REGULATORY COMPLIANCE TEST REPORT

FCC CFR 47 Part 90 Subpart K & T
ISED RSS-119

Report No.: GEMD02-U4 Rev A

Company: GE MDS, LLC

Model Name: RCL220

REGULATORY COMPLIANCE TEST REPORT

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Model Name: RCL220

To: FCC CFR 47 Part 90 Subpart K & T
ISED RSS-119

Test Report Serial No.: GEMD02-U4 Rev A

This report supersedes: NONE

Applicant: GE MDS, LLC
175 Science Parkway
Rochester, NY 14620
USA

Issue Date: 21st August 2023

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.
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Pleasanton California 94566
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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

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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 14th day of January 2022.

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2023

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

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

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 Phase I - recognition for product testing
MRA Phase II – recognition for both product testing and certification

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 14th day of January 2022

Vice President, Accreditation Services
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2023

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

2. DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft	26th June 2023	Draft report for client review.
Rev A	21st August 2023	Initial release.
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In the above table the latest report revision will replace all earlier versions.

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

3. TEST RESULT CERTIFICATE

Manufacturer:	GE MDS, LLC 175 Science Parkway Rochester, NY 14620 USA	**Tested By:**	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Model(s):	RCL220	**Telephone:**	+1 925 462 0304
Type Of Equipment:	Radio Module for Locomotive Control Unit	**Fax:**	+1 925 462 0306
S/N's:	MCR1		
Test Date(s):	9th – 12th & 16th June 2023	**Website:**	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC CFR 47 Part 90 Subpart K & T **ISED RSS-119**	**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.

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.

4. REFERENCES AND MEASUREMENT UNCERTAINTY

4.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
I	A2LA	22nd June 2022	R105 - Requirement's When Making Reference to A2LA Accreditation Status
II	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
III	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
IV	FCC 47 CFR Part 90	April 2010	Private Land Mobile Radio Services; Subpart K & T – Regulations Governing Licensing and Use of Frequencies in the 216.0 – 222.0 MHz Band
V	M 3003	EDITION 4 Oct 2019	Expression of Uncertainty and Confidence in Measurements
VI	FCC 47 CFR Part 2.1033	May 2021	FCC requirements and rules regarding photographs and test setup diagrams.
VII	ISED RSS-119	Issue 12 2015	Land Mobile and Fixed Equipment Operating in the Frequency Range 27.41-960 MHz
VIII	ISED SRSP-512	Issue 1 April 2006	Technical Requirements for Land Mobile and Fixed Radio Services Operating in the Band 220–222 MHz
IX	ISED RSS GEN	Issue 5 April 2018	General Requirements for Compliance of Radio Apparatus

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 GE MDS, LLC Model RCL220 to the requirements of FCC CFR 47 Part 90 Subparts K & T; and ISED RSS-119
Applicant:	GE MDS, LLC 175 Science Parkway Rochester, NY 14620 USA
Manufacturer:	GE MDS, LLC
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California 94566 USA
Test report reference number:	GEMD02-U4 Rev A
Date EUT received:	6th June 2023
Standard(s) applied:	FCC CFR 47 Part 90 Subpart K & T
Dates of test (from - to):	9th – 12th & 16th June 2023
No of Units Tested:	1
Product Family Name:	RCL
Model(s):	RCL220
Location for use:	Indoors
Declared Frequency Range(s):	216-222 MHz
Type of Modulation:	GMSK
EUT Modes of Operation:	12.5 KHz
Declared Nominal Output Power:	33.00 dBm
Transmit/Receive Operation:	Transceiver
Rated Input Voltage and Current:	13.84 VDC 2A
Operating Temperature Range:	-40°C - 70°C
ITU Emission Designator:	6K57G1D
Equipment Dimensions:	3.4”x1.6”x0.4” in
Weight:	< 1 lb
Hardware Rev:	1
Software Rev:	1

5.2. Scope Of Test Program

GE MDS, LLC RCL220

The scope of the test program was to test the GE MDS, LLC RCL220 radio transmitter configurations in the frequency ranges 216 - 222 MHz; for compliance against the following specifications:

FCC CFR 47 Part 90 Subpart K & T

These subparts set out the regulations governing the use of equipment operating in the 216 to 220 MHz and 220 to 222 MHz bands including the eligibility requirements, and specific operational and technical standards for stations licensed in these bands.

ISED RSS-119
General Requirements for Compliance of Radio Apparatus:
Testing was Limited to the band 217-220MHz for ISED RSS 119 using emission mask J.

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

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Manufacturer	Model No.	Serial No.
EUT	GE MDS MCR	GE MDS, LLC	RCL220	MCR1
Support	HP	HP	--	None

5.4. Antenna Details

Type	Manufacturer	Model	Family	Gain (dBi)	BF Gain	Dir BW	X-Pol	Frequency Band (MHz)
OMNI	PCTEL	PCTEL BMAXMFTS	OMNI	0	--	--	--	118-940
OMNI	PCTEL	PCTEL PCT-RSA-220	OMNI	2	--	--	--	217-220
OMNI	Sinclair	Sinclair ST221-SF3SNF	OMNI	2	--	--	--	217-223
OMNI	Sinclair	Stico HDLP-NB-220	OMNI	2	--	--	--	214-228

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

5.5. Cabling and I/O Ports (on the host device to the EUT)

The following is a description of the cable and input / output ports available on the EUT and its host during testing;

Port Type	Port Description	Qty	Screened (Yes/ No)	Length
Pin interface to Host	Multipin	1	N	--
RF Conn x3 (On EUT Host Device)	RF Conn for 220 MHz and LTE	3	N	< 3m

5.6. Test Configurations

Results for the following configurations are provided in this report:

Operational Mode(s)	Data Rate with Highest Power	Channel Frequency (MHz)		
		Low	Mid	High
216-222 MHz				
216-220MHz	9615 bps	217.0125	--	219.9875
220-222MHz	9615 bps	220.0000	--	222.0000

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

6. TEST SUMMARY

List of Measurements

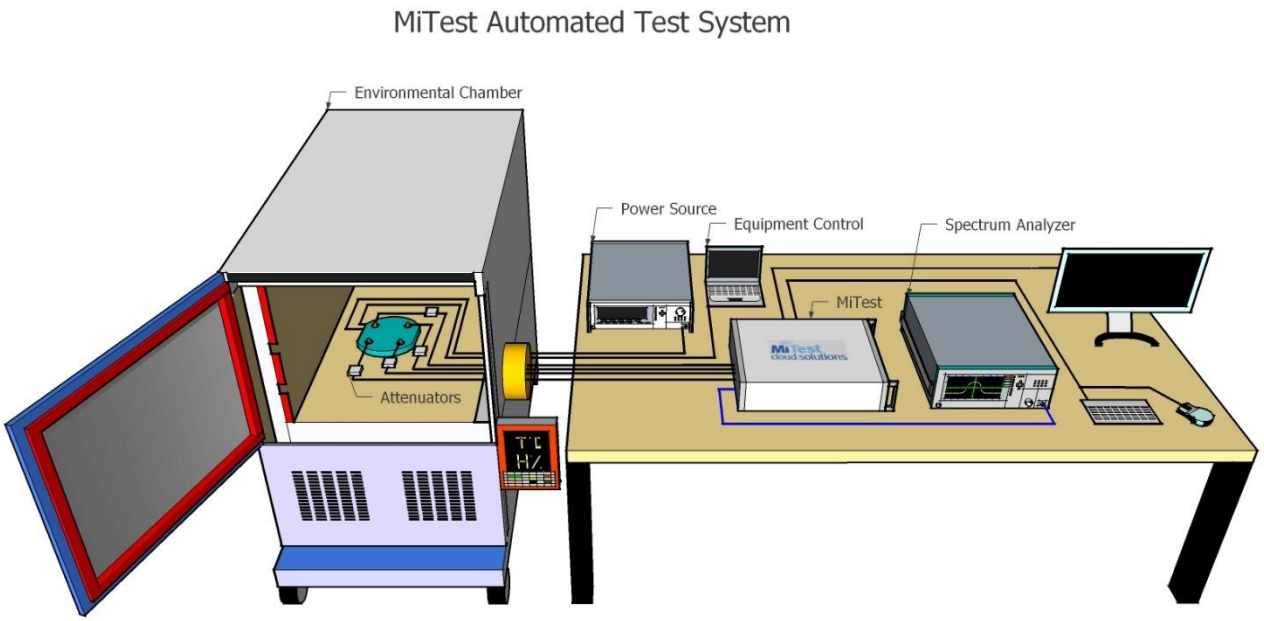
Test Header	Result	Data Link
Conducted Output Power	Complies	View Data
99% Bandwidth	Complies	View Data
Spectrum Emission Mask & Spurious Emissions	Complies	View Data
Frequency Stability	Complies	View Data

Note: Spurious Emissions 10MHz to 6GHz; ISED RSS-119 has the following limit for testing: 50 dBc however, the Spurious Emissions test results indicate that there is significant margin present and as such require no additional testing.

7. TEST EQUIPMENT CONFIGURATION(S)

7.1. Conducted

Conducted RF Emission Test Set-up(s) The following tests were performed using the conducted test set-up shown in the diagram below.



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	23 Sep 2023
#3P1	EUT to MiTest box port 1	Fairview Microwave	SCA1814-0101-72	#3P1	23 Sep 2023
#3P2	EUT to MiTest box port 2	Fairview Microwave	SCA1814-0101-72	#3P2	23 Sep 2023
#3P3	EUT to MiTest box port 3	Fairview Microwave	SCA1814-0101-72	#3P3	23 Sep 2023
#3P4	EUT to MiTest box port 4	Fairview Microwave	SCA1812-0101-72	#3P4	23 Sep 2023
249	Thermocouple; Resistance Thermometer	Thermotronics	GR2105-02	9340 #2	23 Sep 2023
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
408	USB to GPIB interface	National Instruments	GPIB-USB HS	14C0DE9	Not Required
441	USB Wideband Power Sensor	Boonton	55006	9179	20 Sep 2023
442	USB Wideband Power Sensor	Boonton	55006	9181	19 Oct 2023
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
461	Spectrum Analyzer	Agilent	E4440A	MY46185537	27 Sep 2023
493	USB Wideband Power Sensor	Boonton	55006	9634	8 Oct 2023
494	USB Wideband Power Sensor	Boonton	55006	9726	19 Oct 2023
510	Barometer/Thermometer	Digi Sense	68000-49	170871375	4 Jan 2024
519	MiTest Cloud Solutions RF Test Box	MiCOM	2nd Gen DFS	519	22 Sep 2023
75	Environmental Chamber	Thermatron	SE-300-2-2	27946	20 Feb 2024

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)

9. TEST RESULTS

9.1. Conducted Output Power

Conducted Test Conditions for Maximum Conducted Output Power			
Standard:	FCC CFR 47 ISED RSS-119	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Maximum Conducted Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	90.205(e)(f); 90.259 Section 5.4	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Maximum Conducted Output Power Measurement
Test configuration and setup used for the measurement was per the Conducted Test Set-up section specified in this document.
Supporting Information
Calculated Power = A + G + Y+ 10 log (1/x) dBm

A = Total Power [10*Log10 ($10^{a/10}$ + $10^{b/10}$ + $10^{c/10}$ + $10^{d/10}$)]
G = Antenna Gain
Y = Beamforming Gain
x = Duty Cycle (average power measurements only)

Limits Maximum Conducted Output Power
47 CFR 90.205
(E) 217-220 MHz. Limitations on power and antenna heights are specified in § 90.259.
(F) 220-222 MHz. Limitations on power and antenna heights are specified in § 90.729.

47 CFR 90.259
(a) *216–220 MHz band.*
(1) Frequencies in the 216–220 MHz band may be assigned to applicants that establish eligibility in the Industrial/Business Pool.
(2) All operation is secondary to the fixed and mobile services, including the Low Power Radio Service.
(3) In the 216–217 MHz band, no new assignments will be made after January 1, 2002.
(4) In the 217–220 MHz band, the maximum transmitter output power is 2 watts. The maximum antenna height above average terrain (HAAT) is 152 m (500 feet).
(5) In the 217–220 MHz band, base, mobile, and operational fixed operations are permitted.
(6) Wide area operations will not be authorized. The area of normal day-to-day operations will be described in the application in terms of maximum distance from a geographical center (latitude and longitude).

(7) Frequencies will be assigned with a 6.25 kHz, 12.5 kHz, 25 kHz or 50 kHz channel bandwidth. Frequencies may be assigned with a channel bandwidth exceeding 50 kHz only upon a showing of adequate justification.

(8) Assignable 6.25 kHz channels will occur in increments of 6.25 kHz from 217.00625 MHz to 219.99375 MHz. Assignable 12.5 kHz channels will occur in increments of 12.5 kHz from 217.0125 MHz to 219.9875 MHz. Assignable 25 kHz channels will occur in increments of 25 kHz from 217.025 MHz to 219.975 MHz. Assignable 50 kHz channels will occur in increments of 50 kHz from 217.025 MHz to 219.975 MHz.

ISED RSS-119
5.4 Transmitter Output Power
217-218 and 219-220 MHz : 110 / 30 W
220-222: SRSP-512 / 50 W/5kHz ERP

Equipment Configuration for Conducted Output Power			
Variant:	12.5KHz	**Duty Cycle (%):**	99.0
Data Rate:	N/A	**Antenna Gain (dBi):**	N/A
Modulation:	GMSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

High Power Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm) Port(s)				Calculated Total Power	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	Σ Port(s) dBm	dBm	dB	
217.0125	32.78				32.78	33.0	-0.22	H
219.9875	32.84				32.84	33.0	-0.16	H
220.0000	32.89				32.89	33.0	-0.11	H
222.0000	32.92				32.92	33.0	-0.08	H

Low Power Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm) Port(s)				Calculated Total Power	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	Σ Port(s) dBm	dBm	dB	
217.0125	26.82				26.82	33.0	-6.18	L
219.9875	27.00				27.00	33.0	-6.00	L
220.0000	27.23				27.23	33.0	-5.77	L
222.0000	27.31				27.31	33.0	-5.69	L

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

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9.2. 99% Bandwidth

Conducted Test Conditions for 99% Bandwidth			
Standard:	FCC CFR 47:90.259 ISED RSS-119	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	26 dB and 99 % Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	90.209; 90.259(a)(7)(8) Section 5.5	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for 99% Bandwidth Measurement
The bandwidth at 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency.

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

90.209 Bandwidth limitations.
(a) Each authorization issued to a station licensed under this part will show an emission designator representing the class of emission authorized. The designator will be prefixed by a specified necessary bandwidth. This number does not necessarily indicate the bandwidth occupied by the emission at any instant. In those cases where § 2.202 of this chapter does not provide a formula for the computation of necessary bandwidth, the occupied bandwidth, as defined in part 2 of this chapter, may be used in lieu of the necessary bandwidth.

(b) The maximum authorized single channel bandwidth of emission corresponding to the type of emission specified in § 90.207 is as follows:
(1) For A1A or A1B emissions, the maximum authorized bandwidth is 0.25 kHz. The maximum authorized bandwidth for type A3E emission is 8 kHz.

(2) For operations below 25 MHz utilizing J3E emission, the bandwidth occupied by the emission shall not exceed 3000 Hz. The assigned frequency will be specified in the authorization. The authorized carrier frequency will be 1400 Hz lower in frequency than the assigned frequency. Only upper sideband emission may be used. In the case of regularly available double sideband radiotelephone channels, an assigned frequency for J3E emissions is available either 1600 Hz below or 1400 Hz above the double sideband radiotelephone assigned frequency.

(3) For all other types of emissions, the maximum authorized bandwidth shall not be more than that normally authorized for voice operations.

(4) Where a frequency is assigned exclusively to a single licensee, more than a single emission may be used within the authorized bandwidth. In such cases, the frequency stability requirements of § 90.213 must be met for each emission.

(5) Unless specified elsewhere, channel spacings and bandwidths that will be authorized in the following frequency bands are given in the following table.

Table 1 to § 90.209(b)(5)—Standard Channel Spacing/Bandwidth

Frequency band (MHz)	Channel spacing (kHz)	Authorized bandwidth (kHz)
Below 25(2)		
25–50	20	20
72–76	20	20
150–174	17.5	1 3 20/11.25/6
216–220(5)	6.25	20/11.25/6
220–222	5	4
406–512(2)	1 6.25	1 3 6 20/11.25/6
806–809/851–854	12.5	20
809–817/854–862	12.5	6 20/11.25
817–824/862–869	25	6 20

896–901/935–940	12.5	13.6
902–928(4)		
929–930	25	20
1427–1432(5)	12.5	12.5
3 2450–2483.5(2)		
Above 2500(2)		

1 For stations authorized on or after August 18, 1995.

2 Bandwidths for radiolocation stations in the 420–450 MHz band and for stations operating in bands subject to this footnote will be reviewed and authorized on a case-by-case basis.

3 Operations using equipment designed to operate with a 25 kHz channel bandwidth will be authorized a 20 kHz bandwidth. Operations using equipment designed to operate with a 12.5 kHz channel bandwidth will be authorized a 11.25 kHz bandwidth. Operations using equipment designed to operate with a 6.25 kHz channel bandwidth will be authorized a 6 kHz bandwidth. All stations must operate on channels with a bandwidth of 12.5 kHz or less beginning January 1, 2013, unless the operations meet the efficiency standard of § 90.203(j)(3).

4 The maximum authorized bandwidth shall be 12 MHz for non-multilateration LMS operations in the band 909.75–921.75 MHz and 2 MHz in the band 902.00–904.00 MHz. The maximum authorized bandwidth for multilateration LMS operations shall be 5.75 MHz in the 904.00–909.75 MHz band; 2 MHz in the 919.75–921.75 MHz band; 5.75 MHz in the 921.75–927.25 MHz band and its associated 927.25–927.50 MHz narrowband forward link; and 8.00 MHz if the 919.75–921.75 MHz and 921.75–927.25 MHz bands and their associated 927.25–927.50 MHz and 927.50–927.75 MHz narrowband forward links are aggregated.

5 See § 90.259.

6 Operations using equipment designed to operate with a 25 kilohertz channel bandwidth may be authorized up to a 20 kilohertz bandwidth unless the equipment meets the Adjacent Channel Power limits of § 90.221 in which case operations may be authorized up to a 22 kilohertz bandwidth. Operations using equipment designed to operate with a 12.5 kilohertz channel bandwidth may be authorized up to an 11.25 kilohertz bandwidth.

47 CFR 90.259

(a) *216–220 MHz band.*

(7) Frequencies will be assigned with a 6.25 kHz, 12.5 kHz, 25 kHz or 50 kHz channel bandwidth. Frequencies may be assigned with a channel bandwidth exceeding 50 kHz only upon a showing of adequate justification.

(8) Assignable 6.25 kHz channels will occur in increments of 6.25 kHz from 217.00625 MHz to 219.99375 MHz. Assignable 12.5 kHz channels will occur in increments of 12.5 kHz from 217.0125 MHz to 219.9875 MHz. Assignable 25 kHz channels will occur in increments of 25 kHz from 217.025 MHz to 219.975 MHz. Assignable 50 kHz channels will occur in increments of 50 kHz from 217.025 MHz to 219.975 MHz.

47 CFR 90.733 Permissible operations for 220-222MHz

In combining authorized, contiguous channels (including channels derived from multiple authorizations) to form channels wider than 5 kHz, the emission limits in § 90.210(f) must be met only at the outermost edges of the contiguous channels. Transmitters shall be tested to confirm compliance with this requirement with the transmission located as close to the band edges as permitted by the design of the transmitter. The frequency stability requirements in § 90.213 shall apply only to the outermost of the contiguous channels authorized to the licensee. However, the frequency stability employed for transmissions operating inside the outermost contiguous channels must be such that the emission limits in § 90.210(f) are met over the temperature and voltage variations prescribed in § 2.995 of this chapter.

ISED RSS-119 Table 3

Frequency Band (MHz)	Related SRSP for Channelling Plan and ERP	Channel Bandwidth (kHz)	Authorized Bandwidth (kHz)	Spectrum Masks for Equipment With Audio Filter	Spectrum Masks for Equipment Without Audio Filter
217-218 and 219-220	N/A	12.5	11.25	D or I	D or J
220-222	SRSP-512	5	4	F	F

Equipment Configuration for 99% Occupied Bandwidth			
Variant:	12.5KHz	**Duty Cycle (%):**	99.0
Data Rate:	N/A	**Antenna Gain (dBi):**	N/A
Modulation:	GMSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results						
Test Frequency	**Measured 99% Bandwidth (KHz) Port(s)**				**99% Bandwidth (KHz)**	
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**
217.0125	6.57				6.57	6.57
219.9875	6.53				6.53	6.53
220.0000	6.51				6.51	6.51
222.0000	6.46				6.46	6.46

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

Note: click the links in the above matrix to view the graphical image (plot).

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9.3. Spectrum Emission Mask and Spurious Emissions

Conducted Test Conditions for Spectrum Emission Mask			
Standard:	FCC CFR 47:90.210 ISED RSS-119	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Spectrum Emission Mask	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	90.210 (c)(f) Section 5.8.3 Section 5.8.5	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Emission Masks

Emission Mask Limits
Except as indicated in this part, transmitters used in the radio services governed by this part must comply with the emission masks outlined in this section. Unless otherwise stated, per paragraphs (d)(4), (e)(4), and (o) of this section, measurements of emission power can be expressed in either peak or average values provided that emission powers are expressed with the same parameters used to specify the unmodulated transmitter carrier power. For transmitters that do not produce a full power unmodulated carrier, reference to the unmodulated transmitter carrier power refers to the total power contained in the channel bandwidth. Unless indicated elsewhere in this part, the table in this section specifies the emission masks for equipment operating under this part.

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

- (1)On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 5 kHz, but not more than 10 kHz: At least 83 log (fd/5) dB;
- (2)On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 10 kHz, but not more than 250 percent of the authorized bandwidth: At least 29 log (fd2/11) dB or 50 dB, whichever is the lesser attenuation;
- (3) On any frequency removed from the center of the authorized bandwidth by more than 250 percent of the authorized bandwidth: At least 43 + 10 log (P) dB.
- (4) In the 1427–1432 MHz band, licensees are encouraged to take all reasonable steps to ensure that unwanted emissions power does not exceed the following levels in the 1400–1427 MHz band:
- (i)For stations of point-to-point systems in the fixed service: −45 dBW/27 MHz.
- (ii)For stations in the mobile service: −60 dBW/27 MHz.

Emission Mask F. For transmitters operating in the 220–222 MHz frequency band, any emission must be attenuated below the power (P) of the highest emission contained within the authorized bandwidth as follows:

- (1)On any frequency from the center of the authorized bandwidth fo to the edge of the authorized bandwidth fe: Zero dB.
- (2)On any frequency removed from the center of the authorized bandwidth by a displacement frequency (fd in kHz) of more than 2 kHz up to and including 3.75 kHz: 30 + 20(fd − 2) dB or 55 + 10 log (P), or 65 dB, whichever is the lesser attenuation.
- (3) On any frequency beyond 3.75 kHz removed from the center of the authorized bandwidth fd: At least 55 + 10 log (P) dB.

ISED RSS-119 5.8.3 Mask D

Table 7 — Emission Mask D		
Displacement Frequency, fd (kHz)	**Minimum Attenuation (dB)**	**Resolution Bandwidth (Hz)**
5.625 < fd ≤ 12.5	7.27(fd−2.88)	ISED RSS-119: Section:4.2.2
fd > 12.5	Whichever is the lesser: 70 or 50 + 10 log10(p)	ISED RSS-119: Section:4.2.2

ISED RSS-119 5.8.8 Mask J

Table 12 — Emission Mask J		
Displacement Frequency, fd (kHz)	**Minimum Attenuation (dB)**	**Resolution Bandwidth (Hz)**
2.5 < fd ≤ 6.25	53 log10(fd/2.5)	300
6.25 < fd ≤ 9.5	103 log10(fd/3.9)	300
fd > 9.5	Whichever is the lesser: 70 or 157 log10(fd/5.3) or 50 + 10 log10(p)	300 for emissions at fd ≤250% of the authorized bandwidth. Specified in Section 4.2.1 for emissions at fd > 250% of the authorized bandwidth.

Equipment Configuration for Spectrum Emission Mask High Power			
Variant:	12.5KHz	**Duty Cycle (%):**	99.0
Data Rate:	N/A	**Antenna Gain (dBi):**	N/A
Modulation:	GMSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results					
Test Frequency	**Measured Spectrum Mask**				**Complies**
MHz	**Fundamental**	**Spurious Emissions**			**Pass/Fail**
217.0125	FCC Mask IC Mask	10MHz – 1GHz	1 -6 GHz	--	Pass
219.9875	FCC Mask IC Mask	10MHz – 1GHz	1 -6 GHz	--	Pass
	Fundamental	**Spurious Emissions**			
220.0000	Mask	10MHz – 1GHz	1 -6 GHz	--	Pass
222.0000	Mask	10MHz – 1GHz	1 -6 GHz	--	Pass

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

Note: click the links in the above matrix to view the graphical image (plot).
Note2: Spurious Emissions 10MHz -6GHz ISED RSS-119 has the following limit for testing: 50 dBc however, observing the captures there is significant margin present and as such require no additional testing.

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Equipment Configuration for Spectrum Emission Low Power			
Variant:	12.5KHz	**Duty Cycle (%):**	99.0
Data Rate:	N/A	**Antenna Gain (dBi):**	N/A
Modulation:	GMSK	**Beam Forming Gain (Y)(dB):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results					
Test Frequency	**Measured Spectrum Mask**				**Complies**
MHz	**Fundamental**	**Spurious Emissions**			**Pass/Fail**
217.0125	FCC Mask IC Mask	10MHz – 1GHz	--	1 -6 GHz	Pass
219.9875	FCC Mask IC Mask	10MHz – 1GHz	--	1 -6 GHz	Pass
	Fundamental	**Spurious Emissions**			
220.0000	Mask	10MHz – 1GHz	Evaluation	1 -6 GHz	Pass
222.0000	Mask	10MHz – 1GHz	Evaluation	1 -6 GHz	Pass

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

Note: click the links in the above matrix to view the graphical image (plot).
Note2: Spurious Emissions 10MHz -6GHz ISED RSS-119 (217-220 MHz) has the following limit for testing: 50 dBc however, observing the captures there is significant margin present and as such require no additional testing.

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9.4. Frequency Stability

Conducted Test Conditions for Frequency Stability			
Standard:	FCC CFR 47:90.213 RSS-GEN	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Frequency Stability	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	90.213 Section 6.11	**Pressure (mBars):**	999 - 1001
Reference Document(s):	See Normative References		

Test Procedure for Frequency Stability
The transmitter output was connected to a spectrum analyzer and the frequency stability was measured using the analyzers occupied bandwidth measurement capability, which reports the frequency delta from the center frequency in kHz. The values were recorded and ppm values calculated.

Frequency stability was measured through the extremes of temperature on the mid channel and a single operating mode only. Before measurements were taken at each temperature the equipment was allowed time to reach thermal equilibrium.

Frequency Stability Limits
Unless noted elsewhere, transmitters used in the services governed by this part must have a minimum frequency stability as described in the following table.

Minimum Frequency Stability – Parts per million (ppm)

Frequency Range (MHz)	Fixed and base stations	Mobile Stations	
		Over 2 watts output power	2 watts or less output power
Below 25	100	100	200
25-50	20	20	50
72-76	5		50
150-174	5	5	50
216-220	1.0		1.0
220-222	0.1	1.5	1.5
421-512	2.5	5	5
806-809	1.0	1.5	1.5
809-824	1.5	2.5	2.5
851-854	1.0	1.5	1.5
854-869	1.5	2.5	2.5
896-901	0.1	1.5	1.5
902-928	2.5	2.5	2.5
929-930	1.5		
935-940	0.1	1.5	1.5
1427-1435	300	300	300

Equipment Configuration for Carrier Frequencies

Variant:	12.5 KHz	**Duty Cycle (%):**	99.0
Data Rate:	Not Applicable	**Antenna Gain (dBi):**	Not Applicable
Modulation:	GMSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test frequency	217.0125 MHz	Frequency Error		Limit	Margin
Temperature	**Voltage**	**kHz**	**ppm**	**ppm**	**ppm**
25 °C	**13.84 Vdc**	0.2505	0.1154311	±1	-0.8845689
	11.0 Vdc	-0.12525	-0.0577156	±1	-0.9422844
	15.0 Vdc	0.62625	0.2885778	±1	-0.71142
70 °C	**13.84 Vdc**	0.87675	0.404009	±1	-0.59599
60 °C		0.2505	0.1154311	±1	-0.88457
50 °C		0.12525	0.0577156	±1	-0.94228
40 °C		0.37575	0.1731467	±1	-0.82685
30 °C		0.501	0.2308623	±1	-0.76914
20 °C		1.37775	0.6348713	±1	-0.36513
10 °C		1.2525	0.5771557	±1	-0.42284
0 °C		1.12725	0.5194401	±1	-0.48056
-10 °C		-0.37575	-0.1731467	±1	-0.82685
-20 °C		-1.1199	-0.5160532	±1	-0.48395
-30 °C		-1.503	-0.6925868	±1	-0.30741
-40 °C		-1.62825	-0.7503024	±1	-0.2497

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-02 MEASURING FREQUENCY
Measurement Uncertainty:	±0.86 ppm

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Equipment Configuration for Carrier Frequencies

Variant:	12.5 KHz	**Duty Cycle (%):**	99.0
Data Rate:	Not Applicable	**Antenna Gain (dBi):**	Not Applicable
Modulation:	GMSK	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test frequency	220.00 MHz	Frequency Error		Limit	Margin
Temperature	**Voltage**	**kHz**	**ppm**	**ppm**	**ppm**
25 °C	**13.84 Vdc**	1.2525	0.5693182	±1.5	-0.9306818
	11.0 Vdc	1.2525	0.5693182	±1.5	-0.9306818
	15.0 Vdc	1.12725	0.5123864	±1.5	-0.98761
70 °C	**13.84 Vdc**	0.7515	0.341590909	±1.5	-1.158409091
60 °C		1.7535	0.797045455	±1.5	-0.702954545
50 °C		1.7535	0.797045455	±1.5	-0.702954545
40 °C		1.13225	0.514659091	±1.5	-0.985340909
30 °C		1.2525	0.569318182	±1.5	-0.930681818
20 °C		1.37775	0.62625	±1.5	-0.87375
10 °C		1.62825	0.740113636	±1.5	-0.759886364
0 °C		1.002	0.455454545	±1.5	-1.044545455
-10 °C		1.87875	0.853977273	±1.5	-0.646022727
-20 °C		1.503	0.683181818	±1.5	-0.816818182
-30 °C		1.2525	0.569318182	±1.5	-0.930681818
-40 °C		-1.7535	-0.797045455	±1.5	-0.702954545

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-02 MEASURING FREQUENCY
Measurement Uncertainty:	±0.86 ppm

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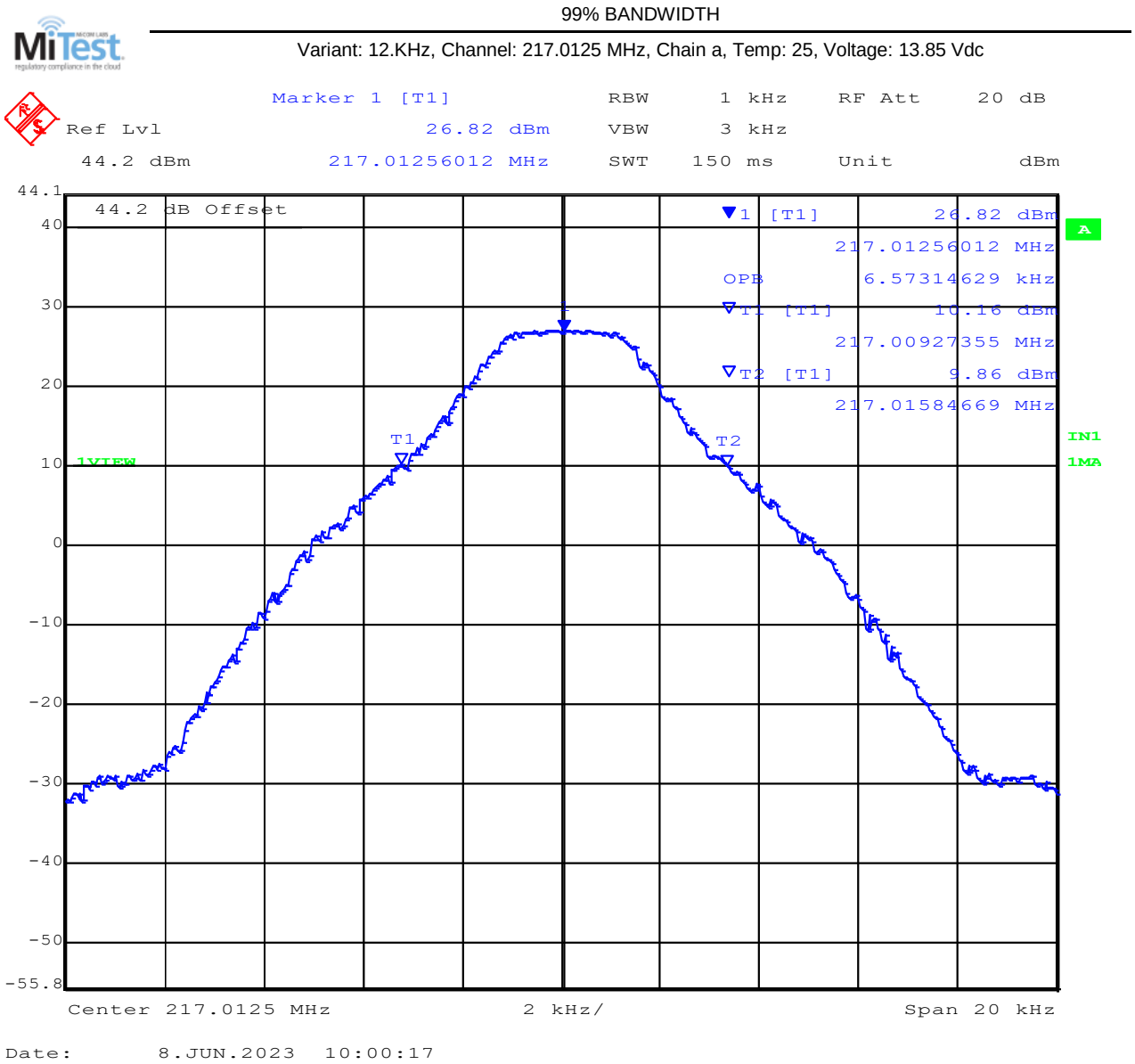
A. APPENDIX - GRAPHICAL IMAGES

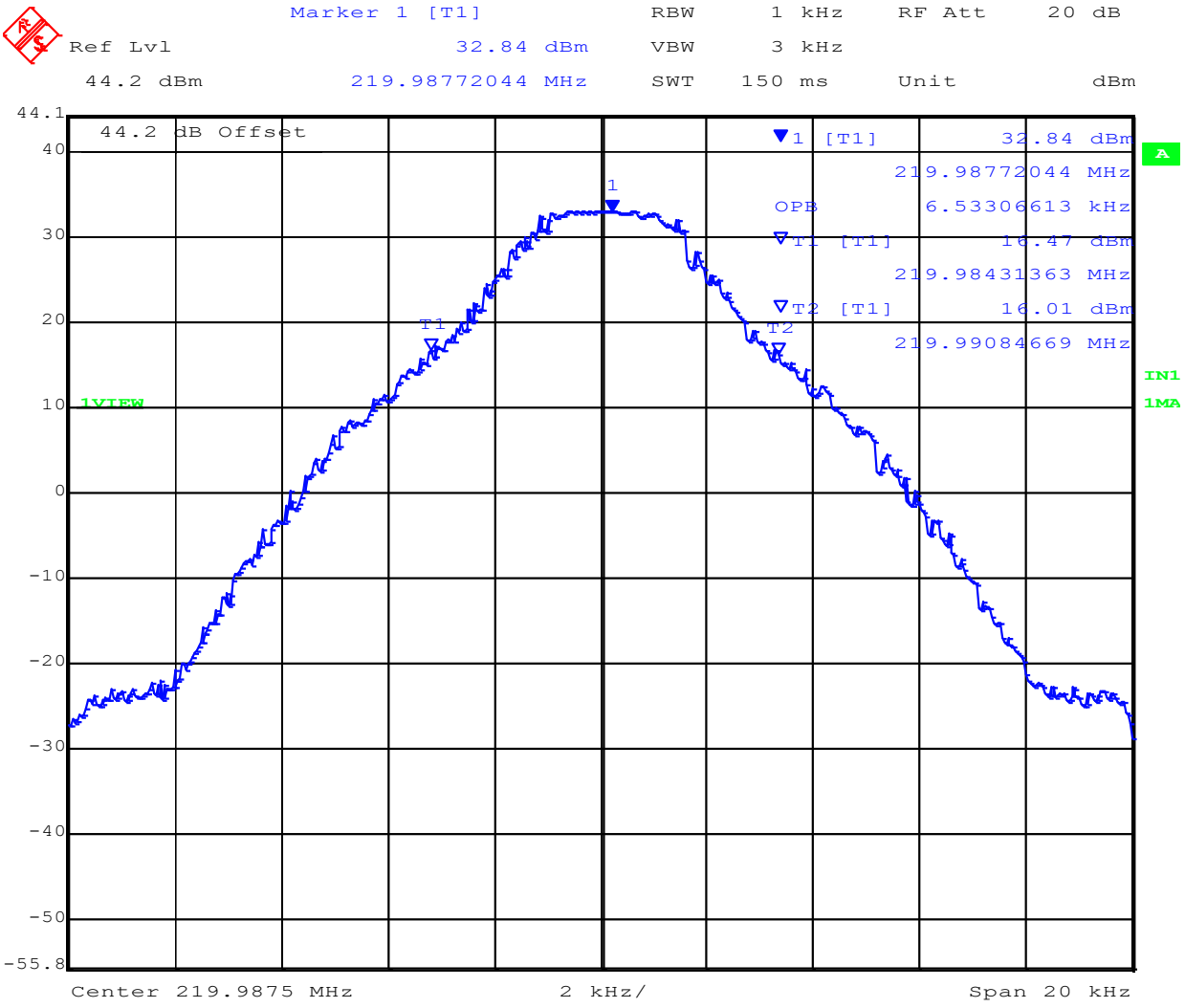
A.1. 99% Bandwidth



back to matrix

99% BANDWIDTH

Variant: 12.KHz, Channel: 219.9875 MHz, Chain a, Temp: 25, Voltage: 13.85 Vdc

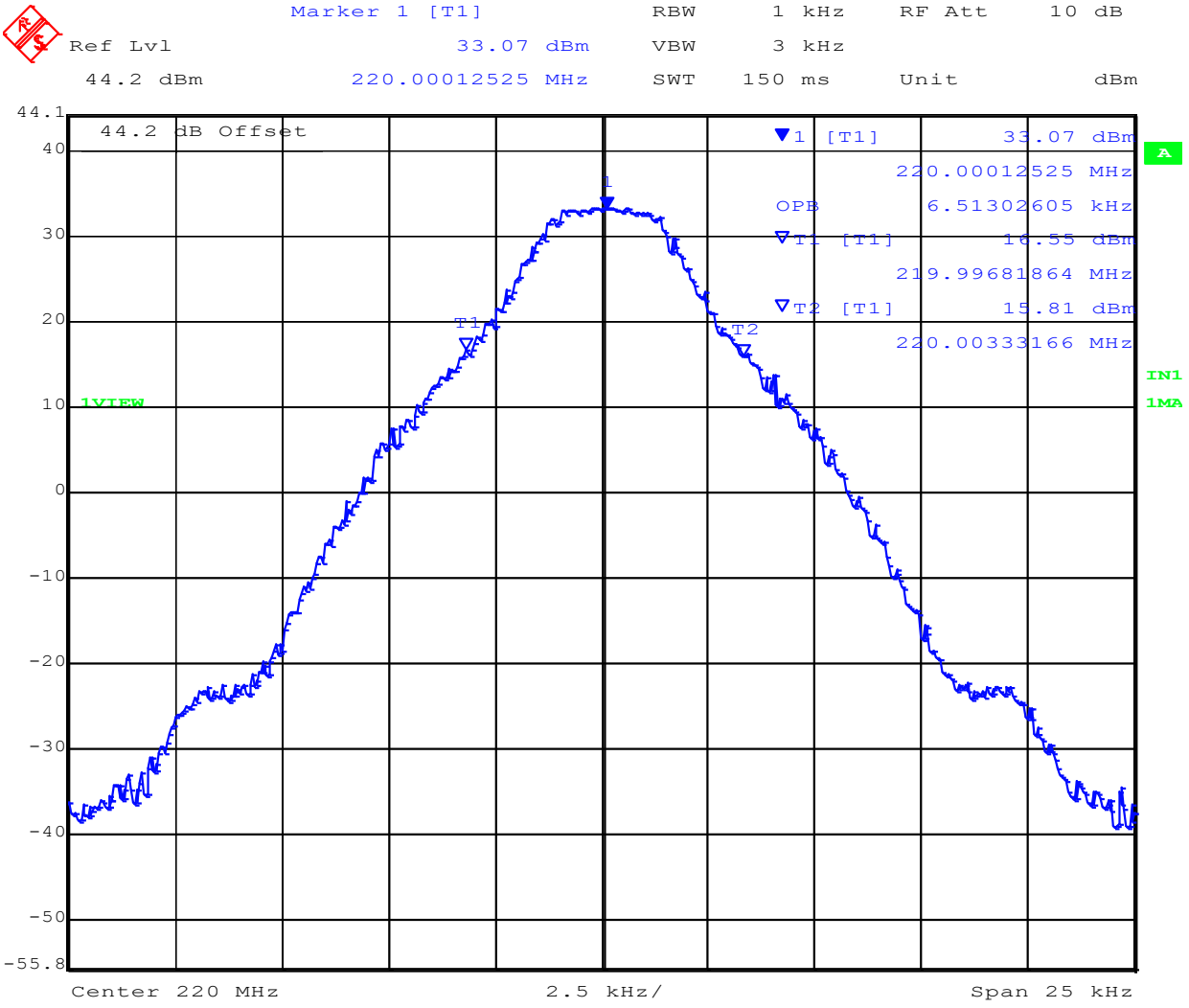


Date: 8.JUN.2023 10:09:25

back to matrix

99% BANDWIDTH

Variant: 12.KHz, Channel: 220.00 MHz, Chain a, Temp: 25, Voltage: 13.85 Vdc

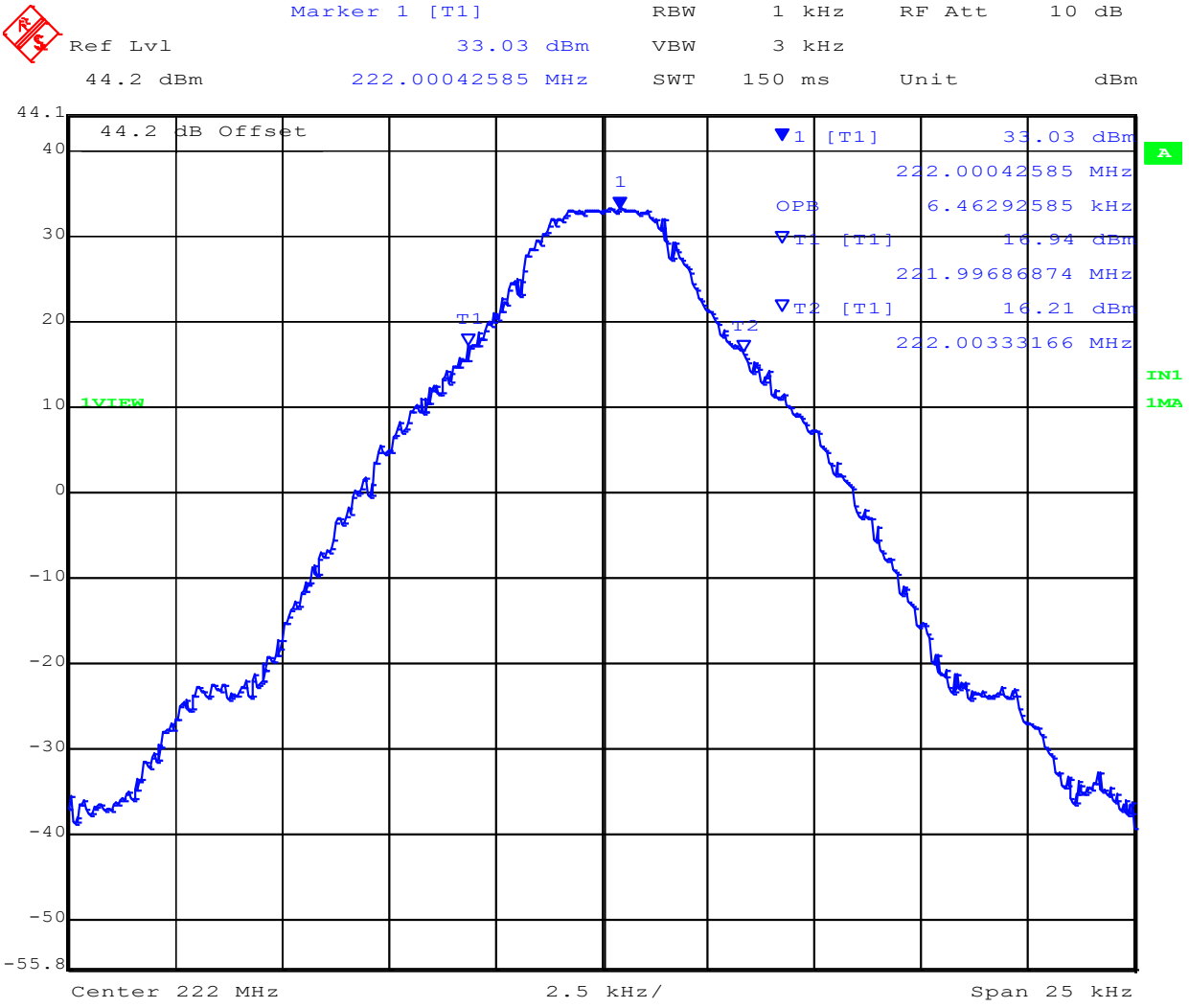


Date: 9.JUN.2023 10:40:43

back to matrix

99% BANDWIDTH

Variant: 12.KHz, Channel: 222.00 MHz, Chain a, Temp: 25, Voltage: 13.85 Vdc

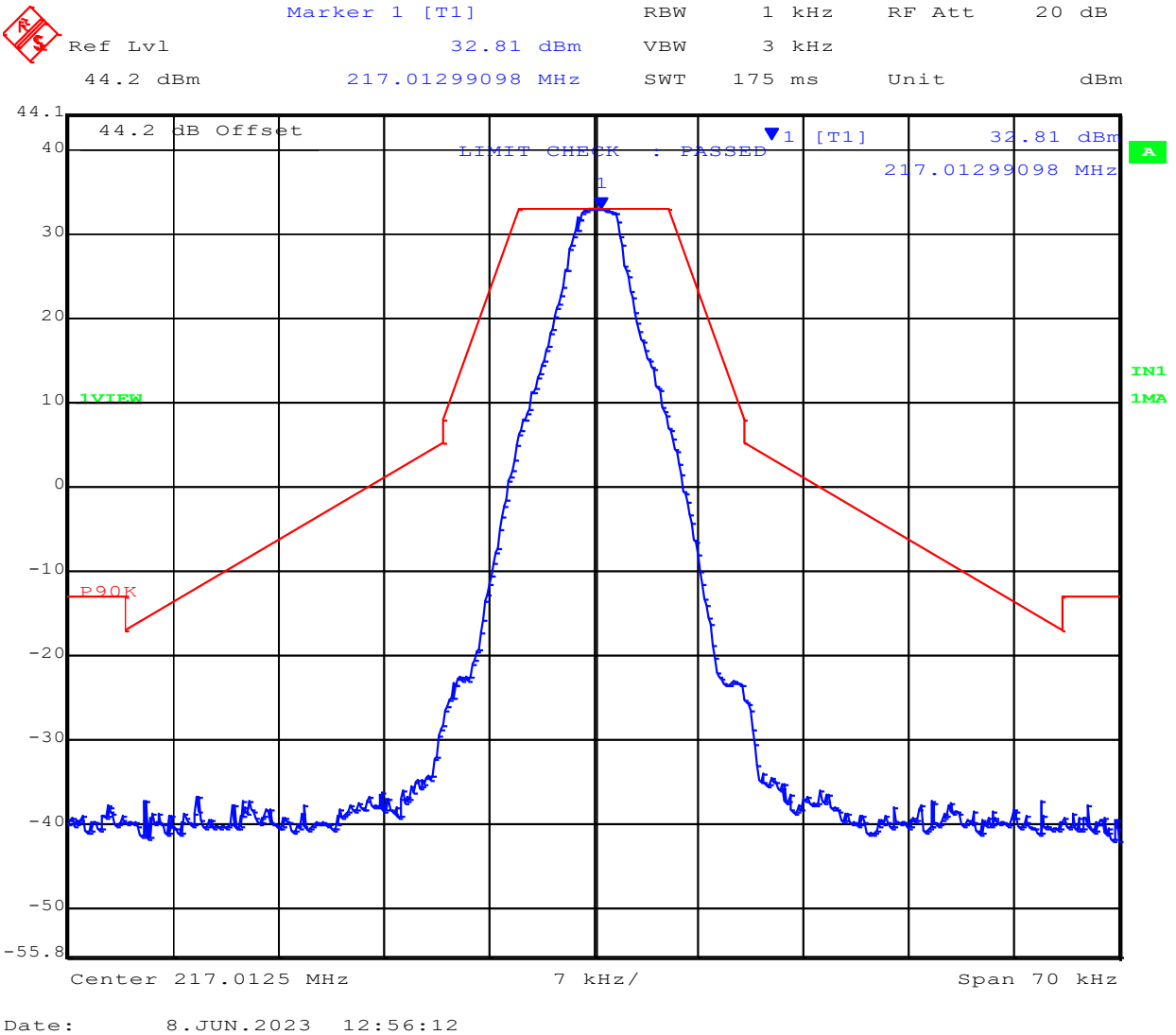


back to matrix

A.2. High Power Spectrum Emission Mask & Spurious Emissions

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

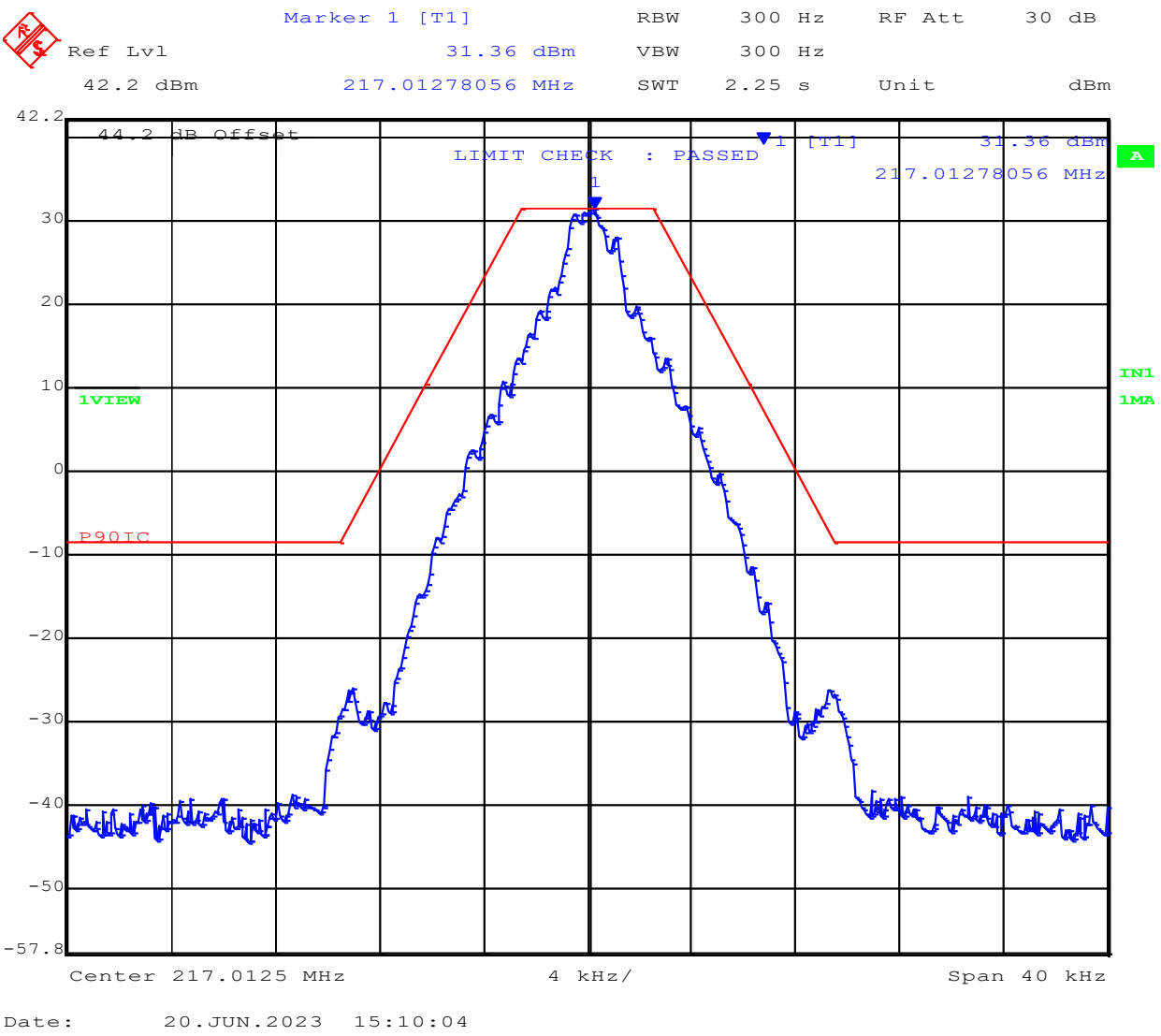


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK ISED

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

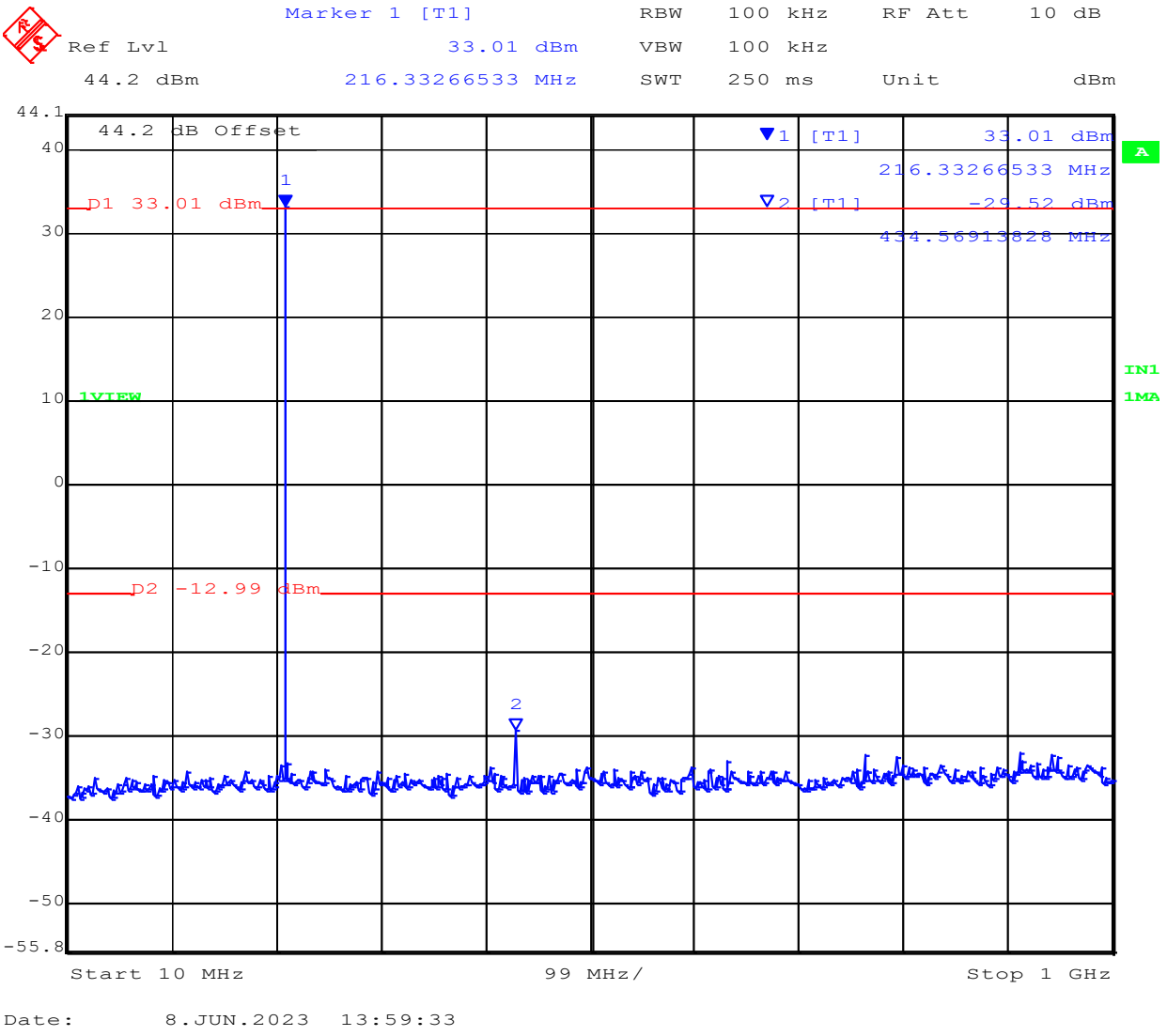


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

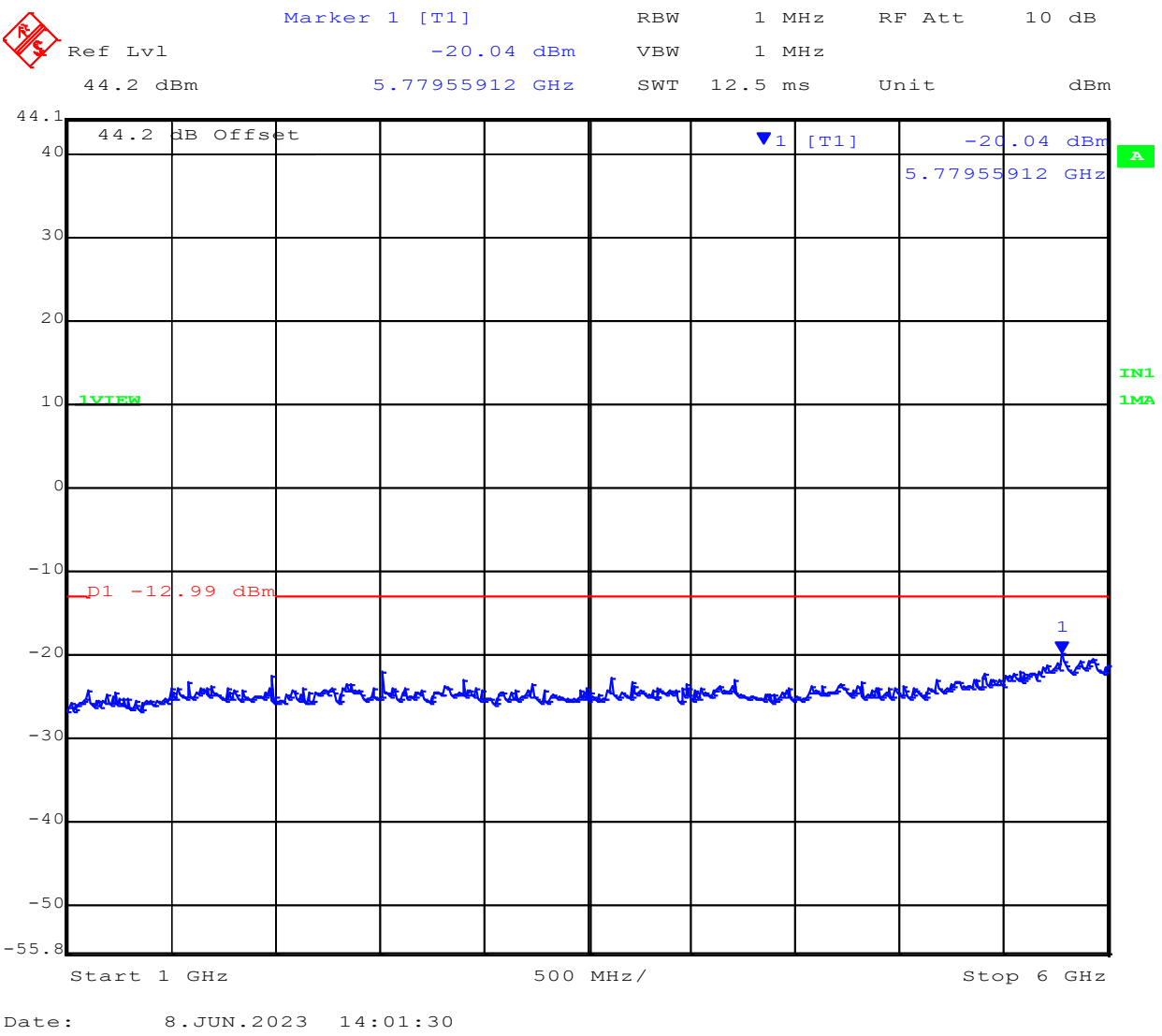


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 6GHz

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

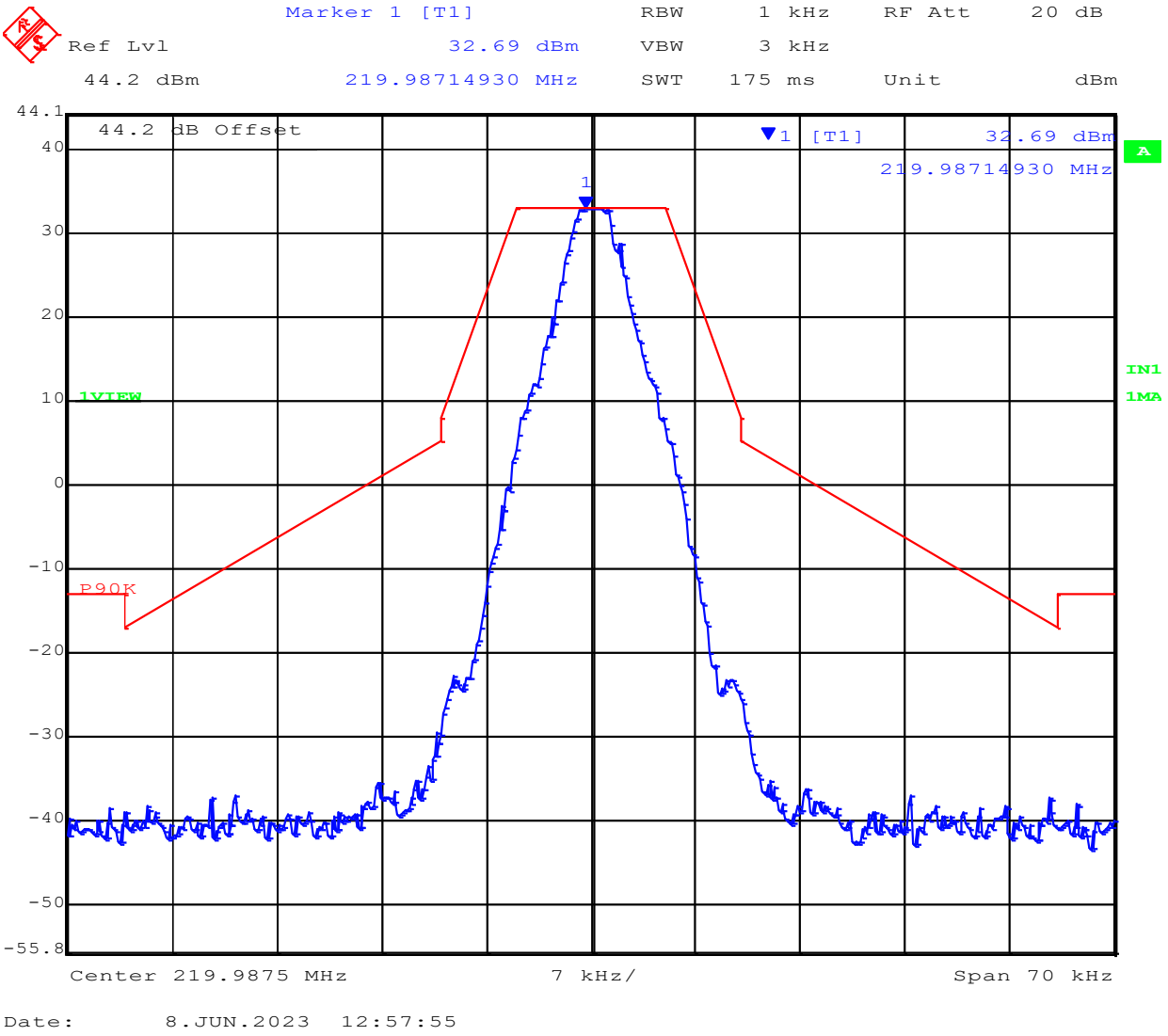


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

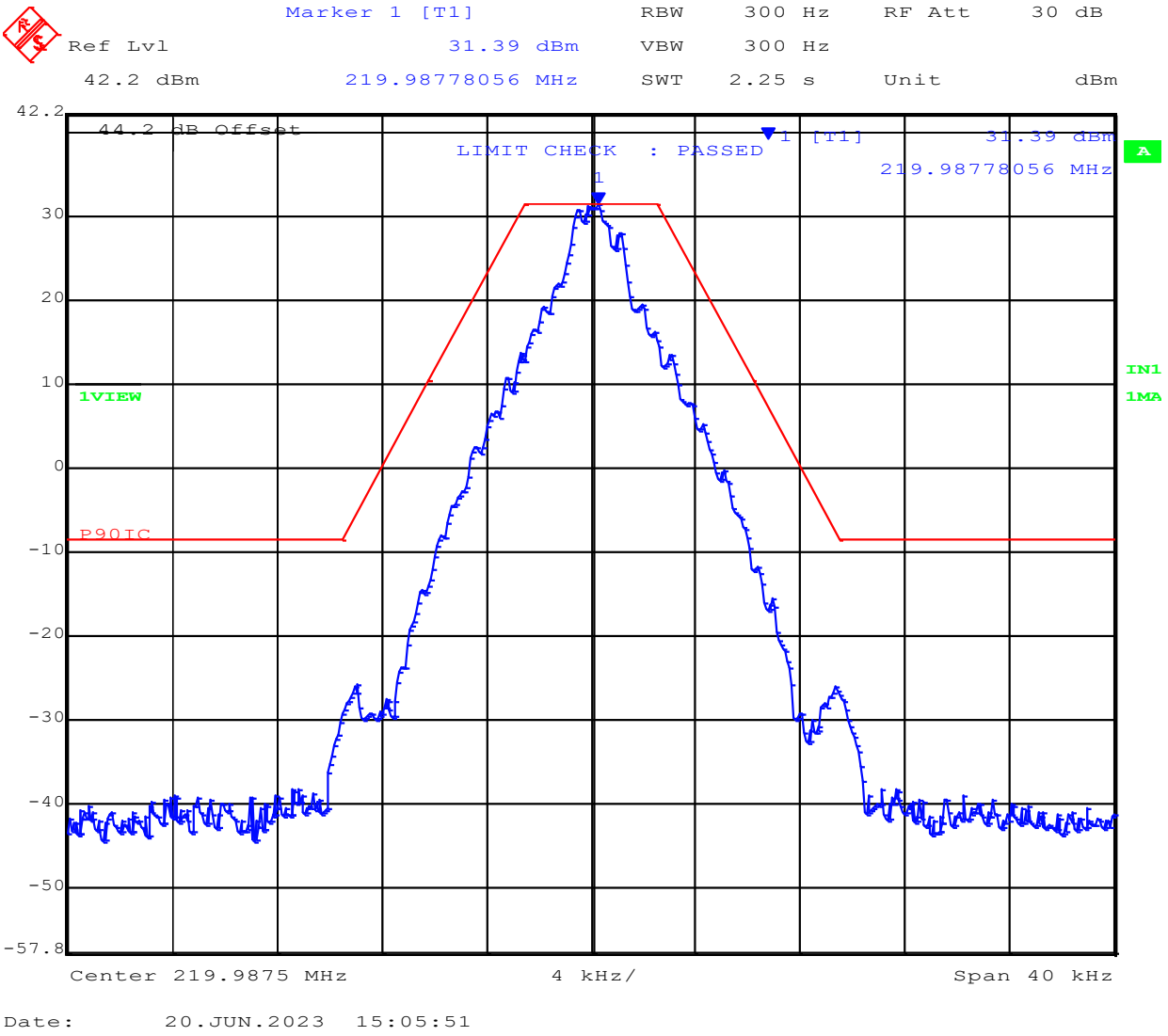


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK ISED

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

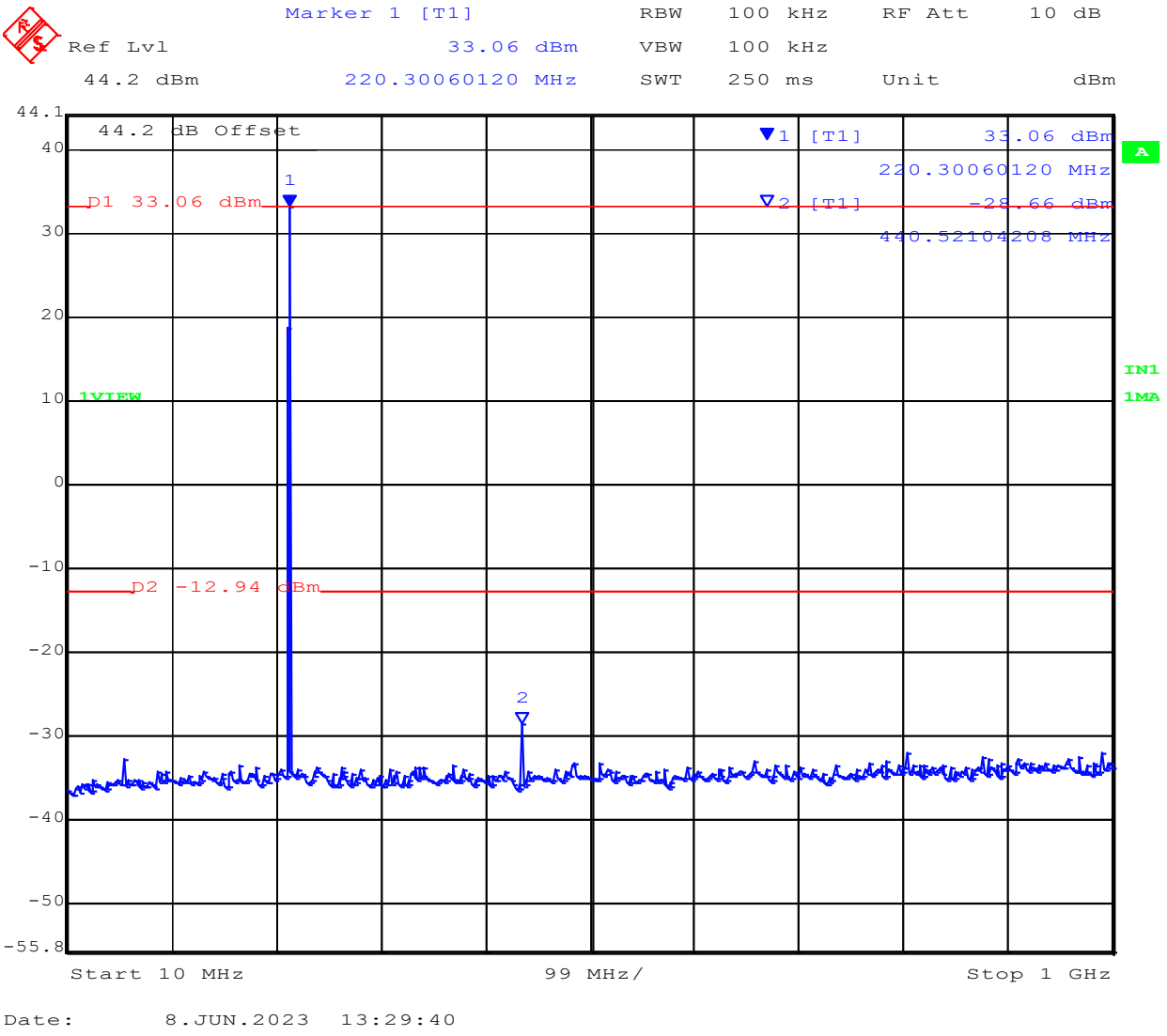


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

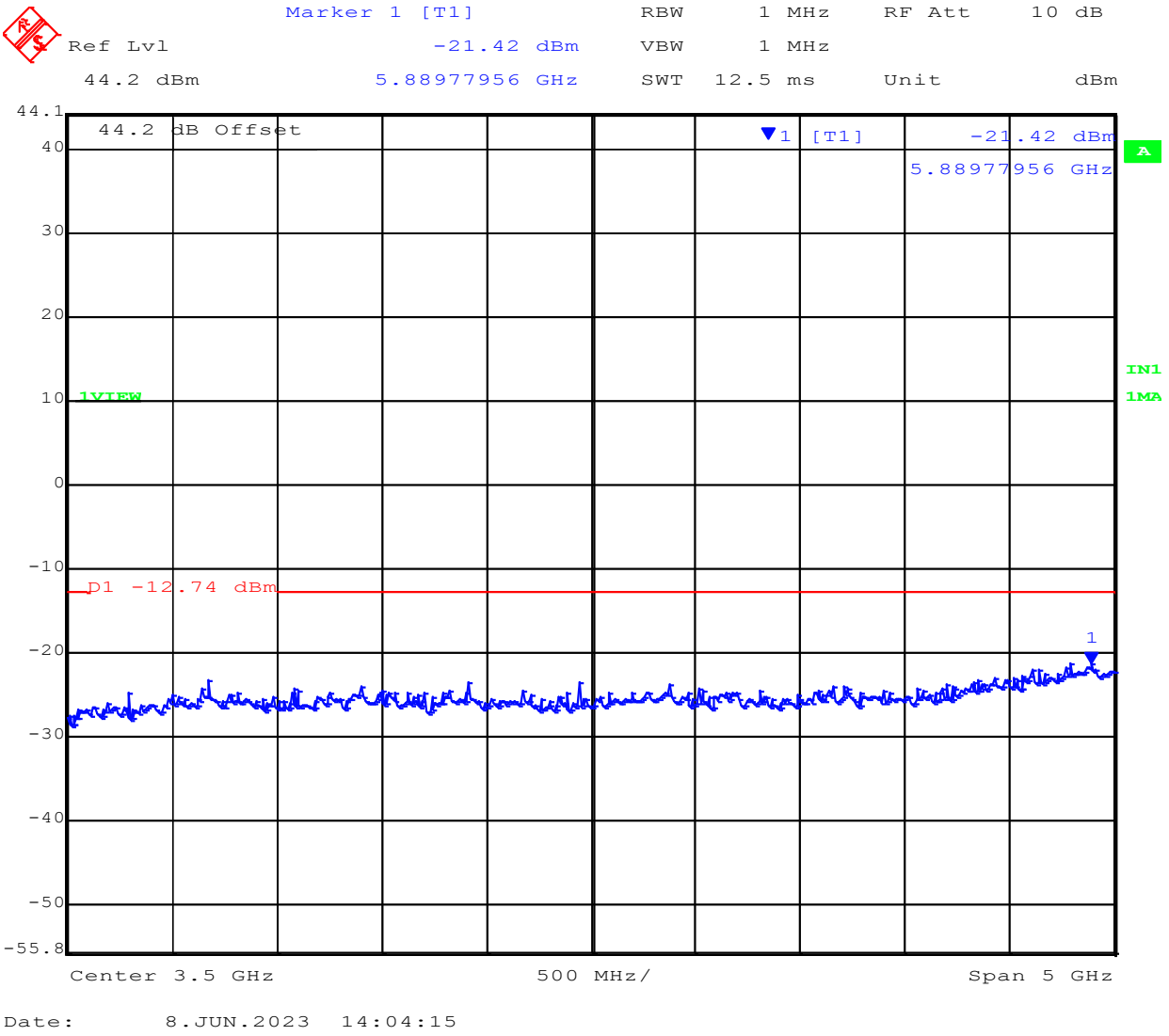


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 6GHz

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

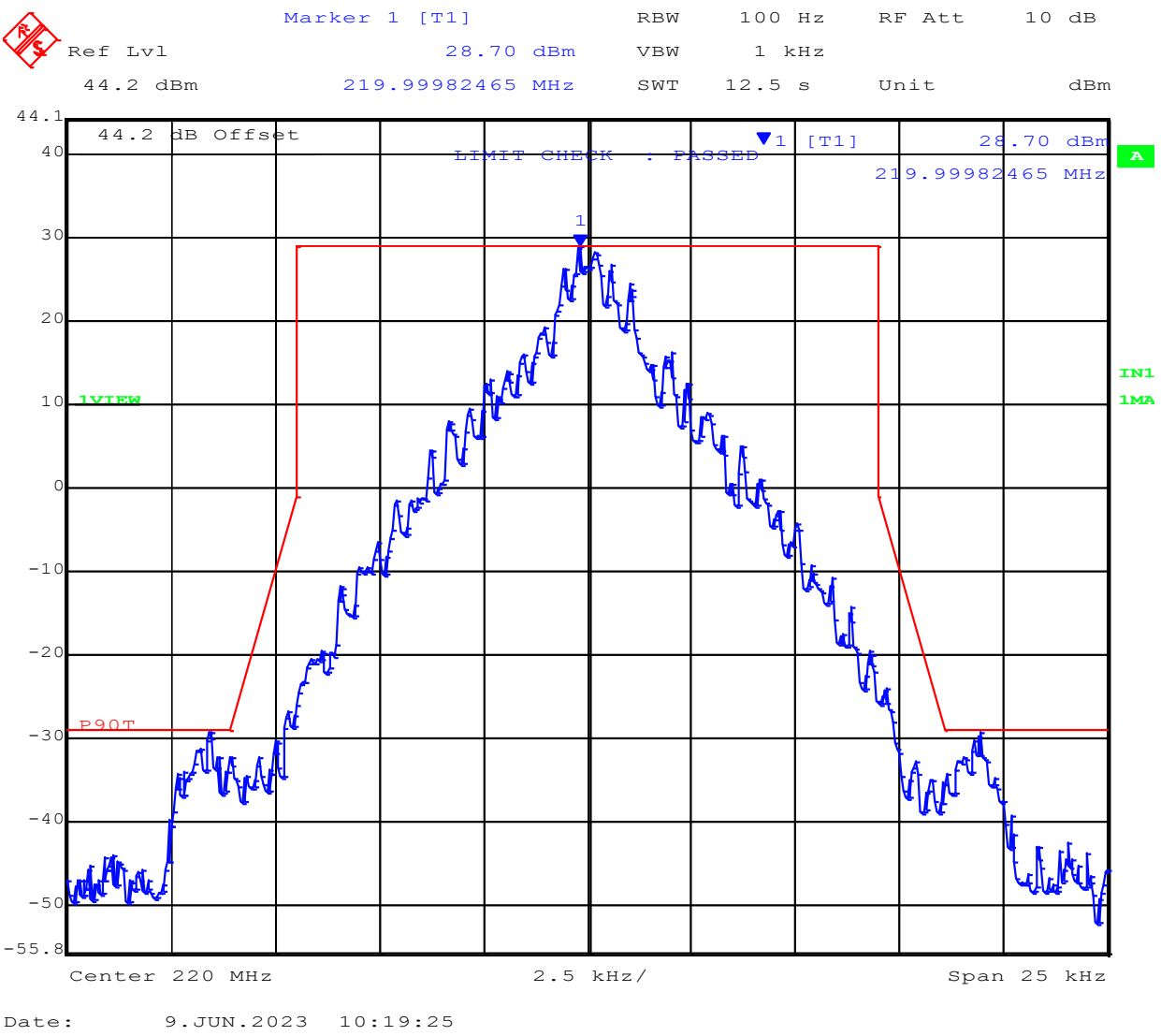


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

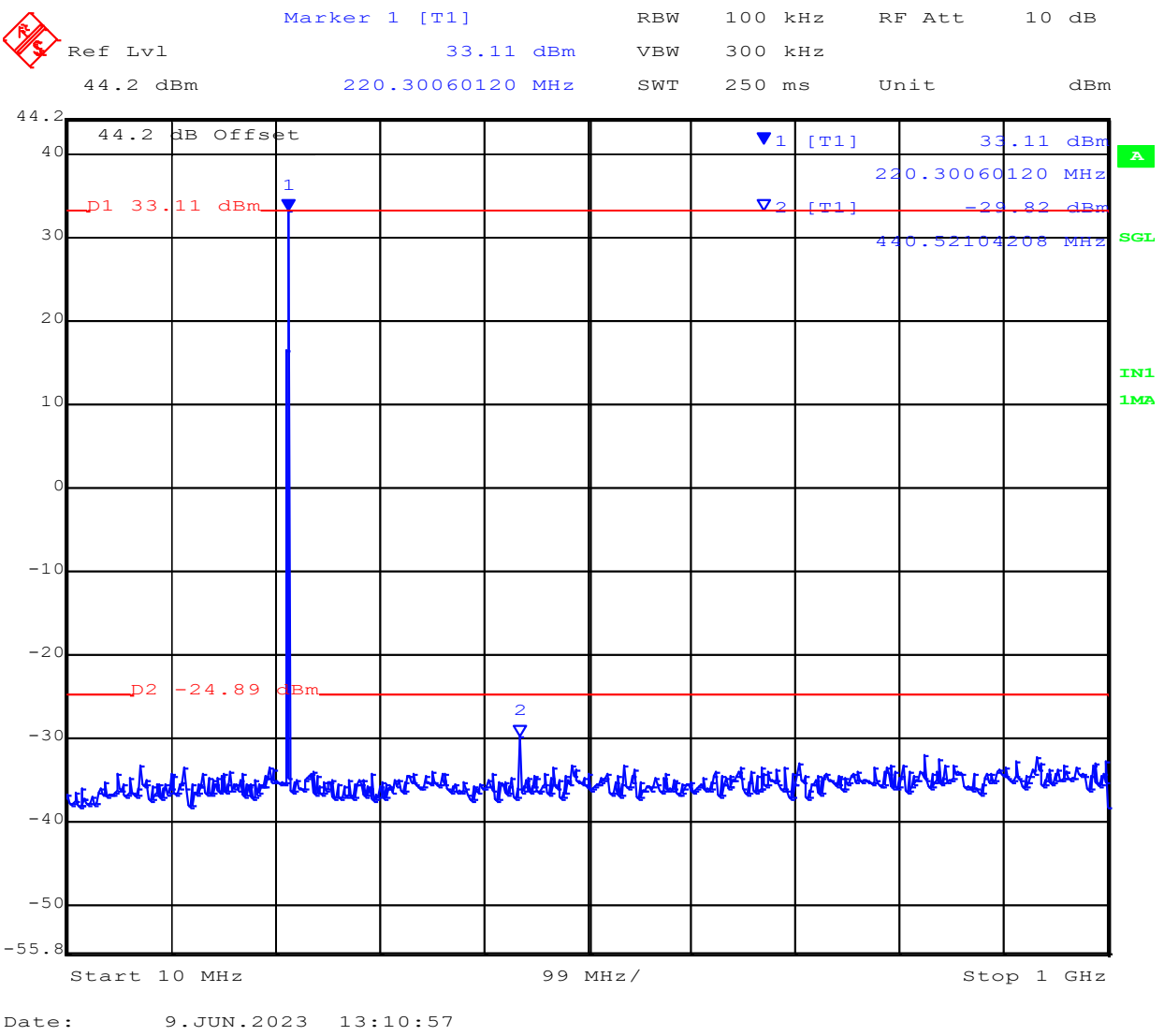


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

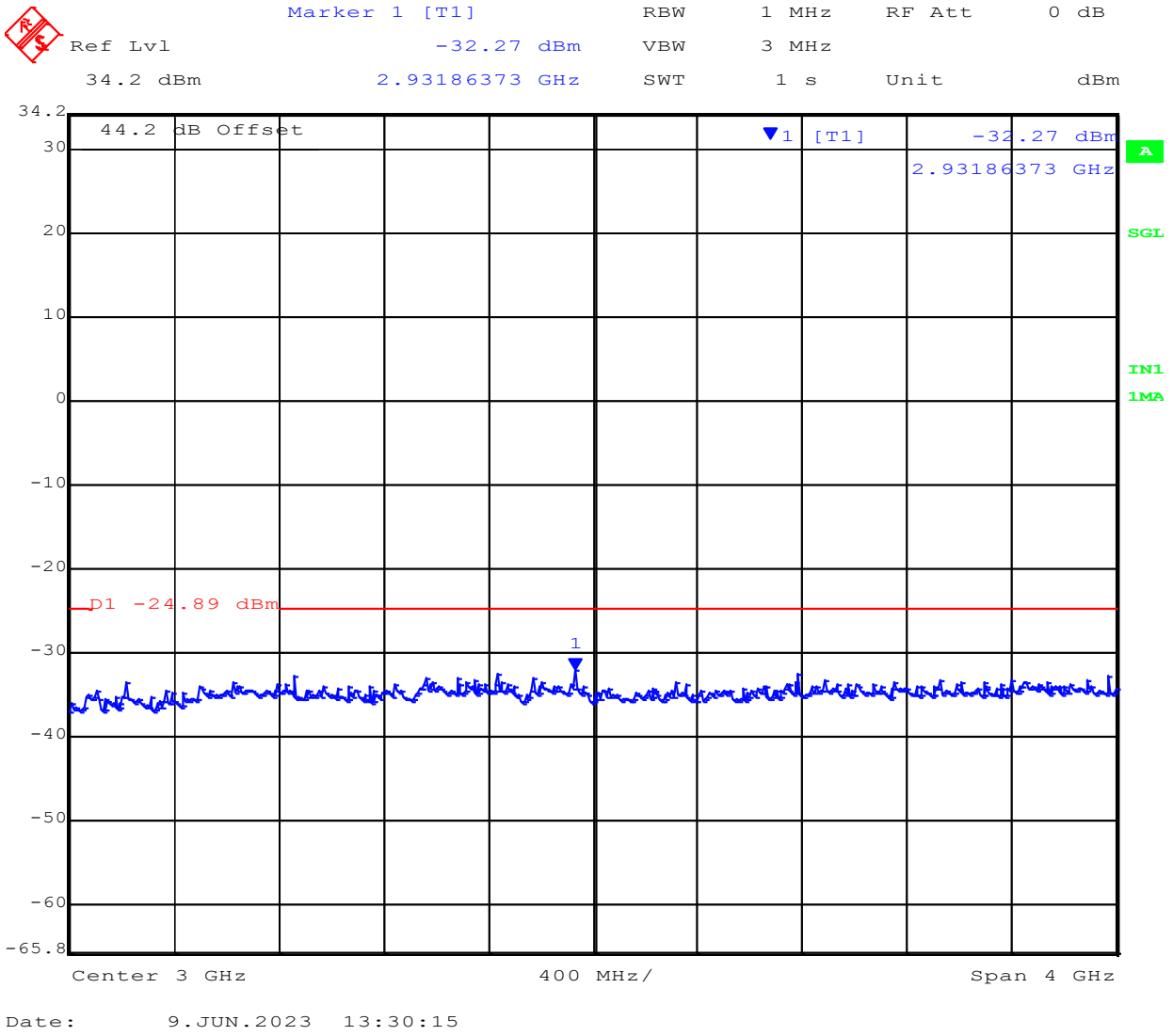


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 5GHz

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

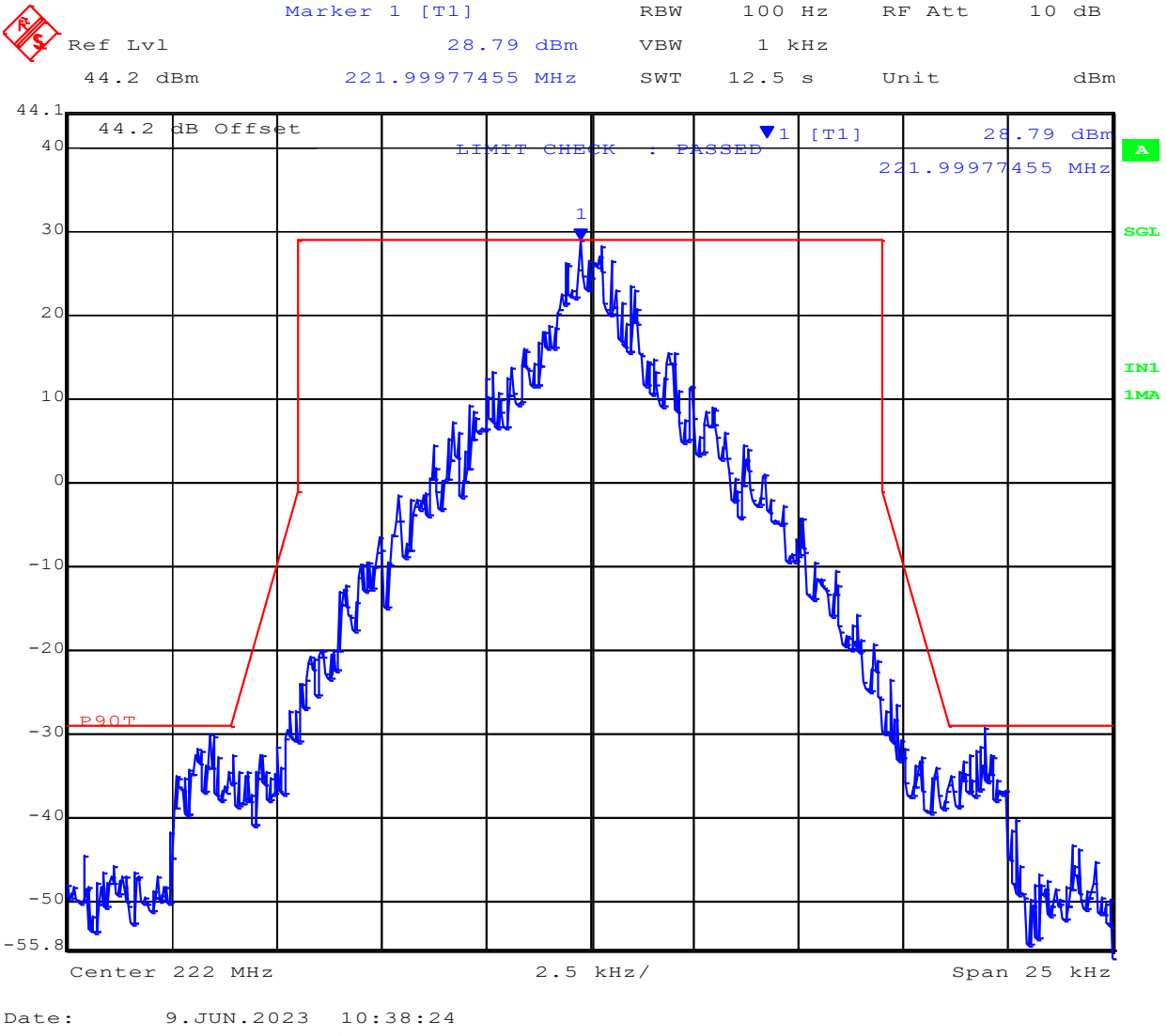


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 0 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

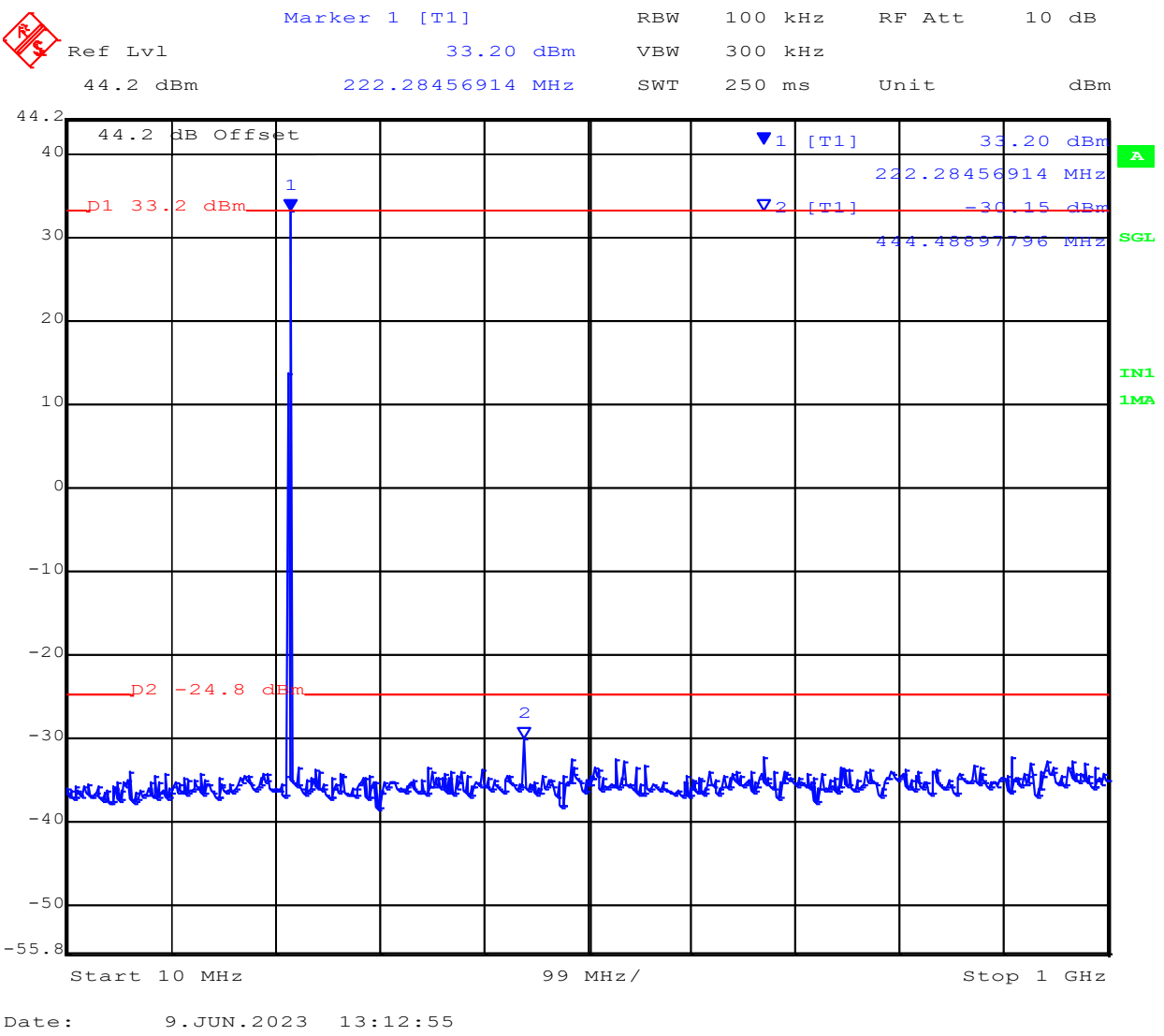


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

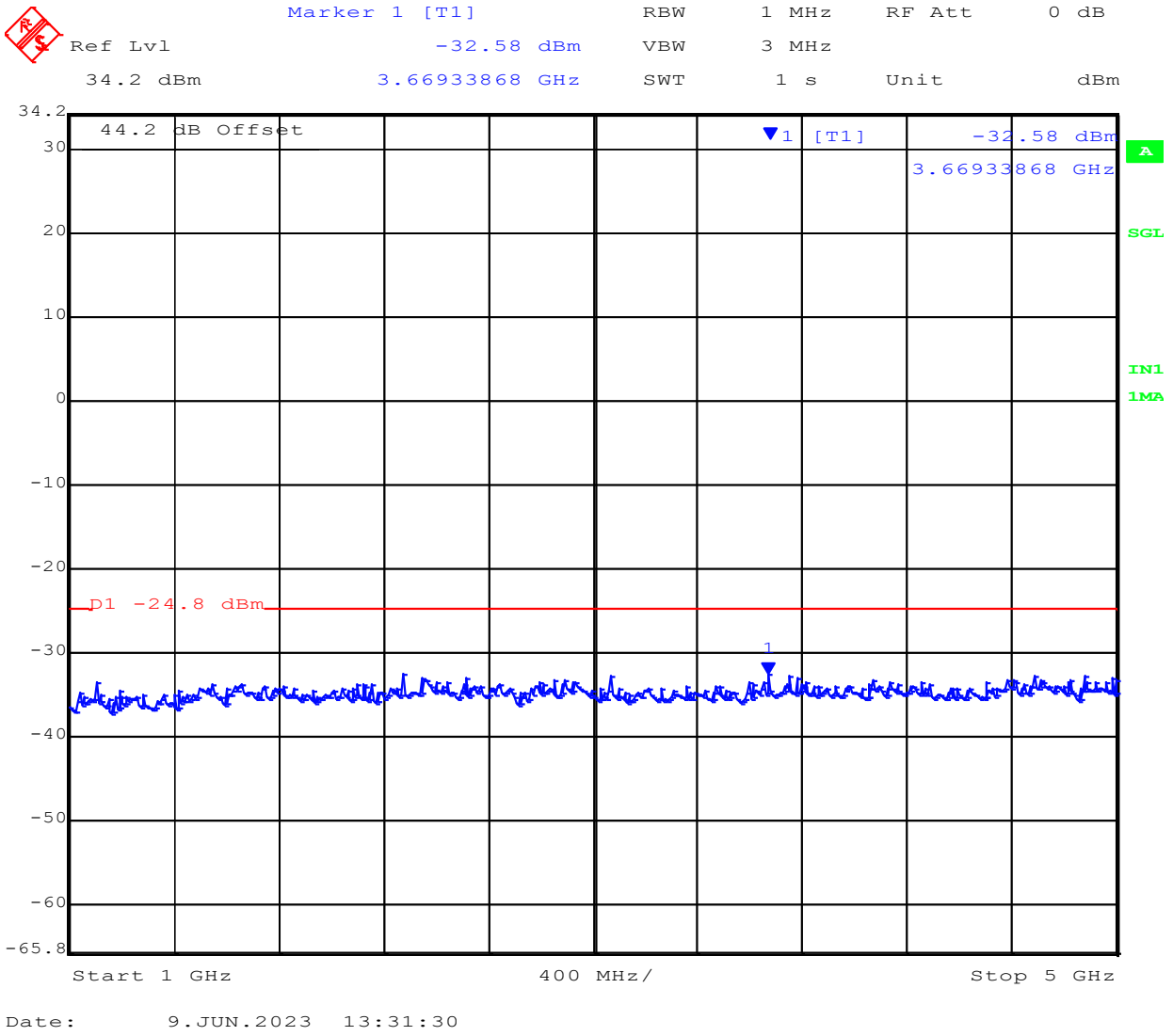


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 5GHz

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc



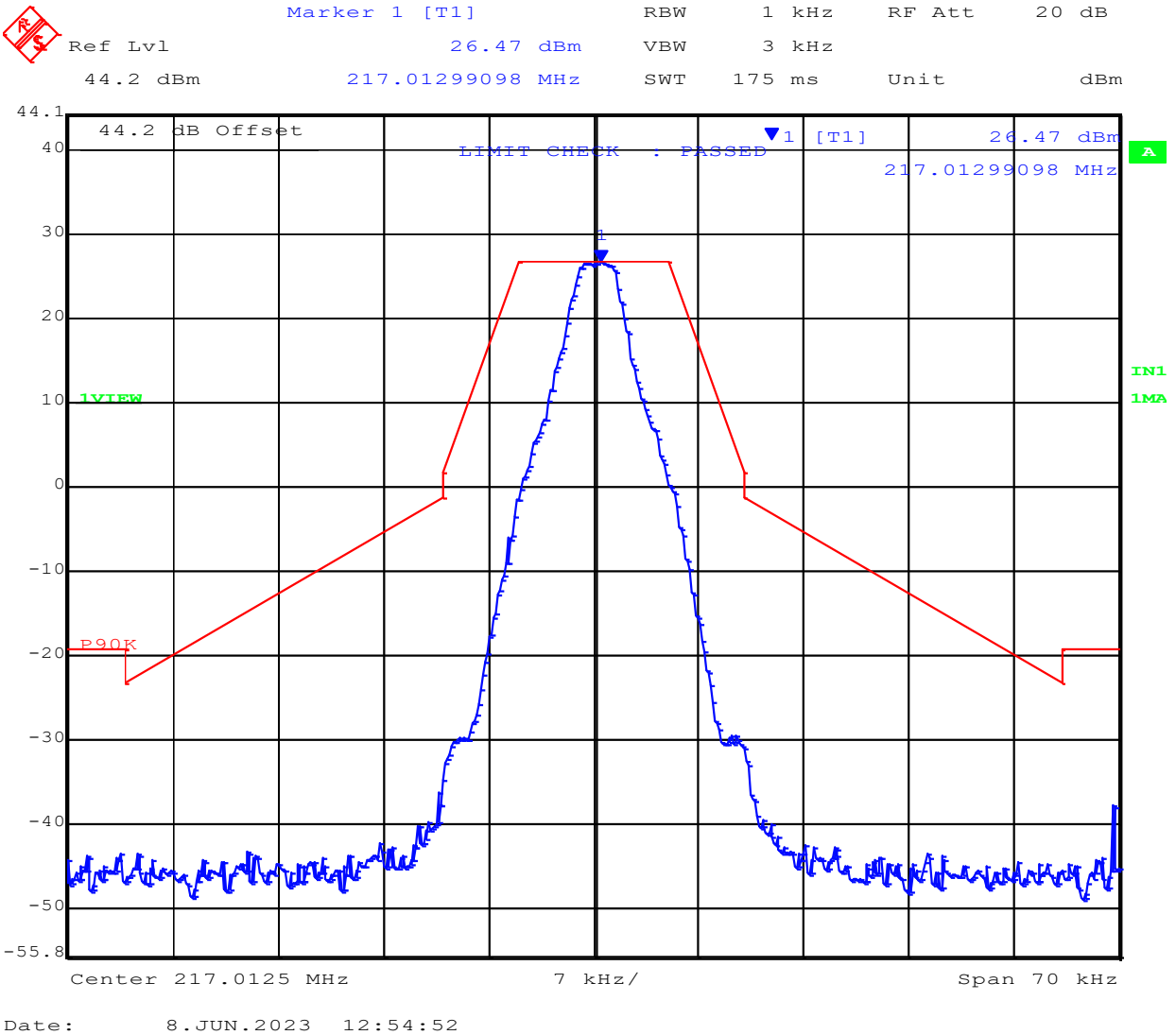
Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 0 Trace Mode = CLRWR		Pass

back to matrix

A.3. Low Power Spectrum Emission Mask & Spurious Emissions

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

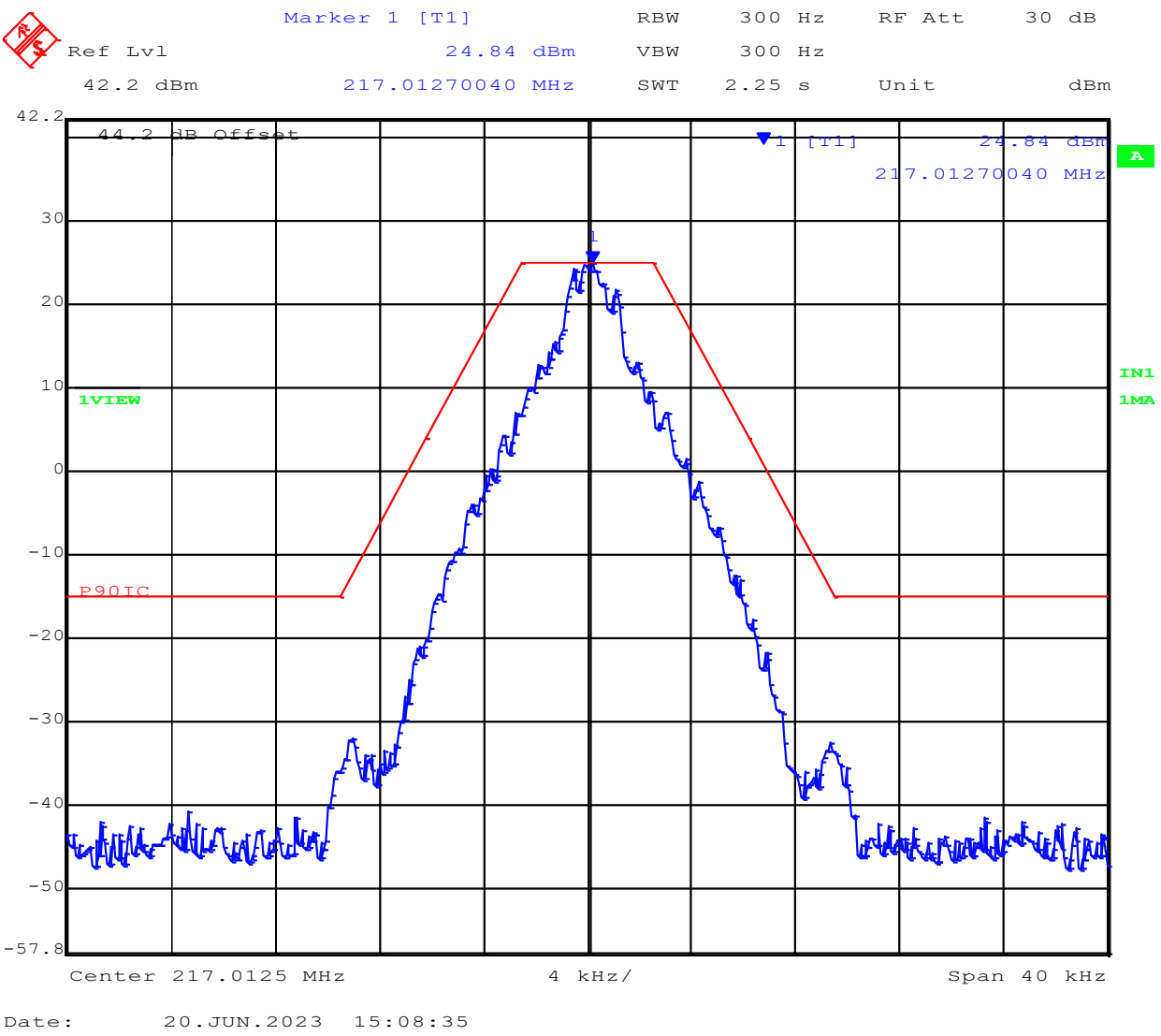


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK ISED

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

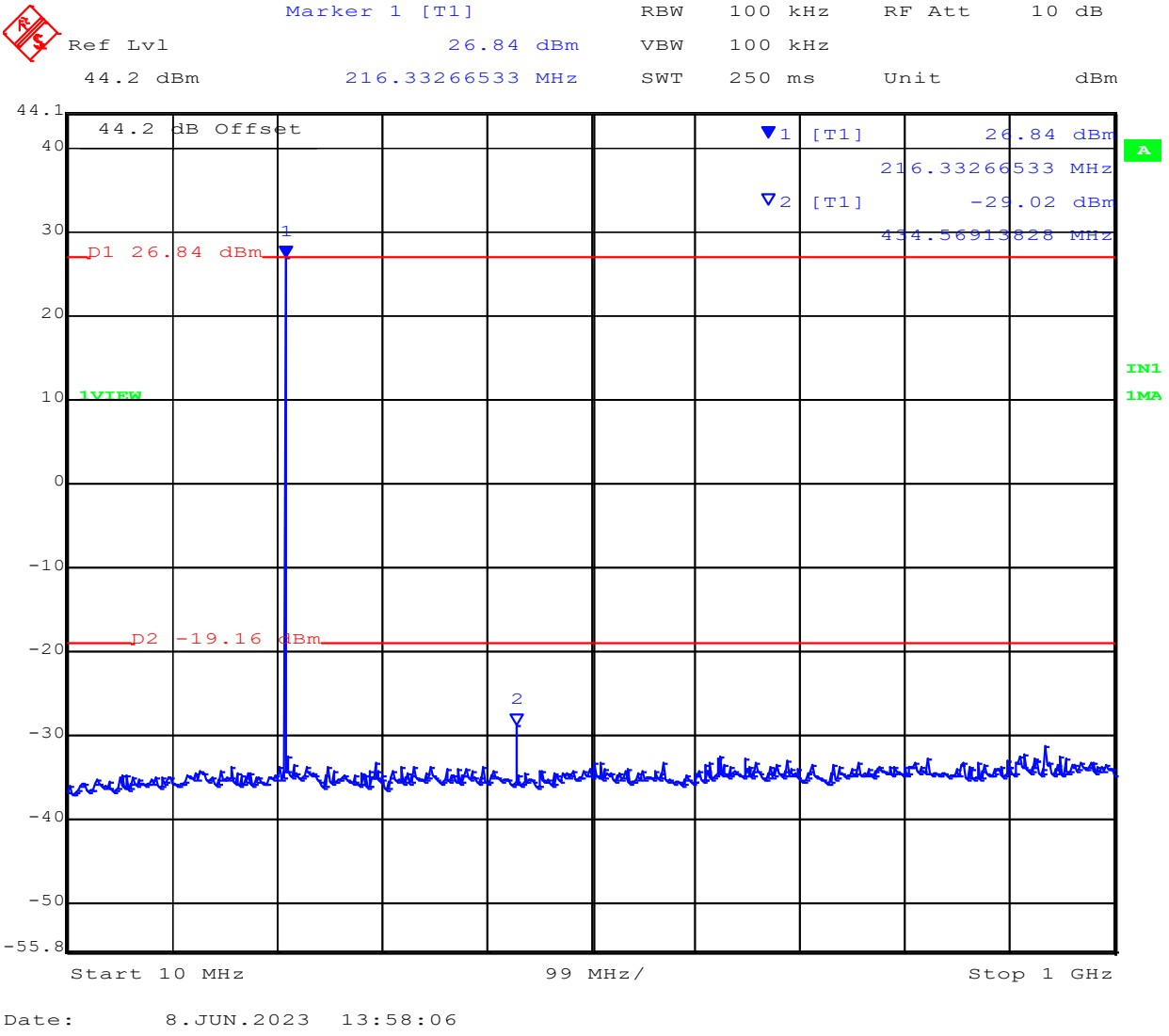


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

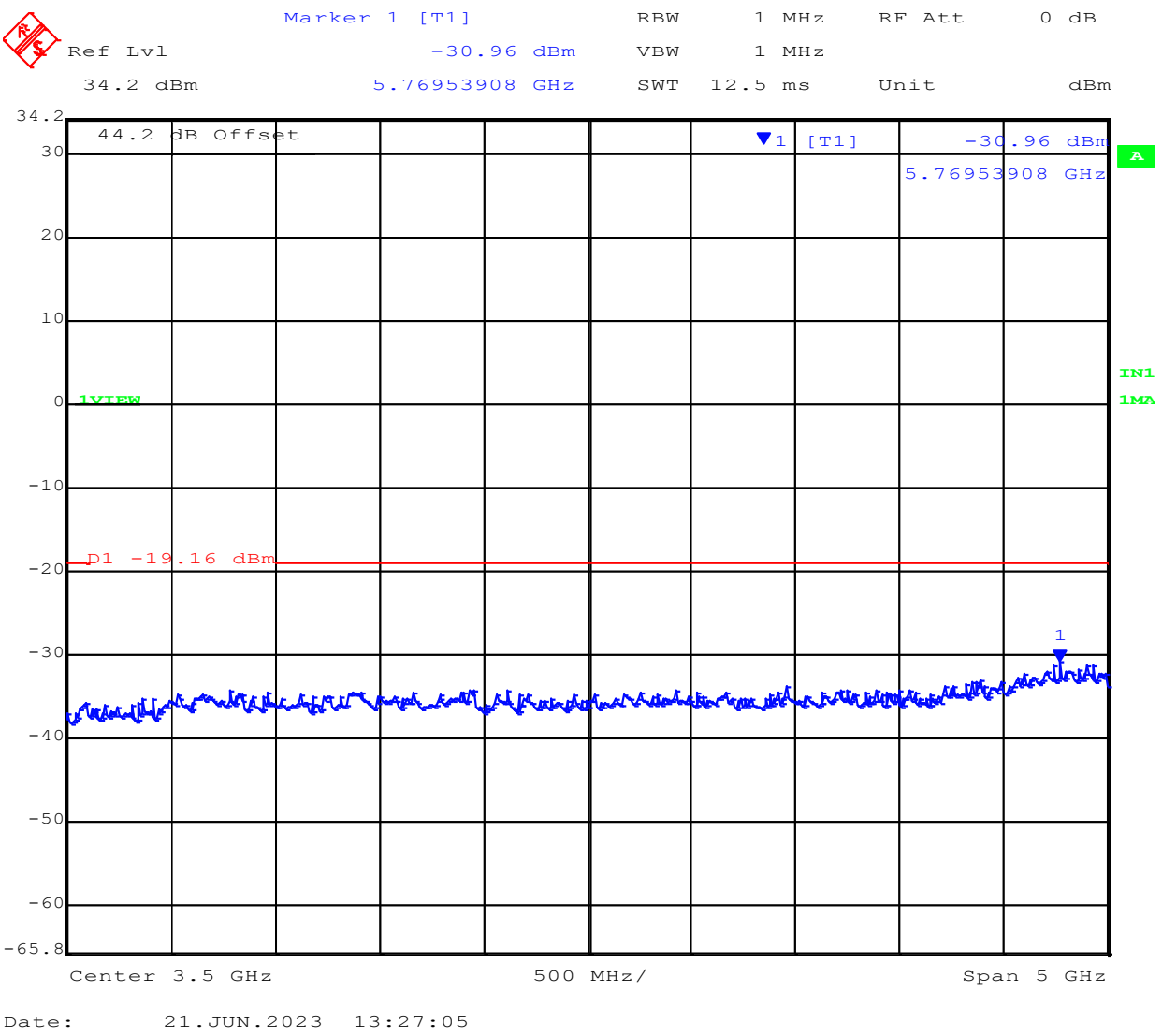


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 6GHz

Variant: 12.5KHz, Channel: 217.0125 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

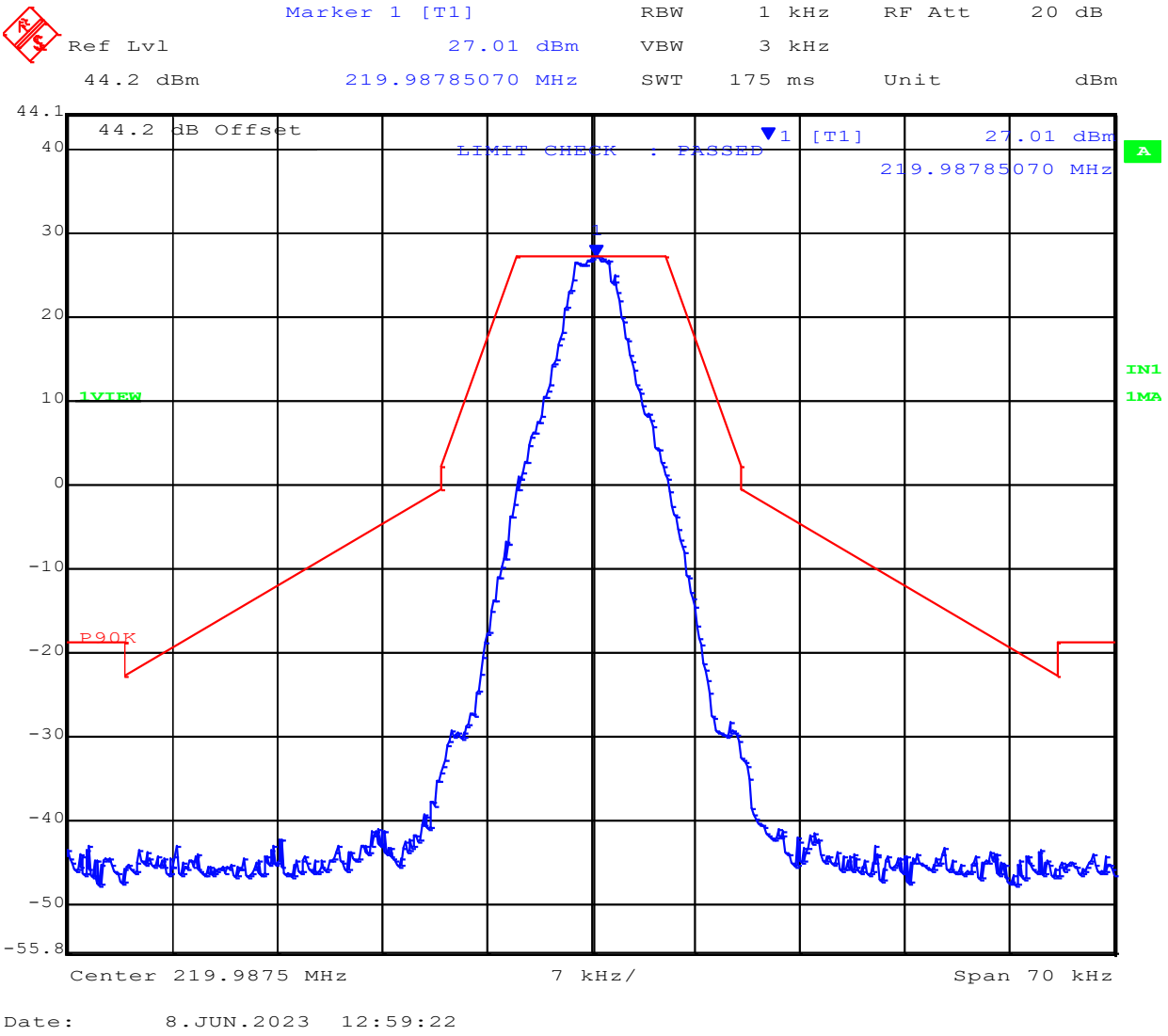


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

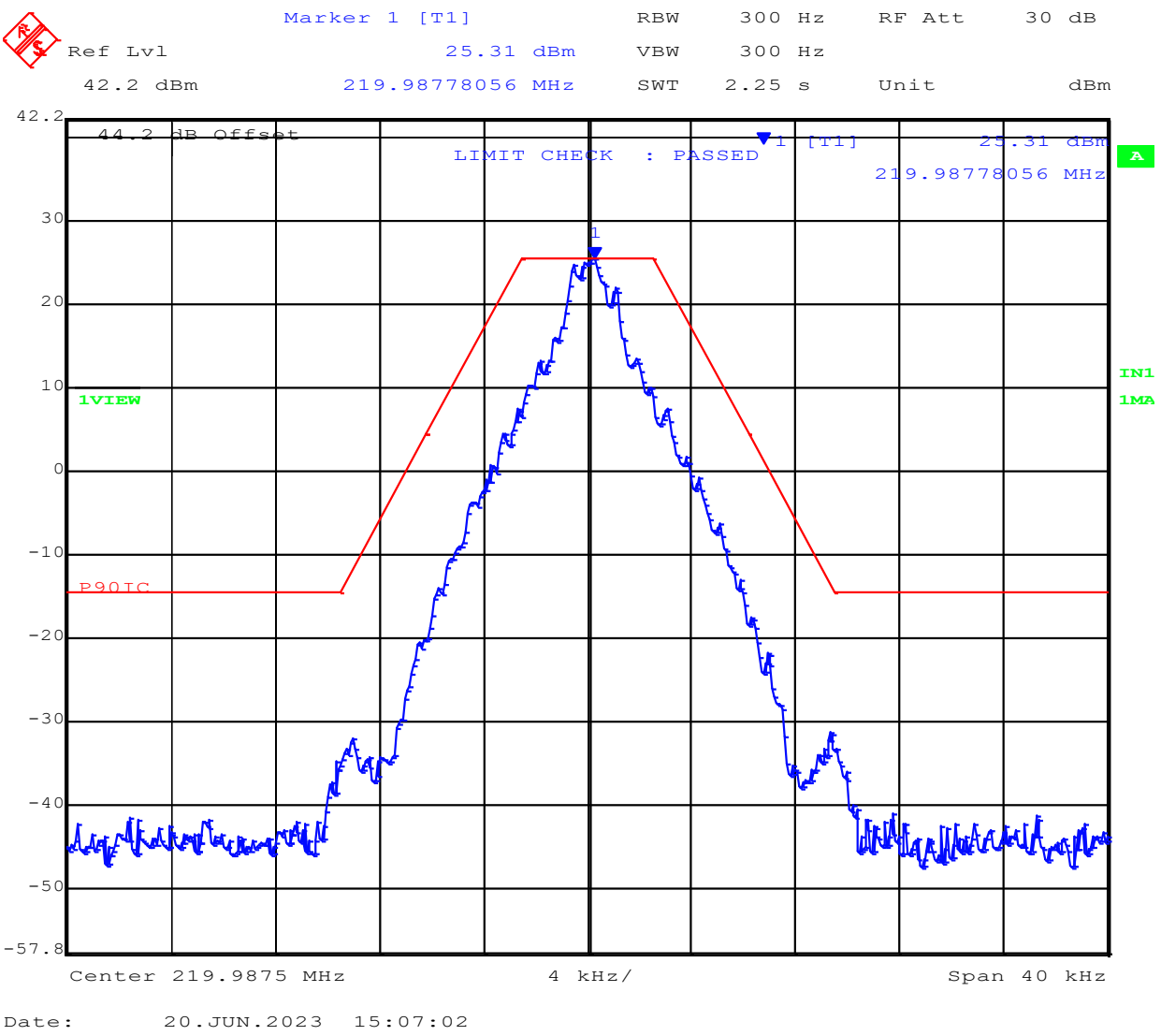


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK ISED

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

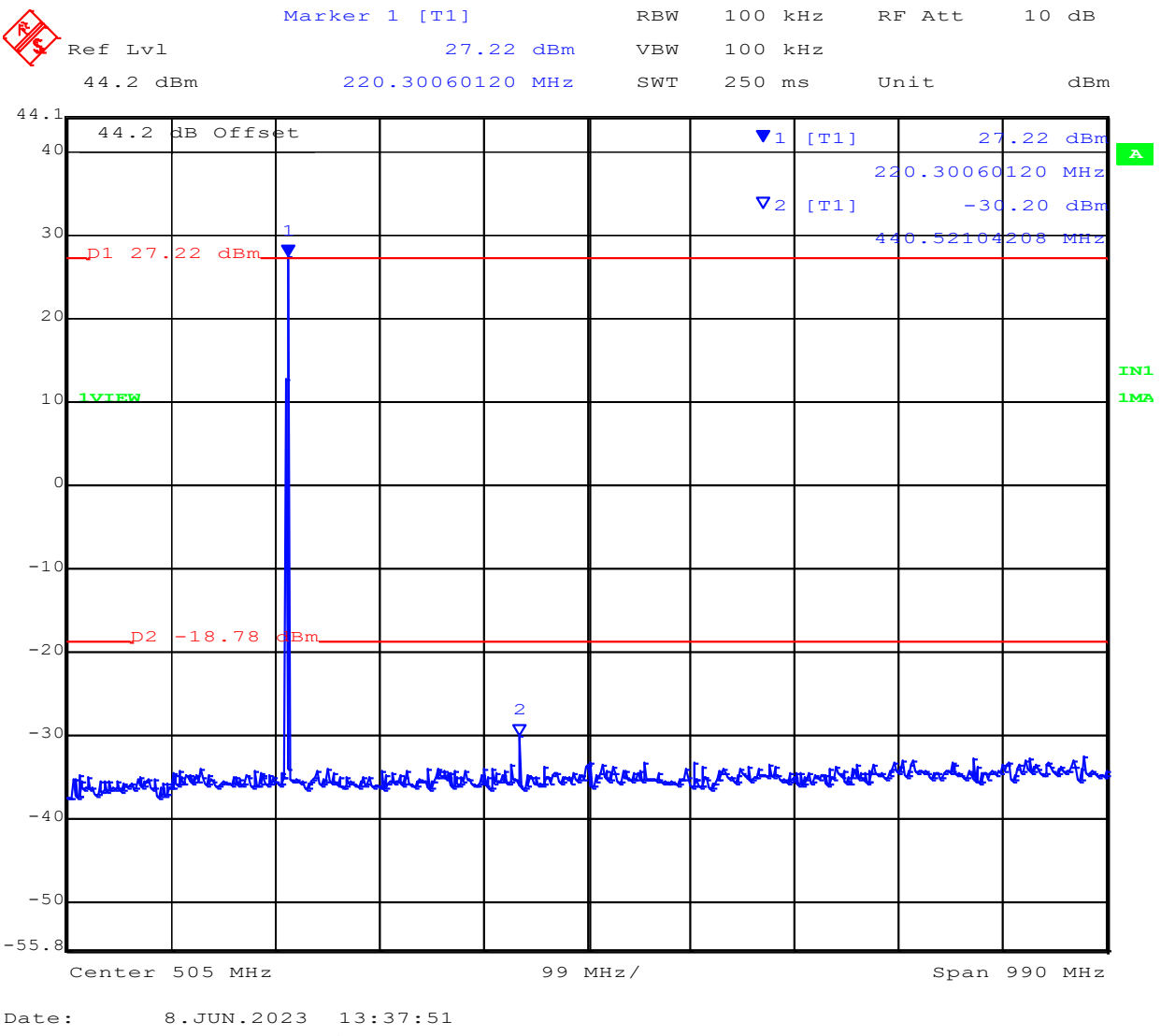


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

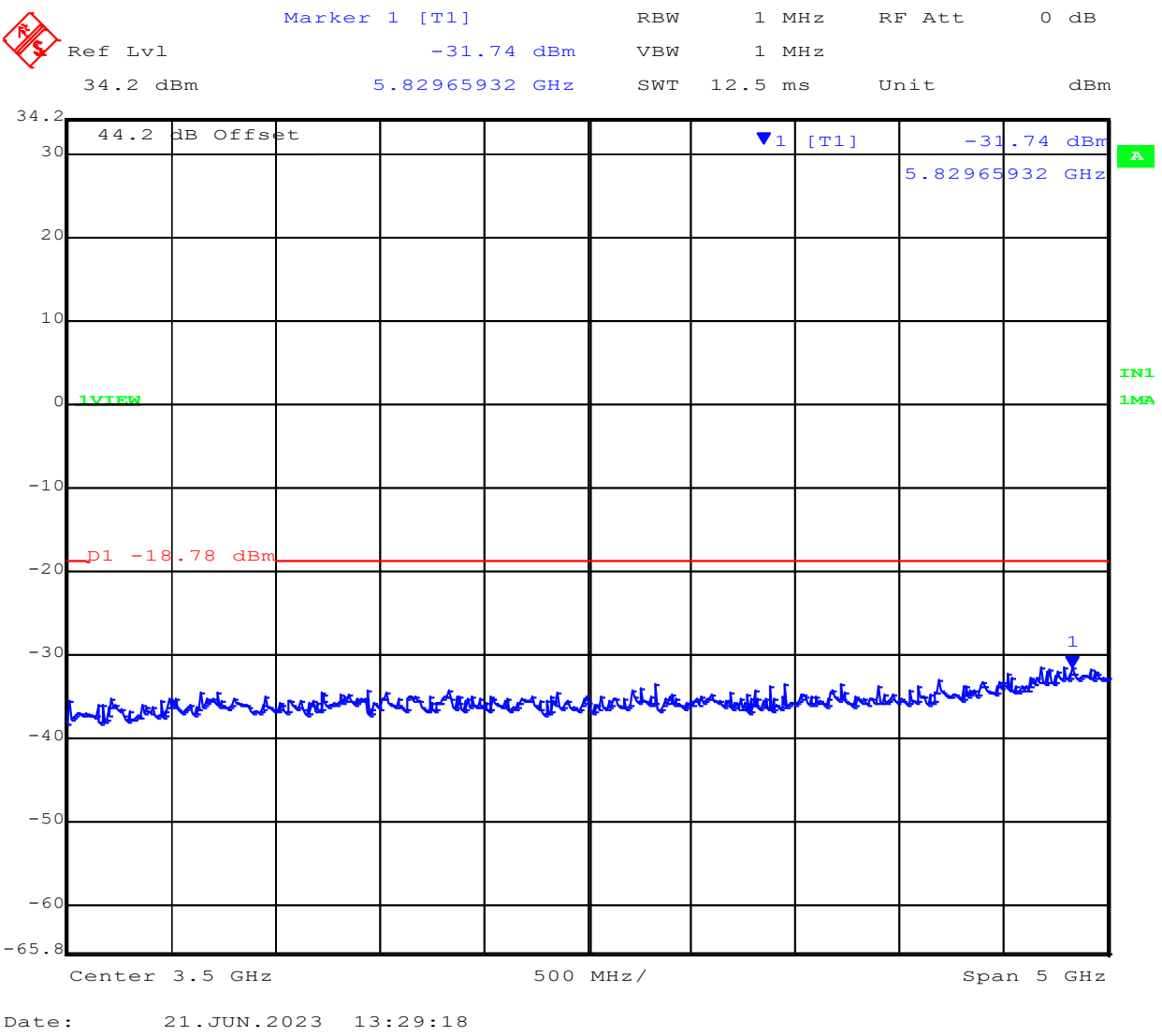


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 6GHz

Variant: 12.5KHz, Channel: 219.9875 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

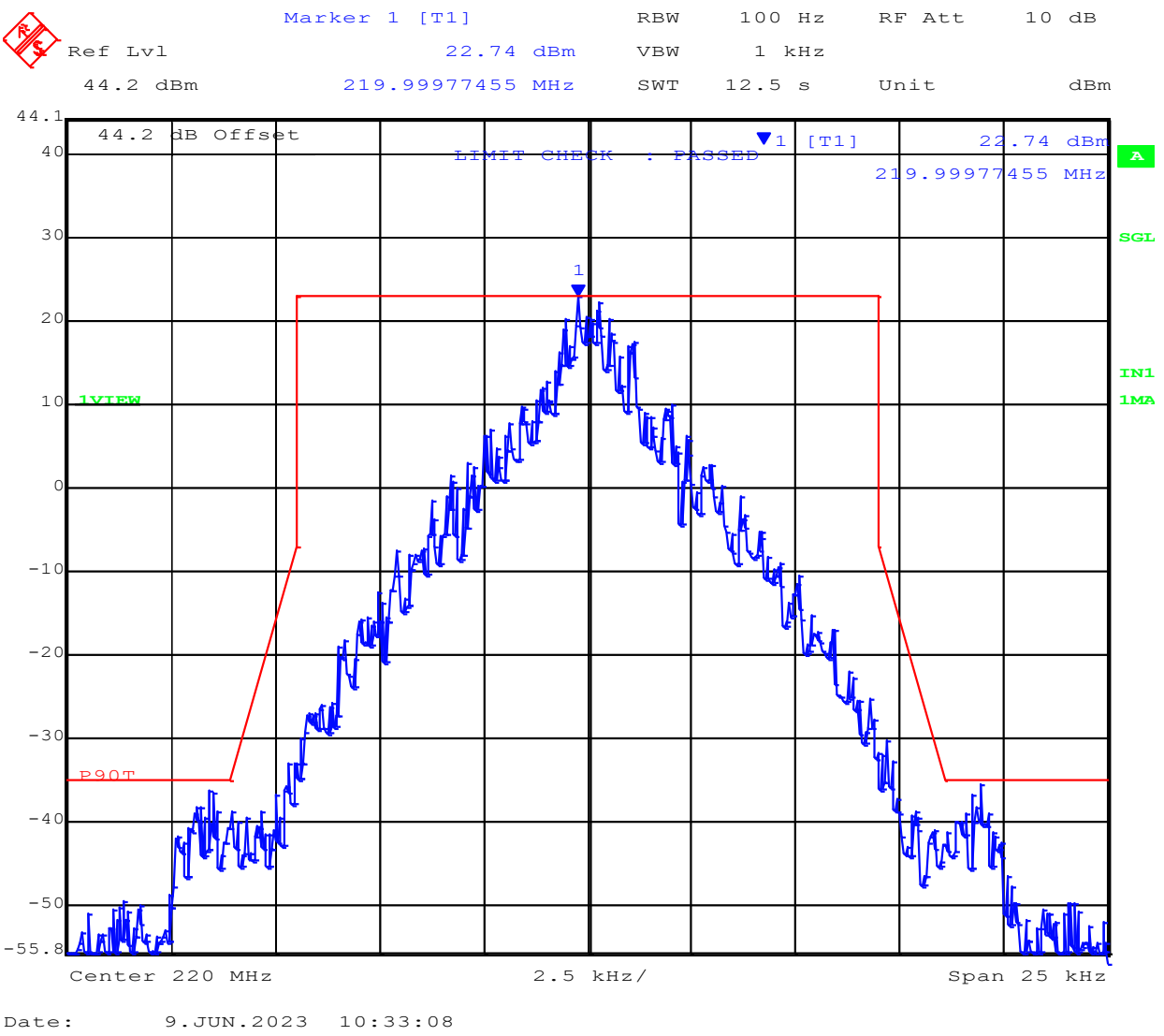


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

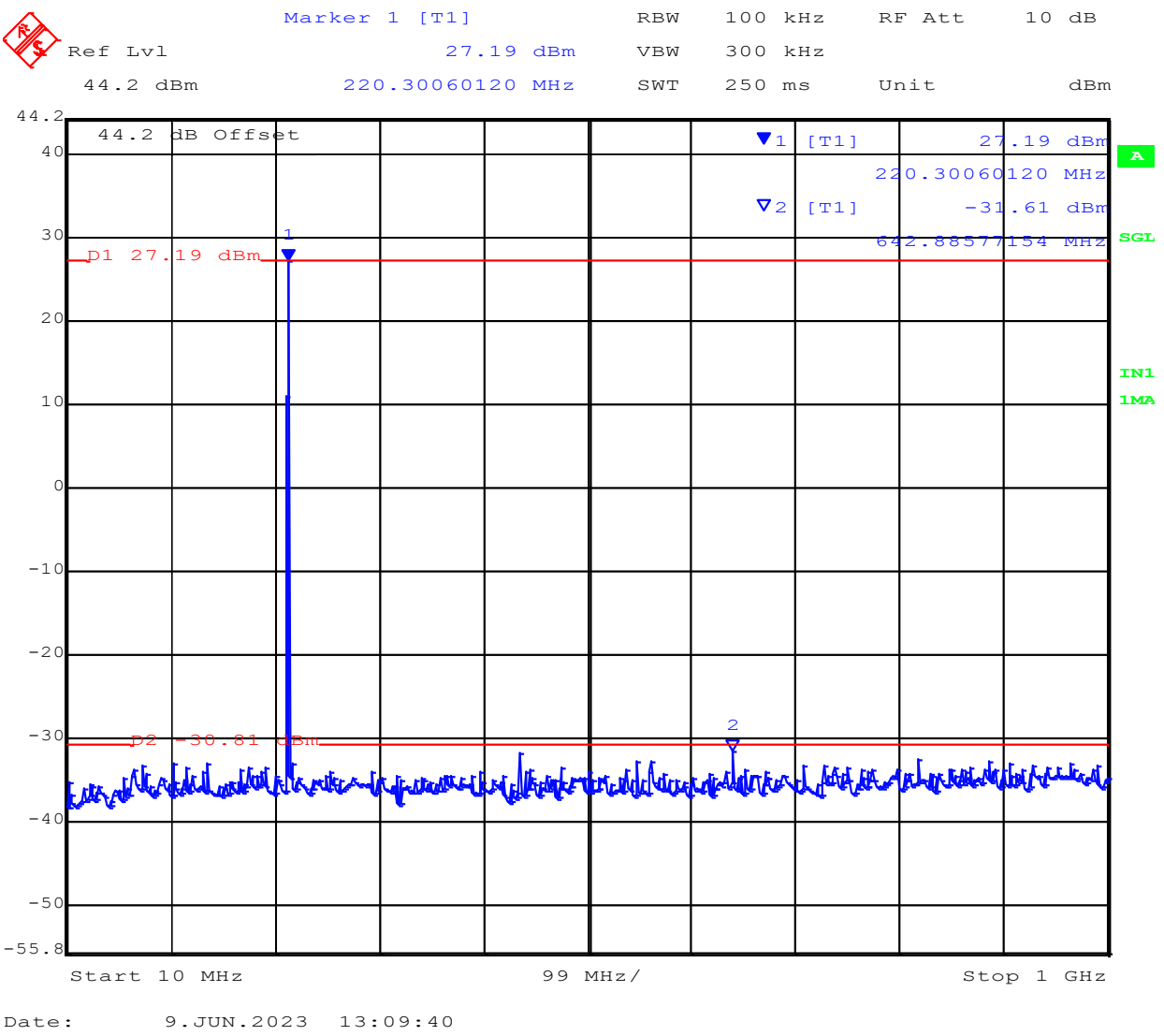


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

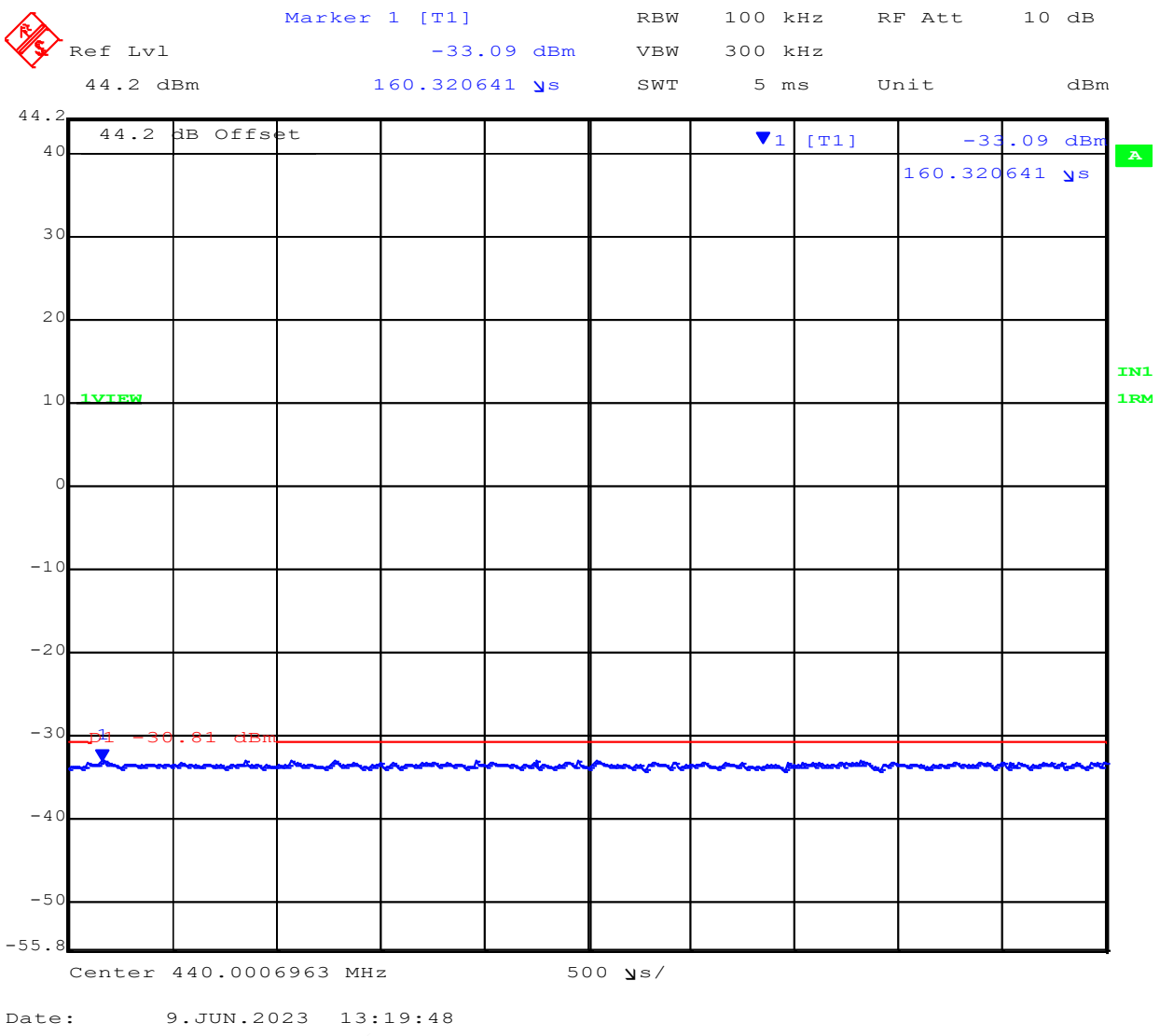


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz Evaluation

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

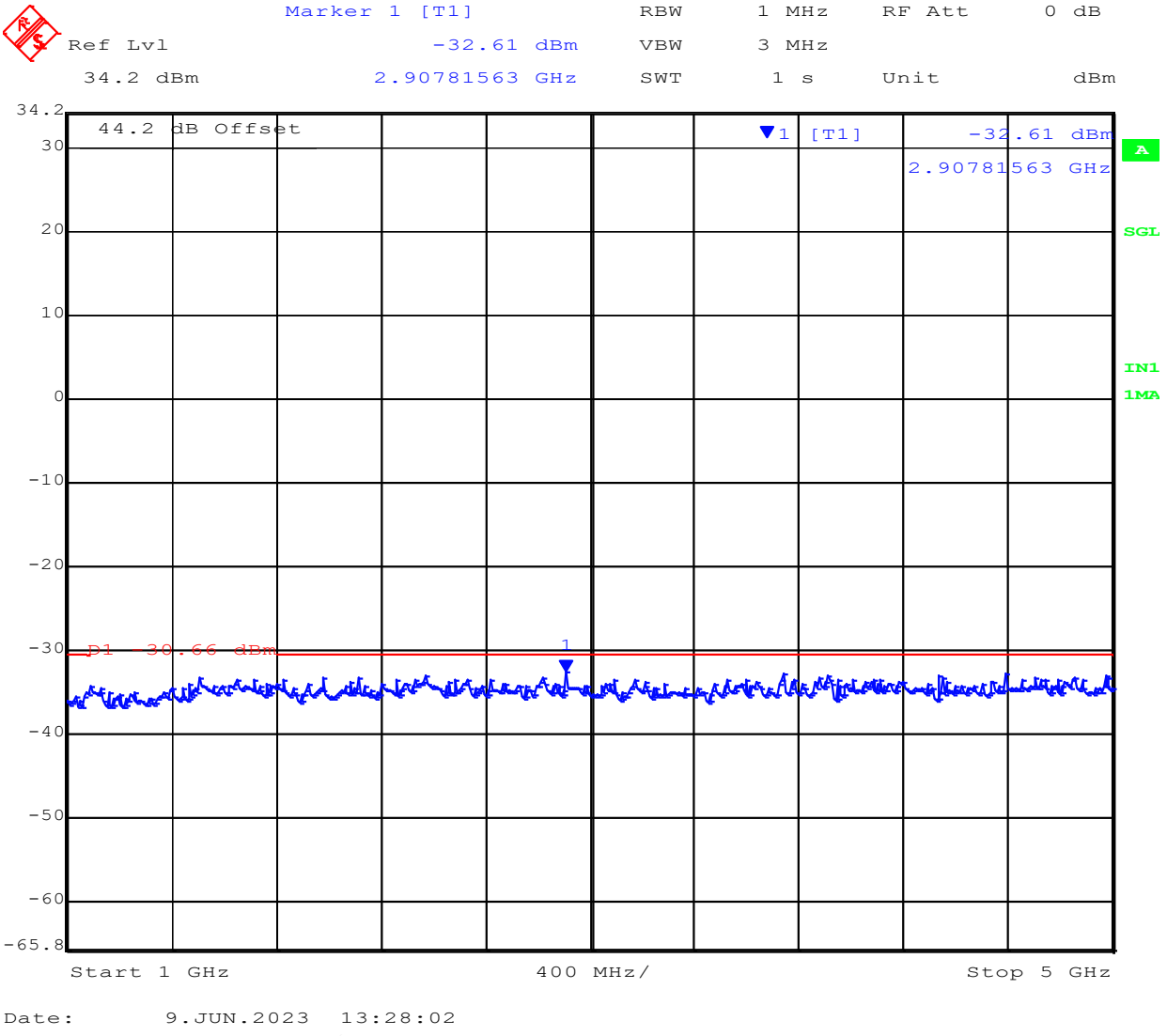


Analyzer Setup		Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 5GHz

Variant: 12.5KHz, Channel: 220.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

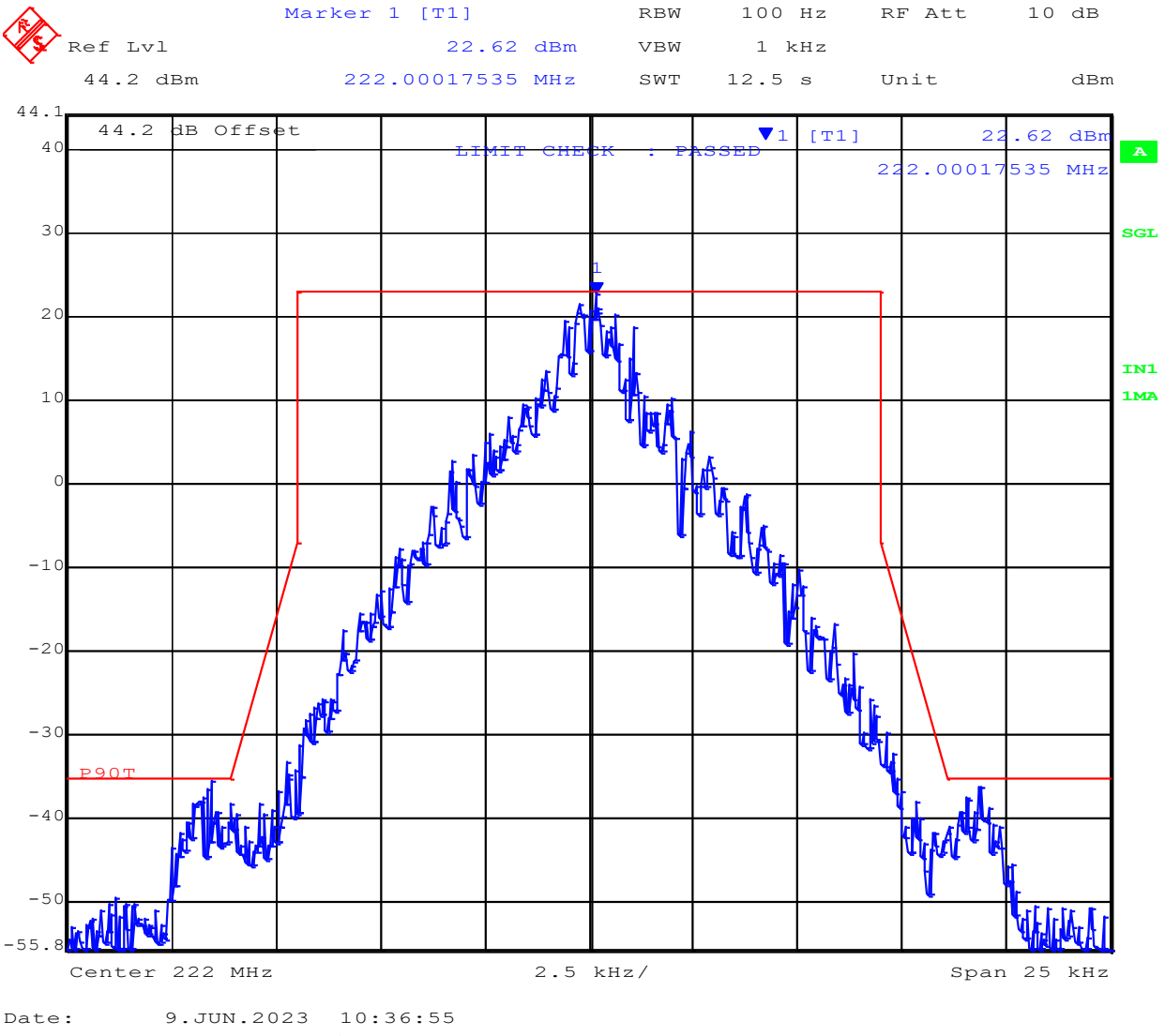


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 0 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION MASK

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

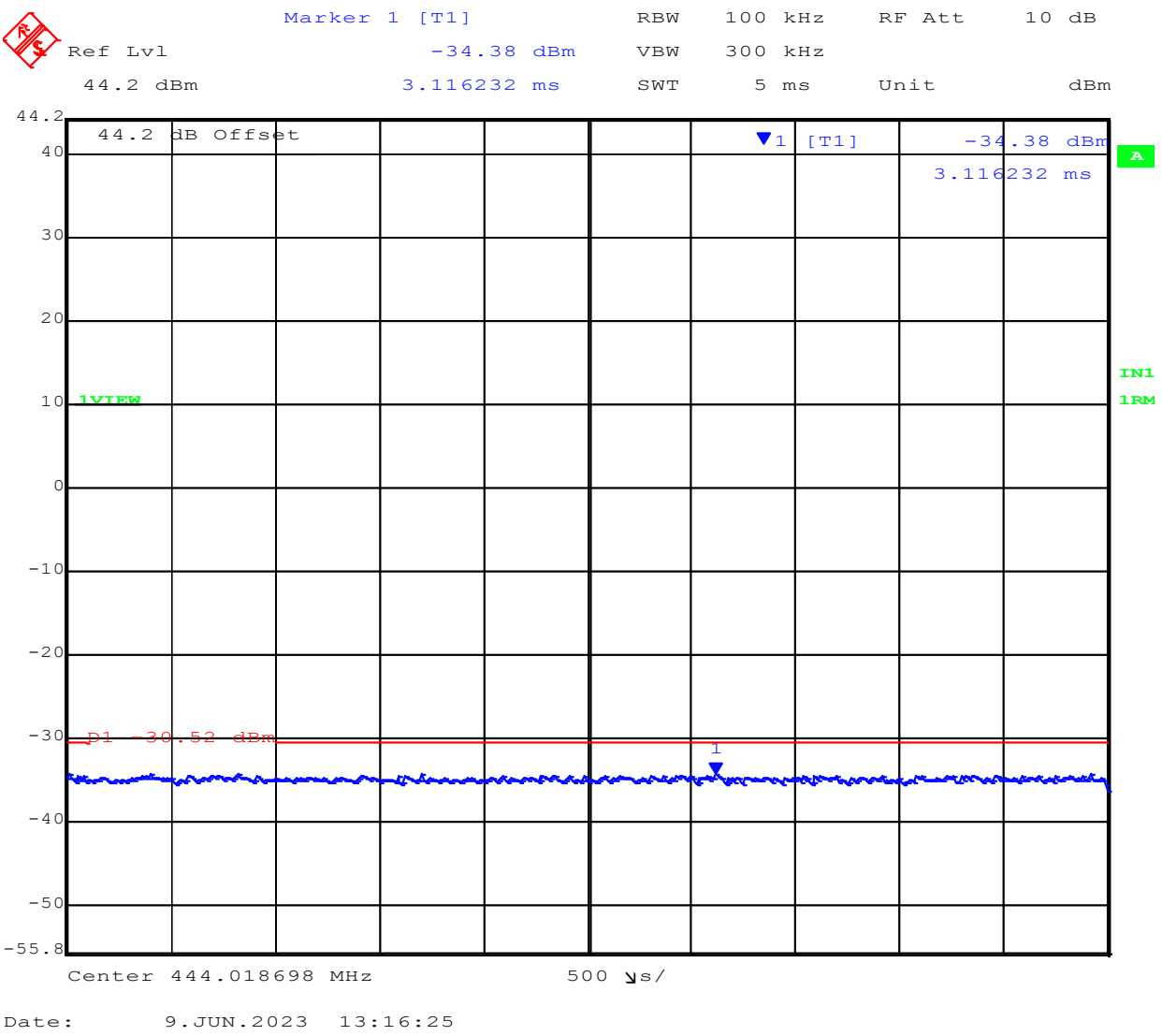


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

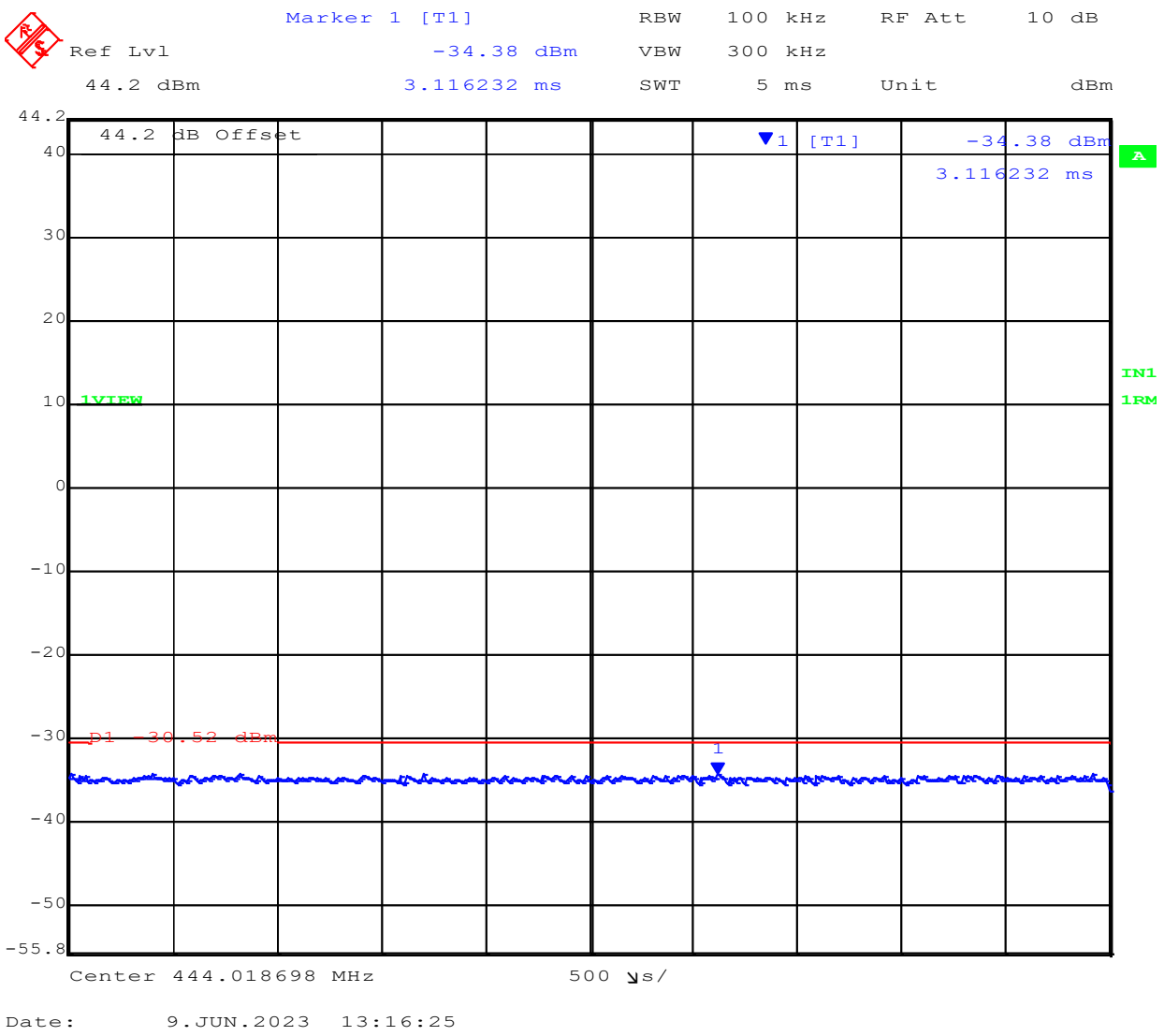


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) =10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 10MHz – 1GHz Evaluation

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc

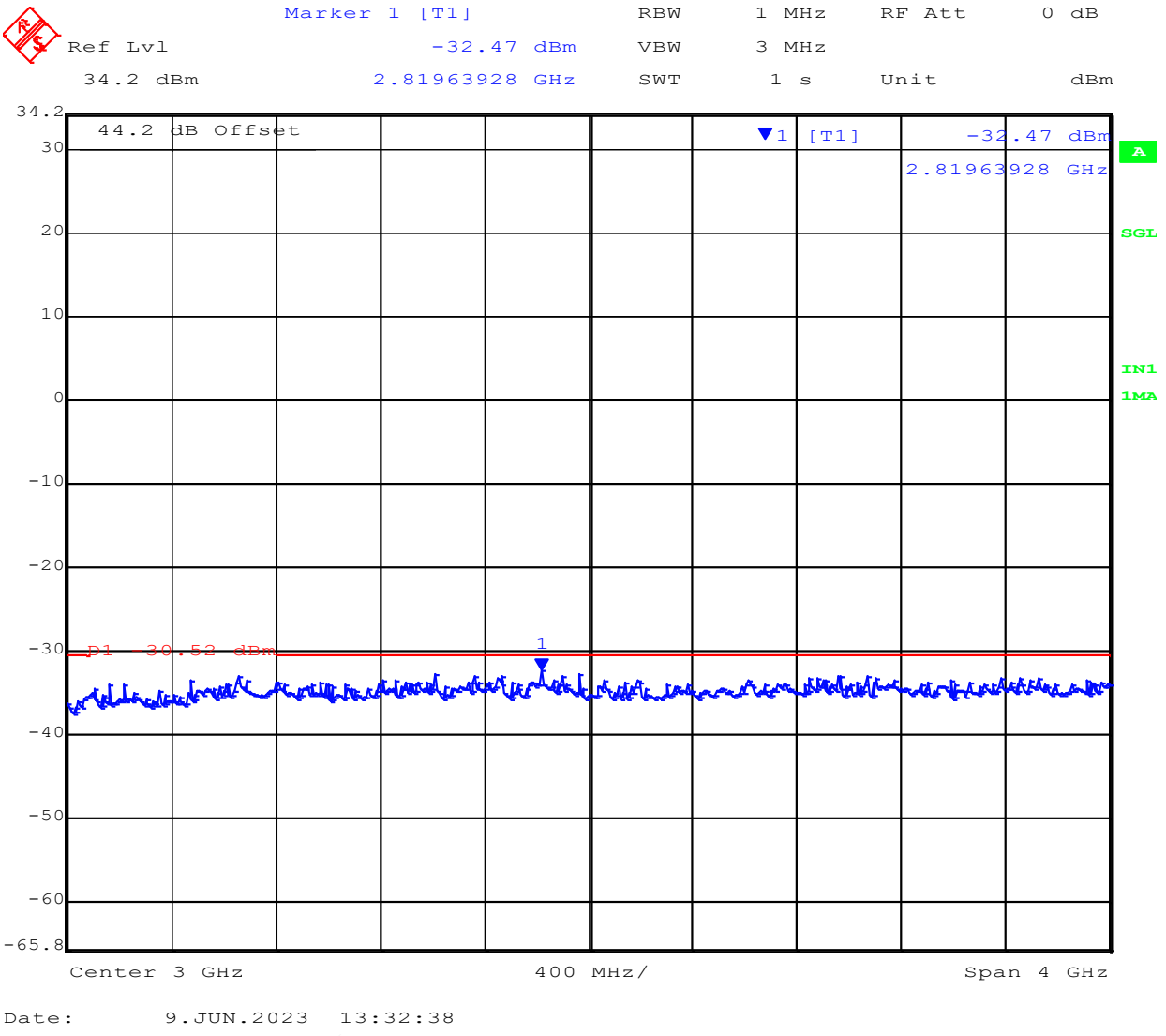


Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = CLRWR		Pass

back to matrix

SPECTRUM EMISSION 1GHz – 5GHz

Variant: 12.5KHz, Channel: 222.00 MHz, Chain a, Temp: 20, Voltage: 13.84 Vdc



Analyzer Setup		Test Results
Detector = Max Peak Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLRWR		Pass

back to matrix

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