

Global EMC Inc. Labs

EMC & RF Test Report

As per
RSS-247 Issue 1:2015
&
FCC Part 15 Subpart C:2015
Unlicensed Intentional Radiators
on the
Prodigy Sleep Monitor
Model: TTU



Amir Emami

Project Engineer
Global EMC Inc.
11 Gordon Collins Dr,
Gormley, ON, L0H 1G0
Canada
Ph: (905) 883-8189

Testing produced for



See Appendix A for full Client & EUT details.




Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

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Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Report Scope

This report addresses the EMC verification testing and test results of the **Prodigy Sleep Monitor Model: TTU**, which is part of the Prodigy Sleep Monitor system, and is herein referred to as EUT (Equipment Under Test). The EUT was tested for emissions and immunity compliance against the following standards:

RSS-247 Issue 1:2015

FCC Part 15 Subpart C 15:2015

Test procedures, results, justifications, and engineering considerations, if any, follow later in this report.

This report does not imply product endorsement by any government, accreditation agency, or Global EMC Inc.

Opinions or interpretations expressed in this report, if any, are outside the scope of Global EMC Inc accreditations. Any opinions expressed do not necessarily reflect the opinions of Global EMC Inc, unless otherwise stated.


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Summary

The results contained in this report relate only to the item(s) tested.

EUT FCC Certification #, FCC ID:	2AFGB100002000
EUT Industry Canada Certification #, IC:	20415-100002000
EUT Passed all tests performed	Yes
Tests conducted by	Amir Emami


For testing dates, see "Testing Environmental Conditions and Dates".

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Test Results Summary

Standard/Method	Description	Class/Limit	Result
FCC 15.203	Antenna Requirement	Unique	Pass See Justification
FCC 15.205 RSS-GEN (Table 6)	Restricted Bands for Intentional Operation	QuasiPeak Average	Pass
FCC 15.207 RSS-GEN (Table 3)	Power Line Conducted Emissions	QuasiPeak Average	Pass
FCC 15.209 RSS-GEN (Table 4)	Spurious Radiated Emissions	QuasiPeak Average	Pass
FCC 15.247(a)2 RSS-247 5.2(1)	6 dB Bandwidth	> 500 kHz	Pass
FCC 15.247(b)2 RSS-247 5.4(4)	Max Output Power	< 1 Watt	Pass
FCC 15.247(b)(4) RSS-247 5.4(4)	Antenna Gain	< 6 dBi	Pass See Justifications
FCC 15.247(d) RSS-247 5.5	Antenna Conducted Spurious	< 20 dBc	Pass
FCC 15.247(e) RSS-247 5.2(2)	Spectral Density	< 8 dBm (3 kHz BW)	Pass
FCC 15.247(i) RSS-102	Maximum Permissible Exposure	> 20 cm separation.	Pass See justification and calculations
Overall Result			Pass

If the product as tested or otherwise complies with the specification, the EUT is deemed to comply with the requirement and is deemed a 'PASS' grade. If not 'FAIL' grade will be issued. Note that 'PASS' / 'FAIL' grade is independent of any measurement uncertainties. A 'PASS' / 'FAIL' grade within measurement uncertainty is marked with a '*'.

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Notes, Justifications, or Deviations

The following notes, justifications for tests not performed or deviations from the above listed specifications apply:

For the Antenna requirement specified in FCC 15.203 (RSS-247 section 5.5), the unit uses a ceramic chip antenna (1.5 dbi gain - Johanson 2450AT18D0100E) with less than 6 dBi gain.

For the Restricted Bands of operation, the EUT is designed to only operate between 2400 – 2483.5 MHz.

For maximum permissible exposure, this device operates at less than 1 Watt at 2400 – 2483.5 MHz and is designed to operate greater than 20 cm from personnel during normal operation. No testing is required, however worst case calculated exposure compliance follows later in this report.

The EUT is not a hybrid system and FCC 15.247 (f) does not apply to it.

The EUT does not have an antenna port and a modified system was not provided. All measurements were performed using the radiated method. Antenna conducted power requirements were obtained using $P = EIRP - G$; and $EIRP = E + 20\log(D) - 104.8$ where E is the received field, D is the measurement distance, and G is the antenna gain.

Sample Calculation(s)

Radiated Emission Test

Margin = Limit – (Received Signal + Antenna Factor + Cable Loss – Pre-Amp Gain)

Margin = 50.5dBμV/m – (50dBμV + 10dB + 2.5dB – 20dB)


Margin = 8.0 dB (pass)

Power Line Conducted Emission Test

Margin = Limit – (Received Signal + Attenuation Factor + Cable Loss + LISN Factor)


Margin = 73.0dBμV – (50dBμV + 10dB + 2.5dB + 0.5dB)

Margin = 10.0 dB (pass)

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Applicable Standards, Specifications and Methods

ANSI C63.4:2014	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 For Testing Unlicensed Wireless Devices
CFR 47 FCC 15.247	Code of Federal Regulations – Radio Frequency Devices
CISPR 22:2008	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement
FCC KDB 558074	FCC KDB 558074 Digital Transmission Systems, measurements and procedures
ICES-003:2012	Digital Apparatus - Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard
RSS-GEN Issue 4 2014	General Requirements and Information for the Certification of Radio Apparatus
RSS-247 Issue 1:2015	Issue 1: Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and Licence-Exempt Local Area Network (LE-LAN) Devices
ISO 17025:2005	General Requirements for the Competence of Testing and Calibration Laboratories

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Document Revision Status

- Revision 1 - October 15, 2015
Initial Release
- Revision 2 - November 10, 2015
Second Release
- Revision 3 - December 23, 2015
Third Release

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Definitions and Acronyms

The following definitions and acronyms are applicable in this report.
See also ANSI C63.14.

AE – Auxiliary Equipment. A digital accessory that feeds data into or receives data from another device (host) that in turn, controls its operation.

BW – Bandwidth. Unless otherwise stated, this refers to the 6 dB bandwidth.

EMC – Electro-Magnetic Compatibility. The ability of an equipment or system to function satisfactorily in its electromagnetic environment without introducing intolerable electromagnetic disturbances to anything in that environment.

EMI – Electro-Magnetic Immunity. The ability to maintain a specified performance when the equipment is subjected to disturbance (unwanted) signals of specified levels.


EUT – Equipment Under Test. A device or system being evaluated for compliance that is representative of a product to be marketed.

ITE – Information Technology Equipment with a primary function(s) of entry, storage, display, retrieval, transmission, processing, switching, or control, of data.

LISN – Line Impedance Stabilization Network

NCR – No Calibration Required

RF – Radio Frequency

Client	Younes Medical Technologies	
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Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Testing Facility

Testing for EMC on the EUT was carried out at Global EMC labs near Toronto, Ontario. The testing lab consists of a 3m semi-anechoic chamber calibrated to be able to allow measurements on an EUT that has a maximum width or length of up to 2m and a height of up to 3m. The chamber is equipped with a turntable that is capable of testing devices up to 3300lb in weight. This facility is capable of testing products that are rated for 120Vac and 240Vac single phase, or devices that are rated for a 208Vac 3 phase input. DC capability is also available for testing. The chamber is equipped with a mast that controls the polarization and height of the antenna. Control of the mast occurs in the control room adjoining the shielded chamber. Radiated emission measurements are performed using a BiLog antenna and a Horn antenna where applicable. Conducted emissions, unless otherwise stated, are performed using a LISN and using the Vertical Ground plane if applicable.

Calibrations and Accreditations


The 3m semi-anechoic chamber is registered with Federal Communications Commission (FCC, 377448), Industry Canada (IC, 6844A-3) and Voluntary Control Council for Interference (VCCI, R-4023, G-506, C-4498, and T-1246). This chamber was calibrated for Normalized Site Attenuation (NSA) using test procedures outlined in ANSI C63.4 "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz". The chamber is lined with ferrite tiles and absorption cones to minimize any undesired reflections. The NSA data is kept on file at Global EMC. For radiated susceptibility testing, a 16 point field calibration has been performed on the chamber. The field uniformity data is kept on file at Global EMC. Global EMC Inc is accredited to ISO 17025 by A2LA with Testing Certificate #2555.01. The laboratory's current scope of accreditation listing can be found as listed on the A2LA website. All measuring equipment is calibrated on an annual or bi-annual basis as listed for each respective test.

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Testing Environmental Conditions and Dates

Following environmental conditions were recorded in the facility during time of testing

Date	Test	Initials	Temperature (°C)	Humidity (%)	Pressure (kPa)
July 20-21, 2015	Radio Requirements	AE	20 – 24	40 – 51	98.0 – 102.0
August 19, 2015	Power Line Conducted Emissions	AE	20 – 24	40 – 51	98.0 – 102.0

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Detailed Test Results Section

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

6dB Bandwidth of Digitally Modulated Systems

Purpose

The purpose of this test is to ensure that the bandwidth occupied exceeds a stated minimum. This helps ensure the utilization of the frequency allocation is sufficiently wide. This also helps prevent corruption of data by ensuring adequate data separation to distinguish the reception of the intended information.


Limits

The limit is as specified in FCC Part 15 and RSS-247.

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz. This should be measured with a 100 kHz RBW and a 300 kHz VBW.

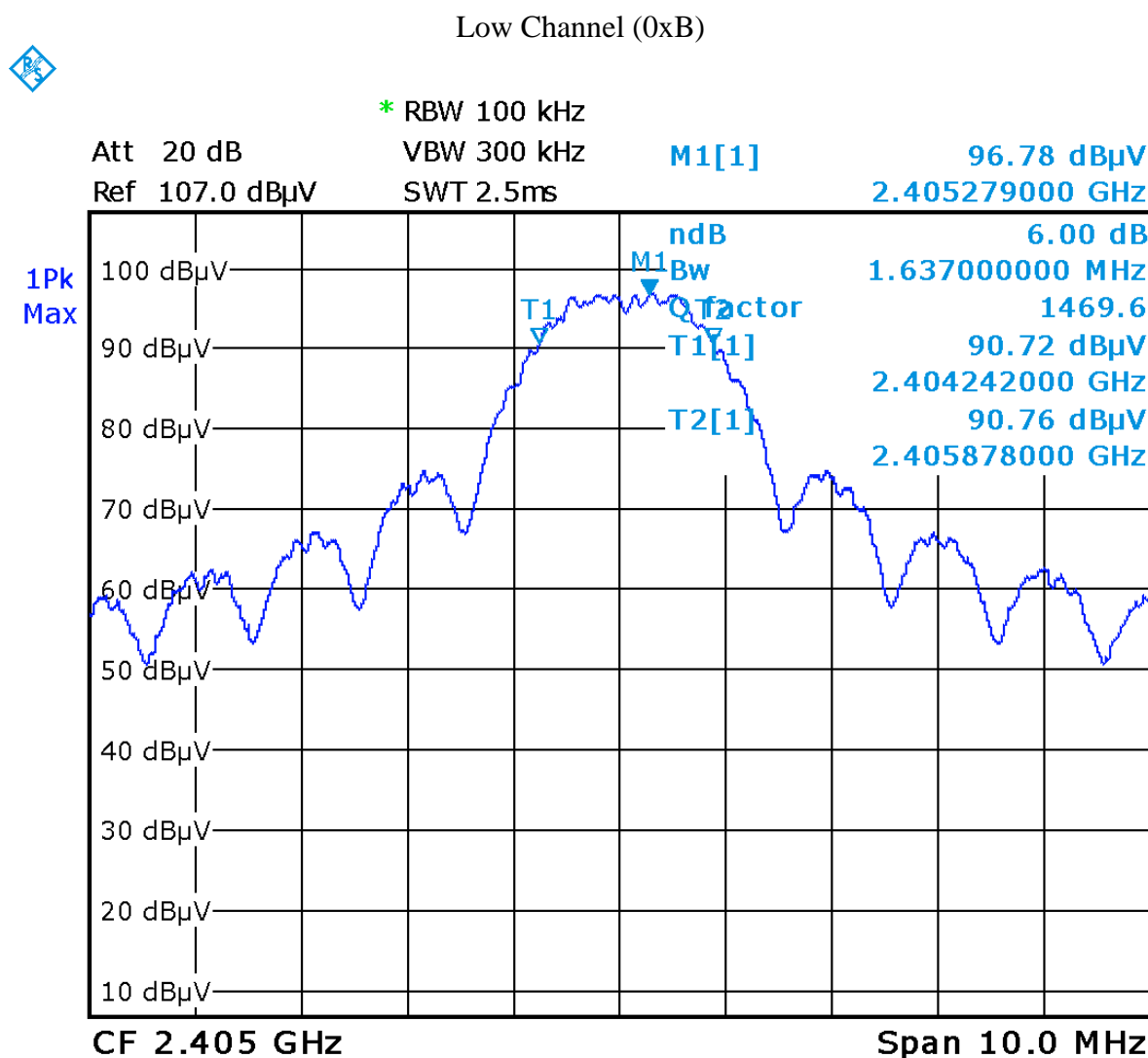
Results

The EUT passed. The minimum 6 dB BW measured was 1.64 MHz and the 20 dB BW was 2.66 MHz.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Graphs

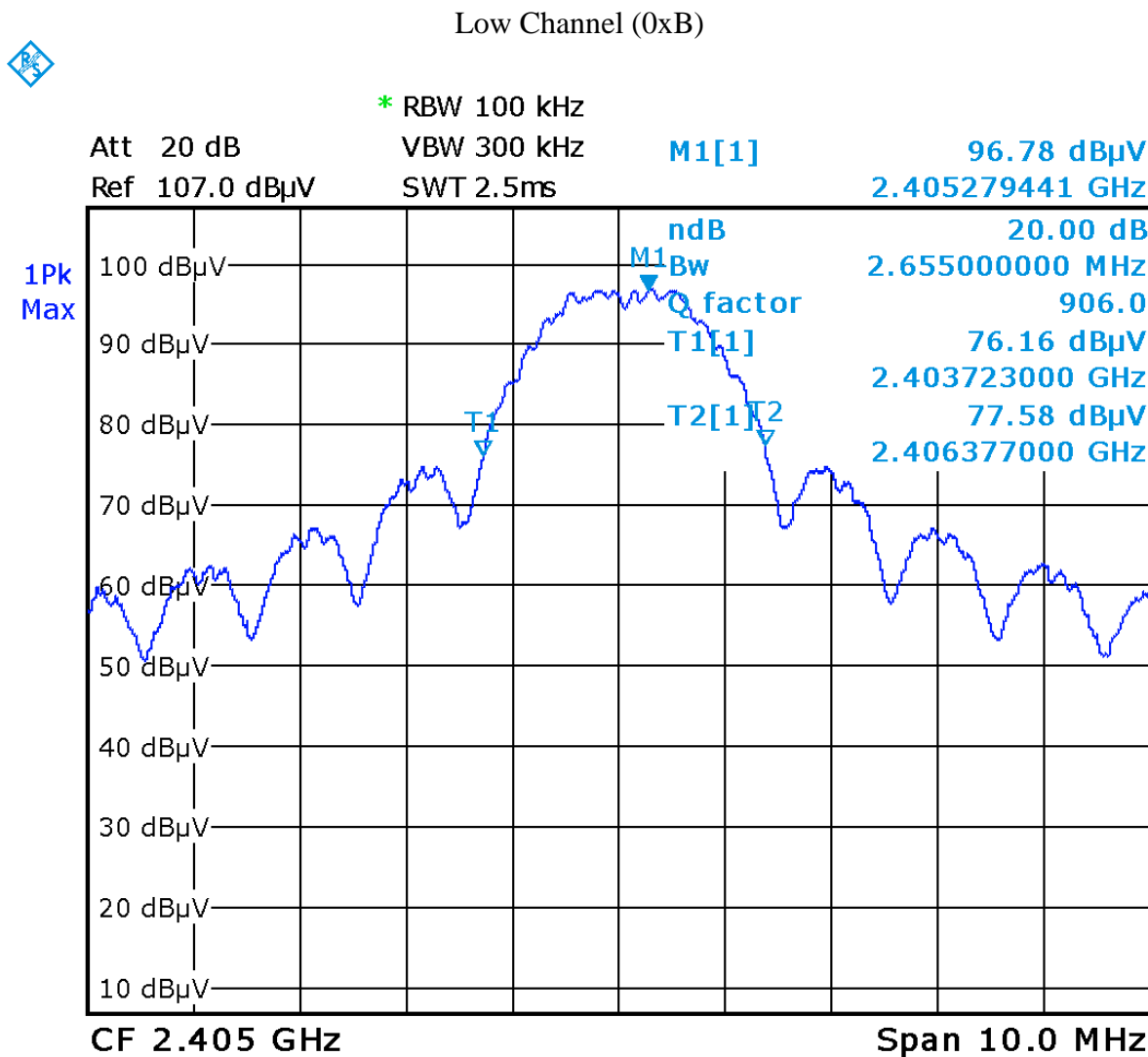
The graphs showed below shows the OBW during the operation of the device. This is measured by a max hold on the spectrum analyzer and the highest resolution bandwidth that is sufficiently low to exhibit the 6 dB bandwidth of a channel during operation of the EUT. Max hold is performed for a duration of not less than 1 minute.



Date: 20.JUL.2015 15:41:04


6 dB BW = 1.64 MHz

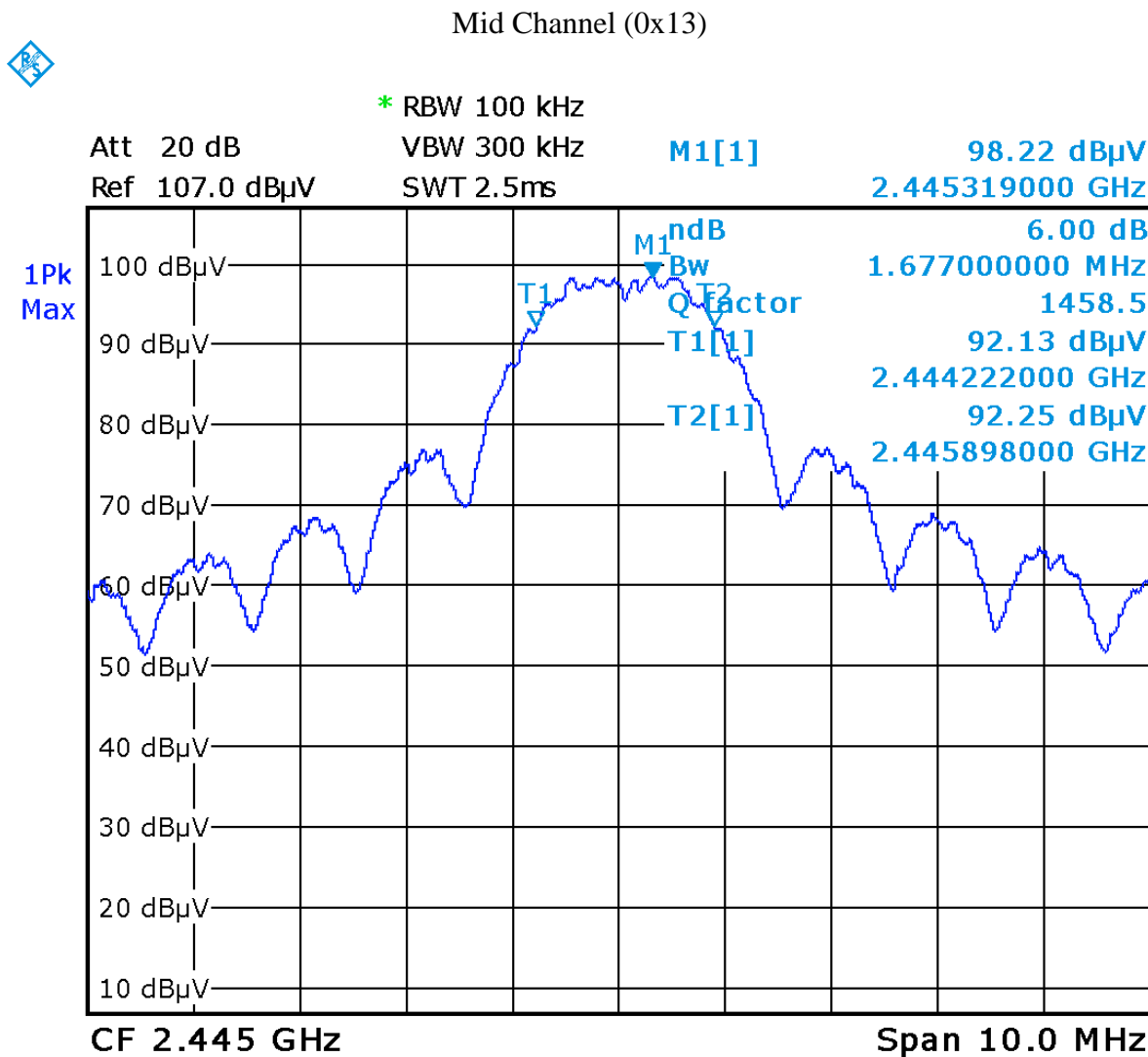
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	



Date: 20.JUL.2015 15:42:01

20 dB BW = 2.66 MHz


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

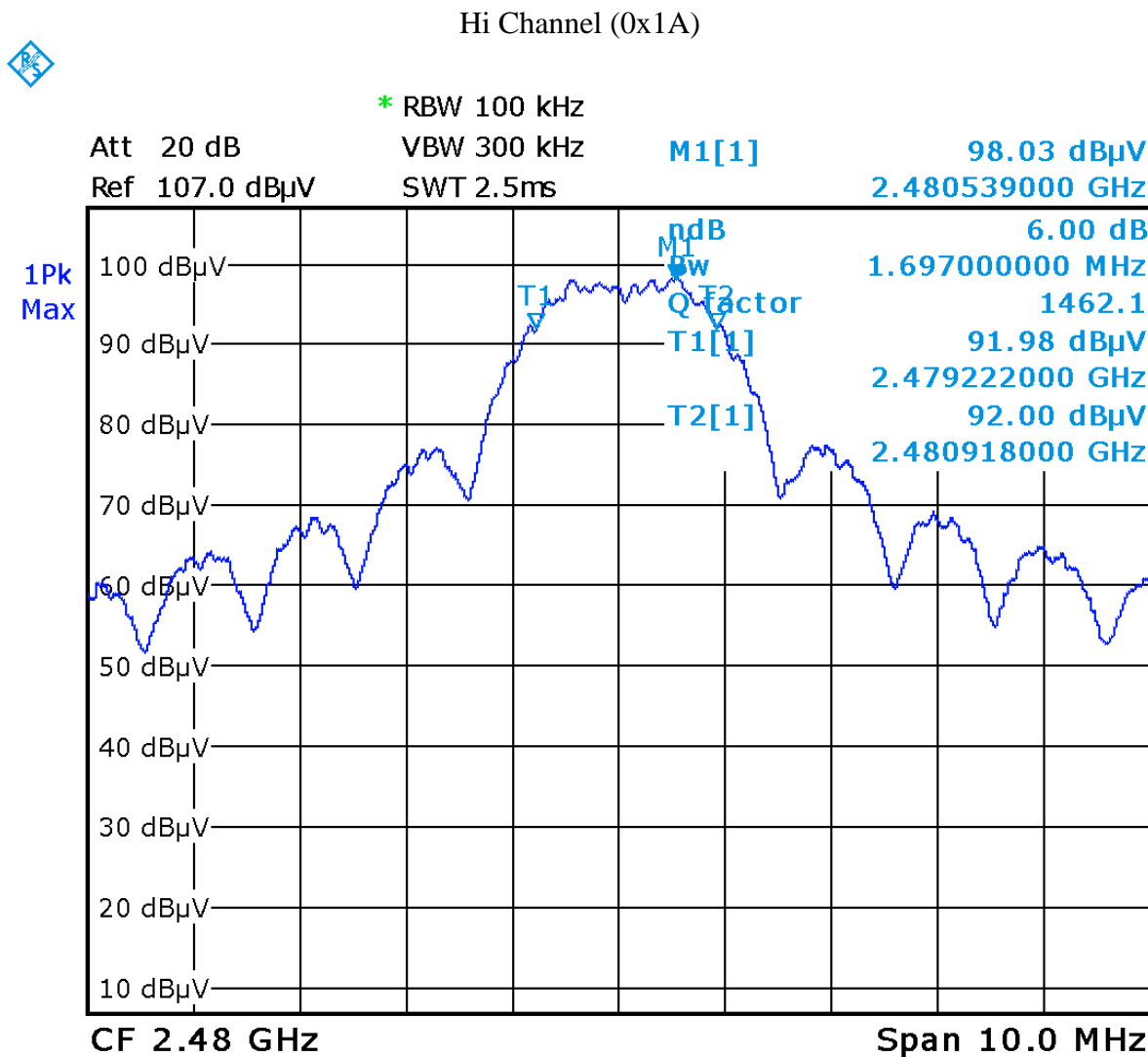


Date: 20.JUL.2015 14:53:40

6 dB BW = 1.68 MHz

20 dB BW = 2.68 MHz

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	




Date: 20.JUL.2015 12:41:02

6 dB BW = 1.70 MHz

20 dB BW = 3.55 MHz


Note: See 'Appendix B – EUT & Test Setup Photos' for photos showing the test set-up.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration Date	Next Calibration Date	Asset #
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov. 15, 2013	Nov. 15, 2015	GEMC 160
Horn Antenna 2 – 18 GHz	WBH218HN	Q-par	Jan. 23, 2014	Jan. 23, 2016	GEMC 6375
Pre-Amp 1 – 26.5 GHz	HP 8449B	HP	Sept 09, 2014	Sept 09, 2016	GEMC 6351
RF Cable 7m	LMR-400-7M- 50Ω-MN-MN	LexTec	NCR	NCR	GEMC 28
RF Cable 10m	LMR-400- 10M-50Ω-MN- MN	LexTec	NCR	NCR	GEMC 29
RF Cable 0.5M	LMR-400- 0.5M-50Ω-MN- MN	LexTec	NCR	NCR	GEMC 31

This report module is based on GEMC template "FCC – Power Line Conducted Emissions Class B_Rev1"

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Maximum Peak Envelope Conducted Power - DM

Purpose

The purpose of this test is to ensure that the maximum power conducted to the radiating element does not exceed the limits specified. This ensures that if the end-user replaces the antenna, the maximum power does not exceed an amount which may create an excessive power level.

Limits

The limits are defined in FCC Part 15.247(b) and RSS-247.


For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands, the peak limit is 1 watt (30 dBm).

Results

The EUT does not have an antenna port and a modified system was not provided. All measurements were performed using the radiated method. Antenna conducted power requirements were obtained using $P = EIRP - G$; and $EIRP = E + 20\log(D) - 104.8$ where E is the received field, D is the measurement distance, and G is the antenna gain.

The EUT passed. The EUT was set to transmit at maximum power (PWR=0) except for the last channel. For channel 0x1A, power was reduced to PWR=8. Channels 0xB, 0x13, 0x19, and 0x1A were measured. The following tables show the peak powers measured.

Horizontal Antenna Polarization				
Channel	Frequency (MHz)	EIRP (dBm)	Antenna Gain (dBi)	Power (dBm)
Low Channel (0xB)	2405	3.1	1.5	1.6
Mid Channel (0x13)	2445	4.6	1.5	3.1
Channel (0x19)	2475	3.9	1.5	2.4
Hi Channel (0x1A)	2480	0.6	1.5	-0.9


Client	Younes Medical Technologies	
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Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Vertical Antenna Polarization				
Channel	Frequency (MHz)	EIRP (dBm)	Antenna Gain (dBi)	Power (dBm)
Low Channel (0xB)	2405	3.1	1.5	1.6
Mid Channel (0x13)	2445	4.5	1.5	3.0
Channel (0x19)	2475	4.4	1.5	2.9
Hi Channel (0x1A)	2480	-0.1	1.5	-1.6

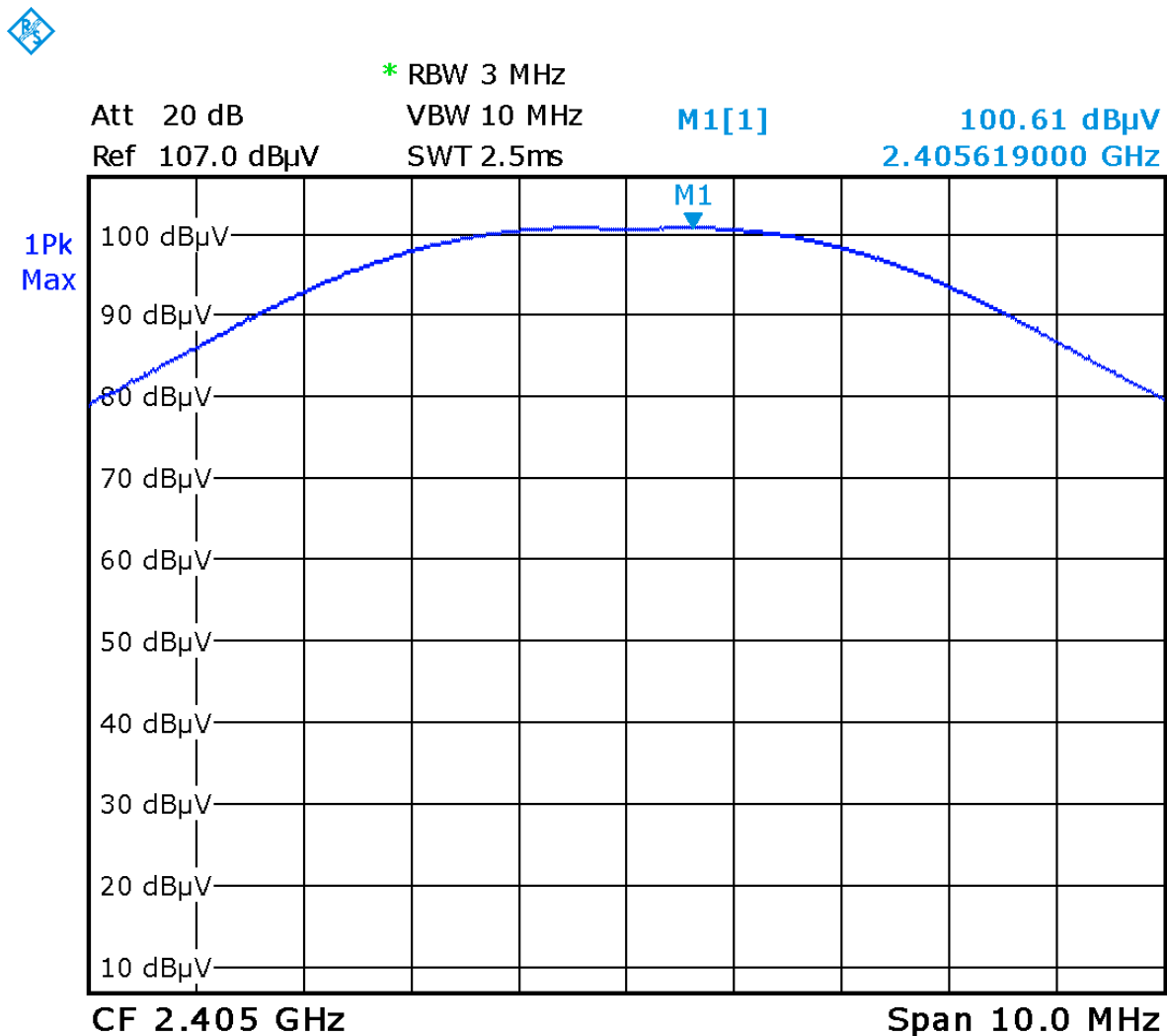
Graphs

The graphs shown below show the peak power output of the device during the radiated measurement during transmit operation of the EUT.


The graphs shown below are maximized peak measurement graphs measured with a resolution bandwidth greater than the 6 dB bandwidth of the EUT, rotated over a full 0-360° and the antenna was scanned from 1 m to 4 m.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
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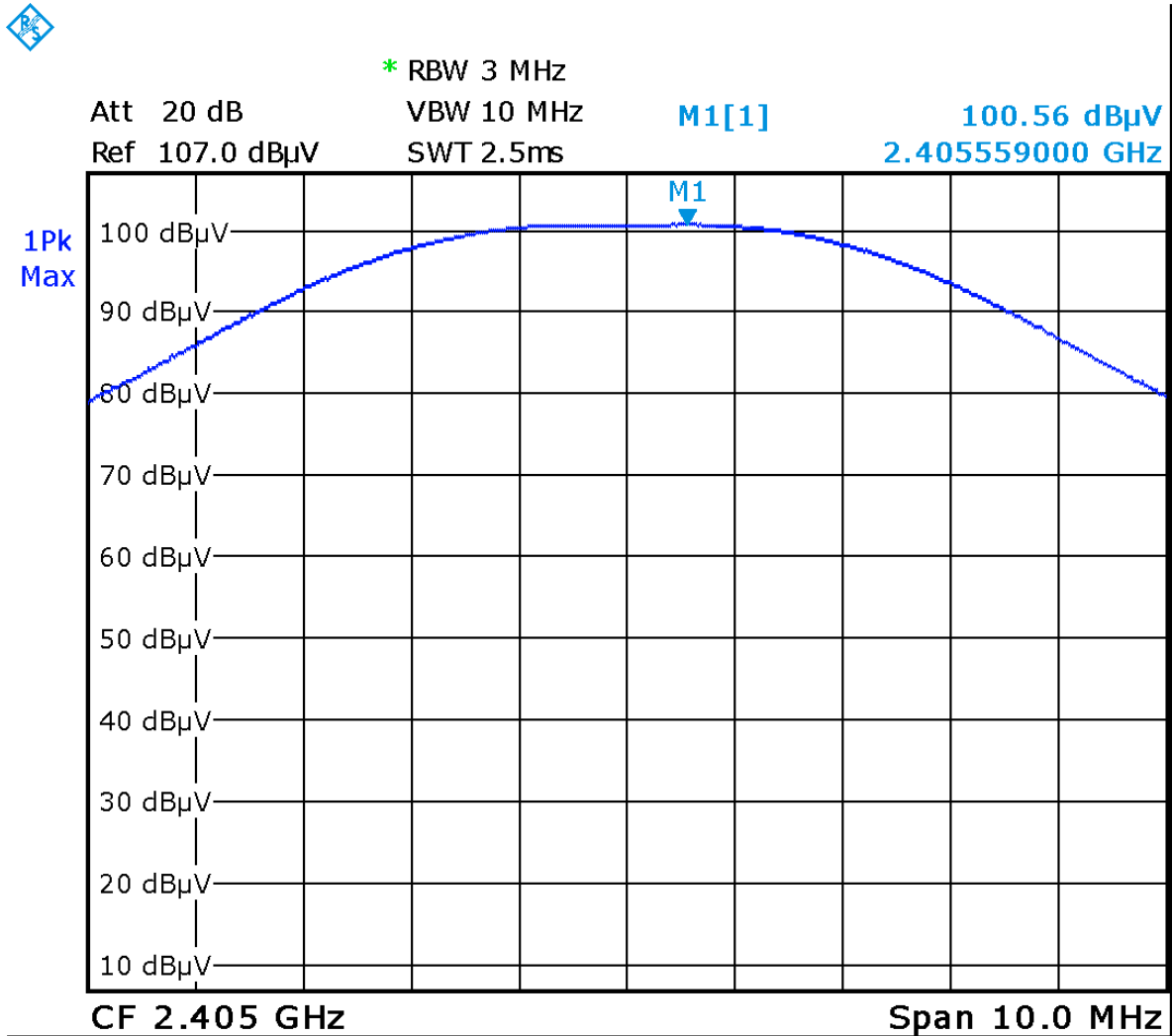
Peak Power, Low Channel (0xB)
Horizontal Antenna




Date: 20.JUL.2015 16:30:56

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

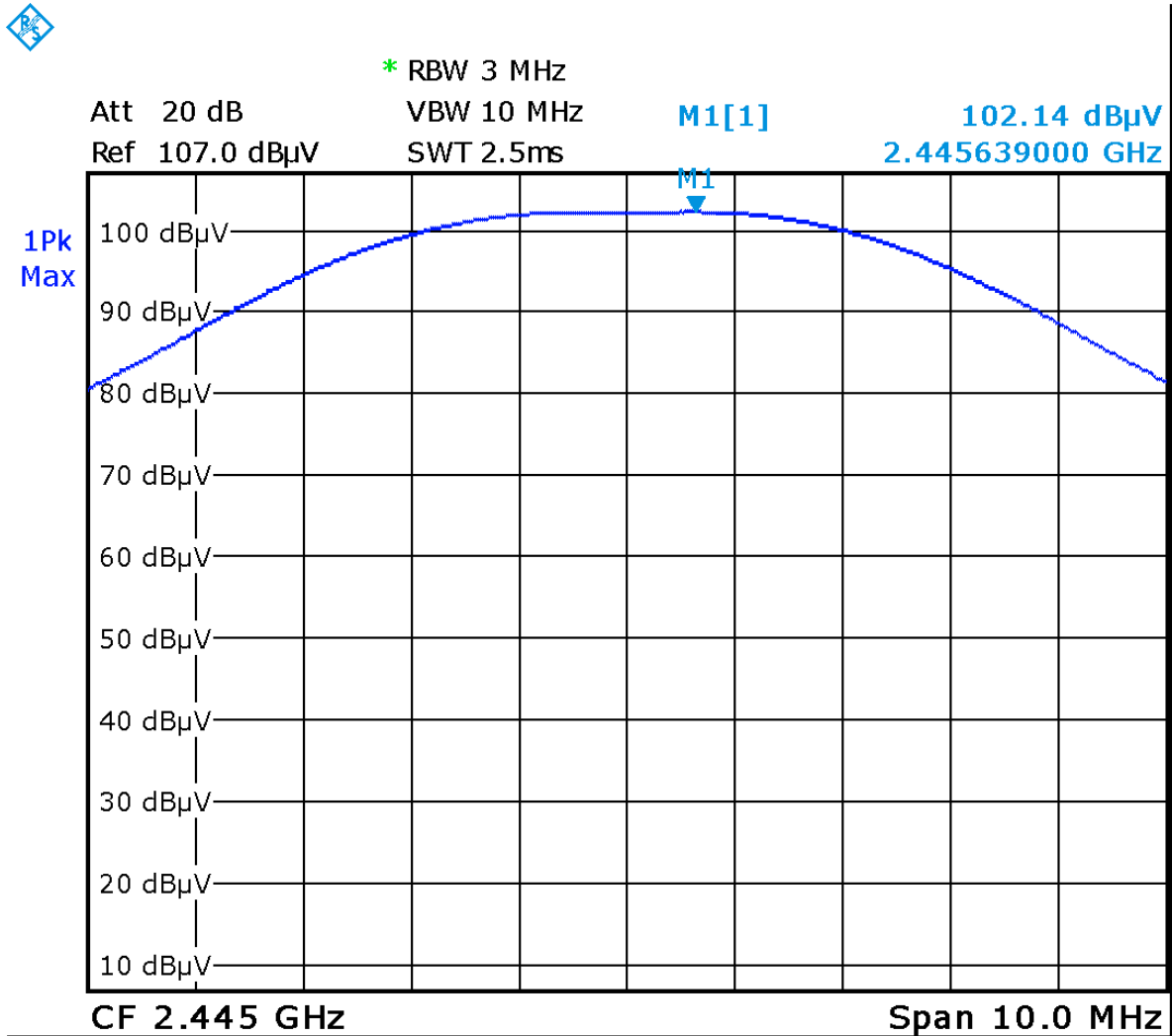
Peak Power, Low Channel (0xB)
Vertical Antenna




Date: 20.JUL.2015 15:59:55

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

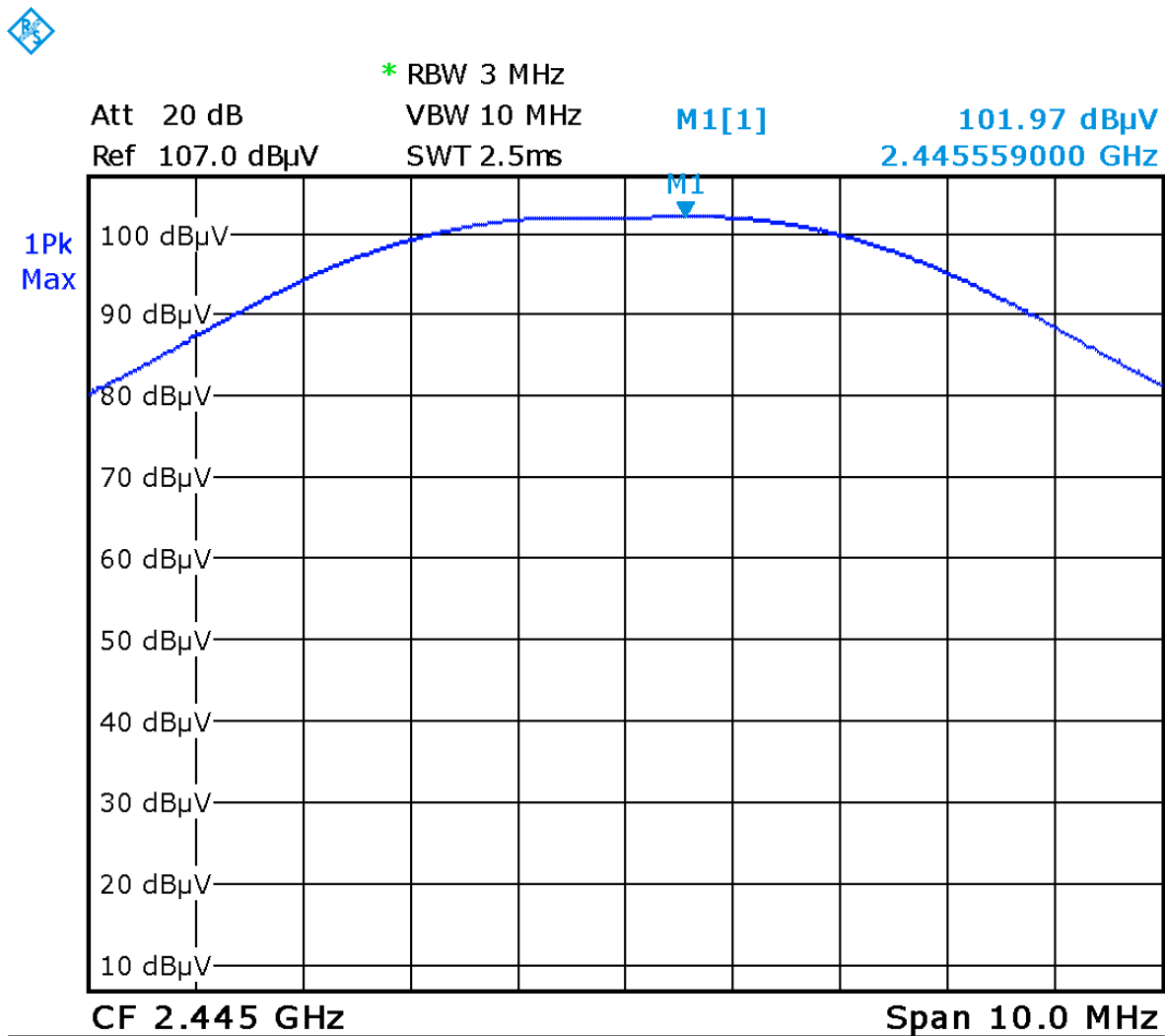
Peak Power, Mid Channel (0x13)
Horizontal Antenna




Date: 20.JUL.2015 14:49:55

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

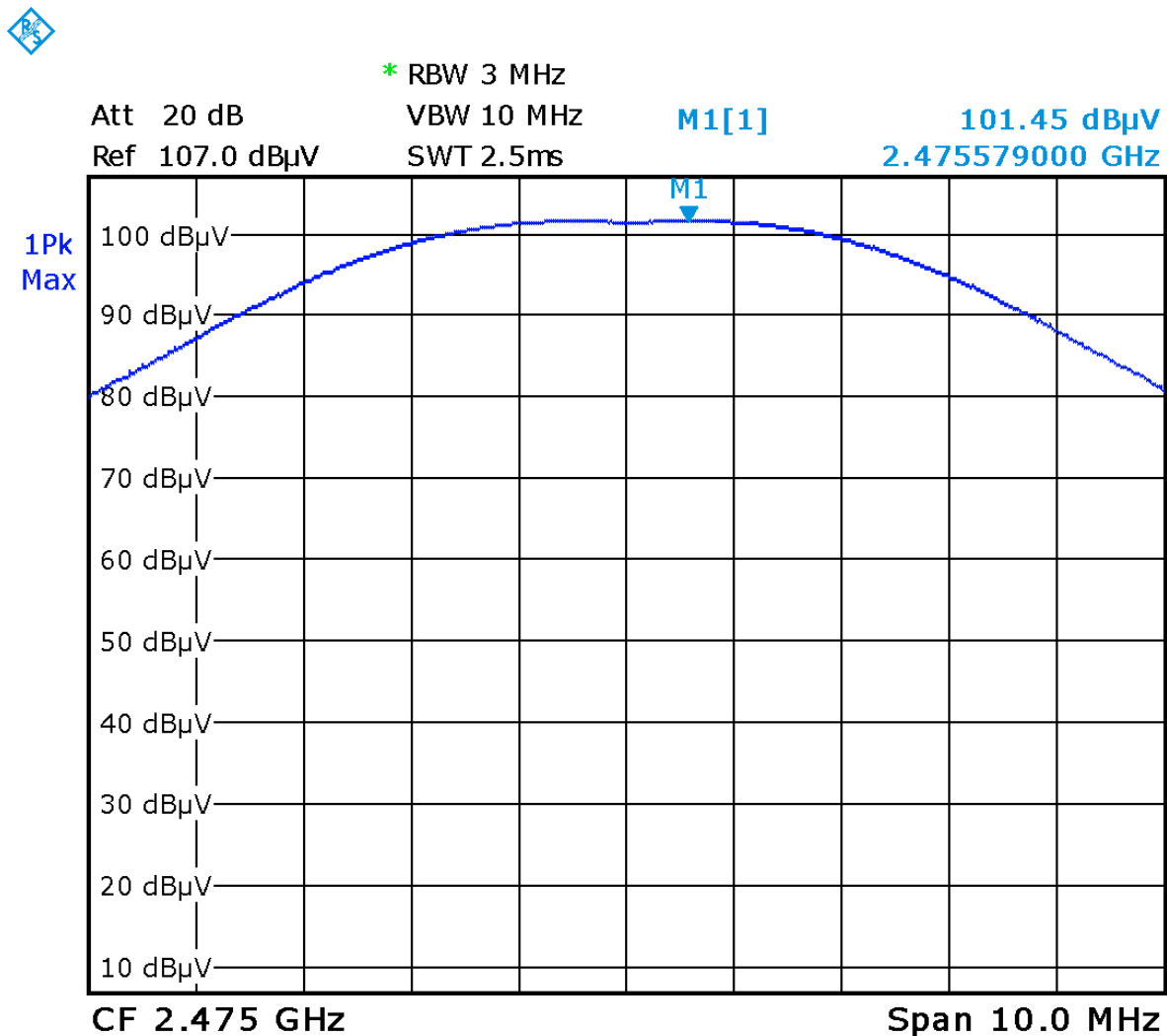
Peak Power, Mid Channel (0x13)
Vertical Antenna




Date: 20.JUL.2015 15:17:55

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

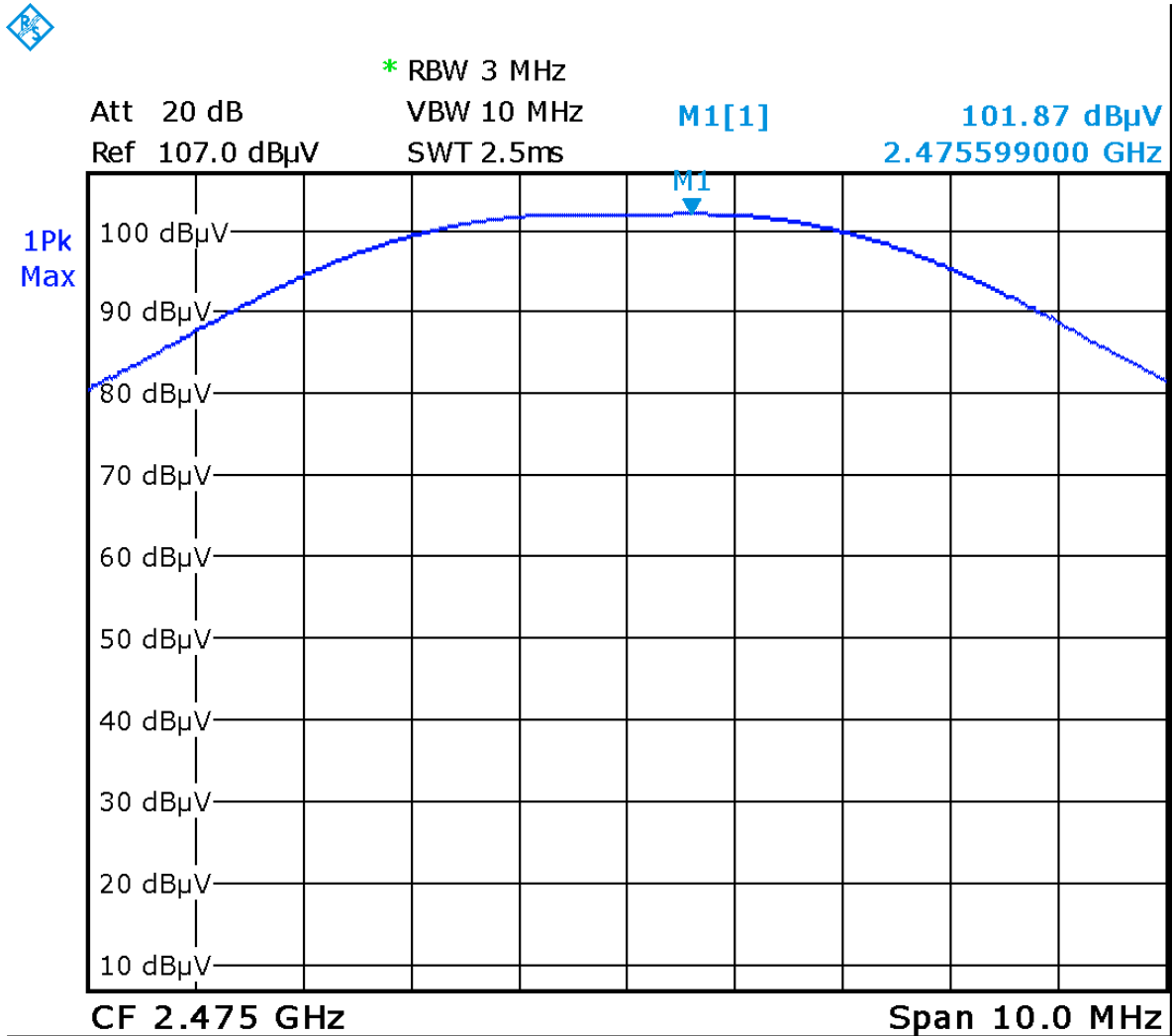
Peak Power, Channel 25 (0x19)
Horizontal Antenna




Date: 7.DEC.2015 19:05:48

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

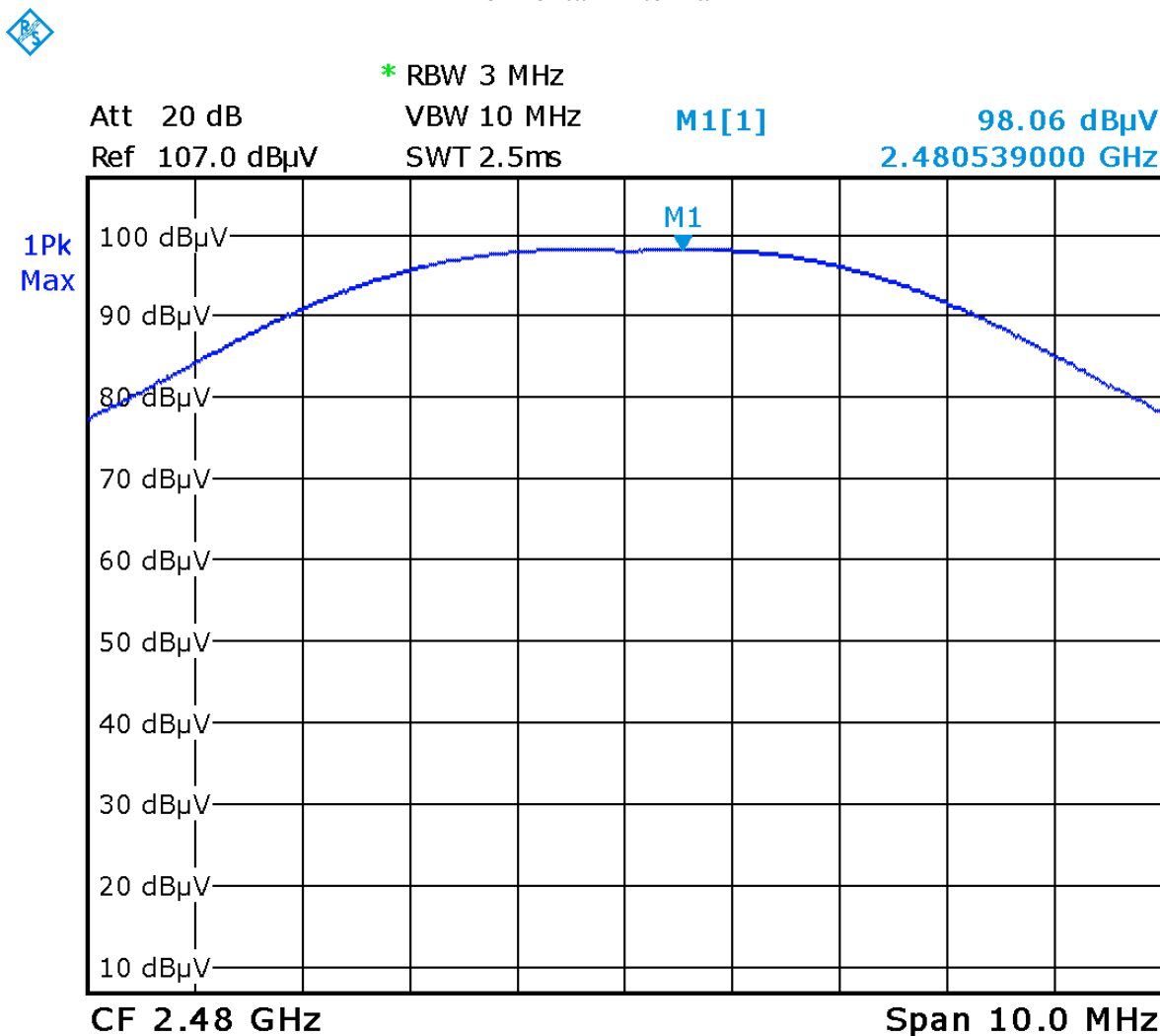
Peak Power, Channel 25 (0x19)
Vertical Antenna




Date: 7.DEC.2015 19:39:56

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

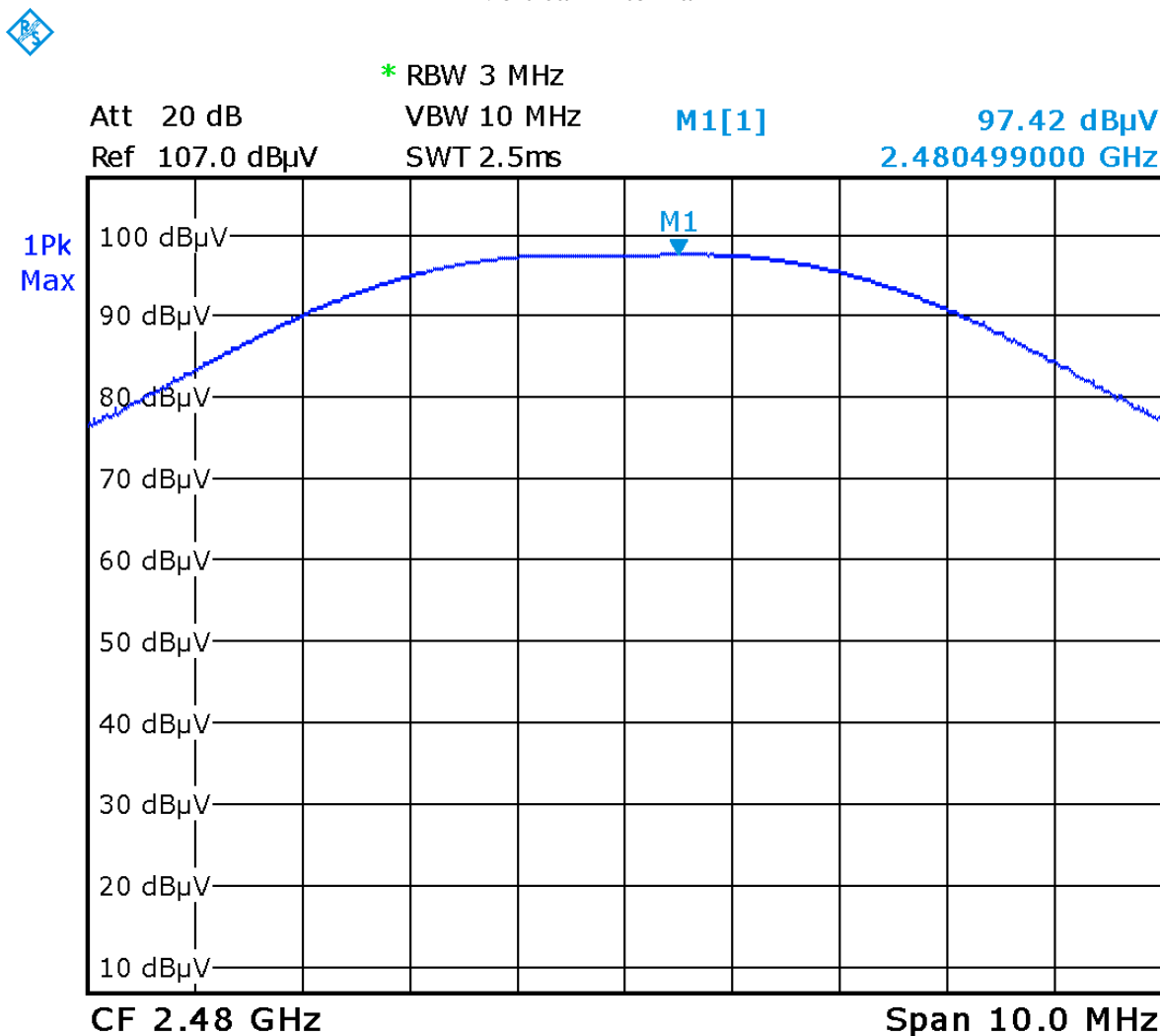
(Reduced Power, PWR = 8)
Peak Power, Hi Channel (0x1A)
Horizontal Antenna



Date: 7.DEC.2015 18:56:45


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

(Reduced Power, PWR = 8)
Peak Power, Hi Channel (0x1A)
Vertical Antenna



Date: 7.DEC.2015 19:52:09


See 'Appendix B – EUT and Test Setup Photos' for photos showing the test set-up.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration Date	Next Calibration Date	Asset #
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov. 15, 2013	Nov. 15, 2015	GEMC 160
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov. 25, 2015	Nov. 25, 2017	GEMC 160
Horn Antenna 2 – 18 GHz	WBH218HN	Q-par	Jan. 23, 2014	Jan. 23, 2016	GEMC 6375
Pre-Amp 1 – 26.5 GHz	HP 8449B	HP	Sept 09, 2014	Sept 09, 2016	GEMC 6351
RF Cable 7m	LMR-400-7M- 50Ω-MN-MN	LexTec	NCR	NCR	GEMC 28
RF Cable 10m	LMR-400- 10M-50Ω-MN- MN	LexTec	NCR	NCR	GEMC 29
RF Cable 0.5M	LMR-400- 0.5M-50Ω-MN- MN	LexTec	NCR	NCR	GEMC 31

This report module is based on GEMC template "FCC – Power Line Conducted Emissions Class B_Rev1"

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Spurious Emissions (-20 dBc Requirement)

Purpose


The purpose of this test is to ensure that the maximum power conducted to the radiating element at frequencies outside of the authorized spectrum does not exceed the limits specified. This ensures that the only the intended signal is delivered to the radiating element.

Limits

The limits are defined in 15.247(d). In any 100 kHz band, the peak spurious harmonics emissions must be at least 20 dB below the fundamental. Spurious Conducted emissions are to be evaluated up to the 10th harmonic. This -20 dBc requirement also applies at the 'band edge' or 2.4 GHz and 2.4835 GHz.

Results

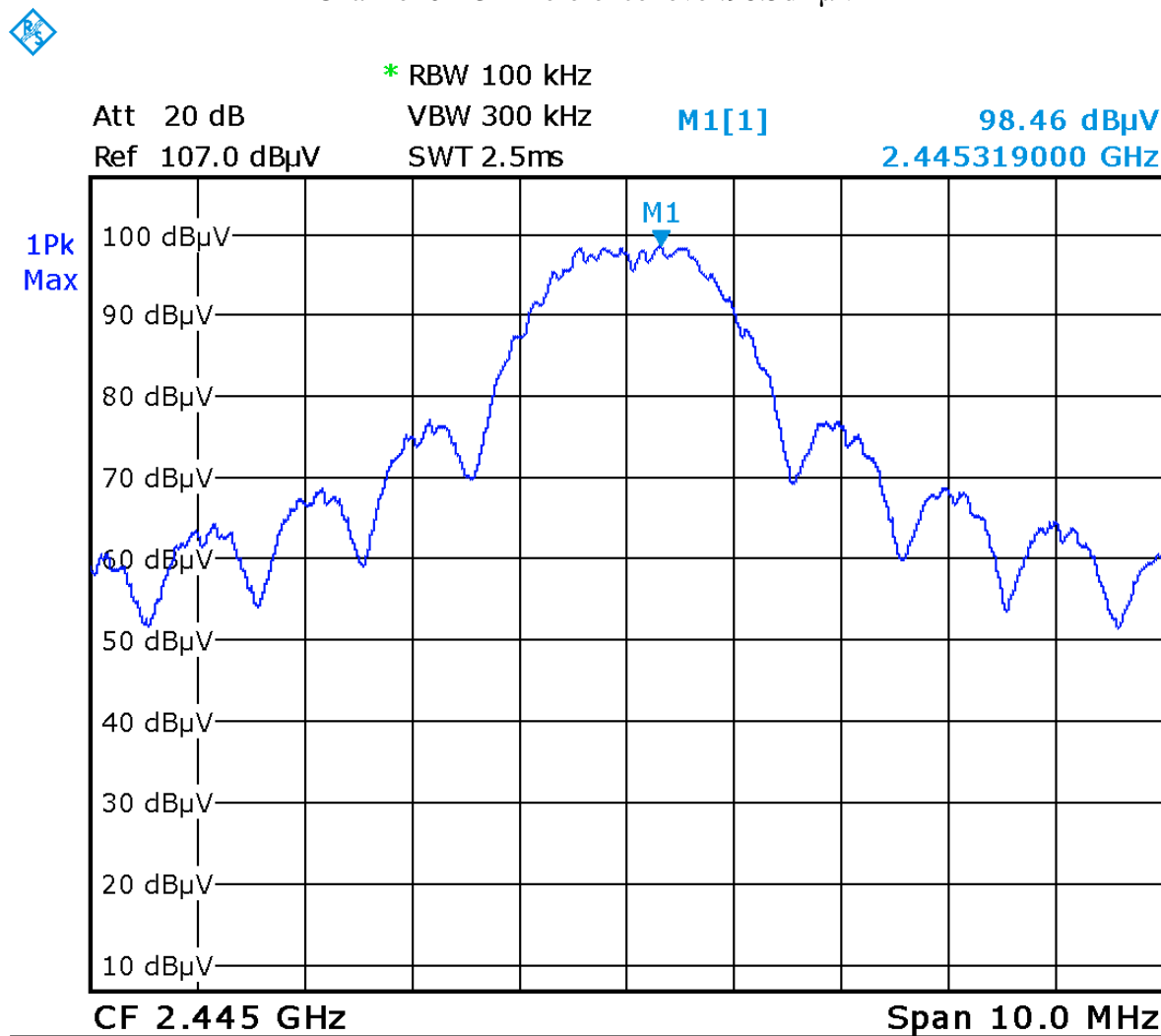
The EUT passed the limits. Low, middle and high bands were measured. The worst case is presented as a graph for the spectrum. The -20 dBc requirement is shown for the lower band edge at 2.4 GHz in the low band. The -20 dBc requirement is also shown for the higher band edge at 2.4835 GHz in the high band.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Graphs

The graphs shown below show the peak power output of the device during the antenna conducted measurement during transmit operation of the EUT.

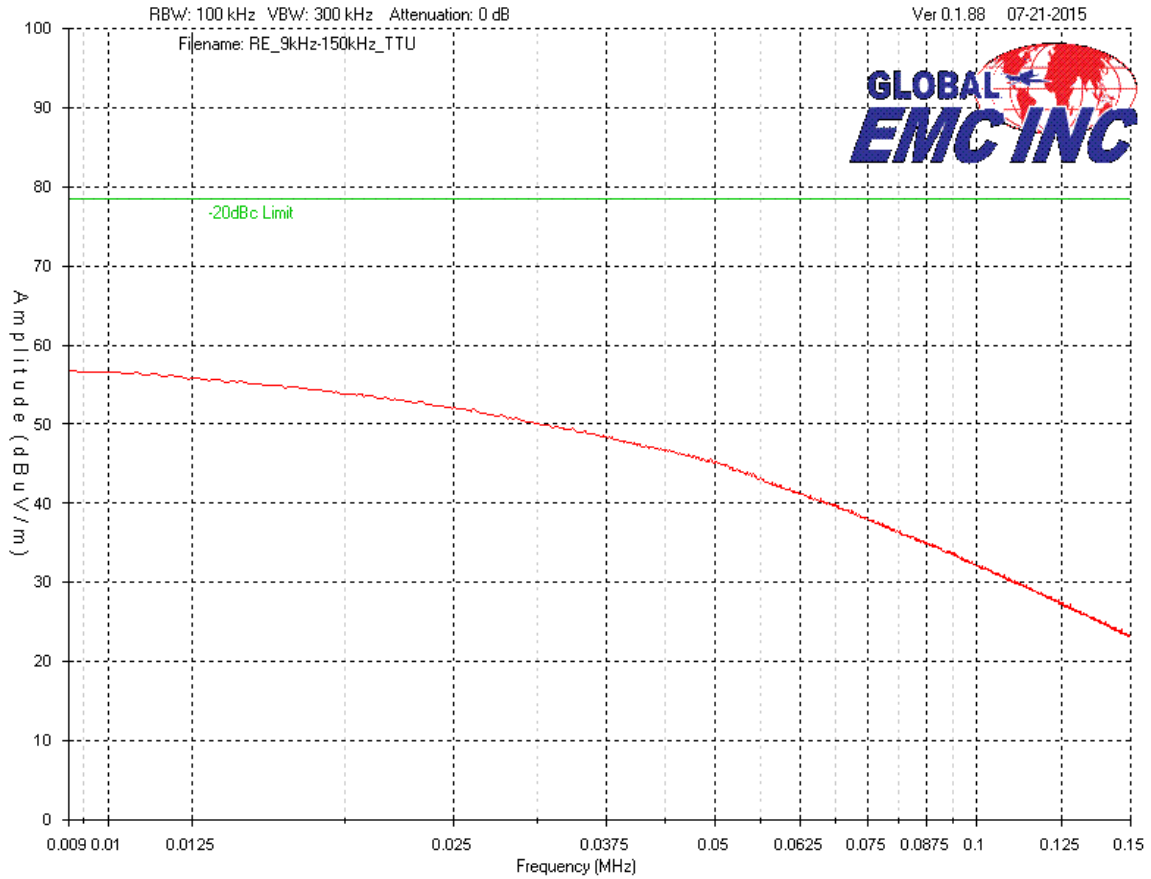
Channel 0x13 – Reference level:98.5dBμV




Date: 20.JUL.2015 15:12:00

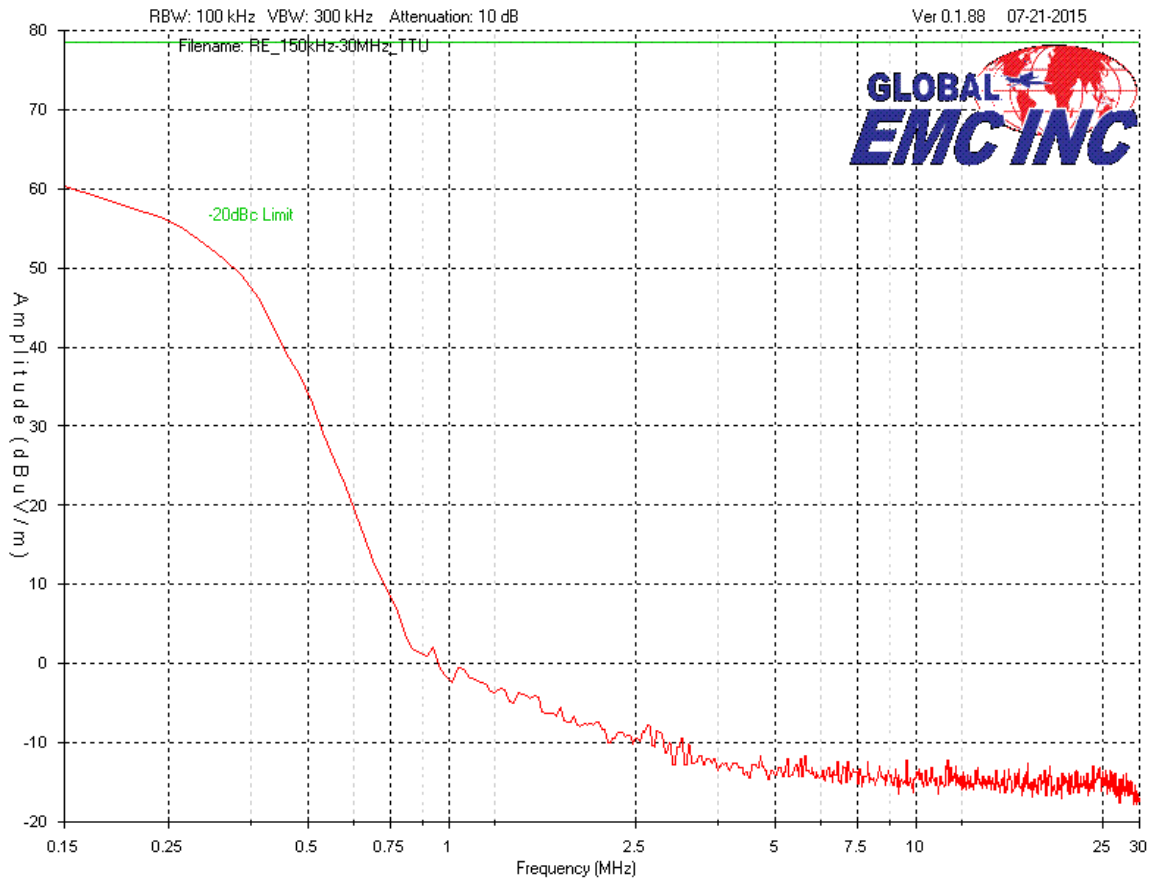
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Channel 0x13, 9 kHz – 150 kHz



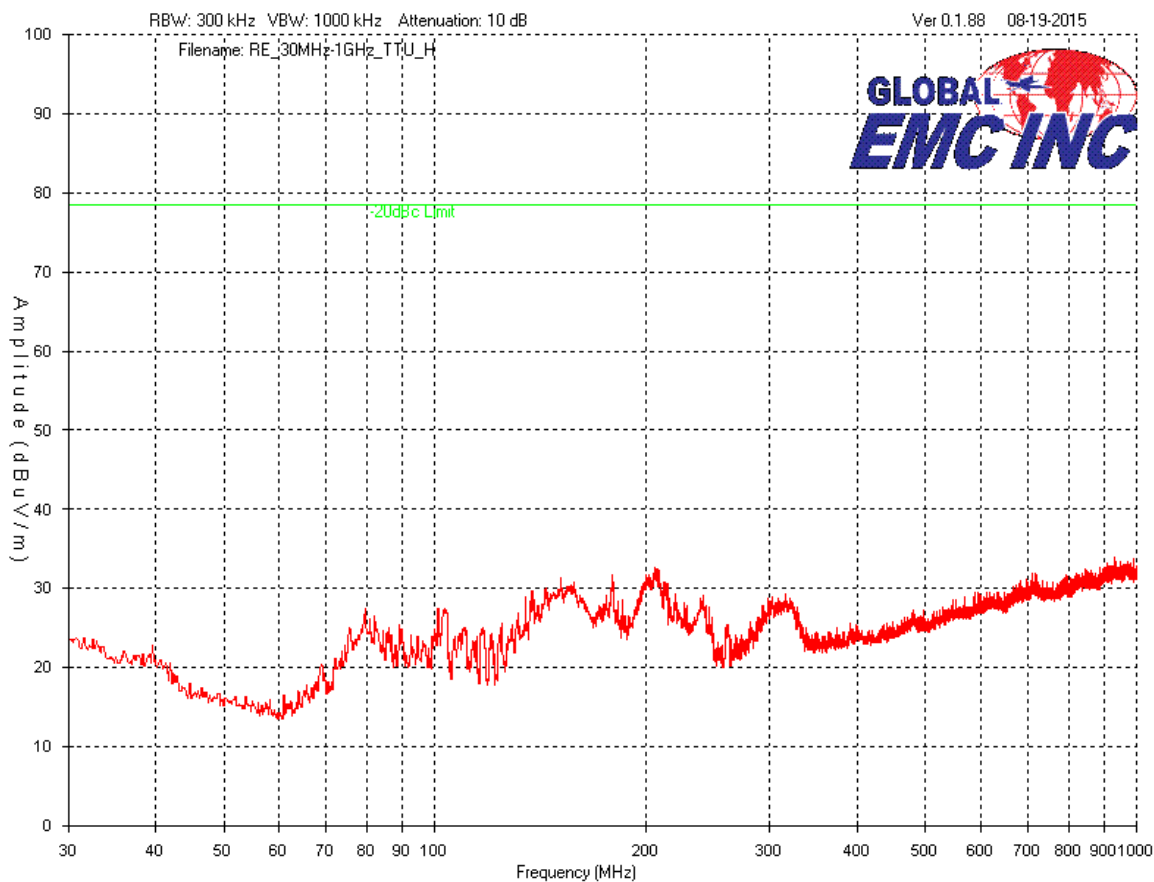
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Channel 0x13, 150 kHz – 30 MHz




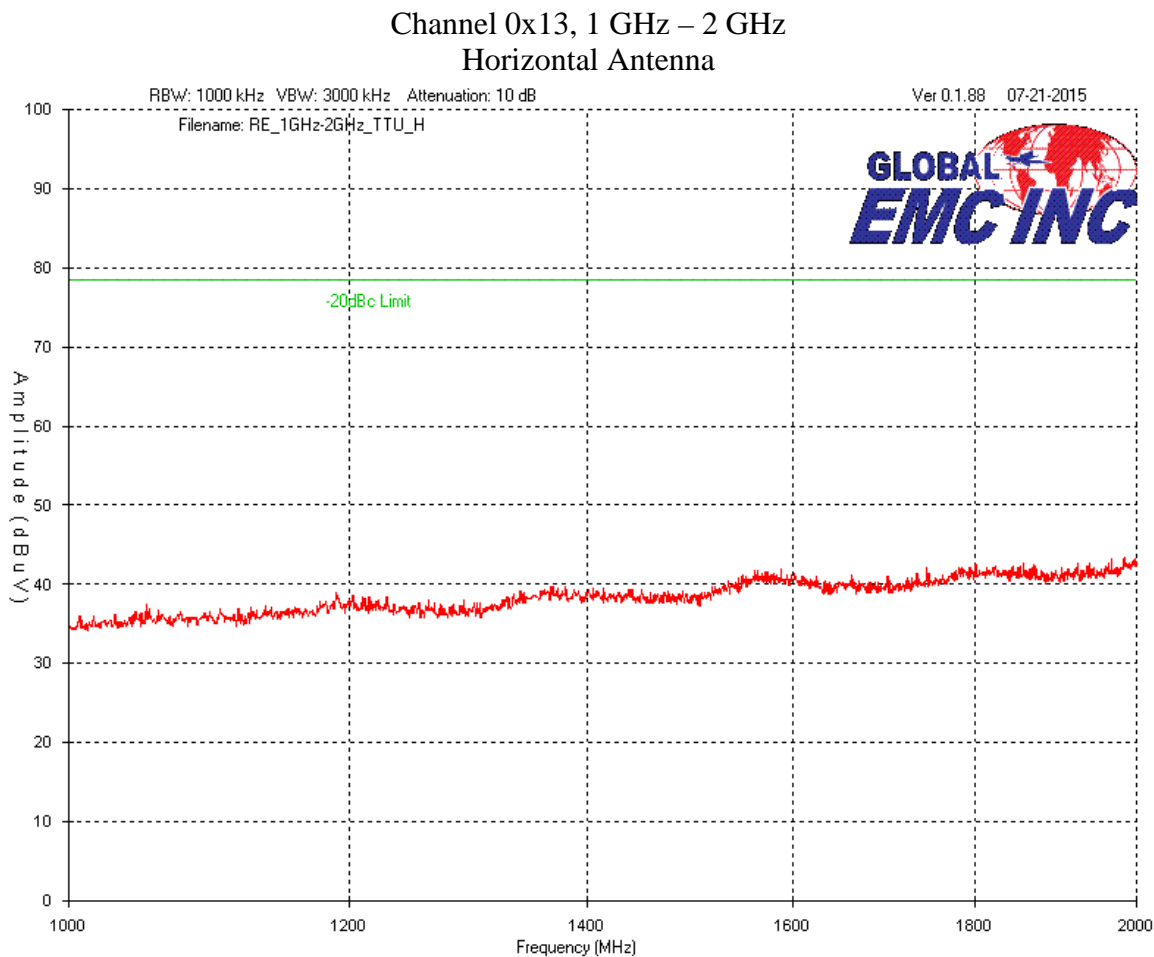
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Channel 0x13, 30 MHz – 1 GHz
Horizontal Antenna




Note: This graph was taken with a RBW of 300 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 30 dB of margin.

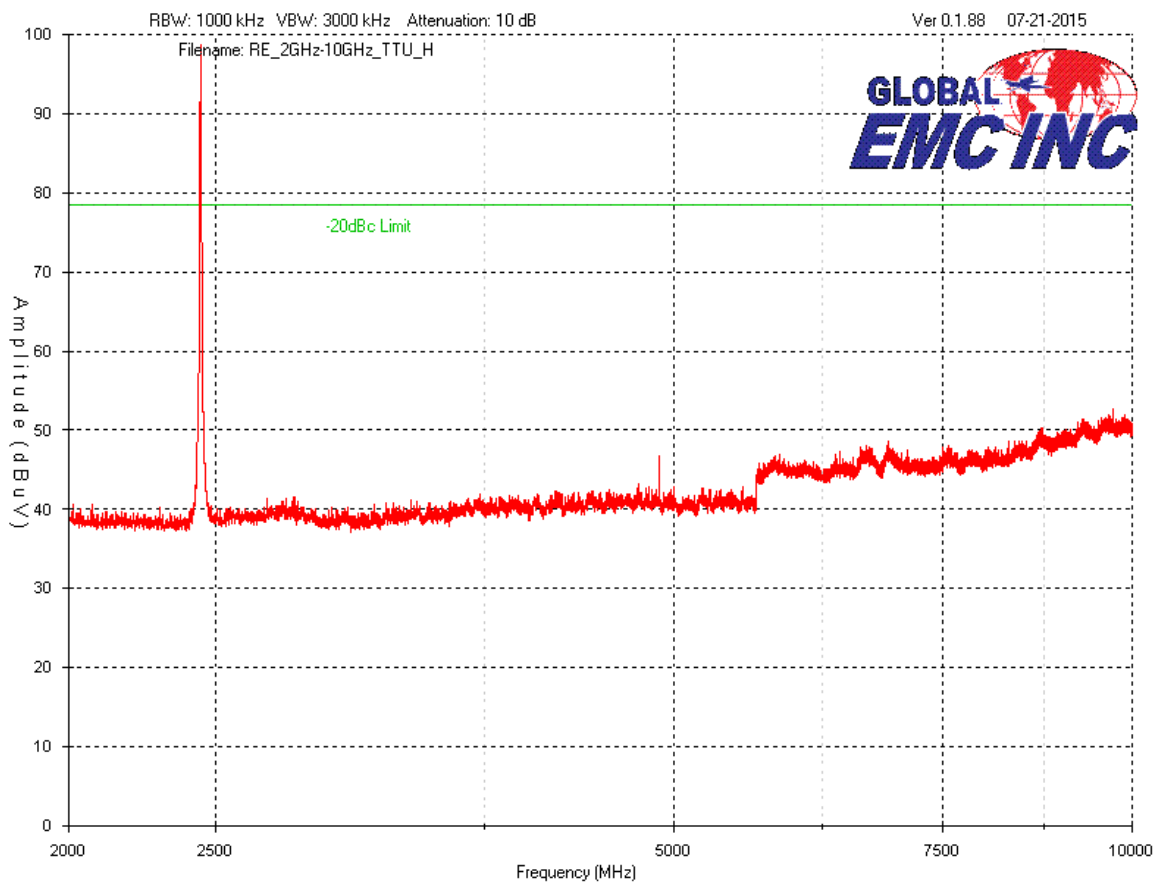
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	




Note: This graph was taken with a RBW of 1000 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 30 dB of margin.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

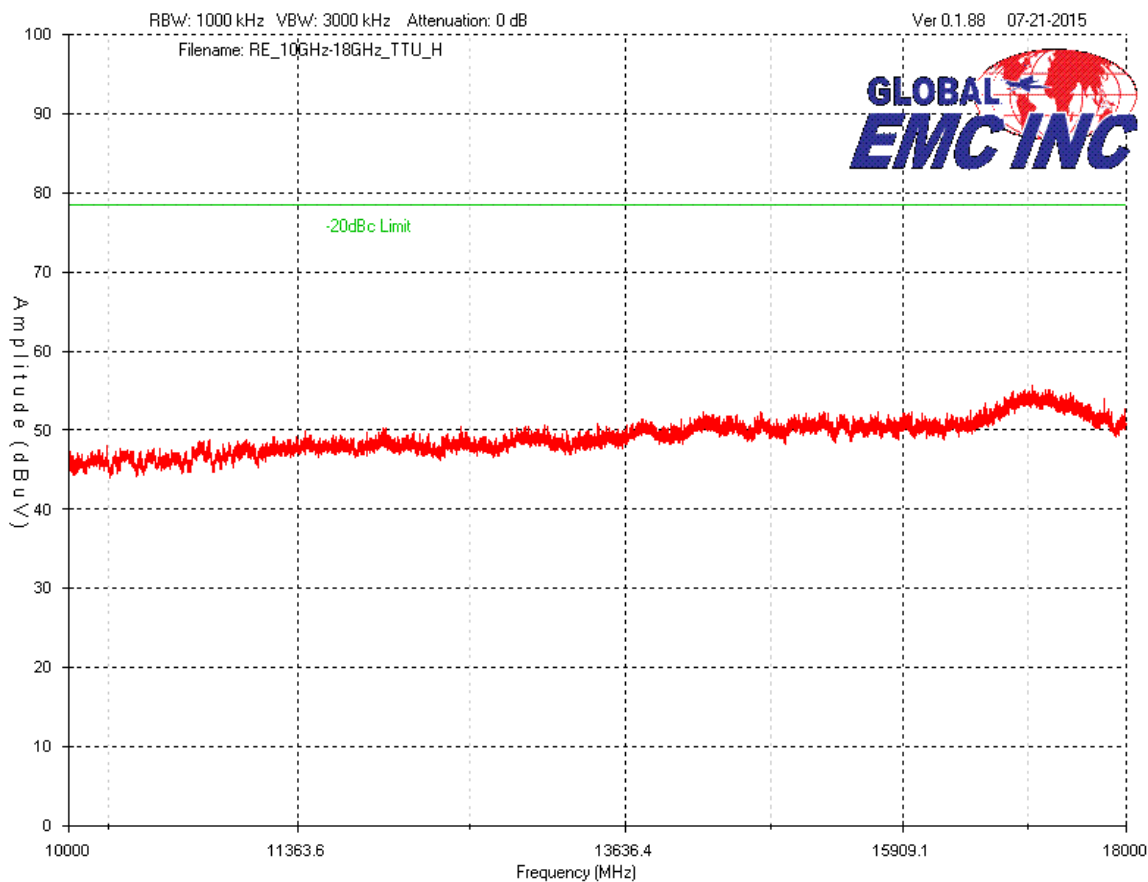
Channel 0x13, 2 GHz – 10 GHz
Horizontal Antenna




Note: This graph was taken with a RBW of 1000 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 30 dB of margin.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

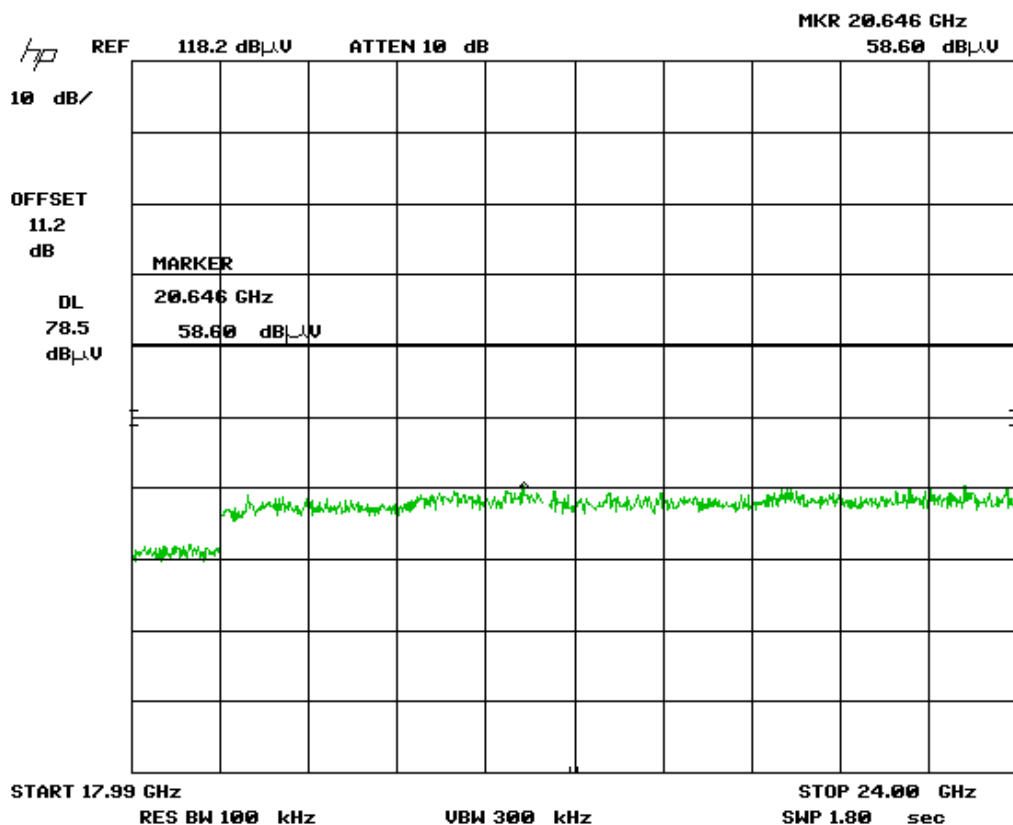
Channel 0x13, 10 GHz – 18 GHz
Horizontal Antenna




Note: This graph was taken with a RBW of 1000 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 20 dB of margin.

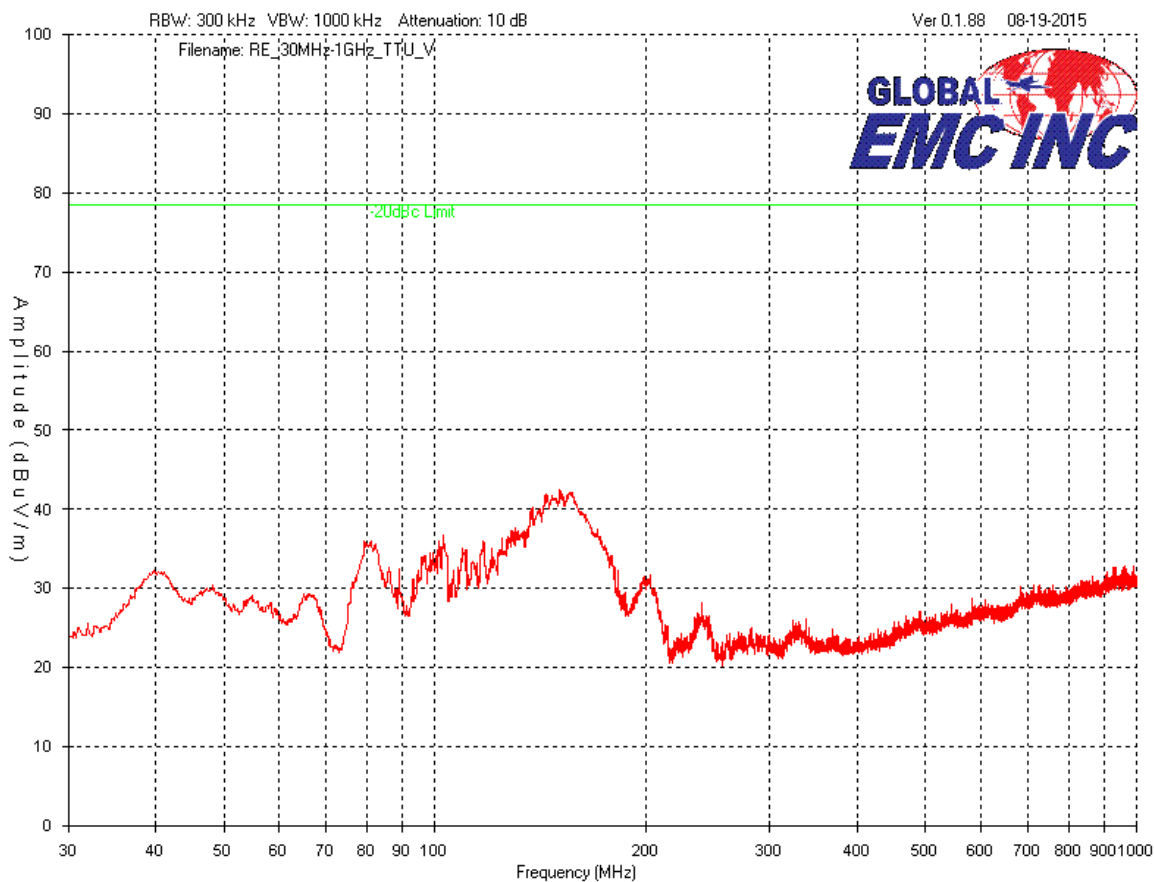
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Channel 0x13, 18 GHz – 24 GHz
Horizontal Antenna




Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

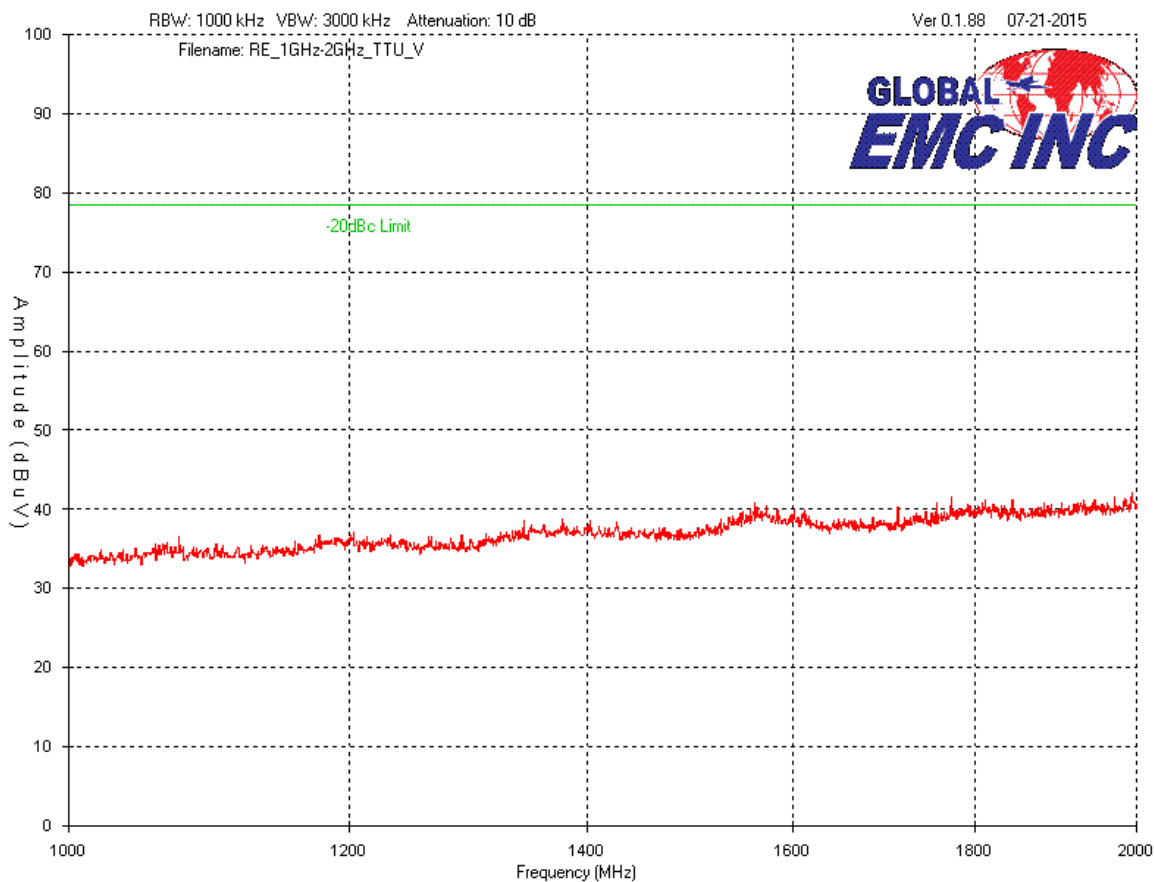
Channel 0x13, 30 MHz – 1 GHz
Vertical Antenna




Note: This graph was taken with a RBW of 300 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 30 dB of margin.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

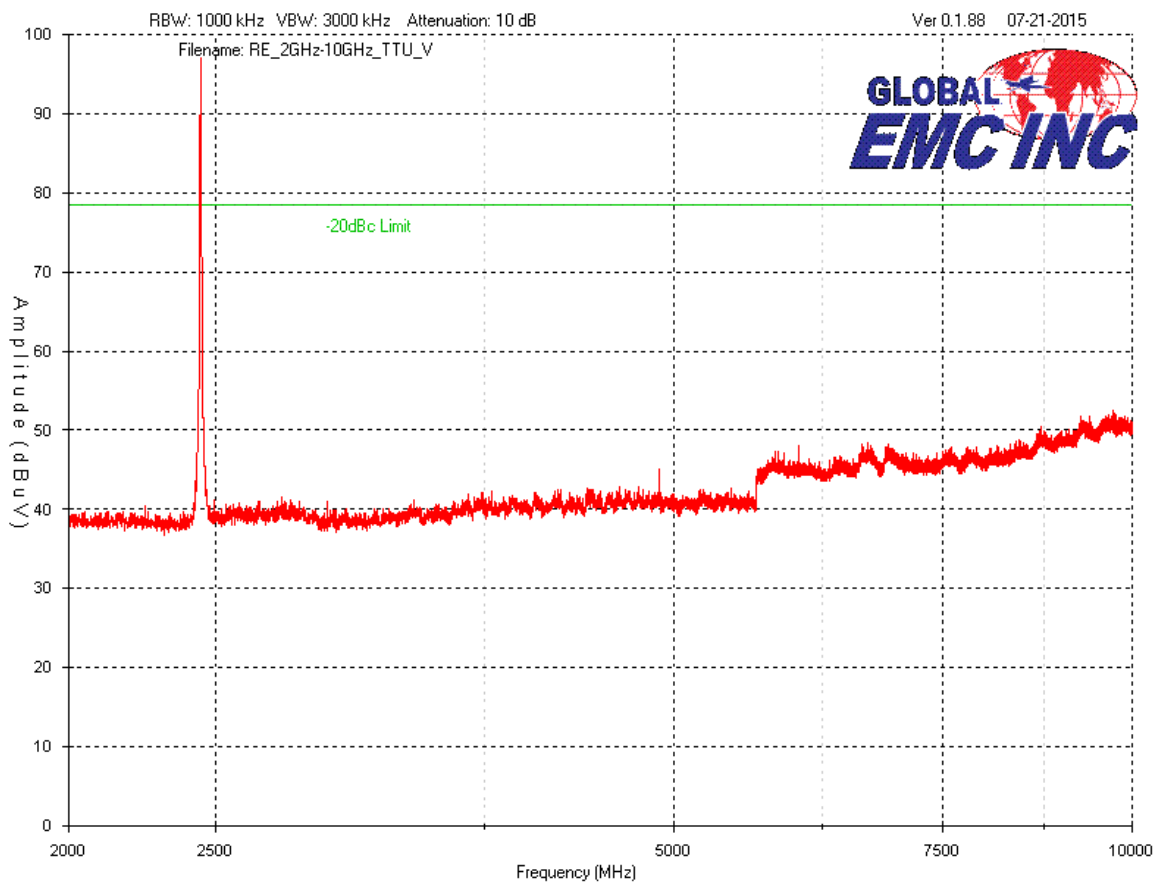
Channel 0x13, 1 GHz – 2 GHz
Vertical Antenna




Note: This graph was taken with a RBW of 1000 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 30 dB of margin.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

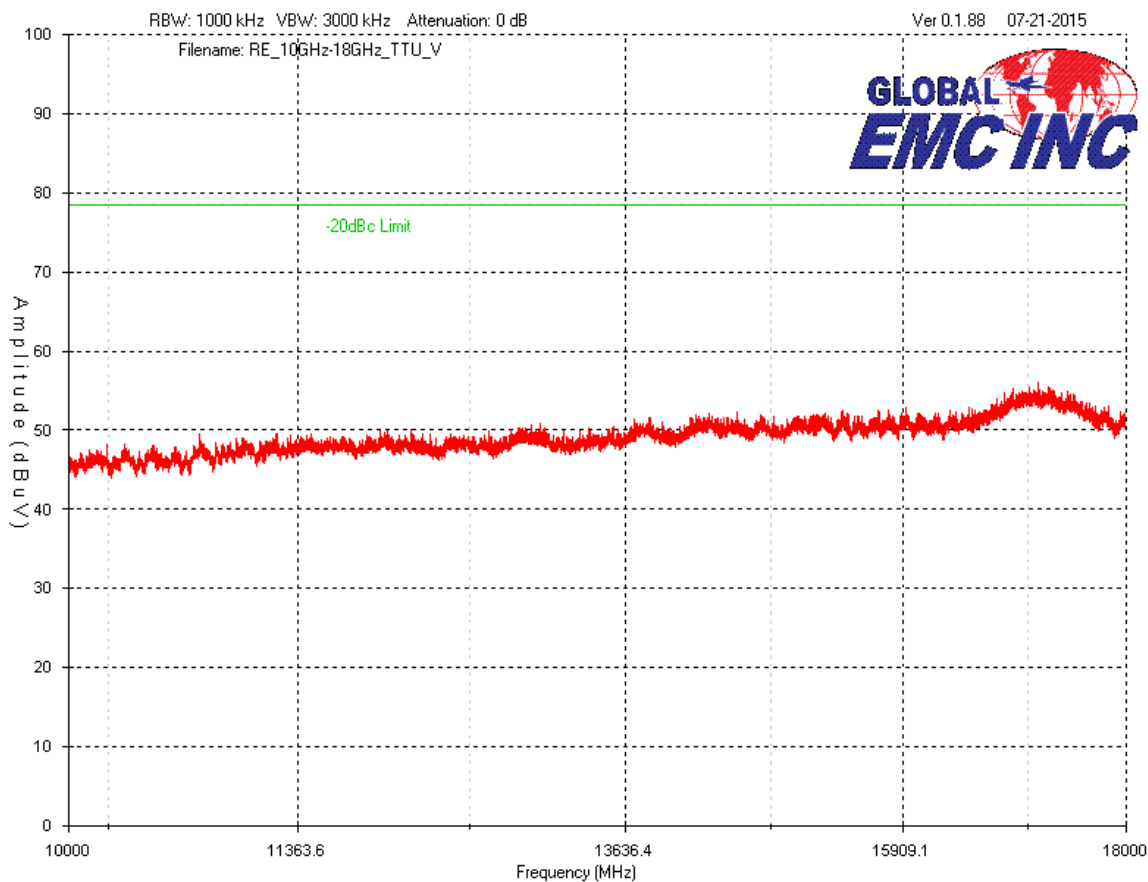
Channel 0x13, 2 GHz – 10 GHz
Vertical Antenna




Note: This graph was taken with a RBW of 1000 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 20 dB of margin.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

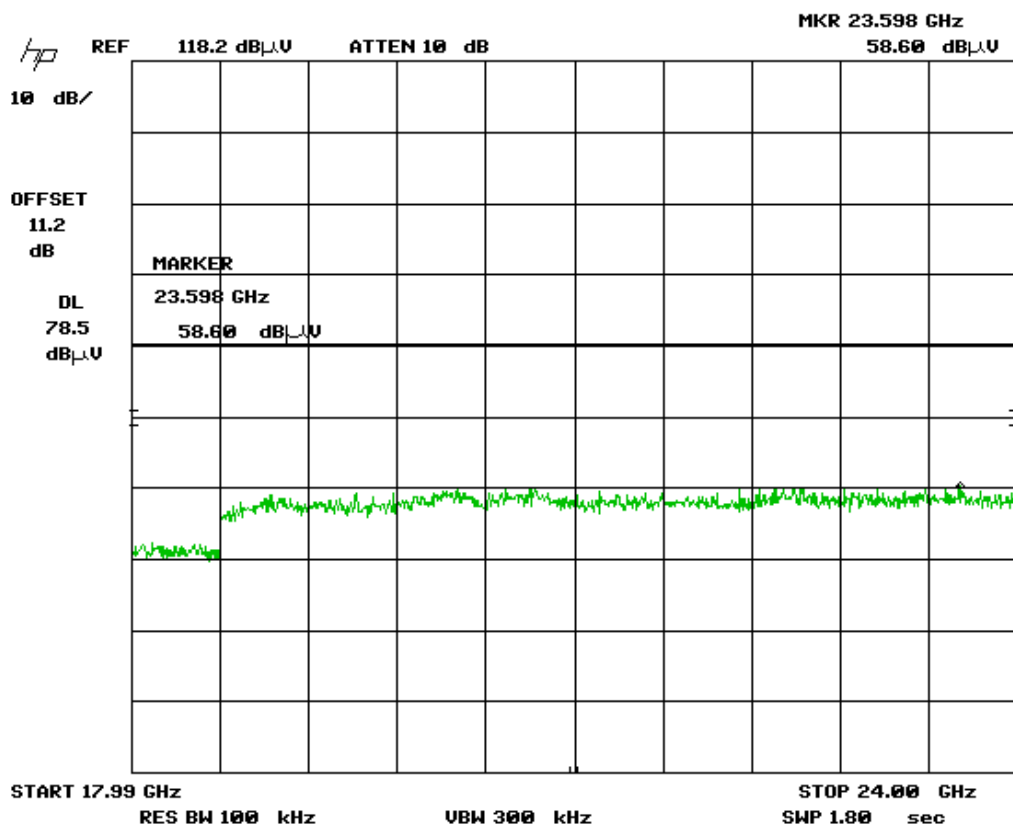
Channel 0x13, 10 GHz – 18 GHz
Vertical Antenna




Note: This graph was taken with a RBW of 1000 kHz which is greater than the required 100kHz measurement bandwidth and there is at least 20 dB of margin.

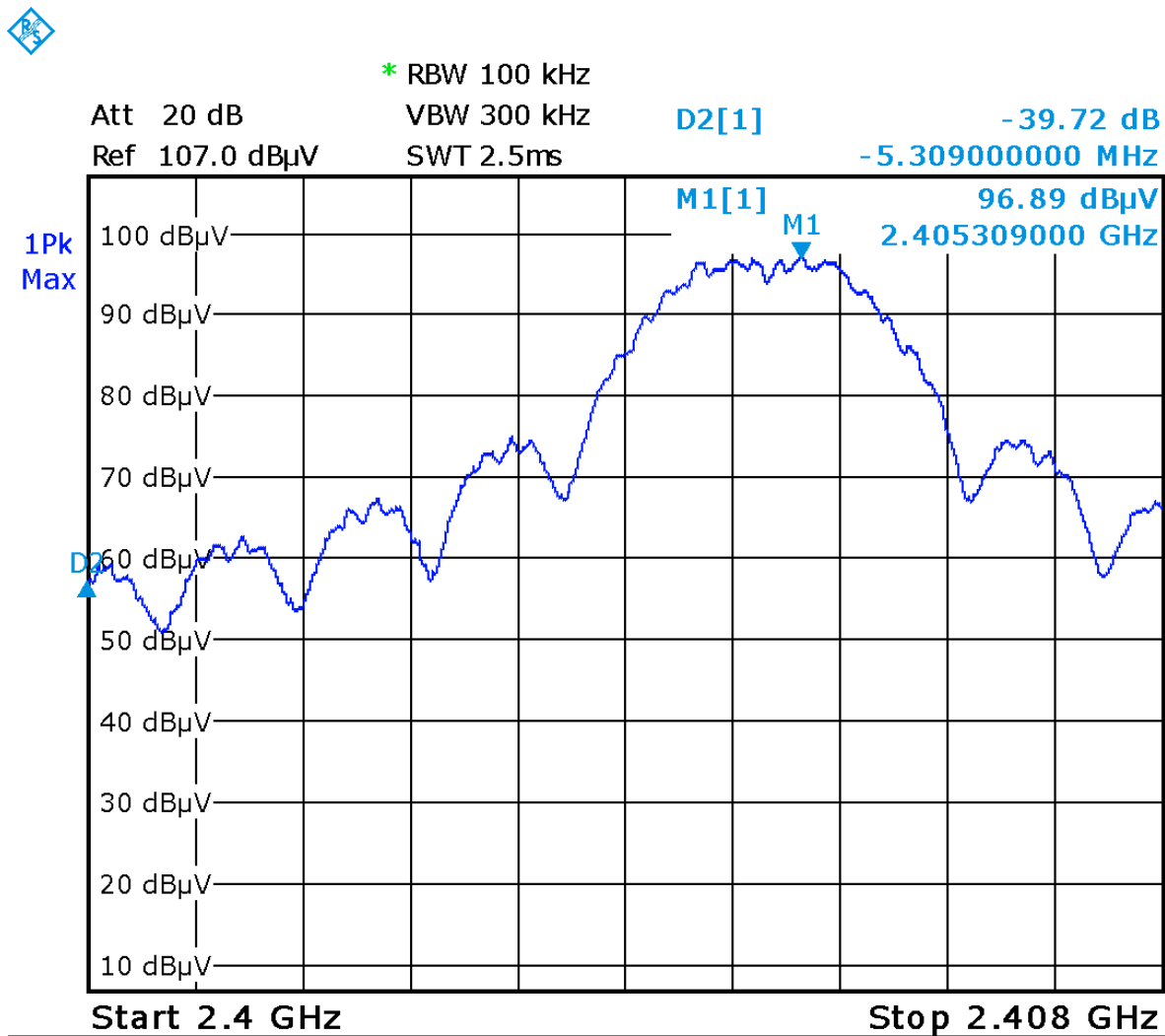
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Channel 0x13, 18 GHz – 24 GHz
Vertical Antenna




Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

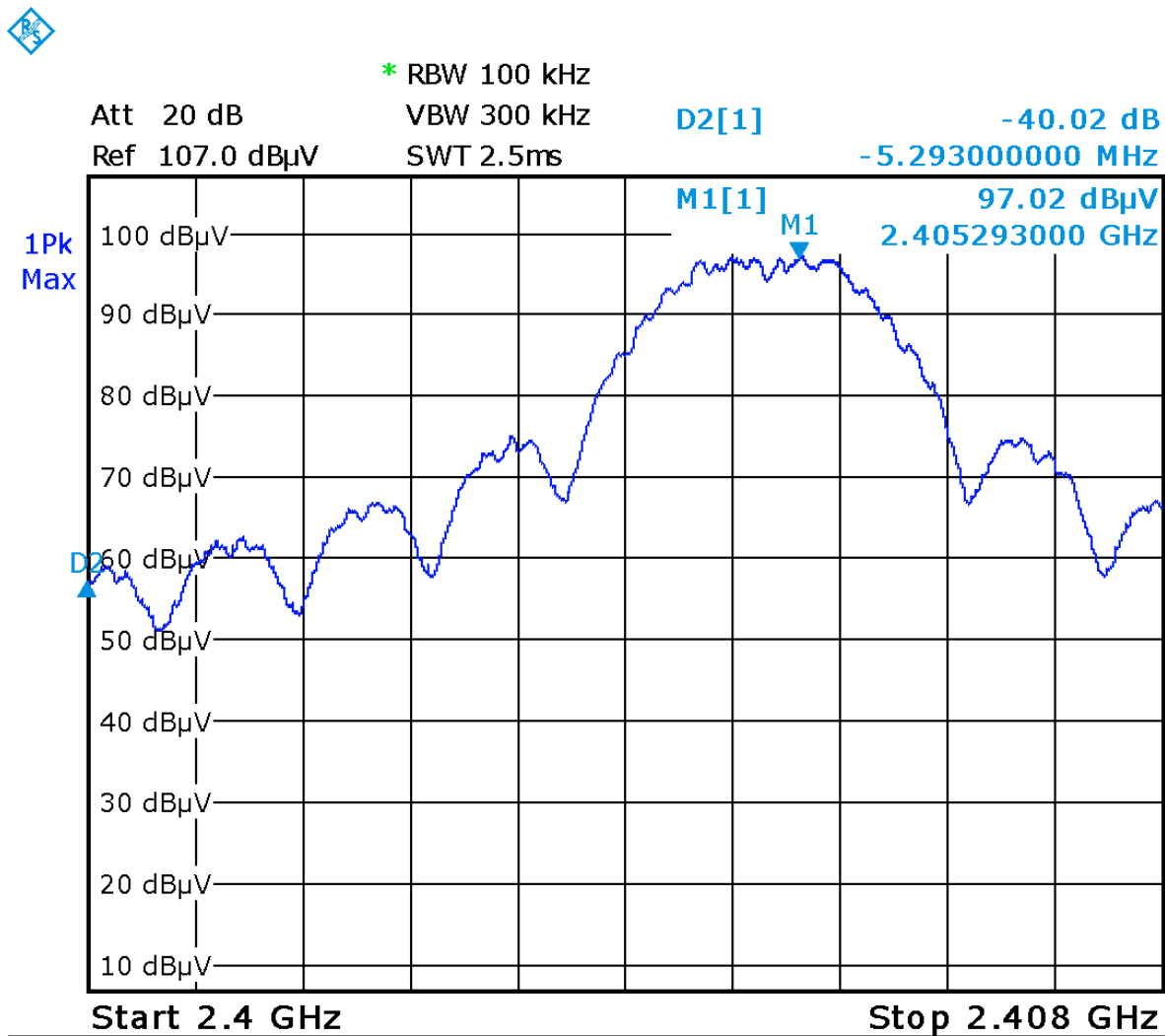
Low Channel (0xB) – 2400 MHz Band Edge
Horizontal Antenna




Date: 20.JUL.2015 15:45:44

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

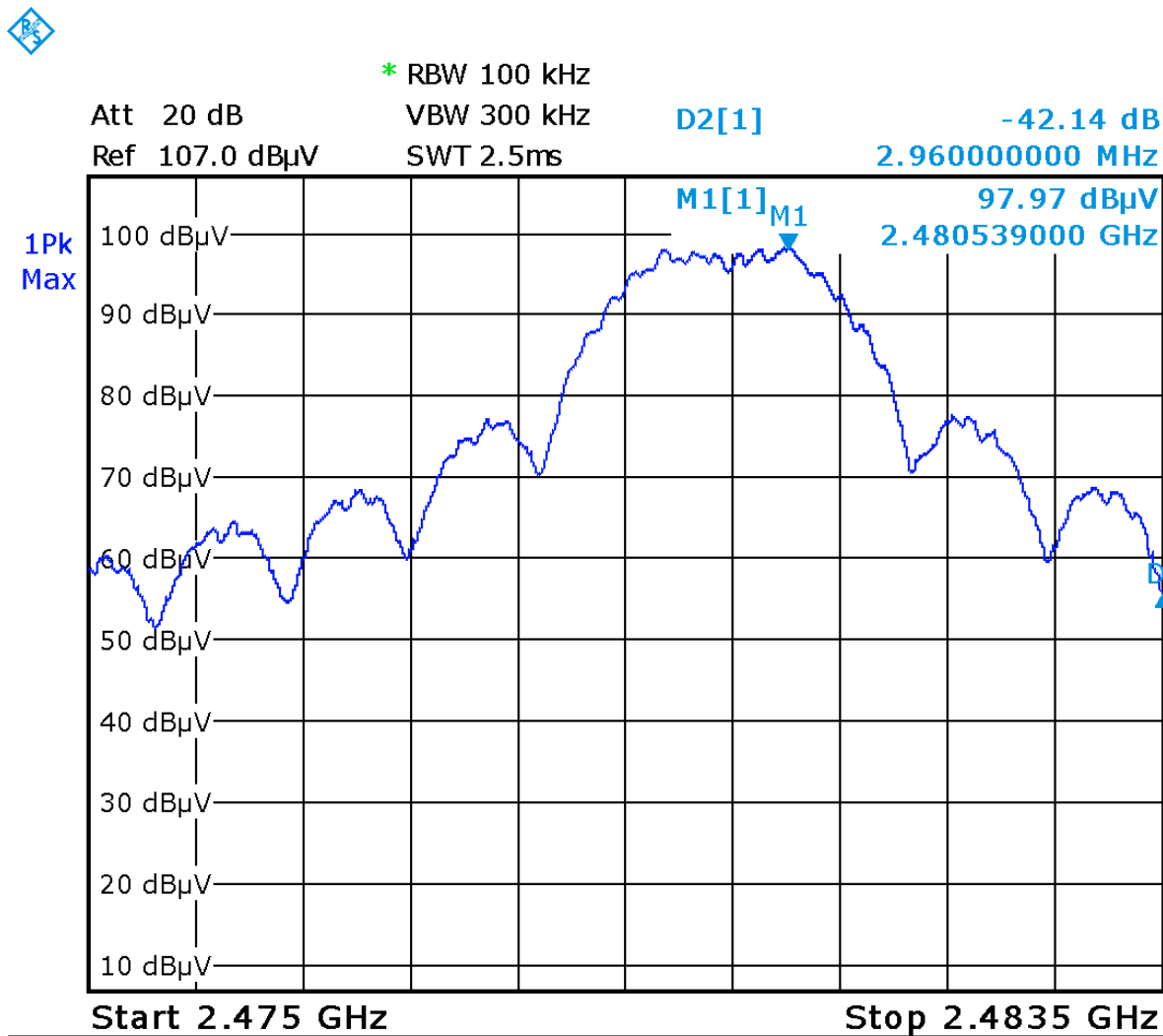
Low Channel (0xB) – 2400 MHz Band Edge
Vertical Antenna




Date: 20.JUL.2015 16:04:44

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

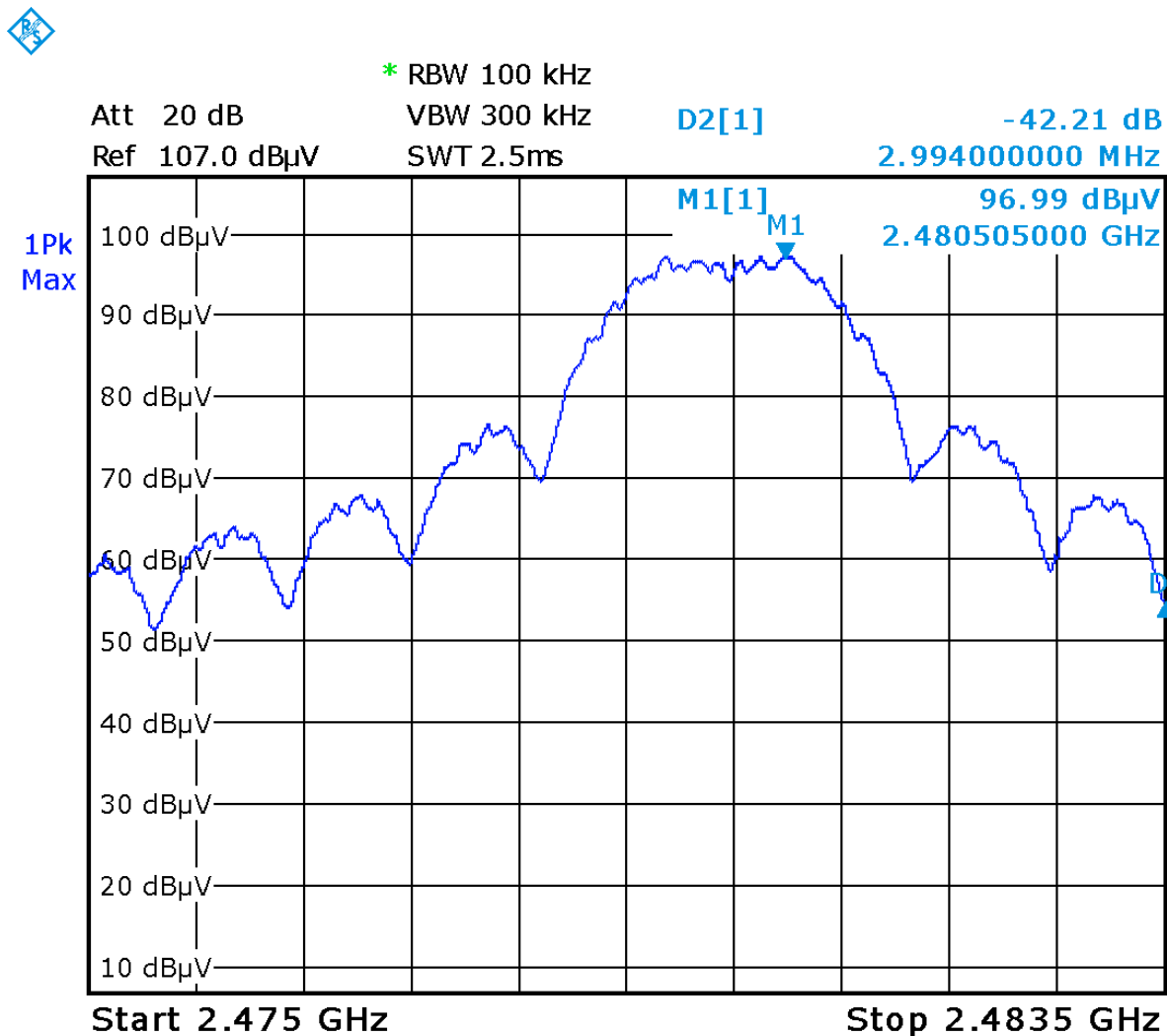
Hi Channel (0x1A) – 2483.5 MHz Band Edge
Horizontal Antenna



Date: 20.JUL.2015 13:05:05


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Hi Channel (0x1A) – 2483.5 MHz Band Edge
Vertical Antenna



Date: 20.JUL.2015 13:44:06


See 'Appendix B – EUT and Test Setup Photos' for photos showing the test set-up.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration Date	Next Calibration Date	Asset #
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov. 15, 2013	Nov. 15, 2015	GEMC 160
Spectrum Analyzer	8566B	HP	Oct 9, 2014	Oct 9, 2016	GEMC 193
Quasi-Peak Adapter	85650A	HP	May 22, 2014	May 22, 2016	GEMC 194
Horn Antenna 2 – 18 GHz	WBH218HN	Q-par	Jan. 23, 2014	Jan. 23, 2016	GEMC 6375
Pre-Amp 1 – 26.5 GHz	HP 8449B	HP	Sept 09, 2014	Sept 09, 2016	GEMC 6351
Horn Antenna 18 - 26.5 GHz	SAS-572	A.H. Systems	Sept 09, 2014	Sept 09, 2016	GEMC 6371
Harmonic Mixer 18 - 26.5 GHz	11970K	HP	Jan. 28, 2014	Jan. 28, 2016	GEMC 158
Pre-Amp 9 kHz - 1 GHz	LNA 6901	Teseq	Jan 30, 2015	Jan 30, 2017	GEMC 168
Loop Antenna	EM 6871	Electro-Metrics	Feb 3, 2015	Feb 3, 2017	GEMC 70
Loop Antenna	EM 6872	Electro-Metrics	Feb 3, 2015	Feb 3, 2017	GEMC 71
BiLog Antenna	3142-C	ETS	Sept. 8, 2014	Sept. 8, 2016	GEMC 8
4GHz-12GHz High Pass filter	11SH10-4000/T12000-0/0	K & L Microwave	NCR	NCR	GEMC 119
RF Cable 7m	LMR-400-7M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 28
RF Cable 10m	LMR-400-10M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 29
RF Cable 0.5M	LMR-400-0.5M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 31

This report module is based on GEMC template "FCC – Power Line Conducted Emissions Class B_Rev1"

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Transmitter Spurious Radiated Emissions

Purpose

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT does not exceed the limits listed below as defined in the applicable test standard, as measured from a receiving antenna. This helps protect broadcast radio services such as television, FM radio, pagers, cellular telephones, emergency services, and so on, from unwanted interference.

Limit(s) and Method

The method is as defined in ANSI C63.10:2013.

The limits are as defined in FCC Part 15, Section 15.209:

The limits, as defined in 15.247(d) for unintentional radiated emissions apply for those emissions that fall in the restricted bands, as defined in Section 15.205(a). These emissions must comply with the radiated emission limits specified in Section 15.209(a).


All unintentional emissions must also meet the ‘Spurious Conducted Emissions’ requirements of -20 dBc or greater. See also ‘Spurious Emissions (-20dBc)’ for further details.

0.009 MHz – 0.490 MHz, 2400/F(kHz) uV/m at 300 m¹
0.490 MHz – 1.705 MHz, 24000/F(kHz) uV/m at 30 m¹
1.705 MHz – 30 MHz, 30 uV/m at 30 m¹
30 MHz – 88 MHz, 100 uV/m (40.0 dBuV/m¹) at 3 m
88 MHz – 216 MHz, 150 uV/m (43.5 dBuV/m¹) at 3 m
216 MHz – 960 MHz, 200 uV/m (46.0 dBuV/m¹) at 3 m
Above 960 MHz, 500 uV/m (54.0 dBuV/m¹) at 3 m
Above 1000 MHz, 500 uV/m (54 dBuV/m²) at 3m
Above 1000 MHz, 500 uV/m (74 dBuV/m³) at 3m

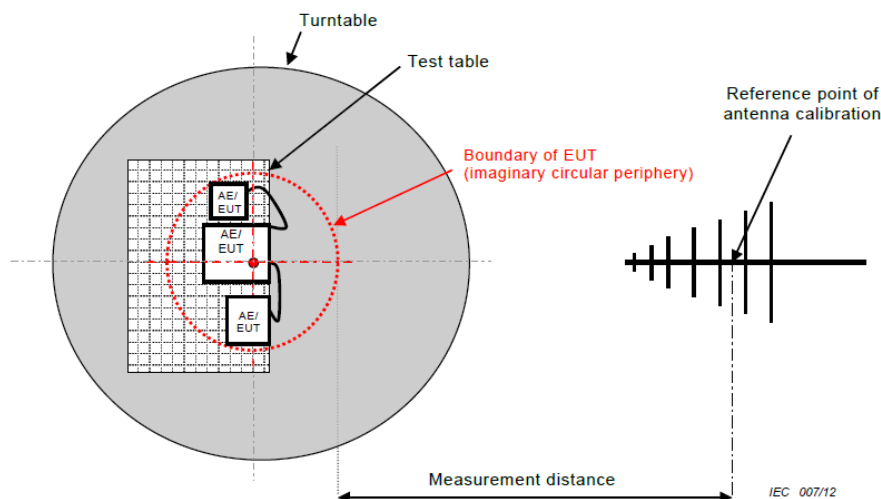
¹Limit is with Quasi Peak detector with bandwidths as defined in CISPR-16-1-1

²Limit is with 1 MHz measurement bandwidth and using an Average detector

³Limit is with 1 MHz measurement bandwidth and using a Peak detector

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Typical Radiated Emissions Setup



Measurement Uncertainty

The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is $\pm 4.25\text{dB}$ for 30MHz – 1GHz and $\pm 4.93\text{dB}$ for 1GHz – 18GHz with a 'k=2' coverage factor and a 95% confidence level.


Preliminary Graphs

The graphs shown below are maximized peak measurement graphs measured with a resolution bandwidth greater than or equal to the final required detector over a full 0-360°. This peaking process is done as a worst case measurement and enables the detection of frequencies of concern for final measurement. For final measurements with the appropriate detector, where applicable, please refer to the tables under Final Measurements.

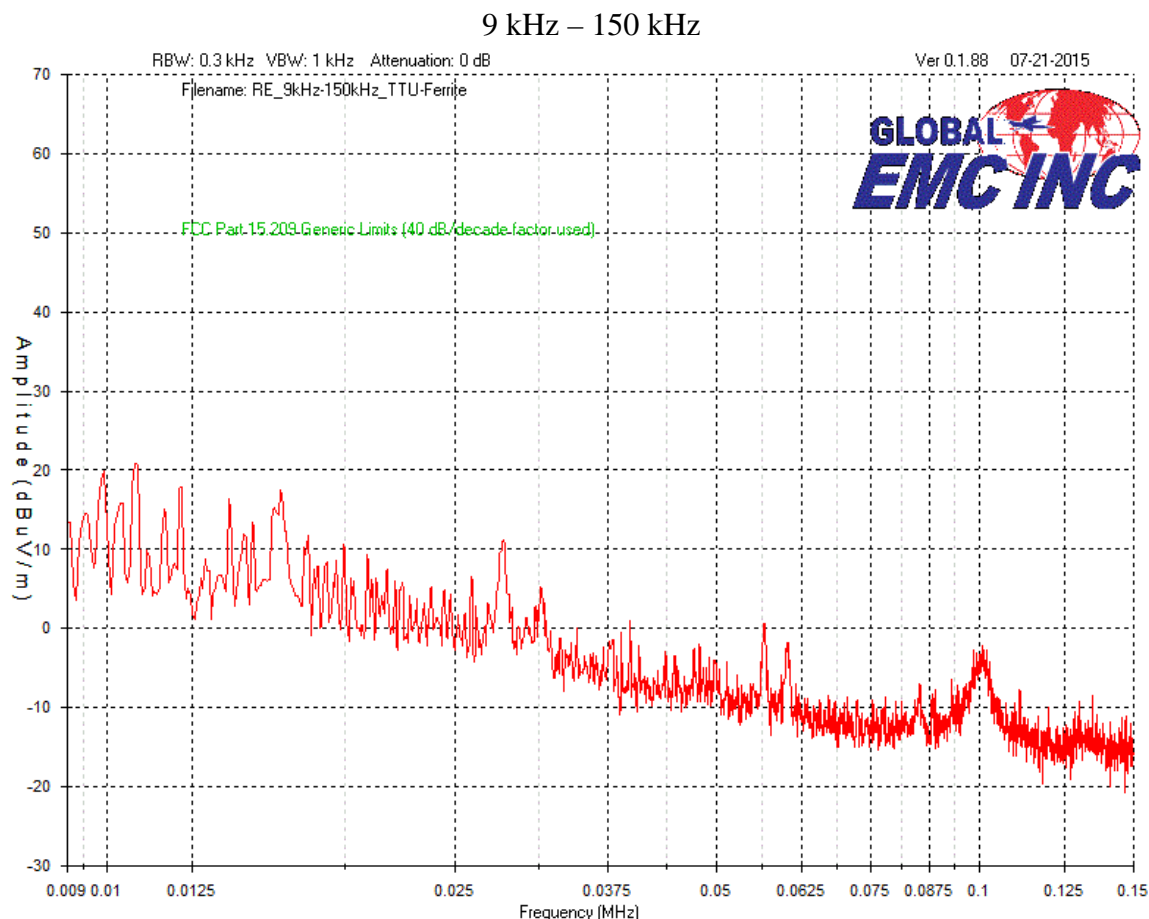
In accordance with FCC Part 15, Subpart A, Section 15.33, the device was scanned to the 10th harmonic (a minimum of a 24.835 GHz).


Devices scanned may be scanned at alternate test distances, and in accordance with FCC Part 15, Subpart A, Section 15.31, an extrapolation factor of 20 dB/decade was used above 30 MHz and 40 dB/decade below 30 MHz. For example for 1 meter measurements, an extrapolation factor 9.5 dB from 20 Log (1m / 3m) is applied.

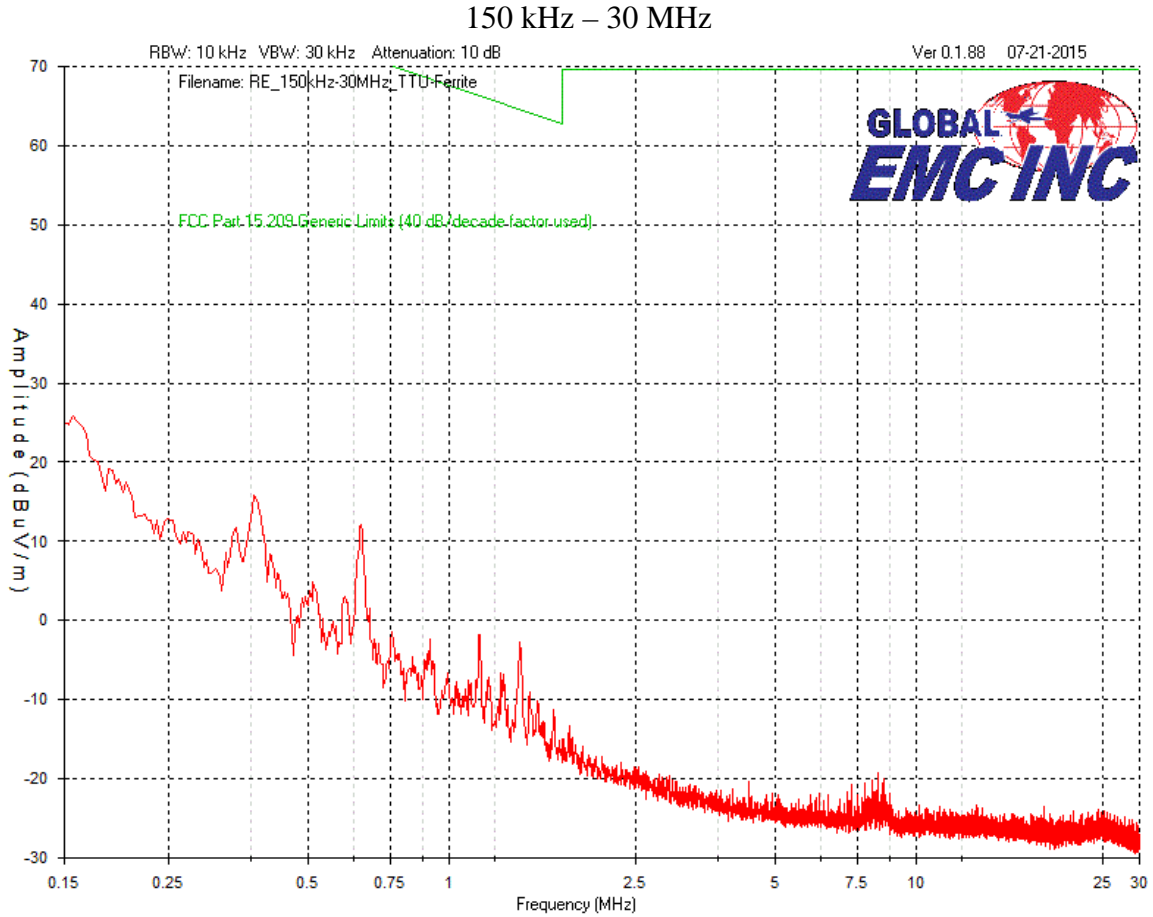
Low, middle and high channels, each in three orthogonal axes were checked. However, the worst case graphs are presented.


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Band-edge measurement graphs are shown for illustration purposes. See final measurement section for all measurements.

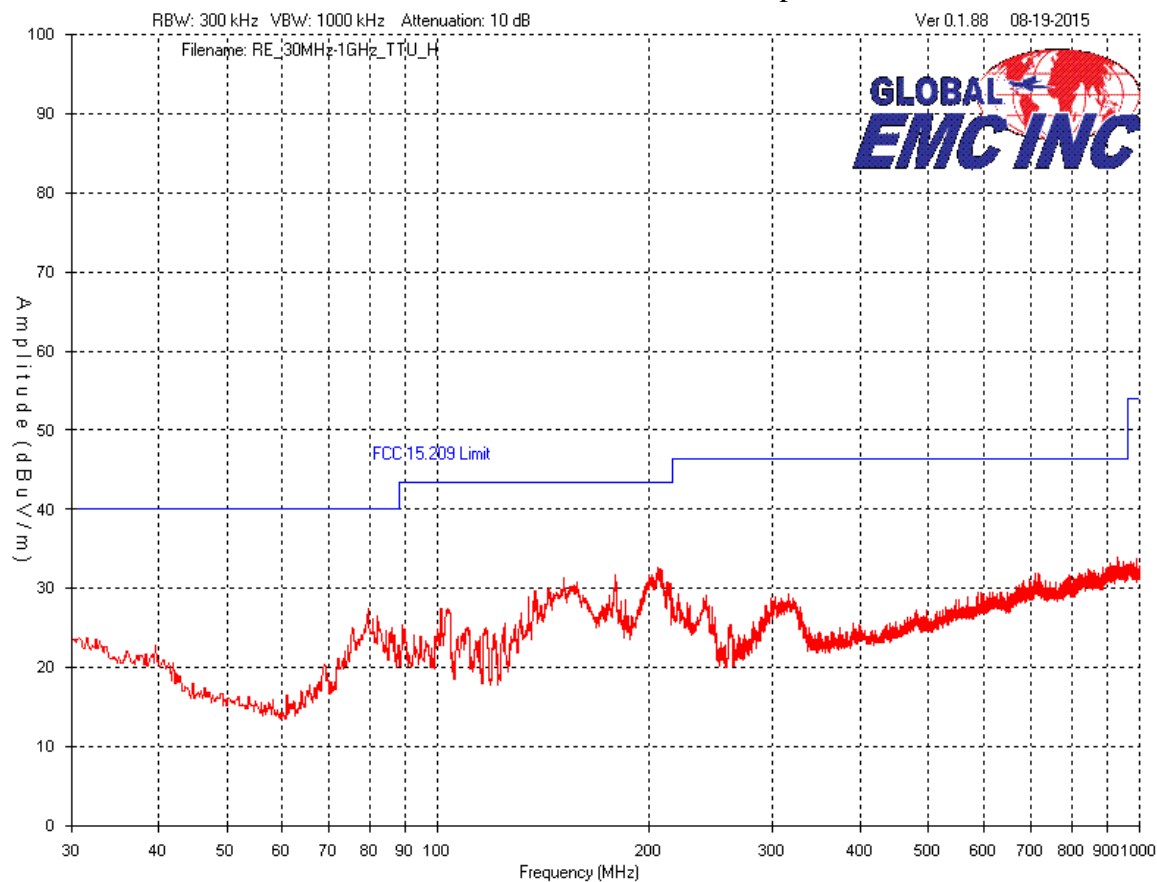



Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	



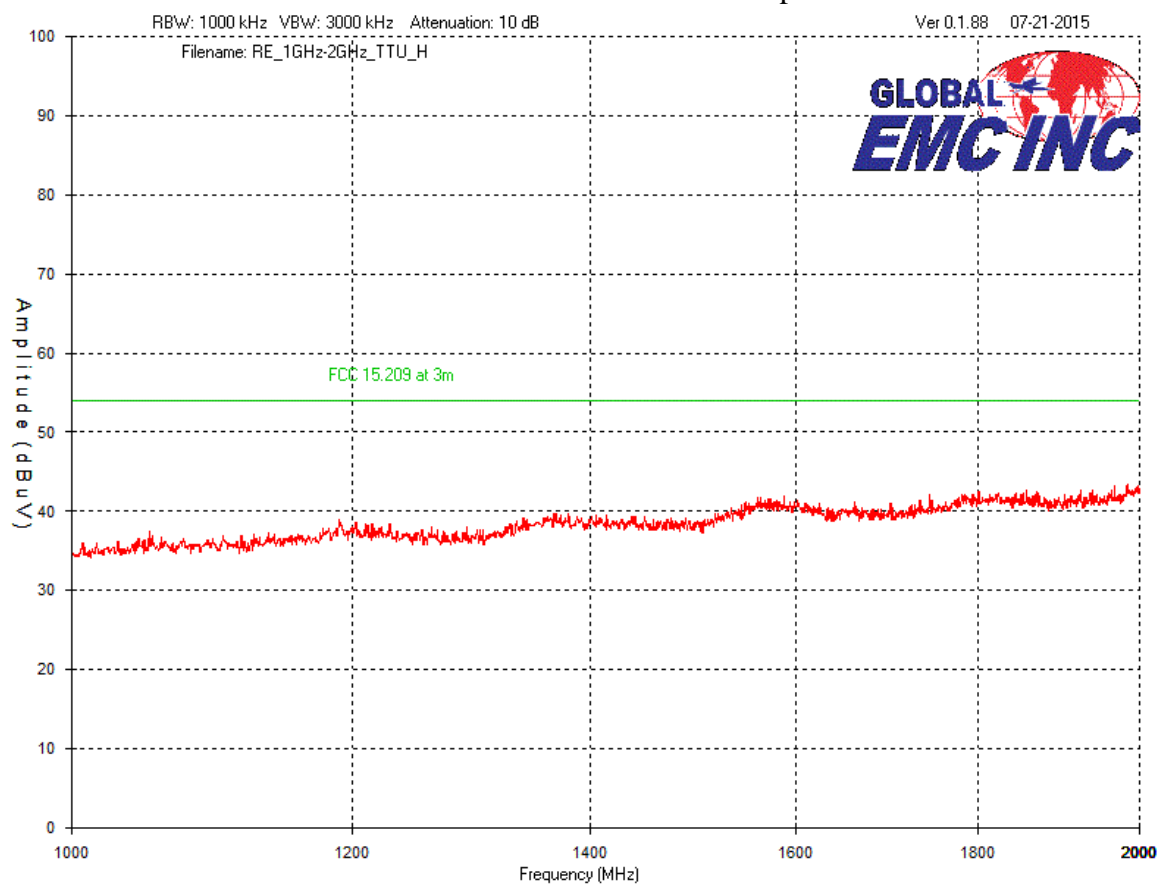
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Mid Channel – 30 MHz – 1 GHz
Horizontal - Peak Emission Graph



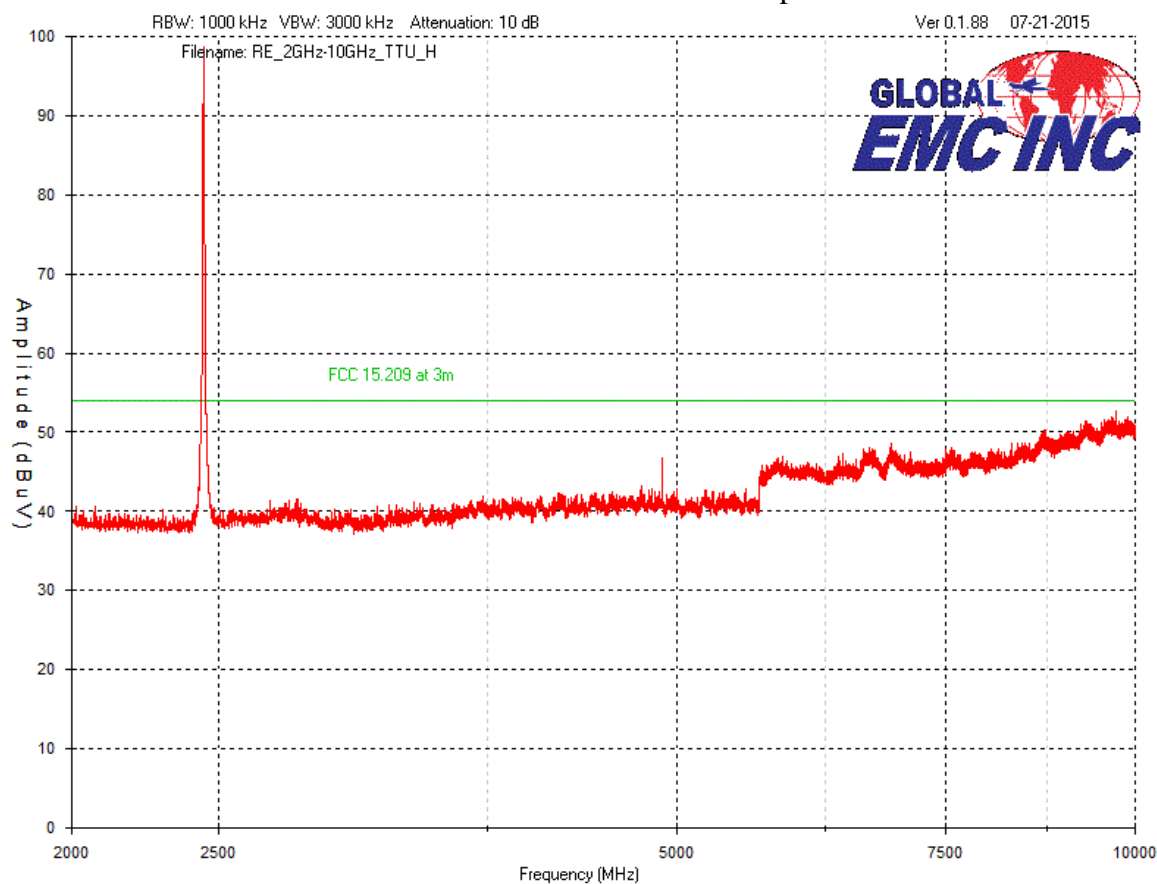
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Mid Channel – 1 GHz – 2 GHz
Horizontal - Peak Emission Graph



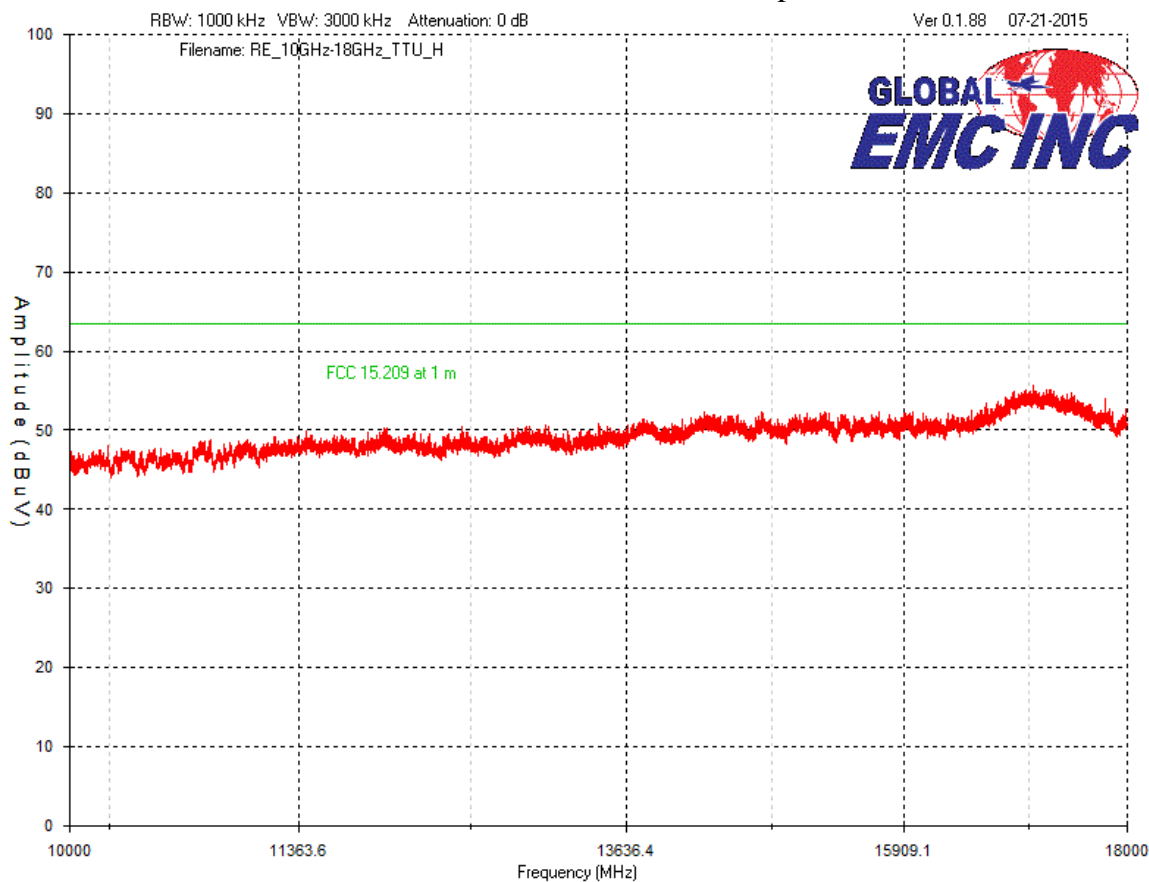
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Mid Channel – 2 GHz – 10 GHz
Horizontal - Peak Emission Graph




Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

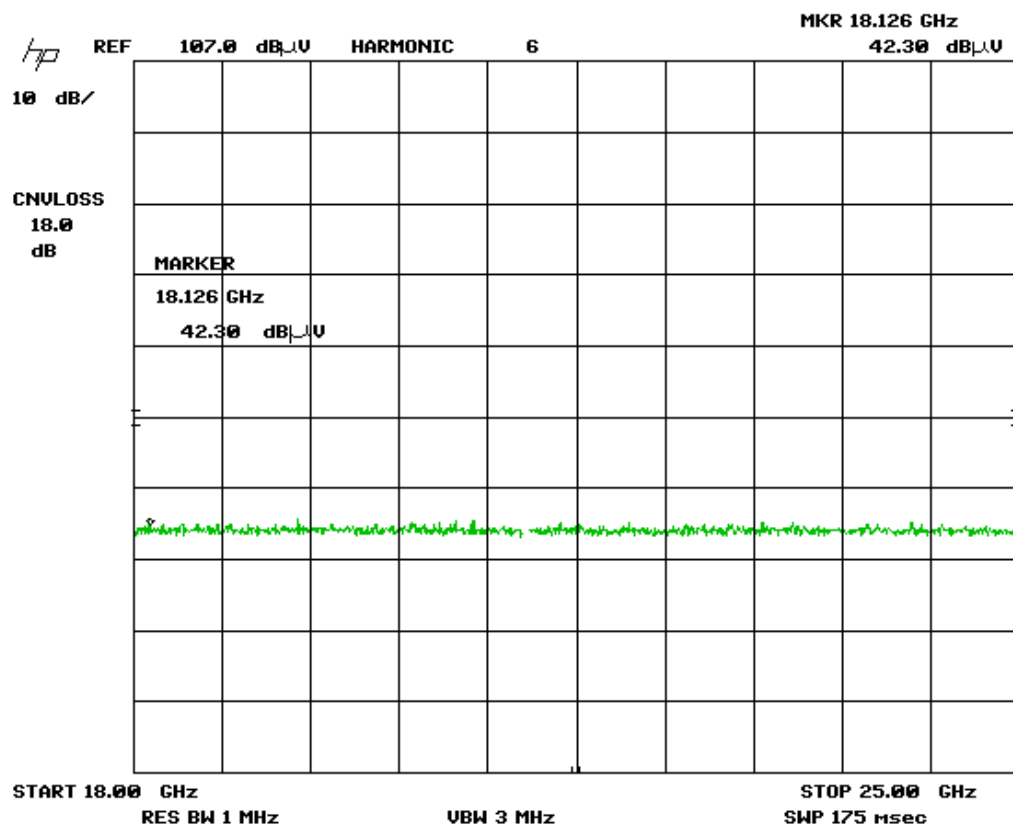
Mid Channel – 10 GHz – 18 GHz
Horizontal - Peak Emission Graph




Plot was taken at a 1 meter distance. All emissions were noise floor of measurement instrument. No emissions were found in this frequency range.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

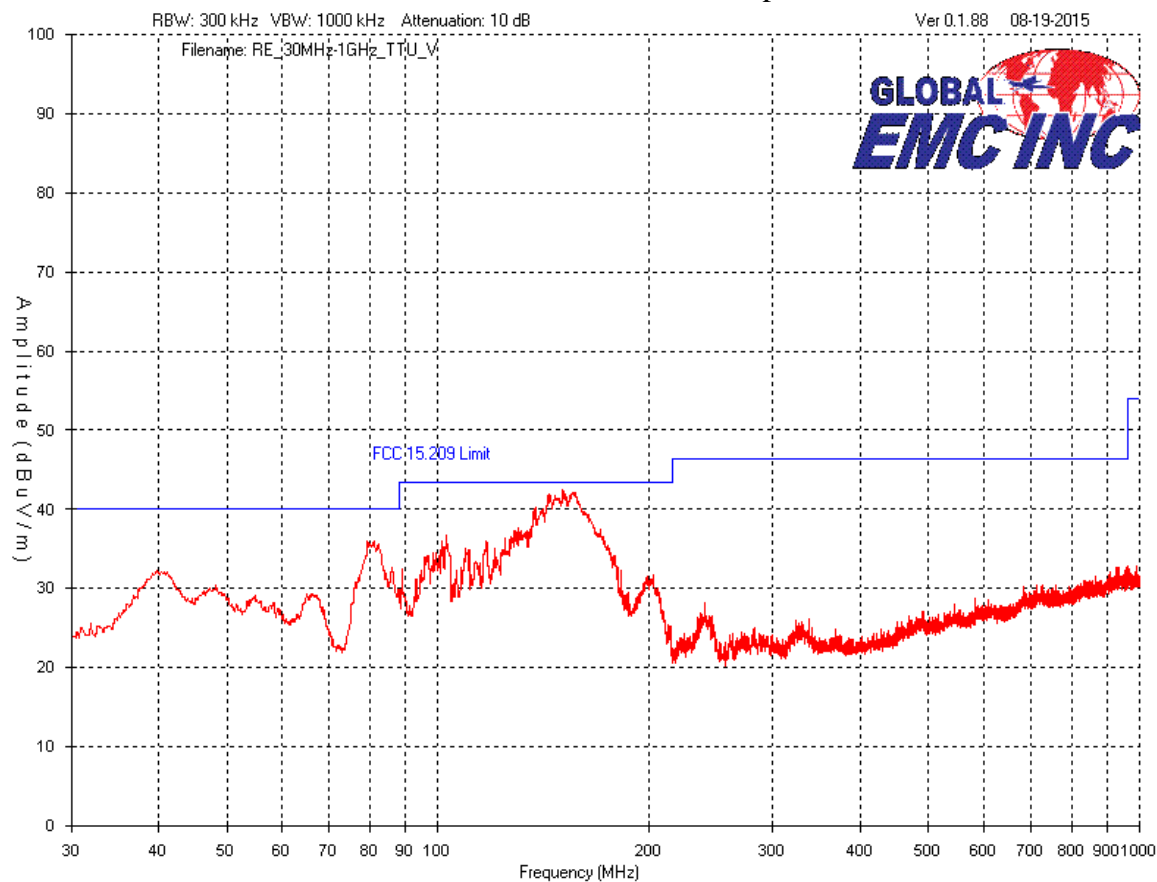
Mid Channel – 18 GHz – 25 GHz
Horizontal - Peak Emission Graph




Plot was taken at a 1 meter distance. All emissions were noise floor of measurement instrument. No emissions were found in this frequency range.

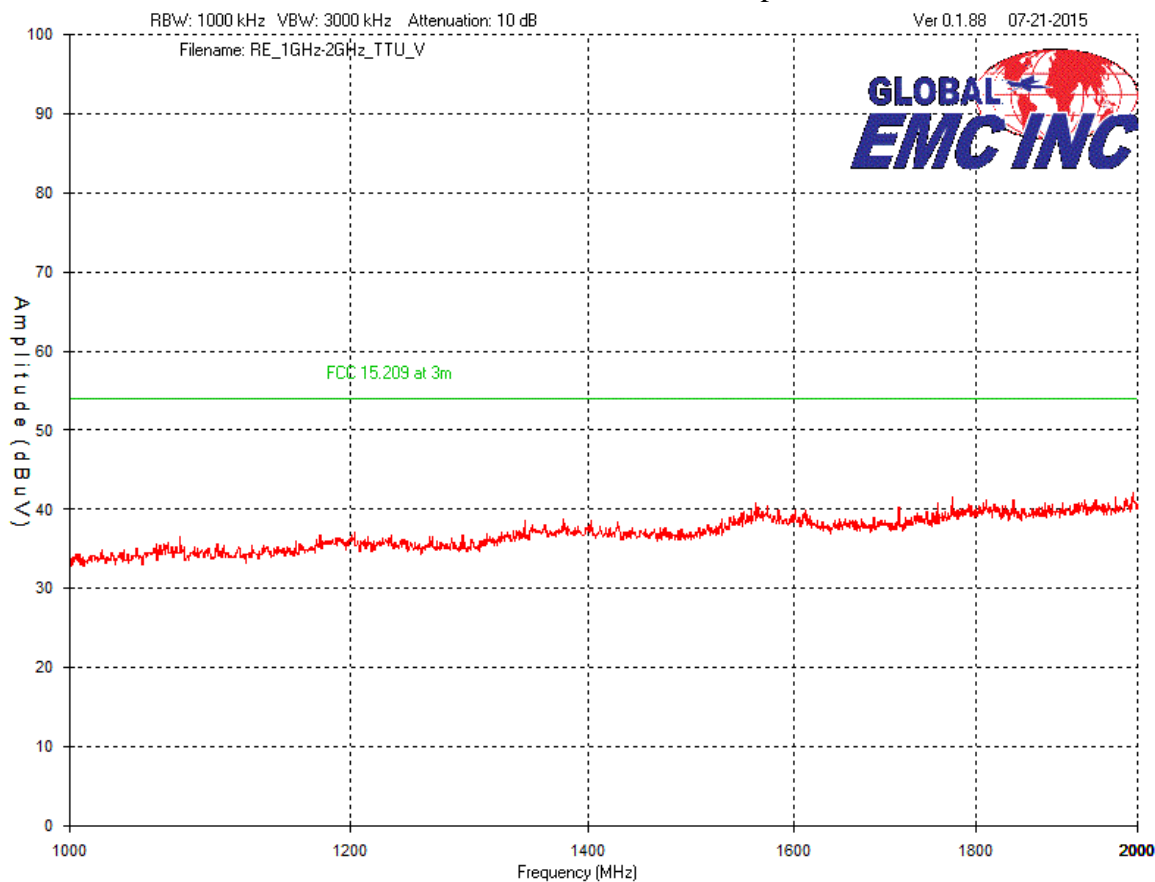
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Mid Channel – 30 MHz – 1 GHz
Vertical - Peak Emission Graph



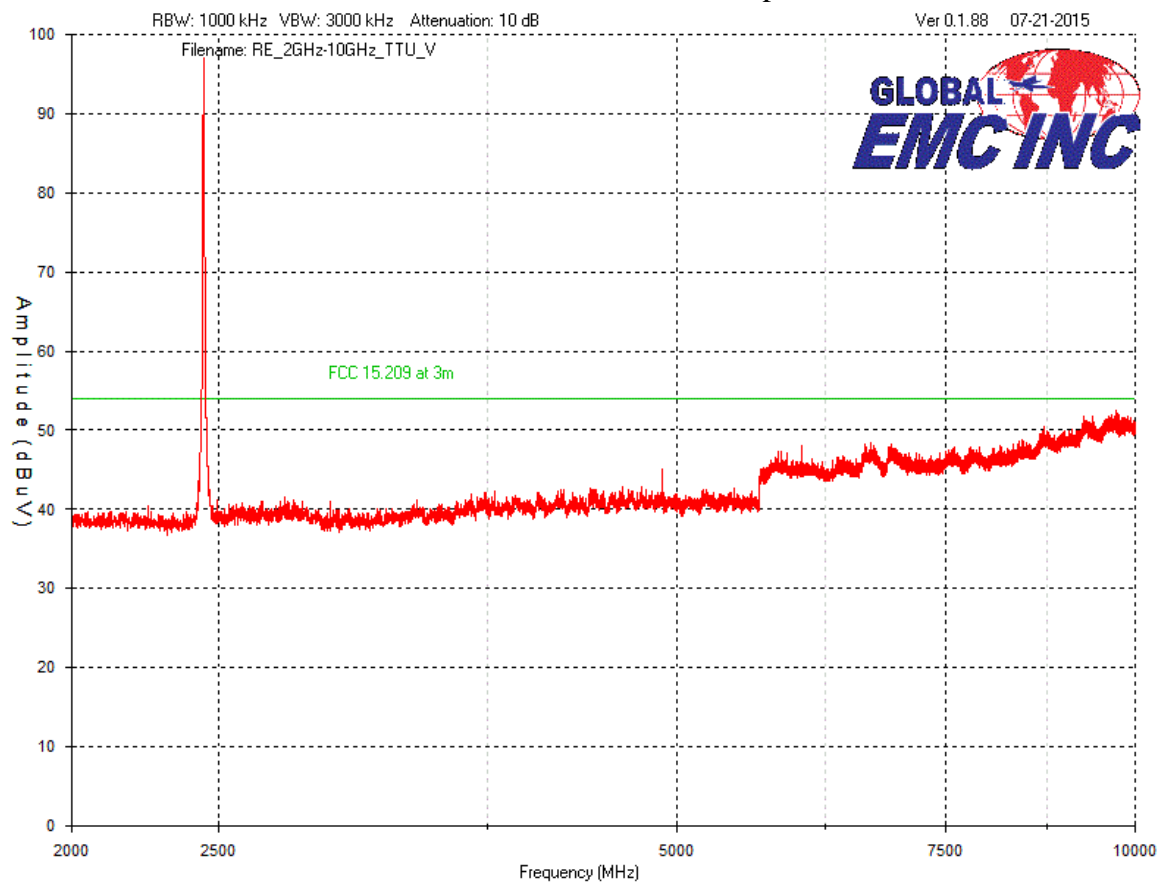
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Mid Channel – 1 GHz – 2 GHz
Vertical - Peak Emission Graph



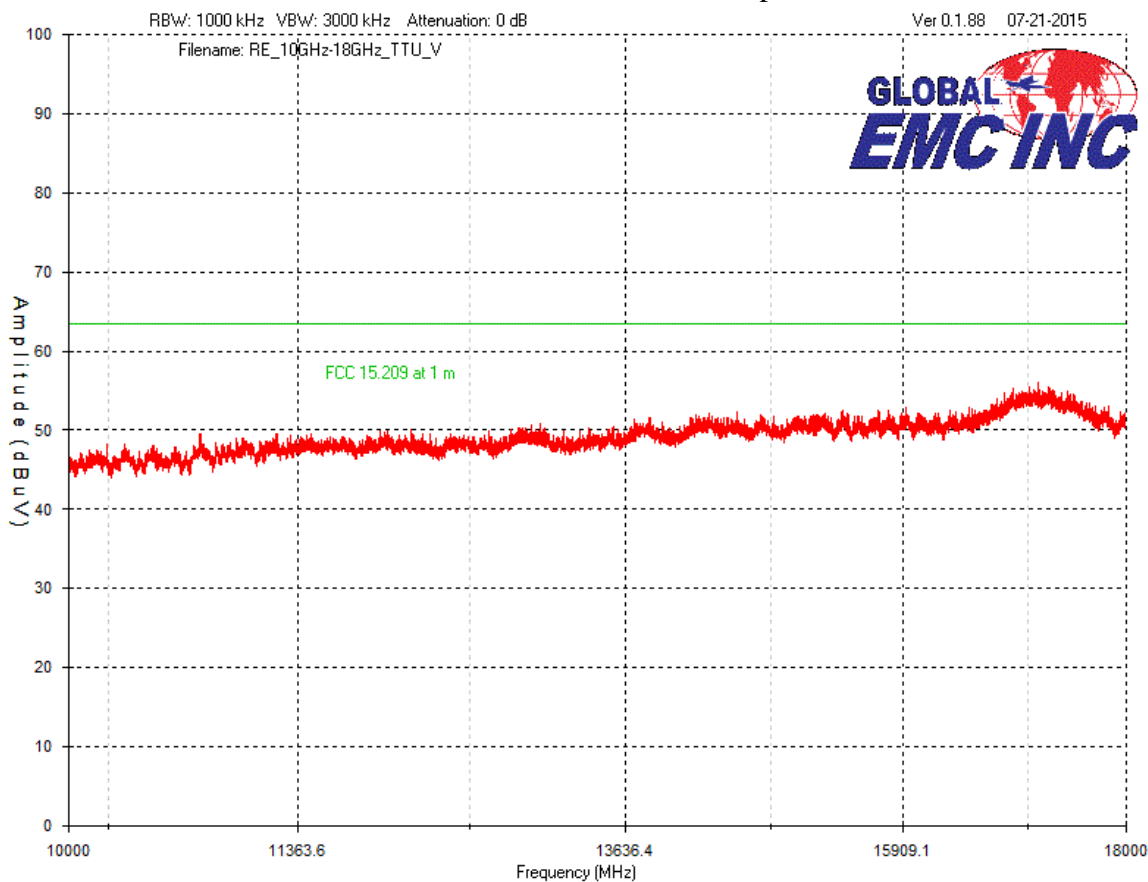
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Mid Channel – 2 GHz – 10 GHz
Vertical - Peak Emission Graph




Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

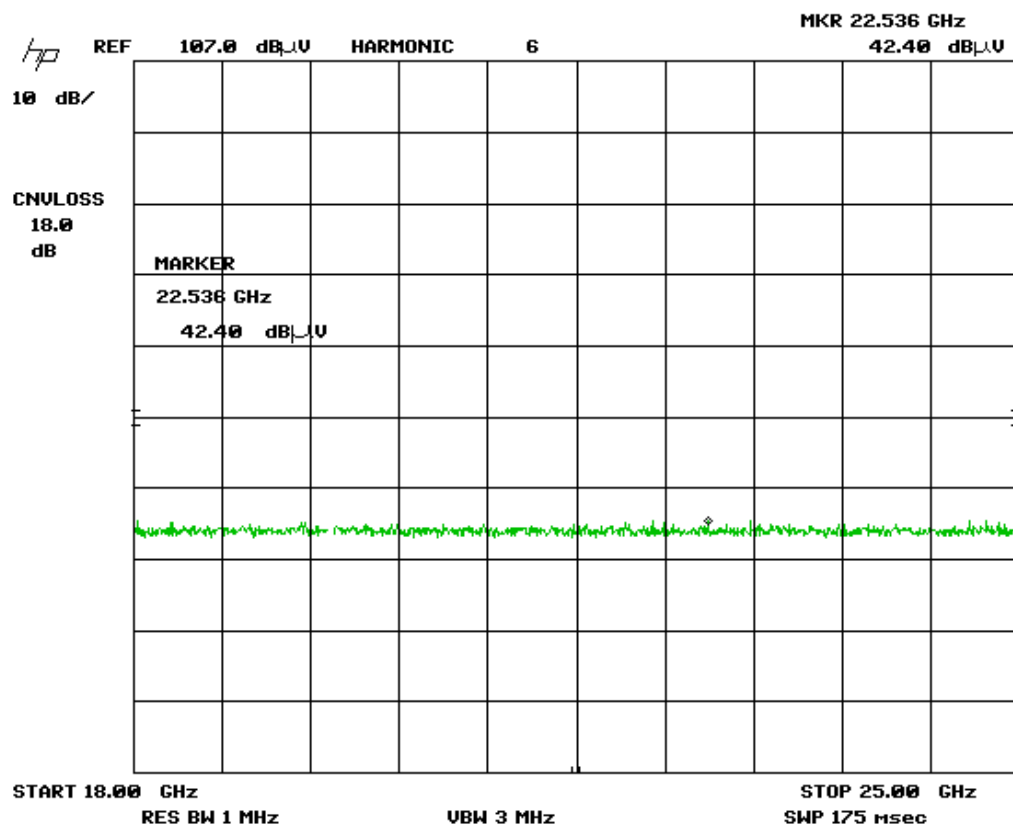
Mid Channel – 10 GHz – 18 GHz
Vertical - Peak Emission Graph




Plot was taken at a 1 meter distance. All emissions were noise floor of measurement instrument. No emissions were found in this frequency range.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

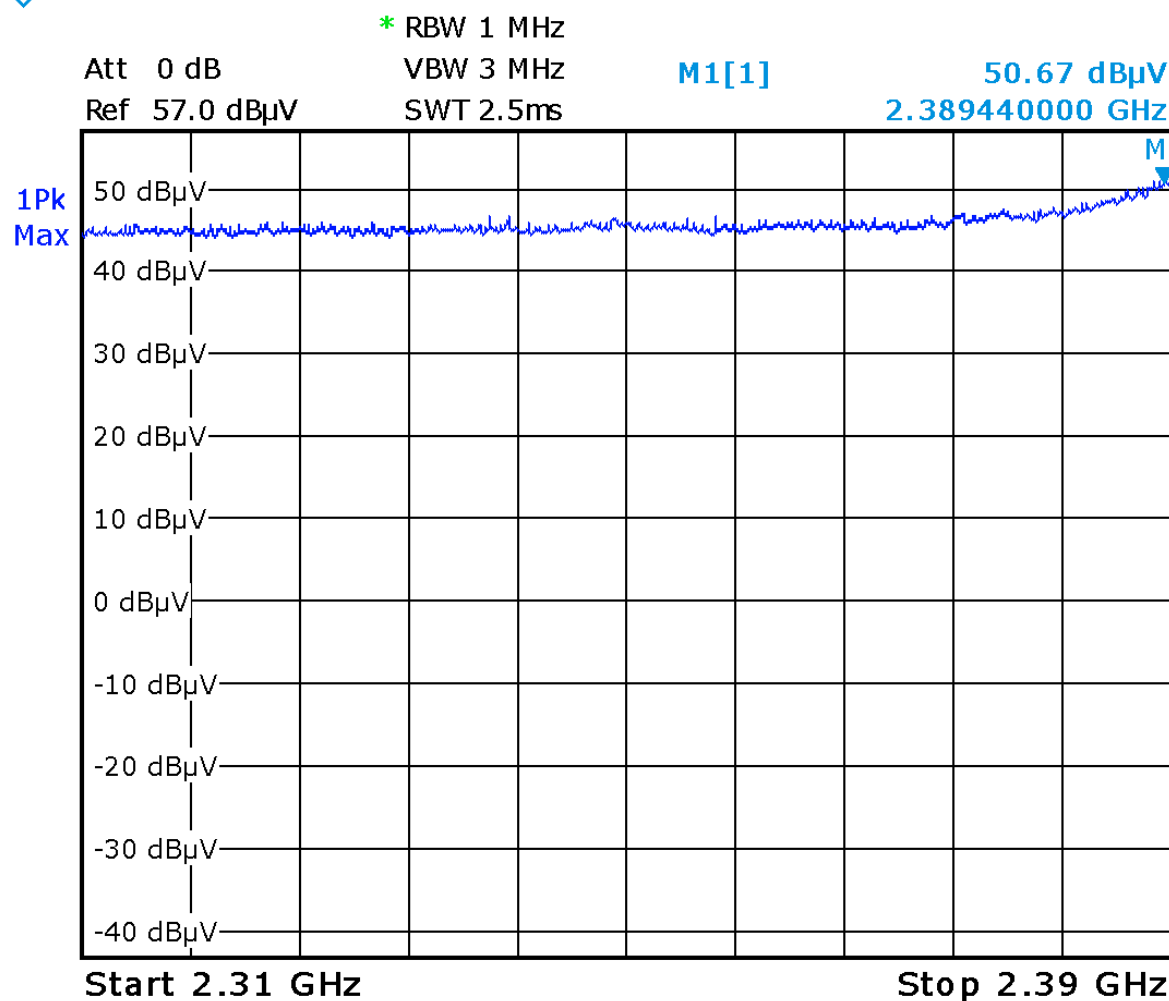
Mid Channel – 18 GHz – 25 GHz
Vertical - Peak Emission Graph




Plot was taken at a 1 meter distance. All emissions were noise floor of measurement instrument. No emissions were found in this frequency range.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

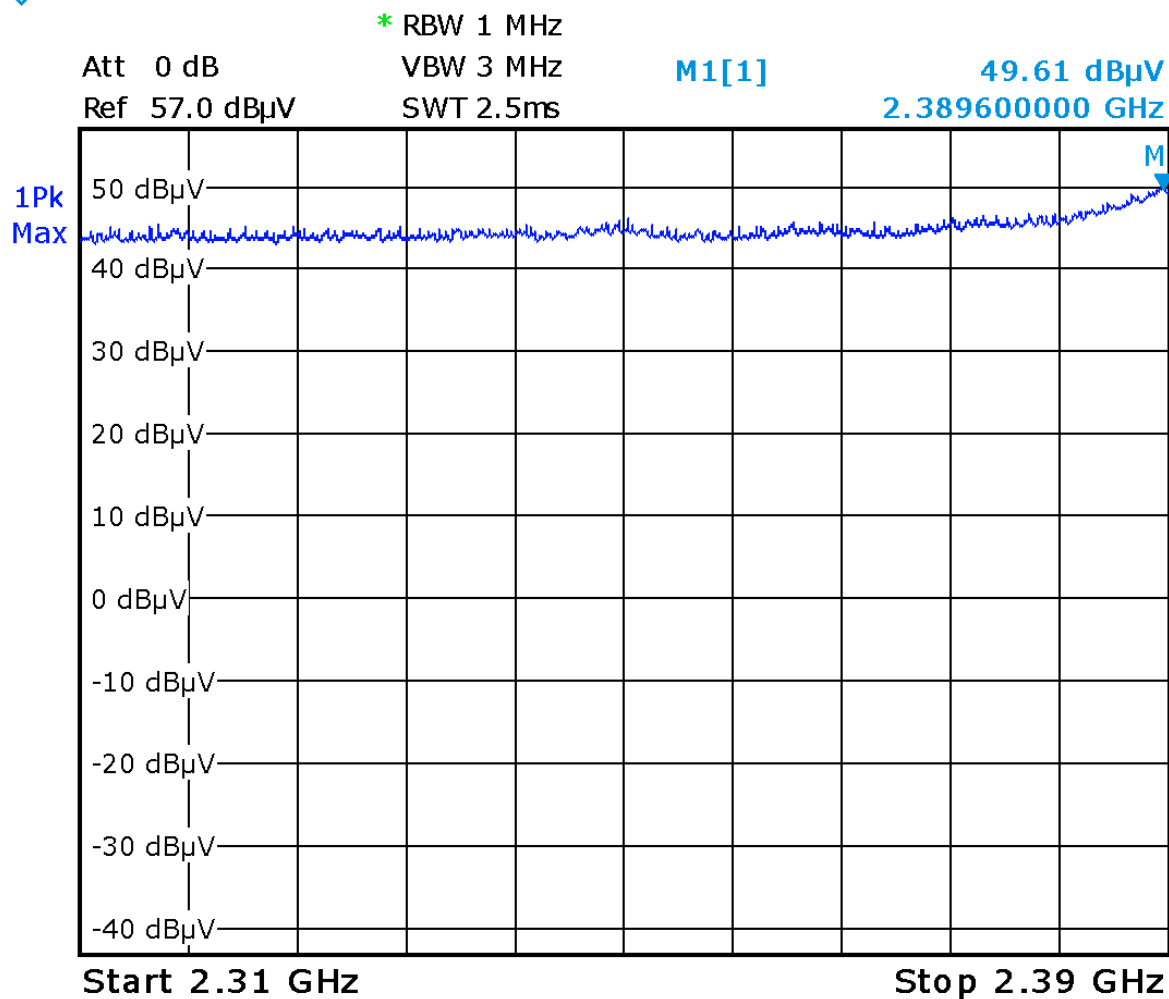
Band Edge – Low Channel (0xB)
Horizontal - Peak Emission




Date: 7.DEC.2015 19:25:15

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

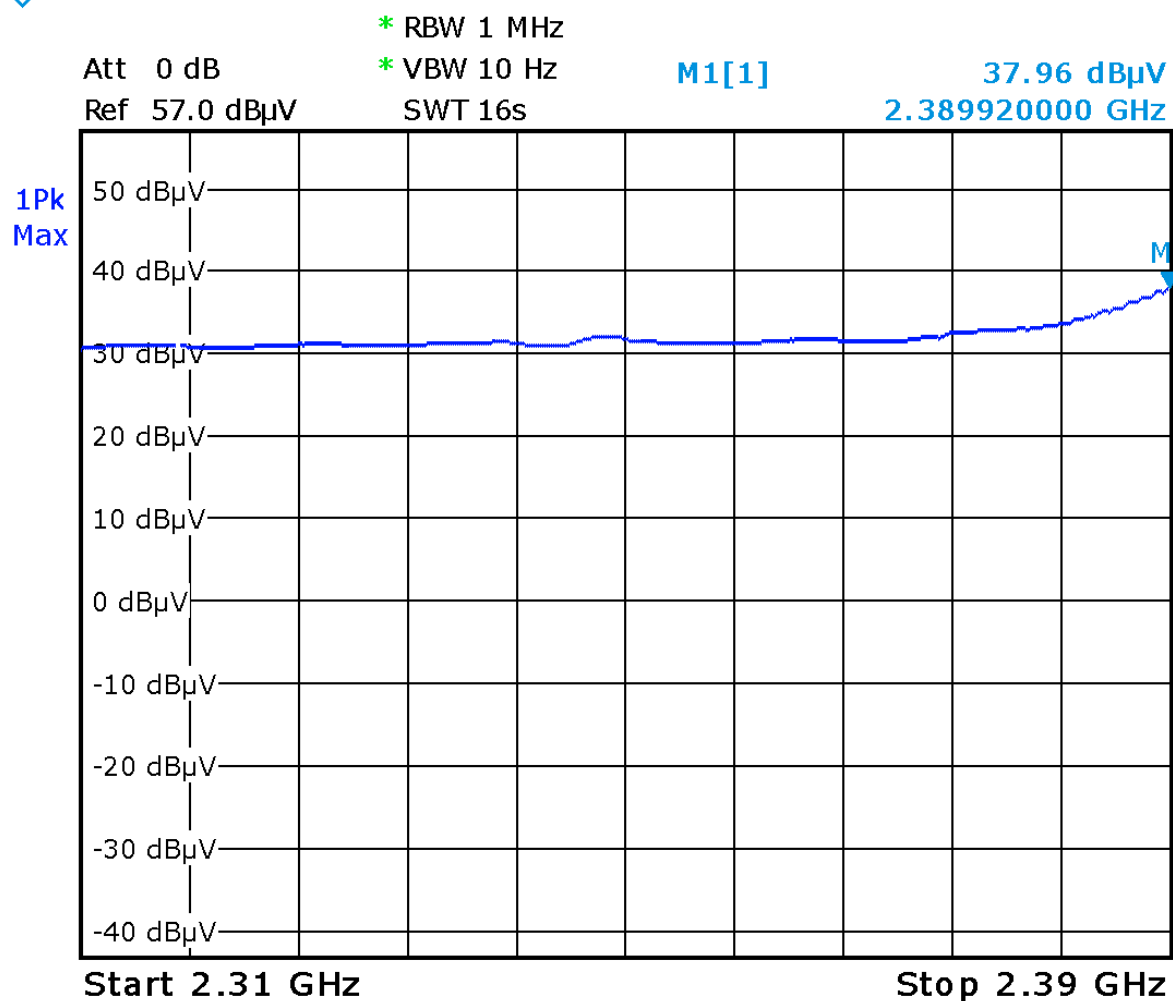
Band Edge – Low Channel (0xB)
Vertical - Peak Emission




Date: 7.DEC.2015 19:31:20

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

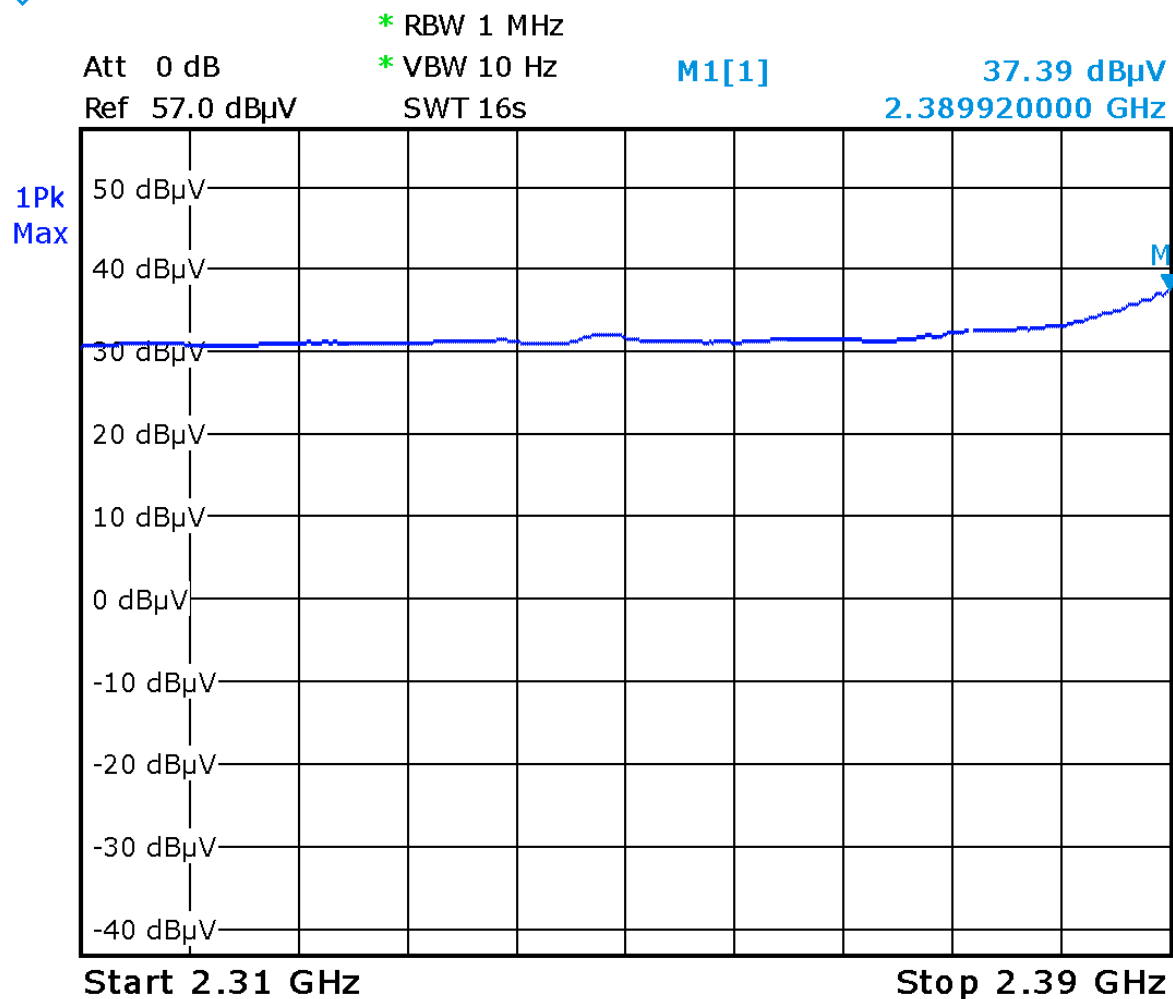
Band Edge – Low Channel (0xB)
Horizontal - Average Emission




Date: 7.DEC.2015 19:26:31

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

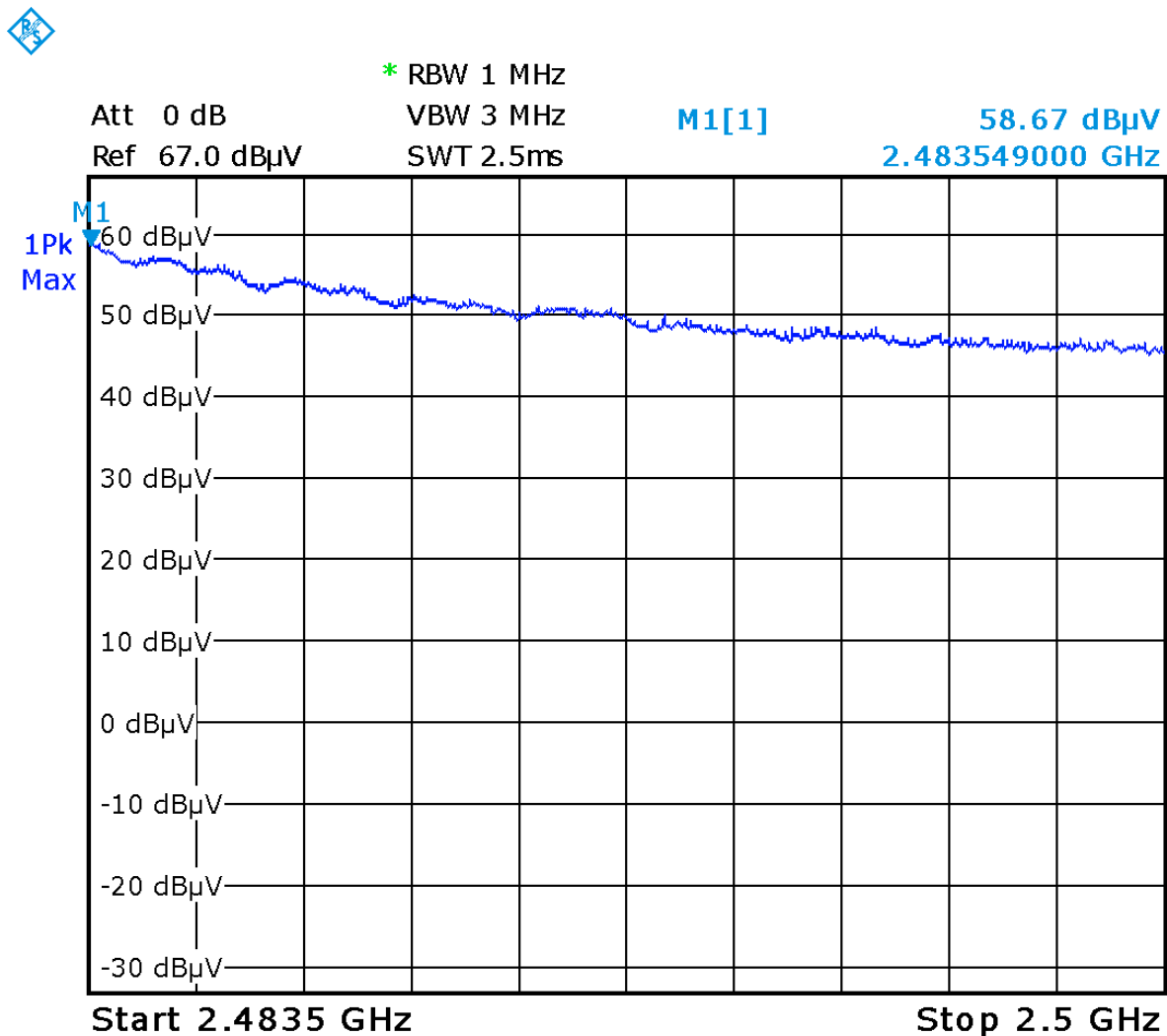
Band Edge – Low Channel (0xB)
Vertical – Average Emission




Date: 7.DEC.2015 19:33:11

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

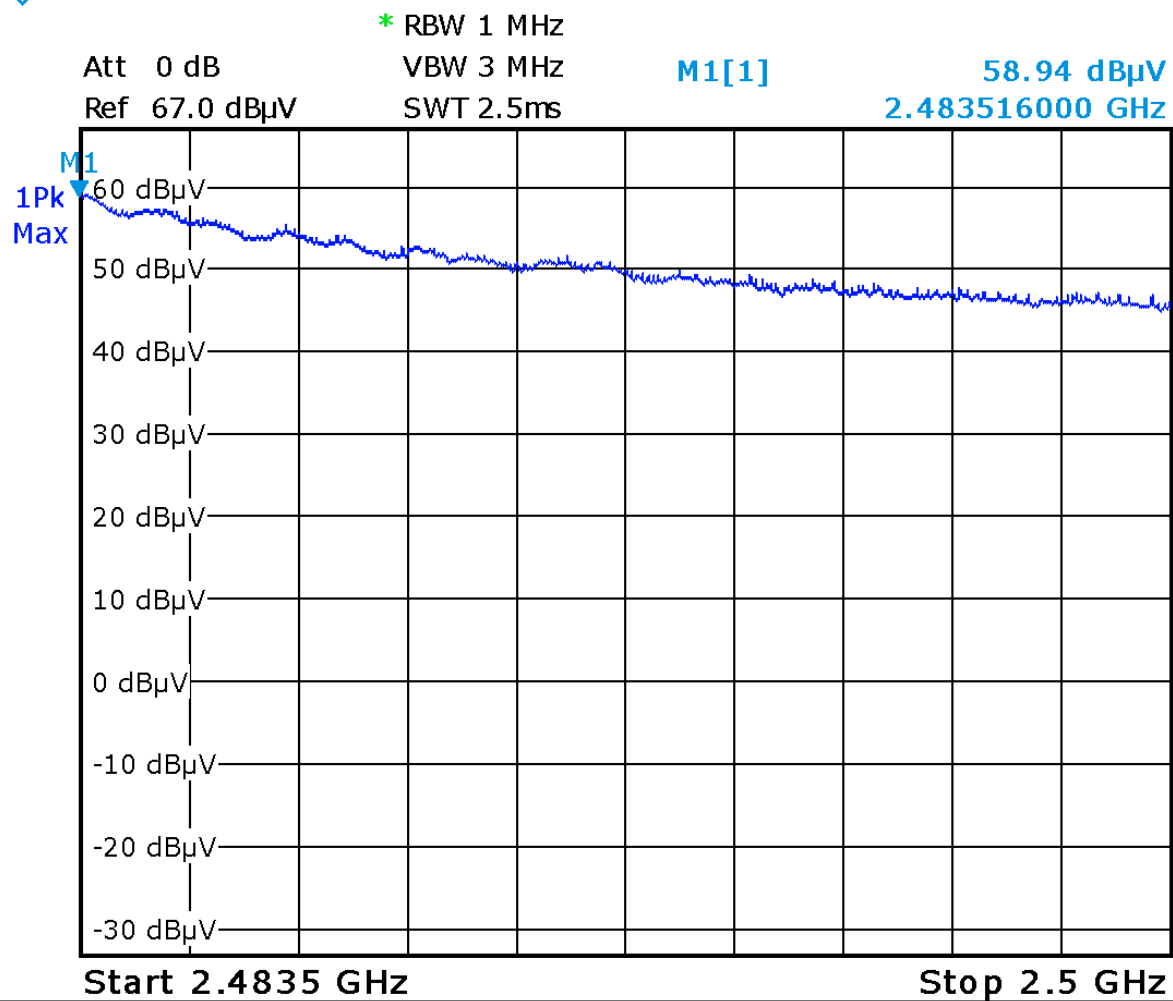
Band Edge – Channel 25 (0x19)
Horizontal - Peak Emission




Date: 7.DEC.2015 19:11:04

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

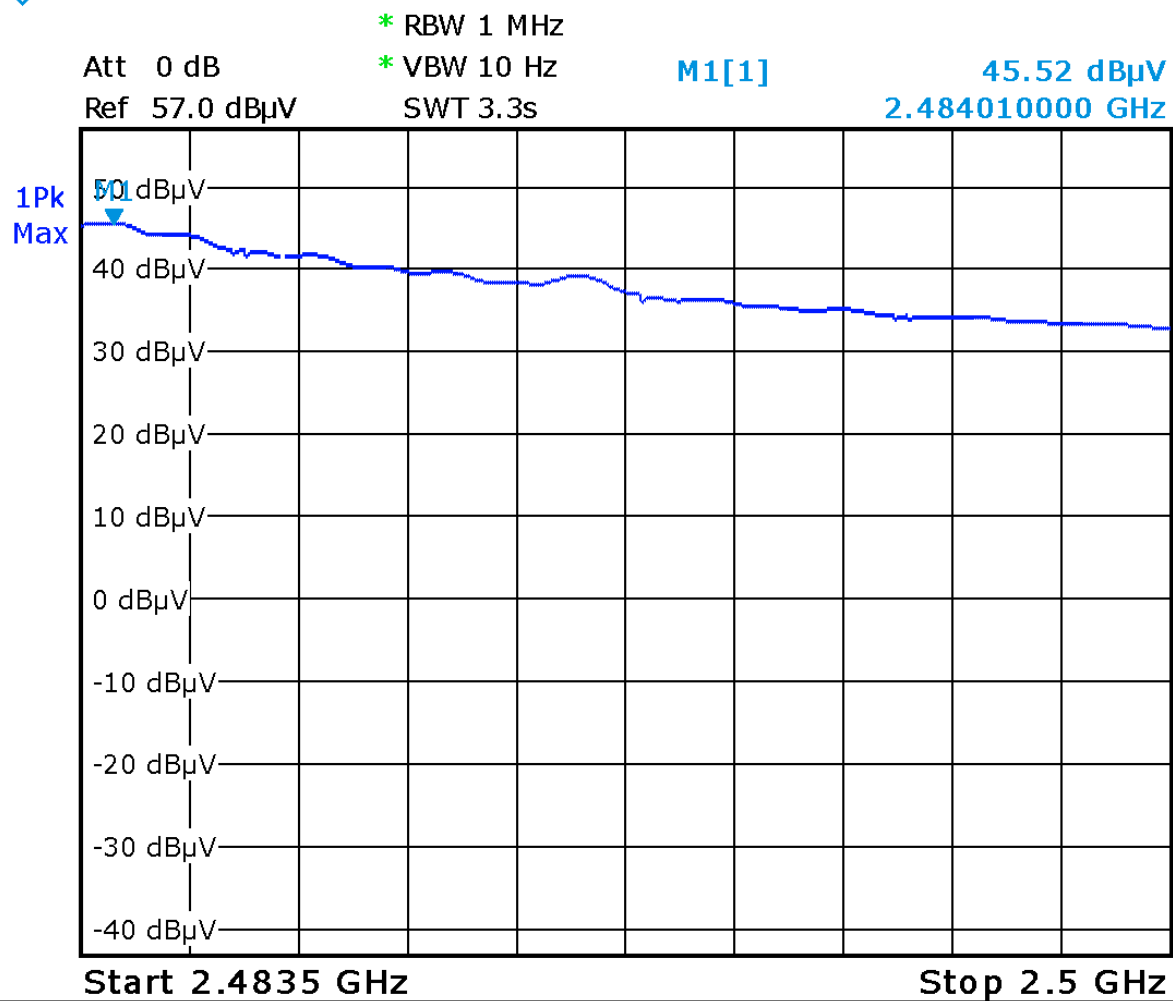
Band Edge – Channel 25 (0x19)
Vertical - Peak Emission




Date: 7.DEC.2015 19:45:14

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

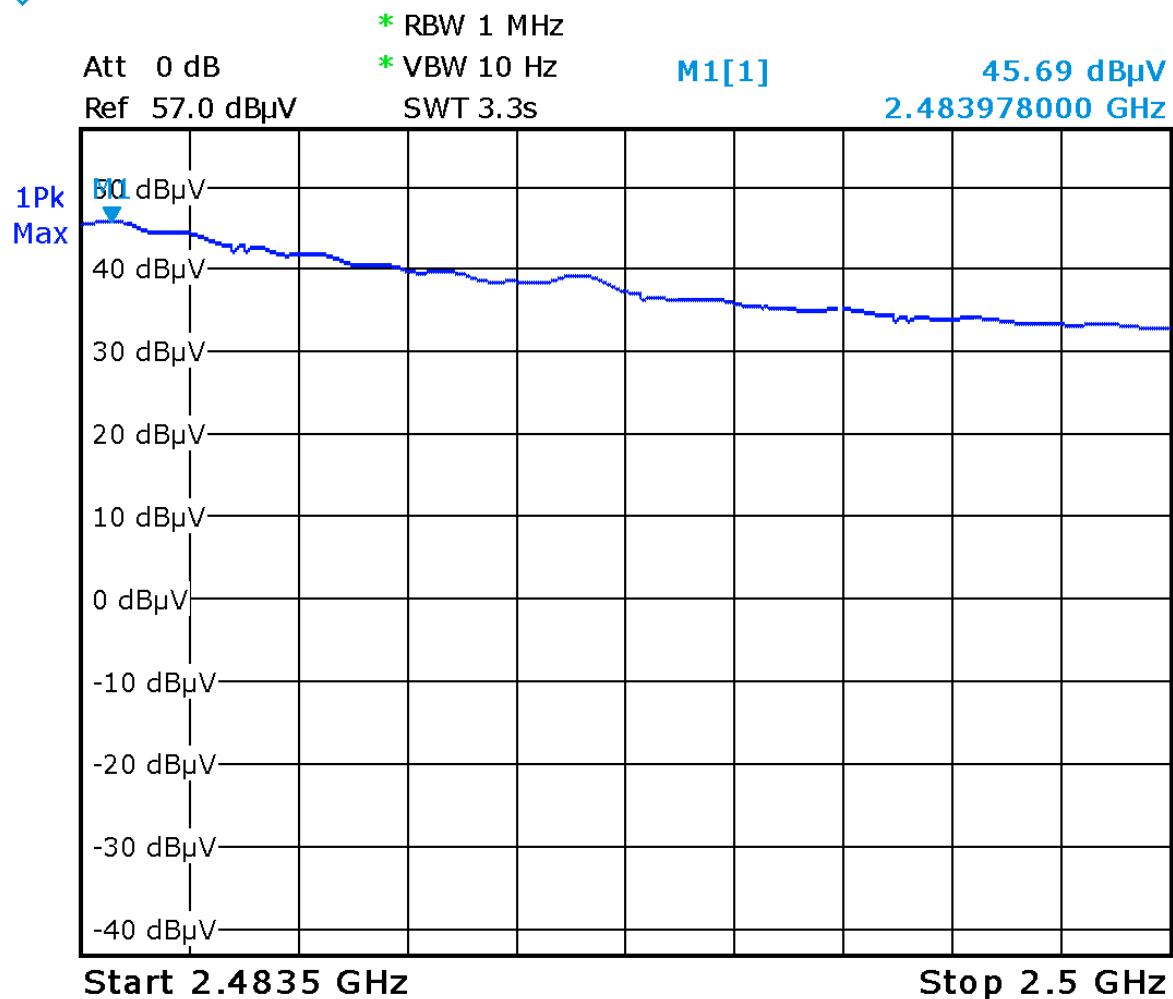
Band Edge – Channel 25 (0x19)
Horizontal - Average Emission




Date: 7.DEC.2015 19:09:38

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

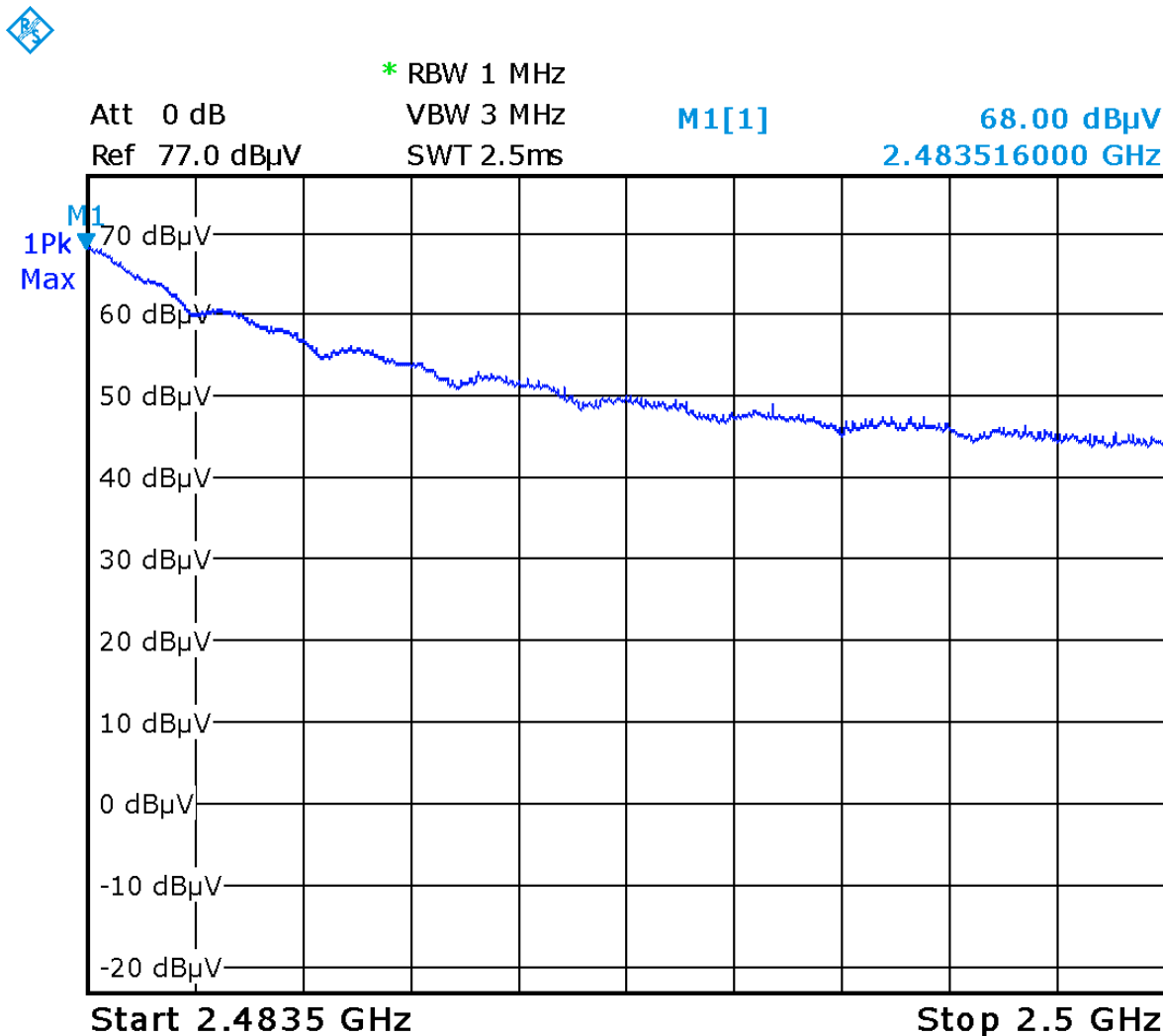
Band Edge – Channel 25 (0x19)
Vertical - Average Emission




Date: 7.DEC.2015 19:43:36

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

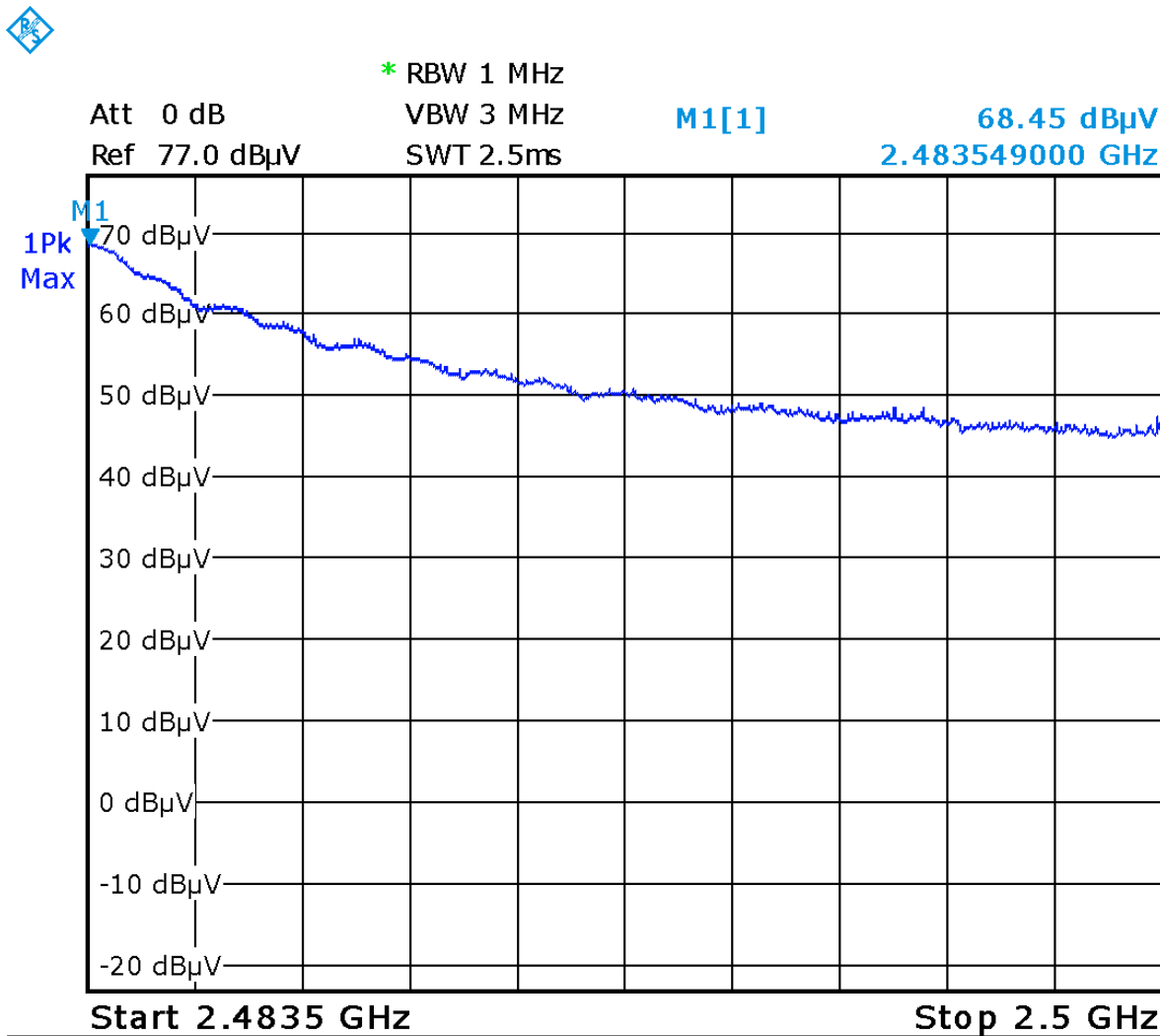
(Reduced Power, PWR = 8)
Band Edge – Hi Channel (0x1A)
Horizontal - Peak Emission




Date: 7.DEC.2015 18:49:10

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

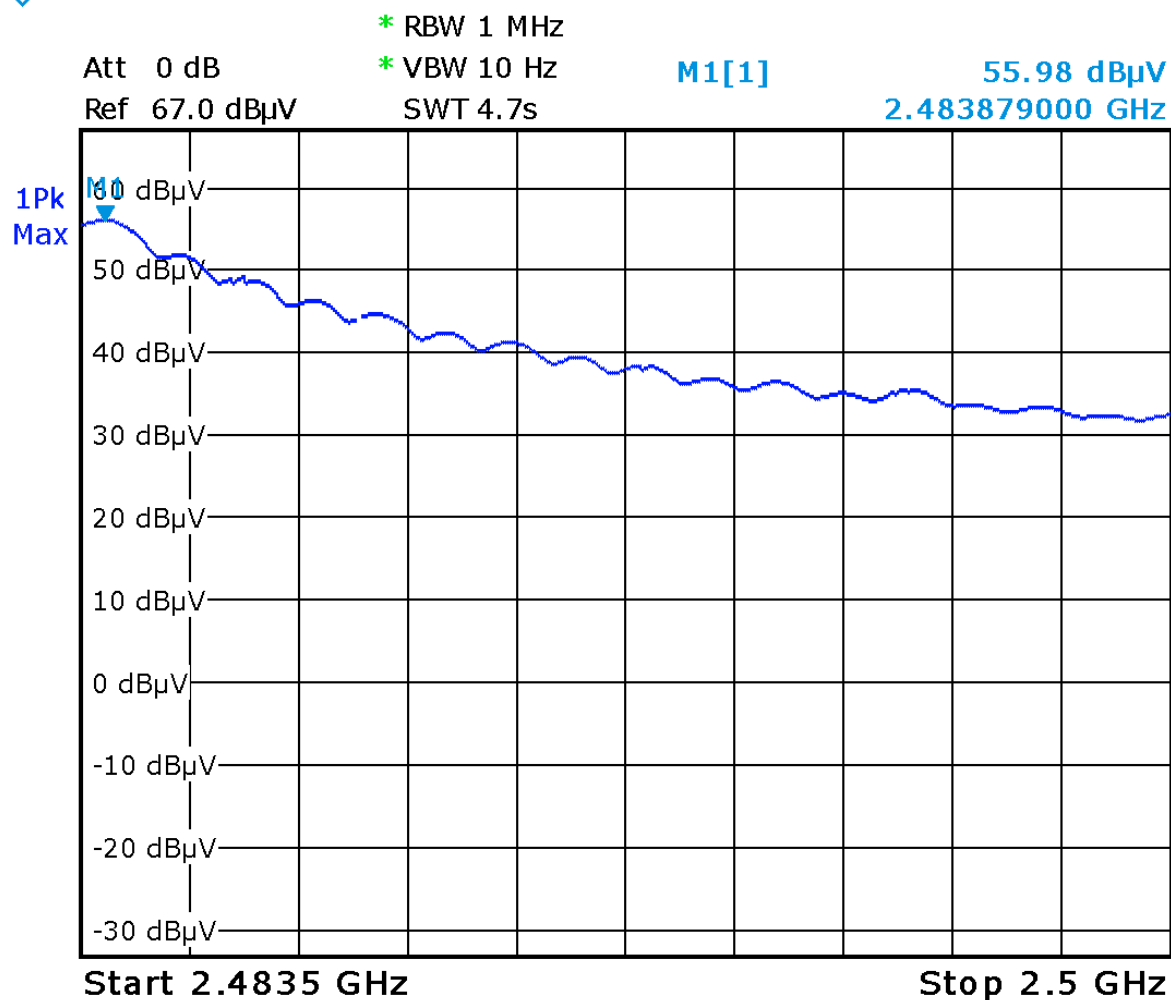
(Reduced Power, PWR = 8)
Band Edge – Hi Channel (0x1A)
Vertical - Peak Emission




Date: 7.DEC.2015 19:48:12

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

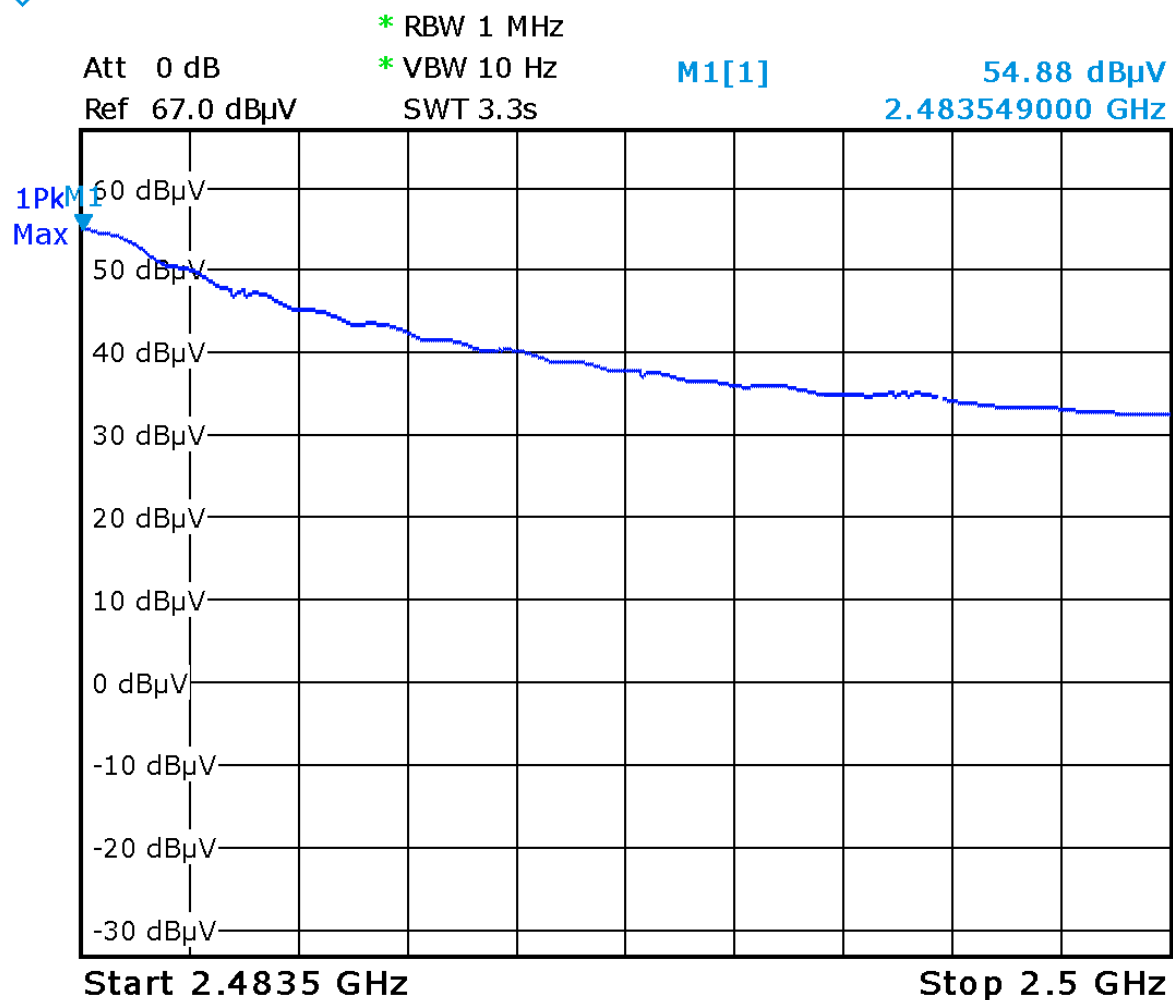
(Reduced Power, PWR = 8)
Band Edge – Hi Channel (0x1A)
Horizontal - Average Emission




Date: 7.DEC.2015 18:47:45

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

(Reduced Power, PWR = 8)
Band Edge – Hi Channel (0x1A)
Vertical – Average Emission



Date: 7.DEC.2015 19:49:37

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Final Measurements

Note: In accordance with 15.247(d), only frequencies exceeding the 15.209 limit that occur within the bands listed in 15.205 need to be verified with a final detector.


Test Frequency (MHz)	Detection mode	Antenna polarity (Horz/Vert)	Raw signal dB(μV)	Antenna factor dB	Cable loss dB + Preset ecor	Attenuator dB	Pre-Amp Gain dB	Received signal dB(μV/m)	Emission limit dB(μV/m)	Margin dB(μV)	Result
Low Channel (11) - X axis (Horizontal)											
2405	Peak	Horz	100.6	26.1	5.4	0.0	33.8	98.3			PASS
2405	Avg	Horz	100.4	26.1	5.4	0.0	33.8	98.1			PASS
2405	Peak	Vert	100.6	26.1	5.4	0.0	33.8	98.3			PASS
2405	Avg	Vert	100.3	26.1	5.4	0.0	33.8	98.0			PASS
2389.4	Peak	Horz	50.7	26.1	5.4	0.0	33.8	48.4	74.0	25.6	PASS
2389.4	Avg	Horz	38.0	26.1	5.4	0.0	33.8	35.7	54.0	18.3	PASS
2389.6	Peak	Vert	49.6	26.1	5.4	0.0	33.8	47.3	74.0	26.7	PASS
2389.9	Avg	Vert	37.4	26.1	5.4	0.0	33.8	35.1	54.0	18.9	PASS

Test Frequency (MHz)	Detection mode	Antenna polarity (Horz/Vert)	Raw signal dB(μV)	Antenna factor dB	Cable loss dB + Preset ecor	Attenuator dB	Pre-Amp Gain dB	Received signal dB(μV/m)	Emission limit dB(μV/m)	Margin dB(μV)	Result
Mid Channel (19) - X axis (Horizontal)											
2445	Peak	Horz	102.1	26.1	5.4	0.0	33.8	99.8			PASS
2445	Avg	Horz	101.9	26.1	5.4	0.0	33.8	99.6			PASS
2445	Peak	Vert	102.0	26.1	5.4	0.0	33.8	99.7			PASS
2445	Avg	Vert	101.7	26.1	5.4	0.0	33.8	99.4			PASS
4890	Peak	Horz	44.5	27.6	7.7	0.0	33.8	46.0	74.0	28.0	PASS
4890	Avg	Horz	32.2	27.6	7.7	0.0	33.8	33.7	54.0	20.3	PASS
4890	Peak	Vert	45.0	27.6	7.7	0.0	33.8	46.5	74.0	27.5	PASS
4890	Avg	Vert	32.9	27.6	7.7	0.0	33.8	34.4	54.0	19.6	PASS

Test Frequency (MHz)	Detection mode	Antenna polarity (Horz/Vert)	Raw signal dB(μV)	Antenna factor dB	Cable loss dB + Preset ecor	Attenuator dB	Pre-Amp Gain dB	Received signal dB(μV/m)	Emission limit dB(μV/m)	Margin dB(μV)	Result
Channel (25) - X axis (Horizontal)											
2475	Peak	Horz	101.5	26.1	5.4	0.0	33.8	99.2			PASS
2475	Avg	Horz	101.2	26.1	5.4	0.0	33.8	98.9			PASS
2475	Peak	Vert	101.9	26.1	5.4	0.0	33.8	99.6			PASS
2475	Avg	Vert	101.7	26.1	5.4	0.0	33.8	99.4			PASS
2483.5	Peak	Horz	58.7	26.1	5.4	0.0	33.8	56.4	74.0	17.6	PASS
2484	Avg	Horz	45.5	26.1	5.4	0.0	33.8	43.2	54.0	10.8	PASS
2483.5	Peak	Vert	58.9	26.1	5.4	0.0	33.8	56.6	74.0	17.4	PASS
2484	Avg	Vert	45.7	26.1	5.4	0.0	33.8	43.4	54.0	10.6	PASS

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Test Frequency (MHz)	Detection mode	Antenna polarity (Horz/Vert)	Raw signal dB(μV)	Antenna factor dB	Cable loss dB + Preselector	Attenuator dB	Pre-Amp Gain dB	Received signal dB(μV/m)	Emission limit dB(μV/m)	Margin dB(μV)	Result
High Channel (26) - X axis (Horizontal)											
2480	Peak	Horz	98.1	26.1	5.4	0.0	33.8	95.8			PASS
2480	Avg	Horz	97.7	26.1	5.4	0.0	33.8	95.4			PASS
2480	Peak	Vert	97.4	26.1	5.4	0.0	33.8	95.1			PASS
2480	Avg	Vert	97.1	26.1	5.4	0.0	33.8	94.8			PASS
2483.5	Peak	Horz	68.0	26.1	5.4	0.0	33.8	65.7	74.0	8.3	PASS
2483.9	Avg	Horz	56.0	26.1	5.4	0.0	33.8	53.7	54.0	0.3	PASS
2483.5	Peak	Vert	68.5	26.1	5.4	0.0	33.8	66.2	74.0	7.8	PASS
2483.5	Avg	Vert	54.9	26.1	5.4	0.0	33.8	52.6	54.0	1.4	PASS

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration Date	Next Calibration Date	Asset #
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov 15, 2013	Nov 15, 2015	GEMC 160
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov 25, 2015	Nov 25, 2017	GEMC 160
Spectrum Analyzer	8566B	HP	Oct 9, 2014	Oct 9, 2016	GEMC 193
Quasi-Peak Adapter	85650A	HP	May 22, 2014	May 22, 2016	GEMC 194
Horn Antenna 2 – 18 GHz	WBH218HN	Q-par	Jan 23, 2014	Jan 23, 2016	GEMC 6375
Pre-Amp 1 – 26.5 GHz	HP 8449B	HP	Sept 09, 2014	Sept 09, 2016	GEMC 6351
Horn Antenna 18 - 26.5 GHz	SAS-572	A.H. Systems	Sept 09, 2014	Sept 09, 2016	GEMC 6371
Harmonic Mixer 18 - 26.5 GHz	11970K	HP	Jan 28, 2014	Jan 28, 2016	GEMC 158
Pre-Amp 9 kHz - 1 GHz	LNA 6901	Teseq	Jan 30, 2015	Jan 30, 2017	GEMC 168
Loop Antenna	EM 6871	Electro-Metrics	Feb 3, 2015	Feb 3, 2017	GEMC 70
Loop Antenna	EM 6872	Electro-Metrics	Feb 3, 2015	Feb 3, 2017	GEMC 71
BiLog Antenna	3142-C	ETS	Sept 8, 2014	Sept 8, 2016	GEMC 8
4GHZ-12GHz High Pass filter	11SH10-4000/T12000-0/0	K & L Microwave	NCR	NCR	GEMC 119
RF Cable 7m	LMR-400-7M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 28
RF Cable 10m	LMR-400-10M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 29
RF Cable 0.5M	LMR-400-0.5M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 31

This report module is based on GEMC template "FCC - 15.209 - Radiated Emissions_Rev1.doc"

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Power Spectral Density - DM

Purpose

The purpose of this test is to ensure that the maximum power spectral density to the radiating element does not exceed the limits specified. This ensures that the modulation is significantly wide enough, or low enough in power that it will allow for co-operation of other wireless devices operating within this frequency allocation.

Limits

The limits are defined in 15.247(e).

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.


Results

The EUT passed. Low, medium, and high bands were tested. The worst case value is -12.8 dBm as measured with a 3 kHz resolution bandwidth (peak power).

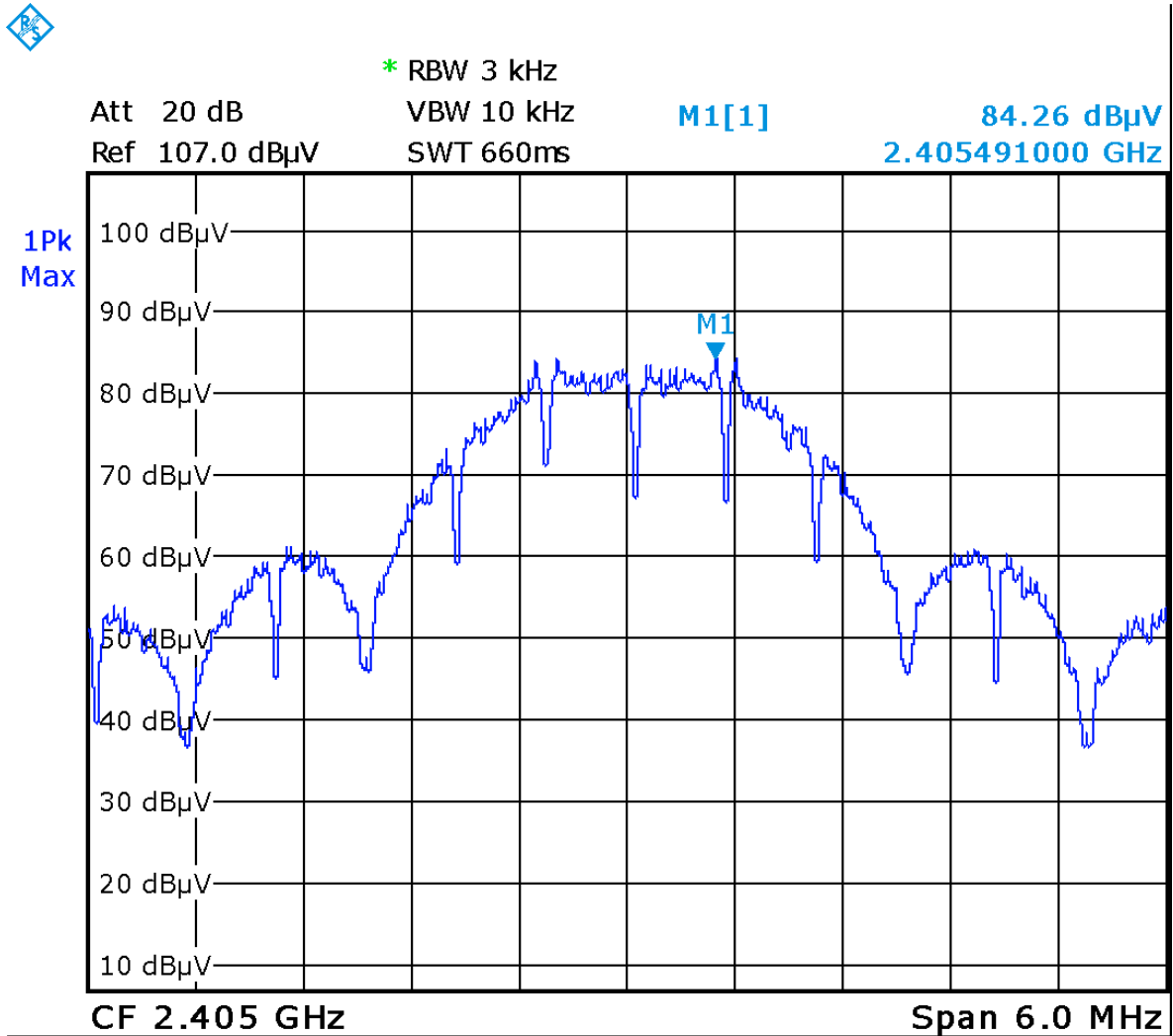
Test Frequency (MHz)	Detection mode	Antenna polarity (Horz/Vert)	Raw signal dB(μV)	Antenna factor dB	Cable loss dB + Preselector	Attenuator dB	Pre-Amp Gain dB	Received signal dB(μV/m)	Conducted PSD (dBm)	Result
Hi Channel										
2480	Peak	Vert	85.1	26.1	5.4	0.0	33.8	82.8	-13.9	PASS
2480	Peak	Horz	86.1	26.1	5.4	0.0	33.8	83.8	-13.0	PASS
Mid Channel										
2445	Peak	Vert	85.9	26.1	5.4	0.0	33.8	83.6	-13.1	PASS
2445	Peak	Horz	86.2	26.1	5.4	0.0	33.8	83.9	-12.8	PASS
Lo Channel										
2405	Peak	Vert	84.3	26.1	5.4	0.0	33.8	82.0	-14.7	PASS
2405	Peak	Horz	84.3	26.1	5.4	0.0	33.8	82.0	-14.7	PASS

Graphs


The graphs shown below show the power spectral density of the device during the radiated measurement operation of the EUT. Low, middle, and high channel was investigated in each mode, with the worst case being presented.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

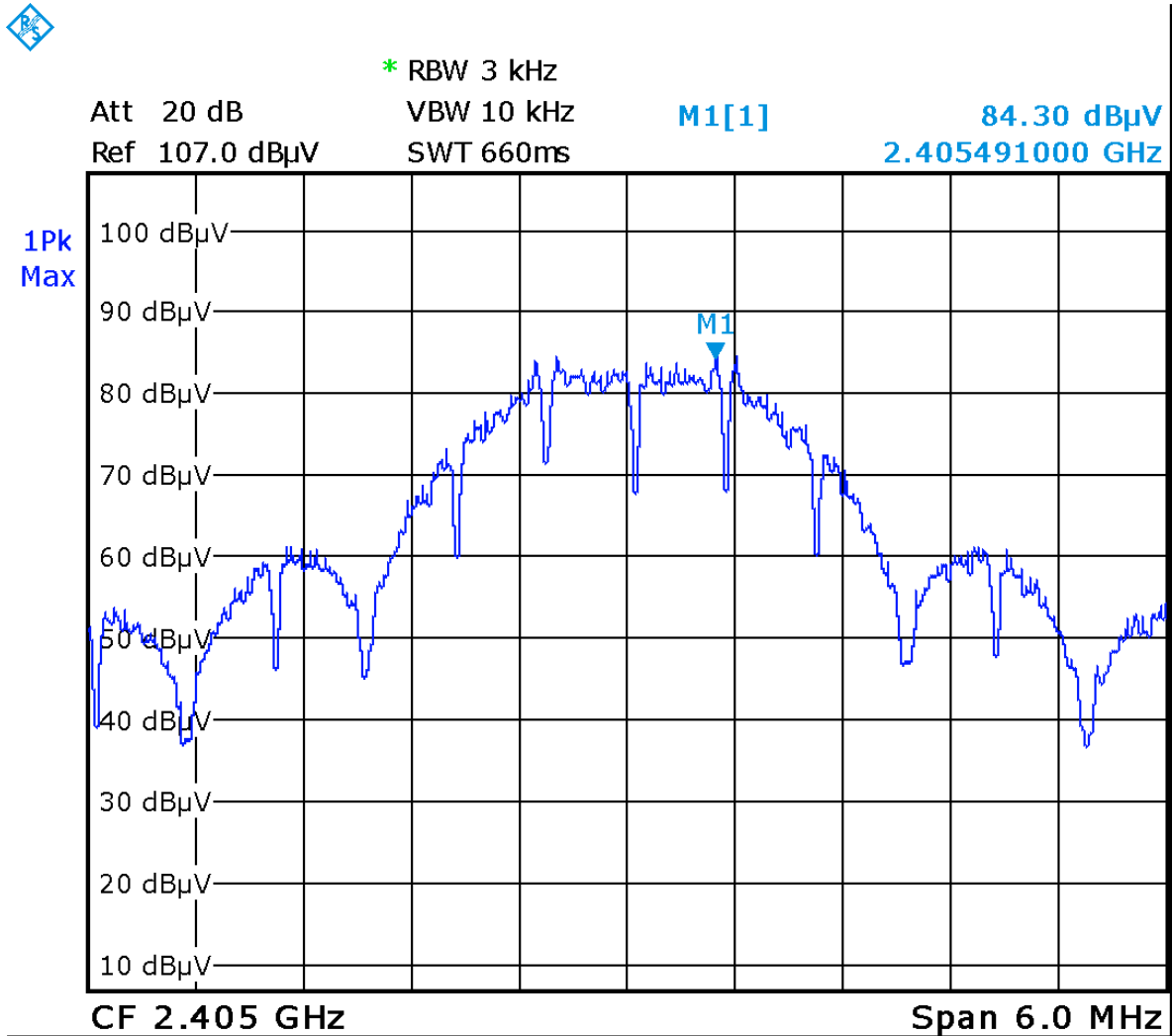
Low Channel (0xB)
Horizontal Antenna




Date: 20.JUL.2015 15:49:56

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

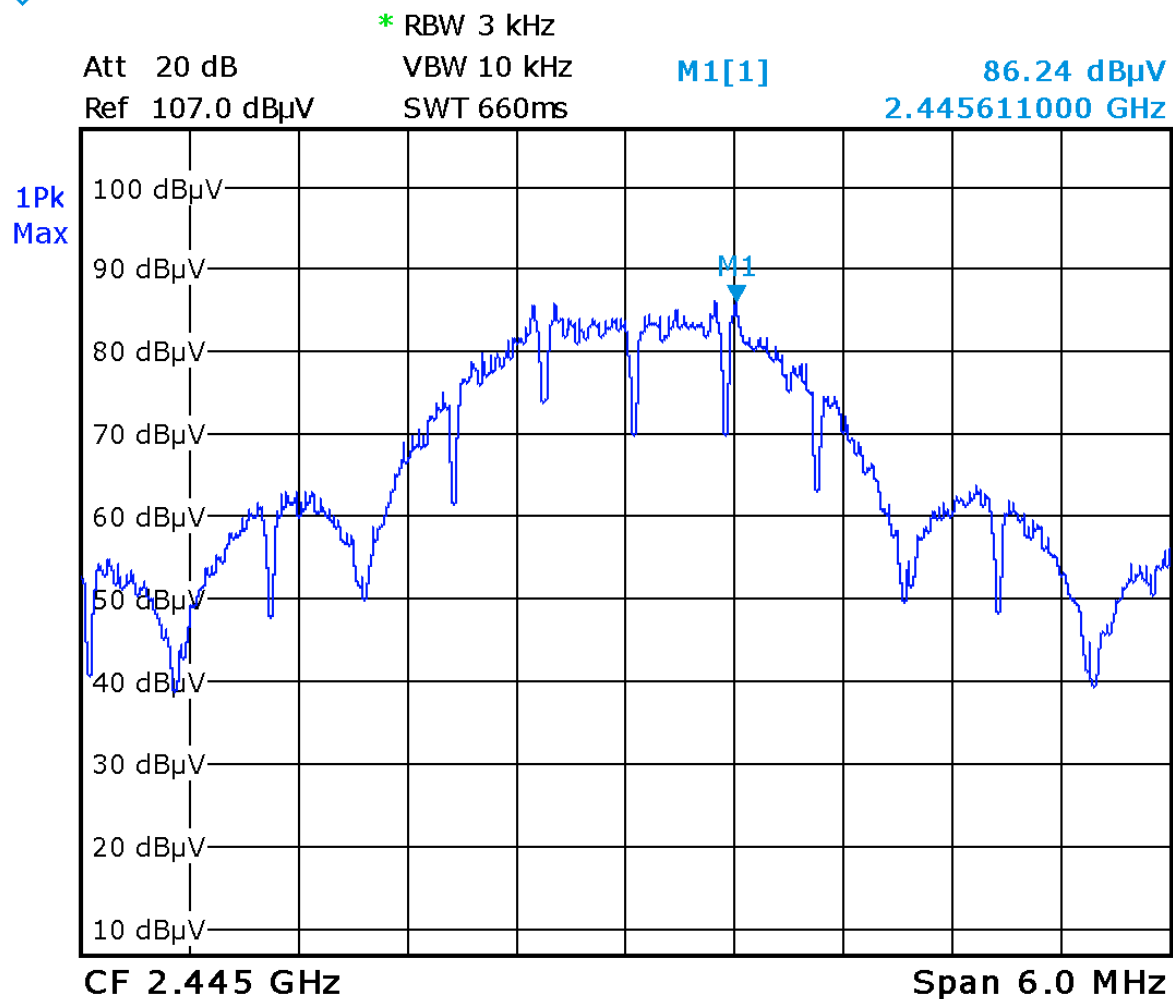
Low Channel (0xB)
Vertical Antenna




Date: 20.JUL.2015 16:02:47

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

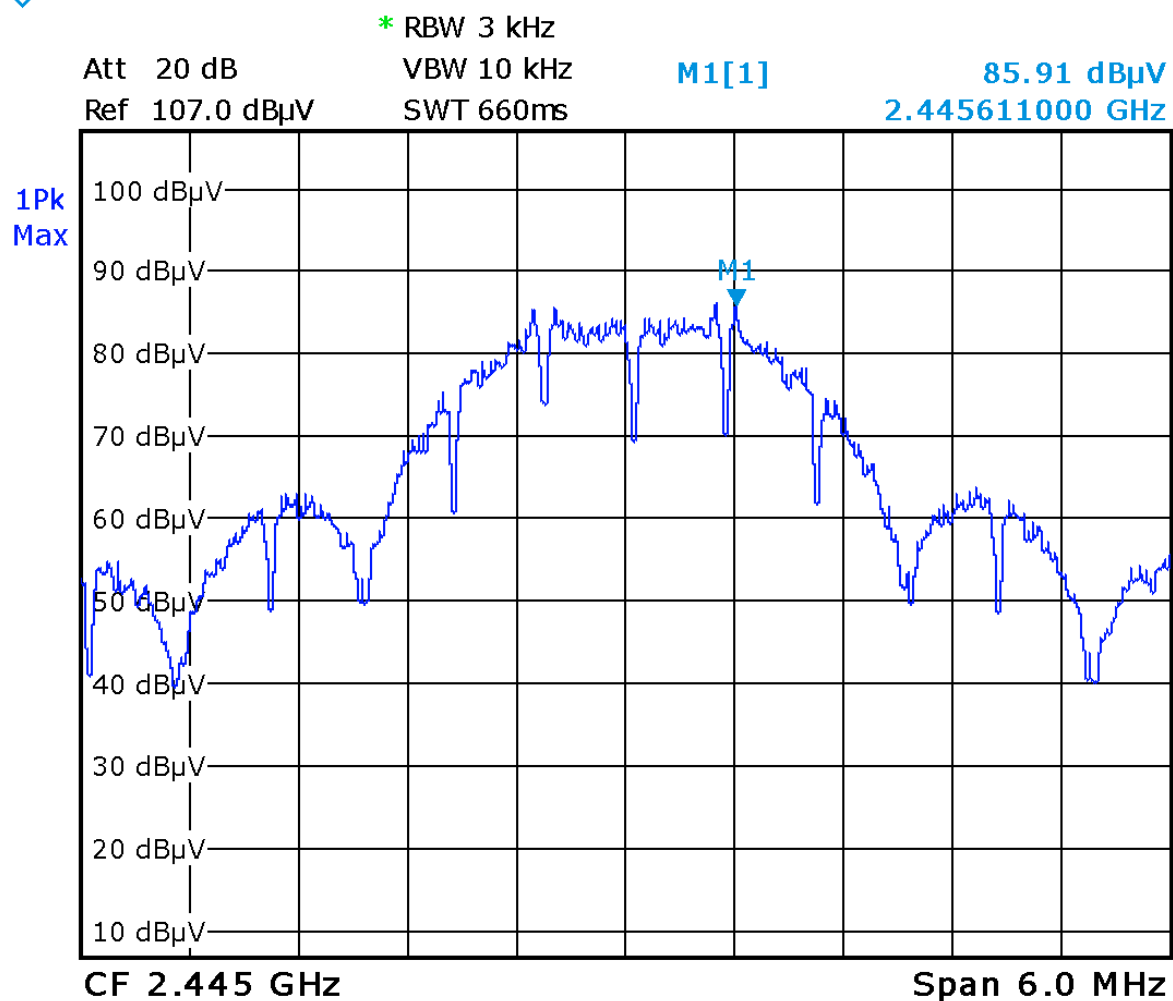
Mid Channel (0x13)
Horizontal Antenna




Date: 20.JUL.2015 15:09:47

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

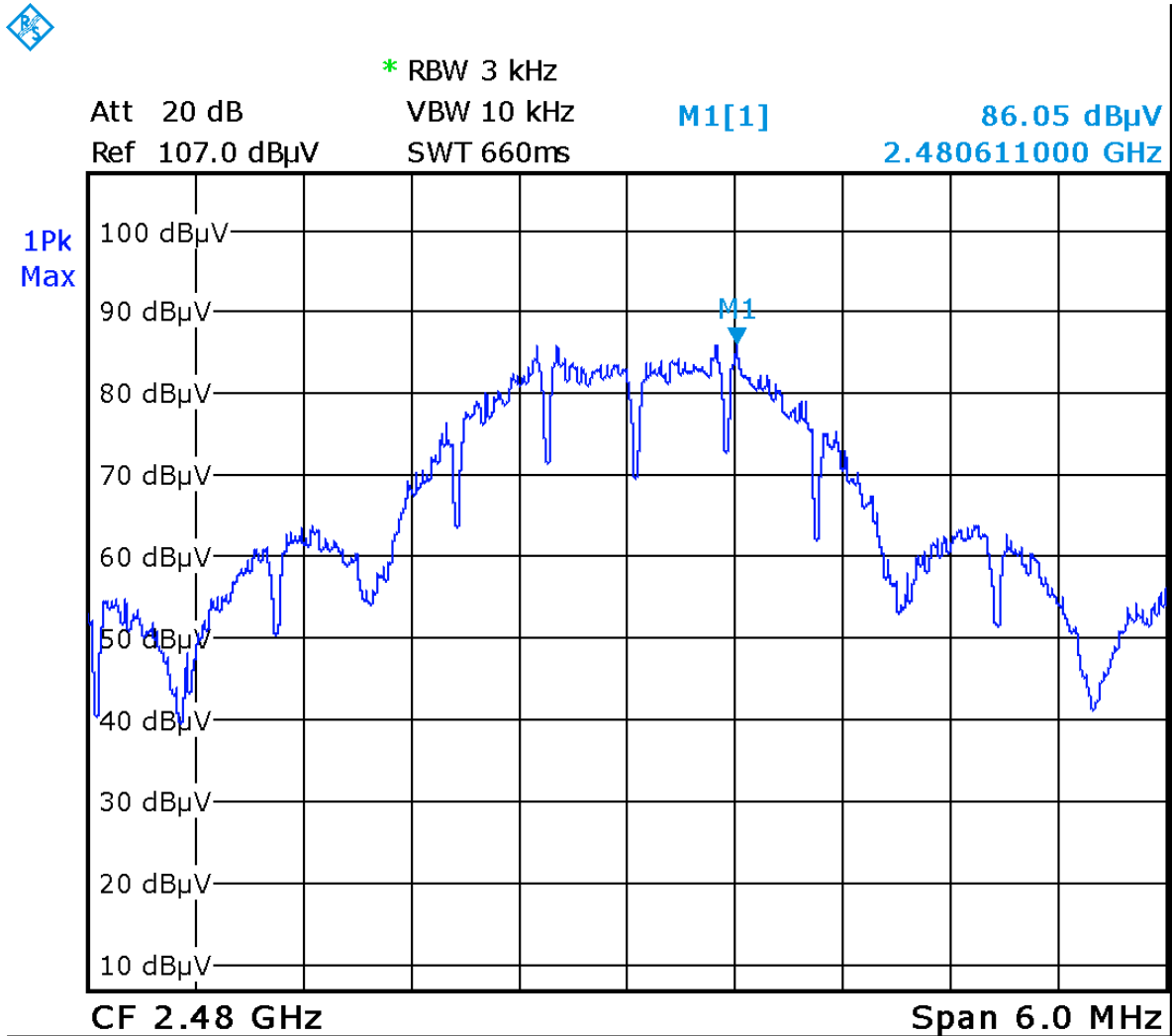
Mid Channel (0x13)
Vertical Antenna




Date: 20.JUL.2015 15:25:58

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

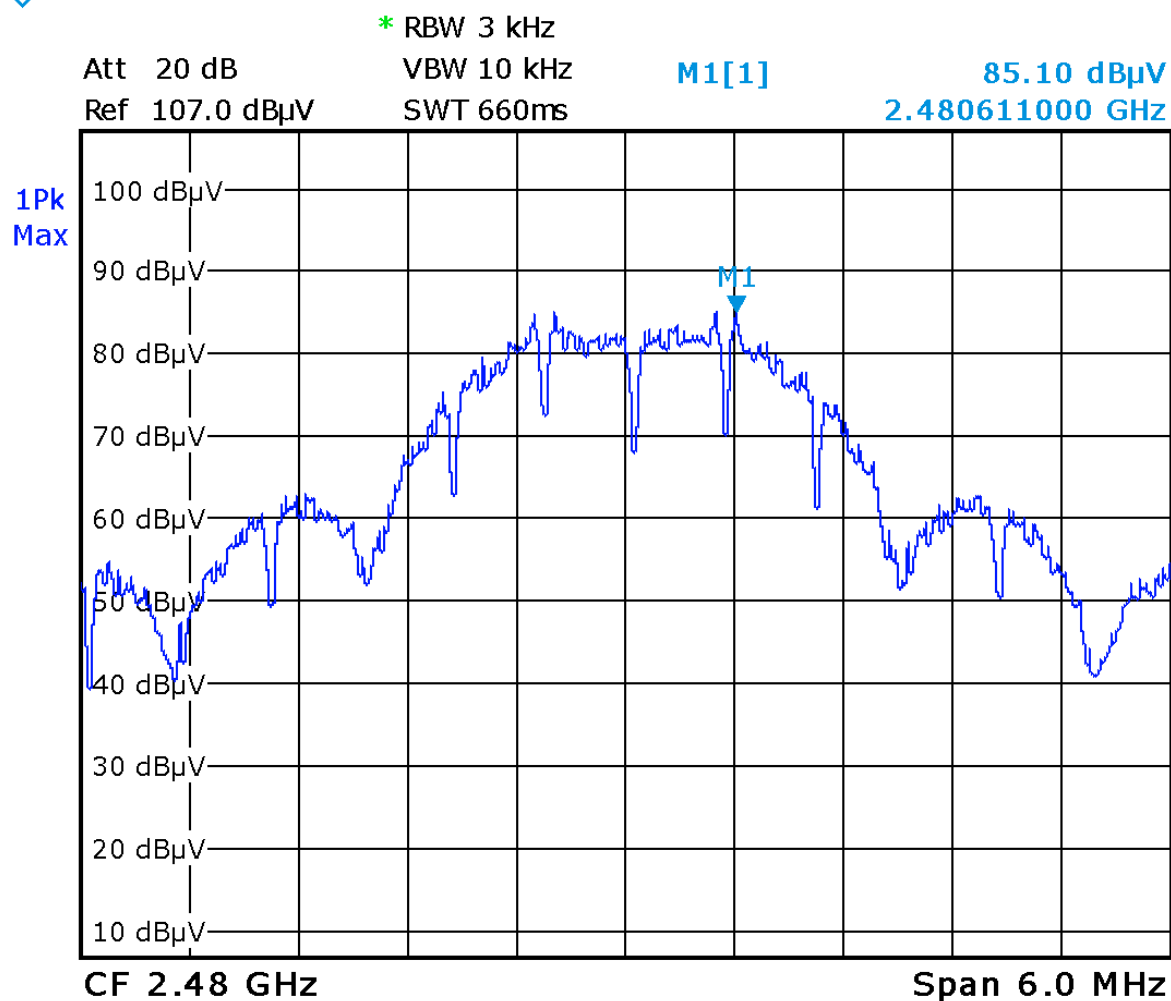
Hi Channel (0x1A)
Horizontal Antenna



Date: 20.JUL.2015 13:08:21


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Hi Channel (0x1A)
Vertical Antenna



Date: 20.JUL.2015 14:03:19


See 'Appendix B – EUT and Test Setup Photos' for photos showing the test set-up.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration Date	Next Calibration Date	Asset #
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov. 15, 2013	Nov. 15, 2015	GEMC 160
Horn Antenna 2 – 18 GHz	WBH218HN	Q-par	Jan. 23, 2014	Jan. 23, 2016	GEMC 6375
Pre-Amp 1 – 26.5 GHz	HP 8449B	HP	Sept 09, 2014	Sept 09, 2016	GEMC 6351
RF Cable 7m	LMR-400-7M- 50Ω-MN-MN	LexTec	NCR	NCR	GEMC 28
RF Cable 10m	LMR-400- 10M-50Ω-MN- MN	LexTec	NCR	NCR	GEMC 29
RF Cable 0.5M	LMR-400- 0.5M-50Ω-MN- MN	LexTec	NCR	NCR	GEMC 31

This report module is based on GEMC template "FCC – Power Line Conducted Emissions Class B_Rev1"

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Maximum Permissible Exposure

Purpose

The purpose of this test is to ensure that the RF energy intentionally transmitted, in terms of power density emitted from the EUT at a stated operating distance does not exceed the limits listed below as defined in the applicable test standard, as calculated based upon readings obtained during testing. This helps protect human exposure to excessive RF fields.

Limit(s) and Method

The limits, as defined in FCC 15.247(i) and FCC 1.1310 Table 1 (B), limits for general public exposure were applied. The limit for the frequency range of 1.5 GHz to 100 GHz was applied. This is a limit of 1.0 mW/cm². The distance used for calculations was 20cm, as this is the minimum distance an operator will be from the EUT during normal operation, as stated by the manufacturer.

Results

The EUT passed the requirements. The worst case calculated power density was 0.02 mW/cm², this is significantly under the 1.0 mW/cm² requirement.

Calculations

Method 1 (conducted power)

Internal antenna

$$P_d = (P_t * G) / (4 * \pi * R^2)$$

Where P_t = 19.2 dBm or 83.2 mW as per Peak power conducted output


Where G = 0.5 dBi, or numerically 1.12

Where R = 20 cm

$$P_d = (83.2 \text{ mW} * 1.12) / (4 * \pi * 20\text{cm}^2)$$

$$P_d = 93.2 \text{ mW} / 5026 \text{ cm}^2$$

$$P_d = 0.018 \text{ mW/cm}^2$$

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Power Line Conducted Emissions

Purpose

The purpose of this test is to ensure that the RF energy unintentionally emitted from the EUT's power line does not exceed the limits listed below as defined in the applicable test standard, as measured from a LISN. This helps protect lower frequency radio services such as AM radio, shortwave radio, amateur radio operators, maritime radio, CB radio, and so on, from unwanted interference.

Limits & Method

The limits are as defined in 47 CFR FCC Part 15 Section 15.207


Method is as defined in ANSI C63.4:2014

Average Limits		Quasi-Peak Limits	
150 kHz – 500 kHz	56 to 46* dB μ V	150 kHz – 500 kHz	66 to 56* dB μ V
500 kHz – 5 MHz	46 dB μ V	500 kHz – 5 MHz	56 dB μ V
5 MHz – 30 MHz	50 dB μ V	5 MHz – 30 MHz	60 dB μ V

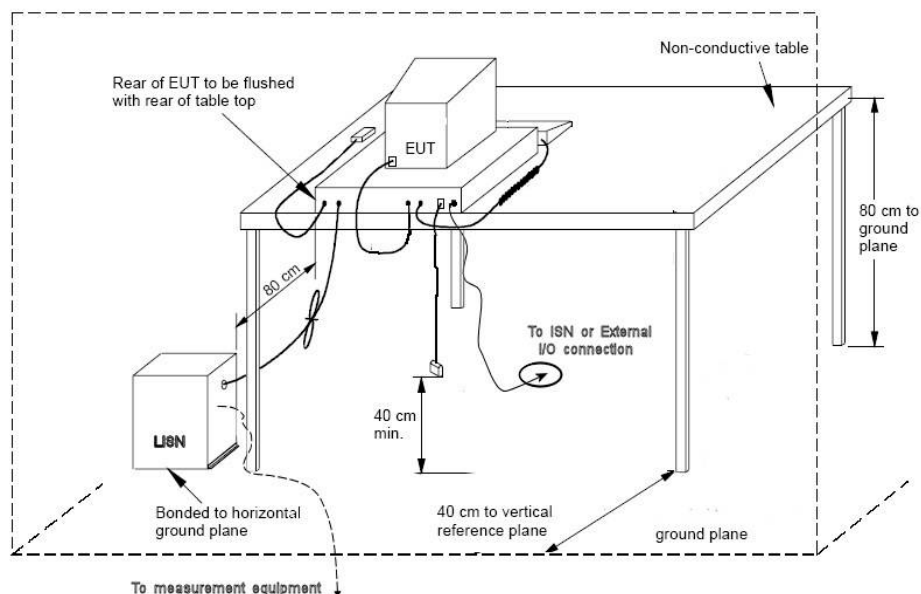
* Decreases linearly with the logarithm of the frequency

Both Quasi-Peak and Average limits are applicable and each is specified as being measured with a resolution bandwidth of 9 kHz. For Quasi-Peak, a video bandwidth at least three times greater than the resolution bandwidth is used.

Based on ANSI C63.4 Section 4.2, if the Peak or Quasi-Peak detector measurements do not exceed the Average limits, then the EUT is deemed to have passed the requirements.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Typical Setup Diagram




Measurement Uncertainty

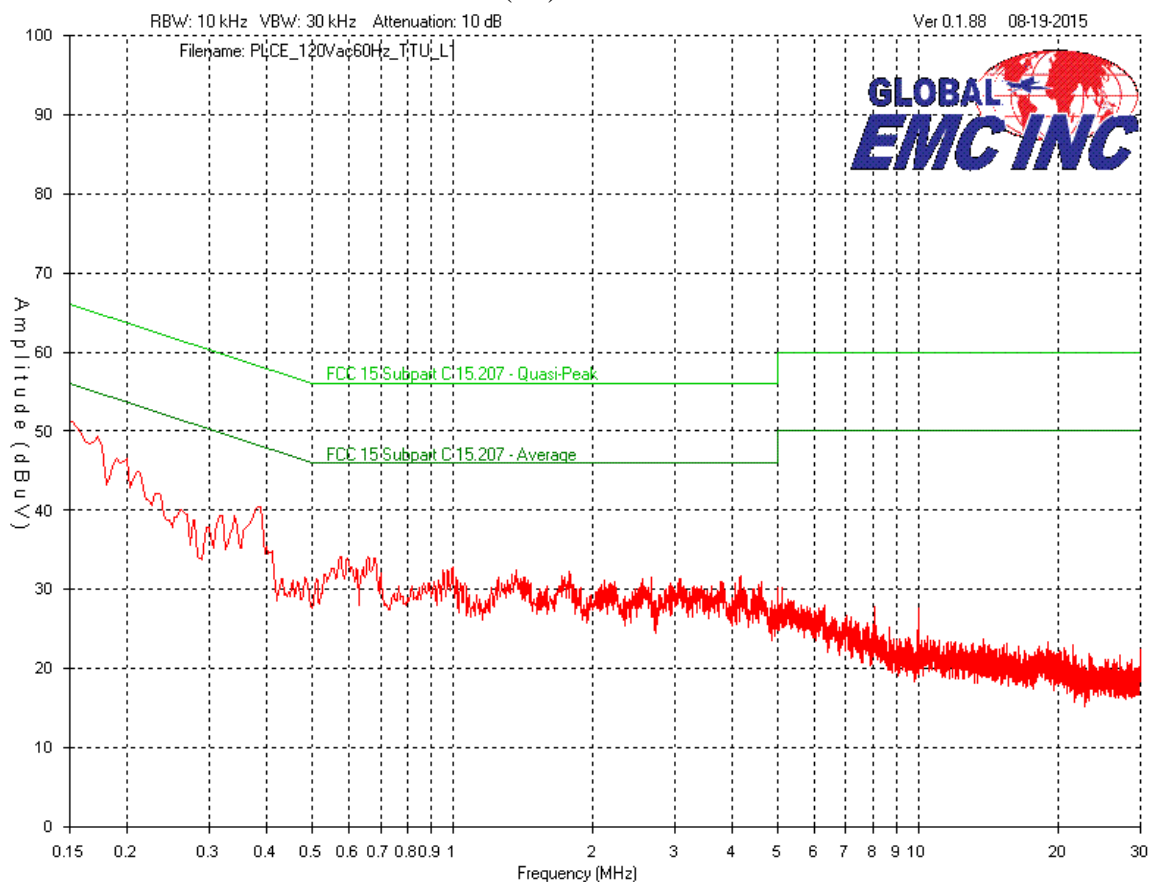
The expanded measurement uncertainty is calculated in accordance with CISPR 16-4-2 and is $\pm 2.91\text{dB}$ with a 'k=2' coverage factor and a 95% confidence level.


Preliminary Graphs

The graphs shown below are maximized peak measurement graphs measured with a resolution bandwidth greater than or equal to the final required detector. This peaking process is done as a worst case measurement and enables the detection of frequencies of concern for final measurement. For final measurements with the appropriate detector, where applicable, please refer to the tables under Final Measurements.

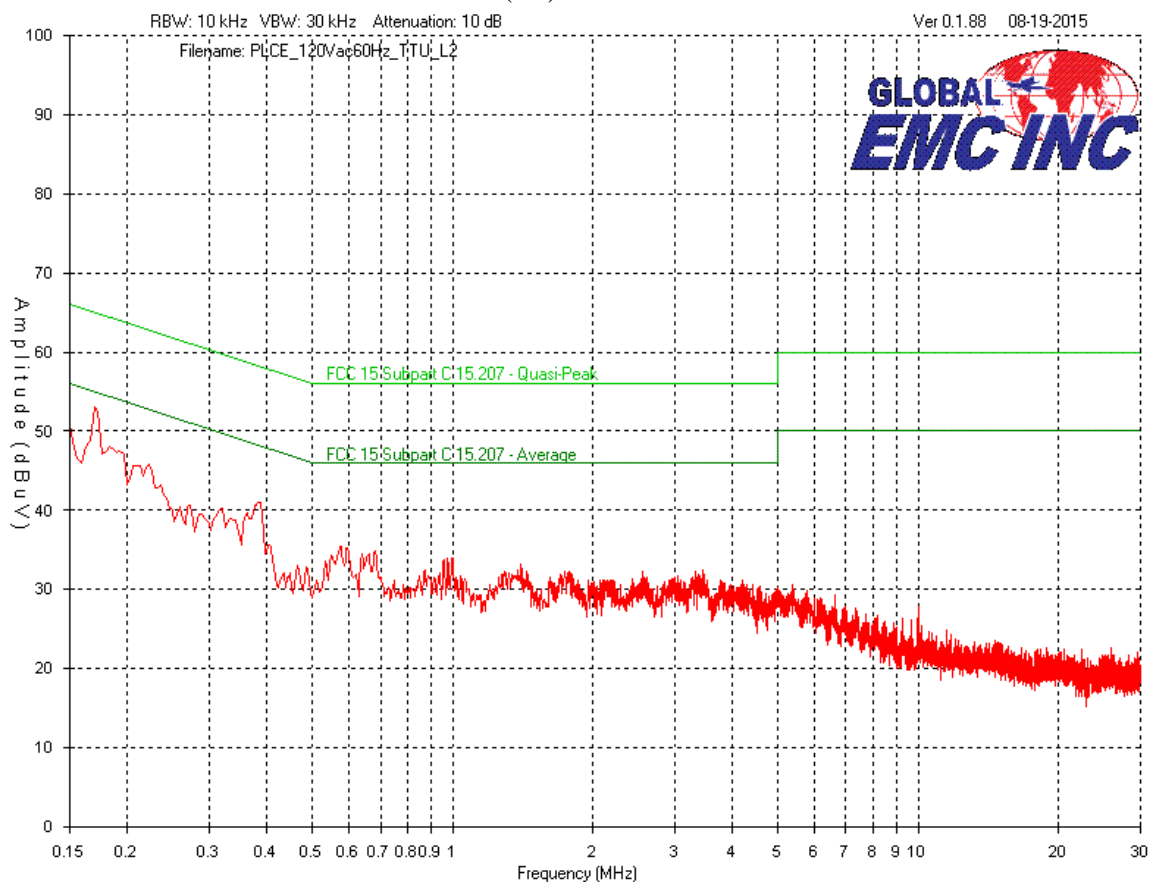
Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Line 1 (L1) – 120Vac 60Hz



Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Line 2 (L2) – 120Vac 60Hz



Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Final Measurements

Product Category			Class B						
Supply			120Vac 60Hz						
Frequency (MHz)	Detector Peak/AVG/QP	Received Signal (dBμV)	Loss Factors (dB)	Level (dBμV)	QP Limit (dBμV)	AVG Limit (dBμV)	QP Margin (dB)	AVG Margin (dB)	Pass/Fail
Line 1									
0.153	AVG	12.2	10.1	22.3	--	55.8	--	33.5	Pass
0.212	AVG	20.2	10.1	30.3	--	53.1	--	22.8	Pass
0.153	PEAK	41.0	10.1	51.1	65.8	--	14.7	--	Pass
0.383	PEAK	30.4	10.1	40.5	58.2	48.2	17.7	7.7	Pass
0.575	PEAK	24.0	10.1	34.1	56	46	21.9	11.9	Pass
1.370	PEAK	22.4	10.1	32.5	56	46	23.5	13.5	Pass
4.151	PEAK	21.5	10.2	31.7	56	46	24.3	14.3	Pass
2.672	PEAK	21.3	10.2	31.5	56	46	24.5	14.5	Pass
Line 2									
0.170	AVG	15.2	10.1	25.3	--	55	--	29.7	Pass
0.233	AVG	21.2	10.1	31.3	--	52.3	--	21.0	Pass
0.170	PEAK	42.9	10.1	53.0	65	--	12.0	--	Pass
0.575	PEAK	25.3	10.1	35.4	56	46	20.6	10.6	Pass
1.403	PEAK	23.1	10.1	33.2	56	46	22.8	12.8	Pass
5.364	PEAK	20.4	10.2	30.6	60	50	29.4	19.4	Pass
6.617	PEAK	19.0	10.3	29.3	60	50	30.7	20.7	Pass
10.004	PEAK	17.5	10.3	27.8	60	50	32.2	22.2	Pass

Average and Quasi-Peak Emissions Table

Note:

Peak = Peak measurement

AVG = Average measurement

QP = Quasi-Peak measurement


See 'Appendix B – EUT, Peripherals and Test Setup Photos' for photos showing the test set-up for the highest line conducted emission

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	


Test Equipment List

Equipment	Model No.	Manufacturer	Last Calibration Date	Next Calibration Date	Asset #
Spectrum Analyzer	ESL 6	Rohde & Schwarz	Nov. 15, 2013	Nov. 15, 2015	GEMC 160
LISN	FCC-LISN-50/250-16-2-01	FCC	Jan. 15, 2015	Jan. 15, 2017	GEMC 65
RF Cable 7m	LMR-400-7M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 28
RF Cable 1m	LMR-400-1M-50Ω-MN-MN	LexTec	NCR	NCR	GEMC 29
10dB Attenuator	FP-50-10	Trilithic	NCR	NCR	GEMC 42
Emissions Software	0.1.88	Global EMC	NCR	NCR	GEMC 58

This report module is based on GEMC report template 'FCC_ICES003_CE_Rev1'

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Appendix A – EUT Summary


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

For further details for filing purposes, refer to filing package.


General EUT Description

Client	
Organization / Address	Younes Medical Technologies 1 Morley Avenue, Suite PE438 Winnipeg, MB, Canada, R3L 2P4
Contact	Mark Younes
Phone	204-949-3202
Email	mark.younes@younessleeptechologies.com
EUT Details	
EUT Name	Prodigy Sleep Monitor - Prodigy Monitor
Equipment Category	Medical Equipment
Basic EUT Functionality	Monitors bio-potential activity during sleep. Performs signal processing on sampled data, transmits wireless and stores on the Prodigy Monitor for later analysis.
Input Voltage and Frequency	Prodigy Monitor: 100-240Vac & 50/60Hz (AC/DC Adaptor)
Rated Input Current	Prodigy Monitor: 1A
Connectors available on EUT	Micro USB 3.5mm jack
Peripherals Required for Test	None
Release type	Final
Intentional Radiator Frequency	2400 – 2483.5 MHz for Zigbee applications as described above.
EUT Configuration	Wireless configured to transmit continuously at 100% duty cycle

Note the EUT is considered to have been received the date of the commencement of the first test, unless otherwise stated. For a close-up picture of the EUT, see ‘Appendix B – EUT and Test Setup Photos’.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Appendix B – EUT and Test Setup Photos

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

Note: These photos are for informational purposes only. Also refer to the PDF files which are separate from this test report.



Figure 1 – Radiated Emissions Setup – Photo 1

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	



Figure 2 – Radiated Emissions Setup – Photo 2

Note: As per ANSI C63.10-2013 Clause 6.3.1, below 1GHz, the height of the EUT was set to 80cm. Above 1GHz, the height was raised to 1.5m.



Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	



Figure 3 – Radiated Emissions Setup – Photo 3

Note: As per ANSI C63.10-2013 Clause 6.3.1, above 1GHz, the height of the EUT was set to 1.5m.

Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	

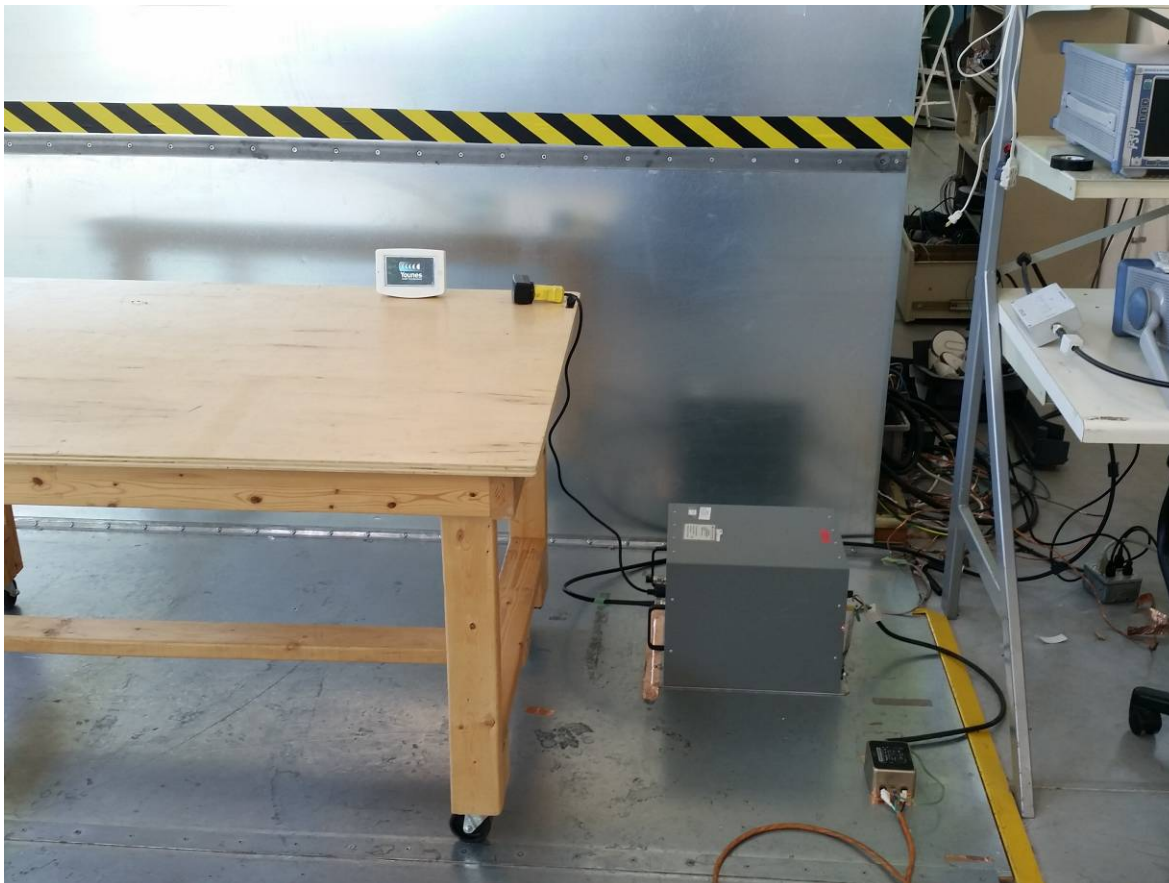


Figure 4 – Power Line Conducted Emissions Setup –Photo 1


Client	Younes Medical Technologies	
Product	Prodigy Sleep Monitor Model: TTU	
Standard(s)	RSS 247 Issue 1:2015 FCC Part 15 Subpart C:2015	



Figure 5 – Power Line Conducted Emissions Setup –Photo 2