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

FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test report No:
3451ERM.006

Test report

USA FCC Part 15.247, 15.209, 15.207
CANADA RSS-247, RSS-Gen
Radio Frequency Devices. Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz
Digital Transmission Systems (DTSs), Frequency Hopping Systems (FHSs) and License-Exempt Local Area Network (LE-LAN) Devices.

(*) Identification of item tested	Automotive infotainment System
(*) Trademark	BMW
(*) Model and /or type reference tested	MGU22H
Other identification of the product	FCC ID: T8GMGU22H IC: 6434A-MGU22H
(*) Features	USB 2.0 (including support for Apple Devices), Bluetooth, WLAN Modul 2.4 / 5 GHz, GNSS, AR-CAM input, Video-out APIX3, CAN, 100Base-T1 and 1000Base-T1
Manufacturer	HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH BECKER-GOERING-STR. 16 76307 KARLSBAD GERMANY
Test method requested, standard	USA FCC Part 15.247, 10-1-20 Edition: Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz USA FCC Part 15.209, 10-1-20 Edition: Radiated emission limits; general requirements CANADA RSS-247 Issue 2 (February 2017). CANADA RSS-Gen Issue 5 (March 2019). 558074 D01 15.247 Meas Guidance v05r02. Guidance for Compliance Measurements on Digital Transmission Systems, Frequency Hopping Spread Spectrum System, and Hybrid System Devices Operating Under section §15.247 of the FCC Rules 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: 2022.03.02 12:15:26 -05'00'
Date of issue	03-02-2022
Report template No	FDT08_23 (*) "Data provided by the client"

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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.

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.

Test case	Frequency (MHz)	U (k=2)	Units
RF Power and PSD	2402-2483	0.88	dB
Occupied Bandwidth		1.87	%
Dwell Time		0.01	%
Band Edge		0.64	dB
Radiated Spurious Emission	30-180	4.27	dB
	180-1000	3.14	dB
	1000-18000	3.30	dB
	18000-40000	3.49	dB

Data provided by the client

Automotive infotainment System.

MGU Head-Unit. The main functionalities are: Navigation, USB, voice recognition and several interfaces to the vehicle and Bluetooth / WLAN.

The Head-unit provides different interfaces like: AR-CAM input, Video-out APIX3 (for the connection of an external Display), 3 USB interfaces (including support for Apple devices), CAN, 100Base-T1 and 1000Base-T1.

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 used for 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
3451/02	Harman MGU 22 non-beam forming mode sample	MGU22H	B43319M259900021	11/8/2021
3451/04	Harman MGU 22 beam forming mode sample	MGU22H	B43359M259900025	11/8/2021

1. Sample S/01 was used for the following test(s): All Conducted tests indicated in appendix A, B and C.

Sample S/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
3451/01	Harman MGU 22 Radiated non-beam forming mode sample	MGU22H	B43319M259900032	11/8/2021
3451/04	Harman MGU 22 beam forming mode sample	MGU22	B43359M259900025	11/8/2021
2874/15	Antenna with Fakra Connector	-	-	03/26/2021

1. Sample S/02 was used for the following test(s): All Radiated tests indicated in appendix A, B and C.

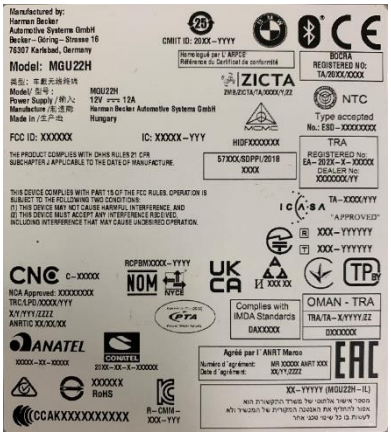
Sample S/01 & S/02 are composed of the following accessories:

Control Nº	Description	Model	Serial Nº	Date of reception
2874/05	Harness	--	--	03/26/2021
2874/13	OABR Connector cable	--	--	03/26/2021
3171/05	Automotive Ethernet Adapter	Rad Moon	13724	03/05/2021
3171/33	Ethernet cable	--	--	03/05/2021
3171/13	USB Type A(male) to Ethernet adapter	Trendnet (TU3-ETG)	327204276	03/05/2021

Test sample description

Ports…… …. :	Port name and description	Cable			
		Specified length [m]	Attached during test	Shielded	Coupled to patient
	BT/WIFI connector – CONM 4POL ROS BMW209-40MT1-A PCN2944	2	☒	☐	☐
	USB1 connector – CONM-SM 4POL ROS D4S20Y-40MA5-B	2	☒	☐	☐
	USB2 connector – CONM-SM 4POL ROS D4S20Y-40MA5-C	2	☒	☐	☐
	USB3 connector – CONM-SM 4POL ROS D4S20Y-40MA5-E	2	☒	☐	☐
	APIX3 connector – CONM-SM 4+2POL ROS 99S22A-40MA5-D	2	☒	☐	☐
	Car Main-connector – CONM 16POL TYC 2300483-s	2	☒	☐	☐
	AR-Cam	2	☒	☐	☐
	100 Base T1/1G Base T1/GPS	2	☒	☐	☐
Supplementary information to the ports……..:	No Data Provided				
Rated power supply..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: 8V to 16V					
	☐	DC:					
Rated Power..... :	No Data Provided						
Clock frequencies..... :	No Data Provided						
Other parameters ..... :	No Data Provided						
Software version..... :	No Data Provided						
Hardware version ..... :	No Data Provided						
Dimensions in cm (W x H x D) :	No Data Provided						
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
	No Data Provided		
Accessories (not part of the test item)..... :	Description	Type	Manufacturer
	USB drives		
	AR-CAM		
	Screen		
Documents as provided by the applicant ..... :	Description	File name	Issue date
	Declaration Equipment Data	FDT30_18 Declaration Equipment Data_MGU22H	11/15/2021
Copy of marking plate:			



Identification of the client

HARMAN BECKER AUTOMOTIVE SYSTEMS GMBH
BECKER-GOERING-STR. 16
76307 KARLSBAD GERMANY

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	11-11-2021
Date (finish)	02-09-2022

Document history

Report number	Date	Description
3451ERM.006	03-02-2022	First release

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: Sravani Gollamudi, Juliana Cherry, Yuri Barone, Koji Nishimoto and Cheikhna Ouattara.

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH (Bluetooth LE)					
Section	**15.247 Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
A.1	§ 2.1049 & §15.247 (a) (2)	RSS-247 5.2 (a)	99% Occupied Bandwidth & 6dB Bandwidth	P	N/A
A.2	§ 15.247 (b)	RSS-247 5.4 (d)	Maximum Output Power and antenna gain	P	N/A
A.3	§ 15.247 (d)	RSS-247 5.5	Band-edge conducted emissions compliance (Transmitter)	P	N/A
A.4	§ 15.247 (e)	RSS-247 5.2 (b)	Power Spectral Density	P	N/A
A.5	§15.247(d)	RSS-247 5.5	Emission limitations Conducted (Transmitter)	P	N/A
A.6	§15.247 (d)	RSS-247 5.5	Emission limitations Radiated (Transmitter)	P	N/A
Supplementary information and remarks: N/A.					

FCC PART 15 PARAGRAPH / RSS-247 (Bluetooth BR/EDR)					
Section	**15.247 Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
B.1	§ 2.1049 & § 15.247 (a) (1)	RSS-247 5.1 (b)	20dB Emission Bandwidth, Occupied Bandwidth & Carrier Frequency Separation	P	N/A
B.2	§ 15.247 (a) (1) (iii)	RSS-247 5.1 (d)	Number of hopping channels	P	N/A
B.3	§ 15.247 (a) (1) (iii)	RSS-247 5.1 (d)	Time of Occupancy (Dwell Time)	P	N/A
B.4	§ 15.247 (b) (3)	RSS-247 5.4 (b)	Maximum peak conducted output power and antenna gain	P	N/A
B.5	§ 15.247 (d)	RSS-247 5.5	Band-edge conducted emissions compliance (Transmitter)	P	N/A
B.6	§ 15.247 (d)	RSS-247 5.5	Emission limitations Conducted (Transmitter)	P	N/A
B.7	§ 15.247 (d)	RSS-247 5.5	Emission limitations Radiated (Transmitter)	P	N/A
Supplementary information and remarks: N/A					

FCC PART 15 PARAGRAPH (Wi-Fi 2.4GHz)					
Section	**15.247 Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
C.1	§ 2.1049 & §15.247 (a) (2)	RSS-247 5.2 (a)	99% Occupied Bandwidth & 6dB Bandwidth	P	N/A
C.2	§ 15.247 (b)	RSS-247 5.4 (d)	Maximum Output Power and antenna gain	P	N/A
C.3	§ 15.247 (d)	RSS-247 5.5	Band-edge conducted emissions compliance (Transmitter)	P	N/A
C.4	§ 15.247 (e)	RSS-247 5.2 (b)	Power Spectral Density	P	N/A
C.5	§15.247(d)	RSS-247 5.5	Emission limitations Conducted (Transmitter)	P	N/A
C.6	§15.247 (d)	RSS-247 5.5	Emission limitations Radiated (Transmitter)	P	N/A
Supplementary information and remarks: N/A.					

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
0101	Climatic chamber	ESPEC North America	ESL-2CA	2020/04	2022/04
1038	TS8997 TEST SYSTEM	Rohde & Schwarz	TS8997	N/A	N/A
1107	ETHERNET SNMP THERMOMETER	HW GROUP	HWg-STE Plain	2020/08	2022/08
1313	WIRELESS MEASUREMENT SOFTWARE R&S WMS32	Rohde & Schwarz	N/A	N/A	N/A

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
0981	RF pre-amplifier	Bonn Elektronik	BLMA0118-2A	2020/11	2022/11
1010	ESR7 EMI Test Receiver	Rohde & Schwarz	ESR7	2020/10	2022/10
1014	Spectrum analyzer	Rohde & Schwarz	FSV40	2021/05	2023/05
1056	Double-ridge Waveguide Horn antenna 18-40 GHz	ETS LINDGREN	3116C	2020/01	2023/01
1057	Double-ridge Waveguide Horn antenna 1-18 GHz	ETS LINDGREN	3115	2020/06	2023/06
1065	BiconicalLog antenna	ETS LINDGREN	3142E	2020/08	2023/08
1111	ETHERNET SNMP THERMOMETER	HW GROUP	HWg-STE Plain	2020/08	2022/08
1179	Semi anechoic Absorber Lined Chamber	Frankonia	SAC 3 plus “L”	N/A	N/A
1314	WIRELESS MEASUREMENT SOFTWARE R&S EMC32	Rohde & Schwarz	N/A	N/A	N/A

Appendix A: **Test results (Bluetooth Low Energy)**

Appendix A Content

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PRODUCT INFORMATION

The following information is provided by the client

Information	**Description**
Modulation	Other forms of modulation
Adaptive	Non-adaptive equipment
Operation mode	
- Operating Frequency Range	2402 – 2480 MHz
- Nominal Channel Bandwidth	2 MHz
- RF Output Power	4 dBm
Extreme operating conditions	
- Temperature range	-40 ºC to +70 ºC
Antenna type	Integrated Antenna
Antenna gain	- 2.5 dBi
Nominal Voltage	
- Supply Voltage	12 V nominal
- Type of power source	DC Power supply
Equipment type	Bluetooth Low Energy
Geo-location capability	No

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01(1) (1 Mbps)	Power supply (V): $V_{nominal}$ = 12 V dc Data Rate: 1 Mbps Bandwidth: 1 MHz Test Frequencies for Conducted/ Radiated tests: Lowest channel: 2402 MHz Middle channel: 2440 MHz Highest channel: 2480 MHz
TC#02(1) (2 Mbps)	Power supply (V): $V_{nominal}$ = 12 V dc Data Rate: 2 Mbps Bandwidth: 2 MHz Test Frequencies for Conducted/ Radiated tests: Lowest channel: 2402 MHz Middle channel: 2440 MHz Highest channel: 2480 MHz

Note (1): For spurious emissions in 1 mbps and 2 mbps a preliminary scan was performed to determine the worst case. The following tables and plots show the results for the worst case in 1 mbps.

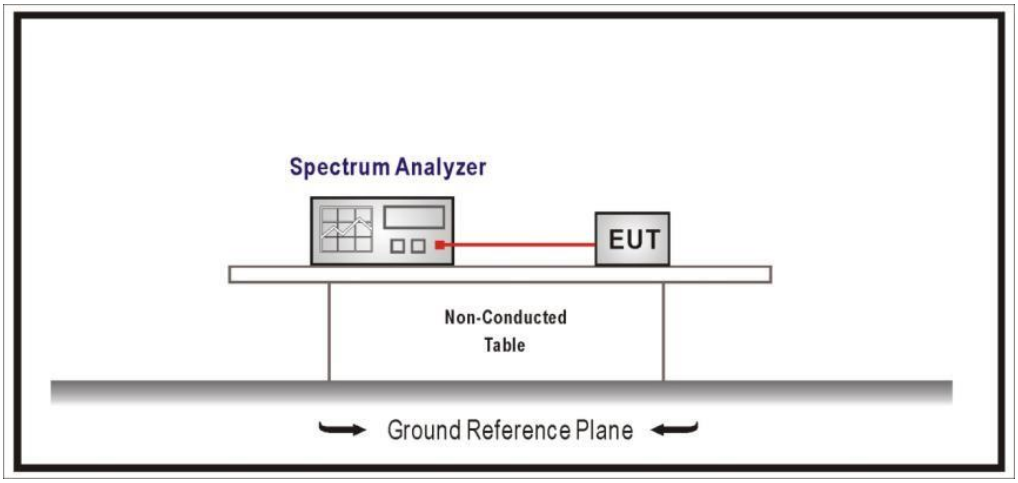
TEST A.1: 99% OCCUPIED BANDWIDTH

LIMITS:	Product standard:	§ 2.1049 and RSS-Gen
	Test standard:	§ 2.1049 and RSS-Gen 6.7

LIMITS

The occupied bandwidth shall be reported for all equipment in addition to the specified bandwidth required in the applicable RSSs

TEST SETUP	

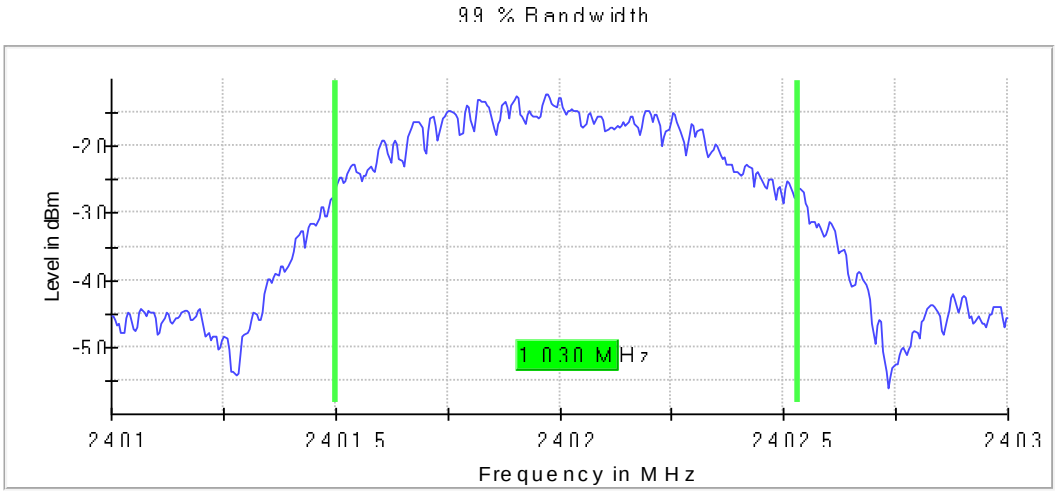


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (1 Mbps)
TEST RESULTS:	PASS

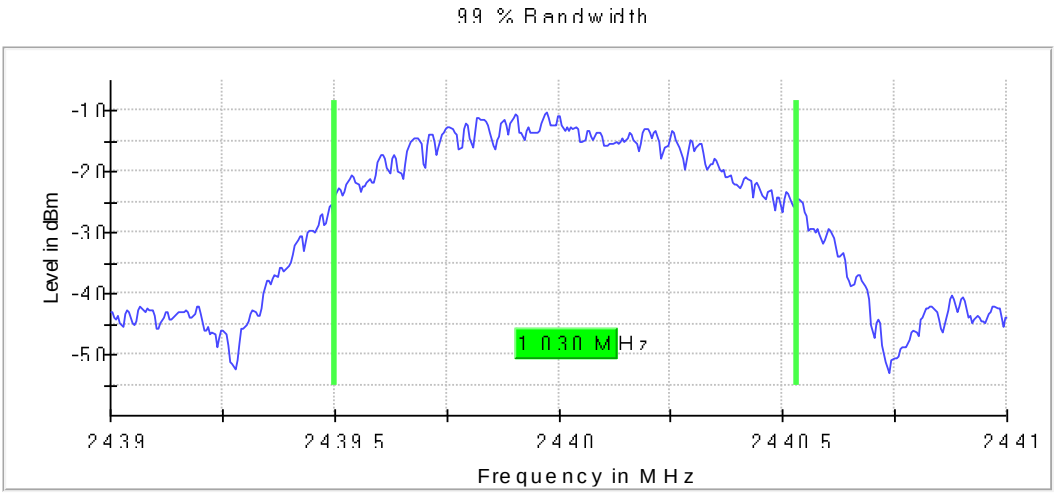
	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
99% bandwidth (MHz)	1.03	1.03	1.03

TEST RESULTS (Cont.):	

Lowest Channel

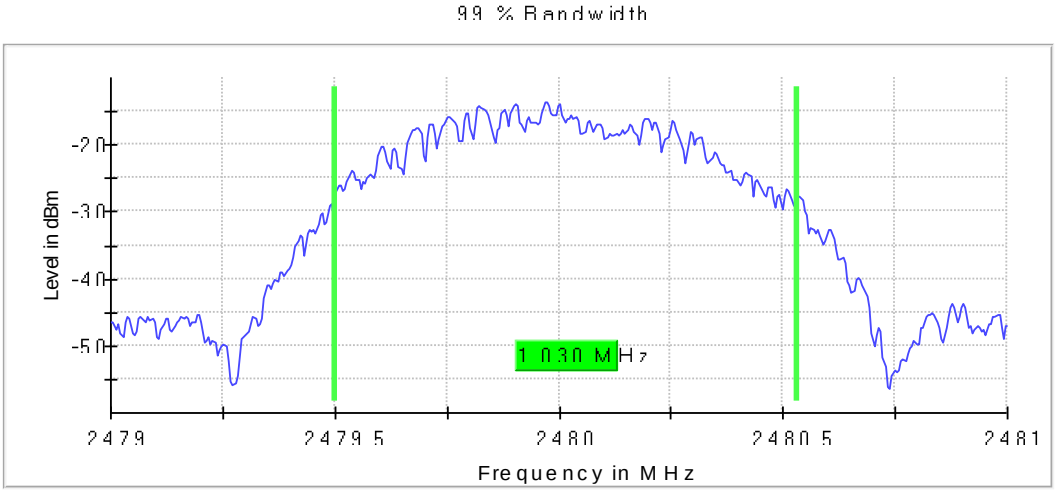


Middle Channel



TEST RESULTS (Cont.):	

Highest Channel



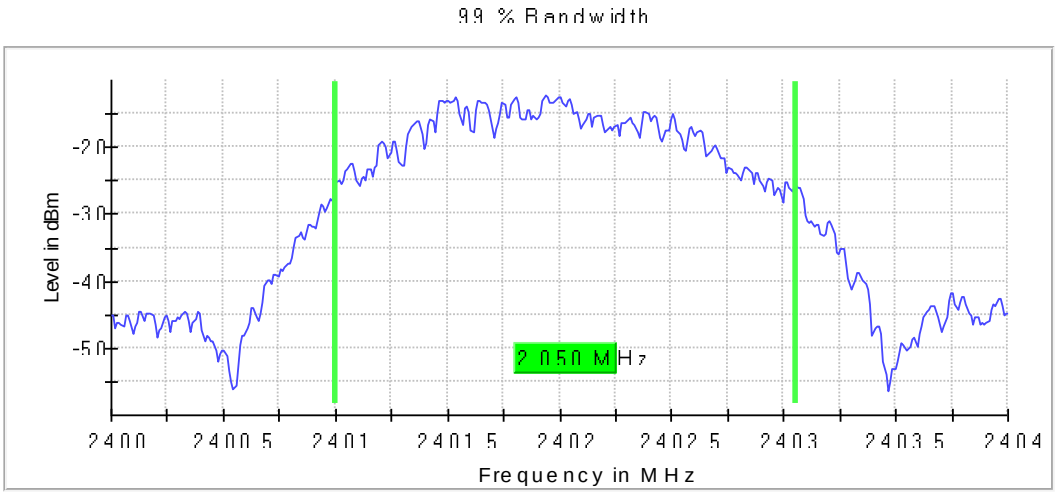
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40100 GHz	2.43925 GHz	2.47900 GHz
Stop Frequency	2.40300 GHz	2.44075 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz	2.000 MHz
RBW	10.000 kHz	10.000 kHz	10.000 kHz
VBW	30.000 kHz	30.000 kHz	30.000 kHz
Sweep Points	400	400	400
Sweep time	189.648 µs	189.648 µs	189.648 µs
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	Off	Off	off
Stable mode	Trace	Trace	Trace
Stable value	0.30 dB	0.30 dB	0.30 dB
Run	8 / max. 150	6 / max. 150	10 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.07 dB	0.13 dB	0.13 dB

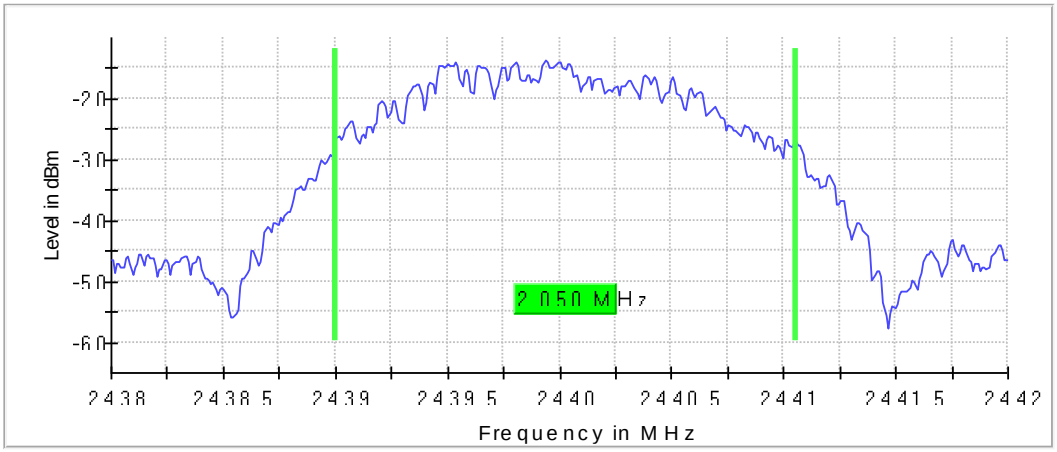
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (2 Mbps)
TEST RESULTS:	PASS

	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
99% bandwidth (MHz)	2.05	2.05	2.05

Lowest Channel

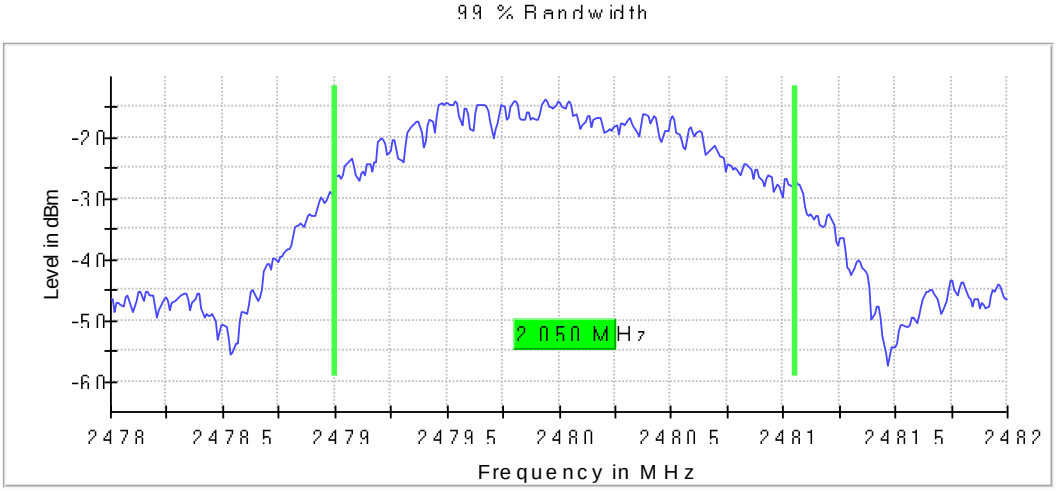


Middle Channel



TEST RESULTS (Cont.):	

Highest Channel



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.43800 GHz	2.47800 GHz
Stop Frequency	2.40400 GHz	2.44200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz	4.000 MHz
RBW	20.000 kHz	20.000 kHz	20.000 kHz
VBW	100.000 kHz	100.000 kHz	100.000 kHz
Sweep Points	400	400	400
Sweep time	94.824 µs	94.824 µs	94.824 µs
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	Off	Off	Off
Stable mode	Trace	Trace	Trace
Stable value	0.30 dB	0.30 dB	0.30 dB
Run	6 / max. 150	6 / max. 150	7 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.06 dB	0.07 dB	0.08 dB

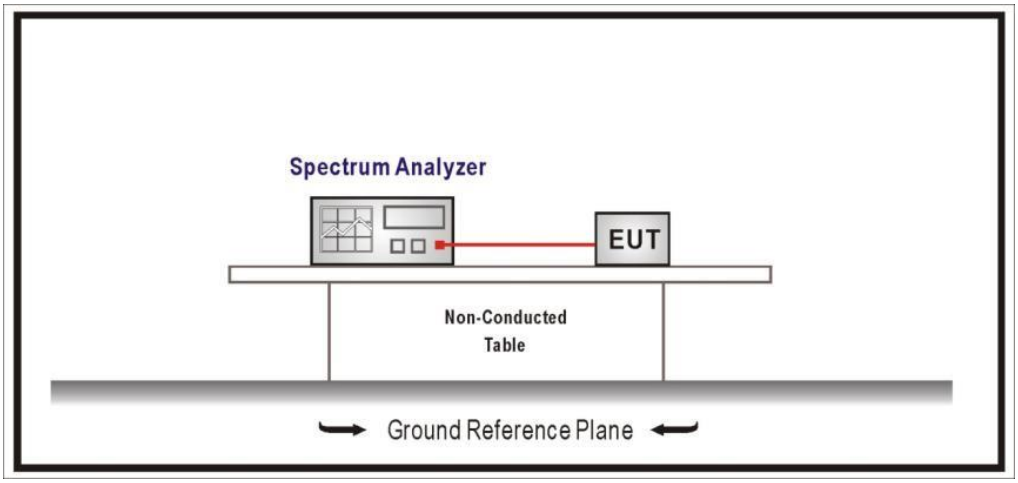
TEST A.2: 6DB BANDWIDTH

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(a)(2) and RSS-247 5.2(a)

LIMITS

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

TEST SETUP	

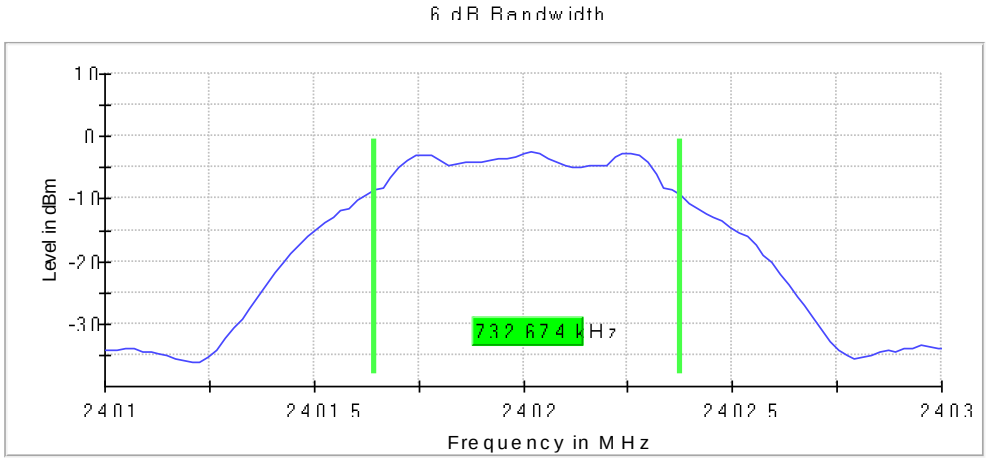


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (1 Mbps)
TEST RESULTS:	PASS

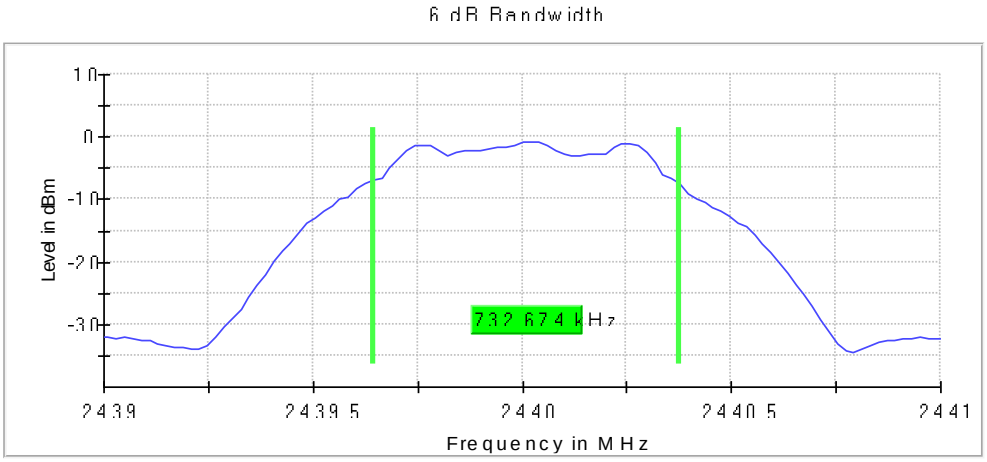
	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
6 dB Spectrum bandwidth (kHz)	732.674	732.674	712.872

TEST RESULTS (Cont.):	

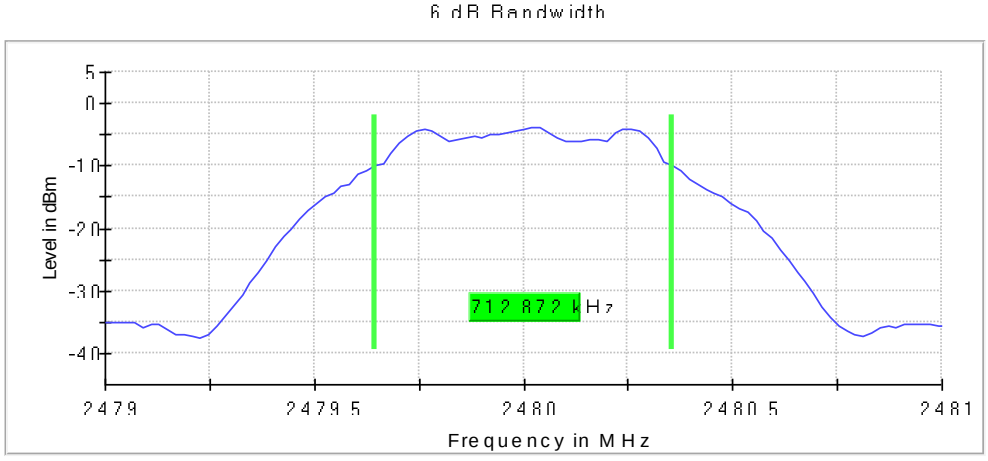
Lowest Channel:



Mid Channel:



High Channel:



TEST RESULTS (Cont.):	

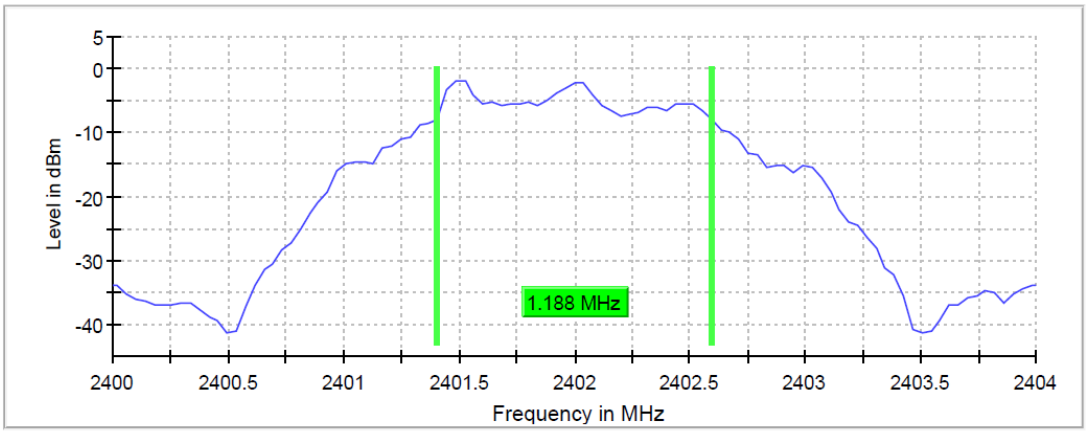
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40100 GHz	2.43900 GHz	2.47900 GHz
Stop Frequency	2.40300 GHz	2.44100 GHz	2.48100 GHz
Span	2.000 MHz	2.000 MHz	2.000 MHz
RBW	100.000 kHz	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz	300.000 kHz
Sweep Points	101	101	101
Sweep time	18.938 µs	18.938 µs	18.938 µs
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	Off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	8 / max. 150	10 / max. 150	8 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.08 dB	0.09 dB	0.11 dB

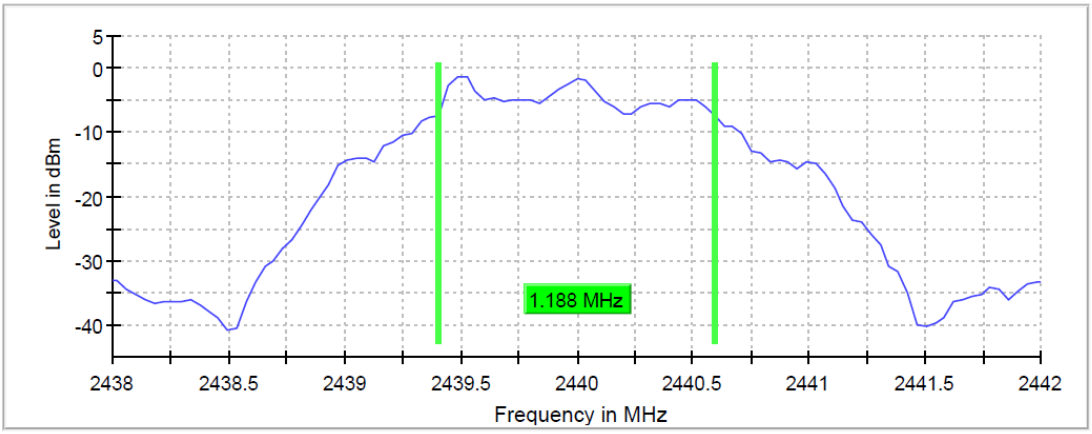
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (2 Mbps)
TEST RESULTS:	PASS

	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
6 dB Spectrum bandwidth (MHz)	1.188	1.188	1.188

Lowest Channel:

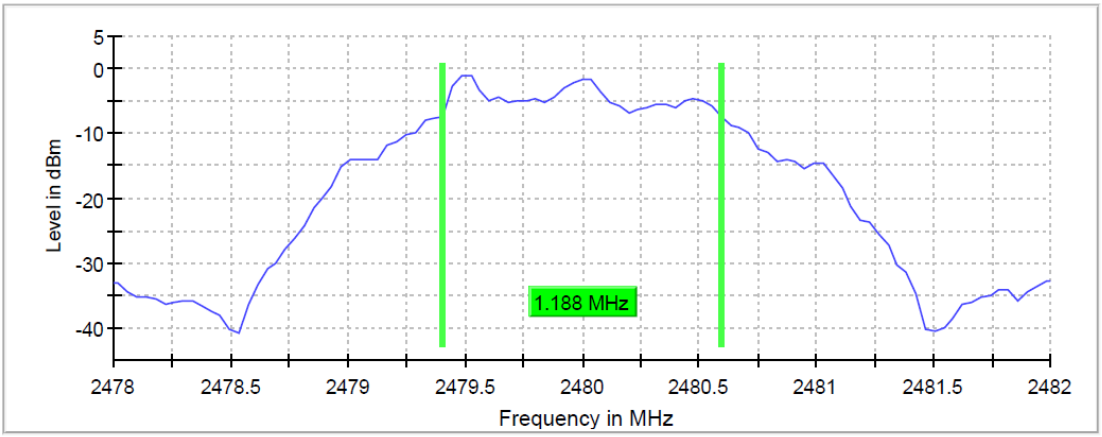


Mid Channel:



TEST RESULTS (Cont.):	

High Channel:



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40000 GHz	2.43800 GHz	2.47800 GHz
Stop Frequency	2.40400 GHz	2.44200 GHz	2.48200 GHz
Span	4.000 MHz	4.000 MHz	4.000 MHz
RBW	100.000 kHz	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz	300.000 kHz
Sweep Points	101	101	101
Sweep time	18.938 µs	18.938 µs	18.938 µs
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	Off	Off	Off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	8 / max. 150	9 / max. 150	10 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.08 dB	0.34 dB	0.01 dB

TEST A.3: MAXIMUM PEAK CONDUCTED OUTPUT POWER AND ANTENNA GAIN

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(b)(3) and RSS-247 5.4(d)

LIMITS

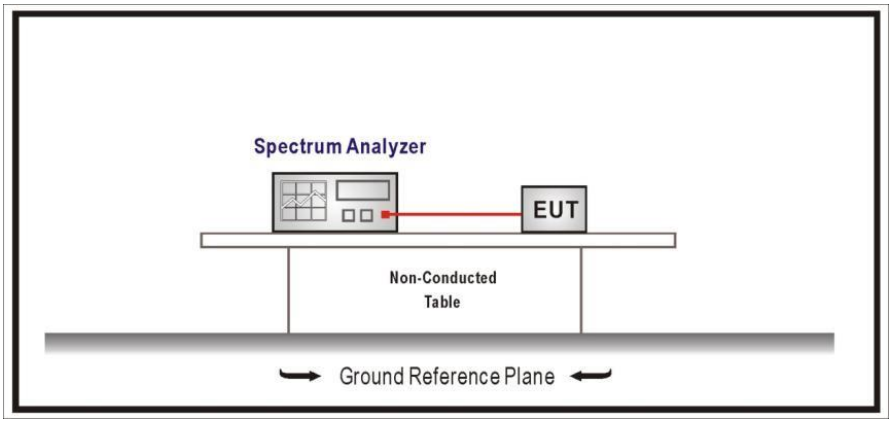
§15.247(b)(3) and RSS-247 5.4(d): For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).

RSS-247 5.4(d): The e.i.r.p. shall not exceed 4 W (36 dBm)

TEST SETUP	

The maximum peak conducted output power was measured using the method according to point 9.1.1. of Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 558074 D01 DTS Meas Guidance v04 dated 05/04/2017.

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



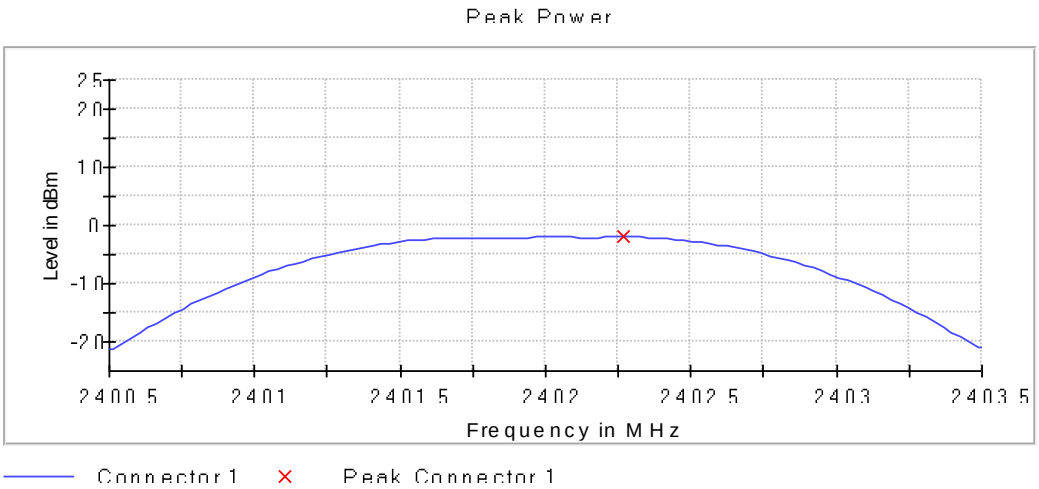
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (1 Mbps)
TEST RESULTS:	PASS

Maximum declared antenna gain: -2.5 dBi

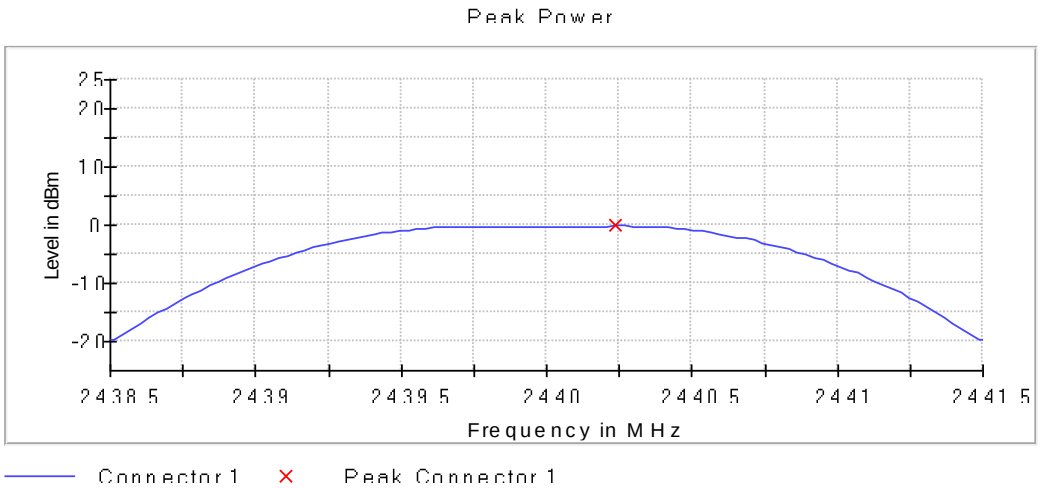
	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
Maximum conducted power (dBm)	-2.0	-0.1	-3.3
Maximum EIRP power (dBm)	-4.5	-2.6	-5.8

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.

Lowest Channel

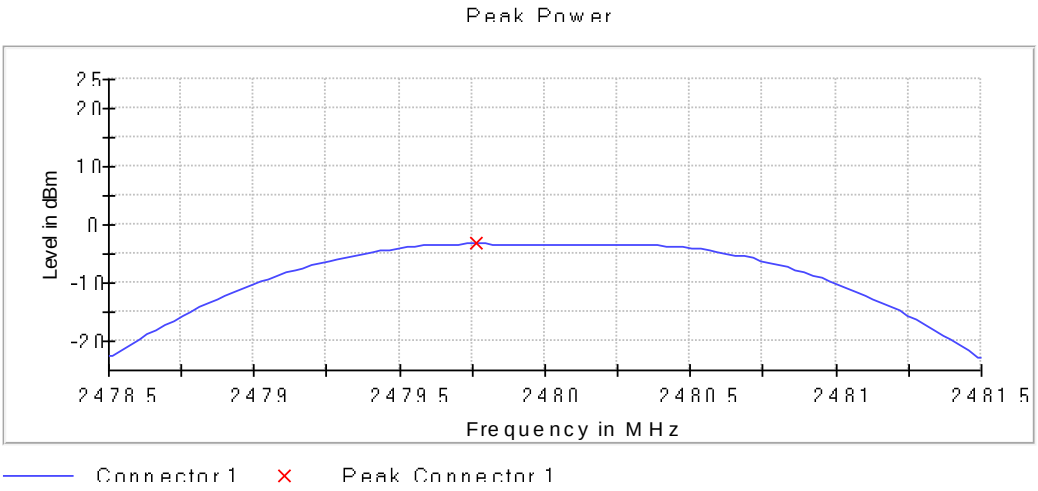


Middle Channel



TEST RESULTS (Cont.):	CONDUCTED PEAK POWER

Highest Channel



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40050 GHz	2.43850 GHz	2.47850 GHz
Stop Frequency	2.40350 GHz	2.44150 GHz	2.48150 GHz
Span	3.000 MHz	3.000 MHz	3.000 MHz
RBW	1.000 MHz	1.000 MHz	1.000 MHz
VBW	3.000 MHz	3.000 MHz	3.000 MHz
Sweep Points	101	101	101
Sweep time	1.907 µs	1.907 µs	1.907 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
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	Off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	4 / max. 150	4 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.06 dB	0.02 dB	0.02 dB

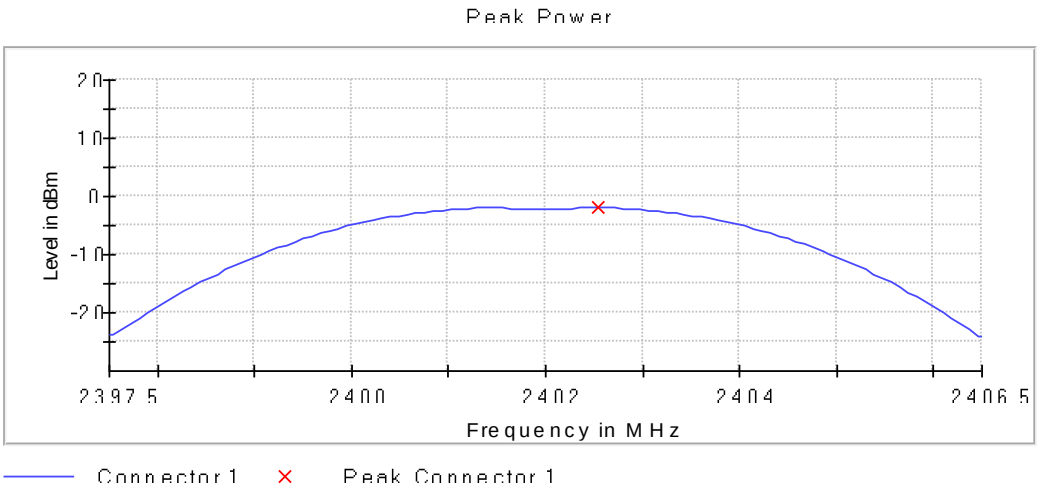
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (2 Mbps)
TEST RESULTS:	PASS

Maximum declared antenna gain: -2.5 dBi

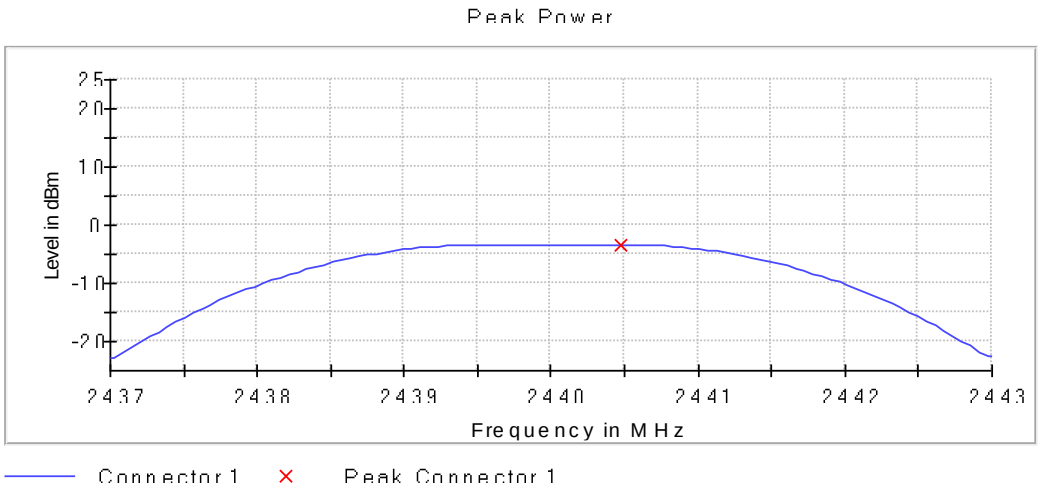
	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
Maximum conducted power (dBm)	-1.9	-3.3	-3.2
Maximum EIRP power (dBm)	-4.4	-5.8	-5.7

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.

Lowest Channel

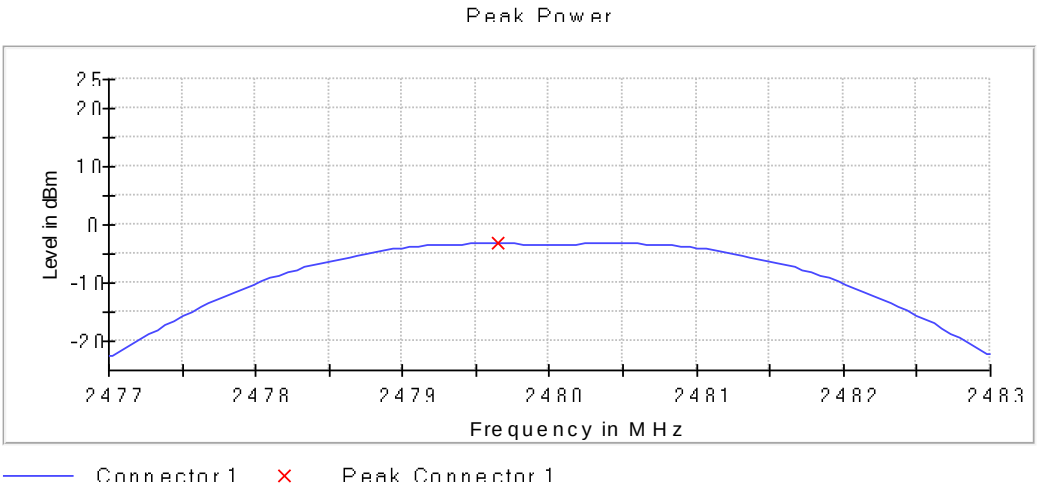


Middle Channel



TEST RESULTS (Cont.):	CONDUCTED PEAK POWER

Highest Channel



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.39750 GHz	2.43700 GHz	2.47700 GHz
Stop Frequency	2.40650 GHz	2.44300 GHz	2.48300 GHz
Span	9.000 MHz	9.000 MHz	9.000 MHz
RBW	3.000 MHz	3.000 MHz	3.000 MHz
VBW	10.000 MHz	10.000 MHz	10.000 MHz
Sweep Points	101	101	101
Sweep time	1.271 µs	1.271 µs	1.271 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
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	FFT	FFT	FFT
Preamp	off	Off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	4 / max. 150	4 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.01 dB	0.02 dB	0.07 dB

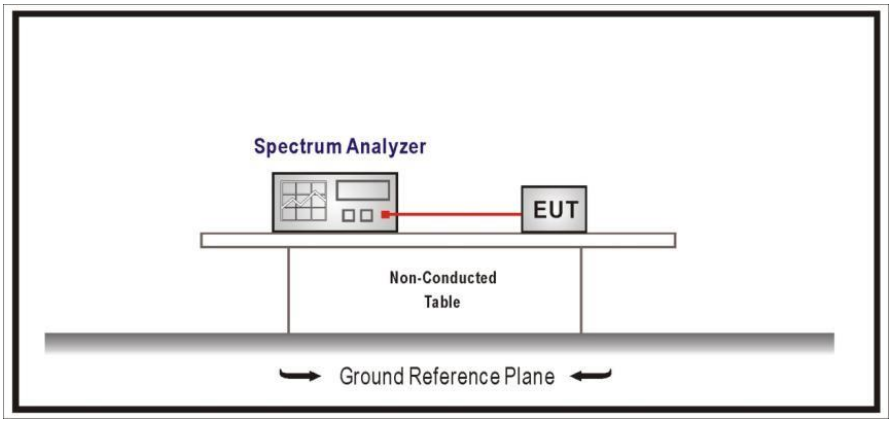
TEST A.4: BAND-EDGE EMISSIONS COMPLIANCE (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(d) and RSS-247 5.5

LIMITS

In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB instead of 20 dB.

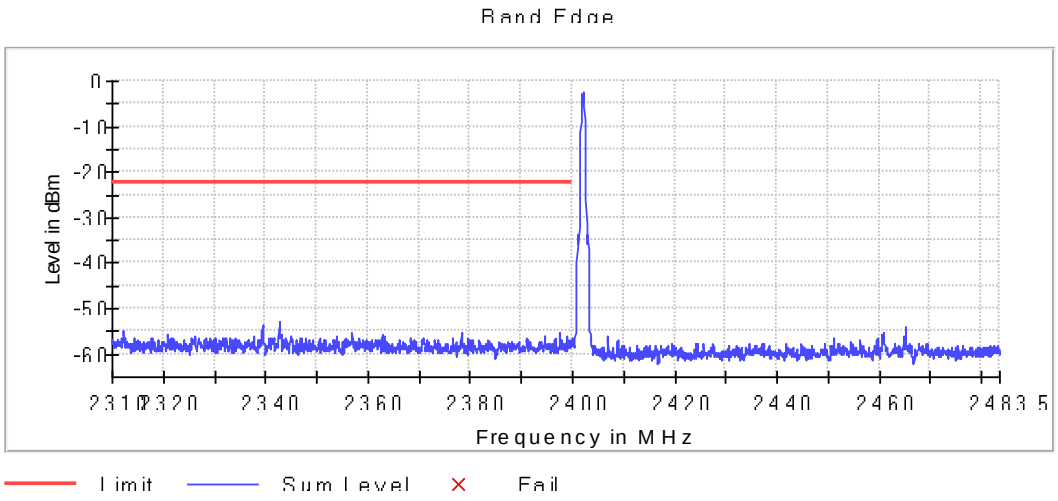
TEST SETUP	



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (1 Mbps)
TEST RESULTS:	PASS

Note: Radiated measurements are also used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

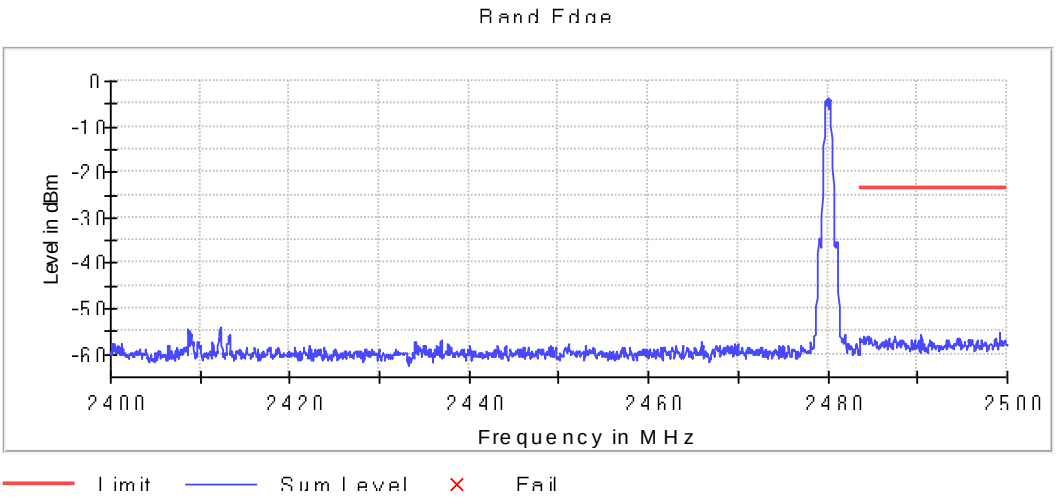
TEST RESULTS (Cont.):	Lowest Channel



Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2342.675000	-53.0	30.5	-22.5	PASS
2342.625000	-53.5	31.0	-22.5	PASS
2342.725000	-53.6	31.0	-22.5	PASS
2339.425000	-53.8	31.3	-22.5	PASS
2339.375000	-54.0	31.5	-22.5	PASS
2339.475000	-54.1	31.5	-22.5	PASS
2342.775000	-54.6	32.0	-22.5	PASS
2312.275000	-54.7	32.2	-22.5	PASS
2339.325000	-54.8	32.3	-22.5	PASS
2312.225000	-55.0	32.5	-22.5	PASS
2378.275000	-55.2	32.6	-22.5	PASS
2397.425000	-55.4	32.8	-22.5	PASS
2378.325000	-55.4	32.8	-22.5	PASS
2356.925000	-55.4	32.9	-22.5	PASS
2356.875000	-55.4	32.9	-22.5	PASS

TEST RESULTS (Cont.):	Highest Channel



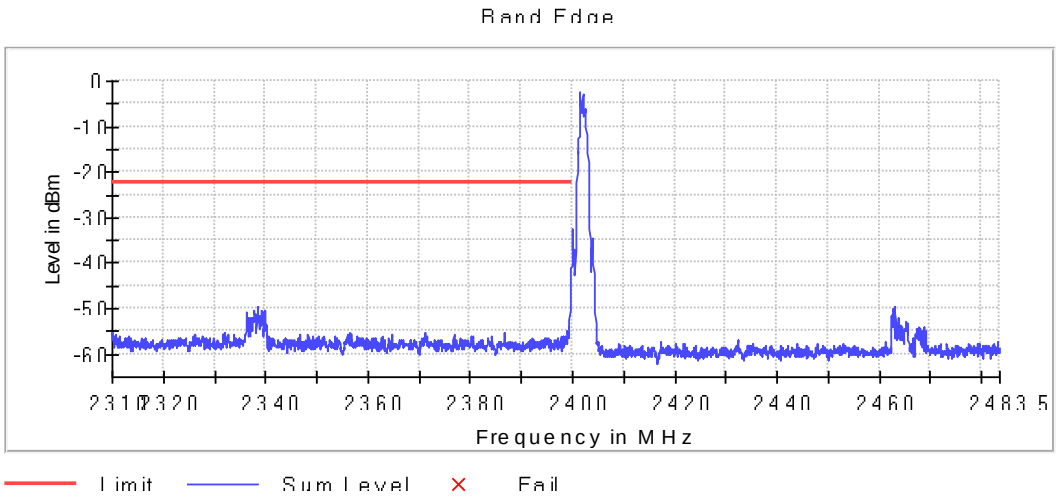
Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2499.175000	-55.3	31.5	-23.8	PASS
2499.225000	-55.3	31.6	-23.8	PASS
2490.425000	-55.6	31.8	-23.8	PASS
2490.375000	-55.8	32.0	-23.8	PASS
2487.525000	-56.0	32.2	-23.8	PASS
2484.475000	-56.1	32.3	-23.8	PASS
2484.075000	-56.2	32.4	-23.8	PASS
2484.525000	-56.2	32.5	-23.8	PASS
2486.825000	-56.3	32.5	-23.8	PASS
2484.825000	-56.3	32.5	-23.8	PASS
2494.425000	-56.4	32.6	-23.8	PASS
2487.375000	-56.4	32.7	-23.8	PASS
2487.575000	-56.4	32.7	-23.8	PASS
2486.775000	-56.5	32.7	-23.8	PASS
2494.375000	-56.5	32.7	-23.8	PASS

TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (2 Mbps)
TEST RESULTS:	PASS

Note: Radiated measurements are also used to show compliance with the limits in the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz.

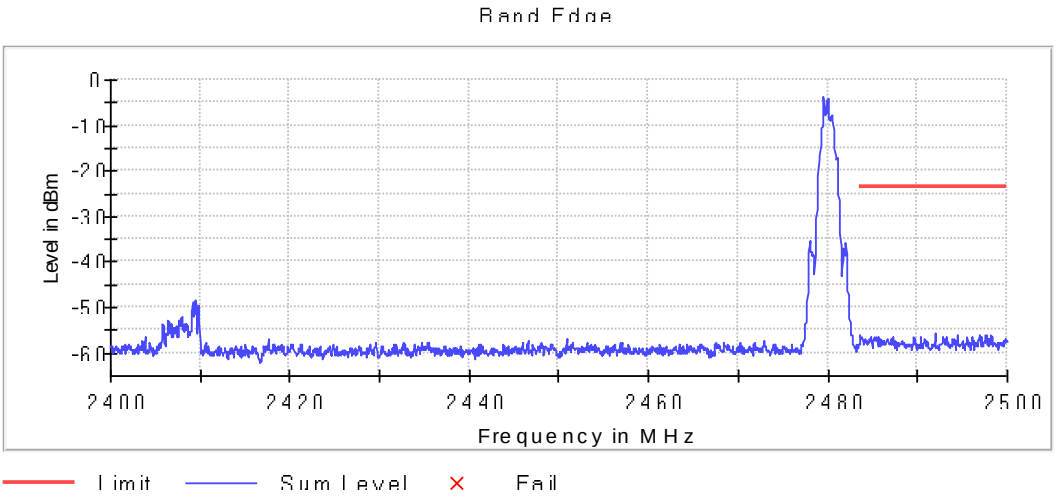
TEST RESULTS (Cont.):	**Lowest Channel**



Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.975000	-32.4	9.9	-22.5	PASS
2399.925000	-34.7	12.2	-22.5	PASS
2399.875000	-37.4	15.0	-22.5	PASS
2399.825000	-40.7	18.2	-22.5	PASS
2399.775000	-41.2	18.8	-22.5	PASS
2399.725000	-44.0	21.5	-22.5	PASS
2399.675000	-46.1	23.6	-22.5	PASS
2399.625000	-46.7	24.3	-22.5	PASS
2399.575000	-48.2	25.7	-22.5	PASS
2399.525000	-48.5	26.1	-22.5	PASS
2338.375000	-49.6	27.1	-22.5	PASS
2338.325000	-49.8	27.3	-22.5	PASS
2399.475000	-50.3	27.8	-22.5	PASS
2339.325000	-50.3	27.8	-22.5	PASS
2337.775000	-50.4	28.0	-22.5	PASS

TEST RESULTS (Cont.):	Highest Channel



Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2491.975000	-55.8	32.2	-23.6	PASS
2492.025000	-56.1	32.5	-23.6	PASS
2494.425000	-56.1	32.5	-23.6	PASS
2497.675000	-56.1	32.5	-23.6	PASS
2483.525000	-56.2	32.6	-23.6	PASS
2498.225000	-56.2	32.6	-23.6	PASS
2496.925000	-56.2	32.6	-23.6	PASS
2497.625000	-56.2	32.6	-23.6	PASS
2496.875000	-56.3	32.7	-23.6	PASS
2494.475000	-56.3	32.7	-23.6	PASS
2483.825000	-56.3	32.7	-23.6	PASS
2495.575000	-56.3	32.7	-23.6	PASS
2492.825000	-56.4	32.8	-23.6	PASS
2497.125000	-56.4	32.8	-23.6	PASS
2485.175000	-56.4	32.8	-23.6	PASS

TEST A.5: POWER SPECTRAL DENSITY

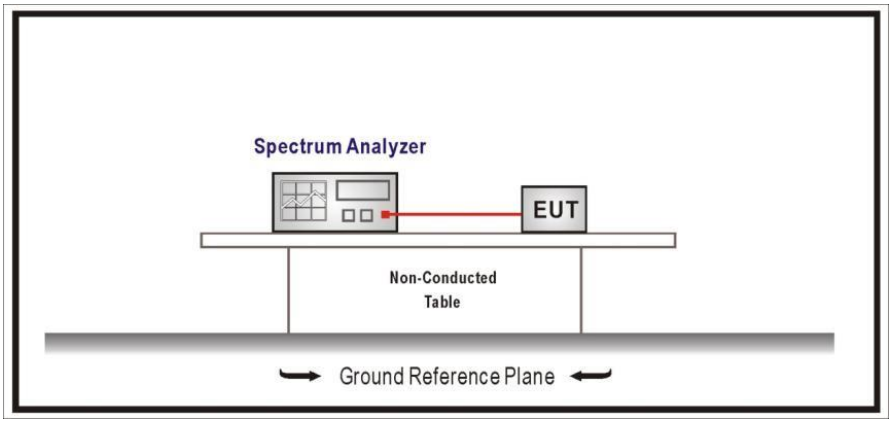
LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(e) and RSS-247 5.2 (b)

LIMITS

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

TEST SETUP

The maximum power spectral density level in the fundamental emission was measured using the method PKPSD (Peak PSD) according to point 10.2. of Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating Under §15.247 558074 D01 DTS Meas Guidance v04 dated 05/04/2017.

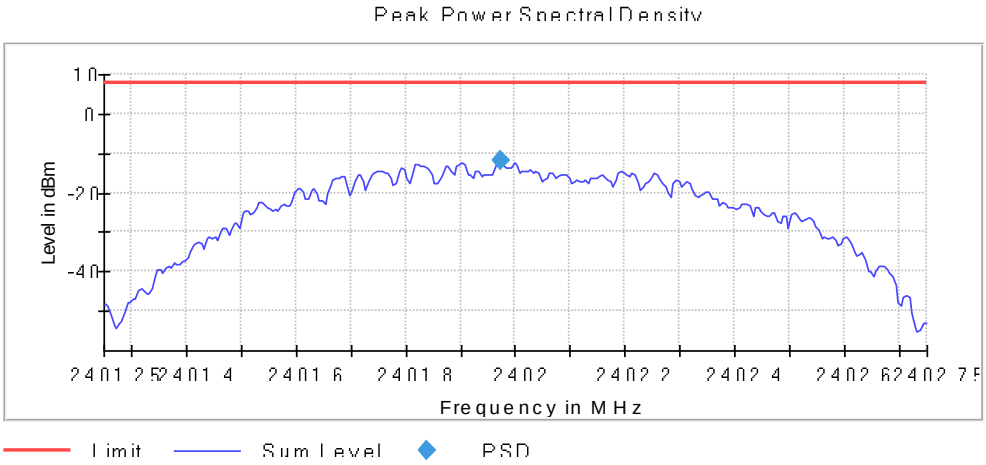


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01(1 Mbps)
TEST RESULTS:	PASS

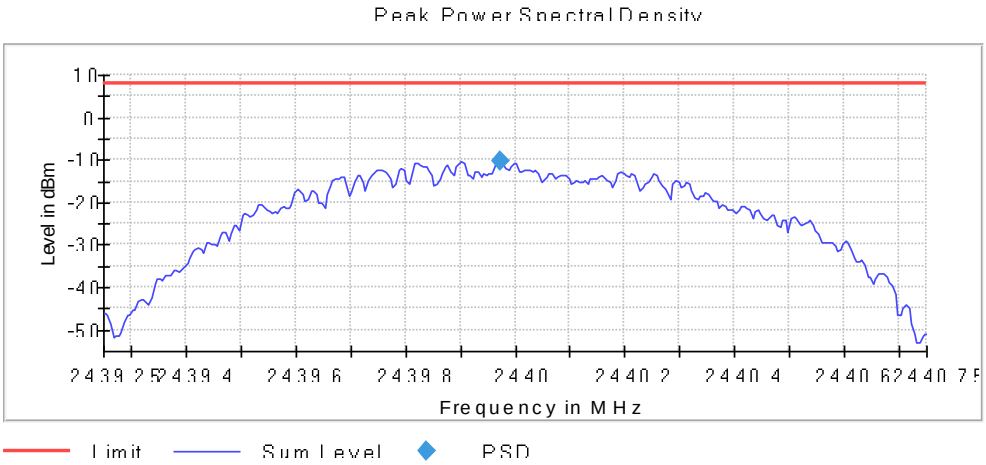
	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
Power spectral density (dBm)	-12.021	-10.112	-13.311

TEST RESULTS (Cont.):	

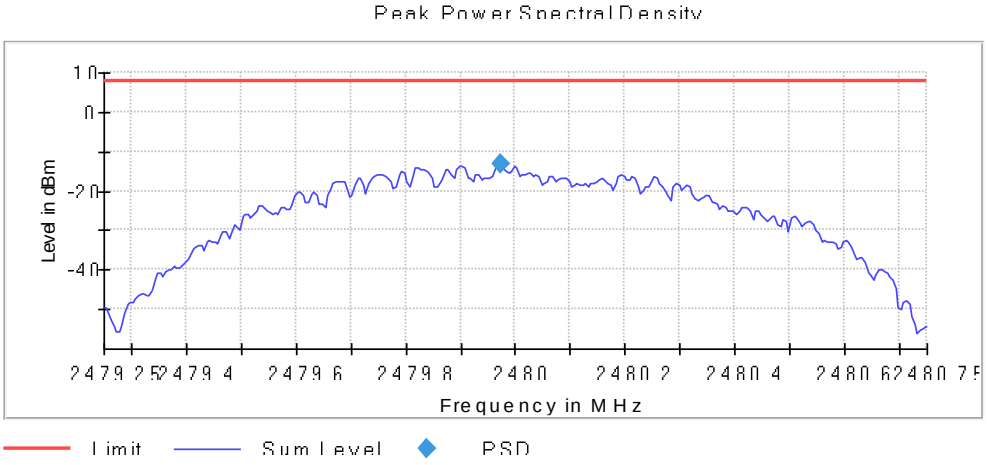
Lowest Channel:



Mid Channel:



High Channel:



TEST RESULTS (Cont.):	

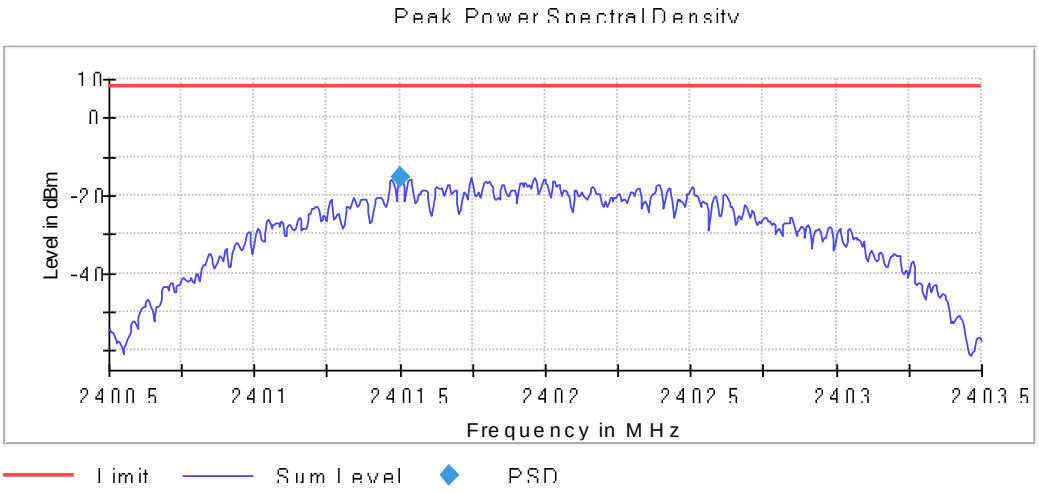
Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40125 GHz	2.43925 GHz	2.47925 GHz
Stop Frequency	2.40275 GHz	2.44075 GHz	2.48075 GHz
Span	1.500 MHz	1.500 MHz	1.500 MHz
RBW	10.000 kHz	10.000 kHz	10.000 kHz
VBW	30.000 kHz	30.000 kHz	30.000 kHz
Sweep Points	300	300	300
Sweep time	1.500 ms	1.500 ms	1.500 ms
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	Sweep	Sweep	Sweep
Preamp	off	Off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	5 / max. 150	5 / max. 150	7 / max. 150
Stable	2 / 2	2 / 2	2 / 2
Max Stable Difference	0.22 dB	0.13 dB	0.13 dB

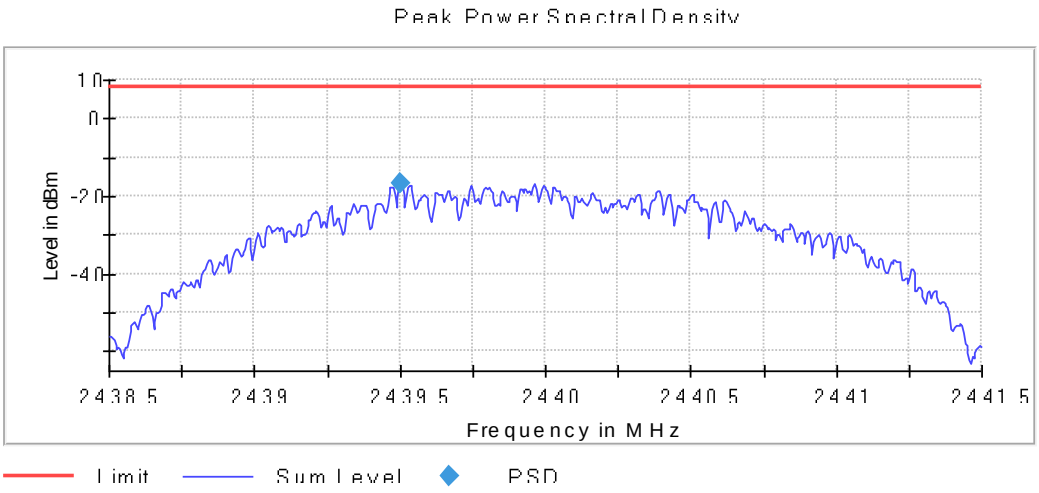
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#02 (2 Mbps)
TEST RESULTS:	PASS

	Lowest frequency 2402 MHz	Middle frequency 2440 MHz	Highest frequency 2480 MHz
Power spectral density (dBm)	-15.348	-16.735	-16.612

Lowest Channel:

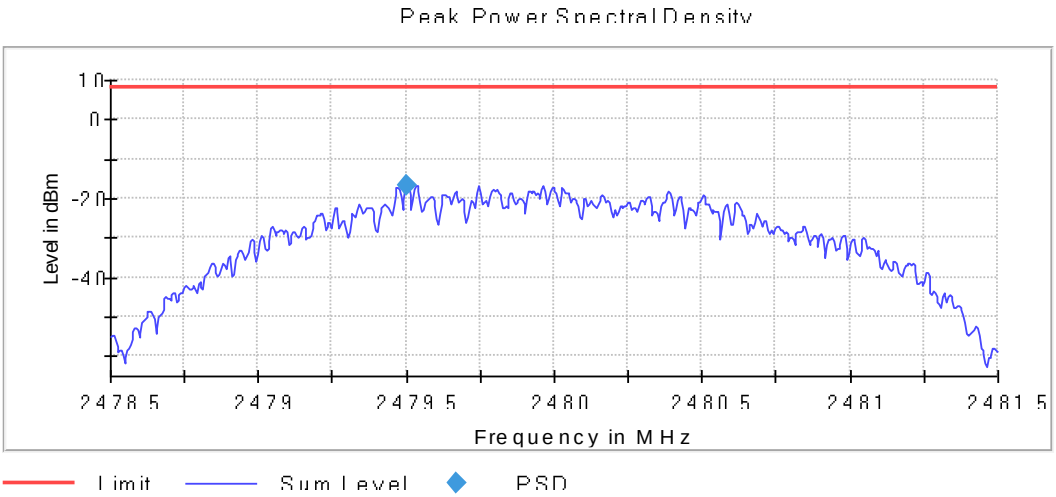


Mid Channel:



TEST RESULTS (Cont.):	

High Channel:



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40050 GHz	2.43850 GHz	2.47850 GHz
Stop Frequency	2.40350 GHz	2.44150 GHz	2.48150 GHz
Span	3.000 MHz	3.000 MHz	3.000 MHz
RBW	10.000 kHz	10.000 kHz	10.000 kHz
VBW	30.000 kHz	30.000 kHz	30.000 kHz
Sweep Points	600	600	600
Sweep time	3.000 ms	3.000 ms	3.000 ms
Reference Level	0.000 dBm	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak	MaxPeak
Sweep Count	100	100	100
Filter	3 dB	3 dB	3 dB
Trace Mode	Max Hold	Max Hold	Max Hold
Sweep type	Sweep	Sweep	Sweep
Preamp	off	Off	off
Stable mode	Trace	Trace	Trace
Stable value	0.50 dB	0.50 dB	0.50 dB
Run	5 / max. 150	5 / max. 150	7 / max. 150
Stable	2 / 2	2 / 2	2 / 2
Max Stable Difference	0.22 dB	0.13 dB	0.22 dB

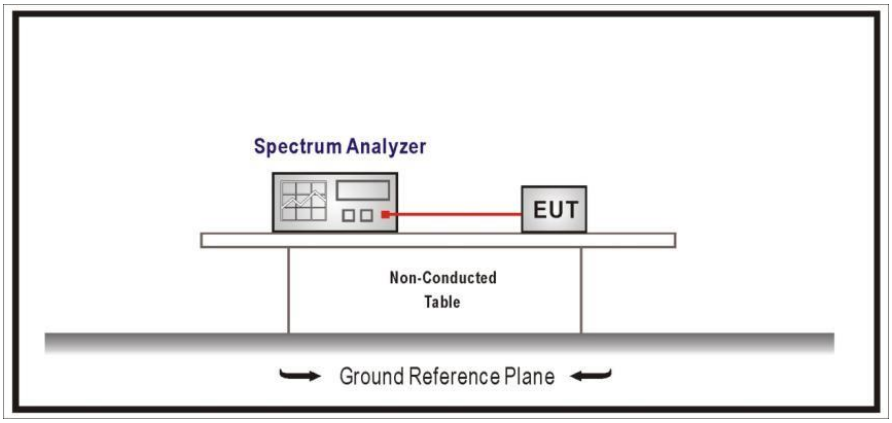
TEST A.6: EMISSION LIMITATIONS CONDUCTED (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(d) and RSS-247 5.5

LIMITS

In any 100 kHz bandwidth outside the frequency band in which the digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required shall be 30 dB instead of 20 dB.

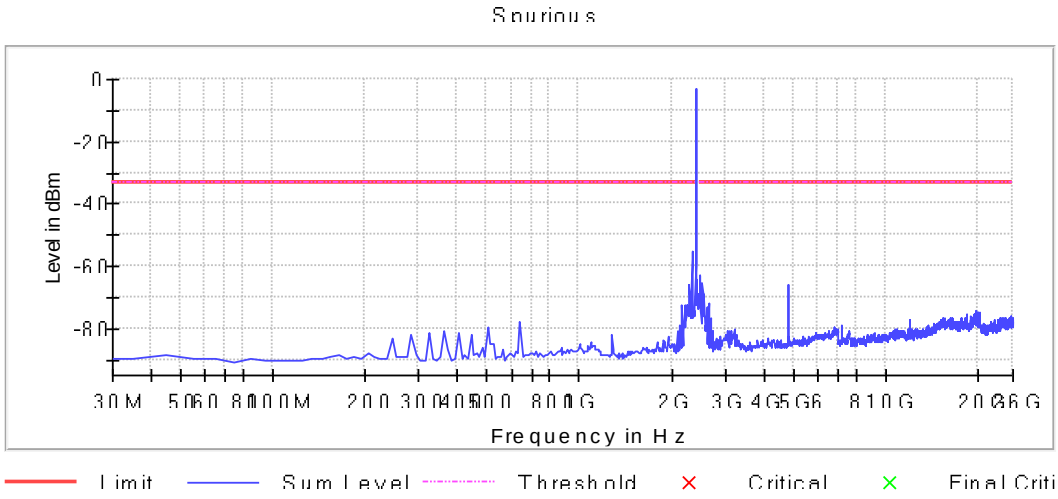
TEST SETUP	



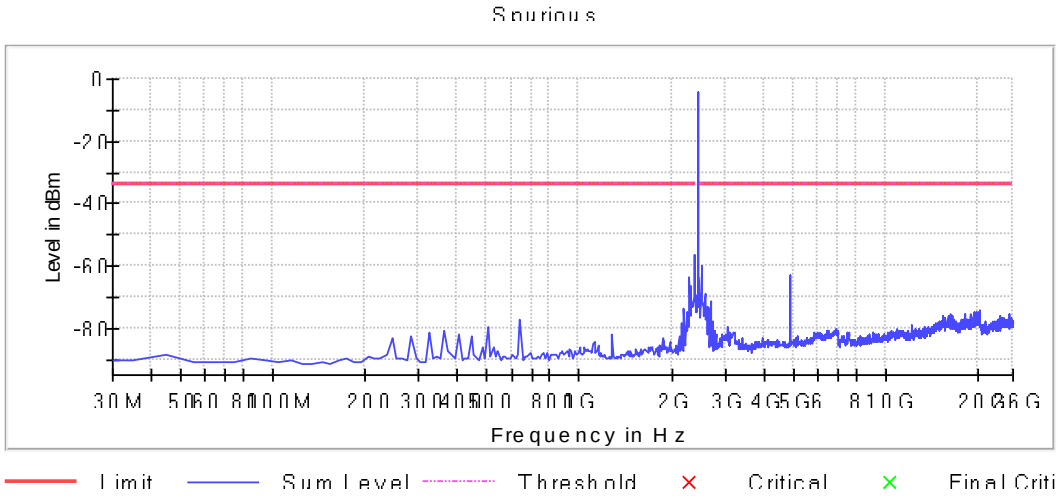
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01 (1mbps)
TEST RESULTS:	PASS

Conducted spurious signals detected were minimum 20 dB respect to the limit for the lowest, middle and highest operating channels.

Lowest Channel

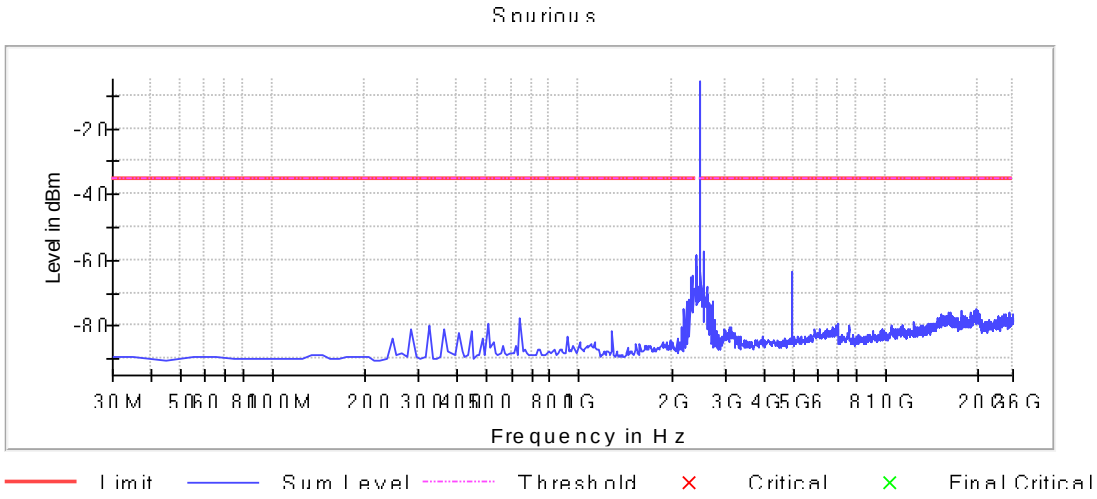


Middle Channel



TEST RESULTS (Cont.):	

Highest Channel



Measurement Settings

Setting	Instrument Value
Start Frequency	**30.000 MHz**
Stop Frequency	**26 GHz**
RBW	100.000 kHz
VBW	300.000 kHz
Sweep Points	32001
Sweep time	32.100 ms
Reference Level	-30.000 dBm
Attenuation	0.000 dB
Detector	MaxPeak
Sweep Count	30
Filter	3 dB
Trace Mode	Max Hold
Sweep type	FFT
Preamp	off
Stable mode	Trace
Stable value	1.00 dB
Run	7 / max. 40
Stable	1 / 1
Max Stable	0.00 dB

TEST A.7: EMISSION LIMITATIONS RADIATED (TRANSMITTER)

LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(d) and RSS-Gen 8.9 and 8.10

LIMITS

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.

RSS-247. Attenuation below the general field strength limits specified in RSS-Gen is not required

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 1-18 GHz Double ridge horn antennas, and 1m for the frequency range 18 GHz- 26 GHz Double ridge horn antenna.

For radiated emissions in the range 18 - 26 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.

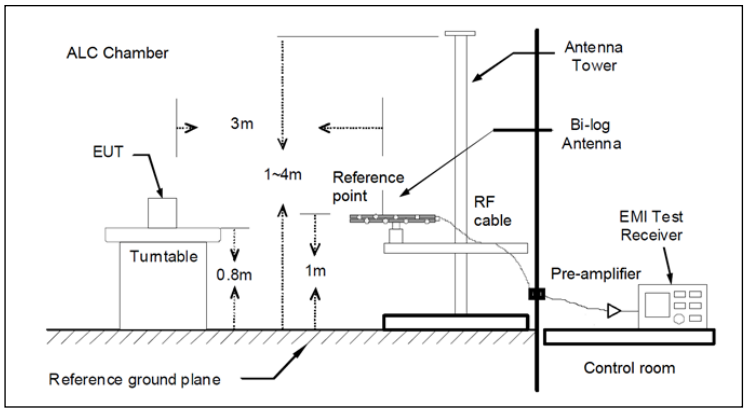
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

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

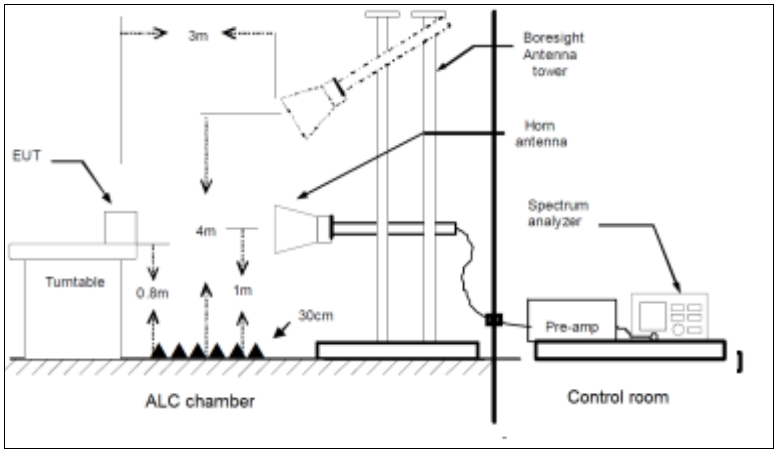
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

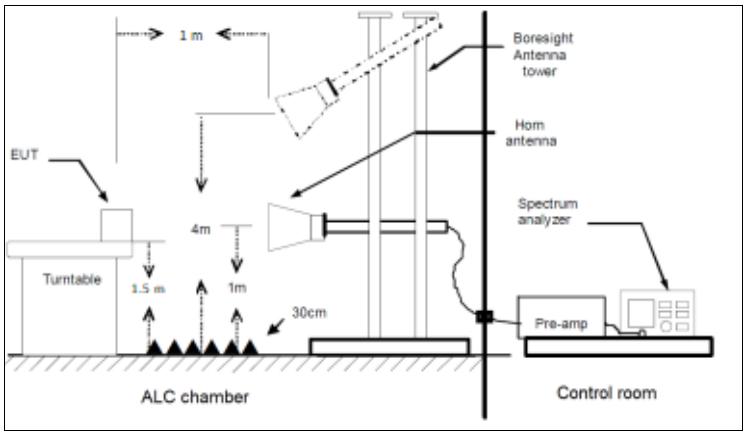
Radiated measurements Setup f < 1 GHz



Radiated measurements setup f > 1-18 GHz



Radiated measurements setup f > 18 GHz



TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01 (1 Mbps)
TEST RESULTS:	PASS

The results for the worst operation mode selected for this range (1 mbps) are shown below.

Frequency range 30 MHz – 1000 MHz

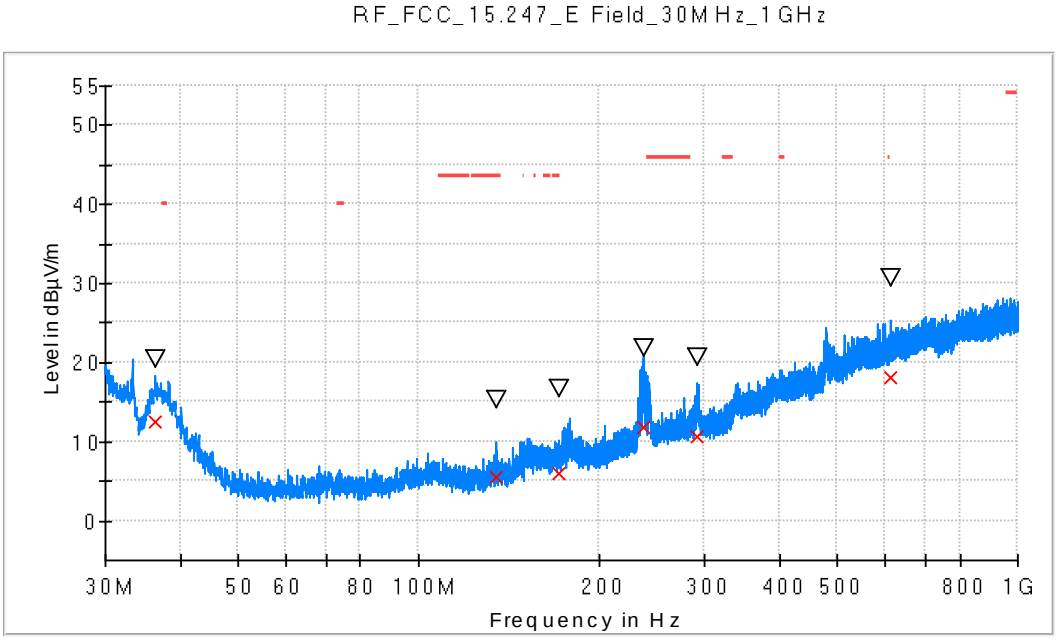
The spurious emissions below 1 GHz do not depend on the operating channel selected in the EUT.

Frequency range 1 GHz – 26 GHz

The results in the next tables show the maximum measured levels in the 1-26 GHz range including the restricted bands 2.31-2.39 GHz and 2.4835-2.5 GHz (see next plots). Please see the following results for worst operation mode selected for this range (1 Mbps).

TEST RESULTS (Cont.):	30-1000 MHz

Mid Channel

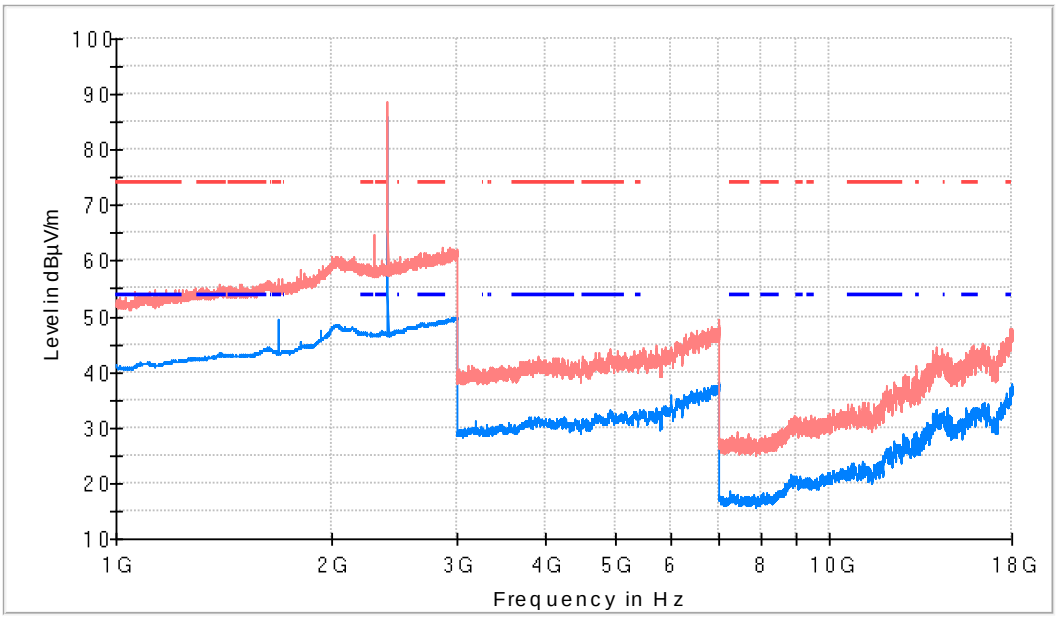


Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
36.353500	20.6	12.5	V	---	---
134.566000	15.3	5.6	V	37.9	43.5
171.717000	16.8	6.1	H	37.5	43.5
236.901000	21.8	11.8	V	---	---
291.706000	20.7	10.7	V	---	---
615.395000	30.7	18.1	H	---	---

TEST RESULTS (Cont.):	1-18 GHz (Lowest Channel)

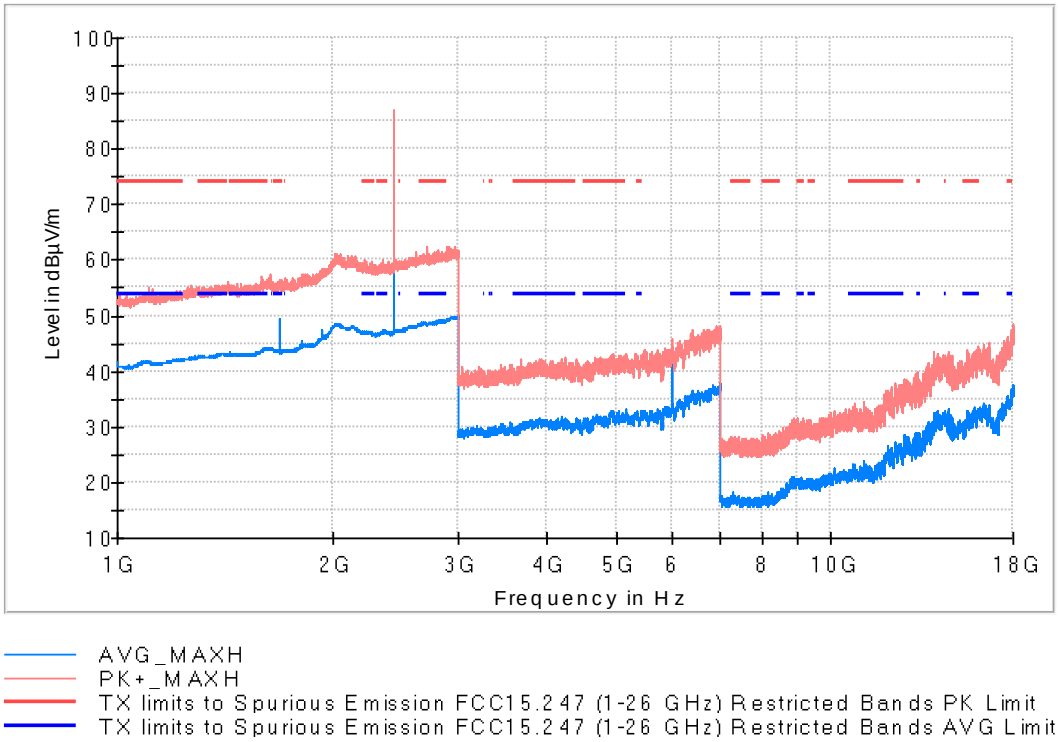
Lowest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
1687.500000	56.7	49.6	H	4.4	54.0	
2402.000000	88.7	86.1	H	---	---	Fundamental
17956.000000	47.1	37.7	V	16.3	54.0	

TEST RESULTS (Cont.):	1-18 GHz (Middle Channel)

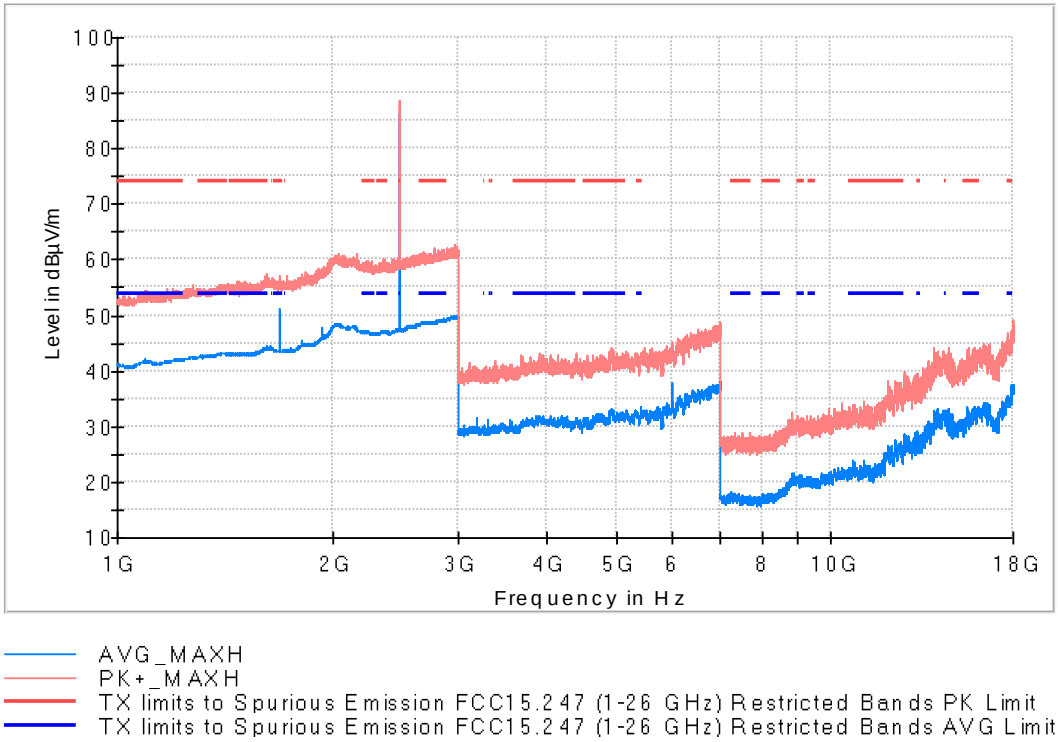
Middle Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
1687.500000	56.6	49.6	H	4.4	54.0	
2440.500000	86.9	83.6	H	---	---	Fundamental

TEST RESULTS (Cont.):	1-18 GHz (Highest Channel)

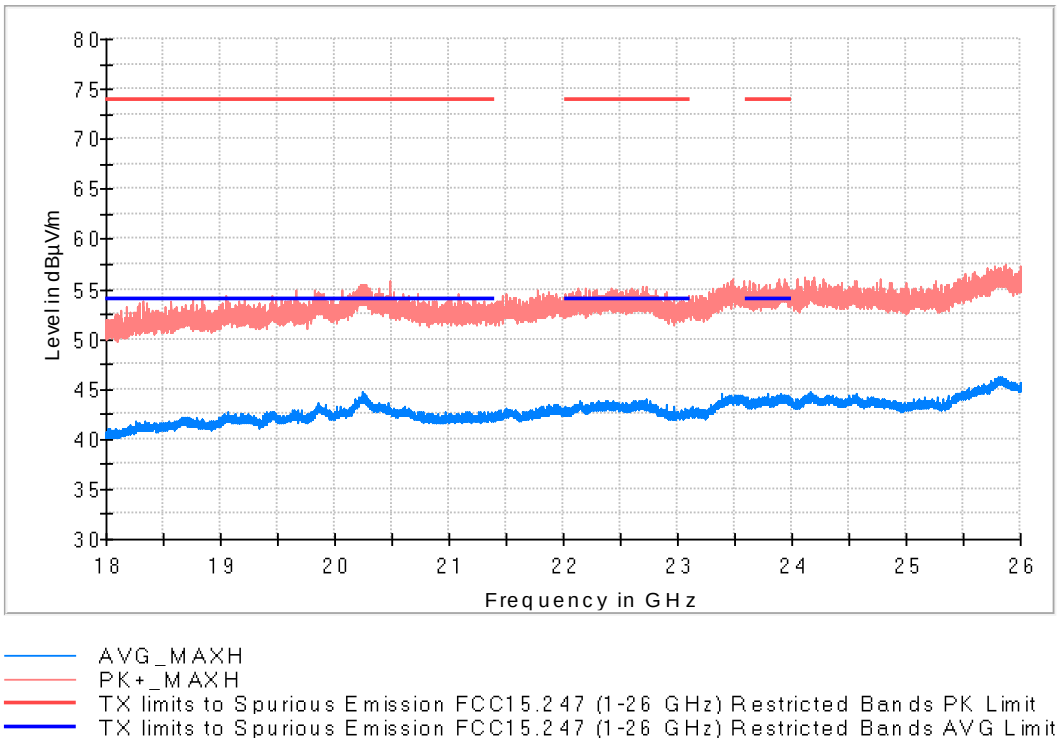
Highest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
1687.500000	57.0	51.1	H	2.9	54.0	
2480.500000	88.7	86.4	H	---	---	Fundamental

TEST RESULTS (Cont.):	18 – 26 GHz

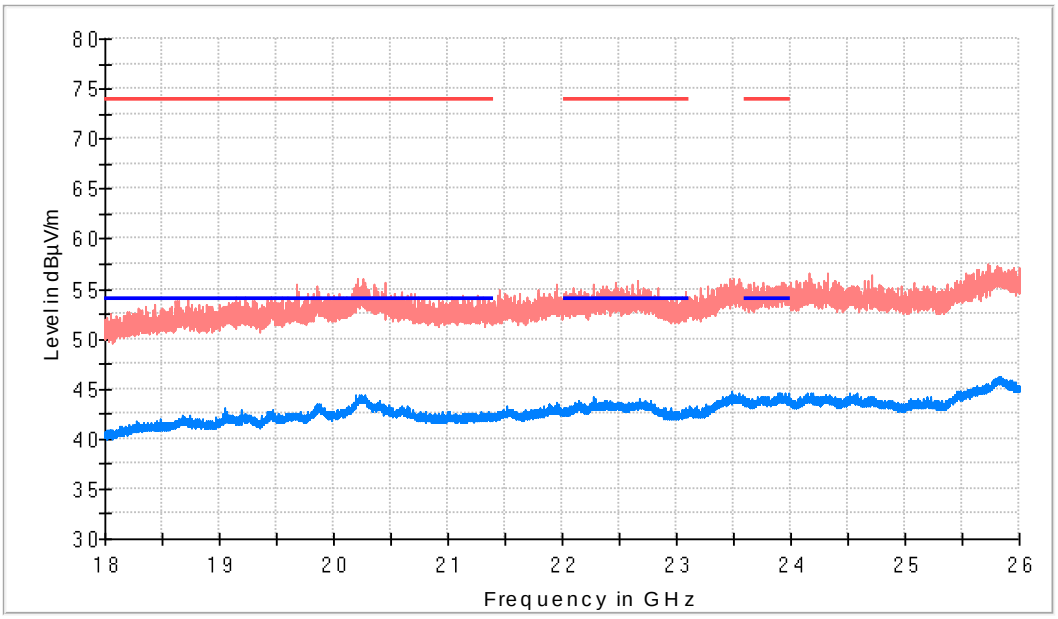
Lowest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Azimuth (deg)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
20255.500000	53.8	44.3	H	-17.0	9.7	54.0

TEST RESULTS (Cont.):	18 – 26 GHz

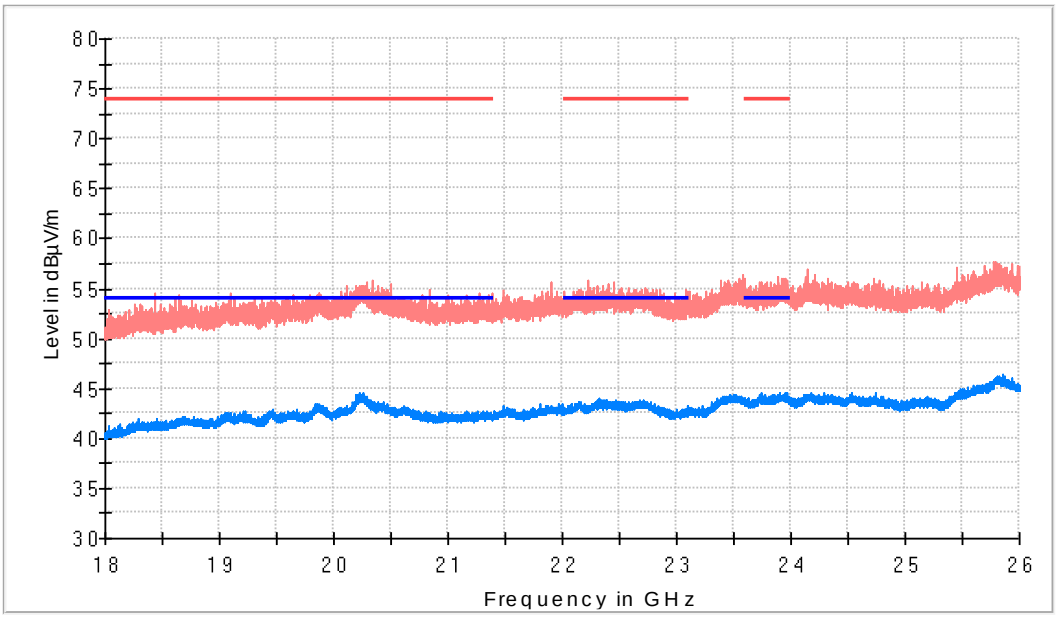
Middle Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Azimuth (deg)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
20243.000000	53.7	44.3	H	-180.0	9.7	54.0

TEST RESULTS (Cont.):	18 – 26 GHz

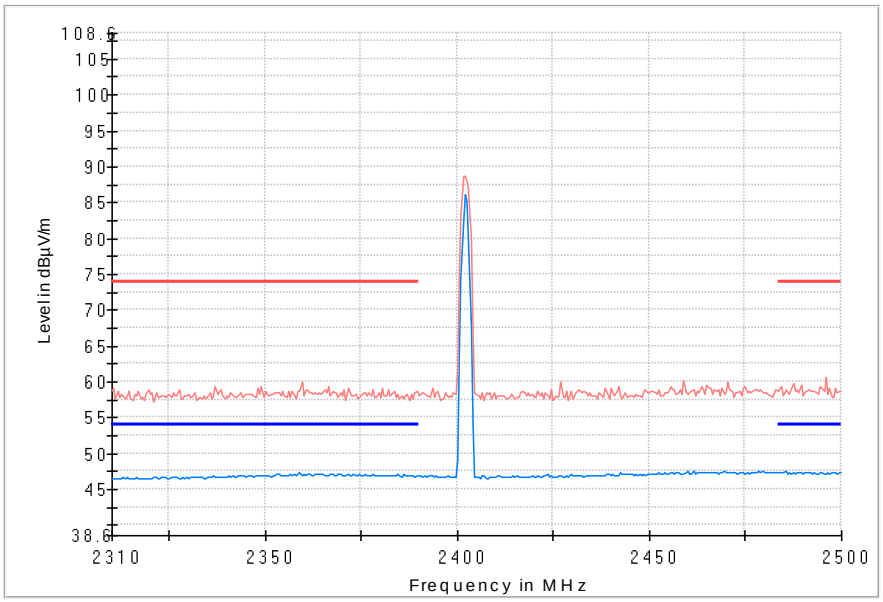
Highest Channel



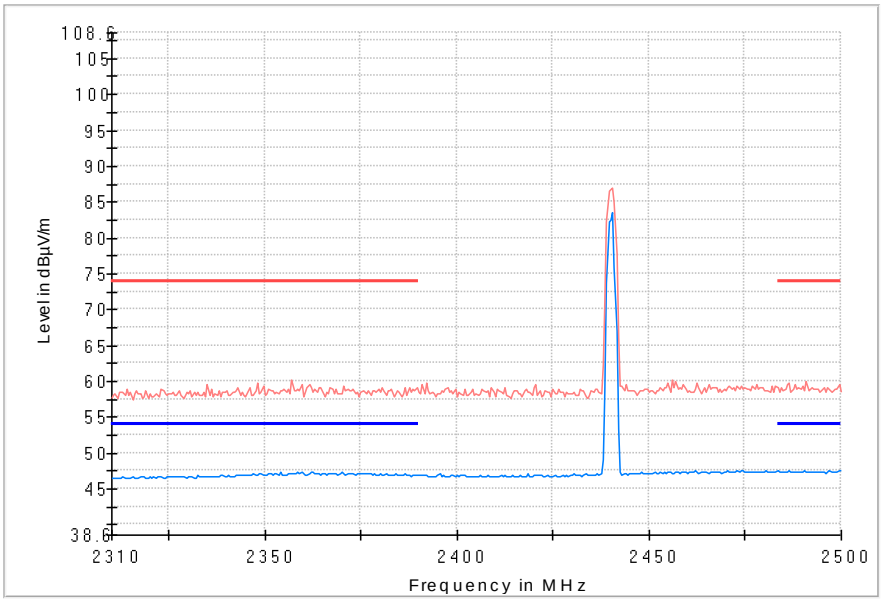
Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Azimuth (deg)	Margin - AVG (dB)	Limit - AVG (dBµV/m)
20239.000000	54.3	44.5	H	-180.0	9.5	54.0

TEST RESULTS (Cont.):	Restricted Bands (2.31 GHz – 2.5 GHz)

Lowest Channel

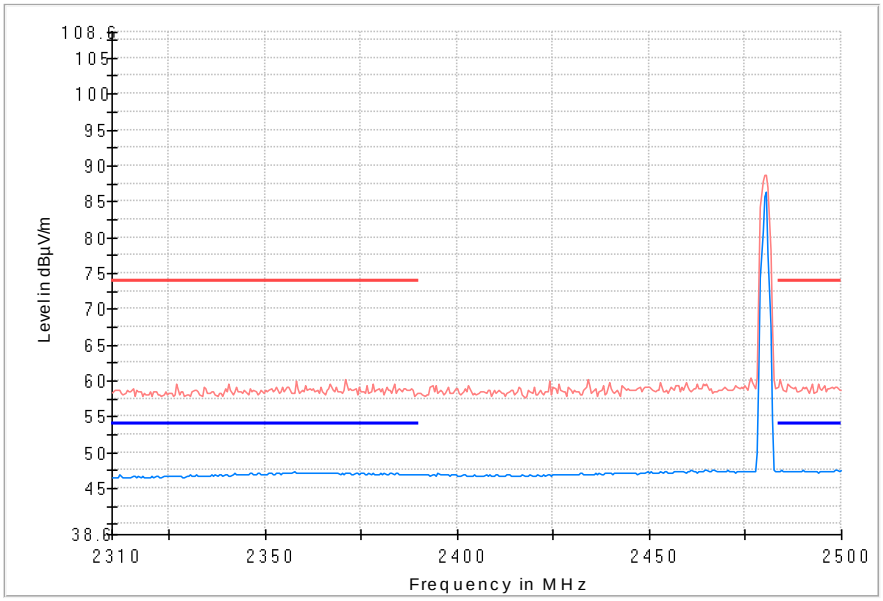


Middle Channel



TEST RESULTS (Cont.):	

Highest Channel



Appendix B: **Test results (Bluetooth EDR)**

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PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	FHSS
Adaptive	Non-Adaptive Equipment
Operation mode 1:	
Operating Frequency Range	2400 – 2483.5 MHz
Nominal Channel Bandwidth	2 MHz
RF Output Power	4 dBm
Extreme operating conditions	-40 ºC to +70 ºC
- Temperature range	
Antenna type	
Antenna gain	-2.5 dBi
Nominal Voltage	
- Supply Voltage	12 Vdc
- Type of power source	DC voltage
Equipment type	Bluetooth Classic
Geo-location capability	No

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01	Power supply (V): $V_{nominal}$ = 12 Vdc Modulation: GFSK Test Frequencies for conducted/Radiated tests: Lowest range: 2402 MHz Middle channel: 2441 MHz Highest range: 2480 MHz
TC#02	Power supply (V): $V_{nominal}$ = 12 Vdc Modulation: π/4-DQPSK Test Frequencies for Conducted/Radiated tests: Lowest range: 2402 MHz Middle channel: 2441 MHz Highest range: 2480 MHz
TC#03	Power supply (V): $V_{nominal}$ = 12 Vdc Modulation: 8-DPSK Test Frequencies for Conducted/Radiated tests: Lowest range: 2402 MHz Middle channel: 2441 MHz Highest range: 2480 MHz

TEST B.1: 20db emission bandwidth, OCCUPIED BANDWIDTH AND CARRIER FREQUENCY SEPARATION

LIMITS:	Product standard:	§ 2.1049, Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(a) (1) and RSS-247 5.1 (b)

LIMITS

Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW.

TEST SETUP: