

Test of RADWIN 2000 JET, RADWIN 5000 JET

To: FCC Part 90 Subpart Z & IC RSS-197

Test Report Serial No.: RDWN35-U3 Rev A





Test of: RADWIN 2000 JET, RADWIN 5000 JET

To: FCC Part 90 Subpart Z & IC RSS-197

Test Report Serial No.: RDWN35-U3 Rev A

This report supersedes NONE

Manufacturer: RADWIN Ltd
27 Habarzel Street
Tel Aviv, 6971039
Israel

Product Function: 3.x GHz Integrated Smart Antenna Outdoor
Radio Service

Copy No: pdf **Issue Date:** 19th March 2015

This Test Report is Issued Under the Authority of:

MiCOM Labs, Inc.

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TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory



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ACCREDITATION, LISTINGS and RECOGNITION

TESTING ACCREDITATION

MiCOM Labs, Inc. is an accredited Electrical testing laboratory per the international standard EN ISO/IEC 17025. 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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RECOGNITION

MiCOM Labs, Inc has widely recognized Electrical testing capabilities. Our international recognition includes Conformity Assessment Body designation by APEC MRA** countries. Our test reports are widely accepted for global type approvals.

Country	Recognition Body	Status	Phase	Identification No.
USA	Federal Communications Commission (FCC)	TCB	-	US0159 Listing #: 102167
Canada	Industry Canada (IC)	FCB	APEC MRA 2	US0159 Listing #: 4143A-2
Japan	MIC (Ministry of Internal Affairs and Communication)	CAB	APEC MRA 2	RCB 210
	VCCI	--	--	A-0012
Europe	European Commission	NB	EU MRA	NB 2280
Australia	Australian Communications and Media Authority (ACMA)	CAB	APEC MRA 1	US0159
Hong Kong	Office of the Telecommunication Authority (OFTA)	CAB	APEC MRA 1	
Korea	Ministry of Information and Communication Radio Research Laboratory (RRL)	CAB	APEC MRA 1	
Singapore	Infocomm Development Authority (IDA)	CAB	APEC MRA 1	
Taiwan	National Communications Commission (NCC) Bureau of Standards, Metrology and Inspection (BSMI)	CAB	APEC MRA 1	
Vietnam	Ministry of Communication (MIC)	CAB	APEC MRA 1	

**APEC MRA – Asia Pacific Economic Community Mutual Recognition Agreement.

Is a recognition agreement under which test lab is accredited to regulatory standards of the APEC member countries.

Phase I - recognition for product testing

Phase II – recognition for both product testing and certification

N/A – Not Applicable

**EU MRA – European Union Mutual Recognition Agreement.

Is a recognition agreement under which test lab is accredited to regulatory standards of the EU member countries.

**NB – Notified Body

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PRODUCT CERTIFICATION

MiCOM Labs, Inc. is an accredited Product Certification Body per the international standard EN ISO/IEC 17065. 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>



United States of America – Telecommunication Certification Body (TCB)

TCB Identifier – US0159

Industry Canada – Certification Body

CAB Identifier – US0159

Europe – Notified Body

Notified Body Identifier - 2280

Japan – Recognized Certification Body (RCB)

RCB Identifier - 210

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DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft #1	12 th March 2015	
Draft #2	16 th March 2015	
Rev A	19 th March 2015	Initial Release

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1. TEST RESULT CERTIFICATE

Manufacturer:	RADWIN Ltd 27 Habarzel Street Tel Aviv, 6971039 Israel	Tested By:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton California, 94566, USA
EUT:	3.x GHz Integrated Smart Antenna Outdoor Radio Device	Telephone:	+1 925 462 0304
Model:	RADWIN 2000 JET, RADWIN 5000 JET	Fax:	+1 925 462 0306
S/N:	Prototype		
Test Date(s):	23rd - 4th March 2015	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC Part 90 Subpart Z & IC RSS-197	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.

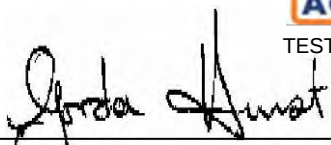
Notes:

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.

Approved & Released for MiCOM Labs, Inc. by:



Graeme Grieve
Quality Manager MiCOM Labs,



Gordon Hurst
President & CEO MiCOM Labs, Inc.



TESTING CERT #2381.01

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2. REFERENCES AND MEASUREMENT UNCERTAINTY

2.1. Normative References

Ref.	Publication	Year	Title
(i)	FCC 47 CFR Part 90	2004	Code of Federal Regulations
(ii)	IC RSS-197	Feb 2010	Wireless Broadband Access Equipment Operating in the Band 3650–3700 MHz
(iii)	ANSI C63.4	2003	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
(iv)	CISPR 22/ EN 55022	1997 1998	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(v)	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
(vi)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(Vii)	ETSI TR 100 028	2001	Parts 1 and 2 Electromagnetic compatibility and Radio Spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics
(Viii)	A2LA	14 th September 2005	Reference to A2LA Accreditation Status – A2LA Advertising Policy

2.2. Test and Uncertainty Procedures

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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3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

Details	Description
Purpose:	Test of the RADWIN 2000 JET, RADWIN 5000 JET to FCC Part 90 Subpart Z & IC RSS-197 regulations.
Applicant:	RADWIN Ltd 27 Habarzel Street Tel Aviv, 6971039 Israel
Manufacturer:	As Applicant
Laboratory performing the tests:	MiCOM Labs, Inc. 575 Boulder Court Pleasanton, California 94566 USA
Test report reference number:	RDWN35-U3 Rev A
Date EUT received:	23 rd February 2015
Dates of test (from - to):	23 rd - 4 th March 2015
Standard(s) applied:	FCC Part 90 Subpart Z & IC RSS-197
No of Units Tested:	1
Type of Equipment:	3 GHz Integrated Smart Antenna Outdoor Radio Device
Manufacturers Trade Name:	RADWIN JET
Model(s):	RADWIN 2000 JET, RADWIN 5000 JET
Location for use:	Outdoor use only
Declared Frequency Range(s):	Transmit: 3,650 – 3,700 MHz, Receiver: 3,650 – 3,700 MHz
Type of Modulation:	BPSK, QPSK, 16QAM, 64QAM
Operational Bandwidths:	5, 10, 20, 40 MHz
Declared Maximum Output Power:	+30 dBm conducted
ITU Emission Designator:	5M0W7W 10M0W7W 20M0W7W 40M0W7W
Transmit/Receive Operation:	Time Division Duplex (TDD)
Rated Input Voltage and Current:	POE: 115Vac 60Hz / +55 Vdc 1.0 A
Operating Temperature Range:	Client declared: -35°C to +60°C
Equipment Dimensions:	13.9" x 9.0" x 2.6" inches
Weight:	11.6 lbs
Primary function of equipment:	3 GHz Integrated Smart Antenna Outdoor Radio Device

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3.2. Scope of Test Program

The scope of the test program was to test the RADWIN 2000 JET, RADWIN 5000 JET for compliance against:-

FCC 47 CFR Part 90, Subpart Z & IC RSS-197 regulatory requirements.

The RADWIN JET has four operational bandwidths 5, 10, 20, 40 MHz with 4 modulation schemes BPSK, QPSK, 16QAM, 64QAM in the frequency range 3650 to 3700 MHz.

Per Part 90 Subpart Z, 90.1319 & RSS-197 Section 4.2 the RADWIN 2000 JET and RADWIN 5000 JET equipment incorporated a contention based protocol therefore this device has access to the full 50 MHz frequency band (3,650 – 3700 MHz).

Product Differences

RADWIN 2000 JET: The RADWIN 2000 denotes that the device is configured for Point to Point installation.

RADWIN 5000 JET: The RADWIN 5000 denotes that the device is configured for Point to Multipoint installation.

The RADWIN 2000 JET and RADWIN 5000 JET is a high-speed, affordable, and reliable radio unit for outdoor environments. The RADWIN 2000 JET and RADWIN 5000 JET deliver wire-like performance at data rates up to 200 Mbit/s to 600 Mbit/s.

The RADWIN 2000 JET and RADWIN 5000 JET operates with integral antennas which has three radio chains. The device can be operated in two different modes 3x3 and 2x2 spatial multiplexing.

3x3 Chain Operation

Antenna gains are as follows;

Chain A (Horizontal Pol) 17 dBi : Chain B (Vertical Pol) 14 dBi : Chain C (Vertical Pol) 14 dBi

2x2 Chain Operation

In this operational mode the device is limited to operate with the lower gain antennas;

Chain B (Vertical Pol) 14 dBi : Chain C (Vertical Pol) 14 dBi

NOTE: This program limited testing to 3x3 operational mode. When implementing the 2x2 mode the antenna chain power level(s) cannot be set higher than those that were measured under the 3x3 case for each operational mode.

RADWIN 2000 JET, RADWIN 5000 JET
Integral Antenna



RADWIN 2000 JET, RADWIN 5000 JET

Integral Antenna



RADWIN 2000 JET, RADWIN 5000 JET
Integral Antenna



RADWIN 2000 JET, RADWIN 5000 JET
POE Injector



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

EUT/ Support	Manufacturer	Equipment Description (Including Brand Name)	Model No.	Serial No.
EUT	RADWIN Ltd.	3.x GHz Integrated Smart Antenna Outdoor Radio Device	RADWIN 2000 JET RADWIN 5000 JET	Prototype
EUT	SINPRO	Power Injector for Power Over Ethernet (POE) 100-240V / 50-60Hz: 55 Vdc, 1.0 A	CPU55A-270-1	C35473741 322
Support	Laptop	Computer		

3.4. Antenna Details

Antenna Type	Port Gain (dBi)	Manufacturer	Model No.	Serial No.
<i>Integral Antenna</i>				
Multipole Beamforming Sector	17	RADWIN Ltd	AM0156440	--
Multipole Beamforming Sector	14			
Multipole Beamforming Sector	14			

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. 2 x 10/100/1000 BT Ethernet

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3.6. Test Configurations

Matrix of test configurations

Parameter	Operational Mode	Test Conditions	Bandwidths (MHz)
99% Occupied BW	Modulated - BPSK QPSK, 16QAM, 64QAM	Ambient, 55 Vdc (POE)	5, 10, 20, 40
Output power			
Peak Power Spectral Density			
Frequency Stability	Modulated	Temperature (-35°C to +60°C) and Voltage Variations (55, 46.75, 63.25 Vdc)	Carrier Breakthrough
Conducted Spurious Emissions	Modulated	Ambient, 55 Vdc	5, 10, 20, 40
Radiated Spurious Emissions	Modulated	Ambient, 55 Vdc	5
AC Wireline Emissions	Modulated	Ambient, 55 Vdc	5

BW (MHz)	Modulation		
	BPSK, QPSK, 16QAM, 64QAM		
	Low (MHz)	Mid (MHz)	High (MHz)
5	3652.50	3675.00	3697.00
10	3655.00	3675.00	3695.00
20	3661.00	3675.00	3689.00
40	--	3675.00	--

3.7. Equipment Modifications

The following modifications were required to bring the equipment into compliance:

1. NONE

3.8. Deviations from the Test Standard

The following deviations from the test standard were required in order to complete the test program:

1. NONE

4. TEST EQUIPMENT CONFIGURATIONS

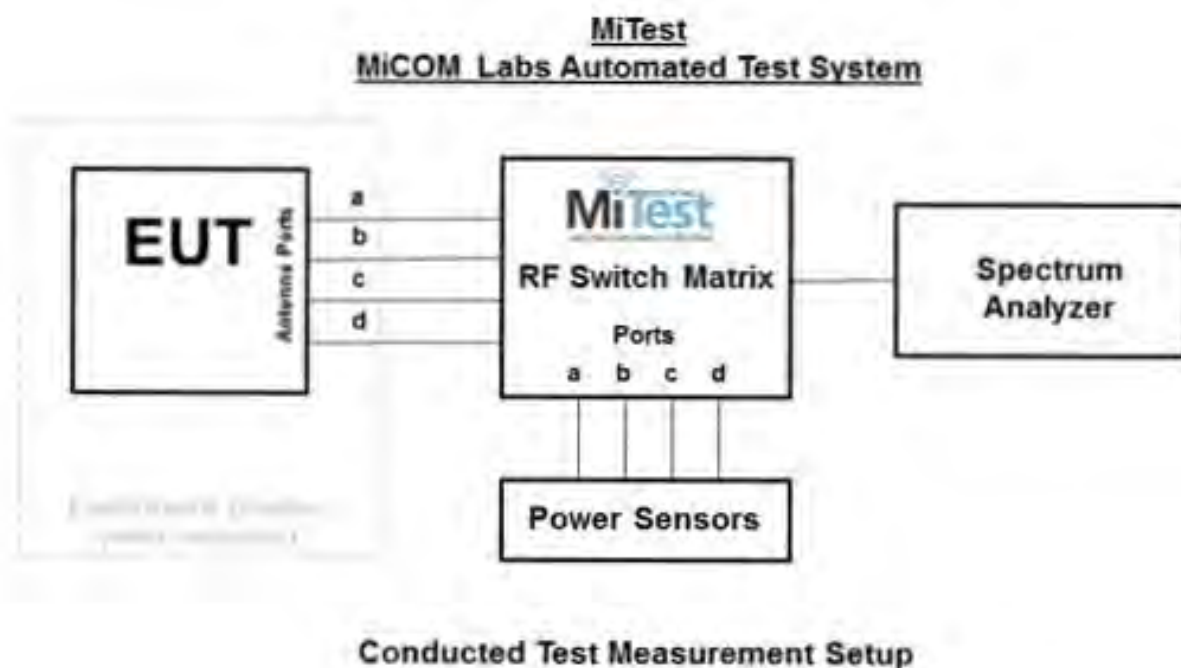
4.1. Conducted Testing

Conducted RF Emission Test Set-up(s) with Environmental Chamber.

The following tests were performed using the conducted test set-up shown in the diagram below.

1. Occupied Bandwidth
2. Peak Output Power
3. Power Spectral Density
4. *Frequency Stability
5. Conducted Spurious Emissions

*environmental chamber utilized



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



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Assets Utilized for Conducted Testing

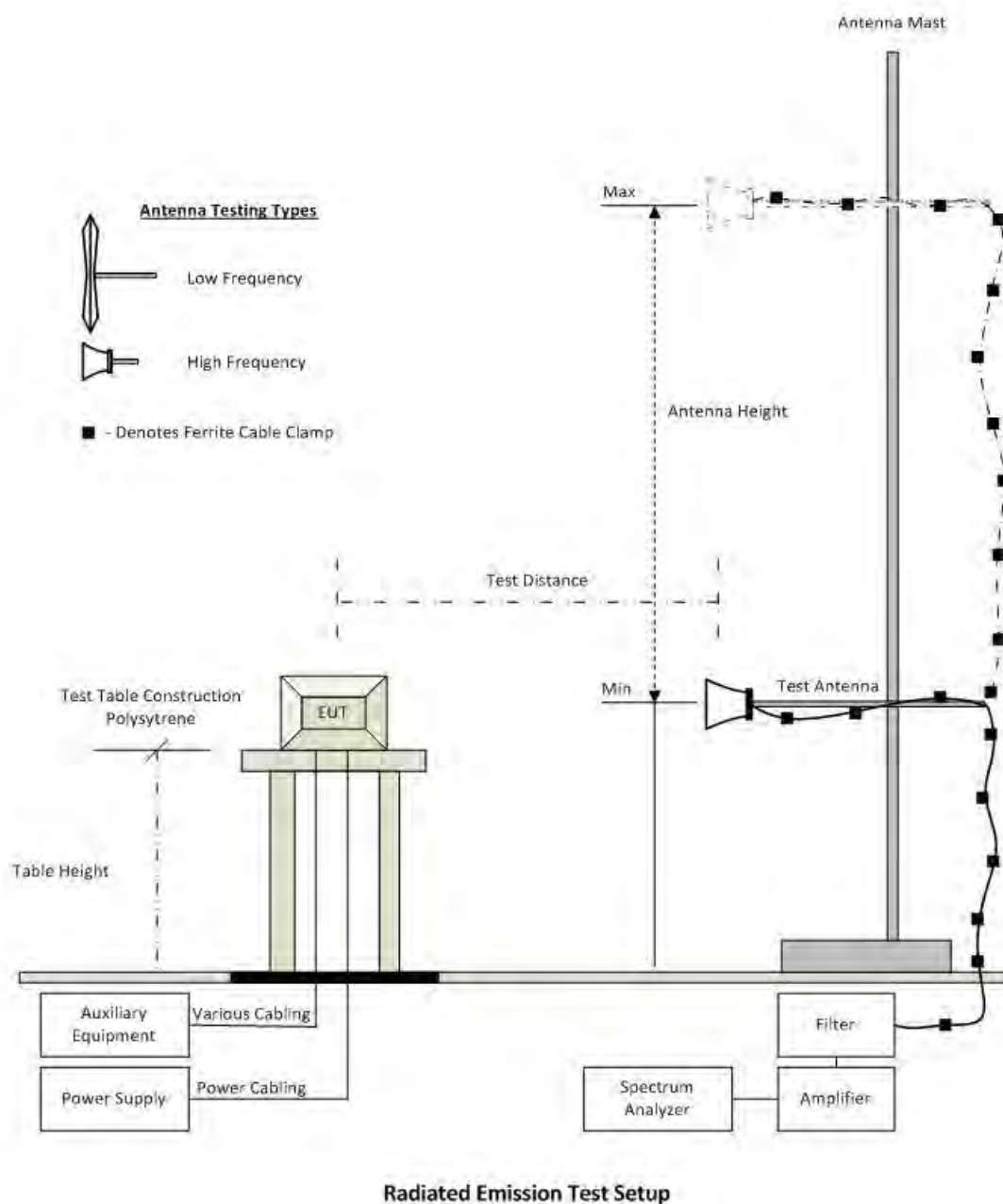
Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
127	Power Supply	HP	6674A	US36370530	Cal when used
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
193	Receiver 20 Hz to 7 GHz	Rhode & Schwarz	ESI 7	838496/007	14 Jan 2016
248	Resistance Thermometer	Thermotronics	GR2105-02	9340 #1	30 Oct 2015
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	31 Jul 2015
376	USB 10MHz - 18GHz Average Power Sensor	Agilent	U2000A	MY51440005	28 Oct 2015
378	Rohde & Schwarz 40 GHz Receiver with Generator	Rhode & Schwarz	ESIB40	100107/040	17 Jul 2015
381	4x4 RF Switch Box	MiCOM Labs	MiTest RF Switch Box	MIC002	30 Jun 2015
419	Laptop with Labview s/w	Lenova	W520	TS02	Not Required
420	USB to GPIB Interface	National Instruments	GPIB-USB HS	1346738	Not Required
435	USB Wideband Power Sensor	Boonton	55006	8730	31 Jul 2015
436	USB Wideband Power Sensor	Boonton	55006	8731	31 Jul 2015
437	USB Wideband Power Sensor	Boonton	55006	8759	31 Jul 2015
445	PoE Injector	D-Link	DPE-101GL	QTAH1E2000625	Not Required
460	Dell Computer with installation of MiTest executable.	Dell	Optiplex330	BC944G1	Not Required
74	Environmental Chamber Chamber 3	Tenney	TTC	12808-1	30 Sep 2015
RF#2 GPIB#1	GPIB cable to Pwr Supply	HP	GPIB	None	Not Required
RF#2 SMA#1	EUT to Mitest box port 1	Flexco	SMA Cable port1	None	30 Jun 2015
RF#2 SMA#2	EUT to Mitest box port 2	Flexco	SMA Cable port2	None	30 Jun 2015
RF#2 SMA#3	EUT to Mitest box port 3	Flexco	SMA Cable port3	None	30 Jun 2015
RF#2 SMA#4	EUT to Mitest box port 3	Flexco	SMA Cable port4	None	30 Jun 2015
RF#2 SMA#SA	Mitest box to Spec Anal	Flexco	SMA Cable SA	None	30 Jun 2015
RF#2 USB#1	USB Cable to Mitest Box	Dynex	USB Cable	None	Not Required

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4.2. Radiated Testing

The following tests were performed using the radiated test set-up shown in the diagram below.

Radiated Emission Measurement Setup



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Assets Utilized for Radiated Emission Testing

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
170	Video System Controller for Semi Anechoic Chamber	Panasonic	WV-CY101	04R08507	Not Required
287	Rohde & Schwarz 40 GHz Receiver	Rhode & Schwarz	ESIB40	100201	31 Jul 2015
301	5470 to 5725 MHz Notch Filter	Microtronics	RBC50704	001	08 Oct 2015
302	5150 to 5350 MHz Notch Filter	Microtronics	BRC50703	002	08 Oct 2015
303	5725 to 5875 MHz Notch filter	Microtronics	BRC50705	003	08 Oct 2015
310	SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001	30 Oct 2015
338	Sunol 30 to 3000 MHz Antenna	Sunol	JB3	A052907	14 Aug 2015
342	2.4 GHz Notch Filter	EWT	EWT-14-0203	H1	08 Oct 2015
343	5.15 GHz Notch Filter	EWT	EWT-14-0200	H1	08 Oct 2015
344	5.35 GHz Notch Filter	EWT	EWT-14-0201	H1	08 Oct 2015
345	5.46 GHz Notch Filter	EWT	EWT-14-0202	H1	08 Oct 2015
377	Band Rejection Filter 5150 to 5880MHz	Microtronics	BRM50716	034	08 Oct 2015
396	2.4 GHz Notch Filter	Microtronics	BRM50701	001	07 Oct 2015
397	Amp 10 - 2500MHz	MiCOM Labs	Amp 10 - 2500 MHz	NA	23 Oct 2015
399	ETS 1-18 GHz Horn Antenna	ETS	3117	00154575	10 Oct 2015
406	Amplifier for Radiated Emissions	MiCOM Labs	40dB 1 to 18GHz Amp	0406	30 May 2015
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
502	Test Software for Radiated Emissions	EMISoft	Vasona	Version 5 Build 59	Not Required
87	Uninterruptible Power Supply	Falcon Electric	ED2000-1/2LC	F3471 02/01	Cal when used

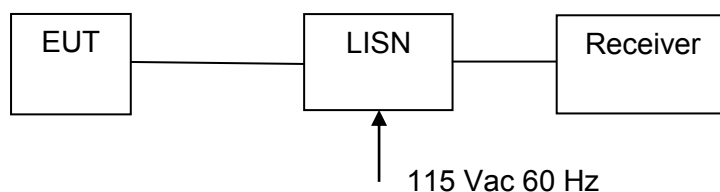
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4.3. ac Wireline

The ac Wireline Conducted Emissions test was performed using the conducted test set-up shown in the diagram below.

Test Measurement Set up



Measurement set up for ac Wireline Conducted Emissions Test

Assets Utilized for ac Wireline Emission Testing

Asset#	Description	Manufacturer	Model#	Serial#	Calibration Due Date
158	Barometer/Thermometer	Control Company	4196	E2846	04 Dec 2015
184	Pulse Limiter	Rhode & Schwarz	ESH3Z2	357.8810.52	Cal when used
190	LISN (two-line V-network)	Rhode & Schwarz	ESH3Z5	836679/006	12 Sep 2015
193	Receiver 20 Hz to 7 GHz	Rhode & Schwarz	ESI 7	838496/007	14 Jan 2015
307	BNC-CABLE	Megaphase	1689 1GVT4	15F50B002	Cal when used
316	Dell desktop computer workstation with Vasona	Dell	Desktop	WS04	Not Required

5. MEASUREMENT AND PRESENTATION OF TEST DATA

The conducted 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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6. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 90, Subpart Z & RSS-197**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
2.1049 5.2	99% Occupied Bandwidth	Bandwidth measurement(s)	Conducted	Complies	7.1.1
2.1046; 90.1321 (a) 5.6	EIRP Rated Power	Modulated Output Power	Conducted	Complies	7.1.2
2.1046; 90.1321 (a) 5.6	Peak EIRP Power Density	Maximum Spectral Density	Conducted	Complies	7.1.3
Subpart C 90.1217	Maximum Permissible Exposure	Exposure to radio frequency energy levels	Radiated	Complies	7.1.4
2.1055(a)(1) 5.3	Frequency Stability	Includes temperature and voltage variations	Conducted	Complies	7.1.5
2.1051; 90.1323 5.7	Conducted Spurious Emissions at Antenna Port	Emissions from the antenna port	Conducted	Complies	7.1.6
2.1053; 90.1323 ANSI/TIA-603 5.8	Radiated Spurious Emissions	Spurious emissions	Radiated	Complies	7.1.7
	Contention Based Protocol		Declaration	Client Declaration	
15.207 RSS_Gen 7.2.7	AC Wireline Conducted	Emissions 150 kHz–30 MHz	Conducted	Complies	7.1.8

Note 1: Test results reported in this document relate only to the items tested

Note 2: The required tests demonstrated compliance as per client declaration of test configuration, monitoring methodology and associated pass/fail criteria

Note 3: Section 3.7 'Equipment Modifications' highlight the equipment modifications that were required to bring the product into compliance with the above matrix

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7. TEST RESULTS

7.1. Device Characteristics

7.1.1. Occupied Bandwidth

FCC 47 CFR Part 90, Subpart Z; 2.1049;

Test Procedure

The transmitter terminal of EUT was connected to the input of the spectrum analyzer set to measure the 99% occupied bandwidth. The system highest power setting was selected with modulation ON.

The measurement of channel bandwidth used a resolution bandwidth of at least one percent of the occupied bandwidth of the fundamental emission.

Test Set-up is shown in Section 4.1 Test Equipment Configurations/Conducted Testing

Ambient conditions.

Temperature: 19 to 26 °C Relative humidity: 31 to 57 % Pressure: 999 to 1009 mbar

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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	5 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3652.5	5.35	5.51	5.11	--	5.51	5.11		
3675	5.31	5.37	5.29	--	5.37	5.29		
3697	5.29	5.25	5.15	--	5.29	5.15		

Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3652.5	4.44	4.44	4.44	---	4.44	4.44		
3675	4.44	4.44	4.42	---	4.44	4.42		
3697	4.44	4.44	4.44	---	4.44	4.44		

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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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	10 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3655	10.28	10.04	10.46	--	10.46	10.04		
3675	10.01	10.55	10.01	--	10.55	10.01		
3695	10.04	9.88	10.10	--	10.10	9.88		

Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3655	8.80	8.71	8.77	--	8.80	8.71		
3675	8.77	8.77	8.77	--	8.77	8.77		
3695	8.77	8.74	8.77	--	8.77	8.74		

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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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	20 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3661	22.60	22.06	26.81	--	26.81	22.06		
3675	23.44	24.4	28.67	--	28.67	23.44		
3689	23.14	24.52	27.05	--	27.05	23.14		

Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3661	17.85	17.61	17.85	---	17.85	17.61		
3675	17.79	17.67	17.91	---	17.91	17.67		
3689	17.79	17.67	17.85	---	17.85	17.67		

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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Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	40 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz)				26 dB Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3675	47.61	63.16	80.00	--	80.00	47.61		

Test Frequency	Measured 99% Bandwidth (MHz)				99% Bandwidth (MHz)			
	Port(s)							
MHz	a	b	c	d	Highest	Lowest		
3675	37.03	37.19	37.83	--	37.83	37.03		

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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7.1.2. Peak Output Power

FCC 47 CFR Part 90, Subpart Z; §90.1321(a)

The following power limits apply to the 3650 – 3675 MHz band.

Base and fixed stations are limited to 25W/25 MHz equivalent isotropically radiated power (EIRP). In any event the peak EIRP power density shall not exceed 1 Watt (+30 dBm) in any one Megahertz slice of spectrum.

EIRP Power Limit 5 MHz Channel Spacing = 37.0 dBm
EIRP Power Limit 10 MHz Channel Spacing = 40.0 dBm
EIRP Power Limit 20 MHz Channel Spacing = 43.0 dBm
EIRP Power Limit 40 MHz Channel Spacing = 46.0 dBm

Test Procedure

Average power measurements were measured with the use of an average power head. The system highest power setting was selected with modulation ON.

Test Set-up is shown in Section 4.1 Test Equipment Configurations/Conducted Testing

Ambient conditions.

Temperature: 19 to 26 °C Relative humidity: 31 to 57 % Pressure: 999 to 1009 mbar

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Equipment Configuration for Peak Transmit Power

Variant:	5 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results									
Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Total EIRP	Limit EIRP	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	dBm	dBm	dBm	
3652.5	13.85	16.71	19.77	--	22.20	36.79	37	-0.21	
3675	13.41	16.36	19.40	--	21.83	36.41	37	-0.59	
3697	13.63	16.47	19.05	--	21.70	36.32	37	-0.68	

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

NOTE: the antenna gain shown in the above matrix is different for each of the three antenna chains

Chain a: 17.00 dBi
Chain b: 14.00 dBi
Chain c: 14.00 dBi

Total EIRP Calculation

Total EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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Equipment Configuration for Peak Transmit Power

Variant:	10 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Total EIRP	Limit EIRP	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	dBm	dBm	dBm	
3655	16.50	18.98	21.80	--	24.39	39.05	40	-0.95	
3675	16.15	18.91	21.56	--	24.19	38.82	40	-1.18	
3695	15.98	19.28	21.75	--	24.35	38.91	40	-1.09	

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

NOTE: the antenna gain shown in the above matrix is different for each of the three antenna chains

Chain a: 17.00 dBi

Chain b: 14.00 dBi

Chain c: 14.00 dBi

Total EIRP Calculation

Total EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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Equipment Configuration for Peak Transmit Power

Variant:	20 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Total EIRP	Limit EIRP	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	dBm	dBm	dBm	
3661	19.33	21.75	24.22	--	26.99	41.57	43	-1.33	14.5
3675	20.02	23.59	25.09	--	28.14	42.76	43	-0.24	16
3689	20.29	23.16	24.75	--	27.87	42.57	43	-0.43	15.5

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

NOTE: the antenna gain shown in the above matrix is different for each of the three antenna chains

Chain a: 17.00 dBi
Chain b: 14.00 dBi
Chain c: 14.00 dBi

Total EIRP Calculation

Total EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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Equipment Configuration for Peak Transmit Power

Variant:	40 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Total EIRP	Limit EIRP	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	dBm	dBm	dBm	
3675	21.86	23.98	25.01	--	28.58	43.41	46	-2.59	

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-01 MEASURING RF OUTPUT POWER
Measurement Uncertainty:	±1.33 dB

NOTE: the antenna gain shown in the above matrix is different for each of the three antenna chains

Chain a: 17.00 dBi
Chain b: 14.00 dBi
Chain c: 14.00 dBi

Total EIRP Calculation

Total EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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7.1.3. Power Spectral Density

FCC 47 CFR Part 90, Subpart Z; §90.1321(a)

The following power limits apply to the 3650 – 3700 MHz band.

Base and fixed stations are limited to 25W/25 MHz equivalent isotropically radiated power (EIRP). In any event the peak EIRP power density shall not exceed 1 Watt (+30 dBm) in any one Megahertz slice of spectrum.

EIRP Power Limit is constant for all channel bandwidths = +30.0 dBm/MHz (137 dBuV/MHz)

Test Procedure

The test methodology used for this measurement was determined to provide the highest possible power density readings.

Power spectral density measurements were performed via the spectrum analyzer and plots were recorded. The system highest power setting was selected and modulation was ON.

Test Set-up is shown in Section 4.1 Test Equipment Configurations/Conducted Testing

Ambient conditions.

Temperature: 19 to 26 °C Relative humidity: 31 to 57 % Pressure: 999 to 1009 mbar

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Equipment Configuration for Power Spectral Density

Variant:	5 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Total EIRP	Limit	Margin
	Port(s) (dBuV/MHz)						
MHz	a	b	c	d	dBuV /MHz	dBuV /MHz	dB
3652.5	112.76	115.62	118.35	--	135.54	137	-1.46
3675	113.80	117.22	118.96	--	136.54	137	-0.46
3697	114.16	117.09	118.83	--	136.54	137	-0.46

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).

Limit 137 dBuV/MHz = +30 dBm

Total Power Density EIRP Calculation

Total Power Density EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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Equipment Configuration for Power Spectral Density

Variant:	10 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Total EIRP	Limit	Margin
	Port(s) (dBuV/MHz)						
MHz	a	b	c	d	dBuV /MHz	dBuV /MHz	dB
3655	112.16	114.88	118.12	--	135.09	137	-1.91
3675	111.99	114.54	118.01	--	134.91	137	-2.09
3695	112.18	114.88	117.78	--	134.92	137	-2.08

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).

Limit 137 dBuV/MHz = +30 dBm

Total Power Density EIRP Calculation

Total Power Density EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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Equipment Configuration for Power Spectral Density

Variant:	20 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Total EIRP	Limit	Margin
	Port(s) (dBuV/MHz)						
MHz	a	b	c	d	dBuV /MHz	dBuV /MHz	dB
3661	110.15	113.21	115.55	--	132.89	137	-4.11
3675	111.54	115.06	116.66	--	134.29	137	-2.71
3689	110.79	114.78	115.62	--	133.57	137	-3.43

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).

Limit 137 dBuV/MHz = +30 dBm

Total Power Density EIRP Calculation

Total Power Density EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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Equipment Configuration for Power Spectral Density

Variant:	40 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density				Total EIRP	Limit	Margin
	Port(s) (dBuV/MHz)						
MHz	a	b	c	d	dBuV /MHz	dBuV /MHz	dB
3575	111.84	114.33	115.75	--	133.78	137	-3.22

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).

Limit 137 dBuV/MHz = +30 dBm

Total Power Density EIRP Calculation

Total Power Density EIRP = $10 * \log(10^{(EIRP \text{ Chain (a/10)})} + 10^{(EIRP \text{ Chain (b/10)})} + 10^{(EIRP \text{ Chain (c/10)})})$

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7.1.4. Maximum Permissible Exposure FCC, Part 90 Subpart C §90.1217

Calculations for Maximum Permissible Exposure Levels

$$\text{Power Density} = P_d \text{ (mW/cm}^2\text{)} = \text{EIRP}/(4\pi d^2)$$

$$\text{EIRP} = P * G$$

P = Peak output power (mW)

G = Antenna numeric gain (numeric)

d = Separation distance (cm)

$$\text{Numeric Gain} = 10^{(G \text{ (dBi)}/10)}$$

The RADWIN 2000 JET and RADWIN 5000 JET has three antenna chains. The peak power in the table below is calculated by assuming a worst case scenario for the maximum gain antenna and output power. The calculated separation distance is worst case found (Operational mode 40 MHz, channel 3675.00 MHz. Calculation was performed using the 17 dBi antenna gain.

Because the EUT belongs to the General Population/Uncontrolled Exposure the limit of power density is 1.0 mW/cm²

Freq. Band (MHz)	Antenna Gain (dBi)	Numeric Gain (numeric)	Max Peak Output Power (dBm)	Peak Output Power (mW)	Calculated Power Density @ 20cm	Distance (cm)	
						Calculated Safe Distance @ 1mW/cm ² Limit(cm)	Minimum Separation Distance (cm)
3,675.0	17	50.12	+28.58	721.1	7.19	53.6	53.6

Note: for mobile or fixed location transmitters the minimum separation distance is 20cm, even if calculations indicate the MPE distance to be less.

Specification

Maximum Permissible Exposure Limits

§90.1217 Systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency levels in excess of the Commission's guidelines. See §1.1307 (b)(1) of this chapter.

Limit = 1 mW / cm² from 1.310 Table 1

Laboratory Measurement Uncertainty for Power Measurements

Measurement uncertainty	±1.33dB
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7.1.5. Frequency Stability; Temperature Variations, and Voltage Variations

FCC 47 CFR Part 90, Subpart Z; 2.1055(a)(1)

Test Procedure

The transmitter output was connected to a spectrum analyzer and the frequency stability was measured in a modulated operational mode as the transmitter could not operate Continuous Wave (CW). Carrier breakthrough was available to provide a measurement point.

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 waited until thermal balance was obtained.

Test Set-up is shown in Section 4.1 Test Equipment Configurations/Conducted Testing

Ambient conditions.

Temperature: 19 to 26 °C Relative humidity: 31 to 57 % Pressure: 999 to 1009 mbar

TABLE OF RESULTS Frequency Stability – Channel Measured 3662.25 MHz

Manufacturers Specification for Frequency Stability

As no apparent frequency stability limits were provided the manufacturer's specification was used ± 20 ppm.



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Equipment Configuration for Carrier Frequencies

Variant:	20 MHz	Duty Cycle (%):	99
Data Rate:	Not Applicable	Antenna Gain (dBi):	Not Applicable
Modulation:	BPSK	Beam Forming Gain (Y):	Not Applicable
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:		Transmitter carrier breakthrough was used for test purposes	

Test Measurement Results

Test frequency	3660 MHz	Measured Frequency	Frequency Error		Limit	Margin
Temperature	Voltage	Hz	kHz	ppm	ppm	ppm
25 °C	48.0 Vdc	3660.003120	3.12	0.85	-20 to +20	-19.15
	61.6 Vdc	3660.003250	3.25	0.89	-20 to +20	-19.11
-35 °C	55 Vdc	3660.001820	1.82	-0.36	-20 to +20	-19.64
-25 °C		3660.001190	1.19	0.33	-20 to +20	-19.67
-15 °C		3660.000670	0.67	0.18	-20 to +20	-19.82
-5 °C		3660.000200	0.2	0.05	-20 to +20	-19.95
5 °C		3660.000670	0.67	0.18	-20 to +20	-19.82
15 °C		3660.001910	1.91	0.52	-20 to +20	-19.48
35 °C		3660.002410	2.41	0.66	-20 to +20	-19.34
45 °C		3660.001630	1.63	0.45	-20 to +20	-19.55
55 °C		3660.001150	1.15	0.31	-20 to +20	-19.69
60 °C		3660.001130	1.13	0.31	-20 to +20	-19.69

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-02 MEASURING FREQUENCY
Measurement Uncertainty:	±0.86 ppm

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

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7.1.6. Spurious Emissions at Antenna Terminals

FCC 47 CFR Part 90, Subpart Z; §90.1323, 2.1051

7.1.6.1. Transmitter Conducted Spurious Emissions (0.03 - 40 GHz)

Test Procedure

Transmitter conducted spurious emissions were measured for BPSK modulation state only. Measurement were made while EUT was operating in a modulated transmit mode of operation, at the appropriate center frequency. Conducted spurious emissions were measured to 40 GHz in a peak hold mode.

Test Set-up is shown in Section 4.1 Test Equipment Configurations/Conducted Testing

Limit

For operation in the 3650 – 3700 band the power of any emission outside the frequency band of operation shall be attenuated below the transmitter power (P) within the licensed band of operation, measured in Watts, by at least $43 + 10 \cdot \log(P) = -13\text{dBm}$.

Ambient conditions.

Temperature: 19 to 26 °C

Relative humidity: 31 to 57 %

Pressure: 999 to 1009 mbar

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Equipment Configuration for Transmitter Spurious Emissions

Variant:	5 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	Not Applicable
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

CHAIN A

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3652.5 MHz	30 - 1000 MHz	-55.80	459.59	-13.0	-41.0
	1000 - 20000 MHz	-24.21	3208.41	-13.0	-11.21
	20000 - 40000 MHz	-19.80	34869.73	-13.0	-6.8

CHAIN B

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3652.5 MHz	30 - 1000 MHz	-52.74	488.75	-13.0	-39.74
	1000 - 20000 MHz	-21.14	3170.34	-13.0	-8.14
	20000 - 40000 MHz	-19.68	34909.81	-13.0	-6.68

CHAIN C

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3652.5 MHz	30 - 1000 MHz	-53.24	411.00	-13.0	-40.24
	1000 - 20000 MHz	-18.61	3246.49	-13.0	-5.61
	20000 - 40000 MHz	-19.48	34549.09	-13.0	-6.48

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

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Equipment Configuration for Transmitter Spurious Emissions

Variant:	5 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	Not Applicable
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

CHAIN A

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3675 MHz	30 - 1000 MHz	-55.17	521.80	-13.0	-42.17
	1000 - 20000 MHz	-23.83	3208.41	-13.0	-10.83
	20000 - 40000 MHz	-20.17	34549.09	-13.0	-7.17

CHAIN B

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3675 MHz	30 - 1000 MHz	-51.92	473.20	-13.0	-38.92
	1000 - 20000 MHz	-21.59	3132.26	-13.0	-8.59
	20000 - 40000 MHz	-20.23	34949.89	-13.0	7.23

CHAIN C

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3675 MHz	30 - 1000 MHz	-53.25	480.98	-13.0	-40.25
	1000 - 20000 MHz	-18.73	3208.41	-13.0	-4.11
	20000 - 40000 MHz	-19.98	34869.73	-13.0	-6.98

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

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Equipment Configuration for Transmitter Spurious Emissions

Variant:	5 MHz	Duty Cycle (%):	99
Data Rate:	-	Antenna Gain (dBi):	Not Applicable
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	Not Applicable
TPC:	Not Applicable	Tested By:	CC
Engineering Test Notes:			

Test Measurement Results

CHAIN A

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3697 MHz	30 - 1000 MHz	-53.57	496.53	-13.0	-40.57
	1000 - 20000 MHz	-23.49	3208.41	-13.0	-10.49
	20000 - 40000 MHz	-20.25	34829.65	-13.0	-7.25

CHAIN B

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3697 MHz	30 - 1000 MHz	-53.38	494.58	-13.0	-40.38
	1000 - 20000 MHz	-21.56	3113.22	-13.0	-8.56
	20000 - 40000 MHz	-20.23	34629.25	-13.0	-7.23

CHAIN C

Temperature	20.0 °C	Maximum Observed Spurious Emission		Limit	Margin
Voltage	56.00 Vdc	Amplitude	Emission Frequency		
Test Frequency	Frequency Range	dBm	MHz	dBm	dB
3697 MHz	30 - 1000 MHz	-52.71	455.71	-13.0	-39.71
	1000 - 20000 MHz	-18.79	3246.49	-13.0	-5.79
	20000 - 40000 MHz	-19.72	34829.65	-13.0	-6.72

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	<=40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	5 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
3652.5	3650	-32.13	-28.78	-28.57	-25.67	-27.01	-23.86	--	--
3697	3700	-47.35	-30.85	-42.51	-27.65	-39.07	-25.16	--	--
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	= 40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	10 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
3655	3650	-34.00	-27.51	-31.87	-24.23	-28.51	-22.40	--	--
3695	3700	-30.25	-28.22	-27.40	-24.25	-24.23	-21.95	--	--
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	= 40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

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Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	20 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
3661	3650	-27.34	-25.10	-26.62	-21.91	-20.05	-19.11	--	--
3689	3700	-27.29	-24.85	-23.01	-20.51	-21.36	-20.23	--	--
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	= 40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

Equipment Configuration for Transmitter Conducted Spurious and Band-Edge Emissions

Variant:	40 MHz	Duty Cycle (%):	99.0
Data Rate:	-	Antenna Gain (dBi):	17/14/14
Modulation:	BPSK	Beam Forming Gain (Y)(dB):	
TPC:	Not Applicable	Tested By:	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Band-Edge Frequency	Transmitter Conducted Band-Edge Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	BE	Limit	BE	Limit	BE	Limit	BE	Limit
3675	3650	-27.46	-20.87	-24.03	-18.86	-18.53	-17.86	--	--
3675	3700	-31.16	-20.87	-26.48	-18.86	-19.66	-17.86	--	--
BE - Maximum band-edge emission found									

Traceability to Industry Recognized Test Methodologies

Work Instruction:	WI-05 MEASUREMENT OF SPURIOUS EMISSIONS
Measurement Uncertainty:	= 40 GHz ± 2.37 dB, > 40 GHz ± 4.6 dB

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

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7.1.7. Radiated Spurious Emissions

7.1.7.1. Transmitter Radiated Emissions

**FCC 47 CFR Part 90, Subpart Z; §90.1323, 2.1053;
ANSI/TIA-603**

Test Procedure

Measurements were made while EUT was operating in a modulated transmit mode of operation, at the appropriate center frequency. Substitution was performed on any emissions observed. The antenna port was attenuated with a 50 Ω termination.

The measurement equipment was set to measure in peak hold mode. The emissions were 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 peak hold mode.

The highest emissions relative to the limit are listed for each frequency band measured.

Limit

For operation in the 3650 – 3700 band the power of any emission outside the frequency band of operation shall be attenuated below the transmitter power (P) within the licensed band of operation, measured in Watts, by at least $43 + 10 \cdot \log(P) = -13\text{dBm}$.

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

Traceability

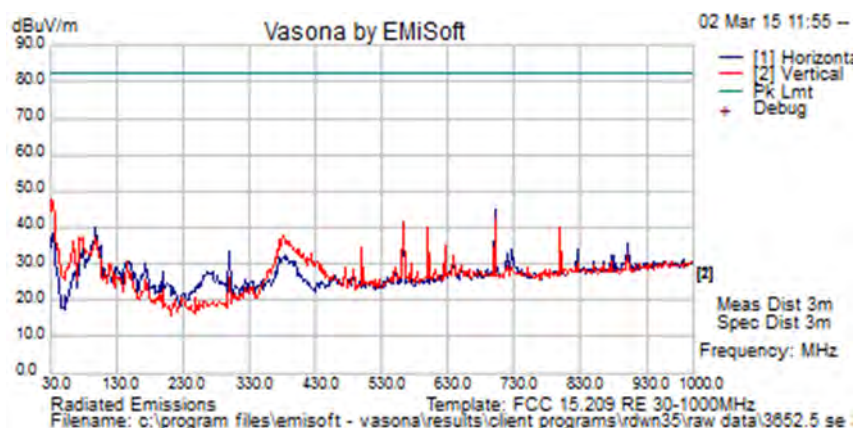
Method
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'

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Test Freq.	3652.5	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	30MHz - 1GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

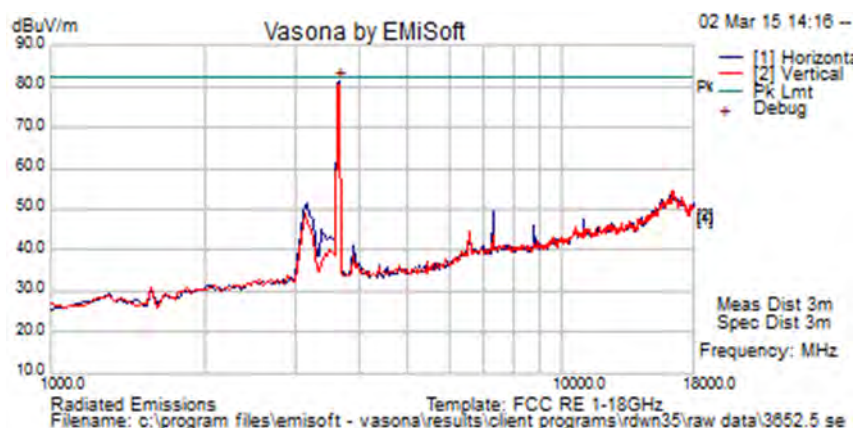
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No emissions observed within 6 dB of the limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 82.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	3652.5	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	1-18GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
3657.315	87.4	4.9	-11.0	81.2	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 82.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

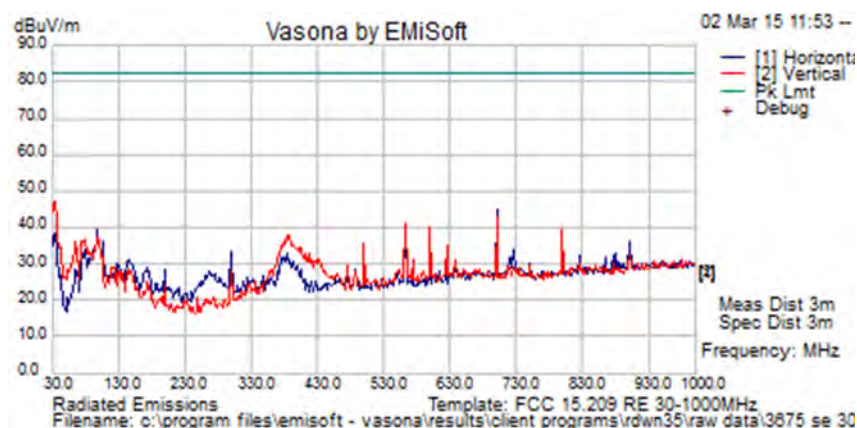
The emission closest to the limit line is the fundamental frequency

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Test Freq.	3675 MHz	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	30MHz - 1GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

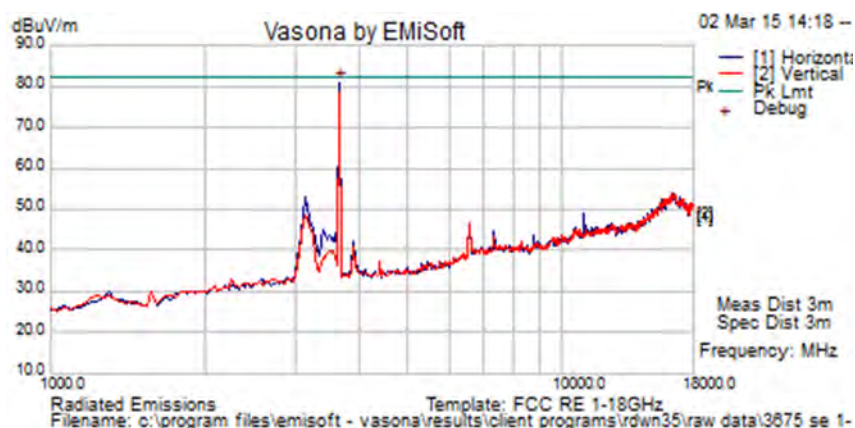
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No emissions observed within 6 dB of the limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 82.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	3675 MHz	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	1-18GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
3657.315	87.1	4.9	-11.0	80.9	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 82.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

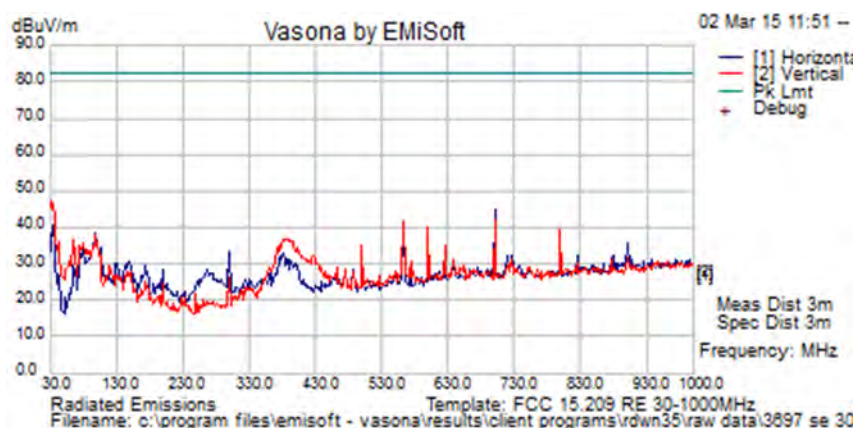
The emission closest to the limit line is the fundamental frequency

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Test Freq.	3697	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	30MHz - 1GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

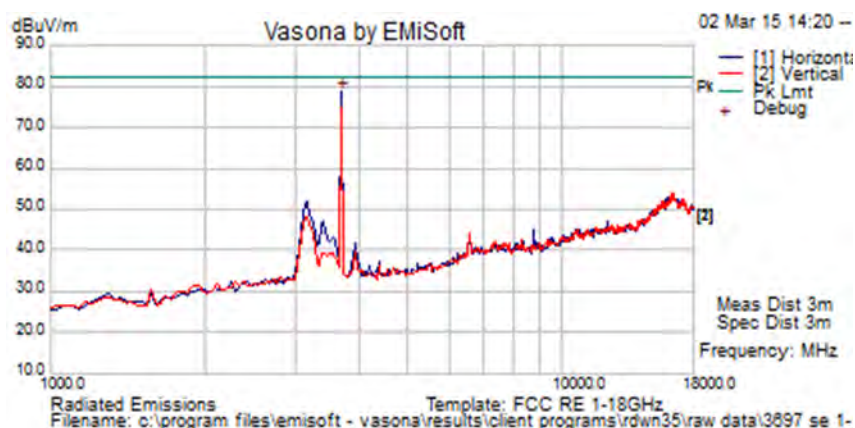
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
No emissions observed within 6 dB of the limit.												
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. Limit = 82.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

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Test Freq.	3697	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	1-18GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
3691.383	84.8	4.9	-11.0	78.8	Peak [Scan]	H	100					FUND
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission NRB = Non-Restricted Band. Limit = 82.23 dBuV/m; RB = Restricted Band. Limits per 15.205												

The emission closest to the limit line is the fundamental frequency

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7.1.7.2. Transmitter Radiated Spurious Emissions (30M-1 GHz)

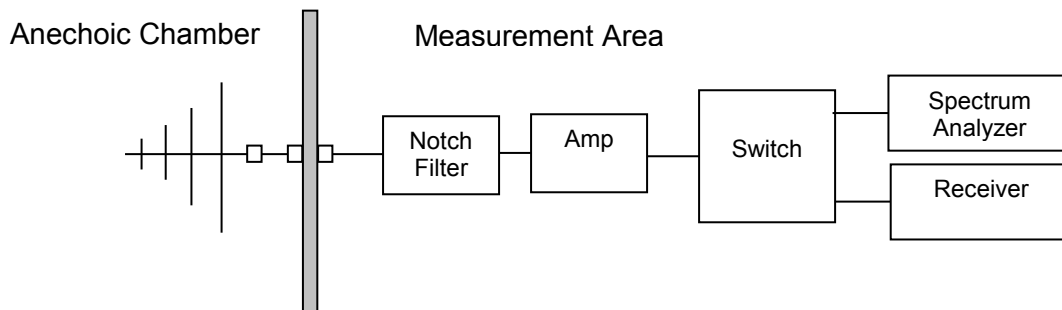
FCC, Part 15 Subpart C §15.205/ §15.209
Industry Canada RSS-111 §4.4

Test Procedure

Preliminary radiated emissions were measured in the anechoic chamber at a 10-meter distance on every azimuth in both horizontal and vertical polarity. The emissions are recorded with a spectrum analyzer in peak hold mode. Emissions closest to the limits are measured in the quasi-peak mode with the tuned receiver using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed. The anechoic chamber test set-up is identified in Section 6 Test Set-Up Photographs.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting



Amplifier Gain from the measured reading. In this test facility, the Antenna Factor, Cable Loss, and Amplifier Gains are loaded into the Rohde & Schwarz Receiver and the corrected field strength can be read directly on the receiver.

$$FS = R + AF + CORR$$

where:

FS = Field Strength

R = Measured Receiver Input Amplitude

AF = Antenna Factor

CORR = Correction Factor = CL – AG + NFL

CL = Cable Loss

AG = Amplifier Gain



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For example:

Given a Receiver input reading of 51.5dB μ V; Antenna Factor of 8.5dB; Cable Loss of 1.3dB; Falloff Factor of 0dB, an Amplifier Gain of 26dB and Notch Filter Loss of 1dB. The Field Strength of the measured emission is:

$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3\text{dB}\mu\text{V/m}$$

Conversion between dB μ V/m (or dB μ V) and μ V/m (or μ V) are done as:

$$\text{Level (dB}\mu\text{V/m)} = 20 * \text{Log (level (\mu V/m))}$$

$$40 \text{ dB}\mu\text{V/m} = 100\mu\text{V/m}$$

$$48 \text{ dB}\mu\text{V/m} = 250\mu\text{V/m}$$

Measurement Results for Spurious Emissions (30 MHz – 1 GHz)

Ambient conditions.

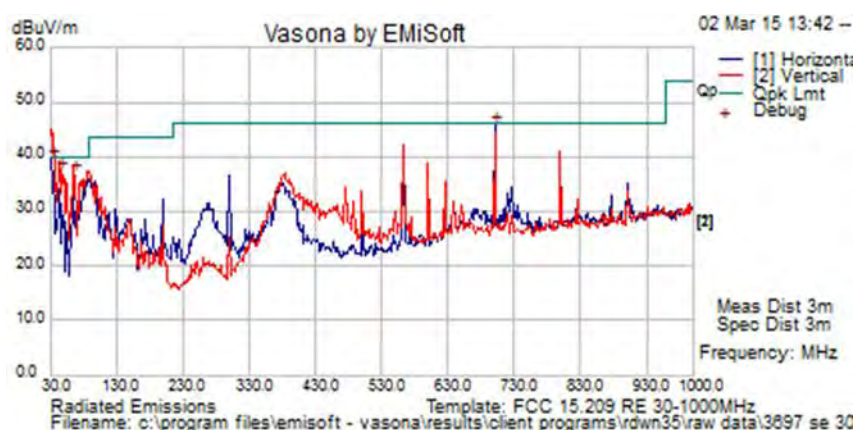
Temperature: 19 to 26 °C Relative humidity: 31 to 57 % Pressure: 999 to 1009 mbar

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Test Freq.	3675 MHz	Engineer	SB
Variant	BPSK	Temp (°C)	18
Freq. Range	30MHz - 1GHz	Rel. Hum.(%)	57
Power Setting	10	Press. (mBars)	1005
Antenna	Integral	Duty Cycle (%)	100%
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
700.017	49.7	5.9	-9.9	45.7	Quasi Peak	H	98	181	46	-0.3	Pass	
34.075	48.8	3.5	-12.9	39.4	Quasi Peak	V	98	0	40.0	-0.6	Pass	
45.259	54.4	3.5	-20.9	37.1	Quasi Peak	V	98	122	40	-2.9	Pass	
66.293	56.6	3.7	-23.3	37.0	Quasi Peak	V	98	207	40	-3.0	Pass	
562.526	48.3	5.5	-11.8	42.0	Quasi Peak	V	98	213	46	-4.0	Pass	
382.753	47.2	5.0	-15.4	36.7	Peak [Scan]	H	98	181	46	-9.3	Pass	
Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission												
NRB = Non-Restricted Band. RB = Restricted Band. Limits per 15.205												

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Specification

Limits

§15.205 (a) Except as shown in paragraph (d) of 15.205 (a), only spurious emissions are permitted in any of the frequency bands listed.

§15.205 (a) Except as shown in paragraphs (d) and (e) of this section, the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section §15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

§15.209 (a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table.

§15.209 (a) Limit Matrix

Frequency(MHz)	Field Strength (μ V/m)	Field Strength (dB μ V/m)	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Laboratory Measurement Uncertainty for Radiated Emissions

Measurement uncertainty	+5.6/ -4.5 dB
-------------------------	---------------

Traceability

Method
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'

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7.1.8. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

FCC, Part 15 Subpart C §15.207

Industry Canada RSS-Gen §7.2.2

Test Procedure

The EUT is configured in accordance with ANSI C63.4. The conducted emissions are measured in a shielded room with a spectrum analyzer in peak hold in the first instance. Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation. The highest emissions relative to the limit are listed.

Test Set-up is shown in Section 4.1 Test Equipment Configurations/Radiated Testing

Ambient conditions.

Temperature: 19 to 26 °C

Relative humidity: 31 to 57 %

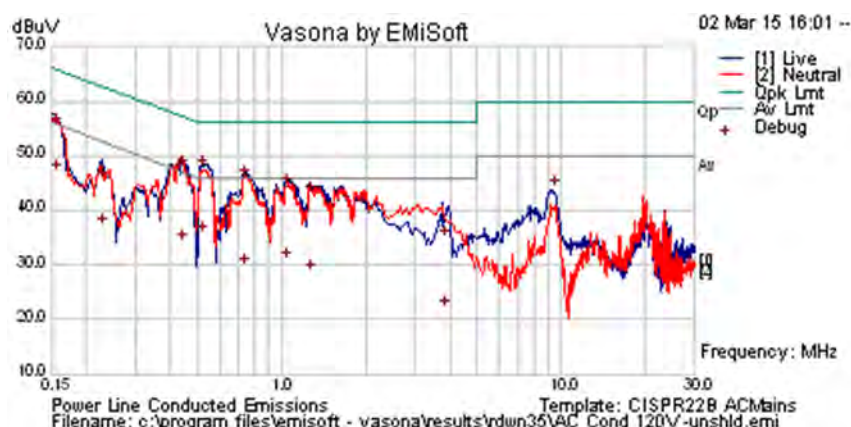
Pressure: 999 to 1009 mbar

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Test Freq.	N/A	Engineer	JMH
Variant	AC Cond 120V	Temp (°C)	20
Freq. Range	0.150 MHz - 30 MHz	Rel. Hum.(%)	37
Power Setting	N/A	Press. (mBars)	1010
Antenna	N/A		
Test Notes 1	Laptop connected to POE with unshielded Enet cable with Type 31 ferrite on Laptop end of cable		
Test Notes 2	SINPRO POE Adapter 120 Vac 60 Hz / 55 Vdc Model No: CPU55A-270-1		



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	Factors dB	Level dBuV	Measurement Type	Line	Limit dBuV	Margin dB	Pass /Fail	Comments
0.155	36.8	9.9	0.1	46.7	Average	Live	55.7	-9.0	Pass	
0.155	45.1	9.9	0.1	55.1	Quasi Peak	Live	65.7	-10.6	Pass	
0.226	27.0	9.9	0.1	36.9	Average	Live	52.6	-15.7	Pass	
0.226	35.4	9.9	0.1	45.4	Quasi Peak	Live	62.6	-17.3	Pass	
0.440	37.5	9.9	0.1	47.5	Quasi Peak	Live	57.1	-9.6	Pass	
0.440	24.0	9.9	0.1	34.0	Average	Live	47.1	-13.1	Pass	
0.518	25.2	9.9	0.1	35.2	Average	Live	46.0	-10.8	Pass	
0.518	37.4	9.9	0.1	47.4	Quasi Peak	Live	56.0	-8.6	Pass	
0.731	19.3	10.0	0.1	29.4	Average	Neutral	46.0	-16.6	Pass	
0.731	35.8	10.0	0.1	45.8	Quasi Peak	Neutral	56.0	-10.2	Pass	
1.038	34.3	9.9	0.1	44.3	Quasi Peak	Live	56.0	-11.7	Pass	
1.038	20.5	9.9	0.1	30.5	Average	Live	46.0	-15.5	Pass	
1.250	18.5	10.0	0.1	28.5	Average	Live	46.0	-17.5	Pass	
1.250	32.7	10.0	0.1	42.8	Quasi Peak	Live	56.0	-13.2	Pass	
3.815	24.2	10.1	0.2	34.5	Quasi Peak	Live	56.0	-21.5	Pass	
3.815	11.6	10.1	0.2	21.9	Average	Live	46.0	-24.1	Pass	
9.388	33.1	10.3	0.4	43.8	Peak [Scan]	Live	50.0	-6.2	Pass	
Legend: DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency										
NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band										

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Specification

Limit

§15.207 (a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50 $\mu\Omega$ line impedance stabilization network (LISN), see §15.207 (a) matrix below. Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal.

§15.207 (a) Limit Matrix

The lower limit applies at the boundary between frequency ranges

Frequency of Emission (MHz)	Conducted Limit (dB μ V)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

* Decreases with the logarithm of the frequency

Laboratory Measurement Uncertainty for Conducted Emissions

Measurement uncertainty	± 2.64 dB
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Traceability

Method
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'

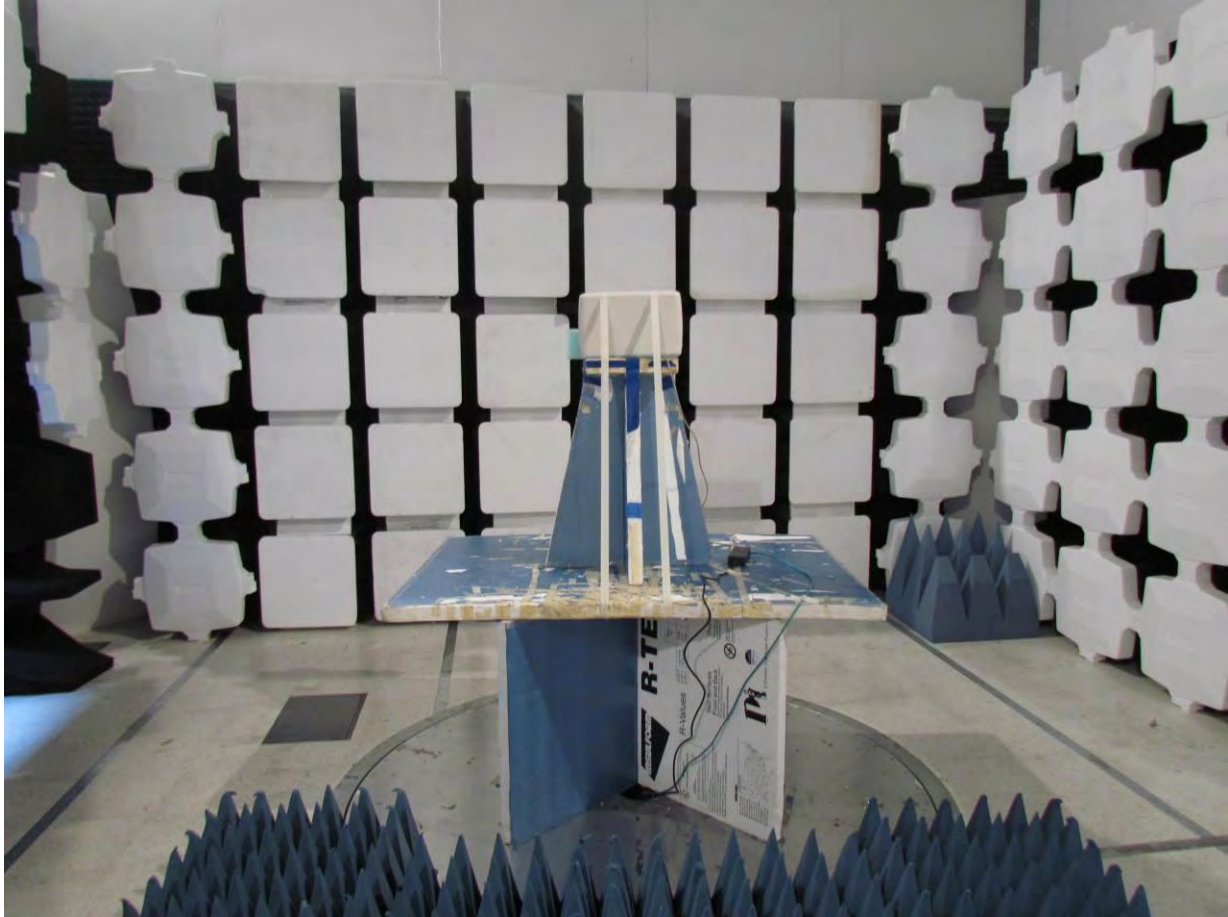
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8. TEST SET-UP PHOTOGRAPHS

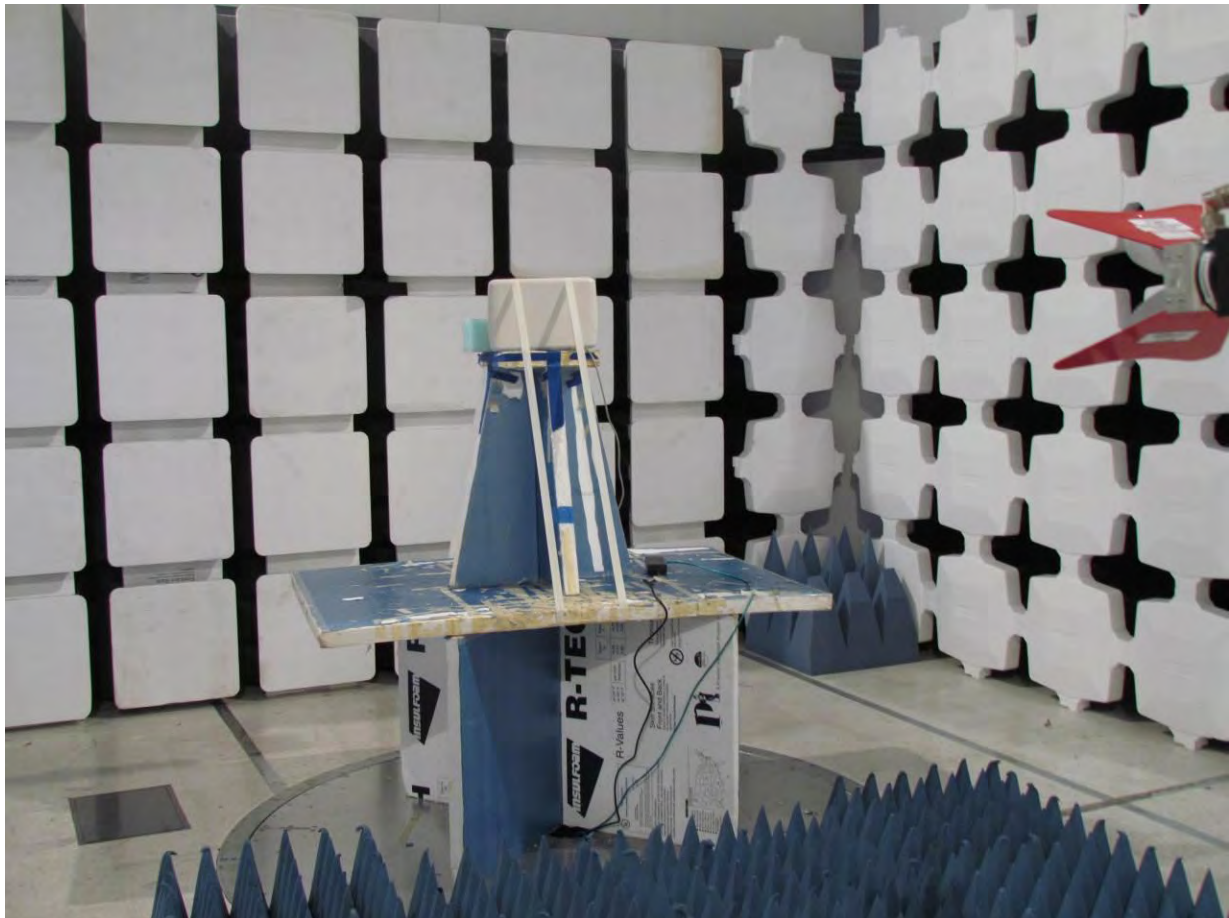
8.1. Conducted Measurement Test Set-Up



8.2. Radiated Spurious Emissions below 1GHz



8.3. Radiated Spurious Emissions above 1GHz



8.4. Digital Emissions (0.03 – 1 GHz)



8.5. ac Wireline Emissions (150 kHz - 30 MHz)







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APPENDIX A GRAPHICAL IMAGES

A.1. CONDUCTED TEST PLOTS

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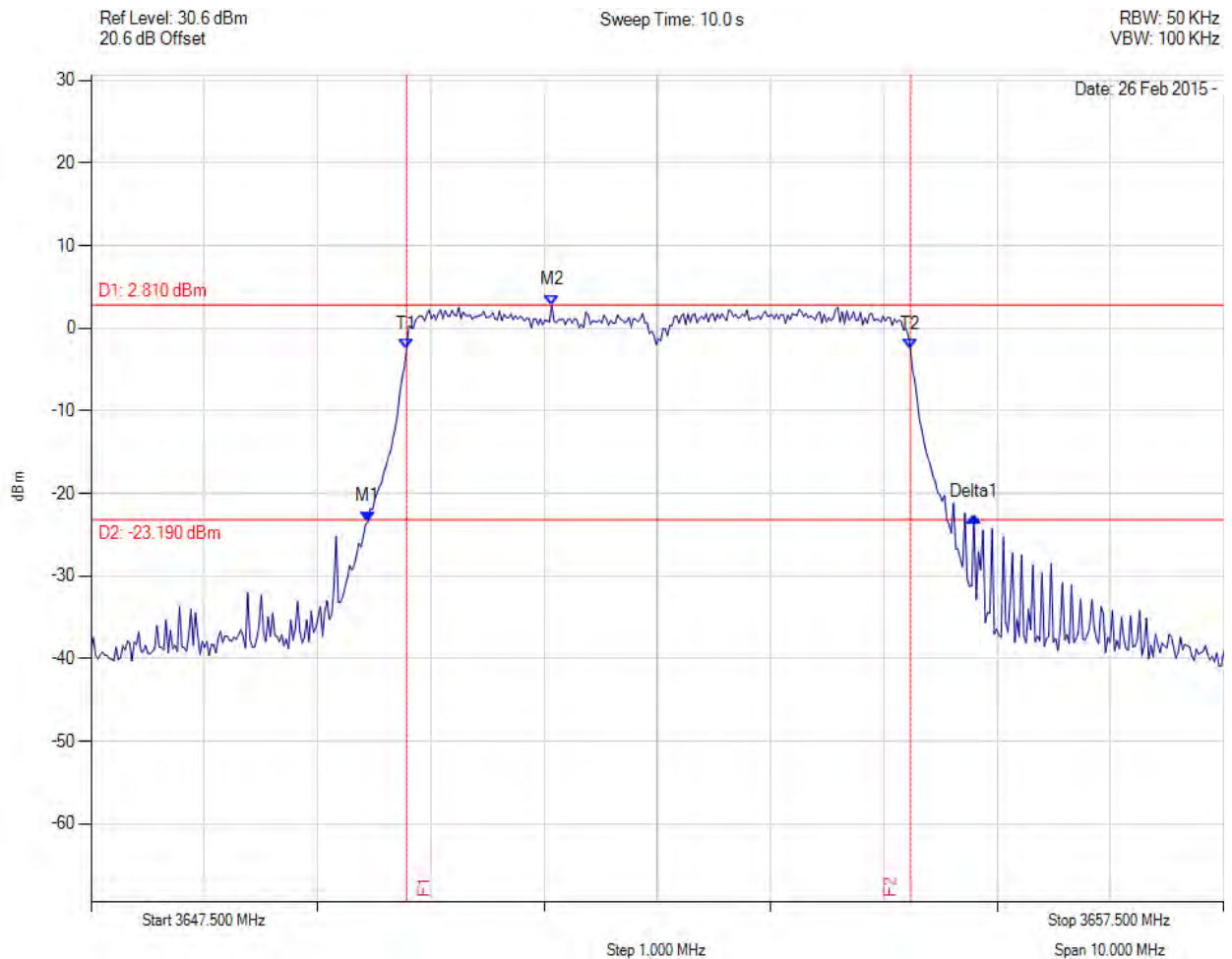


A.1.1. Occupied Bandwidth



26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3652.50 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.945 MHz : -23.386 dBm M2 : 3651.568 MHz : 2.815 dBm Delta1 : 5.351 MHz : 0.592 dB T1 : 3650.286 MHz : -2.550 dBm T2 : 3654.734 MHz : -2.460 dBm OBW : 4.449 MHz	Channel Frequency: 3652.50 MHz

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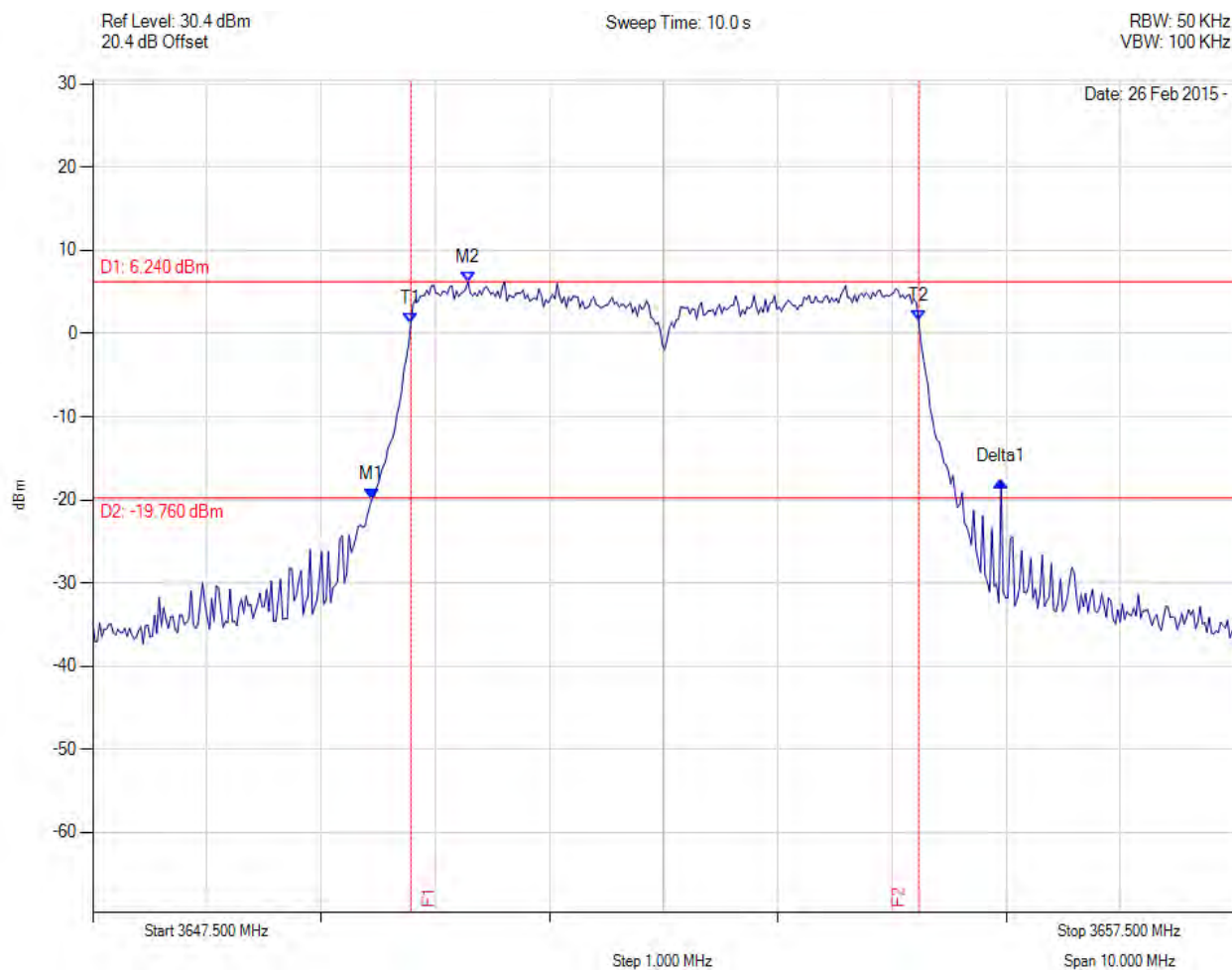


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3652.50 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.945 MHz : -19.884 dBm M2 : 3650.787 MHz : 6.237 dBm Delta1 : 5.511 MHz : 2.097 dB T1 : 3650.286 MHz : 1.270 dBm T2 : 3654.734 MHz : 1.490 dBm OBW : 4.449 MHz	Channel Frequency: 3652.50 MHz

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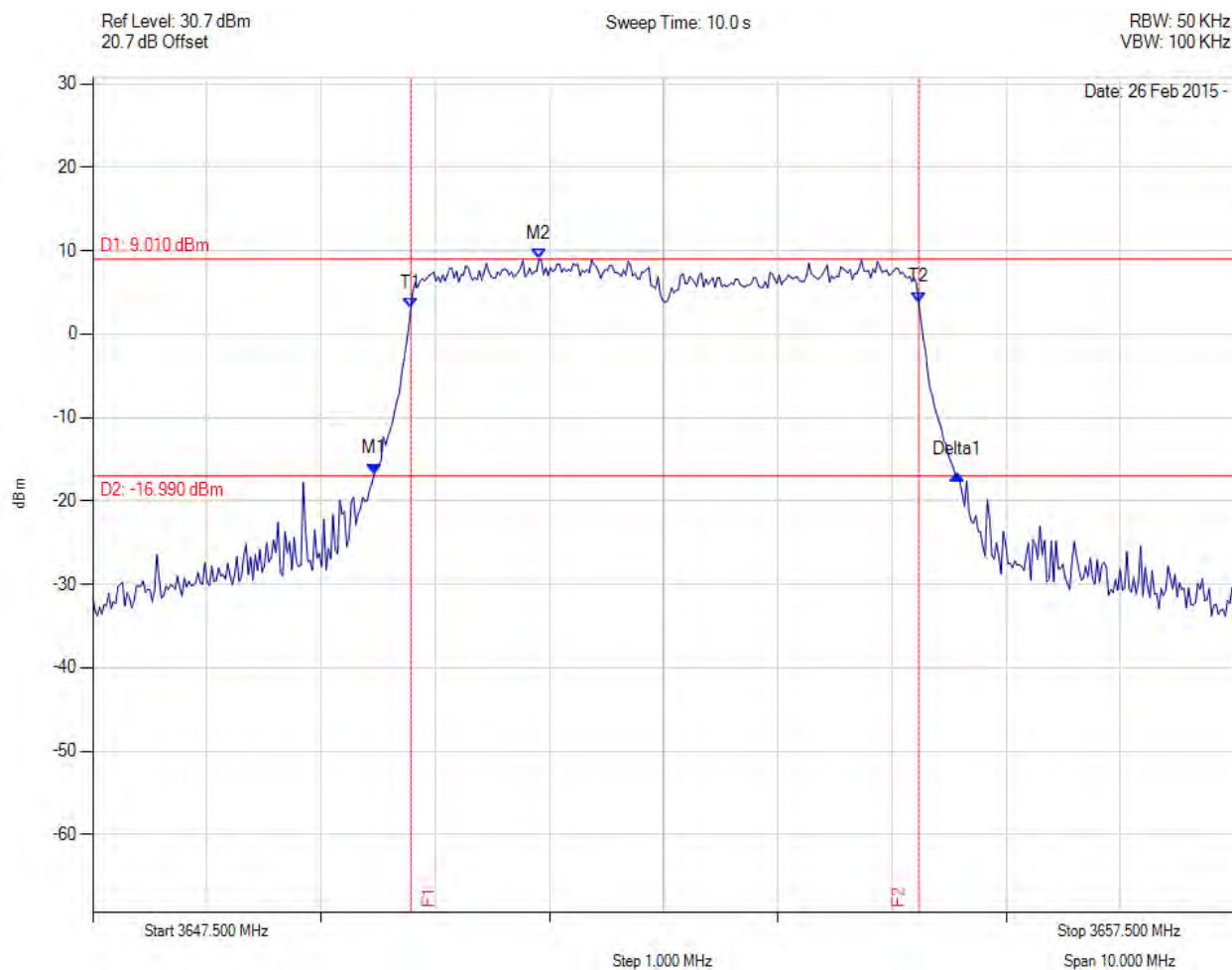


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3652.50 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.965 MHz : -16.749 dBm M2 : 3651.408 MHz : 9.012 dBm Delta1 : 5.110 MHz : -0.134 dB T1 : 3650.286 MHz : 3.060 dBm T2 : 3654.734 MHz : 3.830 dBm OBW : 4.449 MHz	Channel Frequency: 3652.50 MHz

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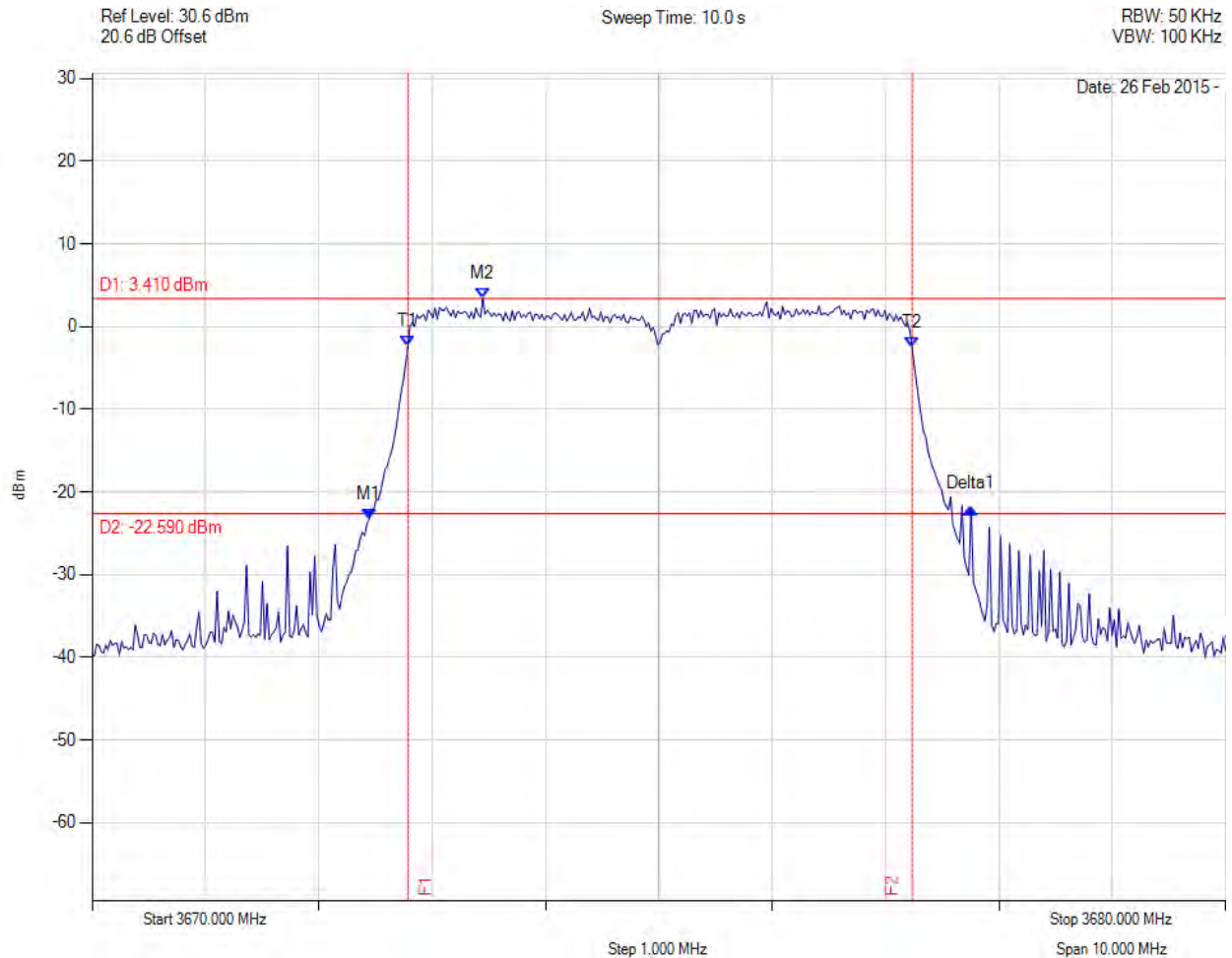


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3672.445 MHz : -23.250 dBm M2 : 3673.447 MHz : 3.407 dBm Delta1 : 5.311 MHz : 1.261 dB T1 : 3672.786 MHz : -2.340 dBm T2 : 3677.234 MHz : -2.590 dBm OBW : 4.449 MHz	Channel Frequency: 3675.00 MHz

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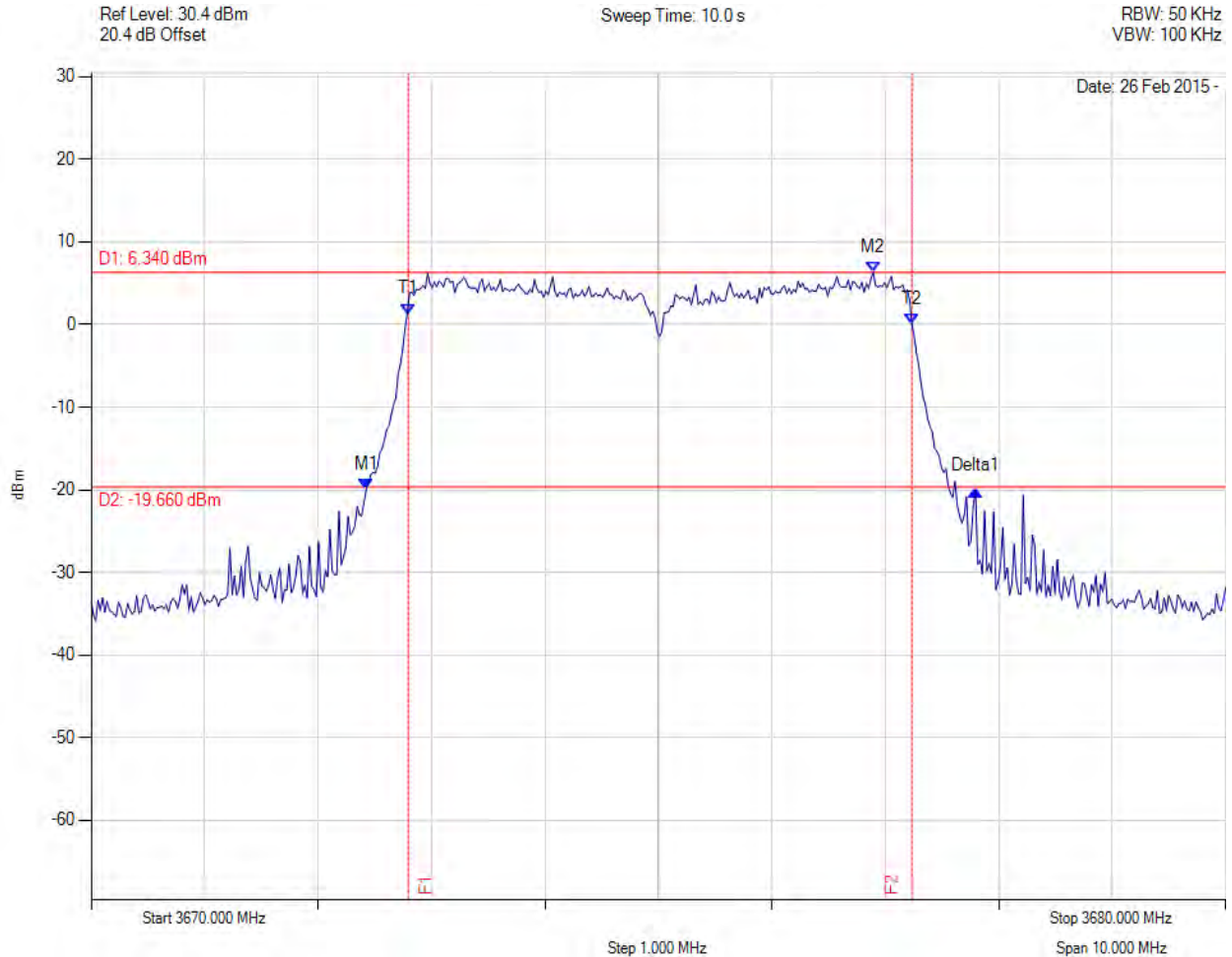


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3672.425 MHz : -19.982 dBm M2 : 3676.894 MHz : 6.341 dBm Delta1 : 5.371 MHz : -0.116 dB T1 : 3672.796 MHz : 1.300 dBm T2 : 3677.234 MHz : 0.080 dBm OBW : 4.449 MHz	Channel Frequency: 3675.00 MHz

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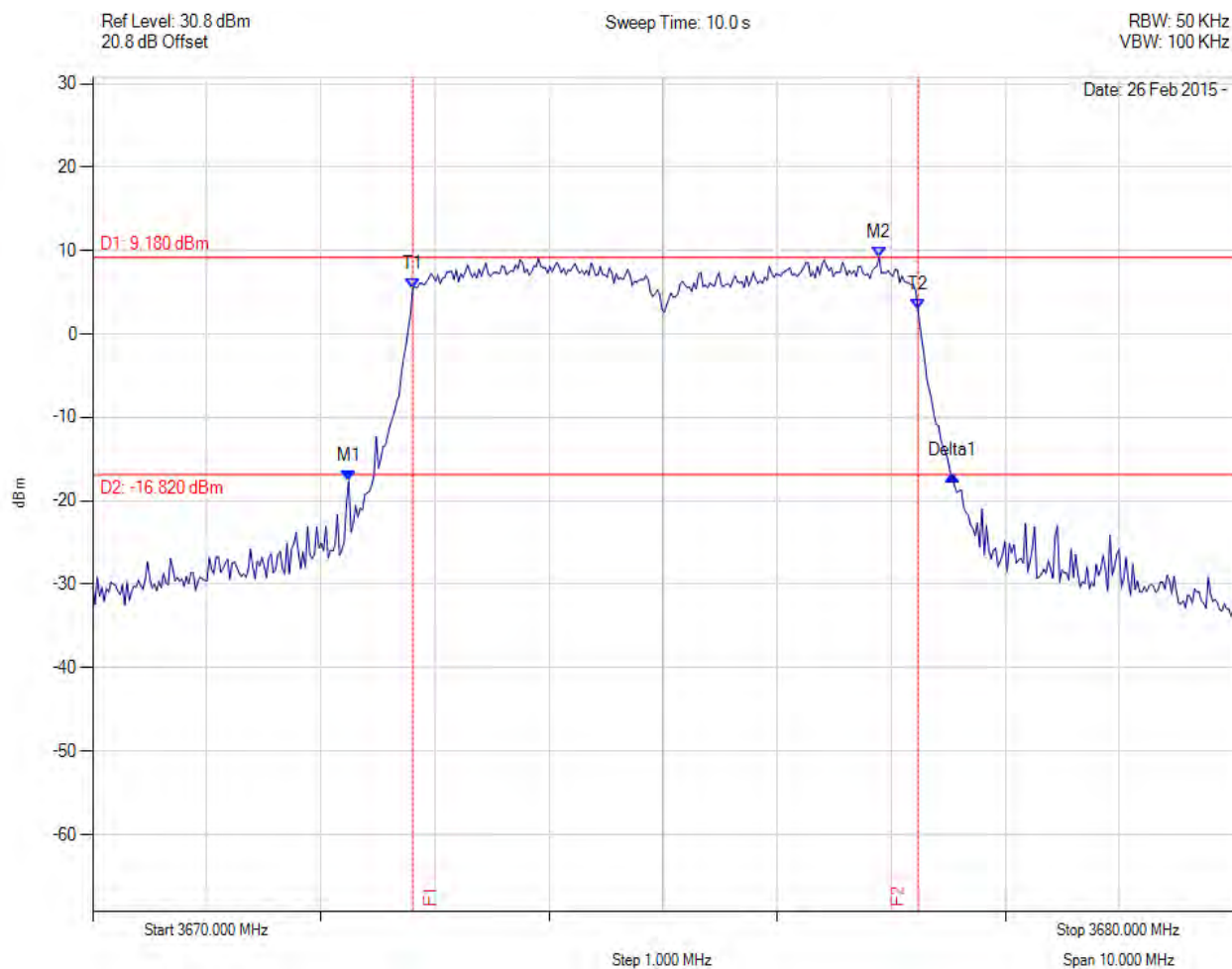


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3672.244 MHz : -17.646 dBm M2 : 3676.894 MHz : 9.181 dBm Delta1 : 5.291 MHz : 0.635 dB T1 : 3672.806 MHz : 5.400 dBm T2 : 3677.234 MHz : 2.880 dBm OBW : 4.429 MHz	Channel Frequency: 3675.00 MHz

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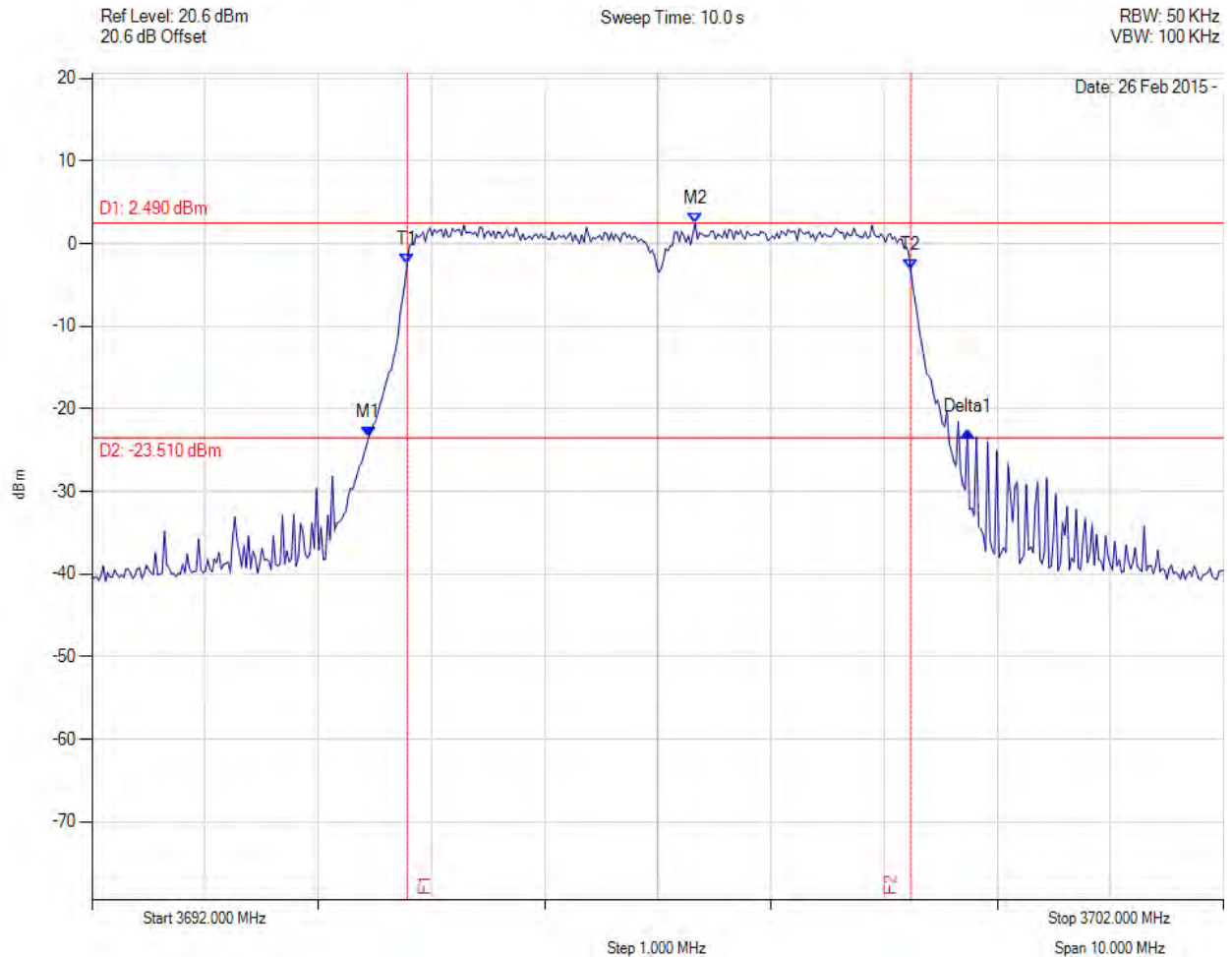


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3697.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3694.445 MHz : -23.425 dBm M2 : 3697.331 MHz : 2.487 dBm Delta1 : 5.291 MHz : 0.614 dB T1 : 3694.786 MHz : -2.420 dBm T2 : 3699.234 MHz : -3.080 dBm OBW : 4.449 MHz	Channel Frequency: 3697.00 MHz

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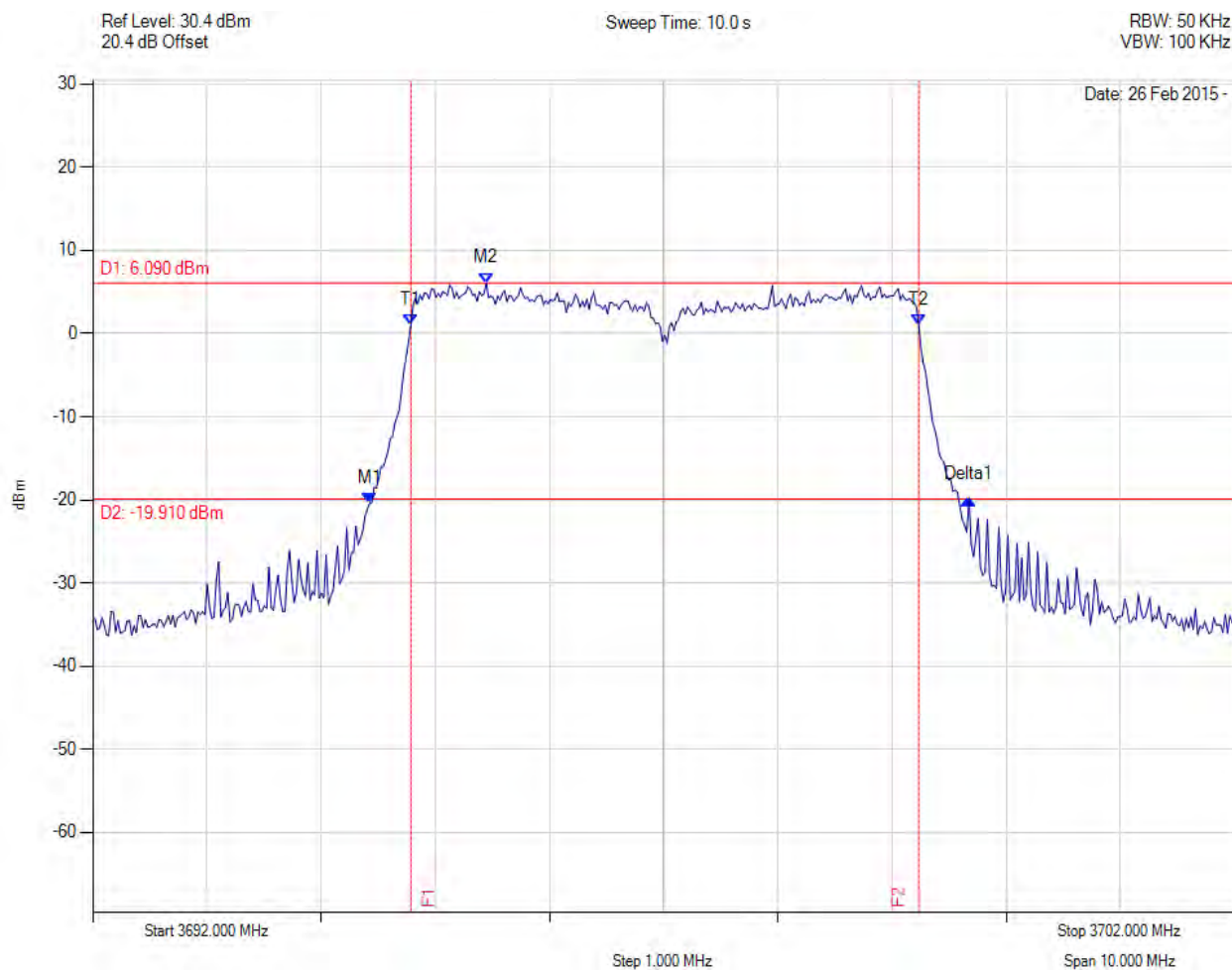


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3697.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3694.425 MHz : -20.458 dBm M2 : 3695.447 MHz : 6.091 dBm Delta1 : 5.251 MHz : 0.549 dB T1 : 3694.786 MHz : 1.070 dBm T2 : 3699.234 MHz : 1.040 dBm OBW : 4.449 MHz	Channel Frequency: 3697.00 MHz

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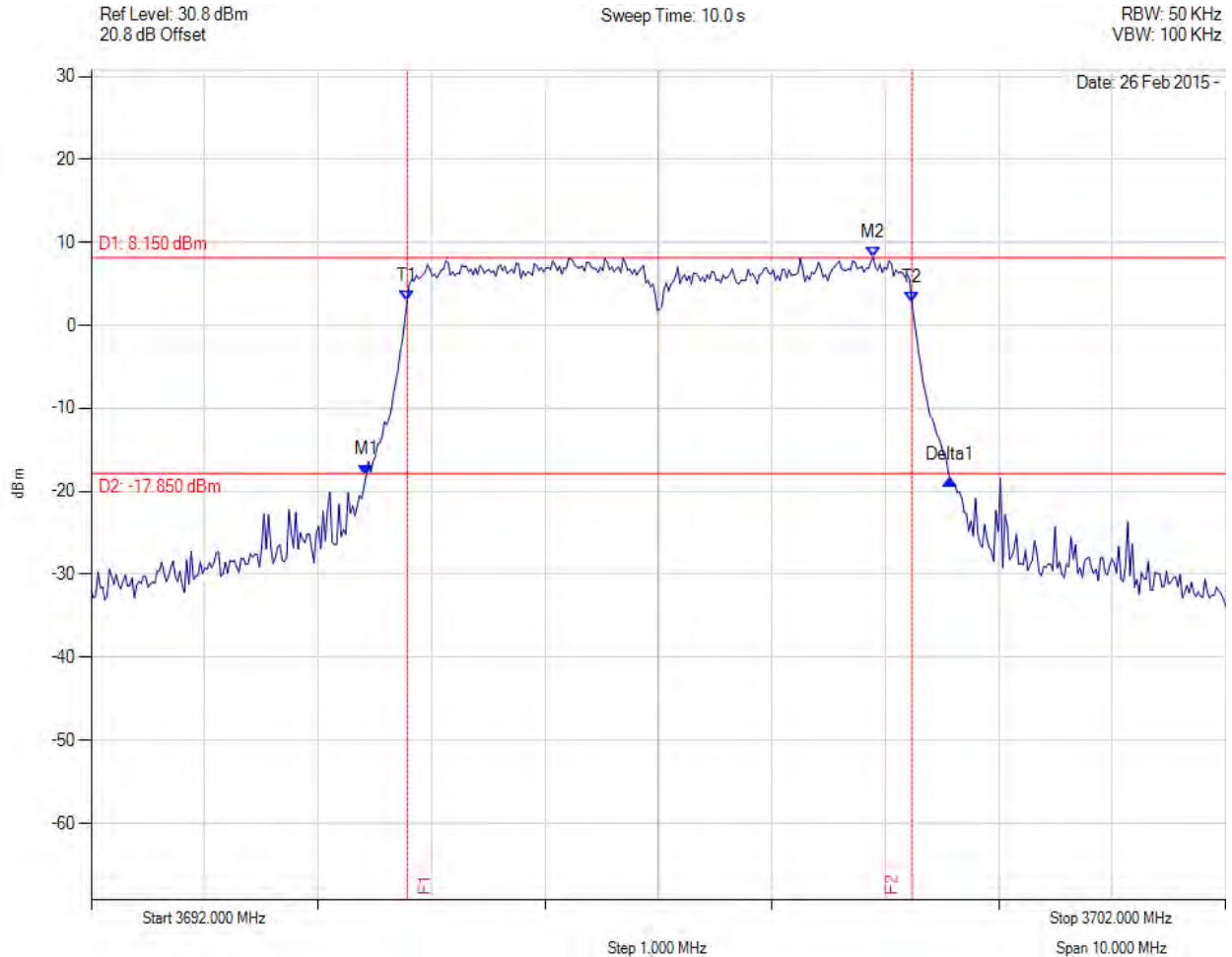


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3697.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3694.425 MHz : -18.006 dBm M2 : 3698.894 MHz : 8.154 dBm Delta1 : 5.150 MHz : -0.622 dB T1 : 3694.786 MHz : 3.020 dBm T2 : 3699.234 MHz : 2.760 dBm OBW : 4.449 MHz	Channel Frequency: 3697.00 MHz

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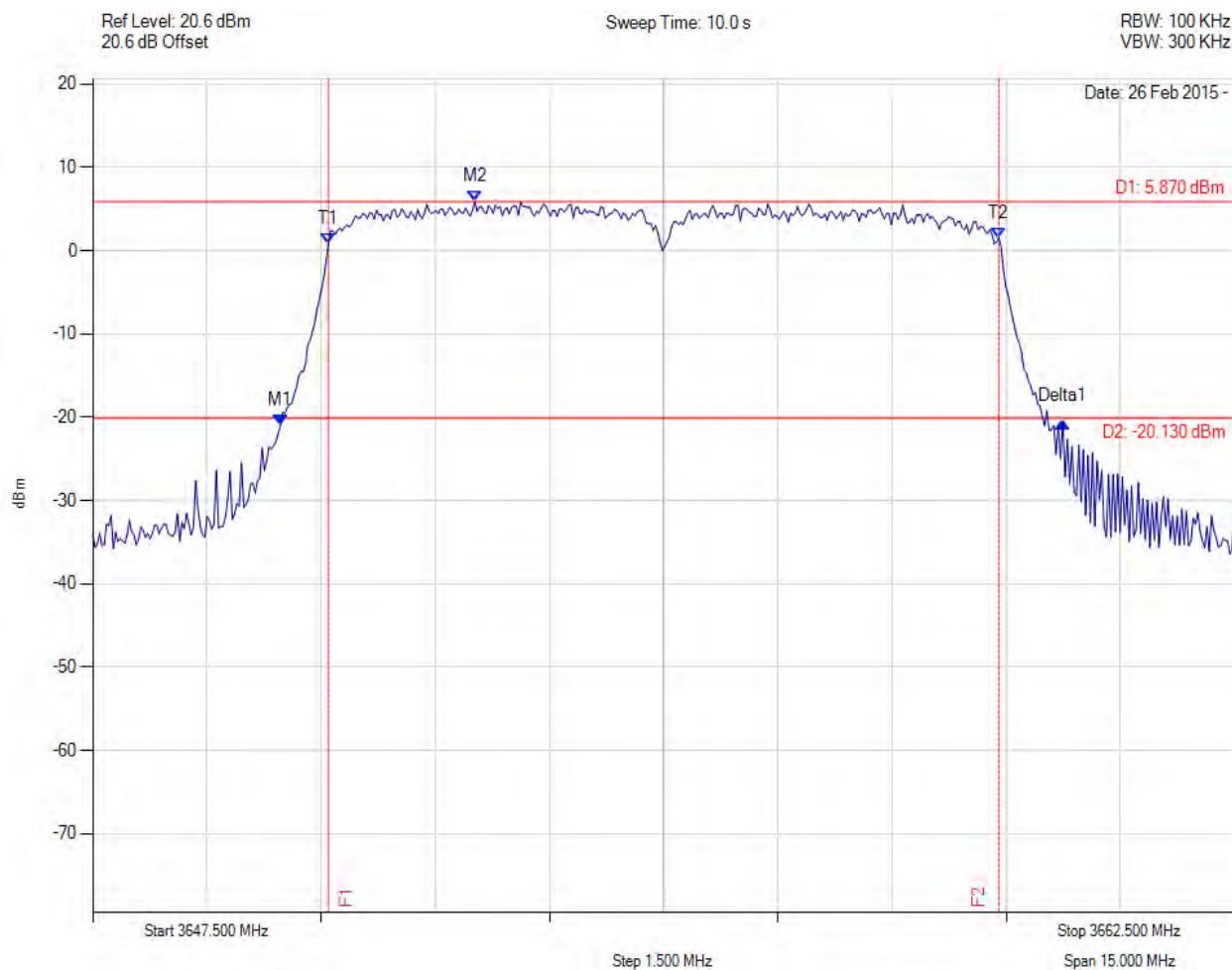


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3655.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.965 MHz : -20.990 dBm M2 : 3652.520 MHz : 5.866 dBm Delta1 : 10.281 MHz : 0.476 dB T1 : 3650.596 MHz : 0.790 dBm T2 : 3659.404 MHz : 1.510 dBm OBW : 10.281 MHz	Channel Frequency: 3655.00 MHz

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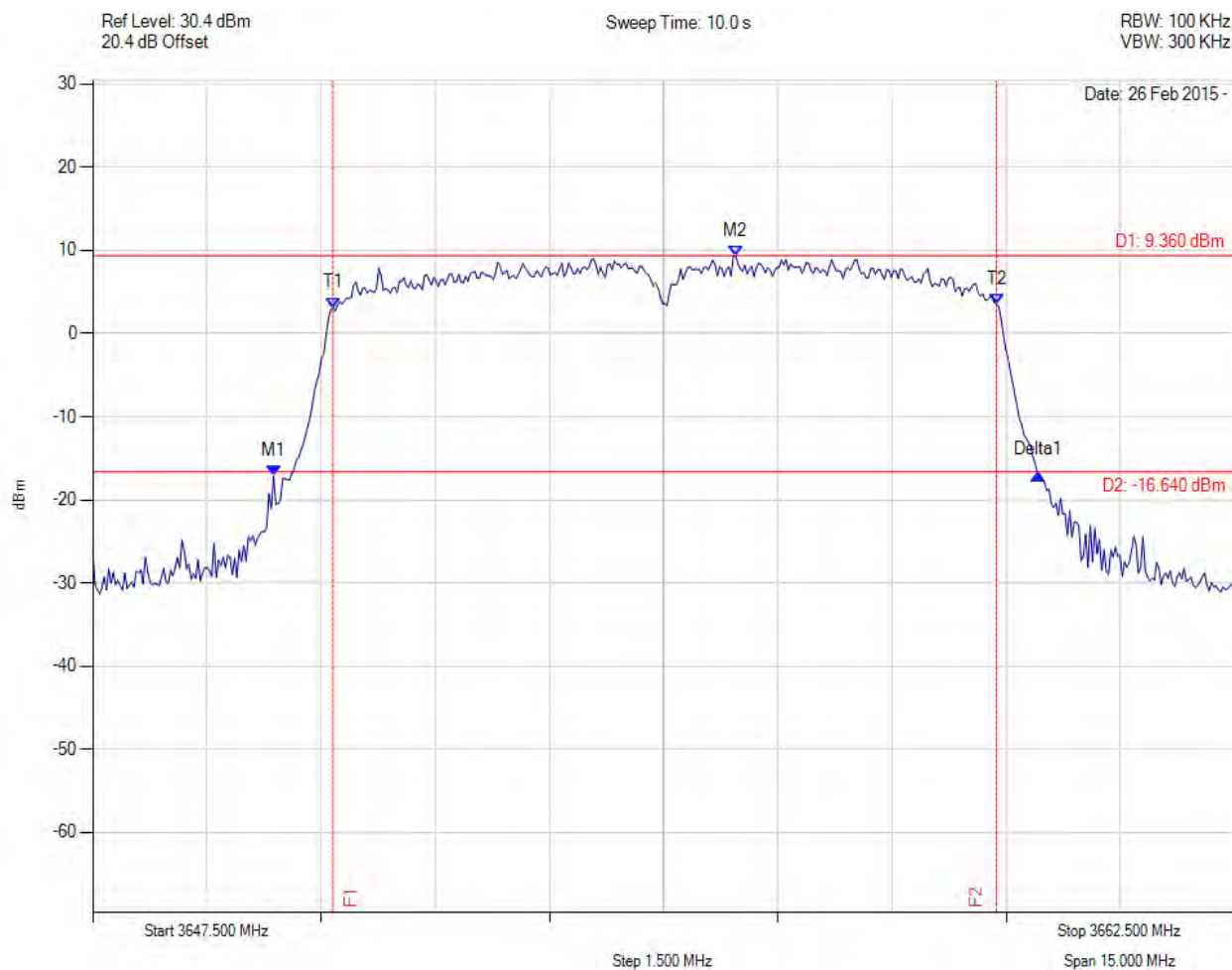


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3655.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.875 MHz : -17.139 dBm M2 : 3655.947 MHz : 9.357 dBm Delta1 : 10.040 MHz : 0.224 dB T1 : 3650.656 MHz : 3.120 dBm T2 : 3659.374 MHz : 3.570 dBm OBW : 8.717 MHz	Channel Frequency: 3655.00 MHz

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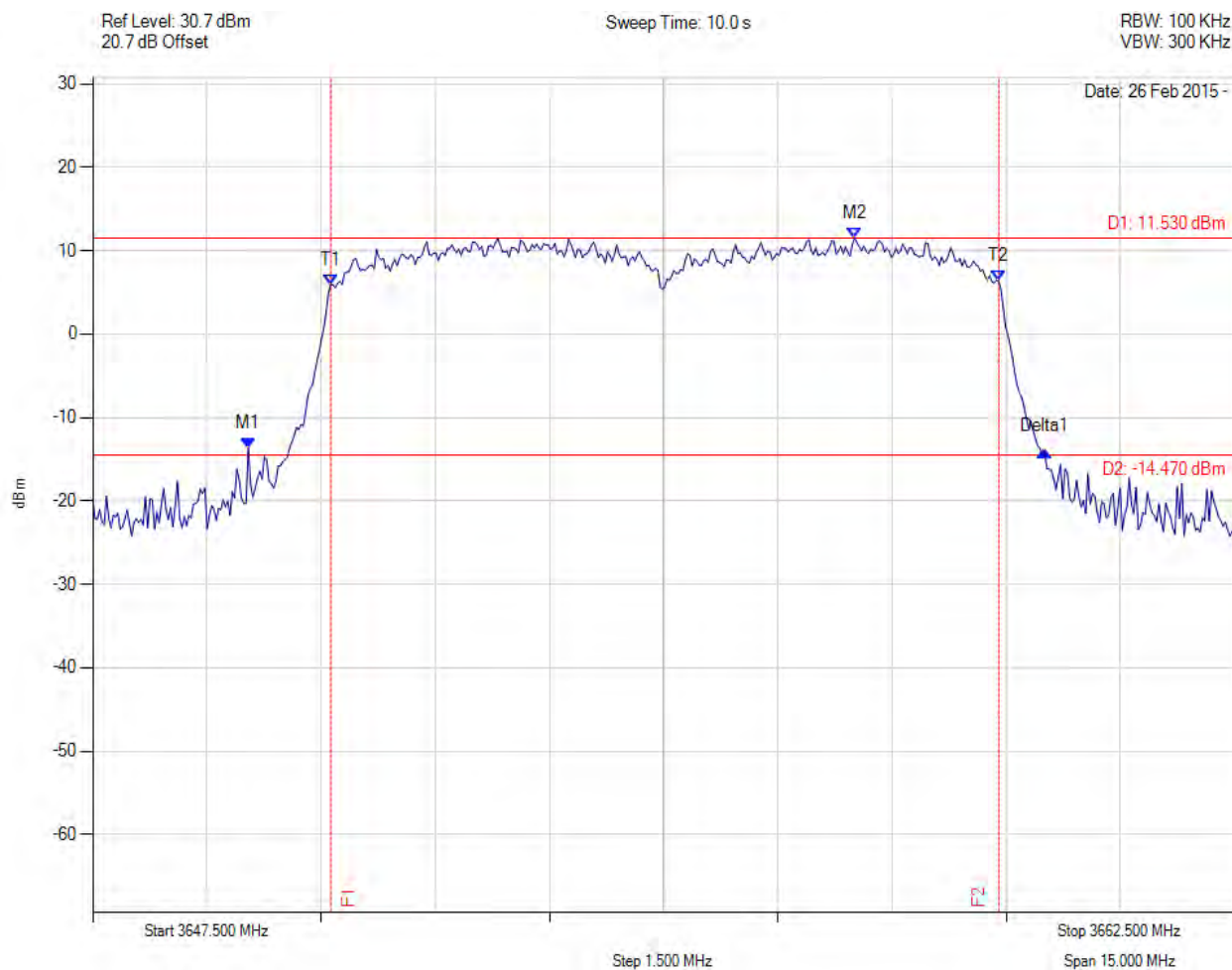


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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3655.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.544 MHz : -13.632 dBm M2 : 3657.510 MHz : 11.528 dBm Delta1 : 10.461 MHz : -0.397 dB T1 : 3650.626 MHz : 5.960 dBm T2 : 3659.404 MHz : 6.320 dBm OBW : 8.778 MHz	Channel Frequency: 3655.00 MHz

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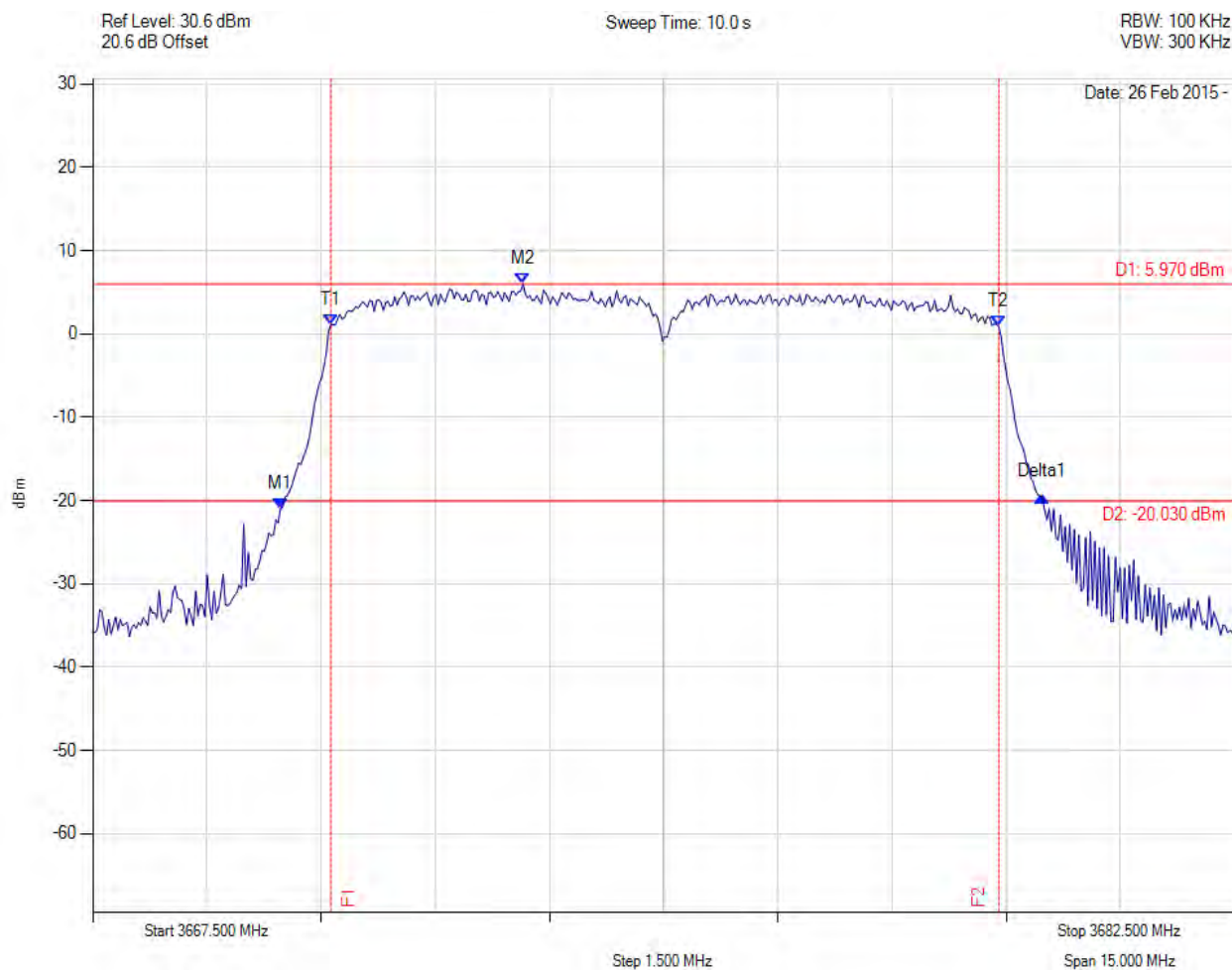


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
Serial #: RDWN35-U3 Rev A
Issue Date: 19th March 2015
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3669.965 MHz : -20.941 dBm M2 : 3673.151 MHz : 5.973 dBm Delta1 : 10.010 MHz : 1.367 dB T1 : 3670.626 MHz : 1.080 dBm T2 : 3679.404 MHz : 0.860 dBm OBW : 8.778 MHz	Channel Frequency: 3675.00 MHz

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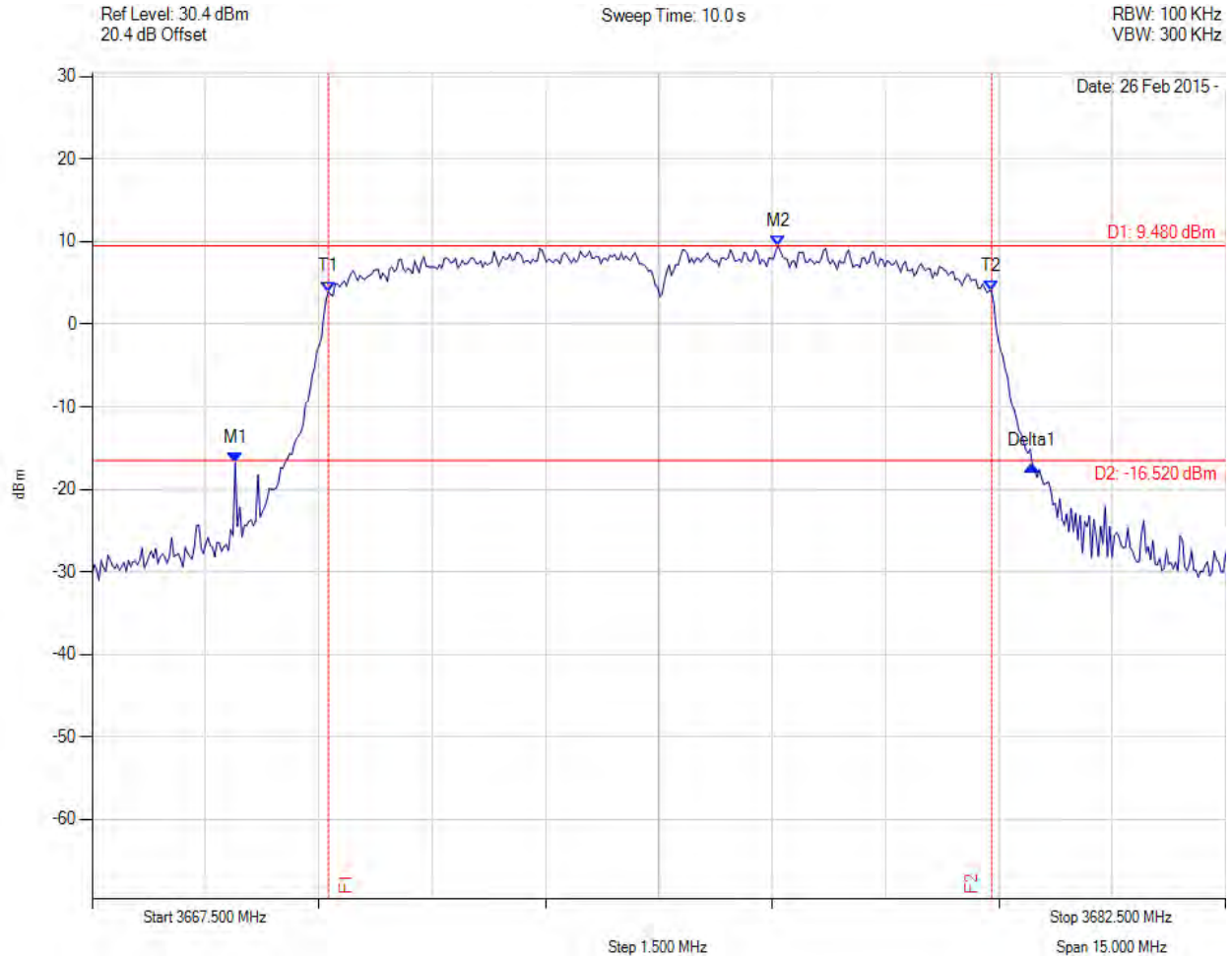


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3669.394 MHz : -16.783 dBm M2 : 3676.578 MHz : 9.483 dBm Delta1 : 10.551 MHz : -0.295 dB T1 : 3670.626 MHz : 3.940 dBm T2 : 3679.404 MHz : 3.960 dBm OBW : 8.778 MHz	Channel Frequency: 3675.00 MHz

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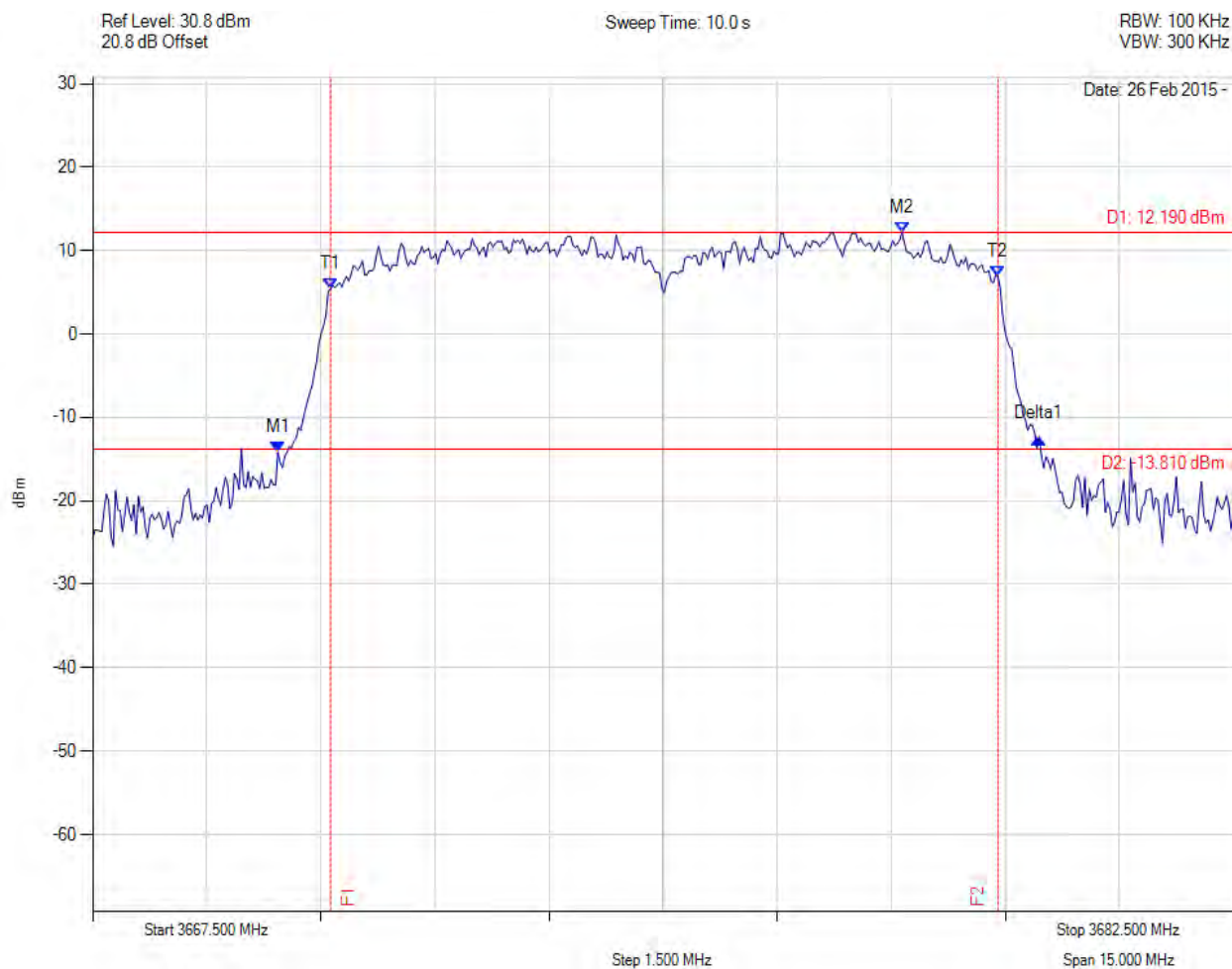


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3669.935 MHz : -14.166 dBm M2 : 3678.141 MHz : 12.185 dBm Delta1 : 10.010 MHz : 1.712 dB T1 : 3670.626 MHz : 5.400 dBm T2 : 3679.404 MHz : 6.910 dBm OBW : 8.778 MHz	Channel Frequency: 3675.00 MHz

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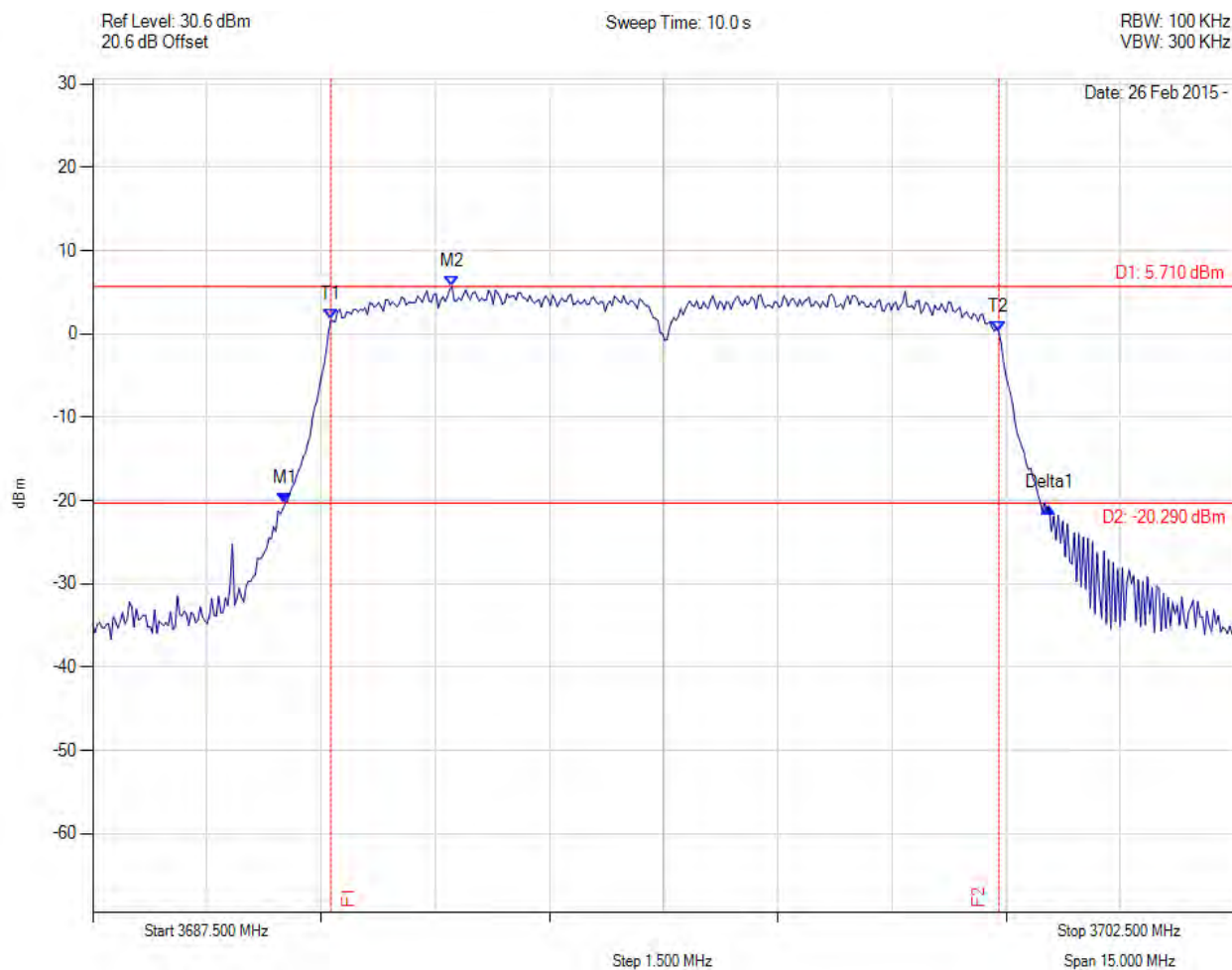


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3695.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3690.025 MHz : -20.372 dBm M2 : 3692.219 MHz : 5.709 dBm Delta1 : 10.040 MHz : -0.413 dB T1 : 3690.626 MHz : 1.730 dBm T2 : 3699.404 MHz : 0.220 dBm OBW : 8.778 MHz	Channel Frequency: 3695.00 MHz

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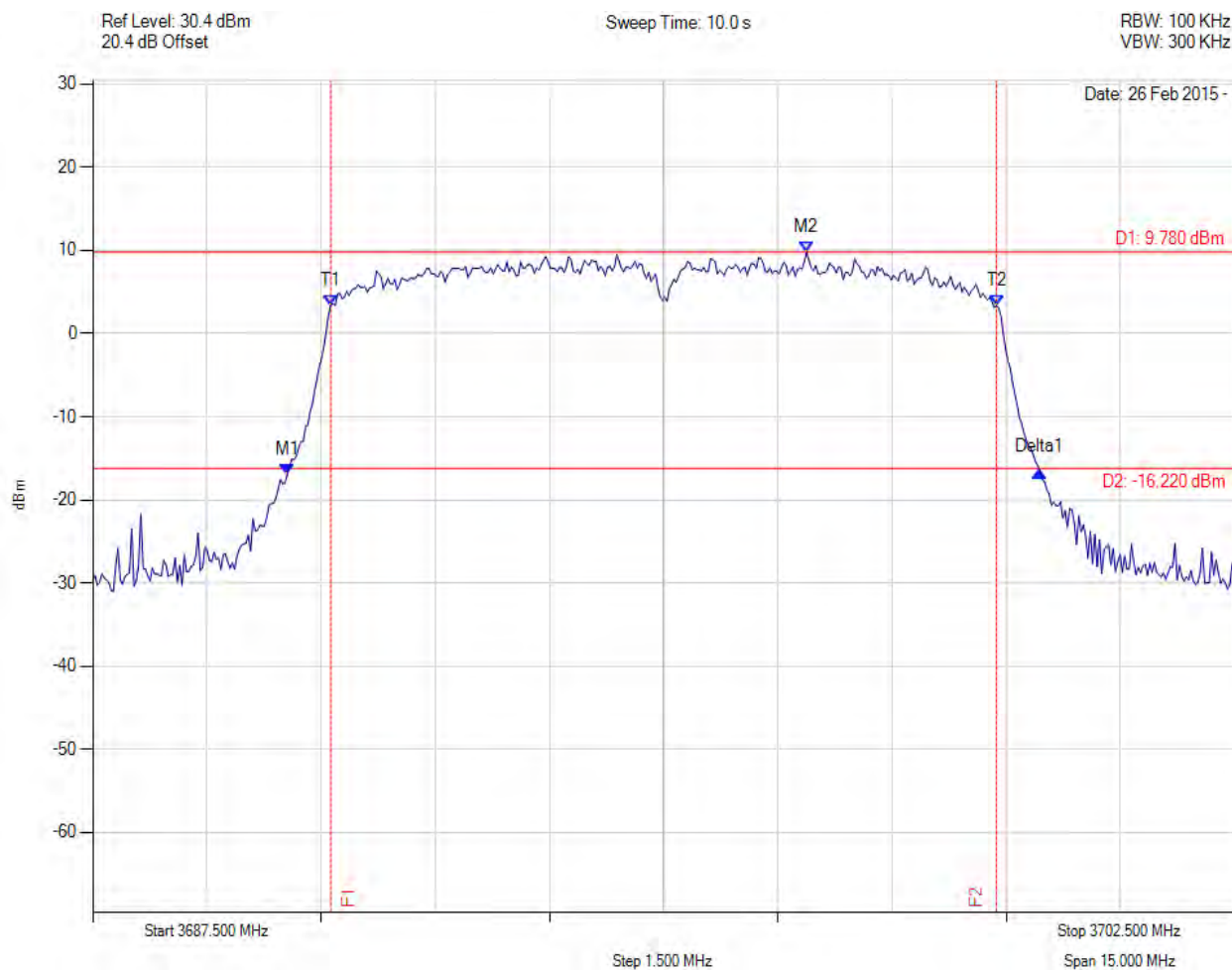


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3695.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3690.055 MHz : -16.976 dBm M2 : 3696.879 MHz : 9.782 dBm Delta1 : 9.890 MHz : 0.423 dB T1 : 3690.626 MHz : 3.430 dBm T2 : 3699.374 MHz : 3.390 dBm OBW : 8.778 MHz	Channel Frequency: 3695.00 MHz

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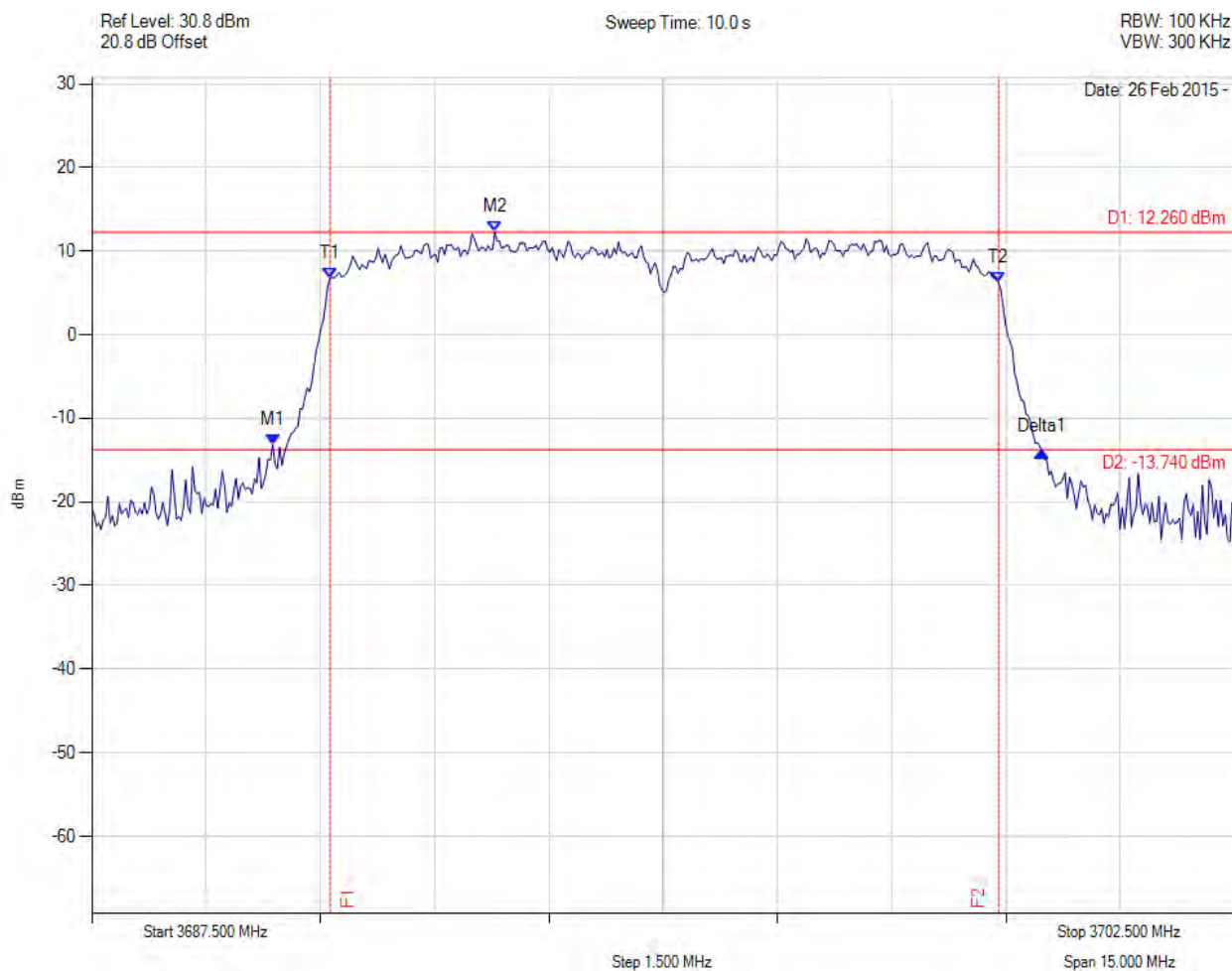


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3695.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3689.875 MHz : -13.121 dBm M2 : 3692.791 MHz : 12.262 dBm Delta1 : 10.100 MHz : -0.846 dB T1 : 3690.626 MHz : 6.800 dBm T2 : 3699.404 MHz : 6.270 dBm OBW : 8.778 MHz	Channel Frequency: 3695.00 MHz

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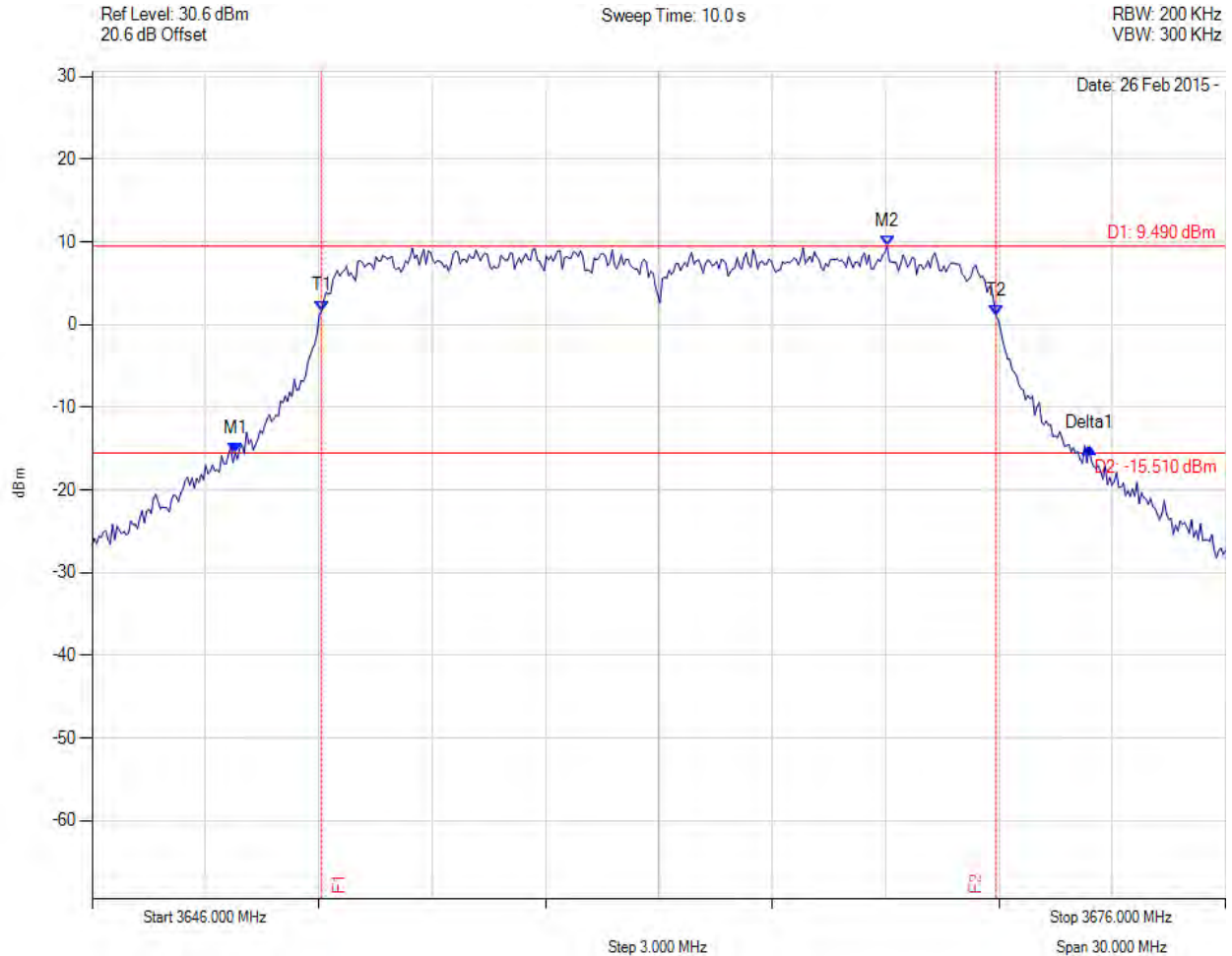


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3661.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3649.788 MHz : -15.566 dBm M2 : 3667.042 MHz : 9.490 dBm Delta1 : 22.605 MHz : 0.744 dB T1 : 3652.072 MHz : 1.680 dBm T2 : 3669.928 MHz : 1.080 dBm OBW : 17.856 MHz	Channel Frequency: 3661.00 MHz

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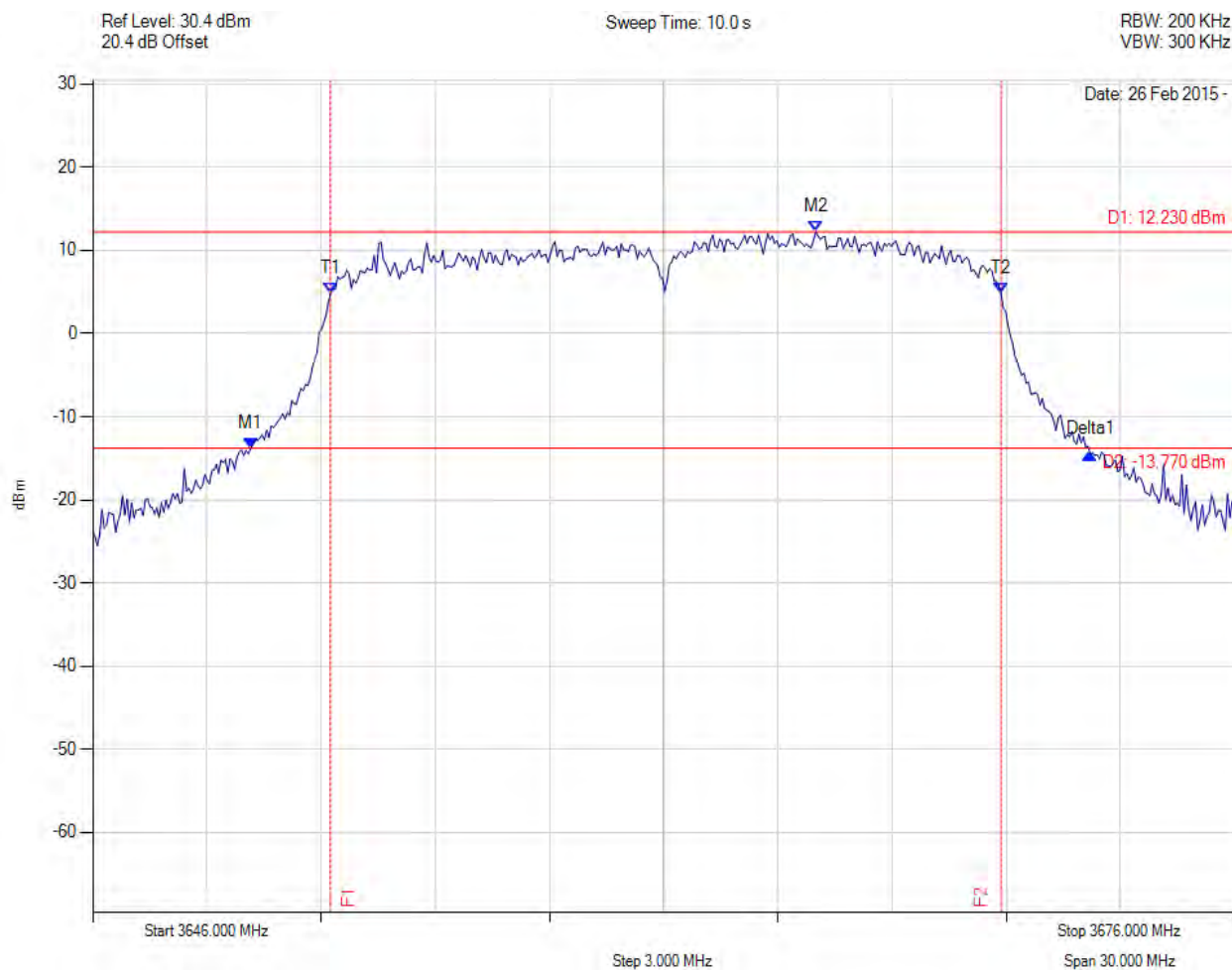


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3661.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.148 MHz : -13.840 dBm M2 : 3664.998 MHz : 12.226 dBm Delta1 : 22.064 MHz : -0.616 dB T1 : 3652.243 MHz : 4.820 dBm T2 : 3669.868 MHz : 4.850 dBm OBW : 17.615 MHz	Channel Frequency: 3661.00 MHz

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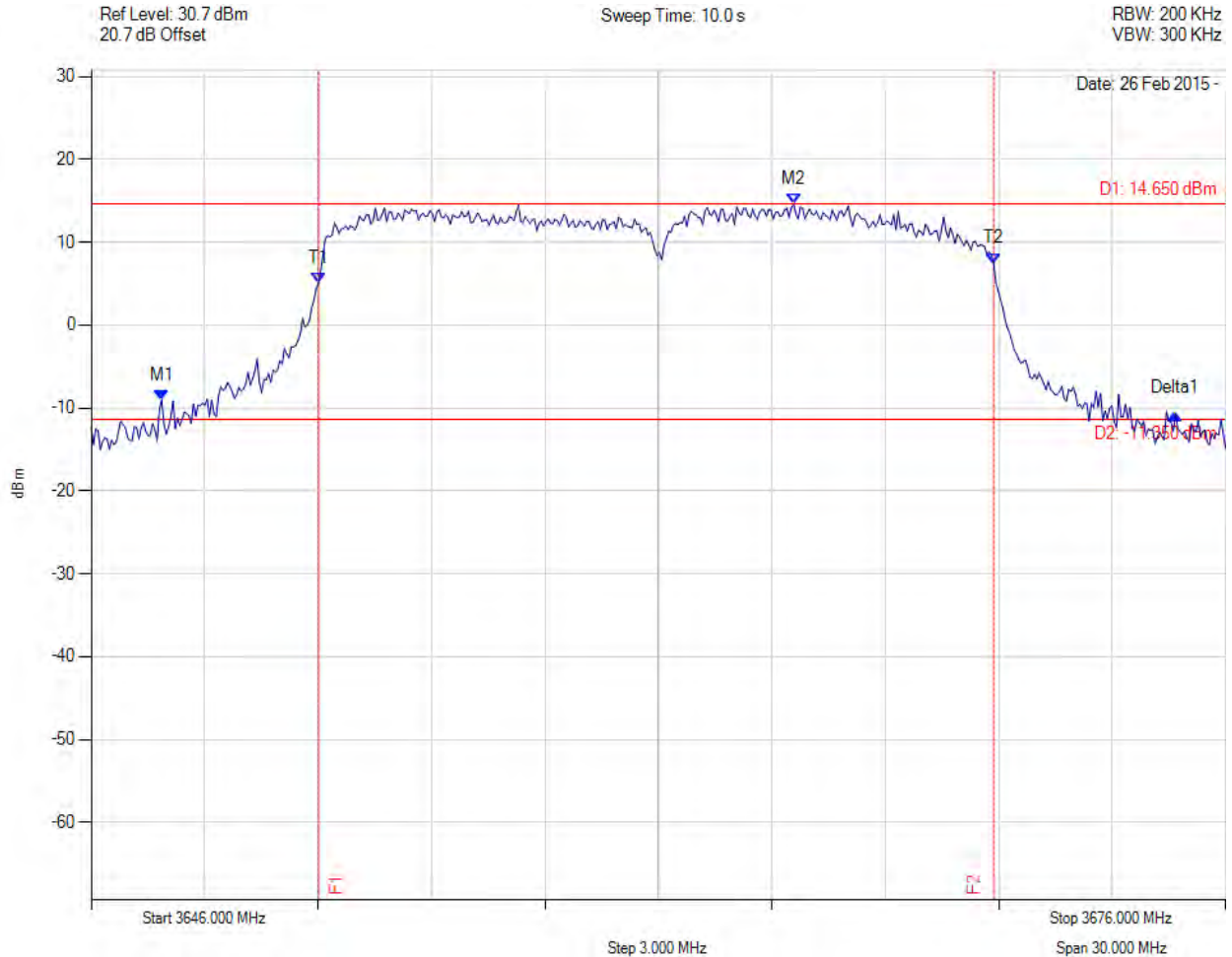


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3661.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3647.864 MHz : -9.033 dBm M2 : 3664.577 MHz : 14.648 dBm Delta1 : 26.814 MHz : -1.627 dB T1 : 3652.012 MHz : 5.040 dBm T2 : 3669.868 MHz : 7.450 dBm OBW : 17.856 MHz	Channel Frequency: 3661.00 MHz

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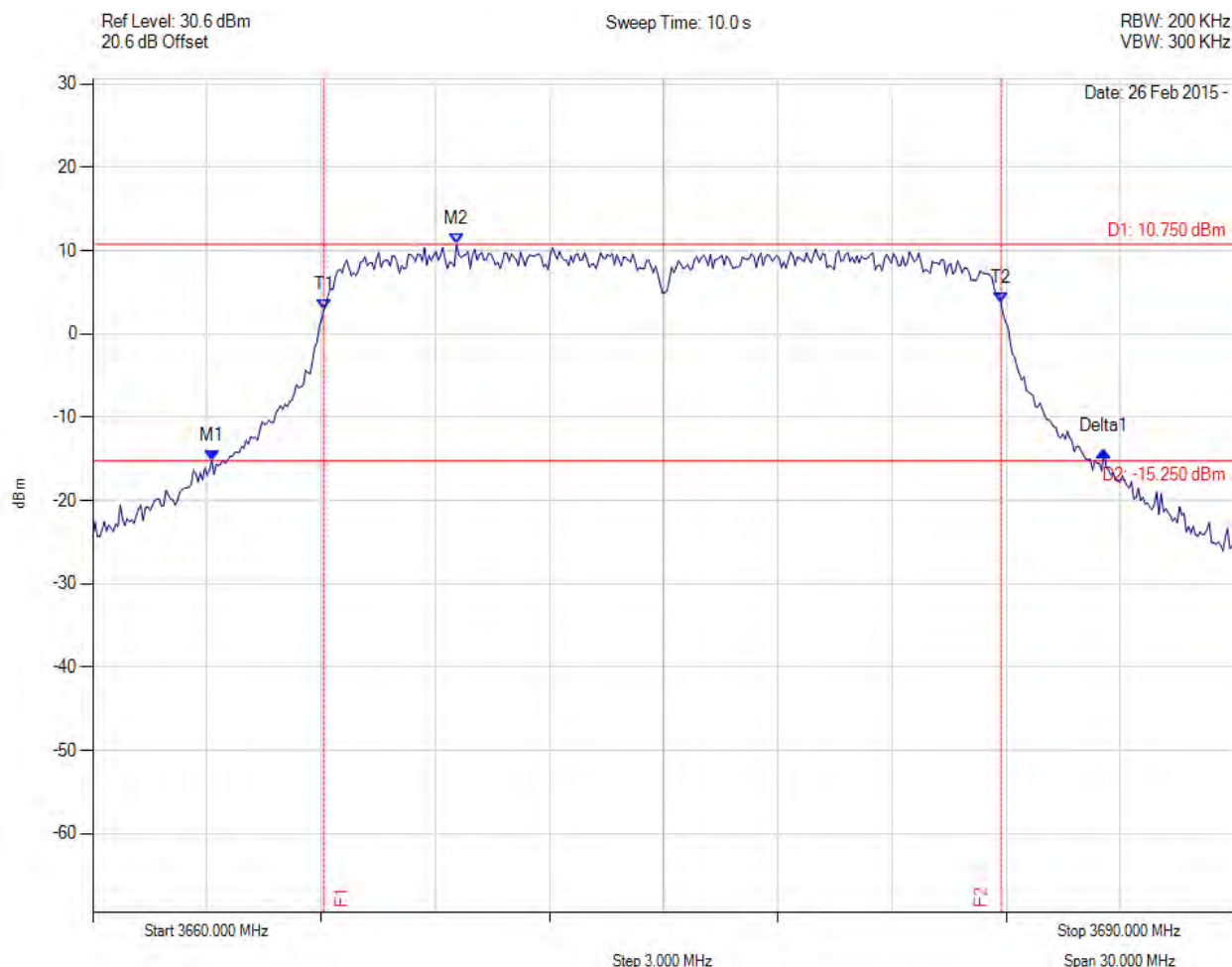


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3663.126 MHz : -15.214 dBm M2 : 3669.559 MHz : 10.747 dBm Delta1 : 23.447 MHz : 1.084 dB T1 : 3666.072 MHz : 2.920 dBm T2 : 3683.868 MHz : 3.710 dBm OBW : 17.956 MHz	Channel Frequency: 3675.00 MHz

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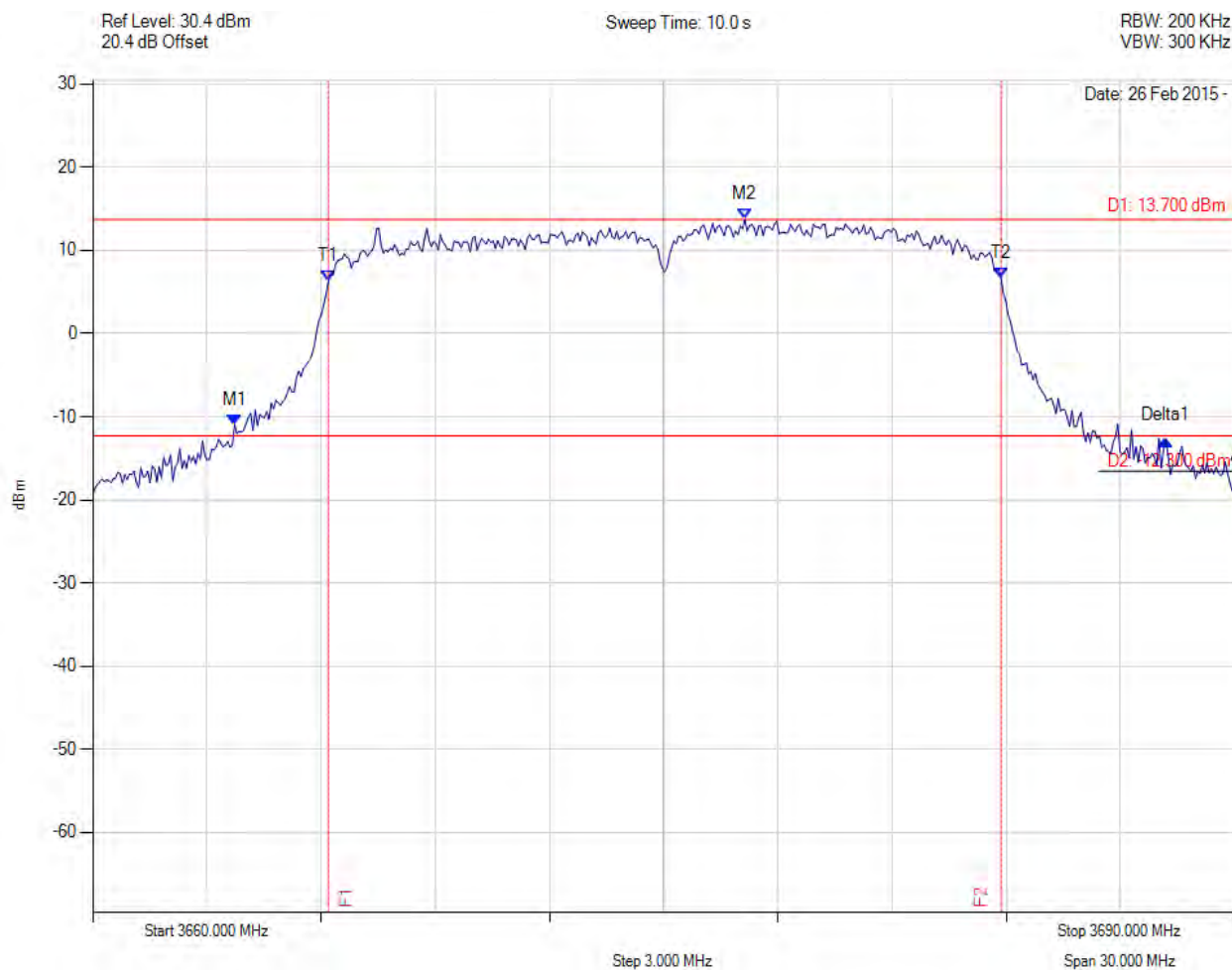


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3663.727 MHz : -10.975 dBm M2 : 3677.134 MHz : 13.699 dBm Delta1 : 24.469 MHz : -1.806 dB T1 : 3666.192 MHz : 6.290 dBm T2 : 3683.868 MHz : 6.640 dBm OBW : 17.675 MHz	Channel Frequency: 3675.00 MHz

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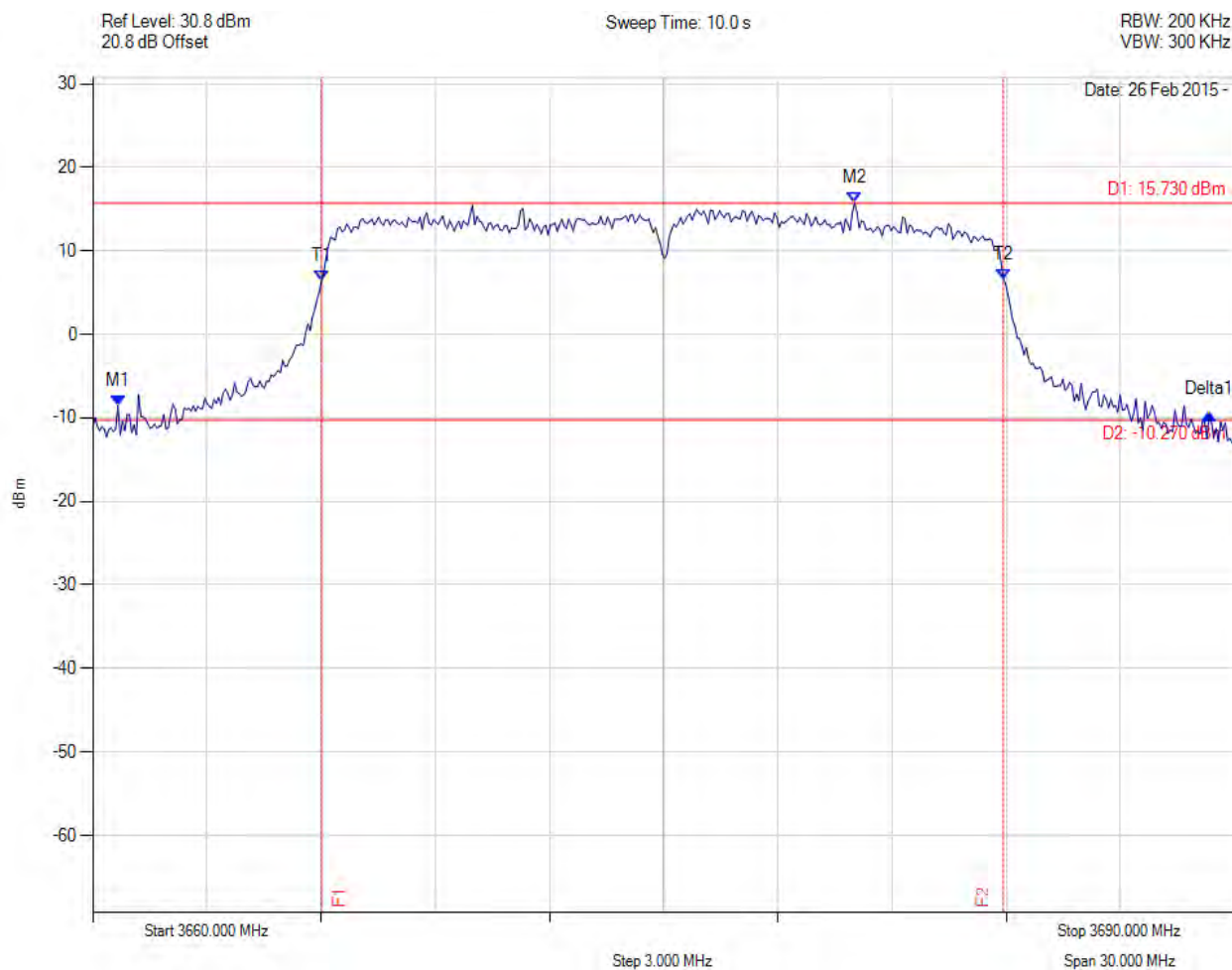


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.661 MHz : -8.533 dBm M2 : 3680.020 MHz : 15.728 dBm Delta1 : 28.677 MHz : -0.992 dB T1 : 3666.012 MHz : 6.470 dBm T2 : 3683.928 MHz : 6.640 dBm OBW : 17.916 MHz	Channel Frequency: 3675.00 MHz

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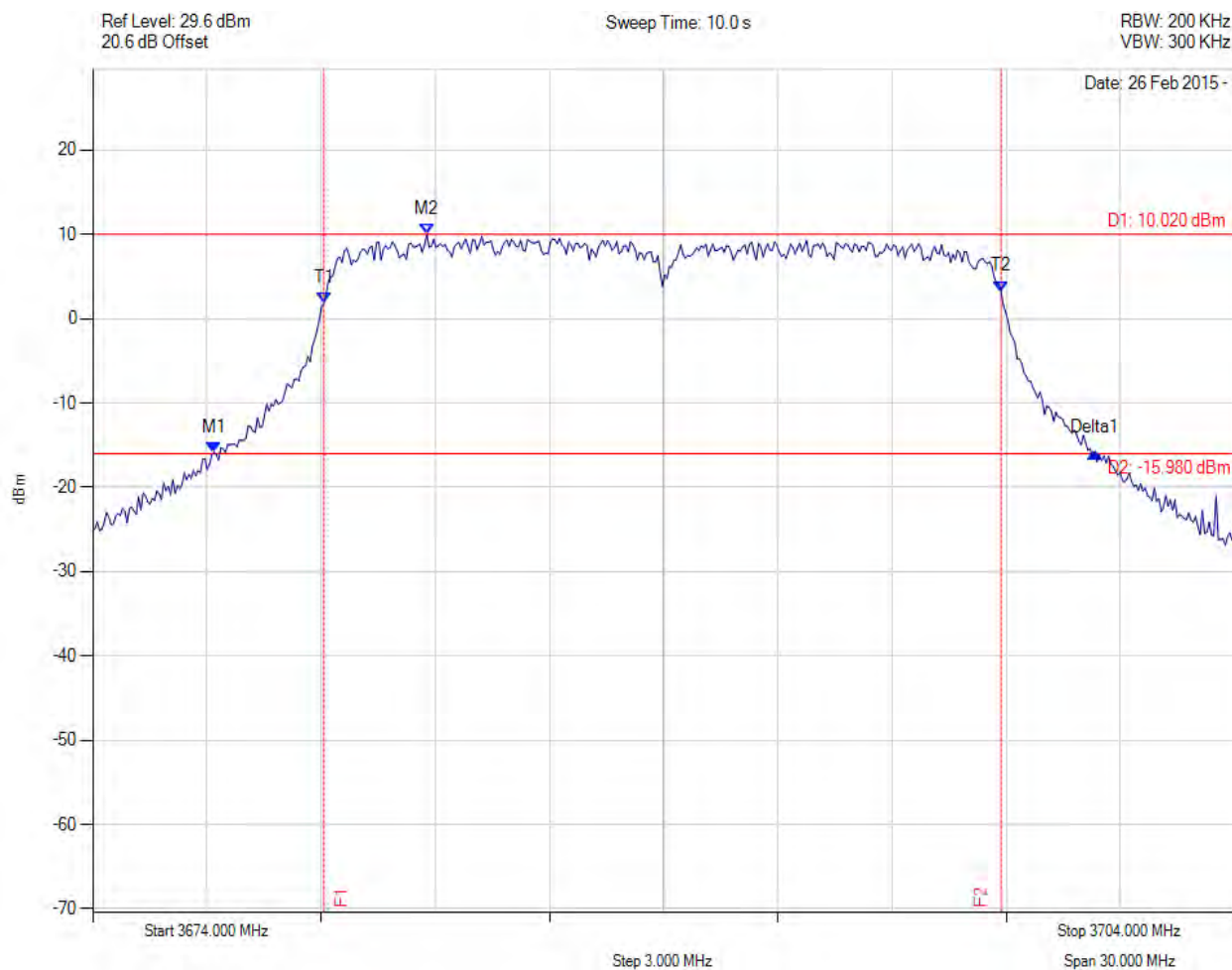


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3689.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3677.186 MHz : -15.856 dBm M2 : 3682.778 MHz : 10.017 dBm Delta1 : 23.146 MHz : 0.024 dB T1 : 3680.072 MHz : 1.820 dBm T2 : 3697.868 MHz : 3.280 dBm OBW : 17.796 MHz	Channel Frequency: 3689.00 MHz

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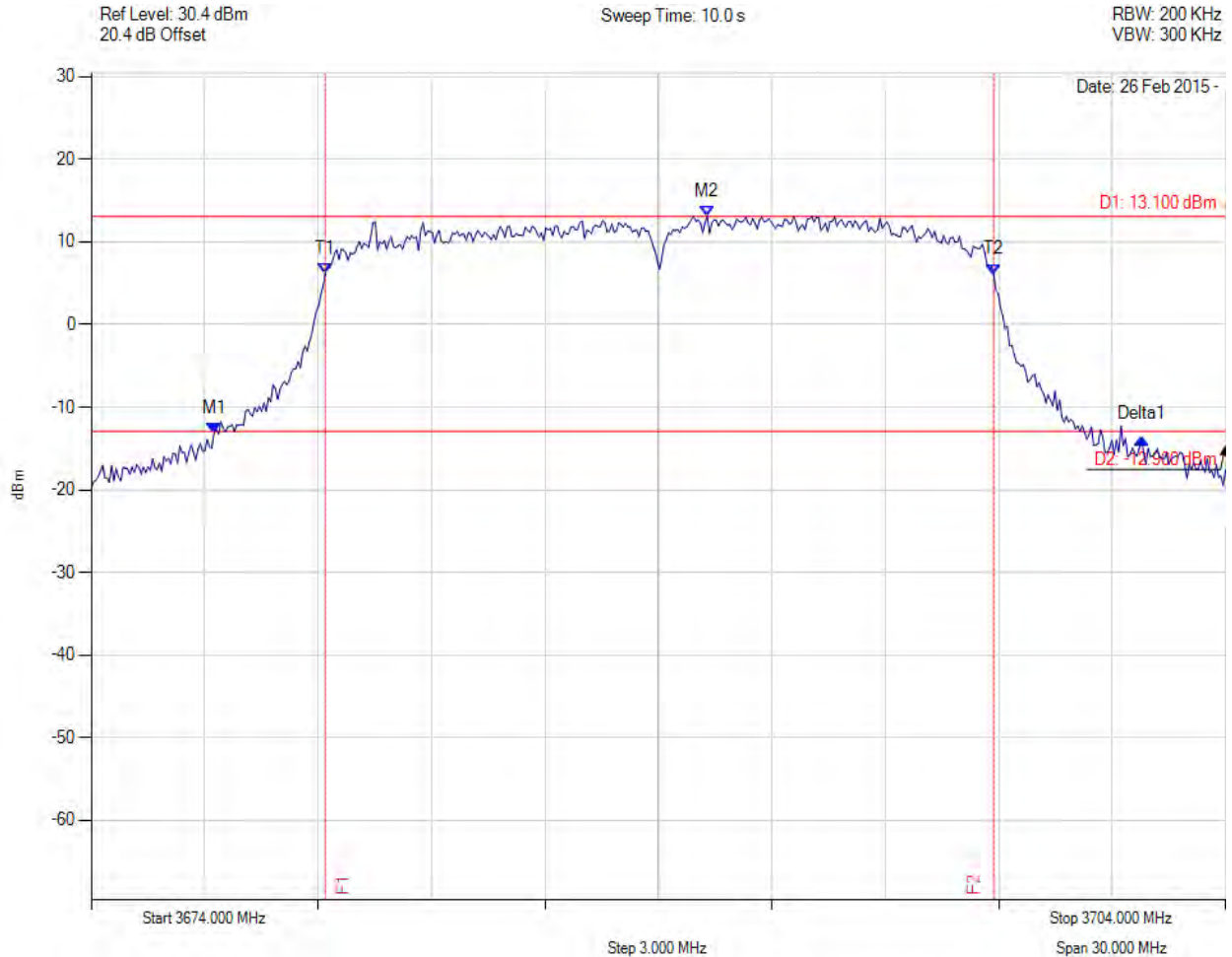


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3689.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3677.246 MHz : -13.126 dBm M2 : 3690.293 MHz : 13.103 dBm Delta1 : 24.529 MHz : -0.685 dB T1 : 3680.192 MHz : 6.190 dBm T2 : 3697.867 MHz : 6.080 dBm OBW : 17.675 MHz	Channel Frequency: 3689.00 MHz

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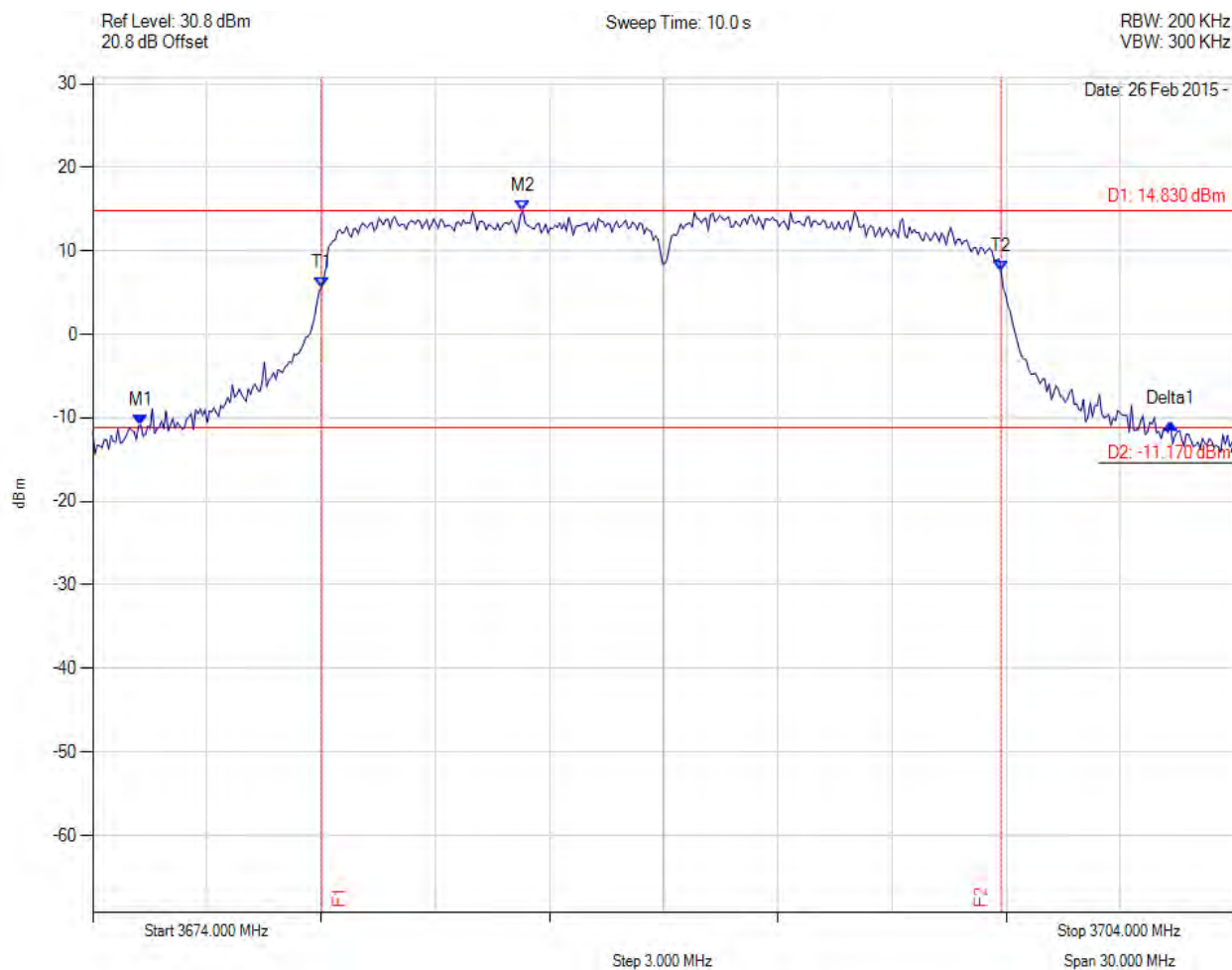


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: , Channel: 3689.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analysers Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3675.263 MHz : -10.863 dBm M2 : 3685.303 MHz : 14.833 dBm Delta1 : 27.054 MHz : 0.118 dB T1 : 3680.012 MHz : 5.650 dBm T2 : 3697.868 MHz : 7.530 dBm OBW : 17.856 MHz	Channel Frequency: 3689.00 MHz

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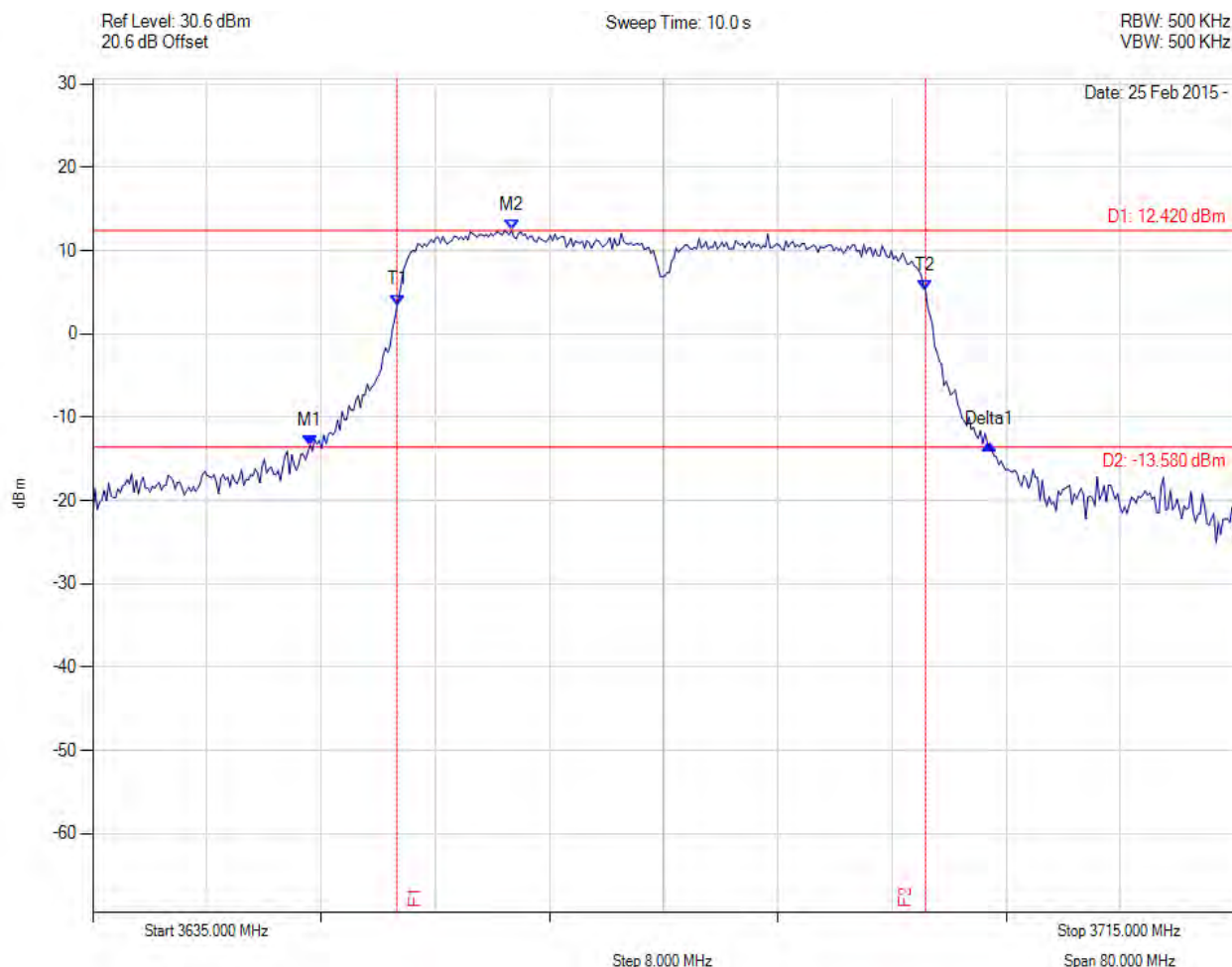


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.230 MHz : -13.341 dBm M2 : 3664.339 MHz : 12.422 dBm Delta1 : 47.615 MHz : 0.120 dB T1 : 3656.323 MHz : 3.490 dBm T2 : 3693.357 MHz : 5.180 dBm OBW : 37.034 MHz	Channel Frequency: 3675.00 MHz

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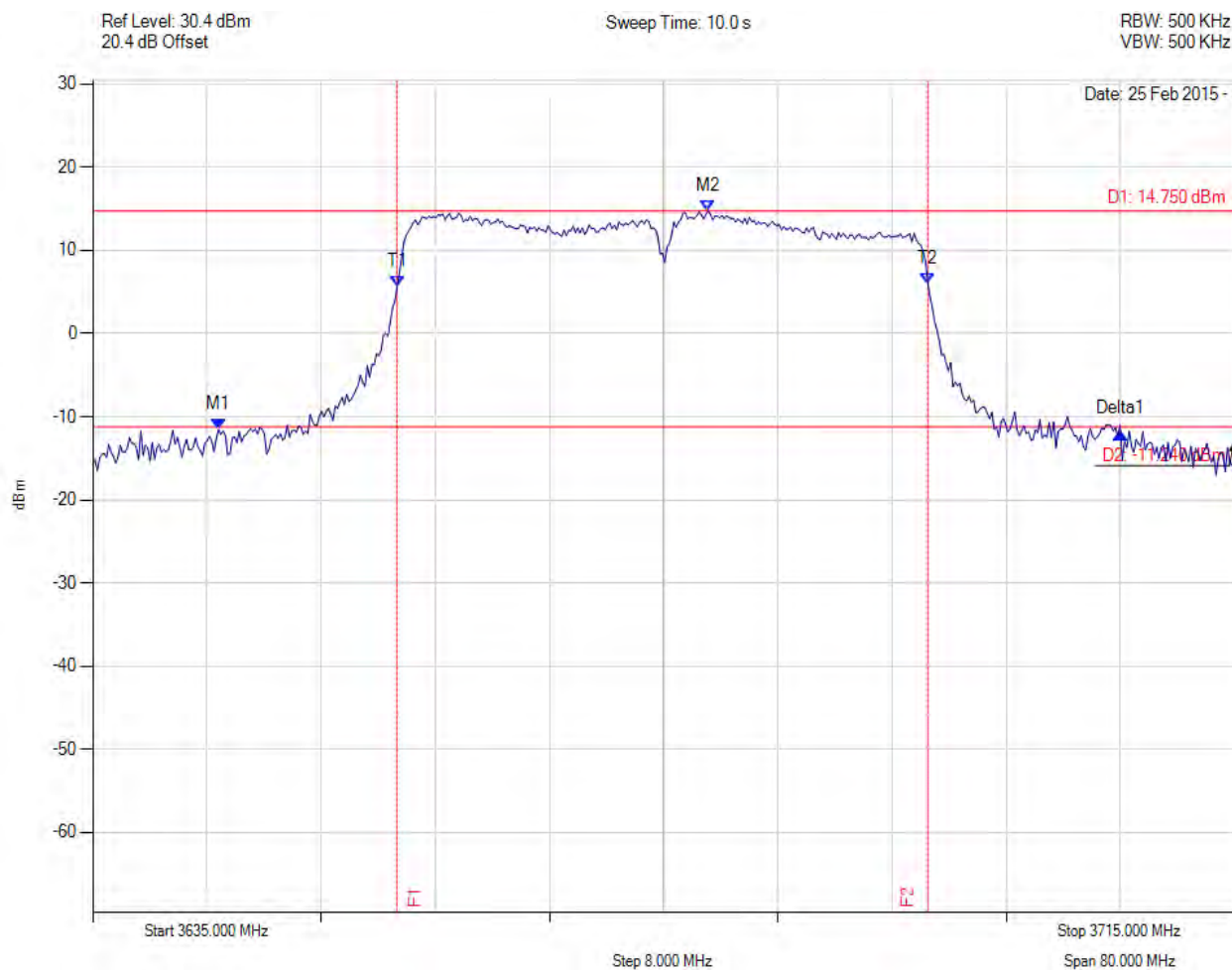


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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26 dB & 99% Occupied Bandwidth

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3643.818 MHz : -11.538 dBm M2 : 3678.126 MHz : 14.754 dBm Delta1 : 63.166 MHz : -0.513 dB T1 : 3656.323 MHz : 5.670 dBm T2 : 3693.517 MHz : 6.070 dBm OBW : 37.194 MHz	Channel Frequency: 3675.00 MHz

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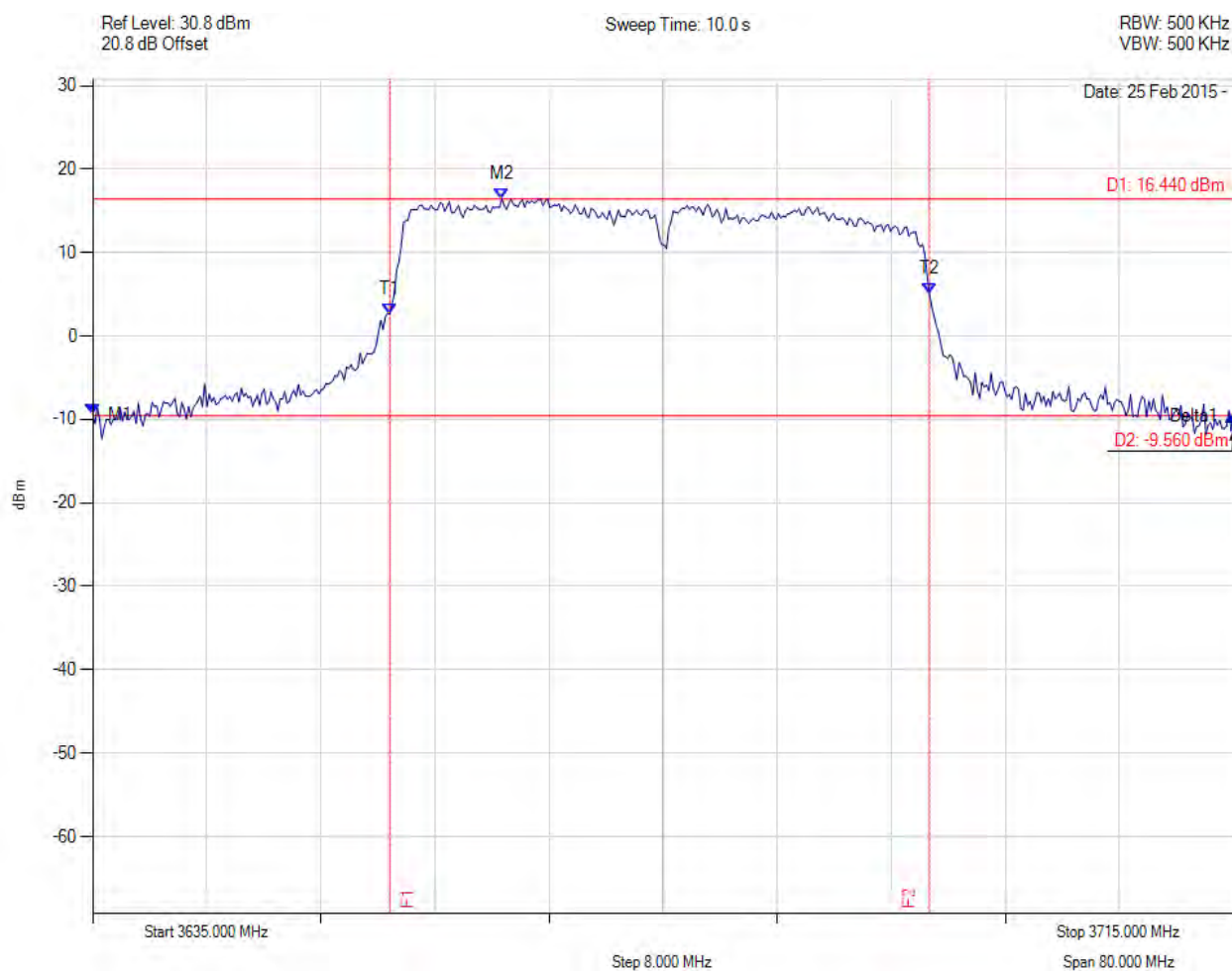


Title: RADWIN 2000 JET, RADWIN 5000 JET
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26 dB & 99% Occupied Bandwidth

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3635.000 MHz : -9.364 dBm M2 : 3663.697 MHz : 16.444 dBm Delta1 : 80.000 MHz : -0.207 dB T1 : 3655.842 MHz : 2.610 dBm T2 : 3693.677 MHz : 5.040 dBm OBW : 37.836 MHz	Channel Frequency: 3675.00 MHz

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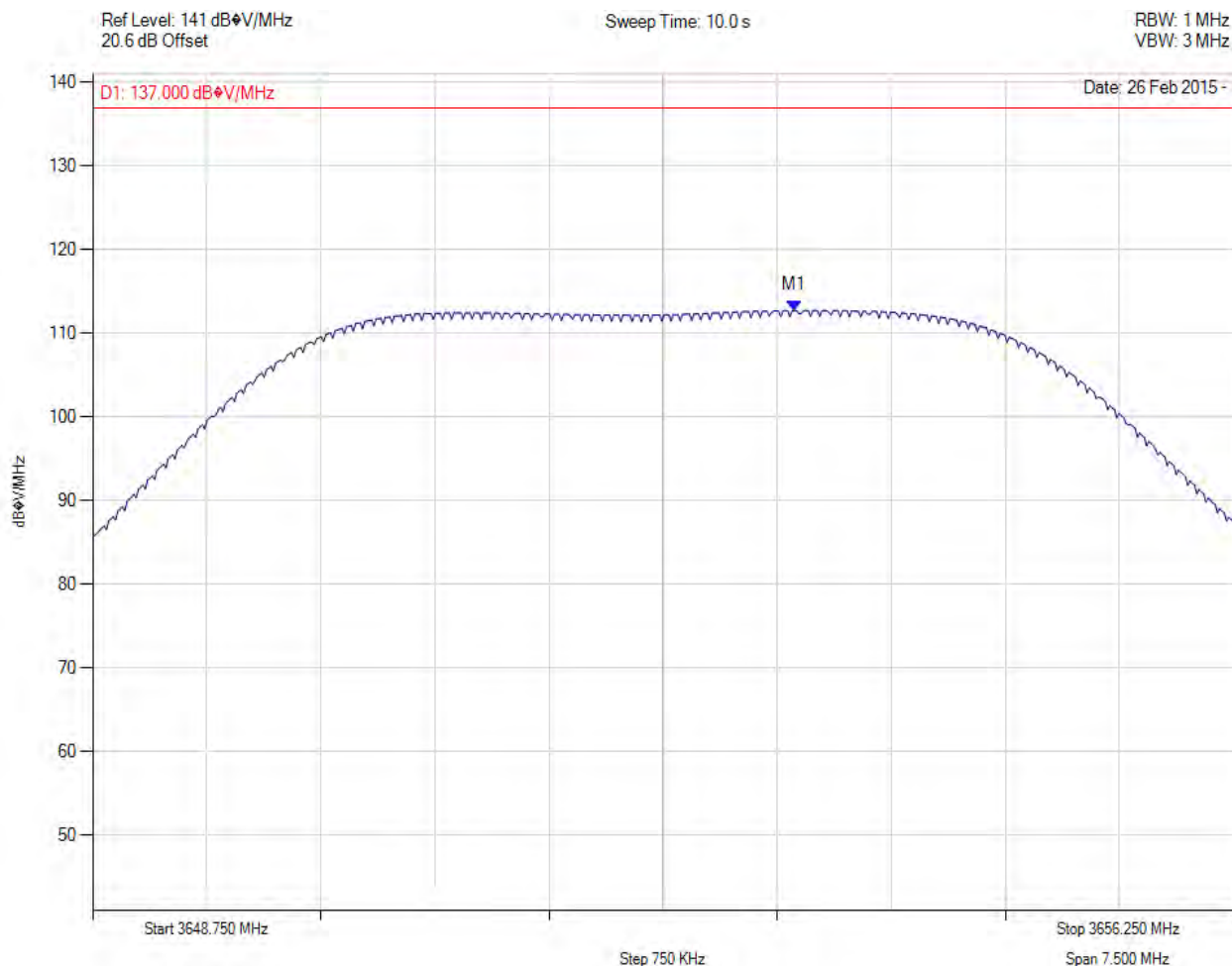
Title: RADWIN 2000 JET, RADWIN 5000 JET
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A.1.2. Power Spectral Density



Power Spectral Density

Variant: , Channel: 3652.50 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3653.364 MHz : 112.758 dBuV/MHz	Channel Frequency: 3652.50 MHz

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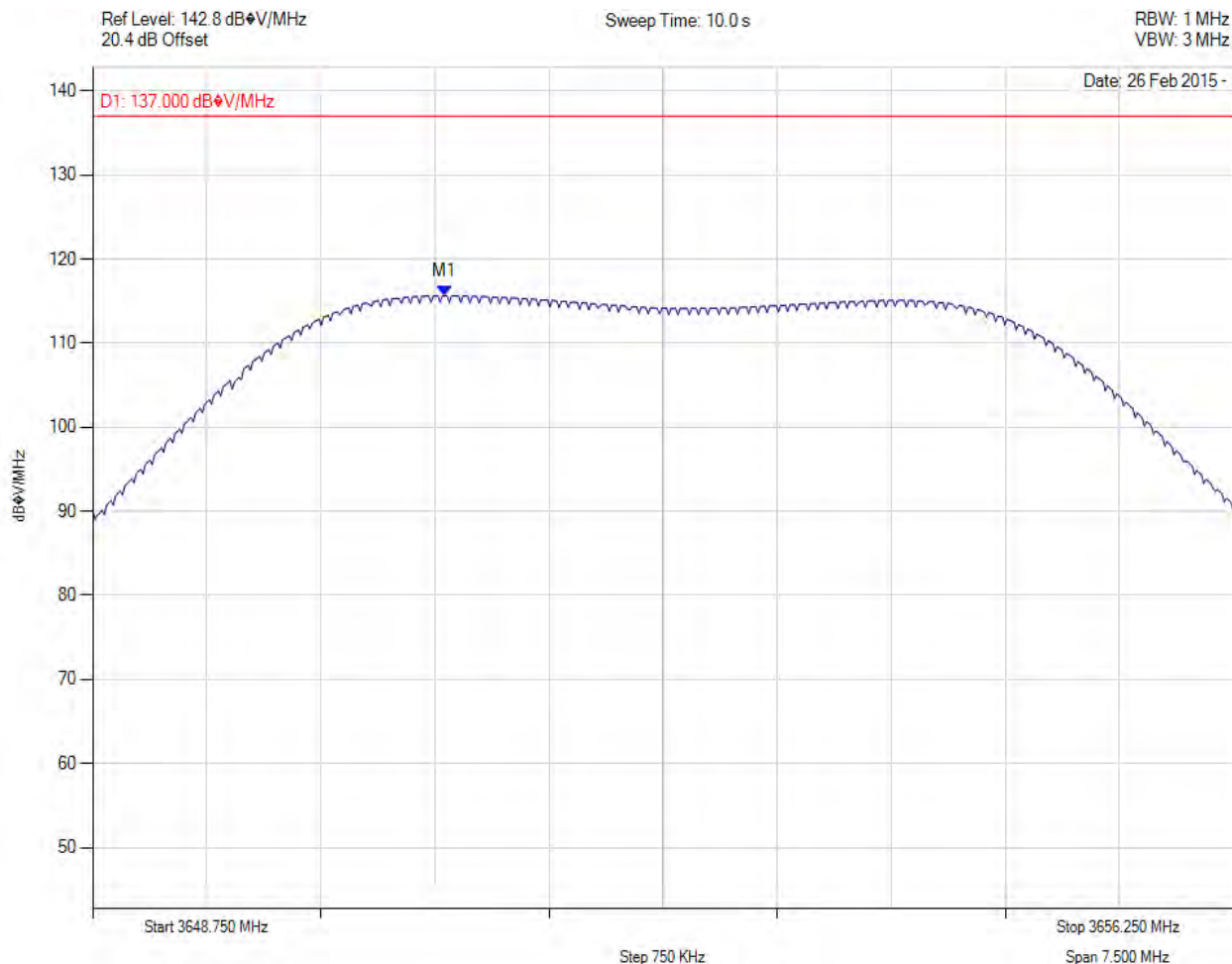


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Power Spectral Density

Variant: , Channel: 3652.50 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3651.065 MHz : 115.621 dBuV/MHz	Channel Frequency: 3652.50 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

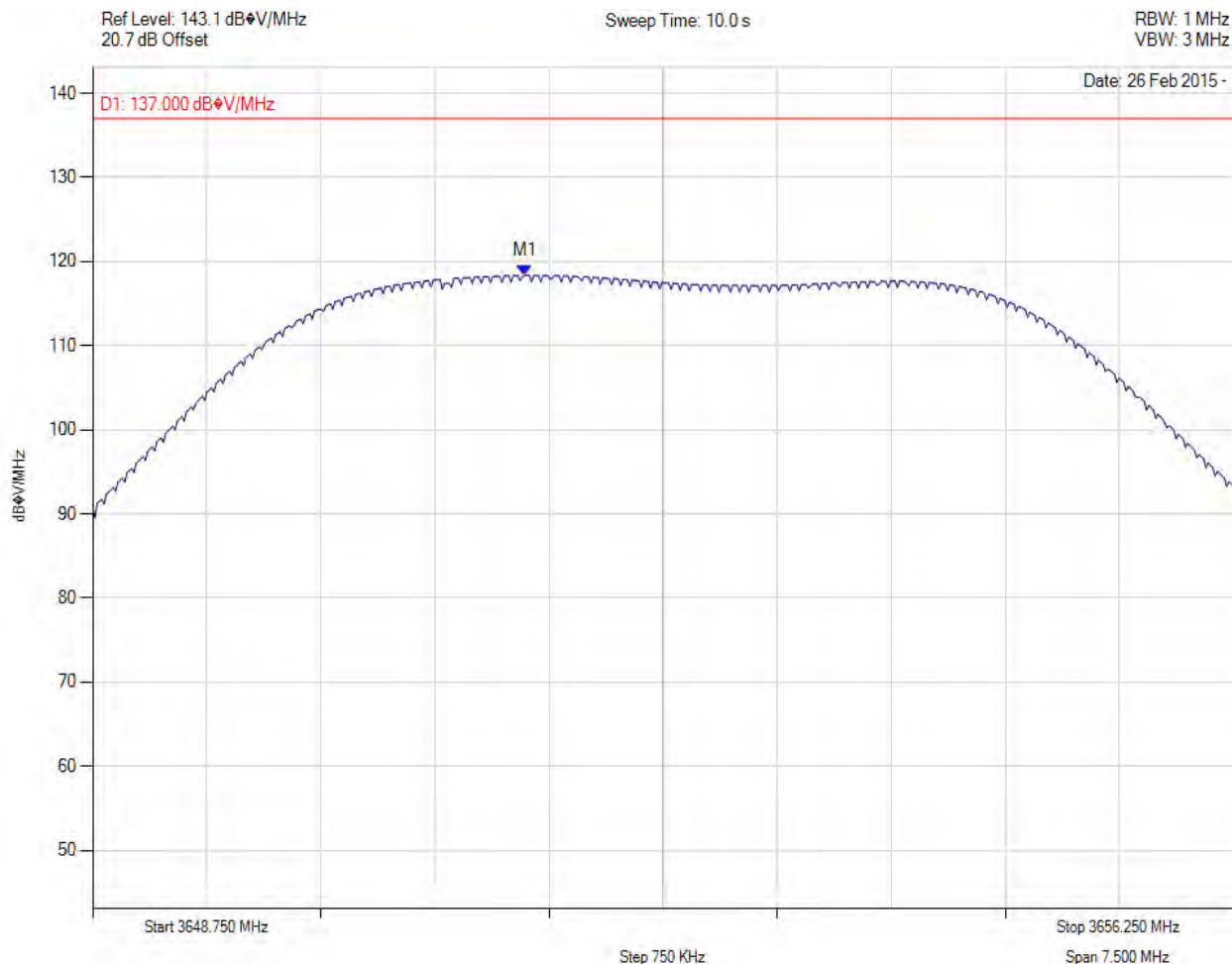


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Power Spectral Density

Variant: , Channel: 3652.50 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3651.591 MHz : 118.346 dBuV/MHz	Channel Frequency: 3652.50 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

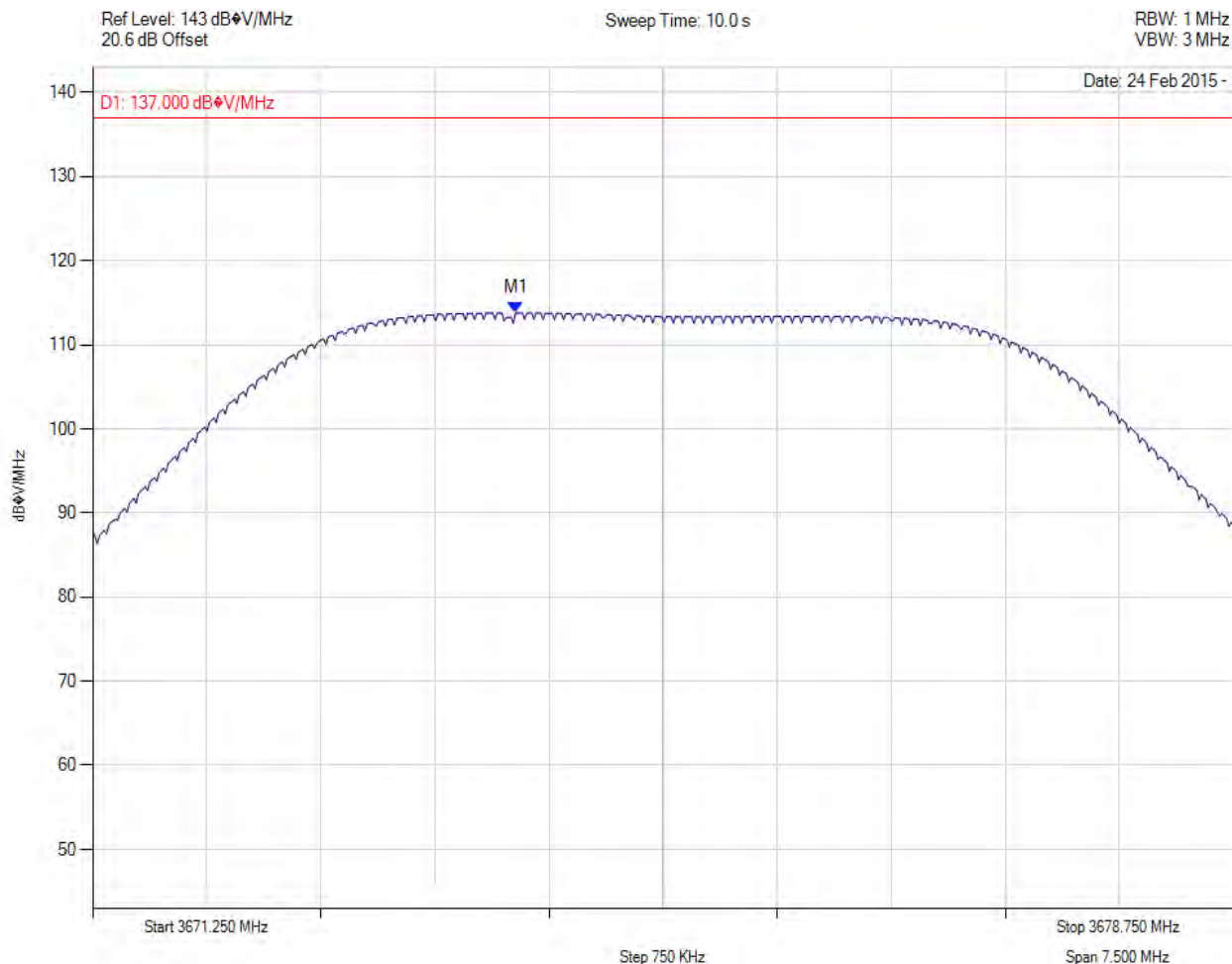


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3674.031 MHz : 113.796 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

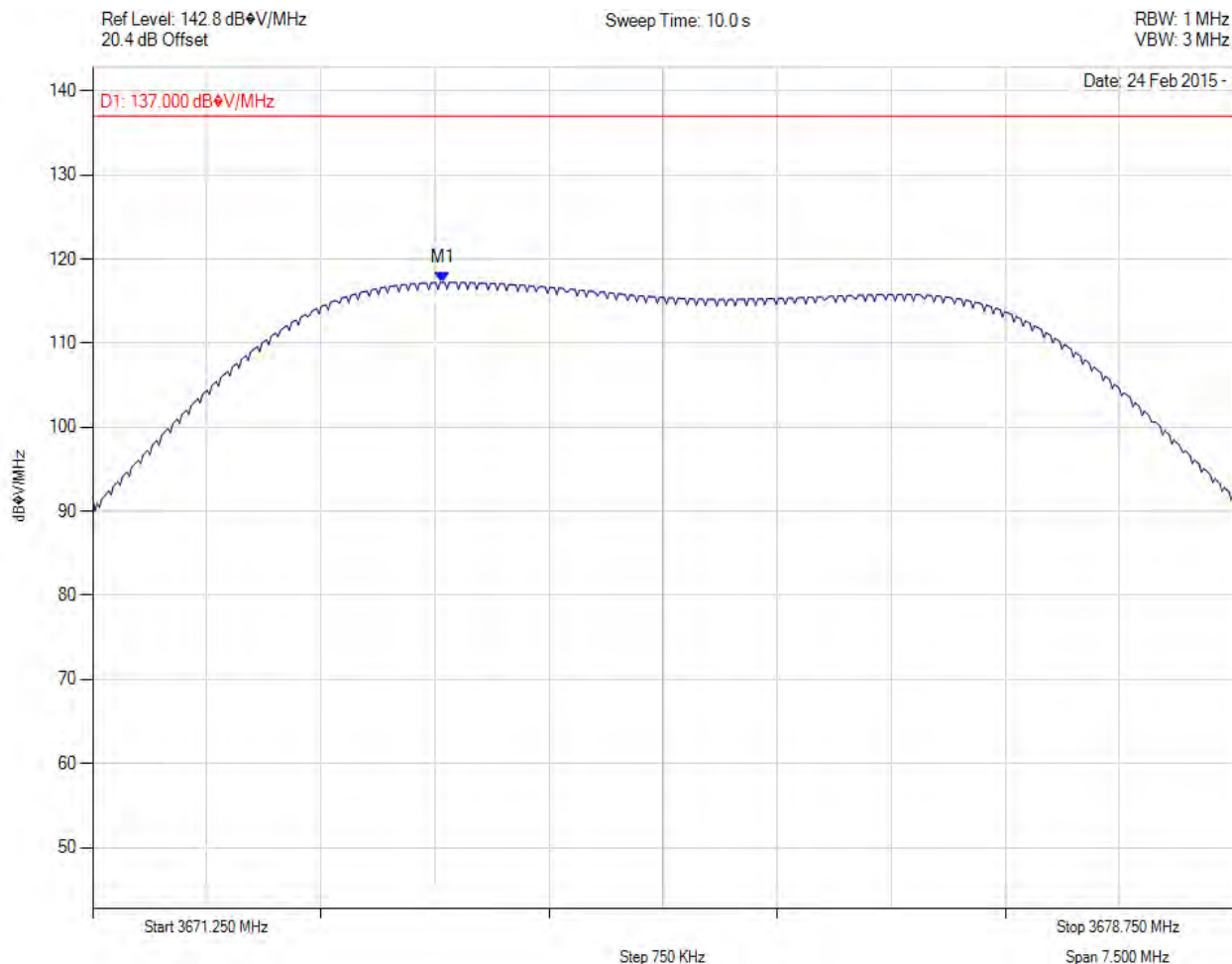


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3673.550 MHz : 117.223 dBuV/MHz	Channel Frequency: 3675.00 MHz

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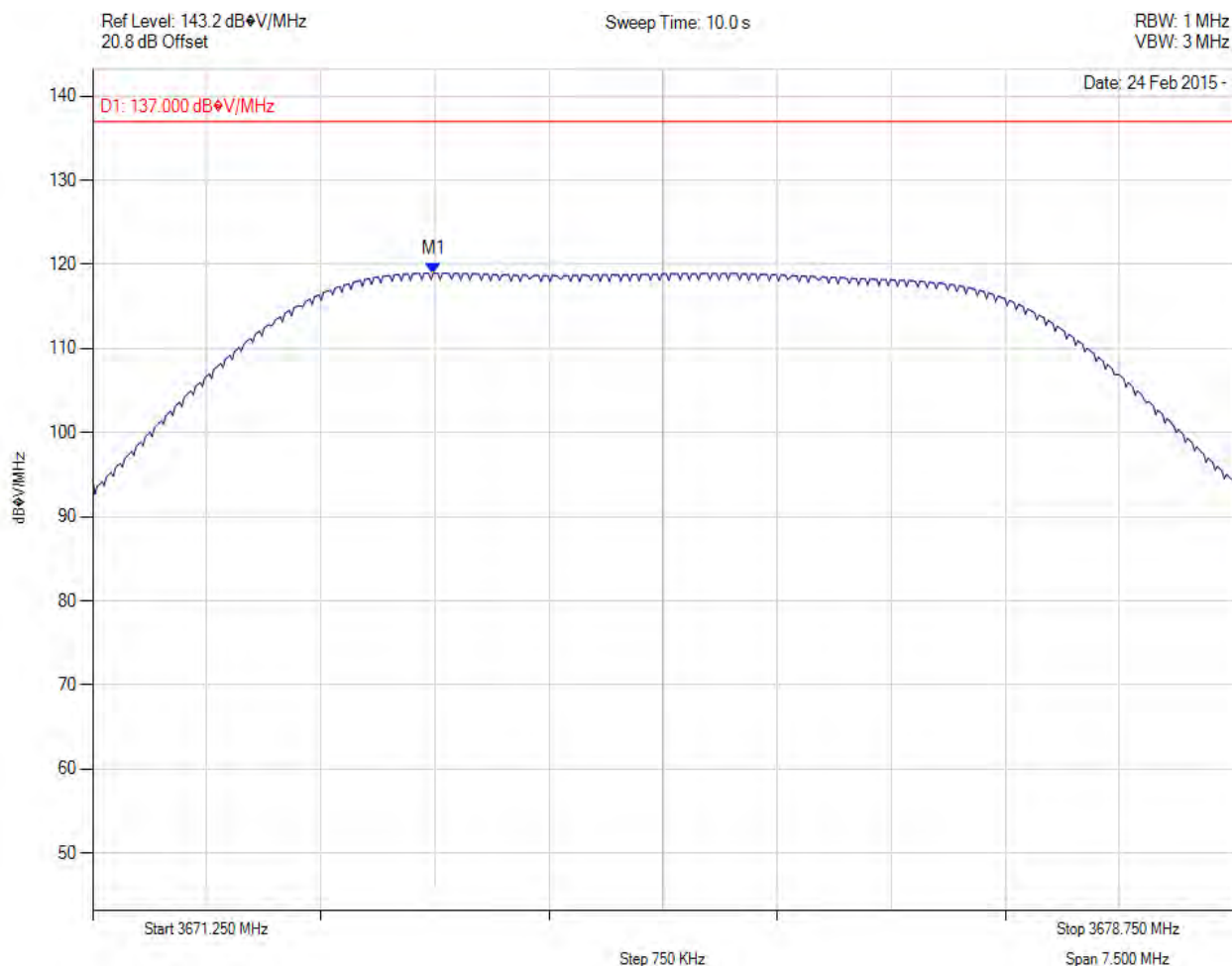


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3673.489 MHz : 118.956 dBμV/MHz	Channel Frequency: 3675.00 MHz

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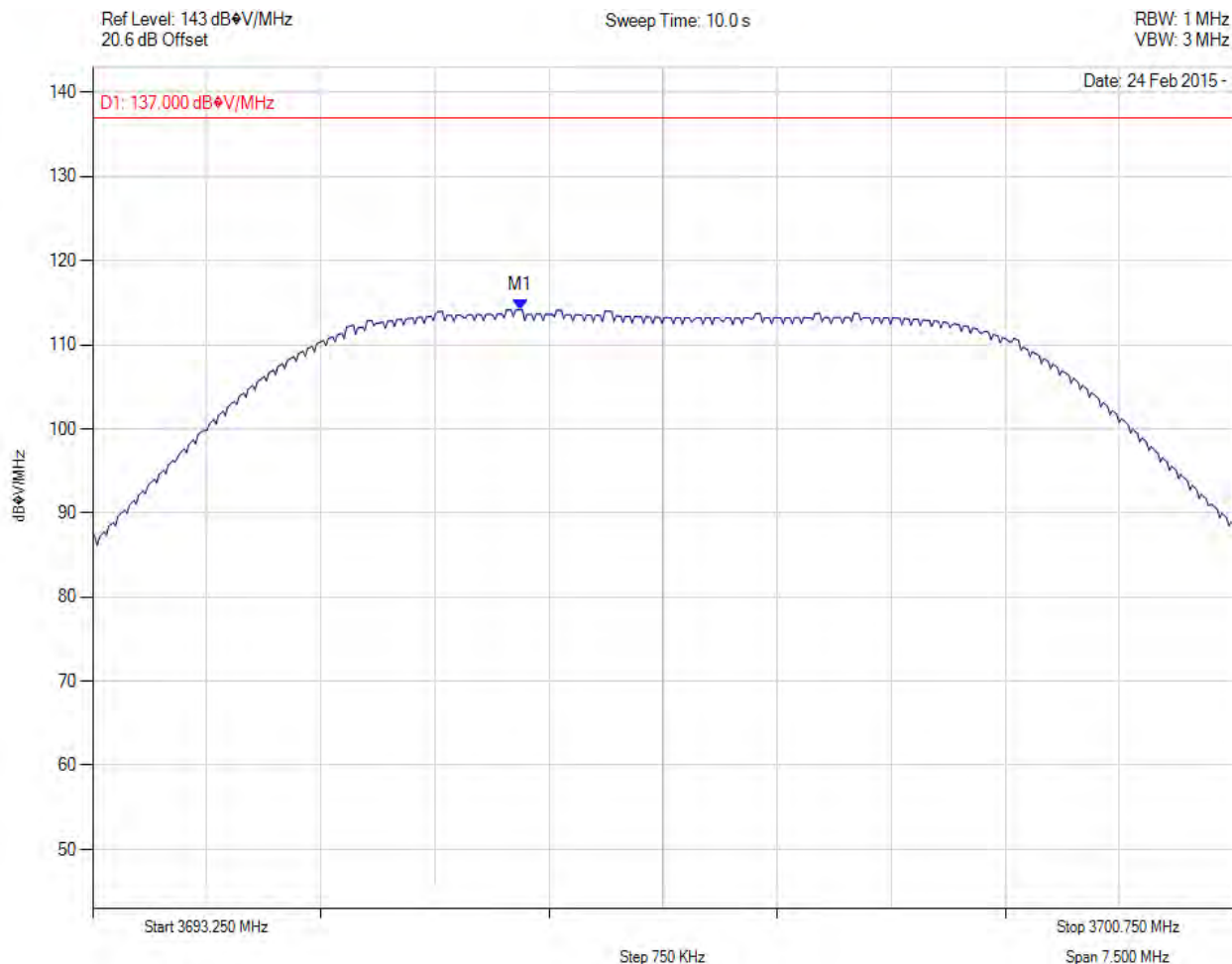


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Power Spectral Density

Variant: BPSK, Channel: 3697.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3696.061 MHz : 114.160 dB μ V/MHz	Channel Frequency: 3697.00 MHz

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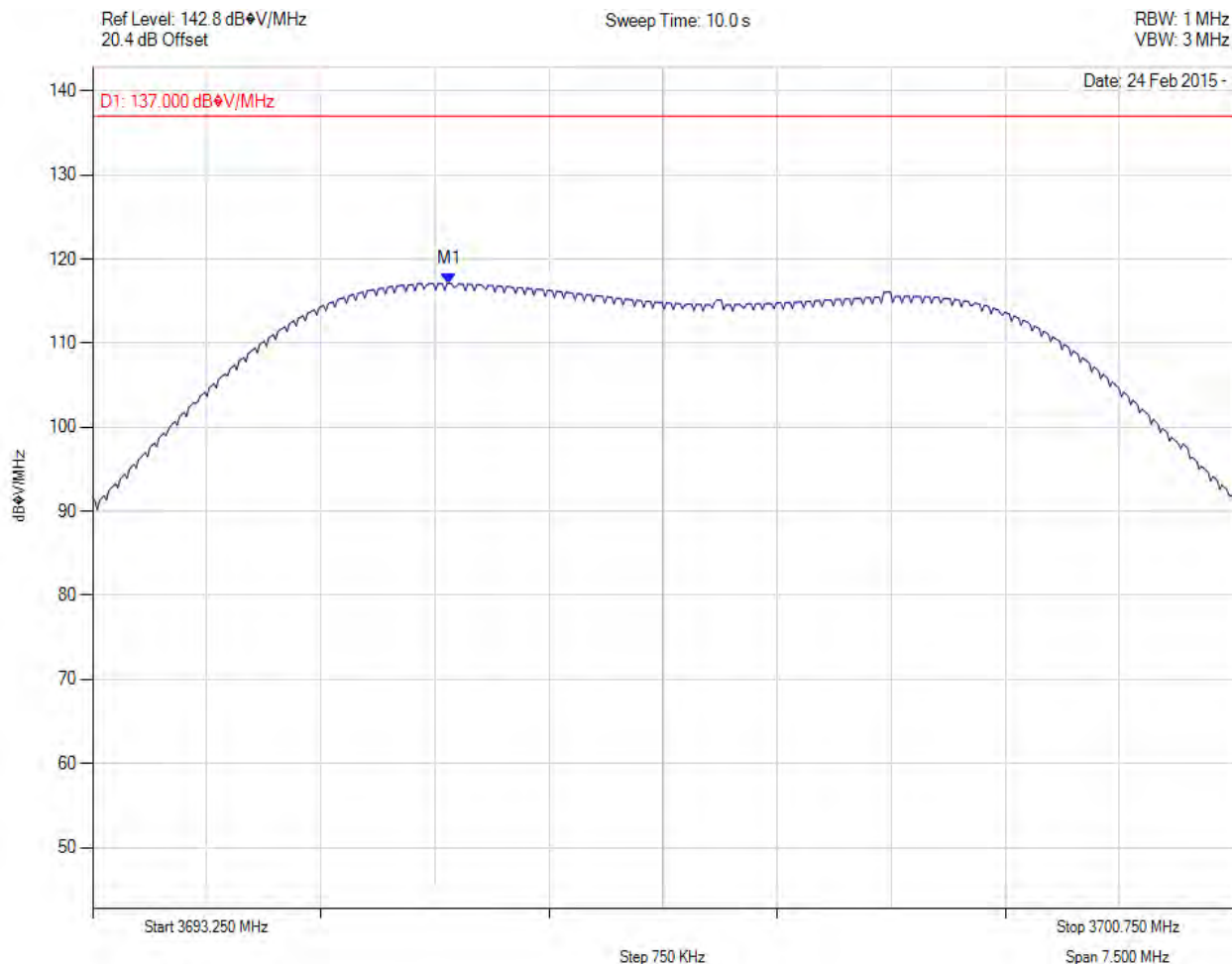


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Power Spectral Density

Variant: BPSK, Channel: 3697.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3695.595 MHz : 117.090 dB μ V/MHz	Channel Frequency: 3697.00 MHz

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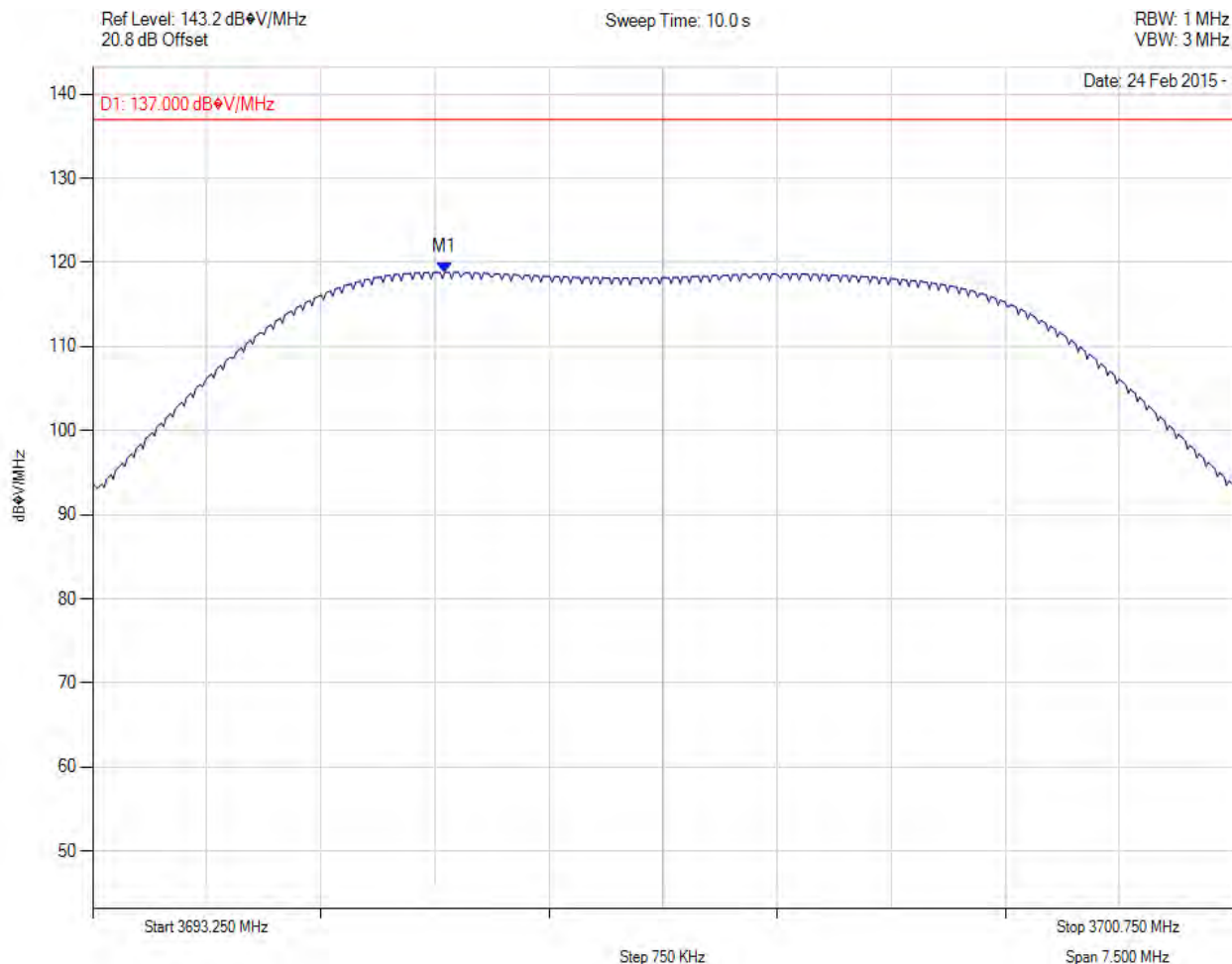


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Power Spectral Density

Variant: BPSK, Channel: 3697.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3695.565 MHz : 118.833 dBuV/MHz	Channel Frequency: 3697.00 MHz

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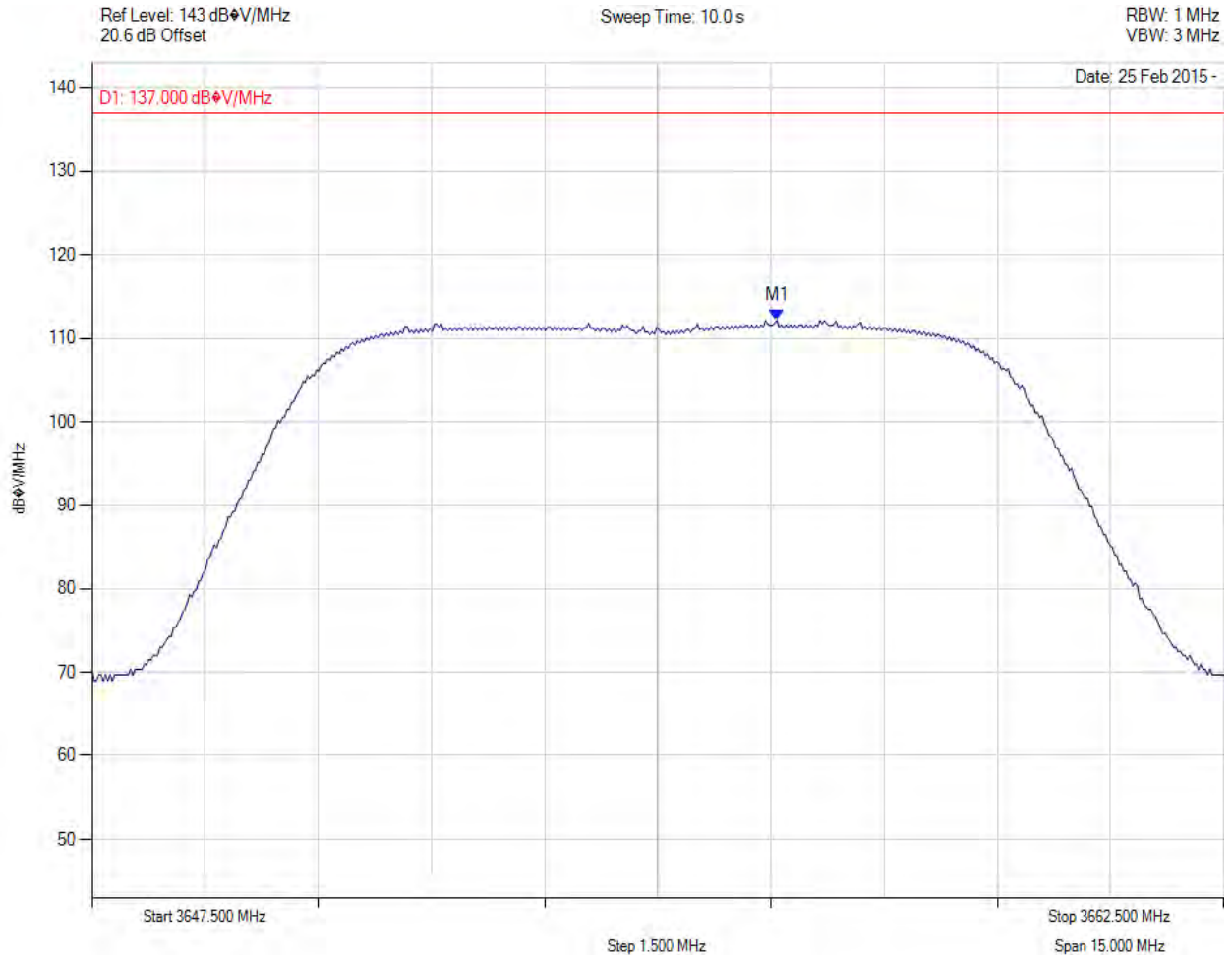


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Power Spectral Density

Variant: BPSK, Channel: 3655.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3656.578 MHz : 112.155 dBuV/MHz	Channel Frequency: 3655.00 MHz

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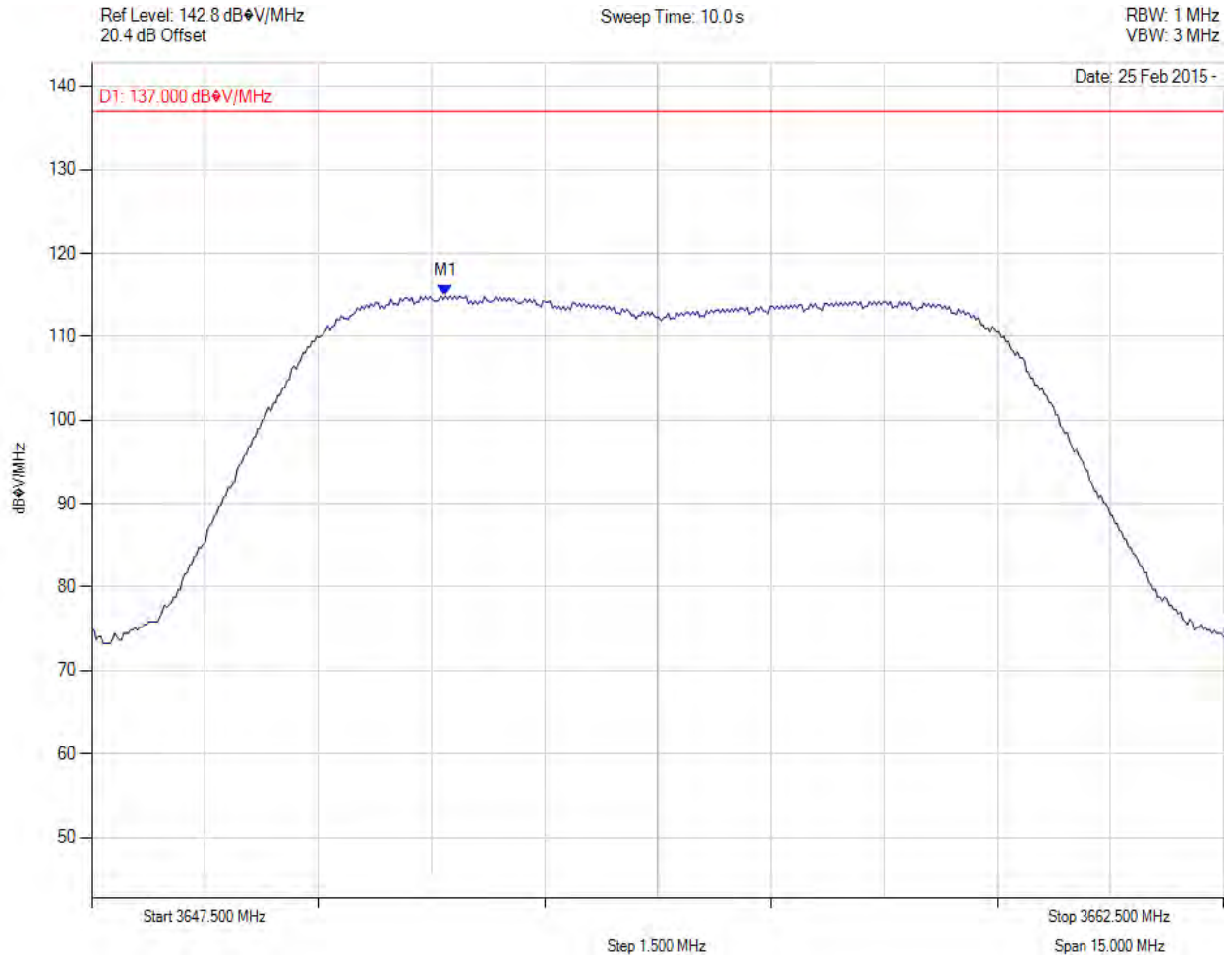


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Power Spectral Density

Variant: BPSK, Channel: 3655.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3652.189 MHz : 114.875 dB μ V/MHz	Channel Frequency: 3655.00 MHz

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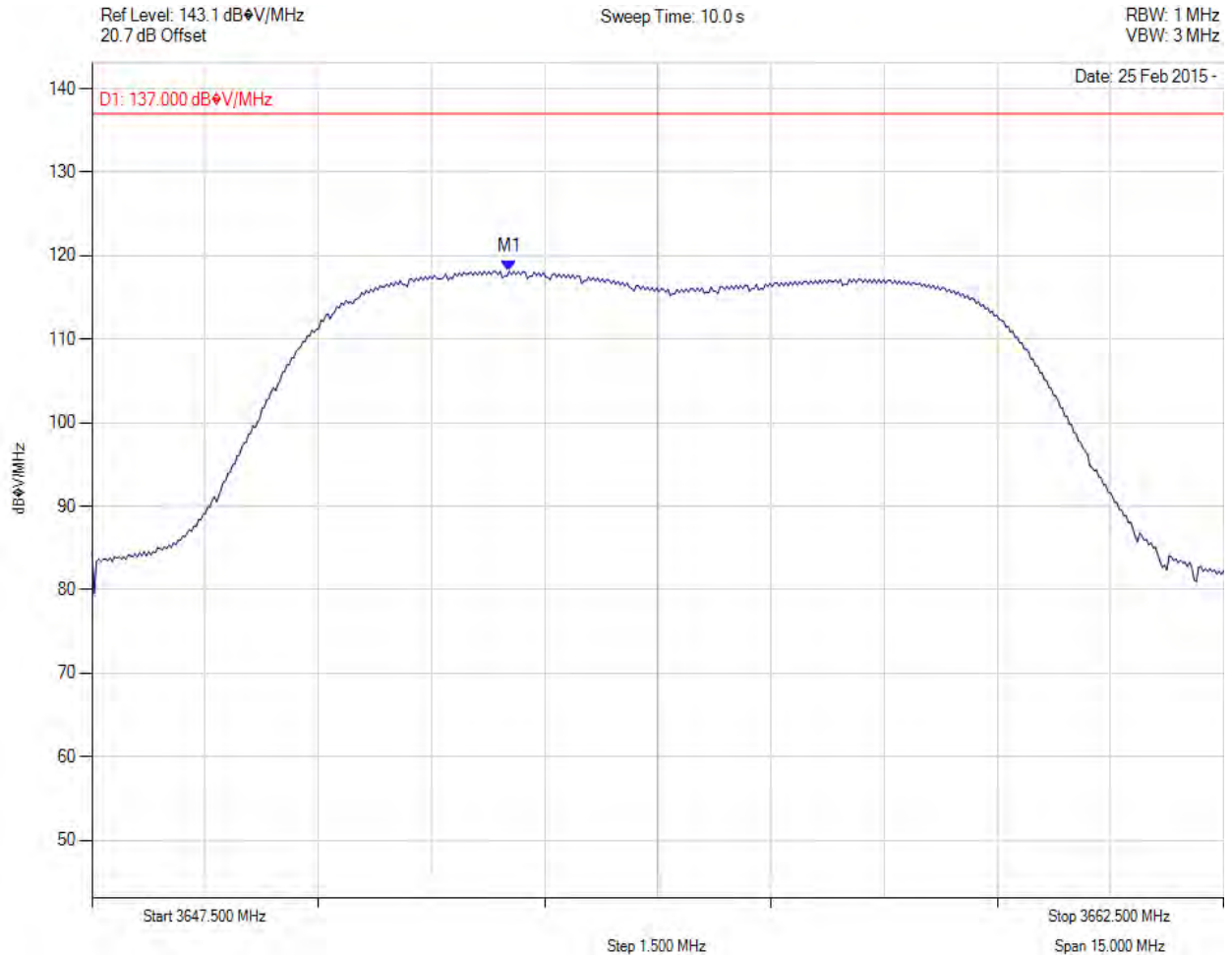


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Power Spectral Density

Variant: BPSK, Channel: 3655.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3653.031 MHz : 118.116 dBuV/MHz	Channel Frequency: 3655.00 MHz

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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3676.127 MHz : 111.987 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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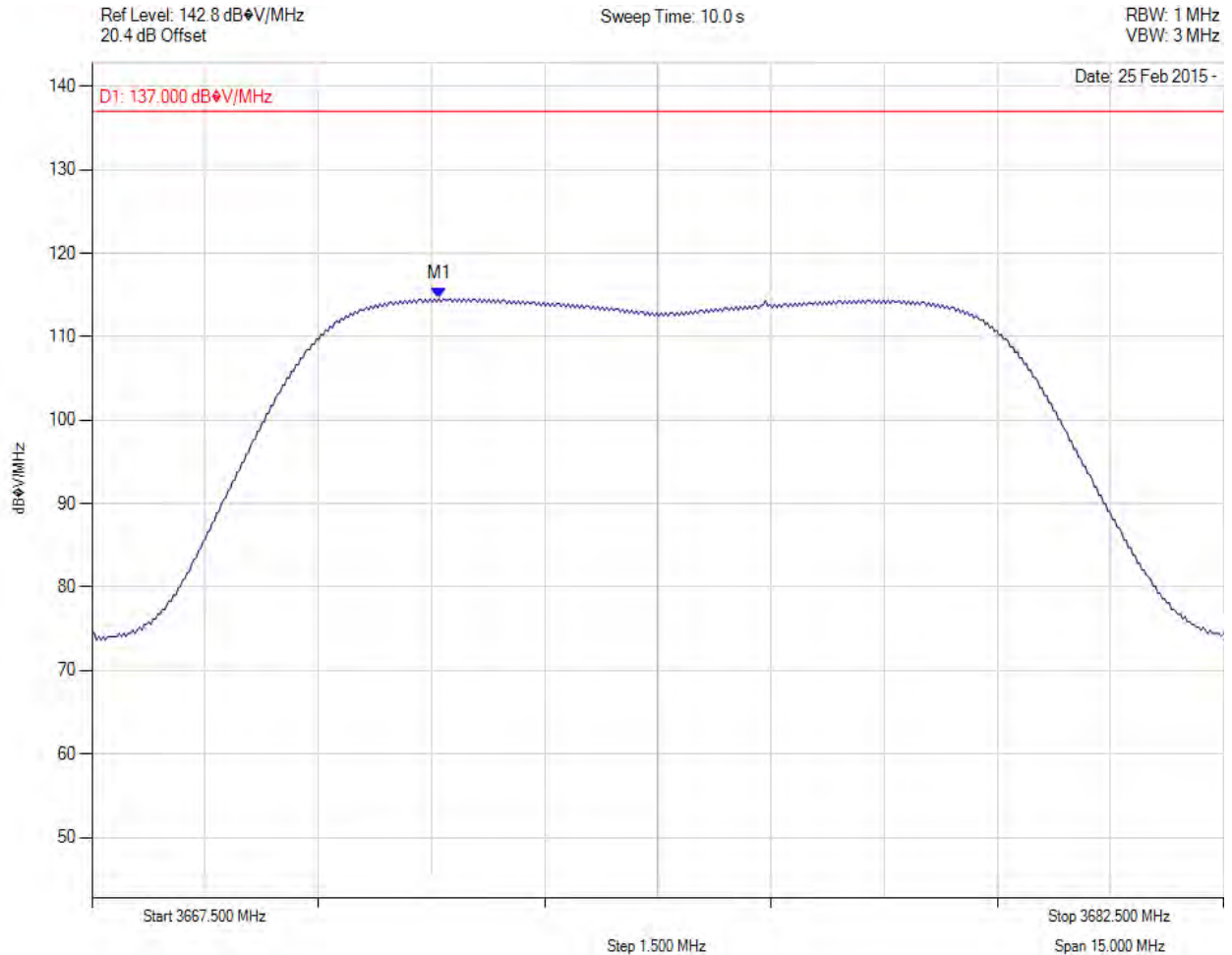


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3672.099 MHz : 114.544 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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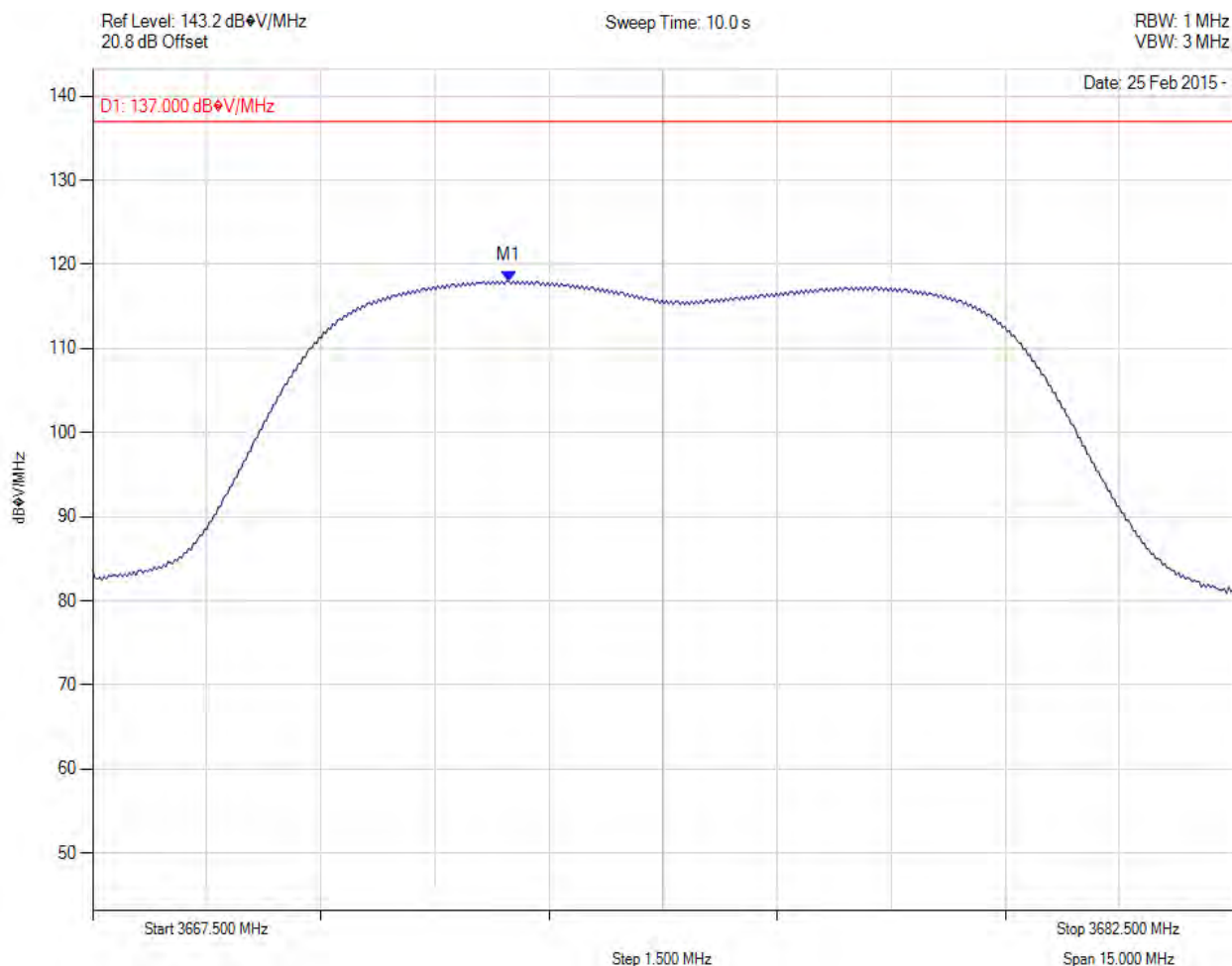


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3672.971 MHz : 118.013 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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Power Spectral Density

Variant: BPSK, Channel: 3695.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3692.971 MHz : 112.175 dB μ V/MHz	Channel Frequency: 3695.00 MHz

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Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3692.129 MHz : 114.879 dBμV/MHz	Channel Frequency: 3695.00 MHz

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Power Spectral Density

Variant: BPSK, Channel: 3695.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3692.941 MHz : 117.784 dB μ V/MHz	Channel Frequency: 3695.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

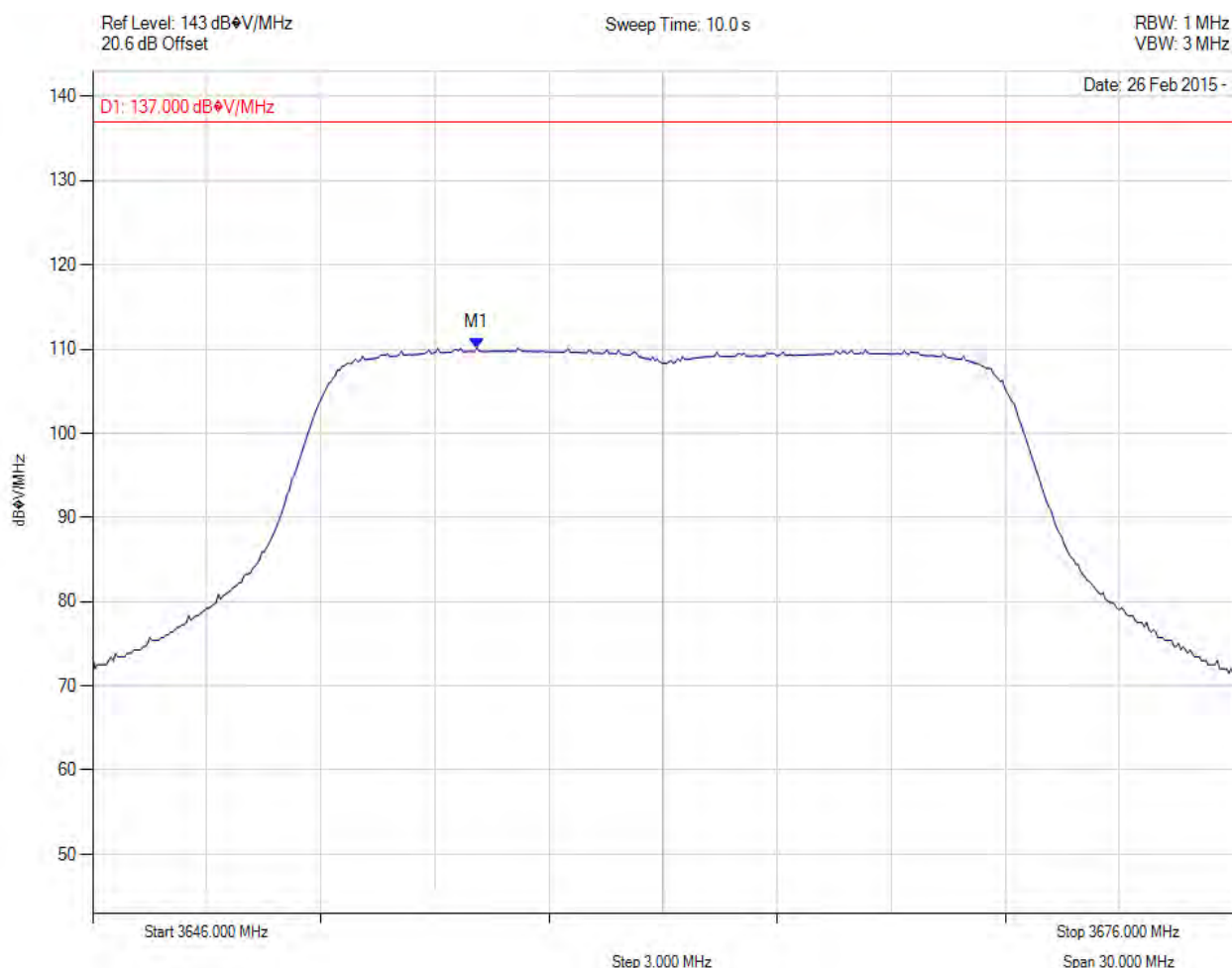


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Power Spectral Density

Variant: , Channel: 3661.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3656.100 MHz : 110.150 dBuV/MHz	Channel Frequency: 3661.00 MHz

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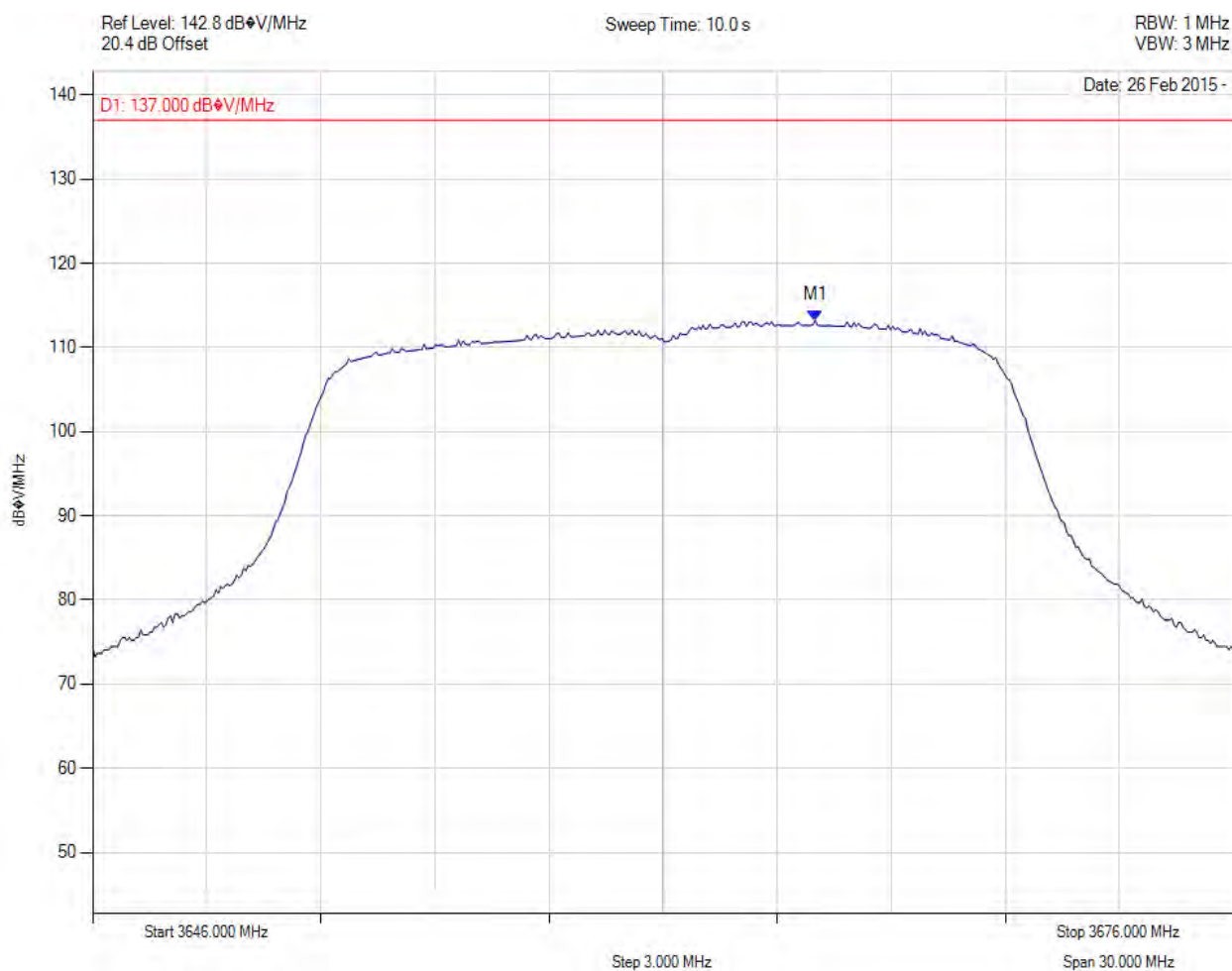


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Power Spectral Density

Variant: , Channel: 3661.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3664.998 MHz : 113.212 dBuV/MHz	Channel Frequency: 3661.00 MHz

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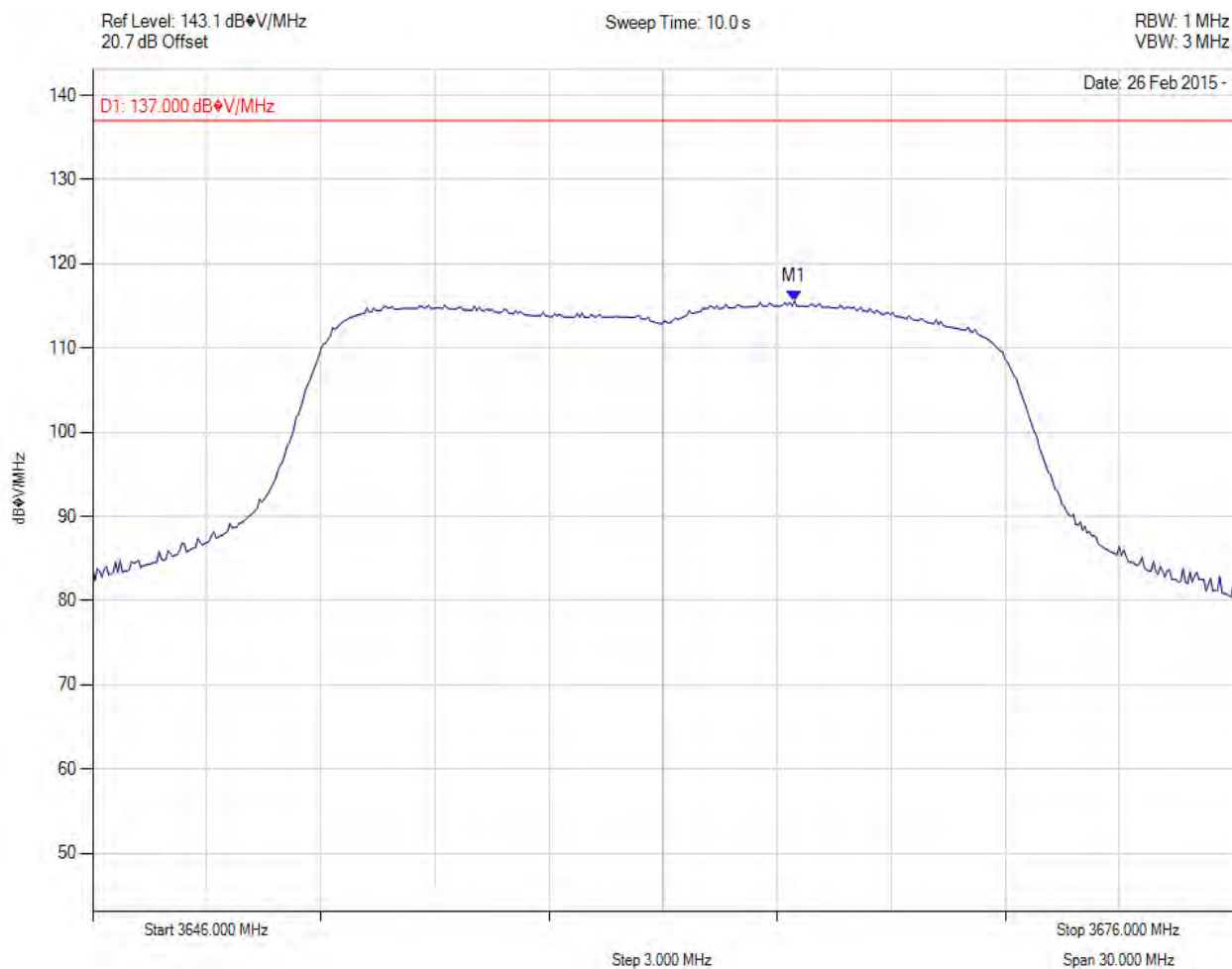


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Power Spectral Density

Variant: , Channel: 3661.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3664.457 MHz : 115.545 dB μ V/MHz	Channel Frequency: 3661.00 MHz

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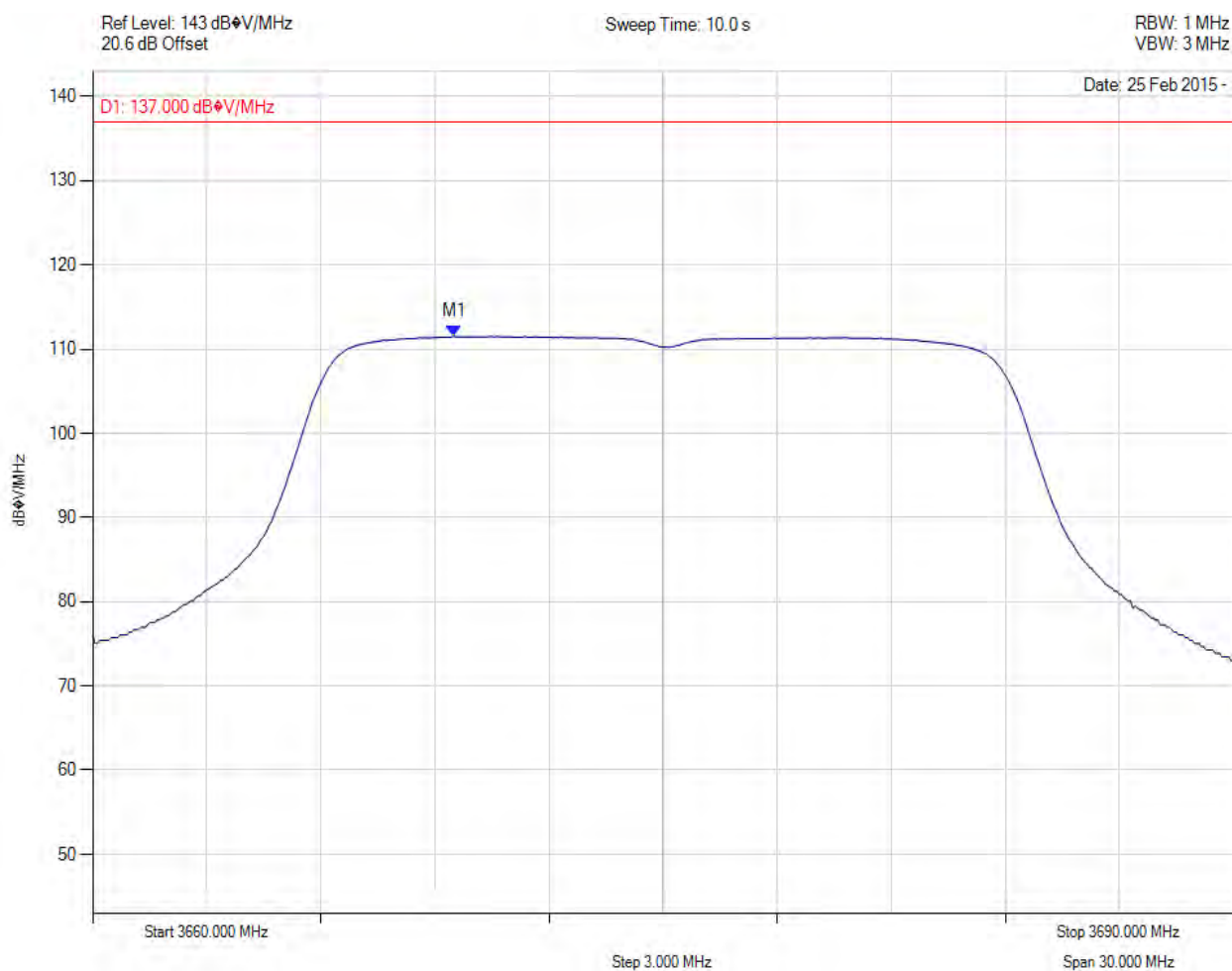


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3669.499 MHz : 111.544 dBuV/MHz	Channel Frequency: 3675.00 MHz

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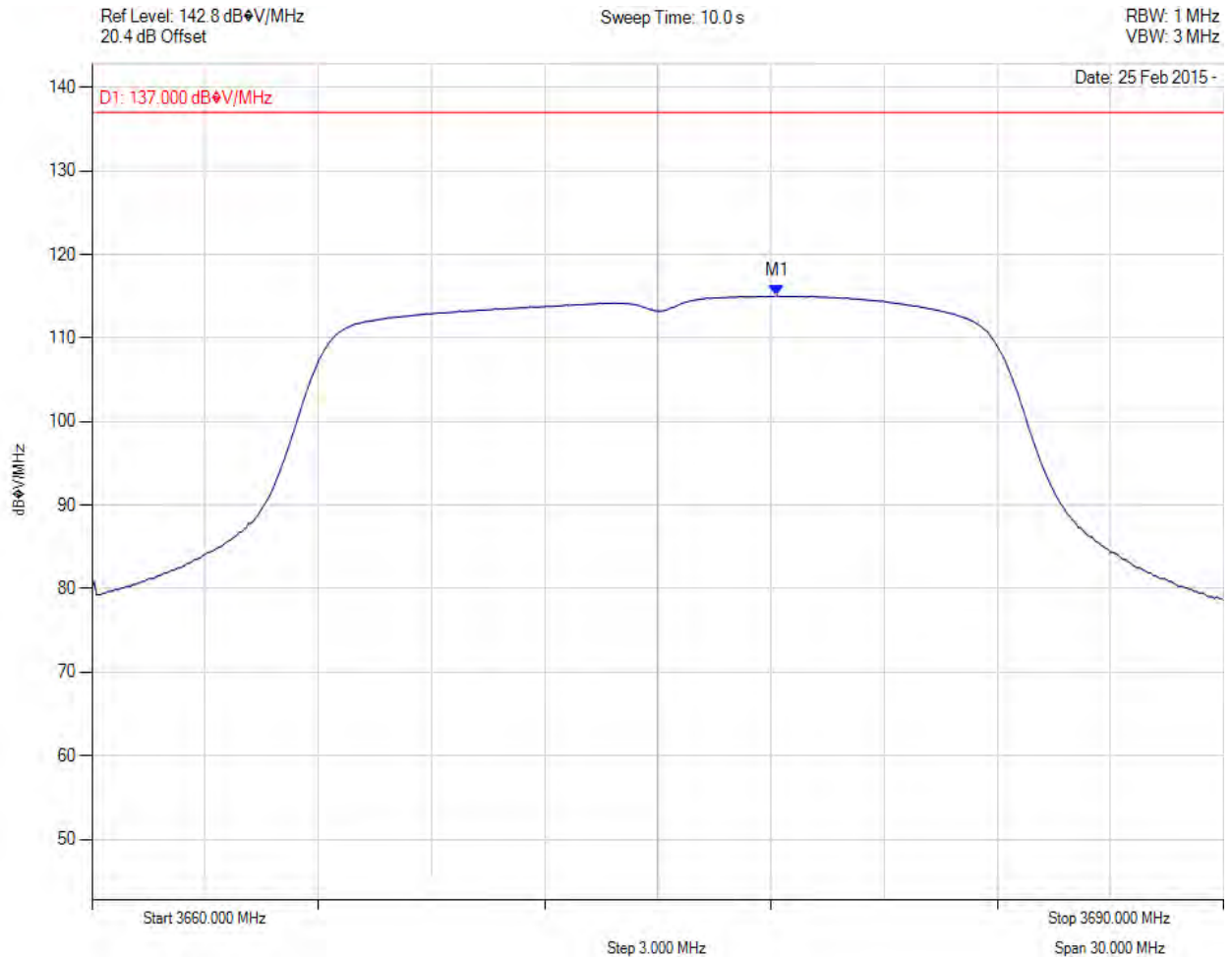


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3678.156 MHz : 115.064 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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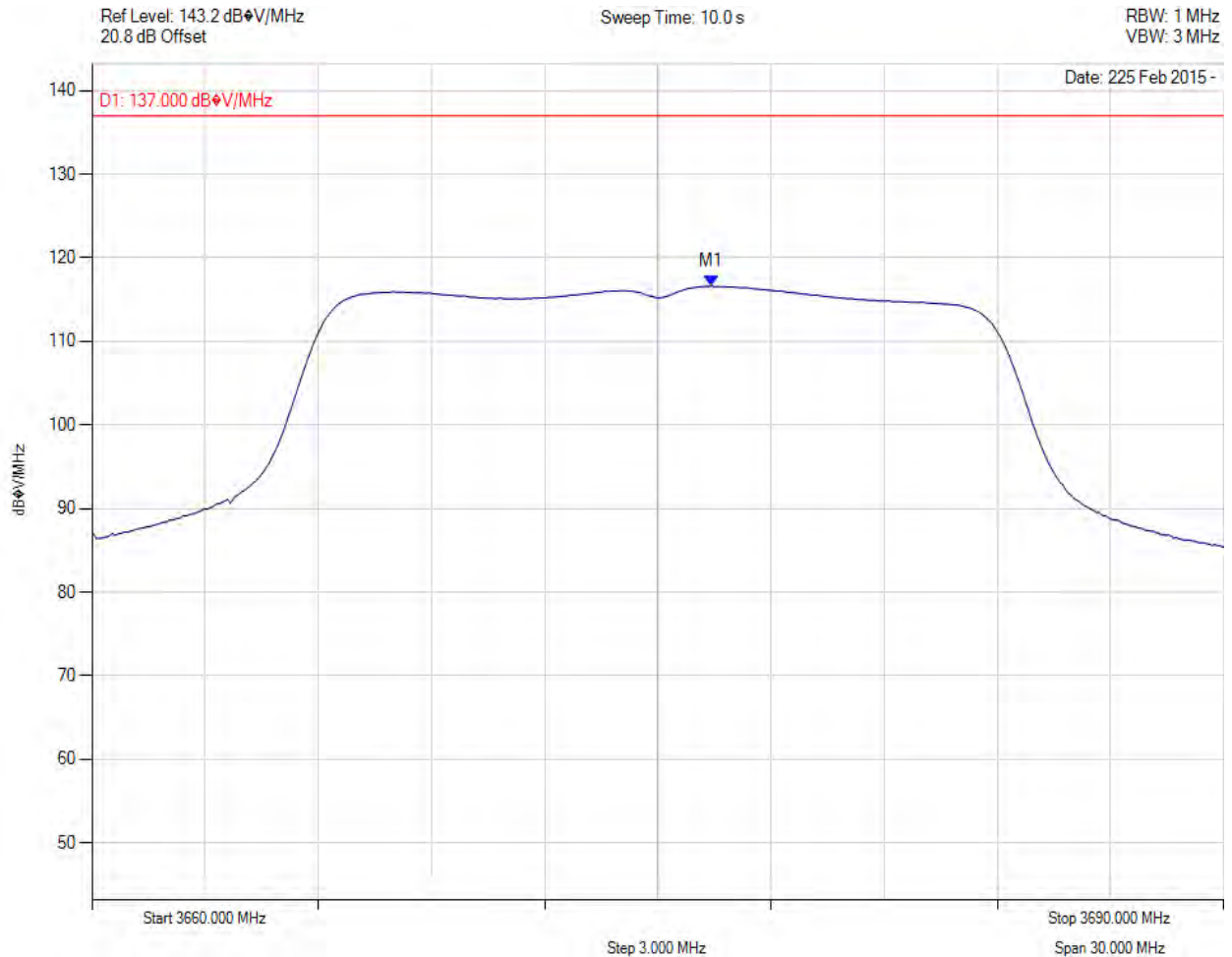


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3676.413 MHz : 116.664 dBuV/MHz	Channel Frequency: 3675.00 MHz

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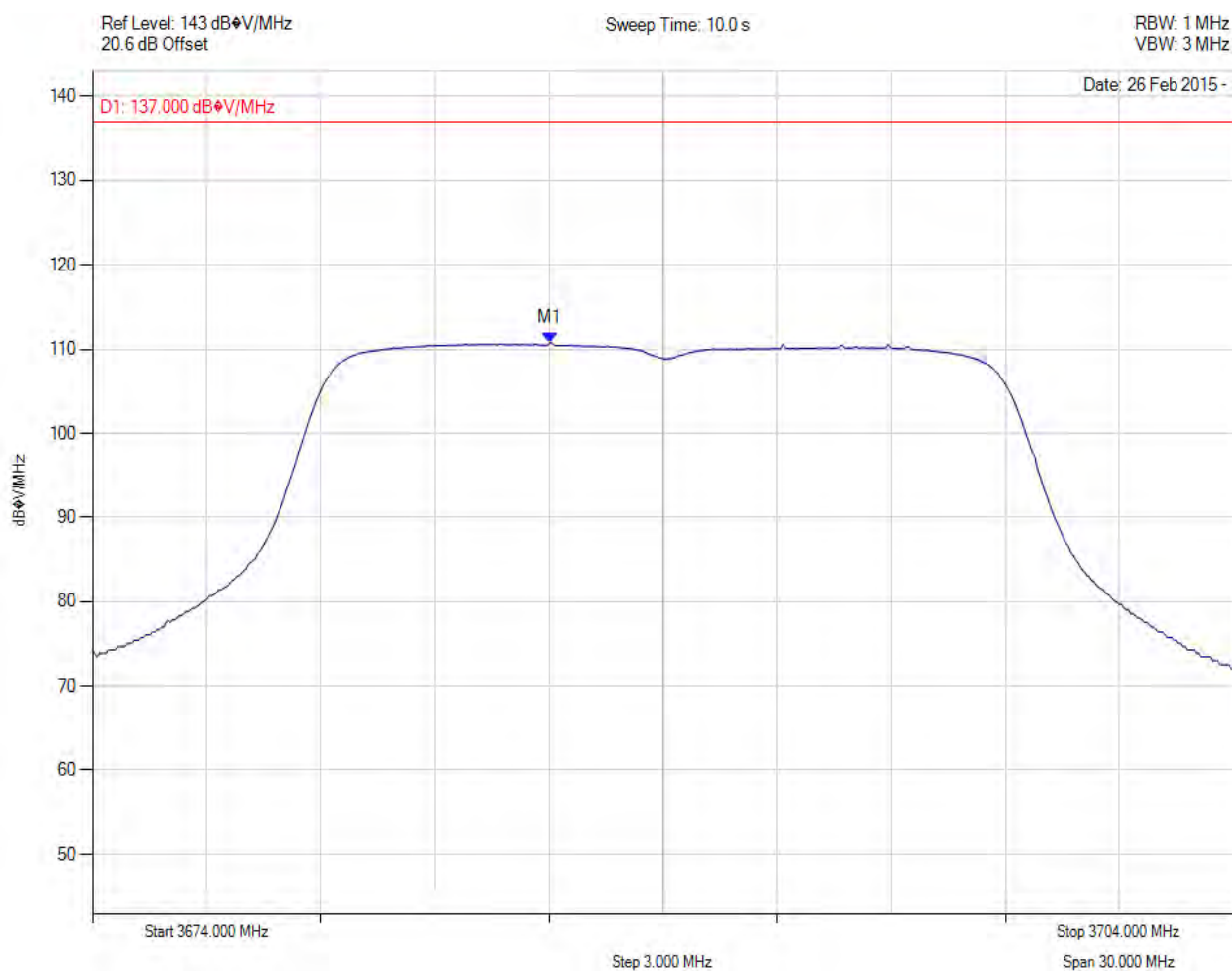


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Power Spectral Density

Variant: , Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3686.024 MHz : 110.787 dBuV/MHz	Channel Frequency: 3675.00 MHz

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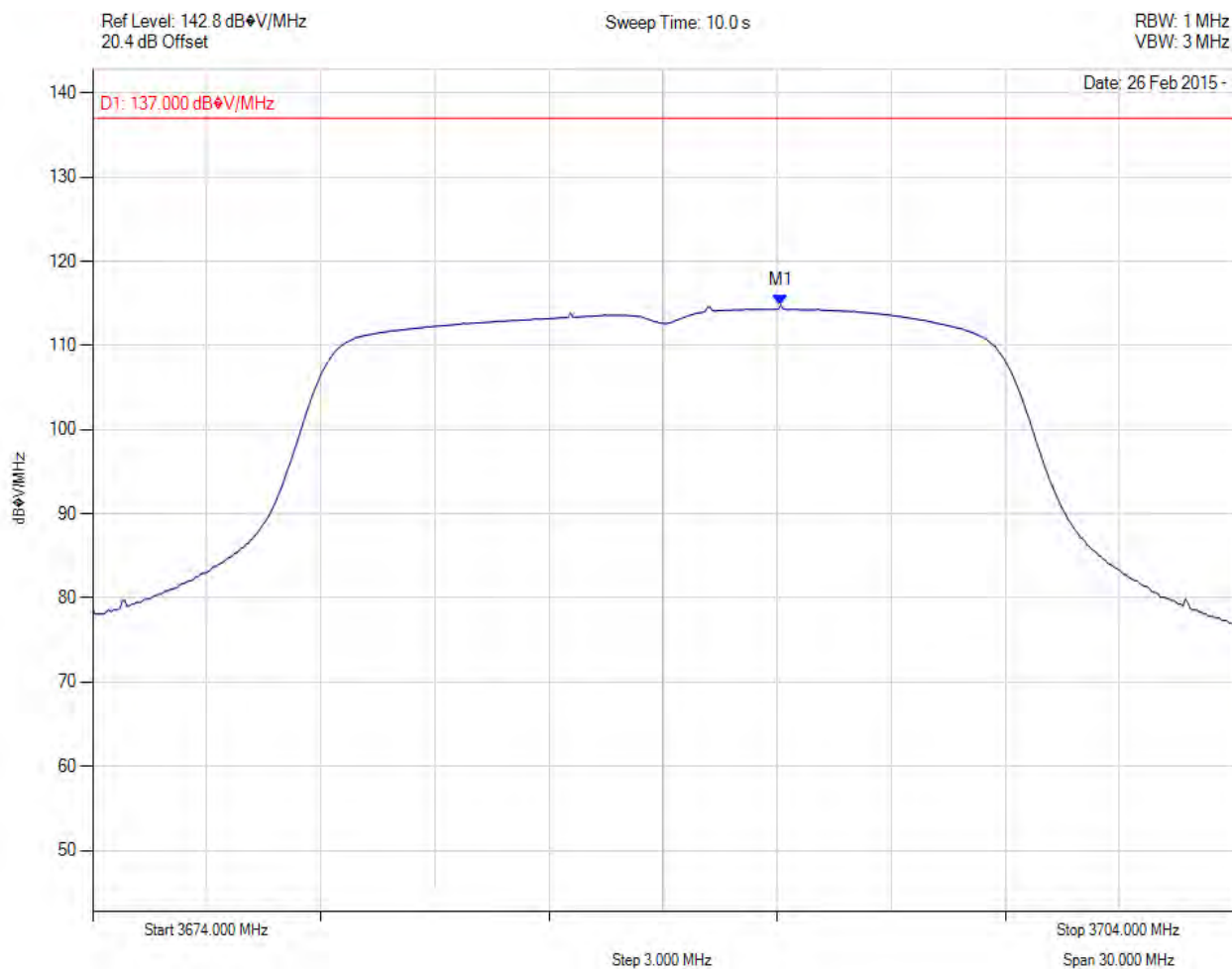


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Power Spectral Density

Variant: , Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3692.096 MHz : 114.784 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

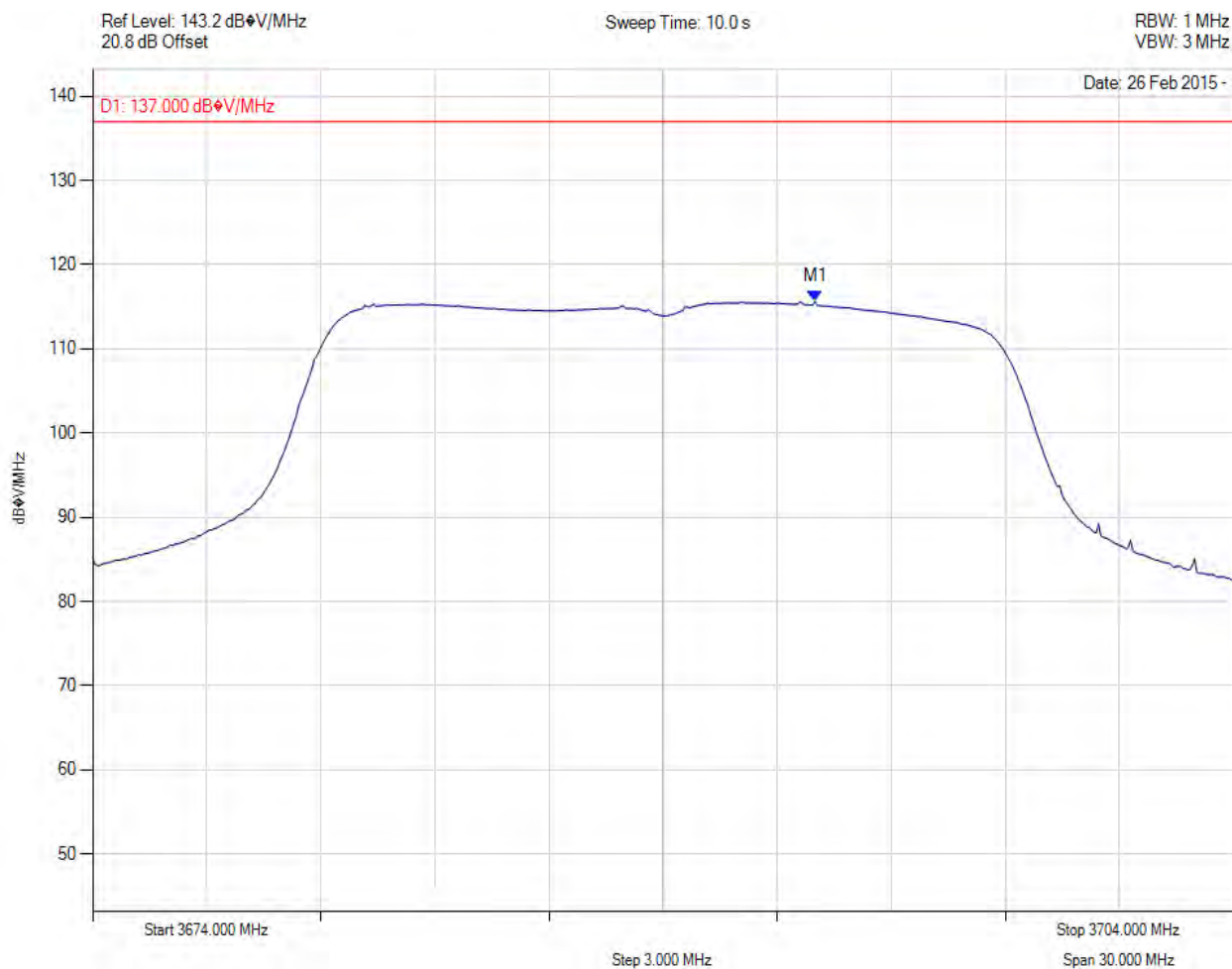


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Power Spectral Density

Variant: , Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3692.998 MHz : 115.621 dBuV/MHz	Channel Frequency: 3675.00 MHz

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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 30 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3662.796 MHz : 111.843 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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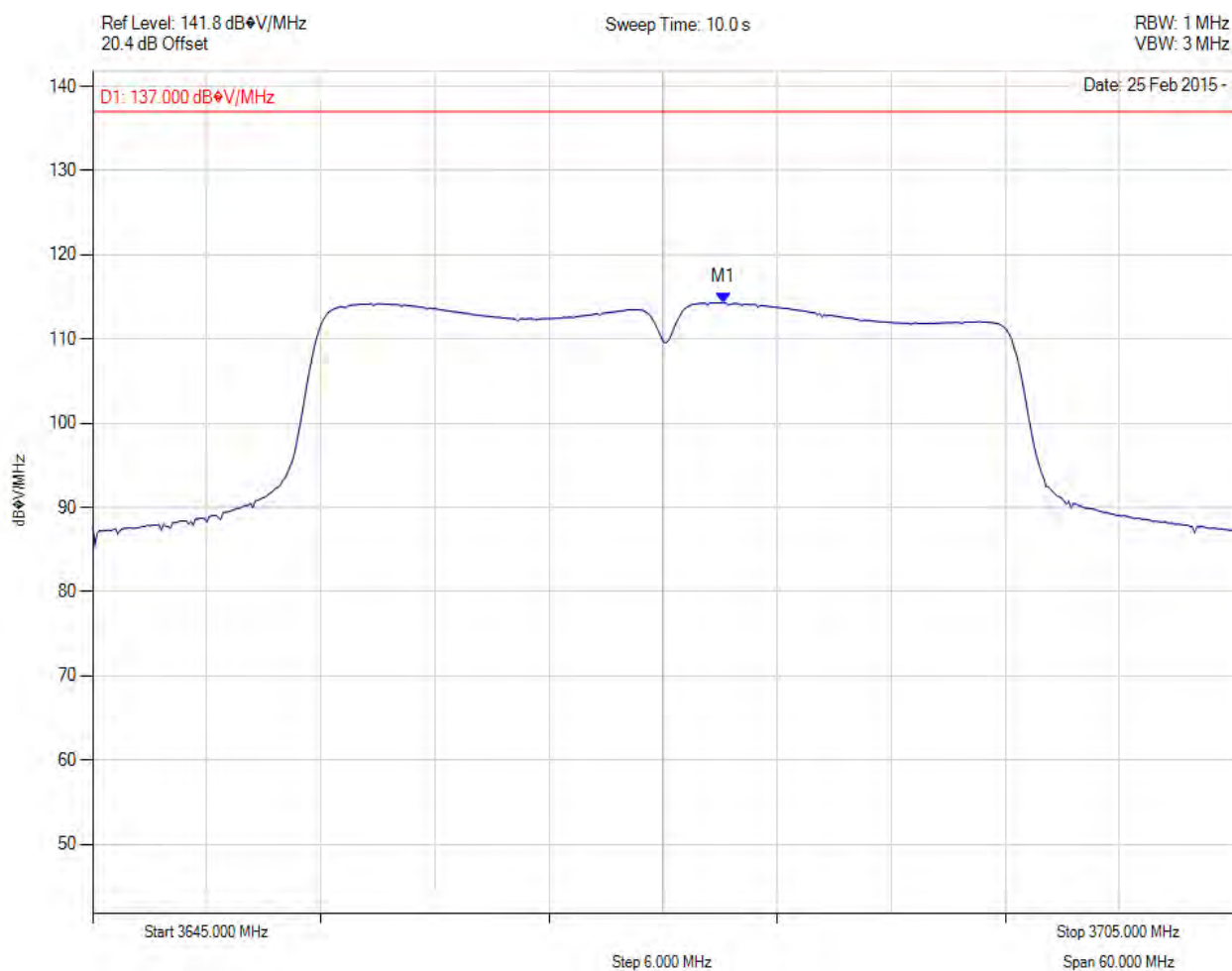


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3678.186 MHz : 114.328 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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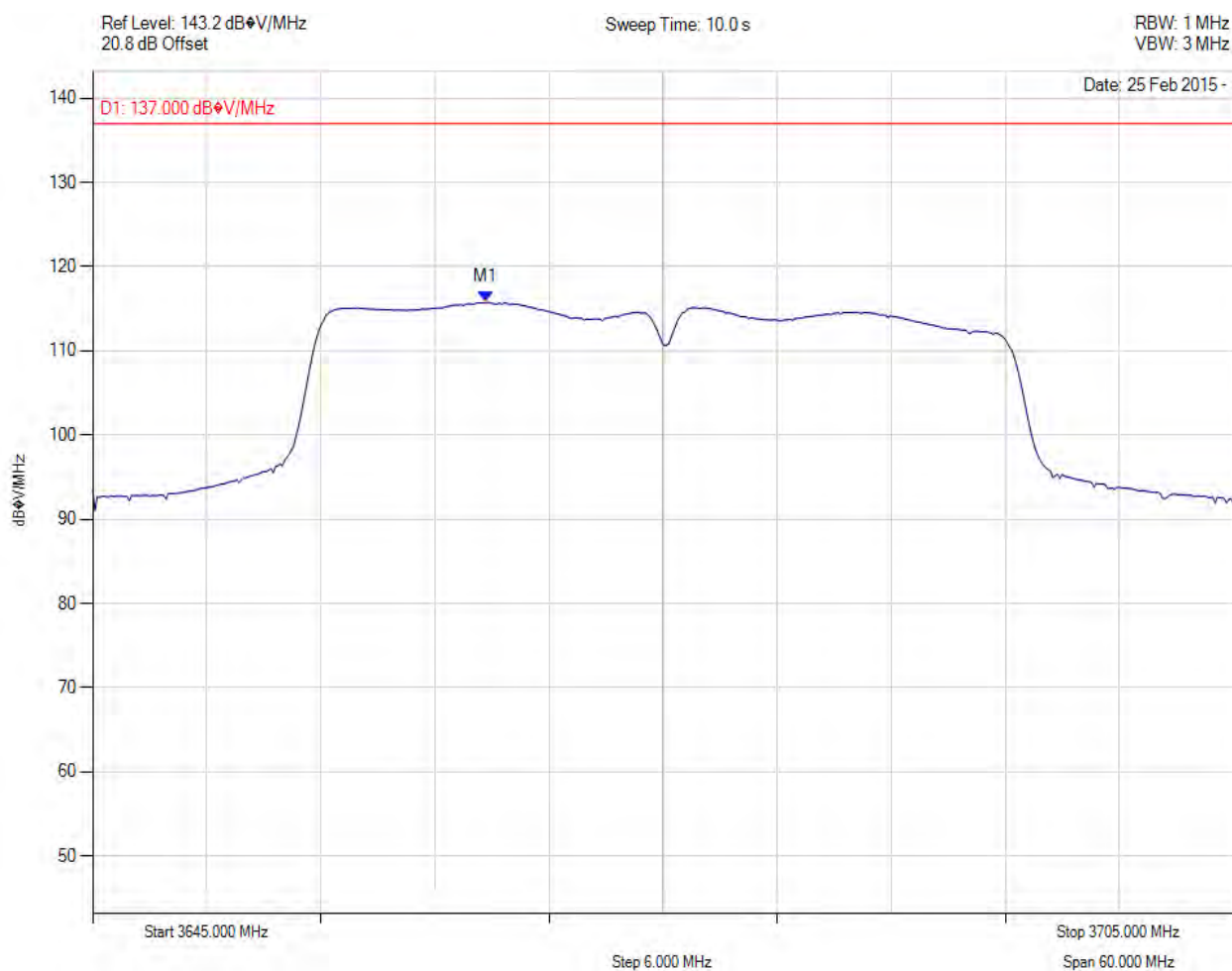


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Power Spectral Density

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = CLR/WRITE	M1 : 3665.681 MHz : 115.752 dB μ V/MHz	Channel Frequency: 3675.00 MHz

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A.1.3. Frequency Stability



Carrier Frequencies 25 °C

Variant: , Channel: 3660.00 MHz, , Temp: nom, Voltage: 46.75 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.003 MHz : -22.038 dBm	Channel Frequency: 3660.00 MHz

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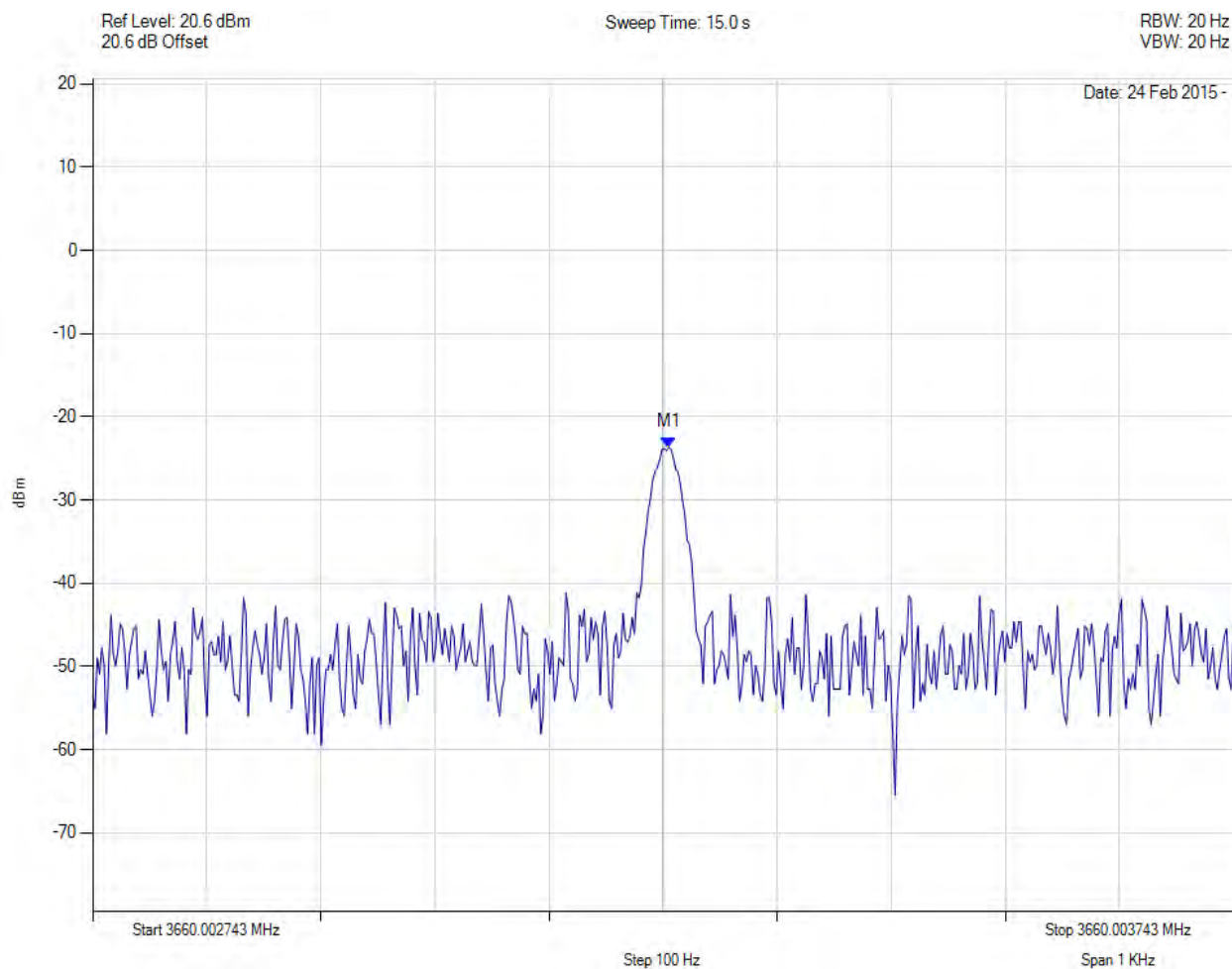


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Carrier Frequencies 25 °C

Variant: , Channel: 3660.00 MHz, , Temp: Ambient, Voltage: 63.25 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.003 MHz : -23.645 dBm	Channel Frequency: 3660.00 MHz

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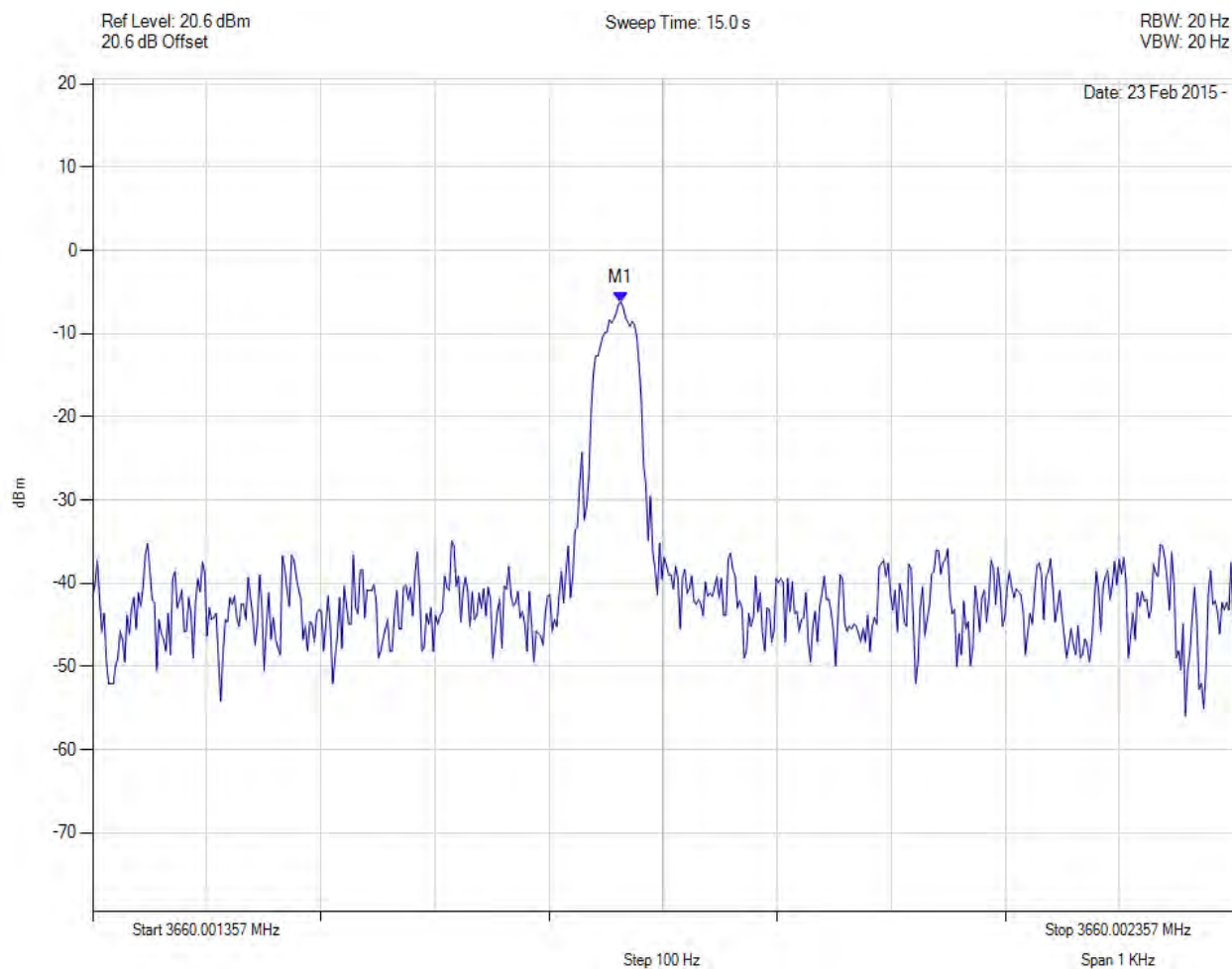


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Carrier Frequencies -35 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3660.002 MHz : -6.218 dBm	Channel Frequency: 3660.00 MHz

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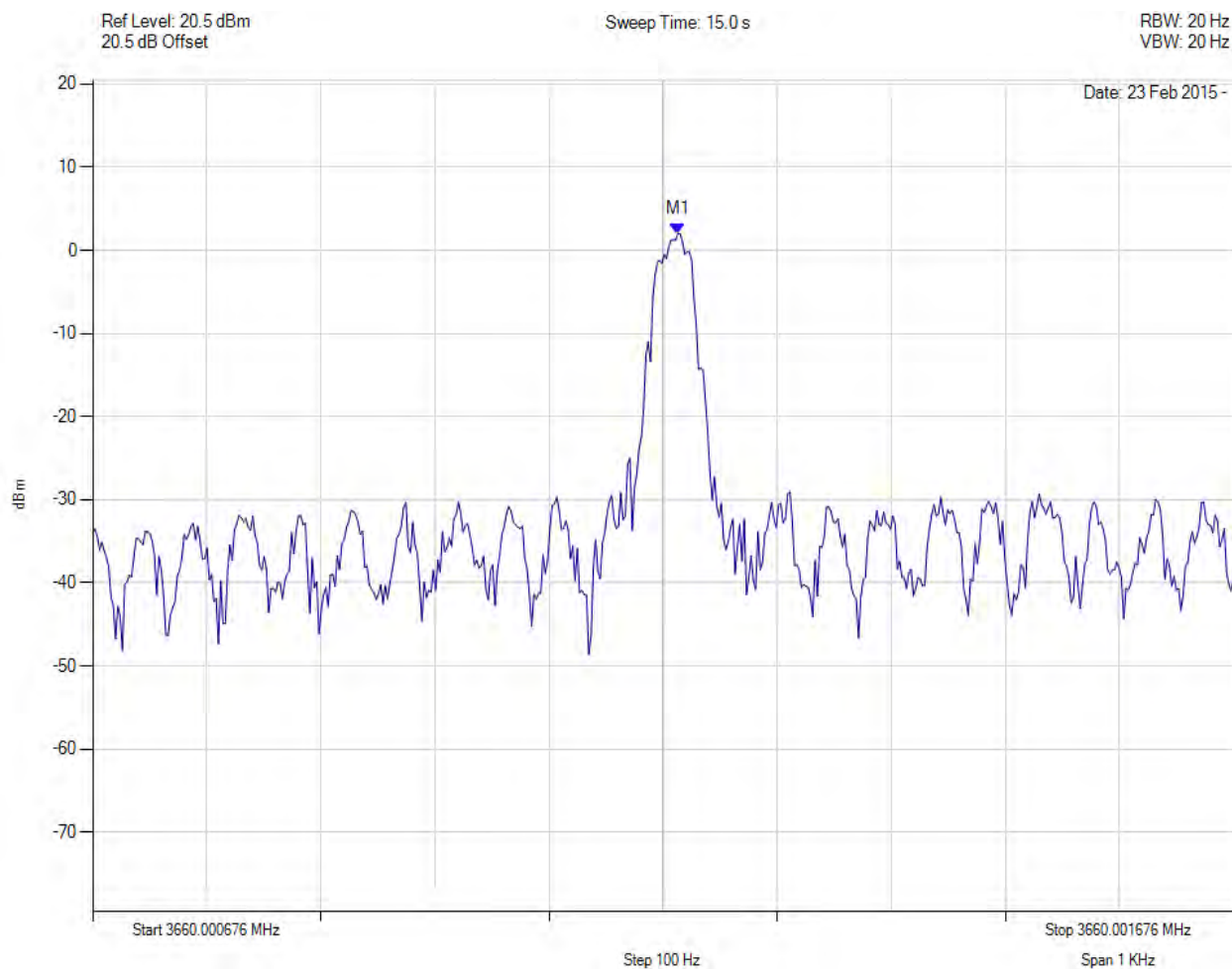


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Carrier Frequencies -25 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3660.001 MHz : 2.019 dBm	Channel Frequency: 3660.00 MHz

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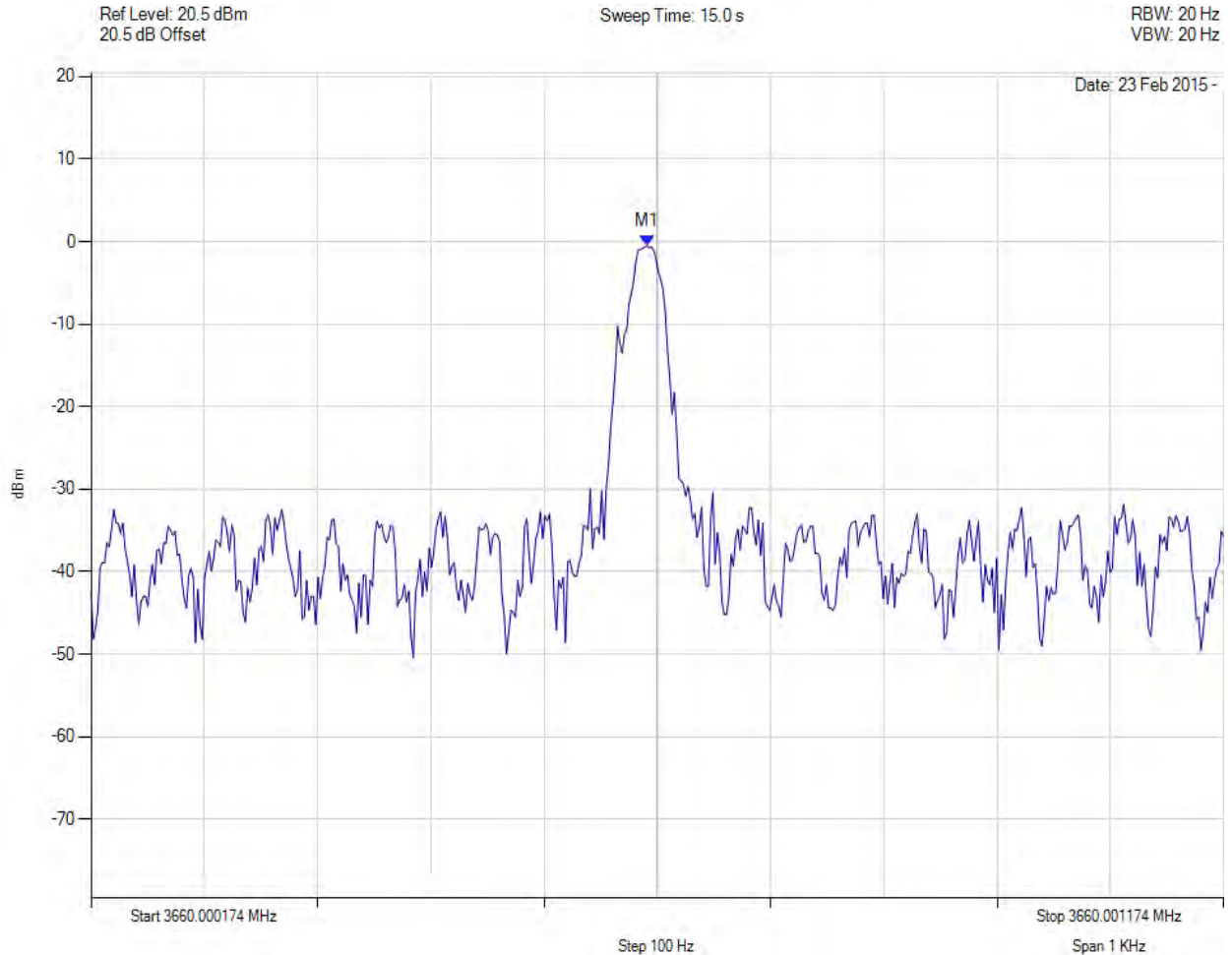


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies -15 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.001 MHz : -0.488 dBm	Channel Frequency: 3660.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

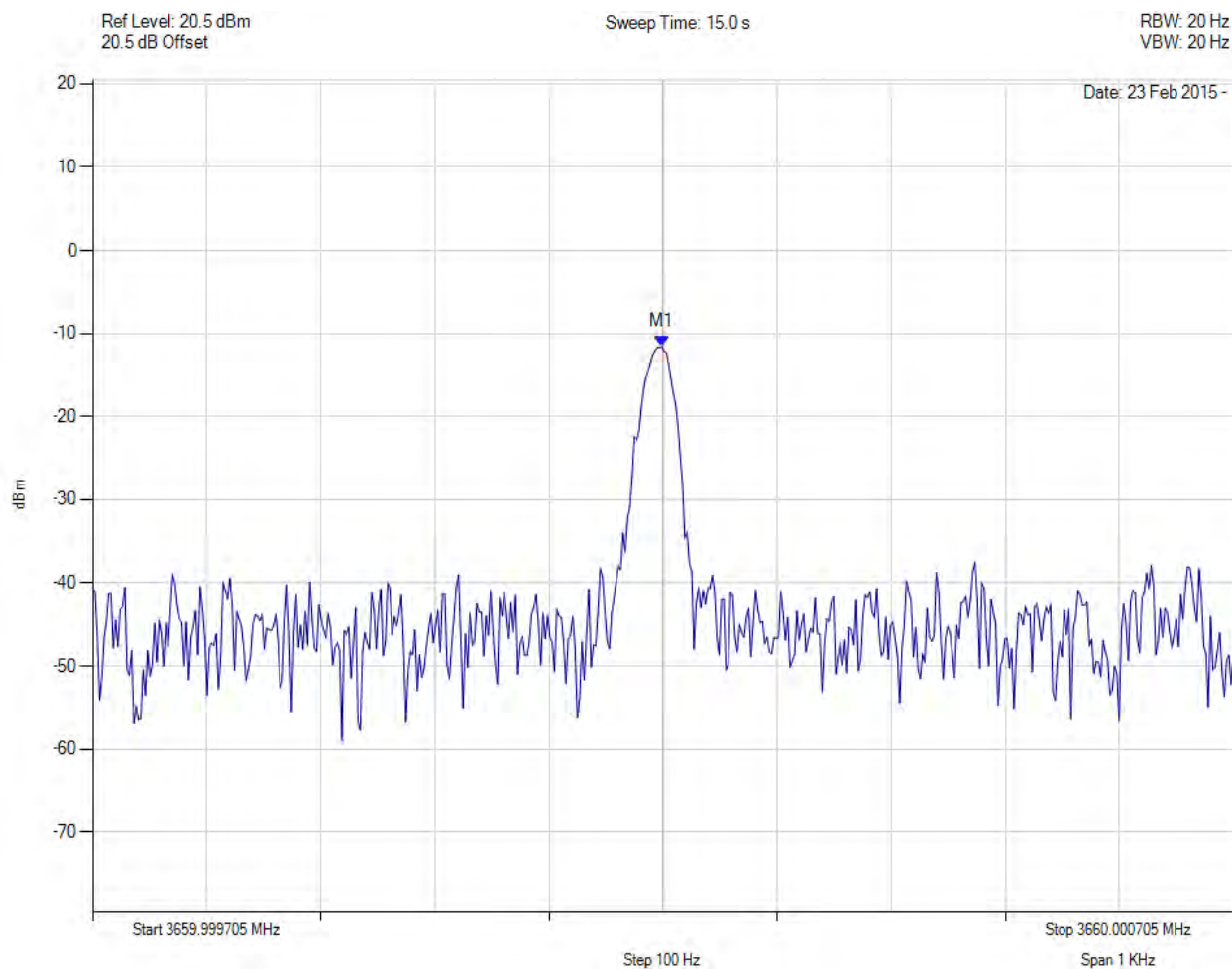


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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Carrier Frequencies -5 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3660.000 MHz : -11.614 dBm	Channel Frequency: 3660.00 MHz

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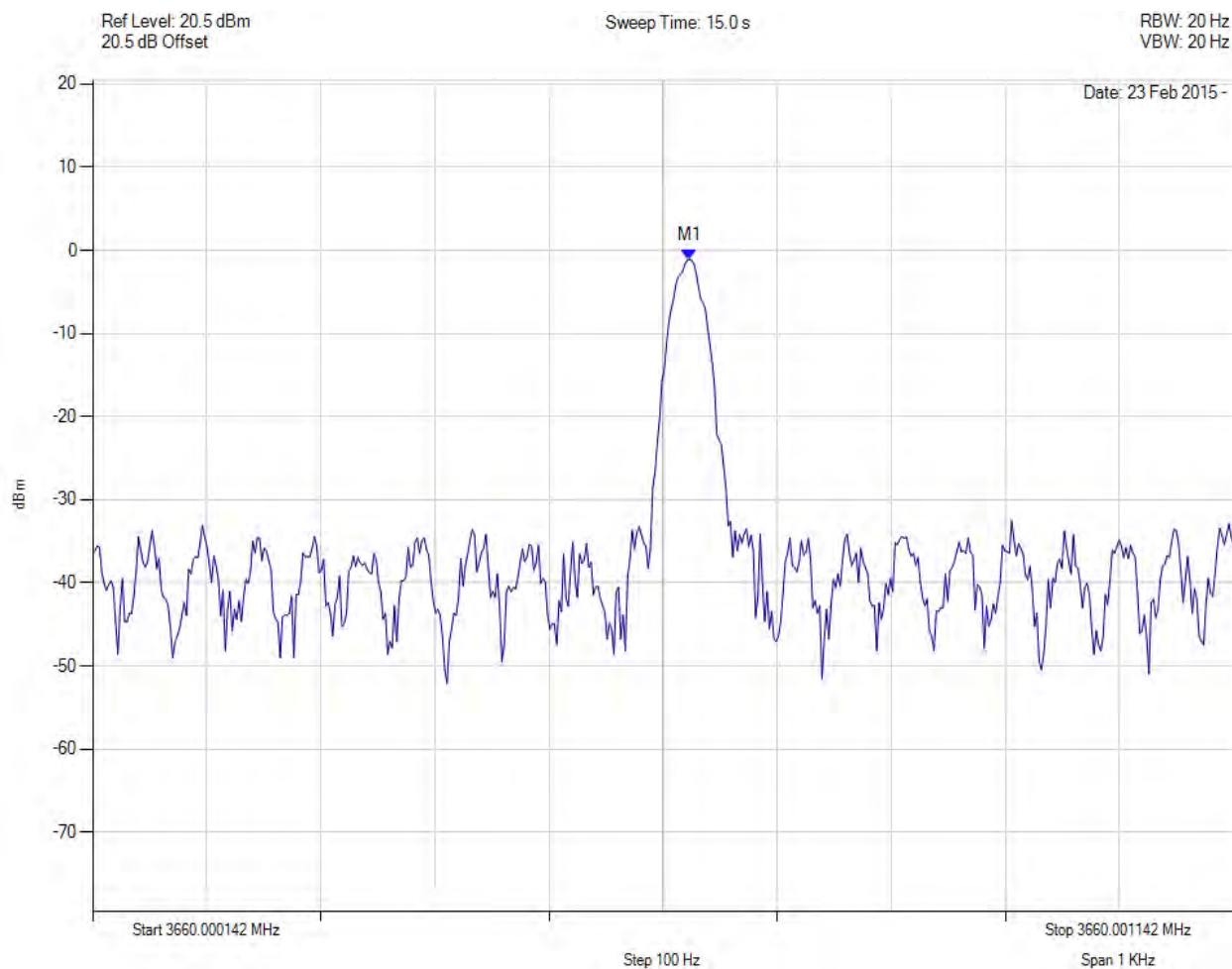


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies 5 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3660.001 MHz : -1.114 dBm	Channel Frequency: 3660.00 MHz

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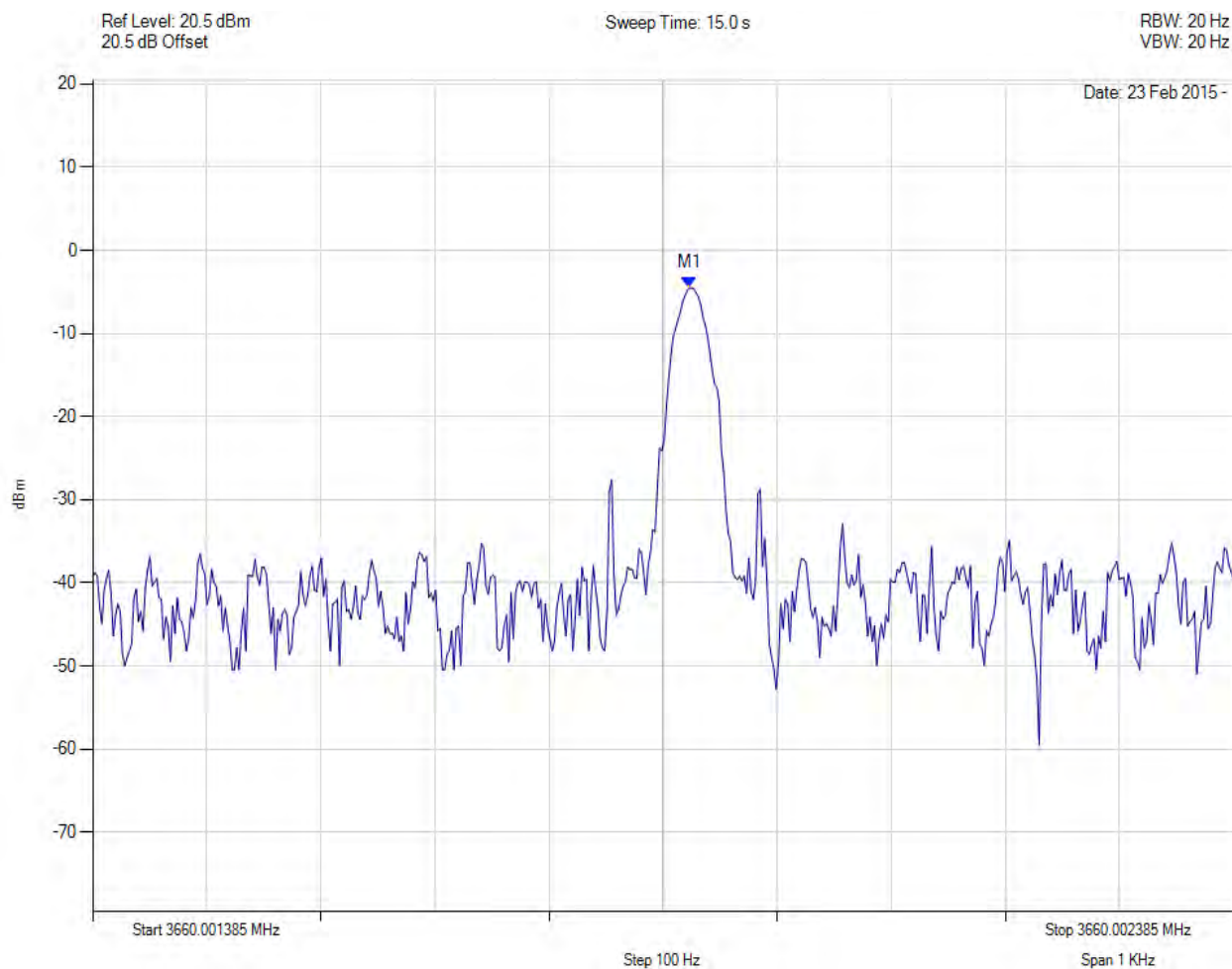


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies 15 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3660.002 MHz : -4.543 dBm	Channel Frequency: 3660.00 MHz

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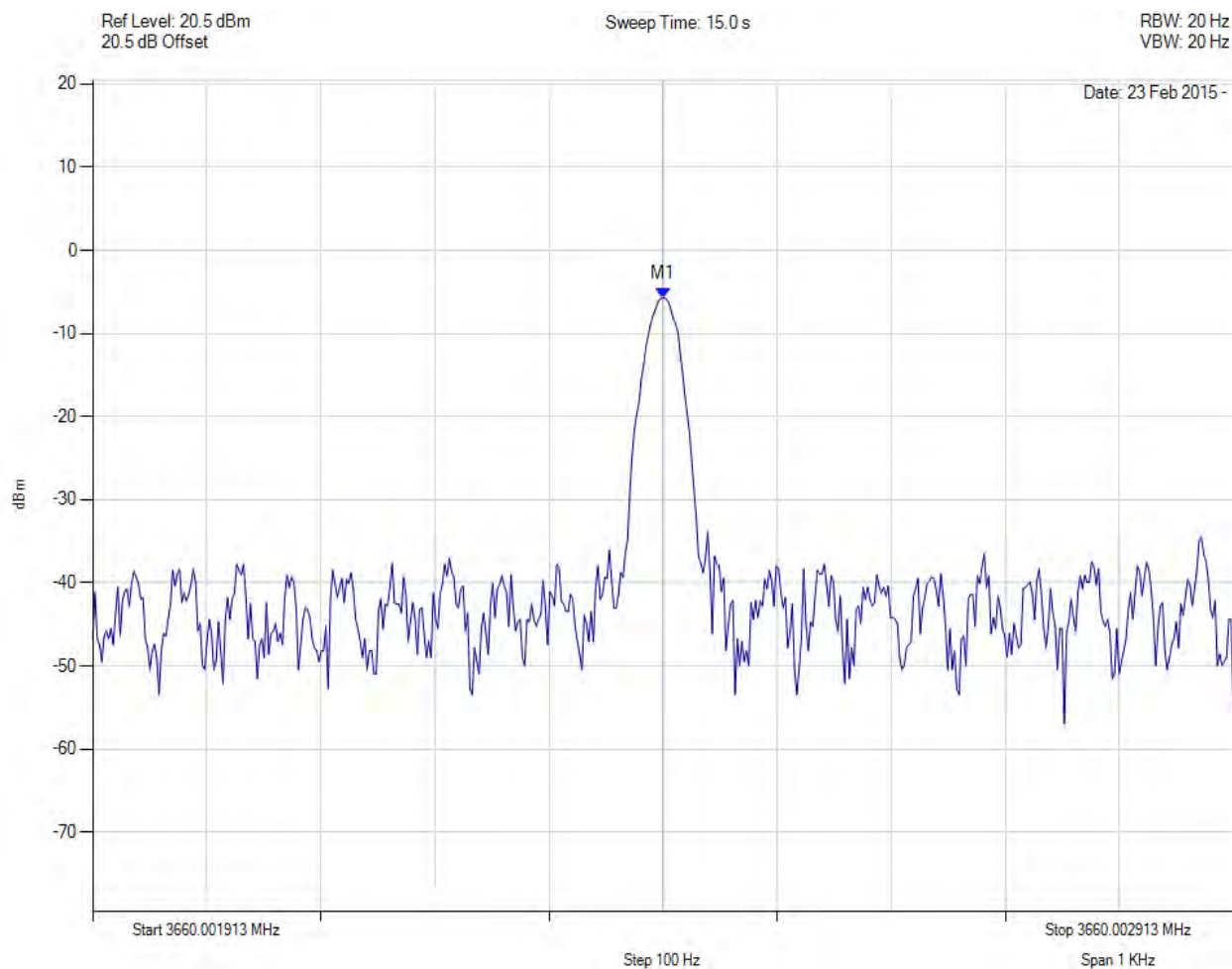


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies 35 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.002 MHz : -5.750 dBm	Channel Frequency: 3660.00 MHz

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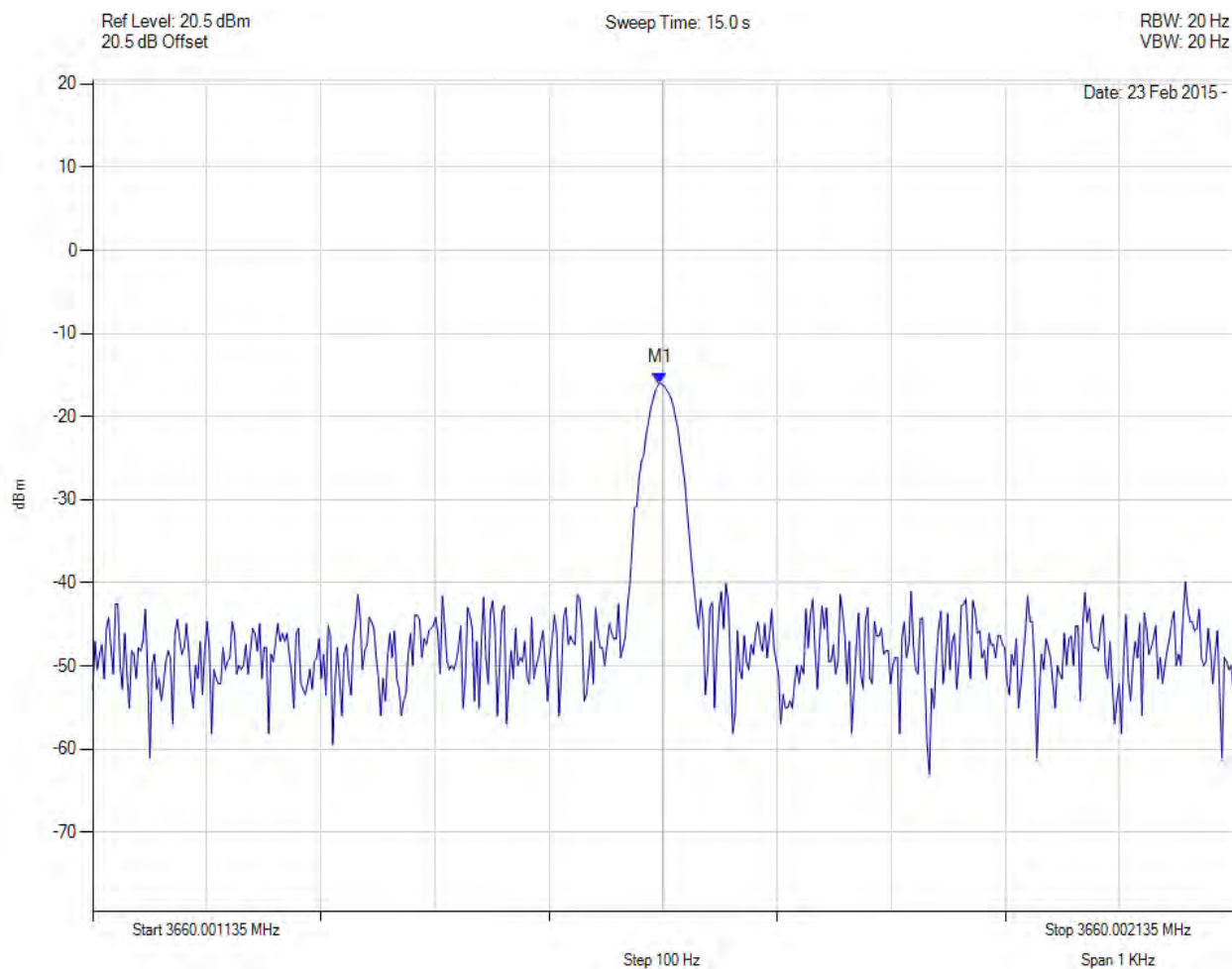


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies 45 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.002 MHz : -15.931 dBm	Channel Frequency: 3660.00 MHz

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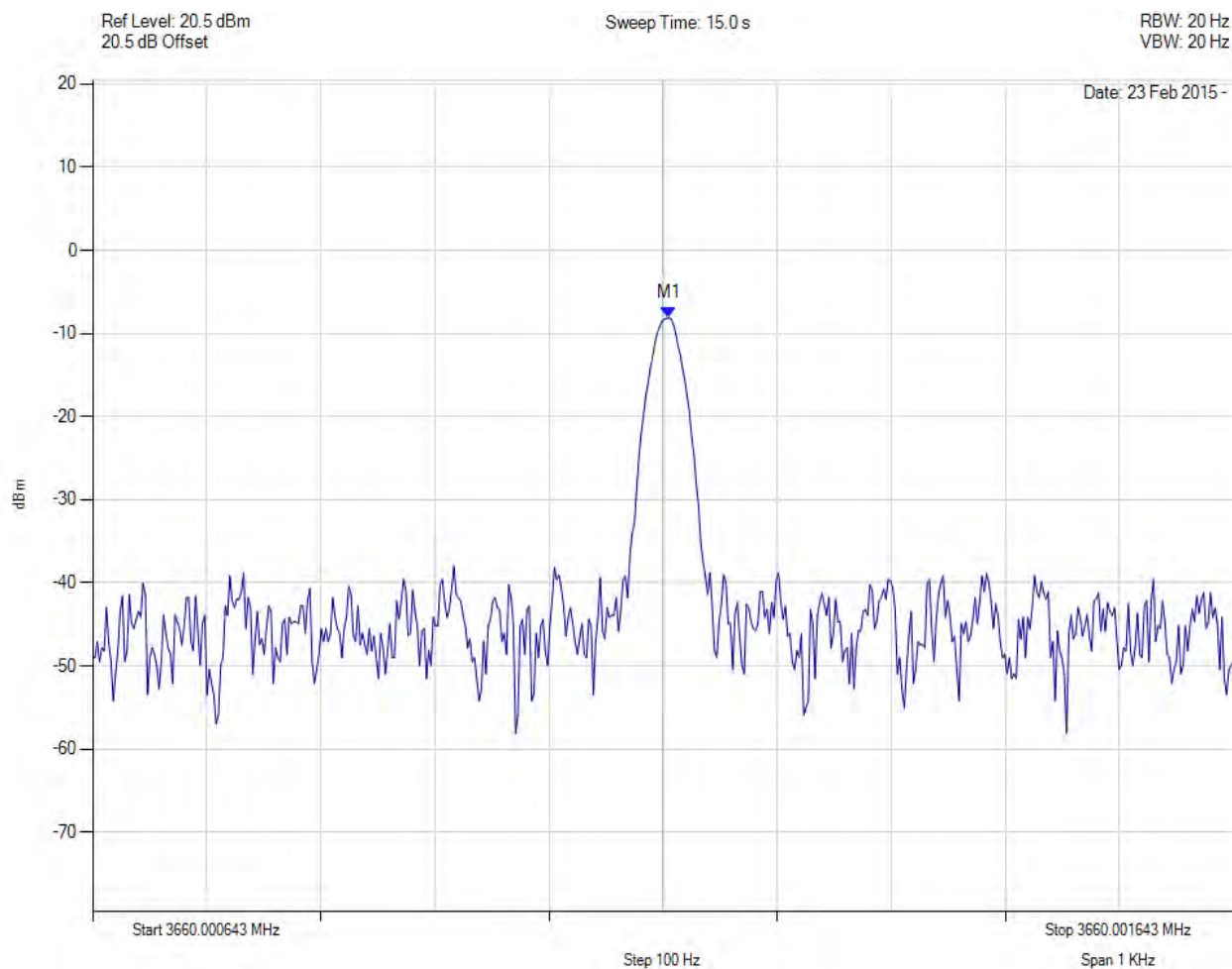


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies 55 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.001 MHz : -8.106 dBm	Channel Frequency: 3660.00 MHz

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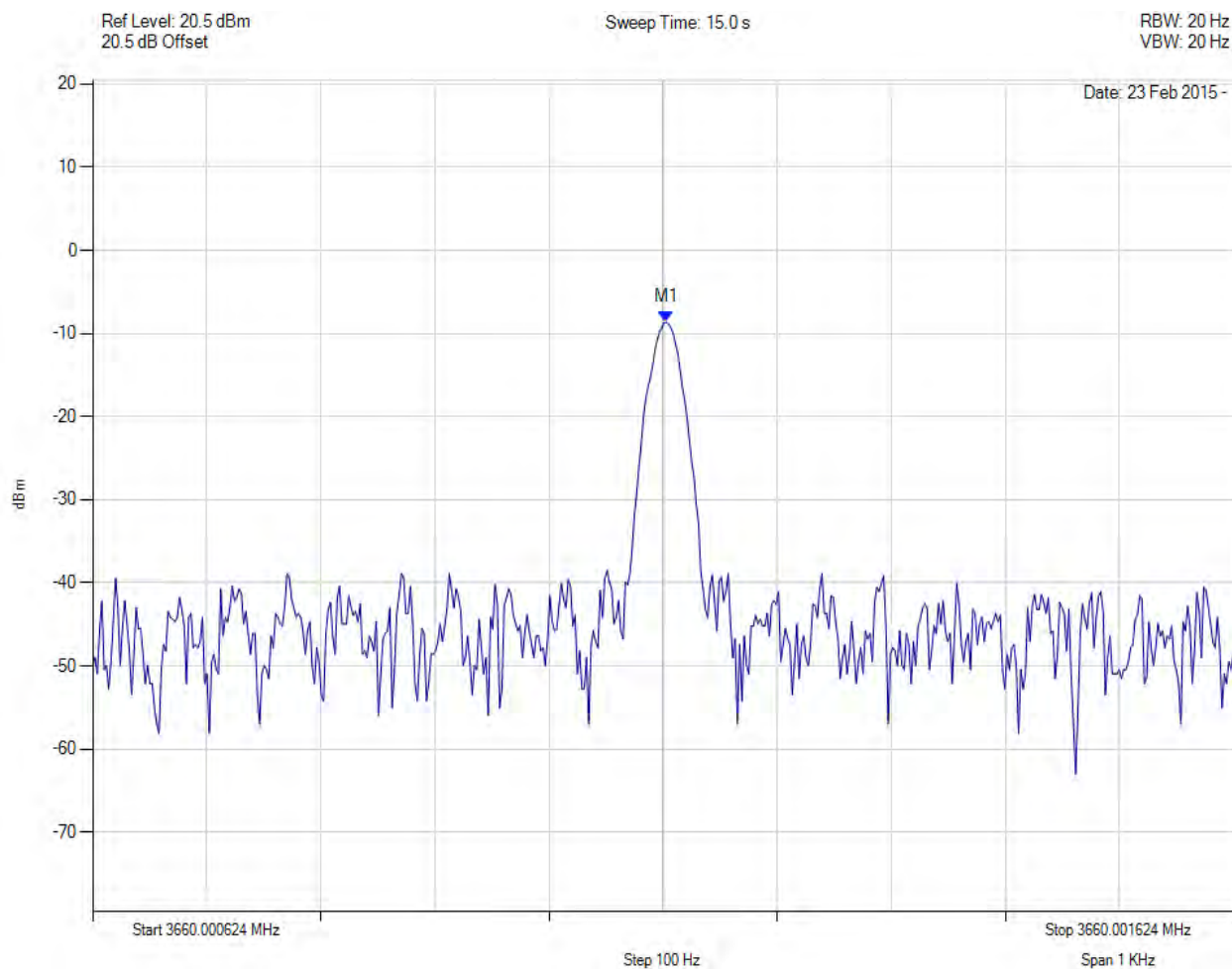


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Carrier Frequencies 60 °C

Variant: , Channel: 3660.00 MHz, Temp: , Voltage: nom Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3660.001 MHz : -8.643 dBm	Channel Frequency: 3660.00 MHz

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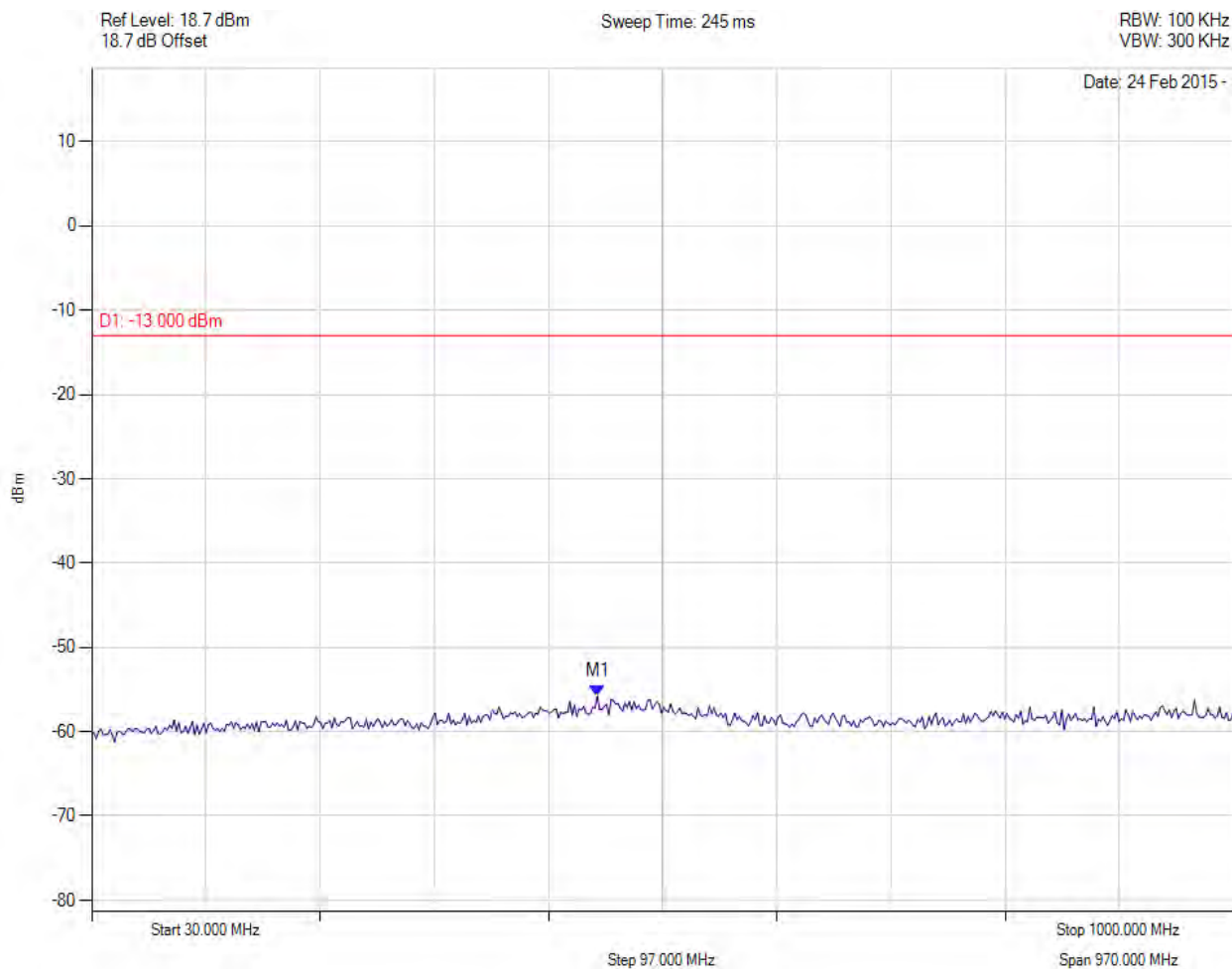
Title: RADWIN 2000 JET, RADWIN 5000 JET
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A.1.4. Conducted Spurious Emissions



Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 459.599 MHz : -55.800 dBm	Channel Frequency: 3653.00 MHz

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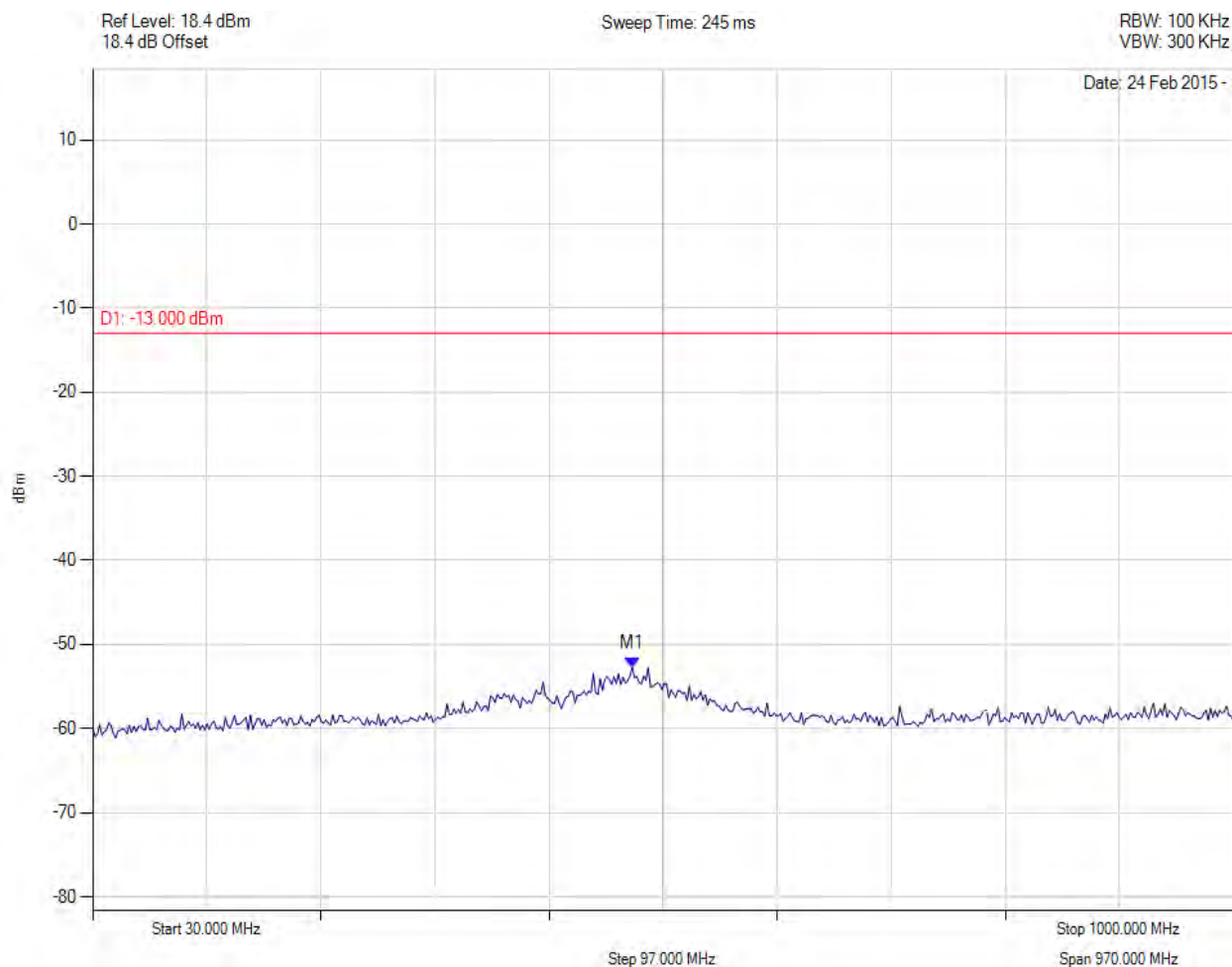


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 488.758 MHz : -52.740 dBm	Channel Frequency: 3653.00 MHz

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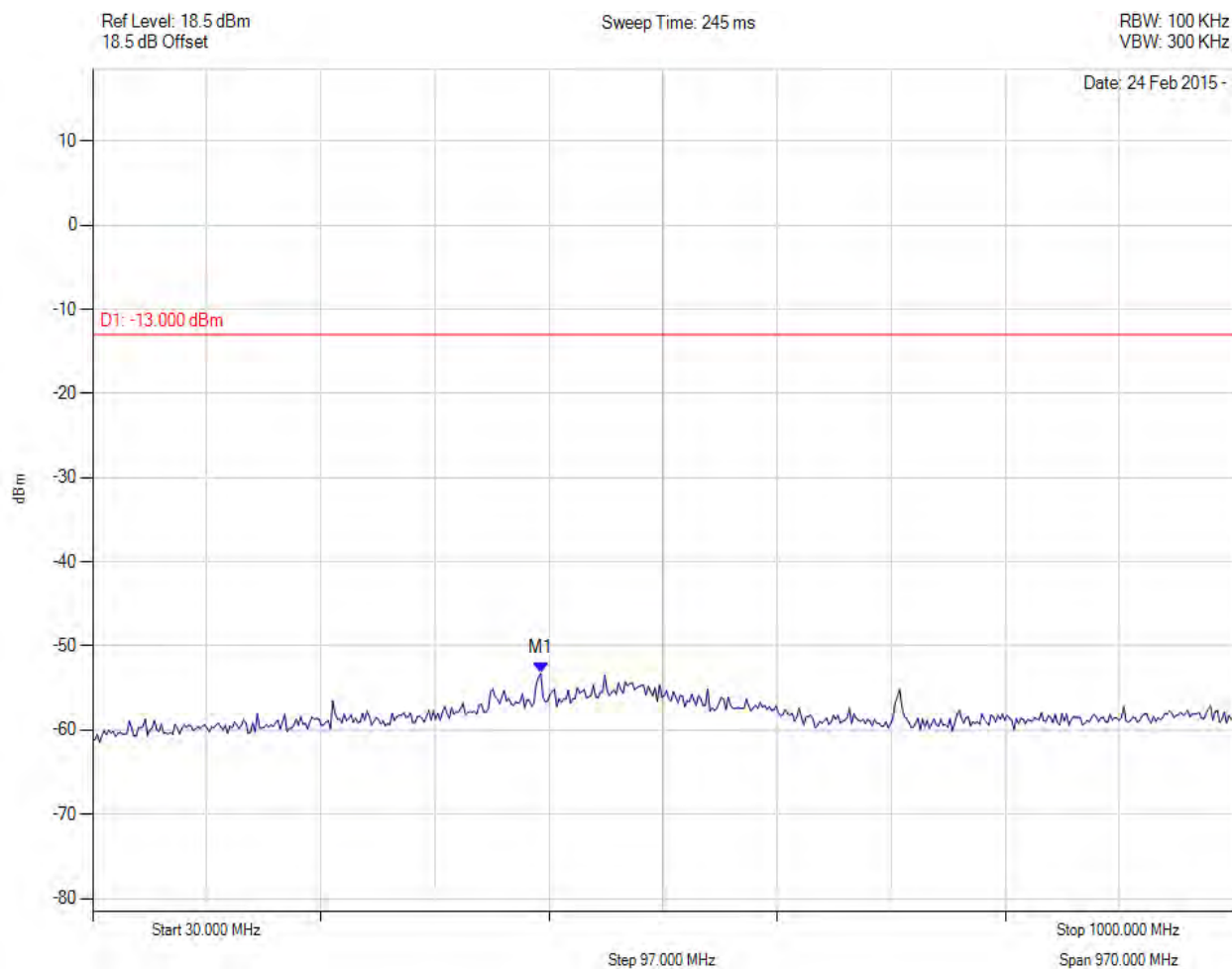


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 411.002 MHz : -53.244 dBm	Channel Frequency: 3653.00 MHz

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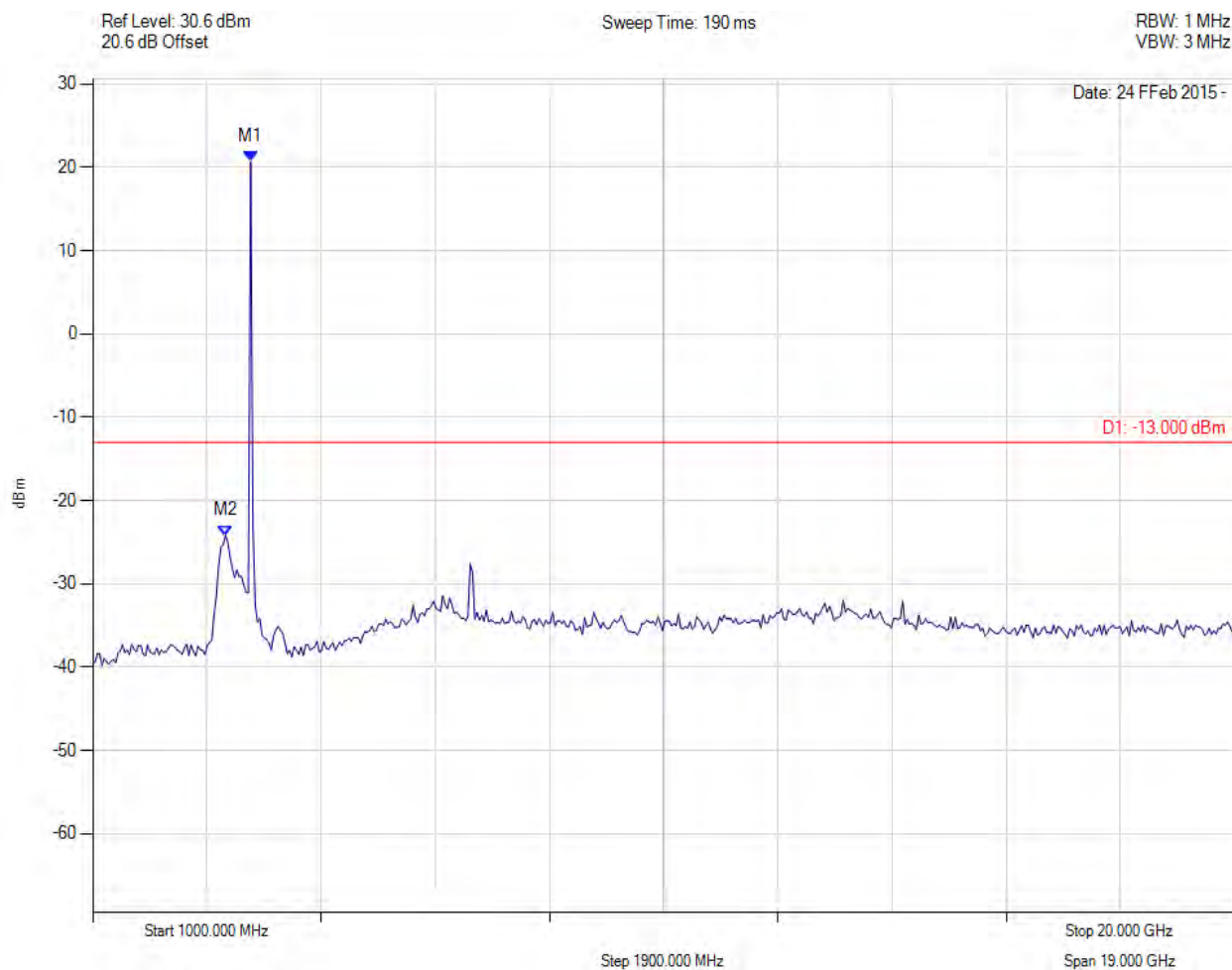


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3627.255 MHz : 20.669 dBm M2 : 3208.417 MHz : -24.207 dBm	Channel Frequency: 3653.00 MHz

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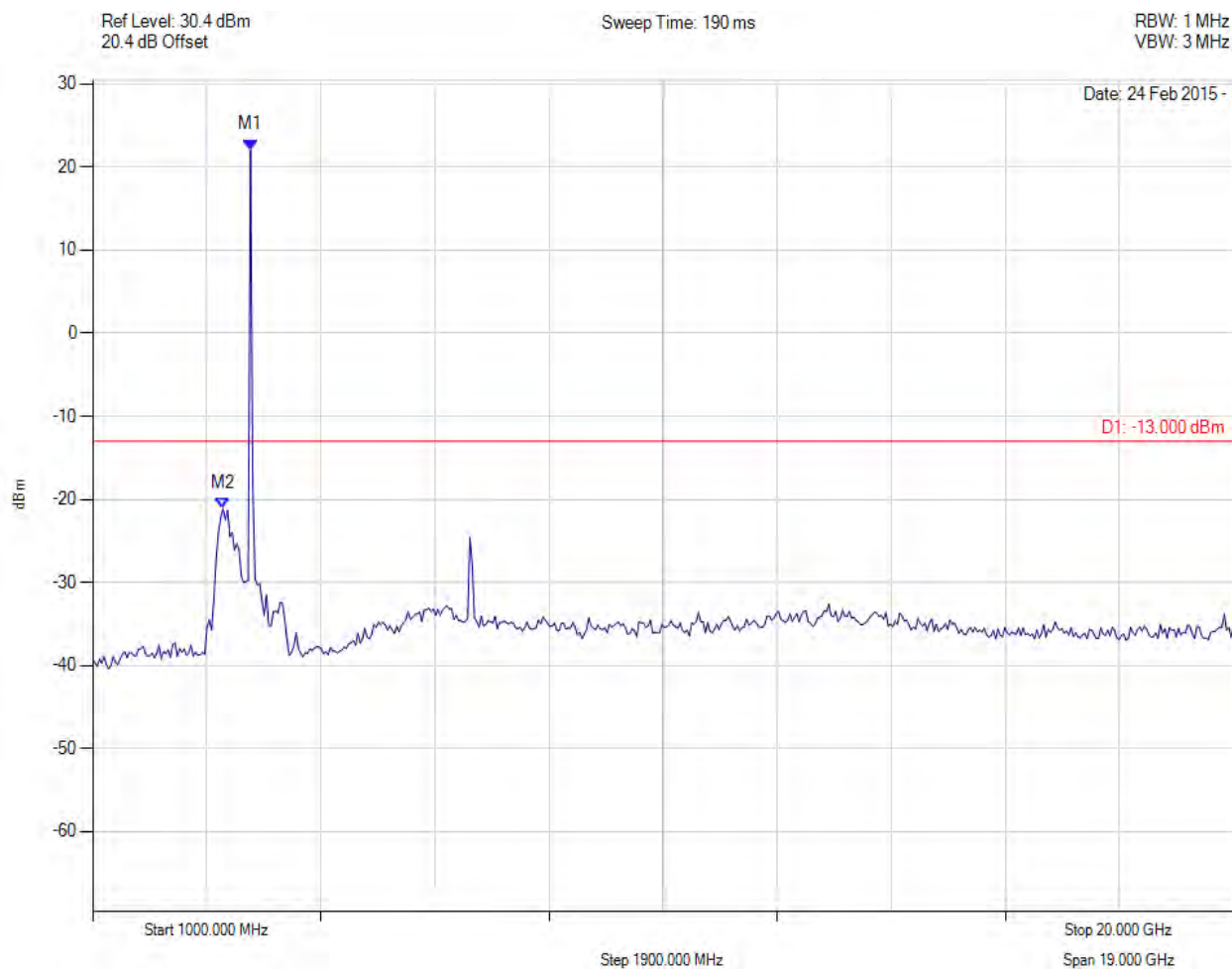


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3627.255 MHz : 22.098 dBm M2 : 3170.341 MHz : -21.137 dBm	Channel Frequency: 3653.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

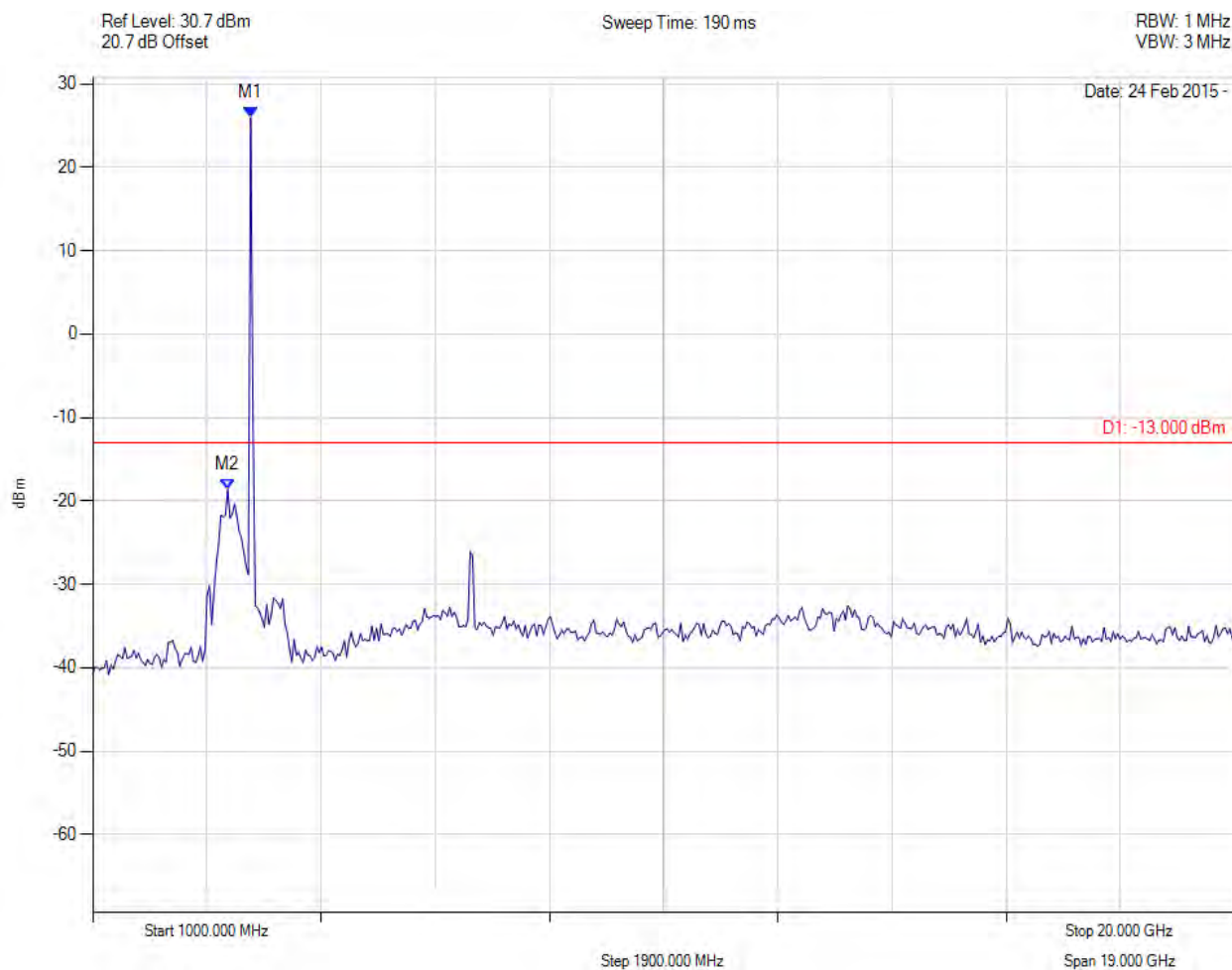


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3627.255 MHz : 25.936 dBm M2 : 3246.493 MHz : -18.614 dBm	Channel Frequency: 3653.00 MHz

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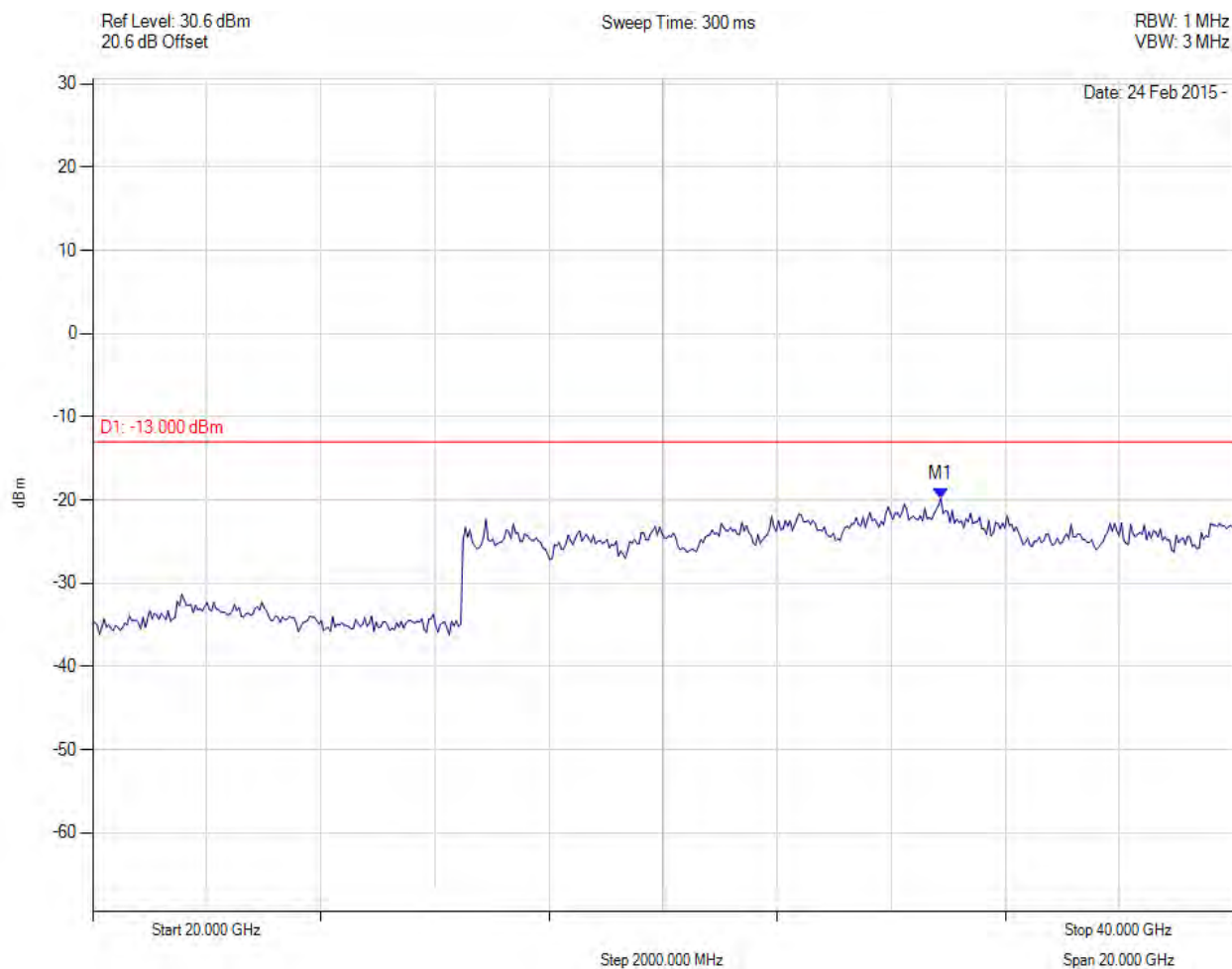


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.870 GHz : -19.798 dBm	Channel Frequency: 3653.00 MHz

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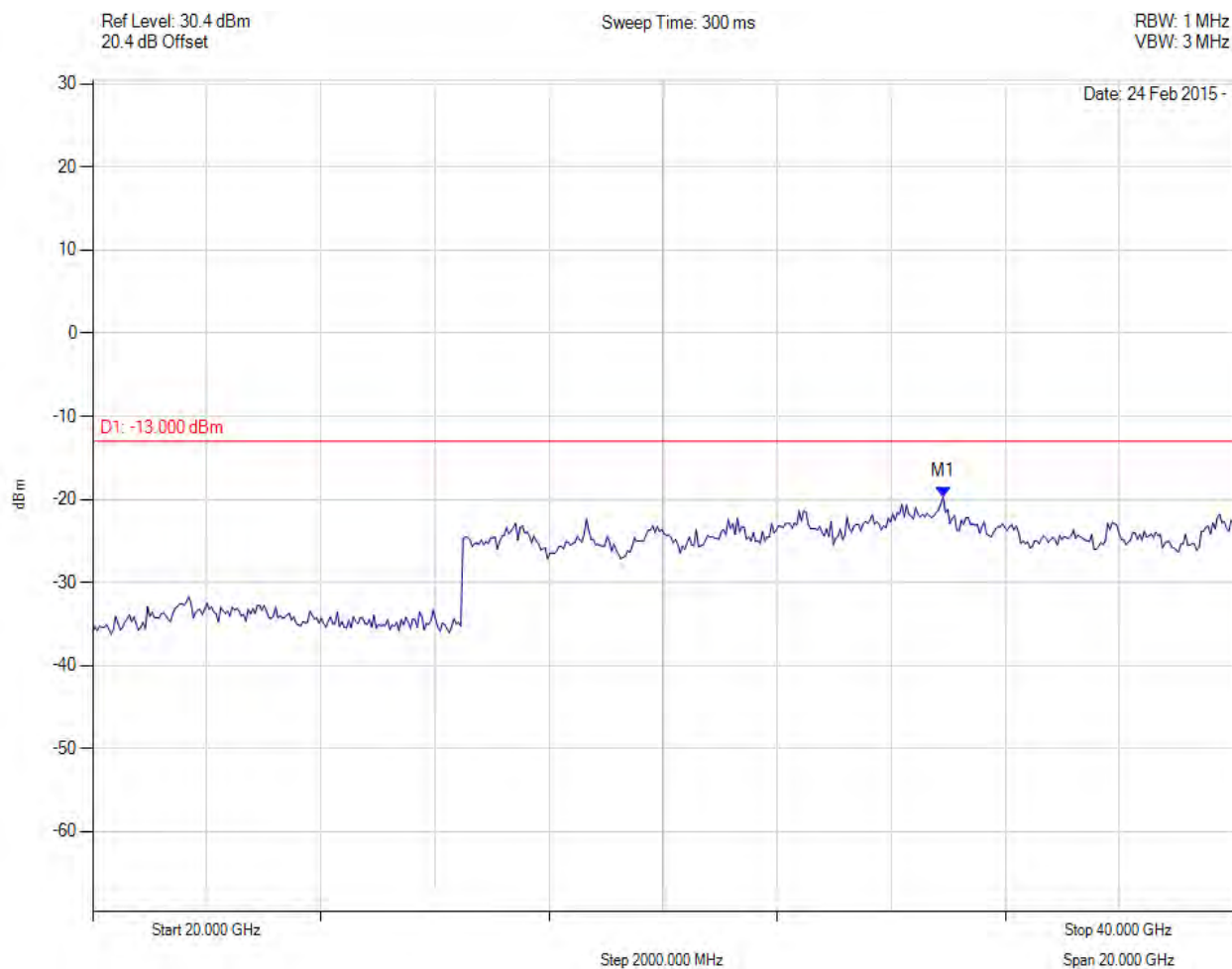


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.910 GHz : -19.679 dBm	Channel Frequency: 3653.00 MHz

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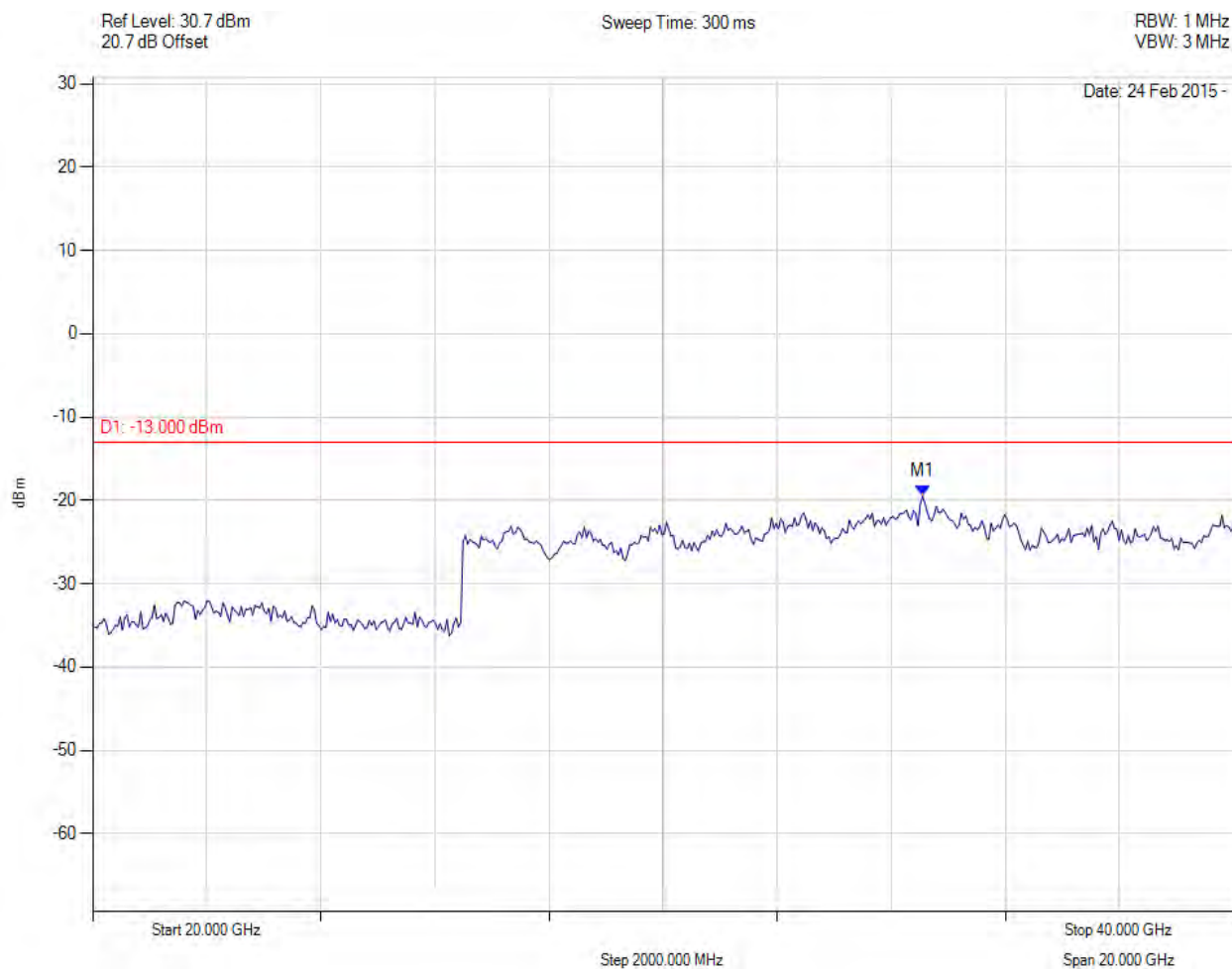


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3652.50 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.549 GHz : -19.485 dBm	Channel Frequency: 3653.00 MHz

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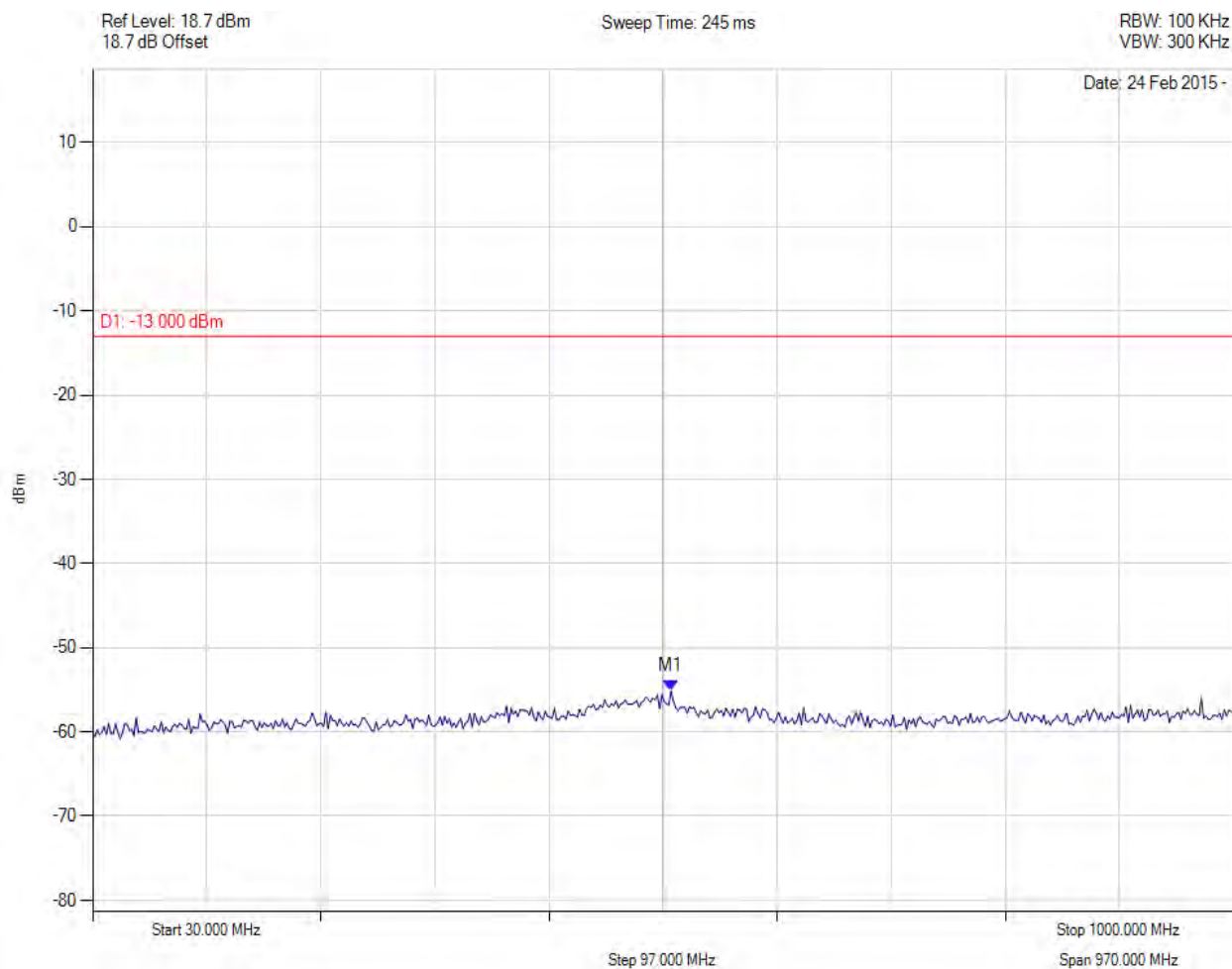


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 521.804 MHz : -55.165 dBm	Channel Frequency: 3675.00 MHz

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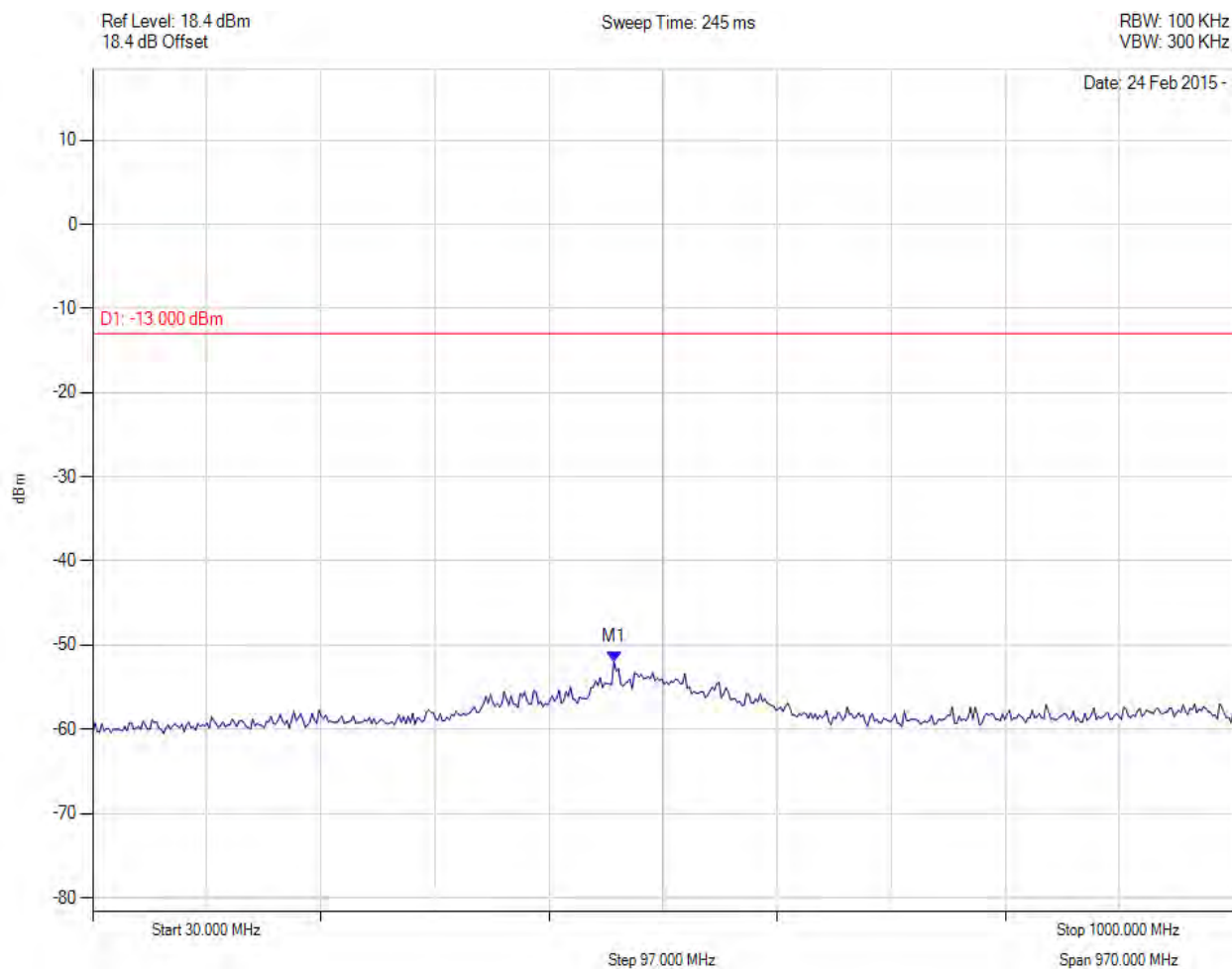


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 473.206 MHz : -51.925 dBm	Channel Frequency: 3675.00 MHz

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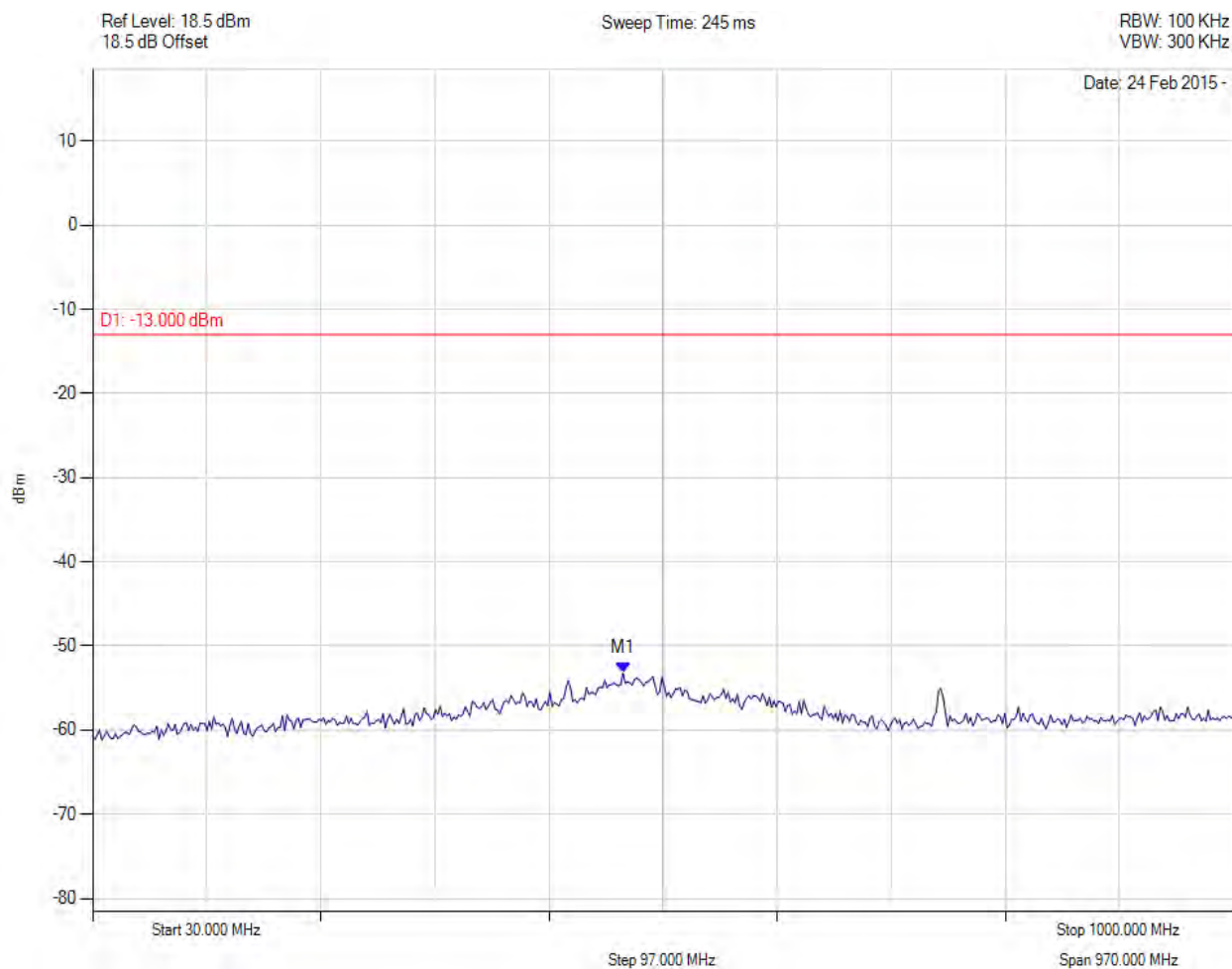


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 480.982 MHz : -53.246 dBm	Channel Frequency: 3675.00 MHz

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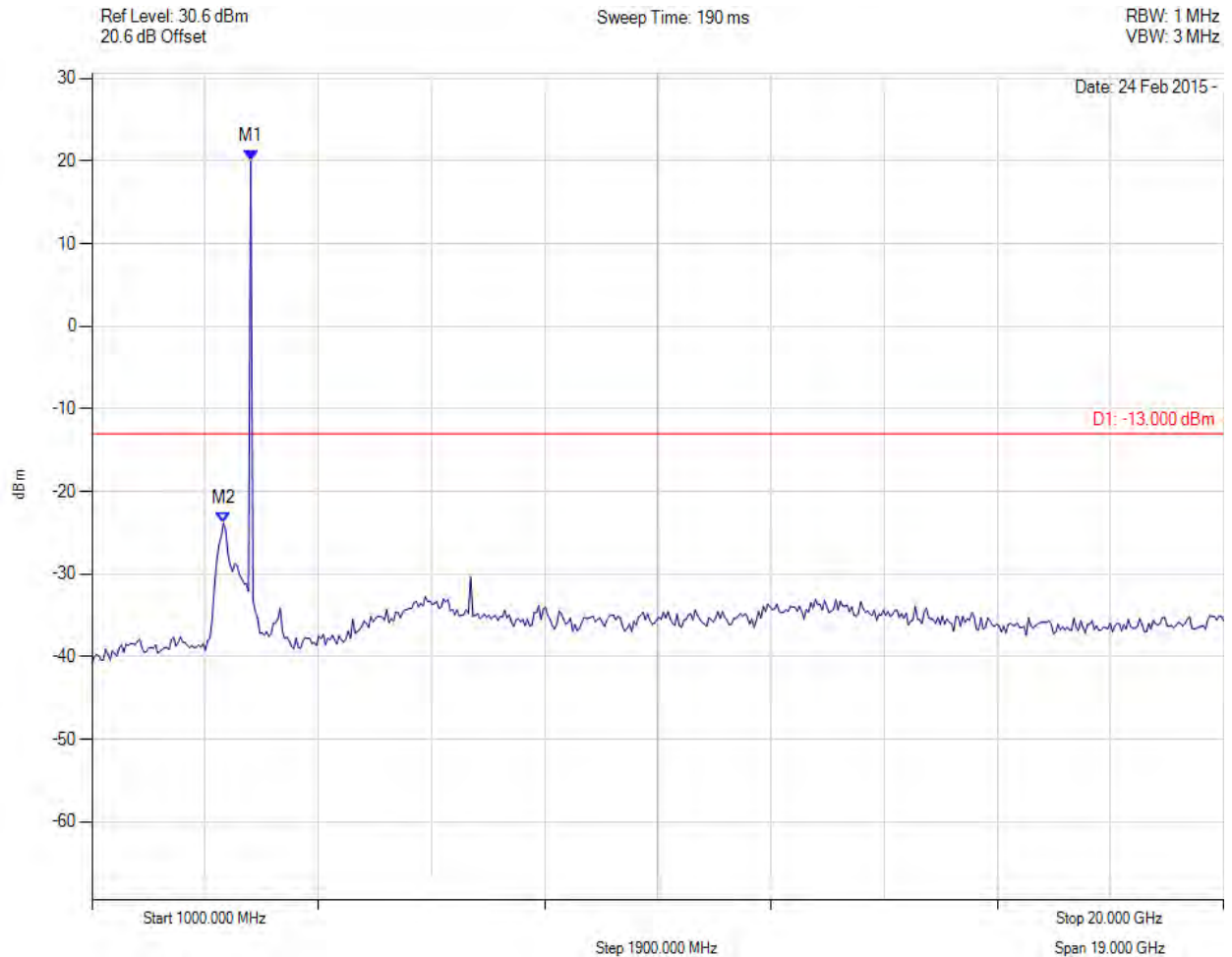


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3665.331 MHz : 19.998 dBm M2 : 3208.417 MHz : -23.833 dBm	Channel Frequency: 3675.00 MHz

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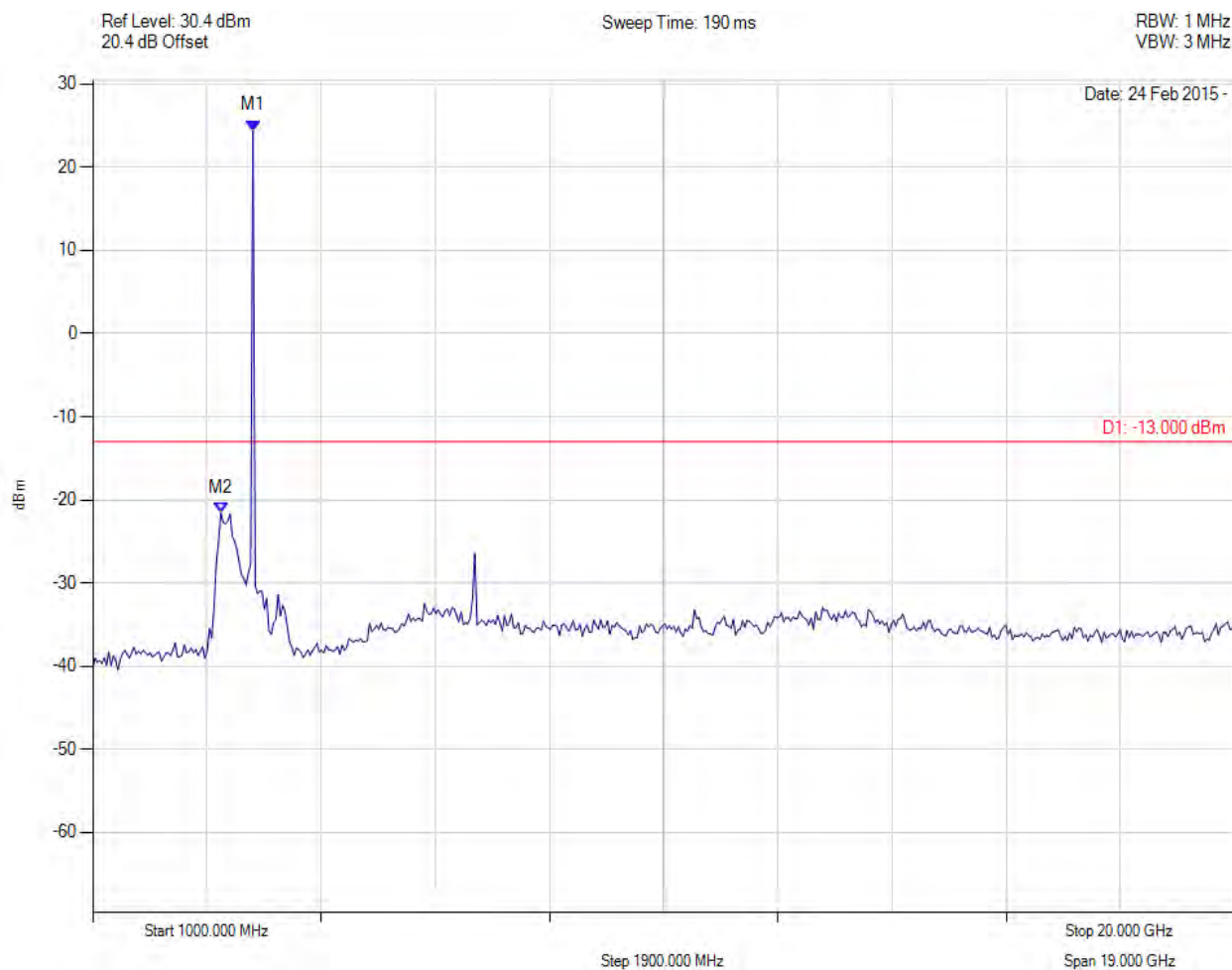


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3665.331 MHz : 24.409 dBm M2 : 3132.265 MHz : -21.591 dBm	Channel Frequency: 3675.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

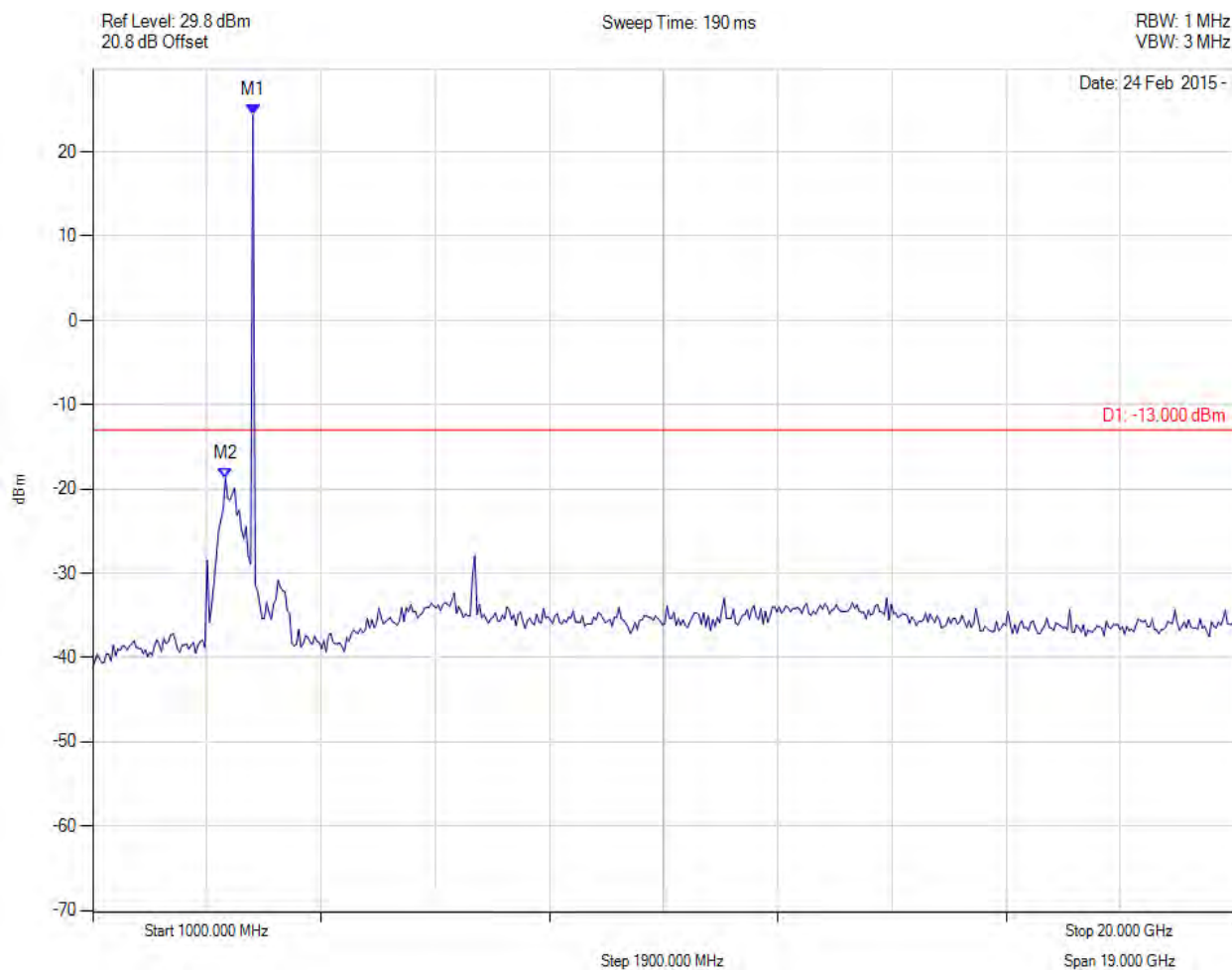


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3665.331 MHz : 24.364 dBm M2 : 3208.417 MHz : -18.727 dBm	Channel Frequency: 3675.00 MHz

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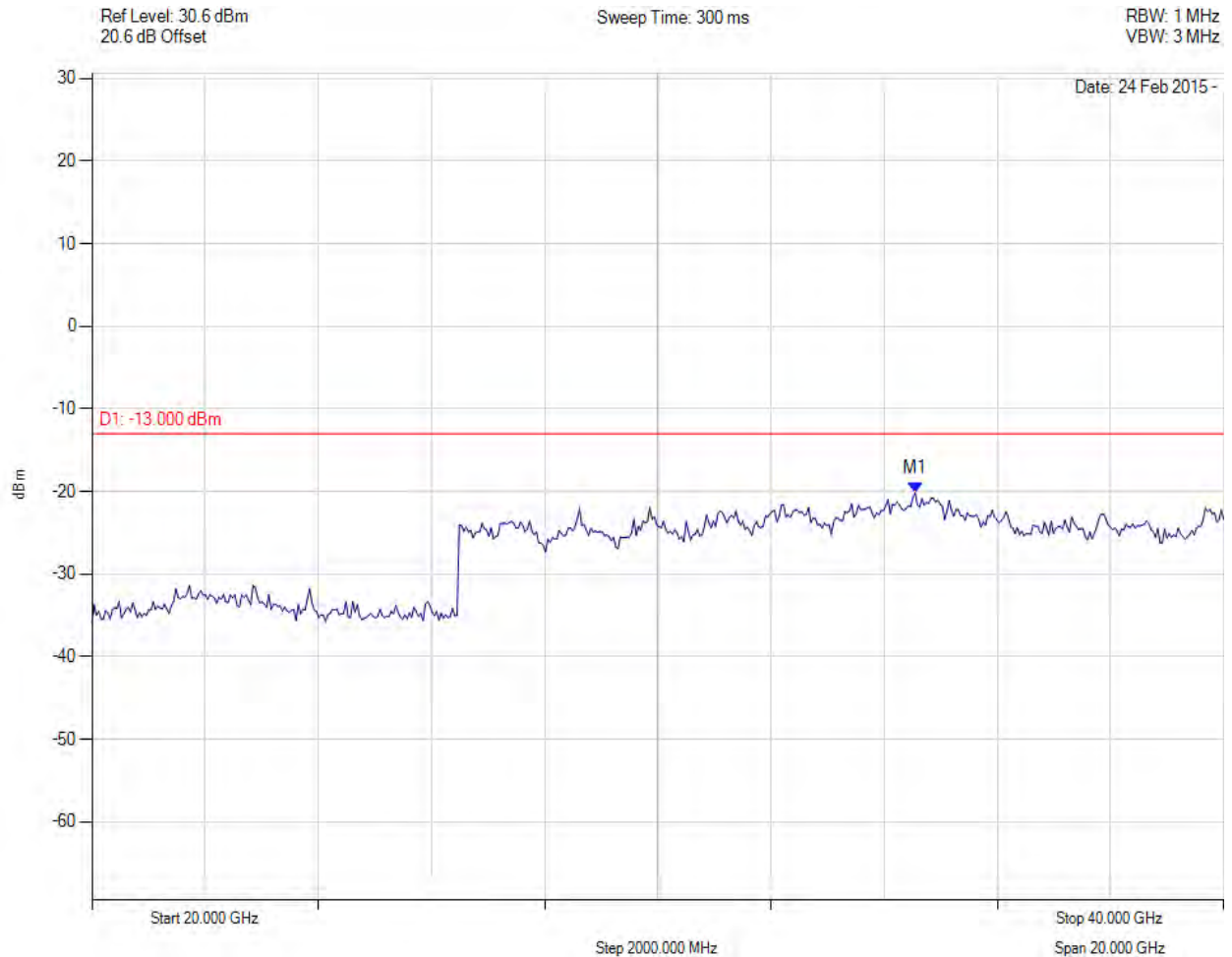


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.549 GHz : -20.168 dBm	Channel Frequency: 3675.00 MHz

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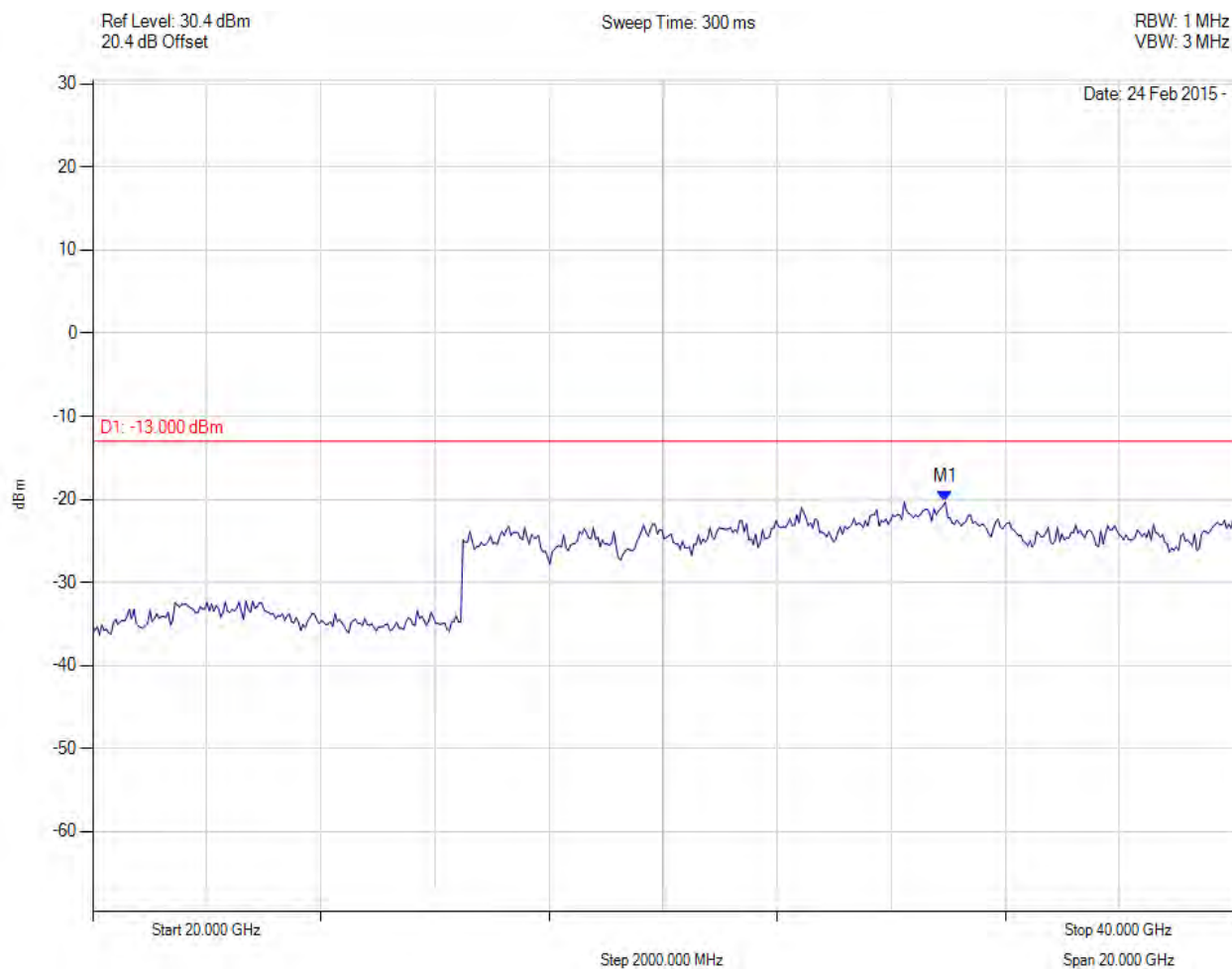


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.950 GHz : -20.318 dBm	Channel Frequency: 3675.00 MHz

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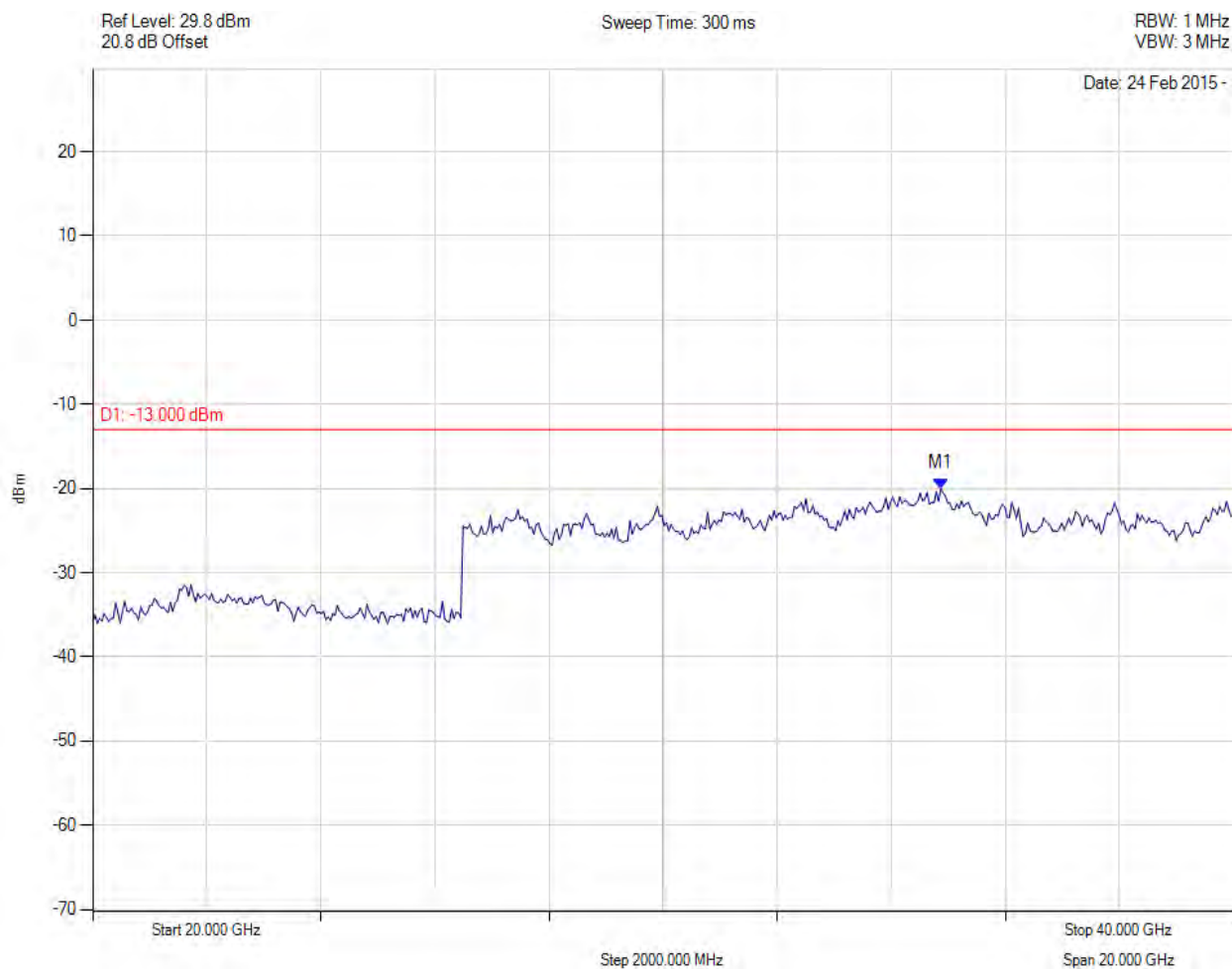


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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.870 GHz : -19.980 dBm	Channel Frequency: 3675.00 MHz

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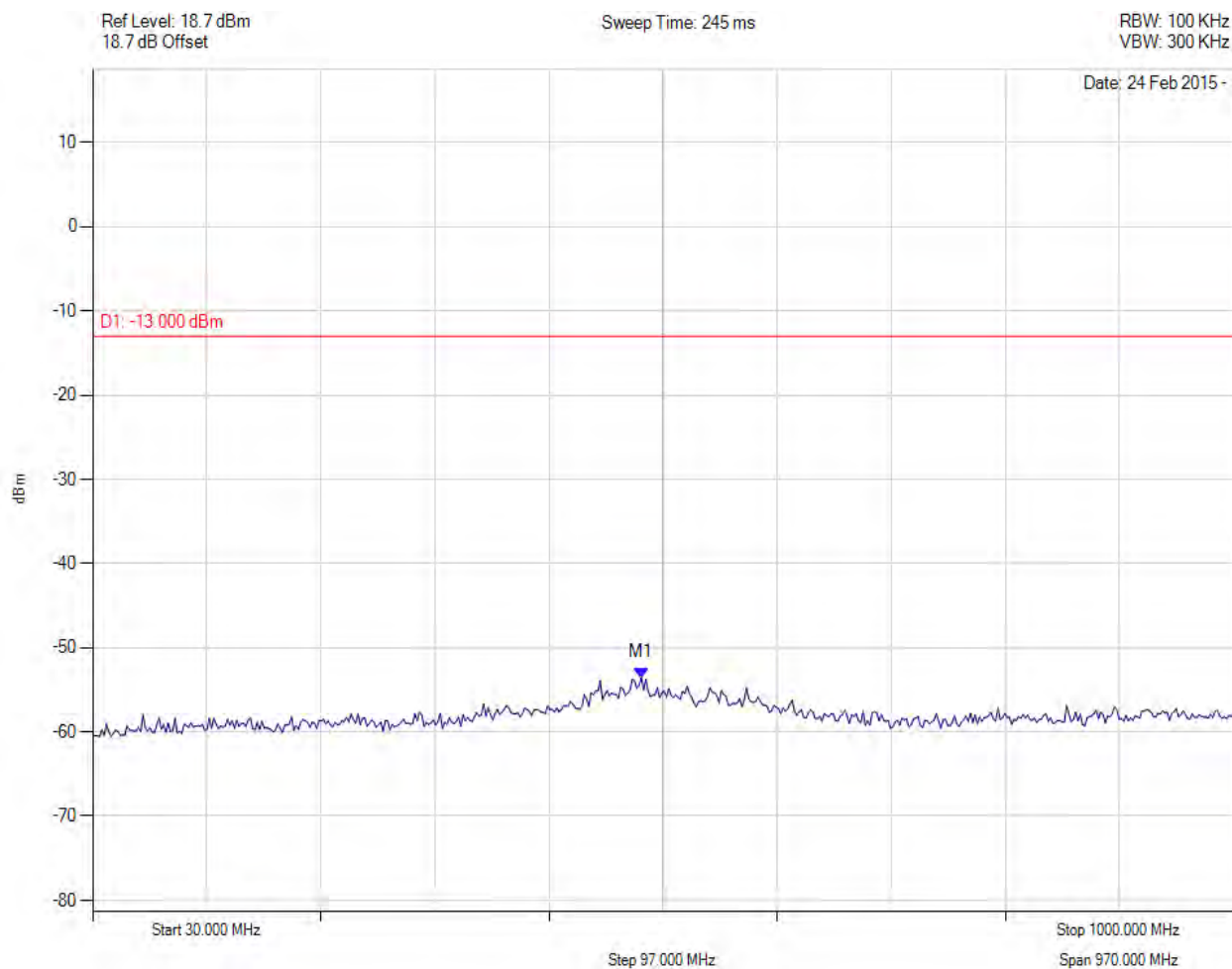


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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 496.533 MHz : -53.569 dBm	Channel Frequency: 3697.00 MHz

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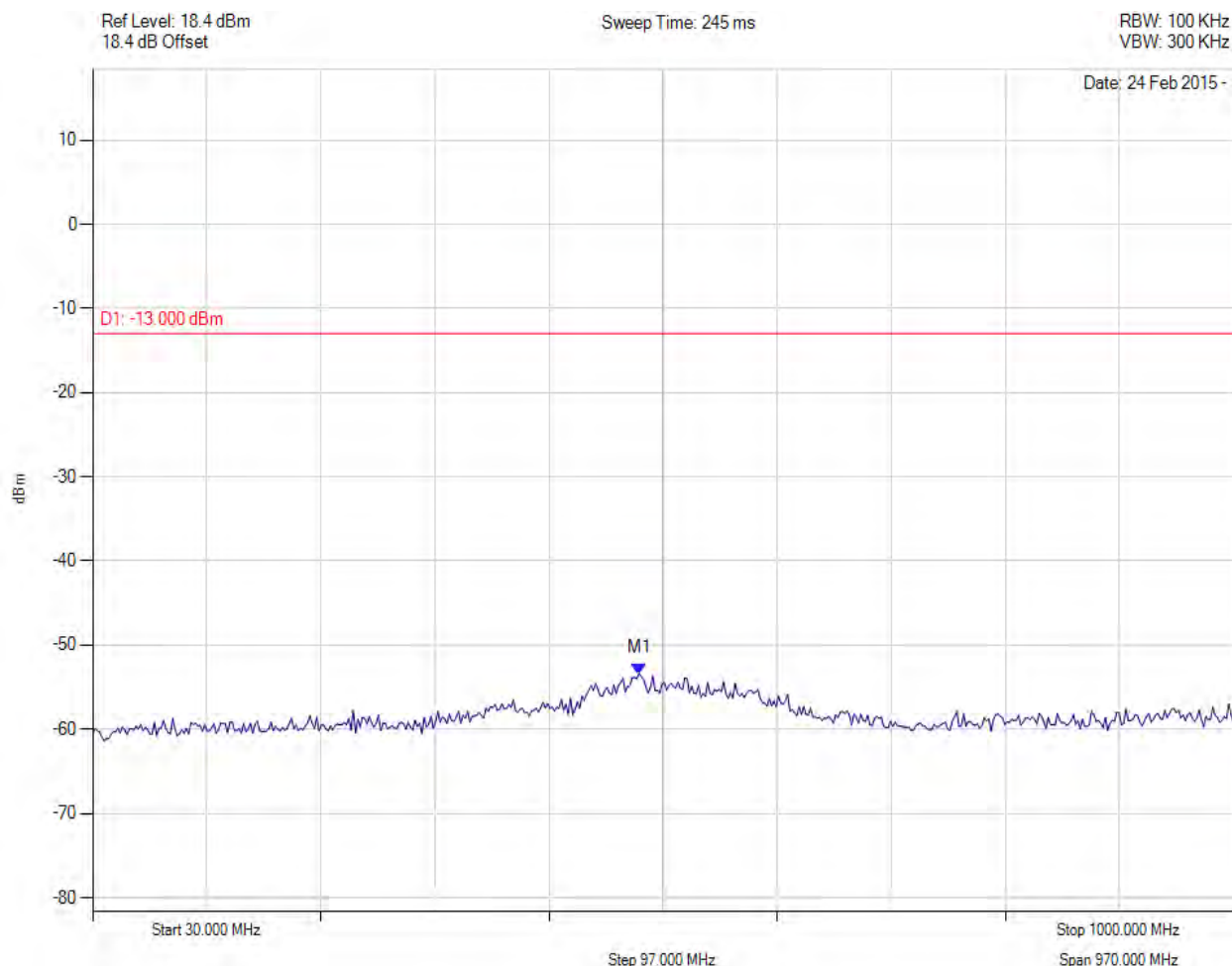


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
Serial #: RDWN35-U3 Rev A
Issue Date: 19th March 2015
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 494.589 MHz : -53.379 dBm	Channel Frequency: 3697.00 MHz

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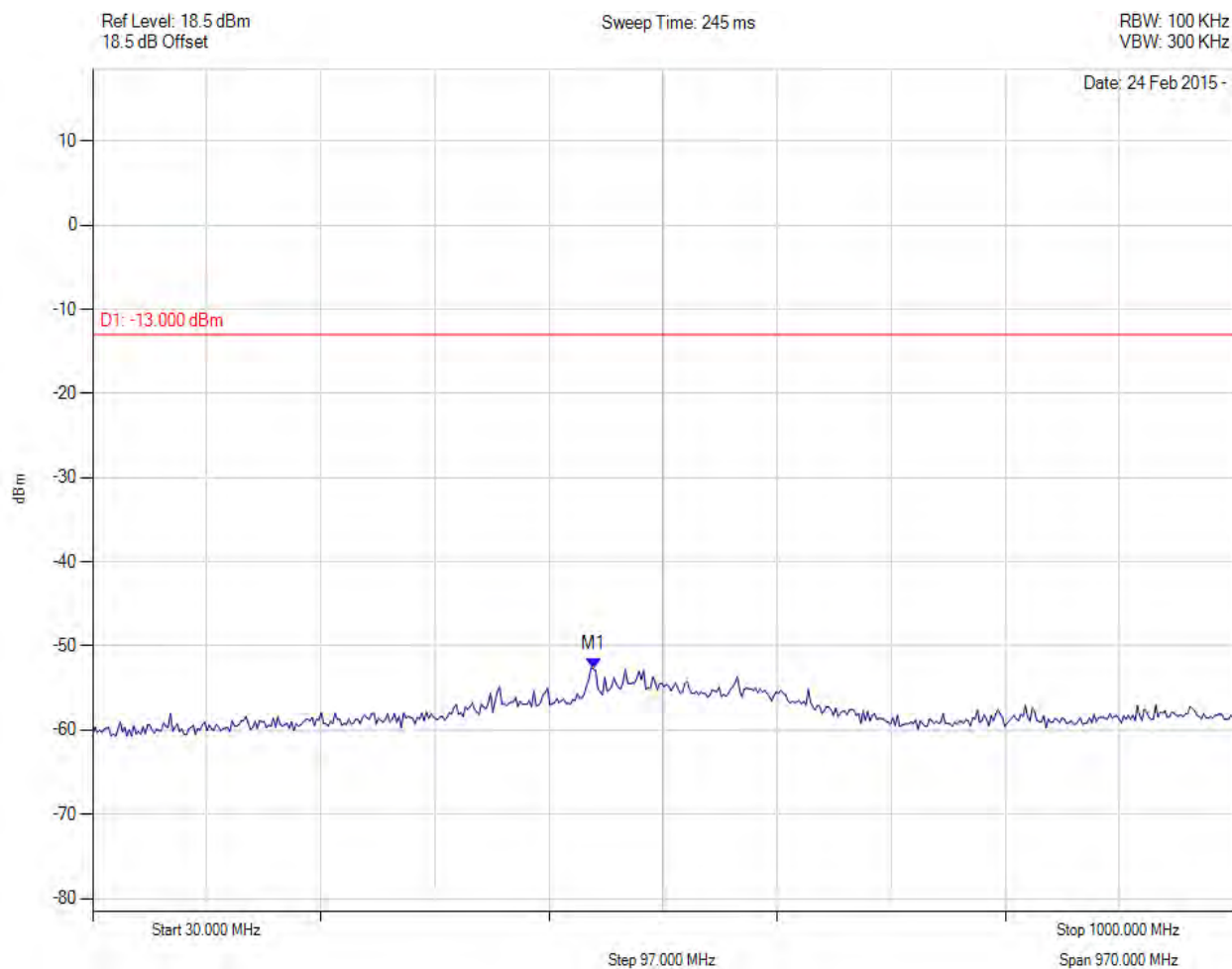


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analysar Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 455.711 MHz : -52.713 dBm	Channel Frequency: 3697.00 MHz

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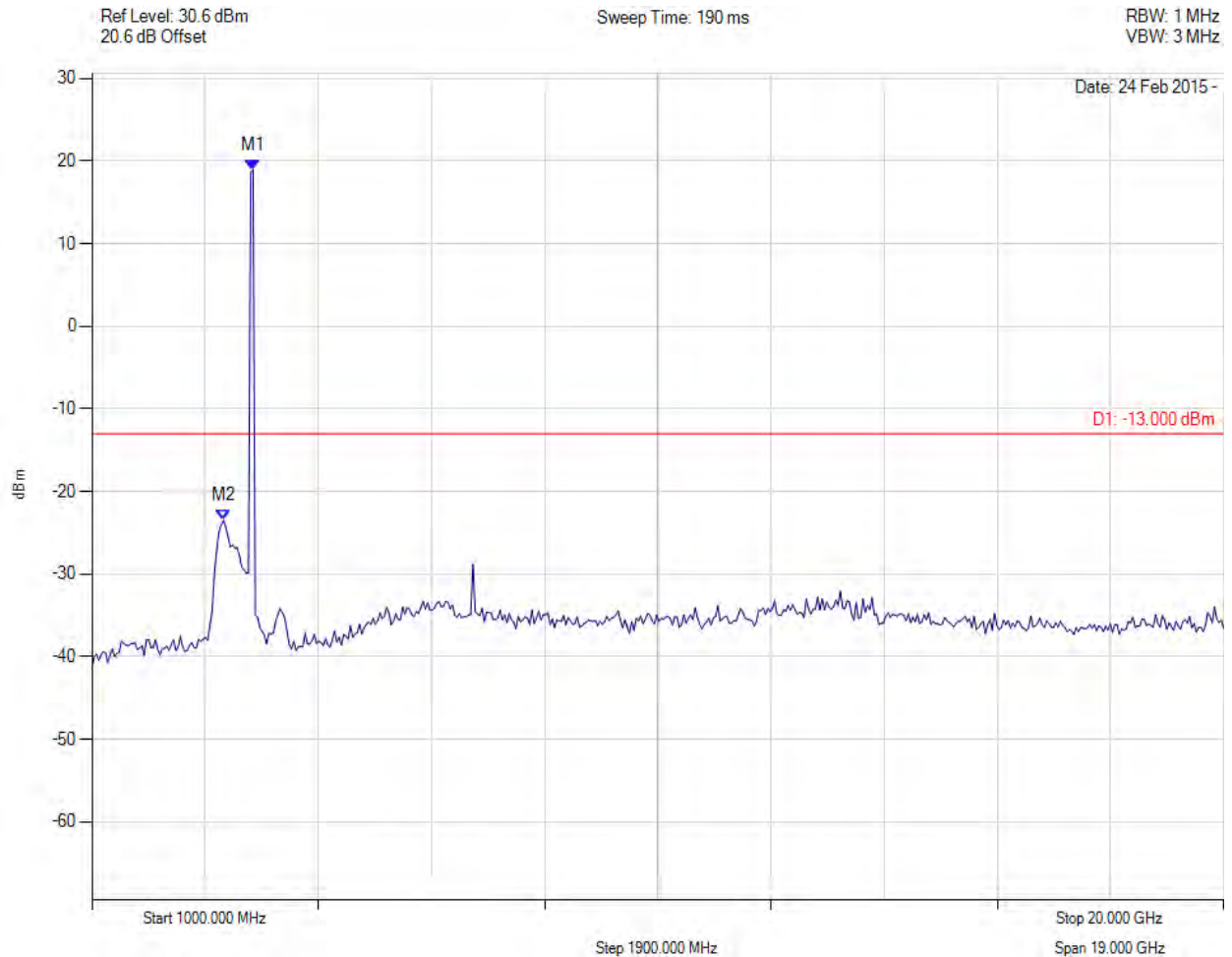


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3703.407 MHz : 18.922 dBm M2 : 3208.417 MHz : -23.485 dBm	Channel Frequency: 3697.00 MHz

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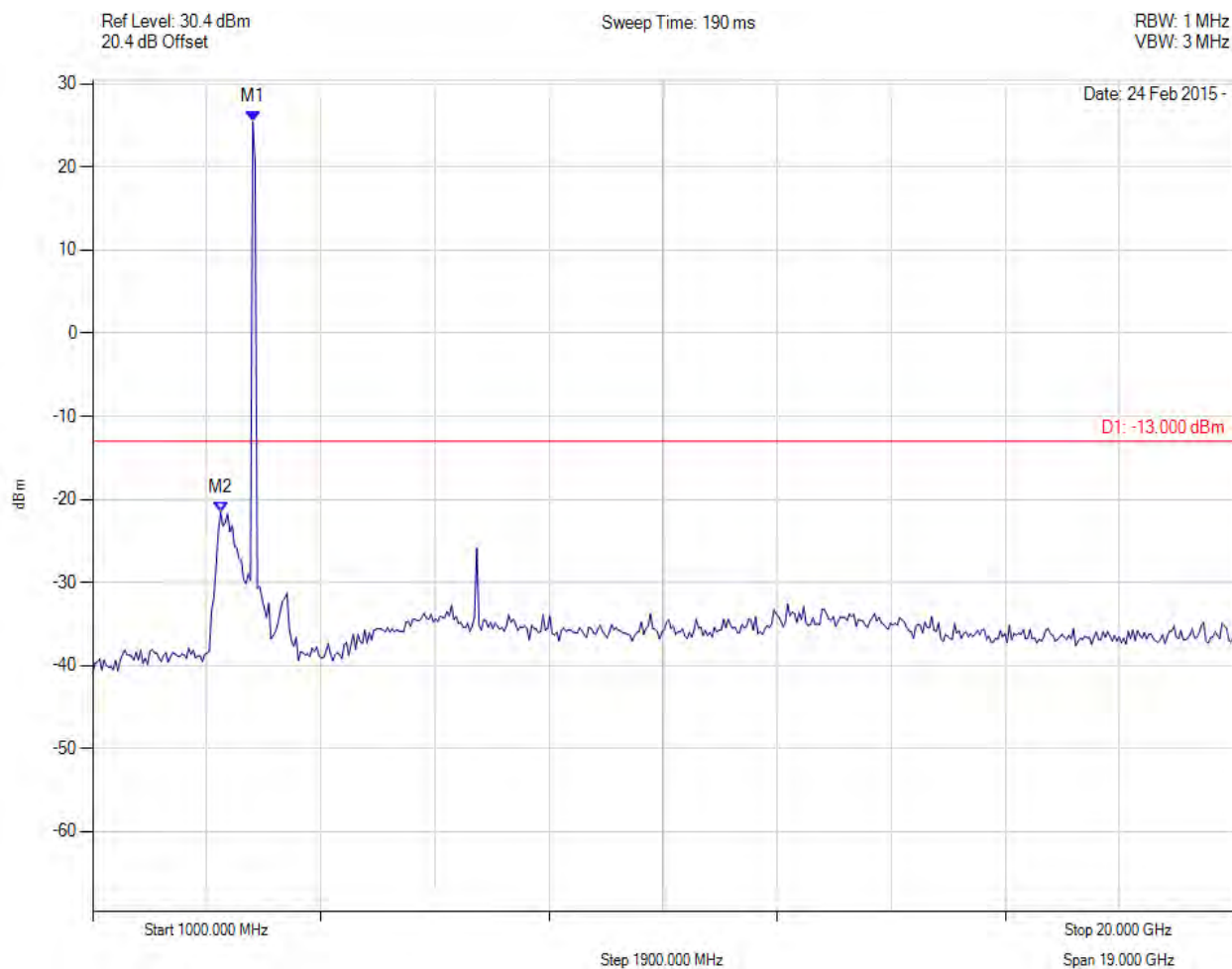


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3665.331 MHz : 25.468 dBm M2 : 3132.265 MHz : -21.562 dBm	Channel Frequency: 3697.00 MHz

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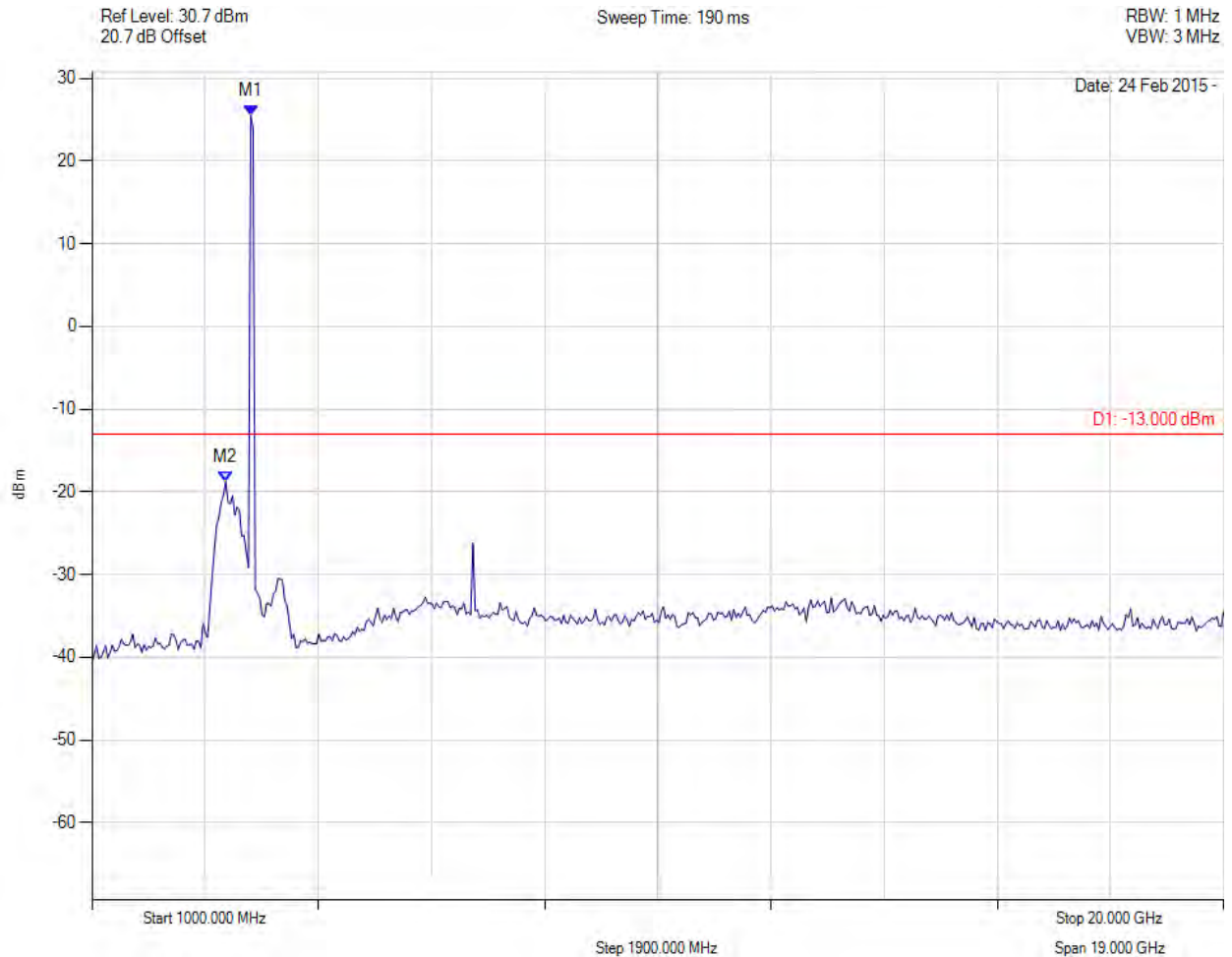


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 3665.331 MHz : 25.519 dBm M2 : 3246.493 MHz : -18.786 dBm	Channel Frequency: 3697.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

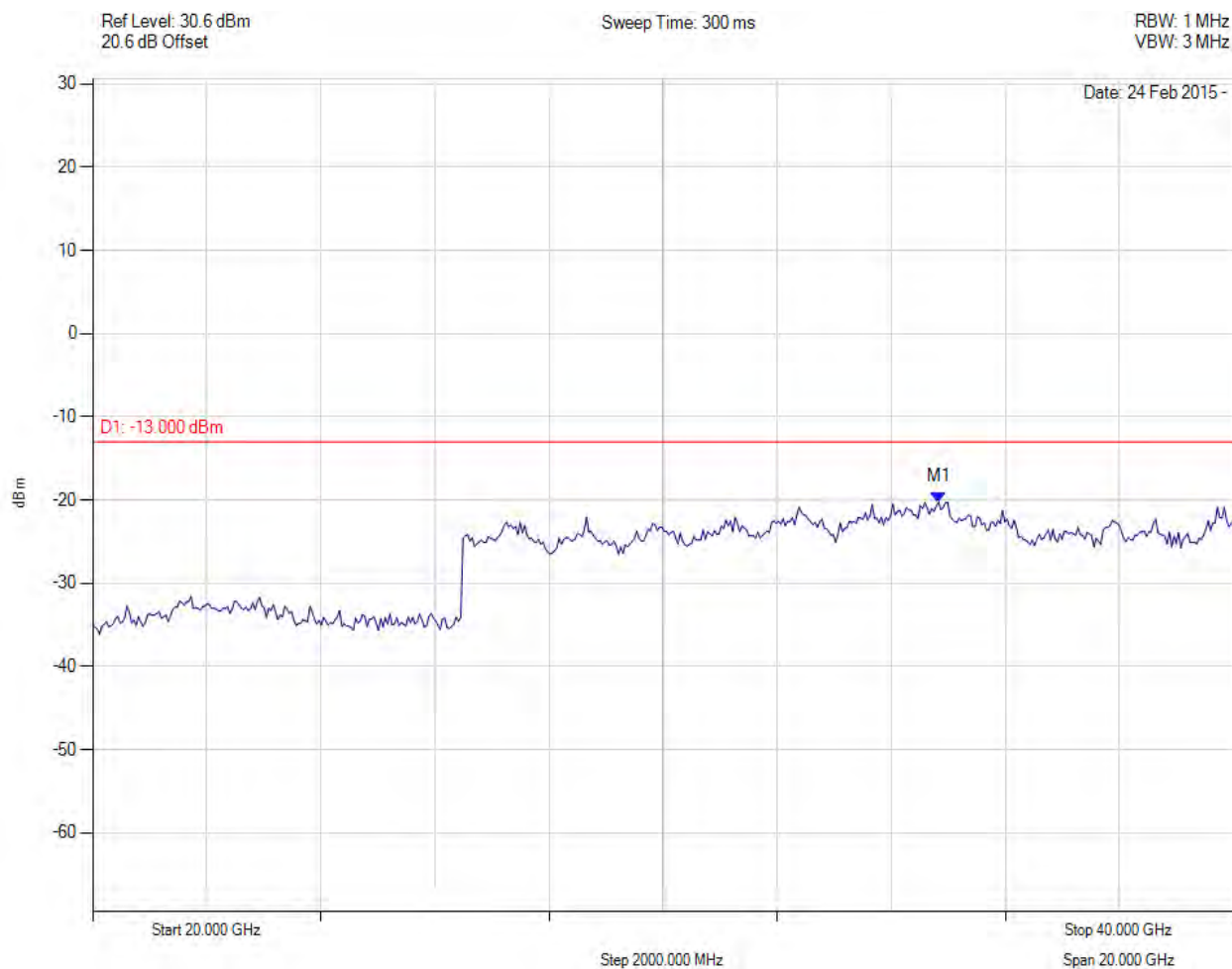


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.830 GHz : -20.250 dBm	Channel Frequency: 3697.00 MHz

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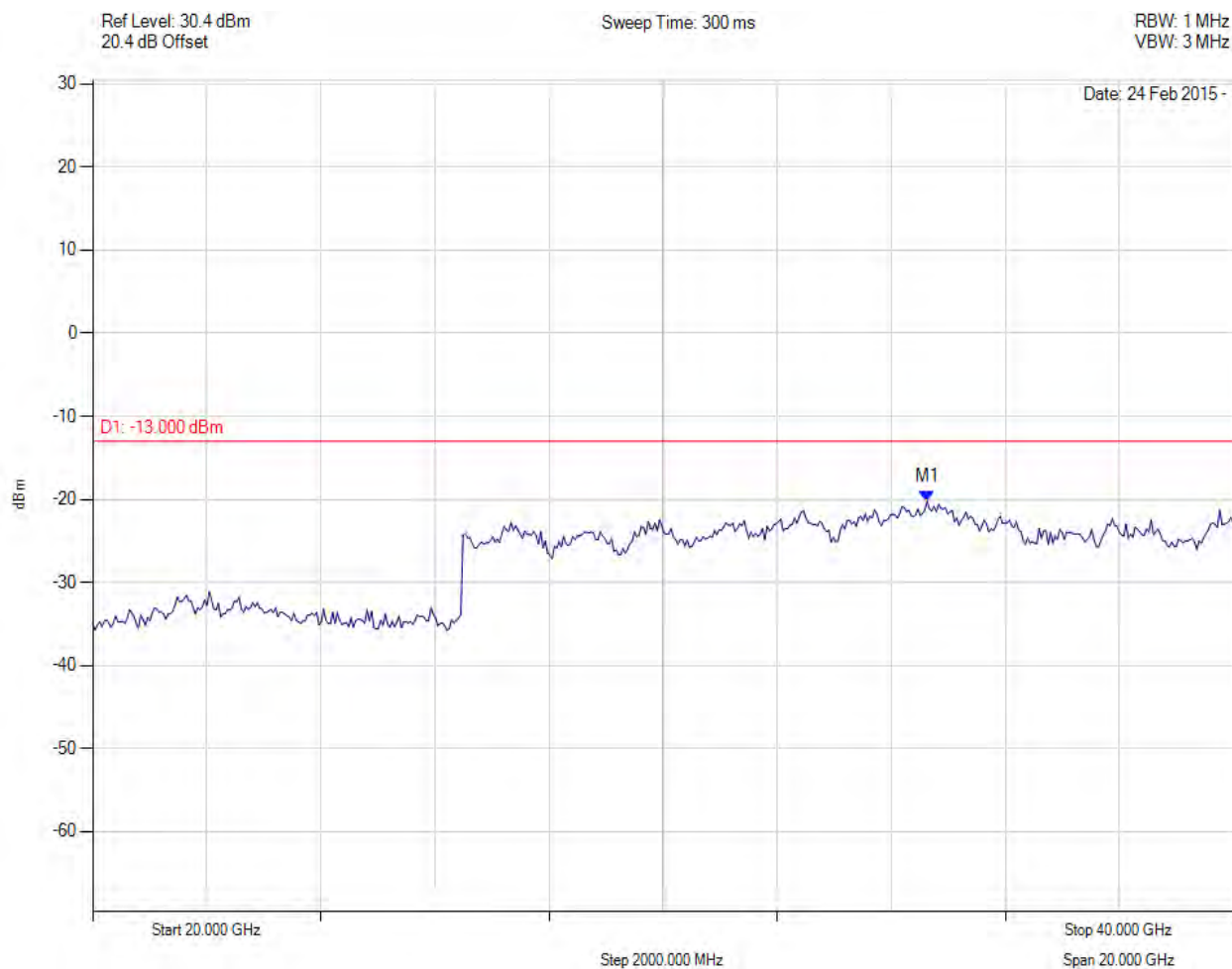


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.629 GHz : -20.232 dBm	Channel Frequency: 3697.00 MHz

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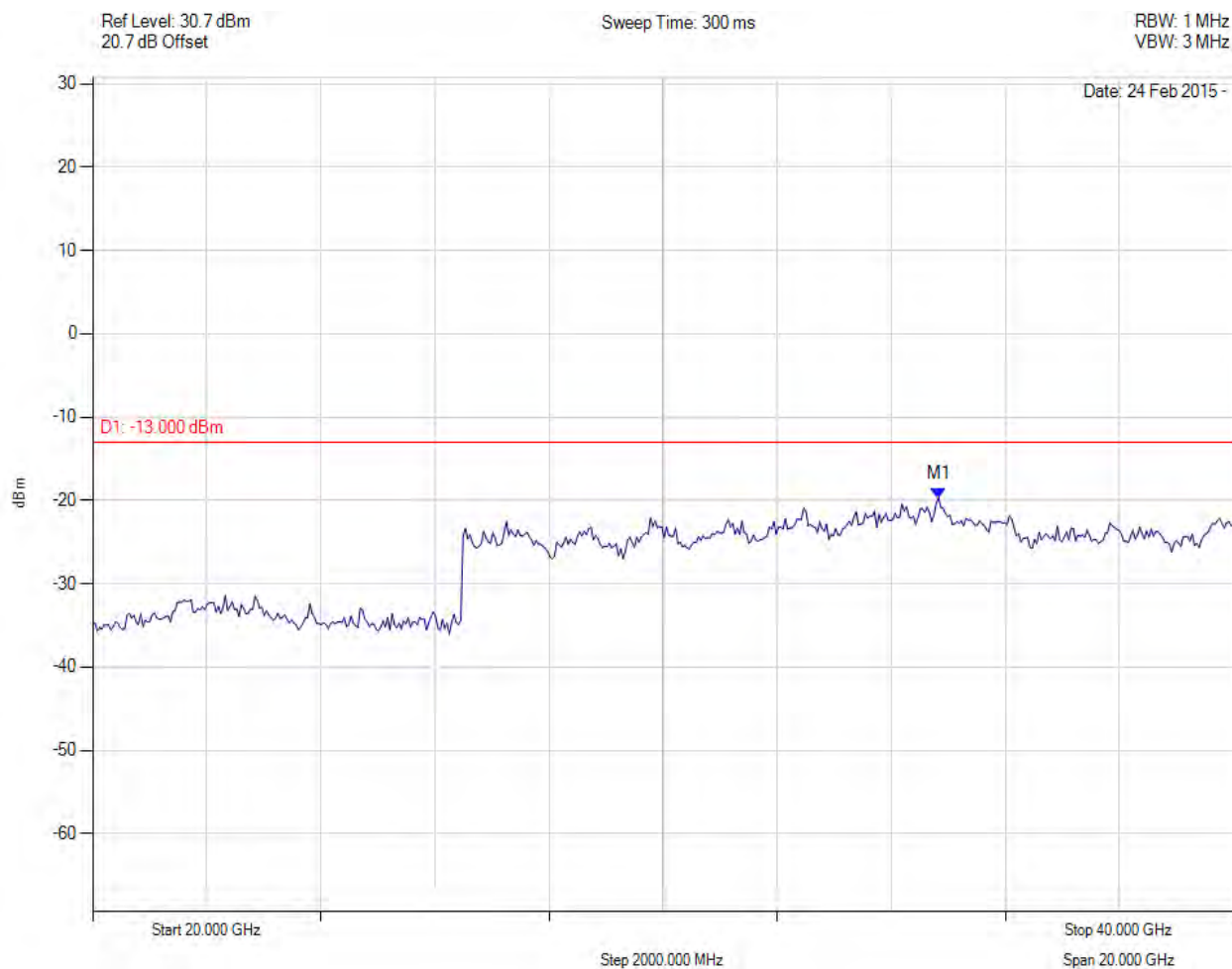


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Unwanted Emissions

Variant: BPSK, Channel: 3697.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = VIEW	M1 : 34.830 GHz : -19.717 dBm	Channel Frequency: 3697.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

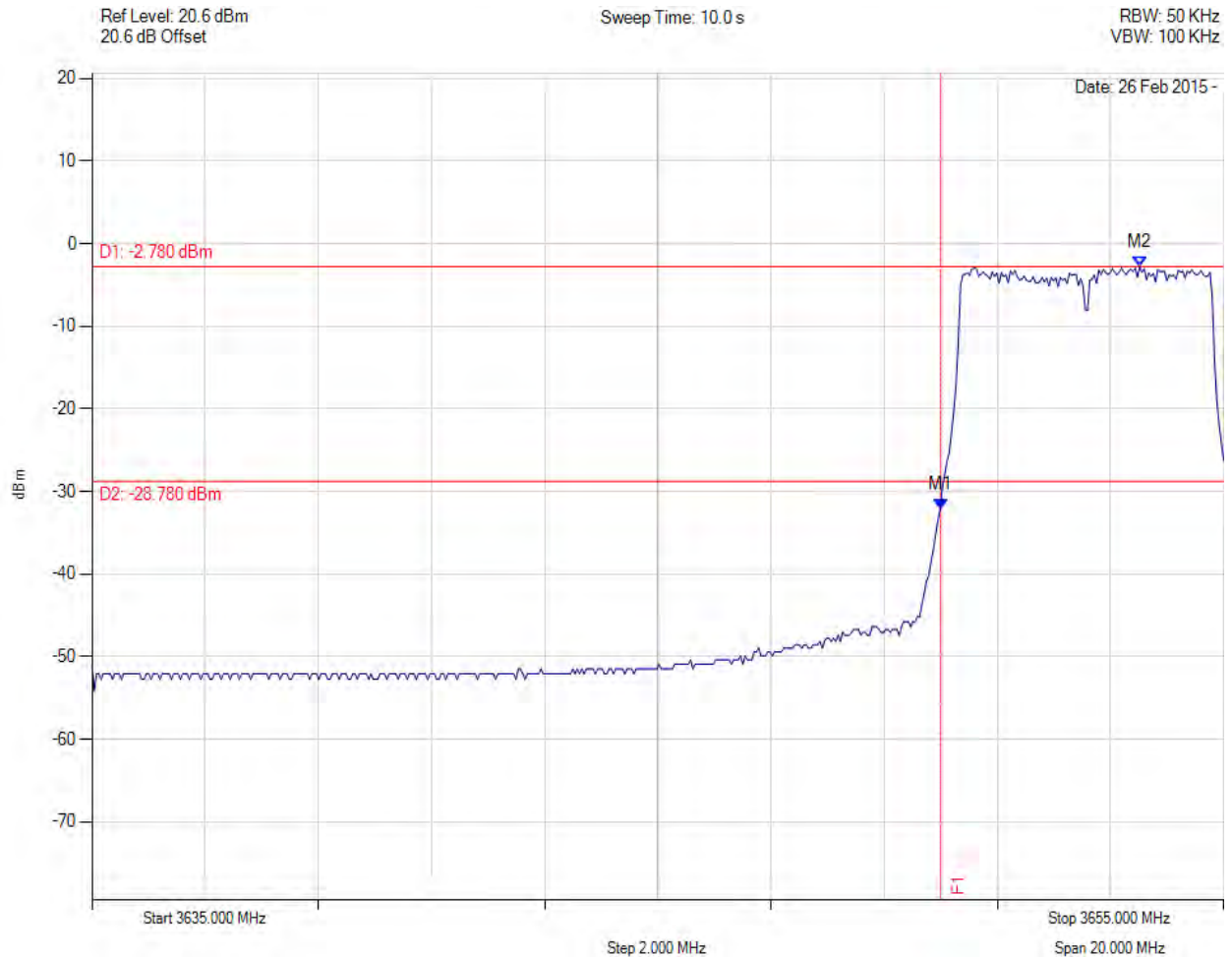


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3652.50 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -32.125 dBm M2 : 3653.517 MHz : -2.781 dBm	Channel Frequency: 3652.50 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

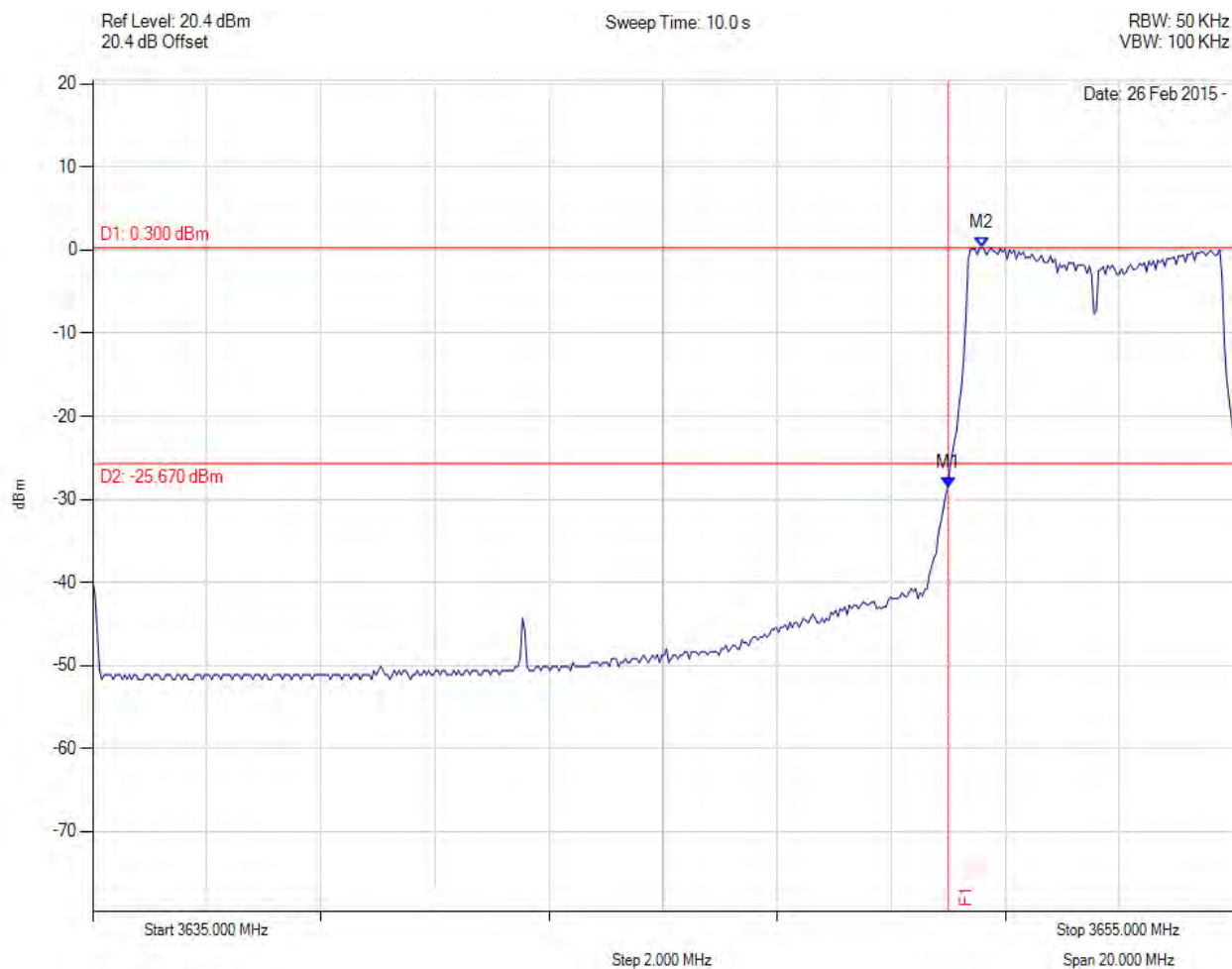


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3652.50 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -28.567 dBm M2 : 3650.591 MHz : 0.327 dBm	Channel Frequency: 3652.50 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

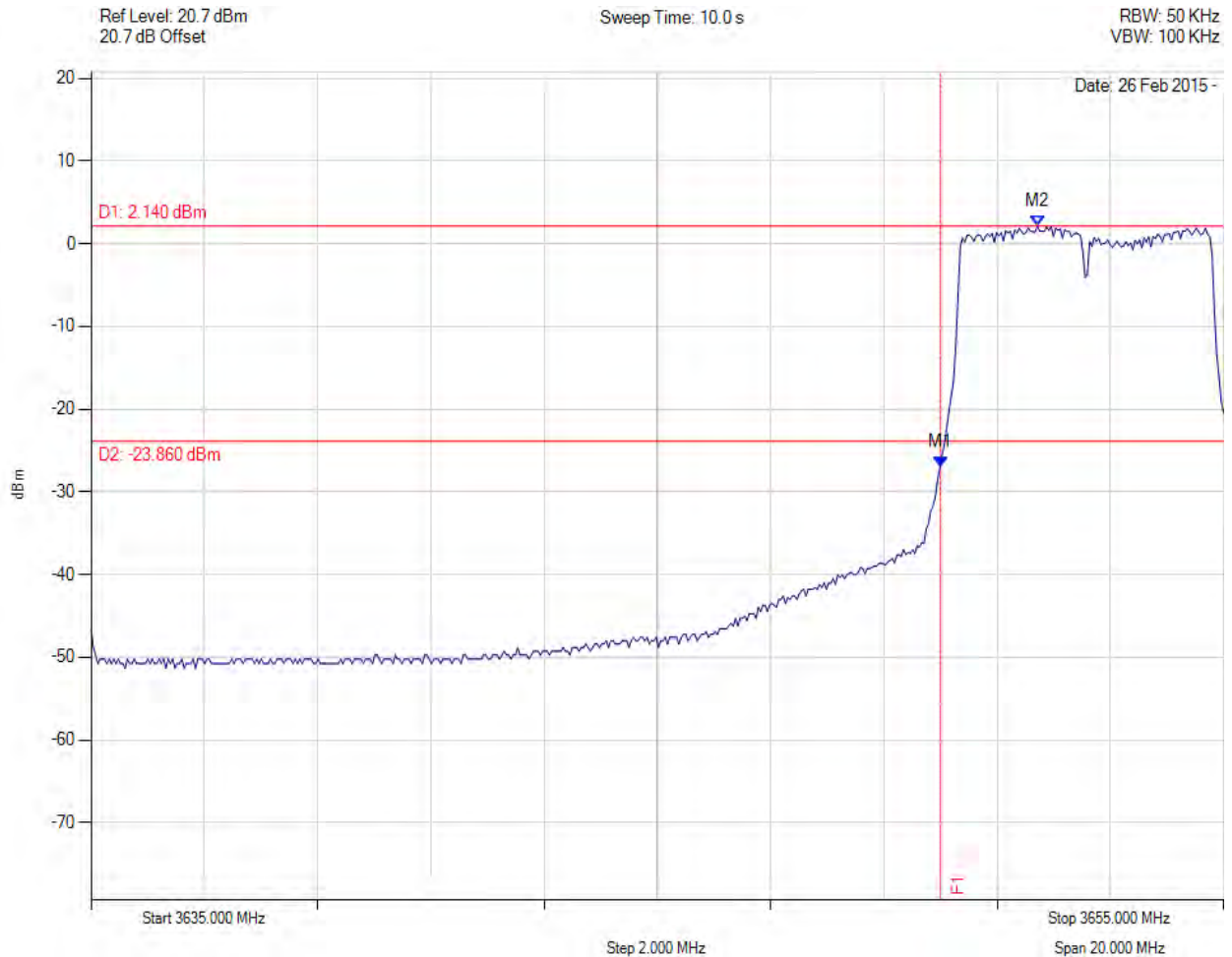


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3652.50 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -27.007 dBm M2 : 3651.713 MHz : 2.138 dBm	Channel Frequency: 3652.50 MHz

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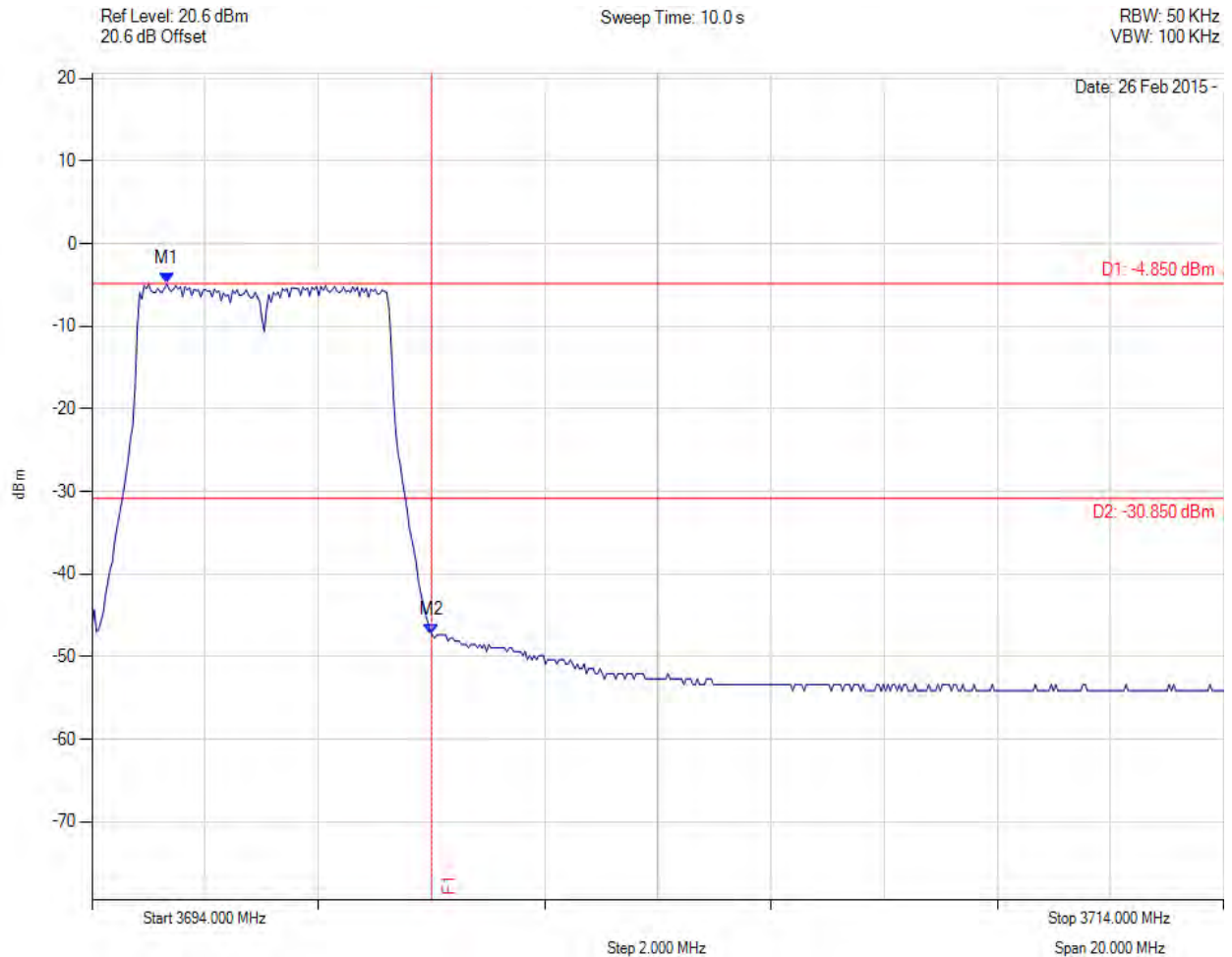


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3697.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3695.323 MHz : -4.850 dBm M2 : 3700.000 MHz : -47.351 dBm	Channel Frequency: 3697.00 MHz

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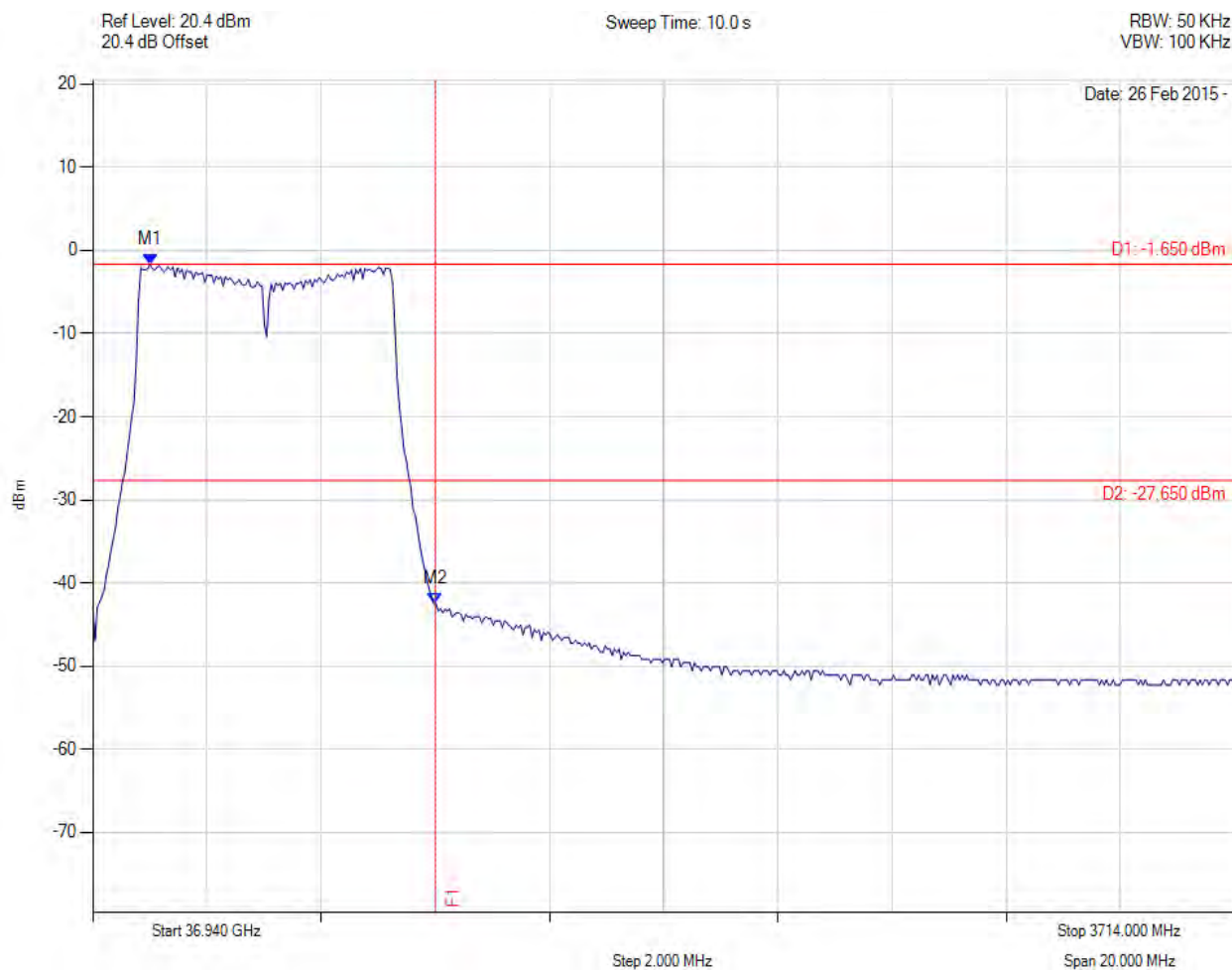


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3697.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 20 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3695.002 MHz : -1.651 dBm M2 : 3700.000 MHz : -42.506 dBm	Channel Frequency: 3697.00 MHz

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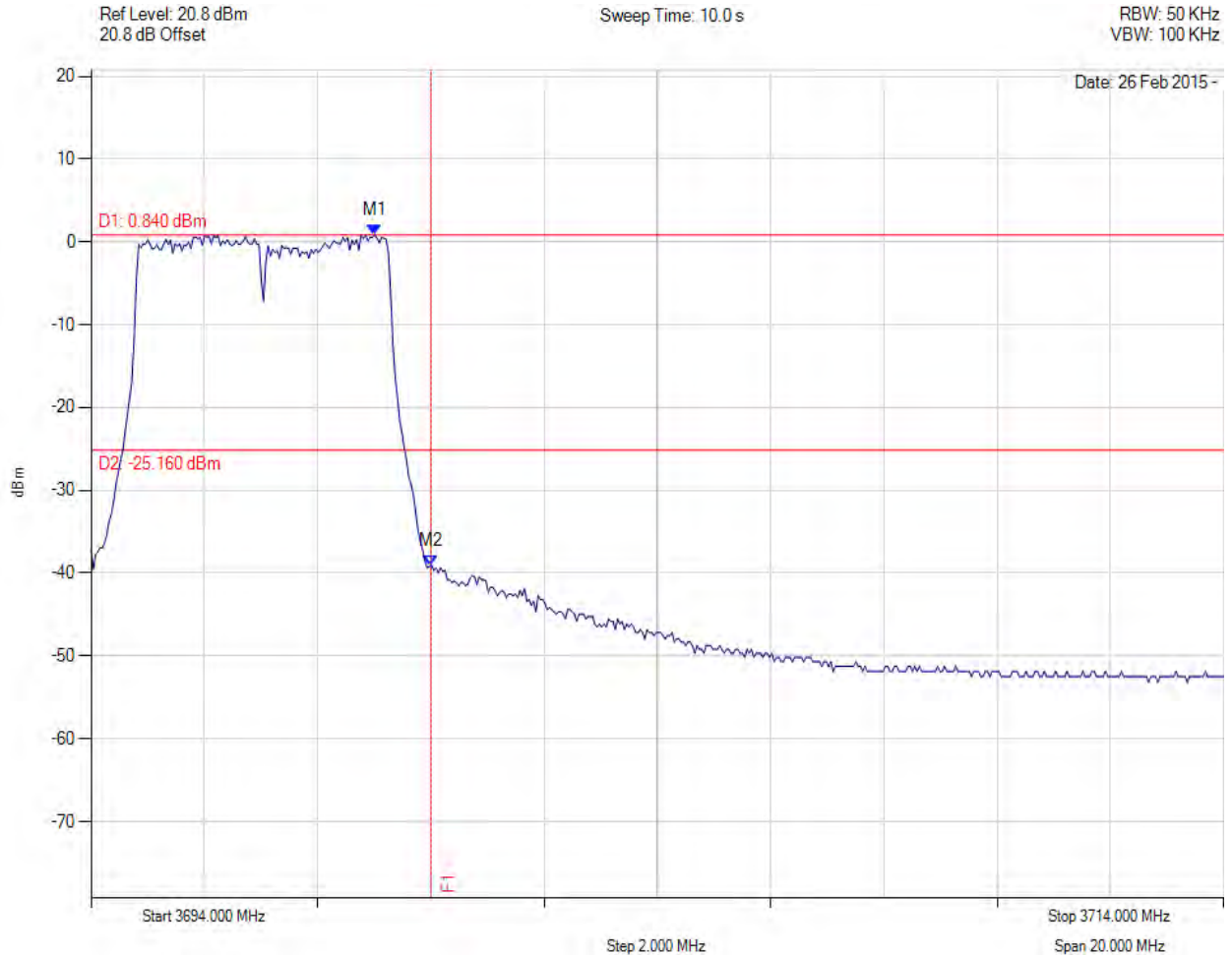


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3697.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3699.010 MHz : 0.840 dBm M2 : 3700.000 MHz : -39.069 dBm	Channel Frequency: 3697.00 MHz

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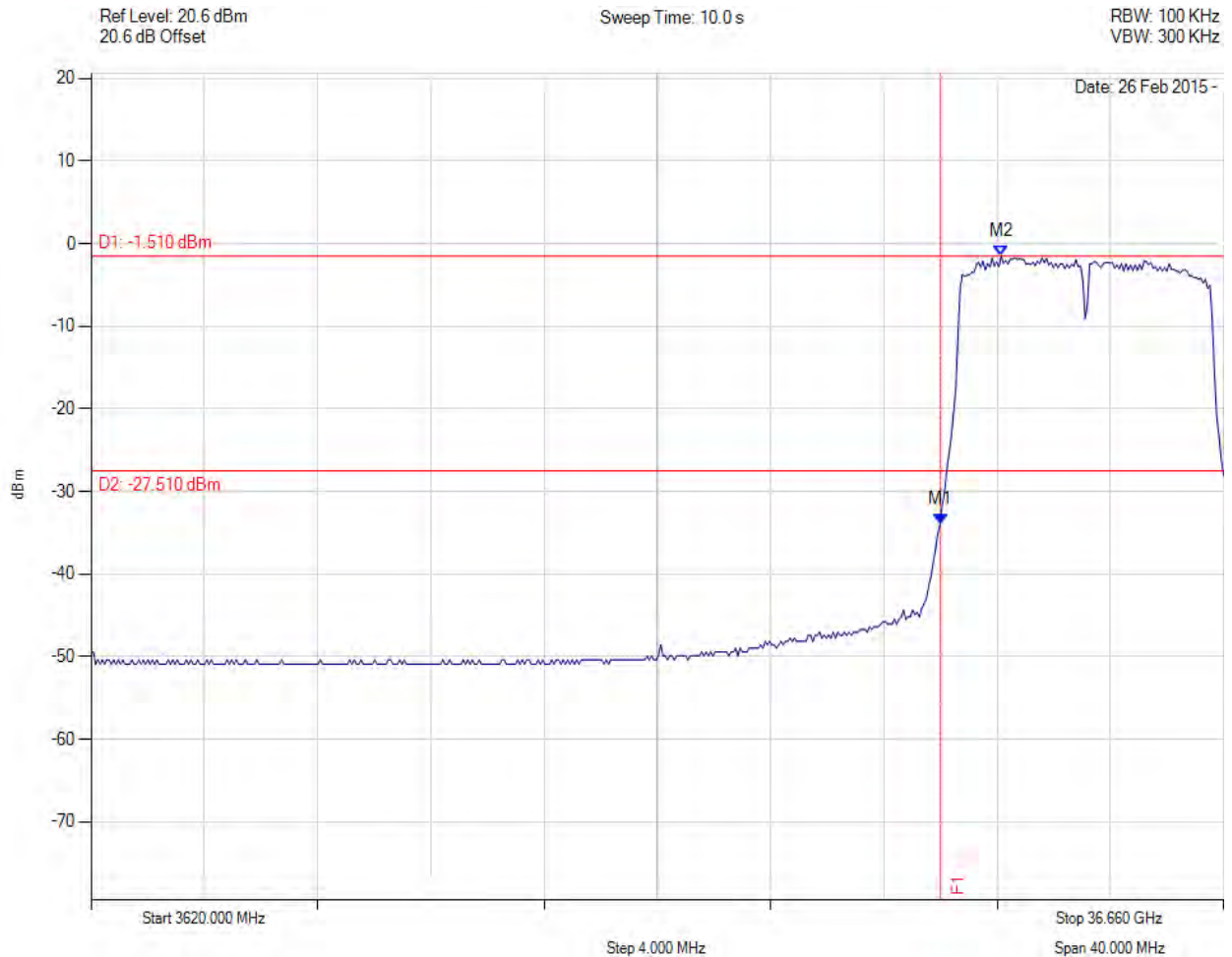


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3655.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -34.001 dBm M2 : 3652.144 MHz : -1.512 dBm	Channel Frequency: 3655.00 MHz

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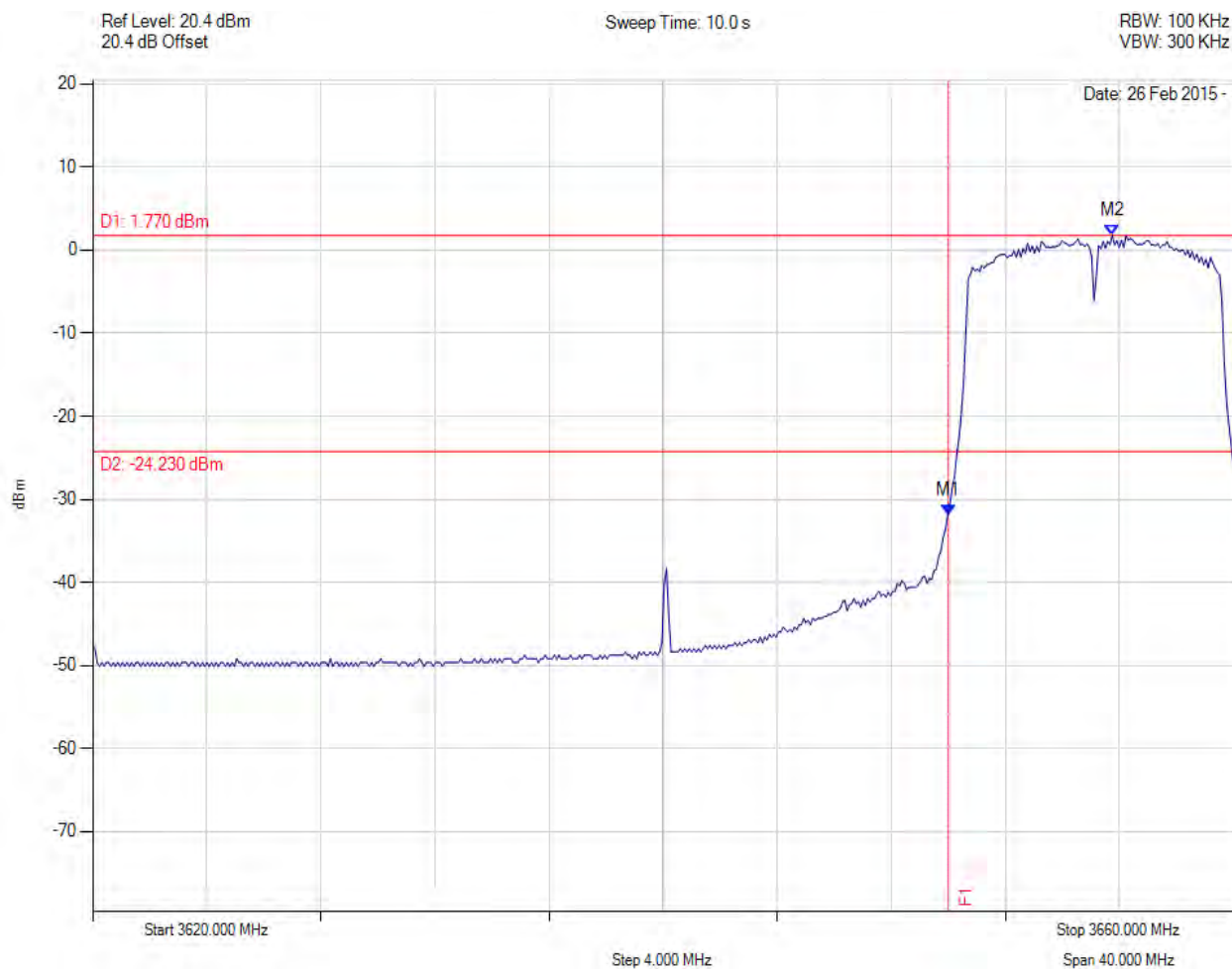


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3655.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -31.869 dBm M2 : 3655.752 MHz : 1.773 dBm	Channel Frequency: 3655.00 MHz

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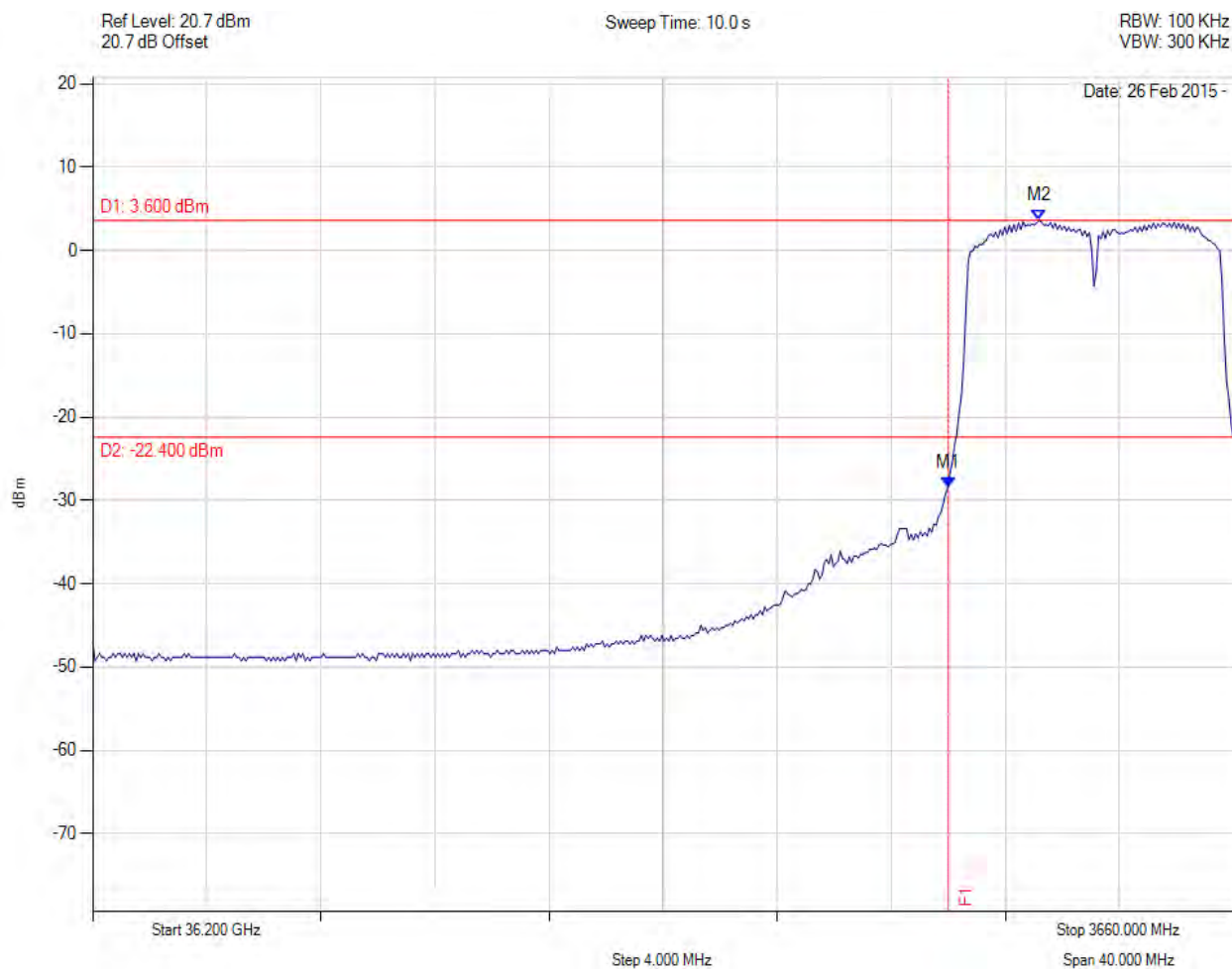


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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3655.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -28.506 dBm M2 : 3653.186 MHz : 3.600 dBm	Channel Frequency: 3655.00 MHz

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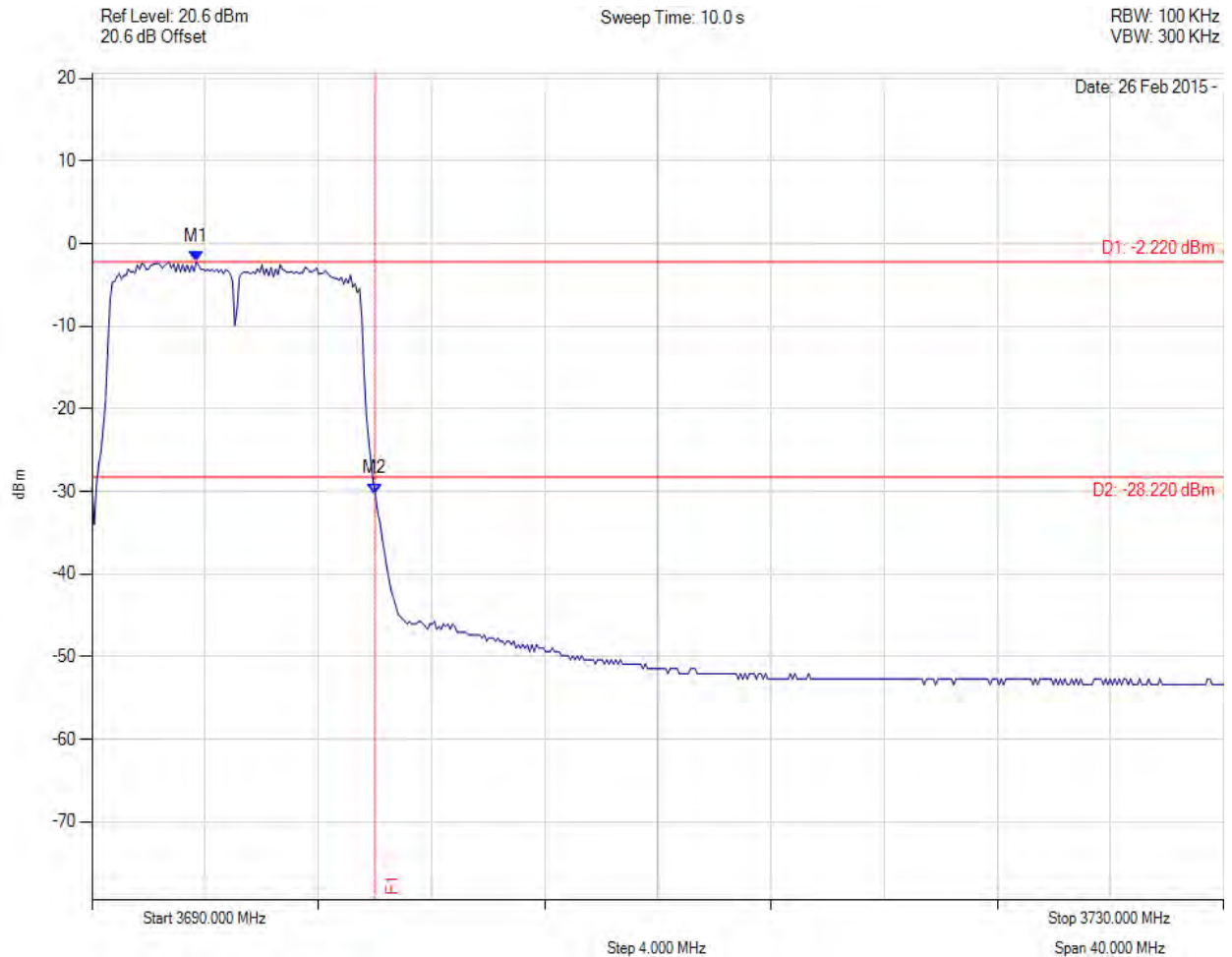


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3695.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3693.687 MHz : -2.216 dBm M2 : 3700.000 MHz : -30.255 dBm	Channel Frequency: 3695.00 MHz

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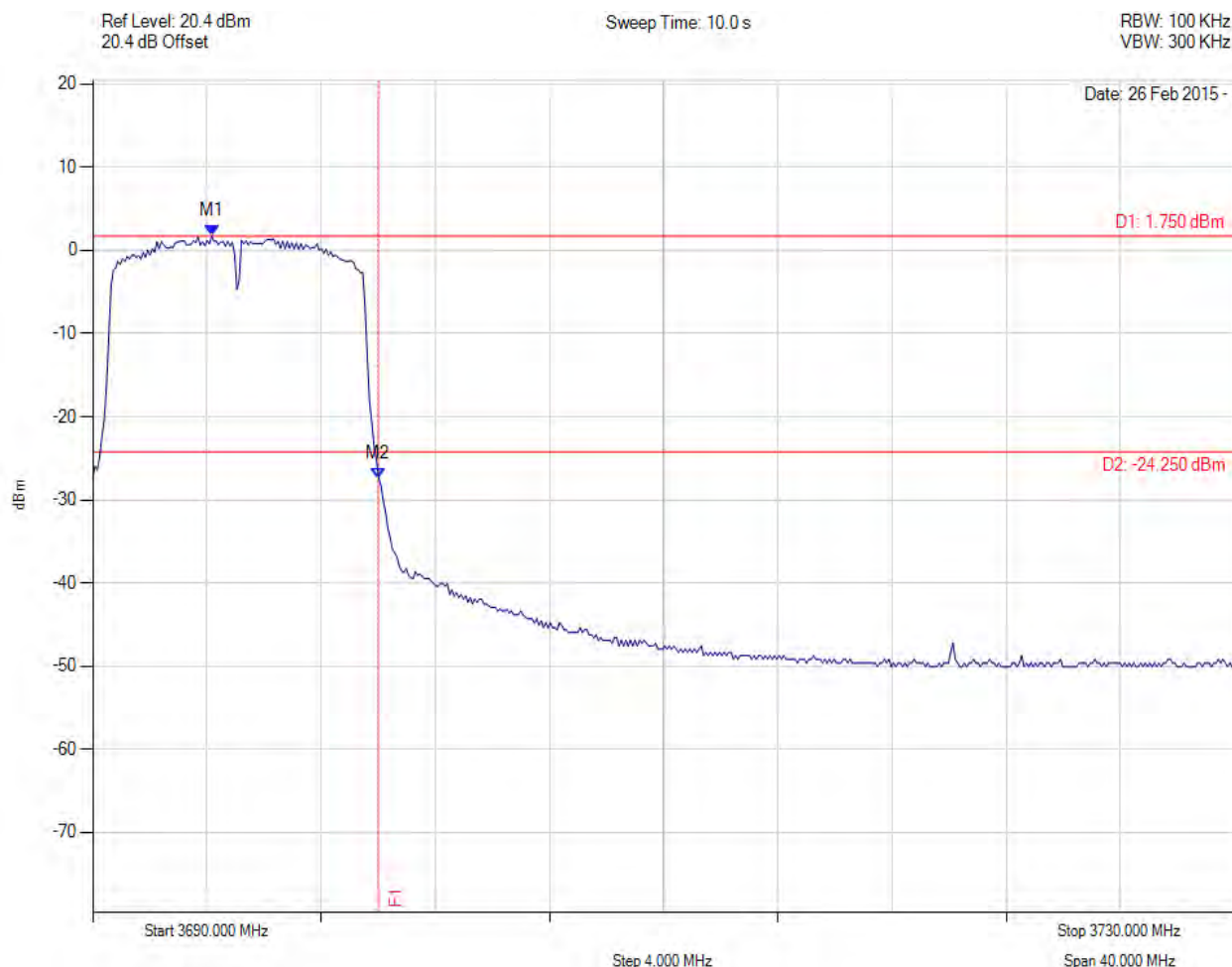


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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3695.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3694.168 MHz : 1.745 dBm M2 : 3700.000 MHz : -27.402 dBm	Channel Frequency: 3695.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

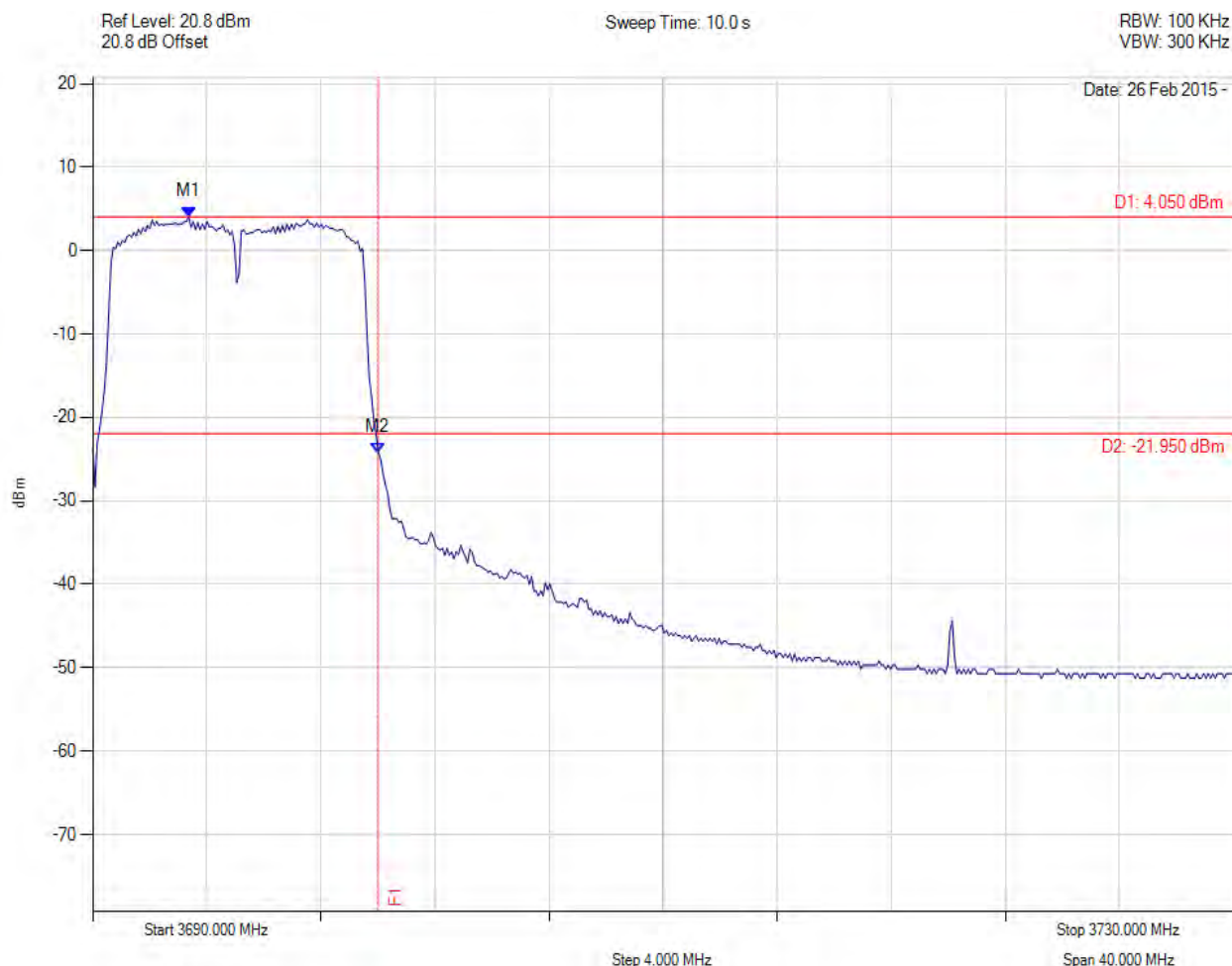


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3695.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3693.367 MHz : 4.054 dBm M2 : 3700.000 MHz : -24.233 dBm	Channel Frequency: 3695.00 MHz

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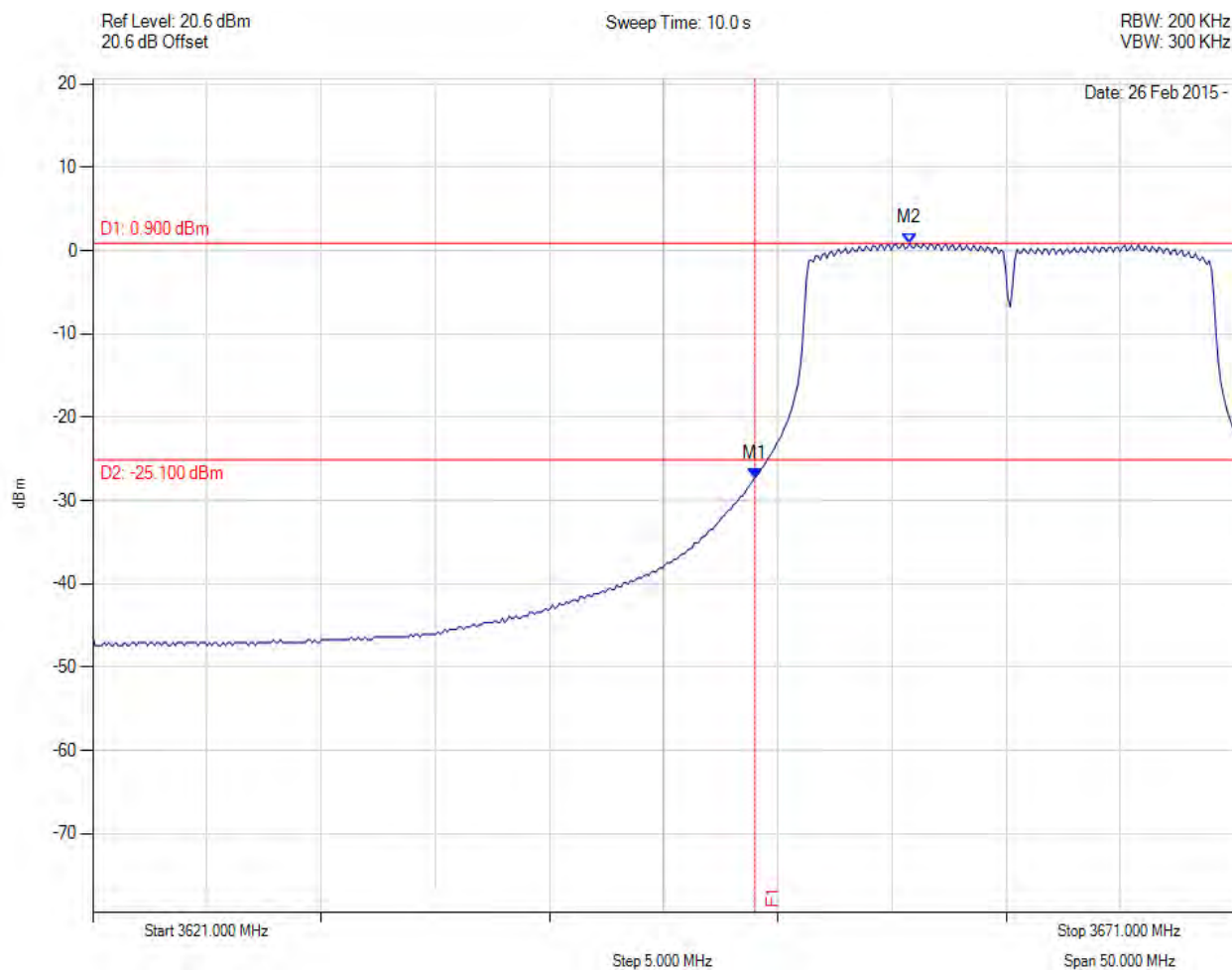


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3661.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -27.345 dBm M2 : 3656.772 MHz : 0.899 dBm	Channel Frequency: 3661.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

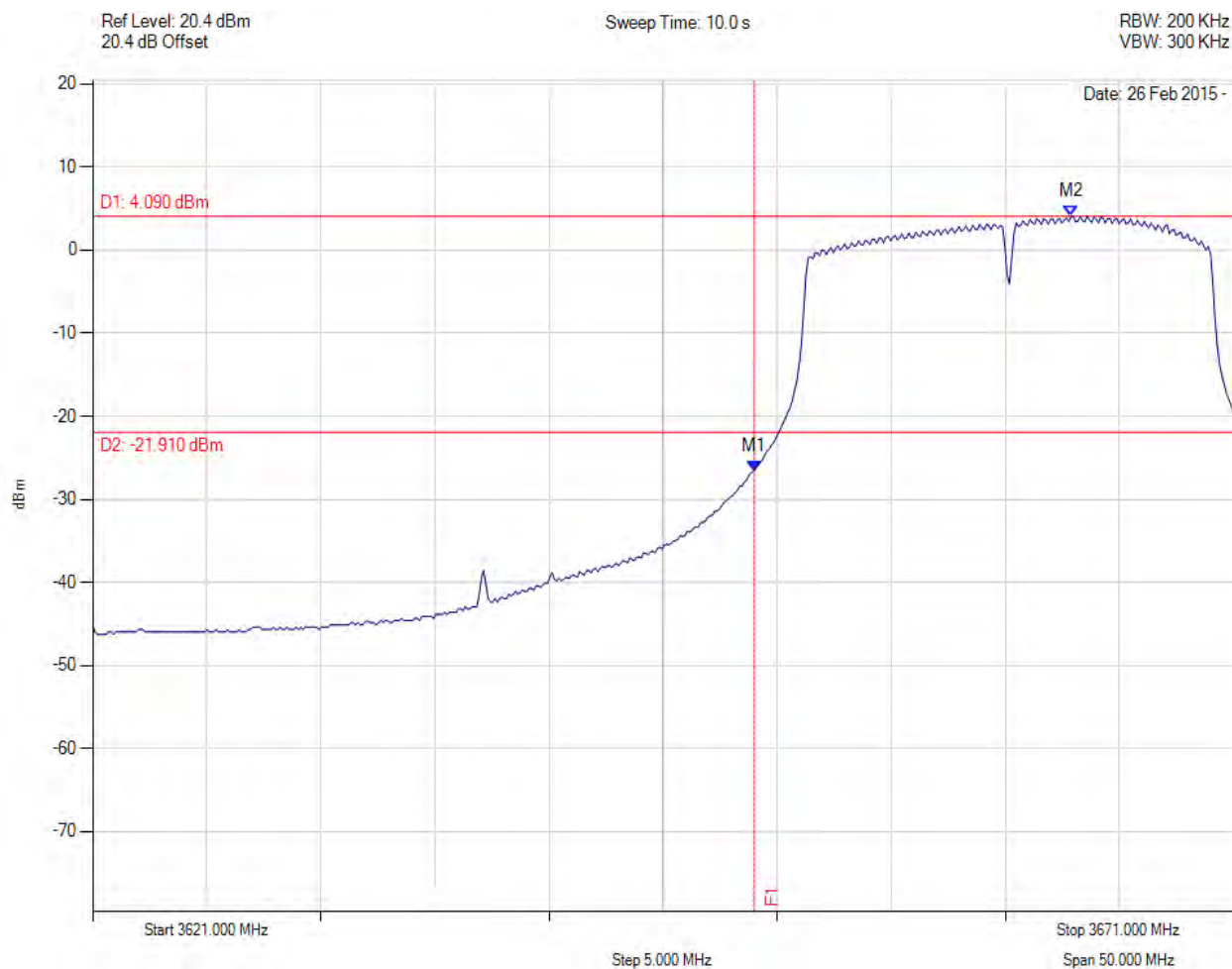


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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3661.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -26.620 dBm M2 : 3663.886 MHz : 4.093 dBm	Channel Frequency: 3661.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

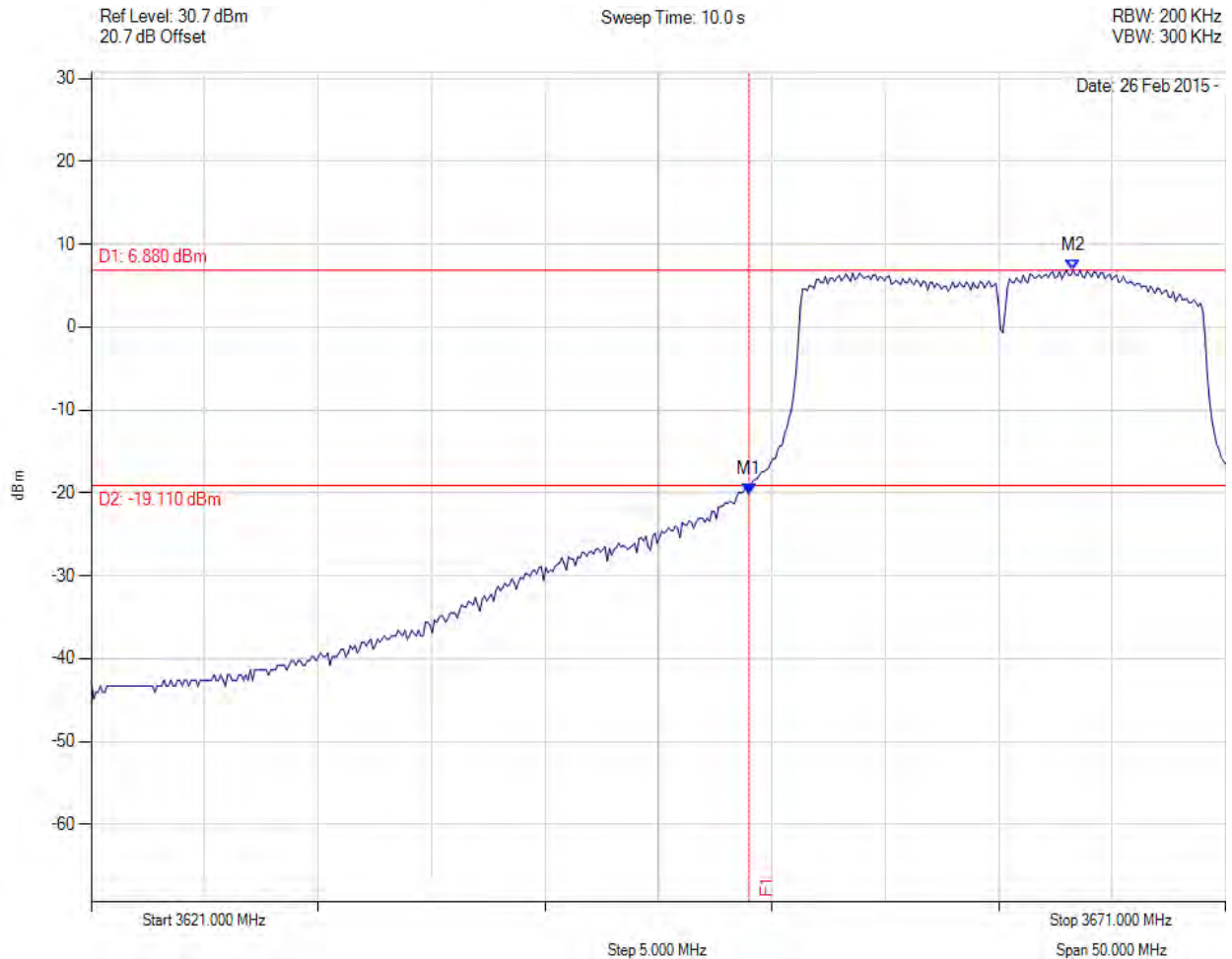


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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3661.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -20.054 dBm M2 : 3664.287 MHz : 6.887 dBm	Channel Frequency: 3661.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

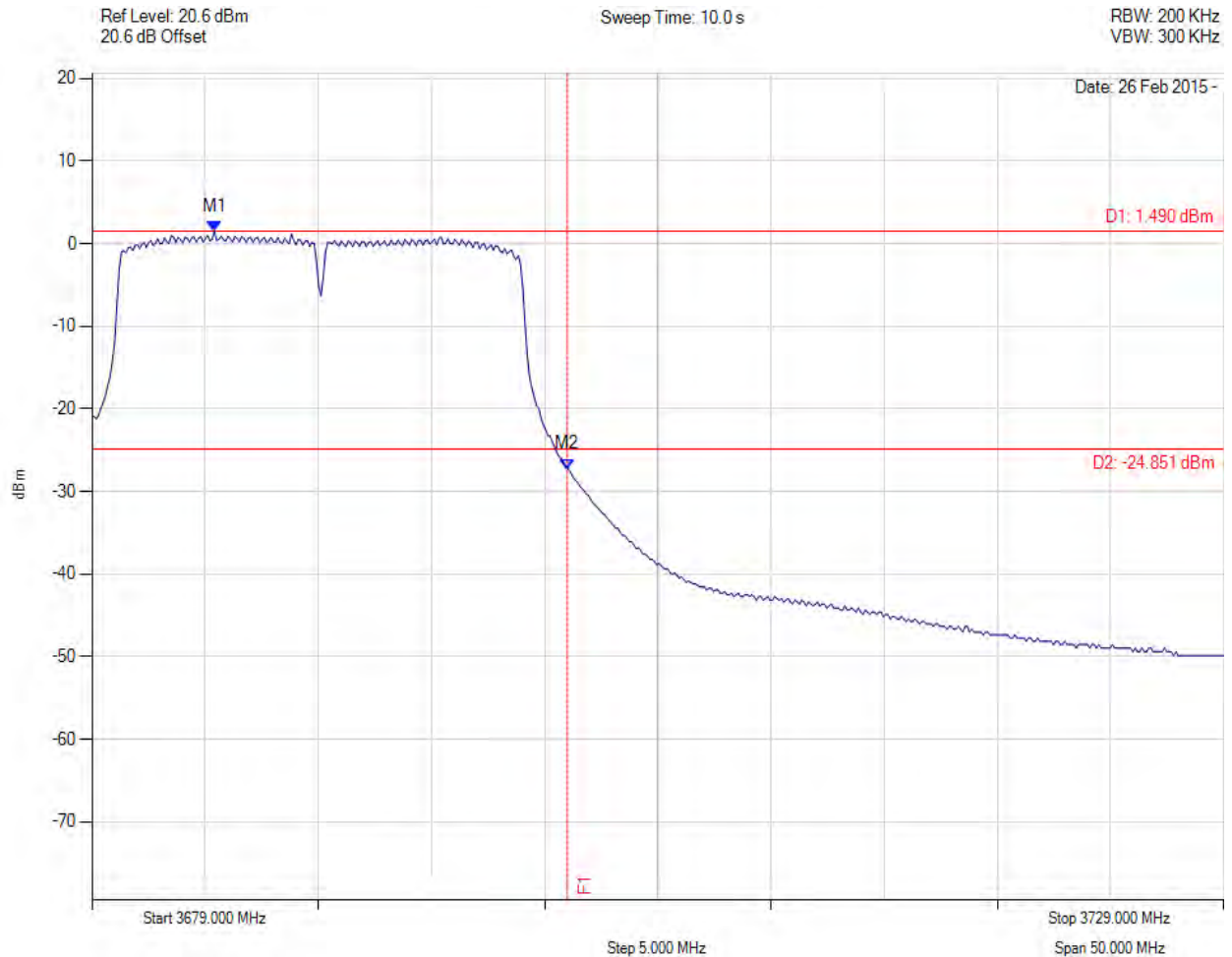


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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3689.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3684.411 MHz : 1.492 dBm M2 : 3700.000 MHz : -27.289 dBm	Channel Frequency: 3689.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

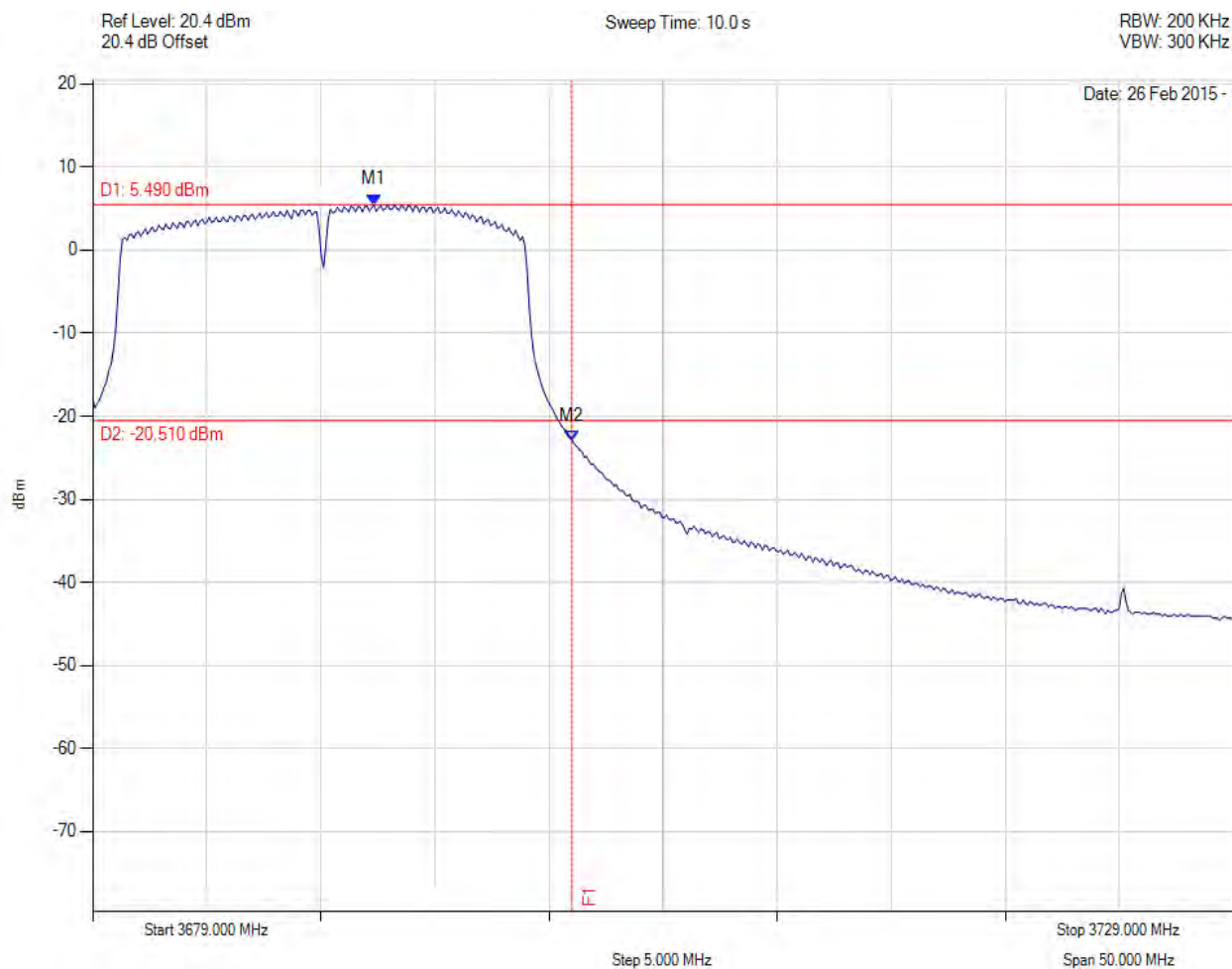


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3689.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3691.325 MHz : 5.492 dBm M2 : 3700.000 MHz : -23.015 dBm	Channel Frequency: 3689.00 MHz

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This test report may be reproduced in full only. The document may only be updated by MiCOM Labs personnel. Any changes will be noted in the Document History section of the report.

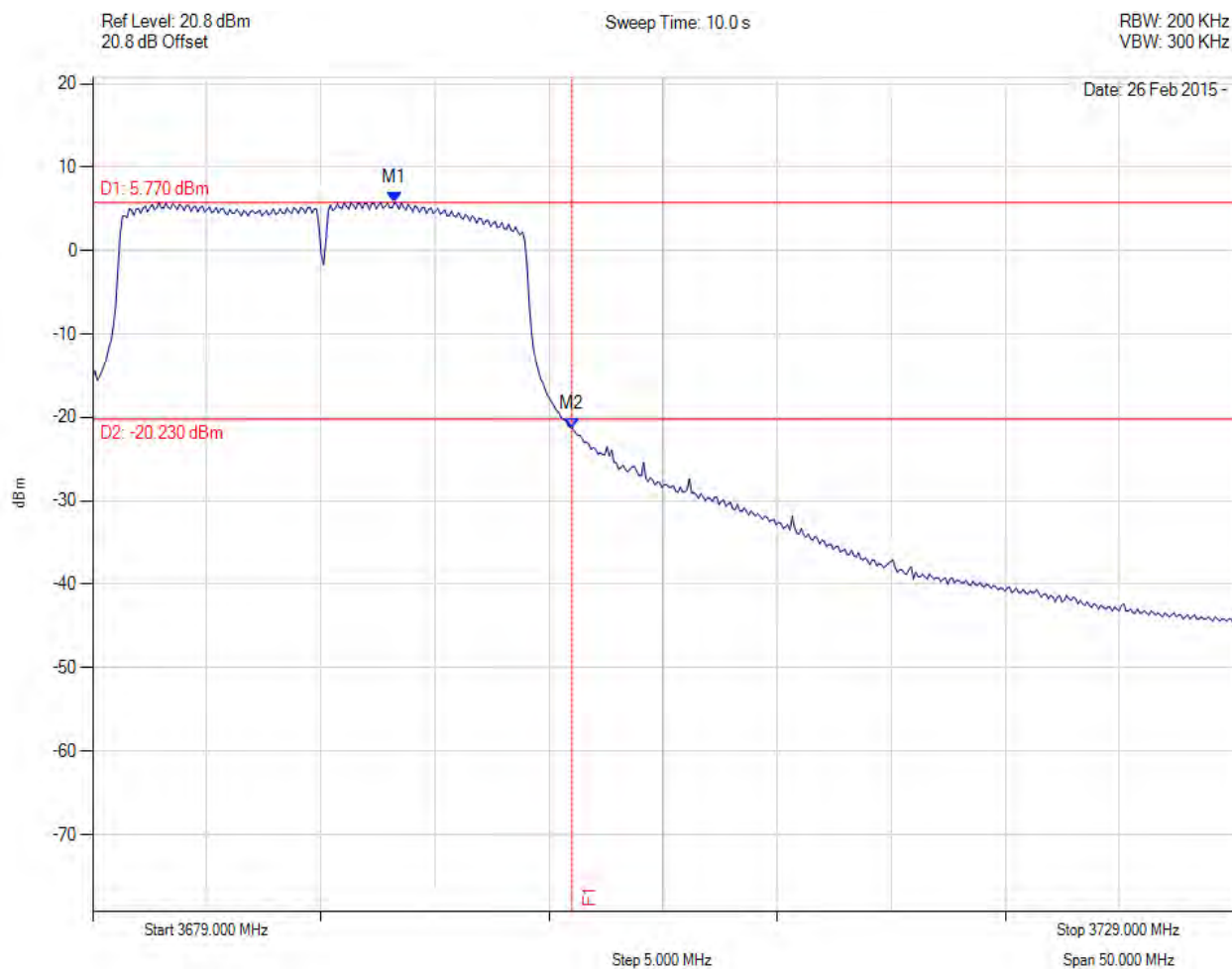


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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: , Channel: 3689.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3692.226 MHz : 5.767 dBm M2 : 3700.000 MHz : -21.362 dBm	Channel Frequency: 3689.00 MHz

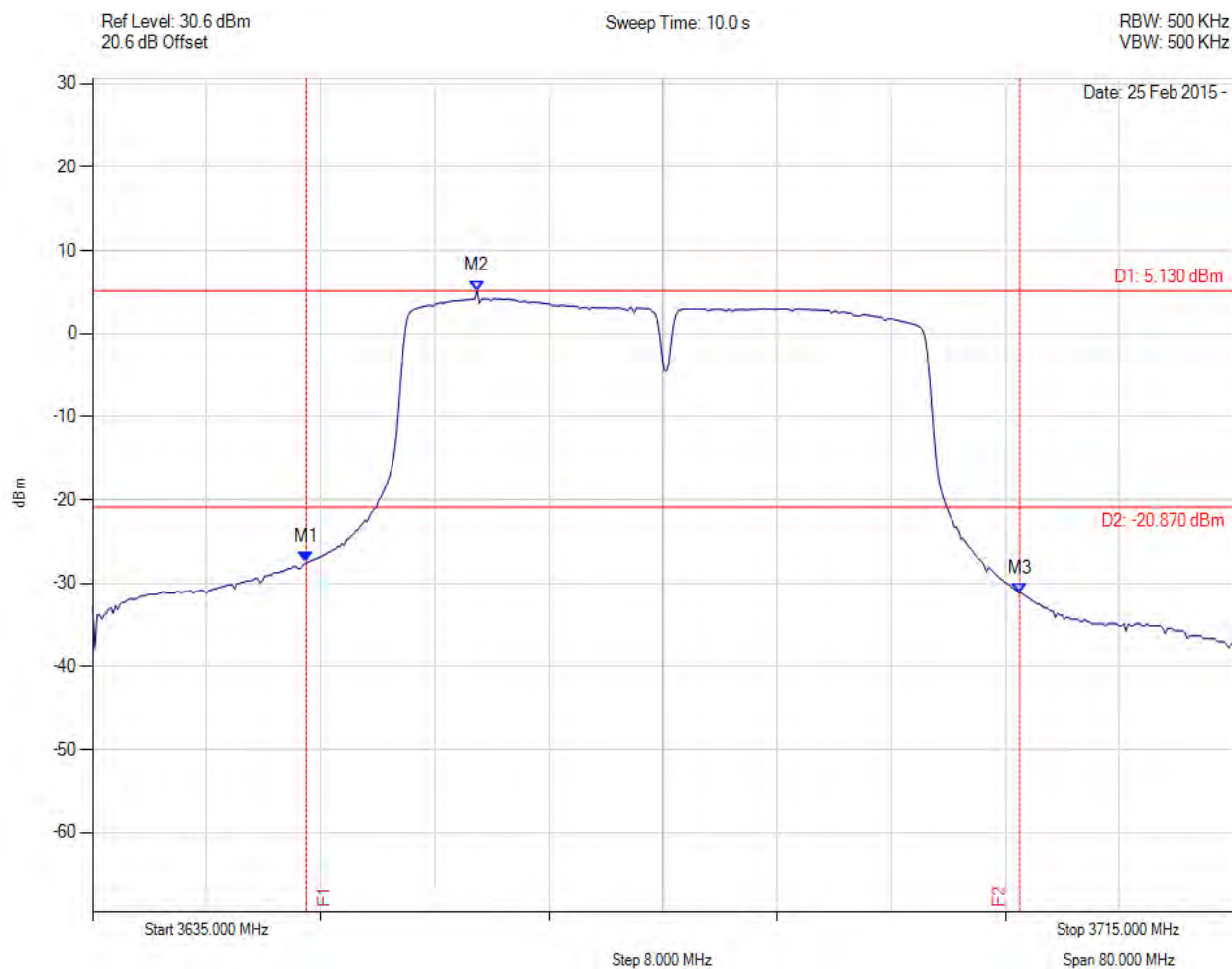
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain a, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -27.464 dBm M2 : 3661.934 MHz : 5.132 dBm M3 : 3700.000 MHz : -31.161 dBm	Channel Frequency: 3675.00 MHz

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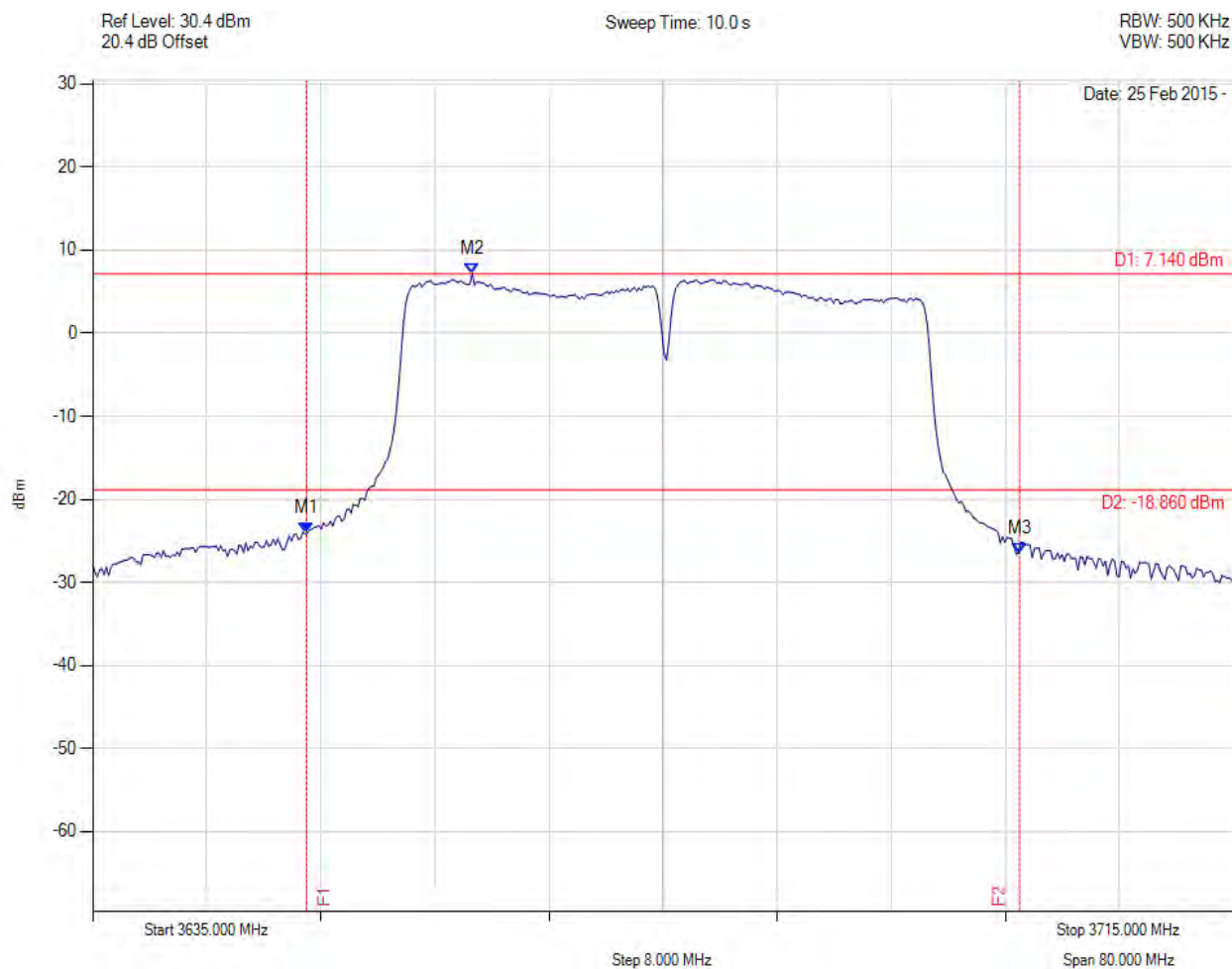


Title: RADWIN 2000 JET, RADWIN 5000 JET
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain b, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -24.027 dBm M2 : 3661.613 MHz : 7.139 dBm M3 : 3700.000 MHz : -26.475 dBm	Channel Frequency: 3675.00 MHz

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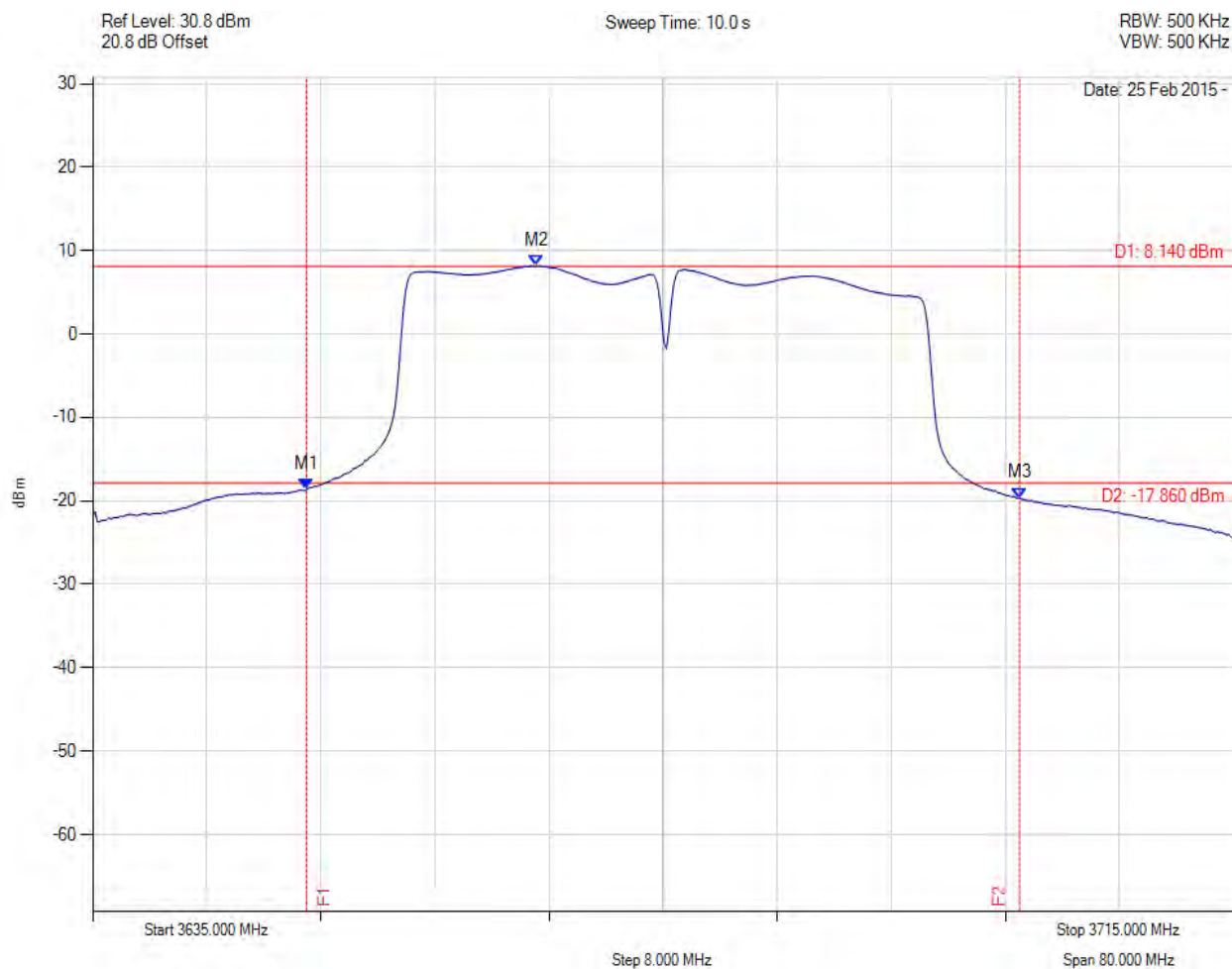


Title: RADWIN 2000 JET, RADWIN 5000 JET
To: FCC Part 90 Subpart Z & IC RSS-197
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Transmitter Conducted Spurious and Band-Edge Emissions

Variant: BPSK, Channel: 3675.00 MHz, Chain c, Temp: Ambient, Voltage: 55 Vdc



Analyser Setup	Marker:Frequency:Amplitude	Test Results
Detector = RMS Sweep Count = 0 RF Atten (dB) = 20 Trace Mode = CLR/WRITE	M1 : 3650.000 MHz : -18.530 dBm M2 : 3666.102 MHz : 8.141 dBm M3 : 3700.000 MHz : -19.660 dBm	Channel Frequency: 3675.00 MHz

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