



Test Lab
Cert 2764.01

FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:

2501BERM.008

Test report

USA FCC Part 15.407 (U-NII), 15.209

CANADA RSS-210, RSS-Gen

Unlicensed National Information Infrastructure Devices. General technical requirements.

License-Exempt Radio Apparatus (All Frequency Bands): Category I Equipment.
General Requirements and Information for the Certification of Radio Apparatus.

Identification of item tested	Display Audio Infotainment Unit 10"TP
Trademark	Visteon
Model and /or type reference	VW MIB Regio
Other identification of the product	FCC ID: NT8-VWMIBREGIO IC: 3043A-VWMIBREGIO HW Version: H04 SW Version: 0107
Features	FM, AM, USB, Bluetooth, WLAN, GNSS
Manufacturer	VISTEON CORPORATION ONE VILLAGE CENTER DRIVE, VAN BUREN TOWNSHIP, MI, 48111 U.S.A
Test method requested, standard	USA FCC Part 15.407 10-1-18 Edition: Unlicensed National Information Infrastructure Devices. General technical requirements. USA FCC Part 15.209 10-1-18 Edition: Radiated emission limits; general requirements. CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 (April 2018). 789033 D02 General UNII Test Procedures New Rules v02r01 Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	11-27-2019
Report template No	FDT08_21

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Competences and guarantees

DEKRA Certification Inc. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation), to perform the tests indicated in the Certificate 2764.01

DEKRA Certification Inc. is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Certification Inc. has a calibration and maintenance program for its measurement equipment.

DEKRA Certification Inc. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Certification at the time of performance of the test.

DEKRA Certification Inc. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

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General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Certification Inc.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Certification Inc. and the Accreditation Bodies.

Uncertainty

Uncertainty (factor $k=2$) was calculated according to the DEKRA Certification internal document PODT000.

Frequency (MHz)	U(k=2)	Units
0,009 - 30	2.69	dB
30-180	3.82	dB
180-1000	2.61	dB
1000-18000	2.92	dB
18000-40000	2.15	dB

Data provided by the client

VW MIB Regio is a Display Audio Infotainment Unit with capacitive 10"TP touch screen with following functionalities: USB 3.1/USB Video, USB Hub, Bluetooth EDR 2.4 GHz, Audio BT streaming music, control and browsing, Wi-Fi hotspot Functionality/Wireless 2.4GHz and 5 GHz band, GNSS receiver-GLONASS, GPS.

DEKRA declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
2501B/08	Vehicular Radio	2GM.035.180.A	VWZ7Z2W0130069	10/31/2019
2501B/23	Harness	----	----	10/31/2019
2501B/30	Fakra USB Cable	-----	----	10/31/2019

1. Sample S/01 has undergone following test(s):

All conducted tests indicated in appendix B, C, D & E.

Sample S/02 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
2501B/06	Vehicular Radio	2GM.035.180.A	VWZ7Z2W0130037	10/31/2019
2501B/20	Harness	----	----	10/31/201

1. Sample S/02 has undergone following test(s):

All radiated tests indicated in appendix B, C, D & E.

Following Accessory item was used with Sample S/02 to perform testing

Control N°	Description	Model	Serial N°	Date of reception
2501B/37	GPS & Am/FM radio antenna	6C0.035.501.G5FQ	02S AZWPL	11/11/2019
2501B/32	Fakra USB Cable	-	-	10/31/2019

Test sample description

Ports..... :	Port name and description		Cable					
			Specified length [m]	Attached during test	Shielded			
	AM/FM Antenna Connection: Fakra			☒	☐			
	GPS Antenna Connector: Fakra			☒	☐			
	USB Video Port			☒	☐			
	USB 3.0			☒	☐			
	Main Connectors			☒	☐			
Supplementary information to the ports..... :	Dual USB HUB Type C							
Rated power supply	Voltage and Frequency		Reference poles					
			L1	L2	L3	N	PE	
	☐	AC:	☐	☐	☐	☐	☐	
	☐	AC:	☐	☐	☐	☐	☐	
	☐	DC:						
	☒	DC: 13.5 / Wireless 2.4 GHz and 5 GHz band						
Rated Power	Sleep current: 300 μ A							
Clock frequencies	48 KHZ, 26 MHZ, 25 MHZ, 36.864 MHZ, 16 MHZ							
Other parameters.....	Display Screensize: 10.1" (diagonal) FHD, 2.14:1, Landscape, Transmissive, Normally black, ADStype							
Software version	0107							
Hardware version.....	H04							
Dimensions in cm (L x W x D)	260.31 X 130.72 X 153.15							
Mounting position.....	☐	Table top equipment						
	☐	Wall/Ceiling mounted equipment						
	☐	Floor standing equipment						
	☐	Hand-held equipment						
	☒	Other: Vehicle / Automotive use						
Modules/parts	Module/parts of test item			Type	Manufacturer			
	N/A							

Accessories (not part of the test item)	Description	Type	Manufacturer
	GPS Antenna	Antenna	-
	Harnesses to power up the Radio	Harnesses	-
	SMA Connectors	SMA	-
	USB Cables	USB	
Documents as provided by the applicant.....	Description	File name	Issue date
	PoA		
	Declaration letters		
	Application Forms FDT 30_14		
	Application forms FRF88_01 FRF91_02		
Copy of marking plate:			
			

Identification of the client

VISTEON CORPORATION
ONE VILLAGE CENTER DRIVE, VAN BUREN TOWNSHIP, MI, 48111 U.S.A

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	11-13-2019
Date (finish)	11-25-2019

Document history

Report number	Date	Description
2501BERM.008	11-27-2019	First release

Environmental conditions

In the control chamber, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the semi-anechoic chamber, the following limits were not exceeded during the test.

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 75 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

In the chamber for conducted measurements, the following limits were not exceeded during the test:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 30 % Max. = 60 %
Air pressure	Min. = 860 mbar Max. = 1060 mbar

Remarks and comments

The tests have been performed by the technical personnel: Divya Adusumilli, Bhagyashree Chaudhary, Koji Nishimoto and Poojita Bhattu.

Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Summary

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.15 GHz -5.25 GHz Band					
Report Section	FCC Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
B.1	§ 15.403 (i) KDB 789033 D02	RSS 247 6.2.1	26dB Emission Bandwidth & Occupied Bandwidth	P	N/A
B.2	§ 15.407 (a) (1) (4)	RSS 247 6.2.1.1	Power Limits. Maximum Output Power	P	N/A
B.3	§ 15.407 (a) (1) (5)	RSS-247 6.2.1.1	Power Spectral Density	P	N/A
B.4	§ 15.407 (b) (1)	RSS-247 6.2.1.2	Band-edge conducted emissions compliance (Transmitter)	P	N/A
--	§ 15.407 (b)(6) § 15.207	RSS-Gen 8.8	Emission limitations Conducted (Transmitter)	N/A	N/A
B.5	§ 15.407 (b)(1)(6)(7) § 15.209 § 15.205	RSS-247 6.2.1.2 RSS-Gen 8.9 & 8.10	Undesirable radiated emissions (Transmitter)	P	N/A
--	§ 15.407 (g)	RSS-Gen 6.11 & 8.11	Frequency Stability	N/M	Refer 1
Supplementary information and remarks: The test set-up was made in accordance to the general provisions of ANSI C63.10: 2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated 12/14/2017 1) The compliance is checked through a description of how this requirement is met that is provided by the applicant.					

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.25 GHz -5.35 GHz Band					
Report Section	FCC Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
C.1	§ 15.403 (i) KDB 789033 D02	RSS 247 6.2.2	26dB Emission Bandwidth & Occupied Bandwidth	P	N/A
C.2	§ 15.407 (a)(2)(4)	RSS 247 6.2.2.1	Power Limits. Maximum Output Power	P	N/A
C.3	§ 15.407 (a)(2)(5)	RSS-247 6.2.2.1	Power Spectral Density	P	N/A
C.4	§ 15.407 (b)(2)	RSS-247 6.2.2.2	Band-edge conducted emissions compliance (Transmitter)	P	N/A
--	§ 15.407 (b)(6) § 15.207	RSS-Gen 8.8	Emission limitations Conducted (Transmitter)	N/A	N/A
C.5	§ 15.407 (b)(2)(6)(7) § 15.209 § 15.205	RSS-247 6.2.2.2 RSS-Gen 8.9 & 8.10	Undesirable radiated emissions (Transmitter)	P	N/A
--	§ 15.407 (g)	RSS-Gen 6.11 & 8.11	Frequency Stability	N/M	Refer 1
Supplementary information and remarks: The test set-up was made in accordance to the general provisions of ANSI C63.10: 2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated 12/14/2017 1) The compliance is checked through a description of how this requirement is met that is provided by the applicant.					

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.47 GHz -5.725 GHz Band					
Report Section	FCC Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
D.1	§ 15.403 (i) KDB 789033 D02	RSS 247 6.2.3	26dB Emission Bandwidth & Occupied Bandwidth	P	N/A
D.2	§ 15.407 (a)(2)(4)	RSS 247 6.2.3.1	Power Limits. Maximum Output Power	P	N/A
D.3	§ 15.407 (a)(2)(5)	RSS-247 6.2.3.1	Power Spectral Density	P	N/A
D.4	§ 15.407 (b)(3)	RSS-247 6.2.3.2	Band-edge conducted emissions compliance (Transmitter)	P	N/A
--	§ 15.407 (b)(6) § 15.207	RSS-Gen 8.8	Emission limitations Conducted (Transmitter)	N/A	N/A
D.5	§ 15.407 (b)(3)(6)(7) § 15.209 § 15.205	RSS-247 6.2.3.2 RSS-Gen 8.9 & 8.10	Undesirable radiated emissions (Transmitter)	P	N/A
--	§ 15.407 (g)	RSS-Gen 6.11 & 8.11	Frequency Stability	N/M	Refer 1
Supplementary information and remarks: The test set-up was made in accordance to the general provisions of ANSI C63.10: 2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated 12/14/2017 1) The compliance is checked through a description of how this requirement is met that is provided by the applicant.					

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.725 GHz -5.85 GHz Band					
Report Section	FCC Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
E.1	§ 15.403 (i) KDB 789033 D02	RSS 247 6.2.4	26dB Emission Bandwidth & Occupied Bandwidth	P	N/A
E.2	§ 15.407 (e)	RSS 247 6.2.4.1	6 dB Emission	P	N/A
E.3	§ 15.407 (a)(3)(4)	RSS 247 6.2.4.1	Power Limits. Maximum Output Power	P	N/A
E.4	§ 15.407 (a)(3)(5)	RSS-247 6.2.4.1	Power Spectral Density	P	N/A
E.5	§ 15.407 (b)(4)	RSS-247 6.2.4.2	Band-edge radiated emissions compliance (Transmitter)	P	N/A
--	§ 15.407 (b)(6) § 15.207	RSS-Gen 8.8	Emission limitations Conducted (Transmitter)	N/A	N/A
E.6	§ 15.407 (b)(4)(6)(7) § 15.209 § 15.205	RSS-247 6.2.4.2 RSS-Gen 8.9 & 8.10	Undesirable radiated emissions (Transmitter)	P	N/A
--	§ 15.407 (g)	RSS-Gen 6.11 & 8.11	Frequency Stability	N/M	Refer 1
Supplementary information and remarks: The test set-up was made in accordance to the general provisions of ANSI C63.10: 2013 and FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01 dated 12/14/2017 1) The compliance is checked through a description of how this requirement is met that is provided by the applicant.					

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) Common Requirements for all bands					
Report Section	FCC Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
--	§ 15.407 (c)	--	Transmission in case of absence of information to transmit, or operational failure.	N/M	Refer 1
Supplementary information and remarks:					
1) The compliance is checked through a description of how this requirement is met that is provided by the applicant.					

List of equipment used during the test

Conducted Measurements

Test system Rohde & Schwarz TS 8997:

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1039	Signal analyzer Rohde & Schwarz FSV40	2018/10	2020/10
1009	RF generator Rohde & Schwarz SMB100A	2019/08	2021/08
1042	RF generator Rohde & Schwarz SMBV100A	2018/01	2021/01
101	Climatic chamber Espec	2019/01	2020/01

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	LAST CALIBRATION	NEXT CALIBRATION
1179	Semi anechoic Absorber Lined Chamber Frankonia SAC 3 plus "L"	N/A	N/A
1064	BiconicalLog antenna ETS LINDGREN 3142E	2017/03	2020/03
1057	Double-ridge Waveguide Horn antenna 1-18 GHz	2017/03	2020/03
1056	Double-ridge Waveguide Horn antenna 18-40 GHz	2017/03	2020/03
1012	Rohde & Schwarz EMI Test Receiver ESR26	2018/09	2020/09
1014	Rohde & Schwarz Spectrum analyzer FSV40	2019/04	2021/04
0981	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA 0118-2A	2018/10	2020/10
0982	RF pre-amplifier 1-18 GHz Bonn Elektronik BLMA1840-1M	2018/10	2020/10

Appendix A: Product Information

Product Information

The following information is provided by the client

Information	Description
Equipment type	WIFI 5GHz
DFS Operating Mode	Slave without Radar Detection
TPC Function	Not Supported ¹
Antenna Specification	BT/WLAN Automotive Chip Antenna
Operating Frequency Range	5150 - 5250 MHz / 5250 - 5350 MHz / 5470 -5725 MHz / 5725 – 5850 MHz
Nominal Channel Bandwidth	20 MHz, 40 MHz
Max. RF Output Power	18.5 dBm
Antenna type	Dedicated antenna (single)
Antenna gain	0 dBi
Supply Voltage	13.5 Vdc
Transmit Data Rate:	IEEE 802.11a: 6, 9, 12, 18, 24, 36, 48, 54 Mbps IEEE 802.11n HT20: 7.2, 14.4, 21.7, 28.9, 43.3, 57.8, 65, 72.2 Mbps IEEE 802.11n HT40: 15, 30, 45, 60, 90, 120, 135, 150 Mbps
Geo-location capability	No

1. TPC not required if Max EIRP < 500mW (27 dBm)

Appendix B: Test results 5.15 GHz – 5.25 GHz Band

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DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01 ⁽¹⁾ (a mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 13.5 \text{ Vdc}$ <u>Test Frequencies for Conducted/Radiated tests: (20 MHz)</u> Lowest range: 5180 MHz Middle channel: 5200 MHz Highest range: 5240 MHz
TC#02 ⁽¹⁾ (n mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 13.5 \text{ Vdc}$ <u>Test Frequencies for Conducted/Radiated tests: (20 MHz)</u> Lowest channel: 5180 MHz Middle channel: 5200 MHz Highest channel: 5240 MHz <u>Test Frequencies for Conducted/Radiated tests: (40 MHz)</u> Lowest channel: 5190 MHz Highest channel: 5230 MHz

Note (1): For spurious emissions for OFDM modes 802.11a, 802.11n20 and 802.11n40 a preliminary scan was performed to determine the worst case.

The data rates of 6Mb/s for 802.11a and MCS0 for 802.11n40 were selected based on preliminary testing that identified those rates corresponding to the worst cases.

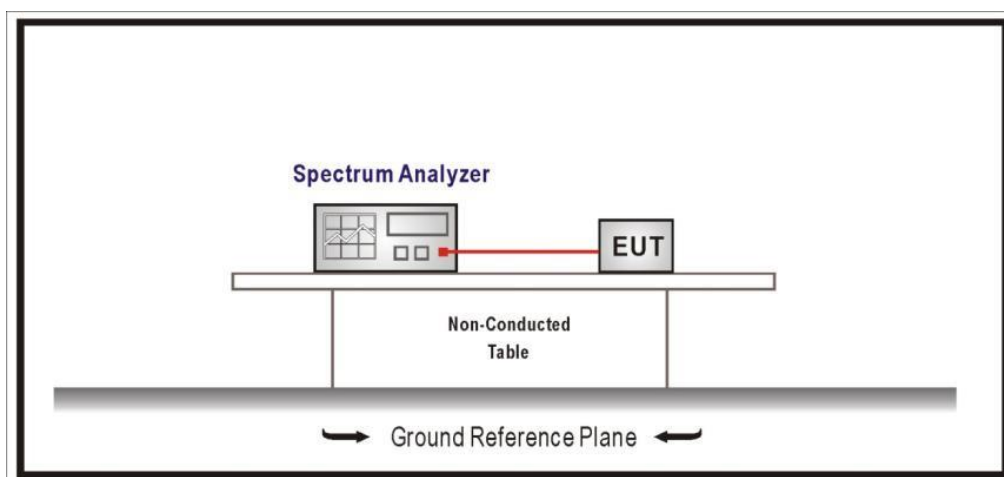
TEST B.1: 26DB EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

LIMITS:

Product standard:	Part 15 Subpart C §15.403 and RSS-247
Test standard:	Part 15 Subpart C §15.403 and RSS-247 6.2.1

No requirements requested

TEST SETUP:



TESTED SAMPLES:

S/01

TESTED CONDITIONS MODES:

TC#01 (a mode)

TEST RESULTS:

PASS

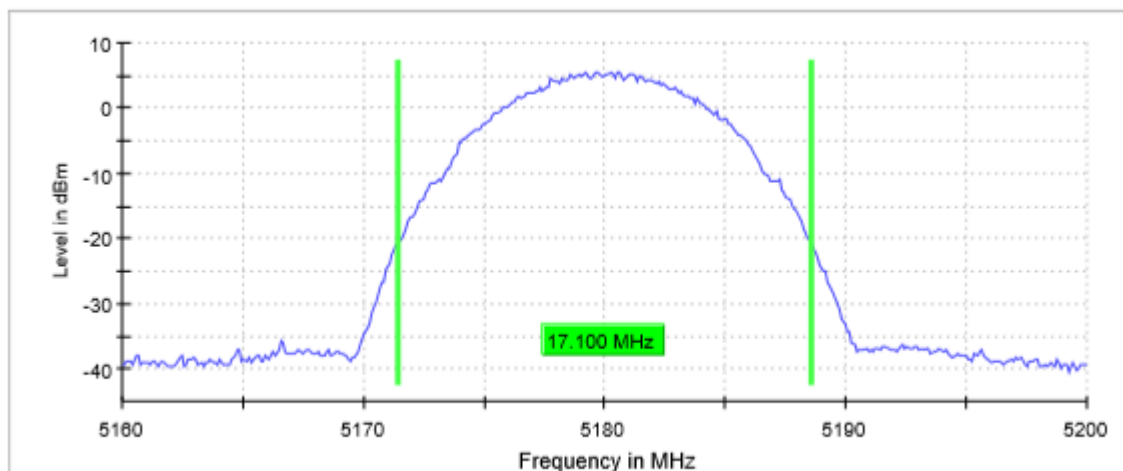
Bandwidth: 20 MHz

	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
26dB Bandwidth (MHz)	17.100	17.300	17.200
Occupied bandwidth (MHz)	13.000	13.000	13.000
Measurement uncertainty (kHz)	<± 8.33		

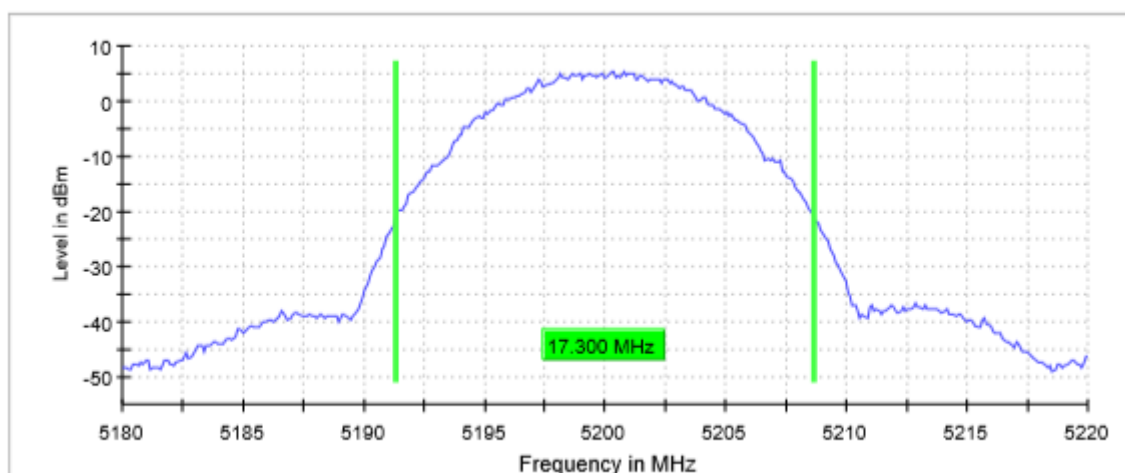
TEST RESULTS (Cont.):

26 dB BANDWIDTH

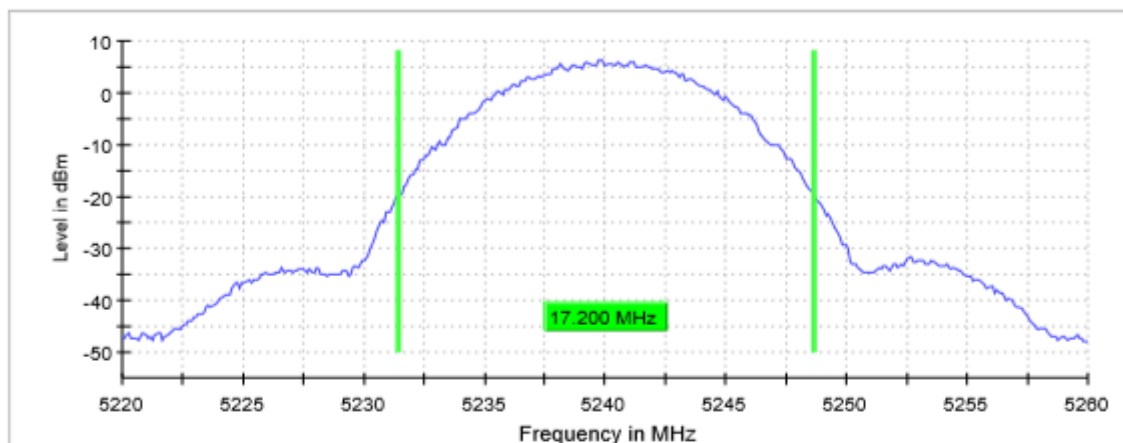
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)

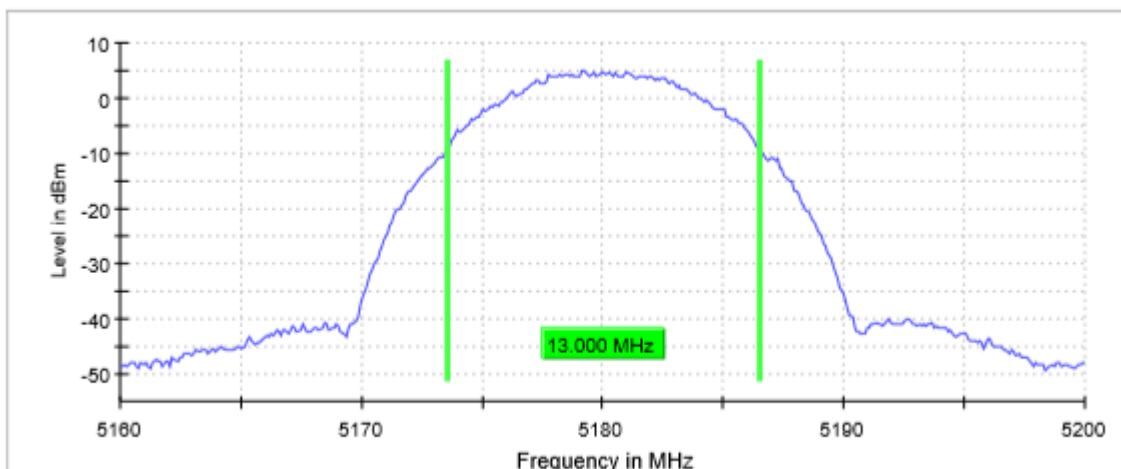
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.16000 GHz	5.18000 GHz	5.22000 GHz
Stop Frequency	5.20000 GHz	5.22000 GHz	5.26000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 KHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
SweepTime	28.477 μ s	28.477 μ s	28.477 μ s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
SweepType	FFT	FFT	FFT
Preamplifier	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	66 / max. 150	58 / max. 150	68 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.00 dB	0.17 dB

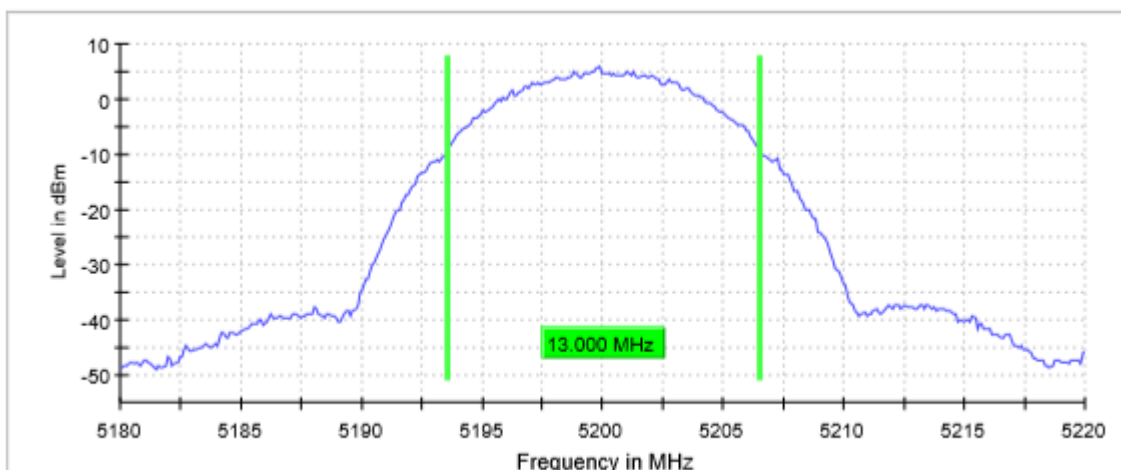
TEST RESULTS (Cont.):

OCCUPIED BANDWIDTH

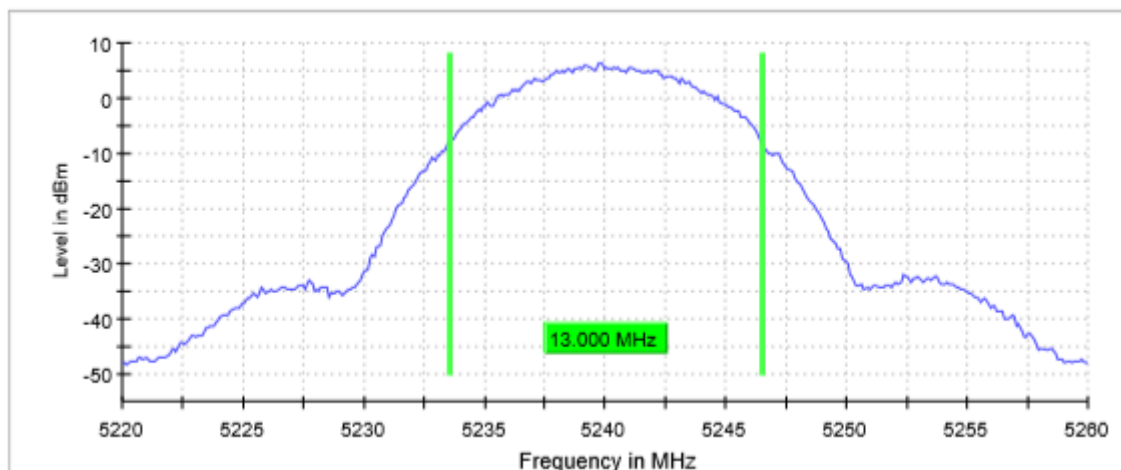
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.16000 GHz	5.18000 GHz	5.22000 GHz
Stop Frequency	5.20000 GHz	5.22000 GHz	5.26000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 KHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
SweepTime	28.477 μ s	28.477 μ s	28.477 μ s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweeptype	FFT	FFT	FFT
Preamplifier	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	40 / max. 150	51 / max. 150	68 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.20 dB	0.13 dB

TESTED SAMPLES:

S/01

TESTED CONDITIONS MODES:

TC#02 (n Mode 20 MHz)

TEST RESULTS:

PASS

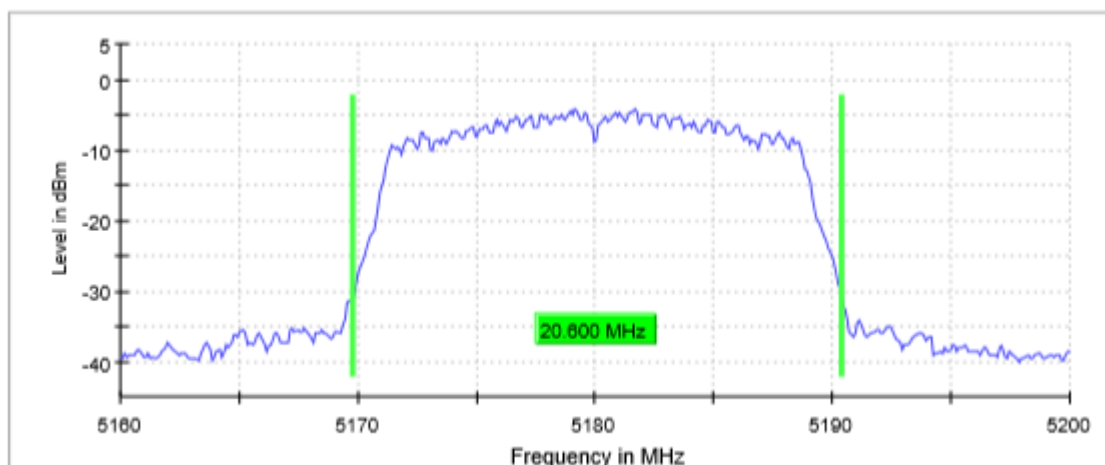
Bandwidth: 20 MHz

	Lowest frequency	Middle frequency	Highest frequency
	5180 MHz	5200 MHz	5240 MHz
26dB bandwidth (MHz)	20.600	20.600	22.600
Occupied bandwidth (MHz)	17.700	17.700	17.700
Measurement uncertainty (kHz)	< $\pm$ 8.33		

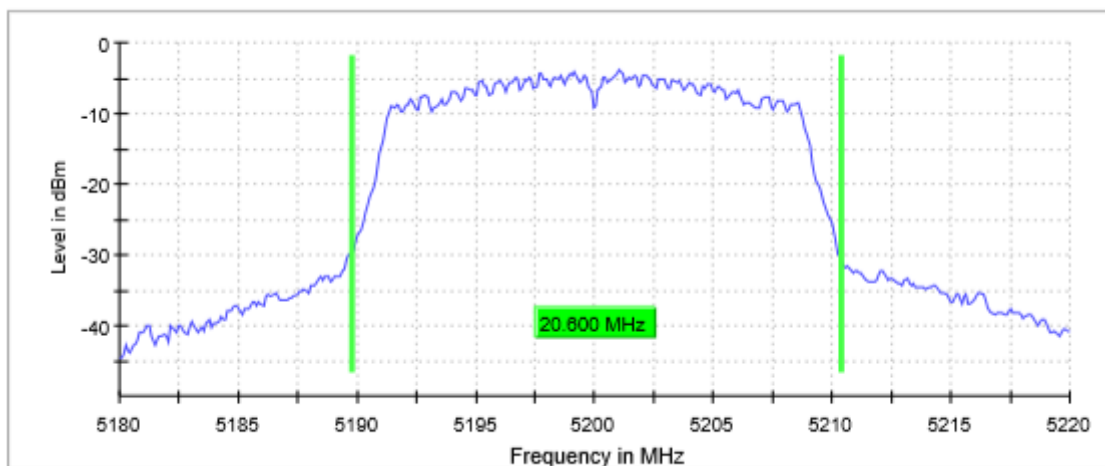
TEST RESULTS (Cont.):

26 dB BANDWIDTH

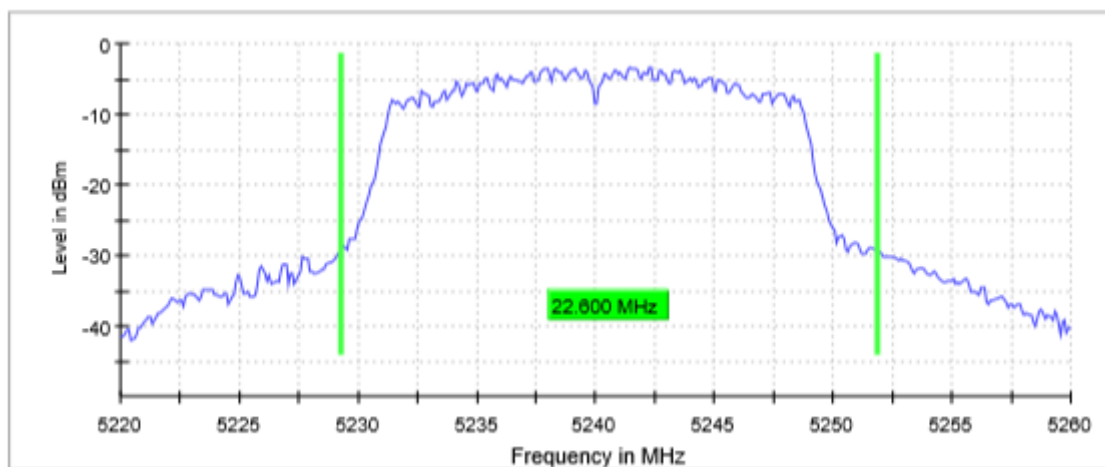
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)

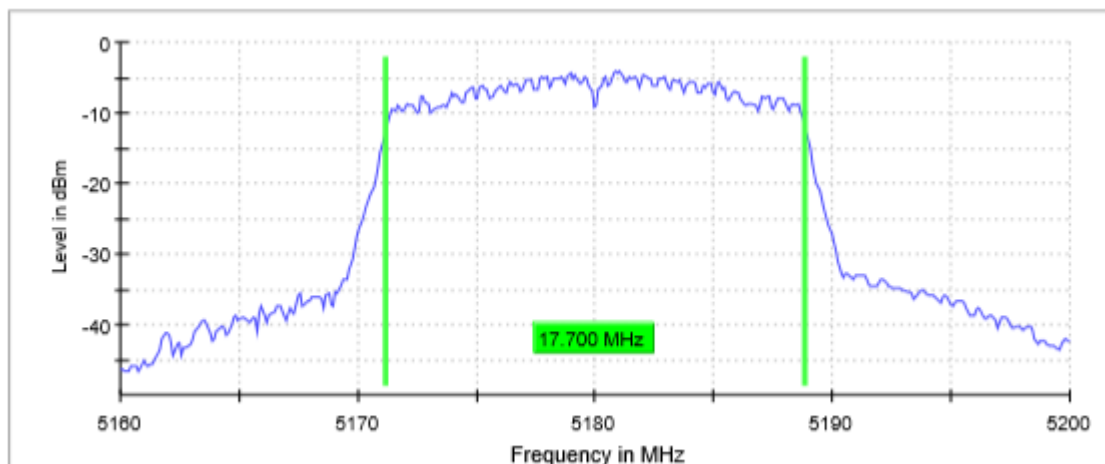
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.16000 GHz	5.18000 GHz	5.22000 GHz
Stop Frequency	5.20000 GHz	5.22000 GHz	5.26000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 kHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
Sweeptime	28.477 μ s	28.477 μ s	28.477 μ s
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB	40.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweeptype	FFT	FFT	FFT
Preamp	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	56 / max. 150	66 / max. 150	53 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.14 dB	0.18 dB	0.04 dB

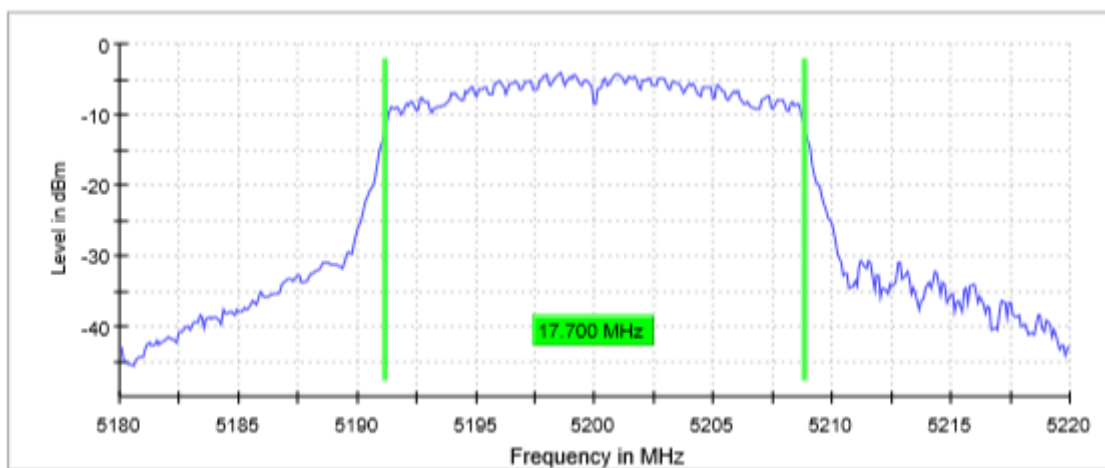
TEST RESULTS (Cont.):

OCCUPIED BANDWIDTH

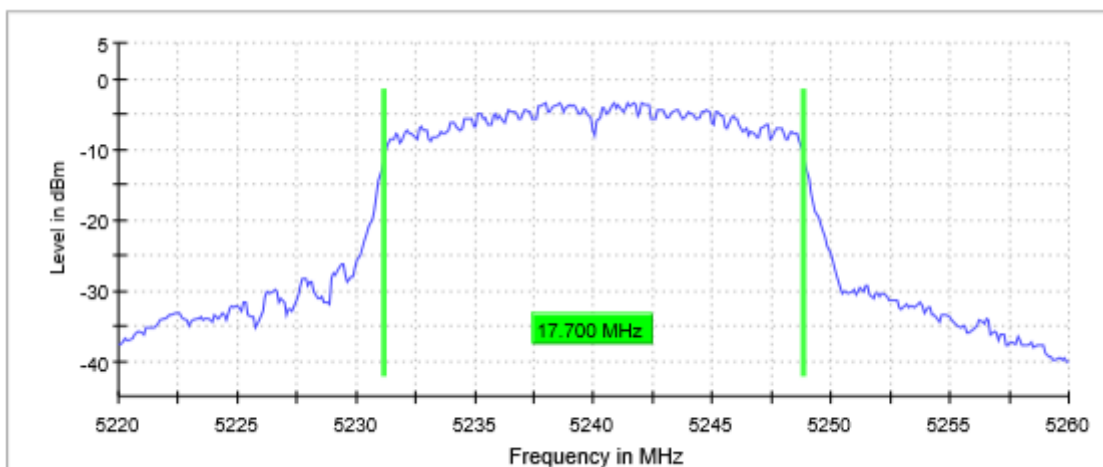
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)			
Measurement			
Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.16000 GHz	5.18000 GHz	5.22000 GHz
Stop Frequency	5.20000 GHz	5.22000 GHz	5.26000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 kHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
Sweeptime	28.477 μs	28.477 μs	28.477 μs
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweeptype	FFT	FFT	FFT
Preamp	off	off	Off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	85 / max. 150	61 / max. 150	67 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.00 dB	0.00 dB

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n Mode 40 MHz)
TEST RESULTS:	PASS

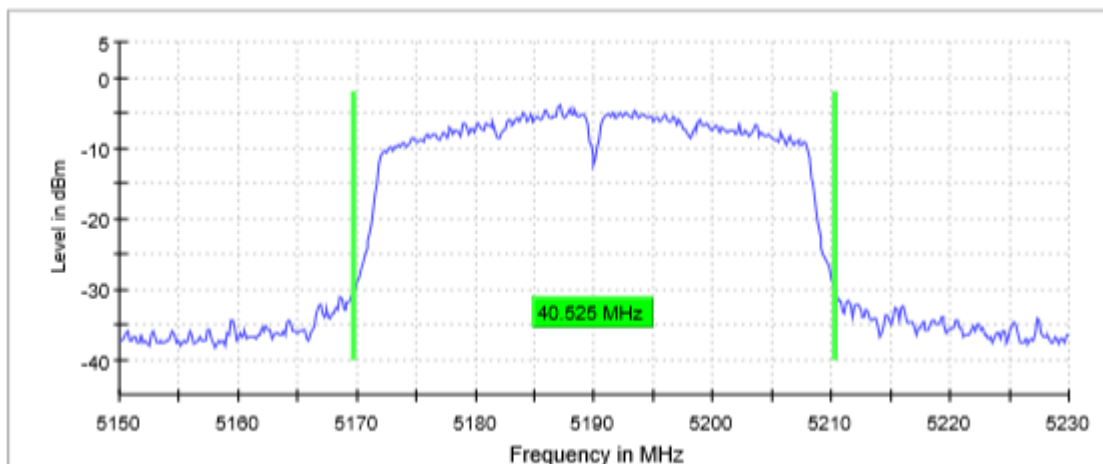
Bandwidth: 40 MHz

	Lowest frequency	Highest frequency
	5190 MHz	5230 MHz
26dB bandwidth (MHz)	40.525	40.525
Occupied bandwidth (MHz)	36.500	36.500
Measurement uncertainty (kHz)	<± 8.33	

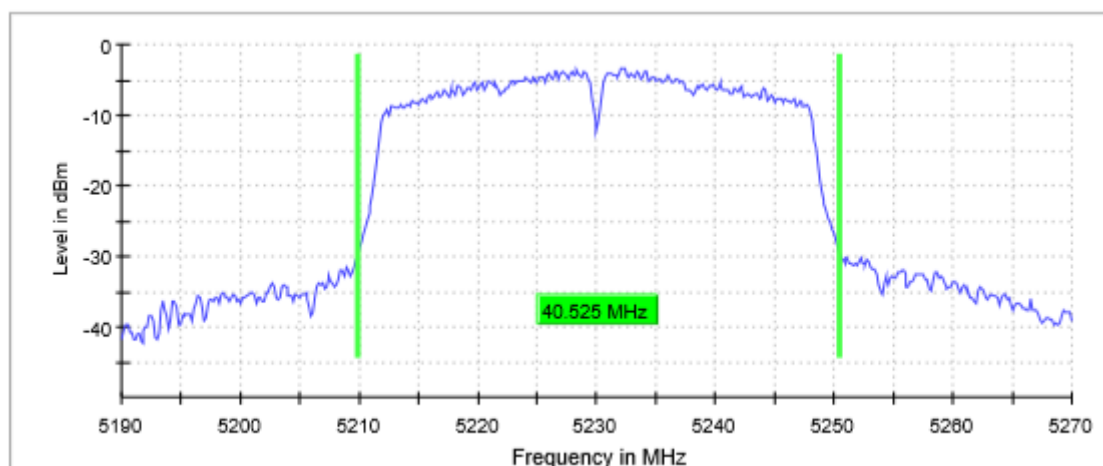
TEST RESULTS (Cont.):

26 dB BANDWIDTH

Lowest Channel



Highest Channel



TEST RESULTS (Cont.)

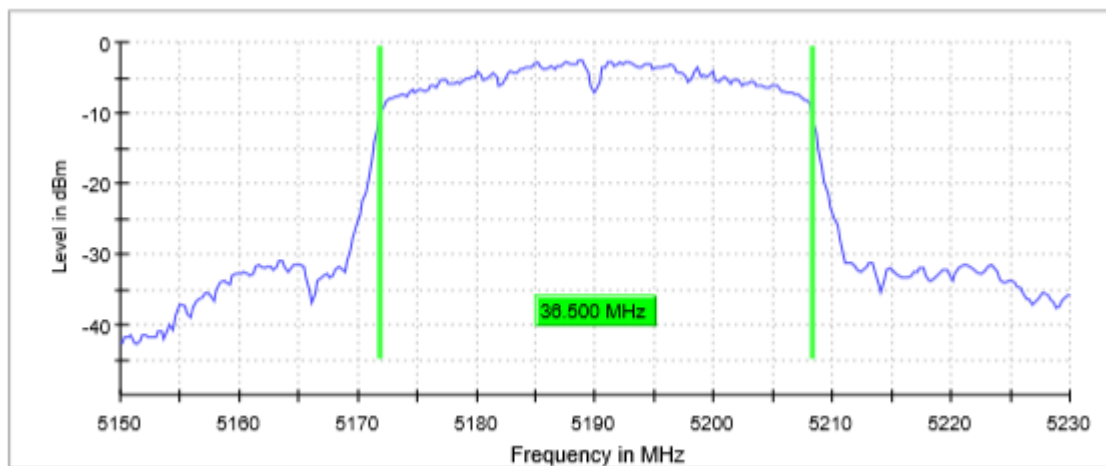
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.15000 GHz	5.19000 GHz
Stop Frequency	5.23000 GHz	5.27000 GHz
Span	80.000 MHz	80.000 MHz
RBW	300.000 kHz	300.000 kHz
VBW	1.000 MHz	1.000 MHz
SweepPoints	533	533
SweepTime	31.621 μ s	31.621 μ s
Reference Level	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	FFT
Preamp	off	Off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	74 / max. 150	104 / max. 150
Stable	5 / 5	5 / 5
Max Stable Difference	0.20 dB	0.00 dB

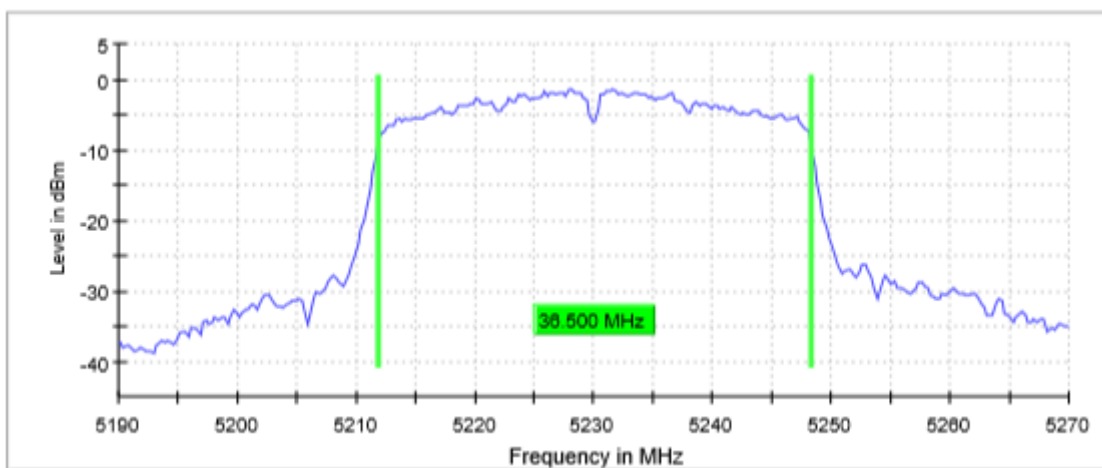
TEST RESULTS (Cont.):

OCCUPIED BANDWIDTH

Lowest Channel



Highest Channel



TEST RESULTS (Cont.)

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.15000 GHz	5.19000 GHz
Stop Frequency	5.23000 GHz	5.27000 GHz
Span	80.000 MHz	80.000 MHz
RBW	200.000 kHz	200.000 kHz
VBW	2.000 MHz	2.000 MHz
SweepPoints	320	320
Sweeptime	18.906 μ s	18.906 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	FFT
Preamplifier	off	Off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	69 / max. 150	118 / max. 150
Stable	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.00 dB

TEST B.2: POWER LIMITS. MAXIMUM OUTPUT POWER

LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(a) (1) (4) and RSS-247 6.2.1.1

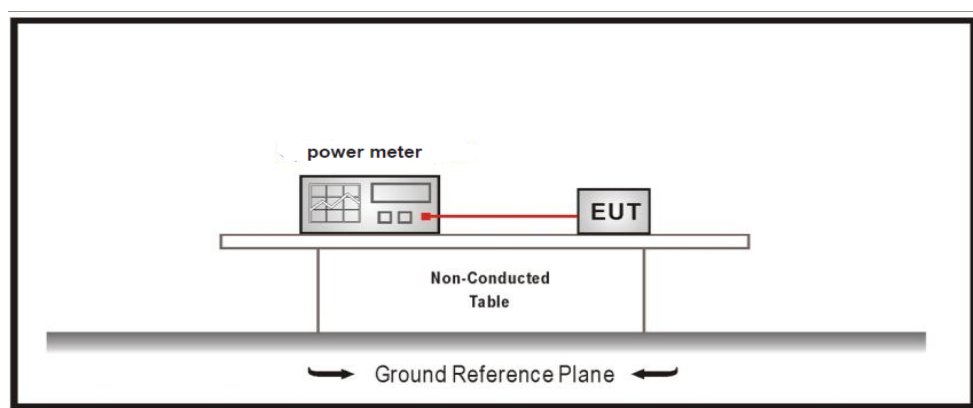
LIMITS

In band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST SETUP

Measured according to ANSI C63.10, Section 11.9.2.3.2 Method AVGPM-G

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (a mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

Maximum declared antenna gain: 0 dBi

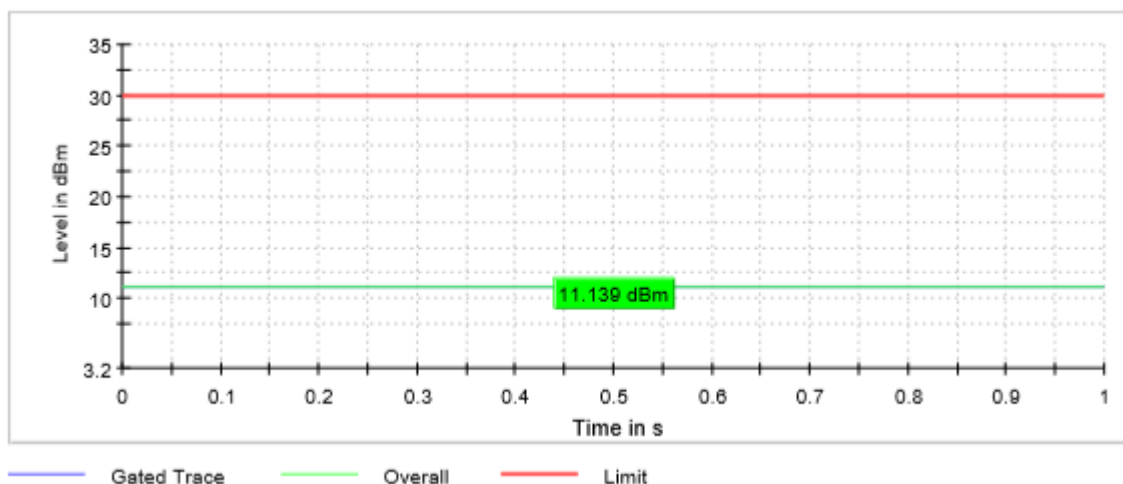
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Maximum conducted power (dBm)	11.1	11.1	11.7
Maximum EIRP power (dBm)	11.1	11.1	11.7
Measurement uncertainty (dB)	<±0.78		

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

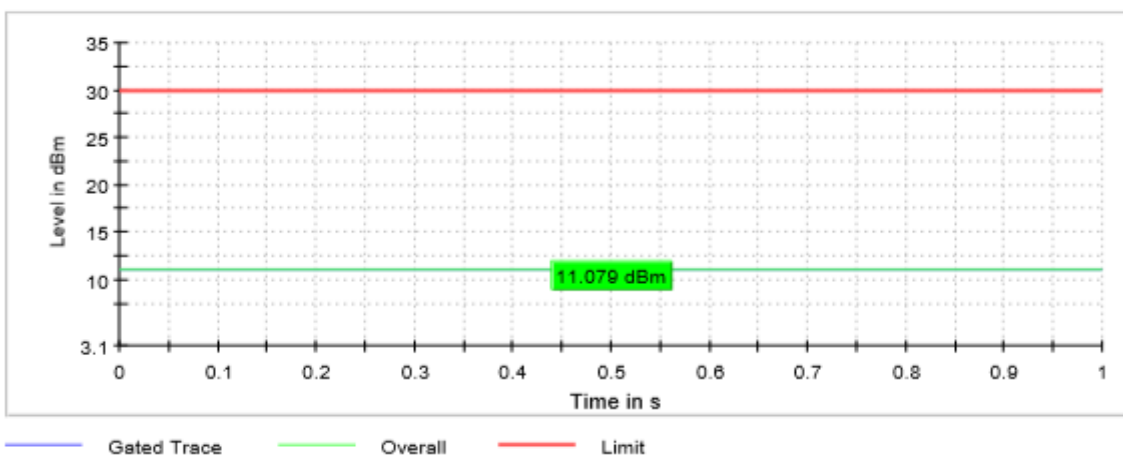
TEST RESULTS (Cont.):

CONDUCTED OUTPUT POWER

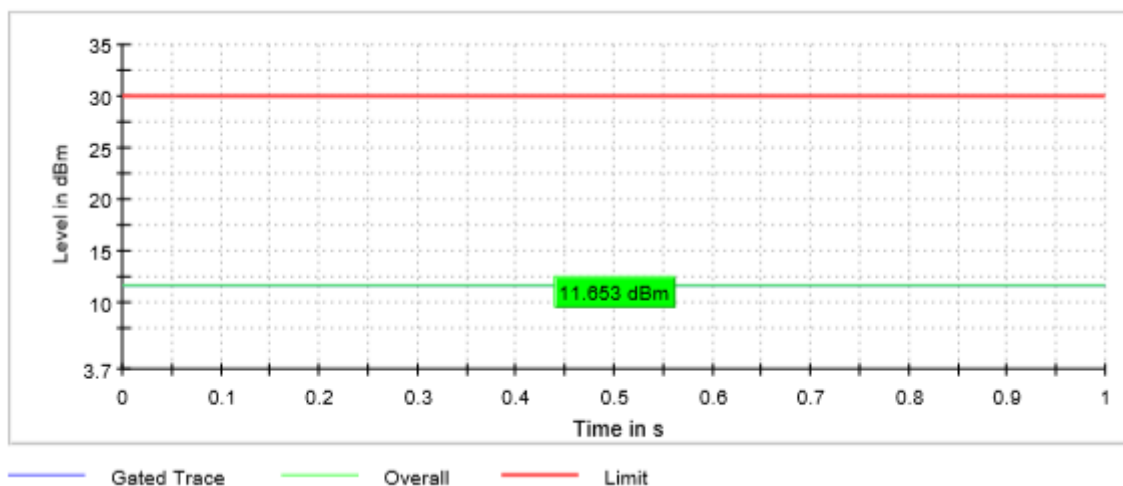
Lowest Channel



Middle Channel



Highest Channel



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 20 MHz)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

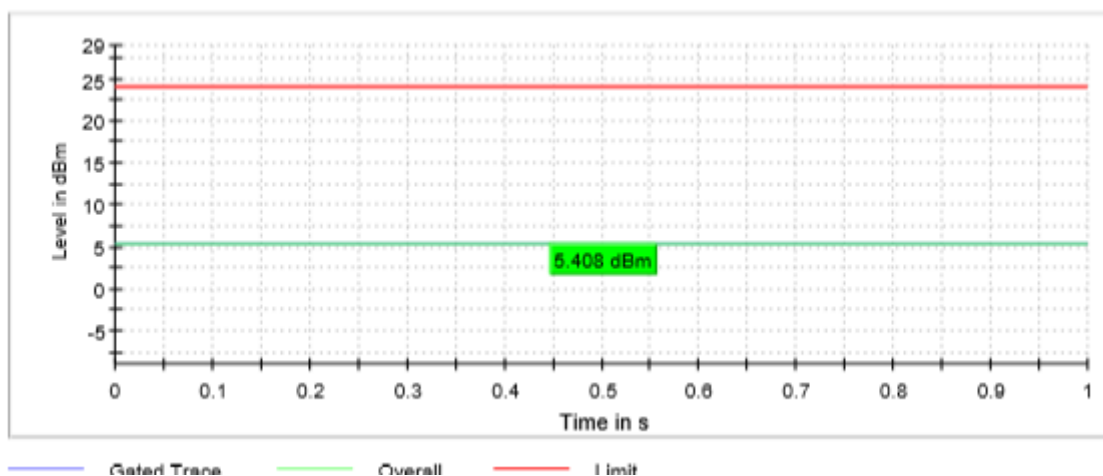
Maximum declared antenna gain: 0 dBi

	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Maximum conducted power (dBm)	5.4	7.9	6.4
Maximum EIRP power (dBm)	5.4	7.9	6.4
Measurement uncertainty (dB)	<±0.78		

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

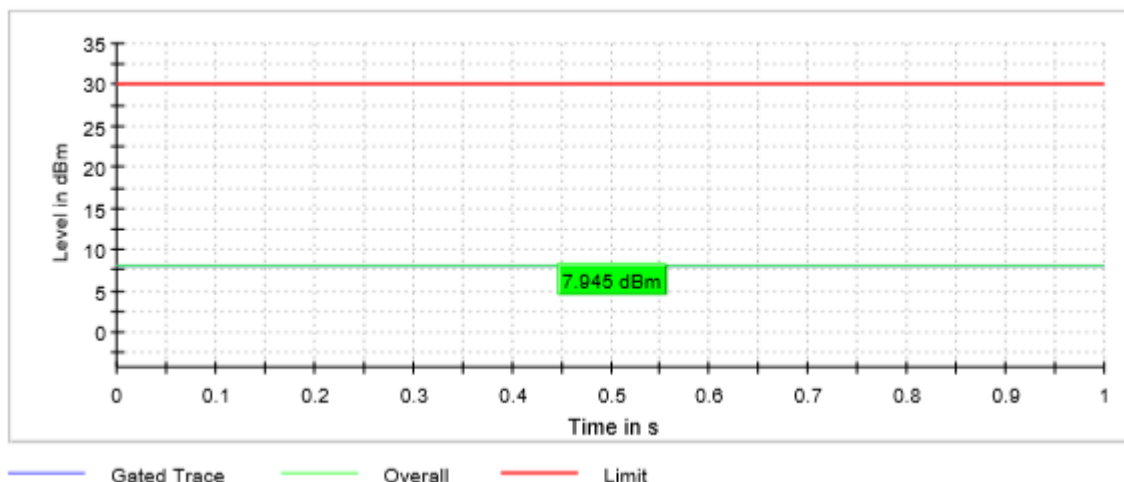
TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER
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Lowest Channel

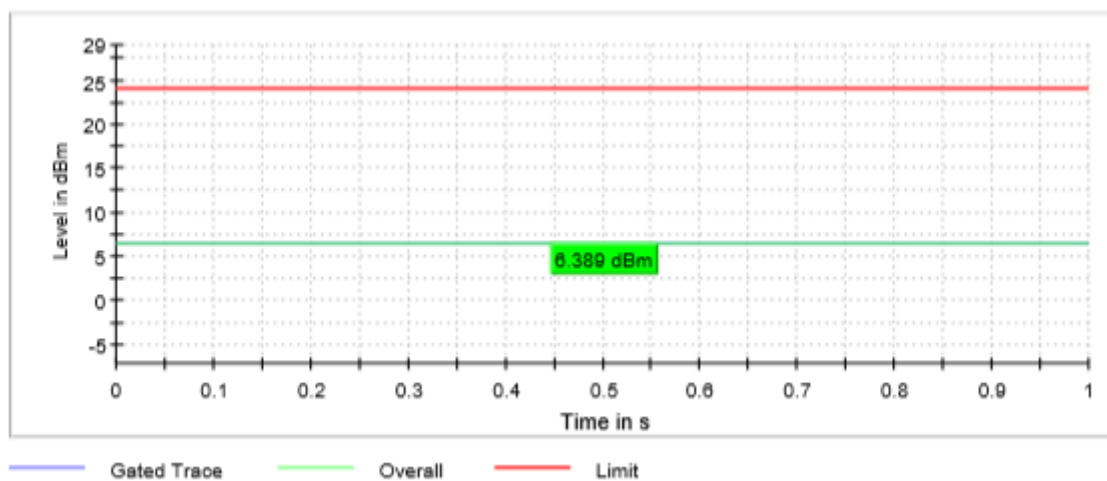


TEST RESULTS (Cont.)

Middle Channel



Highest Channel



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Bandwidth: 40 MHz

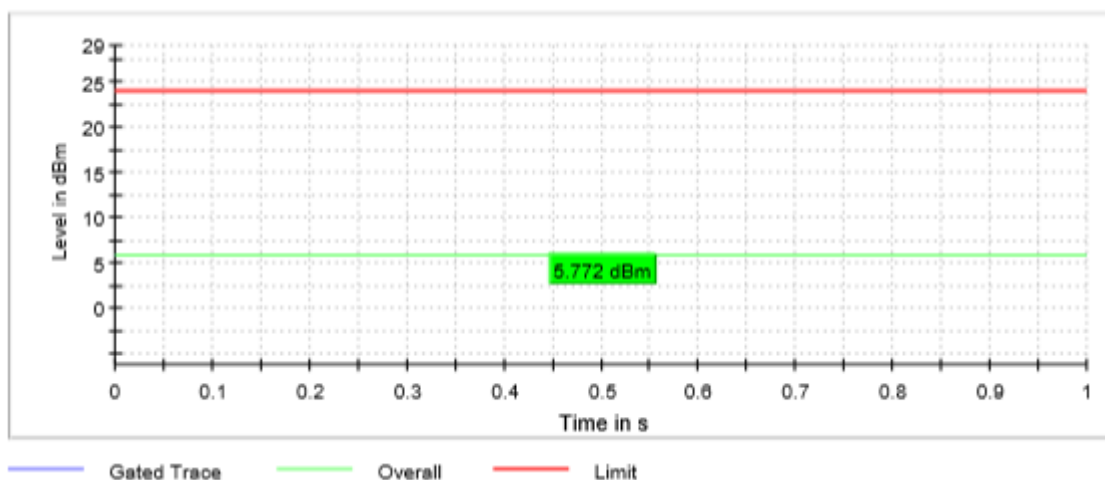
Maximum declared antenna gain: 0 dBi

	Lowest frequency 5190 MHz	Highest frequency 5230 MHz
Maximum conducted power (dBm)	5.8	6.7
Maximum EIRP power (dBm)	5.8	6.7
Measurement uncertainty (dB)	<±0.78	

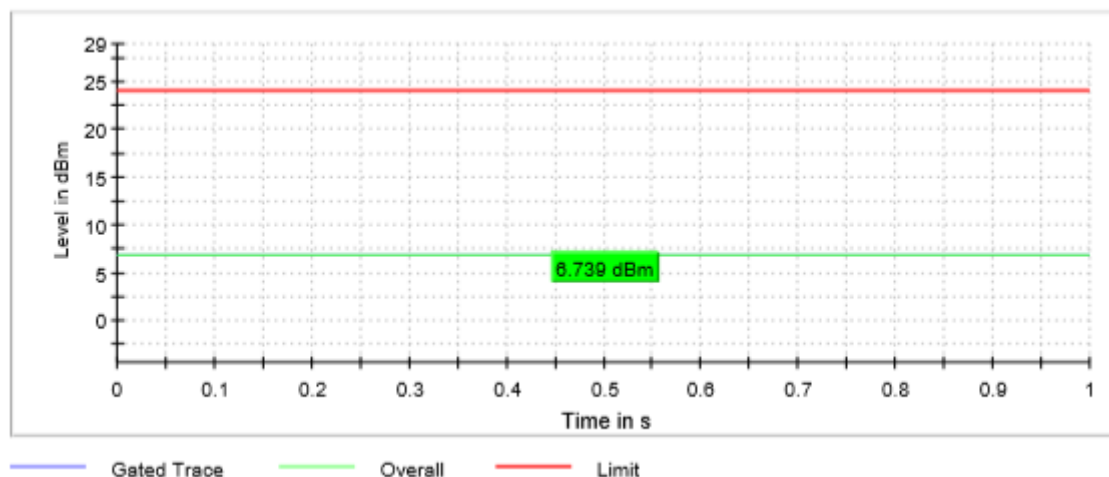
The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER
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Lowest Channel



Highest Channel



TEST B.3: POWER SPECTRAL DENSITY

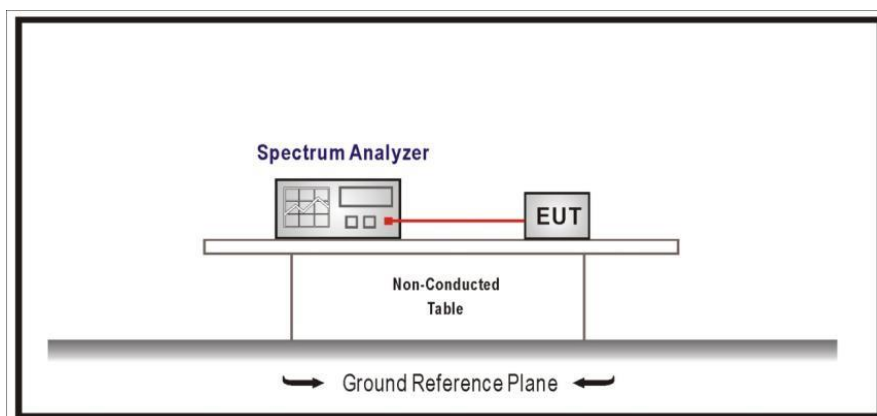
LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(a) (1) (5) and RSS-247 6.2.1.1

LIMITS

In the band 5.15-5.25 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST SETUP

For all modes, the maximum power spectral density level in the fundamental emission was measured using the method according to point F) (Method SA-1) of Guidance 789033 D02 General UNII Test Procedures New Rules v01.



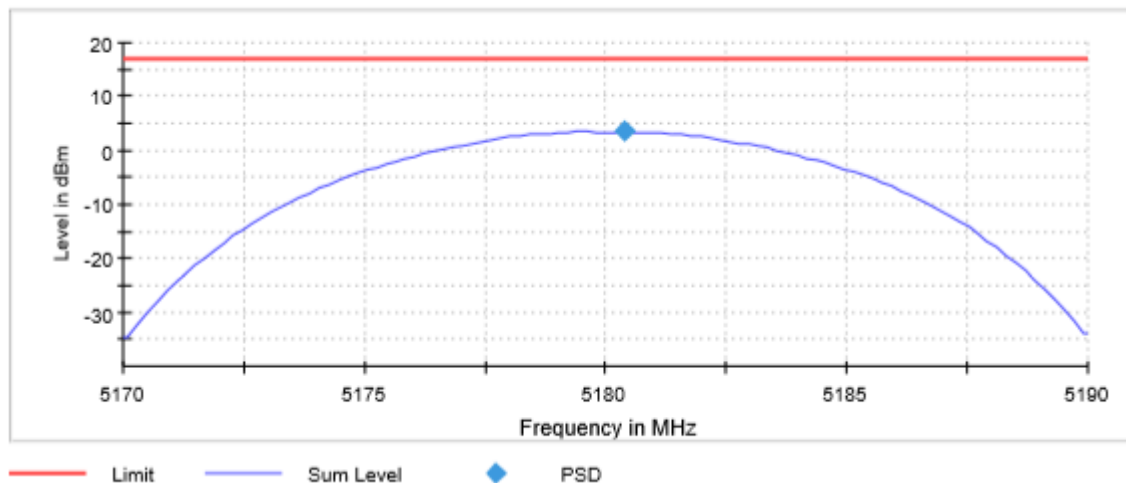
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (a mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

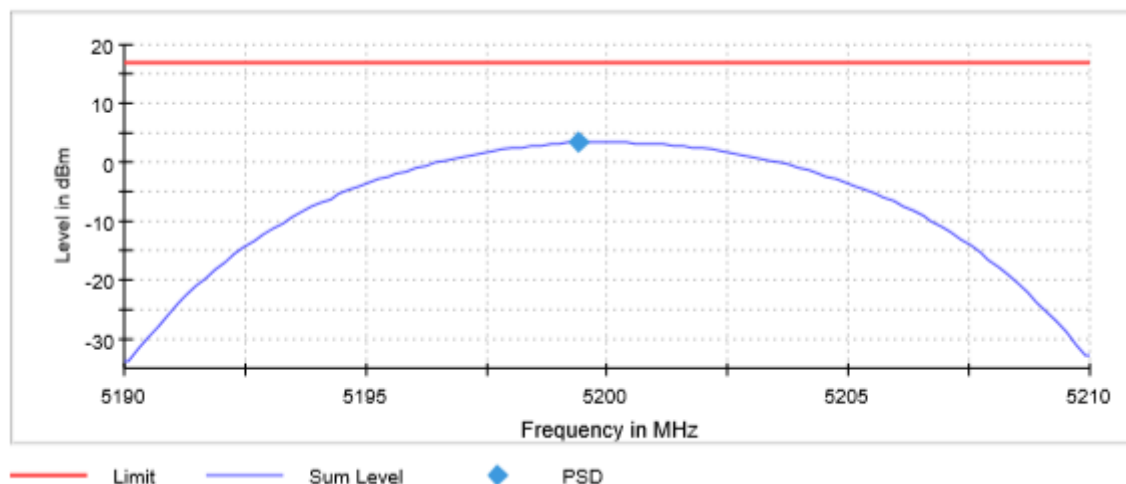
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Power spectral density (dBm)	3.476	3.405	4.012
Measurement uncertainty (dB)	<±0.78		

TEST RESULTS (Cont.):

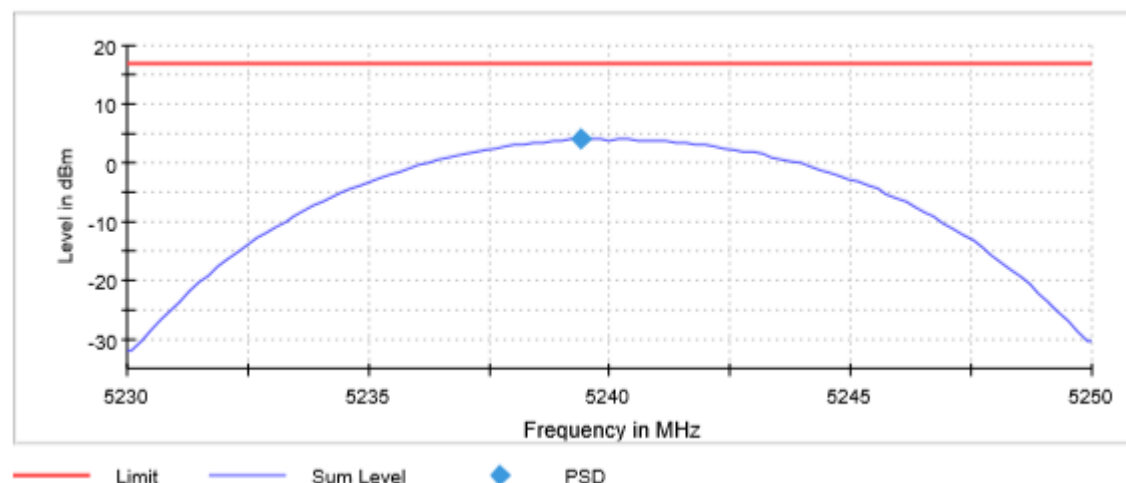
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.17000 GHz	5.19000 GHz	5.23000 GHz
Stop Frequency	5.19000 GHz	5.21000 GHz	5.25000 GHz
Span	20.000 MHz	20.000 MHz	20.000 MHz
RBW	1.000 MHz	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz	3.000 MHz
SweepPoints	101	101	101
SweepTime	2.020 s	2.020 s	2.020 s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	RMS	RMS	RMS
SweepCount	29703	29703	29703
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
SweepType	Sweep	Sweep	Sweep
Preamplifier	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	4 / max. 15	4 / max. 15	4 / max. 15
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.00 dB	0.00 dB

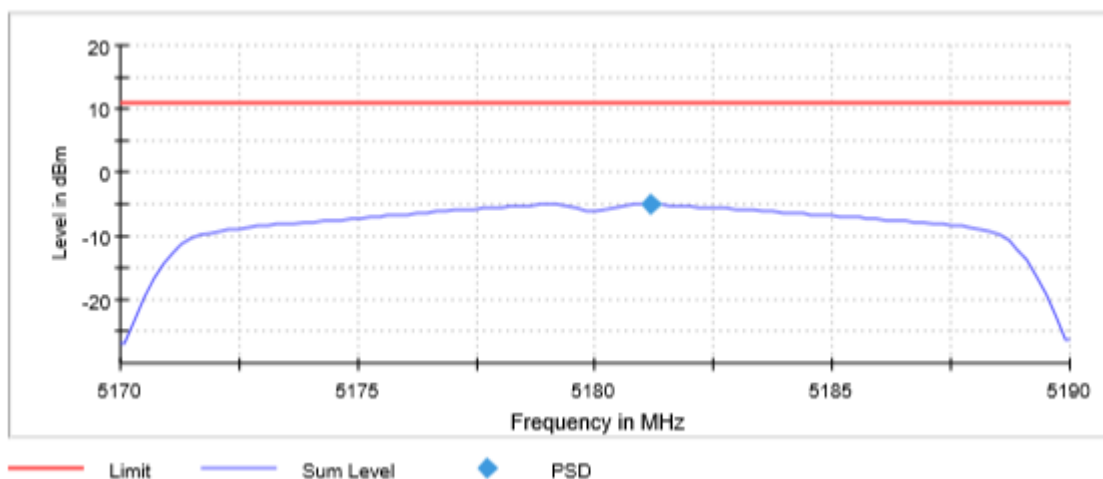
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 20 MHz)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

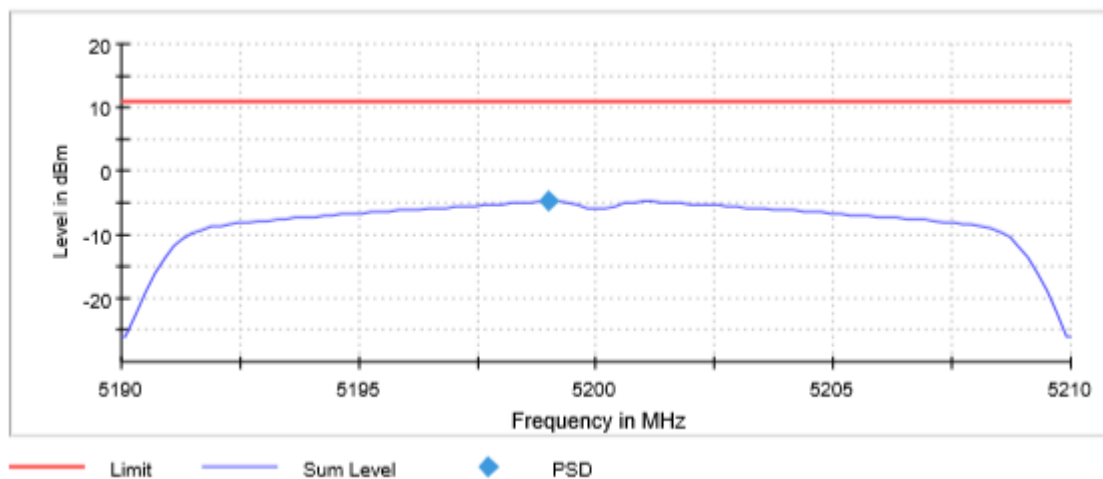
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Power spectral density (dBm)	-4.978	-4.770	-3.952
Measurement uncertainty (dB)	<±0.78		

TEST RESULTS (Cont.):	
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Lowest Channel

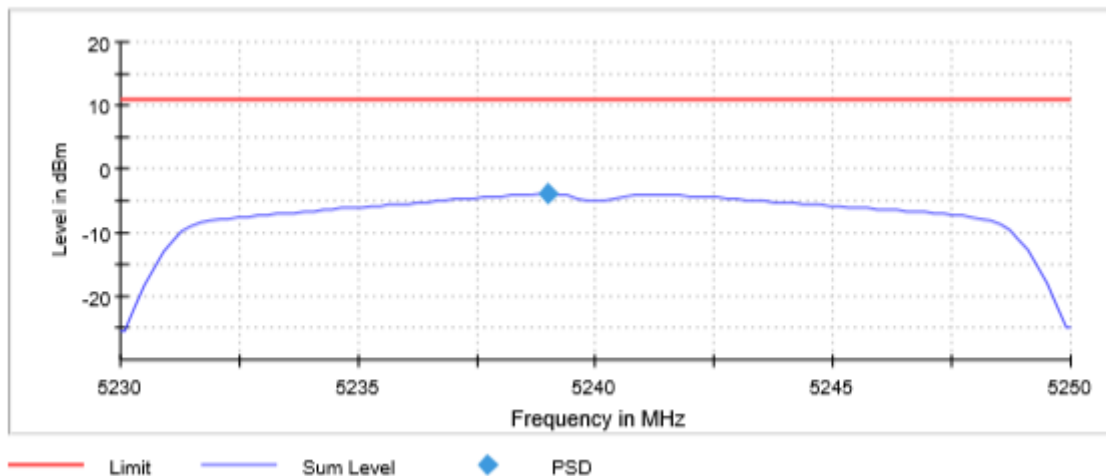


Middle Channel



TEST RESULTS (Cont.):

Highest Channel



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.17000 GHz	5.19000 GHz	5.23000 GHz
Stop Frequency	5.19000 GHz	5.21000 GHz	5.25000 GHz
Span	20.000 MHz	20.000 MHz	20.000 MHz
RBW	1.000 MHz	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz	3.000 MHz
SweepPoints	101	101	101
Sweeptime	2.020 s	2.020 s	2.020 s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	RMS	RMS	RMS
SweepCount	3	3	3
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
SweepType	Sweep	Sweep	Sweep
Preamp	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	4 / max. 15	4 / max. 15	4 / max. 15
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.01 dB	0.01 dB	0.002 dB

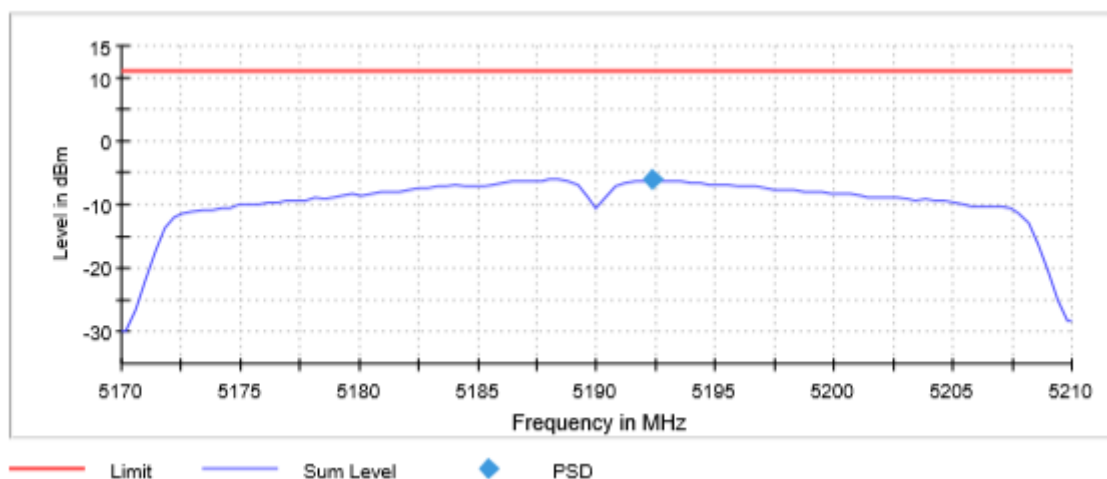
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Bandwidth: 40 MHz

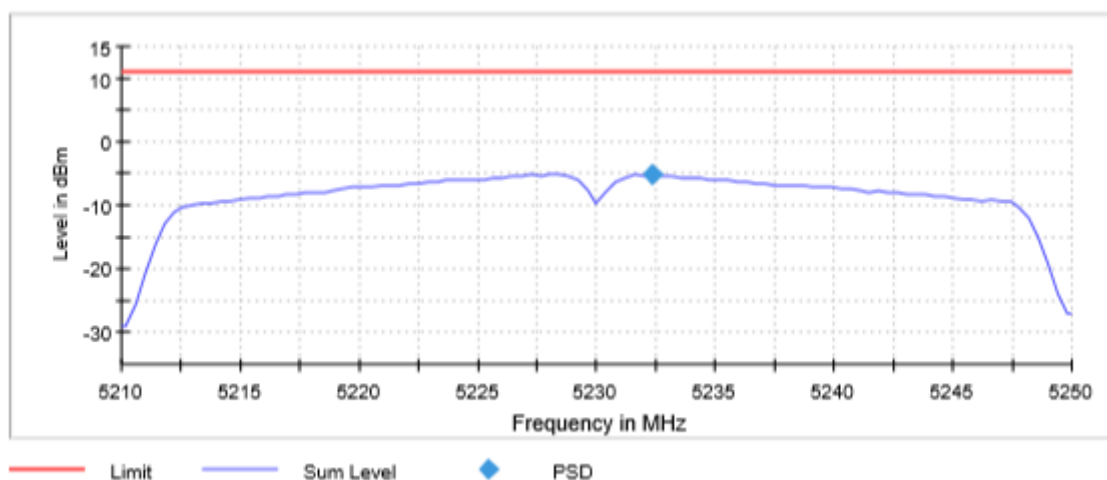
	Lowest frequency 5190 MHz	Highest frequency 5230 MHz
Power spectral density (dBm)	-6.095	-5.067
Measurement uncertainty (dB)	<±0.78	

TEST RESULTS (Cont.):	
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Lowest Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.17000 GHz	5.21000 GHz
Stop Frequency	5.21000 GHz	5.25000 GHz
Span	40.000 MHz	40.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	101	101
SweepTime	2.020 s	2.020 s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	RMS	RMS
SweepCount	29703	29703
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	Sweep	Sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 15	4 / max. 15
Stable	3 / 3	3 / 3
Max Stable Difference	0.09 dB	0.27 dB

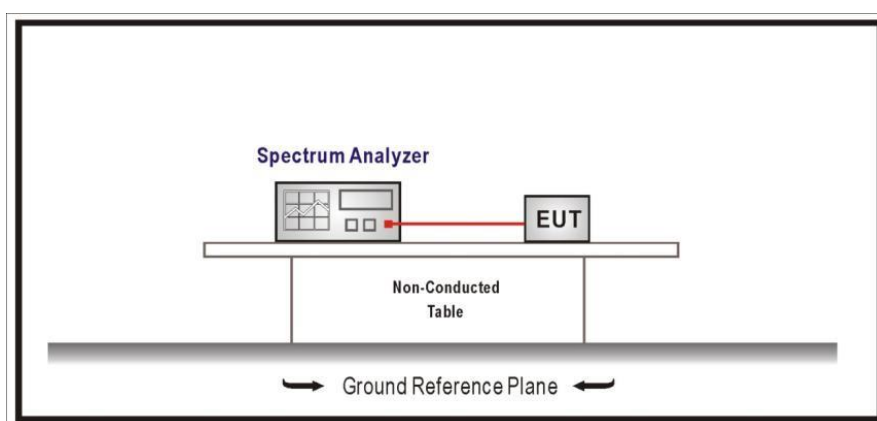
TEST B.4: BAND-EDGE EMISSIONS COMPLIANCE (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(b)(1) and RSS-247 6.2.1.2

LIMITS

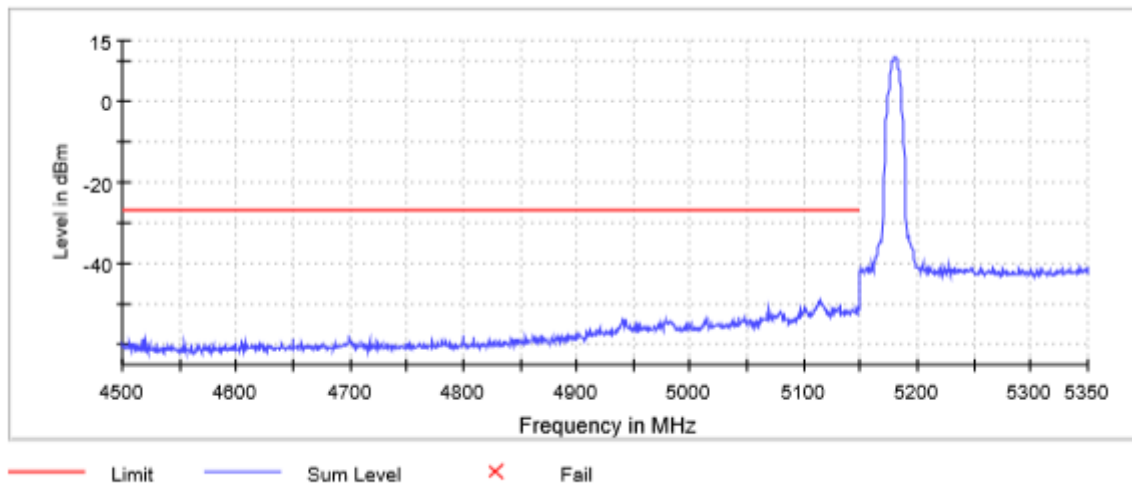
For transmitters operating in the 5.15 – 5.25 GHz band: all emissions outside the frequency band shall not exceed an EIRP of -27 dBm /MHz

TEST SETUP



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (a mode)
TEST RESULTS:	PASS

Lowest Channel



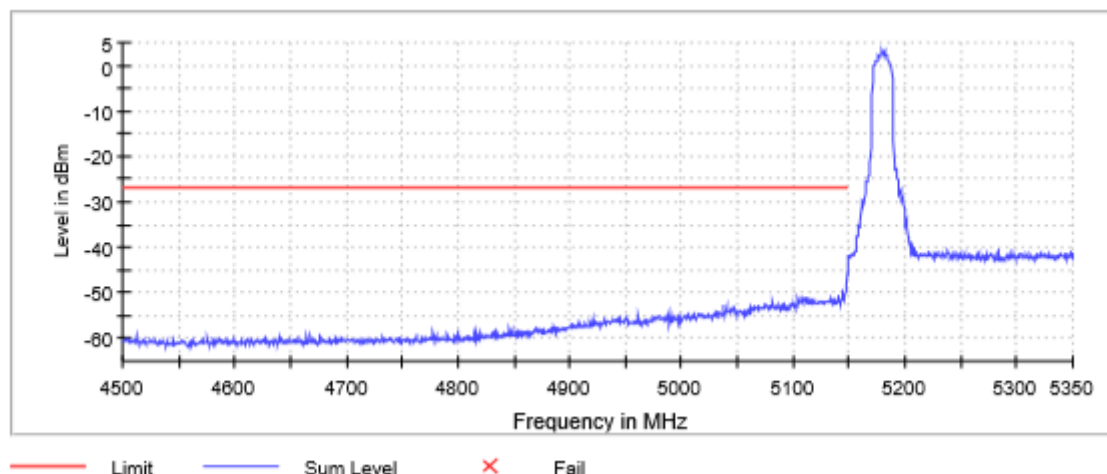
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	4.50000 GHz	5.15000 GHz
Stop Frequency	5.15000 GHz	5.35000 GHz
Span	650.000 MHz	200.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	1300	400
SweepTime	130.000 ms	40.000 ms
Reference Level	-10.000 dBm	10.000 dBm
Attenuation	10.000 dB	30.000 dB
Detector	Maxpeak	Maxpeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	sweep	sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	4 / max. 150	6 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.45 dB

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 20 MHz)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

Lowest Channel



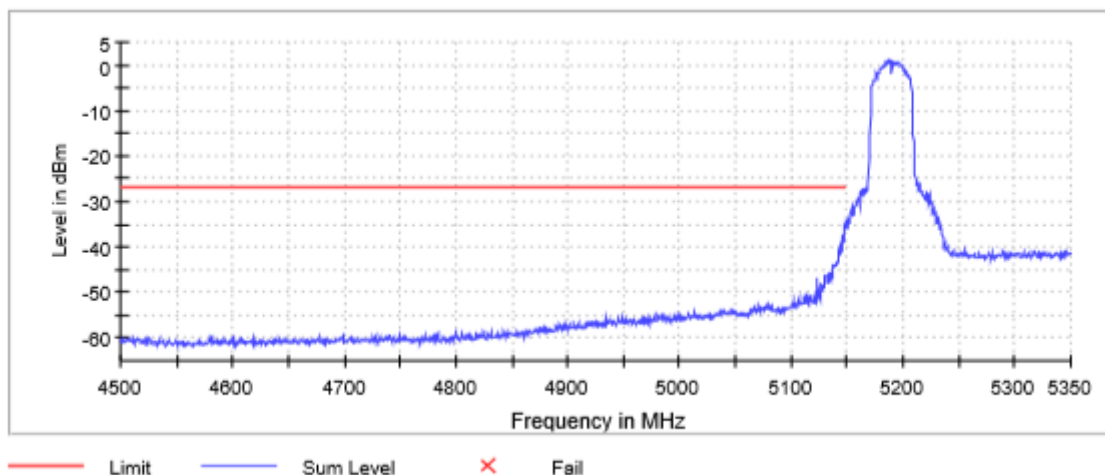
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	4.50000 GHz	5.15000 GHz
Stop Frequency	5.15000 GHz	5.35000 GHz
Span	650.000 MHz	200.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	1300	400
Sweeptime	130.000 ms	40.000 ms
Reference Level	-10.000 dBm	10.000 dBm
Attenuation	10.000 dB	30.000 dB
Detector	Maxpeak	Maxpeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	sweep	sweep
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	16 / max. 150	10 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.35 dB

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Bandwidth: 40 MHz

Lowest Channel



Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	4.50000 GHz	5.15000 GHz
Stop Frequency	5.15000 GHz	5.35000 GHz
Span	650.000 MHz	200.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	1300	400
Sweeptime	130.000 ms	40.000 ms
Reference Level	-10.000 dBm	10.000 dBm
Attenuation	10.000 dB	30.000 dB
Detector	Maxpeak	Maxpeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	sweep	sweep
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	15 / max. 150	19 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.44 dB

TEST B.5: UNDESIRABLE RADIATED EMISSIONS (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(b) (1)(6)(7) and RSS-247 6.2.1.2

LIMITS

For transmitters operating in the 5.15 – 5.25 GHz band: all emissions outside of the 5.15 – 5.25 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.23 dBμ V/m at 3m distance).

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at 3 m for the frequency range 30-1000 MHz (Bilog antenna) and at 1m for the frequency range 1-40 GHz (1 GHz-18 GHz and 18 GHz-40 GHz Double ridge horn antennas).

For radiated emissions in the range 1-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

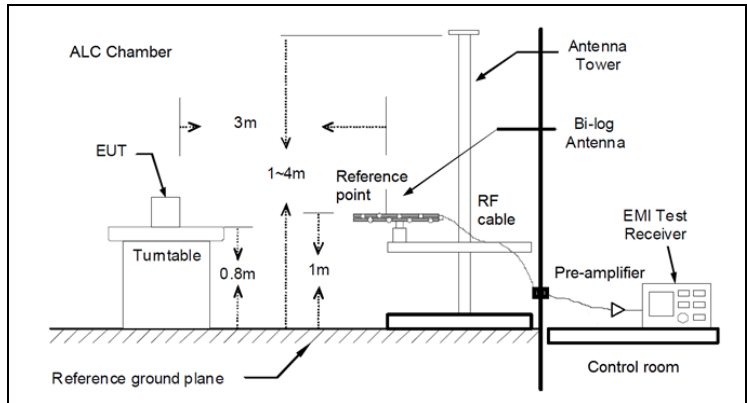
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

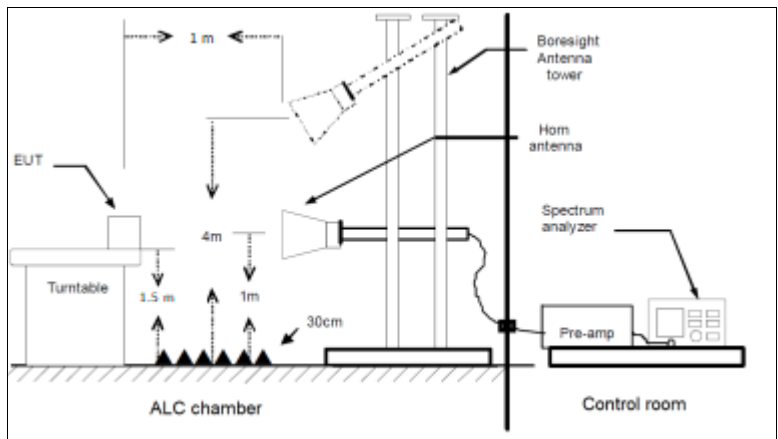
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

Radiated measurements Setup $f < 1$ GHz



Radiated measurements setup $f > 1$ GHz



TESTED SAMPLES:

S/02

TESTED CONDITIONS MODES:

TC#01 (a mode)

TEST RESULTS:

PASS

Frequency range 30 MHz – 1000 MHz

The spurious emissions below 1 GHz do not depend on the operating channel selected in the EUT. See worst operation mode of a mode 20 MHz at Mid channel for UNII-1 as a worst case.

The results and plots below show the maximum measured levels in 30-1000 MHz range

Frequency range 1 GHz – 40 GHz

The results and plots below show the maximum measured levels in the 1- 40 GHz range and the restricted band 4.5 – 5.15 GHz.

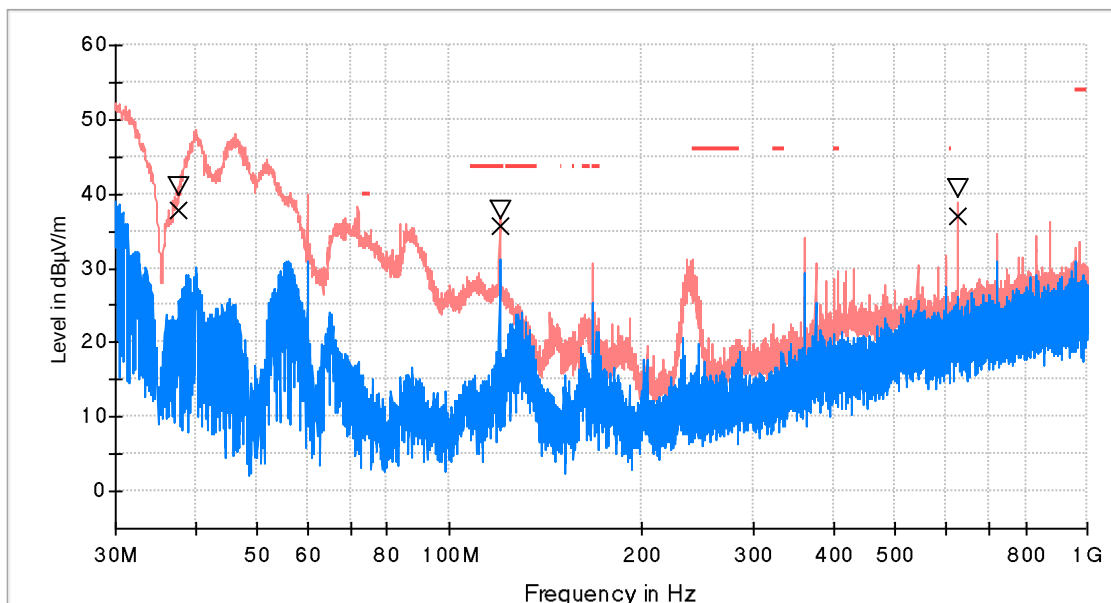
TEST RESULTS (Cont.)

FREQUENCY RANGE

30MHz -1000 MHz

Middle Channel

RF_FCC_15.407_E Field_30MHz_1GHz



- PK+_MAXH
- PK+_CLRWR
- TX limits to Spurious Emission FCC15.407 (30MHz to 1GHz) Restricted Bands QPK Limit
- ∇ MaxPeak-PK+ (Single)
- x QuasiPeak-QPK (Single)

Maximizations

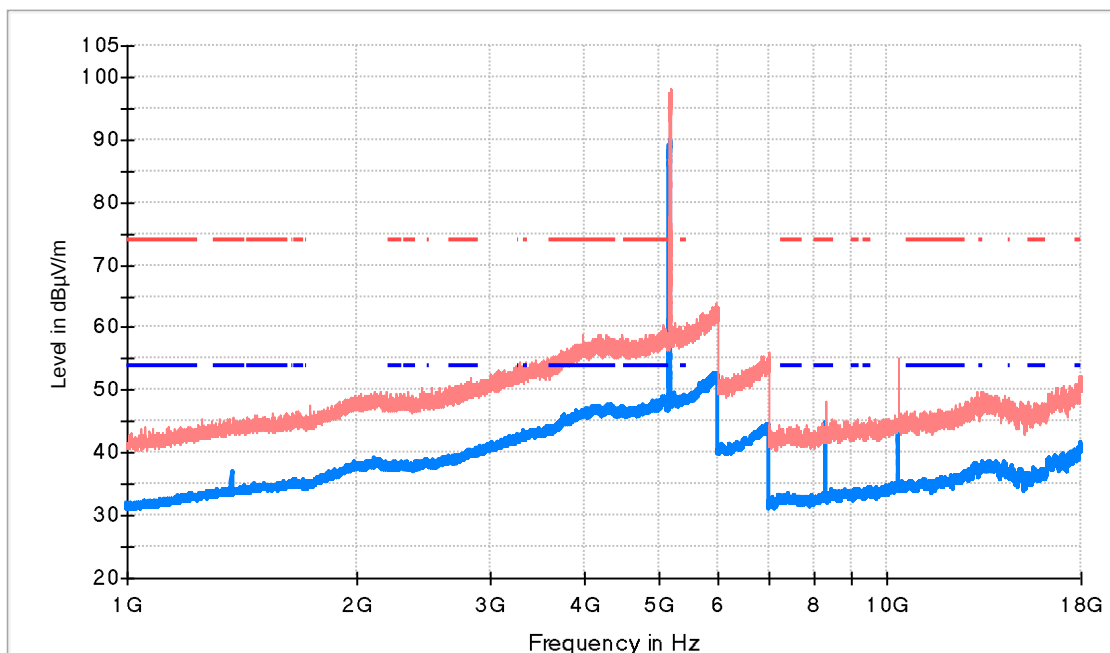
Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Azimuth (deg)
37.663000	41.0	37.8	V	-73.0
119.967500	37.9	35.8	V	160.0
624.998000	40.6	37.1	V	-180.0

TEST RESULTS (Cont.)

FREQUENCY RANGE

1 GHz – 18 GHz

Low Channel



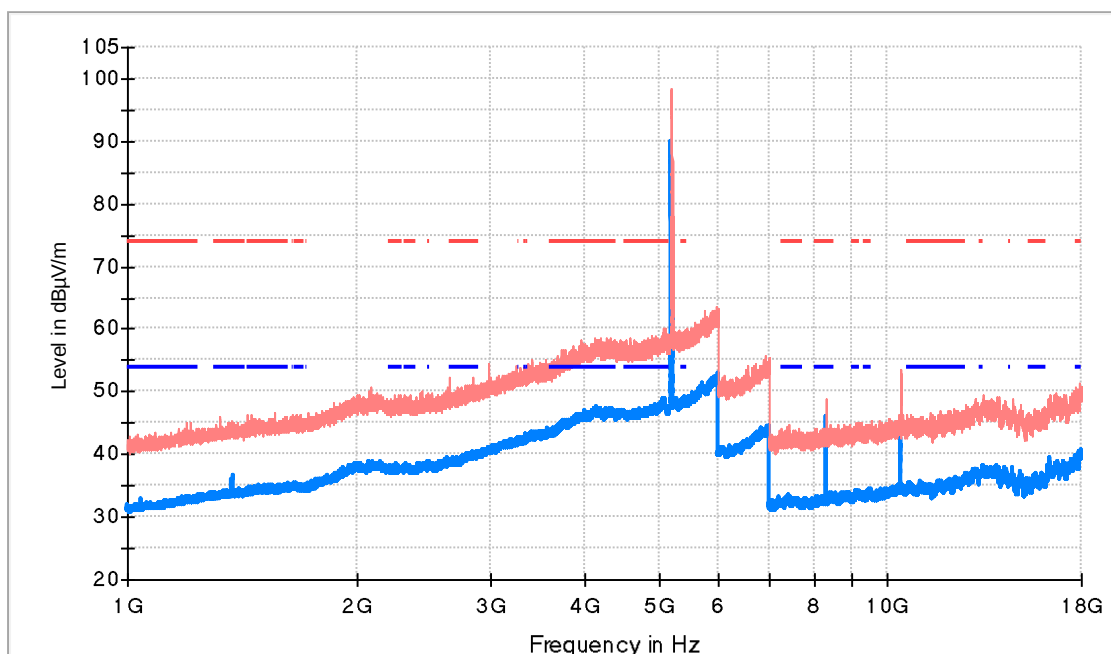
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1374.772727	45.7	37.0	V	
5181.136364	97.2	90.0	V	Fundamental
8287.636364	48.2	44.7	H	
10360.363636	53.0	43.6	H	

TEST RESULTS (Cont.)

Middle Channel



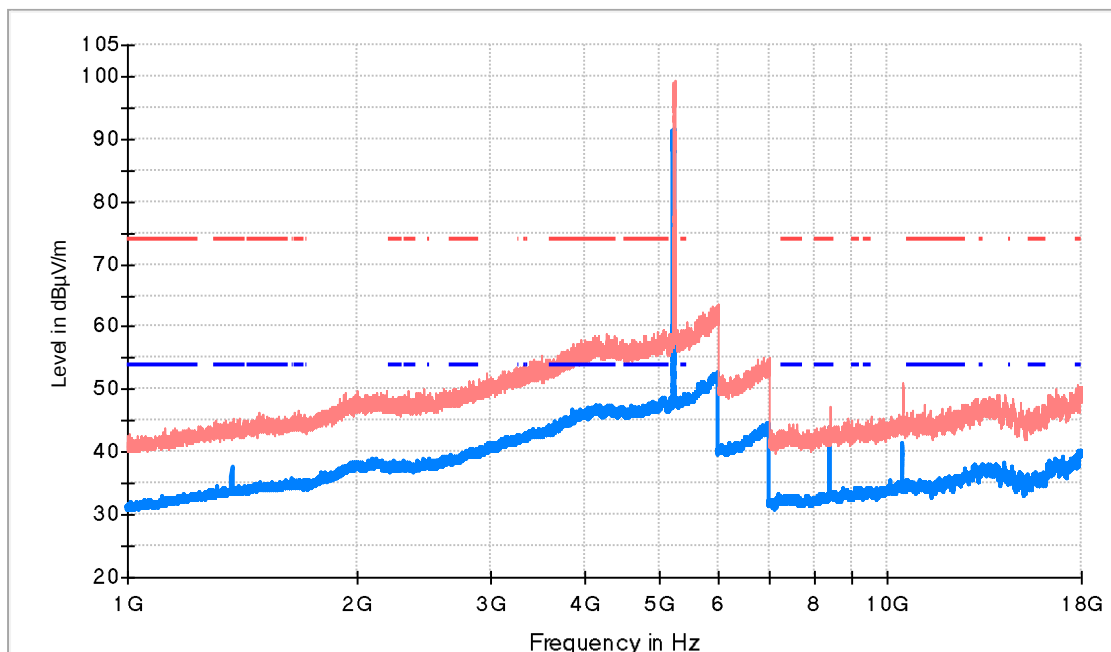
- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1375.227273	43.9	36.7	V	
5200.909091	96.8	90.0	V	Fundamental
8319.818182	48.8	46.0	H	
10398.000000	51.7	42.6	H	

TEST RESULTS (Cont.)

High Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

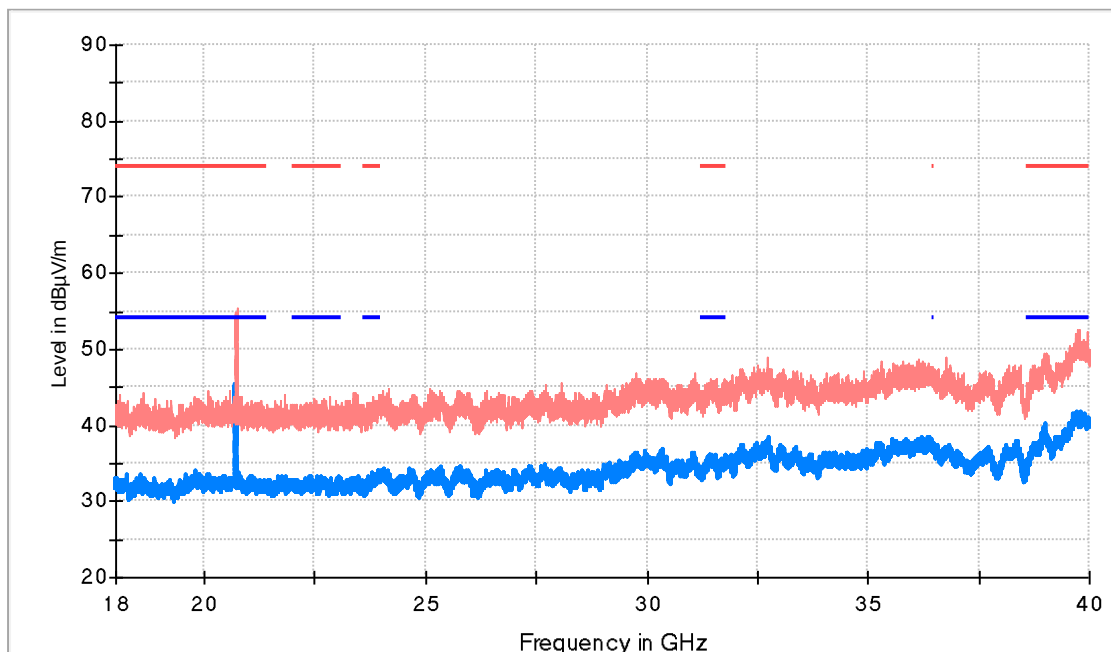
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1374.772727	45.5	37.6	H	
5241.363636	97.0	91.5	V	Fundamental
8383.636364	47.4	43.7	H	
10478.727273	49.0	41.5	H	

TEST RESULTS (Cont.)

18 – 40 GHz

Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

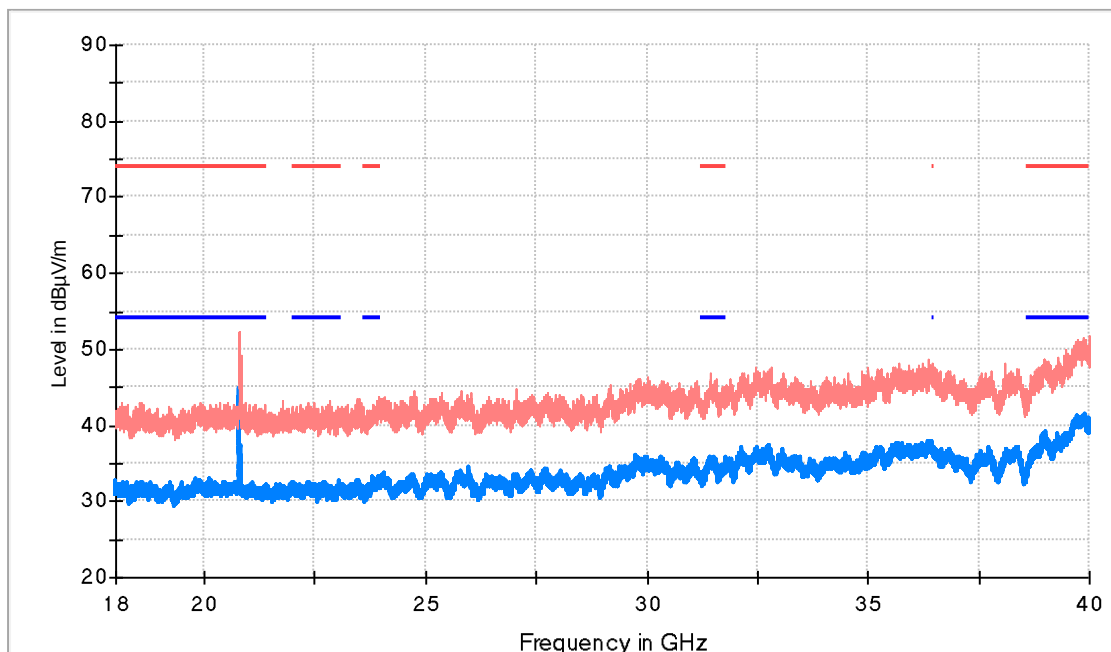
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol
20720.437500	53.8	45.3	H

TEST RESULTS (Cont.)

18 – 40 GHz

Middle Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

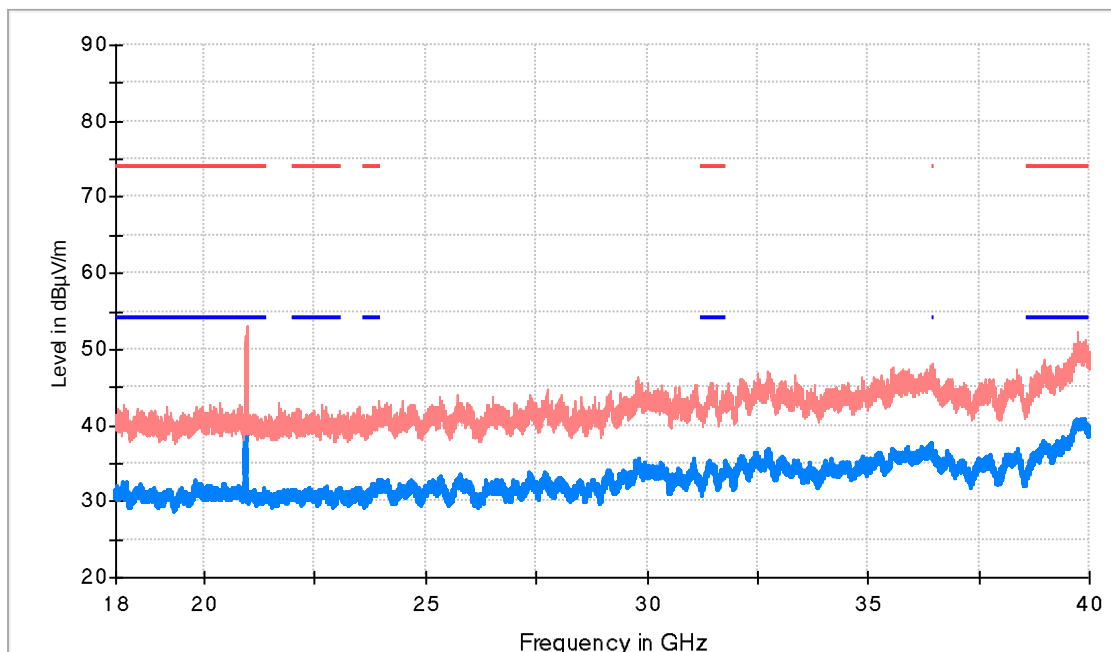
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol
20800.187500	52.3	44.7	H

TEST RESULTS (Cont.)

18 – 40 GHz

High Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

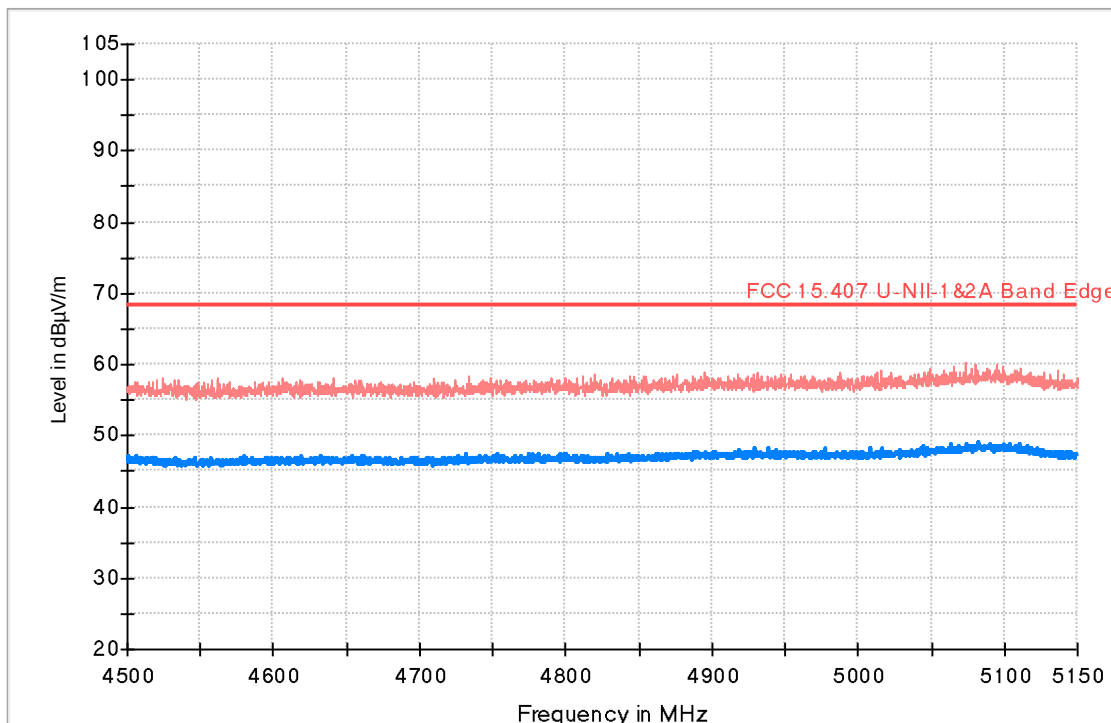
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol
20959.687500	51.7	43.8	H

RESTRICTED BANDS

4.5 GHz – 5.15 GHz

Low Channel



— AVG_MAXH — PK+_MAXH — FCC 15.407 U-NII-1&2A Band Edge

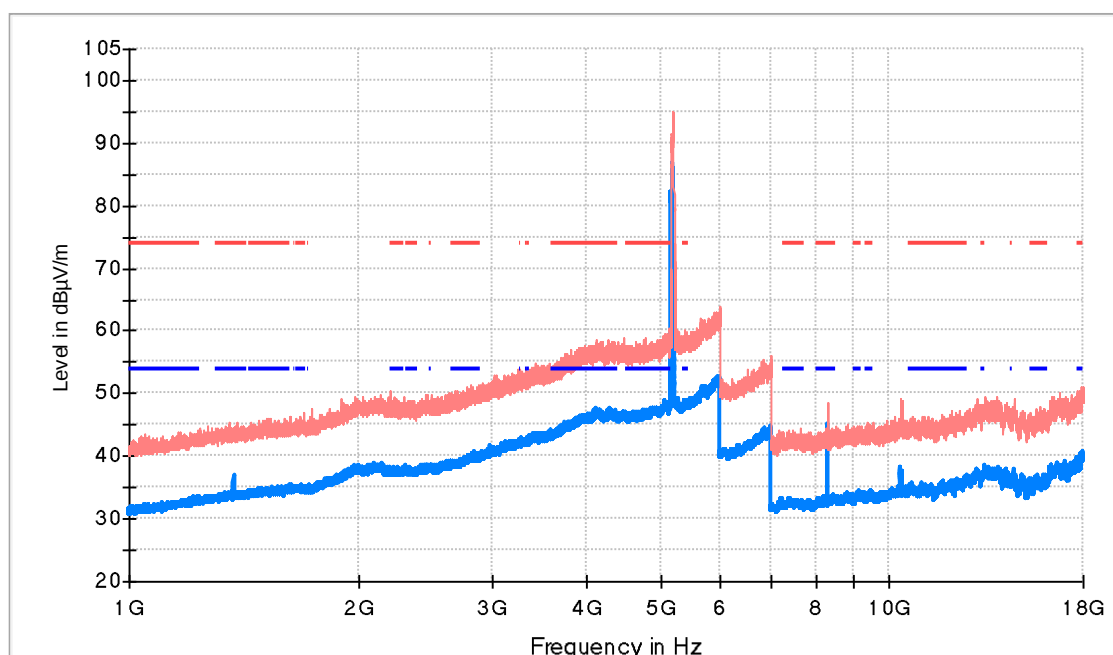
TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Frequency range 1 GHz – 40 GHz

The results and plots below show the maximum measured levels in the 1- 40 GHz range.

FREQUENCY RANGE	1 GHz – 18 GHz
-----------------	----------------

Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

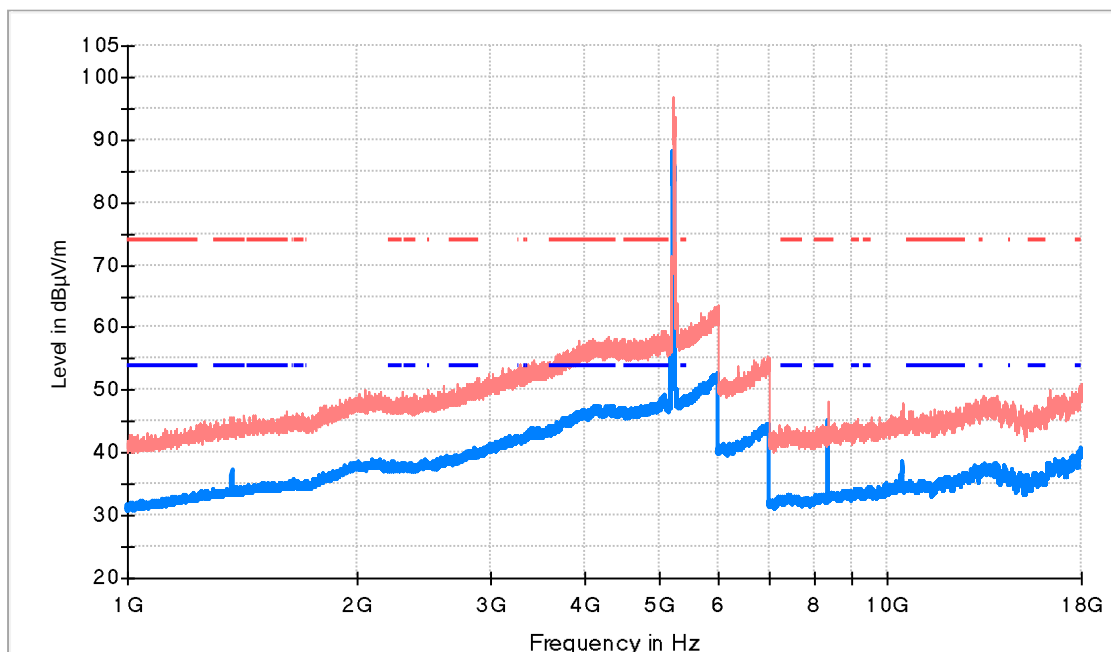
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1374.772727	44.9	37.0	H	
5188.636364	93.6	86.7	V	Fundamental
8304.000000	48.1	45.0	H	
10380.000000	47.9	38.2	H	

TEST RESULTS (Cont.)

1 GHz – 18 GHz

High Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

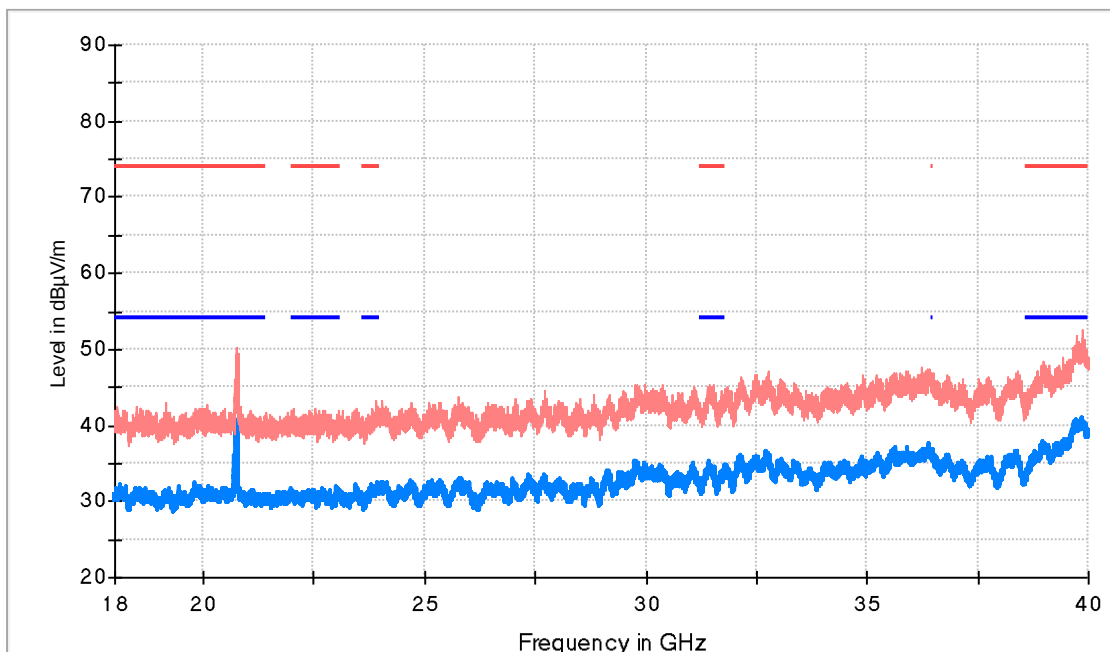
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1374.772727	44.5	37.4	H	
5231.590909	94.6	87.9	H	Fundamental
8367.818182	48.0	45.1	H	
10460.181818	48.1	38.4	H	

FREQUENCY RANGE

18 GHz – 40 GHz

Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

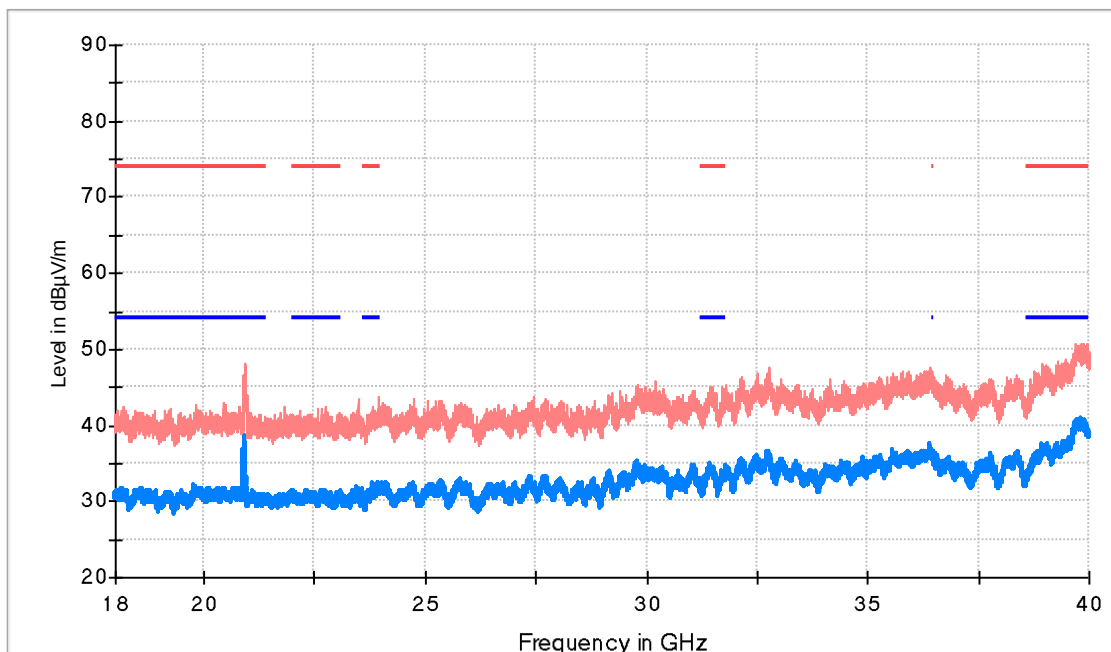
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol
20775.437500	49.4	40.6	H

TEST RESULTS (Cont.)

18 GHz – 40 GHz

High Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

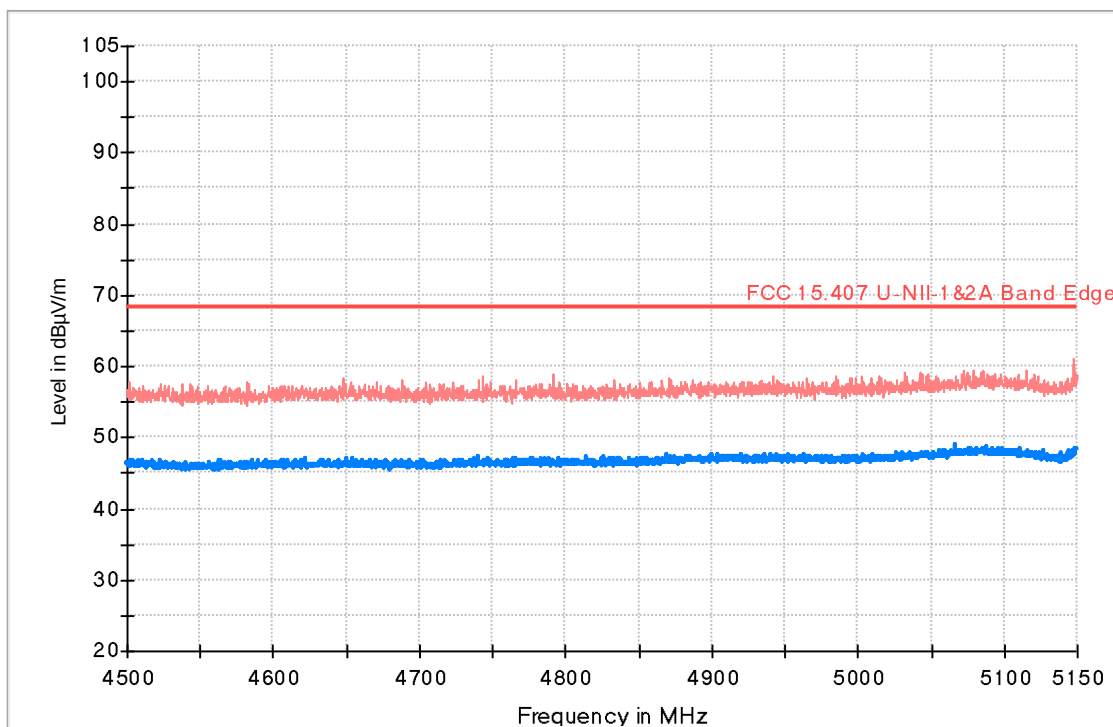
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol
20917.062500	48.2	38.7	H

RESTRICTED BANDS

4.5 GHz – 5.15 GHz

Low Channel



— AVG_MAXH — PK+_MAXH — FCC 15.407 U-NII-1&2A Band Edge

Appendix C:

Test results 5.25 GHz – 5.35 GHz Band

Appendix C Content

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TEST C.5: UNDESIRABLE RADIATED EMISSIONS (TRANSMITTER)94

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01 ⁽¹⁾ (a mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 13.5 \text{ Vdc}$ <u>Test Frequencies for Conducted/Radiated tests (20 MHz):</u> Lowest channel: 5260 MHz Middle channel: 5280 MHz Highest channel: 5320 MHz
TC#02 ⁽¹⁾ (n mode)	<u>Power supply (V):</u> $V_{\text{nominal}} = 13.5 \text{ Vdc}$ <u>Test Frequencies for Conducted/Radiated tests (20 MHz):</u> Lowest channel: 5260 MHz Middle channel: 5280 MHz Highest channel: 5320 MHz <u>Test Frequencies for Conducted/Radiated tests (40 MHz):</u> Lowest channel: 5270 MHz Highest channel: 5310 MHz

Note (1): For spurious emissions for OFDM modes 802.11a, 802.11n20 and 802.11n40 a preliminary scan was performed to determine the worst case.

The data rates of 6Mb/s for 802.11a and MCS0 for 802.11n40 were selected based on preliminary testing that identified those rates corresponding to the worst cases.

TEST C.1: 26DB EMISSION BANDWIDTH AND OCCUPIED BANDWIDTH

LIMITS:

Product standard:

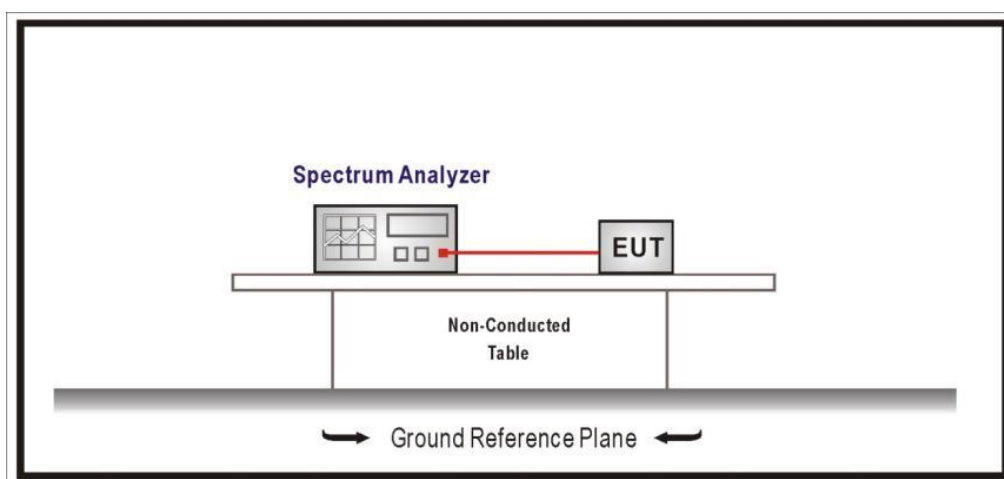
Part 15 Subpart C §15.403 and RSS-247

Test standard:

Part 15 Subpart C §15.403 and RSS-247 6.2.1

No requirements requested

TEST SETUP:



TESTED SAMPLES:

S/01

TESTED CONDITIONS MODES:

TC#01 (a mode)

TEST RESULTS:

PASS

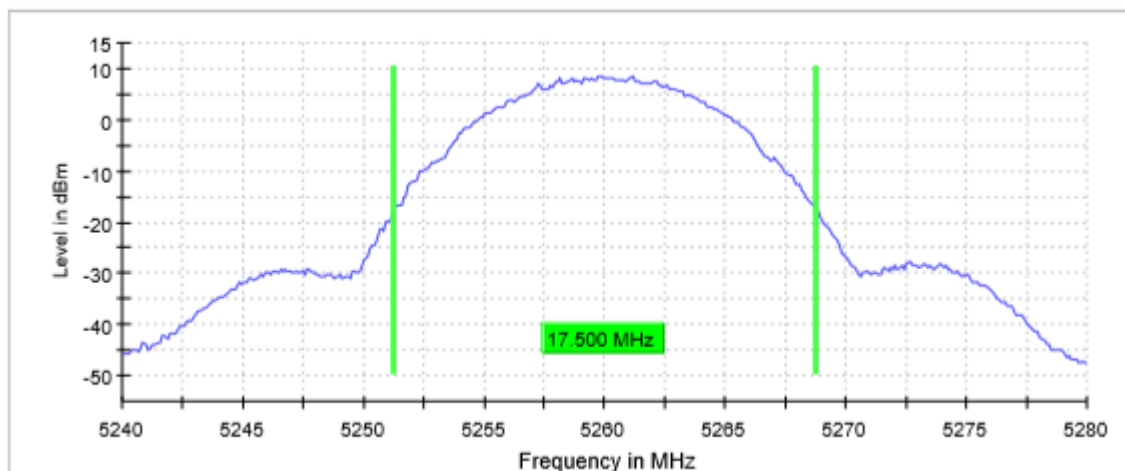
Bandwidth: 20 MHz

	Lowest frequency	Middle frequency	Highest frequency
	5260 MHz	5280 MHz	5320 MHz
26dB Bandwidth (MHz)	17.500	17.700	17.500
Occupied bandwidth (MHz)	13.200	13.300	13.200
Measurement uncertainty (kHz)	<± 8.33		

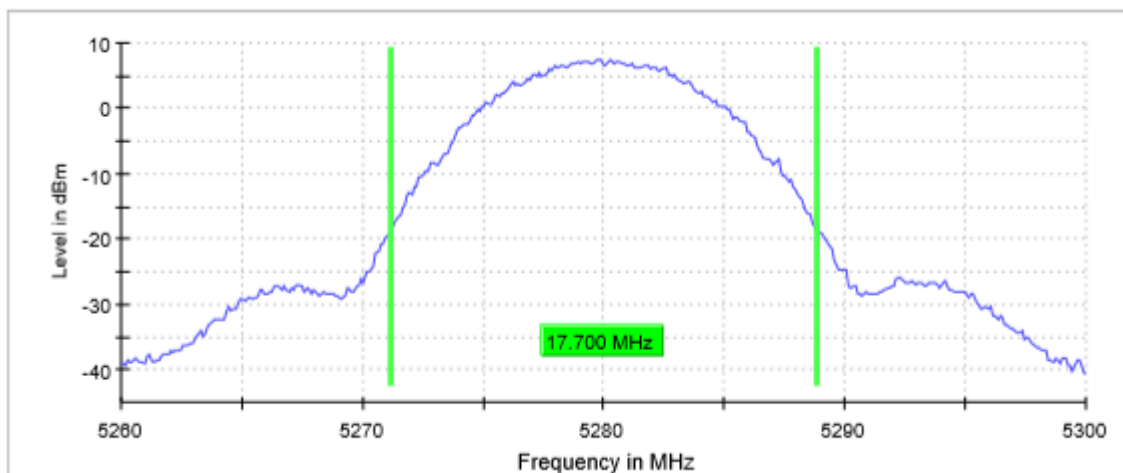
TEST RESULTS (Cont.):

26 dB BANDWIDTH

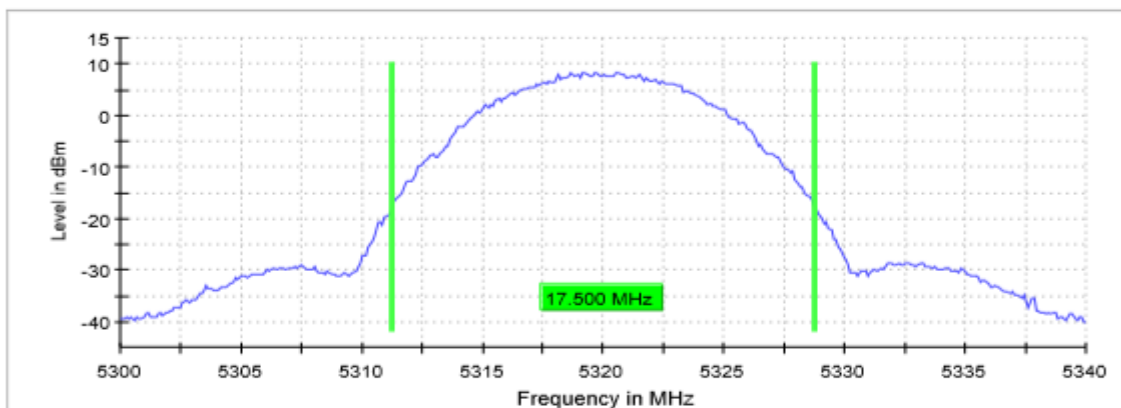
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)

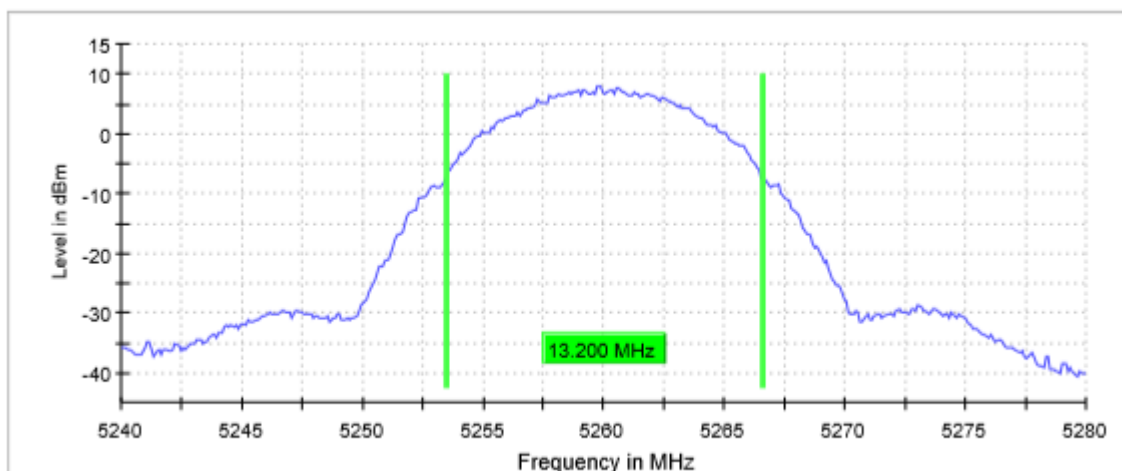
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.24000 GHz	5.26000 GHz	5.30000 GHz
Stop Frequency	5.28000 GHz	5.30000 GHz	5.34000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 kHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
Sweeptime	28.477 μ s	28.477 μ s	28.477 μ s
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB	40.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweeptype	FFT	FFT	FFT
Preamplifier	off	Off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	71 / max. 150	72 / max. 150	63 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.00 dB	0.02 dB

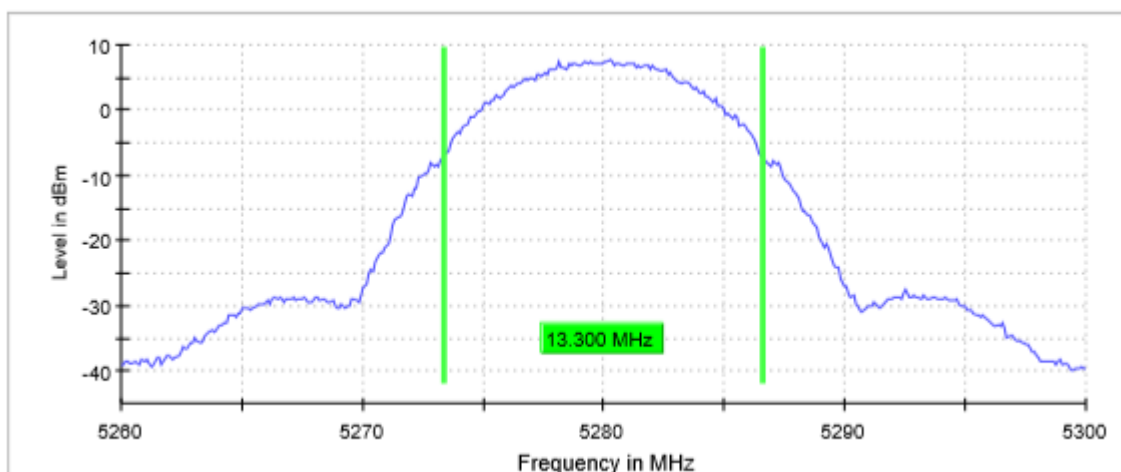
TEST RESULTS (Cont.):

OCCUPIED BANDWIDTH

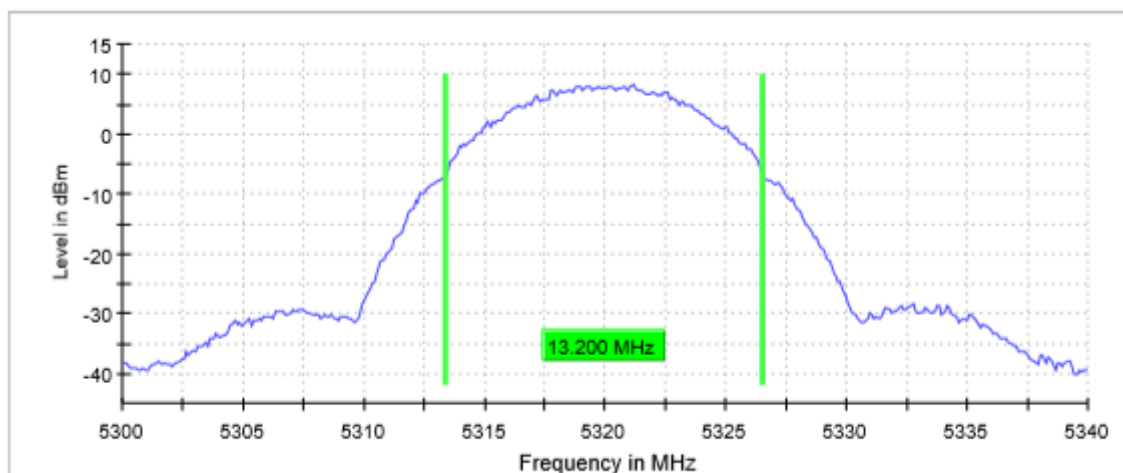
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.24000 GHz	5.26000 GHz	5.30000 GHz
Stop Frequency	5.28000 GHz	5.30000 GHz	5.34000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 kHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
Sweptime	28.477 μ s	28.477 μ s	28.443 μ s
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB	40.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweeptype	FFT	FFT	FFT
Preamp	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	61 / max. 150	73 / max. 150	55 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.19 dB	0.26 dB	0.29 dB

TESTED SAMPLES:

S/01

TESTED CONDITIONS MODES:

TC#02 (n Mode 20 MHz)

TEST RESULTS:

PASS

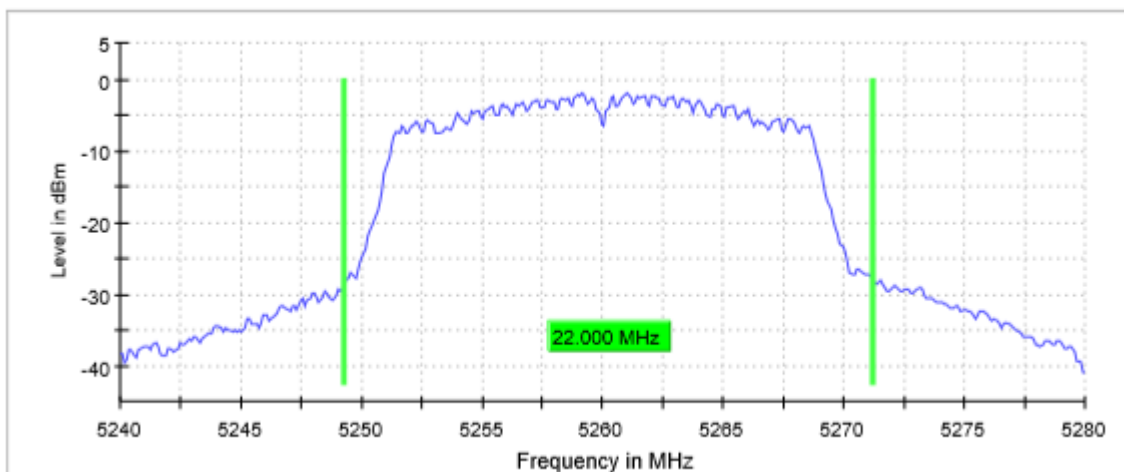
Bandwidth: 20 MHz

	Lowest frequency 5260 MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
26dB bandwidth (MHz)	22.000	22.600	24.000
Occupied bandwidth (MHz)	17.700	17.800	17.700
Measurement uncertainty (kHz)	< $\pm$ 8.33		

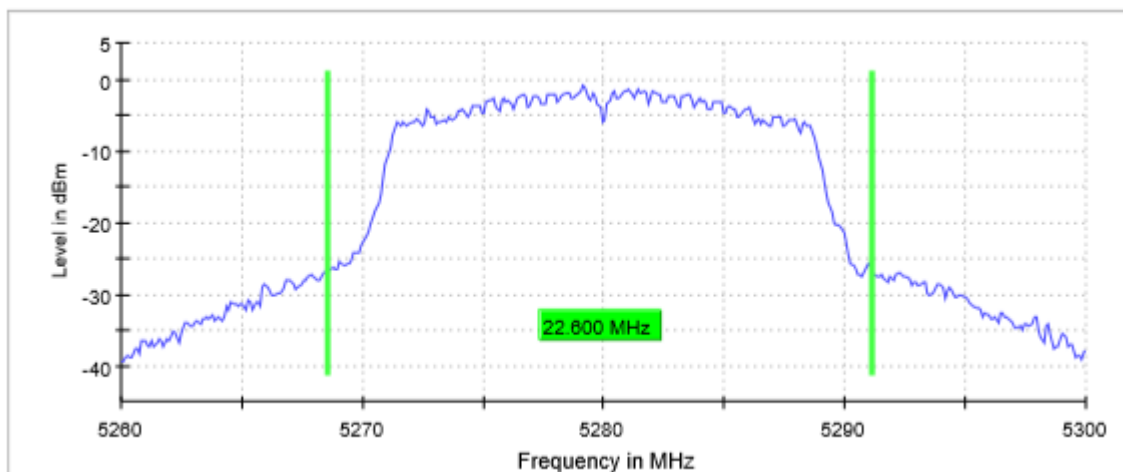
TEST RESULTS (Cont.):

26 dB BANDWIDTH

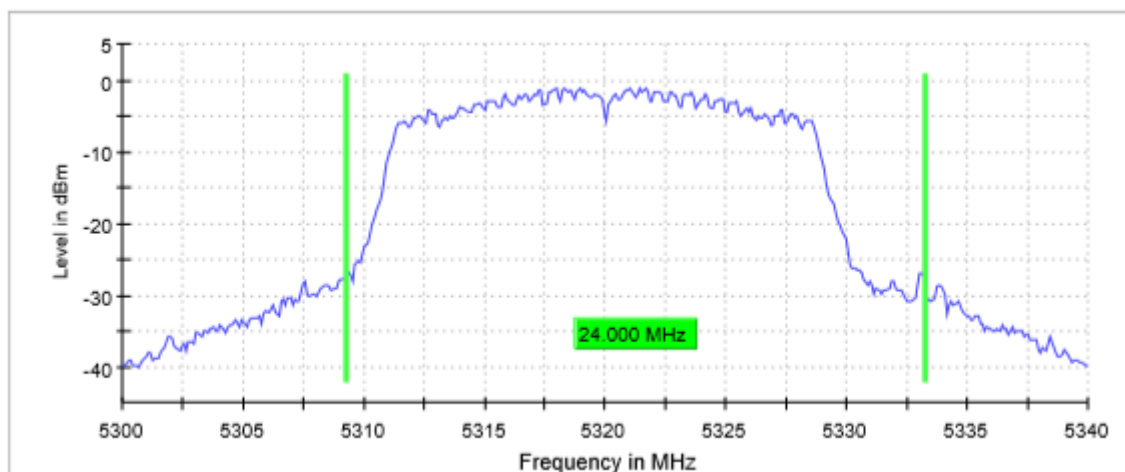
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.):

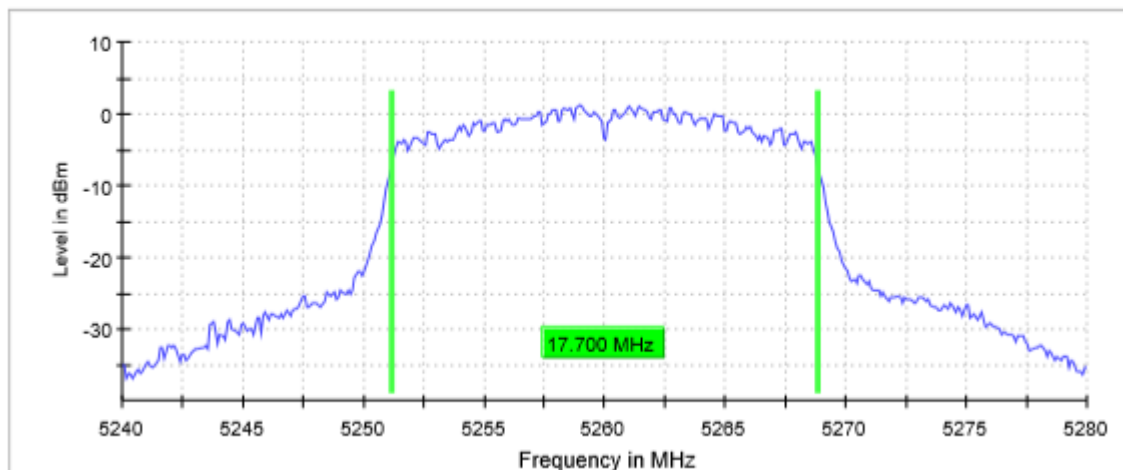
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.24000 GHz	5.26000 GHz	5.30000 GHz
Stop Frequency	5.28000 GHz	5.30000 GHz	5.34000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 kHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
Sweeptime	28.477 μ s	28.477 μ s	28.477 μ s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweeptype	FFT	FFT	FFT
Preamplifier	off	Off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	99 / max. 150	67 / max. 150	79 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.00 dB	0.00 dB

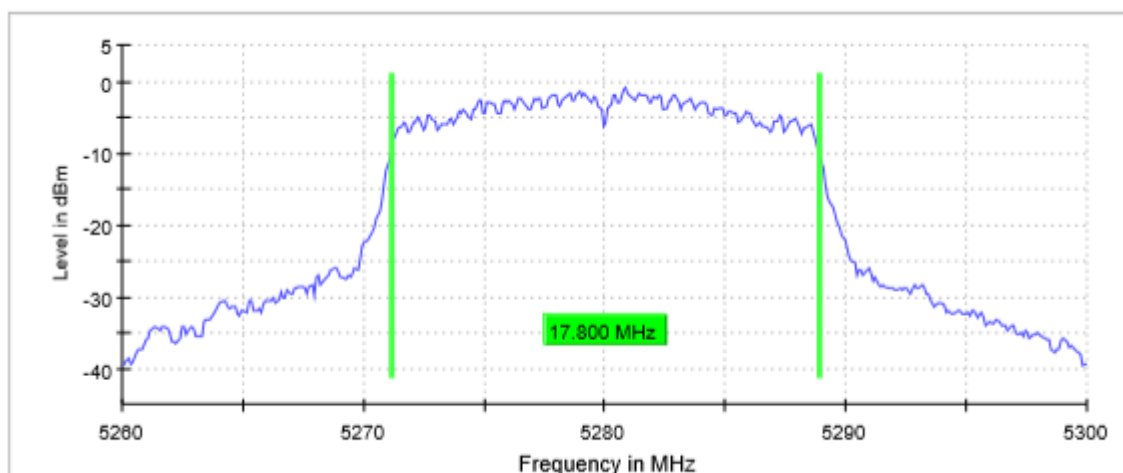
TEST RESULTS (Cont.):

OCCUPIED BANDWIDTH

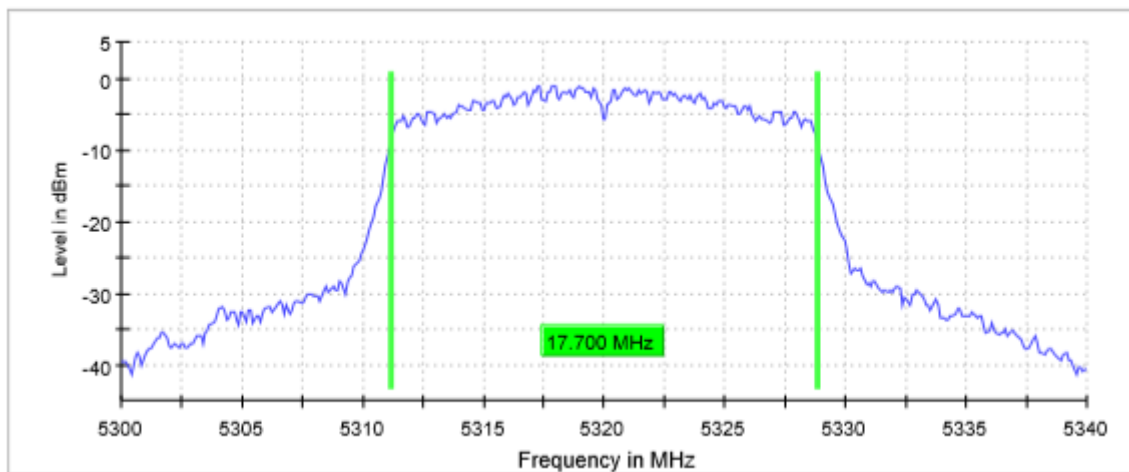
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.24000 GHz	5.26000 GHz	5.30000 GHz
Stop Frequency	5.28000 GHz	5.30000 GHz	5.34000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 KHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	400	400	400
SweepTime	28.477 μ s	28.477 μ s	28.477 μ s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
SweepCount	200	200	200
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
SweepType	FFT	FFT	FFT
Preamplifier	off	off	Off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	49 / max. 150	61 / max. 150	43 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.29 dB	0.00 dB	0.12 dB

TESTED SAMPLES:

S/01

TESTED CONDITIONS MODES:

TC#02 (n Mode 40 MHz)

TEST RESULTS:

PASS

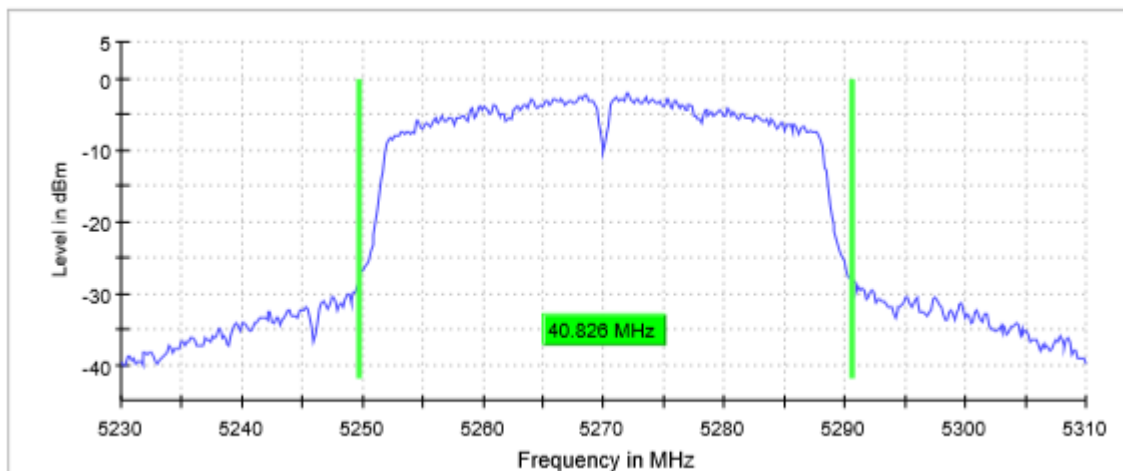
Bandwidth: 40 MHz

	Lowest frequency	Highest frequency
	5270 MHz	5310 MHz
26dB bandwidth (MHz)	40.826	40.976
Occupied bandwidth (MHz)	36.250	36.250
Measurement uncertainty (kHz)	< $\pm$ 8.33	

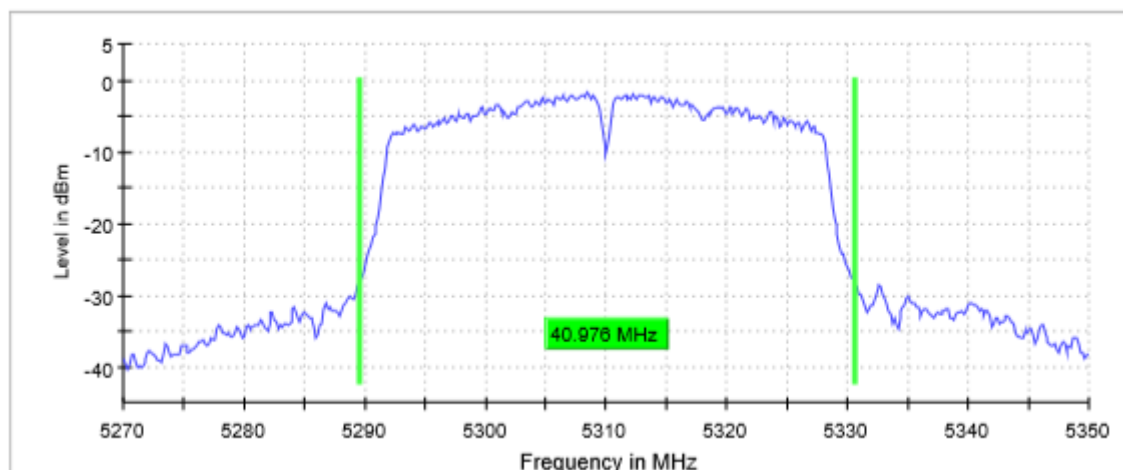
TEST RESULTS (Cont.):

26 dB BANDWIDTH

Lowest Channel



Highest Channel



TEST RESULTS (Cont.):

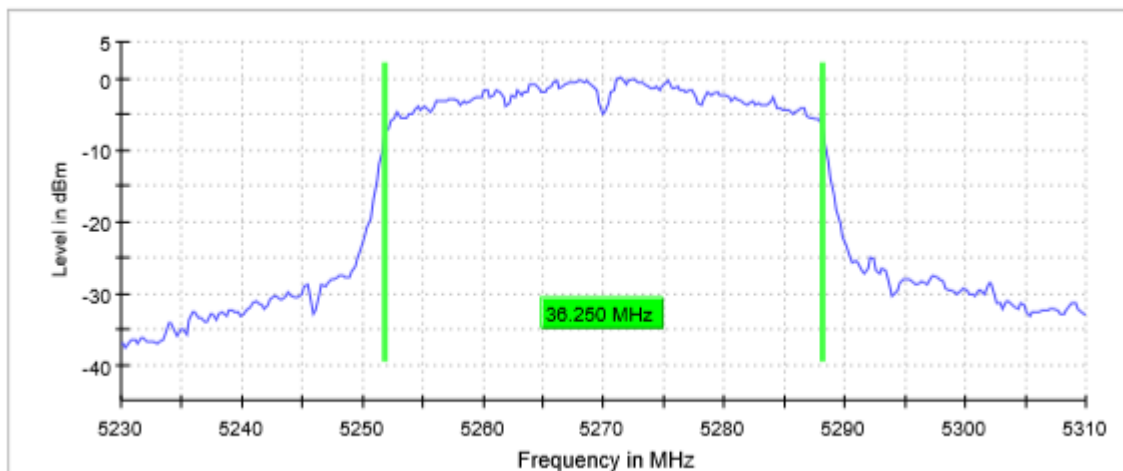
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.23000 GHz	5.27000 GHz
Stop Frequency	5.31000 GHz	5.35000 GHz
Span	80.000 MHz	80.000 MHz
RBW	300.000 kHz	300.000 kHz
VBW	1.000 MHz	1.000 MHz
SweepPoints	533	533
SweepTime	31.621 μ s	31.621 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	FFT
Preamplifier	off	Off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	50 / max. 150	87 / max. 150
Stable	5 / 5	5 / 5
Max Stable Difference	0.08 dB	0.00 dB

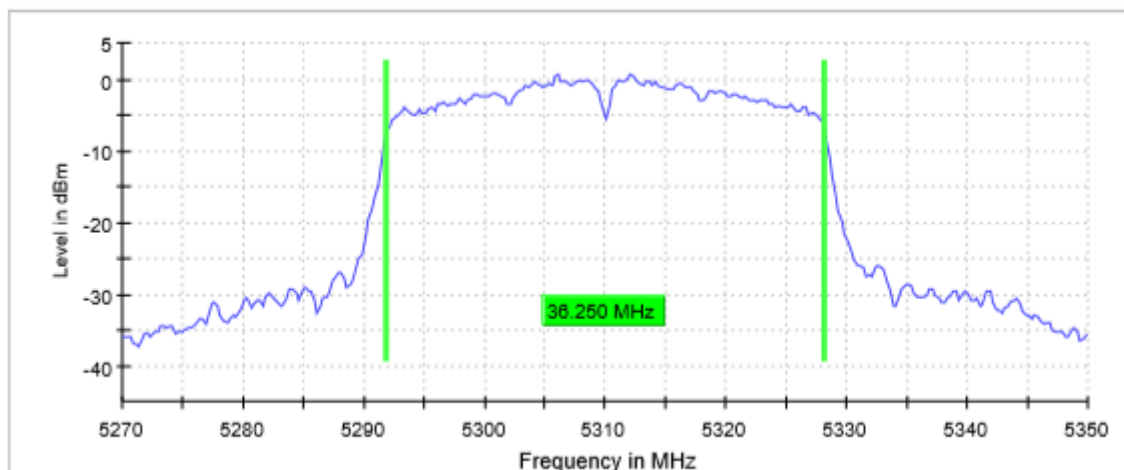
TEST RESULTS (Cont.):

OCCUPIED BANDWIDTH

Lowest Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.23000 GHz	5.27000 GHz
Stop Frequency	5.31000 GHz	5.35000 GHz
Span	80.000 MHz	80.000 MHz
RBW	500.000 kHz	500.000 kHz
VBW	2.000 MHz	2.000 MHz
SweepPoints	320	320
Sweeptime	18.906 μ s	18.906 μ s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	MaxPeak	MaxPeak
SweepCount	200	200
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	FFT	FFT
Preamplifier	off	Off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	82 / max. 150	54 / max. 150
Stable	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.10 dB

TEST C.2: POWER LIMITS. MAXIMUM OUTPUT POWER

LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(a) (2) (4) and RSS-247 6.2.2.1

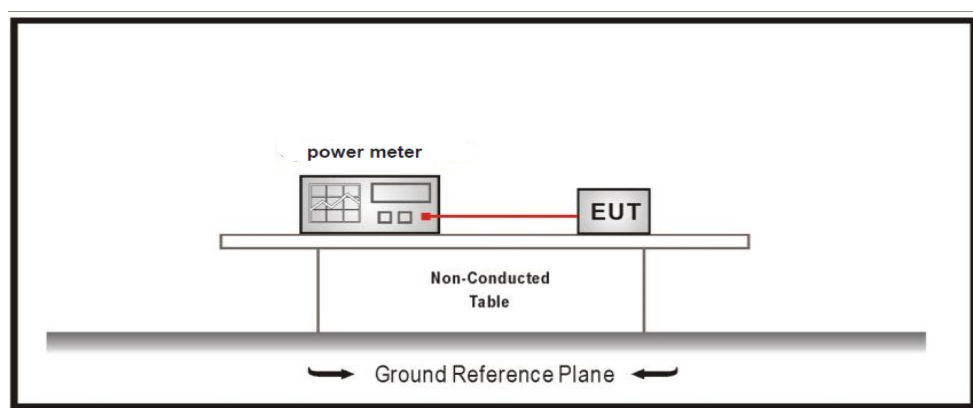
LIMITS

In band 5.25-5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST SETUP

Measured according to ANSI C63.10, Section 11.9.2.3.2 Method AVGPM-G

The EIRP power (dBm) is calculated by adding the declared maximum antenna gain to the measured conducted power



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (a mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

Maximum declared antenna gain: 0 dBi

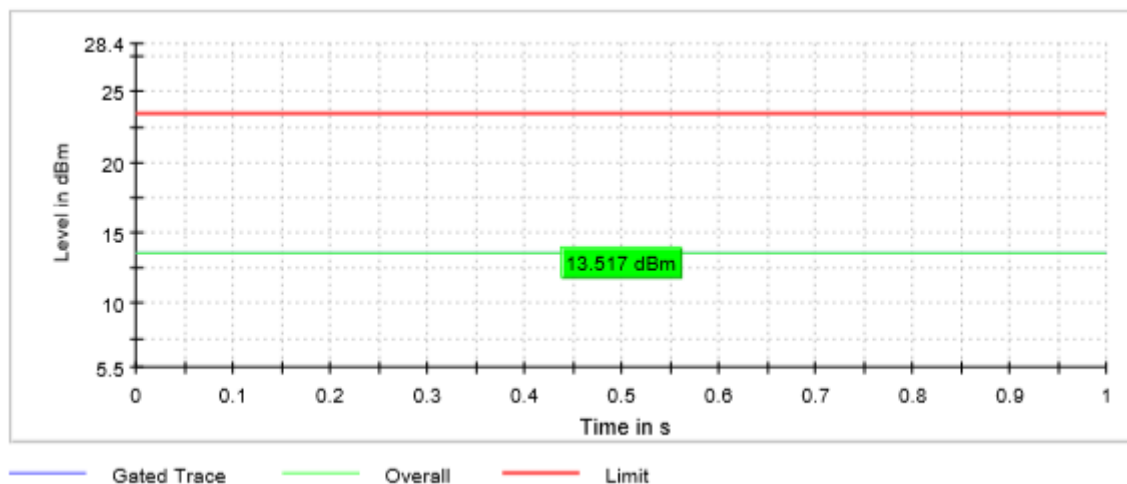
	Lowest frequency 5260 MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
Maximum conducted power (dBm)	13.5	13.1	14.1
Maximum EIRP power (dBm)	13.5	13.1	14.1
Measurement uncertainty (dB)	<±0.78		

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

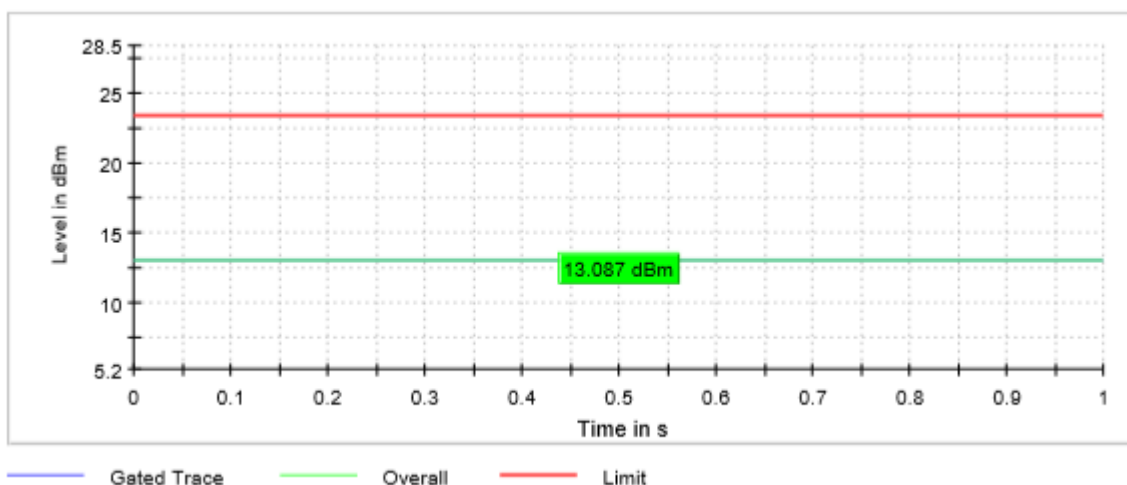
TEST RESULTS (Cont.):

CONDUCTED OUTPUT POWER

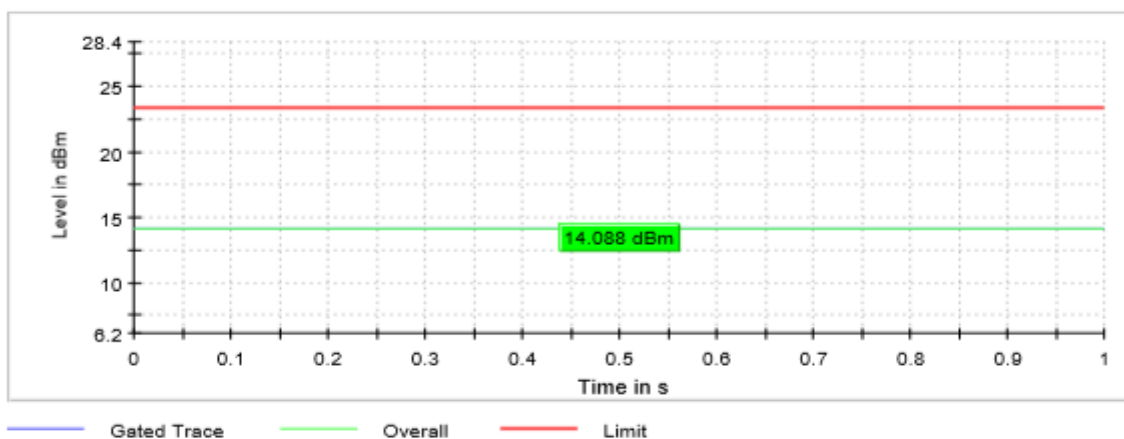
Lowest Channel



Middle Channel



Highest Channel



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 20 MHz)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

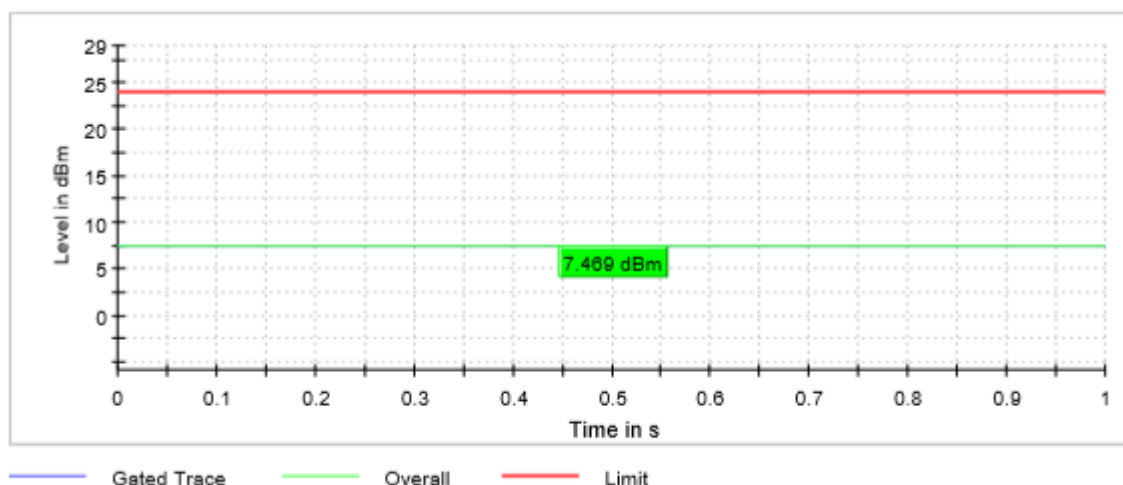
Maximum declared antenna gain: 0 dBi

	Lowest frequency 5260 MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
Maximum conducted power (dBm)	7.5	8.3	8.7
Maximum EIRP power (dBm)	7.5	8.3	8.7
Measurement uncertainty (dB)	<±0.78		

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

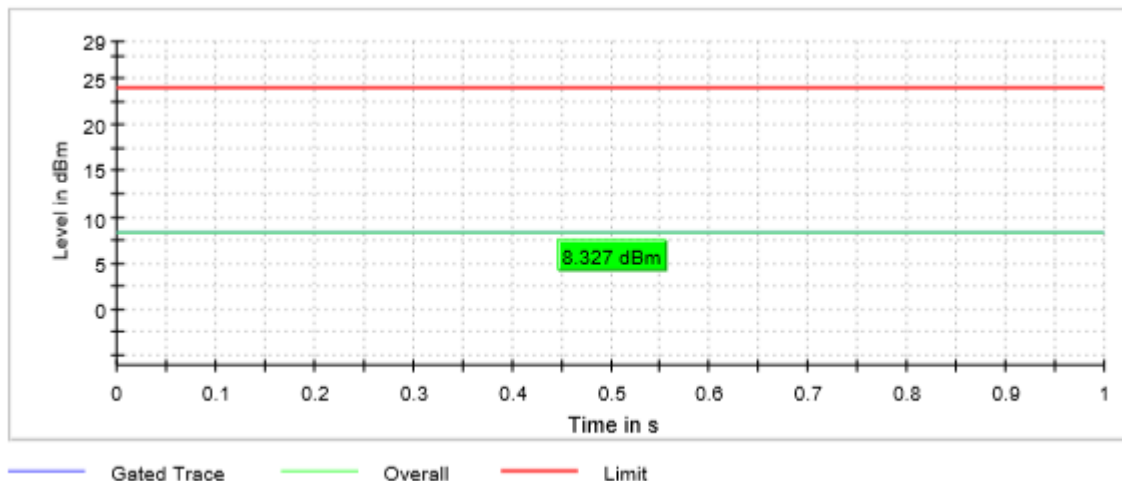
TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER
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Lowest Channel

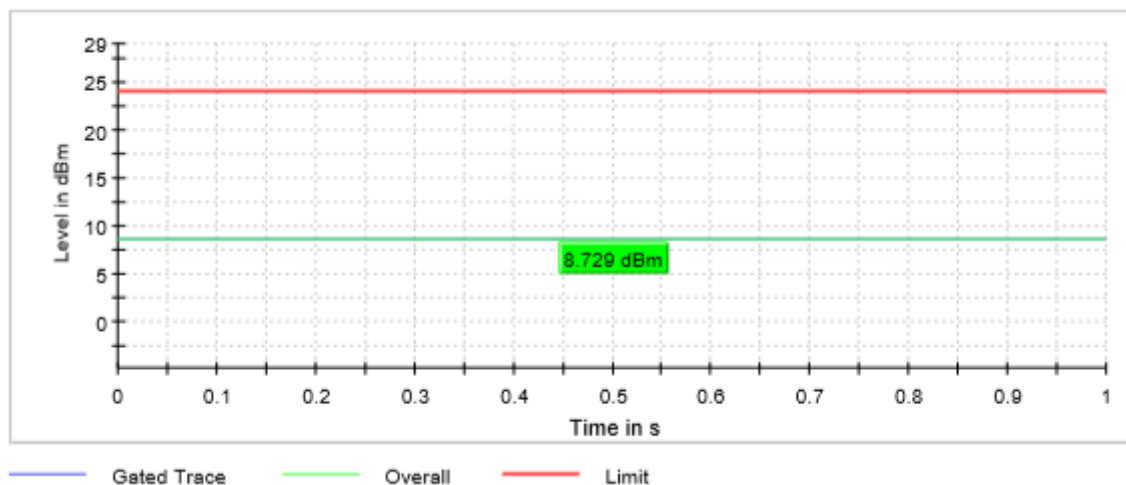


TEST RESULTS (Cont.)

Middle Channel



Highest Channel



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Bandwidth: 40 MHz

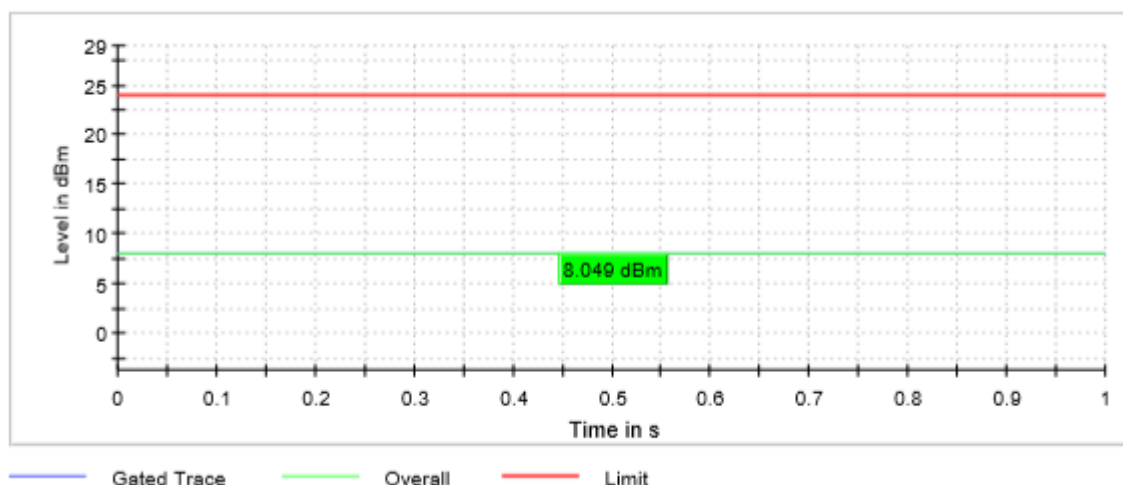
Maximum declared antenna gain: 0 dBi

	Lowest frequency 5270 MHz	Highest frequency 5310 MHz
Maximum conducted power (dBm)	8.0	8.5
Maximum EIRP power (dBm)	8.0	8.5
Measurement uncertainty (dB)	<±0.78	

The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

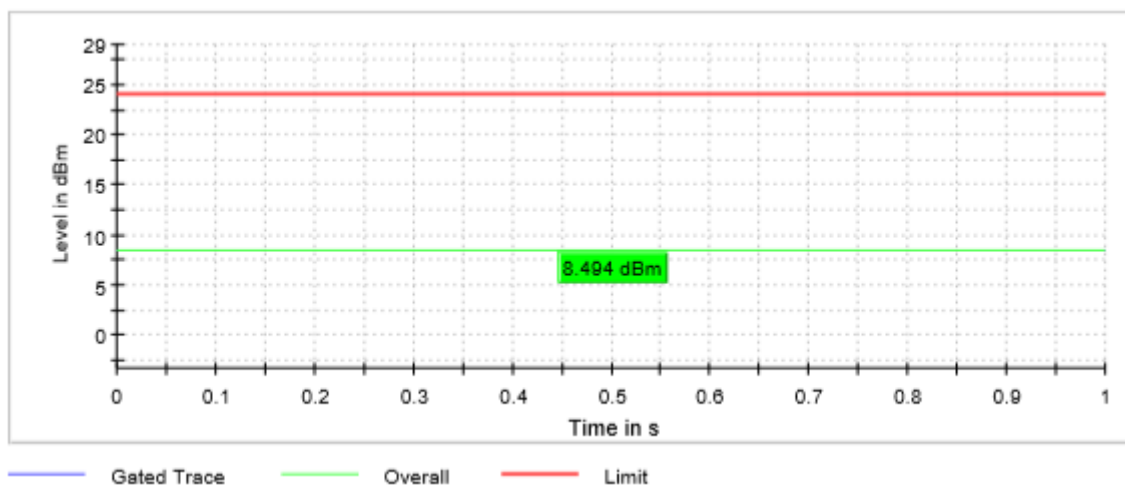
TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER
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Lowest Channel



TEST RESULTS (Cont.)

Highest Channel



TEST C.3: POWER SPECTRAL DENSITY

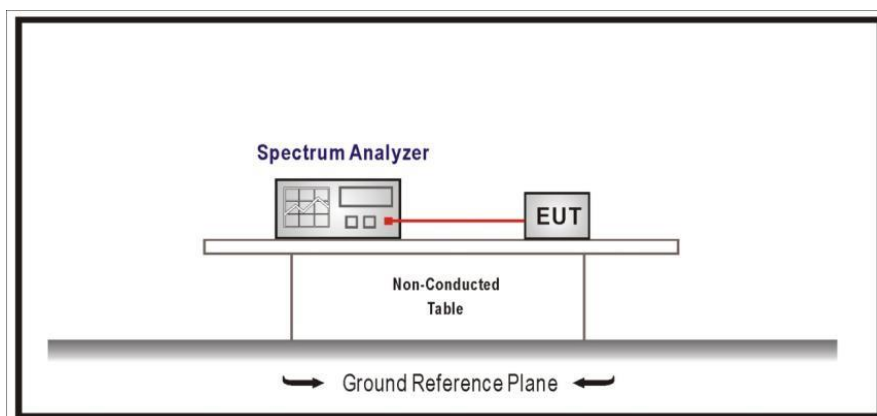
LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(a) (2) (5) and RSS-247 6.2.2.1

LIMITS

In the band 5.25-5.35 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W provided the maximum antenna gain does not exceed 6 dBi. In addition, the maximum power spectral density shall not exceed 17 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

TEST SETUP

For all modes, the maximum power spectral density level in the fundamental emission was measured using the method according to point F) (Method SA-1) of Guidance 789033 D02 General UNII Test Procedures New Rules v01.



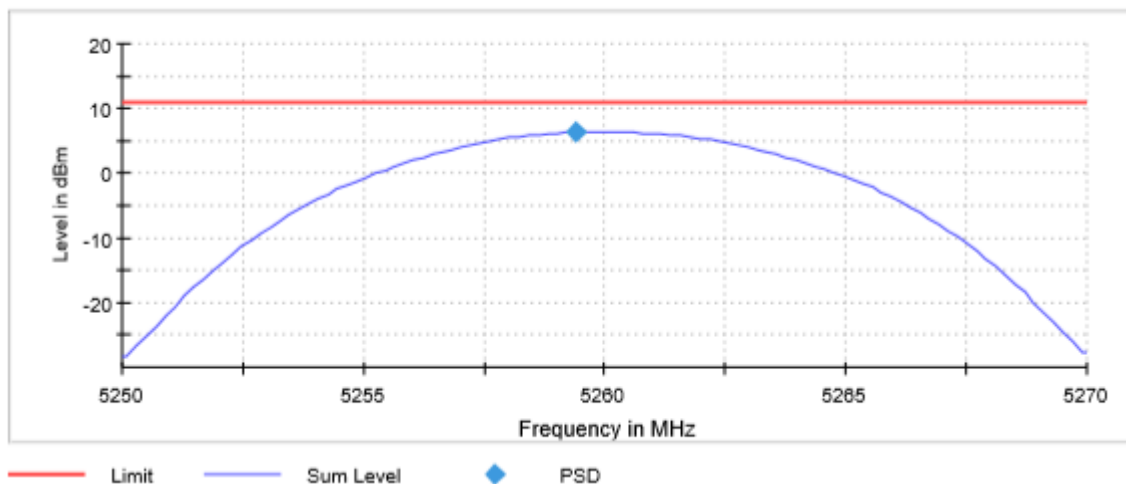
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (a mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

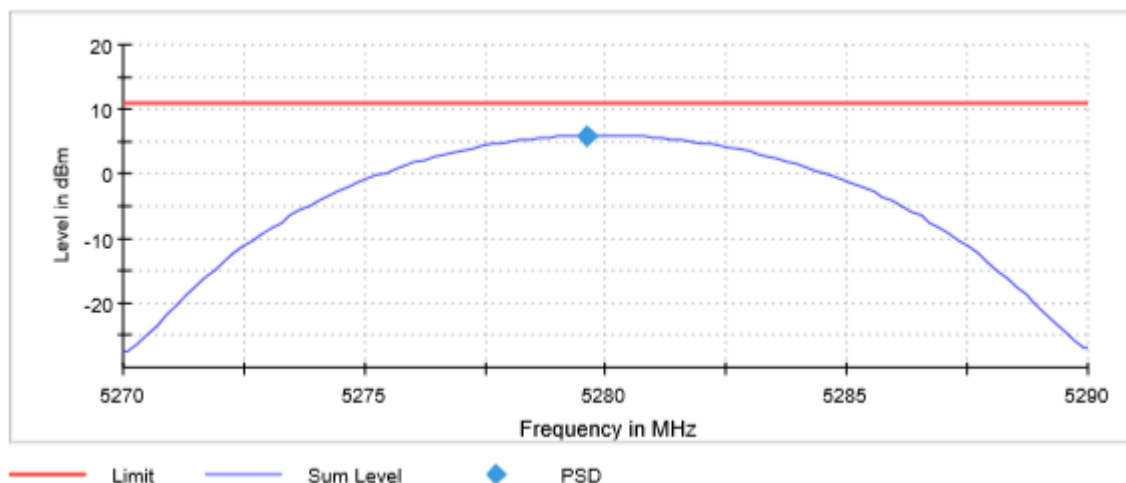
	Lowest frequency 5260 MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
Power spectral density (dBm)	6.317	5.839	6.300
Measurement uncertainty (dB)	<±0.78		

TEST RESULTS (Cont.):

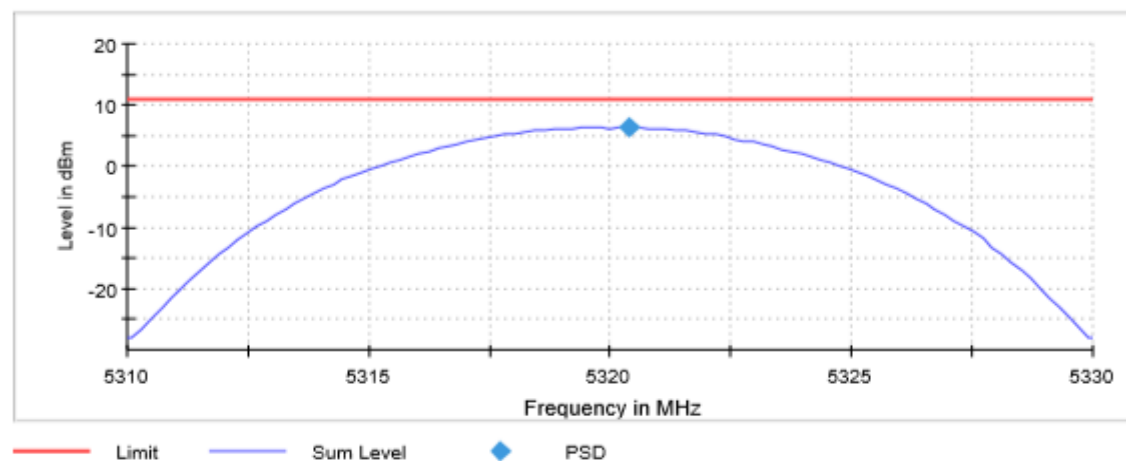
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.25000 GHz	5.27000 GHz	5.31000 GHz
Stop Frequency	5.27000 GHz	5.29000 GHz	5.33000 GHz
Span	20.000 MHz	20.000 MHz	20.000 MHz
RBW	1.000 MHz	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz	3.000 MHz
SweepPoints	101	101	101
Sweptime	2.020 s	2.020 s	2.020 s
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	40.000 dB	40.000 dB	40.000 dB
Detector	RMS	RMS	RMS
SweepCount	29703	29703	29703
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
SweepType	FFT	FFT	FFT
Preamplifier	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	4 / max. 15	6 / max. 15	4 / max. 15
Stable	3 / 3	3 / 3	3 / 3
Max Stable	0.00 dB	0.00 dB	0.00 dB

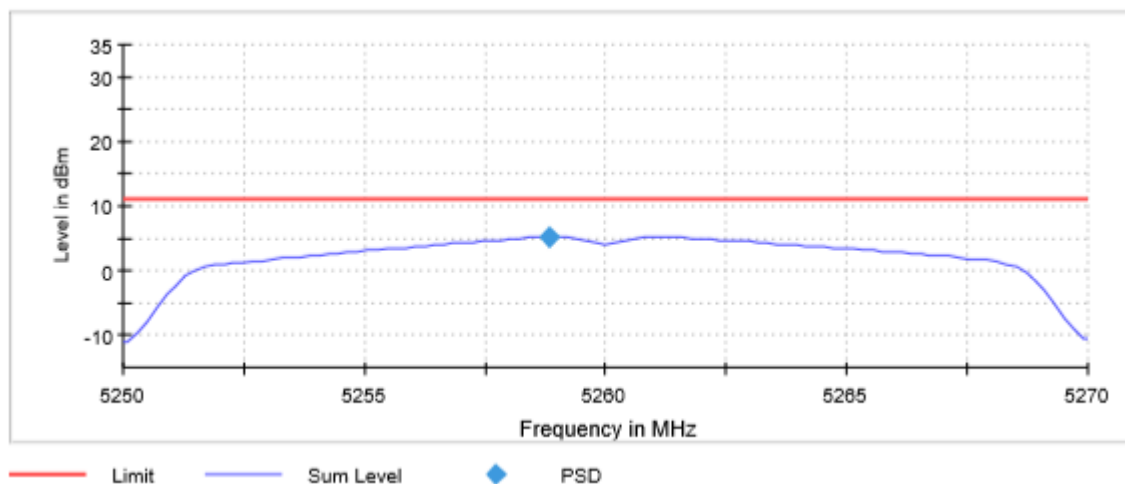
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 20 MHz)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

	Lowest frequency 5260 MHz	Middle frequency 5280 MHz	Highest frequency 5320 MHz
Power spectral density (dBm)	5.224	-1.936	-1.708
Measurement uncertainty (dB)	<±0.78		

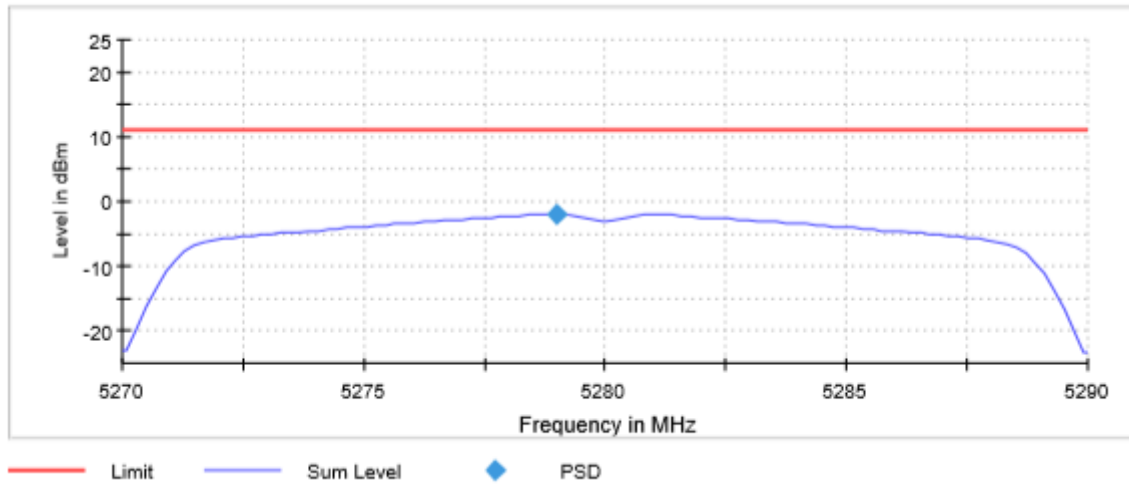
TEST RESULTS (Cont.):	
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Lowest Channel

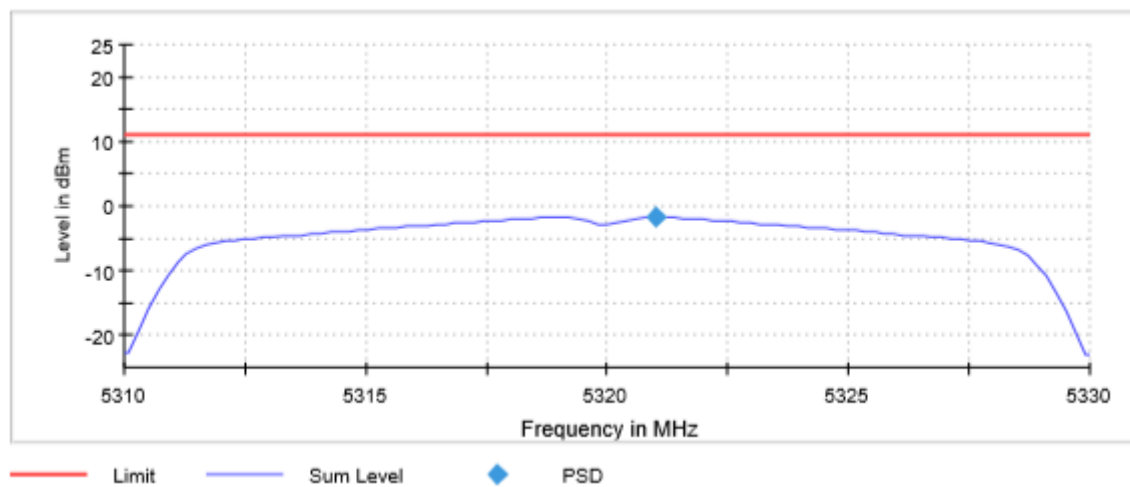


TEST RESULTS (Cont.):

Middle Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.25000 GHz	5.27000 GHz	5.31000 GHz
Stop Frequency	5.27000 GHz	5.29000 GHz	5.33000 GHz
Span	20.000 MHz	20.000 MHz	20.000 MHz
RBW	1.000 MHz kHz	1.000 MHz kHz	1.000 MHz kHz
VBW	3.000 MHz	3.000 MHz	3.000 MHz
SweepPoints	101	101	101
SweepTime	2.020 s	2.020 s	2.020 s
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB	30.000 dB
Detector	RMS	RMS	RMS
SweepCount	29703	29703	29703
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
SweepType	FFT	FFT	FFT
Preamplifier	off	off	off
Stablemode	Trace	Trace	Trace
Stablevalue	0.30 dB	0.30 dB	0.30 dB
Run	4 / max. 15	4 / max. 15	4 / max. 15
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.00 dB	0.02 dB

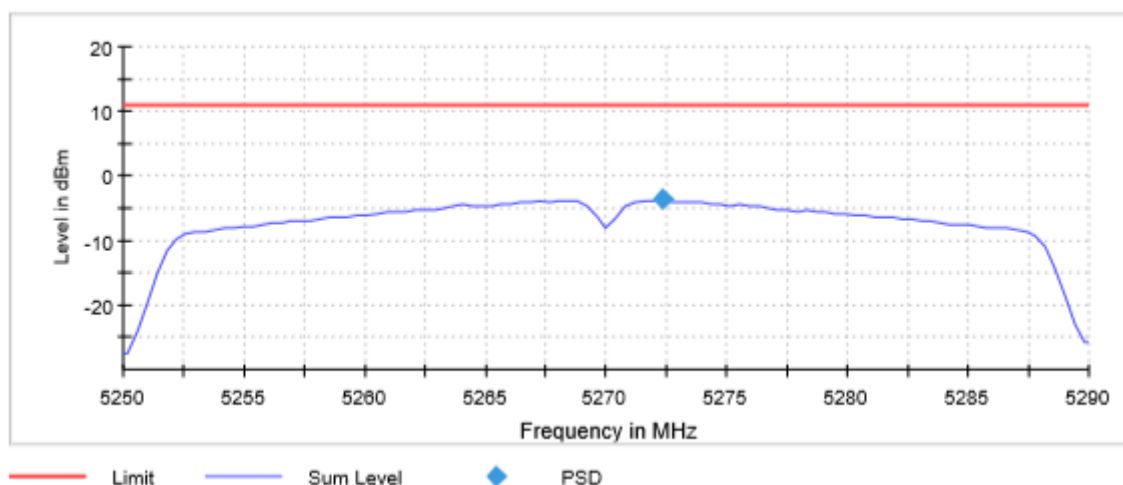
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Bandwidth: 40 MHz

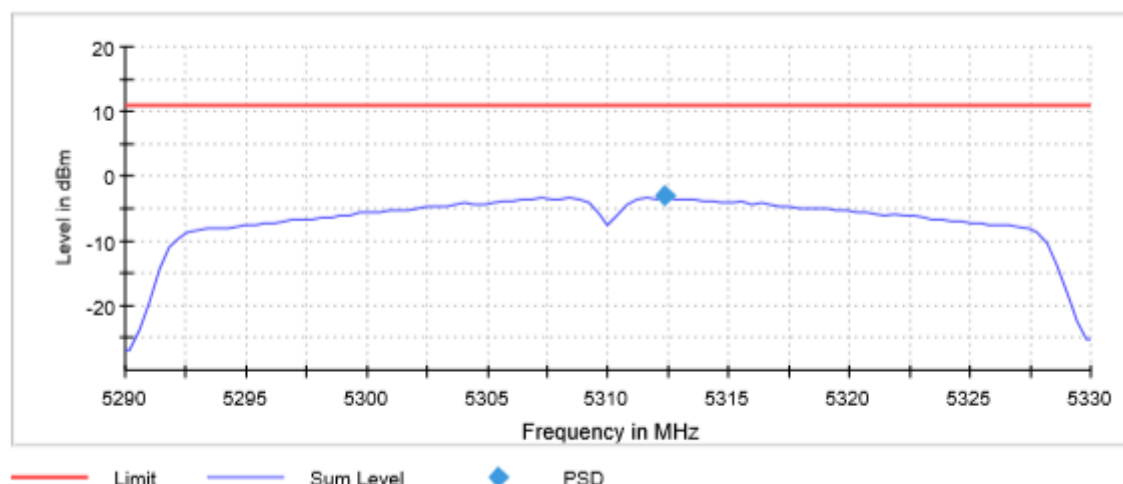
	Lowest frequency 5270 MHz	Highest frequency 5310 MHz
Power spectral density (dBm)	-3.661	-3.126
Measurement uncertainty (dB)	<±0.78	

TEST RESULTS (Cont.):	
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Lowest Channel



Highest Channel



TEST RESULTS (Cont.):

Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.25000 GHz	5.29000 GHz
Stop Frequency	5.29000 GHz	5.33000 GHz
Span	40.000 MHz	40.000 MHz
RBW	1.000 MHz kHz	1.000 MHz kHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	101	101
SweepTime	2.020 s	2.020 s
Reference Level	10.000 dBm	10.000 dBm
Attenuation	30.000 dB	30.000 dB
Detector	RMS	RMS
SweepCount	29703	29703
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
SweepType	FFT	FFT
Preamplifier	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	4 / max. 15	5 / max. 15
Stable	3 / 3	3 / 3
Max Stable Difference	0.16 dB	0.13 dB

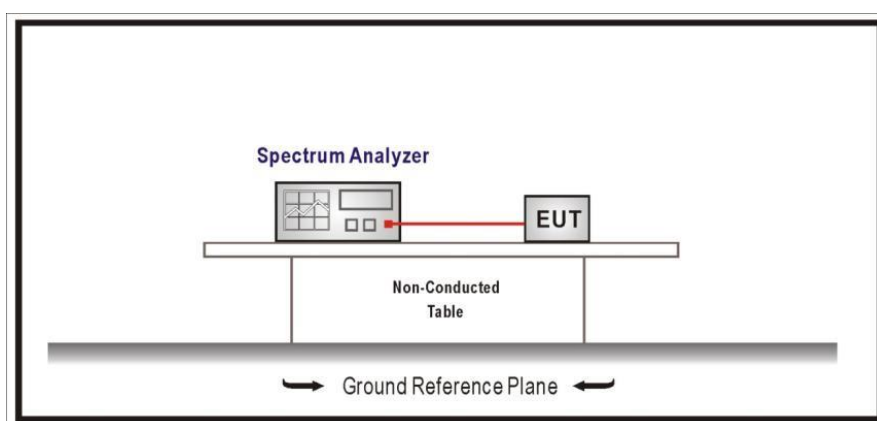
TEST C.4: BAND-EDGE EMISSIONS COMPLIANCE (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(b)(2) and RSS-247 6.2.2.2

LIMITS

For transmitters operating in the 5.25 – 5.35 GHz band: all emissions outside the frequency band shall not exceed an EIRP of -27 dBm /MHz

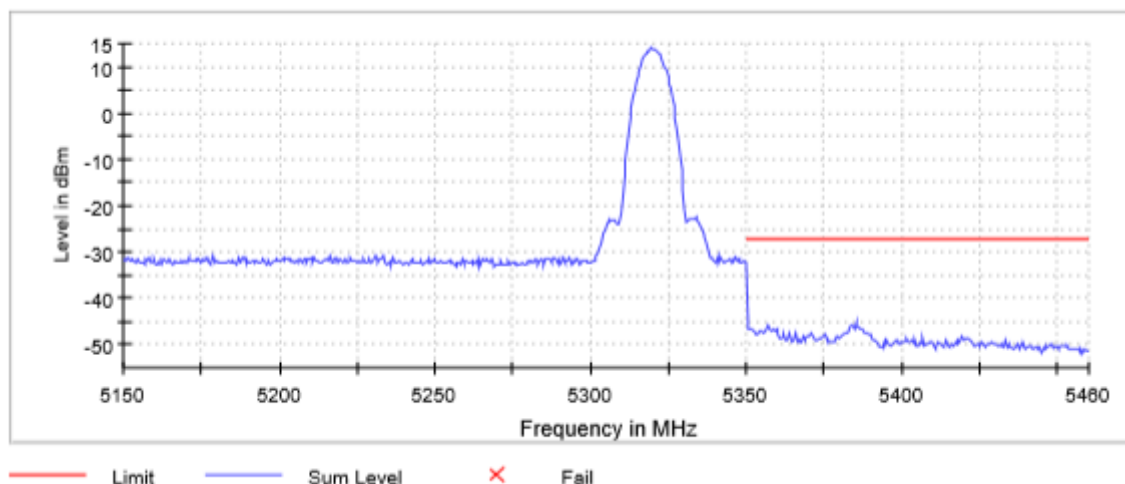
TEST SETUP



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (a mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

Highest Channel



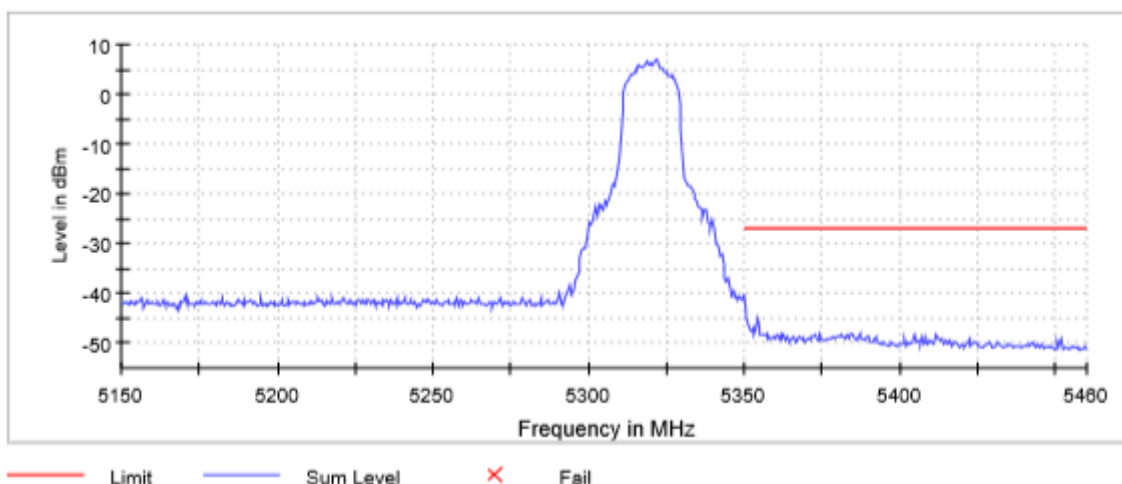
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.15000 GHz	5.35000 GHz
Stop Frequency	5.35000 GHz	5.46000 GHz
Span	200.000 MHz	110.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	400	220
SweepTime	40.000 ms	22.000 ms
Reference Level	20.000 dBm	-10.000 dBm
Attenuation	40.000 dB	10.000 dB
Detector	Maxpeak	Maxpeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	sweep	sweep
Preamp	off	Off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	10 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.39 dB	0.00 dB

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 20 MHz)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

Highest Channel



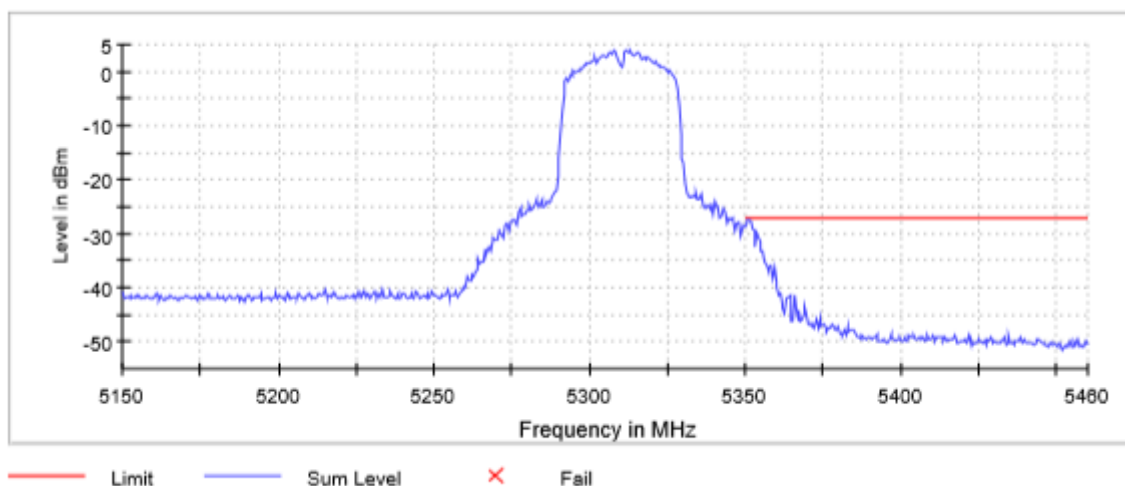
Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.15000 GHz	5.35000 GHz
Stop Frequency	5.35000 GHz	5.46000 GHz
Span	200.000 MHz	110.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	400	220
Sweeptime	40.000 ms	22.000 ms
Reference Level	10.000 dBm	-10.000 dBm
Attenuation	30.000 dB	10.000 dB
Detector	Maxpeak	Maxpeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	sweep	sweep
Preamp	off	Off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	12 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.31 dB	0.00 dB

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Bandwidth: 40 MHz

Highest Channel



Measurement

Setting	Instrument Value	Instrument Value
Start Frequency	5.15000 GHz	5.35000 GHz
Stop Frequency	5.35000 GHz	5.46000 GHz
Span	200.000 MHz	110.000 MHz
RBW	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz
SweepPoints	400	220
Sweeptime	40.000 ms	22.000 ms
Reference Level	10.000 dBm	-10.000 dBm
Attenuation	30.000 dB	10.000 dB
Detector	Maxpeak	Maxpeak
SweepCount	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweeptype	sweep	sweep
Preamp	off	Off
Stablemode	Trace	Trace
Stablevalue	0.50 dB	0.50 dB
Run	24 / max. 150	15 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.40 dB	0.26 dB

TEST C.5: UNDESIRABLE RADIATED EMISSIONS (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(b) (2)(6)(7) and RSS-247 6.2.2.2

LIMITS

For transmitters operating in the 5.25 – 5.35 GHz band: all emissions outside of the 5.25 – 5.35 GHz band shall not exceed an EIRP of -27 dBm/MHz (68.23 dBμ V/m at 3m distance).

Radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c) / RSS-Gen):

Frequency Range (MHz)	Field strength (μV/m)	Field strength (dBμV/m)	Measurement distance (m)
0.009-0.490	2400/F(kHz)	-	300
0.490-1.705	24000/F(kHz)	-	30
1.705 - 30.0	30	-	30
30 - 88	100	40	3
88 - 216	150	43.5	3
216 - 960	200	46	3
960 - 25000	500	54	3

The emission limits shown in the above table are based on measurements employing CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

For average radiated emission measurements above 1000 MHz, there is also a limit corresponding to 20 dB above the indicated values in the table is specified when measuring with peak detector function

TEST SETUP

All radiated tests were performed in a semi-anechoic chamber. The measurement antenna is situated at 3 m for the frequency range 30-1000 MHz (Bilog antenna) and at 1m for the frequency range 1-40 GHz (1 GHz-18 GHz and 18 GHz-40 GHz Double ridge horn antennas).

For radiated emissions in the range 1-40 GHz that is performed at a distance closer than the specified distance, an inverse proportionality factor of 20 dB per decade is used to normalize the measured data for determining compliance.

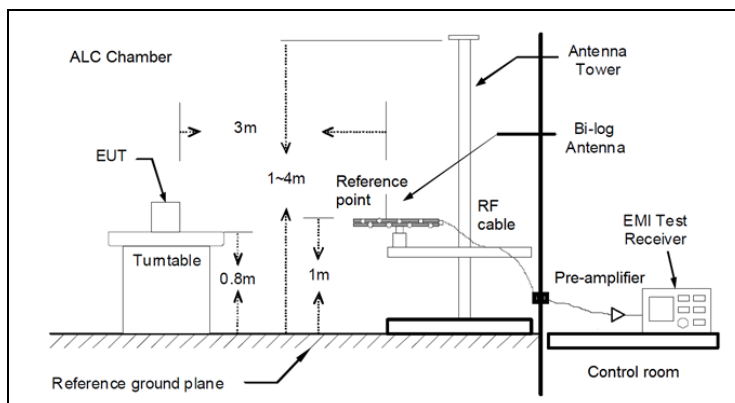
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

Measurements were made in both horizontal and vertical planes of polarization.

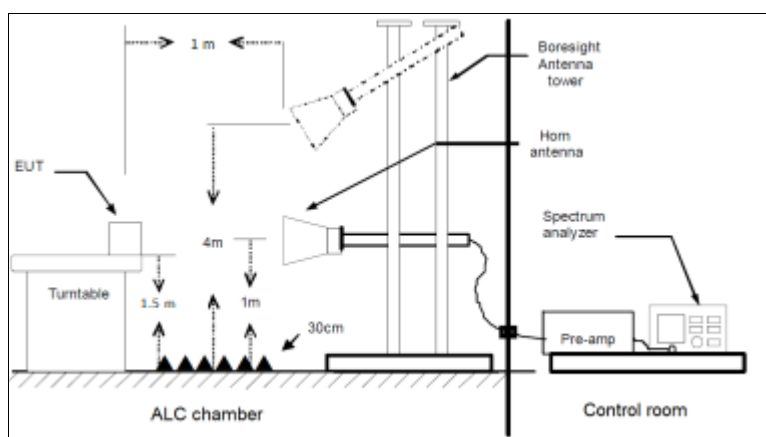
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

Radiated measurements Setup $f < 1$ GHz



Radiated measurements setup $f > 1$ GHz



TESTED SAMPLES:

S/02

TESTED CONDITIONS MODES:

TC#01 (a mode)

TEST RESULTS:

PASS

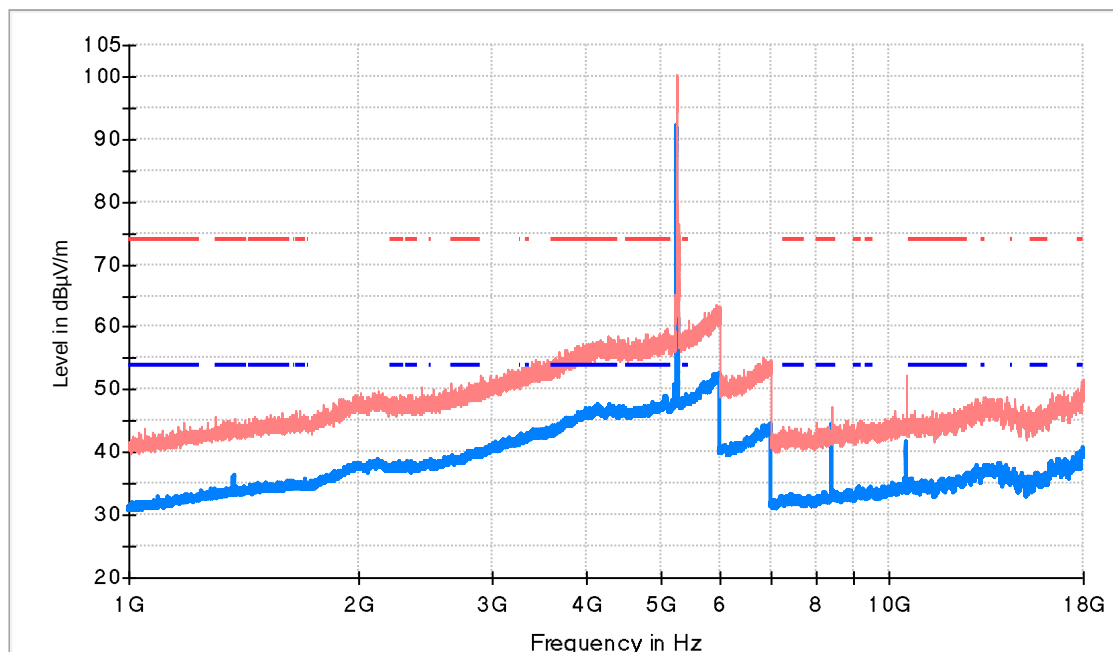
Frequency range 1 GHz – 40 GHz

The results and plots below show the maximum measured levels in the 1- 40 GHz range and the restricted band 5.35GHz- 5.46 GHz.

TEST RESULTS (Cont.)

1 GHz – 18 GHz

Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

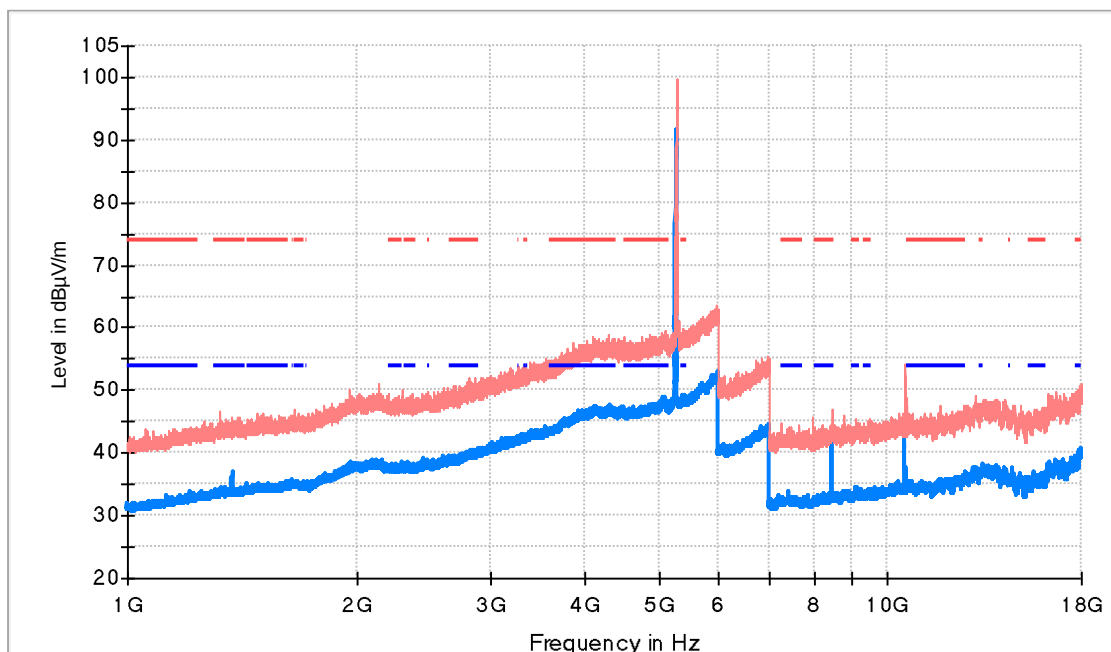
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1375.000000	44.0	36.4	V	
5259.318182	99.5	92.1	H	Fundamental
8415.818182	47.4	44.4	V	
10519.636364	49.9	41.5	H	

TEST RESULTS (Cont.)

1 GHz – 18 GHz

Mid Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

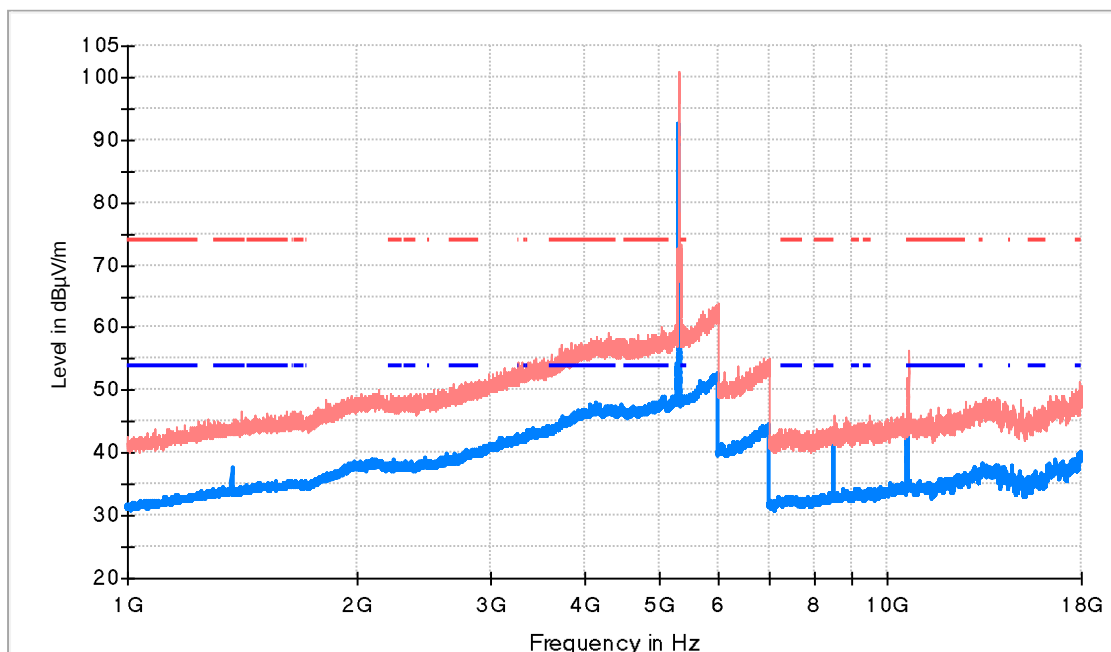
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1375.000000	45.0	36.8	H	
5282.045455	98.1	91.6	V	Fundamental
8448.000000	47.0	43.5	V	
10561.636364	51.0	42.9	H	

TEST RESULTS (Cont.)

1 GHz – 18 GHz

High Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

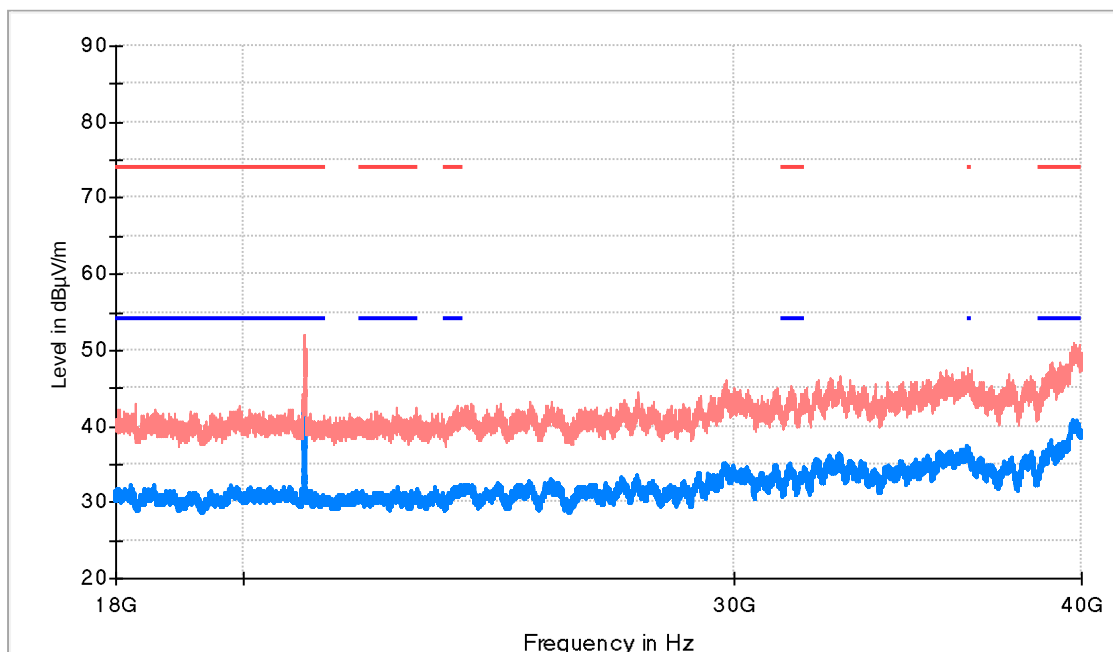
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1375.000000	44.9	37.5	H	
5321.363636	99.5	92.4	H	Fundamental
8511.818182	45.9	41.8	V	
10638.545455	53.2	45.6	H	

TEST RESULTS (Cont.)

18 – 40 GHz

Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

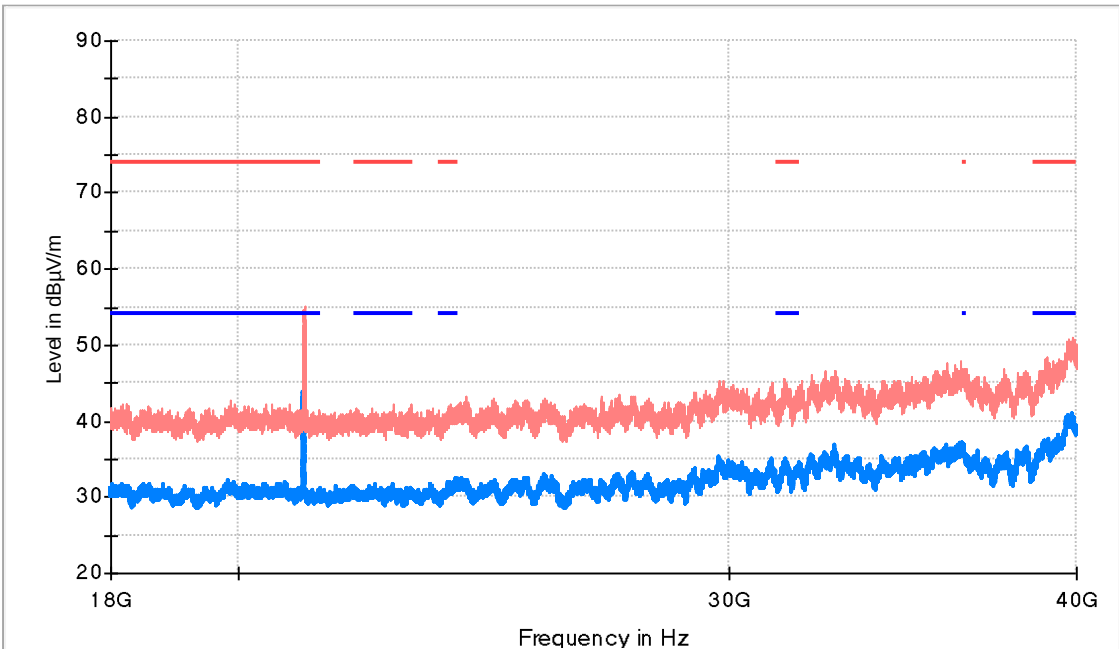
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol
21042.187500	49.7	42.6	H

TEST RESULTS (Cont.)

18 – 40 GHz

Middle Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

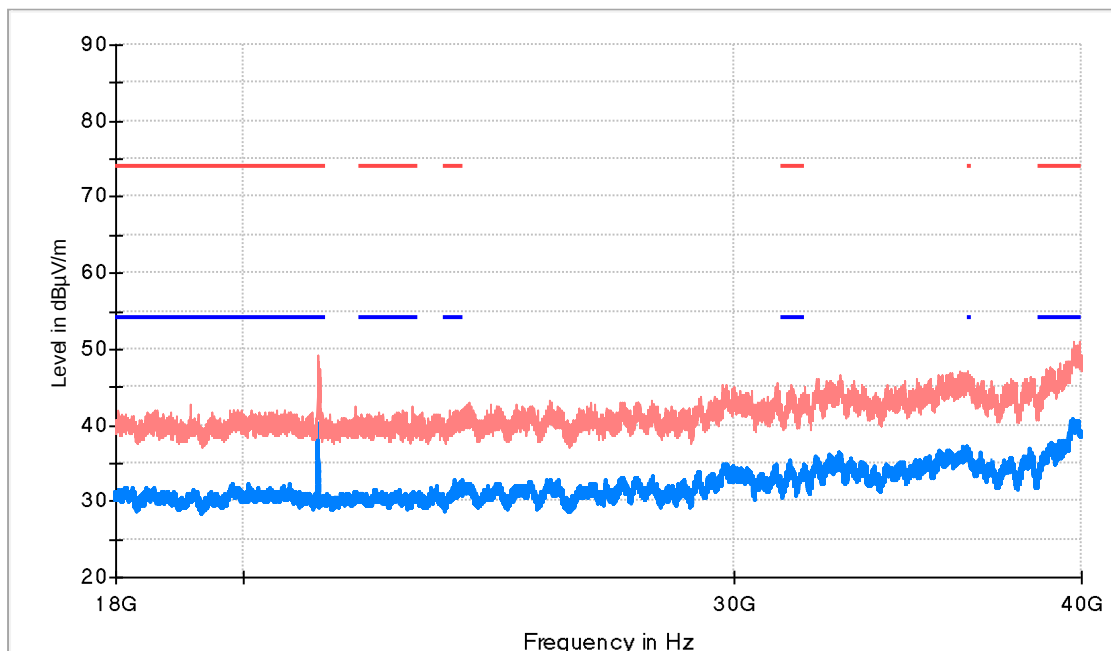
Maximizations

Frequency (MHz)	PK+ MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol
21119.875000	52.9	43.6	H

TEST RESULTS (Cont.)

18 – 40 GHz

High Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

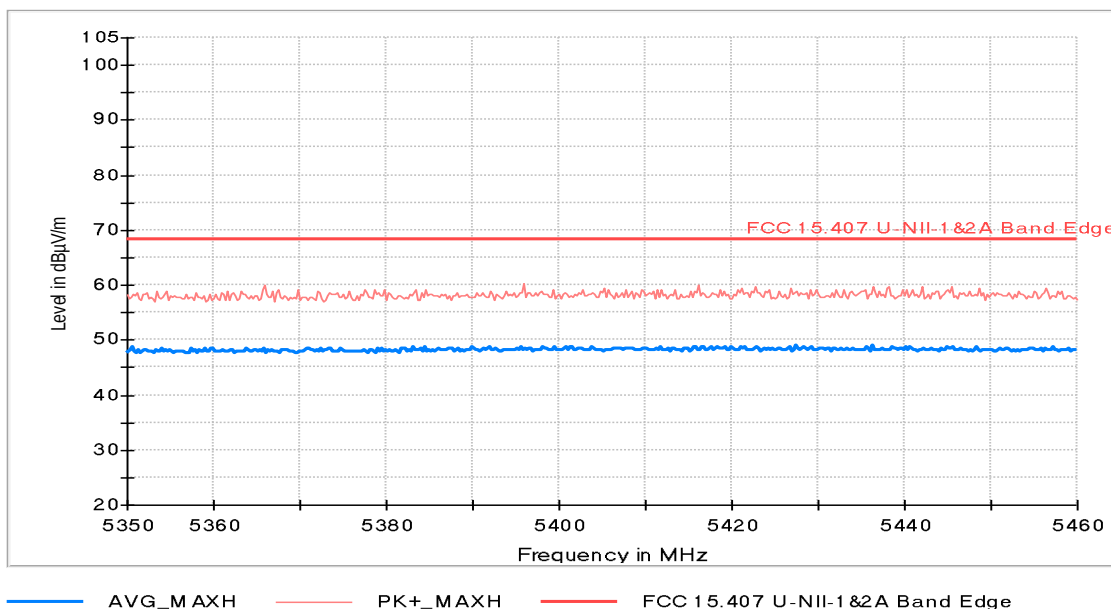
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol
21278.000000	48.3	40.1	V

RESTRICTED BANDS

5.35 GHz – 5.46 GHz

High Channel



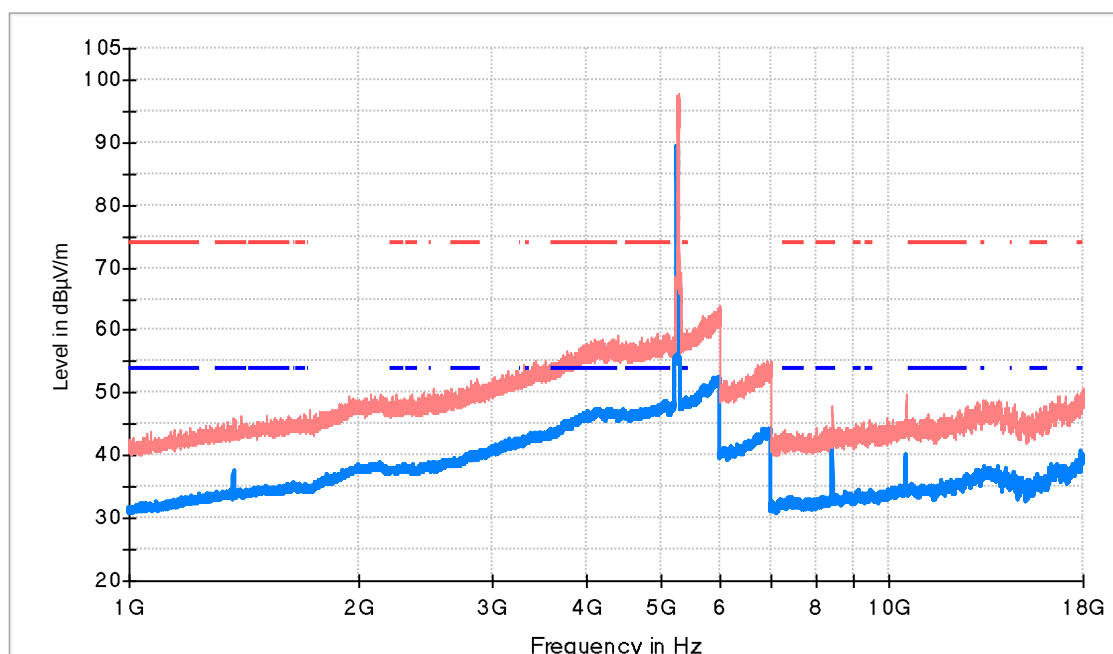
TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#02 (n mode 40 MHz)
TEST RESULTS:	PASS

Frequency range 1 GHz – 40 GHz

The results and plots below show the maximum measured levels in the 1- 40 GHz range.

FREQUENCY RANGE	1 GHz – 18 GHz
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Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

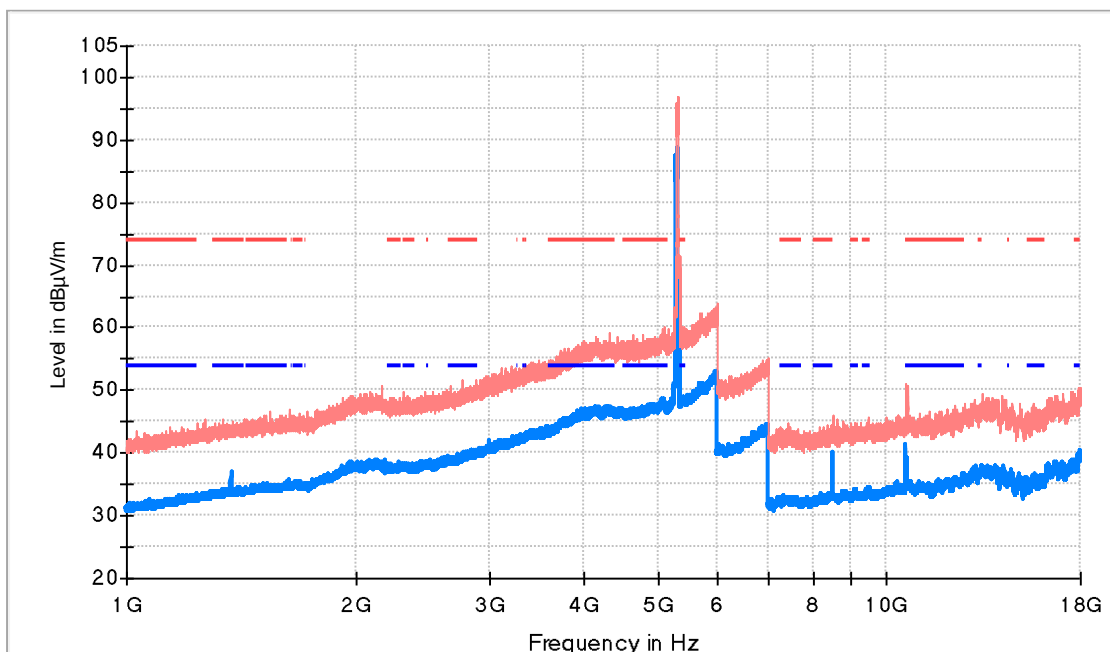
Maximizations

Frequency (MHz)	PK+_MAXH (dBμV/m)	AVG_MAXH (dBμV/m)	Pol	Comment
1374.772727	44.0	37.5	H	
5271.818182	96.3	89.2	V	Fundamental
8431.636364	48.0	44.0	V	
10540.909091	49.7	40.1	V	

TEST RESULTS (Cont.)

1 GHz – 18 GHz

High Channel



- AVG_MAXH
- PK+_MAXH
- - - TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- - - TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

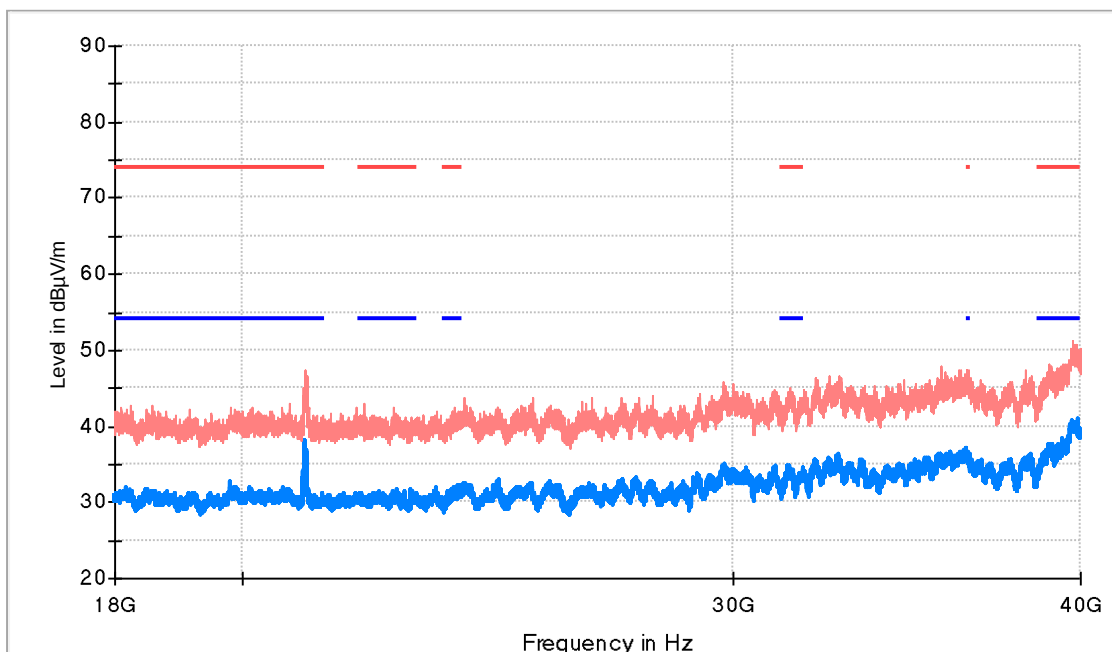
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Comment
1375.000000	44.2	36.9	H	
5312.727273	96.1	88.8	H	Fundamental
8496.000000	46.1	40.1	V	
10623.272727	50.6	41.2	H	

TEST RESULTS (Cont.)

18 GHz – 40 GHz

Low Channel



- AVG_MAXH
- PK+_MAXH
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands PK Limit
- TX limits to Spurious Emission FCC15.407 (1 GHz to 40 GHz) Restricted Bands AVG Limit

Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol
21071.750000	47.0	38.1	H