Test of
Digi ConnectCard for i.MX28 with Atheros AR6233

To: FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: DIGI28-U3A Rev B

TEST REPORT

FROM

Test of Digi ConnectCard for i.MX28 with Atheros AR6233

to

To FCC 47 CFR Part 15.407 & IC RSS-210

Test Report Serial No.: DIGI28-U3A Rev B

Note: this report contains data with regard to the 5,150 to 5,350 MHz and 5470 – 5725 MHz band for the AR6233. 2.4 GHz test data are reported in MiCOM Labs test report DIGI28-U2A

This report supersedes DIGI28-U3A Rev A

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

Product Function: 802.11 a/b/g/n Wireless Module

Copy No: pdf Issue Date: 25th April 2013

This Test Report is Issued Under the Authority of;

MiCOM Labs, Inc.
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TEST CERTIFICATE #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

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 Guide 65. The company is accredited by the American Association for Laboratory Accreditation (A2LA) www.a2la.org test laboratory number 2381.02. MiCOM Labs test schedule is available at the following URL; http://www.a2la.org/scopepdf/2381-02.pdf

United States of America – Telecommunication Certification Body (TCB)
TCB Identifier – US0159

Industry Canada – Certification Body
CAB Identifier – US0159

Europe – Notified Body
Notified Body Identifier - 2280

Japan – Recognized Certification Body (RCB)
RCB Identifier - 210

DOCUMENT HISTORY

Document History		
Revision	**Date**	**Comments**
Draft		
Rev A	29th March 2013	Initial release.
Rev B	25th April 2013	Plots added for verification of compliance with requirements of 15.215.

1. TEST RESULT CERTIFICATE

Applicant:	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:	Atheros AR6233 802.11 a/b/g/n module	Tel:	+1 925 462 0304
Model:	CCWMX28	Fax:	+1 925 462 0306
S/N:	55001667.01		
Test Date(s):	2nd Oct to 27th Nov '12	Website:	www.micomlabs.com

STANDARD(S)	TEST RESULTS
FCC 47 CFR Part 15.407 & 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:

ACCREDITED
TESTING CERTIFICATE #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 15.407	2012	Code of Federal Regulations
(ii)	FCC 06-96	June 2006	Memorandum Opinion and Order
(iii)	FCC OET KDB 662911	4th April 2011	Emissions Testing of Transmitters with Multiple Outputs in the Same Band
(iv)	Industry Canada RSS-210	2010	Low Power License-Exempt Radiocommunication Devices (All Frequency Bands): Category 1 Equipment
(v)	Industry Canada RSS-Gen	2010	General Requirements and Information for the Certification of Radiocommunication Equipment
(vi)	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
(vii)	CISPR 22/ EN 55022	2008 2006+A1:2007	Limits and Methods of Measurements of Radio Disturbance Characteristics of Information Technology Equipment
(viii)	M 3003	Edition 2 Jan. 2007	Expression of Uncertainty and Confidence in Measurements
(ix)	LAB34	Edition 1 Aug 2002	The expression of uncertainty in EMC Testing
(x)	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
(xi)	A2LA	July 2012	Reference to A2LA Accreditation Status – A2LA Advertising Policy
(xii)	FCC Public Notice – DA 02-2138	2002	Guidelines for Assessing Unlicensed National Information Infrastructure (U-NII) Devices

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 ConnectCard for i.MX28 with Atheros AR6233 in the frequency range 5,150 to 5,350 MHz and 5470 -5725 MHz to FCC Part 15.407 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:	DIGI28-U3A Rev B
Date EUT received:	26th October 2012
Standard(s) applied:	FCC 47 CFR Part 15.407 & IC RSS-210
Dates of test (from - to):	2nd Oct to 27th Nov '12
No of Units Tested:	One
Type of Equipment:	802.11a/b/g/n Wi-Fi Module
Applicants Trade Name:	Wi-Fi Module
Model(s):	CCWMX28
Location for use:	Indoor
Declared Frequency Range(s):	5,150 – 5,350 Hz and 5470 - 5725 MHz.
Hardware Rev	30013772-04
Software Rev	DEL-5.9 Rev B
Type of Modulation:	Per 802.11 – OFDM
Declared Nominal Output Power: (Average Power)	5150 – 5250 MHz 802.11a: Legacy +12 dBm 802.11n: HT-20 +12 dBm 802.11n: HT-40 +12 dBm 5250 – 5350 MHz 802.11a: Legacy +12 dBm 802.11n: HT-20 +12 dBm 802.11n: HT-40 +12 dBm 5470 – 5725 MHz 802.11a: Legacy +15 dBm 802.11n: HT-20 +15 dBm 802.11n: HT-40 +15 dBm
EUT Modes of Operation:	Legacy 802.11a, 802.11n HT-20, HT-40
Transmit/Receive Operation:	Time Division Duplex
System Beam Forming:	EUT has no capability for beam forming
Rated Input Voltage and Current:	5 Vdc 0.625 A

Operating Temperature Range:	Declared range -40° to +75C at 95% humidity non condensing
ITU Emission Designator:	5150 – 5250 MHz 802.11a 17M0D1D 802.11n HT-20 18M1D1D 802.11n HT-40 36M7D1D 5250 – 5350 MHz 802.11a 16M9D1D 802.11n HT-20 18M0D1D 802.11n HT-40 36M7D1D 5470 – 5725 MHz 802.11a 18M0D1D 802.11n HT-20 19M6D1D 802.11n HT-40 41M0D1D
Equipment Dimensions:	2” (L) x 1.375 (W) x 0.162” (H) inches
Weight:	< 0.5 oz
Primary function of equipment:	802.11 a/b/g/n wireless module

3.2. Scope of Test Program

Digi ConnectCard for i.MX28 with Atheros AR6233 RF Testing
The scope of the test program was to test the Digi ConnectCard for i.MX28 with Atheros AR6233s in the frequency ranges 5,150 – 5,350 MHz and 5470-5725 MHz for compliance against FCC 47 CFR Part 15.407 and Industry Canada RSS-210 specifications.

Wi-Fi Single Port Module: 55001667.01

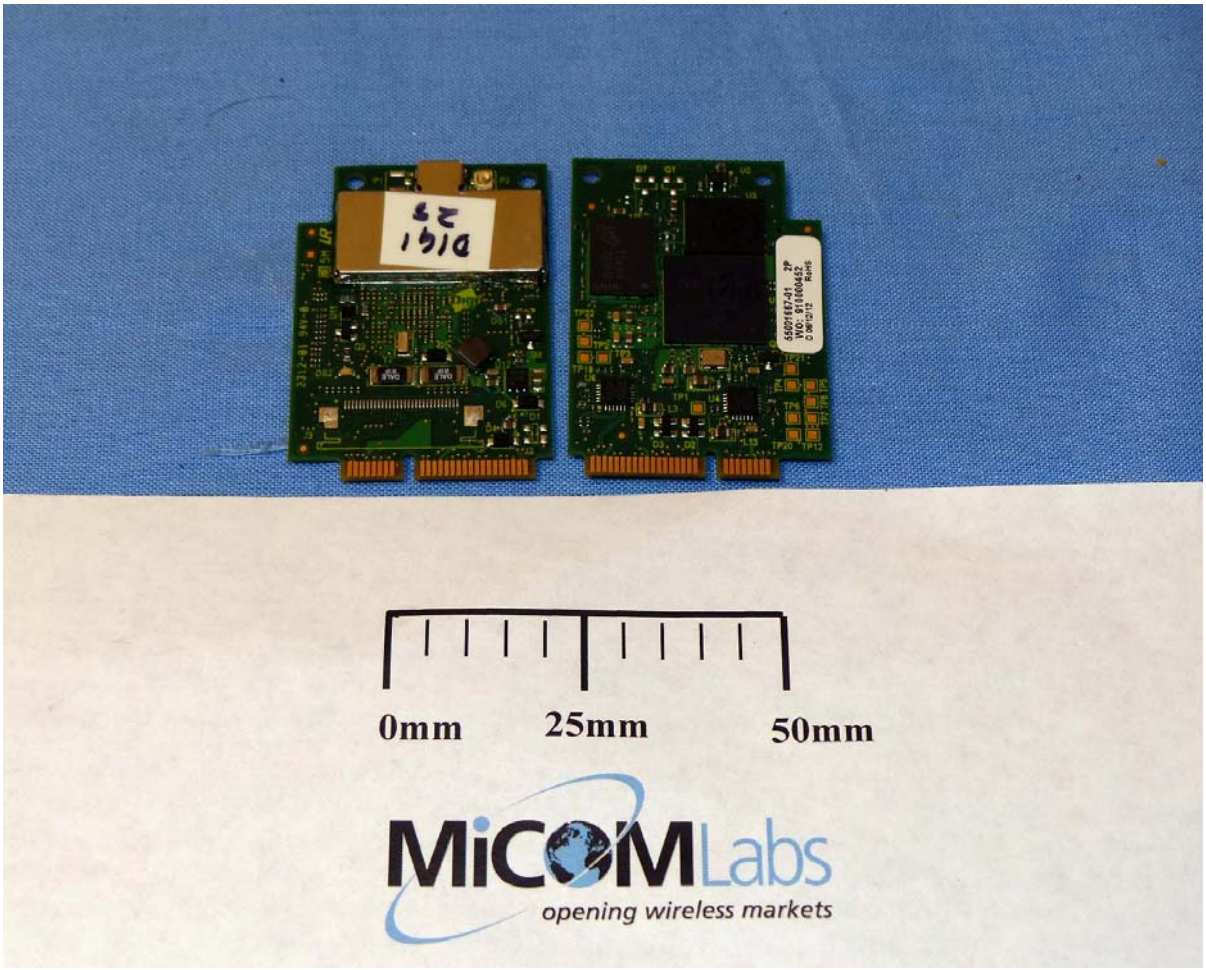
The following operational description of the module was provided by the customer.

The ConnectCard for i.MX28 module set contains a full 802.11 a b g n and Bluetooth radio with a programmable Freescale i.MX28 Processor. The RF section of the part is handled by a Qualcom Atheros Wi-Fi/BT module with a 5GHz RF front end module. Data is entered into the processor through a variety of interfaces including Ethernet, CAN, UART, SPI, I2C, I2S, USB, SDIO, etc. Data is sent to the Wi-Fi/BT module where it is processed and sent to the RF Antenna(s). Likewise data is received in the Wi-Fi/BT module and converted to baseband data where it is sent to the processor for baseband processing and sent out of the module using one of the interface ports.

The module is comprised of a Freescale i.MX28 processor, a Qualcom Atheros Wi-Fi/ Bluetooth Module, an RFMD 5GHz front end module, Diplex filter, and either a BT-2.4GHz Wi-Fi switch or Diversity antenna switch (if no BT). The ConnectCard for i.MX28 functions in both the 2.4 to 2.5GHz, and 4.9 to 6 GHz ISM bands.

The module uses an efficient architecture in which data streams directly from the processor (at baseband) to the Wi-Fi/BT module through data lines. The processor also controls the transceiver's modes within the 802.11 a, b, g, and n modes. The Wi-Fi module includes LNA's for the receive modes and a power amplifier for the transmit mode within the 2.4GHz band. Further a there are transmit-receive switches within the module for the 2.4GHz bands. The antenna(s) are connected to the module through u.FL connectors. With BT capable modules there is a single u.FL connector for a single antenna. For modules without BT, there is a diversity antenna switch and 2 u.FL antenna connectors. The module is available with different amounts of FLASH, and RAM, as well as various processors within the i.MX28 family for customers to store their programs.

Digi ConnectCard for i.MX28 with Atheros AR6233



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

Type (EUT/ Support)	Equipment Description (Including Brand Name)	Mfr	Model No.	Serial No.
EUT	802.11a/b/g/n Module – Single Port	Digi International	CCWMX28	55001667.01
Support	Laptop PC	IBM	Thinkpad	None

3.4. Antenna Details

Antenna Type	Manufacturer	Model Number	Antenna Gain (dBi	
			2.4 GHz	5 GHz
Patch	Taoglas	PC.11	3.0	4.5
Patch	Taoglas	FXP.830	1.8	4
Dual Band Omni	Antenna Factor	ANT-DB1-xxx	-3.10	4.30
Single Band Omni	Bobbintron Electrical Corp.	SA-006-1	1.8	---

3.5. Cabling and I/O Ports

Number and type of I/O ports

1. 1 x DB9 control port on interface card
2. 2 x 2.5 mm DC Power ports on interface card

3.6. Test Configurations

Testing was performed to determine the highest power level versus bit rate. The variant with the highest power was used to exercise the product.

Modes with the highest spectral density will have the highest spurious emissions, only those modes were tested for this test program.

Matrix of test configurations

Operational Mode(s) (802.11)	Variant	Data Rates with Highest Power	Frequencies (MHz)
a,n	Legacy	6 MBit/s	5180/5,200/5,240
	HT-20	6.5 MCS	
	HT-40	13.5 MCS	5,190/5,230
	Legacy	6 MBit/s	5260/5,300/5,320
	HT-20	6.5 MCS	
	HT-40	13.5 MCS	5,270/5,310
	Legacy	6 MBit/s	5500/5,580/5,700
	HT-20	6.5 MCS	
	HT-40	13.5 MCS	5,510/5,590/5,670

Antenna Test Configurations for Radiated Emissions and Band-Edge

The following measurements were performed on all antenna configurations identified in Section 3.4 Antenna Details.

KEY:-

SE – Spurious Emissions
BE – Band-Edge

Spurious Emission and Band-Edge Test Strategy

Spurious emissions were tested in 11a mode which exhibited the highest spectral density. This represents the worst case conditions for radiated emissions. Band edge measurements were made in all modes of operation.

Bands 5,150 – 5250; 5,250 – 5,350, 5470-5725 MHz

15.407			
	11a	**11n HT-20**	**11n HT-40**
5150-5250	SE 5180		
	SE 5200		
	SE 5240		
	BE 5150	BE 5150	BE 5150
5250-5350	SE 5180		
	SE 5200		
	SE 5240		
	BE 5350	BE 5350	BE 5350
5470-5825	SE 5180		
	SE 5200		
	SE 5240		
	BE 5460	BE 5460	BE 5460

3.7. Equipment Modifications

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

1. Band-Edge and Radiated Spurious Power Reduction

   All conducted spurious emission testing was performed with the device set for maximum power at all times. During radiated spurious and band-edge emission testing the output power was reduced in order to comply with the Restricted Band limit criteria.

Single Port Module			PC.11		FXP.830		ANT-DB1-xxx
Band	Mode	Channel (MHz)	Maximum Power Level				
5150-5250	a	5180	20		20		20
		5200	20		20		20
		5240	20		20		20
	HT-20	5180	20		20		20
		5200	20		20		20
		5240	20		20		20
	HT-40	5190	18		18		20
		5230	20		20		20
5250-5350	a	5260	20		20		20
		5300	20		20		20
		5320	20		20		20
	HT-20	5260	20		20		20
		5300	20		20		20
		5320	20		20		20
	HT-40	5270	20		20		20
		5310	18		18		20
5470-5825	a	5500	20		20		20
		5580	20		20		20
		5700	20		20		20
	HT-20	5500	20		20		20
		5580	20		20		20
		5700	20		20		20
	HT-40	5510	17		17		20
		5590	20		20		20
		5670	20		20		20

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

3.9. Subcontracted Testing or Third Party Data

1. NONE

4. TESTING EQUIPMENT CONFIGURATION(S)

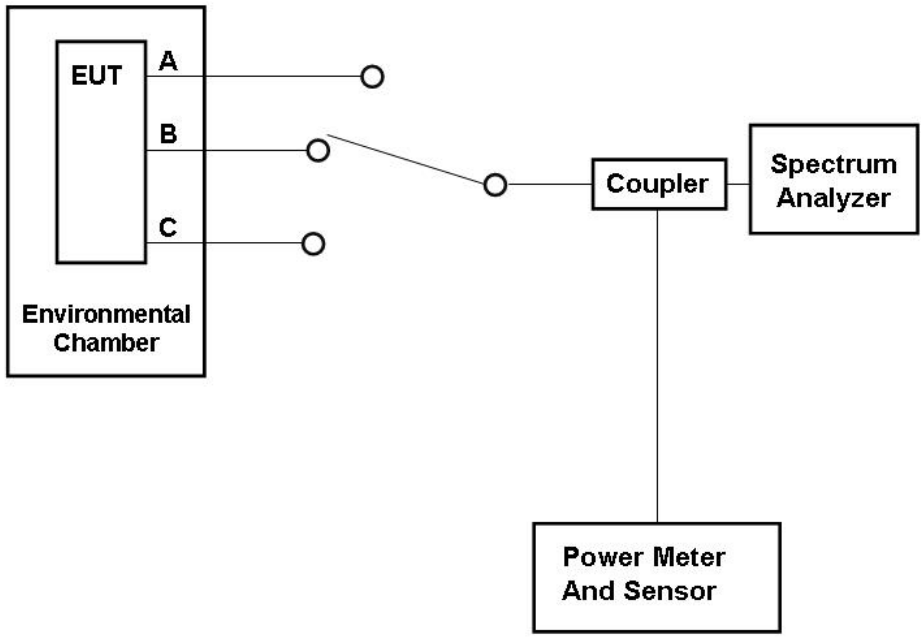
4.1. Conducted RF Emission Test Set-up

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

1. Section 6.1.1.1. 26 dB and 99% Bandwidth
2. Section 6.1.1.2. Maximum Conducted Output Power
3. Section 6.1.1.3. Peak Power Spectral Density
4. Section 6.1.1.4. Peak Excursion Ratio

Conducted Test Set-Up Pictorial Representation

3 - Port Test Configuration

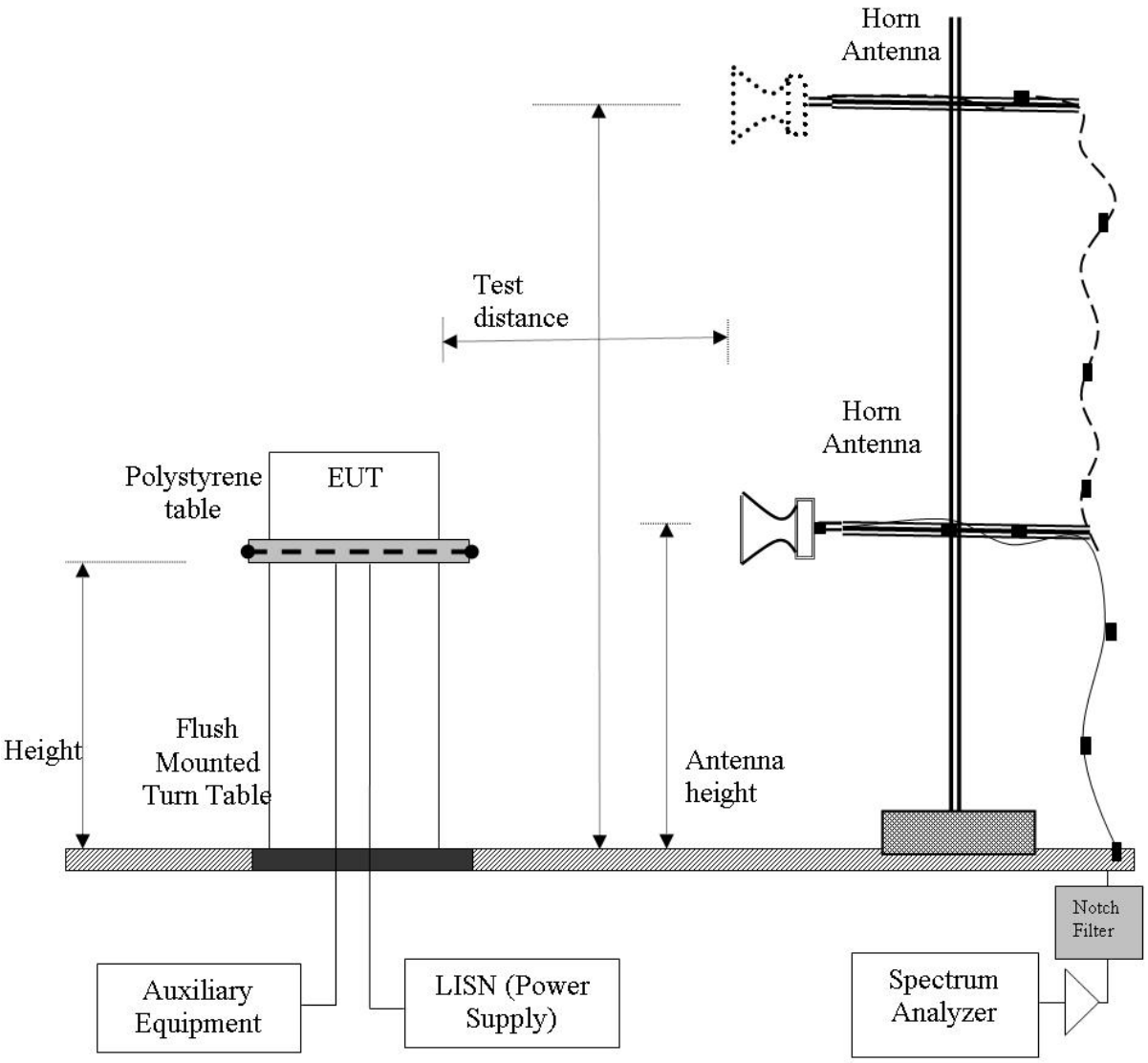


4.2. Radiated Spurious Emission Test Set-up > 1 GHz

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

1. Section 6.1.2.1. Dual Band Patch PC.11 - Single Port Module
2. Section 6.1.2.2. Dual Band Patch PC.11 - Dual Port Module
3. Section 6.1.2.3. Dual Band Patch FXP.830 - Single Port Module
4. Section 6.1.2.4. Dual Band Patch FXP.830 - Dual Port Module
5. Section 6.1.2.5. Dual Band Omni ANT-DB1-xxx - Single Port Module
6. Section 6.1.2.6. Dual Band Omni ANT-DB1-xxx - Dual Port Module

Radiated Emission Measurement Setup – Above 1 GHz

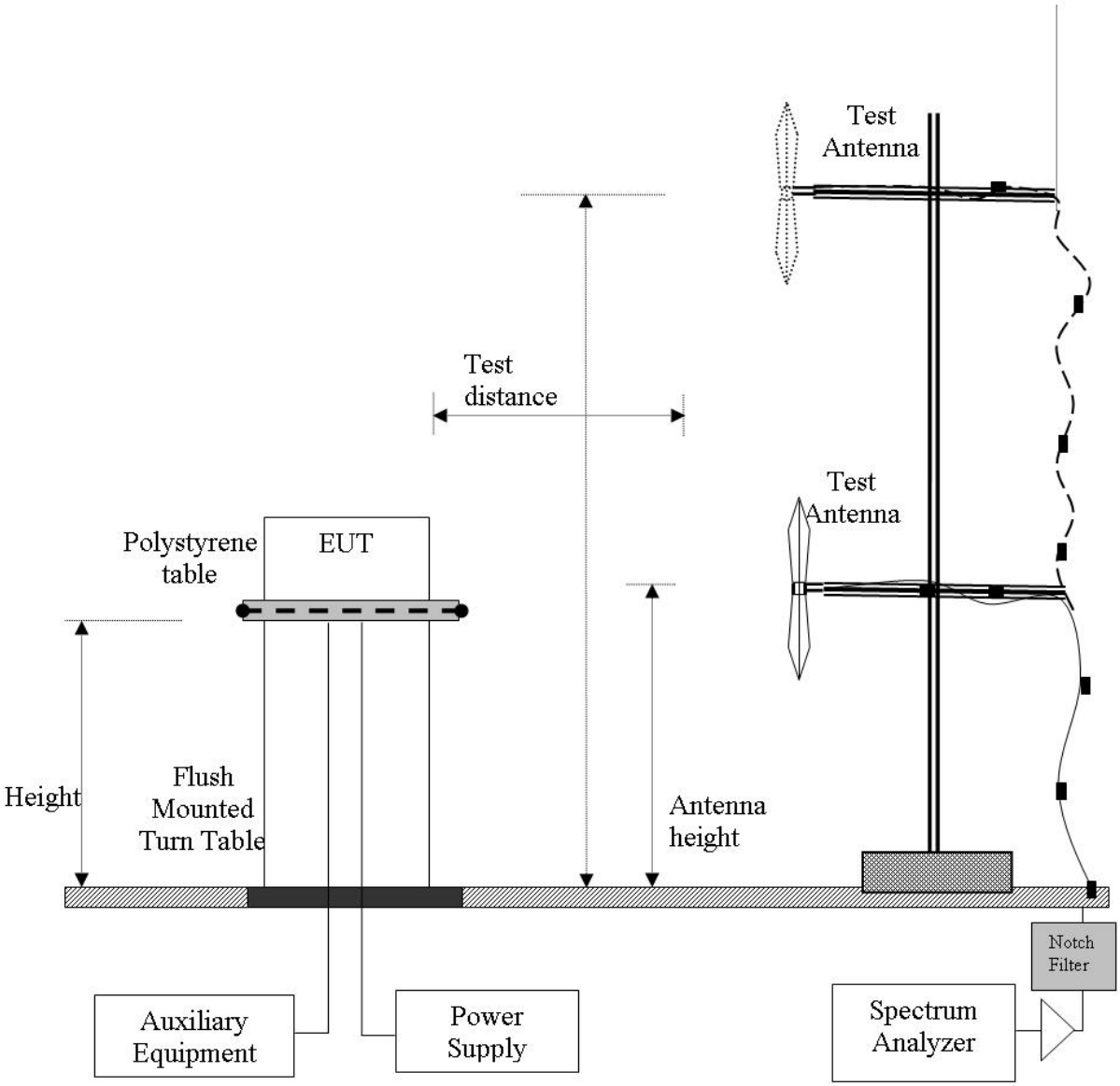


4.3. Digital Emissions Test Set-up (0.03 – 1 GHz)

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

1. Section 6.1.2.7. Digital Emissions

Digital Emission Measurement Setup – Below 1 GHz



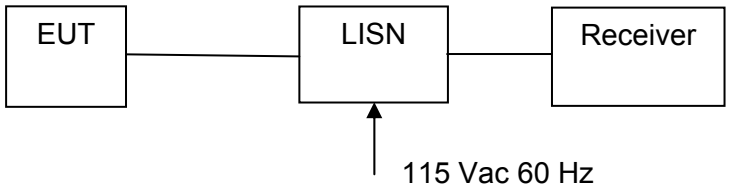
4.4. ac Wireline Emission Test Set-up

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

Refer to MiCOM Labs test report DIGI28-U4.

1. Section 6.1.3 ac Wireline Conducted Emissions

Conducted Test Set-Up Pictorial Representation



Measurement set up for ac Wireline Conducted Emissions Test

5. TEST SUMMARY

List of Measurements

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407** and **Industry Canada RSS-210**.and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.407(a) **A9.2(2)** **4.4**	26dB and 99% Emission BW	Emission bandwidth measurement	Conducted	Complies	6.1.1.1 A.1.1
15.407(a) **A9.2(2)** **4.6**	Maximum Conducted Output Power	Power Measurement	Conducted	Complies	6.1.1.2
15.407(a) **A9.2(2)**	Peak Power Spectral Density	PPSD	Conducted	Complies	6.1.1.3 A.1.2
15.407(a)(6)	Peak Excursion Ratio	<13dB in any 1MHz bandwidth	Conducted	Complies	6.1.1.4 A.1.3
15.407(g) **15.31** **2.1** **4.5**	Frequency Stability	Limits: contained within band of operation at all times.	Applicant declaration	Complies	6.1.1.5
15.407(f) **5.5**	Radio Frequency Radiation Exposure	Exposure to radio frequency energy levels, Maximum Permissible Exposure (MPE)	Conducted	See included MPE exhibit	--

List of Measurements (continued)

The following table represents the list of measurements required under the **FCC CFR47 Part 15.407** and **Industry Canada RSS-210** and **Industry Canada RSS-Gen**.

Section(s)	Test Items	Description	Condition	Result	Test Report Section
15.407(b)(2) **15.205(a)** **15.209(a)** **2.2** **2.6** **A9.3(2)** **4.7**	Radiated Emissions		Radiated		6.1.2
	Transmitter Radiated Spurious Emissions	Emissions above 1 GHz		Complies	*6.1.2.1-6.1.2.6*
	Radiated Band Edge	Band edge results		Complies	*6.1.2.1-6.1.2.6*
15.407(b)(6) **15.205(a)** **15.209(a)** **2.2**	Radiated Emissions	Emissions <1 GHz (30M-1 GHz)		Complies	*6.1.2.7*
15.407(b)(6) **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

List of Measurements (cont'd)

Dynamic Frequency Selection (DFS)
The following table represents the list of measurements required under the **FCC CFR47 Part 15.407(h)(2)** and **FCC Memorandum Opinion and Order FCC 06-96 (Compliance Measurement procedures for Unlicensed National Information Infrastructure devices operating in the 5250-5350 MHz and 5470-5725 MHz bands incorporating dynamic frequency selection).**

Tests performed on Master Device

Section	Test Items	Description	Condition	Result	Test Report Section
	Dynamic Frequency Selection				6.1.4
7.8.1	Detection Bandwidth	UNII Detection Bandwidth	Conducted	Not Applicable	
7.8.2.1	Performance Requirements Check	Initial Channel Availability Check Time	Conducted	Not Applicable	
7.8.2.2		Radar Burst at the Beginning of the Channel Availability Check Time	Conducted	Not Applicable	
7.8.2.3		Radar Burst at the End of the Channel Availability Check Time	Conducted	Not Applicable	
7.8.3	In-Service Monitoring	In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period	Conducted	Complies	
7.8.4	Radar Detection	Statistical Performance Check	Conducted	Not Applicable	

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. 26 dB and 99 % Bandwidth

Conducted Test Conditions for 26 dB and 99% Bandwidth			
Standard:	FCC CFR 47:15.407	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	26 dB and 99 % Bandwidth	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.407 (a)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		

Test Procedure for 26 dB and 99% Bandwidth Measurement

The bandwidth at 26 dB and 99 % is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate center frequency. KDB 789033 Section 5.1 Emission Bandwidth was used in order to prove compliance. The Resolution Bandwidth was set to approximately 1% of the emission bandwidth.

Measurement Results for 26 dB and 99 % Operational Bandwidth(s)

Single Port:

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11a	**Duty Cycle (%):**	100%
Data Rate:	6 Mbit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5180.0	31.463	--	--	--	31.463	31.463		
5200.0	29.960	--	--	--	29.960	29.960		
5240.0	30.661	--	--	--	30.661	30.661		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5180.0	16.934	--	--	--	16.934	16.934		
5200.0	16.934	--	--	--	16.934	16.934		
5240.0	16.934	--	--	--	16.934	16.934		

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

Click on the links above to see the plot

Single Port:

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100%
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5180.0	29.459	--	--	--	29.459	29.459		
5200.0	28.557	--	--	--	28.557	28.557		
5240.0	28.357	--	--	--	28.357	28.357		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5180.0	18.036	--	--	--	18.036	18.036		
5200.0	17.936	--	--	--	17.936	17.936		
5240.0	18.036	--	--	--	18.036	18.036		

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

Click on the links above to see the plot

Single Port:

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5190.0	73.747	--	--	--	73.747	73.747		
5230.0	67.936	--	--	--	67.936	67.936		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5190.0	36.673	--	--	--	36.673	36.673		
5230.0	36.673	--	--	--	36.673	36.673		

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

Click on the links above to see the plot

Single Port:

Equipment Configuration for 26 dB & 99% Occupied Bandwidth

Variant:	802.11a	**Duty Cycle (%):**	100%
Data Rate:	6 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:	Not Applicable		

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5260.0	21.443				22.645	22.645		
5300.0	29.559				29.559	29.559		
5320.0	27.655				27.655	27.655		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5260.0	16.533				16.533	16.533		
5300.0	16.834				16.834	16.834		
5320.0	16.834				16.834	16.834		

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

Click on the links above to see the plot

Single Port

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100%
Data Rate:	6.5 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:	Not Applicable		

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5260.0	22.445				24.649	24.649		
5300.0	26.253				26.253	26.253		
5320.0	26.253				26.253	26.253		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5260.0	17.635				17.836	17.836		
5300.0	17.836				17.836	17.836		
5320.0	17.836				17.836	17.836		

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

Click on the links above to see the plot

Single Port

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MBit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Not Applicable		
Engineering Test Notes:	Not Applicable		

Test Measurement Results								
Test Frequency	**Measured 26 dB Bandwidth (MHz)**				**26 dB Bandwidth (MHz)**			
	Port(s)							
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5270.0	43.888				49.499	49.499		
5310.0	49.499				49.499	49.499		
Test Frequency	**Measured 99% Bandwidth (MHz)**				**99% Bandwidth (MHz)**			
	Port(s)							
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5270.0	36.072				36.273	36.273		
5310.0	36.273				36.273	36.273		

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

Click on the links above to see the plot

Single Port

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11a	**Duty Cycle (%):**	100%
Data Rate:	6 Mbit/s	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5500.0	34.770	--	--	--	34.770	34.770		
5580.0	34.269	--	--	--	34.269	34.269		
5700.0	34.269	--	--	--	34.269	34.269		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5500.0	19.238	--	--	--	19.238	19.238		
5580.0	17.936	--	--	--	17.936	17.936		
5700.0	17.936	--	--	--	17.936	17.936		

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

Click on the links above to see the plot

Single Port

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100%
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5500.0	35.070	--	--	--	35.070	35.070		
5580.0	33.267	--	--	--	33.267	33.267		
5700.0	34.068	--	--	--	34.068	34.068		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	a	b	c	d	Highest	Lowest		
5500.0	19.539	--	--	--	19.539	19.539		
5580.0	18.737	--	--	--	18.737	18.737		
5700.0	19.339	--	--	--	19.339	19.339		

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

Click on the links above to see the plot

Single Port

Equipment Configuration for 26 dB & 99% Occupied Bandwidth			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured 26 dB Bandwidth (MHz) Port(s)				26 dB Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5510.0	78.357	--	--	--	78.357	78.357		
5550.0	79.760	--	--	--	79.760	79.760		
5670.0	77.154	--	--	--	77.154	77.154		

Test Frequency	Measured 99% Bandwidth (MHz) Port(s)				99% Bandwidth (MHz)			
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**		
5510.0	44.890	--	--	--	44.890	44.890		
5550.0	43.687	--	--	--	43.687	43.687		
5670.0	41.082	--	--	--	41.082	41.082		

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

Click on the links above to see the plot

Specification

Limits

FCC, Part 15 §15.407 (a)(1), (a)(2) and Industry Canada RSS-210 § A9.2(2)

(a)(1) For the band 5.15-5.25 GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or +4 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

(a)(2) For the 5.25-5.35 GHz band the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or +11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

Industry Canada RSS-Gen 4.4

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.

Traceability

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

6.1.1.2. Maximum Conducted Output Power

Conducted Test Conditions for Maximum Conducted Output Power			
Standard:	FCC CFR 47:15.407	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Maximum Conducted Output Power	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.407 (a)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		

Test Procedure for Maximum Conducted Output Power Measurement

Method PM (Measurement using an RF average power meter). Section C) 4) of KDB 789033 defines a methodology using an average wideband power meter. Measurements were made while the EUT was operating in a continuous transmission mode (100% duty cycle) at the appropriate center frequency. All cable losses and offsets were taken into consideration in the measured result. All operational modes and frequency bands were measured independently and the resultant calculated. For multiple outputs, the measurements were made simultaneously on each output port and summed in a linear fashion. This technique was used in order to prove compliance.

Maximum Transmit (Conducted) Power, FCC Limits and Industry Canada Limits

Bands 5150 – 5250 MHz

FCC Limits

Conducted Power Limit lesser of: 50 mW or 4 dBm + 10 log (B) dBm. B is the 26 dB emission bandwidth in MHz.

Mode	Frequency Range (MHz)	Minimum 26 dB Bandwidth (MHz)	4 + 10 Log (B) (dBm)	Limit (dBm)
a	5150 – 5250	29.96	+18.77	+17.00
HT-20		28.36	+18.53	+17.00
HT-40		67.94	+22.32	+17.00

Industry Canada Limits

EIRP Limit 5150 – 5250 MHz: Lesser of 200 mW (+23 dBm) or 10 + 10 Log (B) dBm. B is the 99% emission bandwidth in MHz.

Mode	Frequency Range (MHz)	Minimum 99 % Bandwidth (MHz)	4 + 10 Log (B) (dBm)	EIRP Limit (dBm)
a	5150 – 5250	16.93	22.29	+22.29
HT-20		17.94	22.54	+22.54
HT-40		36.67	25.64	+23.00

Bands 5250 – 5350 and 5470 – 5725 MHz

FCC Limits Limits

Limit lesser of: 250 mW or 11 dBm + 10 log (B) dBm

Mode	Frequency Range (MHz)	Maximum 26 dB Bandwidth (MHz)	11 + 10 Log (B) (dBm)	Limit (dBm)
a	5250 – 5350 5470 – 5725	26.95	+25.31	+24.00
HT-20		26.65	+25.26	+24.00
HT-40		67.74	+29.31	+24.00

Industry Canada Limits

Limit lesser of: 250 mW or 11 dBm + 10 log (B) dBm

Mode	Frequency Range (MHz)	Maximum 99% Bandwidth (MHz)	11 + 10 Log (B) (dBm)	Limit (dBm)
a	5250 – 5350	16.73	+23.23	+23.23
HT-20		17.94	+23.54	+23.54
HT-40		36.67	+26.64	+24.00

Limit lesser of: 250 mW or 11 dBm + 10 log (B) dBm

Mode	Frequency Range (MHz)	Maximum 99% Bandwidth (MHz)	11 + 10 Log (B) (dBm)	Limit (dBm)
a	5470 – 5725	17.94	+23.54	+23.54
HT-20		18.74	+23.73	+23.73
HT-40		41.08	+27.14	+24.00

Measurement Results for Maximum Conducted Output Power

Equipment Configuration for Peak Transmit Power			
Variant:	802.11a	**Duty Cycle (%):**	100%
Data Rate:	6 Mbit/s	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5180.0	12.23	--	--	--	12.23	31.463	17.00	-4.77	14
5200.0	12.36	--	--	--	12.36	29.960	17.00	-4.64	13
5240.0	12.47	--	--	--	12.47	30.661	17.00	-4.53	14

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

Equipment Configuration for Peak Transmit Power			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100%
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5180.0	11.96	--	--	--	11.96	29.459	17.00	-5.04	13
5200.0	11.85	--	--	--	11.85	28.557	17.00	-5.15	13
5240.0	12.26	--	--	--	12.26	28.357	17.00	-4.74	13

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

Equipment Configuration for Peak Transmit Power			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5190.0	12.47	--	--	--	12.47	73.747	17.00	-4.53	13
5230.0	12.56	--	--	--	12.56	67.936	17.00	-4.44	13

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

Equipment Configuration for Peak Transmit Power			
Variant:	802.11a	**Duty Cycle (%):**	100%
Data Rate:	6 Mbit/s	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5260.0	12.04	--	--	--	12.04	28.457	24.00	-11.96	14
5300.0	12.41	--	--	--	12.41	26.954	24.00	-11.59	16
5320.0	12.57	--	--	--	12.57	26.954	24.00	-11.43	16

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

Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-20	**Duty Cycle (%):**	100%
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5260.0	11.70	--	--	--	11.70	26.653	24.00	-12.30	14
5300.0	12.29	--	--	--	12.29	28.156	24.00	-11.71	16
5320.0	12.43	--	--	--	12.43	28.557	24.00	-11.57	16

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

Equipment Configuration for Peak Transmit Power

Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5270.0	12.77	--	--	--	12.77	67.936	24.00	-11.23	14
5310.0	12.76	--	--	--	12.76	67.735	24.00	-11.24	14

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

Equipment Configuration for Peak Transmit Power			
Variant:	802.11a	**Duty Cycle (%):**	100%
Data Rate:	6 Mbit/s	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5500.0	15.10	--	--	--	15.10	34.770	24.00	-8.90	20.00
5580.0	14.53	--	--	--	14.53	34.269	24.00	-9.47	20.00
5700.0	15.16	--	--	--	15.16	34.269	24.00	-8.84	20.00

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

Equipment Configuration for Peak Transmit Power			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100%
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5500.0	14.53	--	--	--	14.53	35.070	24.00	-9.47	20.00
5580.0	14.61	--	--	--	14.61	33.267	24.00	-9.39	20.00
5700.0	15.07	--	--	--	15.07	34.068	24.00	-8.93	20.00

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

Equipment Configuration for Peak Transmit Power			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	5
Modulation:	OFDM	**Beam Forming Gain (Y):**	N/A
TPC:	N/A		
Engineering Test Notes:	--		

Test Measurement Results

Test Frequency	Measured Conducted Output Power (dBm)				Calculated Total Power	Minimum 26 dB Bandwidth	Limit	Margin	EUT Power Setting
	Port(s)								
MHz	a	b	c	d	Σ Port(s) dBm	MHz	dBm	dBm	
5510.0	15.30	--	--	--	15.30	78.357	24.00	-8.70	20.00
5550.0	15.30	--	--	--	15.30	79.760	24.00	-8.70	20.00
5670.0	15.30	--	--	--	15.30	77.154	24.00	-8.70	20.00

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

Specification Limits

FCC, Part 15 §15.407 (a)(1), (a)(2) and Industry Canada RSS-210 § A9.2(2)

(a)(1) For the band 5.15-5.25 GHz the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 50 mW or +4 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

(a)(2) For the 5.25-5.35 and 5470-5725 MHz GHz band the maximum conducted output power over the frequency band of operation shall not exceed the lesser of 250 mW or +11 dBm + 10 log B, where B is the 26 dB emission bandwidth in megahertz. In addition, the peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

Industry Canada RSS-210 §A9.2(2)

For the band 5150-5250 MHz, the maximum equivalent isotropically radiated power (e.i.r.p.) shall not exceed 200 mW or 10 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz. The e.i.r.p. spectral density shall not exceed 10 dBm in any 1.0 MHz band.

For the band 5250-5350 MHz and 5470-5725 MHz, the maximum conducted output power shall not exceed 250 mW or 11 + 10 log10 B, dBm, whichever power is less. The power spectral density shall not exceed 11 dBm in any 1.0 MHz band. The maximum e.i.r.p. shall not exceed 1.0 W or 17 + 10 log10 B, dBm, whichever power is less. B is the 99% emission bandwidth in MHz.

Industry Canada RSS-Gen 4.4

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.

Traceability

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

6.1.1.3. Peak Power Spectral Density

Conducted Test Conditions for Power Spectral Density			
Standard:	FCC CFR 47:15.407	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Power Spectral Density	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.247 (a)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		

Test Procedure for Power Spectral Density

The In-Band power spectral density was measured using the measure and sum approach per FCC KDB 662911 (D01 Multiple Transmitter Output v01.)

Measure and sum the spectra across the outputs. With this technique, spectra are measured at each output of the device at the required resolution bandwidth. The individual spectra are then summed mathematically in linear power units. Unlike in-band power measurements, in which the sum involves a single measured value (output power) from each output, measurements for compliance with PSD limits involve summing entire spectra across corresponding frequency bins on the various outputs. Consistency is maintained for any device with N transmitter outputs to be certain the individual outputs are all aligned with the same span and same number of points. In this instance, the linear power spectrum value within the first spectral bin of output 0 is summed with that in the first spectral bin of output 1, and the first spectral bin of output 2, and so on up to the Nth output to obtain the true value for the first frequency bin of the summed spectrum. The summed spectrum value for each frequency bin is computed in this fashion. These summed spectral values were calculated on a computer, and the results read back into the spectrum analyzer as a data file to produce a representative plot of total spectral power density.

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

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

x = Duty Cycle

Equipment Configuration for power density			
Variant:	802.11a	**Duty Cycle (%):**	100
Data Rate:	6 mbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	S Port(s)	Conversion to 3 kHz RBW	dBm	dB
5180.0	2.969	--	--	--	2.969	N/A	4.0	-1.03
5200.0	2.719	--	--	--	2.719	N/A	4.0	-1.28
5240.0	2.949	--	--	--	2.949	N/A	4.0	-1.05

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring RF Spectrum Mask
Measurement Uncertainty:	±2.81 dB

Equipment Configuration for power density			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	S Port(s)	Conversion to 3 kHz RBW	dBm	dB
5180.0	2.448	--	--	--	2.448	N/A	4.0	-1.55
5200.0	2.182	--	--	--	2.182	N/A	4.0	-1.82
5240.0	2.124	--	--	--	2.124	N/A	4.0	-1.88

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

Click on the links above to see the plot

Equipment Configuration for Peak Power Spectral Density			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	S Port(s)	Conversion to 3 kHz RBW	dBm	dB
5190.0	-5.026	--	--	--	-5.026	N/A	4.0	-9.03
5230.0	-4.822	--	--	--	-4.822	N/A	4.0	-8.82

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

Equipment Configuration for power density			
Variant:	802.11a	**Duty Cycle (%):**	100
Data Rate:	6 mbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	S Port(s)	Conversion to 3 kHz RBW	dBm	dB
5260.0	3.027	--	--	--	3.027	N/A	11.0	-7.97
5300.0	2.849	--	--	--	2.849	N/A	11.0	-8.15
5320.0	3.026	--	--	--	3.026	N/A	11.0	-7.97

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

Click on the links above to see the plot

Equipment Configuration for power density

Variant:	802.11n HT-20	**Duty Cycle (%):**	100
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	S Port(s)	Conversion to 3 kHz RBW	dBm	dB
5260.0	2.295	--	--	--	2.295	N/A	11.0	-8.71
5300.0	2.417	--	--	--	2.417	N/A	11.0	-8.58
5320.0	2.514	--	--	--	2.514	N/A	11.0	-8.49

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

Equipment Configuration for Peak Power Spectral Density

Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	a	b	c	d	S Port(s)	Conversion to 3 kHz RBW	dBm	dB
5270.0	-4.745	--	--	--	-4.745	N/A	11.0	-15.75
5310.0	-4.874	--	--	--	-4.874	N/A	11.0	-15.87

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

Equipment Configuration for power density

Variant:	802.11a	**Duty Cycle (%):**	100
Data Rate:	6 mbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**S Port(s)**	**Conversion to 3 kHz RBW**	**dBm**	**dB**
5500.0	4.827	--	--	--	4.827	N/A	11.0	-6.17
5580.0	4.599	--	--	--	4.599	N/A	11.0	-6.40
5700.0	5.139	--	--	--	5.139	N/A	11.0	-5.86

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

Equipment Configuration for power density

Variant:	802.11n HT-20	**Duty Cycle (%):**	100
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**S Port(s)**	**Conversion to 3 kHz RBW**	**dBm**	**dB**
5500.0	4.219	--	--	--	4.219	N/A	11.0	-6.78
5580.0	4.153	--	--	--	4.153	N/A	11.0	-6.85
5700.0	5.051	--	--	--	5.051	N/A	11.0	-5.95

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

Equipment Configuration for Peak Power Spectral Density			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Power Spectral Density (dBm) Port(s)				Calculated Total Power Spectral Density (dBm)		Limit	Margin
MHz	**a**	**b**	**c**	**d**	**S Port(s)**	**Conversion to 3 kHz RBW**	**dBm**	**dB**
5510.0	-2.737	--	--	--	-2.737	N/A	11.0	-13.74
5550.0	-2.516	--	--	--	-2.516	N/A	11.0	-13.52
5670.0	-2.532	--	--	--	-2.532	N/A	11.0	-13.53

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

Specification

FCC, Part 15 §15.407 (a)(1), (a)(2)
5150 – 5250 MHz
(a)(1) The peak power spectral density shall not exceed +4 dBm in any 1 megahertz band.

5250 – 5350 MHz & 5470 – 5725 MHz
(a)(2) The peak power spectral density shall not exceed +11 dBm in any 1 megahertz band.

Industry Canada RSS-210 § **A9.2(1), A9.2(2)**
5150 – 5250 MHz
§ **A9.2(1)** The eirp spectral density shall not exceed +10 dBm in any 1 MHz band

5250 – 5350 MHz & 5470 – 5725 MHz
§ **A9.2(2)** The power spectral density shall not exceed +11 dBm in any 1 MHz band

Traceability

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

6.1.1.4. Peak Excursion Ratio

Conducted Test Conditions for Peak Excursion Ratio			
Standard:	FCC CFR 47:15.407	**Ambient Temp. (ºC):**	24.0 - 27.5
Test Heading:	Peak Excursion Ratio	**Rel. Humidity (%):**	32 - 45
Standard Section(s):	15.407 (a)(6)	**Pressure (mBars):**	999 - 1001
Reference Document(s):	KDB 789033 - D01 DTS General UNII Test Procedures v01		

Test Procedure for Peak Excursion Ratio

Compliance with the peak excursion requirement is demonstrated by confirming the ratio of the maximum of the peak-hold spectrum to the maximum of the average spectrum during continuous transmission. Section F) of KDB 789033 was used in order to prove compliance. This is a conducted measurement using a spectrum analyzer using dual traces. Peak Excursion Ratio is the difference in amplitude (dB) between both traces; The following identifies two spectrum traces on the same plot. Trace 1 is the max hold Peak detector, and Trace 2 is the recalled trace data from Peak Power Spectral Density measurements. Each frequency and operational mode is recalled in order to prove compliance.

Equipment Configuration for peak excursion			
Variant:	802.11a	**Duty Cycle (%):**	100
Data Rate:	6 mbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5180.0	8.73	--	--	--	8.73	8.73	-13.0	-4.27

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	WI-03 Measuring Spectrum Mask
Measurement Uncertainty:	±2.81 dB

Equipment Configuration for peak excursion			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5180.0	8.21	--	--	--	8.21	8.21	-13.0	-4.79

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	
Measurement Uncertainty:	

Click on the links above to see the plot

Equipment Configuration for Peak Excursion Ratio			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5190.0	12.20	--	--	--	12.20	12.20	-13.0	-0.80

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

Equipment Configuration for peak excursion			
Variant:	802.11a	**Duty Cycle (%):**	100
Data Rate:	6 mbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5260.0	8.61	--	--	--	8.61	8.61	-13.0	-4.39

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	
Measurement Uncertainty:	

Click on the links above to see the plot

Equipment Configuration for peak excursion			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5260.0	8.36	--	--	--	8.36	8.36	-13.0	-4.64

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	
Measurement Uncertainty:	

Equipment Configuration for Peak Excursion Ratio			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5270.0	11.93	--	--	--	11.93	11.93	-13.0	-1.07

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

Click on the links above to see the plot

Equipment Configuration for peak excursion			
Variant:	802.11a	**Duty Cycle (%):**	100
Data Rate:	6 mbps	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5500.0	8.56	--	--	--	8.56	8.56	-13.0	-4.44

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	
Measurement Uncertainty:	

Equipment Configuration for peak excursion			
Variant:	802.11n HT-20	**Duty Cycle (%):**	100
Data Rate:	6.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	Max Power		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5500.0	8.36	--	--	--	8.36	8.36	-13.0	-4.64

Traceability to Industry Recognized Test Methodologies	
Work Instruction:	
Measurement Uncertainty:	

Click on the links above to see the plot

Equipment Configuration for Peak Excursion Ratio			
Variant:	802.11n HT-40	**Duty Cycle (%):**	100%
Data Rate:	13.5 MCS	**Antenna Gain (dBi):**	Not Applicable
Modulation:	OFDM	**Beam Forming Gain (Y):**	Not Applicable
TPC:	N/A		
Engineering Test Notes:			

Test Measurement Results

Test Frequency	Measured Peak Excursion (dB) Port(s)				Ratio (dB)		Limit	Lowest Margin
MHz	**a**	**b**	**c**	**d**	**Highest**	**Lowest**	**dB**	**MHz**
5510.0	12.71	--	--	--	12.71	12.71	-13.0	-0.29

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

Click on the links above to see the plot

Specification

Limits

§15.407 (a)(6) The ratio of the peak excursion of the modulation envelope (measured using a peak hold function) to the peak transmit power (measured as specified in this paragraph) shall not exceed 13dB across any 1MHz bandwidth or the emission bandwidth whichever is less

Traceability

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

6.1.1.5. Frequency Stability

FCC, Part 15 Subpart C §15.407(g)
Industry Canada RSS-210 §2.1

Test Procedure

The manufacturer of the equipment is responsible for ensuring that the frequency stability is such that emissions are always maintained within the band of operation under all conditions.

Manufacturer Declaration

The frequency stability of the reference oscillator sets the frequency stability of the RF transceiver signals. Therefore all of the RF signals should have ±20ppm stability.
This stability accounts for room temp tolerance of the crystal oscillator circuit, frequency variation across temperature, and crystal ageing.

±20ppm at 5.250 GHz translates to a maximum frequency shift of ±105 KHz. As the edge of the channels is at least one MHz from either of the band edges, ±105 KHz is more than sufficient to guarantee that the intentional emission will remain in the band over the entire operating range of the EUT.

Specification

Limits

§15.407 (g) Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user's manual.

6.1.2. Radiated Emission Testing

FCC, Part 15 Subpart C §15.407(b)(2), §15.205(a)/15.209(a)
Industry Canada RSS-210 §A9.3(2); §2.2; §2.6; RSS-Gen §4.7

Test Procedure
Testing was performed in a 3-meter anechoic chamber. Preliminary radiated emissions were measured on every azimuth and with the receiving antenna in both horizontal and vertical polarizations. Preliminary emissions were recorded with in Spectrum Analyzer mode, using a maximum peak detector while in peak hold mode. Depending on the frequency band spanned a notch filter and/or waveguide filter was used to remove the fundamental frequency.

Emissions nearest the limits were chosen for maximization and formal measurement using a CISPR compliant receiver. Emissions above 1000 MHz are measured utilizing a CISPR compliant average detector with a tuned receiver, using a bandwidth of 1 MHz. Emissions from 30 MHz – 1000 MHz are measured utilizing a CISPR compliant quasi-peak detector with a tuned receiver, using a bandwidth of 120 kHz. Only the highest emissions relative to the limit are listed.

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

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

Field Strength Calculation 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

The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength (dBµV/m);

$$E = 1000000 \times \sqrt{30P} / 3 \ \mu V/m$$

where P is the EIRP in Watts

Therefore: -27 dBm/MHz = 68.23 dBuV/m

Note: The data in this Section identifies that the EUT is in compliance with the -27dBm/MHz EIRP limit (68.23 dBµV/m) for out of band emissions. All out of band emissions are less than 68.23 dB µV/m.

Specification

Radiated Spurious Emissions

15.407 (b)(2). All emissions outside of the 5,150-5,350MHz band shall not exceed an EIRP of -27dBm/MHz.

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.

RSS-210 §A9.3(2) For transmitters operating in the 5250-5350 MHz band, all emissions outside the 5150-5350 MHz band shall not exceed -27 dBm/MHz e.i.r.p. Devices operating in the 5250-5350 MHz band that generate emissions in the 5150-5250 MHz band shall not exceed out of band emission limit of 27 dBm/MHz e.i.r.p. in the 5150-5250 MHz band in order to operate indoor/outdoor, or alternatively shall comply with the spectral power density for operation within the 5150-5250 MHz band and shall be labeled “for indoor use only”.

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.

RSS-Gen §6 Receiver Spurious Emission Standard
If a radiated measurement is made, all spurious emissions shall comply with the limits of the following Table. The resolution bandwidth of the spectrum analyzer shall be 100 kHz for spurious emission measurements below 1.0 GHz and 1.0 MHz for measurements above 1.0 GHz

Table 1: FCC 15.209 Spurious Emissions Limits

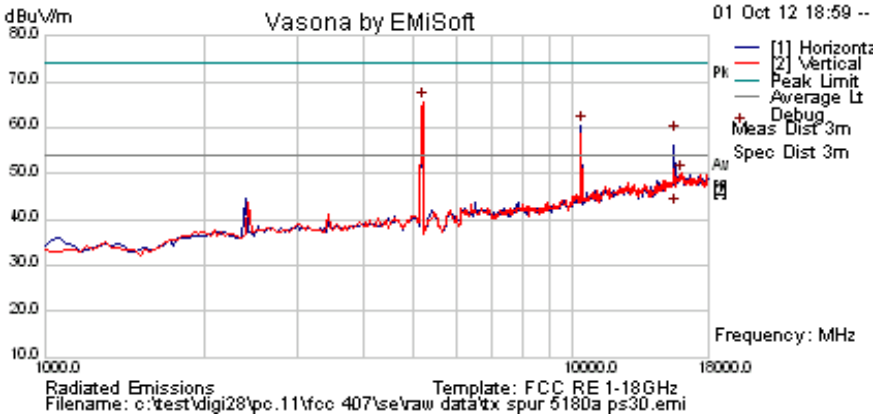
Frequency (MHz)	Field Strength (µV/m)	Field Strength (dBµV/m)	Measurement Distance (meters)
30-88	100	40.0	3
88-216	150	43.5	3
216-960	200	46.0	3
Above 960	500	54.0	3

Traceability:

Test Equipment Used
0088, 0158, 0134, 0304, 0311, 0315, 0310, 0312

6.1.2.1. Dual Band Patch PC.11

Test Freq.	5180 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

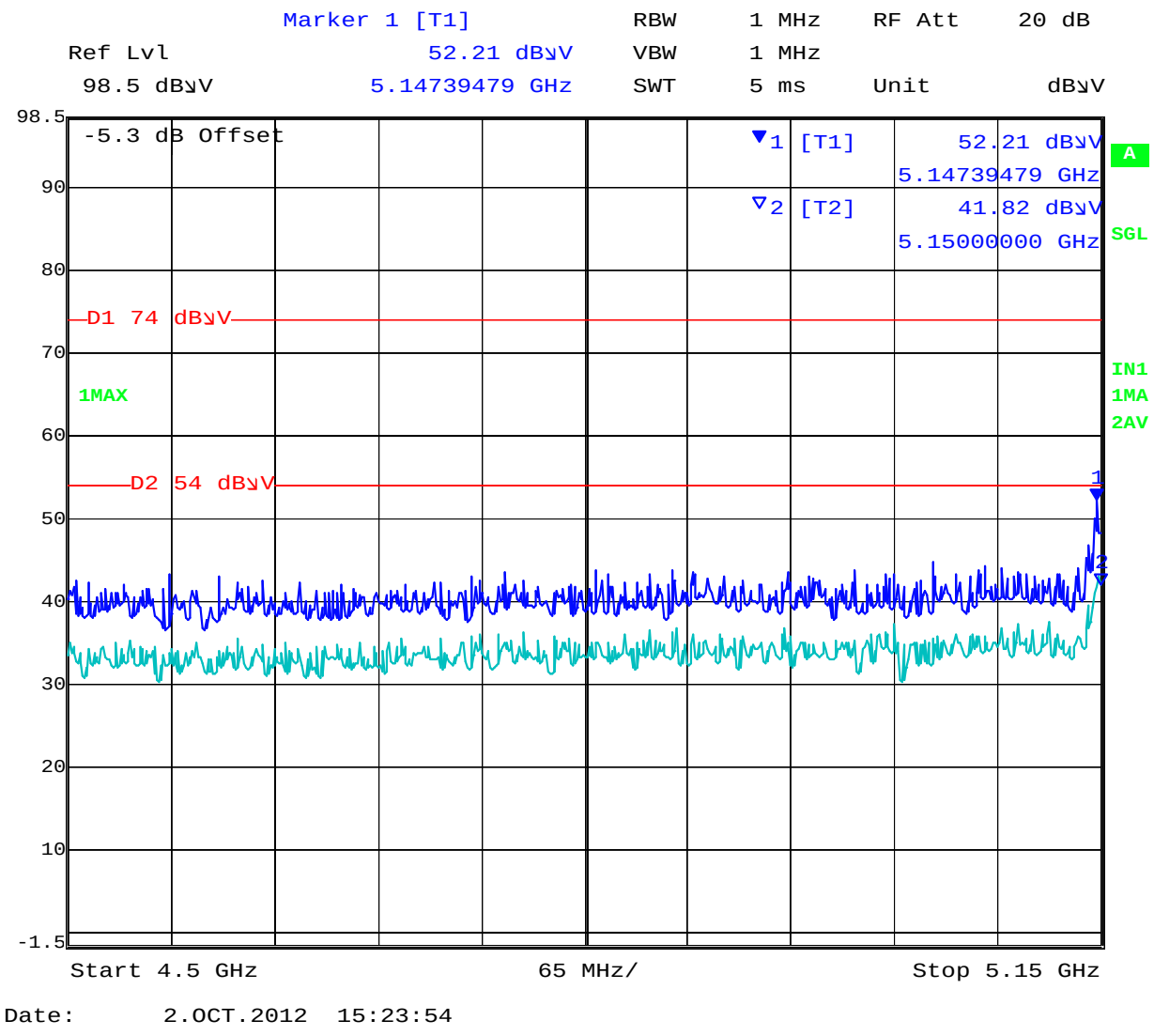


Formally measured emission peaks

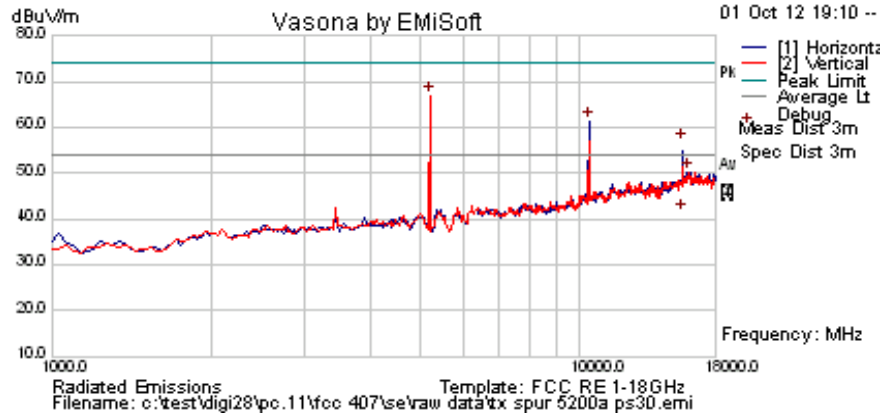
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	70.9	4.6	-9.9	65.6	Peak [Scan]	V						FUND
10368.737	56.4	6.7	-2.5	60.6	Peak [Scan]	H	100	0	54.0	6.6	Pass	NRB
15989.980	41.0	9.0	0.1	50.1	Peak [Scan]	V	100	0	54.0	-3.9	Pass	Noise
15540.441	51.0	8.3	-0.6	58.7	Peak Max	H	133	299	74.0	-15.3	Pass	RB
15540.441	35.0	8.3	-0.6	42.7	Average Max	H	133	299	54.0	-11.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5150 Restricted Band-edge



Test Freq.	5200 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

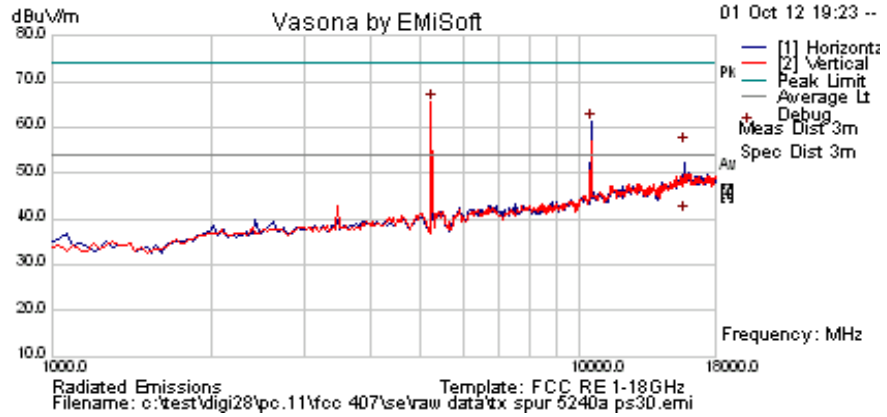


Formally measured emission peaks

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
5190.381	72.3	4.6	-9.9	67.0	Peak [Scan]	V						FUND
10402.806	57.1	6.7	-2.5	61.3	Peak [Scan]	H					Pass	NRB
16058.116	41.0	9.0	0.3	50.3	Peak [Scan]	V	100	0	54.0	-3.7	Pass	Noise
15598.957	49.2	8.4	-0.6	57.0	Peak Max	H	107	319	74.0	-17.0	Pass	RB
15598.957	33.8	8.4	-0.6	41.6	Average Max	H	107	319	54.0	-12.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5240 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

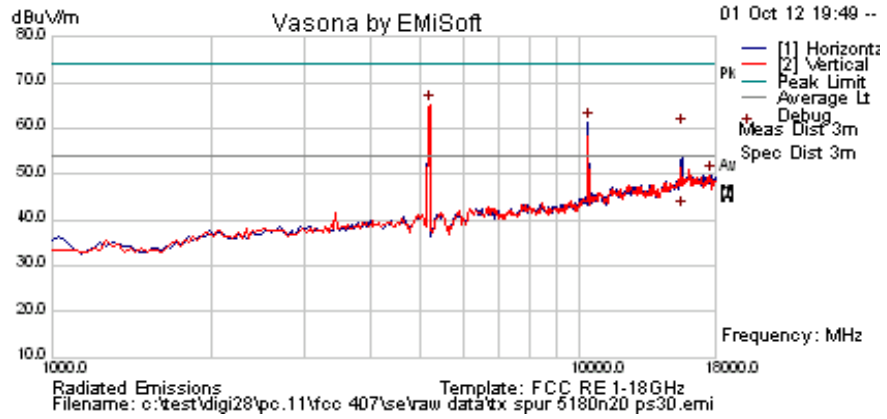


Formally measured emission peaks

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
5224.449	70.8	4.6	-9.8	65.6	Peak [Scan]	V						FUND
10470.942	56.8	6.8	-2.5	61.1	Peak [Scan]	H					Pass	NRB
15717.435	48.0	8.6	-0.4	56.1	Peak Max	H	145	320	74.0	-17.9	Pass	RB
15717.435	32.9	8.6	-0.4	41.0	Average Max	H	145	320	54.0	-13.0	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5180 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

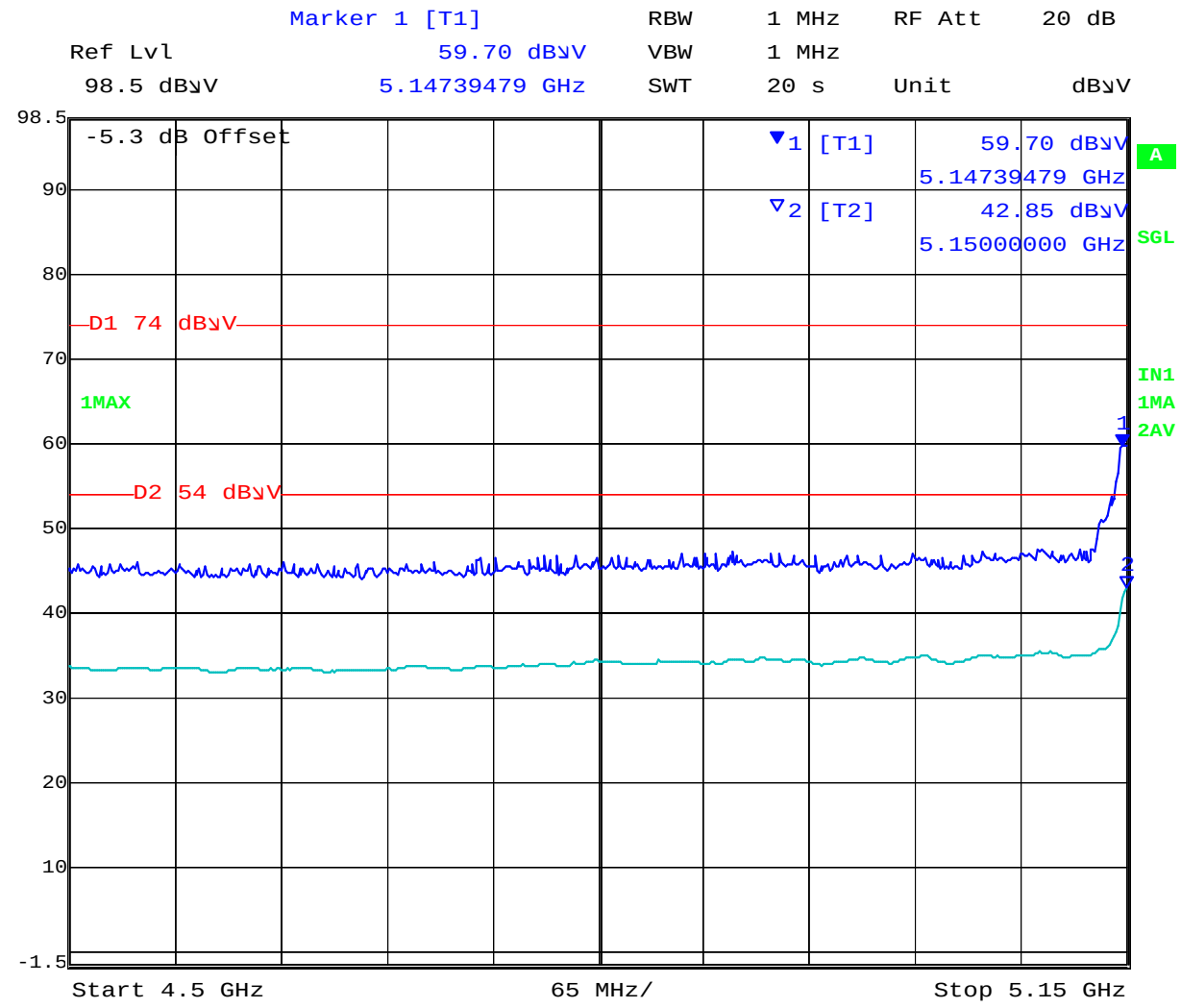


Formally measured emission peaks

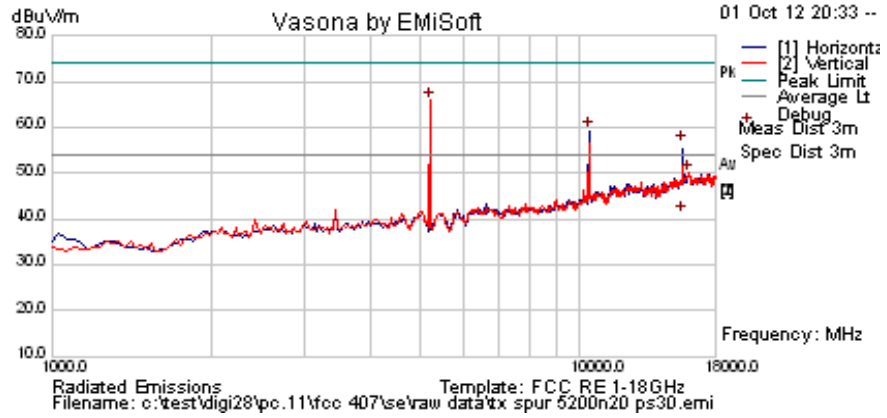
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	70.4	4.6	-9.9	65.2	Peak [Scan]	V						FUND
10368.737	57.2	6.7	-2.5	61.4	Peak [Scan]	H					Pass	NRB
17727.455	40.8	8.8	0.3	49.8	Peak [Scan]	H	100	0	54.0	-4.2	Pass	Noise
15539.318	52.4	8.3	-0.6	60.1	Peak Max	H	115	325	74.0	-14.0	Pass	RB
15539.318	34.5	8.3	-0.6	42.2	Average Max	H	115	325	54.0	-11.8	Pass	RB

Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5150 Restricted Band-edge



Test Freq.	5200 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

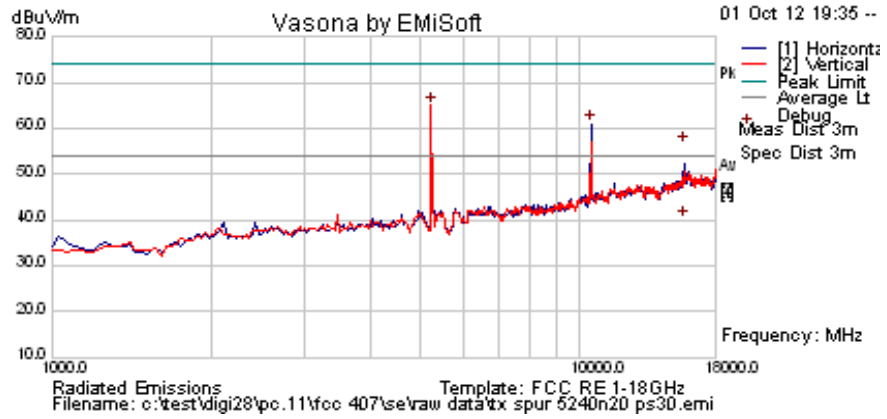


Formally measured emission peaks

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
5190.381	71.3	4.6	-9.9	66.0	Peak [Scan]	V						FUND
10402.806	55.0	6.7	-2.5	59.2	Peak [Scan]	H					Pass	NRB
16024.048	40.7	9.0	0.2	49.9	Peak [Scan]	V	150	0	54.0	-4.1	Pass	Noise
15602.244	48.5	8.4	-0.6	56.3	Peak Max	H	119	318	74.0	-17.7	Pass	RB
15602.244	33.1	8.4	-0.6	40.9	Average Max	H	119	318	54.0	-13.1	Pass	RB

Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

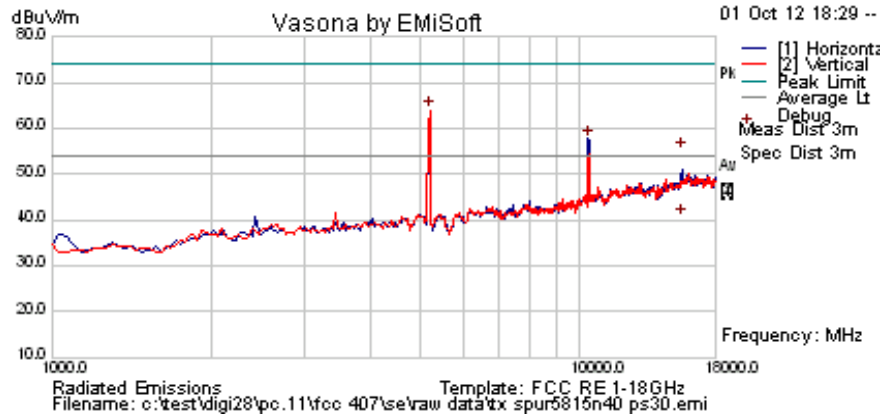
Test Freq.	5240 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			



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
5224.449	70.4	4.6	-9.8	65.2	Peak [Scan]	V						FUND
10470.942	56.7	6.8	-2.5	61.0	Peak [Scan]	H					Pass	NRB
15717.996	48.1	8.6	-0.4	56.3	Peak Max	H	166	296	74.0	-17.7	Pass	RB
15717.996	31.9	8.6	-0.4	40.0	Average Max	H	166	296	54.0	-14.0	Pass	RB
Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5190 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

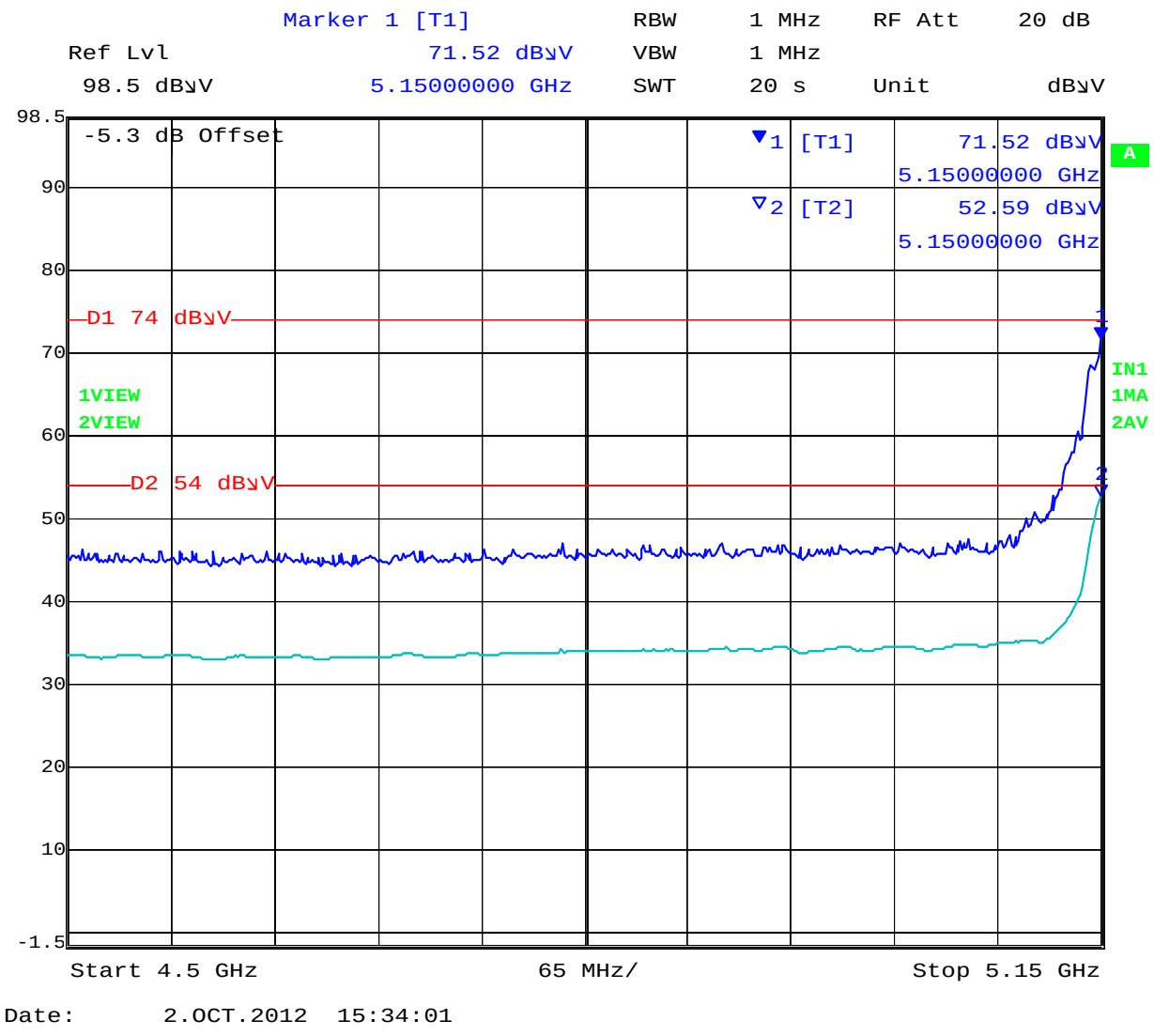


Formally measured emission peaks

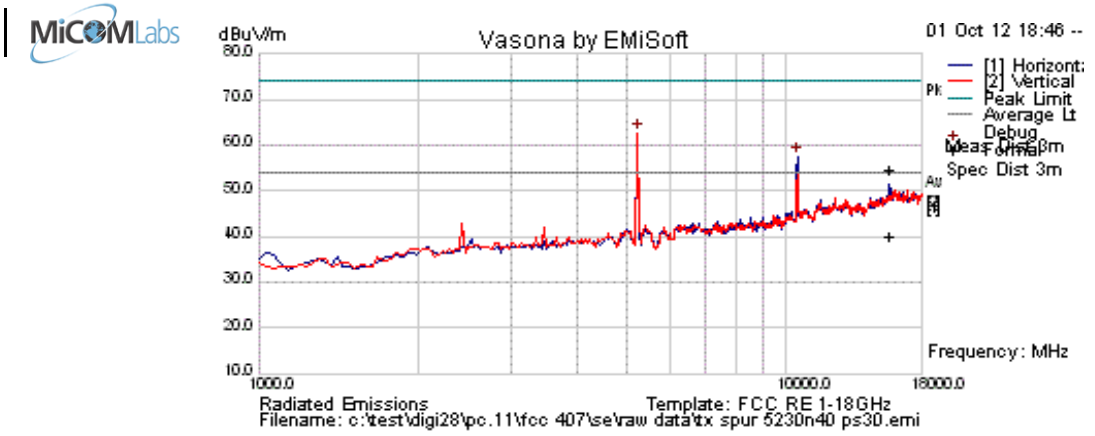
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	69.3	4.6	-9.9	64.0	Peak [Scan]	V						FUND
10368.737	53.6	6.7	-2.5	57.8	Peak [Scan]	H					Pass	NRB
15579.719	47.4	8.3	-0.6	55.2	Peak Max	H	126	324	74.0	-18.8	Pass	RB
15579.719	32.8	8.3	-0.6	40.6	Average Max	H	126	324	54.0	-13.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5150 Restricted Band-edge



Test Freq.	5230 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

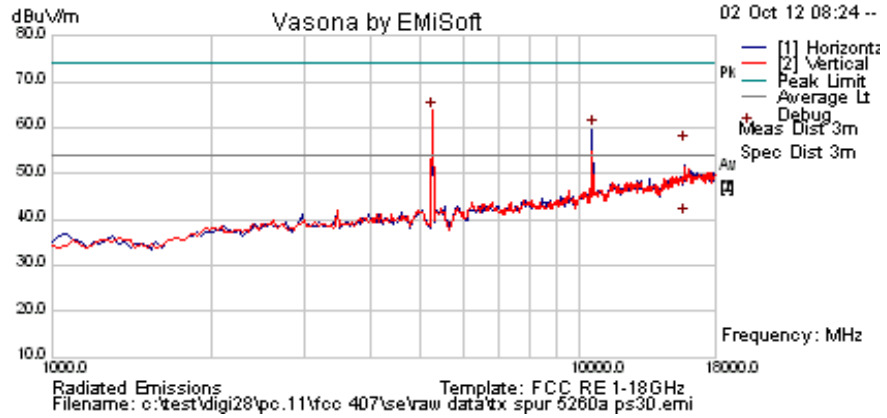


Formally measured emission peaks

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
5224.449	67.9	4.6	-9.8	62.7	Peak [Scan]	V						FUND
10470.942	53.3	6.8	-2.5	57.6	Peak [Scan]	H					Pass	NRB
15690.421	46.8	8.5	-0.5	54.8	Peak Max	H	105	295	74.0	-19.2	Pass	RB
15690.421	32.0	8.5	-0.5	40.1	Average Max	H	105	295	54.0	-13.9	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5260 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

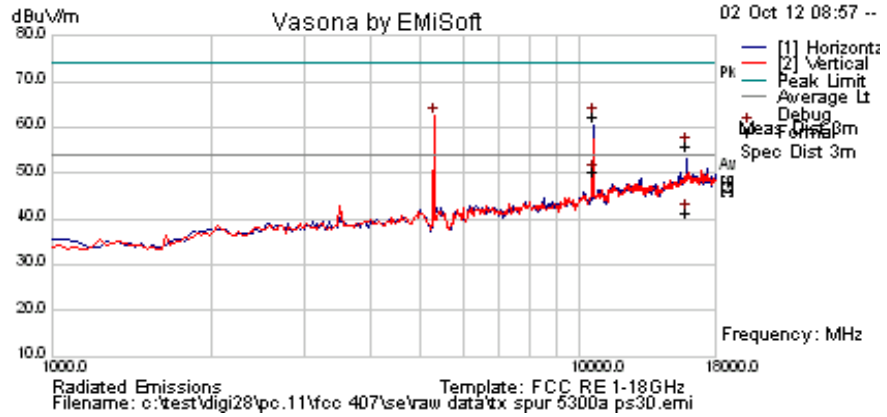


Formally measured emission peaks

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
5258.517	69.0	4.6	-9.7	63.9	Peak [Scan]	V						FUND
10539.078	55.3	6.8	-2.5	59.7	Peak [Scan]	H					Pass	NRB
15779.487	48.1	8.7	-0.3	56.5	Peak Max	H	151	299	74.0	-17.5	Pass	RB
15779.487	32.2	8.7	-0.3	40.6	Average Max	H	151	299	54.0	-13.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5300 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

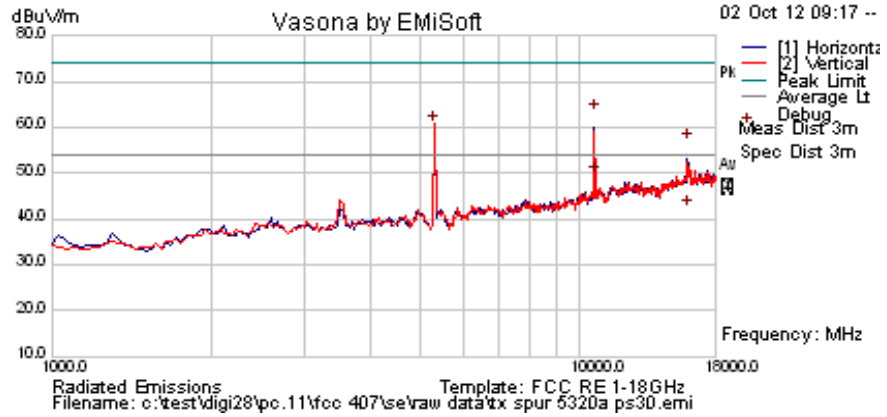


Formally measured emission peaks

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
5292.585	67.4	4.6	-9.6	62.4	Peak [Scan]	V						FUND
10600.440	45.8	6.8	-2.4	50.1	Average Max	H	100	41	54.0	-3.9	Pass	RB
10600.440	58.1	6.8	-2.4	62.5	Peak Max	H	100	41	74.0	-11.5	Pass	RB
15900.281	47.3	8.9	-0.2	56.0	Peak Max	H	142	302	74.0	-18.0	Pass	RB
15900.281	32.6	8.9	-0.2	41.3	Average Max	H	142	302	54.0	-12.7	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5320 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

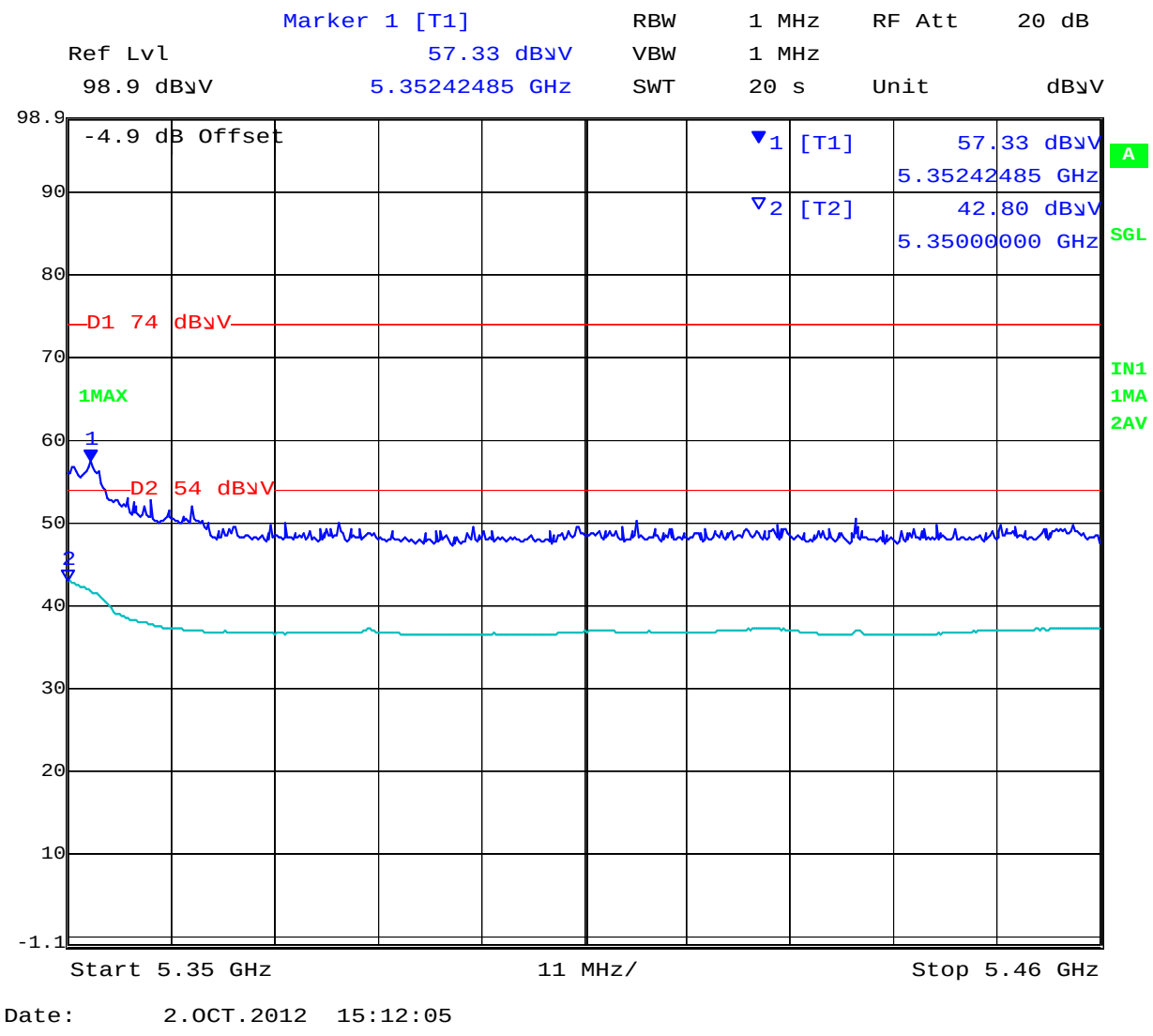


Formally measured emission peaks

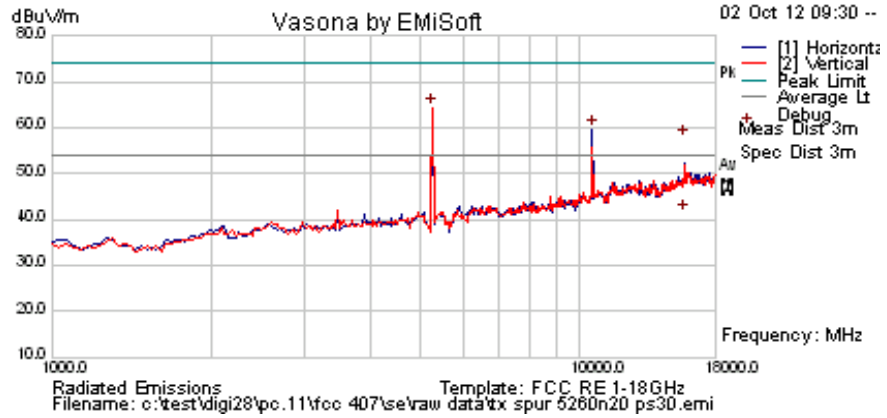
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5313.507	65.6	4.6	-9.5	60.7	Peak [Scan]	V						FUND
10640.682	58.7	6.8	-2.4	63.1	Peak Max	H	115	40	74.0	-10.9	Pass	RB
15960.220	47.7	9.0	0.0	56.7	Peak Max	H	143	301	74.0	-17.3	Pass	RB
10640.682	45.1	6.8	-2.4	49.6	Average Max	H	115	40	54.0	-4.4	Pass	RB
15960.220	33.2	9.0	0.0	42.1	Average Max	H	143	301	54.0	-11.9	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5350 Restricted Band-edge



Test Freq.	5260 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

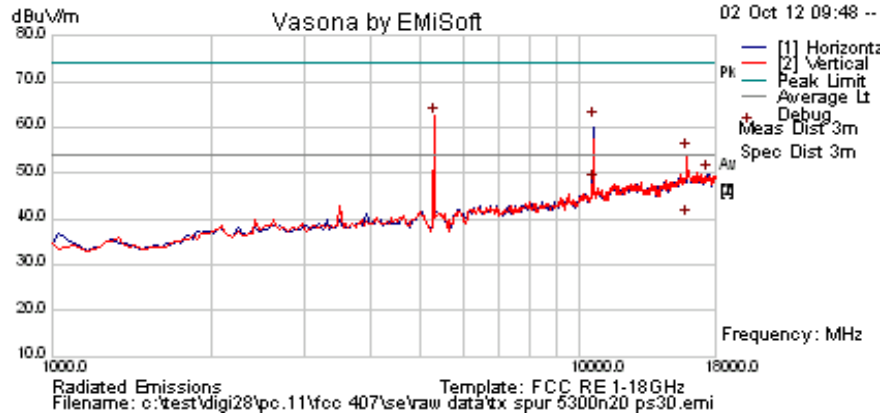


Formally measured emission peaks

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
5258.517	69.6	4.6	-9.7	64.5	Peak [Scan]	V						FUND
10539.078	55.3	6.8	-2.5	59.6	Peak [Scan]	H					Pass	NRB
15780.842	49.2	8.7	-0.3	57.6	Peak Max	H	131	324	74.0	-16.4	Pass	RB
15780.842	33.1	8.7	-0.3	41.5	Average Max	H	131	324	54.0	-12.5	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

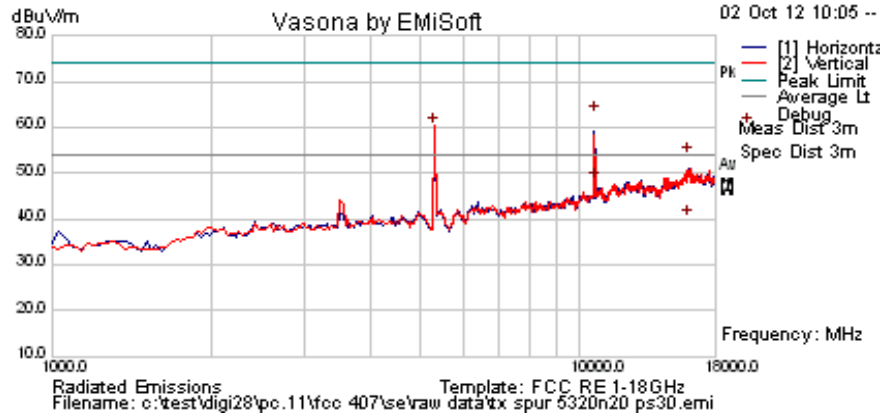
Test Freq.	5300 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			



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
5292.585	67.5	4.6	-9.6	62.5	Peak [Scan]	V						FUND
17420.842	39.8	8.7	1.3	49.8	Peak [Scan]	H	150	0	54	-4.2	Pass	Noise
10603.186	57.0	6.8	-2.4	61.4	Peak Max	H	112	13	74	-12.6	Pass	RB
15901.563	46.0	8.9	-0.2	54.7	Peak Max	H	98	298	74	-19.3	Pass	RB
10603.186	43.5	6.8	-2.4	47.9	Average Max	H	112	13	54	-6.1	Pass	RB
15901.563	31.4	8.9	-0.2	40.1	Average Max	H	98	298	54	-13.9	Pass	RB
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5320 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

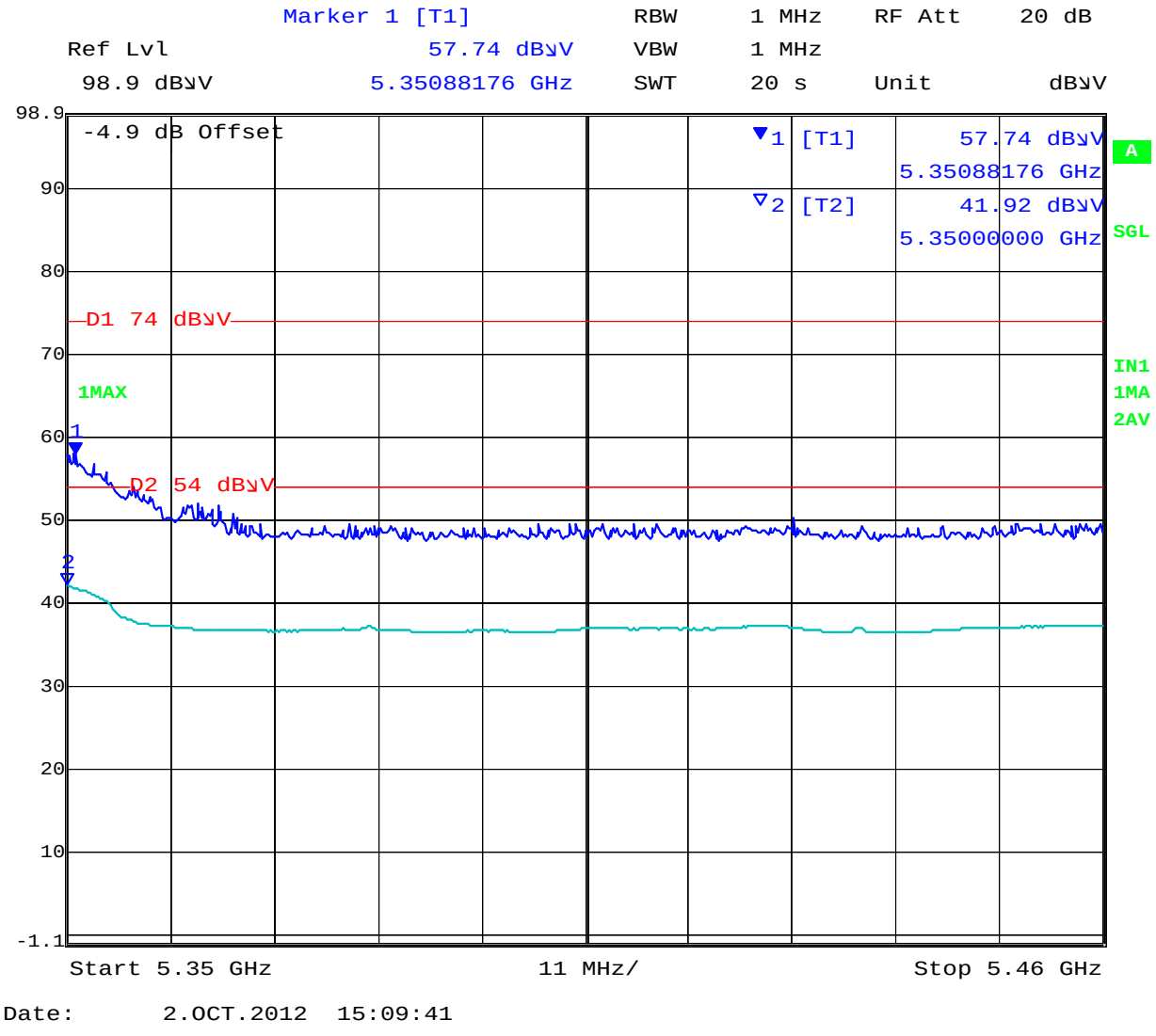


Formally measured emission peaks

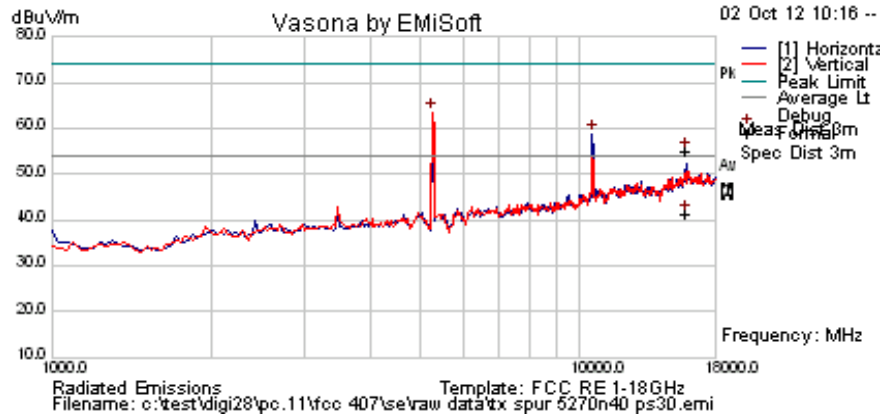
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	65.4	4.6	-9.6	60.4	Peak [Scan]	V						FUND
10639.159	58.2	6.8	-2.4	62.6	Peak Max	H	100	17	74	-11.4	Pass	RB
15961.924	44.9	9.0	0.0	53.9	Peak Max	H	126	361	74	-20.1	Pass	RB
10639.159	43.6	6.8	-2.4	48.1	Average Max	H	100	17	54	-5.9	Pass	RB
15961.924	31.1	9.0	0.0	40.0	Average Max	H	126	361	54	-14.0	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5350 Restricted Band-edge



Test Freq.	5270 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

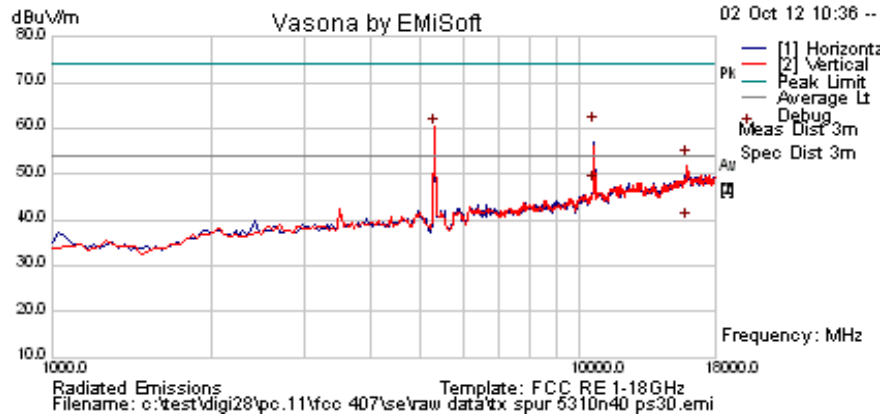


Formally measured emission peaks

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
5258.517	68.7	4.6	-9.7	63.6	Peak [Scan]	V						FUND
10539.078	54.5	6.8	-2.5	58.8	Peak [Scan]	H					Pass	NRB
15812.024	46.6	8.7	-0.3	55.0	Peak Max	H	129	303	74.0	-19.0	Pass	RB
15812.024	32.9	8.7	-0.3	41.4	Average Max	H	129	303	54.0	-12.7	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5310 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

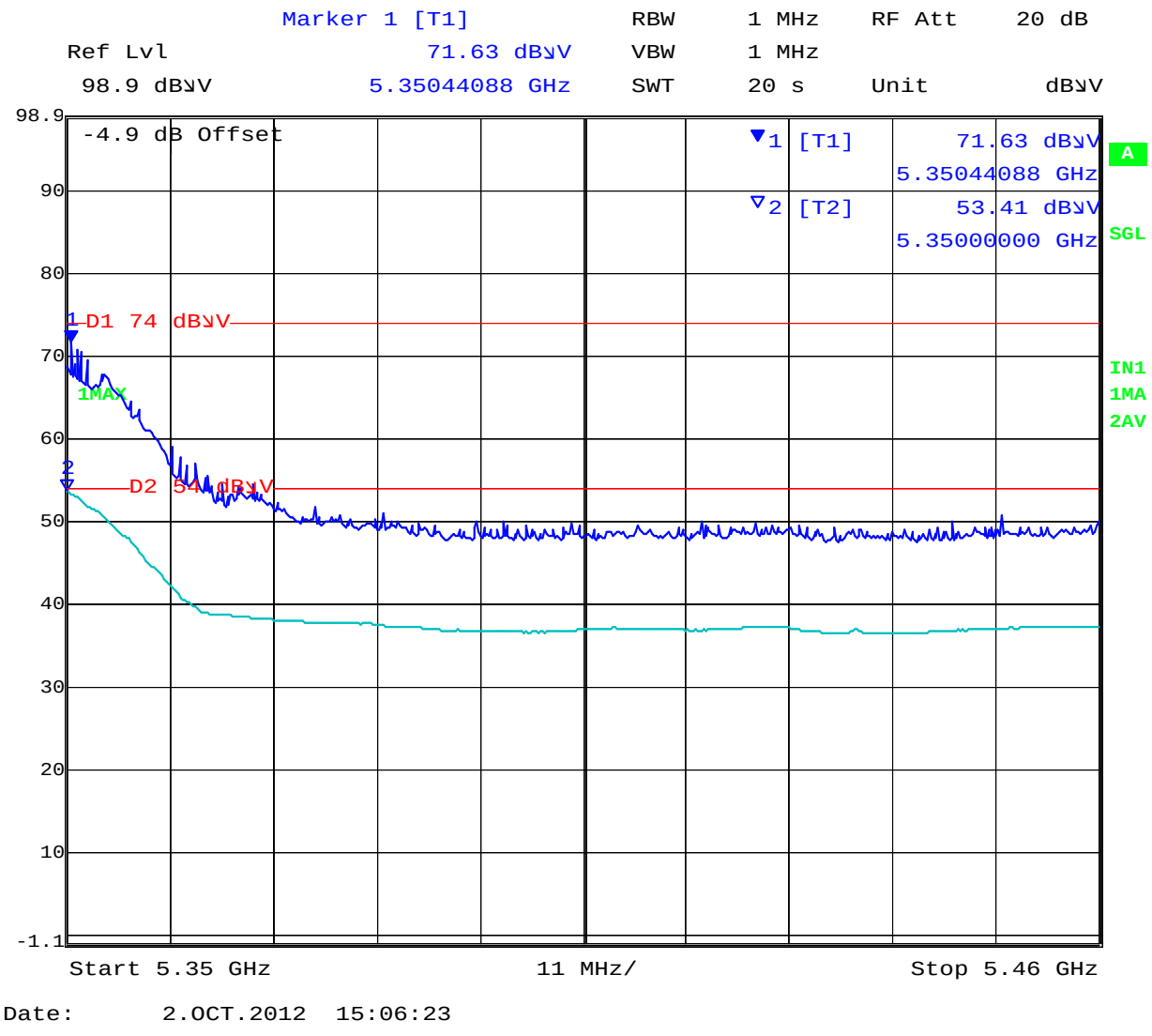


Formally measured emission peaks

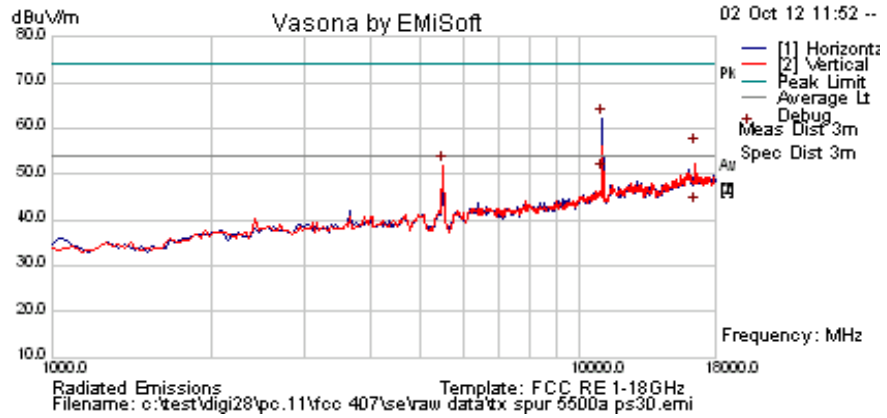
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	65.3	4.6	-9.6	60.3	Peak [Scan]	V						FUND
10625.171	56.2	6.8	-2.4	60.6	Peak Max	H	103	9	74.0	-13.4	Pass	RB
15932.891	44.6	8.9	-0.1	53.4	Peak Max	H	101	231	74.0	-20.6	Pass	RB
10625.171	43.6	6.8	-2.4	48.0	Average Max	H	103	9	54.0	-6.0	Pass	RB
15932.891	31.0	8.9	-0.1	39.8	Average Max	H	101	231	54.0	-14.2	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5350 Restricted Band-edge



Test Freq.	5500 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

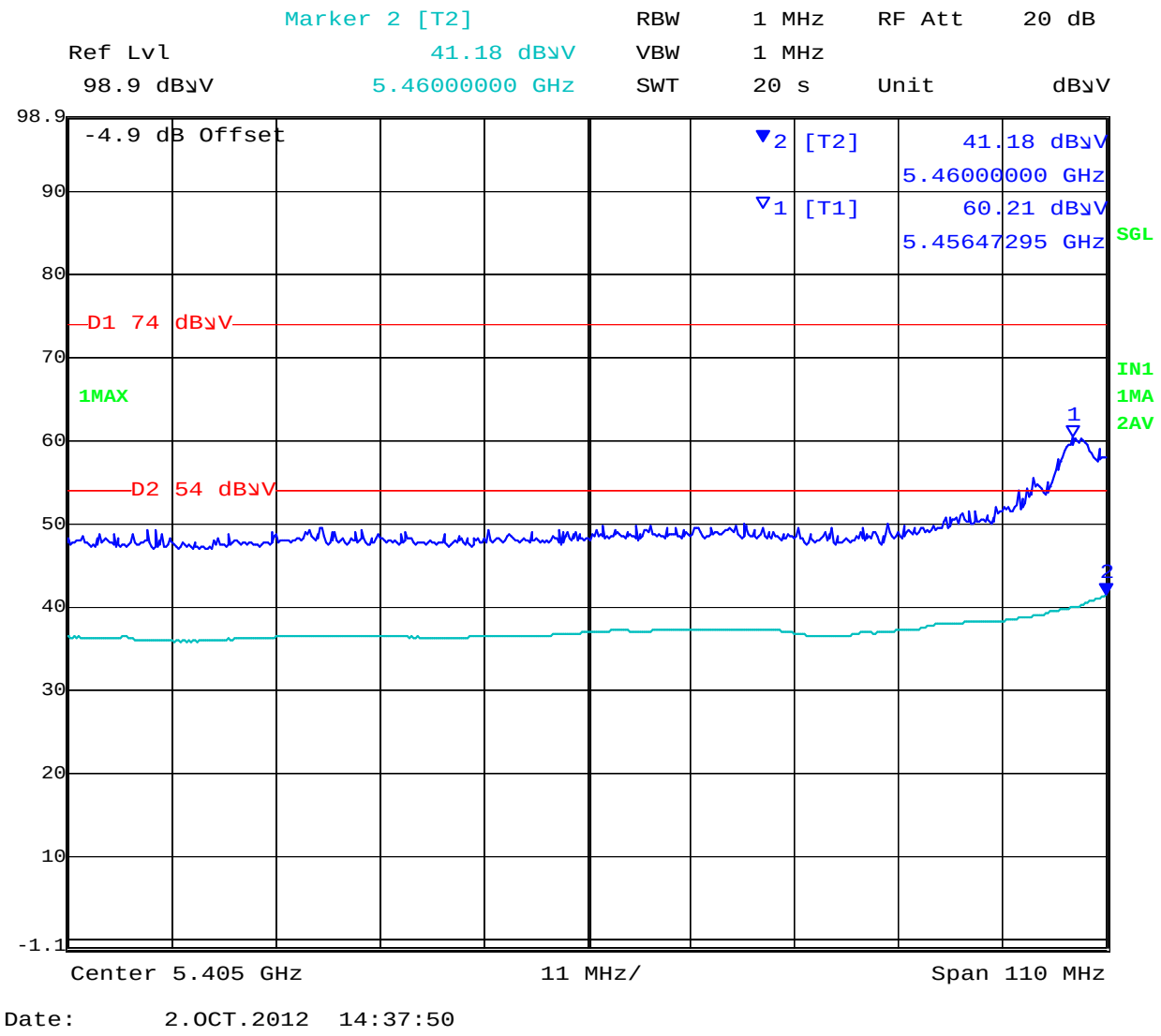


Formally measured emission peaks

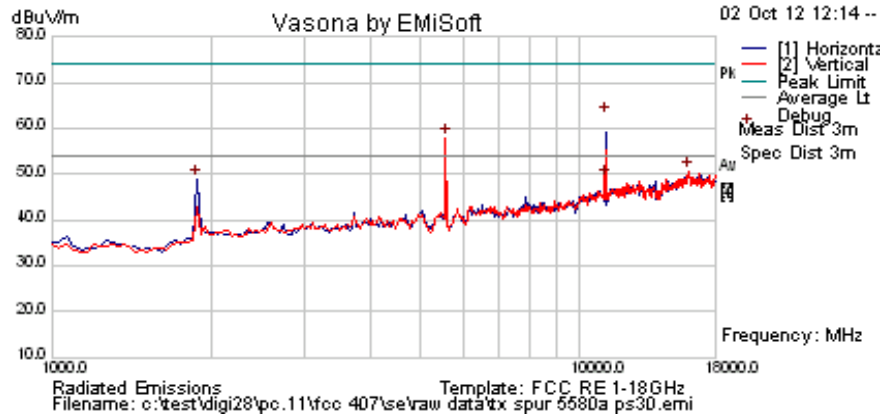
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.993988	57.1	4.6	-9.6	52.1	Peak [Scan]	V						FUND
10998.317	58.6	7.0	-3.1	62.5	Peak Max	H	117	40	74.0	-11.5	Pass	RB
16504.128	46.8	8.8	0.4	56.0	Peak Max	V					Pass	NRB
10998.317	46.4	7.0	-3.1	50.3	Average Max	H	117	40	54.0	-3.7	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5460 Restricted Band edge



Test Freq.	5580 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

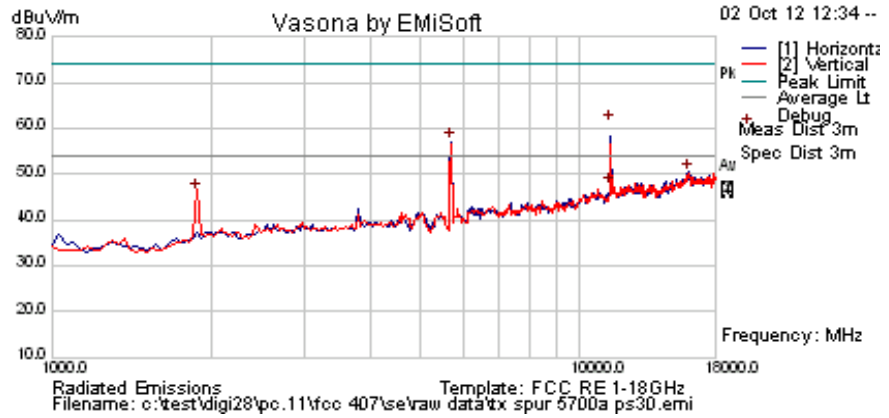


Formally measured emission peaks

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
5565.130261	63.1	4.7	-9.7	58.0	Peak [Scan]	V						FUND
15989.98	41.5	9.0	0.1	50.7	Peak [Scan]	V	150	0	54.0	-3.4	Pass	Noise
1885.771543	58.5	2.7	-12.2	49.0	Peak [Scan]	H	150	0	54.0	-5.0	Pass	NRB
11160.742	58.7	6.9	-3.0	62.6	Peak Max	H	112	46	74.0	-11.4	Pass	RB
11160.742	45.2	6.9	-3.0	49.2	Average Max	H	112	46	54.0	-4.8	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5700 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

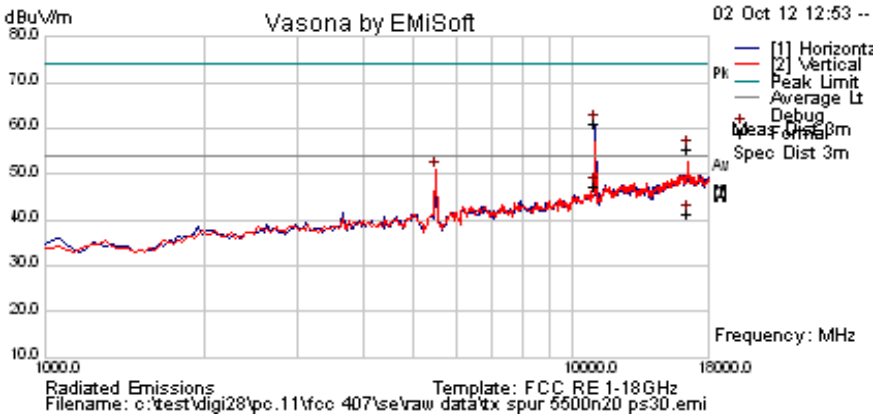


Formally measured emission peaks

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
5701.402806	61.9	4.7	-9.6	57.1	Peak [Scan]	H						FUND
15989.98	41.5	9.0	0.1	50.6	Peak [Scan]	H	100	0	54.0	-3.4	Pass	Noise
1883.236	55.6	2.7	-12.2	46.1	Peak [Scan]	H	98	360	54.0	-7.9	Pass	NRB
11400.654	56.4	6.8	-2.3	61.0	Peak Max	H	99	39	74.0	-13.0	Pass	RB
11400.654	42.9	6.8	-2.3	47.5	Average Max	H	99	39	54.0	-6.5	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5500 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

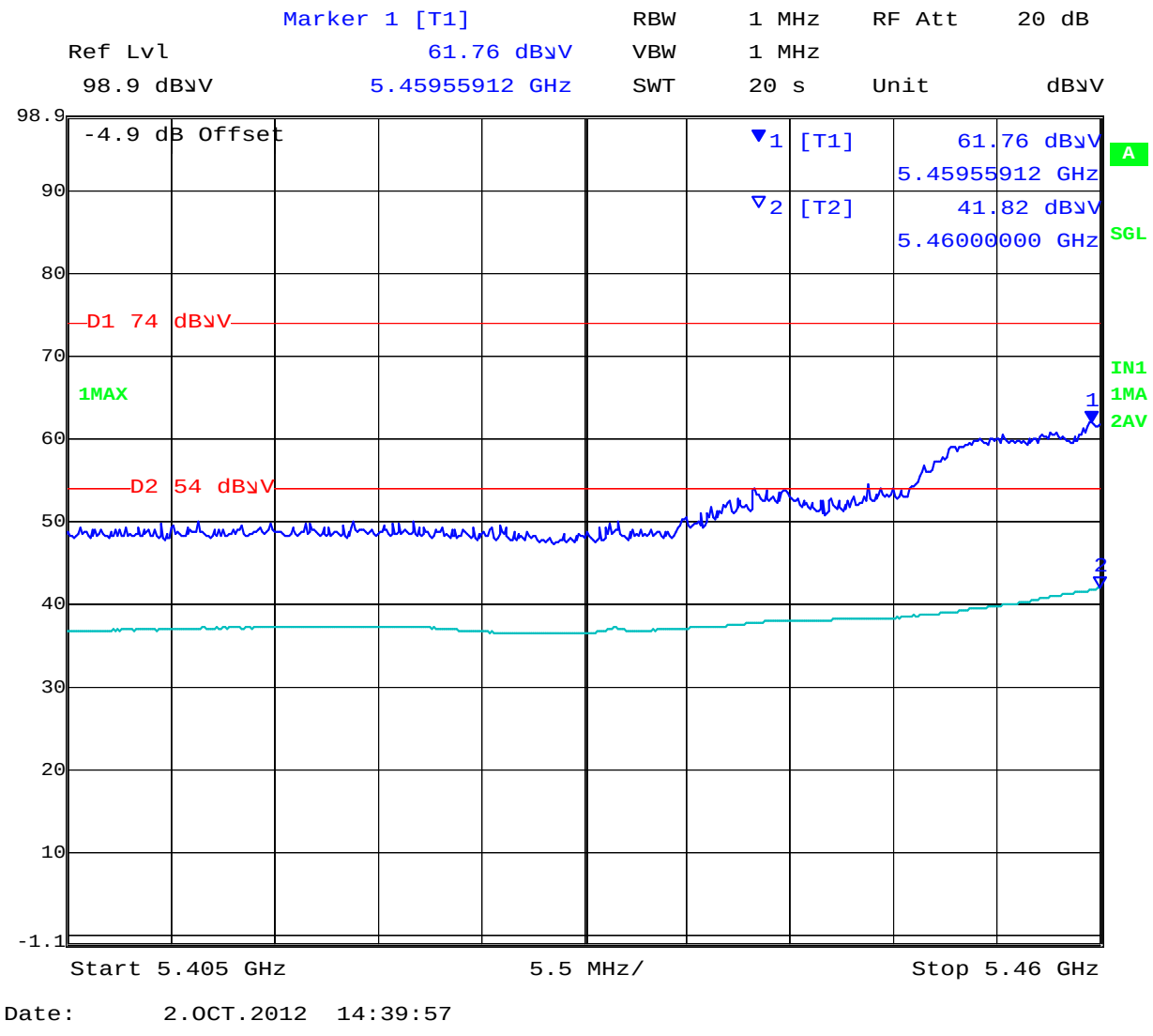


Formally measured emission peaks

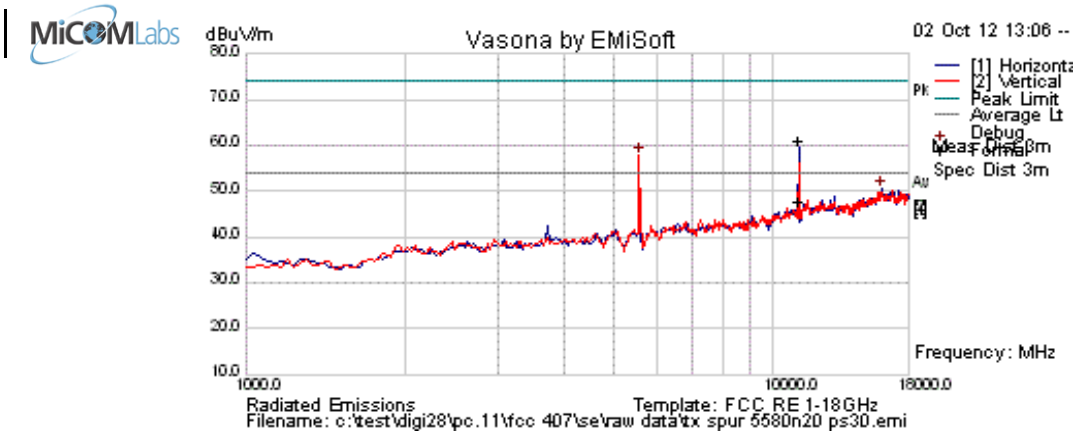
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.994	56.0	4.6	-9.6	51.0	Peak [Scan]	V						FUND
10995.972	57.2	7.0	-3.1	61.1	Peak Max	H	125	47	74	-12.9	Pass	RB
16501.844	46.3	8.8	0.3	55.4	Peak Max	V					Pass	NRB
10995.972	43.6	7.0	-3.1	47.5	Average Max	H	125	47	54	-6.5	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5460 Restricted Band-edge



Test Freq.	5580 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

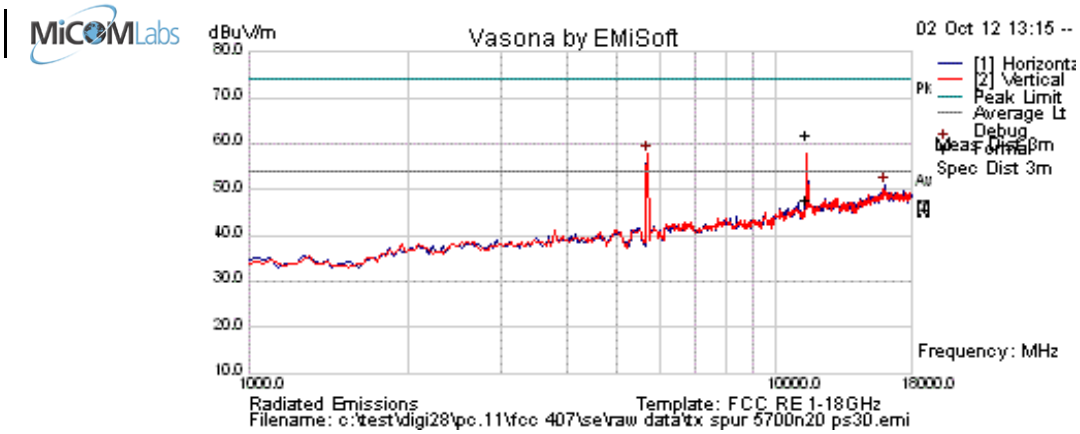


Formally measured emission peaks

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
5565.13	62.9	4.7	-9.7	57.8	Peak [Scan]	V	150					FUND
16024.048	41.2	9	0.2	50.4	Peak [Scan]	H	150	0	54	-3.6	Pass	Noise
11159.84	57.1	6.9	-3	61	Peak Max	H	98	46	74	-13.0	Pass	RB
11159.84	43.9	6.9	-3	47.8	Average Max	H	98	46	54	-6.2	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5700 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	PC.11 patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

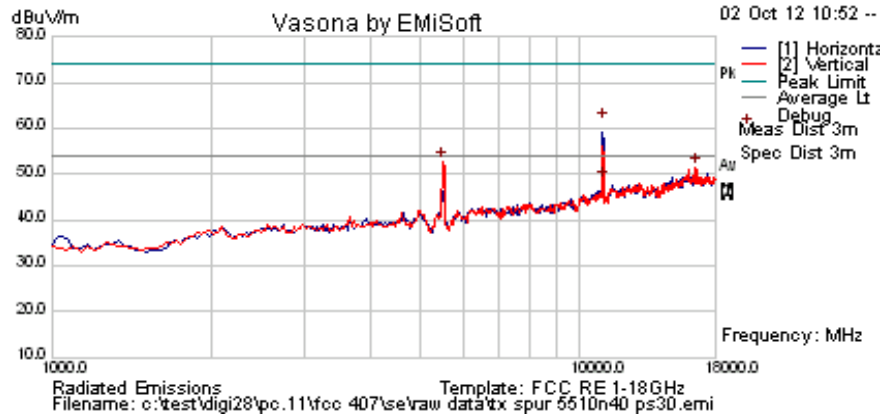


Formally measured emission peaks

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
5701.403	62.7	4.7	-9.6	57.9	Peak [Scan]	V						FUND
16024.048	41.6	9.0	0.2	50.9	Peak [Scan]	V	150	0	54	-3.1	Pass	Noise
11399.199	57.2	6.8	-2.3	61.8	Peak Max	V	98	17	74	-12.2	Pass	RB
11399.199	43.0	6.8	-2.3	47.6	Average Max	v	98	17	54	-6.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5510 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

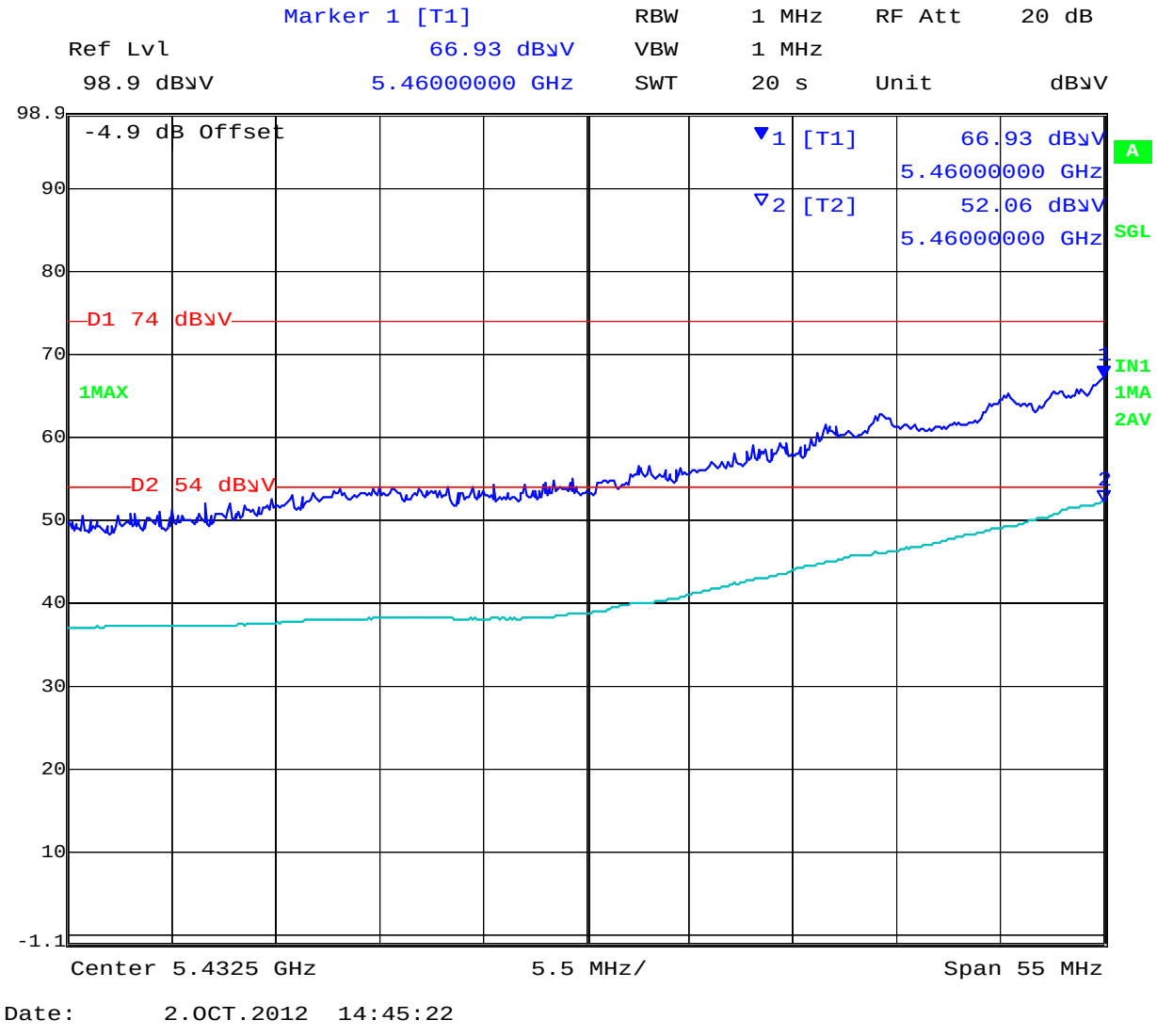


Formally measured emission peaks

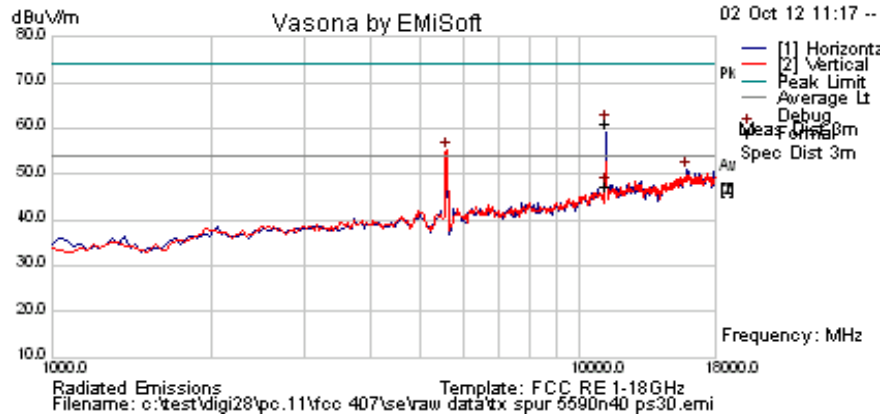
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.994	57.8	4.6	-9.6	52.8	Peak [Scan]	V						FUND
16535.070	42.4	8.8	0.4	51.6	Peak [Scan]	V					Pass	NRB
11025.090	57.6	7.0	-3.1	61.4	Peak Max	H	103	41	74	-12.6	Pass	RB
11025.090	45.0	7.0	-3.1	48.8	Average Max	H	103	41	54	-5.2	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5460 Restricted Band-edge



Test Freq.	5590 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			

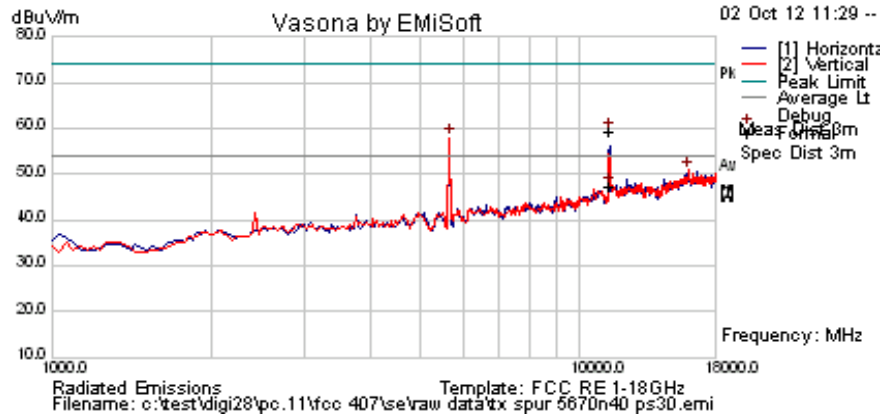


Formally measured emission peaks

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
5599.198	60.3	4.7	-9.7	55.3	Peak [Scan]	V						FUND
15887.776	42.2	8.8	-0.2	50.8	Peak [Scan]	H	150	0	54	-3.2	Pass	Noise
11176.502	57.2	6.9	-2.9	61.2	Peak Max	H	98	45	74	-12.8	Pass	RB
11176.502	43.4	6.9	-2.9	47.4	Average Max	H	98	45	54	-6.6	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5670 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	pc.11 Patch	**Duty Cycle (%)**	100
Test Notes 1	4.5 dBi		
Test Notes 2			



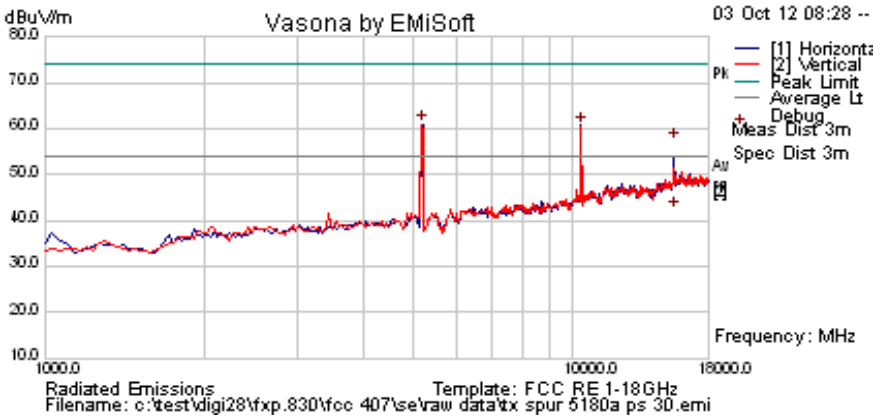
Formally measured emission peaks

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
5667.335	63.0	4.7	-9.7	58.0	Peak [Scan]	V						FUND
16024.048	41.7	9.0	0.2	51.0	Peak [Scan]	V	100	0	54	-3.1	Pass	Noise
11339.879	55.0	6.9	-2.4	59.4	Peak Max	H	120	19	74	-14.6	Pass	RB
11339.879	42.8	6.9	-2.4	47.2	Average Max	H	120	19	54	-6.8	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

6.1.2.2. Dual Band Parch FXP.830

Test Freq.	5180 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

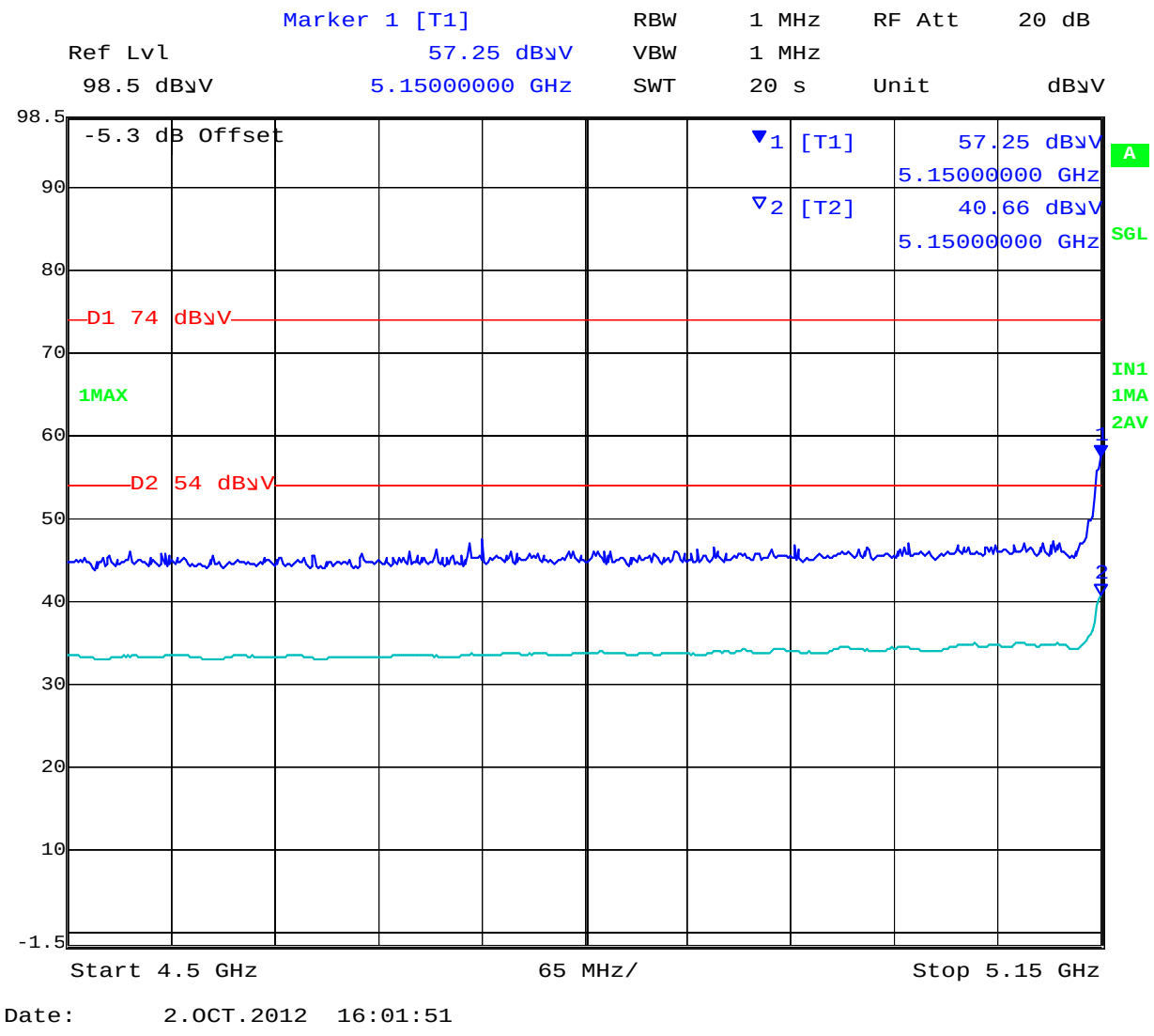


Formally measured emission peaks

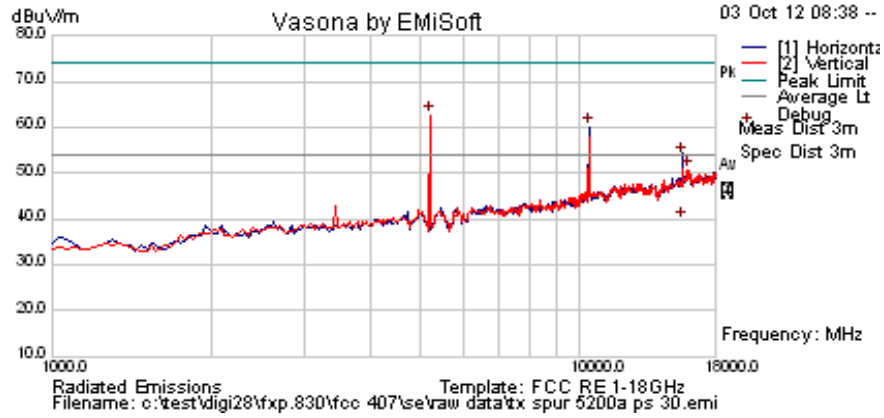
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	66.2	4.6	-9.9	60.9	Peak [Scan]	H						FUND
10368.737	56.5	6.7	-2.5	60.7	Peak [Scan]	H					Pass	NRB
15540.200	49.5	8.3	-0.6	57.2	Peak Max	H	121	294	74.0	-16.8	Pass	RB
15540.200	34.7	8.3	-0.6	42.4	Average Max	H	121	294	54.0	-11.6	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5150 Restricted Band-edge



Test Freq.	5200 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

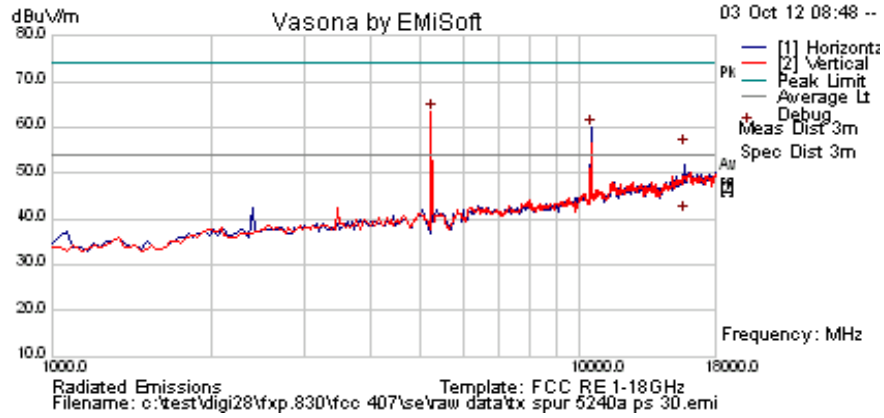


Formally measured emission peaks

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
5190.381	68.0	4.6	-9.9	62.7	Peak [Scan]	V						FUND
10402.806	55.9	6.7	-2.5	60.1	Peak [Scan]	H					Pass	NRB
16024.048	41.4	9.0	0.2	50.6	Peak [Scan]	V	150	0	54.0	-3.4	Pass	Noise
15600.160	45.9	8.4	-0.6	53.7	Peak Max	H	185	250	74.0	-20.3	Pass	RB
15600.160	31.8	8.4	-0.6	39.6	Average Max	H	185	250	54.0	-14.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5240 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

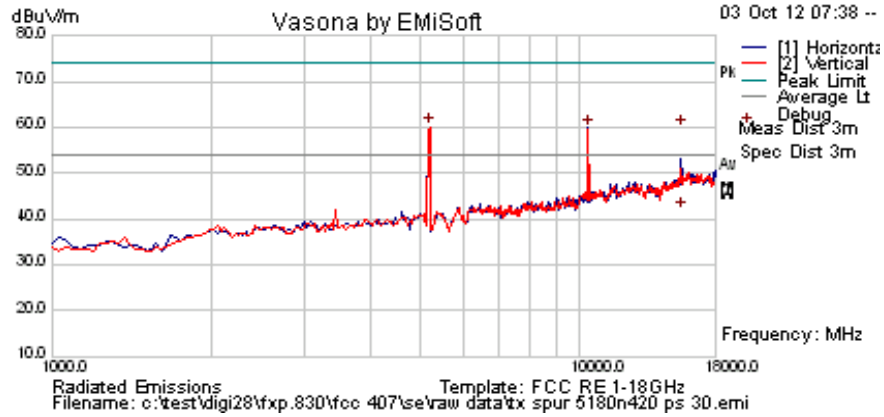


Formally measured emission peaks

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
5224.449	68.6	4.6	-9.8	63.4	Peak [Scan]	V						FUND
10470.942	55.6	6.8	-2.5	59.9	Peak [Scan]	H					Pass	NRB
15717.435	47.5	8.6	-0.4	55.6	Peak Max	H	112	310	74.0	-18.4	Pass	RB
15717.435	32.8	8.6	-0.4	40.9	Average Max	H	112	310	54.0	-13.1	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5180 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

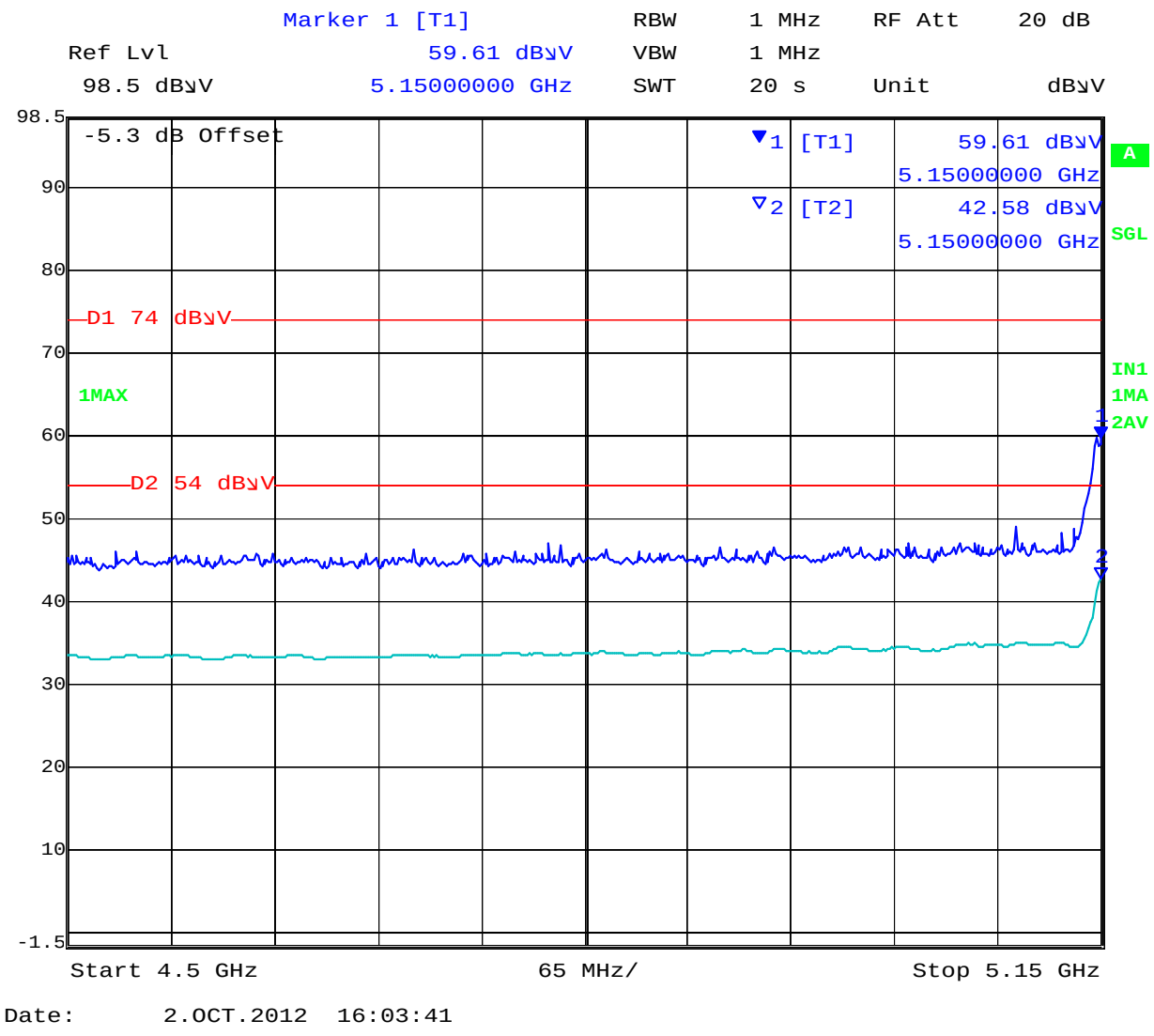


Formally measured emission peaks

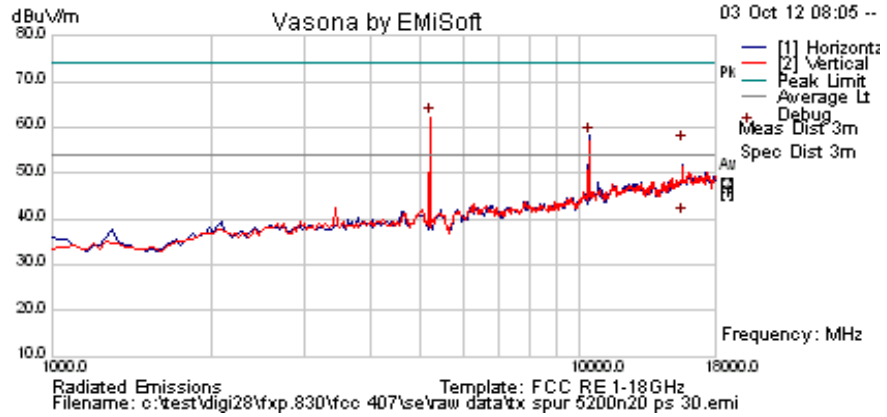
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	65.4	4.6	-9.9	60.1	Peak [Scan]	V						FUND
10368.737	55.7	6.7	-2.5	59.9	Peak [Scan]	H					Pass	NRB
15539.559	52.0	8.3	-0.6	59.7	Peak Max	H	98	298	74.0	-14.4	Pass	RB
15539.559	34.0	8.3	-0.6	41.7	Average Max	H	98	298	54.0	-12.3	Pass	RB

Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5150 Restricted Band-edge



Test Freq.	5200 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

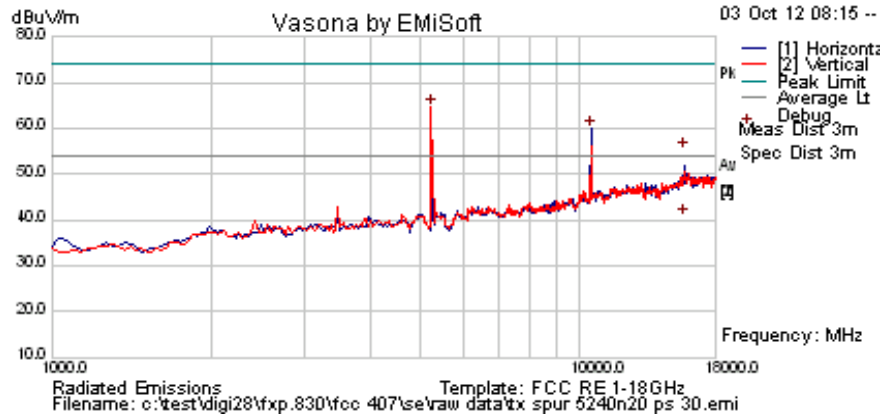


Formally measured emission peaks

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
5190.381	67.4	4.6	-9.9	62.2	Peak [Scan]	V						FUND
10402.806	53.9	6.7	-2.5	58.2	Peak [Scan]	H					Pass	NRB
15600.000	48.8	8.4	-0.6	56.6	Peak Max	H	148	319	74.0	-17.4	Pass	RB
15600.000	32.7	8.4	-0.6	40.5	Average Max	H	148	319	54.0	-13.6	Pass	RB

Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

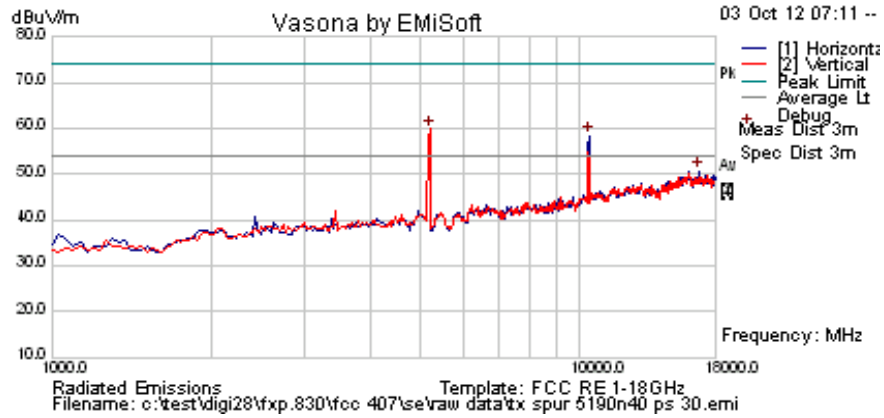
Test Freq.	5240 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			



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
5224.449	69.8	4.6	-9.8	64.6	Peak [Scan]	V						FUND
10470.942	55.6	6.8	-2.5	59.9	Peak [Scan]	H					Pass	NRB
15720.882	46.8	8.6	-0.4	54.9	Peak Max	H	117	323	74.0	-19.1	Pass	RB
15720.882	32.3	8.6	-0.4	40.4	Average Max	H	117	323	54.0	-13.6	Pass	RB
Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5190 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

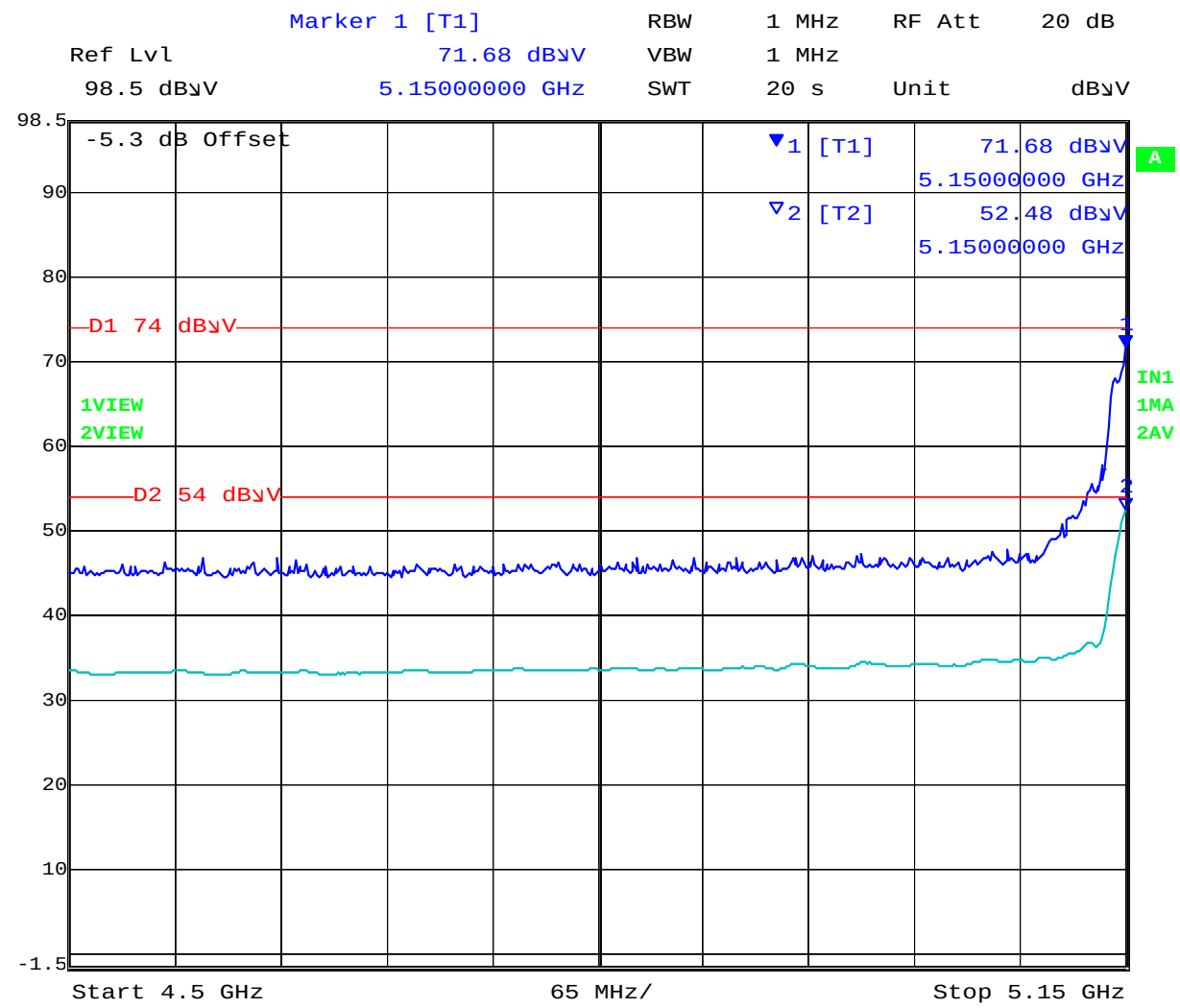


Formally measured emission peaks

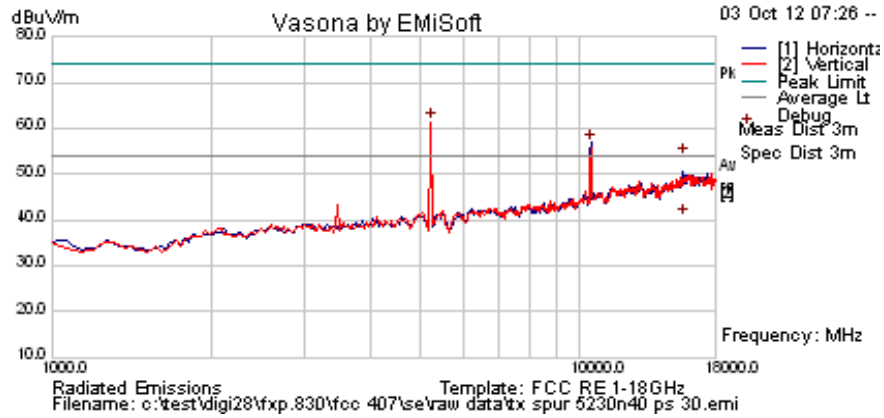
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	65.2	4.6	-9.9	60.0	Peak [Scan]	V						FUND
10402.806	54.2	6.7	-2.5	58.4	Peak [Scan]	H					Pass	NRB
16739.479	41.1	8.7	0.9	50.6	Peak [Scan]	H	150	0	54.0	-3.4	Pass	Noise

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5150 Restricted Band-edge



Test Freq.	5230 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

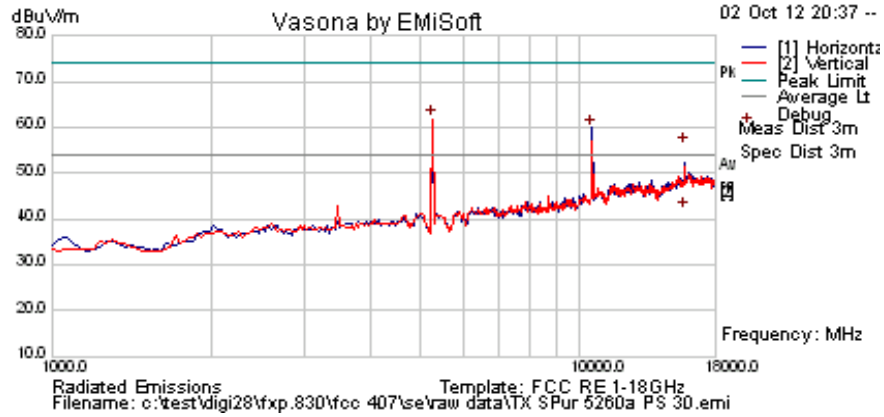


Formally measured emission peaks

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
5224.449	66.6	4.6	-9.8	61.3	Peak [Scan]	V						FUND
10470.942	52.7	6.8	-2.5	57.0	Peak [Scan]	H					Pass	NRB
15693.788	45.9	8.5	-0.5	54.0	Peak Max	H	100	294	74.0	-20.1	Pass	RB
15693.788	32.3	8.5	-0.5	40.3	Average Max	H	100	294	54.0	-13.7	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5260 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	fxp.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

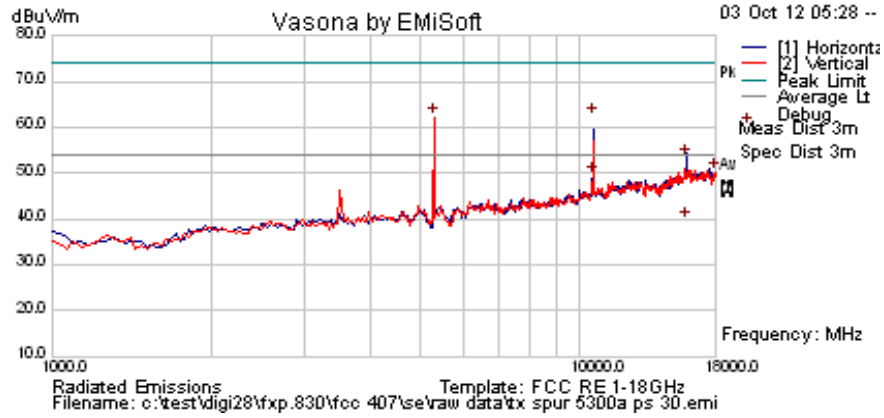


Formally measured emission peaks

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
5258.517	66.9	4.6	-9.7	61.8	Peak [Scan]	V						FUND
10521.683	55.6	6.8	-2.4	59.9	Peak [Scan]	H					Pass	NRB
15778.677	47.4	8.7	-0.3	55.8	Peak Max	H	134	310	74.0	-18.2	Pass	RB
15778.677	33.3	8.7	-0.3	41.6	Average Max	H	134	310	54.0	-12.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5300 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	fxp.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

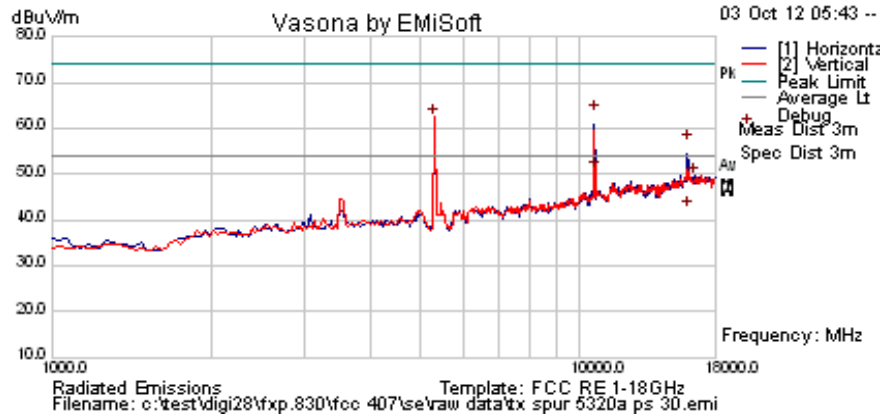


Formally measured emission peaks

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
5292.585	67.3	4.6	-9.6	62.3	Peak [Scan]	V						FUND
17965.932	40.8	8.8	0.7	50.2	Peak [Scan]	V	150	0	54.0	-3.8	Pass	Noise
10600.637	58.1	6.8	-2.4	62.5	Peak Max	H	103	11	74.0	-11.5	Pass	RB
15902.045	44.6	8.9	-0.2	53.3	Peak Max	H	108	299	74.0	-20.7	Pass	RB
10600.637	45.0	6.8	-2.4	49.4	Average Max	H	103	11	54.0	-4.6	Pass	RB
15902.045	30.8	8.9	-0.2	39.5	Average Max	H	108	299	54.0	-14.5	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5320 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	fxp.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

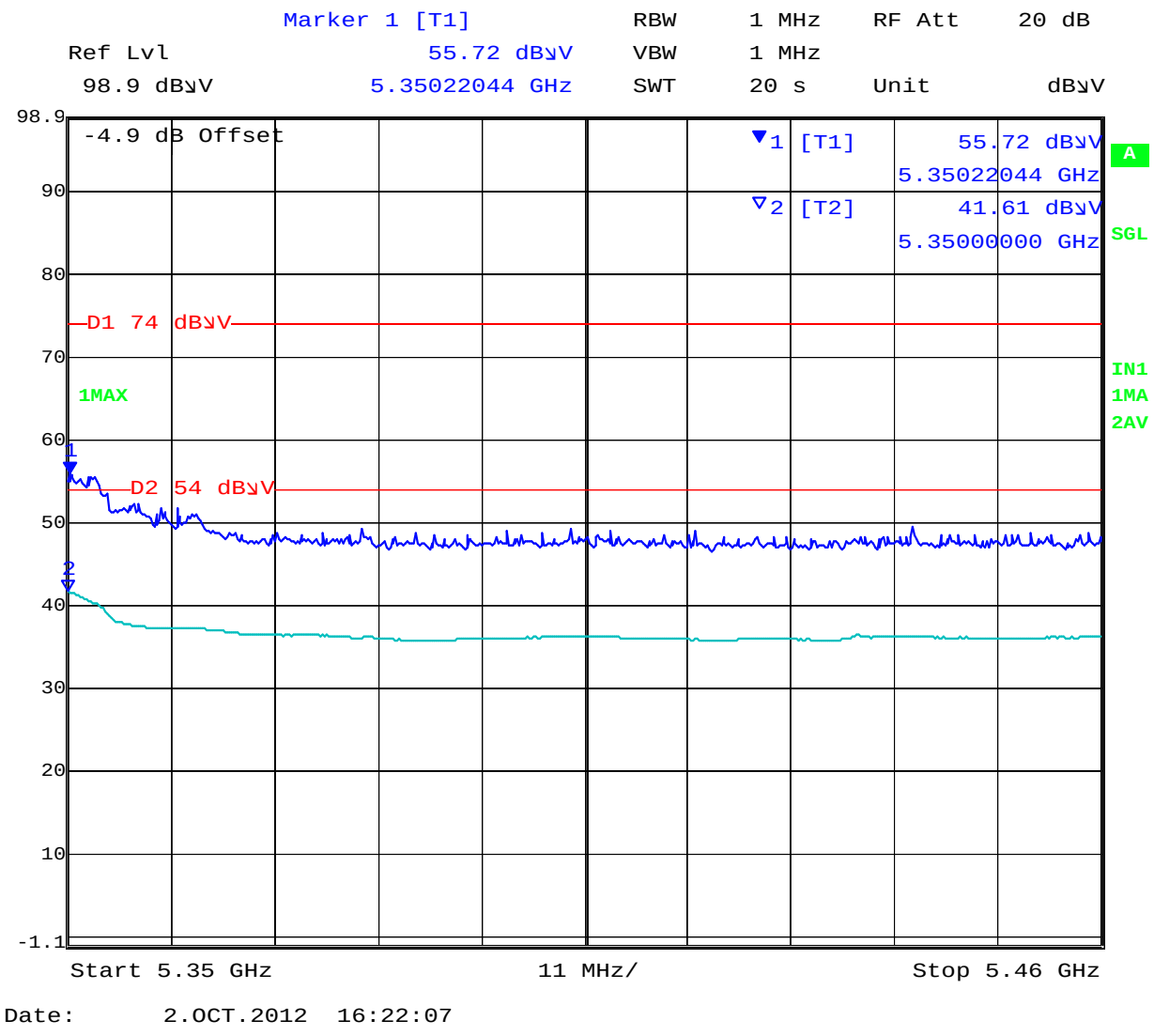


Formally measured emission peaks

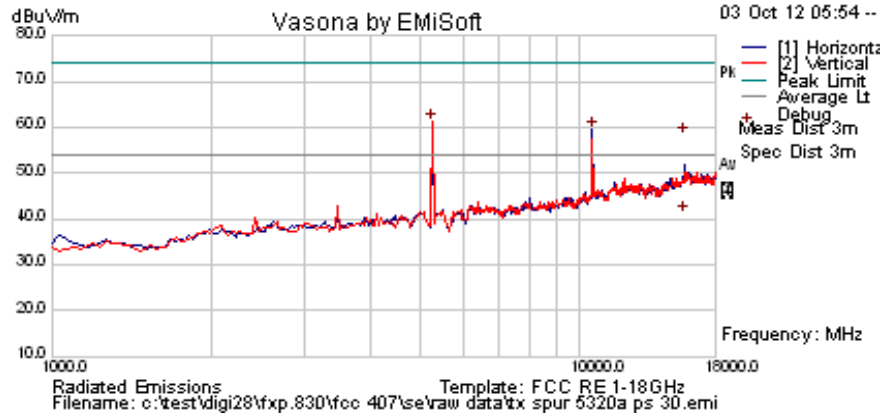
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	67.4	4.6	-9.6	62.5	Peak [Scan]	V						FUND
16501.002	40.5	8.8	0.3	49.7	Peak [Scan]	H	150	0	54.0	-4.3	Pass	Noise
10640.121	58.7	6.8	-2.4	63.1	Peak Max	H	118	9	74.0	-10.9	Pass	RB
15959.038	47.7	9.0	0.0	56.7	Peak Max	H	102	343	74.0	-17.3	Pass	RB
10640.121	46.5	6.8	-2.4	50.9	Average Max	H	118	9	54.0	-3.1	Pass	RB
15959.038	33.4	9.0	0.0	42.4	Average Max	H	102	343	54.0	-11.7	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5350 Restricted Band-edge



Test Freq.	5260 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

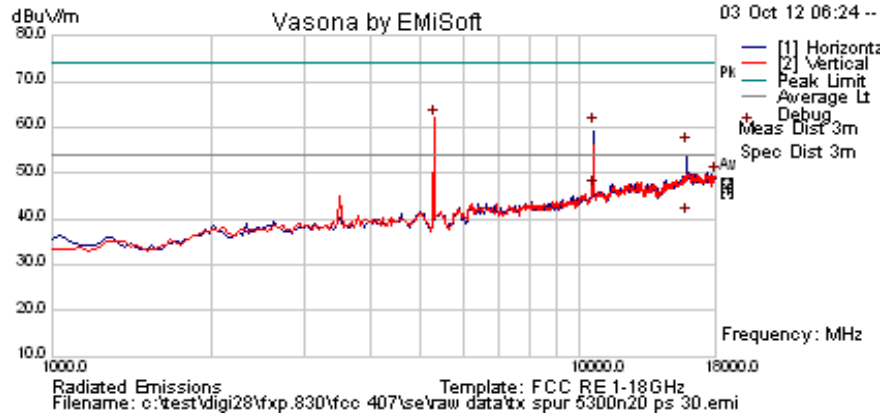


Formally measured emission peaks

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
5258.517	66.3	4.6	-9.7	61.1	Peak [Scan]	V						FUND
10539.078	55.2	6.8	-2.5	59.6	Peak [Scan]	H					Pass	NRB
15778.357	49.8	8.7	-0.3	58.1	Peak Max	H	98	322	74.0	-15.9	Pass	RB
15778.357	32.6	8.7	-0.3	40.9	Average Max	H	98	322	54.0	-13.1	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

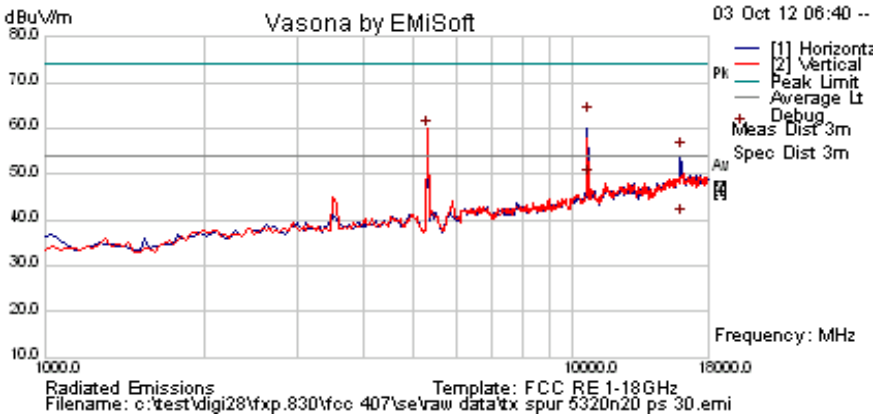
Test Freq.	5300 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			



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
5292.585	67.0	4.6	-9.6	62.0	Peak [Scan]	V						FUND
17965.932	40.2	8.8	0.7	49.6	Peak [Scan]	V	100	0	54	-4.4	Pass	NRB
10600.536	55.8	6.8	-2.4	60.2	Peak Max	H	142	22	74	-13.8	Pass	RB
15899.559	47.2	8.9	-0.2	55.9	Peak Max	H	114	305	74	-18.2	Pass	RB
10600.536	42.0	6.8	-2.4	46.4	Average Max	H	142	22	54	-7.6	Pass	RB
15899.559	31.7	8.9	-0.2	40.4	Average Max	H	114	305	54	-13.6	Pass	RB
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5320 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

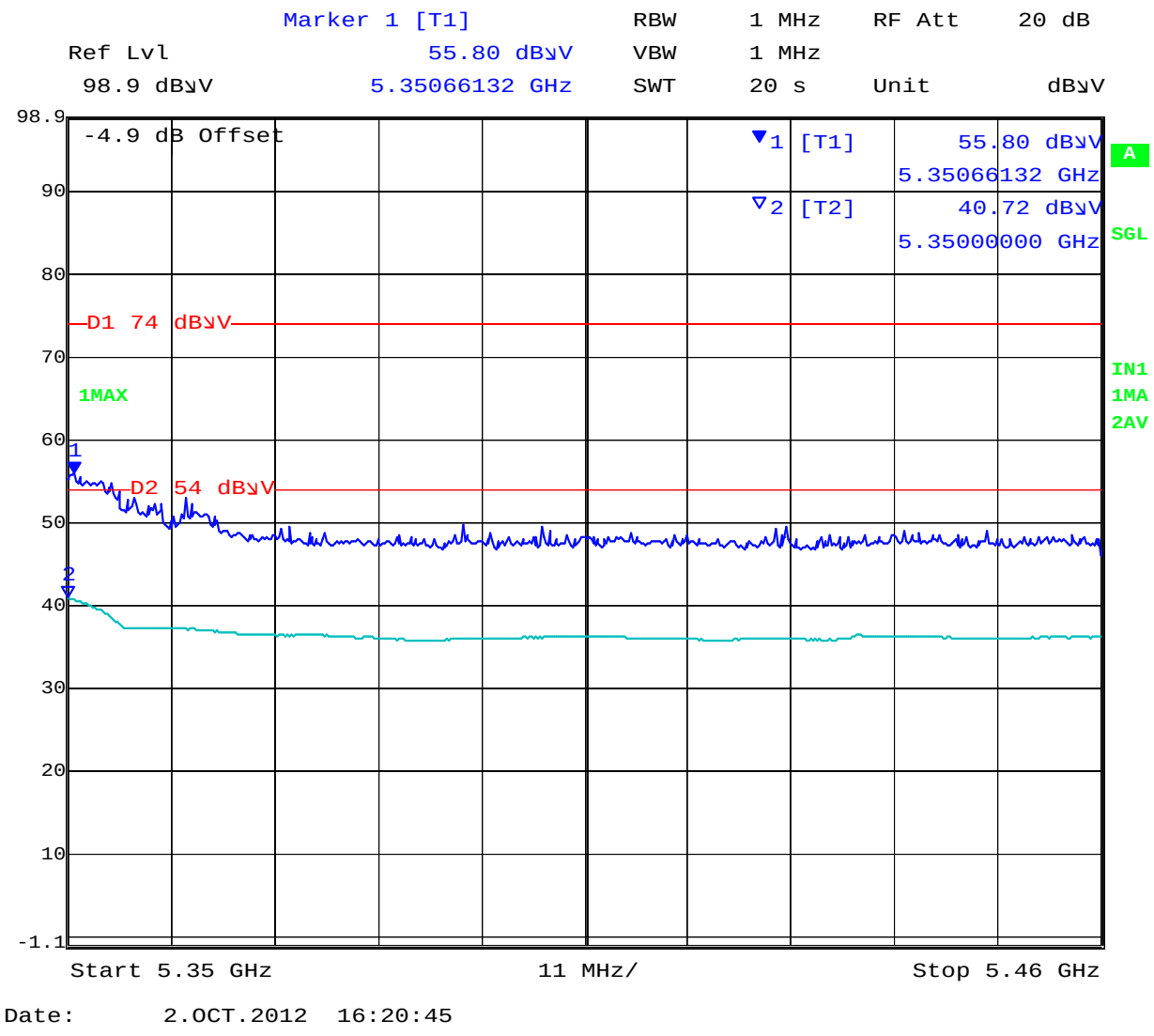


Formally measured emission peaks

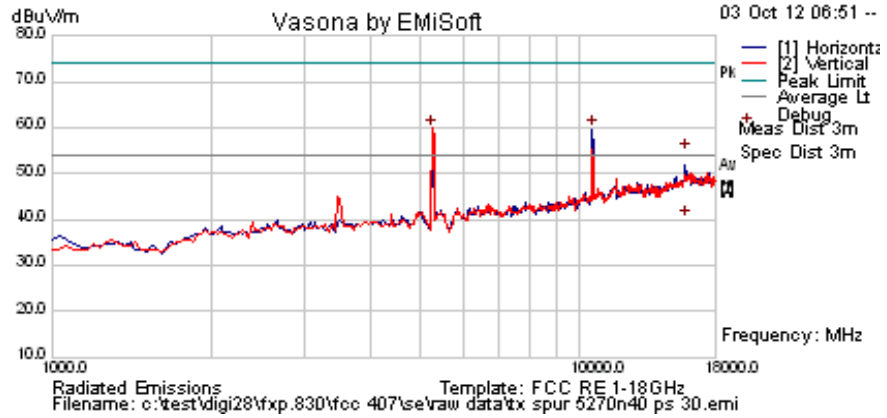
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	64.8	4.6	-9.6	59.9	Peak [Scan]	V						FUND
10641.283	58.3	6.8	-2.4	62.7	Peak Max	H	111	8	74	-11.3	Pass	RB
15961.603	46.1	9.0	0.0	55.1	Peak Max	H	118	344	74	-19.0	Pass	RB
10641.283	44.6	6.8	-2.4	49.0	Average Max	H	111	8	54	-5.0	Pass	RB
15961.603	31.7	9.0	0.0	40.7	Average Max	H	118	344	54	-13.3	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5350 Restricted Band-edge



Test Freq.	5270 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

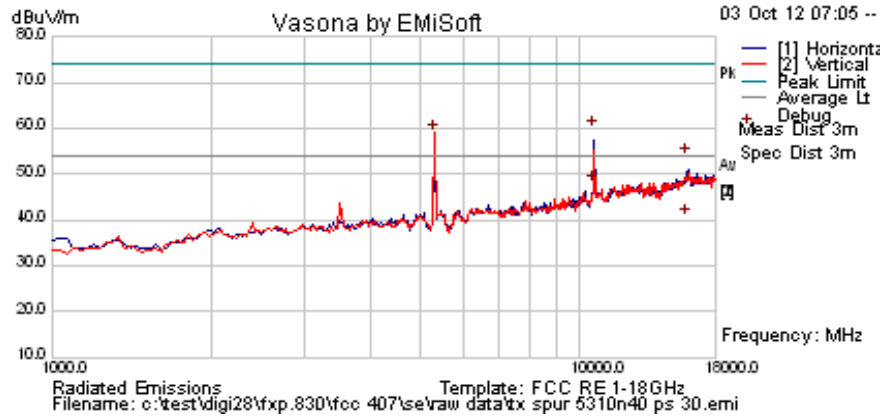


Formally measured emission peaks

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
5258.517	65.0	4.6	-9.7	59.8	Peak [Scan]	V						FUND
10539.078	55.3	6.8	-2.5	59.6	Peak [Scan]	H					Pass	NRB
15810.581	46.0	8.7	-0.3	54.5	Peak Max	H	132	321	74.0	-19.6	Pass	RB
15810.581	31.7	8.7	-0.3	40.2	Average Max	H	132	321	54.0	-13.8	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5310 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

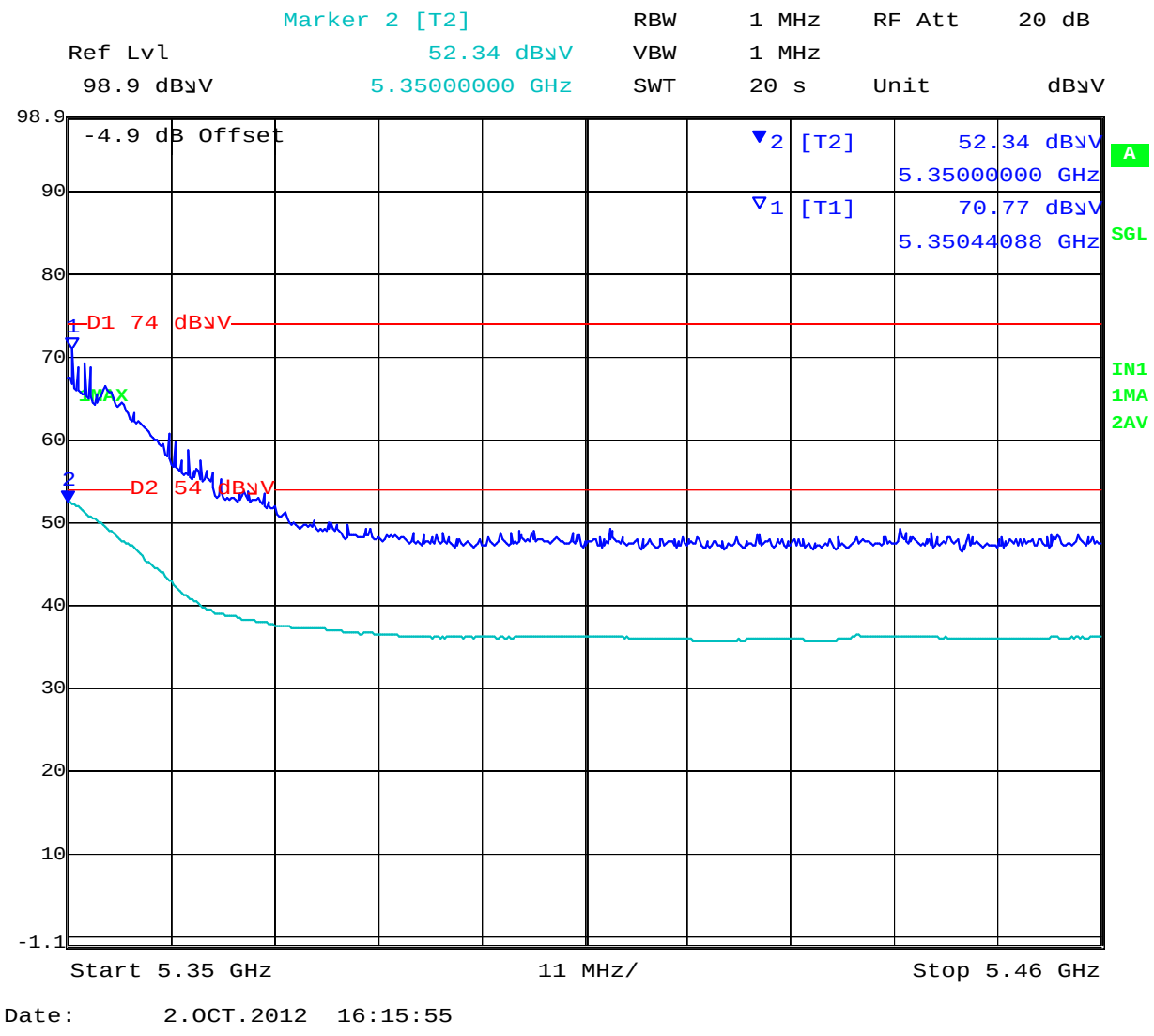


Formally measured emission peaks

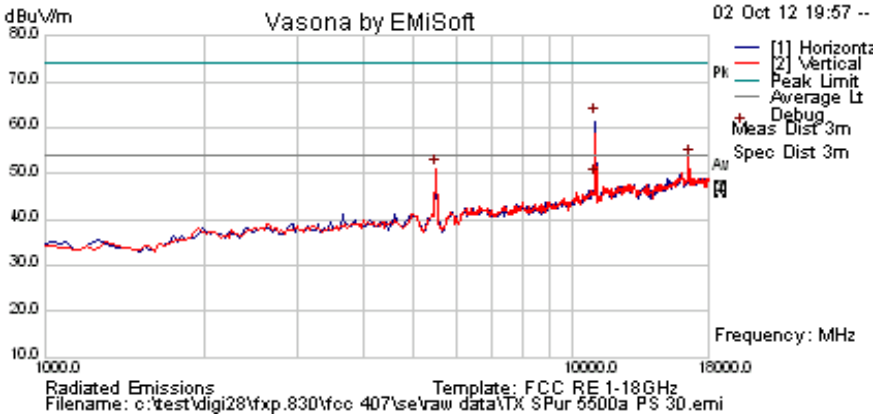
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	64.0	4.6	-9.6	59.0	Peak [Scan]	V						FUND
10620.281	55.3	6.8	-2.4	59.8	Peak Max	H	122	8	74.0	-14.3	Pass	RB
15936.273	45.1	8.9	-0.1	53.9	Peak Max	H	119	248	74.0	-20.1	Pass	RB
10620.281	43.6	6.8	-2.4	48.0	Average Max	H	122	8	54.0	-6.0	Pass	RB
15936.273	31.8	8.9	-0.1	40.7	Average Max	H	119	248	54.0	-13.4	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5350 Restricted Band-edge



Test Freq.	5500 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

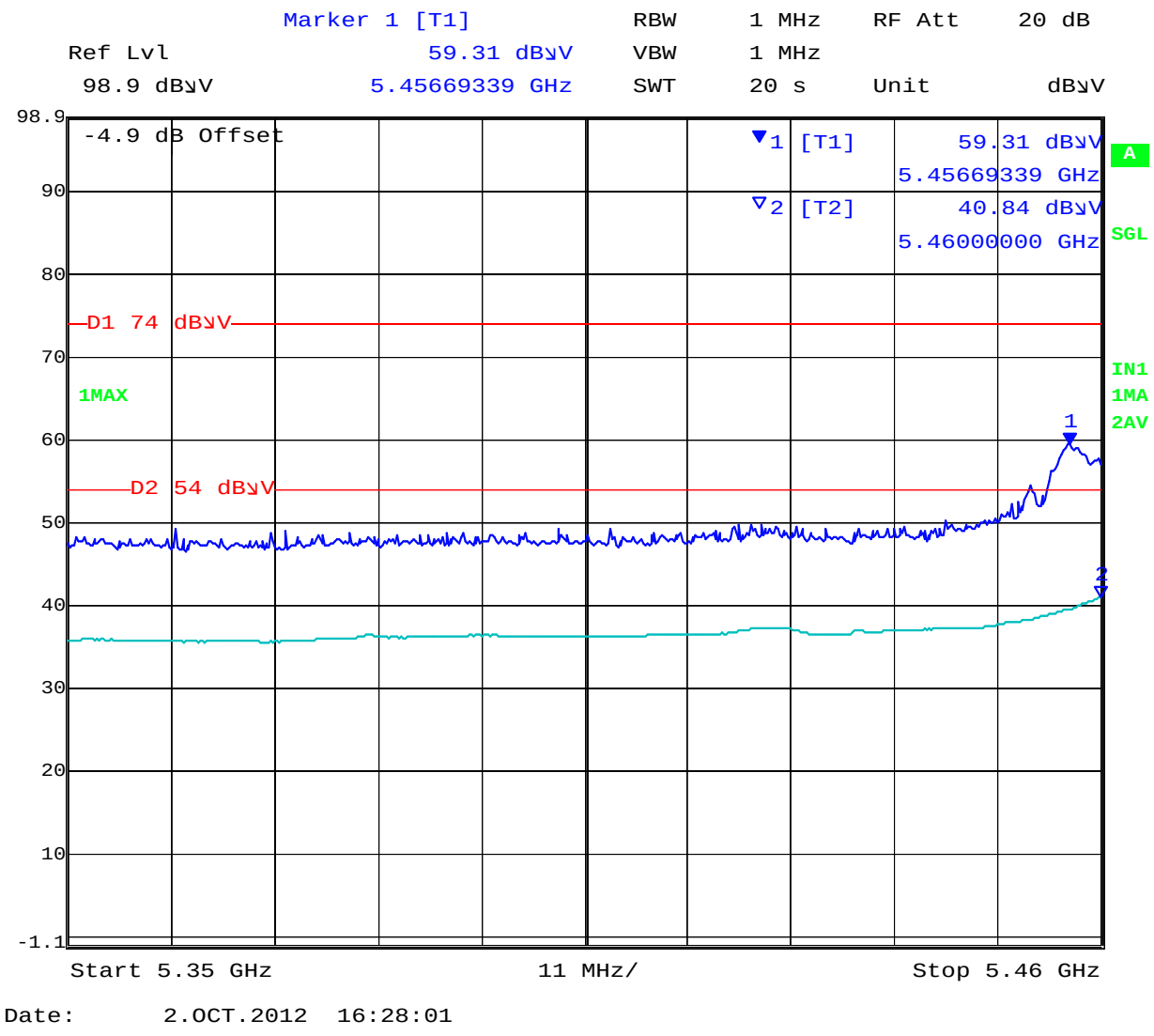


Formally measured emission peaks

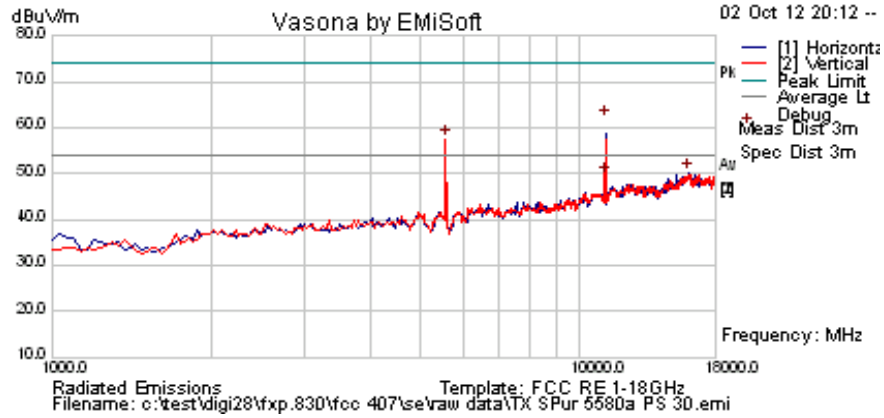
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16535.07	44.3	8.8	0.4	53.5	Peak [Scan]	V						NRB
5496.993988	56.0	4.6	-9.6	51.0	Peak [Scan]	V	100	0	54.0	-3.0	Pass	FUND
10996.553	58.6	7.0	-3.1	62.5	Peak Max	H	126	49	74.0	-11.5	Pass	RB
10996.553	45.1	7.0	-3.1	49.0	Average Max	H	126	49	54.0	-5.0	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5460 Restricted Band-edge



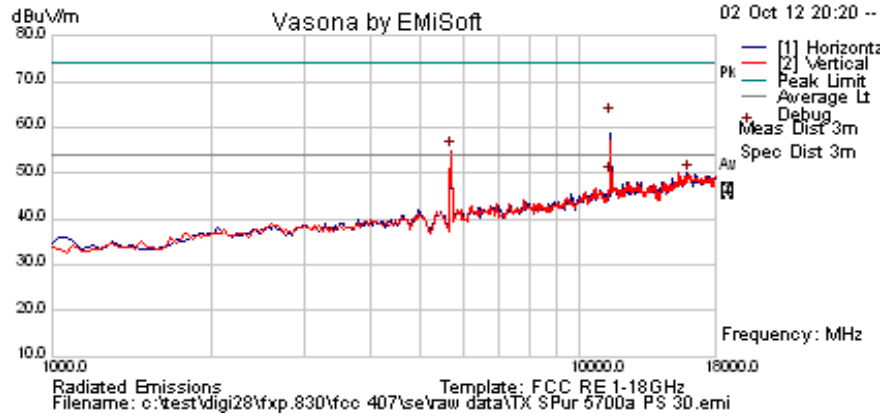
Test Freq.	5580 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			



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
5565.130261	62.5	4.7	-9.7	57.5	Peak [Scan]	V						FUND
16058.116	40.9	9.0	0.3	50.2	Peak [Scan]	H	150	0	54.0	-3.8	Pass	Noise
11161.764	58.2	6.9	-3.0	62.1	Peak Max	H	98	44	74.0	-11.9	Pass	RB
11161.764	45.5	6.9	-3.0	49.5	Average Max	H	98	44	54.0	-4.5	Pass	RB
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5700 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

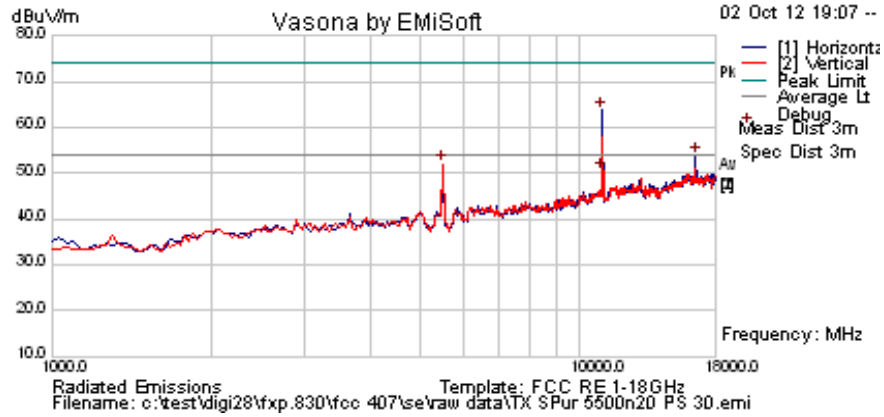


Formally measured emission peaks

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
5701.402806	59.7	4.7	-9.6	54.9	Peak [Scan]	V						FUND
15955.912	41.1	9.0	0.0	50.0	Peak [Scan]	H	150	0	54.0	-4.0	Pass	Noise
11400.481	58.0	6.8	-2.3	62.5	Peak Max	H	98	46	74.0	-11.5	Pass	RB
11400.481	45.0	6.8	-2.3	49.6	Average Max	H	98	46	54.0	-4.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5500 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

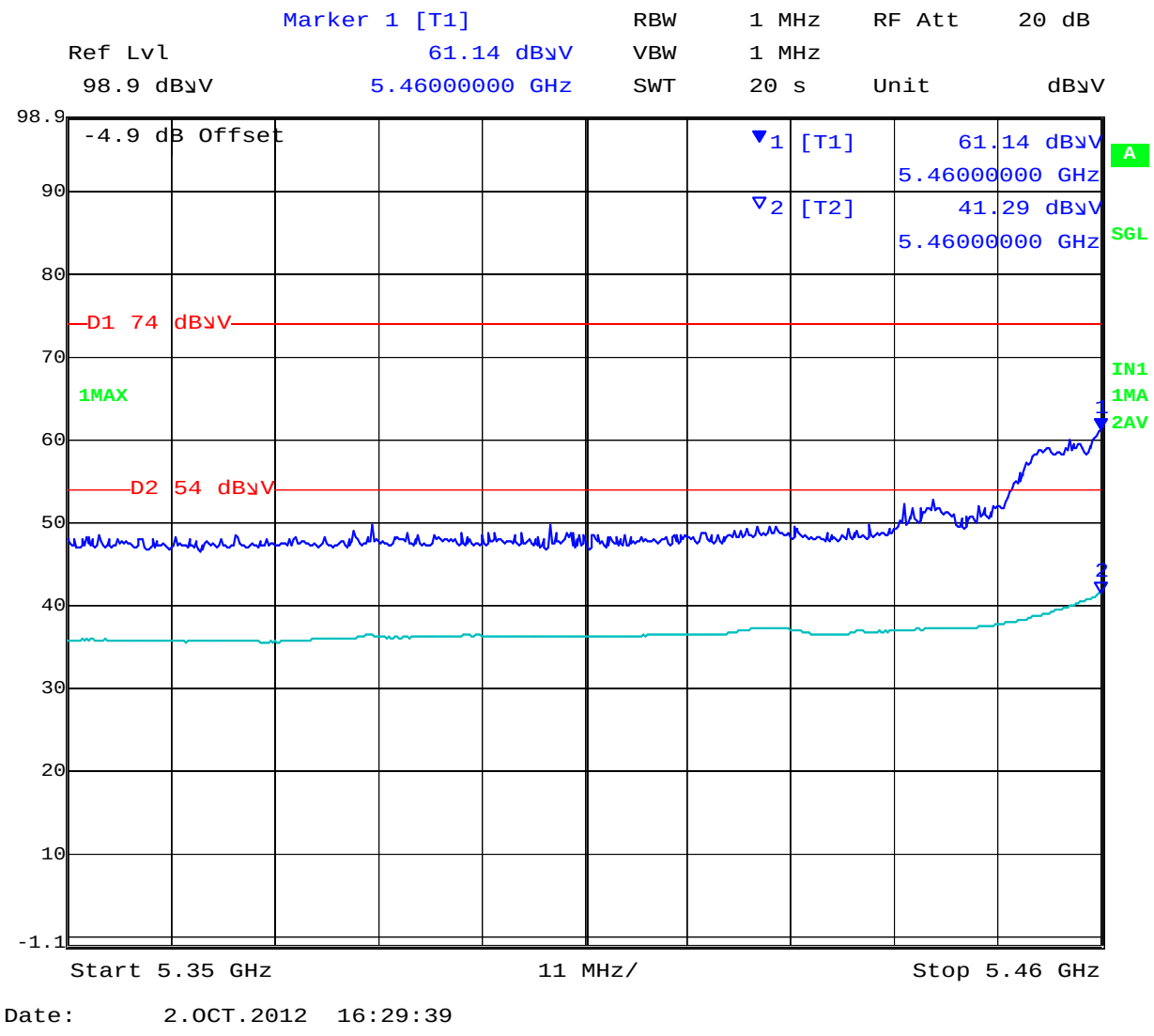


Formally measured emission peaks

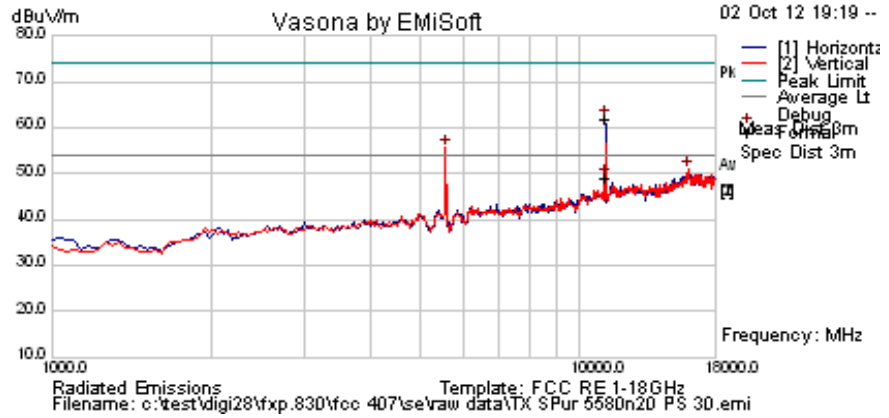
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16535.070	44.7	8.8	0.4	53.9	Peak [Scan]	H					Pass	NRB
5496.994	56.9	4.6	-9.6	51.9	Peak [Scan]	V						FUND
10999.519	59.7	7.0	-3.1	63.6	Peak Max	H	140	15	74	-10.4	Pass	RB
10999.519	46.4	7.0	-3.1	50.3	Average Max	H	140	15	54	-3.8	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5460 Restricted Band-edge



Test Freq.	5580 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

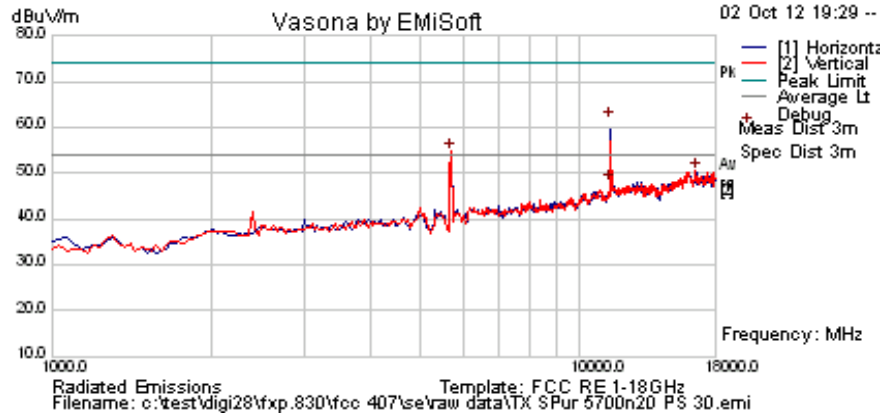


Formally measured emission peaks

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
5565.130	60.7	4.7	-9.7	55.7	Peak [Scan]	V						FUND
15989.980	41.8	9.0	0.1	50.9	Peak [Scan]	V	150	0	54	-3.1	Pass	Noise
11159.920	58.2	6.9	-3.0	62.1	Peak Max	H	102	43	74	-11.9	Pass	RB
11159.920	45.3	6.9	-3.0	49.2	Average Max	H	102	43	54	-4.8	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5700 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

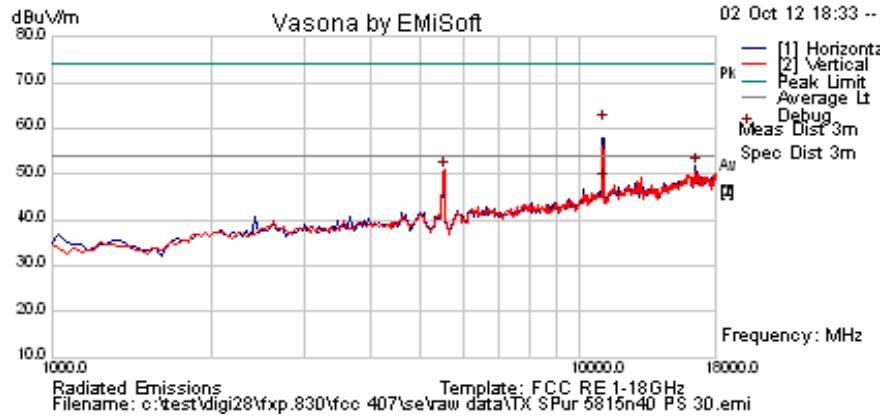


Formally measured emission peaks

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
5701.403	59.6	4.7	-9.6	54.8	Peak [Scan]	V						FUND
16535.070	41.2	8.8	0.4	50.4	Peak [Scan]	V	150	0	54	-3.6	Pass	Noise
11399.519	57.0	6.8	-2.3	61.5	Peak Max	H	113	44	74	-12.5	Pass	RB
11399.519	43.4	6.8	-2.3	47.9	Average Max	H	113	44	54	-6.1	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5510 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

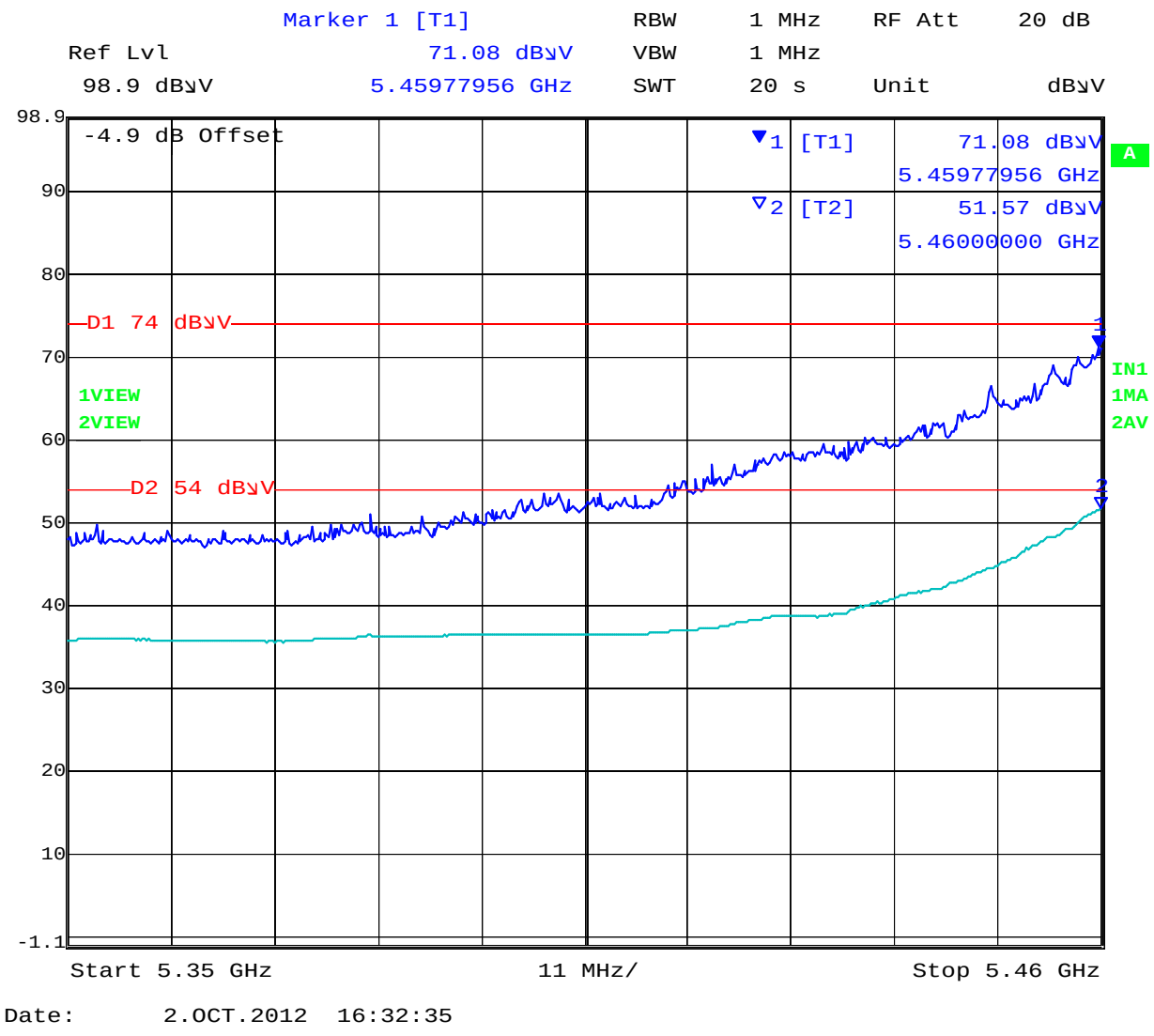


Formally measured emission peaks

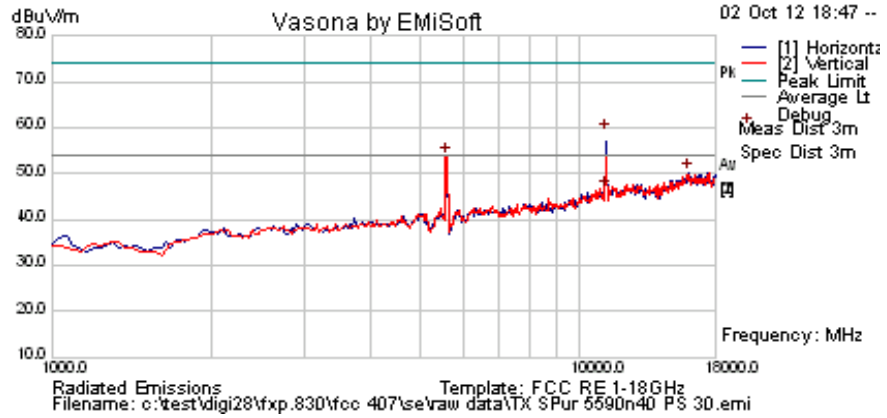
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16535.070	42.7	8.8	0.4	51.9	Peak [Scan]	H	100	0	54	-2.2	Pass	Noise
5531.062	56.0	4.6	-9.7	50.9	Peak [Scan]	V						FUND
11020.761	57.1	7.0	-3.1	60.9	Peak Max	H	120	9	74	-13.1	Pass	RB
11020.761	44.4	7.0	-3.1	48.2	Average Max	H	120	9	54	-5.8	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5460 Restricted Band-edge



Test Freq.	5590 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			

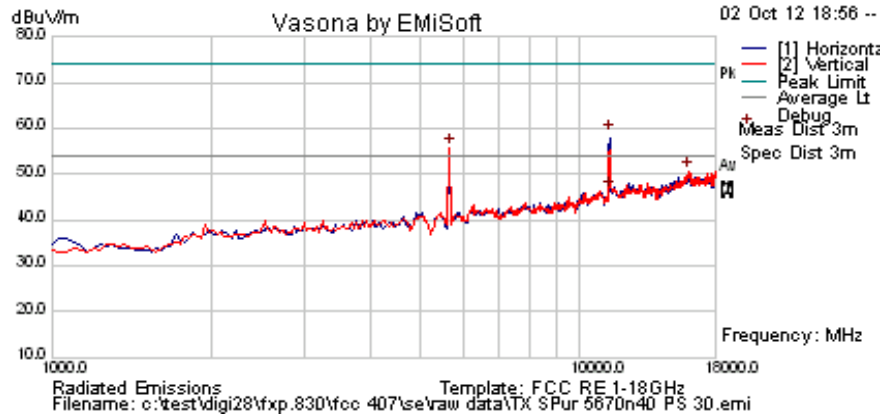


Formally measured emission peaks

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
5565.130	58.9	4.7	-9.7	53.9	Peak [Scan]	V						FUND
16058.116	41.0	9.0	0.3	50.3	Peak [Scan]	H	150	0	54	-3.7	Pass	Noise
11177.475	55.1	6.9	-2.9	59.1	Peak Max	H	114	40	74	-14.9	Pass	RB
11177.475	42.7	6.9	-2.9	46.7	Average Max	H	114	40	54	-7.3	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5670 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	FXP.830	**Duty Cycle (%)**	100
Test Notes 1	3.6 dBi		
Test Notes 2			



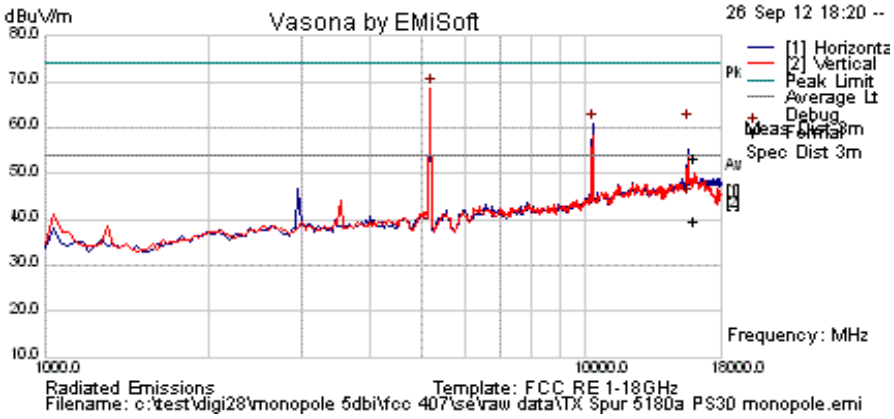
Formally measured emission peaks

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
5667.335	60.8	4.7	-9.7	55.8	Peak [Scan]	V						FUND
16024.048	41.5	9.0	0.2	50.8	Peak [Scan]	V	150	0	54	-3.2	Pass	Noise
11342.124	54.7	6.9	-2.4	59.2	Peak Max	H	108	45	74	-14.8	Pass	RB
11342.124	42.0	6.9	-2.4	46.4	Average Max	H	108	45	54	-7.6	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

6.1.2.3. Dual Band Omni ANT-DB1 xxx

Test Freq.	5180 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	996
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

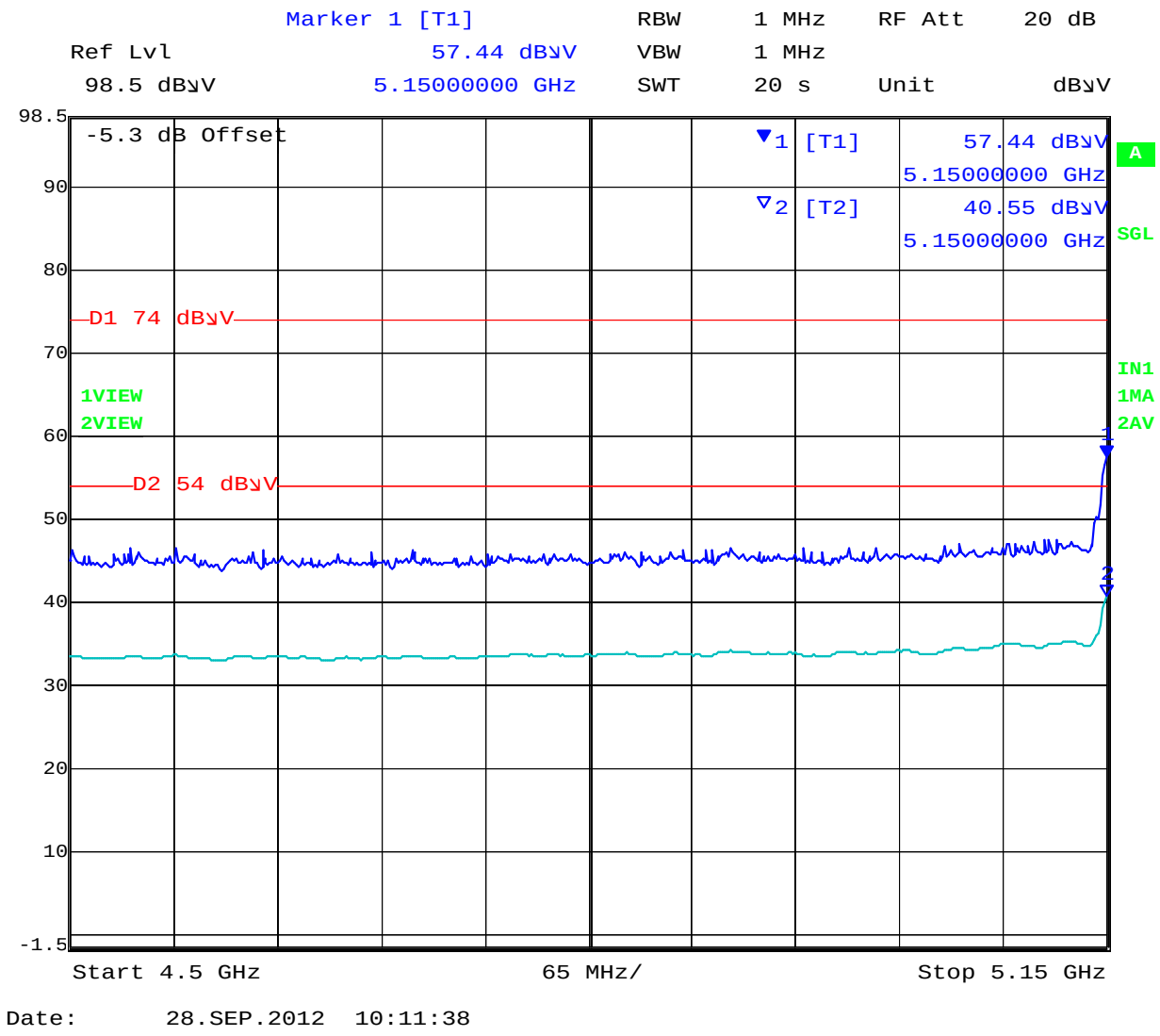


Formally measured emission peaks

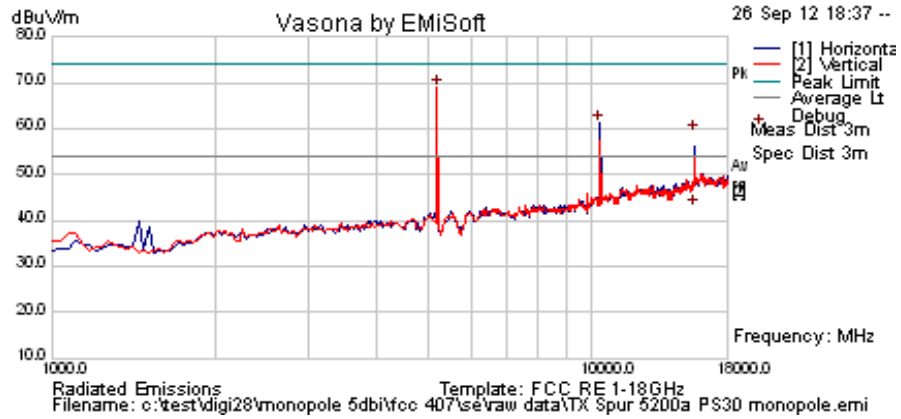
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	70.9	4.6	-9.9	65.6	Peak [Scan]	V						FUND
10368.737	56.4	6.7	-2.5	60.6	Peak [Scan]	H	100	0	68.23	-7.63	Pass	NRB
15989.980	41.0	9.0	0.1	50.1	Peak [Scan]	V	100	0	54.0	-3.9	Pass	Noise
15540.441	51.0	8.3	-0.6	58.7	Peak Max	H	133	299	74.0	-15.3	Pass	RB
15540.441	35.0	8.3	-0.6	42.7	Average Max	H	133	299	54.0	-11.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5150 Restricted Band-edge



Test Freq.	5200 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	996
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1	0		
Test Notes 2			

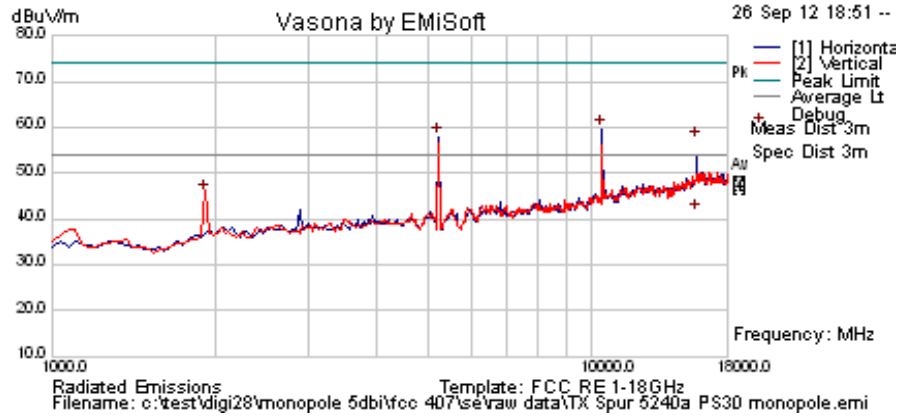


Formally measured emission peaks

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
5197.936	74.2	4.6	-9.9	68.9	Peak [Scan]	V						FUND
10402.806	56.9	6.7	-2.5	61.1	Peak [Scan]	H	100	0	68.23	-7.13	Pass	NRB
15599.723	51.4	8.4	-0.6	59.2	Peak Max	H	135	320	74.0	-14.8	Pass	RB
15599.723	35.1	8.4	-0.6	42.8	Average Max	H	135	320	54.0	-11.2	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5240 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	996
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1	0		
Test Notes 2			

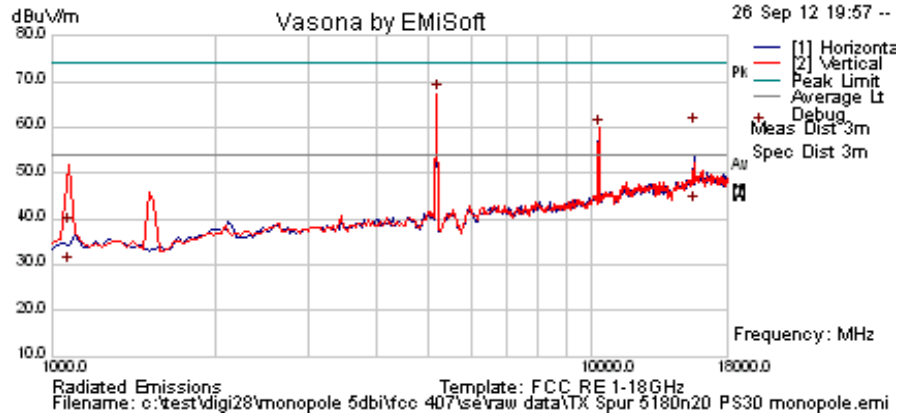


Formally measured emission peaks

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
10470.942	55.3	6.8	-2.5	59.6	Peak [Scan]	H					Pass	NRB
5224.449	63.2	4.6	-9.8	58.0	Peak [Scan]	H						FUND
1921.727	54.9	2.7	-11.9	45.7	Peak [Scan]	V					Pass	NRB
15719.599	49.1	8.6	-0.4	57.2	Peak Max	H	134	317	74.0	-16.8	Pass	RB
15719.599	33.4	8.6	-0.4	41.5	Average Max	H	134	317	54.0	-12.5	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5180 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

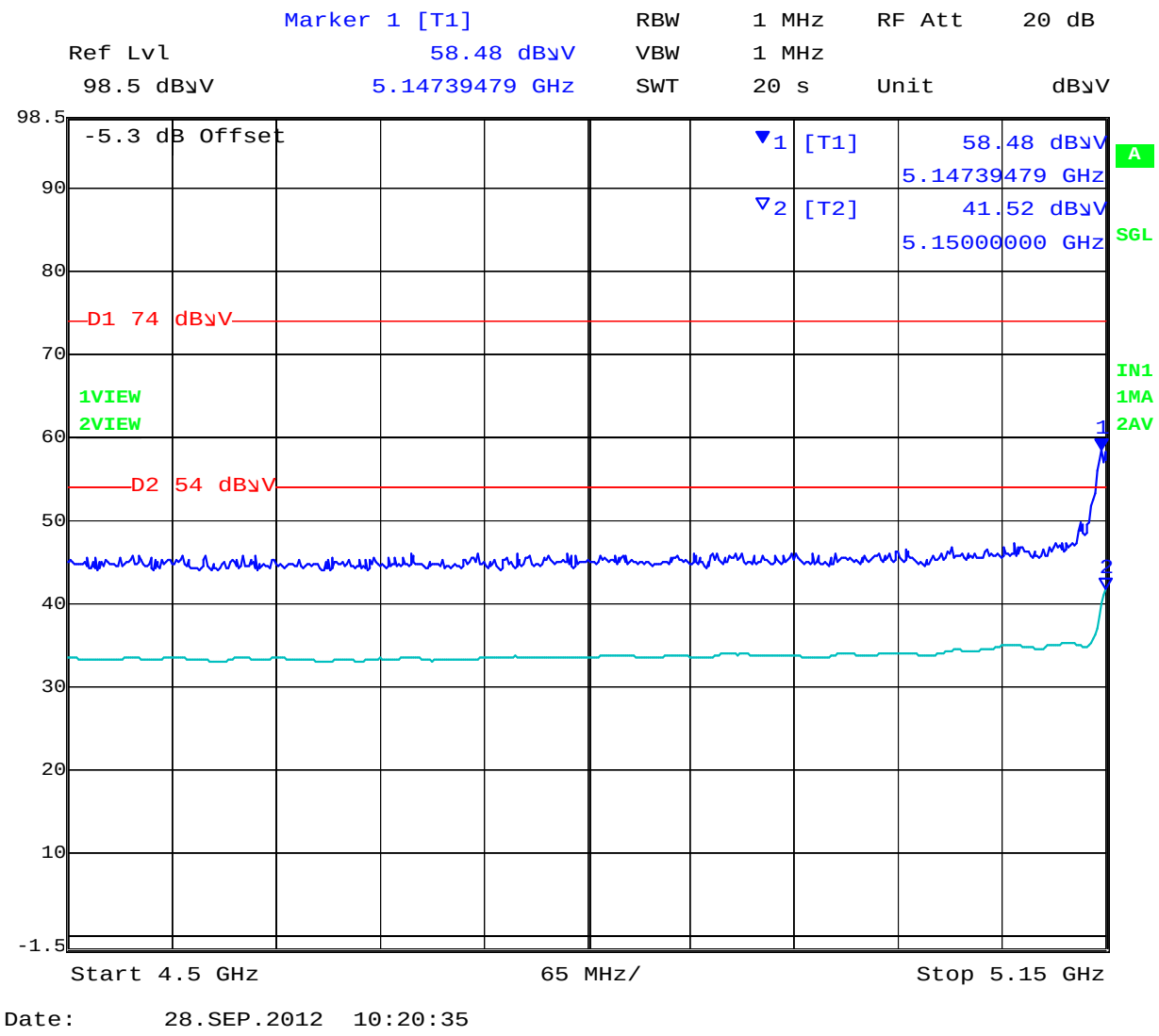


Formally measured emission peaks

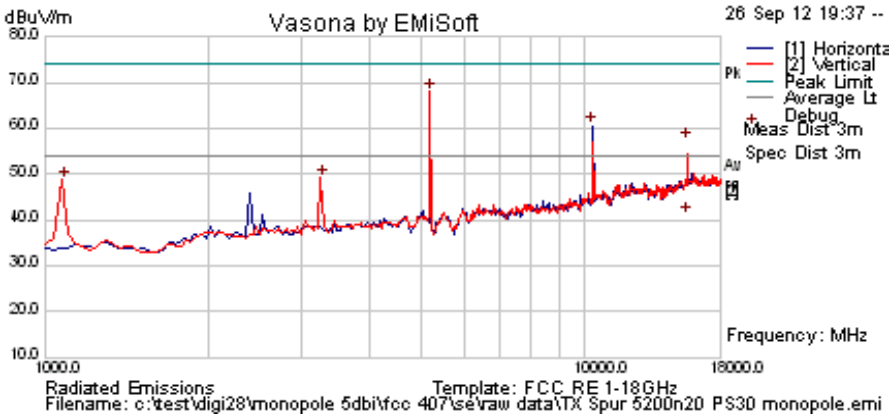
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	72.6	4.6	-9.9	67.3	Peak [Scan]	V						FUND
10368.737	55.7	6.7	-2.5	59.9	Peak [Scan]	V					Pass	NRB
15541.575	52.5	8.3	-0.6	60.2	Peak Max	H	107	294	74.0	-13.8	Pass	RB
1067.804	52.1	2.0	-15.8	38.3	Peak Max	V	110	110	74.0	-35.7	Pass	RB*
15541.575	35.6	8.3	-0.6	43.3	Average Max	H	107	294	54.0	-10.7	Pass	RB
1067.804	43.4	2.0	-15.8	29.6	Average Max	V	110	110	54.0	-24.4	Pass	RB*

Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5150 Restricted Band-edge



Test Freq.	5200 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1	0		
Test Notes 2			

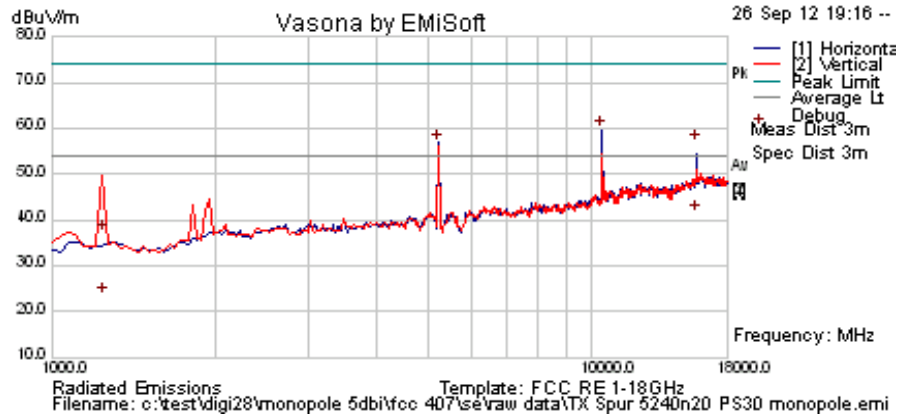


Formally measured emission peaks

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
5190.381	73.2	4.6	-9.9	68.0	Peak [Scan]	V						FUND
10402.806	56.3	6.7	-2.5	60.5	Peak [Scan]	H					Pass	NRB
3277.034	57.4	3.5	-11.8	49.1	Peak [Scan]	V					Pass	NRB
1090.502	62.5	2.0	-15.7	48.9	Peak [Scan]	V	100	0	54.0	-5.1	Pass	RB
15601.342	49.6	8.4	-0.6	57.4	Peak Max	V	101	34	74.0	-16.6	Pass	RB
15601.342	33.3	8.4	-0.6	41.1	Average Max	V	101	34	54.0	-12.9	Pass	RB

Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

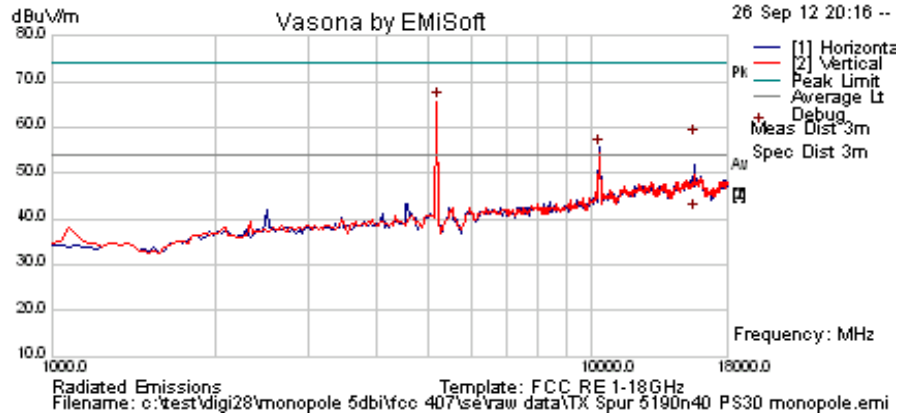
Test Freq.	5240 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	27
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1000
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1	0		
Test Notes 2			



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
10470.942	55.4	6.8	-2.5	59.7	Peak [Scan]	H					Pass	NRB
5224.449	62.1	4.6	-9.8	56.9	Peak [Scan]	H						FUND
15716.313	48.8	8.6	-0.5	57.0	Peak Max	H	100	303	74.0	-17.1	Pass	RB
1238.477	49.1	2.2	-14.3	36.9	Peak Max	V	134	118	74.0	-37.1	Pass	RB
15716.313	33.5	8.6	-0.5	41.6	Average Max	H	100	303	54.0	-12.4	Pass	RB
1238.477	35.4	2.2	-14.3	23.2	Average Max	V	134	118	54.0	-30.8	Pass	RB
Legend:	*Transients in RB; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5190 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	996
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

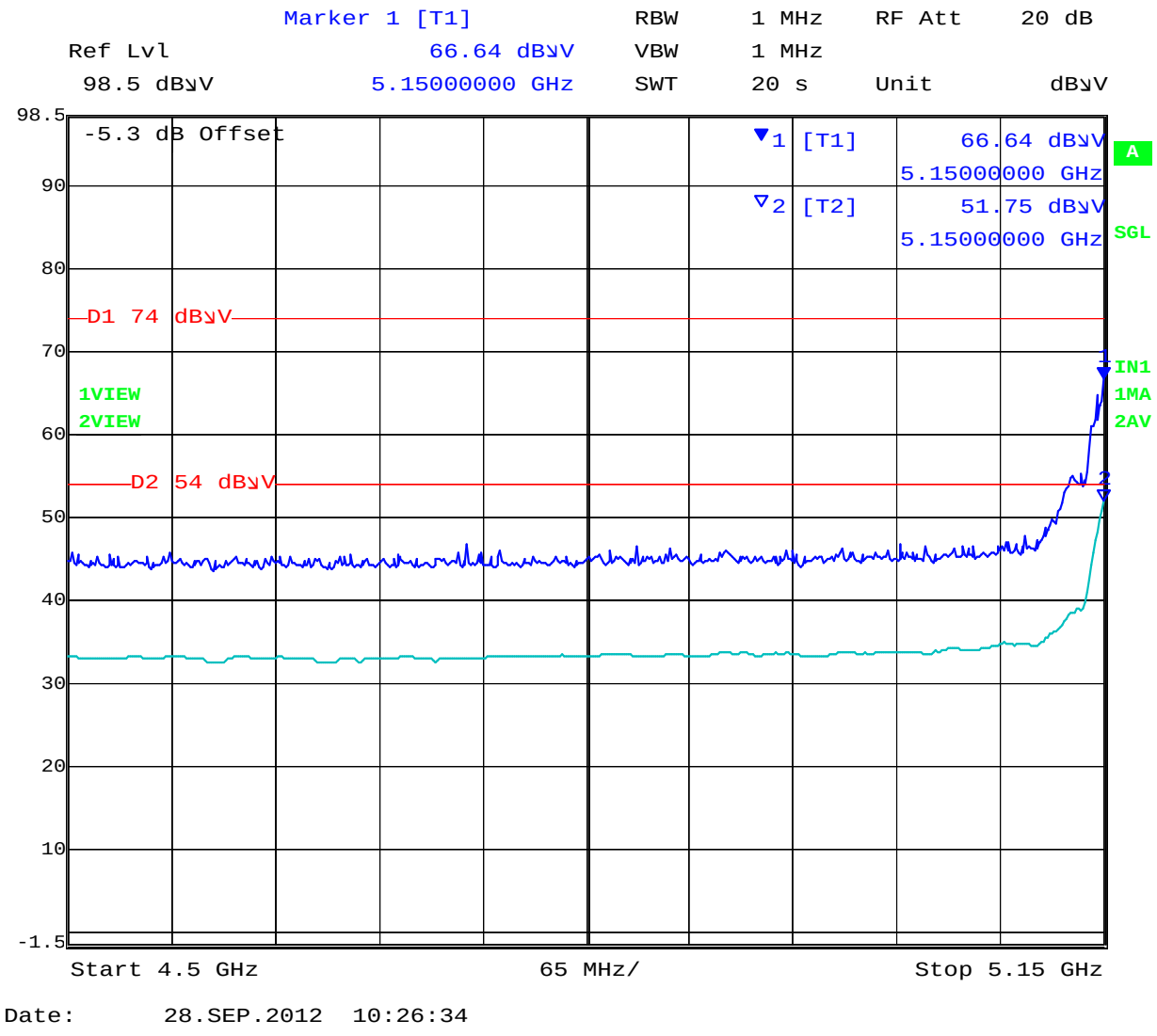


Formally measured emission peaks

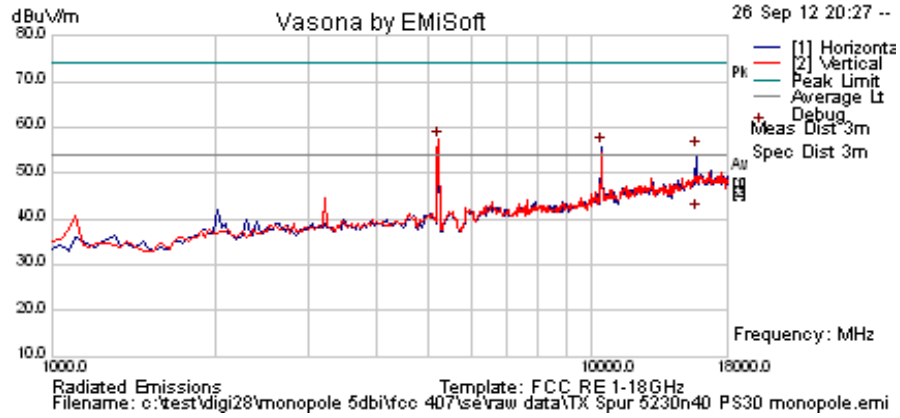
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5190.381	70.9	4.6	-9.9	65.6	Peak [Scan]	V						FUND
10368.737	51.4	6.7	-2.5	55.6	Peak [Scan]	H					Pass	NRB
15570.761	49.8	8.3	-0.6	57.5	Peak Max	H	101	301	74.0	-16.5	Pass	RB
15570.761	33.7	8.3	-0.6	41.4	Average Max	H	101	301	54.0	-12.6	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5150 Restricted Band-edge



Test Freq.	5230 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	996
Antenna	5 dbi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

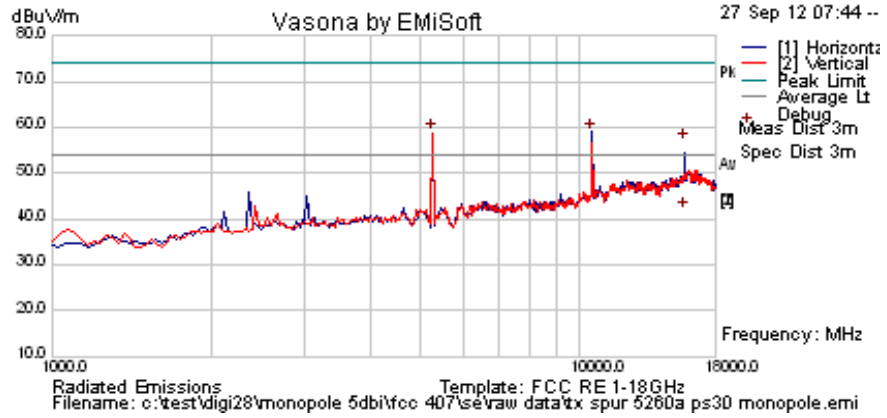


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5224.449	62.6	4.6	-9.8	57.4	Peak [Scan]	V						FUND
10470.942	51.5	6.8	-2.5	55.8	Peak [Scan]	H					Pass	NRB
15693.544	47.2	8.5	-0.5	55.2	Peak Max	H	108	305	74.0	-18.8	Pass	RB
15693.544	33.2	8.5	-0.5	41.3	Average Max	H	108	305	54.0	-12.7	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

Test Freq.	5260 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

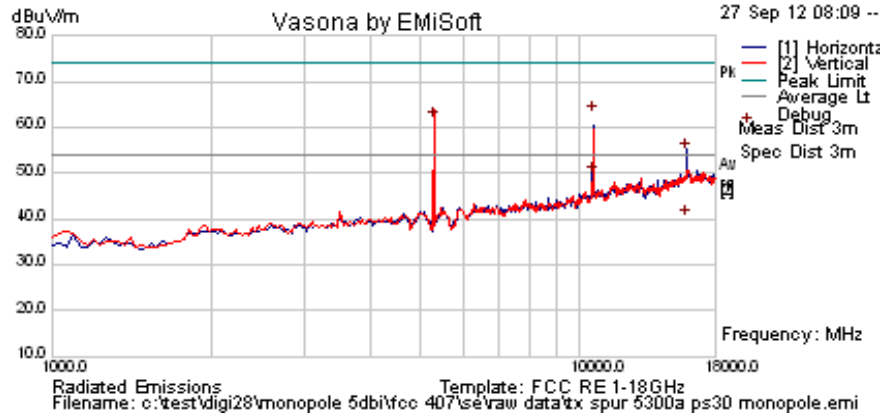


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10505.010	54.7	6.8	-2.4	59.1	Peak [Scan]	H					Pass	NRB
5258.517	63.9	4.6	-9.7	58.7	Peak [Scan]	V						FUND
15781.687	48.6	8.7	-0.3	57.0	Peak.	H	106	303	74.0	-17.0	Pass	RB
15781.687	33.4	8.7	-0.3	41.7	Average Max	H	106	303	54.0	-12.3	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5300 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART = 18	**Press. (mBars)**	1002
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

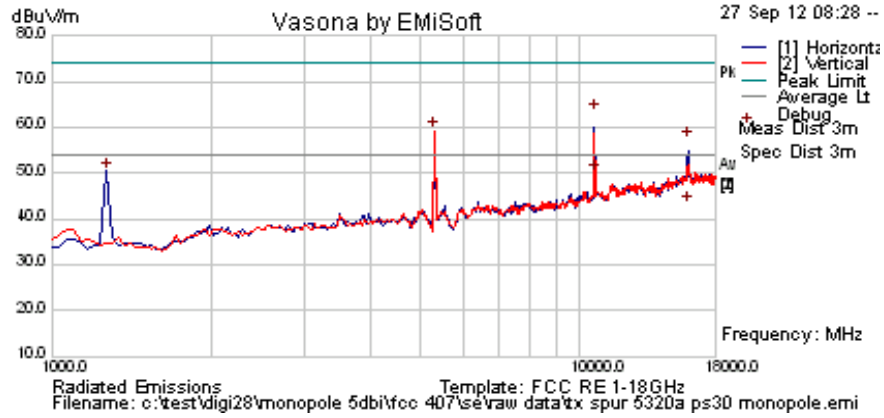


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5295.437	66.7	4.6	-9.6	61.7	Peak [Scan]	H						FUND
10600.645	44.9	6.8	-2.4	49.3	Average Max	H	103	36	54.0	-4.7	Pass	RB
10600.645	58.3	6.8	-2.4	62.7	Peak Max	H	103	36	74.0	-11.3	Pass	RB
15898.594	31.5	8.9	-0.2	40.2	Average Max	H	142	310	54.0	-13.9	Pass	RB
15898.594	45.9	8.9	-0.2	54.6	Peak Max	H	142	310	74.0	-19.4	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5320 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	25
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART = 18	**Press. (mBars)**	1002
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

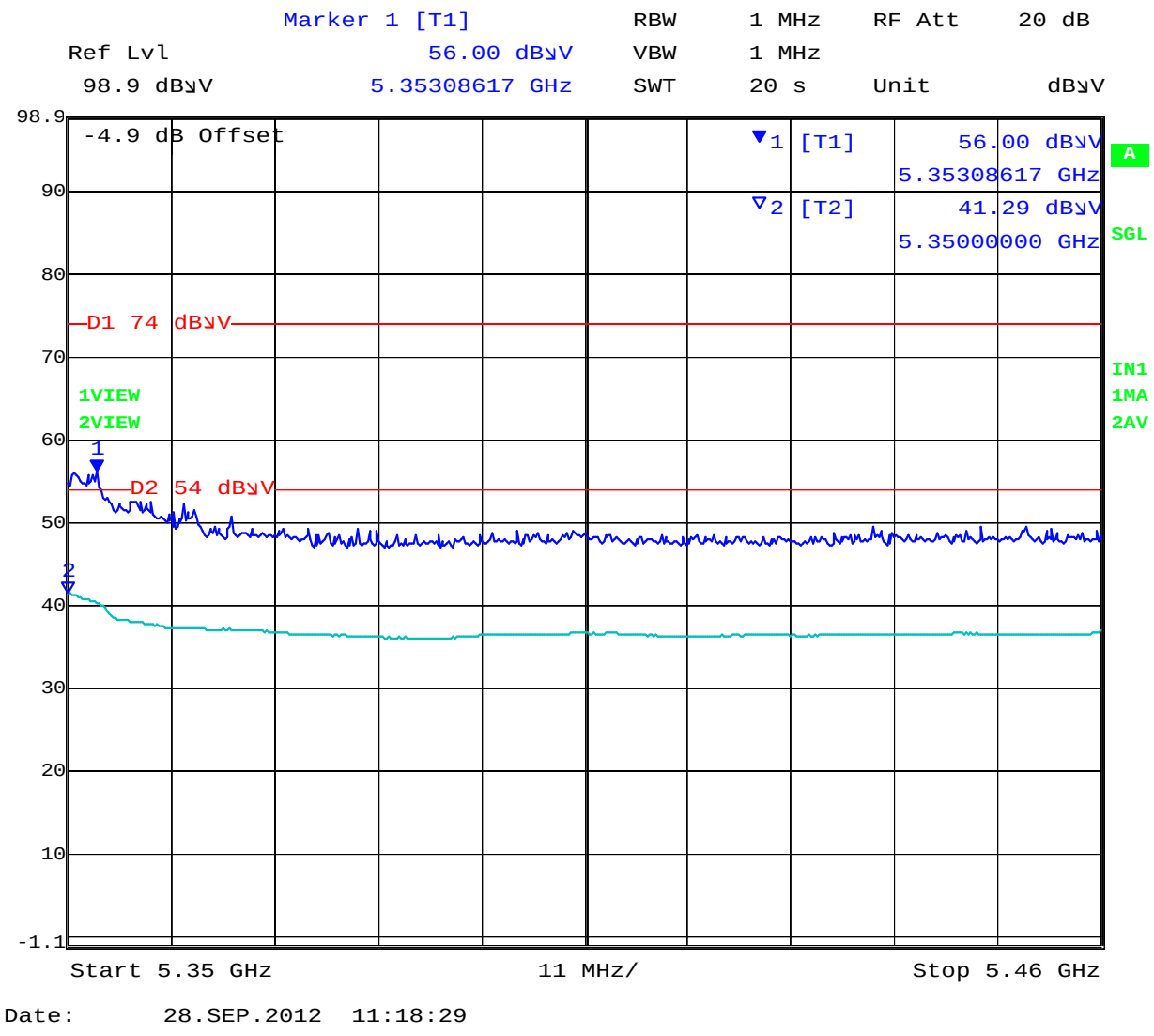


Formally measured emission peaks

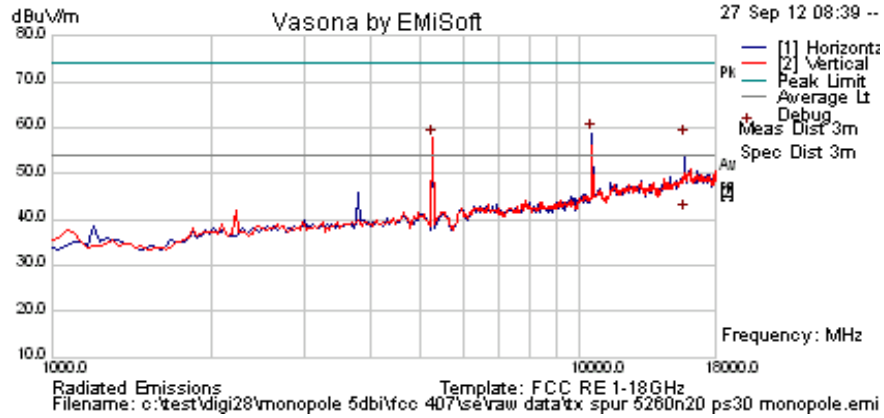
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	64.3	4.6	-9.6	59.3	Peak [Scan]	V						FUND
1272.545	62.1	2.2	-13.9	50.4	Peak [Scan]	H					Pass	NRB
15958.397	48.4	9.0	0.0	57.4	Peak Max	H	108	297	74.0	-16.6	Pass	RB
10640.741	58.9	6.8	-2.4	63.4	Peak Max	H	98	39	74.0	-10.6	Pass	RB
15958.397	34.3	9.0	0.0	43.3	Average Max	H	108	297	54.0	-10.7	Pass	RB
10640.741	45.5	6.8	-2.4	49.9	Average Max	H	98	39	54.0	-4.1	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5350 Restricted Band-edge



Test Freq.	5260 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

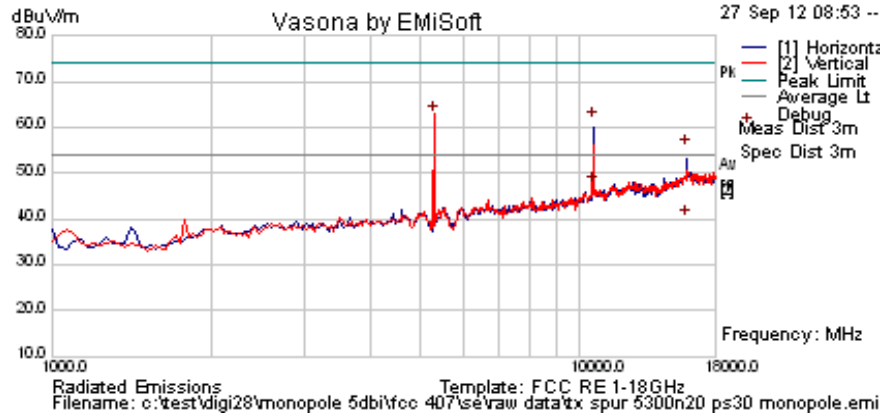


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10505.010	54.5	6.8	-2.4	58.8	Peak [Scan]	H					Pass	NRB
5258.517	62.8	4.6	-9.7	57.6	Peak [Scan]	V						FUND
15781.723	49.5	8.7	-0.3	57.9	Peak Max	H	99	287	74.0	-16.2	Pass	RB
15781.723	33.0	8.7	-0.3	41.4	Average Max	H	99	287	54.0	-12.6	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

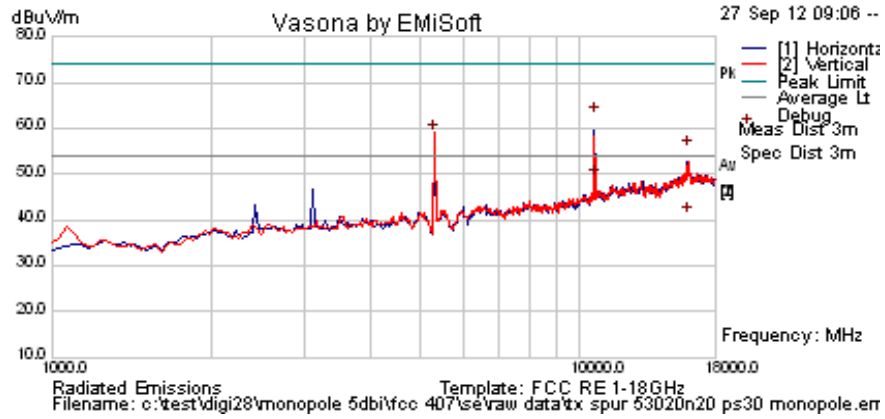
Test Freq.	5300 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART = 18	**Press. (mBars)**	1002
Antenna	Integral 0 dBi Average	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	67.8	4.6	-9.6	62.9	Peak [Scan]	V						FUND
10602.204	57.1	6.8	-2.4	61.5	Peak Max	H	145	13	74	-12.5	Pass	RB
15901.724	46.7	8.9	-0.2	55.4	Peak Max	H	109	307	74	-18.6	Pass	RB
10602.204	42.8	6.8	-2.4	47.2	Average Max	H	145	13	54	-6.8	Pass	RB
15901.724	31.5	8.9	-0.2	40.3	Average Max	H	109	307	54	-13.8	Pass	RB
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5320 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	ART = 18	**Press. (mBars)**	1002
Antenna	Integral 0 dBi Average	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

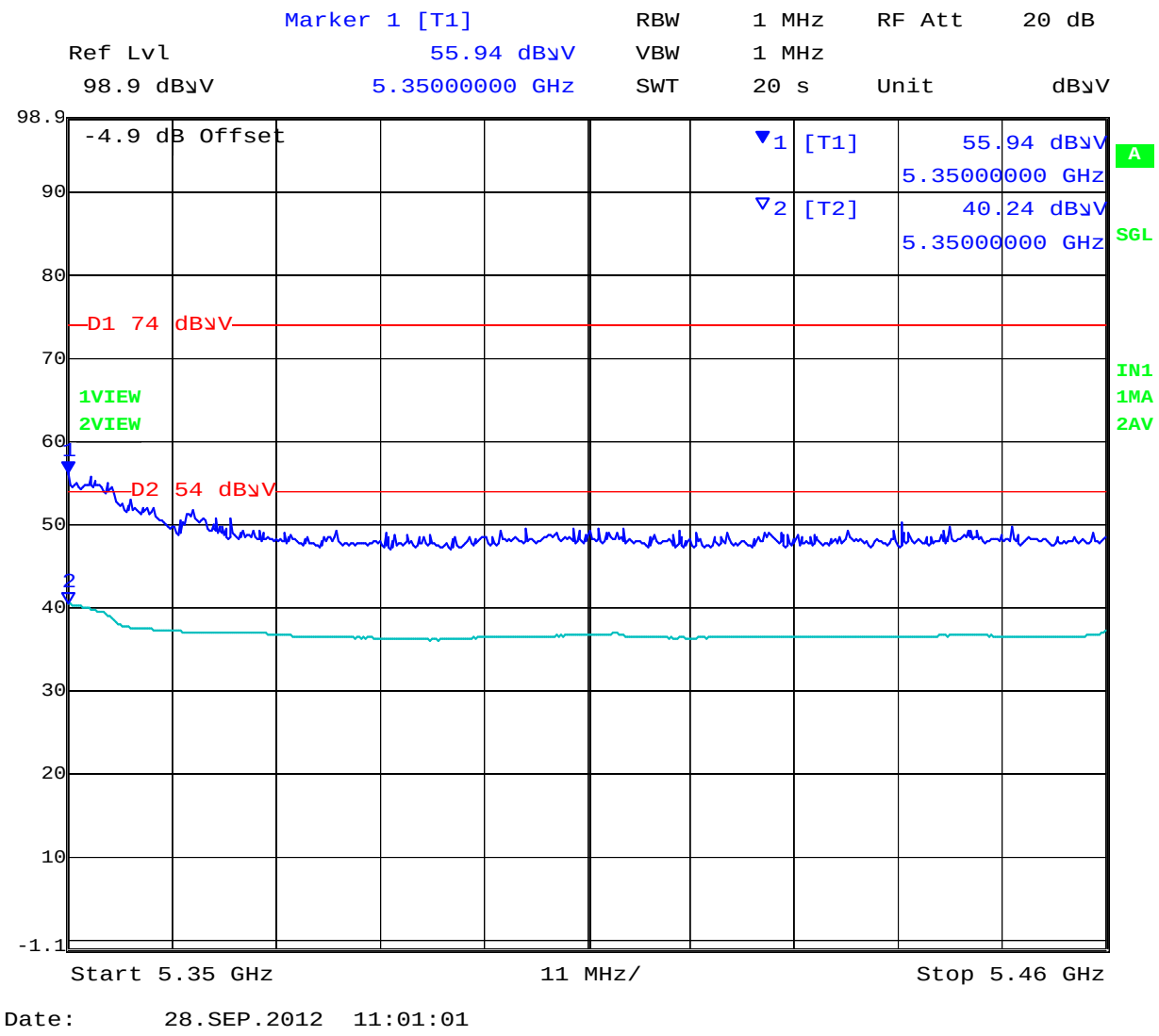


Formally measured emission peaks

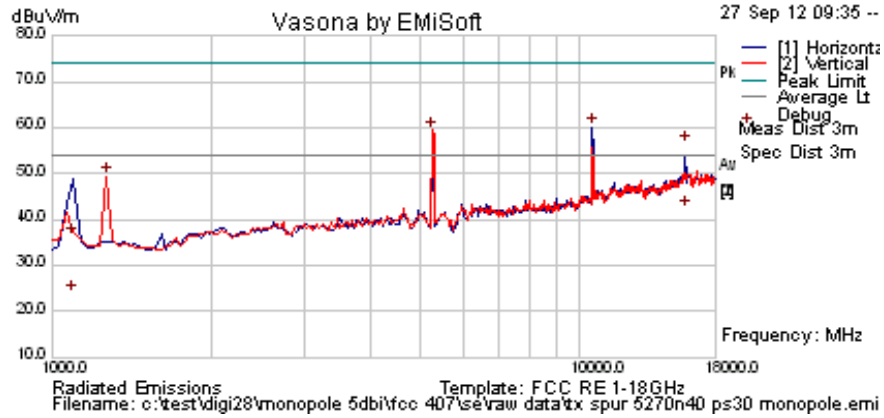
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	63.9	4.6	-9.6	58.9	Peak [Scan]	V						FUND
10641.283	58.3	6.8	-2.4	62.7	Peak Max	H	102	3	74	-11.3	Pass	RB
15961.844	46.6	9.0	0.0	55.6	Peak Max	H	114	339	74	-18.4	Pass	RB
10641.283	44.6	6.8	-2.4	49.1	Average Max	H	102	3	54	-4.9	Pass	RB
15961.844	31.8	9.0	0.0	40.8	Average Max	H	114	339	54	-13.2	Pass	RB

Legend: TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission

802.11n HT-20 5350 Restricted Band-edge



Test Freq.	5270 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

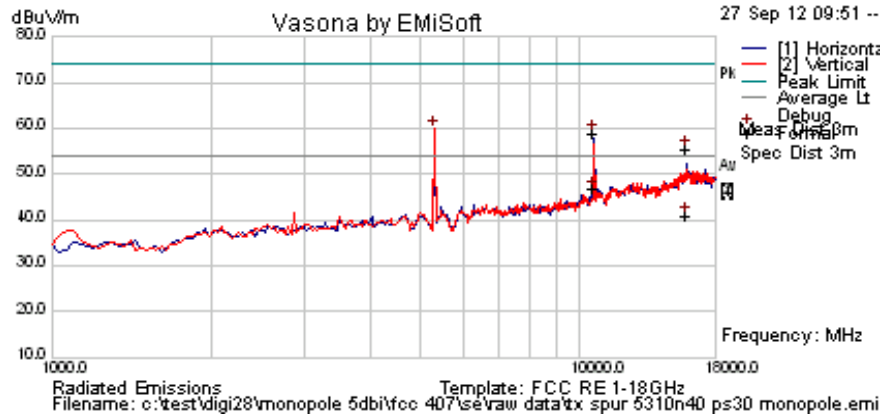


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
10539.078	55.8	6.8	-2.5	60.1	Peak [Scan]	H					Pass	NRB
5258.517	64.5	4.6	-9.7	59.4	Peak [Scan]	V						FUND
1272.545	61.1	2.2	-13.9	49.4	Peak [Scan]	V					Pass	NRB
1096.754	49.9	2.1	-15.7	36.3	Peak Max	H	200	186	74.0	-37.7	Pass	RB*
15810.162	47.8	8.7	-0.3	56.3	Peak Max	H	117	299	74.0	-17.8	Pass	RB
1096.754	37.5	2.1	-15.7	23.9	Average Max	H	200	186	54.0	-30.1	Pass	RB*
15810.162	33.7	8.7	-0.3	42.2	Average Max	H	117	299	54.0	-11.8	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5310 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	Integral 0 dBi Average	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

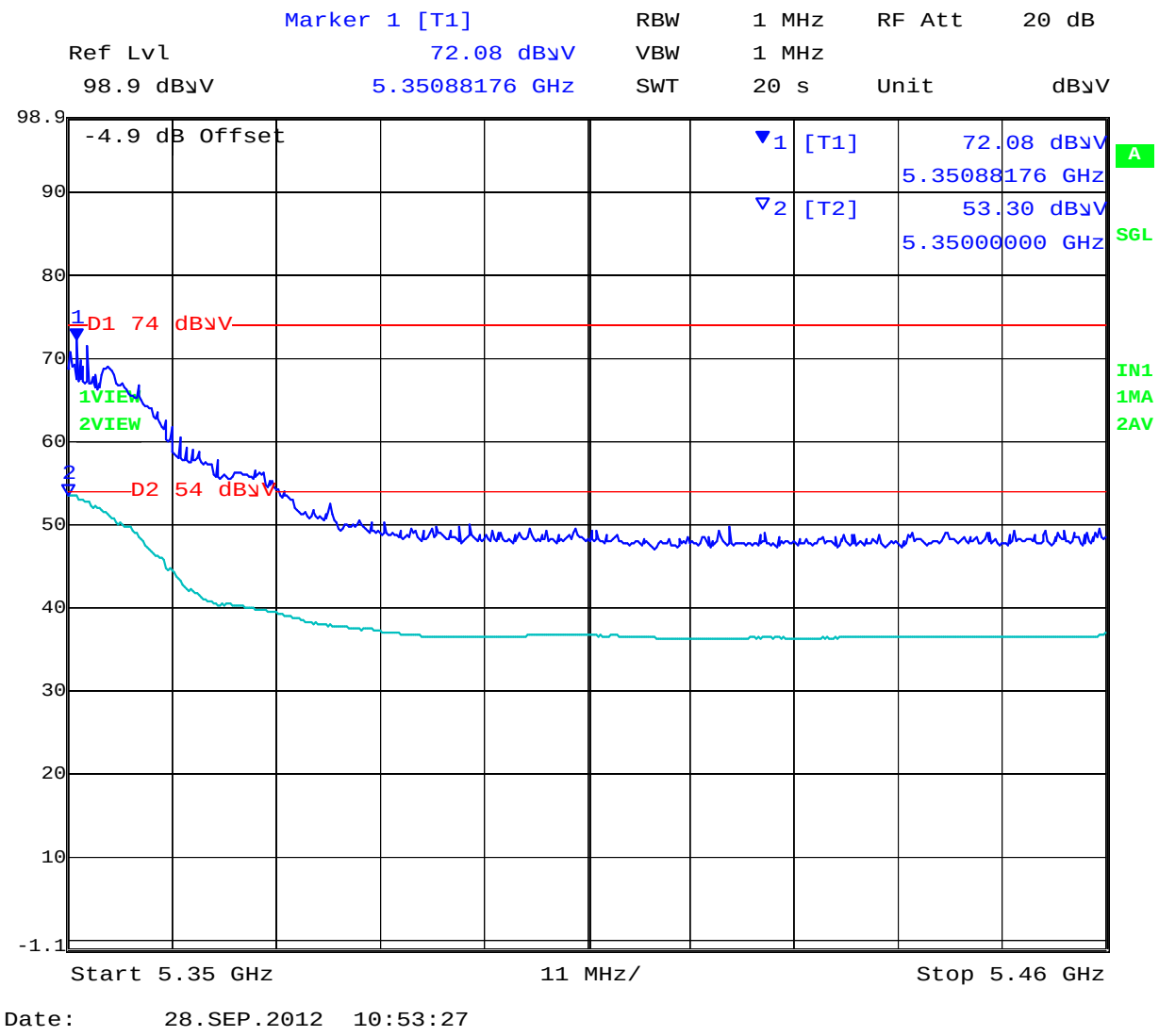


Formally measured emission peaks

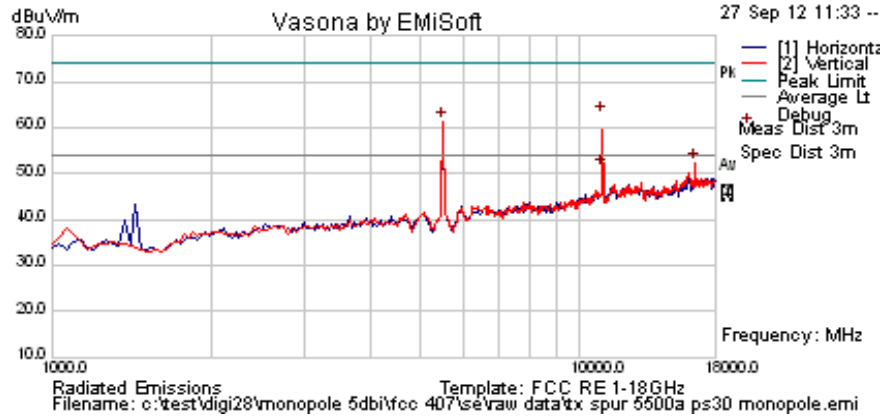
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5292.585	64.8	4.6	-9.6	59.8	Peak [Scan]	V						FUND
10621.723	54.3	6.8	-2.4	58.7	Peak Max	H	103	2	74.0	-15.3	Pass	RB
15932.906	46.8	8.9	-0.1	55.6	Peak Max	H	123	292	74.0	-18.4	Pass	RB
10621.723	42.3	6.8	-2.4	46.7	Average Max	H	103	2	54.0	-7.3	Pass	RB
15932.906	32.0	8.9	-0.1	40.8	Average Max	H	123	292	54.0	-13.2	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5350 Restricted Band-edge



Test Freq.	5500 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	Integral 0 dBi 5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

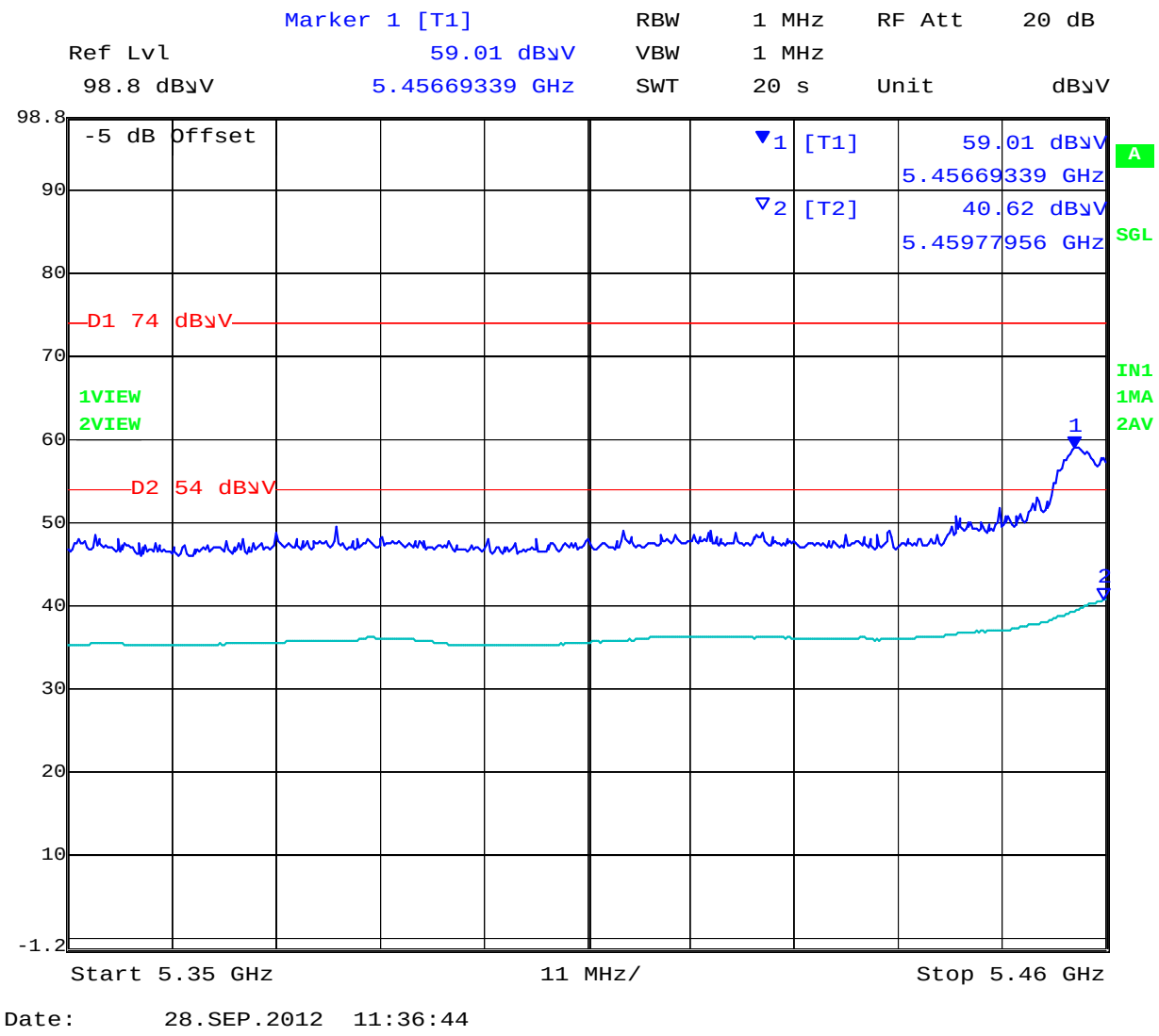


Formally measured emission peaks

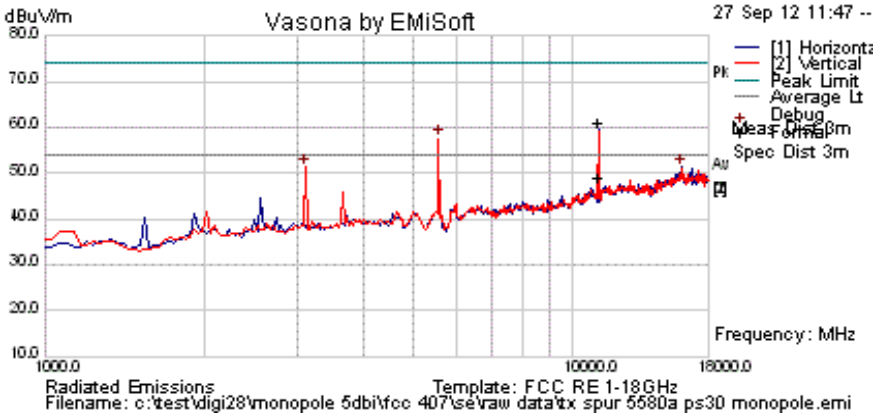
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.993988	66.3	4.6	-9.6	61.3	Peak [Scan]	V						FUND
16501.002	43.2	8.8	0.3	52.3	Peak [Scan]	V	100	0	54.0	-1.7	Pass	NRB
10998.637	59.0	7.0	-3.1	62.9	Peak Max	V	98	305	74.0	-11.1	Pass	RB
10998.637	47.3	7.0	-3.1	51.2	Average Max	V	98	305	54.0	-2.8	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11a 5460 Restricted Band-edge



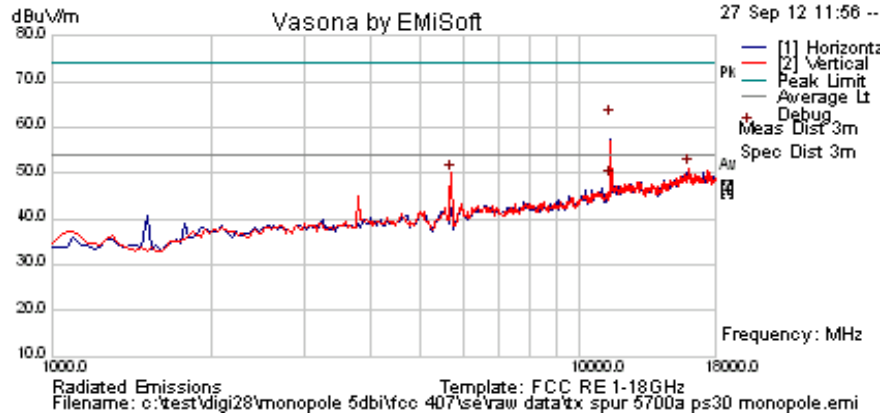
Test Freq.	5580 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	Integral 0 dBi 5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5565.130261	62.6	4.7	-9.7	57.5	Peak [Scan]	V						FUND
15989.98	42.2	9.0	0.1	51.3	Peak [Scan]	H	100	0	54.0	-2.7	Pass	Noise
3112.224449	59.5	3.4	-11.7	51.2	Peak [Scan]	V					Pass	NRB
11162.004	57.3	6.9	-3.0	61.3	Peak Max	H	98	8	74.0	-12.8	Pass	RB
11162.004	45.0	6.9	-3.0	48.9	Average Max	H	98	8	54.0	-5.1	Pass	RB
Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission											
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205											

Test Freq.	5700 MHz	**Engineer**	JMH
Variant	802.11a; 6 Mbs	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	Integral 0 dBi 5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

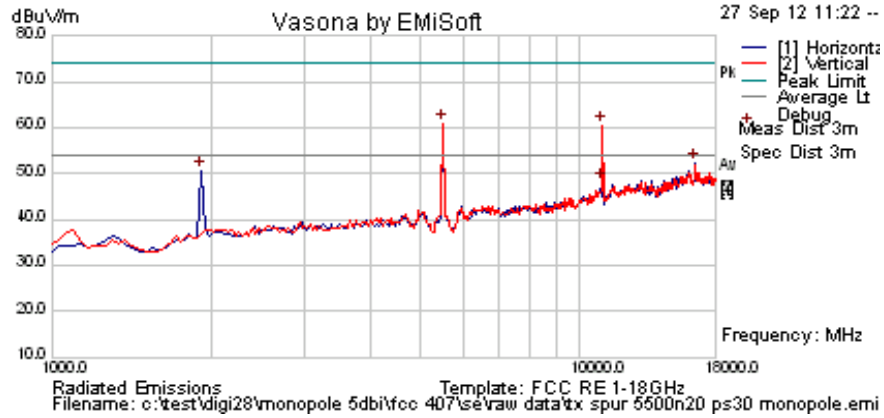


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
16058.116	41.8	9.0	0.3	51.0	Peak [Scan]	V	100	0	54.0	-3.0	Pass	Noise
5701.402806	54.9	4.7	-9.6	50.1	Peak [Scan]	V						FUND
11400.321	57.2	6.8	-2.3	61.8	Peak Max	H	132	21	74.0	-12.2	Pass	RB
11400.321	44.3	6.8	-2.3	48.9	Average Max	H	132	21	54.0	-5.2	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5500 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi MonoPole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

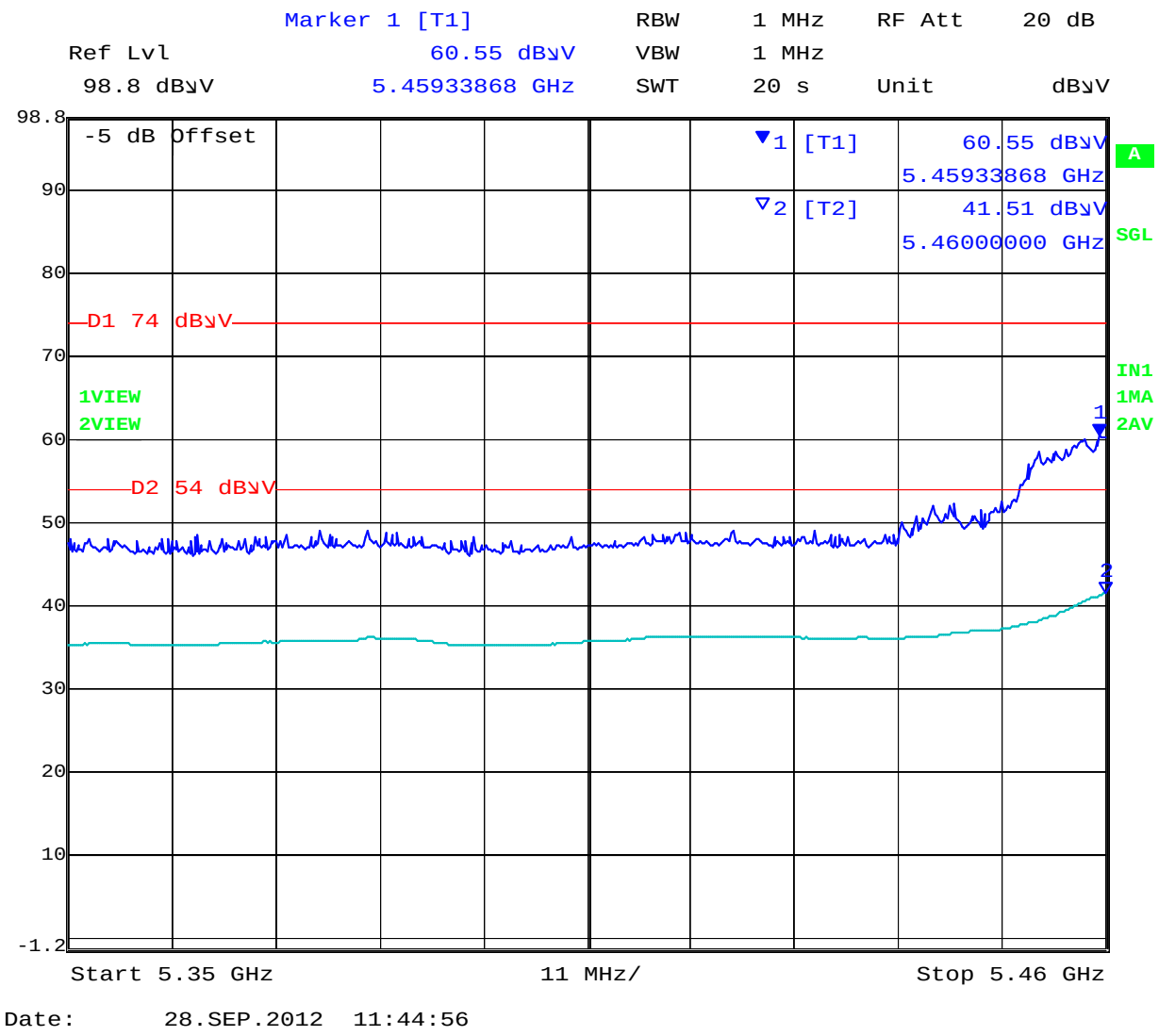


Formally measured emission peaks

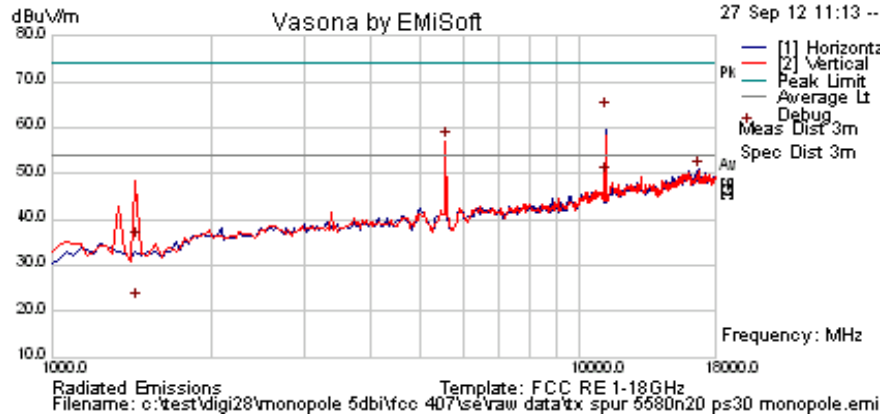
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.994	66.0	4.6	-9.6	61.1	Peak [Scan]	V						FUND
16501.002	43.3	8.8	0.3	52.5	Peak [Scan]	H					Pass	NRB
1919.840	59.9	2.7	-11.9	50.7	Peak [Scan]	H					Pass	NRB
10997.194	56.8	7.0	-3.1	60.7	Peak Max	V	102	306	74	-13.3	Pass	RB
10997.194	44.5	7.0	-3.1	48.4	Average Max	V	102	306	54	-5.6	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-20 5460 Restricted Band-edge



Test Freq.	5580 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi MonoPole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

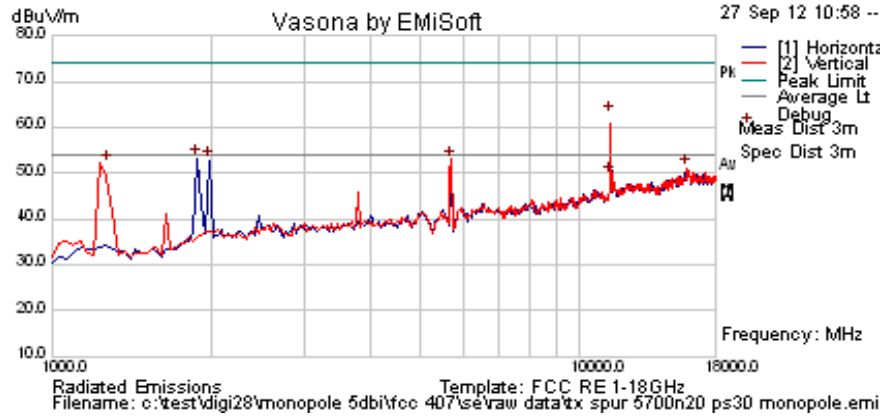


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5565.130	62.2	4.7	-9.7	57.1	Peak [Scan]	V						FUND
16739.479	41.2	8.7	0.9	50.8	Peak [Scan]	H	100	0	54	-3.2	Pass	Noise
11162.794	59.9	6.9	-3.0	63.8	Peak Max	H	98	38	74	-10.2	Pass	RB
1444.854	47.6	2.3	-14.6	35.3	Peak Max	V	124	201	74	-38.7	Pass	RB
11162.794	45.4	6.9	-3.0	49.3	Average Max	H	98	38	54	-4.7	Pass	RB
1444.854	34.3	2.3	-14.6	22.0	Average Max	V	124	201	54	-32.0	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5700 MHz	**Engineer**	JMH
Variant	802.11n HT-20; 6.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi MonoPole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

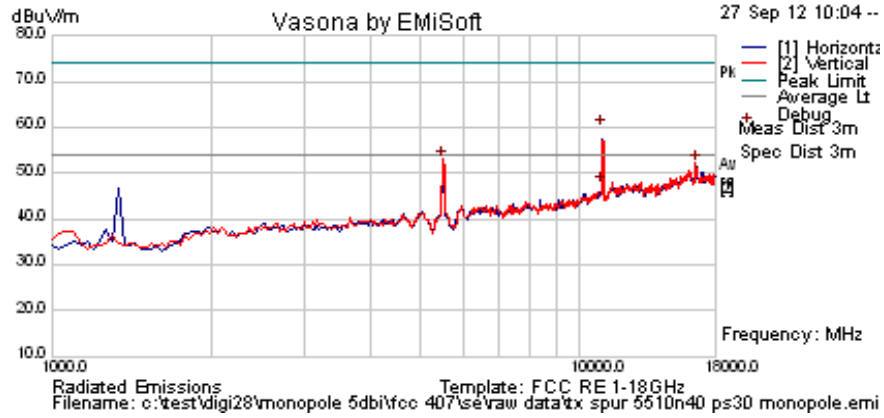


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
1885.772	62.7	2.7	-12.2	53.2	Peak [Scan]	H					Pass	NRB
5701.403	57.8	4.7	-9.6	53.0	Peak [Scan]	V						FUND
1987.976	62.0	2.7	-11.9	52.9	Peak [Scan]	H					Pass	NRB
1271.904	64.0	2.2	-13.9	52.3	Peak [Scan]	V					Pass	NRB
15921.844	42.4	8.9	-0.1	51.1	Peak [Scan]	V	100	0	54	-2.9	Pass	Noise
11399.840	58.2	6.8	-2.3	62.8	Peak Max	V	98	41	74	-11.2	Pass	RB
11399.840	45.0	6.8	-2.3	49.5	Average Max	V	98	41	54	-4.5	Pass	RB

Legend:	TX = Transmitter Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5510 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	5 dBi Monopole	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

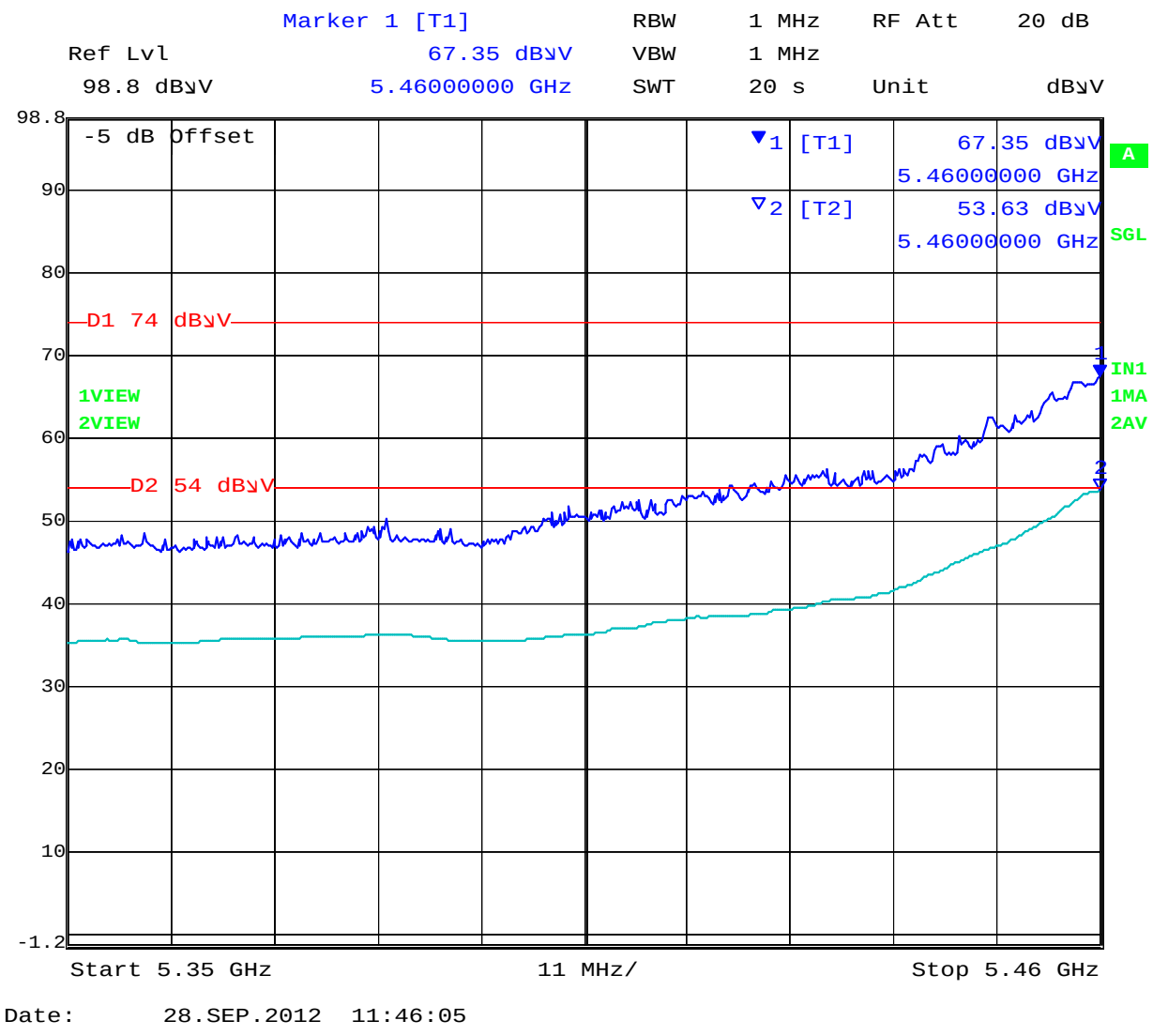


Formally measured emission peaks

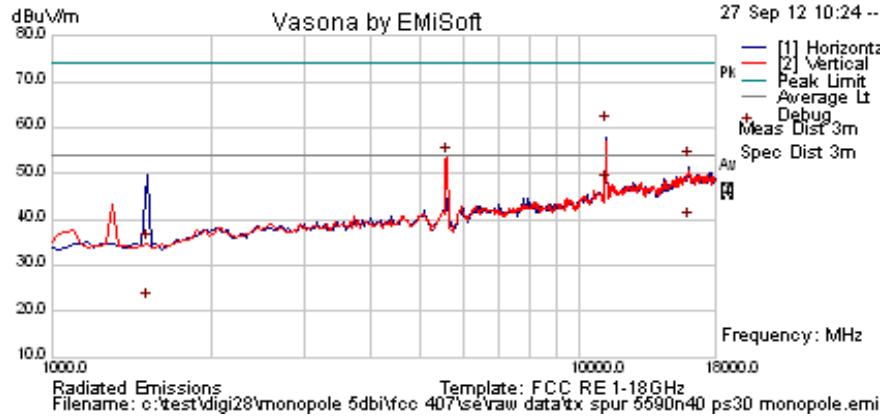
Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5496.994	58.1	4.6	-9.6	53.1	Peak [Scan]	V						FUND
16535.070	42.9	8.8	0.4	52.1	Peak [Scan]	V					Pass	NRB
11016.032	56.0	7.0	-3.1	59.8	Peak Max	H	98	41	74	-14.2	Pass	RB
11016.032	43.3	7.0	-3.1	47.2	Average Max	H	98	41	54	-6.8	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

802.11n HT-40 5460 Restricted Band-edge



Test Freq.	5590 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	Integral 0 dBi Average	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			

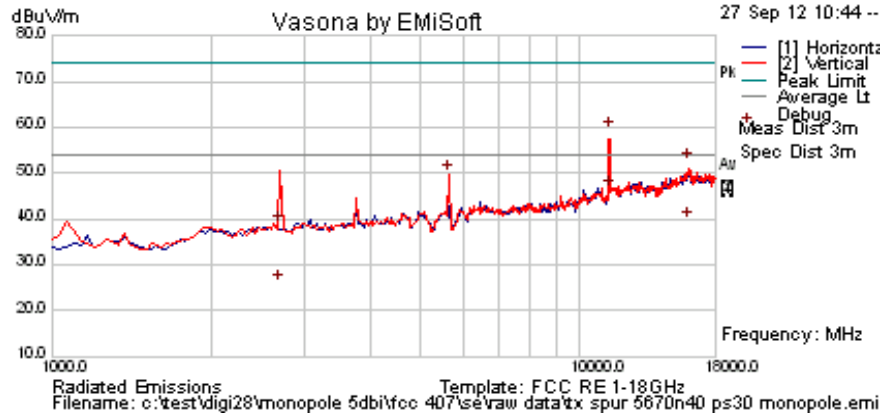


Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5599.198	58.8	4.7	-9.7	53.8	Peak [Scan]	V						FUND
11176.193	56.7	6.9	-2.9	60.7	Peak Max	H	148	15	74	-13.3	Pass	RB
16058.116	43.6	9.0	0.3	52.9	Peak Max	H	162	107	74	-21.1	Pass	RB
11176.193	44.0	6.9	-2.9	48.0	Average Max	H	148	15	54	-6.0	Pass	RB
16058.116	30.5	9.0	0.3	39.8	Average Max	H	162	107	54	-14.2	Pass	RB
1511.419	47.5	2.4	-15.2	34.8	Peak Max	H	98	49	74	-39.2	Pass	RB*
1511.419	35.0	2.4	-15.2	22.2	Average Max	H	98	49	54	-31.8	Pass	RB

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

Test Freq.	5670 MHz	**Engineer**	JMH
Variant	802.11n HT-40; 13.5 MCS	**Temp (ºC)**	26
Freq. Range	1000 MHz - 18000 MHz	**Rel. Hum.(%)**	33
Power Setting	30	**Press. (mBars)**	1002
Antenna	Integral 0 dBi Average	**Duty Cycle (%)**	100
Test Notes 1			
Test Notes 2			



Formally measured emission peaks

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV/m	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV/m	Margin dB	Pass /Fail	Comments
5633.267	55.0	4.7	-9.7	49.9	Peak [Scan]	V						FUND
11336.340	55.0	6.9	-2.5	59.4	Peak Max	V	100	0	74	-14.6	Pass	RB
15991.210	43.3	9.0	0.1	52.5	Peak Max	V	144	319	74	-21.5	Pass	RB
2703.299	47.4	3.2	-11.7	38.9	Peak Max	V	114	42	74	-35.1	Pass	RB*
11336.340	42.0	6.9	-2.5	46.4	Average Max	V	100	0	54	-7.6	Pass	RB
15991.210	30.6	9.0	0.1	39.7	Average Max	V	144	319	54	-14.3	Pass	RB
2703.299	34.7	3.2	-11.7	26.2	Average Max	V	114	42	54	-27.9	Pass	RB*

Legend:	* = Transient Emissions; DIG = Digital Emissions; FUND = Fundamental; WB = Wideband Emission
	NRB = Non-Restricted Band. Limit = 68.23 dBuV/m; RB = Restricted Band. Limits per 15.205

6.1.2.4. Digital Emissions (30M-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:

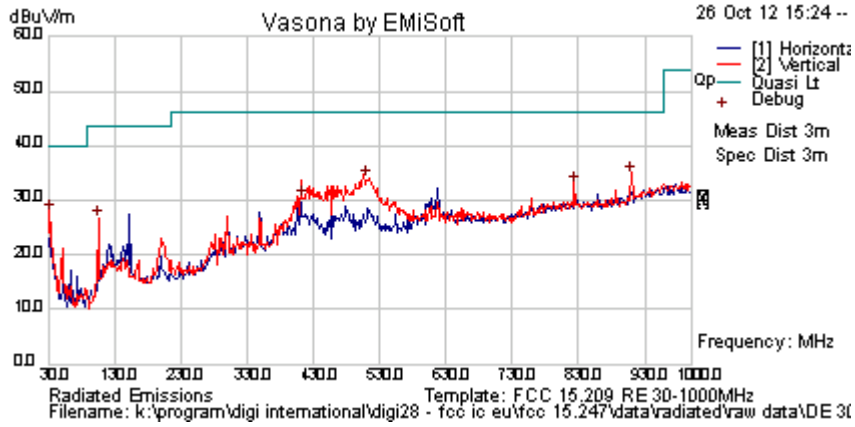
FS = 51.5 + 8.5 + 1.3 - 26.0 +1 = 36.3dBμV/m

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 = 100μV/m
48 dBμV/m = 250μV/m

Test Freq.	2437 MHz	**Engineer**	
Variant	Digital Emissions	**Temp (ºC)**	
Freq. Range	30 MHz - 1000 MHz	**Rel. Hum.(%)**	
Power Setting	20	**Press. (mBars)**	
Antenna	SA-006-1		
Test Notes 1	Single Port Module		
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
32.169	35.5	3.5	-11.4	27.7	Peak [Scan]	V	98	0	40	-12.3	Pass	
414.605	39.1	5.5	-14.3	30.3	Peak [Scan]	V	98	0	46	-15.8	Pass	
511.605	40.6	5.9	-12.8	33.7	Peak [Scan]	V	98	0	46	-12.3	Pass	
823.383	34.2	6.9	-8.4	32.8	Peak [Scan]	V	98	0	46	-13.2	Pass	
910.770	35.1	7.1	-7.7	34.5	Peak [Scan]	V	98	0	46	-11.5	Pass	
105.767	42.0	4.1	-19.7	26.4	Peak [Scan]	V	98	0	43.5	-17.1	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.

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

6.1.4. DFS (Dynamic Frequency Selection)

6.1.4.1. Test Procedure and Setup

FCC, Part 15 Subpart C §15.407(h)
FCC 06-96 Memorandum Opinion and Order
Industry Canada RSS-210 A9.4

5.1.9.1.1. Interference Threshold values, Master or Client incorporating In-Service Monitoring

Maximum Transmit Power	**Value (see note)**
≥ 200 milliwatt	-64 dBm
< 200 milliwatt	-62 dBm
Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna	

5.1.9.1.2. DFS Response requirement values

Parameter	**Value**
Non-occupancy period	Minimum 30 minutes
Channel Availability Check Time	60 seconds
Channel Move Time	10 seconds See Note 1.
Channel Closing Transmission Time	200 milliseconds + an aggregate of 60 milliseconds over remaining 10 second period. See Notes 1 and 2.
U-NII Detection Bandwidth	Minimum 80% of the 99% power bandwidth See Note 3.

Note 1: The instant that the *Channel Move Time* and the *Channel Closing Transmission Time* begins is as follows:

- For the Short pulse radar Test Signals this instant is the end of the *Burst*.
- For the Frequency Hopping radar Test Signal, this instant is the end of the last radar *Burst* generated.
- For the Long Pulse radar Test Signal this instant is the end of the 12 second period defining the radar transmission.

Note 2: The *Channel Closing Transmission Time* is comprised of 200 milliseconds starting at the beginning of the *Channel Move Time* plus any additional intermittent control signals required to facilitate *Channel* changes (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the *U-NII Detection Bandwidth* detection test, radar type 1 is used and for each frequency step the minimum percentage of detection is 90%. Measurements are performed with no data traffic.

5.1.9.1.3. Radar Test Waveforms

This section provides the parameters for required test waveforms, minimum percentage of successful detections, and the minimum number of trials that must be used for determining DFS conformance. Step intervals of 0.1 microsecond for Pulse Width, 1 microsecond for PRI, 1 MHz for chirp width and 1 for the number of pulses will be utilized for the random determination of specific test waveforms.

Short Pulse Radar Test Waveforms

Radar Type	Pulse Width (µsec)	PRI (µsec)	Number of Pulses	Minimum Percentage of Successful Detection	Minimum Trials
1	1	1428	18	60%	30
2	1-5	150-230	23-29	60%	30
3	6-10	200-500	16-18	60%	30
4	11-20	200-500	12-16	60%	30
Aggregate (Radar Types 1-4)				80%	120

A minimum of 30 unique waveforms are required for each of the short pulse radar types 2 through 4. For short pulse radar type 1, the same waveform is used a minimum of 30 times. If more than 30 waveforms are used for short pulse radar types 2 through 4, then each additional waveform must also be unique and not repeated from the previous waveforms. The aggregate is the average of the percentage of successful detections of short pulse radar types 1-4.

Long Pulse Radar Test Waveform

Radar Type	Pulse Width (µsec)	Chirp Width (MHz)	PRI (µsec)	Number of Pulses per *Burst*	Number of *Bursts*	Minimum Percentage of Successful Detection	Minimum Trials
5	50-100	5-20	1000-2000	1-3	8-20	80%	30

The parameters for this waveform are randomly chosen. Thirty unique waveforms are required for the Long Pulse radar test signal. If more than 30 waveforms are used for the Long Pulse radar test signal, then each additional waveform must also be unique and not repeated from the previous waveforms.

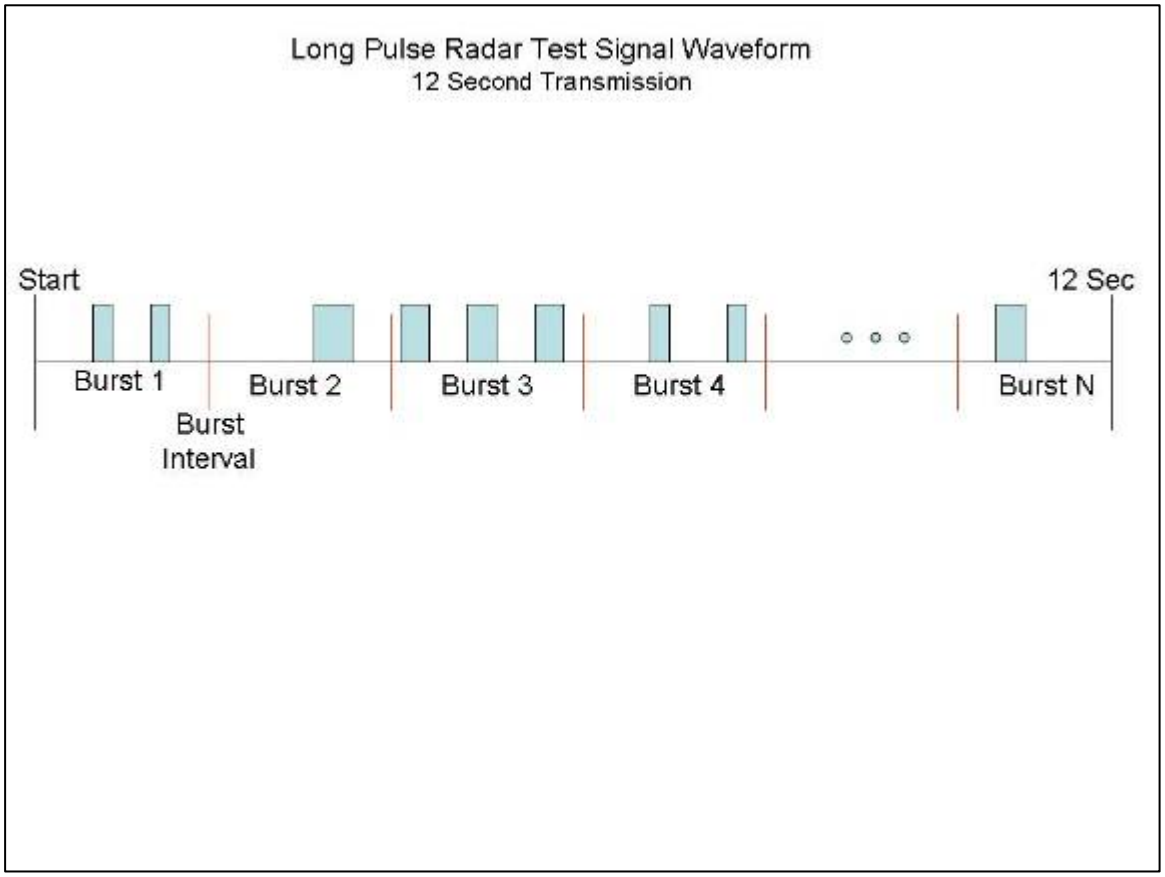
Each waveform is defined as follows:

1) The transmission period for the Long Pulse Radar test signal is 12 seconds.
2) There are a total of 8 to 20 *Bursts* in the 12 second period, with the number of *Bursts* being randomly chosen. This number is *Burst Count*.
3) Each *Burst* consists of 1 to 3 pulses, with the number of pulses being randomly chosen. Each *Burst* within the 12 second sequence may have a different number of pulses.
4) The pulse width is between 50 and 100 microseconds, with the pulse width being randomly chosen. Each pulse within a *Burst* will have the same pulse width. Pulses in different *Bursts* may have different pulse widths.
5) Each pulse has a linear FM chirp between 5 and 20 MHz, with the chirp width being randomly chosen. Each pulse within a *Burst* will have the same chirp width. Pulses in different *Bursts* may have different chirp widths. The chirp is centered on the pulse. For example, with a radar frequency of 5300 MHz and a 20 MHz chirped signal, the chirp starts at 5290 MHz and ends at 5310 MHz.
6) If more than one pulse is present in a *Burst*, the time between the pulses will be between 1000 and 2000 microseconds, with the time being randomly chosen. If three pulses are present in a *Burst*, the time between the first and second pulses is chosen independently of the time between the second and third pulses.
7) The 12 second transmission period is divided into even intervals. The number of intervals is equal to *Burst_Count*. Each interval is of length (12,000,000 / *Burst_Count*) microseconds. Each interval contains one *Burst*. The start time for the *Burst*, relative to the beginning of the interval, is between 1 and [(12,000,000 / *Burst_Count*) – (Total *Burst* Length) + (One Random PRI Interval)] microseconds, with the start time being randomly chosen. The step interval for the start time is 1 microsecond. The start time for each *Burst* is chosen independently.

A representative example of a Long Pulse radar test waveform:

1) The total test signal length is 12 seconds.
2) 8 *Bursts* are randomly generated for the *Burst_Count*.
3) *Burst* 1 has 2 randomly generated pulses.
4) The pulse width (for both pulses) is randomly selected to be 75 microseconds.
5) The PRI is randomly selected to be at 1213 microseconds.
6) *Bursts* 2 through 8 are generated using steps 3 – 5.
7) Each *Burst* is contained in even intervals of 1,500,000 microseconds. The starting location for Pulse 1, *Burst* 1 is randomly generated (1 to 1,500,000 minus the total *Burst* 1 length + 1 random PRI interval) at the 325,001 microsecond step. *Bursts* 2 through 8 randomly fall in successive 1,500,000 microsecond intervals (i.e. *Burst* 2 falls in the 1,500,001 – 3,000,000 microsecond range).

Graphical representation of the Long Pulse radar Test Waveform.



5.1.9.1.4. Frequency Hopping Radar Test Waveform

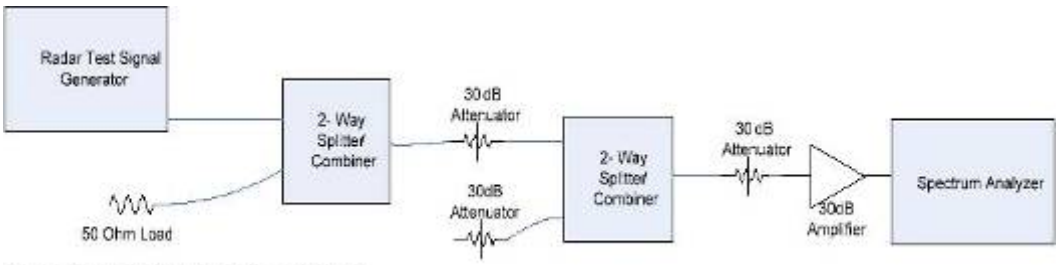
Frequency Hopping Radar Test Waveform

Radar Type	Pulse Width (µsec)	PRI (µsec)	Pulses per Hop	Hopping Rate (kHz)	Hopping Sequence Length (msec)	Minimum Percentage of Successful Detection	Minimum Trials
6	1	333	9	.333	300	70%	30

For the Frequency Hopping Radar Type, the same *Burst* parameters are used for each waveform. The hopping sequence is different for each waveform and a 100-length segment is selected from the hopping sequence defined by the following algorithm:

5.1.9.1.5. Radar Waveform Calibration

The following equipment setup was used to calibrate the conducted Radar Waveform. A spectrum analyzer was used to establish the test signal level for each radar type. During this process there were no transmissions by either the Master or Client Device. The spectrum analyzer was switched to the zero span (Time Domain) mode at the frequency of the Radar Waveform generator. Peak detection was utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) were set to 3 MHz.
The signal generator amplitude was set so that the power level measured at the spectrum analyzer was -61dBm (Ref Section 5.1). The 30dB amplifier gain was entered as an amplitude offset on the spectrum analyzer.

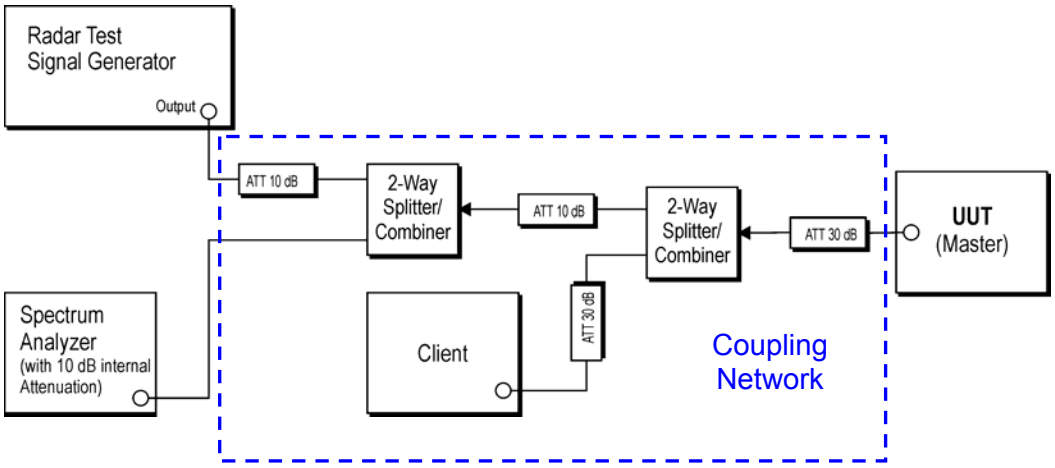


Conducted Calibration Setup

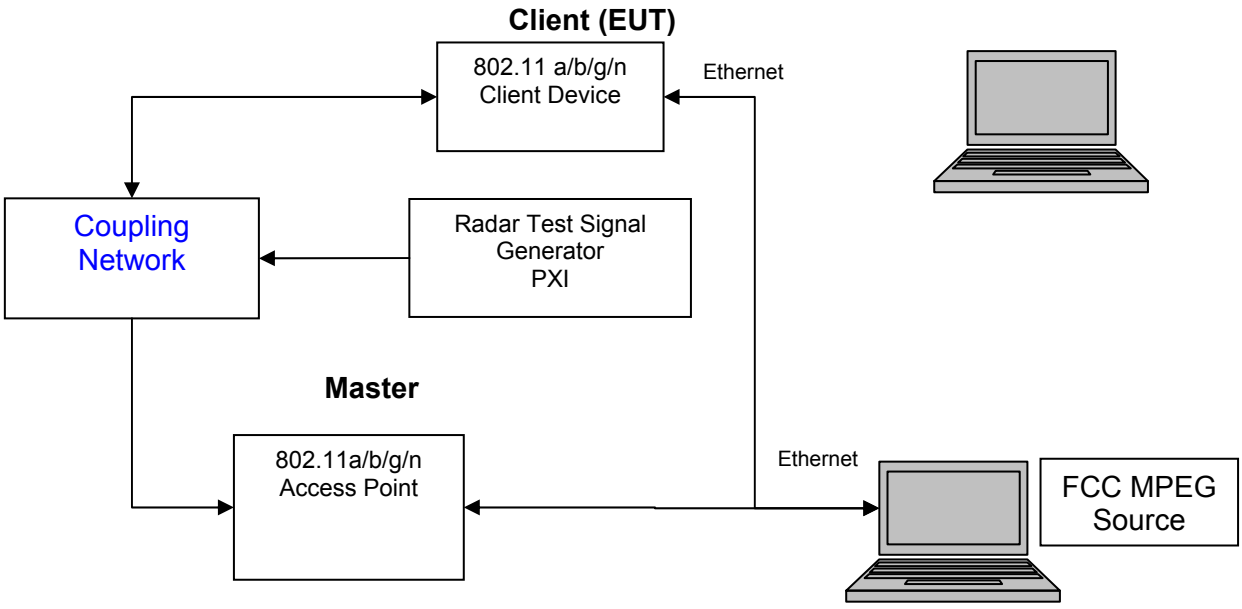
5.1.9.1.6. Block Diagram(s) of Test Setup

Block Diagram(s) of Test Setup

Setup for Conducted Measurements where the EUT is the Master with injection of Radar Test Waveforms at the Master.



Support Equipment Configuration



The EUT is a Client Device without radar detection.

Applicability of DFS Requirements Prior to Use of a Channel

(Ref Table 1 of FCC 06-96)

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
Non-Occupancy Period	Yes	Yes	Yes
DFS Detection Threshold	Yes	Not required	Yes
Channel Availability Check Time	Yes	Not required	Not required
Uniform Spreading	Yes	Not required	Not required
U-NII Detection Bandwidth	Yes	Not required	Yes

Applicability of DFS requirements during normal operation

(Ref Table 2 of FCC 06-96)

Requirement	Operational Mode		
	Master	Client Without Radar Detection	Client With Radar Detection
DFS Detection Threshold	Yes	Not required	Yes
Channel Closing Transmission Time	Yes	Yes	Yes
Channel Move Time	Yes	Yes	Yes
U-NII Detection Bandwidth	Yes	Not required	Yes

6.2. Dynamic Frequency Selection (DFS) Test Results

6.2.1. In-Service Monitoring for Channel Move Time, Channel Closing Transmission Time and Non-Occupancy Period

FCC §15.407(h)(2)(iii)

The steps below define the procedure to determine the above mentioned parameters when a radar Burst with a level equal to the DFS Detection Threshold is generated on the Operating Channel of the U-NII device.

A U-NII device operating as a Client Device will associate with the EUT (Master). The requisite MPEG video file ("TestFile.mpg" available on the NTIA website at the following link http://ntiacsd.ntia.doc.gov/dfs/) is streamed from the master device (AP) to the client.

Channel Closing Transmission Time - Measurement

A Type 1 waveform was introduced to the EUT, from which a 12 second transmission record was digitally captured, collecting nearly 250M samples of data, which included in excess of 600 ms of pre-trigger data. This Type 1 waveform had an integral marker built into its construction, marking the start of the radar waveform play, which directly triggered the PXI digitizer's data capture via the PXI backplane trigger bus.

The test system was set-up to capture all transmission data for access point events above a threshold level of -50 dBm. The test equipment time stamps all captured events with respect to T0 (zero time indicating the start of the measurements sequence) starting the 612.1 ms pre-trigger period followed by the radar type 1 burst period.

Radar (Type 1) Pre-trigger period	612.1 ms
Type 1 burst period	25.70 ms

(The period of the 18 pulse burst includes [18 pulses *1.428mS PRI] = 25.704 ms. Then add 1 µs pulse width for the final pulse.)

Total	637.8 ms

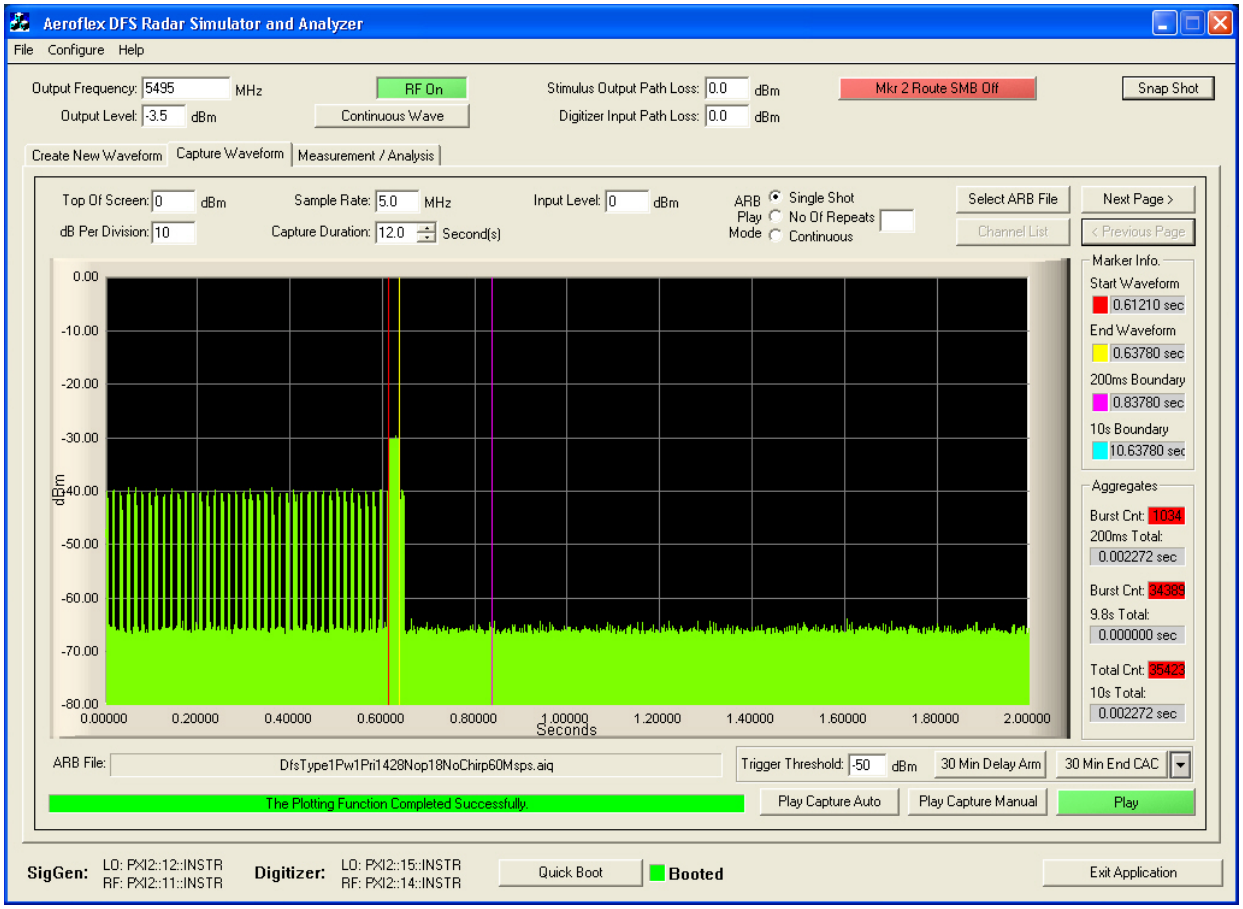
Channel Closing Transmission Time starts immediately after the last radar pulse is transmitted i.e. 637.8 ms after the start of the trace capture period.

Therefore, pulses seen after this 637.8 ms boundary are identified and totaled to provide an aggregate total of transmissions in order to determine whether the EUT is compliant with the Channel Closing Transmission Time requirements as described in MO&O FCC 06-96. In this case, it was found that an aggregate total of 0.00 ms of transmission time accrued. This value is found at the right hand side at the foot of the following plot (10s Total).

Channel Closing Transmission Time
5,500 MHz (802.11a) = 2.272 mSecs (limit 260 mSecs)

Channel Move Time
5,500MHz (802.11a) = 0.022 Secs (limit 10 Secs)

Channel Move Time, Channel Closing Transmission Time for Type 1 Radar Captured by the Test System - 0 to 2 seconds



Channel Move Time, Channel Closing Transmission Time for Type 1 Radar Captured by the Test System - 2 to 4 seconds