



Company: Beam Authentic
Model Tested: BEAM1
Report Number: 22720
DLS Project: 8791

166 South Carter, Genoa City, WI 53128

Code of Federal Regulations 47 Part 15 – Radio Frequency Devices

Subpart C – Intentional Radiators

Section 15.247

**Operation within the bands 902 - 928 MHz,
2400 - 2483.5 MHz, 5725 - 5875 MHz,
and 24.0 - 24.25 GHz.**

THE FOLLOWING MEETS THE ABOVE TEST SPECIFICATION

FCC ID: 2ALRSBZ

Formal Name: BEAM1
Kind of Equipment: Wearable device
Frequency Range: 2402 to 2480 MHz
Test Configuration: Tabletop
Model Number(s): BEAM1
Model(s) Tested: BEAM1
Serial Number(s): E6:BA:E4:8E:445B,E9:0D:6D:6D:D5:83, E1:5E:6A:A0:40:3F
Date of Tests: April 18 – 25, 2017
Test Conducted For: Beam Authentic
25 Tamalpais Avenue
San Anselmo, CA 94960, USA

NOTICE: “This test report relates only to the items tested and must not be used by the client to claim product endorsement by NVLAP or any agency of the U.S. Government”. Please see the “Description of Test Sample” page listed inside of this report.

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SIGNATURE PAGE

Tested By:

A handwritten signature in black ink that reads "Paul Leo".

Paul Leo
Test Engineer

Reviewed By:

A handwritten signature in black ink that reads "William Stumpf".

William Stumpf
OATS Manager

Approved By:

A handwritten signature in black ink that reads "Brian J. Mattson".

Brian Mattson
General Manager



Company: Beam Authentic
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United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2005

NVLAP LAB CODE: 100276-0

D.L.S. Electronic Systems, Inc.
Wheeling, IL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Electromagnetic Compatibility & Telecommunications

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2016-08-16 through 2017-09-30

Effective Dates



For the National Voluntary Laboratory Accreditation Program

**ELECTROMAGNETIC
COMPATIBILITY &
TELECOMMUNICATIONS**

NVLAP LAB CODE 100276-0

Emissions

Designation

Off-site test location

Description

D.L.S. Electronics performs radiated emissions testing at an additional location, 166 South Carter Street, Genoa City, WI 53128.



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1.0 Summary of Test Report

It was determined that the Beam Authentic BEAM1, model BEAM1, complies with the requirements of CFR 47 Part 15 Subpart C Section 15.247.

Subpart C Section 15.247 Applicable Technical Requirements Tested:

Section	Description	Procedure	Note	Compliant?
Informative	Duty Cycle	ANSI C63.10-2013 Section 11.6(b)	1	NA
15.247(a)(2)	DTS Bandwidth	ANSI C63.10-2013 Sections 11.8 & 11.8.2	1	Yes
15.247(b)(3)	Fundamental Emission Output Power	ANSI C63.10-2013 Sections 11.9.1 & 11.9.1.1	1	Yes
15.247(e)	Maximum Power Spectral Density	ANSI C63.10-2013 Sections 11.10 & 11.10.2	1	Yes
15.247(d)	Operating Band-Edge Measurements – RF Conducted	ANSI C63.10-2013 Sections 11.11, 11.11.2 & 11.11.3	1	Yes
15.247(d) 15.205(a) 15.209(a)	Restricted Band-Edge Measurements - Radiated	ANSI C63.10-2013 Sections 11.12 & 11.12.1	2	Yes
15.247(d)	Emissions in Non- Restricted Frequency Bands – RF Conducted	ANSI C63.10-2013 Sections 11.11, 11.11.2 & 11.11.3	1	Yes
15.247(d) 15.205(a) 15.209(a)	Emissions in Restricted Frequency Bands – Radiated	ANSI C63.10-2013 Sections 11.12 & 11.12.1	2	Yes
15.207	AC Line Conducted Emissions	ANSI C63.10-2013 Section 6.2	3	Yes

Note 1: RF conducted measurement.

Note 2: Radiated emission measurement.

Note 3: AC power line conducted measurement.



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2.0 Introduction

During April 18 – 25, 2017, the BEAM1, model BEAM1, as provided from Beam Authentic was tested to the requirements of CFR 47 Part 15 Subpart C Section 15.247. To meet these requirements, the procedures contained within this report were performed by personnel of D.L.S Electronic Systems, Inc.

3.0 Test Facilities

D.L.S. Electronic Systems, Inc. is a full service EMC/Safety Testing Laboratory accredited to ISO 17025. NVLAP Certificate and Scope can be viewed at <http://www.dlsemc.com/certificate>. Our facilities are registered with the FCC, Industry Canada, and VCCI.

Wisconsin Test Facility:

D.L.S. Electronic Systems, Inc.
166 S. Carter Street
Genoa City, Wisconsin 53128

Wheeling Test Facility:

D.L.S. Electronic Systems, Inc.
1250 Peterson Drive
Wheeling, IL 60090

FCC Registration #90531

4.0 Description of Test Sample

Description:

The BEAM1 devices is a wearable consumer electronic device that allow the user to wear and share what they care about via a BLE connection to the BEAM iOS or Android smartphone app to the BEAM platform.

Type of Equipment / Frequency Range:

Wearable device (portable) / 2402-2480 MHz

Physical Dimensions of Equipment Under Test:

Length: 50.85 mm, Width: 50.85 mm, Height: 10 mm



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4.0 Description of Test Sample - continued

Power Source:

5 Volt rechargeable battery
120V & 240V / 60Hz power supply for charging the battery (used for AC line conducted testing)

Internal Frequencies:

2400 MHz, 180 MHz, 64 MHz, 1 MHz

Transmit / Receive Frequencies Used For Test Purpose:

Low channel: 2402 MHz, Middle channel: 2440 MHz, High channel: 2480 MHz

Type of Modulation(s) / Antenna Type:

Gaussian frequency-shift keying– GFSK /
Inverted F (-9.1 dBi gain)

Description of Circuit Board(s) / Part Number:

DVT/PVT	830-00008
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5.0 Test Equipment

A list of the equipment used can be found in the table below. All primary equipment was calibrated against known reference standards with a verified traceable path to NIST.

Radiated 30 – 1000 MHz (Site 2)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/006	20 Hz – 40 GHz	4-6-17	4-6-18
Preamplifier	Rohde & Schwarz	TS-PR10	032001/004	9 kHz – 1 GHz	12-2-16	12-2-17
Antenna	EMCO	3104C	00054892	20 MHz – 200 MHz	3-11-16	3-11-18
Antenna	EMCO	3146	1205	200 MHz – 1 GHz	3-23-16	3-23-18
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

AC Line Conducted (Screen Room)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Narda PMM	9010F	020WW401 02	10Hz-50MHz	6-23-16	6-23-17
LISN	Solar	9252-50-R-24-BNC	961019	9 kHz – 30 MHz	8-4-16	8-4-17
Filter- High-Pass	SOLAR	7930-120	090702	120 kHz – 30 MHz	11-4-16	11-4-17
Limiter	Electro-Metrics	EM-7600	705	9 kHz – 30 MHz	11-4-16	11-4-17
Test Software	Narda PMM	PMM Emission Suite	Rel.2.17	N/A	N/A	N/A



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5.0 Test Equipment - continued

Radiated 1-26 GHz (Site G1)

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	4-6-17	4-6-18
Preamp	Ciao	CA118-4010	101	1GHz-18GHz	1-9-17	1-9-18
Horn Antenna	EMCO	3115	9502-4451	1-18GHz	6-1-15	6-1-17
Filter- High-Pass	Q-Microwave	100462	2	4.2GHz-18GHz	9-23-16	9-23-17
Preamp	Miteq	AMF-8B-180265-40-10P-H/S	438727	18GHz-26GHz	6-6-16	6-6-17
Horn Antenna	EMCO	3116	2549	18 – 40GHz	9-2-16	9-2-18
High Pass Filter	K & L	50140 11SH10- 18000/T40000 -K-K	8	18-40 GHz	1-9-17	1-9-18
Test Software	Rohde & Schwarz	ESK-1	V1.7.1	N/A	N/A	N/A

RF Conducted / Other

Description	Manufacturer	Model Number	Serial Number	Frequency Range	Cal Date	Cal Due Dates
Receiver	Rohde & Schwarz	ESI 40	837808/005	20 Hz – 40 GHz	4-6-17	4-6-18



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6.0 Test Arrangements

Radiated Emissions Measurement Arrangement:

All radiated emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2013, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up. See Appendix C for measurement uncertainty.

Unless otherwise noted, the bandwidth of the measuring receiver / analyzer used during testing is shown below.

Frequency Range	Bandwidth (-6 dB)
10 to 150 kHz	200 Hz
150 kHz to 30 MHz	9 kHz
30 MHz to 1 GHz	120 kHz
Above 1 GHz	1 MHz

RF Conducted Emissions Measurement Arrangement:

All RF conducted emission measurements were performed at D.L.S. Electronic Systems, Inc. and set up according to ANSI C63.10-2013, unless otherwise noted. Description of procedures and measurements can be found in Appendix B – Measurement Data. See Appendix A for additional photos of the test set up. See Appendix C for measurement uncertainty.

7.0 Test Conditions

Temperature and Humidity:

70°F at 35% RH unless otherwise noted on test data

Supply Voltage:

5 Volt rechargeable battery

120V & 240V / 60Hz power supply for charging the battery (used for AC line conducted testing) – Apple 5W USB Power Adapter, model MD810LL/A



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8.0 Modifications Made To EUT For Compliance

Added 0.5 pF capacitor at C48 (originally was do-not-place).

9.0 Additional Descriptions

The EUT was programmed for continuous transmission on Low, Mid, and High channels, with a 62% duty cycle.

For radiated emissions, the EUT with was rotated through 3 orthogonal axis to find worst-case.

AC line conducted emissions were explored with a baseline fully charged battery operated unit, a unit charging a discharged battery while displaying data, and a fully charged unit connected to the AC mains. Data was supplied for all three conditions.

10.0 FCC 15.31 (e) Supply Voltage Requirement statement

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

Compliance Statement: This device complies with the requirements of Part 15.31(e):

- This device is battery operated. All tests were performed using a new (or fully charged) battery.
- This device provides a constant regulated voltage to the RF circuitry regardless of supply voltage (see schematic diagrams).
- This device does not provide a constant regulated voltage to the RF circuitry regardless of supply voltage. Data has been supplied in this test report that supports compliance. Details:



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11.0 FCC 15.23 Antenna Requirement statement

SECTION 15.203 ANTENNA REQUIREMENT

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.... This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221.

Statement: This wireless device (Intentional Radiator) meets the requirements of FCC Part 15.203:

- The antenna is permanently attached
- The antenna has a unique coupling to the intentional radiator.
Description of coupling:
- This intentional radiator is professionally installed
- This intentional radiator, in accordance with Section 15.31(d), must be measured at the installation site.

12.0 Results

Measurements were performed in accordance with CFR 47 Part 15 Subpart C Section 15.247 and ANSI C63.10-2013. Graphical and tabular data can be found in Appendix B at the end of this report.

13.0 Conclusion

The BEAM1, model BEAM1, as provided from Beam Authentic, tested during April 18 – 25, 2017 **meets** the requirements of CFR 47 Part 15 Subpart C Section 15.247.



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Appendix A – Test Setup Photos

Company: Beam Authentic
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Radiated Emissions below 1 GHz – Position 1



Radiated Emissions below 1 GHz – Position 2





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Appendix A – Test Setup Photos - continued

Radiated Emissions below 1 GHz – Position 3



Radiated Emissions above 1 GHz – Position 1





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Appendix A – Test Setup Photos - continued

Radiated Emissions above 1 GHz – Position 2



Radiated Emissions above 1 GHz – Position 3





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Appendix A – Test Setup Photos - continued

RF Conducted



AC Line Conducted





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Appendix B – Measurement Data

B1.0 Duty Cycle during testing

Rule Part: Informative

Test Procedure: ANSI 63.10-2013, section 11.6(b)

Limit: Not Applicable

Results: Duty Cycle = 62% over a 5ms period
Duty Cycle Correction = 4.152 dB (for voltage measurements)

Sample Equations: Total on Time = 390.781563 μ s
Total on + off Time = 631.262525 μ s
$$\text{Duty cycle } x = (390.781563 \mu\text{s} / 631.262525 \mu\text{s}) = 0.62 = 62\%$$
$$20 \log (1.0 / 0.62) = 4.152$$
$$\text{Duty Cycle Correction Factor} = 4.152 \text{ dB (for voltage measurements)}$$

Test Date: 4-18-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Duty Cycle - Conducted – KDB558074 (6.0)
 Operator: Paul L
 Comment: Mid Channel: 19 Frequency: 2440 MHz

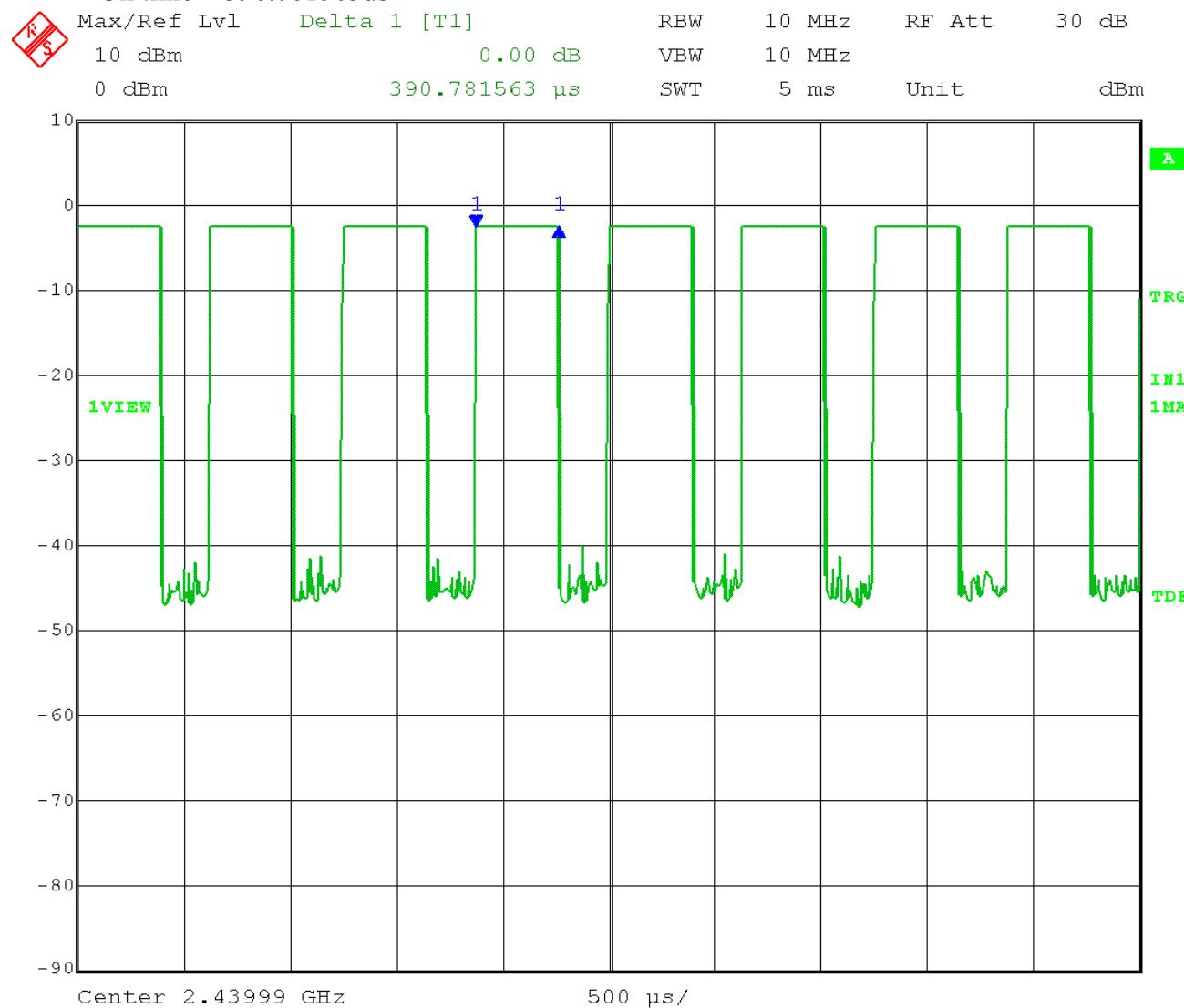
1 cycle time = 631.262525us

Duty cycle x = (390.781563us / 631.262525us) = 0.62 = 62%

Power duty cycle correction factor = $10 \log (1/0.62) = 2.077 \text{ dB}$

Voltage duty cycle correction factor = $20 \log (1/0.62) = 4.152 \text{ dB}$

On time = 390.781563us



Date: 18.APR.2017 11:38:25

Test Date: 4-18-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Duty Cycle - Conducted – KDB558074 (6.0)
 Operator: Paul L
 Comment: Mid Channel: 19 Frequency: 2441 MHz

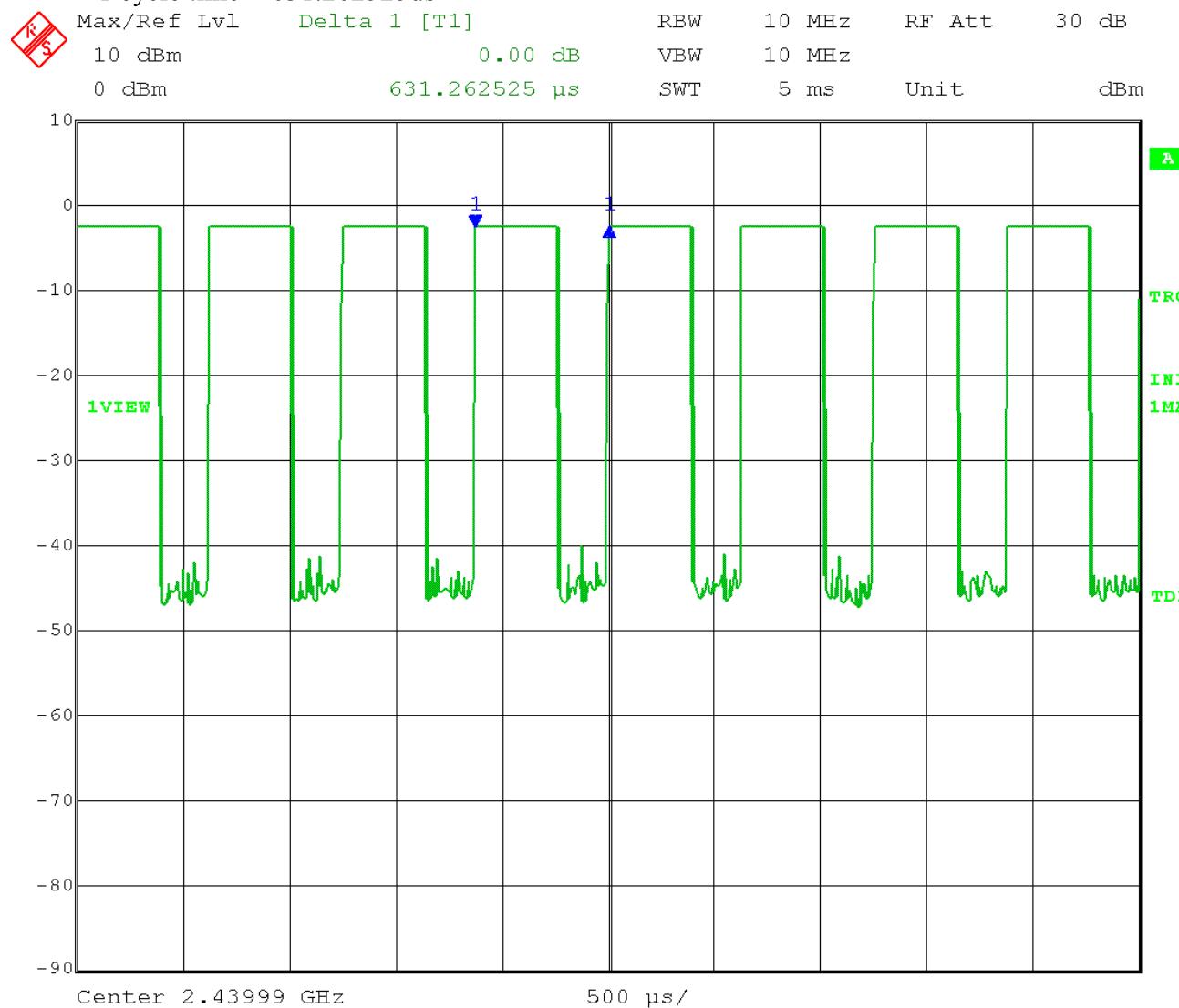
1 cycle time = 631.262525us

$$\text{Duty cycle x} = (390.781563\text{us} / 631.262525\text{us}) = 0.62 = 62\%$$

Power duty cycle correction factor = $10 \log (1/0.62) = 2.077 \text{ dB}$

Voltage duty cycle correction factor = $20 \log (1/0.62) = 4.152 \text{ dB}$

1 cycle time = 631.262525us



Date: 18.APR.2017 11:39:29



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Appendix B

B2.0 DTS Bandwidth (6 dB bandwidth)

Rule Part: FCC Part 15.247(a)(2)

Test Procedure: ANSI C63.10-2013, sections 11.8 & 11.8.2

Limit: Must be greater than 500 kHz.

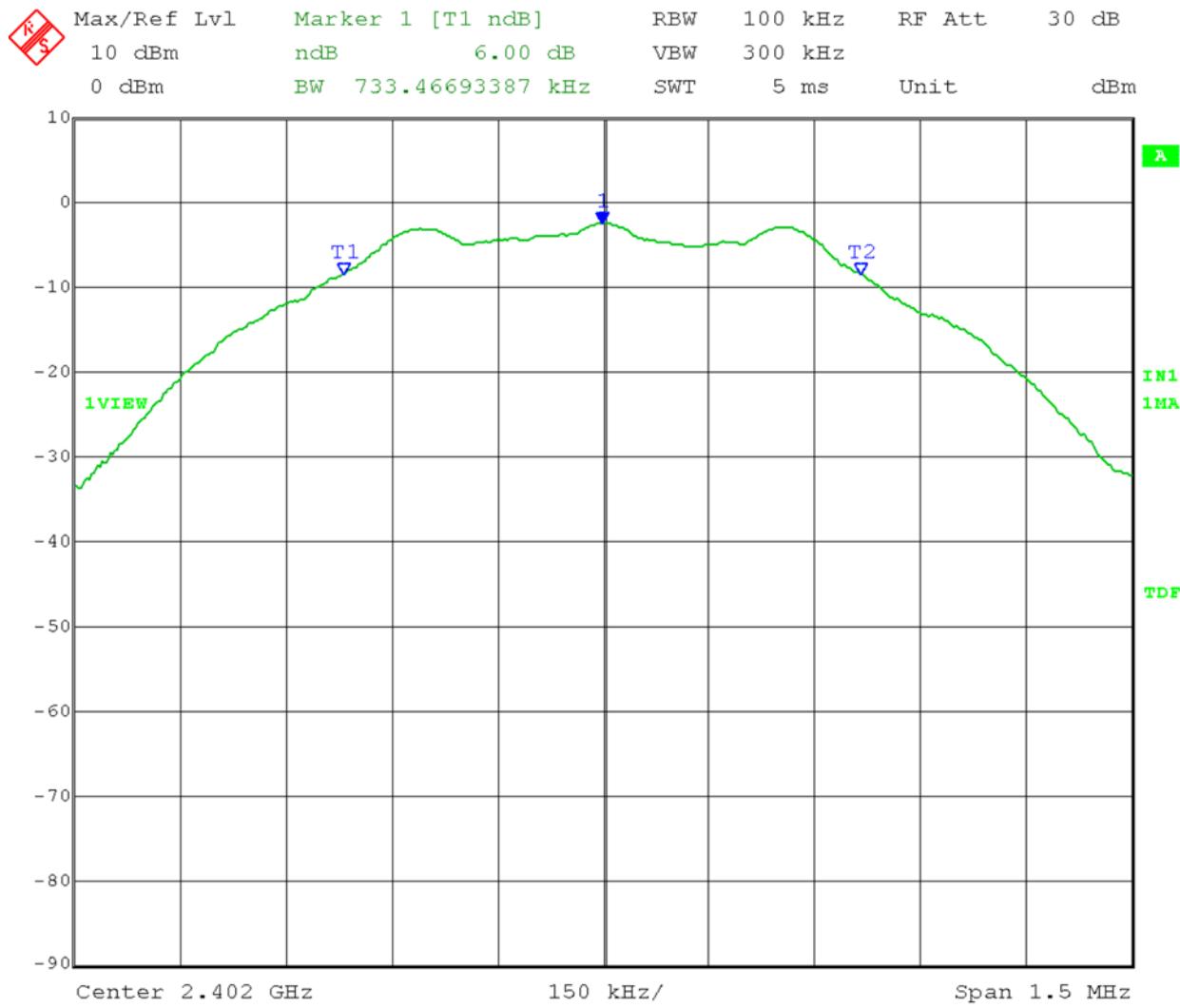
Results: Compliant
6 dB bandwidth = 733 kHz

Notes: The EUT was set to transmit at its maximum power and maximum duty cycle (62%). The EUT was tested at Low, Mid., and High Channels.

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: DTS Bandwidth - Conducted
Operator: Paul L

Comment: Low Channel: Ch.0 Frequency: 2402 MHz
Limit: ≥ 500 kHz

6 dB Bandwidth =733.47kHz

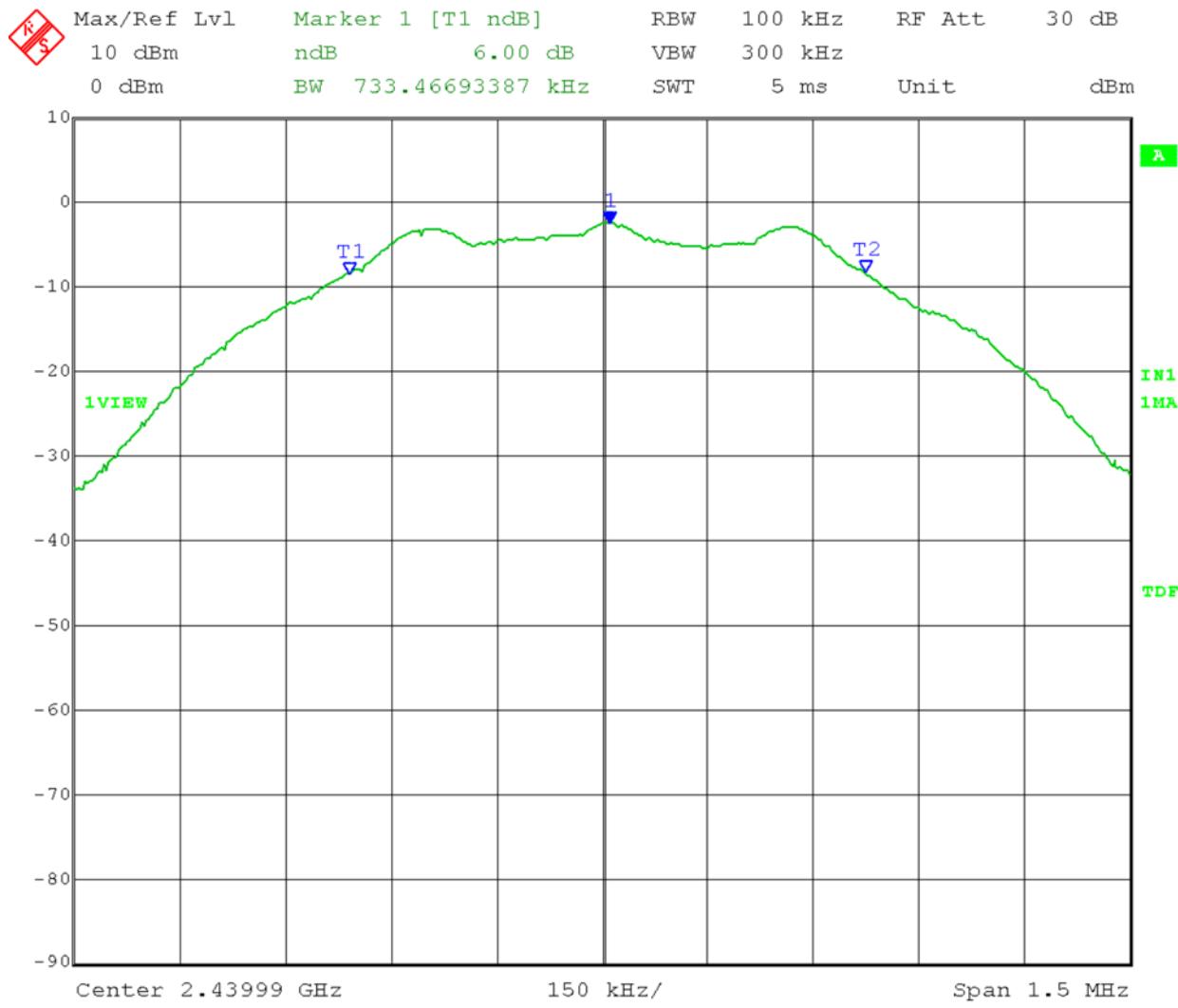


Date: 18.APR.2017 12:06:12

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: DTS Bandwidth - Conducted
Operator: Paul L

Comment: Mid Channel; Ch.19 Frequency: 2440 MHz
Limit: ≥ 500 kHz

6 dB Bandwidth =733.47kHz

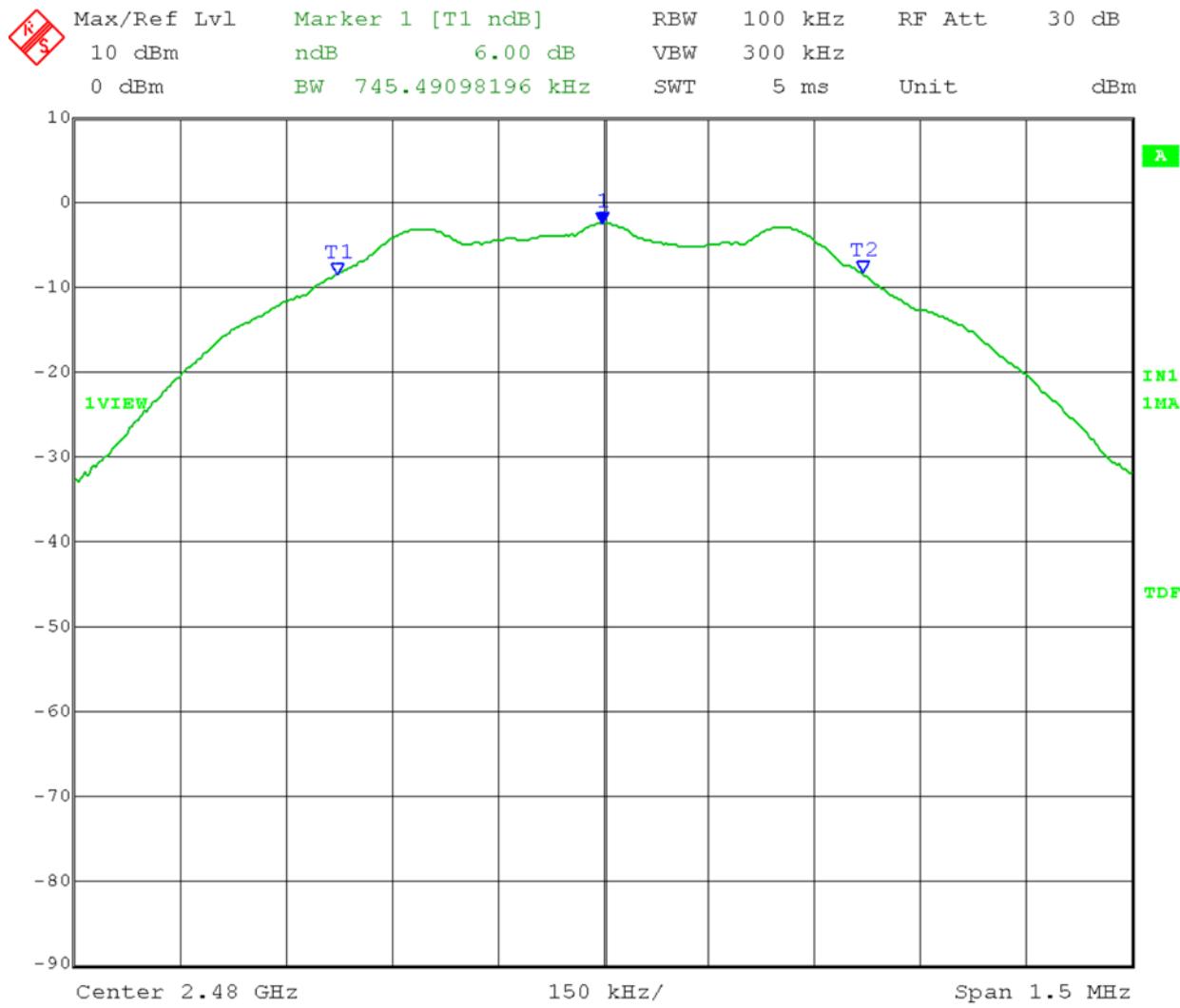


Date: 18.APR.2017 12:02:30

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: DTS Bandwidth - Conducted
Operator: Paul L

Comment: High Channel: Ch.39 Frequency: 2480 MHz
Limit: ≥ 500 kHz

$$6 \text{ dB Bandwidth} = 745.49$$



Date: 18.APR.2017 12:09:45



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Appendix B

B3.0 Fundamental Emission Output Power

Rule Part: FCC Part 15.247(b)(3)

Test Procedure: ANSI C63.10-2013, sections 11.9.1 & 11.9.1.1

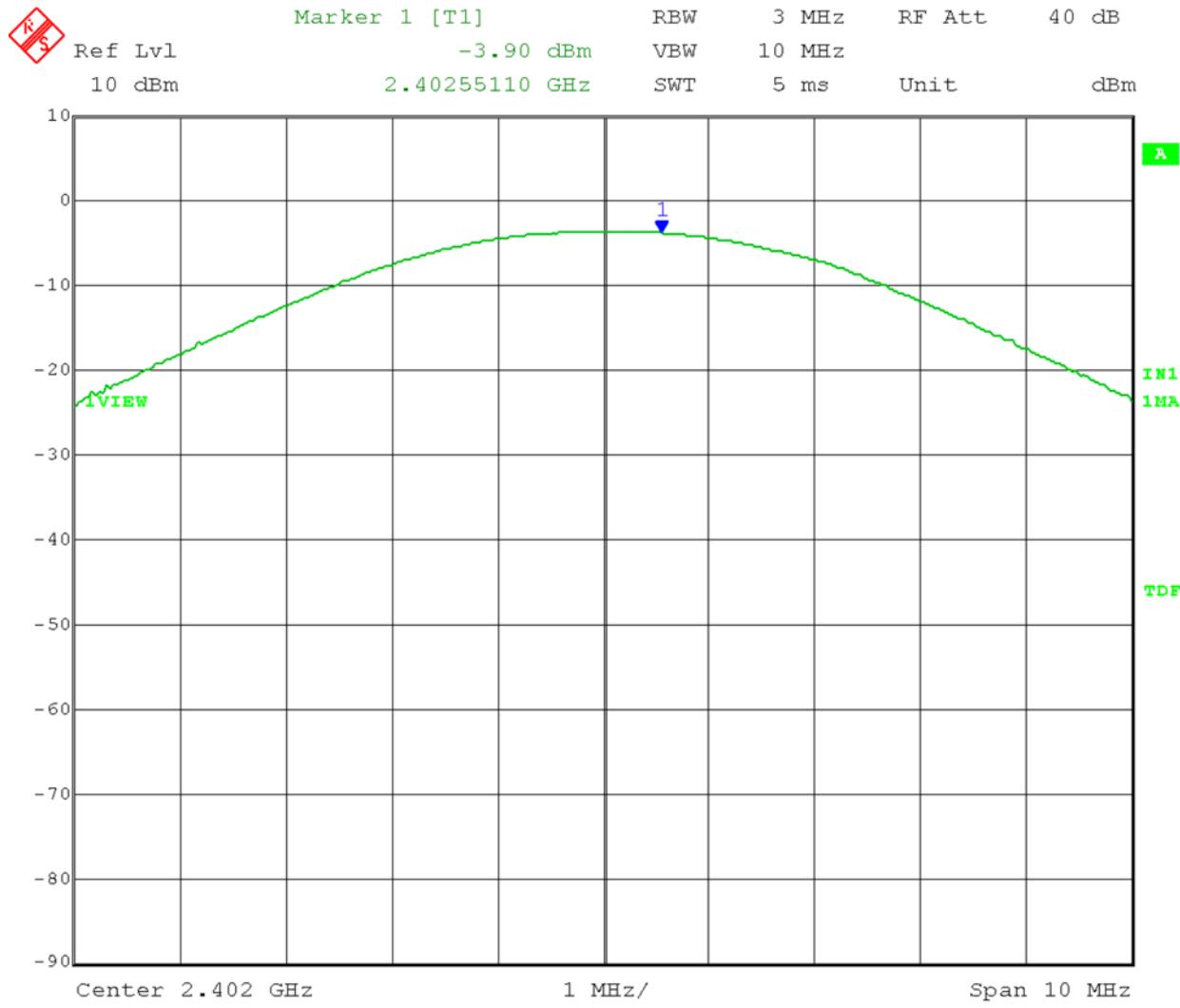
Limit: 1 Watt (30 dBm)

Results: Compliant
Maximum peak conducted output power = -0.39 dBm

Notes: This was an RF conducted measurement. The EUT was connected to the measuring equipment through the external antenna connector. Cable loss was accounted for in the transducer factors set in the analyzer. The EUT was set to transmit continuously (62% Duty Cycle) at its maximum power level at the low, middle and high channels of the operating band. Peak Output power was measured with a spectrum analyzer.

Test Date: 4-25-2017
Company: Beam Authentic
EUT: Beam 1
Test: Peak Output Power - Conducted
Operator: Paul L
Comment: Low Channel; Ch.0 Frequency: 2402 MHz
Limit: 1 Watt

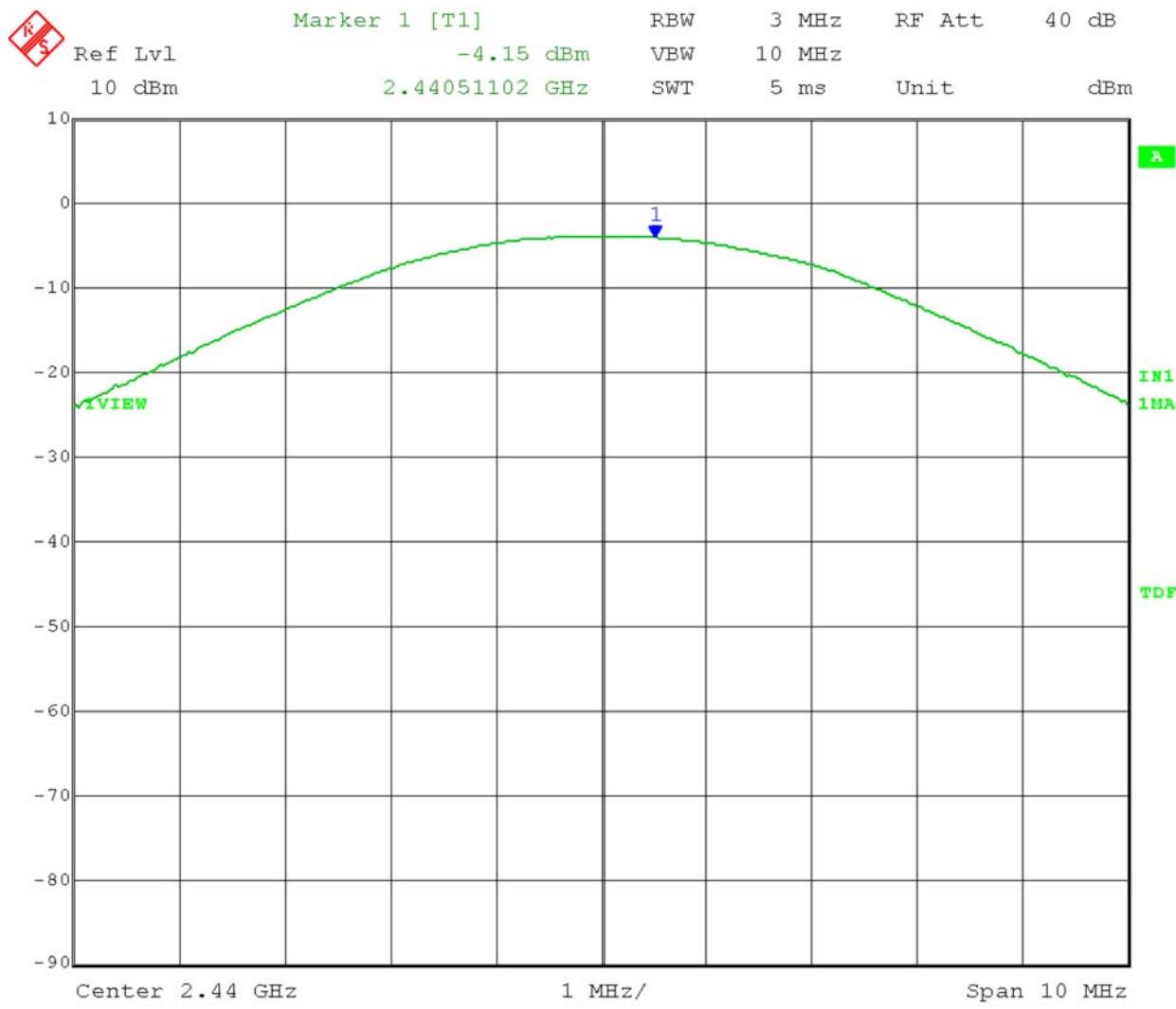
Peak Output Power = -3.90 dBm = .407 mW



Date: 25.APR.2017 14:25:30

Test Date: 4-25-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Peak Output Power - Conducted
 Operator: Paul L
 Comment: Mid Channel: Ch.19 Frequency: 2440 MHz
 Limit: 1 Watt

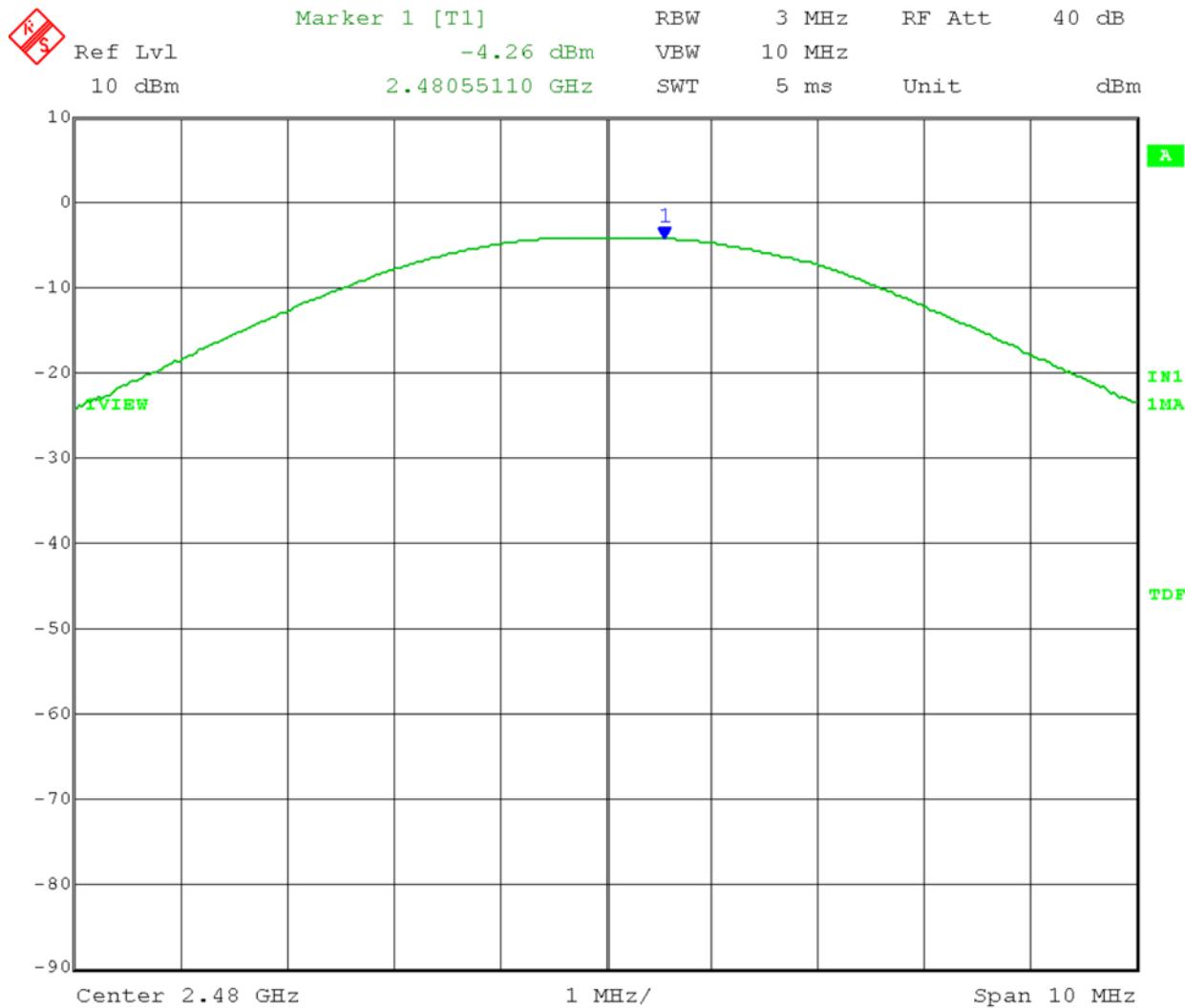
Peak Output Power = -4.15 dBm = .385mW



Date: 25.APR.2017 14:45:00

Test Date: 4-25-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Peak Output Power - Conducted
 Operator: Paul L
 Comment: High Channel: Ch.39 Frequency: 2480 MHz
 Limit: 1 Watt

Peak Output Power = -4.26dBm = .375mW



Date: 25.APR.2017 14:46:40



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Appendix B

B4.0 Maximum Power Spectral Density

Rule Part: FCC Part 15.247(e)

Test Procedure: ANSI C63.10-2013, sections 11.10 & 11.10.2

Limit: +8 dBm / 3 kHz

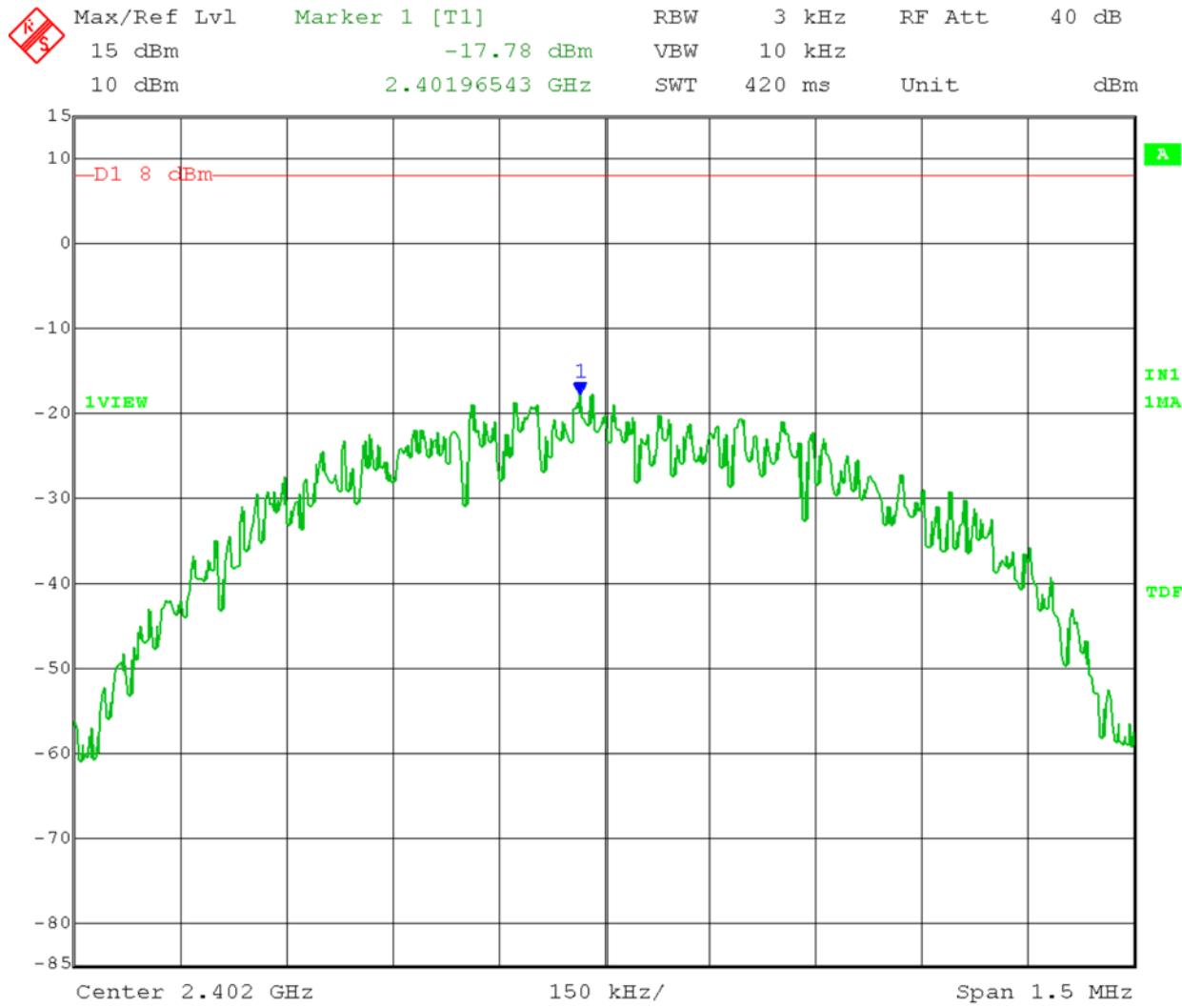
Results: Compliant
Maximum peak power spectral density = -17.78 dBm / 3 kHz

Notes: The EUT was set to transmit at its maximum power, maximum data rate, and maximum duty cycle (62%). Low, Mid. & High Channels were tested. PSD Method PKPSD was used for this test.

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: Peak power spectral density - Conducted
Operator: Paul L

Comment: Low Channel: Ch.0 Frequency: 2402 MHz
Limit: 8 dBm/3kHz

Power in 3 kHz Bandwidth = -17.78 dBm

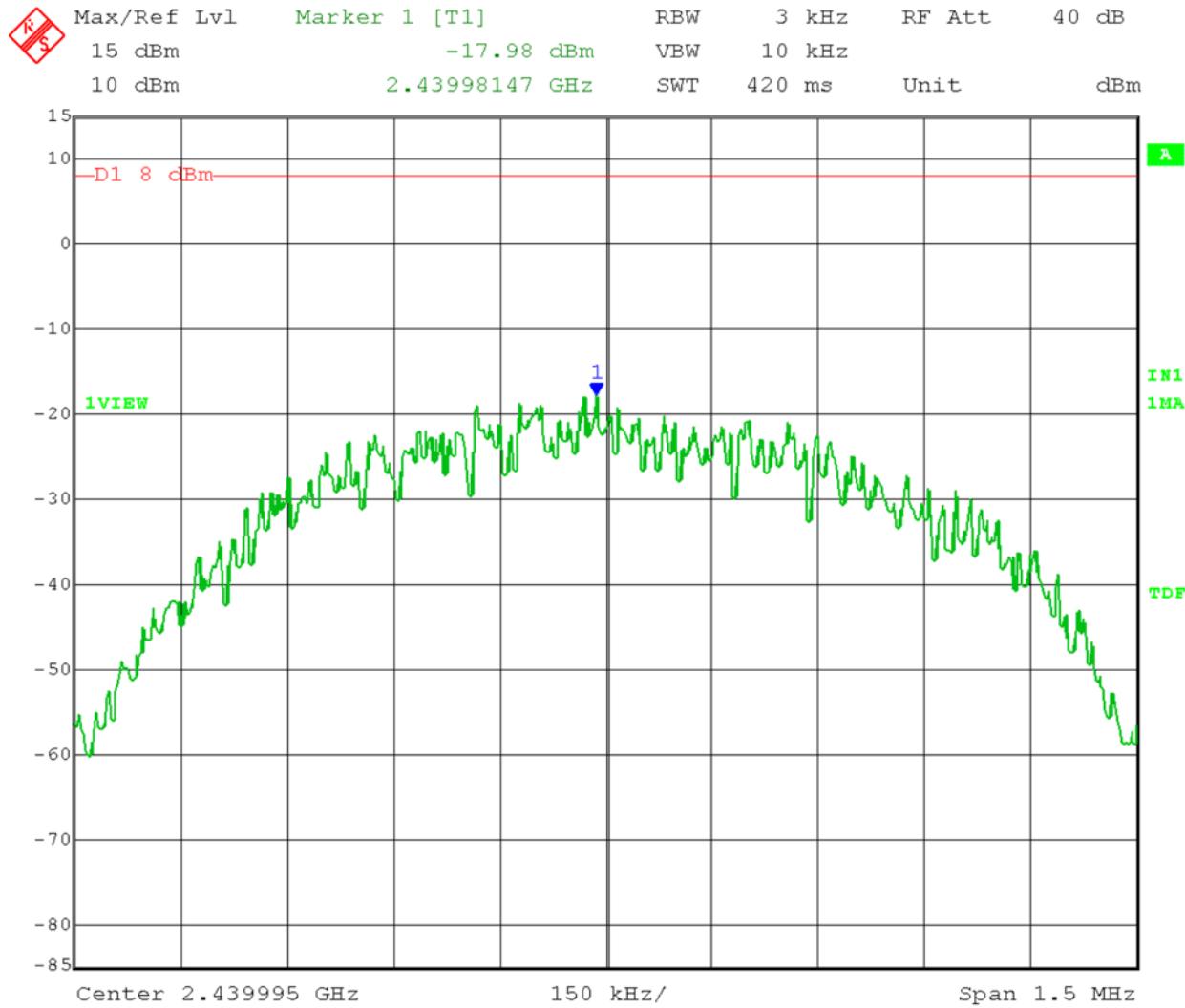


Date: 18.APR.2017 14:38:36

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: Peak power spectral density - Conducted
Operator: Paul L

Comment: Mid Channel; Ch.19 Frequency: 2440 MHz
Limit: 8 dBm/3kHz

Power in 3 kHz Bandwidth = -17.98 dBm

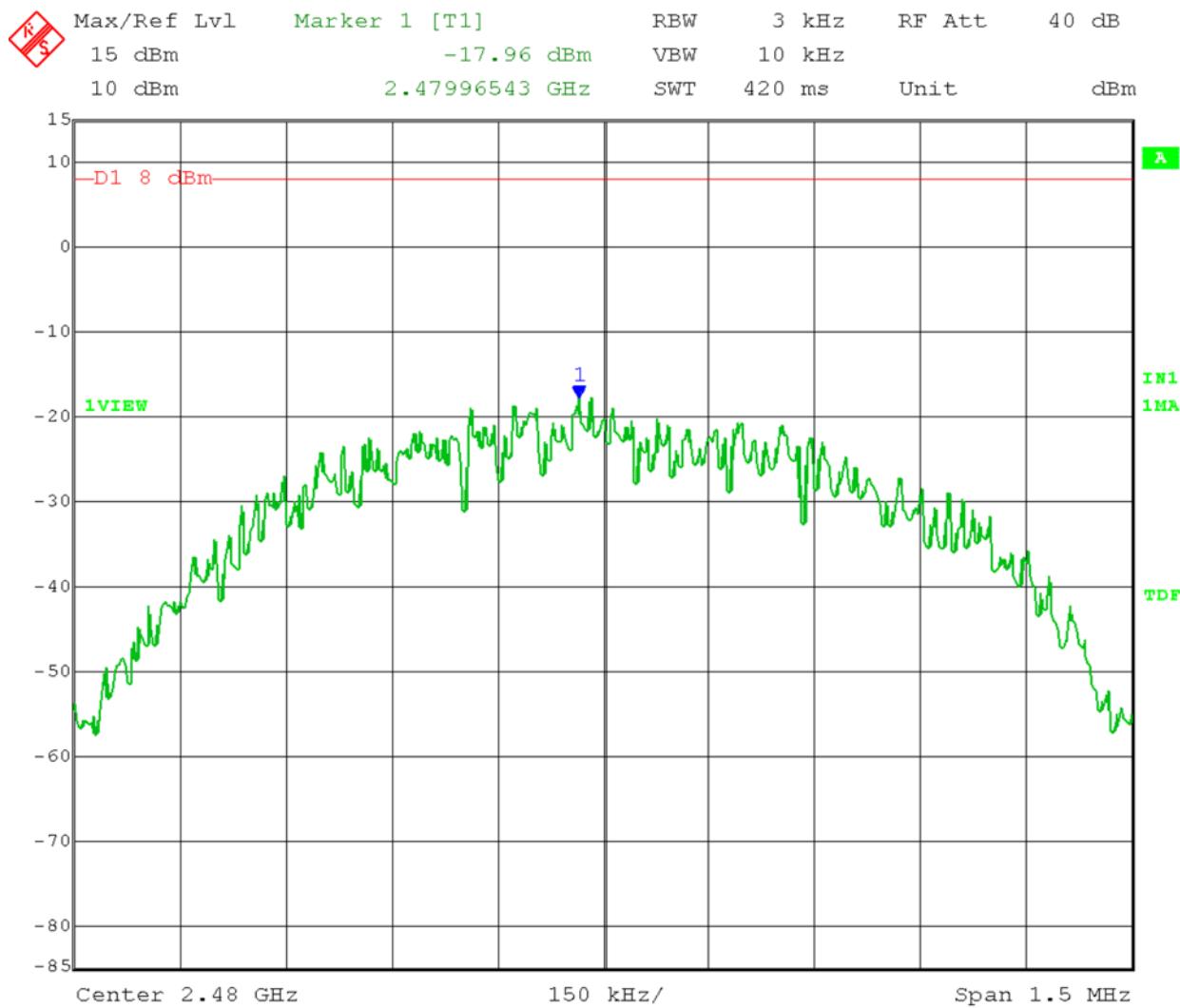


Date: 18.APR.2017 14:35:51

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: Peak power spectral density - Conducted
Operator: Paul L

Comment: High Channel: Ch.78 Frequency: 2480 MHz
Limit: 8 dBm/3kHz

Power in 3 kHz Bandwidth = -17.96 dBm



Date: 18.APR.2017 14:31:51



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Appendix B

B5.0 Operating Band-Edge – RF Conducted

Rule Part: FCC Part 15.247(d)

Test Procedure: ANSI C63.10-2013, sections 11.11, 11.11.2, and 11.11.3

Limit: 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. (Device complies with Power Option 1).

Results: Compliant

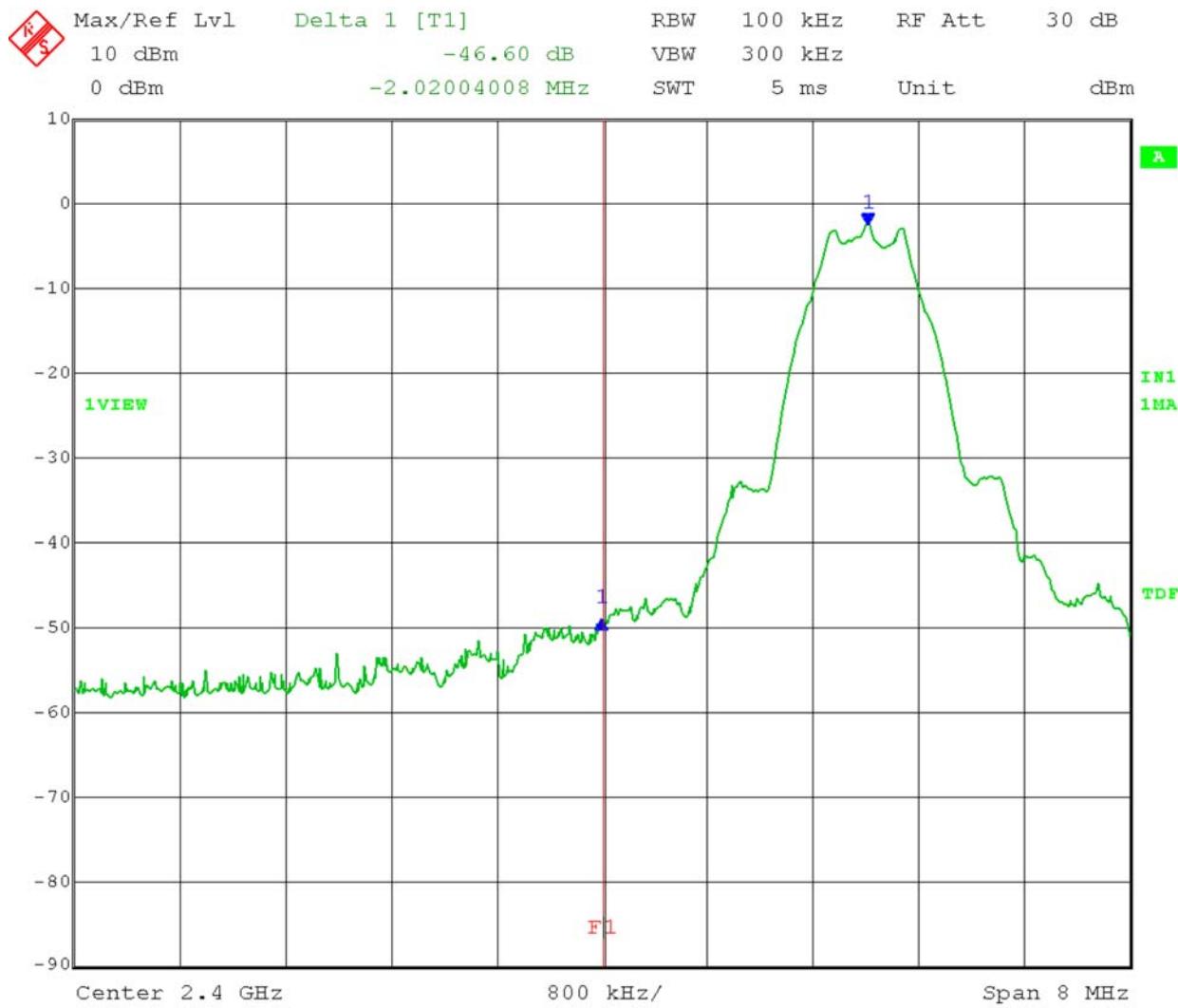
Notes: This was an RF conducted measurement. The EUT was connected to the measuring equipment through a temporary external antenna connector. Cable loss was accounted for in the transducer factors set in the analyzer.

The EUT was set to transmit continuously (62% Duty Cycle) at its maximum power level at the low and high channels of the operating band.

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: Lower operating band edge - Conducted
Operator: Paul L

Comment: Low Channel: Ch.0 Frequency: 2402 MHz

Band-Edge Frequency = 2.400 GHz
Band-Edge > 20 dB Below Peak In-Band Emission

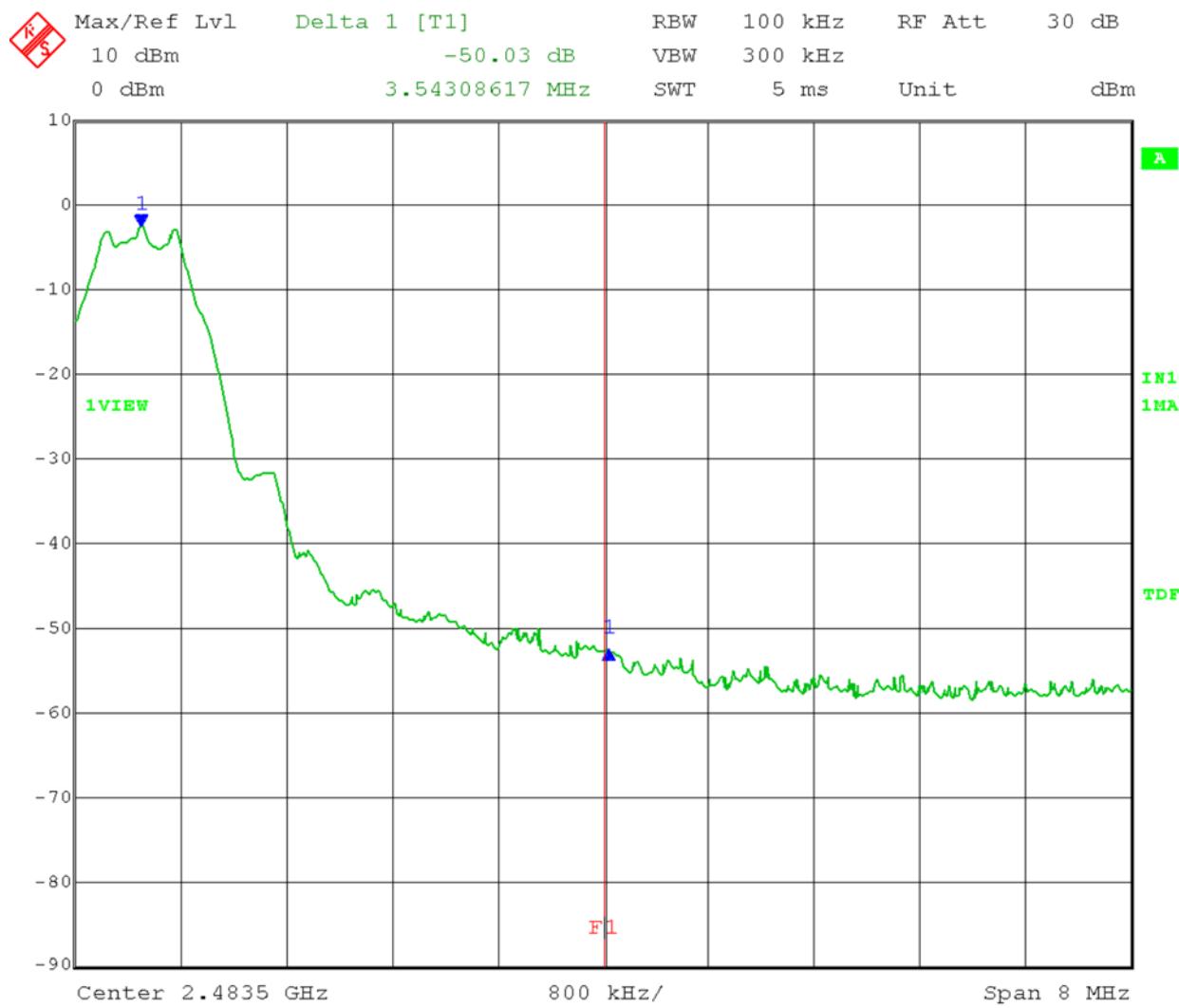


Date: 18.APR.2017 15:03:23

Test Date: 4-18-2017
Company: Beam Authentic
EUT: Beam 1
Test: Upper operating band edge - Conducted
Operator: Paul L

Comment: High Channel: Ch.39 Frequency: 2480 MHz

Band-Edge Frequency = 2.4835 GHz
Limit: Band-Edge > 20 dB Below Peak In-Band Emission





Company: Beam Authentic
Model Tested: BEAM1
Report Number: 22720
DLS Project: 8791

166 South Carter, Genoa City, WI 53128

Appendix B

B6.0 Restricted Band-Edge – Radiated

Rule Part: FCC Part 15.247(d), 15.205(a), 15.209(a)

Test Procedure: ANSI C63.10-2013, sections 11.12 & 11.12.1

Limit: FCC 15.209

Results: Compliant

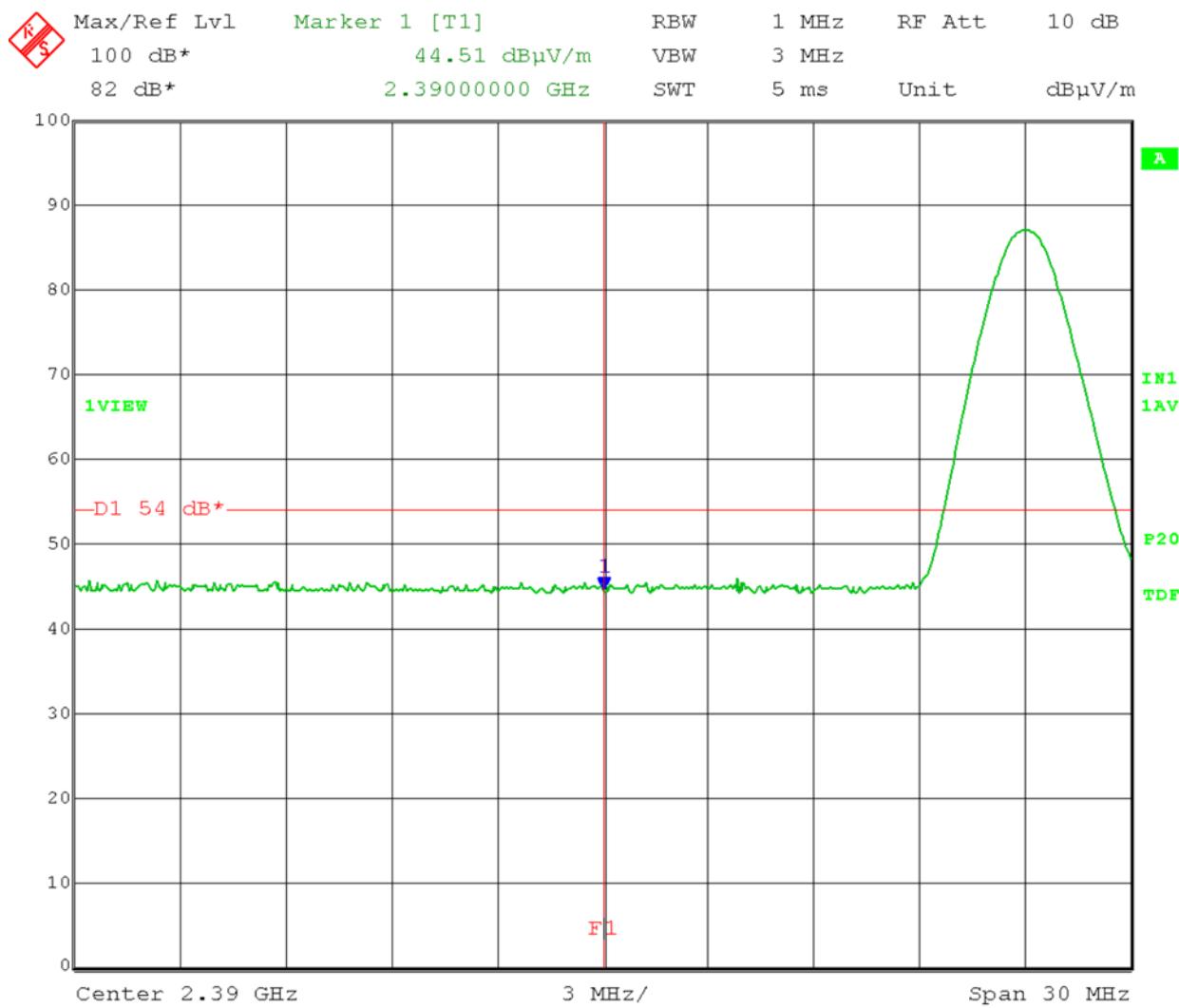
Notes: The EUT was set to transmit continuously (62% Duty Cycle) at its maximum power level at the low and high channels of the operating band. A duty cycle correction factor of 4.152 dB was added to the measured average level. Peak measurements were taken with RBW = 1 MHz, VBW = 3 MHz. Average measurements were taken with RBW = 1 MHz, VBW = 3 MHz.

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: Low Channel: 0 Frequency: 2402 MHz
 Lower Restricted Band-Edge frequency: 2.39 GHz
 Duty cycle correction (95% duty cycle) = $20 \log(1/0.62) = 4.152 \text{ dB}$

Average level at restricted band edge: $44.51 \text{ dB}\mu\text{V/m} + 4.152 \text{ dB} = \mathbf{48.662 \text{ dB}\mu\text{V/m}}$

VERTICAL:

AVERAGE: Limit: 54 dB μ V/m at 3meters



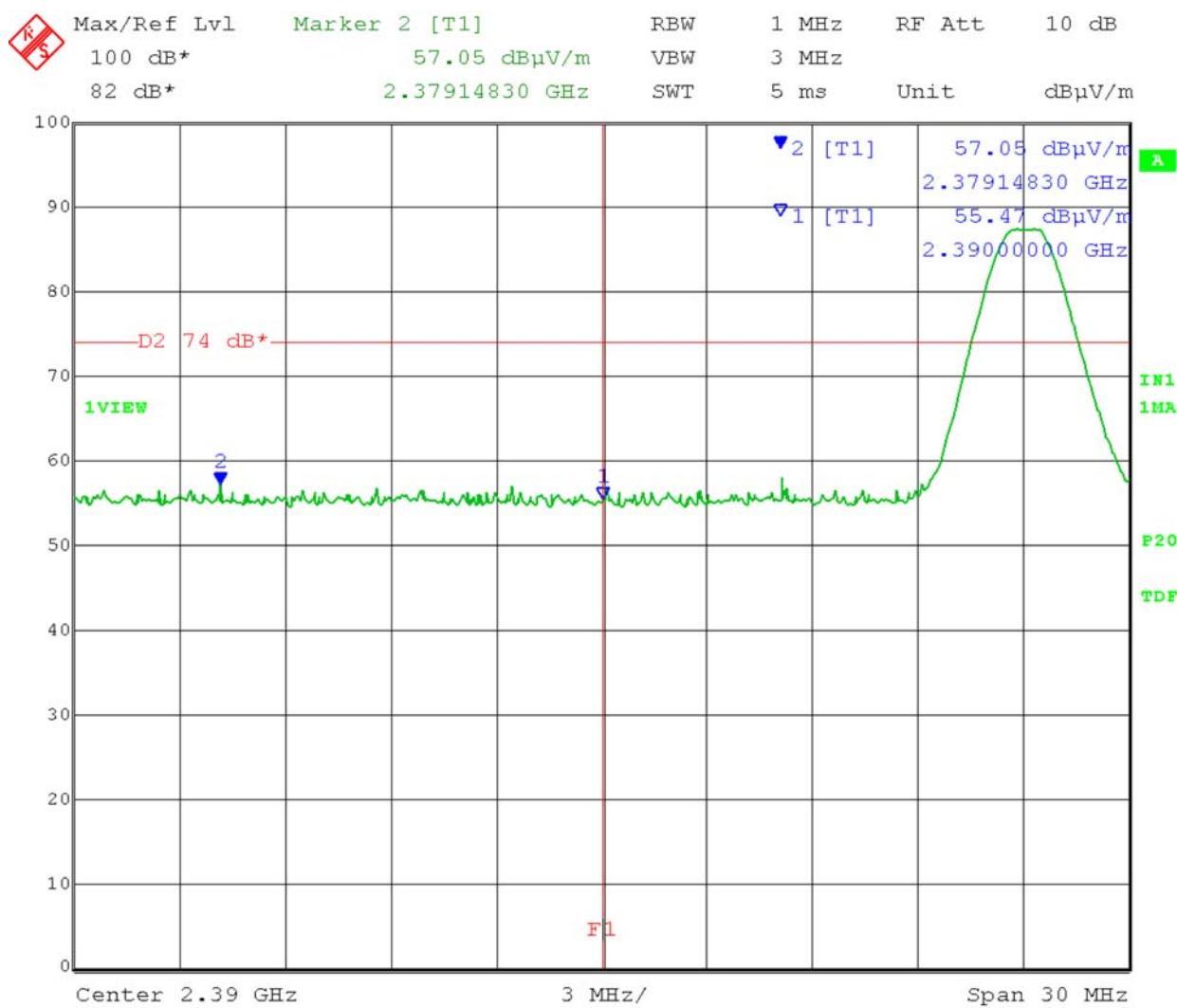
Date: 21.APR.2017 14:00:27

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: Low Channel: 0 Frequency: 2402 MHz
 Lower Restricted Band-Edge frequency: 2.39 GHz

Peak level at restricted band edge: **57.05 dB μ V/m**

VERTICAL:

PEAK: Limit: 74 dB μ V/m at 3meters



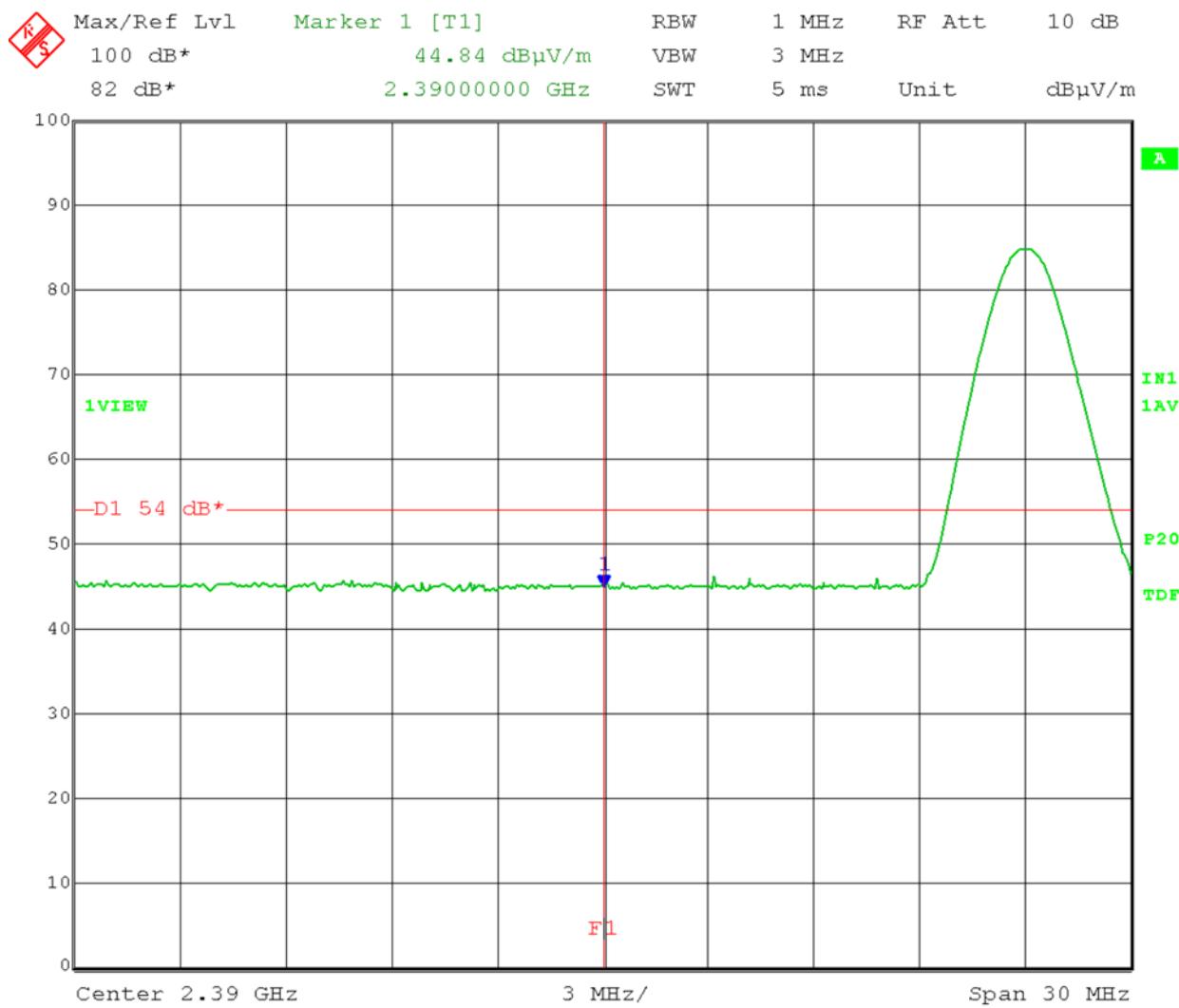
Date: 21.APR.2017 14:02:25

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: Low Channel: 0 Frequency: 2402 MHz
 Lower Restricted Band-Edge frequency: 2.39 GHz
 Duty cycle correction (95% duty cycle) = $20 \log(1/0.62) = 4.152 \text{ dB}$

Average level at restricted band edge: $44.84 \text{ dB}\mu\text{V/m} + 4.152 \text{ dB} = \mathbf{48.992 \text{ dB}\mu\text{V/m}}$

HORIZONTAL:

AVERAGE: Limit: 54 dB μ V/m at 3meters



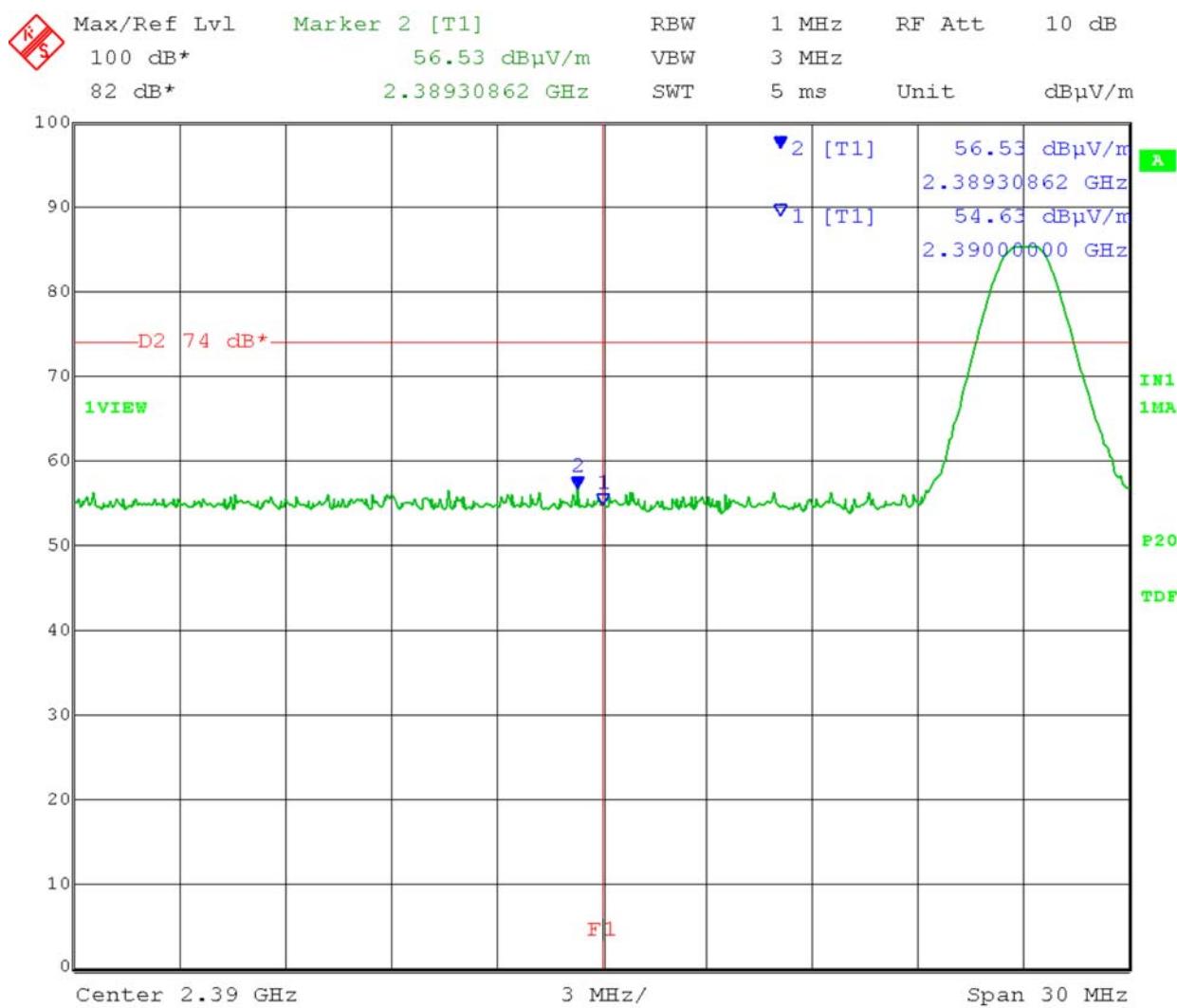
Date: 21.APR.2017 14:13:59

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: Low Channel: 0 Frequency: 2402 MHz
 Lower Restricted Band-Edge frequency: 2.39 GHz

Peak level at restricted band edge: **56.53 dB μ V/m**

HORIZONTAL:

PEAK: Limit: 74 dB μ V/m at 3meters



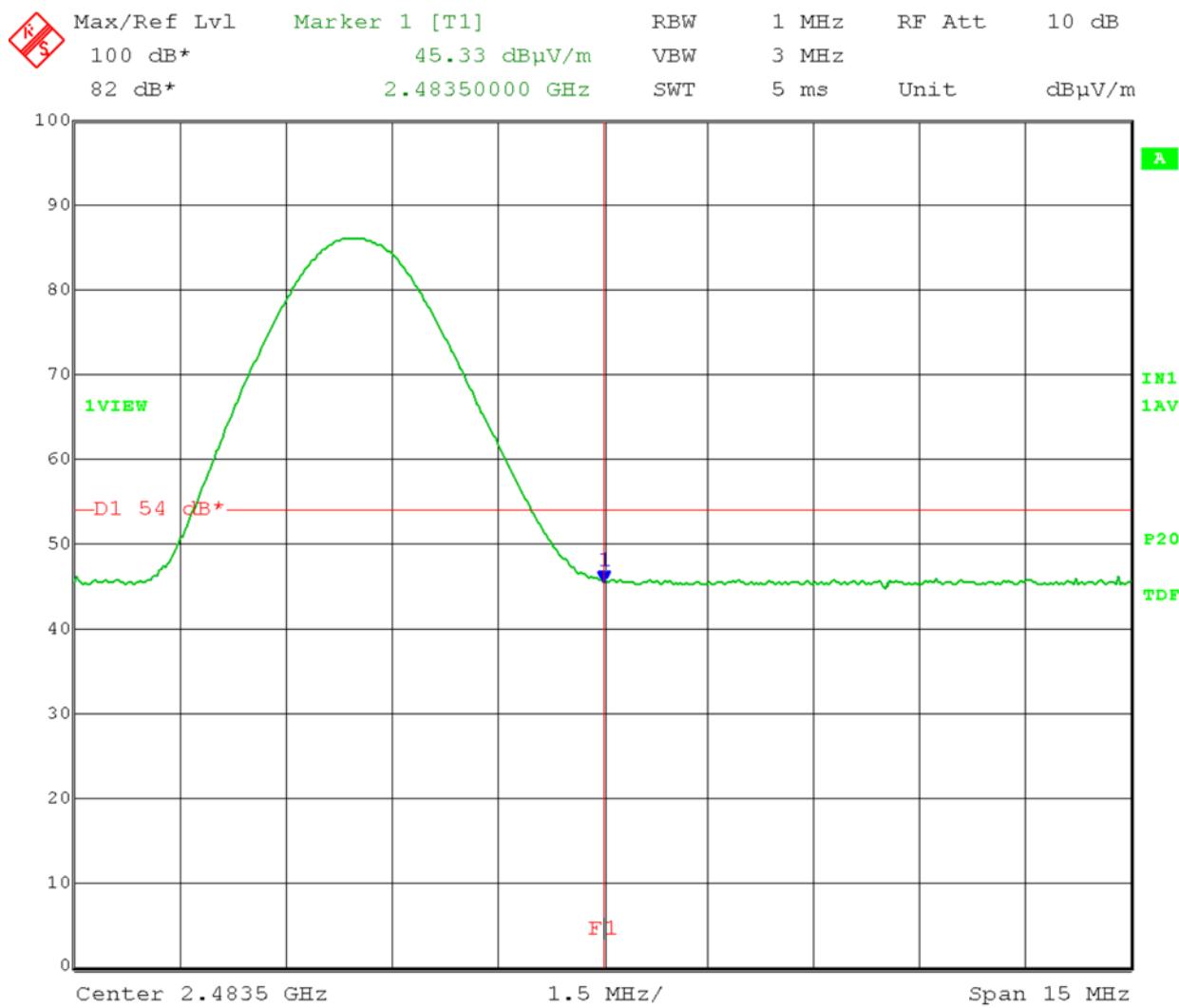
Date: 21.APR.2017 14:15:56

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: High Channel: 78 Frequency: 2480 MHz
 Upper Restricted Band-Edge frequency: 2.4835 GHz
 Duty cycle correction (62% duty cycle) = $20 \log(1/0.62) = 4.152 \text{ dB}$

Average level at restricted band edge: $45.33 \text{ dB}\mu\text{V/m} + 4.152 \text{ dB} = \mathbf{49.482 \text{ dB}\mu\text{V/m}}$

VERTICAL:

AVERAGE: Limit: 54 dB μ V/m at 3meters



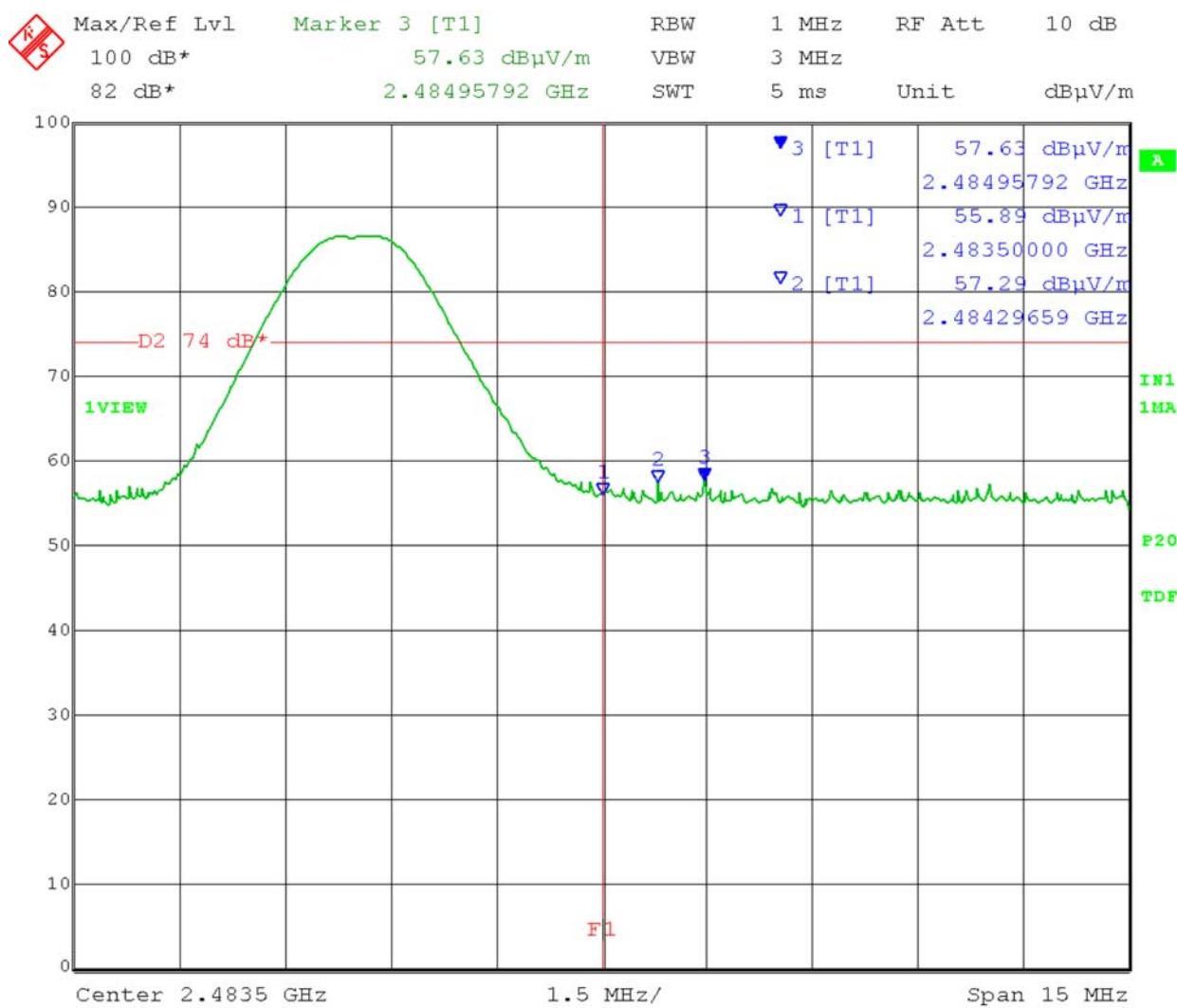
Date: 21.APR.2017 13:40:40

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: High Channel: 78 Frequency: 2480 MHz
 Upper Restricted Band-Edge frequency: 2.4835 GHz

Peak level at restricted band edge: **57.63 dB μ V/m**

VERTICAL:

PEAK: Limit: 74 dB μ V/m at 3meters



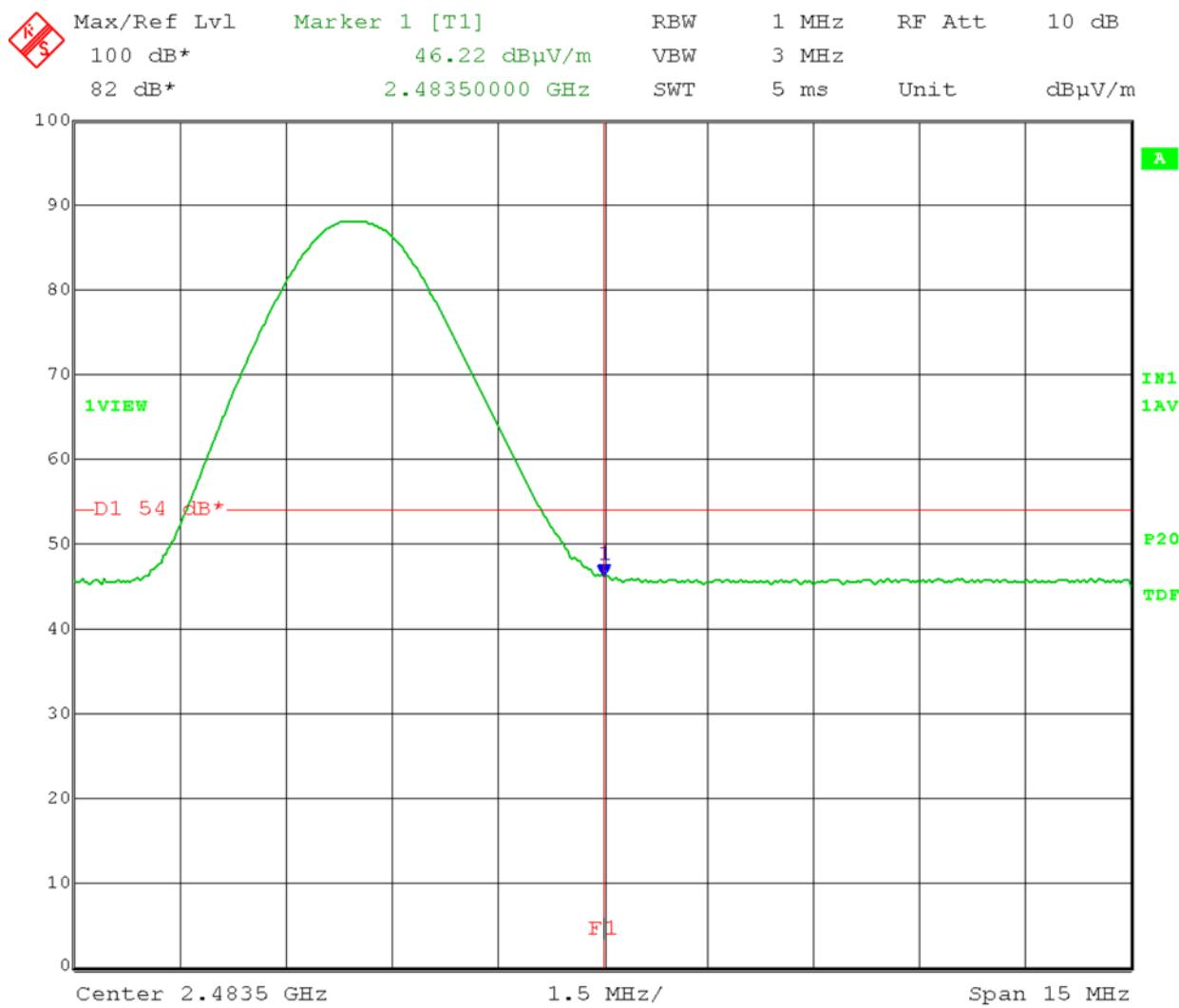
Date: 21.APR.2017 13:39:29

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: High Channel: 78 Frequency: 2480 MHz
 Upper Restricted Band-Edge frequency: 2.4835 GHz
 Duty cycle correction (62% duty cycle) = $20 \log(1/0.62) = 4.152 \text{ dB}$

Average level at restricted band edge: $46.22 \text{ dB}\mu\text{V/m} + 4.152 \text{ dB} = \mathbf{50.372 \text{ dB}\mu\text{V/m}}$

HORIZONTAL:

AVERAGE: Limit: 54 dB μ V/m at 3meters



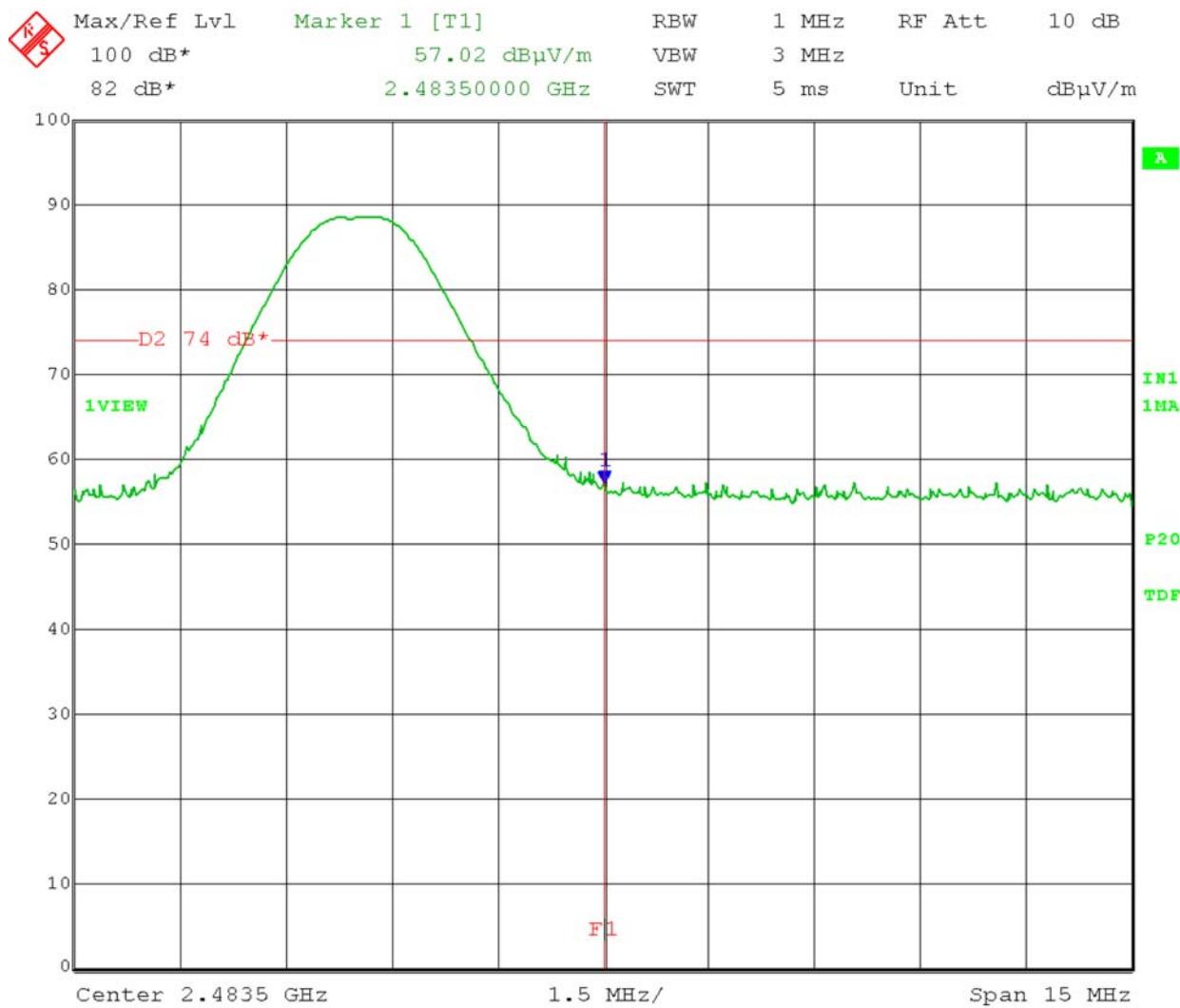
Date: 21.APR.2017 13:28:20

Test Date: 4-21-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Upper Restricted Band-Edge - Radiated
 Operator: Paul L
 Comment: High Channel: 78 Frequency: 2480 MHz
 Upper Restricted Band-Edge frequency: 2.4835 GHz

Peak level at restricted band edge: **57.02 dB μ V/m**

HORIZONTAL:

PEAK: Limit: 74 dB μ V/m at 3meters



Date: 21.APR.2017 13:30:27



Company: Beam Authentic
Model Tested: BEAM1
Report Number: 22720
DLS Project: 8791

166 South Carter, Genoa City, WI 53128

Appendix B

B7.0 Emissions in Non-Restricted Frequency Bands – RF Conducted

Rule Part: FCC Part 15.247(d)

Test Procedure: ANSI C63.10-2013, sections 11.11, 11.11.1, 11.11.2, 11.11.3

Limit: 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. (Device complies with Power Option 1).

Results: Compliant

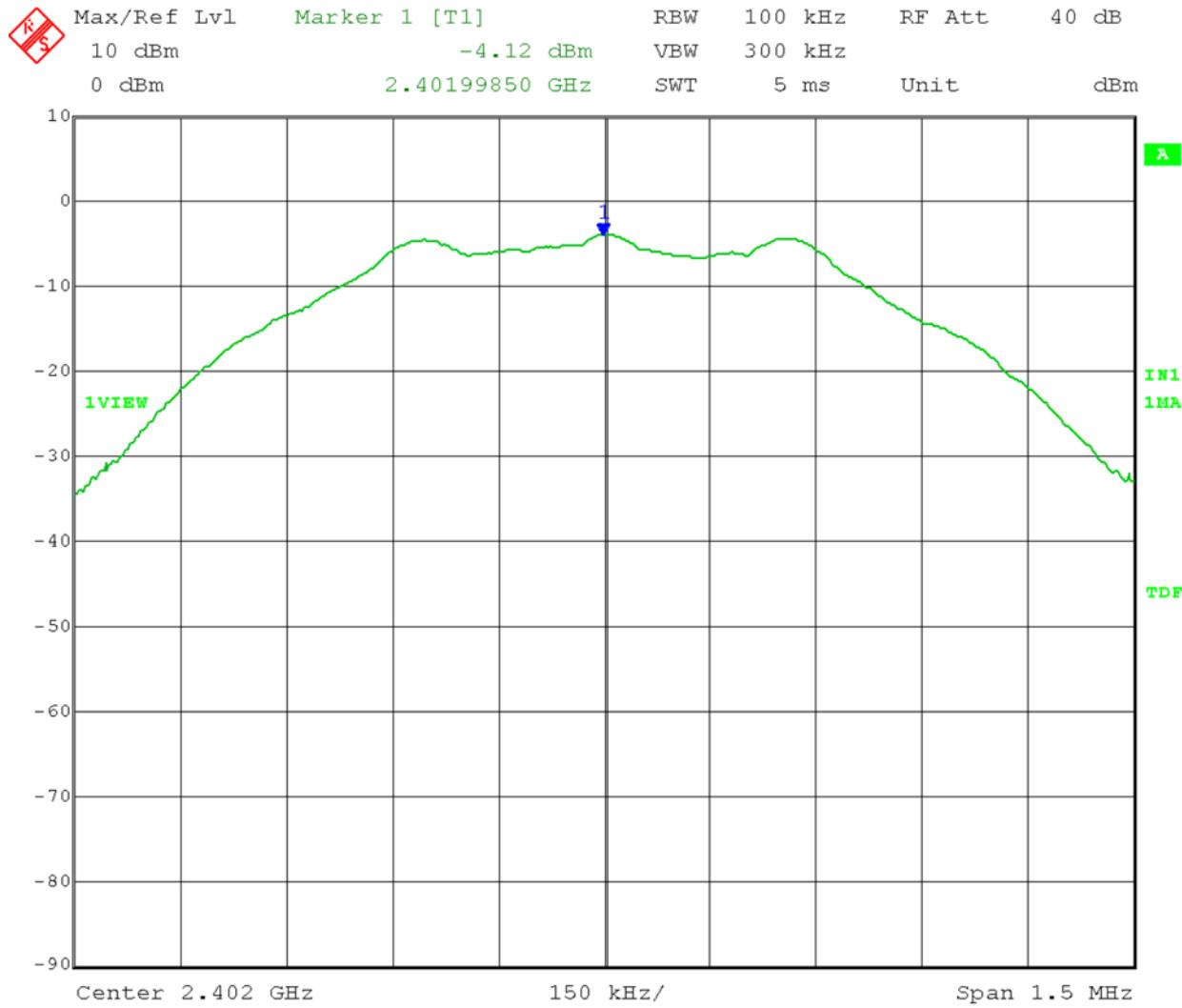
Notes: This was an RF conducted measurement. The EUT was connected to the measuring equipment through a temporary external antenna connector. Cable loss was accounted for in the transducer factors set in the analyzer.

The EUT was set to transmit continuously (62% Duty Cycle) at its maximum power level at the low, middle and high channels of the operating band. A peak detector was used for this test.

Test Date: 4-25-2017
Company: Beam Authentic
EUT: Beam 1
Test: Spurious Emissions - Conducted
Operator: Paul L

Comment: **Low Channel: Ch.0 Frequency: 2402 MHz**
Reference Level: -4.12 dBm
Limit: -4.12 dBm -20 dB = -24.12 dBm

Reference level measurement: -4.12dbm

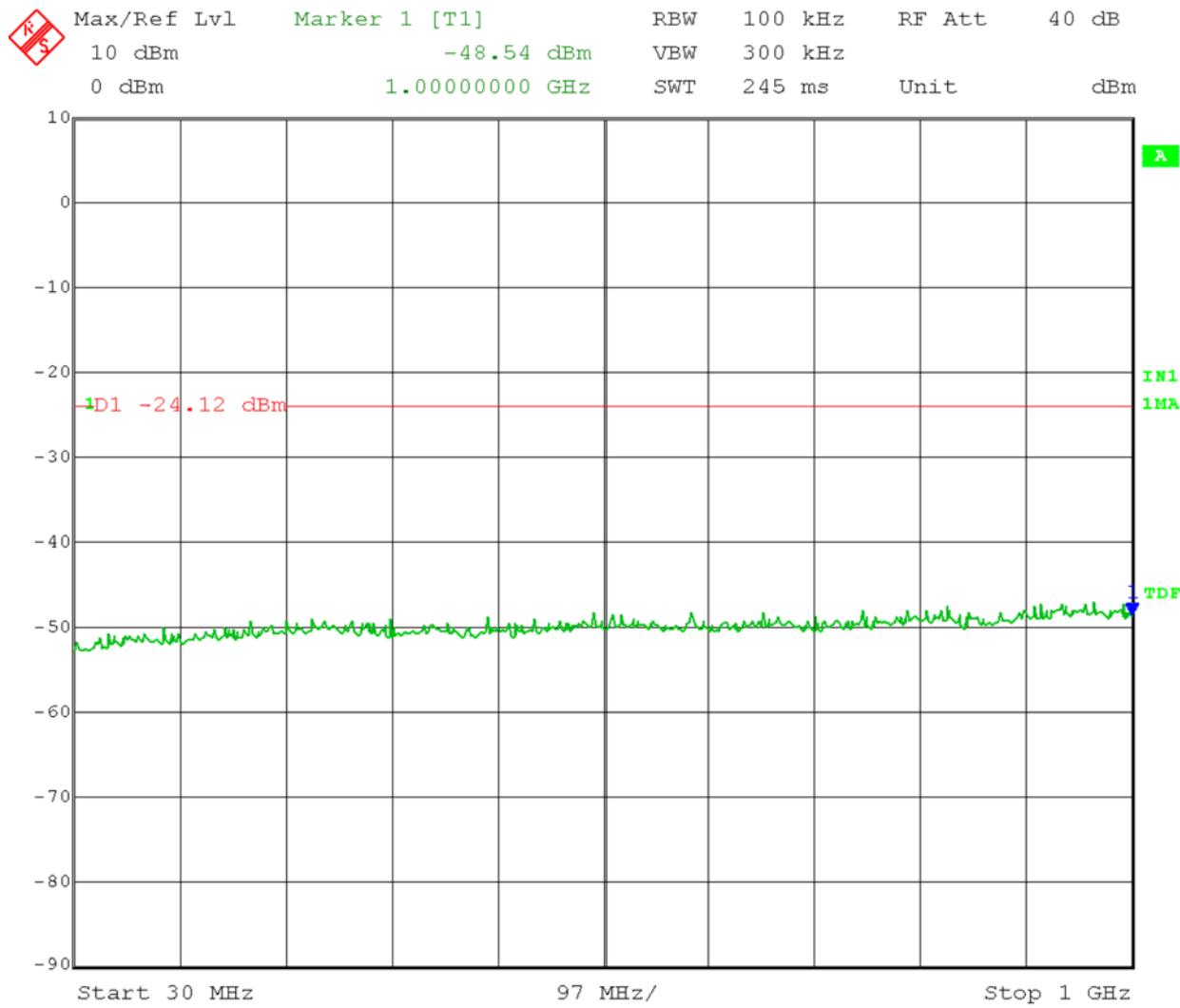


Test Date: 4-25-2017
Company: Beam Authentic
EUT: Beam 1
Test: Spurious Emissions - Conducted
Operator: Paul L

Comment: **Low Channel: Ch.0 Frequency: 2402 MHz**
Reference Level: -4.12 dBm
Limit: -4.12 dBm -20 dB = -24.12 dBm

Reference level measurement: -4.12dbm

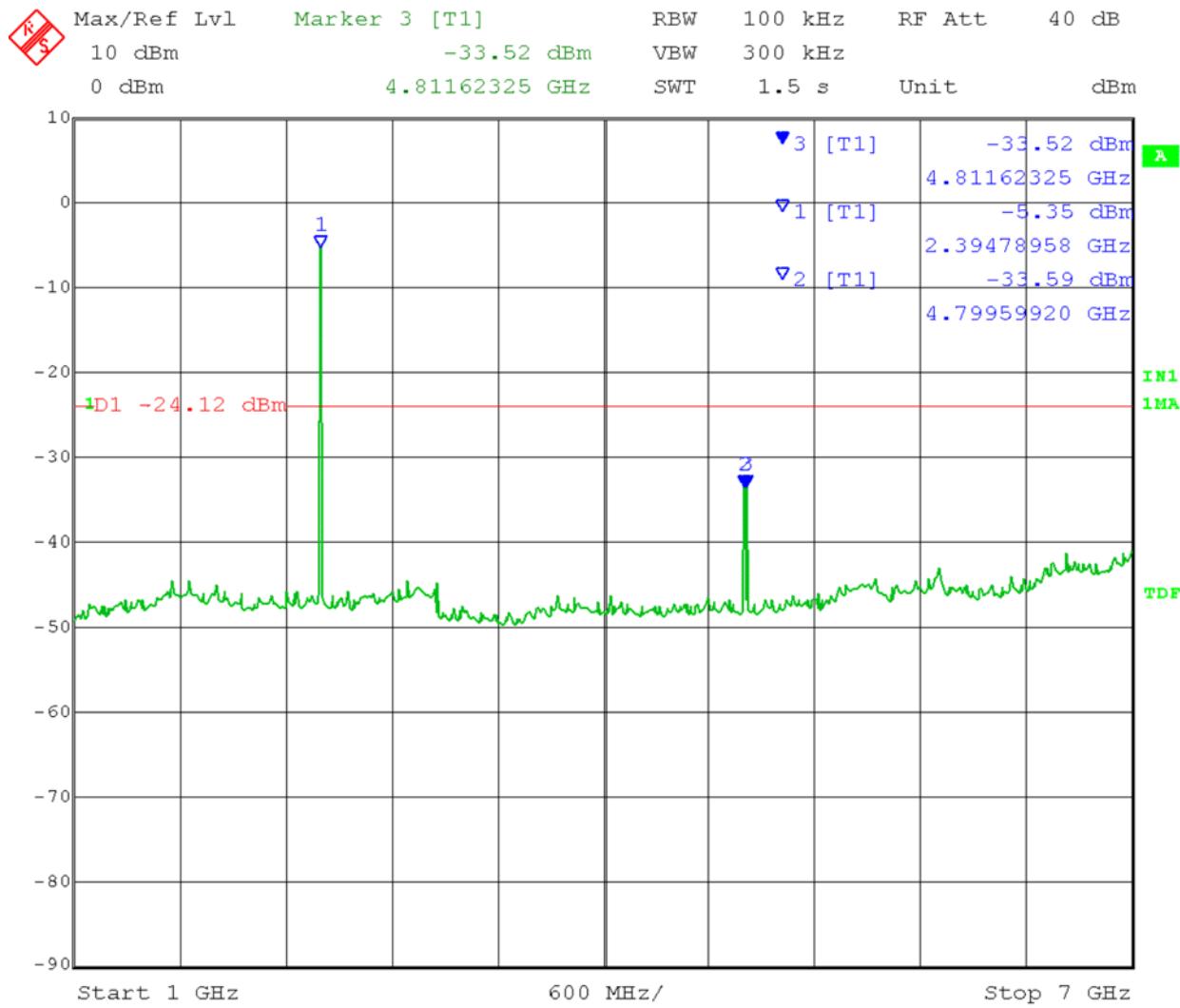
Frequency Range: 30-1000 MHz



Test Date: 4-25-2017
Company: Beam Authentic
EUT: Beam 1
Test: Spurious Emissions - Conducted
Operator: Paul L

Comment: **Low Channel: Ch.0 Frequency: 2402 MHz**
Reference Level: -4.12 dBm
Limit: -4.12 dBm -20 dB = -24.12 dBm

Reference level measurement: -4.12dbm Frequency Range: 1 – 7 GHz

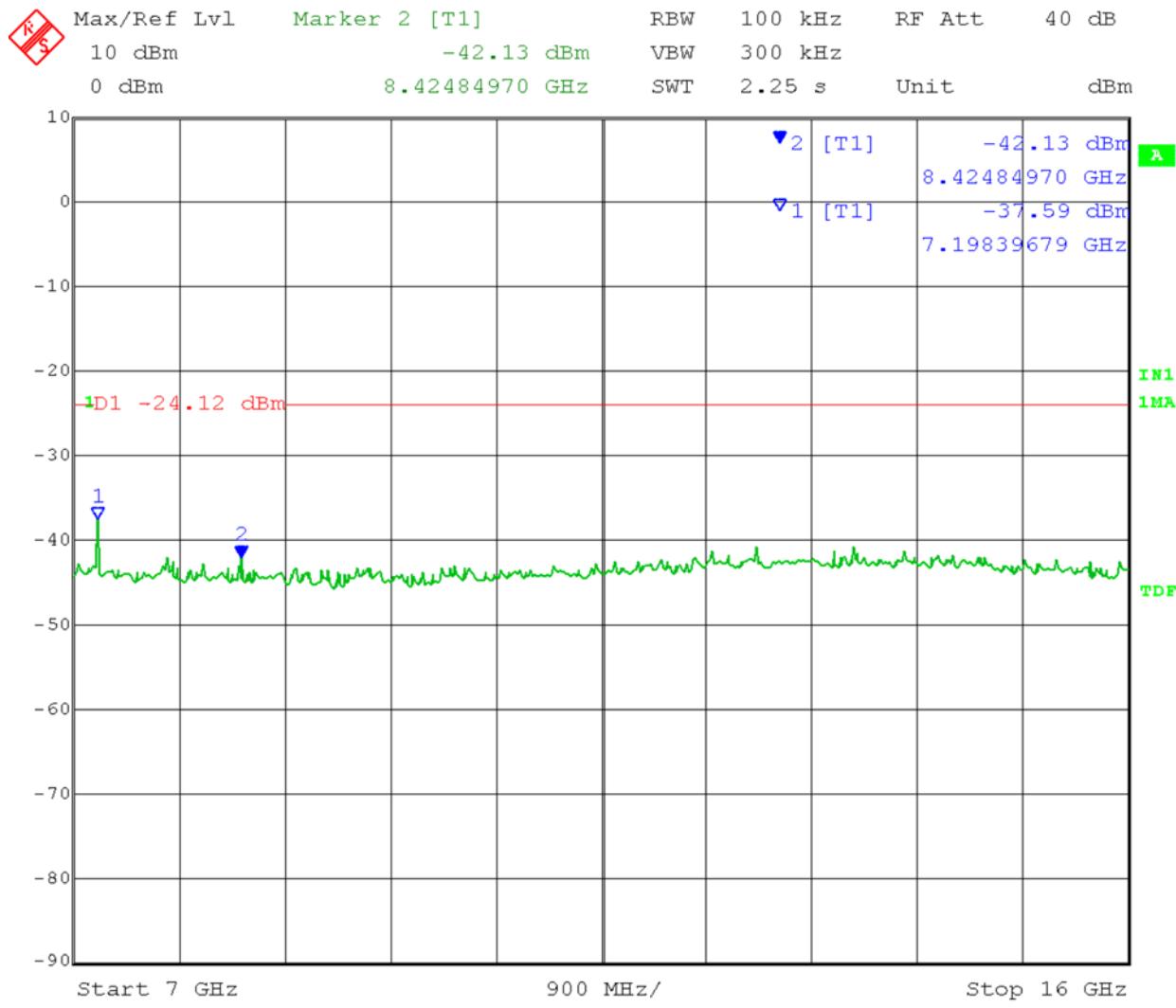


Test Date: 4-25-2017
 Company: Beam Authentic
 EUT: Beam 1
 Test: Spurious Emissions - Conducted
 Operator: Paul L

Comment: **Low Channel: Ch.0 Frequency: 2402 MHz**
 Reference Level: -4.12 dBm
 Limit: -4.12 dBm -20 dB = -24.12 dBm

Reference level measurement: -4.12dbm

Frequency Range: 7 – 16 GHz

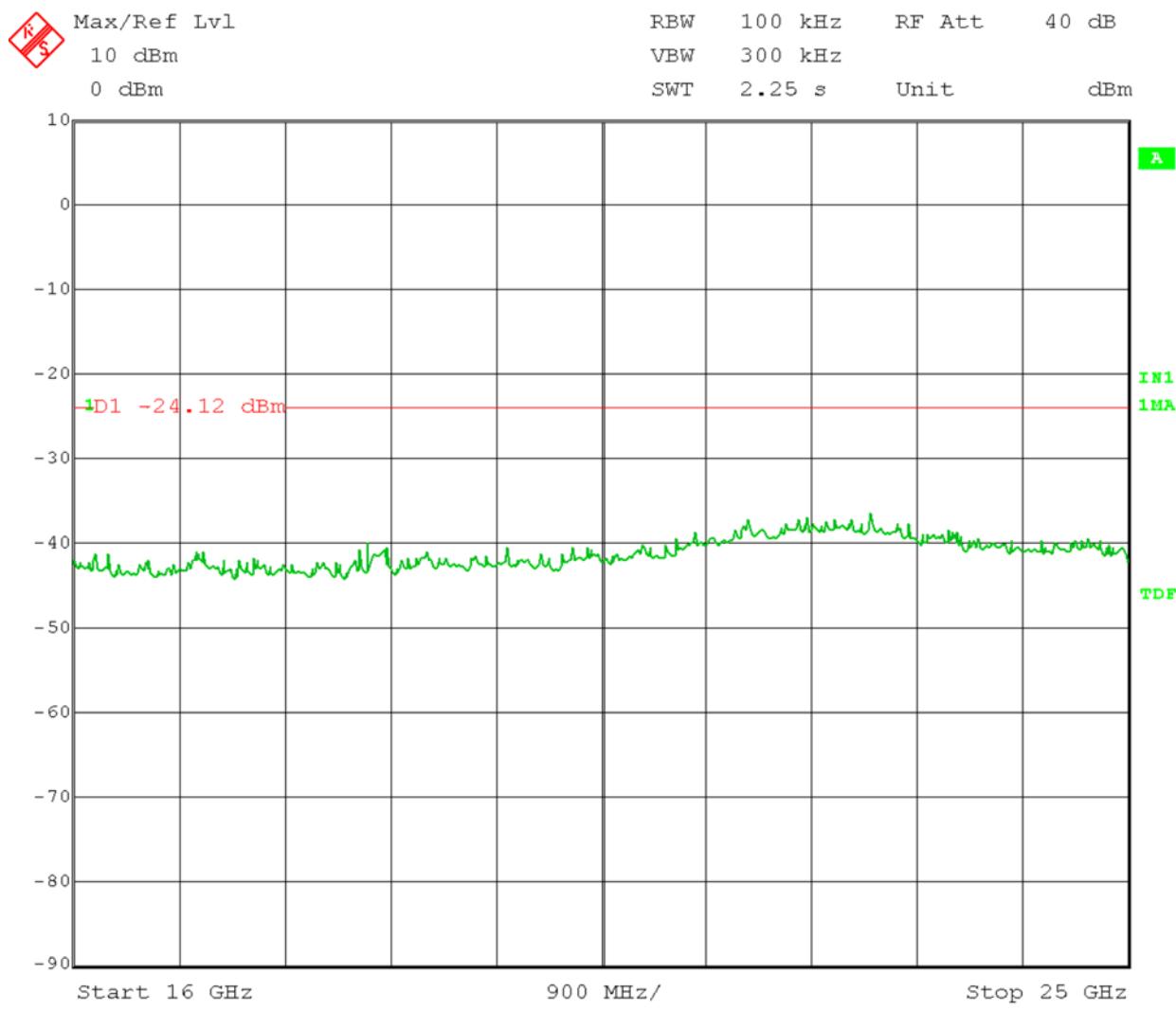


Date: 25.APR.2017 15:36:38

Test Date: 4-25-2017
Company: Beam Authentic
EUT: Beam 1
Test: Spurious Emissions - Conducted
Operator: Paul L

Comment: **Low Channel: Ch.0 Frequency: 2402 MHz**
Reference Level: -4.12 dBm
Limit: -4.12 dBm -20 dB = -24.12 dBm

Reference level measurement: -4.12dbm Frequency Range: 16 – 25 GHz



Date: 25.APR.2017 15:39:03