Test of Digi Intenational XLRP

To: FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: DIGI44-U2 Rev A

TEST REPORT

FROM

Test of Digi Intenational XLRP

To FCC 47 CFR Part 15.247 & IC RSS-210

Test Report Serial No.: DIGI44-U2 Rev A

This report supersedes: NONE

Applicant: Digi International
355 South 520 West, Suite 180
Lindon
Utah, 84042 USA

Product Function: General purpose wireless communication link

Copy No: pdf Issue Date: 22th April 2014

This Test Report is Issued Under the Authority of;

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

TESTING CERT #2381.01

MiCOM Labs is an ISO 17025 Accredited Testing Laboratory

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ACCREDITATION, LISTINGS & 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


American Association for Laboratory Accreditation

Accredited Laboratory

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence in the field of

Electrical Testing

This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2005 *General Requirements for the Competence of Testing and Calibration Laboratories*. This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality management system (*refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009*).

Presented this 28th day of February 2014.

President & CEO
For the Accreditation Council
Certificate Number 2381.01
Valid to November 30, 2015

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

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

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


American Association for Laboratory Accreditation

Accredited Product Certification Body

A2LA has accredited

MICOM LABS

Pleasanton, CA

for technical competence as a

Product Certification Body

This product certification body is accredited in accordance with the recognized International Standard ISO/IEC 17065:2012 - *Requirements for bodies certifying products, processes and services*. This accreditation demonstrates technical competence for a defined scope and the operation of a quality management system.

Presented this 28th day of February 2014.

President & CEO
For the Accreditation Council
Certificate Number 2381.02
Valid to November 30, 2015

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

United States of America – Telecommunication Certification Body (TCB)
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

DOCUMENT HISTORY

Document History		
Revision	Date	Comments
Draft		
Rev A	22nd April 2014	Initial release.

1. TEST RESULT CERTIFICATE

Manufacturer:	Digi International 355 South 520 West, Suite 180 Lindon Utah, 84042 USA	Tested By:	MiCOM Labs, Inc. 440 Boulder Court Suite 200 Pleasanton California, 94566, USA
EUT:	General purpose wireless communication link	Telephone:	+1 925 462 0304
Model:	XLRP	Fax:	+1 925 462 0306
S/N's:	B17		
Test Date(s):	20th - 26th March 2014	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.247 & IC RSS-210	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:

A2LA ACCREDITED
TESTING CERT #2381.01

Graeme Grieve
Quality Manager MiCOM Labs,

Gordon Hurst
President & CEO MiCOM Labs, Inc.

2. REFERENCES AND MEASUREMENT UNCERTAINTY

2.1. Normative References

REF.	PUBLICATION	YEAR	TITLE
i.	FCC 47 CFR Part 15, Subpart C	2012	Title 47: Telecommunication PART 15—RADIO FREQUENCY DEVICES Subpart C—Intentional Radiators
ii.	RSS-210 Annex 8	2010	Radio Standards Specification 210, Issue 8, Low-power Licence-exempt Radiocommunication Devices (All Frequency Bands): Category I Equipment
iii.	FCC OET KDB 662911	4th April 2011	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
iv.	DA 00-705	2000	FCC DA 00-705 "Filing and Measurement Guidelines for Frequency Hopping Spread Spectrum Systems" released March 30, 2000
v.	RSS-GEN	2010	Radio Standards Specification-Gen, Issue 3, General Requirements and Information for the Certification of Radiocommunication Equipment
vi.	FCC 47 CFR Part 15, Subpart B	2012	47 CFR Part 15, SubPart B; Unintentional Radiators
vii.	ICES-003	2004	Spectrum Management and Telecommunications Policy Interference-Causing Equipment Standard Digital Apparatus; Issue 4
viii.	ANSI C63.4	2009	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
ix.	CISPR 22/ EN 55022	2008 2006+A1:2007	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
x.	M 3003	Edition 1 Dec. 1997	Expression of Uncertainty and Confidence in Measurements
xi.	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
xii.	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
xiii.	A2LA	July 2012	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.

3. PRODUCT DETAILS AND TEST CONFIGURATIONS

3.1. Technical Details

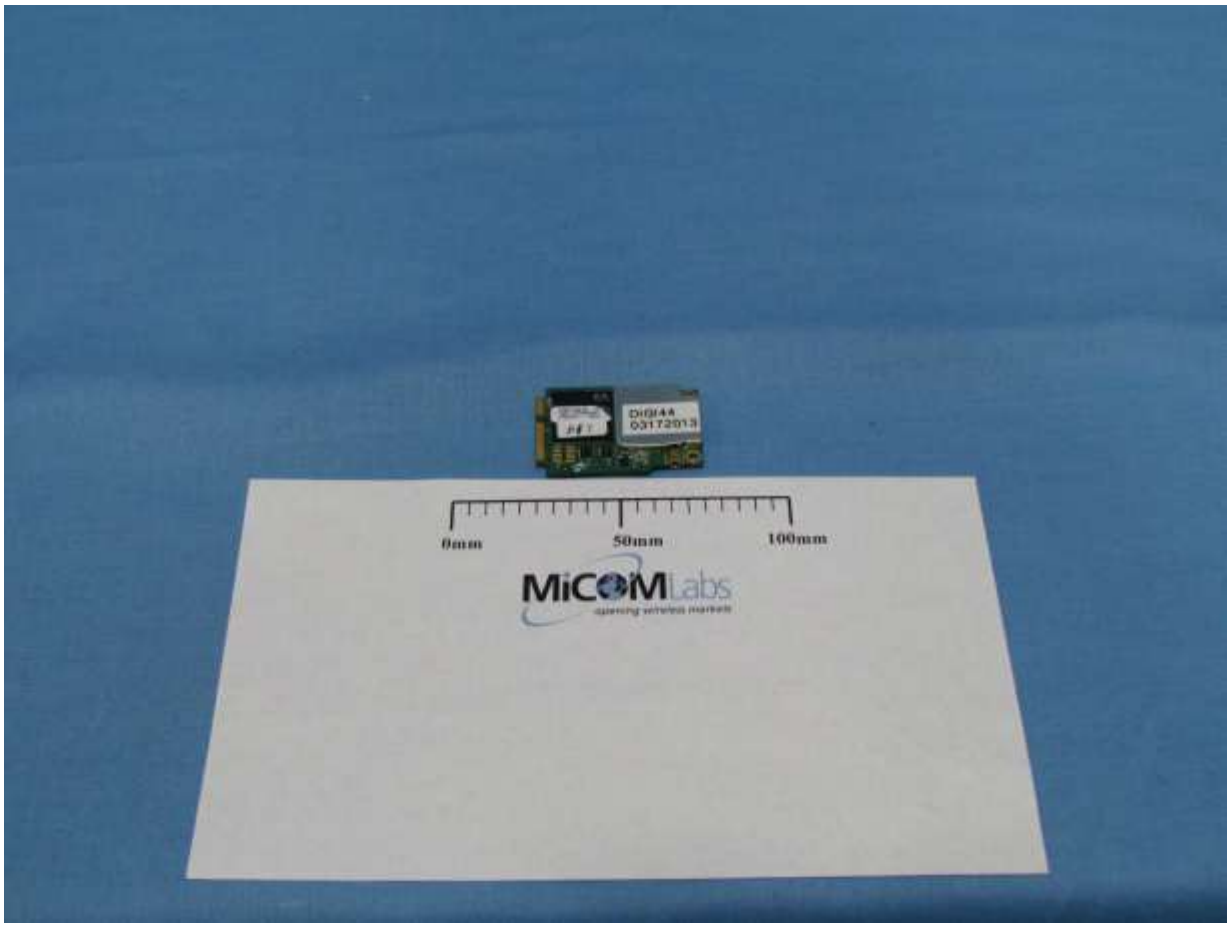
Details	Description
Purpose:	Test of the Digi Intenational XLRP operating in W-Fi mode to FCC Part 15.247 and Industry Canada RSS-210 regulations.
Applicant:	Digi International 355 South 520 West, Suite 180 Lindon Utah, 84042 USA
Manufacturer:	As applicant.
Laboratory performing the tests:	MiCOM Labs, Inc. 440 Boulder Court, Suite 200 Pleasanton, California 94566 USA
Test report reference number:	DIGI44-U2 Rev A
Date EUT received:	17th March 2014
Standard(s) applied:	FCC 47 CFR Part 15.247 & IC RSS-210
Dates of test (from - to):	20th - 26th March 2014
No of Units Tested:	One
Type of Equipment:	DSSS Module
Manufacturers Trade Name:	Digi International
Model(s):	XLRP
Location for use:	Indoor and Outdoor
Declared Frequency Range(s):	902 - 928 MHz
Hardware Rev	A
Software Rev	28000
Type of Modulation:	DSSS
Declared Nominal Average Output Power:	Maximum Power : +30 dBm Minimum Power : -10 dBm
EUT Modes of Operation:	10 and 20 MHz Bandwidth
Transmit/Receive Operation:	Time Division Duplex
System Beam Forming:	EUT has no capability for antenna beam forming
Rated Input Voltage and Current:	5 Vdc
Operating Temperature Range:	Manufacturer declared range -40o to +75ºC at 95% humidity non condensing up to 45ºC; linear decrease to 40% RH noncondensing 75ºC
ITU Emission Designator:	10 MHz: 20 MHz:
Equipment Dimensions:	52x35x6.5mm
Weight:	10 grams
Primary function of equipment:	General purpose wireless communication link

3.2. Scope of Test Program

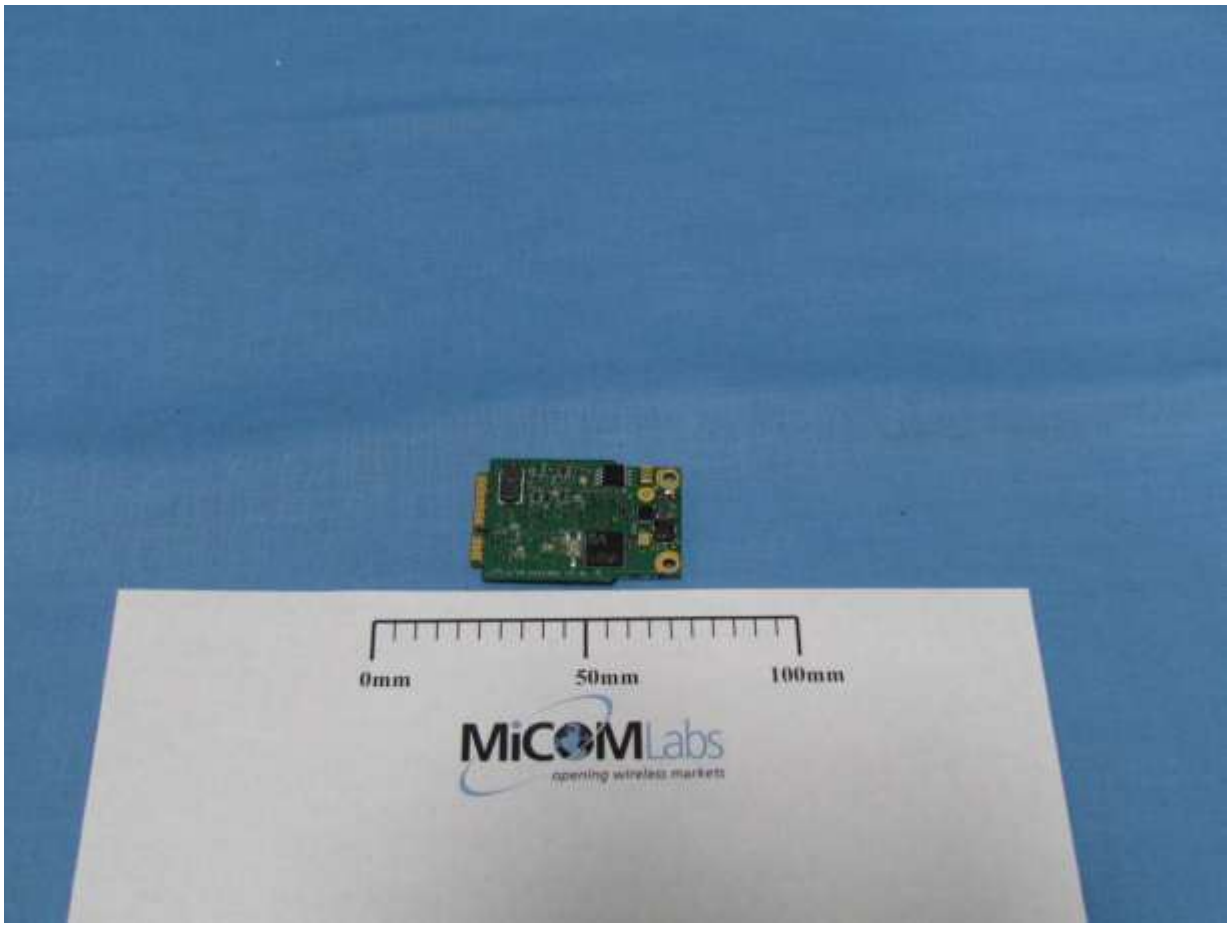
Digi Intenational XLRP RF Testing

The scope of the test program was to test the Digi Intenational XLRP (10 and 20 MHz bandwidths) in the frequency range 902 - 928 MHz for compliance against FCC 47 CFR Part 15.247 and Industry Canada RSS-210 specifications.

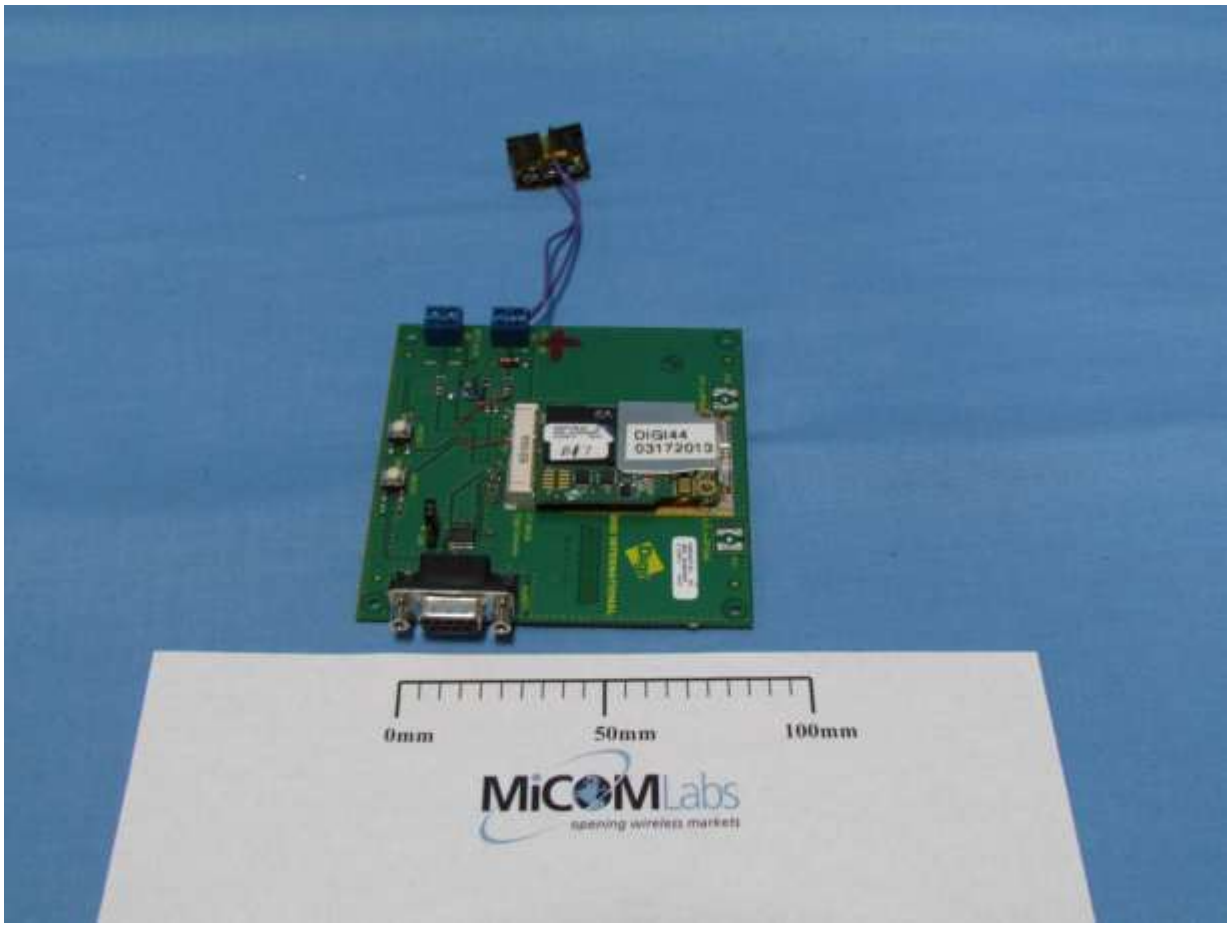
Digi Intenational XLRP Module



Digi Intenational XLRP Module



Digi Intenational XLRP Module
Test Fixure



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

Equipment Type	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	915 MHz DSSS Wireless Module	Digi International	XLRP	B17
Support	Laptop PC	IBM	Thinkpad	None

3.4. Antenna Details

OMNI Antennas

Part Number	Connector Type	Antenna Gain (dBi)	Application	Minimum Cable Loss or Power Reduction Required (dB)
A09-F0	RPN	0.0	Fixed	0
A09-F1	RPN	1.0	Fixed	0
A09-F2	RPN	2.1	Fixed	0
A09-F3	RPN	3.1	Fixed	0
A09-F4	RPN	4.1	Fixed	0
A09-F5	RPN	5.1	Fixed	0
A09-F6	RPN	6.1	Fixed	0.1
A09-F7	RPN	7.1	Fixed	1.1
A09-F8	RPN	8.1	Fixed	2.1
A09-W7	RPN	7.1	Fixed	1.1
A09-F0	RPSMA	0.0	Fixed	0
A09-F1	RPSMA	1.0	Fixed	0
A09-F2	RPSMA	2.1	Fixed	0
A09-F3	RPSMA	3.1	Fixed	0
A09-F4	RPSMA	4.1	Fixed	0
A09-F5	RPSMA	5.1	Fixed	0
A09-F6	RPSMA	6.1	Fixed	0.1
A09-F7	RPSMA	7.1	Fixed	1.1
A09-F8	RPSMA	8.1	Fixed	2.1
A09-M7	RPSMAF	7.2	Fixed	1.2
A09-W7SM	RPSMA	7.1	Fixed	1.1
A09-F0TM	RPTNC	0.0	Fixed	0
A09-F1TM	RPTNC	1.0	Fixed	0

OMNI Antenna List (Cont'd)

Part Number	Connector Type	Antenna Gain (dBi)	Application	Minimum Cable Loss or Power Reduction Required (dB)
A09-F2TM	RPTNC	2.1	Fixed	0
A09-F3TM	RPTNC	3.1	Fixed	0
A09-F4TM	RPTNC	4.1	Fixed	0
A09-F5TM	RPTNC	5.1	Fixed	0
A09-F6TM	RPTNC	6.1	Fixed	0.1
A09-F7TM	RPTNC	7.1	Fixed	1.1
A09-F8TM	RPTNC	8.1	Fixed	2.1
A09-W7TM	RPTNC	7.1	Fixed	1.1
A09-HSM-7	RPSMA	3.0	Fixed / Mobile	0
A09-HASM-675	RPSMA	2.1	Fixed / Mobile	0
A09-HABMM-P6I	MMCX	2.1	Fixed / Mobile	0
A09-HABMM-6-P6I	MMCX	2.1	Fixed / Mobile	0
A09-HBMM-P6I	MMCX	2.1	Fixed / Mobile	0
A09-HRSM	RPSMA	2.1	Fixed	0
A09-HASM-7	RPSMA	2.1	Fixed	0
A09-HG	RPSMA	2.1	Fixed	0
A09-HATM	RPTNC	2.1	Fixed	0
A09-HATM-10	RPTNC	2.1	Fixed/Mobile	0
A09-H	RPSMA	2.1	Fixed	0
A09-HBMMP6I	MMCX	2.1	Fixed/Mobile	0
A09-QBMMP6I	MMCX	1.9	Fixed/Mobile	0
A09-QSM-3	RPSMA	1.9	Fixed / Mobile	0
A09-QSM-3H	RPSMA	1.9	Fixed / Mobile	0
A09-QBMM-P6I	MMCX	1.9	Fixed / Mobile	0

Highlighted OMNI Antenna is the highest gain 8.1 dBi. This was a test candidate for radiated testing

Yagi Antenna Selection

Part Number	Type	Connector Type	Antenna Gain (dBi)	Application	Minimum Cable Loss or Power Reduction Required (dB)
A09-Y6	2 Element Yagi	RPN	6.1	Fixed / Mobile	0.1
A09-Y7	3 Element Yagi	RPN	7.1	Fixed / Mobile	1.1
A09-Y8	4 Element Yagi	RPN	8.1	Fixed / Mobile	2.1
A09-Y9	4 Element Yagi	RPN	9.1	Fixed / Mobile	3.1
A09-Y10	5 Element Yagi	RPN	10.1	Fixed / Mobile	4.1
A09-Y11	6 Element Yagi	RPN	11.1	Fixed / Mobile	5.1
A09-Y12	7 Element Yagi	RPN	12.1	Fixed / Mobile	6.1
A09-Y13	9 Element Yagi	RPN	13.1	Fixed / Mobile	7.1
A09-Y14	10 Element Yagi	RPN	14.1	Fixed / Mobile	8.1
A09-Y14	12 Element Yagi	RPN	14.1	Fixed / Mobile	8.1
A09-Y15	13 Element Yagi	RPN	15.1	Fixed / Mobile	9.1
A09-Y15	15 Element Yagi	RPN	15.1	Fixed / Mobile	9.1
A09-Y6TM	2 Element Yagi	RPTNC	6.1	Fixed / Mobile	0.1
A09-Y7TM	3 Element Yagi	RPTNC	7.1	Fixed / Mobile	1.1
A09-Y8TM	4 Element Yagi	RPTNC	8.1	Fixed / Mobile	2.1
A09-Y9TM	4 Element Yagi	RPTNC	9.1	Fixed / Mobile	3.1
A09-Y10TM	5 Element Yagi	RPTNC	10.1	Fixed / Mobile	4.1
A09-Y11TM	6 Element Yagi	RPTNC	11.1	Fixed / Mobile	5.1
A09-Y12TM	7 Element Yagi	RPTNC	12.1	Fixed / Mobile	6.1
A09-Y13TM	9 Element Yagi	RPTNC	13.1	Fixed / Mobile	7.1
A09-Y14TM	10 Element Yagi	RPTNC	14.1	Fixed / Mobile	8.1
A09-Y14TM	12 Element Yagi	RPTNC	14.1	Fixed / Mobile	8.1
A09-Y15TM	13 Element Yagi	RPTNC	15.1	Fixed / Mobile	9.1
A09-Y15TM	15 Element Yagi	RPTNC	15.1	Fixed / Mobile	9.1

Highlighted Yagi antenna is the highest gain 8.1 dBi. This was a test candidate for radiated testing

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. 1 x SMB (RF antenna port)

3.6. Test Configurations

Testing was performed on the following variants

Operational Mode(s)	Variant	Data Rate(s)	Frequencies (MHz)
10 MHz	DSSS	9.77 kBit/s 3.32 Mbit/s	909.0 915.0 921.0
20 MHz	DSSS	None	915.0

Measurement results for the above configurations are provided in this report.

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

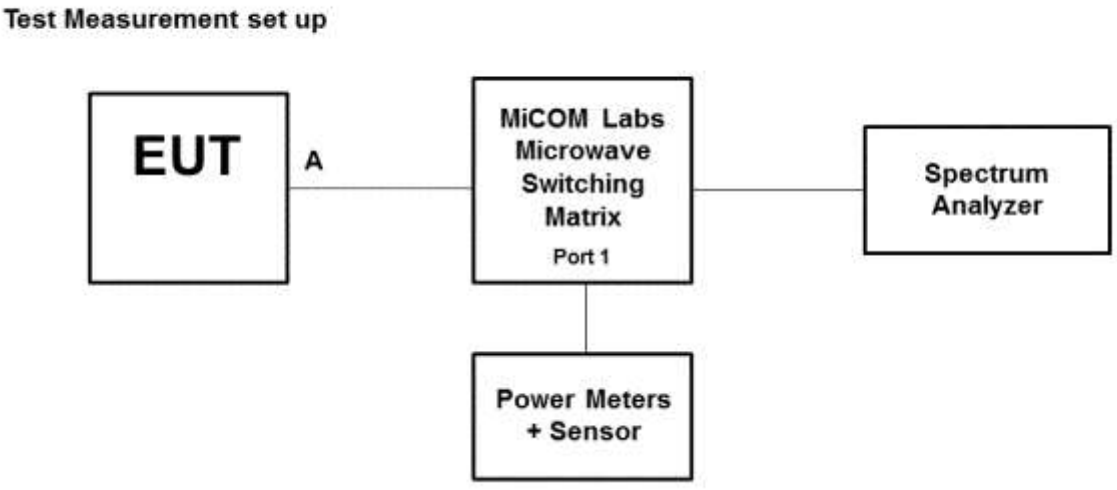
4. TEST EQUIPMENT CONFIGURATION(S)

4.1. Conducted RF Emission Test Set-up

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

1. Section 6.1.1.1. 6 dB and 99% Bandwidth
2. Section 6.1.1.2. Peak Output Power
3. Section 6.1.1.3. Power Spectral Density
4. Section 6.1.1.4. Conducted Spurious Emissions

Conducted Test Set-Up Pictorial Representation



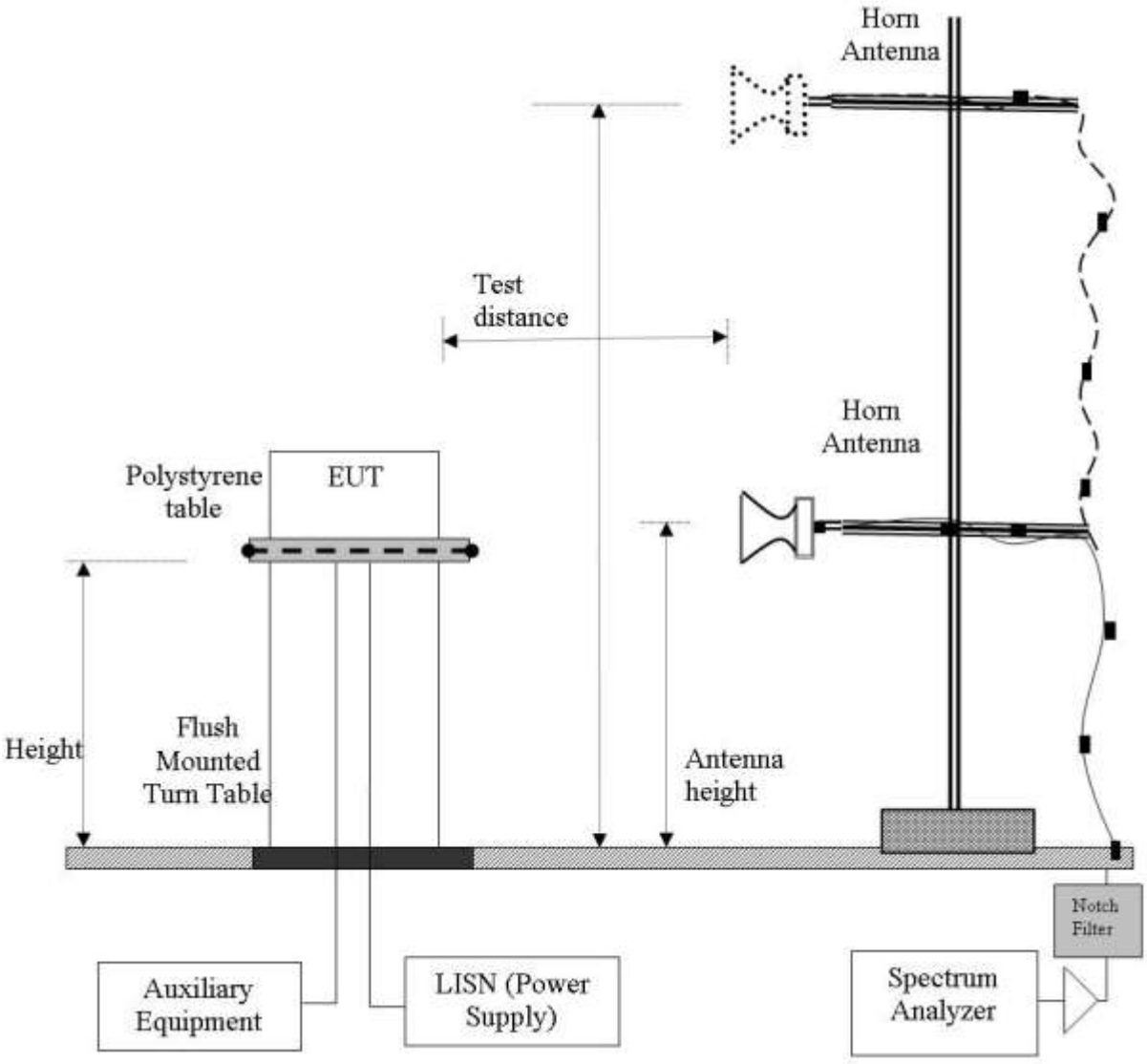
Conducted Test Measurement Setup

4.2. Radiated Spurious Emission Test Set-up > 1 GHz

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

1. Section 6.1.2.1. OMNI Antenna
2. Section 6.1.2.3. Yagi Antenna

Radiated Emission Measurement Setup – Above 1 GHz

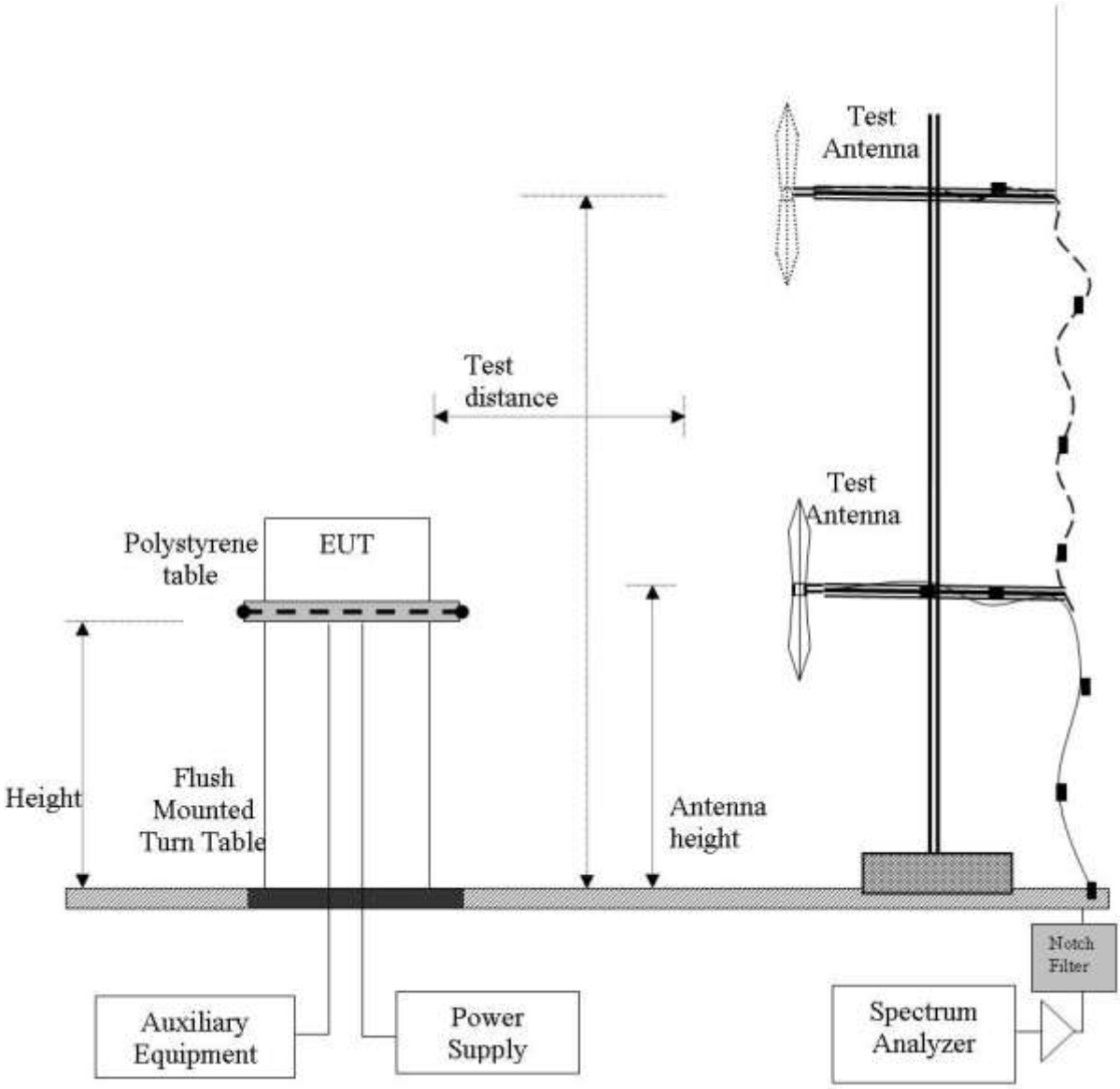


4.3. Digital Emissions Test Set-up (0.03 – 1 GHz)

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

1. Section 6.1.2.3

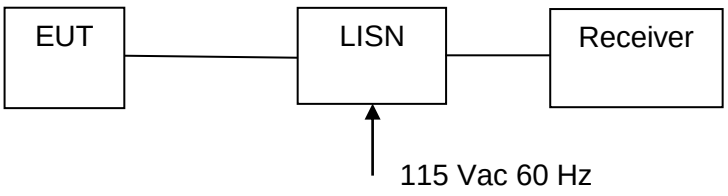
Digital Emission Measurement Setup – Below 1 GHz



4.4. ac Wireline Emission Test Set-up

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

1. Section 6.1.3 ac Wireline Conducted Emissions



Measurement Setup for Conducted Emissions Test

ac Wieline Emission test not required as the device is dc powered

5. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen.**

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(a)(2) **A8.2(1)** **4.4**	6 dB and 99 % Bandwidths	≥500 kHz	Conducted	Complies	6.1.1
15.247(b)(3) **15.31(e)** **A8.4(4)**	Peak Output Power Voltage Variation	Shall not exceed 1W Variation of supply voltage 85 % -115 %	Conducted	Complies	6.1.2
15.247(e) **A8.2**	Peak Power Spectral Density	Shall not be greater than +8 dBm in any 3 kHz band	Conducted	Complies	6.1.3
15.247(d) **15.205 /** **15.209** **A8.5** **2.2** **4.7**	Spurious Emissions (30MHz - 26 GHz b/g and 30 MHz – 40 GHz a)	The radiated emission in any 100 kHz of out-band shall be at least 20 dB below the highest in-band spectral density	Conducted	Complies	6.1.4

List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.247, Industry Canada RSS-210,** and **Industry Canada RSS-Gen.**

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.247(d) **15.205 /** **15.209** **A8.5** **2.2** **2.6** **4.7**	Radiated Emissions	Restricted Bands	Radiated	Complies	6.1.2.1-6.1.2.8
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	6.1.2.1-6.1.2.8
	Radiated Band Edge	Band-edge results Peak Emissions		Complies	6.1.2.1-6.1.2.8
15.205 / **15.209** **2.2**	Radiated Spurious Emissions	Emissions <1 GHz (30M-1 GHz)	Radiated	Complies	*6.1.2.9*
15.207 **7.2.2**	AC Wireline Conducted Emissions 150 kHz–30 MHz	Conducted Emissions	Conducted	N/A EUT is DC powered	*6.1.3*

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 highlights the equipment modifications that were required to bring the product into compliance with the above test matrix*

6. TEST RESULTS

6.1. Device Characteristics

6.1.1. Conducted Testing

6.1.1.1. 6 dB and 99 % Bandwidth

Conducted Test Conditions for 6 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	6 dB and 99 % Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(2)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.1 Emission Bandwidth		

Test Procedure for 6 dB and 99% Bandwidth Measurement
The bandwidth at 6 dB and 99 % was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate centre frequency.

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
909.0	9.303	--	--	--	9.303	9.303	≥500.0	-8.80
915.0	8.818	--	--	--	8.818	8.818	≥500.0	-8.32
921.0	8.818	--	--	--	8.818	8.818	≥500.0	-8.32

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
909.0	9.170	--	--	--	9.170		
915.0	9.082	--	--	--	9.082		
921.0	9.082	--	--	--	9.082		

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).

Equipment Configuration for 6 dB & 99% Bandwidth

Variant:	10 MHz (High Data Rate)	**Duty Cycle (%):**	99
Data Rate:	3.32 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
909.0	9.611	--	--	--	9.611	9.611	≥500.0	-9.11
915.0	9.611	--	--	--	9.611	9.611	≥500.0	-9.11
921.0	9.567	--	--	--	9.567	9.567	≥500.0	-9.07

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
909.0	9.523	--	--	--	9.523		
915.0	9.523	--	--	--	9.523		
921.0	9.523	--	--	--	9.523		

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).

Equipment Configuration for 6 dB & 99% Bandwidth			
Variant:	20 MHz	**Duty Cycle (%):**	93
Data Rate:	None	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Measured 6 dB Bandwidth (MHz) Port(s)				6 dB Bandwidth (MHz)		Limit	Lowest Margin
MHz	a	b	c	d	Highest	Lowest	KHz	MHz
915.0	18.517	--	--	--	18.517	18.517	≥500.0	-18.02

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				Maximum 99% Bandwidth (MHz)		
MHz	a	b	c	d			
915.0	18.277	--	--	--	18.277		

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

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

Specification

Limits

§15.247 (a)(2) & RSS-210 §A8.2(1)
The minimum 6 dB bandwidth shall be at least 500 kHz.

§ IC RSS-Gen 4.4.1 Occupied Bandwidth When an occupied bandwidth value is not specified in the applicable RSS, the transmitted signal bandwidth to be reported is to be its 99% emission bandwidth, as calculated or measured.

§ IC RSS-Gen 4.4.2 6 dB Bandwidth Where indicated, the 6 dB bandwidth is measured at the points when the spectral density of the signal is 6 dB down from the in –band spectral density of the modulated signal, with the transmitter modulated by a representative signal.

Traceability

Test Equipment Used
0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

6.1.1.2. Peak Output Power

Conducted Test Conditions for Fundamental Emission Output Power			
Standard:	FCC CFR 47:15.247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Emission Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)(2)	**Pressure (mBars):**	999 - 1004
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.2 Fundamental Emission Output Power KDB 662911 was implemented for In-band power measurements. The measure and sum technique was implemented in all cases.		

Test Procedure for Fundamental Emission Output Power Measurement
The transmitter terminal of EUT was connected to the input of the spectrum analyzer set to measure peak power. The resolution filter bandwidth was set to 6 dB, peak detector selected and the analyzer built-in power function was used to integrate peak power over the 20 dB bandwidth.

Supporting Information
Calculated Power = A + G + 10 log (1/x) dBm
A = Total Power [10 Log10 ($10^{a/10}$ + $10^{b/10}$ + $10^{c/10}$ + $10^{d/10}$)], G = Antenna Gain,
x = Duty Cycle

Equipment Configuration for Peak Output Power			
Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	8.10
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
909.0	29.67	--	--	--	29.67	30.00	-0.33	23.15
915.0	29.51	--	--	--	29.51	30.00	-0.49	23.14
921.0	29.57	--	--	--	29.57	30.00	-0.43	23.55

Traceability to Industry Recognized Test Methodologies

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

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

Equipment Configuration for Peak Output Power			
Variant:	10 MHz (High Data Rate)	**Duty Cycle (%):**	99
Data Rate:	3.32 Mbit/s	**Antenna Gain (dBi):**	0 dBi
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
909.0	29.76	--	--	--	29.76	30.00	-0.24	21.64
915.0	29.45	--	--	--	29.45	30.00	-0.55	21.91
921.0	29.58	--	--	--	29.58	30.00	-0.42	21.80

Traceability to Industry Recognized Test Methodologies

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

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

Equipment Configuration for Peak Output Power			
Variant:	20 MHz	**Duty Cycle (%):**	93
Data Rate:	None	**Antenna Gain (dBi):**	8.10
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)					Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
915.0	29.85	--	--	--	29.85	30.00	-0.15	20.25

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

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

Lowest Power setting

As this test is representative of all data rates and bandwidths only the 10 MHz lowest data rate was examined

Equipment Configuration at Lowest Output Power Setting – Average Power

Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	8.10
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Output Power (dBm) Port(s)				Calculated Total Power Σ Port(s)	Limit	Margin	EUT Power Setting
MHz	a	b	c	d	dBm	dBm	dBm	
909.0	-15.48	--	--	--	-15.48	30.00	-45.48	
915.0	-15.51	--	--	--	-15.51	30.00	-45.51	
921.0	-15.62	--	--	--	-15.62	30.00	-45.62	

Traceability to Industry Recognized Test Methodologies

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

Specification

Limits

§15.247 (b) The maximum peak output power of the intentional radiator shall not exceed the following:

§15.247 (b) (3) For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands: 1.0 watt.

15.247 (b) (4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

15.247 (c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400–2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

(ii) Systems operating in the 5725–5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.

§15.31 (e) For intentional radiators, measurements of the variation of the input power or the radiated signal level of the fundamental frequency component of the emission, as appropriate, shall be performed with the supply voltage varied between 85% and 115% of the nominal rated supply voltage. For battery operated equipment, the equipment tests shall be performed using a new battery.

§ RSS-210 A8.4(4) For systems employing digital modulation techniques operating in the 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz bands the maximum peak conducted power shall not exceed 1 watt.

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

6.1.1.3. Power Spectral Density

Conducted Test Conditions for Power Spectral Density			
Standard:	FCC CFR 47:15.247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Power Spectral Density	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (e)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.3 Maximum Power Spectral Density Level in the Emission Bandwidth		

Test Procedure for Power Spectral Density

The transmitter output was connected to a spectrum analyzer and the maximum level in a 3 kHz bandwidth was measured. A peak value was found over the full emission bandwidth and the frequency span reduced to obtain enhanced resolution. Sweep time ≥ span / 3 kHz with video averaging turned off. The Peak Power Spectral Density is the highest level found across the emission in a 3 kHz resolution bandwidth.

Supporting Information

Calculated Power = A + 10 log (1/x) dBm

A = Total Power Spectral Density [10 Log10 ($10^{a/10}$ + $10^{b/10}$ + $10^{c/10}$ + $10^{d/10}$)]

x = Duty Cycle

Limit Line: KDB 662911 was implemented for In-band power spectral density (PSD) measurements - Option (2) measure and subtract 10 log (N) dB from the limit for devices with multiple RF ports

Equipment Configuration for Power Spectral Density - Peak			
Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
909.0	4.886	--	--	--	4.886	-5.114	8.00	-13.11
915.0	4.831	--	--	--	4.831	-5.169	8.00	-13.17
921.0	5.226	--	--	--	5.226	-4.774	8.00	-12.77

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).

Equipment Configuration for Power Spectral Density - Peak			
Variant:	10 MHz (High Data Rate)	**Duty Cycle (%):**	99
Data Rate:	3.32 Mbit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d	Σ Port(s) per 30kHz RBW	Conversion to 3 kHz RBW	dBm	dB
909.0	3.656	--	--	--	3.656	-6.344	8.00	-14.34
915.0	3.239	--	--	--	3.239	-6.761	8.00	-14.76
921.0	4.341	--	--	--	4.341	-5.659	8.00	-13.66

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).

Equipment Configuration for Power Spectral Density - Peak			
Variant:	20 MHz	**Duty Cycle (%):**	93
Data Rate:	None	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm)				Calculated Total Power Spectral Density		Limit	Margin
	Port(s)				dBm			
MHz	a	b	c	d		Conversion to 3 kHz RBW	dBm	dB
915.0	-5.575	--	--	--	-5.575	-15.575	8.00	-23.57

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

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

Specification
Peak Power Spectral Density Limits

§15.247(e) For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission

RSS-210 §**A8.2(2)** The transmitter power spectral density (into the antenna) shall not be greater than +8 dBm in any 3 kHz band during any time interval of continuous transmission or over 1.0 second if the transmission exceeds 1.0 second duration.

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-01 'Measuring RF Output Power'	0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117

6.1.1.4. Conducted Spurious Emissions

Conducted Test Conditions for Transmitter Conducted Spurious and Band-Edge Emissions			
Standard:	FCC CFR 47:15.247	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Max Unwanted Emission Levels	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (d)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 558074 - D01 DTS Measurement Guidance v01: Section 5.4 Maximum Unwanted Emission Levels		

Test Procedure for Transmitter Conducted Spurious and Band-Edge Emissions Measurement
Transmitter Conducted Spurious and Band-Edge emissions were measured at a limit of 20 dB below the highest in-band spectral density measured with a spectrum analyzer connected to the antenna terminal. Measurements were made while EUT was operating in transmit mode of operation at the appropriate centre frequency closest to the band-edge. Emissions were maximized during the measurement and limits derived from the peak spectral power and drawn on each plot.

Equipment Configuration for Conducted Low Band-Edge Emissions - Peak			
Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Channel Frequency:	909.0 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	850.0 - 915.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-32.22	-11.69	903.90	--	--	-1.900

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 Conducted High Band-Edge Emissions - Peak			
Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Channel Frequency:	921.0 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	915.0 - 978.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-33.52	-11.36	926.20	--	--	-1.800

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 Emissions			
Variant:	10 MHz (Low Data Rate)	**Duty Cycle (%):**	40
Data Rate:	9.77 KBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
909.0	30.0 - 10000.0	-59.847	-11.74	--	--	--	--	--	--
915.0	30.0 - 10000.0	-59.575	-11.79	--	--	--	--	--	--
921.0	30.0 - 10000.0	-60.225	-11.91	--	--	--	--	--	--

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 Conducted Low Band-Edge Emissions - Peak			
Variant:	10 MHz (High Data Rate)	**Duty Cycle (%):**	99
Data Rate:	3.32 Mbit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Channel Frequency:	909.0 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	850.0 - 915.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-32.63	-8.26	903.80	--	--	-1.800

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 Conducted High Band-Edge Emissions - Peak			
Variant:	10 MHz (High Data Rate)	**Duty Cycle (%):**	99
Data Rate:	3.32 Mbit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Channel Frequency:	921.0 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	915.0 - 978.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-33.86	-8.38	926.10	--	--	-1.900

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 Emissions			
Variant:	10 MHz (High Data Rate)	**Duty Cycle (%):**	99
Data Rate:	3.32 Mbit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
909.0	30.0 - 10000.0	-48.263	-8.21	--	--	--	--	--	--
915.0	30.0 - 10000.0	-48.017	-8.32	--	--	--	--	--	--
921.0	30.0 - 10000.0	-47.873	-8.49	--	--	--	--	--	--

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 Conducted Low Band-Edge Emissions - Peak			
Variant:	20 MHz	**Duty Cycle (%):**	93
Data Rate:	None	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Channel Frequency:	915.0 MHz					
Band-Edge Frequency:	902.0 MHz					
Test Frequency Range:	850.0 - 925.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M1 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-35.18	-15.22	905.30	--	--	-3.300

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 Conducted High Band-Edge Emissions - Peak			
Variant:	20 MHz	**Duty Cycle (%):**	93
Data Rate:	None	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Channel Frequency:	915.0 MHz					
Band-Edge Frequency:	928.0 MHz					
Test Frequency Range:	905.0 - 978.0 MHz					
Port(s)	**Band-Edge Markers and Limit**			**Amended Limit**		**Margin**
	M3 Amplitude (dBm)	**Plot Limit (dBm)**	**M2 Frequency (MHz)**	**Amplitude (dBm)**	**M2A Frequency (MHz)**	**(MHz)**
a	-35.80	-15.20	924.70	--	--	-3.300

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 Emissions			
Variant:	20 MHz	**Duty Cycle (%):**	93
Data Rate:	None	**Antenna Gain (dBi):**	Not Applicable
Modulation:	DSSS	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable	**Tested By:**	SB
Engineering Test Notes:	No software version listed. X-CTU was used to operate and communicate with the EUT.		

Test Measurement Results

Test Frequency	Frequency Range	Transmitter Conducted Spurious Emissions (dBm)							
		Port a		Port b		Port c		Port d	
MHz	MHz	SE	Limit	SE	Limit	SE	Limit	SE	Limit
915.0	30.0 - 10000.0	-48.617	-15.46	--	--	--	--	--	--

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).

Specification

Limits Band-Edge

Lower Limit Band-edge	Upper Limit Band-edge	Limit below highest level of desired power
2,400 MHz	2,483.5 MHz	≥ 20 dB
5725 MHz	5850 MHz	

§15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

§15.247(d)
If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

RSS-Gen §4.7
The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

Laboratory Measurement Uncertainty for Conducted Spurious Emissions

Measurement uncertainty	±2.37 dB

Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-05 'Measurement of Spurious Emissions'	0088, 0158, 0287, 0252, 0313, 0314, 0070, 0116, 0117.

6.1.2. Radiated Emission Testing

Transmitter Radiated Spurious Emissions (above 1 GHz); Peak Field Strength Measurements; and Radiated Band Edge Measurements – Restricted Bands

FCC, Part 15 Subpart C §15.247(d) 15.205; 15.209
Industry Canada RSS-210 §A8.5, §2.2, §2.6
Industry Canada RSS-Gen §4.7

Test Procedure
The worst case highest spectral density radiated emissions above 1 GHz are measured in the anechoic chamber at a 3-meter distance on every azimuth in both horizontal and vertical polarities. The emissions are recorded and maximized as a function of azimuth by rotation through 360° with a spectrum analyzer in peak hold mode. Depending on the frequency band spanned a notch filter and waveguide filter was used to remove the fundamental frequency. The highest emissions relative to the limit are listed for each frequency spanned.

All measurements on any frequency or frequencies over 1 MHz are based on the use of measurement instrumentation employing an average detector function. All measurements above 1 GHz were performed using a minimum resolution bandwidth of 1 MHz.

Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Loss, and subtracting Amplifier Gain from the measured reading. All factors are included in the reported data.

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

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

FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3 dBμV/m

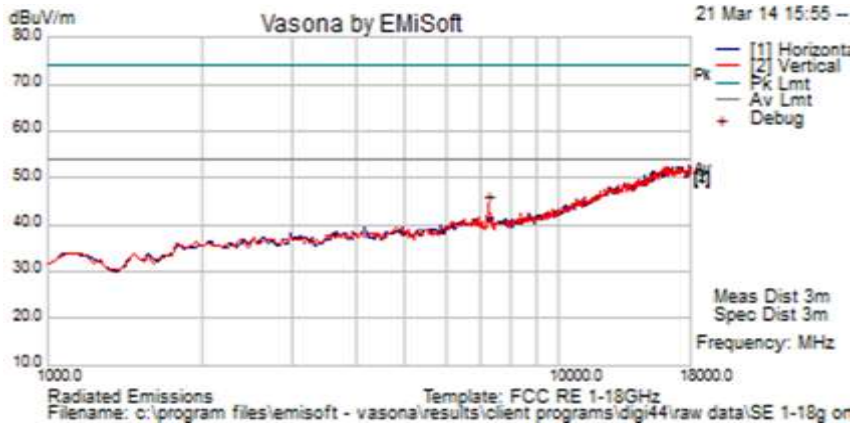
Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

Level (dBμV/m) = 20 * Log (level (μV/m))

40 dBμV/m = 100 μV/m
48 dBμV/m = 250 μV/m

6.1.2.1. OMNI - Spurious Emissions

Test Freq.	909 MHz (10 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	22.3	**Press. (mBars)**	1008
Antenna	Omni		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

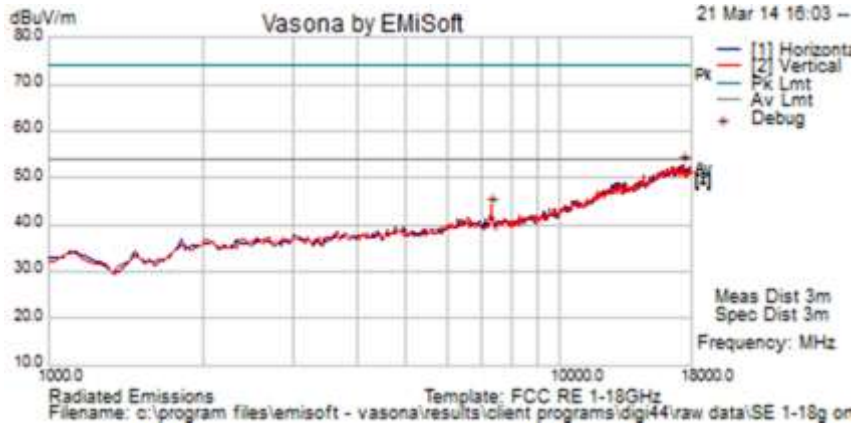


Formally measured emission peaks

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
7272.949	37.1	7.2	-0.2	44.0	Peak [Scan]	V	98	-1	54	-10.0	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

Test Freq.	915 MHz (10 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	22.3	**Press. (mBars)**	1008
Antenna	Omni		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

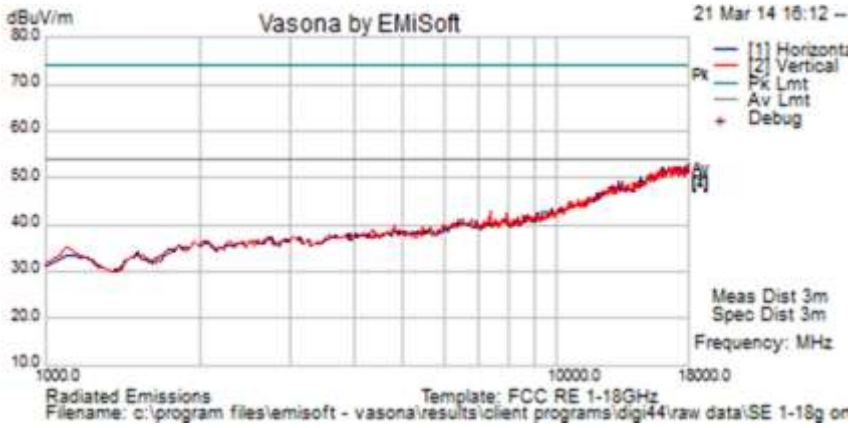


Formally measured emission peaks

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
7309.805	36.6	7.2	-0.3	43.5	Peak [Scan]	V	100	-1	54.0	-10.5	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

Test Freq.	921 MHz (10 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	22.3	**Press. (mBars)**	1008
Antenna	Omni		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

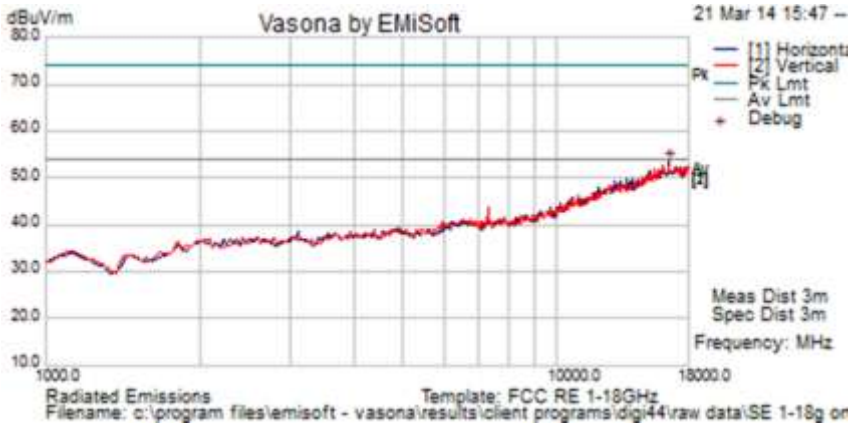


Formally measured emission peaks

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:	DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
	NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

Test Freq.	915 MHz (20 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	22.3	**Press. (mBars)**	1008
Antenna	Omni		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			



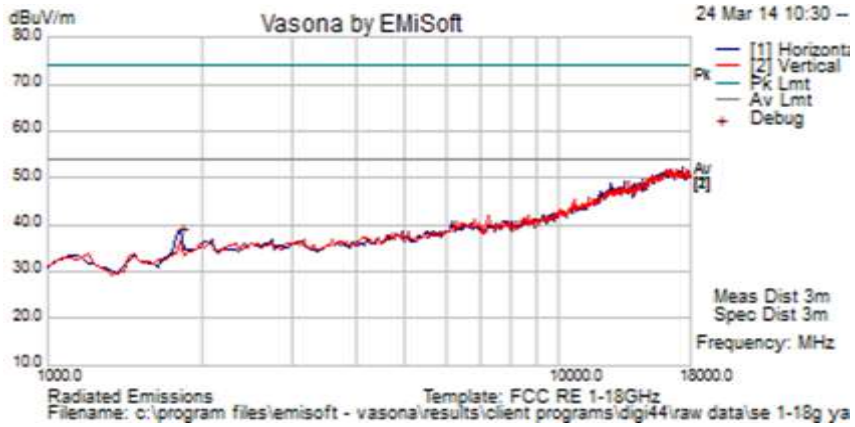
Formally measured emission peaks

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:	DIG = Digital Device Emission; TX = Transmitter Emission; FUND = Fundamental Frequency
	NRB = Non-Restricted Band, Limit is 20 dB below Fundamental; RB = Restricted Band

6.1.2.2. Yagi - Spurious Emissions

Test Freq.	909 MHz (10 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

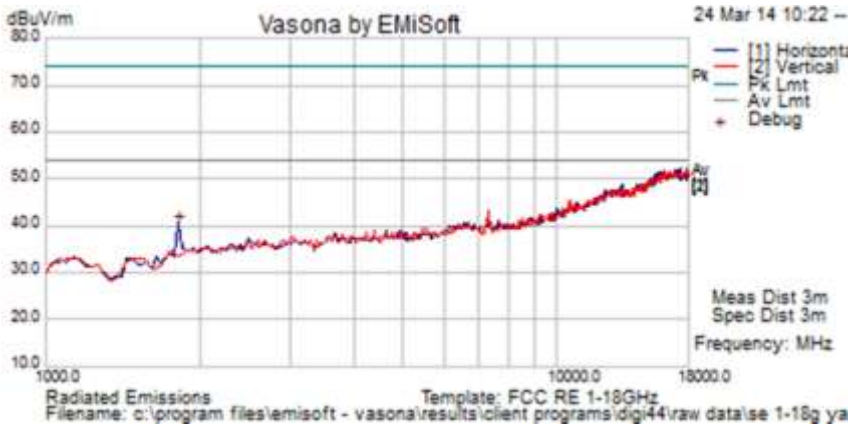


Formally measured emission peaks

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
1832.228	40.6	3.4	-6.8	37.2	Peak [Scan]	H	99	-1	54	-16.8	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

Test Freq.	915 MHz (10 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

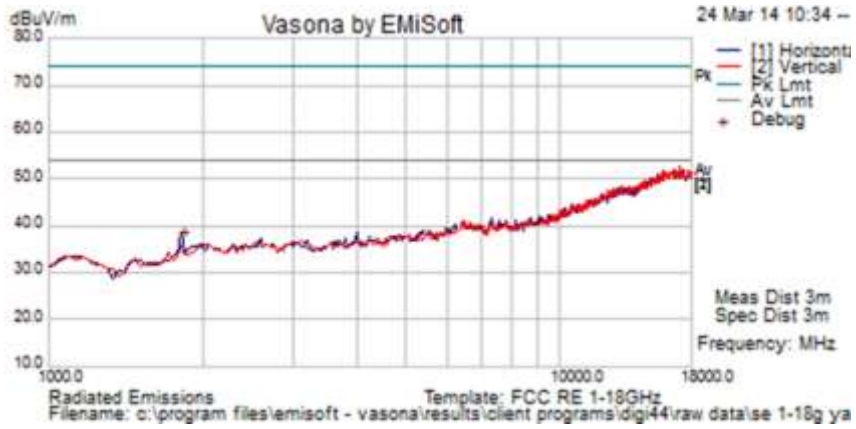


Formally measured emission peaks

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
1816.410	43.8	3.4	-6.9	40.2	Peak [Scan]	H	99	-1	54	-13.8	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

Test Freq.	921 MHz (10 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

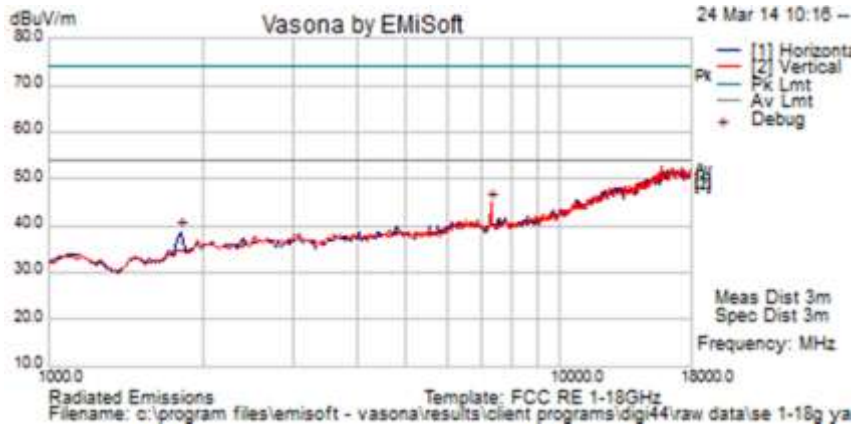


Formally measured emission peaks

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
1832.228	40.2	3.4	-6.8	36.8	Peak [Scan]	H	99	-1	54	-17.2	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

Test Freq.	915 MHz (20 MHz)	**Engineer**	SB
Variant	DSSS	**Temp (ºC)**	24.2
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
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
1816.410	42.2	3.4	-6.9	38.7	Peak [Scan]	H	99	-1	54	-15.3	Pass	
7304.279	37.8	7.2	-0.3	44.7	Peak [Scan]	V	99	-1	54	-9.3	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											

Specification Limits

FCC §15.247(d) and RSS-210 §A8.5 In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits.

FCC §15.247(d)
If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section §15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(a)).

IC RSS-210 §A8.5 If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

IC RSS-Gen §4.7
The search for unwanted emissions shall be from the lowest frequency internally generated or used in the device (local oscillator, intermediate of carrier frequency), or from 30 MHz , whichever is the lowest frequency, to the 5th harmonic of the highest frequency generated without exceeding 40 GHz.

FCC §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.

FCC §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.

FCC §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 (μV/m)	Field Strength (dBμV/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	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

6.1.2.3. Digital Emissions (0.03-1 GHz)

FCC, Part 15 Subpart C §15.205/ §15.209
Industry Canada RSS-210 §2.2

Test Procedure

Testing 30M-1 GHz was performed in a 3-meter anechoic chamber using a CISPR compliant receiver. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. To further maximize emissions the receive antenna was varied between 1 and 4 meters. The emissions are recorded with receiver 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.

The EUT had two methods of powering on ac/dc converter and Power over Ethernet (POE). Both modes were tested for emissions below 1GHz.

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

For example:
Given a Receiver input reading of 51.5dBμV; 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:

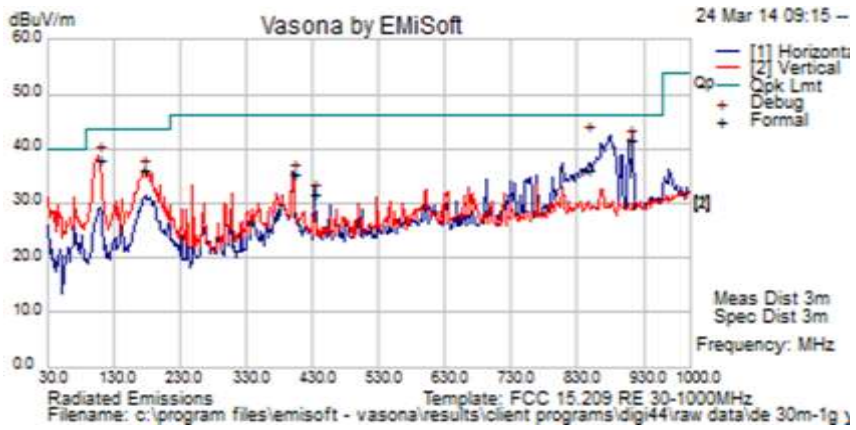
$$FS = 51.5 + 8.5 + 1.3 - 26.0 + 1 = 36.3 dB\mu V/m$$

Conversion between dBμV/m (or dBμV) and μV/m (or μV) are done as:

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

40 dBμV/m = 100μV/m
48 dBμV/m = 250μV/m

Test Freq.	909 MHz (10 MHz)	**Engineer**	SB
Variant	Digital Emissions	**Temp (ºC)**	24.2
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

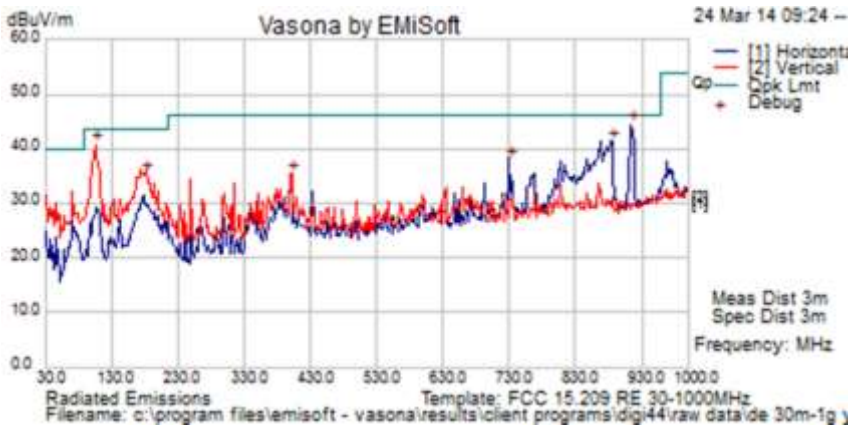


Formally measured emission peaks

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
845.251	37.6	7.0	-8.4	36.2	Quasi Max	H	162	71	46	-9.8	Pass	
107.475	53.1	4.1	-19.3	37.9	Quasi Max	V	98	55	43.5	-5.6	Pass	
908.637	42.3	7.1	-7.7	41.7	Peak [Scan]	H	100					FUND
401.091	44.7	5.5	-14.7	35.5	Peak [Scan]	H	98	86	46	-10.6	Pass	
432.693	40.1	5.6	-14.2	31.5	Peak [Scan]	H	98	86	46	-14.5	Pass	
175.985	51.4	4.5	-19.9	36.0	Peak [Scan]	V	98	86	43.5	-7.5	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

Test Freq.	915 MHz (10 MHz)	**Engineer**	SB
Variant	Digital Emissions	**Temp (ºC)**	24.2
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

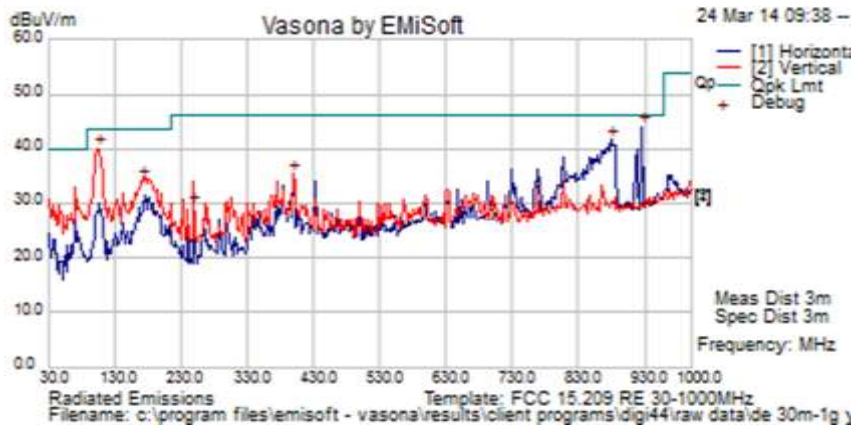


Formally measured emission peaks

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
104.812	56.0	4.1	-19.7	40.4	Quasi Max	V	100	0	43.5	-3.1	Pass	
914.469	45.1	7.1	-7.7	44.5	Peak [Scan]	H	100					FUND
883.367	42.3	7.1	-8.1	41.4	Peak [Scan]	H	100	0	46.0	-4.7	Pass	
182.290	50.7	4.5	-19.9	35.3	Peak [Scan]	V	100	-1	43.5	-8.2	Pass	
400.750	44.7	5.5	-14.8	35.4	Peak [Scan]	V	100	-1	46.0	-10.6	Pass	
729.696	41.2	6.6	-9.8	38.0	Peak [Scan]	H	100	-1	46.0	-8.0	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

Test Freq.	921 MHz (10 MHz)	**Engineer**	SB
Variant	Digital Emissions	**Temp (ºC)**	24.2
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
Test Notes 2			

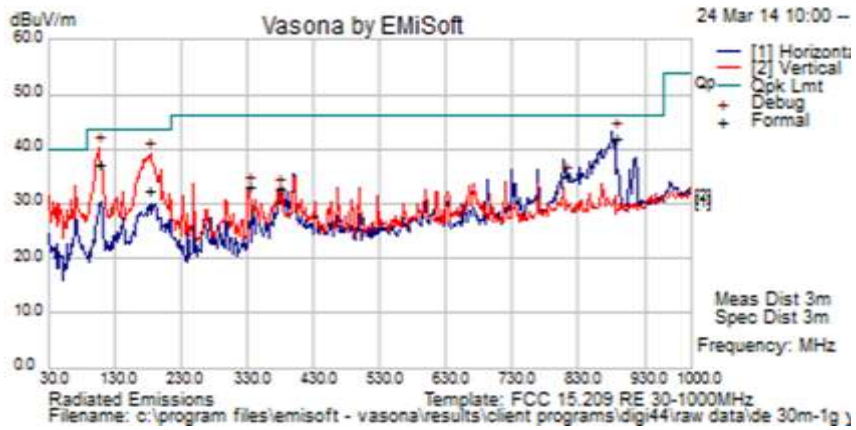


Formally measured emission peaks

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
105.631	55.6	4.1	-19.7	40.0	Quasi Max	V	100	0	43.5	-3.5	Pass	
879.479	42.8	7.1	-8.2	41.7	Quasi Max	H	100	0	46.0	-4.3	Pass	
926.132	44.4	7.2	-7.6	44.1	Peak [Scan]	H	100					FUND
173.075	49.5	4.5	-19.7	34.3	Peak [Scan]	V	98	-1	43.5	-9.2	Pass	
399.570	44.7	5.5	-14.8	35.4	Peak [Scan]	V	98	-1	46.0	-10.6	Pass	
248.735	43.5	4.9	-19.0	29.3	Peak [Scan]	V	98	-1	46.0	-16.7	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

Test Freq.	915 MHz (20 MHz)	**Engineer**	SB
Variant	Digital Emissions	**Temp (ºC)**	24.2
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	33
Power Setting	23.2	**Press. (mBars)**	1008
Antenna	Yagi		
Test Notes 1	5VDC; EUT Label: B17; Support Laptop Inside w/ serial cable;		
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
883.702	42.8	7.1	-8.1	41.9	Quasi Max	H	106	266	46.0	-4.2	Pass	
106.232	52.7	4.1	-19.6	37.2	Quasi Max	V	98	62	43.5	-6.3	Pass	
181.563	47.7	4.5	-19.9	32.3	Quasi Max	V	111	55	43.5	-11.2	Pass	
333.125	44.2	5.2	-16.4	33.0	Peak [Scan]	V	111	55	46.0	-13.0	Pass	
378.230	42.6	5.4	-15.3	32.7	Peak [Scan]	V	111	55	46.0	-13.3	Pass	
810.365	36.5	7.2	-8.7	35.0	Peak [Scan]	H	111	55	46.0	-11.0	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

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) and **RSS-Gen §2.2** Limit Matrix

Frequency(MHz)	Field Strength (μV/m)	Field Strength (dBμV/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	Test Equipment Used
Measurements were made per work instruction WI-03 'Measurement of Radiated Emissions'	0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

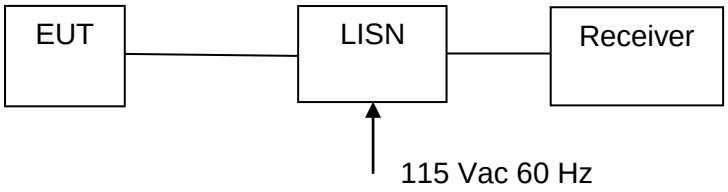
6.1.3. AC Wireline Conducted Emissions (150 kHz – 30 MHz)

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 Measurement Set up



Measurement set up for AC Wireline Conducted Emissions Test

Measurement Results for AC Wireline Conducted Emissions (150 kHz – 30 MHz)

Ambient conditions.
Temperature: 17 to 23 °C Relative humidity: 31 to 57 % Pressure: 999 to 1012 mbar

Not required - EUT is power by DC only.

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 μΩ 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.

RSS-Gen §7.2.2
The radio frequency voltage that is conducted back into the AC power lines in the frequency range of 0.15 MHz to 30 MHz shall not exceed the limits shown in the table below. The tighter limit applies at the frequency range boundaries.

§15.207 (a) and **RSS-Gen §7.2.2** Limit Matrix
The lower limit applies at the boundary between frequency ranges

Frequency of Emission (MHz)	Conducted Limit (dBμV)	
	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

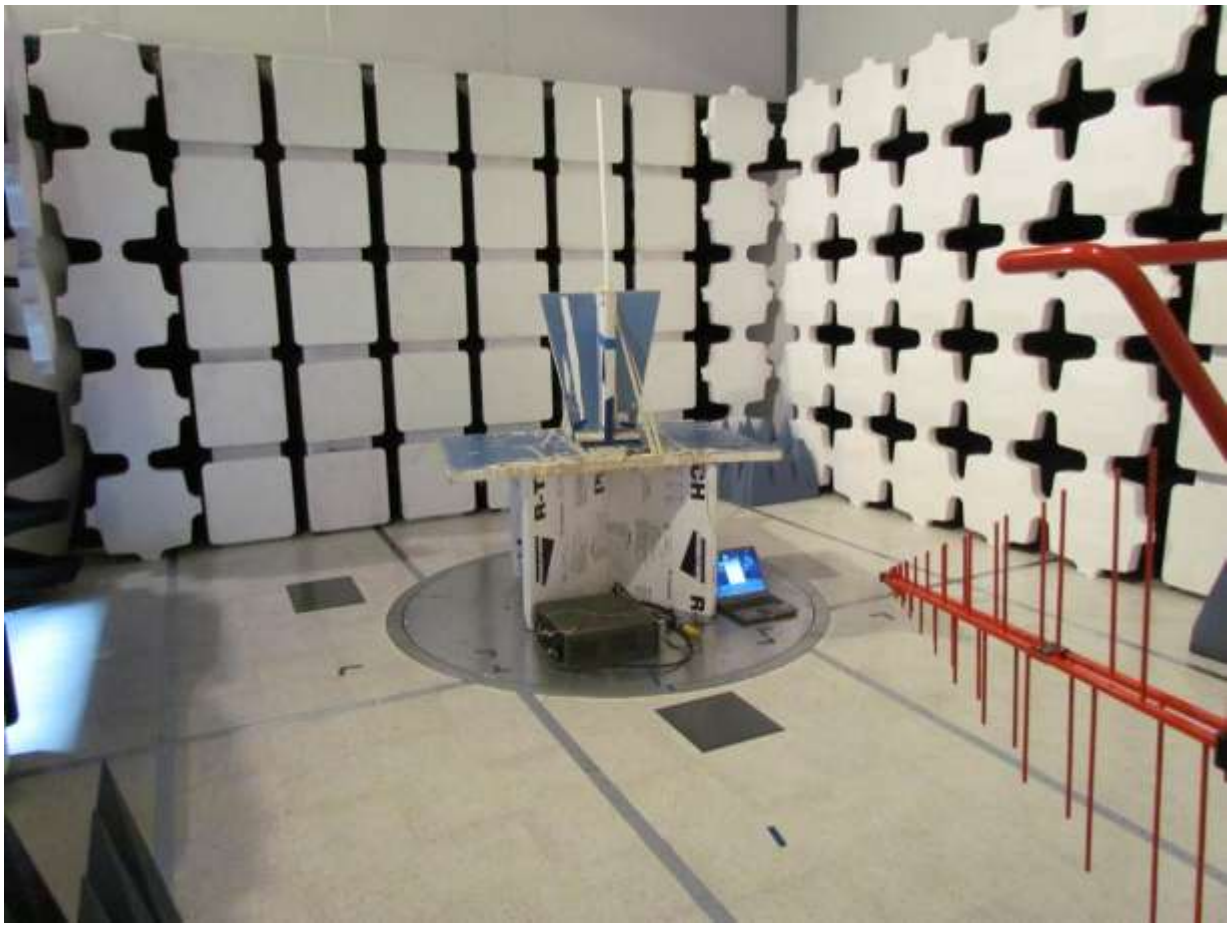
Traceability

Method	Test Equipment Used
Measurements were made per work instruction WI-EMC-01 'Measurement of Conducted Emissions'	0158, 0184, 0287, 0190, 0293, 0307

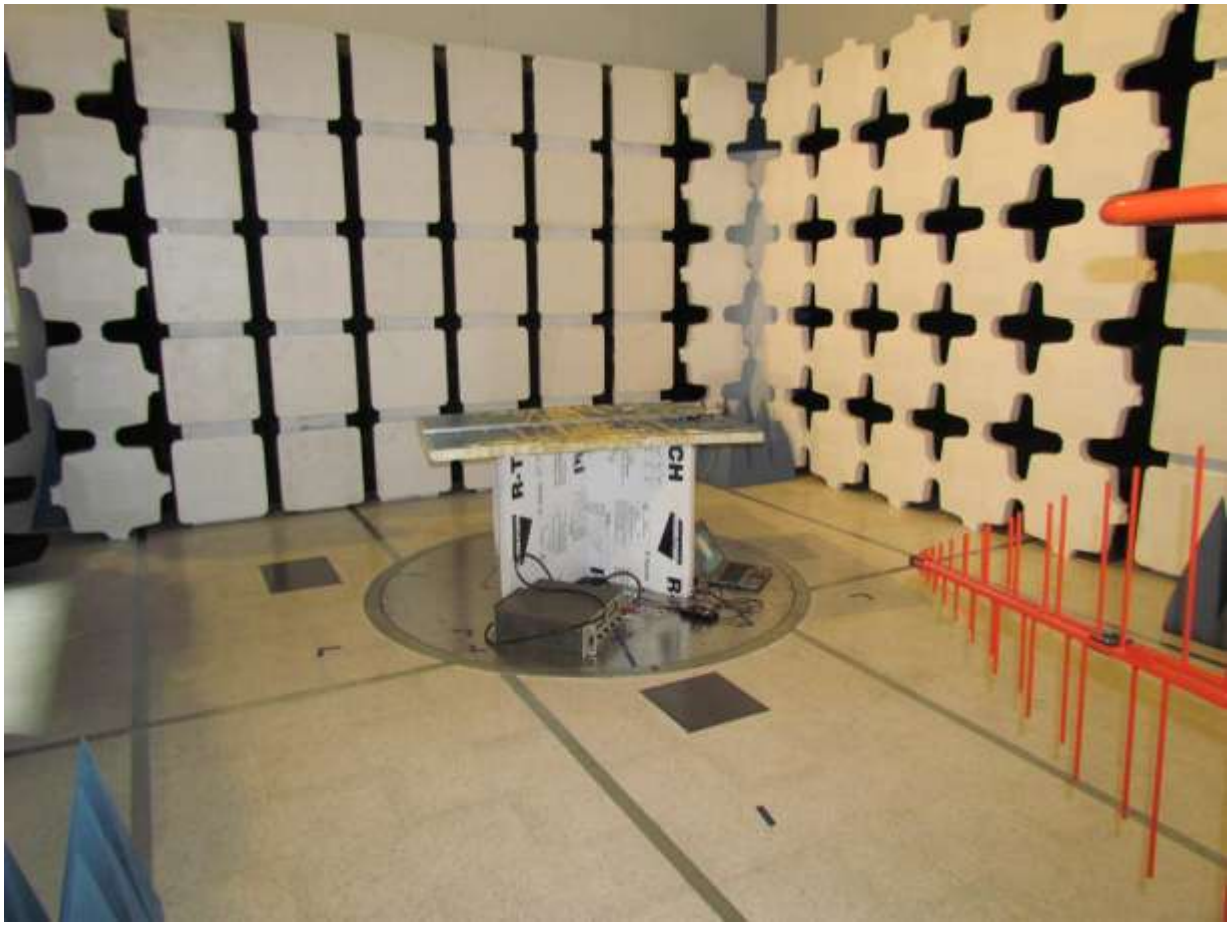
7. PHOTOGRAPHS

7.1. Conducted Test Setup

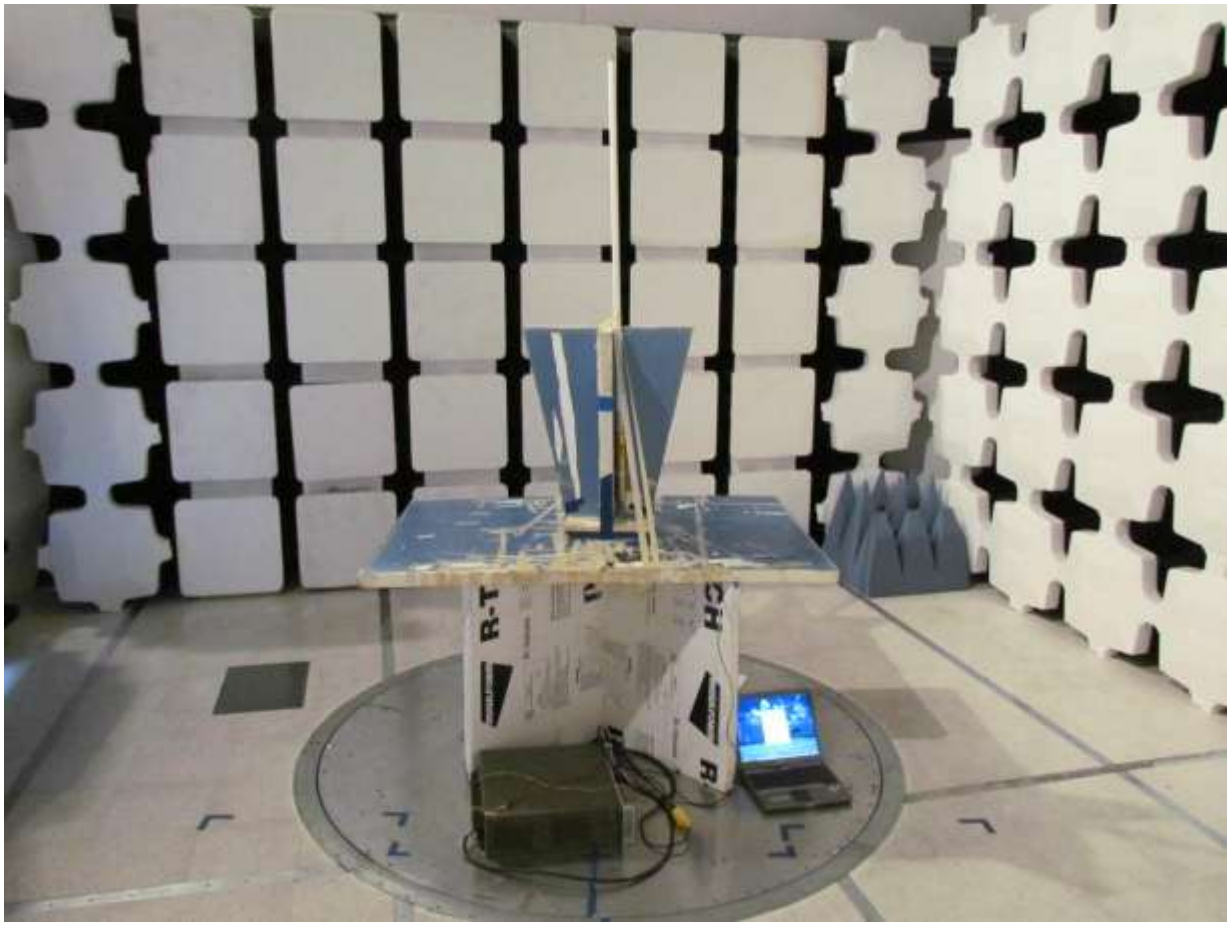
7.2. Test Setup - Digital Emissions below 1 GHz



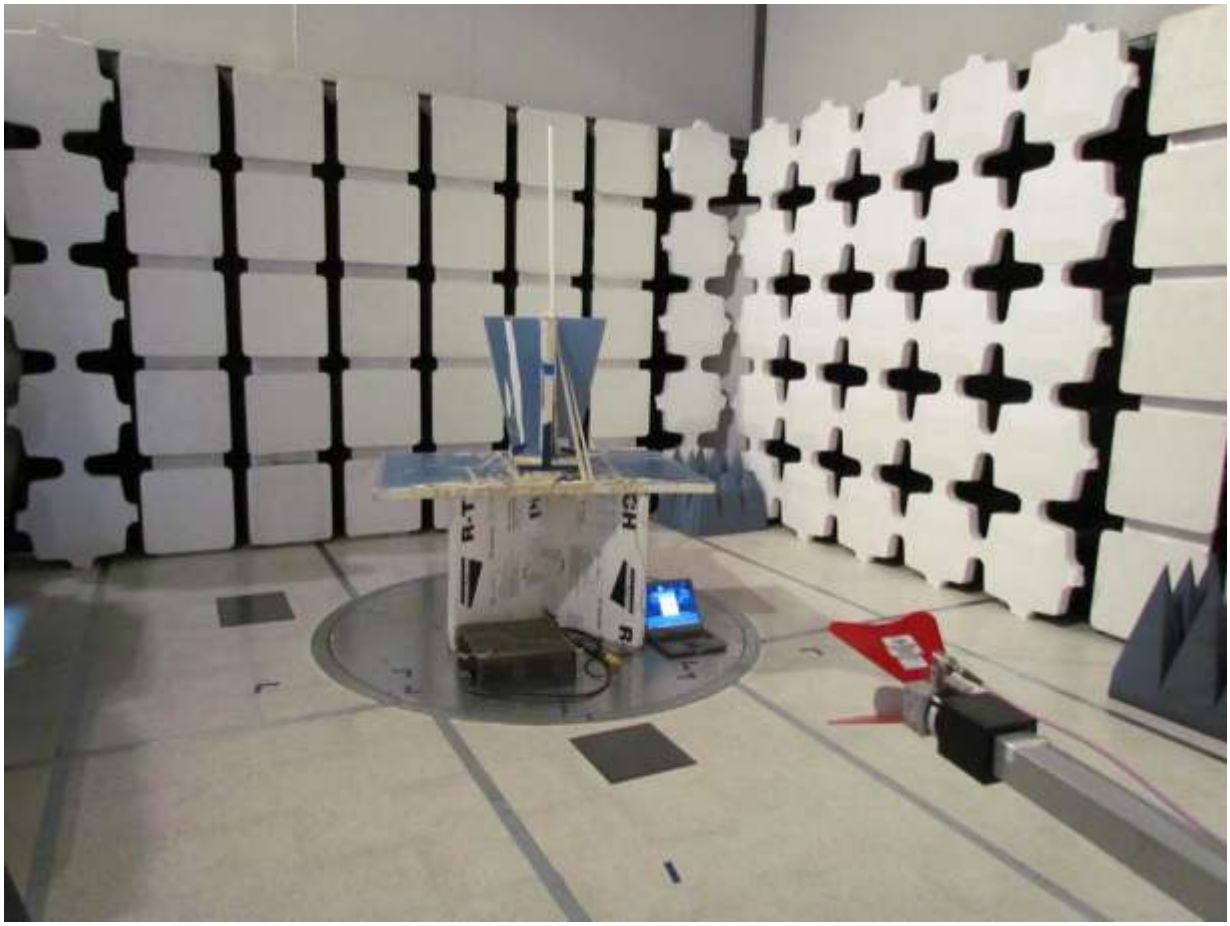
8.1 dBi OMNI antenna



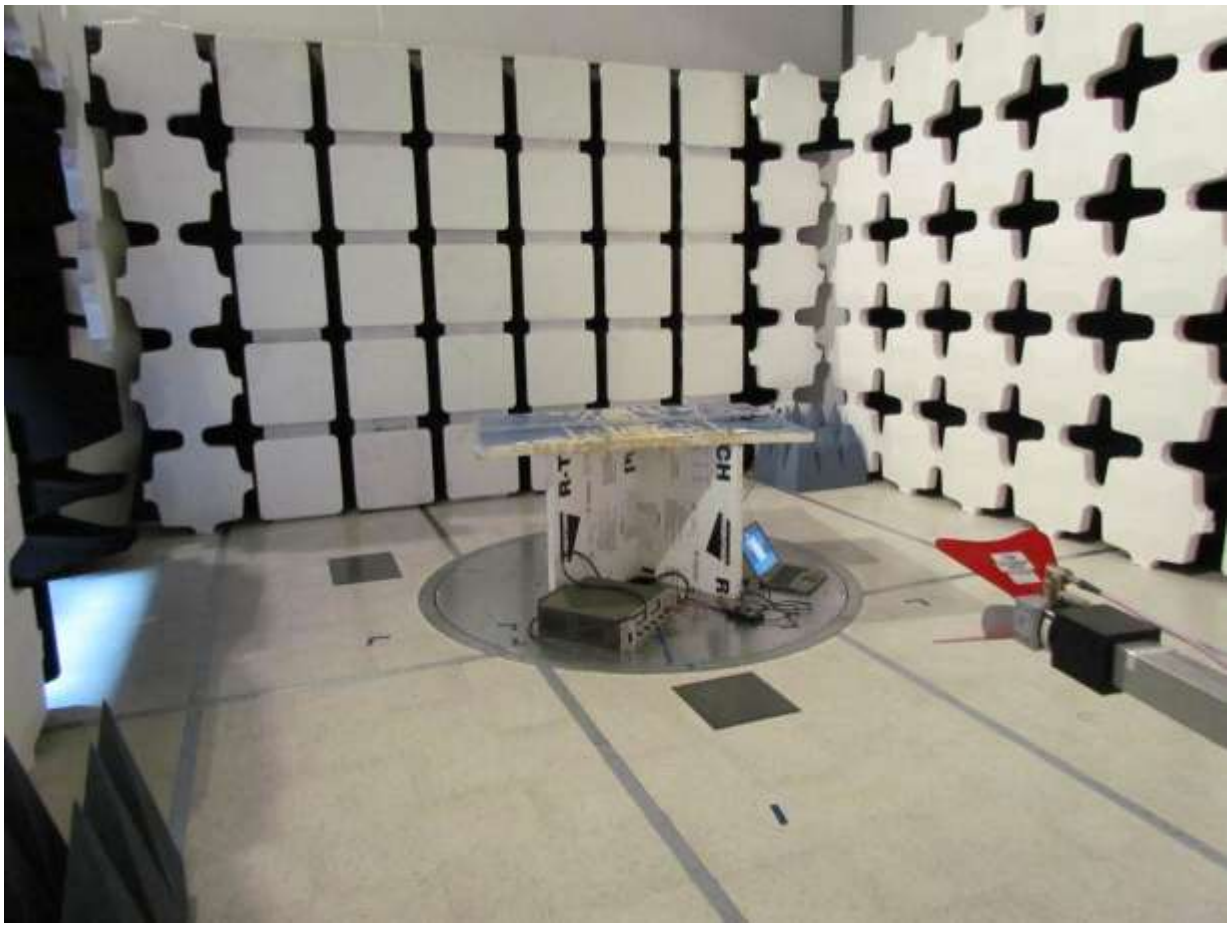
15.1 dBi Yagi antenna



7.3. Radiated Emissions Test Setup >1 GHz



8.1 dBi OMNI antenna



15.1 dBi Yagi antenna

8. TEST EQUIPMENT

Asset #	Instrument	Manufacturer	Part #	Serial #	Calibration Due Date
0117	Power Sensor	Hewlett Packard	8487D	3318A00371	18th Oct 14
0223	Power Meter	Hewlett Packard	EPM-442A	US37480256	18th Oct 14
0376	Power Sensor	Agilent	U2000A	MY51440005	28th Oct 14
0390	Power Sensor	Agilent	U2002A	MY50000103	17th Oct 14
0158	Barometer /Thermometer	Control Co.	4196	E2846	6th Dec 14
0193	EMI Receiver	Rhode & Schwartz	ESI 7	838496/007	2nd Dec 13
0287	EMI Receiver	Rhode & Schwartz	ESIB40	100201	31st Jul 14
0378	EMI Receiver	Rhode & Schwartz	ESIB40	100107/040	17th Jul 14
0338	30 - 3000 MHz Antenna	Sunol	JB3	A052907	14th Aug 14
0399	1-18 GHz Horn Antenna	EMCO	3117	00154575	10th Oct 14
0252	SMA Cable	Megaphase	Sucoflex 104	None	N/A
0310	2m SMA Cable	Micro-Coax	UFA210A-0-0787-3G03G0	209089-001	N/A
0312	3m SMA Cable	Micro-Coax	UFA210A-1-1181-3G0300	209092-001	N/A
0314	30dB N-Type Attenuator	ARRA	N9444-30	1623	N/A
0359	DFS Test System	Aeroflex	PXI-1042	300001/004	21st Oct 14
0299	DFS Test Software	Aeroflex	PXIModule	Version 7.1.0	N/A
0502	EMC Test Software	EMISoft	Vasona	5.0051	N/A
0503	RF Conducted Test Software	National Instruments	Labview	Version 8.2	N/A
0398	RF Conducted Test Software	MiCOM Labs ATS	--	Version 1.8	N/A
0380	RF Switch	MiCOM Labs	MIC001	MIC001	20th March 14

APPENDIX

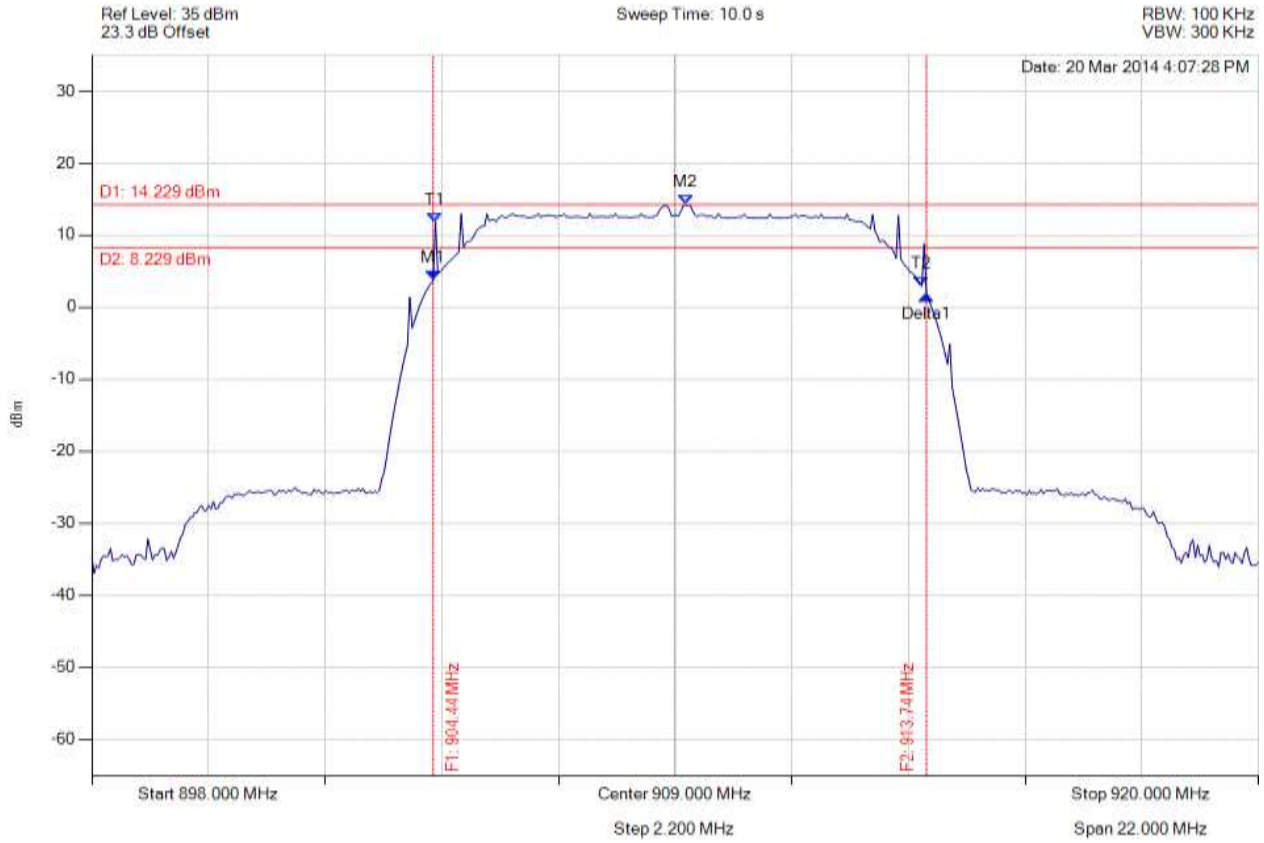
A. SUPPORTING INFORMATION

A.1. CONDUCTED TEST PLOTS

A.1.1. 6 dB & 99% Bandwidth

6 dB & 99% BANDWIDTH

Variant: Low Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

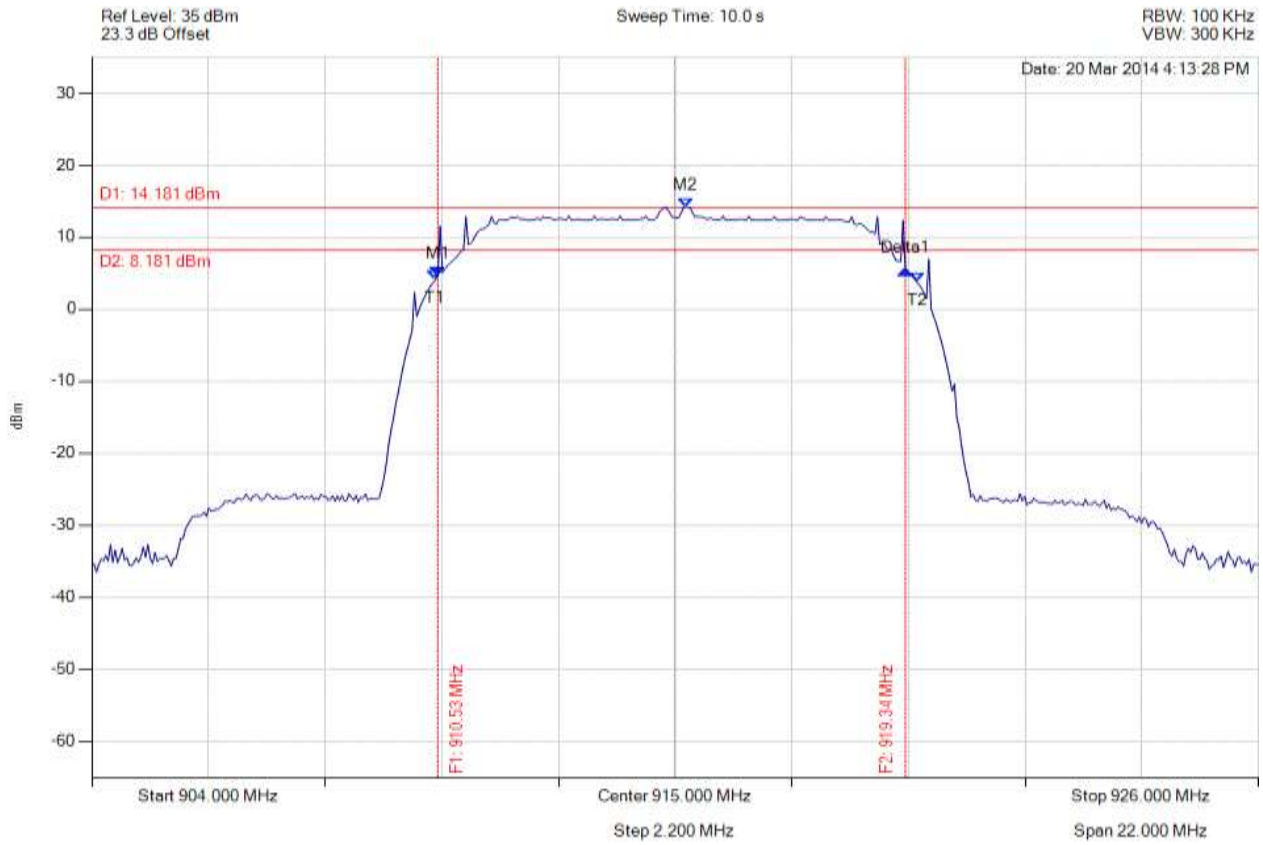


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 904.437 MHz : 3.780 dBm M2 : 909.198 MHz : 14.229 dBm Delta1 : 9.303 MHz : -2.133 dB T1 : 904.481 MHz : 11.860 dBm T2 : 913.651 MHz : 2.922 dBm OBW : 9.170 MHz	Measured 6 dB Bandwidth: 9.303 MHz Limit: ≥500.0 kHz Margin: -8.80 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: Low Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

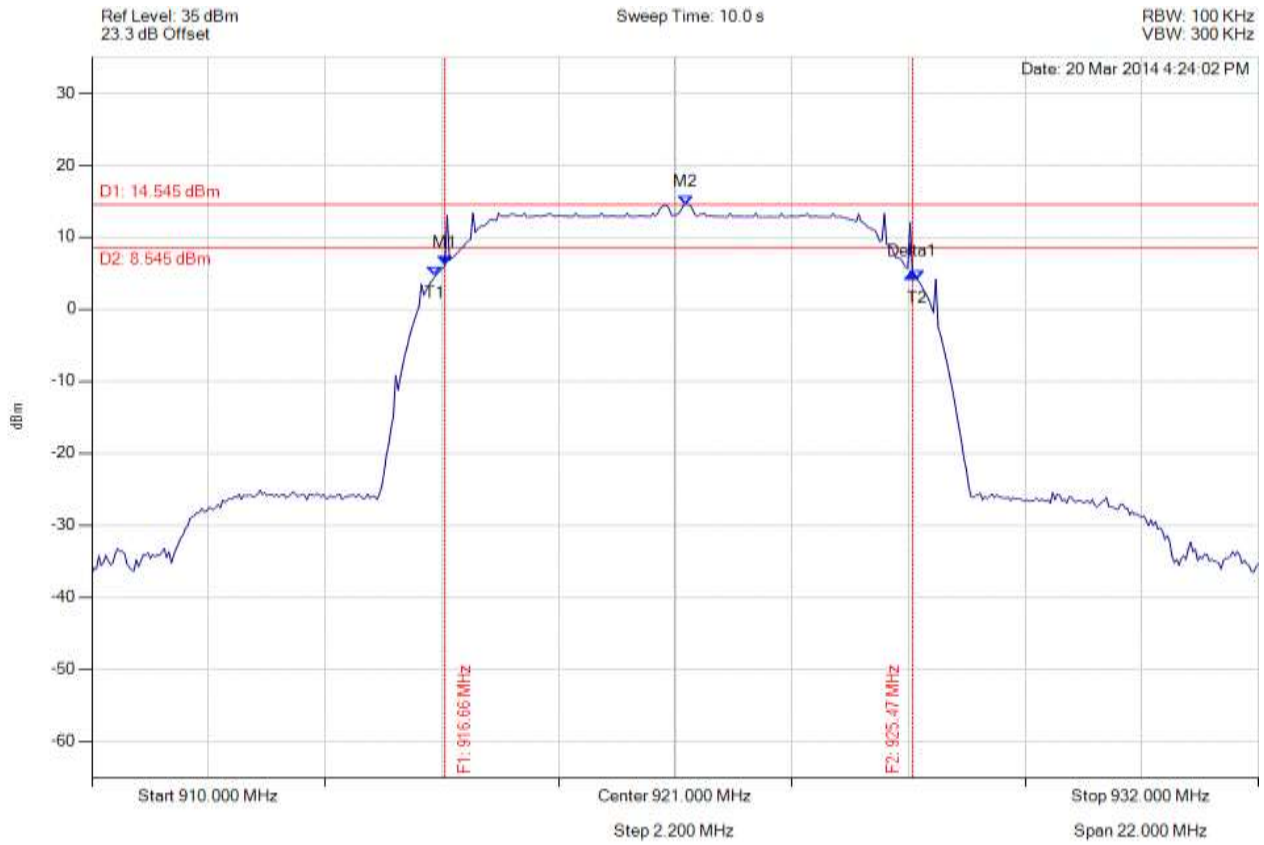


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 910.525 MHz : 4.585 dBm M2 : 915.198 MHz : 14.181 dBm Delta1 : 8.818 MHz : 0.891 dB T1 : 910.481 MHz : 4.124 dBm T2 : 919.563 MHz : 3.719 dBm OBW : 9.082 MHz	Measured 6 dB Bandwidth: 8.818 MHz Limit: ≥500.0 kHz Margin: -8.32 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: Low Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

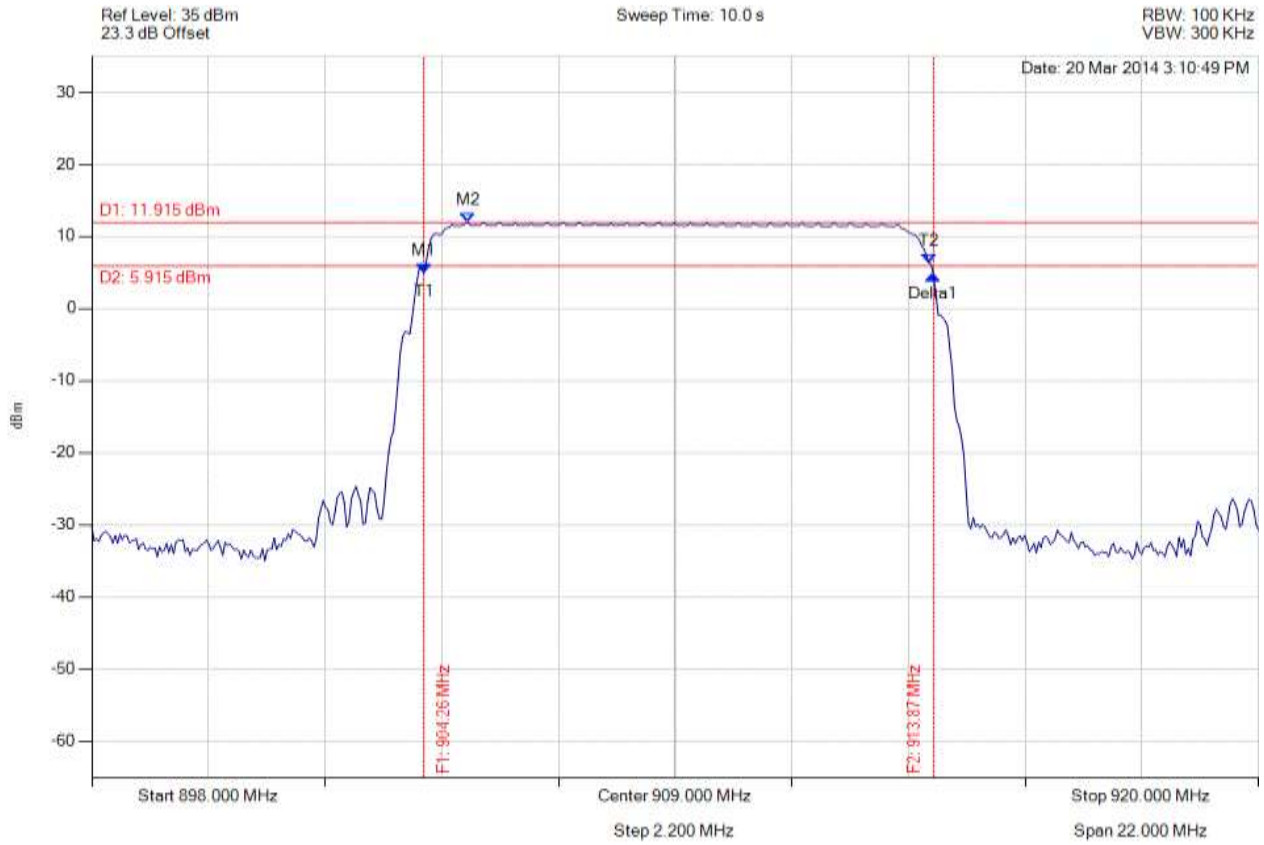


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 916.657 MHz : 6.064 dBm M2 : 921.198 MHz : 14.545 dBm Delta1 : 8.818 MHz : -1.031 dB T1 : 916.481 MHz : 4.691 dBm T2 : 925.563 MHz : 4.136 dBm OBW : 9.082 MHz	Measured 6 dB Bandwidth: 8.818 MHz Limit: ≥500.0 kHz Margin: -8.32 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: High Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

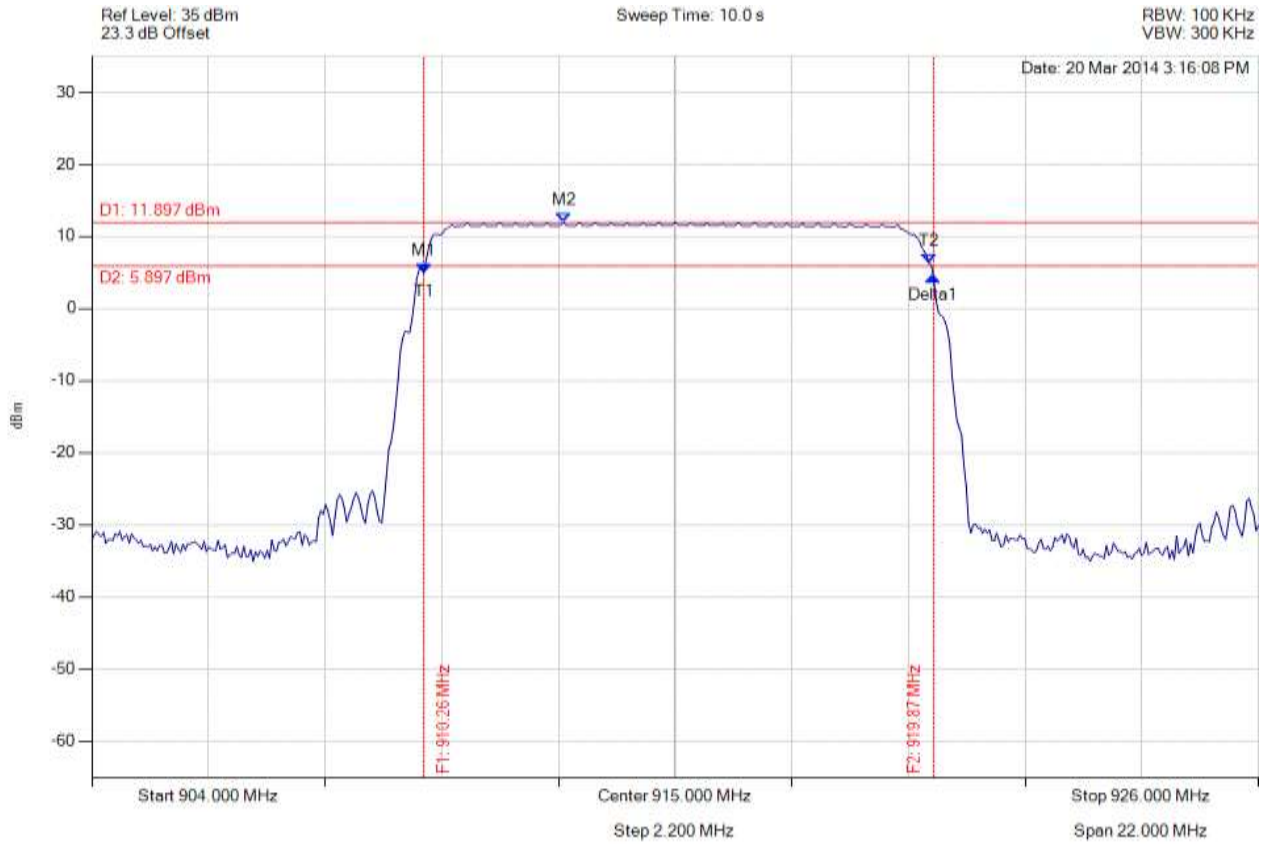


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 904.261 MHz : 4.980 dBm M2 : 905.098 MHz : 11.915 dBm Delta1 : 9.611 MHz : -0.344 dB T1 : 904.261 MHz : 4.980 dBm T2 : 913.784 MHz : 6.357 dBm OBW : 9.523 MHz	Measured 6 dB Bandwidth: 9.611 MHz Limit: ≥500.0 kHz Margin: -9.11 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: High Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

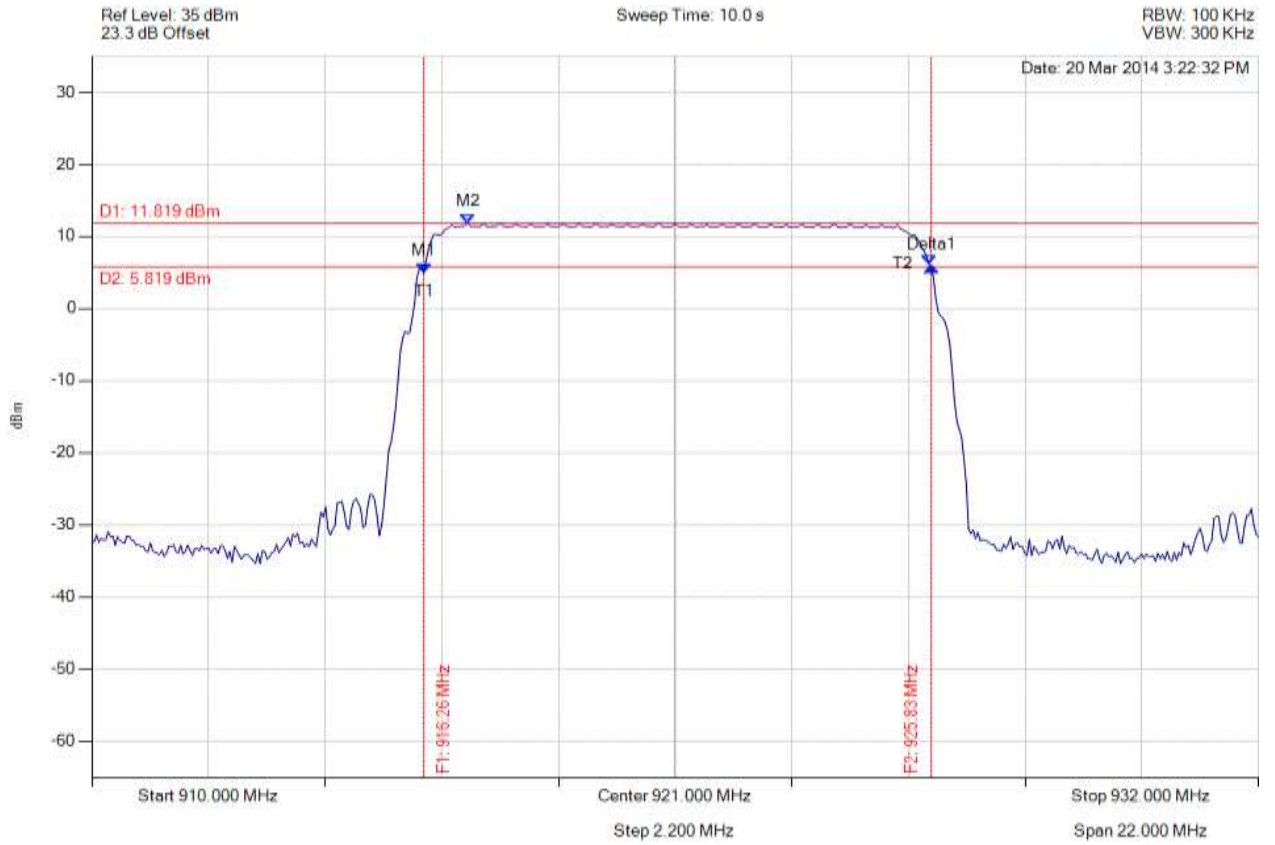


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 910.261 MHz : 4.925 dBm M2 : 912.906 MHz : 11.897 dBm Delta1 : 9.611 MHz : -0.464 dB T1 : 910.261 MHz : 4.925 dBm T2 : 919.784 MHz : 6.302 dBm OBW : 9.523 MHz	Measured 6 dB Bandwidth: 9.611 MHz Limit: ≥500.0 kHz Margin: -9.11 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: High Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

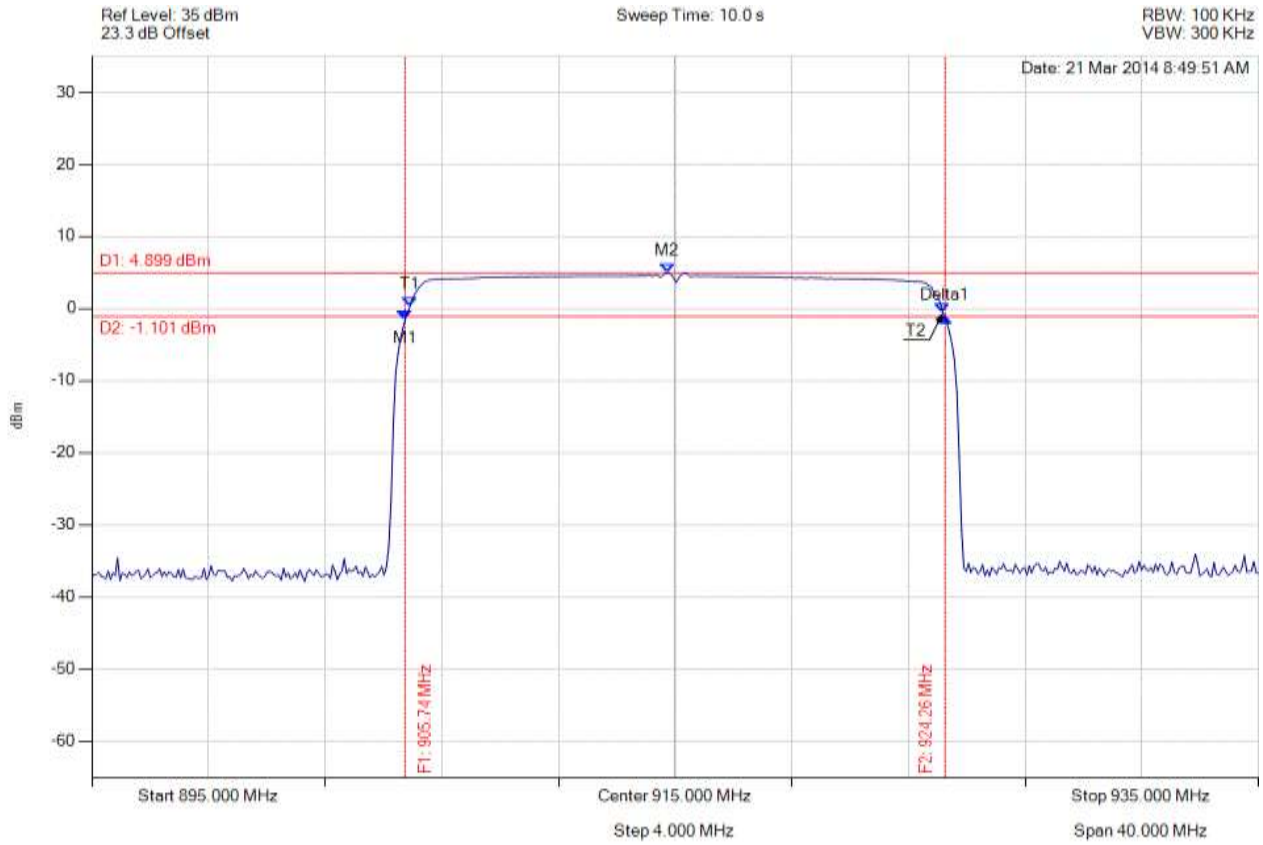


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 916.261 MHz : 4.937 dBm M2 : 917.098 MHz : 11.819 dBm Delta1 : 9.567 MHz : 0.875 dB T1 : 916.261 MHz : 4.937 dBm T2 : 925.784 MHz : 6.208 dBm OBW : 9.523 MHz	Measured 6 dB Bandwidth: 9.567 MHz Limit: ≥500.0 kHz Margin: -9.07 MHz

Back to the Matrix

6 dB & 99% BANDWIDTH

Variant: 20 MHz, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



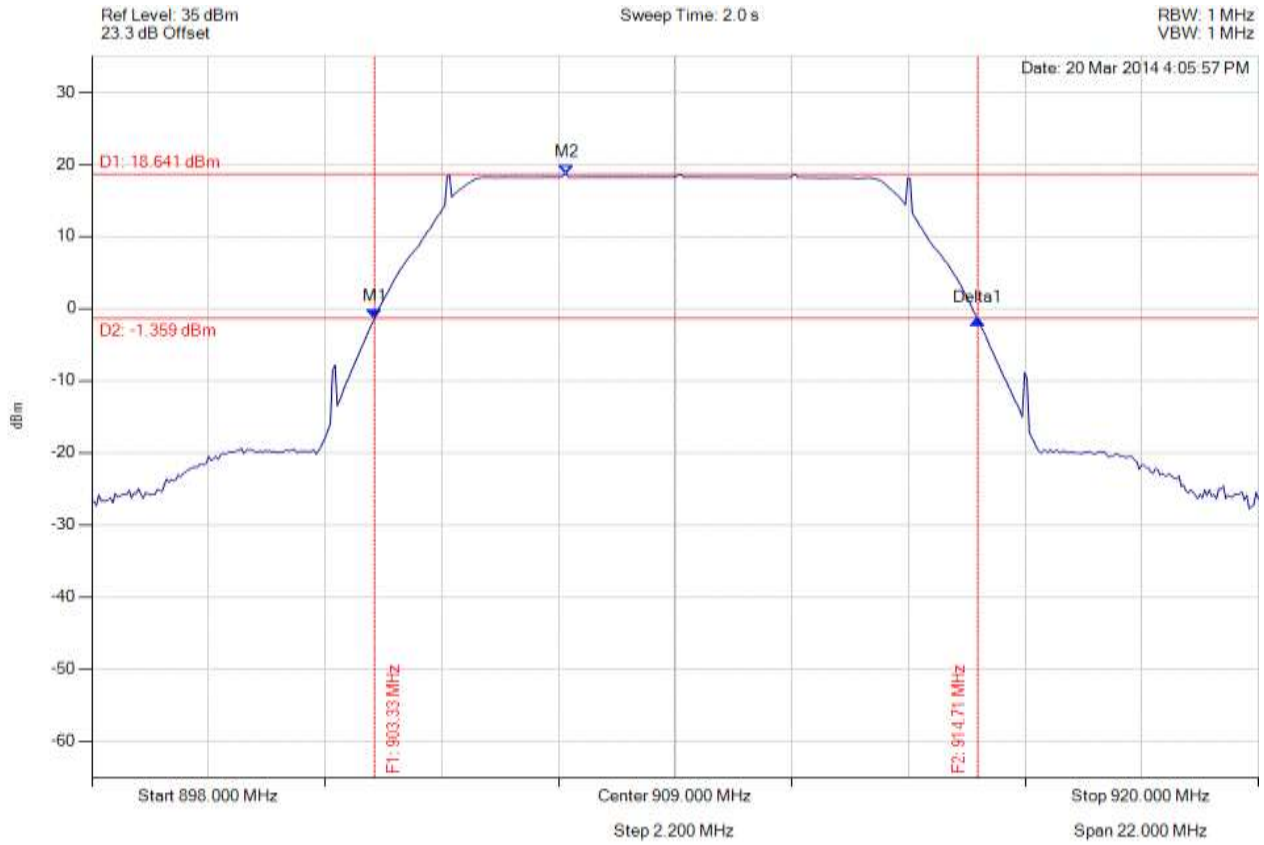
Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 905.741 MHz : -1.593 dBm M2 : 914.719 MHz : 4.899 dBm Delta1 : 18.517 MHz : 0.321 dB T1 : 905.902 MHz : 0.251 dBm T2 : 924.178 MHz : -0.582 dBm OBW : 18.277 MHz	Measured 6 dB Bandwidth: 18.517 MHz Limit: ≥500.0 kHz Margin: -18.02 MHz

Back to the Matrix

A.1.2. Peak Output Power

PEAK OUTPUT POWER

Variant: Low Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

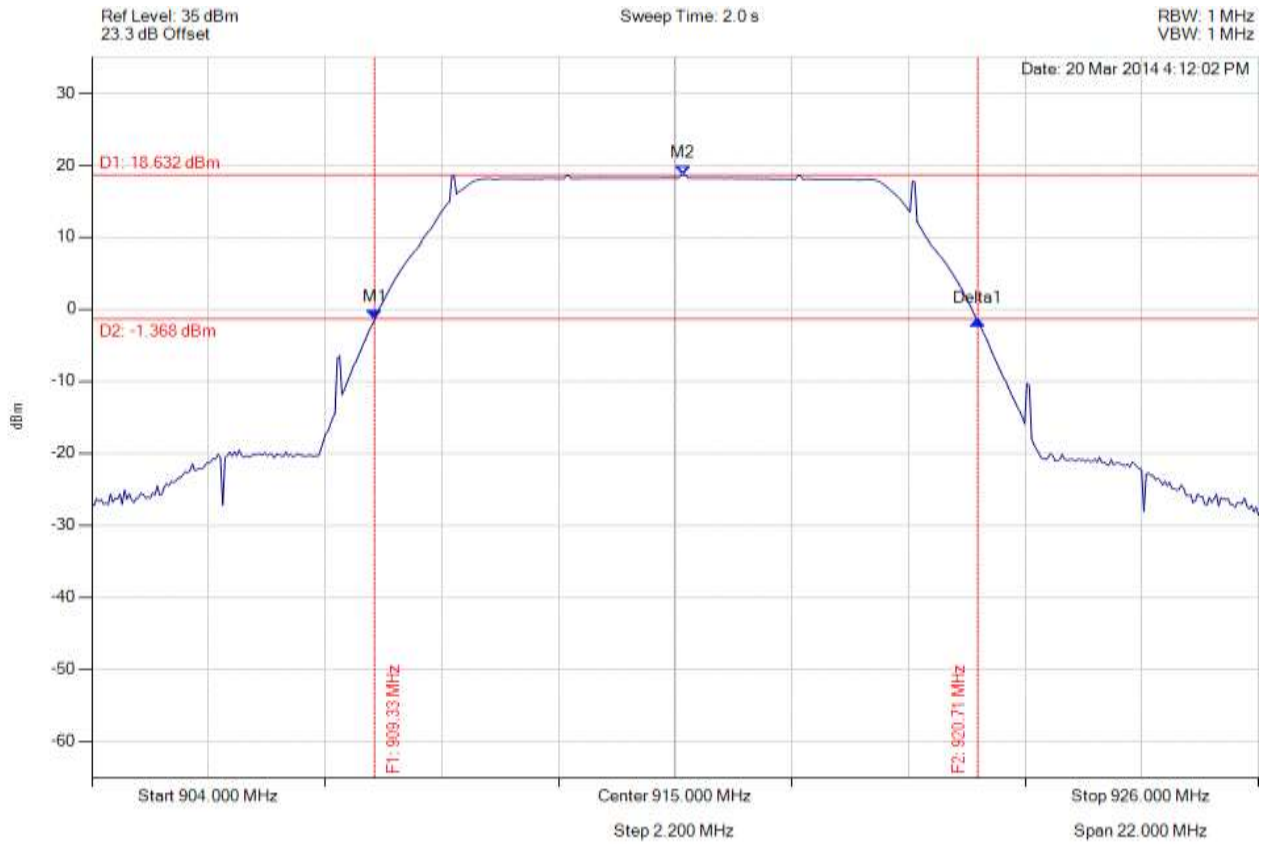


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 903.335 MHz : -1.374 dBm M2 : 906.950 MHz : 18.641 dBm Delta1 : 11.375 MHz : -0.153 dB	Channel Power: 29.67 dBm Limit: 27.90 dBm Margin: 1.77 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: Low Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 909.335 MHz : -1.408 dBm M2 : 915.154 MHz : 18.632 dBm Delta1 : 11.375 MHz : -0.203 dB	Channel Power: 29.51 dBm Limit: 27.90 dBm Margin: 1.61 dB

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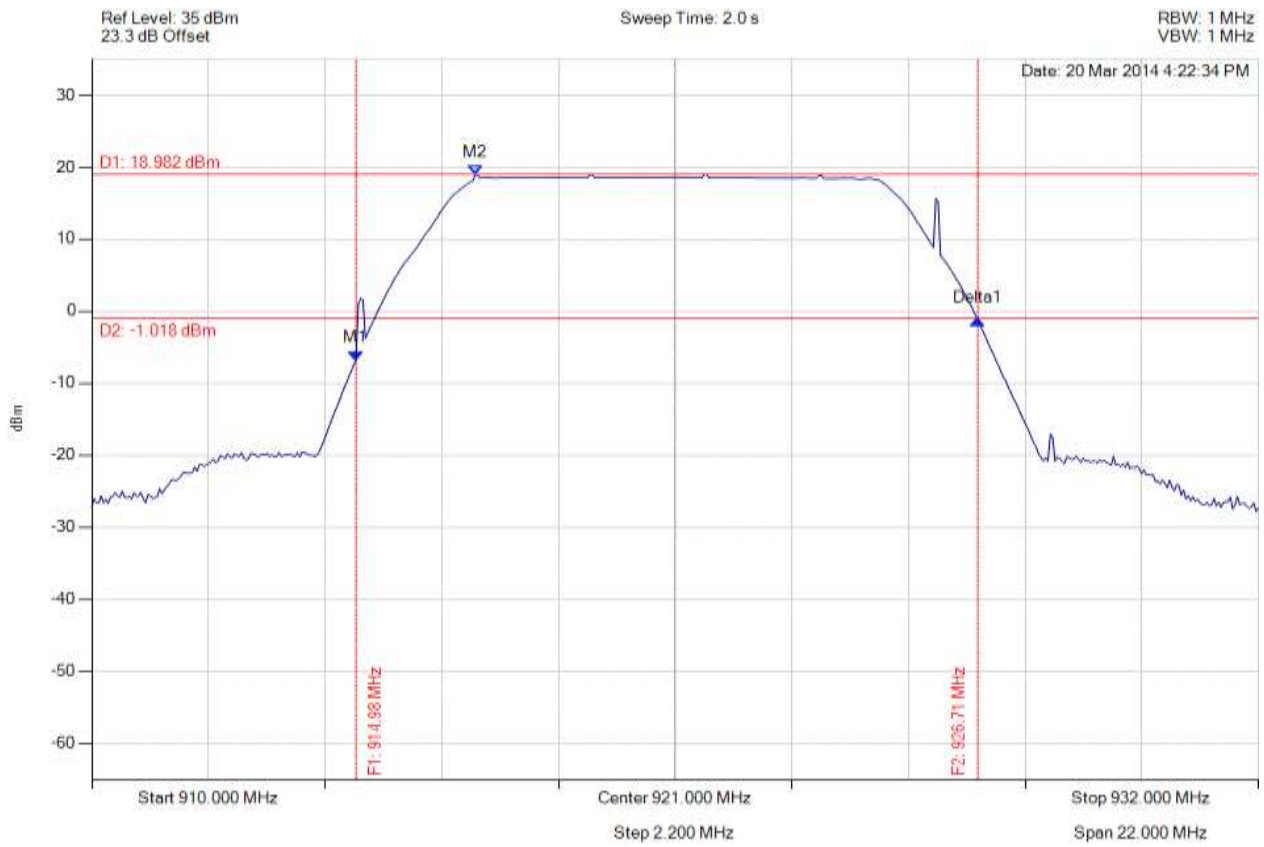
PEAK OUTPUT POWER

Variant: Low Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.982 MHz : -6.796 dBm M2 : 917.230 MHz : 18.982 dBm Delta1 : 11.727 MHz : 5.544 dB	Channel Power: 29.57 dBm Limit: 27.90 dBm Margin: 1.67 dB

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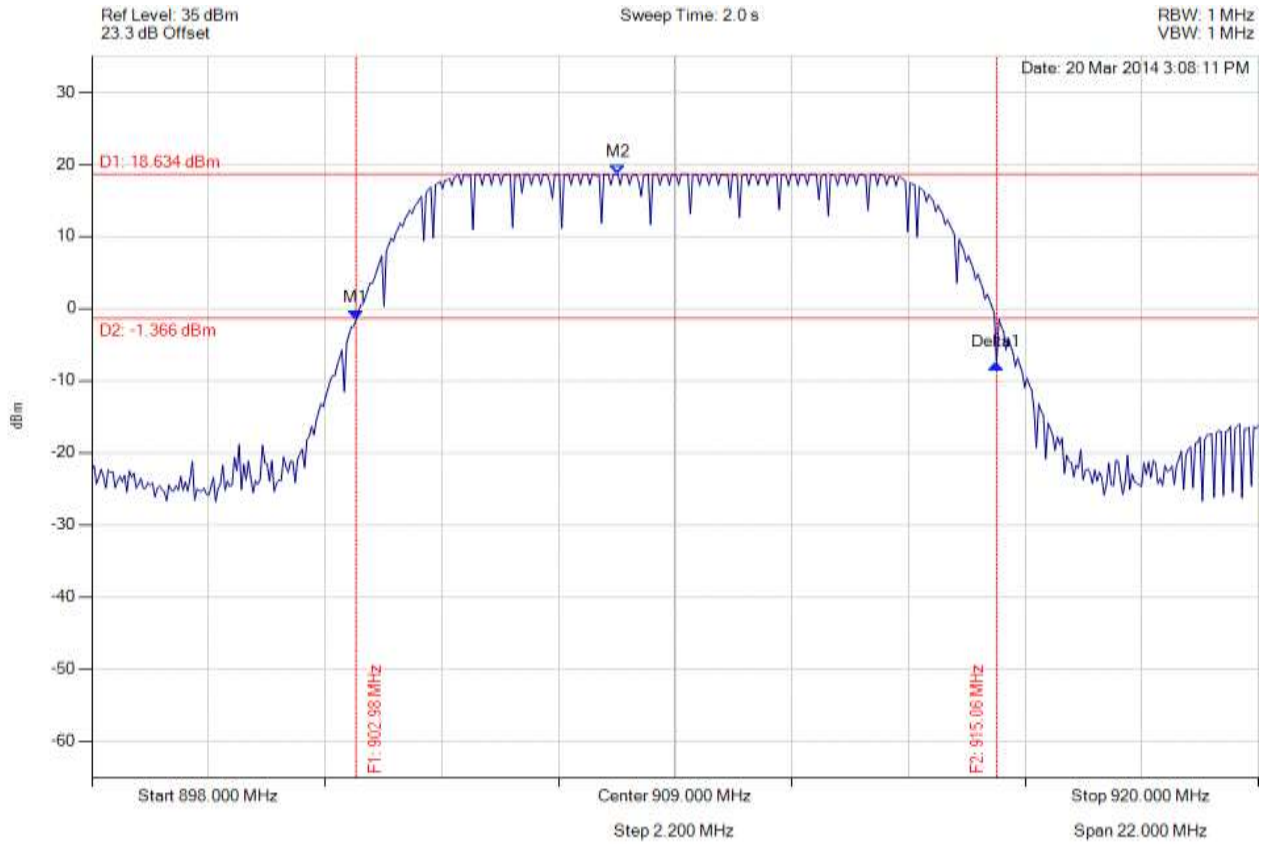
PEAK OUTPUT POWER

Variant: High Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.982 MHz : -1.563 dBm M2 : 907.920 MHz : 18.634 dBm Delta1 : 12.080 MHz : -6.148 dB	Channel Power: 29.76 dBm Limit: 27.90 dBm Margin: 1.86 dB

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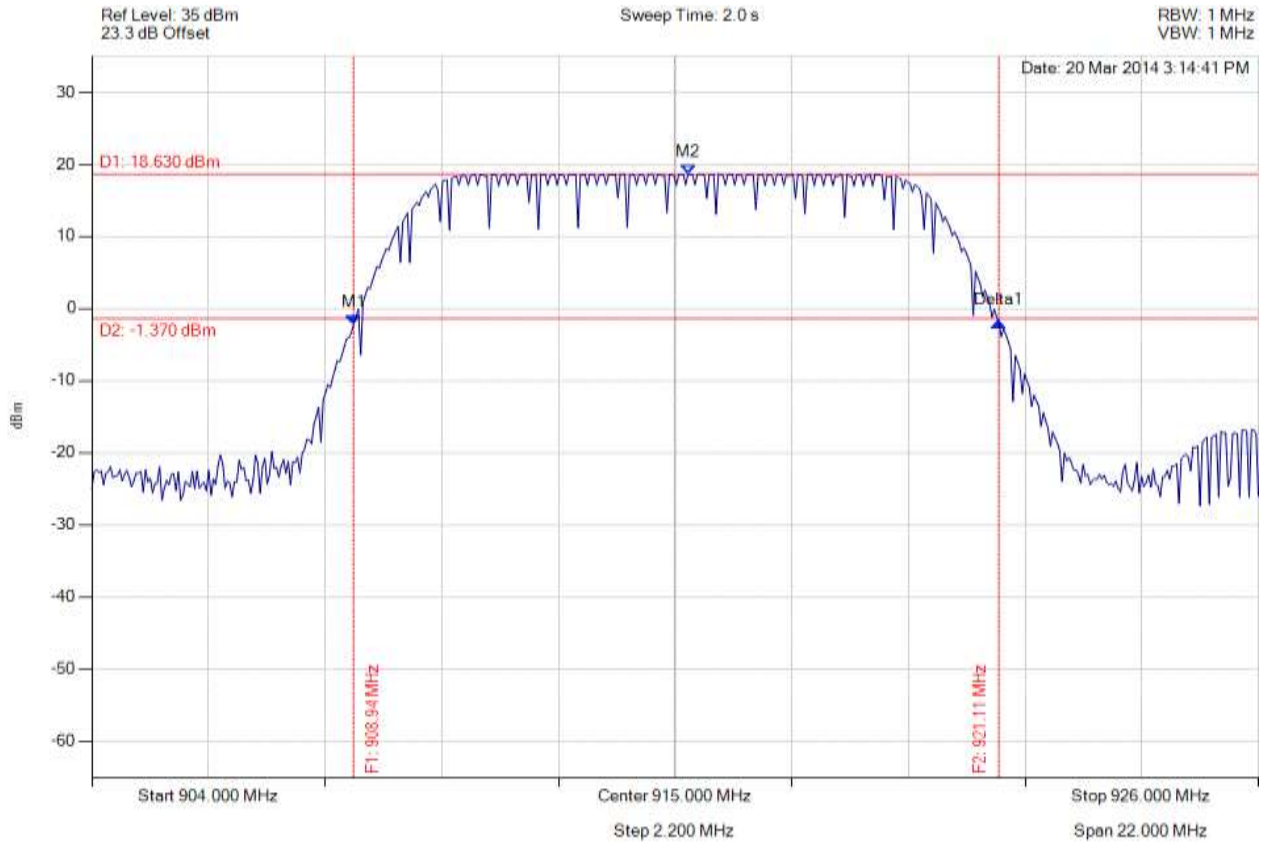
PEAK OUTPUT POWER

Variant: High Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

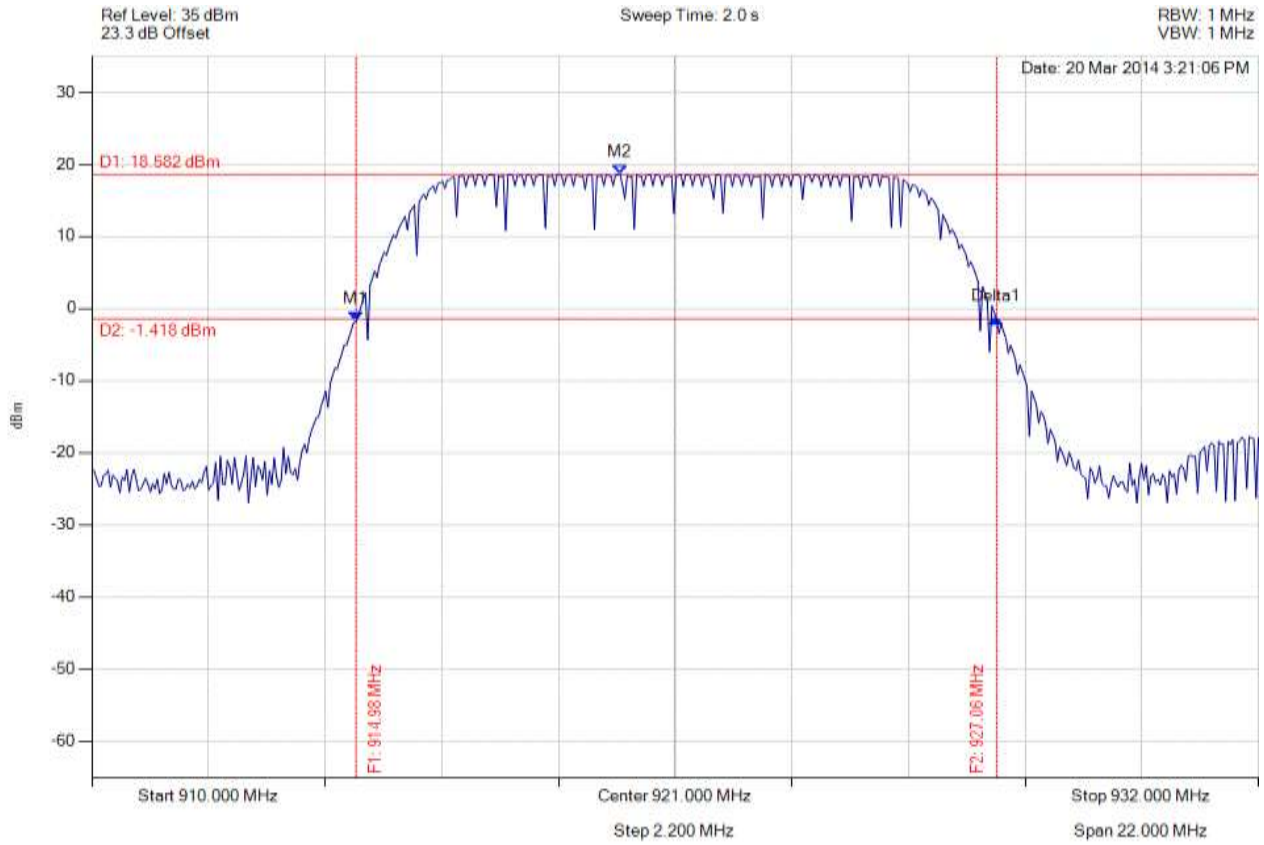


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 908.938 MHz : -2.163 dBm M2 : 915.242 MHz : 18.630 dBm Delta1 : 12.168 MHz : 0.234 dB	Channel Power: 29.45 dBm Limit: 27.90 dBm Margin: 1.55 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: High Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

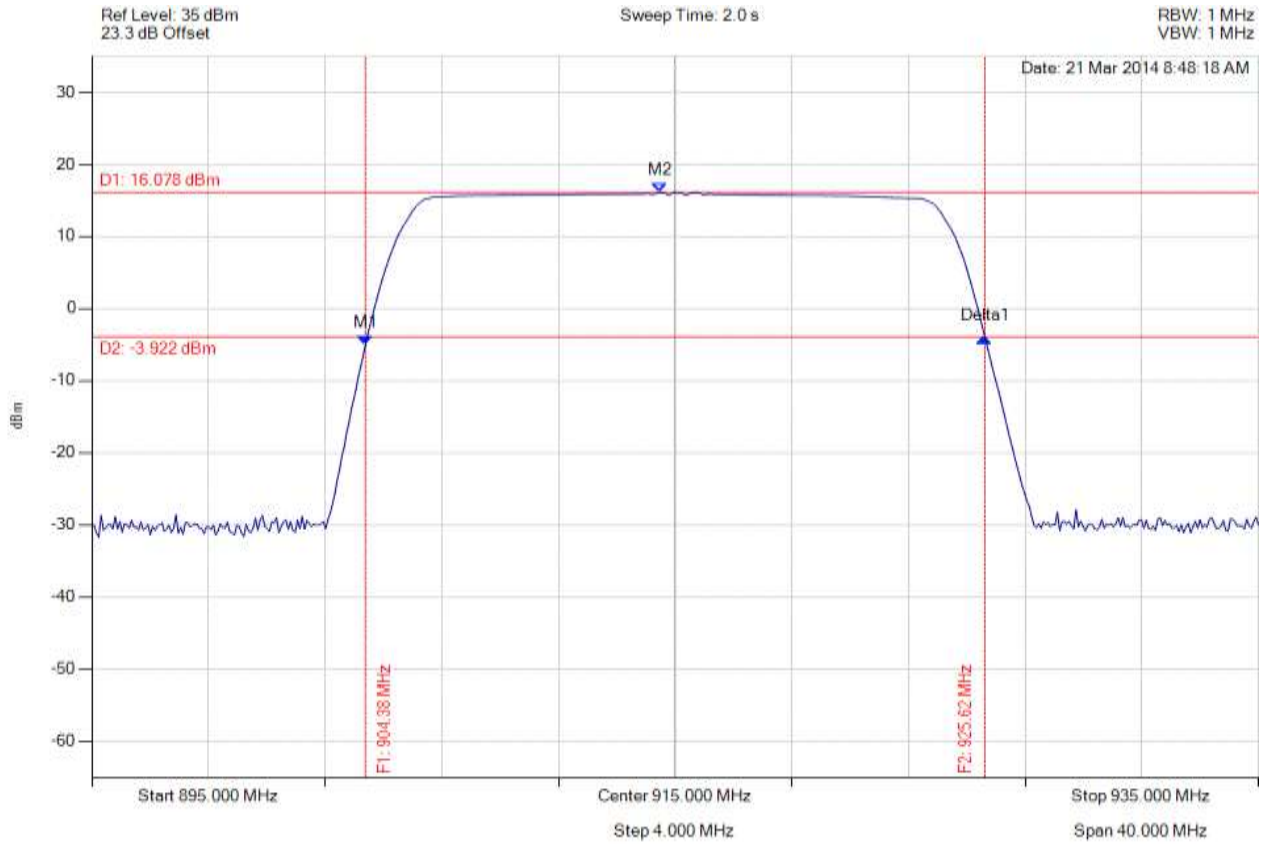


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.982 MHz : -1.766 dBm M2 : 919.964 MHz : 18.582 dBm Delta1 : 12.080 MHz : 0.317 dB	Channel Power: 29.58 dBm Limit: 27.90 dBm Margin: 1.68 dB

Back to the Matrix

PEAK OUTPUT POWER

Variant: 20 MHz, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 904.379 MHz : -5.120 dBm M2 : 914.479 MHz : 16.078 dBm Delta1 : 21.242 MHz : 1.147 dB	Channel Power: 29.85 dBm Limit: 27.90 dBm Margin: 1.95 dB

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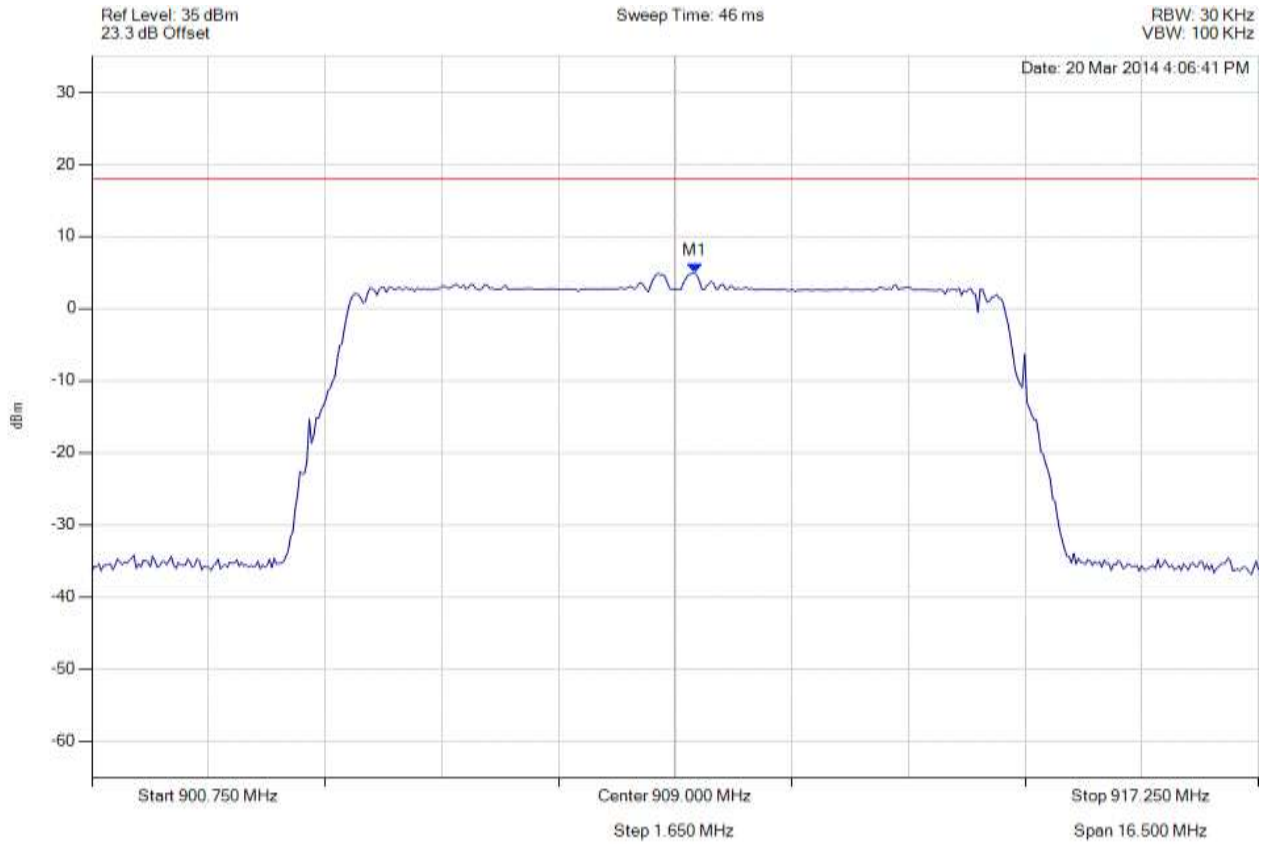
A.1.3. Power Spectral Density

POWER SPECTRAL DENSITY - PEAK

Variant: Low Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

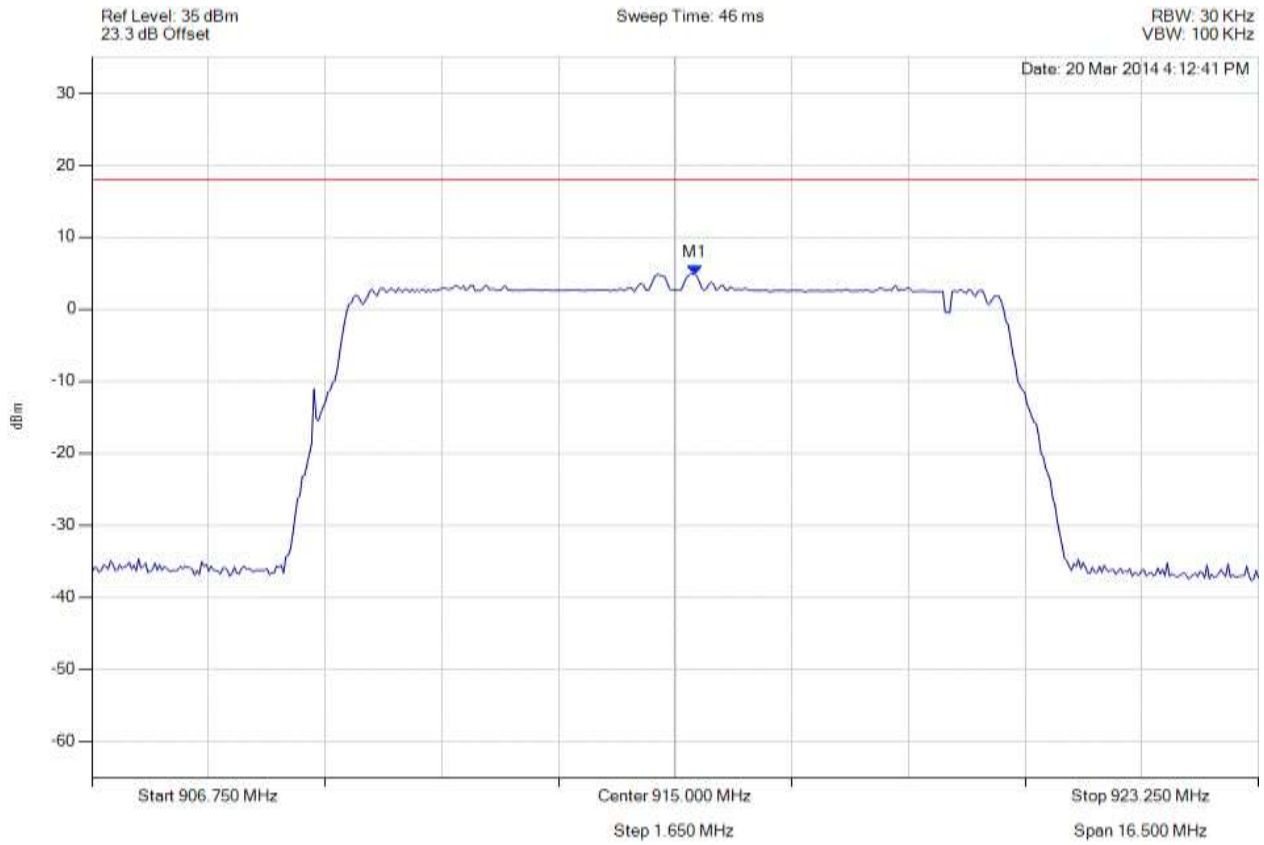


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 909.281 MHz : 4.886 dBm	Limit: ≤ 18.000 dBm Margin: -13.11 dB

Back to the Matrix

POWER SPECTRAL DENSITY - PEAK

Variant: Low Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

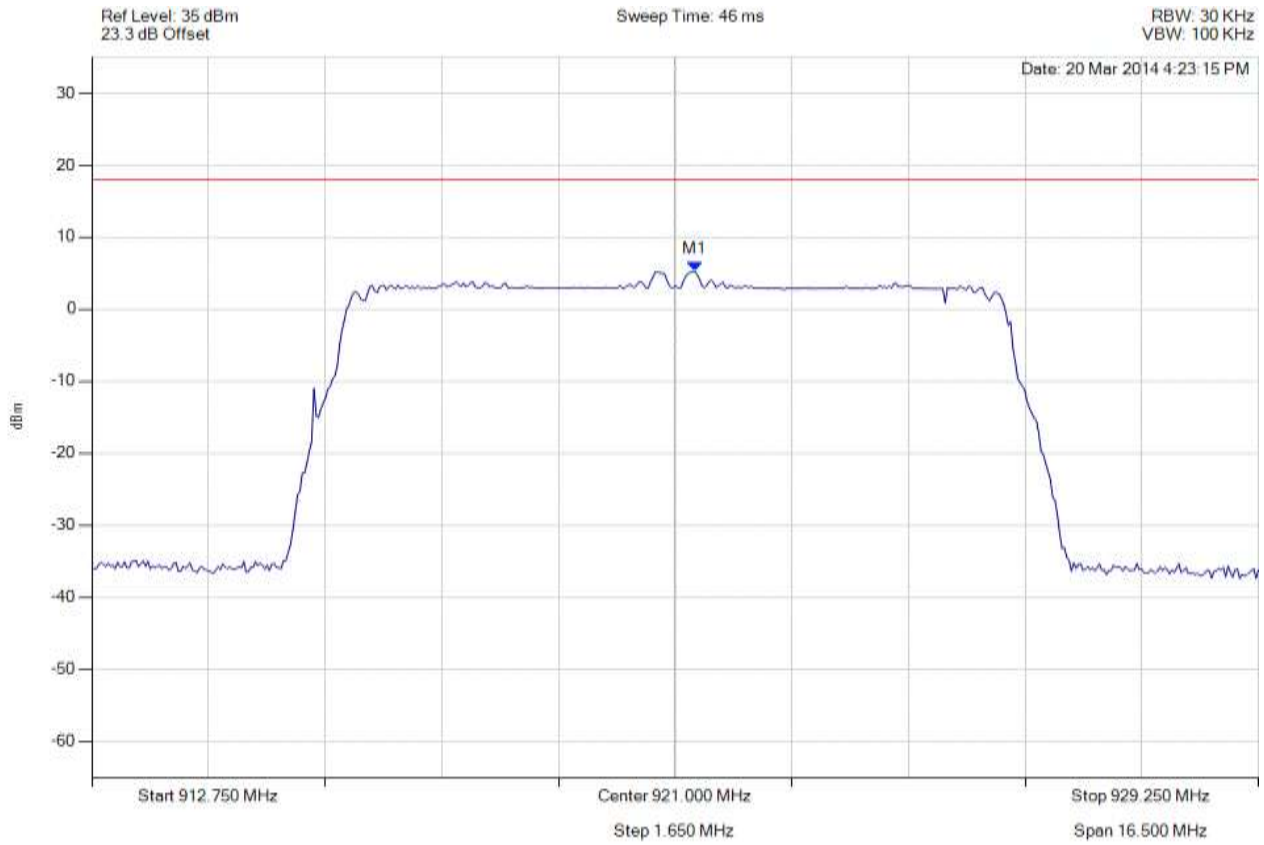


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.281 MHz : 4.831 dBm	Limit: ≤ 18.000 dBm Margin: -13.17 dB

Back to the Matrix

POWER SPECTRAL DENSITY - PEAK

Variant: Low Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

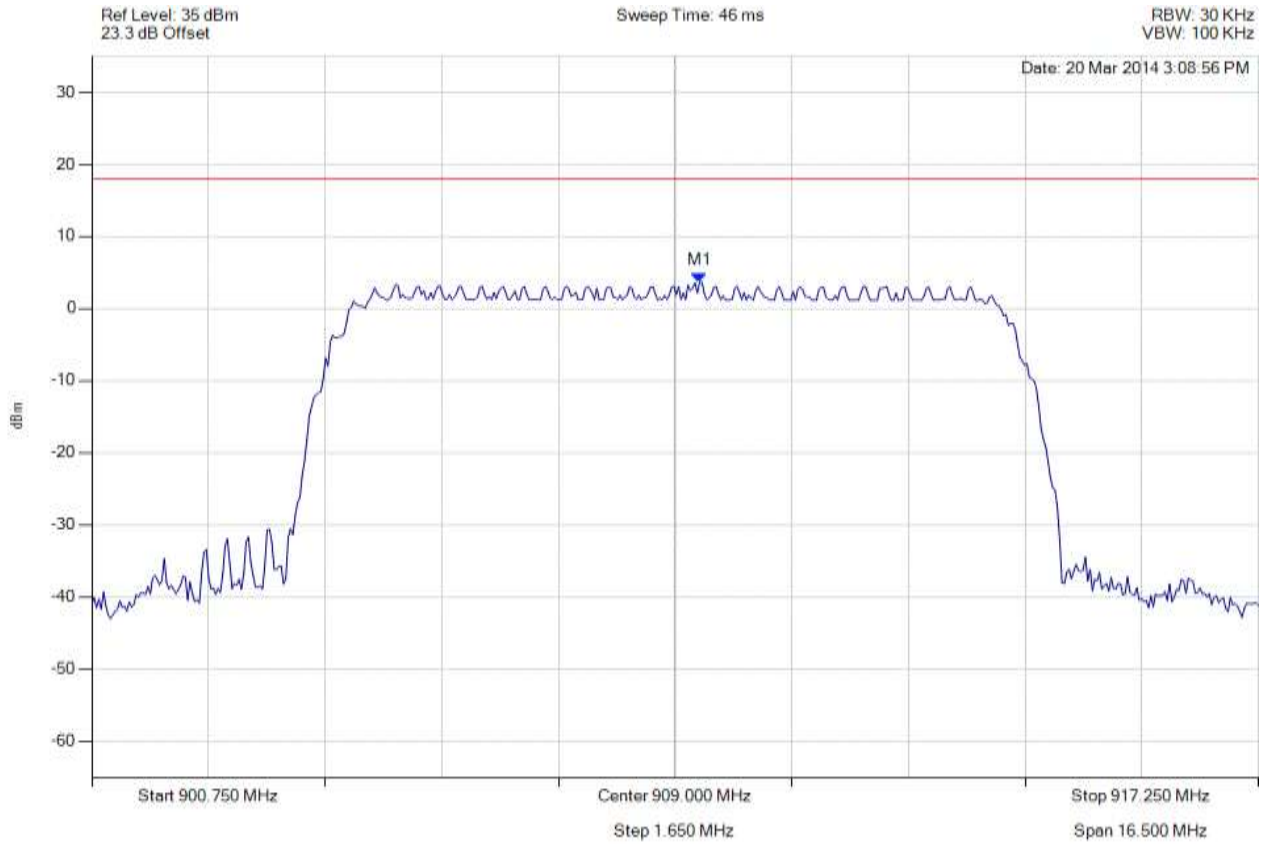


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 921.281 MHz : 5.226 dBm	Limit: ≤ 18.000 dBm Margin: -12.77 dB

Back to the Matrix

POWER SPECTRAL DENSITY - PEAK

Variant: High Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

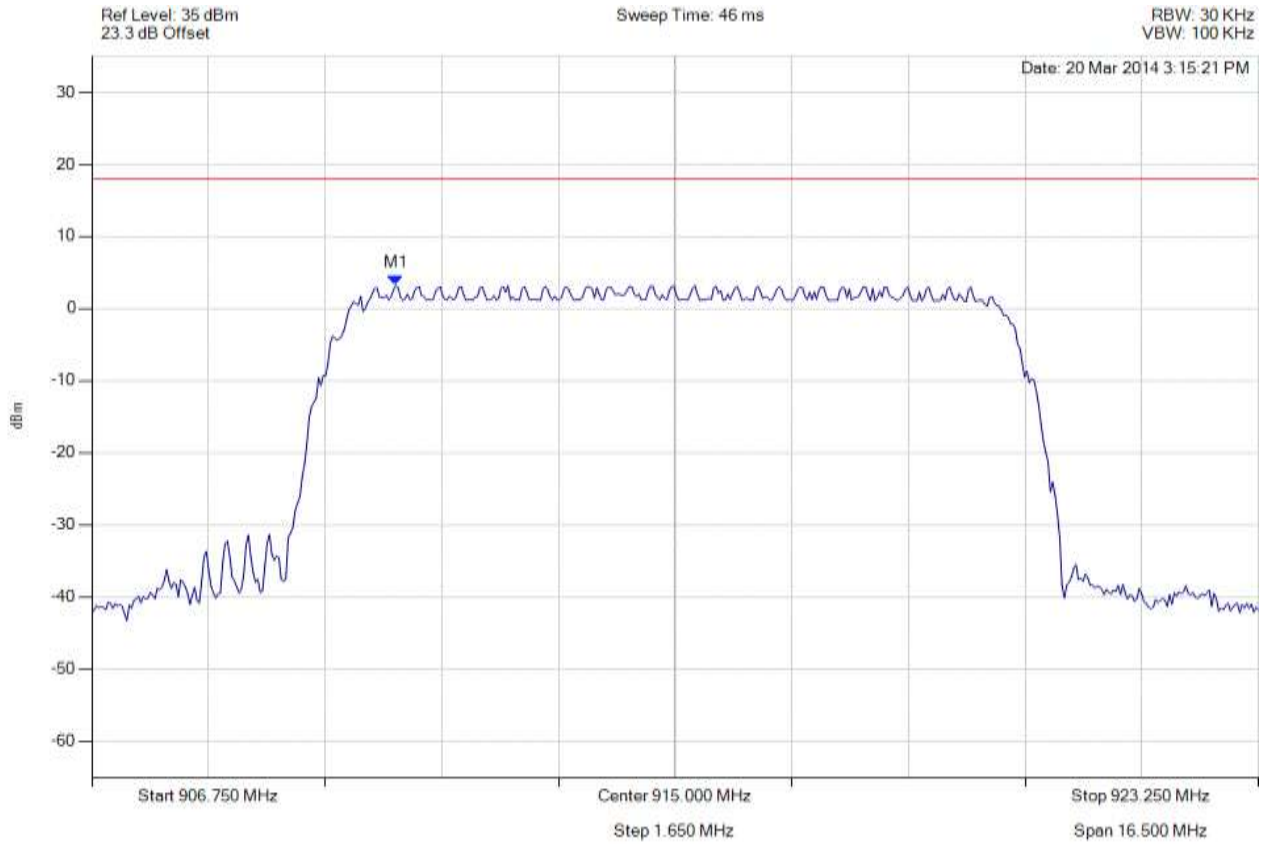


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 909.347 MHz : 3.656 dBm	Limit: ≤ 18.000 dBm Margin: -14.34 dB

Back to the Matrix

POWER SPECTRAL DENSITY - PEAK

Variant: High Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc

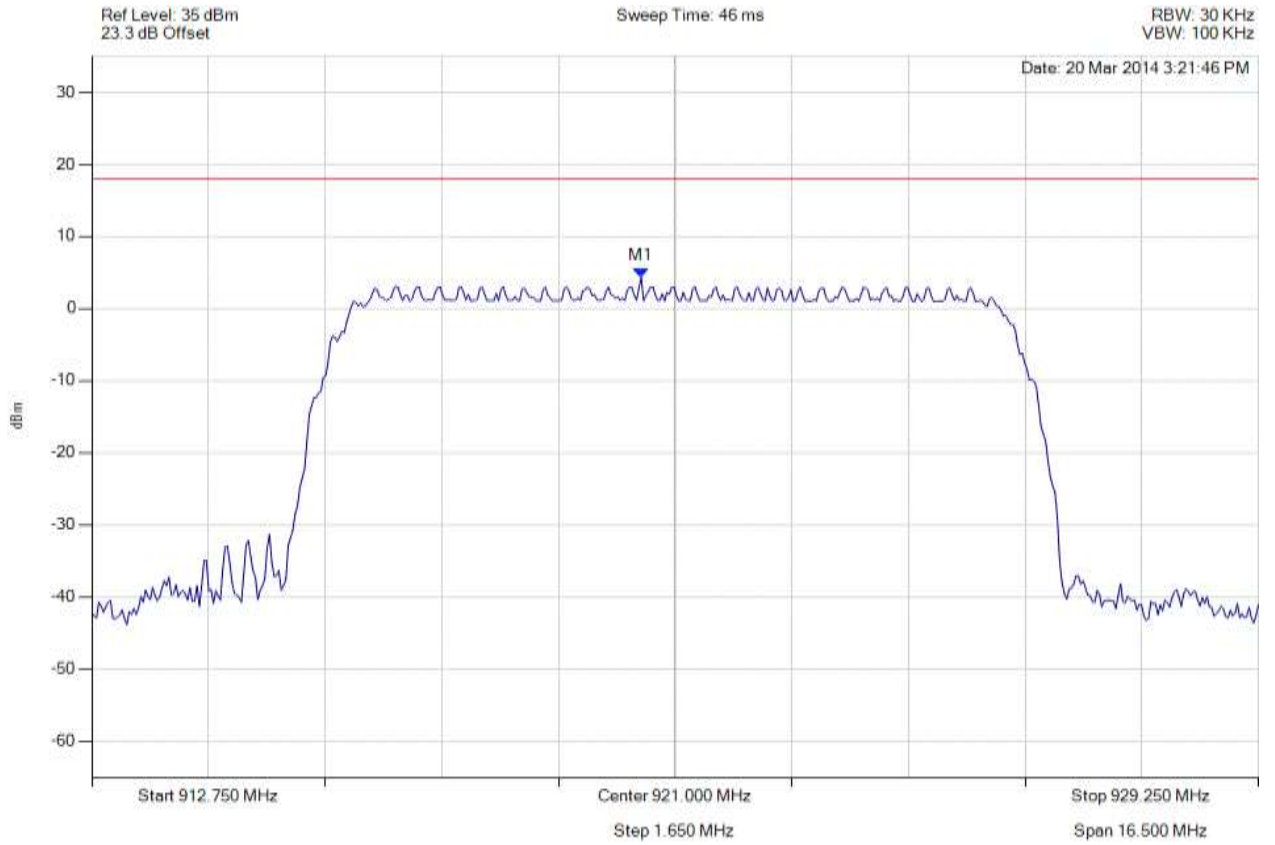


Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 911.049 MHz : 3.239 dBm	Limit: ≤ 18.000 dBm Margin: -14.76 dB

Back to the Matrix

POWER SPECTRAL DENSITY - PEAK

Variant: High Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 920.521 MHz : 4.341 dBm	Limit: ≤ 18.000 dBm Margin: -13.66 dB

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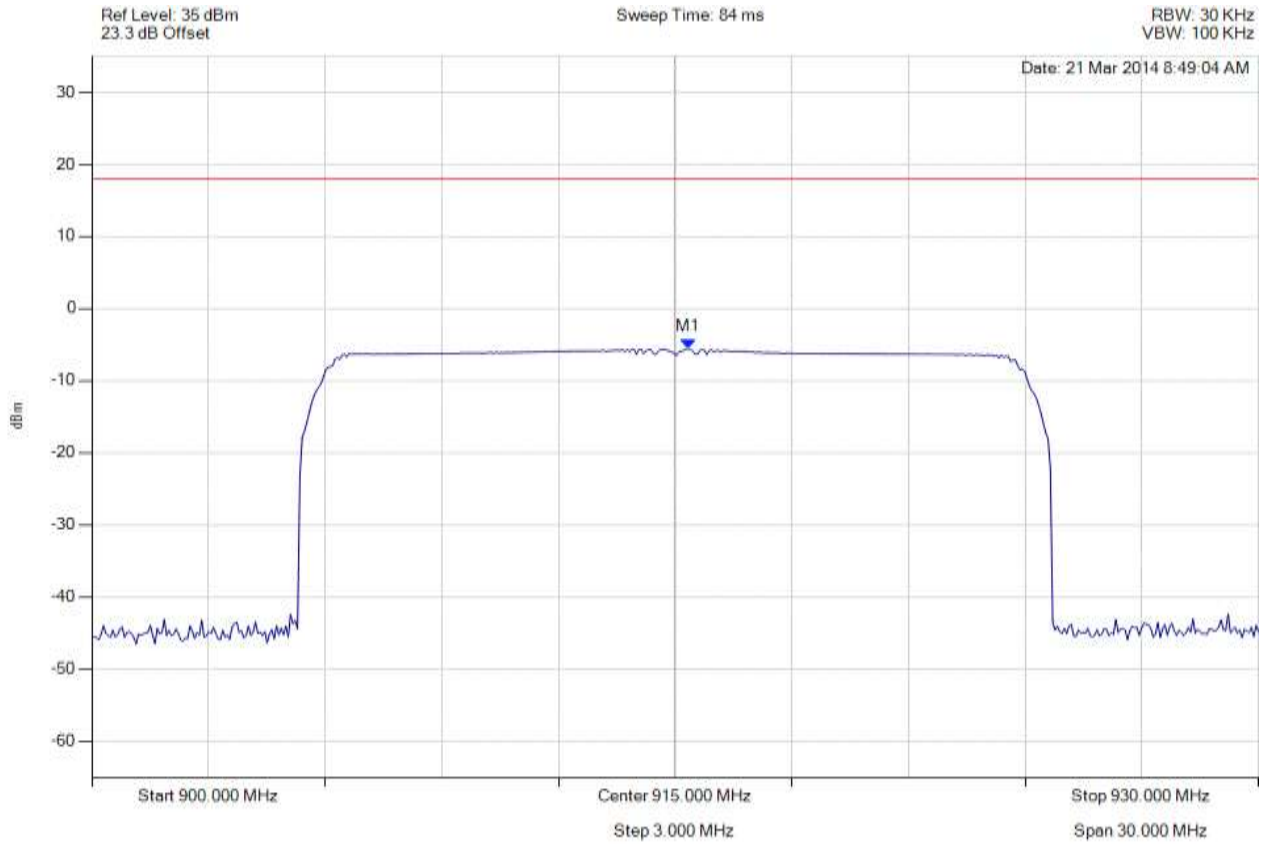
POWER SPECTRAL DENSITY - PEAK

Variant: 20 MHz, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 915.331 MHz : -5.575 dBm	Limit: ≤ 18.000 dBm Margin: dB

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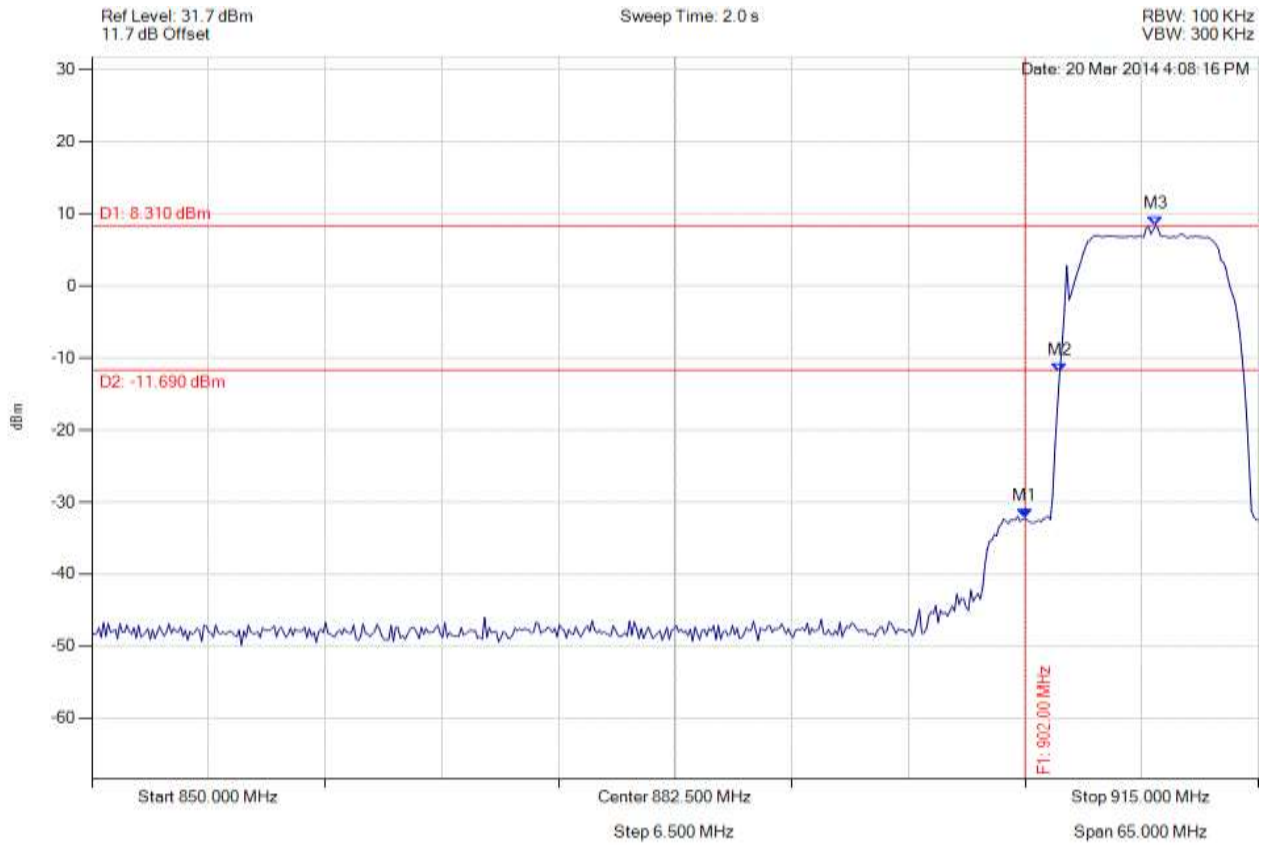
A.1.4. Conducted Spurious Emissions

CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: Low Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -32.223 dBm M2 : 903.928 MHz : -11.969 dBm M3 : 909.269 MHz : 8.310 dBm	Channel Frequency: 909.00 MHz

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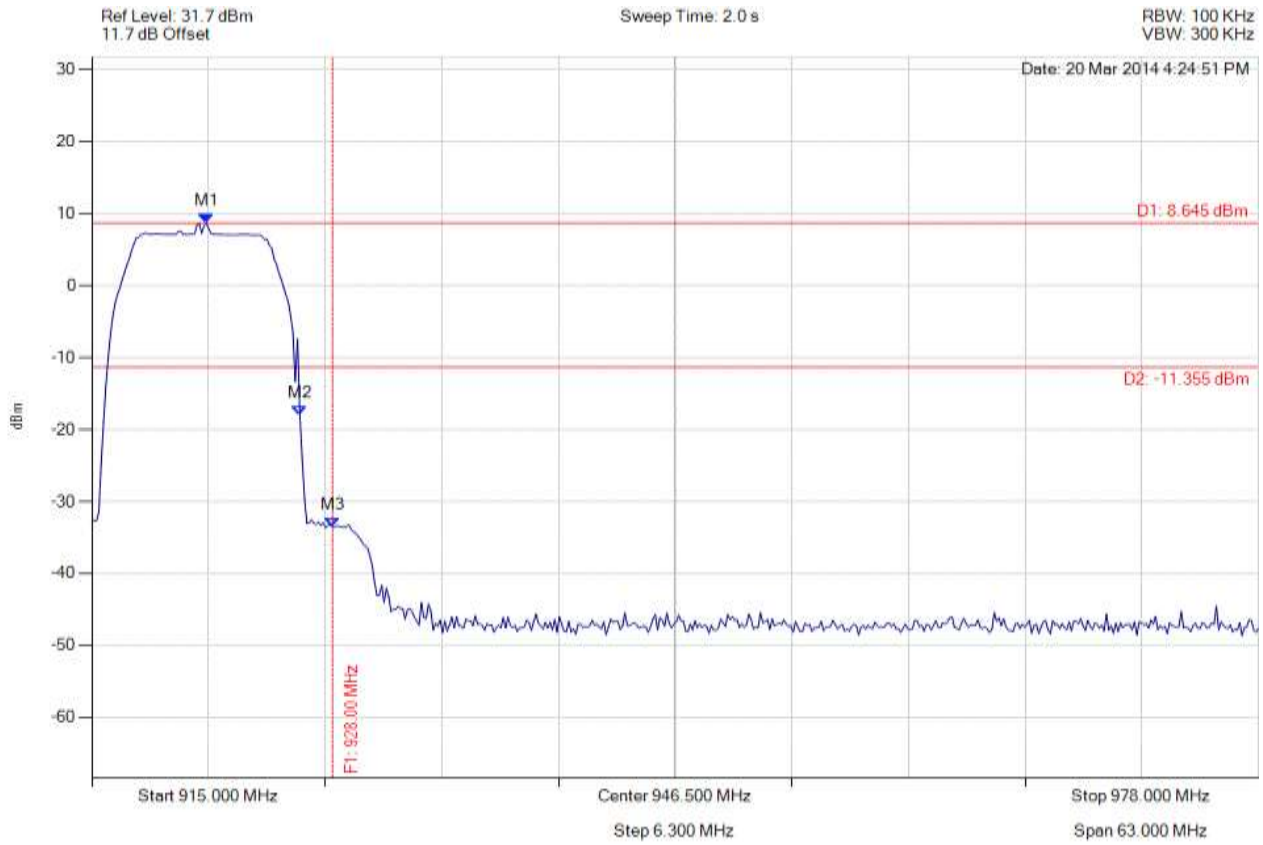
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: Low Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 921.186 MHz : 8.645 dBm M2 : 926.236 MHz : -18.092 dBm M3 : 928.000 MHz : -33.520 dBm	Channel Frequency: 921.00 MHz

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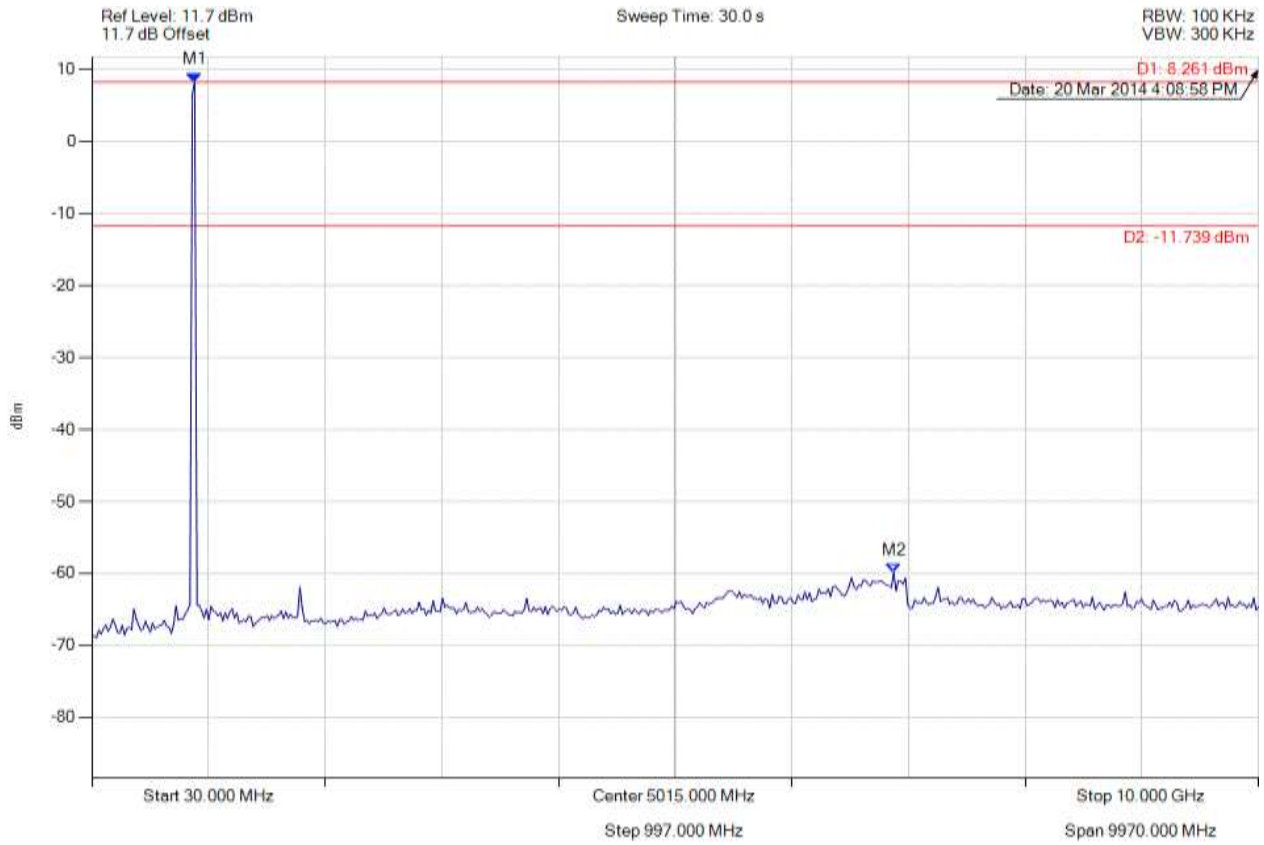
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: Low Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 8.261 dBm M2 : 6883.126 MHz : -59.847 dBm	Limit: -11.74 dBm Margin: -48.11 dB

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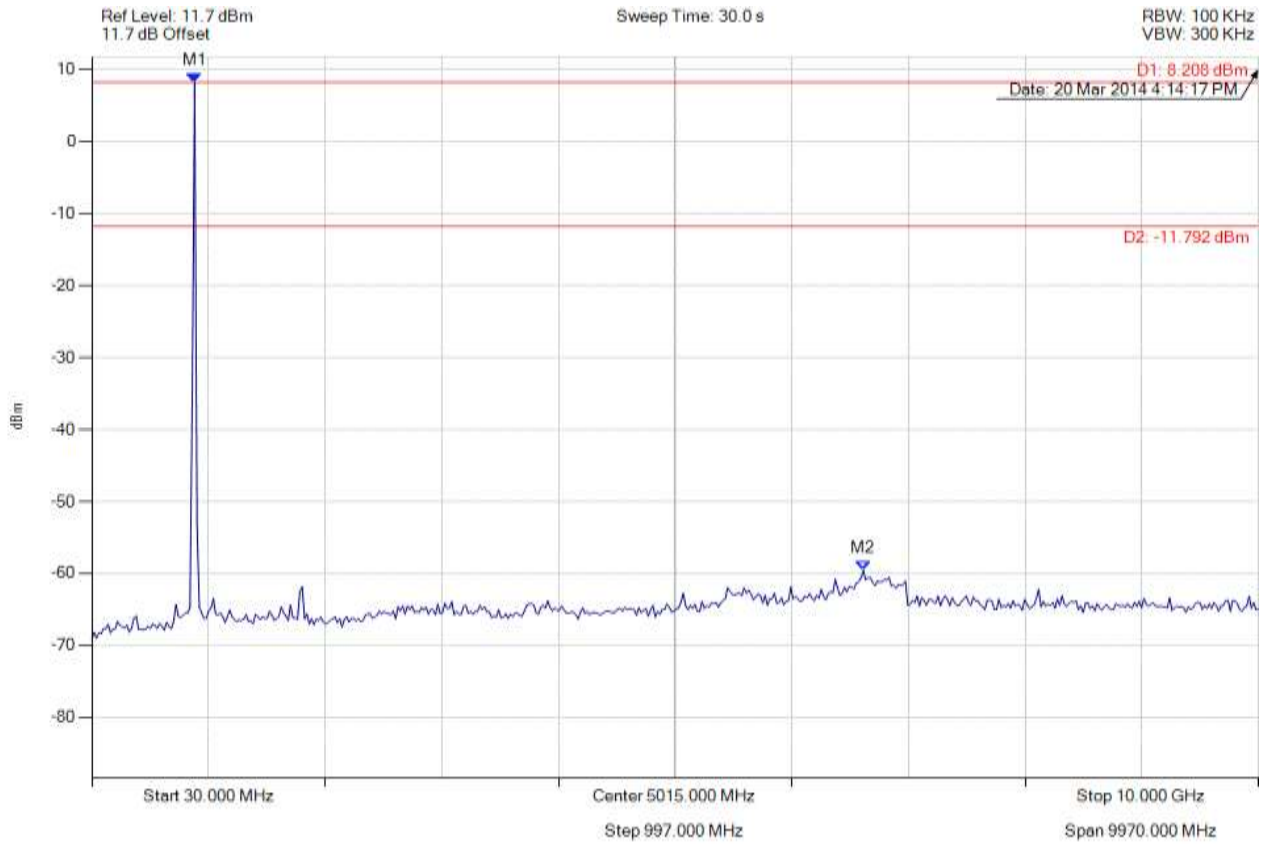
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: Low Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 8.208 dBm M2 : 6623.387 MHz : -59.575 dBm	Limit: -11.79 dBm Margin: -47.79 dB

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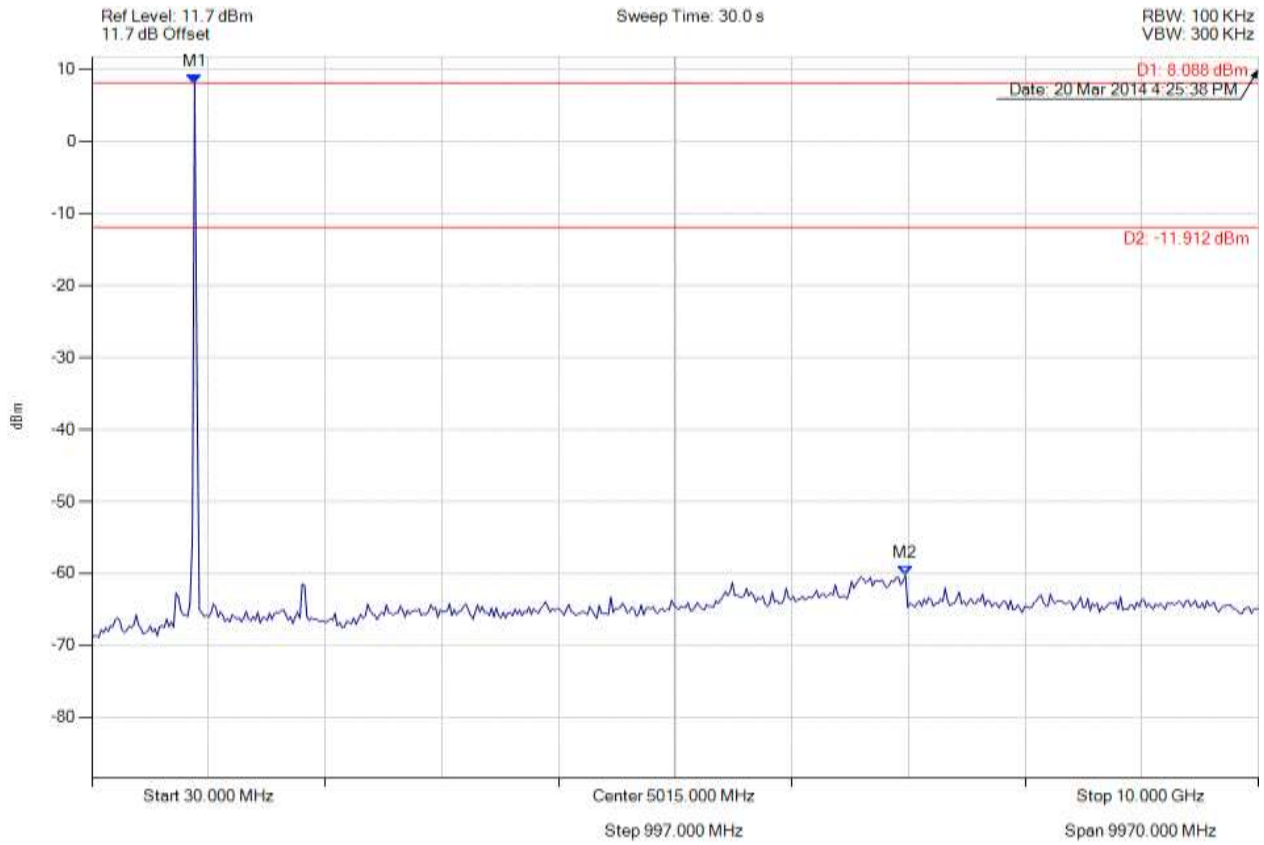
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: Low Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 8.088 dBm M2 : 6983.026 MHz : -60.225 dBm	Limit: -11.91 dBm Margin: -48.31 dB

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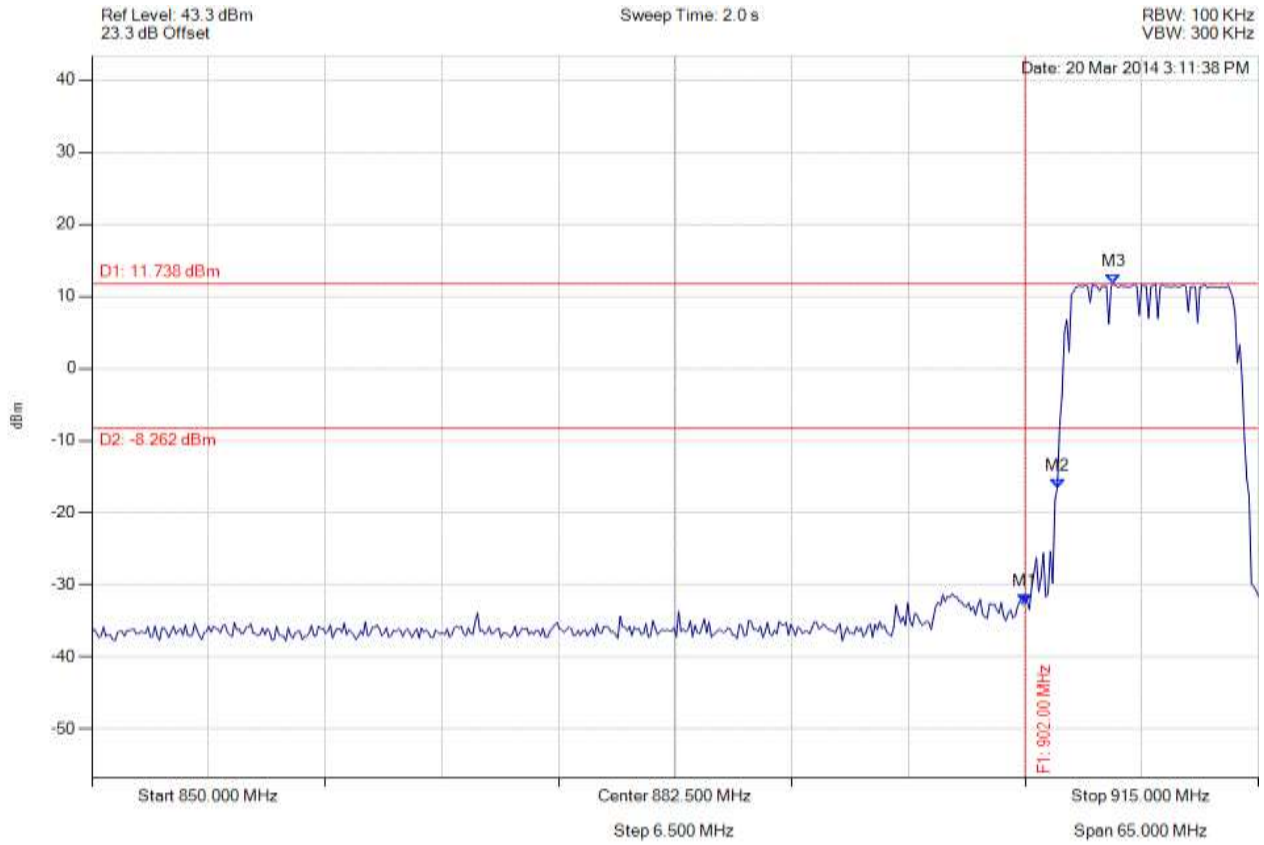
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: High Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -32.634 dBm M2 : 903.798 MHz : -16.525 dBm M3 : 906.924 MHz : 11.738 dBm	Channel Frequency: 909.00 MHz

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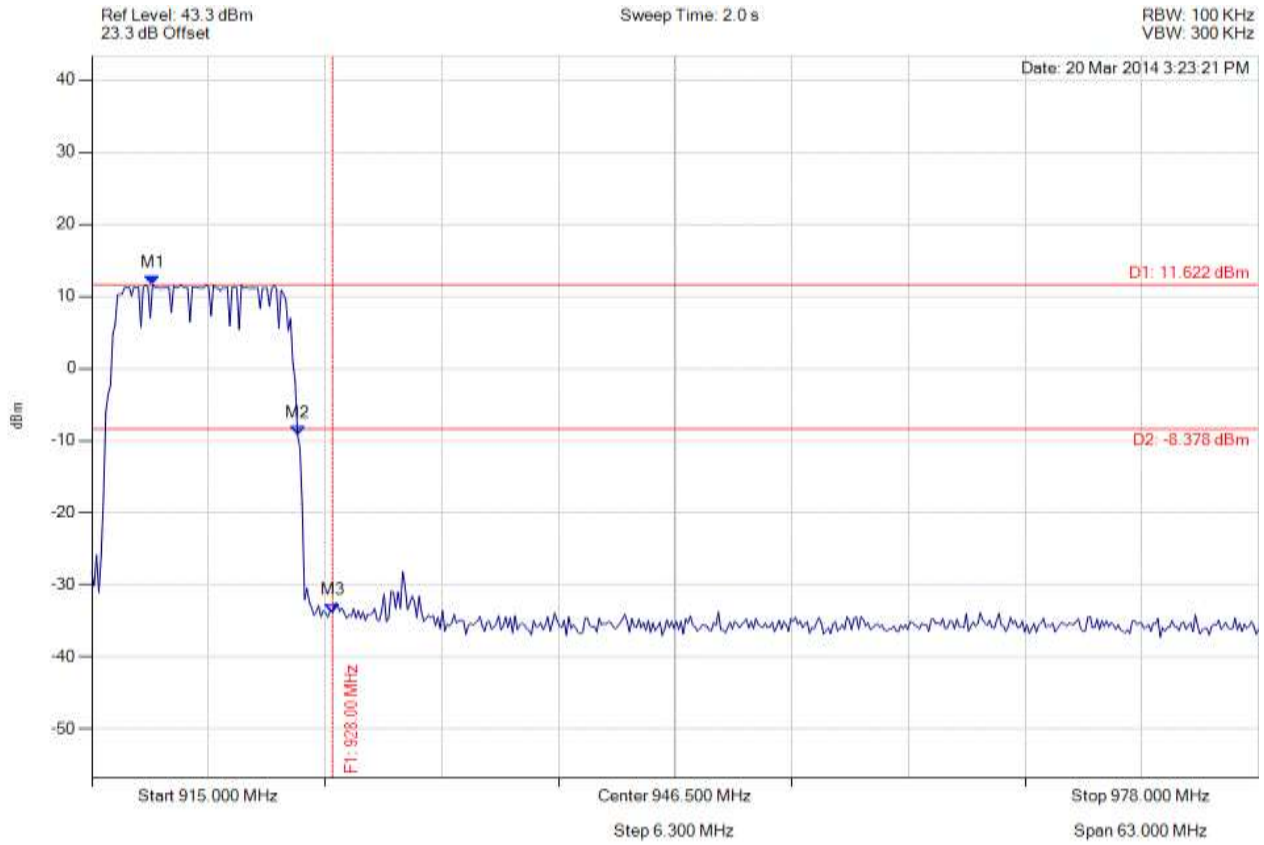
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: High Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 918.283 MHz : 11.622 dBm M2 : 926.110 MHz : -9.183 dBm M3 : 928.000 MHz : -33.856 dBm	Channel Frequency: 921.00 MHz

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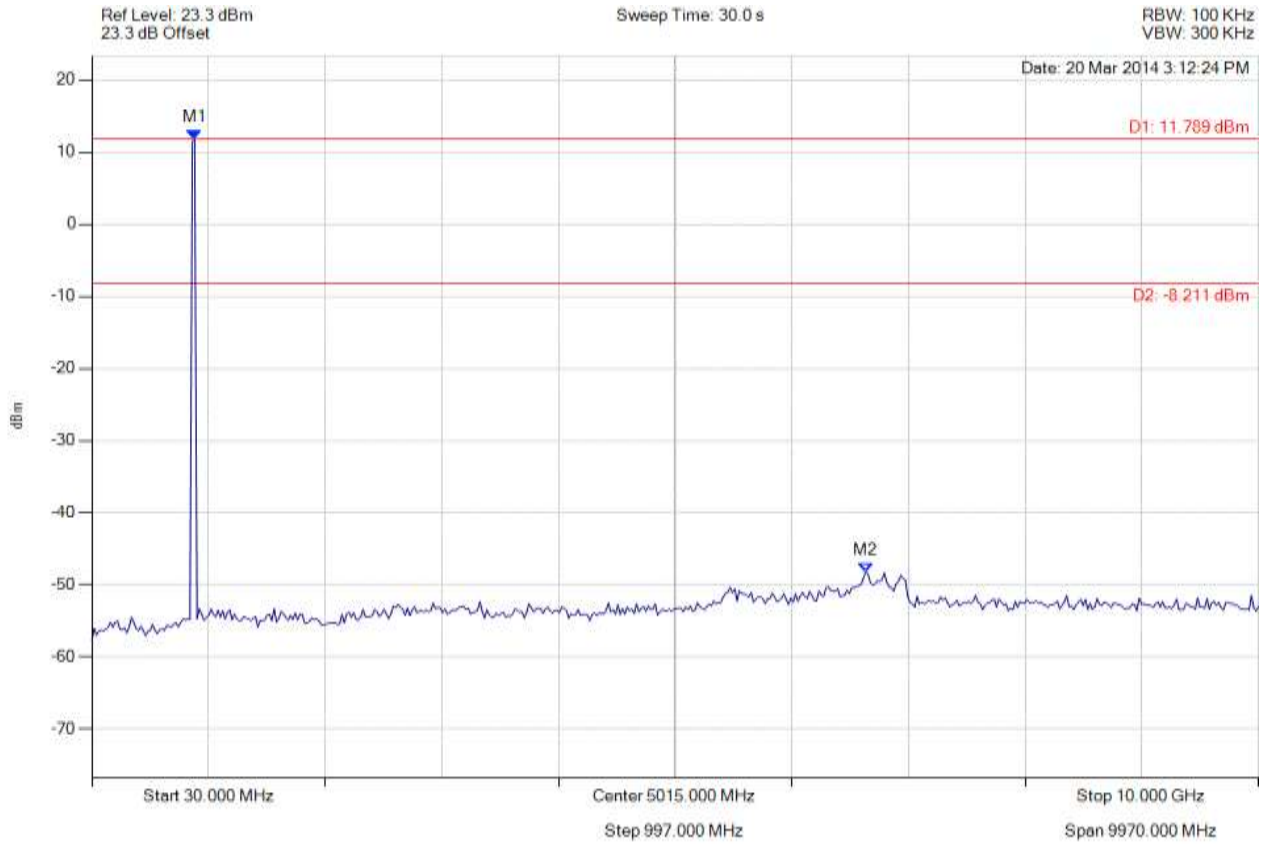
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: High Data Rate, Channel: 909.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 11.789 dBm M2 : 6643.367 MHz : -48.263 dBm	Limit: -8.21 dBm Margin: -40.05 dB

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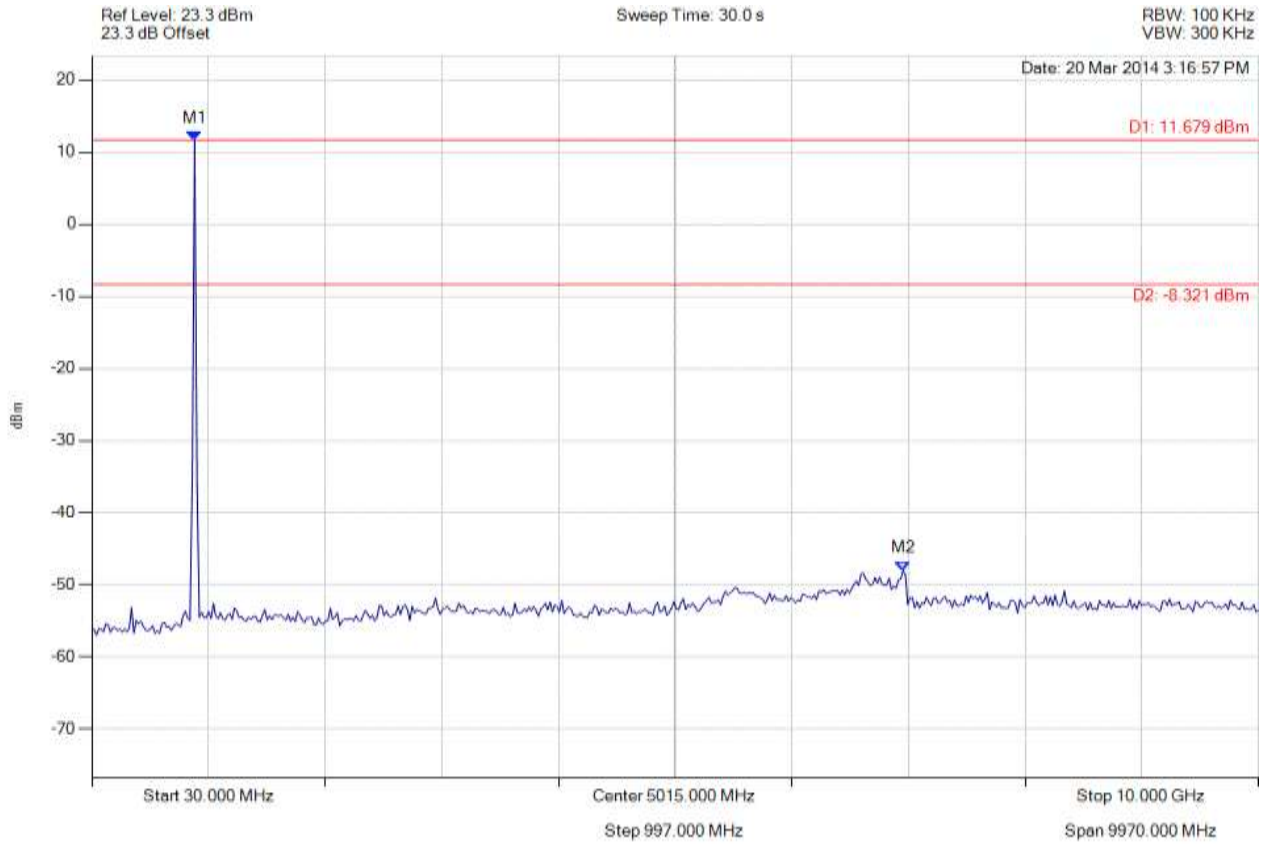
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: High Data Rate, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 11.679 dBm M2 : 6963.046 MHz : -48.017 dBm	Limit: -8.32 dBm Margin: -39.70 dB

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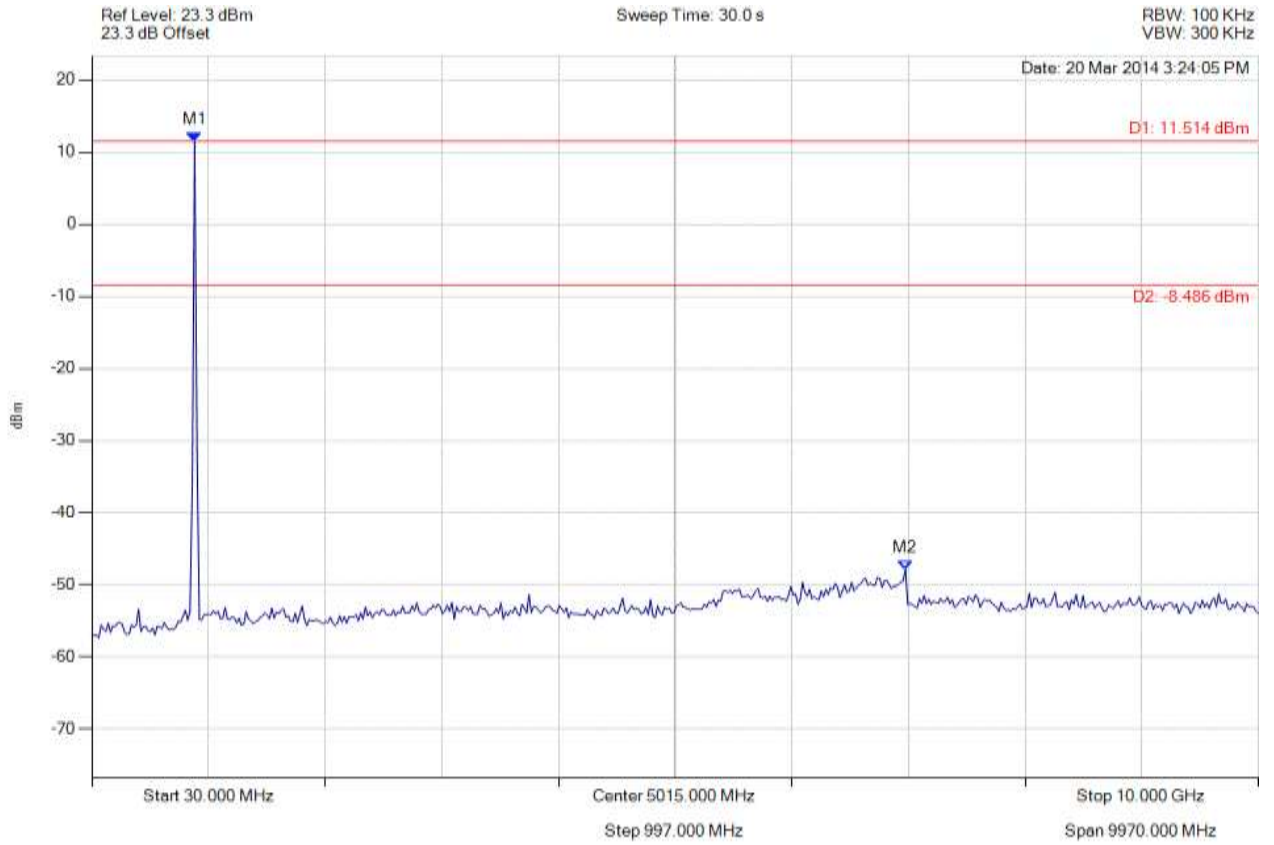
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: High Data Rate, Channel: 921.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 11.514 dBm M2 : 6983.026 MHz : -47.873 dBm	Limit: -8.49 dBm Margin: -39.38 dB

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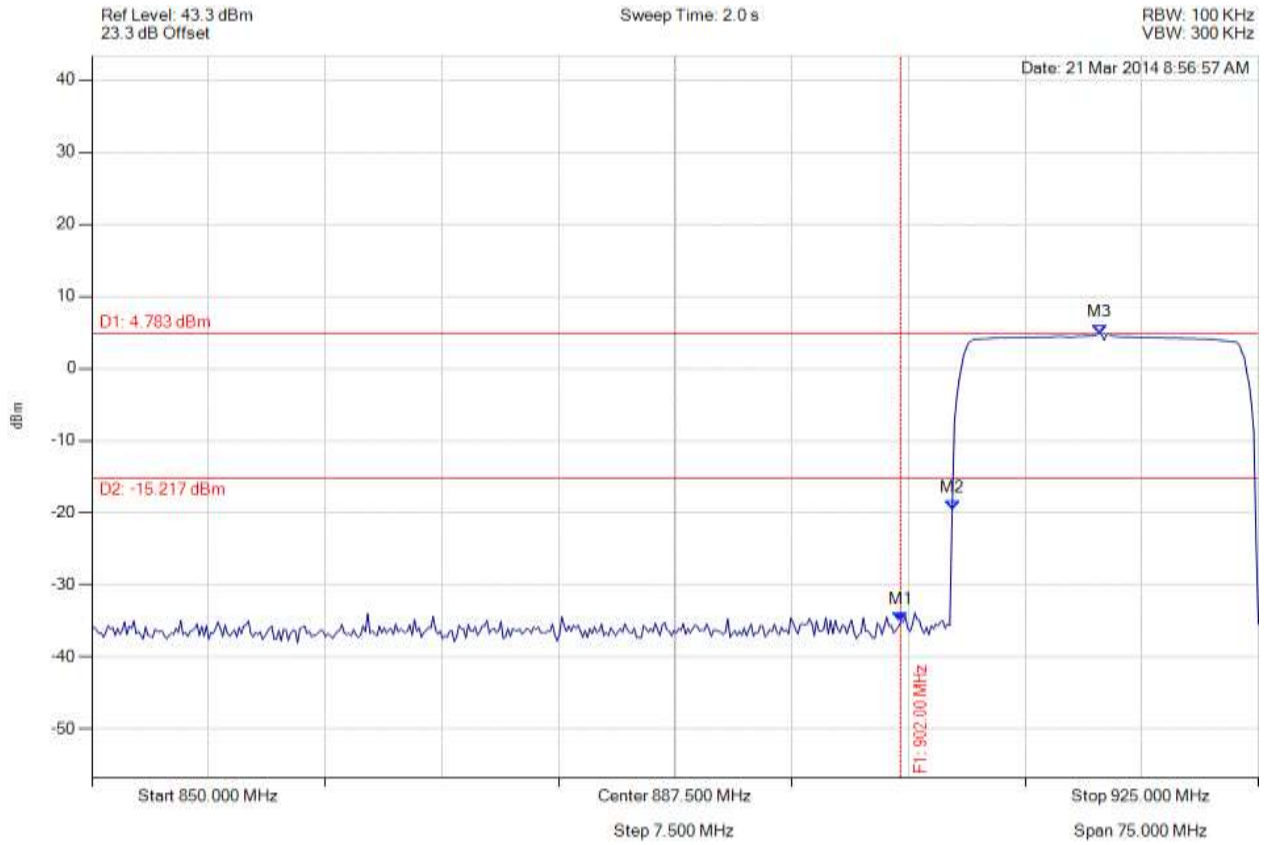
CONDUCTED LOW BAND-EDGE EMISSION - PEAK

Variant: 20 MHz, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 902.000 MHz : -35.180 dBm M2 : 905.311 MHz : -19.616 dBm M3 : 914.780 MHz : 4.783 dBm	Channel Frequency: 915.00 MHz

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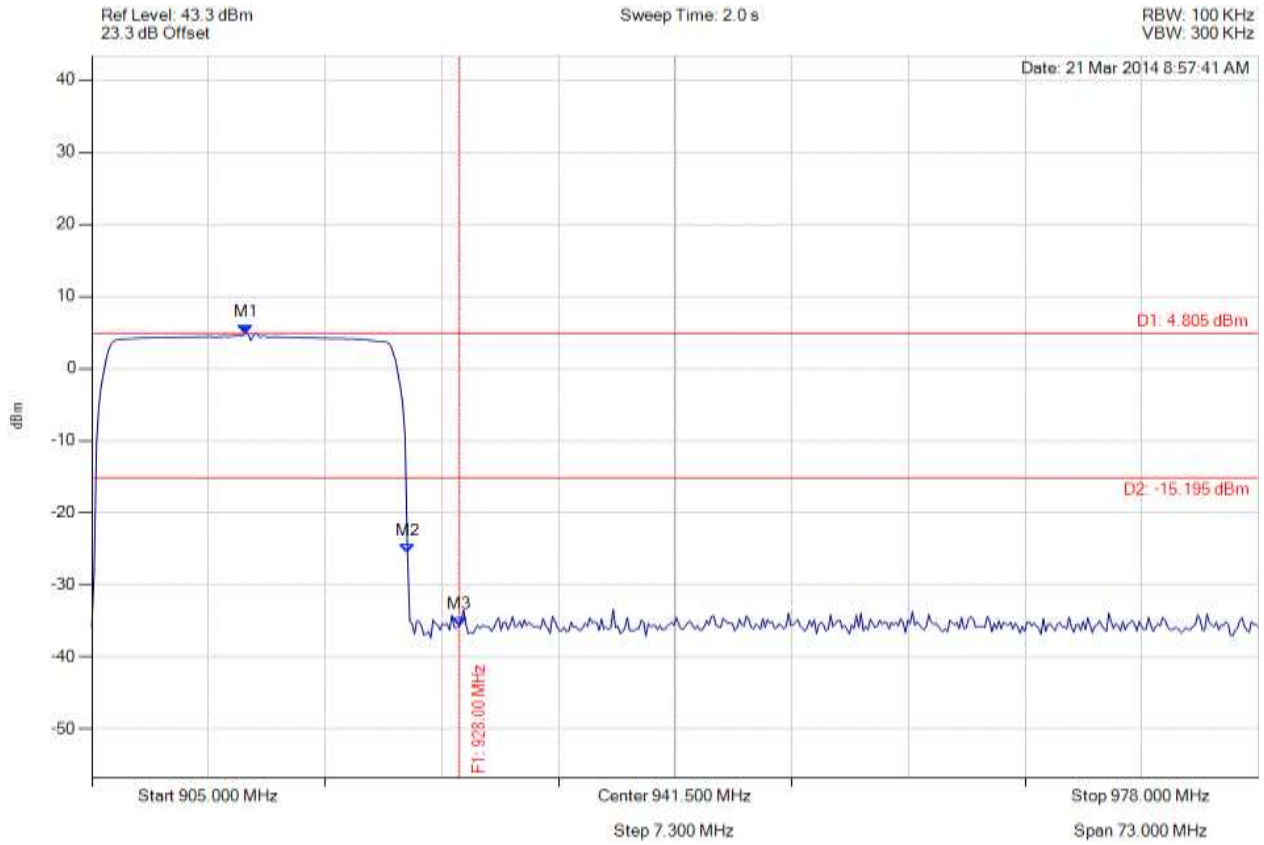
CONDUCTED HIGH BAND-EDGE EMISSION - PEAK

Variant: 20 MHz, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 30 Trace Mode = VIEW	M1 : 914.655 MHz : 4.805 dBm M2 : 924.749 MHz : -25.567 dBm M3 : 928.000 MHz : -35.801 dBm	Channel Frequency: 915.00 MHz

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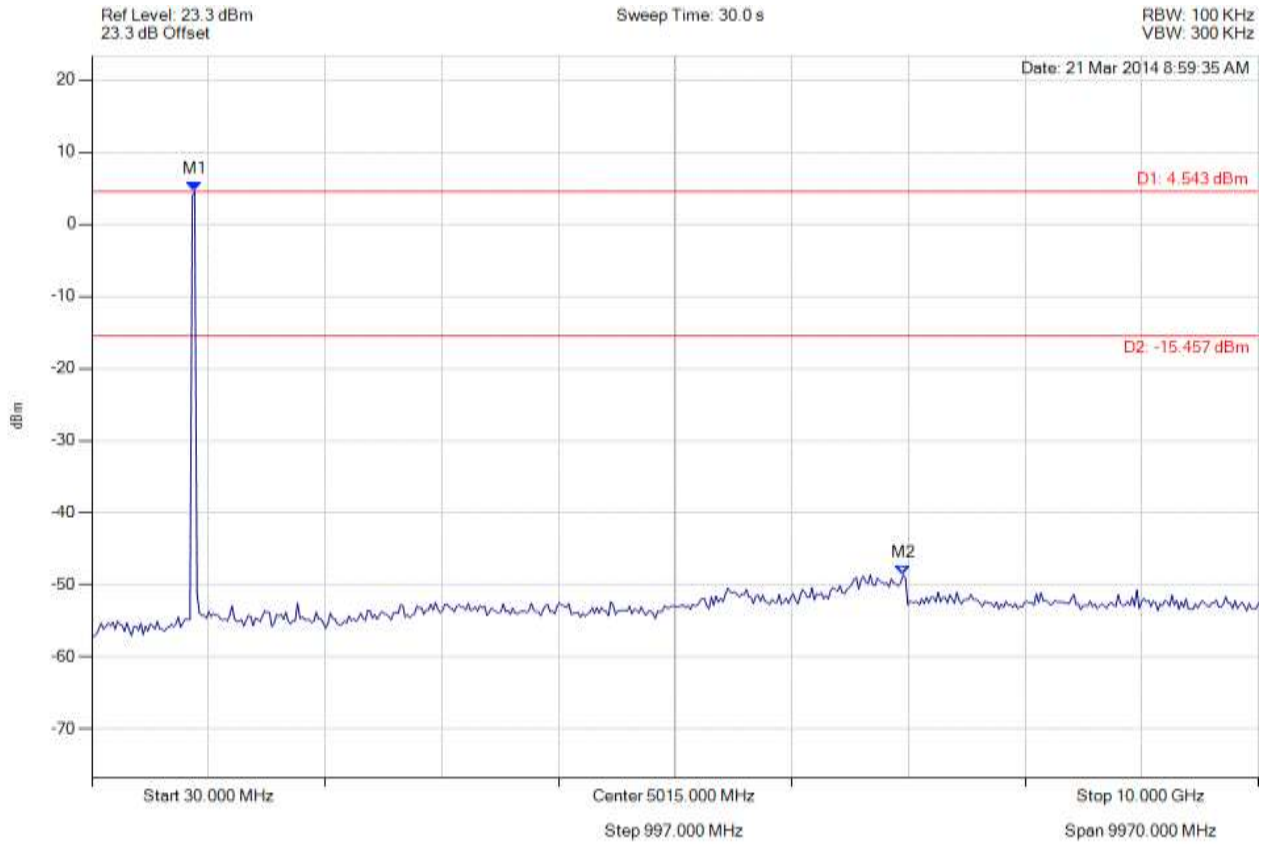
CONDUCTED SPURIOUS EMISSIONS - PEAK

Variant: 20 MHz, Channel: 915.00 MHz, Chain a, Temp: Ambient, Voltage: 5 Vdc



Analyser Setup	Marker : Frequency : Amplitude	Test Results
Detector = MAX PEAK Sweep Count = 0 RF Atten (dB) = 10 Trace Mode = VIEW	M1 : 909.118 MHz : 4.543 dBm M2 : 6963.046 MHz : -48.617 dBm	Limit: -15.46 dBm Margin: -33.16 dB

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