



FCC LISTED, REGISTRATION
NUMBER: 2764.01

ISED LISTED REGISTRATION
NUMBER: 23595-1

Test report No:
3284ERM.002A1

Partial Test report

**USA FCC Part 15.247, 15.209
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	Digital Cluster with BTLE
(*) Trademark	VISTEON
(*) Model and /or type reference tested	2W CLUSTER_ML
Other identification of the product	FCC ID: NT8-H2WCLUSTERML IC: 3043A-H2WCML
(*) Features	BT 5.0 LE
Manufacturer	VISTEON CORPORATION One Village Center Drive. Van Buren Township, MI Postcode/Zip Code: 48111.
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 (April 2018). 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
Date of issue	01-11-2022
Report template No	FDT08_23 (*) "Data provided by the client"

Index

Competences and guarantees	3
General conditions	3
Uncertainty	3
Data provided by the client.....	4
Usage of samples	4
Test sample description	5
Identification of the client.....	6
Testing period and place.....	6
Document history	6
Modifications to the reference test report	6
Environmental conditions	7
Remarks and comments	7
Testing verdicts.....	8
Summary	8
List of equipment used during the test.....	9
Appendix A: Test results (Bluetooth Low Energy)	10

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.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Certification Inc.

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
Radiated 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 2W Cluster is a Digital Cluster for 2 wheels vehicles, features Bluetooth that allows receiving incoming call, read phone and mailing status, and provides navigation guidance to the user.

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

Usage of samples

Samples undergoing test have been selected by: The client.

Sample S/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
3285/05	RF Radio	2W CLUSTER_ML	MLCD010DB0V4K	06/28/2021

Sample S/01 is composed of the following accessories:

Control N°	Description	Model	Serial N°	Date of reception
3284/04	Harness	--	--	05/21/2021

1. Sample S/01 has undergone 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		
	24 Pin External Connector		<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>			
Supplementary information to the ports..... :	Not provided data						
Rated power supply	Voltage and Frequency		Reference poles				
			L1	L2		L1	L2
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>	AC:	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	DC: Nominal voltage DC 13.2Vdc					
<input type="checkbox"/>	DC:						
Rated Power	No Data Provided						
Clock frequencies..... :	No Data Provided						
Other parameters	No Data Provided						
Software version	01.02.01						
Hardware version	PWB25990						
Dimensions in cm (L x W x D)..... :	161.4 x 98.8 x 49.3 mm						
Mounting position	<input type="checkbox"/>	Table top equipment					
	<input type="checkbox"/>	Wall/Ceiling mounted equipment					
	<input type="checkbox"/>	Floor standing equipment					
	<input type="checkbox"/>	Hand-held equipment					
	<input checked="" type="checkbox"/>	Other: Installed on 2 wheels vehicle					
Modules/parts..... :	Module/parts of test item		Type	Manufacturer			
	No Data Provided						
Accessories (not part of the test item)	Description		Type	Manufacturer			
	No Data Provided						

Documents as provided by the applicant	Description	File name	Issue date
	Declaration Equipment Data	FDT30_18 Declaration Equipment Data_updated 20210811	08/11/2021

Copy of marking plate:



Identification of the client

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

Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	07-06-2021
Date (finish)	07-12-2021

Document history

Report number	Date	Description
3284ERM.002	08-11-2021	First release
3284ERM.002A1	01-11-2022	Second release

Modifications to the reference test report

It was introduced the following modification in respect to the test report number 3284ERM.002 related with the same samples:

Clauses/ Sub-Clauses	Modification	Justification
Page 1 / Title page	Other identification of the product updated	To show additional identification information.

This modification test report cancels and replaces the test report 3284ERM.002.

Environmental conditions

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

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

In the semianechoic chamber, the following limits were not exceeded during the test.

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

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

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

Remarks and comments

The tests have been performed by the technical personnel Lourdes Valverde and Koji Nishimoto.

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH / RSS-247 (Bluetooth Low Energy)					
Report Section	15.247 Spec Clause	RSS Spec Clause	Test Description	Verdict	Remark
-	§ 2.1049	RSS-Gen 6.7	99% Occupied Bandwidth	N/M	Refer 1
-	§ 15.247 (a) (2) 6 dB Bandwidth	RSS-247 5.2. (a)	6dB Emission Bandwidth	N/M	Refer 1
-	§ 15.247 (b) (3)	RSS-247 5.4. (d)	Maximum peak conducted output power and antenna gain	N/M	Refer 1
-	§ 15.247 (d)	RSS-247 5.5.	Band-edge emissions compliance (Transmitter)	N/M	Refer 1
-	§ 15.247 (e)	RSS-247 5.2. (b)	Power spectral density	N/M	Refer 1
-	§15.207 (a)	RSS Gen 8.8	Conducted Emission Limits	N/M	Refer 1
A.1	§ 15.247 (d)	RSS-Gen 8.9 & 8.10.	Emission limitations radiated (Transmitter)	P	N/A
Supplementary information and remarks: 1. Customer did not request to perform the tests.					

List of equipment used during the test

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
0981	RF pre-amplifier 1-18 GHz	Bonn Elektronik	BLMA 0118-2A	2020/11	2022/11
1012	EMI Test Receiver	Rohde & Schwarz	ESR26	2019/12	2021/12
1014	SIGNAL ANALYZER	Rohde & Schwarz	FSV40	2021/05	2023/05
1057	Horn Antenna	ETS Lindgren	3115	2020/06	2023/06
1065	Biconical log Antenna	ETS Lindgren	3142E	2020/08	2023/08
1111	Ethernet SNMP Thermometer	HW Group	HWg-STE Plain	2020/08	2021/08
1179	Semi-Anechoic Chamber	Frankonia	SAC 3plus 'L'	N/A	N/A
1314	Wireless measurement software EMC 32	Rohde & Schwarz	-	N/A	N/A

Appendix A: Test results (Bluetooth Low Energy)

Appendix A Content

PRODUCT INFORMATION	12
DESCRIPTION OF TEST CONDITIONS	13
TEST A.1: EMISSION LIMITATIONS RADIATED (TRANSMITTER).....	14

PRODUCT INFORMATION

The following information is provided by the client

Information	Description
Modulation	BFSK
Operation mode	
- Operating Frequency Range	2400 – 2483.5 MHz
- Nominal Channel Bandwidth	1 MHz
- RF Output Power	+5 dBm
Extreme operating conditions	
- Temperature range	Nominal 20 °C; Min: -20 °C; Max: +60 °C
Antenna type	Multilayer chip Antenna
Antenna gain	+0.2 dBi
Nominal Voltage	
- Supply Voltage	13.2 Vdc
- Type of power source	DC Voltage
Equipment type	Bluetooth Low Energy
Geo-location capability	No

DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION
TC#01 (1 Mbps)	<p>Power supply (V): $V_{\text{nominal}} = 13.2 \text{ Vdc}$</p> <p>Bandwidth: 1 MHz</p> <p><u>Test Frequencies for Radiated tests:</u> Lowest channel: 2402 MHz Middle channel: 2440 MHz Highest channel: 2480 MHz</p>

TEST A.1: 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 ($\mu\text{V}/\text{m}$)	Field strength ($\text{dB}\mu\text{V}/\text{m}$)	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.

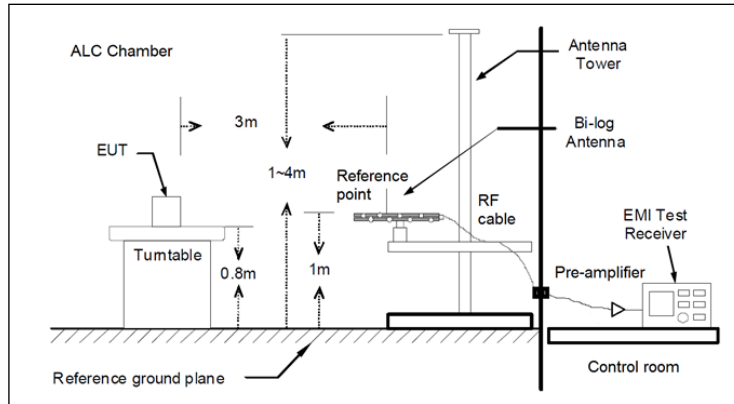
The equipment under test was set up on a non-conductive platform above the ground plane and the situation and orientation was varied to find the maximum radiated emission. It was also rotated 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

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

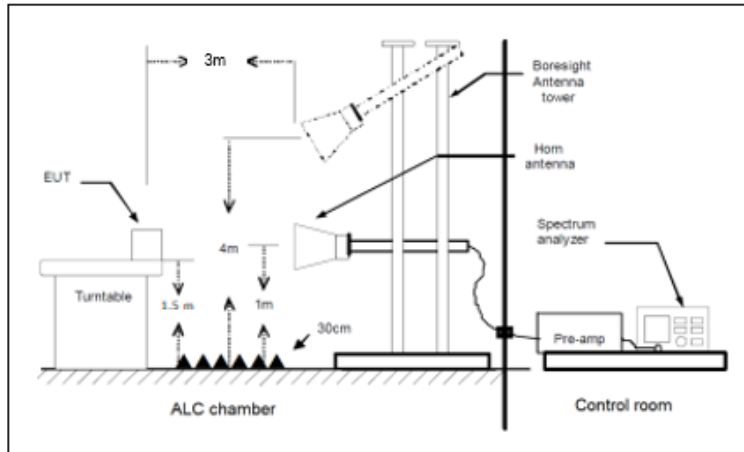
The field strength is calculated by adding correction factor to the measured level from the spectrum analyzer. This correction factor includes antenna factor, cable loss and pre-amplifiers gain.

TEST SETUP (CONT.)

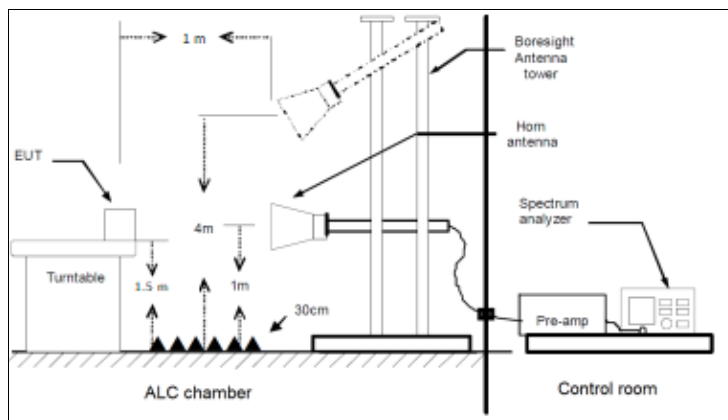
Radiated measurements Setup $f < 1$ GHz



Radiated measurements setup $f > 1-18$ GHz



Radiated measurements setup $f > 18$ GHz



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

Frequency range 30 MHz – 1000 MHz

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

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).

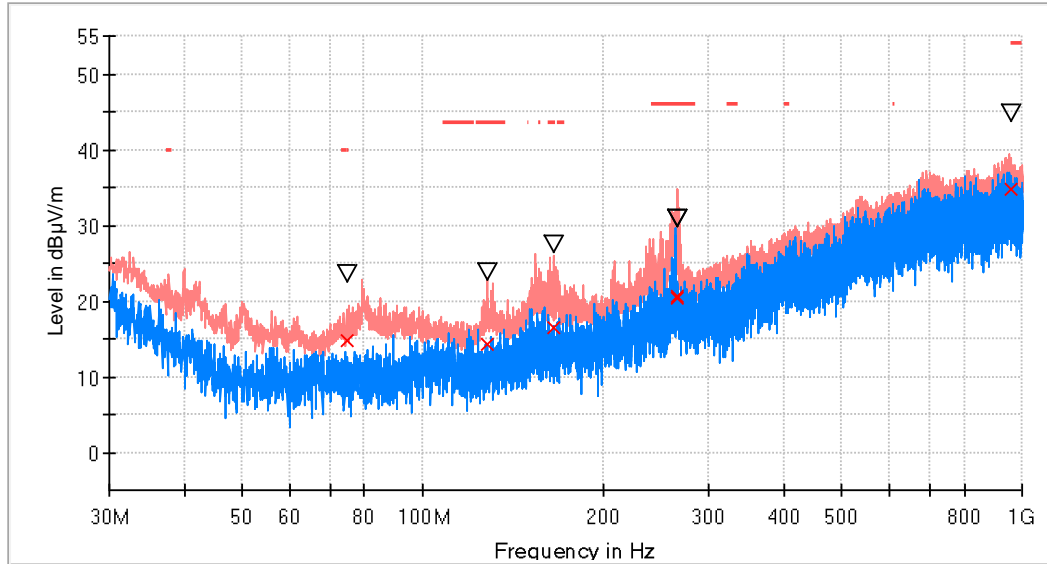
For 18 GHz – 26 GHz frequency range the radiated spurious signals detected were at 10 dB below the reference limit or lower for lowest, middle and highest channels.

TEST RESULTS (Cont.):

30-1000 MHz

Mid Channel

RF_FCC_15.247_E Field_30MHz_1GHz



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

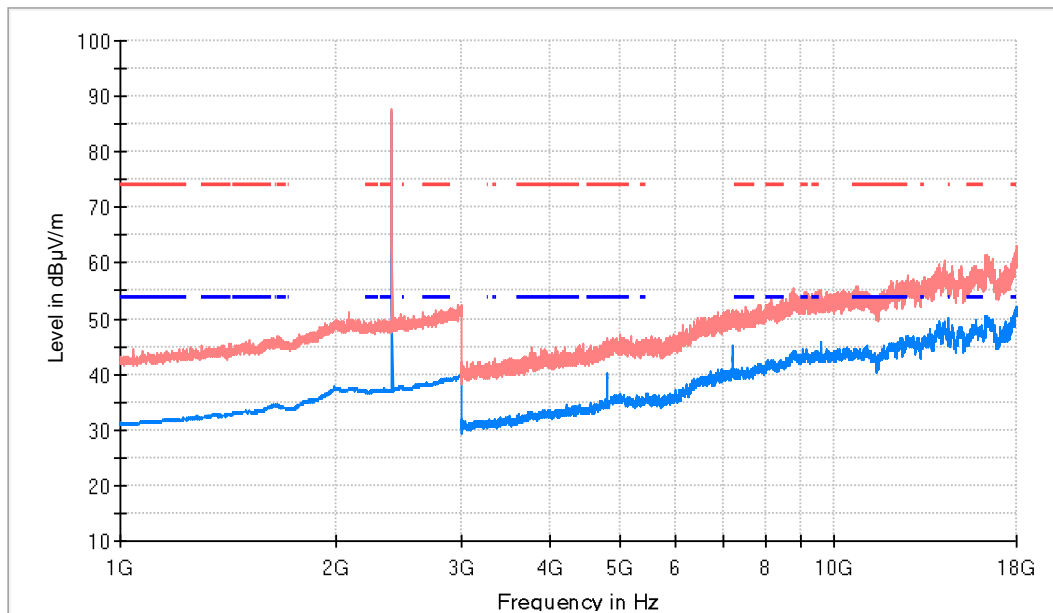
Result Table_Single

Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
74.571500	23.4	14.8	V	25.2	40.0
128.212500	23.9	14.4	V	29.2	43.5
164.878500	27.5	16.5	V	27.0	43.5
265.176500	30.9	20.6	H	25.4	46.0
266.583000	30.8	20.5	H	25.5	46.0
961.539500	44.8	34.7	H	19.3	54.0

TEST RESULTS (Cont.):

1-18 GHz (Lowest Channel)

1GHz_18GHz_HP & VP_CH Low



- 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

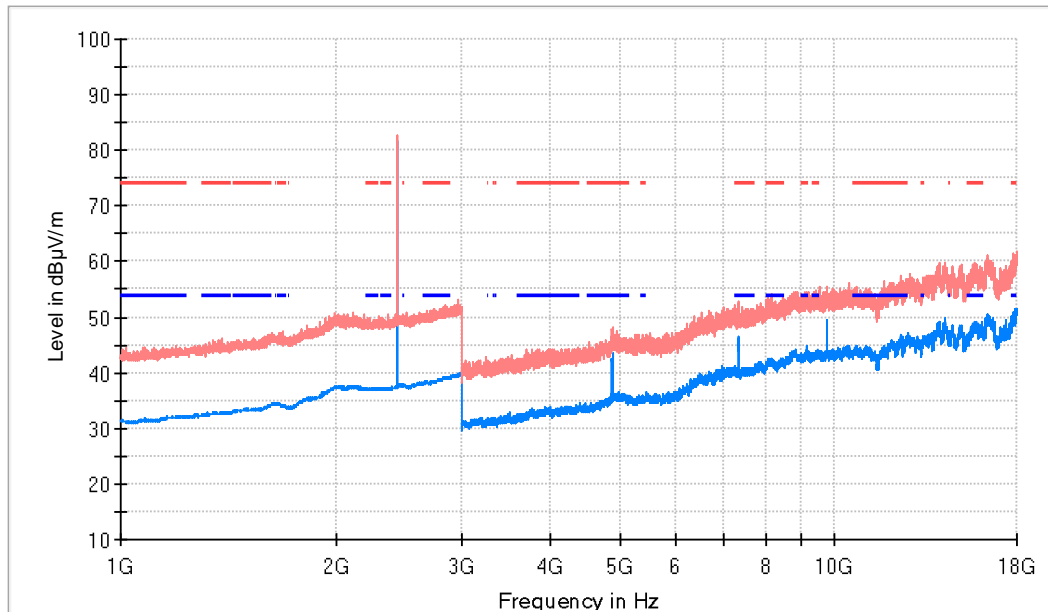
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	87.7	87.1	H	---	---	Fundamental
4803.000000	46.1	40.1	V	13.9	54.0	
7205.000000	51.6	45.1	V	---	---	
9607.000000	54.2	45.9	V	---	---	

TEST RESULTS (Cont.):

1-18 GHz (Middle Channel)

1GHz_18GHz_HP & VP_CH Mid



- 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

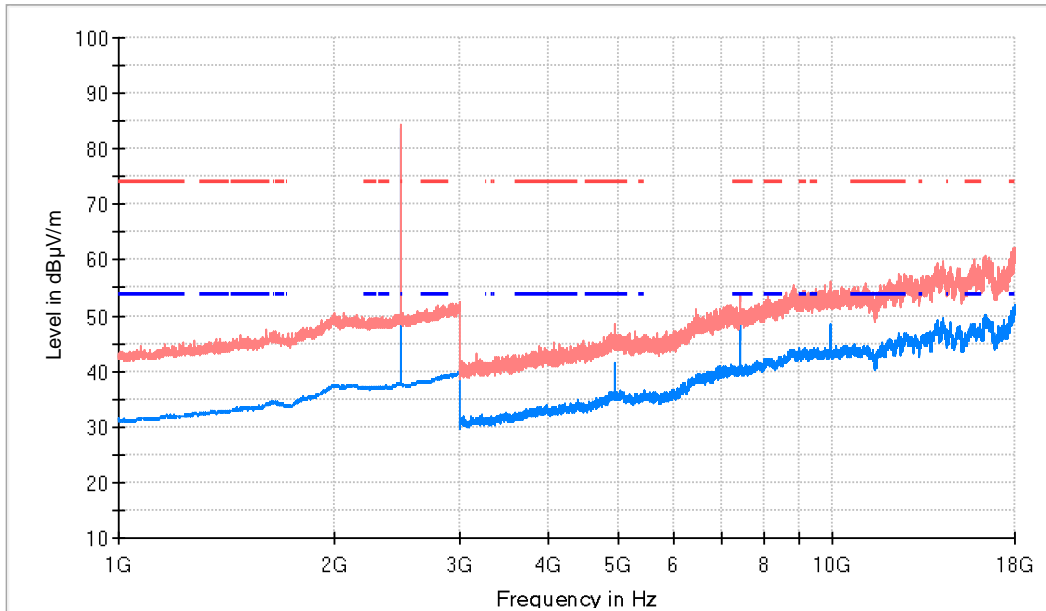
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2440.000000	82.8	81.9	V	---	---	Fundamental
4880.000000	48.2	43.4	V	10.6	54.0	
7320.500000	52.7	46.7	H	7.3	54.0	
9758.500000	55.2	49.6	V	---	---	

TEST RESULTS (Cont.):

1-18 GHz (Highest Channel)

1GHz_18GHz_HP & VP_CH High



- 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

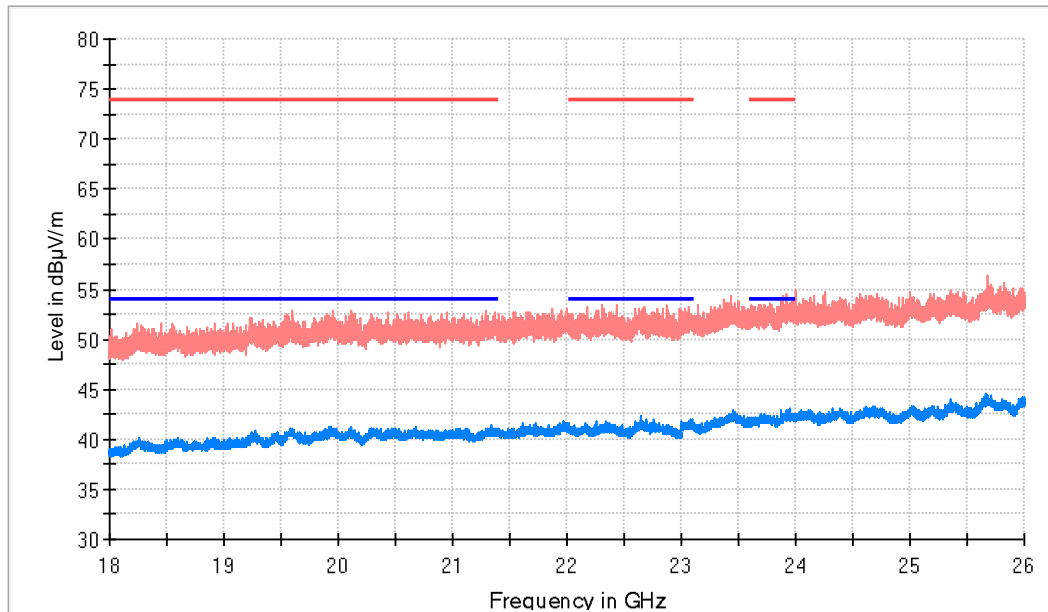
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2480.000000	84.4	83.7	H	---	---	Fundamental
4959.000000	46.9	41.3	V	12.7	54.0	
7439.000000	53.7	49.8	H	4.2	54.0	
9921.000000	55.0	48.7	V	---	---	

TEST RESULTS (Cont.):

18 – 26 GHz

Low 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

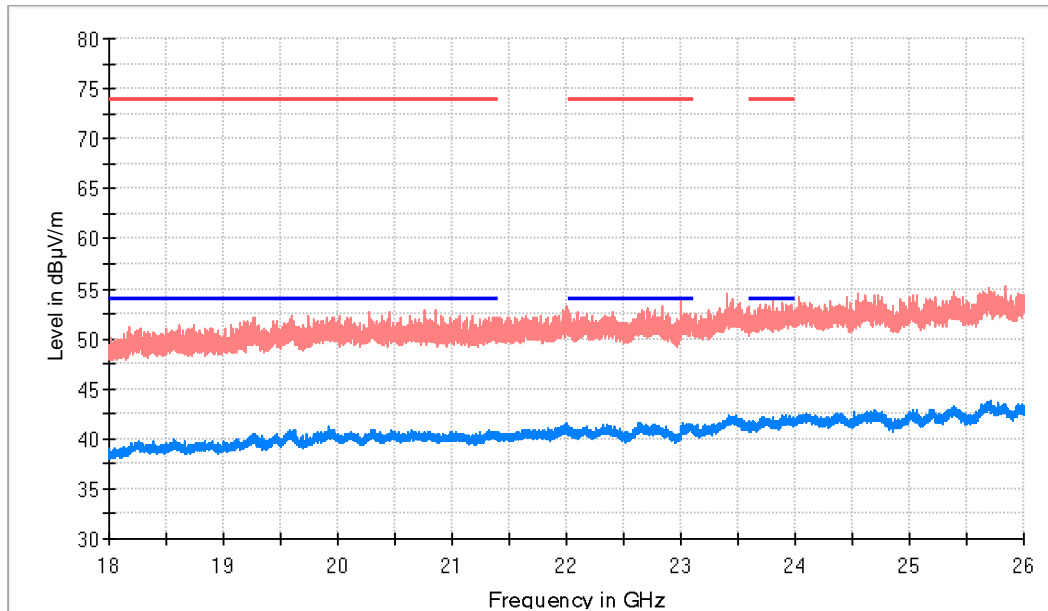
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	PoI	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23957.000000	53.1	43.0	V	11.0	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

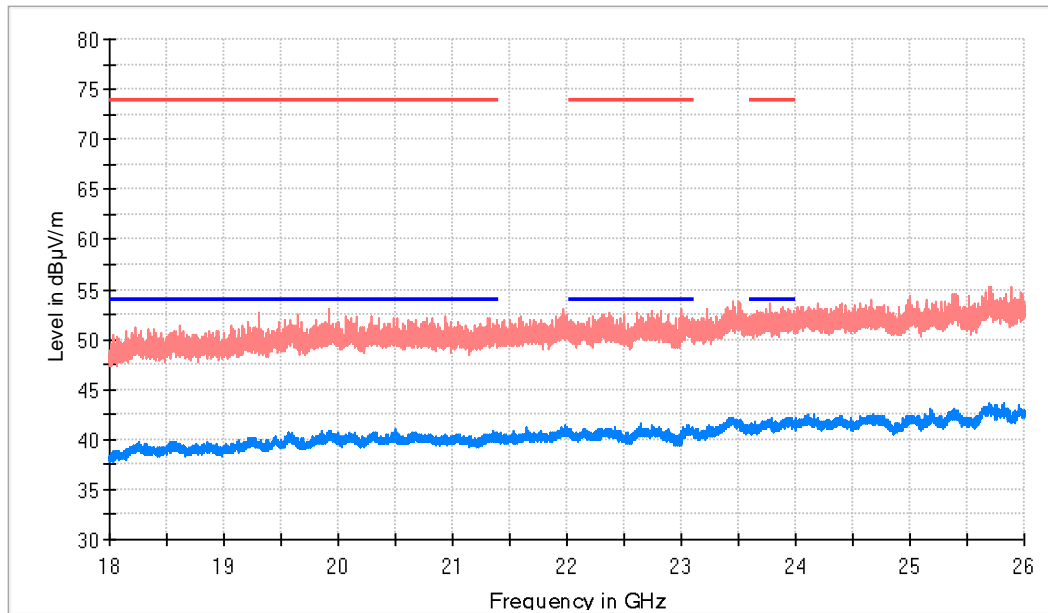
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23880.000000	51.9	42.4	H	11.6	54.0

TEST RESULTS (Cont.):

18 – 26 GHz

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

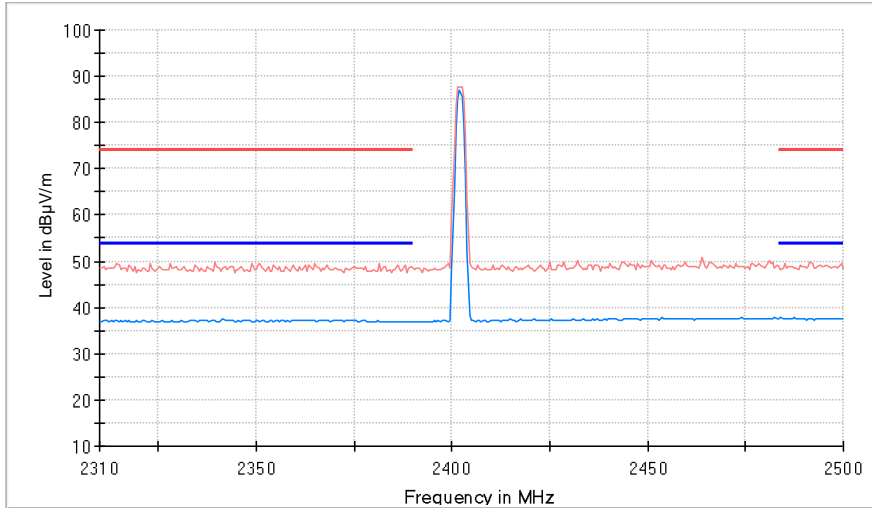
Maximizations

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23972.000000	51.8	42.2	H	11.8	54.0

TEST RESULTS (Cont.):

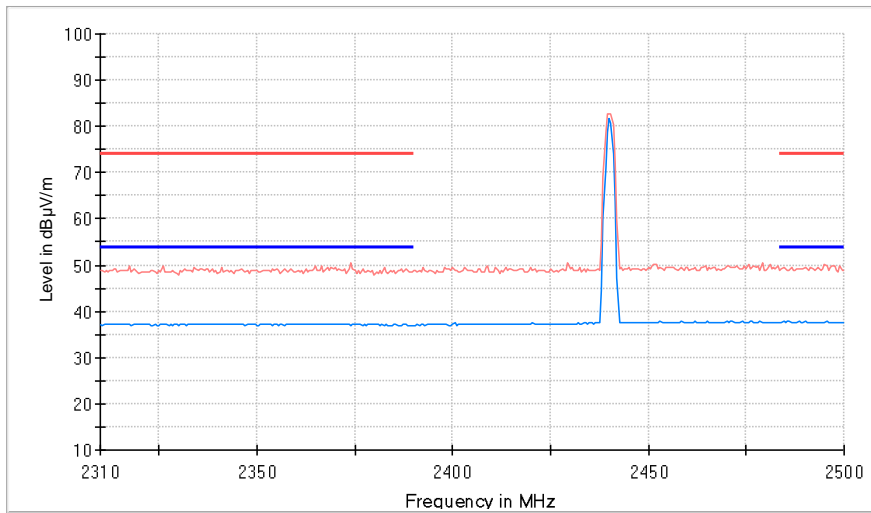
Restricted Bands (2.31 GHz – 2.5 GHz)

Low 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

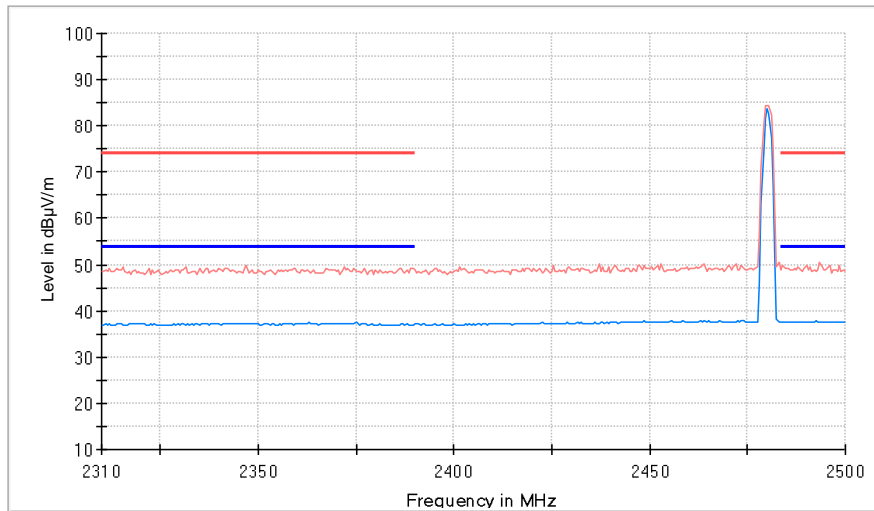
Middle Channel



- 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

TEST RESULTS (Cont.):

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