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<i>Client:</i>	CowManager B.V. Gerverscop 9, 3481LT Harmelen, Netherlands		
<i>Test Item:</i>	Digital Transmission System (DTS) ZigBee		
<i>Identification:</i>	CWS3	<i>Serial Number:</i>	EA08 8216 (CH11), EA08 8338 (CH18) and EA08 8217 (CH26) (conducted tests) EA08 9958 (CH11), EA07 1323 (CH18) and EA06 9100 (CH26) (radiated tests)
<i>Project No.:</i>	16071303	<i>Date of Receipt:</i>	December 13, 2016
<i>Testing Location:</i>	TÜV Rheinland Nederland B.V. Eiberkamp 10 9351VT Leek		
<i>Test Specification:</i>	FCC 47 CFR Part 15, Subpart C, Section 15.247 (10-1-15 Edition) RSS-Gen (Issue 4, November 2014) and RSS-247 (Issue 2, February 2017) ANSI C63.10-2013		
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<i>Test Result:</i>	<i>The test item passed the test specification(s).</i>		
<i>Testing Laboratory:</i>	TÜV Rheinland Nederland B.V. Eiberkamp 10 9351 VT Leek		
<i>Tested by:</i>		<i>Reviewed by:</i>	
2017-05-10	R. van der Meer / Inspector	2017-05-10	E. van der Wal / Reviewer
<i>Date</i>	<i>Name/Position</i>	<i>Signature</i>	<i>Date</i>
			<i>Name/Position</i>
			<i>Signature</i>
<i>Other Aspects:-.</i>			
<i>Abbreviations:</i> P(ass) = passed F(ail) = failed N/A = not applicable N/T = not tested			

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TEST SUMMARY

5.1.1 CONDUCTED MEASUREMENTS AT ANTENNA PORT

RESULT: PASS

5.1.2 DTS BANDWIDTH

RESULT: PASS

5.1.3 PEAK POWER SPECTRAL DENSITY

RESULT: PASS

5.1.4 BAND EDGE CONDUCTED EMISSIONS

RESULT: Pass

5.1.5 RADIATED SPURIOUS EMISSIONS OF TRANSMITTER

RESULT: PASS

5.2.1 AC POWER LINE CONDUCTED EMISSION OF TRANSMITTER

RESULT: Not Applicable

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General Remarks

1.1 Complementary Materials

There is no attachment to this test report.

2. Test Sites

2.1 Test Facilities

The Federal Communications Commission and Industry Canada has reviewed the technical characteristics of the test facilities at TÜV Rheinland Nederland B.V., located in Leek, 9351VT Eiberkamp 10, The Netherlands, and has found these test facilities to be in compliance with the requirements of 47 CFR Part 15, section 2.948.

The description of the test facilities has been filed at the Office of the Federal Communications Commission under registration number 90828. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

The description of the test facilities has been filed to Industry Canada under registration number 2932G-2. The facility has been added to the list of laboratories performing these test services for the public on a fee basis.

Normal test conditions:

Temperature (*) : +19°C to +25°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 3.6V, battery operated only (new battery used).

When it was impracticable to carry out the tests under these conditions, a note to this effect stating the ambient temperature and relative humidity during the tests are stated separately.

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2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Model Name	Inventory number	Calibration date (mm/yyyy)	Calibration due date (mm/yyyy)
For Antenna Port Conducted Emissions					
Temperature-Humiditymeter	Extech	SD500	A00446	04/2016	04/2017
Spectrum Analyzer	Rohde & Schwarz	FSV	A01744	07/2016	07/2017
RF Cable	Huber + Suhner	Sucoflex 102	A01844	05/2016	05/2017
For Radiated Emissions					
Measurement Receiver	Rohde & Schwarz	ESCI	A00314	03/2016	03/2017
RF Cable S-AR	Gigalink	APG0500	A00447	01/2016	01/2017
Controller	Maturo	SCU/088/8090811	A00450	N/A	N/A
Controller	EMCS	DOC202	A00257	N/A	N/A
Test facility	Comtest	FCC listed: 90828 IC: 2932G-2	A00235	04/2014	04/2017
Spectrum Analyzer	Rohde & Schwarz	FSV	A00337	06/2016	06/2017
Antenna mast	EMCS	AP-4702C	A00258	N/A	N/A
Amplifier for A00209	EMCS	--	A00378	N/A	N/A
Temperature-Humiditymeter	Extech	SD500	A00444	04/2016	04/2017
Guidehorn 1-18 GHz	EMCO	3115	A00009	04/2016	04/2017
Guidehorn 18-26.5 GHz	EMCO	3160-09	A00209	04/2016	04/2017
Biconilog Testantenna	Teseq	CBL 6111D	A00466	06/2016	06/2017
2.4 GHz bandreject filter	BSC	XN-1783	A00065	N/A	N/A
Bandpass filter 4-10 GHz	Reactel	7AS-7G-6G-511	A00131	N/A	N/A
Bandpass filter 10-26 GHz	Reactel	9HS-10G/26.5G-S11	A00151	N/A	N/A
Preamplifier 0.5 - 18 GHz	Miteq	AMF-5D-005180-28-13p	A00247	N/A	N/A
Filterbox	EMCS	RFS06S	A00255	02/2016	02/2017

Conformance of the used measurement and test equipment with the requirements of ISO/IEC 17025:2005 has been confirmed before testing. NA= Not Applicable

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2.3 Measurement Uncertainty

Table 2: Emission Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 6GHz	2.5dB
	> 6GHz	2.7 to 4.2
Radiated Emission		
	30MHz - 1GHz	5.22dB
	> 1GHz	5.22dB

3. General Product Information

3.1 Product Function and Intended Use

The brand CowManager B.V. model CWS3, hereafter referred to as EUT, is a ZigBee transceiver used to transmit data within a ZigBee network consisting of a label, Router and Coordinator. ZigBee uses Offset Quadrature Phase-shift Keying (OQPSK) and Direct Sequence Spread Spectrum (DSSS) for modulating radio-signals in physical layer based on 802.15.4 protocols. The 802.15.4 (ZigBee) channel allocation consists of 16 channels numbered 11 to 26, starting at 2.405GHz (CH11) and ending at 2.480GHz (CH26). Bandwidth is 2MHz per channel.

The EUT is a Zigbee device fitted with an integral PCB mounted antenna. All radiated testing was performed using three samples preconfigured for the test frequencies as described in section 4.2, the conducted tests were performed using three samples preconfigured for the test frequencies as described in section 4.2. The conducted samples were supplied with a female SMA connector in place of the internal antenna to enable direct connection to test equipment.

The content of this report and measurement results have not been changed other than the way of presenting the data.

3.2 System Details

Details and an overview of the system and all of its components, as it has been tested, may be found below.

EUT	:	Digital Transmission System (DTS), ZigBee
Manufacturer	:	CowManager BV
Brand	:	CowManager
Model(s)	:	CWS3
Serial Number(s)	:	EA08 8216 (CH11), EA08 8338 (CH18) and EA08 8217 (CH26) (conducted tests) EA08 9958 (CH11), EA07 1323 (CH18) and EA06 9100 (CH26) (radiated tests)
Firmware version	:	7.4
Voltage input rating	:	-
Voltage output rating	:	3.6 Vdc (from non-rechargeable battery)
Current input rating	:	--
Antenna	:	Internal, integrated on the PCB
Antenna Gain	:	+ 1.0 dBi
Operating frequency	:	2405 MHz-2480 MHz.
Modulation	:	OQPSK
Data-rate	:	250 kbps
Remarks	:	n.a.

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Table 3: Interfaces present on the EUT

There are no interface ports present on the EUT.

3.3 Countermeasures to achieve compliance

No additional measures were employed to achieve compliance.

4. Test Set-up and Operation Modes

4.1 Test Methodology

The test methodology used is based on the requirements of RSS-GEN, RSS-247, 47 CFR Part 15, Sections 15.31, 15.33, 15.35, 15.205, 15.207, 15.209, 15.247.

The test methods, which have been used, are based on ANSI C63.10-2013.

4.2 Operation Modes

Testing was performed at the lowest operating frequency (2405 MHz), at the operating frequency in the middle of the specified frequency band (2440 MHz) and at the highest operating frequency (2480 MHz). These operation modes were selected after review of the capabilities and characteristics of the EUT. The test modes and settings were enabled by the applicant.

The EUT has been tested in the modes as described in table below

Operation Mode	EUT Status	Frequency (MHz)	TX power control setting
Transmit (Tx)	On	2405 (Ch 11)	0x1D
Transmit (Tx)	On	2440 (Ch 18)	0x1D
Transmit (Tx)	On	2480 (Ch 26)	0x1D

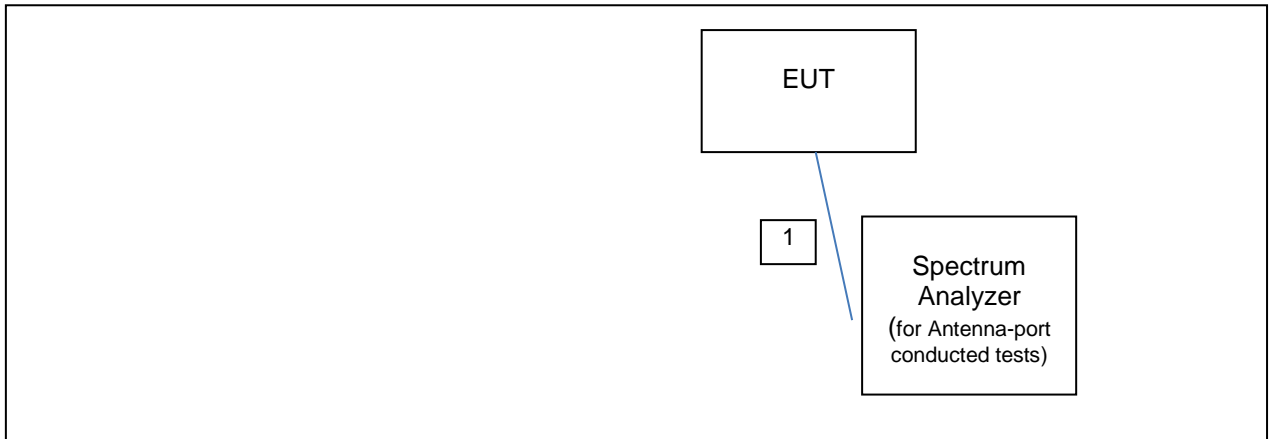
The stated TX power control setting is secured in firmware (version 7.4) and is not accessible by the user.

4.3 Physical Configuration for Testing

The EUT was pre-programmed for the required settings as mentioned in section 4.2.

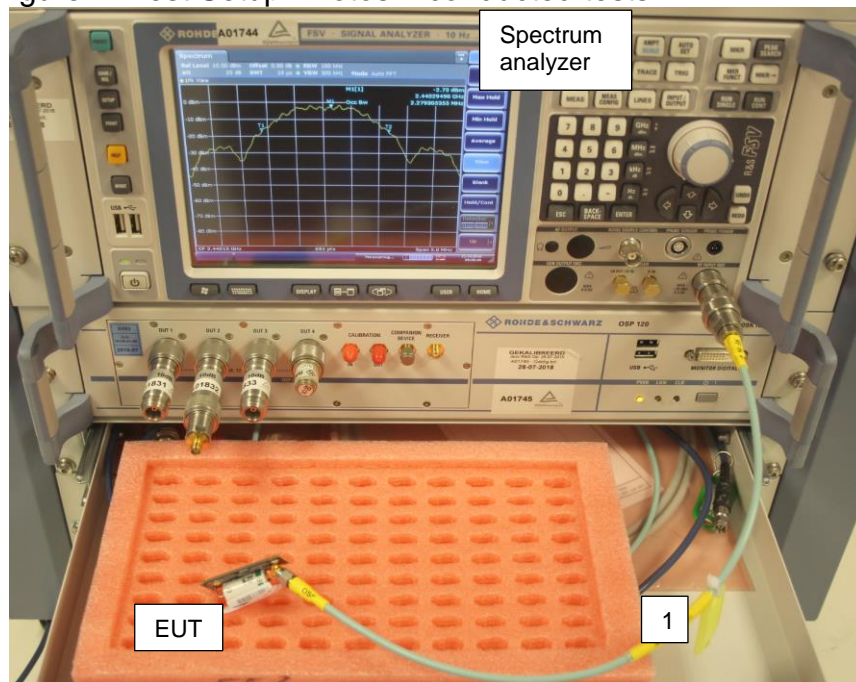
The justification and manipulation of cables and equipment in order to simulate a worst-case behavior of the test setup has been carried out as prescribed in ANSI C63.10-2013.

Figure 1: Test Setup Diagram – antenna port conducted tests.



No.	Port	From	To	Remarks
1.	Antenna port	EUT	Spectrum analyzer	Conducted tests

Figure 2: Test Setup Photos – conducted tests



5. Test Results

5.1 Conducted Measurements at Antenna Port

5.1.1 Conducted Output Power

RESULT: PASS

Date of testing: 2016-12-21

Requirements:

FCC 15.247(b)(3)

For systems using digital modulation in the 2400-2483.5 MHz band, the maximum peak output power is 1W (+30dBm).

RSS-247 section 5.4(4): the e.i.r.p. shall not exceed 4 W (+36 dBm).

Test procedure:

The Peak Conducted Output Power was measured using the method according to section 11.9.1.1 in ANSI C63.10-2013.

The maximum peak output power (conducted) was measured at the antenna connector with a spectrum analyzer. The final measurement takes into account the loss generated by all the involved cables.

Measurement uncertainty is +/- 2.5 dB.

Notes: $mW = 10^{(dBm/10)}$

$dBm = 10 \times \log(mW)$

plots : Peak power plots,

Figures 1a, 1b and 1c show plots of the Peak Power outputs, correction factors (= 0.8dB Cableloss) included in the reading.

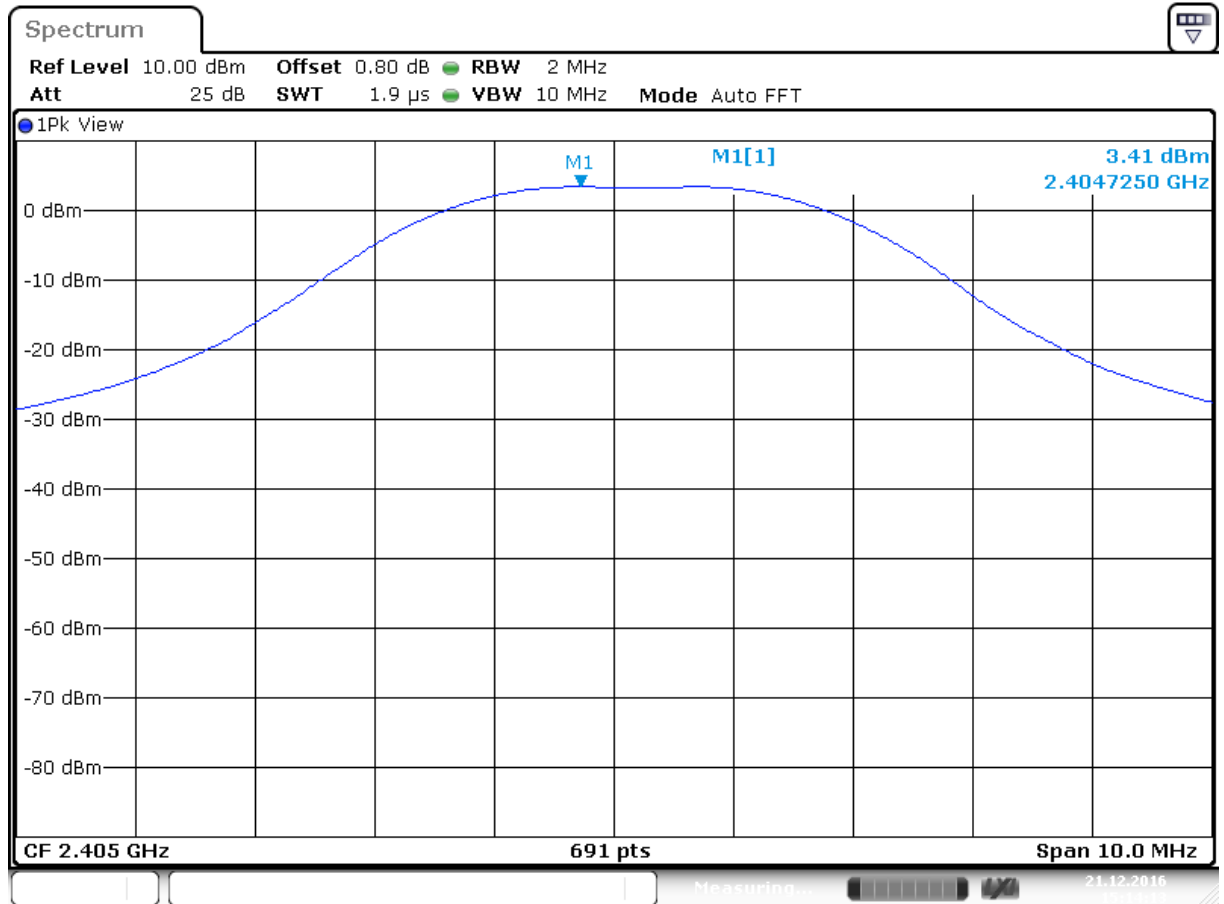
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Conducted Output Power

Frequency [MHz]	Output Power [dBm] (mW)	Limit [dBm]	Verdict [Pass/Fail]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (mW)	Plot number
2405	3.41 (2.19 mW)	+30	Pass	1.0	4.41	2.76	1A
2440	3.45 (2.21 mW)	+30	Pass	1.0	4.45	2.79	1B
2480	3.13 (2.06 mW)	+30	Pass	1.0	4.13	2.59	1C



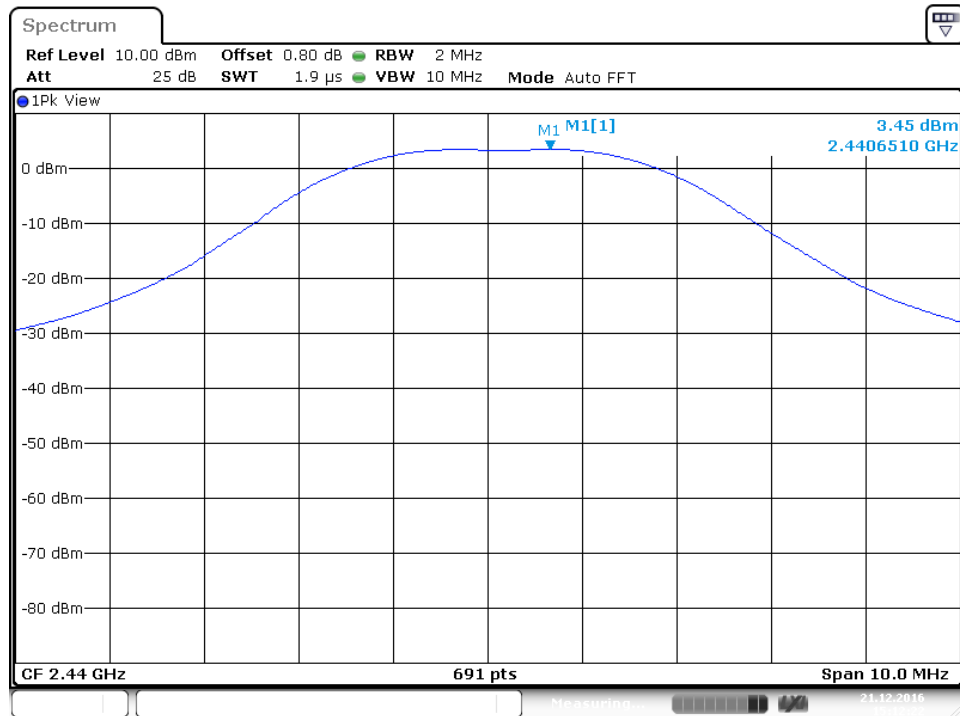
Date: 21.DEC.2016 15:14:13

Plot A

Test Report No.:

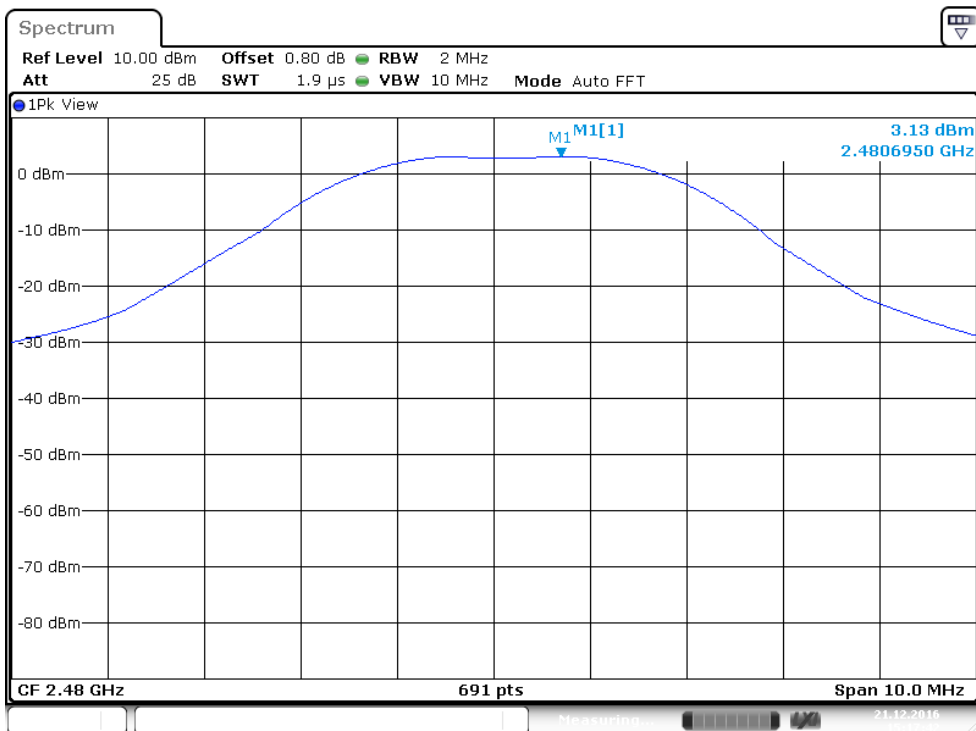
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Date: 21.DEC.2016 15:12:22

Plot B



Date: 21.DEC.2016 15:17:42

Plot C

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5.1.2 DTS Bandwidth

RESULT: Pass

Date of testing: 2016-12-21

Requirements:

FCC 15.247(a)(2)

For systems using digital modulation in the 2400-2483.5MHz band, the 6dB bandwidth shall be at least 500kHz. For 99% Bandwidth: RSS-Gen Section 4.6.1: No requirement is given.

Test procedure DTS bandwidth:

ANSI C63.10-2013 section 11.8.1 Option 1

The transmitter shall be operated at its maximum carrier power measured under normal test conditions. The span of the analyzer shall be set to capture all products of the modulation process, including the emission skirts. The resolution bandwidth shall be set as close to 1% of the selected span as is possible without being below 1%. The video bandwidth shall be set to 3 times the resolution bandwidth. Video averaging is not permitted. Where practical, a sampling detector shall be used given that a peak or peak hold may produce a wider bandwidth than actual.

A spectrum analyzer was connected to the antenna port of the EUT. The spectrum analyzer resolution bandwidth was set to 1% of the selected span, Video bandwidth was set to 3 times the resolution bandwidth. The span was set to capture the whole modulation process. The Spectrum analyzers automated function for x BW was used. Measurement uncertainty is +/- 26kHz.

Plots A1,B1 and C1 shown on the next pages are of the 6 dB bandwidth.
Plots A2,B2 and C2 shown on the next pages are of the 99% bandwidth.

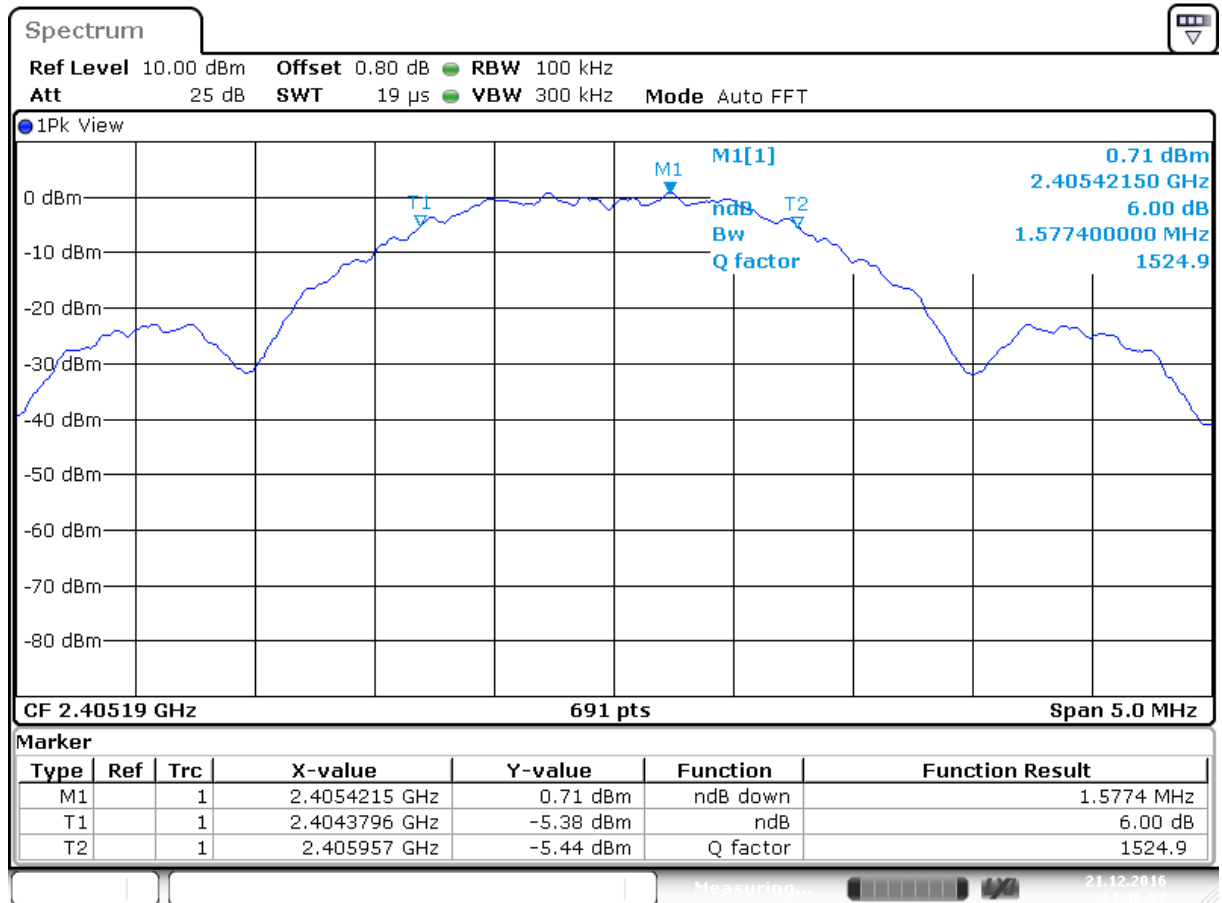
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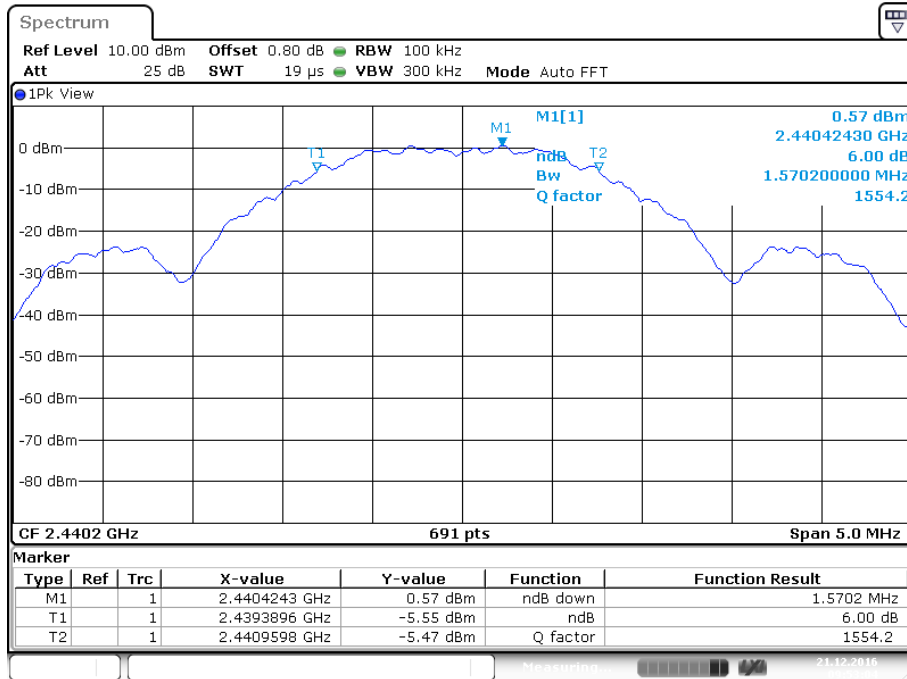
6dB and 99% Bandwidth

Operating Frequency [MHz]	99% Bandwidth [kHz]	6dB Bandwidth [kHz]	Limit [kHz]	Verdict [Pass/Fail]	Plot number
2405	2337	1577	>500	Pass	A1
2440	2287	1570	>500	Pass	B1
2480	2294	1548	>500	Pass	C1



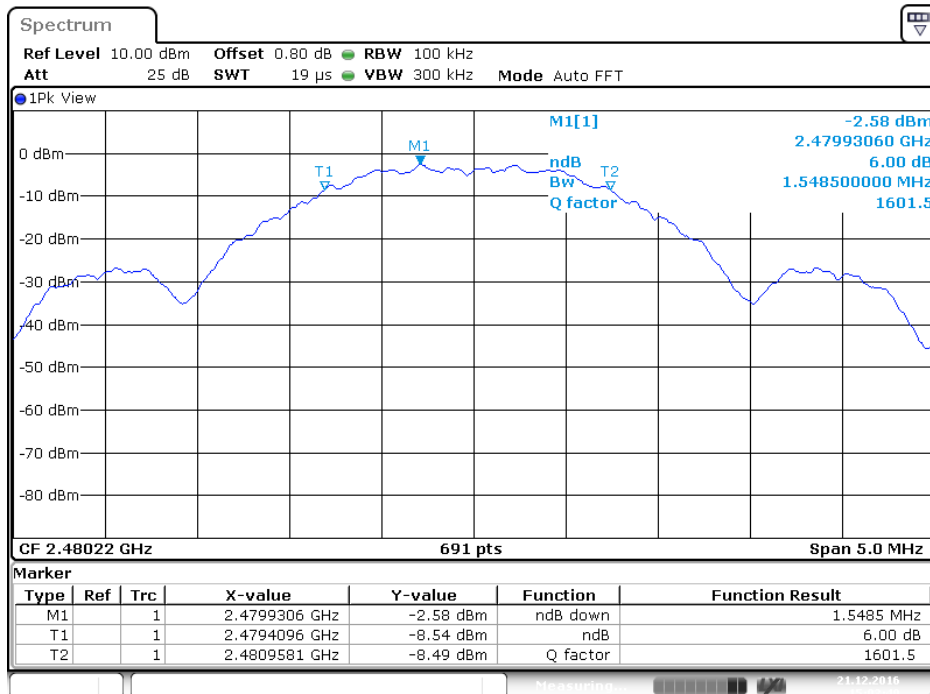
Date: 21.DEC.2016 14:46:57

Plot A1



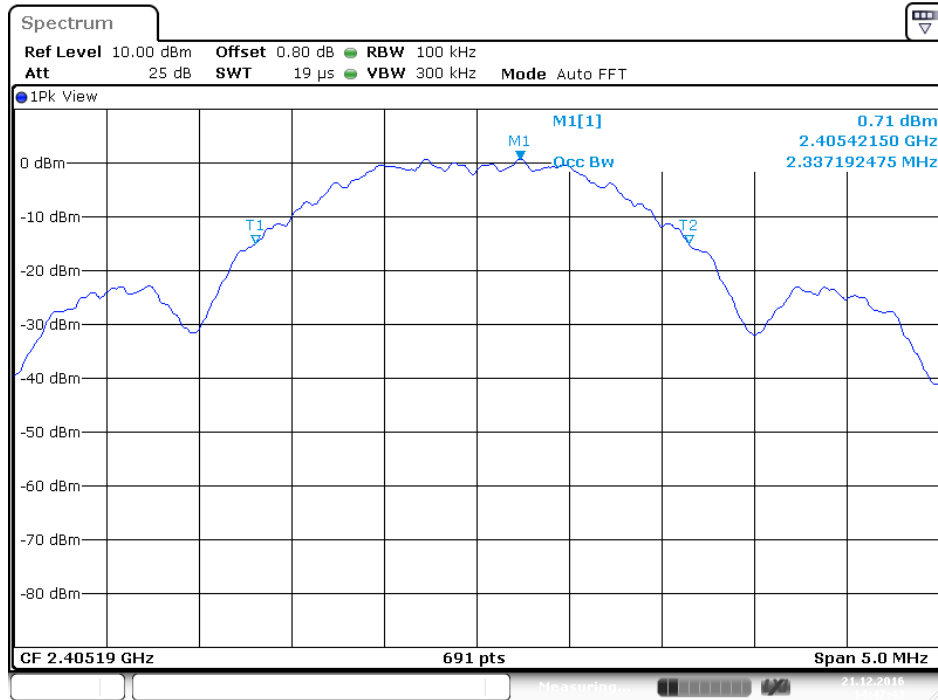
Date: 21.DEC.2016 09:53:04

Plot B1



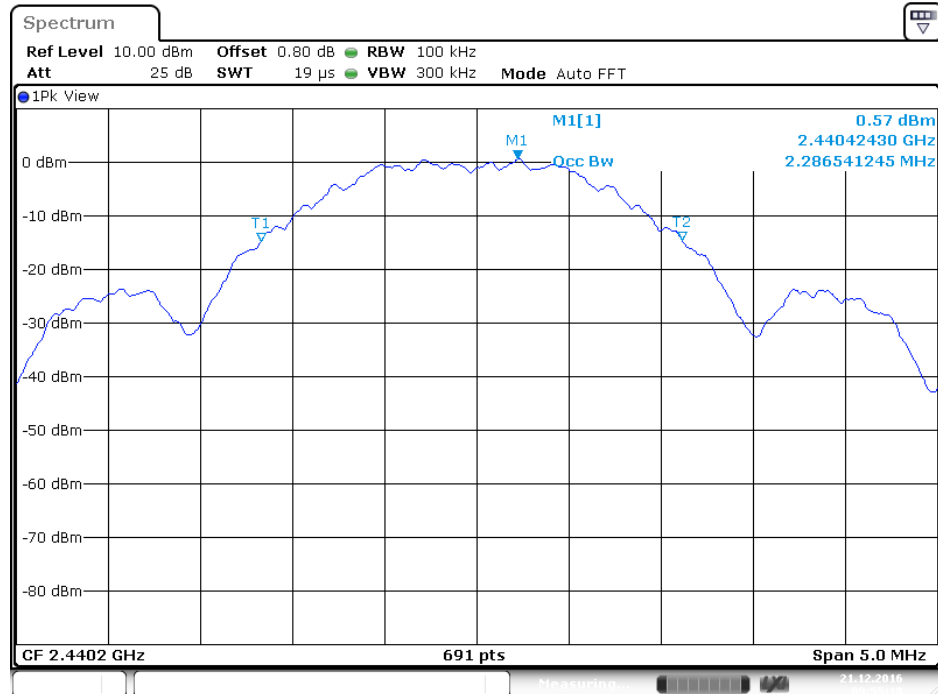
Date: 21.DEC.2016 15:03:49

Plot C1



Date: 21 DEC 2016 14:47:44

Plot A2



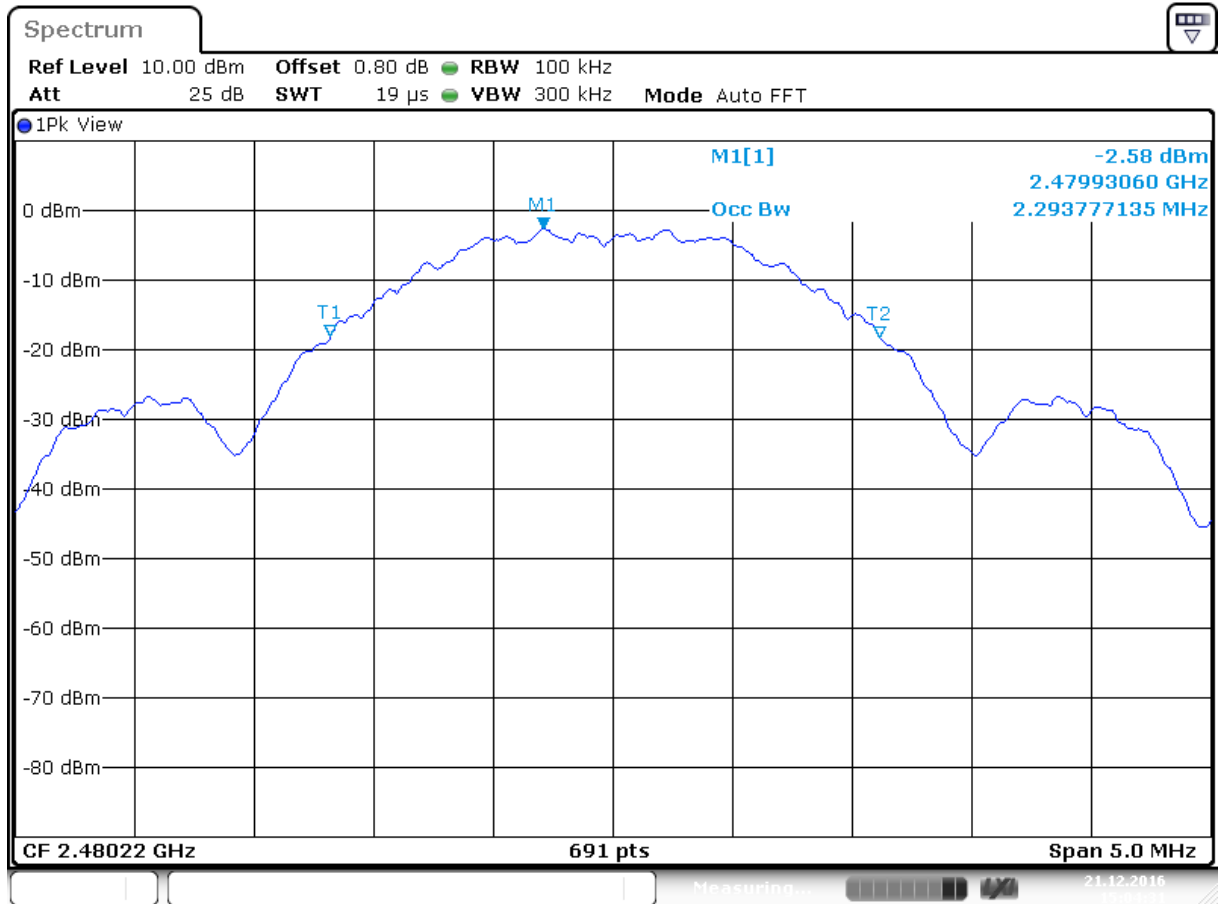
Date: 21 DEC 2016 09:55:18

Plot B2

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Date: 21.DEC.2016 15:04:31

Plot C2

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5.1.3 Peak Power Spectral Density

RESULT: Pass

Date of testing: 2016-12-21

Requirements:

FCC 15.247(e) and RSS-247 section 5.2(2)

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

Test procedure:

ANSI C63.10-2013

The section 11.10.2 PKPSD peak PSD procedure was used. A spectrum analyzer was connected to the antenna port of the EUT. The analyzer resolution bandwidth was set to 3kHz and the video bandwidth was set to 10kHz. The sweep time was set to auto couple and the trace was allowed to stabilize before making the final measurement. By using the Peak marker function the maximum amplitude was determined. The final measurement takes into account the loss generated by all the involved cables (0.8 dB).

Measurement uncertainty is +/- 1.1 dB.

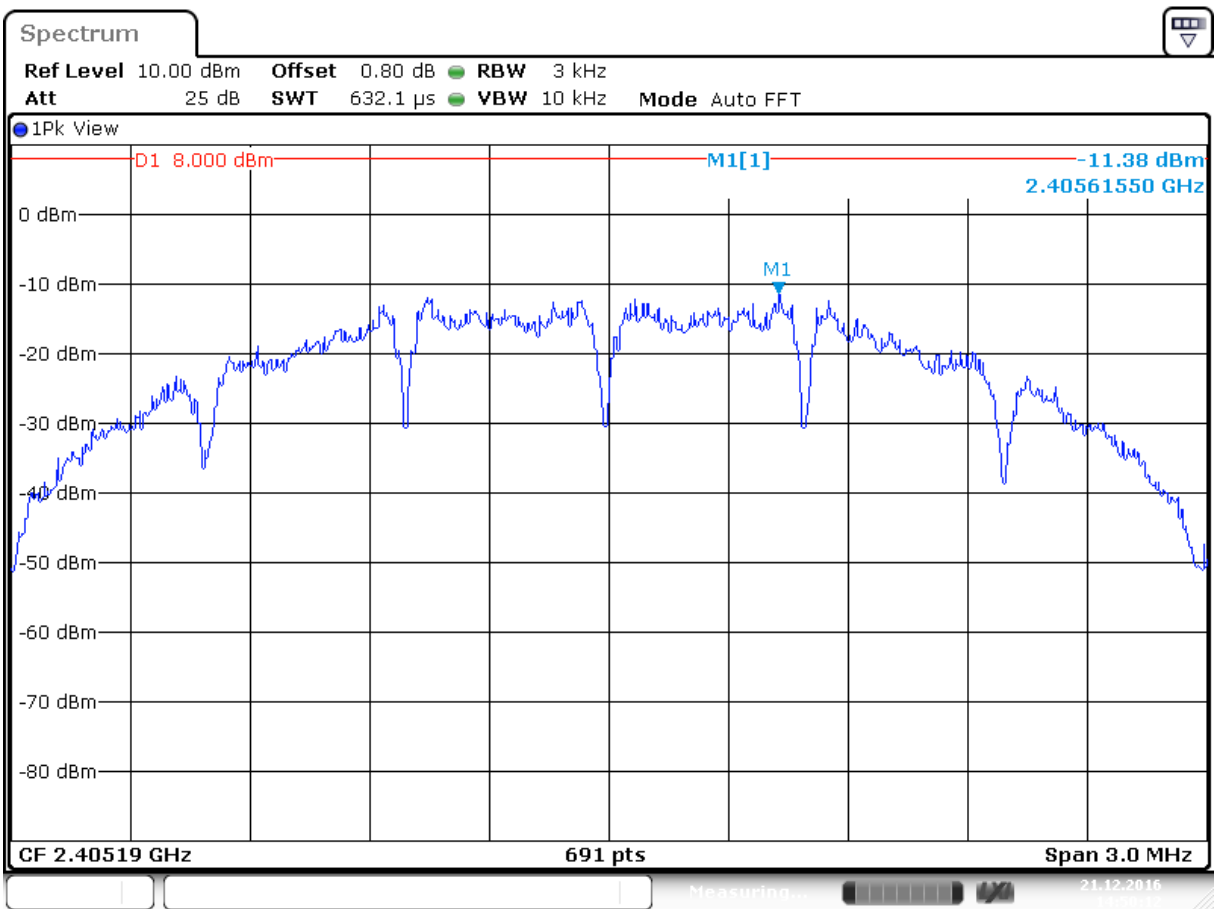
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Peak Power Spectral Density

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2405	-11.4	8	Pass	A
2440	-13.1	8	Pass	B
2480	-12.3	8	Pass	C



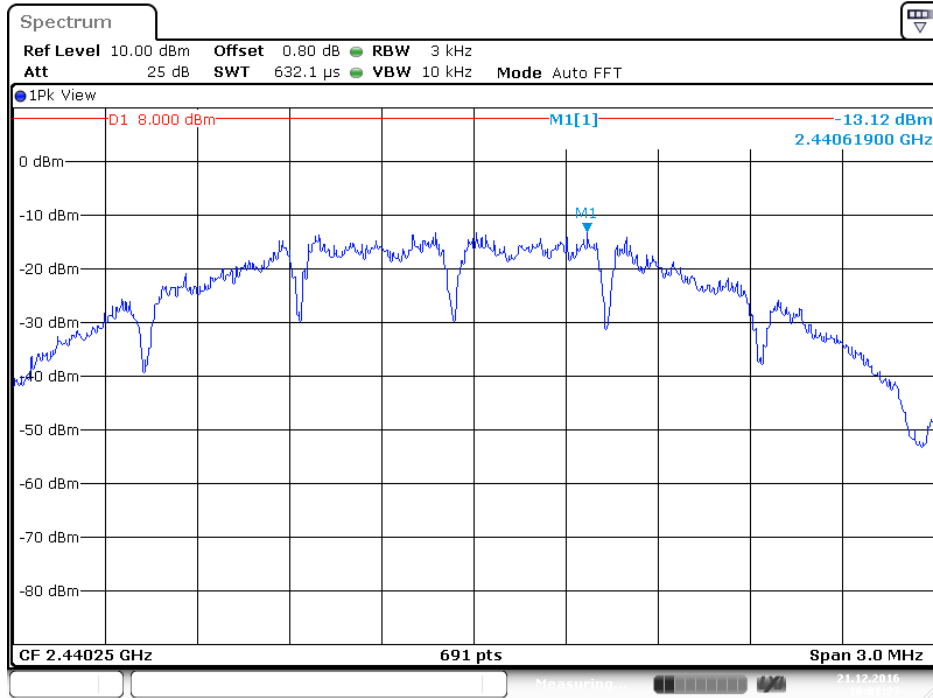
Date: 21.DEC.2016 14:50:12

Plot A

Test Report No.:

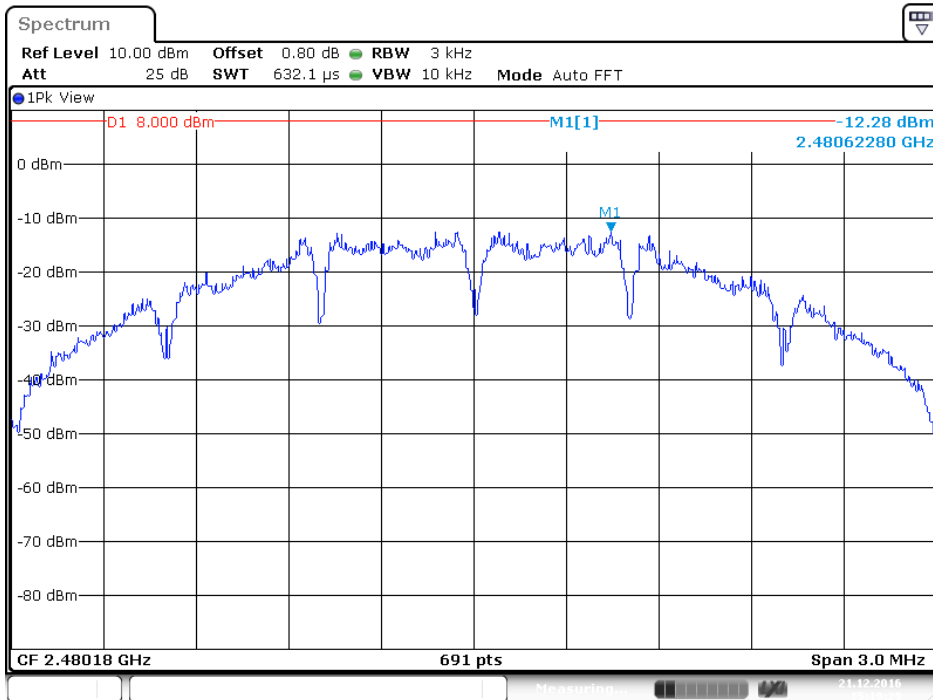
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Date: 21.DEC.2016 10:01:23

Plot B



Date: 21.DEC.2016 15:19:28

Plot C

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5.1.4 Band Edge Conducted Emissions

RESULT: Pass

Date of testing: 2016-12-21

Requirements:

FCC 15.205, FCC 15.209, FCC 15.247(d) and RSS-247 section 5.5

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.

Test procedure:

ANSI C63.10-2013
Section 11.13

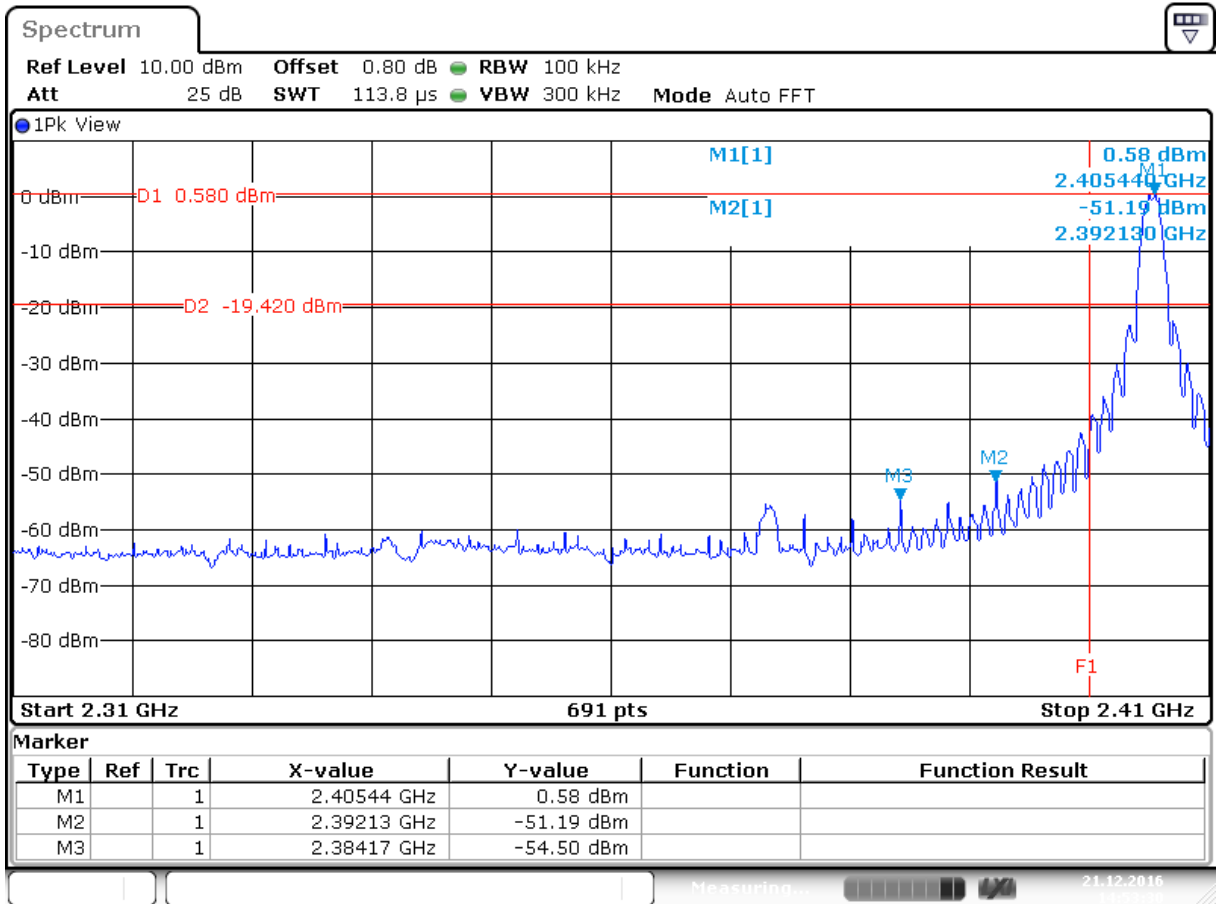
The marker-delta method, as described in ANSI C63.10 was used.

Measurements were performed using a spectrum analyzer with a suitable span to encompass the peak of the fundamental and using the following settings:
RBW = 100kHz, VBW = 300kHz.

The highest emission amplitudes relative to the appropriate limit were measured and recorded in this report.

Measurement uncertainty is +/- 2.5 dB.

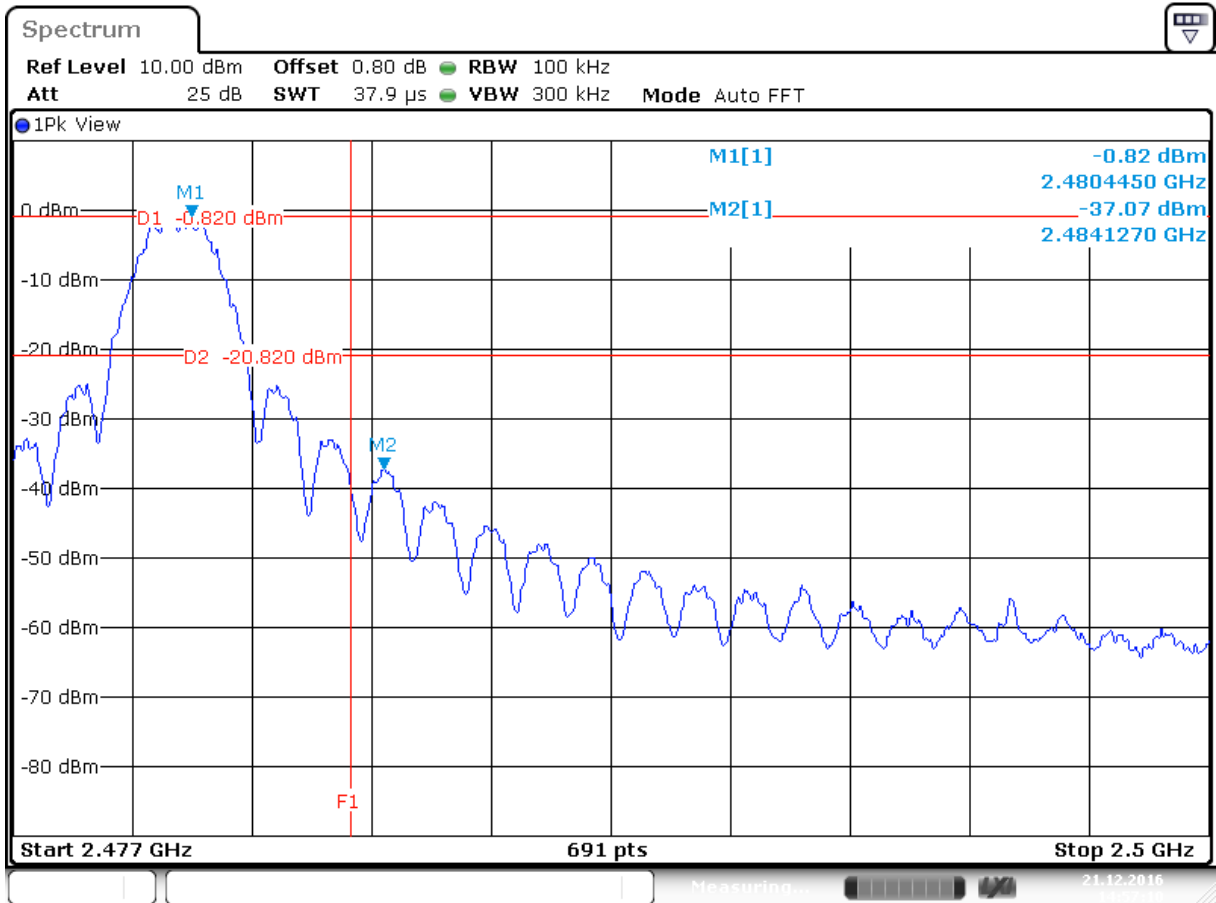
Results: All out of band spurious emissions are more than 20 dB below the fundamental. See the figures on the following pages.



Date: 21.DEC 2016 14:53:30

Plot: Band Edge Conducted Emission, Spectral Diagram, 2405 MHz

Plot showing more than 20 dB band edge attenuation.
 F1 shows the band edge frequency of 2400 MHz.



Date: 21.DEC.2016 14:57:10

Plot: Band Edge Conducted Emission, Spectral Diagram, 2480 MHz.
Plot showing more than 20 dB band edge attenuation.
F1 shows the band edge frequency of 2483.5 MHz.

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5.1.5 Radiated Spurious Emissions of Transmitter

RESULT: Pass

Date of testing: 2016-12-13 and 14

Frequency range: 30 MHz - 25GHz

Requirements:

FCC 15.209, FCC 15.247(d) and RSS-Gen

Radiated emissions which fall outside the operation frequency band and outside restricted bands shall either meet the limit specified in FCC 15.209(a) or be attenuated at least 20dB below the power level in the 100kHz bandwidth within the band that contains the highest level of the desired power (the less severe limit applies).

Radiated emissions which fall in the restricted bands, as defined in FCC 15.205(a) RSS-Gen Table 6, must comply with the radiated emission limits specified in FCC 15.209(a) and RSS-Gen Table 4.

Test procedure: ANSI C63.10-2013

The EUT was placed on the top of a rotating non-conductive table 1.5 meters above the ground in a semi-anechoic chamber. Before final measurements of radiated emissions were performed, the EUT was scanned to determine its emission spectrum profile. The physical arrangement of the test system and the associated cabling were varied in order to ensure that maximum emission amplitudes were attained. The spectrum was examined from 30MHz to the 10th harmonic of the highest fundamental transmitter frequency (25GHz). Final radiated emission measurements were made at 3m distance. At each frequency where a spurious emission was found, the EUT was rotated 360° and the antenna was raised and lowered from 1 to 4m in order to determine the emission's maximum level. Measurements were taken using both horizontal and vertical antenna polarizations.

The highest emission amplitudes relative to the appropriate limit were recorded in this report. Field strength values of radiated emissions at frequencies not listed in the tables are more than 20 dB below the applicable limit. The levels are expressed in dBm which are derived from $\text{dBm} = E(\text{dB}\mu\text{V}/\text{m}) - 95.2\text{dB}$. Where Peak (Pk) values were at least 6 dB under the Average (Av) limits, Av value was not tested. Where applicable Average values were obtained by using the duty cycle correction factor.

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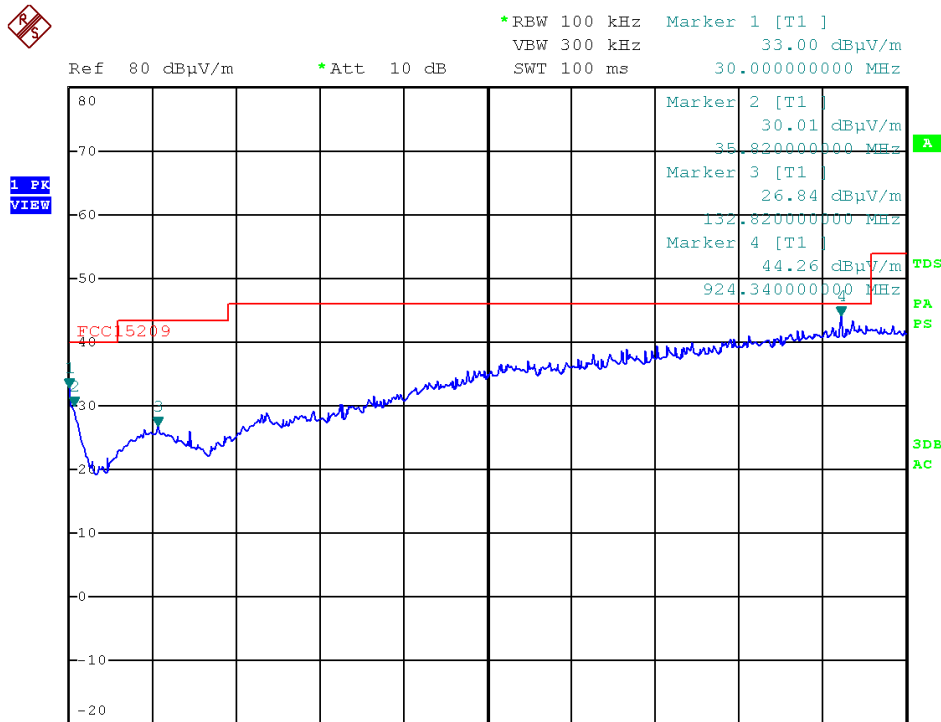
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Radiated Emissions, 30MHz - 1GHz, Horizontal and Vertical Antenna Orientations

Frequency [MHz]	EUT Orientation	Antenna Orientation	Level QP [dBµV/m]	Limit QP [dBµV/m]	Verdict [Pass/Fail]
30.00	Vertical	Vertical	25.0	40.0	Pass
35.82	Vertical	Vertical	22.0	40.0	Pass
132.82	Vertical	Horizontal	18.3	43.5	Pass
169.68	Vertical	Vertical	17.0	43.5	Pass
561.56	Vertical	Vertical	29.0	46.0	Pass
924.34 (noise)	Vertical	Vertical	34.9	46.0	Pass

- Notes:
- Level QP = Reading QP + Factor
 - Tested in modes as described in section 4.2, the 6 highest values noted. Preliminary measurements indicated that the radiated emissions from EUT were not affected by the EUT's operating frequency.
 - *^R refers to a frequency in a restricted band
 - Quasi Peak detector used with a bandwidth of 120 kHz.
 - Measurement uncertainty is +/- 5.22 dB.



ORI

Date: 13.DEC.2016 15:27:19

Plot of the emissions (Peak detector values shown)

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Radiated Emissions, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2405 MHz.

Frequency [MHz]	EUT Orientation	Antenna Orientation	Detector	Bandwidth (MHz)	Level [dBm]	Limit [dBm]	Result
1439.73 ^{*R}	Horizontal	Horizontal	Pk	1	-53.5	--41.2 (Av) -21.2 (Pk)	Pass
1440.30 ^{*R}	Vertical	Vertical	Pk	1	-56.2	--41.2 (Av) -21.2 (Pk)	Pass
2310-2390 ^{*R}	Vertical	Vertical	Pk	1	-56.6	-41.2 (Av) -21.2 (Pk)	Pass
4892.84	Vertical	Vertical	Pk	1	-50.6	-41.2 (Av) -21.2 (Pk)	Pass
6521.28	Vertical	Horizontal	Pk	1	-45.9	-41.2 (Av) -21.2 (Pk)	Pass
11525.51 ^{*R}	Vertical	Vertical	Pk	1	-41.1	-21.2 (Pk)	Pass
11525.51 ^{*R}	Vertical	Vertical	Av	Dcf=-38.7dB	-79.8	-41.2 (Av)	Pass
12217.96 ^{*R}	Vertical	Vertical	Pk	1	-42.9	-21.2 (Pk)	Pass
12217.96 ^{*R}	Vertical	Vertical	Av	Dcf=-38.7dB	-81.6	-41.2 (Av)	Pass
12972.60	Horizontal	Horizontal	Pk	1	-46.9	-21.2 (Pk)	Pass
16610.70	Horizontal	Horizontal	Pk	1	-43.3	-21.2 (Pk)	Pass
16610.70	Horizontal	Horizontal	Av	Dcf=-38.7dB	-82.0	-41.2 (Av)	Pass

Radiated Emissions, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2440 MHz.

Frequency [MHz]	EUT Orientation	Antenna Orientation	Detector	Bandwidth (MHz)	Level [dBm]	Limit [dBm]	Result
2310-2390 ^{*R}	Vertical	Horizontal	Pk	1	-57.2	-41.2 (Av) -21.2 (Pk)	Pass
2483.5-2500 ^{*R}	Vertical	Vertical	Pk	1	-49.0	-41.2 (Av) -21.2 (Pk)	Pass
6757.19	Vertical	Vertical	Pk	1	-46.3	-41.2 (Av) -21.2 (Pk)	Pass
6762.54	Vertical	Horizontal	Pk	1	-46.4	-41.2 (Av) -21.2 (Pk)	Pass
10605.57 ^{*R}	Vertical	Horizontal	Pk	1	-43.6	-21.2 (Pk)	Pass
10605.57 ^{*R}	Vertical	Horizontal	Av	Dcf=-38.7dB	-82.3	-41.2 (Av)	Pass
11393.22 ^{*R}	Vertical	Horizontal	Pk	1	-40.3	-21.2 (Pk)	Pass
11393.22 ^{*R}	Vertical	Horizontal	Av	Dcf=-38.7dB	-79.0	-41.2 (Av)	Pass
11489.19 ^{*R}	Vertical	Vertical	Pk	1	-41.2	-21.2 (Pk)	Pass
11489.19 ^{*R}	Vertical	Vertical	Av	Dcf=-38.7dB	-79.9	-41.2 (Av)	Pass
16651.14	Horizontal	Vertical	Pk	1	-43.3	-21.2 (Pk)	Pass
16651.14	Horizontal	Vertical	Av	Dcf=-38.7dB	-82.0	-41.2 (Av)	Pass
21223.00 ^{*R}	Horizontal	Horizontal	Pk	1	-44.3	-21.2 (Pk)	Pass
21223.00 ^{*R}	Horizontal	Horizontal	Av	Dcf=-38.7dB	-83.0	-41.2 (Av)	Pass

Test Report No.:

16071303.fcc01

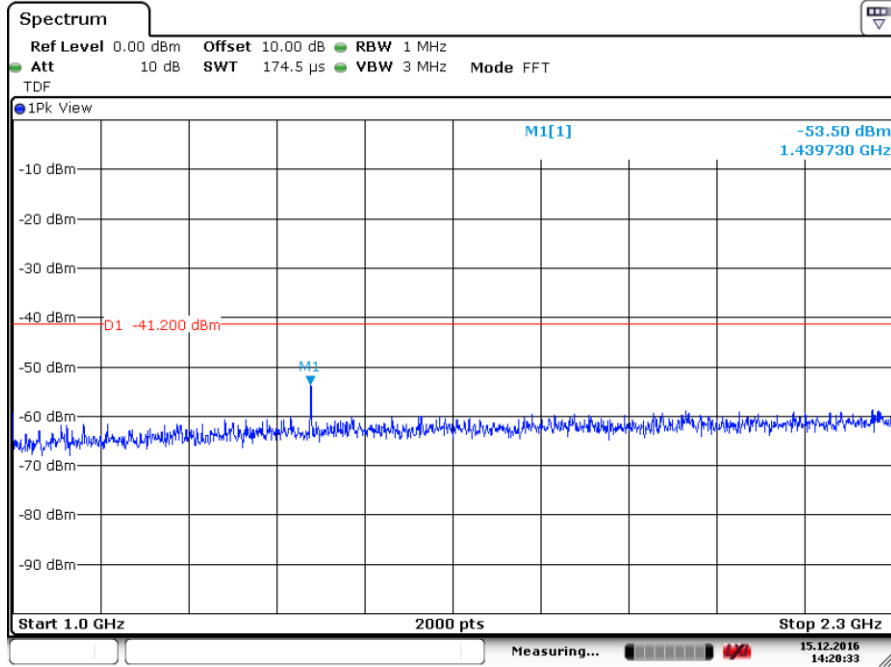
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Radiated Emissions, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2480 MHz.

Frequency [MHz]	EUT Orientation	Antenna Orientation	Detector	Bandwidth (MHz)	Level [dBm]	Limit [dBm]	Result
14397.82 ^{*R}	Horizontal	Horizontal	Pk	1	-51.5	-41.2 (Av) -21.2 (Pk)	Pass
2483.5-2500 ^{*R}	Vertical	Vertical	Pk	1	-56.9	-41.2 (Av) -21.2 (Pk)	Pass
6453.60	Vertical	Vertical	Pk	1	-45.6	-21.2 (Pk)	Pass
6453.60	Vertical	Vertical	Av	Dcf=-38.7dB	-84.3	-41.2 (Av)	Pass
9913.90	Vertical	Vertical	Pk	1	-44.9	-21.2 (Pk)	Pass
9913.90	Vertical	Vertical	Av	Dcf=-38.7dB	-83.6	-41.2 (Av)	Pass
11176.81	Vertical	Horizontal	Pk	1	-42.0	-21.2 (Pk)	Pass
11176.81	Vertical	Horizontal	Av	Dcf=-38.7dB	-80.7	-41.2 (Av)	Pass
11541.19	Vertical	Vertical	Pk	1	-39.4	-21.2 (Pk)	Pass
11541.19	Vertical	Vertical	Av	Dcf=-38.7dB	-78.1	-41.2 (Av)	Pass
11607.34	Vertical	Horizontal	Pk	1	-41.7	-21.2 (Pk)	Pass
11607.34	Vertical	Horizontal	Av	Dcf=-38.7dB	-80.4	-41.2 (Av)	Pass
13761.00	Vertical	Vertical	Pk	1	-43.8	-21.2 (Pk)	Pass
13761.00	Vertical	Vertical	Av	Dcf=-38.7dB	-82.5	-41.2 (Av)	Pass
16836.80	Vertical	Vertical	Pk	1	-42.8	-21.2 (Pk)	Pass
16836.80	Vertical	Vertical	Av	Dcf=-38.7dB	-81.5	-41.2 (Av)	Pass
17800.00	Vertical	Vertical	Pk	1	-35.6	-21.2 (Pk)	Pass
17800.00	Vertical	Vertical	Av	Dcf=-38.7dB	-74.3	-41.2 (Av)	Pass
21361.00	Vertical	Vertical	Pk	1	-44.0	-21.2 (Pk)	Pass
21361.00	Vertical	Vertical	Av	Dcf=-38.7dB	-82.7	-41.2 (Av)	Pass
22051.00	Vertical	Horizontal	Pk	1	-45.3	-21.2 (Pk)	Pass
22051.00	Vertical	Horizontal	Av	Dcf=-38.7dB	-84.0	-41.2 (Av)	Pass

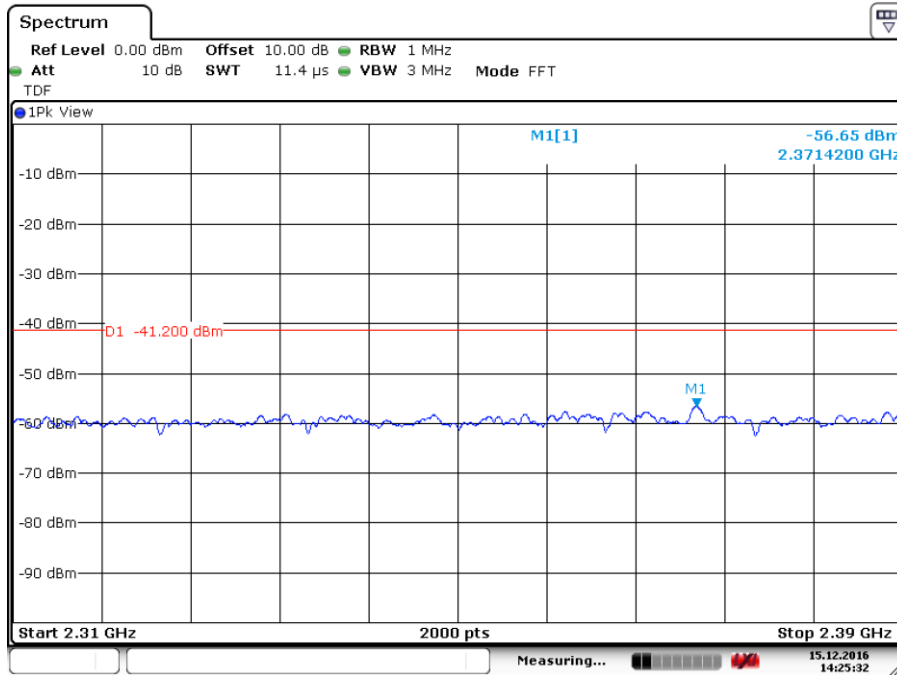
- Notes:
- *R refers to a frequency in a restricted band,
 - *H refers to a frequency which is a harmonic of the fundamental.
 - Measurement uncertainty is +/- 5.5 dB.
 - Dcf= -38.7 dB refers to a duty cycle correction factor that is used to convert Pk value to Av value, see section 6 for details.
 - a selection of plots is provided on the next pages

Plots of the radiated emissions



Date: 15.DEC.2016 14:20:33

Plot of the emissions at 2405 MHz, Horizontal polarization, Peak values shown



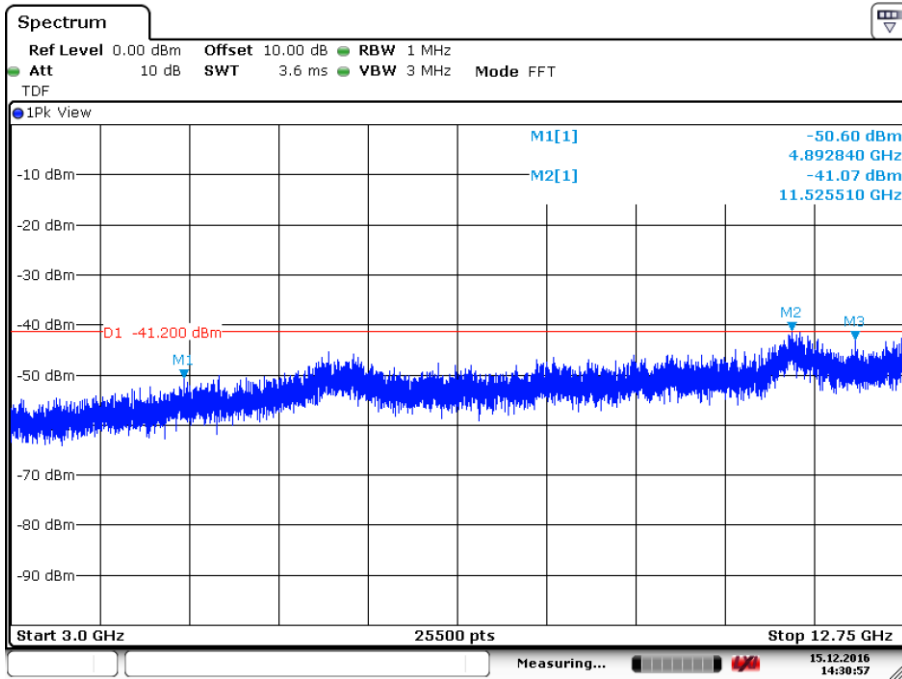
Date: 15.DEC.2016 14:25:32

Plot of the emissions in the restricted band 2.31 -2.39GHz at 2405 MHz, Vertical polarization, Peak values shown

Test Report No.:

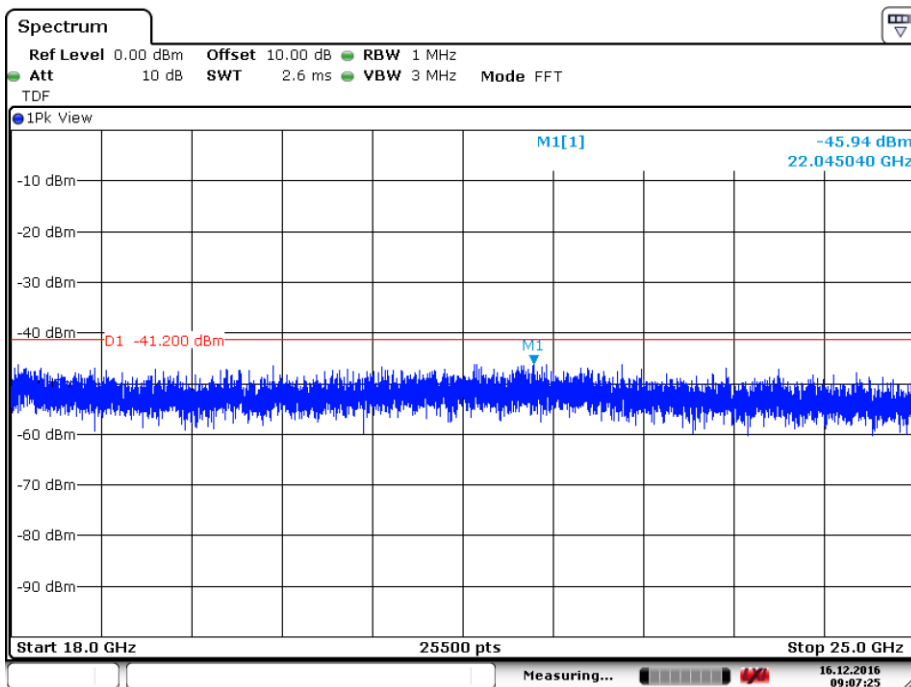
16071303.fcc01

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Date: 15.DEC.2016 14:30:57

Plot of the emissions at 2405 MHz, Vertical polarization, Peak values shown



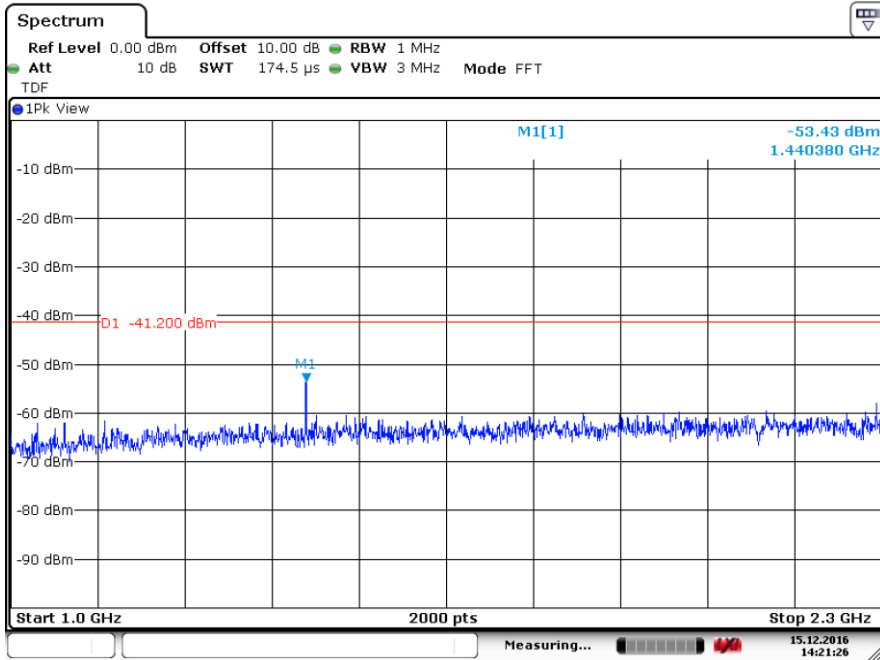
Date: 16.DEC.2016 09:07:25

Plot of the emissions at 2405 MHz, Vertical polarization, Peak values shown

Test Report No.:

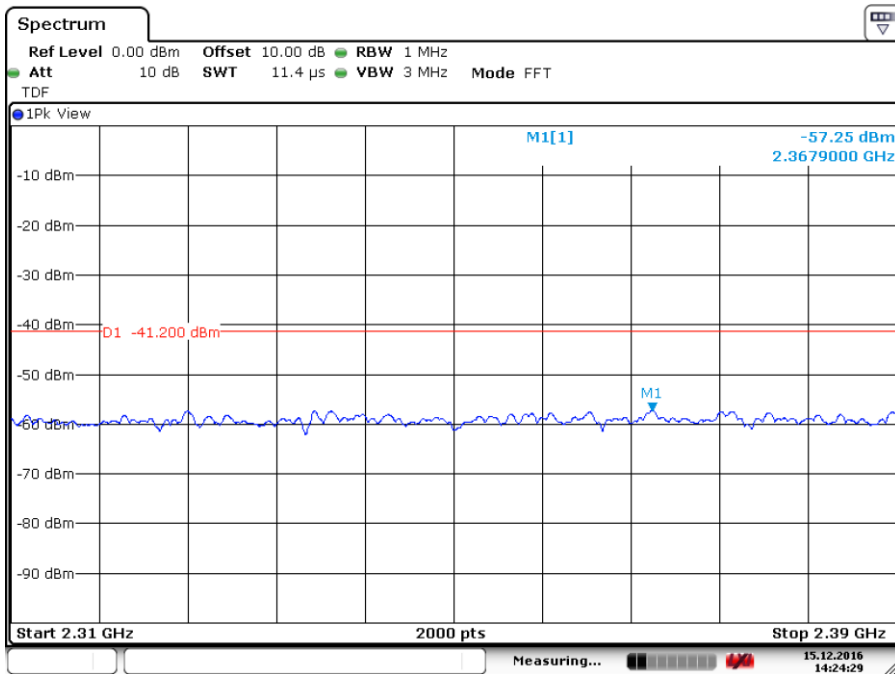
16071303.fcc01

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Date: 15.DEC.2016 14:21:26

Plot of the emissions at 2440 MHz, Horizontal polarization, Peak values shown



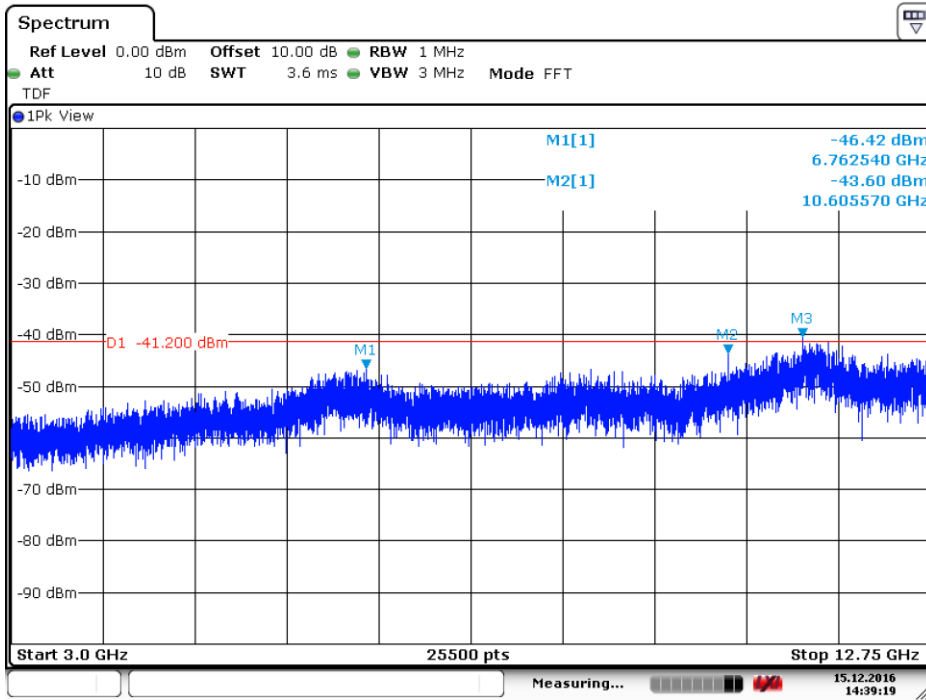
Date: 15.DEC.2016 14:24:29

Plot of the emissions in the restricted band 2.31 -2.39GHz at 2440 MHz, Horizontal polarization, Peak values shown

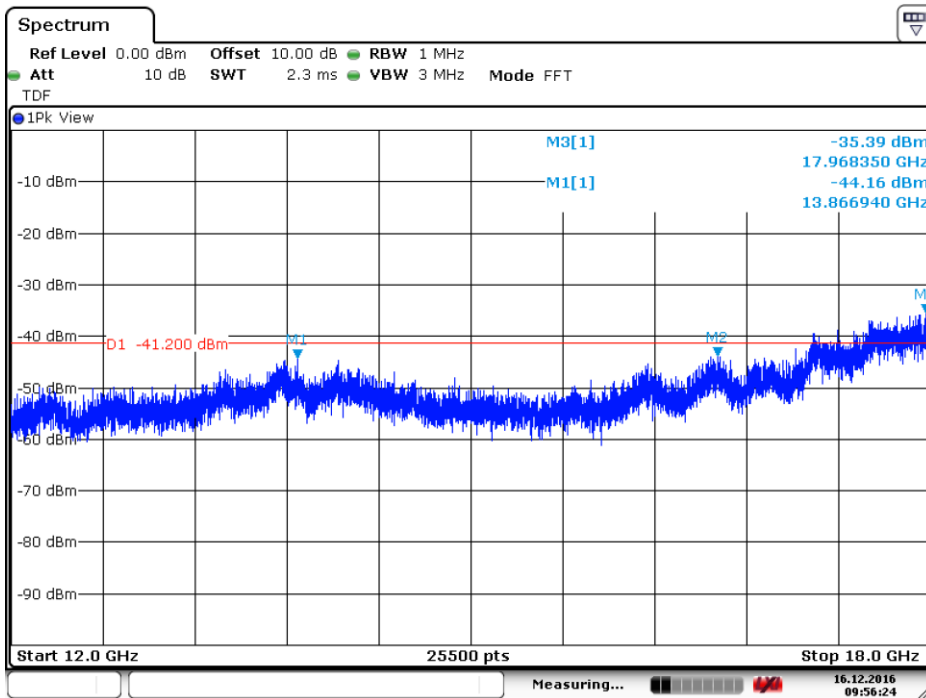
Test Report No.:

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Plot of the emissions at 2440 MHz, Horizontal polarization, Peak values shown

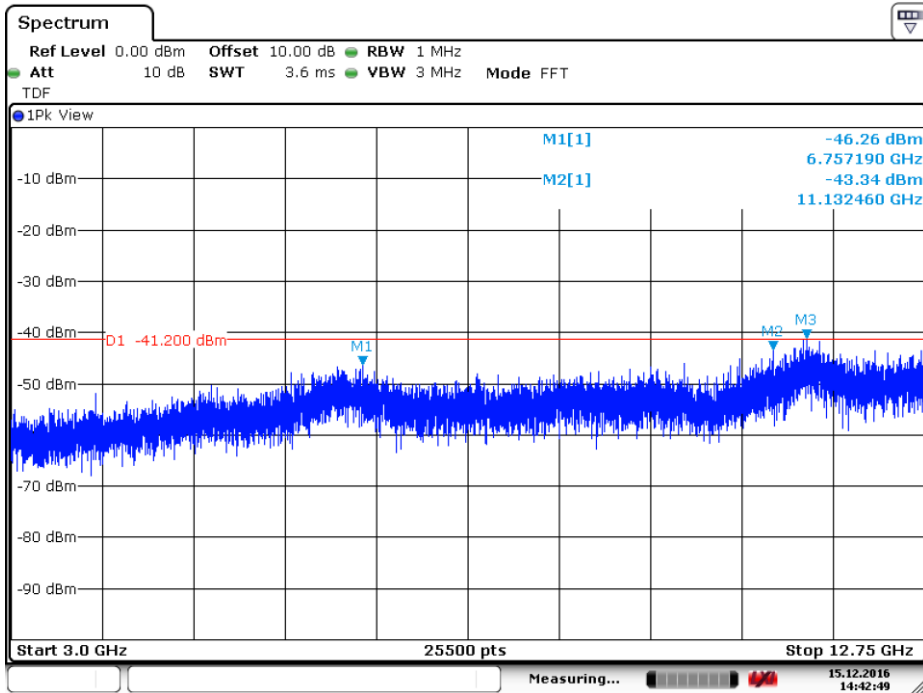


Plot of the emissions at 2440 MHz, Horizontal polarization, Peak values shown

Test Report No.:

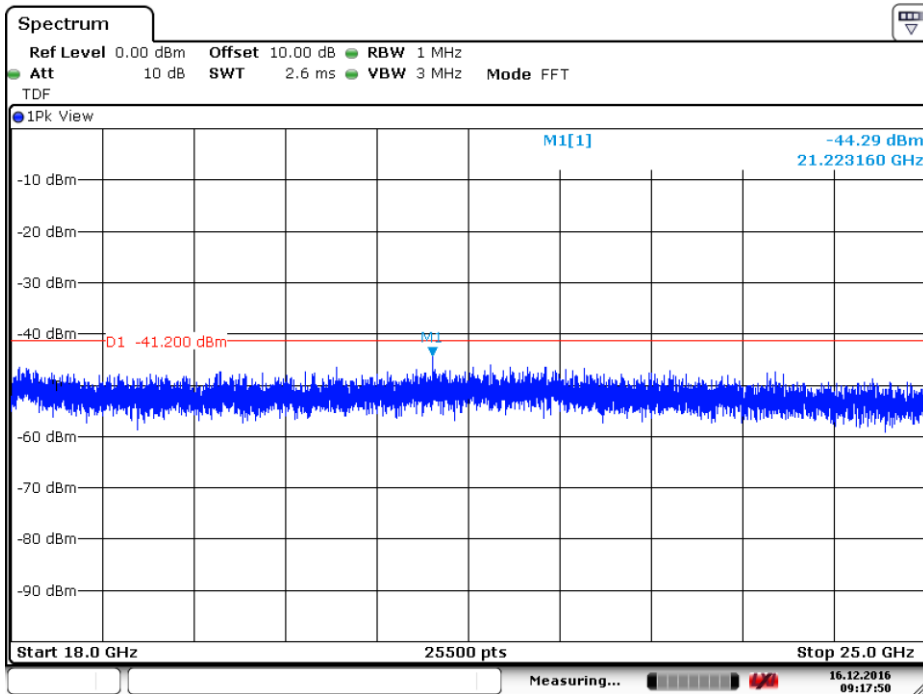
16071303.fcc01

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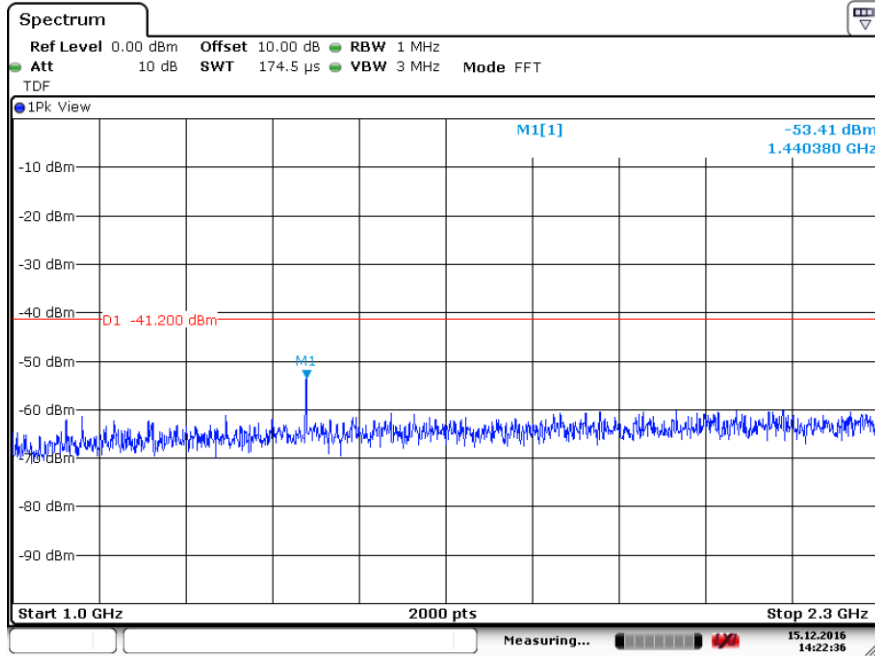
Date: 15.DEC.2016 14:42:49

Plot of the emissions at 2440 MHz, Vertical polarization, Peak values shown



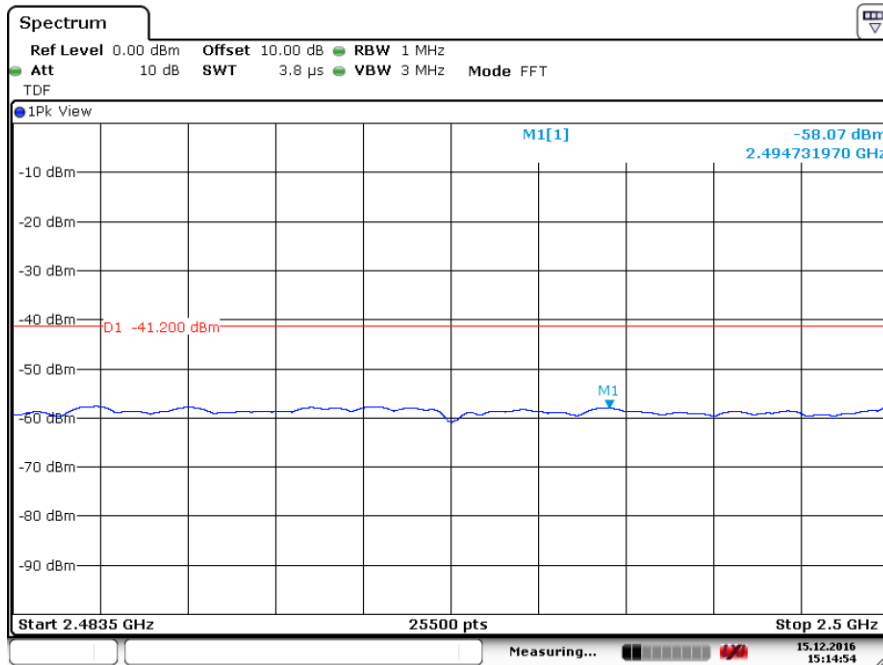
Date: 16.DEC.2016 09:17:50

Plot of the emissions at 2440 MHz, Horizontal polarization, Peak values shown



Date: 15.DEC.2016 14:22:36

Plot Radiated unwanted emissions in the range 1 – 2.35 GHz at 2480MHz
(Peak values, Antenna horizontal position shown).



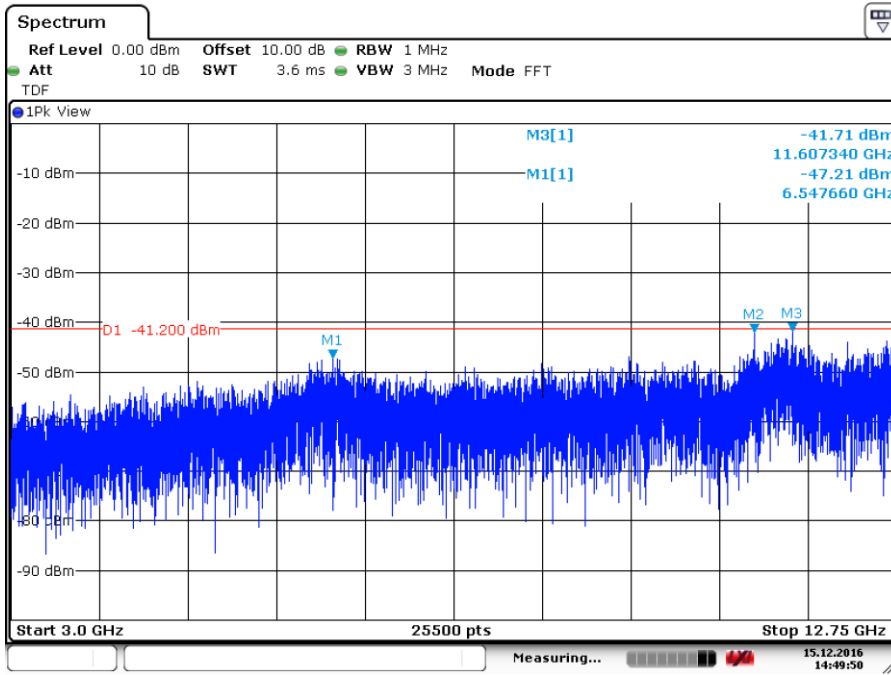
Date: 15.DEC.2016 15:14:54

Plot Radiated unwanted emissions in the range 2.4835 – 2.5 GHz at 2480MHz
(Peak values, Antenna Vertical position shown).

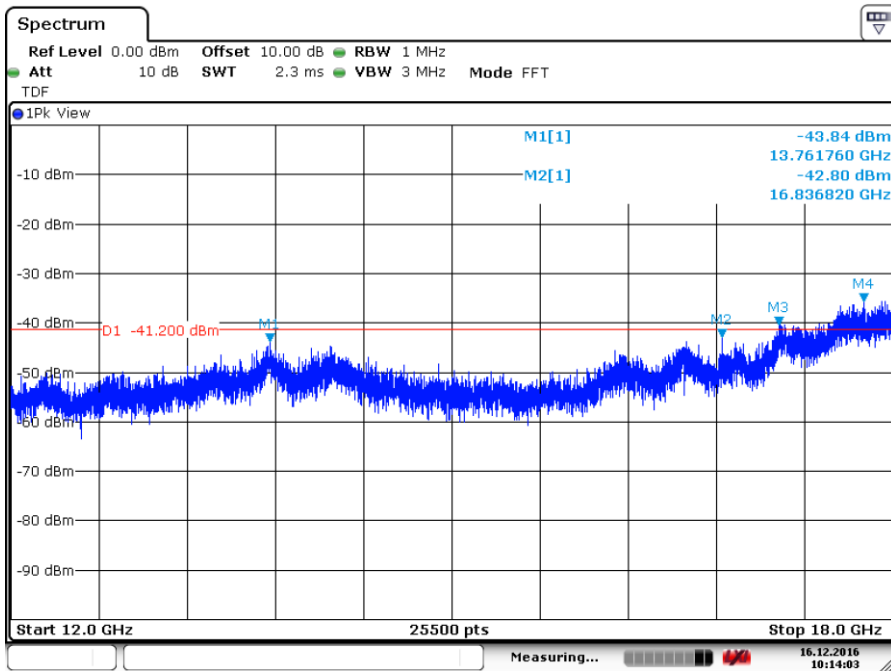
Test Report No.:

16071303.fcc01

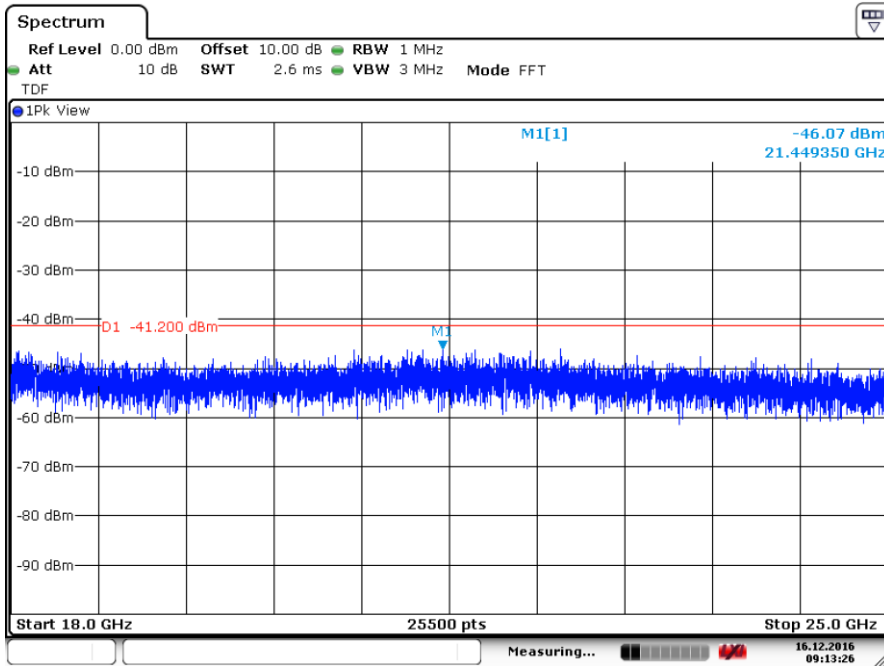
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Plot Radiated unwanted emissions in the range 3 – 12 GHz at 2480MHz (Peak values, Antenna Horizontal position shown).

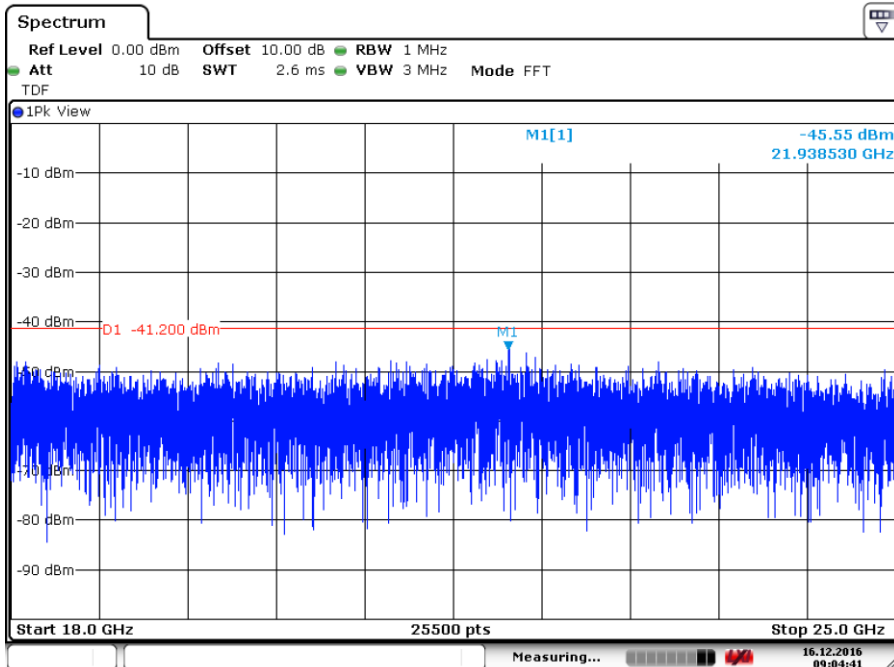


Plot Radiated unwanted emissions in the range 12 – 18 GHz at 2480MHz (Peak values, Antenna Vertical position shown).



Date: 16.DEC.2016 09:13:26

Plot Radiated unwanted emissions in the range 18 – 25 GHz at 2480MHz (Peak values, Antenna Horizontal position shown).



Date: 16.DEC.2016 09:04:41

Plot Radiated unwanted emissions in the range 18 – 25 GHz at 2480MHz (Peak values, Antenna Vertical position shown).

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5.2 AC Power Line Conducted Measurements

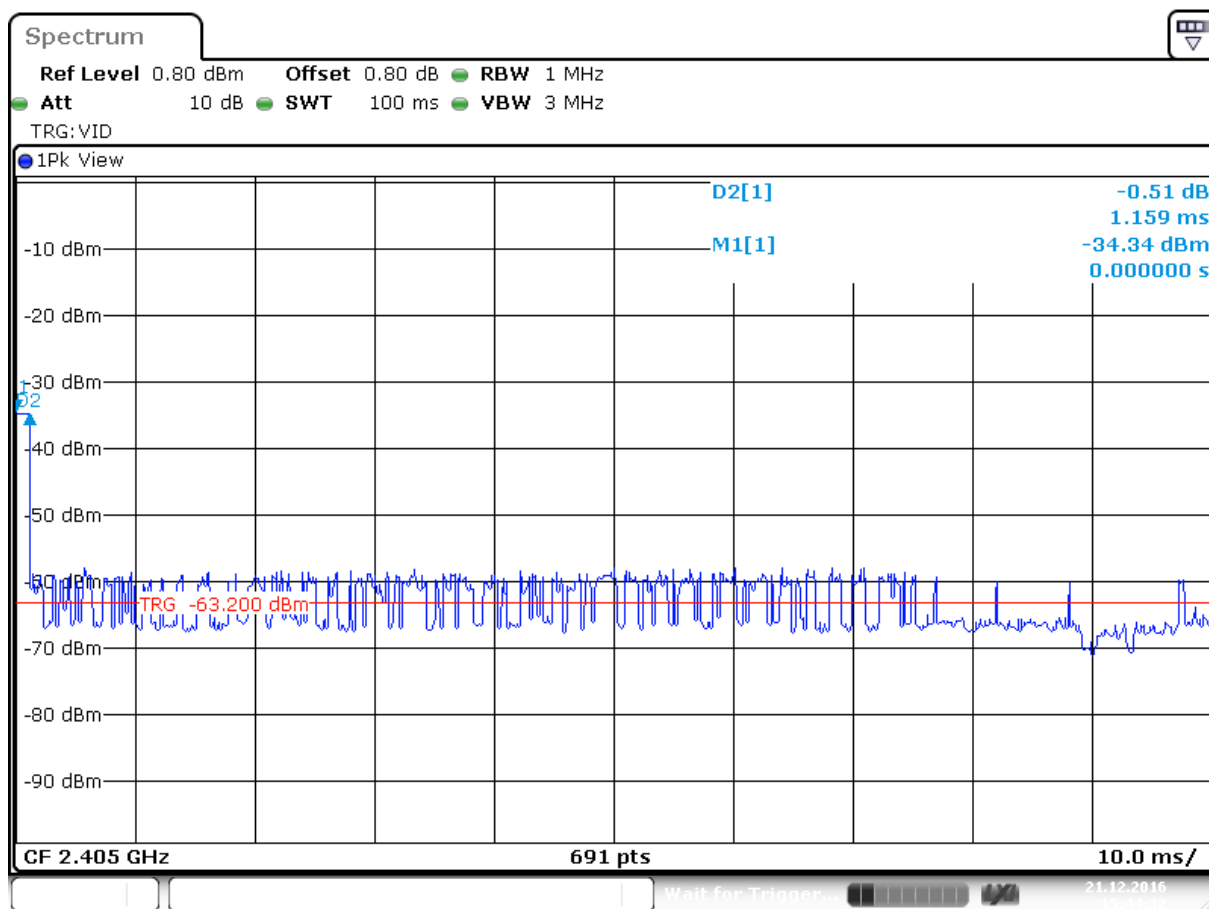
RESULT: Not Applicable.

EUT is battery (non-rechargeable) operated only.

6 Duty cycle correction

The Dwell Time of the EUT, see plot below, is less than 100 ms and the measured value with Average detector may be adjusted with a "duty cycle correction factor", derived from $20 \log(\text{dwell time}/100\text{ms})$. In this case:

$$\text{Duty Cycle Correction factor} = 20 \log(1.159\text{ms}/100\text{ms}) = -38.7 \text{ dB.}$$



Date: 21.DEC.2016 15:44:33

Plot Dwell time of the emissions in a 100ms period

Note: Tested on Serial number: EA01 0002 (programmed for normal operation)

< End of report >