

Test Report No.:		18100501.r01	<i>Page 1 of 44</i>														
<i>Client:</i>	Inofab Saglik Teknolojileri AS ODTU Teknokent Silikon Blok 15A, Cankaya / Ankara ODTU kampusu - Turkey Mr. Kerem Yasar																
<i>Test Item:</i>	Spirohome Personal																
<i>Identification:</i>	Spirohome Personal	<i>Serial Number:</i>	0120900014 (conducted tests) and S011800135 and S011800137 (radiated tests)														
<i>Project No.:</i>	18100501	<i>Date of Receipt:</i>	October 01, 2018														
<i>Testing Location:</i>	TÜV Rheinland Nederland B.V. Eiberkamp 10 9351 VT Leek																
<i>Test Specification:</i>	FCC 47 CFR Part 15, Subpart C, Section 15.247 (10-1-17 Edition) ANSI C63.10-2013 KDB 558074 D0115.247 Mas Guidance v05, August 24, 2018																
<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>R. van der Meer</i> R. van der Meer																
2019-08-02	R. van der Meer / Inspector	2019-08-02	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> <table> <tr> <td>P(ass)</td> <td>=</td> <td><i>passed</i></td> </tr> <tr> <td>Fail)</td> <td>=</td> <td><i>failed</i></td> </tr> <tr> <td>N/A</td> <td>=</td> <td><i>not applicable</i></td> </tr> <tr> <td>N/T</td> <td>=</td> <td><i>not tested</i></td> </tr> </table>						P(ass)	=	<i>passed</i>	Fail)	=	<i>failed</i>	N/A	=	<i>not applicable</i>	N/T	=	<i>not tested</i>
P(ass)	=	<i>passed</i>															
Fail)	=	<i>failed</i>															
N/A	=	<i>not applicable</i>															
N/T	=	<i>not tested</i>															
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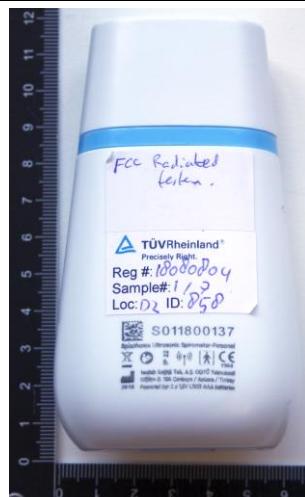
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Top view radiated sample



Rear view radiated sample

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TEST SUMMARY

Test Specification Clause	Test Case	Pass	Fail	Not applicable	Not performed
§15.247(a2)	Spectrum Bandwidth of a DSSS System / 6dB BW	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§ 15.247 (b) (3)	Maximum output power (conducted)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (e)	Peak power spectral density	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (d)	Band-edge compliance of conducted emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.205	Band-edge compliance of radiated emissions	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§15.247 (d)	Spurious Emission - conducted (Transmitter)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§ 15.209	Spurious Emission - radiated (Transmitter)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
§ 15.207	AC Power Line Conducted Emissions <30 MHz	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Revisions Revisions

Revision Revision	Datum Date	Anmerkung Remark	Verfasser Author
-	18.10.2018	First release	R. van der Meer
01	13.11.2018	Added FCC ID, corrected modelname	R. van der Meer
02	12.04.2019	Removed pcb photos	R. van der Meer
03	02.08.2019	Added Band Edge Radiated plots	R. van der Meer

Note: Latest revision report will replace all previous reports

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1 General Remarks

1.1 Complementary Materials

None.

1.2 Special Accessories

None.

1.3 Equipment modifications

None

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2 Test Sites

2.1 Test Facilities

The Semi-Anechoic chamber and AC Line Conducted measurement facility used to collect the radiated and conducted data has been constructed in accordance with ANSI C63.7. The site has been measured in accordance with and verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2014, at a test distance of 3 meters. The site is listed with the FCC and ISED and accredited by RVA (Cert #L484). The 3 meter semi-anechoic chamber used to collect the radiated data has been verified to comply with the theoretical normalized site attenuation requirements of ANSI C63.4-2014, at a test distance of 3 meter

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 786213. 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 (*) : +15°C to +35°C
Relative humidity(*) : 20 % to 75 %
Supply voltage : 3 Vdc.

(*)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	06/2018	06/2019
Spectrum Analyzer	Rohde & Schwarz	FSV	A01744	07/2018	07/2020
3 Vdc Power Supply	Voltcraft	PS 303 Pro	A00264	12/2017	12/2018
RF Cable	Property applicant	--	--	N/A	N/A
For Radiated Emissions					
Measurement Receiver	Rohde & Schwarz	ESCI	A00314	03/2018	03/2019
RF Cable S-AR	Gigalink	APG0500	A00447	01/2018	01/2019
Controller	Maturo	SCU/088/8090811	A00450	N/A	N/A
Controller	EMCS	DOC202	A00257	N/A	N/A
Test facility	Comtest	FCC listed: 786213 IC: 2932G-2	A00235	10/2017	10/2020
Spectrum Analyzer	Rohde & Schwarz	FSV	A00377	07/2018	07/2019
Antenna mast	EMCS	AP-4702C	A00258	N/A	N/A
Temperature-Humiditymeter	Extech	SD500	A00444	06/2018	06/2019
Guidehorn 1-18 GHz	EMCO	3115	A00008	12/2017	12/2020
Guidehorn 18-26.5 GHz	EMCO	RA42-K-F-4B-C	A00209	01/2018	01/2021
RF amplifier 18-26.5 GHz	EMCS	-	A00378	N/A	N/A
Biconilog Testantenna	Teseq	CBL 6111D	A00466	10/2017	10/2018
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	03/2018	03/2019

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 Accreditation

The reported tests were performed under ISO17025 accreditation, unless otherwise specified as 'not under Accreditation'.

An overview of all TÜV Rheinland Nederland B.V. accreditations, notifications and designations, please visit our website www.tuv.com/nl. You can find the relevant declarations under the download link.

2.4 Measurement Uncertainty

Table 2: Emission Measurement Uncertainty

Measurement Type	Frequency	Uncertainty
Antenna Port Conducted Emission	< 1.3GHz	1.7dB
	1.3 - 40GHz	2.9 – 3.4dB
Radiated Emission	150kHz - 30MHz	±5.0dB
	30MHz - 1GHz	±5.1dB
	> 1GHz	±5.1dB

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3 General Product Information

The EUT is control device with Bluetooth Low Energy 4.0 specification. Through the EUT a wireless datalink is established in order to communicate information. The EUT has the capability of operating in the 2.4 GHz frequency band. The EUT's antenna has a gain of +5 dBi.

Table 3: Interfaces present on the EUT

There are no interface ports present on the EUT.

3.1 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 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 and KDB 558074 D0115.247 Mas Guidance v05, August 24, 2018.

For details, see under each test item.

4.2 Operation Modes

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

Operation Mode	EUT Status	Frequency (MHz)
Transmit Modulated (Tx)	On	2402
Transmit Modulated (Tx)	On	2440
Transmit Modulated (Tx)	On	2480
Normal mode (BLE)	On	2402 -2480

These operation modes were selected after review of the capabilities and characteristics of the EUT. For antenna port conducted tests the EUT (SN: 0120900014) has a switch on the pcb which by each press cycles through test modes and select the desired mode or frequency. For radiated tests in Normal Mode an EUT (SN: S011800135) and AUX1 was provided to be able to operate in Normal Mode. For radiated tests on a single frequency an EUT(SN: S011800137) was provided which by means of the front panel switch by each press could cycle to the desired test frequency.

A continuously transmit at a specified output power and channel was programmed in the firmware of the EUT.

Firmware version and power setting as provided by the applicant:

Spirohome Firmware version: 3.4.2

Spirohome DTM (direct test mode) Firmware: 1.2.0 (for conducted tests)

Power setting: 0 dBm

4.3 Physical Configuration for Testing

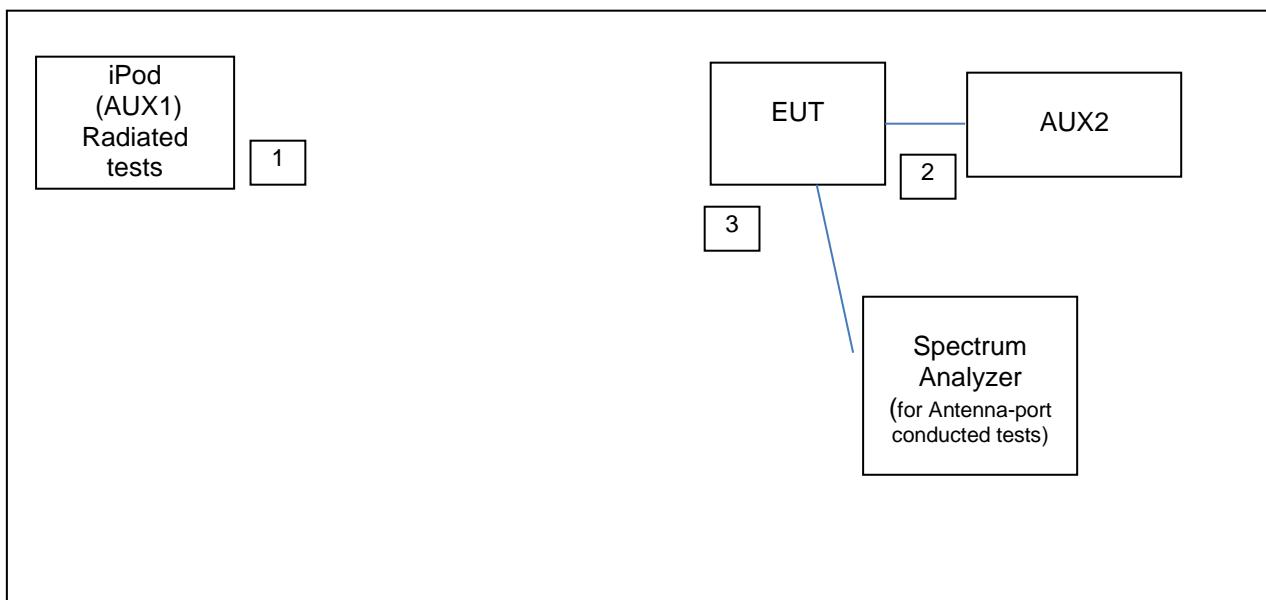
The EUT was tested on a stand-alone basis.

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.

Test setup photographs are provided in the separate document:

18100501.p01_Inofab_Spirohome Clinic_Photo Report_Testsetup.pdf.

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



No.	Port	From	To	Remarks
1.	BLE connection	AUX1	EUT	Radiated tests
2.	3 Vdc	AUX2	EUT	Conducted tests
3.	Antenna port	EUT	Spectrum analyzer	Conducted tests

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5 Test Software

No test software used.

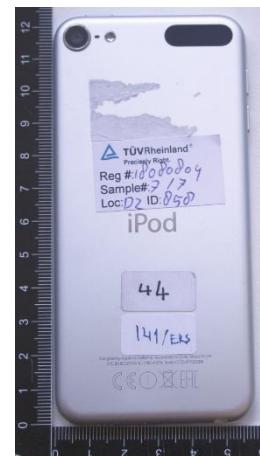
5.1 Special Accessories and Auxiliary Equipment

The product has been tested together with the following additional accessories:

The auxiliary items were not used during testing, but instead are only used to make the required settings for testing. For setting the transmit frequency, enable modulation etc.

1. AUX1

Product: programmer for radiated tests
Brand: Apple
Model: Ipod
Serial Number: CCQV97Y2GGNK
Remark: for making test settings, property applicant



2. AUX2

Product: Power Supply
Brand: Voltcraft
Model: PS 303 Pro
Output voltage: 3 Vdc
Remark: used only for conducted tests to energize EUT

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6 Test Results

6.1 DTS Bandwidth

RESULT: PASS

Date of testing: 2018-10-10

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.

Test procedure DTS 6dB bandwidth:

ANSI C63.10-2013 section 11.8.1 Option 1

A spectrum analyzer was connected to the antenna port of the EUT. The spectrum analyzer resolution bandwidth was set to 100kHz, video bandwidth to 300kHz and the span wide enough to capture the modulated carrier.

Plots A1,B1 and C1 shown on the next pages are of the 6 dB bandwidth.

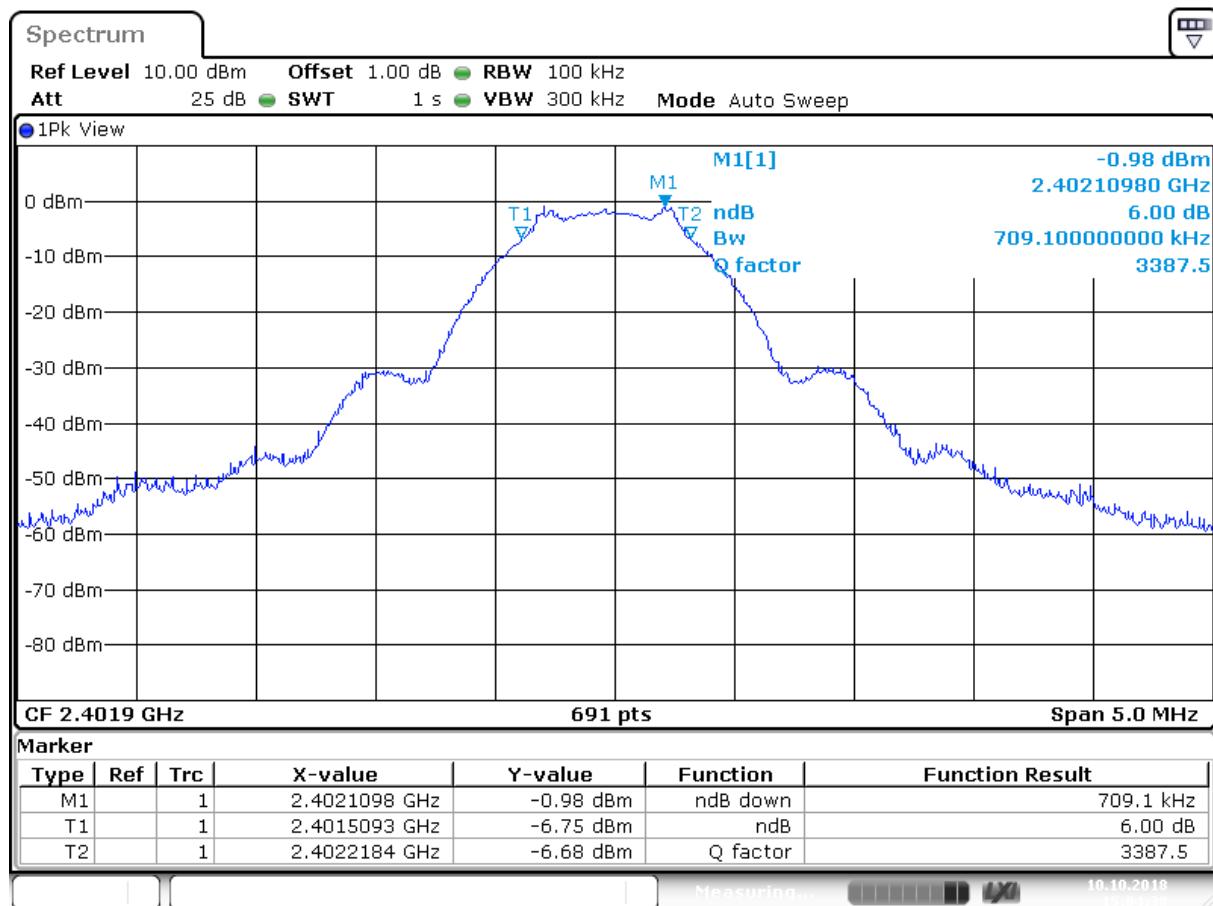
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DTS Bandwidth

Operating Frequency [MHz]	DTS 6dB Bandwidth [kHz]	Limit 6 dB BW [kHz]	Verdict [Pass/Fail]	Plot number
2402	709.1	>500	Pass	A1/A2
2440	709.1	>500	Pass	B1/B2
2480	738.1	>500	Pass	C1/C2



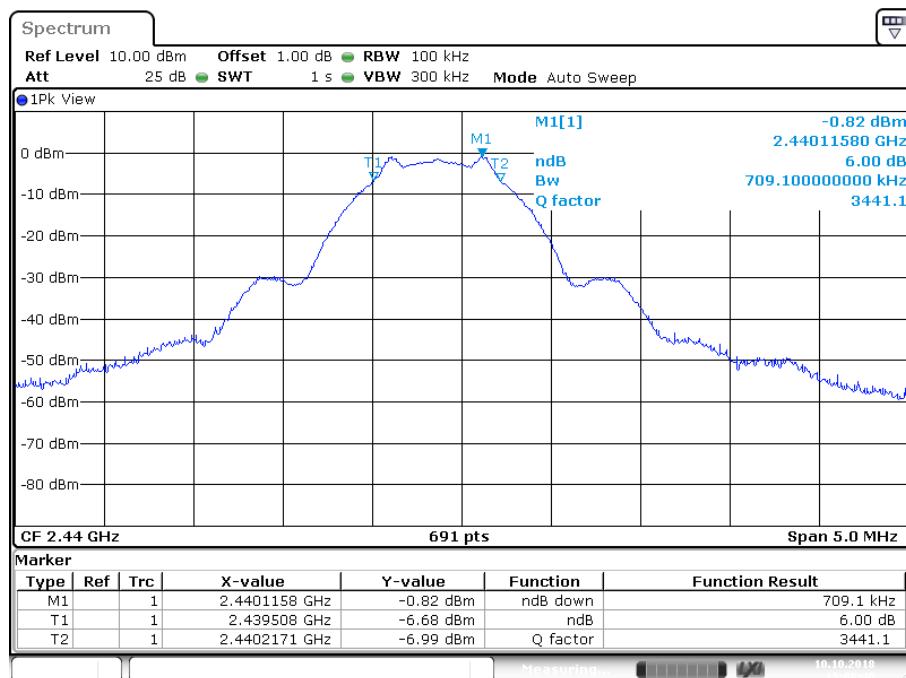
Date: 10.OCT.2018 15:04:38

Plot A1

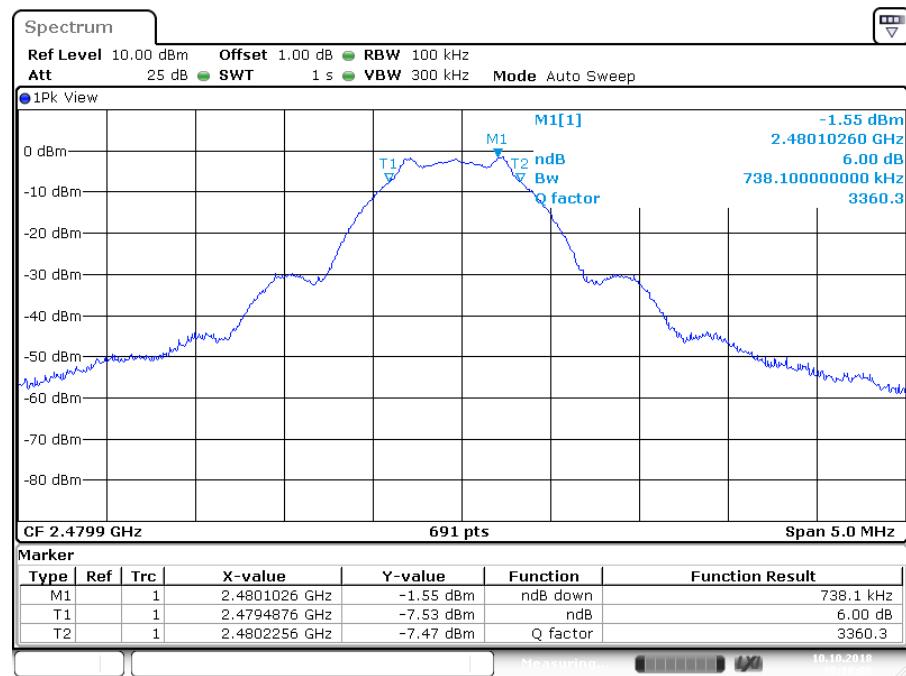
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Date: 10.OCT.2018 15:08:41

Plot B1

Date: 10.OCT.2018 15:10:09

Plot C1

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6.2 Maximum peak conducted output power

RESULT: PASS

Date of testing: 2018-10-11

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).

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 +/- 2.9 dB.

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

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

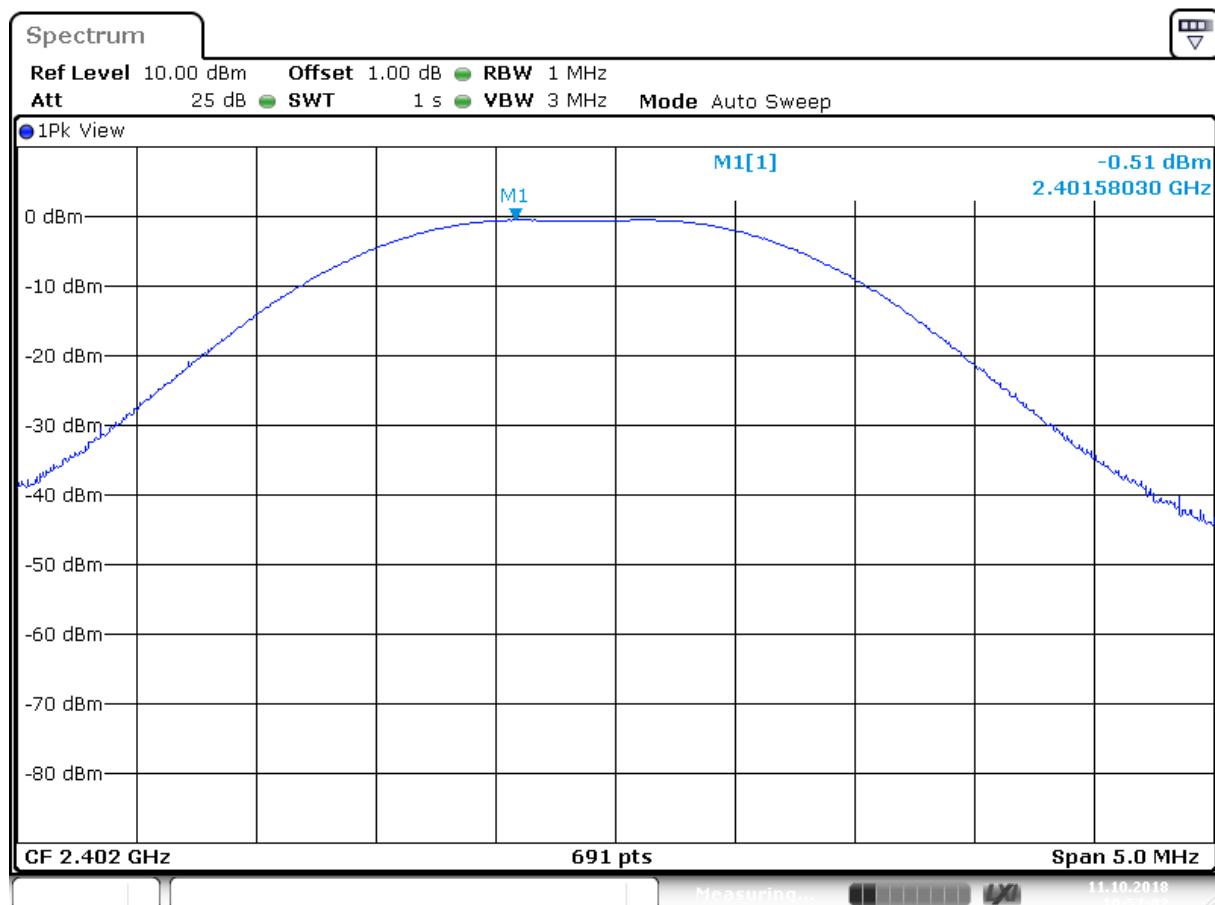
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Maximum Peak Conducted Output Power

Frequency [MHz]	Output Power [W]	Limit [Watt]	Verdict [Pass/Fail]	Antenna Gain (dBi)	EIRP (dBm)	EIRP (W)	Plot number
2402	(-0.51 dBm) 0.00089 W	1	Pass	+5.0	+4.49	0.0028	A
2440	(-0.66 dBm) 0.00086 W	1	Pass	+5.0	+4.34	0.0027	B
2480	(-1.16dBm) 0.00077 W	1	Pass	+5.0	+3.84	0.0024	C



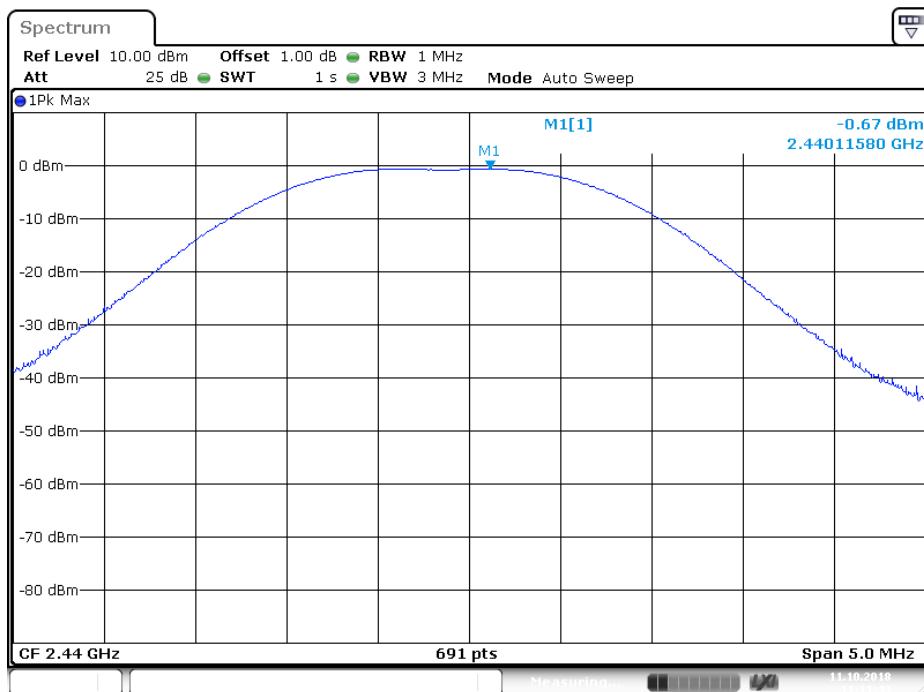
Date: 11.OCT.2018 10:57:02

Plot A

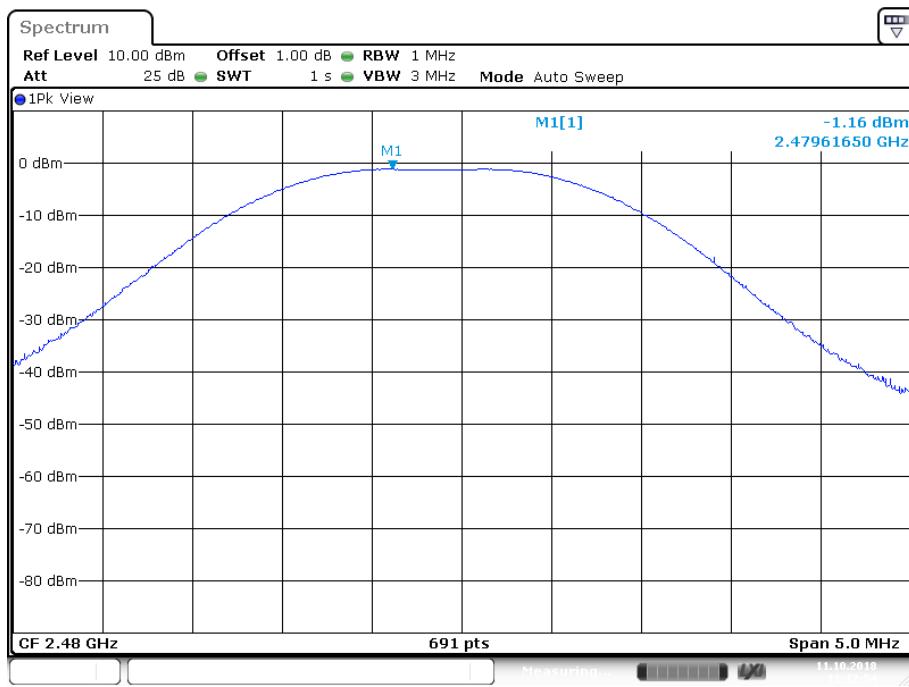
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Date: 11.OCT.2018 11:11:43

Plot B


Date: 11.OCT.2018 11:12:54

Plot C

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6.3 Peak Power Spectral Density

RESULT: PASS

Date of testing: 2018-10-11

Requirements:

FCC 15.247(e)

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 (1.0 dB).

Measurement uncertainty is +/- 2.9 dB.

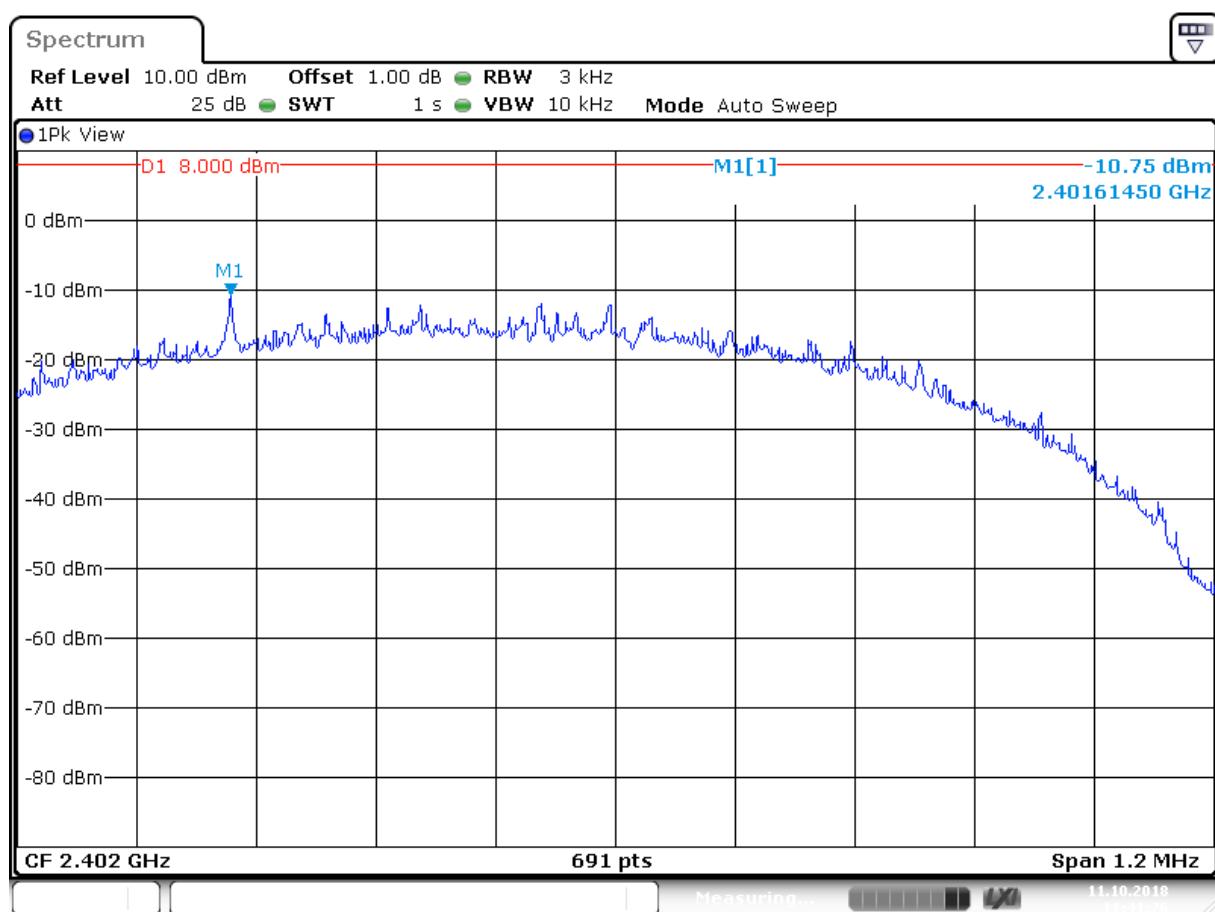
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Peak Power Spectral Density

Operating Frequency [MHz]	Max PSD [dBm]	Limit [dBm]	Verdict [Pass/Fail]	Plot
2402	-10.7	8	Pass	A
2440	-10.9	8	Pass	B
2480	-11.0	8	Pass	C



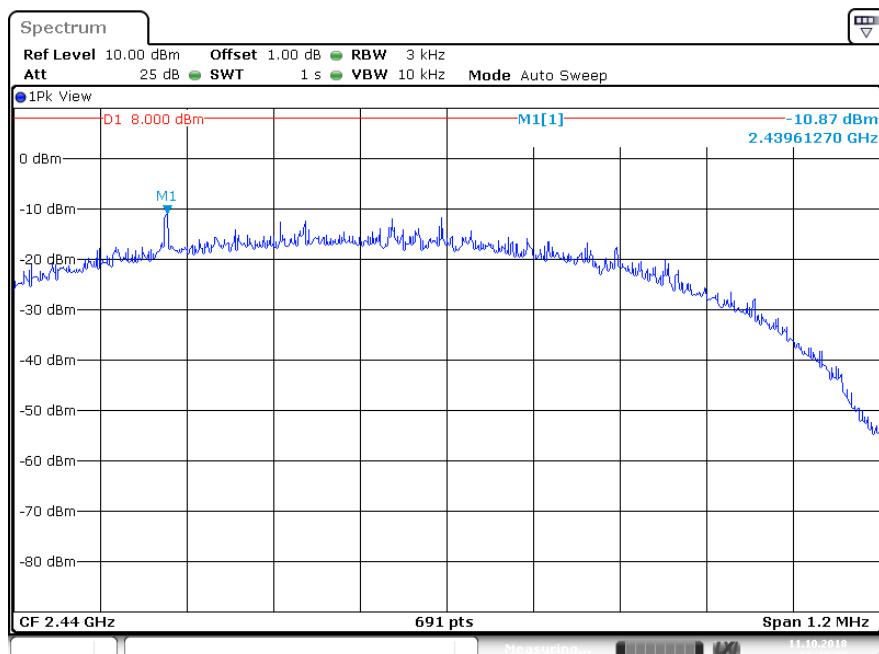
Date: 11.OCT.2018 11:41:26

Plot A

Test Report No.:

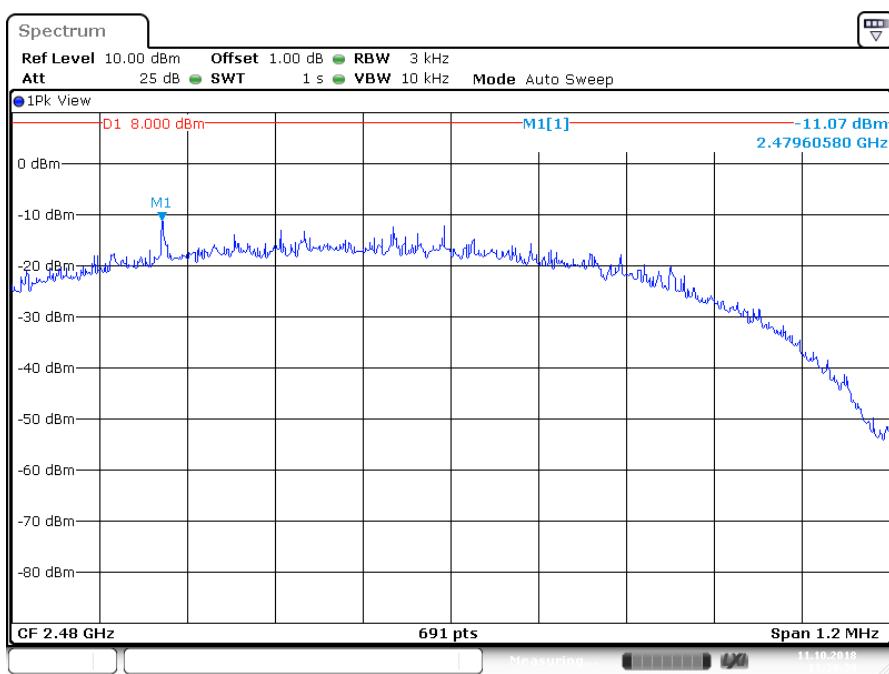
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Date: 11.OCT.2018 11:42:33

Plot B



Date: 11.OCT.2018 11:39:39

Plot C

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6.4 Out of band emissions

RESULT: Pass

Date of testing: 2018-10-11

Requirements:

FCC 15.205, FCC 15.209, FCC 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.

Test procedure:

ANSI C63.10-2013

KDB 558074 D0115.247 Mas Guidance v05, August 24, 2018

Section 11.11 for measurements in non-restricted bands and 11.13 for band-edge measurements

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.

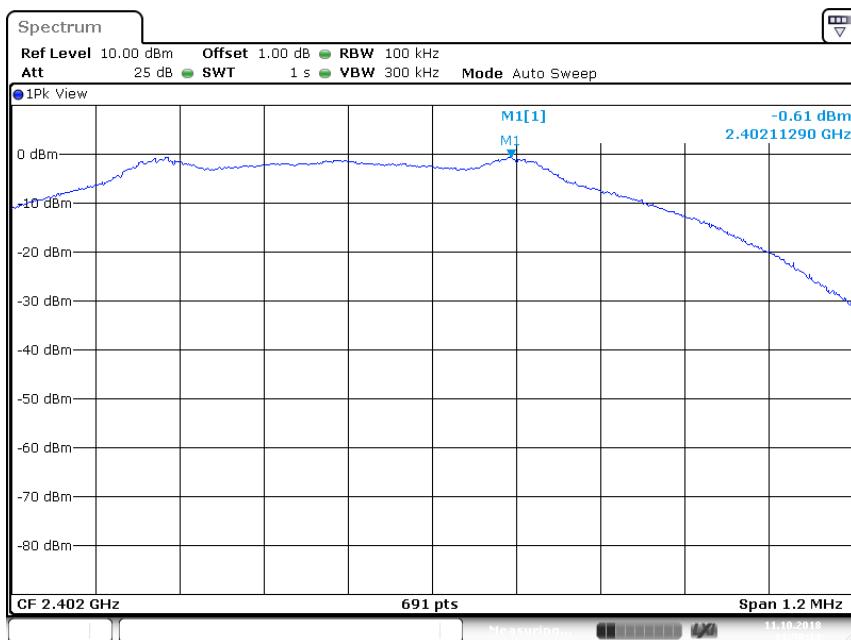
Measurement uncertainty is +/- 2.9 dB.

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

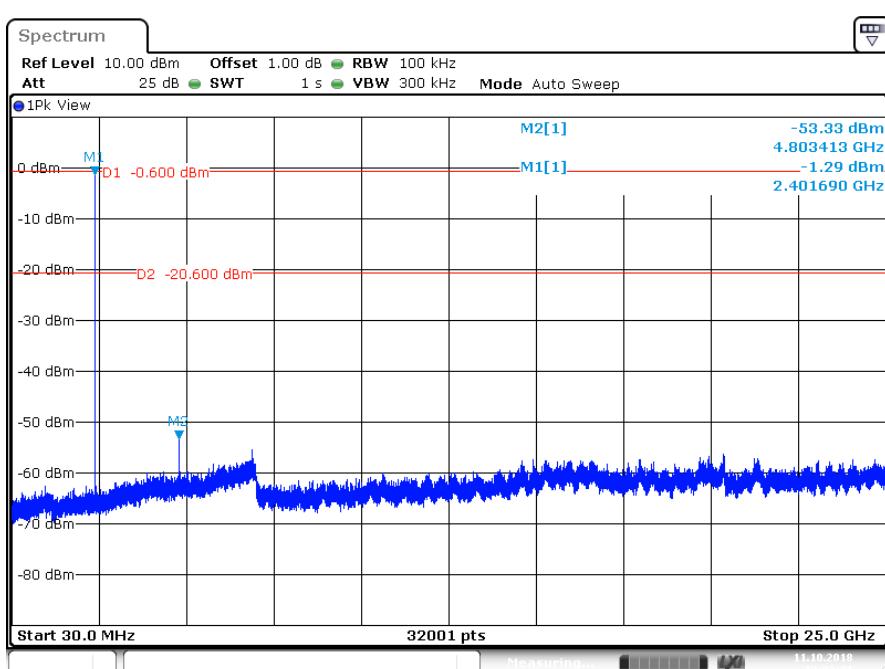
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Plot PSD reference level (taken at 2402 MHz)

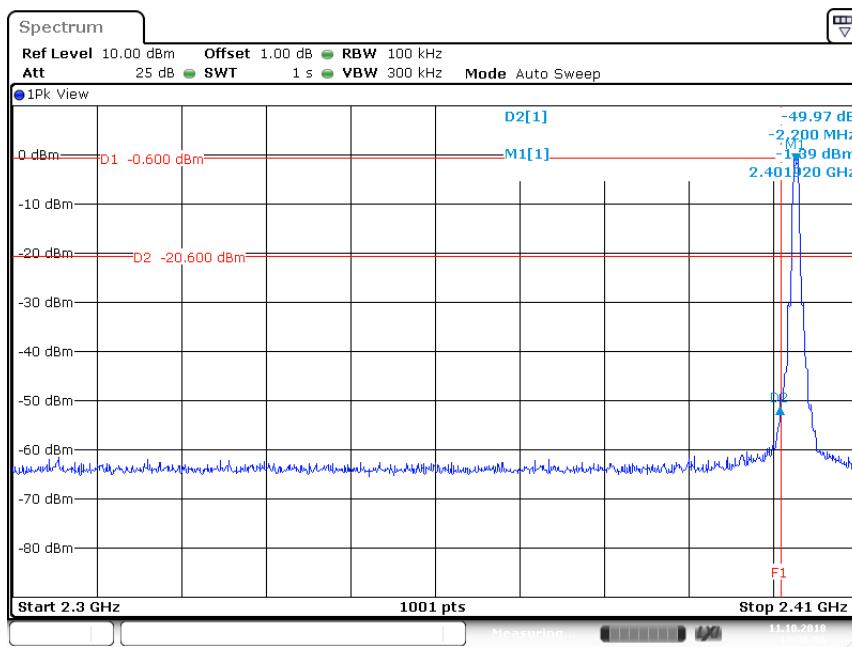


Plot of the emissions in non-restricted bands, conducted spurious emissions 2402 MHz

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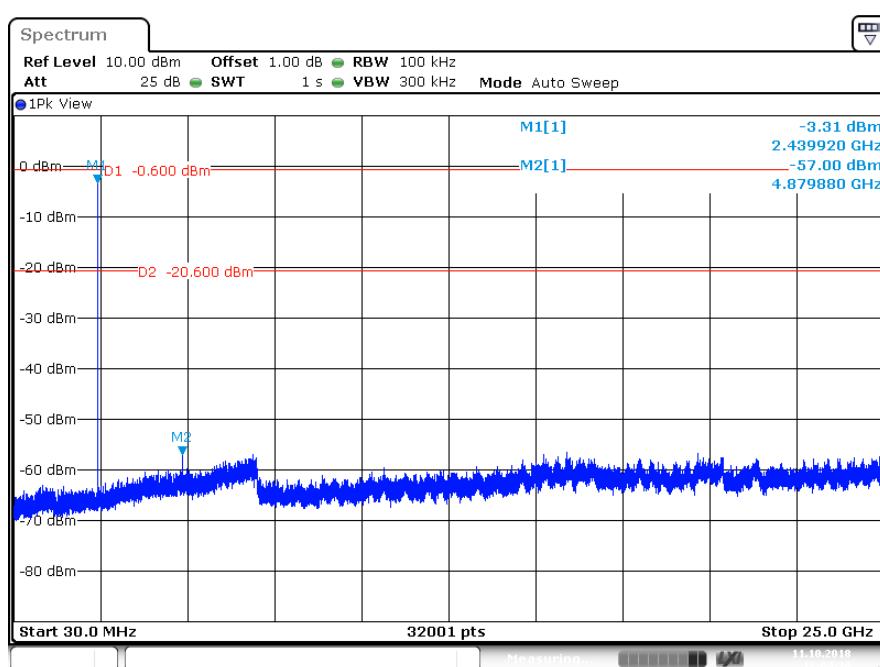
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Plot: Band Edge Conducted Emission, Spectral Diagram, 2402 MHz

Plot showing more than 20 dB band edge attenuation relative to the maximum in-band PSD level. F1 shows the band edge frequency of 2400 MHz. Reference level is the PSD value of -0.6 dBm



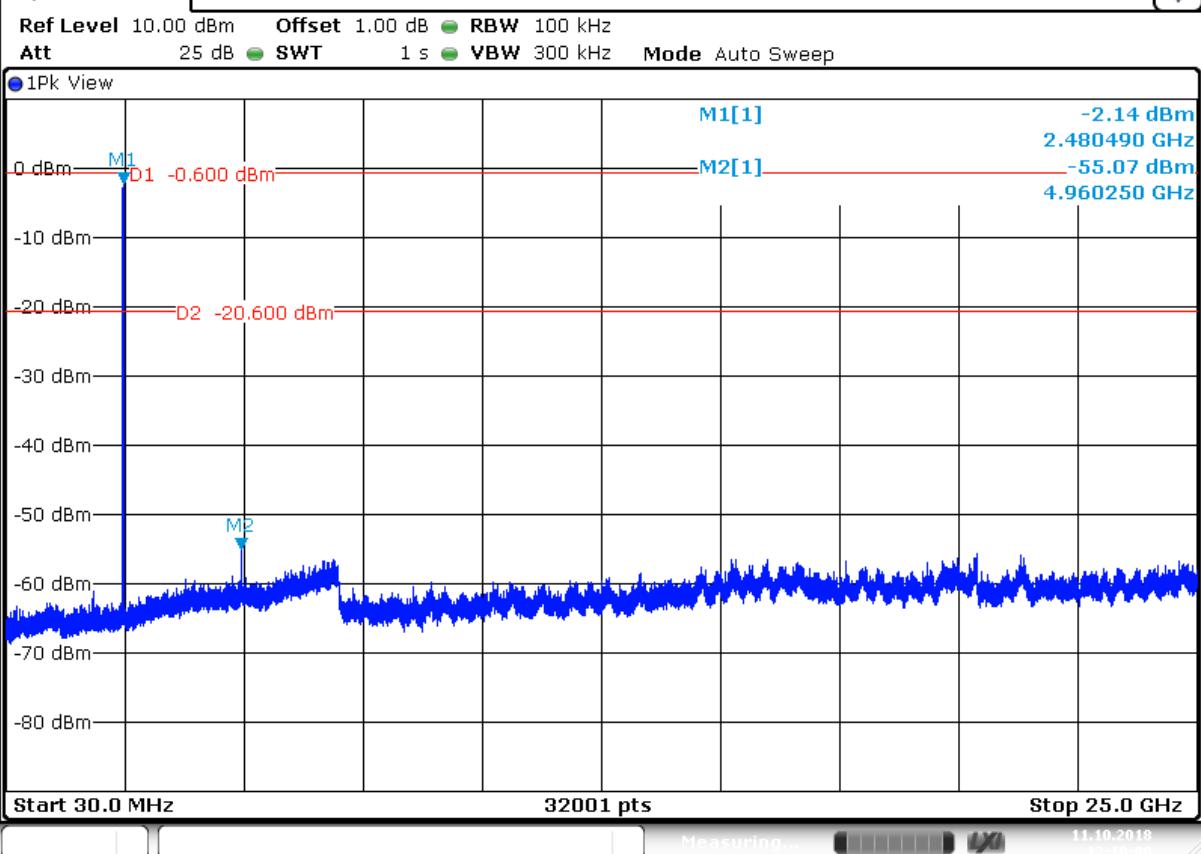
Plot of the emissions in non-restricted bands, conducted spurious emissions 2440 MHz

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Spectrum



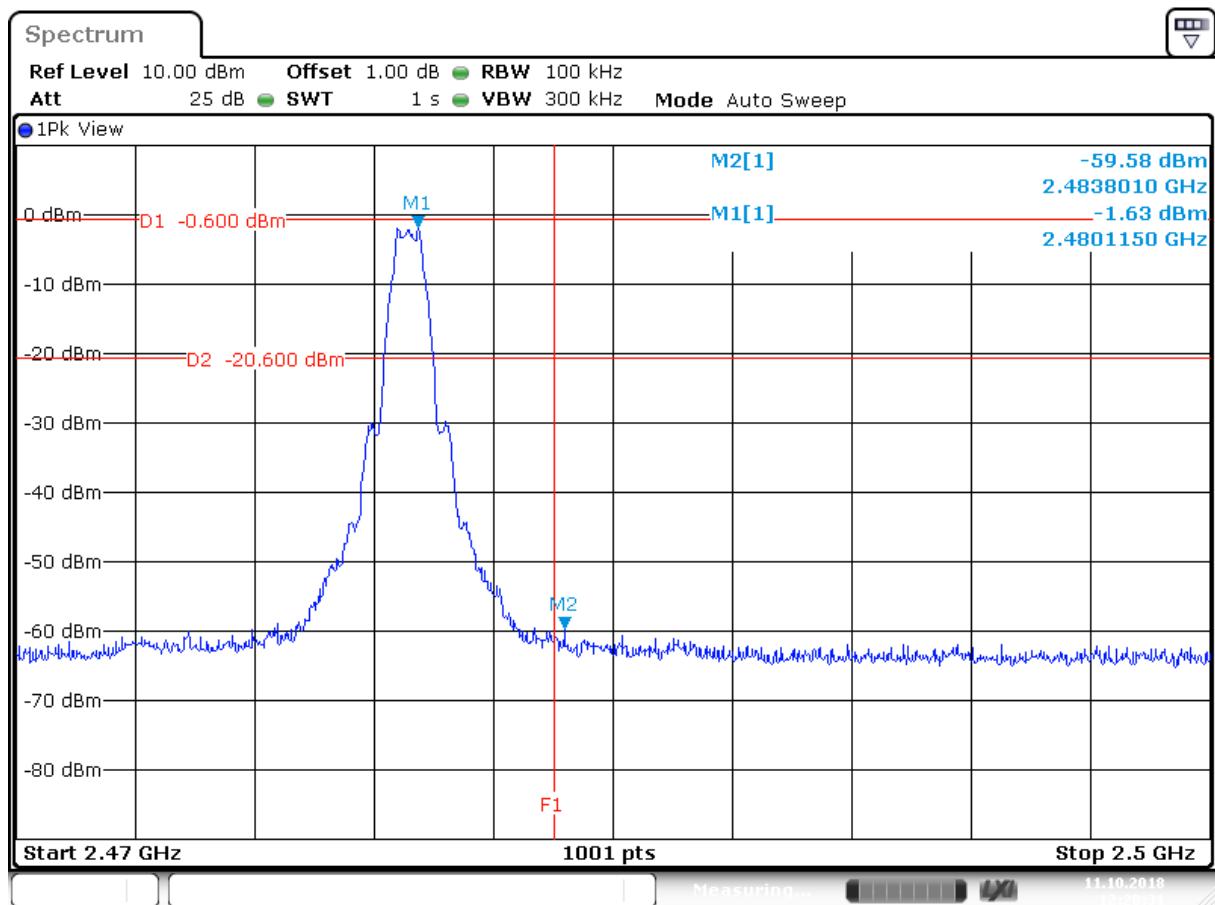
Date: 11.OCT.2018 12:10:00

Plot of the emissions in non-restricted bands, conducted spurious emissions 2480 MHz

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Date: 11.OCT.2018 12:20:32

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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6.5 Radiated Spurious Emissions of Transmitter

RESULT: PASS

Date of testing: 2018-10-2 and 15

Frequency range: 30MHz - 25GHz

Requirements:

FCC 15.209 and FCC 15.247(d)

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), must comply with the radiated emission limits specified in FCC 15.209(a).

Test procedure:

ANSI C63.10-2013

KDB 558074 D0115.247 Mas Guidance v05, August 24, 2018

Preliminary emission profile testing was performed inside the anechoic chamber. The EUT was placed on a non-conductive table 80cm (<1 GHz) and 150cm (>1 GHz) above the floor. The EUT was positioned as shown in the separate setup photographs document.

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, 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. Where Peak (Pk) values were at least 6 dB under the Average (Av) limits, Av value was not tested. Where Average values were tested, Average values were measured using a reduced Video Bandwidth, with a minimum of >10 kHz.

A new set of fully loaded batteries were used to supply the EUT.

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

Frequency [MHz]	EUT Frequency / Orientation	Antenna Orientation	Level QP [dB μ V/m]	Limit QP [dB μ V/m]	Verdict [Pass/Fail]
728.8	2402 MHz /Vertical	Horizontal	27.9	46.0	Pass
877.6	2402 MHz / Z position	Horizontal	28.3	46.0	Pass
729.3	2440 MHz / Horizontal	Horizontal	28.9	46.0	Pass
973.6* ^R	2440 MHz / Vertical	Horizontal	33.3	46.0	Pass
689.0	2480 MHz / Vertical	Vertical	26.6	46.0	Pass
783.1	2480 MHz / Horizontal	Vertical	27.2	46.0	Pass

Note:

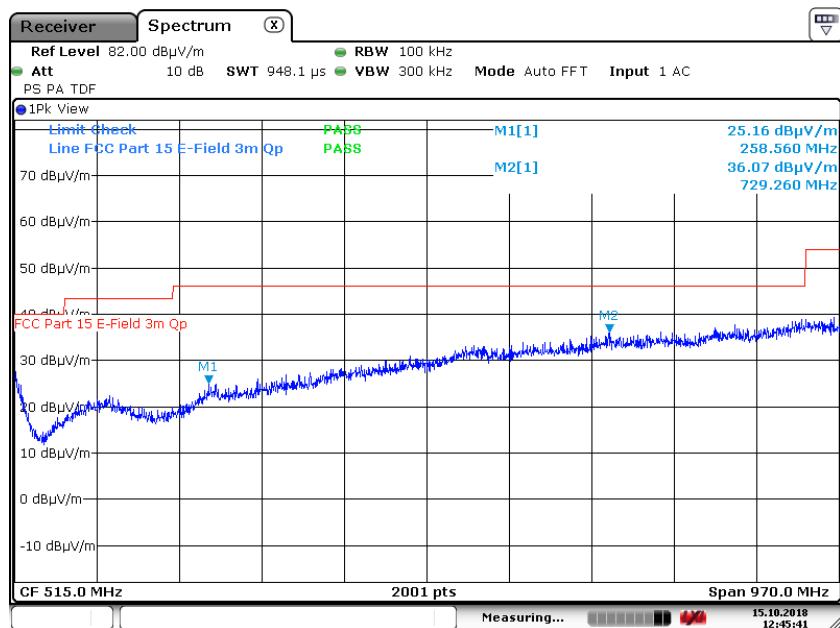
- Level QP = Reading QP + Factor
- Tested in modes as described in section 4.2, the 6 highest values noted..
- *^R refers to a frequency in a restricted band
- Quasi Peak detector used with a bandwidth of 120 kHz.
- Measurement uncertainty is +/- 5.1 dB.

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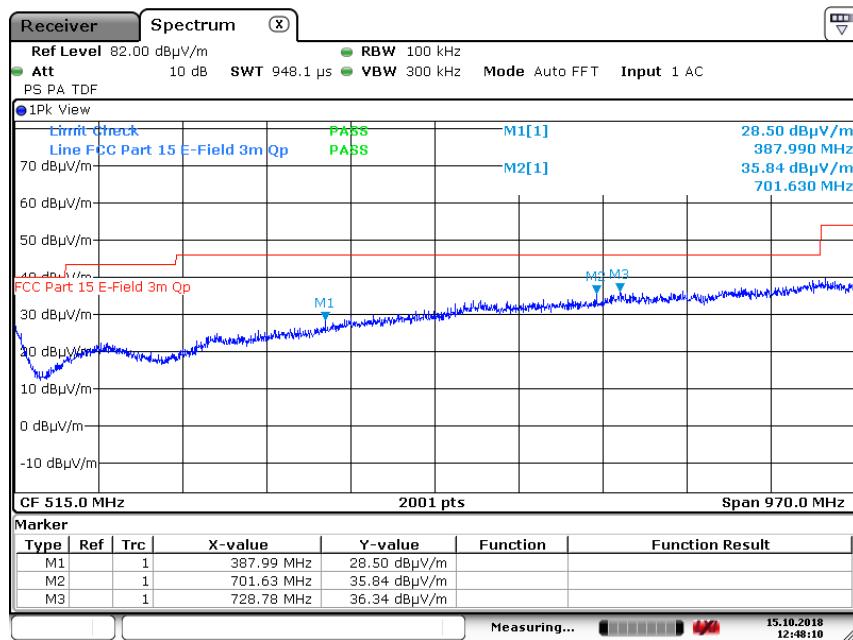
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Plot of the emissions below 1 GHz



Date: 15.OCT.2018 12:45:41

Plot 1: the emissions at 2402 MHz, EUT Vertical-Antenna Horizontal polarization, Peak values shown



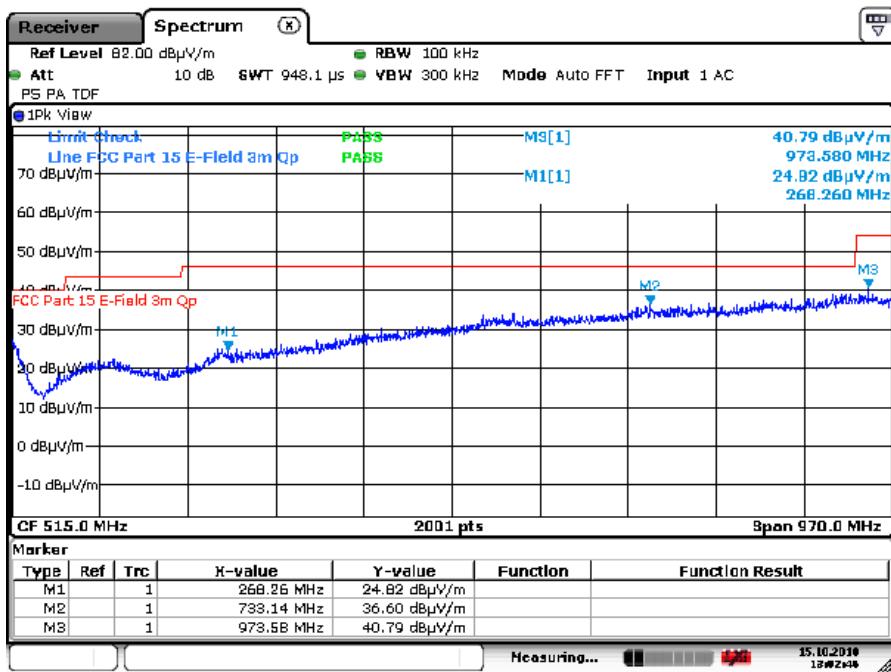
Date: 15.OCT.2018 12:48:10

Plot 2: the emissions at 2402 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

Test Report No.:

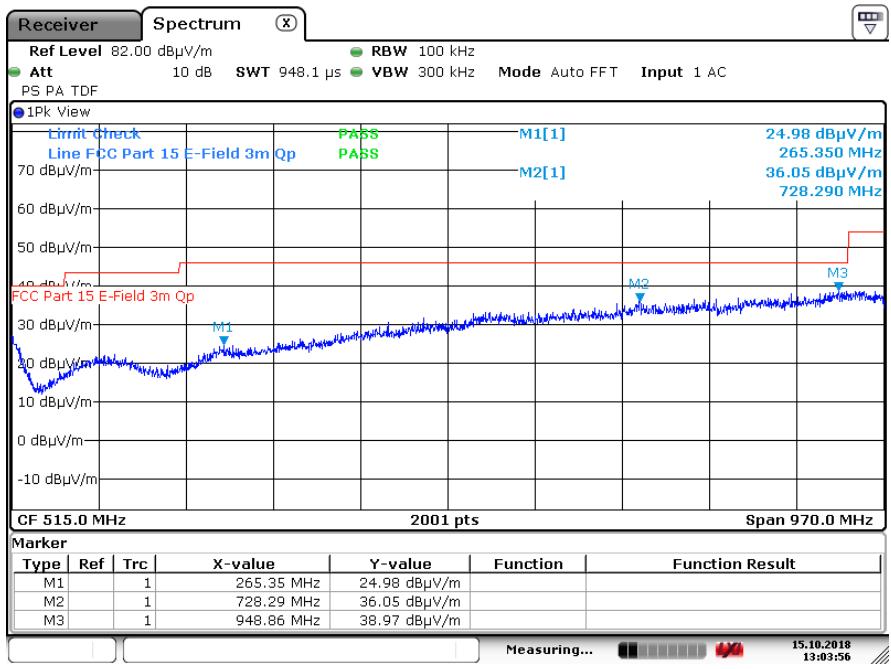
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Date: 15.OCT.2018 13:02:47

Plot 3: the emissions at 2440 MHz, EUT Vertical-Antenna Horizontal polarization, Peak values shown



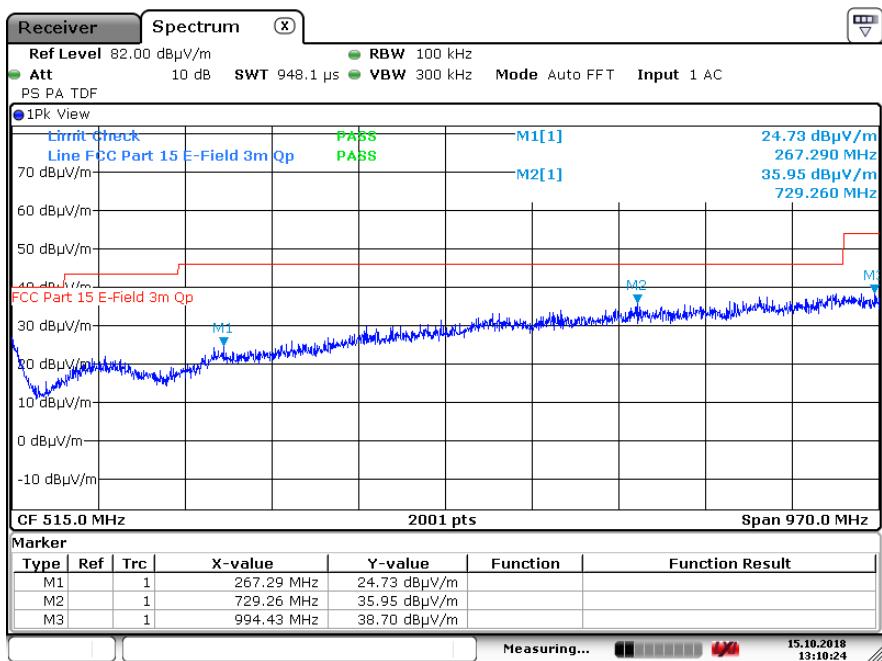
Date: 15.OCT.2018 13:03:57

Plot 4: the emissions at 2440 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

Test Report No.:

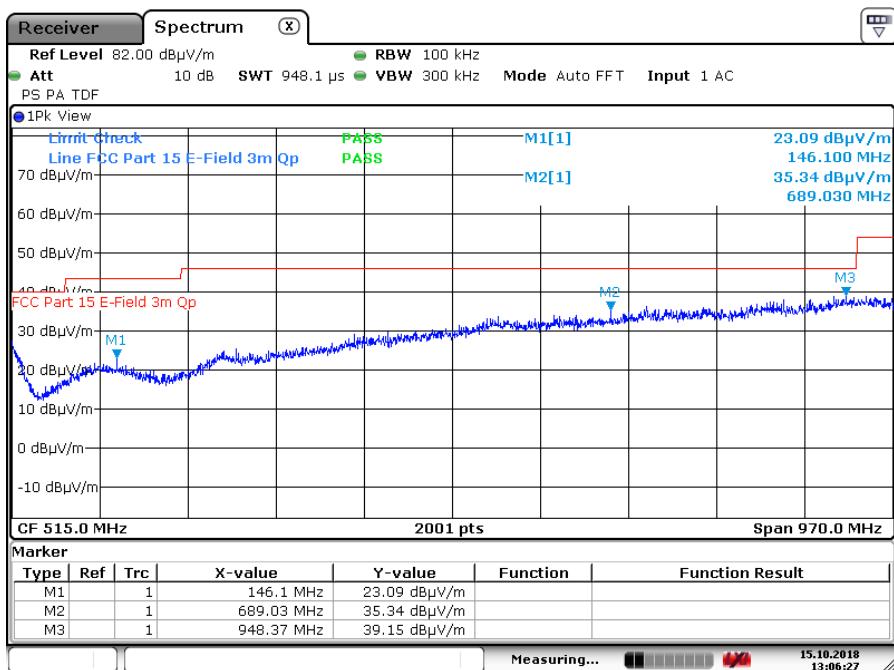
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Date: 15.OCT.2018 13:10:24

Plot 5: the emissions at 2480 MHz, EUT Vertical-Antenna Horizontal polarization, Peak values shown



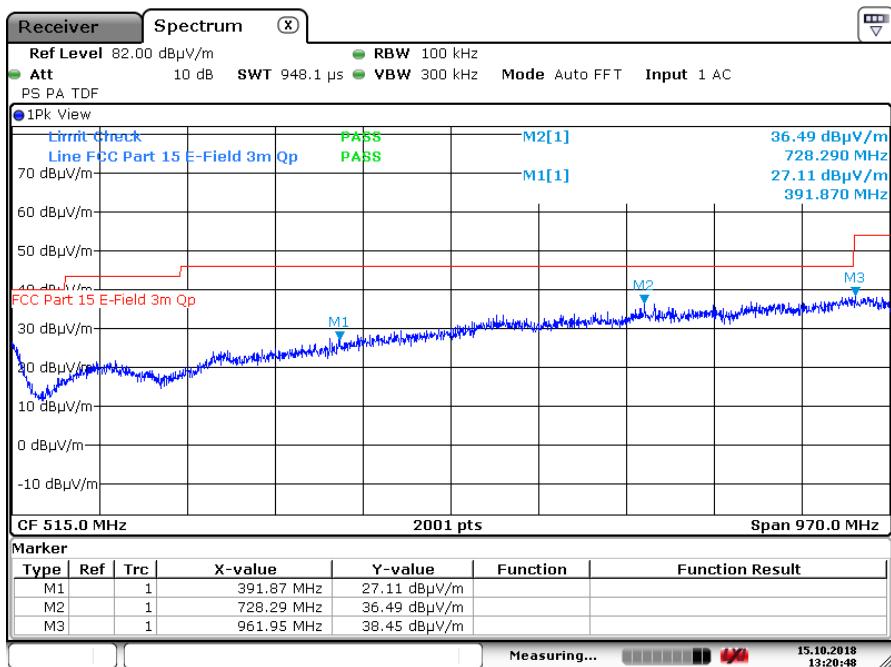
Date: 15.OCT.2018 13:06:28

Plot 6: the emissions at 2480 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

Test Report No.:

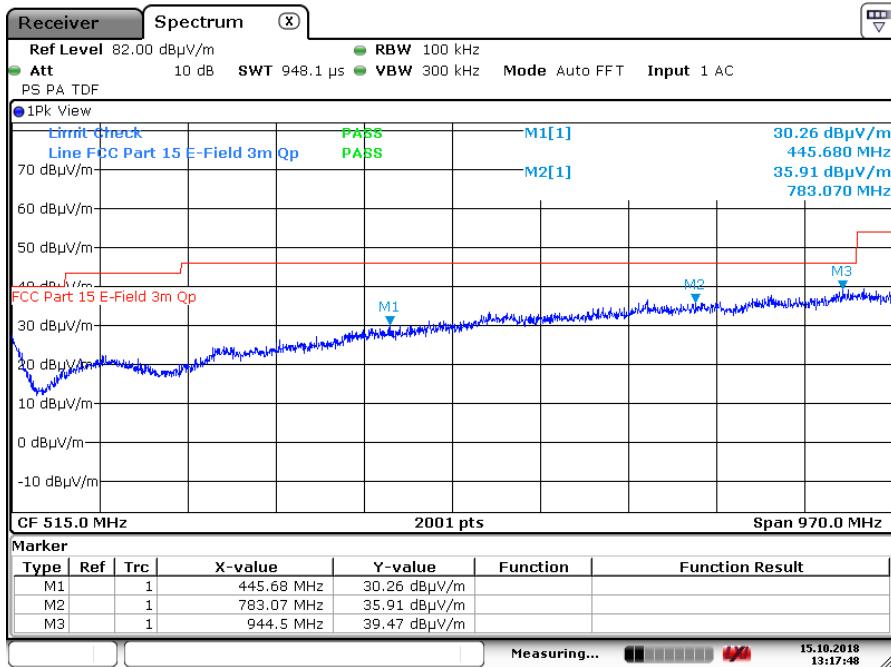
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Date: 15.OCT.2018 13:20:48

Plot 7: the emissions at 2480 MHz, EUT Z-Antenna Horizontal polarization, Peak values shown



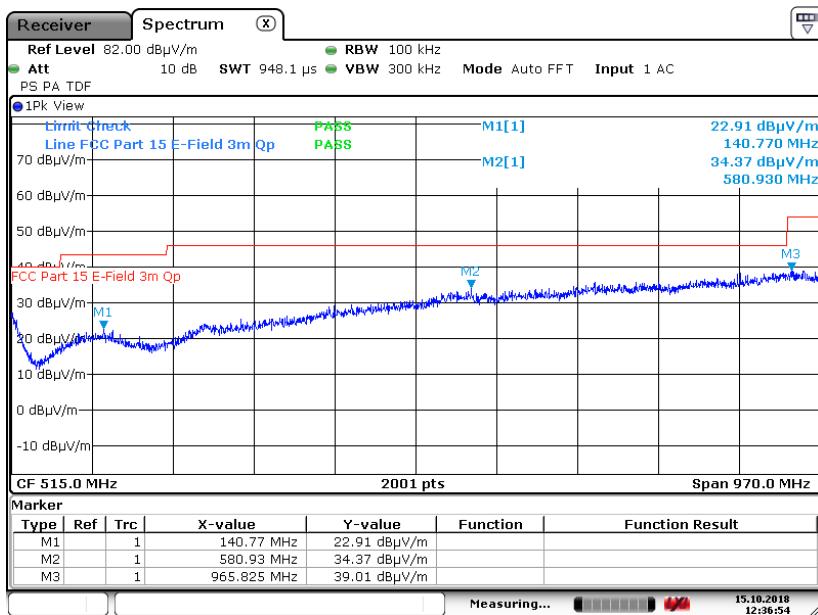
Date: 15.OCT.2018 13:17:47

Plot 8: the emissions at 2480 MHz, EUT Z-Antenna Vertical polarization, Peak values shown

Test Report No.:

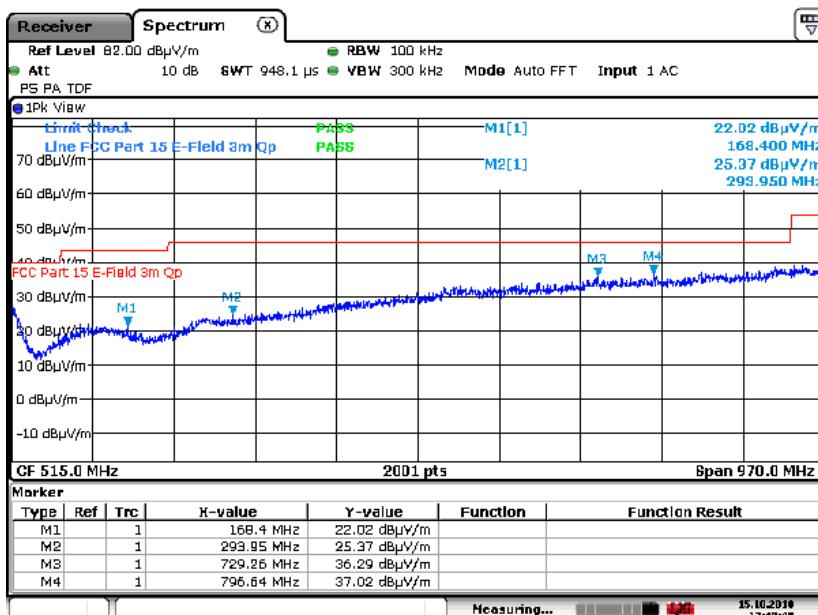
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Date: 15.OCT.2018 12:36:55

Plot 9: the emissions EUT in Normal operation, EUT Horizontal-Antenna Horizontal polarization, Peak values shown



Date: 15.OCT.2018 12:40:49

Plot 10: the emissions EUT in Normal operation, EUT Z-Antenna Vertical polarization, Peak values shown

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Radiated Emissions, 1 - 25GHz, Horizontal and Vertical Antenna Orientations, 2402 MHz.

Frequency [MHz]	EUT Orientation	Antenna Orientation	Level Pk [dB μ V/m]	Limit [dB μ V/m]	Result
1001* ^R	Vertical	Vertical	40.1	54 (Av) 74 (Pk)	Pass
1081* ^R	Vertical	Vertical	41.0	54 (Av) 74 (Pk)	Pass
5221* ^R	Horizontal	Vertical	49.4	54 (Av) 74 (Pk)	Pass
6854	Horizontal	Vertical	52.6	54 (Av) 74 (Pk)	Pass
9898	Horizontal	Vertical	53.7 Pk 46.9 Av	54 (Av) 74 (Pk)	Pass
11497*noise	-	Vertical	61.7 Pk 50.7 Av	54 (Av) 74 (Pk)	Pass

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

Frequency [MHz]	EUT Orientation	Antenna Orientation	Level Pk [dB μ V/m]	Limit [dB μ V/m]	Result
1001* ^R	Horizontal	Horizontal	40.1	54 (Av) 74 (Pk)	Pass
1081* ^R	Horizontal	Vertical	40.3	54 (Av) 74 (Pk)	Pass
4879* ^{H*R}	Horizontal	Horizontal	40.0	54 (Av) 74 (Pk)	Pass
6834	Horizontal	Horizontal	53.3 Pk 44.0 Av	54 (Av) 74 (Pk)	Pass
8079* ^{HR}	Horizontal	Horizontal	52.4 Pk 40.0 Av	54 (Av) 74 (Pk)	Pass
11388*noise	-	Vertical	62.6 Pk 52.3 Av	54 (Av) 74 (Pk)	Pass

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

Frequency [MHz]	EUT Orientation	Antenna Orientation	Level Pk [dB μ V/m]	Limit [dB μ V/m]	Result
1001* ^R	Z	Horizontal	43.5	54 (Av) 74 (Pk)	Pass
1167* ^R	Horizontal	Horizontal	40.7	54 (Av) 74 (Pk)	Pass
1321* ^R	Horizontal	Horizontal	40.1	54 (Av) 74 (Pk)	Pass
6299	Z	Vertical	54.1 Pk 41.1 Av	54 (Av) 74 (Pk)	Pass
6919	Vertical	Vertical	53.7 Pk 42.7 Av	54 (Av) 74 (Pk)	Pass
11400*noise	-	Vertical	61.2 Pk 52.0 Av	54 (Av) 74 (Pk)	Pass

Radiated field strength measurements (1 - 25 GHz, E-field), EUT normal operation

Frequency [MHz]	EUT Orientation	Antenna Orientation	Level Pk [dB μ V/m]	Limit [dB μ V/m]	Result
1010* ^R	Z	Horizontal	37.2	54 (Av) 74 (Pk)	Pass
1080* ^R	Horizontal	Vertical	39.6	54 (Av) 74 (Pk)	Pass
1321* ^R	Horizontal	Horizontal	38.6	54 (Av) 74 (Pk)	Pass
3796* ^R	Horizontal	Vertical	45.3	54 (Av) 74 (Pk)	Pass
6731	Horizontal	Vertical	52.4 Pk 41.2 Av	54 (Av) 74 (Pk)	Pass
11400*noise	-	Vertical	62.2 Pk 50.5 Av	54 (Av) 74 (Pk)	Pass

Notes:

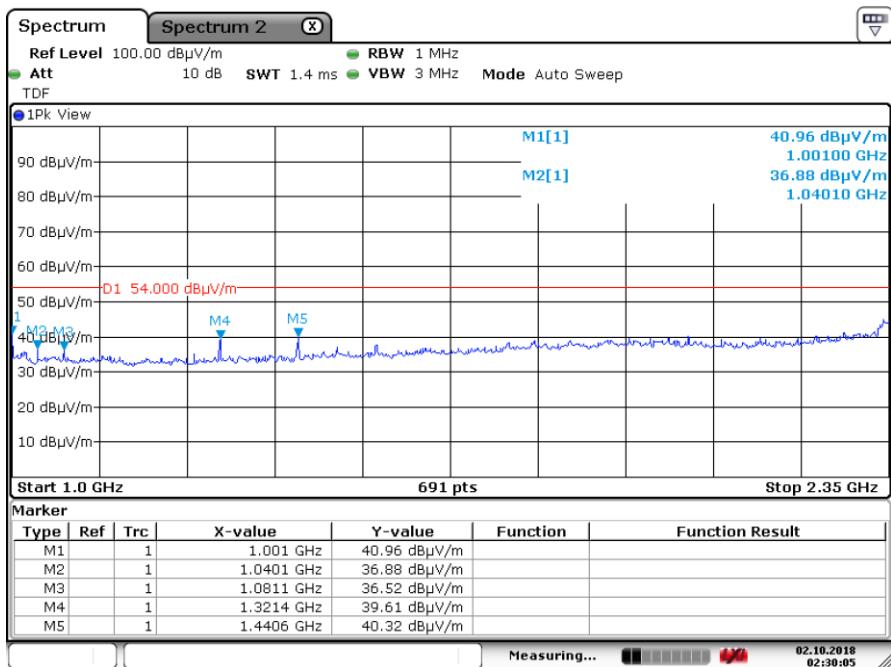
- *R refers to a frequency in a restricted band,
- *H refers to a frequency which is a harmonic of the fundamental.
- Peak detector used with a bandwidth of 1 MHz, where Peak (Pk) values were within Average (Av) limits, Av not tested.
- six highest values noted.
- Measurement uncertainty is +/- 5.1 dB.

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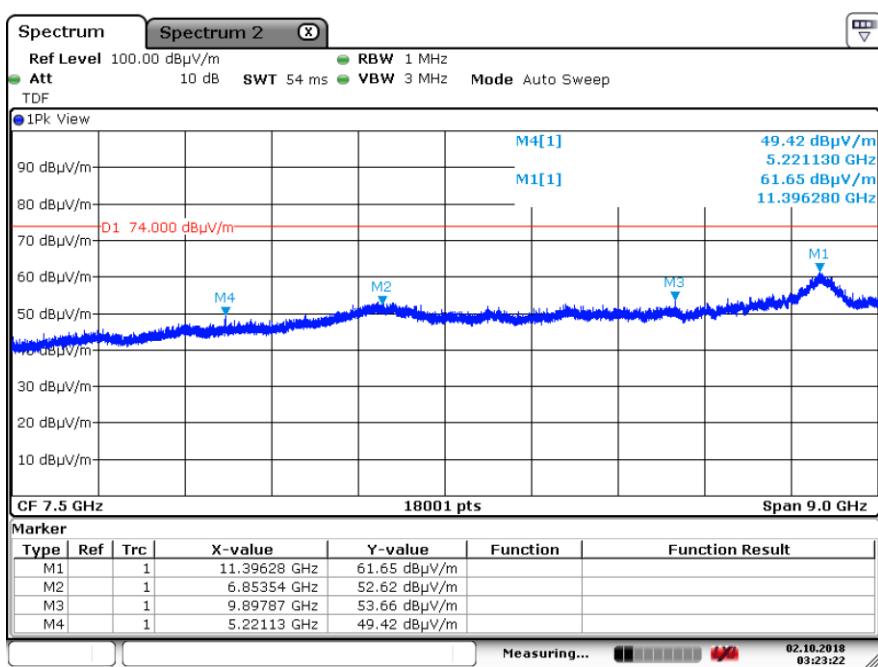
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6.6 Plots of the radiated emissions



Date: 2.OCT.2018 02:30:06

Plot 11: the emissions at 2402 MHz, EUT Vertical-Antenna Horizontal polarization, Peak values shown



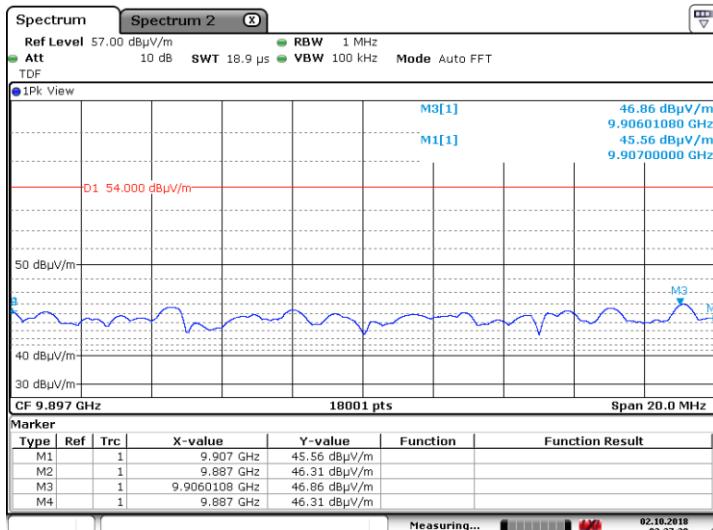
Date: 2.OCT.2018 03:23:21

Plot 12a: the emissions at 2402 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

Test Report No.:

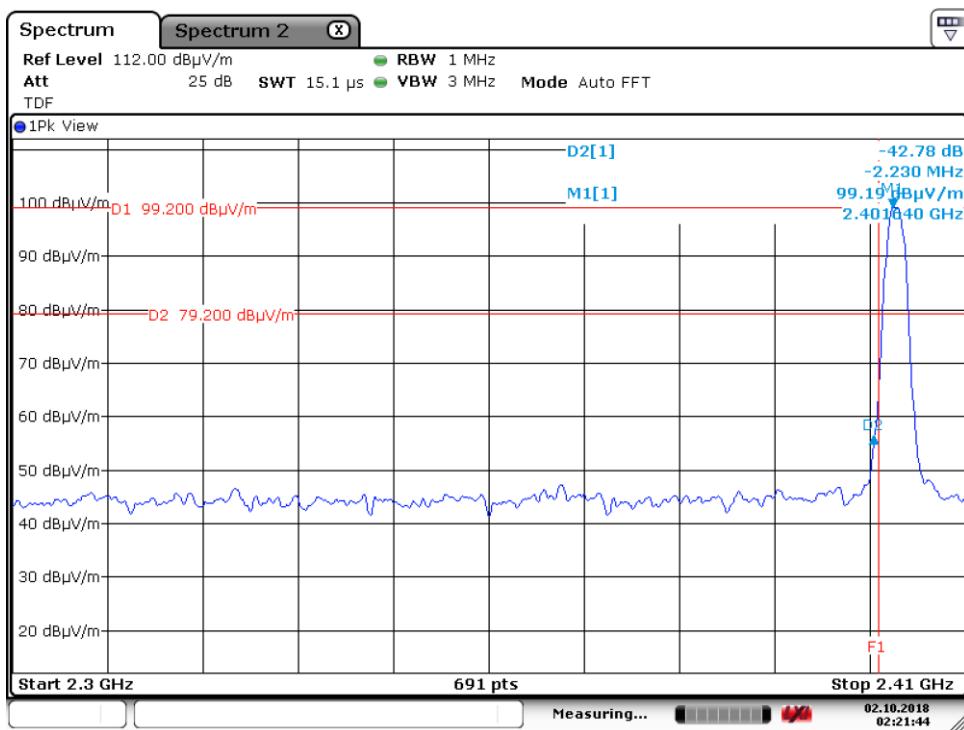
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Date: 2.OCT.2016 03:27:29

Plot 12b: the emissions at 2402 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown



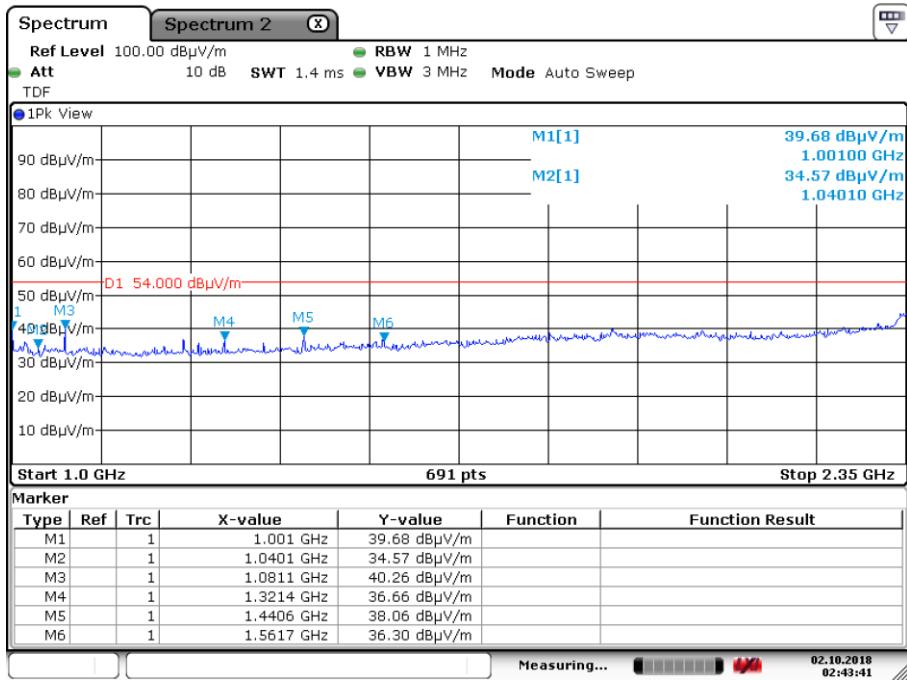
Date: 2.OCT.2016 02:21:44

Plot 12c: Band Edge Low, at 2402 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

Test Report No.:

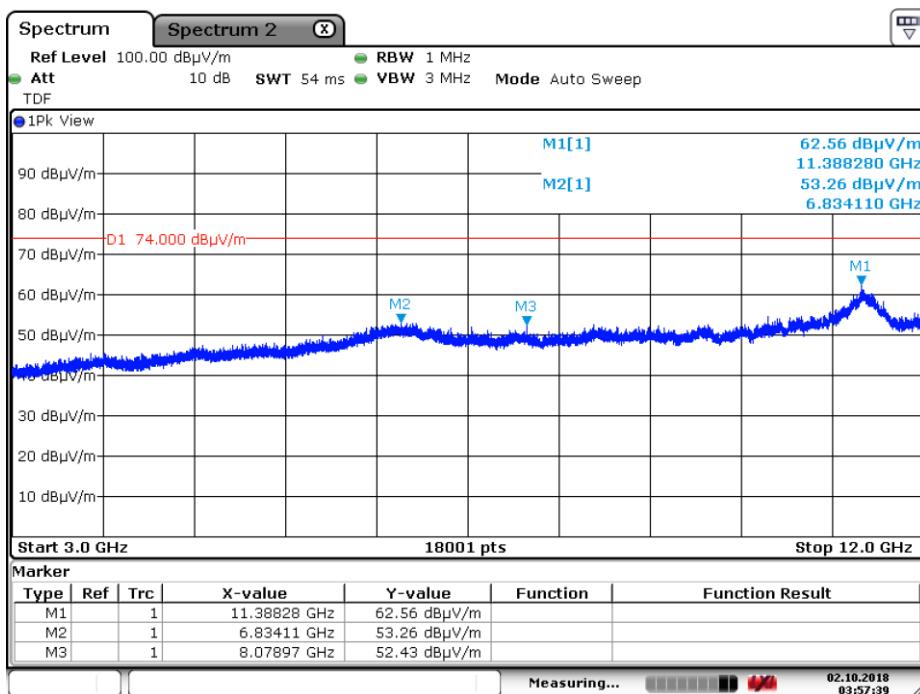
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Date: 2.OCT.2018 02:43:42

Plot 13: the emissions at 2440 MHz, EUT Horizontal-Antenna Vertical polarization, Peak values shown



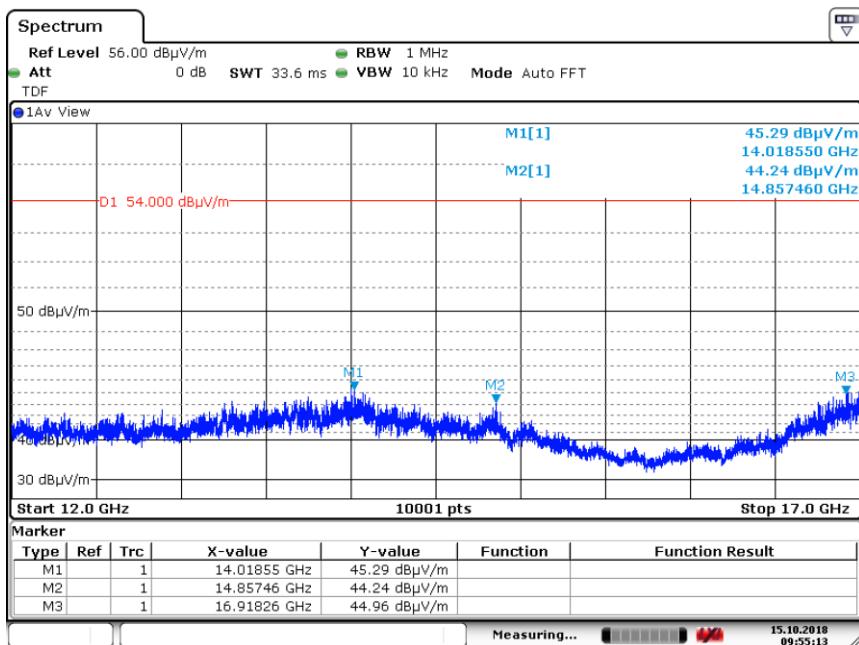
Date: 2.OCT.2018 03:57:39

Plot 14: the emissions at 2440 MHz, EUT Horizontal-Antenna Horizontal polarization, Peak values shown

Test Report No.:

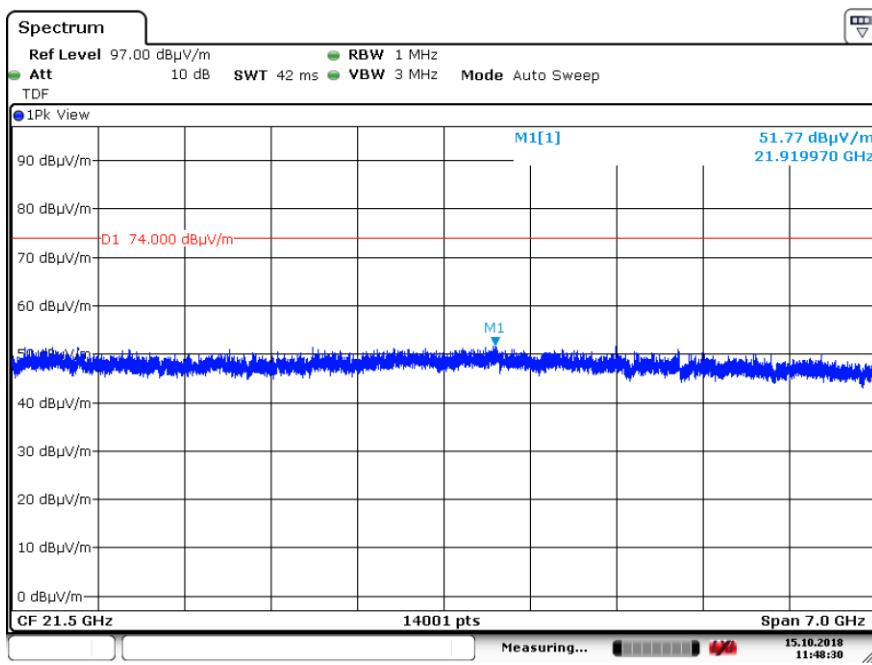
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Date: 15.OCT.2018 09:55:13

Plot 15: the emissions at 2440 MHz, EUT Vertical-Antenna Horizontal polarization, Average values shown



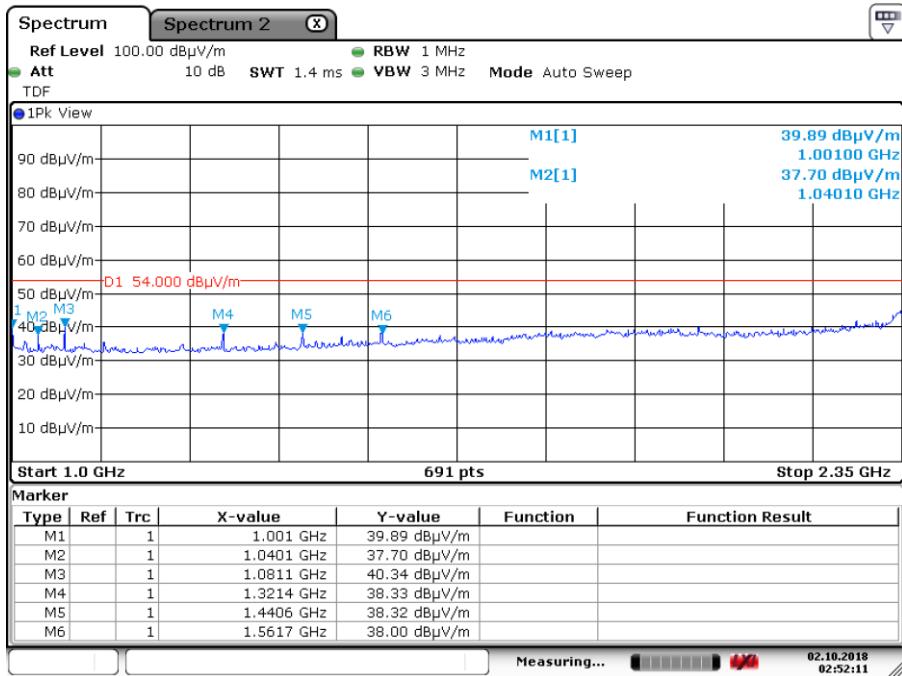
Date: 15.OCT.2018 11:48:30

Plot 16: the emissions at 2440 MHz, EUT Z pos.-Antenna Vertical polarization, Peak values shown

Test Report No.:

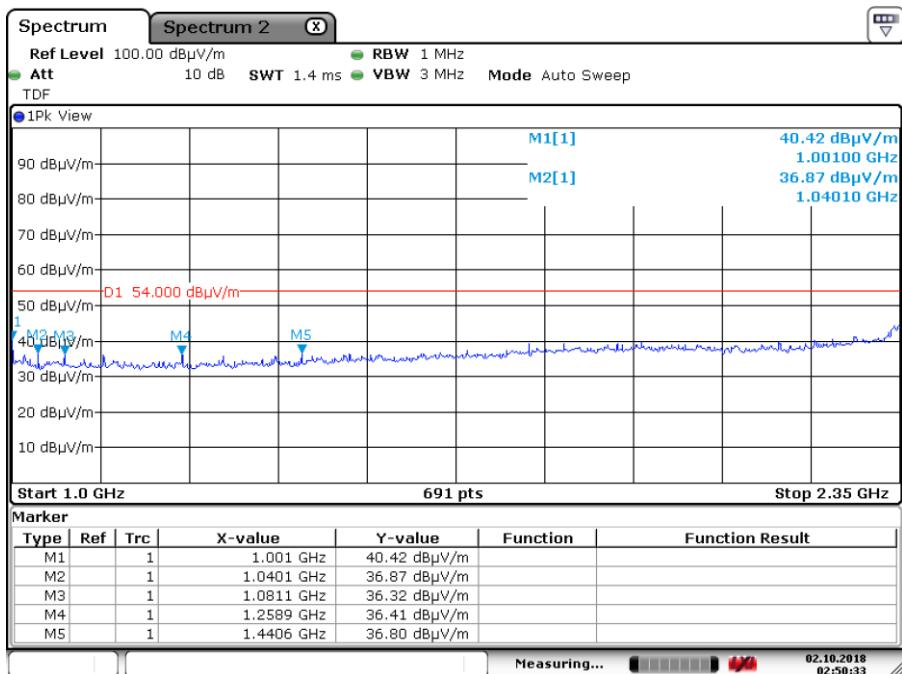
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Date: 2.OCT.2018 02:52:12

Plot 17: the emissions at 2480 MHz, EUT Vertical-Antenna Horizontal polarization, Peak values shown



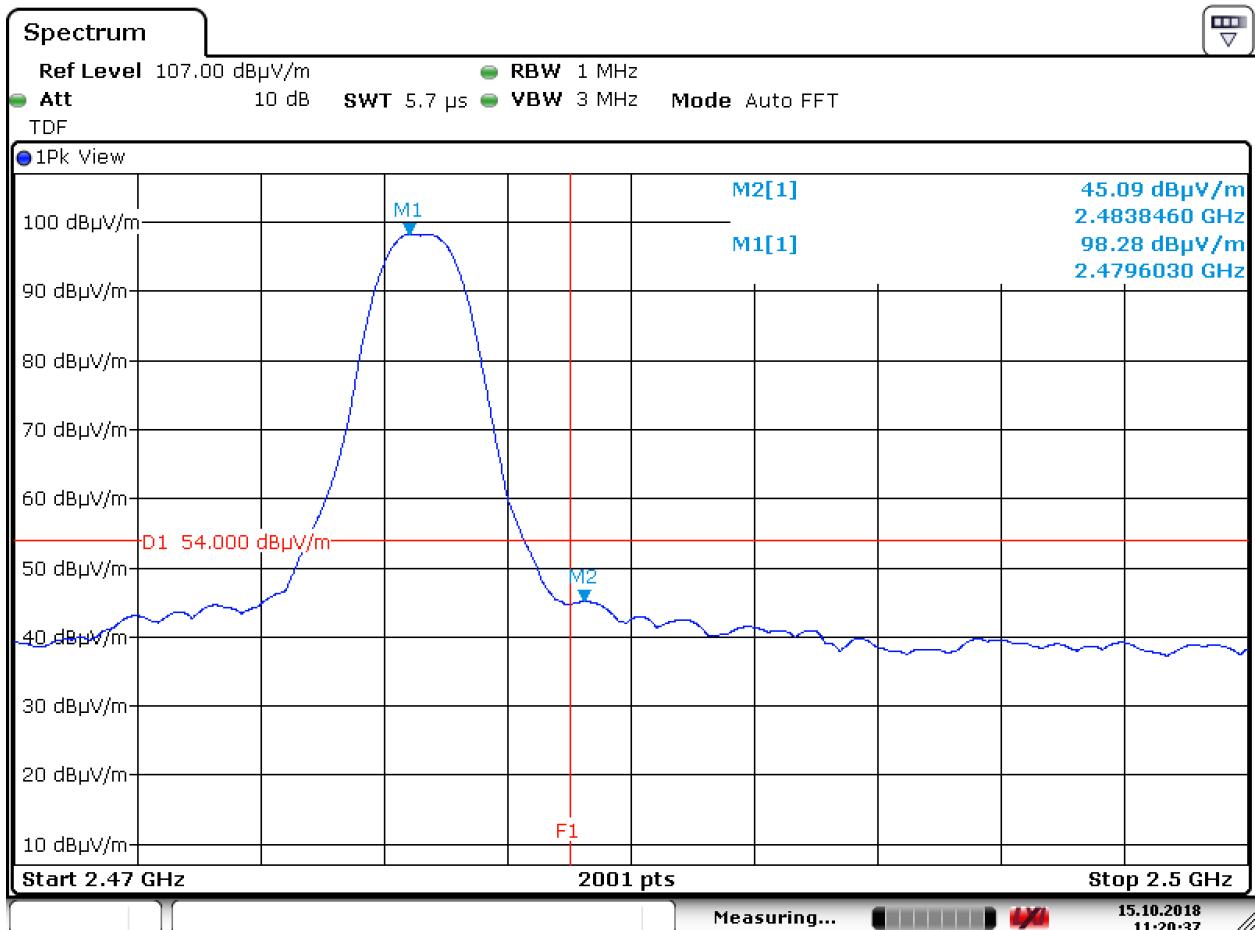
Date: 2.OCT.2018 02:50:34

Plot 18: the emissions at 2480 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

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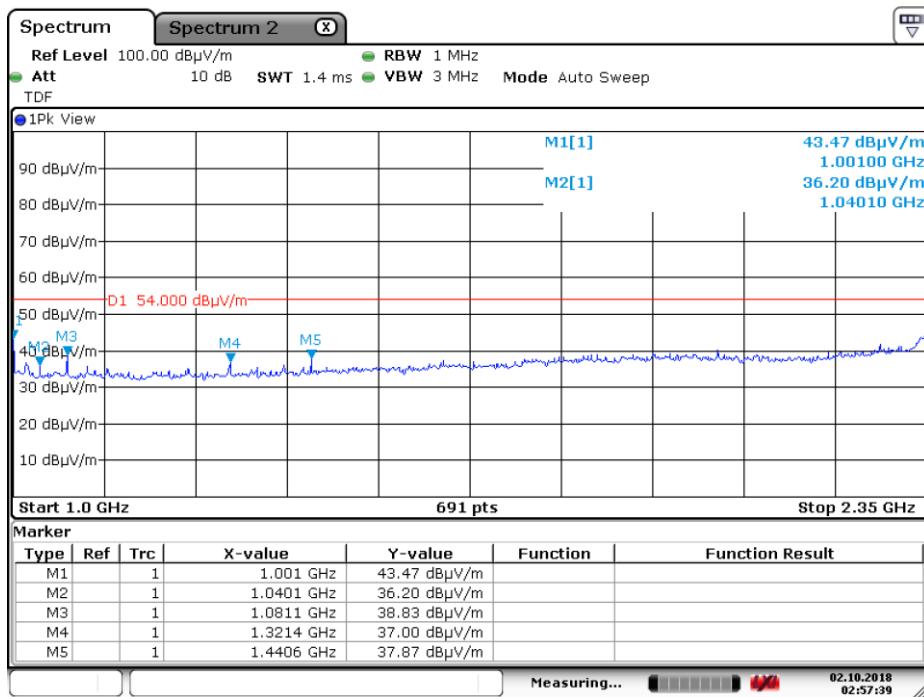
Date: 15.OCT.2018 11:20:36

Plot 18a: Band edge High emissions at 2480 MHz, EUT Vertical-Antenna Vertical polarization, Peak values shown

Test Report No.:

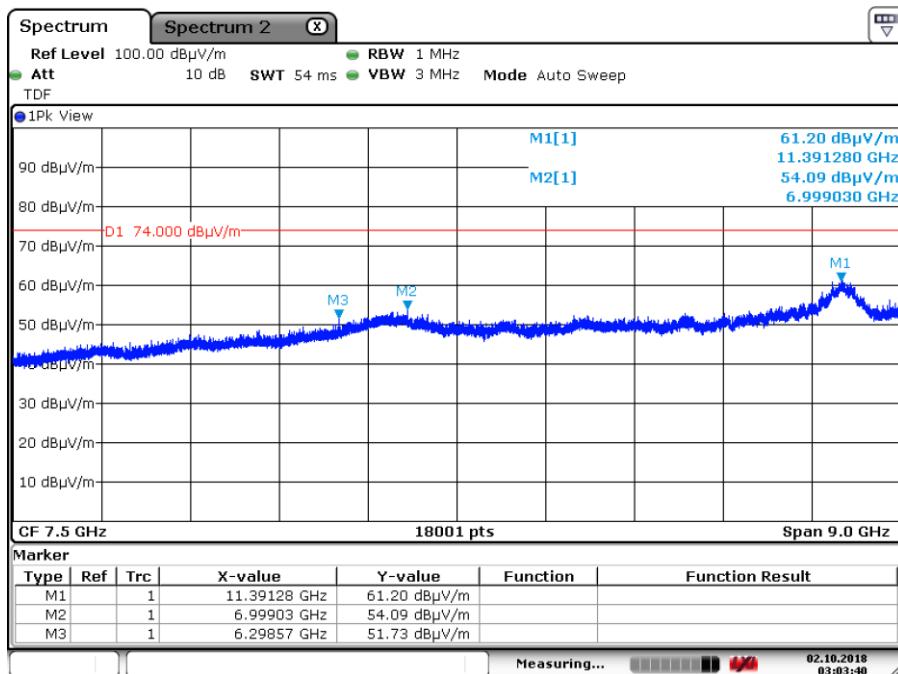
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Date: 2.OCT.2018 02:57:40

Plot 19: the emissions at 2480 MHz, EUT Z-Antenna Vertical polarization, Peak values shown



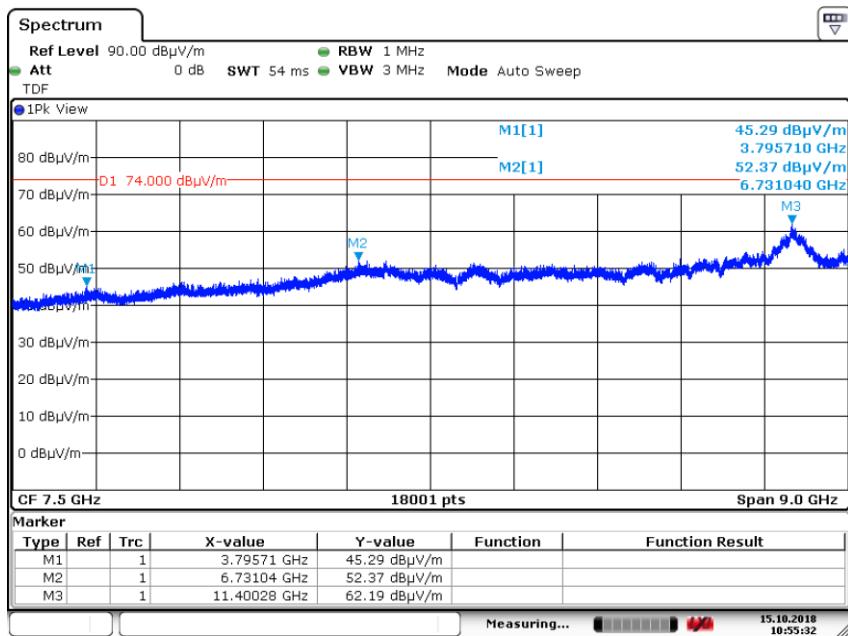
Date: 2.OCT.2018 03:03:39

Plot 20: the emissions at 2480 MHz, EUT Z-Antenna Vertical polarization, Peak values shown

Test Report No.:

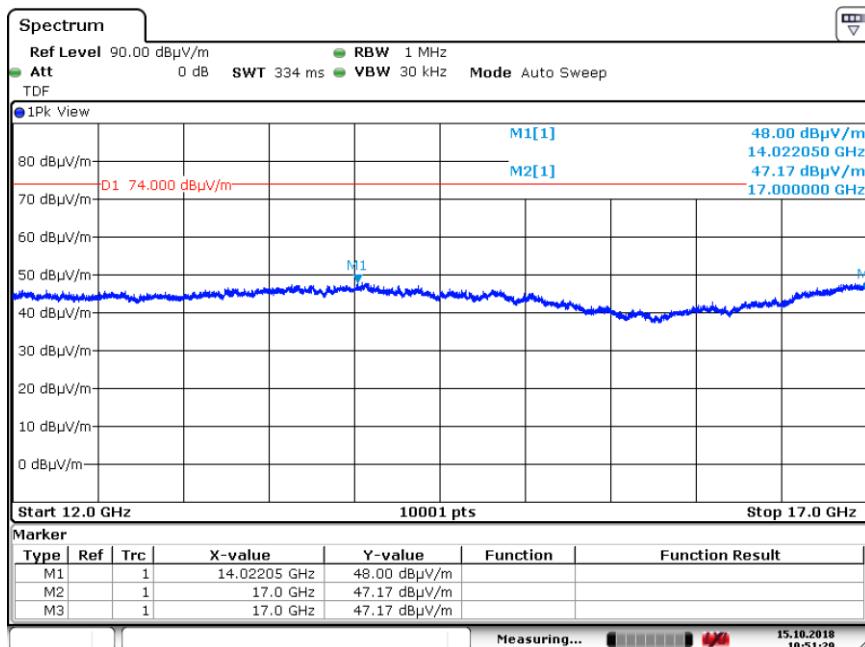
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Date: 15.OCT.2018 10:55:31

Plot 21: the emissions EUT in Normal operation, EUT Horizontal-Antenna Vertical polarization, Peak values shown



Date: 15.OCT.2018 10:51:29

Plot 22: the emissions EUT in Normal operation, EUT Z-Antenna Vertical polarization, Peak values shown, reduced VBW

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6.7 AC Power Line Conducted Measurements

RESULT: Not Applicable, EUT is battery operated only.

End of report