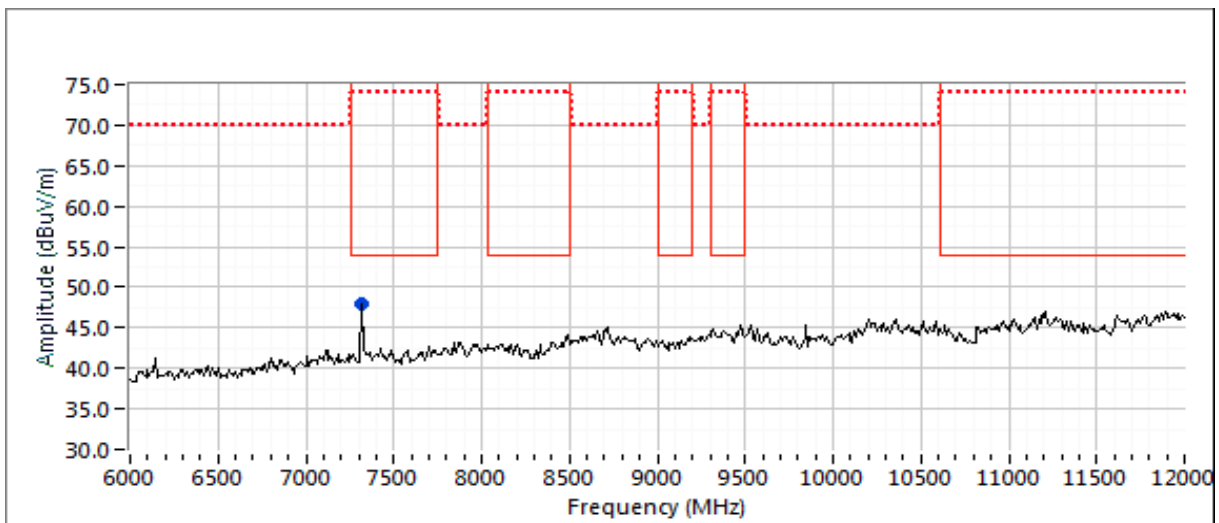
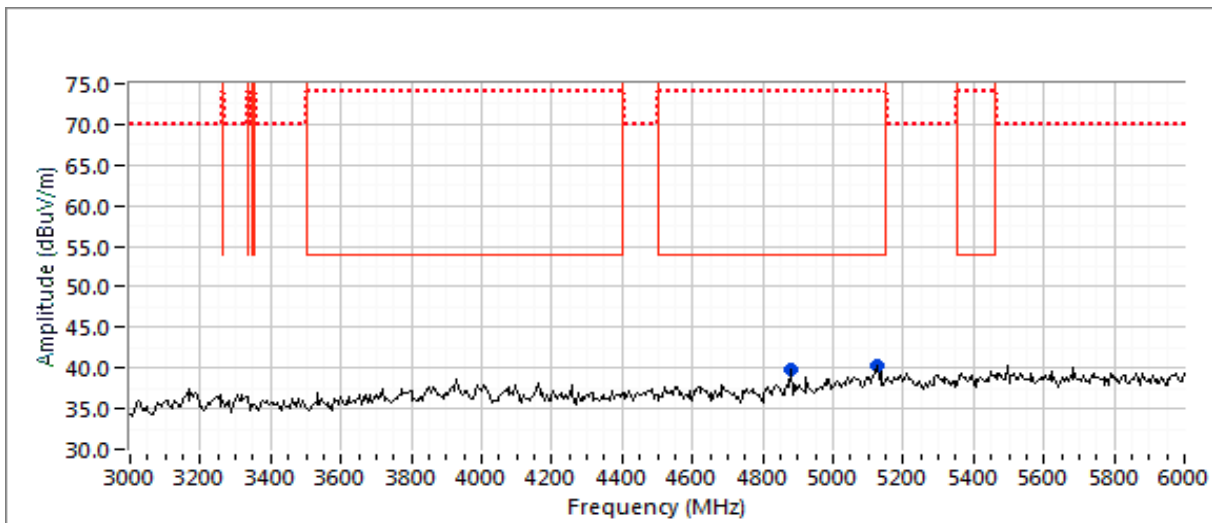
Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range





EMC Test Data

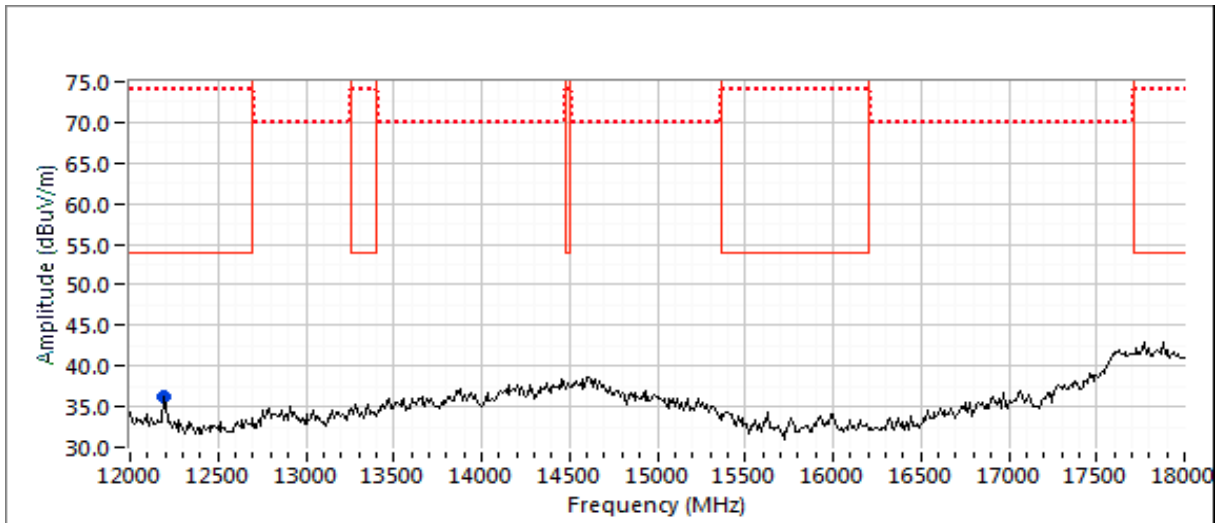
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





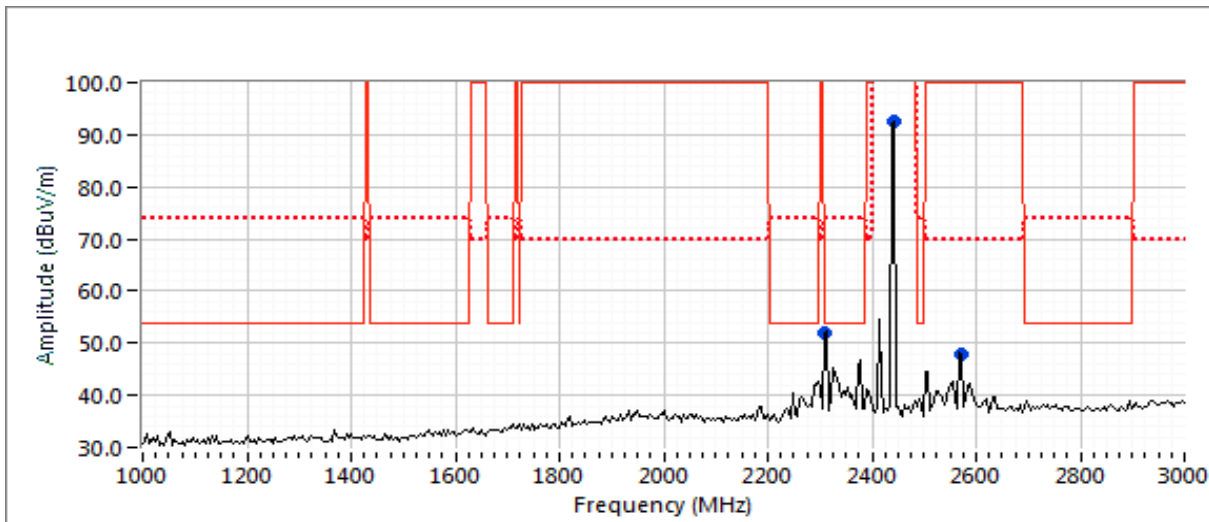
EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #1b: Center Channel, EUT Side 1

Channel: 17 Mode: BLE Power Setting: Max
 Tx Chain: Main Data Rate: 1 Mbps

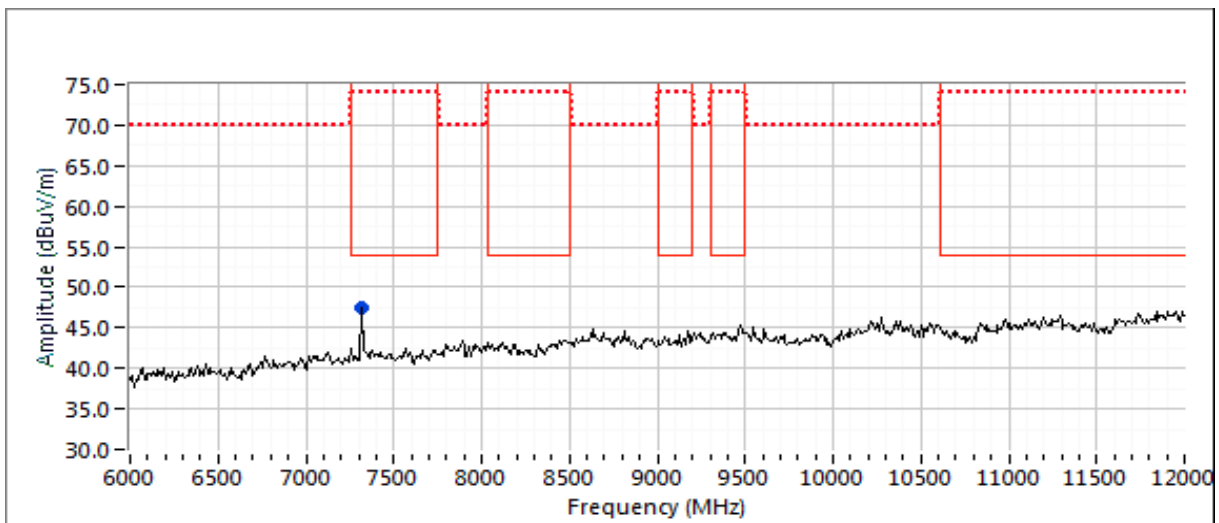
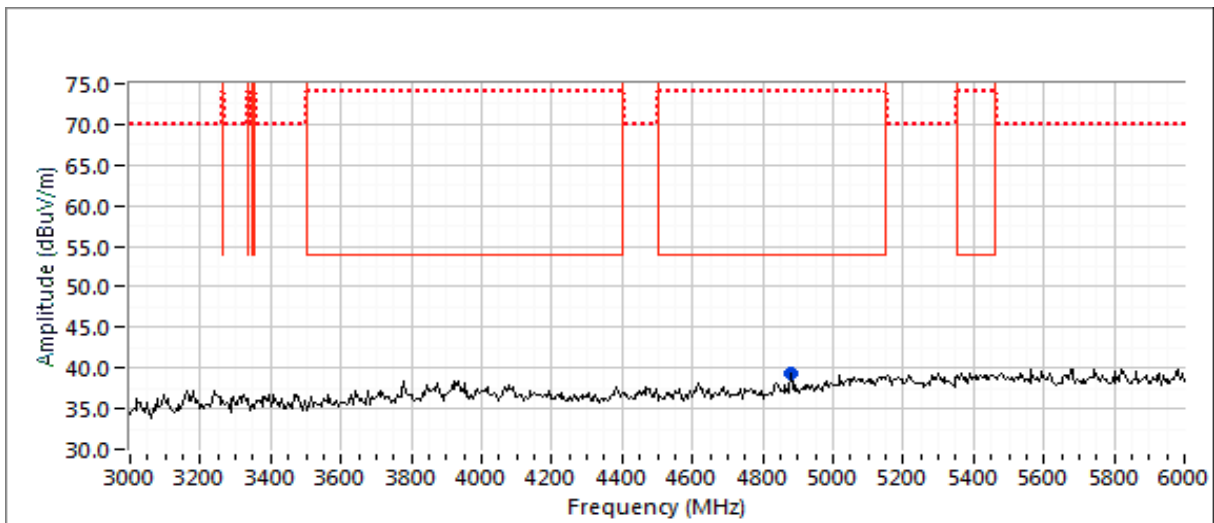
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dBμV/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2312.020	51.9	V	54.0	-2.1	Avg	183	2.0	Note 6; RB 1 MHz; VB: 500 Hz
2311.730	55.0	V	74.0	-19.0	PK	183	2.0	RB 1 MHz; VB: 3 MHz
2568.040	46.7	H	54.0	-7.3	Avg	127	1.0	Note 1&6; RB 1 MHz; VB: 500 Hz
2568.250	51.8	H	74.0	-22.2	PK	127	1.0	Note 1; RB 1 MHz; VB: 3 MHz
4880.160	36.4	H	54.0	-17.6	Avg	230	1.9	Note 6; RB 1 MHz; VB 1 kHz
4880.830	47.6	H	74.0	-26.4	PK	230	1.9	RB 1 MHz; VB 3 MHz
7320.920	43.9	V	54.0	-10.1	Avg	224	2.1	Note 6; RB 1 MHz; VB 1 kHz
7320.140	54.3	V	74.0	-19.7	PK	224	2.1	RB 1 MHz; VB 3 MHz





EMC Test Data

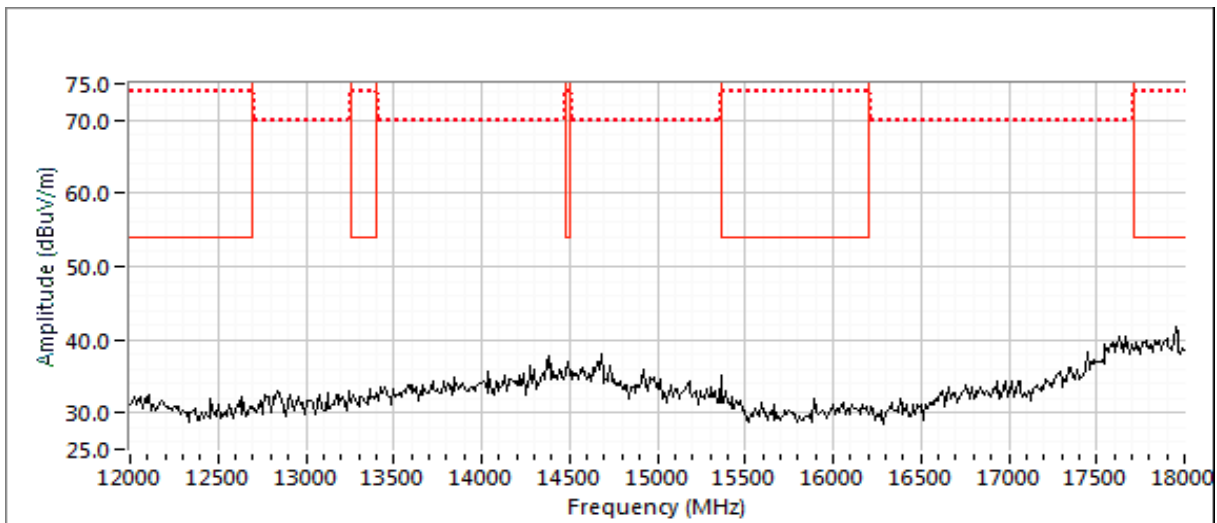
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





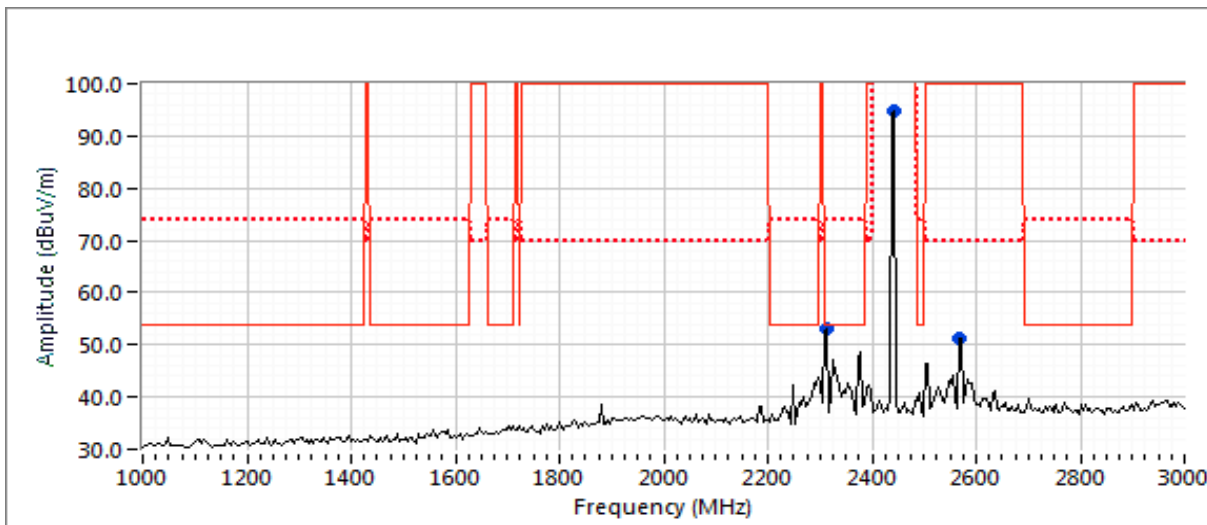
EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #1c: Center Channel, EUT Side 2

Channel: 17 Mode: BLE Power Setting: Max
Tx Chain: Main Data Rate: 1 Mbps

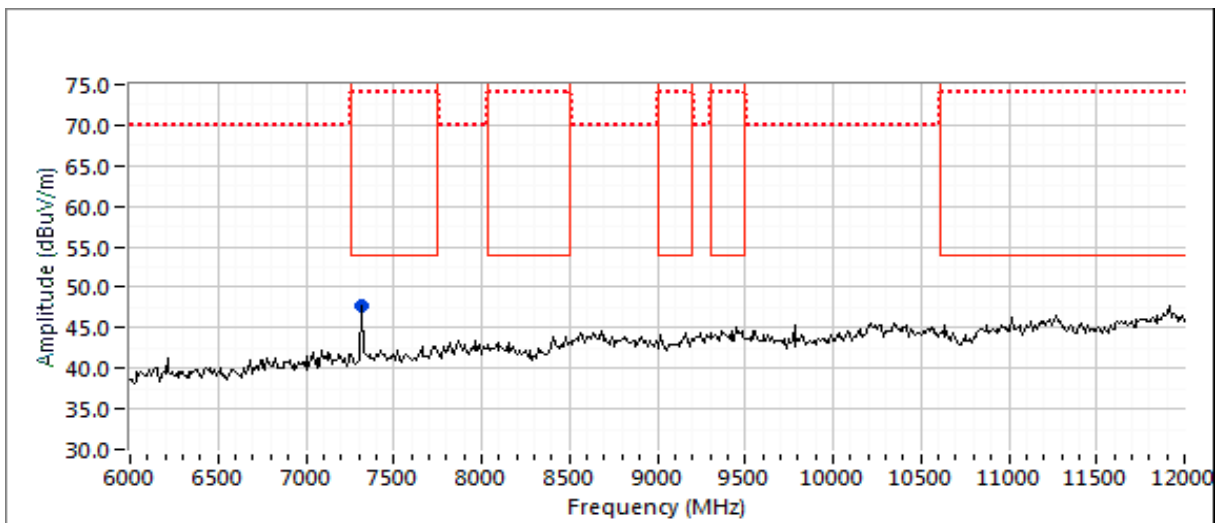
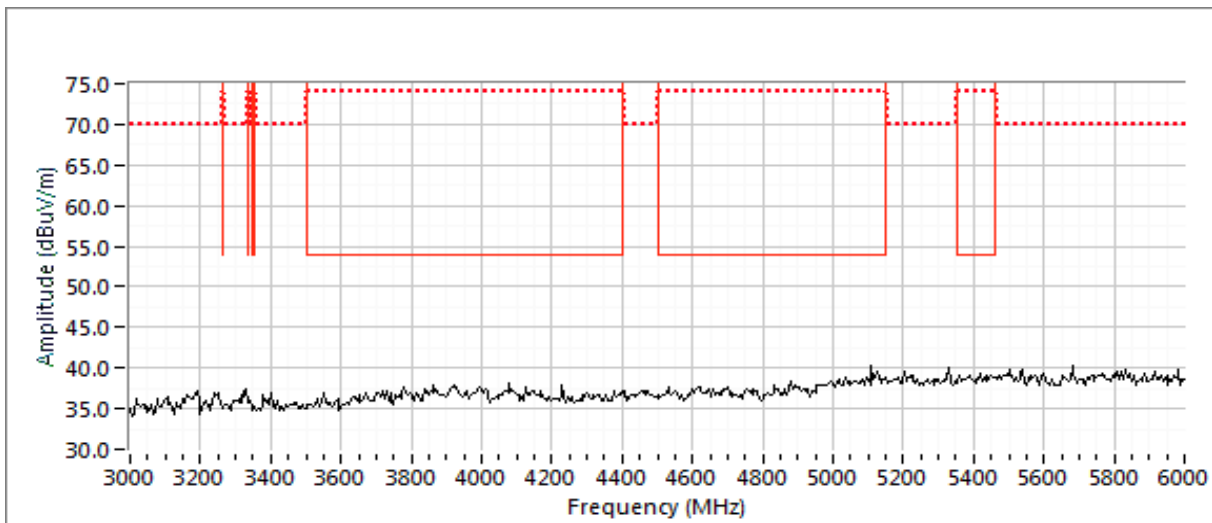
Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2312.010	53.2	V	54.0	-0.8	AVG	40	1.5	Note 6; RB 1 MHz; VB: 500 Hz
2311.790	56.4	V	74.0	-17.6	PK	40	1.5	RB 1 MHz; VB: 3 MHz
2568.080	50.4	V	54.0	-3.6	AVG	48	1.5	Note 1&6; RB 1 MHz; VB: 500 Hz
2568.380	54.3	V	74.0	-19.7	PK	48	1.5	Note 1; RB 1 MHz; VB: 3 MHz
7319.550	41.8	H	54.0	-12.2	AVG	128	1.1	Note 6; RB 1 MHz; VB 1 kHz
7320.780	53.4	H	74.0	-20.6	PK	128	1.1	RB 1 MHz; VB 3 MHz





EMC Test Data

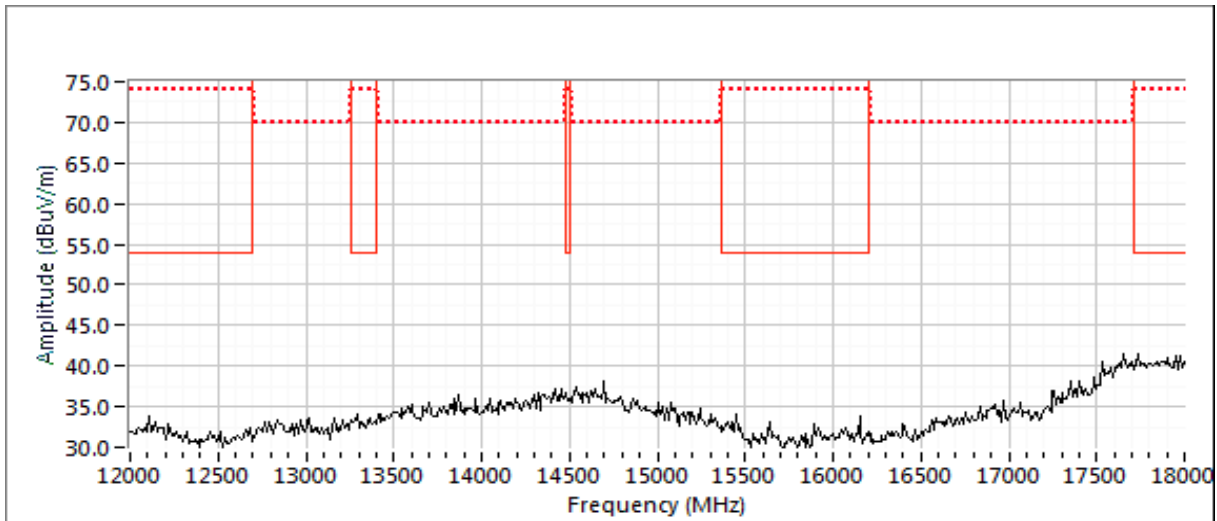
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #2: Radiated Spurious Emissions, 1,000 - 25000 MHz. Operating Mode: BLE, EUT Flat

Date of Test: 5/22/2019

Config. Used: 1

Test Engineer: M. Birgani

Config Change: None

Test Location: FT Ch #4

EUT Voltage: 3.0 VDC

Run #2a: Low Channel

Channel: 37

Mode: BLE

Power Setting: Max

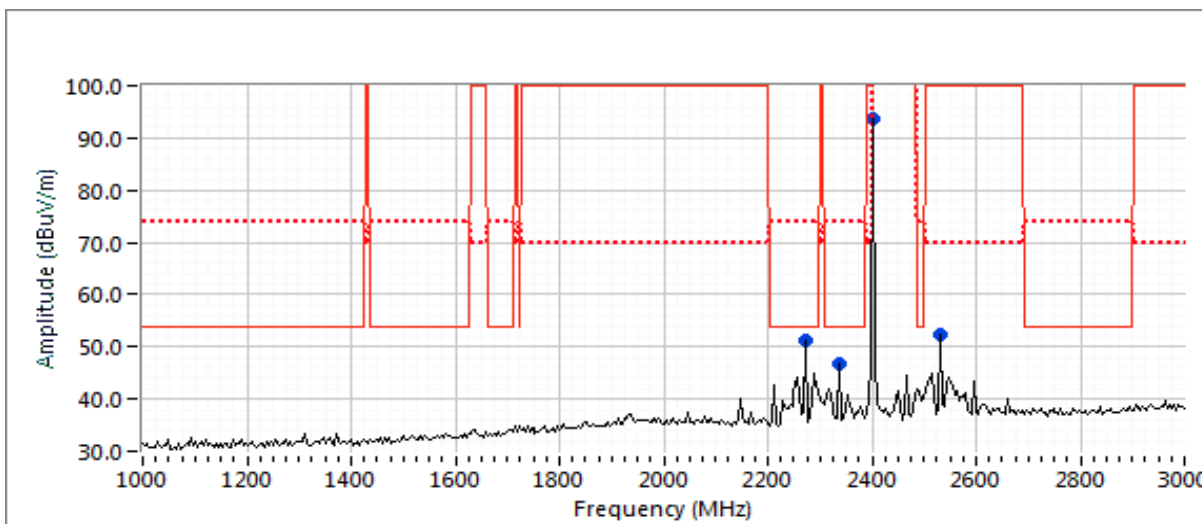
Tx Chain: Main

Data Rate: 1 Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2530.020	51.6	H	54.0	-2.4	AVG	161	1.0	Note 1&6; RB 1 MHz; VB: 500 Hz
2274.010	51.1	H	54.0	-2.9	AVG	131	1.0	Note 6; RB 1 MHz; VB: 500 Hz
2338.070	46.4	H	54.0	-7.6	AVG	139	1.5	Note 6; RB 1 MHz; VB: 500 Hz
4804.170	40.8	V	54.0	-13.2	AVG	349	1.5	Note 6; RB 1 MHz; VB 1 kHz
2530.110	55.2	H	74.0	-18.8	PK	161	1.0	Note 1; RB 1 MHz; VB: 3 MHz
2273.740	54.5	H	74.0	-19.5	PK	131	1.0	RB 1 MHz; VB: 3 MHz
2338.190	51.1	H	74.0	-22.9	PK	139	1.5	RB 1 MHz; VB: 3 MHz
4804.500	49.4	V	74.0	-24.6	PK	349	1.5	RB 1 MHz; VB 3 MHz

Note:

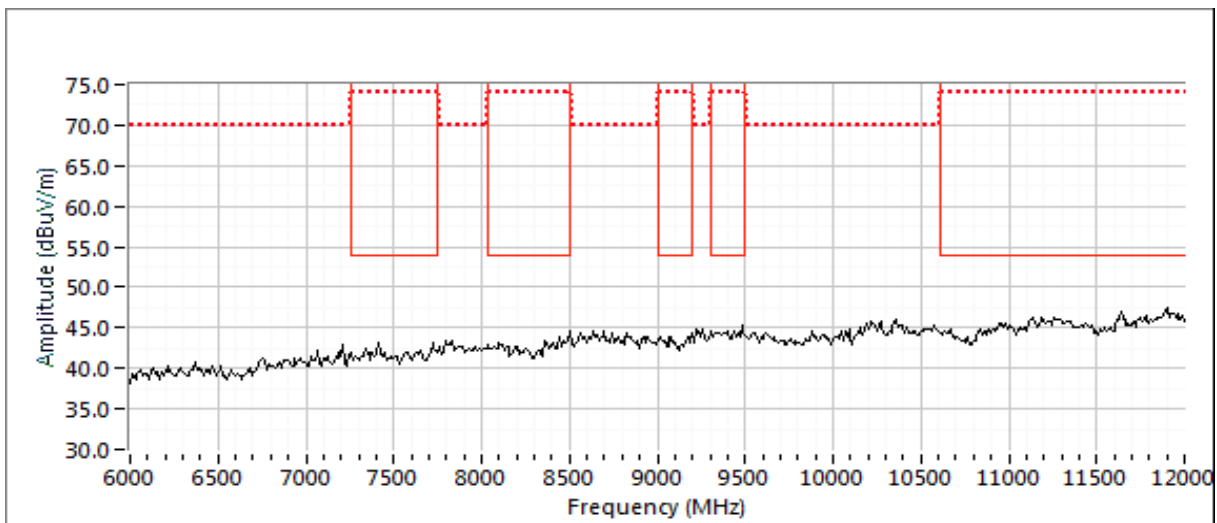
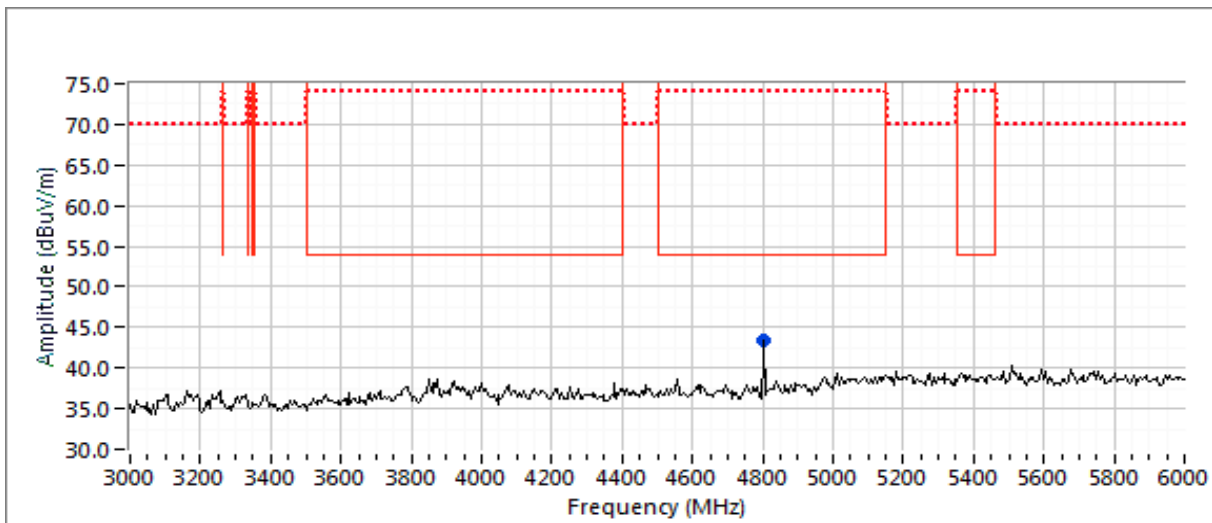
Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range





EMC Test Data

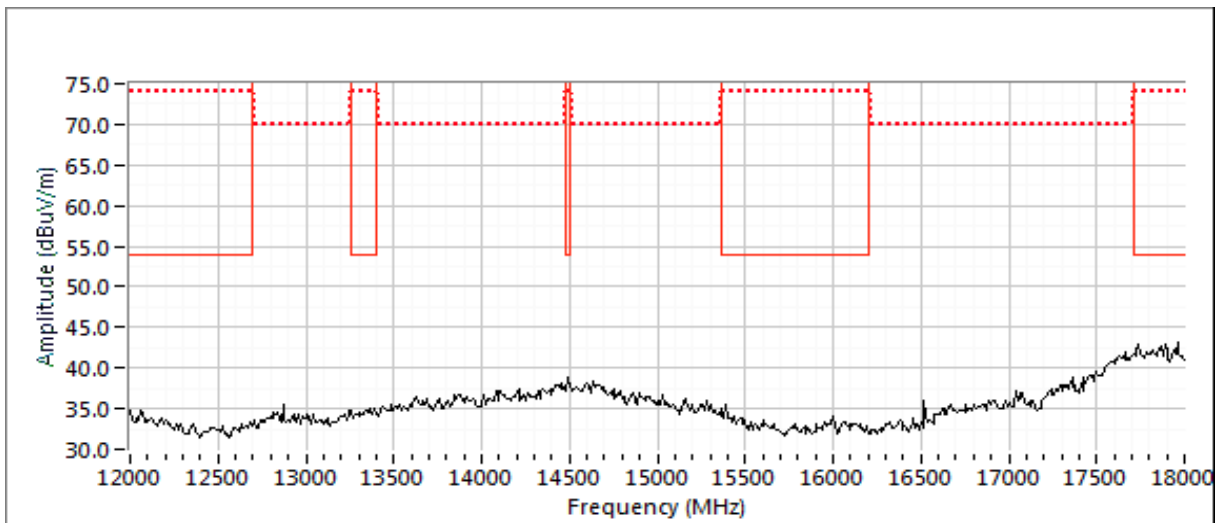
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

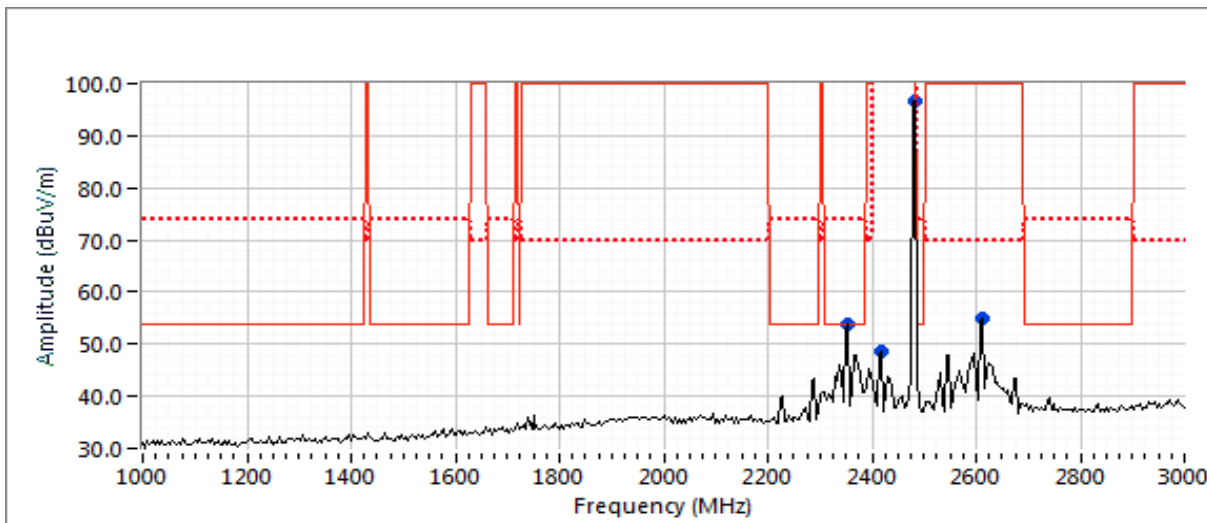
Run #2b: High Channel

Channel: 39 Mode: BLE Power Setting: Max
Tx Chain: Main Data Rate: 1 Mbps

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2352.050	52.6	H	54.0	-1.4	AVG	43	1.0	Note 6; RB 1 MHz; VB: 500 Hz
2416.060	48.6	H	54.0	-5.4	AVG	26	1.0	Note 1&6; RB 1 MHz; VB: 500 Hz
7439.580	43.1	H	54.0	-10.9	AVG	225	1.0	Note 6; RB 1 MHz; VB 1 kHz
2613.010	38.9	H	54.0	-15.1	AVG	12	1.1	Note 1&6; RB 1 MHz; VB: 500 Hz
4960.100	38.8	V	54.0	-15.2	AVG	115	1.5	Note 6; RB 1 MHz; VB 1 kHz
2351.760	55.7	H	74.0	-18.3	PK	43	1.0	RB 1 MHz; VB: 3 MHz
7439.540	54.0	H	74.0	-20.0	PK	225	1.0	RB 1 MHz; VB 3 MHz
2416.300	53.0	H	74.0	-21.0	PK	26	1.0	Note 1; RB 1 MHz; VB: 3 MHz
4960.290	48.6	V	74.0	-25.4	PK	115	1.5	RB 1 MHz; VB 3 MHz
2613.180	48.5	H	74.0	-25.5	PK	12	1.1	RB 1 MHz; VB: 3 MHz

Note:

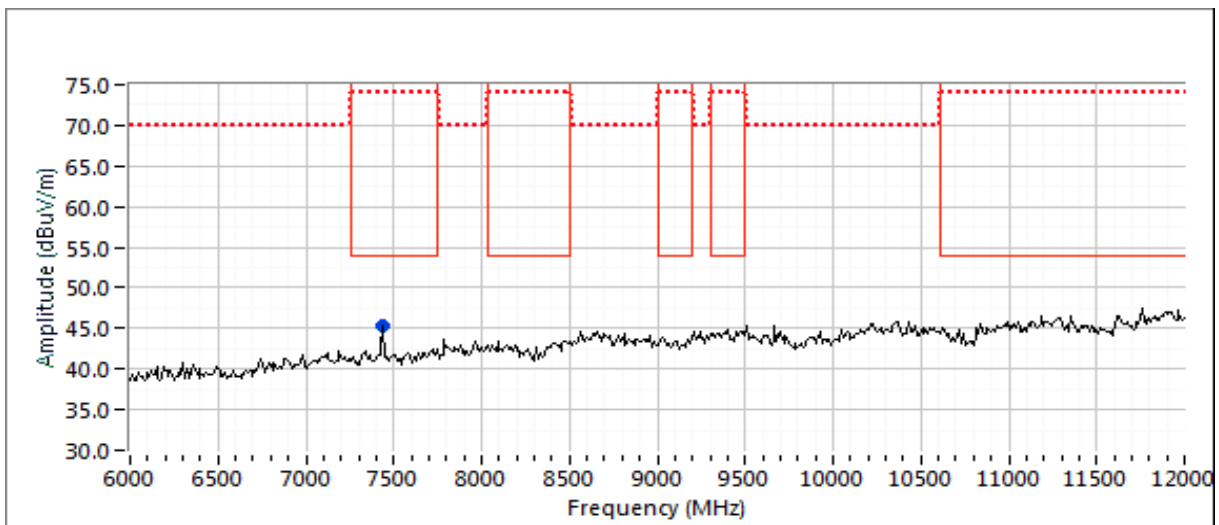
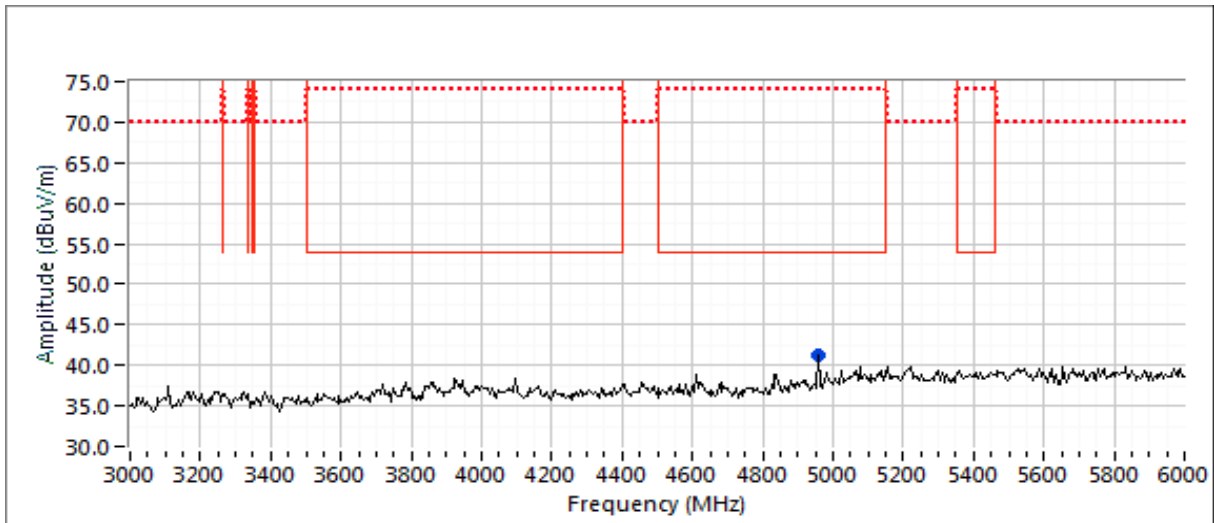
Scans made between 18 - 25 GHz with the measurement antenna moved around the card and its antennas 20-50cm from the device indicated there were no significant emissions in this frequency range





EMC Test Data

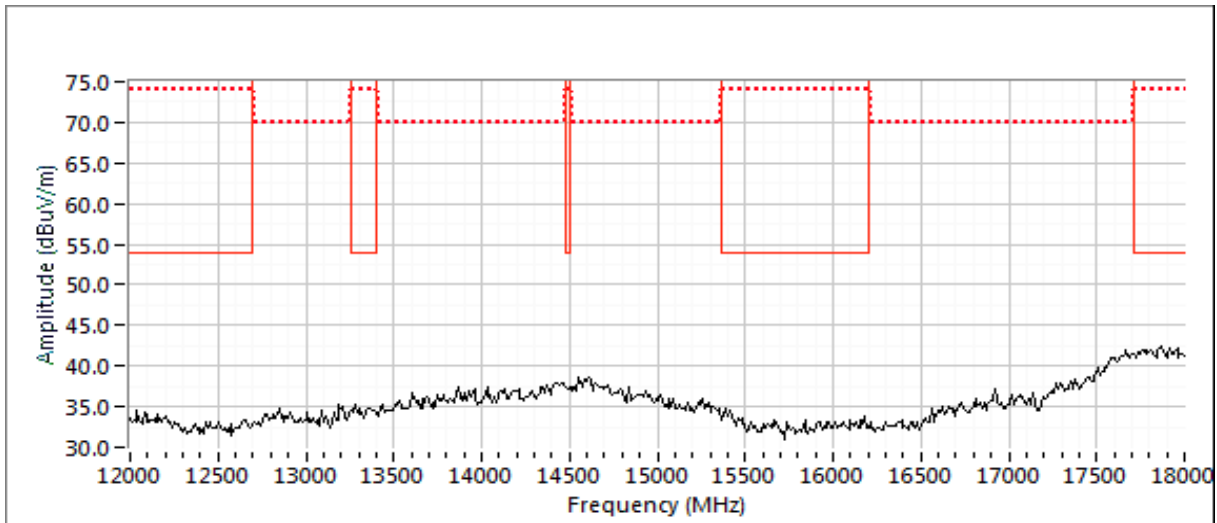
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #3: Radiated Spurious Emissions, band edge. Operating Mode: BLE, EUT Flat

Date of Test: 5/22/2019

Config. Used: 1

Test Engineer: M. Birgani

Config Change: None

Test Location: FT Ch #4

EUT Voltage: 3.0 VDC

Run #3a: Low Channel

Channel: 37

Mode: BLE

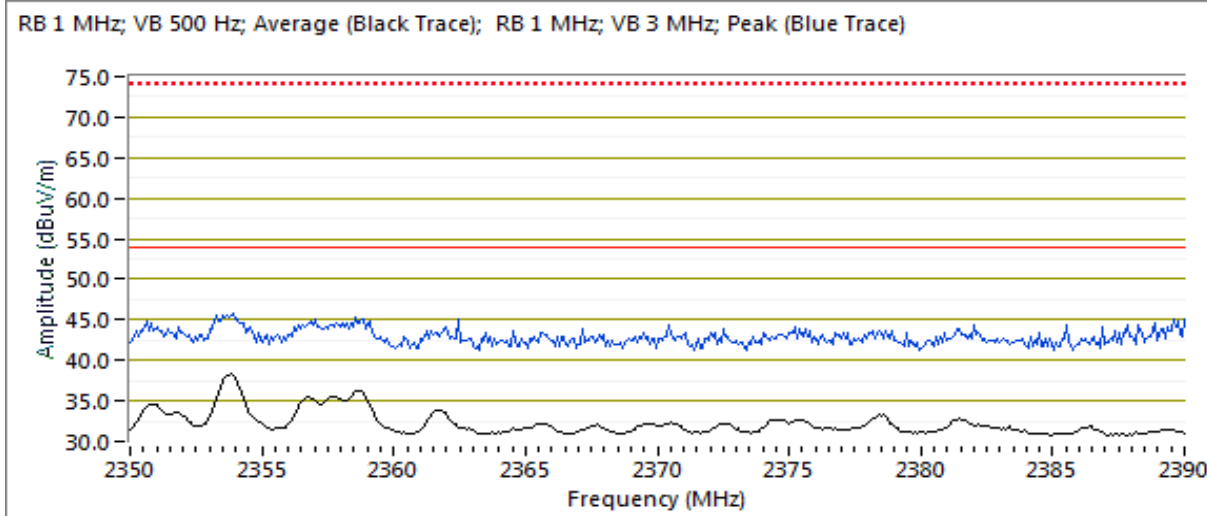
Power Setting: Max

Tx Chain: Main

Data Rate: 1 Mbps

Band Edge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	Pk/QP/Avg	degrees	meters	
2353.770	39.7	V	54.0	-14.3	AVG	140	1.0	Note 6; RB 1 MHz; VB: 500 Hz
2353.690	38.1	H	54.0	-15.9	AVG	142	1.5	Note 6; RB 1 MHz; VB: 500 Hz
2389.120	47.7	V	74.0	-26.3	PK	140	1.0	RB 1 MHz; VB: 3 MHz
2357.700	46.1	H	74.0	-27.9	PK	142	1.5	RB 1 MHz; VB: 3 MHz





EMC Test Data

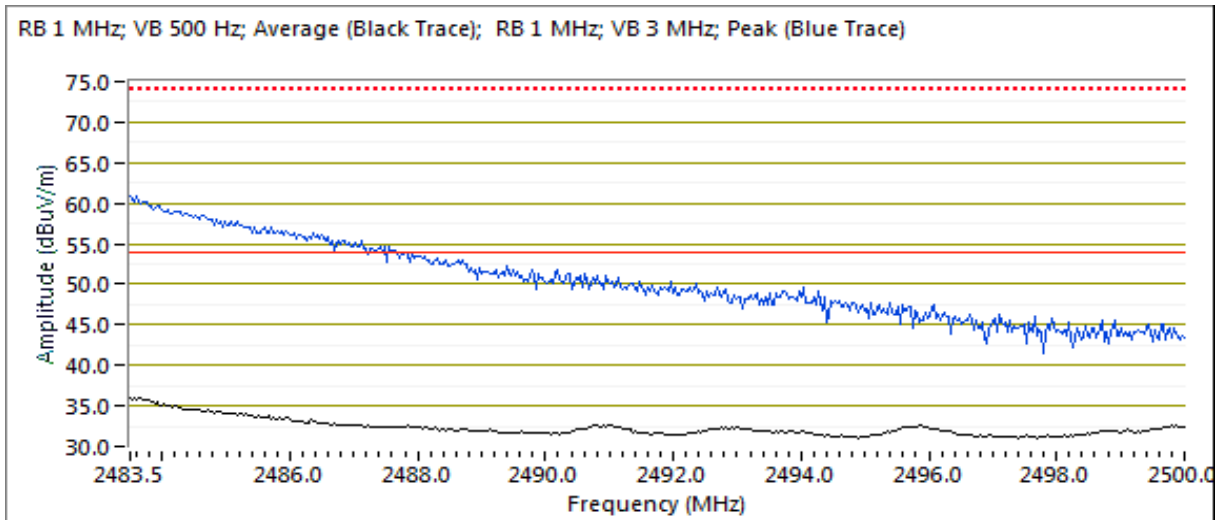
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #3b: High Channel

Channel: 39 Mode: BLE Power Setting: Max
Tx Chain: Main Data Rate: 1 Mbps

Band Edge

Frequency	Level	Pol	15.209 / 15.247		Detector	Azimuth	Height	Comments
MHz	dB μ V/m	v/h	Limit	Margin	PK/QP/Avg	degrees	meters	
2483.510	61.0	H	74.0	-13.0	PK	188	2.0	RB 1 MHz; VB: 3 MHz
2483.520	59.4	V	74.0	-14.6	PK	61	1.9	RB 1 MHz; VB: 3 MHz
2483.600	36.0	H	54.0	-18.0	AVG	188	2.0	Note 6; RB 1 MHz; VB: 500 Hz
2483.550	35.2	V	54.0	-18.8	AVG	61	1.9	Note 6; RB 1 MHz; VB: 500 Hz





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

RSS-247 and FCC 15.247 (DTS) Antenna Port Measurements Power, PSD, Bandwidth and Spurious Emissions

Test Specific Details

Objective: The objective of this test session is to perform final qualification testing of the EUT with respect to the specification listed above.

Date of Test: 5/28/2019
Test Engineer: M. Birgani
Test Location: Lab 4

Config. Used: 2
Config Change: -
EUT Voltage: Battery

General Test Configuration

The EUT was connected to the spectrum analyzer or power meter via a suitable attenuator. All measurements were made on a single chain.

All measurements have been corrected to allow for the external attenuators used.

Ambient Conditions:

Temperature: 22 °C
Rel. Humidity: 39 %

Summary of Results

Run #	Pwr setting	Avg Pwr	Test Performed	Limit	Pass / Fail	Result / Margin
1	Max	-	Output Power	15.247(b)	Pass	4.5 dBm
2	Max	-	Power spectral Density (PSD)	15.247(d)	Pass	3.4 dBm/30 kHz
3	Max	-	Minimum 6 dB Bandwidth	15.247(a)	Pass	0.717 MHz
3	Max	-	99% Bandwidth	RSS GEN	-	1.069 MHz
4	Max	-	Spurious emissions	15.247(b)	Pass	margin >20 dBc

Modifications Made During Testing

No modifications were made to the EUT during testing

Deviations From The Standard

No deviations were made from the requirements of the standard.



EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

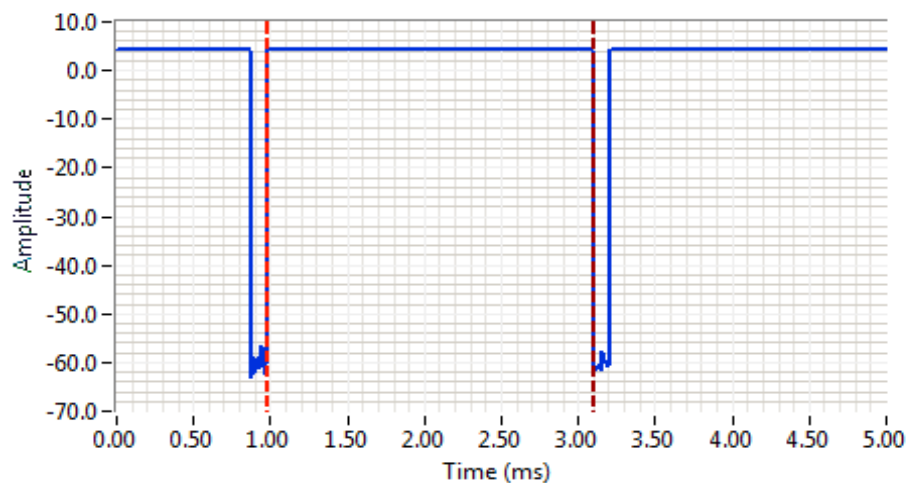
Sample Notes

Sample S/N: B823730001
Driver: Minicom
Antenna: Integral

Procedure Comments:

Measurements performed in accordance with FCC KDB 558074 and ANSI C63.10

Mode	Data Rate	Duty Cycle (x)	Constant DC?	T (ms)	Pwr Cor Factor*	Lin Volt Cor Factor**	Min VBW for FS (Hz)
BLE	1 Mb/s	95.3%	Yes	2.12	0.2	0.4	472



Analyzer Settings

Agilent Technologies,
E4446A
CF: 2402.000 MHz
SPAN: 0.000 MHz
RB: 3.000 MHz
VB: 3.000 MHz
Detector: POS
Attn: 20 DB
RL Offset: 0.0 DB
Sweep Time: 5.0ms

Comments

BLE 1Mbps
Off time: 0.105 ms
On time: 2.120 ms
Duty cycle: 95.3%

Cursor	0.981675	20.0		Delta Time (ms)	2.120
Cursor	3.102094	20.0		Delta Amplitude	0.0





EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #1: Output Power

Mode: BLE

Power Setting	Frequency (MHz)	Output Power		Antenna Gain (dBi)	Result	EIRP		Output Power	
		(dBm)	mW			dBm	W	(dBm)	mW
Max	2402	4.5	2.8	-1.5	Pass	3.0	0.0020		
Max	2440	4.4	2.7	-1.5	Pass	2.9	0.0019		
Max	2480	4.3	2.7	-1.5	Pass	2.8	0.0019		

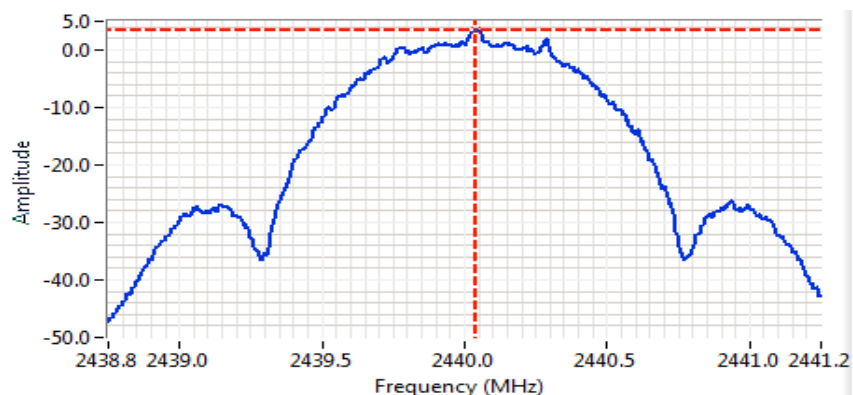
Note 1: Output power measured using a peak power meter, spurious limit is -20 dBc.

Run #2: Power spectral Density

Mode: BLE

Power Setting	Frequency (MHz)	PSD	Limit dBm/3 kHz	Result
		(dBm/30 kHz) Note 1		
Max	2402	2.4	8.0	Pass
Max	2440	3.4	8.0	Pass
Max	2480	3.1	8.0	Pass

Note 1: Test performed per method PKSPD, in KDB 558074. Power spectral density measured using: $3 \text{ kHz} \leq \text{RBW} \leq 100 \text{ kHz}$, $\text{VBW}=3*\text{RBW}$, peak detector, span = $1.5*\text{DTS BW}$, auto sweep time, max hold.



Analyzer Settings
Agilent Technologies,
E4446A
CF: 2440.000 MHz
SPAN: 2.500 MHz
RB: 30.0 kHz
VB: 100 kHz
Detector: POS
Attn: 20 DB
RL Offset: 0.2 DB
Sweep Time: 2.6ms
Comments
PSD: 3.4 dBm/30kHz

Cursor 2440.041667 3.4
0.000000 0.0





EMC Test Data

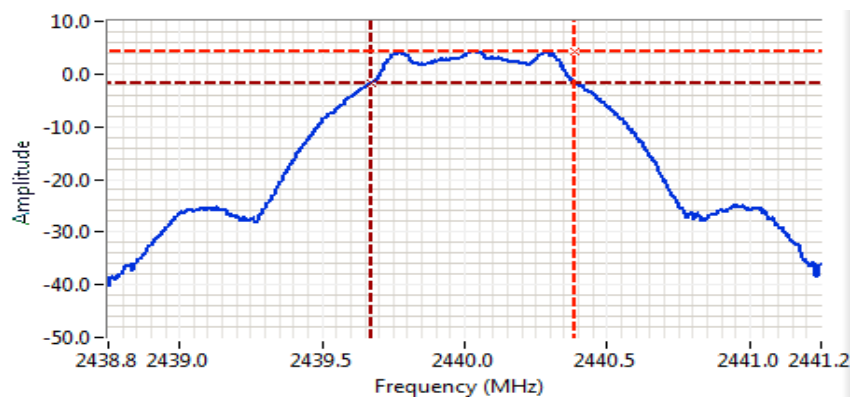
Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #3: Signal Bandwidth

Mode: BLE

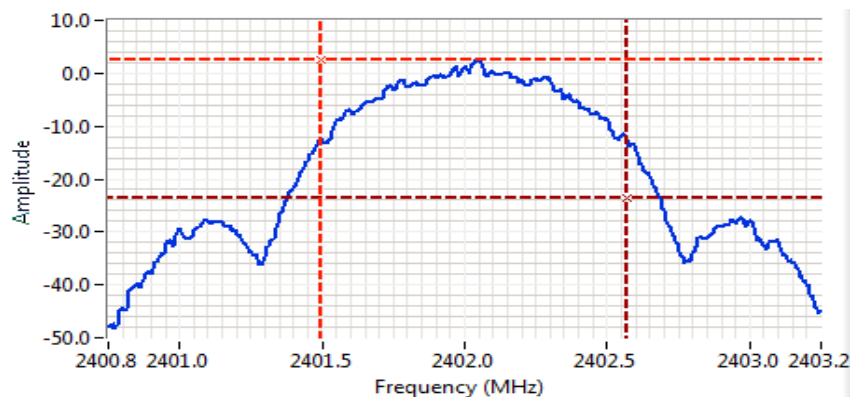
Power Setting	Frequency (MHz)	Bandwidth (MHz)		RBW Setting (MHz)	
		DTS	99%	DTS	99%
Max	2402	0.721	1.069	0.1	0.03
Max	2440	0.717	1.052	0.1	0.03
Max	2480	0.717	1.057	0.1	0.03

Note 1: DTS BW: RBW=100 kHz, VBW $\geq 3 \times$ RBW, peak detector, max hold, auto sweep time, Span 2-5 times measured BW.
99% BW: RBW=1-5% of 99%BW, VBW $\geq 3 \times$ RBW, peak detector, max hold, auto sweep time. Span 1.5-5 times OBW.



Analyzer Settings

Agilent Technologies,
E4446A
CF: 2440.000 MHz
SPAN: 2.500 MHz
RB: 100 kHz
VB: 300 kHz
Detector: POS
Attn: 20 DB
RL Offset: 0.0 DB
Sweep Time: 1.0ms
Comments
DTS BW: 717 kHz



Analyzer Settings

Agilent Technologies,
E4446A
CF: 2402.000 MHz
SPAN: 2.500 MHz
RB: 30.0 kHz
VB: 100 kHz
Detector: POS
Attn: 20 DB
RL Offset: 0.0 DB
Sweep Time: 2.6ms
Comments
99% BW: 1.069 MHz





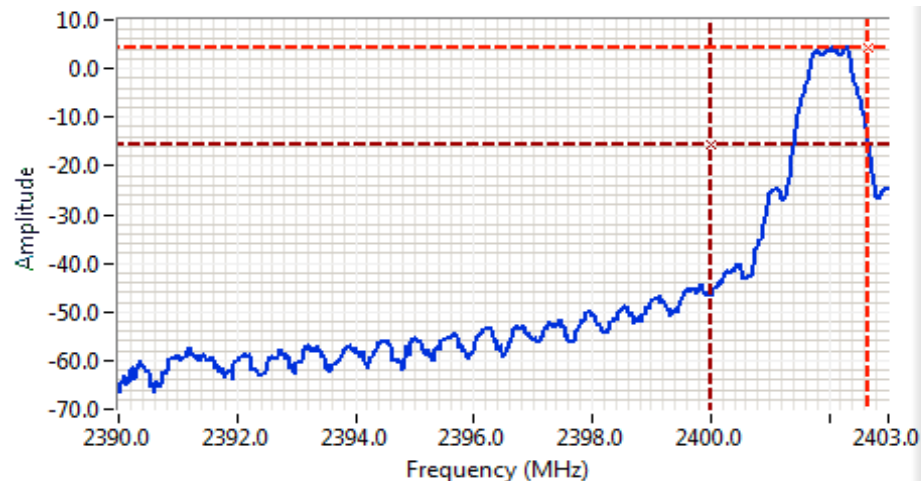
EMC Test Data

Client:	Enovate Medical	Job Number:	PR095459
Model:	A0001707	T-Log Number:	TL095459-RA
Contact:	Cameron Boone	Project Manager:	Deepa Shetty
Standard:	FCC 15.247, RSS-247	Project Coordinator:	Deniz Demirci
		Class:	N/A

Run #4: Out of Band Spurious Emissions

Frequency (MHz)	Power Setting	Mode	Limit	Result
2402	Max	BLE	-20 dBc	Pass

Additional plot showing compliance with -20 dBc limit from 2390 MHz to 2400 MHz. Radiated measurements used to show compliance with the limits in the restricted band below 2390 MHz.



Analyzer Settings

Agilent Technologies,
E4446A

CF: 2396.500 MHz

SPAN: 13.000 MHz

RB: 100 kHz

VB: 300 kHz

Detector: POS

Attn: 20 DB

RL Offset: 0.0 DB

Sweep Time: 1.3ms

Comments

20dBc at 2400MHz

Cursor	2402.653333	4.4	Delta Freq.	2.653
Cursor	2400.000000	-15.6	Delta Amplitude	20.0



End of Report

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