

FCC Test Report

Ericsson AB (EAB) Antenna Integrated Radio Unit,
Product Name: AIR 6449 B41



In accordance with FCC 47 CFR Part 27 and
FCC 47 Part 2 (LTE+NR)

Prepared for: Ericsson AB (EAB)
Isafjordsgatan 10
Kista
164 80
SWEDEN

Add value.
Inspire trust.

FCC ID: TA8AKRD901141

COMMERCIAL-IN-CONFIDENCE

Document 75948804-01 Issue 01

SIGNATURE

A handwritten signature of Simon Bennett.

NAME	JOB TITLE	RESPONSIBLE FOR	ISSUE DATE
Simon Bennett	Innovations Manager	Authorised Signatory	21 May 2020

Signatures in this approval box have checked this document in line with the requirements of TÜV SÜD 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 27 and FCC 47 Part 2. The sample tested was found to comply with the requirements defined in the applied rules.

RESPONSIBLE FOR	NAME	DATE	SIGNATURE
Testing	Hector Trujillo		A handwritten signature of Hector Trujillo.
Supervision	Jack Tuckwell		A handwritten signature of Jack Tuckwell.

FCC Accreditation

563983 Delta Test Laboratory, Västerås

EXECUTIVE SUMMARY

A sample of this product was tested and found to be compliant with FCC 47 CFR Part 27: 2019 and FCC 47 Part 2: 2019 for the tests detailed in section 1.3.



Accred. no. 10363
Testing
ISO/IEC 17025

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Interpretations and any expressed are outside the scope of our Swedac Accreditation.
Items marked NSA (Not Swedac Accredited).

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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	21 May 2020

Table 1

1.2 Introduction

Applicant	Ericsson AB (EAB)
Manufacturer	Ericsson AB (EAB)
Product Name(s)	AIR 6449 B41
Product Number(s)	KRD 901 141/2
Serial Number(s)	C82A592337
Hardware Version(s)	R1D
Software Version(s)	CXP 2030039/1_R31A107b5
Number of Samples Tested	1
Test Specification/Issue/Date	FCC 47 CFR Part 27: 2019 FCC 47 Part 2: 2019
Test Plan/Issue/Date	2/12022-HRB 105 601-237 rev.B
Order Number	9400764568
Date	09-April-2020
Date of Receipt of EUT	28-April-2020
Start of Test	28-April-2020
Finish of Test	30-April-2020
Name of Engineer(s)	Hector Trujillo, supervised by Jack Tuckwell
Related Document(s)	ANSI C63.26:2015



1.3 Brief Summary of Results

A brief summary of the tests carried out in accordance with FCC 47 CFR Part 27 and FCC 47 Part 2 is shown below.

Section	Specification Clause		Test Description	Result	Comments/Base Standard
	Part 27	Part 2			
Configuration and Mode: DC Powered - LTE 1 Carrier					
2.1	27.53	2.1053	Radiated Spurious Emissions	Pass	KDB 971168 D01 v02r02 ANSI C63.26:2015
Configuration and Mode: DC Powered - NR 1 Carrier					
2.1	27.53	2.1053	Radiated Spurious Emissions	Pass	KDB 971168 D01 v02r02 ANSI C63.26:2015
Configuration and Mode: DC Powered - NR 2 Carriers					
2.1	27.53	2.1053	Radiated Spurious Emissions	Pass	KDB 971168 D01 v02r02 ANSI C63.26:2015
Configuration and Mode: DC Powered - LTE 3 Carriers					
2.1	27.53	2.1053	Radiated Spurious Emissions	Pass	KDB 971168 D01 v02r02 ANSI C63.26:2015
Configuration and Mode: DC Powered - 1 LTE + 1 NR, 2 Carriers					
2.1	27.53	2.1053	Radiated Spurious Emissions	Pass	KDB 971168 D01 v02r02 ANSI C63.26:2015
Configuration and Mode: DC Powered - 3 LTE + 1 NR 4 Carriers					
2.1	27.53	2.1053	Radiated Spurious Emissions	Pass	KDB 971168 D01 v02r02 ANSI C63.26:2015

Table 2



1.4 Application Form

Equipment Description

Technical Description: <i>(Please provide a brief description of the intended use of the equipment)</i>	Antenna Integrated Radio Unit
Manufacturer:	Ericsson AB
Model:	AIR 6449 B41
Part Number:	KRD 901 141/2* (with un-security software and RDNB board for testing purpose) KRD 901 141/21 (with security software and RDNB board for testing purpose) KRD 901 141/1 (with un-security software and antenna) KRD 901 141/11** (with security software and antenna) Note*: Tests have been performed on this unit. Note**: This will be the marketed, sold unit.
Hardware Version:	R1D
Software Version:	CXP 2030039/1_R31A107b5
FCC ID (if applicable)	TA8AKRD901141
IC ID (if applicable)	Not applicable

Intentional Radiators

Technology	NR	LTE
Frequency Band (MHz)	2496 to 2690	2496 to 2690
Conducted Declared Output Power (dBm)	36 dBm/MHz, max 55 dBm	36 dBm/MHz, max 55 dBm
Antenna Gain (dBi)	23.8	23.8
Supported Bandwidth(s) (MHz)	20, 40, 60, 80, 100 MHz, SCS: 30 kHz	10, 20
Modulation Scheme(s)	QPSK, 16QAM, 64QAM, 256QAM	QPSK, 16QAM, 64QAM, 256QAM
ITU Emission Designator	18M3W7D 37M9W7D 57M9W7D 77M4W7D 97M3W7D 176MW7D	8M95W7D 17M9W7D 57M7W7D
Bottom Frequency (MHz)	2496 MHz	2496 MHz
Middle Frequency (MHz)	2593.02 MHz	2593 MHz
Top Frequency (MHz)	2690 MHz	2690 MHz

Un-intentional Radiators

Highest frequency generated or used in the device or on which the device operates or tunes	CPRI 10,3 Gbit/s
Lowest frequency generated or used in the device or on which the device operates or tunes	
Class A Digital Device (Use in commercial, industrial or business environment)	<input type="checkbox"/>
Class B Digital Device (Use in residential environment only)	<input checked="" type="checkbox"/>



DC Power Source

Nominal voltage:	-54.5	V
Extreme upper voltage:	-36	V
Extreme lower voltage:	-58.5	V
Max current:	50	A

Temperature

Minimum temperature:	-40.0	°C
Maximum temperature:	+55.0	°C

Antenna Characteristics

Antenna connector <input type="checkbox"/>			State impedance		Ohm
Temporary antenna connector <input checked="" type="checkbox"/>			State impedance	50	Ohm
Integral antenna <input checked="" type="checkbox"/>	Type:	AAS (Advanced antenna system)	Gain	23.8	dBi
External antenna <input type="checkbox"/>	Type:		Gain		dBi
For external antenna only: Standard Antenna Jack <input type="checkbox"/> If yes, describe how user is prohibited from changing antenna (if not professional installed): Equipment is only ever professionally installed <input type="checkbox"/> Non-standard Antenna Jack <input type="checkbox"/>					

Ancillaries (if applicable)

Manufacturer:		Part Number:	
Model:		Country of Origin:	

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

A handwritten signature in blue ink that appears to read "Linda Grell".

Name: Linda Grell

Position held: Regulatory Engineer

Date: 20 May 2020

1.5 Product Information

1.5.1 Technical Description

The Equipment Under Test (EUT) AIR 6449 B41 is an Ericsson AB Antenna Integrated Radio Unit working in the public mobile service from 2496 to 2690 MHz band which provides communication connections to the 2496 to 2690 MHz network.

1.5.2 Test Setup Diagram(s)

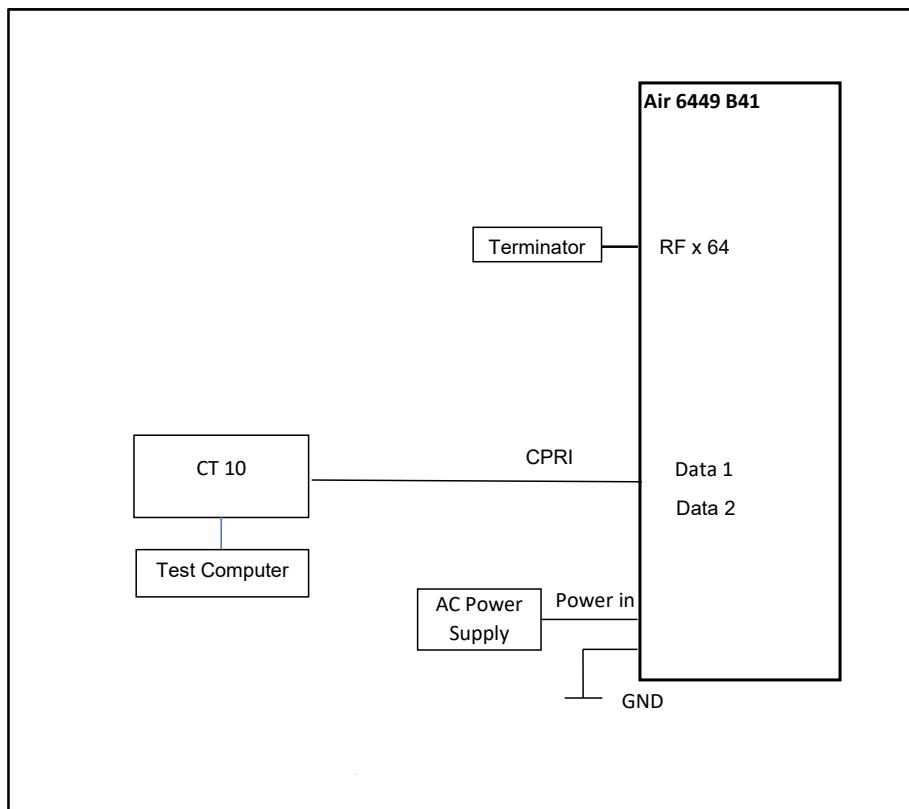


Figure 1

1.5.3 EUT Configuration and Rationale for Radiated Spurious Emissions

The EUT was mounted in a fixed position corresponding to its final installation position.

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
Model: AIR 6449, Serial Number: C82A592337			
0	As supplied by the customer	Not Applicable	Not Applicable

Table 3

1.8 Test Location

TÜV SÜD conducted the following tests at the Delta Test Facility, Elektronicgatan 47, Västerås, Sweden.

Test Name	Name of Engineer(s)	Accreditation
Configuration and Mode: DC Powered LTE (10 MHz) – 1C – 2593 MHz (M)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac
Configuration and Mode: DC Powered NR (60 MHz) – 1C – 2593.02 MHz (M)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac
Configuration and Mode: DC Powered NR (60 MHz) – 1C – 2526 MHz (B) and 2660 MHz (T)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac
Configuration and Mode: DC Powered NR (60 MHz) – 2C – 2526 MHz + 2660 MHz (M)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac
Configuration and Mode: DC Powered LTE (10 MHz) – 3C - 2501 MHz + 2511 MHz + 2685 MHz (M)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac
Configuration and Mode: DC Powered 1 NR (60 MHz) + 1 LTE (10 MHz) - 2C - 2526 MHz + 2685 MHz (M)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac
Configuration and Mode: DC Powered 1 NR (60 MHz) + 3 LTE (10 MHz) – 4C – 2526 MHz + 2665 MHz + 2675 MHz + 2685 MHz (M)		
Radiated Spurious Emissions	Hector Trujillo, supervised by Jack Tuckwell	Swedac

Table 4



2 Test Details

2.1 Radiated Spurious Emissions

2.1.1 Specification Reference

FCC 47 CFR Part 27, Clause 27.53(m)
FCC 47 Part 2, Clause 2.1053

2.1.2 Equipment Under Test and Modification State

AIR 6449, S/N: C82A592337 - Modification State 0

2.1.3 Date of Test

28-April-2020 to 30-April-2020

2.1.4 Test Method

The test was performed in accordance with ANSI C63.26 Clause 5. The EUT was configured as defined in ANSI C63.26, clause 5.5.2.3.2.

As a result of the conducted measurements that were performed on the EUT, it was established that LTE 10 MHz and NR 60 MHz were the bandwidth configurations which gave the highest output power and therefore deemed to be worst case operating modes. Further measurements in the Radiated environment were carried out to determine which radio technology gave the worst-case spurious emissions profile between LTE and NR. This was performed on the Middle channel for both technologies with the worst-case result being NR. Further tests on Bottom and Top channels were then carried out for NR. In addition, further measurements were carried out on combinations of LTE + NR as detailed in the results below.

The EUT was set up on a support replicating typical installation conditions at a height of 1.5 m above the reference ground plane, (see setup photos) within a semi-anechoic chamber on a remotely controlled turntable.

Pre-scan and final measurements were made using a Field Strength method in accordance with ANSI C63.26 Clause 5.5.4. The readings were maximized by adjusting the antenna height, polarization and turntable azimuth, in accordance with the specification. Final results were then converted to eirp and are displayed in the plots below. The correction for field strength measurements to eirp at 3 m was 95.2 dB and at 1 m was 85.2 dB. An RBW of 1 MHz and VBW of 3 MHz was used for all measurements with a Peak detector and trace set to Max Hold. In all cases below where the limit line is exceeded – this is the intentional transmit frequency and is not subject to the limits defined in FCC Part 27(m). A high pass filter in conjunction with a pre-amplifier was used for the measurement ranges of 8 – 27 GHz.

2.1.5 Environmental Conditions

Ambient Temperature 21.6 - 22.7 °C
Relative Humidity 25.3 - 28.0 %

2.1.6 Test Results

DC Powered - LTE (10 MHz) – 1C – 2593 MHz (M)

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 5 – 2593 MHz - 30 MHz to 1 GHz

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

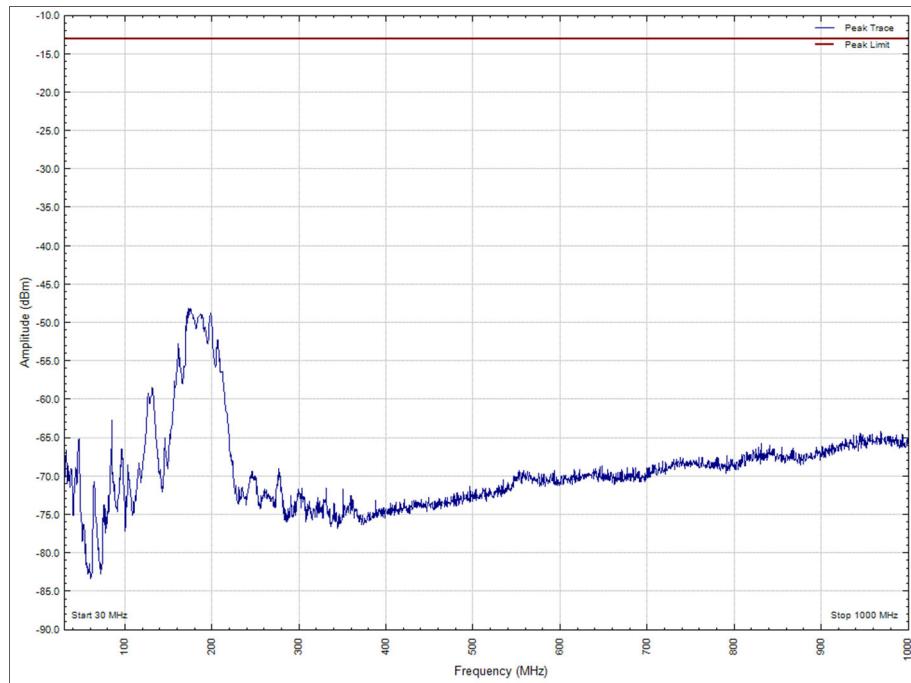


Figure 2 – 2593 MHz, 30 MHz to 1 GHz, Horizontal

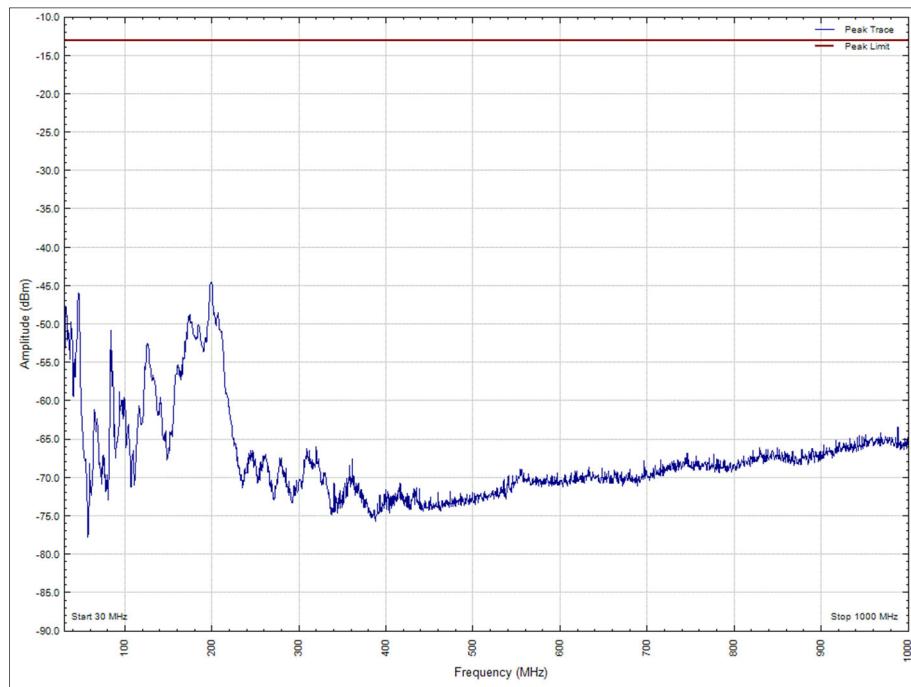


Figure 3 – 2593 MHz, 30 MHz to 1 GHz, Vertical

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 6 – 2593 MHz, 1 GHz to 26 GHz

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

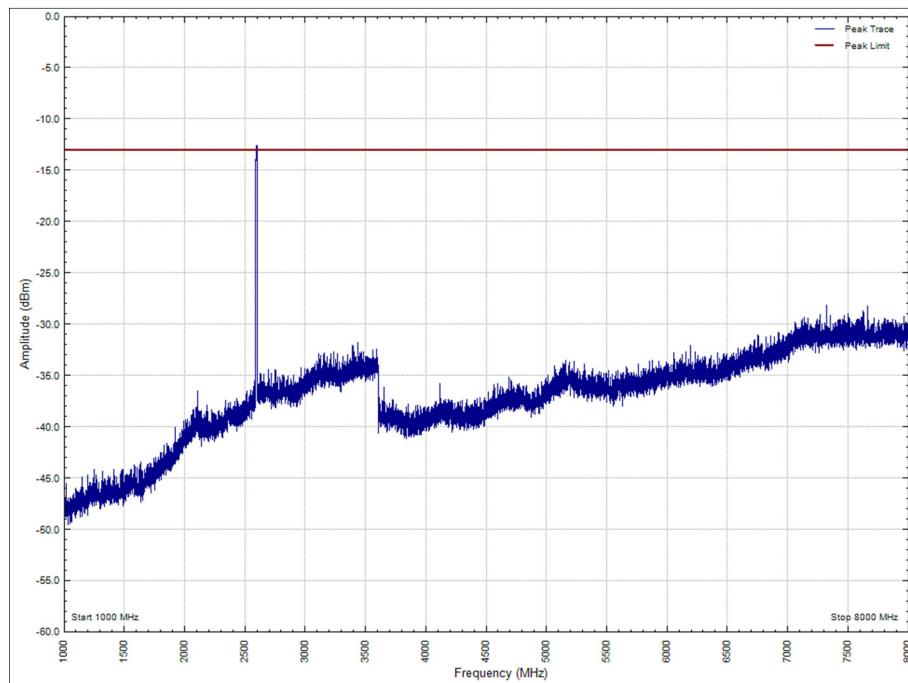


Figure 4 – 2593 MHz, 1 GHz to 8 GHz, Horizontal

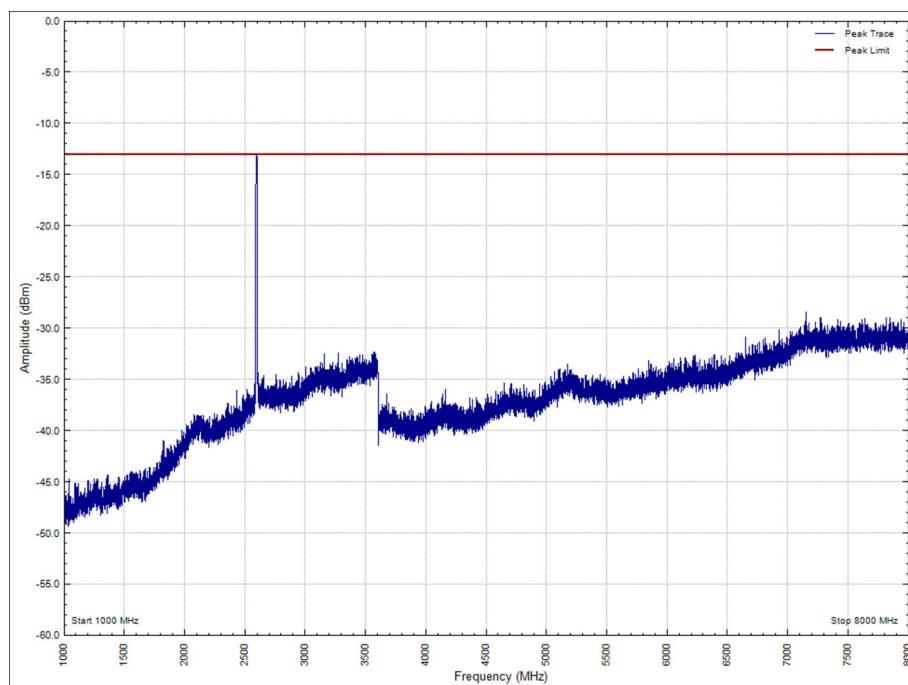


Figure 5 – 2593 MHz, 1 GHz to 8 GHz, Vertical

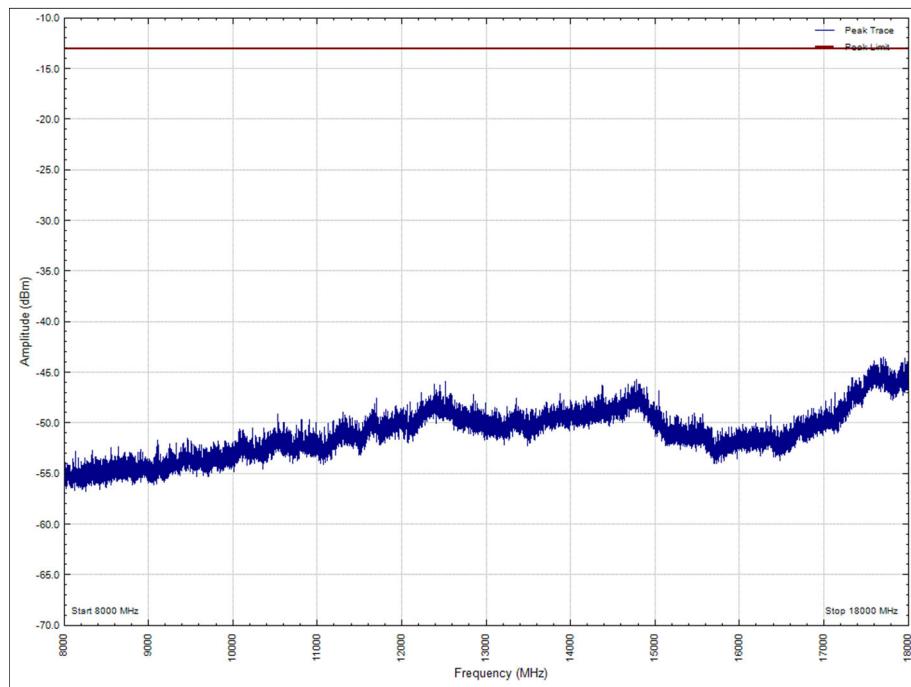


Figure 6 – 2593 MHz, 8 GHz to 18 GHz, Horizontal

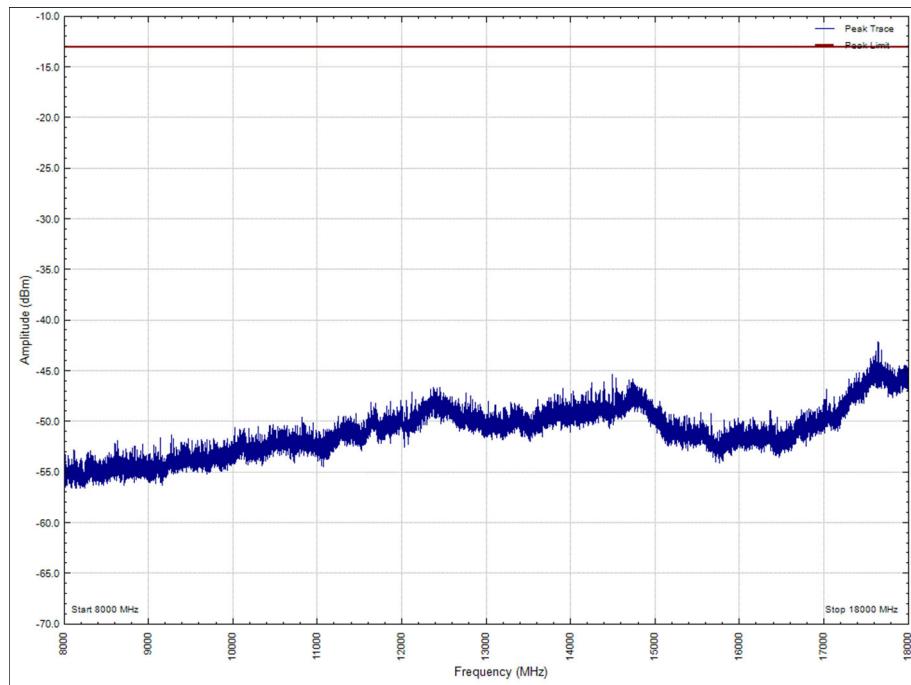


Figure 7 – 2593 MHz, 8 GHz to 18 GHz, Vertical

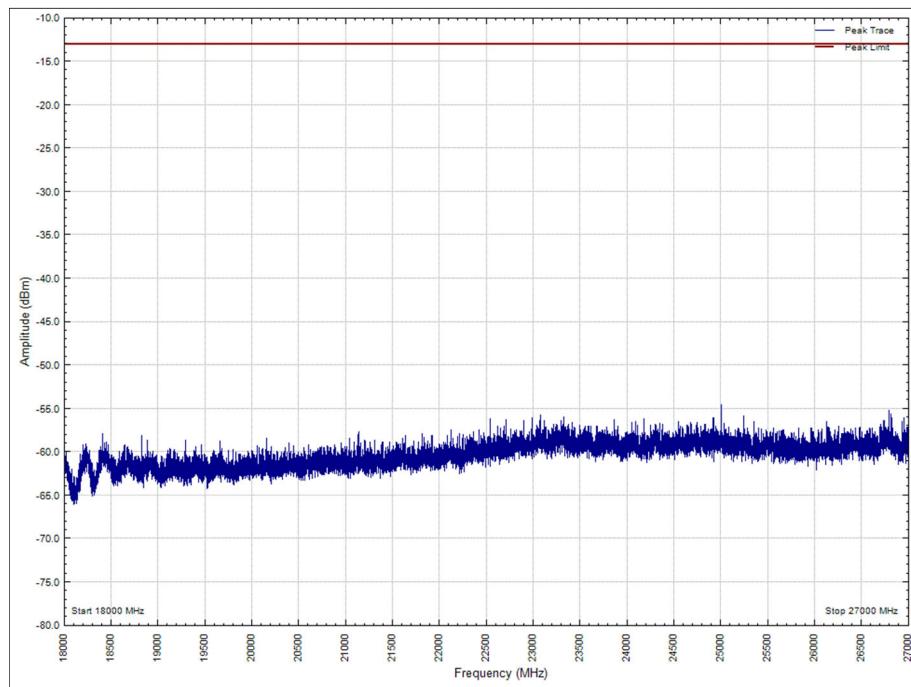


Figure 8 – 2593 MHz, 18 GHz to 26 GHz, Horizontal

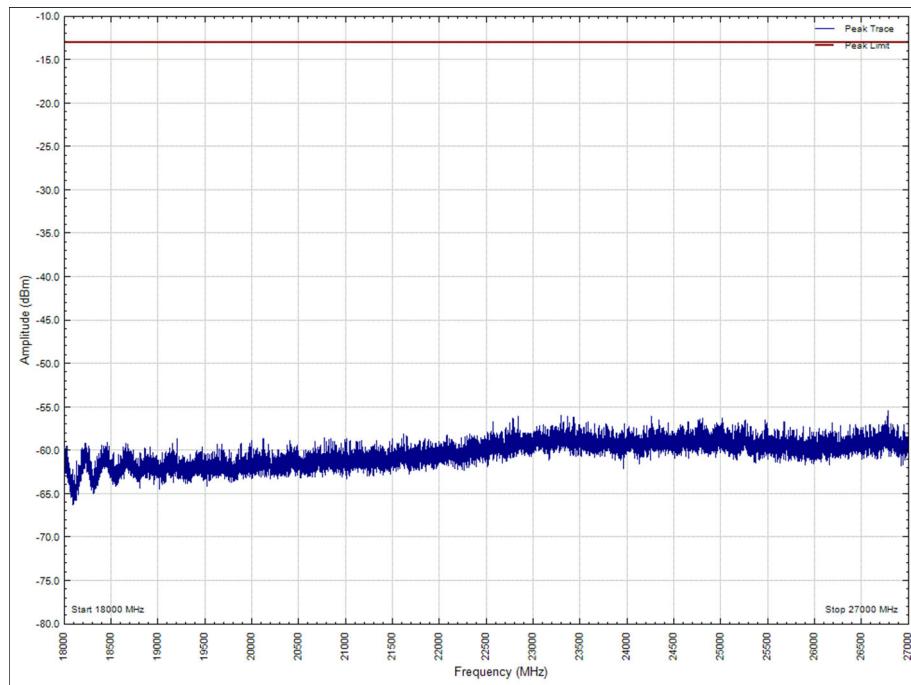


Figure 9 – 2593 MHz, 18 GHz to 26 GHz, Vertical

DC Powered - NR (60 MHz) – 1C – 2593.02 MHz (M)

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 7 – 2593.02 MHz - 30 MHz to 1 GHz

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

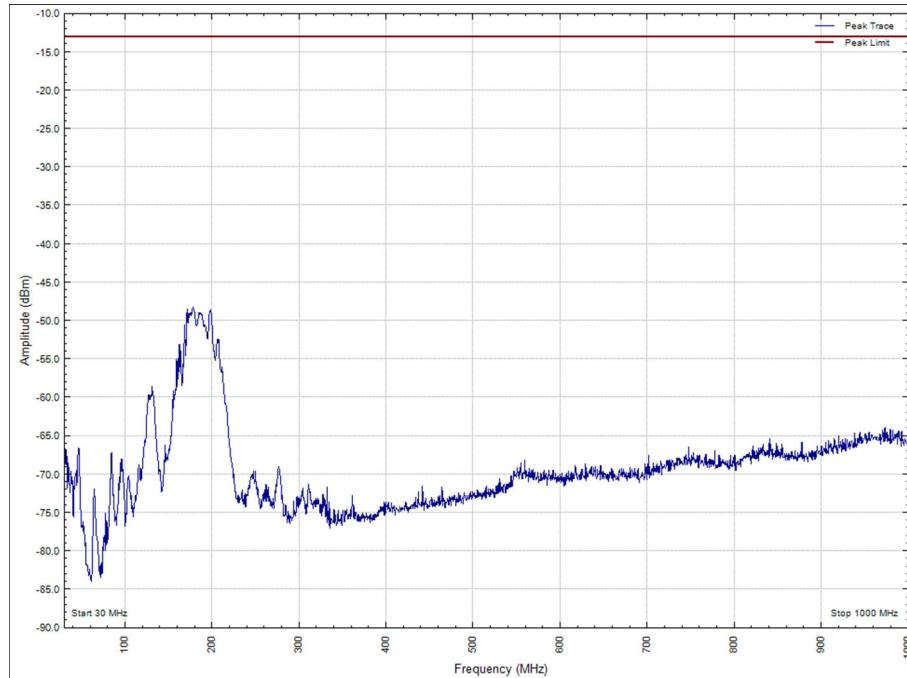


Figure 10 – 2593.02 MHz, 30 MHz to 1 GHz, Horizontal

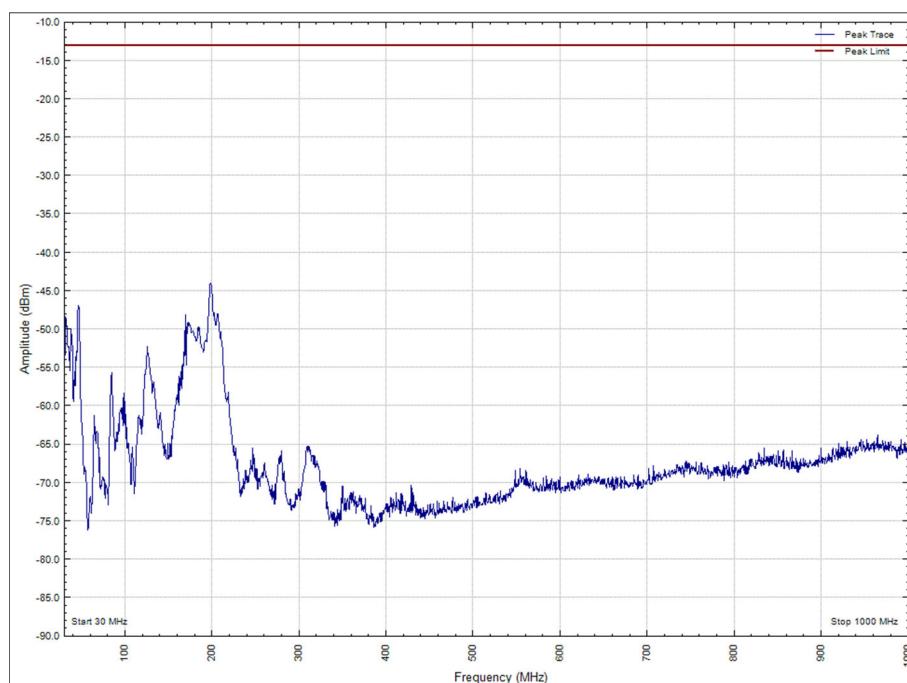


Figure 11 - 30 MHz to 1 GHz, Vertical

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 8 – 2593.02 MHz, 1 GHz to 27 GHz

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

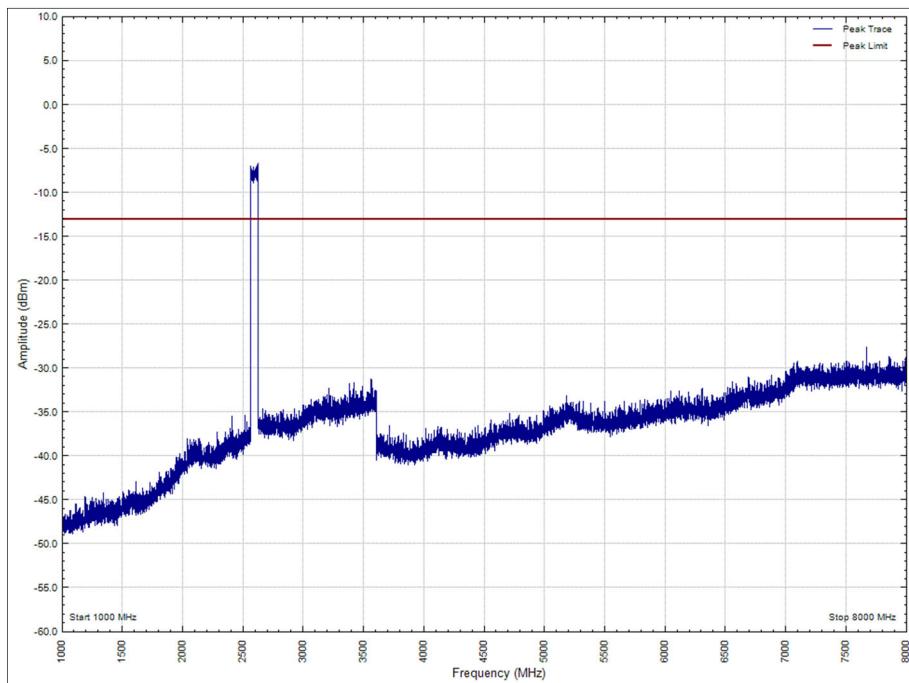


Figure 12 - 2593.02 MHz, 1 GHz to 8 GHz, Horizontal

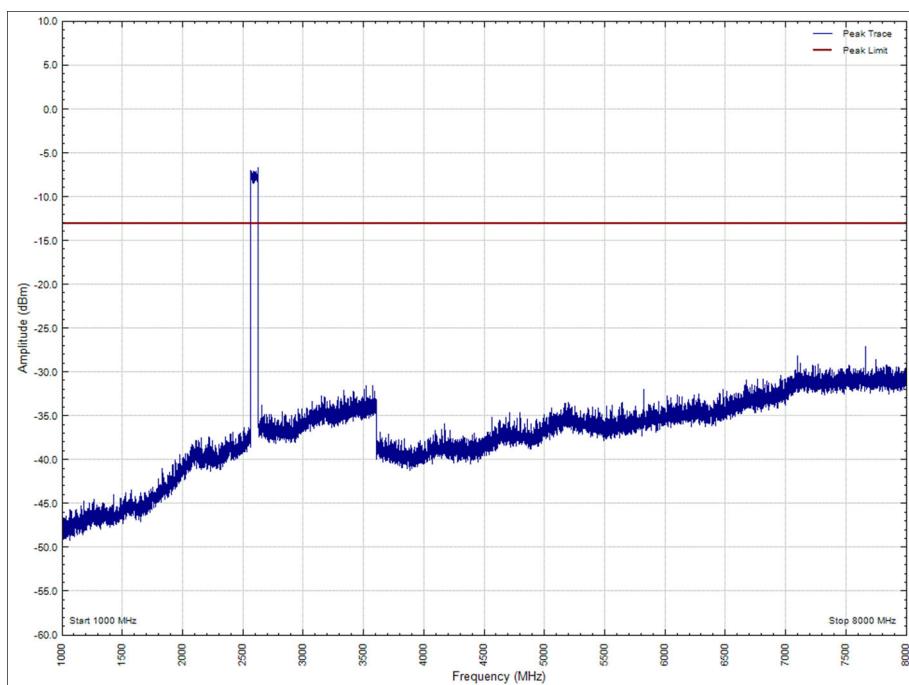


Figure 13 - 2593.02 MHz, 1 GHz to 8 GHz, Vertical

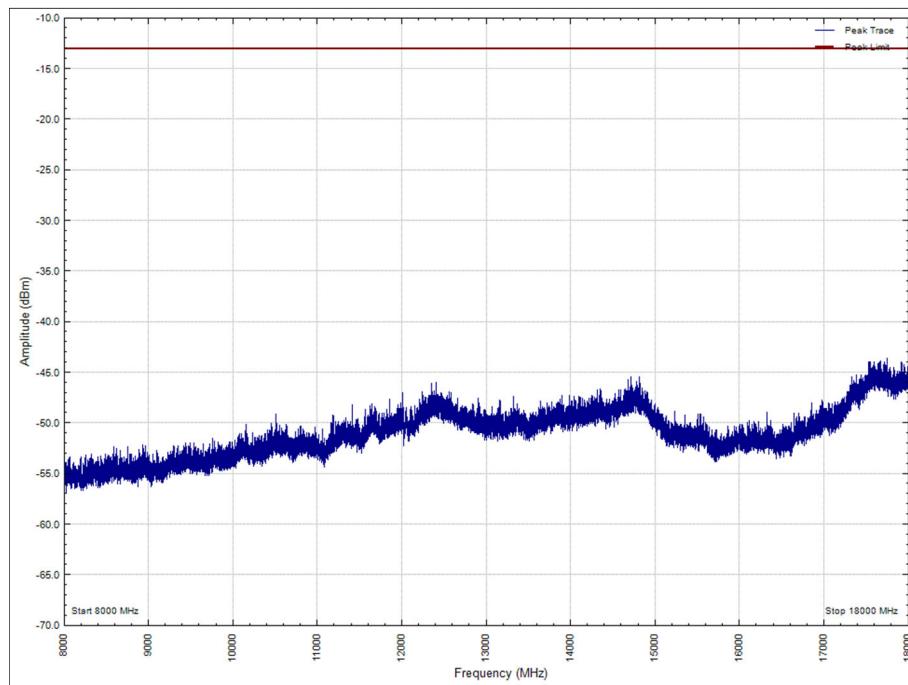


Figure 14 - 2593.02 MHz, 8 GHz to 18 GHz, Horizontal

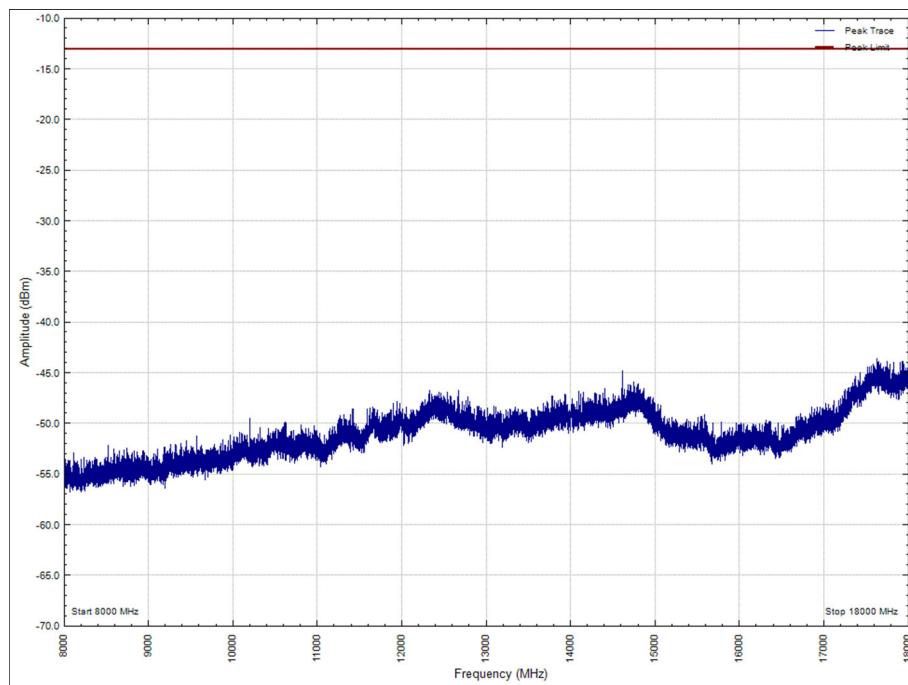


Figure 15 - 2593.02 MHz, 8 GHz to 18 GHz, Vertical

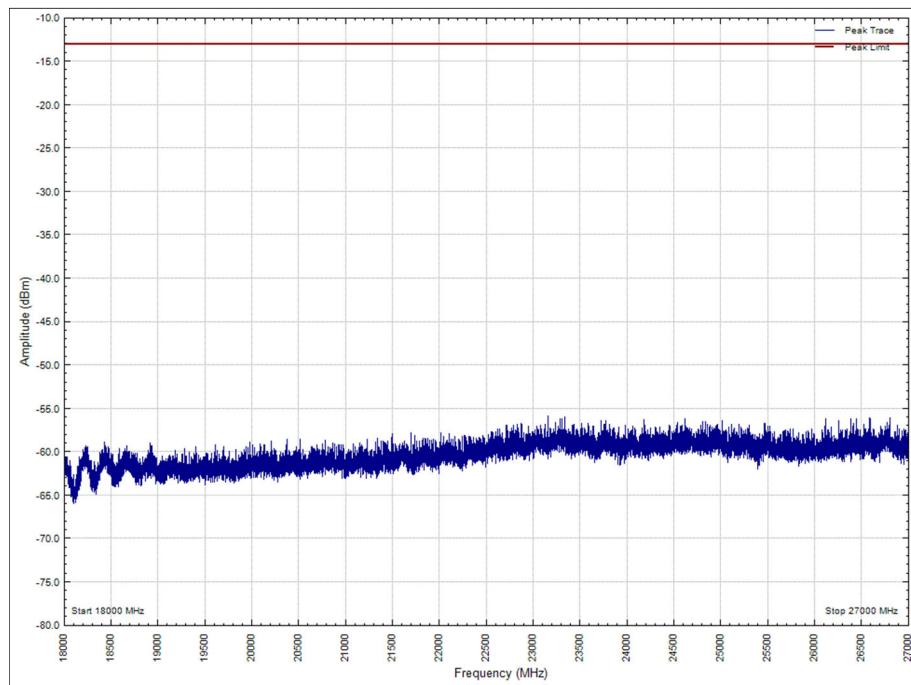


Figure 16 - 2593.02 MHz, 18 GHz to 27 GHz, Vertical

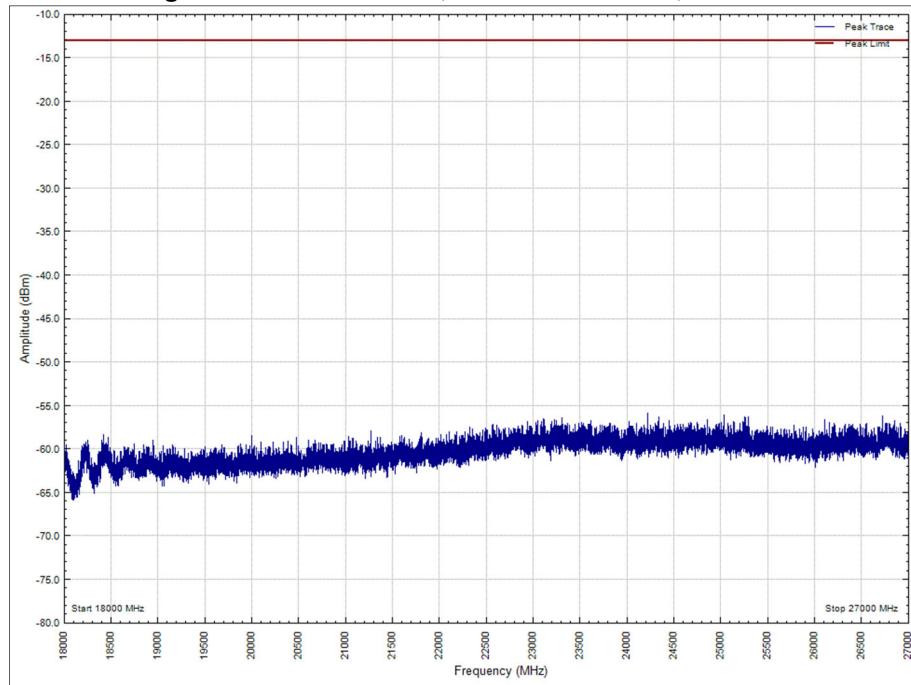


Figure 17 - 2593.02 MHz, 18 GHz to 27 GHz, Horizontal

DC Powered – NR (60 MHz) – 1C – 2526 MHz (B) and 2660 MHz (T)

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 9 – 2526 MHz, 30 MHz to 1 GHz

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

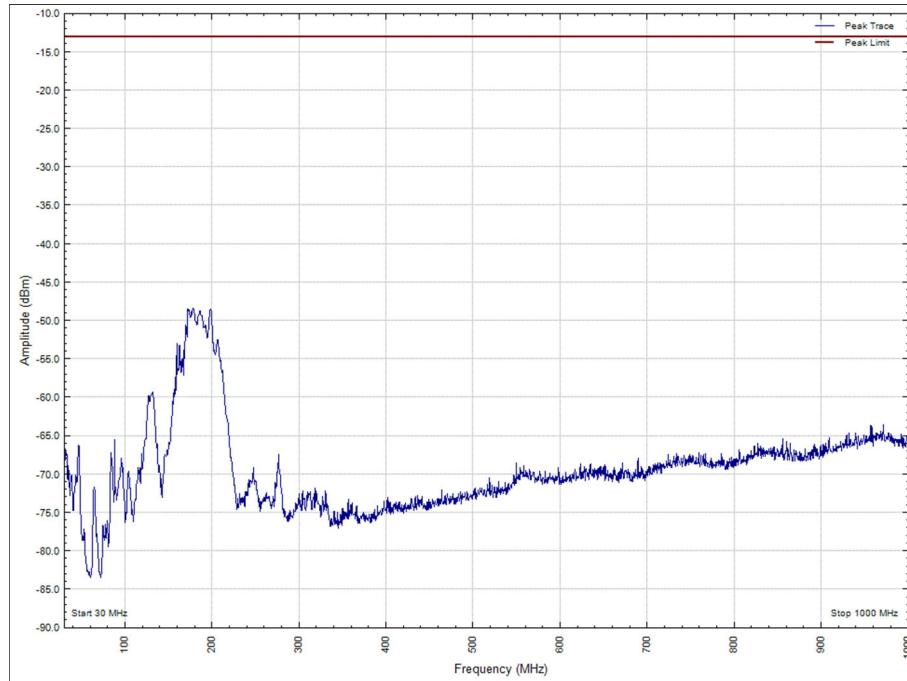


Figure 18 - 2526 MHz - 30 MHz to 1 GHz, Horizontal

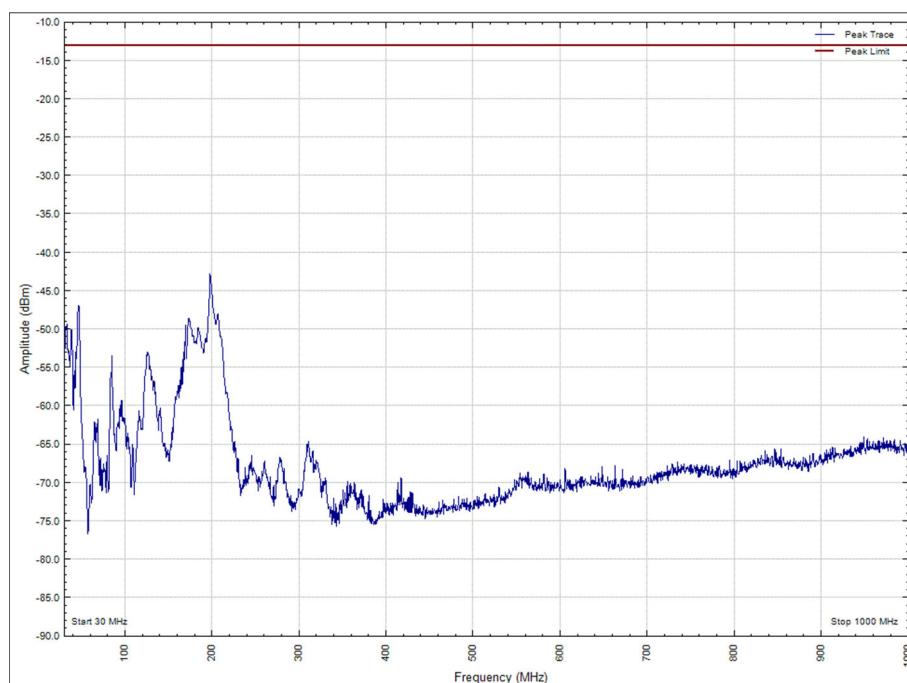


Figure 19 - 2526 MHz - 30 MHz to 1 GHz, Vertical

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 10 – 2526 MHz, 1 GHz to 27 GHz

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

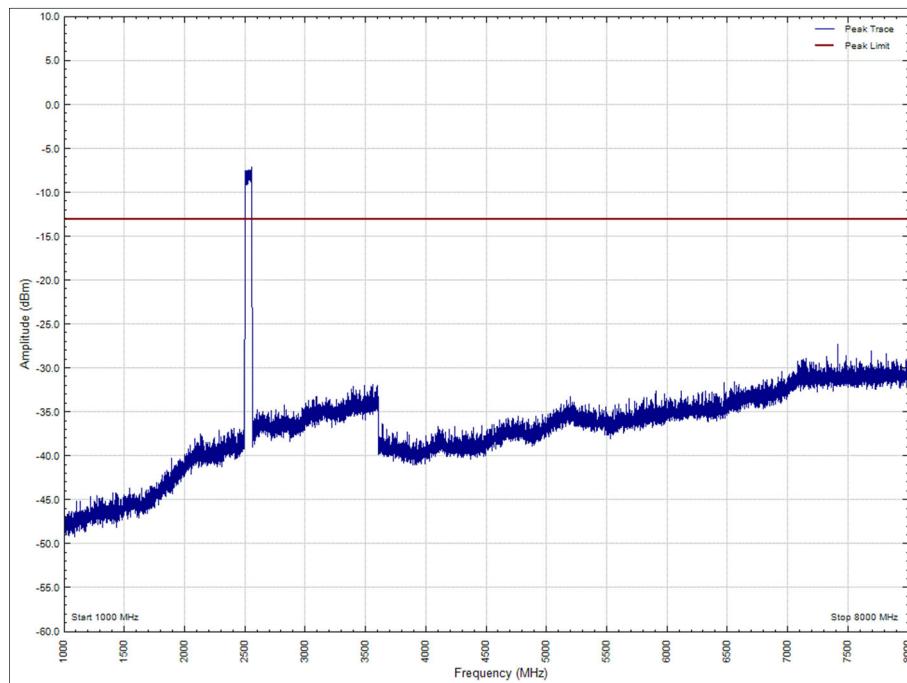


Figure 20 - 2526 MHz - 1 GHz to 8 GHz, Horizontal

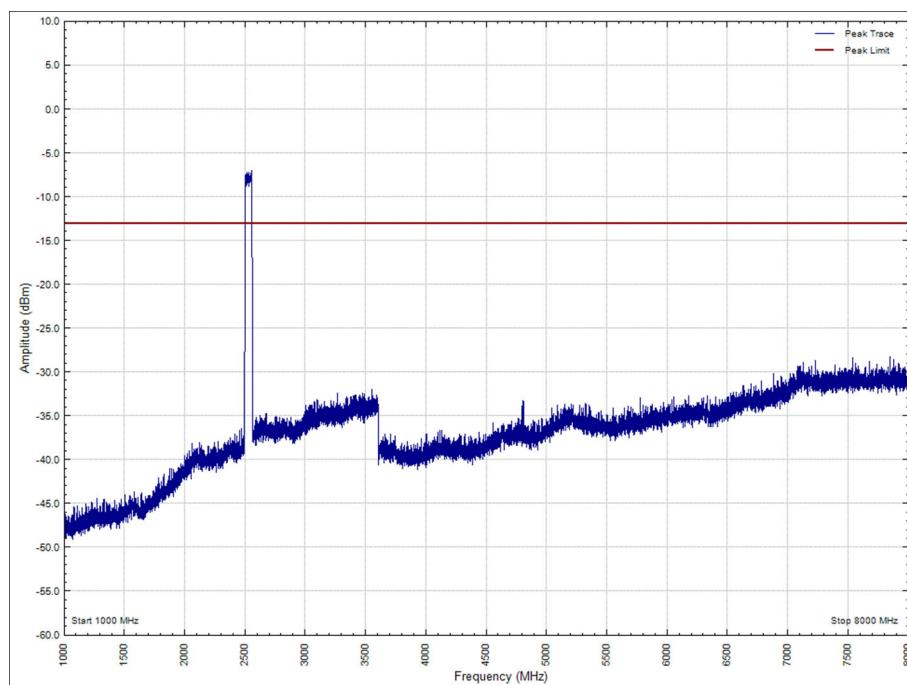


Figure 21 - 2526 MHz - 1 GHz to 8 GHz, Vertical

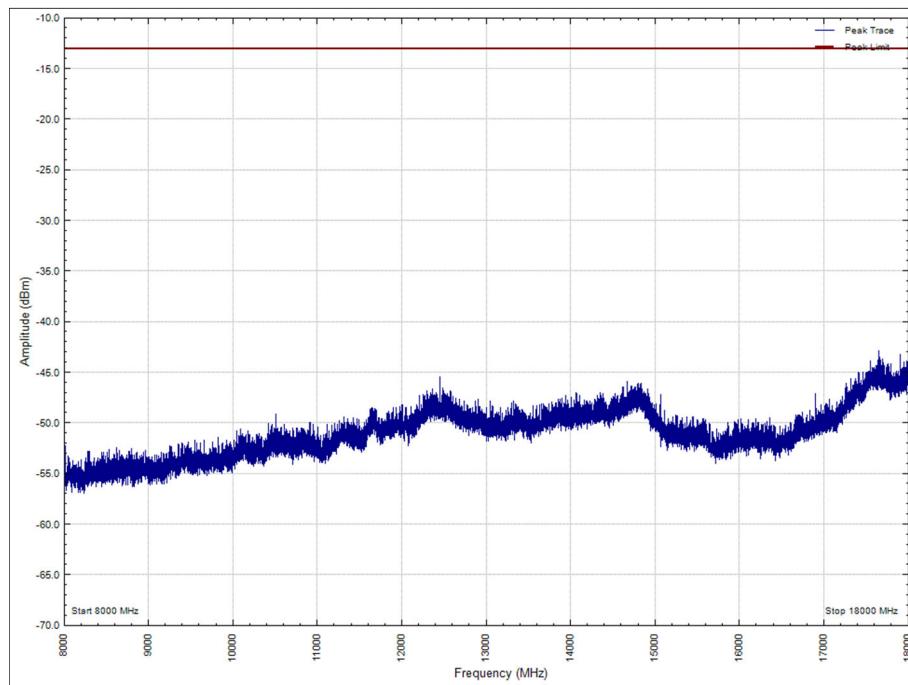


Figure 22 - 2526 MHz - 8 GHz to 18 GHz, Horizontal

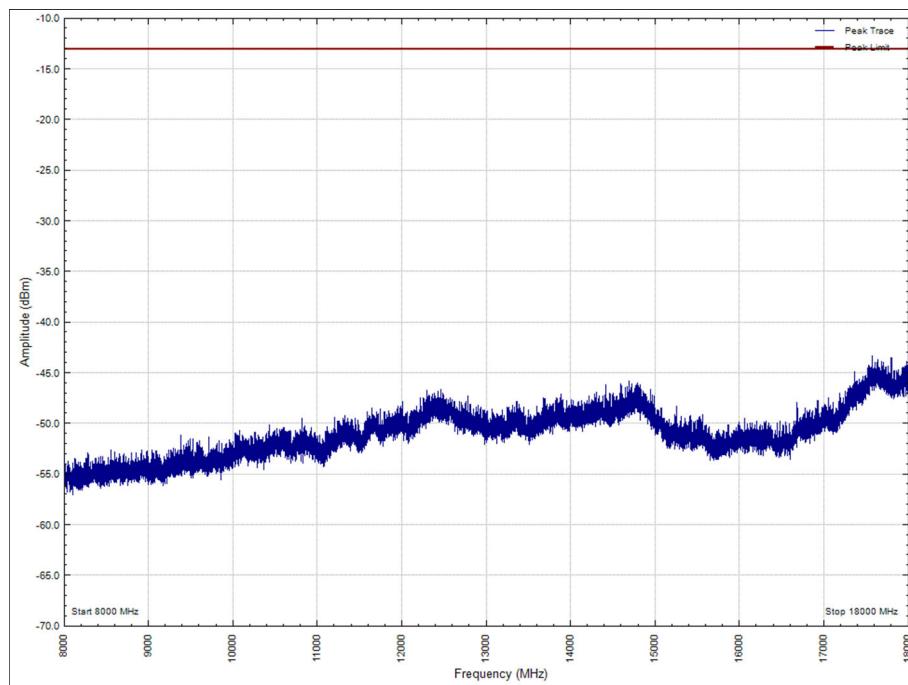


Figure 23 - 2526.00 MHz - 8 GHz to 18 GHz, Vertical

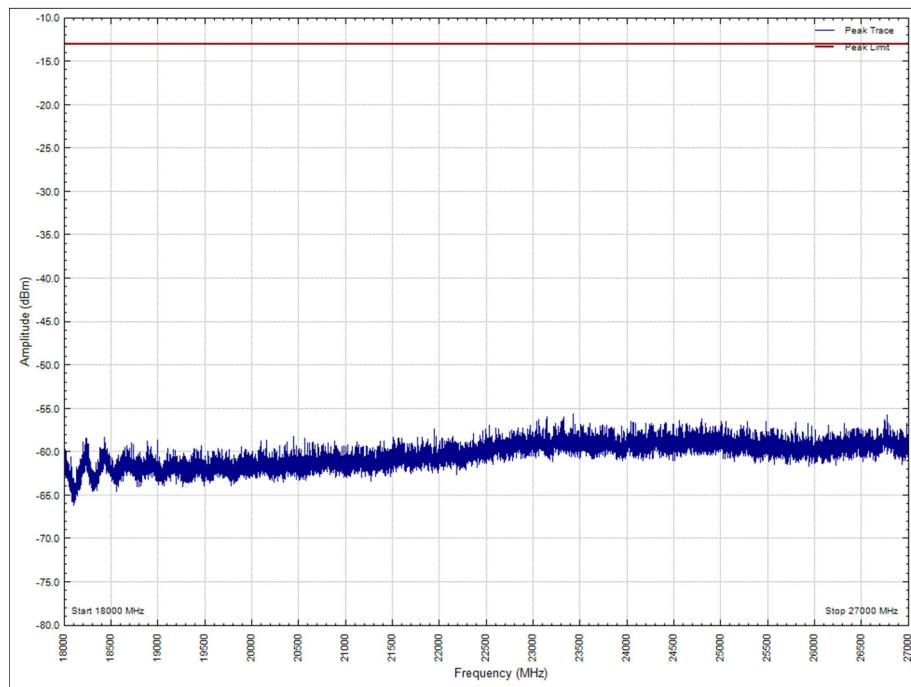


Figure 24 - 2526 MHz - 18 GHz to 27 GHz, Horizontal

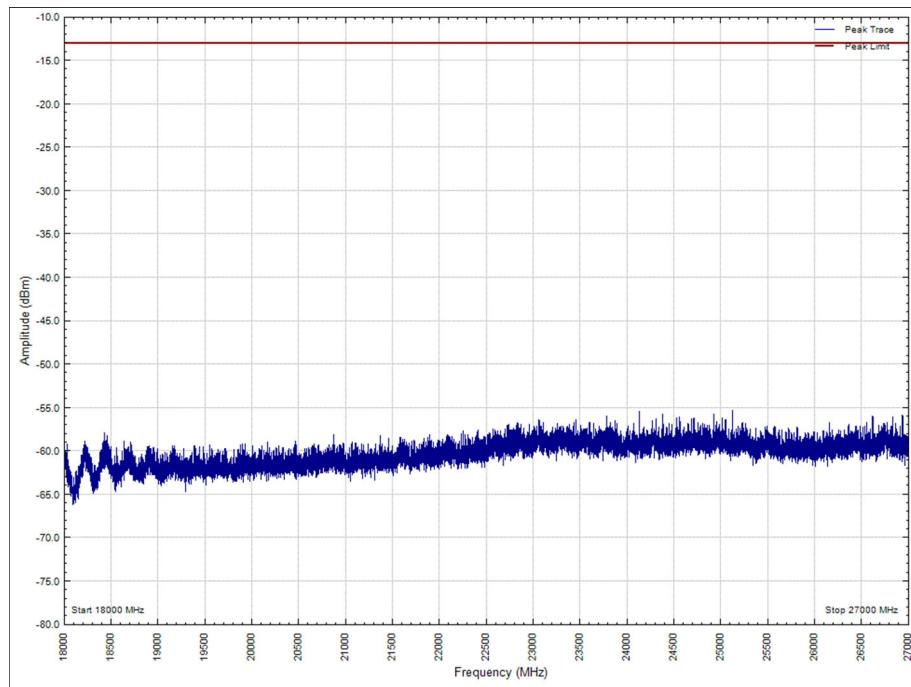


Figure 25 - 2526.00 MHz - 18 GHz to 27 GHz, Vertical

DC Powered – NR (60 MHz) – 2C – 2526 MHz + 2660 MHz (M)

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 11 – 2660 MHz, 30 MHz to 1 GHz

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

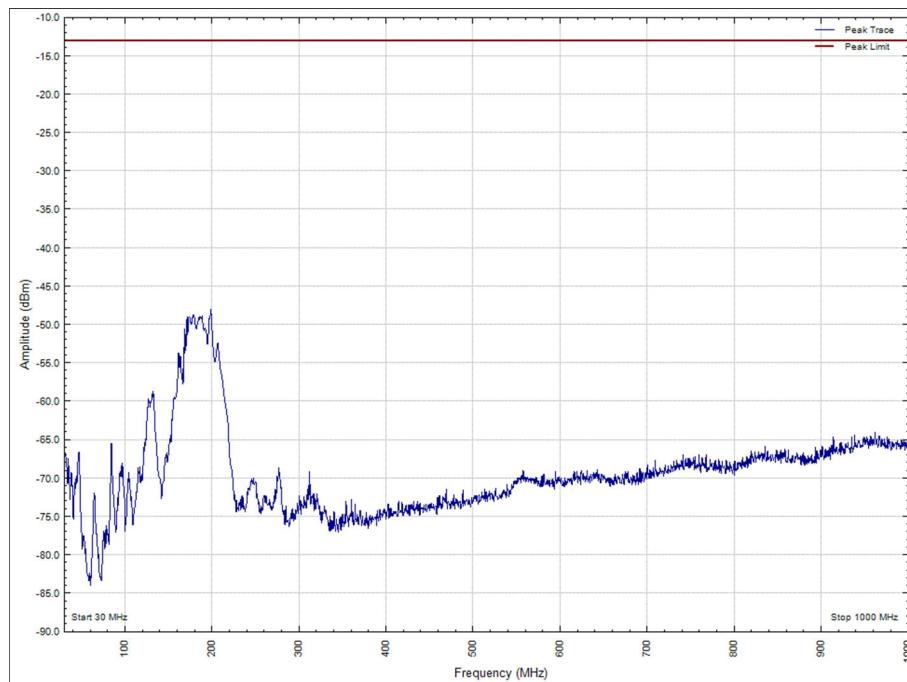


Figure 26 - 2660 MHz - 30 MHz to 1 GHz, Horizontal

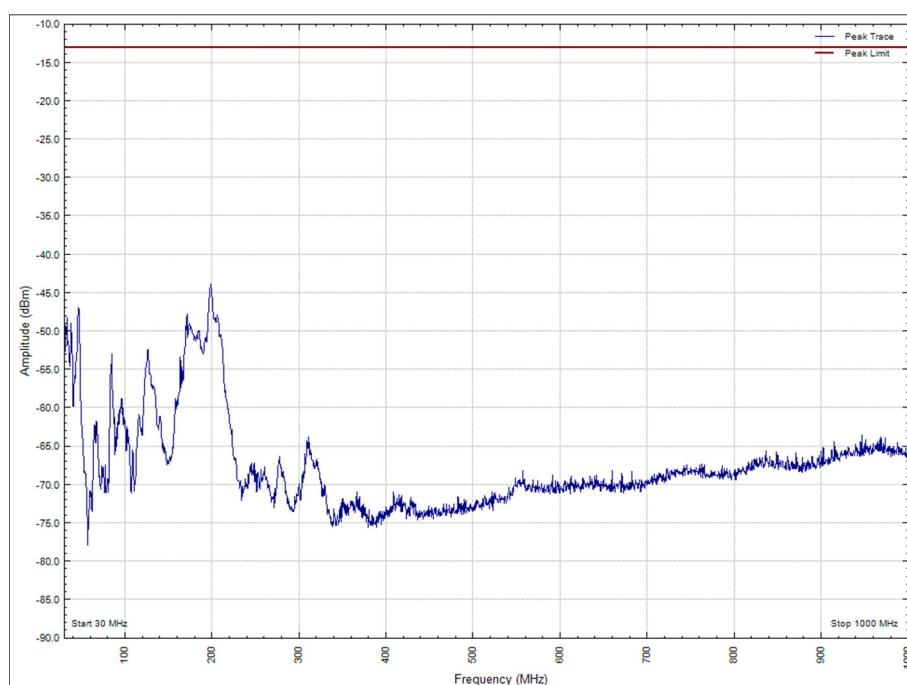


Figure 27 - 2660 MHz - 30 MHz to 1 GHz, Vertical

Frequency (MHz)	Level (dB μ V/m)	Limit (dB μ V/m)	Margin (dB)	Angle (°)	Height (cm)	Polarisation	Orientation
*							

Table 12 – 2660 MHz, 1 GHz to 27 GHz

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

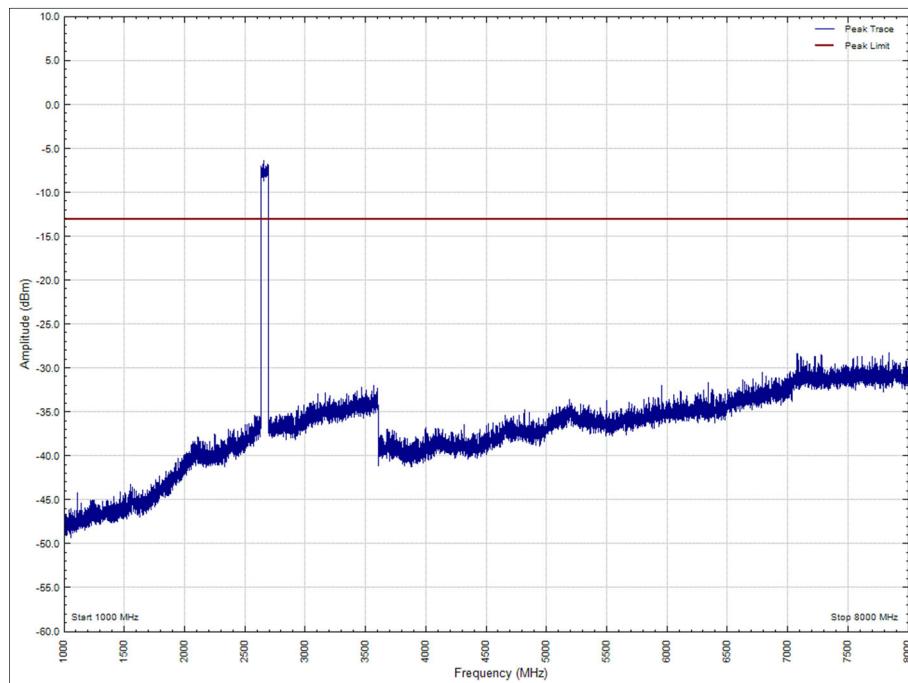


Figure 28 - 2660 MHz - 1 GHz to 8 GHz, Horizontal

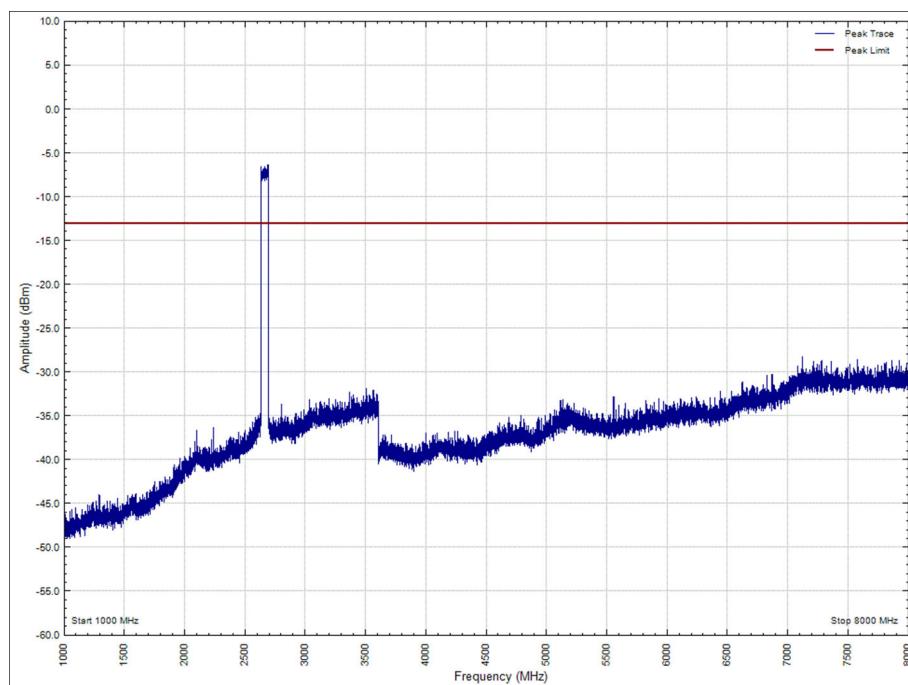


Figure 29 - 2660 MHz - 1 GHz to 8 GHz, Vertical

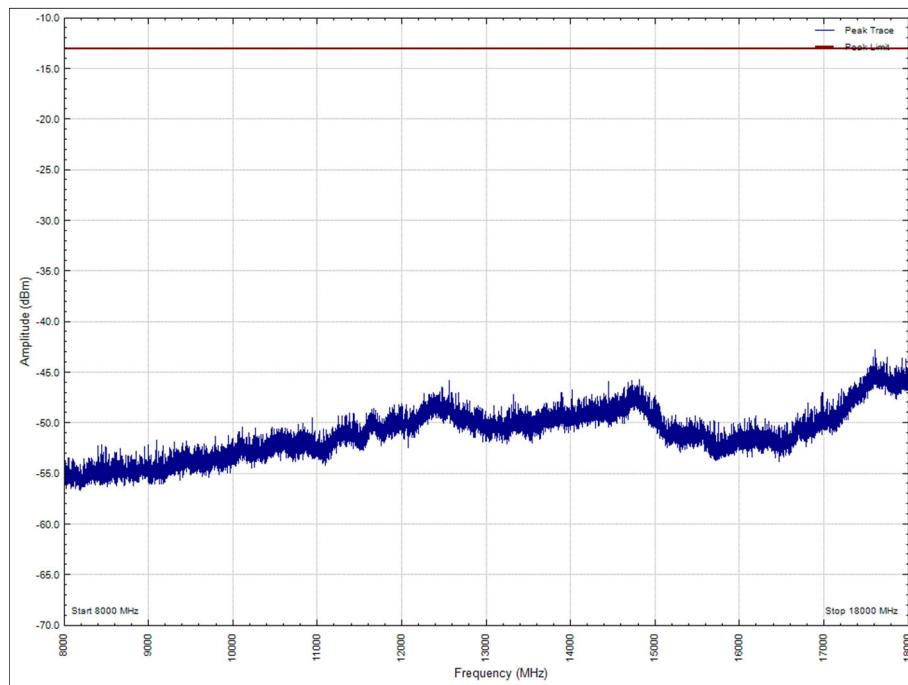


Figure 30 - 2660 MHz - 8 GHz to 18 GHz Horizontal

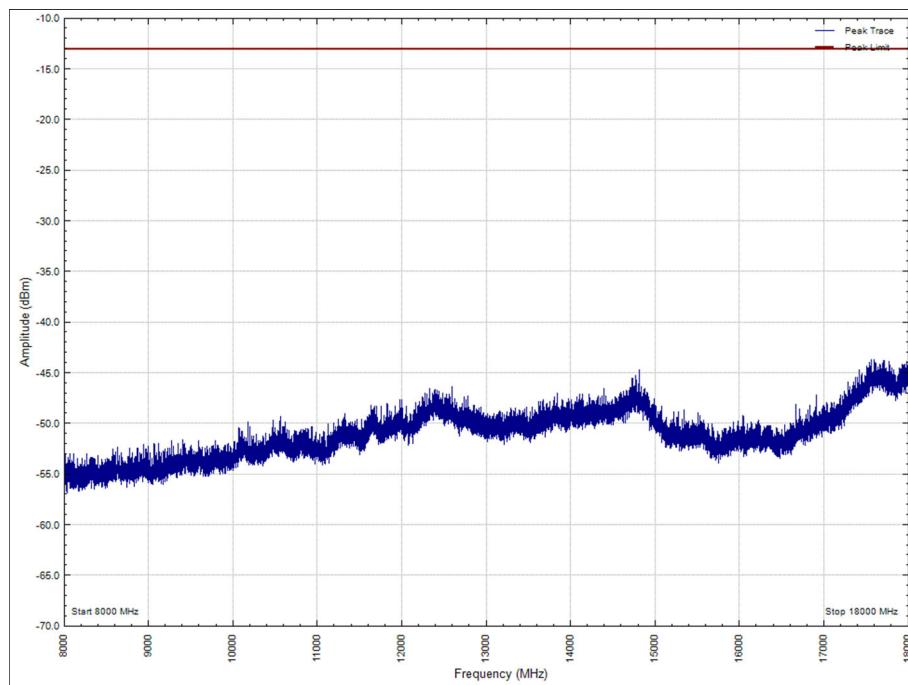


Figure 31 - 2660 MHz - 8 GHz to 18 GHz, Vertical

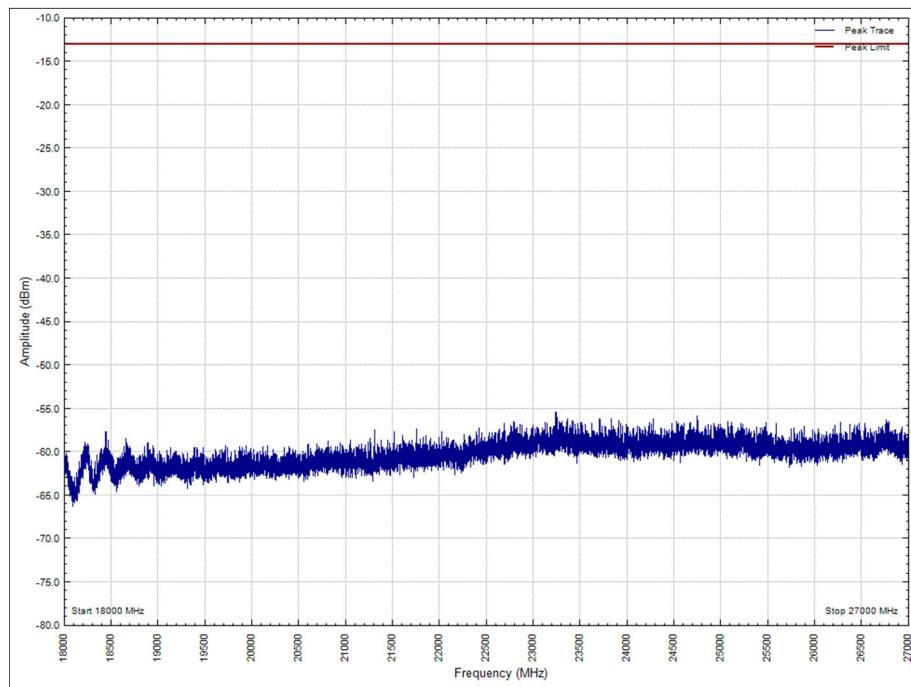


Figure 32 - 2660 MHz - 18 GHz to 27 GHz, Horizontal

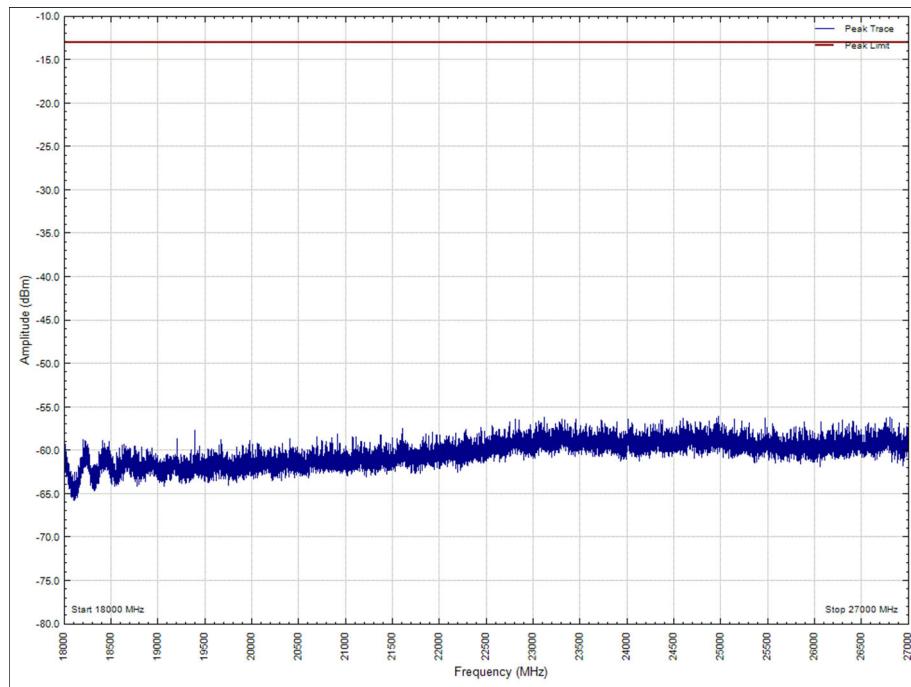


Figure 33 - 2660 MHz - 18 GHz to 27 GHz Vertical