ENGINEERING TEST REPORT

Bluetooth Audio Module
Model: WBT1010
FCC ID: WUO-WBT1010

Applicant:

Sonavox Canada Inc.
81 Zenway Blvd. Unit # 25
Woodbridge, Ontario
Canada L4H 0S5

In Accordance With

Federal Communications Commission (FCC)
Part 15, Subpart C, Section 15.247 Frequency Hopping Spread Spectrum (FHSS)

UltraTech's File No.: BAS-121F15C247

This Test report is Issued under the Authority of Tri M. Luu Vice President of Engineering UltraTech Group of Labs Date: March 4, 2013	
Report Prepared by: Dan Huynh Issued Date: March 4, 2013	Tested by: Mr. Hung Trinh Test Dates: January 15 - 18, 2013

- *The results in this Test Report apply only to the sample(s) tested, and the sample tested is randomly selected.*
- *This report must not be used by the client to claim product endorsement by NVLAP or any agency of the US Government.*

UltraTech

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FCC	VCCI	Industry Canada Approved Test Facility	NVLAP	BSMI	Korea KCC-RRL
91038	1309	46390-2049	NvLap Lab Code 200093-0	SL2-IN-E-1119R	CA2049

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EXHIBIT 1. INTRODUCTION

1.1. SCOPE

Reference:	FCC Part 15, Subpart C, Section 15.247
Title:	Code of Federal Regulations (CFR), Title 47 – Telecommunication, Part 15
Purpose of Test:	Equipment Certification for Frequency Hopping Spread Spectrum (FHSS) Transmitter.
Test Procedures:	ANSI C63.4-2009 ANSI C63.10-2009/ FCC Public Notice DA 00-705
Environmental Classification:	[x] Commercial, industrial or business environment [x] Residential environment

1.2. RELATED SUBMITTAL(S)/GRANT(S)

None.

1.3. NORMATIVE REFERENCES

Publication	Year	Title
47 CFR Parts 0-19	2012	Code of Federal Regulations (CFR), Title 47 – Telecommunication
ANSI C63.4	2009	American National Standard for 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	2009	American National Standard for Testing Unlicensed Wireless Devices
CISPR 22 & EN 55022	2008-09, Edition 6.0 2006	Information Technology Equipment - Radio Disturbance Characteristics - Limits and Methods of Measurement
CISPR 16-1-1 +A1 +A2	2006 2006 2007	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-1: Measuring Apparatus
CISPR 16-1-2 +A1 +A2	2003 2004 2006	Specification for radio disturbance and immunity measuring apparatus and methods. Part 1-2: Conducted disturbances
FCC Public Notice DA 00-705	2000	Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems
FCC ET Docket No. 99-231	2002	Amendment to FCC Part 15 of the Commission's Rules Regarding to Spread Spectrum Devices

EXHIBIT 2. PERFORMANCE ASSESSMENT

2.1. CLIENT INFORMATION

APPLICANT	
Name:	Sonavox Canada Inc.
Address:	81 Zenway Blvd. Unit # 25 Woodbridge, Ontario Canada L4H 0S5
Contact Person:	Mr Joe Riggi Phone #: 905-265-2060 Fax #: 905-265-1853 Email Address: jriggi@sonavox.com

MANUFACTURER	
Name:	Sonavox Canada Inc.
Address:	81 Zenway Blvd. Unit # 25 Woodbridge, Ontario Canada L4H 0S5
Contact Person:	Mr Joe Riggi Phone #: 905-265-2060 Fax #: 905-265-1853 Email Address: jriggi@sonavox.com

2.2. EQUIPMENT UNDER TEST (EUT) INFORMATION

The following information (with the exception of the Date of Receipt) has been supplied by the applicant.

Brand Name:	Sonavox Canada Inc.
Product Name:	Bluetooth Audio Module
Model Name or Number:	WBT1010
Serial Number:	Test Sample
Type of Equipment:	Spread Spectrum Transmitter
Input Power Supply Type:	External Regulated DC Sources
Primary User Functions of EUT:	Bluetooth audio interface

2.3. EUT'S TECHNICAL SPECIFICATIONS

TRANSMITTER	
Equipment Type:	▪ Portable ▪ Mobile ▪ Base Station (fixed use)
Intended Operating Environment:	▪ Commercial, industrial or business environment ▪ Residential environment
Power Supply Requirement:	5 VDC
RF Output Power Rating:	8 dBm
Operating Frequency Range:	2402 – 2480 MHz
RF Output Impedance:	50 Ohm
Duty Cycle:	Continuous
Modulation Type:	8DPSK, π/4 DQPSK
Antenna Connector Type:	Integral

2.4. ASSOCIATED ANTENNA DESCRIPTIONS

Manufacturer:	Johanson Technology
Type:	Chip antenna
Model:	2450AT43B100
Frequency Range:	2.400 – 2.500 GHz
Impedance:	50 Ohm
Gain (dBi):	1.3 (max)

2.5. LIST OF EUT'S PORTS

Port Number	EUT's Port Description	Number of Identical Ports	Connector Type	Cable Type (Shielded/Non-shielded)
1	DC Supply & I/O Port	1	Pin Header	No cable, direct connection

2.6. ANCILLARY EQUIPMENT

The EUT was tested while connected to the following representative configuration of ancillary equipment necessary to exercise the ports during tests:

Ancillary Equipment # 1	
Description:	Test Jig
Brand name:	Sonavox Canada Inc.
Model Name or Number:	N/A
Connected to EUT's Port:	I/O Port

EXHIBIT 3. EUT OPERATING CONDITIONS AND CONFIGURATIONS DURING TESTS

3.1. CLIMATE TEST CONDITIONS

The climate conditions of the test environment are as follows:

Temperature:	21°C
Humidity:	51%
Pressure:	102 kPa
Power Input Source:	5 VDC

3.2. OPERATIONAL TEST CONDITIONS & ARRANGEMENT FOR TESTS

Operating Modes:	▪ Each of lowest, middle and highest channel frequencies transmits continuously for emissions measurements. ▪ The EUT operates in normal Frequency Hopping mode for occupancy duration, and frequency separation.
Special Test Software & Hardware:	Special software provided by the Applicant is installed to allow the EUT to operate in hopping mode or at each channel frequency continuously. For example, the transmitter will be operated at each of lowest, middle and highest frequencies individually continuously during testing.
Special Hardware Used:	Test Jig
Transmitter Test Antenna:	The EUT is tested with the antenna fitted in a manner typical of normal intended use as integral antenna equipment as described with the test results.

Transmitter Test Signals	
Frequency Band(s):	2402 – 2480 MHz
Frequency(ies) Tested: (Near lowest, near middle & near highest frequencies in the frequency range of operation.)	2402, 2440 and 2480 MHz
RF Power Output: (measured maximum output power at antenna terminals)	6.31 mW (conducted)
Normal Test Modulation:	8DPSK, π/4 DQPSK
Modulating Signal Source:	Internal

EXHIBIT 4. SUMMARY OF TEST RESULTS

4.1. LOCATION OF TESTS

All of the measurements described in this report were performed at Ultratech Group of Labs located in the city of Oakville, Province of Ontario, Canada.

- AC Power Line Conducted Emissions were performed in UltraTech's shielded room, 24'(L) by 16'(W) by 8'(H).
- Radiated Emissions were performed at the Ultratech's 3-10 TDK Semi-Anechoic Chamber situated in the Town of Oakville, province of Ontario. This test site been calibrated in accordance with ANSI C63.4, and found to be in compliance with the requirements of Sec. 2.948 of the FCC Rules. The descriptions and site measurement data of the Oakville 3-10 TDK Semi-Anechoic Chamber has been filed with FCC office (FCC File No.: 91038) and Industry Canada office (Industry Canada File No.: 2049A-3). Expiry Date: 2014-04-04.

4.2. APPLICABILITY & SUMMARY OF EMC EMISSION TEST RESULTS

FCC Section(s)	Test Requirements	Compliance (Yes/No)
15.203	Antenna requirements	Yes
15.207(a)	AC Power Line Conducted Emissions	Yes
15.247(a)	Provisions for Frequency Hopping Systems	Yes
15.247(b)(1)	Peak Conducted Output Power	Yes
15.247(d)	Band-Edge and RF Conducted Spurious Emissions at the Transmitter Antenna Terminal	Yes
15.247(d), 15.209 & 15.205	Transmitter Spurious Radiated Emissions	Yes
15.247(i), 1.1307, 1.1310, 2.1091, 2.1093	RF Exposure	Yes

4.3. MODIFICATIONS INCORPORATED IN THE EUT FOR COMPLIANCE PURPOSES

None.

EXHIBIT 5. MEASUREMENTS, EXAMINATIONS & TEST DATA FOR EMC EMISSIONS

5.1. POWER LINE CONDUCTED EMISSIONS [§15.207(a)]

5.1.1. Limit(s)

The equipment shall meet the limits of the following table:

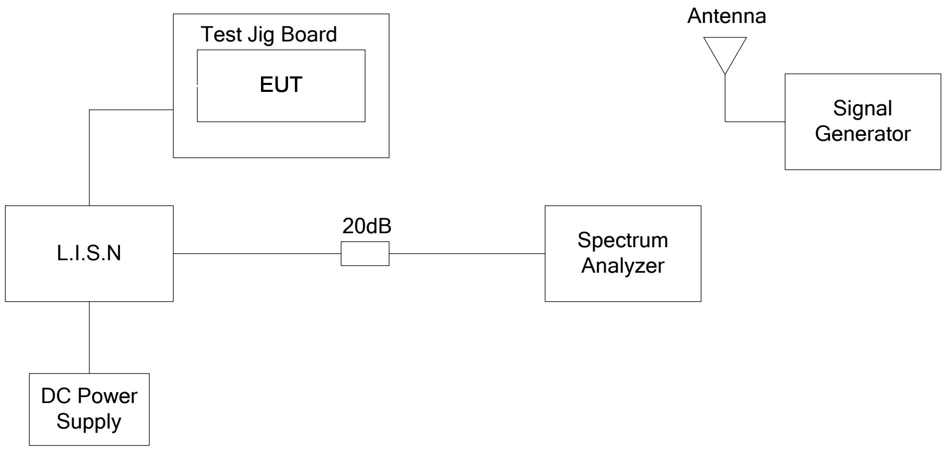
Frequency of emission (MHz)	Conducted Limits (dBμV)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5-30	60	50

*Decreases linearly with the logarithm of the frequency

5.1.2. Method of Measurements

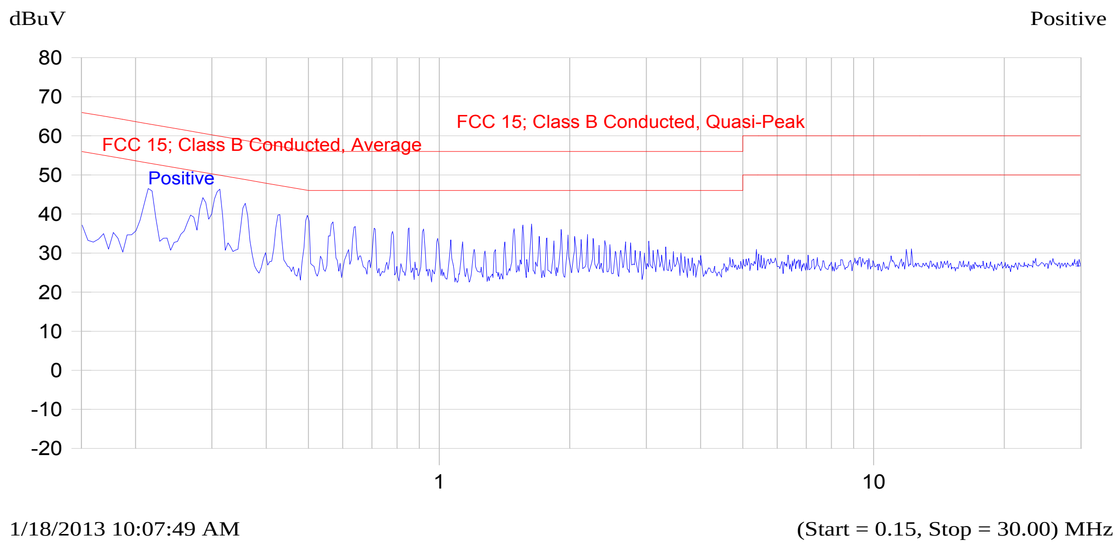
ANSI C63.4-2009

5.1.3. Test Arrangement



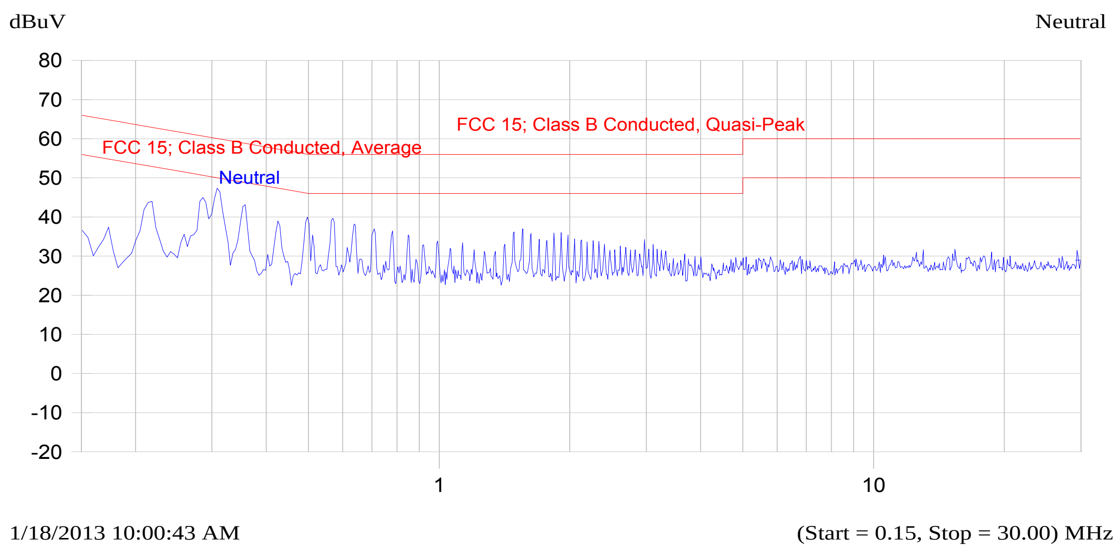
5.1.4. Test Data

Plot 5.1.4.1. Power Line Conducted Emissions, Tx Mode, Line Voltage: 5VDC, Line Tested: Positive



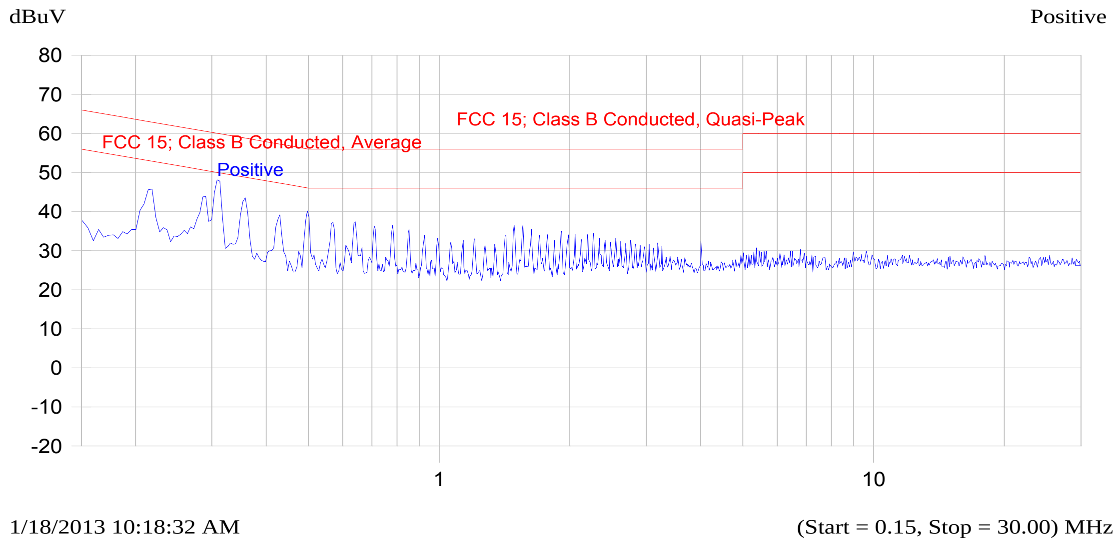
Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.213	46.1	43.5	-20.6	41.9	-12.2	Positive
0.306	48.8	46.9	-14.6	43.9	-7.5	Positive
0.495	41.8	38.8	-17.3	38.0	-8.1	Positive
1.628	36.6	33.9	-22.1	31.8	-14.2	Positive

Plot 5.1.4.2. Power Line Conducted Emissions, Tx Mode, Line Voltage: 5VDC, Line Tested: Negative



Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.306	48.8	47.6	-13.8	44.8	-6.7	Neutral
0.566	40.7	37.0	-19.0	34.2	-11.8	Neutral
1.555	38.6	36.0	-20.0	34.4	-11.6	Neutral

Plot 5.1.4.3. Power Line Conducted Emissions, Rx Mode, Line Voltage: 5VDC, Line Tested: Positive



Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.307	48.5	46.6	-14.9	43.9	-7.6	Positive
0.495	42.3	39.0	-17.2	38.1	-8.0	Positive
1.556	38.7	36.0	-20.0	34.8	-11.2	Positive

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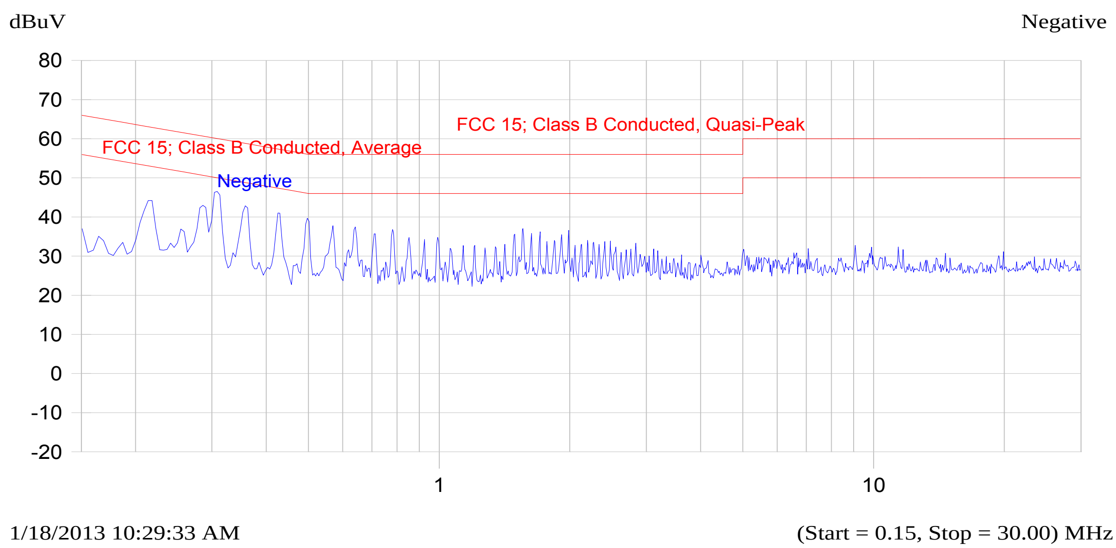
Plot 5.1.4.4. Power Line Conducted Emissions, Rx Mode, Line Voltage: 5VDC, Line Tested: Negative



Frequency MHz	Peak dBuV	QP dBuV	Delta QP-QP Limit dB	Avg dBuV	Delta Avg-Avg Limit dB	Trace Name
0.306	48.2	46.8	-14.7	44.1	-7.4	Negative
0.493	42.4	37.7	-18.5	36.0	-10.2	Negative
1.559	39.1	35.6	-20.4	33.1	-12.9	Negative

5.2. COMPLIANCE WITH FCC PART 15 – GENERAL TECHNICAL REQUIREMENTS

FCC Section	FCC Rules	Manufacturer's Clarification
15.31	The hoping function must be disabled for tests, which should be performed with the EUT transmitting on the number of frequencies specified in this Section. The measurements made at the upper and lower ends of the band of operation should be made with the EUT tuned to the highest and lowest available channels.	Complies with this requirement.
15.203	Described how the EUT complies with the requirement that either its antenna is permanently attached, or that it employs a unique antenna connector, for every antenna proposed for use with the EUT. The exception is in those cases where EUT must be professionally installed. In order to demonstrate that professional installation is required, the following 3 points must be addressed: ➢ The application (or intended use) of the EUT ➢ The installation requirements of the EUT ➢ The method by which the EUT will be marketed	The antenna employs is integral.
15.204	Provided the information for every antenna proposed for use with the EUT: ➢ type (e.g. Yagi, patch, grid, dish, etc…), ➢ manufacturer and model number ➢ gain with reference to an isotropic radiator	Uses integral antenna.
15.247(a)	Description of how the EUT meets the definition of a frequency hopping spread spectrum, found in Section 2.1. Based on the technical description.	See Operational Description
15.247(a)	Pseudo Frequency Hopping Sequence: Describe how the hopping sequence is generated. Provide an example of the hopping sequence channels, in order to demonstrate that the sequence meets the requirements specified in the definition of a frequency hopping spread spectrum system, found in Section 2.1	See Operational Description

FCC Section	FCC Rules	Manufacturer's Clarification
15.247(a)	Equal Hopping Frequency Use: Describe how each individual EUT meets the requirement that each of its hopping channels is used equally on average (e.g. that each new transmission event begins on the next channel in the hopping sequence after final channel used in the previous transmission events).	See Operational Description
15.247(g)	Describe how the EUT complies with the requirement that it be designed to be capable of operating as a true frequency hopping system	See Operational Description
15.247(h)	Describe how the EUT complies with the requirement that it not have the ability to coordinated with other FHSS is an effort to avoid the simultaneous occupancy of individual hopping frequencies by multiple transmitters	See Operational Description
Public Notice DA 00-705	System Receiver Input Bandwidth: Describe how the associated receiver(s) complies with the requirement that its input bandwidth (either RF or IF) matches the bandwidth of the transmitted signal.	See Operational Description
Public Notice DA 00-705	System Receiver Hopping Capability: Describe how the associated receiver(s) has the ability to shift frequencies in synchronization with the transmitted signals	See Operational Description

5.3. PROVISIONS FOR FREQUENCY HOPPING SYSTEMS [§ 15.247(a)(1)]

5.3.1. Limit

§ 15.247(a)(1): Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400–2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

§ 15.247(a)(1)(iii): Frequency hopping systems in the 2400–2483.5 MHz band shall use at least 15 channels. The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed. Frequency hopping systems may avoid or suppress transmissions on a particular hopping frequency provided that a minimum of 15 channels are used.

5.3.2. Method of Measurements

FCC Public Notice DA 00-705

Carrier Frequency Separation:

The hopping function of the EUT is enabled. Use the spectrum analyzer setting as follows:

- Span = wide enough to capture the peaks of two adjacent channels
- RBW = 1% of the span
- VBW ≥ RBW
- Sweep = Auto
- Detector = peak
- Trace = max hold

Number of hopping frequency:

The hopping function of the EUT is enabled. Use the spectrum analyzer setting as follows:

- Span = the frequency band of operation
- RBW = 1% of the span
- VBW ≥ RBW
- Sweep = Auto
- Detector = peak
- Trace = max hold

Time of Occupancy (Dwell Time):

The hopping function of the EUT is enabled. Use the spectrum analyzer setting as follows:

- Span = 0 Hz centered on a hopping channel
- RBW = 1 MHz
- VBW $\geq$ RBW
- Sweep = as necessary to capture the entire dwell time per hopping channel
- Detector = peak
- Trace = max hold

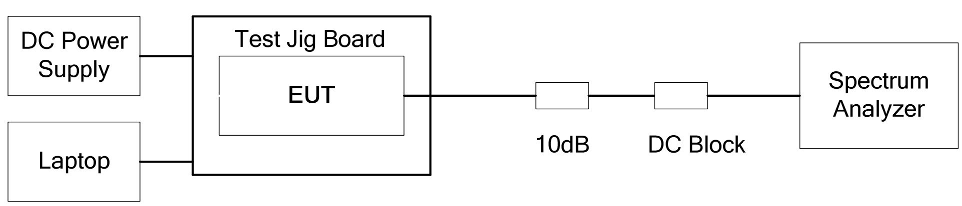
If possible, use the marker-delta function to determine the dwell time. If this value varies with different modes of operation (e.g. date rate modulation format, etc.), repeat this test for each variation. The limit is specified in one of the subparagraphs of this Section. Submit this plot(s). An oscilloscope may be used instead of a spectrum analyzer.

20 dB Bandwidth:

Use the spectrum analyzer setting as follows:

- Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel
- RBW = 1% of the 20 dB bandwidth
- VBW $\geq$ RBW
- Sweep = auto
- Detector = peak
- Trace = max hold
- The transmitter shall be transmitting at its maximum data rate.
- Allow the trace to stabilize.
- Use the marker-to-peak function to set the marker to the peak of the emission.
- Use the marker-delta function to measure 20 dB down on both sides of the emission.
- The 20 dB BW is the delta reading in frequency between two markers.

5.3.3. Test Arrangement



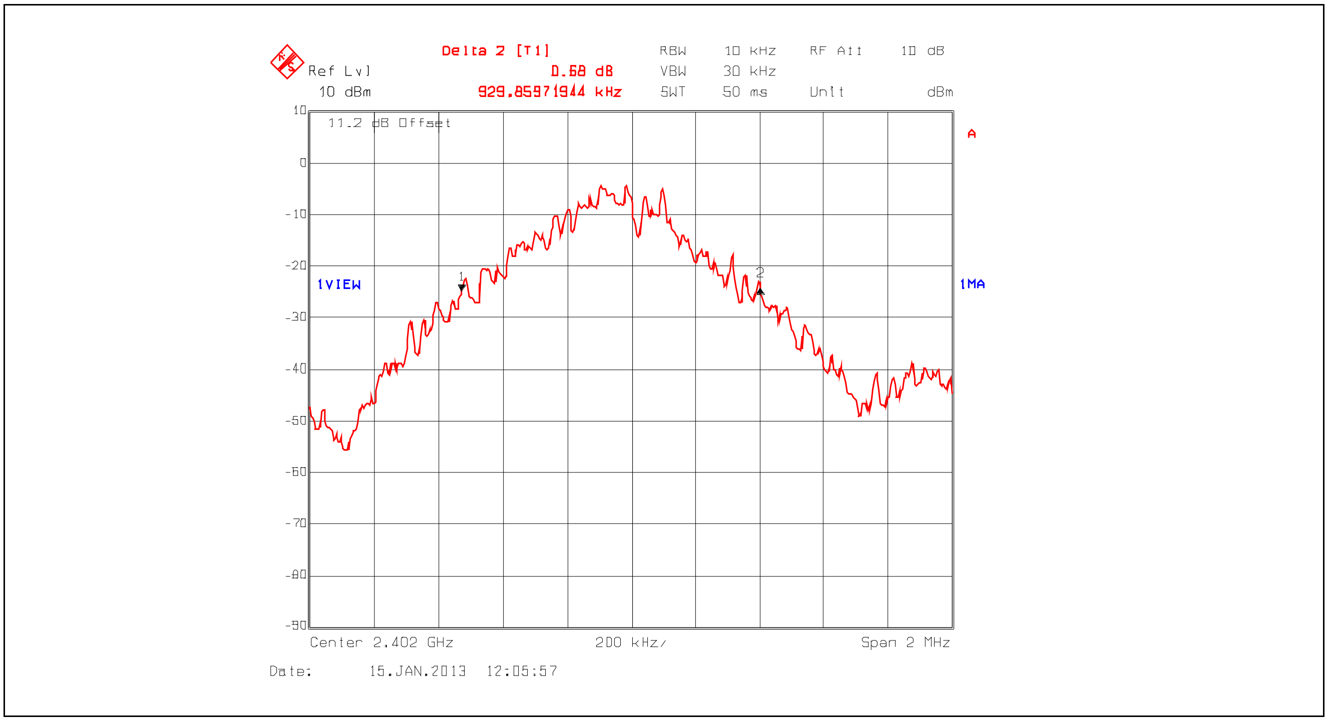
5.3.4. Test Data

Test Description	FCC Specification	Measured Values	Comments
Frequency Hopping Systems Requirements	The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.	--	See Note 1
20 dB BW of the hopping channel	--	1.27 MHz	See Note 2
Channel Hopping Frequency Separation	Minimum of 25 kHz or 20dB BW whichever is greater or 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW	1.0 MHz	See Note 2
Number hopping frequencies	Shall use at least 15 channels	79 hopping frequencies	See Note 1 and 2
Average Time of Occupancy	The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed	328.36 ms	See Note 2

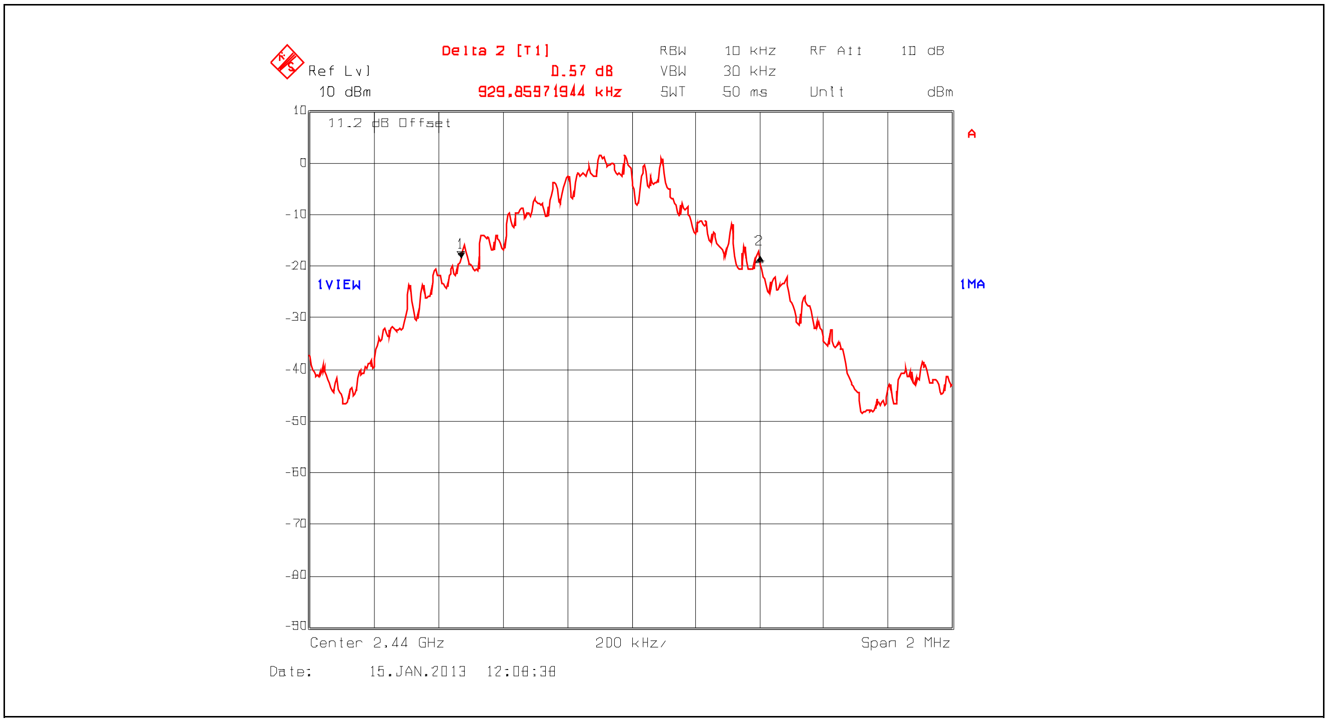
Note 1: See operational description exhibit for details.

Note 2: See the following plots for details.

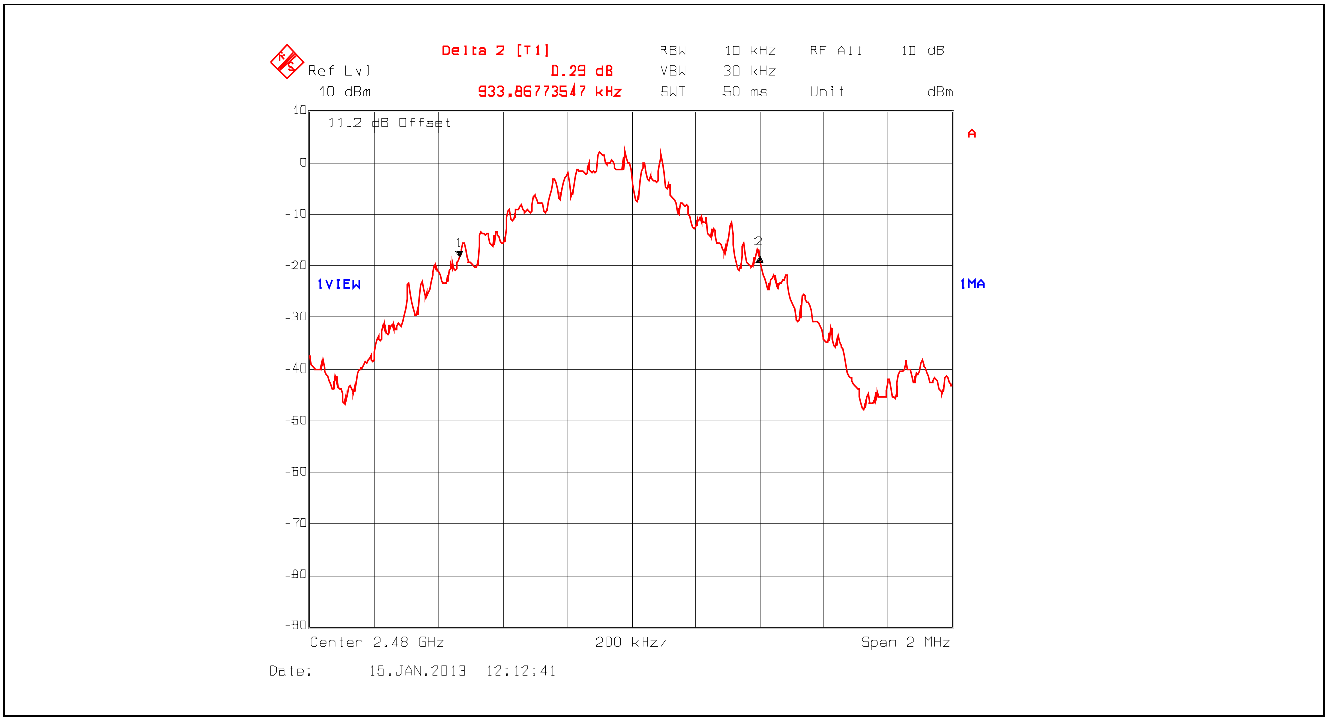
Plot 5.3.4.1. 20 dB Bandwidth, 2402 MHz, ACL Basic DH5 339 Payload



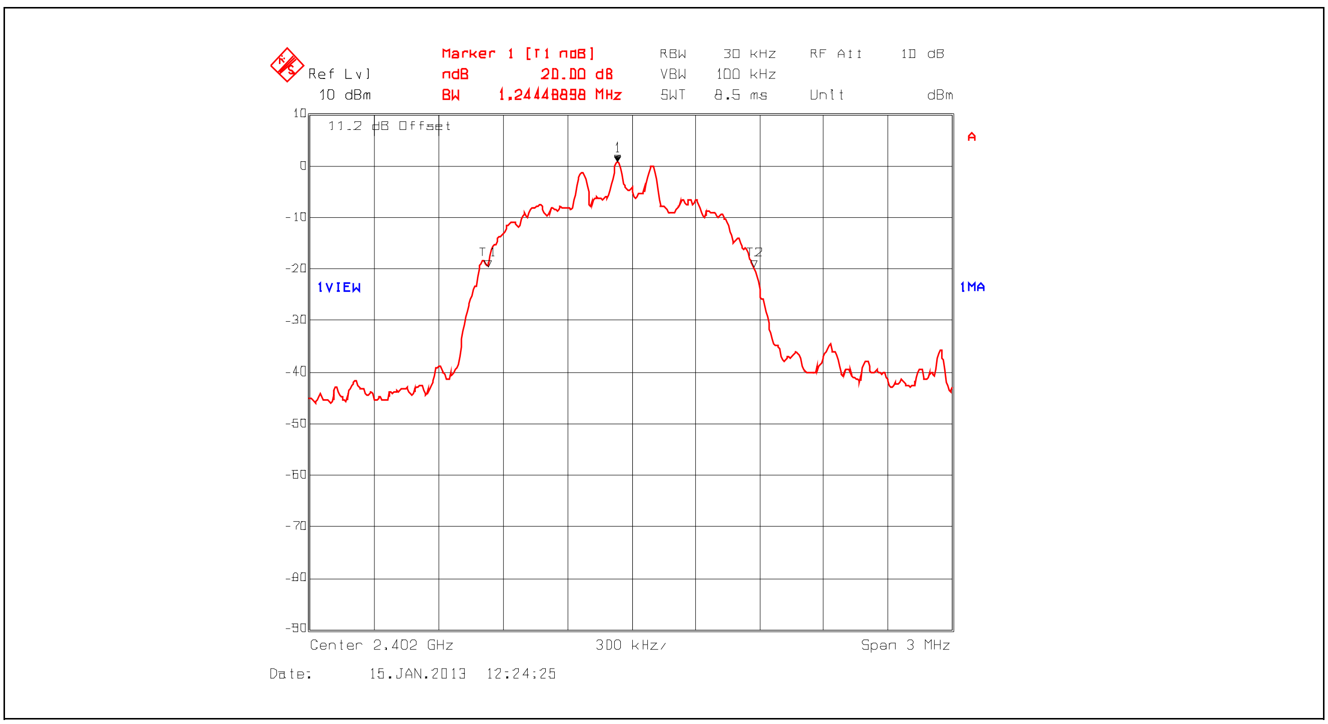
Plot 5.3.4.2. 20 dB Bandwidth, 2440 MHz, ACL Basic DH5 339 Payload



Plot 5.3.4.3. 20 dB Bandwidth, 2480 MHz, ACL Basic DH5 339 Payload



Plot 5.3.4.4. 20 dB Bandwidth, 2402 MHz, ACL EDR 3-DH5 1021 Payload



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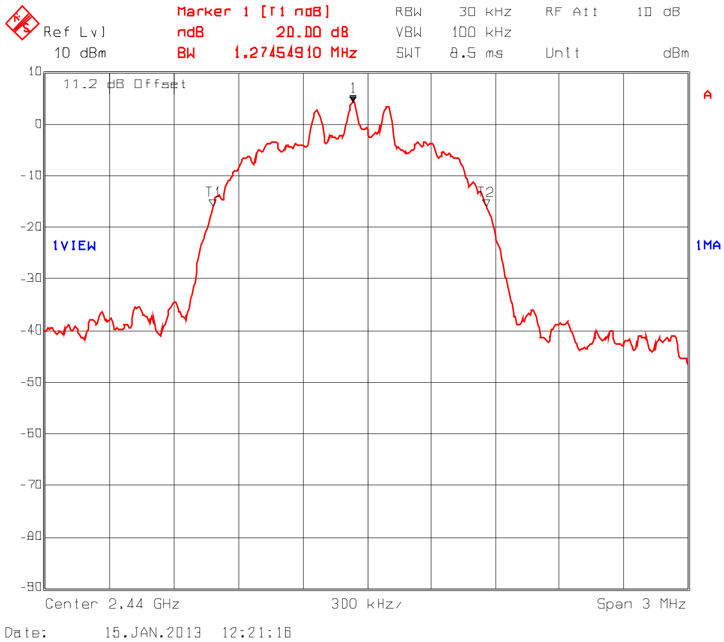
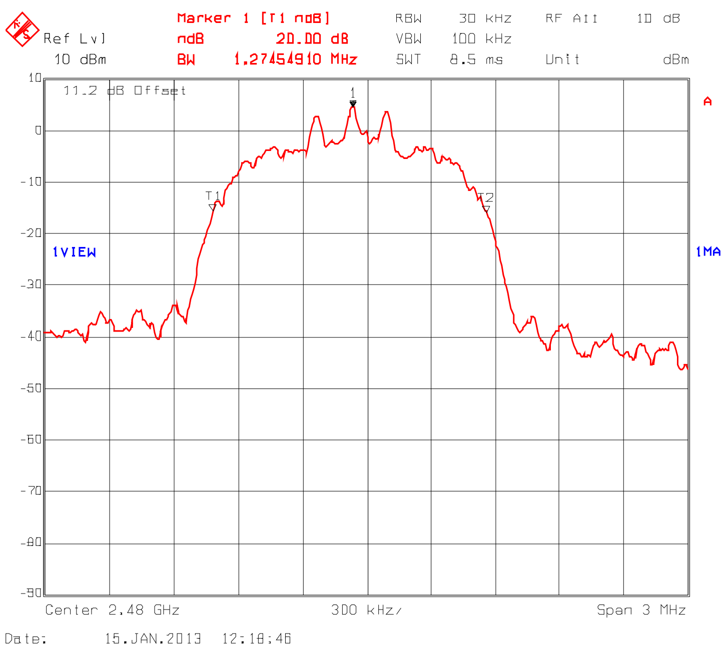
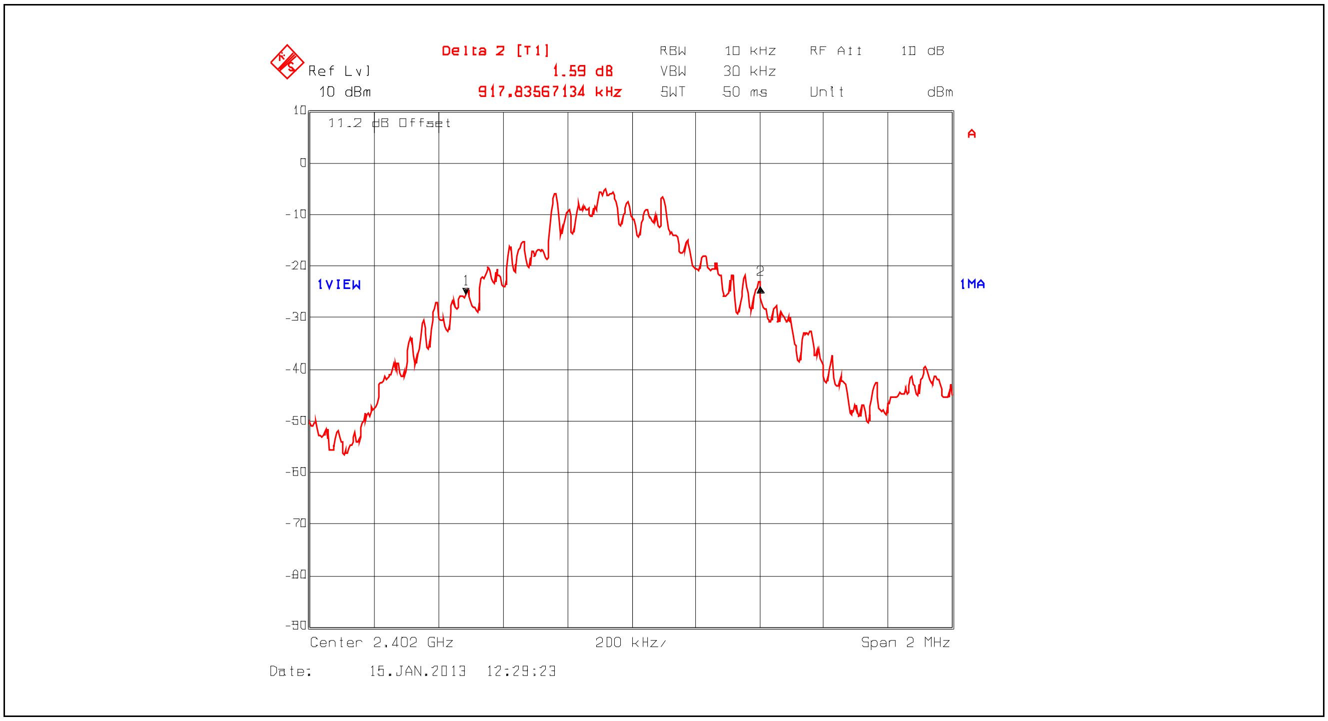
Plot 5.3.4.5. 20 dB Bandwidth, 2440 MHz, ACL EDR 3- DH5 1021 Payload



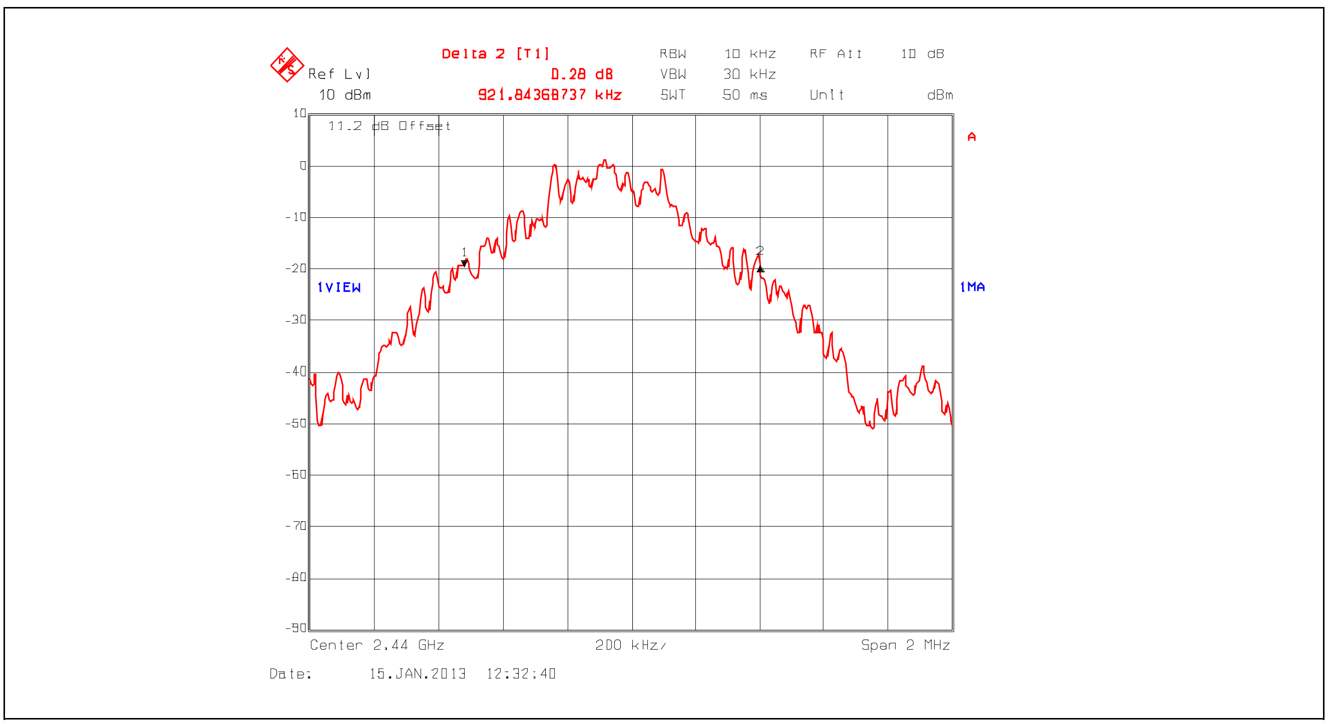
Plot 5.3.4.6. 20 dB Bandwidth, 2480 MHz, ACL EDR 3- DH5 1021 Payload



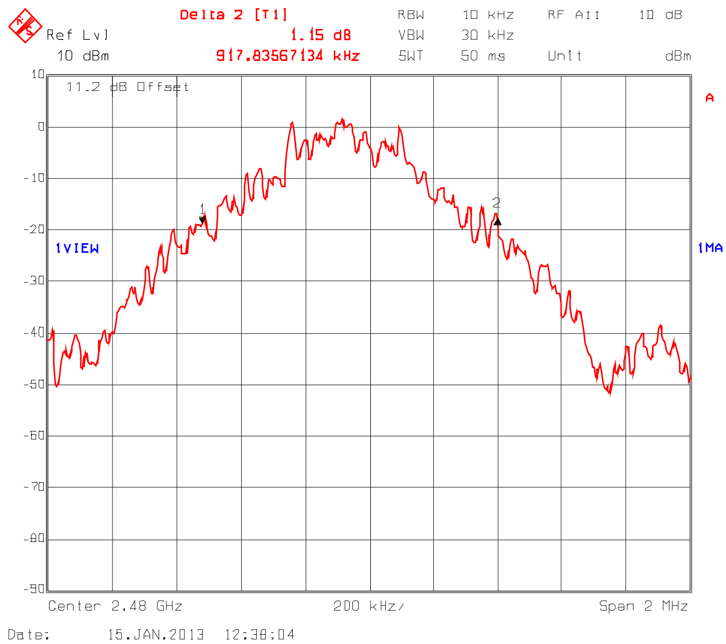
Plot 5.3.4.7. 20 dB Bandwidth, 2402 MHz, SCO Basic HV3 30 Payload



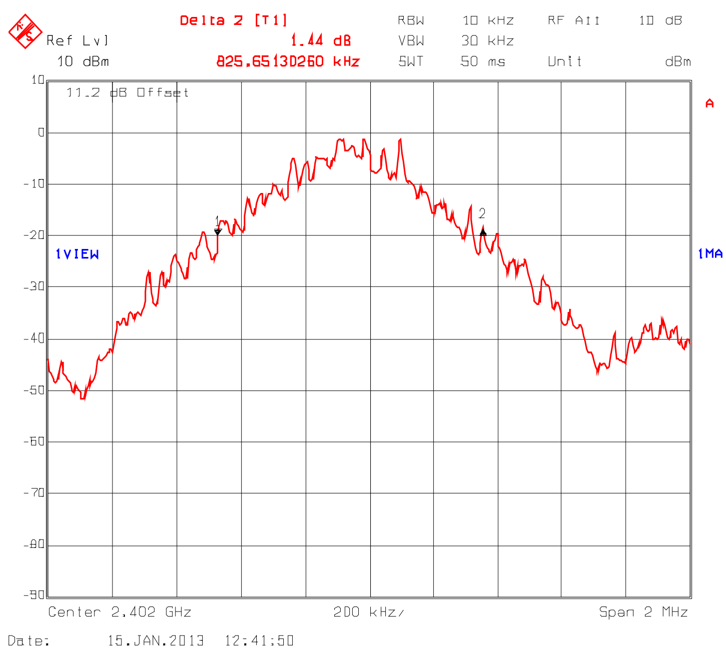
Plot 5.3.4.8. 20 dB Bandwidth, 2440 MHz, SCO Basic HV3 30 Payload



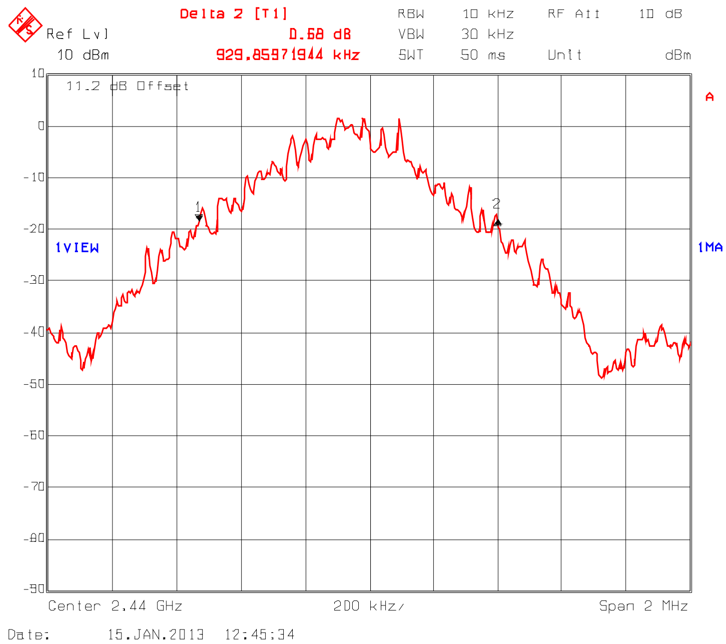
Plot 5.3.4.9. 20 dB Bandwidth, 2480 MHz, SCO Basic HV3 30 Payload



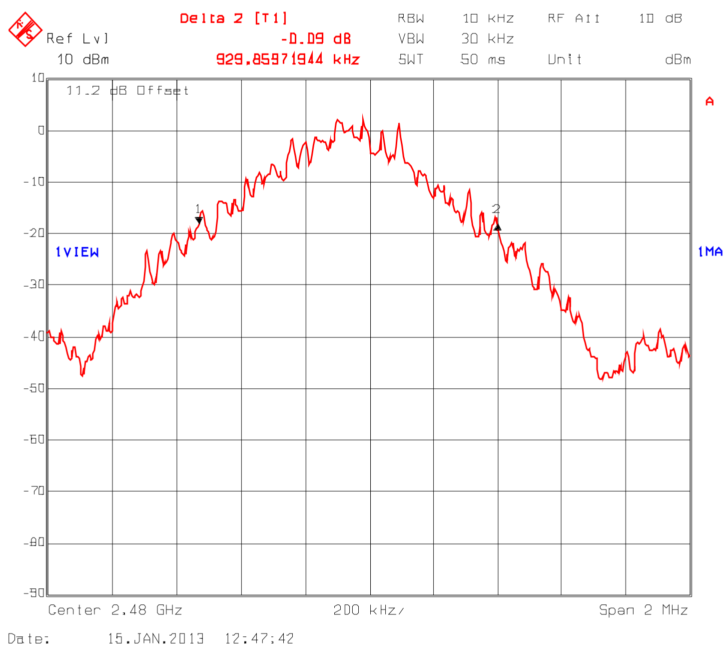
Plot 5.3.4.10. 20 dB Bandwidth, 2402 MHz, eSCO Basic EV5 180 Payload



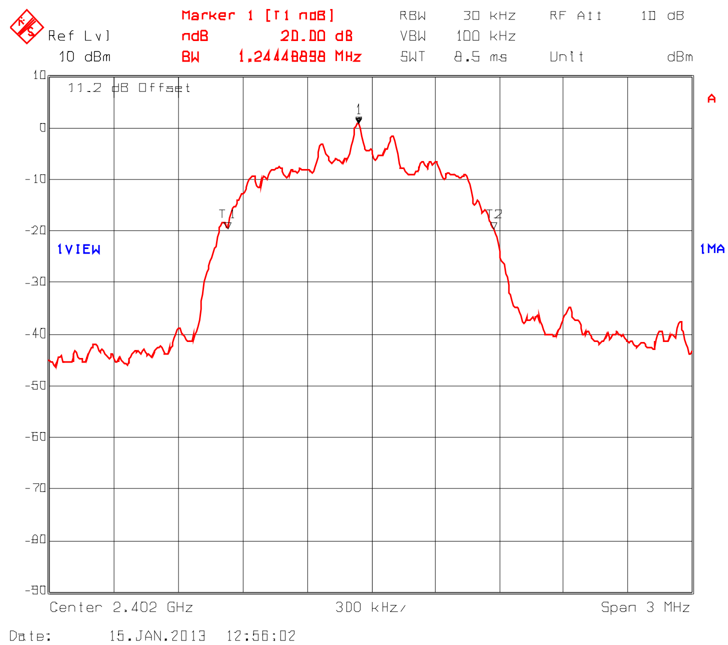
Plot 5.3.4.11. 20 dB Bandwidth, 2440 MHz, eSCO Basic EV5 180 Payload



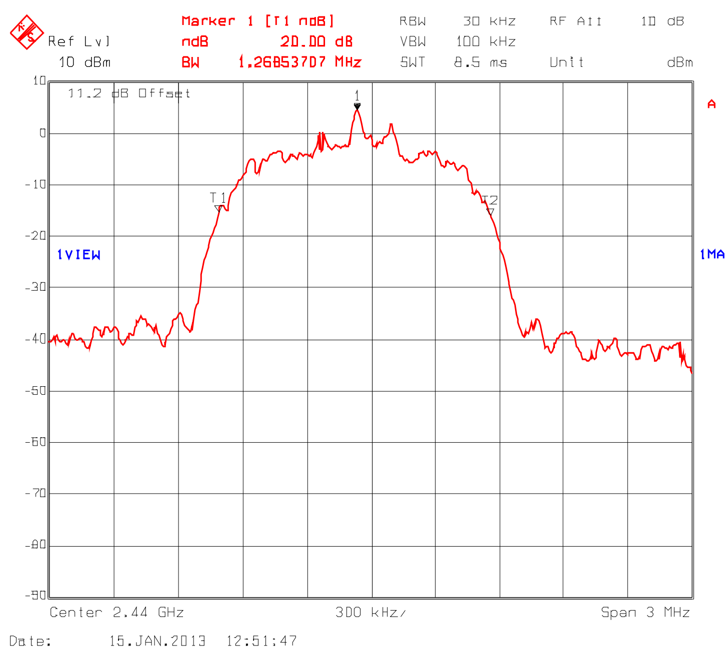
Plot 5.3.4.12. 20 dB Bandwidth, 2480 MHz, eSCO Basic EV5 180 Payload



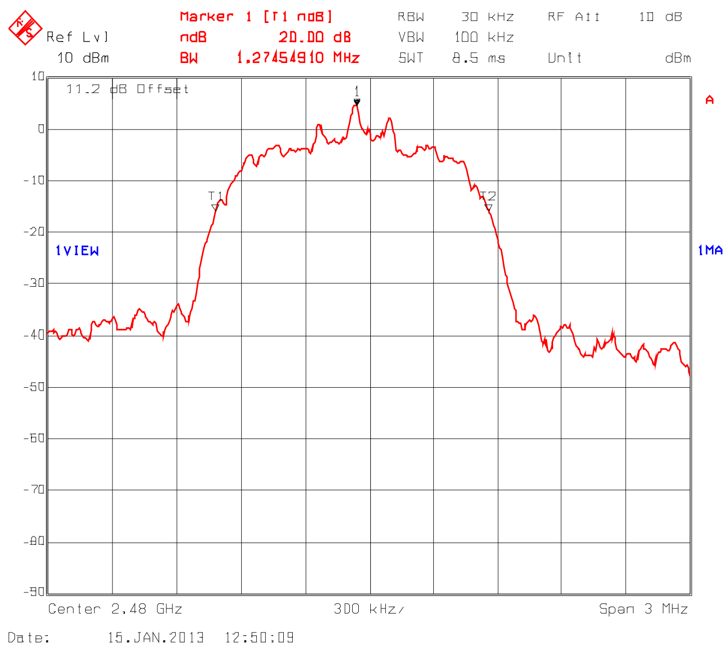
Plot 5.3.4.13. 20 dB Bandwidth, 2402 MHz, eSCO EDR 3- EV5 540 Payload



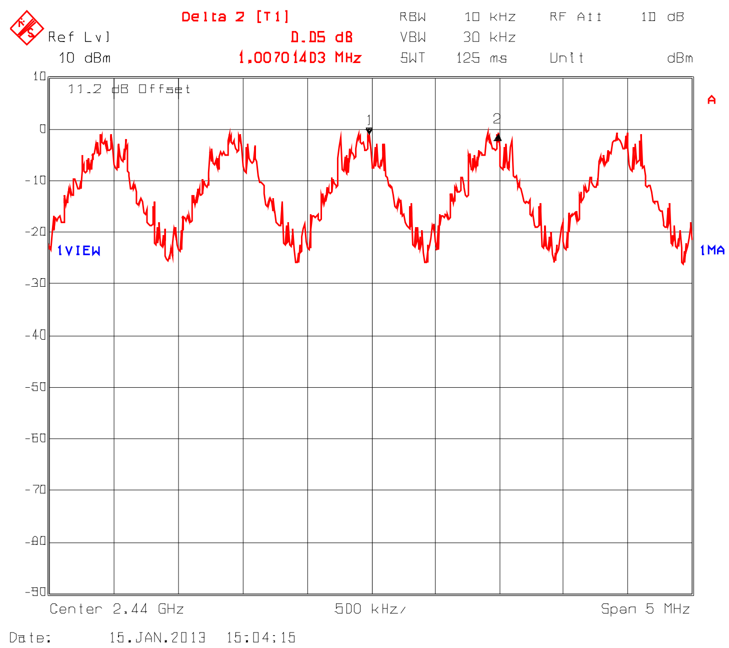
Plot 5.3.4.14. 20 dB Bandwidth, 2440 MHz, eSCO EDR 3- EV5 540 Payload



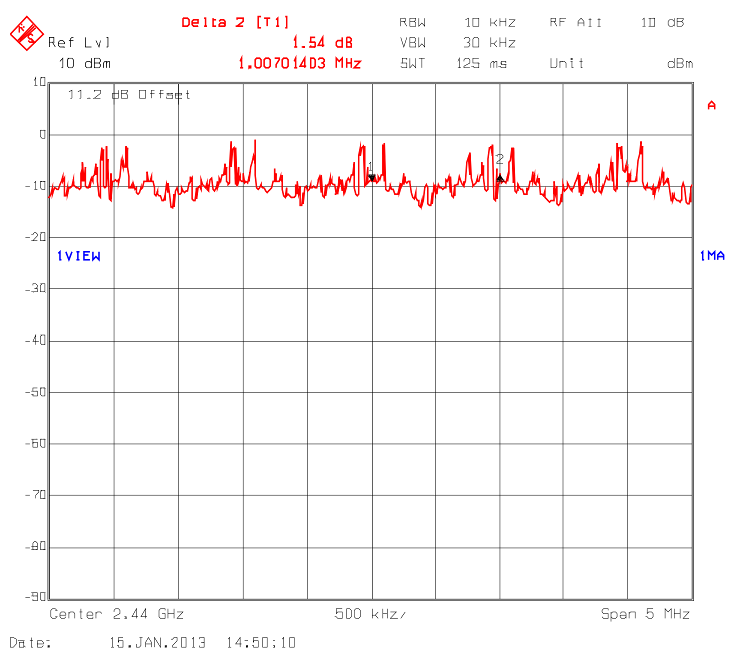
Plot 5.3.4.15. 20 dB Bandwidth, 2480 MHz, eSCO EDR 3- EV5 540 Payload



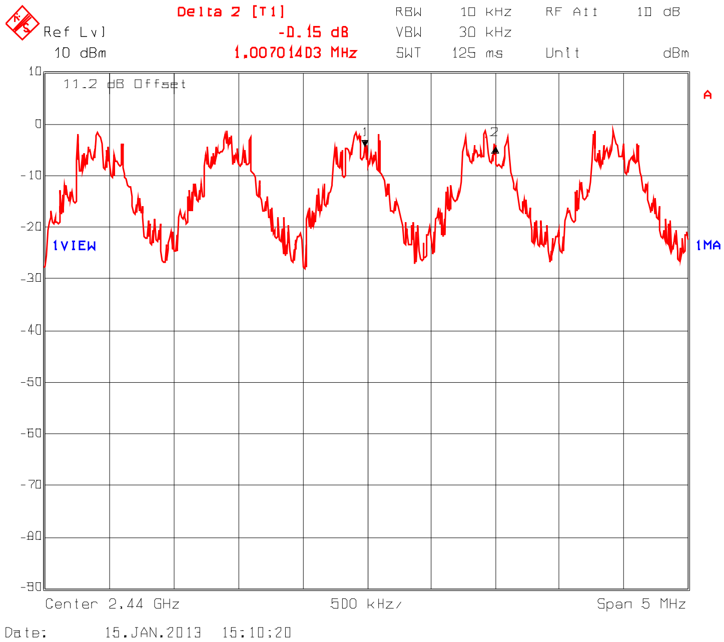
Plot 5.3.4.16. Carrier Frequency Separation, ACL Basic DH5 339 Payload



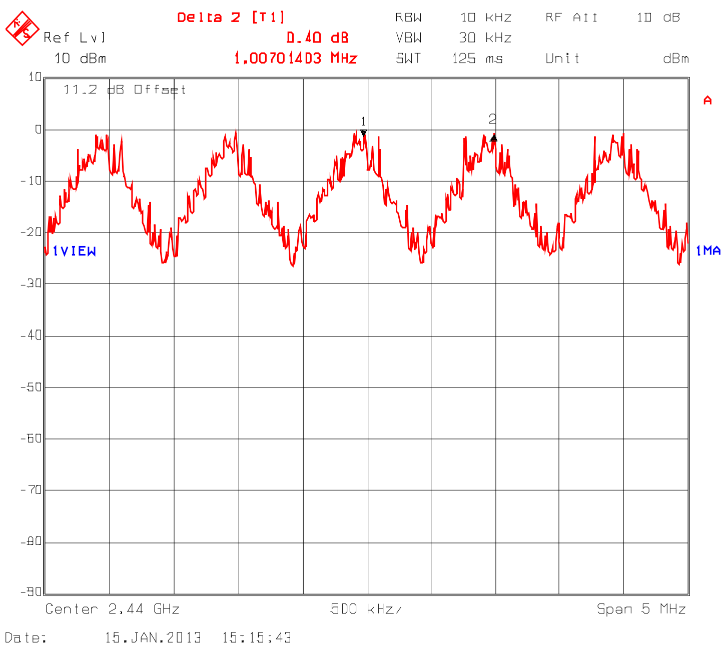
Plot 5.3.4.17. Carrier Frequency Separation, ACL EDR 3-DH5 1021 Payload



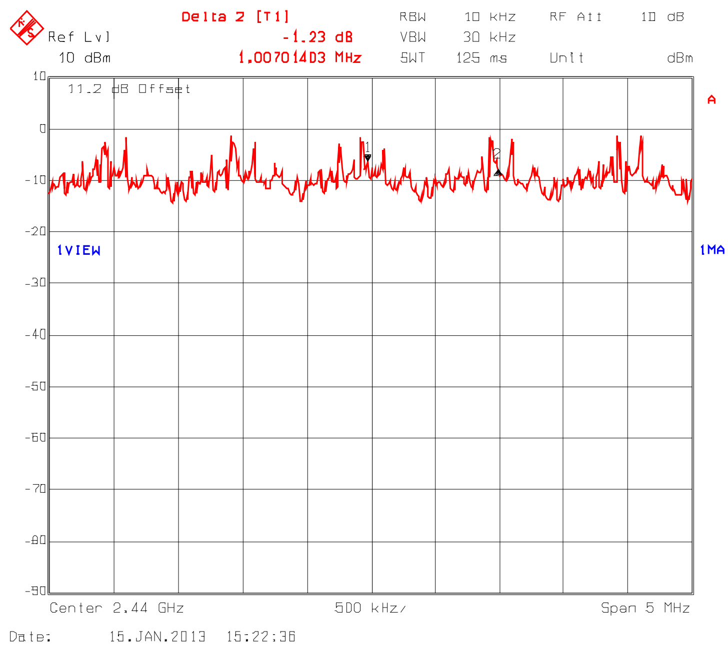
Plot 5.3.4.18. Carrier Frequency Separation, SCO Basic HV3 30 Payload



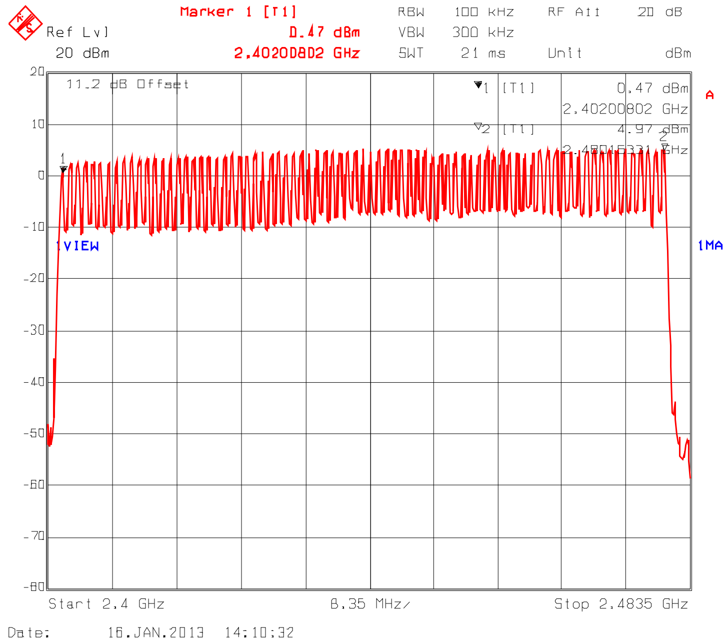
Plot 5.3.4.19. Carrier Frequency Separation, eSCO Basic EV5 180 Payload



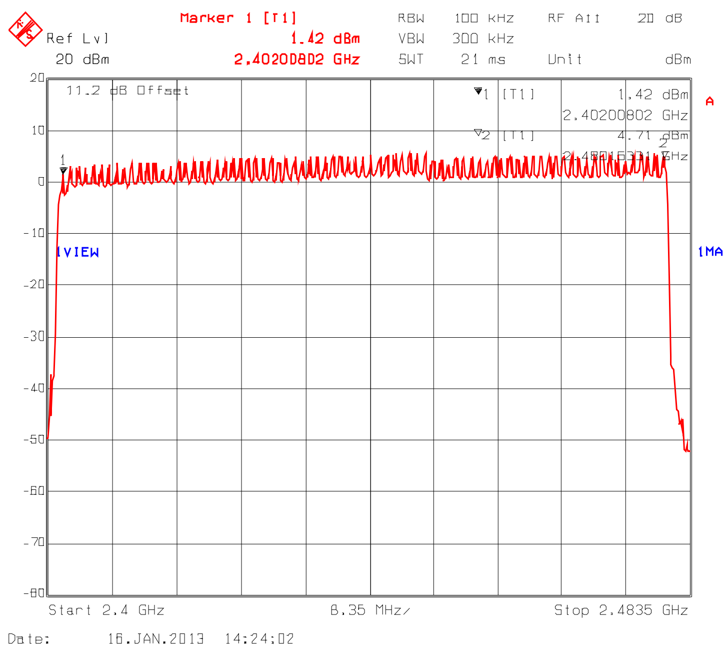
Plot 5.3.4.20. Carrier Frequency Separation, eSCO EDR 3- EV5 540 Payload



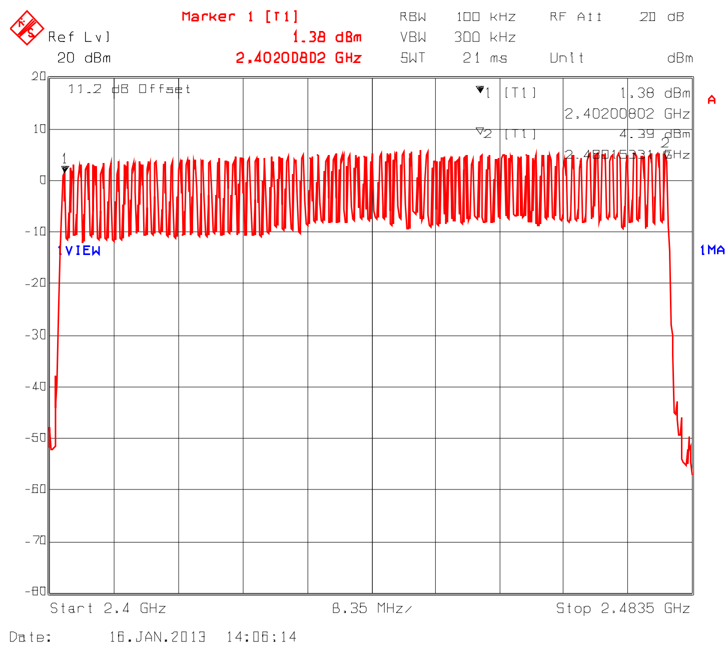
Plot 5.3.4.21. Number of Hopping Frequencies, ACL Basic DH5 339 Payload, 79 hopping channels



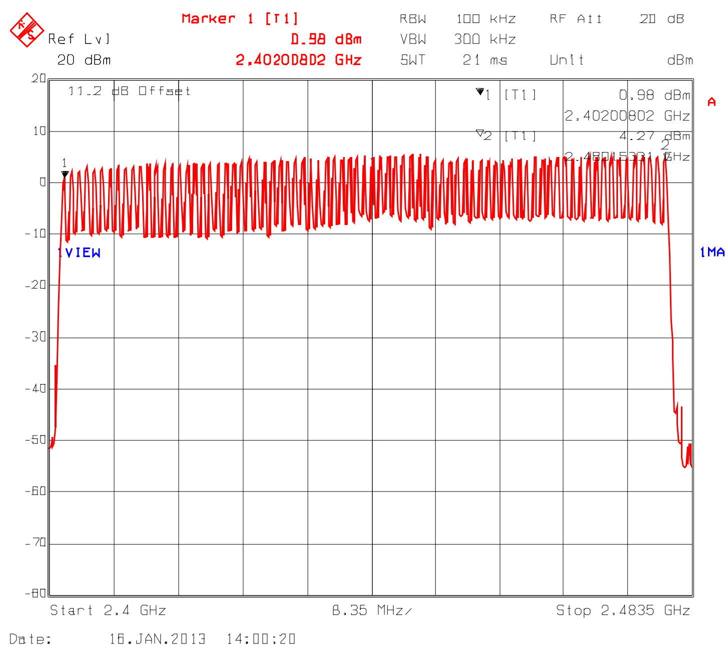
Plot 5.3.4.22. Number of Hopping Frequencies, ACL EDR 3-DH5 1021 Payload, 79 hopping channels



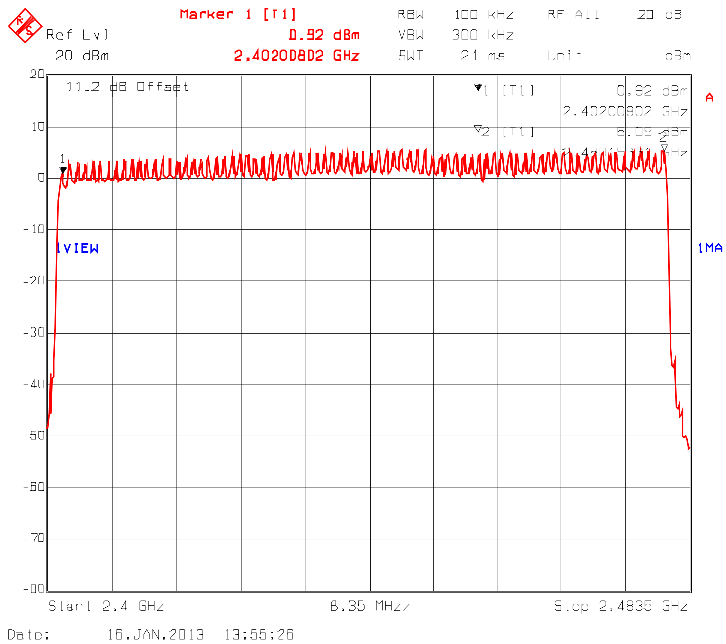
Plot 5.3.4.23. Number of Hopping Frequencies, SCO Basic HV3 30 Payload, 79 hopping channels



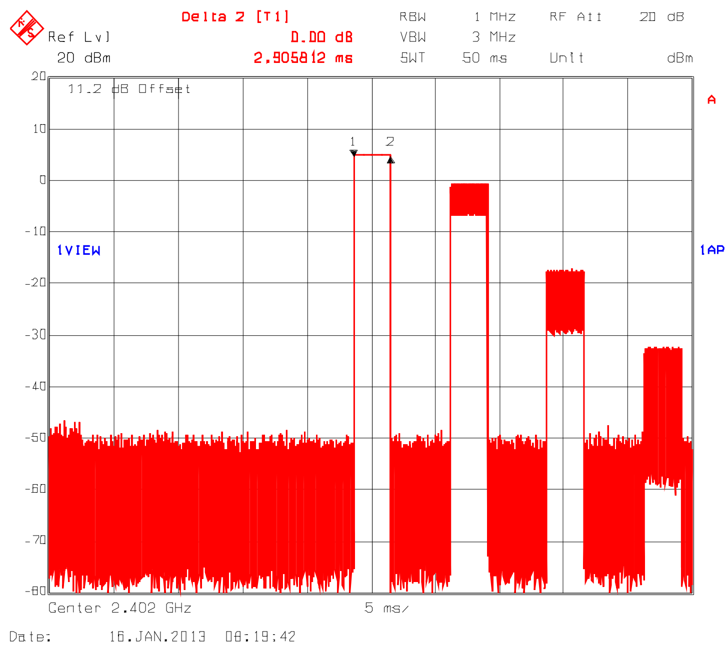
Plot 5.3.4.24. Number of Hopping Frequencies, eSCO Basic EV5 180 Payload, 79 hopping channels



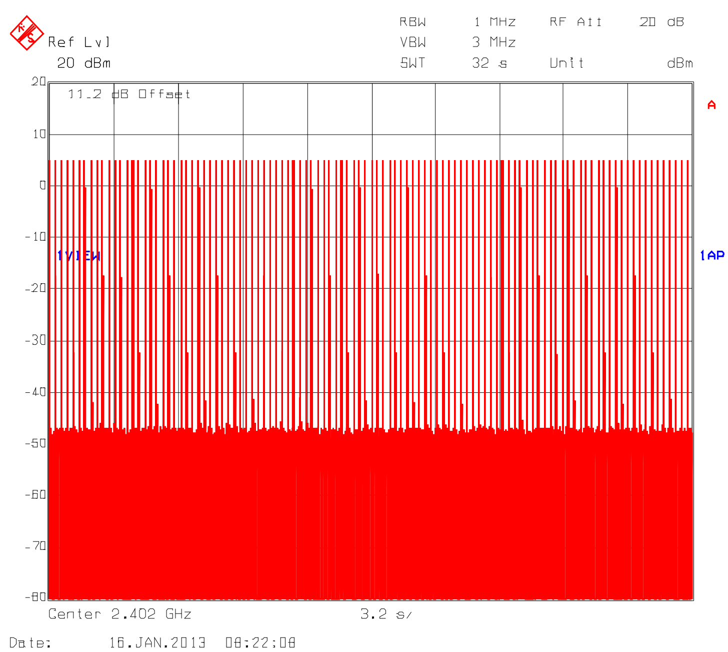
Plot 5.3.4.25. Number of Hopping Frequencies, eSCO EDR 3- EV5 540 Payload, 79 hopping channels



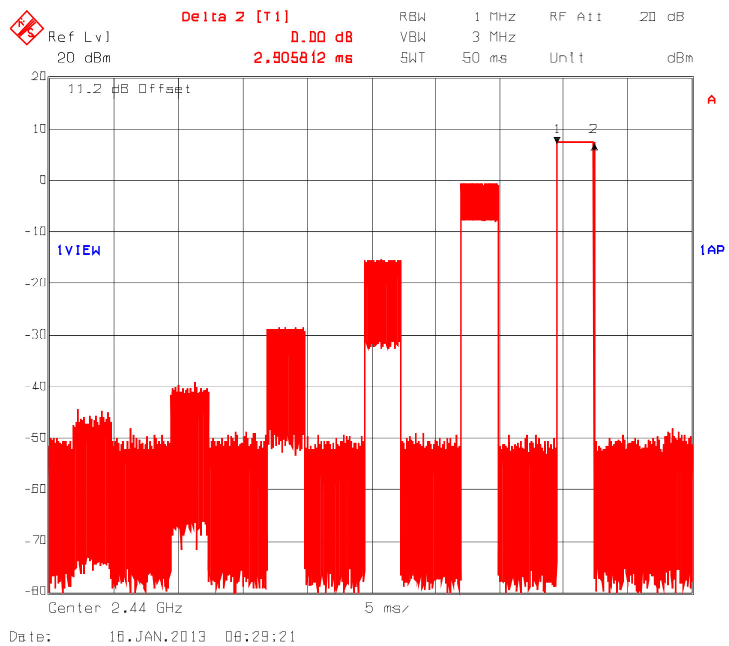
Plot 5.3.4.26. Time of Occupancy, 2402 MHz, ACL Basic DH5 339 Payload, Dwell Time @ 2402 MHz = 2.905812 ms



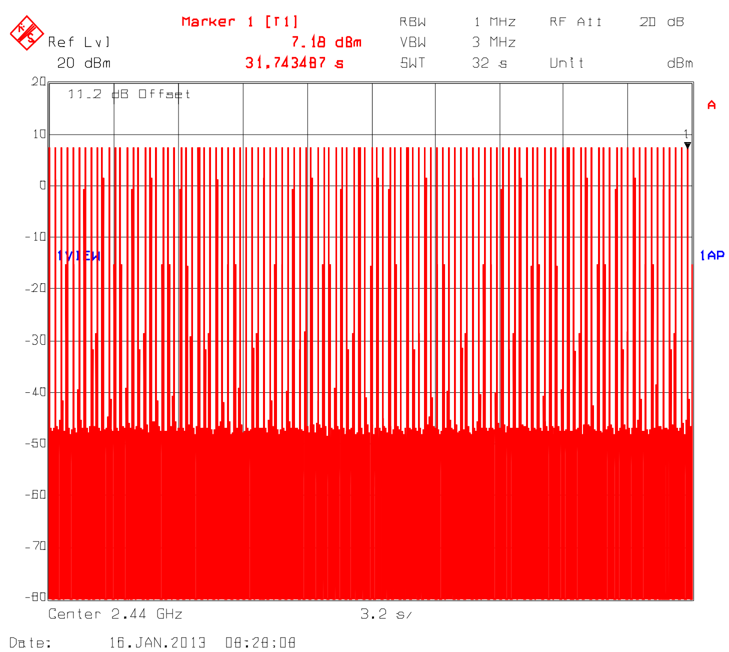
Plot 5.3.4.27. Time of Occupancy, 2402 MHz, ACL Basic DH5 339 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 2.905812 ms x 113 = 328.36 ms



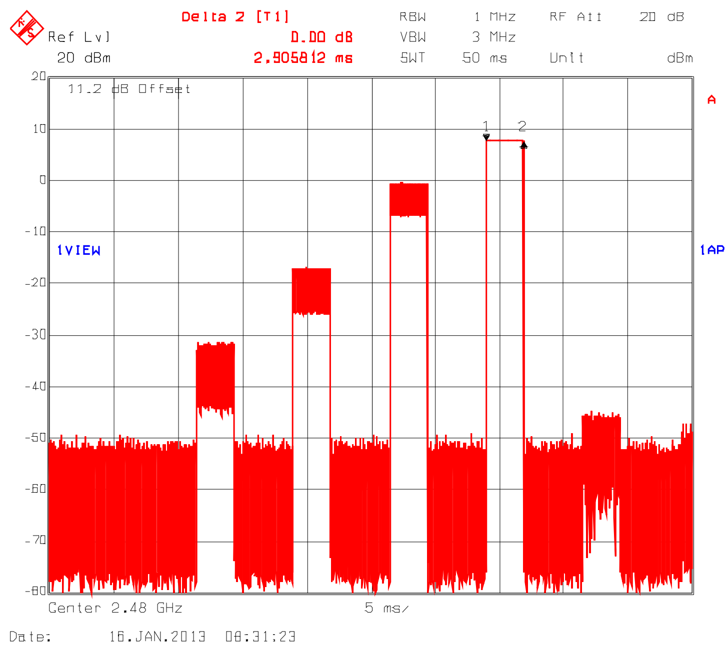
Plot 5.3.4.28. Time of Occupancy, 2440 MHz, ACL Basic DH5 339 Payload, Dwell Time @ 2440 MHz = 2.905812 ms



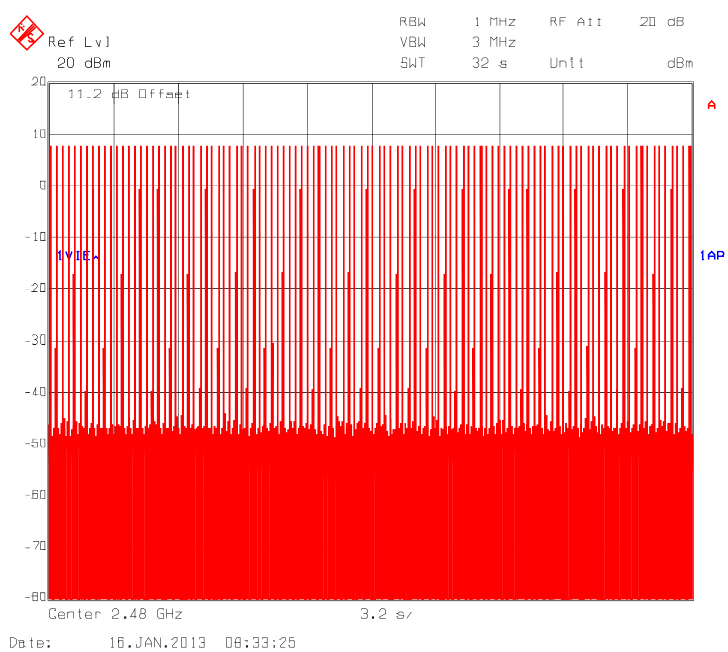
Plot 5.3.4.29. Time of Occupancy, 2440 MHz, ACL Basic DH5 339 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 2.905812 ms x 113 = 328.36 ms



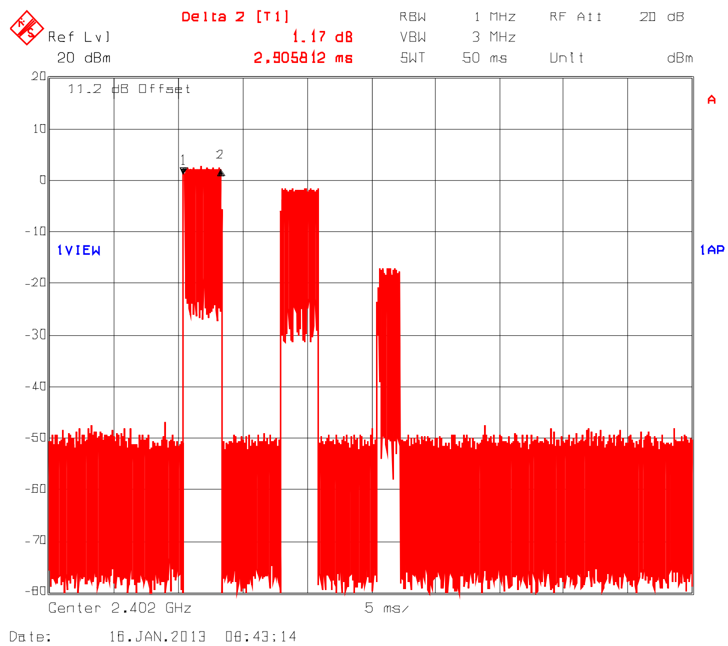
Plot 5.3.4.30. Time of Occupancy, 2480 MHz, ACL Basic DH5 339 Payload, Dwell Time @ 2480 MHz = 2.905812 ms



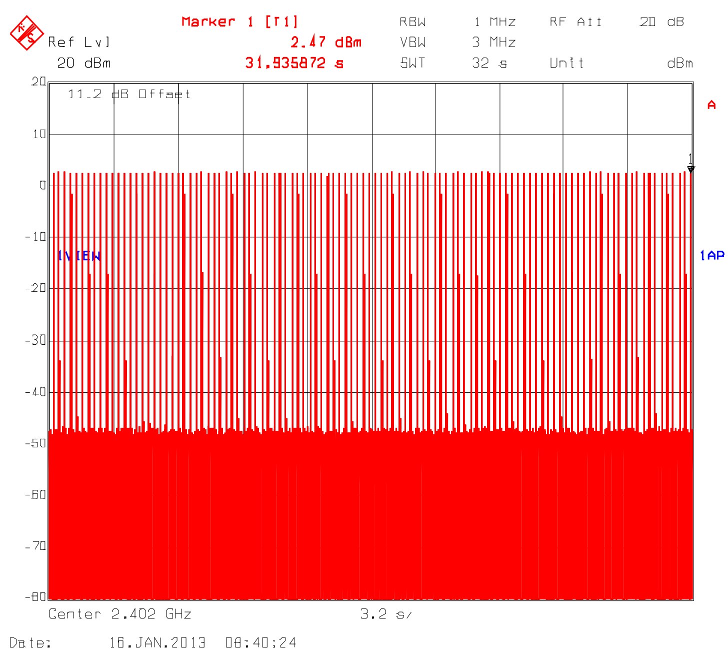
Plot 5.3.4.31. Time of Occupancy, 2480 MHz, ACL Basic DH5 339 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 2.905812 ms x 113 = 328.36 ms



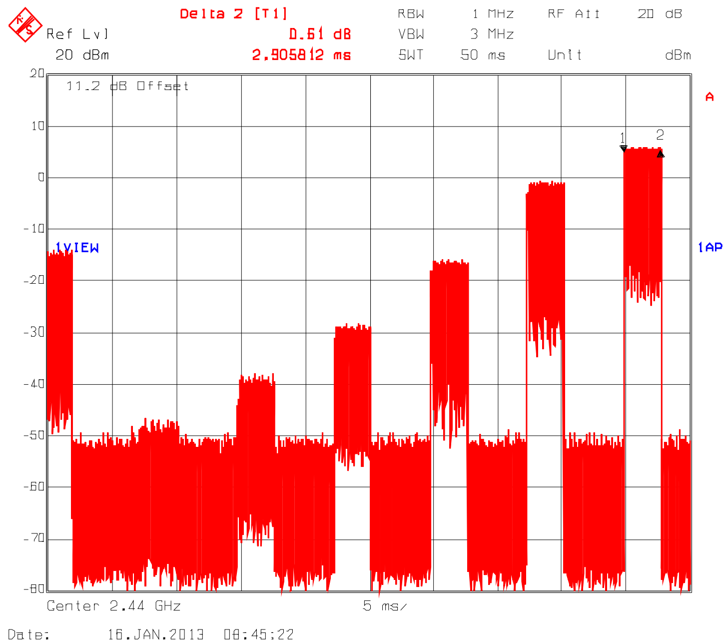
Plot 5.3.4.32. Time of Occupancy, 2402 MHz, ACL EDR 3-DH5 1021 Payload, Dwell Time @ 2402 MHz = 2.905812 ms



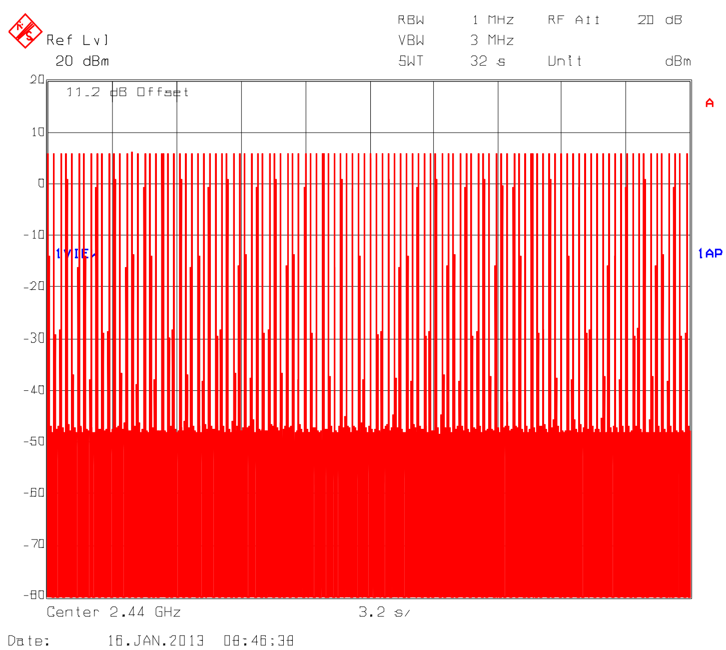
Plot 5.3.4.33. Time of Occupancy, 2402 MHz, ACL EDR 3-DH5 1021 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 2.905812 ms x 113 = 328.36 ms



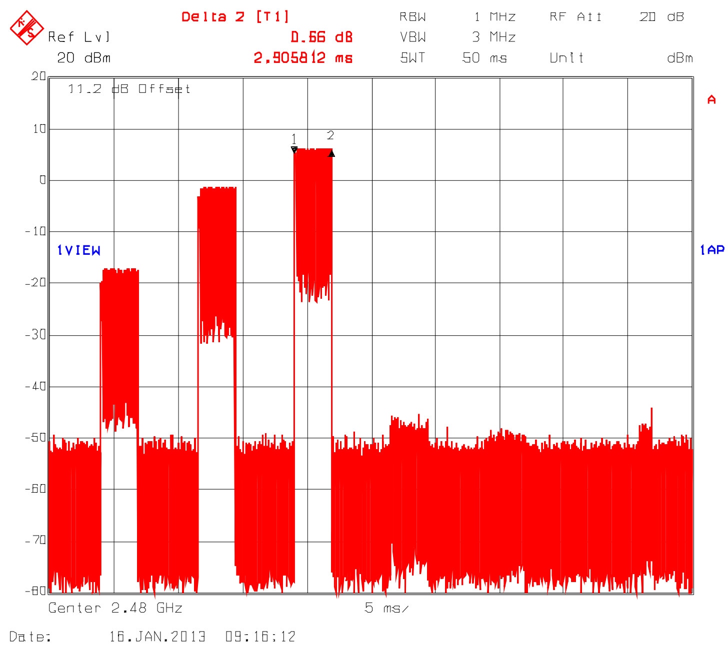
Plot 5.3.4.34. Time of Occupancy, 2440 MHz, ACL EDR 3- DH5 1021 Payload, Dwell Time @ 2440 MHz = 2.905812 ms



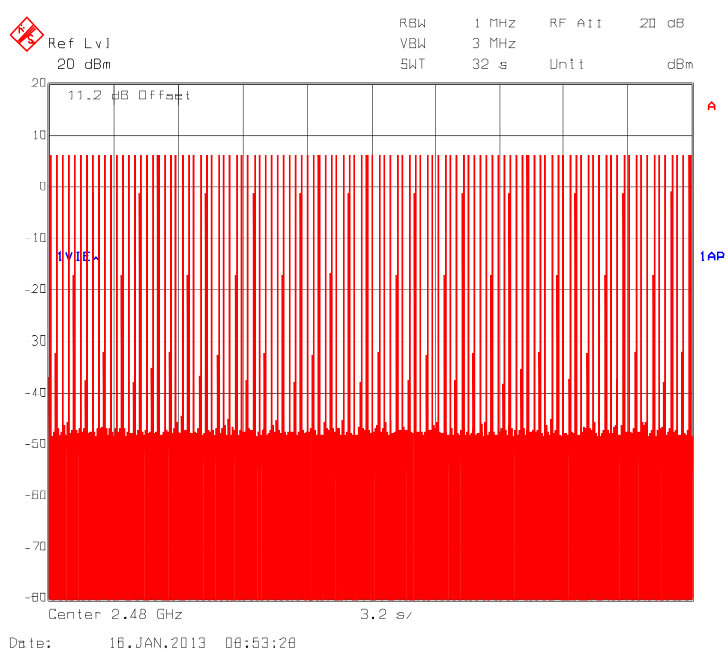
Plot 5.3.4.35. Time of Occupancy, 2440 MHz, ACL EDR 3- DH5 1021 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 2.905812 ms x 113 = 328.36 ms



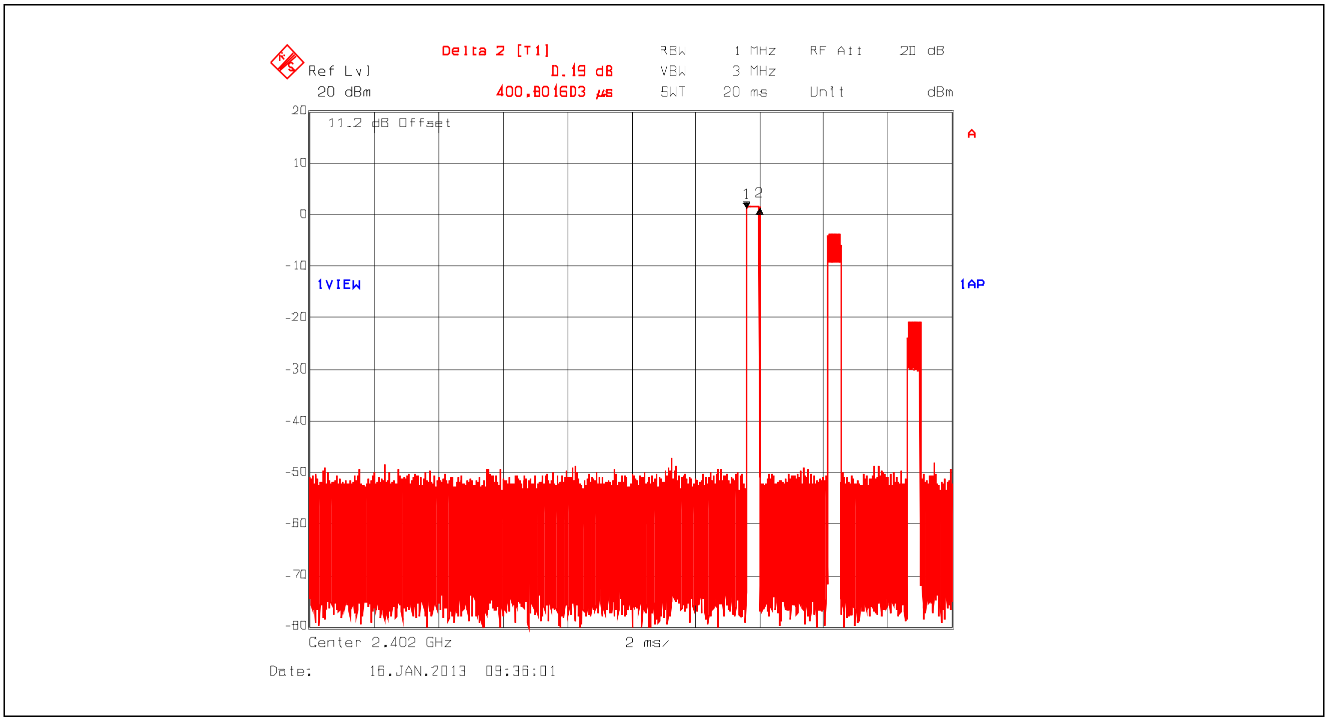
Plot 5.3.4.36. Time of Occupancy, 2480 MHz, ACL EDR 3- DH5 1021 Payload, Dwell Time @ 2480 MHz = 2.905812 ms



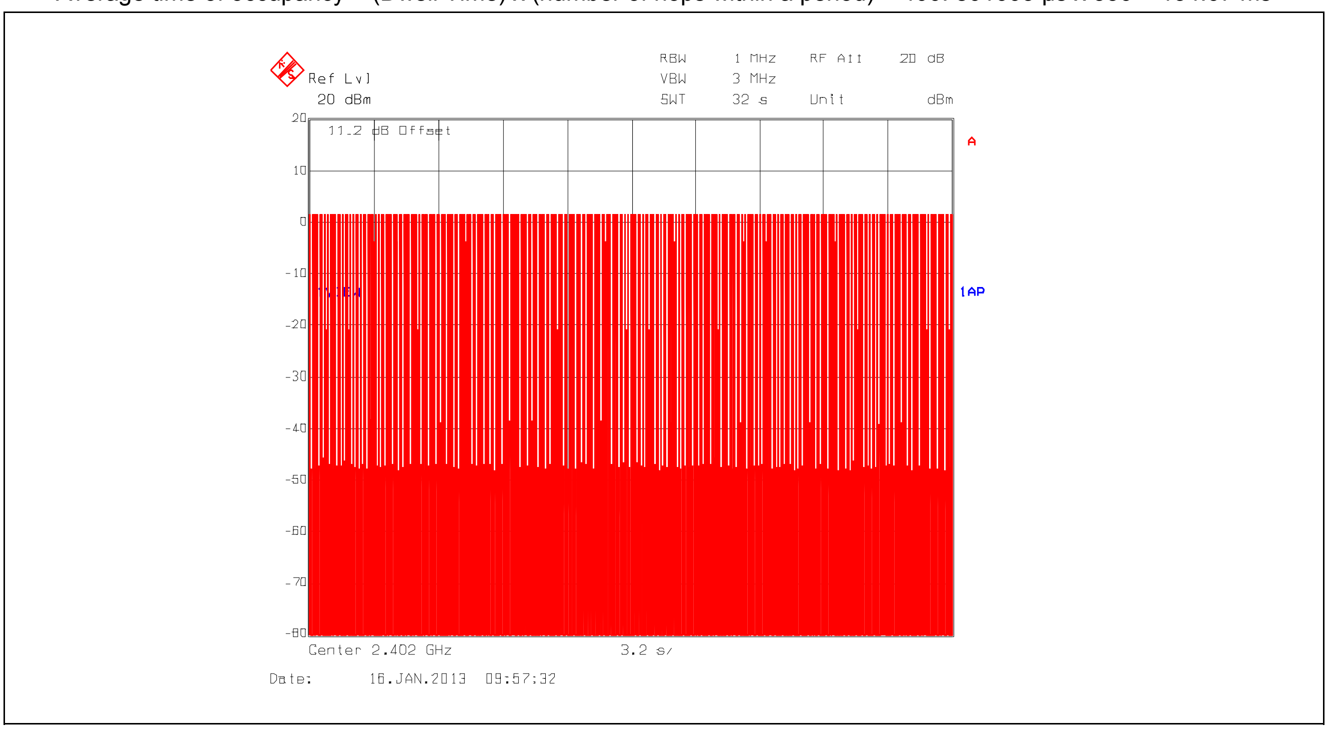
Plot 5.3.4.37. Time of Occupancy, 2480 MHz, ACL EDR 3- DH5 1021 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 2.905812 ms x 113 = 328.36 ms



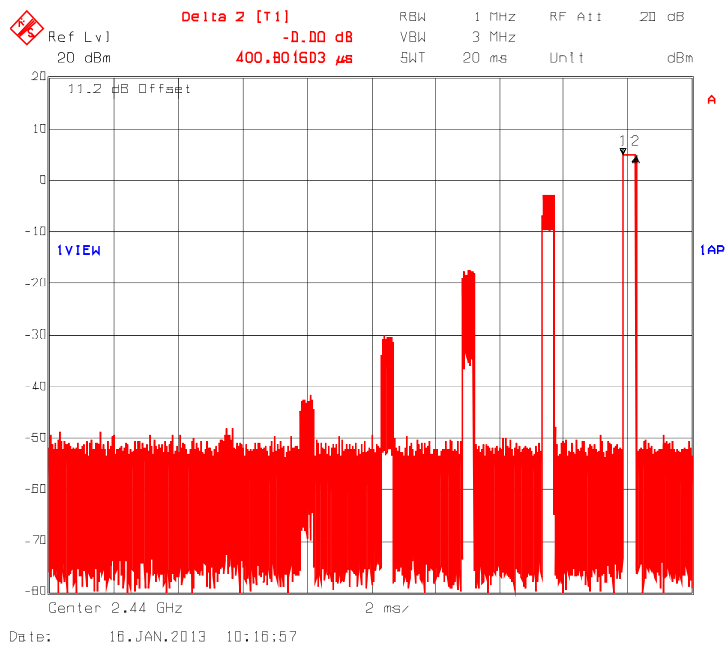
Plot 5.3.4.38. Time of Occupancy, 2402 MHz, SCO Basic HV3 30 Payload, Dwell Time @ 2402 MHz = 400.801603 µs



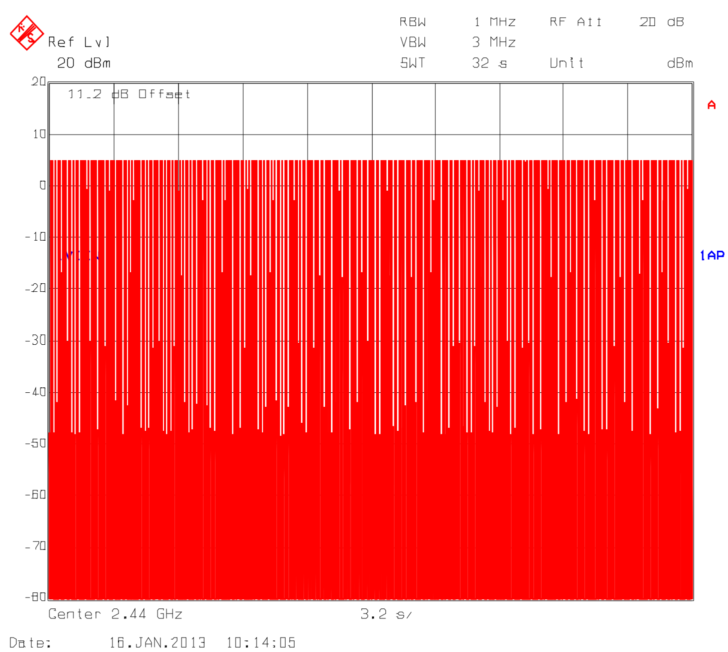
Plot 5.3.4.39. Time of Occupancy, 2402 MHz, SCO Basic HV3 30 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 400. 801603 µs x 336 = 134.67 ms



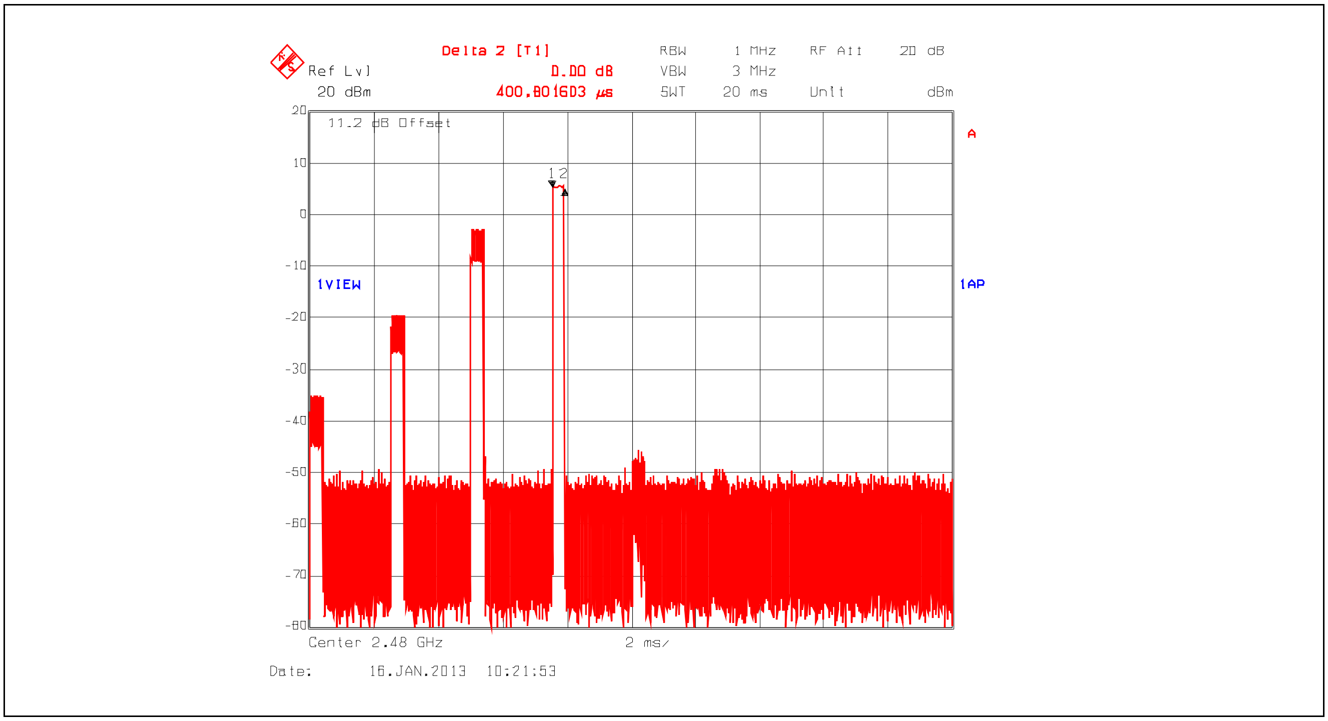
Plot 5.3.4.40. Time of Occupancy, 2440 MHz, SCO Basic HV3 30 Payload, Dwell Time @ 2440 MHz = 400.801603 μs



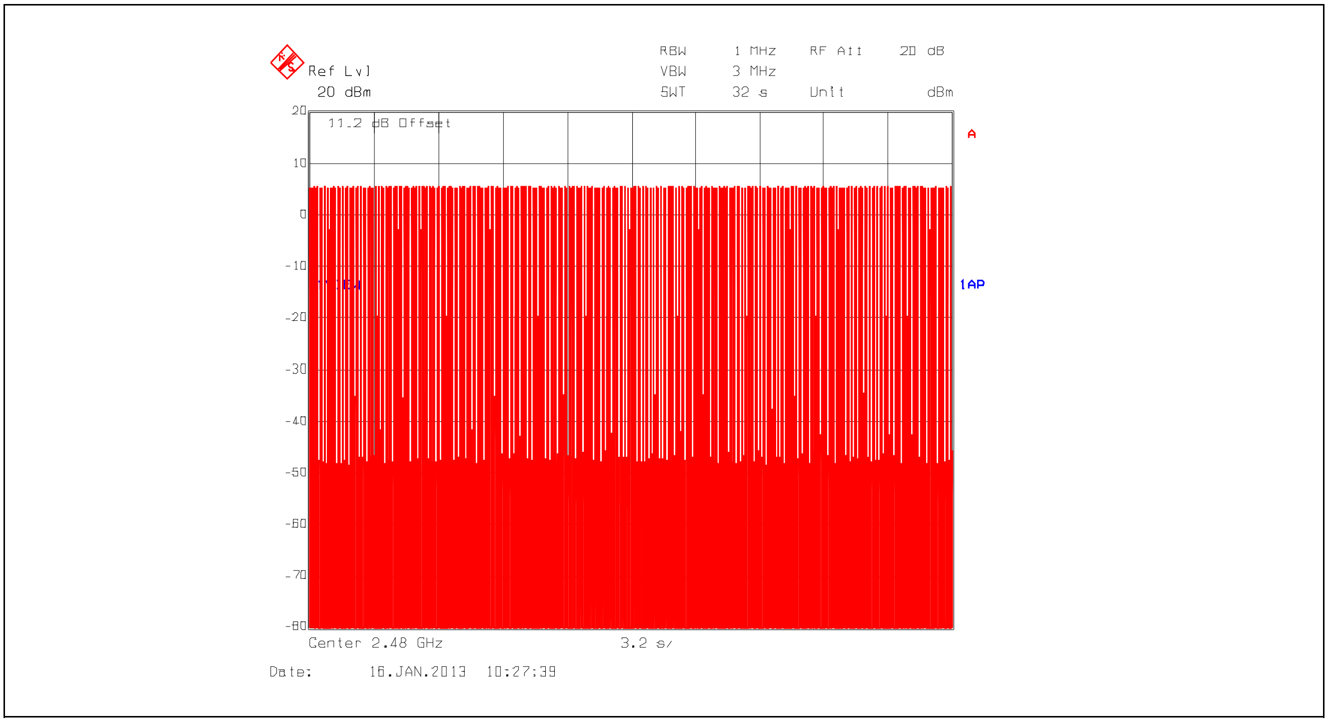
Plot 5.3.4.41. Time of Occupancy, 2440 MHz, SCO Basic HV3 30 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 400. 801603 μs x 336 = 134.67 ms



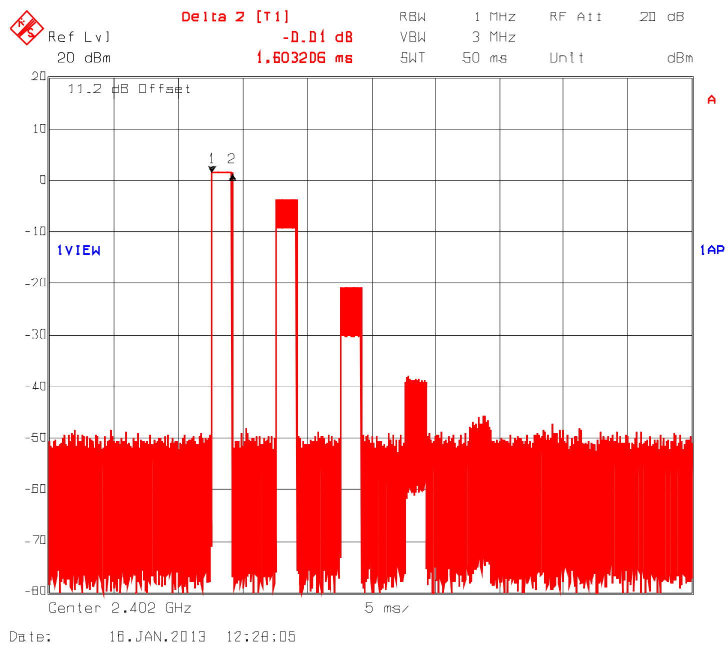
Plot 5.3.4.42. Time of Occupancy, 2480 MHz, SCO Basic HV3 30 Payload, Dwell Time @ 2480 MHz = 400.801603 µs



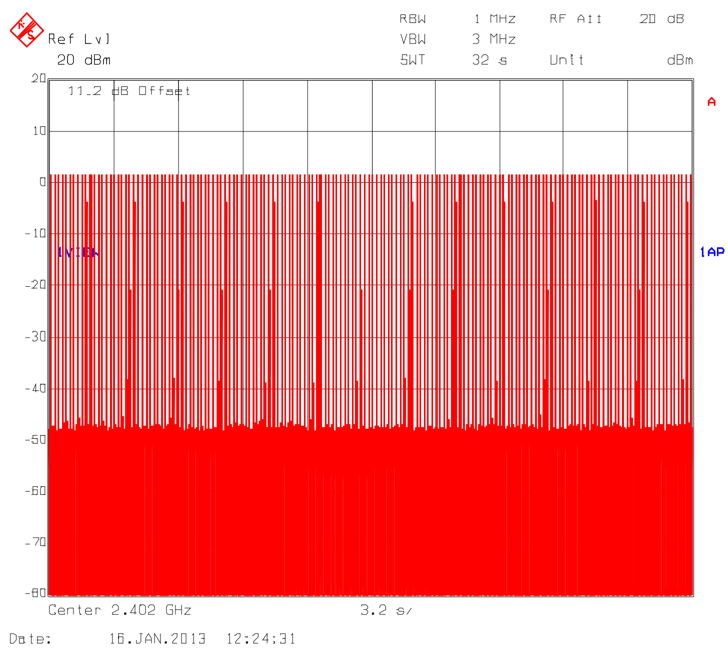
Plot 5.3.4.43. Time of Occupancy, 2480 MHz, SCO Basic HV3 30 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 400. 801603 µs x 336 = 134.67ms



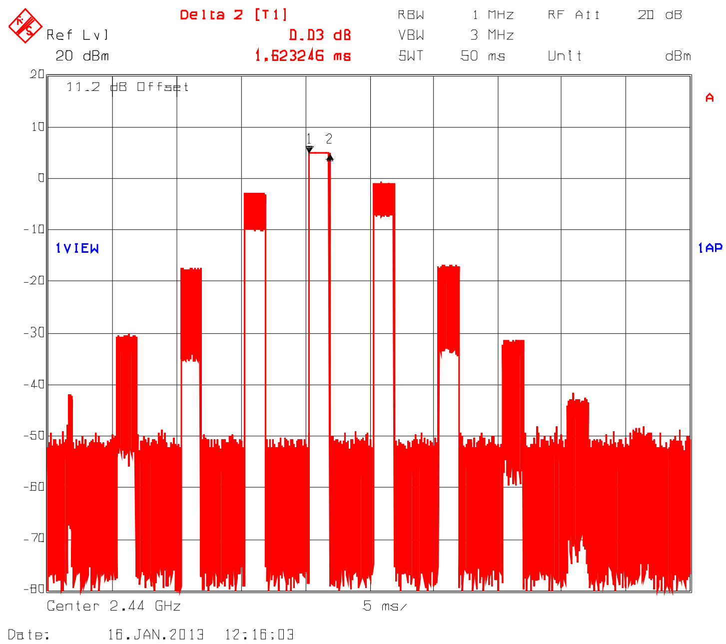
Plot 5.3.4.44. Time of Occupancy, 2402 MHz, eSCO Basic EV5 180 Payload, Dwell Time @ 2402 MHz = 1.603206 ms



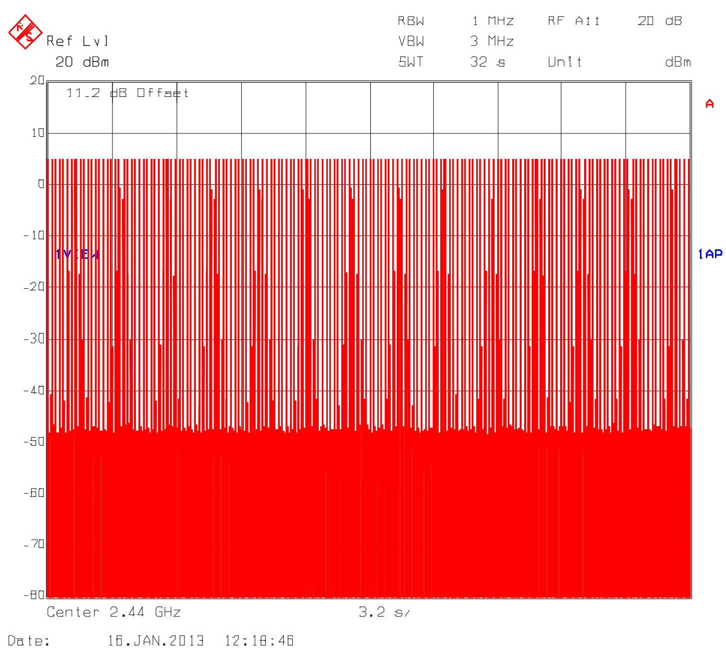
Plot 5.3.4.45. Time of Occupancy, 2402 MHz, eSCO Basic EV5 180 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 1.603206 ms x 166 = 266.13 ms



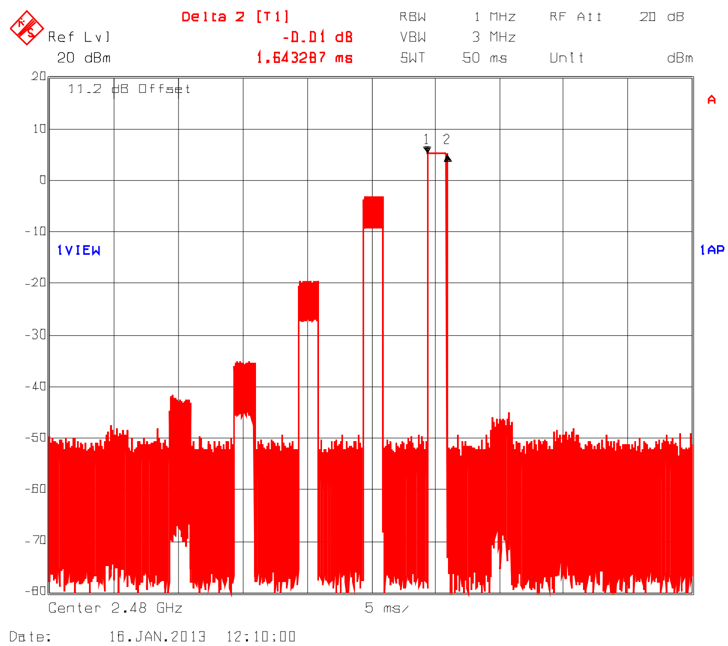
Plot 5.3.4.46. Time of Occupancy, 2440 MHz, eSCO Basic EV5 180 Payload, Dwell Time @ 2440 MHz = 1.623246 ms



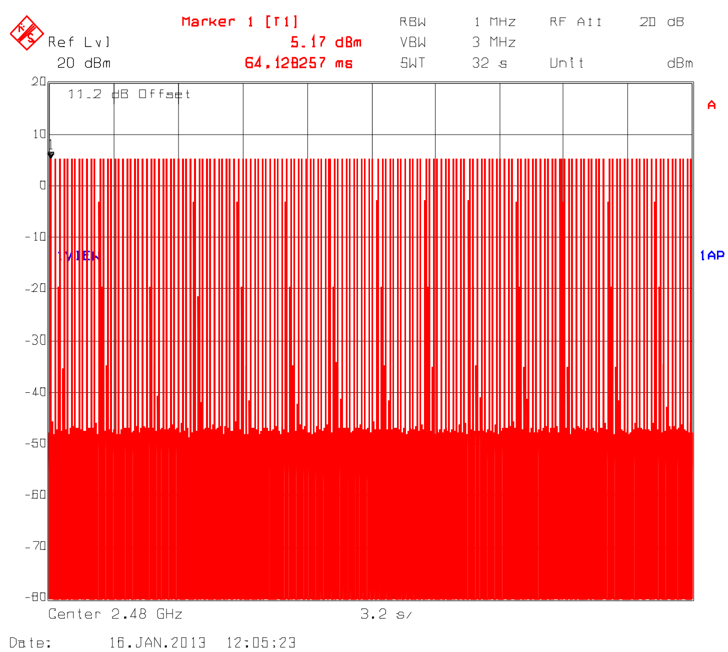
Plot 5.3.4.47. Time of Occupancy, 2440 MHz, eSCO Basic EV5 180 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 1.623246 ms x 166 = 269.46 ms



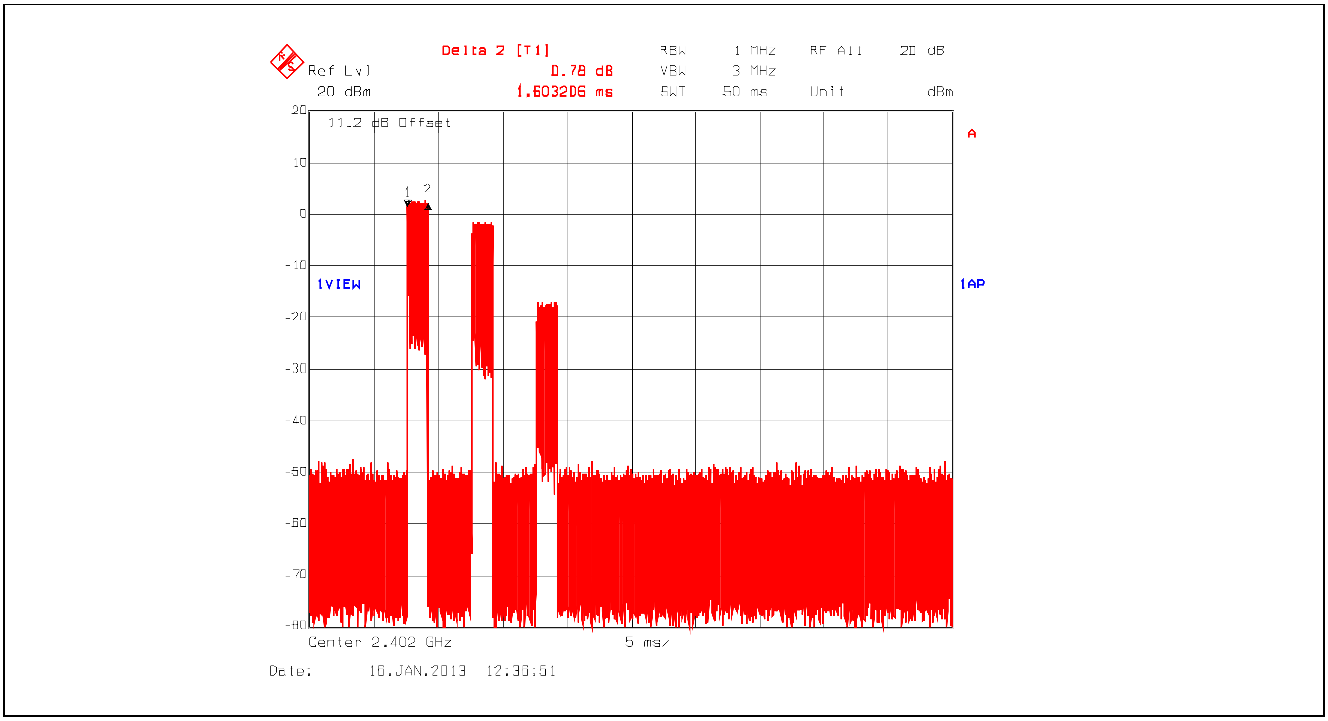
Plot 5.3.4.48. Time of Occupancy, 2480 MHz, eSCO Basic EV5 180 Payload, Dwell Time @ 2480 MHz = 1.643287 ms



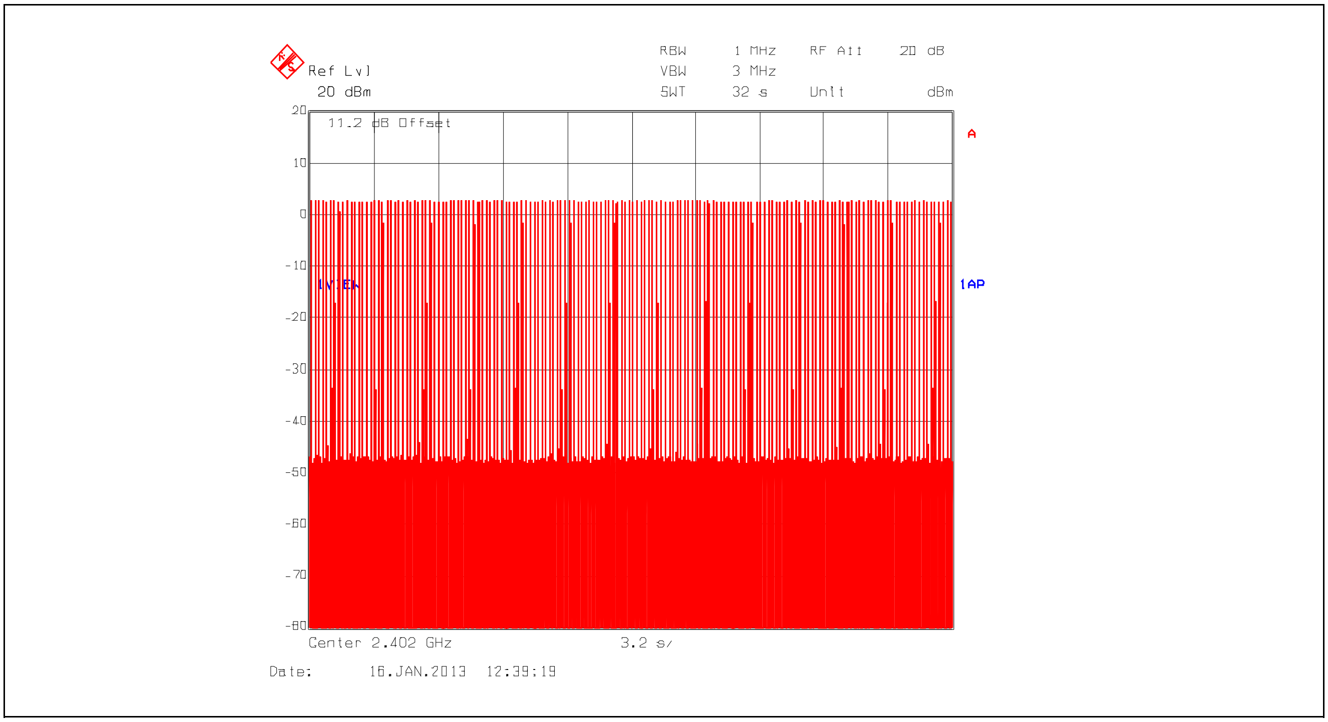
Plot 5.3.4.49. Time of Occupancy, 2480 MHz, eSCO Basic EV5 180 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 1.643287 ms x 166 = 272.79 ms



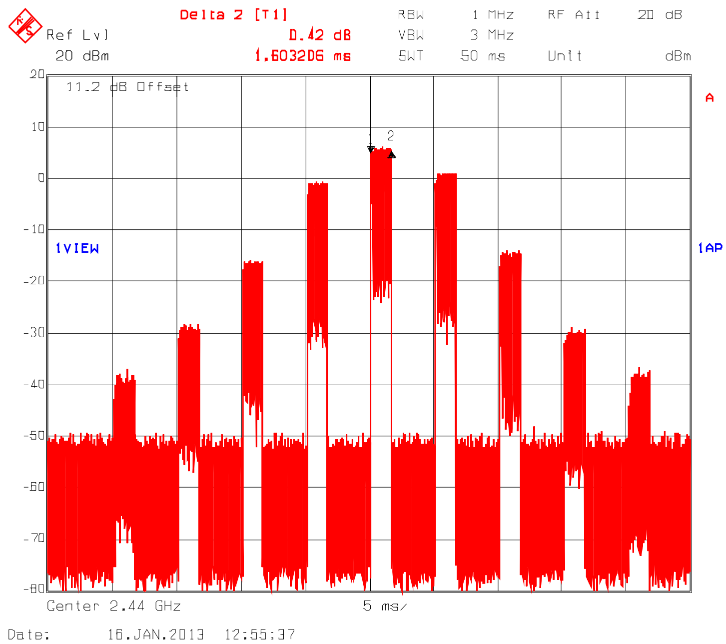
Plot 5.3.4.50. Time of Occupancy, 2402 MHz, eSCO EDR 3- EV5 540 Payload, Dwell Time @ 2402 MHz = 1.603206 ms



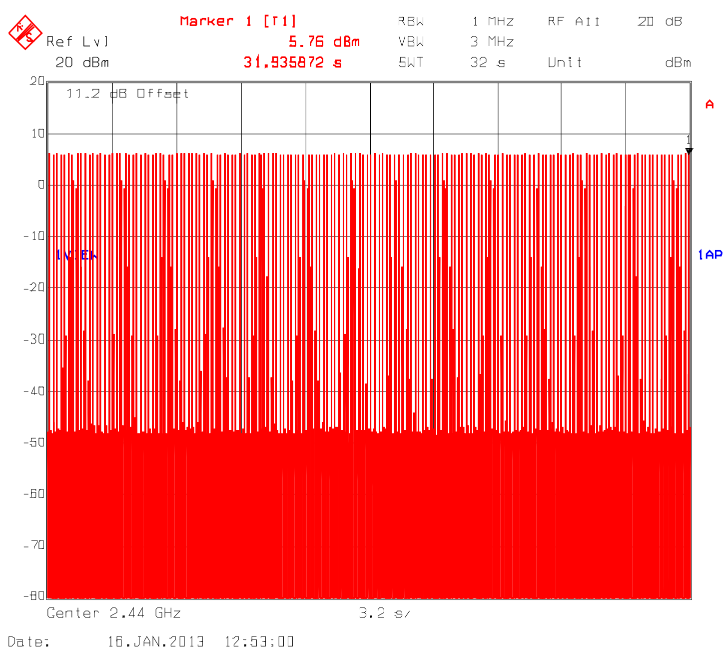
Plot 5.3.4.51. Time of Occupancy, 2402 MHz, eSCO EDR 3- EV5 540 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 1.603206 ms x 166 = 266.13 ms



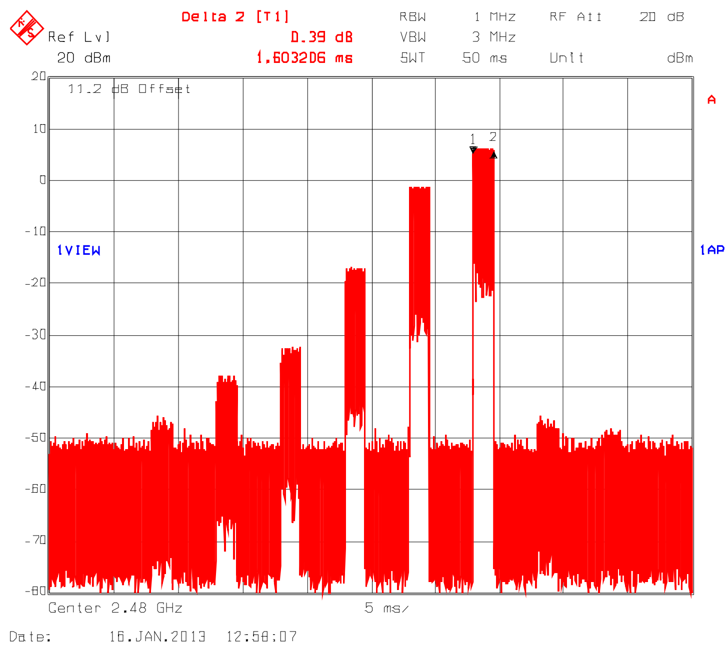
Plot 5.3.4.52. Time of Occupancy, 2440 MHz, eSCO EDR 3- EV5 540 Payload, Dwell Time @ 2440 MHz = 1.603206 ms



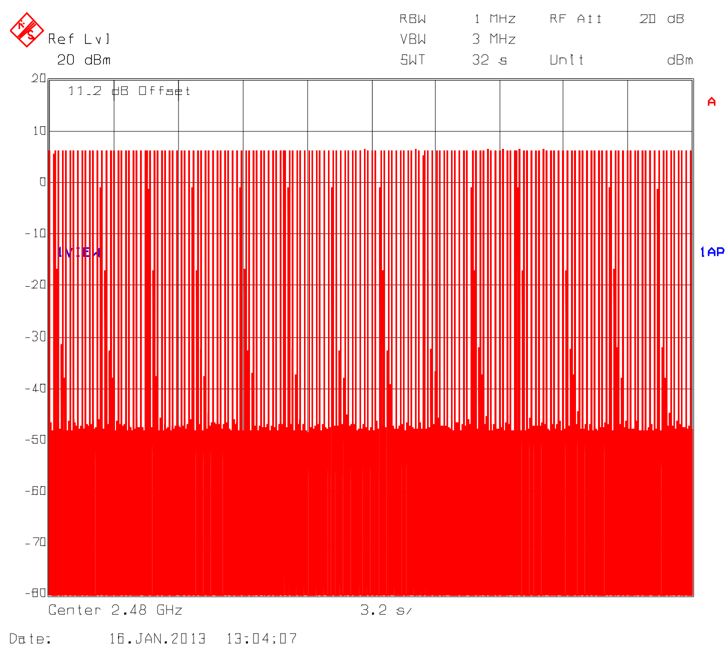
Plot 5.3.4.53. Time of Occupancy, 2440 MHz, eSCO EDR 3- EV5 540 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 1.603206 ms x 166 = 266.13 ms



Plot 5.3.4.54. Time of Occupancy, 2480 MHz, eSCO EDR 3- EV5 540 Payload, Dwell Time @ 2480 MHz = 1.603206 ms



Plot 5.3.4.55. Time of Occupancy, 2480 MHz, eSCO EDR 3- EV5 540 Payload
Average time of occupancy = (Dwell Time) x (number of hops within a period) = 1.603206 ms x 166 = 266.13 ms



5.4. PEAK CONDUCTED OUTPUT POWER [§ 15.247(b)(2)]

5.4.1. Limit

§15.247(b)(1): For frequency hopping systems operating in the 2400–2483.5 MHz band employing at least 75 non-overlapping hopping channels, and all frequency hopping systems in the 5725–5850 MHz band: 1 watt. For all other frequency hopping systems in the 2400–2483.5 MHz band: 0.125 watts.

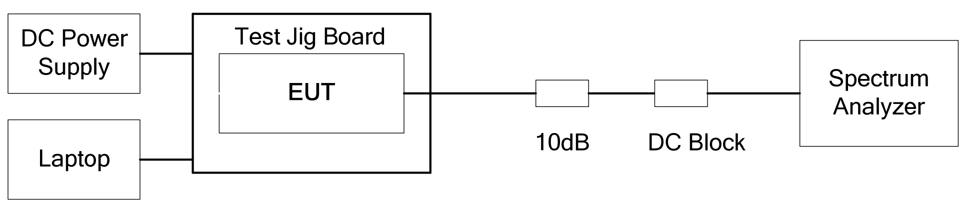
§15.247(b)(4): The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

§15.247(b)(4)(i): Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum peak output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

5.4.2. Method of Measurements

FCC Public Notice DA 00-705 and ANSI C63.10.

5.4.3. Test Arrangement



5.4.4. Test Data

Operating Mode	Frequency (MHz)	Peak Output Power at Antenna Terminal (dBm)	Calculated EIRP (dBm)	Peak Output Power Limit (dBm)	EIRP Limit (dBm)
ACL Basic DH5	2402	4.79	6.09	21	36
	2440	7.38	8.68	21	36
	2480	7.91	9.21	21	36
ACL EDR 3-DH5	2402	2.99	4.29	21	36
	2440	6.29	7.59	21	36
	2480	6.63	7.93	21	36
SCO Basic HV3	2402	1.57	2.87	21	36
	2440	7.38	8.68	21	36
	2480	8.00	9.30	21	36
eSCO Basic EV5	2402	4.79	6.09	21	36
	2440	7.38	8.68	21	36
	2480	7.91	9.21	21	36
eSCO EDR 3-EV5	2402	2.99	4.29	21	36
	2440	6.29	7.59	21	36
	2480	6.78	8.08	21	36

Notes:
1. The EIRP shall be calculated based on the transmitter maximum antenna gain (G_{dBi}), cable loss (CL_{dB}) and peak output power at antenna terminal (P_{dBm}). Calculated EIRP = $P_{dBm} + G_{dBi} - CL_{dB}$
2. EUT uses a maximum antenna gain of 1.3 dBi.

5.5. TRANSMITTER BAND-EDGE & SPURIOUS CONDUCTED EMISSIONS [§ 15.247(d)]

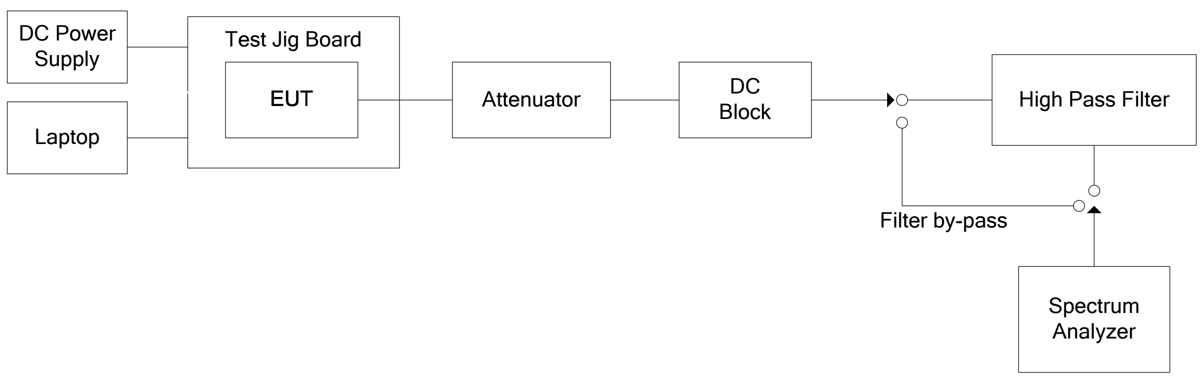
5.5.1. Limit

§ 15.247 (d): 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 that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

5.5.2. Method of Measurements

FCC Public Notice DA 00-705 and ANSI C63.10

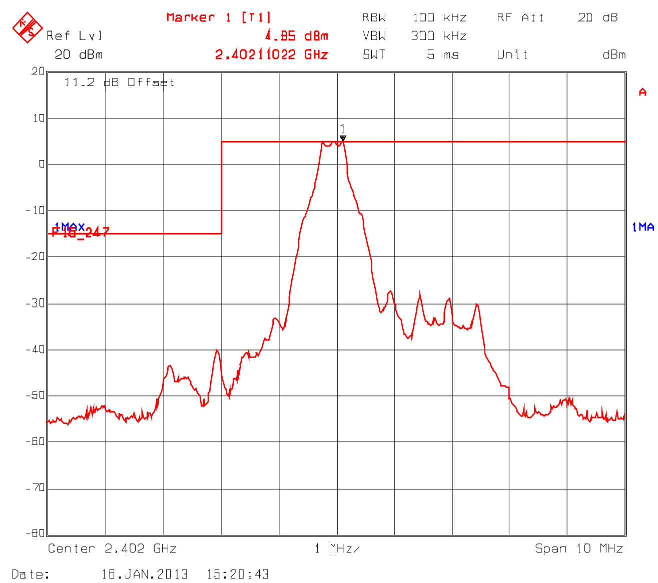
5.5.3. Test Arrangement



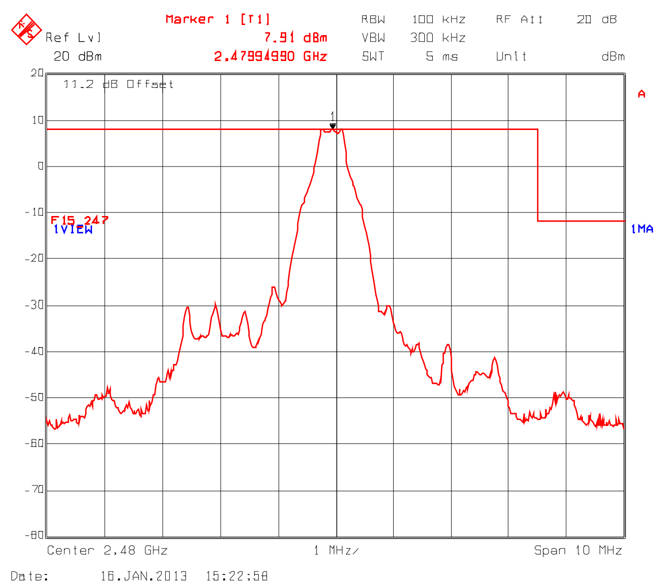
5.5.4. Test Data

5.5.4.1. Band-Edge RF Conducted Emissions

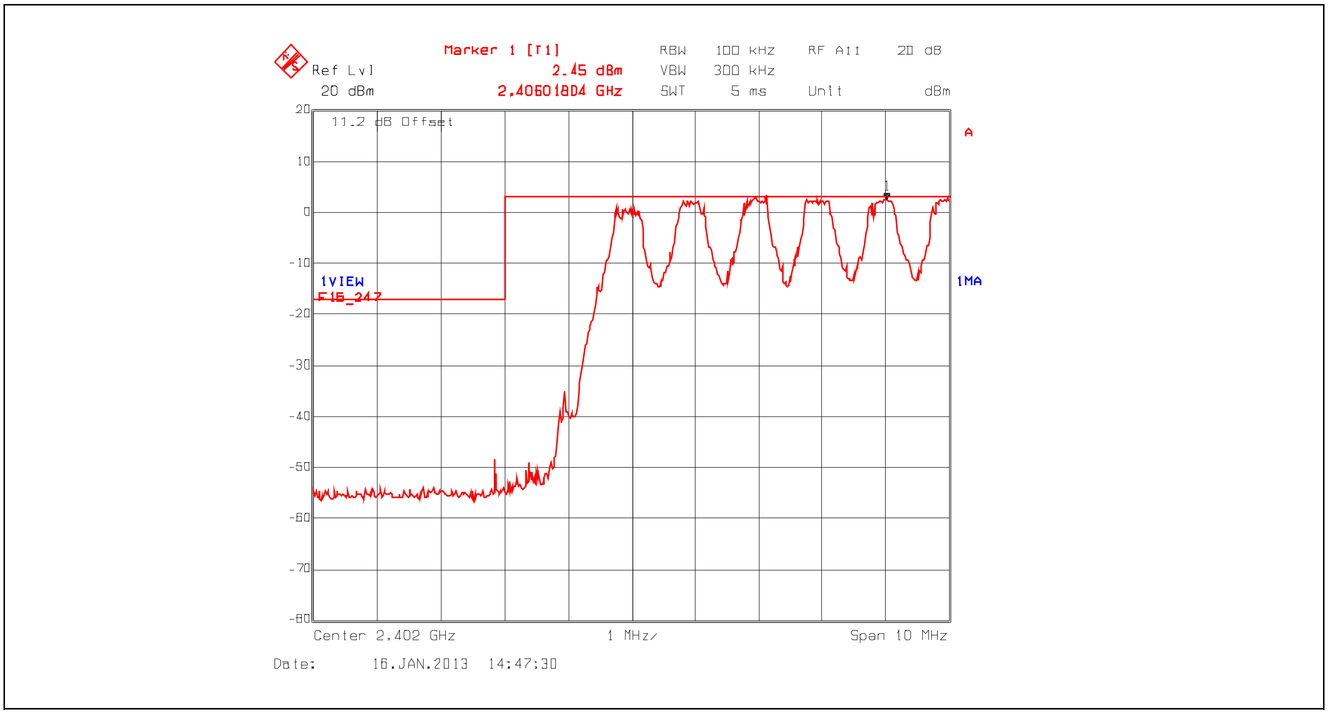
Plot 5.5.4.1.1. Band-Edge RF Conducted Emissions, ACL Basic DH5 339 Payload
Single Frequency Mode, Low End of Frequency Band, 2402 MHz



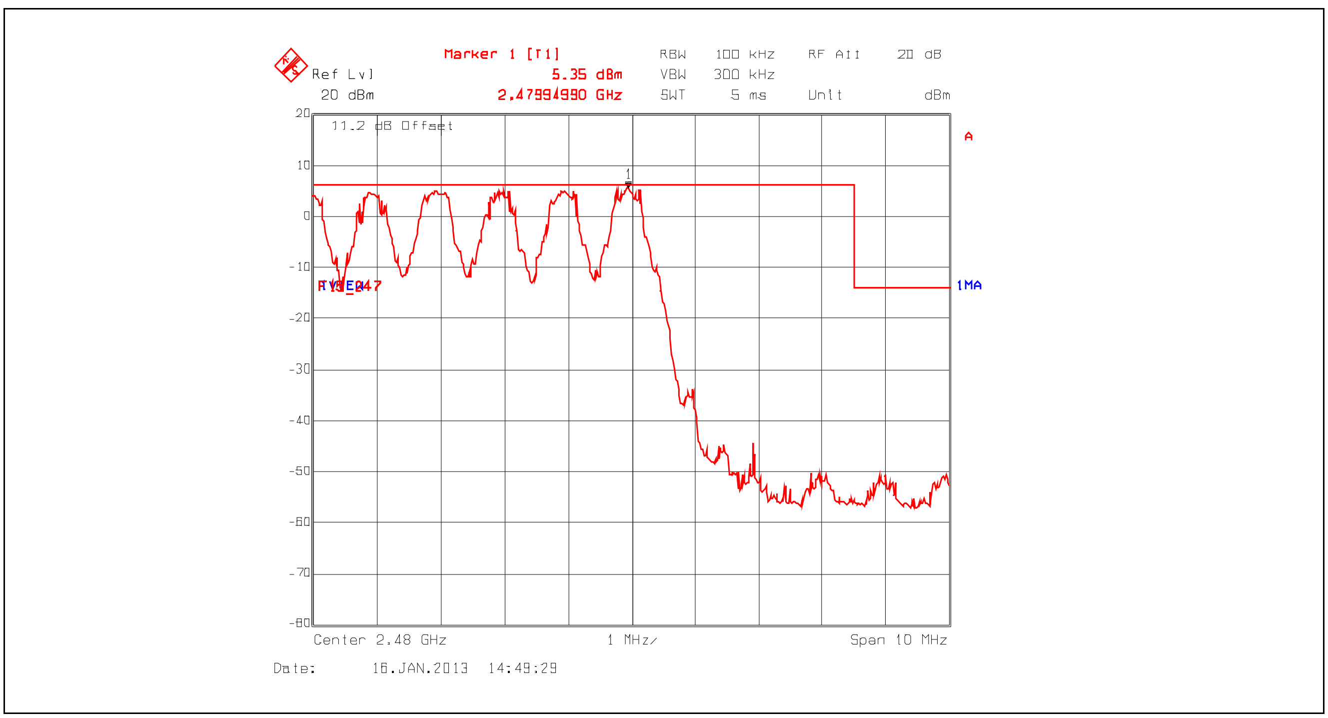
Plot 5.5.4.1.2. Band-Edge RF Conducted Emissions, ACL Basic DH5 339 Payload
Single Frequency Mode, High End of Frequency Band, 2480 MHz



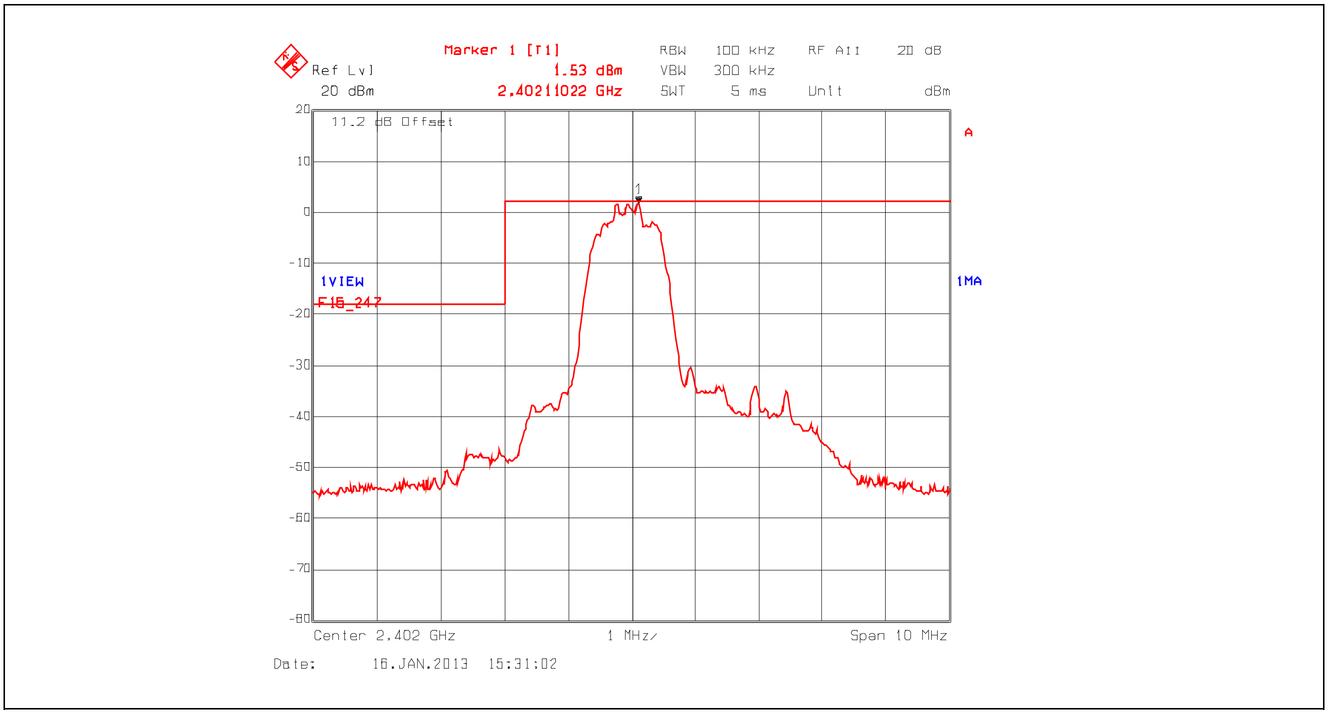
Plot 5.5.4.1.3. Band-Edge RF Conducted Emissions, ACL Basic DH5 339 Payload
Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



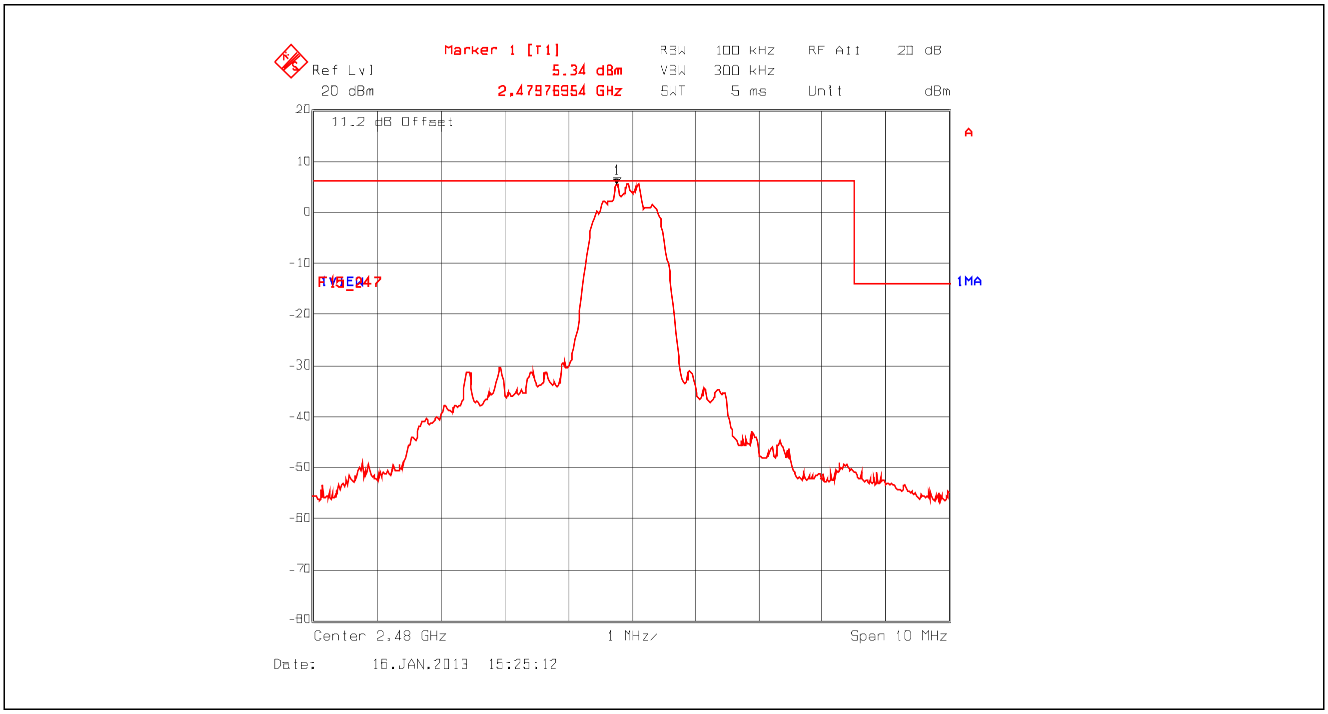
Plot 5.5.4.1.4. Band-Edge RF Conducted Emissions, ACL Basic DH5 339 Payload
Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz



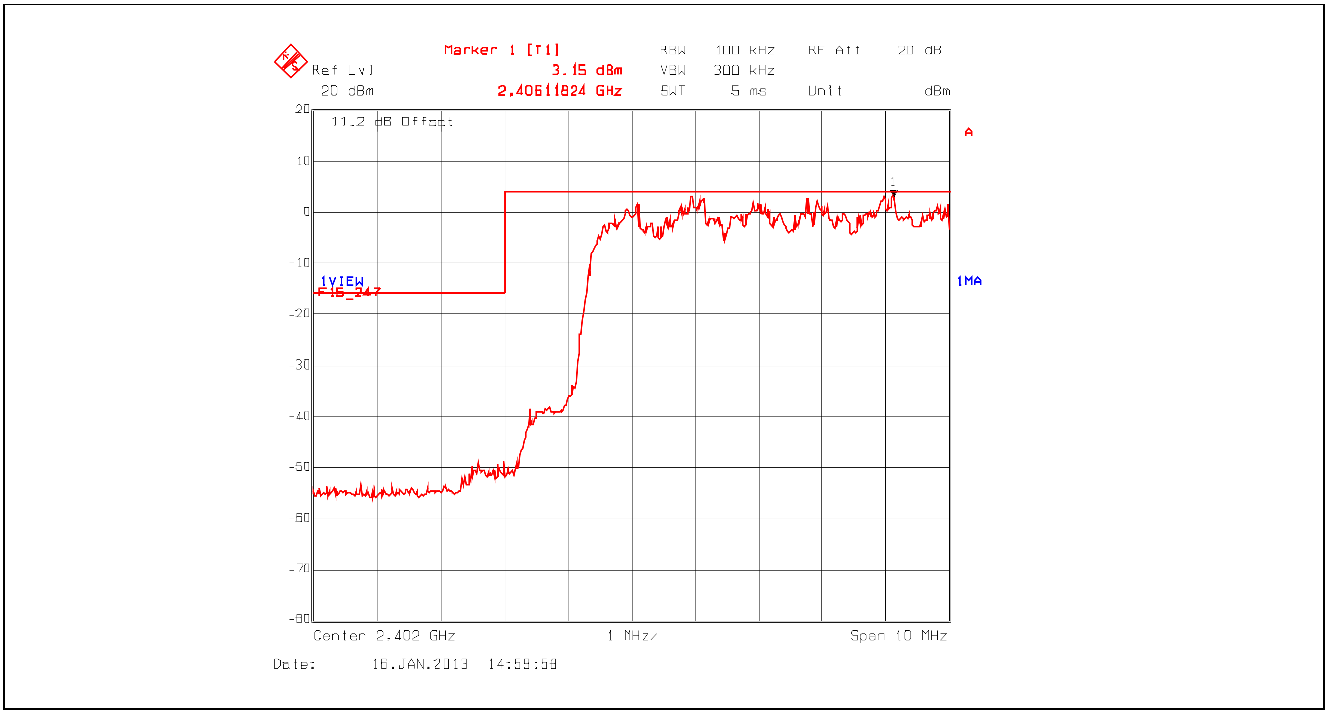
Plot 5.5.4.1.5. Band-Edge RF Conducted Emissions, ACL EDR 3-DH5 1021 Payload
Single Frequency Mode, Low End of Frequency Band, 2402 MHz



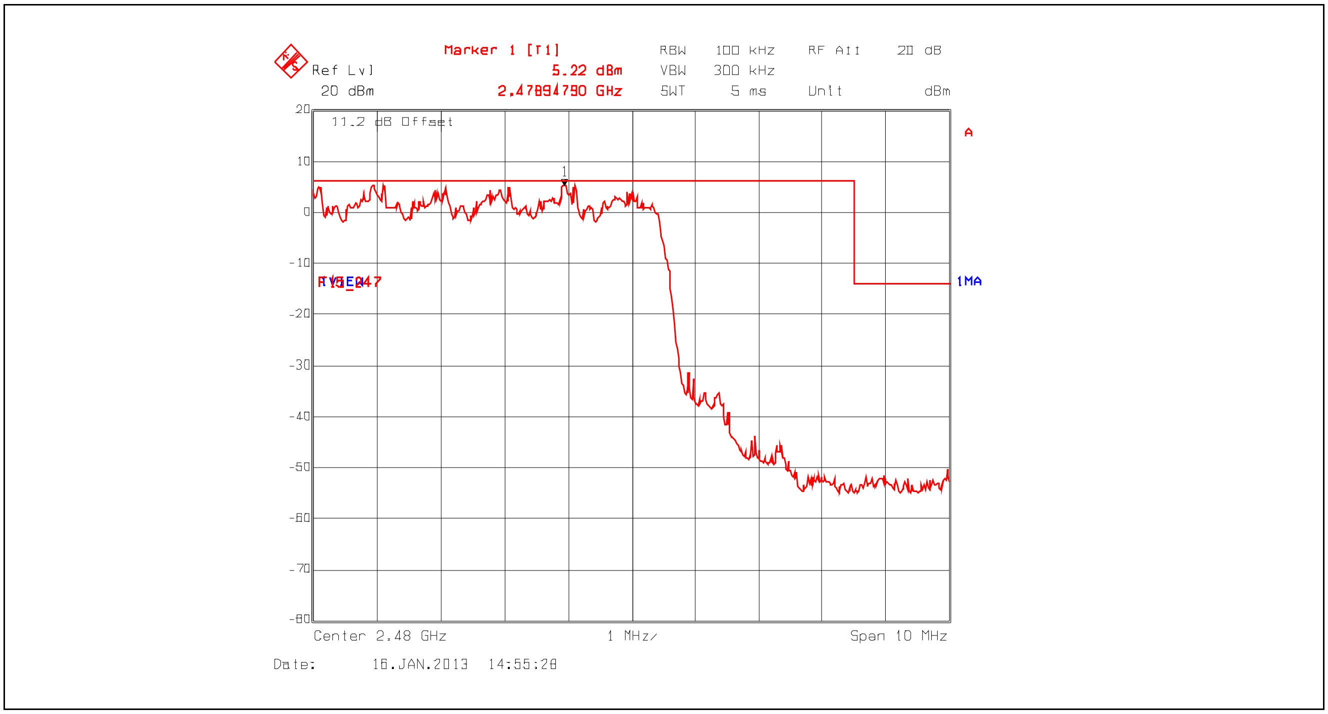
Plot 5.5.4.1.6. Band-Edge RF Conducted Emissions, ACL EDR 3-DH5 1021 Payload
Single Frequency Mode, High End of Frequency Band, 2480 MHz



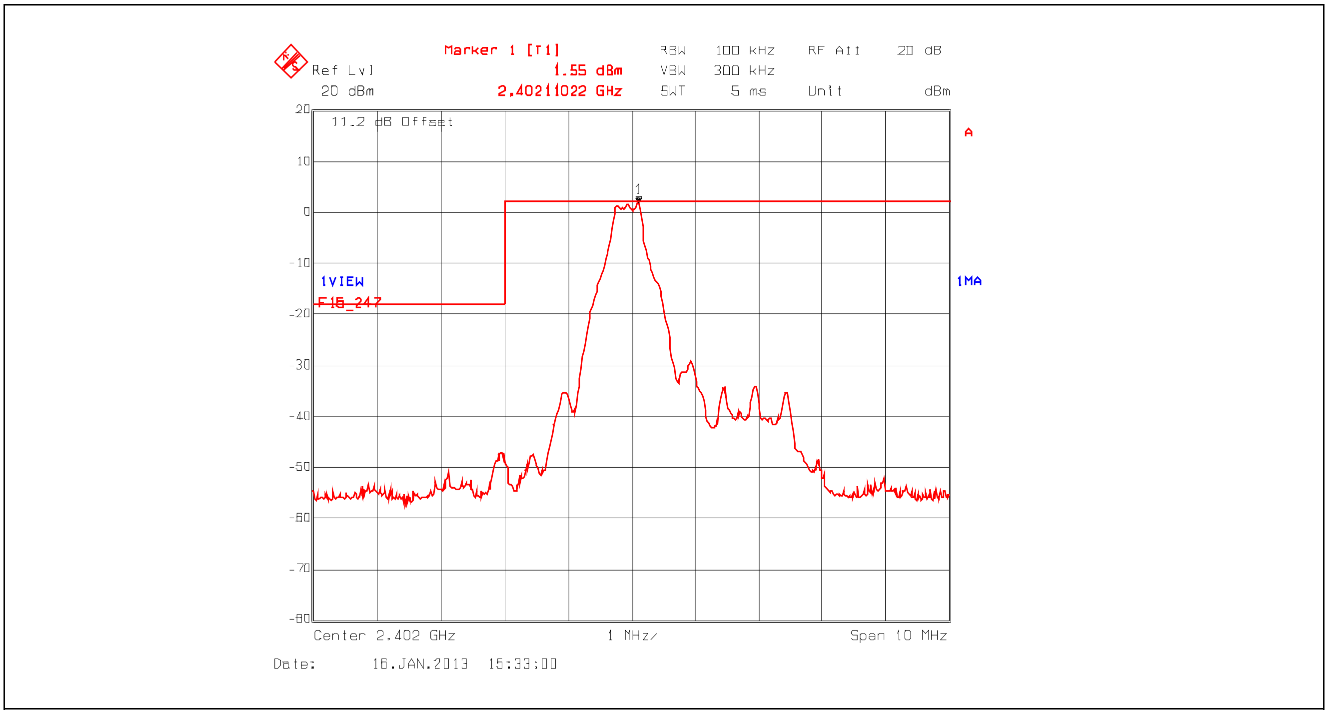
Plot 5.5.4.1.7. Band-Edge RF Conducted Emissions, ACL EDR 3-DH5 1021 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



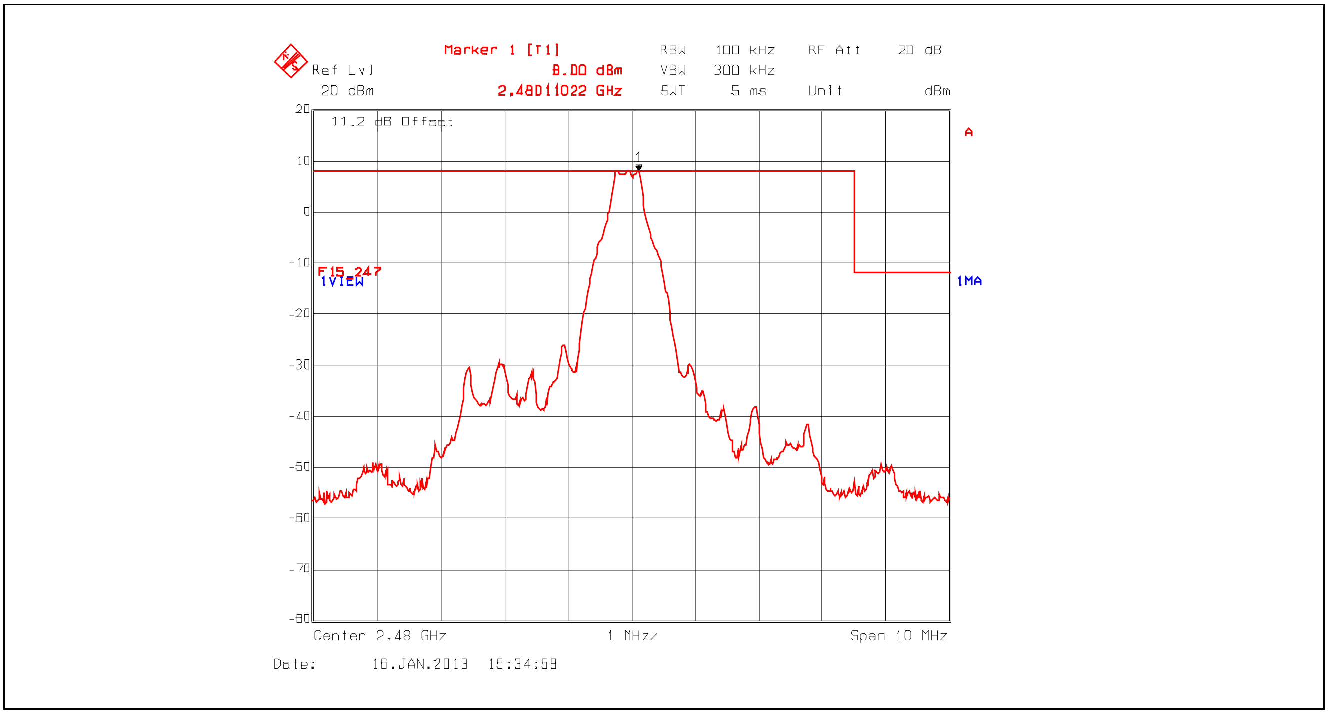
Plot 5.5.4.1.8. Band-Edge RF Conducted Emissions, ACL EDR 3-DH5 1021 Payload Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz



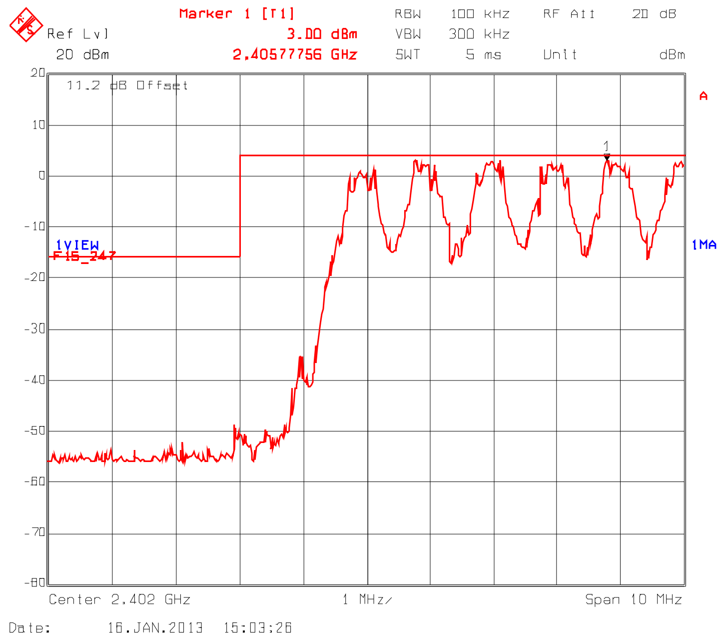
Plot 5.5.4.1.9. Band-Edge RF Conducted Emissions, SCO Basic HV3 30 Payload
Single Frequency Mode, Low End of Frequency Band, 2402 MHz



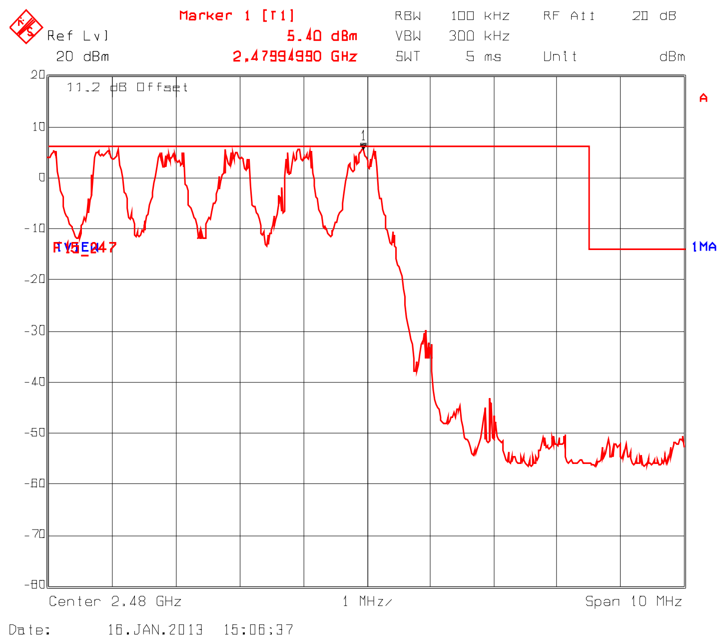
Plot 5.5.4.1.10. Band-Edge RF Conducted Emissions, SCO Basic HV3 30 Payload
Single Frequency Mode, High End of Frequency Band, 2480 MHz



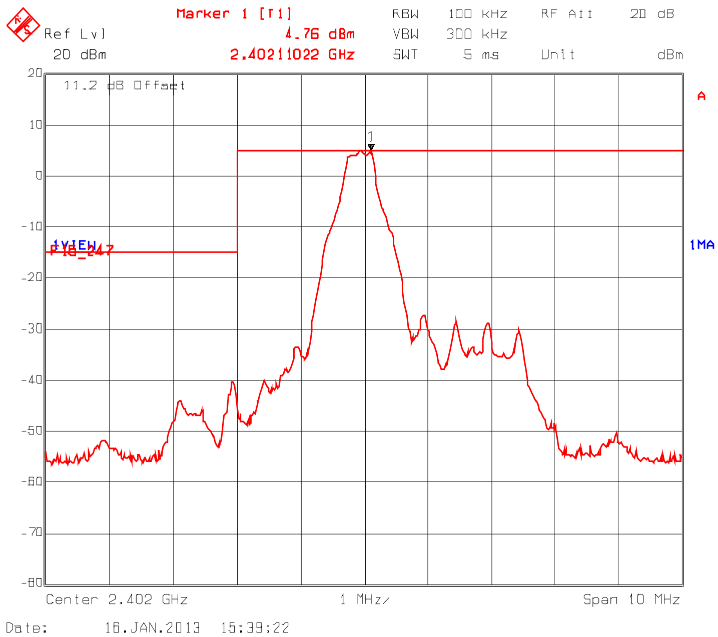
Plot 5.5.4.1.11. Band-Edge RF Conducted Emissions, SCO Basic HV3 30 Payload
Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



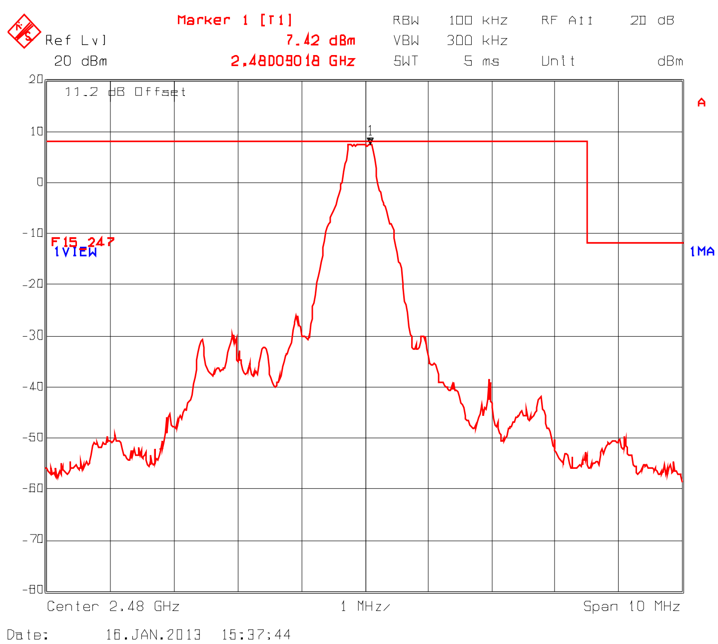
Plot 5.5.4.1.12. Band-Edge RF Conducted Emissions, SCO Basic HV3 30 Payload
Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz



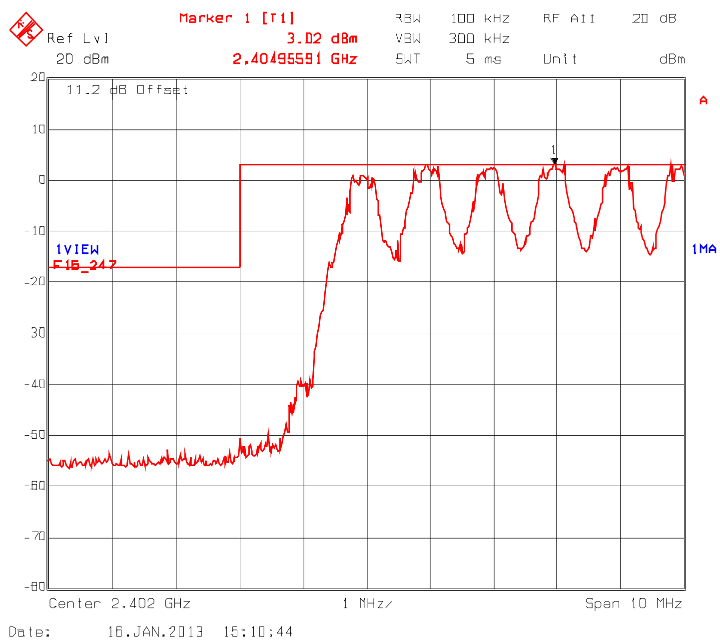
Plot 5.5.4.1.13. Band-Edge RF Conducted Emissions, eSCO Basic EV5 180 Payload
Single Frequency Mode, Low End of Frequency Band, 2402 MHz



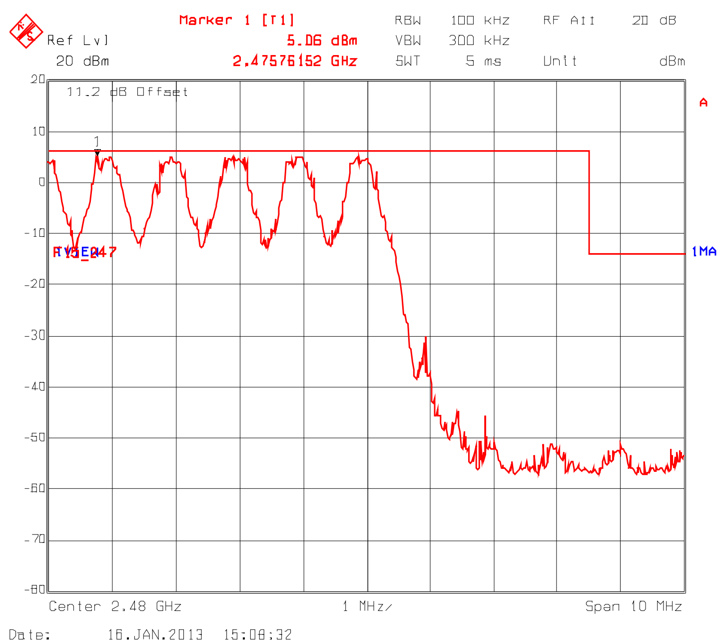
Plot 5.5.4.1.14. Band-Edge RF Conducted Emissions, eSCO Basic EV5 180 Payload
Single Frequency Mode, High End of Frequency Band, 2480 MHz



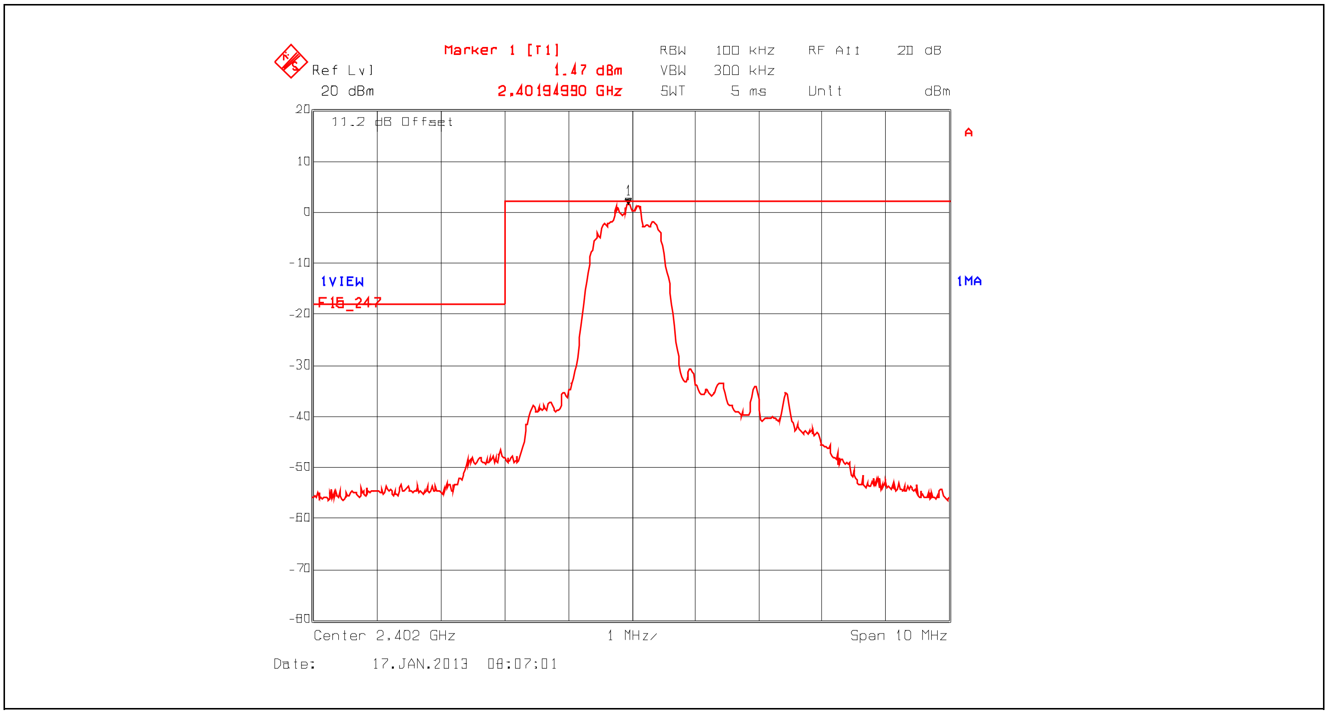
Plot 5.5.4.1.15. Band-Edge RF Conducted Emissions, eSCO Basic EV5 180 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



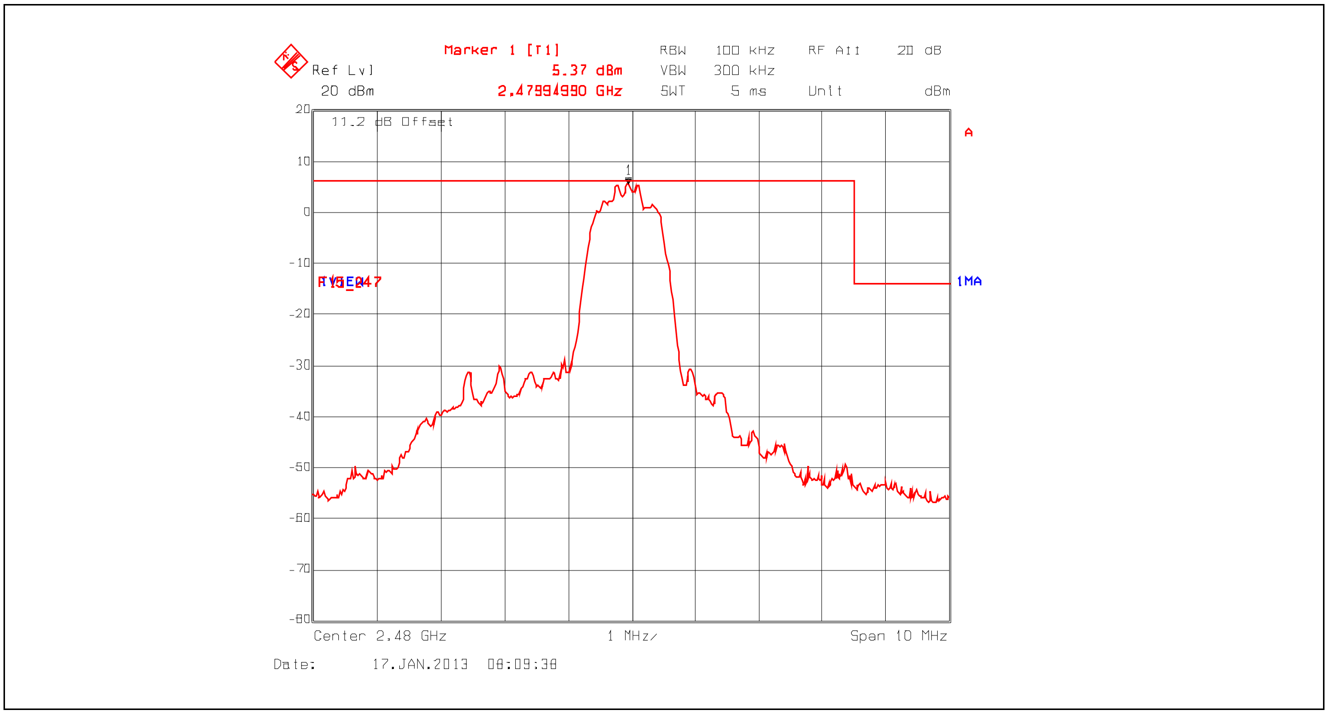
Plot 5.5.4.1.16. Band-Edge RF Conducted Emissions, eSCO Basic EV5 180 Payload Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz



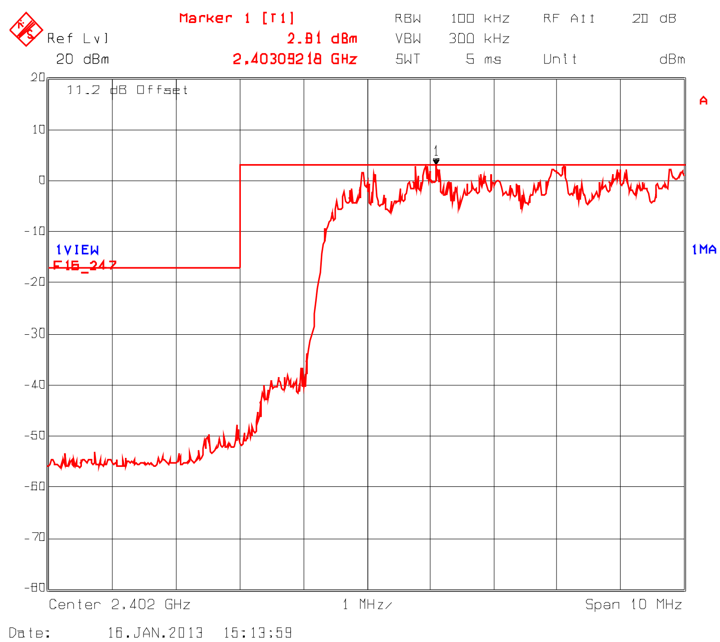
Plot 5.5.4.1.17. Band-Edge RF Conducted Emissions, eSCO EDR 3-EV5 540 Payload
Single Frequency Mode, Low End of Frequency Band, 2402 MHz



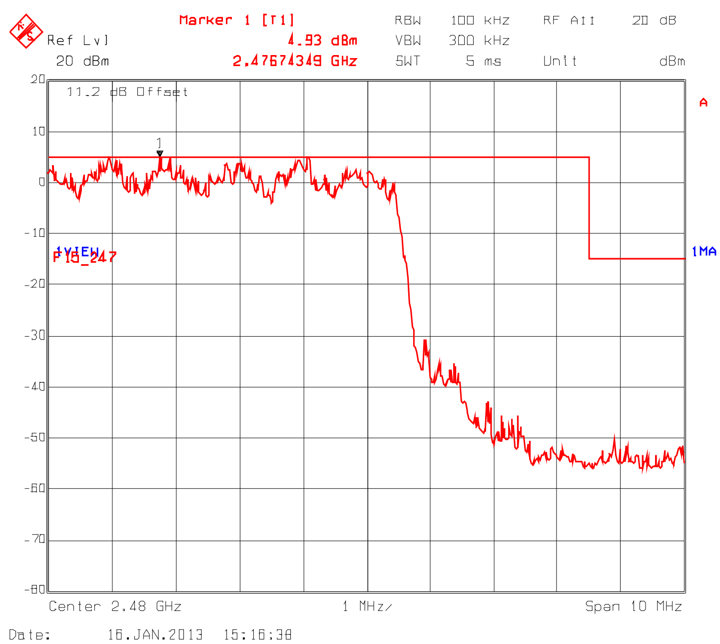
Plot 5.5.4.1.18. Band-Edge RF Conducted Emissions, eSCO EDR 3-EV5 540 Payload
Single Frequency Mode, High End of Frequency Band, 2480 MHz



Plot 5.5.4.1.19. Band-Edge RF Conducted Emissions, eSCO EDR 3-EV5 540 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



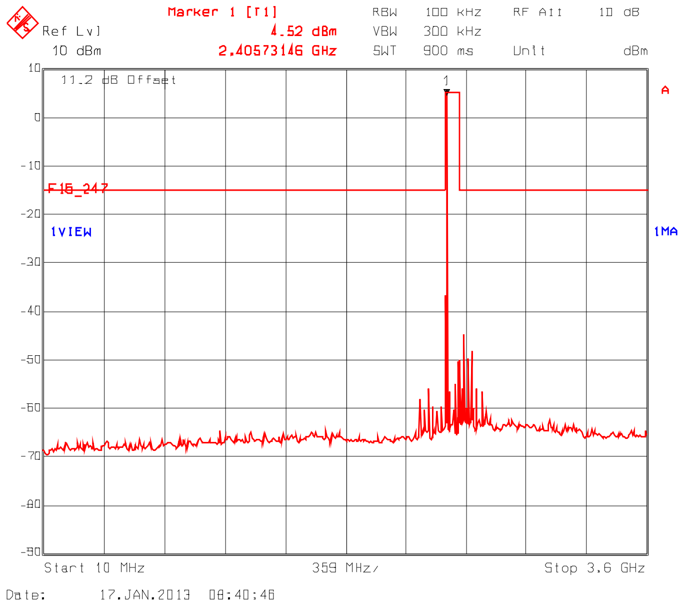
Plot 5.5.4.1.20. Band-Edge RF Conducted Emissions, eSCO EDR 3-EV5 540 Payload Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz



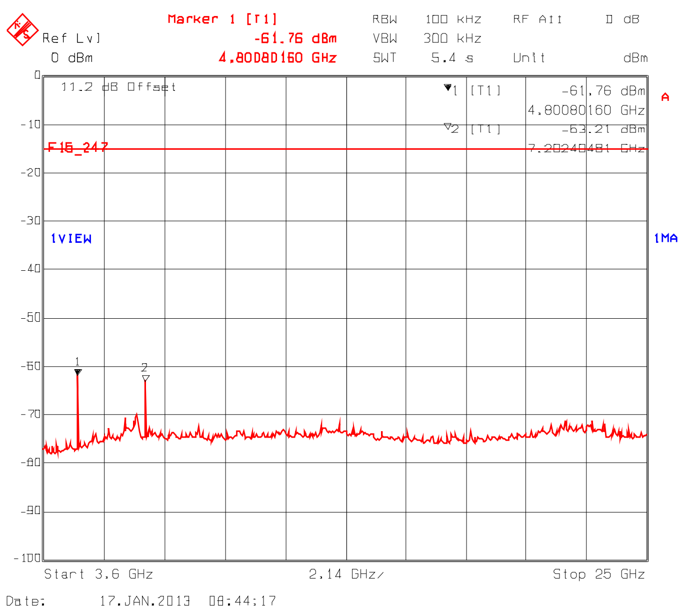
5.5.4.2. Spurious RF Conducted Emissions

Remark: The following test results are the worst-case measurements.

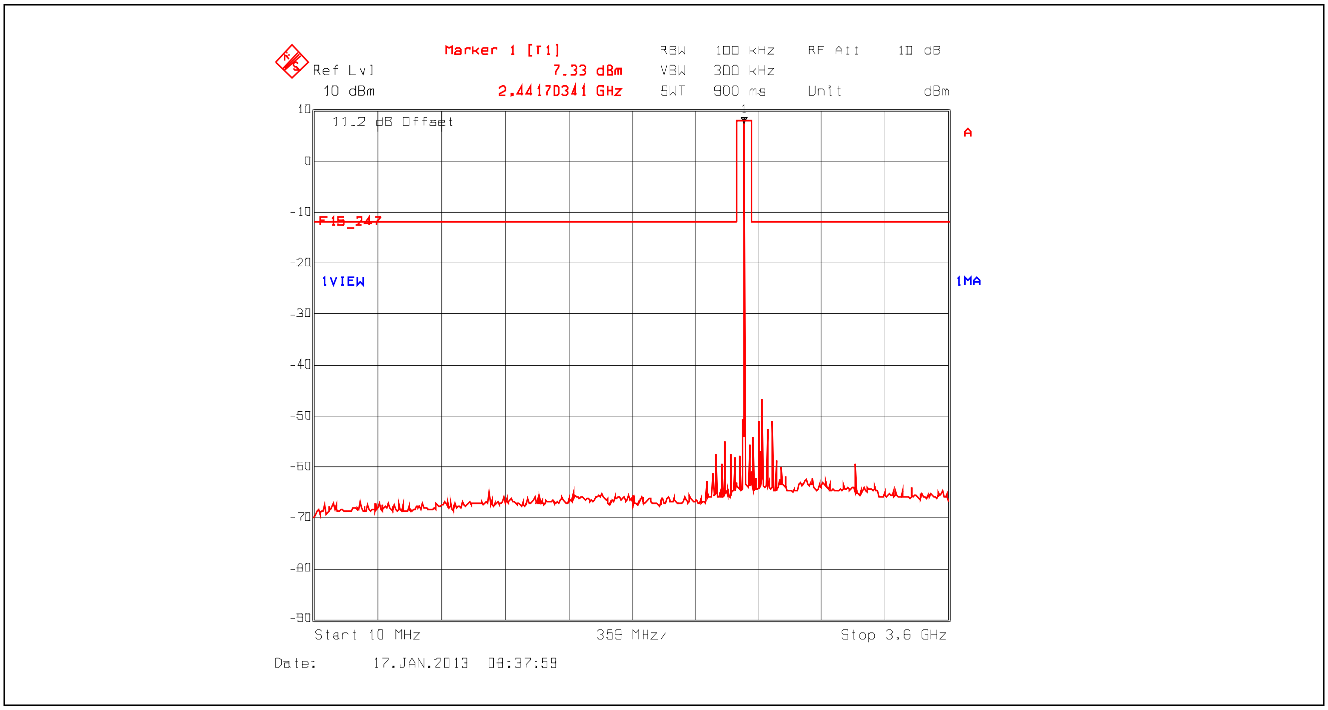
Plot 5.5.4.2.1. Spurious RF Conducted Emissions
2402 MHz, ACL Basic DH5 339 Payload, 10 MHz – 3.6 GHz



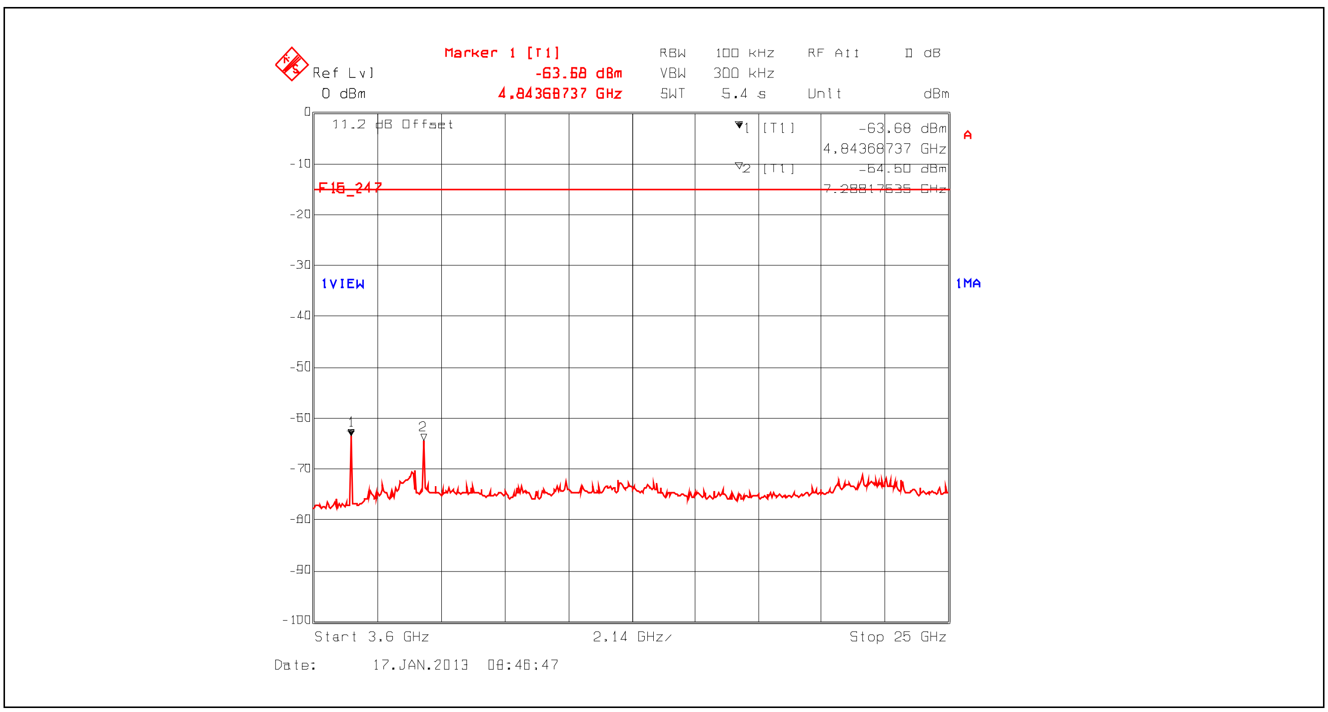
Plot 5.5.4.2.2. Spurious RF Conducted Emissions
2402 MHz, ACL Basic DH5 339 Payload, 3.6 GHz – 25 GHz



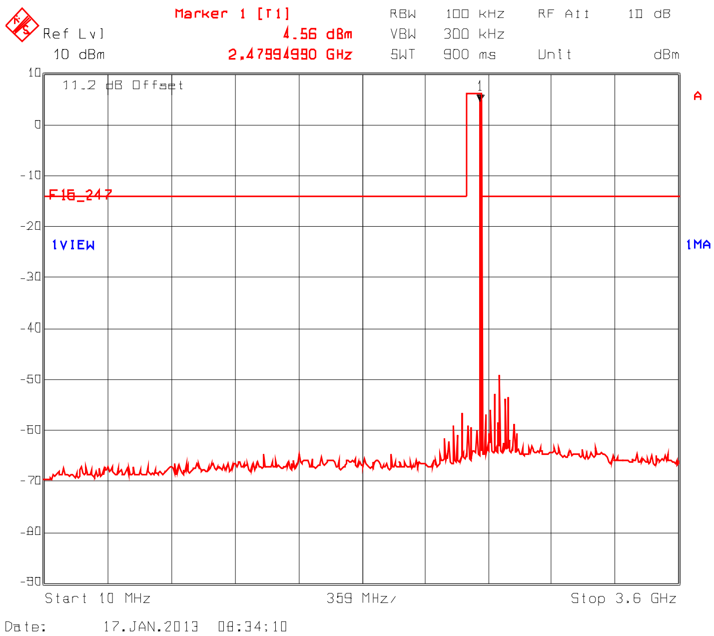
Plot 5.5.4.2.3. Spurious RF Conducted Emissions
2440 MHz, ACL Basic DH5 339 Payload, 10 MHz – 3.6 GHz



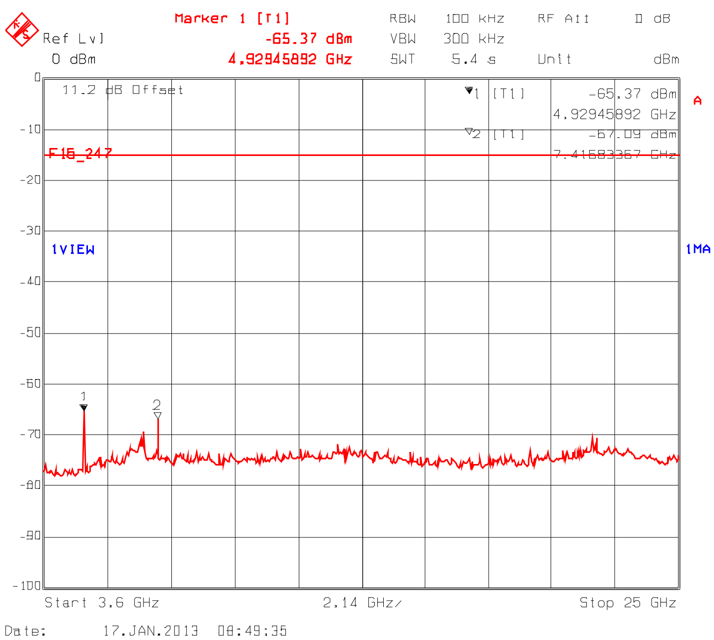
Plot 5.5.4.2.4. Spurious RF Conducted Emissions
2440 MHz, ACL Basic DH5 339 Payload, 3.6 GHz – 25 GHz



Plot 5.5.4.2.5. Spurious RF Conducted Emissions
2480 MHz, ACL Basic DH5 339 Payload, 10 MHz – 3.6 GHz



Plot 5.5.4.2.6. Spurious RF Conducted Emissions
2480 MHz, ACL Basic DH5 339 Payload, 3.6 GHz – 25 GHz



5.6. TRANSMITTER SPURIOUS RADIATED EMISSIONS AT 3 METERS [§§ 15.247(d), 15.209 & 15.205]

5.6.1. Limit

§ 15.247 (d): 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 that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

Section 15.205(a) - Restricted Bands of Operation

MHz	MHz	MHz	GHz
0.090–0.110	16.42–16.423	399.9–410	4.5–5.15
[1] 0.495–0.505	16.69475–16.69525	608–614	5.35–5.46
2.1735–2.1905	16.80425–16.80475	960–1240	7.25–7.75
4.125–4.128	25.5–25.67	1300–1427	8.025–8.5
4.17725–4.17775	37.5–38.25	1435–1626.5	9.0–9.2
4.20725–4.20775	73–74.6	1645.5–1646.5	9.3–9.5
6.215–6.218	74.8–75.2	1660–1710	10.6–12.7
6.26775–6.26825	108–121.94	1718.8–1722.2	13.25–13.4
6.31175–6.31225	123–138	2200–2300	14.47–14.5
8.291–8.294	149.9–150.05	2310–2390	15.35–16.2
8.362–8.366	156.52475–156.52525	2483.5–2500	17.7–21.4
8.37625–8.38675	156.7–156.9	2655–2900	22.01–23.12
8.41425–8.41475	162.0125–167.17	3260–3267	23.6–24.0
12.29–12.293	167.72–173.2	3332–3339	31.2–31.8
12.51975–12.52025	240–285	3345.8–3358	36.43–36.5
12.57675–12.57725	322–335.4	3600–4400	([2])
13.36–13.41.			

[1] Until February 1, 1999, this restricted band shall be 0.490–0.510 MHz.
[2] Above 38.6

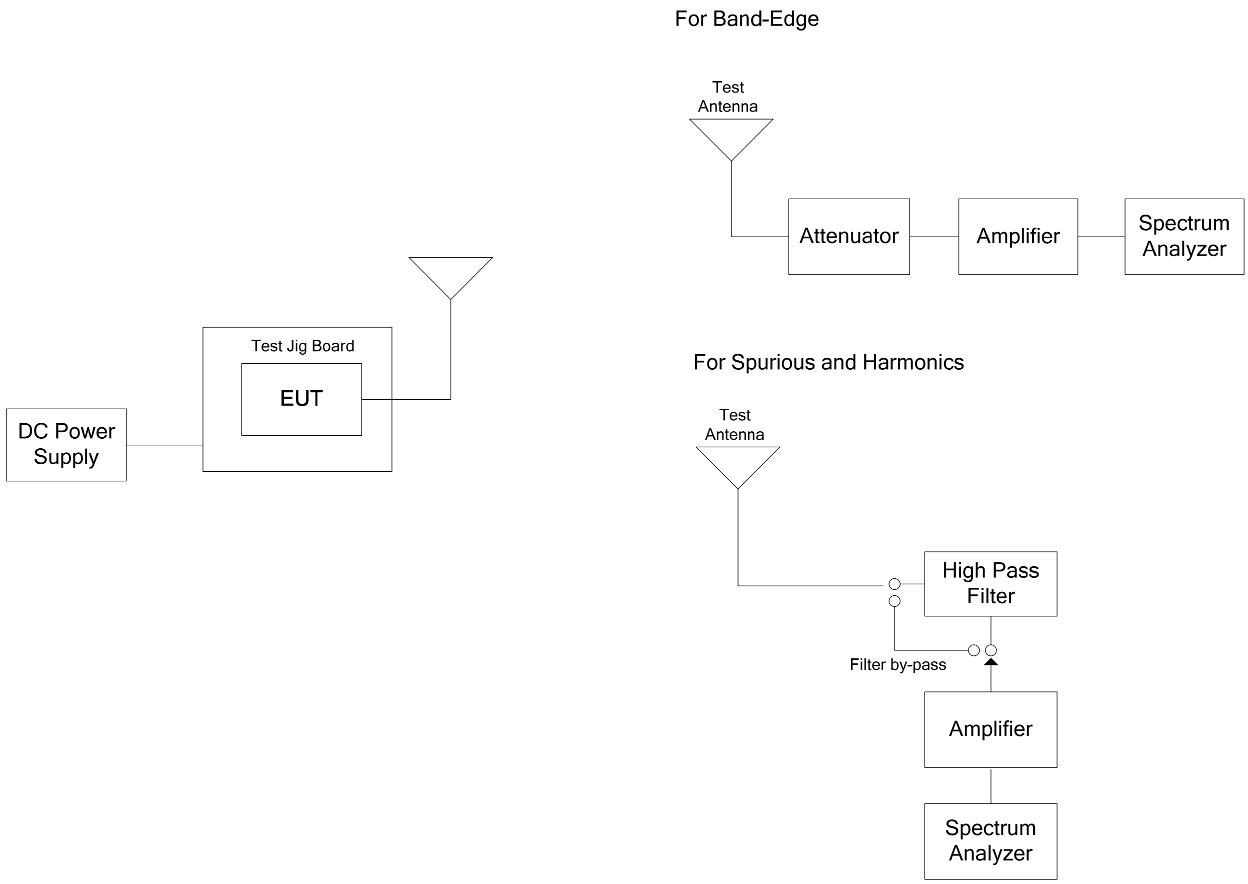
Section 15.209(a) - Field Strength Limits within Restricted Frequency Bands

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 - 0.490	2,400 / F (kHz)	300
0.490 - 1.705	24,000 / F (kHz)	30
1.705 - 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 – 960	200	3
Above 960	500	3

5.6.2. Method of Measurements

FCC Public Notice DA 00-705, ANSI C63.10 and ANSI 63.4 procedures.

5.6.3. Test Arrangement



5.6.4. Test Data

Remark(s):

- All spurious emissions that are in excess of 20 dB below the specified limit shall be recorded.
- EUT shall be tested in three orthogonal positions.
- The following test results are the worst-case measurements, derived from exploratory tests.

5.6.4.1. Spurious Radiated Emissions

Fundamental Frequency: 2402 MHz
Operating Mode: ACL Basic DH5 339 Payload
Frequency Test Range: 30 MHz – 25 GHz

Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/ Fail
2402	103.99	--	V	46.0	--	--	--
2402	102.35	--	H	46.0	--	--	--
4804	54.28	47.63	V	54.0	84.0	-6.4	Pass*
4804	58.33	50.98	H	54.0	84.0	-3.0	Pass*

All other spurious emissions and harmonics are more than 20 dB below the applicable limit.

*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency: 2440 MHz
Operating Mode: ACL Basic DH5 339 Payload
Frequency Test Range: 30 MHz – 25 GHz

Frequency (MHz)	RF Peak Level (dBµV/m)	RF Avg Level (dBµV/m)	Antenna Plane (H/V)	Limit 15.209 (dBµV/m)	Limit 15.247 (dBµV/m)	Margin (dB)	Pass/ Fail
2440	103.69	--	V	--	--	--	--
2440	101.42	--	H	--	--	--	--
4880	57.01	48.97	V	54.0	83.7	-5.0	Pass*
4880	59.05	51.28	H	54.0	83.7	-2.7	Pass*
7320	55.32	45.33	V	54.0	83.7	-8.7	Pass*
7320	54.12	42.35	H	54.0	83.7	-11.7	Pass*

All other spurious emissions and harmonics are more than 20 dB below the applicable limit.

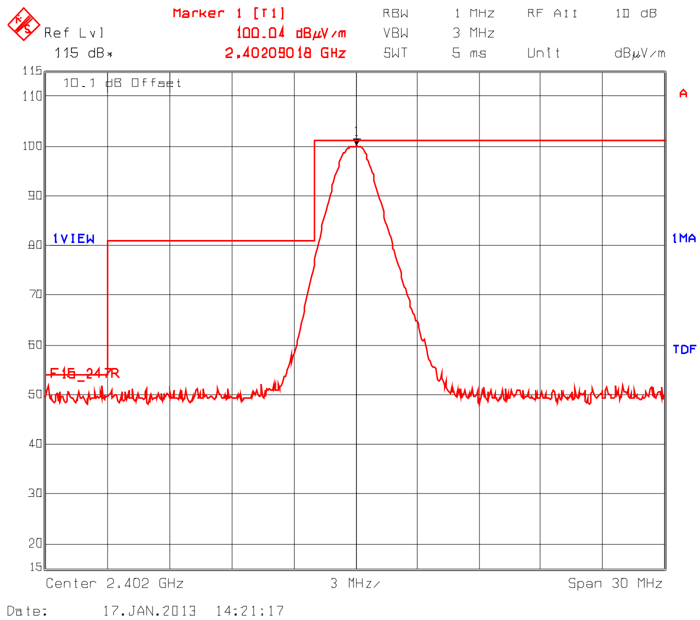
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

Fundamental Frequency:	2480 MHz						
Operating Mode:	ACL Basic DH5 339 Payload						
Frequency Test Range:	30 MHz – 25 GHz						
Frequency (MHz)	**RF Peak Level (dBµV/m)**	**RF Avg Level (dBµV/m)**	**Antenna Plane (H/V)**	**Limit 15.209 (dBµV/m)**	**Limit 15.247 (dBµV/m)**	**Margin (dB)**	**Pass/ Fail**
2480	103.80	--	V	--	--	--	--
2480	101.35	--	H	--	--	--	--
4960	55.62	47.94	V	54.0	83.8	-6.1	Pass*
4960	57.25	49.62	H	54.0	83.8	-4.4	Pass*
7440	53.82	42.34	V	54.0	83.8	-11.7	Pass*
7440	54.08	42.51	H	54.0	83.8	-11.5	Pass*
All other spurious emissions and harmonics are more than 20 dB below the applicable limit.							

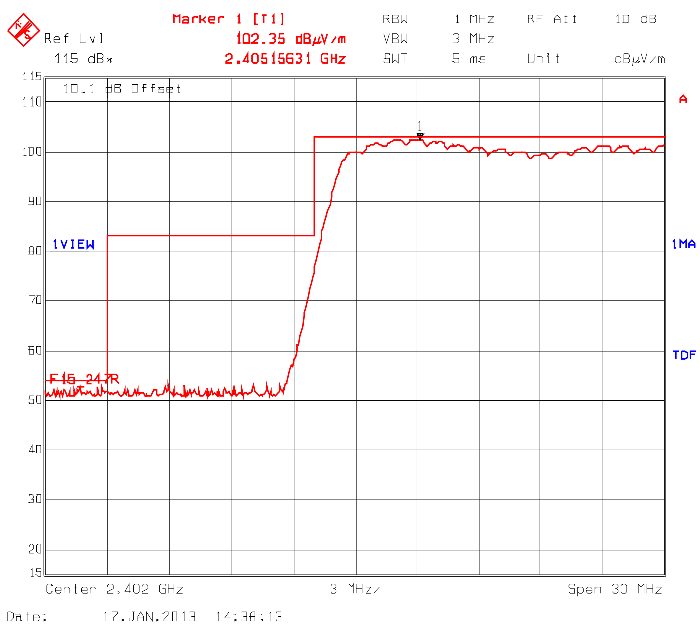
*Field strength of emissions appearing within restricted frequency bands shall not exceed the limits in § 15.209.

5.6.4.2. Band-Edge RF Radiated Emissions

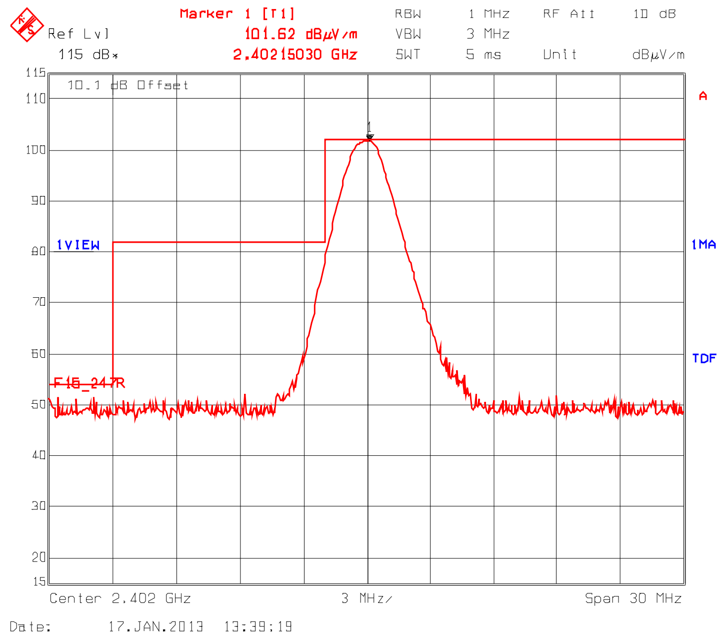
Plot 5.6.4.2.1. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL Basic DH5 339 Payload Single Frequency Mode, Low End of Frequency Band, 2402 MHz



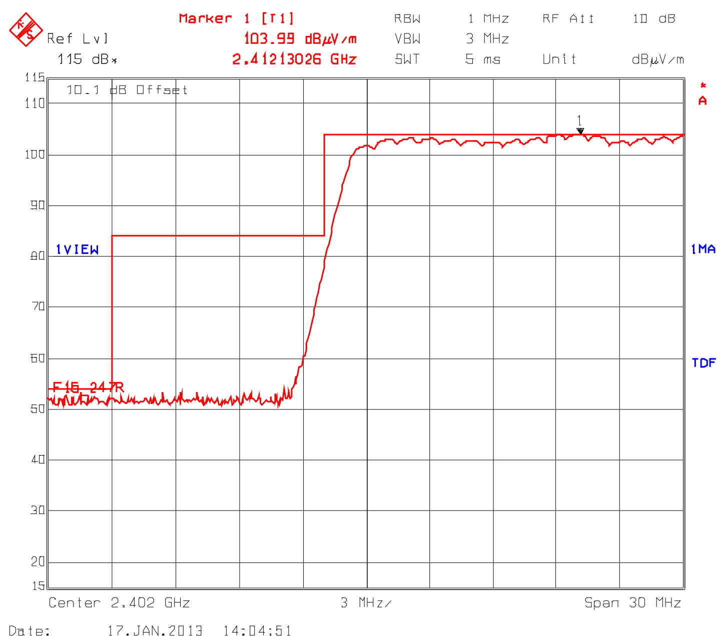
Plot 5.6.4.2.2. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL Basic DH5 339 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



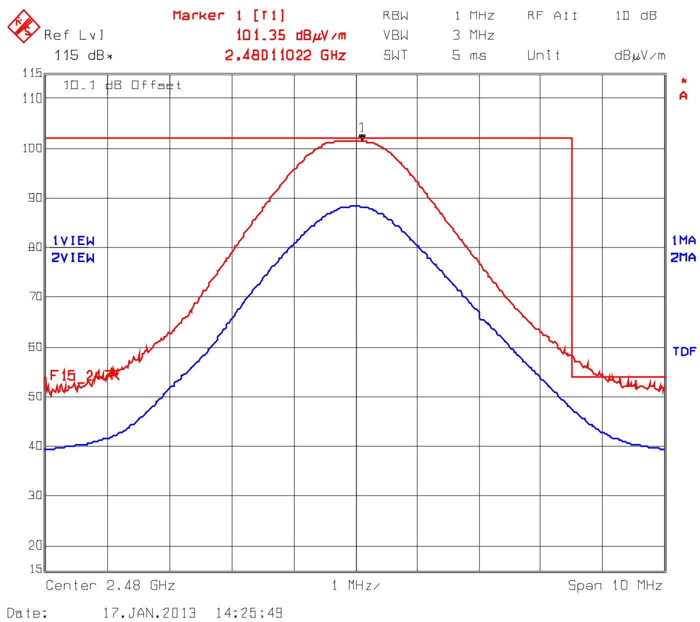
Plot 5.6.4.2.3. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL Basic DH5 339 Payload Single Frequency Mode, Low End of Frequency Band, 2402 MHz



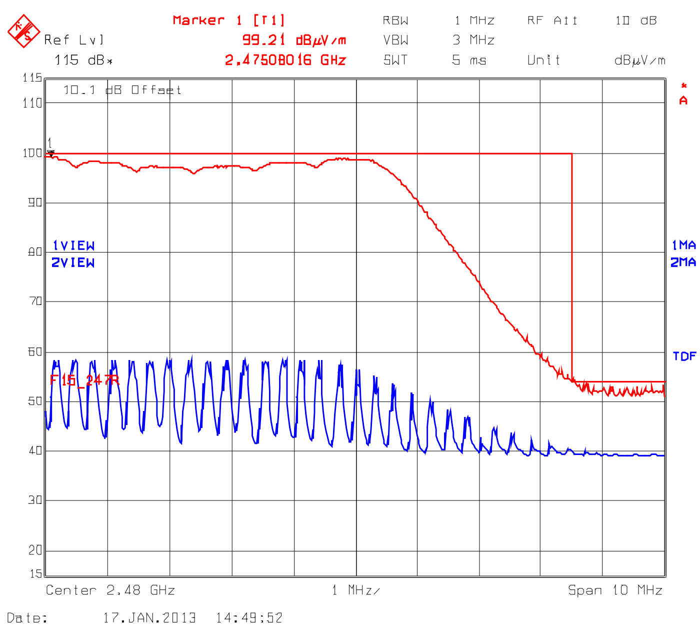
Plot 5.6.4.2.4. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL Basic DH5 339 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



Plot 5.6.4.2.5. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL Basic DH5 339 Payload Single Frequency Mode, Low End of Frequency Band, 2480 MHz

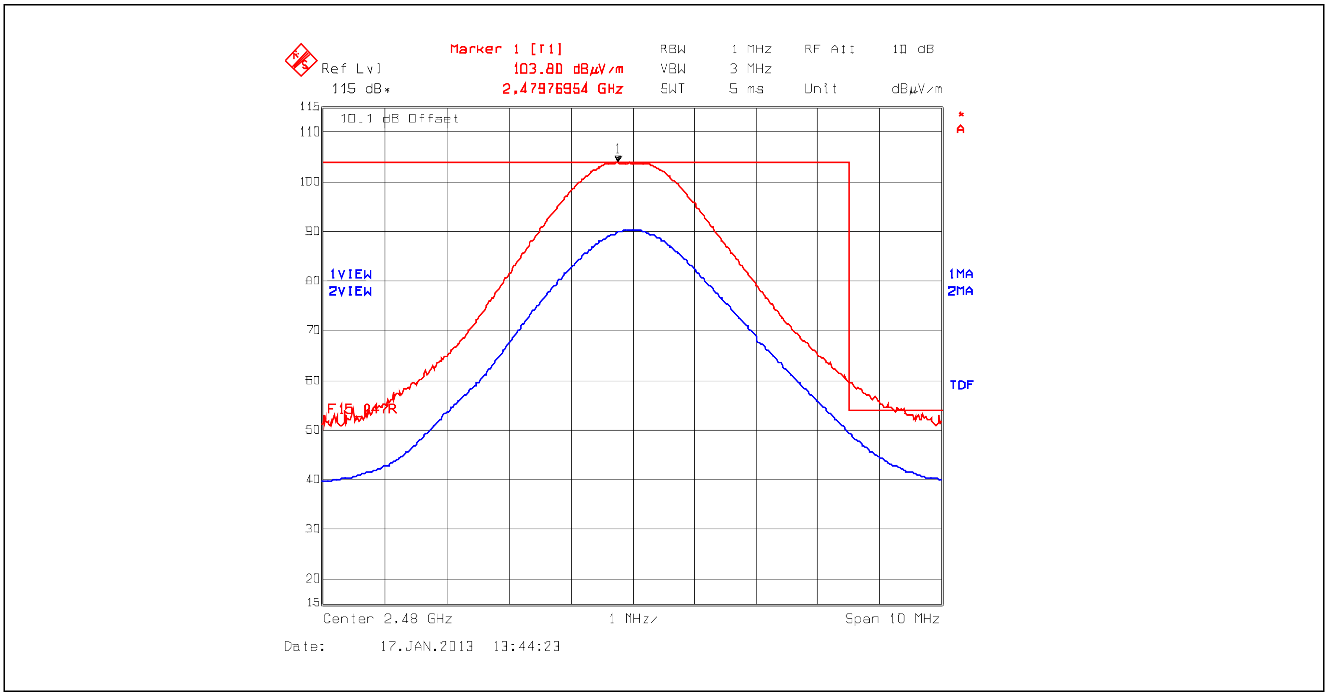


Plot 5.6.4.2.6. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL Basic DH5 339 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2480 MHz

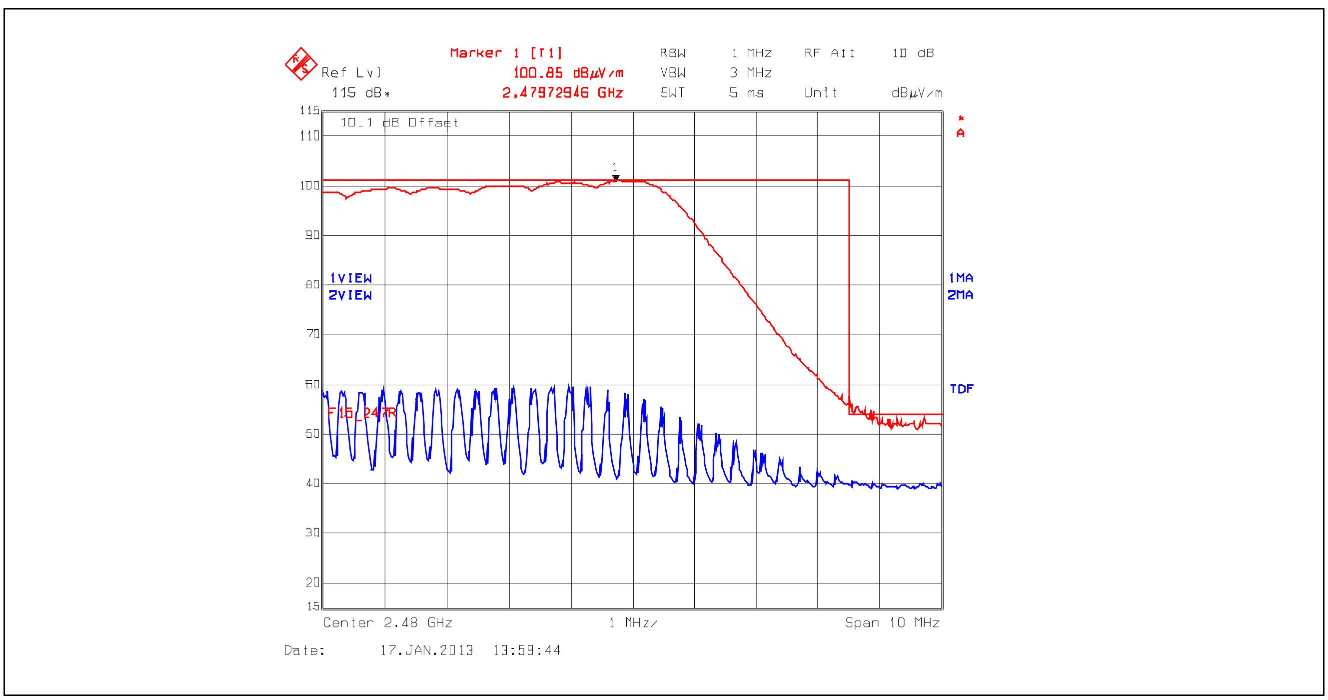


Trace 1: RBW = 1 MHz, VBW = 3 MHz; Trace 2: RBW = 1 MHz, VBW = 10 Hz

Plot 5.6.4.2.7. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL Basic DH5 339 Payload Single Frequency Mode, Low End of Frequency Band, 2480 MHz

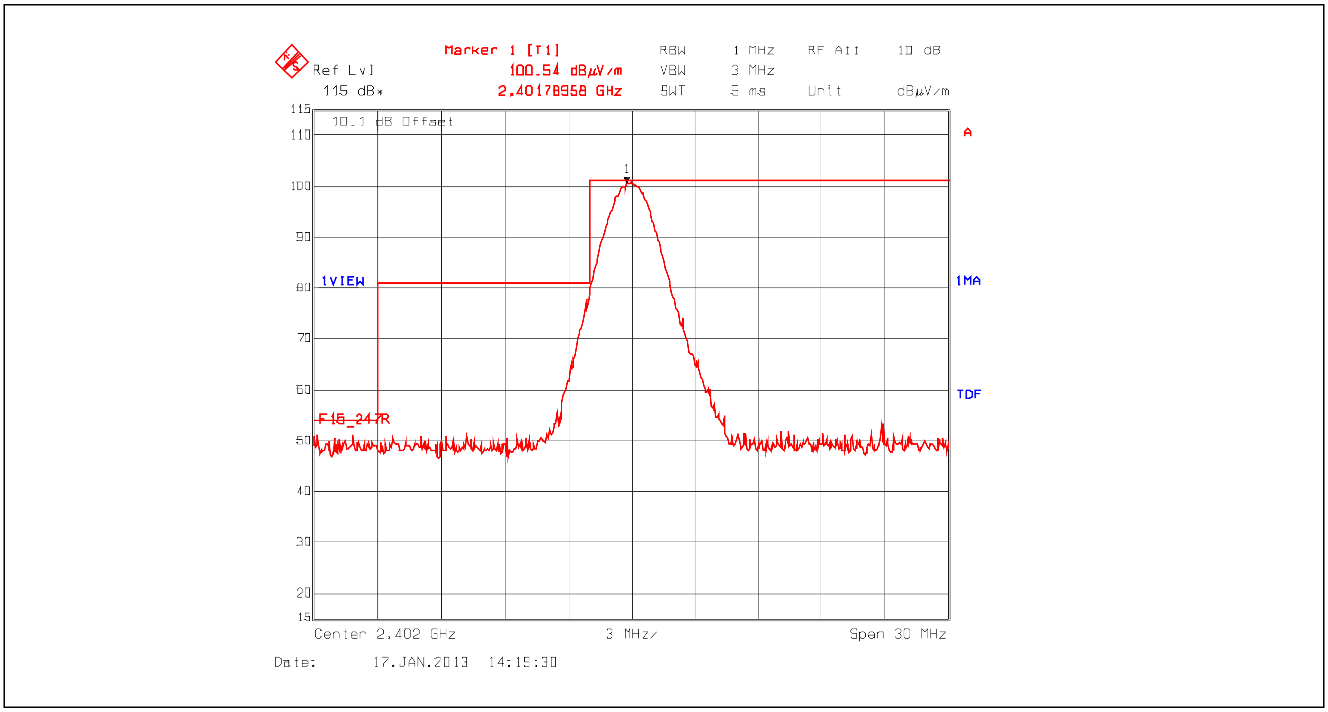


Plot 5.6.4.2.8. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL Basic DH5 339 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2480 MHz

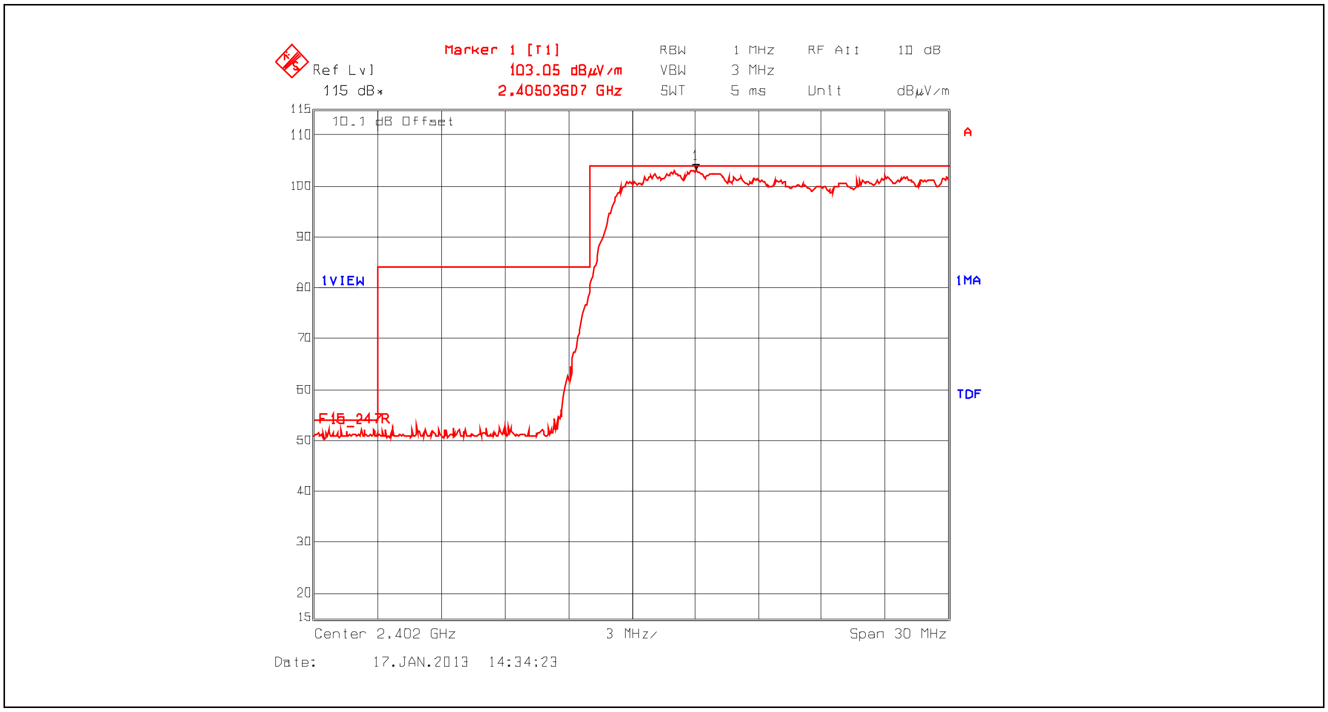


Trace 1: RBW = 1 MHz, VBW = 3 MHz; Trace 2: RBW = 1 MHz, VBW = 10 Hz

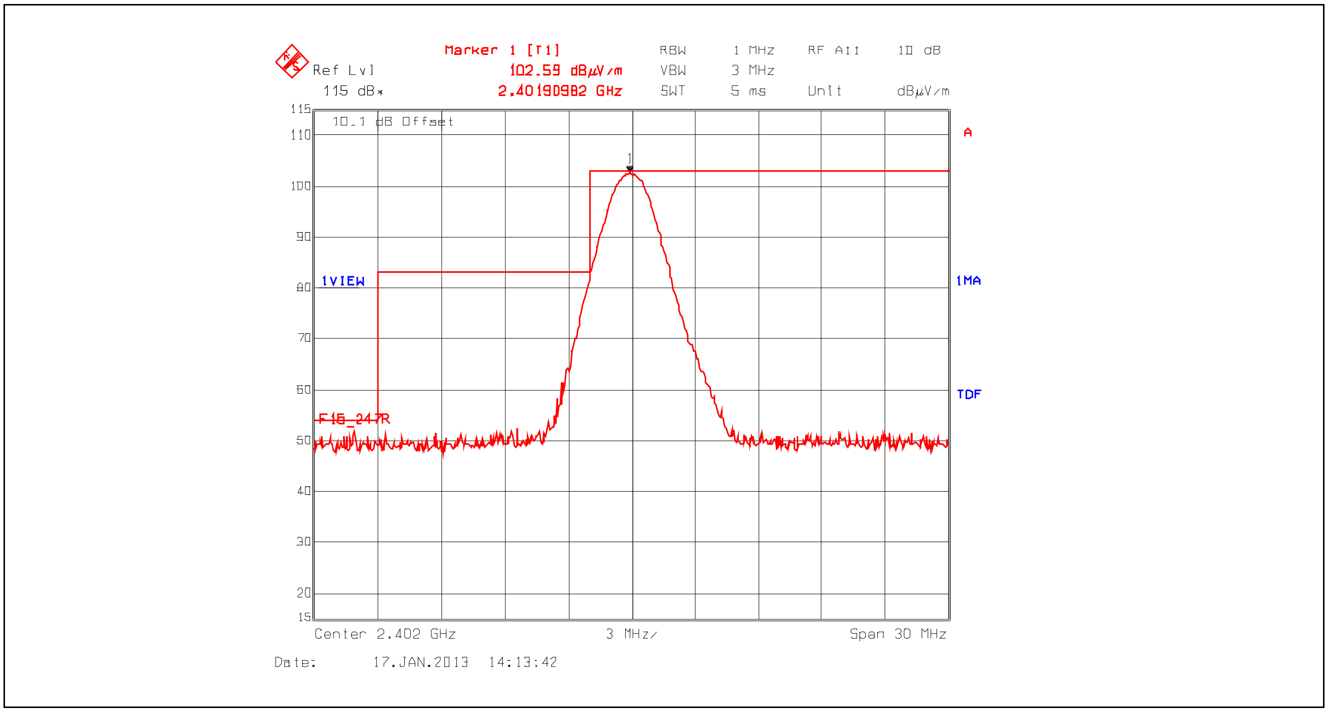
Plot 5.6.4.2.9. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL EDR 3-DH5 1021 Payload Single Frequency Mode, Low End of Frequency Band, 2402 MHz



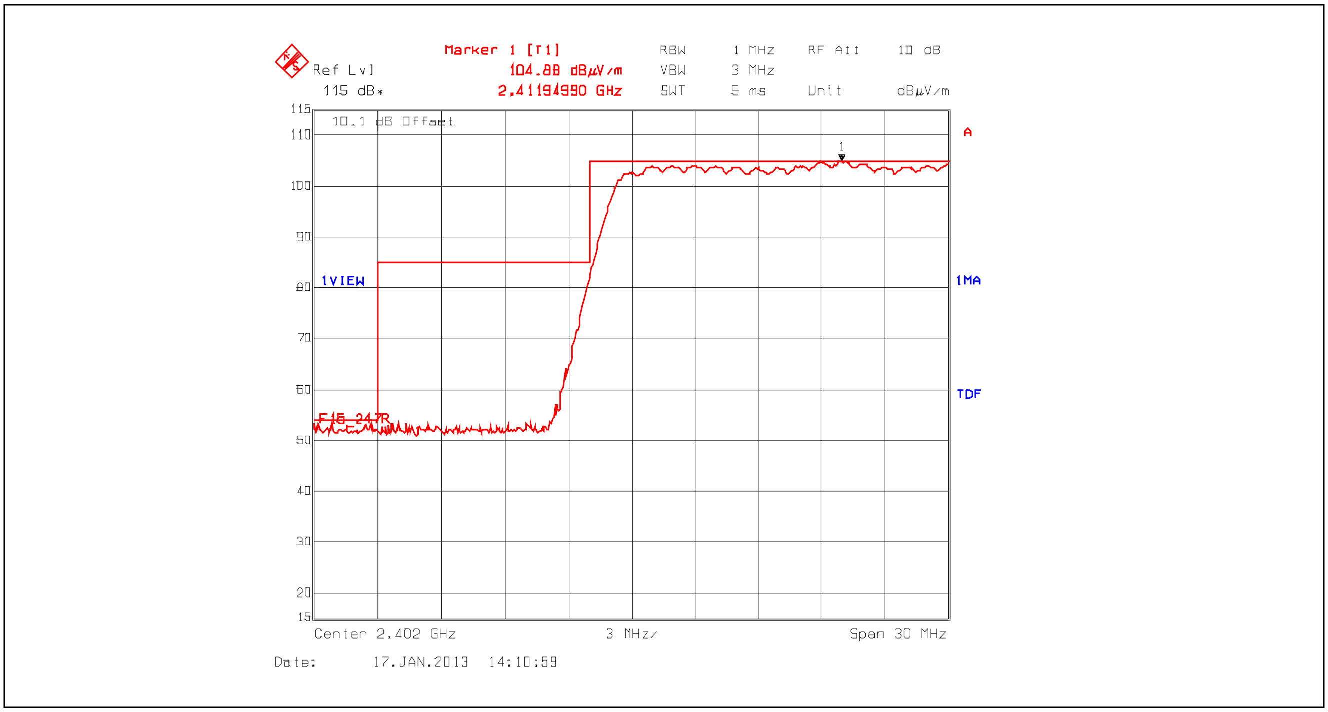
Plot 5.6.4.2.10. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL EDR 3-DH5 1021 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



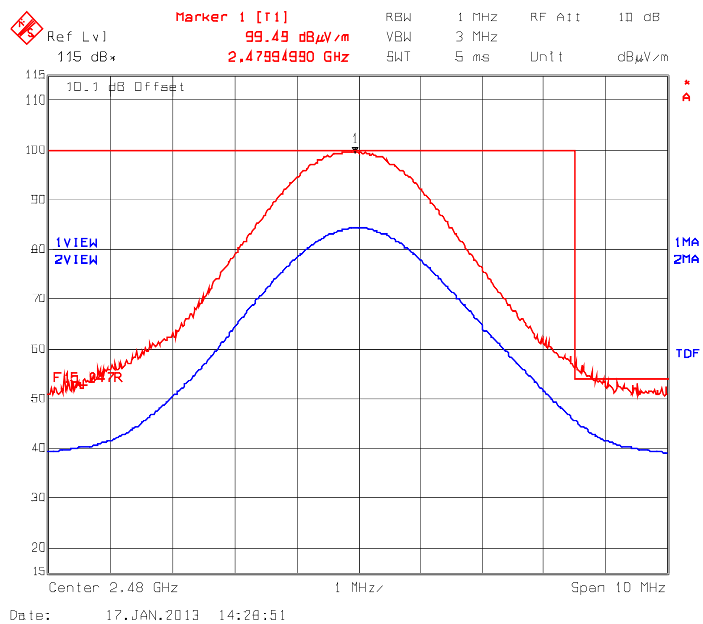
Plot 5.6.4.2.11. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL EDR 3-DH5 1021 Payload Single Frequency Mode, Low End of Frequency Band, 2402 MHz



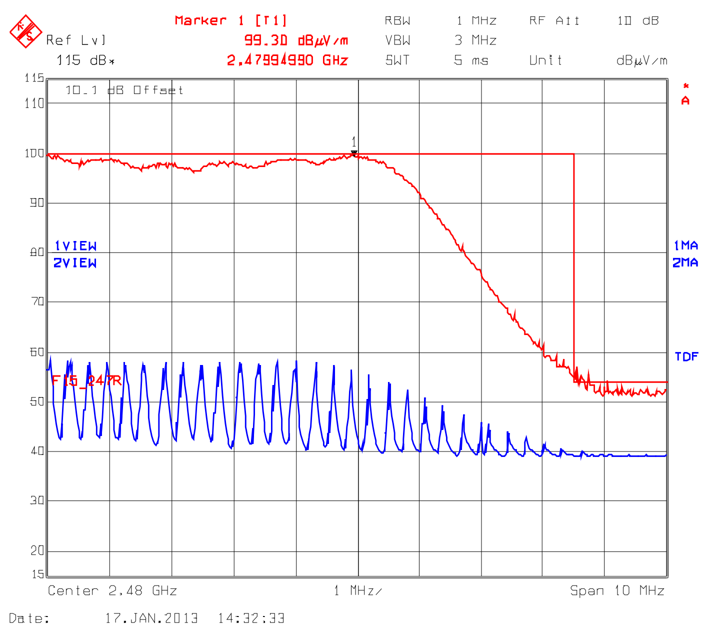
Plot 5.6.4.2.12. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL EDR 3-DH5 1021 Payload Pseudorandom Channel Hopping Mode, Low End of Frequency Band, 2402 MHz



Plot 5.6.4.2.13. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL EDR 3-DH5 1021 Payload Single Frequency Mode, High End of Frequency Band, 2480 MHz

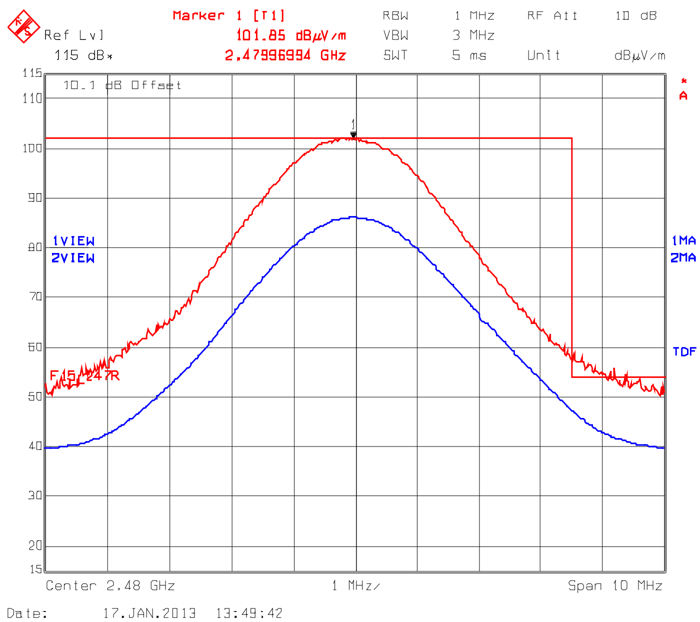


Plot 5.6.4.2.14. Band-Edge RF Radiated Emissions at 3 m, Horizontal Polarization, ACL EDR 3-DH5 1021 Payload Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz

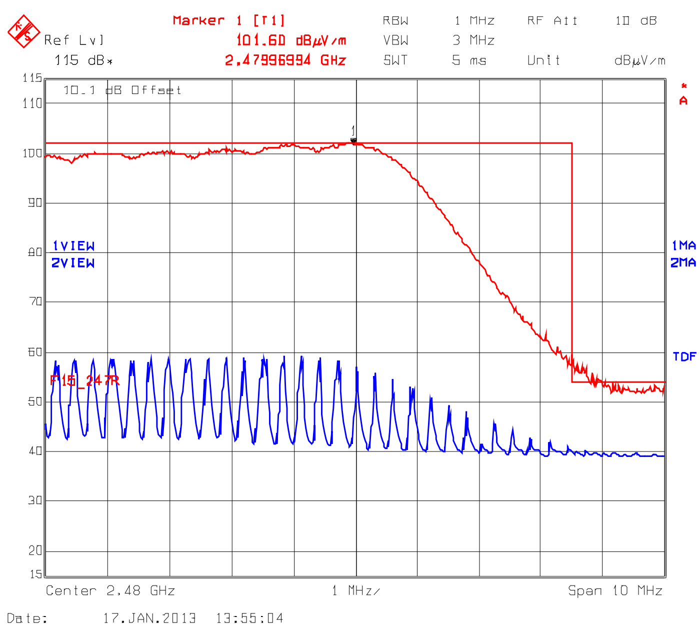


Trace 1: RBW = 1 MHz, VBW = 3 MHz; Trace 2: RBW = 1 MHz, VBW = 10 Hz

Plot 5.6.4.2.15. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL EDR 3-DH5 1021 Payload Single Frequency Mode, High End of Frequency Band, 2480 MHz



Plot 5.6.4.2.16. Band-Edge RF Radiated Emissions at 3 m, Vertical Polarization, ACL EDR 3-DH5 1021 Payload Pseudorandom Channel Hopping Mode, High End of Frequency Band, 2480 MHz



Trace 1: RBW = 1 MHz, VBW = 3 MHz; Trace 2: RBW = 1 MHz, VBW = 10 Hz

5.7. RF EXPOSURE REQUIRMENTS [§§ 15.247(i), & 2.1093]

Pursuant to KDB 447498 D01 Mobile Portable RF Exposure V04, Section (2)(a)(i) a device may be used in portable exposure conditions with no restrictions on host platforms when either the source-based time-averaged output power is ≤ 60/*f*(GHz) mW.

Output Power Limit for Portable Exposure Conditions = 60/f(GHz) mW = 60/2.48 mW = 24 mW

Maximum EUT Output Power Level = 8.51mW EIRP

Conclusion: Complies with portable RF exposure conditions.

EXHIBIT 6. TEST EQUIPMENT LIST

Test Instruments	Manufacturer	Model No.	Serial No.	Frequency Range	Cal. Due Date
Spectrum Analyzer	Agilent	E7401A	US40240432	9 kHz–1.5 GHz	01 May 2013
Attenuator	Pasternack	PE7010-20	-	DC–2 GHz	Cal. On use
L.I.S.N	EMCO	3825/2	8907-1531	10 kHz -100 MHz	05 Apr 2013
Spectrum Analyzer	Rohde & Schwarz	FSEK30	100077	20Hz–40 GHz	02 Nov 2013
DC Block	Hewlett Packard	11742A	12460	0.045–26.5 GHz	Cal on use
DC Power Supply	Tenma	72-7295	490300270	1 – 40 Vdc	Cal on use
Horn Antenna	ETS Lundgren	3115	6570	1 -18 GHz	02 Apr 2013
RF Amplifier	Hewlett Packard	84498	3008A00769	1 – 26.5 GHz	06 Aug 2013
Attenuator	Pasternack	PE7024-10	4	DC–26.5 GHz	Cal on use
Spectrum Analyzer	Rohde & Schwarz	ESU40	100033	20 Hz – 40 GHz	19 Mar 2013
RF Amplifier	AH System	PAM-0118	225	20 MHz – 18 GHz	16 Mar 2013
Biconi-Log Antenna	ETS Lindgren	3142B	1575	26 – 3000 MHz	04 May 2013
Horn Antenna	EMCO	3160-09	118385	18 – 26.5 GHz	30 July 2014
High Pass Filter	K & L	11SH10-4000/T12000	4	Cut off 2.4 GHz	Cal on use
Signal Generator	Hewlett Packard	8648C	3443U00391	100 kHz - 3200 Hz	3 Jan 2014

EXHIBIT 7. MEASUREMENT UNCERTAINTY

The measurement uncertainties stated were calculated in accordance with the requirements of CISPR 16-4-2 @ IEC:2003 and JCGM 100:2008 (GUM 1995) – Guide to the Expression of Uncertainty in Measurement.

7.1. LINE CONDUCTED EMISSION MEASUREMENT UNCERTAINTY

	Line Conducted Emission Measurement Uncertainty (150 kHz – 30 MHz):	Measured	Limit
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	± 1.57	± 1.8
U	**Expanded uncertainty U:** $U = 2u_c(y)$	± 3.14	± 3.6

7.2. RADIATED EMISSION MEASUREMENT UNCERTAINTY

	Radiated Emission Measurement Uncertainty @ 3m, Horizontal (30-1000 MHz):	Measured	Limit
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	± 2.15	± 2.6
U	**Expanded uncertainty U:** $U = 2u_c(y)$	± 4.30	± 5.2

	Radiated Emission Measurement Uncertainty @ 3m, Vertical (30-1000 MHz):	Measured	Limit
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	± 2.39	± 2.6
U	**Expanded uncertainty U:** $U = 2u_c(y)$	± 4.78	± 5.2

	Radiated Emission Measurement Uncertainty @ 3 m, Horizontal & Vertical (1 – 18 GHz):	Measured	Limit
u_c	**Combined standard uncertainty:** $u_c(y) = \sqrt{\sum_{I=1}^{m} u_i^2(y)}$	± 1.87	Under consideration
U	**Expanded uncertainty U:** $U = 2u_c(y)$	± 3.75	Under consideration