

Report on the FCC Testing of the

Crane Electronics Ltd

RF Transceiver, Model: 101/482 ISS B

In accordance with FCC 47 CFR Part 15C

Prepared for: Crane Electronics Ltd
Watling Drive
Sketchley Meadows
Hinckley
LE10 3EY
United Kingdom

FCC ID: TA6RFM01



Product Service

**Choose certainty.
Add value.**

COMMERCIAL-IN-CONFIDENCE

Date: July 2018

Document Number: 75941542-01 | Issue: 01

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Project Management	Natalie Bennett	02 July 2018	
Authorised Signatory	Matthew Russell	02 July 2018	

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD Product Service document control rules.

ENGINEERING STATEMENT

The measurements shown in this report were made in accordance with the procedures described on test pages. All reported testing was carried out on a sample equipment to demonstrate limited compliance with FCC 47 CFR Part 15C. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Graeme Lawler	02 July 2018	

FCC Accreditation

90987 Octagon House, Fareham Test Laboratory

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 15C: 2017.



DISCLAIMER AND COPYRIGHT

This non-binding report has been prepared by TÜV SÜD Product Service with all reasonable skill and care. The document is confidential to the potential Client and TÜV SÜD Product Service. No part of this document may be reproduced without the prior written approval of TÜV SÜD Product Service. © 2018 TÜV SÜD Product Service

ACCREDITATION

Our UKAS Accreditation does not cover opinions and interpretations and any expressed are outside the scope of our UKAS Accreditation. Results of tests not covered by our UKAS Accreditation Schedule are marked NUA (Not UKAS Accredited).

TÜV SÜD Product Service
is a trading name of TÜV SÜD Ltd
Registered in Scotland at East Kilbride,
Glasgow G75 0QF, United Kingdom
Registered number: SC215164

TÜV SÜD Ltd is a
TÜV SÜD Group Company

Phone: +44 (0) 1489 558100
Fax: +44 (0) 1489 558101
www.tuv-sud.co.uk

TÜV SÜD Product Service
Octagon House
Concorde Way
Fareham
Hampshire PO15 5RL
United Kingdom



Contents

1 Report Summary2

1.1 Report Modification Record.....2

1.2 Introduction.....2

1.3 Brief Summary of Results3

1.4 Application Form4

1.5 Product Information6

1.6 Deviations from the Standard.....6

1.7 EUT Modification Record6

1.8 Test Location.....6

2 Test Details7

2.1 Field Strength of Emissions7

2.2 Field Strength of Fundamental43

3 Measurement Uncertainty45

1 Report Summary

1.1 Report Modification Record

Alterations and additions to this report will be issued to the holders of each copy in the form of a complete document.

Issue	Description of Change	Date of Issue
1	First Issue	02 July 2018

Table 1

1.2 Introduction

Applicant	Crane Electronics Ltd
Manufacturer	Crane Electronics Ltd
Model Number(s)	101/482 ISS B
Serial Number(s)	Not Serialised (75941542-TSR0001)
Hardware Version(s)	ISSUE B
Software Version(s)	5.0
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 15C: 2017
Order Number	050802
Date	29-January-2018
Date of Receipt of EUT	21-February-2018
Start of Test	30-April-2018
Finish of Test	19-June-2018
Name of Engineer(s)	Graeme Lawler
Related Document(s)	ANSI C63.10 (2013)



Product Service

1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 15C is shown below.

Section	Specification Clause	Test Description	Result	Comments/Base Standard
Configuration and Mode: Battery Powered - 2.4 GHz SRD Transmitter				
2.1	15.249 (a)(d) and 15.209	Field Strength of Emissions	Pass	
2.2	15.249 (a) and 15.35 (b)	Field Strength of Fundamental	Pass	

Table 2

1.4 Application Form

EQUIPMENT DESCRIPTION	
Model Name/Number	101/482 ISS B
Part Number	101482
Hardware Version	ISSUE B
Software Version	5.0
FCC ID (if applicable)	TA6RFM01
Industry Canada ID (if applicable)	N/A
Technical Description (Please provide a brief description of the intended use of the equipment)	Transmits and receives digital information primarily for Torque Measurement Systems.

INTENTIONAL RADIATORS									
Technology	Frequency Band (MHz)	Conducted Declared Output Power (dBm)	Antenna Gain (dBi)	Supported Bandwidth (s) (MHz)	Modulation Scheme(s)	ITU Emission Designator	Test Channels (MHz)		
							Bottom	Middle	Top
Use Nordic nRF24LE1	2402 to 2480	0	1.69	1	GFSK	1M00F1D	2402	2440	2480

UN-INTENTIONAL RADIATOR	
Highest frequency generated or used in the device or on which the device operates or tunes	2.480 MHz
Lowest frequency generated or used in the device or on which the device operates or tunes	2.402 MHz
Class A Digital Device (Use in commercial, industrial or business environment) ☐	
Class B Digital Device (Use in residential environment only) ☒	

Power Source			
AC	Single Phase	Three Phase	Nominal Voltage
	N/A	N/A	N/A
External DC	Nominal Voltage	Maximum Current	
	3.3 V	0.020 A	
Battery	Nominal Voltage	Battery Operating End Point Voltage	
	N/A	N/A	
Can EUT transmit whilst being charged?			Yes ☐ No ☒

EXTREME CONDITIONS			
Maximum temperature	+55	°C	Minimum temperature
			-20
			°C

Ancillaries
Please list all ancillaries which will be used with the device.
None



Product Service

ANTENNA CHARACTERISTICS			
☐	Antenna connector		State impedance Ohm
☐	Temporary antenna connector		State impedance Ohm
☒	Integral antenna	Type YAGEO CHIP ANTENNA ANT3216A063R24	
☐	External antenna	Type	

I hereby declare that the information supplied is correct and complete.

Name: *Neil McDonald*

Position held: Technical Director Date: 02 July 2018

1.5 Product Information

1.5.1 Technical Description

Transmits and receives digital information primarily for torque management systems.

1.6 Deviations from the Standard

No deviations from the applicable test standard were made during testing.

1.7 EUT Modification Record

The table below details modifications made to the EUT during the test programme.
The modifications incorporated during each test are recorded on the appropriate test pages.

Modification State	Description of Modification still fitted to EUT	Modification Fitted By	Date Modification Fitted
Serial Number: Not Serialised (75941542-TSR0001)			
0	As supplied by the customer	Not Applicable	Not Applicable
1	We have reduced the emissions from the ancillary equipment by using a battery and braiding on cable. The RF module is unmodified.	Crane Electronics Ltd	13-June-2018

Table 3

1.8 Test Location

TÜV SÜD Product Service conducted the following tests at our Fareham Test Laboratory.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: Battery Powered - 2.4 GHz SRD Transmitter		
Field Strength of Emissions	Graeme Lawler	UKAS
Field Strength of Fundamental	Graeme Lawler	UKAS

Table 4

Office Address:

Octagon House
Concorde Way
Segensworth North
Fareham
Hampshire
PO15 5RL
United Kingdom

2 Test Details

2.1 Field Strength of Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.249 (a)(d)

2.1.2 Equipment Under Test and Modification State

101/482 ISS B, S/N: Not Serialised (75941542-TSR0001) - Modification State 0 and 1

Testing over the frequency range 1 GHz to 25 GHz was performed with the EUT at Modification State 0

Testing over the frequency range 30 MHz to 1 GHz was performed with the EUT at Modification State 1

2.1.3 Date of Test

30-April-2018 to 19-June-2018

2.1.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.3, 6.5 and 6.6.

For frequencies > 1 GHz, plots for average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.3 to characterize the EUT. Where emissions were detected, final average measurements were taken in accordance with ANSI C63.10 clause 4.1.4.2.2.

The plots shown are the characterization of the EUT. The limits on the plots represent the general radiated field strength limits, (74/54 dBuV/m) The limits shown have been used as a threshold to determine where further measurements are necessary. Where results are within 10 dB of the limits shown on the plots, further investigation was carried out and reported in results tables.

The following conversion can be applied to convert from dBuV/m to uV/m:
 $10^{(\text{Field Strength in dBuV/m}/20)}$.

For frequencies > 18 GHz, the measurement distance was reduced to 1 meter and the limit line was increased by $20 \cdot \text{LOG}(3/1) = 9.54$ dB.

2.1.5 Environmental Conditions

Ambient Temperature	23.2 °C
Relative Humidity	58.0 %

2.1.6 Test Results

Battery Powered - 2.4 GHz SRD Transmitter

Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	EUT Orientation	Polarity
400.028	39.00	46.00	7.00	170	1.00	X	Horizontal
743.998	41.42	46.00	4.58	45	1.01	Y	Horizontal
791.996	39.89	46.00	6.11	51	1.01	Z	Horizontal
840.004	42.57	46.00	3.43	46	1.00	Z	Horizontal
887.994	42.85	46.00	3.15	135	1.00	Z	Horizontal
935.999	42.34	46.00	3.66	149	1.48	Z	Horizontal

Table 5 - 2402 MHz, 30 MHz to 1 GHz

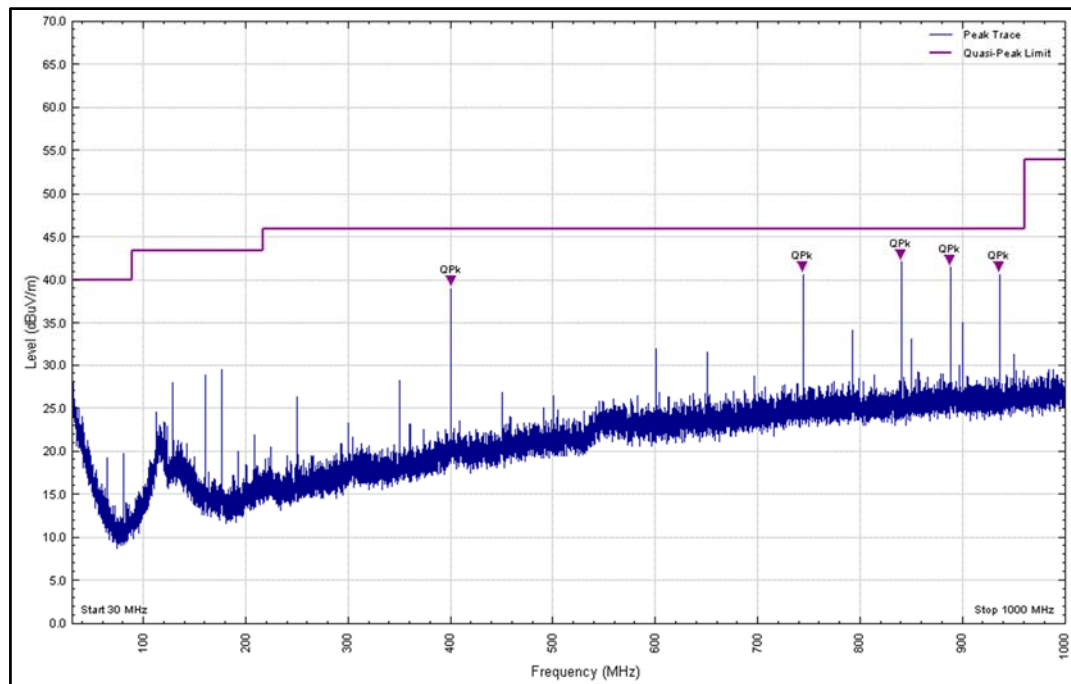


Figure 1 - 2402 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: X

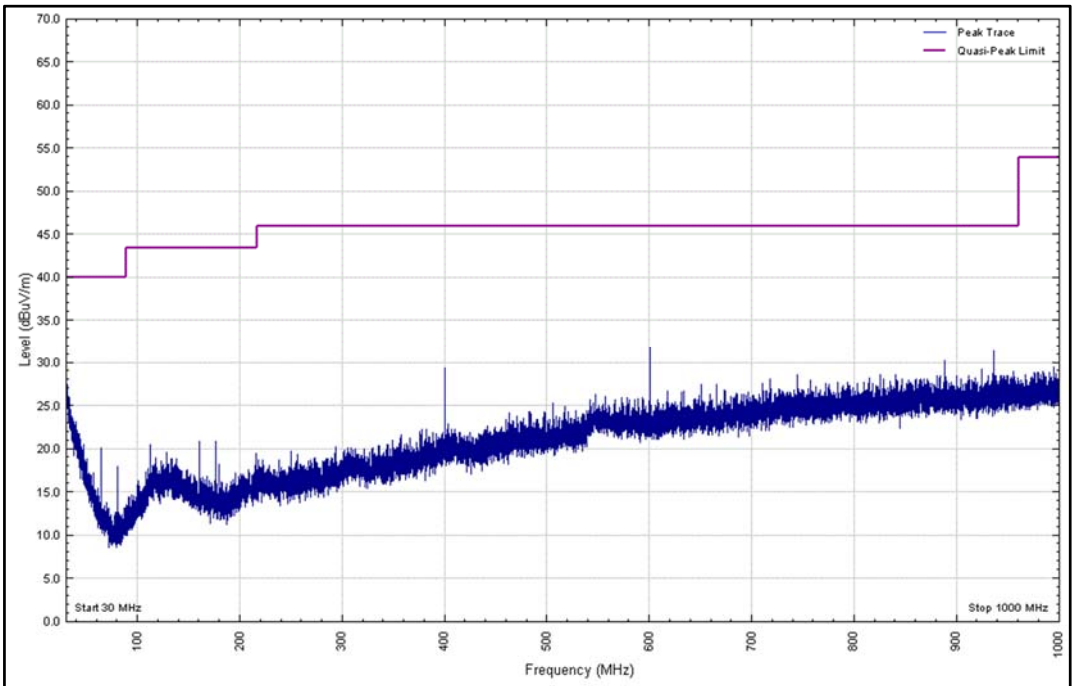


Figure 2 - 2402 MHz, 30 MHz to 1 GHz, Vertical, Orientation: X

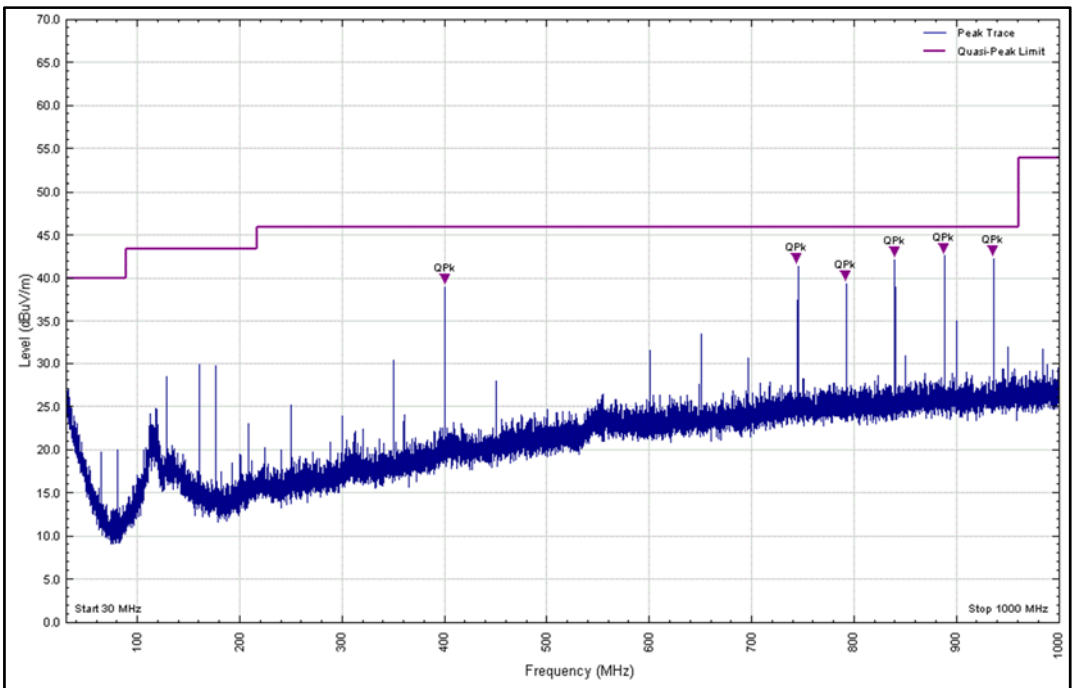


Figure 3 - 2402 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: Y

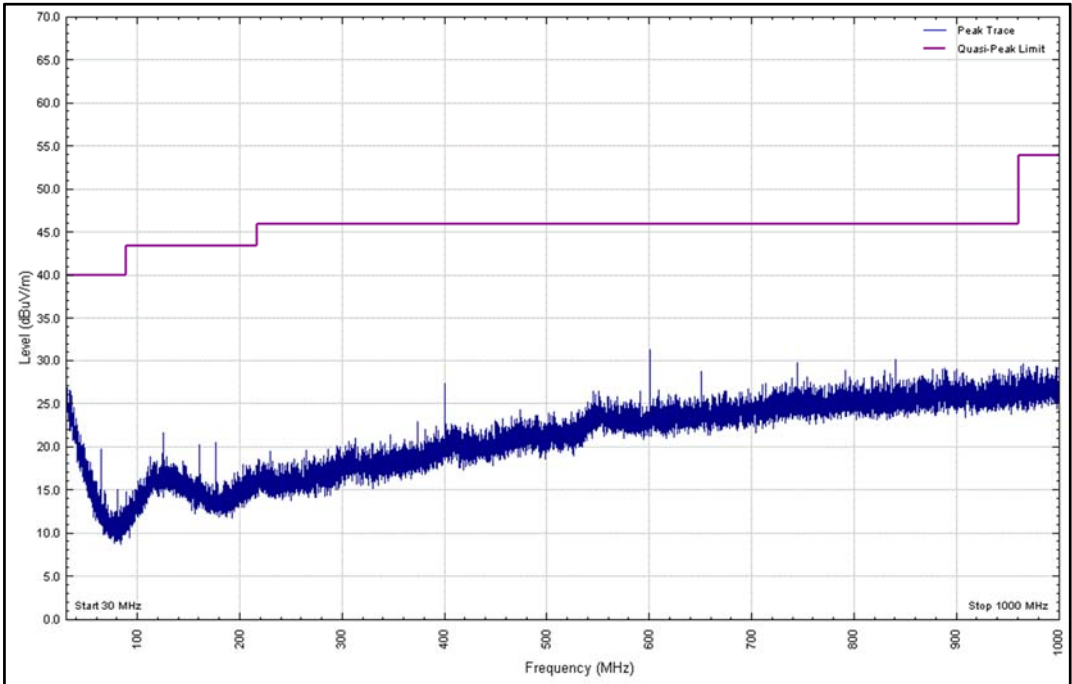


Figure 4 - 2402 MHz, 30 MHz to 1 GHz, Vertical, Orientation: Y

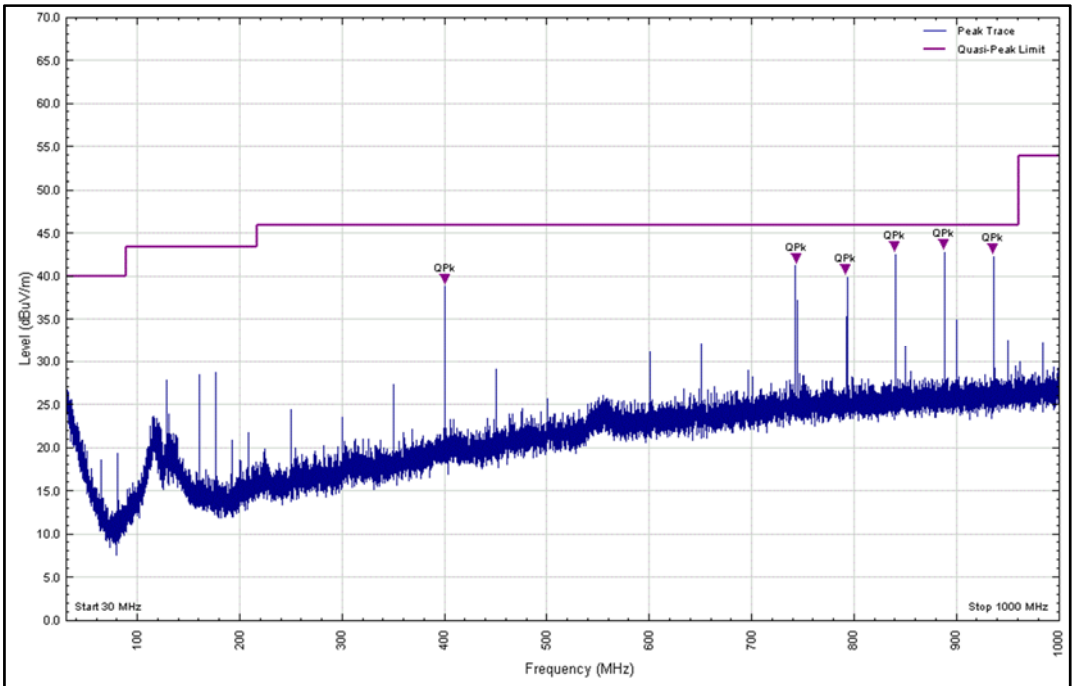


Figure 5 - 2402 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: Z

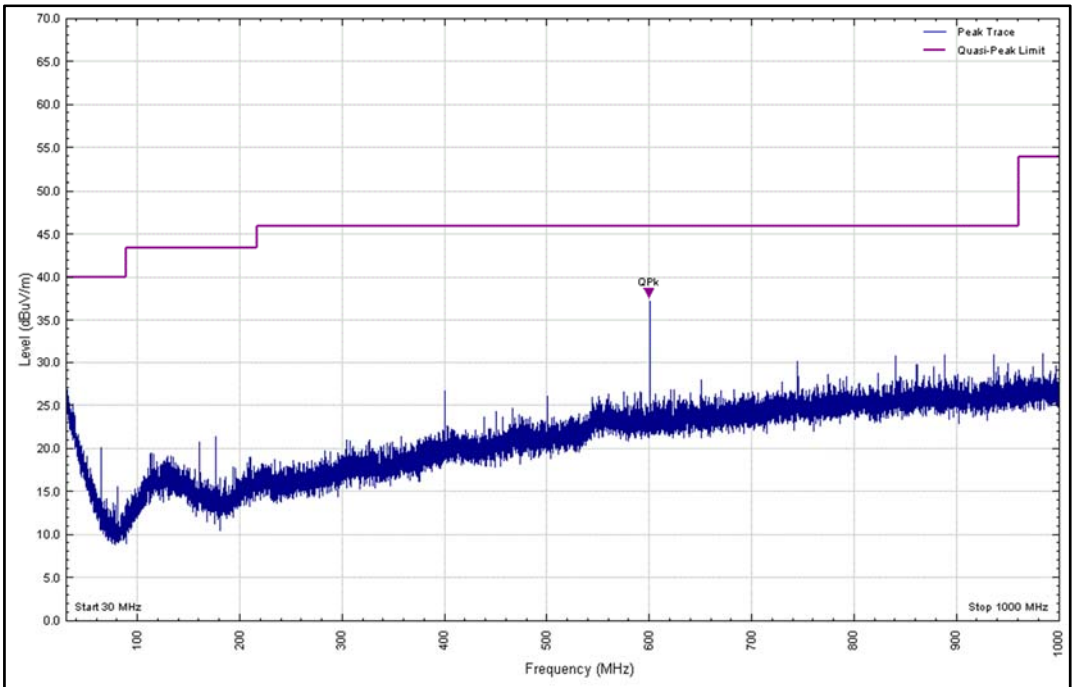


Figure 6 - 2402 MHz, 30 MHz to 1 GHz, Vertical, Orientation: Z



Frequency (MHz)	Result (dBµV/m)		Limit (dBµV/m)		Margin (dBµV/m)	
	Peak	Average	Peak	Average	Peak	Average
*						

Table 6 - 2402 MHz, 1 GHz to 25 GHz

*No emissions were detected within 10 dB of the limit.

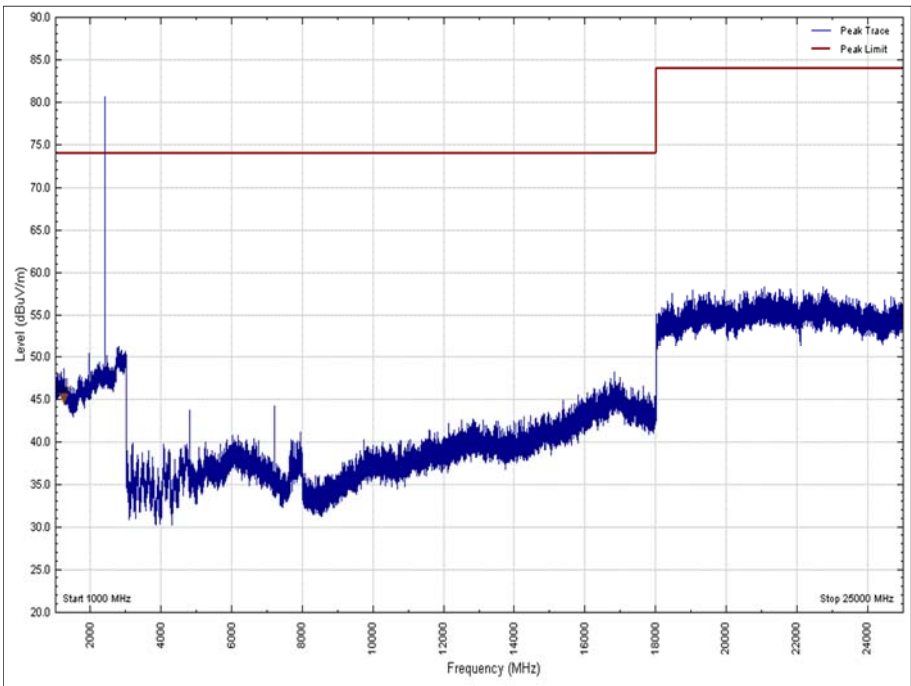


Figure 7 - 2402 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: X

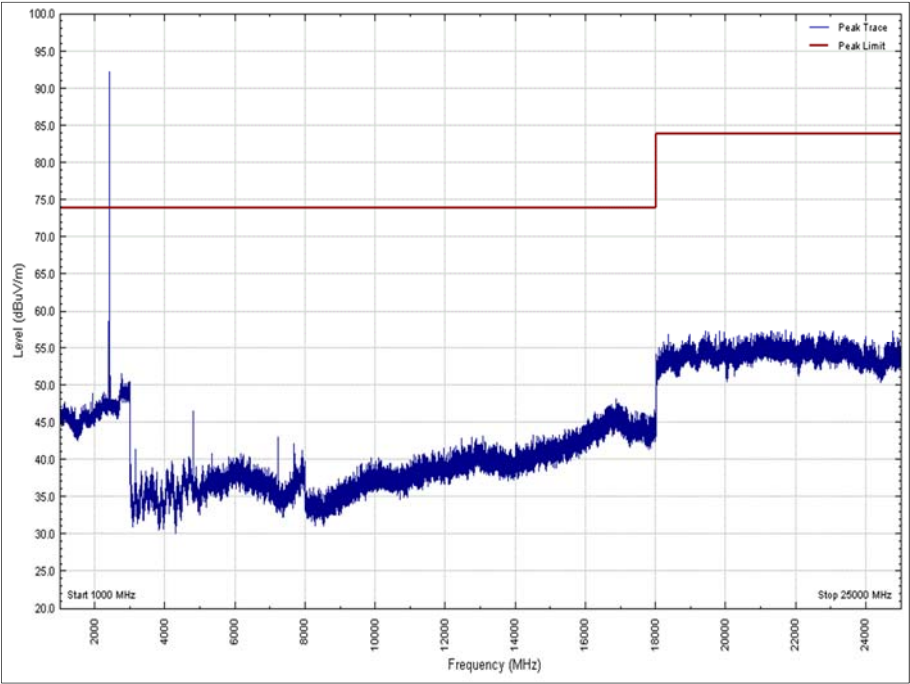


Figure 8 - 2402 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: X

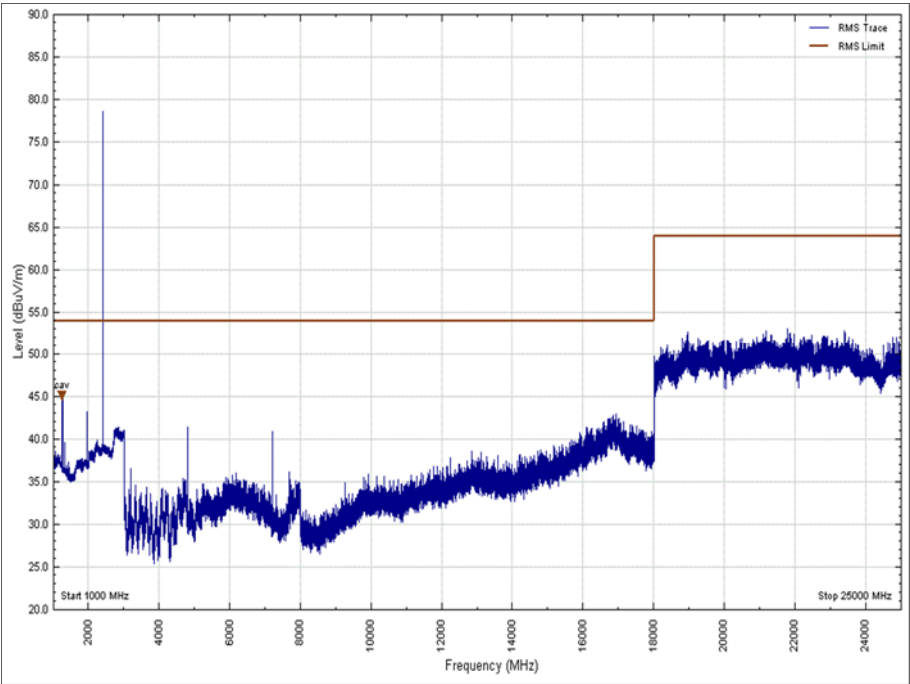


Figure 9 - 2402 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: X

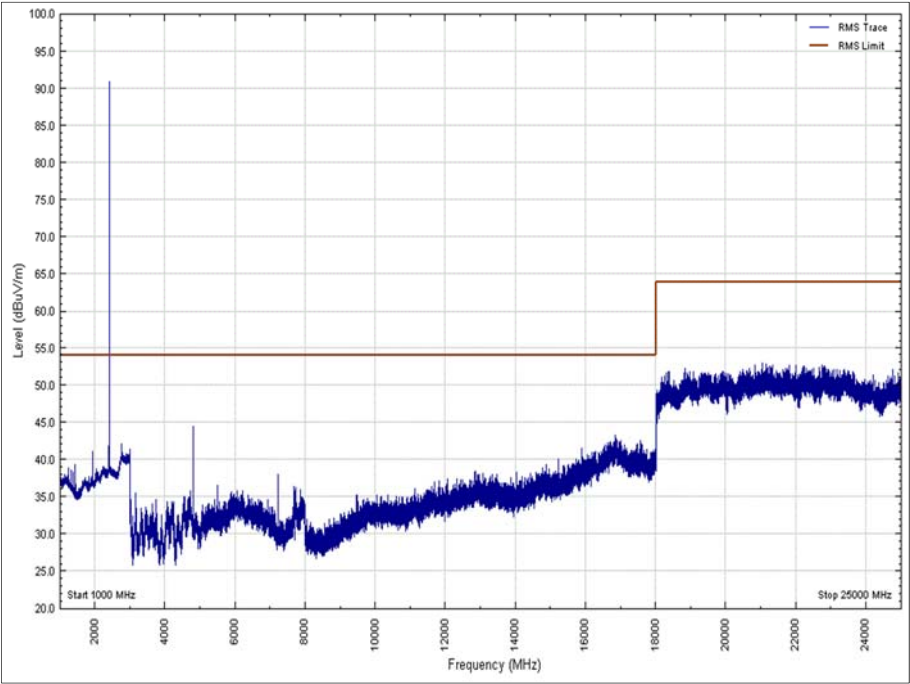


Figure 10 - 2402 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: X

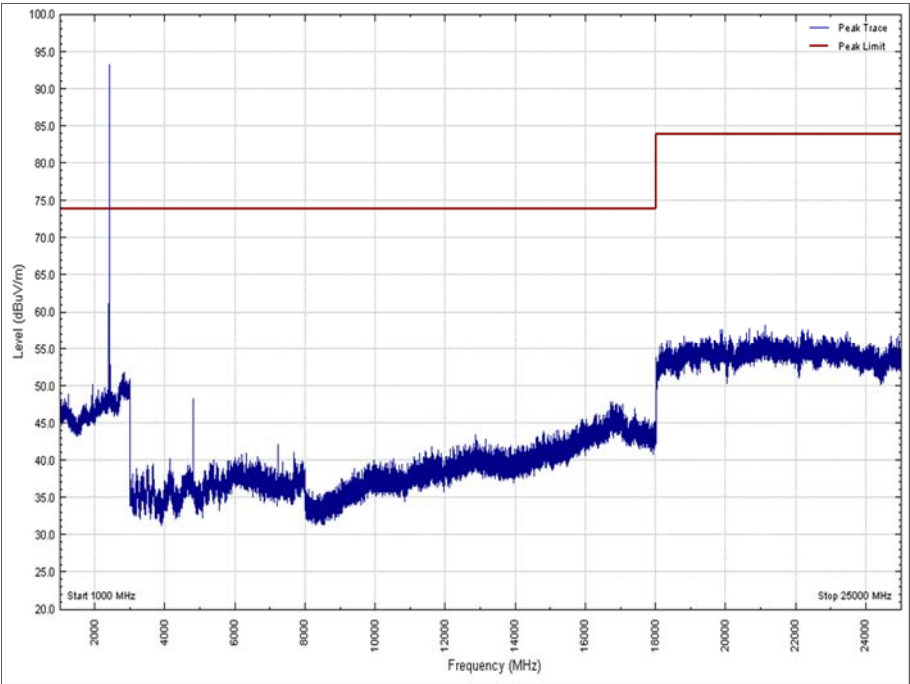


Figure 11 - 2402 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Y

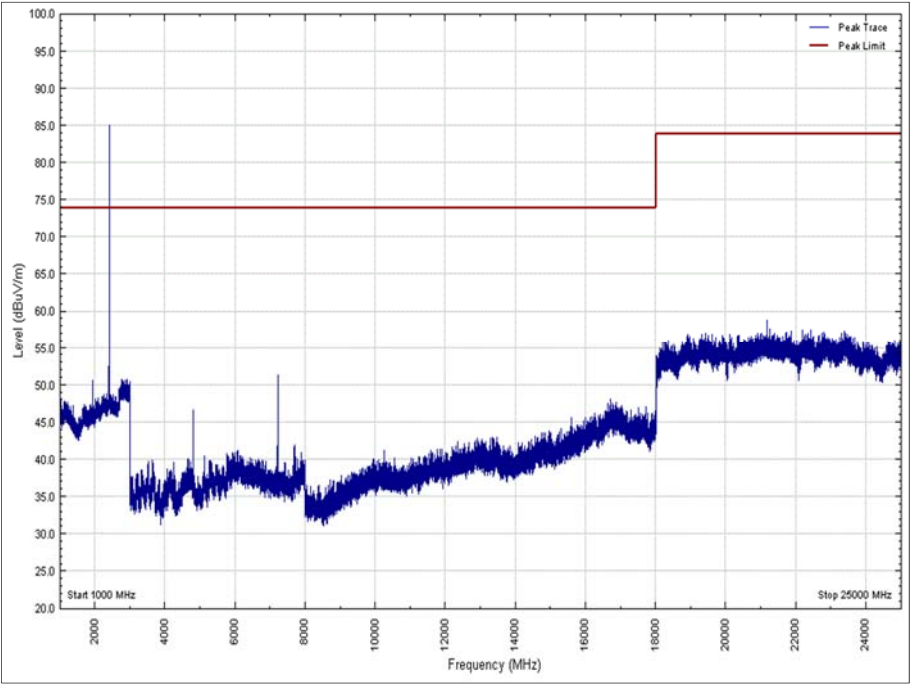


Figure 12 - 2402 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Y

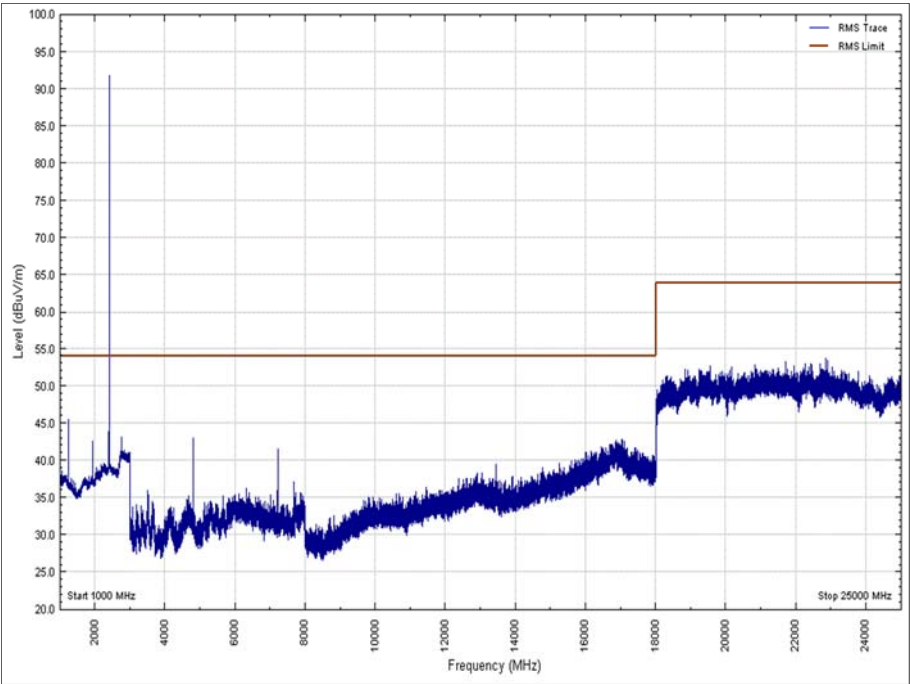


Figure 13 - 2402 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: Y

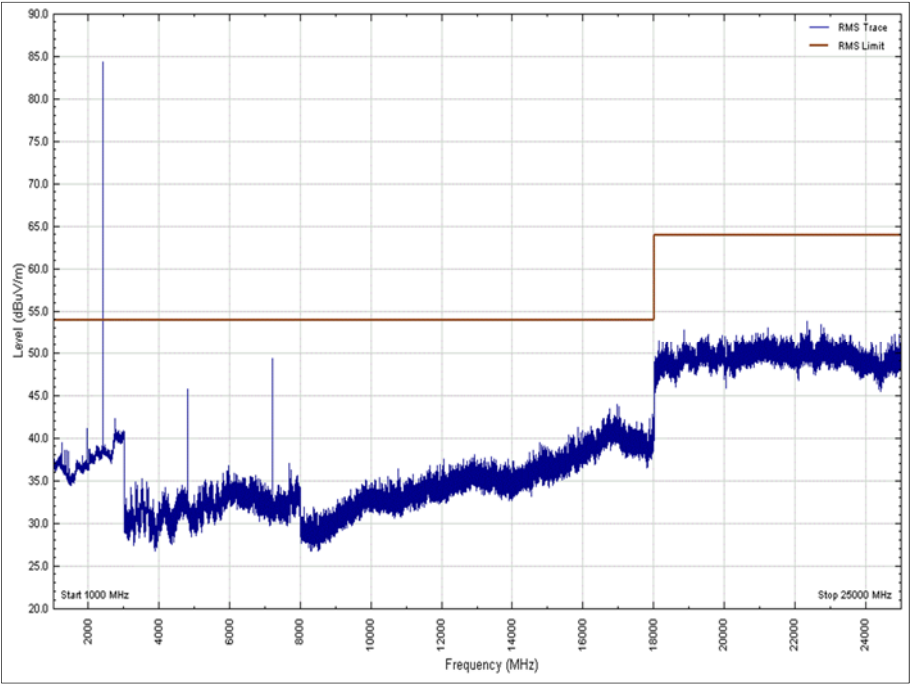


Figure 14 - 2402 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: Y

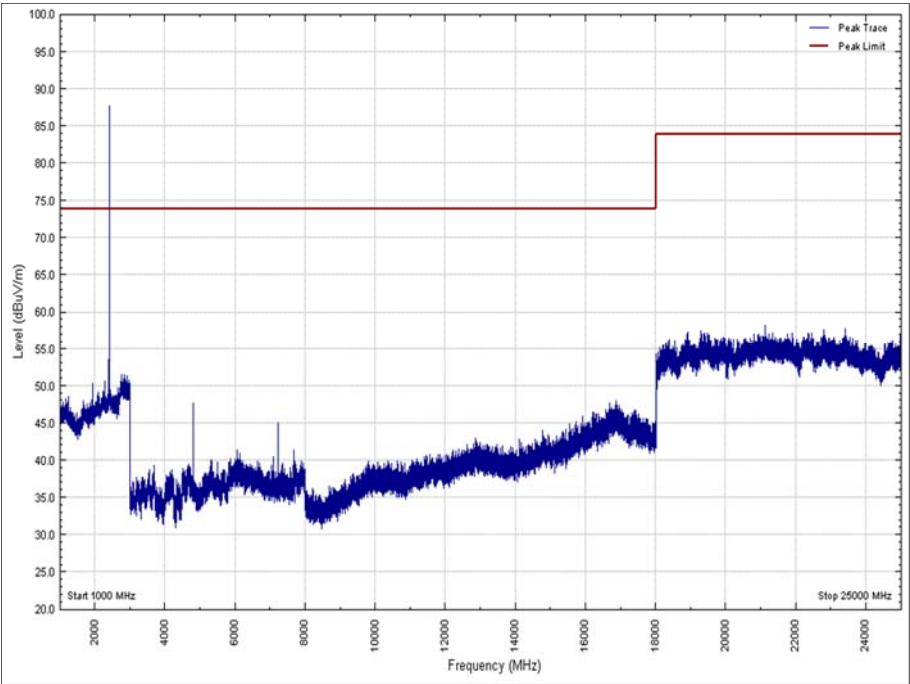


Figure 15 - 2402 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Z

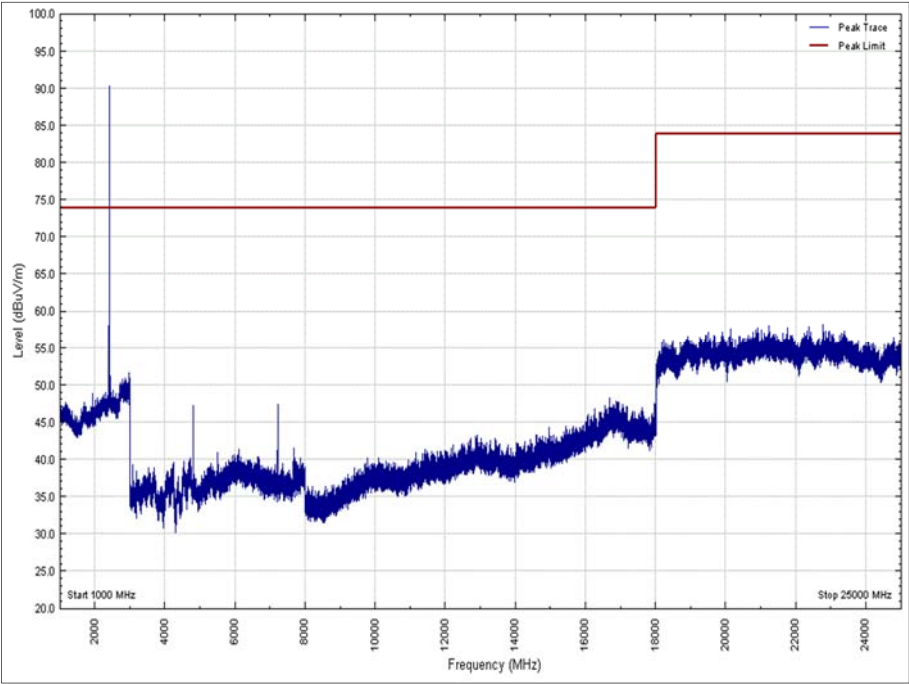


Figure 16 - 2402 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Z

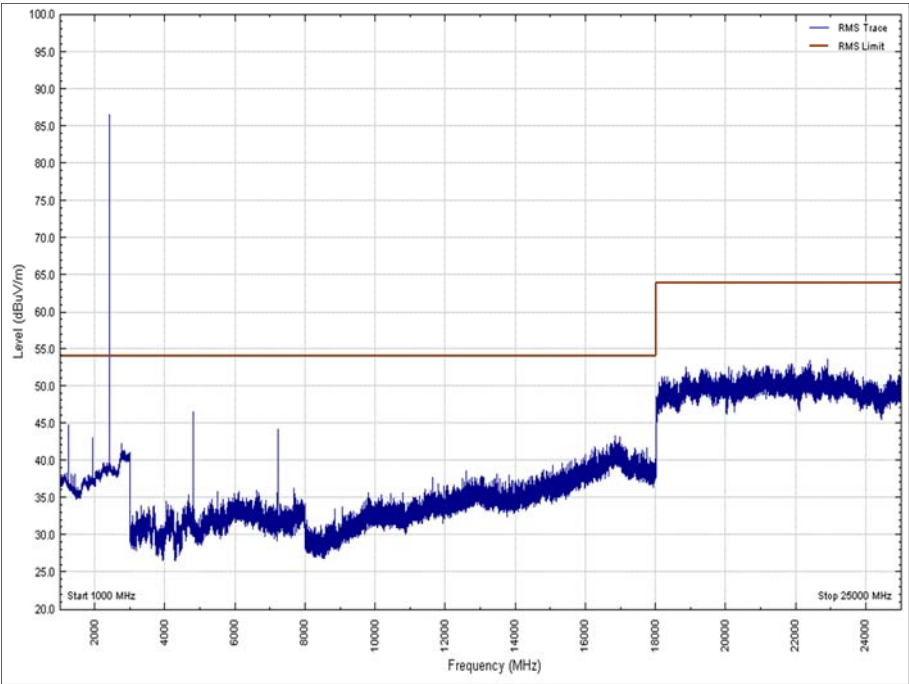


Figure 17 - 2402 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: Z

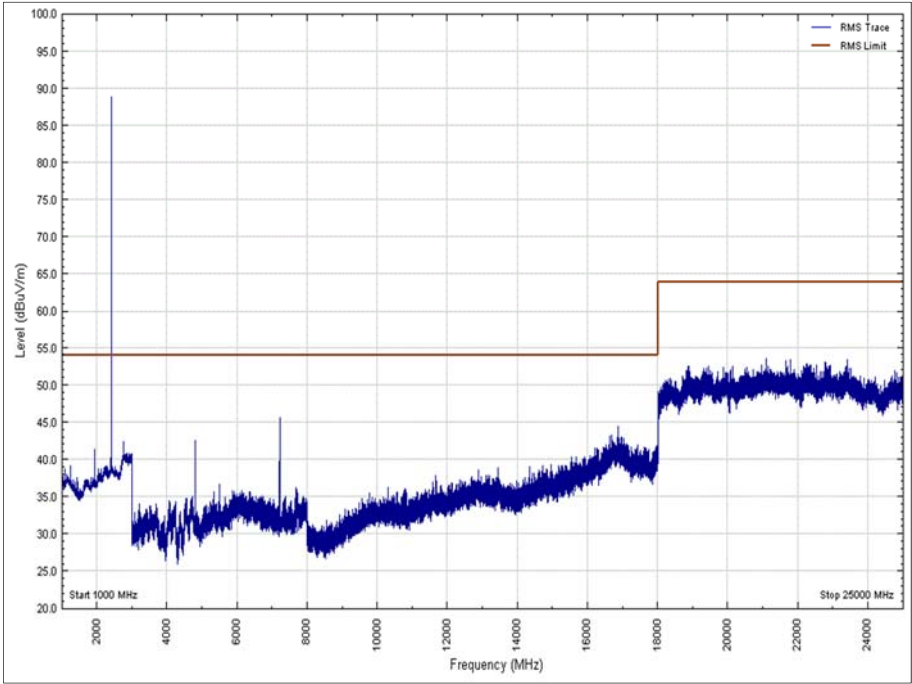


Figure 18 - 2402 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: Z



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	EUT Orientation	Polarity
743.999	41.50	46.00	4.50	35	1.08	X	Horizontal
791.999	39.97	46.00	6.03	38	1.00	Z	Horizontal
840.001	42.63	46.00	3.37	142	1.00	Z	Horizontal
888.002	43.20	46.00	2.80	136	1.00	Z	Horizontal
900.063	40.40	46.00	5.60	130	1.00	Y	Horizontal
936.005	43.16	46.00	2.84	125	1.45	Y	Horizontal

Table 7 - 2440 MHz, 30 MHz to 1 GHz

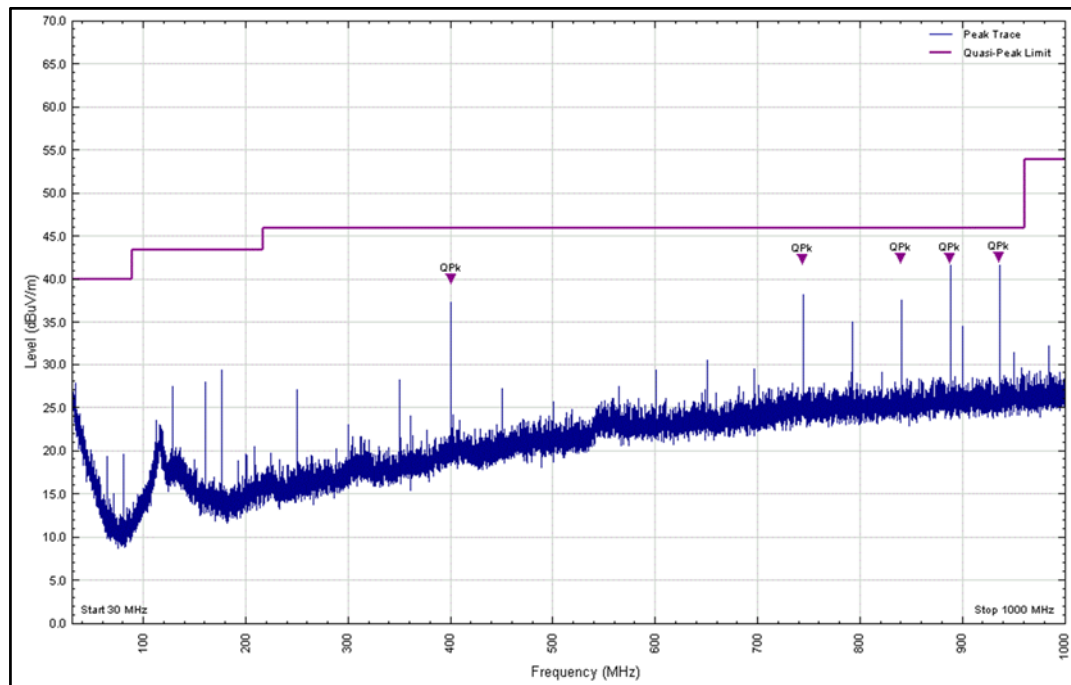


Figure 19 - 2440 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: X

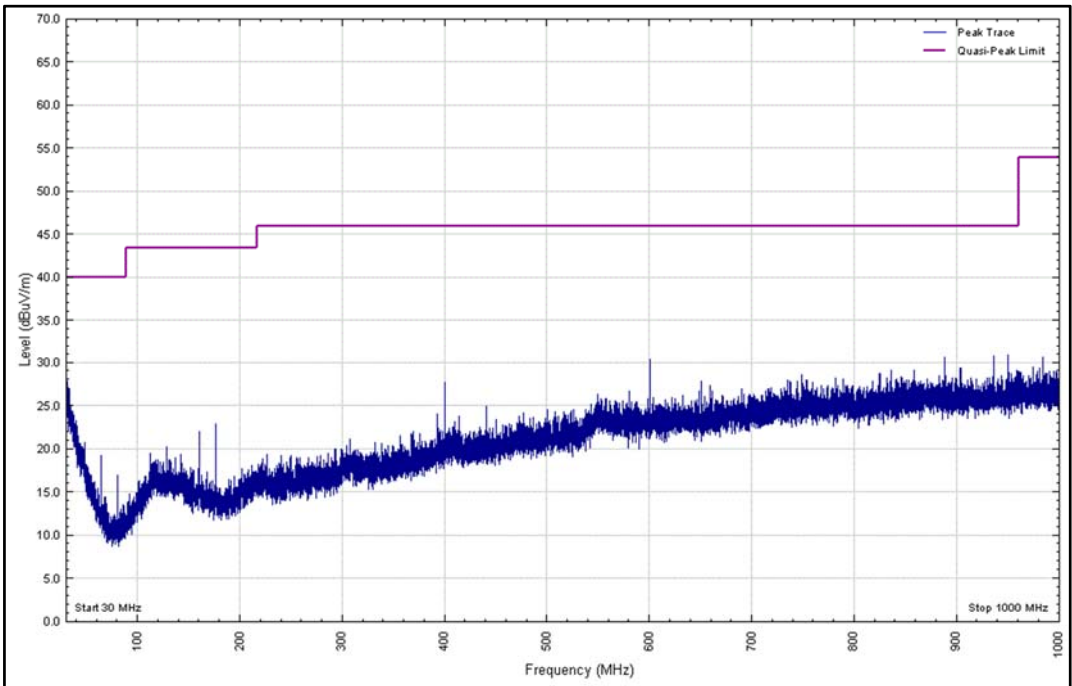


Figure 20 - 2440 MHz, 30 MHz to 1 GHz, Vertical, Orientation: X

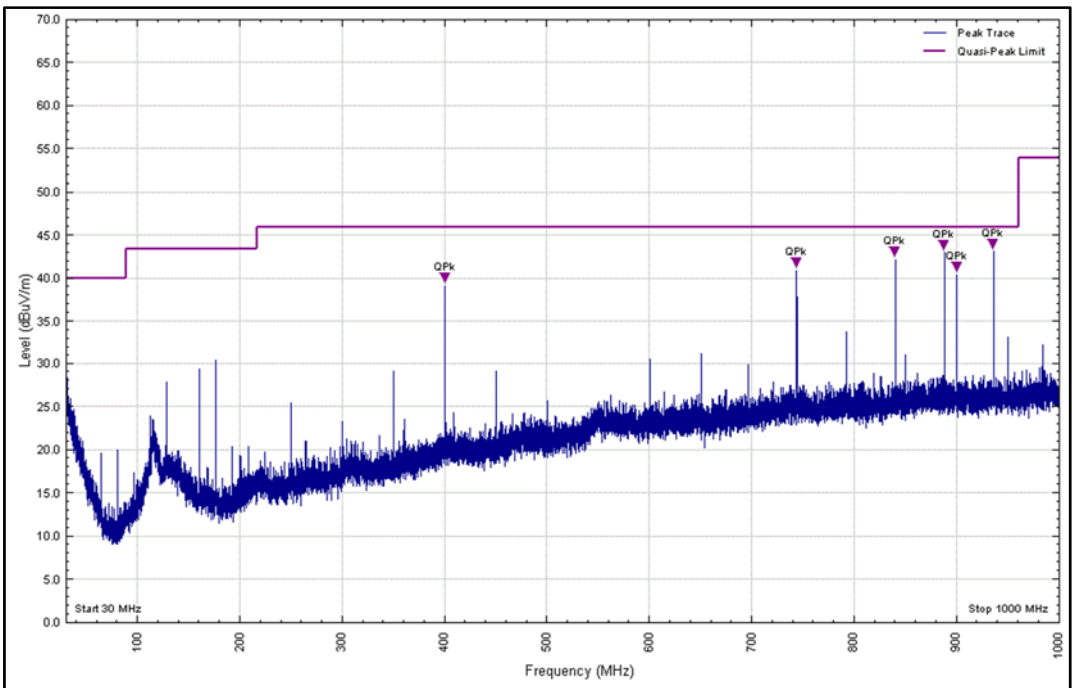


Figure 21 - 2440 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: Y

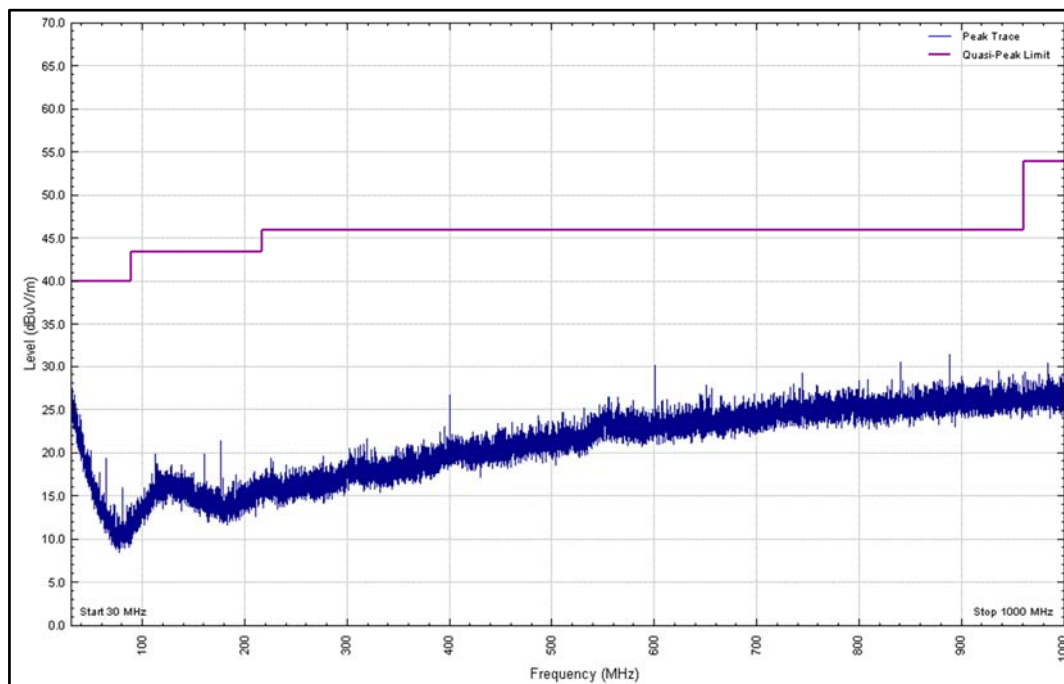


Figure 22 - 2440 MHz, 30 MHz to 1 GHz, Vertical, Orientation: Y

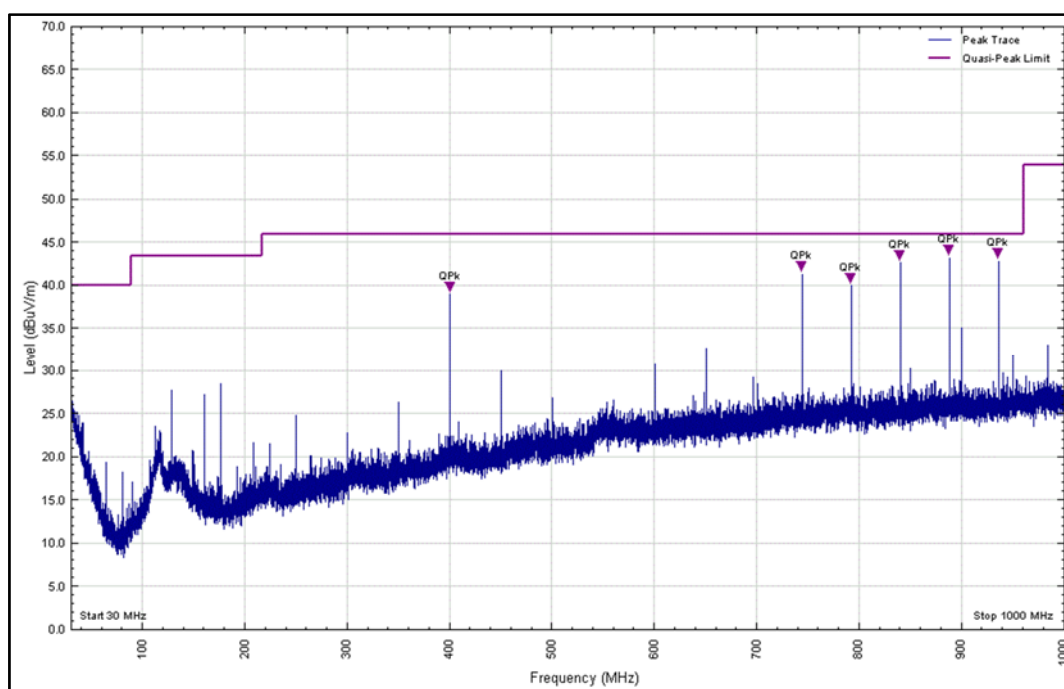


Figure 23 - 2440 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: Z

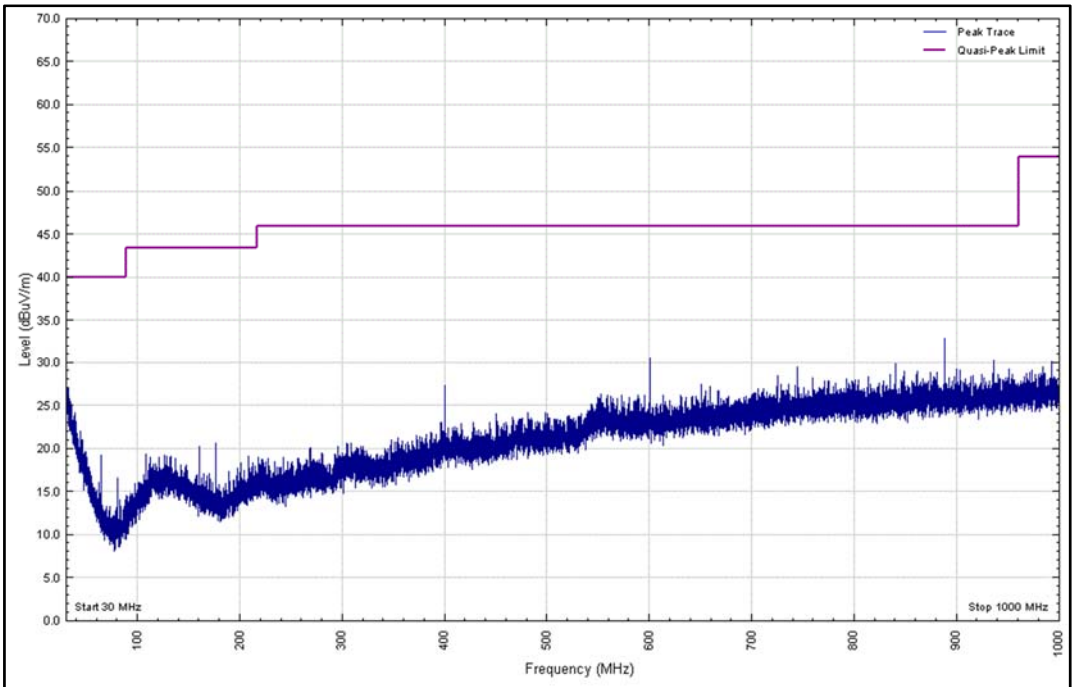


Figure 24 - 2440 MHz, 30 MHz to 1 GHz, Vertical, Orientation: Z



Frequency (MHz)	Result (dB μ V/m)		Limit (dB μ V/m)		Margin (dB μ V/m)	
	Peak	Average	Peak	Average	Peak	Average
*						

Table 8 - 2440 MHz, 1 GHz to 25 GHz

*No emissions were detected within 10 dB of the limit.

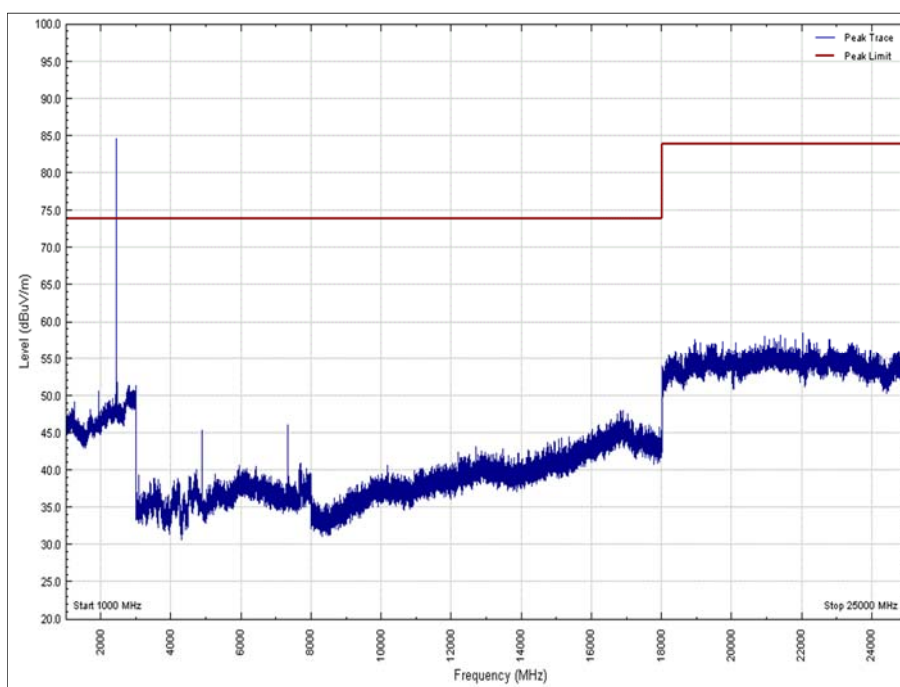


Figure 25 - 2440 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: X

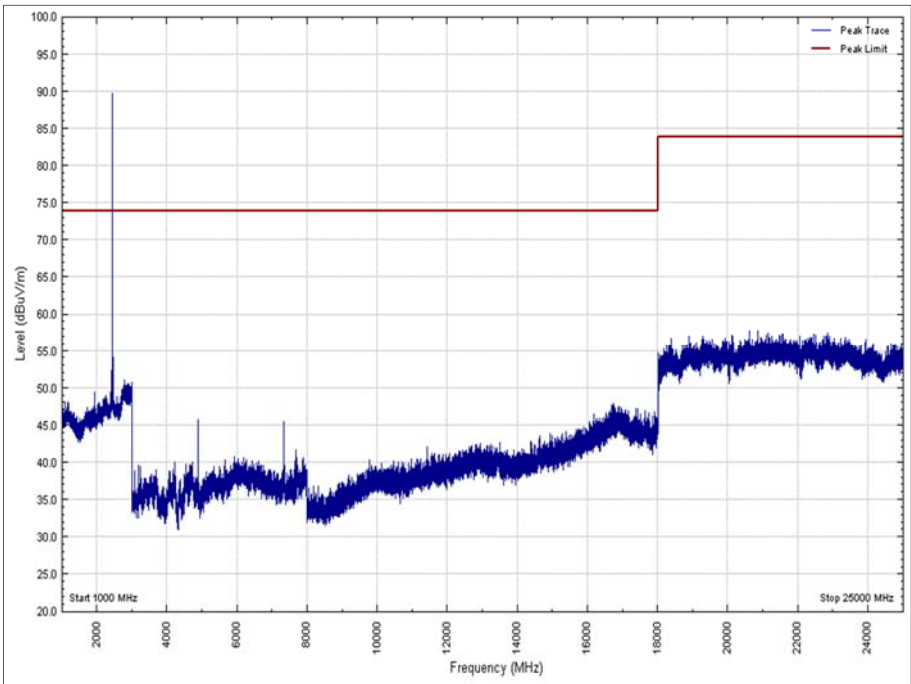


Figure 26 - 2440 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: X

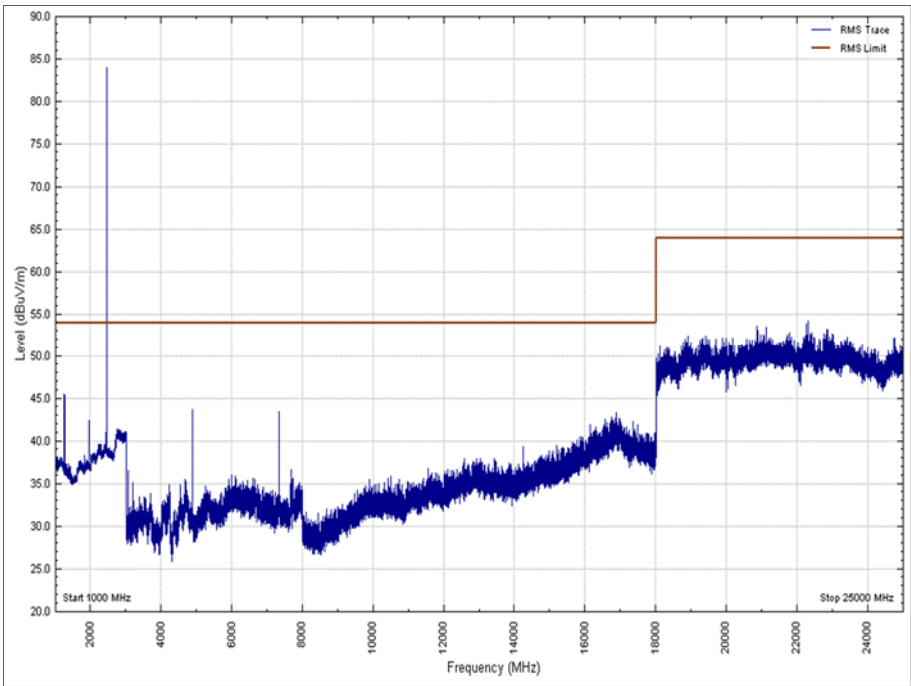


Figure 27 - 2440 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: X

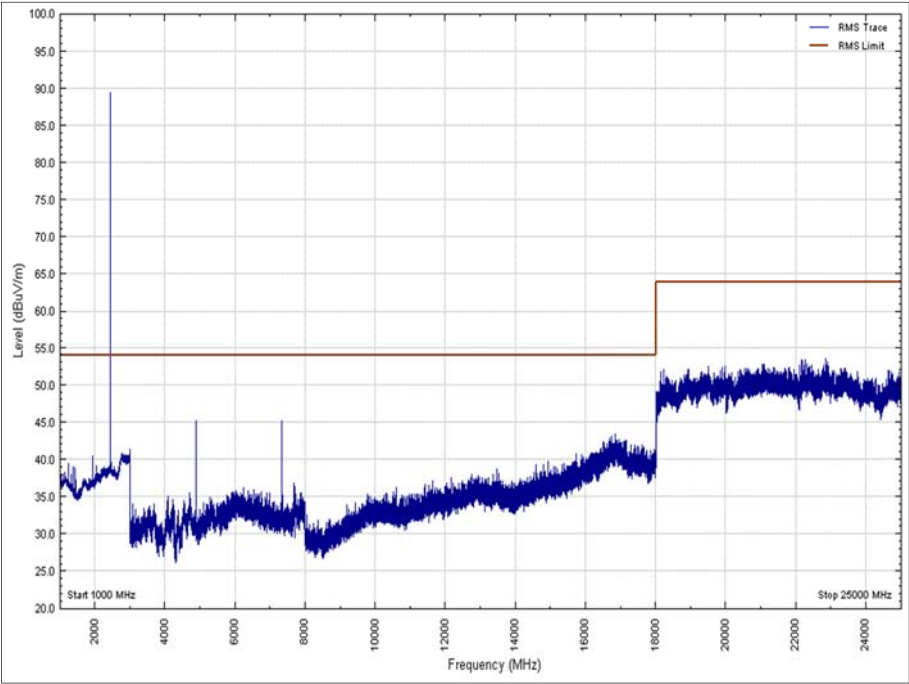


Figure 28 - 2440 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: X

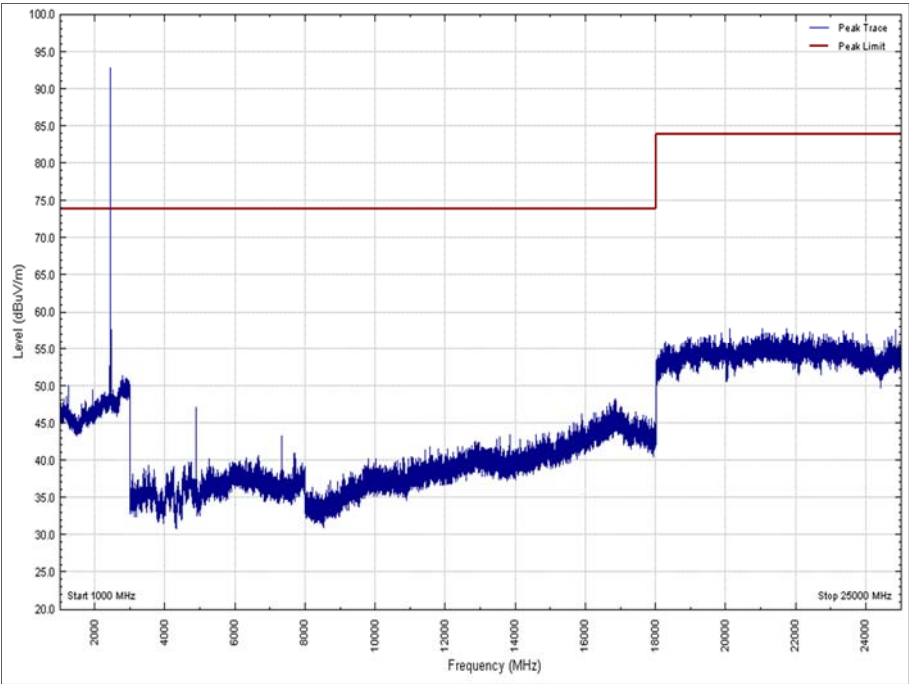


Figure 29 - 2440 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Y

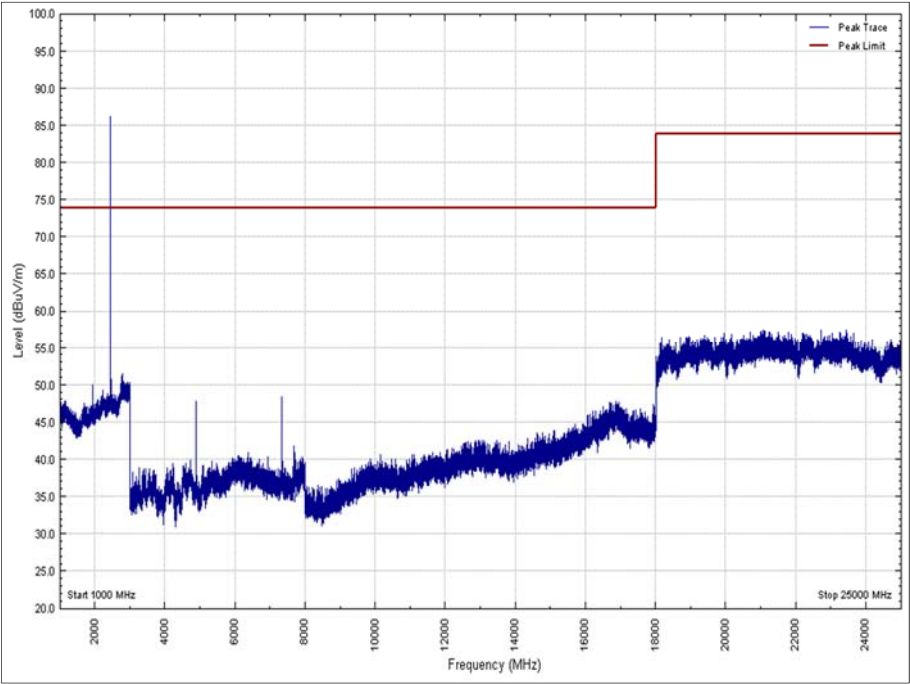


Figure 30 - 2440 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Y

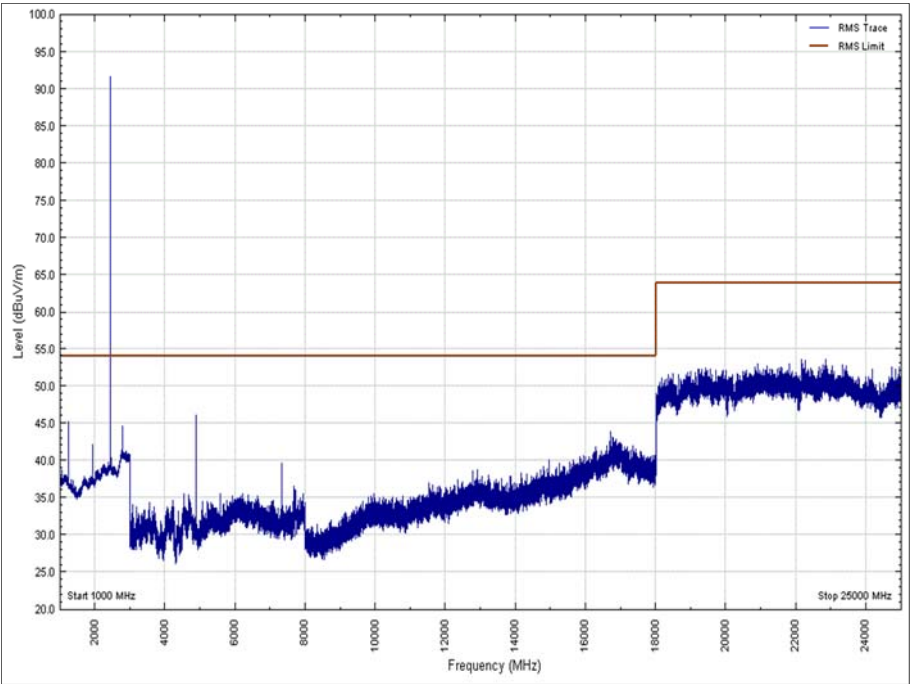


Figure 31 - 2440 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: Y

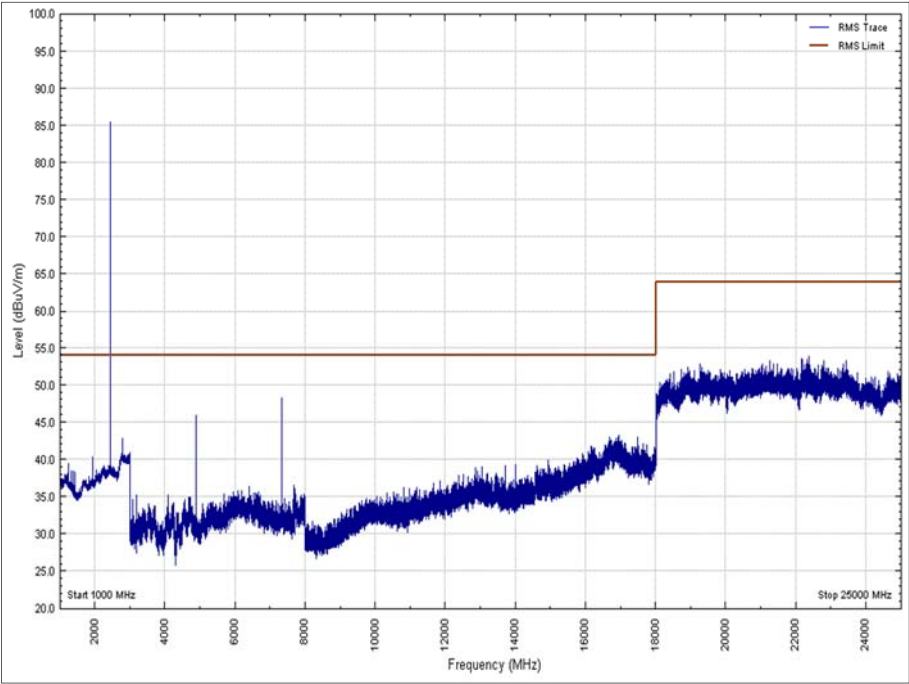


Figure 32 - 2440 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: Y

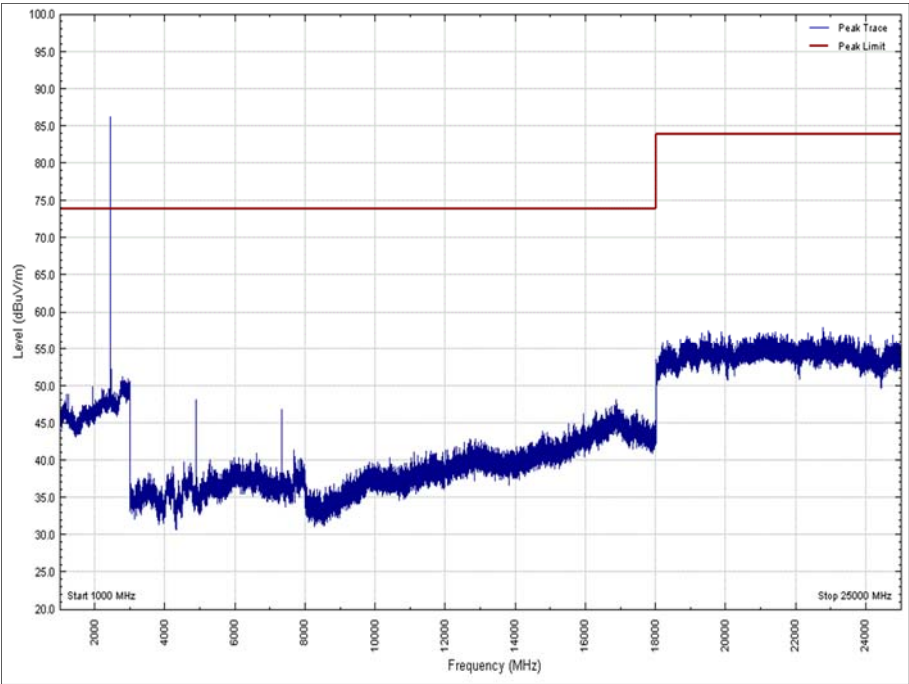


Figure 33 - 2440 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Z

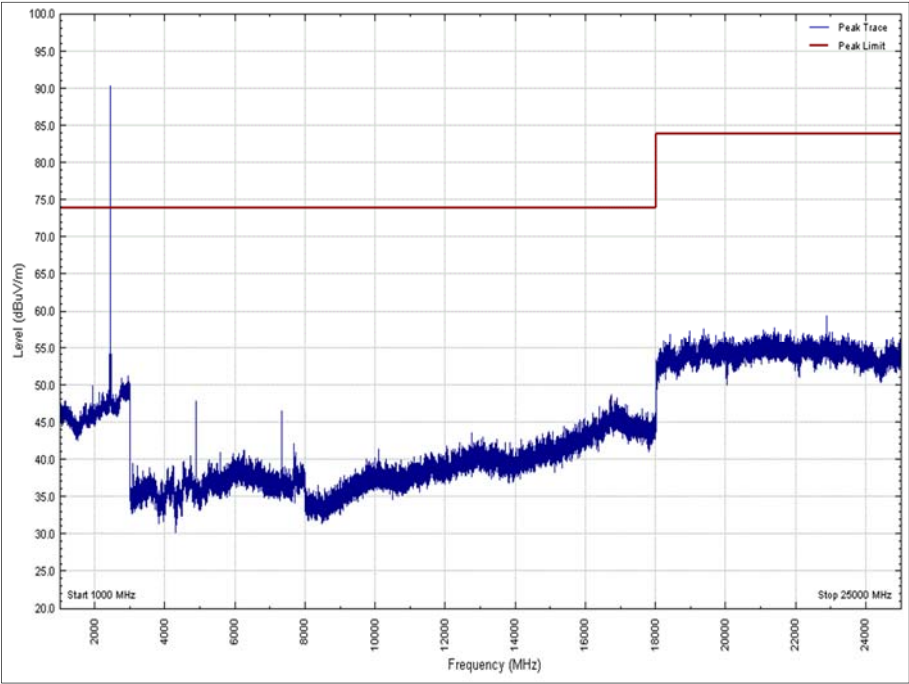


Figure 34 - 2440 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Z

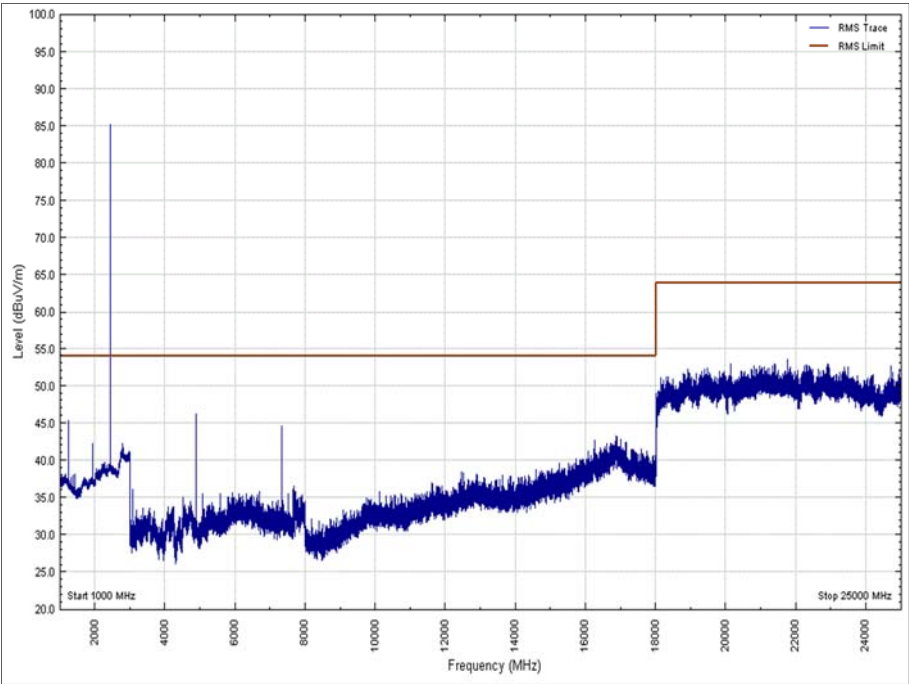


Figure 35 - 2440 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Z

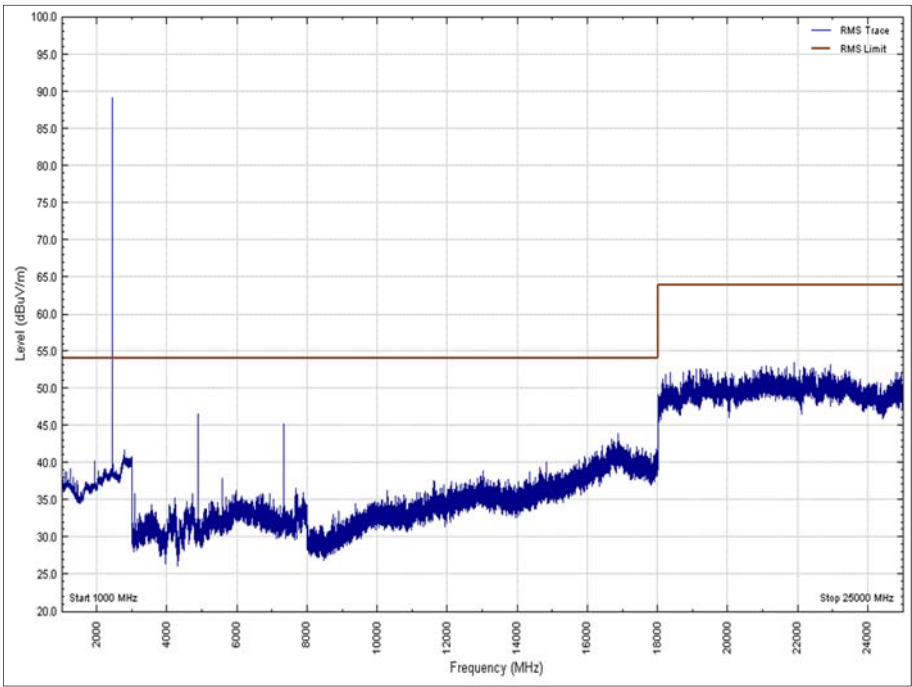


Figure 36 - 2440 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Z



Frequency (MHz)	QP Level (dBuV/m)	QP Limit (dBuV/m)	QP Margin (dBuV/m)	Angle(Deg)	Height(m)	EUT Orientation	Polarity
400.035	39.21	46.00	6.79	17	1.00	Y	Horizontal
744.005	41.35	46.00	4.65	37	1.06	X	Horizontal
840.002	43.11	46.00	2.89	46	1.00	Z	Horizontal
888.010	42.66	46.00	3.34	135	1.00	Y	Horizontal
900.067	40.59	46.00	5.41	133	1.00	Y	Horizontal
936.001	42.33	46.00	3.67	143	1.51	Y	Horizontal

Table 9 - 2480 MHz, 30 MHz to 1 GHz, Vertical

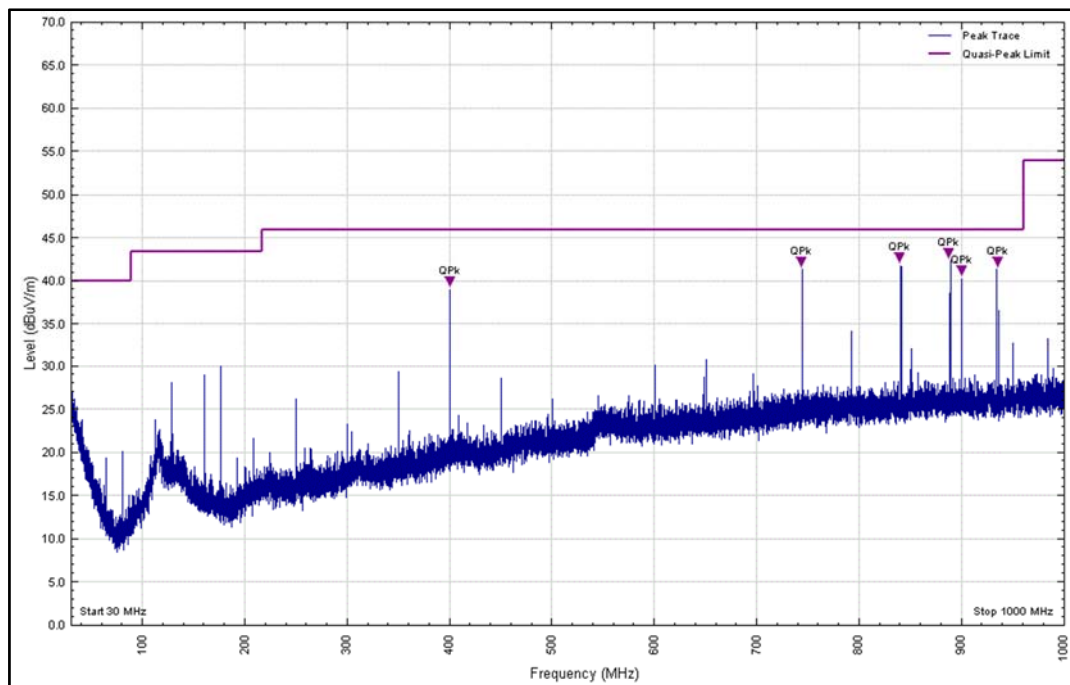


Figure 37 - 2440 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: X

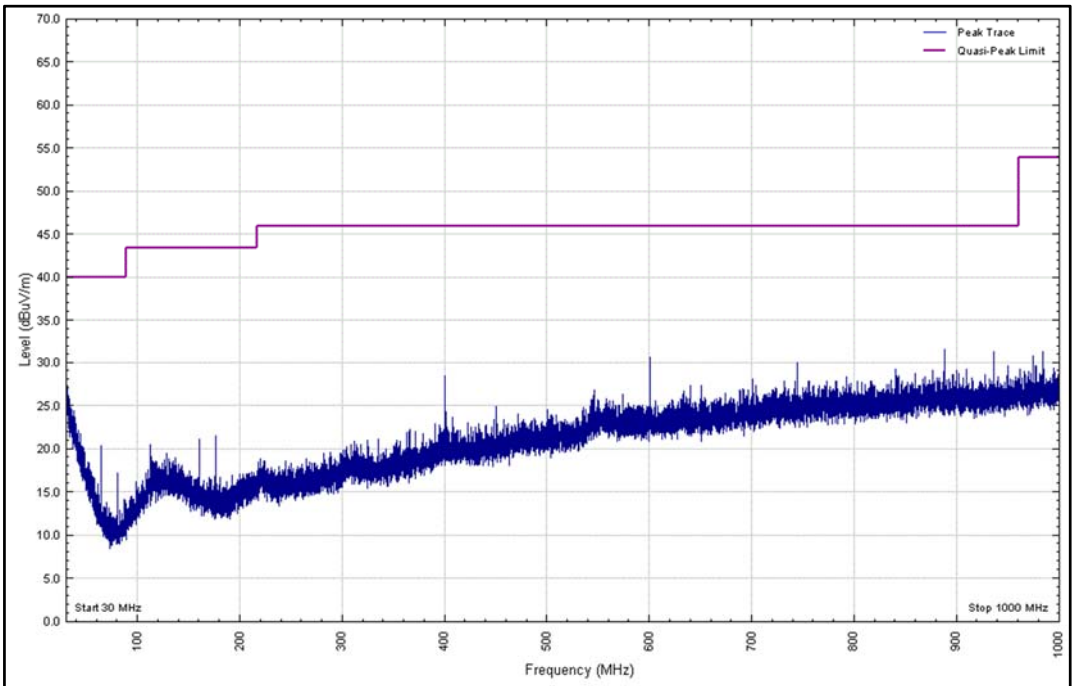


Figure 38 - 2440 MHz, 30 MHz to 1 GHz, Vertical, Orientation: X

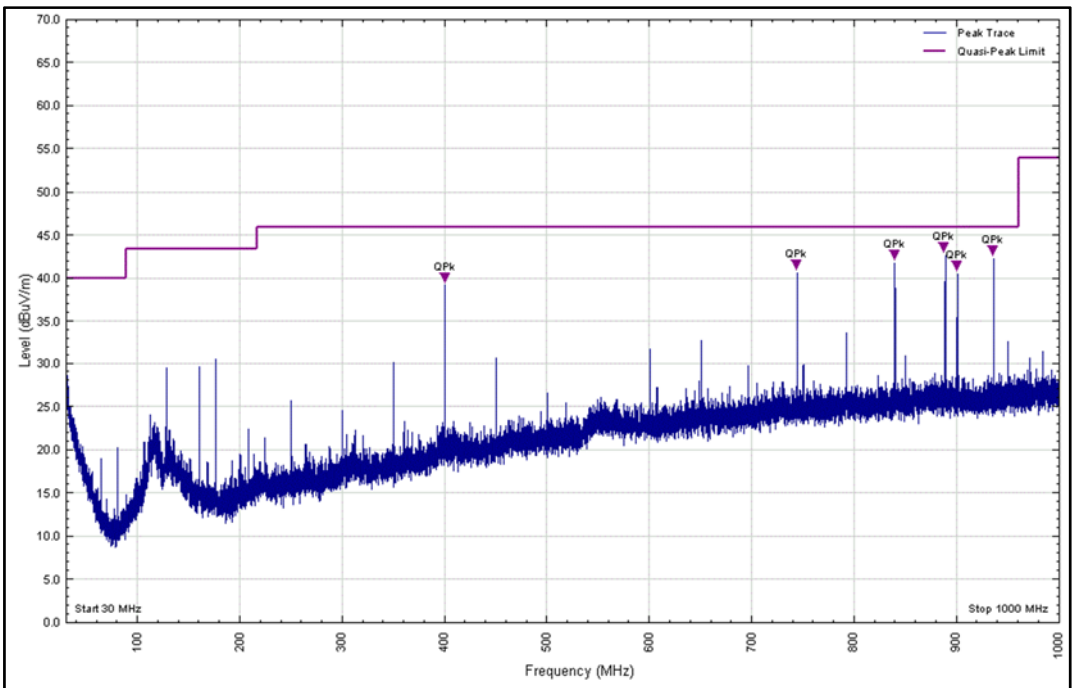


Figure 39 - 2440 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: Y

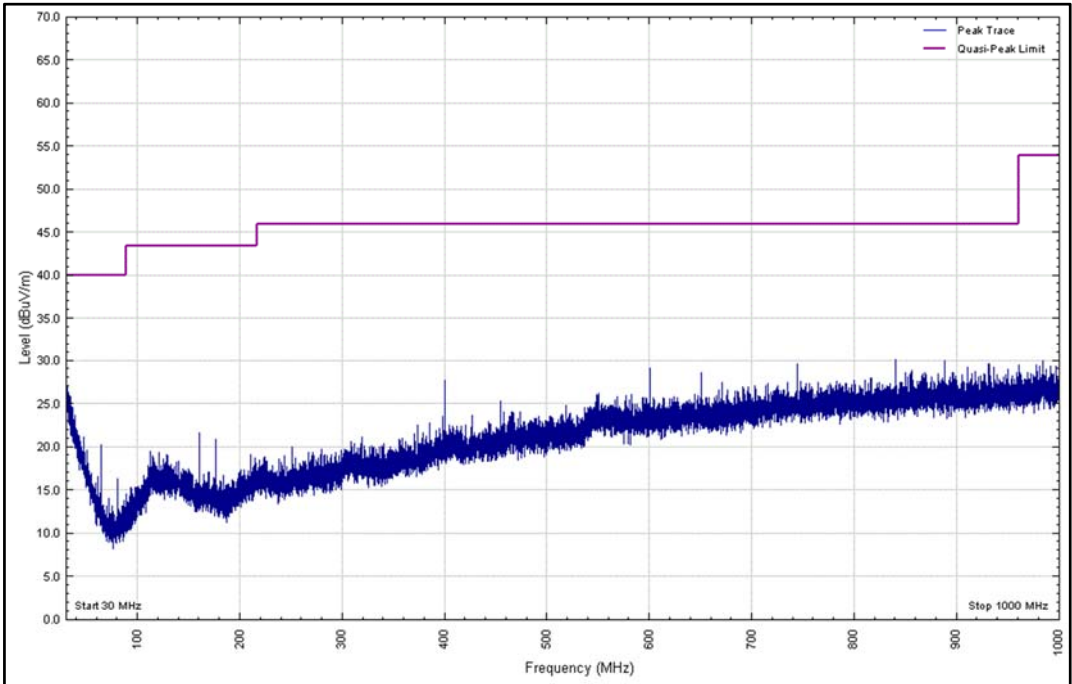


Figure 40 - 2440 MHz, 30 MHz to 1 GHz, Vertical, Orientation: Y

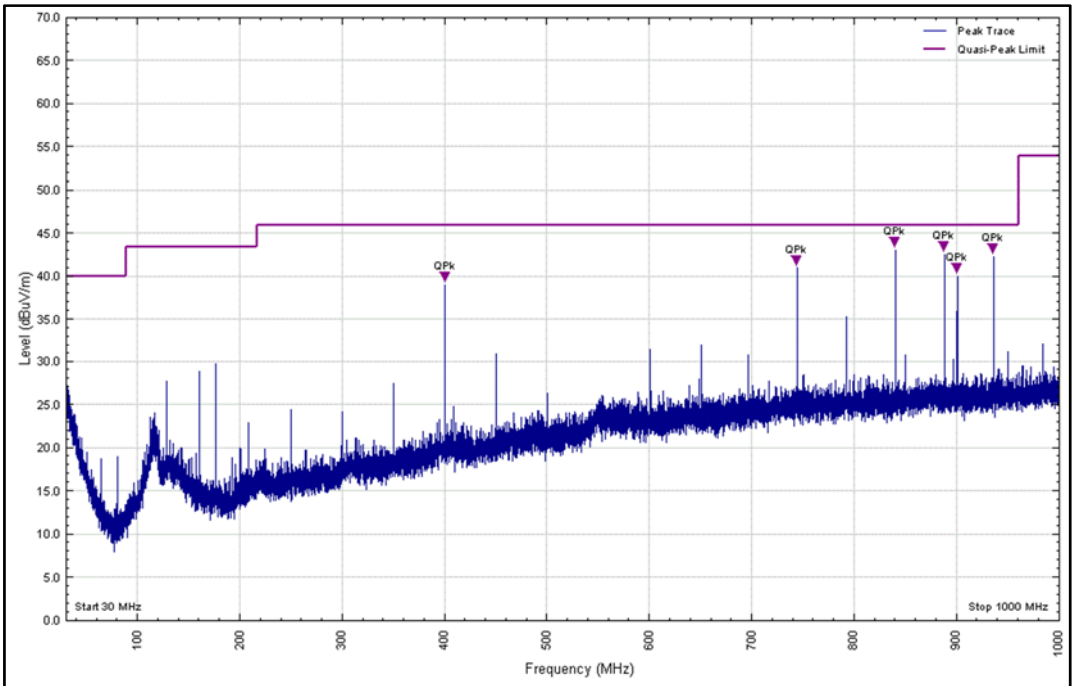


Figure 41 - 2440 MHz, 30 MHz to 1 GHz, Horizontal, Orientation: Z

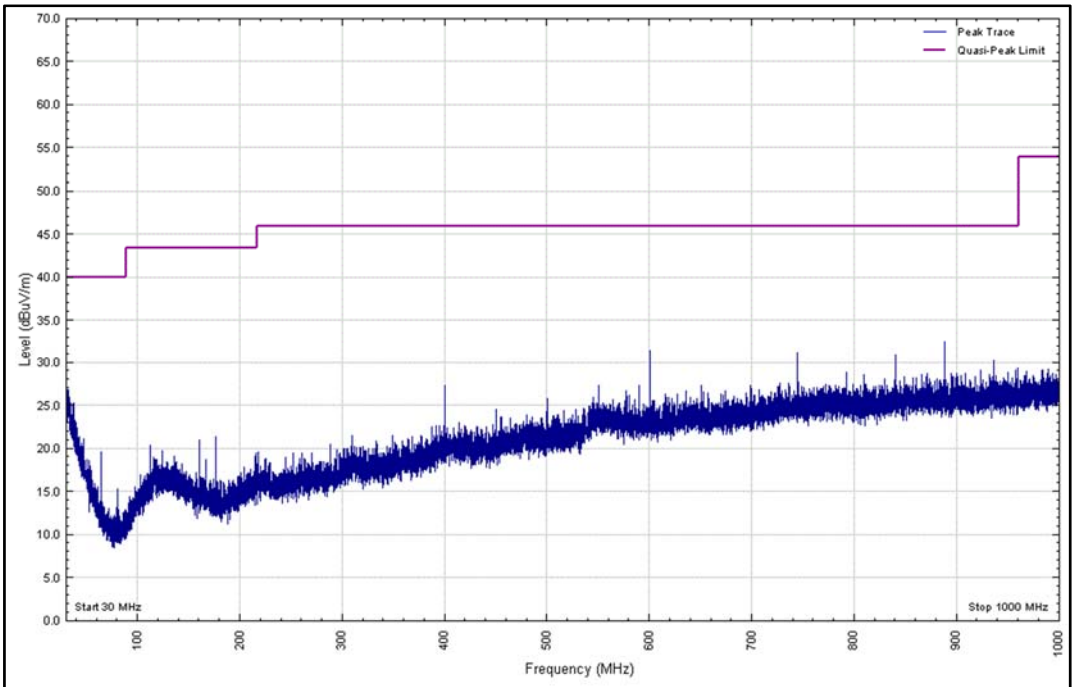


Figure 42 - 2440 MHz, 30 MHz to 1 GHz, Vertical, Orientation: Z



Frequency (MHz)	Result (dBµV/m)		Limit (dBµV/m)		Margin (dBµV/m)	
	Peak	Average	Peak	Average	Peak	Average
*						

Table 10 - 2480 MHz, 1 GHz to 25 GHz

*No emissions were detected within 10 dB of the limit.

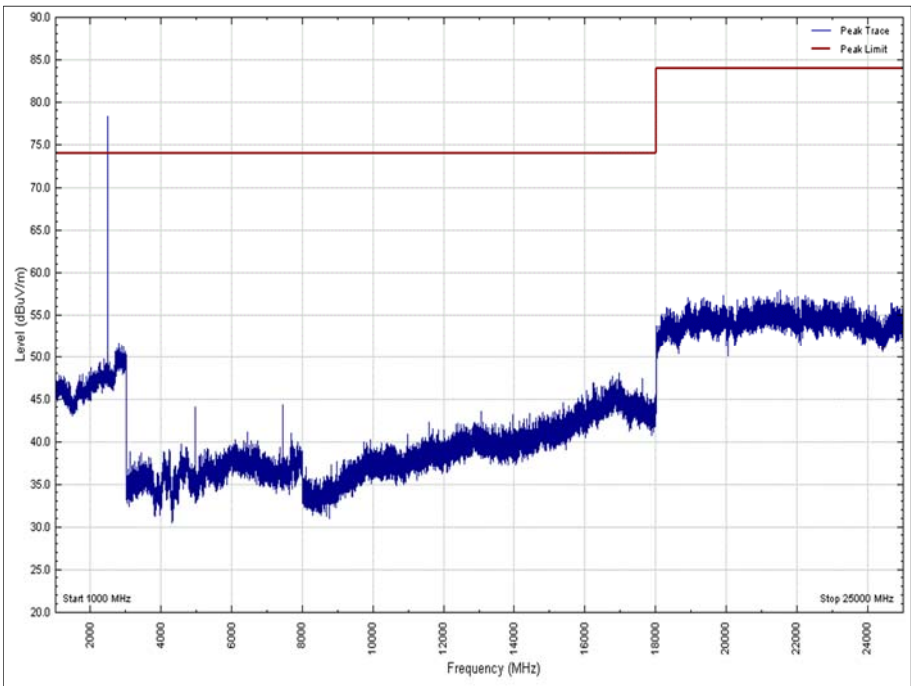


Figure 43 - 2480 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: X

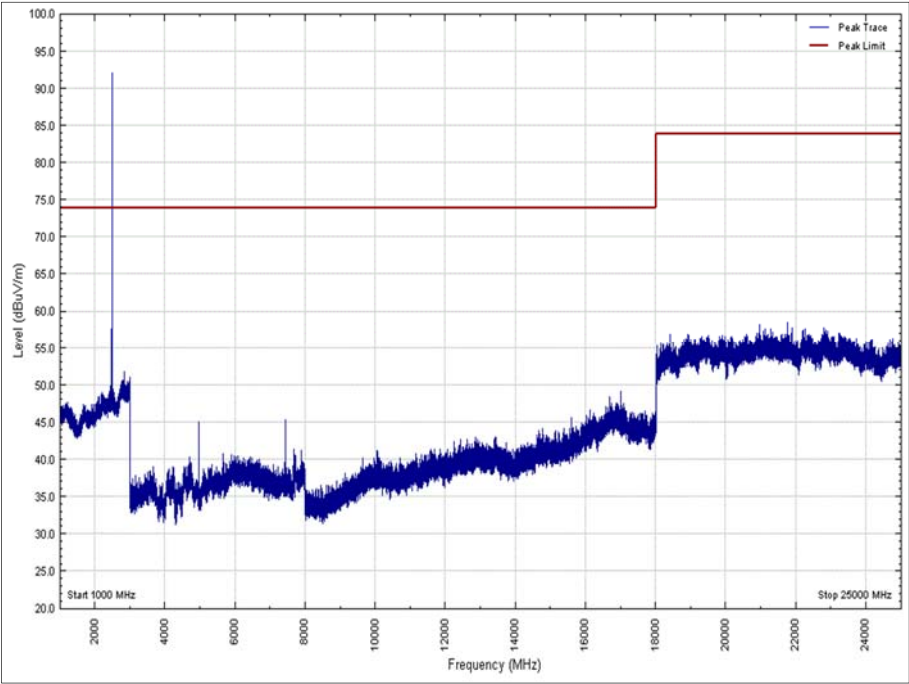


Figure 44 - 2480 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: X

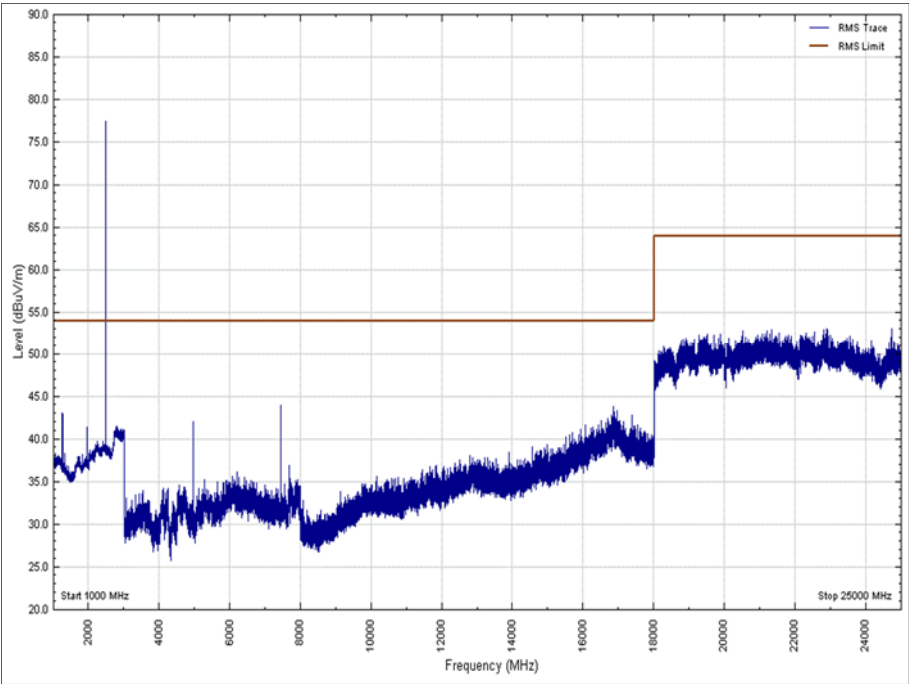


Figure 45 - 2480 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: X

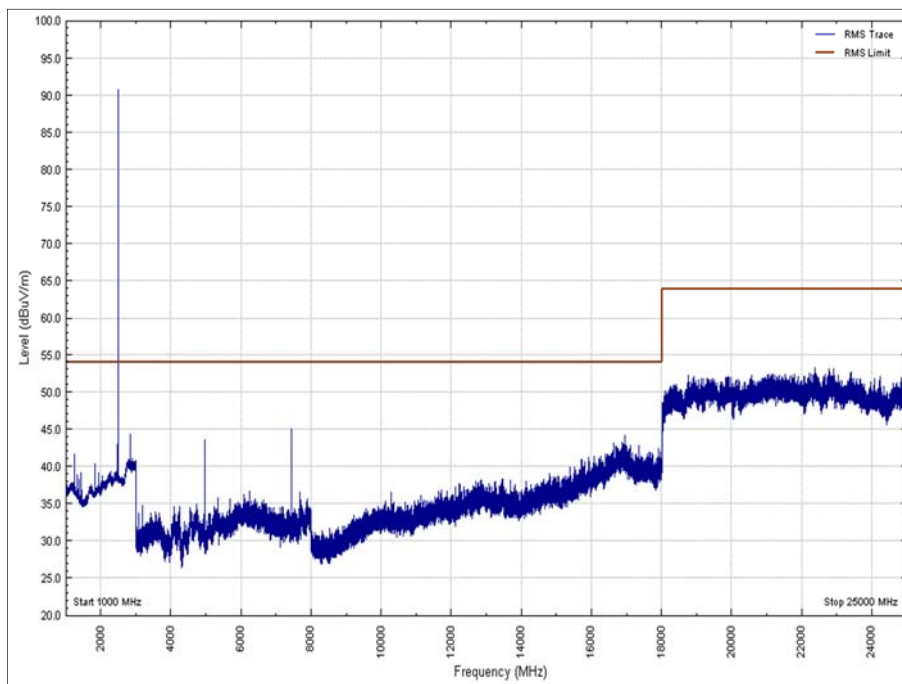


Figure 46 - 2480 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: X

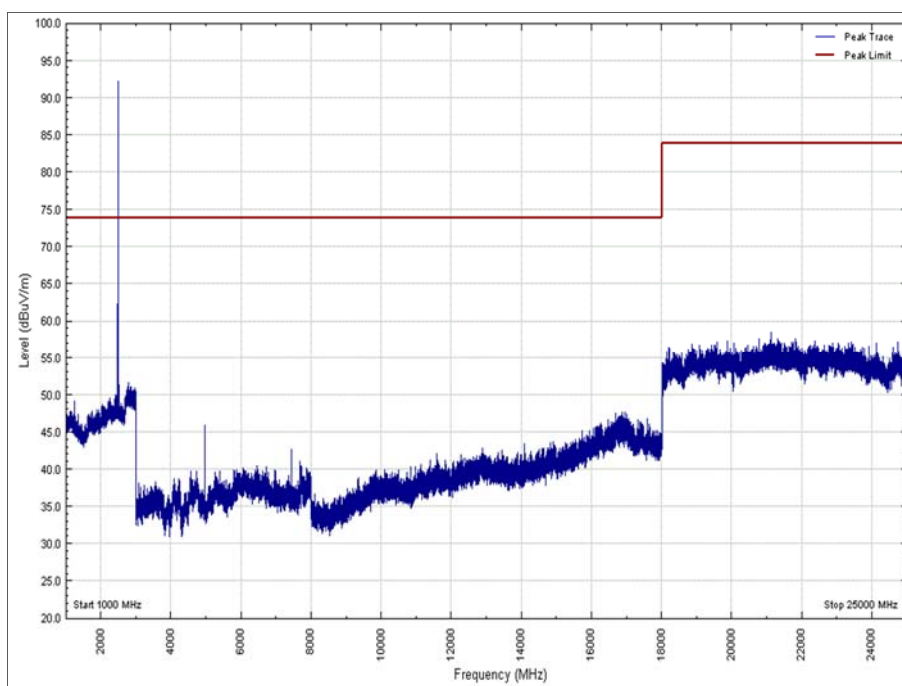


Figure 47 - 2480 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Y

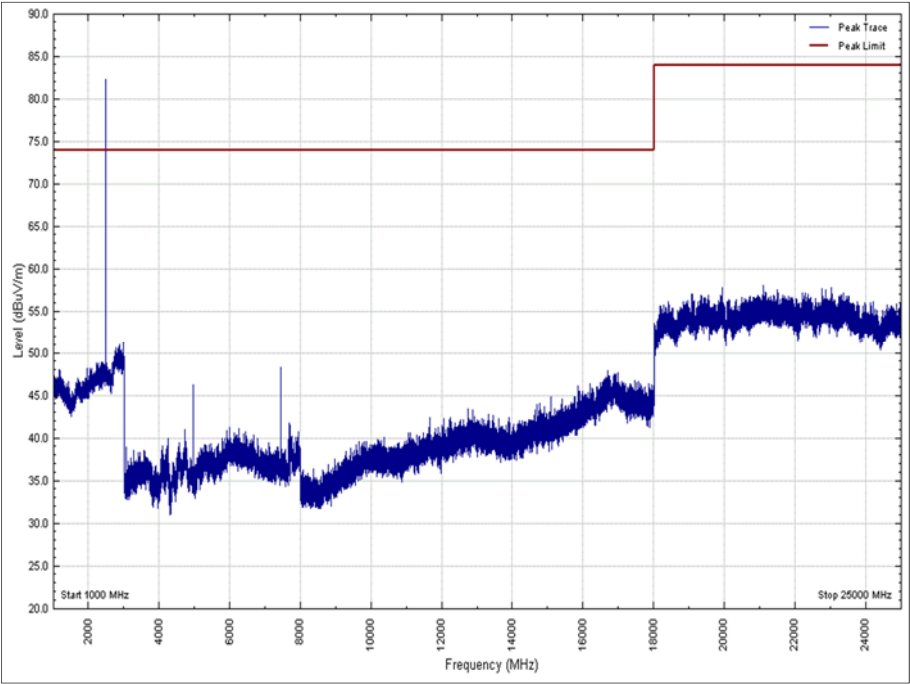


Figure 48 - 2480 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Y

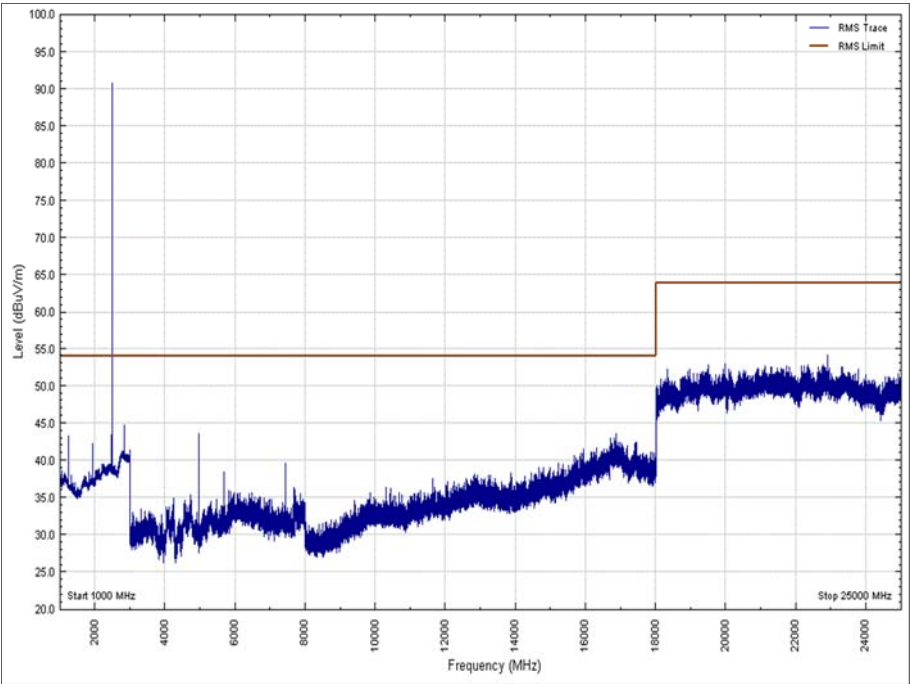


Figure 49 - 2480 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: Y

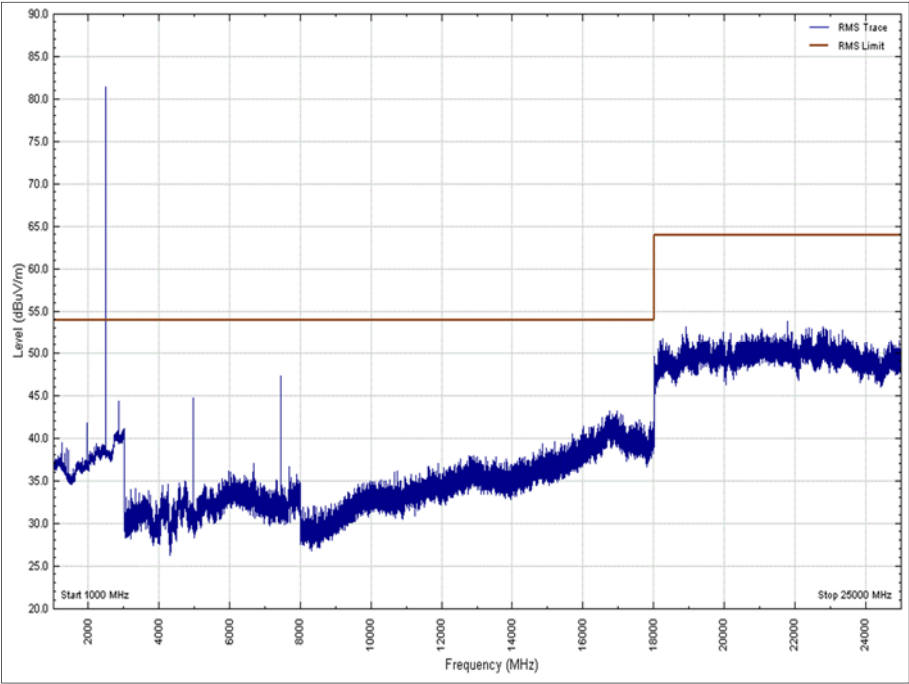


Figure 50 - 2480 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: Y

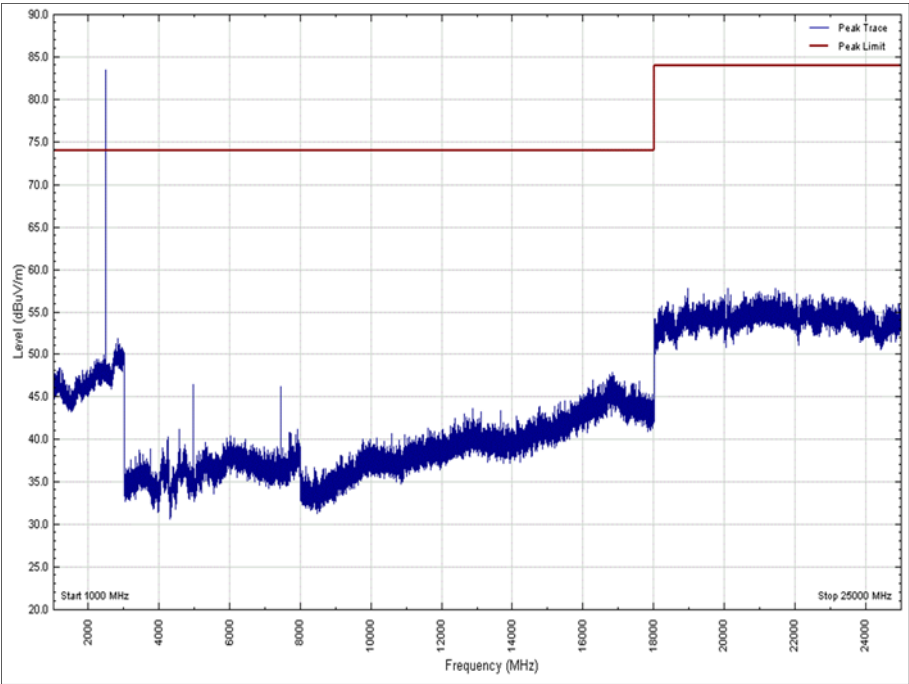


Figure 51 - 2480 MHz, 1 GHz to 25 GHz, Peak, Vertical, Orientation: Z

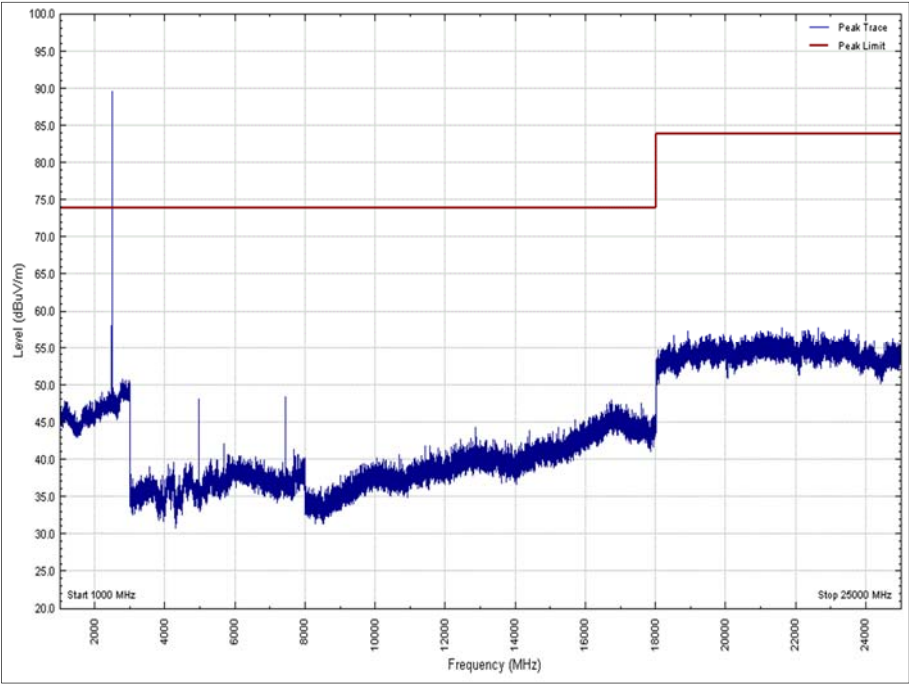


Figure 52 - 2480 MHz, 1 GHz to 25 GHz, Peak, Horizontal, Orientation: Z

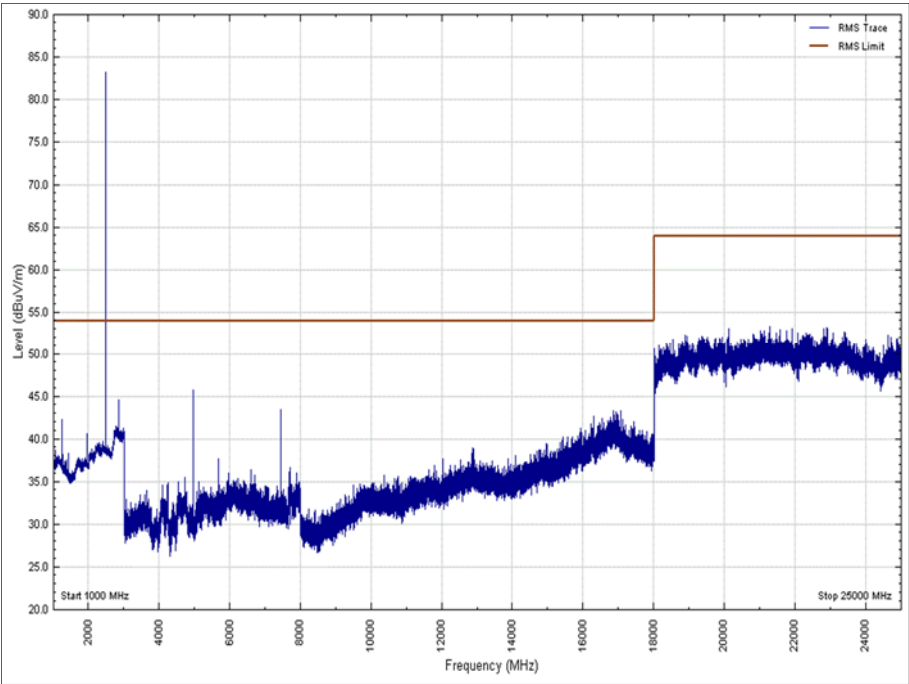


Figure 53 - 2480 MHz, 1 GHz to 25 GHz, RMS, Vertical, Orientation: Z

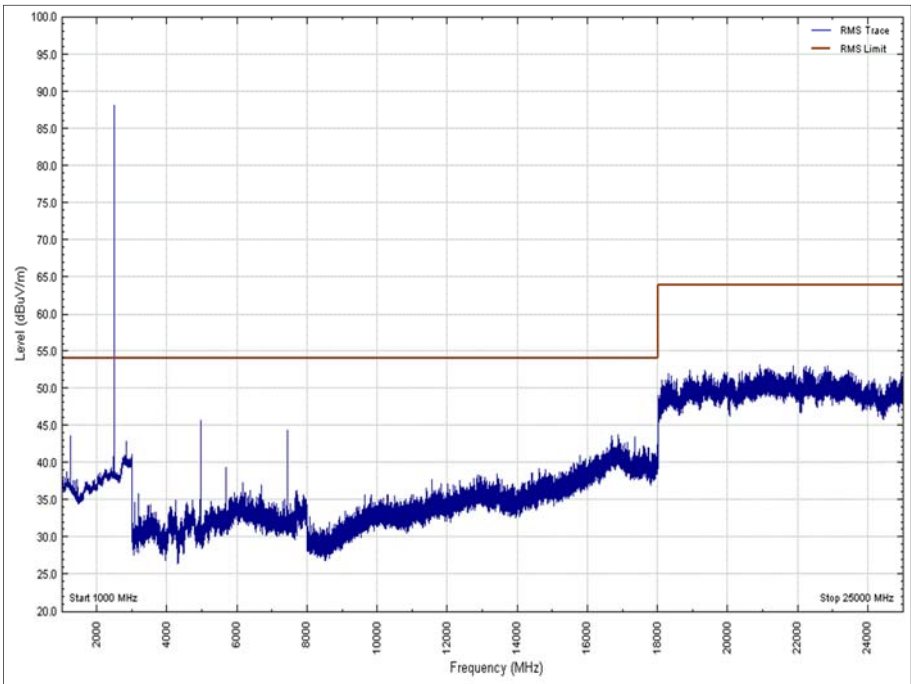


Figure 54 - 2480 MHz, 1 GHz to 25 GHz, RMS, Horizontal, Orientation: Z

FCC 47 CFR Part 15. Limit Clause 15.249 (a)

Fundamental Frequency (MHz)	Field Strength of Harmonics (microvolts/meter)
902 to 928	500
2400 to 2483.5	500
5725 to 5875	500
24000 to 24250	2500

Table 11 - FCC Limit Table - 15.249

FCC 47 CFR Part 15. Limit Clause 15.249 (d) and 15.209

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in 15.209, whichever is the lesser attenuation.

Frequency (MHz)	Field Strength (microvolts/meter)
0.009 to 0.490	2400/F (kHz)
0.490 to 1.705	24000/F (kHz)
1.705 to 30.0	30
30 to 88	100
88 to 216	150
216 to 960	200
Above 960	500

Table 12 - FCC Limit Table - 15.209

2.1.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Antenna (Bilog)	Schaffner	CBL6143	287	24	18-Apr-2018
Antenna 18-40GHz (Double Ridge Guide)	Q-Par Angus Ltd	QSH 180K	1511	24	7-Dec-2018
Pre-Amplifier	Phase One	PS04-0086	1533	12	12-Jan-2019
18GHz - 40GHz Pre-Amplifier	Phase One	PS04-0087	1534	12	2-Feb-2019
Screened Room (5)	Rainford	Rainford	1545	36	18-Jul-2019
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	A1	2138	12	21-Feb-2019
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018*
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	Maturo GmbH	NCD	3917	-	TU
2 Metre SMA Type Cable	Rhophase	3PS-1801A-2000-3PS	4113	12	20-Dec-2018
1GHz to 8GHz Low Noise Amplifier	Wright Technologies	APS04-0085	4365	12	18-Oct-2018
Suspended Substrate Highpass Filter	Advance Power Components	11SH10-3000/X18000-O/O	4412	12	23-Jun-2018*
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018*
Cable (Rx, SMAm-SMAm 0.5m)	Scott Cables	SLSLL18-SMSM-00.50M	4528	6	15-Aug-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	01-Mar-2019
Mast Controller	Maturo GmbH	NCD	4810	-	TU
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	4811	-	TU
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	12-Feb-2019
Hygrometer	Rotronic	HP21	4989	12	26-Apr-2019

Table 13

TU - Traceability Unscheduled

*Items were only used for testing performed on 30th April 2018 therefore were in calibration at the time of use.

2.2 Field Strength of Fundamental

2.2.1 Specification Reference

FCC 47 CFR Part 15C, Clause 15.249 (a) and 15.35 (b)

2.2.2 Equipment Under Test and Modification State

101/482 ISS B, S/N: Not Serialised (75941542-TSR0001) - Modification State 0 and 1

2.2.3 Date of Test

30-April-2018 to 23-May-2018

2.2.4 Test Method

The test was performed in accordance with ANSI C63.10, clause 6.3 and 6.6.

A duty cycle correction factor has been applied to the peak measurement to determine the average value.

Duty cycle correction factor (dB) = $20 \log (637.5 \mu\text{s} / (1595.8 \mu\text{s} + 637.5 \mu\text{s})) = -10.89 \text{ dB}$.

Where 637.5 μs is the on time and 1595.8 μs is the off time over one complete pulse train.

2.2.5 Environmental Conditions

Ambient Temperature 23.5 °C
Relative Humidity 46.0 %

2.2.6 Test Results

Battery Powered - 2.4 GHz SRD Transmitter

Frequency (MHz)	Field Strength (dB $\mu\text{V}/\text{m}$)
2402	94.88
2440	94.16
2480	91.13

Table 14 - Peak Level

Frequency (MHz)	Field Strength (dB $\mu\text{V}/\text{m}$)
2402	83.99
2440	83.27
2480	80.24

Table 15 - Average Level

FCC 47 CFR Part 15, Limit Clause 15.249 (a)

Fundamental Frequency (MHz)	Average Field Strength of Fundamental (millivolts/meter)
902 to 928	50
2400 to 2483.5	50
5725 to 5875	50
24000 to 24250	250

Table 16

FCC 47 CFR Part 15, Limit Clause 15.35 (b)

The limit on peak radio frequency emissions is 20 dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.

2.2.7 Test Location and Test Equipment Used

This test was carried out in EMC Chamber 5.

Instrument	Manufacturer	Type No	TE No	Calibration Period (months)	Calibration Due
Screened Room (5)	Rainford	Rainford	1545	36	18-Jul-2019
Turntable Controller	Inn-Co GmbH	CO 1000	1606	-	TU
Hygrometer	Rotronic	A1	2138	12	21-Feb-2019
Cable (N-N, 8m)	Rhophase	NPS-2302-8000-NPS	3248	12	02-May-2018*
EMI Test Receiver	Rohde & Schwarz	ESU40	3506	12	22-Nov-2018
Tilt Antenna Mast	Maturo GmbH	TAM 4.0-P	3916	-	TU
Mast Controller	Maturo GmbH	NCD	3917	-	TU
Cable (Rx, Km-Km 2m)	Scott Cables	KPS-1501-2000-KPS	4526	6	22-May-2018*
EMI Receiver	Keysight Technologies	N9038A MXE	4628	12	22-Jun-2018
Double Ridged Waveguide Horn Antenna	ETS-Lindgren	3117	4722	12	01-Mar-2019
Double Ridge Broadband Horn Antenna	Schwarzbeck	BBHA 9120 B	4848	12	12-Feb-2019
Hygrometer	Rotronic	HP21	4989	12	26-Apr-2019

Table 17

TU - Traceability Unscheduled

*Items were only used for testing performed on 30 April 2018 therefore were in calibration at the time of use.



3 Measurement Uncertainty

For a 95% confidence level, the measurement uncertainties for defined systems are:

Test Name	Measurement Uncertainty
Field Strength of Emissions	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB
Field Strength of Fundamental	30 MHz to 1 GHz: ± 5.2 dB 1 GHz to 40 GHz: ± 6.3 dB

Table 18