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:
3943ERM.006A1

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	Sense Line Assembly (SLA)
(*) Trademark	Visteon
(*) Model and /or type reference tested	SLAP3X6
Other identification of the product	FCC ID: NT8-SLAP3X6 IC: 3043A-SLAP3X6 HVIN: 1.5 FVIN: 1.0 Hw version: VPRAMU-14B115-AB Sw version: SWO100-28685-001F00
(*) Features	Cell Monitoring Unit in Wireless Battery Management
Manufacturer	Visteon Corporation One Village Center Drive, Van Buren Township, MI 48111, USA.
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 (April 2019): 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 of issue	5/15/2023
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	%
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

The DUT is an Electronic module intended to monitor battery module cell groups voltages and module temperatures from the High Voltage battery bus in addition to activate cell balancing to improve battery cells life.

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
3942/02	CMUp 3X6	CMUp	-	11/28/2022

1. Sample S/01 was used for following test(s)

   All tests indicated in appendix A.

Sample S/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
3942/16	Radiated CMUp 3X6	CMUp	-	11/28/2022

1. Sample S/02 was used for following test(s)

   All Radiated tests indicated in appendix A.

Test sample description

Ports..... :	Port name and description		Cable				
			Specified length [m]	Attached during test	Shielded	Coupled to patient	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
				☐	☐	☐	
Supplementary information to the ports..... :	No Data Provided						
Rated power supply..... :	Voltage and Frequency		Reference poles				
			L1	L2	L3	N	PE
	☐	AC:	☐	☐	☐	☐	☐
	☐	AC:	☐	☐	☐	☐	☐
	☒	DC: Minimum 12 V , Nominal 21.9 V , Maximum 25.2 V.					
	☐	DC:					
Rated Power..... :	6 mA						
Clock frequencies..... :	40 MHz						
Other parameters ..... :	No Data Provided						
Software version..... :	SWO100-28685-001F00						
Hardware version ..... :	VPRAMU-14B115-AB						
Dimensions in cm (W x H x D) ... :	365.1 mm x 69.6 mm x 647.93 mm						
Mounting position ..... :	☐	*Table top equipment*					
	☐	*Wall/Ceiling mounted equipment*					
	☐	*Floor standing equipment*					
	☐	*Hand-held equipment*					
	☒	*Other: Integrated in-side electric vehicle battery pack.*					
Modules/parts..... :	Module/parts of test item		Type		Manufacturer		
	No Data Provided						

Accessories (not part of the test item)..... :	Description	Type	Manufacturer
	Harness		
	URT dongle		
	Fixtures		
Documents as provided by the applicant ..... :	Description	File name	Issue date
	Setup instructions	Setup instructions	Nov 29th, 2022
Copy of marking plate:			
No Marking plate found.			

Identification of the client

VISTEON CORPORATION
One Village Center Drive.
Van Buren Township, MI. 48111
USA

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	11-28-2022
Date (finish)	04-05-2023

Document history

Report number	Date	Description
3943ERM.006	04-28-2023	First release
3943ERM.006A1	05-15-2023	Second release. Spectrum analyzer settings have been added. The modification of the test report cancels and replaces the test report no. 3943ERM.006.

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, Yuri Barone, Koji Nishimoto.

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH (Proprietary protocol)					
Section	**FCC Spec Clause**	**RSS Spec Clause**	**Test Description**	**Verdict**	**Remark**
A.1	§ 2.1049	RSS-GEN 6.7	99% Occupied Bandwidth	P	N/A
A.2	§15.247 (a) (2)	RSS-247 5.2 (a)	6dB Bandwidth	P	N/A
A.3	§ 15.247 (b) (3)	RSS-247 5.4 (d)	Maximum Output Power and antenna gain	P	N/A
A.4	§ 15.247 (d)	RSS-247 5.5	Band-edge conducted emissions compliance (Transmitter)	P	N/A
A.5	§ 15.247 (e)	RSS-247 5.2 (b)	Power Spectral Density	P	N/A
-	§15.247 (d)	RSS-247 5.5	Emission limitations Conducted (Transmitter)	N/A	Refer 1
A.6	§15.247 (d)	RSS-247 5.5	Emission limitations Radiated (Transmitter)	P	N/A

Supplementary information and remarks:

1. DUT has integral antenna.

List of equipment used during the test

Conducted Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	LAST CALIBRATION	NEXT CALIBRATION
1038	TS8997 TEST SYSTEM	Rohde & Schwarz	N/A	N/A
1107	ETHERNET SNMP THERMOMETER- RF1 ROOM	-	2022-10-18	2024-10-18
1313	WIRELESS MEASUREMENT SOFTWARE R&S WMS32	Rohde & Schwarz	N/A	N/A

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	LAST CALIBRATION	NEXT CALIBRATION
878	Power supply (AMETEK / PROG-DC-PS)	Rohde & Schwarz	N/A	N/A
1012	ESR26 EMI Test Receiver	Rohde & Schwarz	2023-01-08	2025-01-08
1014	FSV40 Signal Analyzer 40GHz	Rohde & Schwarz	2021-05-19	2023-05-19
1055	3116C DOUBLE-RIDGED WAVEGUIDE HORN ANTENNAS (18-40GHz)	ETS LINDGREN	2023-02-06	2026-02-06
1057	3115 Double-Ridged Waveguide Horn Antenna 1-18 GHz	ETS LINDGREN	2020-06-03	2023-06-03
1065	3142E Biconilog Antenna	ETS LINDGREN	2020-08-13	2023-08-13
1108	Ethernet SNMP Thermometer- CR Room	HW GROUP	2022-10-18	2024-10-18
1111	Ethernet SNMP Thermometer- SAC	HW GROUP	2022-10-18	2024-10-18
1179	Semi anechoic Absorber Lined Chamber	FRANKONIA	N/A	N/A
1314	Wireless Measurement Software R&S EMC32	Rohde & Schwarz	N/A	N/A
1461	Low Noise Preamplifier (1-18GHz)	Bonn Elektronik	2022-06-01	2024-06-01

Appendix A: Test results (Proprietary Protocol)

Appendix A Content

PRODUCT INFORMATION

The following information is provided by the client

Information	**Description**
Modulation	GFSK
Adaptive	Non-adaptive equipment
Operation mode	
- Operating Frequency Range	2405 – 2480 MHz
- Nominal Channel Bandwidth	2 MHz
- RF Output Power	10 dBm
Antenna type	Integrated chip antenna
Antenna gain	2.6 dBi
Nominal Voltage	
- Supply Voltage	21.9 V nominal
- Type of power source	DC Power supply
Equipment type	Wireless Battery Management

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01	Power supply (V): $V_{nominal}$ = 21.9 V dc Bandwidth: 2 MHz Test Frequencies for Conducted/ Radiated tests: Lowest channel: 2405 MHz Middle channel: 2445 MHz Highest channel: 2480 MHz

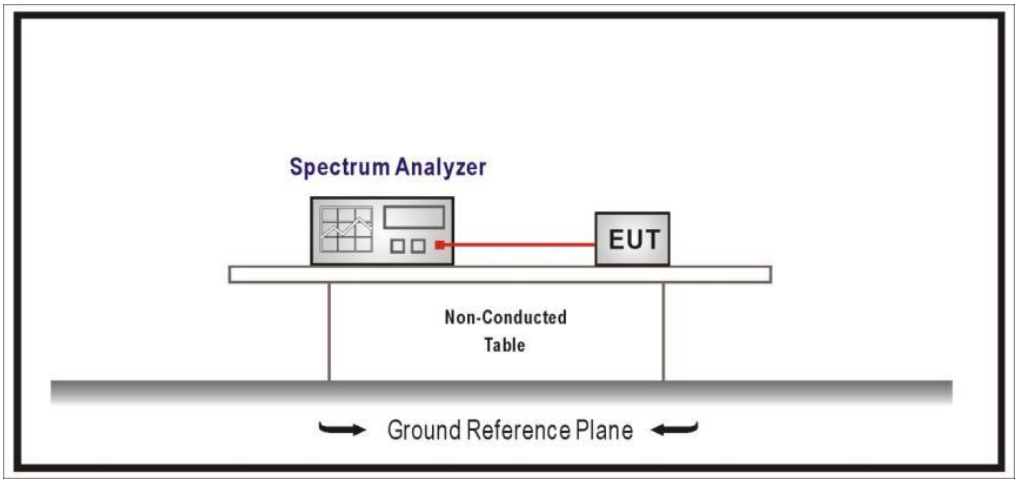
TEST A.1: 99% OCCUPIED BANDWIDTH

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	

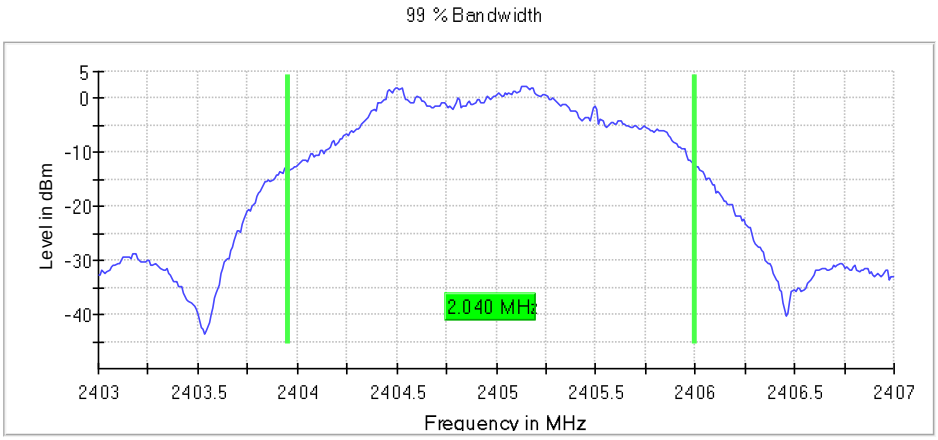


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

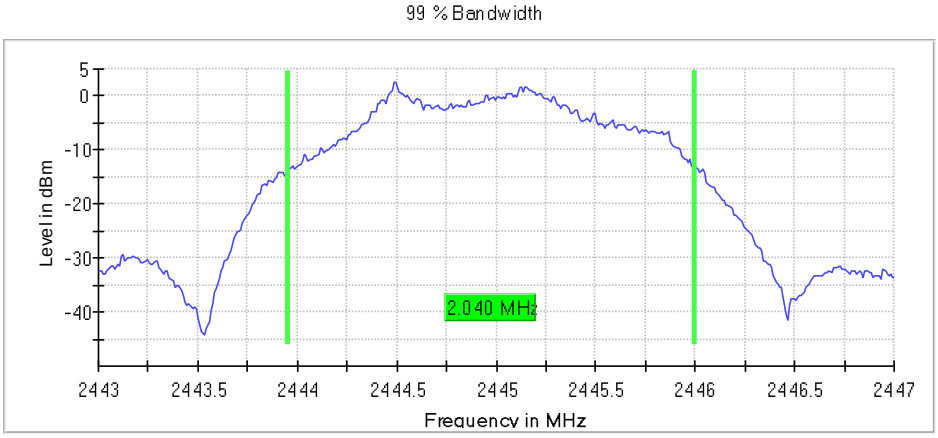
	Lowest frequency 2405 MHz	Middle frequency 2445 MHz	Highest frequency 2480 MHz
99% bandwidth (MHz)	2.04	2.04	2.04

TEST RESULTS (Cont.):	

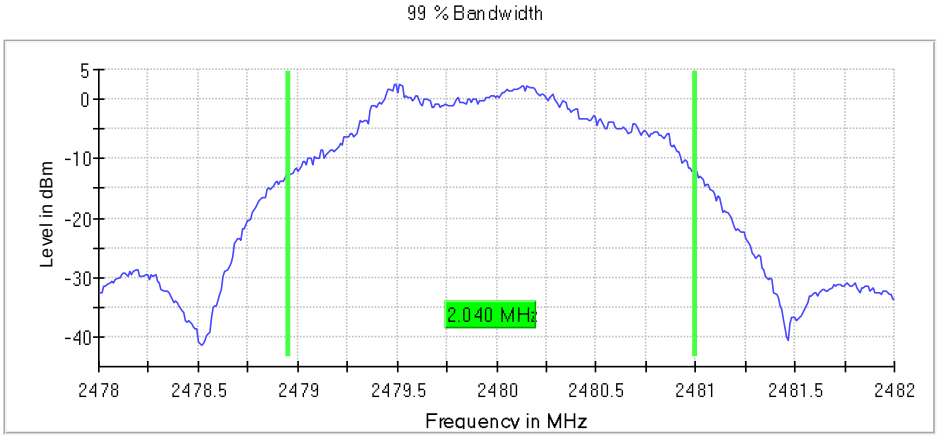
Lowest Channel



Middle Channel



Highest Channel



TEST RESULTS (Cont.):	

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40300 GHz	2.44300 GHz	2.47800 GHz
Stop Frequency	2.40700 GHz	2.44700 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	210.000 µs	210.000 µs	210.000 µs
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	18.000 dB	18.000 dB	18.000 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	67 / max. 150	62 / max. 150	43 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.12 dB	0.00 dB	0.23 dB

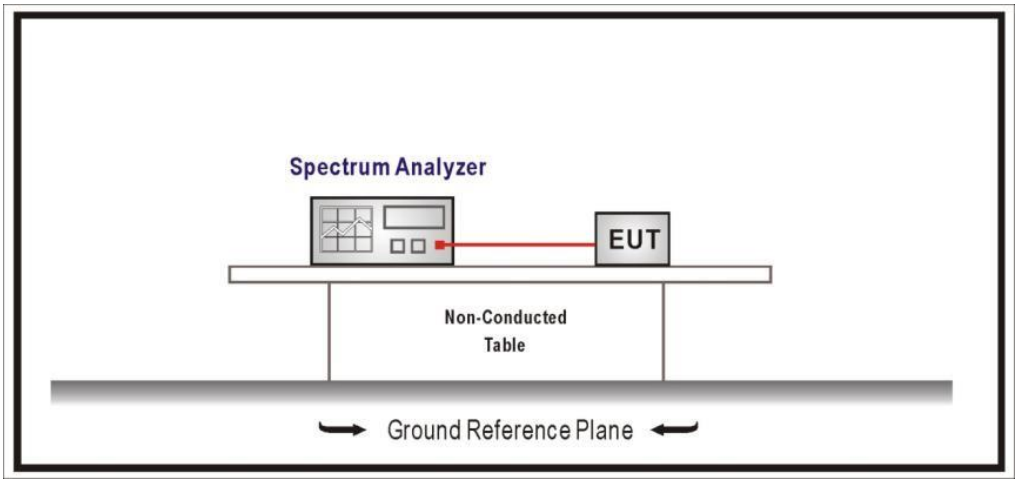
TEST A.2: 6DB BANDWIDTH

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	

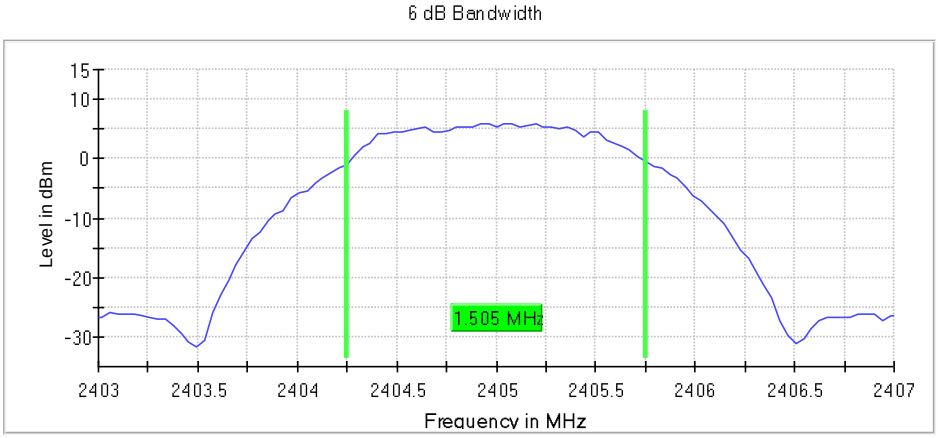


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

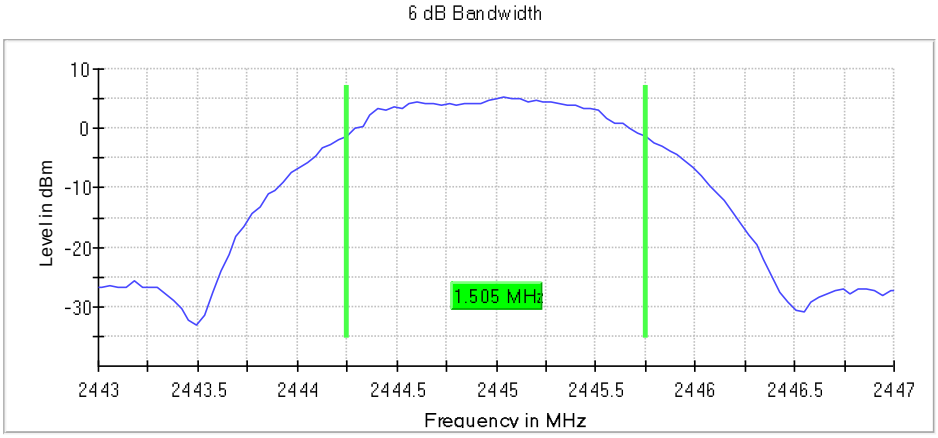
	Lowest frequency 2405 MHz	Middle frequency 2445 MHz	Highest frequency 2480 MHz
6 dB Spectrum bandwidth (MHz)	1.505	1.505	1.465

TEST RESULTS (Cont.):	

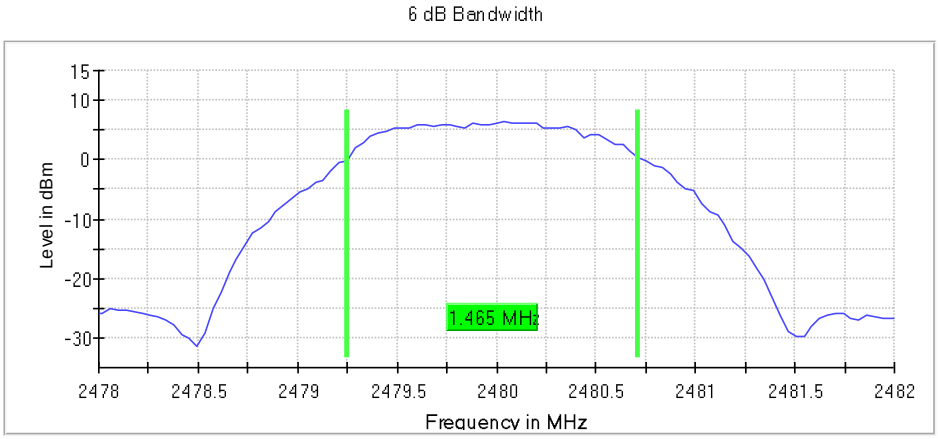
Lowest Channel:



Mid Channel:



High Channel:



TEST RESULTS (Cont.):	

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40300 GHz	2.44300 GHz	2.47800 GHz
Stop Frequency	2.40700 GHz	2.44700 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	41.830 µs	41.830 µs	41.830 µs
Reference Level	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	18.000 dB	18.000 dB	18.000 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	17 / max. 150	11 / max. 150	22 / max. 150
Stable	5 / 5	5 / 5	5 / 5
Max Stable Difference	0.24 dB	0.29 dB	0.00 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

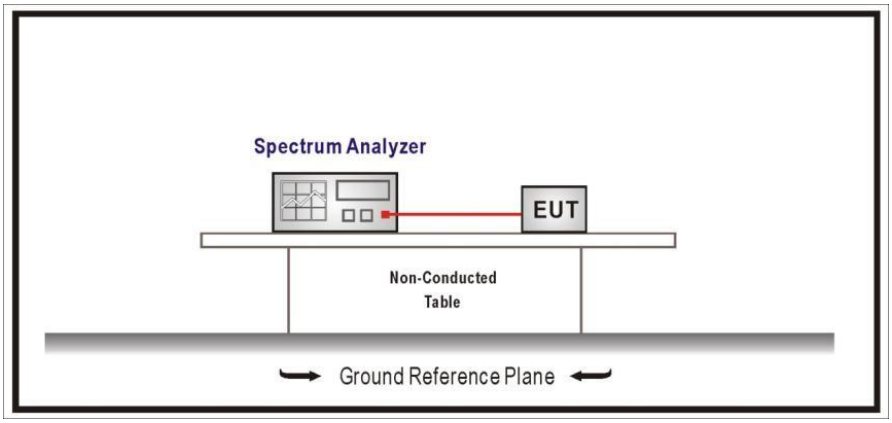
§15.247(b)(3) and RSS-247 5.4(d): For systems using digital modulation in the 2400-2483.5 MHz band: 1 watt (30 dBm).

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.



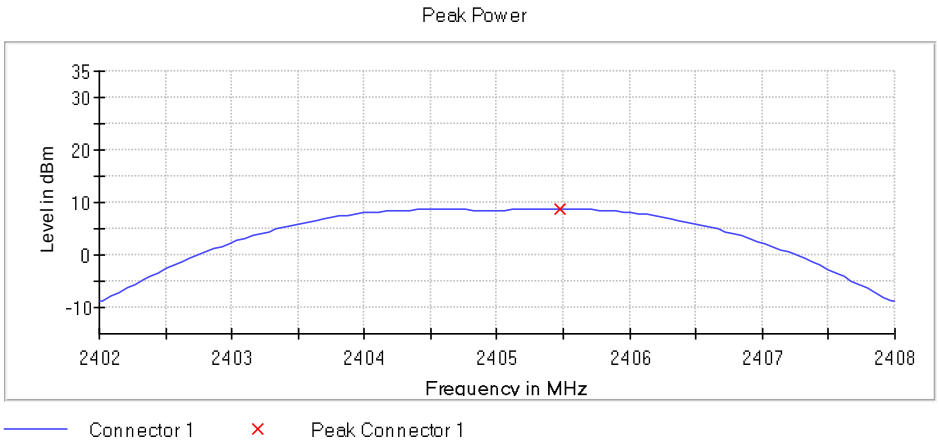
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

Maximum declared antenna gain: +2.6 dBi

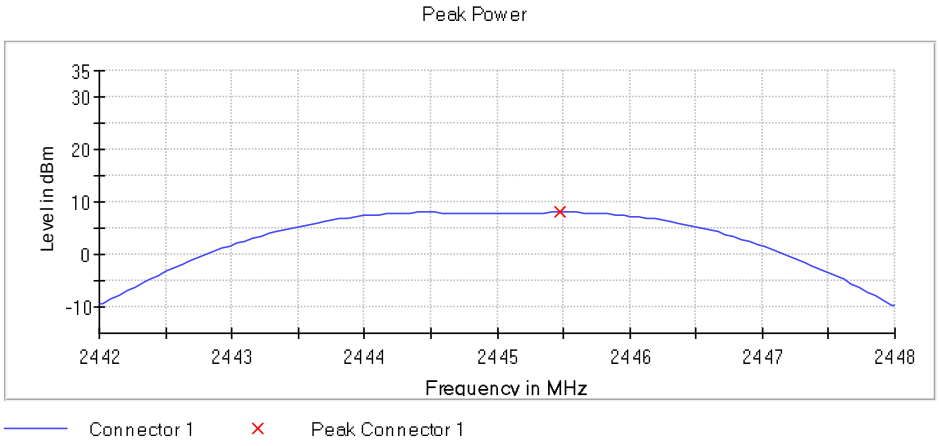
	Lowest frequency 2405 MHz	Middle frequency 2445 MHz	Highest frequency 2480 MHz
Maximum conducted power (dBm)	8.7	8.0	9.1
Maximum EIRP power (dBm)	11.3	10.6	11.7

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

Lowest Channel

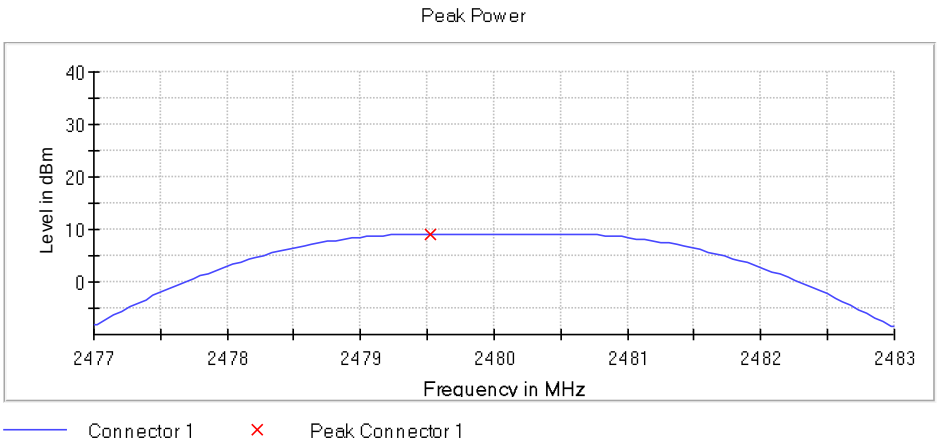


Middle Channel



TEST RESULTS (Cont.):	CONDUCTED PEAK POWER

Highest Channel



Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40200 GHz	2.44200 GHz	2.47700 GHz
Stop Frequency	2.40800 GHz	2.44800 GHz	2.48300 GHz
Span	6.000 MHz	6.000 MHz	6.000 MHz
RBW	2.000 MHz	2.000 MHz	2.000 MHz
VBW	10.000 MHz	10.000 MHz	10.000 MHz
Sweep Points	101	101	101
Sweep time	1.000 ms	1.000 ms	1.000 ms
Reference Level	20.000 dBm	20.000 dBm	20.000 dBm
Attenuation	28.000 dB	28.000 dB	28.000 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	4 / max. 150	4 / max. 150	4 / max. 150
Stable	3 / 3	3 / 3	3 / 3
Max Stable Difference	0.05 dB	0.04 dB	0.04 dB

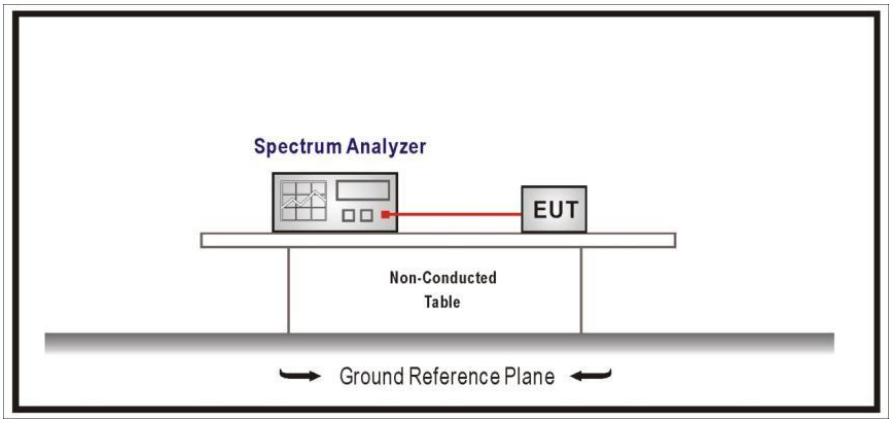
TEST A.4: BAND-EDGE EMISSIONS COMPLIANCE (TRANSMITTER)

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.

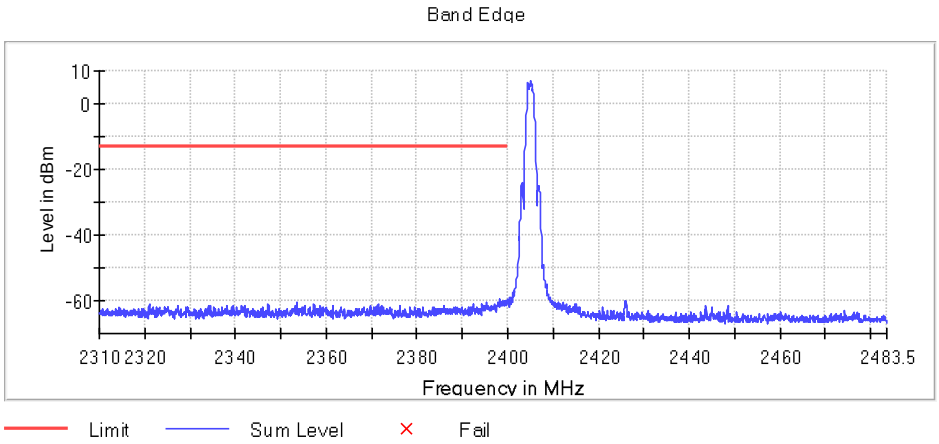
TEST SETUP	



TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
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.

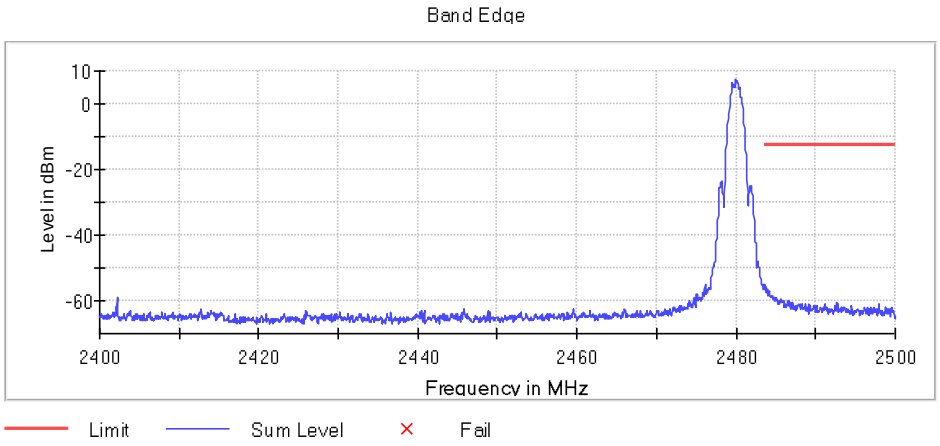
TEST RESULTS (Cont.):	Lowest Channel



Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2399.875000	-59.4	46.2	-13.1	PASS
2398.125000	-59.6	46.5	-13.1	PASS
2399.925000	-59.6	46.5	-13.1	PASS
2398.075000	-59.6	46.5	-13.1	PASS
2399.825000	-59.6	46.5	-13.1	PASS
2399.375000	-60.0	46.8	-13.1	PASS
2399.975000	-60.1	46.9	-13.1	PASS
2398.775000	-60.2	47.1	-13.1	PASS
2399.675000	-60.2	47.1	-13.1	PASS
2399.325000	-60.3	47.1	-13.1	PASS
2398.325000	-60.3	47.1	-13.1	PASS
2398.725000	-60.3	47.2	-13.1	PASS
2399.725000	-60.3	47.2	-13.1	PASS
2398.175000	-60.4	47.2	-13.1	PASS
2397.925000	-60.5	47.3	-13.1	PASS

TEST RESULTS (Cont.):	Highest Channel



Measurement

Frequency (MHz)	Level (dBm)	Margin (dB)	Limit (dBm)	Result
2483.625000	-54.9	42.5	-12.4	PASS
2483.675000	-55.1	42.7	-12.4	PASS
2483.525000	-55.5	43.1	-12.4	PASS
2483.725000	-55.8	43.4	-12.4	PASS
2483.575000	-56.3	43.9	-12.4	PASS
2483.875000	-56.6	44.2	-12.4	PASS
2483.925000	-56.6	44.2	-12.4	PASS
2484.175000	-57.0	44.6	-12.4	PASS
2484.125000	-57.0	44.6	-12.4	PASS
2483.825000	-57.1	44.7	-12.4	PASS
2483.775000	-57.4	45.0	-12.4	PASS
2483.975000	-57.9	45.5	-12.4	PASS
2484.025000	-58.1	45.7	-12.4	PASS
2484.275000	-58.3	45.9	-12.4	PASS
2484.225000	-58.3	45.9	-12.4	PASS

TEST RESULTS (Cont.):	

Spectrum Analyzer Parameters

Setting	Instrument Value - low	Instrument Value- high
Start Frequency	2.31000 GHz	2.40000 GHz
Stop Frequency	2.40000 GHz	2.48350 GHz
Span	90.000 MHz	83.500 MHz
RBW	100.000 kHz	100.000 kHz
VBW	300.000 kHz	300.000 kHz
Sweep Points	1800	1670
Sweep time	113.672 µs	94.727 µs
Reference Level	0.000 dBm	0.000 dBm
Attenuation	20.000 dB	20.000 dB
Detector	MaxPeak	MaxPeak
Sweep Count	100	100
Filter	3 dB	3 dB
Trace Mode	Max Hold	Max Hold
Sweep type	FFT	FFT
Preamp	off	off
Stable mode	Trace	Trace
Stable value	0.50 dB	0.50 dB
Run	4 / max. 150	5 / max. 150
Stable	3 / 3	3 / 3
Max Stable Difference	0.00 dB	0.12 dB

TEST A.5: POWER SPECTRAL DENSITY

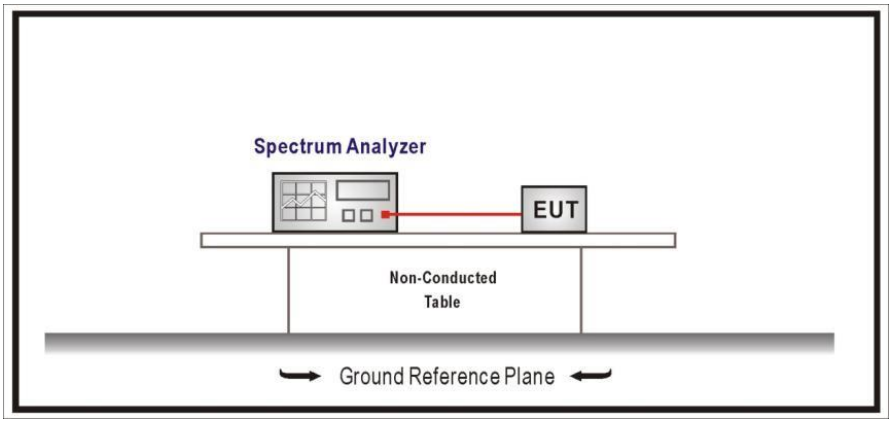
LIMITS:	Product standard:	Part 15 Subpart C §15.247 and RSS-247
	Test standard:	Part 15 Subpart C §15.247(e) and RSS-247 5.2 (b)

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 v05r02 (April 2019).

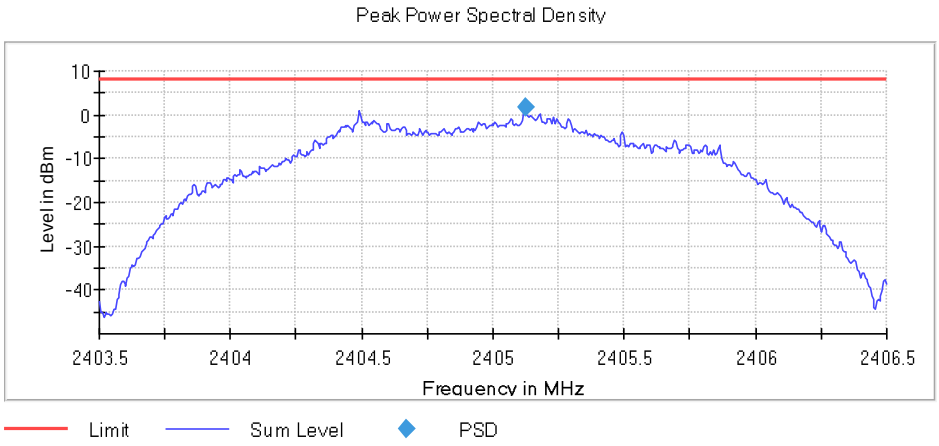


TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

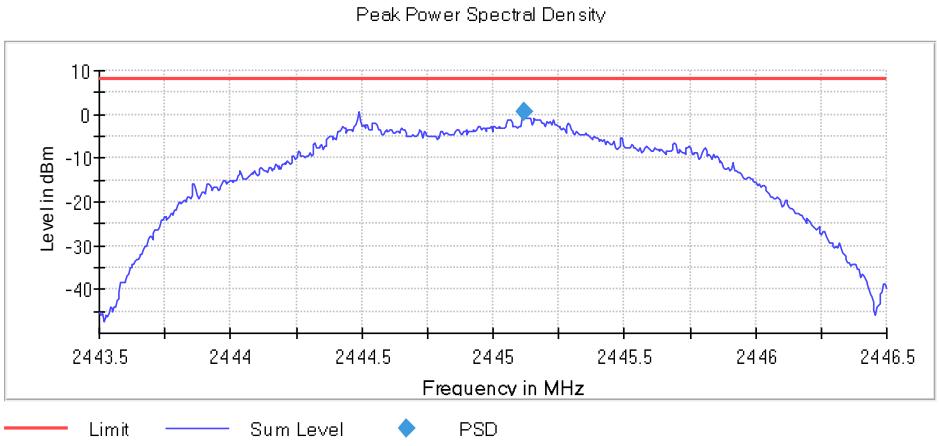
	Lowest frequency 2405 MHz	Middle frequency 2445 MHz	Highest frequency 2480 MHz
Power spectral density (dBm)	1.591	0.790	2.031

TEST RESULTS (Cont.):	

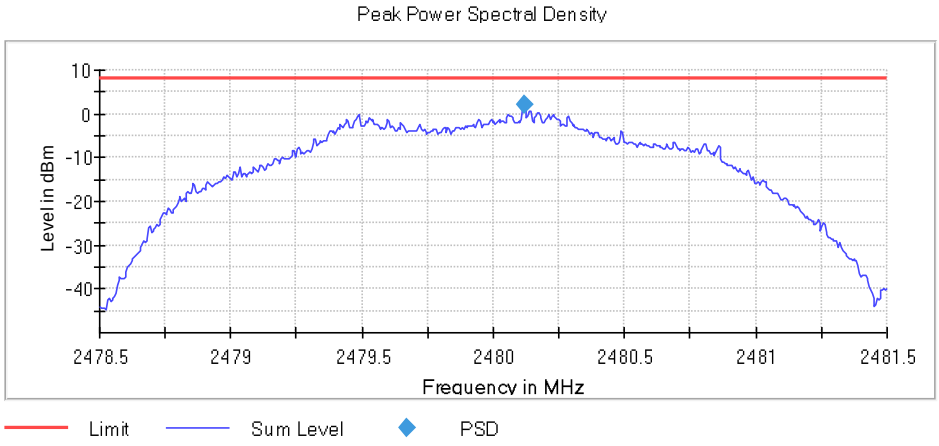
Lowest Channel:



Mid Channel:



High Channel:



TEST RESULTS (Cont.):	

Measurement

Setting	Instrument Value	Instrument Value	Instrument Value
Start Frequency	2.40350 GHz	2.44350 GHz	2.47850 GHz
Stop Frequency	2.40650 GHz	2.44650 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	10.000 dBm	10.000 dBm	10.000 dBm
Attenuation	18.000 dB	18.000 dB	18.000 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	47 / max. 150	58 / max. 150	30 / max. 150
Stable	2 / 2	2 / 2	2 / 2
Max Stable Difference	0.50 dB	0.00 dB	0.33 dB

TEST A.6: 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.

TEST SETUP

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

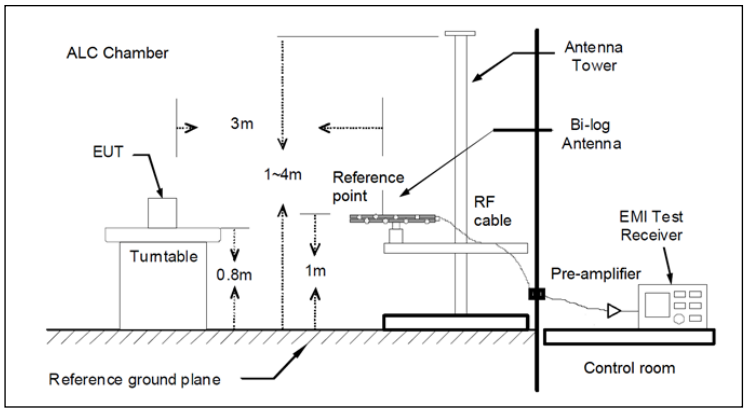
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360º and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

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

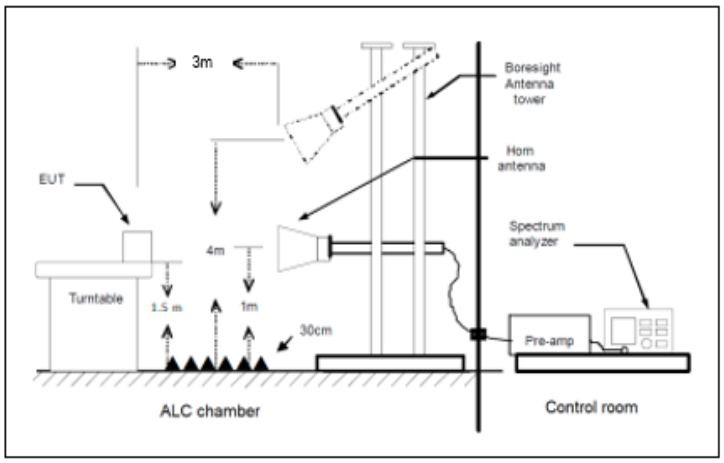
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

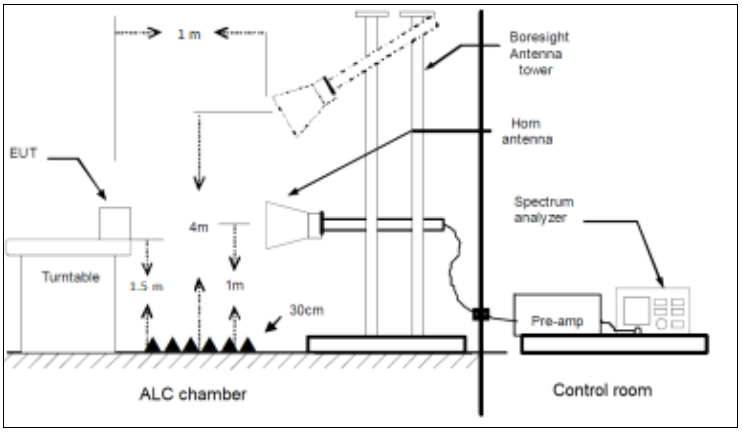
Radiated measurements Setup f < 1 GHz



Radiated measurements setup f > 1-18 GHz



Radiated measurements setup f > 18 GHz



TESTED SAMPLES:	S/02
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	PASS

The preliminary test was performed in three different DUT orientations (X, Y and Z) to determine the worst case. The worst case results were shown in the following test results.

Frequency range 30 MHz – 1000 MHz

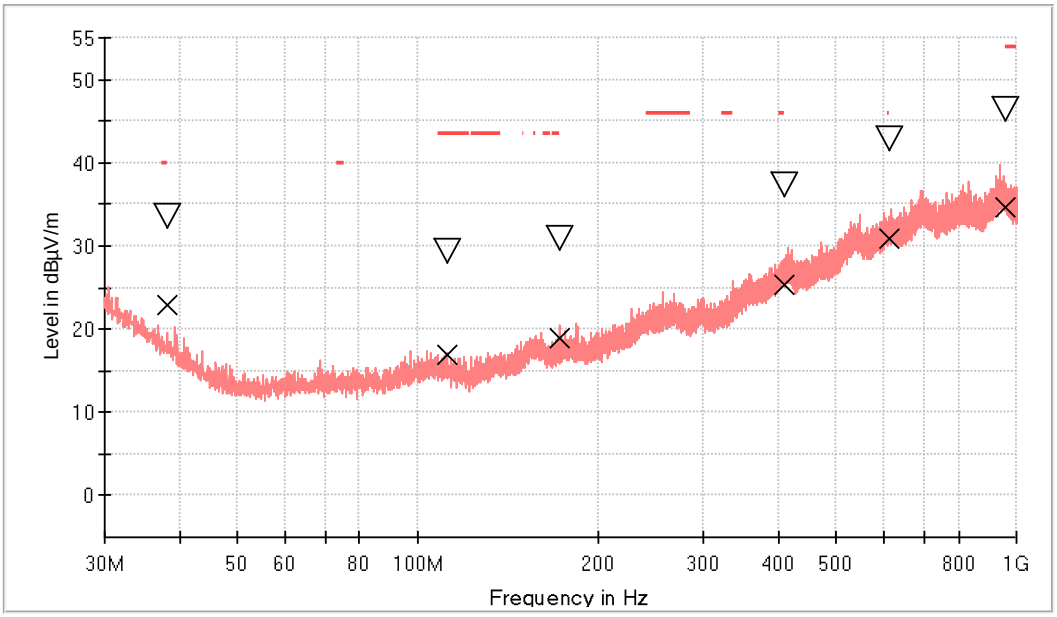
The spurious emissions below 1 GHz do not depend on the operating channel selected in the DUT.

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).

TEST RESULTS (Cont.):	30-1000 MHz

Mid Channel



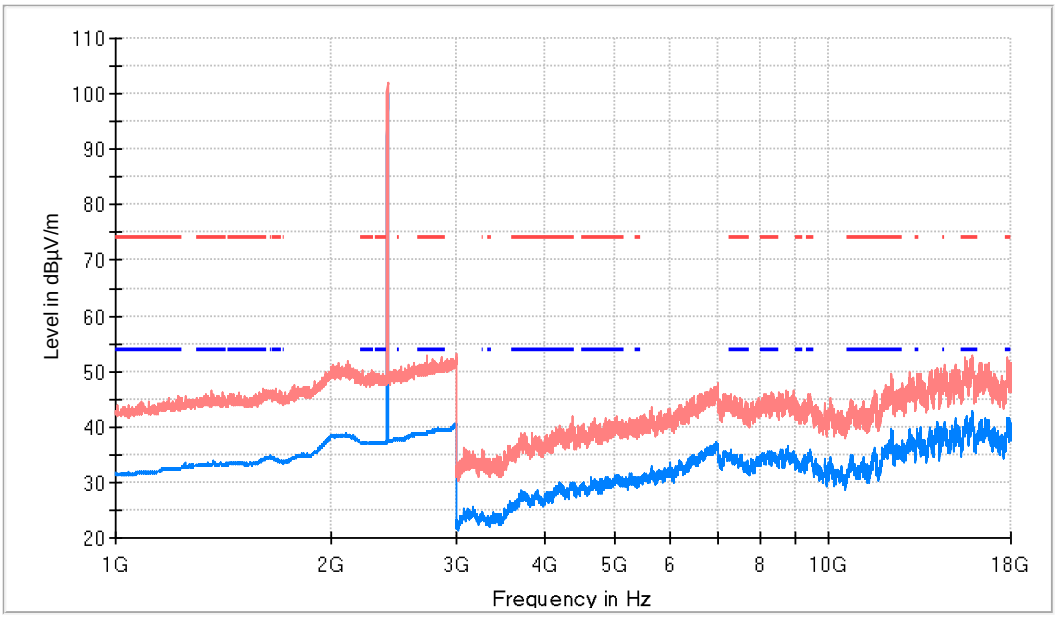
PK+_MAXH
TX limits to Spurious Emission FCC15.247 (30MHz to 1GHz) Restricted Bands QPK Limit
MaxPeak-PK+ (Single)
QuasiPeak-QPK (Single)

Maximizations

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
38.148000	33.6	23.0	V	17.1	40.0
112.013500	29.3	17.0	H	26.5	43.5
173.026500	31.0	18.8	H	24.7	43.5
408.639500	37.3	25.3	H	20.7	46.0
613.261000	42.9	30.9	V	15.1	46.0
960.375500	46.3	34.6	H	19.4	54.0

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

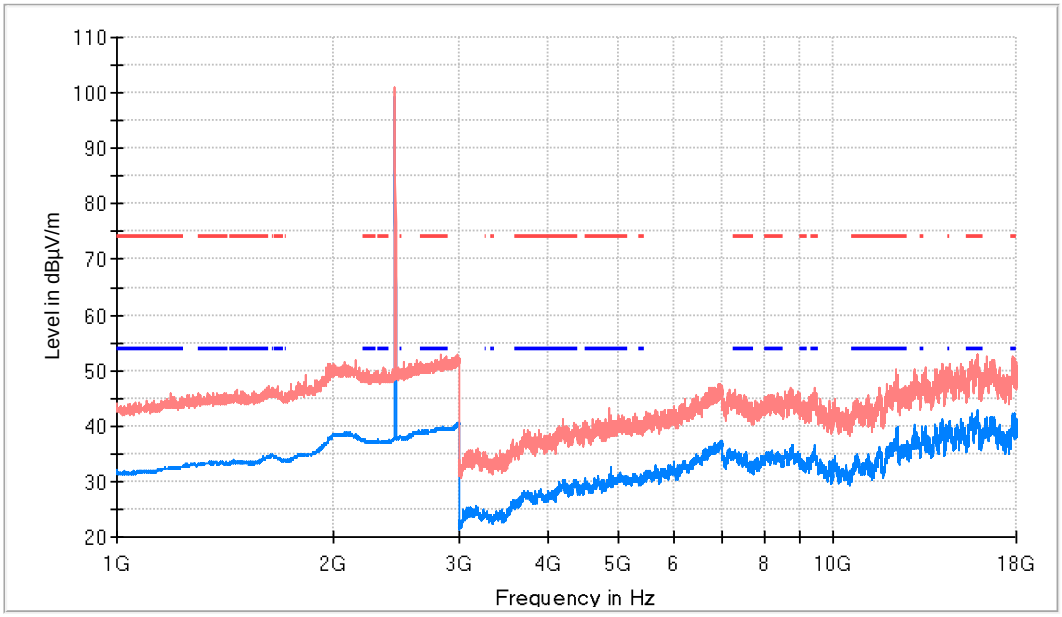
Lowest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2404.500000	102.1	97.5	H	---	---	Fundamental
2734.000000	53.0	38.9	V	15.2	54.0	
12252.000000	49.3	38.6	H	15.4	54.0	
17785.500000	52.6	41.2	V	12.8	54.0	

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

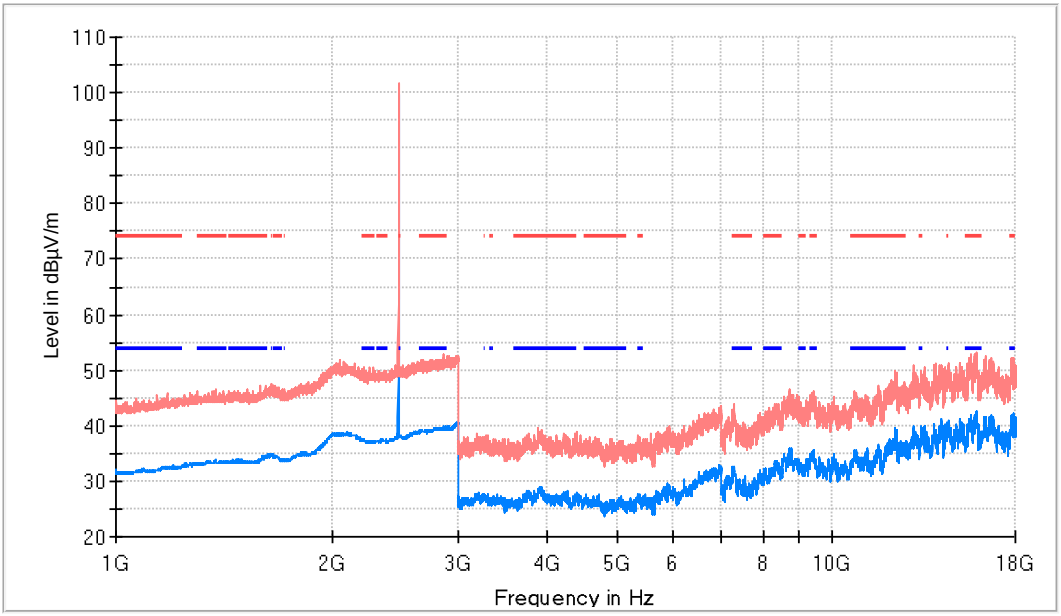
Middle Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2444.500000	101.2	96.6	H	---	---	Fundamental
2837.000000	52.8	39.6	V	14.4	54.0	
12264.500000	50.3	39.2	V	14.8	54.0	
15887.500000	53.0	42.4	H	11.6	54.0	

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

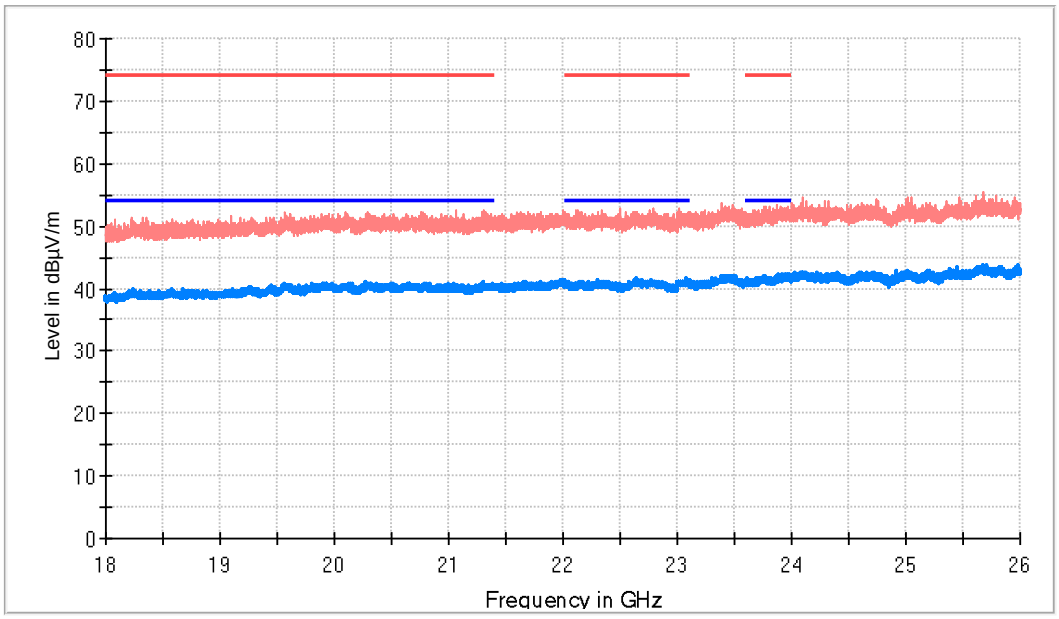
Highest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2480.500000	101.6	98.7	H	---	---	Fundamental
2870.000000	52.8	39.6	H	14.4	54.0	
12253.000000	49.8	39.1	H	14.9	54.0	
15796.000000	52.4	40.9	H	13.1	54.0	

TEST RESULTS (Cont.):	18 – 26 GHz

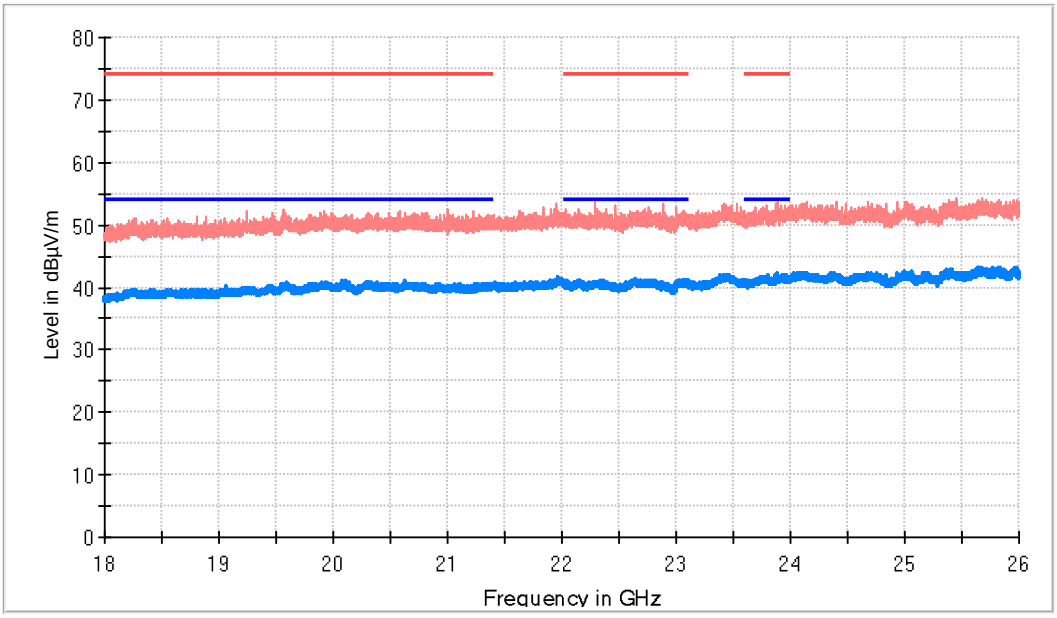
Lowest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
22500.000000	51.9	41.0	H	13.0	54.0

TEST RESULTS (Cont.):	18 – 26 GHz

Middle Channel

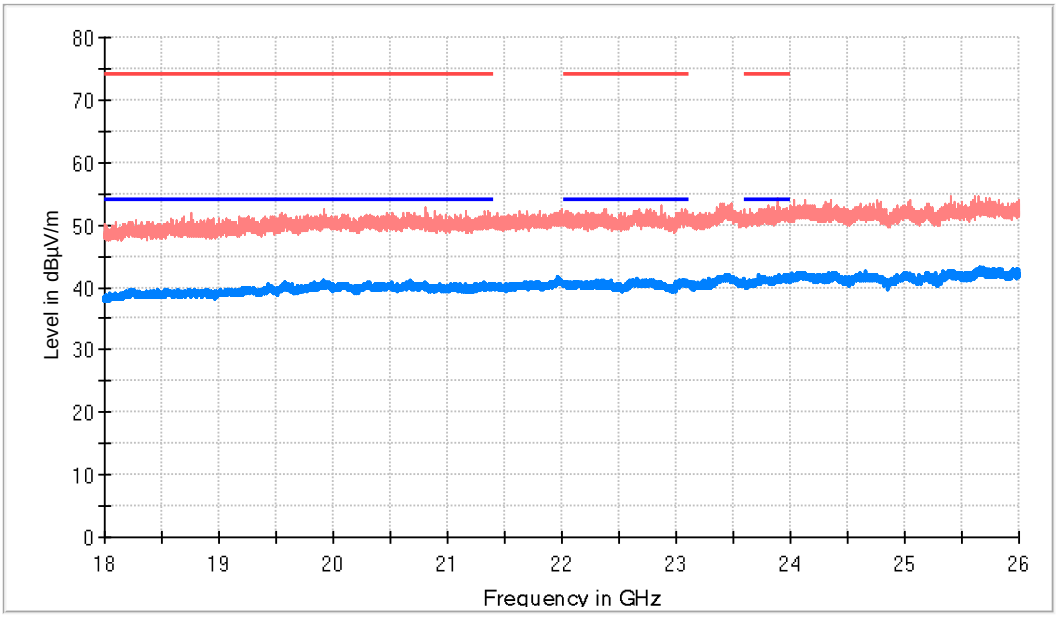


AVG_MAXH
PK+_MAXH
TX limits to Spurious Emission FCC15.247 (1-26 GHz) Restricted Bands PK Limit
TX limits to Spurious Emission FCC15.247 (1-26 GHz) Restricted Bands AVG Limit

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
20635.500000	49.5	41.2	H	12.8	54.0

TEST RESULTS (Cont.):	18 – 26 GHz

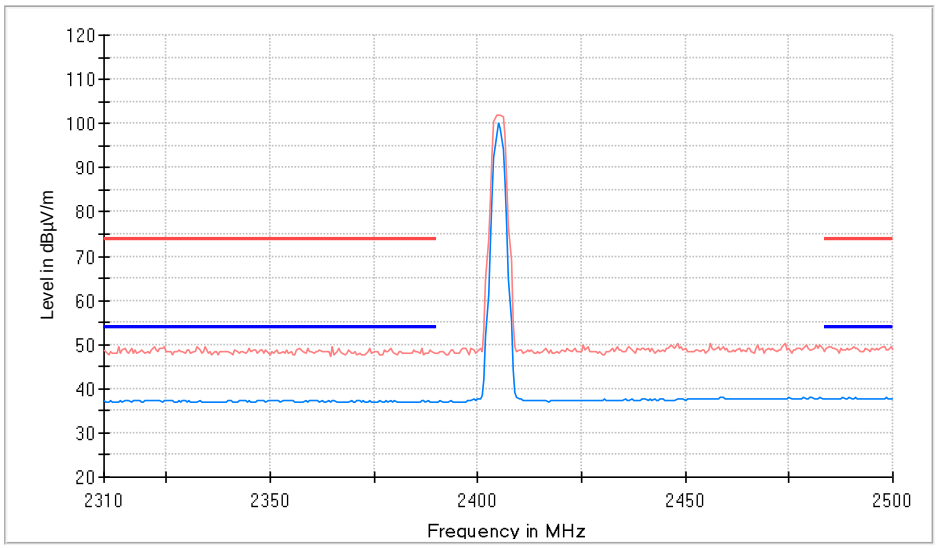
Highest Channel



Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
19400.500000	50.2	40.4	H	13.6	54.0

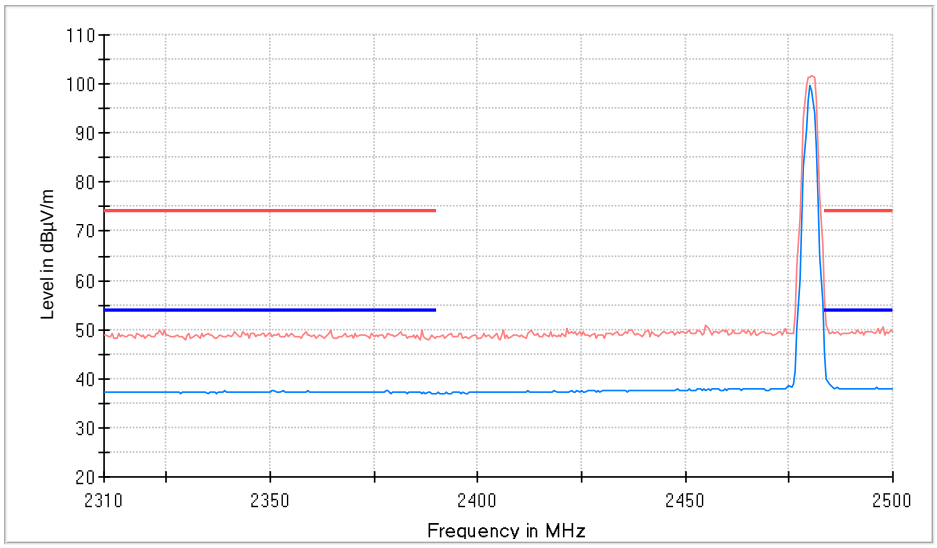
TEST RESULTS (Cont.):	Restricted Bands (2.31 GHz – 2.5 GHz)

Lowest Channel



AVG_MAXH
PK+_MAXH
TX limits to Spurious Emission FCC15.247 (1-26 GHz) Restricted Bands PK Limit
TX limits to Spurious Emission FCC15.247 (1-26 GHz) Restricted Bands AVG Limit

Highest Channel



AVG_MAXH
PK+_MAXH
TX limits to Spurious Emission FCC15.247 (1-26 GHz) Restricted Bands PK Limit
TX limits to Spurious Emission FCC15.247 (1-26 GHz) Restricted Bands AVG Limit

TEST RESULTS (Cont.):	

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time
30 MHz – 1 GHz	48.5 kHz	RMS; PK+	100 kHz	1 s

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time
1 GHz – 3 GHz	500 kHz	PK+; AVG	1 MHz	1 s
3 GHz – 18 GHz	500 kHz	PK+; AVG	1 MHz	1 s

Spectrum Analyzer Parameters

Subrange	Step Size	Detectors	Bandwidth	Sweep Time
18 GHz – 26 GHz	500 kHz	PK+; AVG	1 MHz	1 s