849 NW State Road 45
Newberry, FL 32669 USA
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352.472.5500
Fax: 352.472.2030
Email: info@timcoengr.com
Website: www.timcoengr.com

FCC PART 15.247 & IC RSS-247

2.4 GHz DTS

TEST REPORT

Applicant	**SKULPT, INC.**
Address	**333 BRYANT ST. , SUITE 330**
	SAN FRANCISCO CA 94107 USA
FCC ID	**2AF43-15**
IC Certification Number	**20757-15**
Model Number	CHISEL
Product Description	FITNESS TRACKING DEVICE
Date Sample Received	10/5/2015
Final Test Date	10/12/2015
Tested By	Cory Leverett
Approved By	Sid Sanders

Report Number	Version Number	Description	Issue Date
2060AUT15TestReport	Rev1	Initial Issue	10/13/2015

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

The test results relate only to the items tested.

Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report
☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025: 2005 requirements.

I attest that the necessary measurements were made, under my supervision, at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name:

Cory Leverett
Engineering Project Manager

Date: 10/13/2015

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GENERAL INFORMATION

EUT Specification

Regulatory Standards	FCC Title 47 CFR Part 15.247 IC RSS-247 Issue 1 IC RSS-GEN Issue 4		
FCC ID	**2AF43-015**		
IC Certification Number	**20757-15**		
Model	CHISEL		
EUT Description	FITNESS TRACKING DEVICE		
Modulation Type	Bluetooth LE (GFSK 1 Mbps)		
Operating Frequency	TX: 2402 – 2480 MHz	RX: 2402 – 2480 MHz	
EUT Power Source	☒ 110–120Vac/50– 60Hz (While in charging Cradle)		
	☐ DC Power		
	☒ Battery Operated		
Test Item	☐ Prototype	☒ Pre-Production	☐ Production
Type of Equipment	☐ Fixed	☐ Mobile	☒ Portable
Antenna Connector	None (Temp Connector Provided for testing)		
Antenna	Integral PCB Chip		
Test Facility	**Timco Engineering Inc. located at 849 NW State Road 45 Newberry, FL 32669 USA.**		
Test Conditions	Temperature: 24-26ºC Relative humidity: 50-65%		
Measurement Standard	ANSI C63.10-2013 (Measurement Procedures) ANSI C63.4-2009 (Radiated Site Validation)		
Test Exercise			

Test Supporting Equipment

Device	Manufacturer	Model	S/N	Supplied By	Used For
Charging Cradle	Skulpt	-	-	Applicant	Charging EUT, Powerline Conducted test

RESULTS SUMMARY

FCC Rule Part No.	IC Standard Ref.	Requirement	Test Item	Result
15.215 (c)	RSS-GEN 6.6	Occupied Bandwidth	99% Bandwidth	Pass
			20 dB Bandwidth	Pass
15.247(a)(e)	RSS-247 § 5.2	Digital Transmission Systems	6 dB Bandwidth	Pass
			Power Spectral Density	Pass
15.247(b)	RSS-247 § 5.4	Transmitter Output Power and Equivalent Isotropically Radiated Power	Peak Power Output (ERP)	Pass
			Antenna Gain (EIRP)	Pass
15.247(d)	RSS-247 § 5.5	Unwanted Emissions	Bandedge	Pass
			Radiated Spurious	Pass

Notes:

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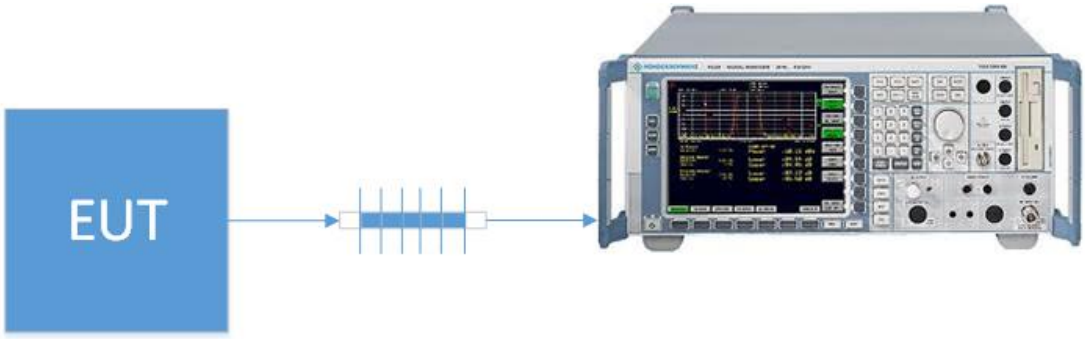
DTS BANDWIDTH

Rules Part No.: FCC 15.247 (a)(2) , IC RSS 247 § 5.2.1

Requirements: The minimum 6 dB bandwidth shall be 500 kHz.

Test Method: ANSI C63.10 § 11.8.1 DTS Bandwidth Option 1

Setup:



Test Data: 6 dB Occupied Bandwidth Measurement Table

Tuned Frequency (MHz)	6 dB BW (KHz)	Limit (KHz)	Margin (KHz)
2402	713.42	≥ 500	213.42
2442	689.37	≥ 500	189.37
2480	761.52	≥ 500	261.52

RESULTS: Meets Requirements

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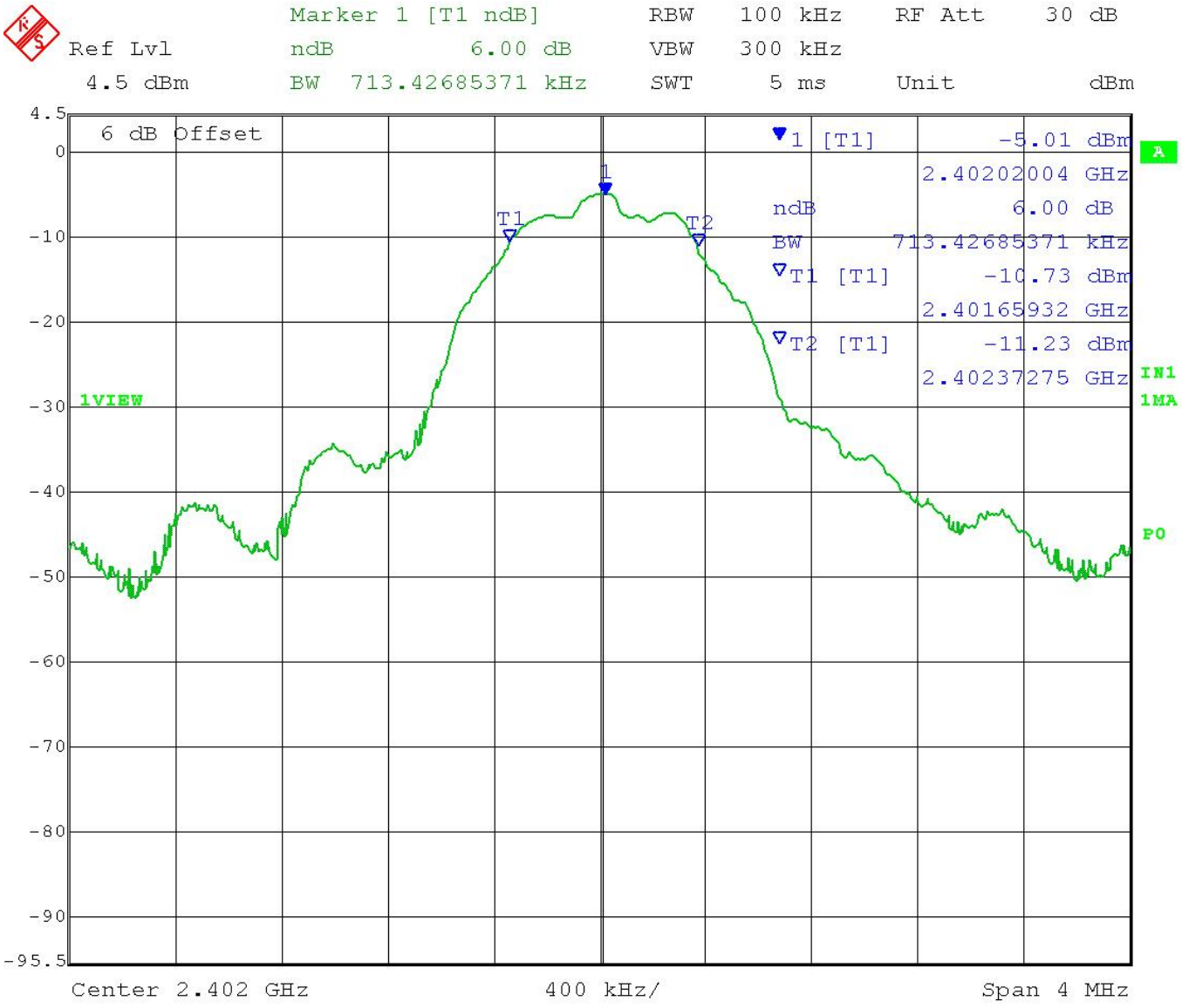
DTS BANDWIDTH

Test Data: **6dB Bandwidth Plot Low End of Band**



Date: 6.OCT.2015 15:33:21

RESULTS: Meets Requirements

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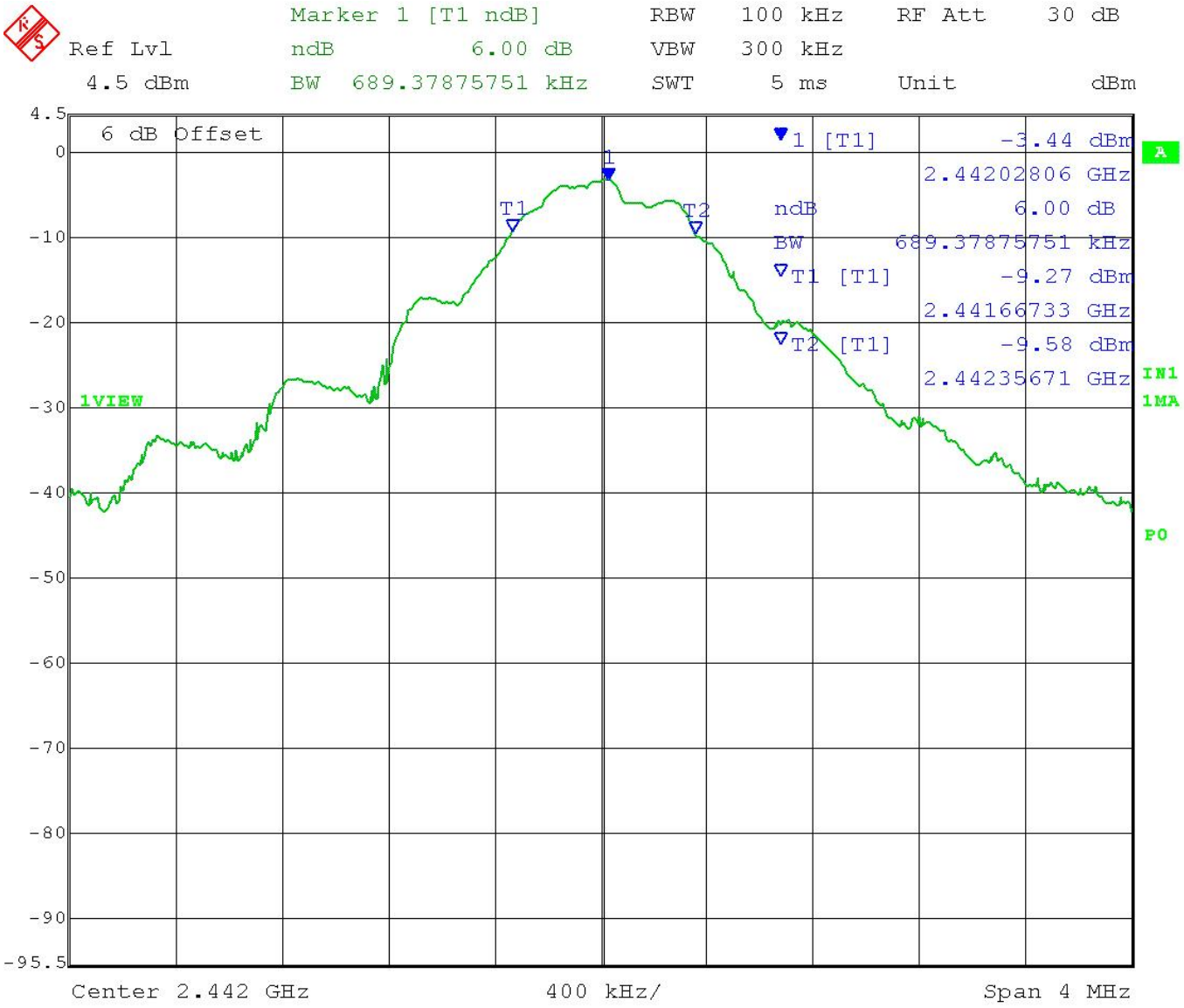
DTS BANDWIDTH

Test Data: **6dB Bandwidth Plot Middle of Band**



Date: 6.OCT.2015 15:31:31

RESULTS: Meets Requirements

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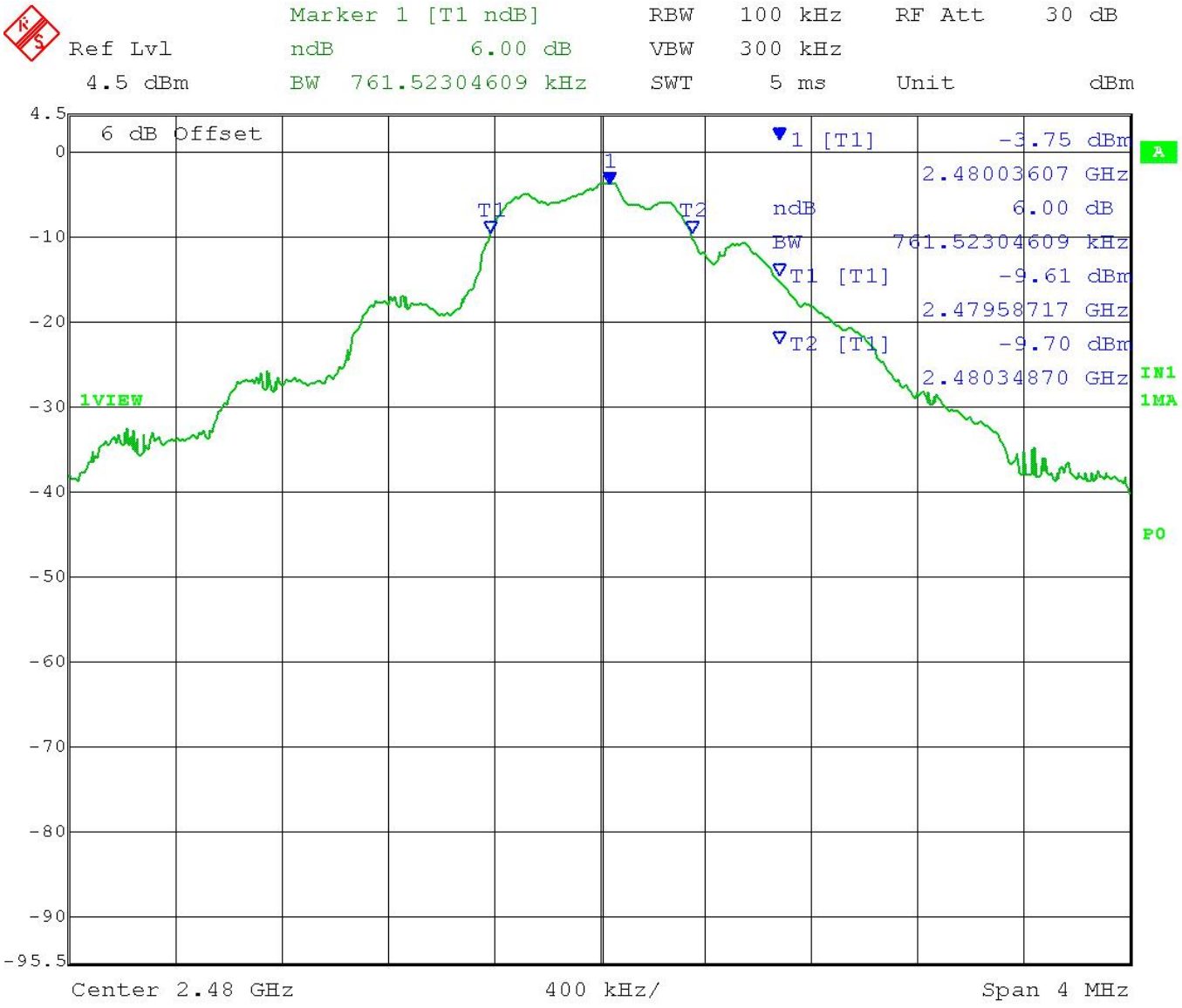
DTS BANDWIDTH

Test Data: **6dB Bandwidth Plot High end of Band**



Date: 6.OCT.2015 15:30:32

RESULTS: Meets Requirements

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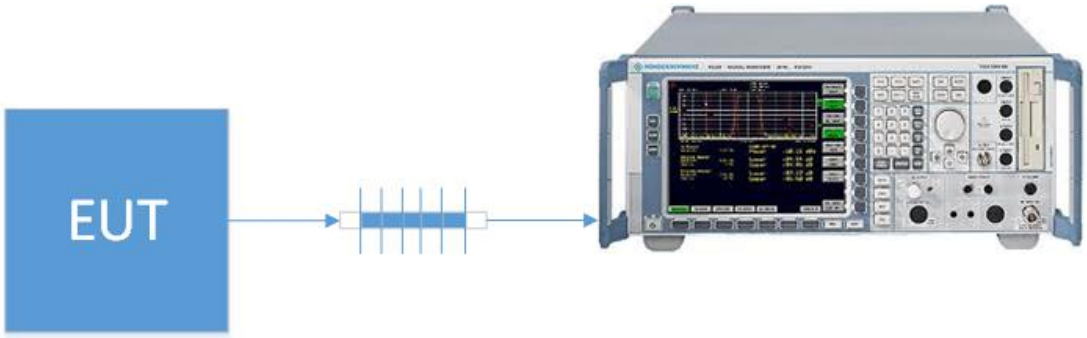
PEAK POWER OUTPUT

Rules Part No.: FCC 15.247(b) (3) (4), IC RSS 247 § 5.4.4

Requirements: Maximum Conducted Peak Power Output shall not exceed 1 Watt
Also the Peak Power Output shall not exceed 4 Watts EIRP

Test Method: ANSI C63.10 § 11.2 Power Limits, definitions, and device configuration
ANSI C63.10 § 11.9.1.1 Fundamental Output Power RBW ≥ DTS Bandwidth
ANSI C63.10 § Annex G Relationship among Field Strength and ERP/EIRP

Setup:



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PEAK POWER OUTPUT

Test Data: **Peak Conducted Power Output Measurement Table**

Peak Conducted Power Output Measurement				
Tuned Frequency (MHz)	Level (dBm)	ERP (W)	Limit (W)	Margin (W)
2402	-4.63	0.00034	1.00	0.99966
2442	-3.14	0.00049	1.00	0.99951
2480	-3.42	0.00045	1.00	0.99955

ERP to EIRP Conversion formula: EIRP = ERP + 2.15 dB

Peak EIRP Power Output Calculation				
Tuned Frequency (MHz)	ERP (dBm)	EIRP (W)	Limit (W)	Margin (W)
2402	-4.63	0.00056	4.00	3.99944
2442	-3.14	0.00080	4.00	3.99920
2480	-3.42	0.00075	4.00	3.99925

RESULTS: Meets Requirements

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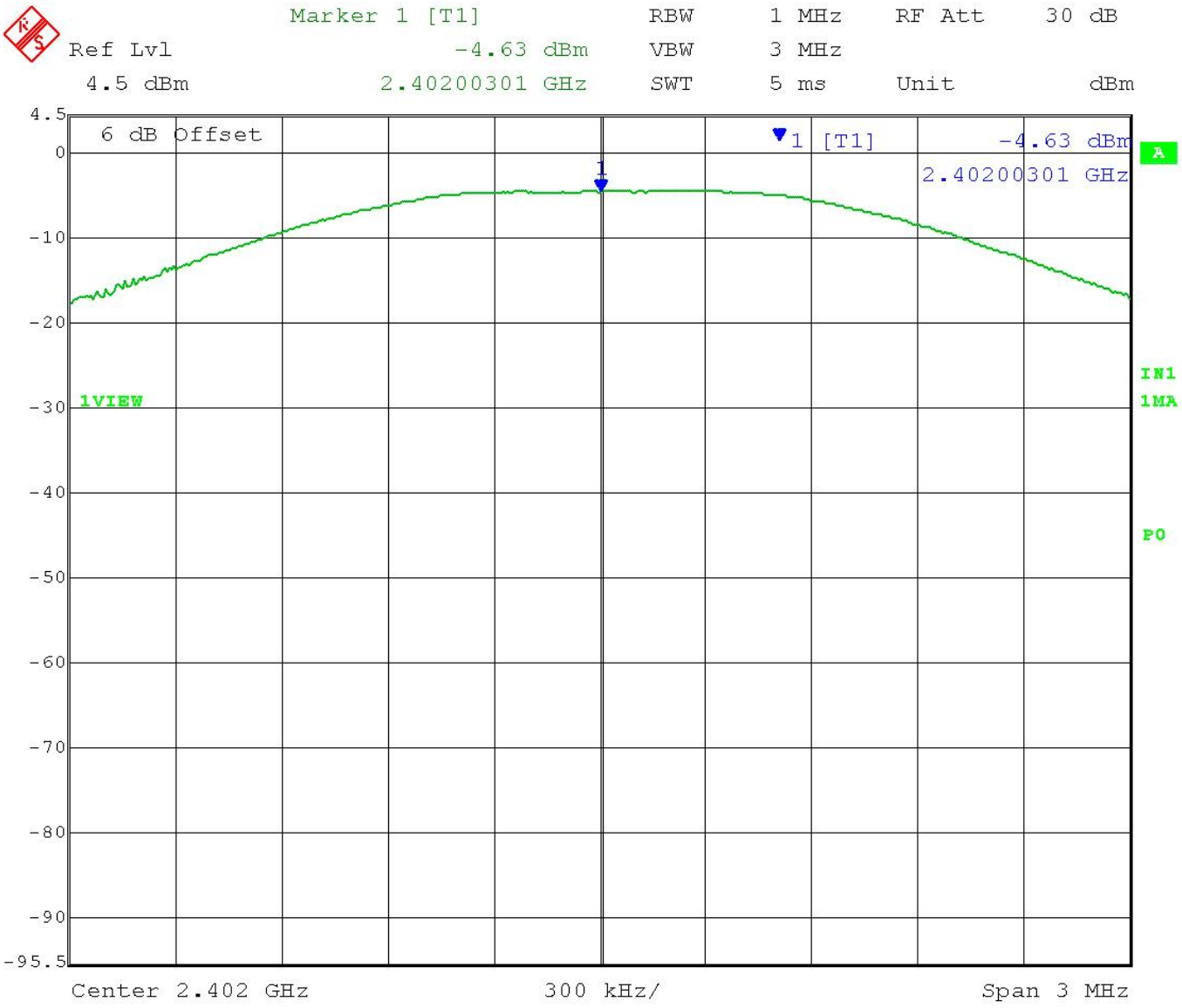
PEAK POWER OUTPUT

Test Data: **Peak Power Output Plot Low End of Band**



Date: 6.OCT.2015 15:56:37

RESULTS: Meets Requirements

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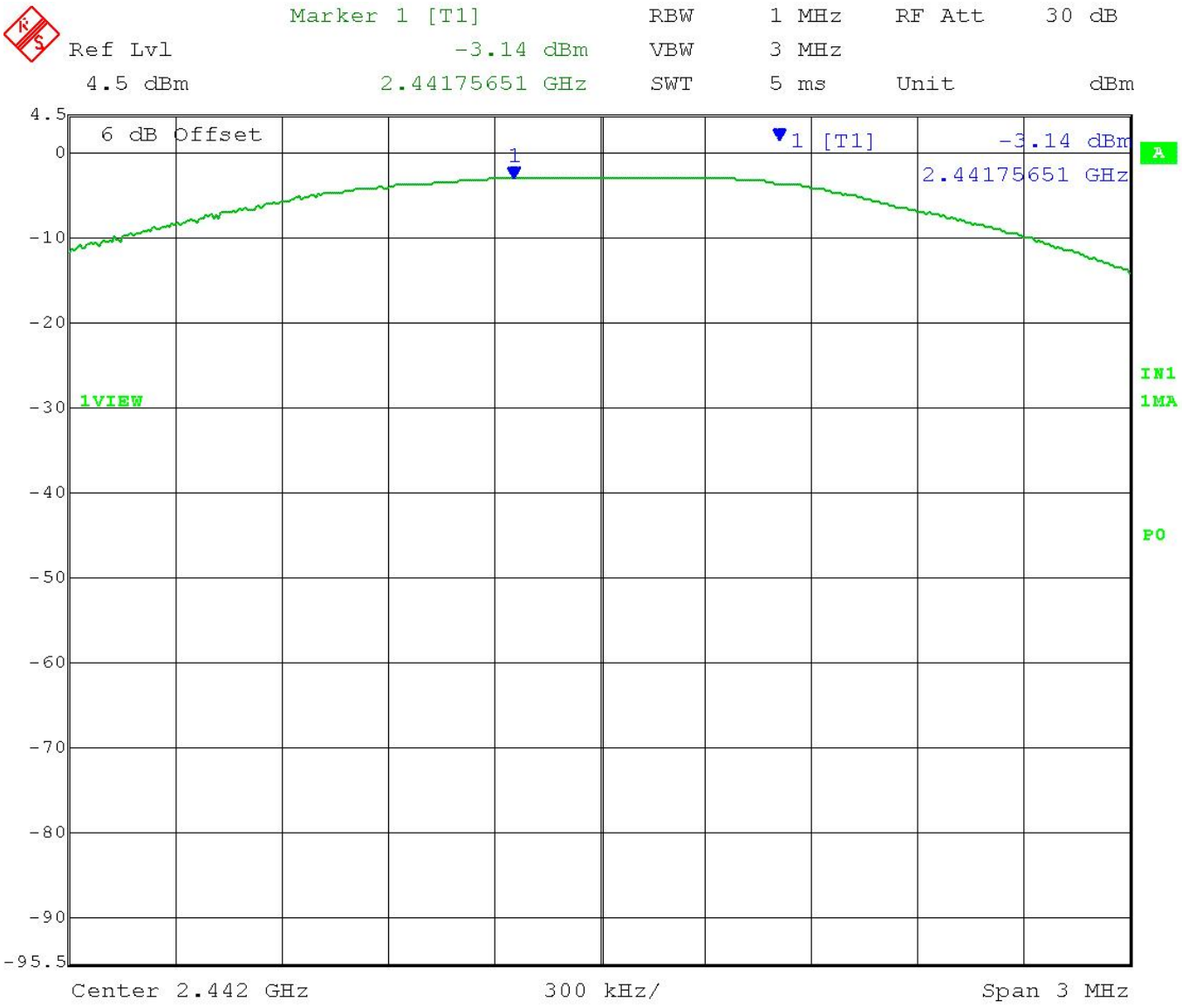
PEAK POWER OUTPUT

Test Data: **Peak Power Output Plot Middle of Band**



Date: 6.OCT.2015 15:57:31

RESULTS: Meets Requirements

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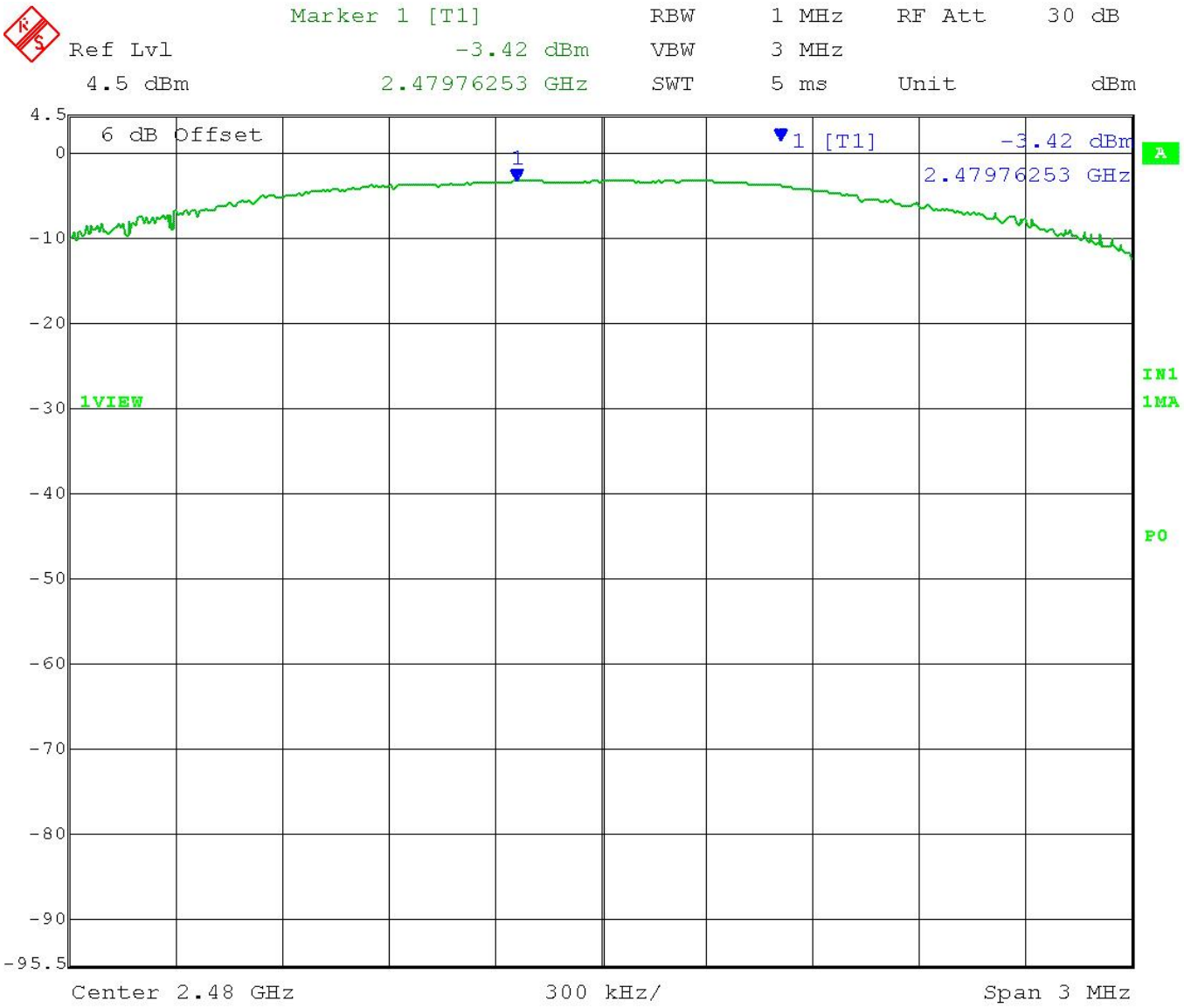
PEAK POWER OUTPUT

Test Data: **Peak Power Output High End of Band**



Date: 6.OCT.2015 15:58:20

RESULTS: Meets Requirements

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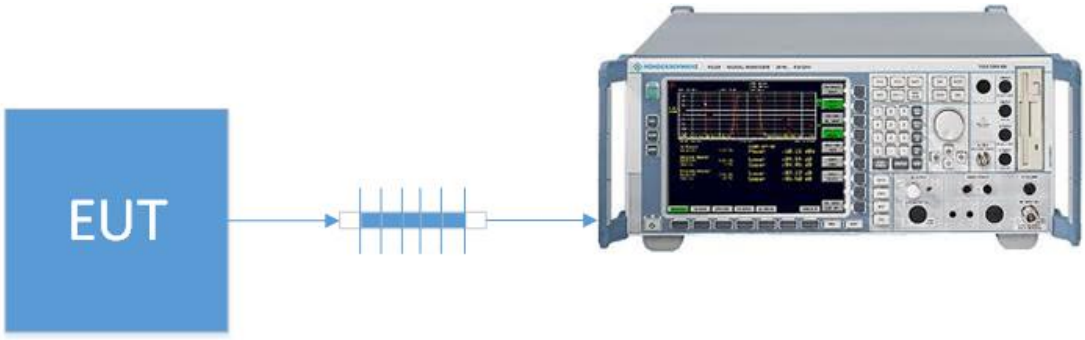
POWER SPECTRAL DENSITY

Rules Part No.: FCC 15.247(e), IC RSS 247 § 5.2.2

Requirements: The transmitter power spectral density conducted from the transmitter to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

Test Method: ANSI C63.10 § 11.2 Power Limits, definitions, and device configuration
ANSI C63.10 § 11.10.2 Maximum PSD in the fundamental- Method PKPSD

Setup:



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POWER SPECTRAL DENSITY

Test Data: **Power Spectral Density Measurement Table**

Peak Conducted Power Spectral Density			
Tuned Frequency (MHz)	Level (dBm/3KHz)	Limit (dBm/3KHz)	Margin (dB)
2402	-6.32	8.00	14.32
2442	-4.73	8.00	12.73
2480	-5.00	8.00	13.00

RESULTS: Meets Requirements

Table of Contents

POWER SPECTRAL DENSITY

Test Data: **Power Spectral Density Plot Low End of Band**

RESULTS: Meets Requirements

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POWER SPECTRAL DENSITY

Test Data: **Power Spectral Density Plot Middle of Band**

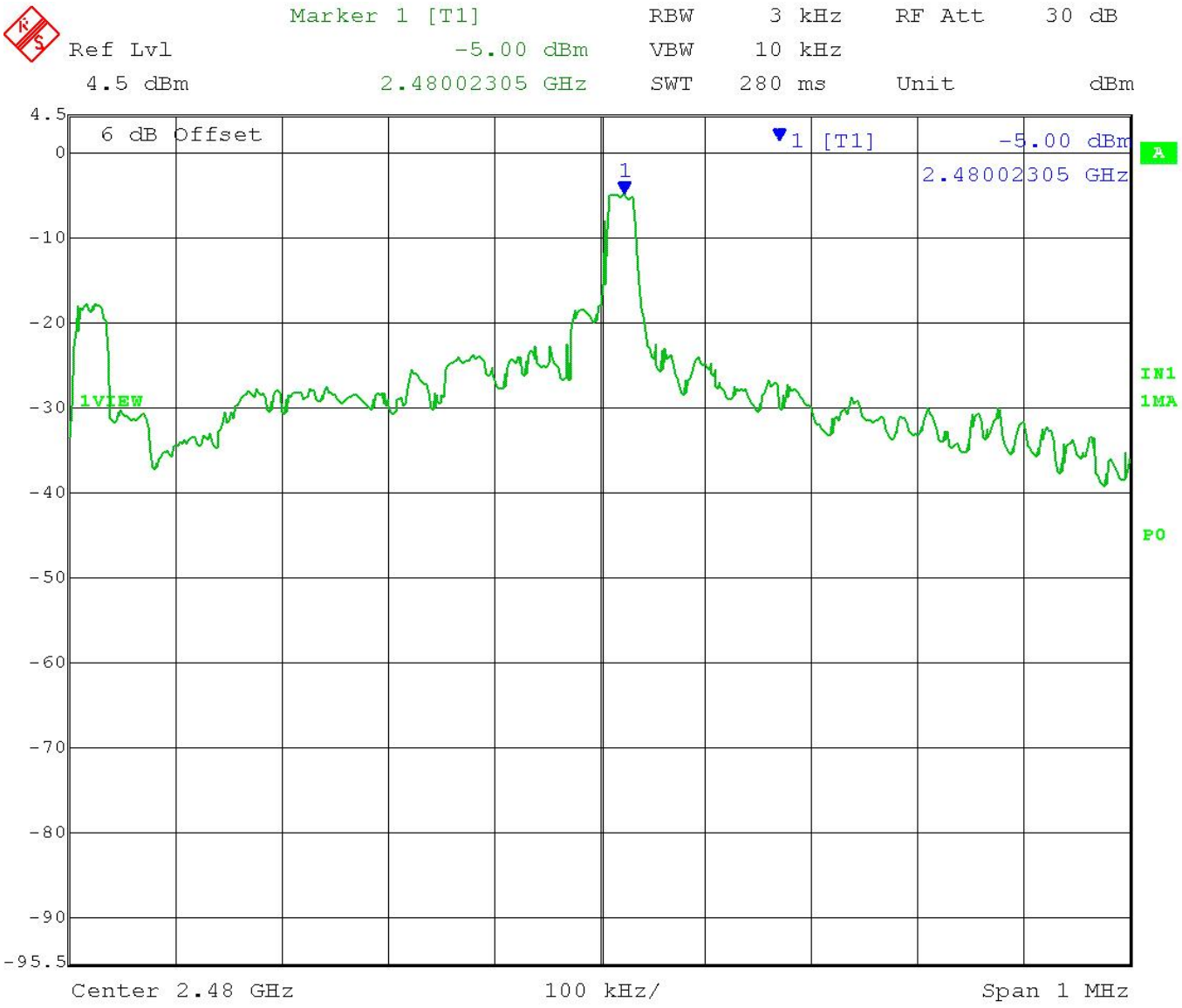
Date: 6.OCT.2015 16:01:29

RESULTS: Meets Requirements

Table of Contents

POWER SPECTRAL DENSITY

Test Data: **Power Spectral Density Plot High End of Band**



Date: 6.OCT.2015 16:00:20

RESULTS: Meets Requirements

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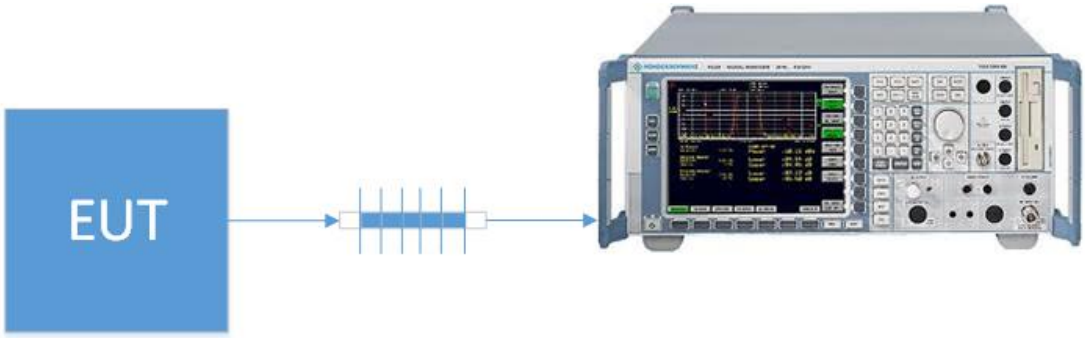
OCCUPIED BANDWIDTH

Rules Part No.: FCC 15.215 (c), IC RSS GEN § 6.6

Requirements: The 20 dB Bandwidth shall remain inside the band of operation.
The 99% Bandwidth is for reporting only.

Test Method: ANSI C63.10 § 6.9.2 Occupied Bandwidth- Relative procedure
ANSI C63.10 § 6.9.3 Occupied Bandwidth- 99% Power Bandwidth procedure

Setup:



Test Data: **Occupied Bandwidth Measurement Table**

Tuned Frequency (MHz)	20 dB BW (MHz)	99% BW (MHz)
2402	1.11	1.05
2442	1.10	1.29
2480	1.15	1.60

RESULTS: Meets Requirements

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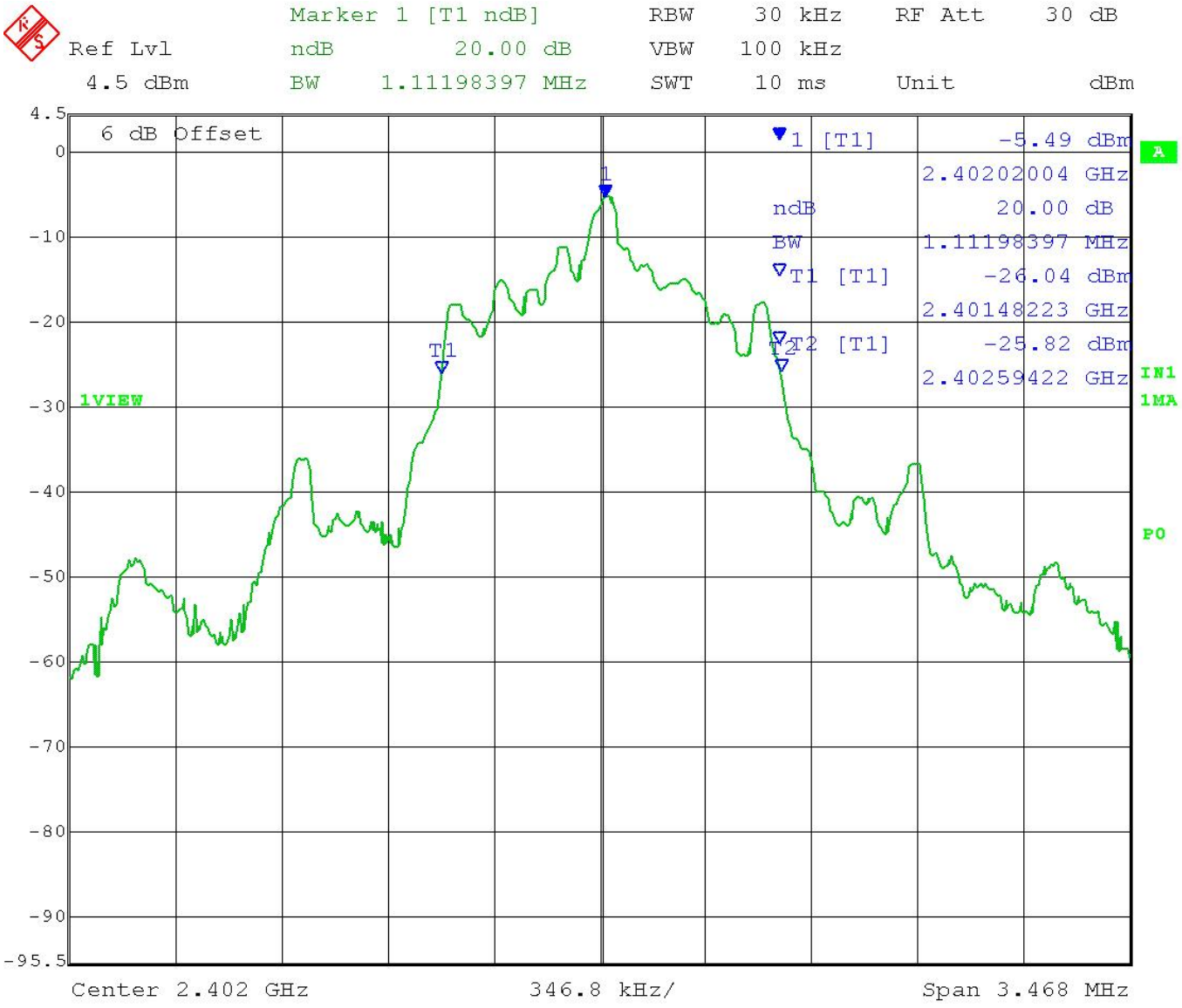
OCCUPIED BANDWIDTH

Test Data: **20 dB Bandwidth Plot Low End of Band**



Date: 6.OCT.2015 15:37:12

RESULTS: Meets Requirements

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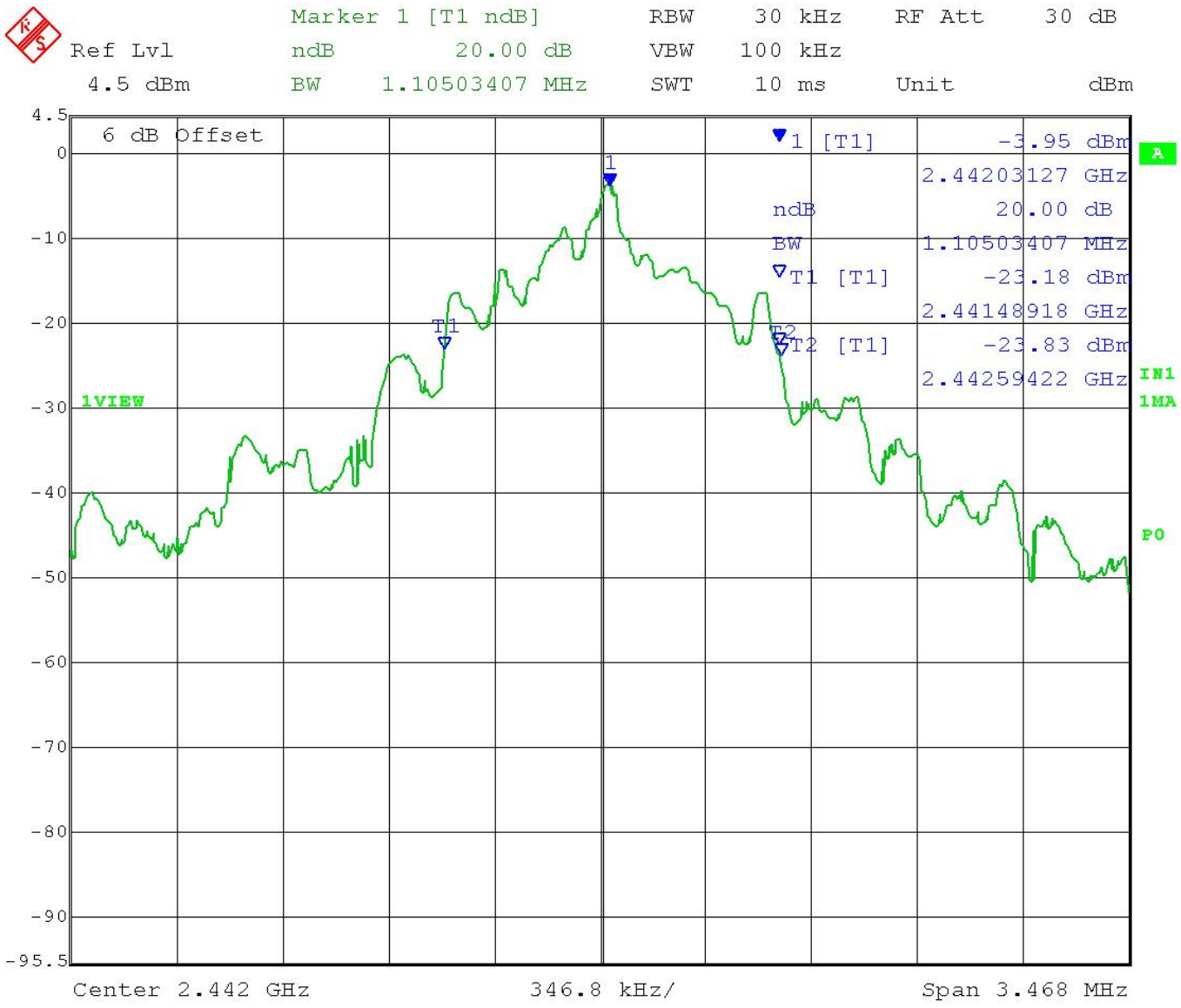
OCCUPIED BANDWIDTH

Test Data: **20 dB Bandwidth Plot Middle of Band**



Date: 6.OCT.2015 15:38:51

RESULTS: Meets Requirements

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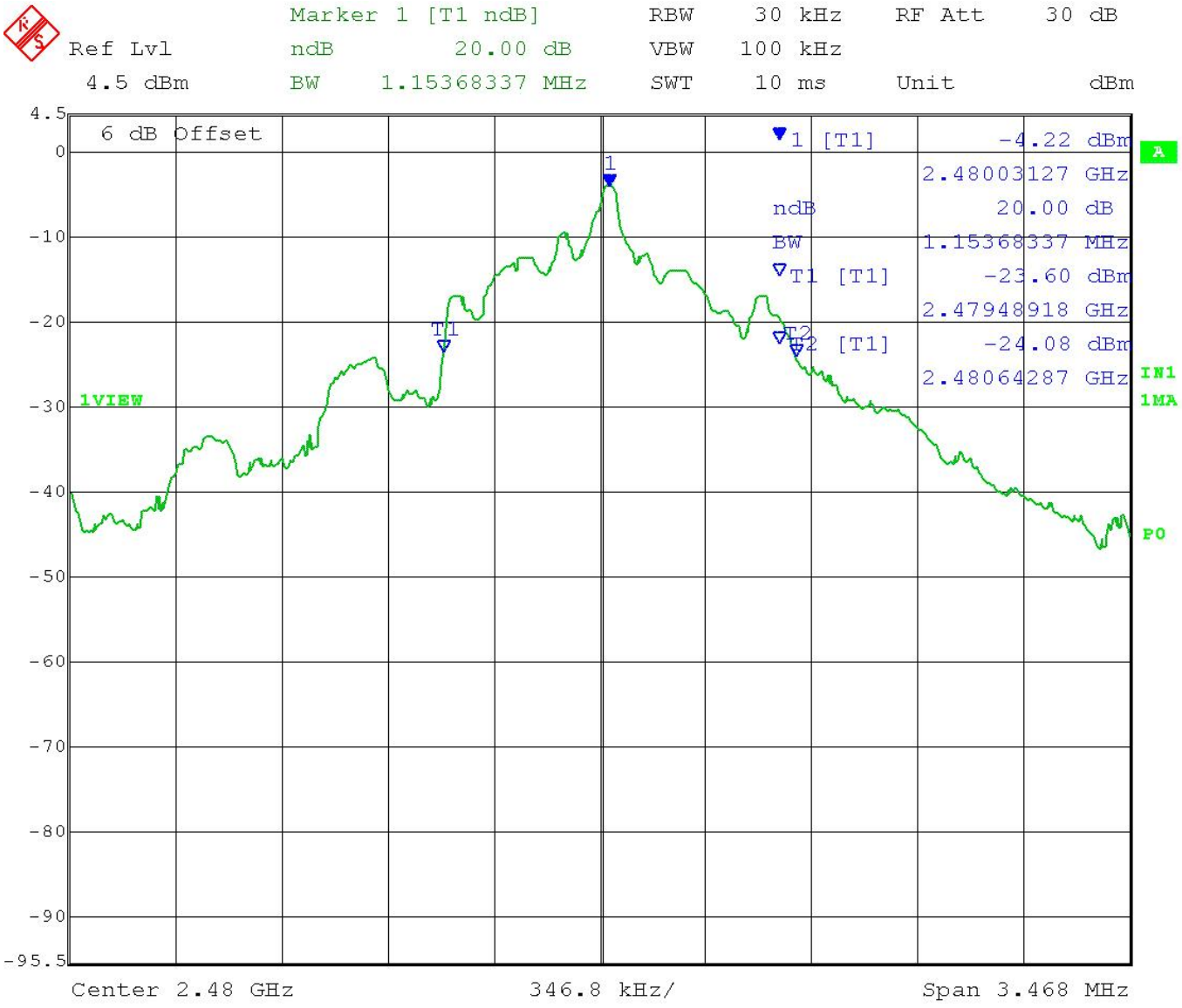
OCCUPIED BANDWIDTH

Test Data: **20 dB Bandwidth Plot High end of Band**



Date: 6.OCT.2015 15:39:43

RESULTS: Meets Requirements

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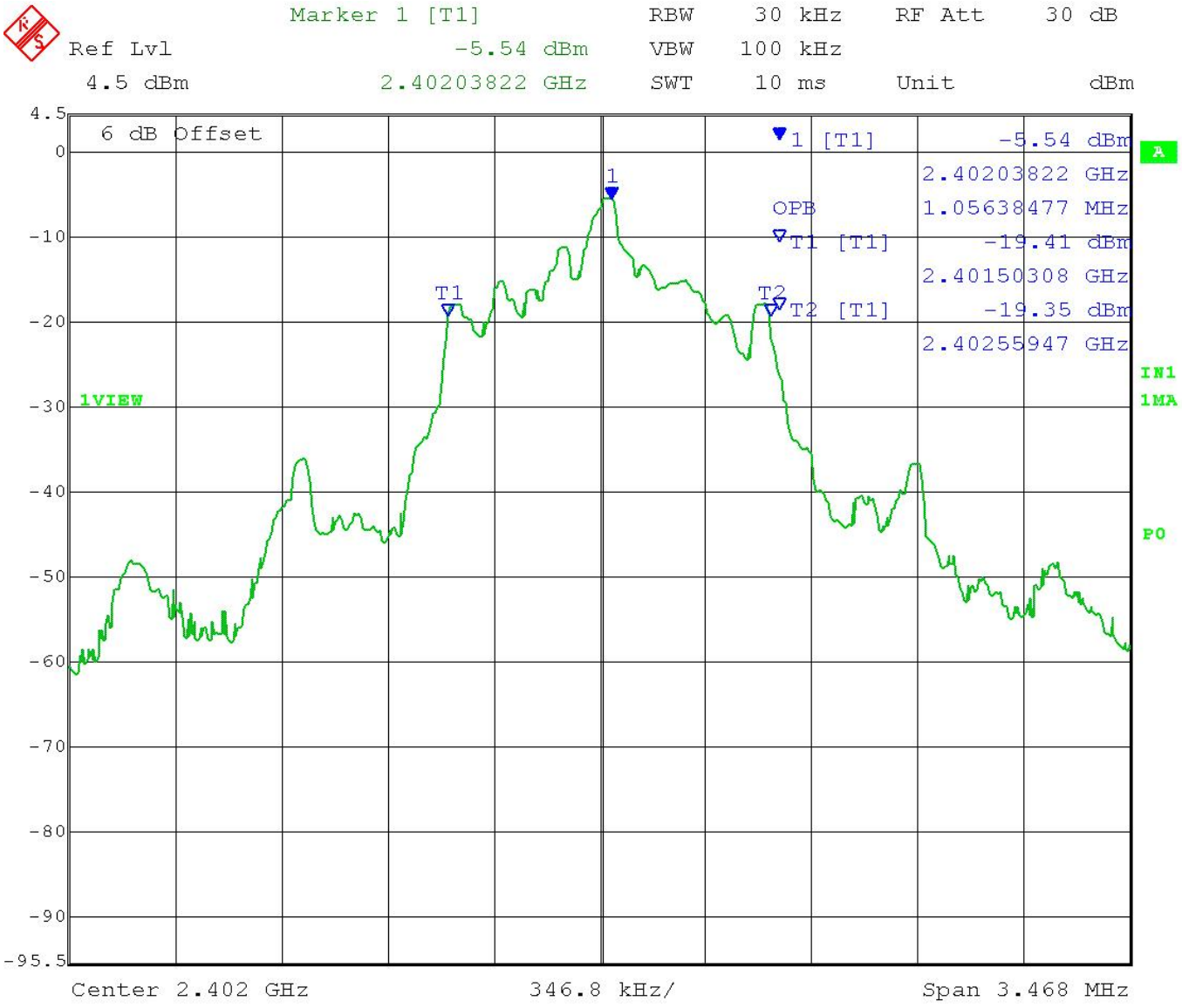
OCCUPIED BANDWIDTH

Test Data: **99% Bandwidth Low End of Band**



Date: 6.OCT.2015 15:47:06

RESULTS: Meets Requirements

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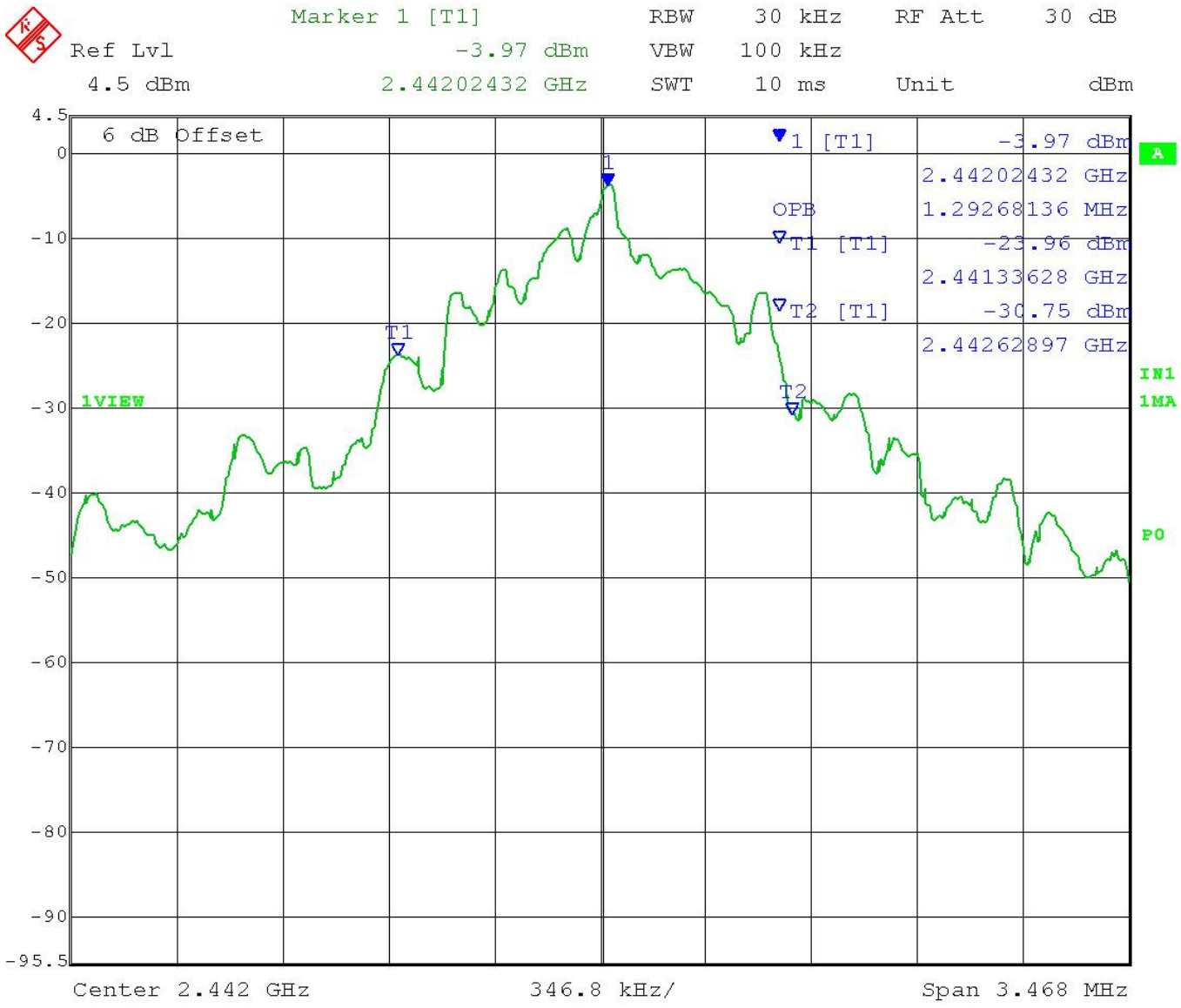
OCCUPIED BANDWIDTH

Test Data: **99% Bandwidth Middle of Band**



Date: 6.OCT.2015 15:45:56

RESULTS: Meets Requirements

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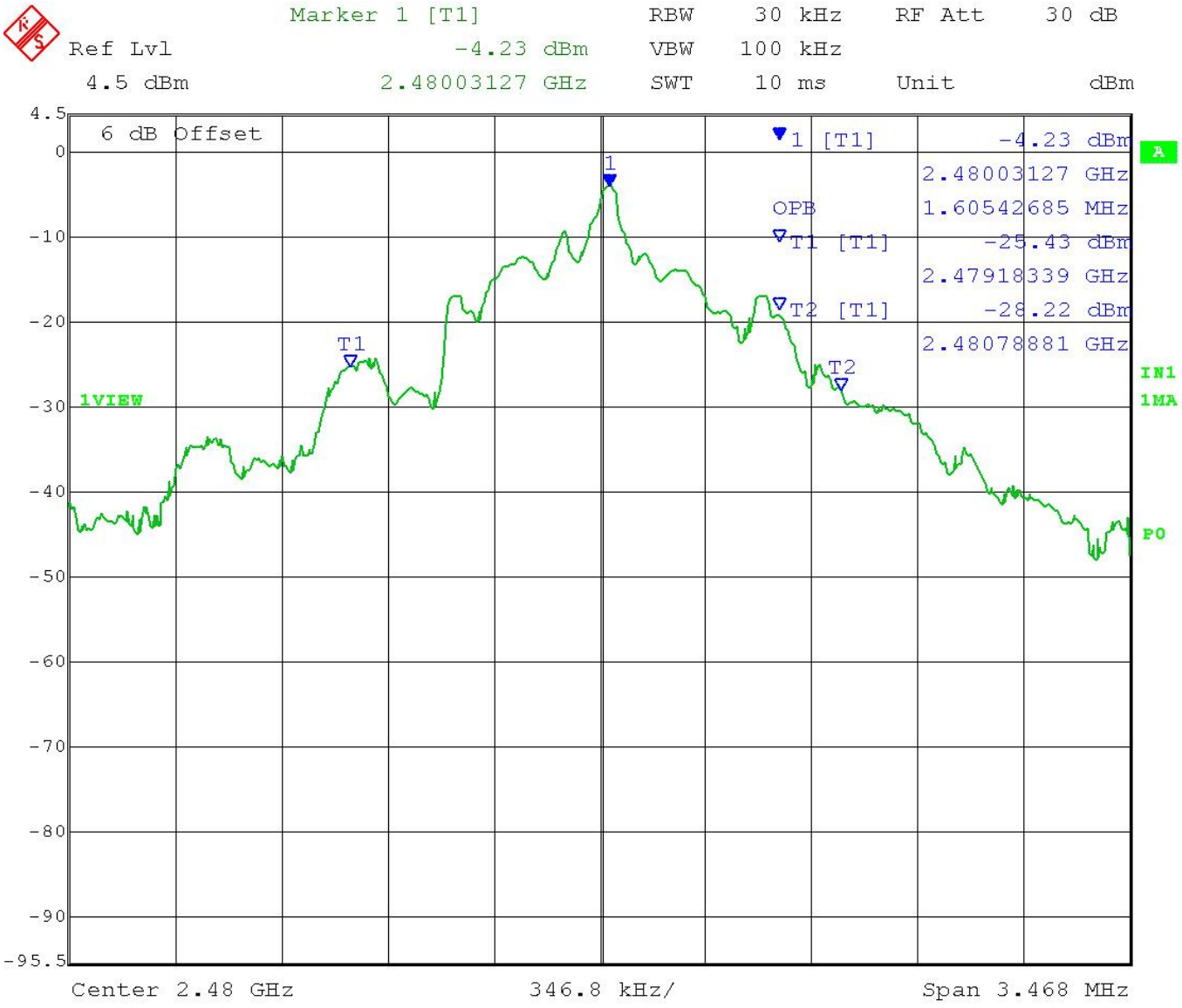
OCCUPIED BANDWIDTH

Test Data: **99% Bandwidth High end of Band**



Date: 6.OCT.2015 15:42:59

RESULTS: Meets Requirements

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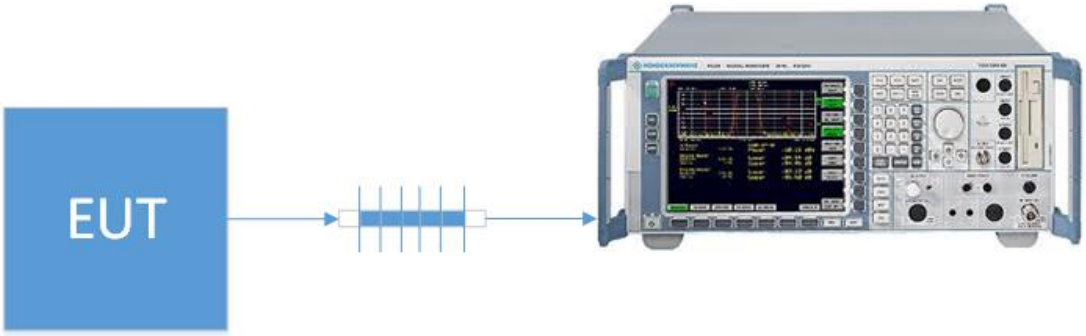
BANDEDGE

Rule Part No.: FCC 15.247(d), IC RSS 247 § 5.5

Requirements: Emissions must be at least 20dB down from the highest emission level Within the authorized band as measured with a 100 kHz RBW.

Test Method: ANSI C63.10 § 6.10.4 Authorized band-edge relative method (non-restricted)
ANSI C63.10 § 6.10.6 Marker Delta Method (restricted band edge)

Setup:



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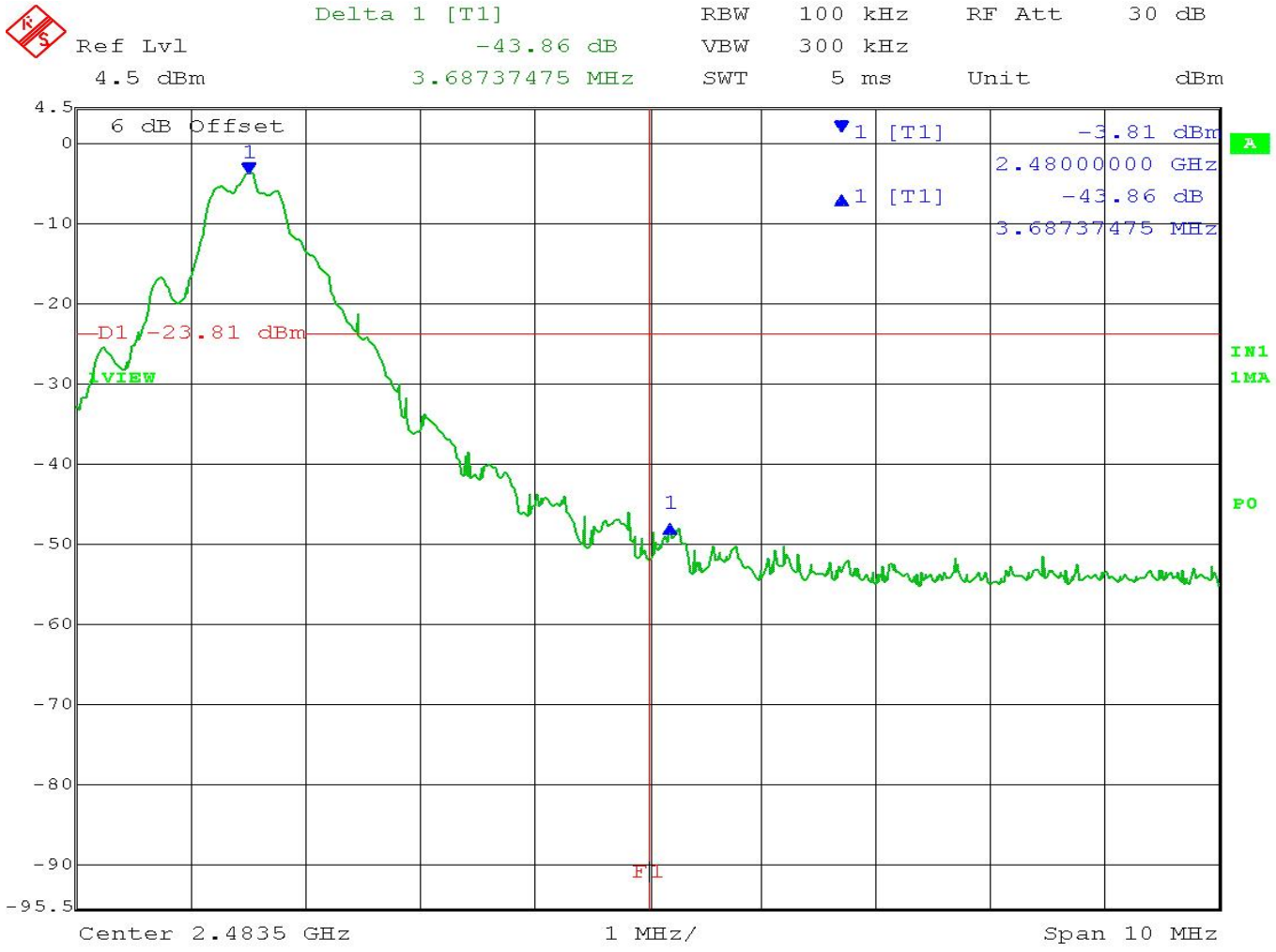
BANDEDGE

Test Data: **Upper Restricted Band Edge Plot Marker Delta Method**

Peak/ Average	Field Strength of Carrier (dBuV/m)	Emission Level Below Carrier (dB)	Field Strength of Emission (dBuV/m)	Emission Limit (dBuV/m)	Margin (dB)
Peak	91.69	43.86	47.83	74	26.17
Average	82.89	43.86	39.03	54	14.97



Date: 6.OCT.2015 16:06:28

RESULTS: Meets Requirements

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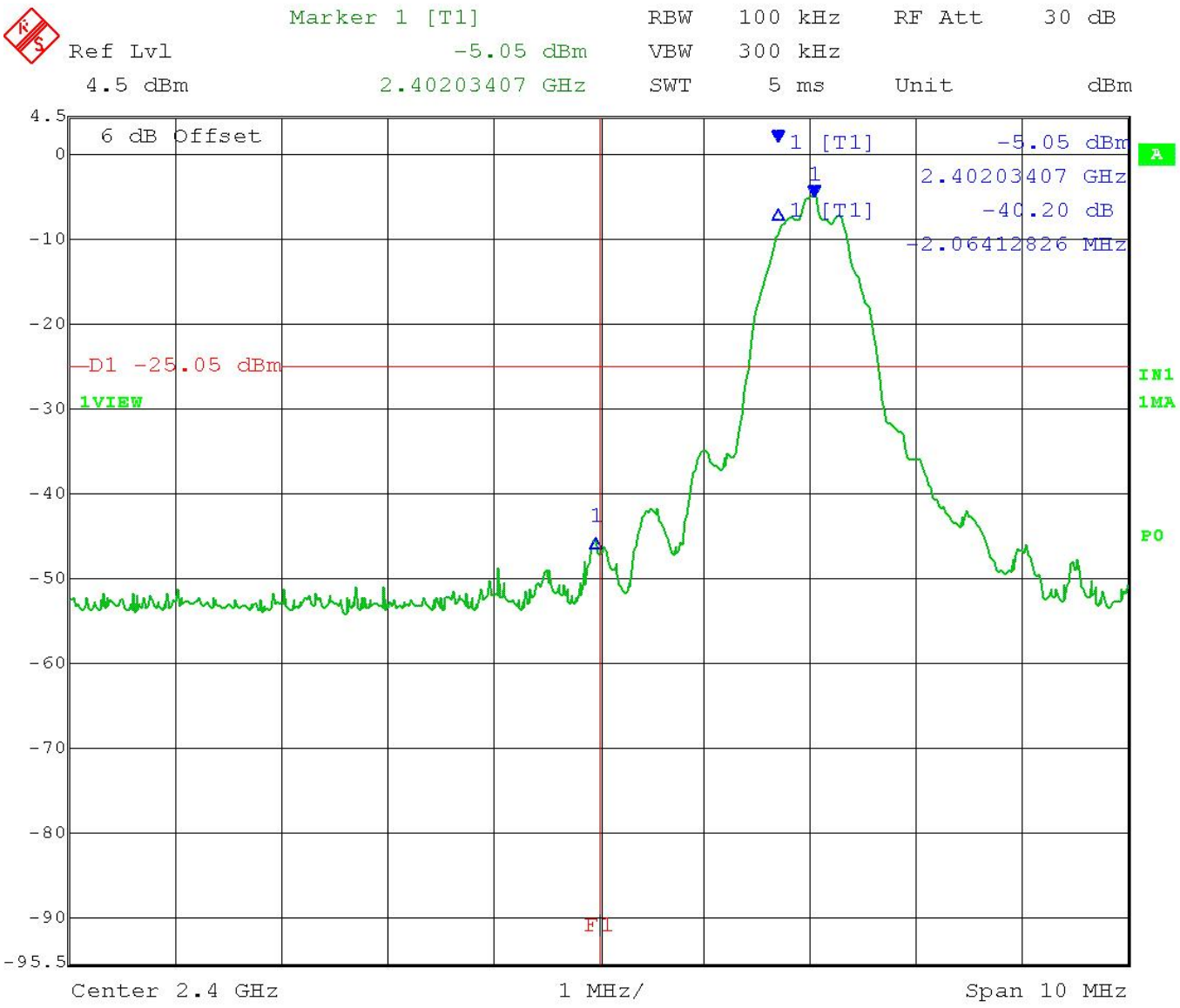
BANDEDGE

Test Data: **Lower Band Edge Plot**



Date: 6.OCT.2015 16:04:08

RESULTS: Meets Requirements

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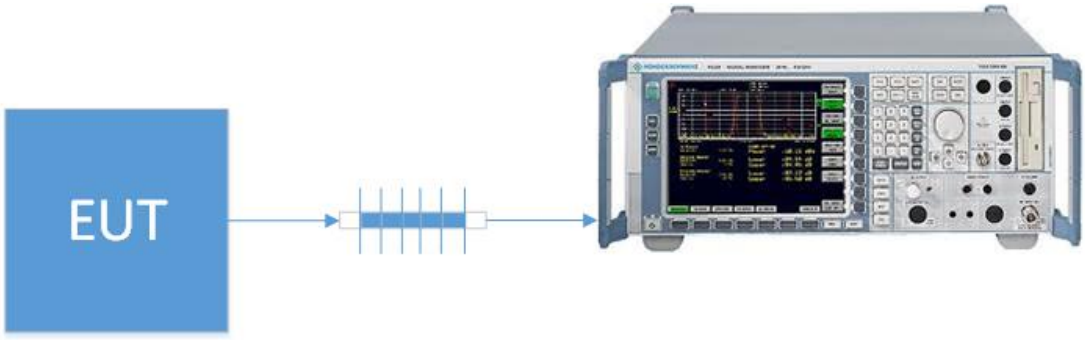
ANTENNA CONDUCTED SPURIOUS EMISSIONS

Rules Part No.: FCC part 15.247 (d) & 15.209, IC RSS 247 § 5.5 & RSS GEN § 8.9

Requirements: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below

Test Method: ANSI C63.10 § 11.11.1 General Information
ANSI C63.10 § 11.11.2 Reference level measurement
ANSI C63.10 § 11.11.3 Emission level measurement

Setup:



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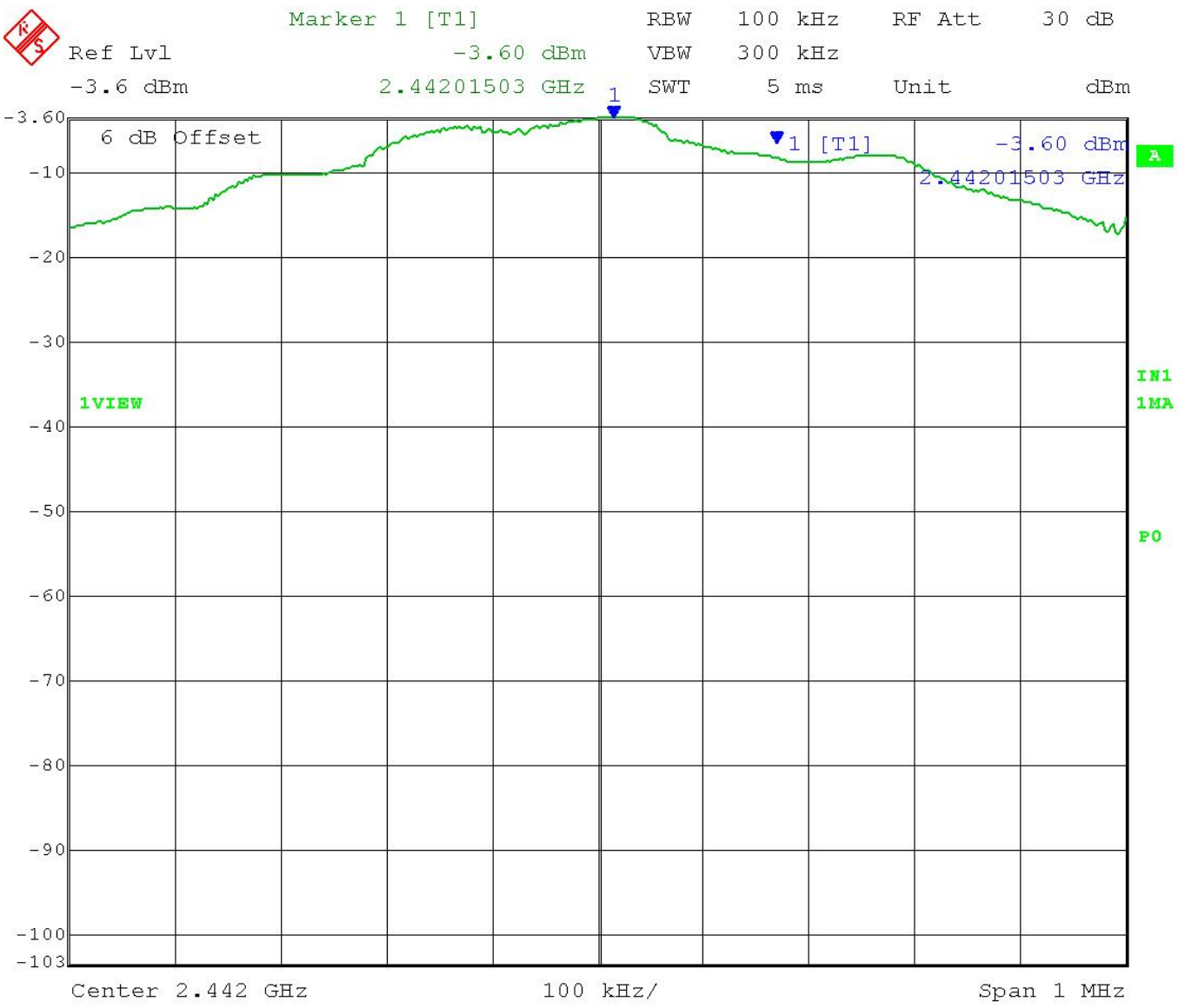
ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **100 KHz Reference Level Plot**



Date: 6.OCT.2015 14:30:06

RESULTS: Meets Requirements

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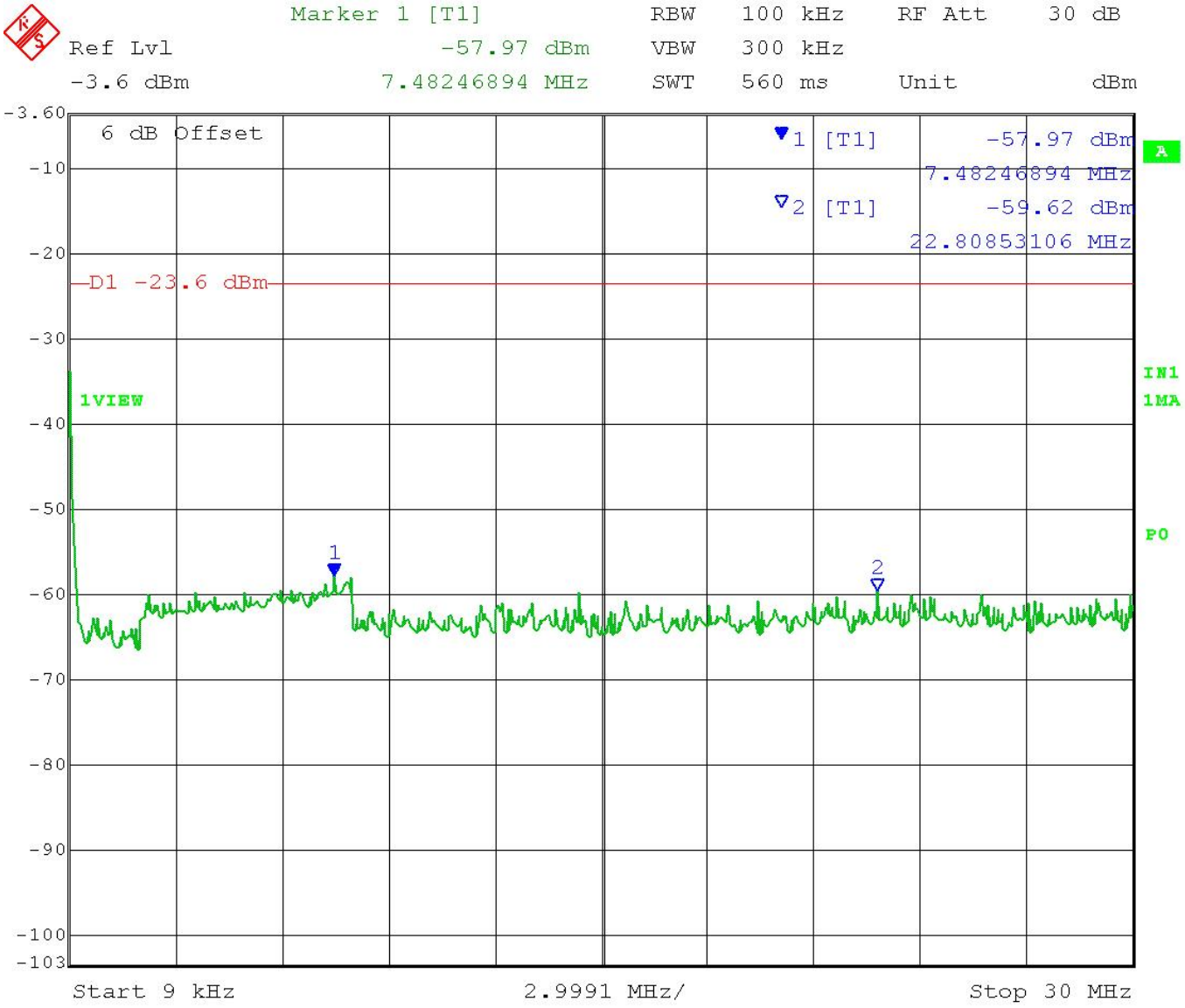
ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **Low End of Band 9 KHz – 30 MHz Plot**



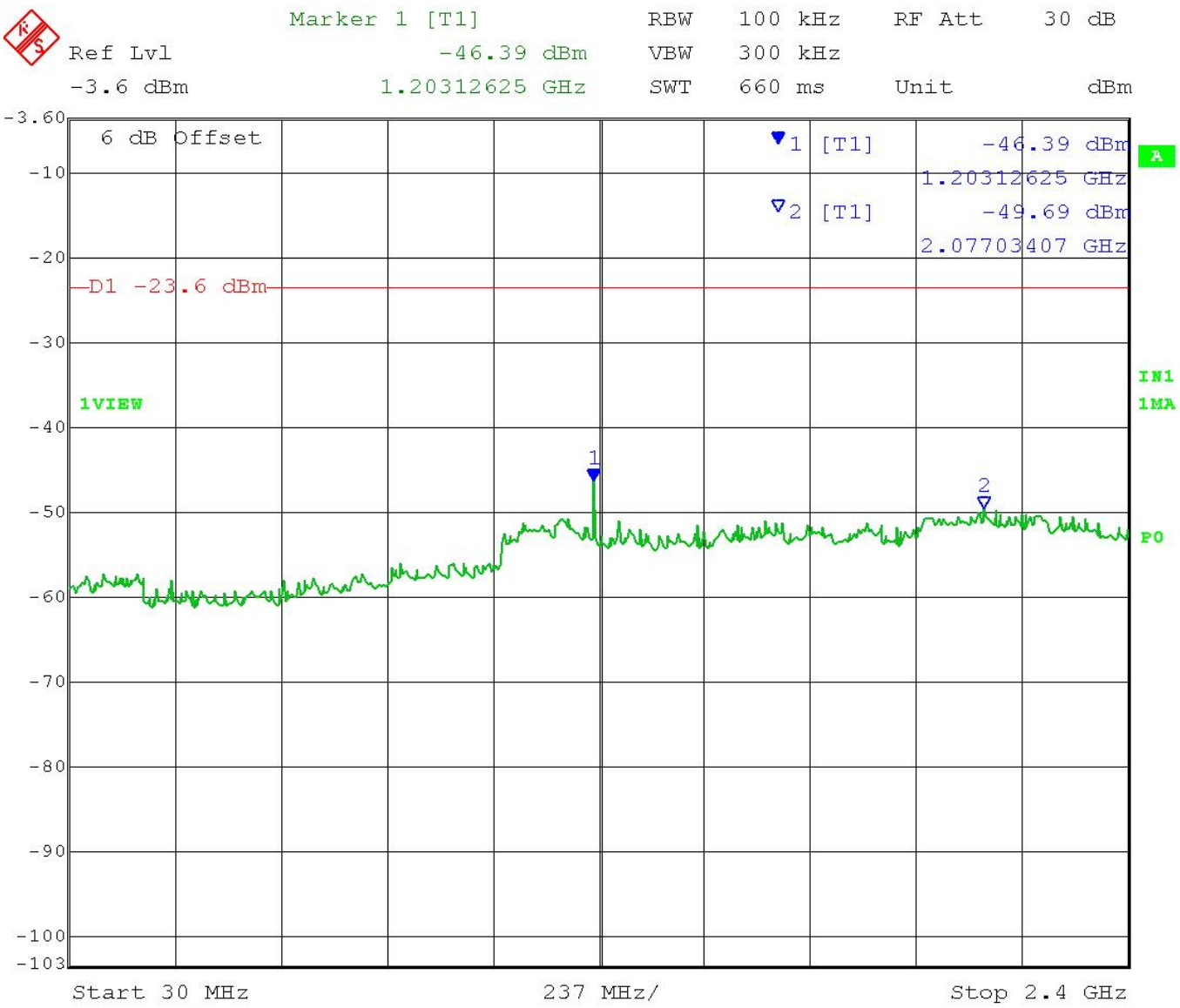
Date: 6.OCT.2015 14:56:31

RESULTS: Meets Requirements

Table of Contents

ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **Low End of Band 30 MHz – 2.4 GHz Plot**



Date: 6.OCT.2015 14:54:58

RESULTS: Meets Requirements

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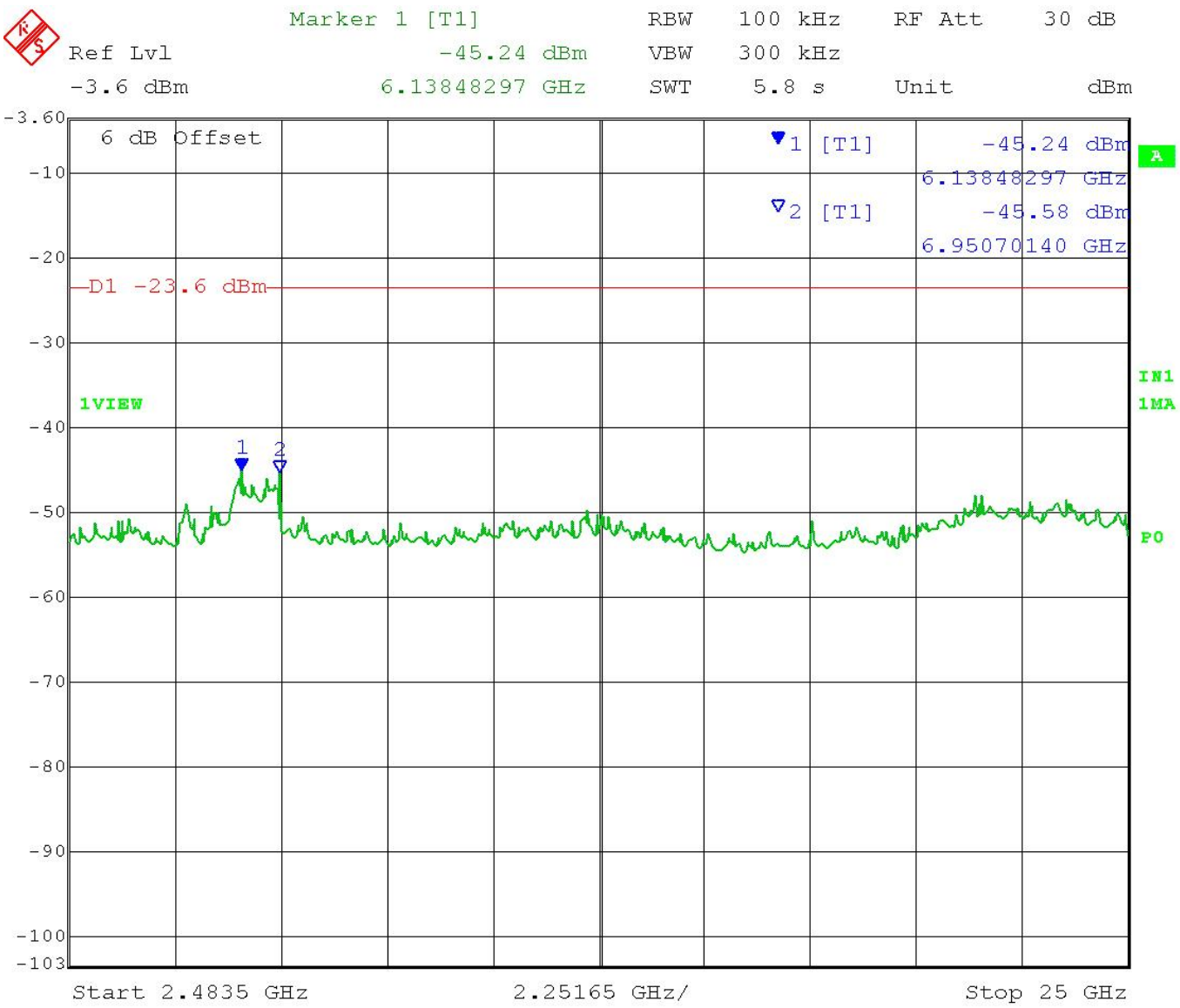
ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **Low End of Band 2.4835 GHz – 25 GHz Plot**



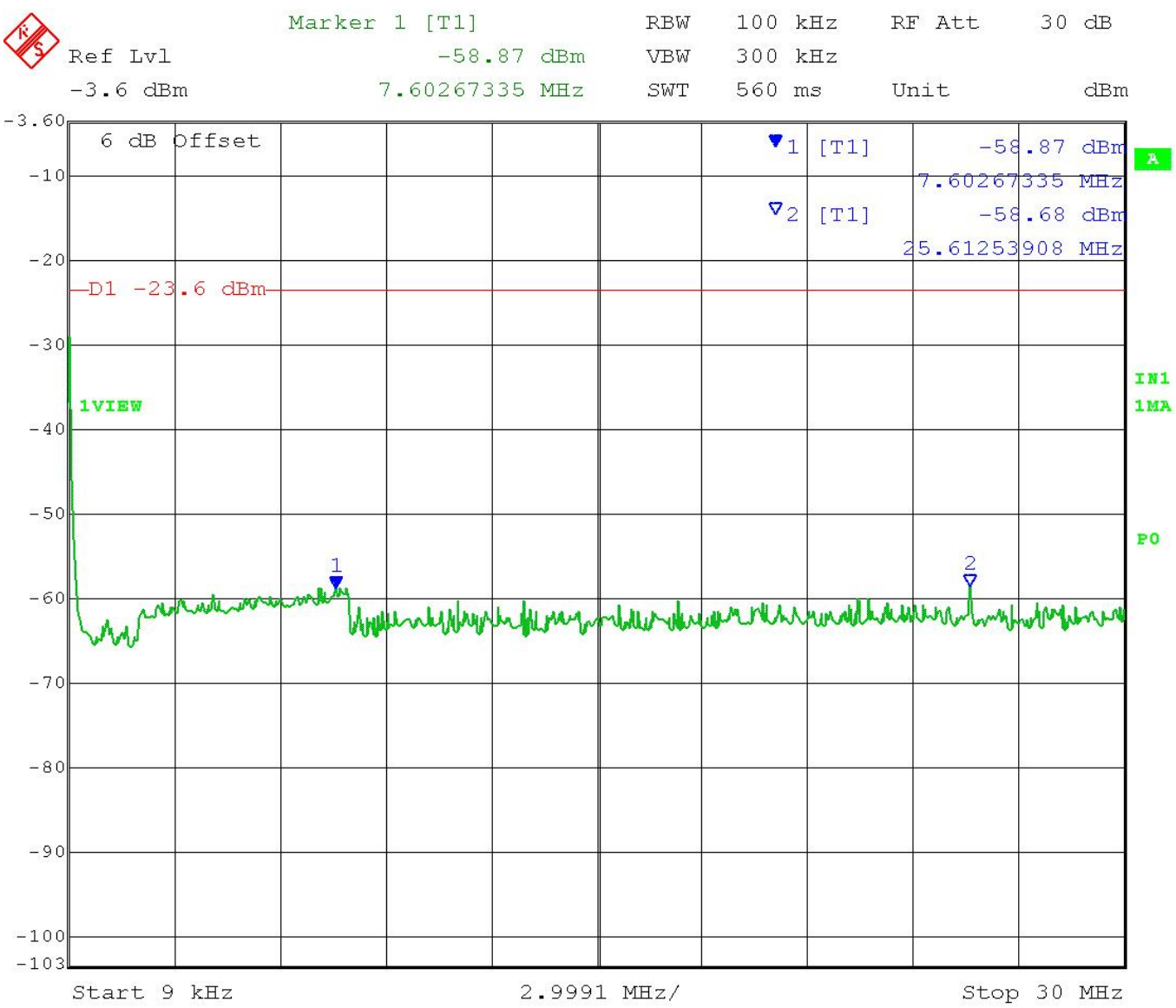
Date: 6.OCT.2015 14:57:45

RESULTS: Meets Requirements

Table of Contents

ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **Middle of Band 9 KHz – 30 MHz Plot**



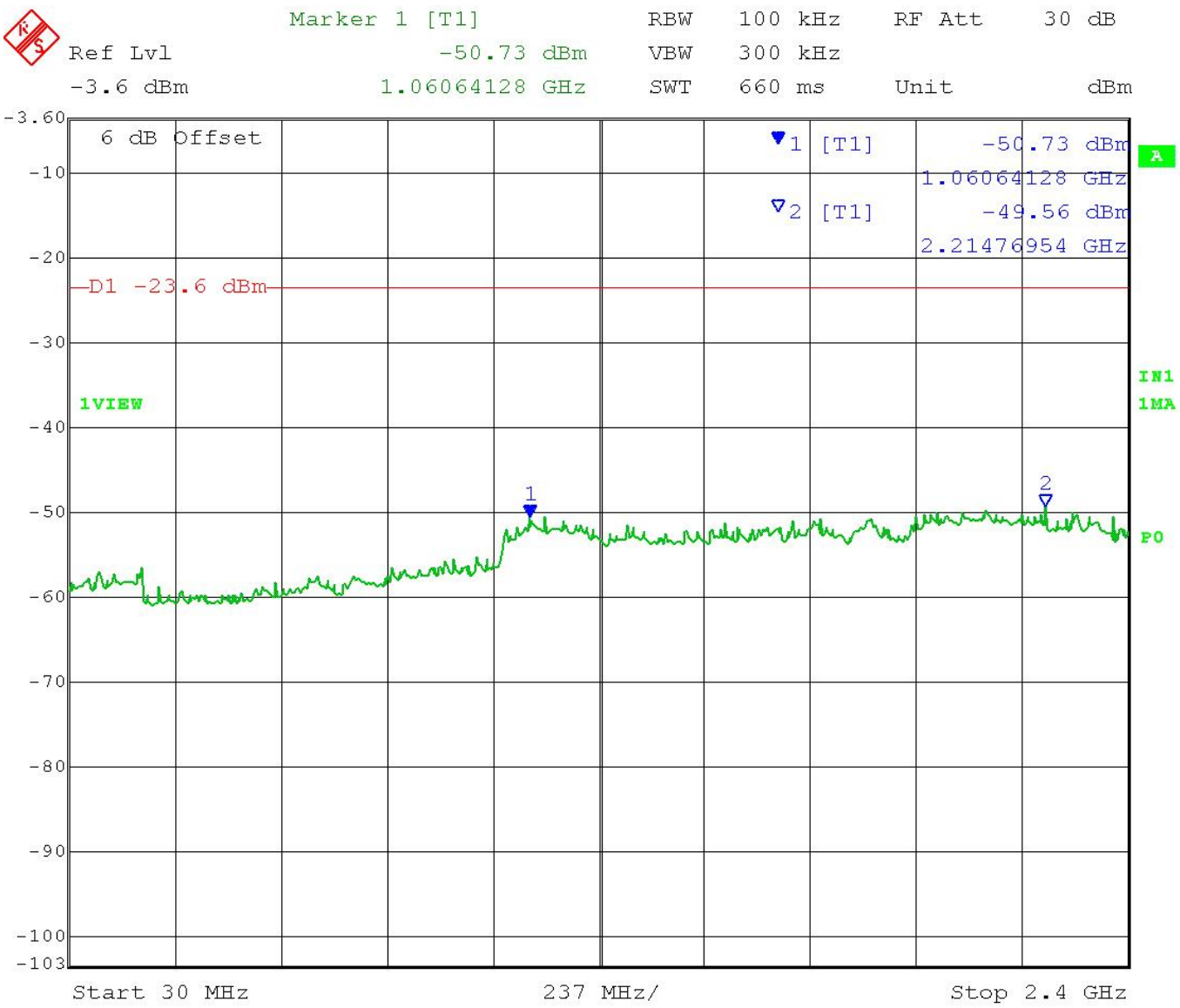
Date: 6.OCT.2015 14:32:25

RESULTS: Meets Requirements

Table of Contents

ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **Middle of Band 30 MHz – 2.4 GHz Plot**



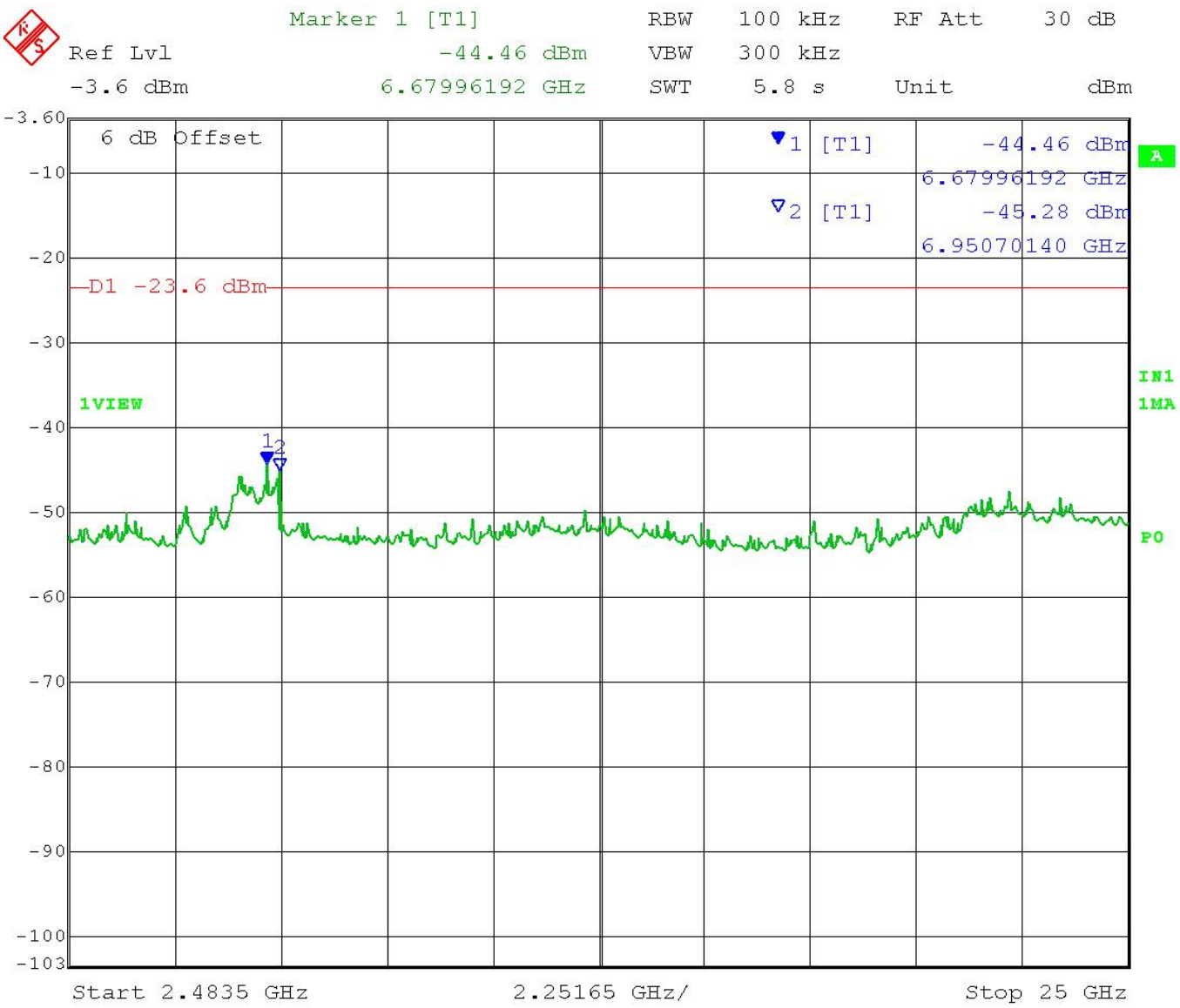
Date: 6.OCT.2015 14:34:21

RESULTS: Meets Requirements

Table of Contents

ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **Middle of Band 2.4835 GHz – 25 GHz Plot**



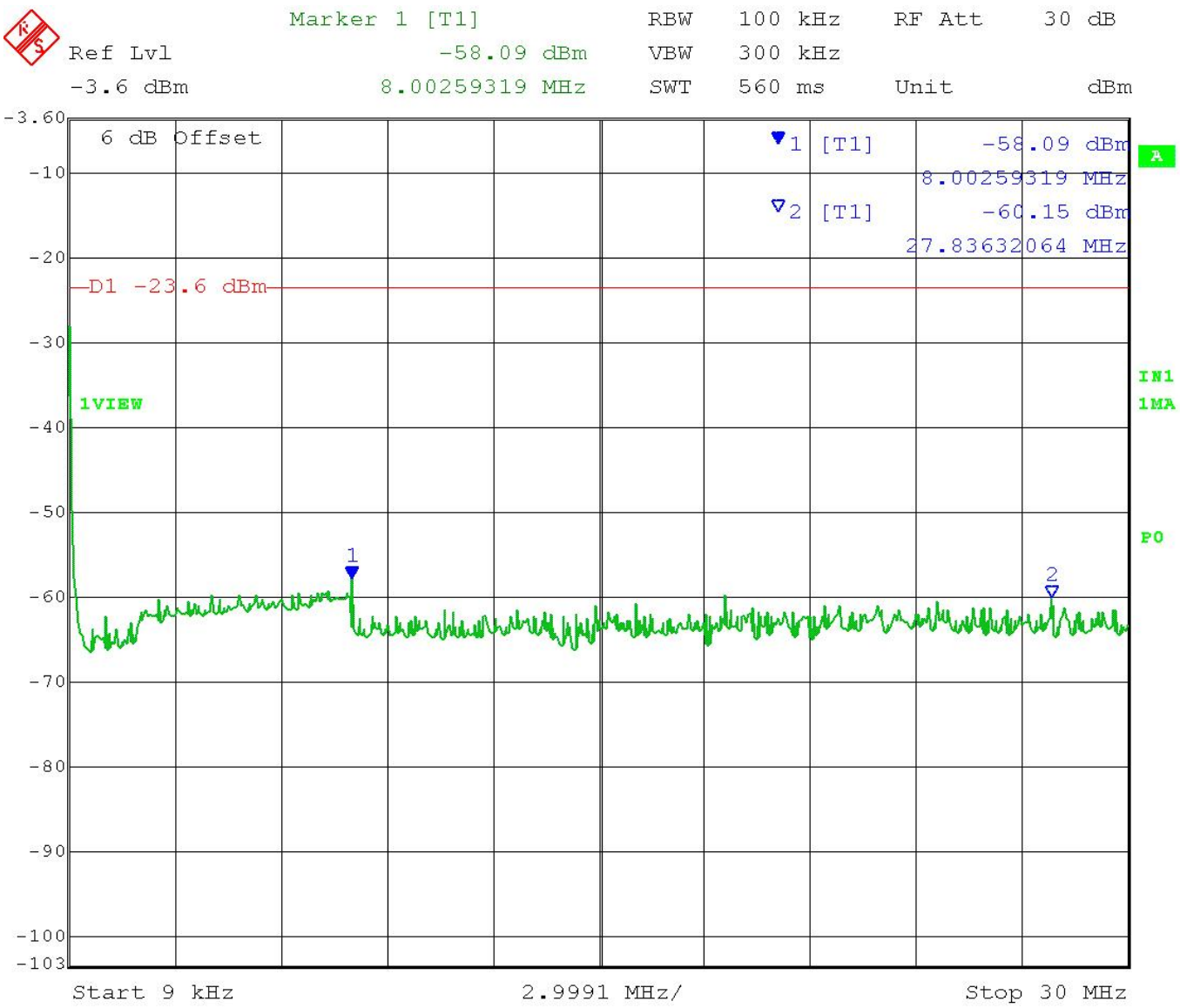
Date: 6.OCT.2015 14:35:12

RESULTS: Meets Requirements

Table of Contents

ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **High End of Band 9 KHz – 30 MHz Plot**



Date: 6.OCT.2015 15:00:21

RESULTS: Meets Requirements

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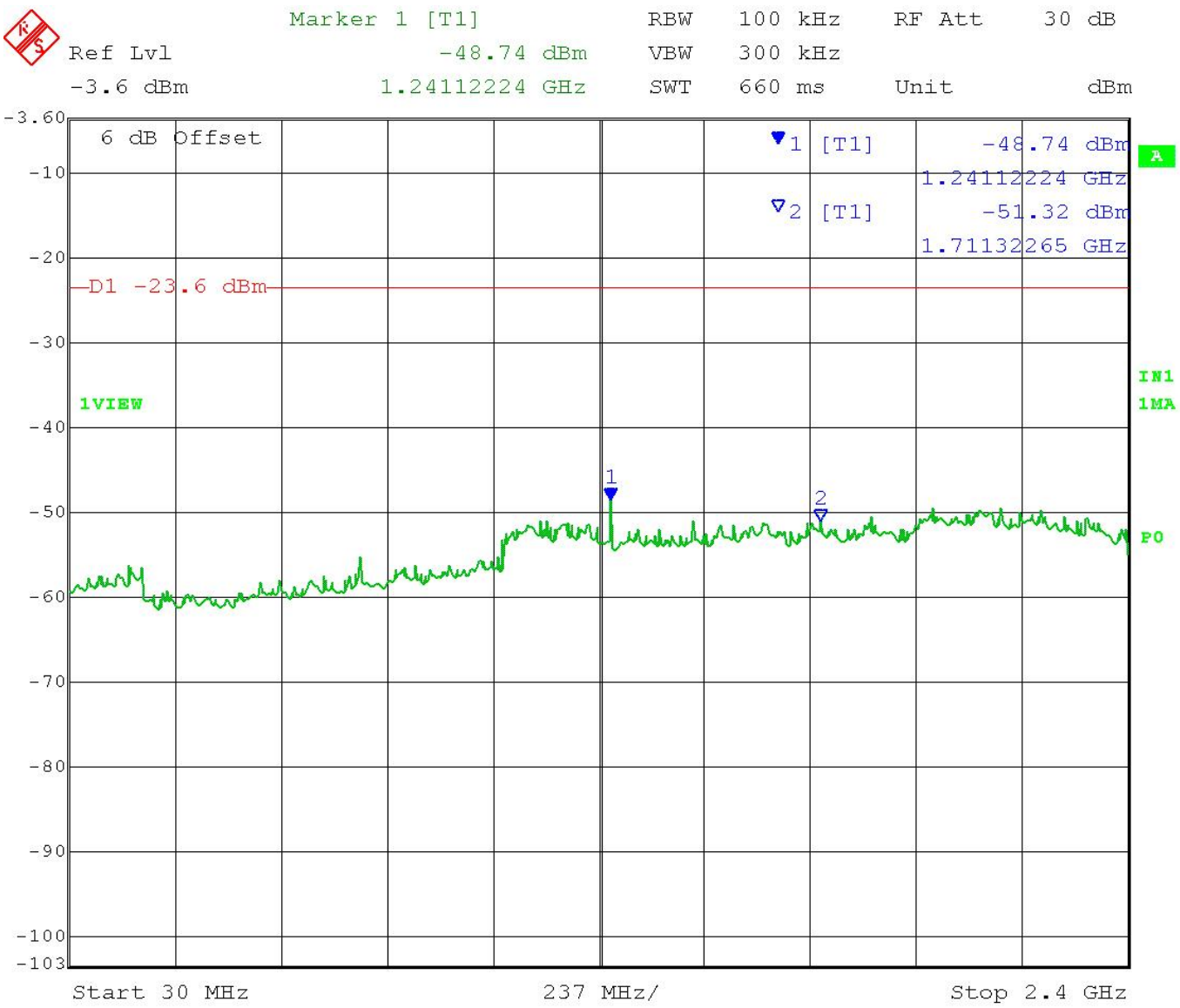
ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **High End of Band 30 MHz – 2.4 GHz Plot**



Date: 6.OCT.2015 14:59:14

RESULTS: Meets Requirements

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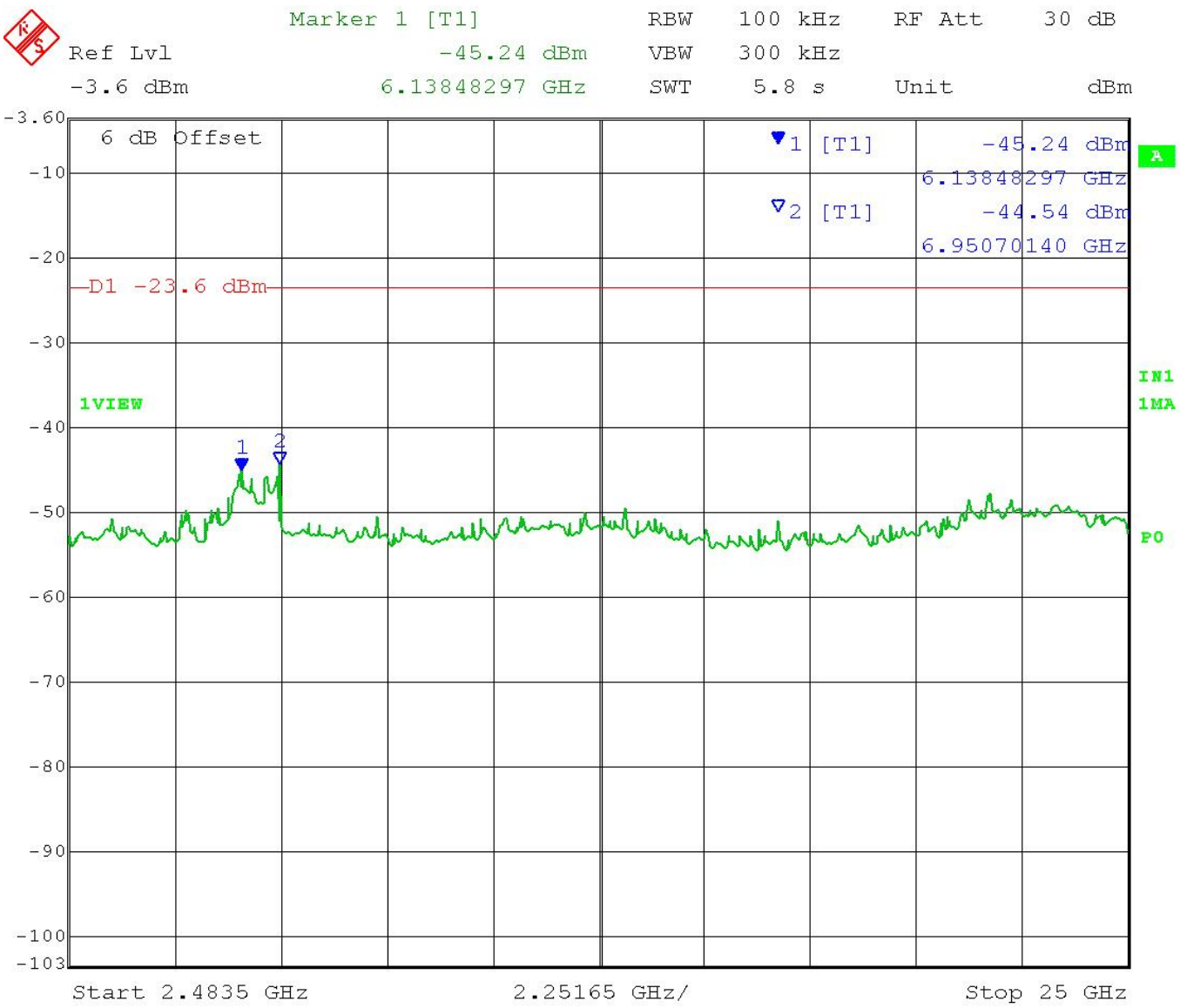
ANTENNA CONDUCTED SPURIOUS EMISSIONS

Test Data: **High End of Band 2.4835 GHz – 25 GHz Plot**



Date: 6.OCT.2015 14:38:35

RESULTS: Meets Requirements

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RADIATED SPURIOUS EMISSIONS

Rules Part No.: FCC part 15.247 (d) & 15.209, IC RSS 247 § 5.5 & RSS GEN § 8.9

Requirements: In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below

In addition, Emissions found in restricted bands the levels must comply with the general limits found in FCC part 15.209

Frequency	Limits
FCC Part 15.209, IC RSS-GEN 8.9	
9 to 490 kHz	2400/F (kHz) µV/m @ 300 meters
490 to 1705 kHz	24000/F (kHz) µV/m @ 30 meters
1705 kHz to 30 MHz	29.54 dBµV/m @ 30 meters
30 – 88	40.0 dBµV/m @ 3 meters
80 – 216	43.5 dBµV/m @ 3 meters
216 – 960	46.0 dBµV/m @ 3 meters
Above 960	54.0 dBµV/m @ 3 meters

Test Method: ANSI C63.4 § Annex D Validation of radiated emissions standard test sites
ANSI C63.10 § 6.3 Common requirements radiated emissions
ANSI C63.10 § 6.4 Emissions below 30 MHz
ANSI C63.10 § 6.5 Emissions between 30 & 1000 MHz
ANSI C63.10 § 6.6 Emissions above 1 GHz

Field Strength Calculation:

The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBµV) to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+ CL = FS
33	20 dBµV	+ 10.36 dB	+ 0.5 = 30.86 dBµV/m @ 3m

Notes: Only emissions within 20dB of the limit are reported from 9 KHz to 25 GHz

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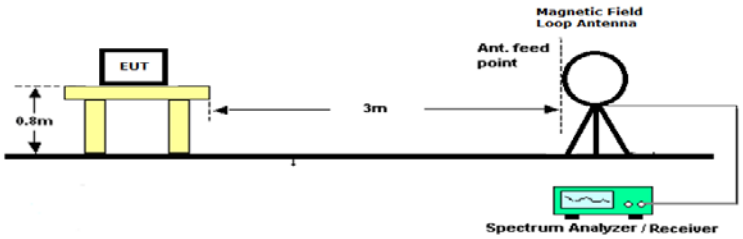
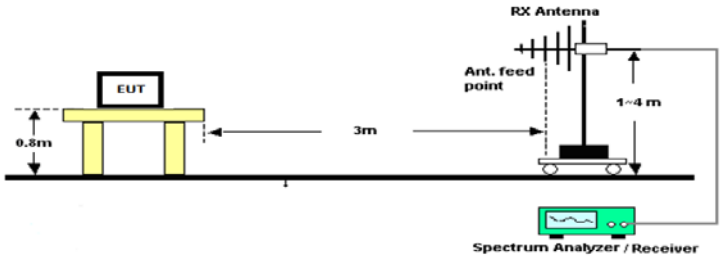
RADIATED SPURIOUS EMISSIONS

Setup:

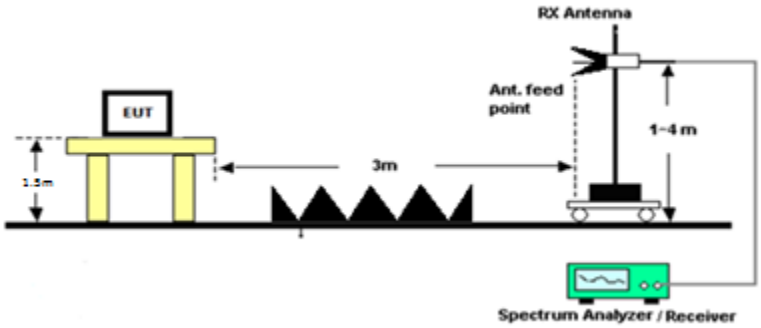
Emissions below 30 MHz



Emissions 30 – 1000 MHz



Emissions above 1 GHz



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RADIATED SPURIOUS EMISSIONS

Test Data: Field Strength table

Tuned Frequency MHz	Emission Frequency MHz	Det	Meter Reading dBuV	Ant. Pol	Coax Loss dB	Correction Factor dB/m	Field Strength dBuV/m	Margin dB
2,402.00	2,354.75	PK	16.1	H	3.15	32.05	51.33	2.67
2,402.00	2,383.82	PK	16.5	H	3.17	32.11	51.74	2.26
2,402.00	4,804.00	AV	1.7	V	4.9	34.13	40.68	13.32
2,402.00	4,804.00	AV	4.9	H	4.9	34.13	43.91	10.09
2,402.00	4,804.00	PK	13.8	V	4.9	34.13	52.81	21.19
2,402.00	4,804.00	PK	16.2	H	4.9	34.13	55.19	18.81
2,402.00	7,206.00	AV	-1.8	V	5.72	36.07	40	14
2,402.00	7,206.00	AV	-0.3	H	5.72	36.07	41.52	12.48
2,402.00	7,206.00	PK	11.6	V	5.72	36.07	53.37	20.63
2,402.00	7,206.00	PK	12.6	H	5.72	36.07	54.38	19.62
2,402.00	9,608.00	AV	6.5	V	6.78	36.64	49.89	4.11
2,402.00	9,608.00	AV	8.9	H	6.78	36.64	52.36	1.64
2,402.00	9,608.00	PK	17.6	V	6.78	36.64	61.06	12.94
2,402.00	9,608.00	PK	19.9	H	6.78	36.64	63.34	10.66
2,442.00	2,350.28	PK	14	H	3.15	32.04	49.17	4.83
2,442.00	2,392.46	PK	14.4	H	3.17	32.13	49.7	4.3
2,442.00	4,884.00	AV	2.9	V	4.94	34.14	41.93	12.07
2,442.00	4,884.00	AV	5.3	H	4.94	34.14	44.36	9.64
2,442.00	4,884.00	PK	14.3	V	4.94	34.14	53.41	20.59
2,442.00	4,884.00	PK	15.3	H	4.94	34.14	54.35	19.65
2,442.00	7,326.00	AV	1.4	H	5.8	36.01	43.2	10.8
2,442.00	7,326.00	AV	2.7	V	5.8	36.01	44.52	9.48
2,442.00	7,326.00	PK	13.9	H	5.8	36.01	55.73	18.27
2,442.00	7,326.00	PK	14.1	V	5.8	36.01	55.94	18.06
2,442.00	9,768.00	AV	4.4	V	6.83	36.82	48.08	5.92
2,442.00	9,768.00	AV	8.6	H	6.83	36.82	52.28	1.72
2,442.00	9,768.00	PK	16.4	V	6.83	36.82	60.08	13.92
2,442.00	9,768.00	PK	19.8	H	6.83	36.82	63.48	10.52
2,480.00	2,344.35	PK	14.8	H	3.14	32.03	50.01	3.99
2,480.00	2,384.87	PK	13.7	H	3.17	32.11	49.02	4.98
2,480.00	2,480.00	AV	52.4	H	3.24	32.3	87.89	39.49
2,480.00	2,480.00	PK	56.2	H	3.24	32.3	91.69	35.69
2,480.00	2,498.91	AV	1.1	H	3.25	32.34	36.71	17.29
2,480.00	2,498.91	PK	18.9	H	3.25	32.34	54.52	19.48
2,480.00	4,960.00	AV	4.3	V	4.98	34.16	43.45	10.55
2,480.00	4,960.00	AV	9.8	H	4.98	34.16	48.93	5.07
2,480.00	4,960.00	PK	15.3	V	4.98	34.16	54.48	19.52
2,480.00	4,960.00	PK	17.9	H	4.98	34.16	57.02	16.98
2,480.00	7,440.00	AV	1.2	V	5.86	35.96	43.04	10.96
2,480.00	7,440.00	AV	3	H	5.86	35.96	44.77	9.23
2,480.00	7,440.00	PK	15.1	V	5.86	35.96	56.91	17.09
2,480.00	7,440.00	PK	15.7	H	5.86	35.96	57.53	16.47
2,480.00	9,920.00	AV	2.4	V	6.88	37	46.3	7.7
2,480.00	9,920.00	AV	6.1	H	6.88	37	49.93	4.07
2,480.00	9,920.00	PK	15.6	V	6.88	37	59.46	14.54
2,480.00	9,920.00	PK	18.2	H	6.88	37	62.12	11.88

Results Meet Requirements

AC POWER LINE CONDUCTED EMISSIONS

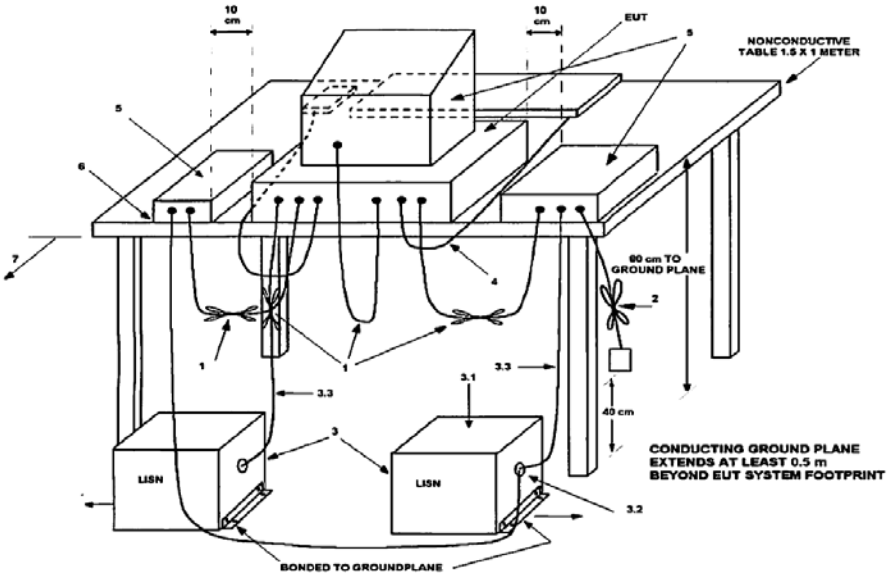
Rules Part No.: FCC 15.207(a)

Requirements:

Frequency (MHz)	Quasi Peak Limits (dBµV)	Average Limits (dBµV)
0.15 – 0.5	66 – 56 *	56 – 46 *
0.5 – 5.0	56	46
5.0 – 30	60	50
* Decrease with logarithm of frequency		

Test Method: ANSI C63.10 § 6.2 Test Method for AC power-line conducted emissions

Setup:



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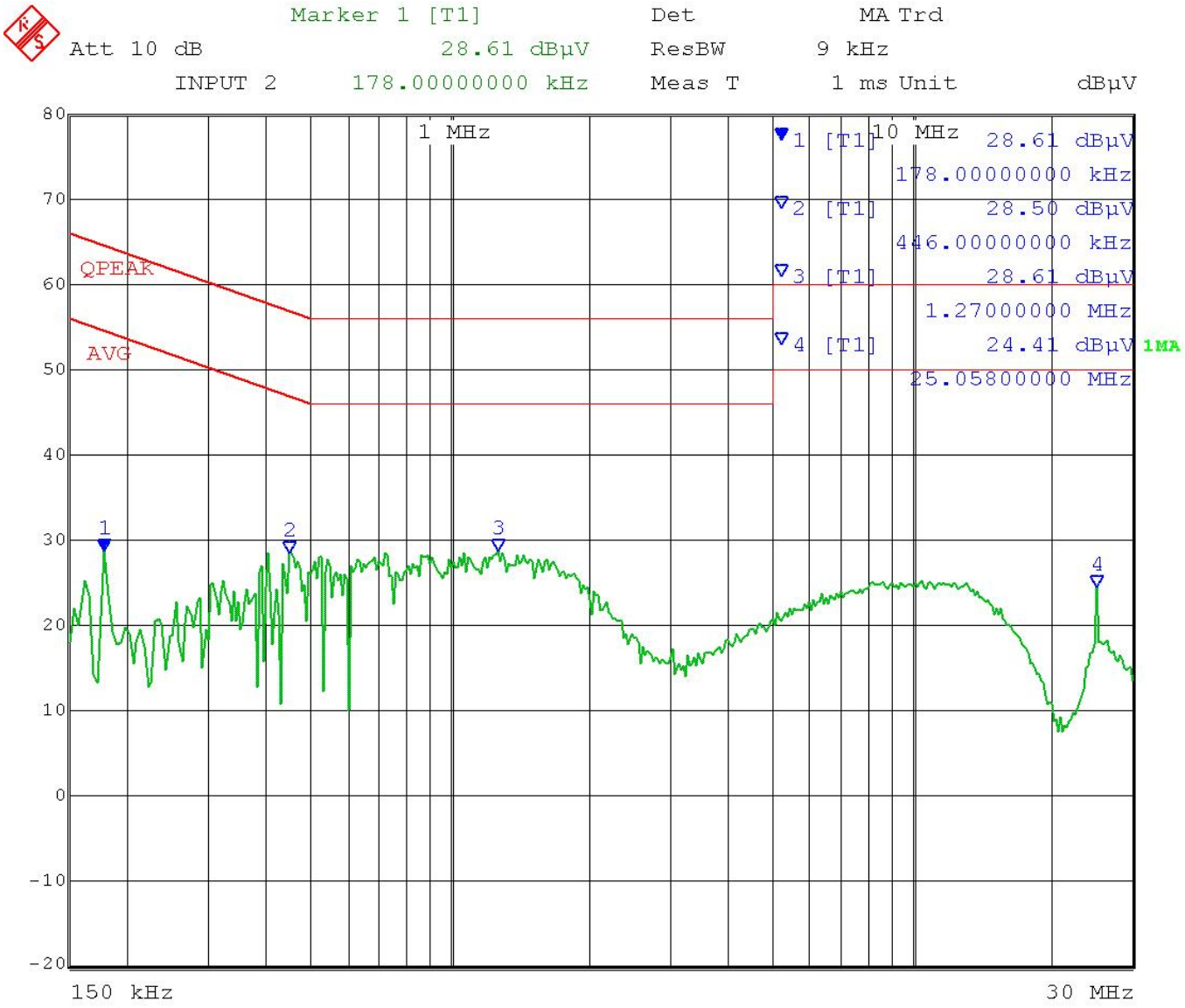
AC POWER LINE CONDUCTED EMISSIONS

Test Data: **Powerline 1 Peak Plot**

The following plots represent the emissions read for power line Conducted. Both lines were observed.



Date: 6.OCT.2015 11:34:48

RESULTS: Meets Requirements

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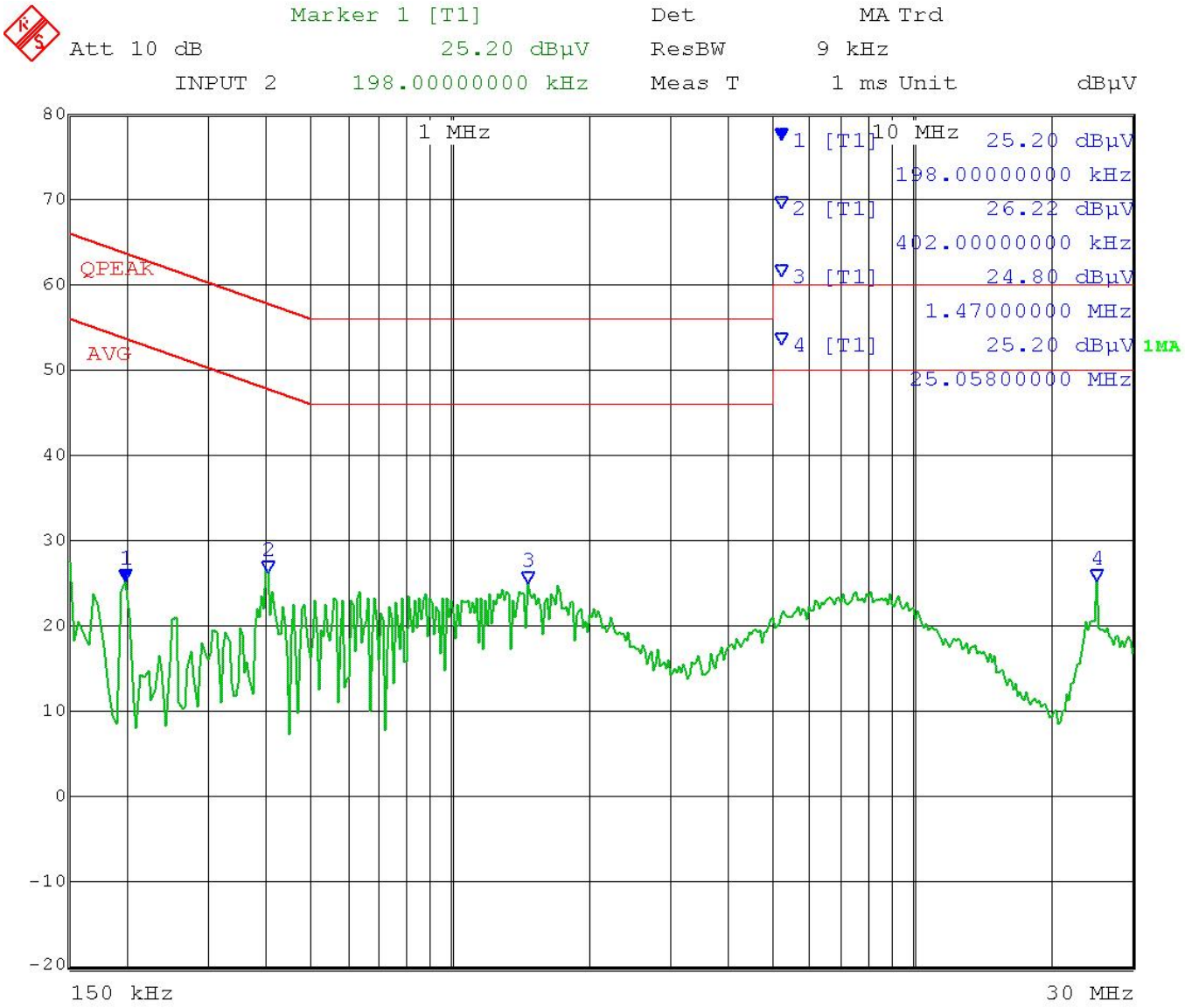
POWER LINE CONDUCTED INTERFERENCE

Test Data: **Power Line 2 Peak Plot**



Date: 6.OCT.2015 11:25:47

RESULTS: Meets Requirements

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EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconnical Chamber	Eaton Chamber	94455-1	1057	06/14/13	12/14/15
Antenna: Log-Periodic Chamber	Eaton	96005	1243	05/31/13	11/30/15
Antenna: Passive Loop	EMC Test Systems	EMCO 6512	9706-1211	07/09/15	07/09/17
LISN	Electro-Metrics	ANS-25/2	2604	07/15/15	07/15/17
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	12/31/13	12/31/15
Antenna: Double-Ridged Horn/ETS Horn 1	ETS-Lindgren Chamber	3117	00035923	06/13/14	06/13/16
EMI Test Receiver R & S ESIB 40 Screen Room	Rohde & Schwarz	ESIB 40	100274	08/12/14	08/12/16
Software: Field Strength Program	Timco	N/A	Version 4.0	NA	NA
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	03/11/14	03/11/16

***EMI RECEIVER SOFTWARE VERSION**

The receiver firmware used was version 4.43 Service Pack 3

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