C2PC TEST REPORT

Report Number: 14663671-E1V1

Applicant	:	SPOTTER RF LLC 709 E. TECHNOLOGY AVE. BLDG E 3100 OREM, UTAH 84097, U.S.A.
Model	:	C550, AX250-3D, 3D-250, AX350-2D, AX400-2D
Brand	:	SPOTTER RF LLC
FCC ID	:	CO6-C550-LIC
EUT Description	:	COMPACT SURVEILLANCE RADAR
Test Standard(s)	:	FCC CFR47 PART 90

Date of Issue:
March 20, 2023

Prepared by:
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ACCREDITED
CERT #0751.05

Revision History

Rev.	Issue Date	Revisions	Revised By
V1	2023-03-20	Initial Issue	---

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1. ATTESTATION OF TEST RESULTS

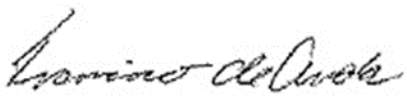
COMPANY NAME:	SPOTTERRF LLC 709 E. TECHNOLOGY AVE. BLDG E 3100 OREM, UTAH 84097, U.S.A.
EUT DESCRIPTION:	COMPACT SURVEILLANCE RADAR
MODEL:	C550, AX250-3D, 3D-250, AX350-2D, AX400-2D
MODEL TESTED:	AX250-3D
SERIAL NUMBER:	Radiated: SP45345 Conducted: SP45167
SAMPLE RECEIPT DATE:	2023-2-3
DATE TESTED:	2023-2-7 to 2023-2-15

APPLICABLE STANDARDS	
STANDARD	**TEST RESULTS**
CFR 47 Part 90	Complies

UL Verification Services Inc. tested the above equipment in accordance with the requirements set forth in the above standards. All indications of Pass/Fail in this report are opinions expressed by UL Verification Services Inc. based on interpretations and/or observations of test results. Measurement Uncertainties were not taken into account and are published for informational purposes only. The test results show that the equipment tested is capable of demonstrating compliance with the requirements as documented in this report.

Note: The results documented in this report apply only to the tested sample, under the conditions and modes of operation as described herein. This document may not be altered or revised in any way unless done so by UL Verification Services Inc. and all revisions are duly noted in the revisions section. Any alteration of this document not carried out by UL Verification Services Inc. will constitute fraud and shall nullify the document. This report must not be used by the client to claim product certification, approval, or endorsement by A2LA, NIST, any agency of the Federal Government, or any agency of any government.

Approved & Released For
UL Verification Services Inc. By:



Francisco de Anda
Staff Engineer
UL Verification Services Inc.

Prepared & Reviewed by

Henry Lau
Senior Project Engineer
UL Verification Services Inc.

2. TEST RESULTS SUMMARY

This report contains data provided by the customer which can impact the validity of results. UL Verification Services Inc. is only responsible for the validity of results after the integration of the data provided by the customer.

Below is a list of the data provided by the customer:

1) Antenna gain and type (see section 6.3)
2) Cable Loss (see section 9.2 & 9.3)

FCC Clause	Requirement	Result	Comment
§2.1049	Occupied Bandwidth	Complies	
§2.1046, §90.205(s), §90.103(c)(13)	Output Power	Complies	
§2.1055, §90.213(b)	Frequency Stability	Not tested	Refer to Original report
§2.1051, §90.210	Conducted Spurious Emissions	Complies	
§2.1053, §90.210	Radiated Spurious Emissions	Complies	
§1.1310 & 2.1091	RF Exposure	Complies	Refer to UL Report # 14663671-E3

3. TEST METHODOLOGY

The tests documented in this report were performed in accordance with FCC CFR 47 Part 2, FCC CFR 47 Part 90, 971168 D01 Power Meas License Digital Systems v03r01.

4. FACILITIES AND ACCREDITATION

UL Verification Services Inc. is accredited by A2LA, Certificate Number 0751.05, for all testing performed within the scope of this report. Testing was performed at the locations noted below.

	Address	ISED CABID	ISED Company Number	FCC Registration
☒	Building 1: 47173 Benicia Street Fremont, CA 94538, U.S.A	US0104	2324A	550739
☐	Building 2: 47266 Benicia Street Fremont, CA 94538, U.S.A	US0104	2324A	550739
☒	Building 4: 47658 Kato Rd Fremont, CA 94538, U.S.A	US0104	2324A	550739

5. DECISION RULES AND MEASUREMENT UNCERTAINTY

5.1. METROLOGICAL TRACEABILITY

All test and measuring equipment utilized to perform the tests documented in this report are calibrated on a regular basis, with a maximum time between calibrations of one year or the manufacturers' recommendation, whichever is less, and where applicable is traceable to recognized national standards.

5.2. DECISION RULES

The Decision Rule is based on Simple Acceptance in accordance with ISO Guide 98-4:2012 Clause 8.2. (Measurement uncertainty is not taken into account when stating conformity with a specified requirement.)

5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

PARAMETER	U_{Lab}
Radio Frequency (Spectrum Analyzer)	141.16 Hz
Occupied Bandwidth	1.22%
RF Power Measurement Direct Method Using Power Meter	1.3 dB (PK) 0.45 dB (AV)
Unwanted Emissions, conducted	1.94 dB
Worst Case Conducted Disturbance, 9KHz to 0.15 MHz	3.78 dB
Worst Case Conducted Disturbance, 0.15 to 30 MHz	3.40 dB
Worst Case Radiated Disturbance, 9KHz to 30 MHz	2.87 dB
Worst Case Radiated Disturbance, 30 to 1000 MHz	6.01 dB
Worst Case Radiated Disturbance, 1000 to 18000 MHz	4.73 dB
Worst Case Radiated Disturbance, 18000 to 26000 MHz	4.51 dB
Worst Case Radiated Disturbance, 26000 to 40000 MHz	5.29 dB
Time Domain Measurements	3.39 %
Temperature	0.57°C
Humidity	3.39%
DC Supply voltages	0.57%

Uncertainty figures are valid to a confidence level of 95%.

5.4. SAMPLE CALCULATION

RADIATED EMISSIONS

Where relevant, the following sample calculation is provided:
Field Strength (dBuV/m) = Measured Voltage (dBuV) + Antenna Factor (dB/m) + Cable Loss (dB) – Preamp Gain (dB)
36.5 dBuV + 18.7 dB/m + 0.6 dB – 26.9 dB = 28.9 dBuV/m

MAINS CONDUCTED EMISSIONS

Where relevant, the following sample calculation is provided:
Final Voltage (dBuV) = Measured Voltage (dBuV) + Cable Loss (dB) + Limiter Factor (dB) + LISN Insertion Loss.
36.5 dBuV + 0 dB +10.1 dB+ 0 dB = 46.6 dBuV

6. EQUIPMENT UNDER TEST

6.1. DESCRIPTION OF EUT

The EUT is 10 GHz medium range Compact Surveillance Radar (CSR). The unit operates only between channel 2 through 9 (10.055 GHz to 10.455 GHz)

The radio module is manufactured by SpotterRF LLC.

6.2. PERMISIVE CHANGE SCOPE

Purpose for C2PC permissive change is to add a new antenna rotating motor and reduction of BW by 10MHz and implementing a wider antenna plate and longer coax cable to antenna.

6.3. MODEL DIFFERENCES

Model AX250-3D and 3D-250 uses model C550 Hardware but implements the rotating motor and reduction of BW by 10Mhz and implements a wider antenna plate with a longer coax cable to antenna.

Model AX350-2D and AX400-2D are electrically identical to AX250-3D and 3D-250 without the rotating base.

6.4. MAXIMUM OUTPUT POWER

The transmitter has a maximum peak conducted output power as follows:

Frequency (GHz)	Channel	Output Power (dBm)	Output Power (mW)
10.075	2	20.94	124.17
10.225	5	20.98	125.31
10.425	9	20.61	115.08

6.5. DESCRIPTION OF AVAILABLE ANTENNAS

The antenna(s) gain and type, as provided by the manufacturer' are as follows:

The radio utilizes a patch antenna, with a maximum gain of 14 dBi.

6.6. SOFTWARE AND FIRMWARE

The EUT firmware installed during testing was v3.0.0-alpha.00502

6.7. WORST-CASE CONFIGURATION AND MODE

Radiated emission was performed with the EUT set to transmit at the channel with highest output power as worst-case scenario for Below 1GHz, Above 1GHz.
For Above 18GHz, Radiated emission was performed with the EUT set to transmit at the low mid and high channel.

The EUT has eight usable channels and each channel has 50MHz bandwidth with frequency modulation on continuous wave format.

Sweeping mode at which the continuous wave frequency sweeps inside the 50 MHz band while the output power measured as shown below under 9.3 and 9.4.

All final radiated testing was performed with the EUT in upright orientation as indicated by the installation instructions.

6.8. DESCRIPTION OF TEST SETUP

SUPPORT EQUIPMENT

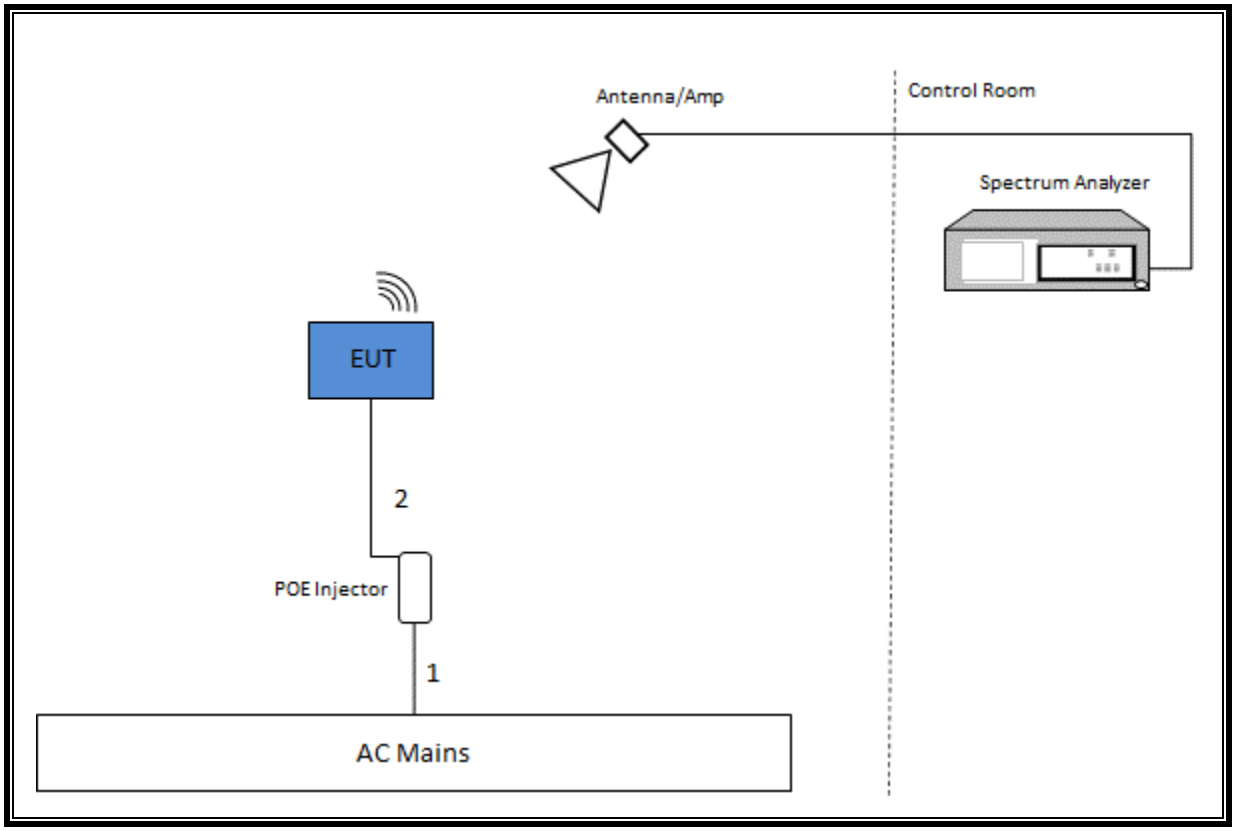
SUPPORT TEST EQUIPMENT				
Description	**Manufacturer**	**Model**	**Serial Number**	**FCC ID/ DoC**
POE Power Supply	Phoenix Contact	Various	Various	DoC

I/O CABLES (CONDUCTED TEST)						
Cable No.	**Port**	**# of Identical Ports**	**Connector Type**	**Cable Type**	**Cable Length (m)**	**Remarks**
1	AC	1	AC	Unshielded	1m	None
2	Ethernet	1	RJ45	Unshielded	1m	None

TEST SETUP

The EUT is powered via the POE adapter. Test software exercised using the Laptop controlled through the Ethernet cables. Laptop was removed for final testing.

SETUP DIAGRAM FOR TESTS



7. MEASUREMENT METHOD

On Time and Duty Cycle: ANSI C63.25-2015 Section 5.2.4.3.4

Occupied BW (99%): ANSI C63.25-2015 Section 5.4.3

Output Power: ANSI C63.25-2015 Section 5.2.3.2

Radiated Spurious emissions: ANSI C63.25-2015 Section 5.5

Conducted Spurious emissions: ANSI C63.25-2015 Section 5.7

8. TEST AND MEASUREMENT EQUIPMENT

The following test and measurement equipment was utilized for the tests documented in this report:

TEST EQUIPMENT LIST					
Description	**Manufacturer**	**Model**	**ID Num**	**Cal Due**	**Last Cal**
EMI TEST RECEIVER	Rohde & Schwarz	ESW44	101724	2023/02/28	2022/02/16
Antenna, BroadBand Hybrid, 30MHz to 2GHz	Sunol Sciences Corp.	JB1	80813	2023/06/08	2022/06/08
Thermometer	Control Company	14-650-118	175731	2024/02/29	2023/02/08
Amplifier, 9KHz to 1GHz, 32dB	SONOMA INSTRUMENT	310	382692	2023/02/28	2022/02/28
RF Filter Box, 1-18GHz	UL	N/A	197920	2023/04/19	2022/04/19
Horn Antenna 1-18GHz	ETS Lindgren	3117	223083	2023/10/25	2022/10/25
Attenuator, 20dB	Mini-Circuits	VAT-20+	231193	Verify before use	
Attenuator, 6dB	Mini-Circuits	VAT-6+	231191	Verify before use	
Horn Antenna 18-26.5 GHz	A.R.A	MWH-1826/B	172364	2023/03/08	2022/03/08
RF Amplifier 18-26.5GHz	AMPLICAL	AMP18G26.5-60	215705	2023/02/26	2022/02/26
Antenna, Horn 26.5 to 40GHz	A.R.A	MWH-2640/B	81104	2023/12/15	2022/12/15
Rf Amplifier, 26-40GHz Kit	AMPLICAL	AMP26G40-65	172365	2023/03/08	2022/03/08
Spectrum Analyzer, PXA, 3Hz to 44GHz	Keysight Technologies Inc	N9030A	125178	2023/02/28	2022/02/03
Attenuator, 10dB	Mini-Circuits	VAT-10+	231192	Verify before use	
Power Sensor, P - series, 50MHz to 18GHz, Wideband	Keysight Technologies Inc	N1921A	81319	2024/01/31	2023/01/25
Power Meter, P-series single channel	Keysight Technologies Inc	N1911A	90719	2024/01/31	2023/01/25
Spectrum Analyzer, PXA, 3Hz to 50GHz w/Ext. Mixer	Keysight Technologies Inc	N9030A	80125	2023/02/28	2023/02/01
Antenna Horn, Rectangle, WR22	Custom Microwave Inc.	HO22R	201518	2023/07/06	2022/07/06
Low Noise Amplifier 40-50GHz	ERAVANT	SBL-3335033040-2222-E1	215450	2023/04/14	2022/04/14
Antenna Horn, Rectangle, 50 – 75GHz	Custom Microwave Inc.	No Model #	H15-1	Verify before use	
LNA, 50-75 GHz	VIVA TECH	VTLNA-15-6018-FB	202496	2023-07-08	2022-07-08
UL TEST SOFTWARE LIST					
Radiated Software	UL	UL EMC	Rev 9.5 18 Jan 2023		
Antenna Port Software	UL	UL RF	AP2022.8.16		

9. ANTENNA PORT TEST RESULTS

9.1. OCCUPIED BANDWIDTH

LIMITS

FCC §2.1049

None; for reporting purposes only.

TEST PROCEDURE

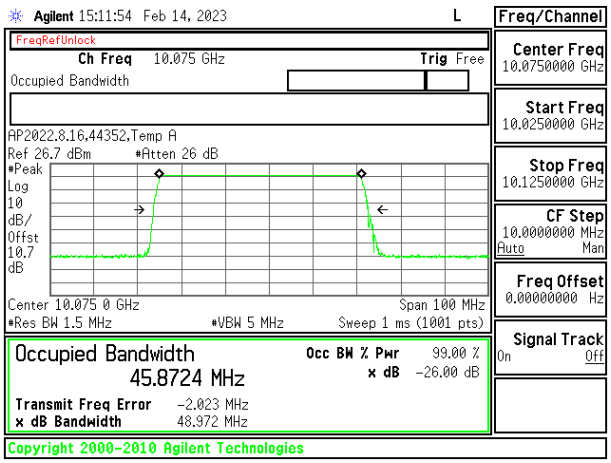
The transmitter output is connected to the spectrum analyzer. The sweep time is coupled. The spectrum analyzer internal 26dB bandwidth function is utilized.

KDB 971168 Occupied bandwidth measurement method is used.

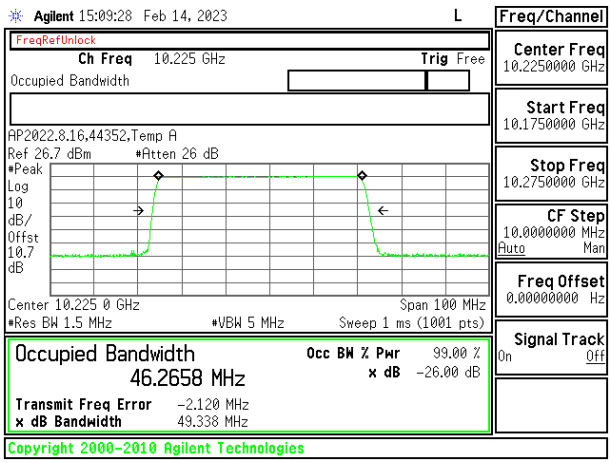
RESULTS

26dB BANDWIDTH SWEEPING MODE

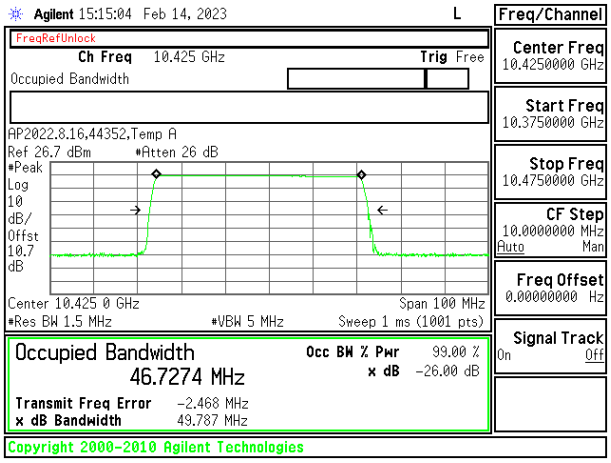
Channel	Frequency (GHz)	26dB Bandwidth (MHz)
2	10.075	48.972
5	10.225	49.338
9	10.425	49.787



LOW CHANNEL 1



MID CHANNEL 6



HIGH CHANNEL 11

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9.2. OUTPUT POWER

LIMITS

FCC §2.1046

FCC §90.205(s) the output power shall not exceed by more than 20 percent either the output power shown in the Radio Equipment List

FCC §90.103(c) (13) operations in this band are limited to survey operations using transmitters with a peak power not to exceed 5 watts into the antenna.

TEST PROCEDURE

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband peak power sensor. Peak output power was read directly from power meter.

The SMA cable has a declared worst-case loss of 1dB by manufacturer.

KDB 971168 Wideband power measurement method is used.

RESULTS

Tested By:	44352
Date:	2023-02-07

Channel	Frequency (GHz)	Peak Power Reading (dBm)	Limit (dBm)	Margin
		Sweep mode		Sweep mode (dBm)
2	10.075	20.94	37	-16.06
5	10.225	20.98	37	-16.02
9	10.425	20.61	37	-16.39

9.3. AVERAGE POWER

LIMITS

None; for reporting purposes only.

TEST PROCEDURE

The transmitter output is connected to a power meter.

RESULTS

The power output was measured on the EUT antenna port using SMA cable with 10dB attenuator connected to a power meter via wideband average power sensor. Gated average output power was read directly from power meter.

The SMA cable has a declared worst-case loss of 1dB by manufacturer.

KDB 971168 Wideband power measurement method is used.

Tested By:	44352	
Date:	2023-02-07	
Channel	Frequency (GHz)	AV Power (dBm) Sweep
2	10.075	20.87
5	10.225	20.89
9	10.425	20.57

9.4. CONDUCTED SPURIOUS EMISSIONS

LIMITS

FCC §2.1051 FCC §2.1057, & FCC §90.210

For frequencies outside the authorized band, the attenuation must be at least 43 + 10 log(Pm) dB. Pm is defined as the mean power of the radar in Watts. This equation will result in a -13 dBm limit line, regardless of the value of Pm: Pm (dBW) - attenuation = Pm (dBW) - (43 + 10 log(Pm)) = -43 dBW = -13 dBm.

TEST PROCEDURE

The transmitter output is connected to a spectrum analyzer.
The resolution bandwidth is set to 1MHz. The video bandwidth is set to 3MHz.

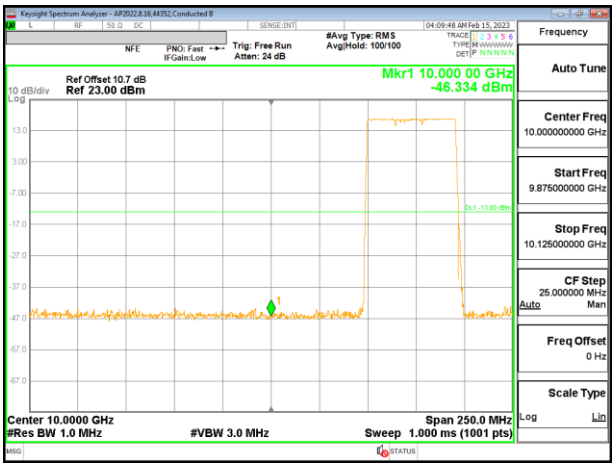
The spectrum from 20MHz to 40GHz is investigated with the transmitter set to the lowest, middle, and highest channels.

RESULTS

For 40GHz to 53GHz, see section 10.5 & 10.6.

SPURIOUS EMISSIONS SWEEPING MODE

LOW CHANNEL



LOW CH BANDEDGE

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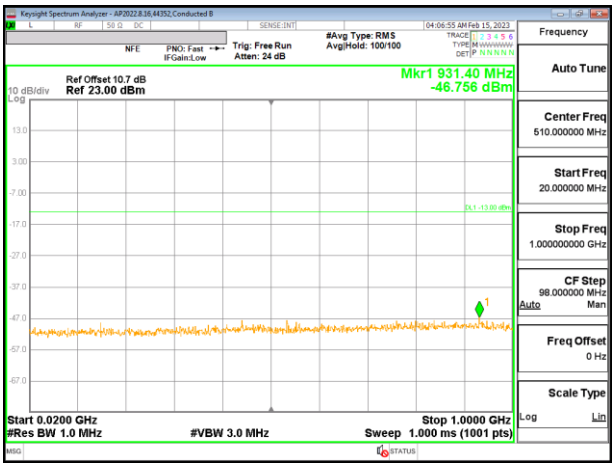
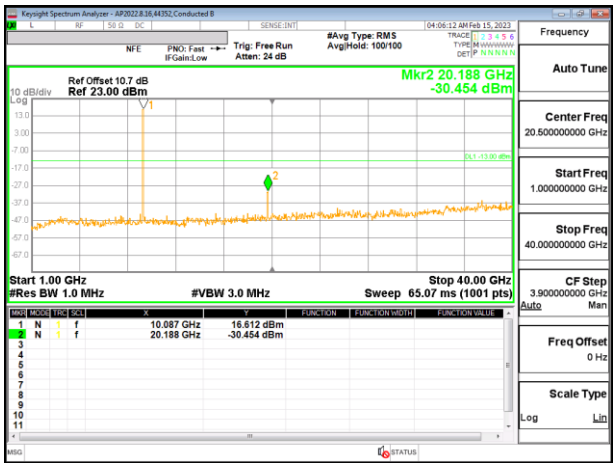
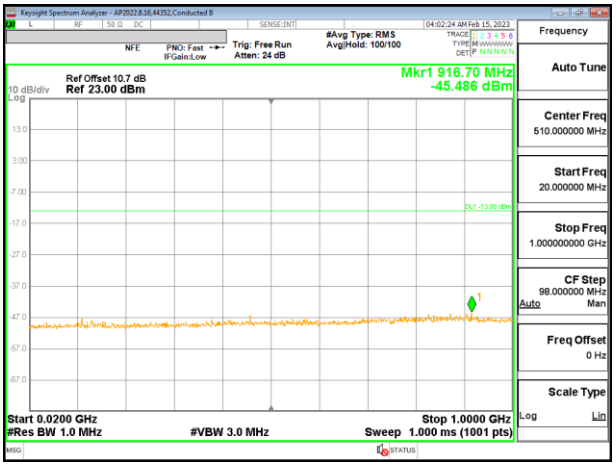


SPURIOUS LOW CH 20-1000MHz

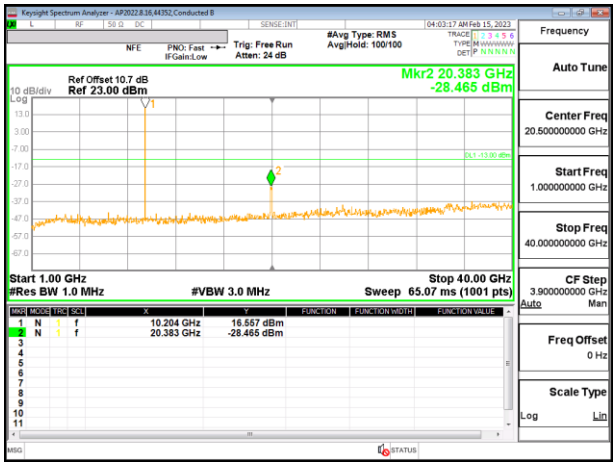


SPURIOUS LOW CH 1-40GHz

SPURIOUS EMISSIONS, MID CHANNEL

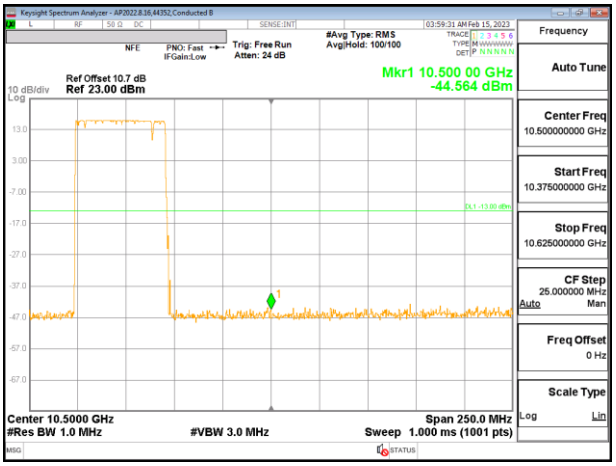


SPURIOUS MID CH 20-1000MHz



SPURIOUS MID CH 1-40GHz

HIGH CHANNEL



HIGH CH BANDEDGE(RBW=1MHz & VBW=3MHz)

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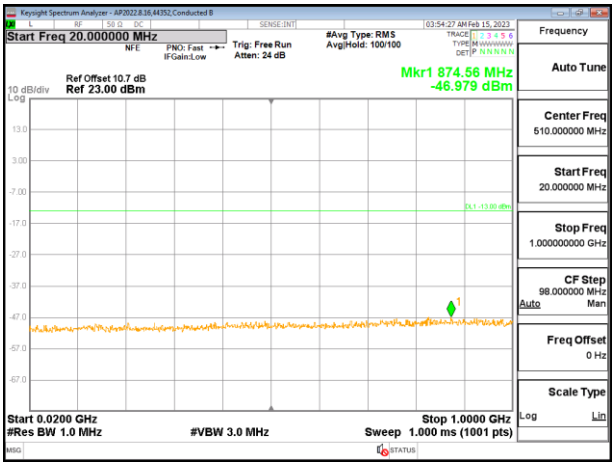
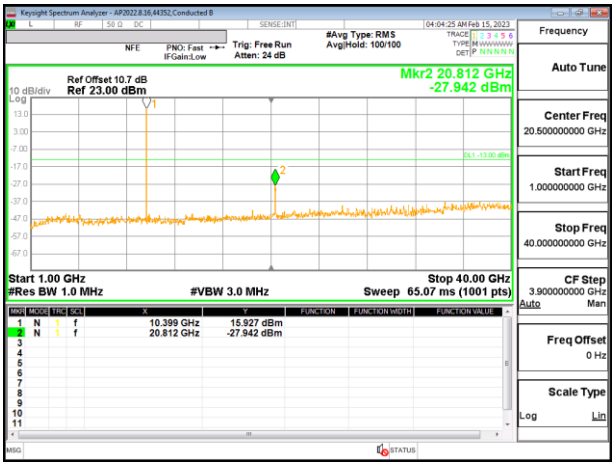


SPURIOUS HIGH CH 20-1000MHz



SPURIOUS HIGH CH 1-40GHz

10. RADIATED TEST RESULTS

10.1. LIMITS AND PROCEDURE

LIMITS

FCC §2.1053 & FCC §90.210

For frequencies outside the authorized band, the attenuation must be at least 43 + 10 log(Pm) dB. Pm is defined as the mean power of the radar in Watts. This equation will result in a -13 dBm limit line, regardless of the value of Pm: Pm (dBW) - attenuation = Pm (dBW) - (43 + 10 log(Pm)) = -43 dBW = -13 dBm or 82 dBuV/m at 3m.

Emission Mask C. For transmitters that are not equipped with an audio low-pass filter, the power of any emission must be attenuated below the unmodulated carrier output power (P) as follows:

(1) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (f_d/5) dB;

(2) On any frequency removed from the center of the authorized bandwidth by a displacement frequency (f_d in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least 29 log (f_d^2/11) dB or 50 dB, whichever is the lesser attenuation;

(3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.

Equation (3) results in a -13 dBm limit line, regardless of the value of Pm: Pm (dBW) - attenuation = Pm (dBW) - (43 + 10 log(Pm)) = -43 dBW = -13 dBm or 82 dBuV/m at 3m.

TEST PROCEDURE

The EUT is placed on a non-conducting table 80 cm above the ground plane. The antenna to EUT distance is 3 meters. The EUT is configured in accordance with ANSI C63.26. The EUT is set to transmit in a continuous mode.

For measurements below 1 GHz the resolution bandwidth is set to 100 kHz for peak detection measurements or 120 kHz for quasi-peak detection measurements in the 30-1000MHz range, 9kHz for peak and/or quasi-peak detection measurements in the 0.15-30MHz range and 200Hz for peak and/or quasi-peak detection measurements in the 9 to 150kHz range. Peak detection is used unless otherwise noted as quasi-peak or average (9-90kHz and 110-490kHz).

For pre-scans above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 30 KHz for peak measurements.

For final measurements above 1 GHz the resolution bandwidth is set to 1 MHz; the video bandwidth is set to 3 MHz for peak measurements and as applicable for average measurements.

The spectrum from 9 kHz to 18 GHz and 40 GHz to 53 GHz, the channel with the highest output power was tested.
The spectrum from 18 MHz to 40 GHz is investigated with the transmitter set at the low mid and high channel.

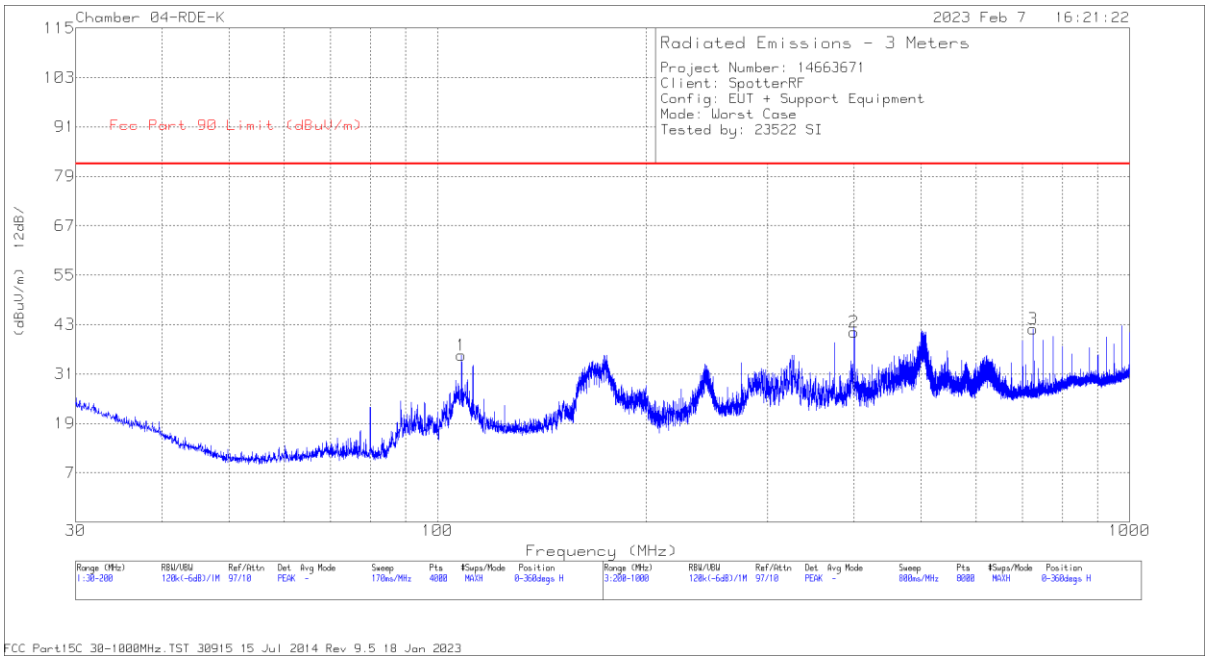
The frequency range of interest is monitored at a fixed antenna height and EUT azimuth. The EUT is rotated through 360 degrees to maximize emissions received. The antenna is scanned from 1 to 4 meters above the ground plane to further maximize the emission. Measurements are made with the antenna polarized in both the vertical and the horizontal positions.

RESULTS

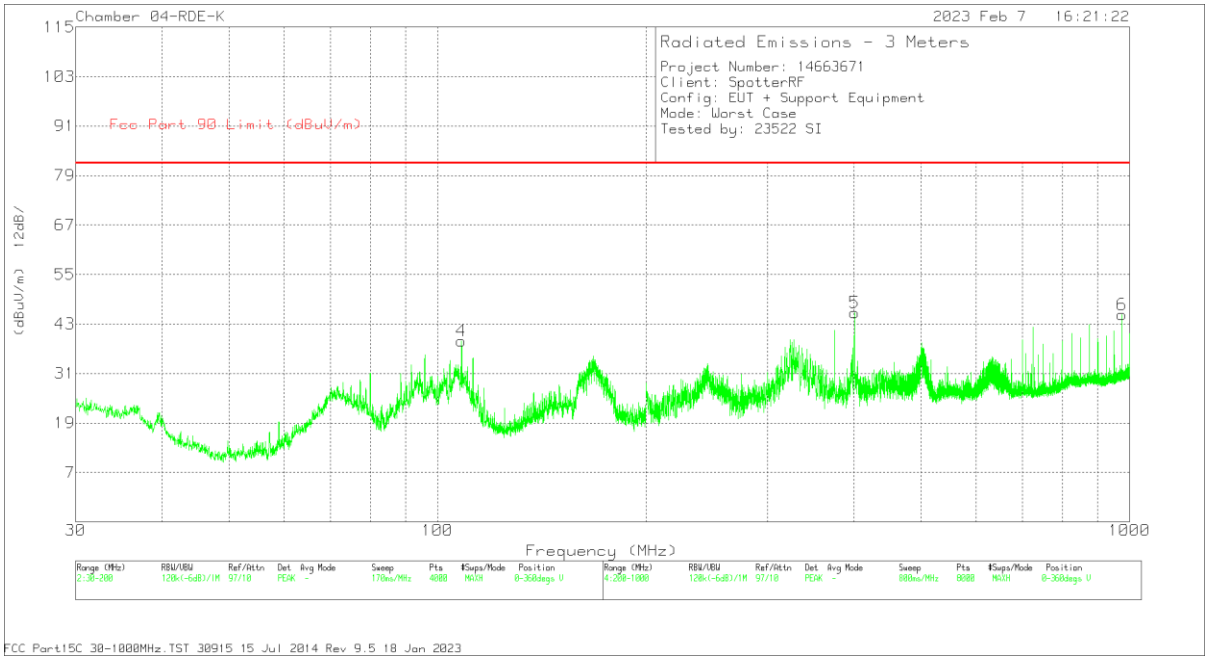
10.2. WORST-CASE BELOW 1 GHz

SPURIOUS EMISSIONS 30 TO 1000 MHz (WORST-CASE CONFIGURATION,)

30 TO 1000 MHz HORIZONTAL PLOT



30 TO 1000 MHz VERTICAL PLOT



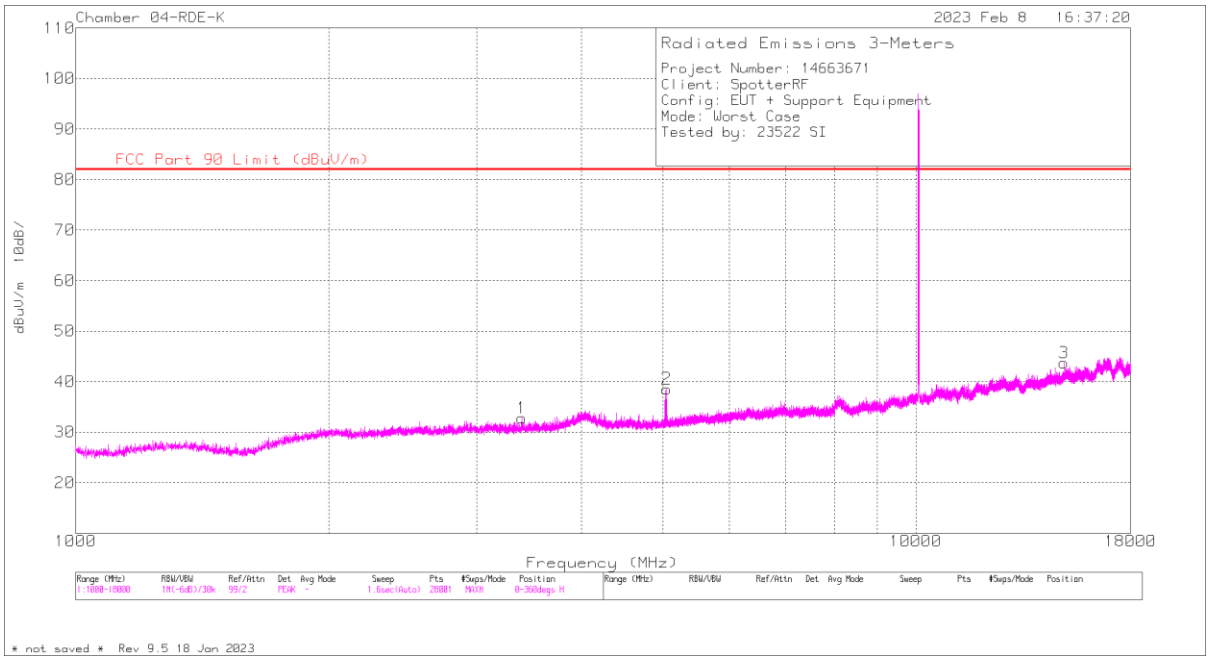
BELOW 1 GHz HORIZONTAL AND VERTICAL DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	80813 ACF (dB)	Amp/Cbl (dB)	Corrected Reading (dBuV/m)	Fcc Part 90 Limit (dBuV/m)	Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 108.348	48.03	Pk	18.4	-30.9	35.53	82	-46.47	0-360	299	H
4	* 108.348	51.41	Pk	18.4	-30.9	38.91	82	-43.09	0-360	101	V
2	399.526	48.8	Pk	21.8	-29.4	41.2	82	-40.8	0-360	299	H
3	724.968	43.67	Pk	26.7	-28.5	41.87	82	-40.13	0-360	299	H
5	* 400.239	48.73	Pk	21.8	-29.4	41.13	82	-40.87	183	150	V
6	* 975.001	42.04	Pk	29.3	-26	45.34	82	-36.66	0-360	101	V

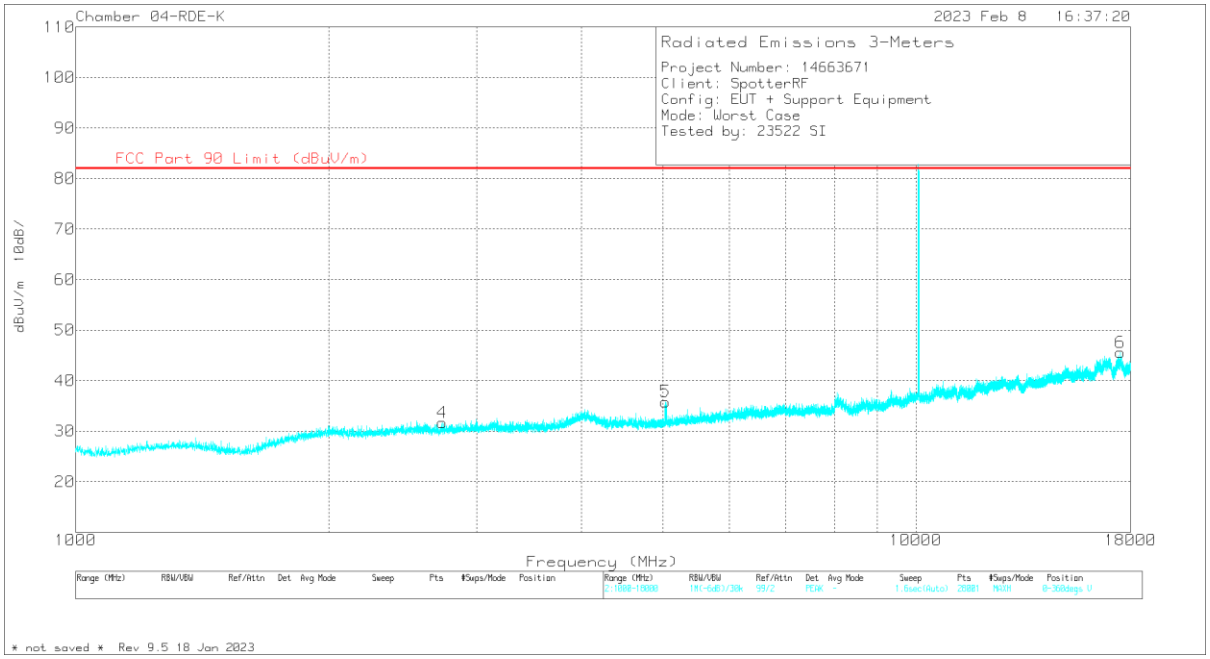
Pk - Peak detector

10.3. WORST-CASE TRANSMITTER ABOVE 1 GHz

1000 TO 18000 MHz HORIZONTAL PLOT



1000 TO 18000 MHz VERTICAL PLOT



Note, the signal over the limit line is the fundamental frequency of the EUT

ABOVE 1 GHz HORIZONTAL AND VERTICAL DATA

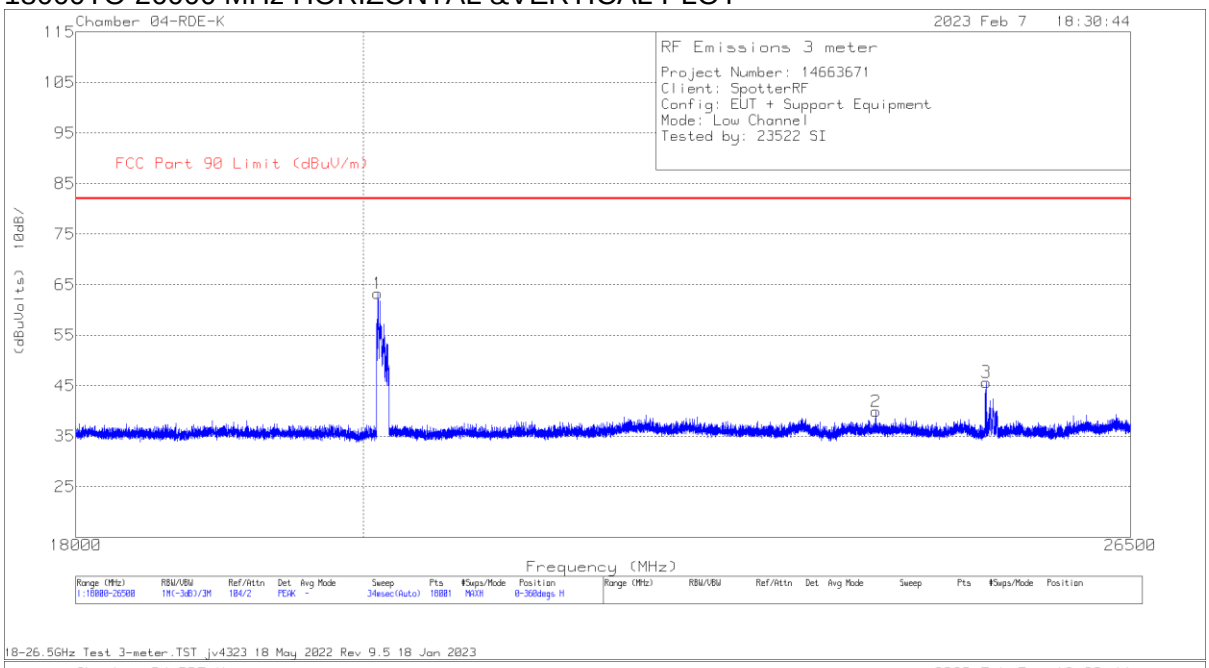
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	223083 ACF (dB) 3mH	Amp/Cbl (dB)	Pad	Corrected Reading dBuV/m	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
2	5046.015	51.47	Pk	33.9	-41	26	70.37	82	-11.63	201	146	H
1	3396.319	51.4	Pk	32.7	-42.7	26	67.4	82	-14.6	179	117	H
3	15009.635	45.85	Pk	40.1	-34.8	26	77.15	82	-4.85	269	234	H
5	5034.99	49.88	Pk	33.8	-41.1	26	68.58	82	-13.42	45	147	V
4	2728.725	52.18	Pk	32.3	-43.9	26	66.58	82	-15.42	28	352	V
6	17500.309	44.92	Pk	40.8	-31.4	26	80.32	82	-1.68	325	269	V

Pk - Peak detector
Marker 1, 3, 4 & 6 are noise floor.

10.4. TRANSMITTER ABOVE 18 GHz

Low Channel

18000TO 26000 MHz HORIZONTAL &VERTICAL PLOT

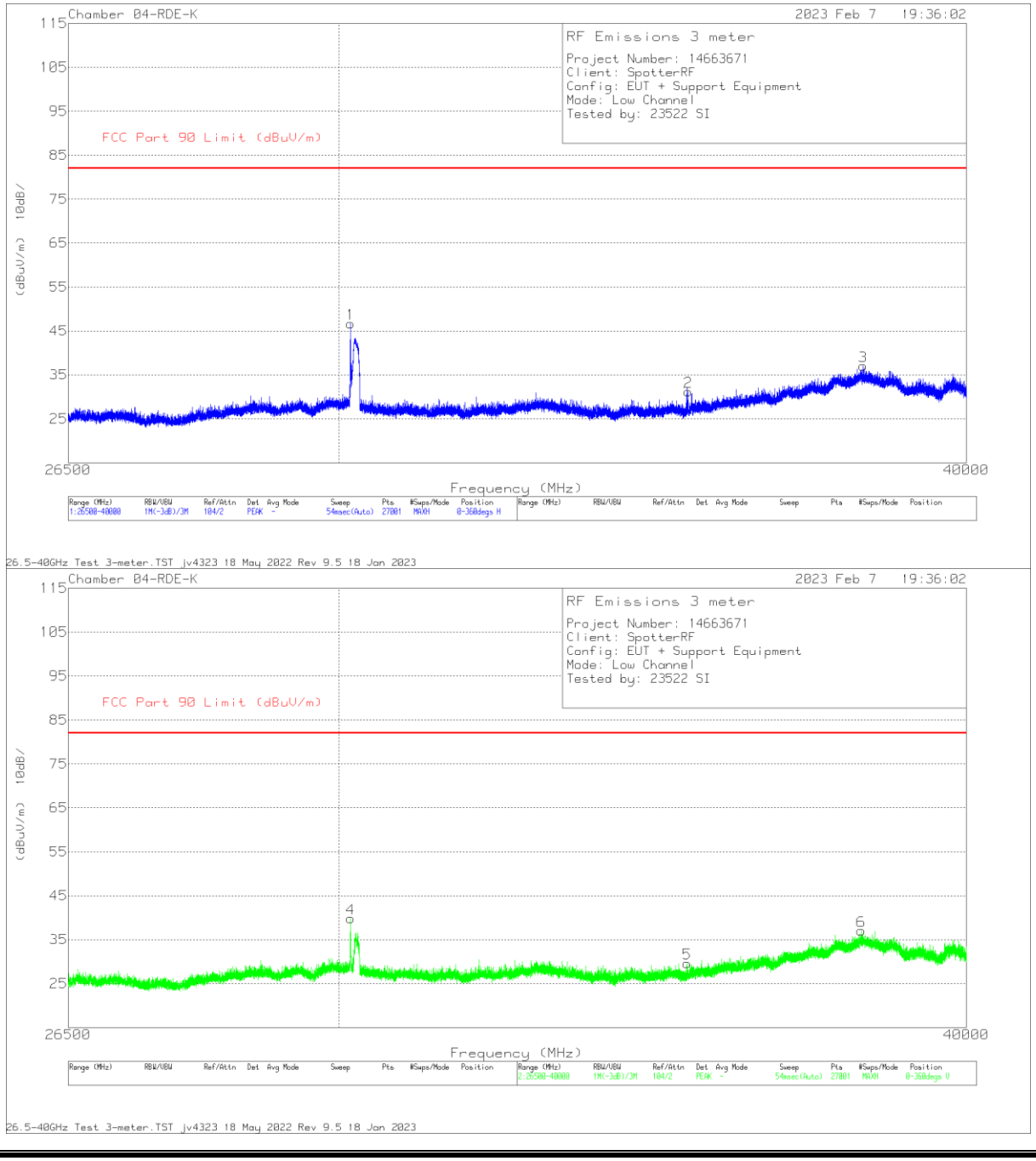


18000 TO 26000 MHz HORIZONTAL & VERTICAL DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	172364 AF (dB)	215705 amp/cbl (dB)	Cables (dB)	Corrected Reading (dBuVolts)	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 20106.179	73.9	Pk	32.9	-60.3	18.5	65	82	-17	97	295	H
2	24137.469	46.58	Pk	34.1	-61.1	20.3	39.88	82	-42.12	0-360	101	H
3	25137.636	51.89	Pk	34.3	-61.2	20.7	45.69	82	-36.31	0-360	199	H
4	* 20109.416	71.91	Pk	32.9	-60.3	18.5	63.01	82	-18.99	0-360	200	V
5	* 22065.359	46.75	Pk	33.5	-60.8	19.3	38.75	82	-43.25	0-360	200	V
6	25234.913	47.25	Pk	34.4	-61.2	20.8	41.25	82	-40.75	0-360	101	V

Pk - Peak detector

26000 TO 40000 MHz HORIZONTAL & VERTICAL PLOT



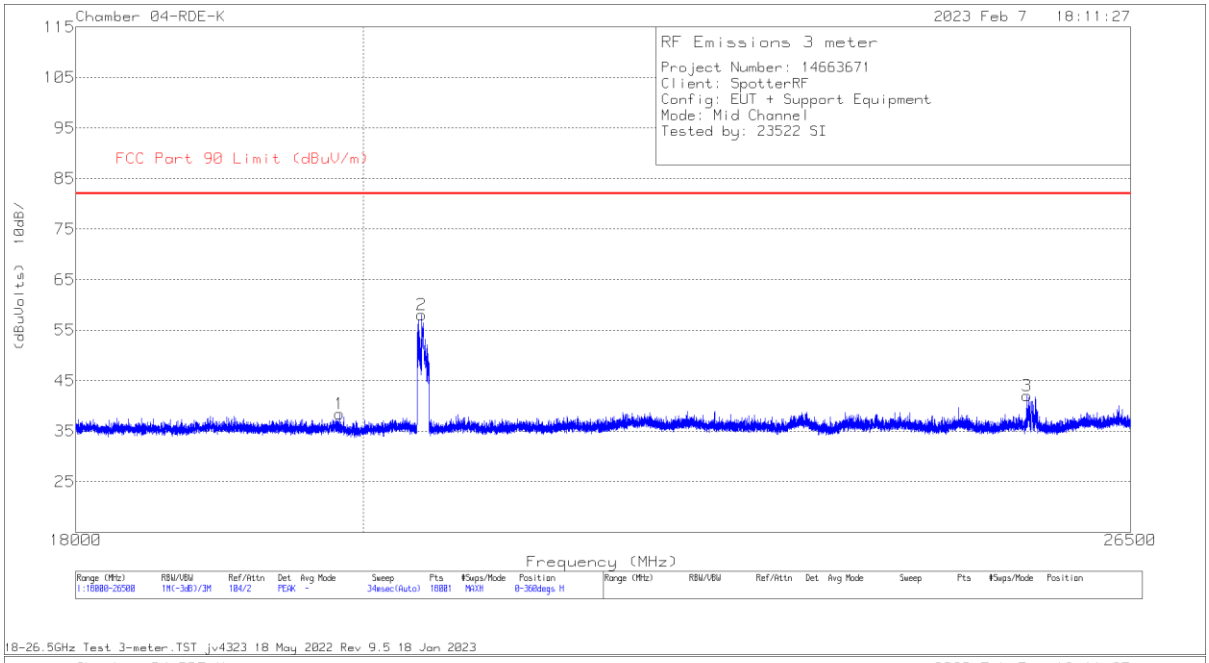
26000 TO 40000 MHz HORIZONTAL & VERTICAL DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	81104 AF (dB/m)	172345 amp/cbl (dB)	Cables (dB)	Corrected Reading (dBuV/m)	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30164.714	60.64	Pk	36.4	-70.2	22.9	49.74	82	-32.26	19	238	H
2	35207.5	42.49	Pk	37.3	-73.5	24.9	31.19	82	-50.81	0-360	101	H
3	38148.5	41.52	Pk	37.7	-68.6	26.4	37.02	82	-44.98	0-360	101	H
4	30164.5	50.73	Pk	36.4	-70.2	22.9	39.83	82	-42.17	0-360	200	V
5	35192	40.72	Pk	37.6	-73.6	24.9	29.62	82	-52.38	0-360	200	V
6	38117.5	40.9	Pk	38	-68.4	26.5	37	82	-45	0-360	200	V

Pk - Peak detector

Mid Channel

18000TO 26000 MHz HORIZONTAL &VERTICAL PLOT

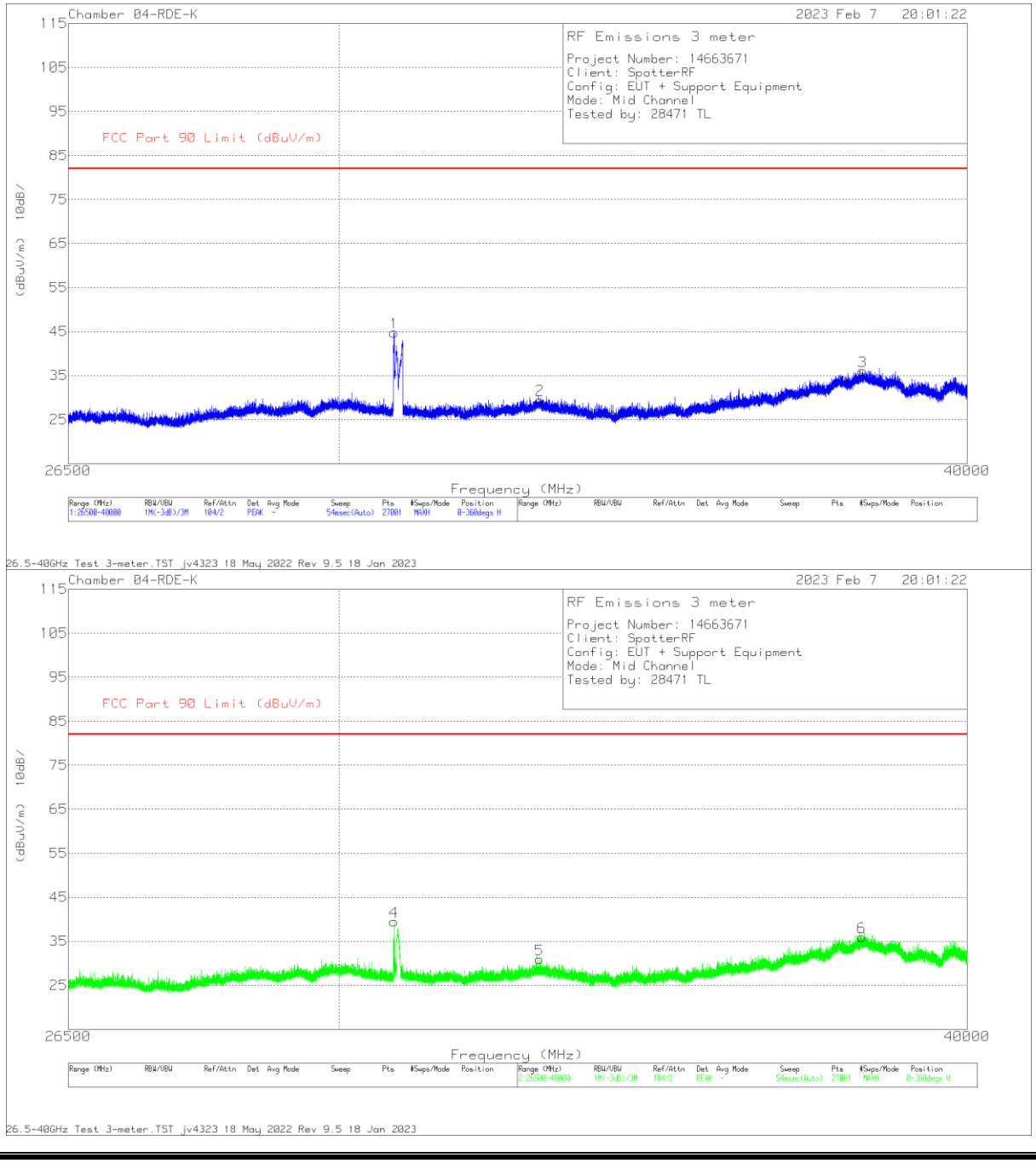


18000 TO 26000 MHz HORIZONTAL & VERTICAL DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	172364 AF (dB)	215705 amp/cbl (dB)	Cables (dB)	Corrected Reading (dBuVolts)	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 19826.555	48.06	Pk	32.9	-60.8	18.3	38.46	82	-43.54	0-360	101	H
2	* 20432.946	67.67	Pk	33.1	-59.8	18.7	59.67	82	-22.33	102	232	H
3	25512.108	47.91	Pk	34.4	-61.2	20.9	42.01	82	-39.99	0-360	101	H
4	* 18538.805	49.33	Pk	32.6	-60.6	17.8	39.13	82	-42.87	0-360	101	V
5	* 20427.221	64.9	Pk	33.1	-59.8	18.7	56.9	82	-25.1	0-360	200	V
6	25546.58	46.12	Pk	34.4	-61.2	20.9	40.22	82	-41.78	0-360	101	V

Pk - Peak detector

26000 TO 40000 MHz HORIZONTAL & VERTICAL PLOT



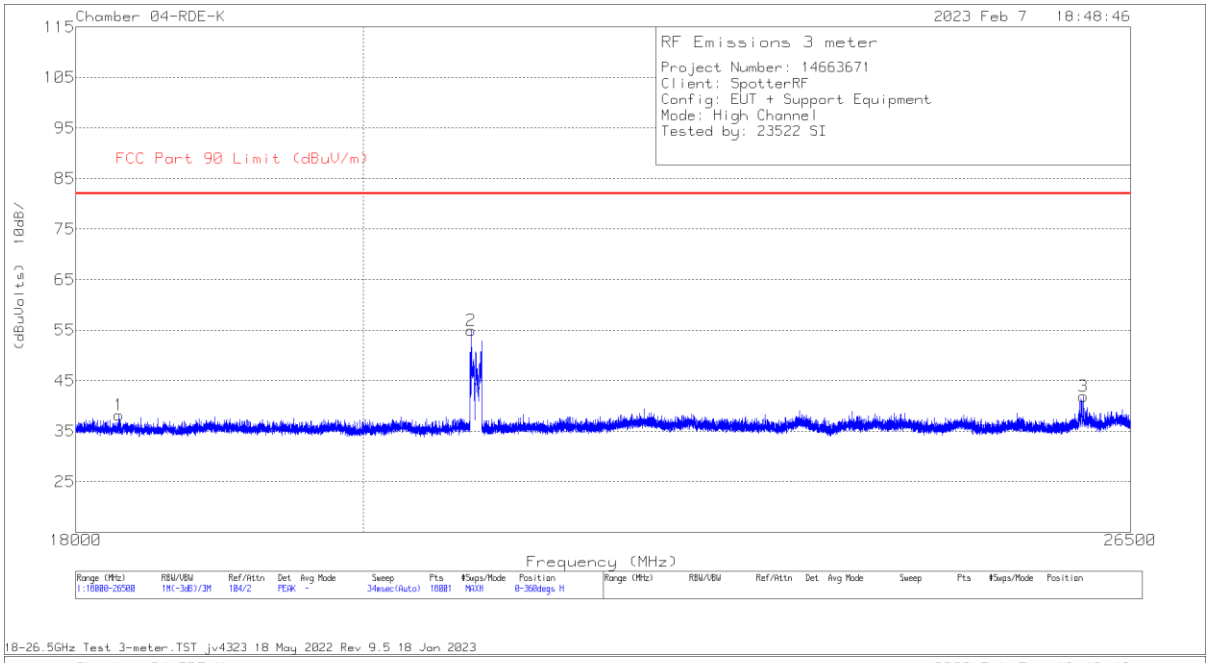
26000 TO 40000 MHz HORIZONTAL & VERTICAL DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	81104 AF (dB/m)	172345 amp/cbl (dB)	Cables (dB)	Corrected Reading (dBuV/m)	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	30764.776	56.61	Pk	36.2	-70.1	23.2	45.91	82	-36.09	32	288	H
2	32890	39.41	Pk	36.9	-70.9	24.1	29.51	82	-52.49	0-360	200	H
3	38127	40.05	Pk	38	-68.5	26.5	36.05	82	-45.95	0-360	200	H
4	30764.5	50.21	Pk	36.2	-70.1	23.2	39.51	82	-42.49	0-360	200	V
5	32881	40.63	Pk	37.1	-70.9	24.1	30.93	82	-51.07	0-360	200	V
6	38109.5	39.98	Pk	37.9	-68.4	26.5	35.98	82	-46.02	0-360	200	V

Pk - Peak detector

High Channel

18000 TO 26000 MHz HORIZONTAL &VERTICAL PLOT

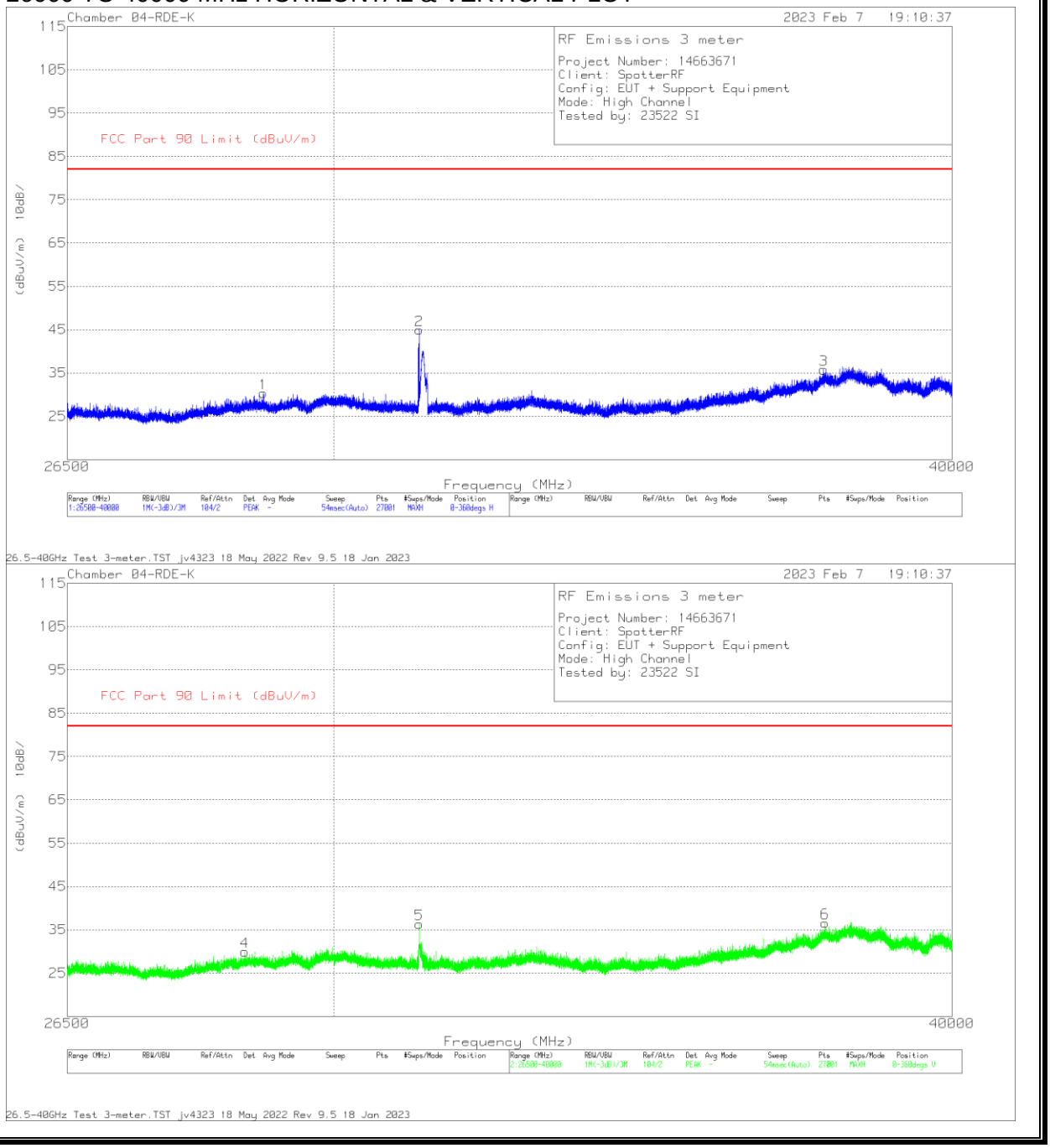


18000 TO 26000 MHz HORIZONTAL & VERTICAL DATA

Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	172364 AF (dB)	215705 amp/cbl (dB)	Cables (dB)	Corrected Reading (dBuVolts)	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	* 18287.111	48.75	Pk	32.5	-60.8	17.7	38.15	82	-43.85	0-360	101	H
2	* 20808.059	59.81	Pk	33.1	-59.5	18.9	52.31	82	-29.69	101	202	H
3	26048.552	46.72	Pk	34.7	-60.7	21.2	41.92	82	-40.08	0-360	101	H
4	* 19626.805	47.69	Pk	32.8	-60.9	18.3	37.89	82	-44.11	0-360	101	V
5	* 20809.721	59.16	Pk	33.1	-59.5	18.9	51.66	82	-30.34	0-360	200	V
6	26005.58	45.63	Pk	34.6	-60.8	21.1	40.53	82	-41.47	0-360	101	V

Pk - Peak detector

26000 TO 40000 MHz HORIZONTAL & VERTICAL PLOT



26000 TO 40000 MHz HORIZONTAL & VERTICAL DATA

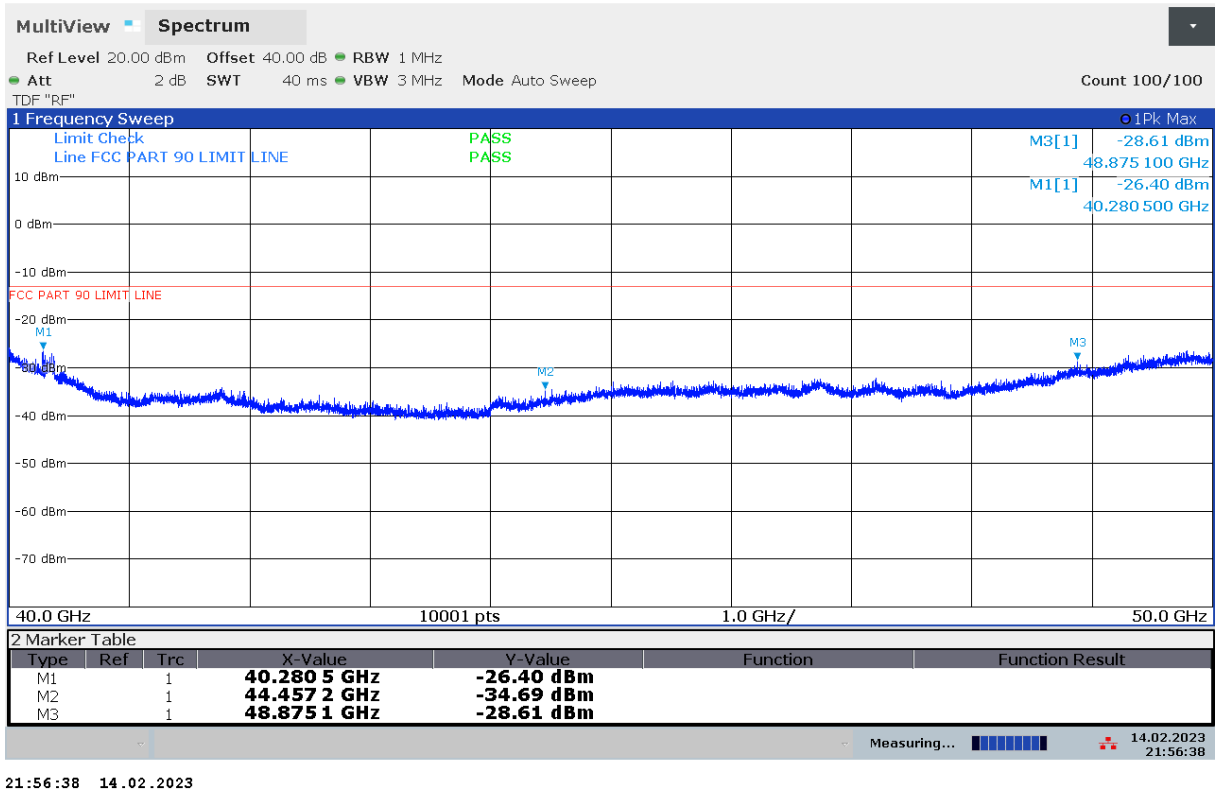
Marker	Frequency (MHz)	Meter Reading (dBuV)	Det	81104 AF (dB/m)	172345 amp/cbl (dB)	Cables (dB)	Corrected Reading (dBuV/m)	FCC Part 90 Limit (dBuV/m)	PK Margin (dB)	Azimuth (Degs)	Height (cm)	Polarity
1	29030	43.63	Pk	36.1	-71.8	22.4	30.33	82	-51.67	0-360	101	H
2	* 31214.5	54.83	Pk	36.5	-69.8	23.4	44.93	82	-37.07	0-360	200	H
2	* 31214.641	56.69	Pk	36.6	-69.8	23.4	46.89	82	-35.11	22	317	H
3	37679.5	40.07	Pk	38.1	-68.8	26.4	35.77	82	-46.23	0-360	200	H
4	28783	43.42	Pk	36.2	-72	22.3	29.92	82	-52.08	0-360	101	V
5	* 31214.5	46.24	Pk	36.5	-69.8	23.4	36.34	82	-45.66	0-360	101	V
6	37706	40.79	Pk	38.1	-68.7	26.4	36.59	82	-45.41	0-360	101	V

10.5. WORST CASE TRANSMITTER ABOVE 40 GHz

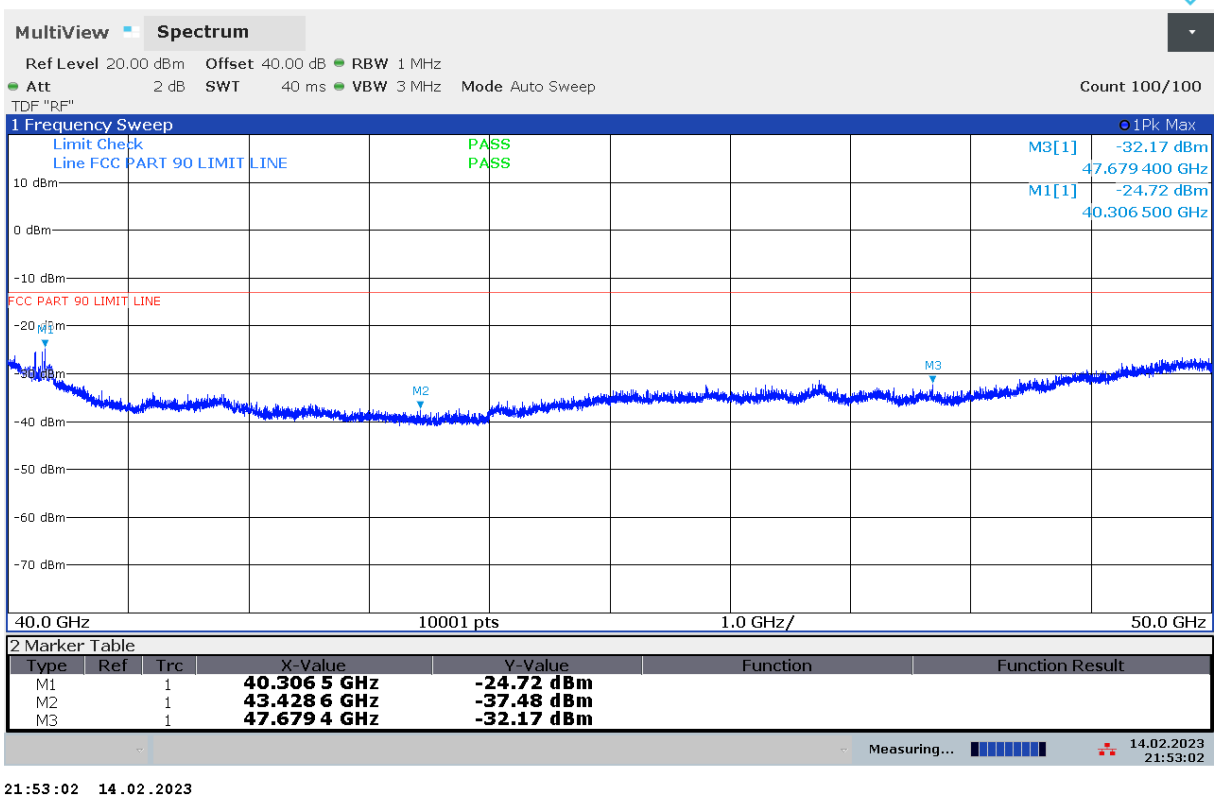
Worst Case

Tester: 19437 HL

40000 TO 50000 MHz HORIZONTAL PLOT



40000 TO 50000 MHz VERTICAL PLOT

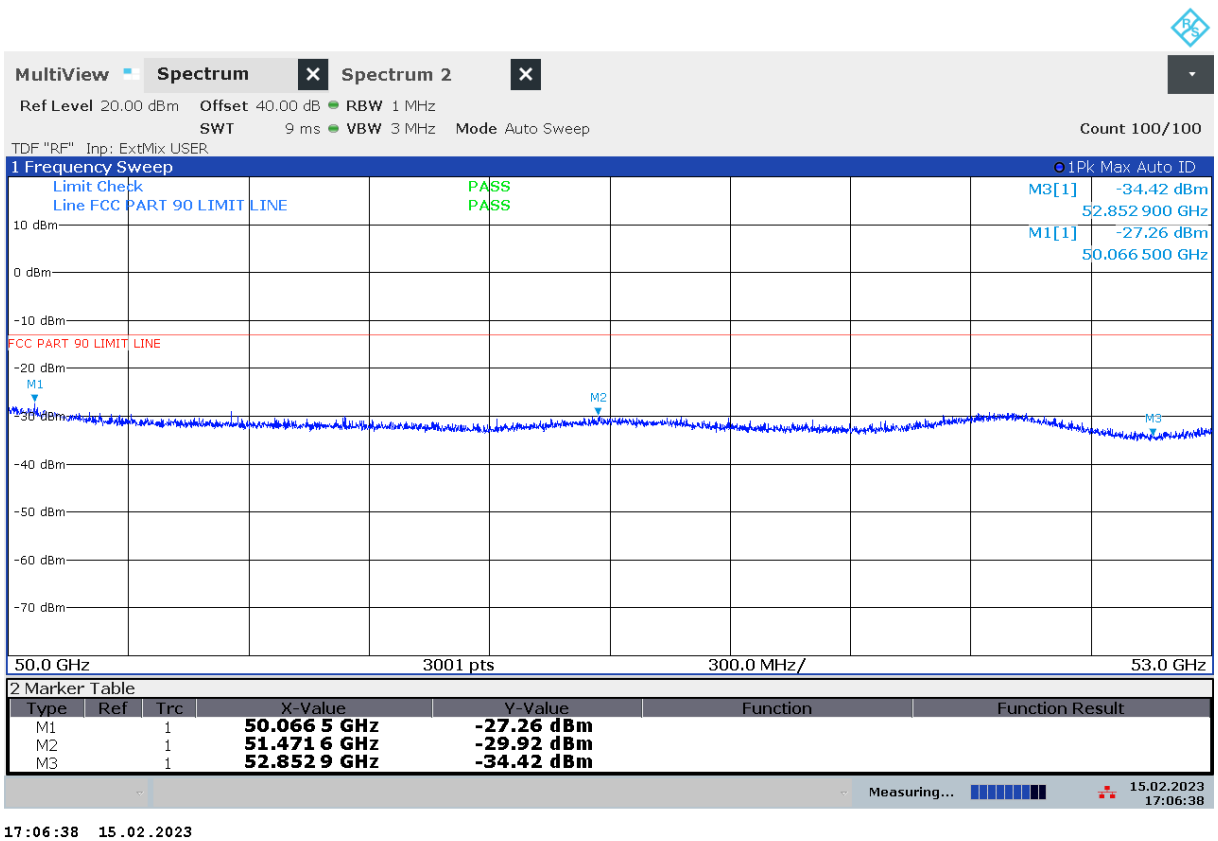


10.6. WORST CASE TRANSMITTER ABOVE 50 GHz

Worst Case

Tester: 19437 HL

50000 TO 53000 MHz HORIZONTAL PLOT



50000 TO 53000 MHz VERTICAL PLOT