DEKRA Certification, Inc.
405 Glenn Dr. Suite 12,
Sterling, VA 20164
United States of America

DEKRA

ACCREDITED
Test Lab
Cert 2764.01

FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test report No:
2427ERM.002A1

Test report

USA FCC Part 15.407 (U-NIII), 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	High Performance Display Controller (HPDC)
Trademark	Panasonic
Model and /or type reference	HPDC
Other identification of the product	FCC ID: ACJ932A-HPDC IC: 216A-HPDC HVIN: HPDC
Features	LVDS, Ethernet, A2B, BT, Wi-Fi, USB
Manufacturer	Panasonic Automotive Systems Company of America 776 Georgia Hwy 74 Peachtree city, GA 30269
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). Guidance for Compliance Testing of Unlicensed National Information Infrastructure (U-NII) Devices 789033 D02 General UNII Test Procedures New Rules v02r01 dated 12/14/2018. 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 Digitally signed by Domingo Galvez DN: cn=Domingo Galvez, o=DEKRA Certification Inc., ou=Regulatory Lab, email=dgalvez@dekra.com, c=US Date: 2019.06.13 17:03:47 -04'00'
Date of issue	06-11-2019
Report template No	FDT08_21

Index

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.

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

LVDS, Ethernet, A2B, BT, Wi-Fi, USB

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 Nº	Description	Model	Serial Nº	Date of reception
2427.09	HPDC Unit	GA200FRDMMM	100092	01/24/2019

Following accessories were used with Sample S/01 to keep S/01 in testing mode

Control Nº	Description	Model	Serial Nº	Date of reception
2427.05	Innolux Display for HPDC Unit	DD102ZA-01C	0139	01/11/2019
2427.02	Center Molex connector to Ethernet	-	2M20181210-1304	1/11/2019
2427.01	Power cable	-	-	1/11/2019
2427.03	Molex blue cable to Innolux Display	-	20181218-0958	1/11/2019
2427.04	Power cable for display	-	-	1/11/2019

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

   All conducted tests indicated in appendix A, B & C.

Sample S/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
2427.06	HPDC Unit	GA200FRDMMM	100042	01/11/2019

Following accessories were used with Sample S/02 to keep S/02 in testing mode

Control Nº	Description	Model	Serial Nº	Date of reception
2427.11	Innolux Display for HPDC Unit	DD102ZA-01C	0030	01/24/2019
2427.02	Center Molex connector to Ethernet Interface cable	-	2M20181210-1304	1/11/2019
2427.01	Power cable	-	-	1/11/2019
2427.03	Molex blue cable to Innolux Display	-	20181218-0958	1/11/2019
2427.04	Power cable for display	-	-	1/11/2019

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

   All radiated tests indicated in appendix A, B & C.

Test sample description

Ports..... :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded		
	Main Harness		2	☒	☐		
				☐	☐		
Supplementary information to the ports..... :	*Not provided data*						
Rated power supply .....:	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☐	DC					
	☒	DC: 14.4 Vdc					
Rated Power .....:	*Data not provided*						
Clock frequencies .....:	*Data not provided*						
Other parameters.....:	*Data not provided*						
Software version .....:	R7						
Hardware version.....:	PV						
Dimensions in cm (L x W x D) ....:	*10 x 10 x 3*						
Mounting position.....:	☐	Table top equipment					
	☐	Wall/Ceiling mounted equipment					
	☐	Floor standing equipment					
	☐	Hand-held equipment					
	☒	Other: Vehicle Equipment					
Modules/parts .....:	Module/parts of test item		Type	Manufacturer			
	CX-MG29N04D		HPDC	Panasonic			
Accessories (not part of the test item).....:	Description		Type	Manufacturer			
	Not provided data						
Documents as provided by the applicant.....:	Description		File name	Issue date			
	FDT30_14 Data Declaration Equipment Data						

Copy of marking plate:


Identification of the client

PANASONIC AUTOMOTIVE SYSTEMS COMPANY OF AMERICA
776 GEORGIA HWY 74 PEACHTREE CITY, GA 30269

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	03-04-2019
Date (finish)	04-02-2019

Document history

Report number	Date	Description
2427ERM.002	04-17-2019	First release
2427ERM.002A1	06-11-2019	Second release

Modifications to the reference test report

It was introduced the following modifications in respect to the test report number 2427ERM.002 related with the same samples, in the next clauses and sub-clauses:

Clauses/ Sub-Clauses	Modification	Justification
Page 138/172/194/211/ Conducted Bandwidth,Power test cases	Inserted the RSS MID CHANNEL	Documentation error

This modification test report cancels and replaces the test report 2427ERM.002

Environmental conditions

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

Temperature	Min. = 15 ºC Max. = 35 ºC
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 ºC Max. = 35 ºC
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 ºC Max. = 35 ºC
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, 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	**15.407 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	Maximum 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	Refer 1
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 2

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) DUT is incorporated with integral antenna.
2) Acc. To FCC, Manufacturers of UNII devices are responsible for frequency stability compliance.

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.25 GHz -5.35 GHz Band					
Report Section	**15.407 Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
C.1	§ 15.403 (i) KDB 789033 D02	RSS 247 6.2.1	26dB Emission Bandwidth & Occupied Bandwidth	P	N/A
C.2	§ 15.407 (a) (1) (4)	RSS 247 6.2.1.1	Power Limits. Maximum Output Power	P	N/A
C.3	§ 15.407 (a) (1) (5)	RSS-247 6.2.1.1	Maximum Power Spectral Density	P	N/A
C.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	Refer 1
C.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 2

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) DUT is incorporated with integral antenna.
2) Acc. To FCC, Manufacturers of UNII devices are responsible for frequency stability compliance.

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.47 GHz -5.725 GHz Band					
Report Section	**15.247 Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
D.1	§ 15.403 (i) KDB 789033 D02	RSS 247 6.2.4	26dB Emission Bandwidth & Occupied Bandwidth	P	N/A
D.2	§ 15.407 (e)	RSS 247 6.2.4.1	6dB Bandwidth	P	N/A
D.3	§ 15.407 (a)(3)(4)	RSS 247 6.2.4.1	Power Limits. Maximum Output Power	P	N/A
D.4	§ 15.407 (a)(3)(5)	RSS-247 6.2.4.1	Maximum Power Spectral Density	P	N/A
D.5	§ 15.407 (b)(4)	RSS-247 6.2.4.2	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	Refer 1
D.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 2

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) DUT is incorporated with integral antenna.

2) Acc. To FCC, Manufacturers of UNII devices are responsible for frequency stability compliance.

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) 5.725 GHz -5.85 GHz Band					
Report Section	**15.247 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	6dB Bandwidth	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	Maximum Power Spectral Density	P	N/A
E.5	§ 15.407 (b)(4)	RSS-247 6.2.4.2	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	Refer 1
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 2

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) DUT is incorporated with integral antenna.

2) Acc. To FCC, Manufacturers of UNII devices are responsible for frequency stability compliance.

FCC PART 15 PARAGRAPH / RSS-247 (WIFI 5GHz) Common Requirements for all bands					
Report Section	**15.247 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	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
1039	Signal Analyzer	ROHDE & SCHWARZ	FSV40	2017/03	2019/03
1040	EMI Test Receiver	ROHDE & SCHWARZ	OSP120 / OSPB157	2017/03	2019/03
1041	RF generator	ROHDE & SCHWARZ	SMB100A	2017/04	2019/04
1042	RF generator	ROHDE & SCHWARZ	SMBV100A	2018/01	2019/01
0101	Climatic Chamber	ESPEC NA	ESL-2CA	2019/01	2020/01

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
1014	Signal Analyzer	ROHDE & SCHWARZ	FSV40	2017/03	2019/03
1012	EMI Test Receiver	ROHDE & SCHWARZ	ESR26	2018/09	2020/09
1058	Double Ridged Waveguide Horn Antenna	ETS LINDGREN	3115	2017/03	2020/03
1055	Double Ridged Waveguide Horn Antenna	ETS LINDGREN	3116C	2016/12	2019/12
1065	Biconilog Antenna	ETS LINDGREN	3142E	2017/03	2020/03
0981	Preamplifier	BONN ELEKTRONIK	BLMA 0118-2A	2017/05	2019/05
0980	Preamplifier	BONN ELEKTRONIK	BLNA 0360-01N	2017/05	2019/05
0982	Preamplifier	BONN ELEKTRONIK	BLMA1840-1M	2017/05	2019/05
1017	EMC measurement software	ROHDE & SCHWARZ	EMC32 V9.01	---	---

Appendix A: **DUT Description**

DUT Description

The following information is provided by the client

Information	Description
Equipment type	WIFI 5GHz/2.4 GHz + BT BR/EDR
DFS Operating Mode	Slave without Radar Detection
TPC Function	Not Supported[1]
Antenna Specification	Equipment with only one antenna
Operating Frequency Range	5150 - 5250 MHz / 5250 - 5350 MHz / 5470 -5725 MHz/ 5725-5850 MHz
Nominal Channel Bandwidth	20/ 40/ 80 MHz
Antenna type	Dedicated antenna (single)
Antenna gain	-2.5 dBi
Supply Voltage	14.4 Vdc
Modulation:	OFDM (QPSK, BPSK,16QAM,64QAM,256QAM)
Communication Mode:	IP Based (Load Based)
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 IEEE 802.11ac VHT20: 86.7 Mbps IEEE 802.11ac VHT40: 180, 200 Mbps IEEE 802.11ac VHT80: 390, 433.3 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

Appendix B Content

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS(1) (2)	DESCRIPTION
TC#01 **(a mode)**	Power supply (V): $V_{nominal}$ = 14.4 Vdc Test Frequencies for Conducted/Radiated tests: **(20 MHz)** Lowest range: 5180 MHz Middle channel: 5200 MHz Highest range: 5240 MHz
TC#02 **(n mode)**	Power supply (V): $V_{nominal}$ = 14.4 Vdc Test Frequencies for Conducted/Radiated tests: **(20 MHz)** Lowest channel: 5180 MHz Middle channel: 5200 MHz Highest channel: 5240 MHz Test Frequencies for Conducted/Radiated tests: **(40 MHz)** Lowest channel: 5190 MHz Highest channel: 5230 MHz
TC#03 **(ac mode)**	Power supply (V): $V_{nominal}$ = 14.4 Vdc Test Frequencies for Conducted/Radiated tests: **(20 MHz)** Lowest channel: 5180 MHz Middle channel: 5200 MHz Highest channel: 5240 MHz Test Frequencies for Conducted/Radiated tests: **(40 MHz)** Lowest channel: 5190 MHz Highest channel: 5230 MHz Test Frequencies for Conducted/Radiated tests: **(80 MHz)** Middle channel: 5210 MHz

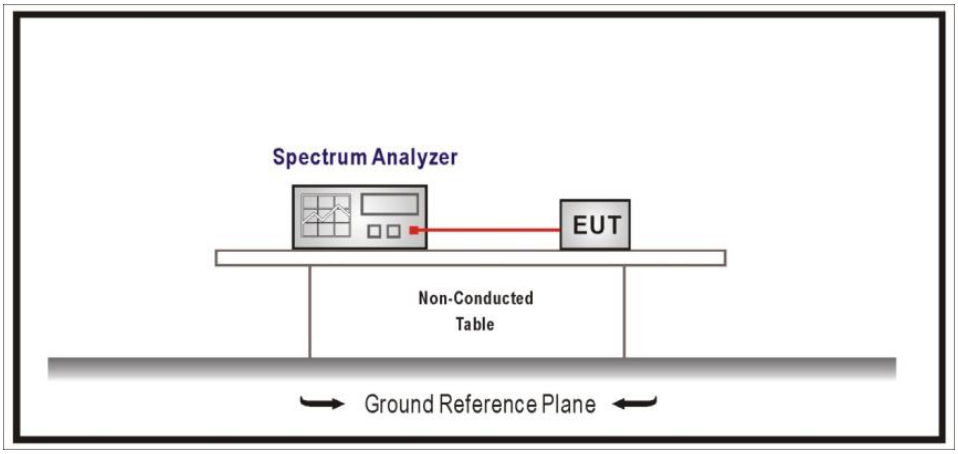
Note (1): For radiated spurious emissions for OFDM modes 802.11a, 802.11n20/40 and 802.11ac20/40/80 a preliminary scan was performed to determine the worst case.
Note (2): For radiated/conducted measurements, a preliminary scan was performed to determine the worst case. The data rates of 6Mb/s for 802.11a, MCS0 for 802.11n20/n40, and MCS8 for 802.11ac20/ac40/ac80 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:	



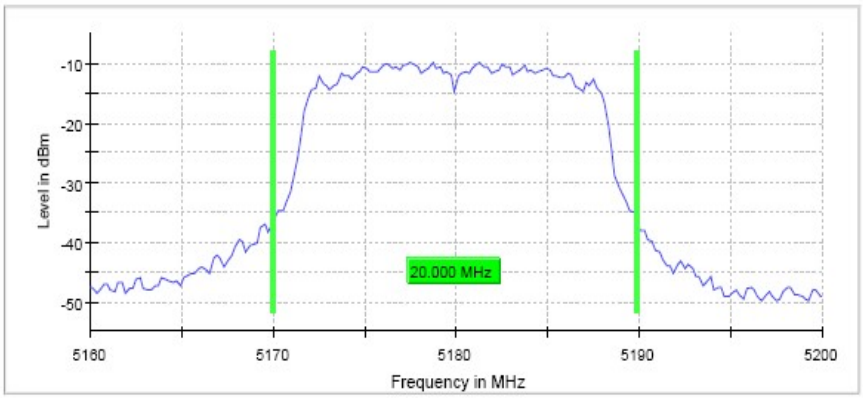
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 **(a mode)**
TEST RESULTS:	PASS

Bandwidth: 20 MHz

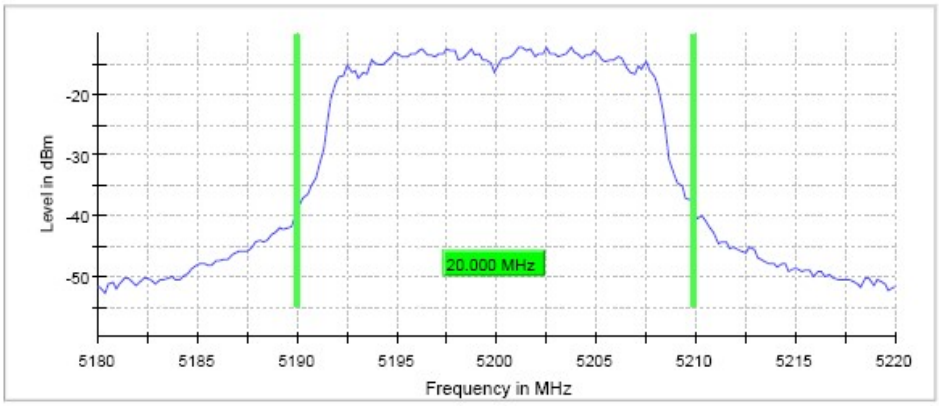
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
26dB Bandwidth (MHz)	20	20	19.8
Occupied bandwidth (MHz)	16.4	16.4	16.4
Measurement uncertainty (kHz)	<± 8.33		

TEST RESULTS (Cont.):	26 dB BANDWIDTH

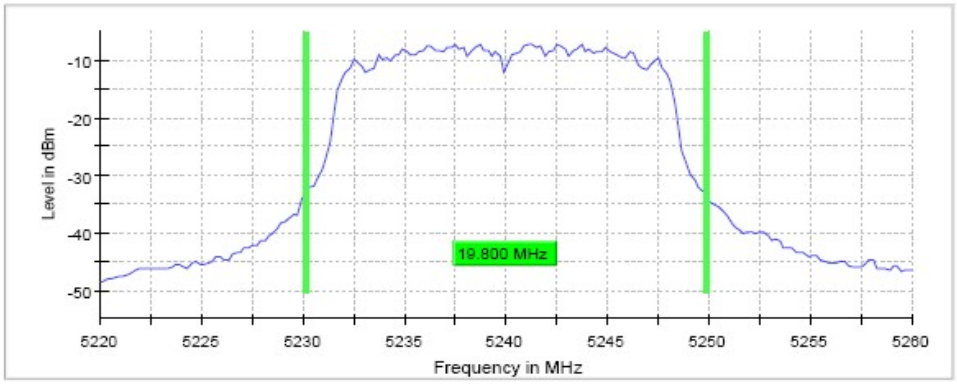
Lowest Channel



Middle Channel

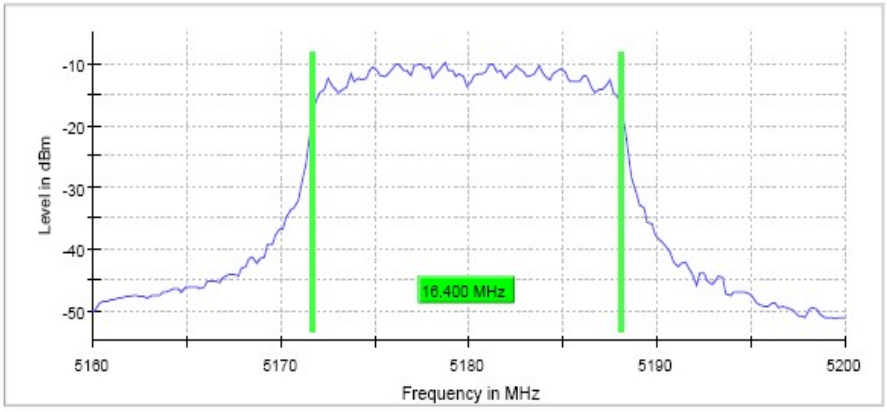


Highest Channel

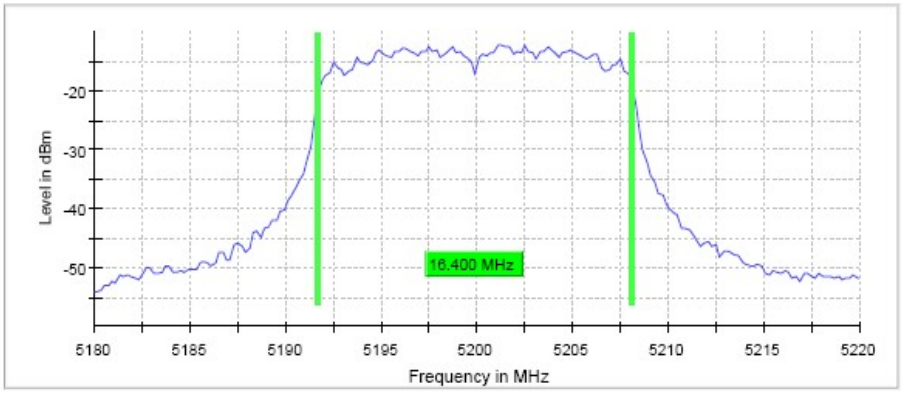


TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH

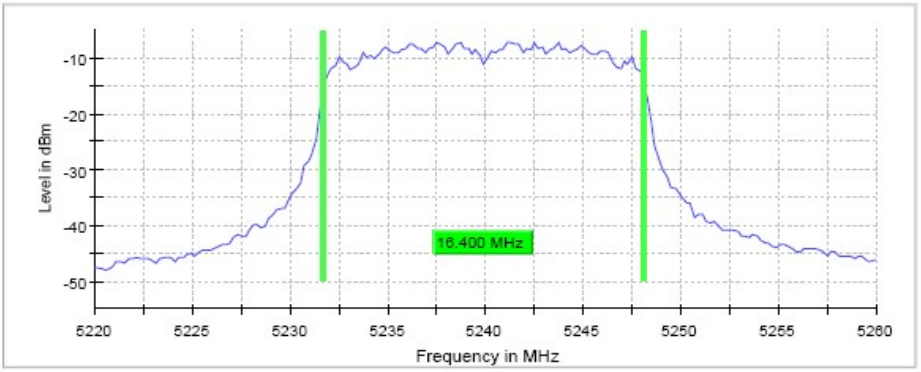
Lowest Channel



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	200	200	200
Sweeptime	28.443 µs	28.443 µs	28.443 µs
Reference Level	10.000 dBm	0.000 dBm	0.000 dBm
Attenuation	30.000 dB	20.000 dB	20.000 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	51 / max. 150	44 / max. 150	58 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.17 dB	0.03 dB	0.06 dB

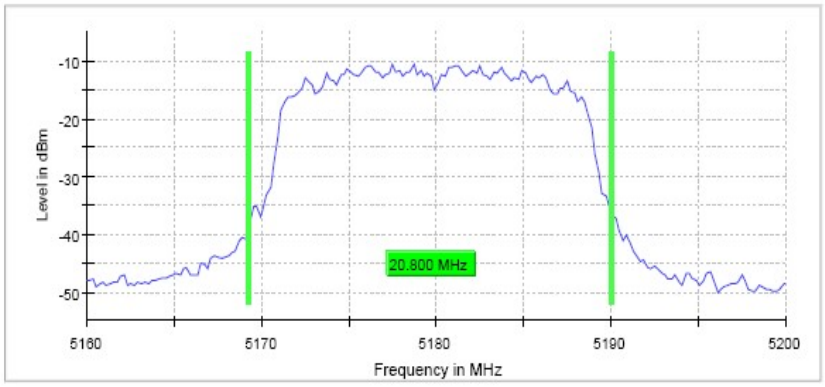
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 **(n Mode)**
TEST RESULTS:	PASS

Bandwidth: 20 MHz

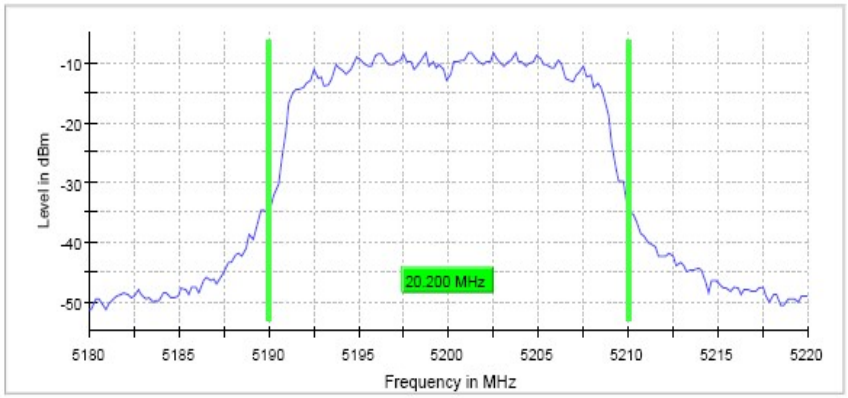
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
26dB bandwidth (MHz)	20.8	20.2	20.8
Occupied bandwidth (MHz)	17.4	17.4	17.6
Measurement uncertainty (kHz)	<± 8.33		

TEST RESULTS (Cont.):	26 dB BANDWIDTH

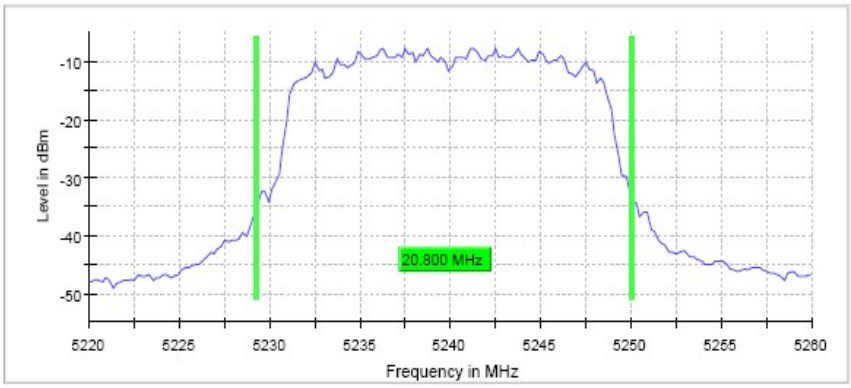
Lowest Channel



Middle Channel

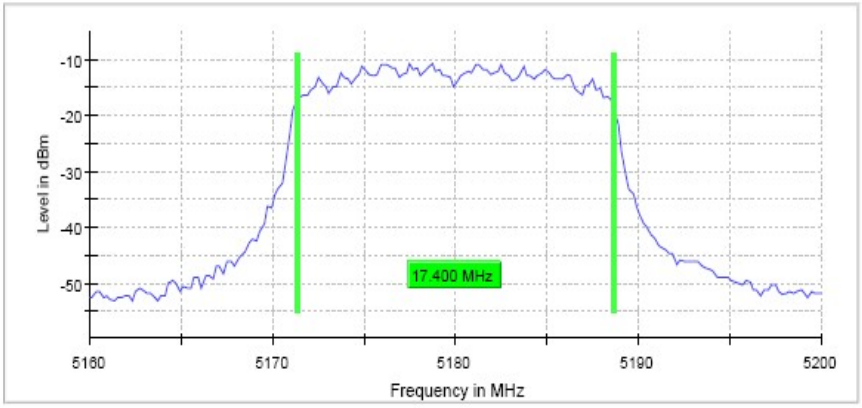


Highest Channel

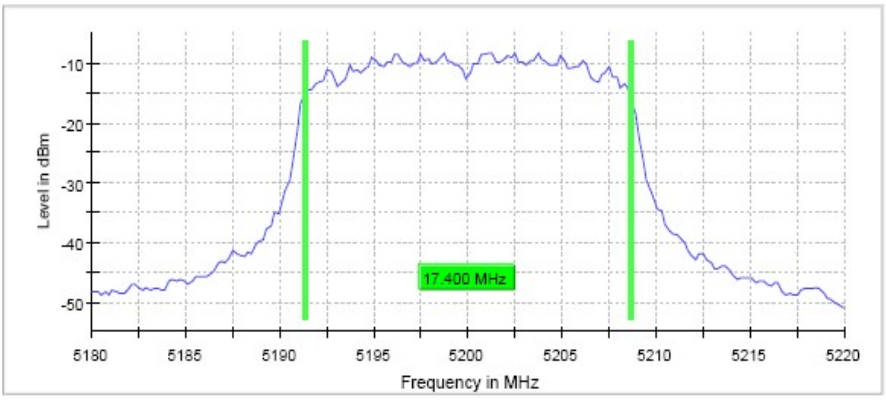


TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH

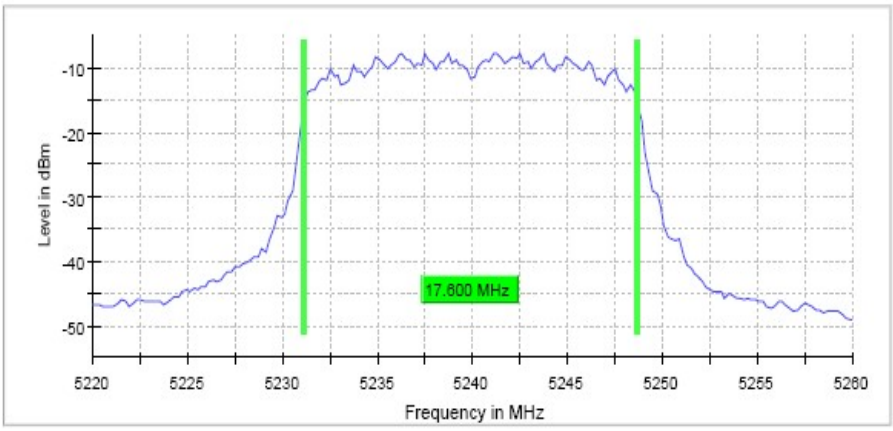
Lowest Channel



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	200	200	200
Sweeptime	28.443 µs	28.443 µs	28.443 µs
Reference Level	10.000 dBm	10.000 dBm	0.000 dBm
Attenuation	30.000 dB	20.000 dB	20.000 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	73 / max. 150	49 / max. 150	50 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.30 dB	0.00 dB	0.07 dB

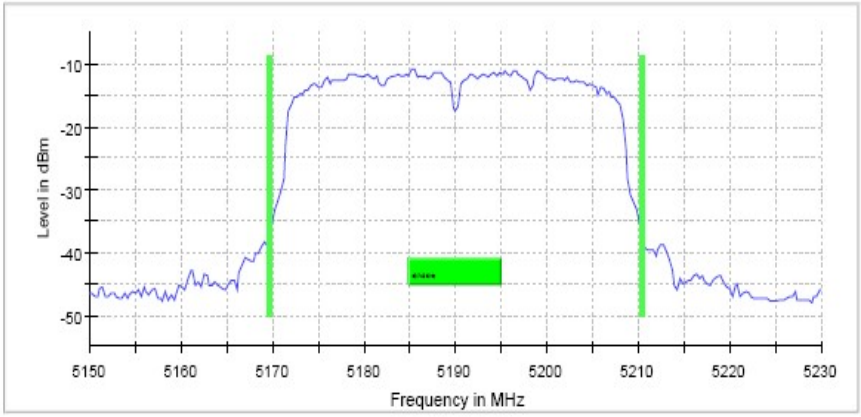
TEST RESULTS (Cont.)	n Mode

Bandwidth: 40 MHz

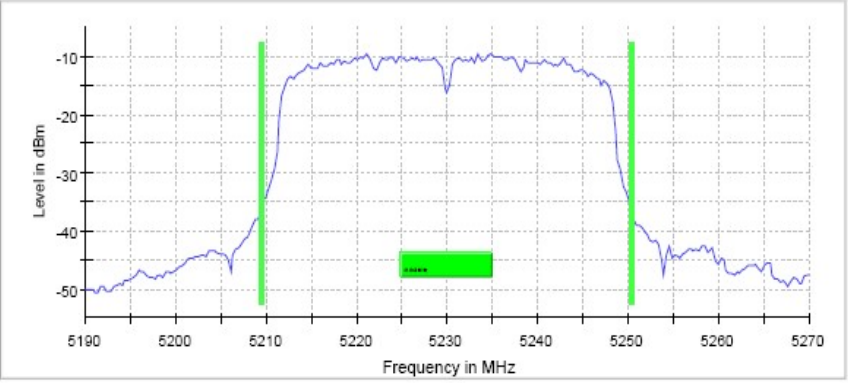
	Lowest frequency 5190 MHz	Highest frequency 5230 MHz
26dB bandwidth (MHz)	40.7	41.05
Occupied bandwidth (MHz)	36.5	36.5
Measurement uncertainty (kHz)	<± 8.33	

TEST RESULTS (Cont.):	26 dB BANDWIDTH

Lowest Channel

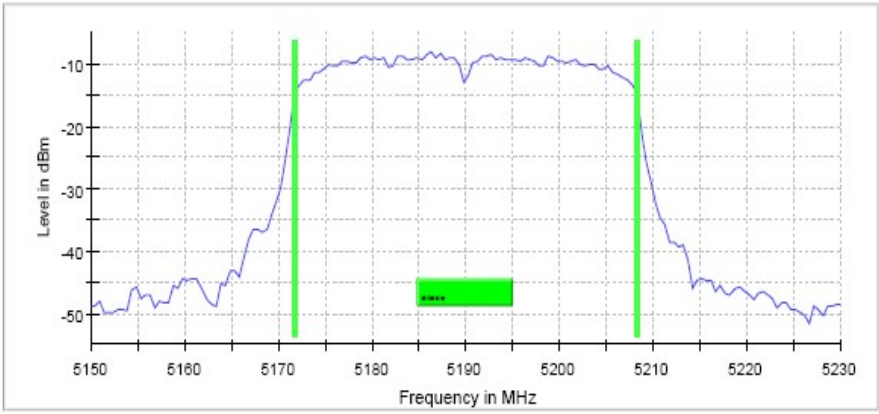


Highest Channel

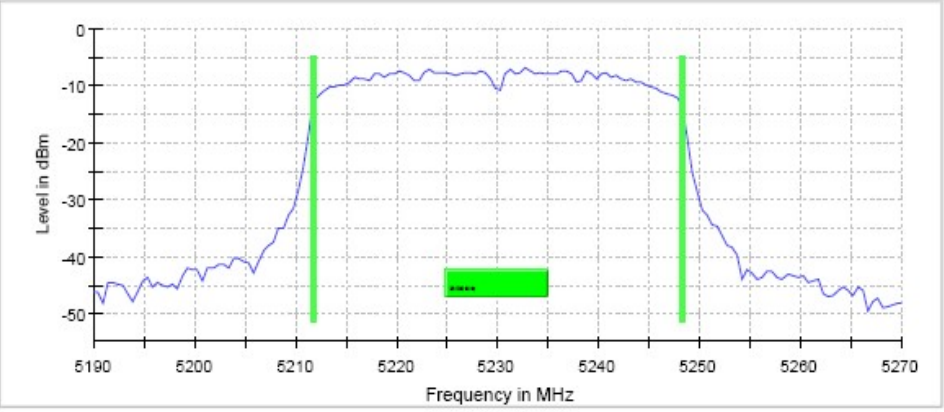


TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH

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	500.000 kHz	500.000 KHz
VBW	2.000 MHz	2.000 MHz
SweepPoints	267	267
Sweeptime	31.603 µs	31.603 µs
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
Preamp	off	off
Stablemode	Trace	Trace
Stablevalue	0.30 dB	0.30 dB
Run	150 / max.	148 / max. 150
Stable	0 / 5	5 / 5
Max Stable	0.76 dB	0.28 dB

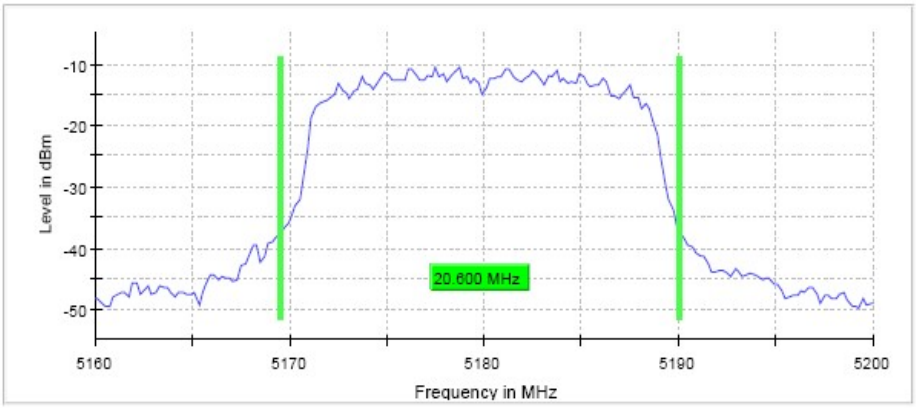
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 (ac mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

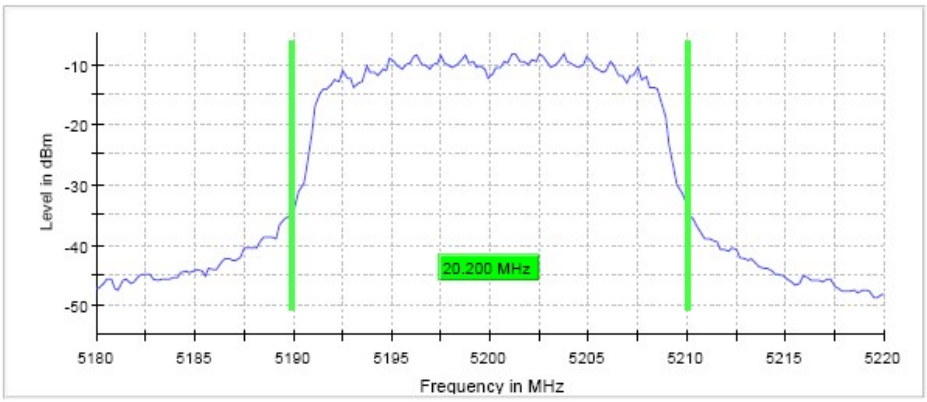
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
26db bandwidth (MHz)	20.6	20.2	20.2
Occupied bandwidth (MHz)	17.4	17.4	17.4
Measurement uncertainty (kHz)	<± 8.33		

TEST RESULTS (Cont.):	26 dB BANDWIDTH

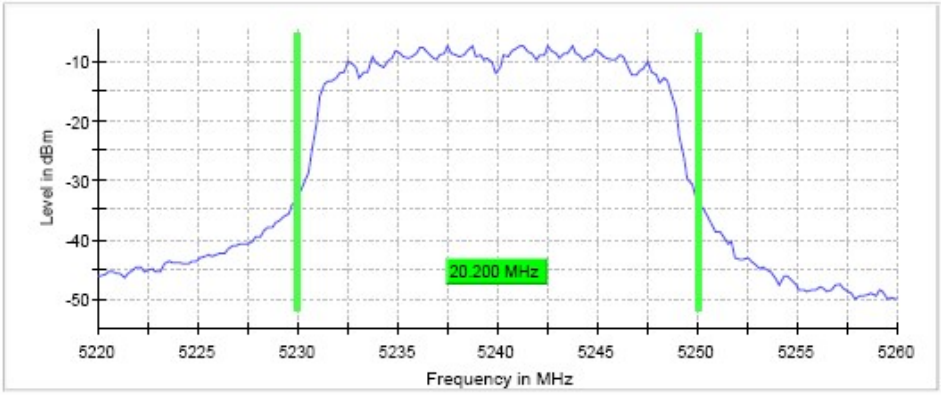
Lowest Channel



Middle Channel

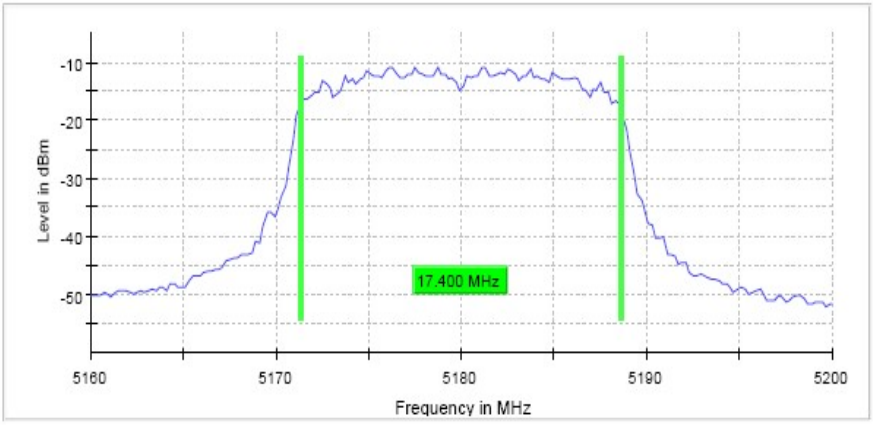


Highest Channel

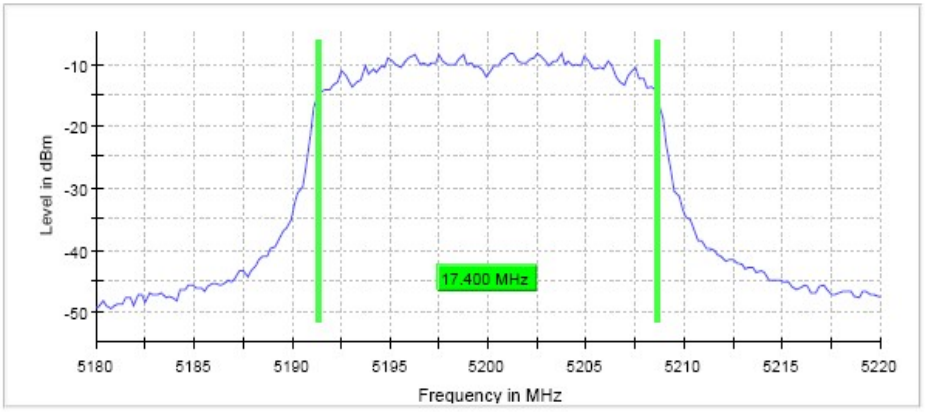


TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH

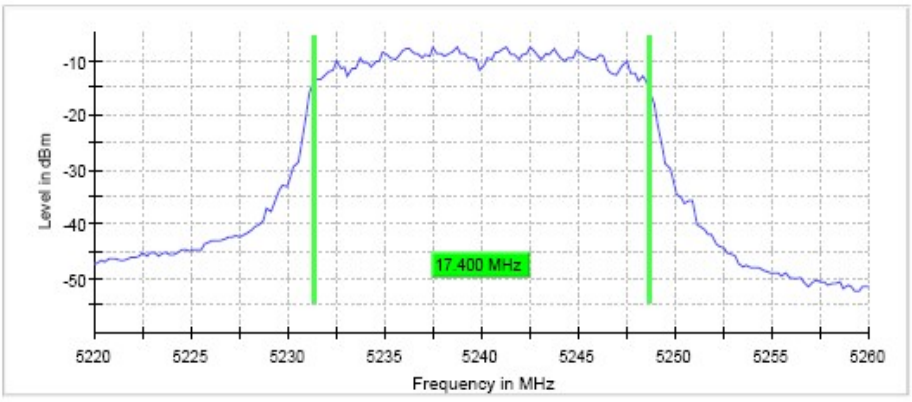
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.)	

Measurement

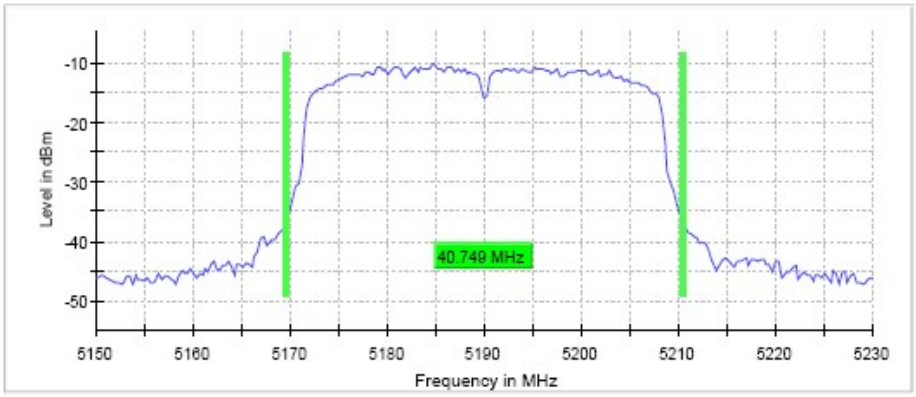
Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.16000 GHz	5.18000 GHz	5.22000 GHz
Stop Frequency	5.20000 GHz	5.22000 GHz	5.26000 GHz
Span	40.000 MHz	40.000 MHz	40.000 MHz
RBW	200.000 kHz	200.000 KHz	200.000 kHz
VBW	1.000 MHz	1.000 MHz	1.000 MHz
SweepPoints	200	200	200
Sweeptime	28.443 µs	28.443 µs	28.443 µs
Reference Level	10.000 dBm	0.000 dBm	0.000 dBm
Attenuation	30.000 dB	20.000 dB	20.000 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	48 / max. 150	38 / max. 150	70 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.00 dB	0.11 dB	0.00 dB

TEST RESULTS	ac mode (40 MHz)

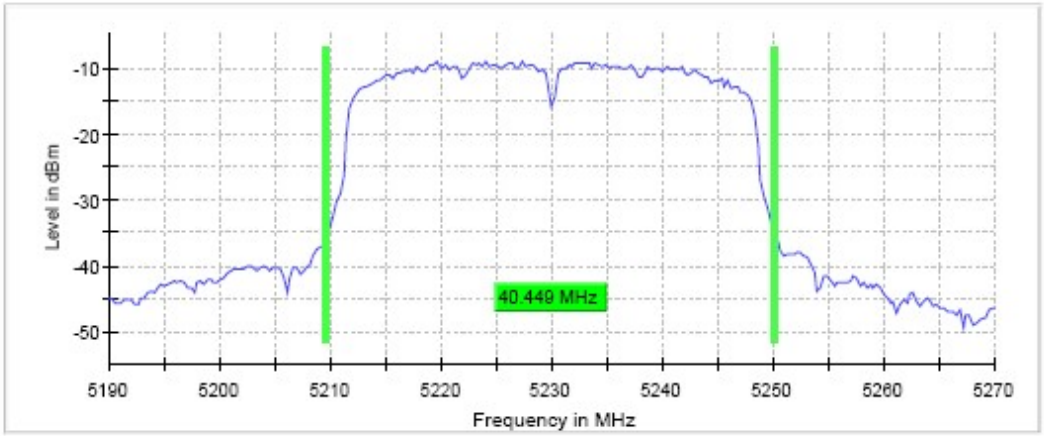
	Lowest frequency 5190 MHz	Highest frequency 5230 MHz
26dB bandwidth (MHz)	40.749	40.449
Occupied bandwidth (MHz)	36.5	36.5
Measurement uncertainty (kHz)	<± 8.33	

TEST RESULTS (Cont.):	26 dB BANDWIDTH

Lowest Channel

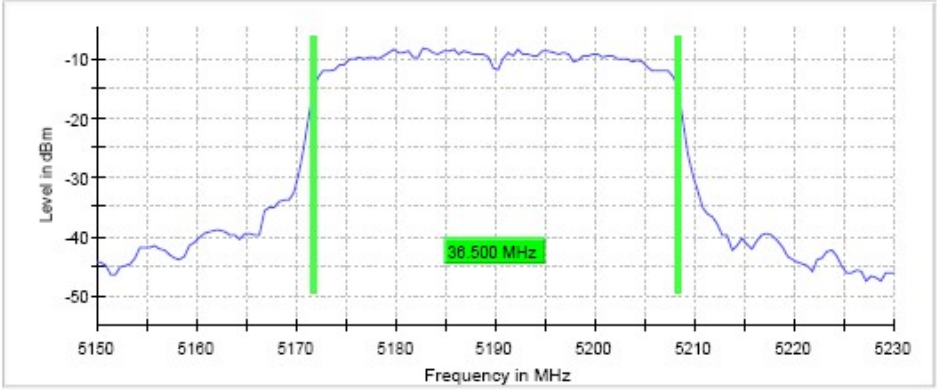


Highest Channel

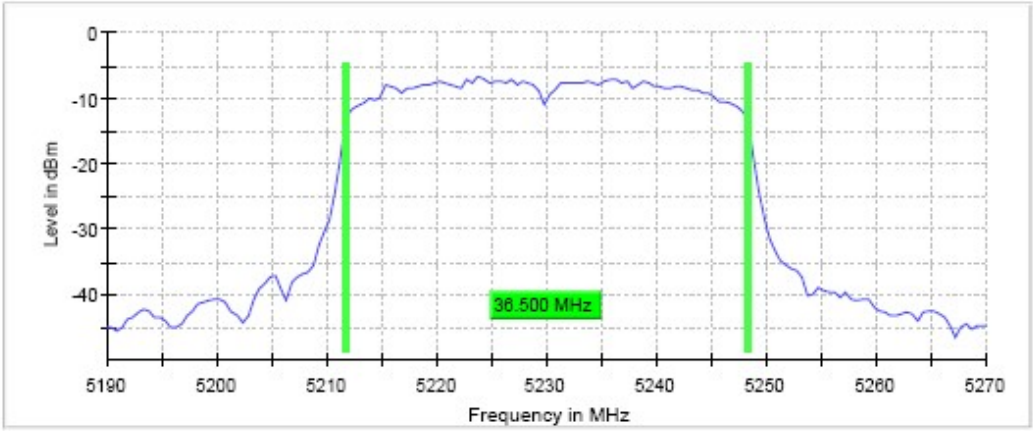


TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH

Lowest Channel



Highest Channel



TEST RESULTS (Cont.)	

Measurement

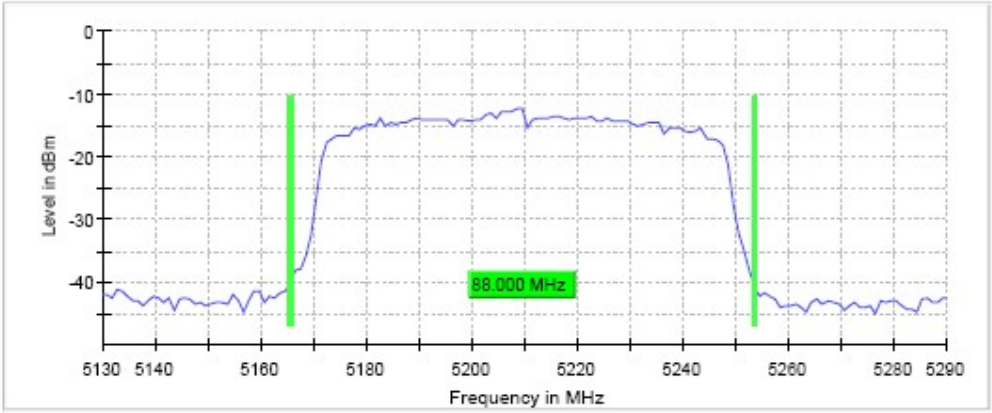
Setting	Instrument Value	Instrument Value
Start Frequency	5.15000 GHz	5.19000 GHz
Stop Frequency	5.23000 GHz	5.27000 GHz
Span	80.000 MHz	80.000 MHz
RBW	500.000 kHz	500.000 kHz
VBW	2.000 MHz	2.000 MHz
SweepPoints	267	267
Sweeptime	31.603 µs	31.603 µs
Reference Level	10.000 dBm	0.000 dBm
Attenuation	30.000 dB	20.000 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	84 / max. 150	77 / max. 150
Stable	5 / 5	5 / 5
Max Stable Difference	0.13 dB	0.26 dB

TEST RESULTS	ac mode (80 MHz)

	Lowest frequency 5210 MHz
26dB bandwidth (MHz)	88
Occupied bandwidth (MHz)	75
Measurement uncertainty (kHz)	<± 8.33

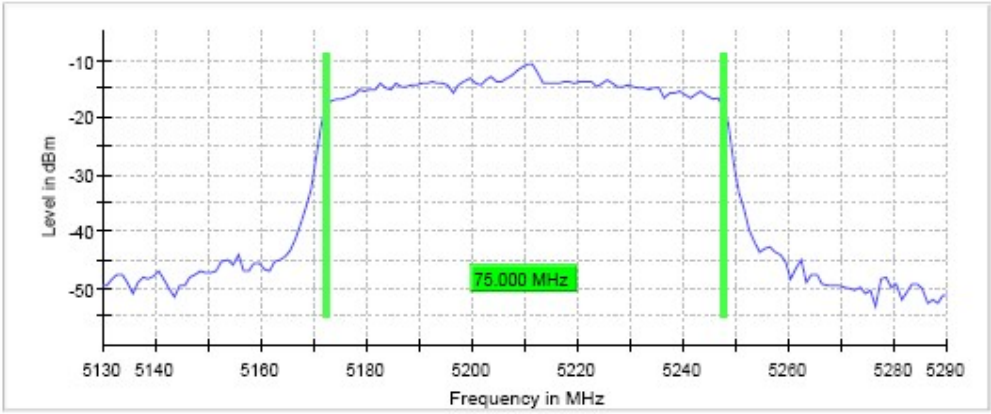
TEST RESULTS (Cont.):	26 dB BANDWIDTH

Lowest Channel



TEST RESULTS (Cont.):	OCCUPIED BANDWIDTH

Lowest Channel



Measurement

Setting	Instrument Value
Start Frequency	5.13000 GHz
Stop Frequency	5.29000 GHz
Span	160.000 MHz
RBW	1.000 MHz
VBW	3.000 MHz
SweepPoints	160
Sweeptime	22.754 µs
Reference Level	10.000 dBm
Attenuation	30.000 dB
Detector	MaxPeak
SweepCount	200
Filter	3 dB
Trace Mode	Max Hold
Sweeptype	FFT
Preamp	off
Stablemode	Trace
Stablevalue	0.30 dB
Run	56 / max. 150
Stable	5 / 5
Max Stable Difference	0.14 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

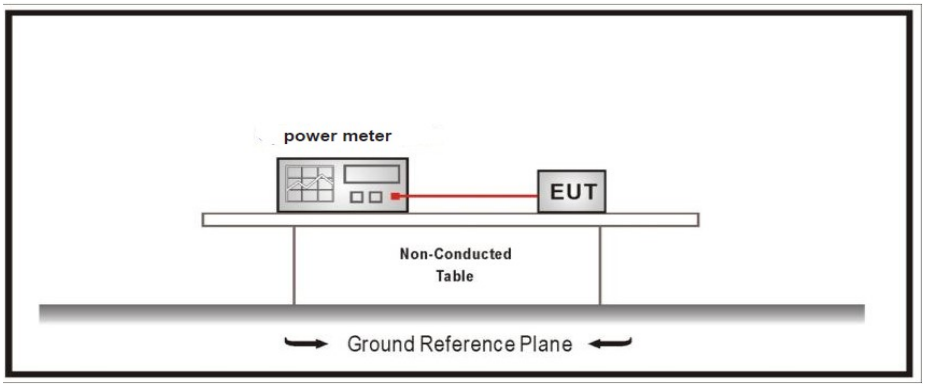
LIMITS

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

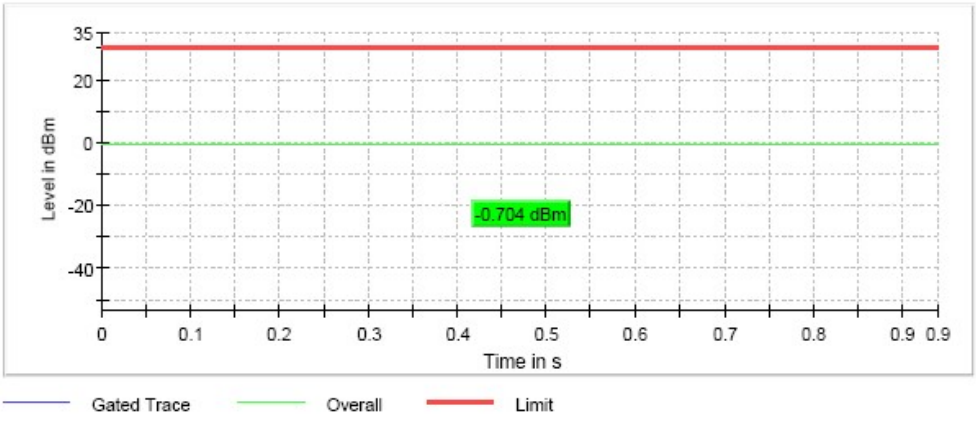
Maximum declared antenna gain: -2.5 dBi

	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Maximum conducted power (dBm)	-0.7	-2.9	2.1
Maximum EIRP power (dBm)	-3.2	-5.4	-0.4
Measurement uncertainty (dB)	<±0.78		

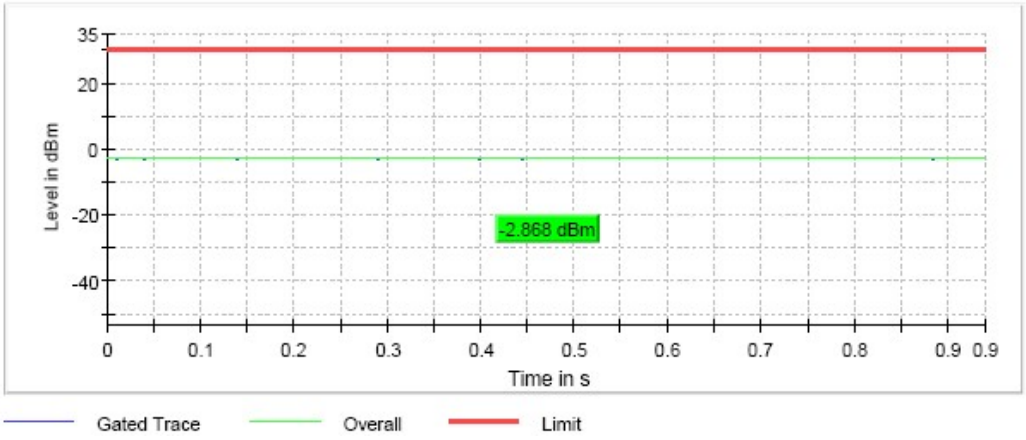
The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER

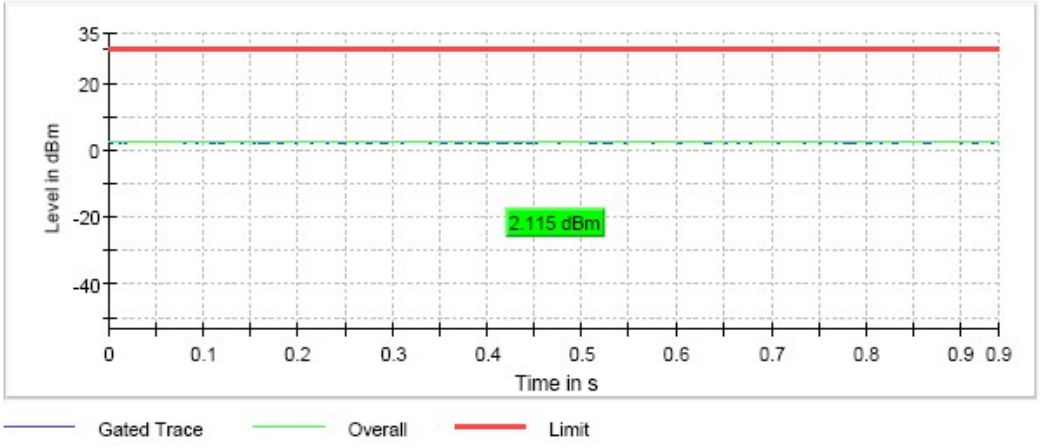
Lowest Channel



Middle Channel



Highest Channel



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

Bandwidth: 20 MHz

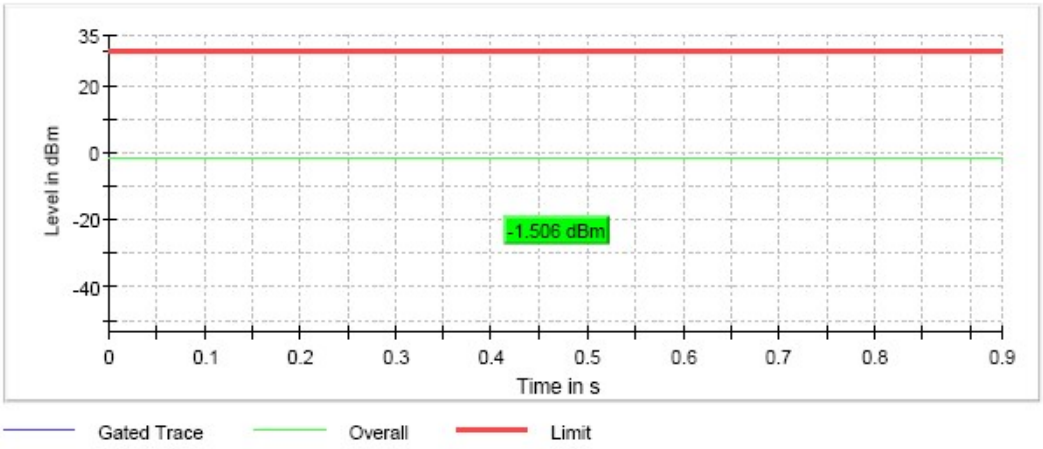
Maximum declared antenna gain: -2.5 dBi

	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Maximum conducted power (dBm)	-1.5	0.8	1.7
Maximum EIRP power (dBm)	-4.0	-1.7	-0.8
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.

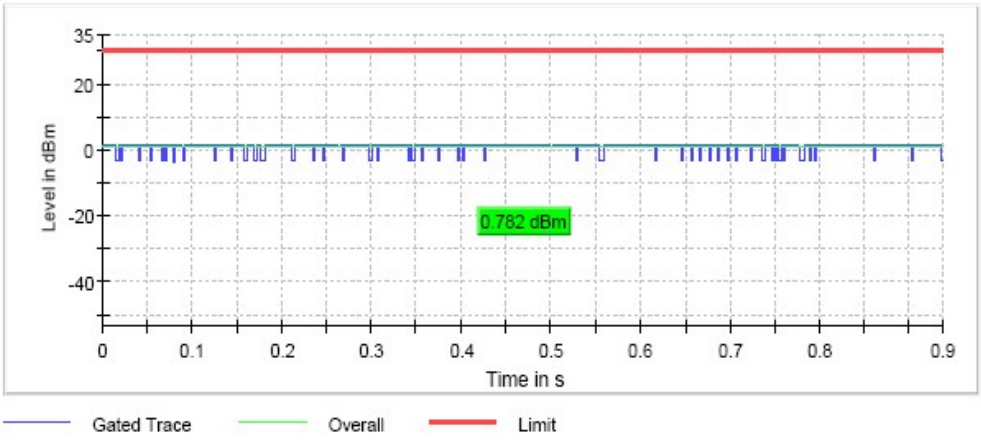
TEST RESULTS (Cont.):	**CONDUCTED OUTPUT POWER**

Lowest Channel

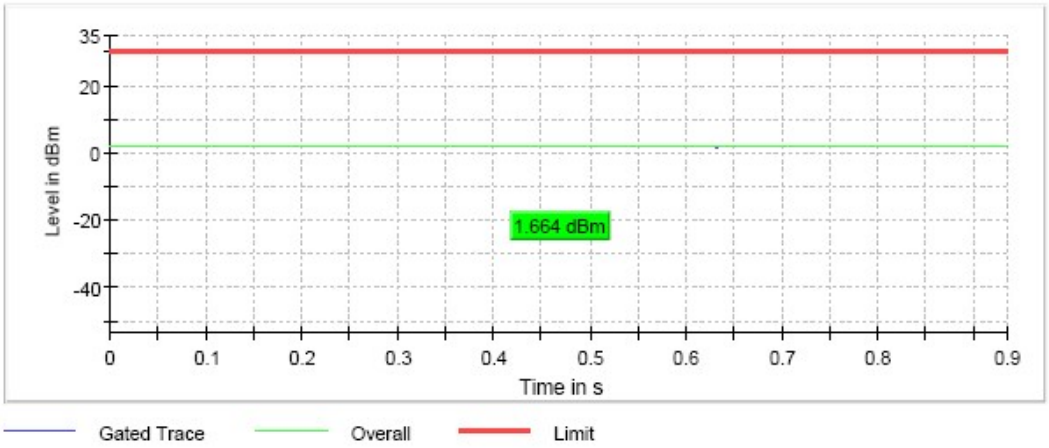


TEST RESULTS (Cont.)	

Middle Channel



Highest Channel



TEST RESULTS	n Mode (40 MHz)

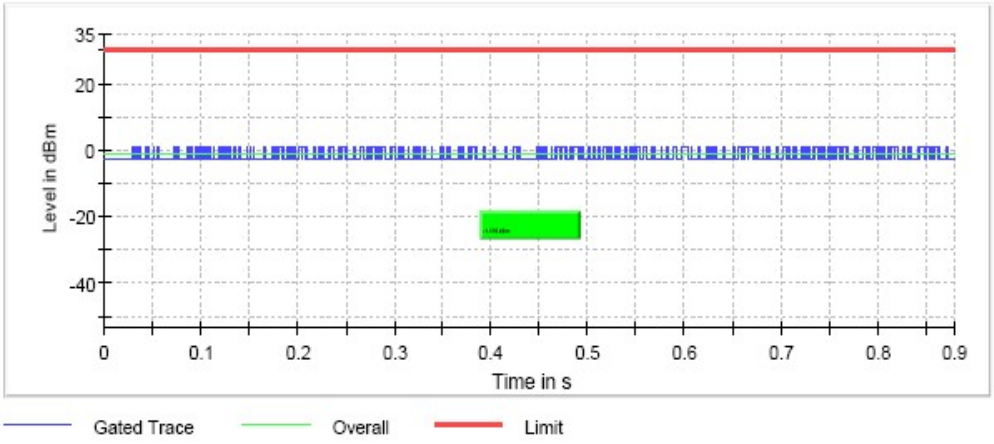
Maximum declared antenna gain: -2.5 dBi

	Lowest frequency 5190 MHz	Highest frequency 5230 MHz
Maximum conducted power (dBm)	-1.2	-0.6
Maximum EIRP power (dBm)	-3.7	-3.1
Measurement uncertainty (dB)	<±0.78	

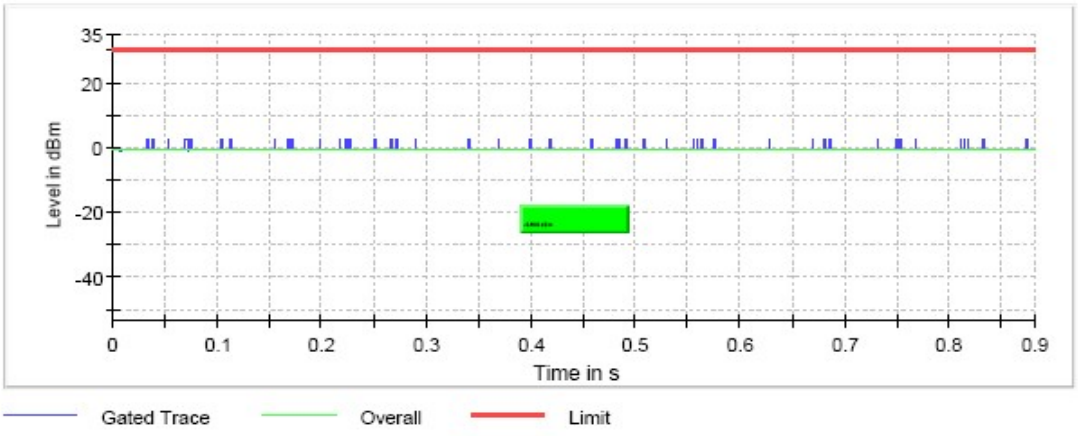
The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER

Lowest Channel



Highest Channel



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#03 **(ac mode)**
TEST RESULTS:	PASS

Bandwidth: 20 MHz

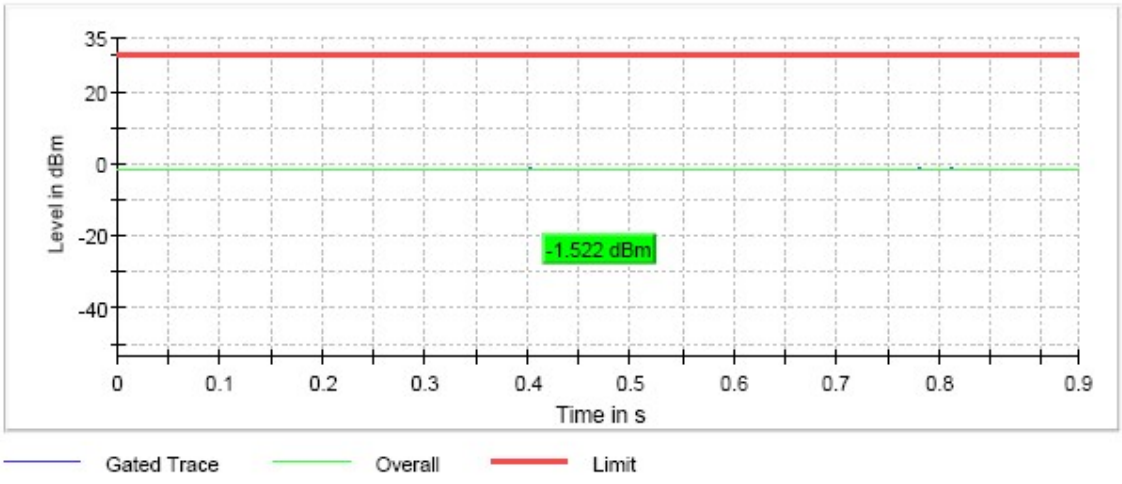
Maximum declared antenna gain: -2.5 dBi

	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Maximum conducted power (dBm)	-1.5	1.1	1.7
Maximum EIRP power (dBm)	-4.0	-1.4	-0.8
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.

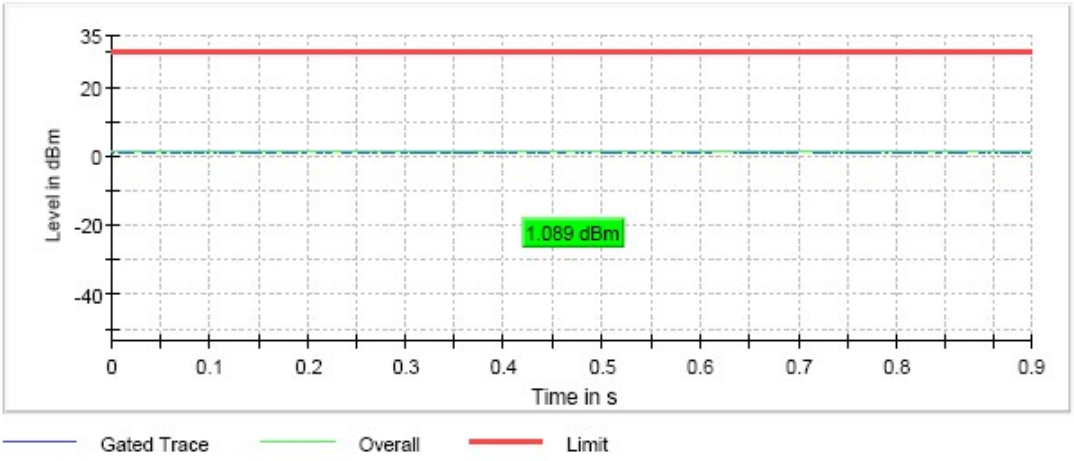
TEST RESULTS (Cont.):	**CONDUCTED OUTPUT POWER**

Lowest Channel

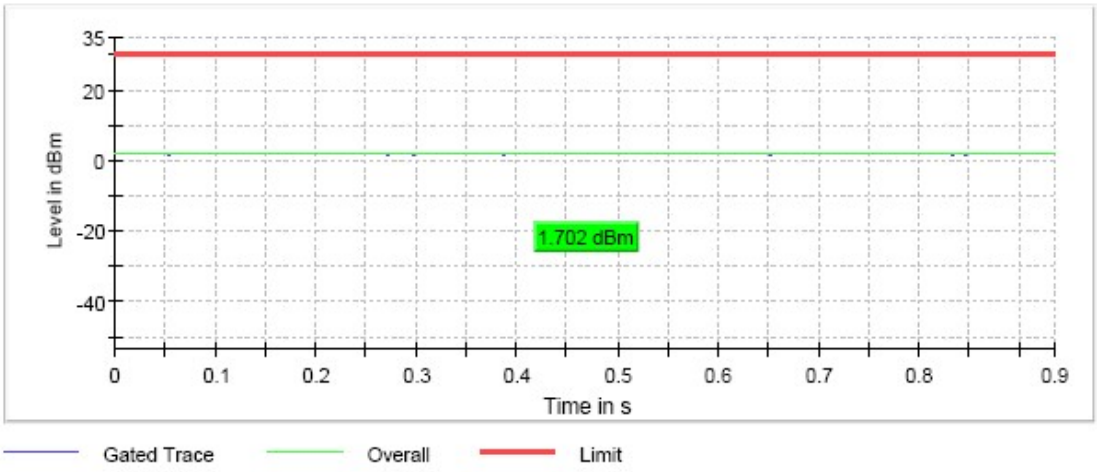


TEST RESULTS (Cont.)	

Middle Channel



Highest Channel



TEST RESULTS	ac mode (40 MHz)

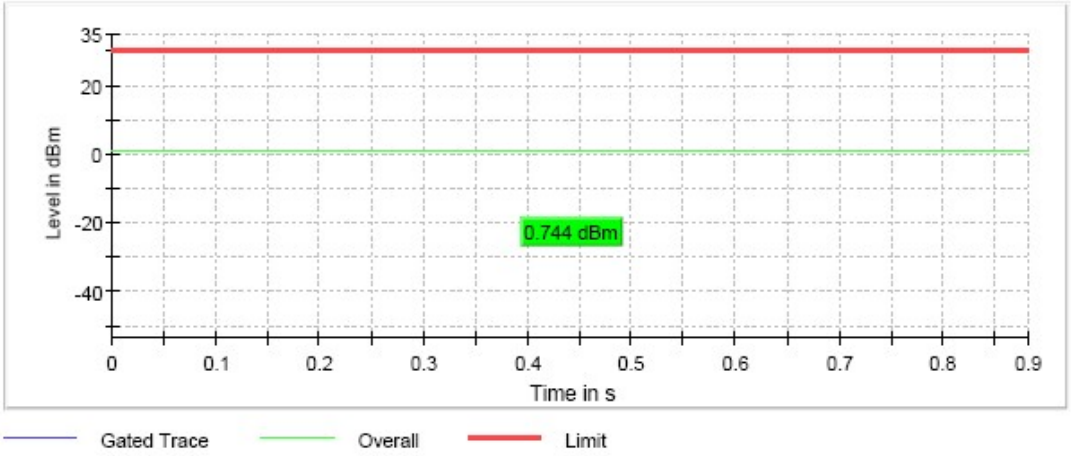
Maximum declared antenna gain: -2.5 dBi

	Lowest frequency 5180 MHz	Highest frequency 5230 MHz
Maximum conducted power (dBm)	0.7	2.3
Maximum EIRP power (dBm)	-1.8	-0.2
Measurement uncertainty (dB)	<±0.78	

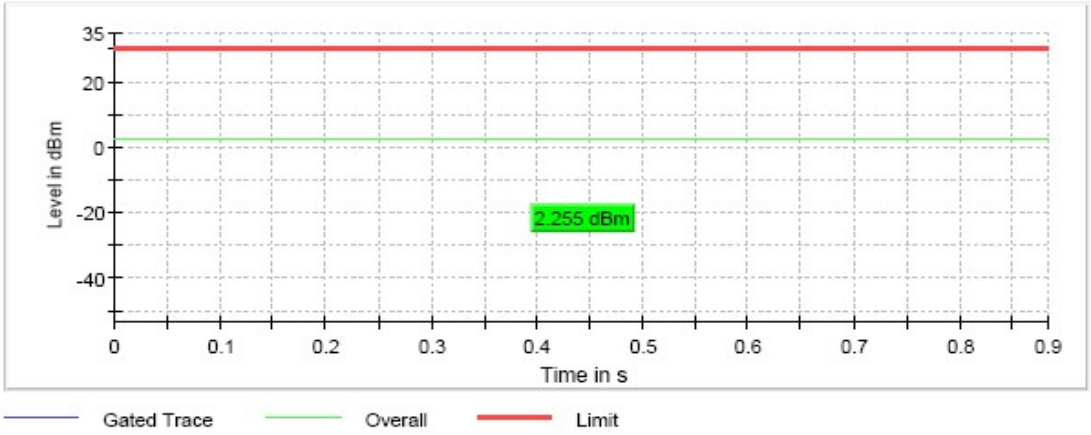
The maximum directional gain of the antenna is less than 6 dBi and therefore the maximum output power is not required to be reduced from the stated values.

TEST RESULTS (Cont.):	CONDUCTED OUTPUT POWER

Lowest Channel



Highest Channel



TEST RESULTS	ac mode (80 MHz)

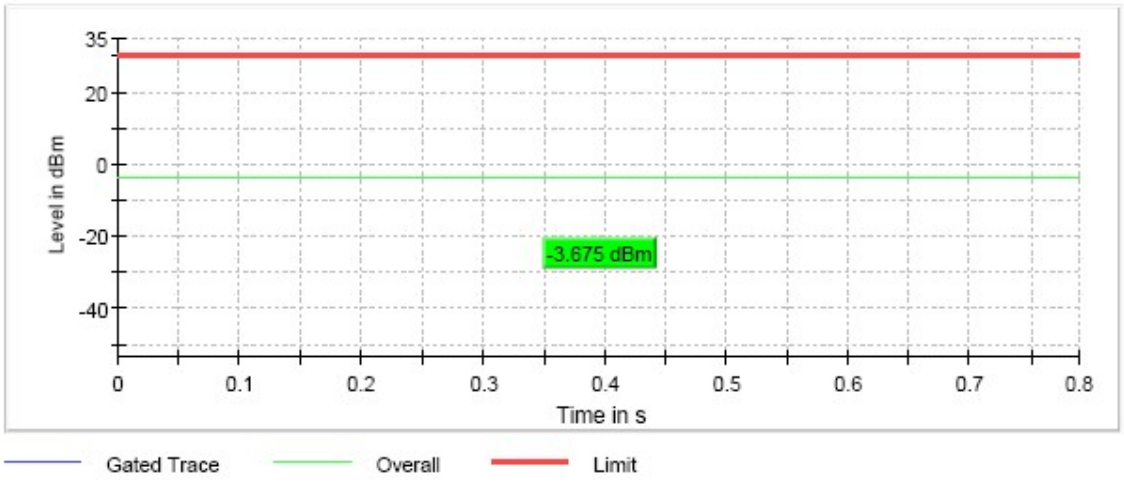
Maximum declared antenna gain: -2.5 dBi

	Lowest frequency 5210 MHz
Maximum conducted power (dBm)	-3.7
Maximum EIRP power (dBm)	-6.2
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



TEST B.3: POWER SPECTRAL DENSITY

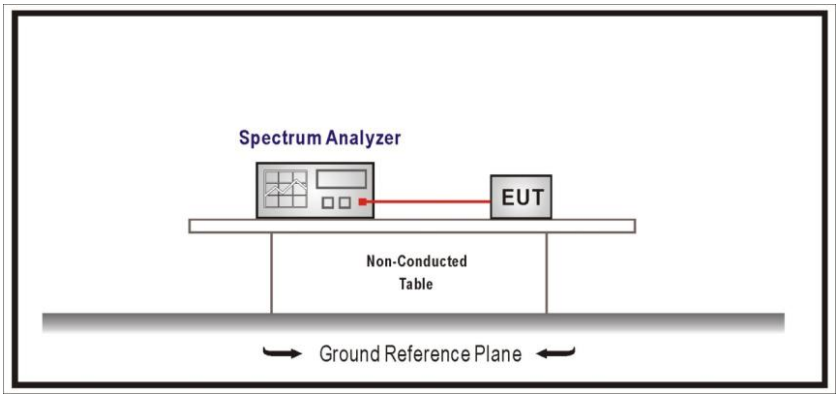
LIMITS:	Product standard:	Part 15 Subpart C §15.407 and RSS-247
	Test standard:	Part 15 Subpart C §15.407(a) (1) (5) and RSS-247 6.2.1.1

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 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.



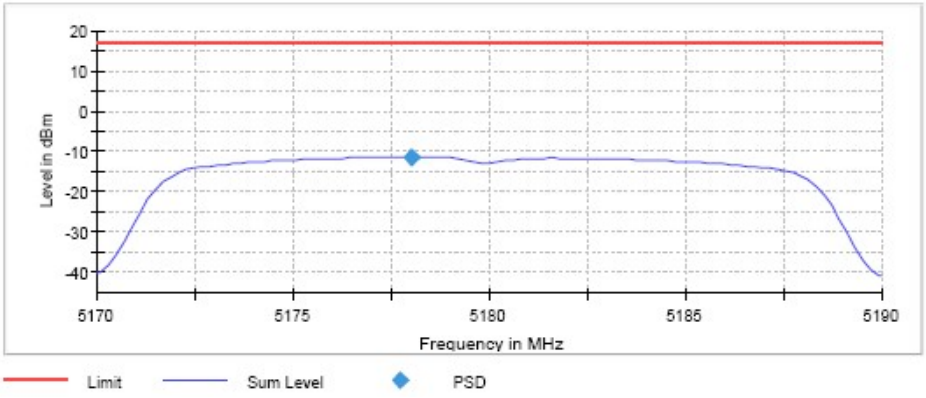
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 **(a mode)**
TEST RESULTS:	PASS

Bandwidth: 20 MHz

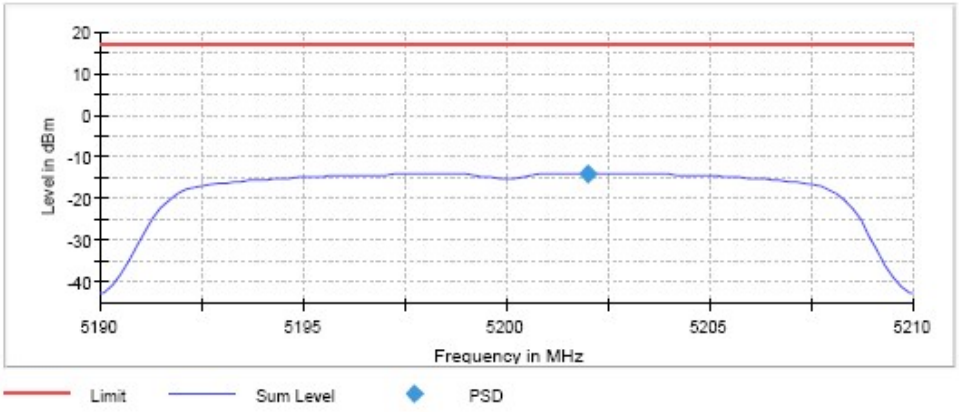
	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Power spectral density (dBm)	-11.420	-13.914	-8.948
Measurement uncertainty (dB)	<±0.78		

TEST RESULTS (Cont.):	

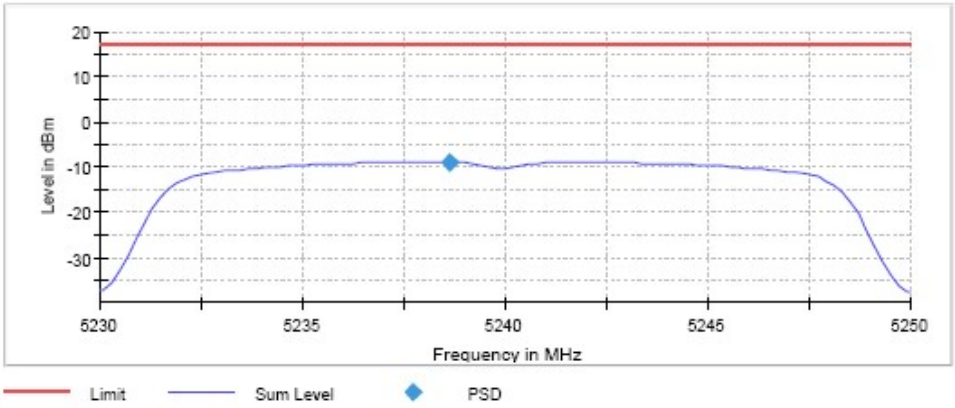
Low Channel



Middle Channel



High Channel



TEST RESULTS (Cont.):	

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	5.17000 GHz	5.19000	5.23000
Stop Frequency	5.19000 GHz	5.21000	5.25000
Span	20.000 MHz	20.000	20.000 MHz
RBW	1.000 MHz kHz	1.000	1.000 MHz
VBW	3.000 MHz	3.000	3.000 MHz
SweepPoints	101	101	101
Sweeptime	2.020 s	2.020 s	2.020 s
Reference Level	0.000 dBm	20.000	0.000 dBm
Attenuation	20.000 dB	40.000 dB	20.000 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. 150	4 / max.	4 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable	0.02 dB	0.04 dB	0.02 dB

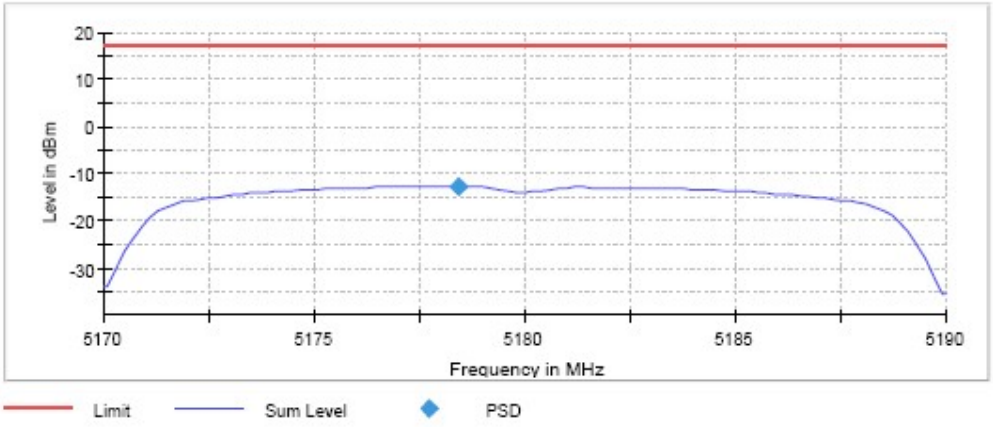
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (n mode)
TEST RESULTS:	PASS

Bandwidth: 20 MHz

	Lowest frequency 5180 MHz	Middle frequency 5200 MHz	Highest frequency 5240 MHz
Power spectral density (dBm)	-12.738	-10.348	-9.791
Measurement uncertainty (dB)	<±0.78		

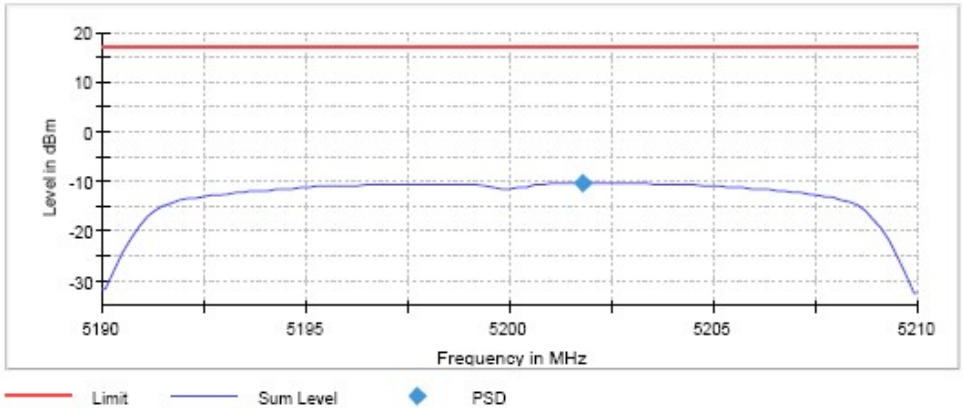
TEST RESULTS (Cont.):	

Low Channel



TEST RESULTS (Cont.):	

Middle Channel



High Channel