REGULATORY COMPLIANCE TEST REPORT

FCC Part 15 Subpart F 15.519
Hand-Held UWB Device

Report No.: ALER03-U2 Rev A

Company: Alereon Inc.

Model Name: AL5350B Based UWB Modules

REGULATORY COMPLIANCE TEST REPORT

Company Name: Alereon Inc.

Model Name: AL5350B Based UWB Modules

To: FCC CFR 47 Part 15 Subpart F 15.519

Test Report Serial No.: ALER03-U2 Rev A

This report supersedes: NONE

Applicant: Alereon Inc.
10800 Pecan Park Blvd, STE 100
Austin, Texas 78750
USA

Issue Date: 24th March 2021

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
575 Boulder Court
Pleasanton California 94566
USA
Phone: +1 (925) 462-0304
Fax: +1 (925) 462-0306
www.micomlabs.com

A2LA ACCREDITED
TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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MiCOM Labs, 575 Boulder Court, Pleasanton, California 94566 USA, Phone: +1 (925) 462 0304, Fax: +1 (925) 462 0306, www.micomlabs.com

1. ACCREDITATION, LISTINGS & RECOGNITION

1.1. TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard ISO/IEC 17025:2017. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.01. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-01.pdf

Accredited Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017 *General requirements for the competence of testing and calibration laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated April 2017*).

Presented this 24th day of February 2020.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2021

For the tests to which this accreditation applies, please refer to the laboratory's Electrical Scope of Accreditation.

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1.2. RECOGNITION

MiCOM Labs, Inc is widely recognized for its wireless testing and certification capabilities. In addition to being recognized for Testing and Certification under Phase 2 Mutual Recognition Agreements (MRA) with Canada, Europe, United Kingdom and Japan, our international recognition includes Conformity Assessment Body (CAB) designation status under agreements with Asia Pacific (APEC) MRA Phase 1 countries giving acceptance of MiCOM Labs test reports. MiCOM Labs test reports are accepted globally.

Country	Recognition Body	Status	MRA Phase	Identification No.
USA	Federal Communications Commission (FCC)	TCB	-	US0159 Test Firm Designation#: US1084
Canada	Industry Canada (ISED)	FCB	APEC MRA 2	US0159 ISED#: 4143A
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	Japan MRA 2	RCB 210
	Japan Approvals Institute for Telecommunication Equipment (JATE)			
	VCCI	--	--	A-0012
Europe	European Commission	NB	EU MRA 2	NB 2280
United Kingdom	Department for Business, Energy & Industrial Strategy (BEIS)	AB	UK MRA 2	AB 2280
Mexico	Instituto Federal de Telecomunicaciones (IFT)	CAB	Mexico MRA 1	US0159
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)			
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)			
Singapore	Infocomm Development Authority (IDA)			
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)			
Vietnam	Ministry of Communication (MIC)			

TCB – Telecommunications Certification Bodies (TCB)
FCB – Foreign Certification Body
CAB – Conformity Assessment Body
NB – Notified Body
AB – Approved Body
MRA – Mutual Recognition Agreement
MRA PhasePhase I - recognition for product testing
Phase II – recognition for both product testing and certification

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1.3. PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard ISO/IEC 17065:2012. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-02.pdf

Accredited Product Certification Body

A2LA has accredited

MiCOM LABS

Pleasanton, CA

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC 17065:2012 *Requirements for bodies certifying products, processes and services*. This product certification body also meets the *A2LA R322 – Specific Requirements – Notified Body Accreditation Requirements* and *A2LA R308 - Specific Requirements - ISO-IEC 17065 - Telecommunication Certification Body Accreditation Program*. This accreditation demonstrates technical competence for a defined scope and the operation of a management system.

Presented this 24th day of February 2020

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2021

For the product certification schemes to which this accreditation applies, please refer to the organization's Product Certification Scope of Accreditation.

United States of America – Telecommunication Certification Body (TCB)
Industry Canada – Certification Body, CAB Identifier – US0159
Europe – Notified Body (NB), NB Identifier - 2280
UK – Approved Body (AB), AB Identifier - 2280
Japan – Recognized Certification Body (RCB), RCB Identifier - 210

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2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	16th March 2021	Draft for review
Draft #2	22nd March 2021	
Draft #3	23rd March 2021	
Rev A	24th March 2021	Initial Release

In the above table the latest report revision will replace all earlier versions.

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3. TEST RESULT CERTIFICATE

Manufacturer:	Alereon Inc. 10800 Pecan Park Blvd, STE 100 Austin, Texas 78750 USA	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton, California 94566 USA
Model:	AL5350B Based UWB Modules	**Telephone:**	+1 925 462 0304
Equipment Type:	Mobile & Portable Client Device	**Fax:**	+1 925 462 0306
S/N's:	AL5804 Impact: 21062294 AL5808 Octal: 21030754 AL5830 Commander 256: 20510133 AL5833 Destroyer 256: 1037463-101 AL5834 Combat 256: 20510161 AL5835 Camouflage 256: 20510302		
Test Date(s):	5th – 12th March 2021	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 15 Subpart F 15.519	**EQUIPMENT COMPLIES**

MiCOM Labs, Inc. tested the equipment mentioned in accordance with the requirements set forth in the above standards. Test results indicate that the equipment tested is capable of demonstrating compliance with the requirements as documented within this report.

Notes:

1. This document reports conditions under which testing was conducted and the results of testing performed.

2. Details of test methods used have been recorded and kept on file by the laboratory.

3. Test results apply only to the item(s) tested.

A2LA ACCREDITED
TESTING CERT #2381.01

Approved & Released for MiCOM Labs, Inc. by:

Graeme Grieve
Quality Manager MiCOM Labs, Inc.

Gordon Hurst
President & CEO MiCOM Labs, Inc.

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4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
I	FCC 47 CFR Part F	2018	Radio Frequency Devices; Subpart F –Ultra Wide Band Devices
II	A2LA	August 2018	R105 - Requirement's When Making Reference to A2LA Accreditation Status
III	ANSI C63.10	2013	American National Standard for Testing Unlicensed Wireless Devices
IV	ANSI C63.4	2014	American National Standards for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz
V	ETSI TR 100 028	2001-12	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
VI	M 3003	Edition 3 Nov.2012	Expression of Uncertainty and Confidence in Measurements
VII	FCC 47 CFR Part 2.1033	2016	FCC requirements and rules regarding photographs and test setup diagrams.
VIII	KDB 393764 D01 UWB FAQ v02	January 29, 2018	Ultra-Wideband (UWB) Devices frequently asked questions

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4.2. Test and Uncertainty Procedure

Conducted and radiated emission measurements were conducted in accordance with American National Standards Institute ANSI C63.4, listed in the Normative References section of this report.

Measurement uncertainty figures are calculated in accordance with ETSI TR 100 028 Parts 1 and 2.

Measurement uncertainties stated are based on a standard uncertainty multiplied by a coverage factor k = 2, providing a level of confidence of approximately 95 % in accordance with UKAS document M 3003 listed in the Normative References section of this report.

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5. PRODUCT DETAILS AND TEST CONFIGURATIONS

5.1. Technical Details

Details	Description
Purpose:	Test of the Alereon AL5350B Based UWB Modules to FCC CFR 47 Part 15 Subpart F 15.519 Ultra-Wideband (UWB); Hand-Held Device
Applicant:	Alereon Inc. 10800 Pecan Park Blvd, STE 100 Austin, TX 78750 USA
Manufacturer:	As applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	ALER03-U2
Date EUT received:	5th March 2021
Standard(s) applied:	FCC Part 15 Subpart F 15.519
Dates of test (from - to):	8th – 12h March 2021
No of Units Tested:	1
Product Name:	AL5350B Based UWB Modules
Model(s):	AL5804 Impact: 1.7g, L1.215” x W0.565”, Rev 1, SW Rev 30006 AL5808 Octal: 1.5g, L1.040” x W0.565”, Rev 1, SW Rev 30006 AL5830 Commander 256: 2.8g, L1.040” x W0.565”, Rev 1, SW Rev 30006 AL5833 Destroyer 256: 5.2g, L1.690” x W1.252”, Rev 1, SW Rev 30006 AL5834 Combat 256: 5.2g, L1.790” x W0.710”, Rev 1, SW Rev 30006 AL5835 Camouflage 256: 4.1g, L1.980” x W0.860”, Rev 1, SW Rev 30006
Location for use:	Indoors and Outdoors
Declared Frequency Range(s):	3100-10600 MHz
Type of Modulation:	BPM/BPSK
EUT Modes of Operation:	UWB
Declared Nominal Output Power (dBm):	-41.3 dBm
Rated Input Voltage and Current:	AL5804 Impact: 5.0 VDC, 180mA AL5808 Octal: 3.3 VDC, 180mA AL5830 Commander 256: 3.3 VDC, 180mA AL5833 Destroyer 256: 3.3 VDC, 180mA AL5834 Combat 256: 5.0 VDC, 180mA AL5835 Camouflage 256: 5.0 VDC, 180mA
Operating Temp Range: (manufacturers declaration)	-40 to +85°C
Product Application:	Mobile & Portable Client Devices

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5.2. Scope Of Test Program

Alereon Inc. Company: AL5350B Based UWB Modules

The scope of the test program was to test the Alereon Inc. Company AL5350B Based UWB Modules configurations in the frequency ranges 3100 - 10600 MHz for compliance against the following specification:

FCC CFR 47 Part 15 Subpart F – 15.519
Compliance Measurement Procedures for Unlicensed National Information Infrastructure devices operating in the 3100 - 10600 MHz bands.

Model Differences
AL5804 Impact – USB Interface
AL5808 Octal – Serial Interface
AL5830 Commander 256 – Serial Interface
AL5833 Destroyer 256 – Serial Interface
AL5834 Combat 256 – USB Interface
AL5835 Camouflage 256 – Serial Interface

The manufacturer declares that all 6 Models use the same RF chipset, see Appendix B Manufacturers Declaration on Similarities. Conducted testing was performed on the AL5834 Combat 256 model with USB Interface.

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5.3. Equipment Model(s) and Serial Number(s)

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr.	Model No.	Serial No.
EUT	Combat 256	Alereon Inc	AL5834	20510161
	Impact	Alereon Inc	AL5804	21062294
	Commander 256	Alereon Inc	AL5830	20510133
	Camouflage 256	Alereon Inc	AL5835	20510302
	Octal	Alereon Inc	AL5808	21030754
	Destroyer 256	Alereon Inc	AL5833	1037463-101
Support	Host Board	Alereon Inc	N/A	N/A
Support	Laptop	Lenovo	N/A	N/A

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
Chip	Taiyo Yuden	AH086M555003	Patch	1.0/0.2/0.2	N/A	--	No	3168-3696
Chip	Taiyo Yuden	AH086M555003	Patch	0.2/-0.2/0.1	N/A	--	No	6600-7656
Chip	Taiyo Yuden	AH086M555003	Patch	0.1/-1.8/-1.8	N/A	--	No	7656-8712

BF Gain - Beamforming Gain
Dir BW - Directional BeamWidth
X-Pol - Cross Polarization

5.5. Cabling and I/O Ports

Custom 60 pin interface to Host Board/ USB

a. USB Type A Port
b. Custom USB Port
c. Serial Port
d. Parallel Interface

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5.6. Test Configurations

Results for the following configurations are provided in this report:

Band(s)	Transmission Rate	Channel Frequency (MHz)		
		Low	Mid	High
1	Max	3432	3960	4488
3	Max	6600	7128	7656*
6	Max	7656*	8184	8712

*These frequencies are the same for Band 3 and Band 6. As a result, radiated testing only presents a single set of results.

5.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:
1. NONE

5.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:
1. NONE

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6. TEST SUMMARY

List of Measurements

Test Header	Result	Data Link
UWB Bandwidth	Complies	View Data
Peak Power	Complies	View Data
Peak Power Density	Complies	View Data
Spurious Radiated Emissions	Complies	View Data
Spurious Radiated Emissions in GPS Bands	Complies	View Data
Shutdown Timing Requirements	Complies	View Data
AC Wireline Emissions	*Not Applicable	Vdc Modules
Comments: None		

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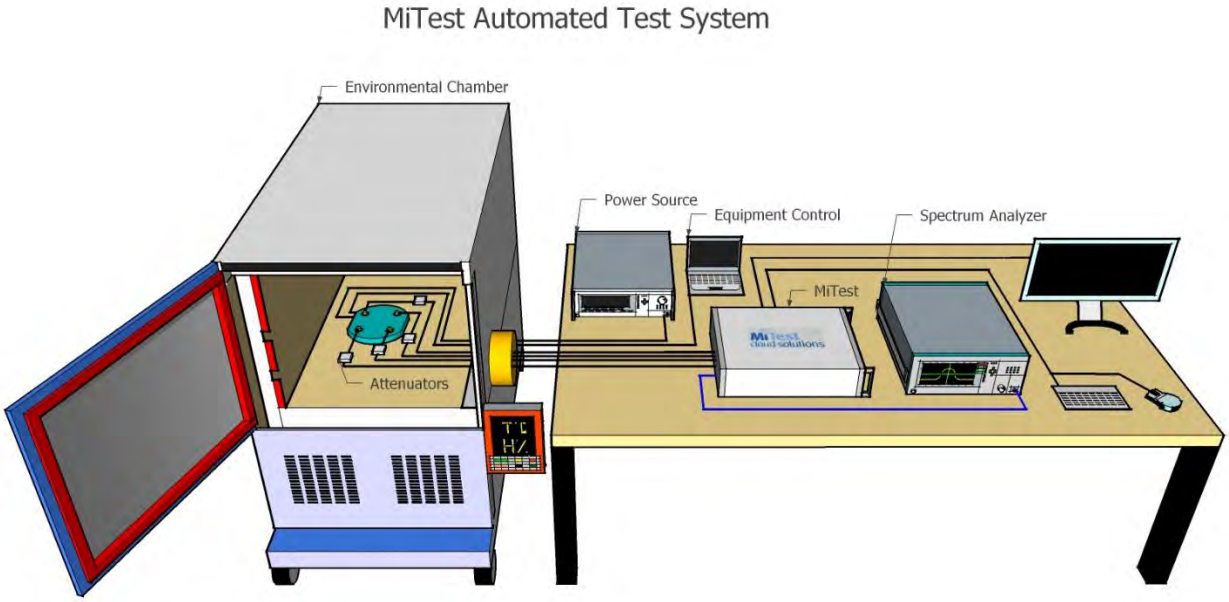
7. TEST EQUIPMENT CONFIGURATION(S)

7.1. Conducted Test Setup



A full system calibration was performed on the test station and any resulting system losses (or gains) were considered in the production of all final measurement data.

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
#3 SA	MiTest Box to SA	Fairview Microwave	SCA1814-0101-72	#3 SA	4 Jun 2021
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	4 Jun 2021
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	4 Jun 2021
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	4 Jun 2021
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	4 Jun 2021
249	Thermocouple; Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	30 Oct 2021
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2021
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Jun 2021
398	MiTest RF Conducted Test Software	MiCOM	MiTest ATS	Version 4.2.3.0	Not Required
405	DC Power Supply 0-60V	Agilent	6654A	MY4001826	Cal when used

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408	USB to GPIB interface	National Instruments	GPIB-USB HS	14C0DE9	Not Required
440	USB Wideband Power Sensor	Boonton	55006	9178	22 Jun 2021
441	USB Wideband Power Sensor	Boonton	55006	9179	20 Jun 2021
442	USB Wideband Power Sensor	Boonton	55006	9181	19 Jun 2021
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
461	Spectrum Analyzer	Agilent	E4440A	MY46185537	20 Jun 2021
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2021
515	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen with DFS	515	4 Jun 2021
534	Power Sensor 50 GHz -70dBm to +20dBm	R&S	NRP50SN	1419.0093K02-100888-SB	26 Feb 2022
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	20 Feb 2022

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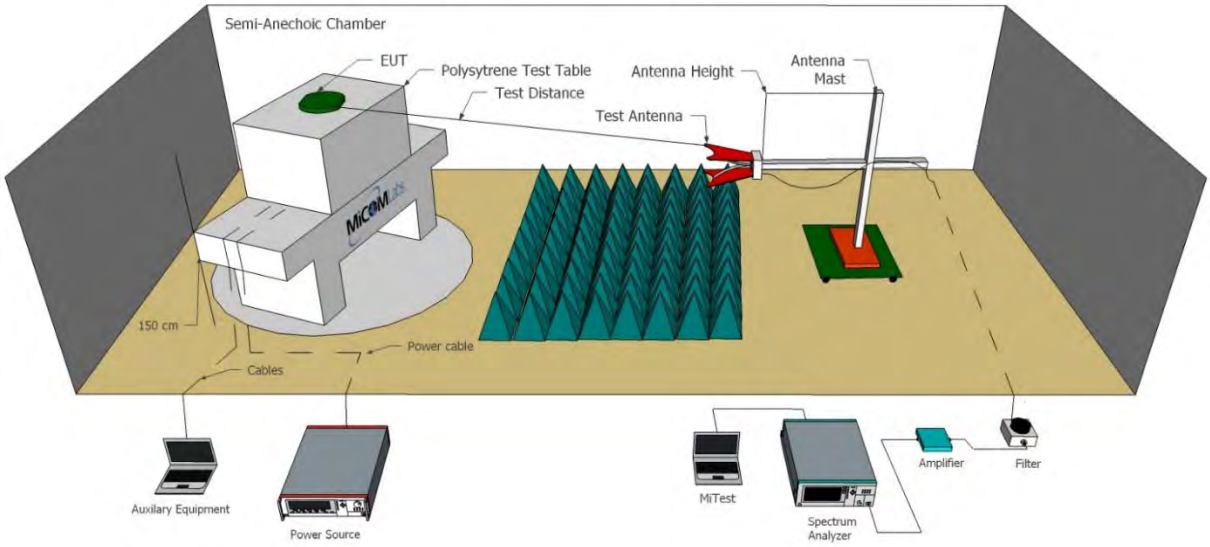
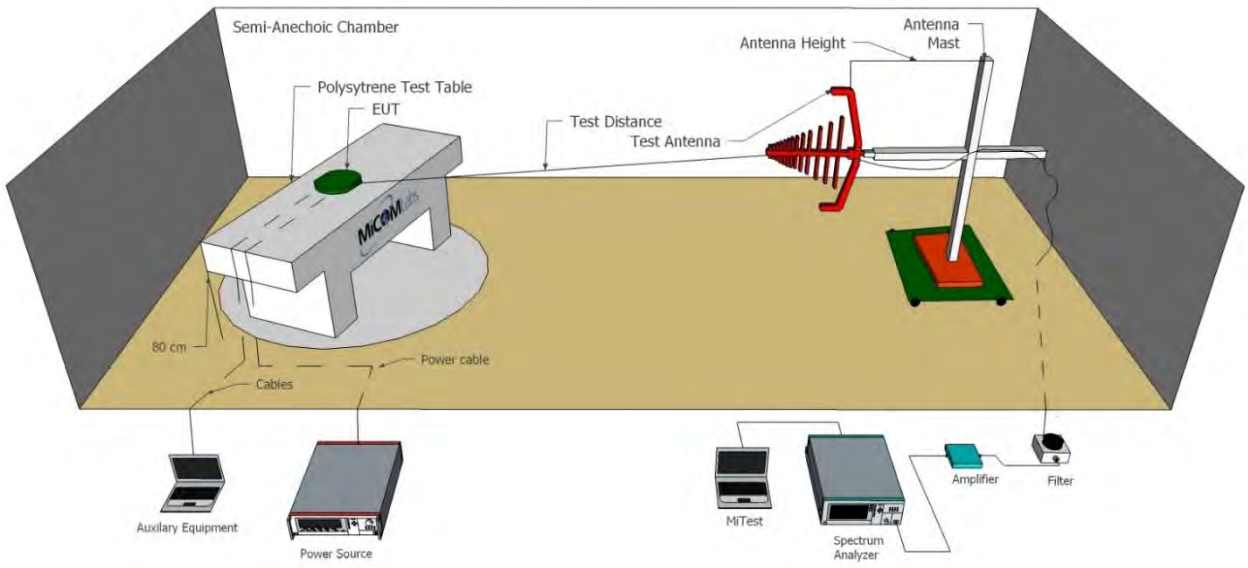
7.2. Radiated Emissions - 3m Chamber

The following tests were performed using the radiated test set-up shown in the diagram below.
Radiated emissions above and below 1GHz.

Radiated Emissions Above 1GHz Test Setup



Radiated Emissions Below 1GHz Test Setup



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A full system calibration was performed on the test station and any resulting system losses (or gains) were considered in the production of all final measurement data.

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CU101	04R08507	Not Required
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	8 Oct 2021
298	3M Radiated Emissions Chamber Maintenance Check	MiCOM	3M Chamber	298	26 Apr 2021
330	Variac 0-280 Vac	Staco Energy Co	3PN1020B	0546	Cal when used
336	Active loop Ant 10kHz to 30 MHz	EMCO	EMCO 6502	00060498	29 Nov 2021
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	4 Apr 2021
341	900MHz Notch Filter	EWT	EWT-14-0199	H1	4 May 2021
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	4 May 2021
346	1.6 TO 10GHz High Pass Filter	EWT	EWT-57-0112	H1	4 May 2021
373	26III RMS Multimeter	Fluke	Fluke 26 series III	76080720	21 Jun 2021
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	12 Jun 2021
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	9 May 2021
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	12 May 2021
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	9 May 2021
410	Desktop Computer	Dell	Inspiron 620	WS38	Not Required
411	Mast/Turntable Controller	Sunol Sciences	SC98V	060199-1D	Not Required
412	USB to GPIB Interface	National Instruments	GPIB-USB HS	11B8DC2	Not Required
413	Mast Controller	Sunol Science	TWR95-4	030801-3	Not Required
414	DC Power Supply 0-60V	HP	6274	1029A01285	Cal when used
415	Turntable Controller	Sunol Sciences	Turntable Controller	None	Not Required
416	Gigabit ethernet filter	ETS-Lingren	Gigafoil 260366	None	Not Required
447	MiTest Rad Emissions Test Software	MiCOM	Rad Emissions Test Software Version 1.0	447	Not Required
462	Schwarzbeck cable from Antenna to Amplifier.	Schwarzbeck	AK 9513	462	4 May 2021

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463	Schwarzbeck cable from Amplifier to Bulkhead.	Schwarzbeck	AK 9513	463	4 May 2021
464	Schwarzbeck cable from Bulkhead to Receiver	Schwarzbeck	AK 9513	464	4 May 2021
466	Low Pass Filter DC-1500 MHz	Mini-Circuits	NLP-1750+	VUU10401438	4 May 2021
480	Cable - Bulkhead to Amp	SRC Haverhill	157-3050360	480	4 May 2021
481	Cable - Bulkhead to Receiver	SRC Haverhill	151-3050787	481	4 May 2021
510	Barometer/Thermometer	Control Company	68000-49	170871375	20 Dec 2021
518	Cable - Amp to Antenna	SRC Haverhill	157-3051574	518	4 May 2021
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used

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8. MEASUREMENT AND PRESENTATION OF TEST DATA

The measurement and graphical data presented in this test report was generated automatically using state-of-the-art technology creating an easy to read report structure. Numerical measurement data is separated from supporting graphical data (plots) through hyperlinks. Numerical measurement data can be reviewed without scrolling through numerous graphical pages to arrive at the next data matrix.

Plots have been relegated into the Appendix 'Graphical Data'.

Test and report automation was performed by MiTest. MiTest is an automated test system developed by MiCOM Labs. MiTest is the first cloud based modular test system enabling end-to-end automation of regulatory compliance testing for conducted RF testing.

The MiCOM Labs "MiTest" Automated Test System" (Patent Pending)

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9. TEST RESULTS

9.1. USB Bandwidth

Conducted Test Conditions for UWB Bandwidth			
Standard:	FCC CFR 47:15.519	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	UWB Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	ANSI C63.10 Section 10.1	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for UWB Bandwidth Measurement
The UWB Bandwidth is measured radiated, at a 3-meter distance, while EUT is operating in transmission mode at the appropriate center frequency. The Resolution Bandwidth was set to 1MHz RBW IAW ANSI C63.10.
Testing was performed under ambient conditions at nominal voltage.

Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document.

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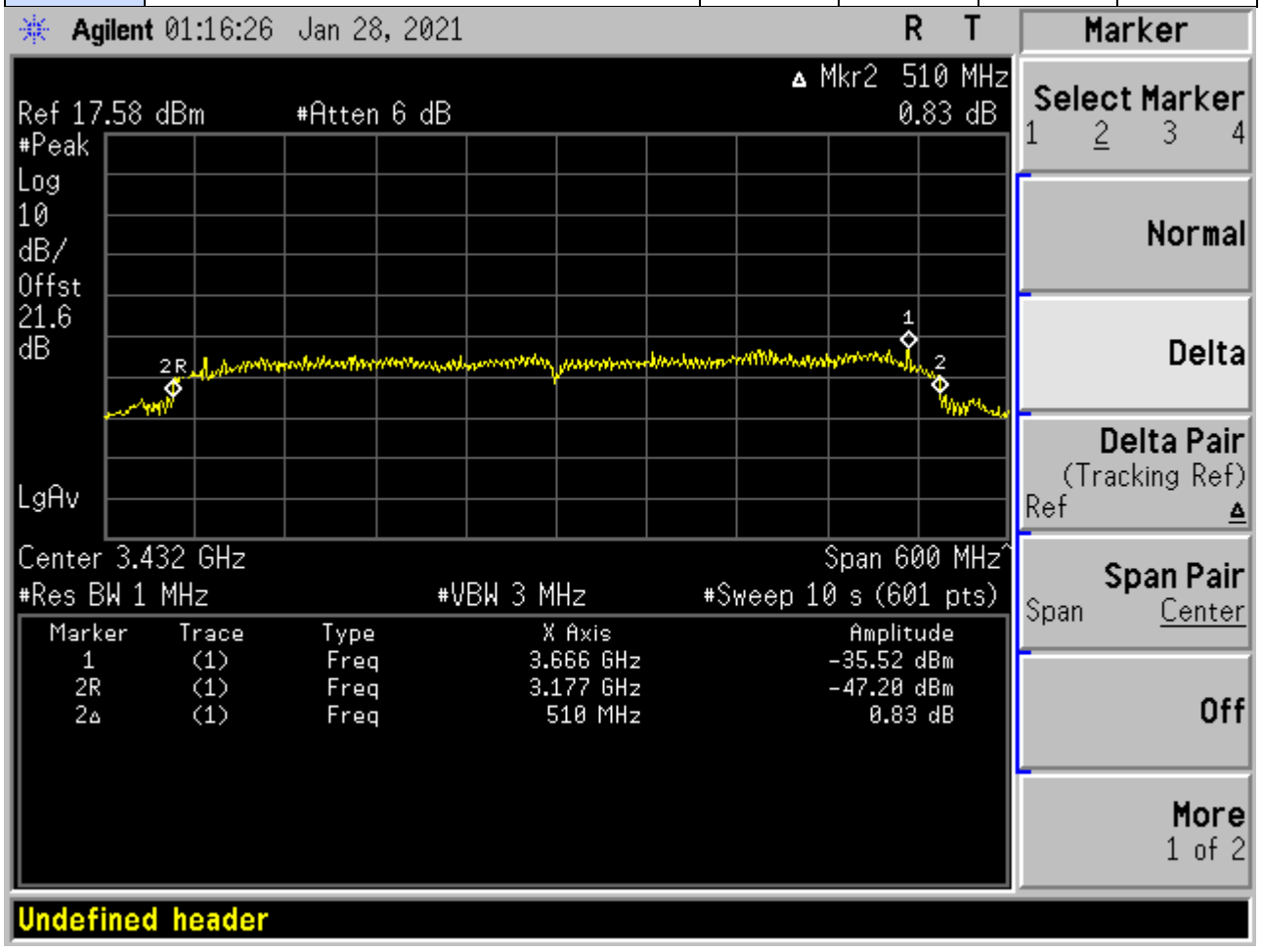
Equipment Configuration for UWB Bandwidth

Variant:	Band Group 1	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
3432.00	510.0	510.0	510.0		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

The above values are representative of the worst-case value between polarities and based on the power measurements.

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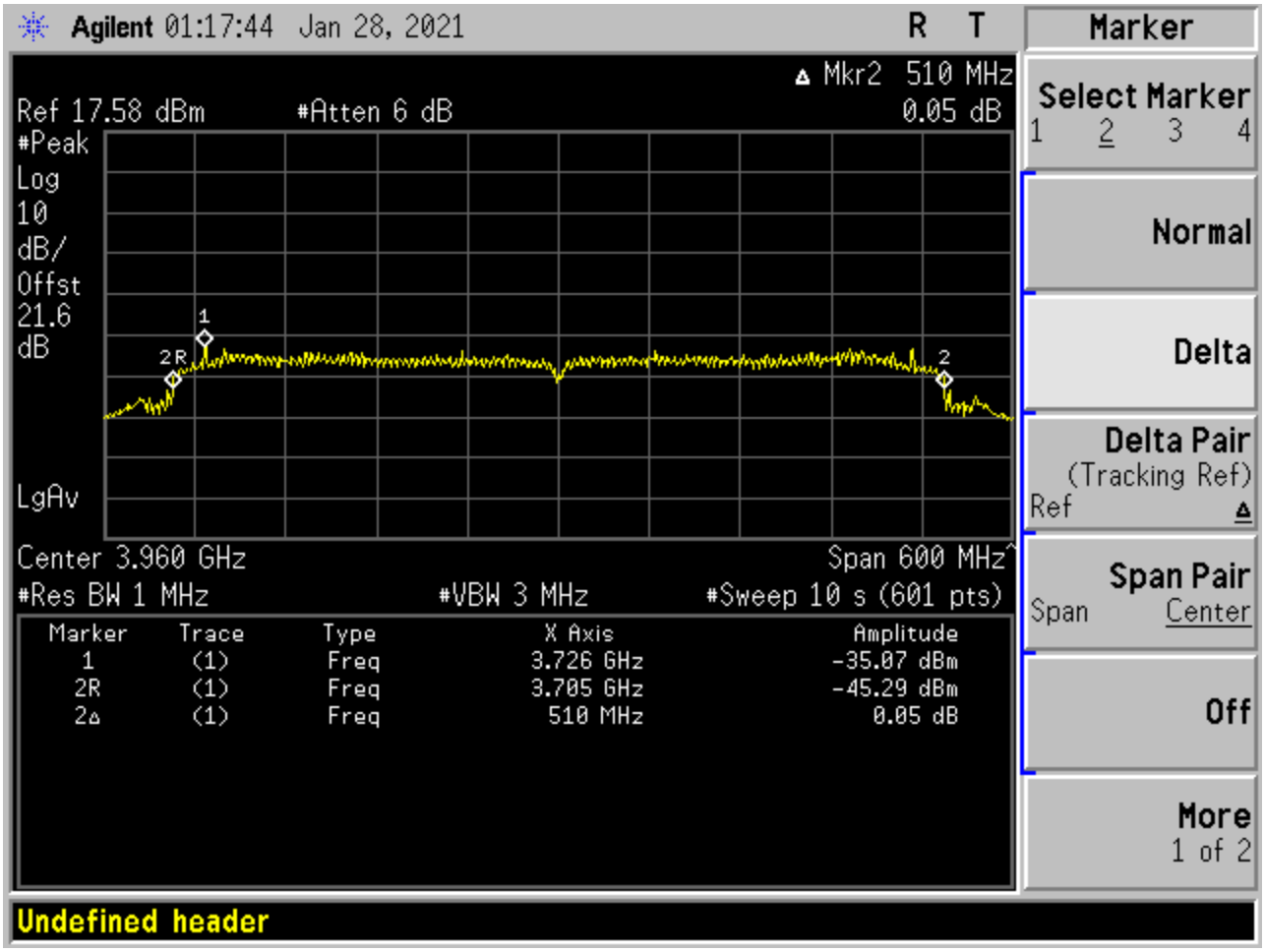
Equipment Configuration for UWB Bandwidth

Variant:	Band Group 1	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
3960.00	510.0	510.0	510.0		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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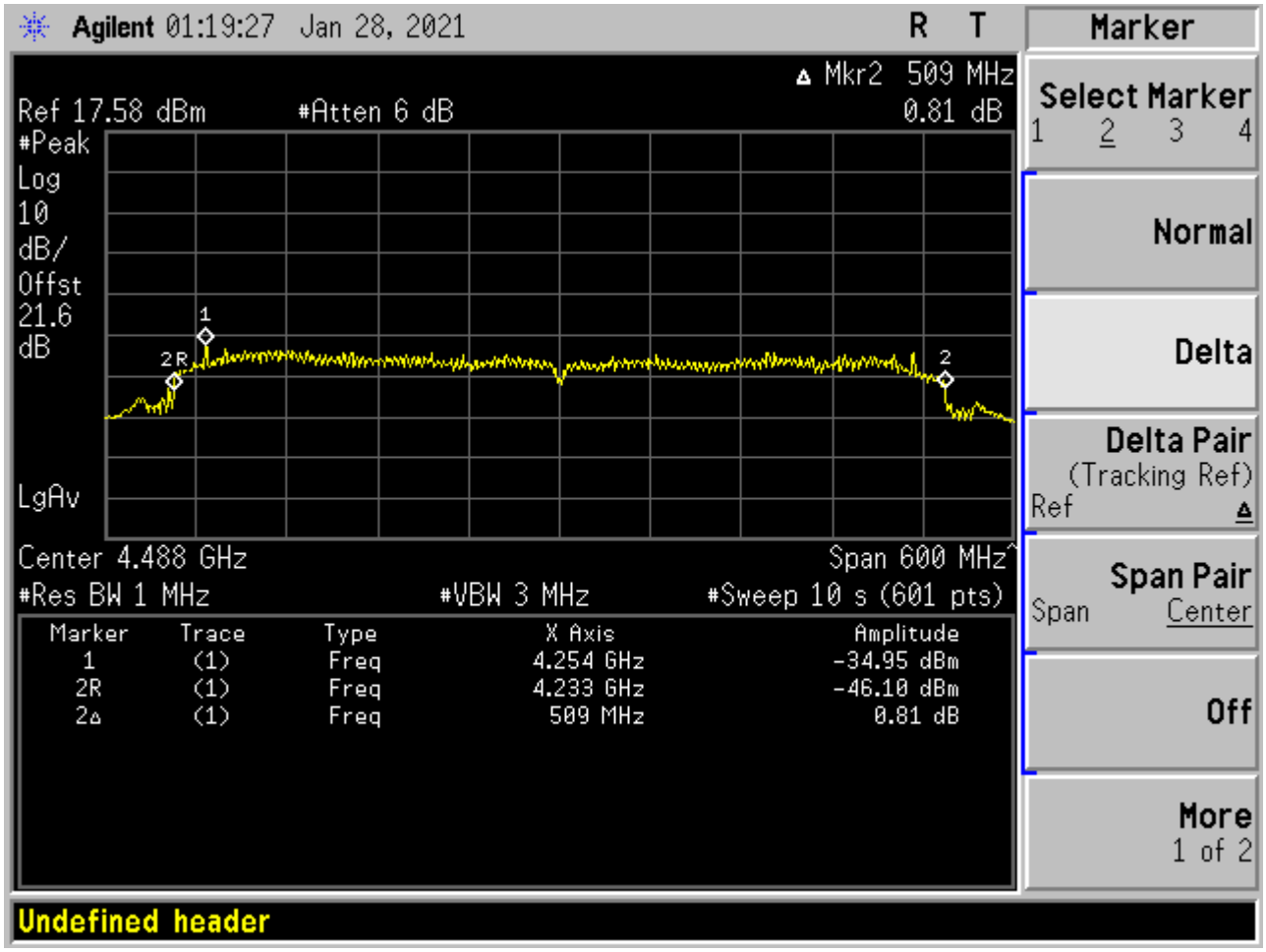
Equipment Configuration for UWB Bandwidth

Variant:	Band Group 1	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
4488.00	509.00	509.00	509.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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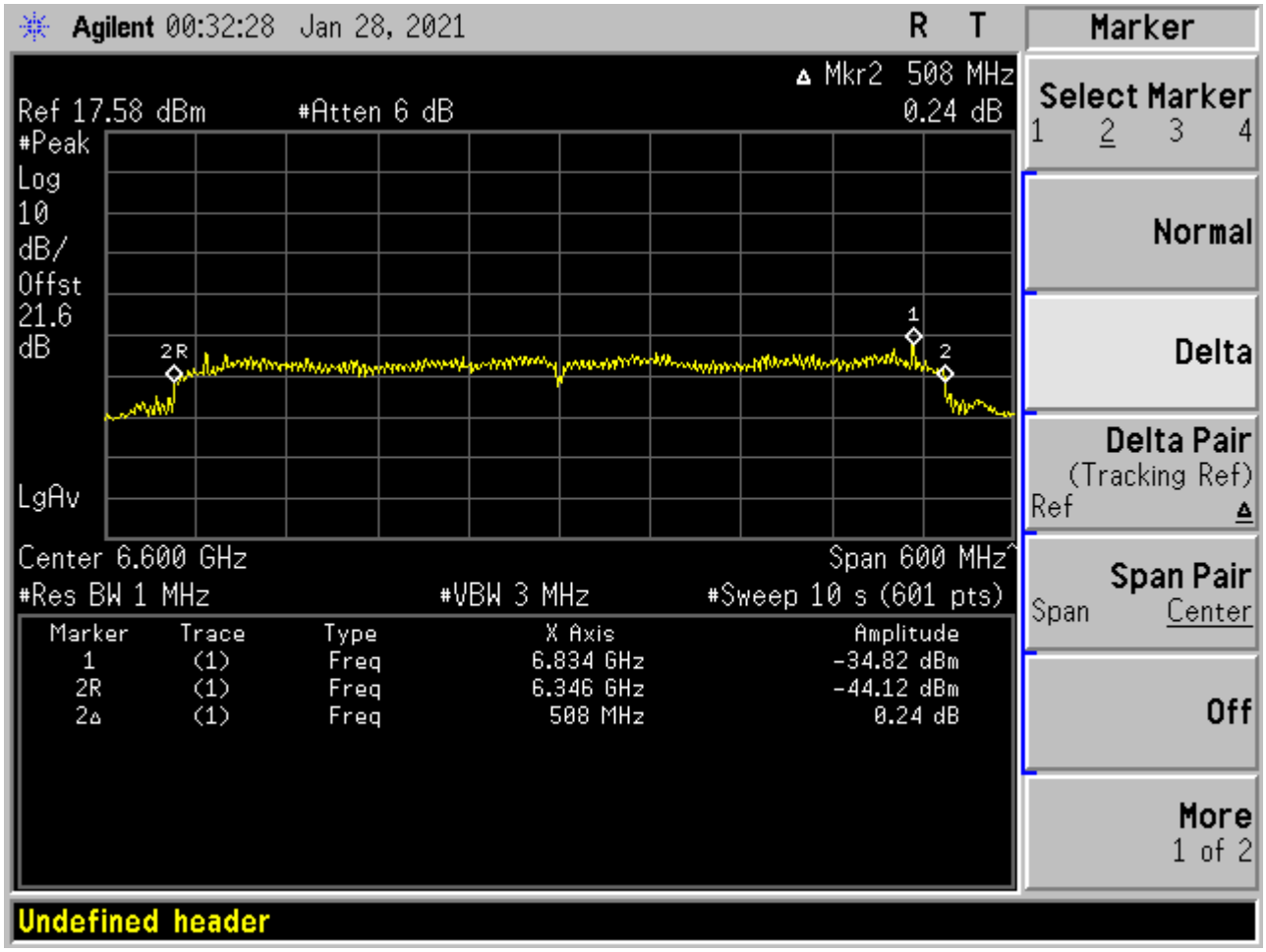
Equipment Configuration for UWB Bandwidth

Variant:	Band Group 3	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
6600.00	508.00	508.00	508.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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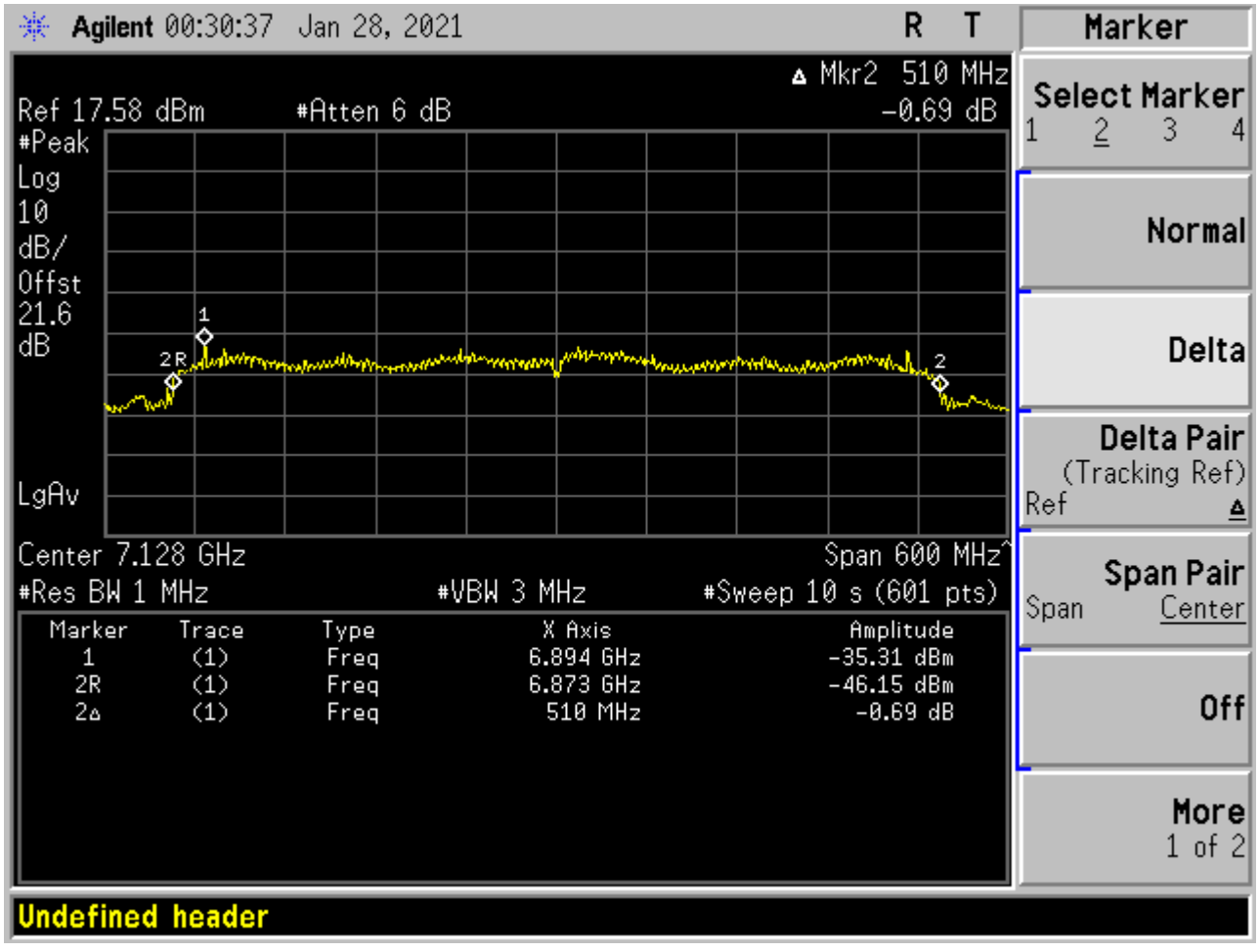
Equipment Configuration for UWB Bandwidth			
Variant:	Band Group 3	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
7128.00	510.00	510.00	510.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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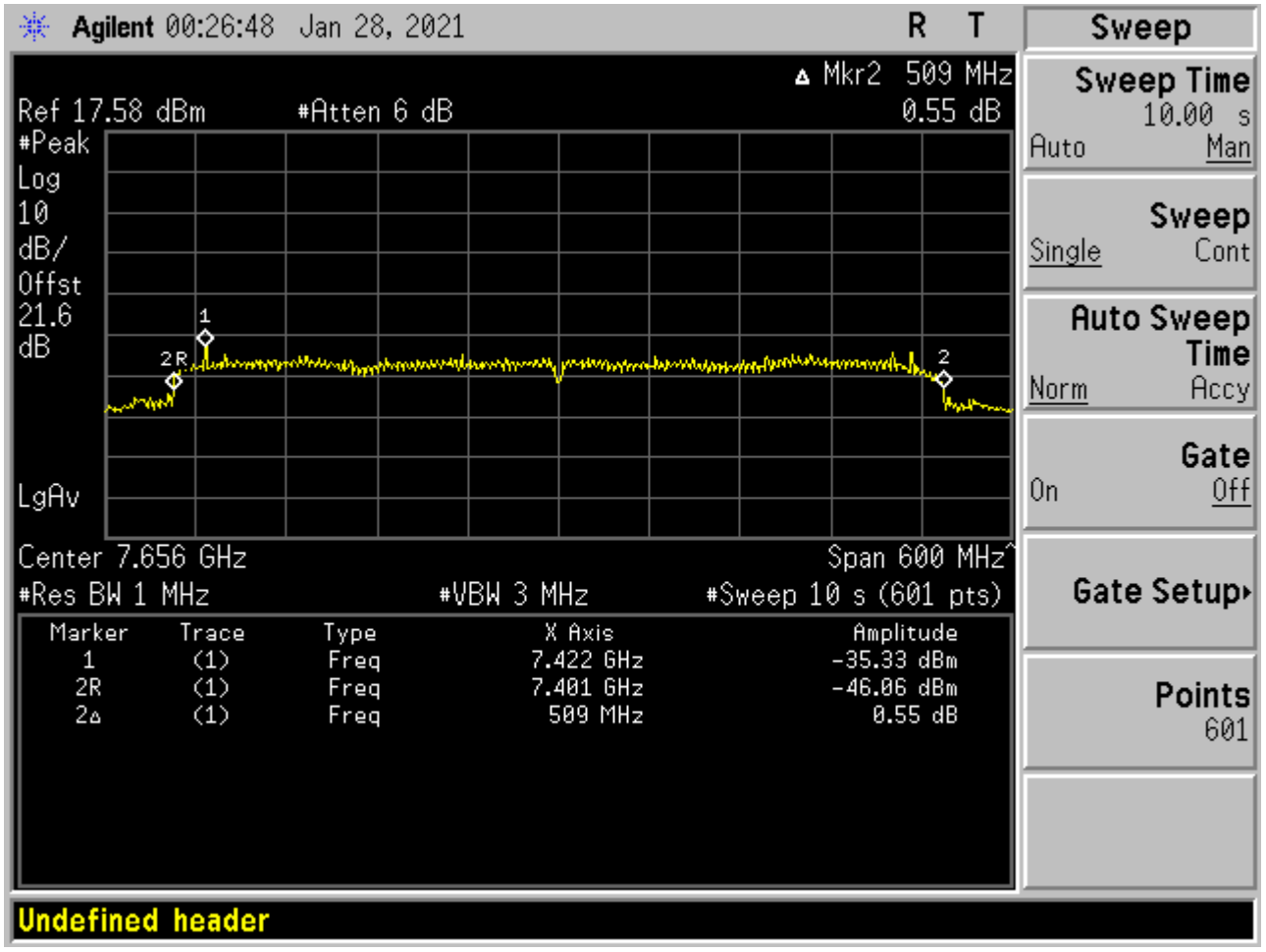
Equipment Configuration for UWB Bandwidth

Variant:	Band Group 3	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
7656.00	509.00	509.00	509.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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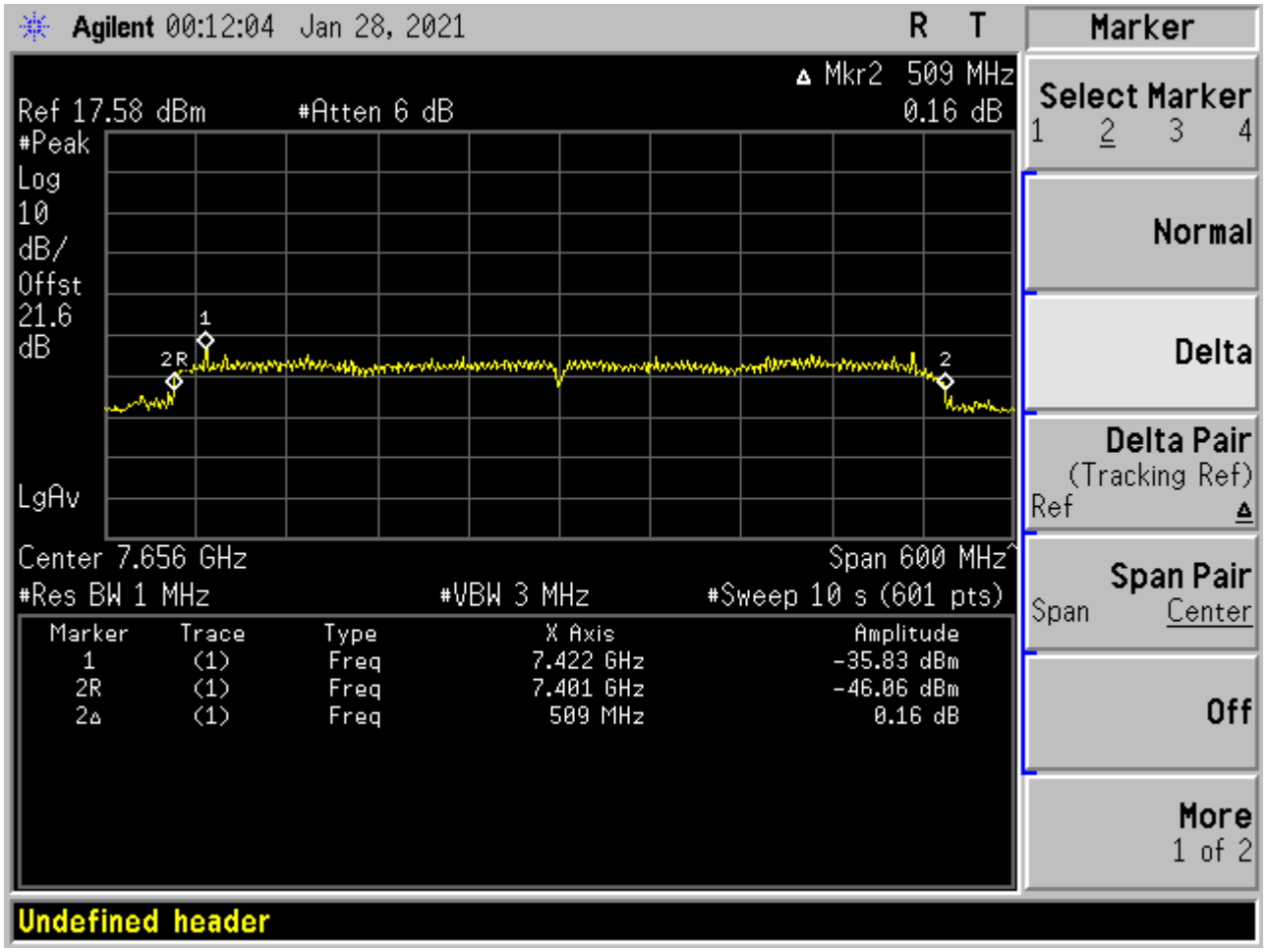
Equipment Configuration for UWB Bandwidth

Variant:	Band Group 3	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
7656.00	509.00	509.00	509.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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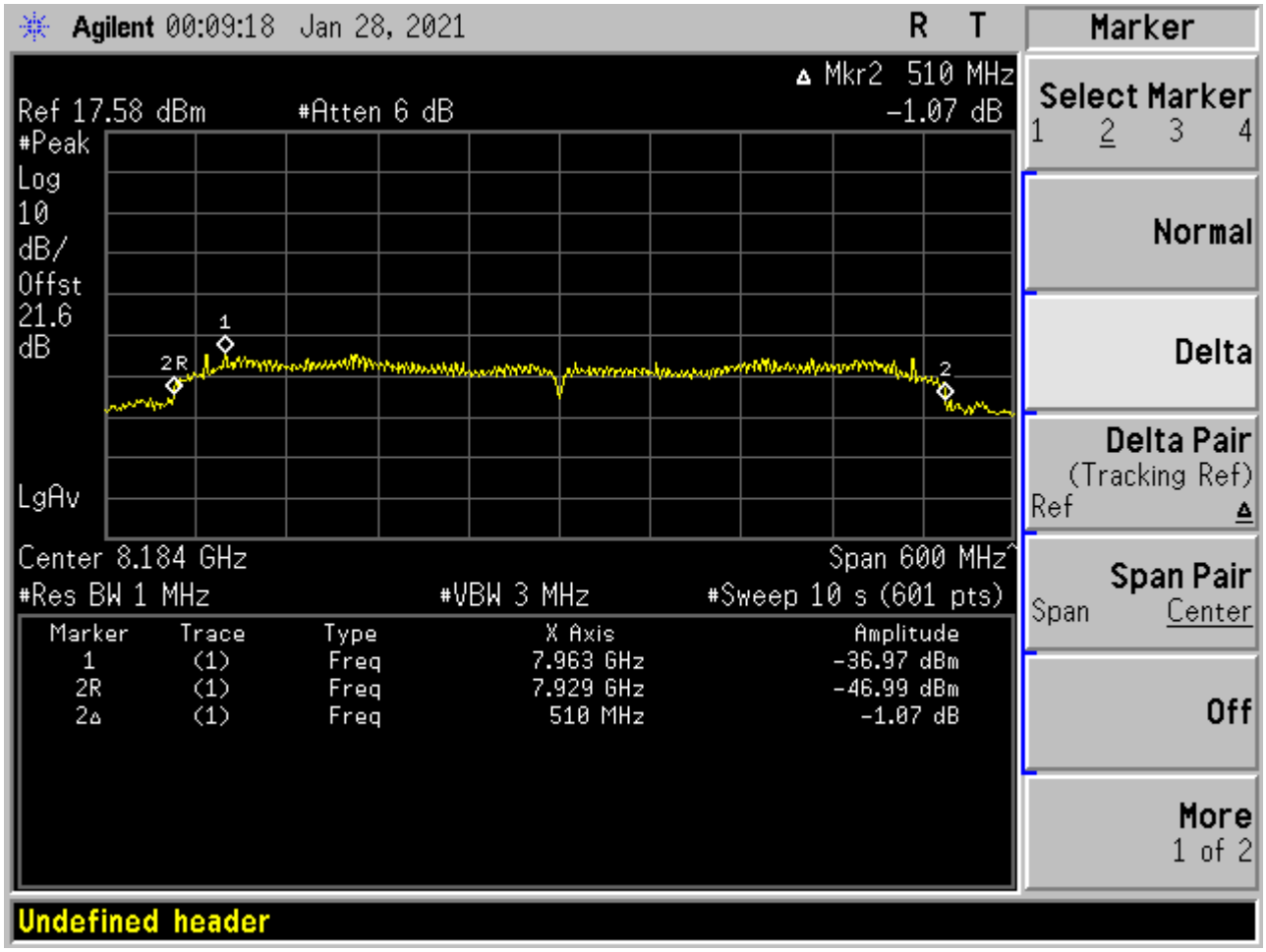
Equipment Configuration for UWB Bandwidth			
Variant:	Band Group 3	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
8184.00	510.00	510.00	510.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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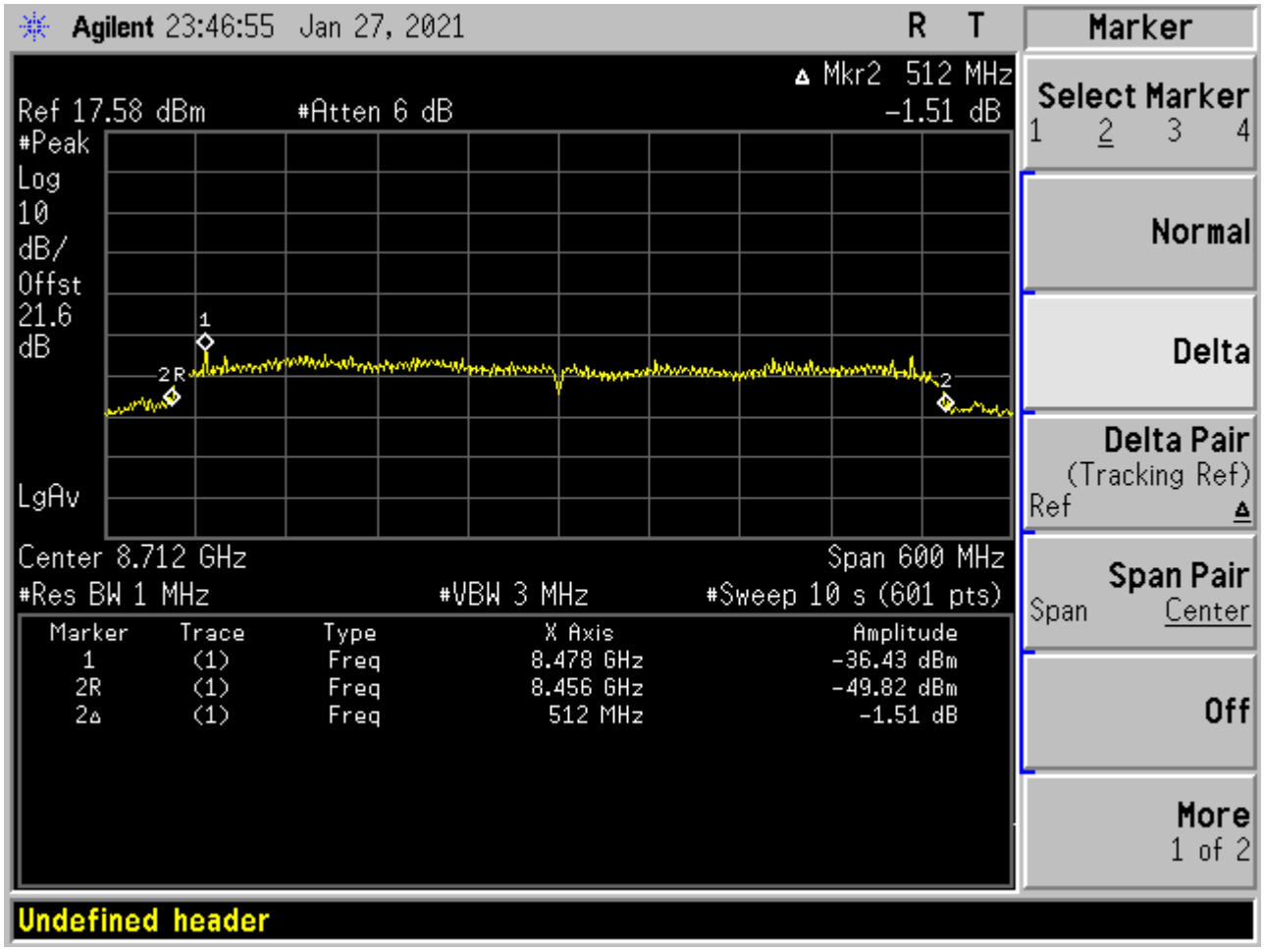
Equipment Configuration for UWB Bandwidth			
Variant:	UWB	**Duty Cycle (%):**	100
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Frequency	Measured Bandwidth (MHz)	Bandwidth (MHz)			
MHz	**Port A**	**Highest**	**Lowest**		
8712.00	512.00	512.00	512.00		



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 MEASURING RF SPECTRUM MASK
Measurement Uncertainty:	±2.81 dB

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9.2. Average Transmit Power

Conducted Test Conditions for Average Output Power			
Standard:	FCC CFR 47:15.519	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Radiated Emissions UWB Transmission	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.519 (c)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	None		

Test Procedure for UWB Transmission

Testing was performed under ambient conditions at nominal voltage.

Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document. Supporting KDB's referenced below.

Operating Frequency Band:
3100-10600 MHz

Limits Maximum EIRP (dBm)

Frequency (MHz)	EIRP Limit (dBm)
3100 - 10600	-41.3

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Equipment Configuration for Average RF Output Power			
Variant:	Band Group 1	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Output Power(dBm)	Calculated EIRP	EIRP Limit	Margin	EUT Power Setting
	Port A	dBm	dBm	dB	Numeric
3432.00	-45.67	-44.67	-41.3	-3.37	Max
3960.00	-44.93	-43.93	-41.3	-2.63	Max
4488.00	-45.30	-44.30	-41.3	-3.00	Max

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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Equipment Configuration for RF Output Power			
Variant:	Band Group 3	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Output Power(dBm)	Calculated EIRP	EIRP Limit	Margin	EUT Power Setting
	Port A	dBm	dBm	dB	Numeric
6600.00	-46.35	-46.15	-41.3	-4.85	Max
7128.00	-46.23	-46.03	-41.3	-4.73	Max
7656.00	-47.17	-46.97	-41.3	-5.67	Max

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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Equipment Configuration for RF Output Power			
Variant:	Band Group 6	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Output Power(dBm)	Calculated EIRP	EIRP Limit	Margin	EUT Power Setting
	Port A	dBm	dBm	dB	Numeric
7656.00	-47.09	-46.89	-41.3	-5.59	Max
8184.00	-47.27	-47.07	-41.3	-5.77	Max
8712.00	-47.41	-47.21	-41.3	-5.91	Max

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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9.3. Peak Power Density

Test Conditions for Maximum Peak Power Density			
Standard:	FCC CFR 47:15.519 (e)	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Peak Power Density	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	ANSI C63.10 Section 10.3.6	**Pressure (mBars):**	999 - 1001
Reference Document(s):	None		

Test Procedure for UWB Transmission

Testing was performed under ambient conditions at nominal voltage.

Test configuration and setup used for the measurement was per the Radiated Test Set-up section specified in this document. Supporting KDB's referenced below.

Measurements were gathered with a RBW of 1MHz and converted to 50MHz using the following formula:

$EIRP_{1\ MHz} = EIRP_{50\ MHz} + 20\log(1MHz/50MHz) = 0dBm + (-34dBm) = -34dBm$

(dBuV/m) = P(e.i.r.p.(dBm)) + 95.2

Operating Frequency Band:
3100-10600 MHz

Limits Maximum EIRP (dBm)

Frequency (MHz)	EIRP Limit (dBm/50MHz)	EIRP Limit (dBm/1MHz)
3100 - 10600	0	-34.0

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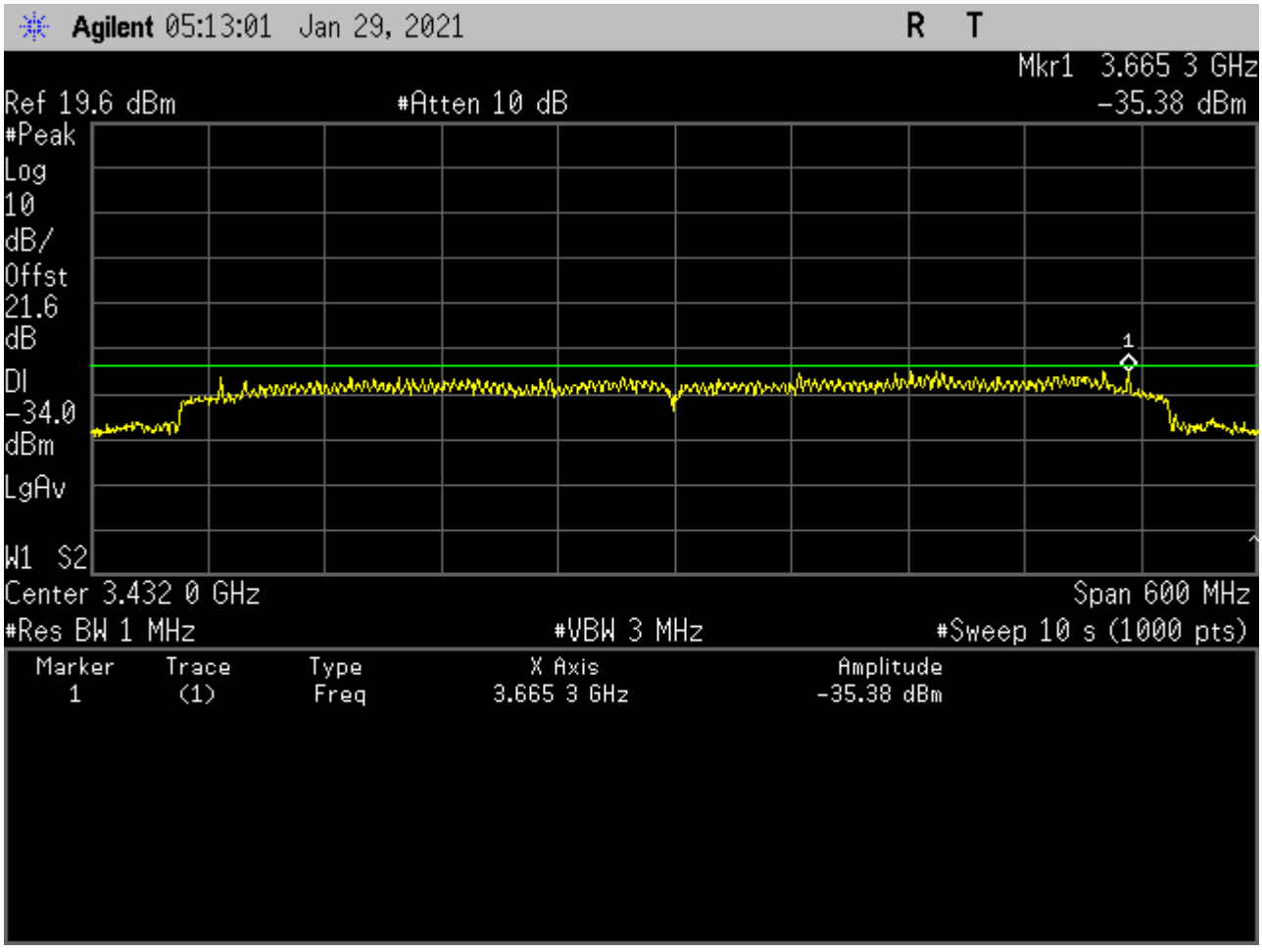
Equipment Configuration for Peak Power Density			
Variant:	Band 1	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
3432.00	-35.38	-34.38	-34.00	-0.38	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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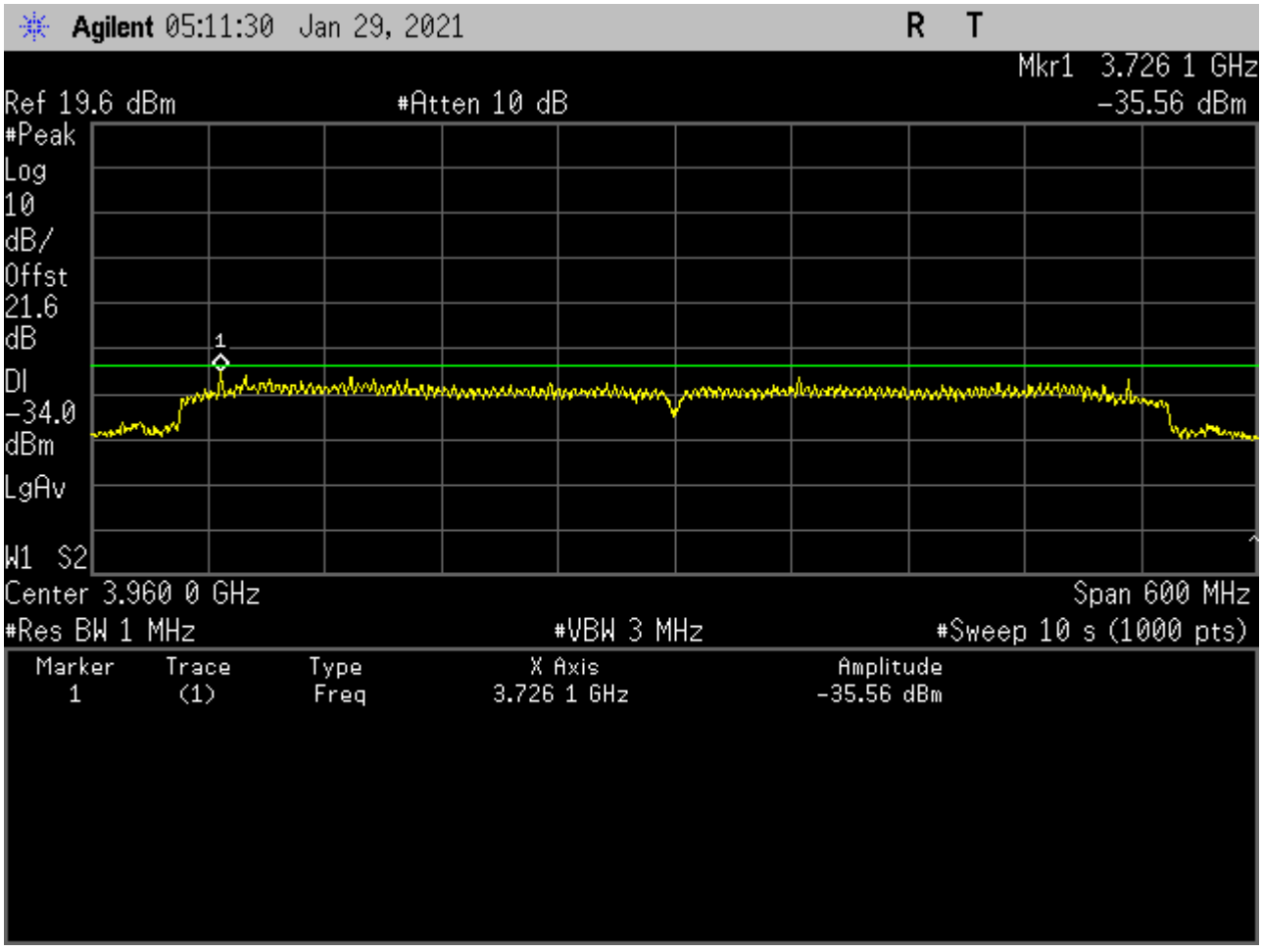
Equipment Configuration for Peak Power Density			
Variant:	Band 1	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
3960.00	-35.56	-34.56	-34.00	-0.56	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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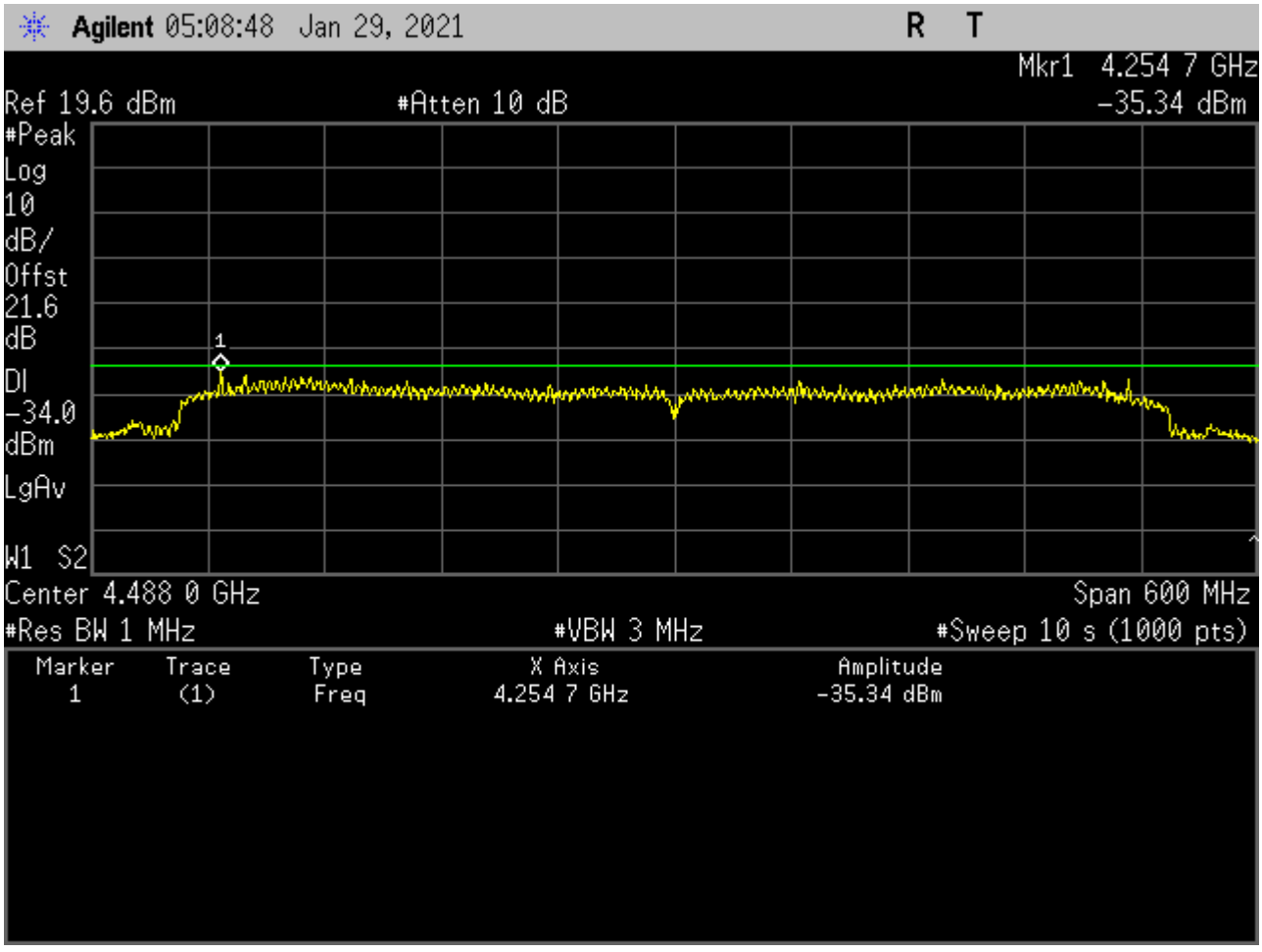
Equipment Configuration for Peak Power Density			
Variant:	Band 1	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	1.0/0.2/0.2
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
4488.00	-35.34	-34.34	-34.00	-0.34	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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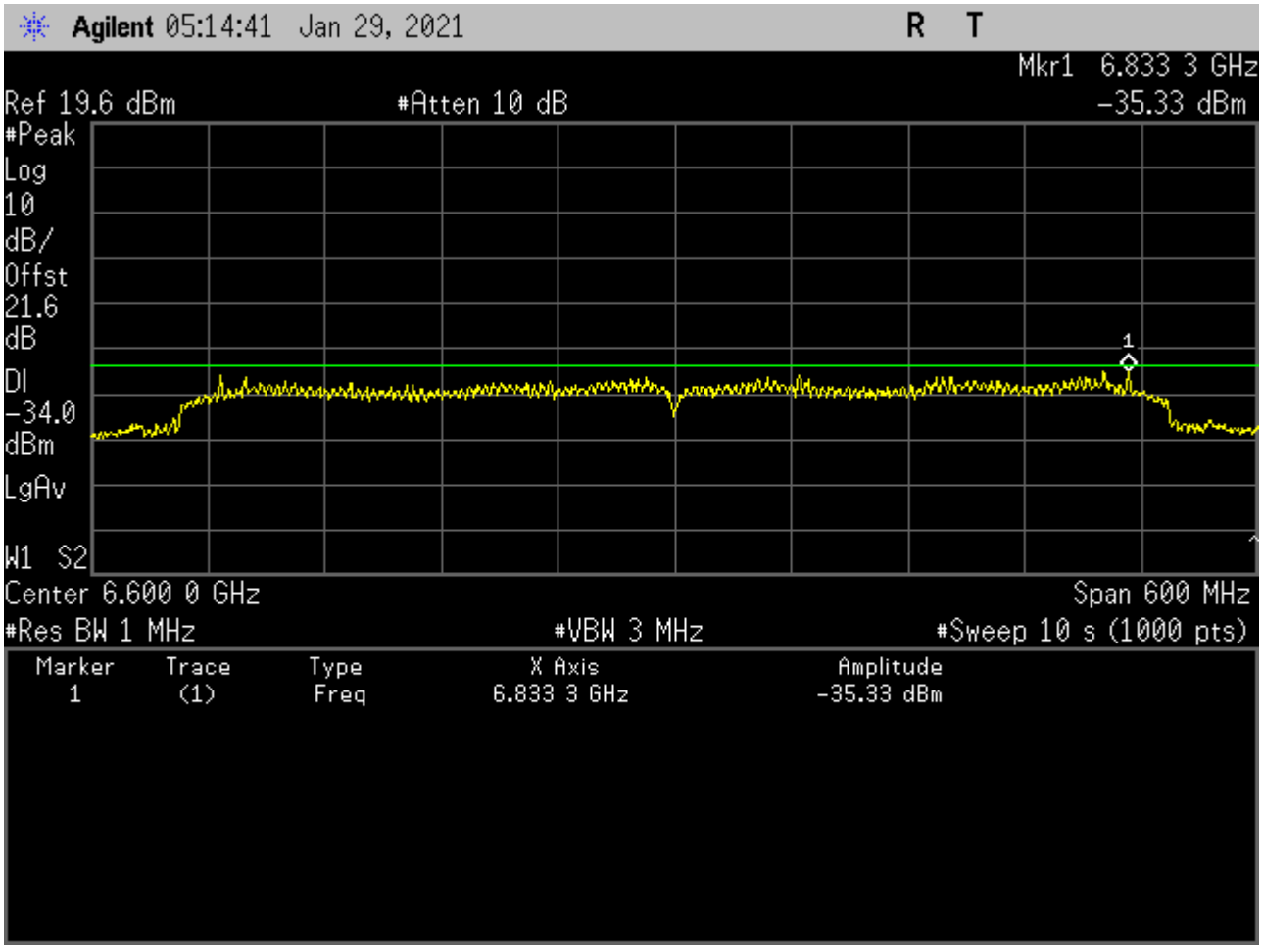
Equipment Configuration for Peak Power Density			
Variant:	Band 3	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
6600.00	-35.33	-35.13	-34.00	-1.13	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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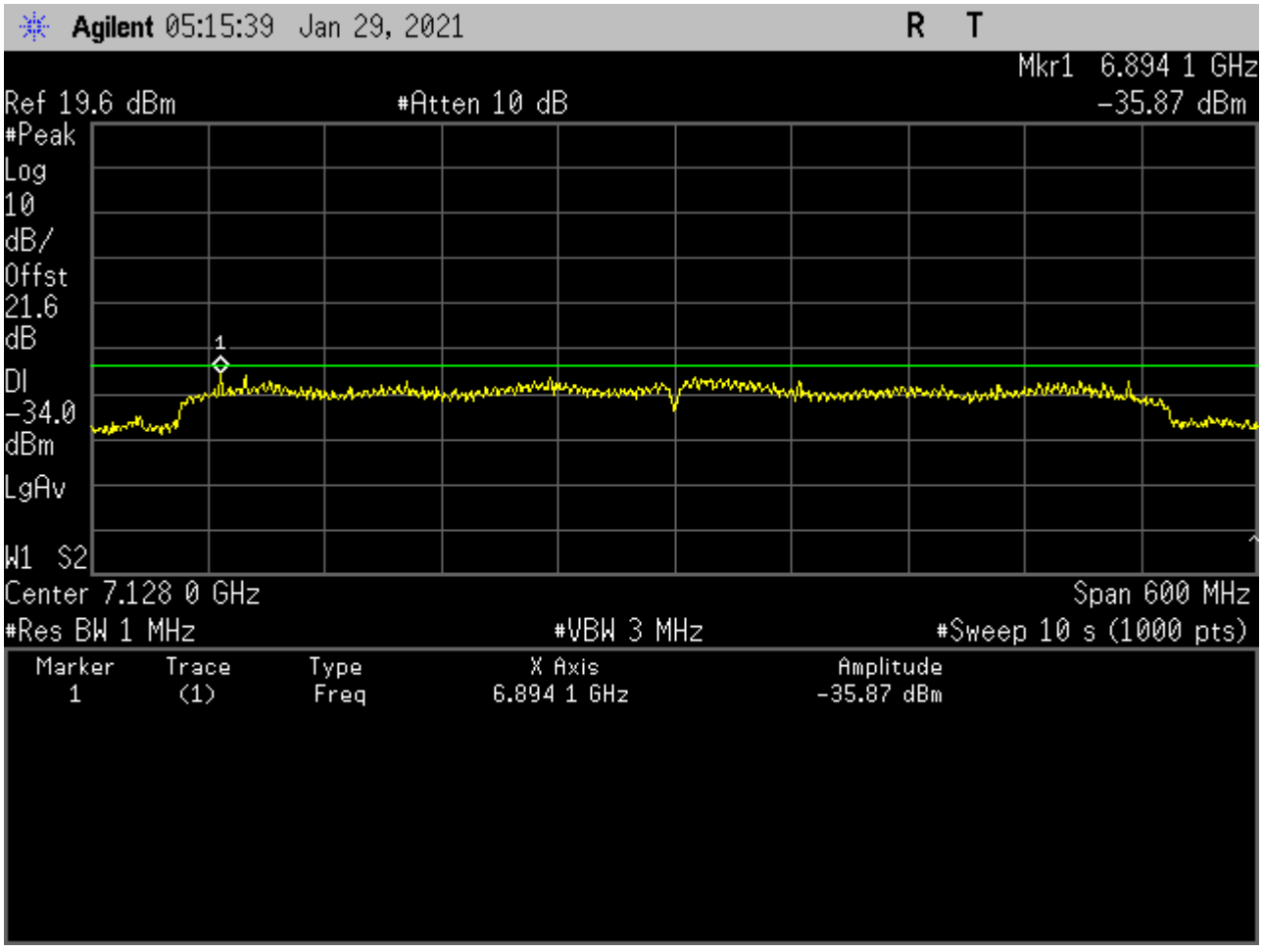
Equipment Configuration for Peak Power Density			
Variant:	Band 3	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
7128.00	-35.87	-35.67	-34.00	-1.67	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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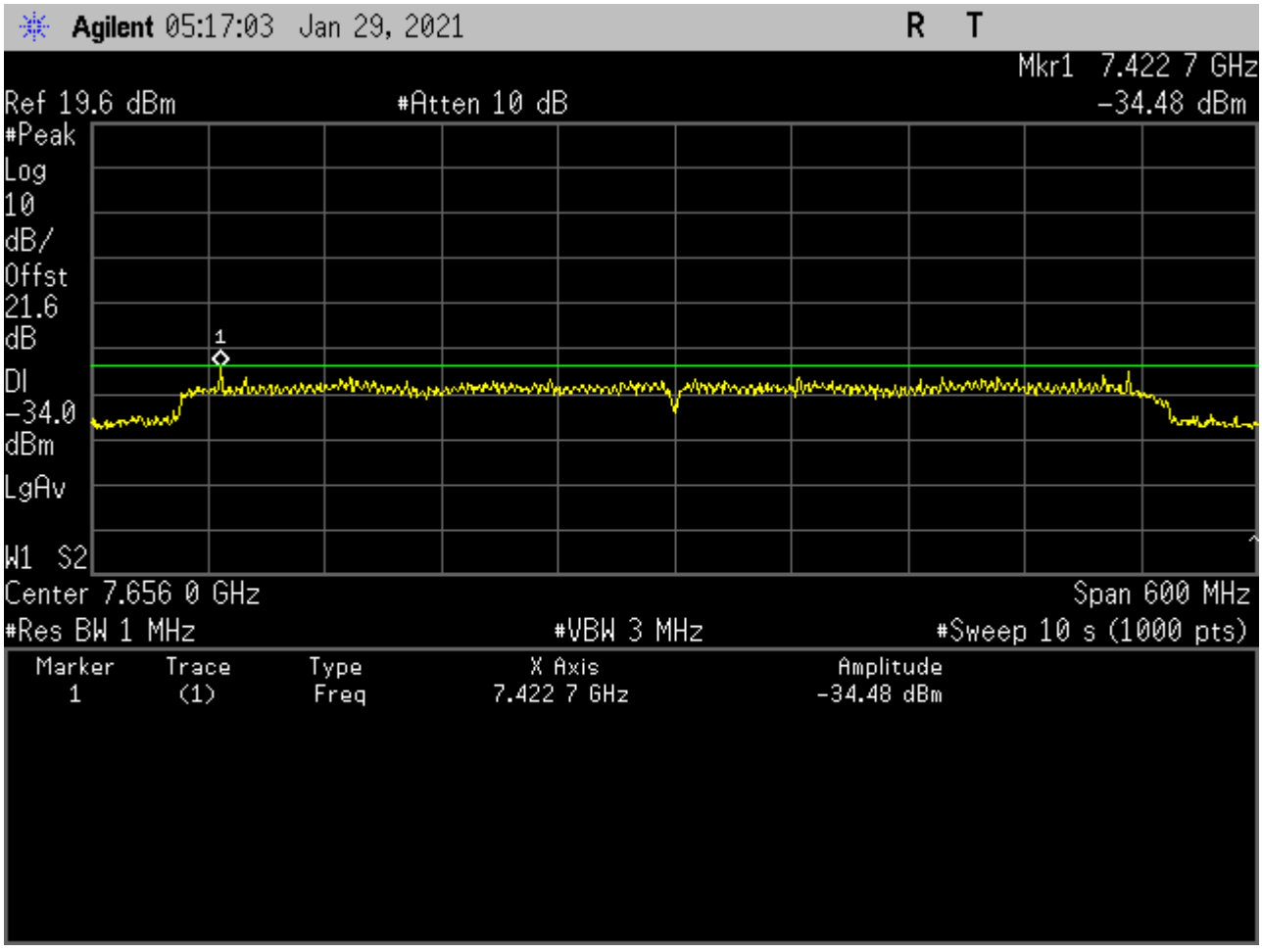
Equipment Configuration for Peak Power Density			
Variant:	Band 3	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.2/-0.2/0.1
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
7656.00	-34.48	-34.28	-34.00	-0.28	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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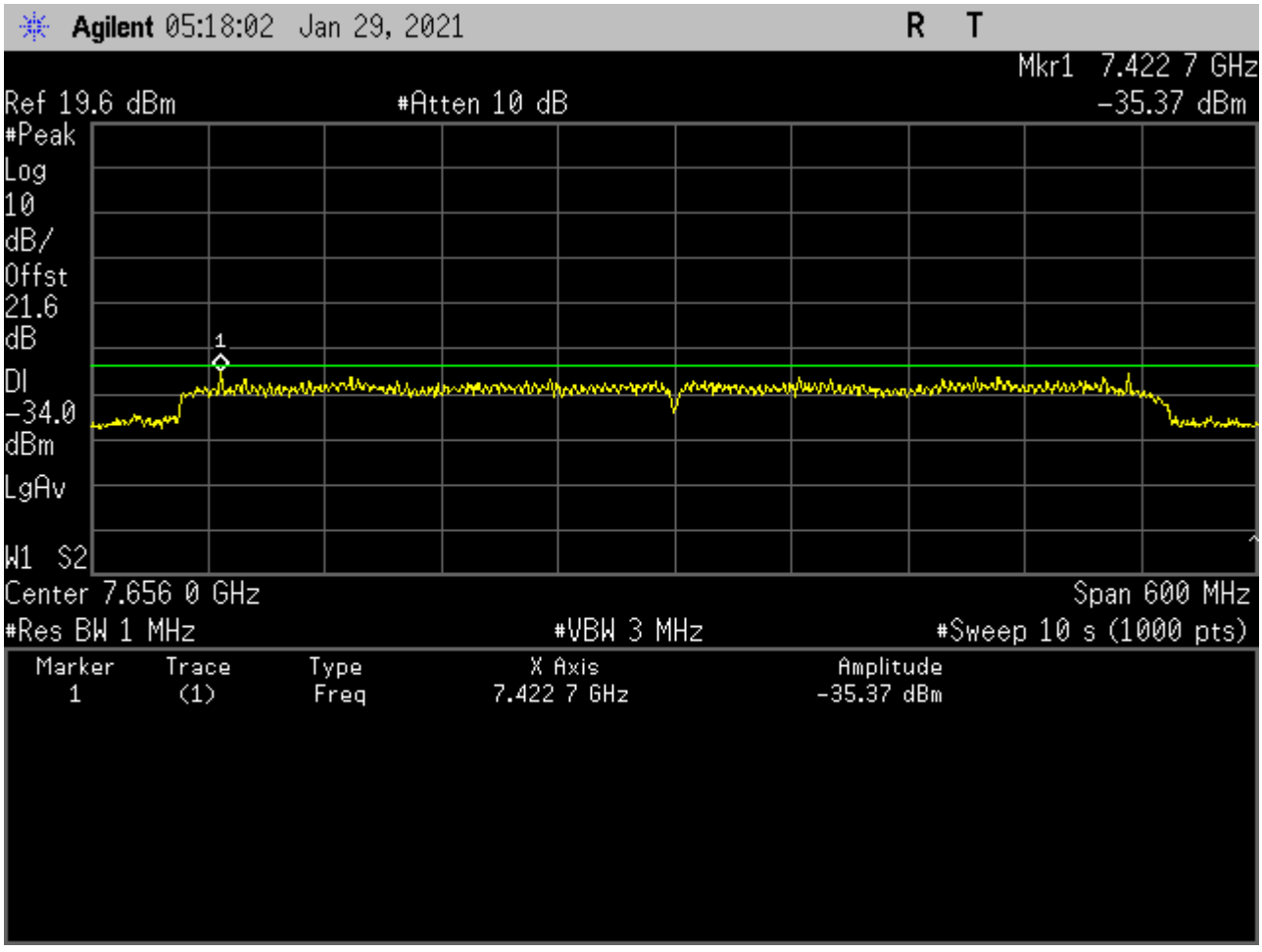
Equipment Configuration for Peak Power Density			
Variant:	Band 6	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
7656.00	-35.37	-35.17	-34.00	-1.17	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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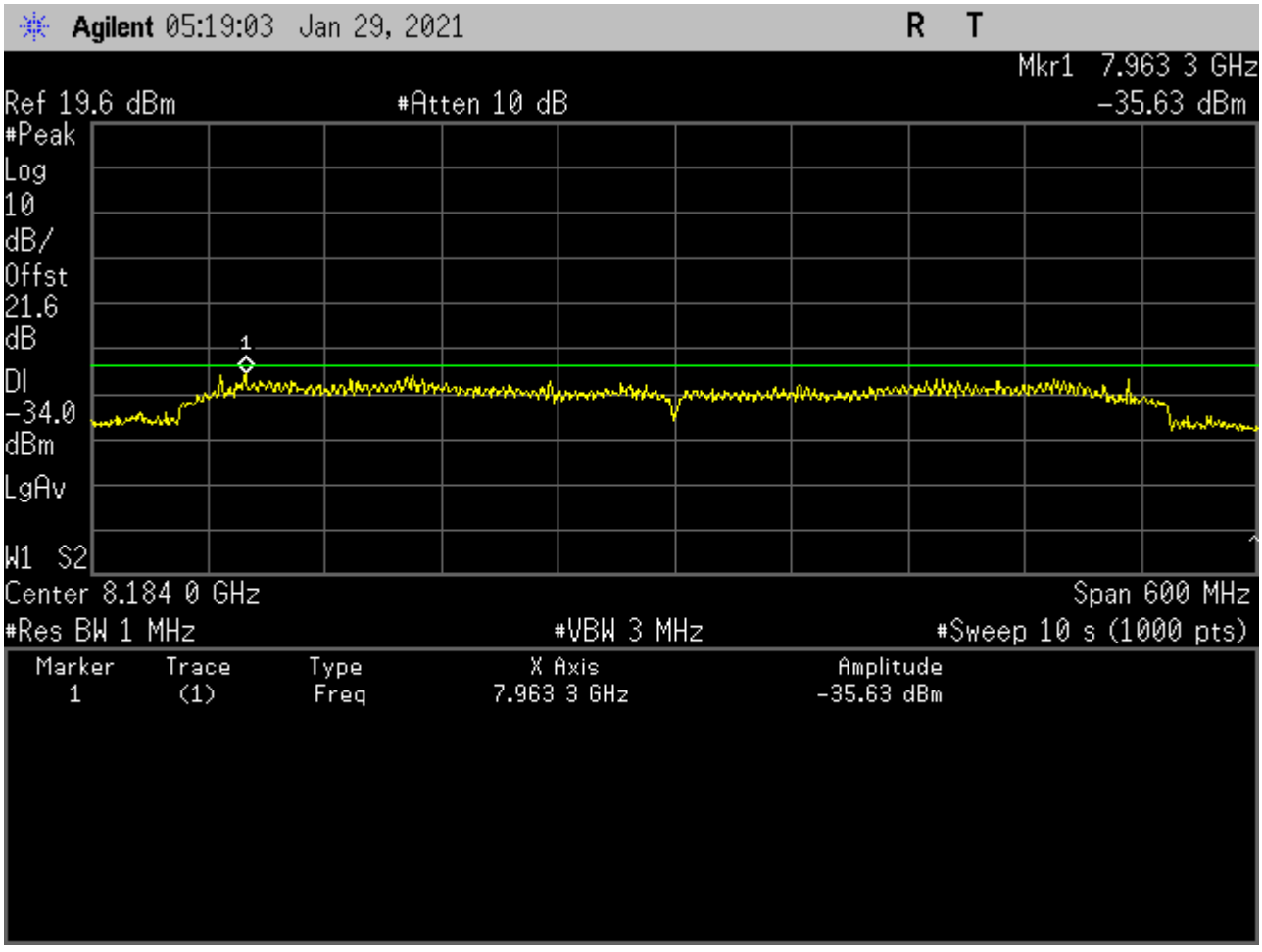
Equipment Configuration for Peak Power Density			
Variant:	Band 6	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
8184.00	-35.63	-35.43	-34.00	-1.43	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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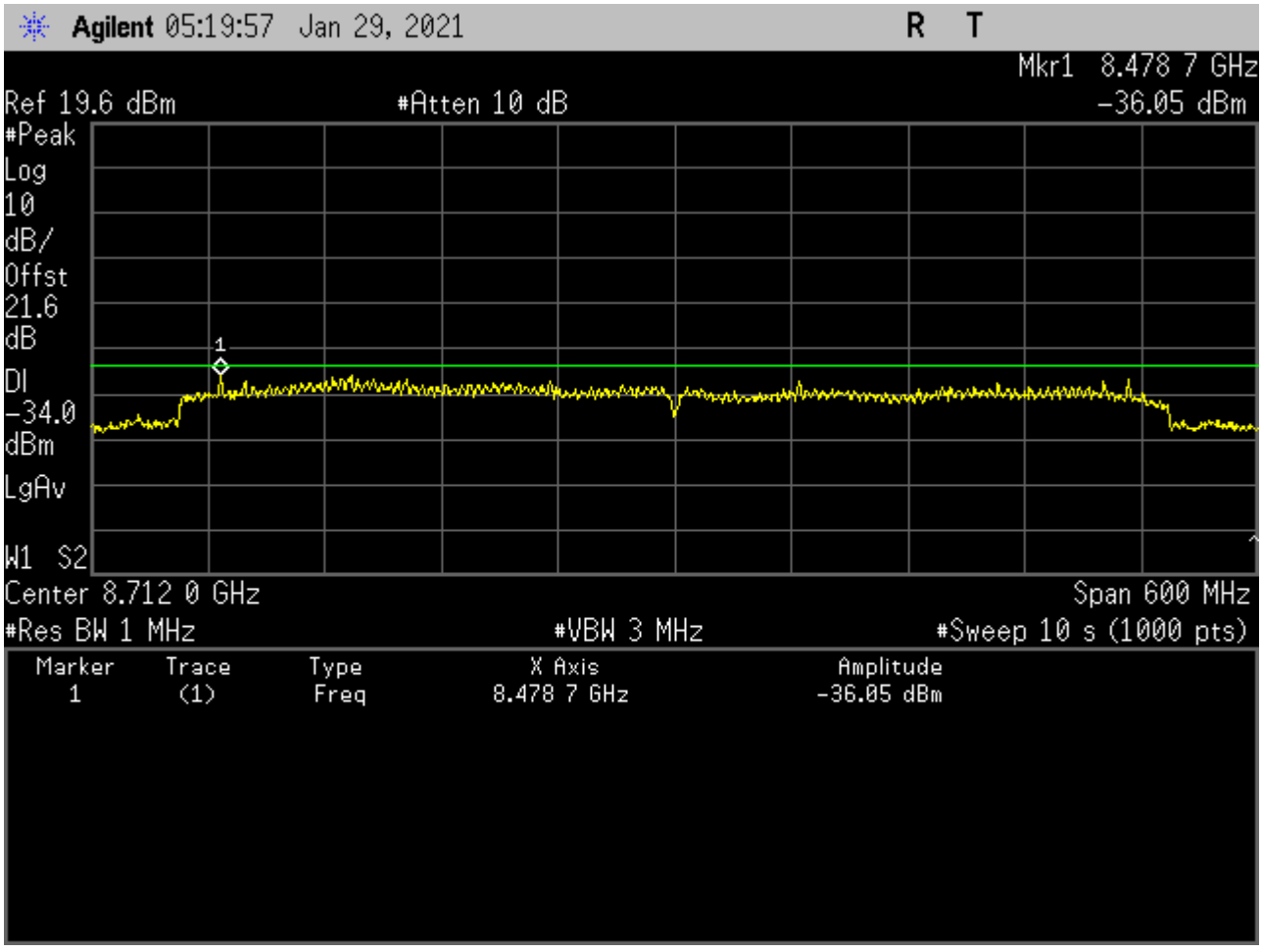
Equipment Configuration for Peak Power Density			
Variant:	Band 6	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency MHz	Measured Peak Power Density (dBm)	Calculated EIRP (dBm)	EIRP Limit (dBm)	Margin (dB)	EUT Power Setting
8712.00	-36.05	-35.85	-34.00	-1.85	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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9.4. Transmitter Spurious Band Emissions

Radiated Test Conditions for Radiated Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47 15.519	**Ambient Temp. (ºC):**	20.0 - 24.5
Test Heading:	Radiated Spurious and Band-Edge Emissions	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	ANSI C63.10 Section 10.2 + 10.3	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Radiated Spurious and Band-Edge Emissions
Radiated emissions for restricted bands above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in max hold mode. Depending on the frequency band spanned a notch filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.
Measurements on any restricted band frequency or frequencies above 1 GHz are based on the use of measurement instrumentation employing peak and average detectors. All measurements were performed using a resolution bandwidth of 1 MHz.

Limits for Restricted Bands (15.205, 15.209)
Peak emission: 68.23 dBuV/m
Average emission: 54 dBuV/m

Field Strength Calculation
The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.
FS = R + AF + CORR - FO

where:
FS = Field Strength
R = Measured Spectrum analyzer Input Amplitude
AF = Antenna Factor
CORR = Correction Factor = CL – AG + NFL
CL = Cable Loss
AG = Amplifier Gain
FO = Distance Falloff Factor
NFL = Notch Filter Loss

Measurements made at 1 meter to meet noise floor to limit requirements

Frequency Range		Average Limit	
MHz	**MHz**	**EIRP (dBm)**	**EIRP at 1 Meters (dBuV/m)**
960	1610	-75.3	29.4
1610	1990	-63.3	41.4
1990	3100	-61.3	43.4
3100	10600	-41.3	63.4
10600	18000	-61.3	43.4

Radiated Spurious Emissions in the GPS Bands 15.519 (d)

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Frequency Range		Average Limit	
MHz	MHz	EIRP (dBm)	EIRP at 1 Meters (dBuV/m)
1164	1240	-85.3	19.47
1559	1610	-85.3	19.47

50 MHz Peak Emissions 15.519 (e)
Within 50 MHz bandwidth centered on highest radiated emissions $f_{M,}$ Limit is 0.0 dBm EIRP. At 1-meter distance the equivalent level is 104.77 dBuV/m

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9.4.1. Transmitter Spurious Emissions

9.4.2. Band 1

Equipment Configuration for Spurious Emissions

Antenna:	Chip	**Variant:**	Band Group 1
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	3432.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1597.77	28.98	Average	Vertical	150	0	29.40	-0.42	Pass
2	1597.77	28.98	Average	Horizontal	150	0	29.40	-0.42	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

1610-1990 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1920.70	29.55	Average	Vertical	150	0	41.40	-11.85	Pass
2	1920.70	28.76	Average	Horizontal	150	0	41.40	-12.64	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

1990-3100 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	2655.11	29.32	Average	Vertical	150	0	43.40	-14.08	Pass
2	3100.00	30.03	Average	Horizontal	150	0	43.40	-13.37	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

3100-10600 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	3460.72	50.78	Average	Vertical	150	0	63.40	-12.62	Pass
2	3641.08	59.72	Average	Horizontal	150	0	63.40	-3.68	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

10600-18000 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	15701.40	40.22	Average	Vertical	150	0	43.4	-3.18	Pass
2	15671.74	40.36	Average	Horizontal	150	0	43.4	-3.04	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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Equipment Configuration for Spurious Emissions

Antenna:	Chip	**Variant:**	Band Group 1
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	3960.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1443.74	27.23	Average	Vertical	150	0	29.4	-2.17	Pass
2	1597.77	29.18	Average	Horizontal	150	0	29.4	-0.22	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1610-1990 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1920.07	29.90	Average	Vertical	150	0	41.40	-11.50	Pass
2	1631.32	30.77	Average	Horizontal	150	0	41.40	-10.63	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1990-3100 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	2655.11	29.36	Average	Vertical	150	0	43.40	-14.04	Pass
2	2657.33	30.52	Average	Horizontal	150	0	43.40	-12.88	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

3100-10600 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	3926.65	52.94	Average	Vertical	150	0	63.40	-10.46	Pass
2	3761.32	59.48	Average	Horizontal	150	0	63.40	-3.92	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

10600-18000 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1567.17	40.23	Average	Vertical	150	0	43.4	-3.17	Pass
2	1567.17	40.11	Average	Horizontal	150	0	43.4	-3.29	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

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Equipment Configuration for Spurious Emissions

Antenna:	Chip	**Variant:**	Band Group 1
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	4488.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1413.18	28.72	Average	Vertical	150	0	29.4	-0.68	Pass
2	1299.49	28.00	Average	Horizontal	150	0	29.4	-1.40	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1610-1990 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1920.70	29.67	Average	Vertical	150	0	41.40	-11.73	Pass
2	1830.84	30.67	Average	Horizontal	150	0	41.40	-10.73	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1990-3100 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	2655.11	29.15	Average	Vertical	150	0	43.40	-14.25	Pass
2	1996.67	30.88	Average	Horizontal	150	0	43.40	-12.52	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

3100-10600 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	4678.15	54.41	Average	Vertical	150	0	63.40	-8.99	Pass
2	4678.15	60.50	Average	Horizontal	150	0	63.40	-2.90	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

10600-18000 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	15671.74	40.30	Average	Vertical	150	0	43.4	-3.10	Pass
2	15671.74	40.23	Average	Horizontal	150	0	43.4	-3.17	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

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9.4.3. Band 2

Equipment Configuration for Spurious Emissions			
Antenna:	Chip	**Variant:**	Band Group 3
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	6600.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1243.26	26.92	Average	Vertical	150	0	29.4	-2.48	Pass
2	1410.74	28.20	Average	Horizontal	150	0	29.4	-1.20	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

1610-1990 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1887.95	30.17	Average	Vertical	150	0	41.40	-11.23	Pass
2	1859.01	29.96	Average	Horizontal	150	0	41.40	-11.44	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

1990-3100 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	2801.92	30.17	Average	Vertical	150	0	43.40	-13.23	Pass
2	2659.55	29.76	Average	Horizontal	150	0	43.40	-13.64	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

3100-10600 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	6376.55	51.20	Average	Vertical	150	0	63.40	-12.20	Pass
2	6376.55	61.08	Average	Horizontal	150	0	63.40	-2.32	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

10600-18000 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	15671.74	40.55	Average	Vertical	150	0	43.4	-2.85	Pass
2	15671.74	40.55	Average	Horizontal	150	0	43.4	-2.85	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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Equipment Configuration for Spurious Emissions

Antenna:	Chip	**Variant:**	Band Group 3
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	7128.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1272.60	27.99	Average	Vertical	150	0	29.4	-1.41	Pass
2	1602.66	28.00	Average	Horizontal	150	0	29.4	-1.40	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1610-1990 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1920.70	31.85	Average	Vertical	150	0	41.40	-9.55	Pass
2	1920.70	33.46	Average	Horizontal	150	0	41.40	-7.94	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1990-3100 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	2655.11	32.60	Average	Vertical	150	0	43.40	-10.80	Pass
2	1996.67	31.81	Average	Horizontal	150	0	43.40	-11.59	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

3100-10600 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	6917.63	51.01	Average	Vertical	150	0	63.40	-12.39	Pass
2	7338.47	60.36	Average	Horizontal	150	0	63.40	-3.04	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

10600-18000 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	15671.74	40.55	Average	Vertical	150	0	43.4	-2.85	Pass
2	15671.74	40.61	Average	Horizontal	150	0	43.4	-2.79	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

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9.4.4. Band 3 & 6

Equipment Configuration for Spurious Emissions

Antenna:	Chip	**Variant:**	Band Group 3/6
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	7656.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1270.16	27.03	Average	Vertical	150	0	29.4	-2.37	Pass
2	1594.10	28.57	Average	Horizontal	150	0	29.4	-0.83	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1610-1990 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1920.70	31.77	Average	Vertical	150	0	41.40	-9.63	Pass
2	1920.70	34.68	Average	Horizontal	150	0	41.40	-6.72	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1990-3100 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	2655.11	29.19	Average	Vertical	150	0	43.40	-14.21	Pass
2	1996.67	30.05	Average	Horizontal	150	0	43.40	-13.35	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

3100-10600 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	7819.43	52.36	Average	Vertical	150	0	63.40	-11.04	Pass
2	7864.52	60.79	Average	Horizontal	150	0	63.40	-2.61	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

10600-18000 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	15671.74	40.55	Average	Vertical	150	0	43.4	-2.85	Pass
2	15671.74	40.55	Average	Horizontal	150	0	43.4	-2.85	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

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9.4.5. Band 6

Equipment Configuration for Spurious Emissions			
Antenna:	Chip	**Variant:**	Band Group 6
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	8184.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1270.01	27.84	Average	Vertical	150	0	29.4	-1.56	Pass
2	1597.77	28.17	Average	Horizontal	150	0	29.4	-1.23	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

1610-1990 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1920.70	30.79	Average	Vertical	150	0	41.40	-10.61	Pass
2	1920.70	34.08	Average	Horizontal	150	0	41.40	-7.32	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

1990-3100 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	3017.69	28.78	Average	Vertical	150	0	43.40	-14.62	Pass
2	2659.55	29.84	Average	Horizontal	150	0	43.40	-13.56	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

3100-10600 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	8029.85	50.88	Average	Vertical	150	0	63.40	-12.52	Pass
2	7969.73	61.75	Average	Horizontal	150	0	63.40	-1.65	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

10600-18000 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	15671.74	40.48	Average	Vertical	150	0	43.4	-2.92	Pass
2	15671.74	40.48	Average	Horizontal	150	0	43.4	-2.92	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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Equipment Configuration for Spurious Emissions

Antenna:	Chip	**Variant:**	Band Group 6
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	8712.00	**Data Rate:**	200Mbp/s
Power Setting:	Max	**Tested By:**	JMH

Test Measurement Results

1000.00– 1610.00 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1271.38	26.68	Average	Vertical	150	0	29.4	-2.72	Pass
2	1594.10	28.70	Average	Horizontal	150	0	29.4	-0.70	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1610-1990 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	1920.70	30.05	Average	Vertical	150	0	41.40	-11.35	Pass
2	1920.70	35.82	Average	Horizontal	150	0	41.40	-5.58	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

1990-3100 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	2655.11	29.36	Average	Vertical	150	0	43.40	-14.04	Pass
2	2657.33	30.19	Average	Horizontal	150	0	43.40	-13.21	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

3100-10600 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	8570.94	51.56	Average	Vertical	150	0	63.40	-11.84	Pass
2	8915.53	60.15	Average	Horizontal	150	0	63.40	-3.25	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

10600-18000 MHz

Num	Frequency MHz	Level dBµV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBµV/m	Margin dB	Pass /Fail
1	15671.74	40.48	Average	Vertical	150	0	43.4	-2.92	Pass
2	15671.74	40.42	Average	Horizontal	150	0	43.4	-2.98	Pass

Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter

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9.4.6. GPS Band Emissions

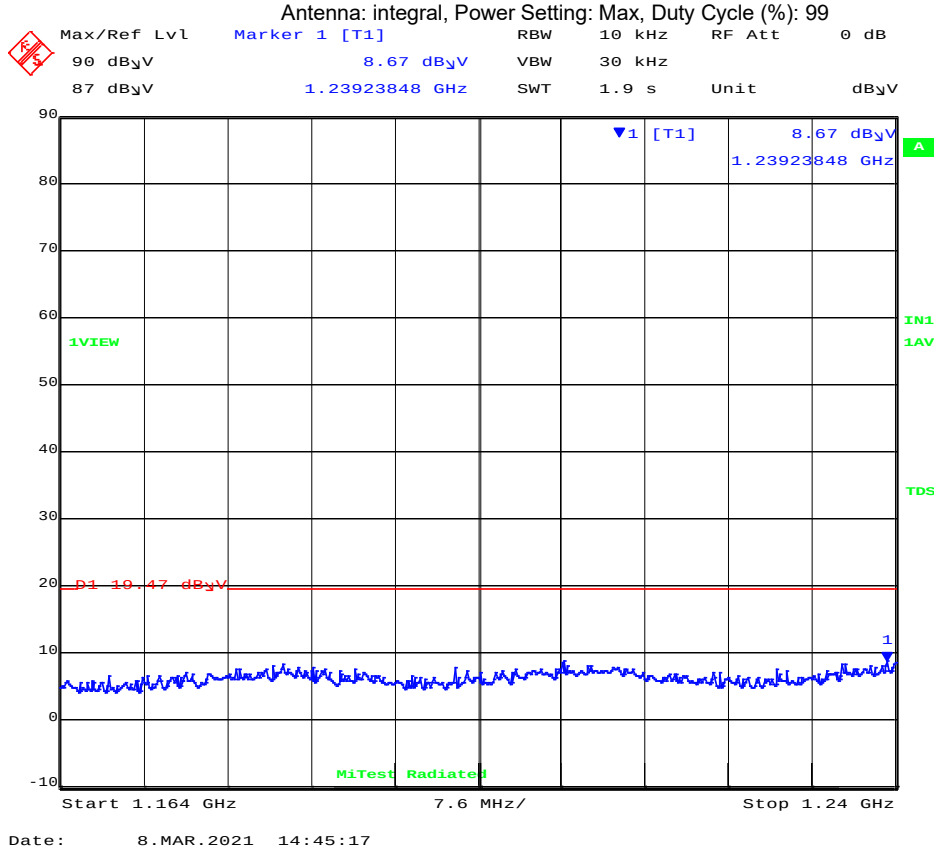
9.4.6.0.1. 3432 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	3432.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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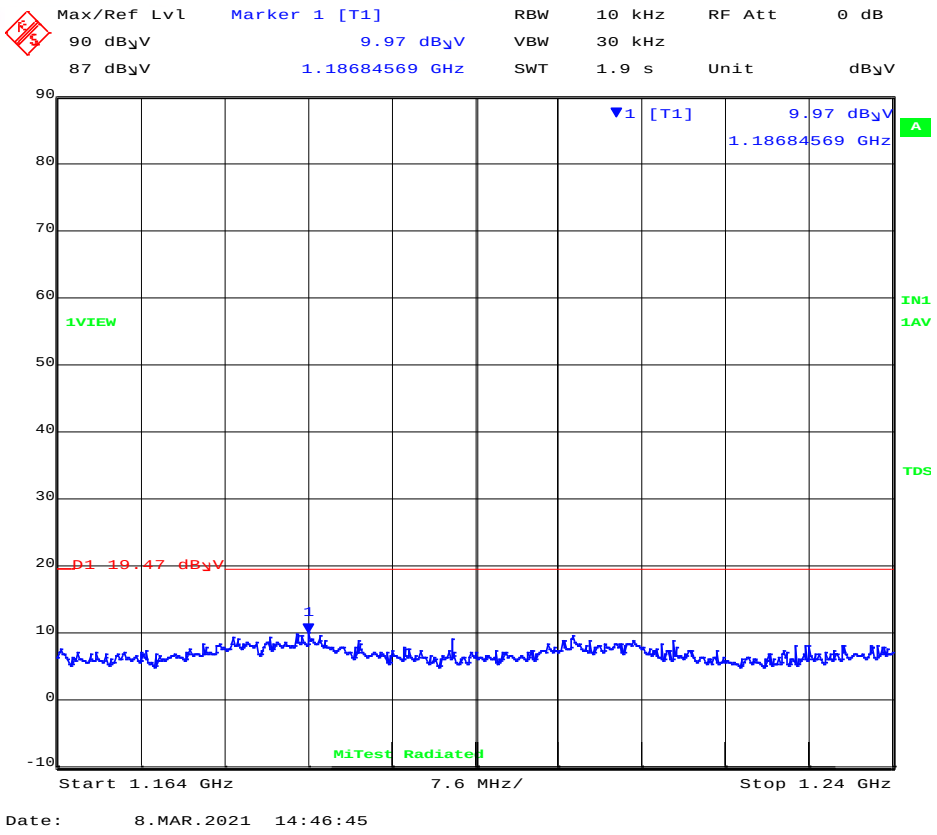

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1239.23	8.67	Average	Vertical	150	0	19.47	-10.8	Pass
2	1186.84	9.97	Average	Horizontal	150	0	19.47	-9.5	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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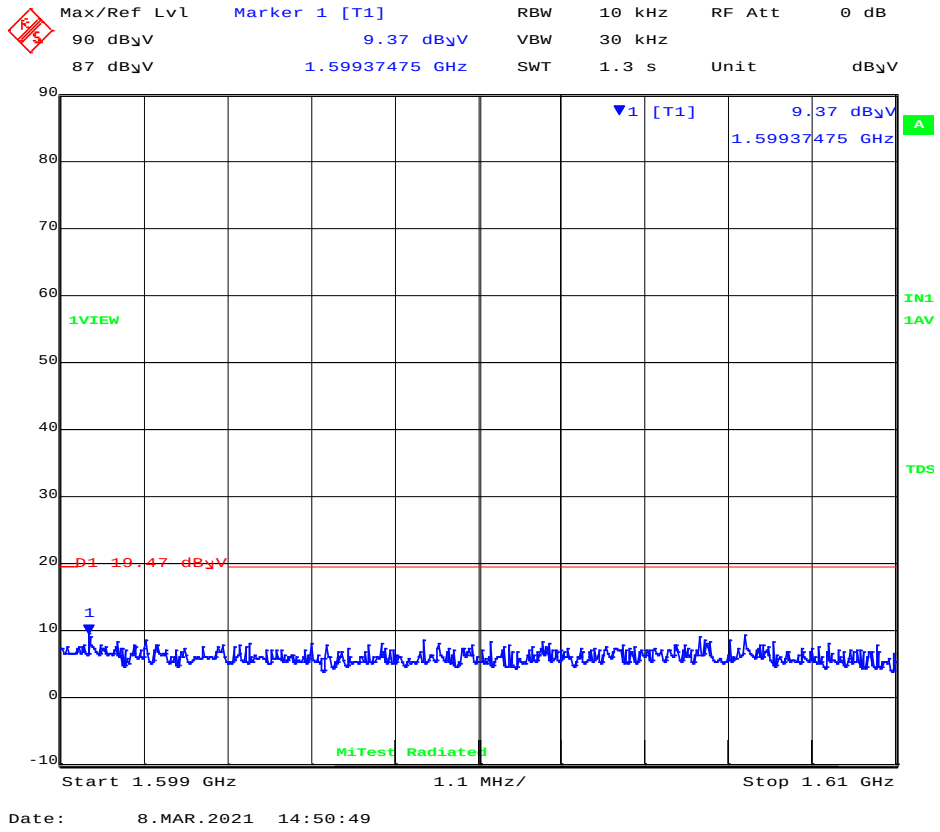
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	3432.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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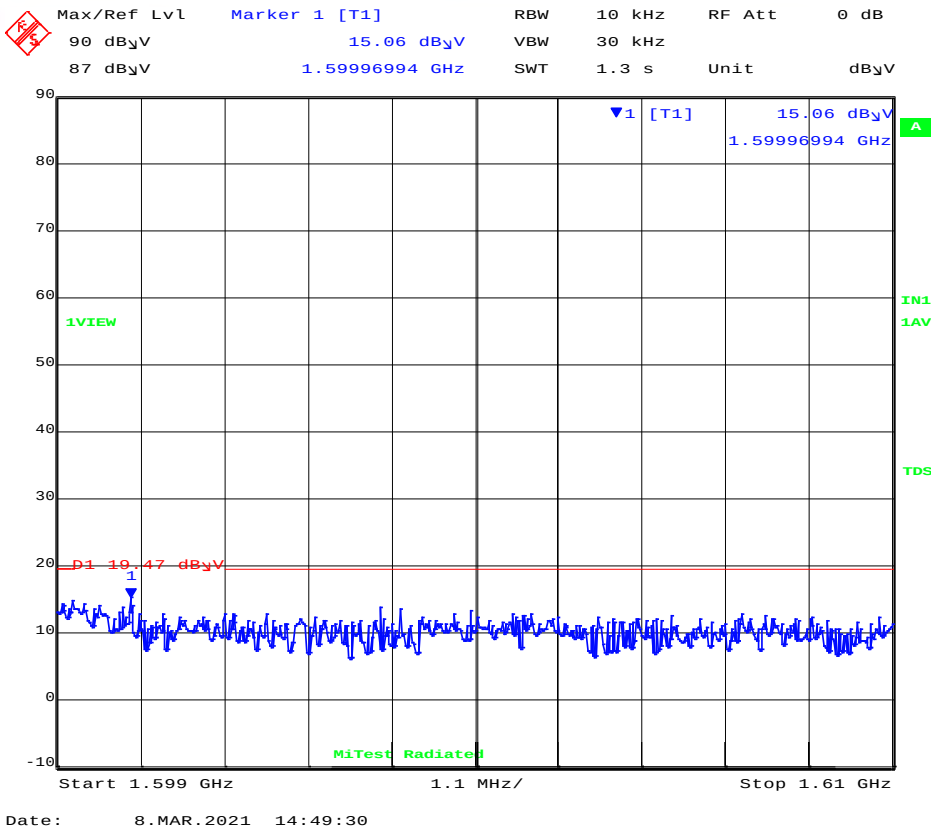

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1599.37	9.37	Average	Vertical	150	0	19.47	-10.1	Pass
2	1599.96	15.06	Average	Horizontal	150	0	19.47	-4.41	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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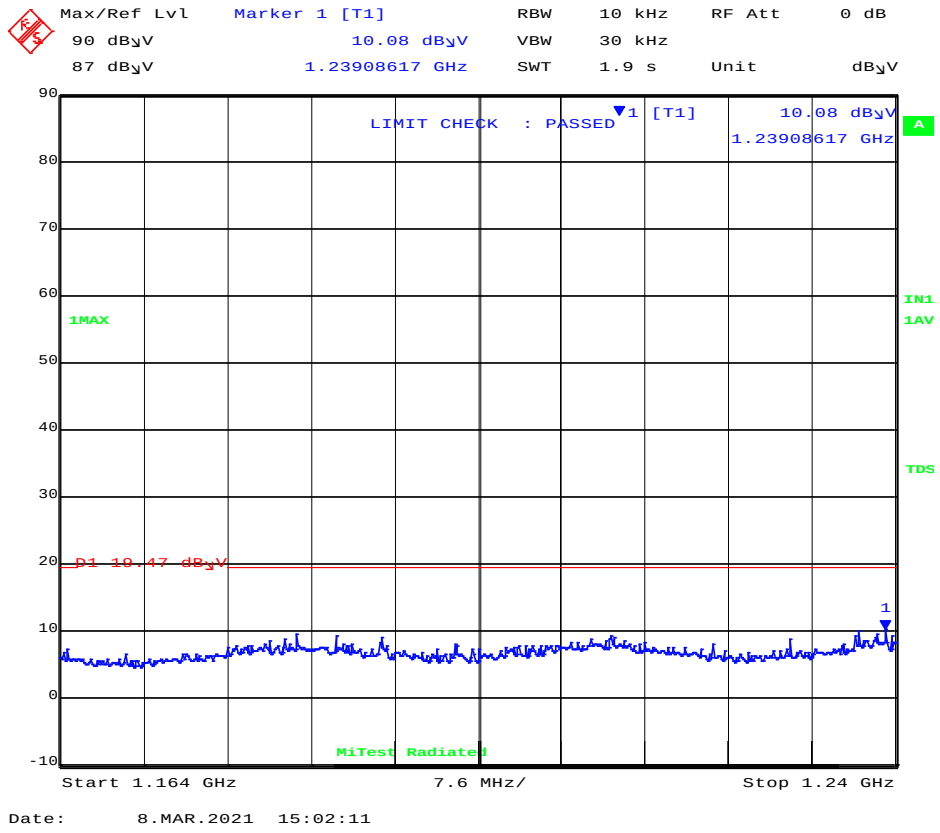
9.4.6.0.2. 3960 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	3960.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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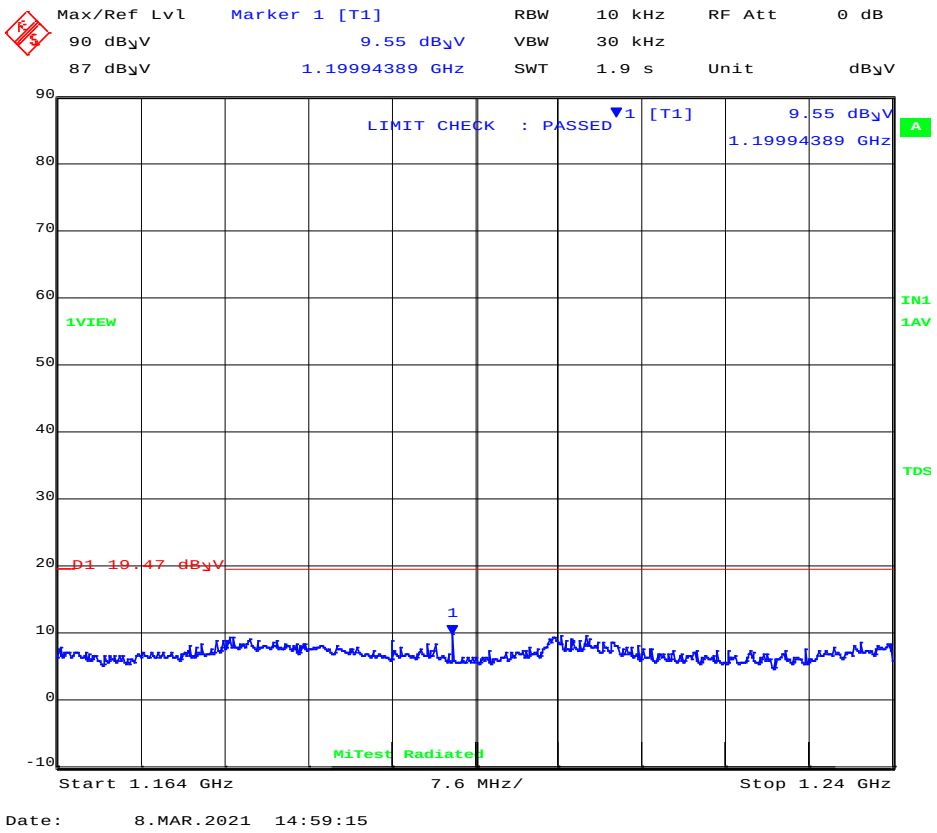

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1239.08	10.08	Average	Vertical	150	0	19.47	-9.39	Pass
2	1199.94	9.55	Average	Horizontal	150	0	19.47	-9.92	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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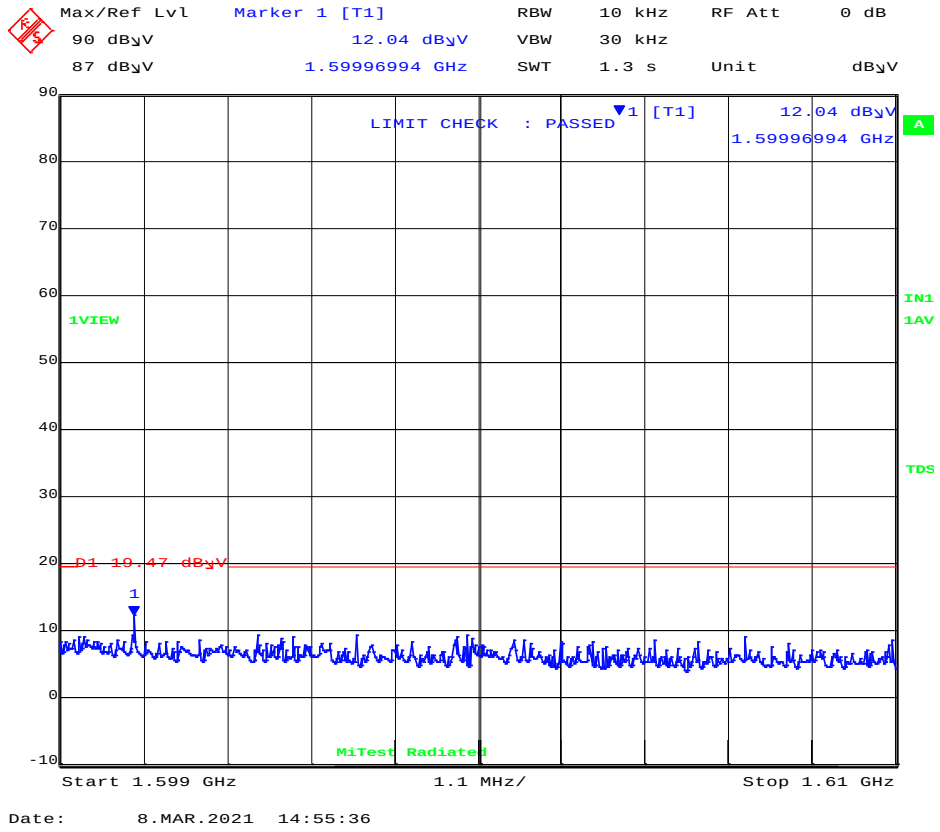
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	3960.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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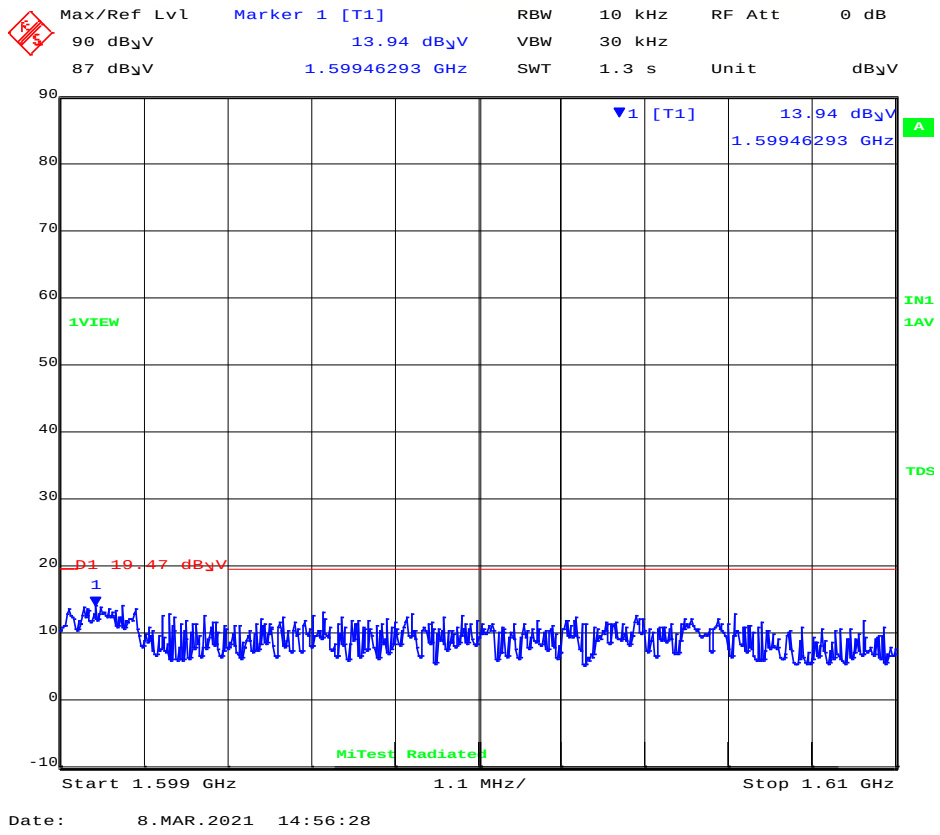

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1599.96	12.04	Average	Vertical	150	0	19.47	-7.43	Pass
2	1599.46	13.94	Average	Horizontal	150	0	19.47	-5.53	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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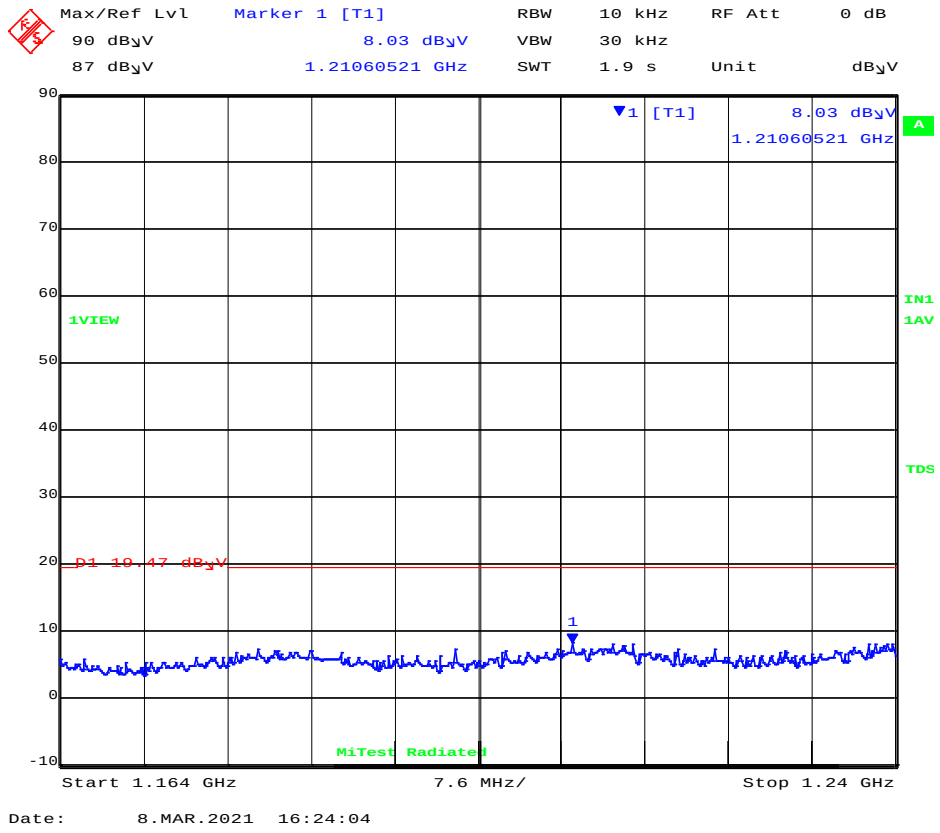
9.4.6.0.3. 4488 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	4488.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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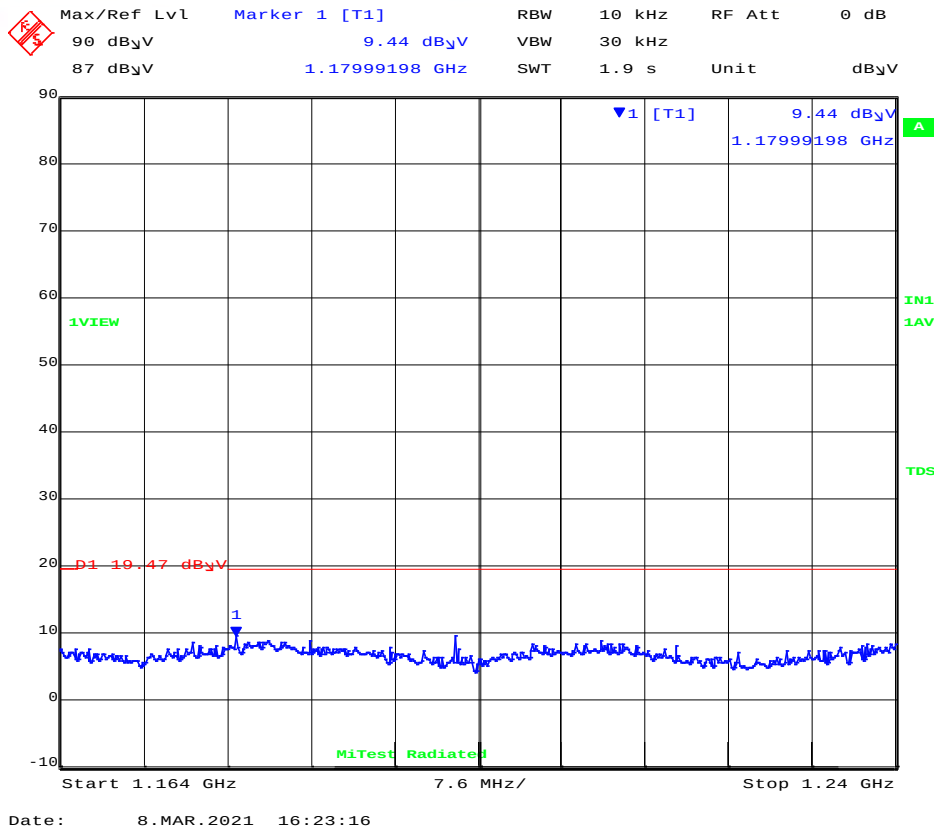

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1210.60	8.03	Average	Vertical	150	0	19.47	-11.44	Pass
2	1179.99	9.44	Average	Horizontal	150	0	19.47	-10.03	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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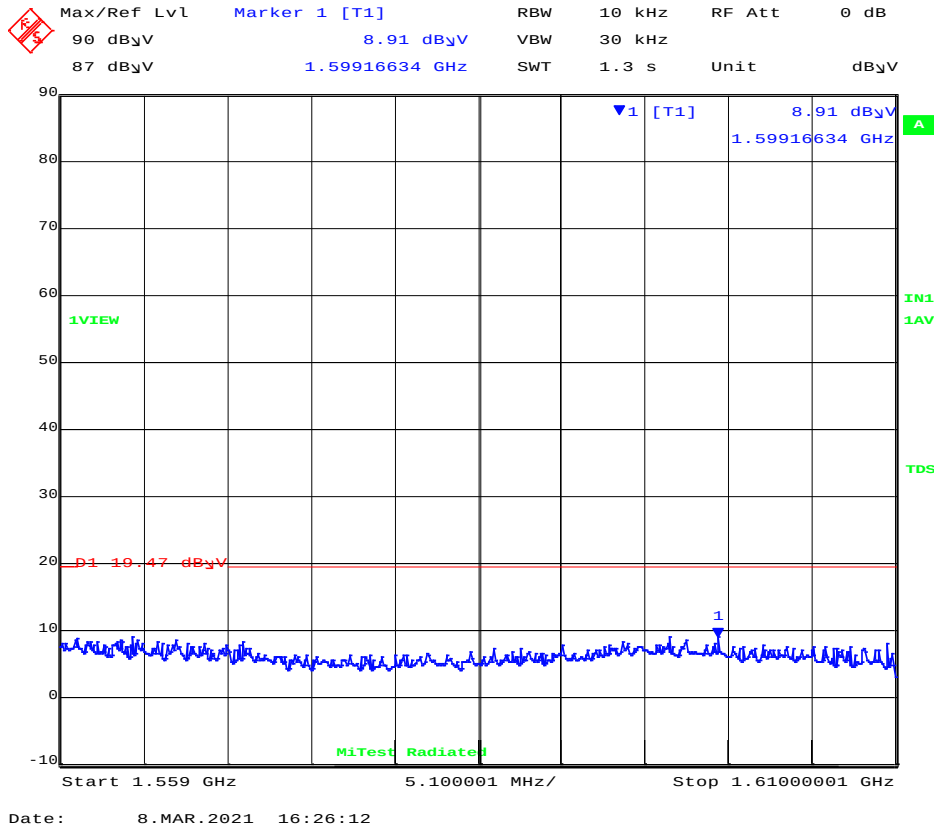
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	1.0/0.2/0.2	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	4488.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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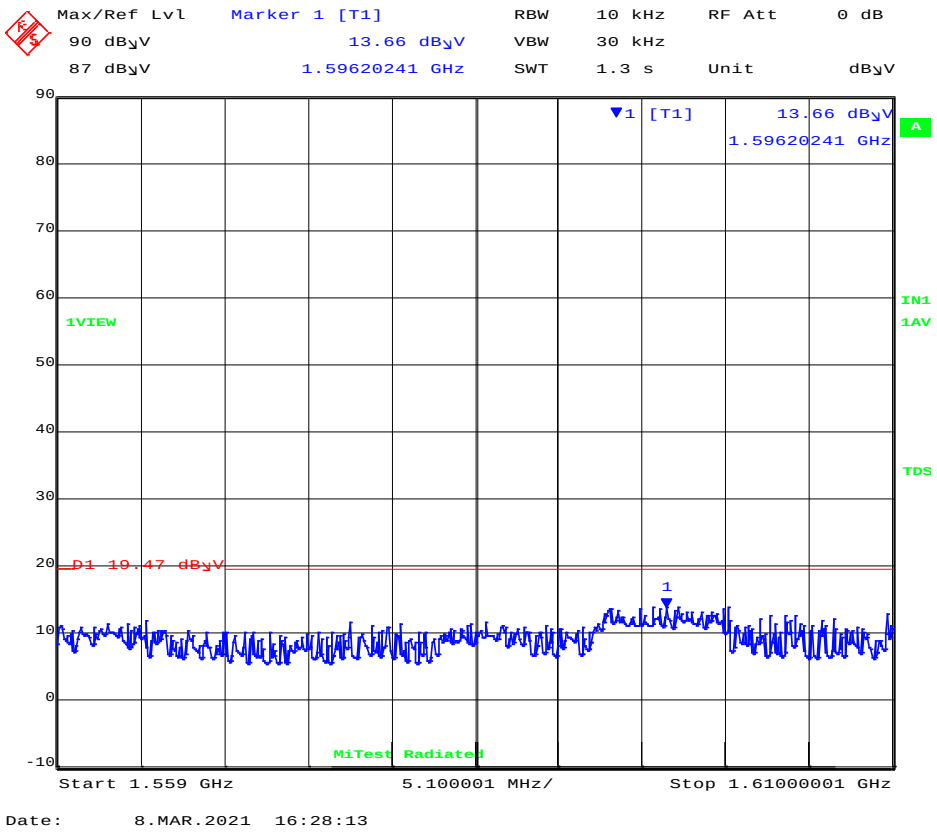

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1599.16	8.91	Average	Vertical	150	0	19.47	-10.56	Pass
2	1596.20	13.66	Average	Horizontal	150	0	19.47	-5.81	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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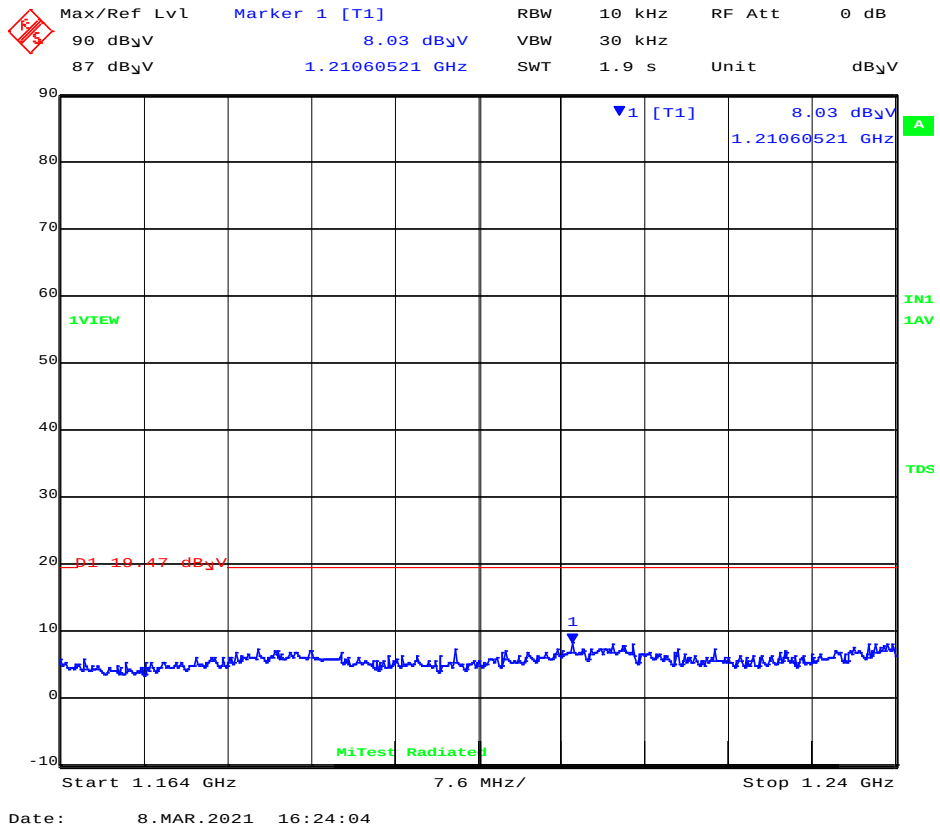
9.4.6.0.4. 6600 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.2/-0.2/0.1	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	6600.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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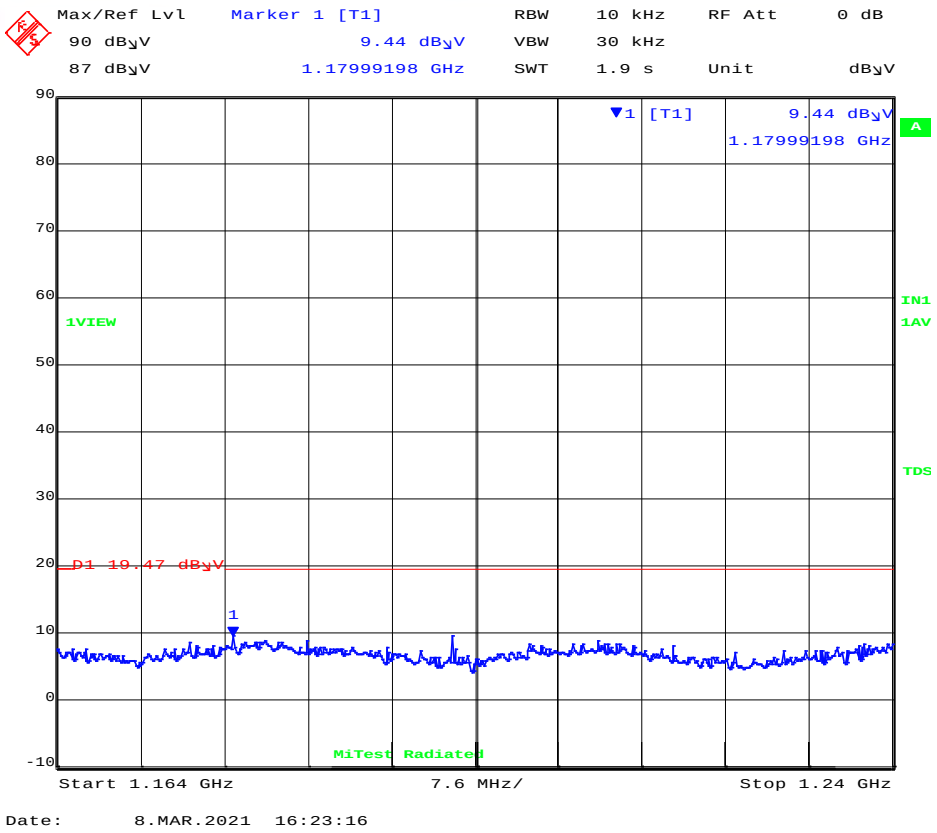

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1210.60	8.03	Average	Vertical	150	0	19.47	-11.44	Pass
2	1179.99	9.44	Average	Horizontal	150	0	19.47	-10.03	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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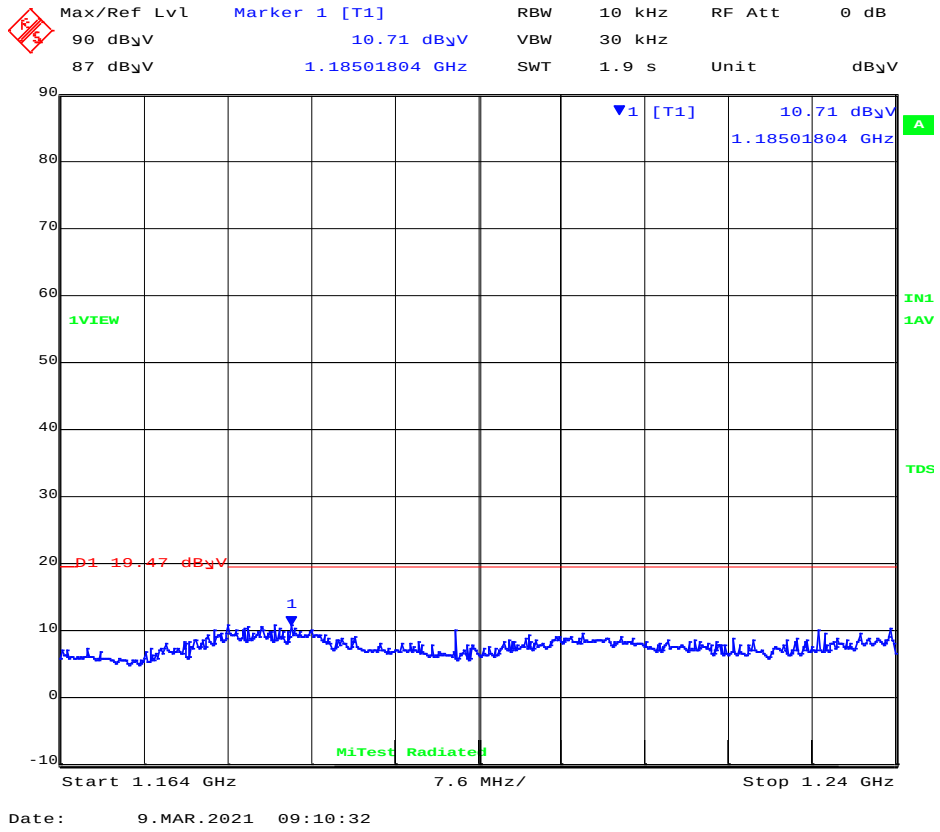
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.2/-0.2/0.1	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	6600.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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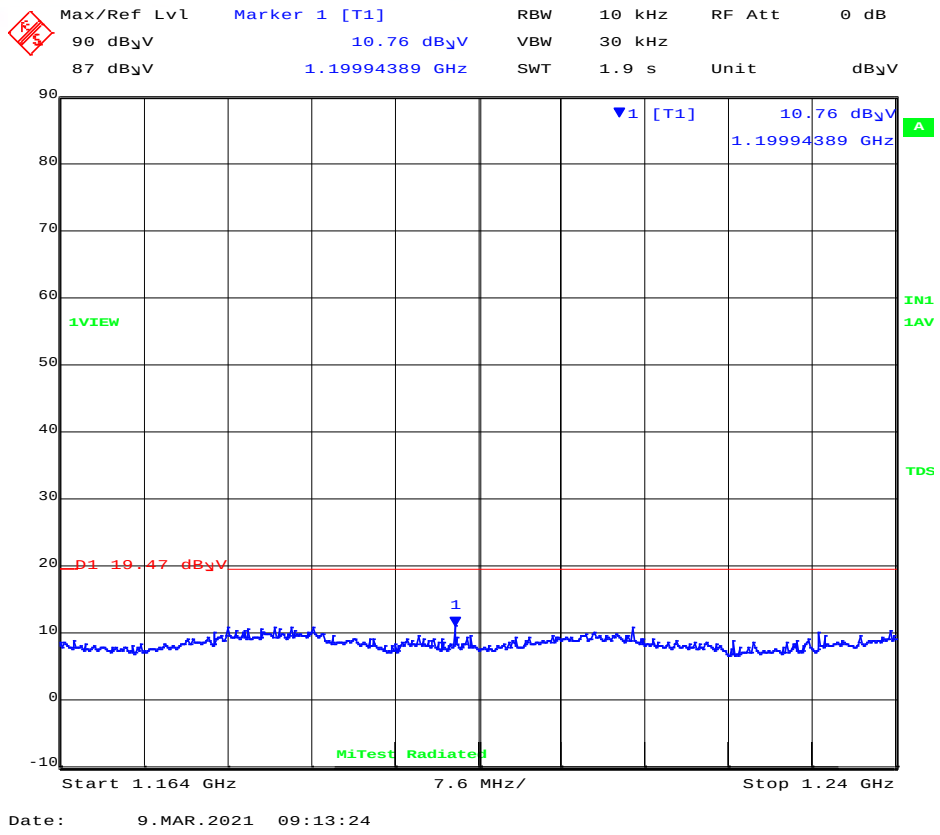

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1185.01	10.71	Average	Vertical	150	0	19.47	-8.76	Pass
2	1199.94	10.76	Average	Horizontal	150	0	19.47	-8.71	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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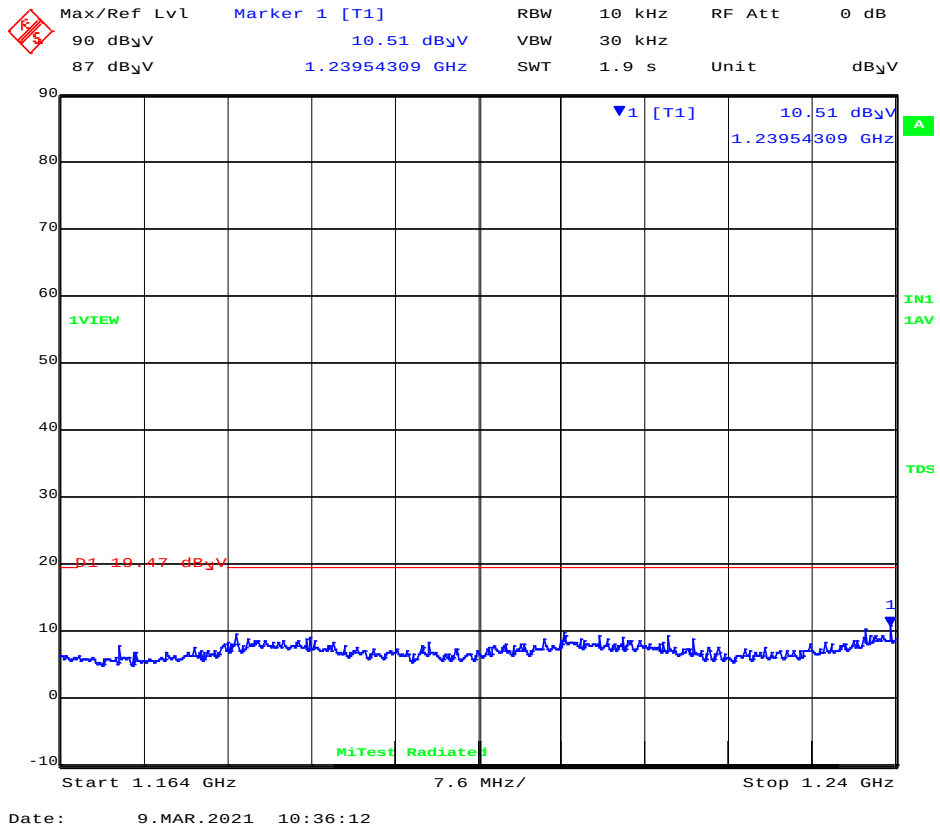
9.4.6.0.5. 7128 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.2/-0.2/0.1	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	7128.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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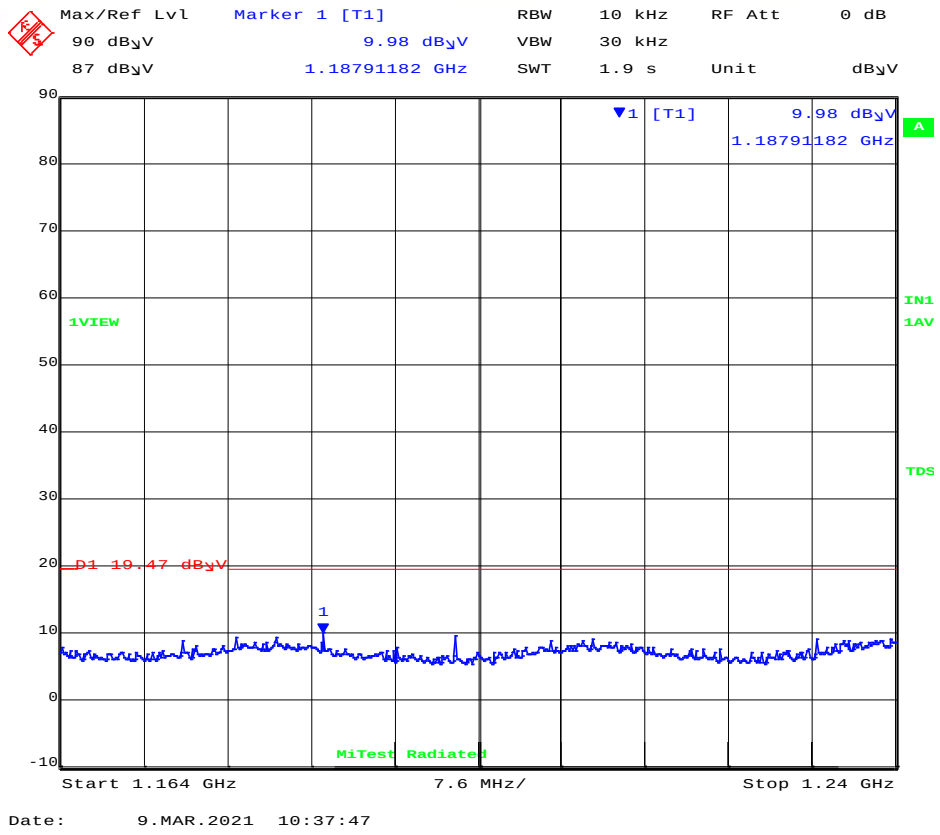

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1239.54	10.51	Average	Vertical	150	0	19.47	-8.96	Pass
2	1187.11	9.98	Average	Horizontal	150	0	19.47	-9.49	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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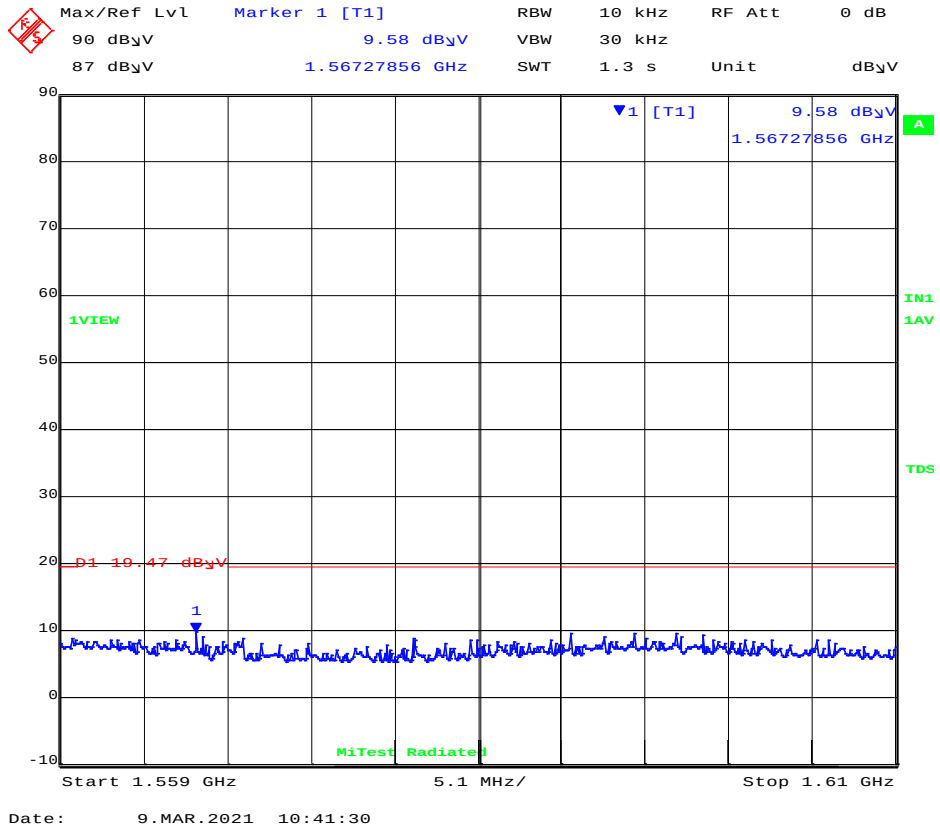
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.2/-0.2/0.1	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	7128.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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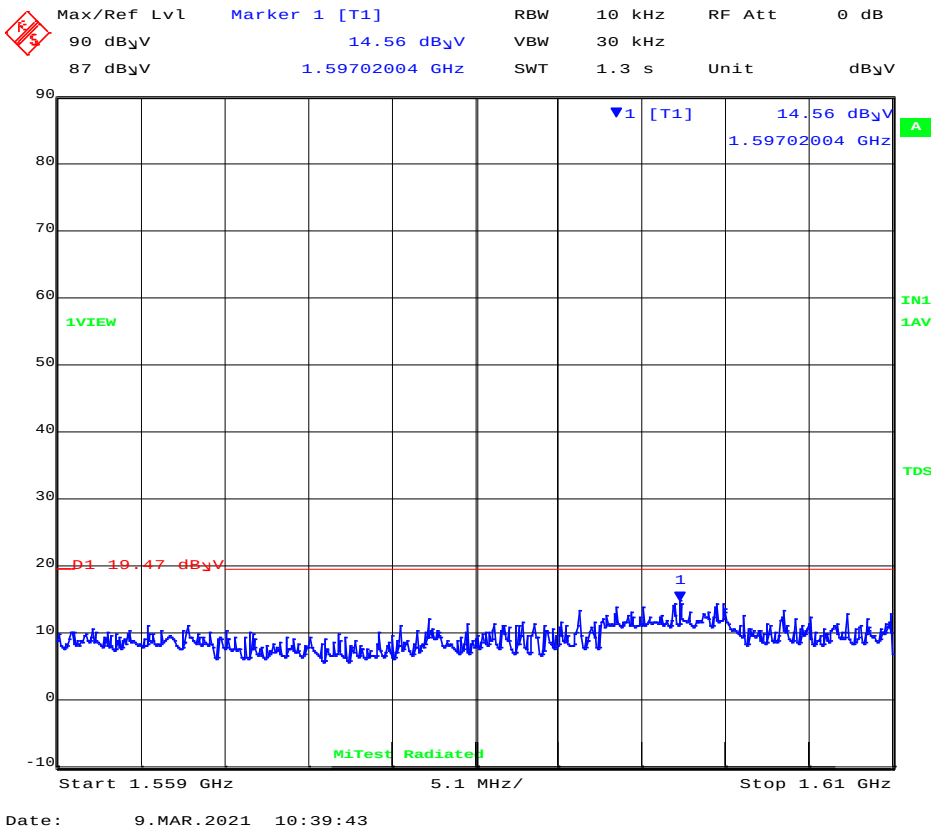

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1567.27	9.58	Average	Vertical	150	0	19.47	-9.89	Pass
2	1597.02	14.56	Average	Horizontal	150	0	19.47	-4.91	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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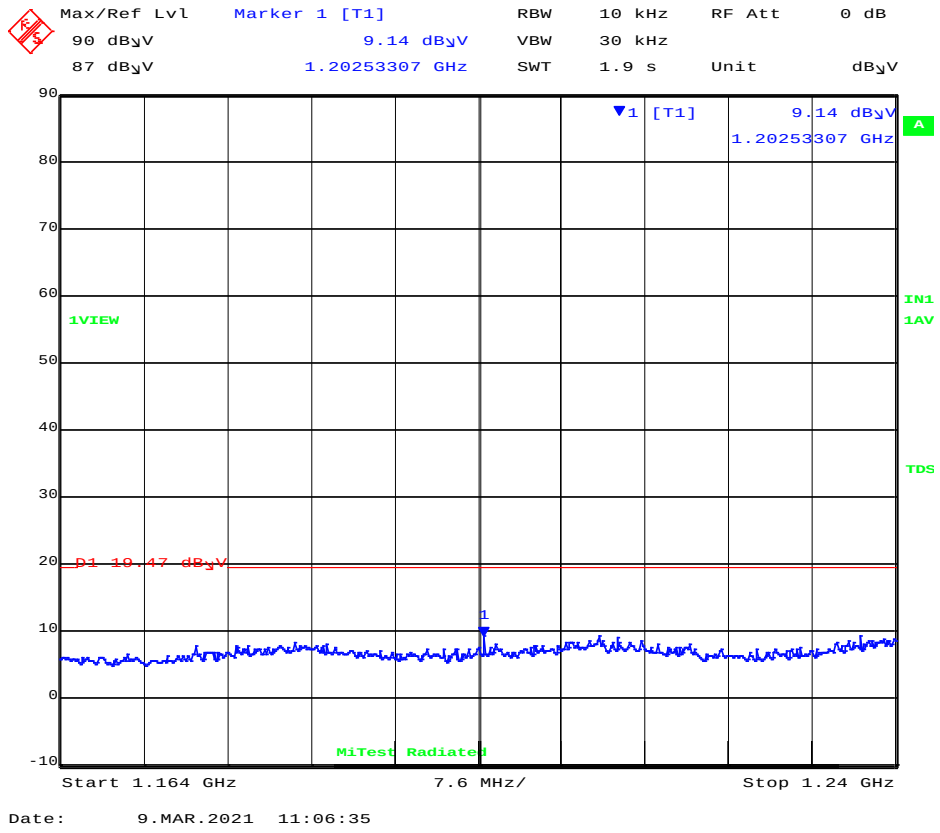
9.4.6.0.6. 7656 MHz (Covers Band Group 3 TFC 7 and Band Group 6 TFC 5

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.2/-0.2/0.1	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	7656.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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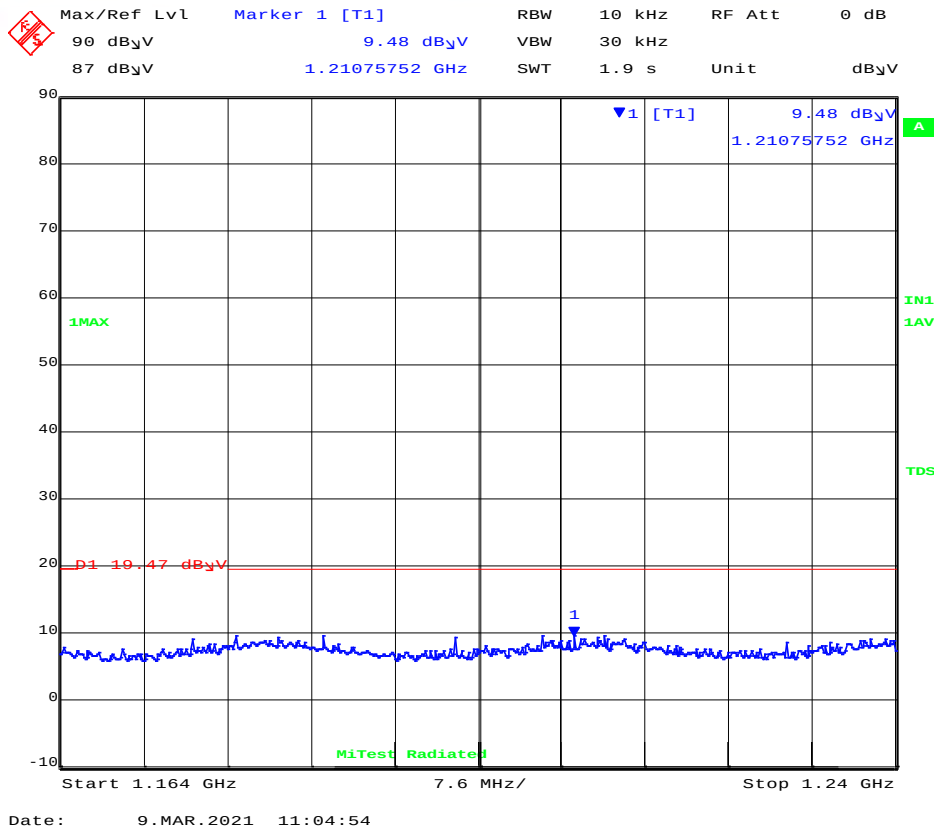

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1202.53	9.14	Average	Vertical	150	0	19.47	-10.33	Pass
2	1210.75	9.48	Average	Horizontal	150	0	19.47	-9.99	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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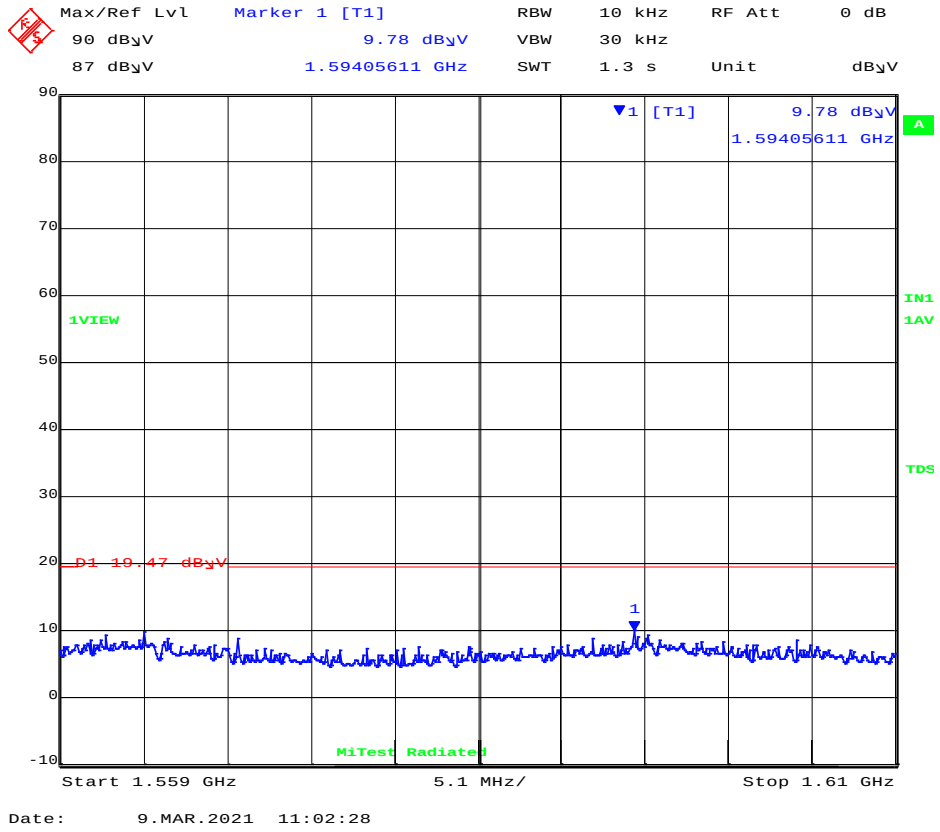
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.2/-0.2/0.1	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	7656.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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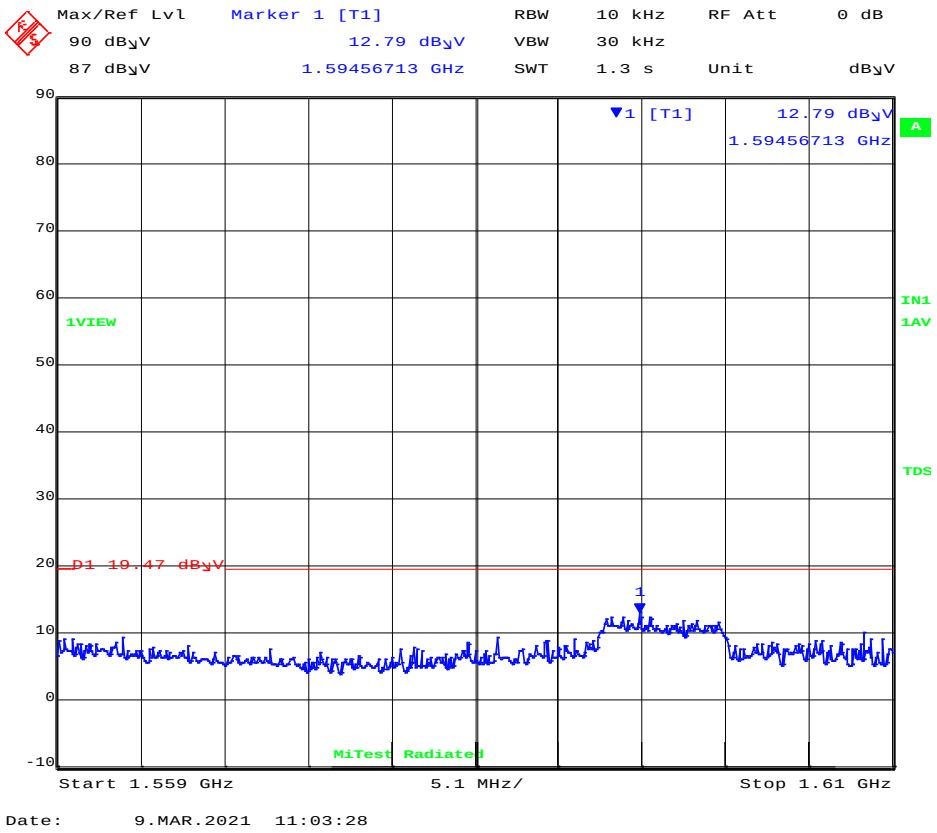

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1594.05	9.78	Average	Vertical	150	0	19.47	-9.69	Pass
2	1594.56	12.79	Average	Horizontal	150	0	19.47	-6.68	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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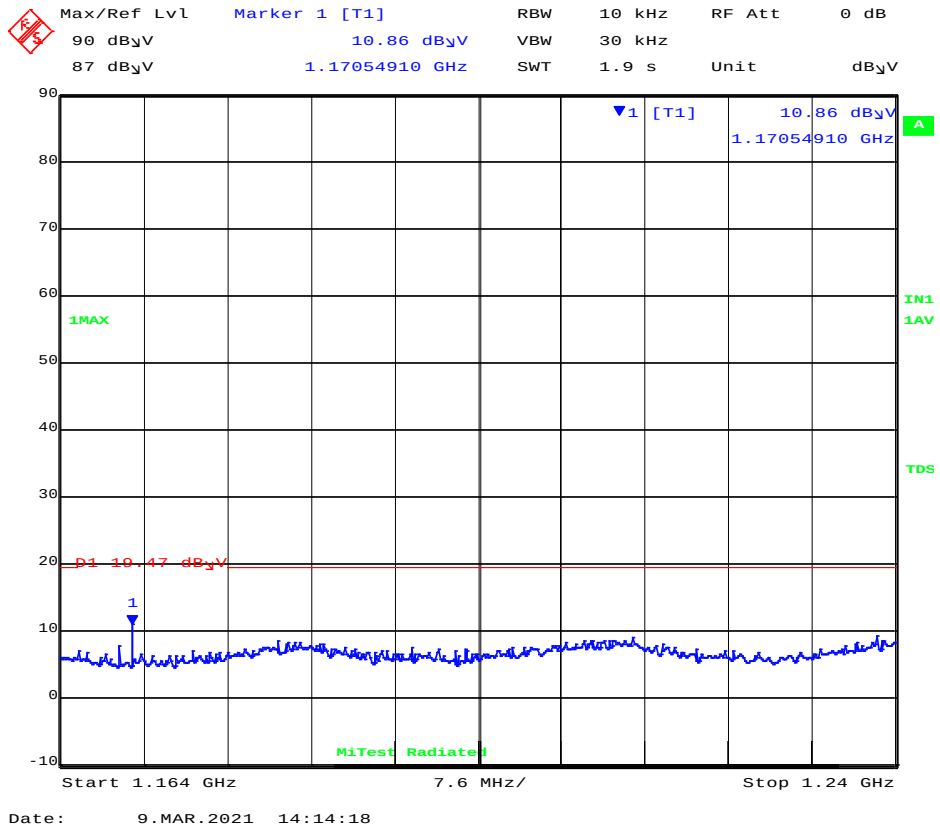
9.4.6.0.7. 8184 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.1/-1.8/-1.8	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	8184.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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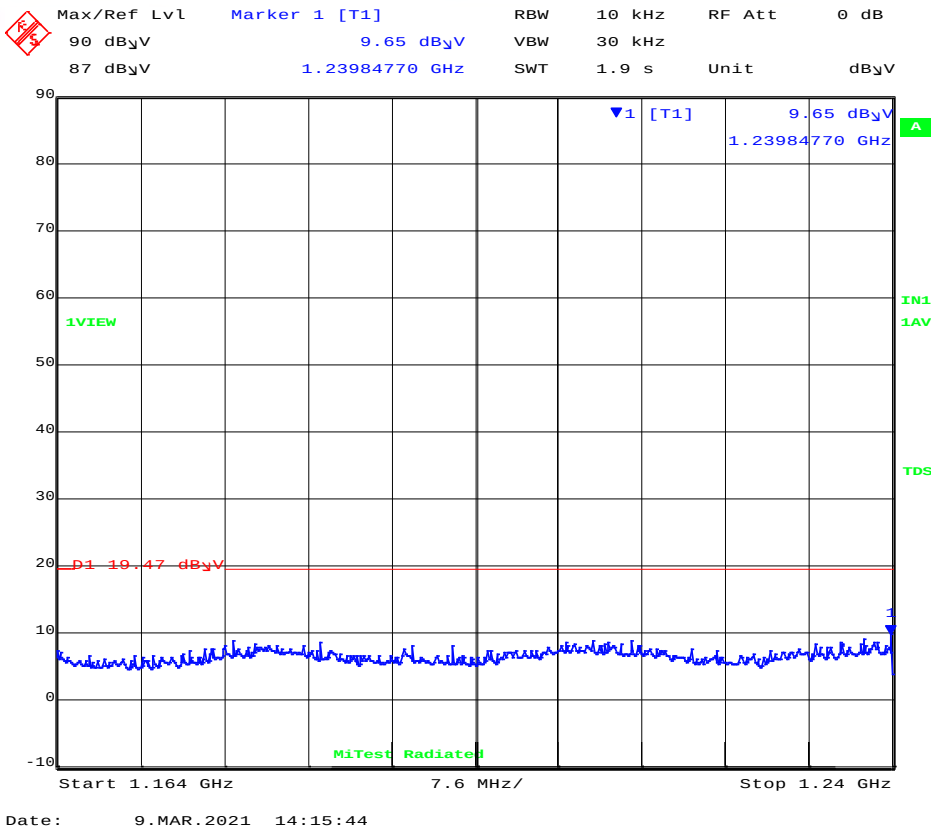

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1170.54	10.86	Average	Vertical	150	0	19.47	-8.61	Pass
2	1239.84	9.65	Average	Horizontal	150	0	19.47	-9.82	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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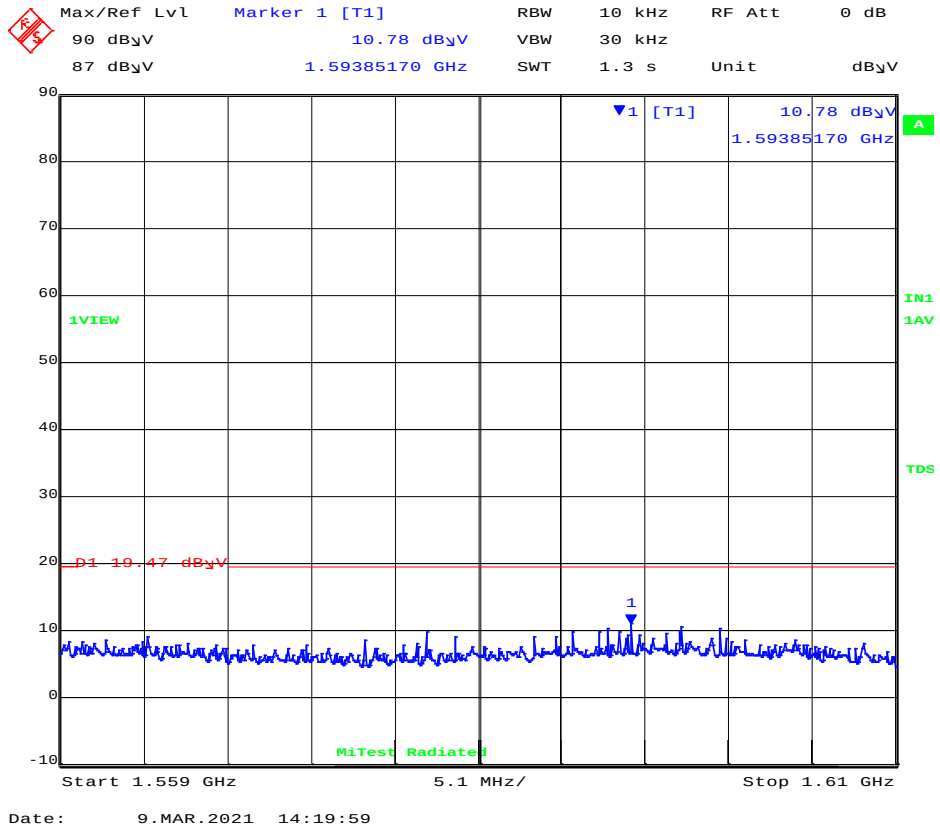
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.1/-1.8/-1.8	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	8184.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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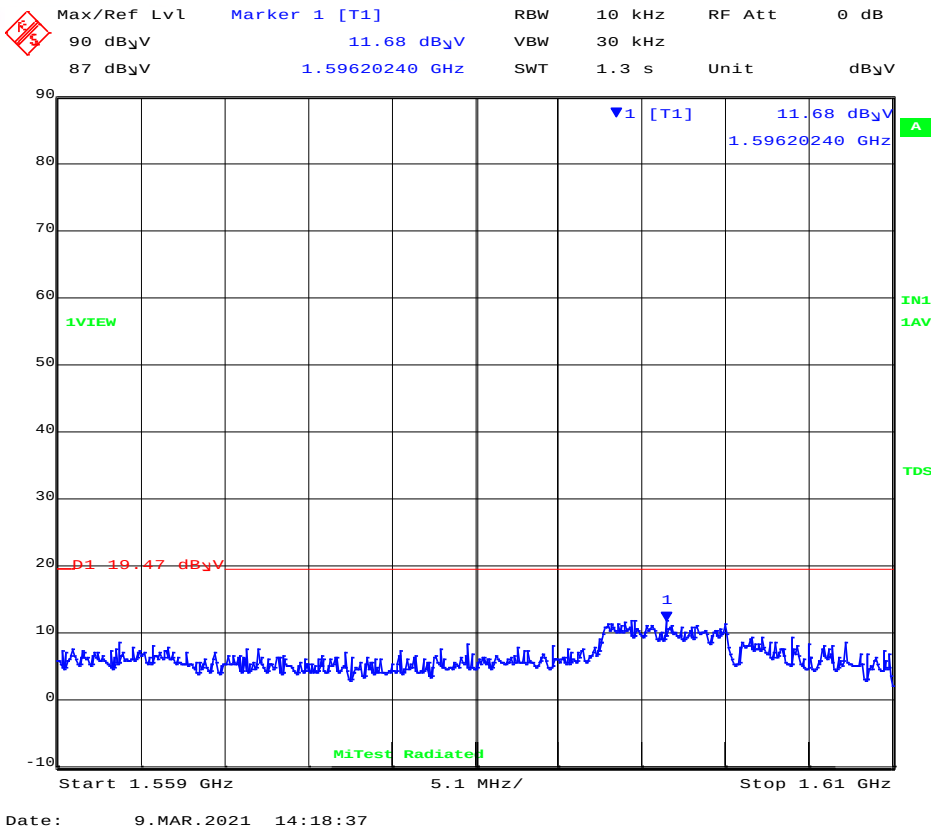

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1593.85	10.78	Average	Vertical	150	0	19.47	-8.69	Pass
2	1596.20	11.68	Average	Horizontal	150	0	19.47	-7.79	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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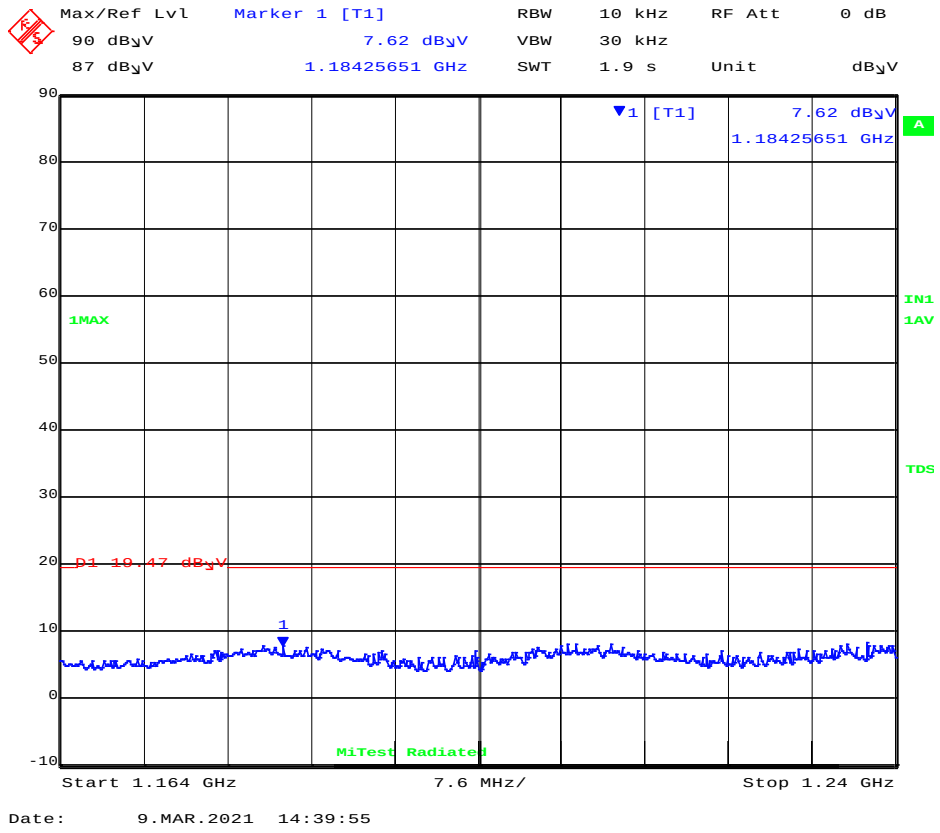
9.4.6.0.8. 8712 MHz

Equipment Configuration for Spurious Emissions 1.164 – 1.24 GHz			
Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.1/-1.8/-1.8	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	8712.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.164-1.24GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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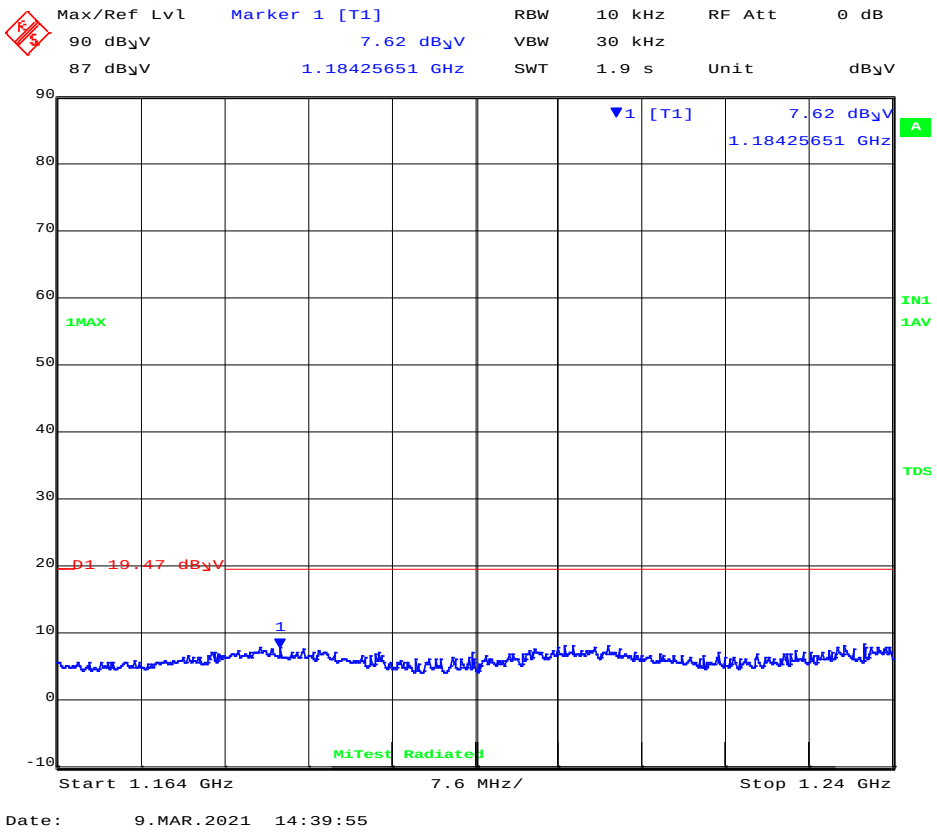

Antenna Polarity: Horizontal

1164.00 – 1240.00 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1184.25	7.62	Average	Vertical	150	0	19.47	-11.85	Pass
2	1184.25	7.62	Average	Horizontal	150	0	19.47	-11.85	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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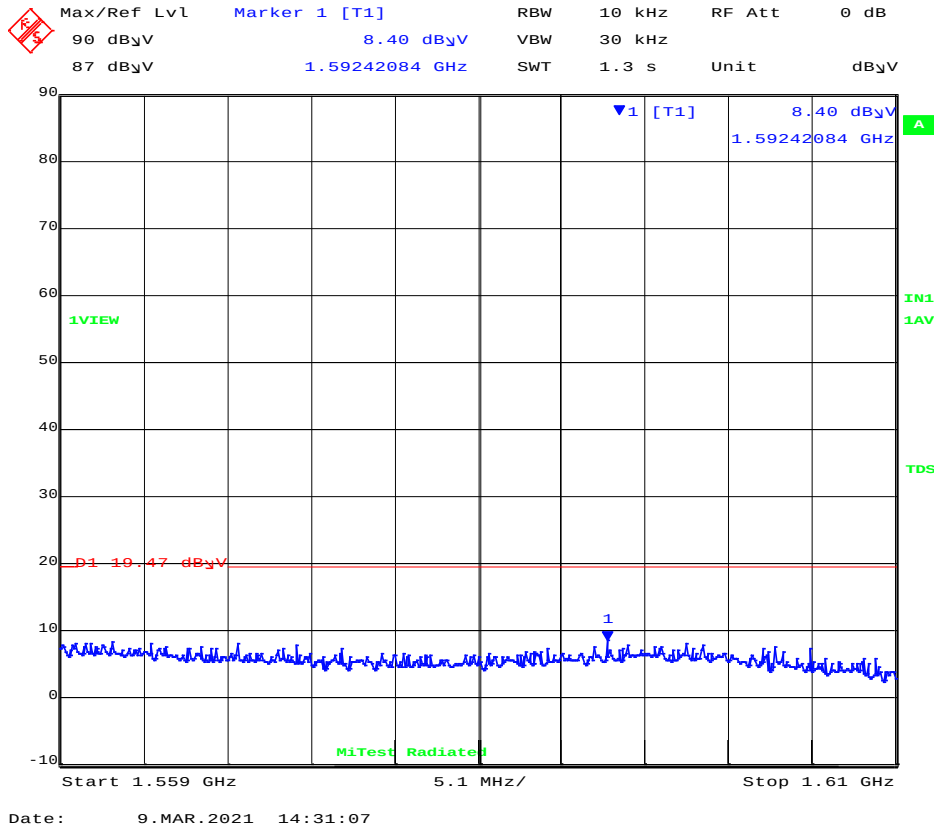
Equipment Configuration for Spurious Emissions 1.559 – 1.610 GHz

Antenna:	Chip	**Variant:**	500 MHz Bandwidth
Antenna Gain (dBi):	0.1/-1.8/-1.8	**Modulation:**	BPM/BPSK
Beam Forming Gain (Y):	Not Applicable	**Duty Cycle (%):**	99%
Channel Frequency (MHz):	8712.00	**Data Rate:**	
Power Setting:	Max	**Tested By:**	SB

Test Measurement Results

RADIATED SPURIOUS EMISSIONS 1.559-1.610GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99



Antenna Polarity: Vertical

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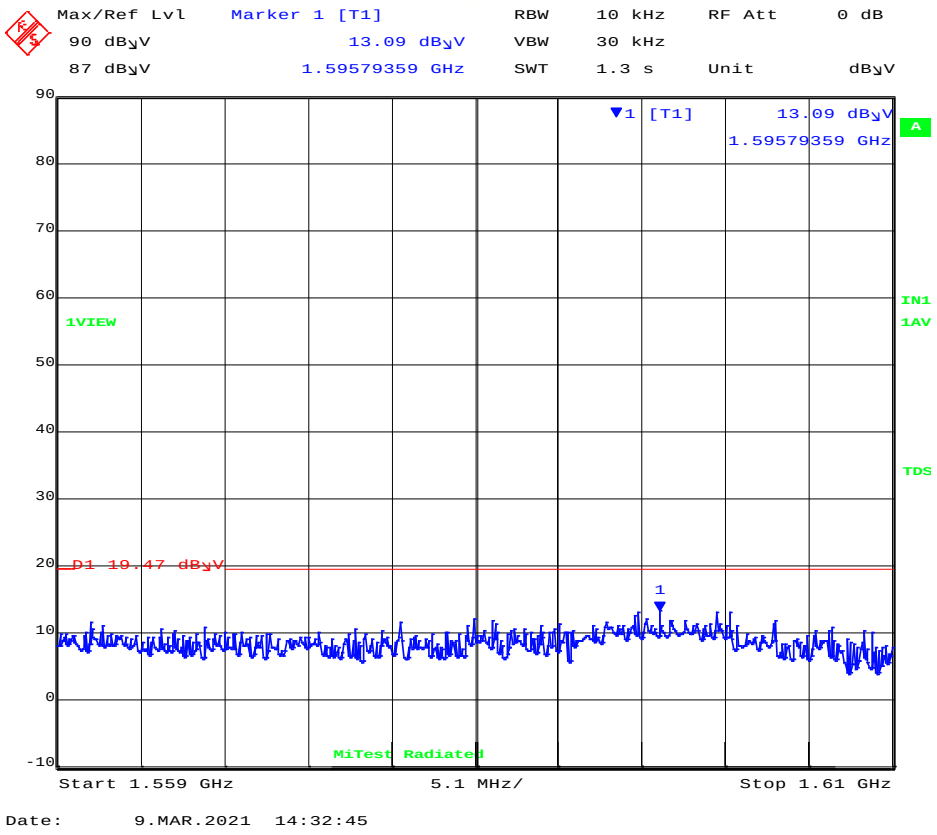

Antenna Polarity: Horizontal

1559 - 1610 MHz									
Num	**Frequency MHz**	**Level dBµV/m**	**Measurement Type**	**Pol**	**Hgt cm**	**Azt Deg**	**Limit dBµV/m**	**Margin dB**	**Pass /Fail**
1	1592.42	8.40	Average	Vertical	150	0	19.47	-11.07	Pass
2	1595.79	13.09	Average	Horizontal	150	0	19.47	-6.38	Pass
Test Notes: EUT powered by USB or 3.3V, Measurement distance 1 meter									

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9.4. Shutoff Timing Requirements

Radiated Test Conditions for Shutoff Timing Requirements			
Standard:	FCC CFR 47:15.519 (a)(1)	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Shutoff Timing Requirements	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	ANSI C63.10 Section 10.3.6	**Pressure (mBars):**	999 - 1001
Reference Document(s):	None		

Test Procedure for UWB Transmission

Testing was performed under ambient conditions at nominal voltage.

Test configuration and setup used for the measurement was per the Radiated Test Set-up section specified in this document.

Operating Frequency Band:
3100-10600 MHz

Limits
The UWB intentional radiator shall cease transmission within 10 seconds unless it receives an acknowledgement from the associated receiver that its transmission is being received.

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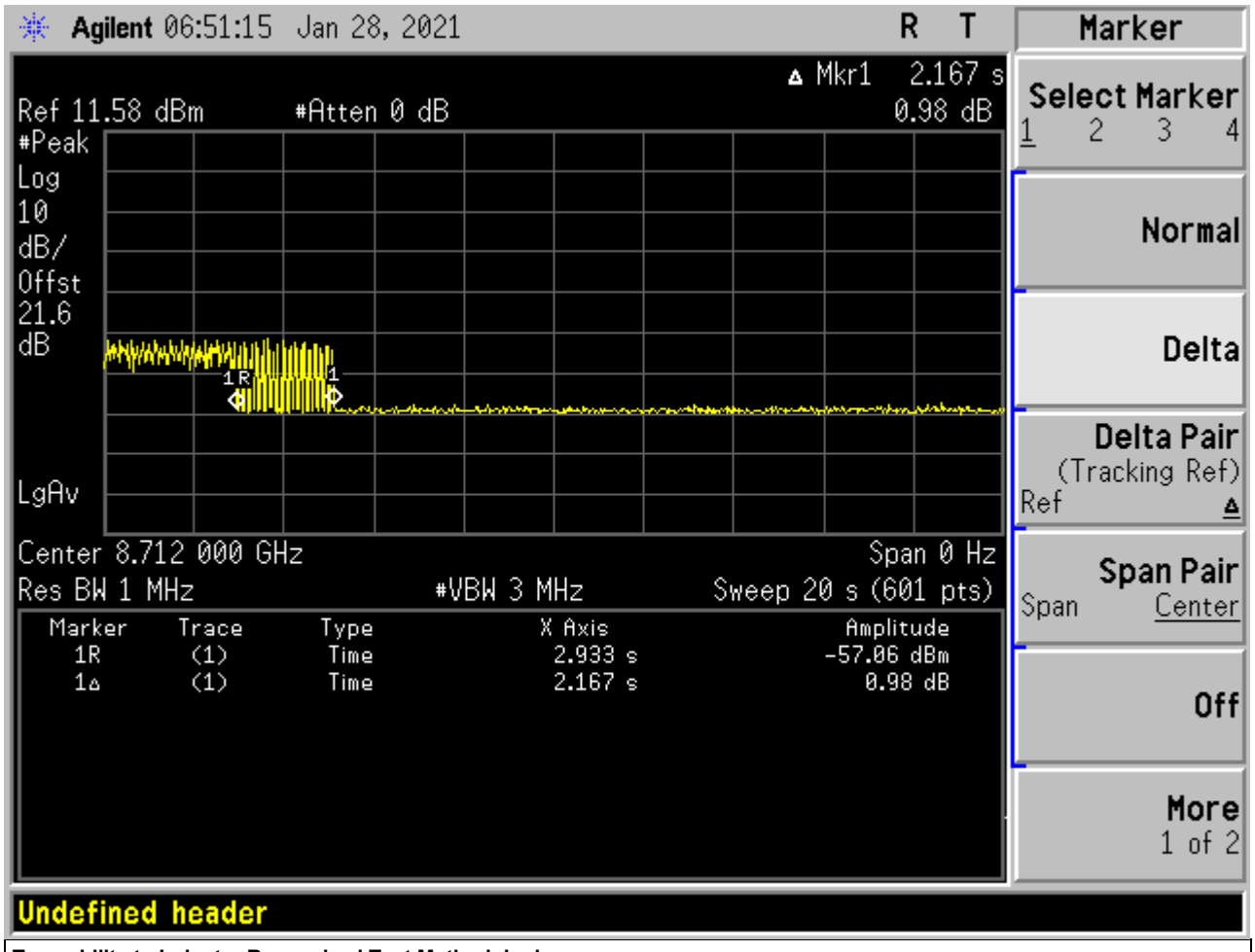
Equipment Configuration for Shutdown Timing Requirements			
Variant:	Band 6	**Duty Cycle (%):**	99
Data Rate:	200Mbp/s	**Antenna Gain (dBi):**	0.1/-1.8/-1.8
Modulation:	BPM/BPSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Frequency (MHz)	Shutdown Time	Limit	Margin	EUT Power Setting
	(s)	(s)	(s)	Numeric
8712.00	2.167	10	-7.83	Max



Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Uncertainty:	±1.33 dB

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A. APPENDIX - GRAPHICAL IMAGES

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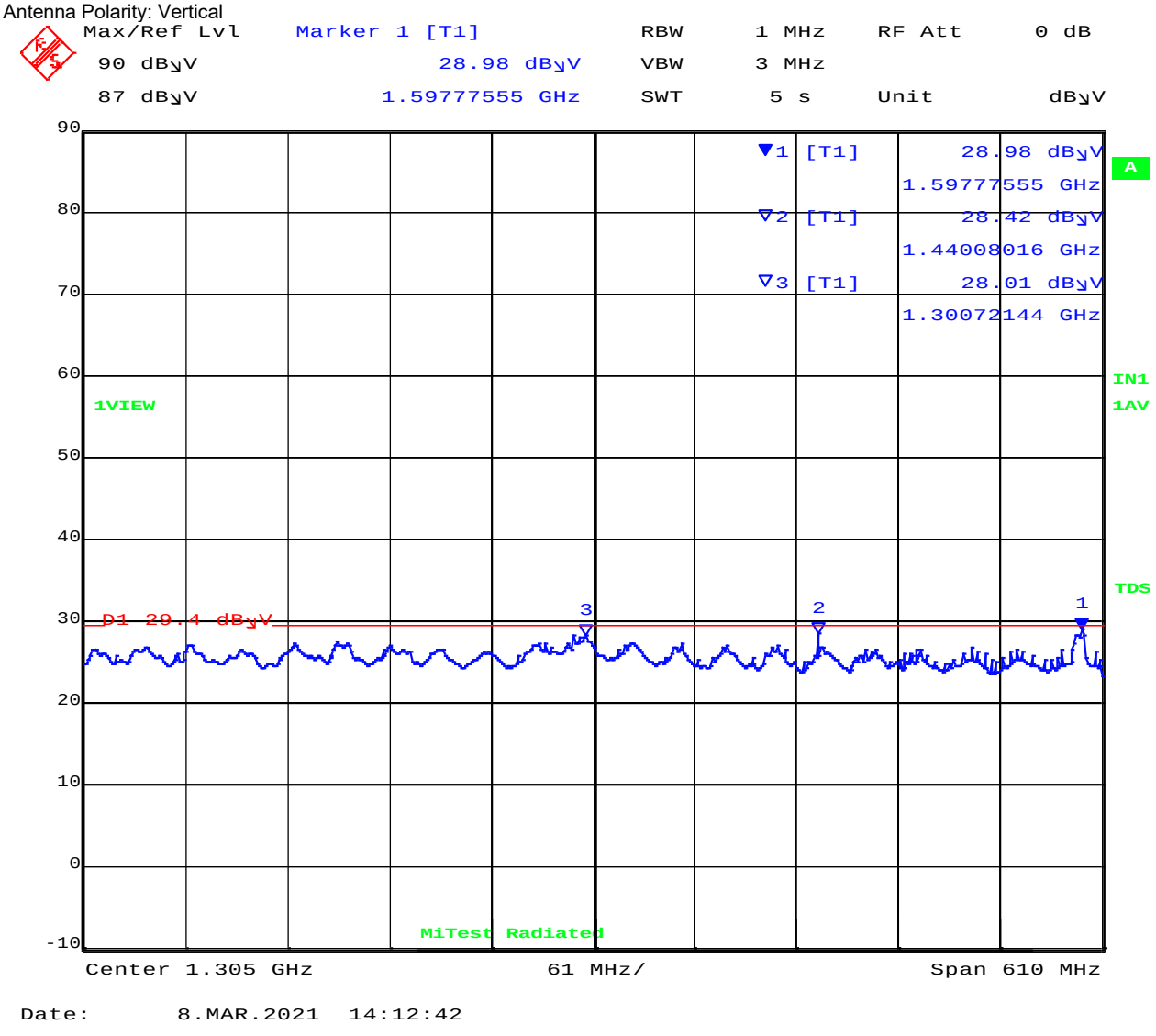
A.1 Transmitter Spurious Emissions

A.1.1 Band 1

RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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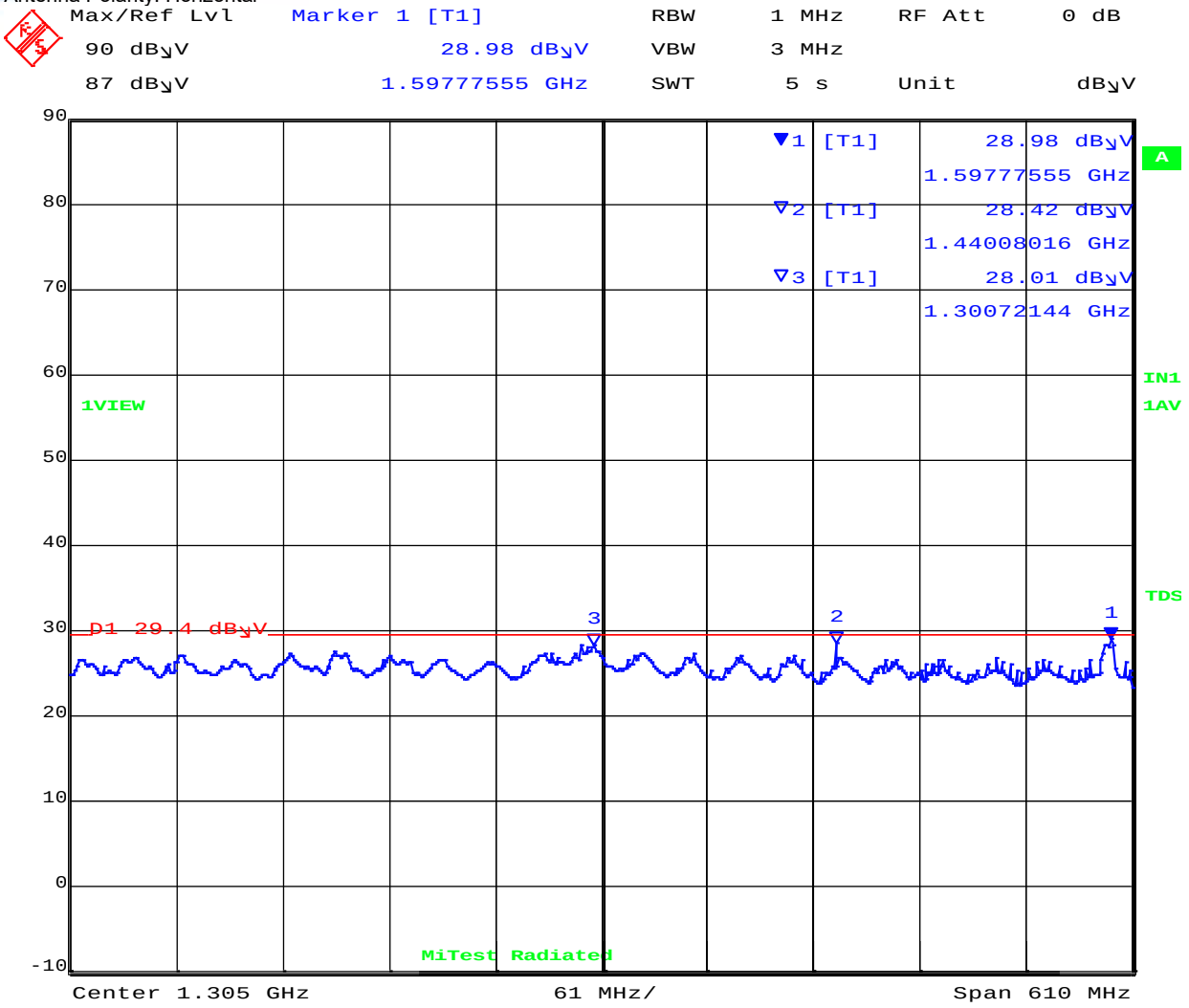
Antenna Polarity: Horizontal



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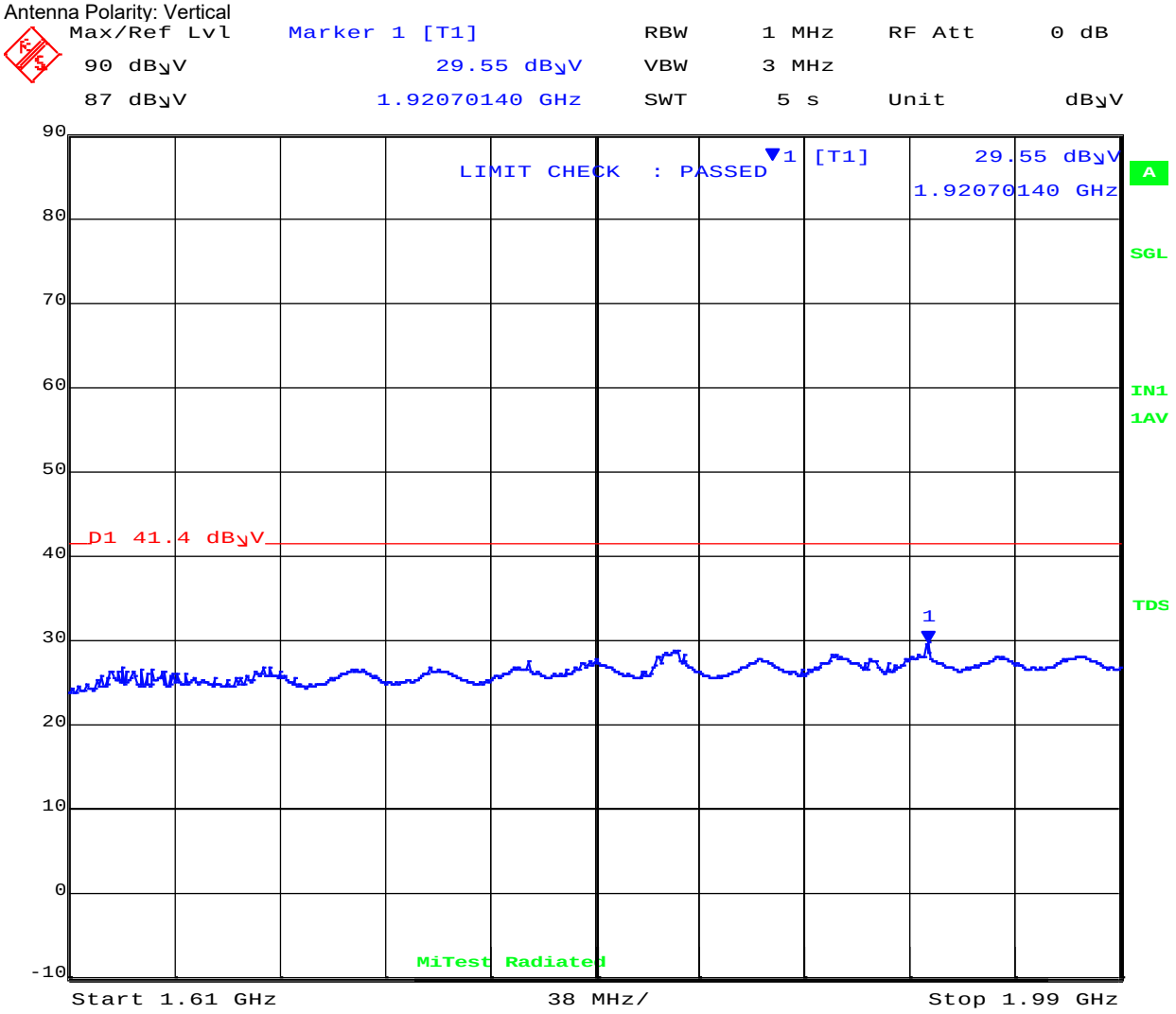
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 8.MAR.2021 14:15:54

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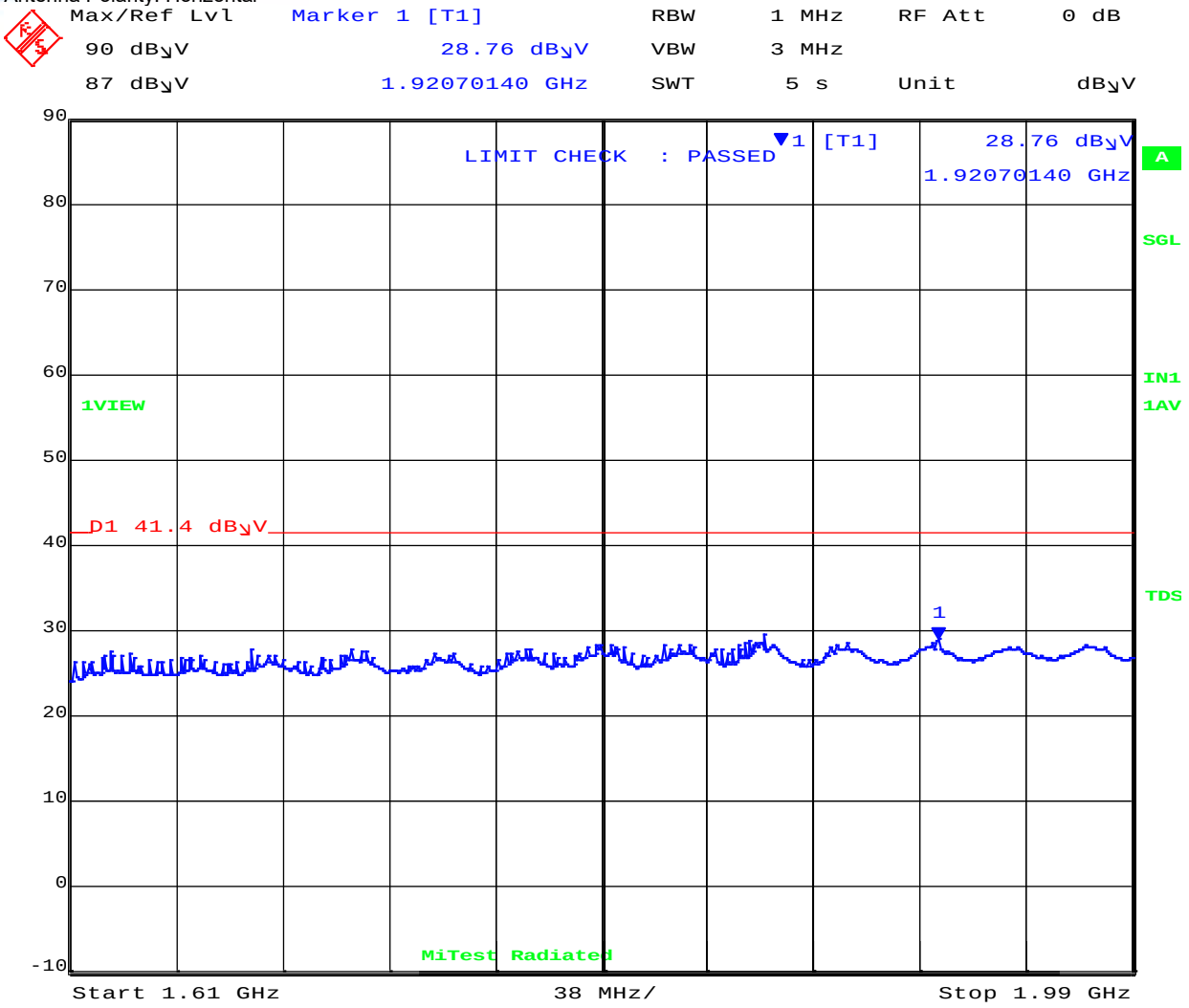
Antenna Polarity: Horizontal



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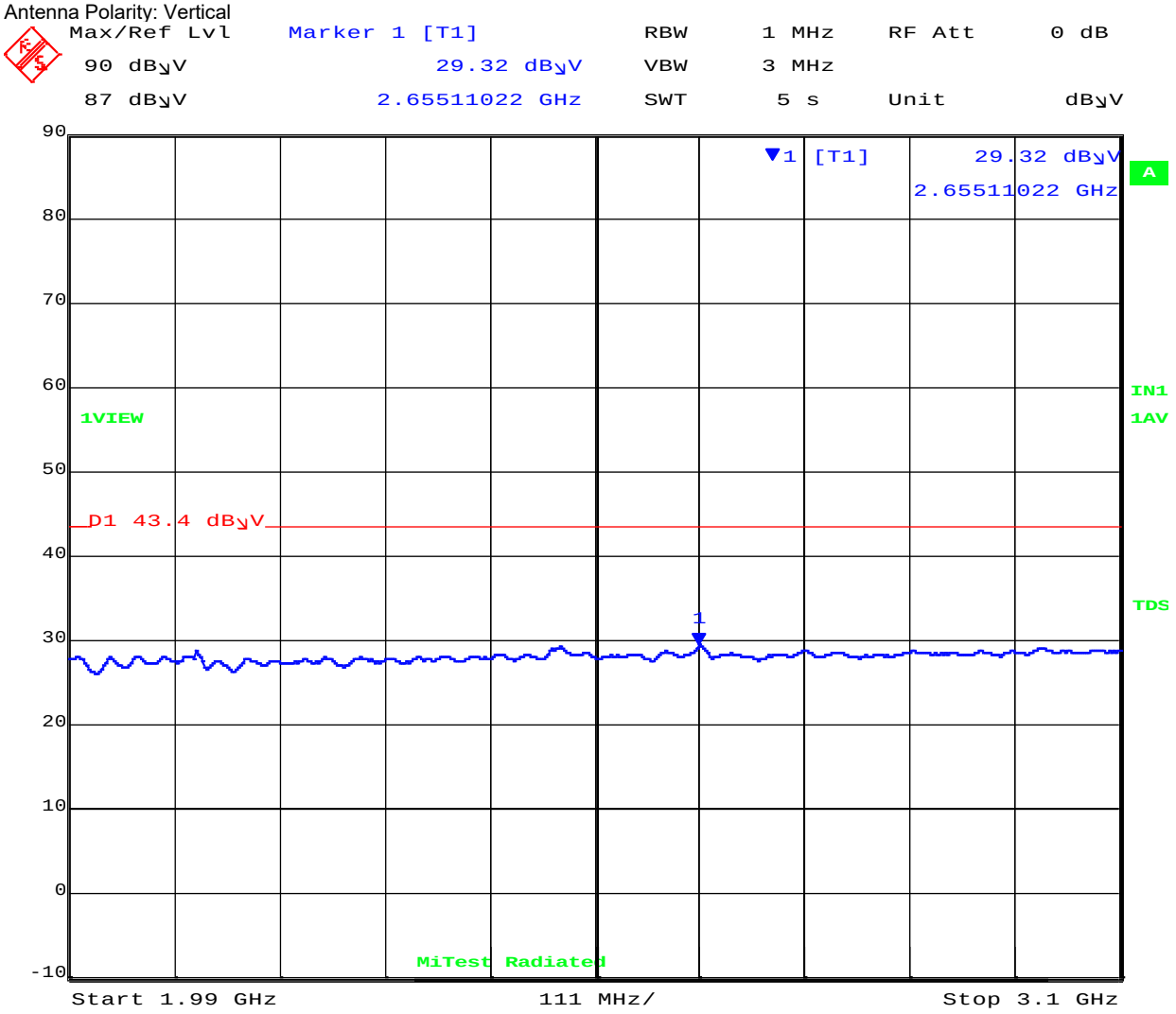
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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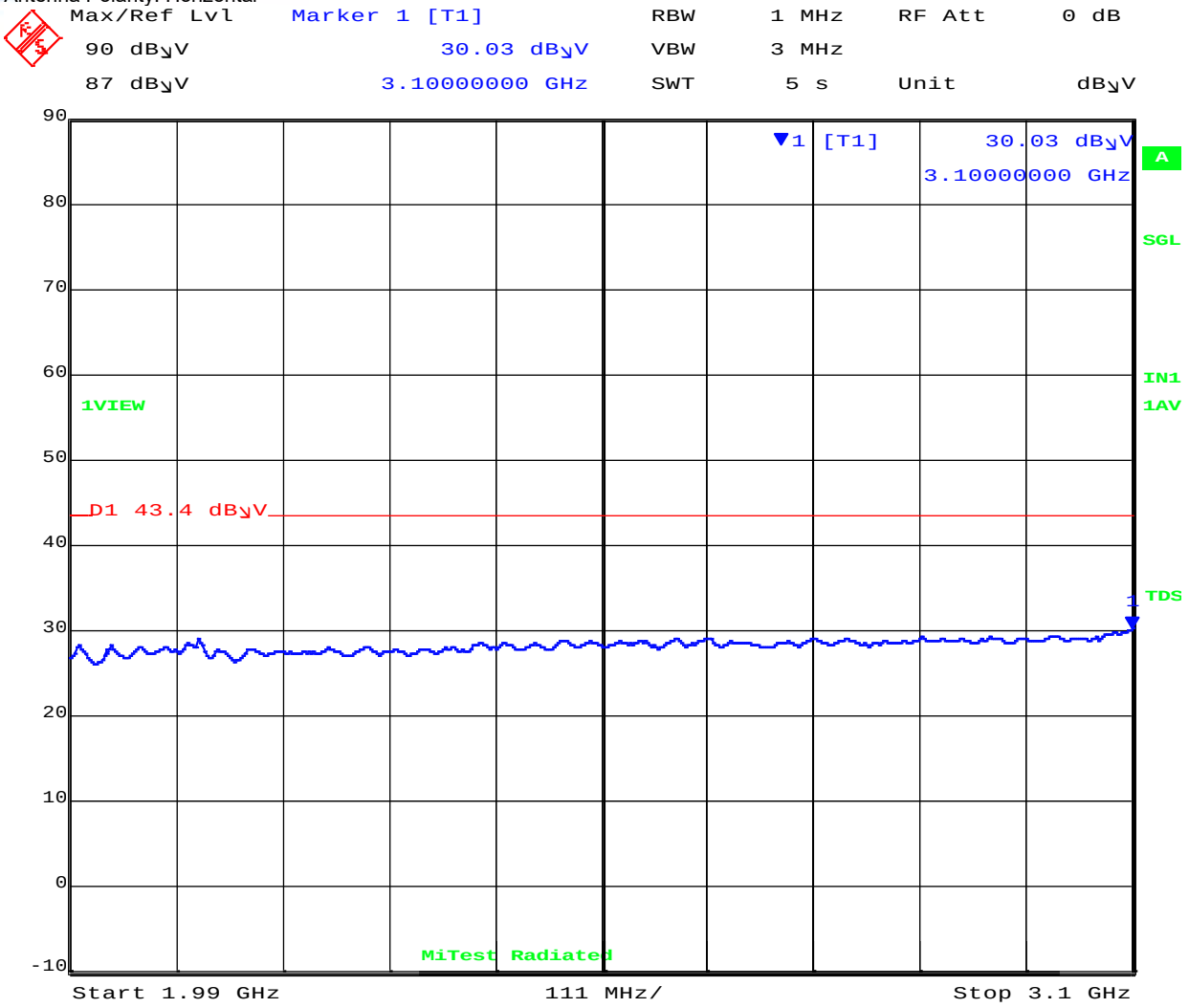
Antenna Polarity: Horizontal



Date: 8.MAR.2021 14:25:04

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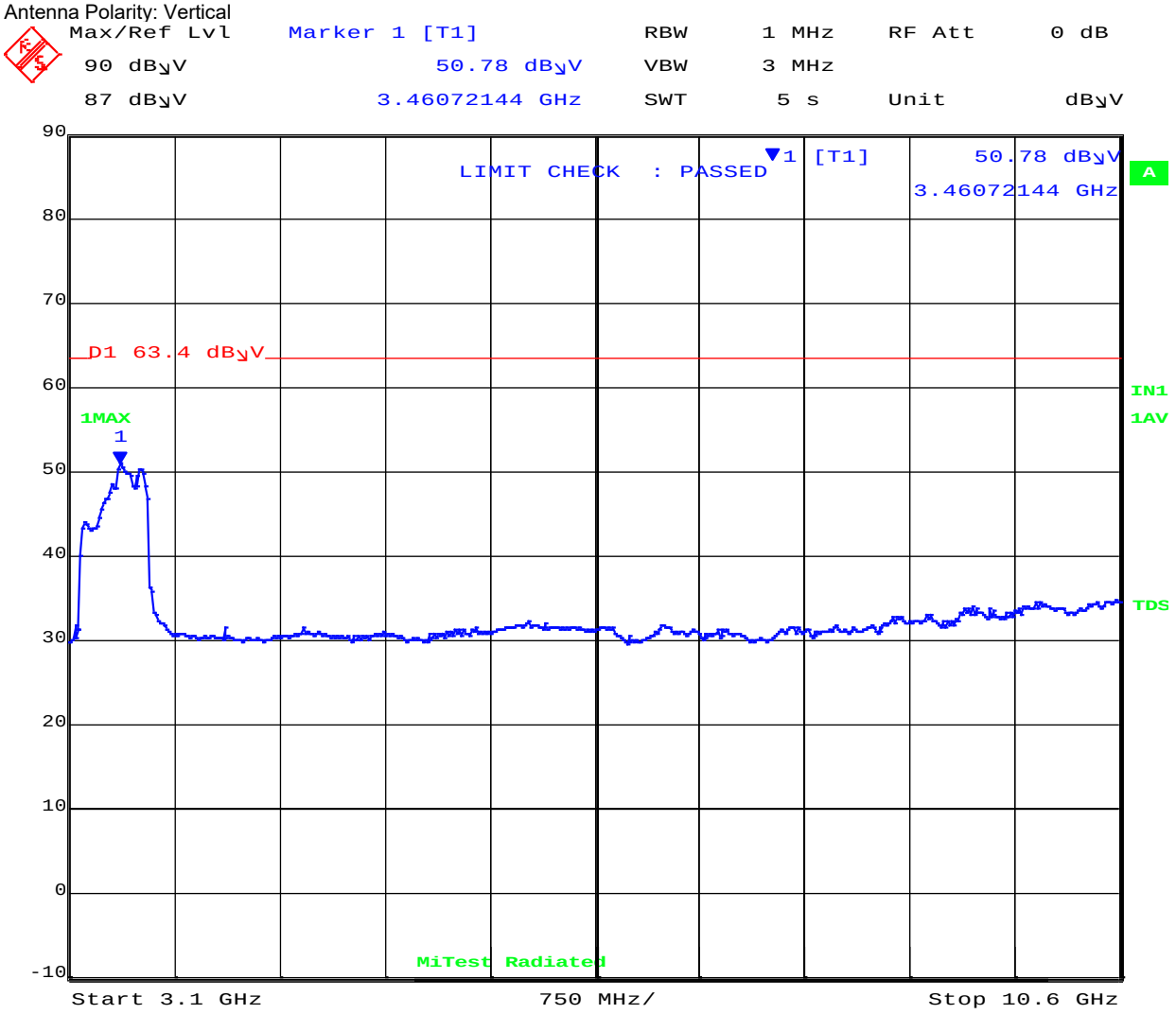
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 8.MAR.2021 14:32:40

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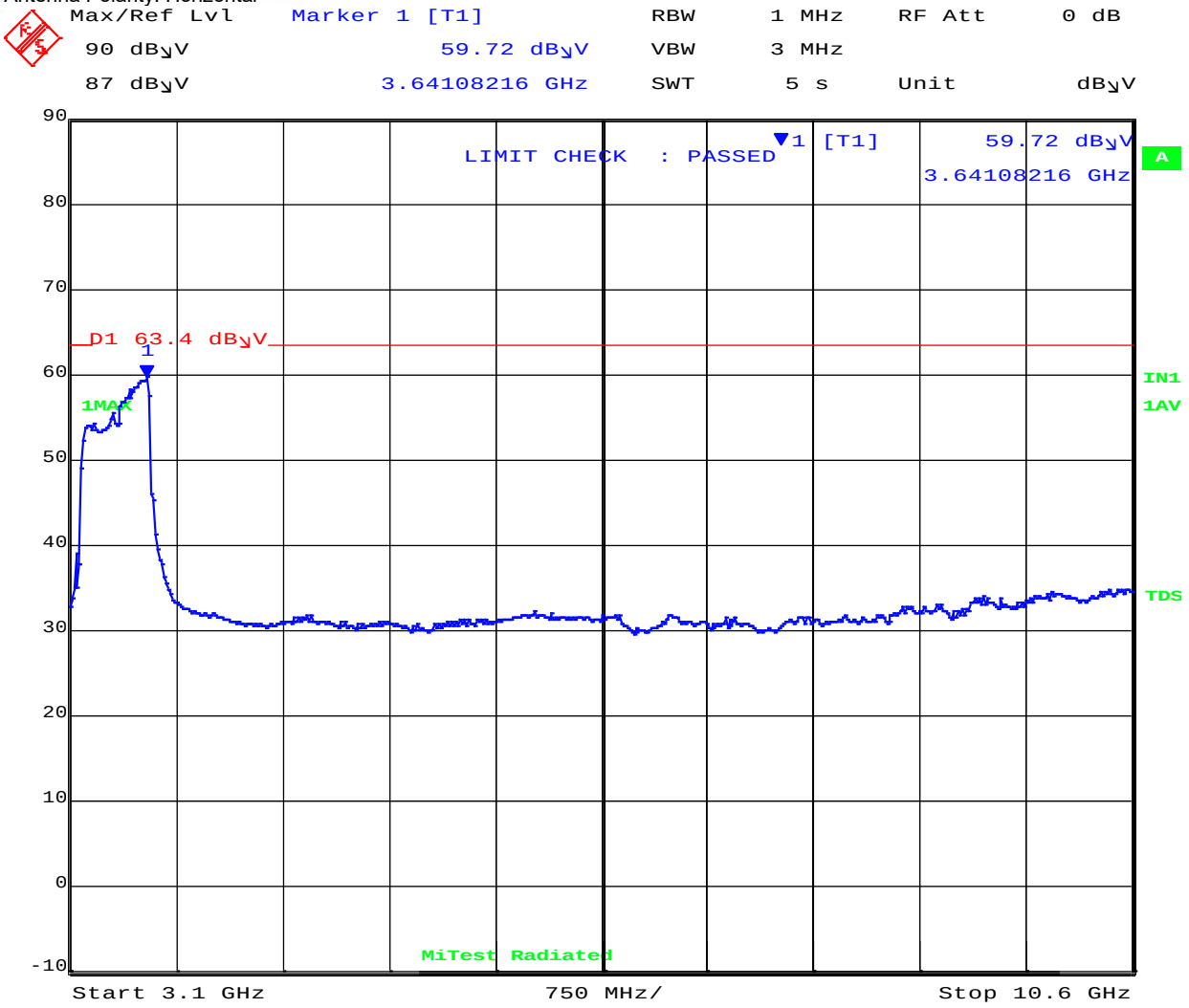
Antenna Polarity: Horizontal



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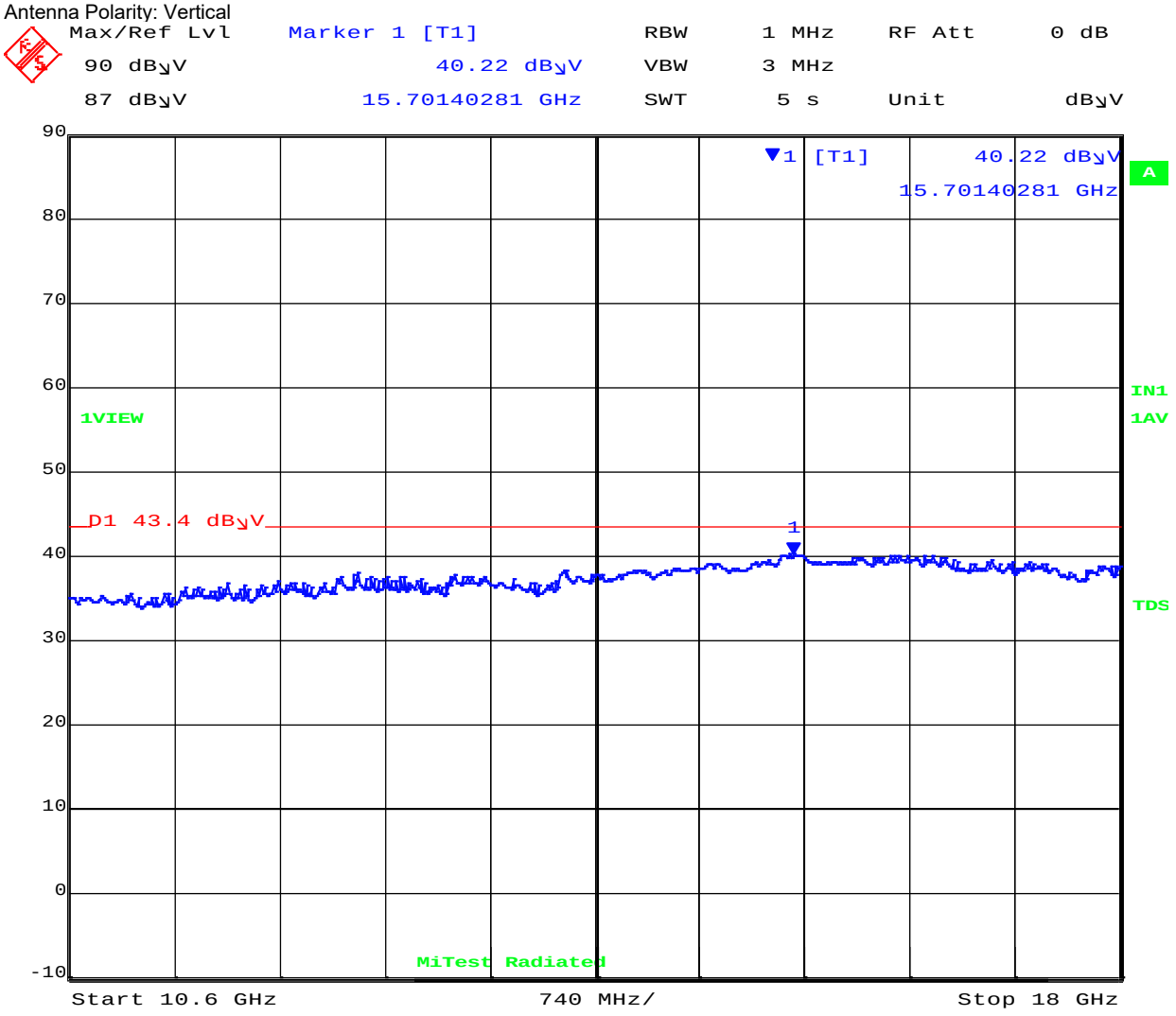
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 8.MAR.2021 14:40:43

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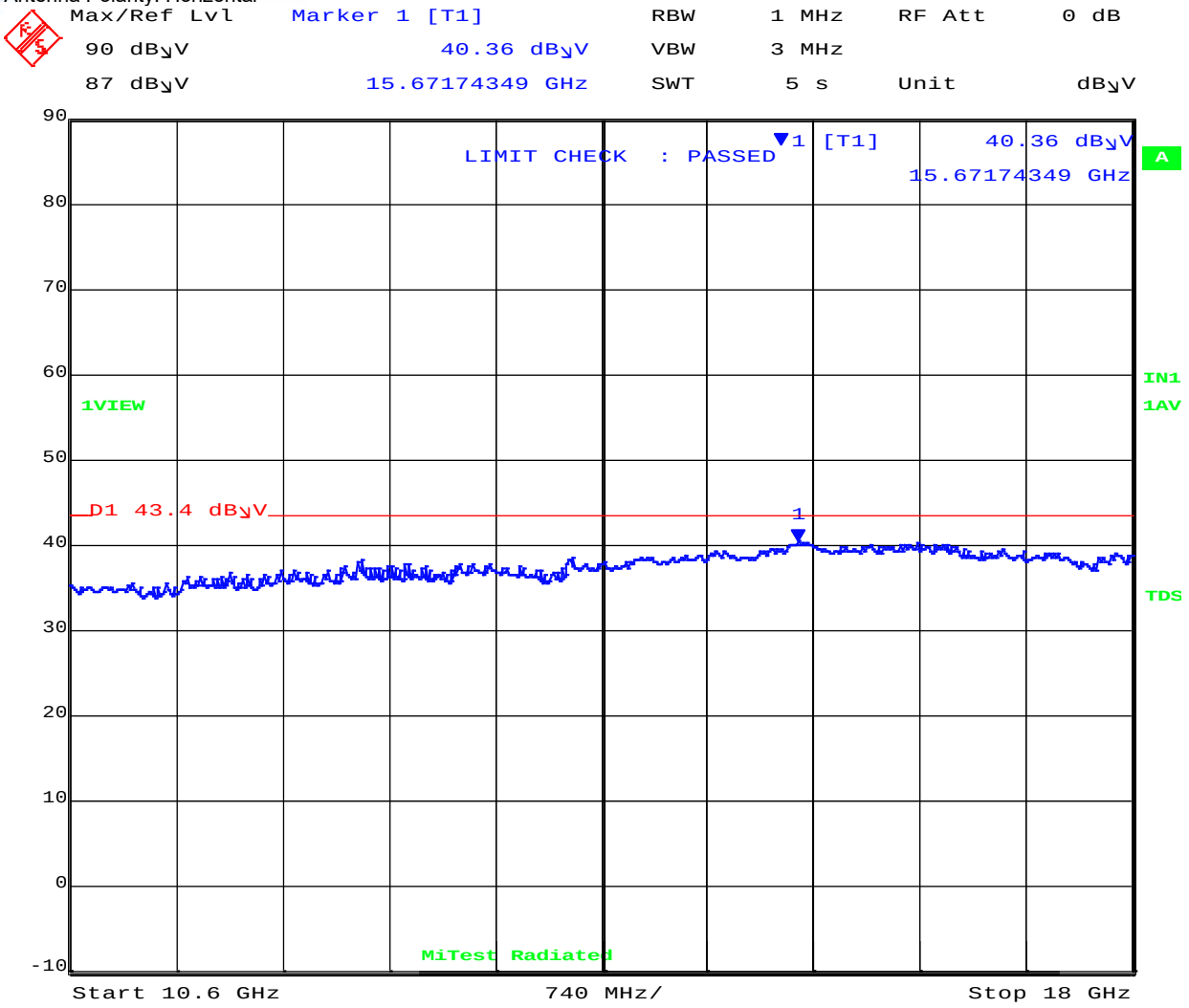
Antenna Polarity: Horizontal



Date: 8.MAR.2021 14:39:11

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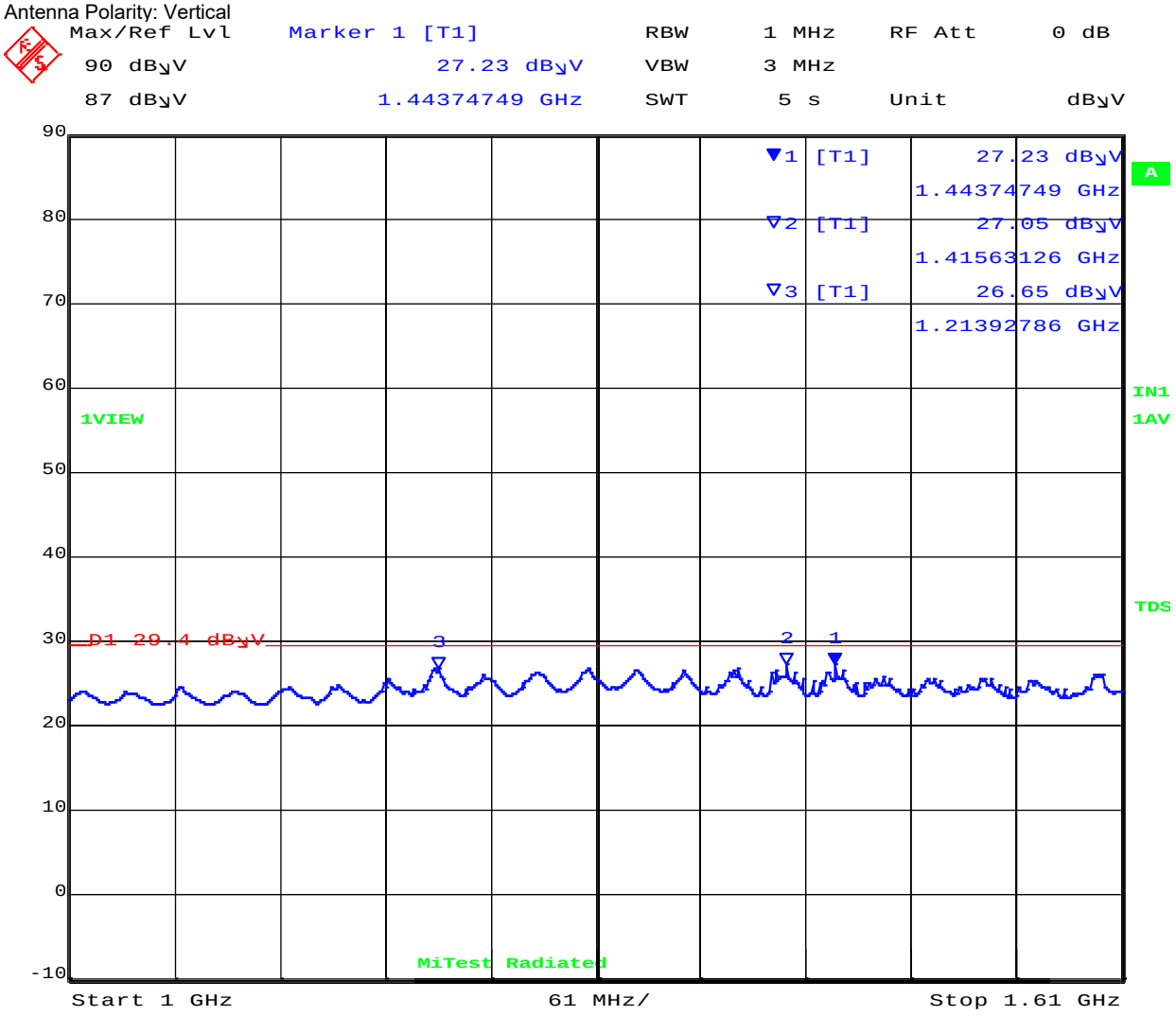
RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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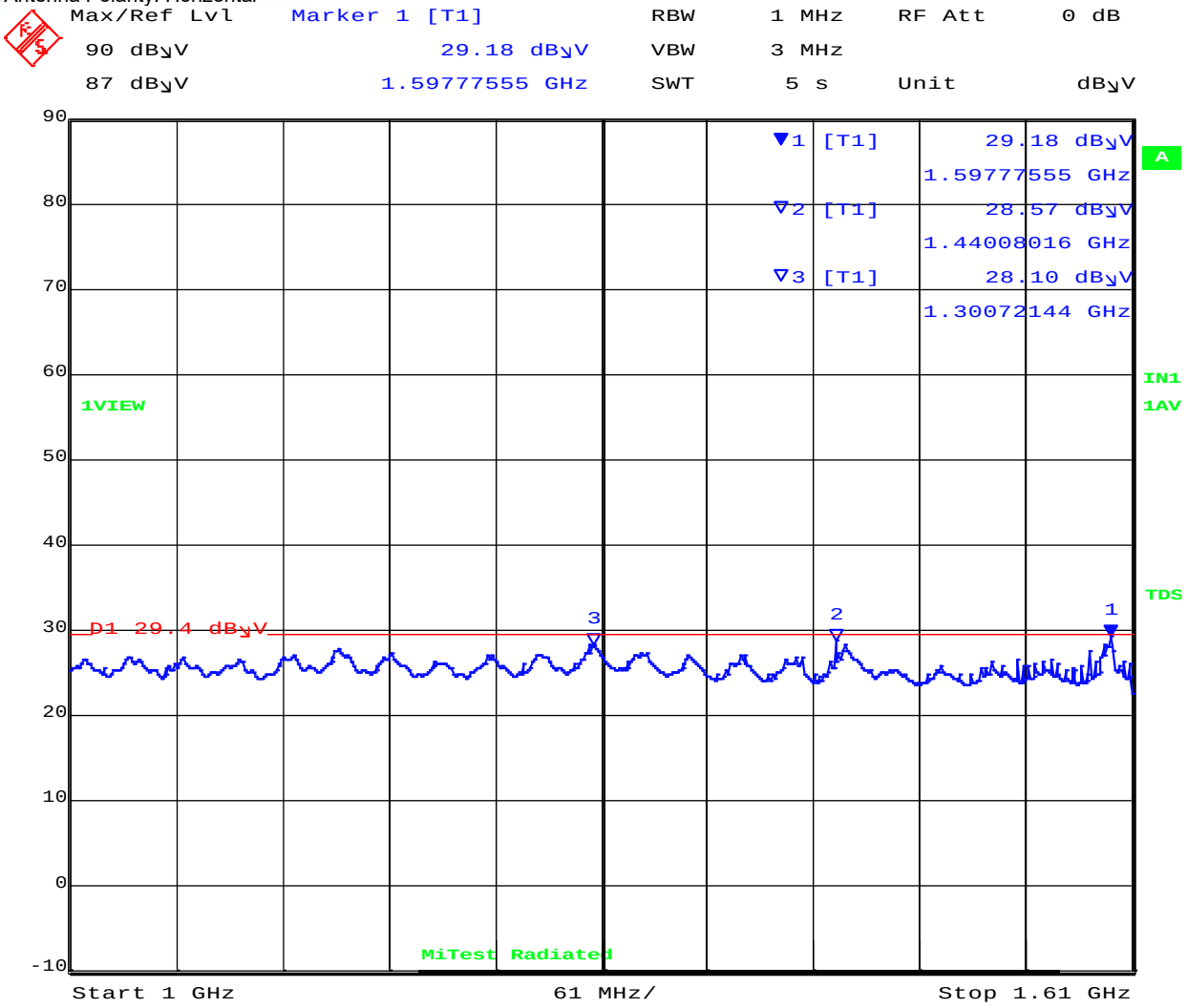
Antenna Polarity: Horizontal



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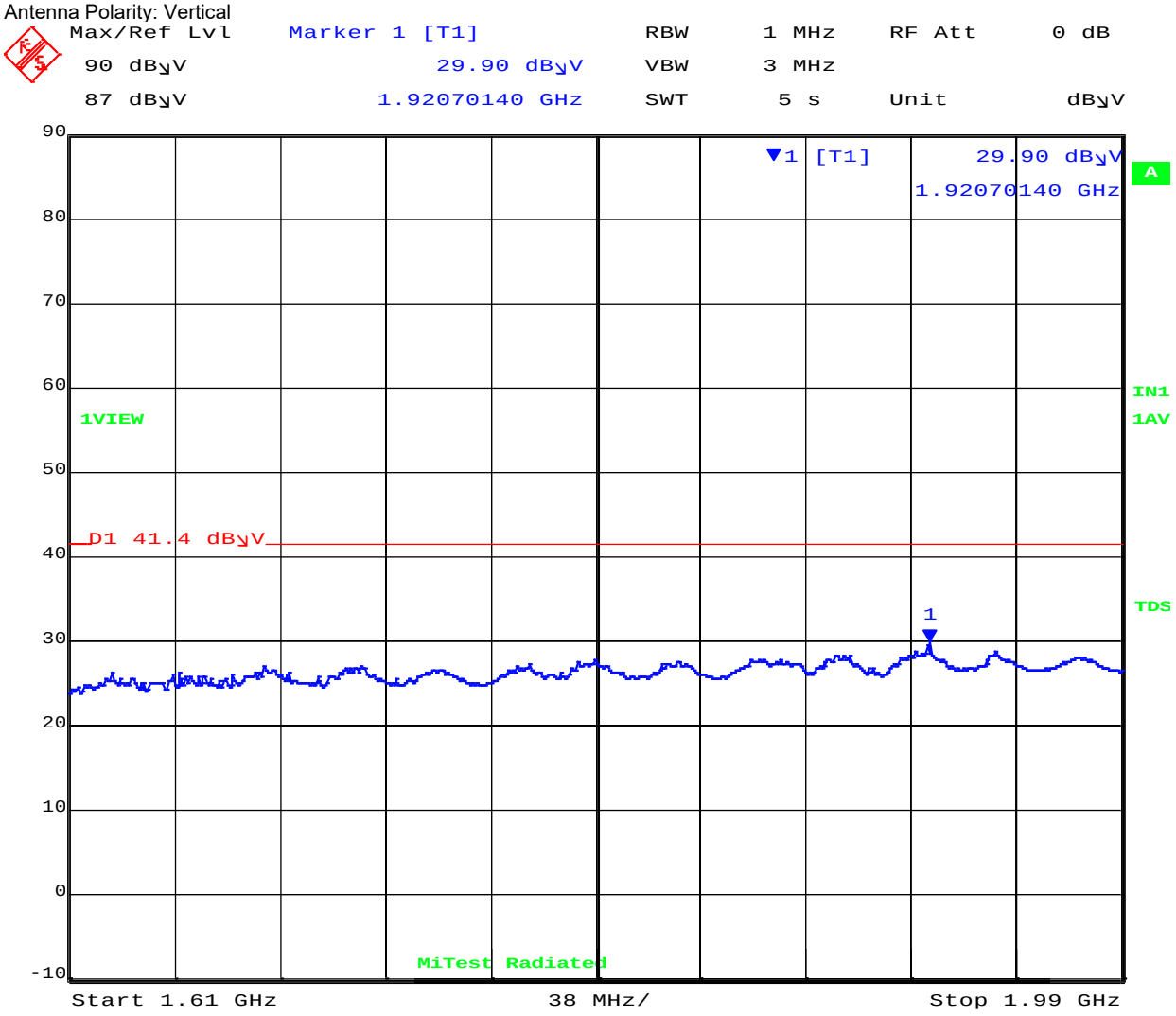
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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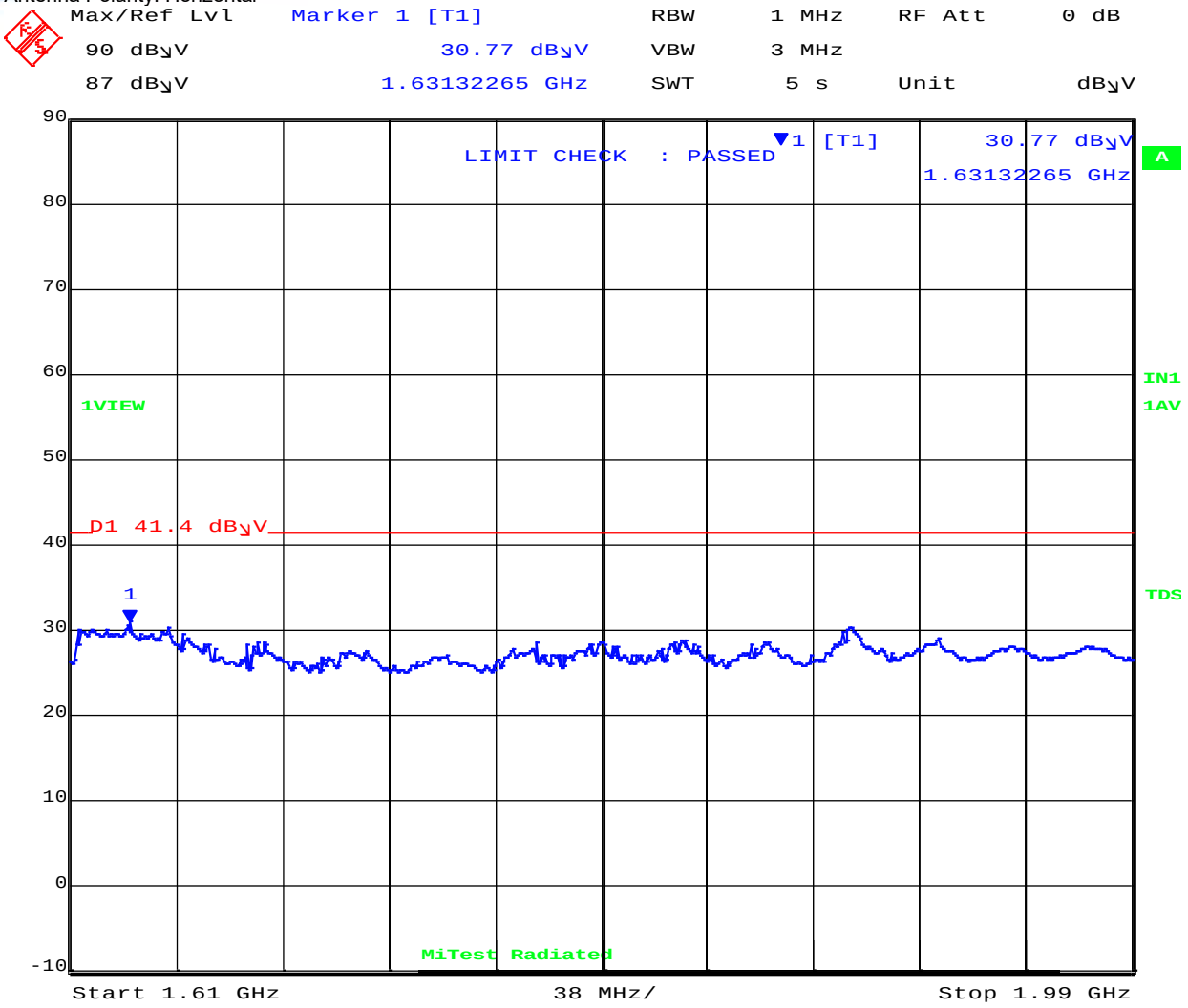
Antenna Polarity: Horizontal



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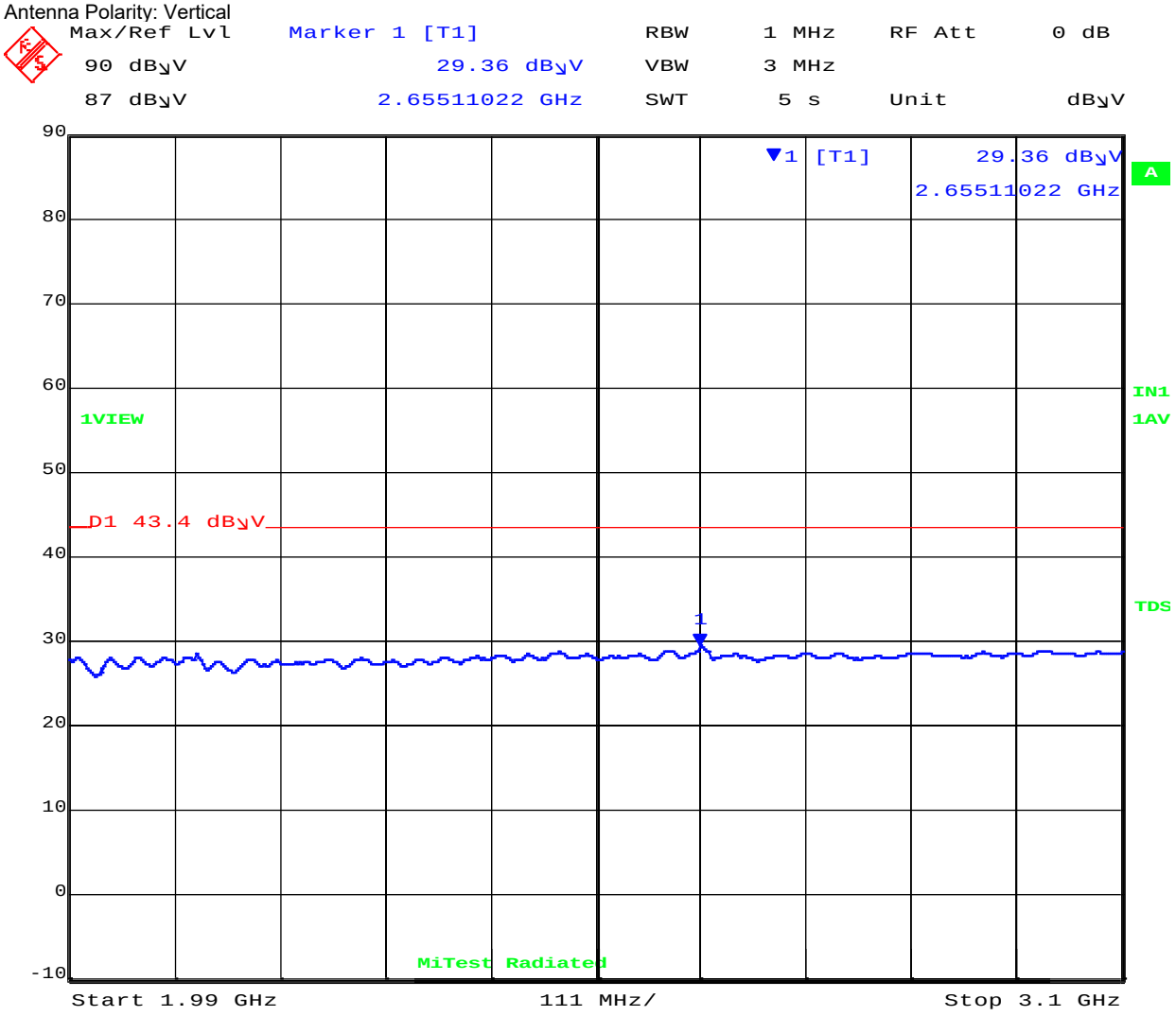
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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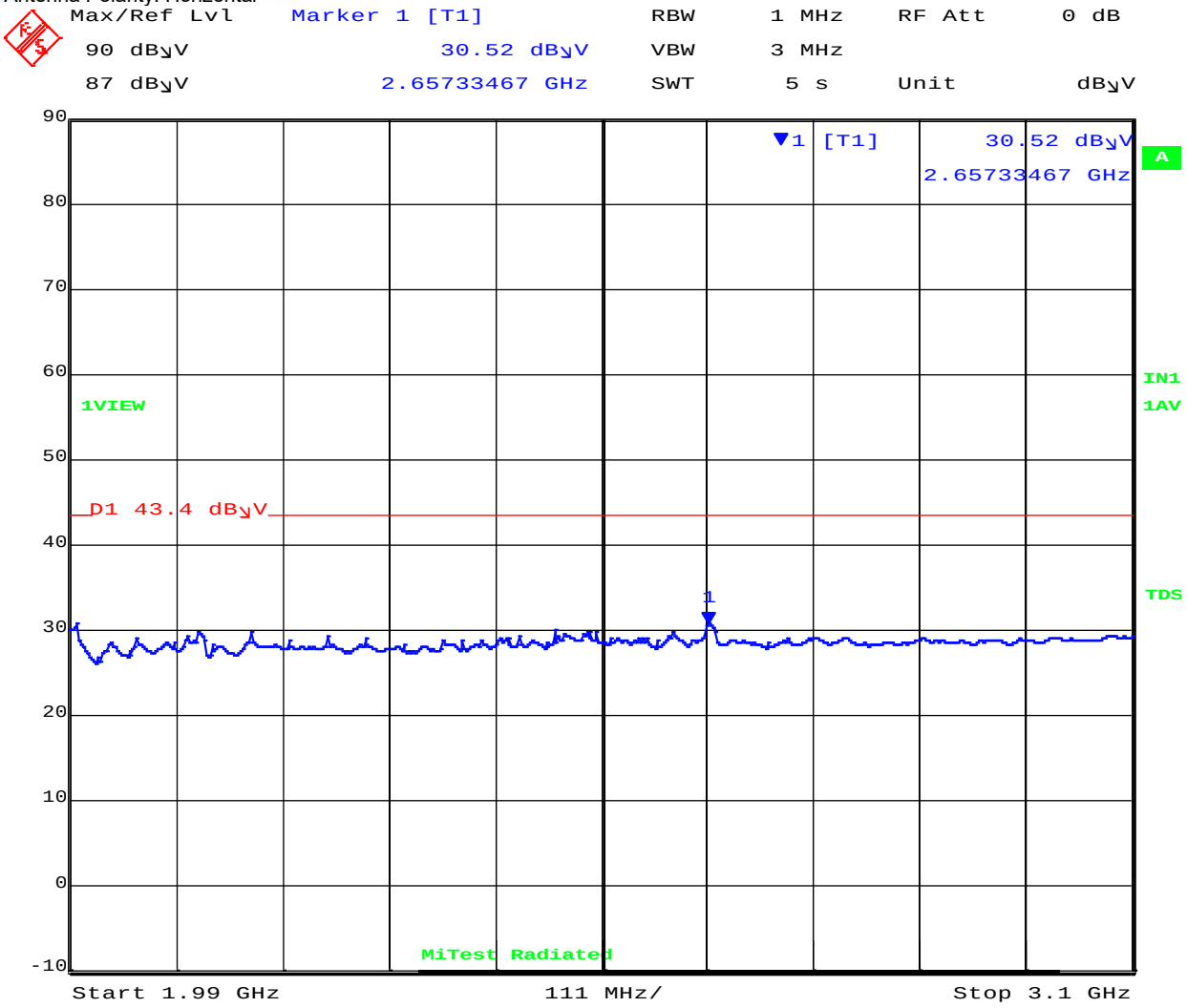
Antenna Polarity: Horizontal



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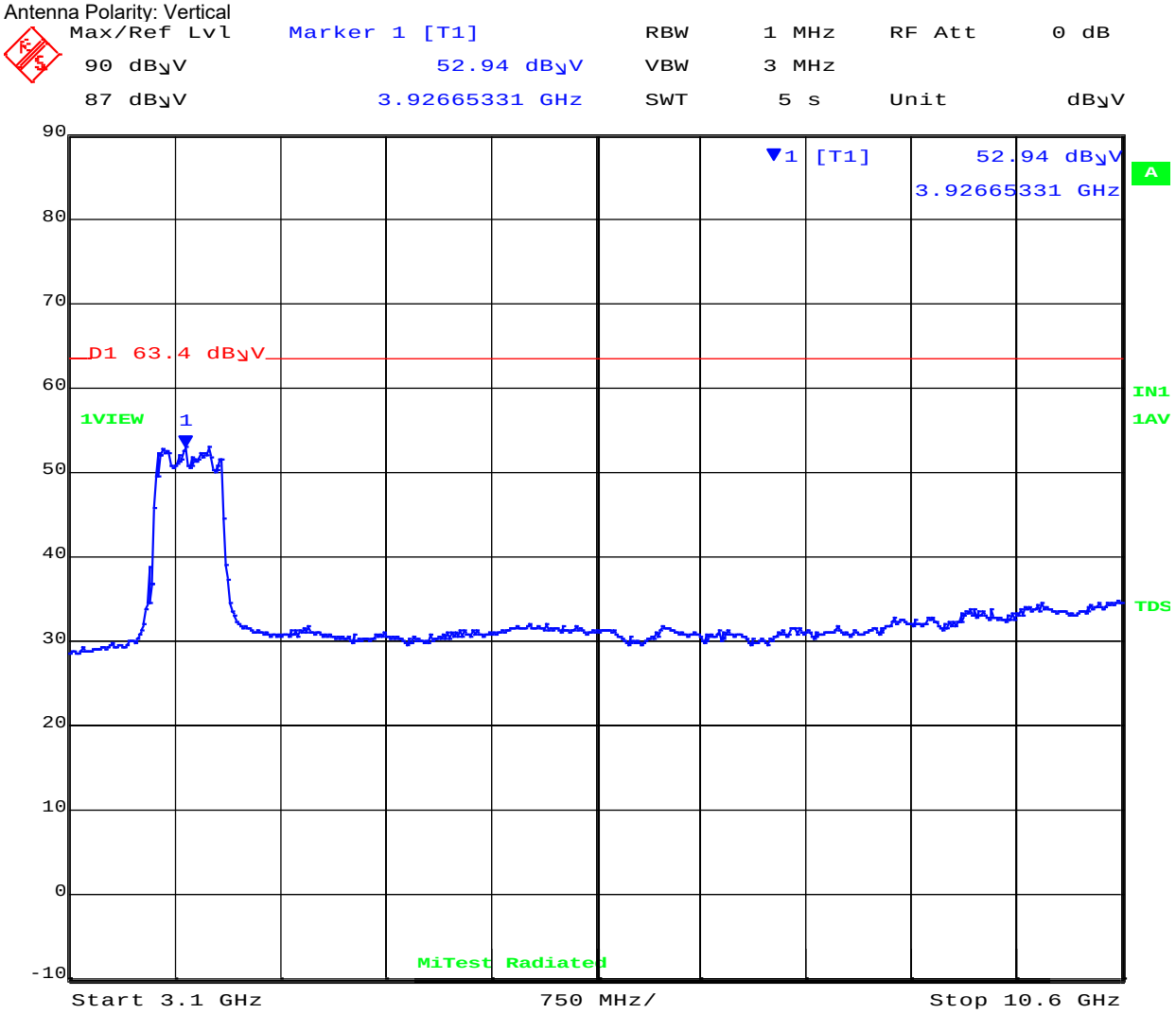
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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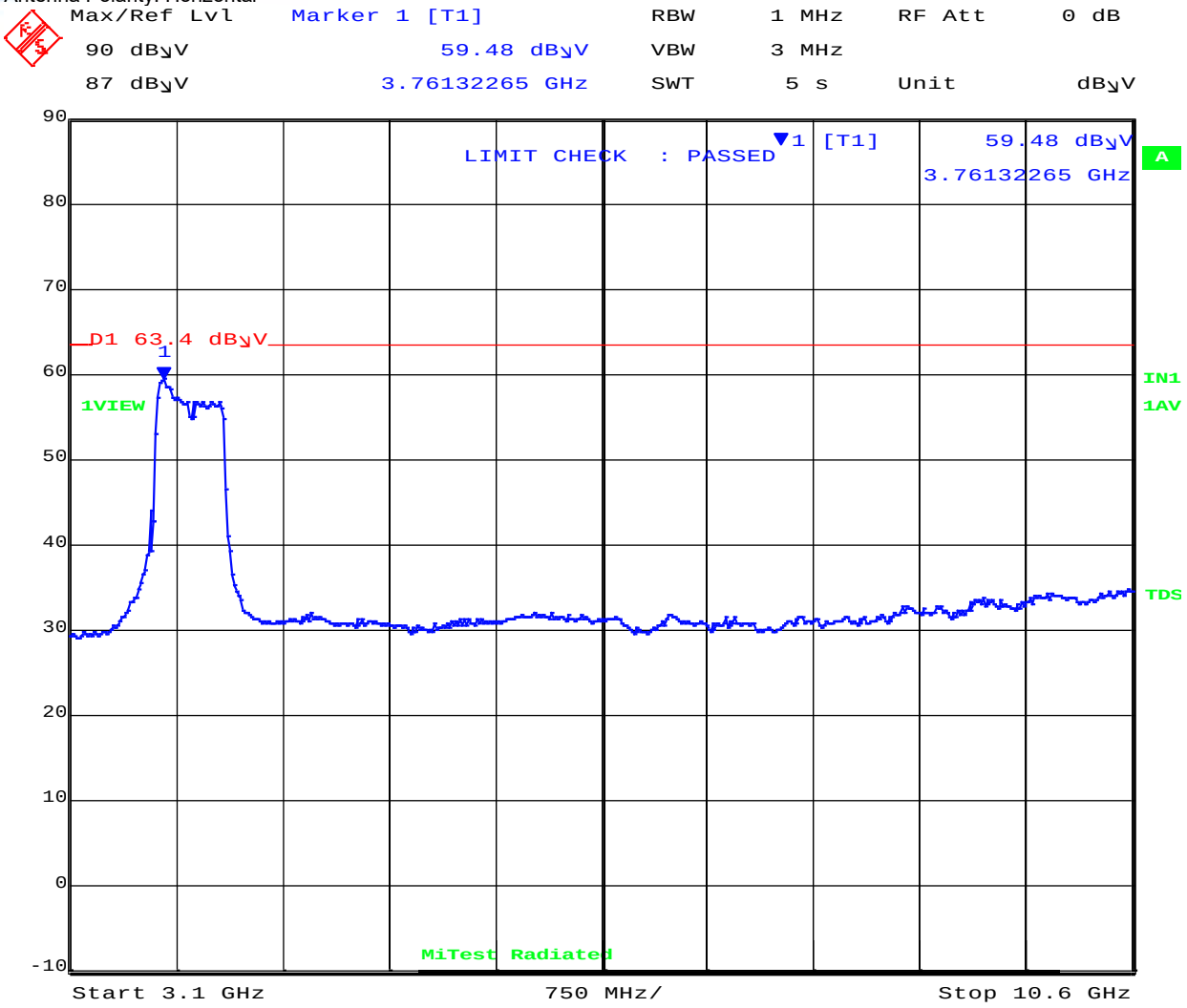
Antenna Polarity: Horizontal



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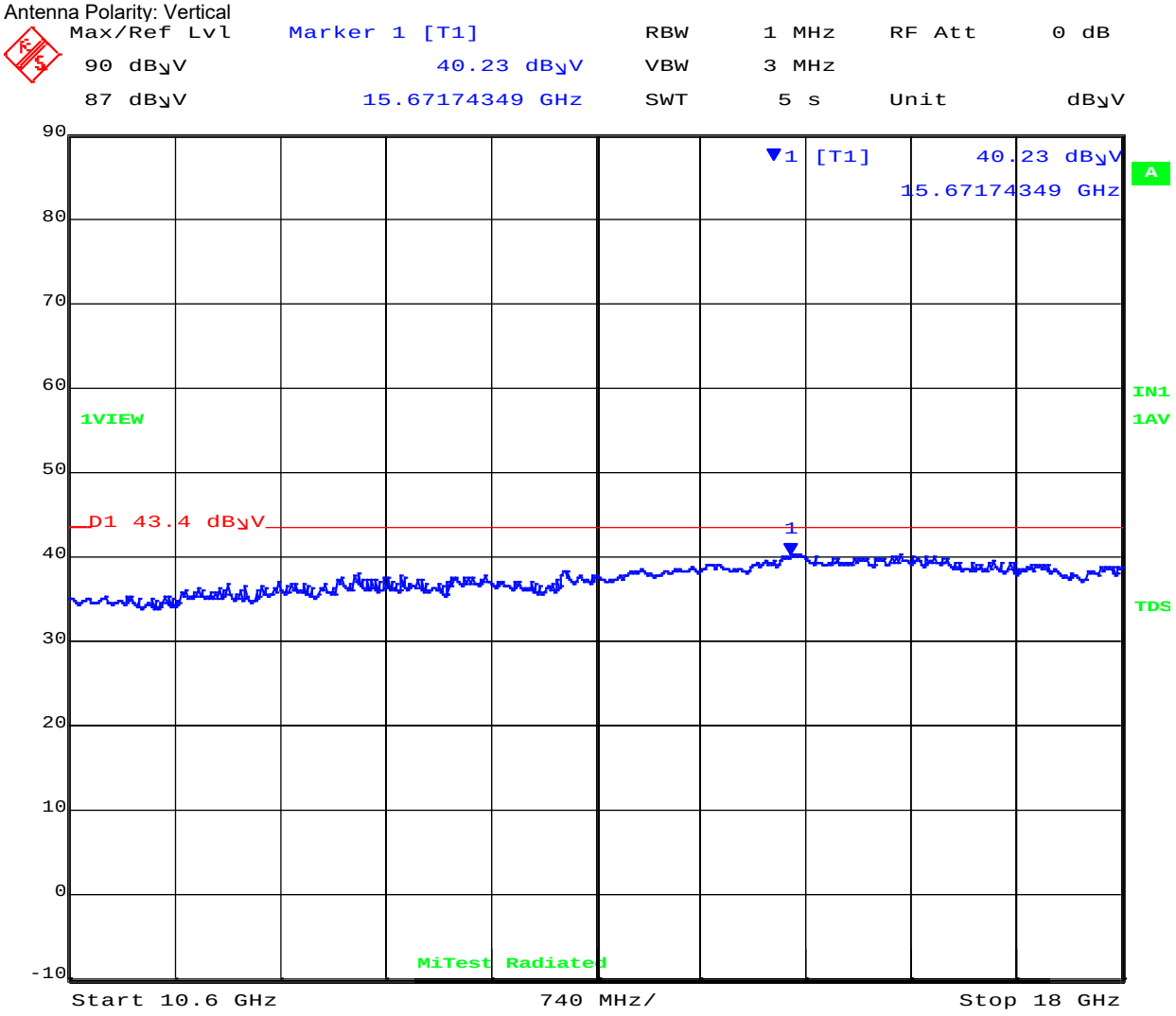
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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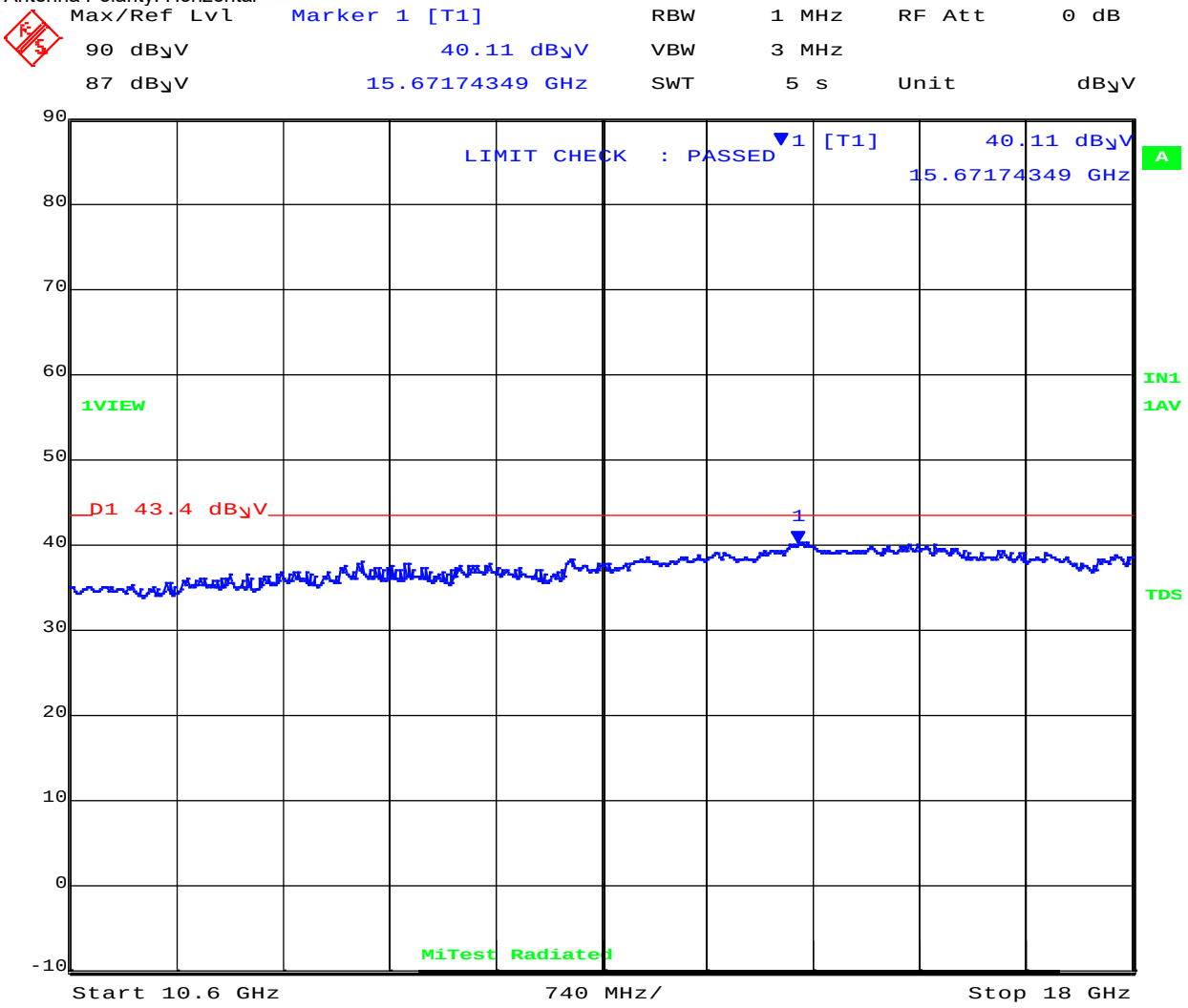
Antenna Polarity: Horizontal



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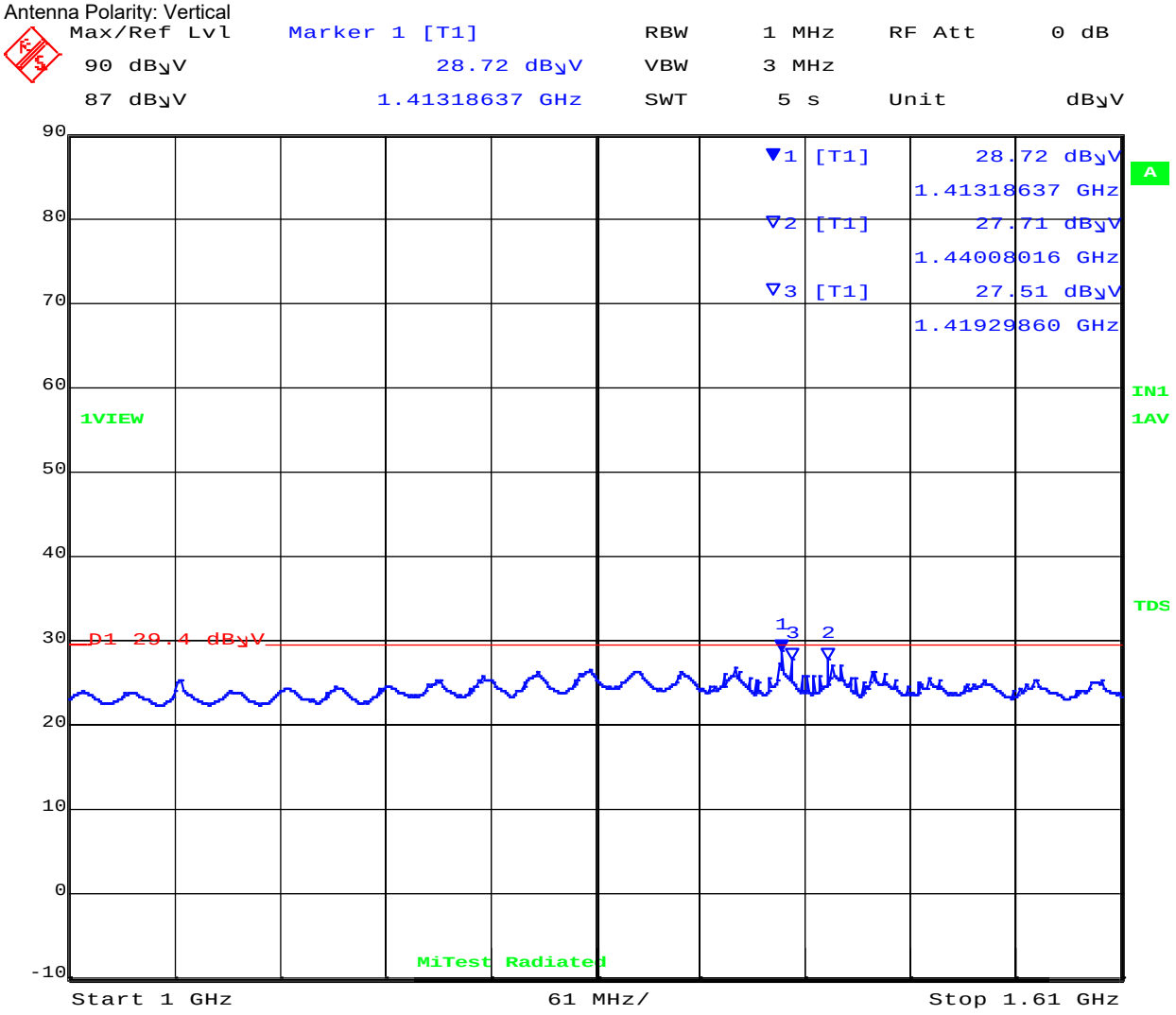
RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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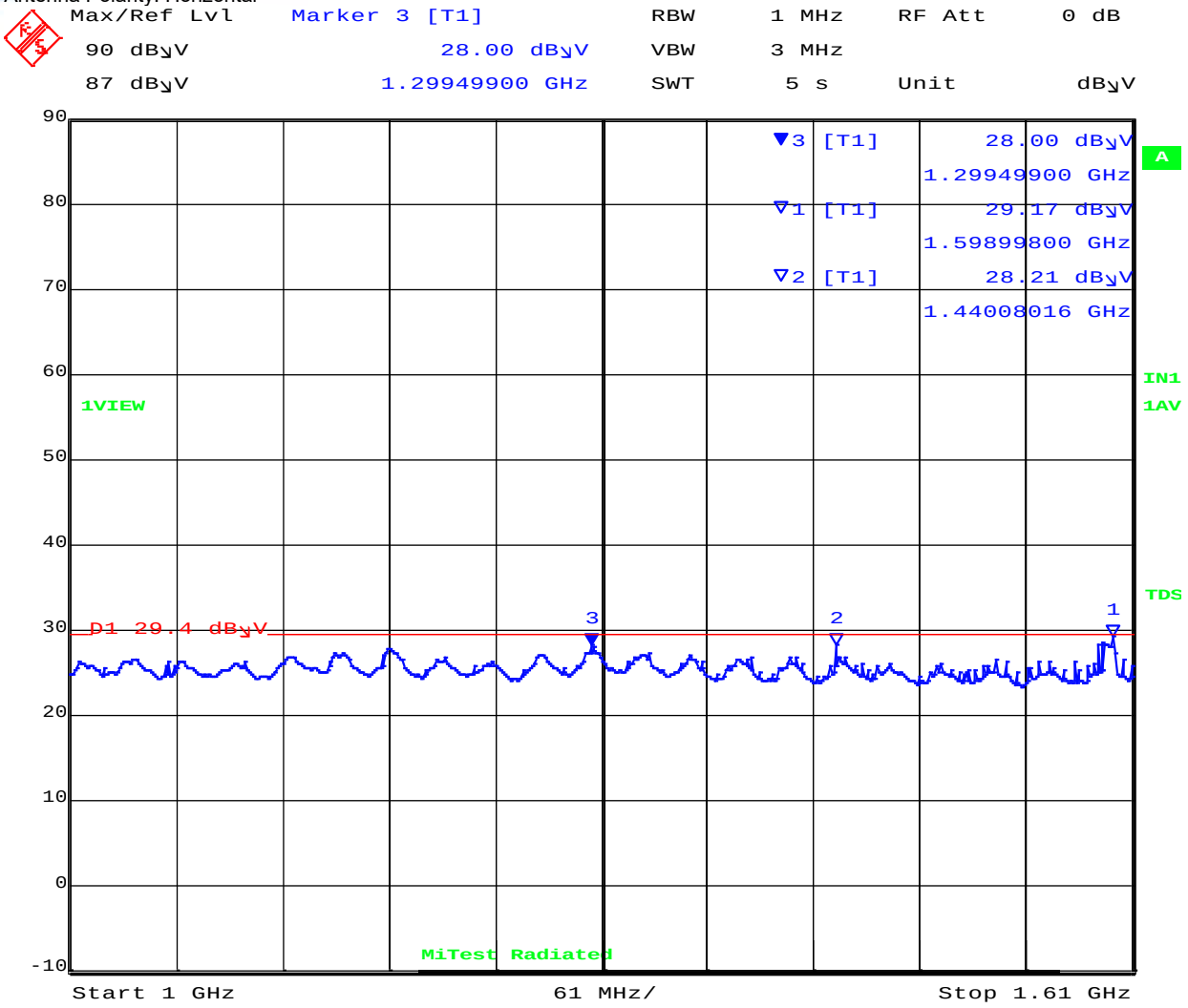
Antenna Polarity: Horizontal



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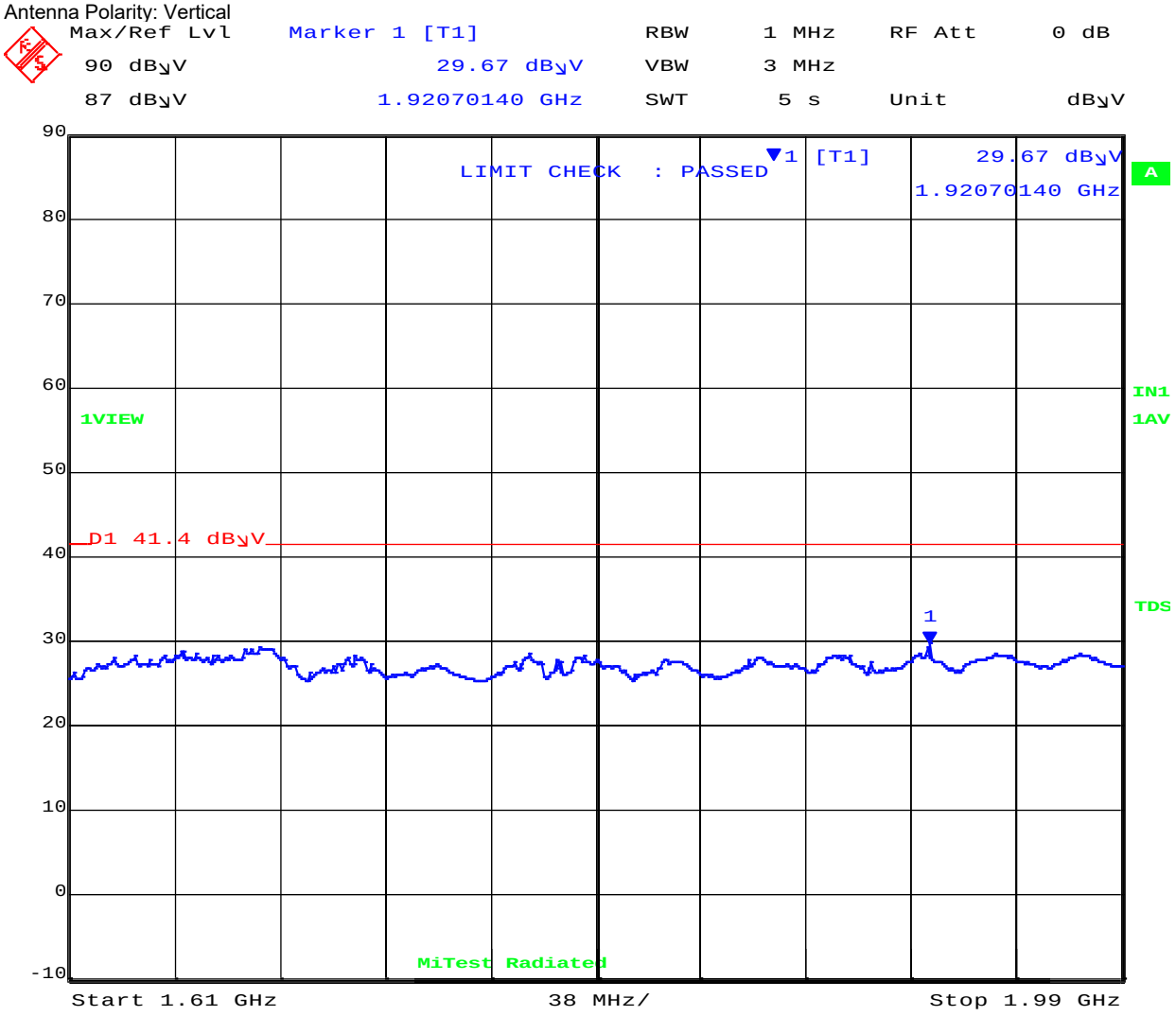
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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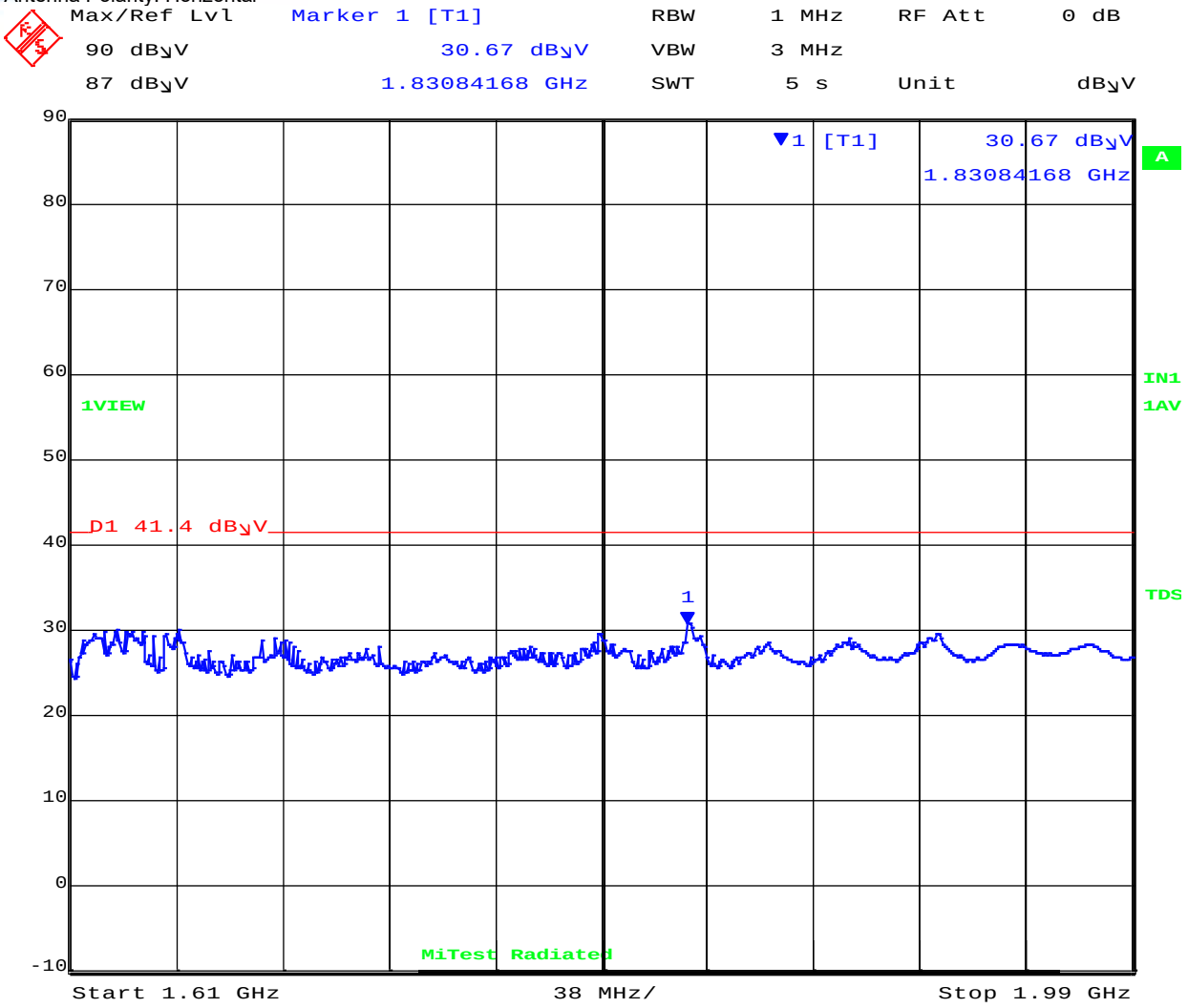
Antenna Polarity: Horizontal



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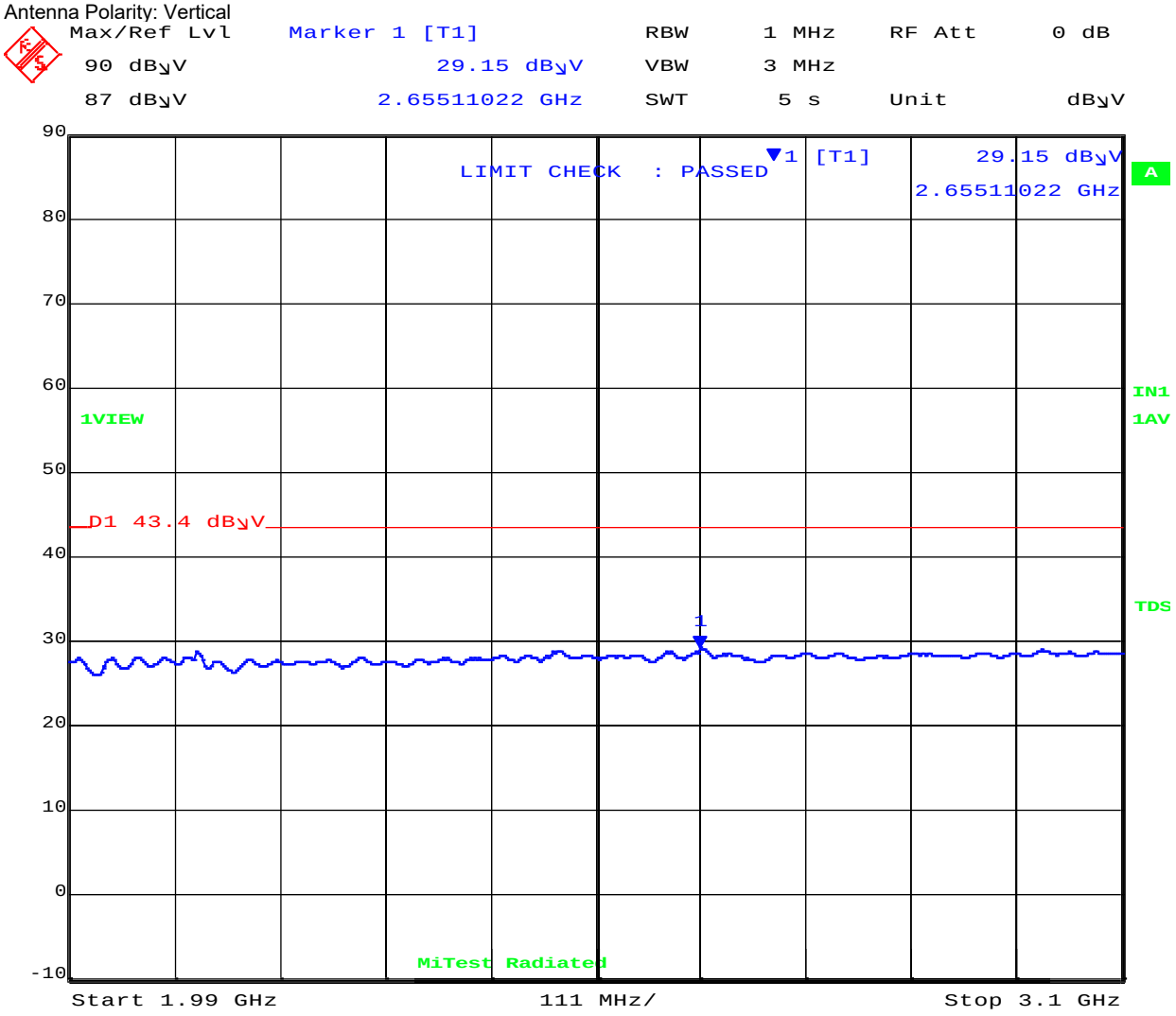
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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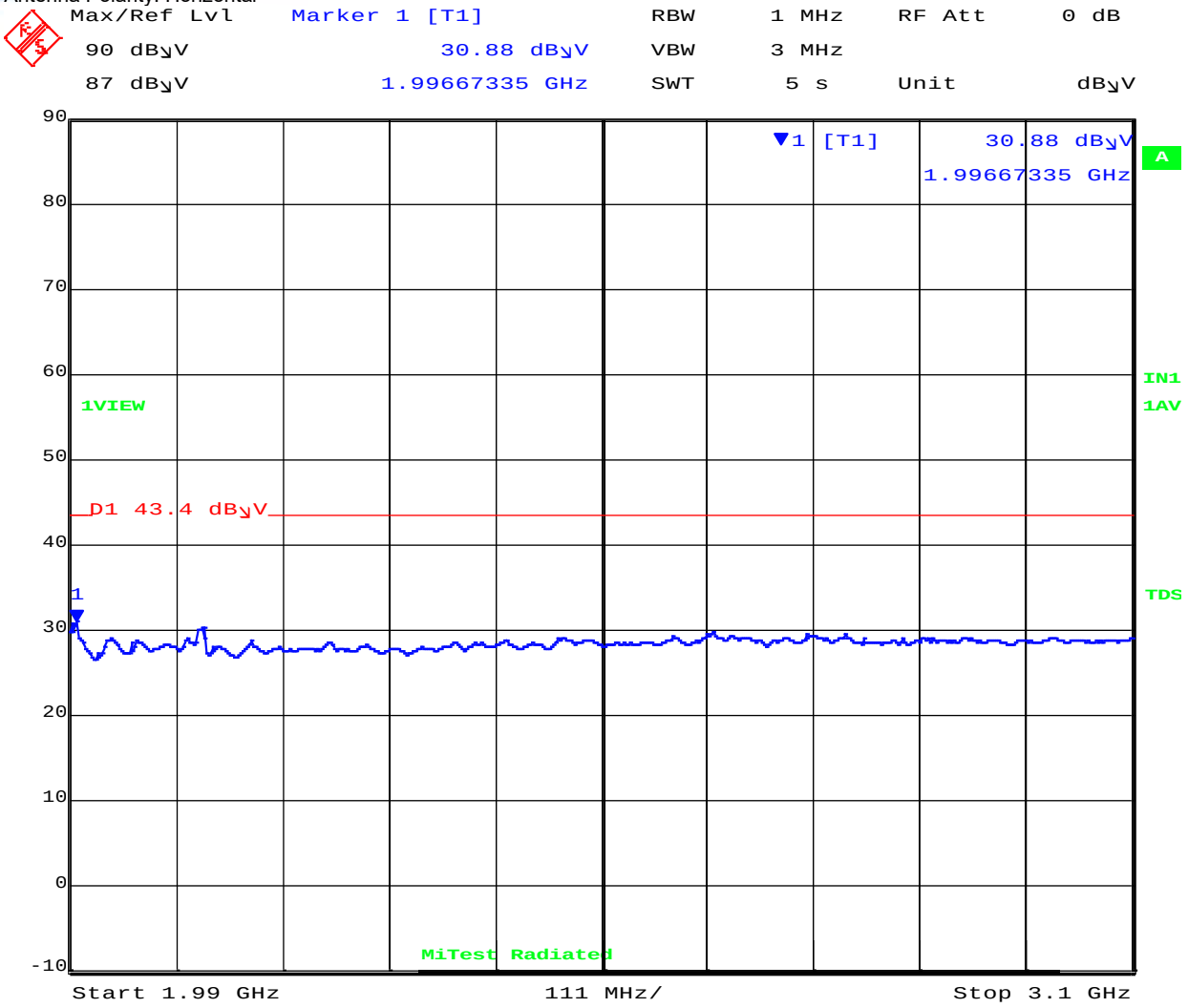
Antenna Polarity: Horizontal



Date: 8.MAR.2021 16:09:04

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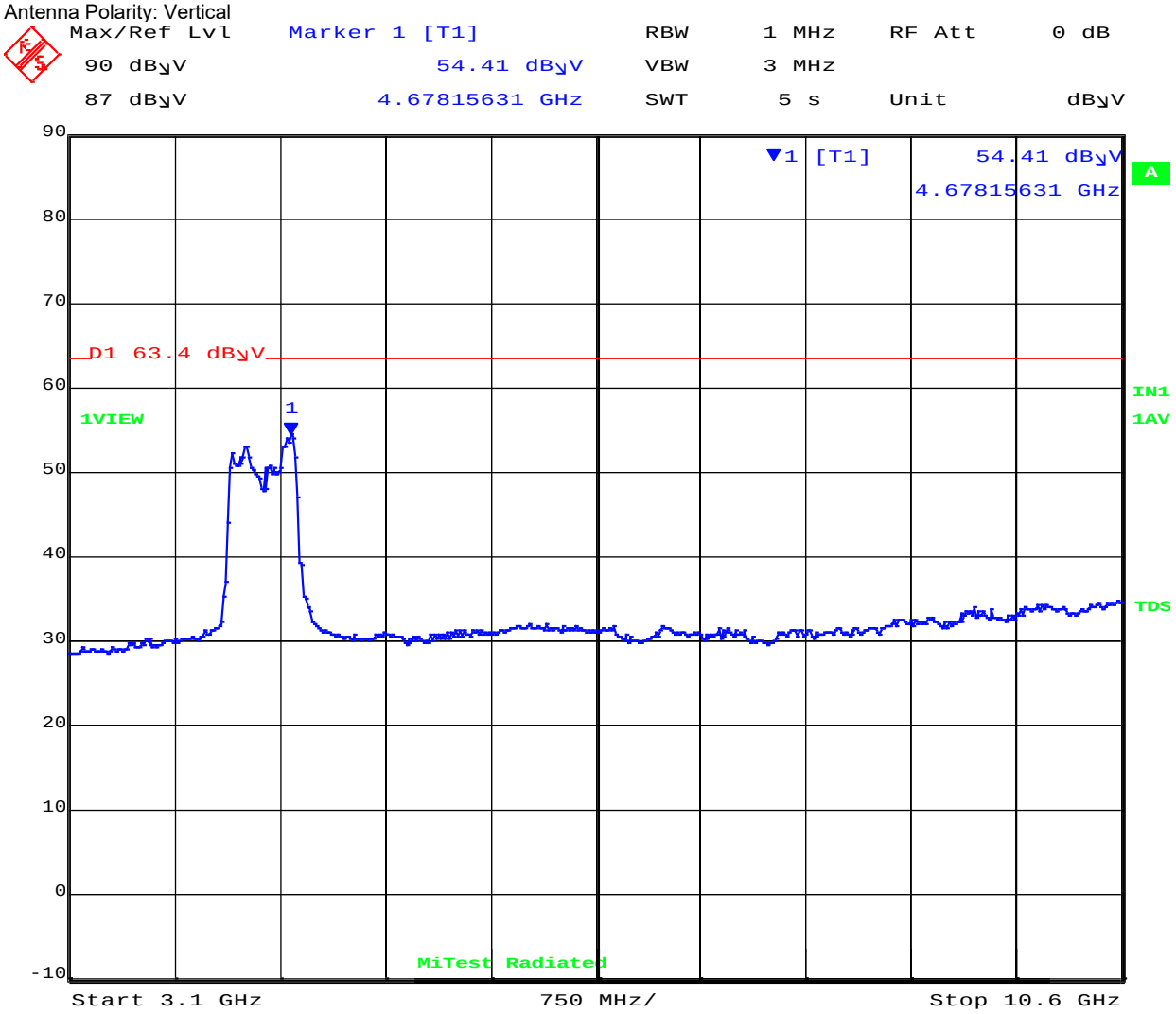
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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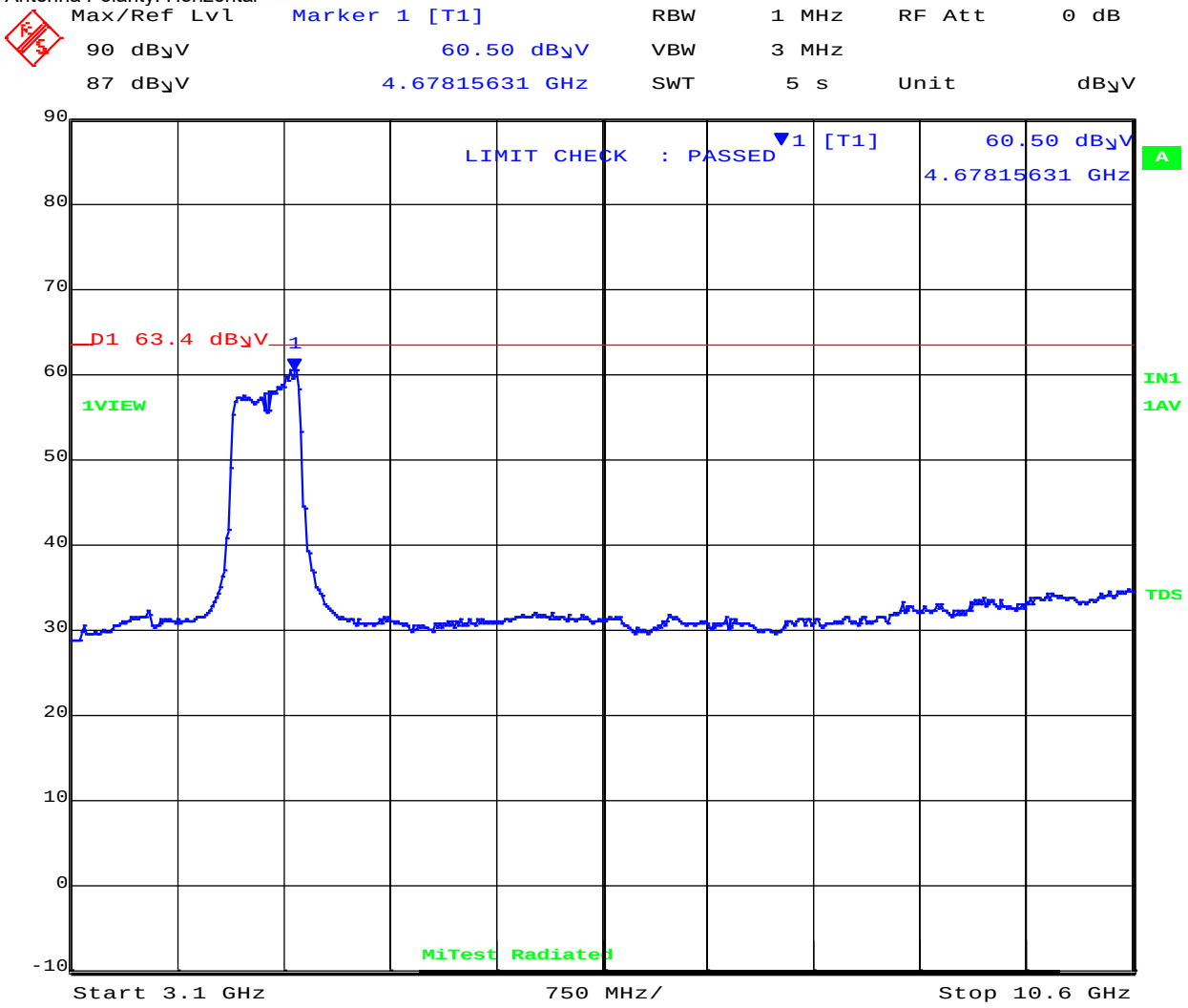
Antenna Polarity: Horizontal



Date: 8.MAR.2021 16:02:34

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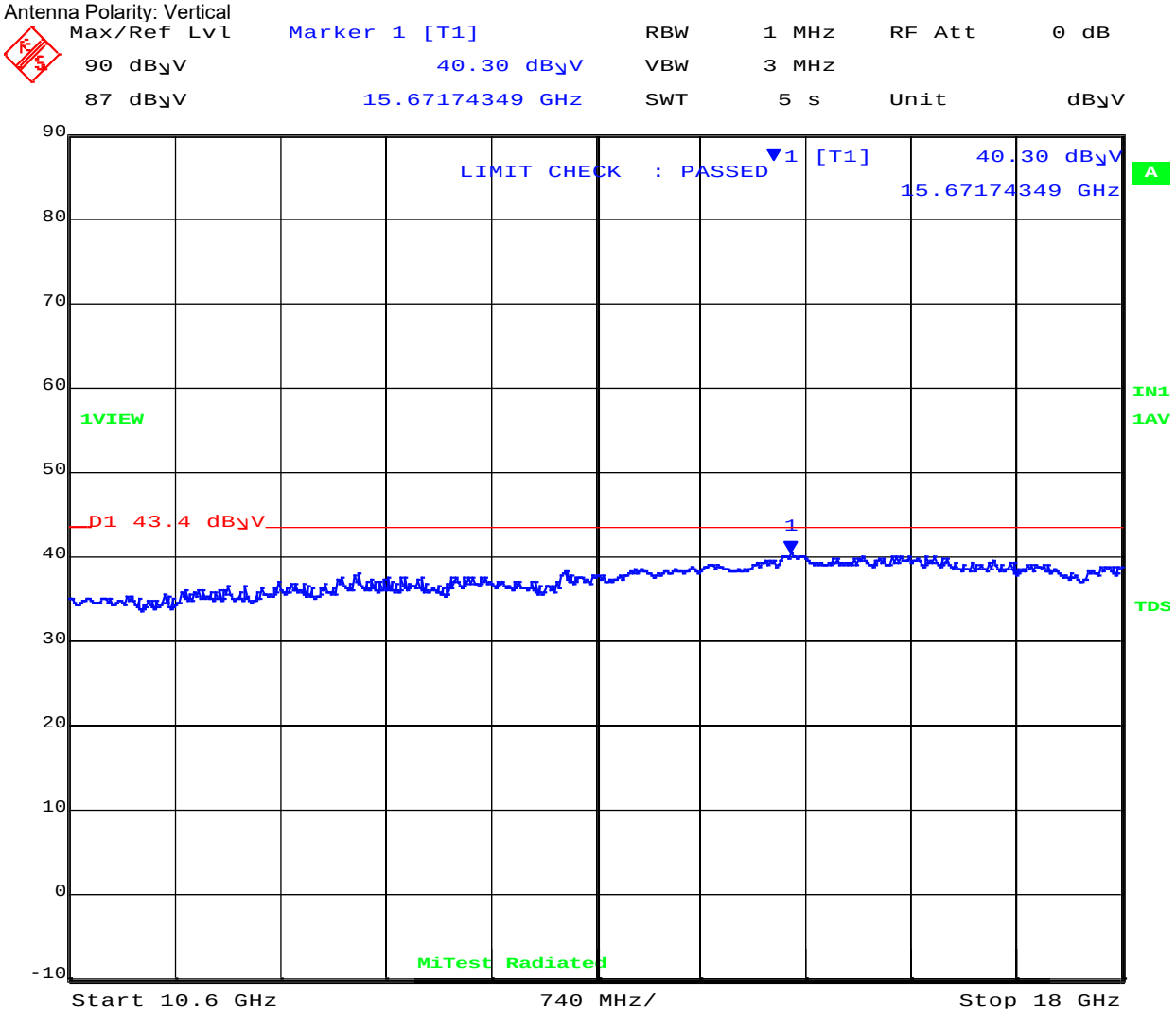
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 8.MAR.2021 15:58:48

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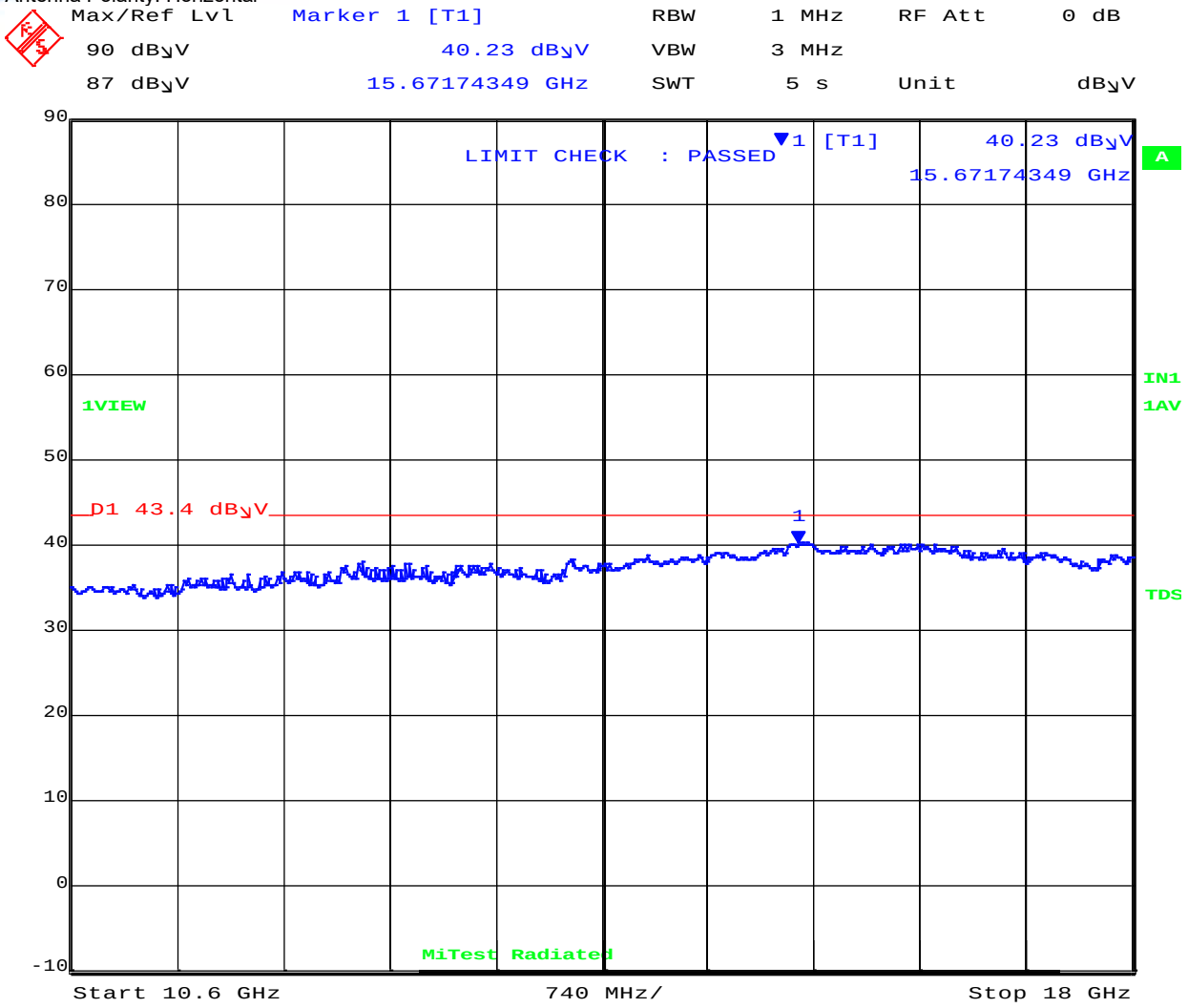
Antenna Polarity: Horizontal



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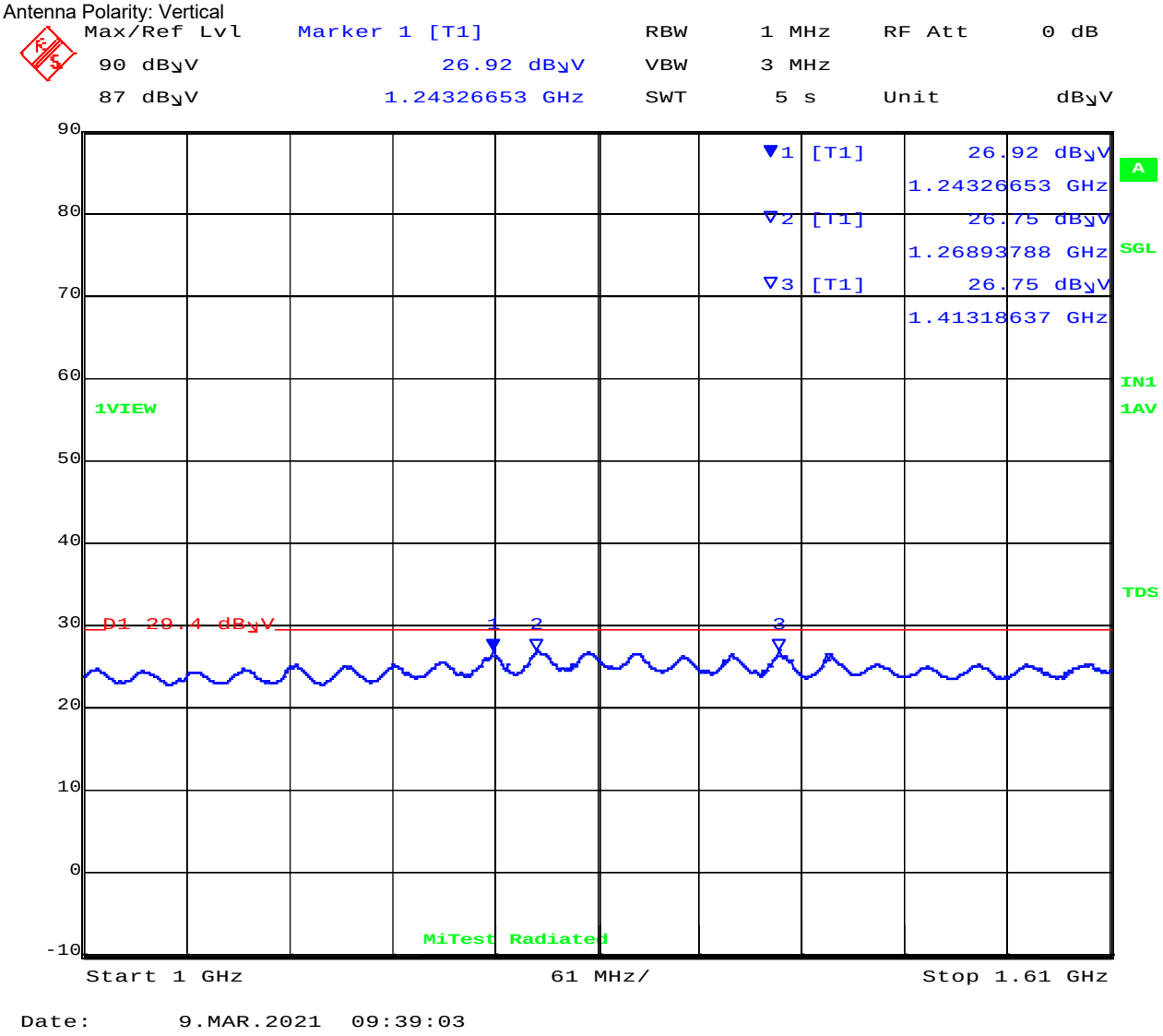
A.1.2 Band 3

RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 09:39:03

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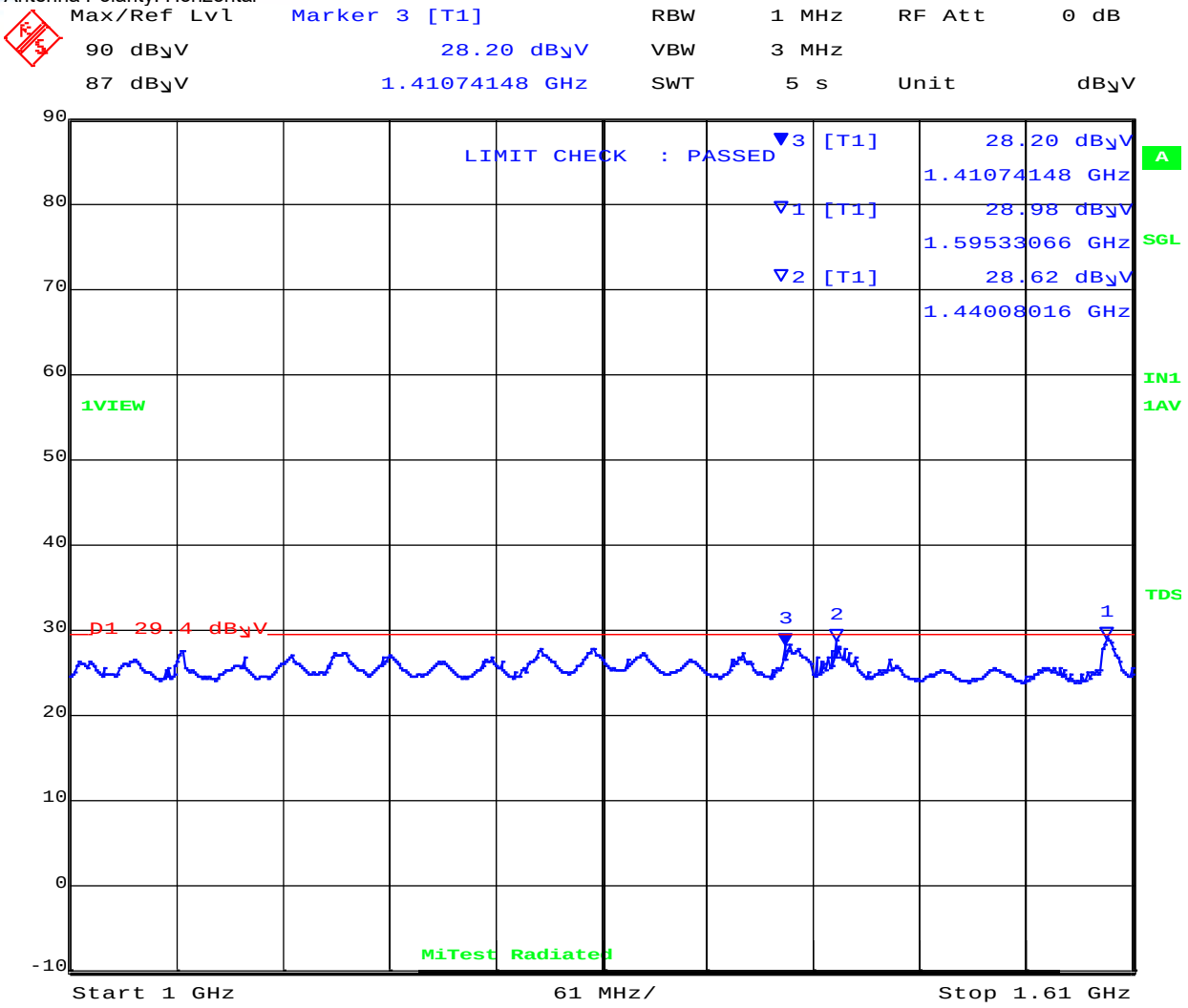
Antenna Polarity: Horizontal



Date: 9.MAR.2021 09:37:31

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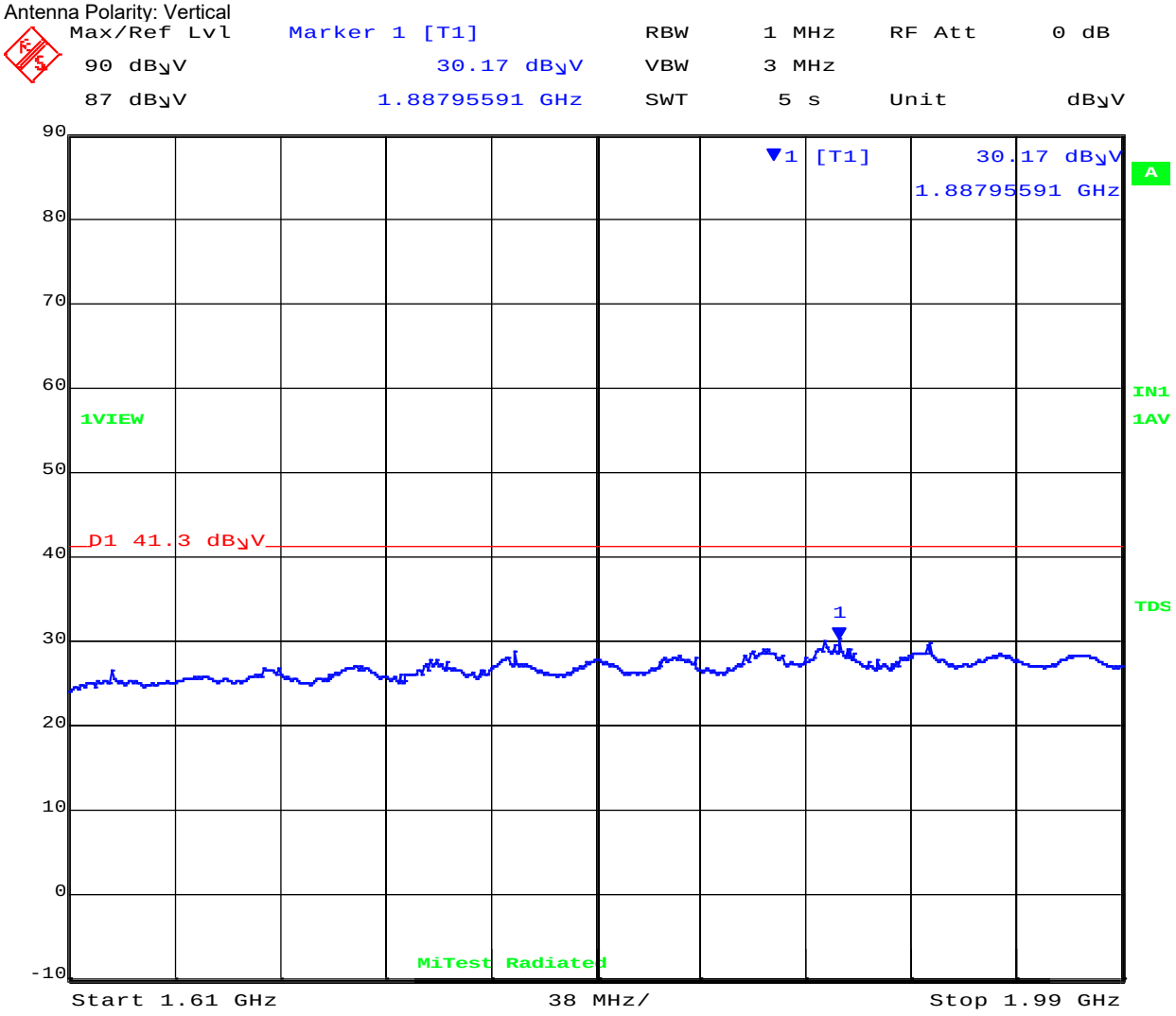
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 09:44:52

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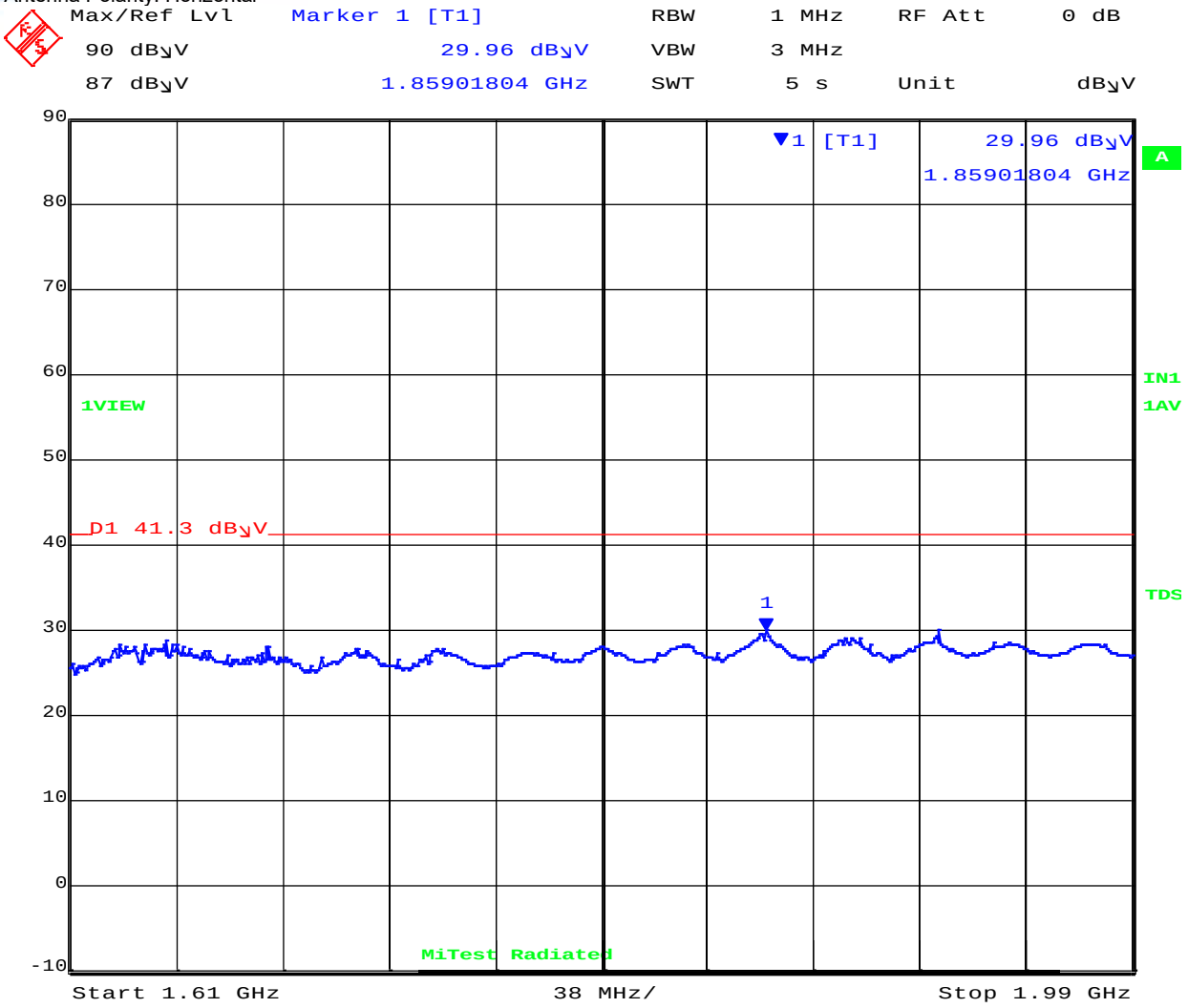
Antenna Polarity: Horizontal



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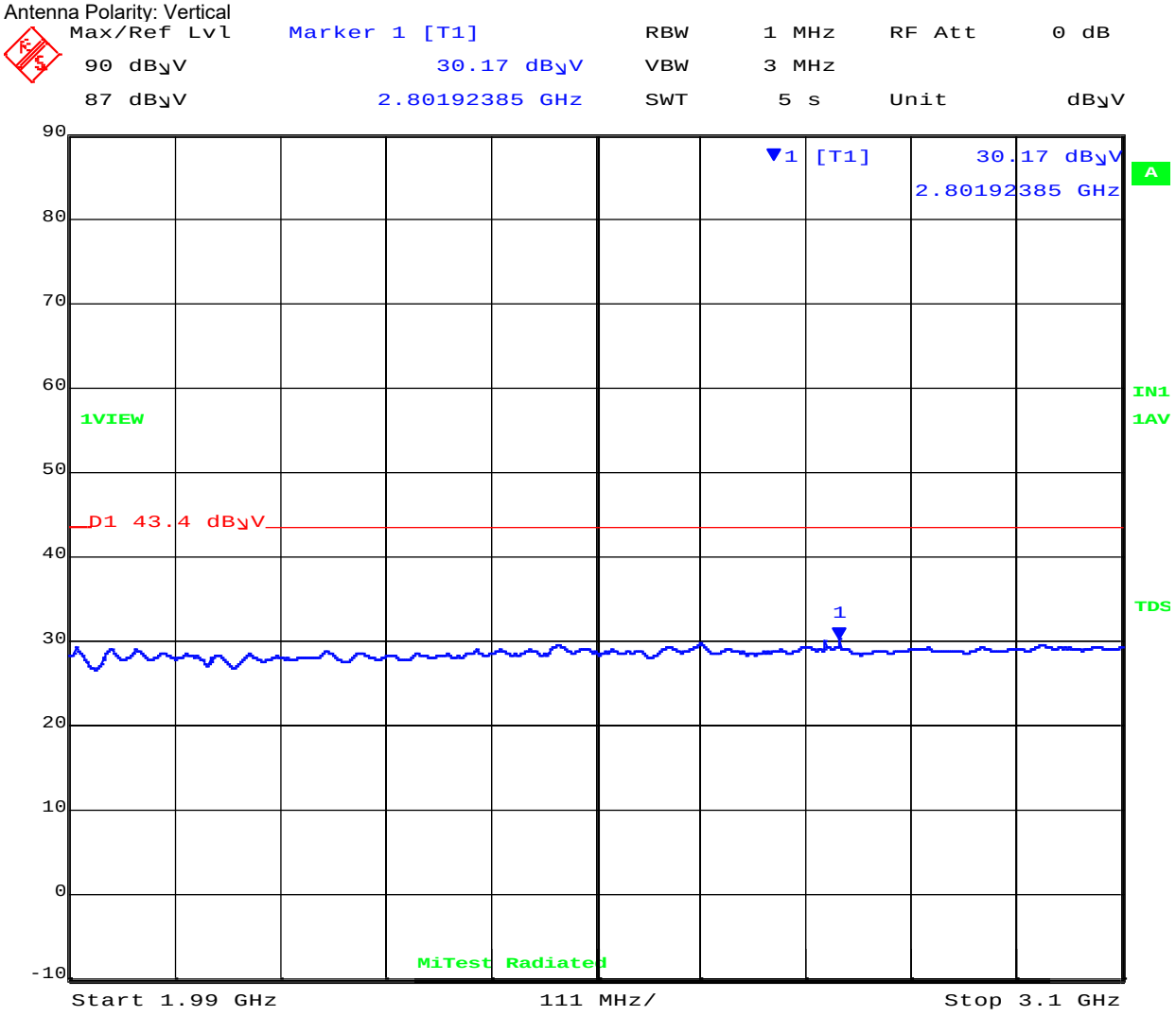
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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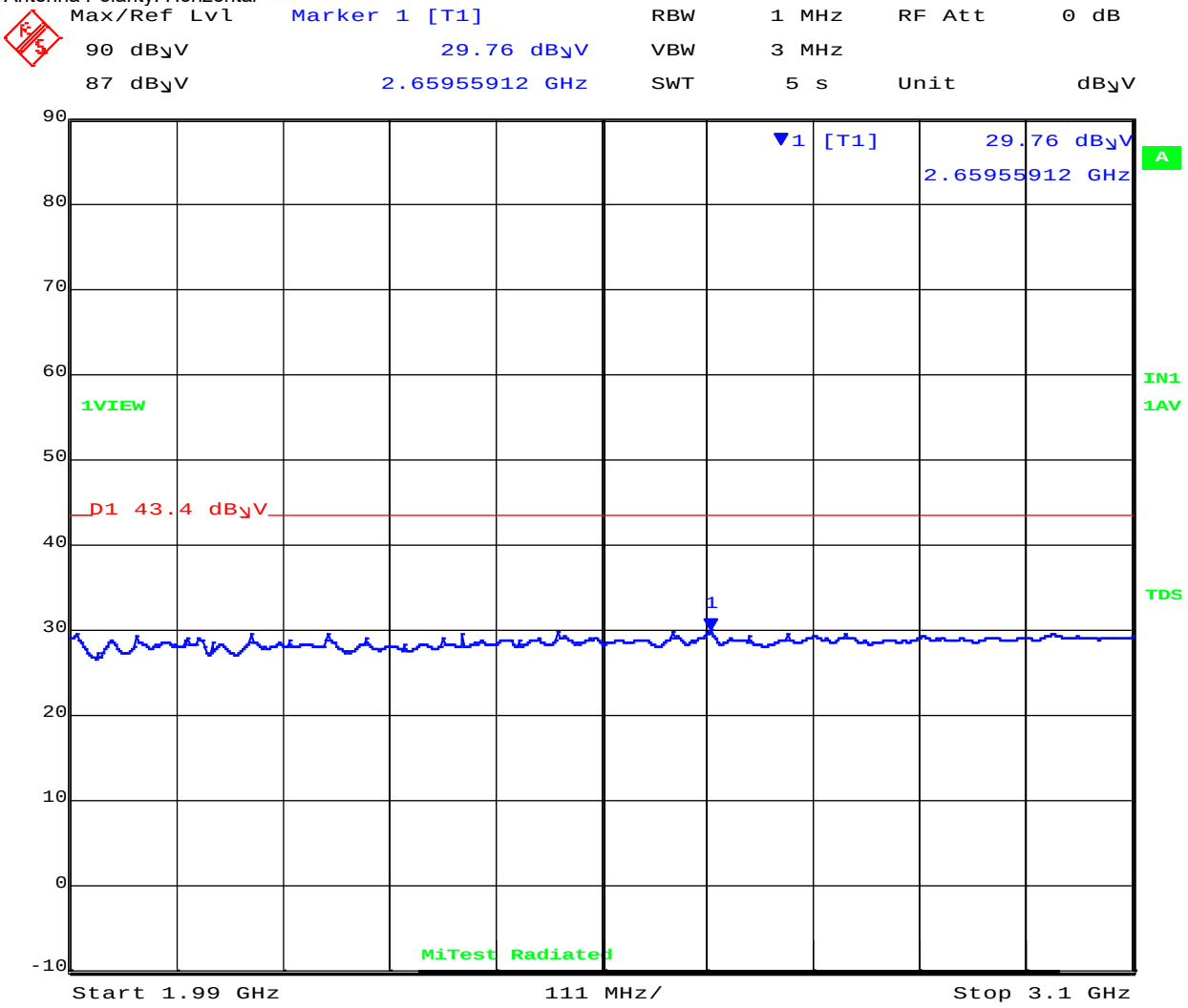
Antenna Polarity: Horizontal



Date: 9.MAR.2021 09:55:43

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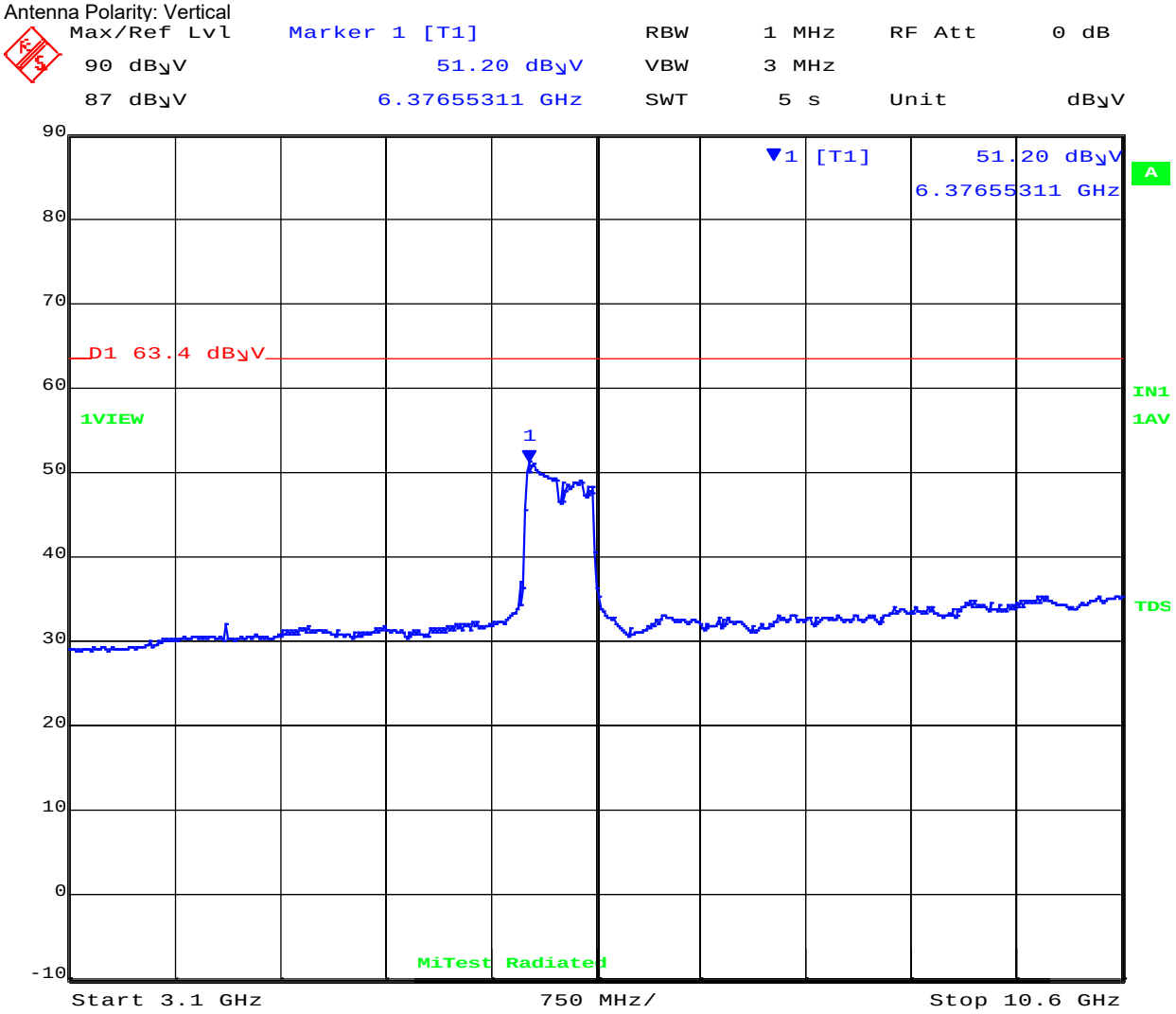
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 10:02:18

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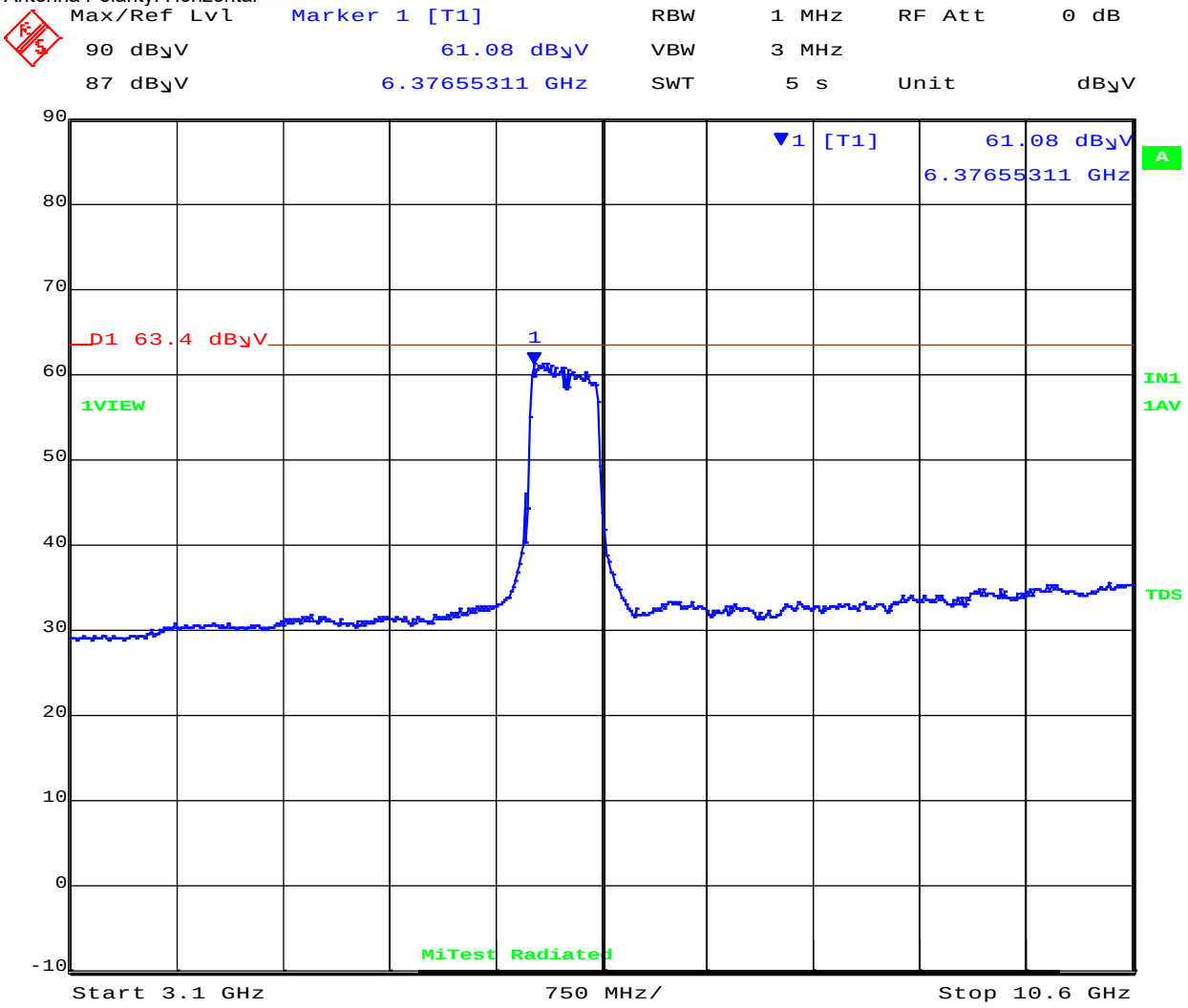
Antenna Polarity: Horizontal



Date: 9.MAR.2021 09:59:36

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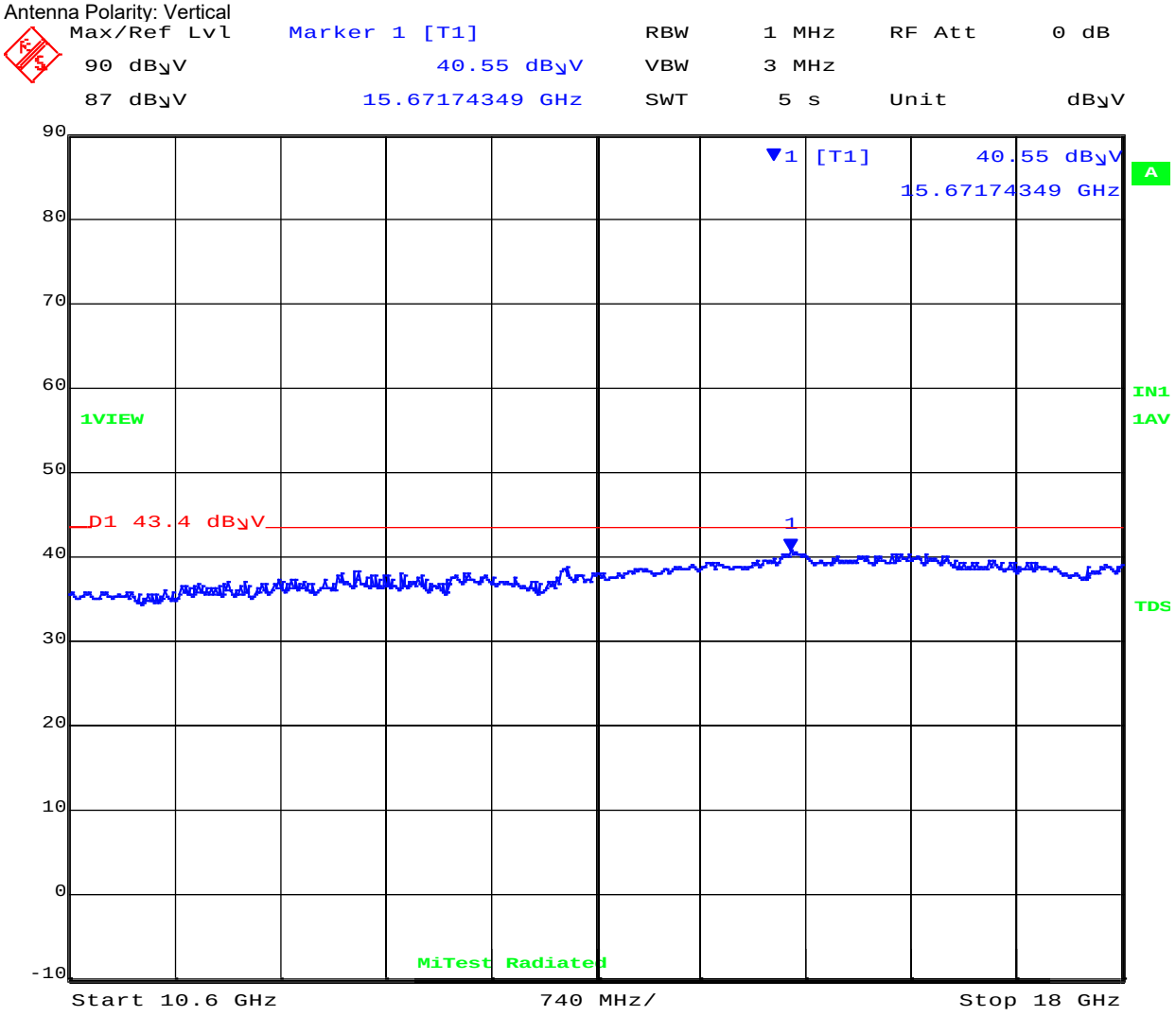
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 10:03:24

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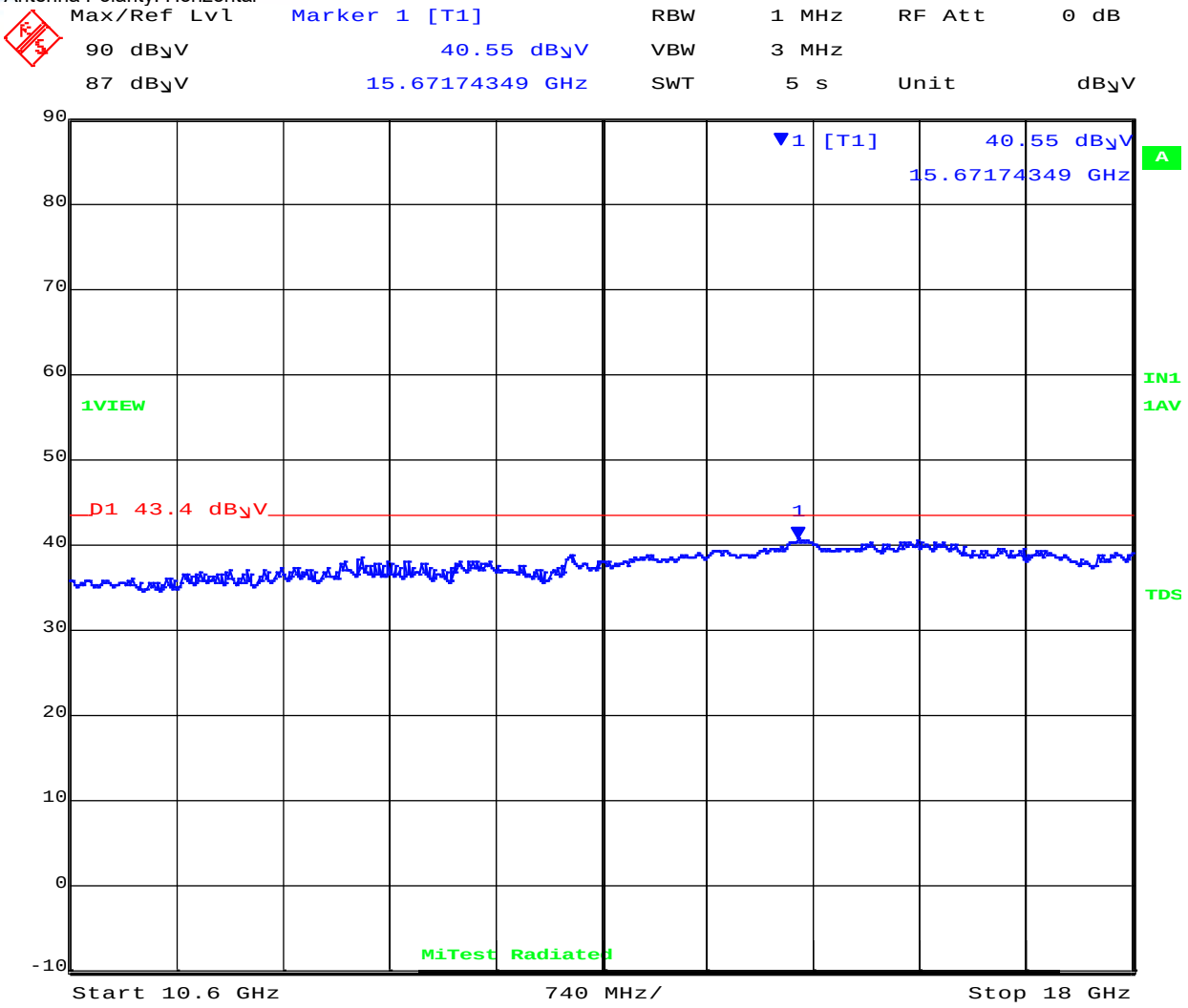
Antenna Polarity: Horizontal



Date: 9.MAR.2021 10:05:35

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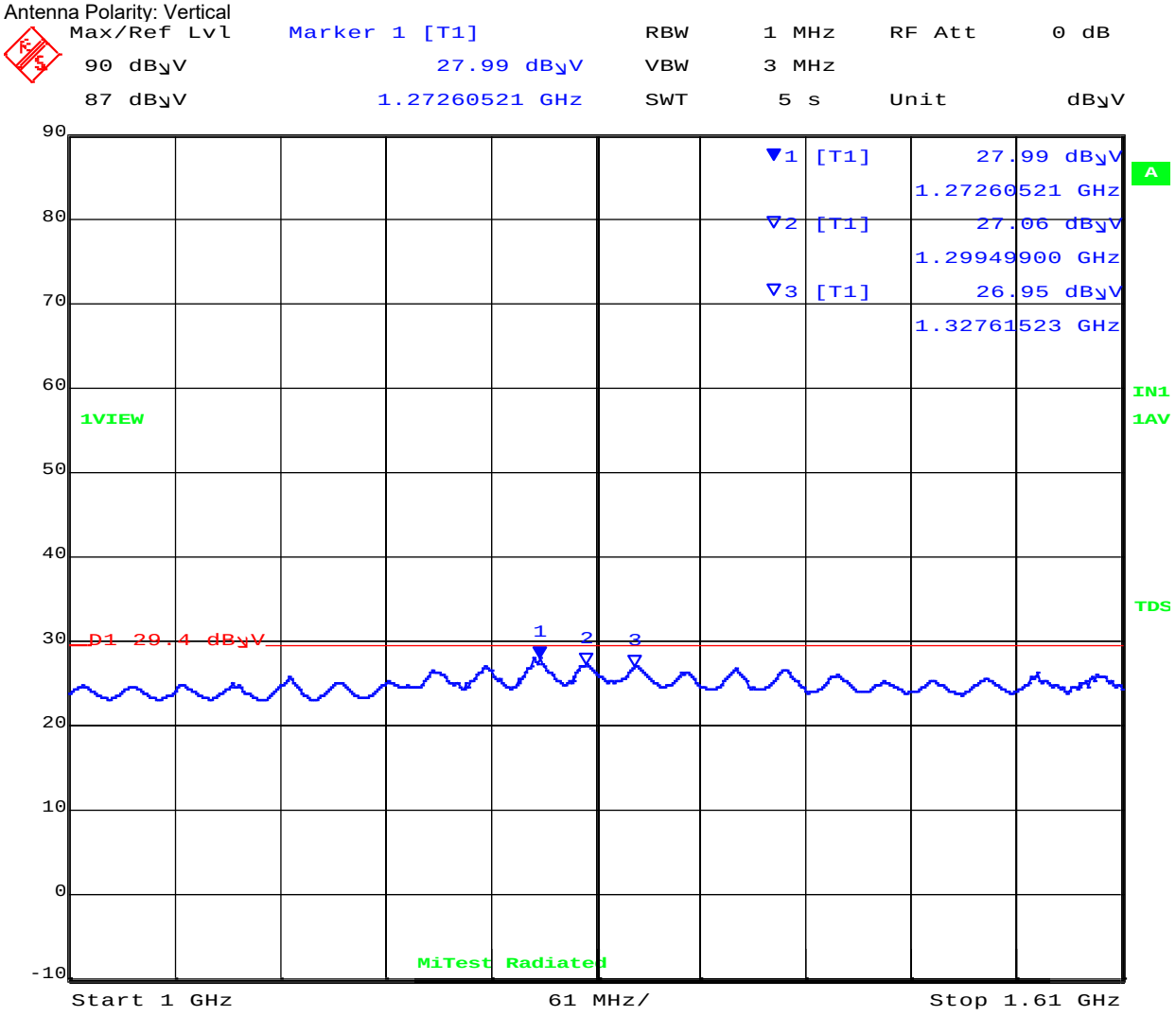
RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 10:33:06

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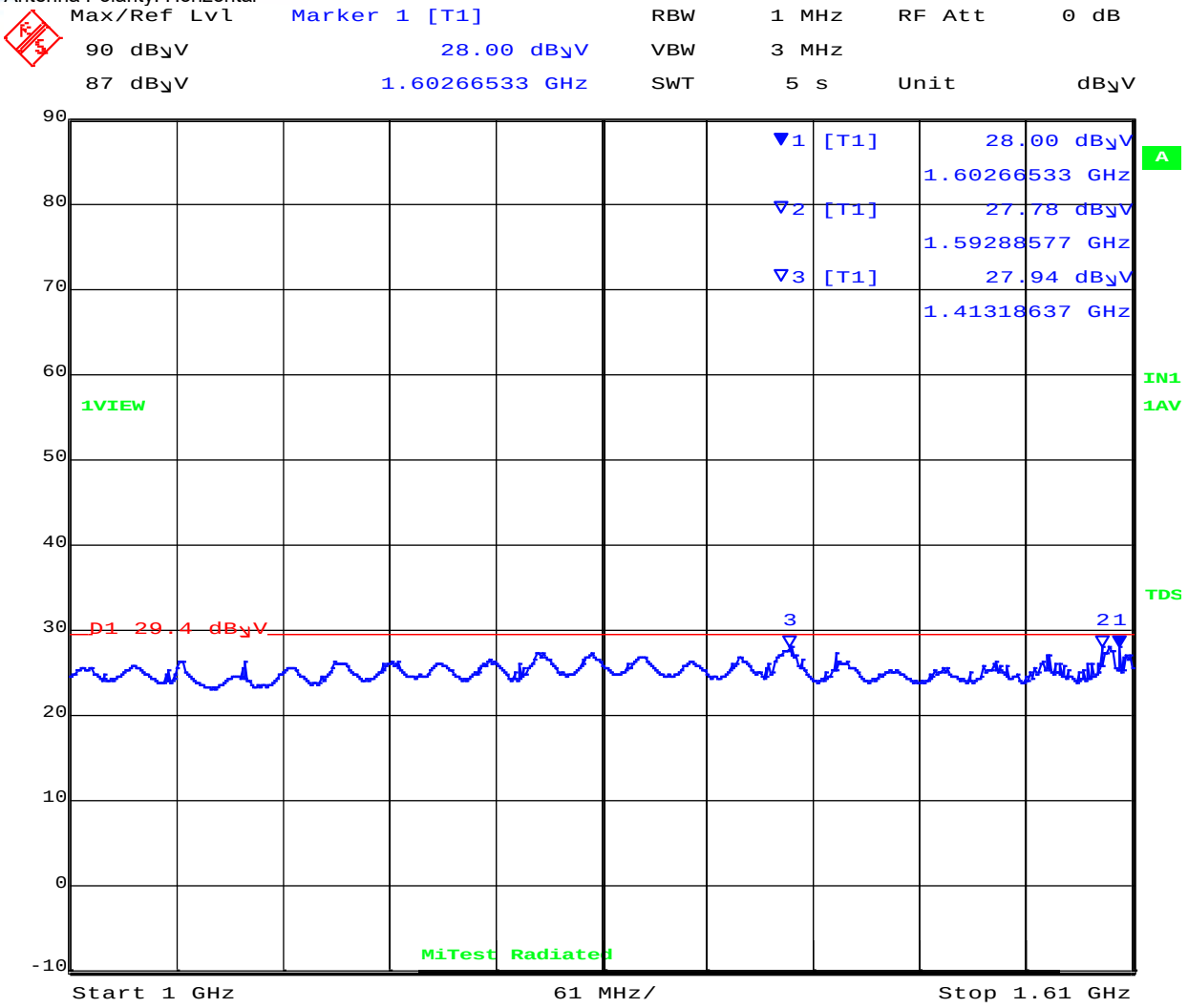
Antenna Polarity: Horizontal



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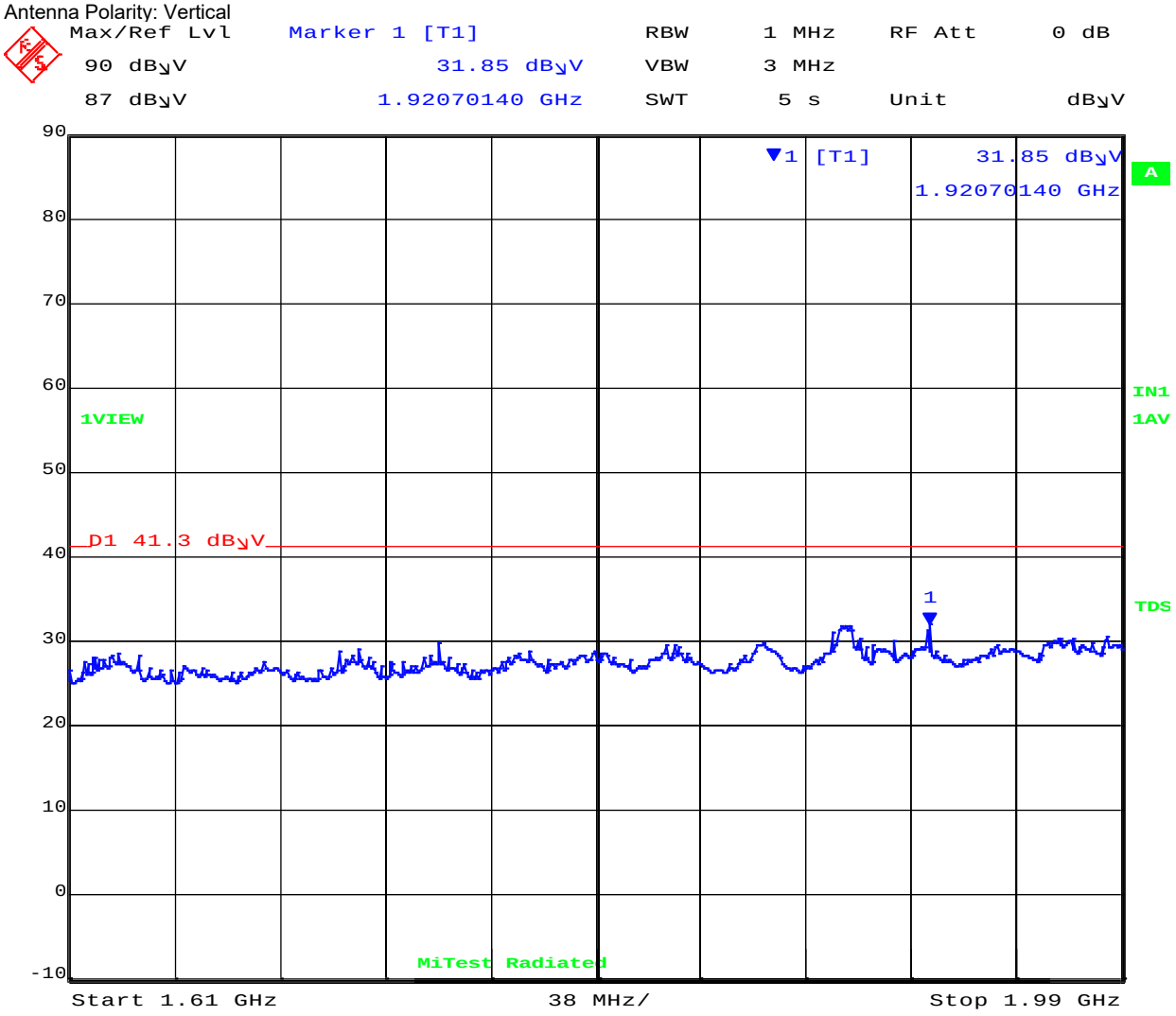
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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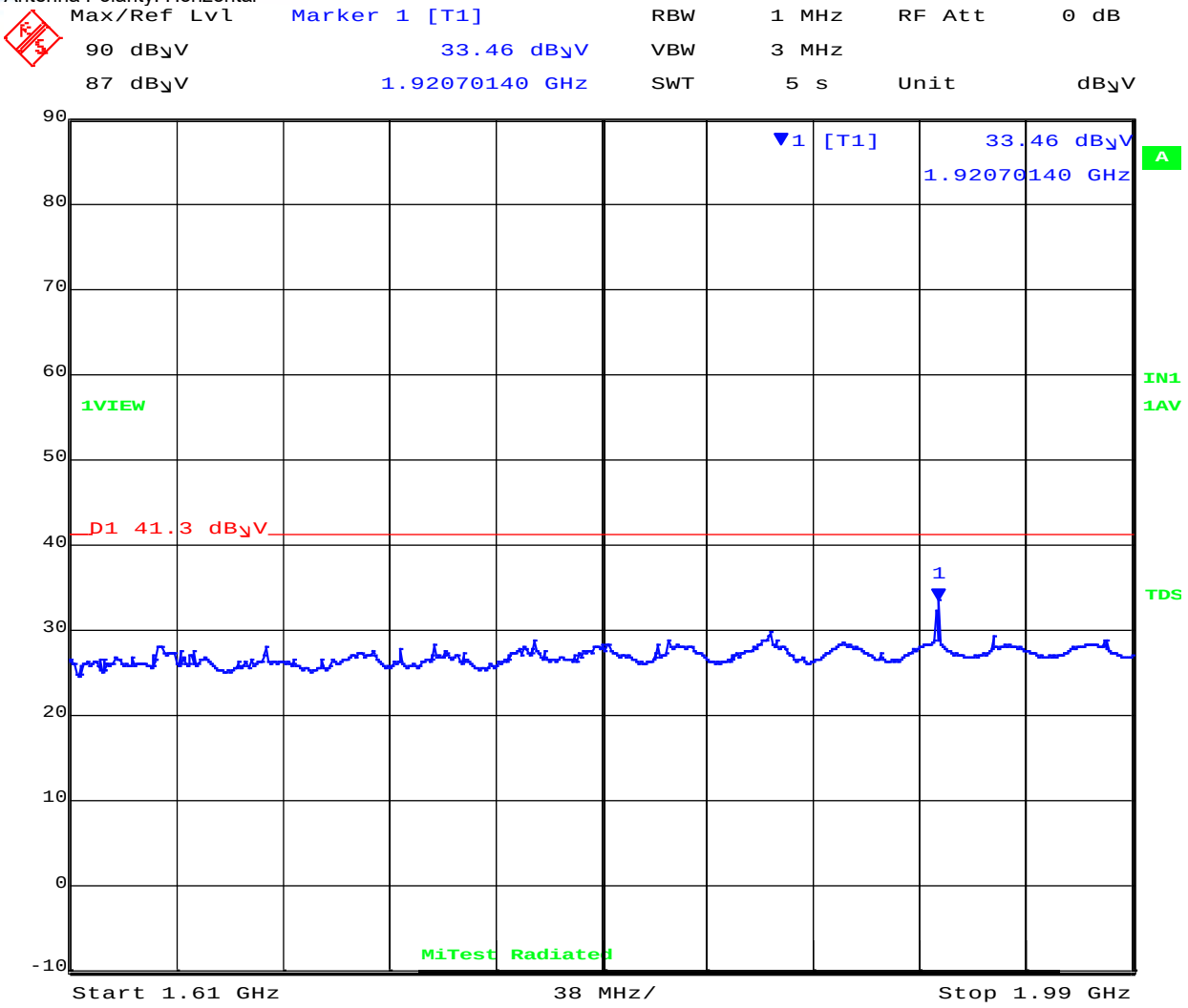
Antenna Polarity: Horizontal



Date: 9.MAR.2021 10:29:18

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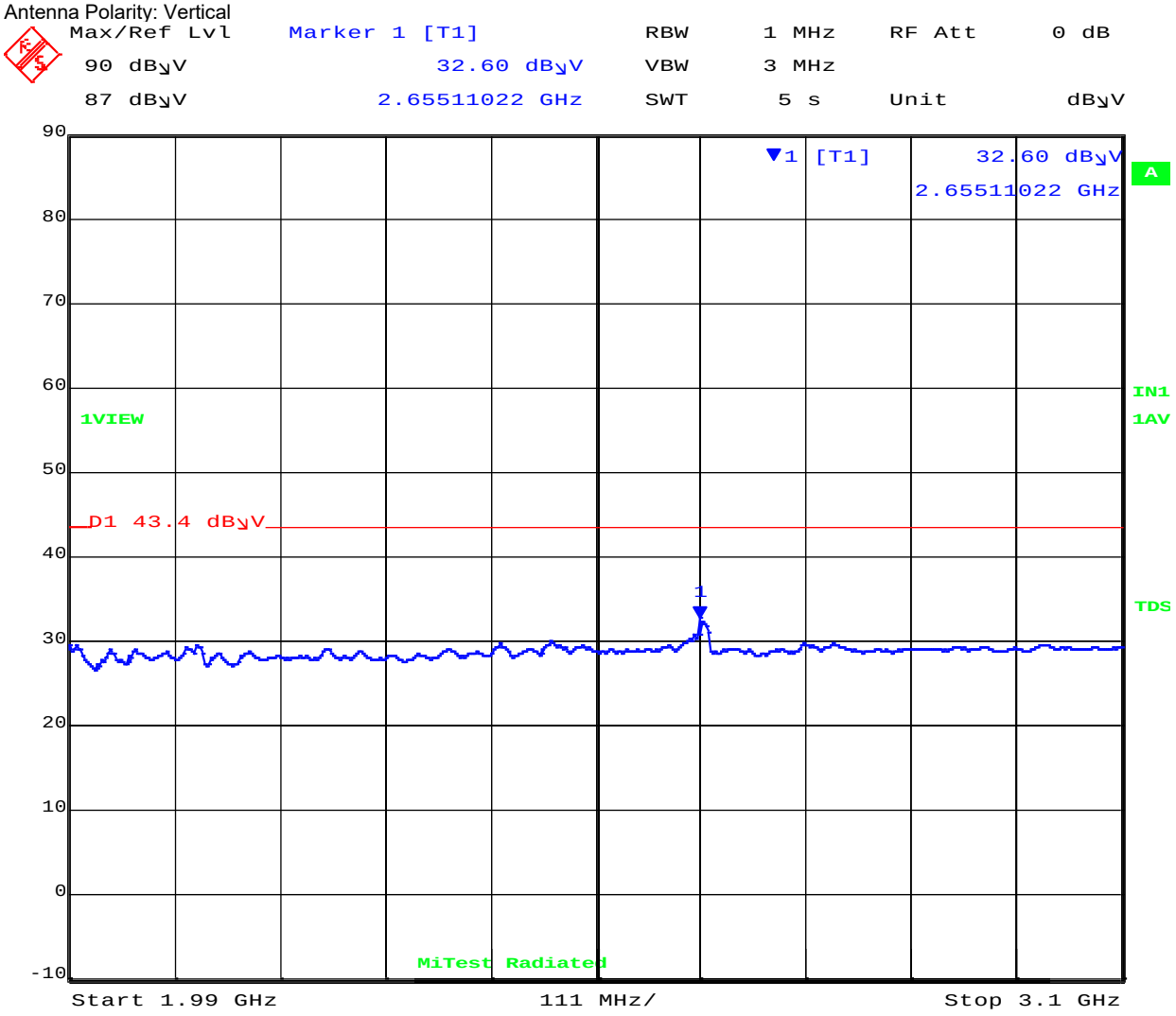
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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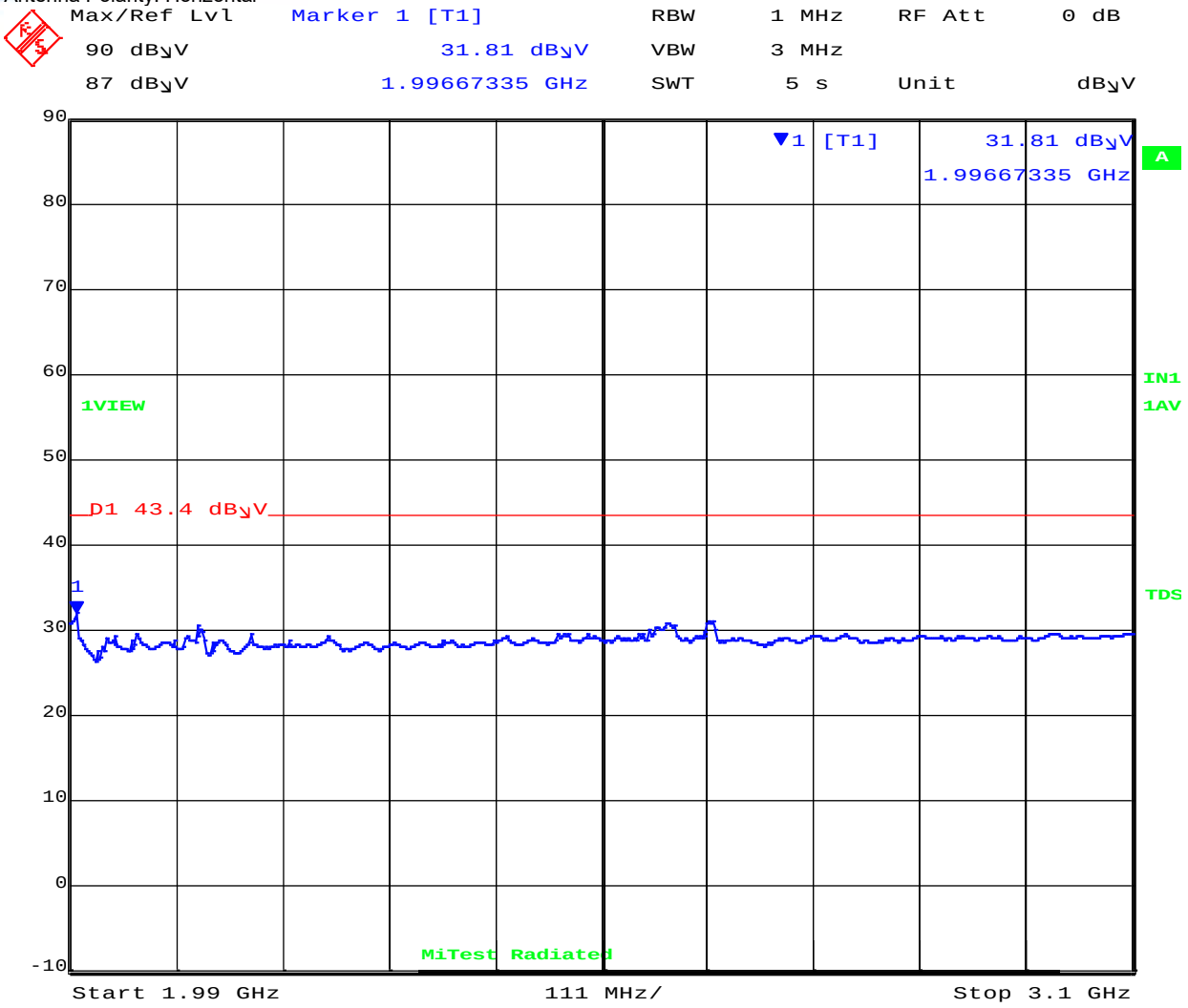
Antenna Polarity: Horizontal



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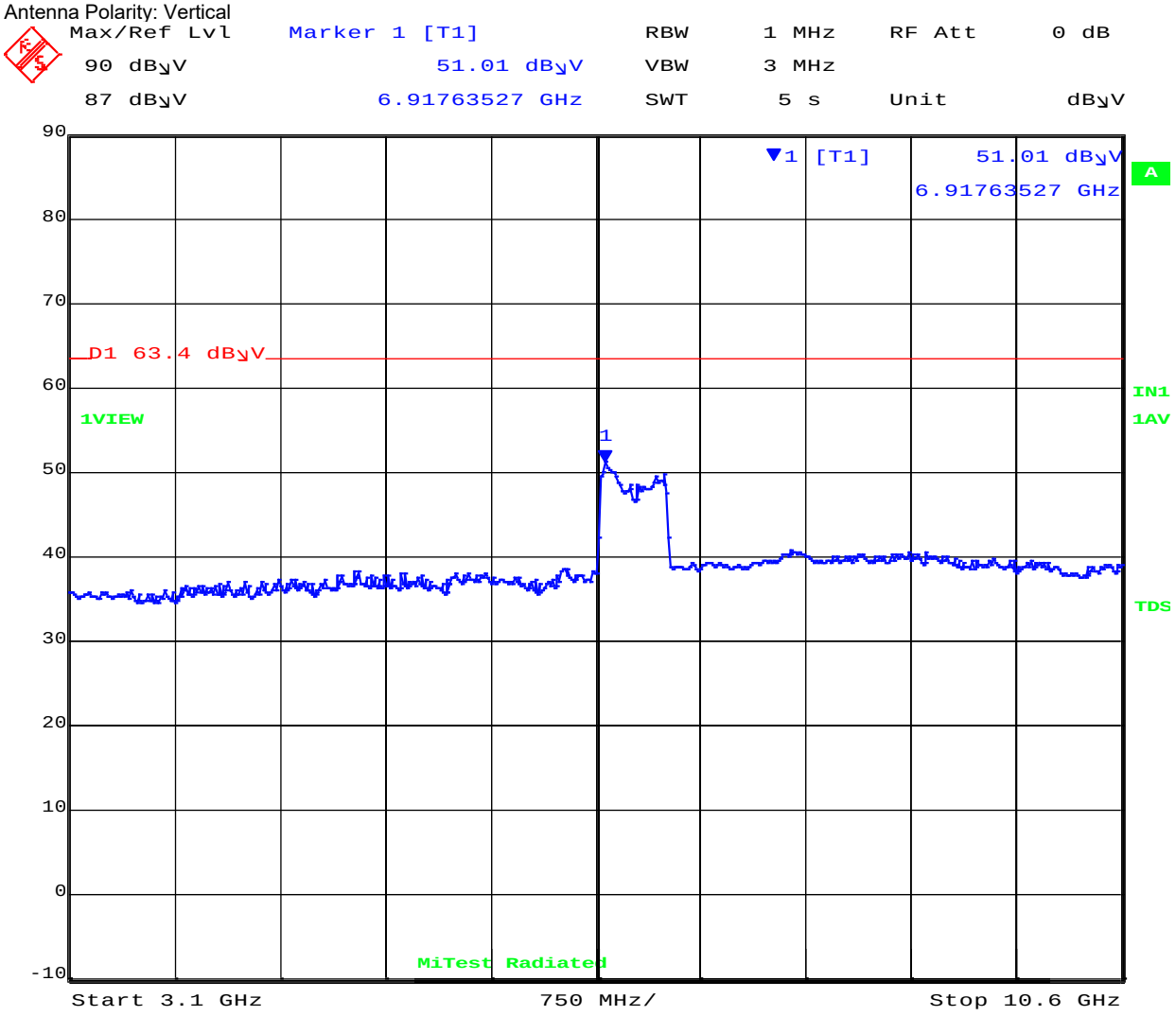
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 10:16:40

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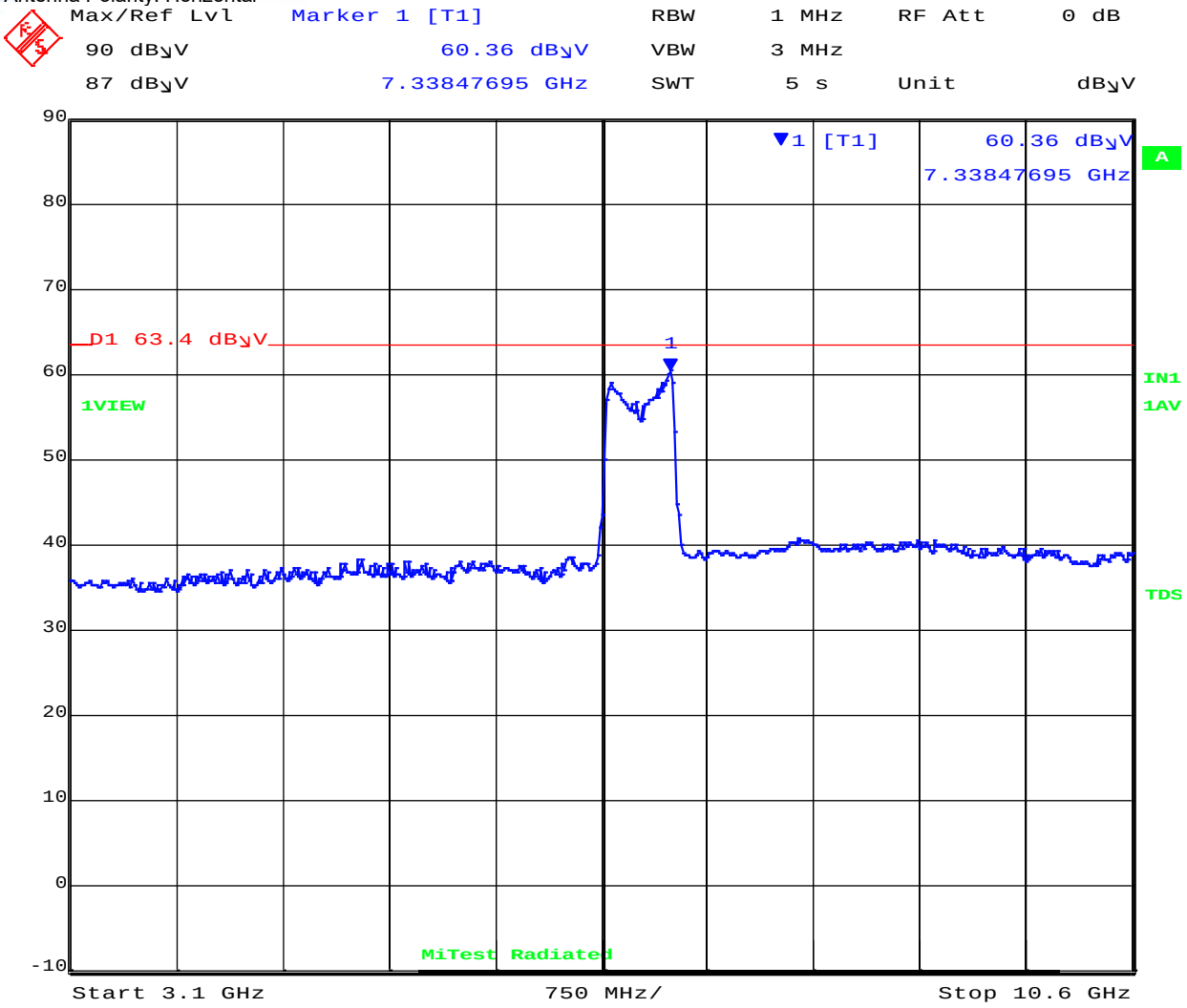
Antenna Polarity: Horizontal



Date: 9.MAR.2021 10:18:56

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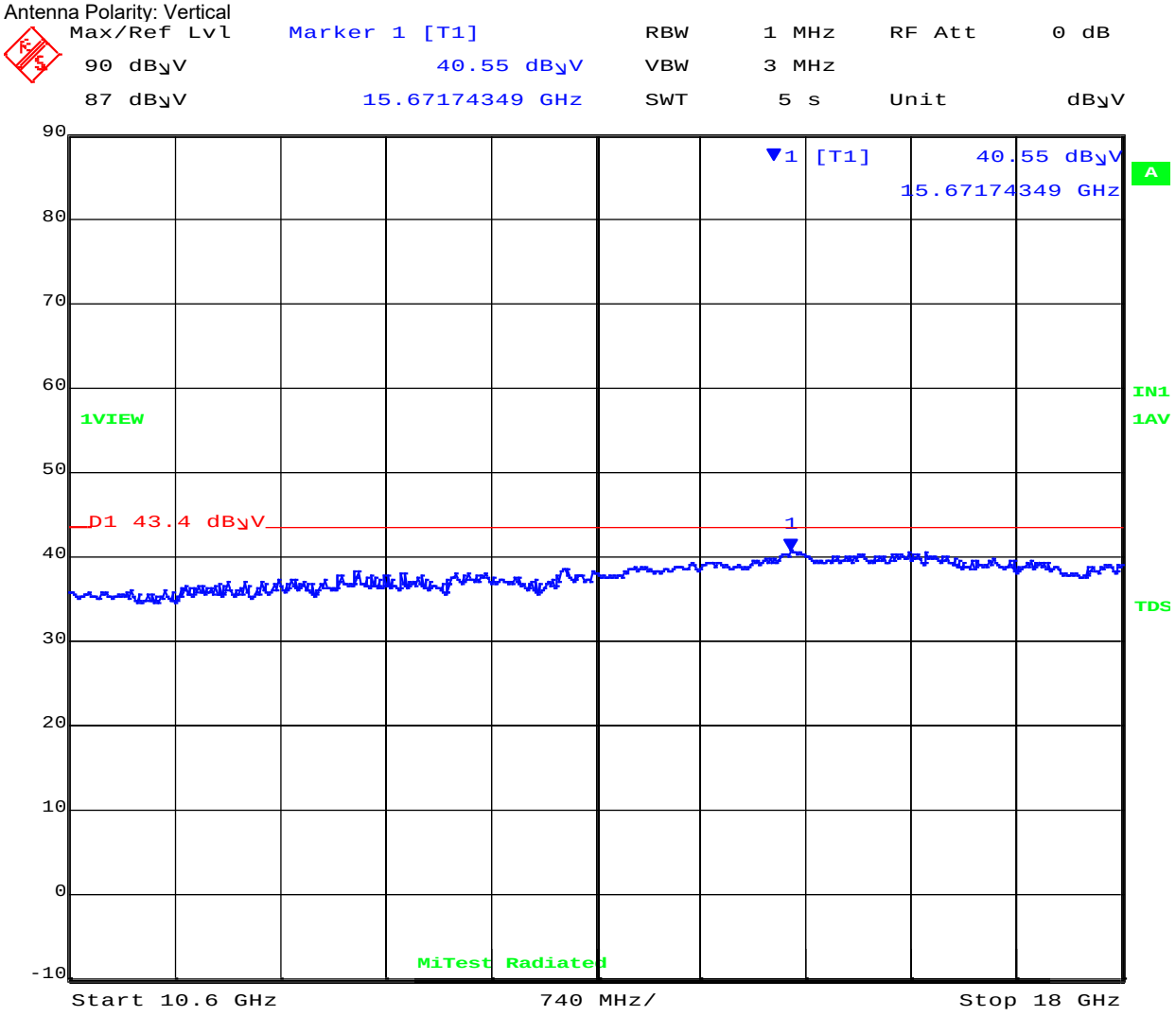
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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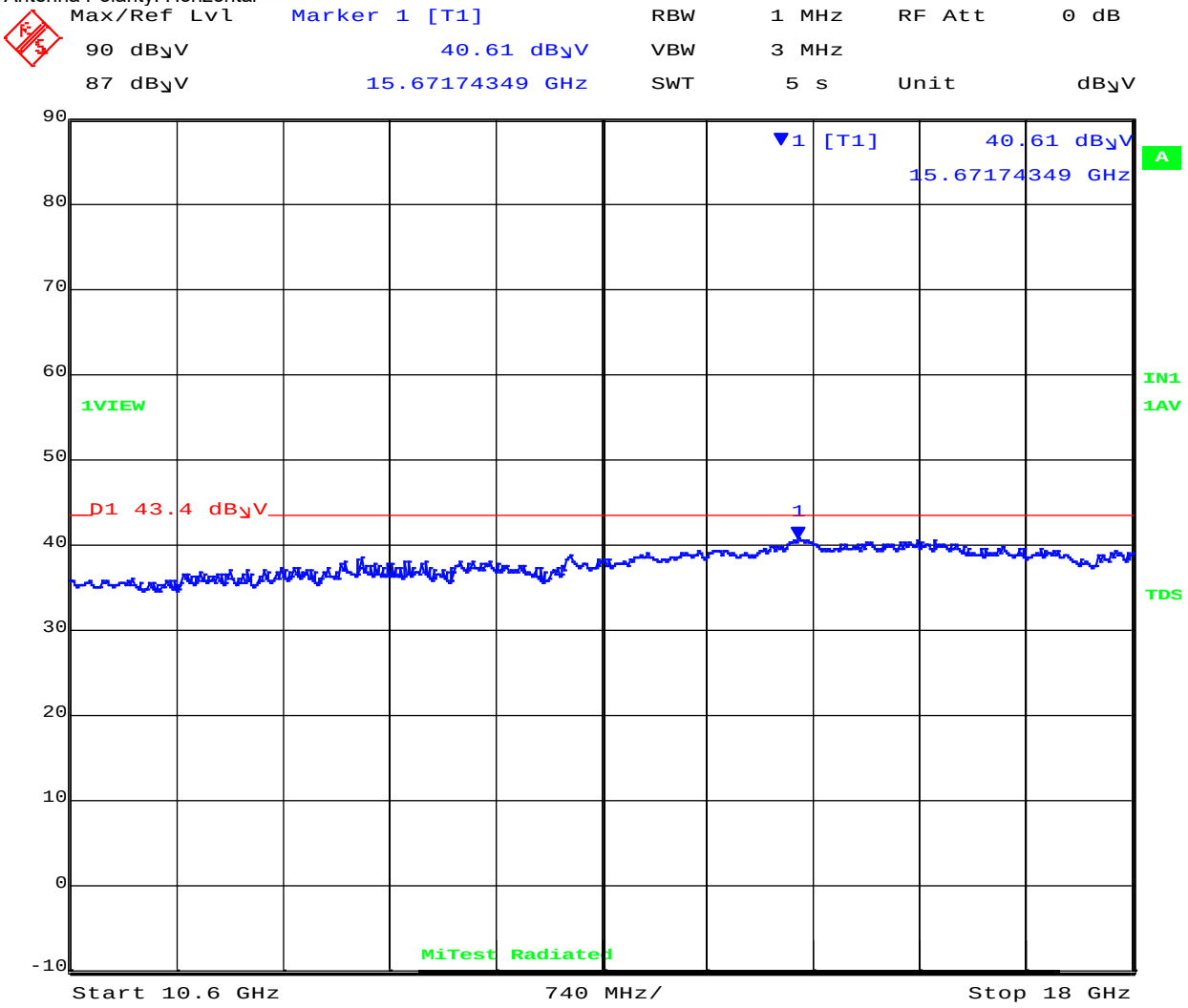
Antenna Polarity: Horizontal



Date: 9.MAR.2021 10:12:21

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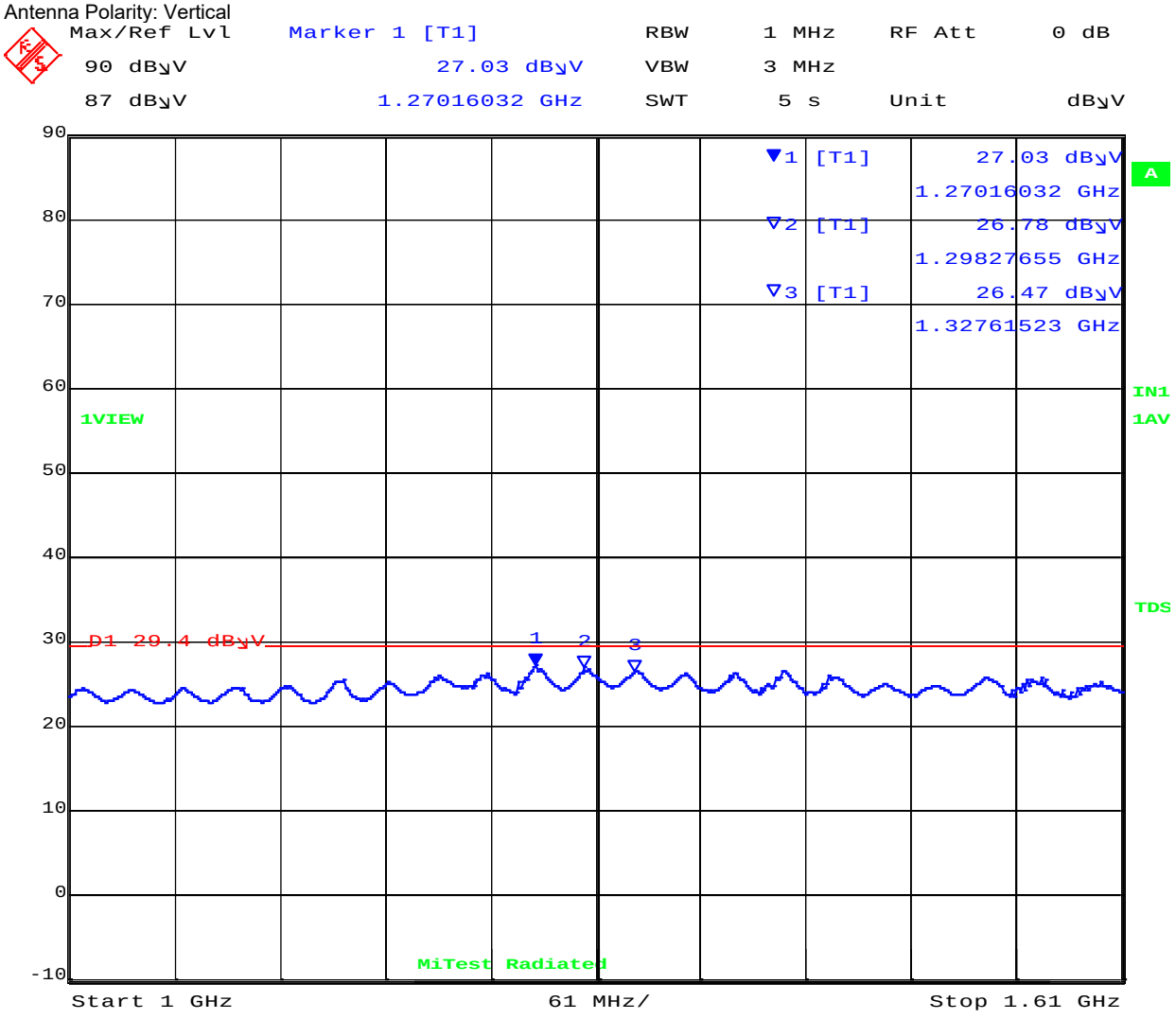
A.1.3 Band 3 & 6

RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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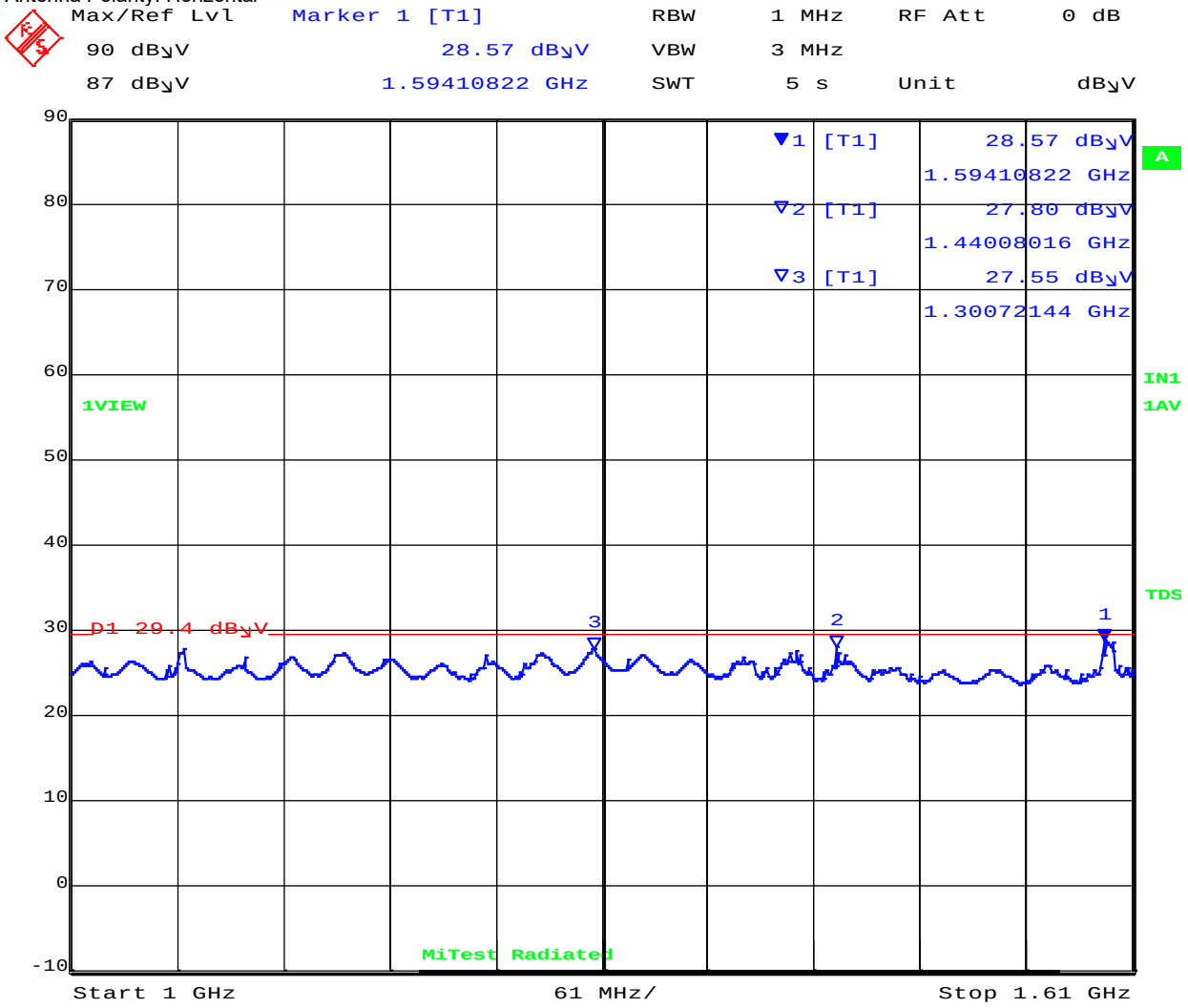
Antenna Polarity: Horizontal



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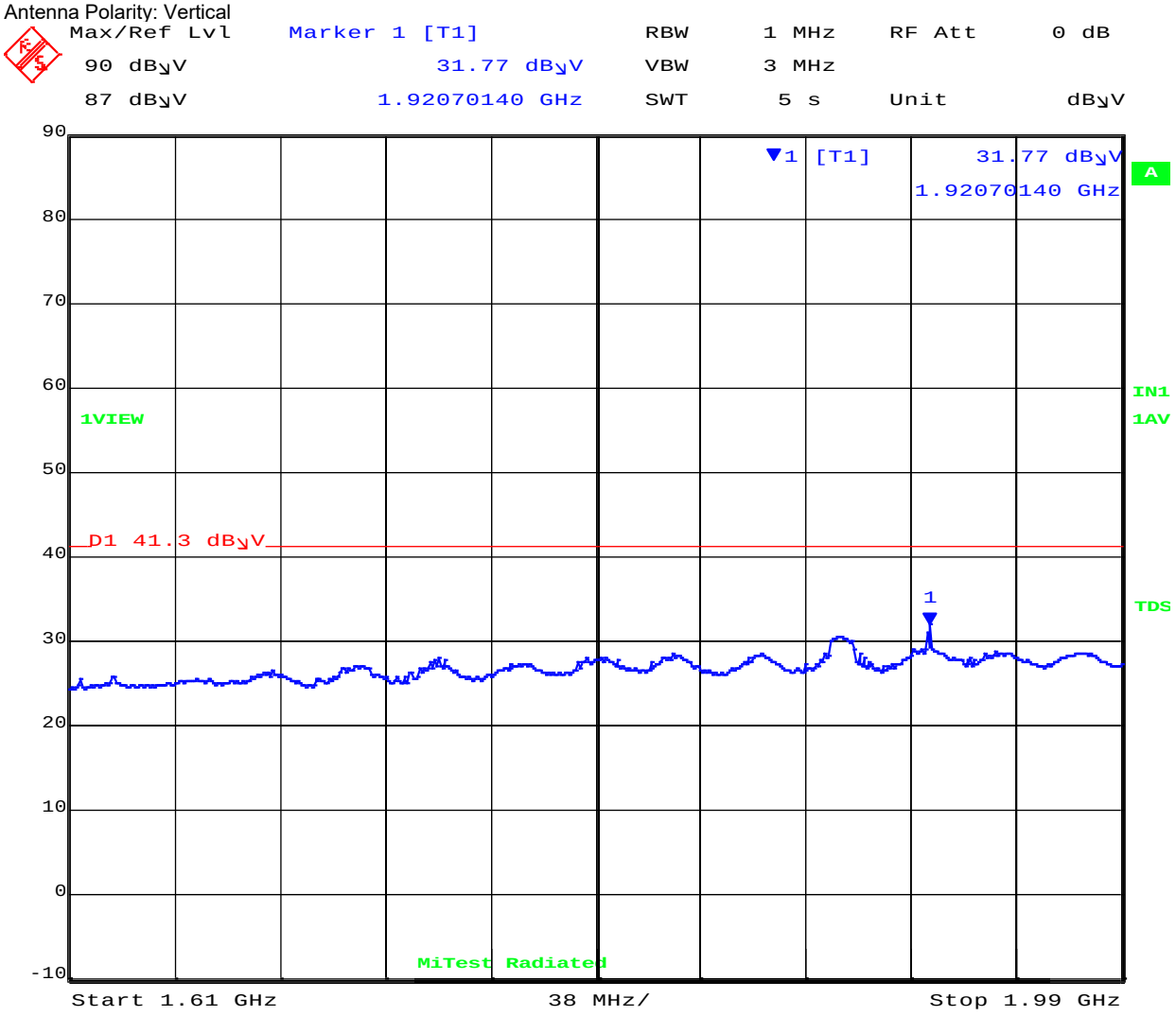
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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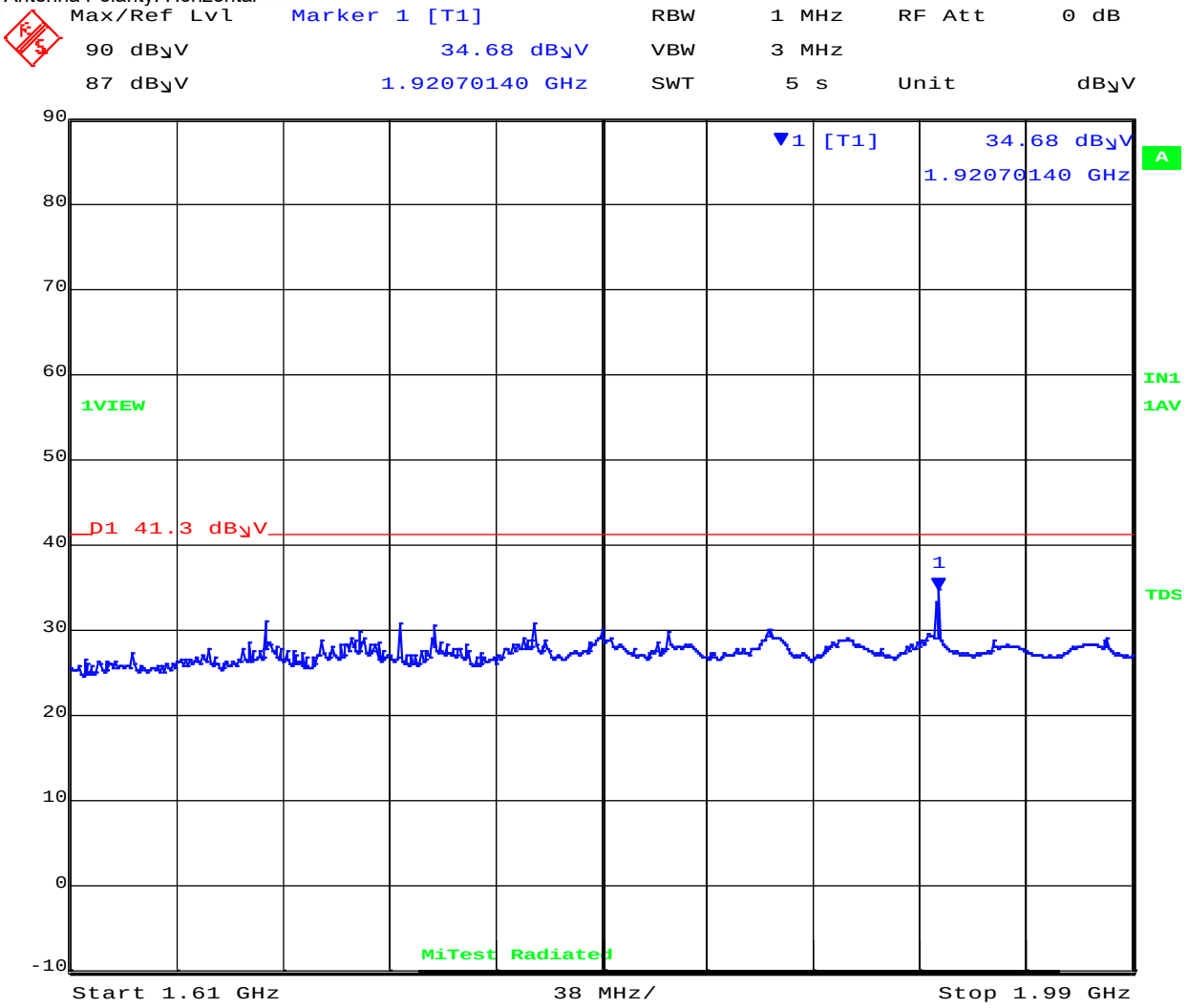
Antenna Polarity: Horizontal



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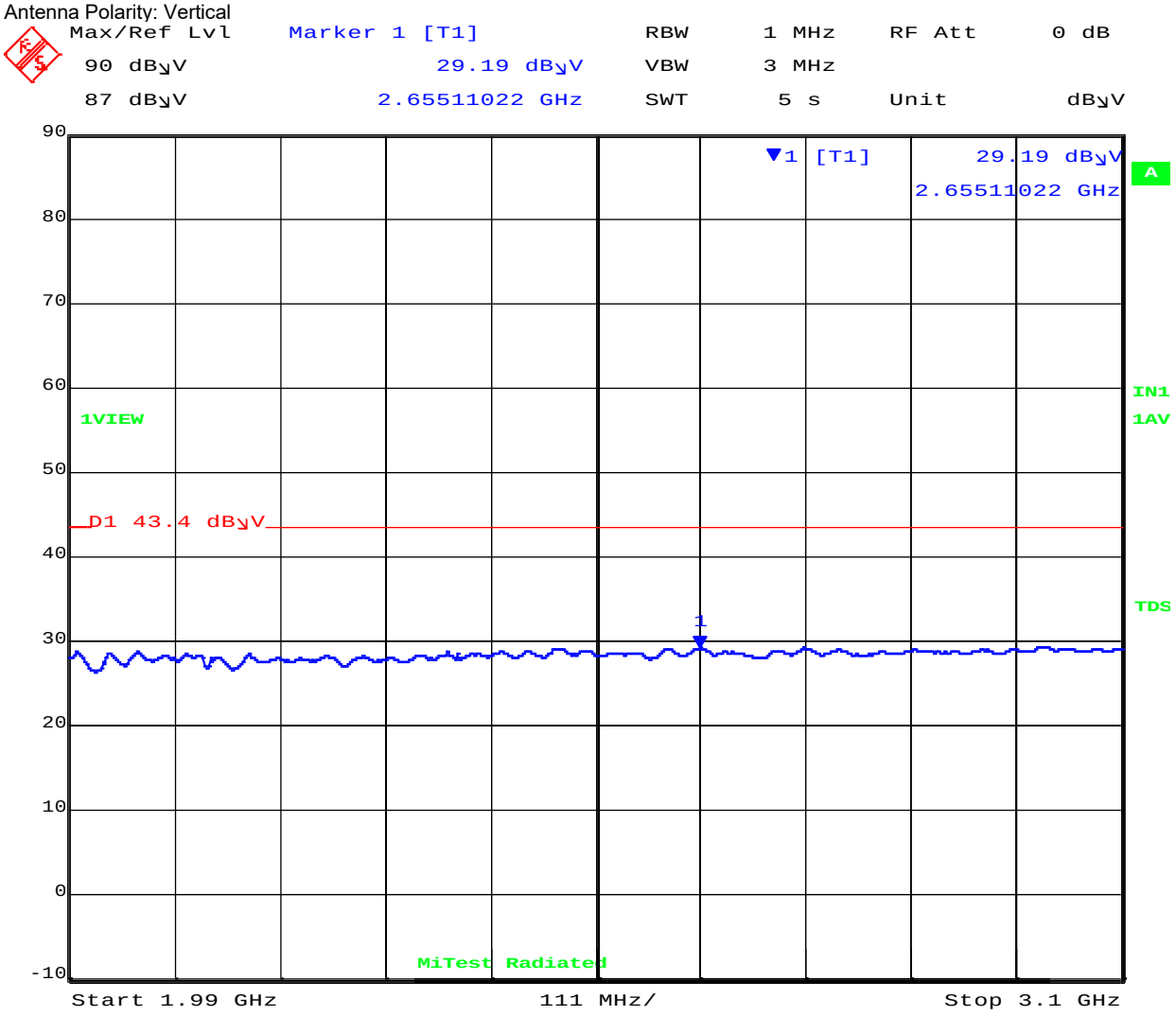
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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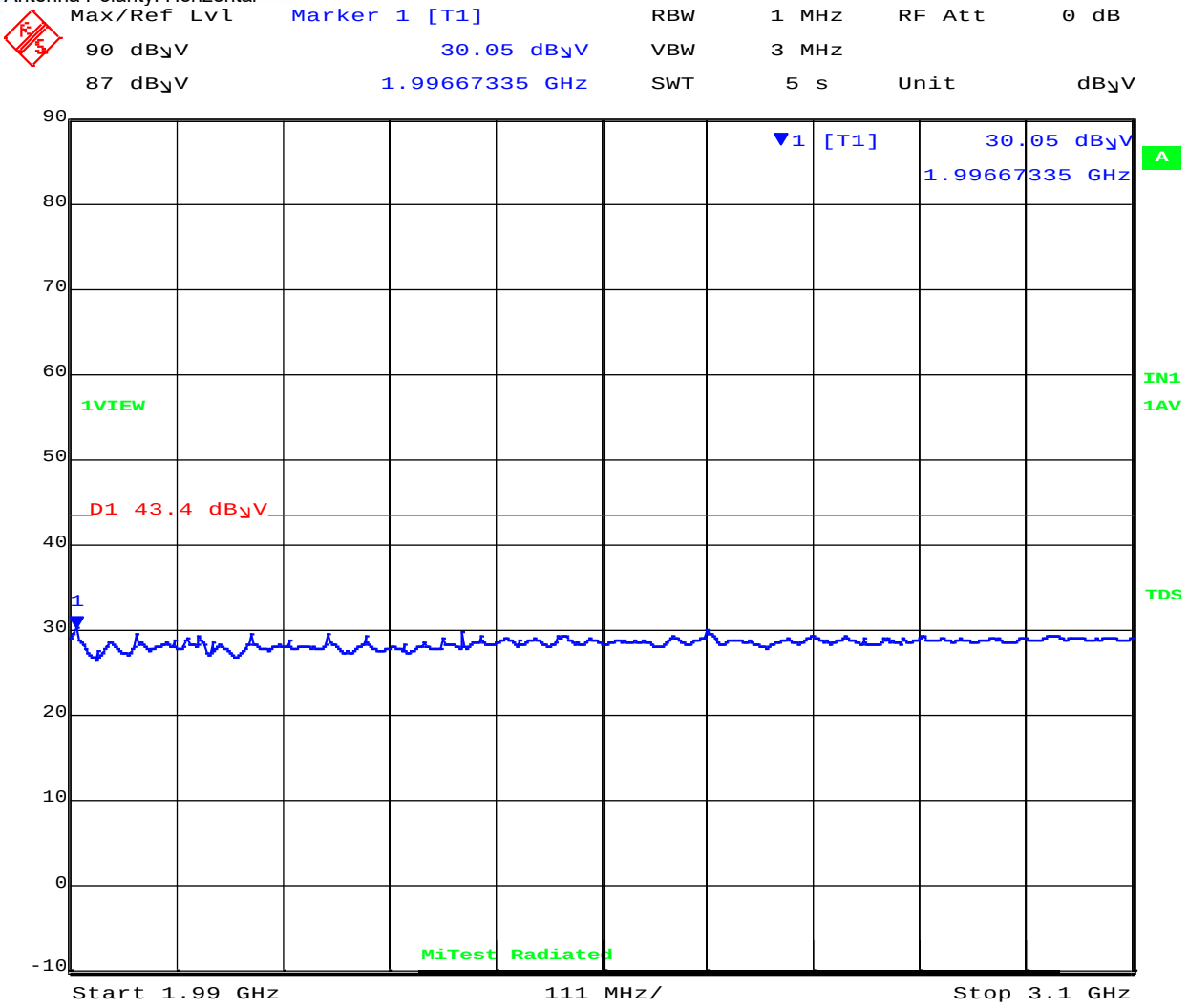
Antenna Polarity: Horizontal



Date: 9.MAR.2021 11:33:10

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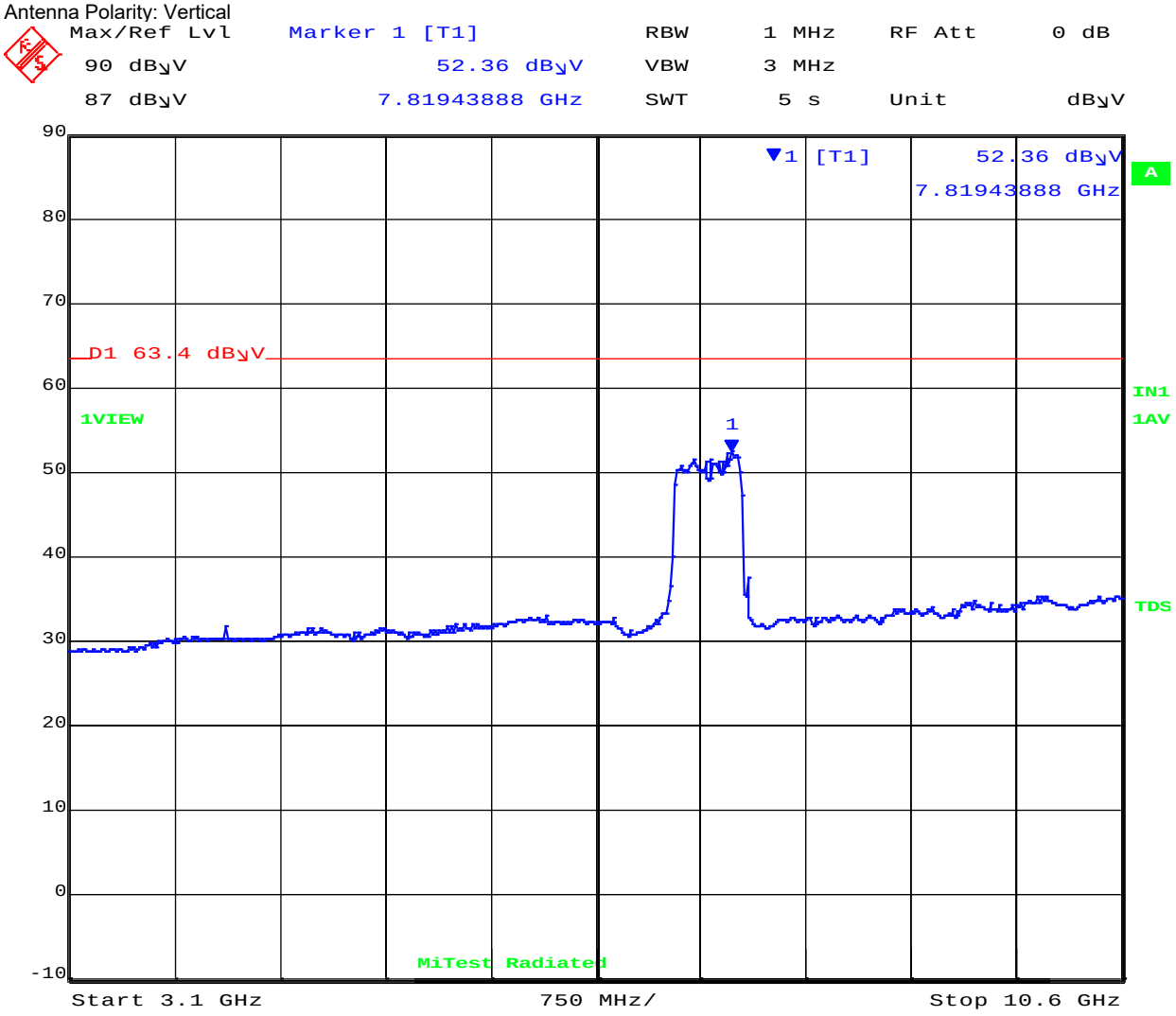
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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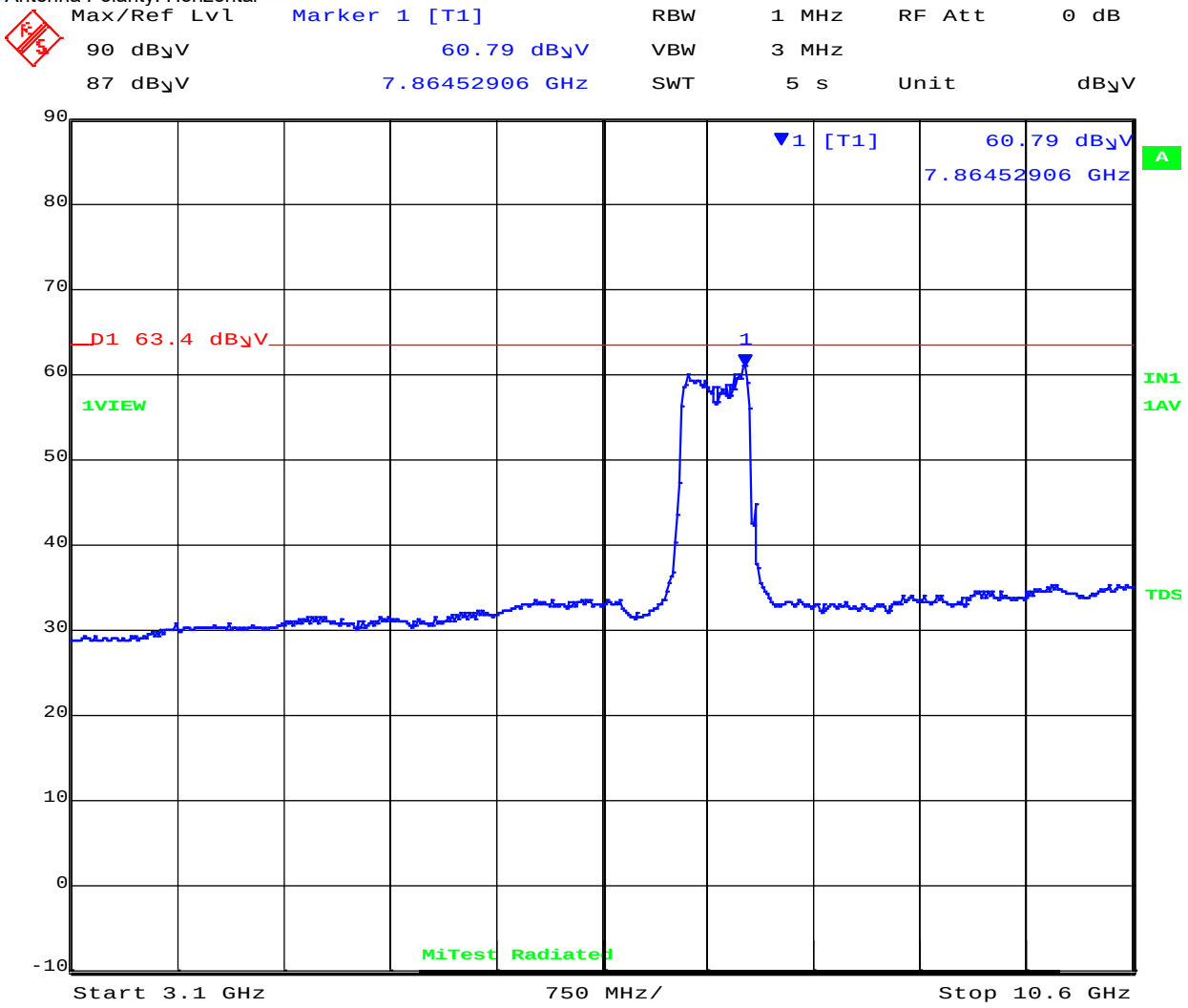
Antenna Polarity: Horizontal



Date: 9.MAR.2021 11:36:13

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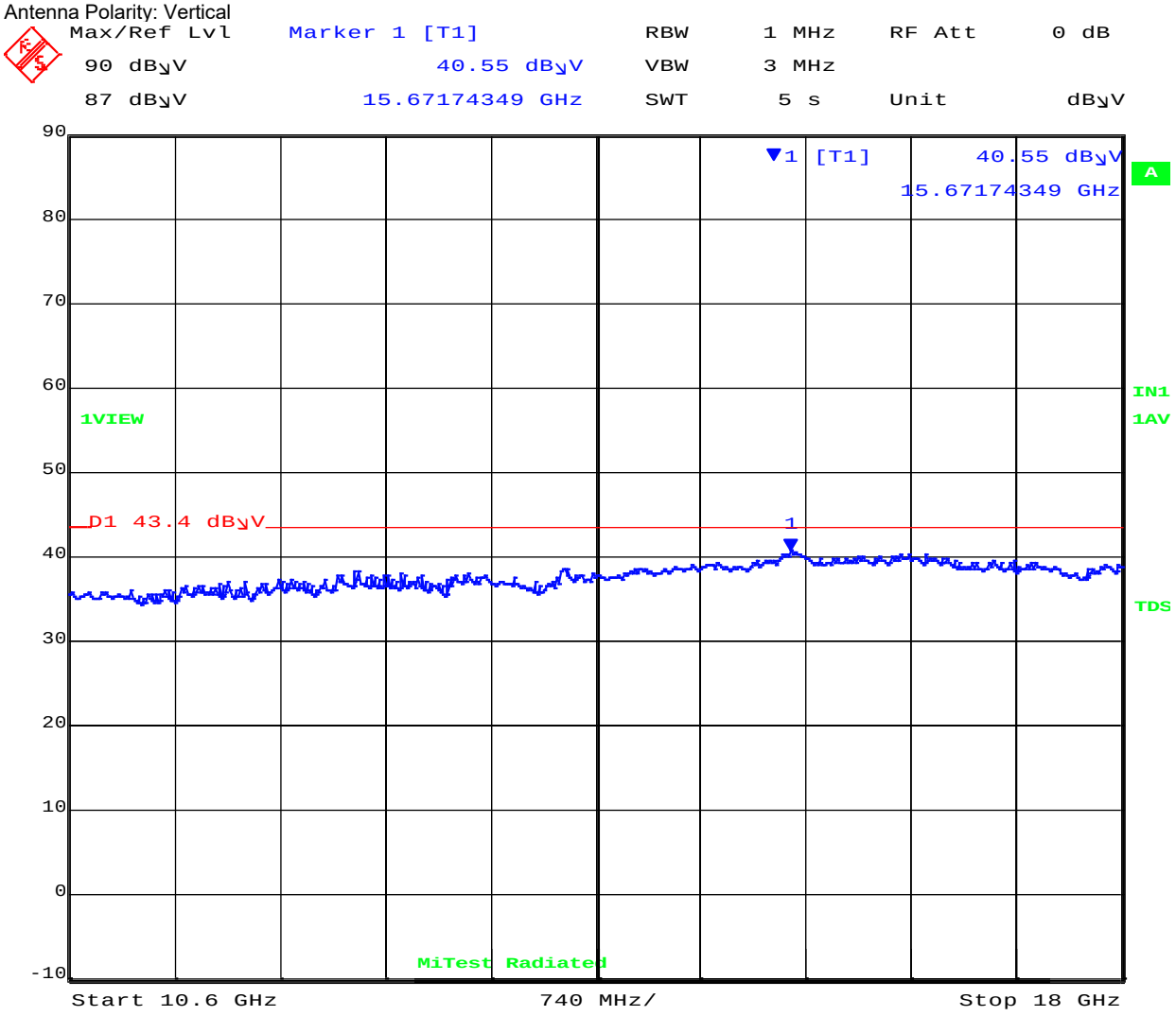
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 11:39:07

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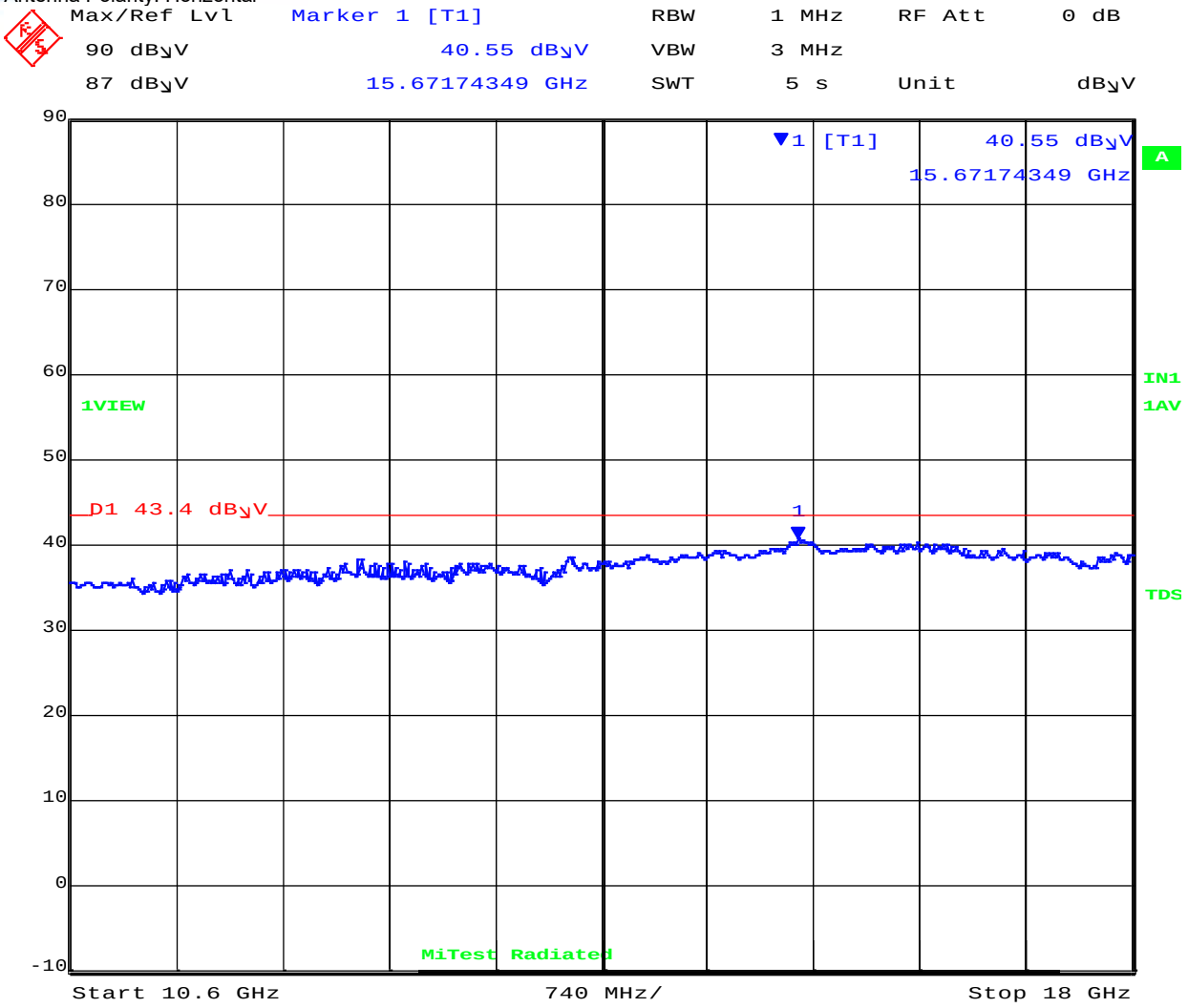
Antenna Polarity: Horizontal



Date: 9.MAR.2021 11:40:07

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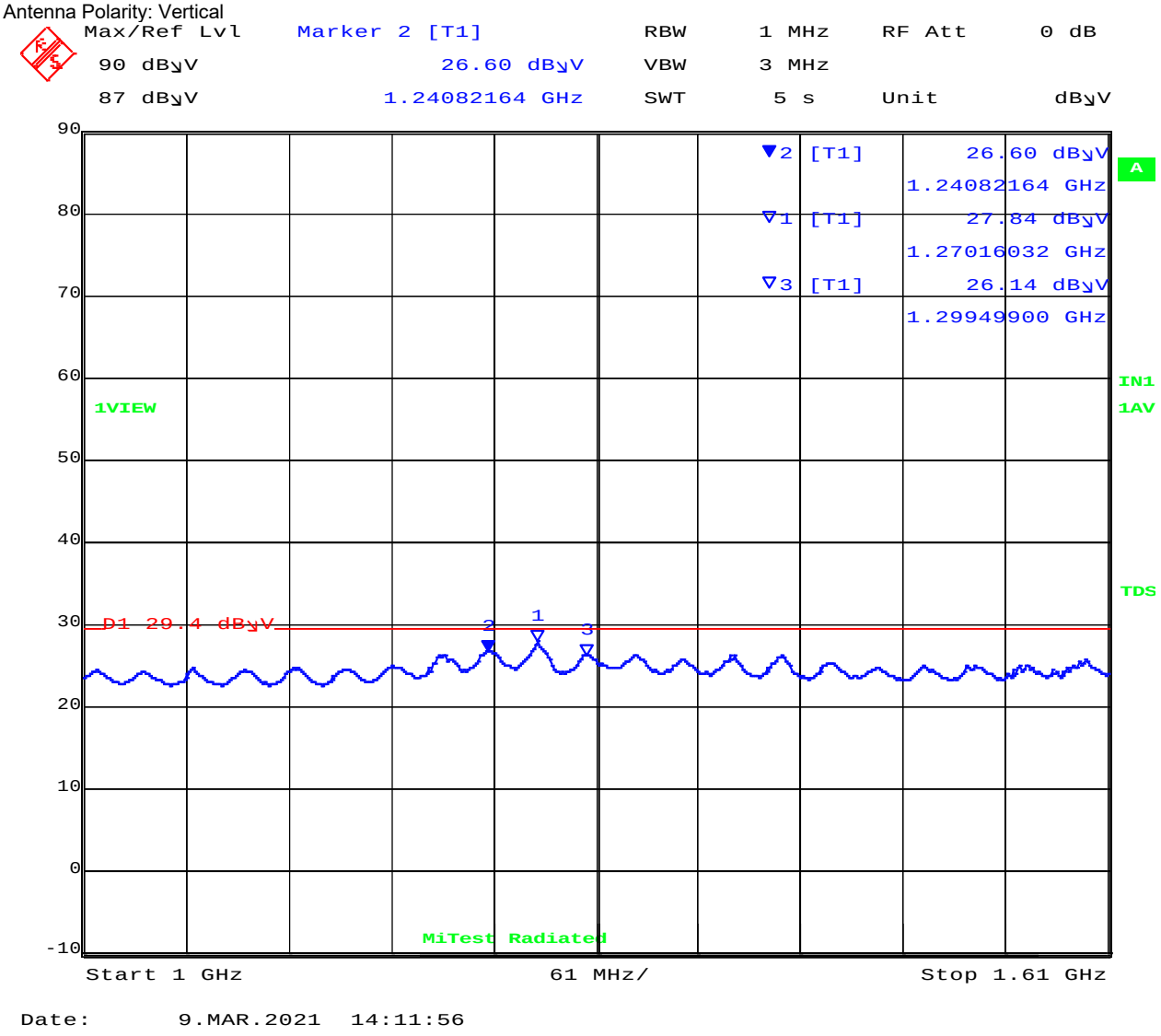
A.1.4 Band 6

RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 14:11:56

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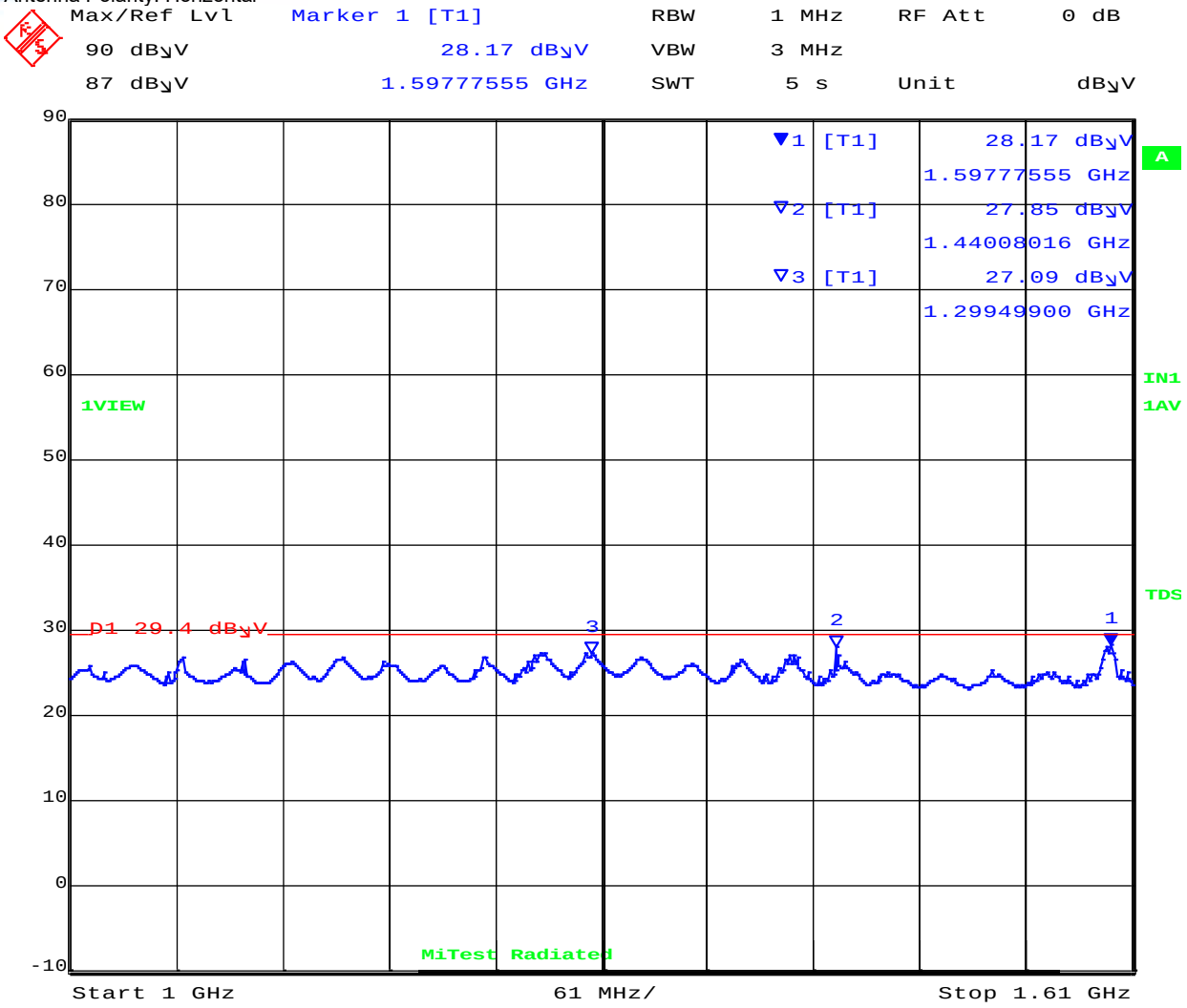
Antenna Polarity: Horizontal



Date: 9.MAR.2021 14:10:13

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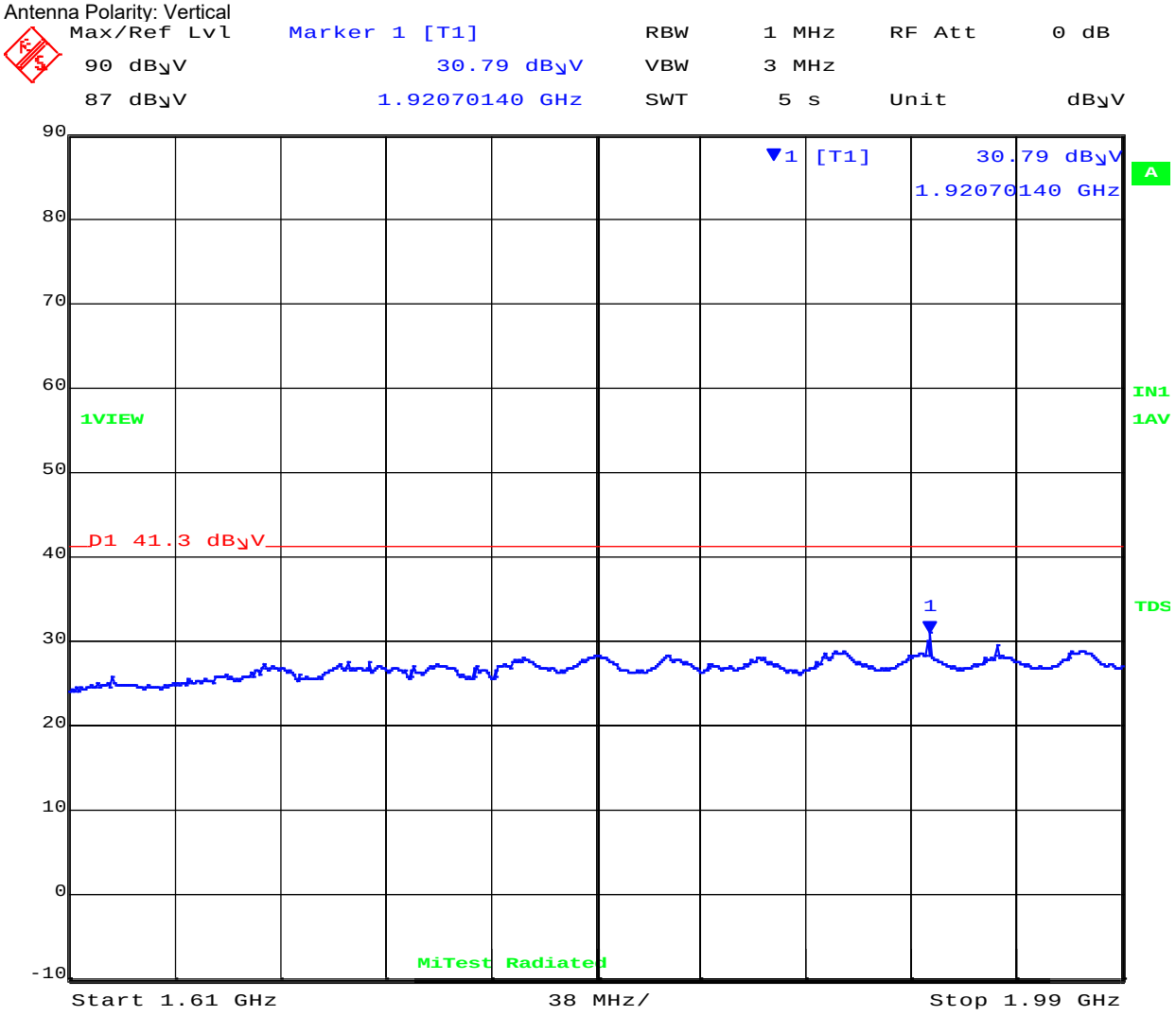
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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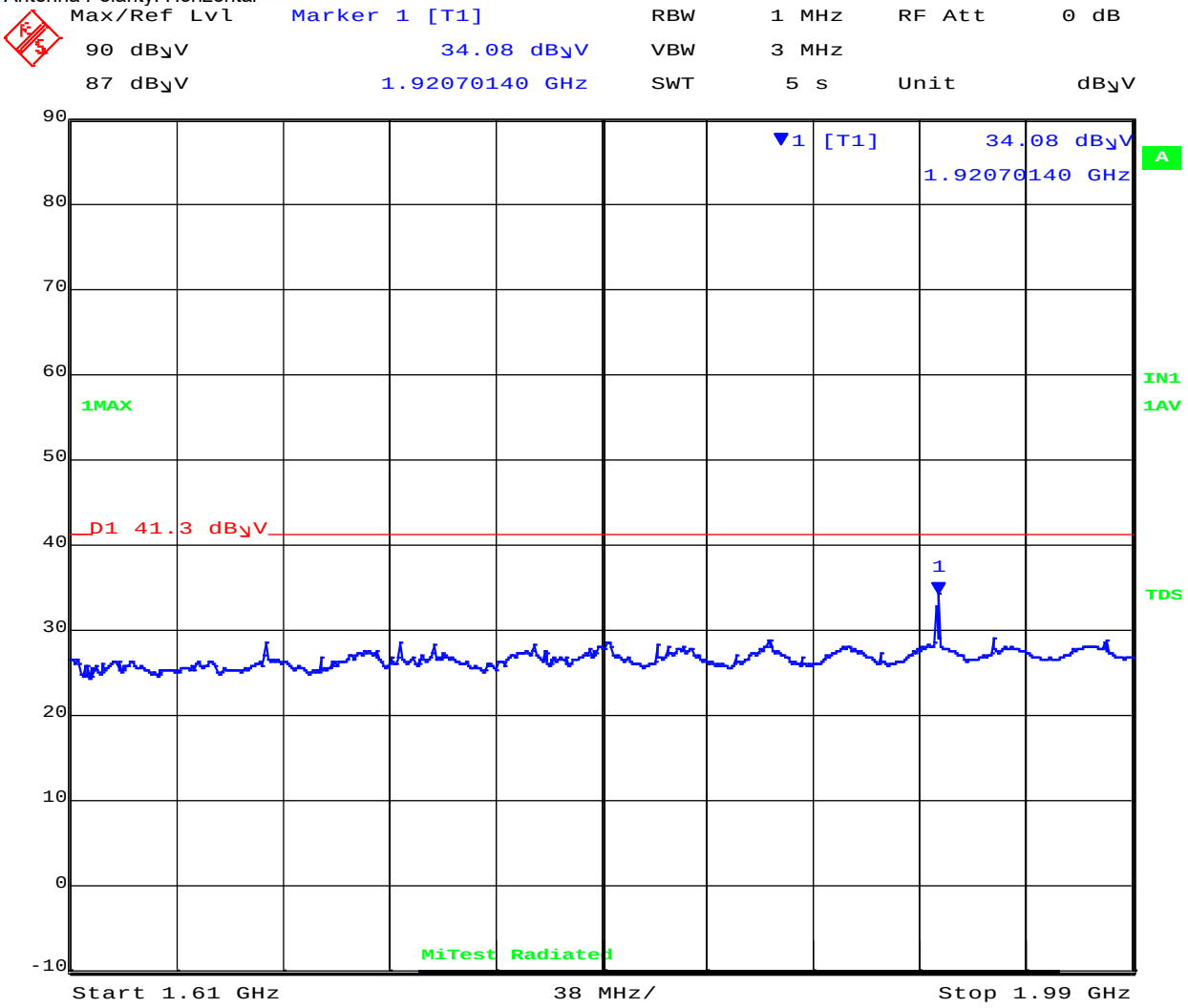
Antenna Polarity: Horizontal



Date: 9.MAR.2021 14:05:20

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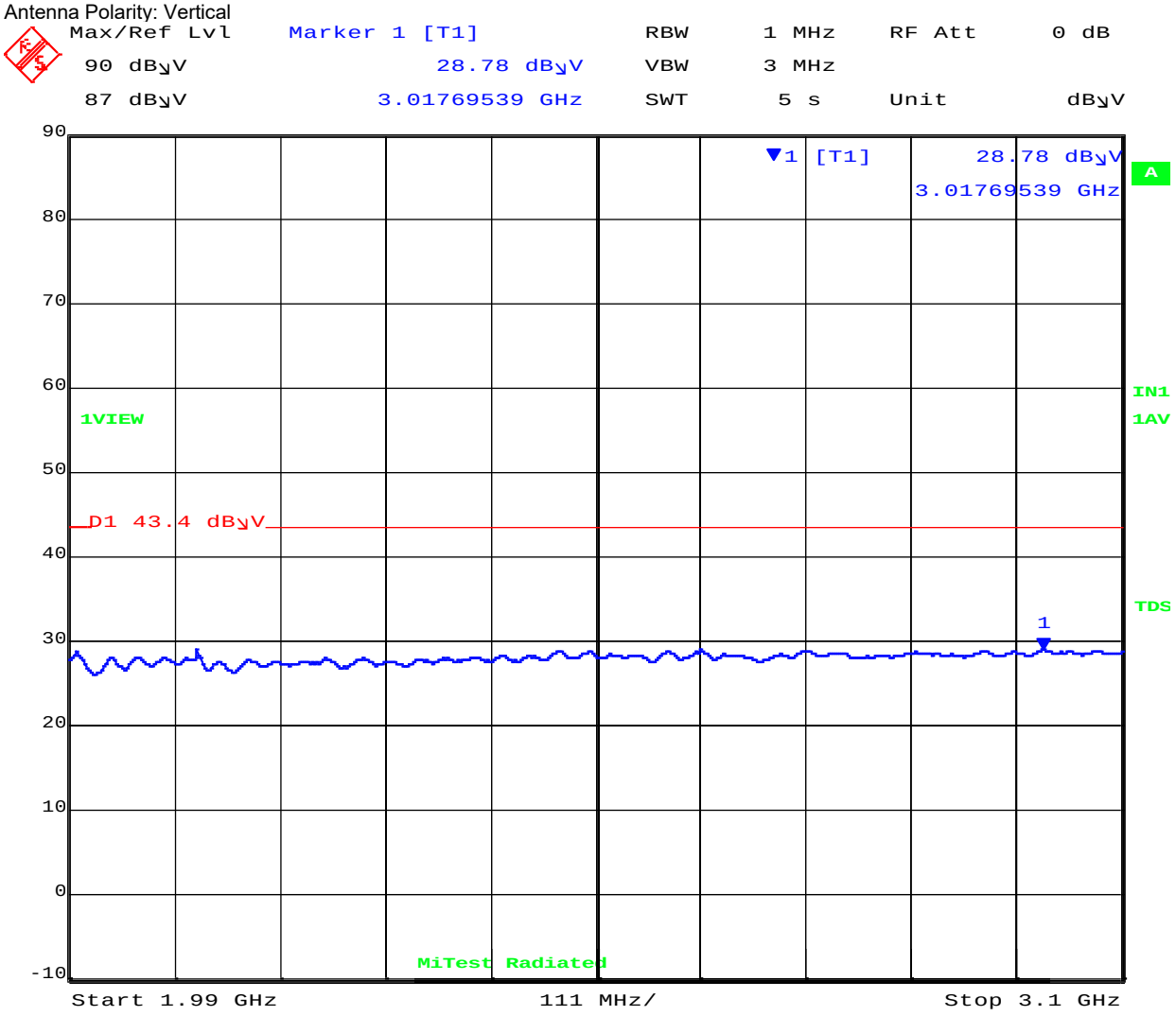
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 14:01:44

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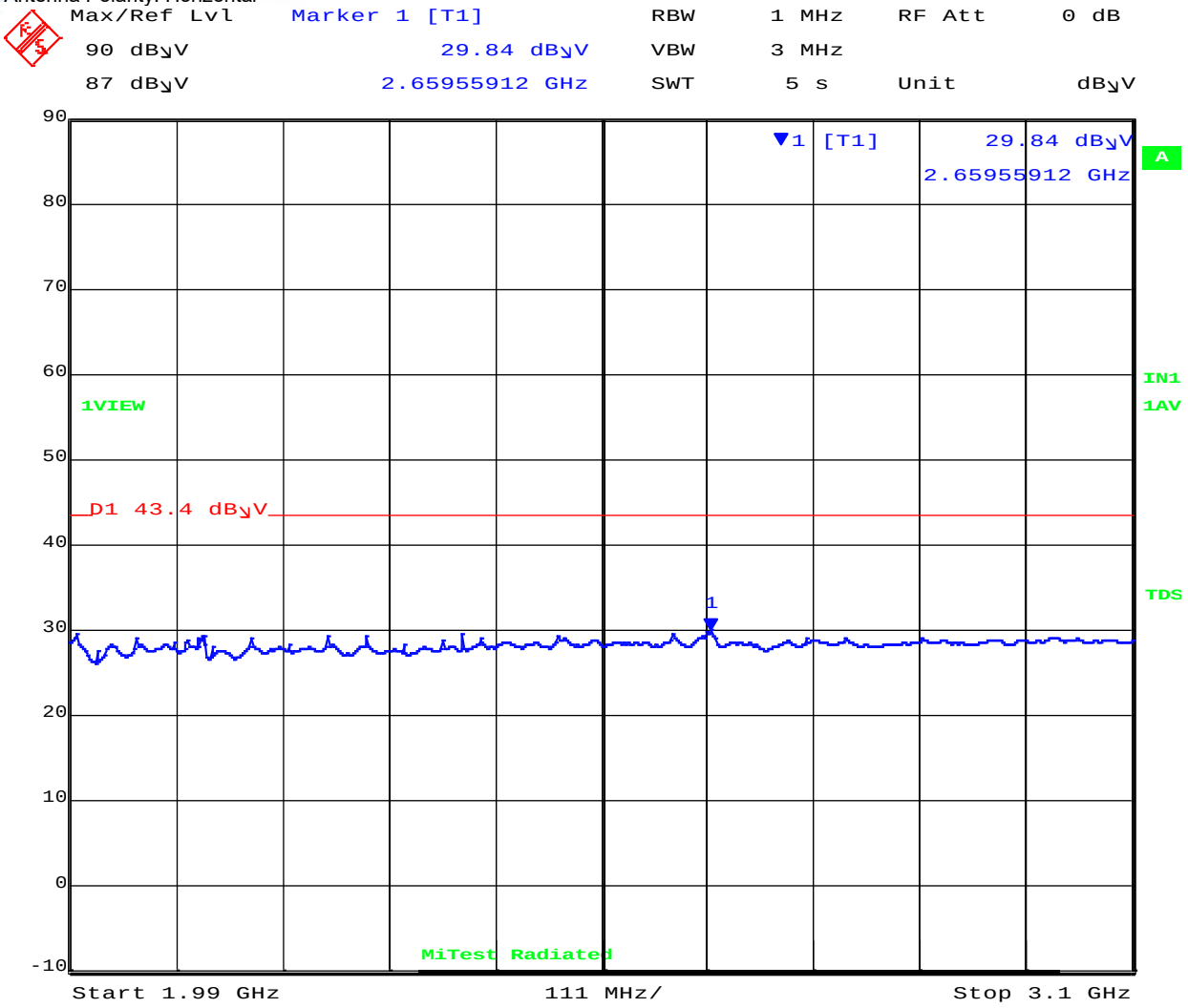
Antenna Polarity: Horizontal



Date: 9.MAR.2021 13:59:59

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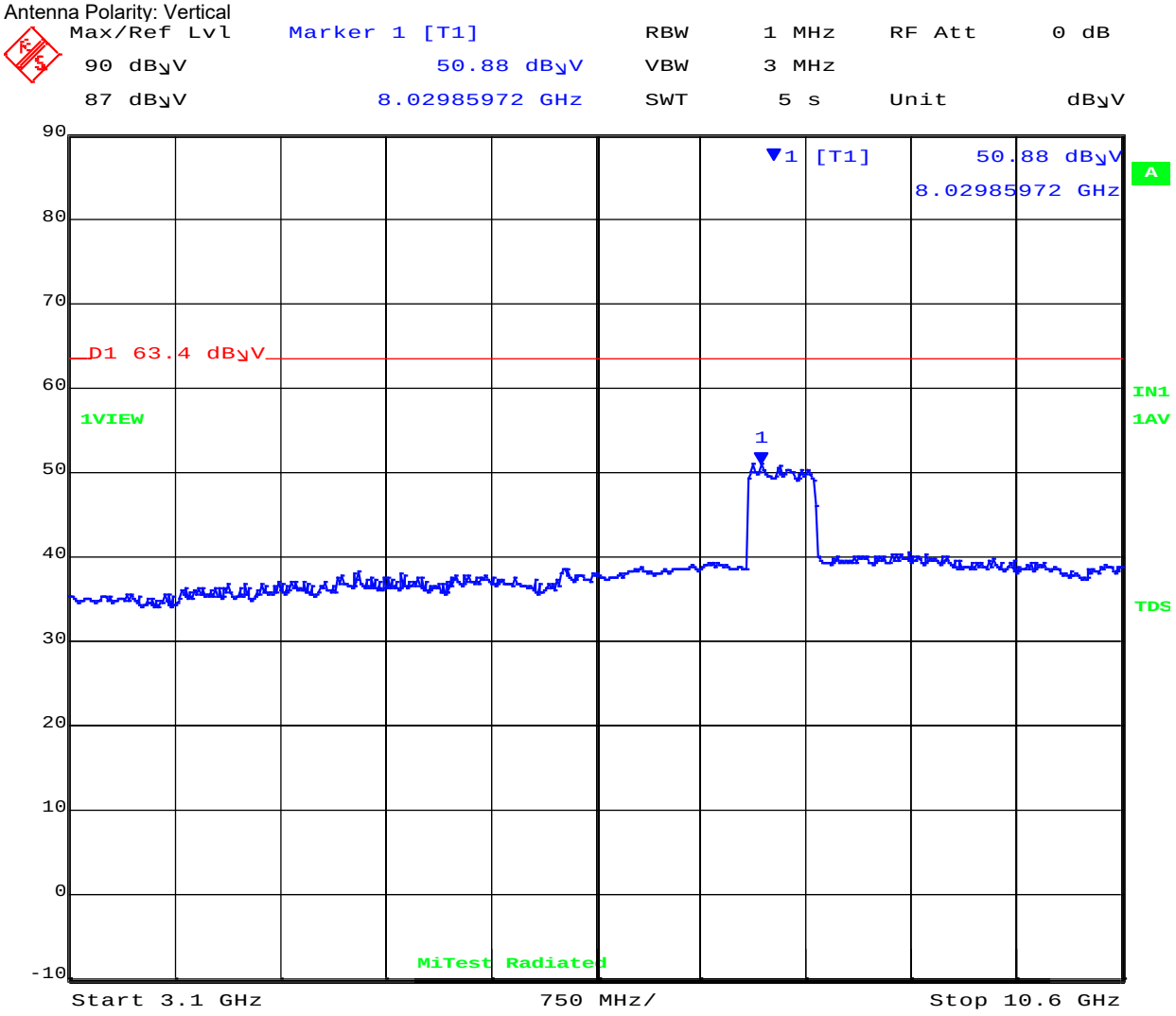
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 13:55:07

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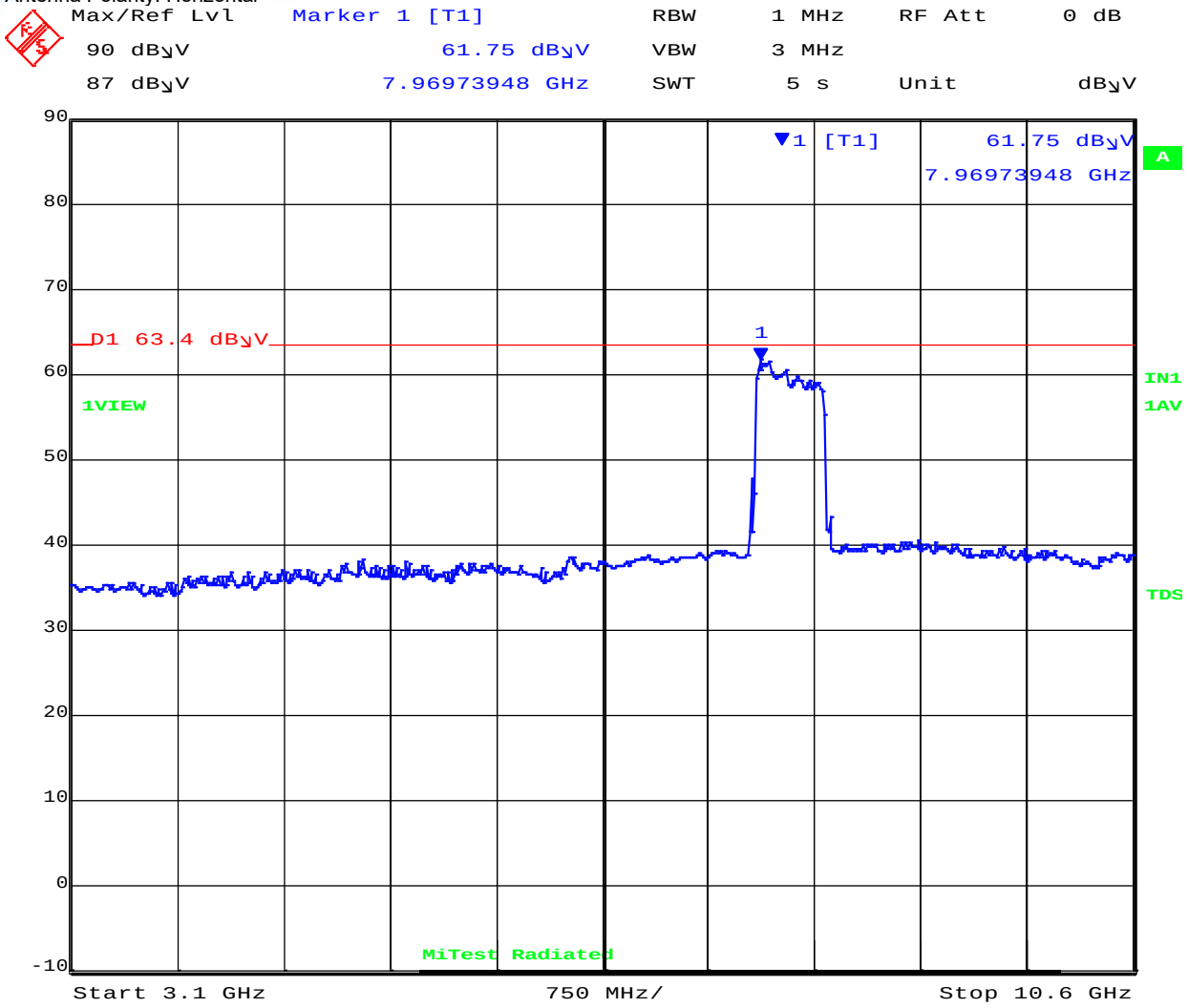
Antenna Polarity: Horizontal



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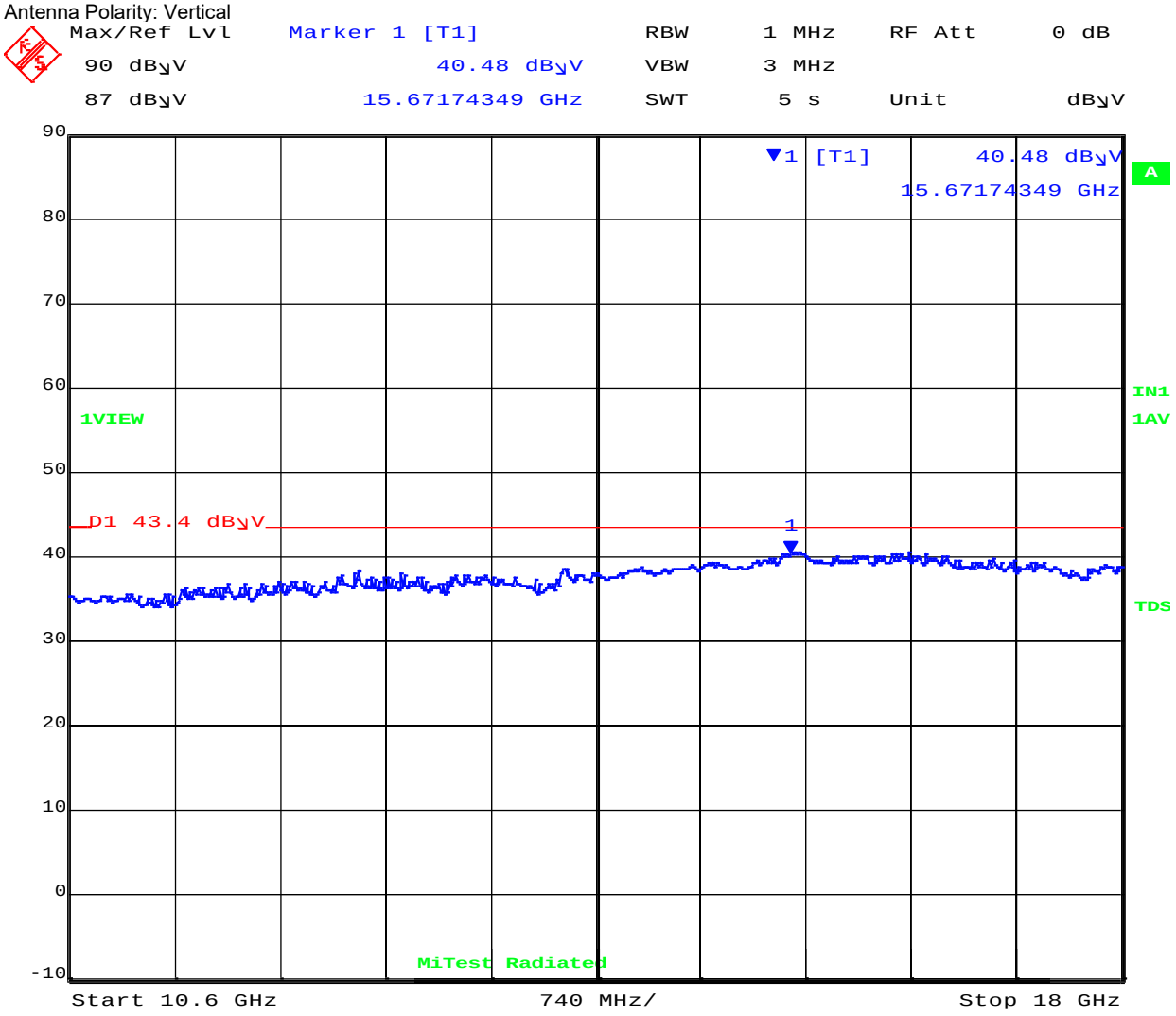
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 13:52:55

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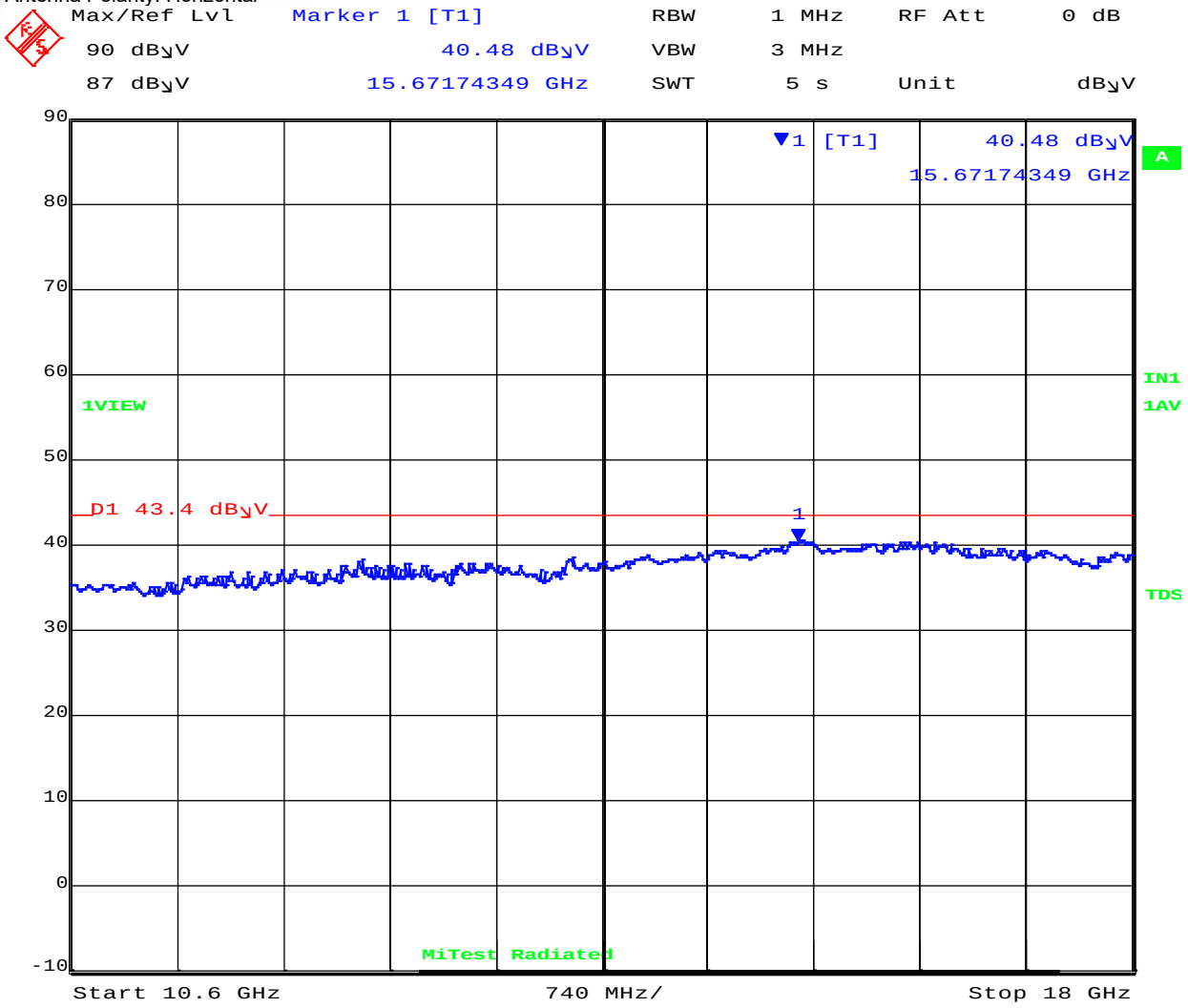
Antenna Polarity: Horizontal



Date: 9.MAR.2021 13:50:52

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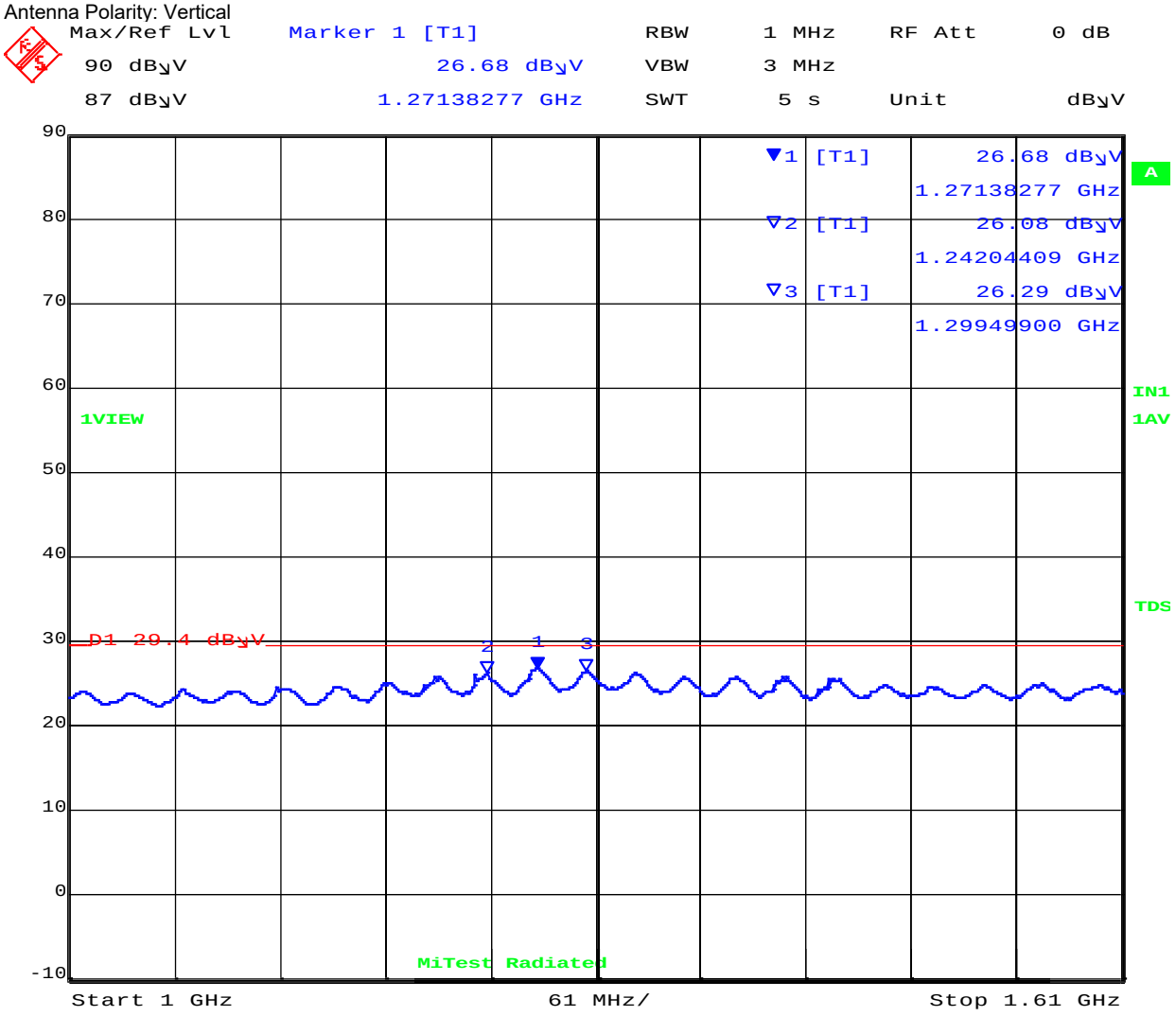
RADIATED SPURIOUS EMISSIONS 1.0-1.61GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 14:42:21

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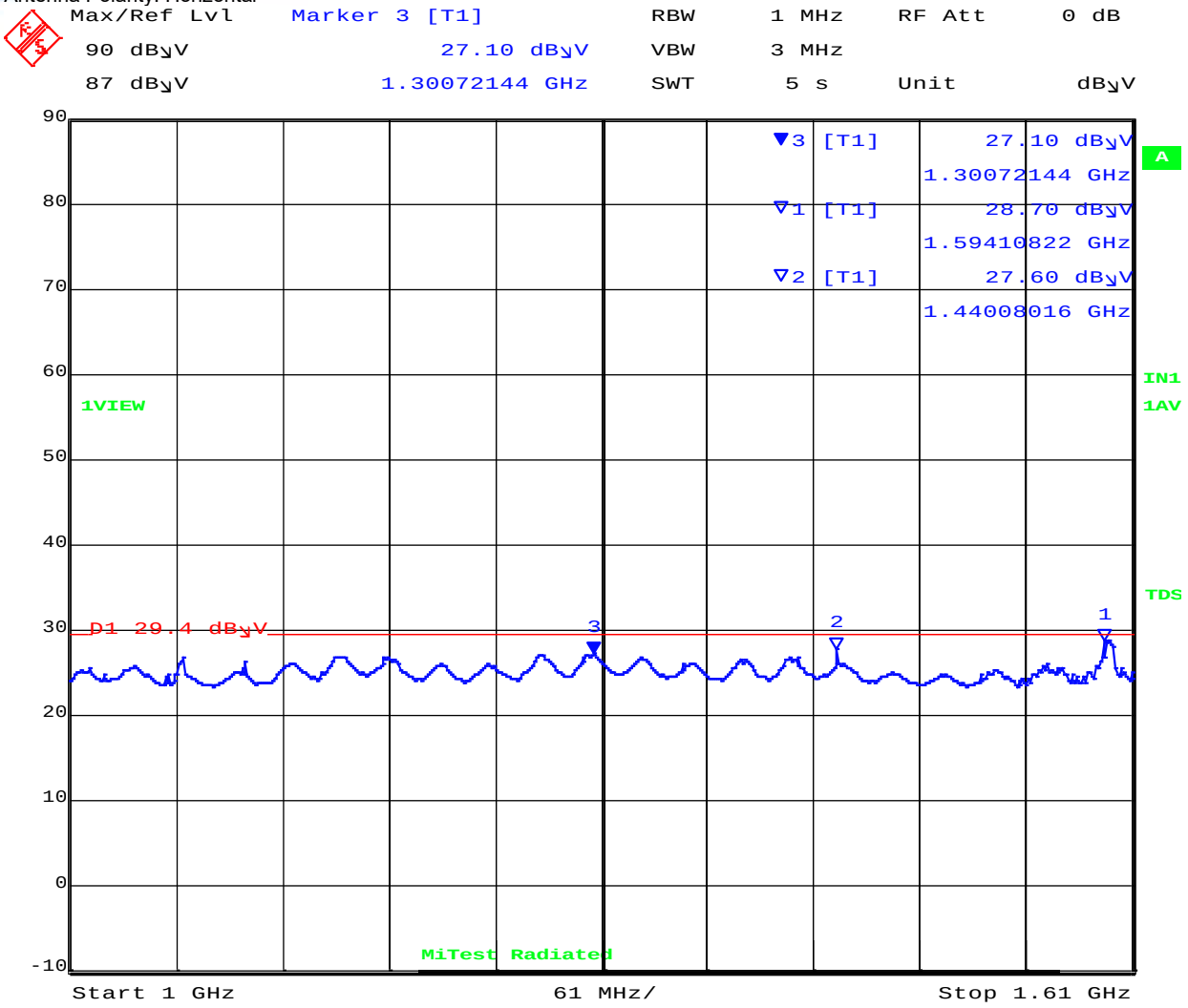
Antenna Polarity: Horizontal



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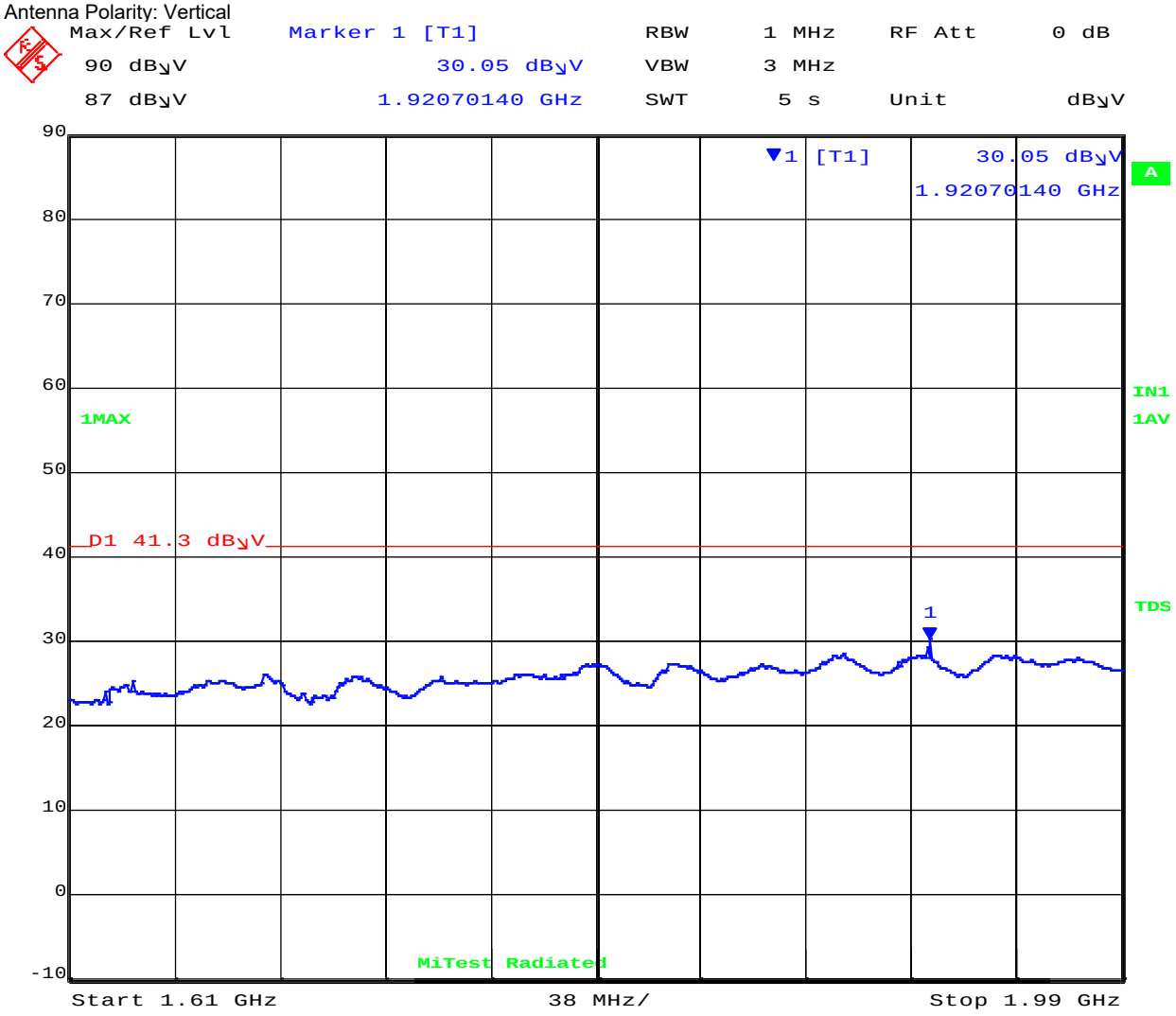
RADIATED SPURIOUS EMISSIONS 1.61-1.99GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 14:54:54

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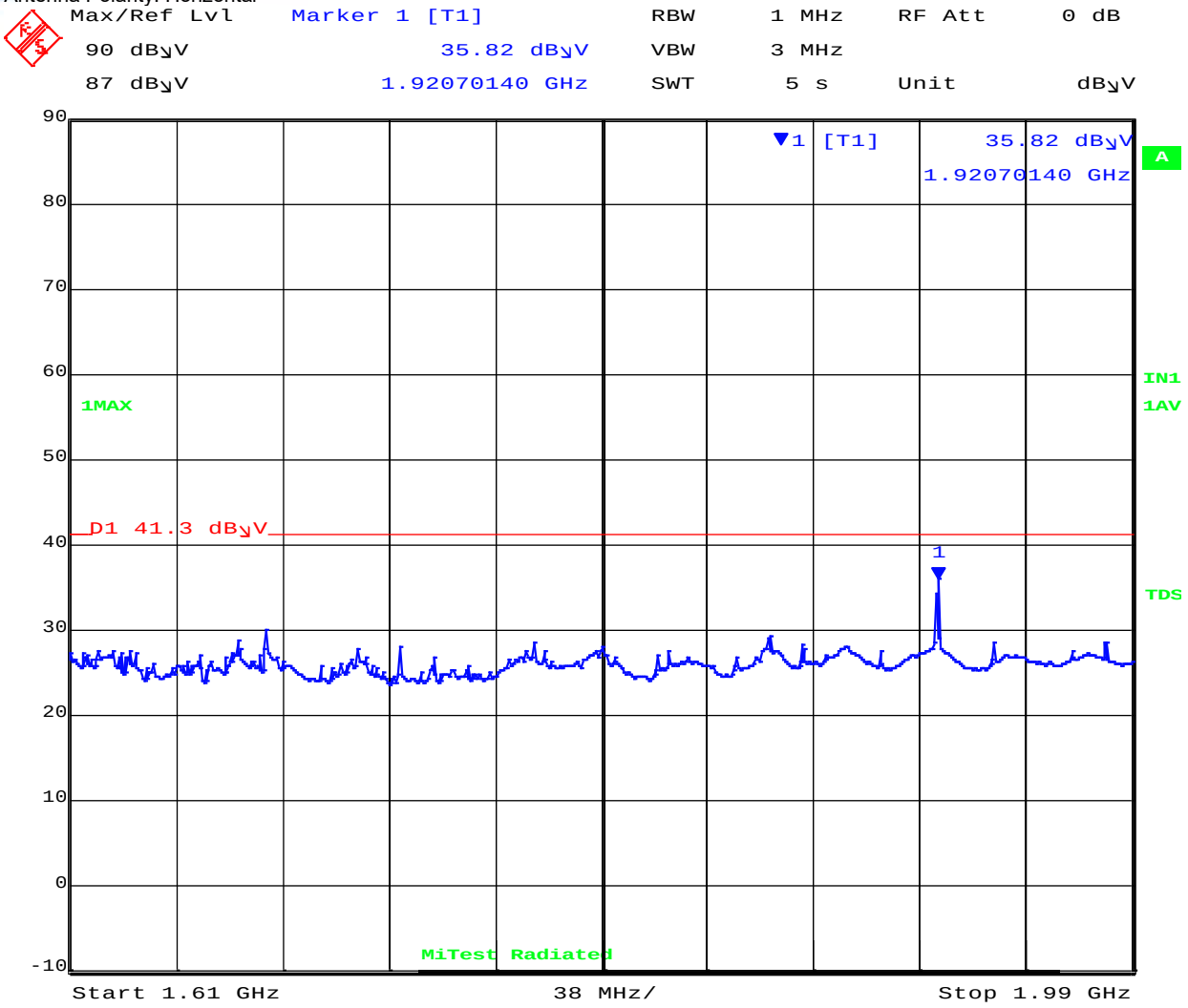
Antenna Polarity: Horizontal



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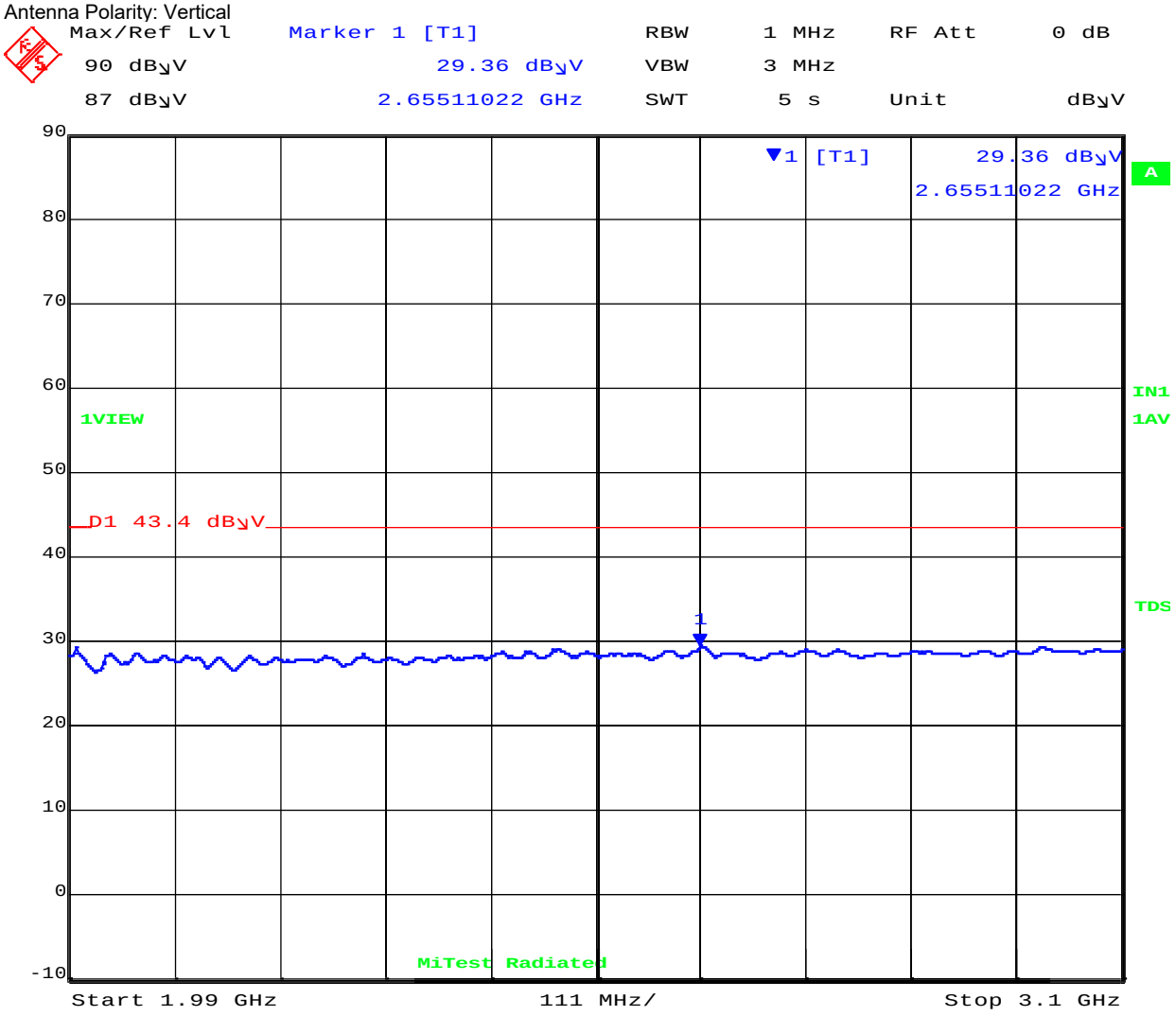
RADIATED SPURIOUS EMISSIONS 1.99-3.1GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 15:00:05

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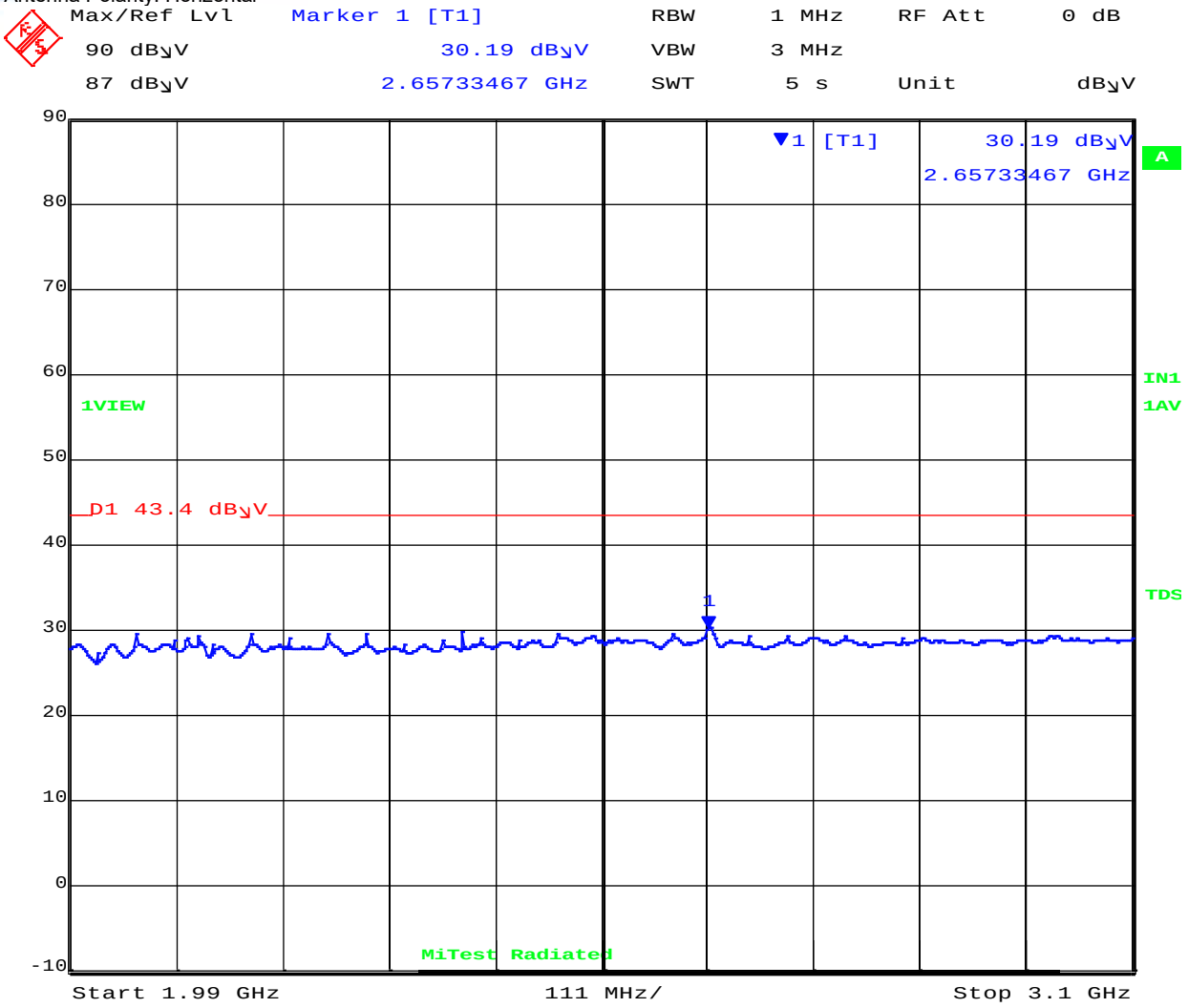
Antenna Polarity: Horizontal



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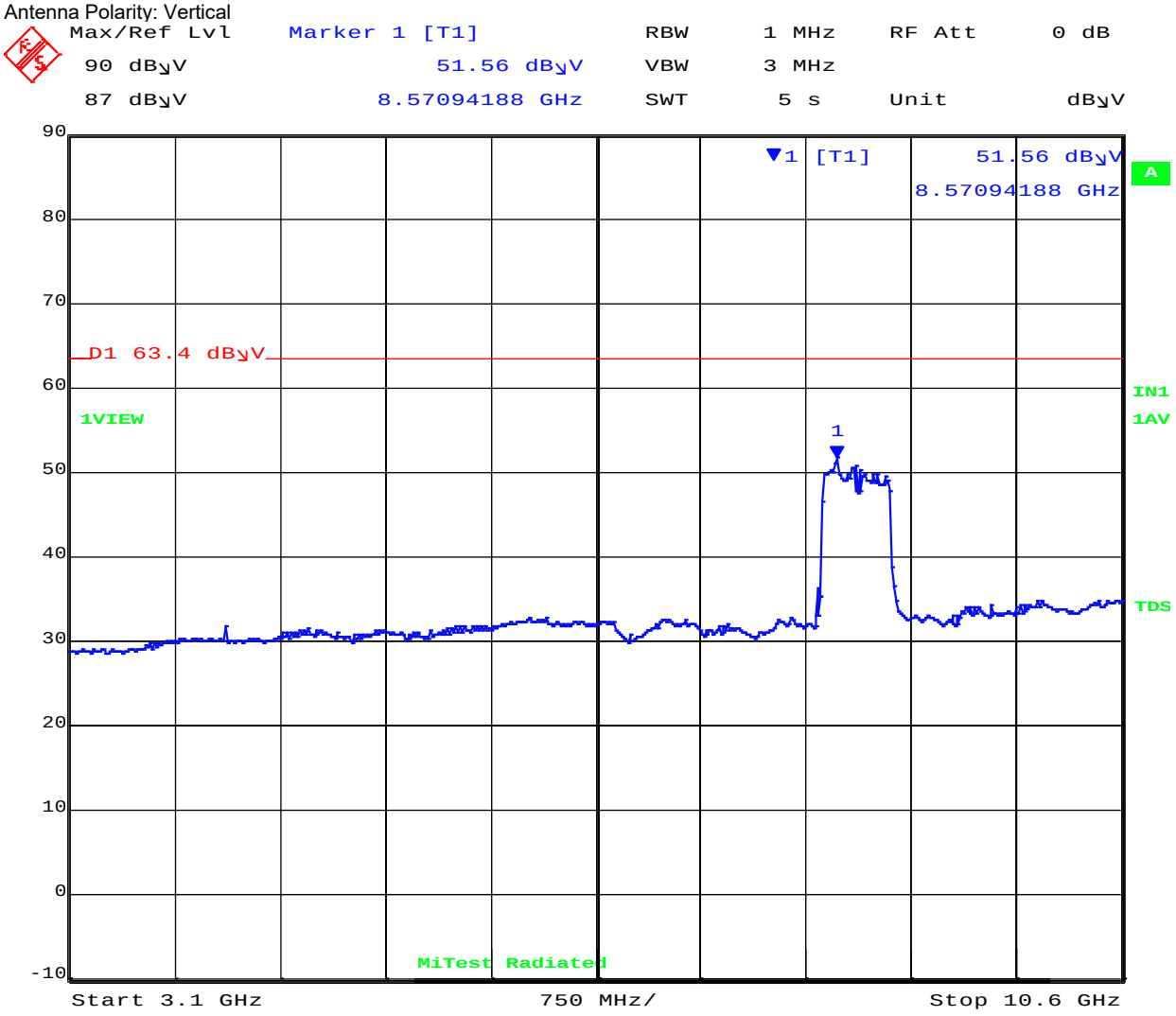
RADIATED SPURIOUS EMISSIONS 3.1-10.6GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



Date: 9.MAR.2021 15:02:34

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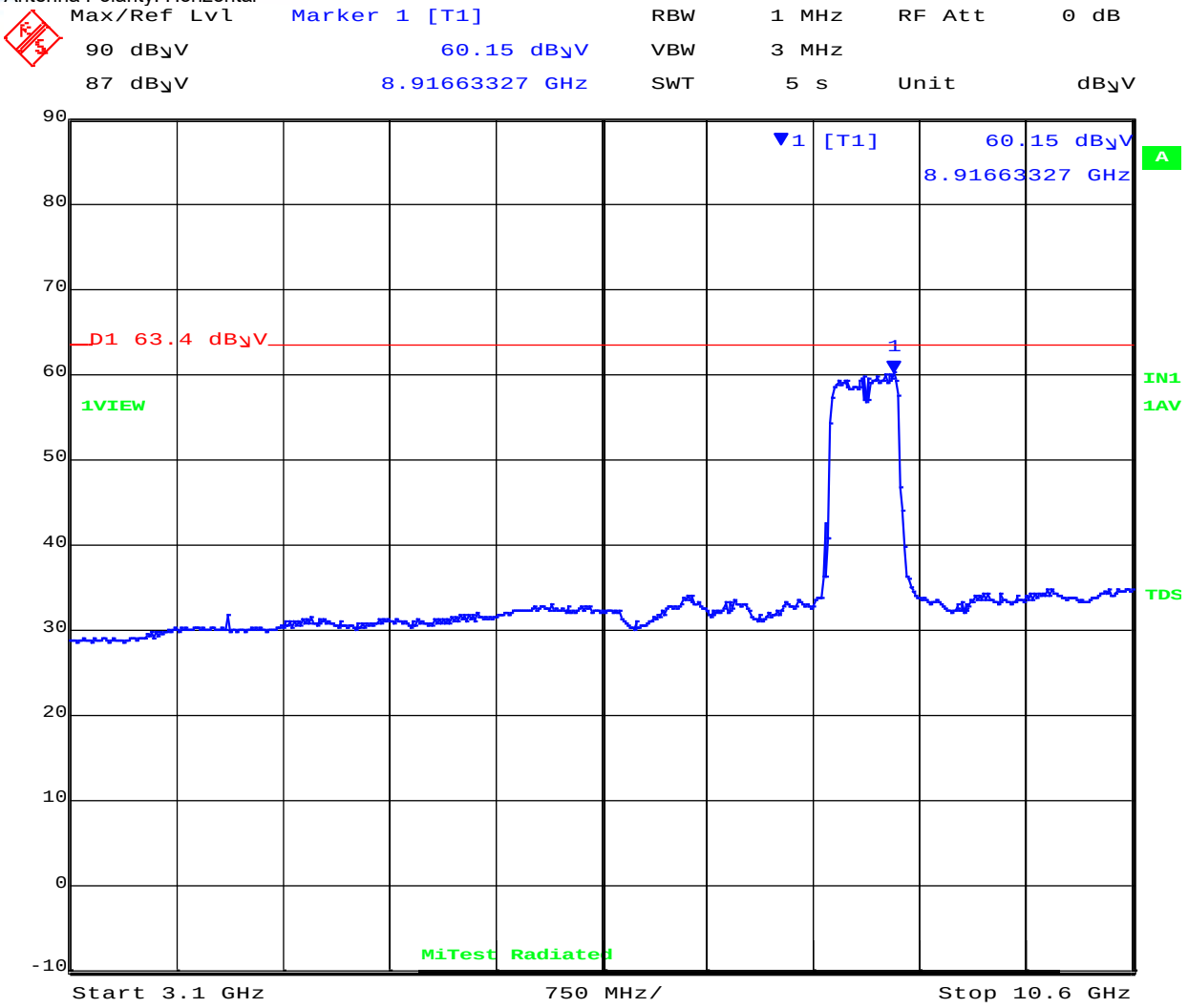
Antenna Polarity: Horizontal



Date: 9.MAR.2021 15:03:46

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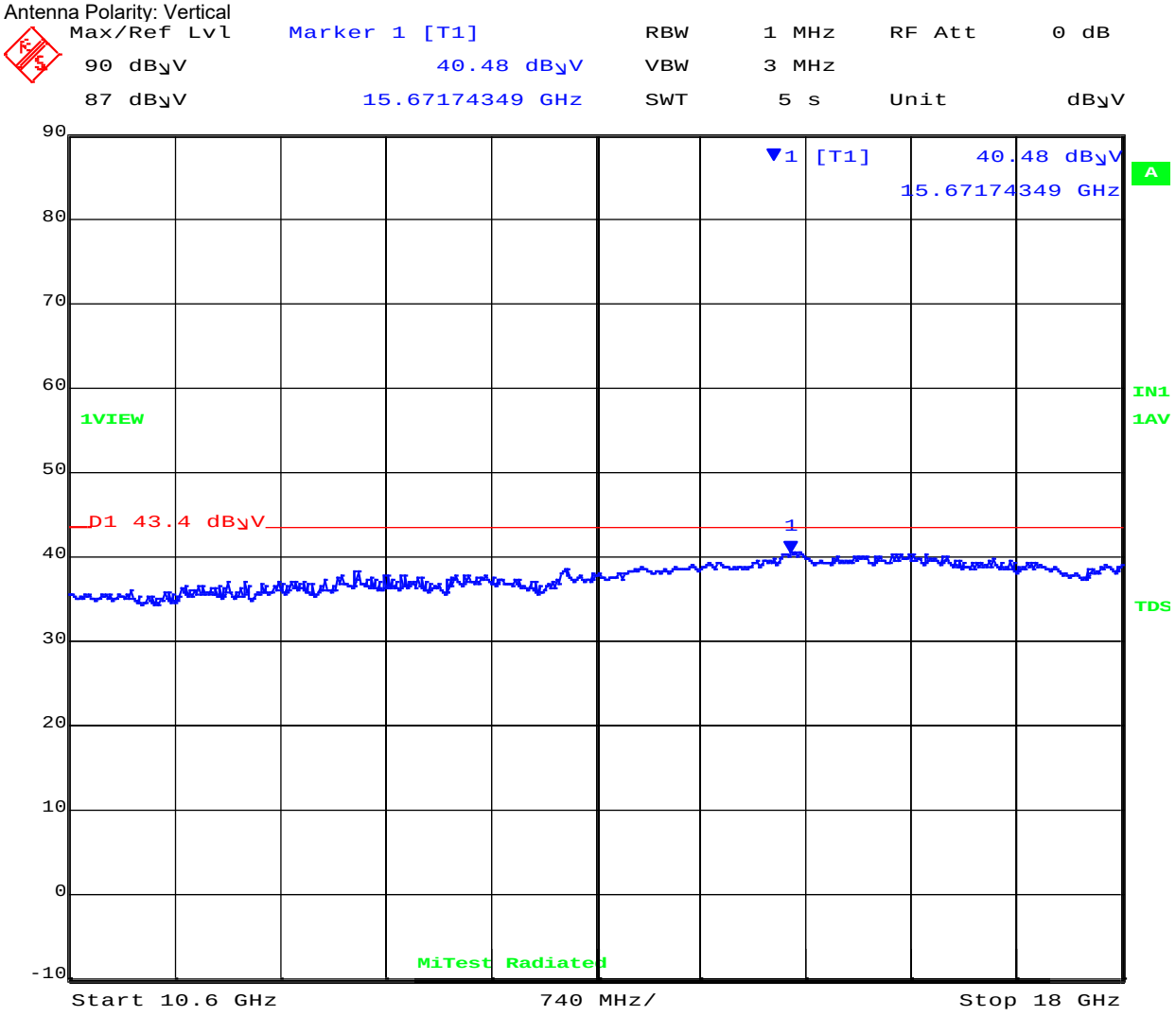
RADIATED SPURIOUS EMISSIONS 10.6-16GHz

Antenna: integral, Power Setting: Max, Duty Cycle (%): 99

Antenna Polarity: Vertical



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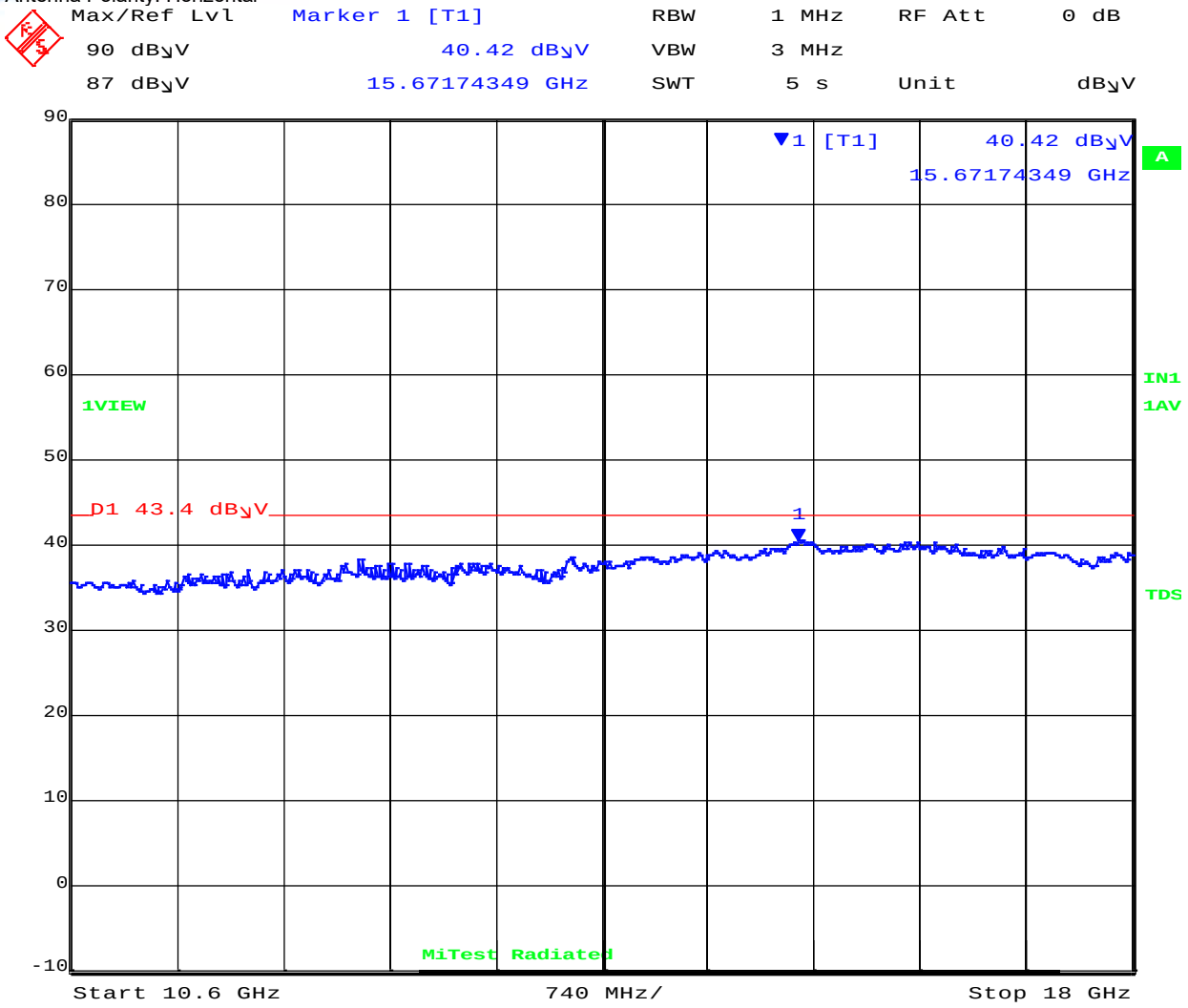
Antenna Polarity: Horizontal



Date: 9.MAR.2021 15:05:20

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B. APPENDIX – Manufacturer Declaration on Similarity of Models

alereon

www.alereon.com | 10800 Pecan Park Blvd. | Suite 100 | Austin,Tx 78750 | 512.345.4200 | 512.345.4201

To whom it may concern,

This is to inform you that the boards listed below all use the exact same Alereon chipset AL5350B/AL5100 and therefore the same radio. We are transmitting UWB that operates in frequencies of: 3168 MHz – 4752 MHz & 6336 MHz – 8968 MHz

1. AL5804_Impact – uses USB interface
2. AL5834_Combat256 – uses USB interface
3. AL5830_Commander256 – uses compact flash interface (parallel port)
4. AL5833_Destroyer256 - uses compact flash interface (parallel port)
5. AL5835_Camouflage256 – uses I2C_UART interface
6. AL5808_Octal – uses Octal SPI interface

All these boards have the same radio design/layout except for the external connector (USB, parallel port or serial) and form factor, therefore for the conducted tests, testing just the AL5834_Combat256 is perfectly adequate.

Sincerely,

David Shoemaker
CEO
Alereon, Inc.

03/23/2021

3/23/2021 CONFIDENTIAL 1 of 1

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