





FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION NUMBER: 23595-1

Test report No: 4415ERM.003A1

Partial Test report

USA FCC Part 15.247, 15.407 15.209, 15.207 CANADA RSS-247, RSS-Gen

(*) Identification of item tested	Infotainment Head Unit Android Based
(*) Trademark	HARMAN
(*) Model and /or type reference tested	TAS700 BRA
Other identification of the product	Model: B-Plat FCC ID: 2AHPN-BE2874
(*) Features	AM/FM receiver, Bluetooth EDR, Wi-Fi 2.4GHz & 5GHz
Manufacturer	Harman da Amazonia. Av. Cupiúba, 401 – Distrito Industrial Manaus, Amazonas, 69075-060, Brasil
Test method requested, standard	USA FCC Part 15.247 (06-01-20): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz USA FCC Part 15.407 (03-08-24): Unlicensed National Information Infrastructure Devices. General technical requirements. USA FCC Part 15.209 (06-28-21): Radiated emission limits; general requirements. CANADA RSS-247 Issue 3 (August 2023). CANADA RSS-Gen Issue 5 amendment 1 (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	See Appendix A
Approved by (name / position & signature)	Domingo Galvez EMC&RF Lab Manager
Date of issue	07-25-2024
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.

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General conditions

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

Uncertainty

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

Test case	Frequency (MHz)	U (k=2)	Units
	30-180	4.27	dB
Redicted Courieus Emission	180-1000	3.14	dB
Radiated Spurious Emission	1000-18000	3.30	dB
	18000-40000	3.49	dB



Data provided by the client

The following data has been provided by the client:

- Information relating to the description of the sample ("Identification of the item tested", "Trademark", "Model and/or type reference tested").
- 2. The sample consists of a Receiver Assy, Radio & Display.

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:

ld	Control Number	Description	Model	Serial №	Date of Reception	Application
S/01	4415/04	Infotainment Unit - BRA B (Radiated)	TAS700	T2869HR047900008	02/23/2024	Element Under Test

Sample S/01 is composed of the following accessories:

ld	Control Number	Description	Model	Serial Nº	Date of Reception	Application
S/01	4415/26	USB C-Type Hub Harness	-	-	04/04/2024	Accessory
S/01	4415/30	USB Cables (Type A)	-	-	04/04/2024	Accessory
S/01	4415/31	HU Power Harness	-	-	04/04/2024	Accessory
S/01	4415/34	AM/FM and GPS Antennas	-	-	04/04/2024	Accessory

Sample S/01 was used for following test(s): All Radiated tests indicated in appendix A.



Test sample description

Ports:			Cable						
	Port name and description		Specified max length [m]	Attached during test		Shielde	d (Coupled to patient (3)	
	RF_Port 1 = BT/WLAN- 5GHz (Module Pin C01)			[X]		[X]		[]	
	RF_Port 2 = WLAN 2,4GHz (Module Pin K02)			[X]		[X]		[]	
	No Da	ata Provided		1]	[]		[]	
	No Da	ata Provided]]	[]		[]	
	No Da	ata Provided]]	[]		[]	
	No Da	ata Provided]]	[]		[]	
Supplementary information to the ports:	No Data Provided								
Rated power supply:	Voltage and Frequency			Reference poles					
				L1	L2	L3	N	PE	
	[]	AC:		[]	[]	[]	[]	[]	
	[] AC:			[]	[]	[]	[]	[]	
	[X] DC: 12 V nominal		Car battery, 8	V to 16\	/ max				
	[]	DC:							
Rated Power:	No Da	ata Provided							
Clock frequencies:	No Da	ata Provided							
Other parameters:	No Data Provided								
Software version:	R5.2								
Hardware version:	C1								
Dimensions in cm (W x H x D):	No Data Provided								
Mounting position:	[]	Tabletop equipme	nt						
	[] Wall/Ceiling mounted equipment								



	[] Floor standing equipment			
	[] Hand-held equipment			
	[X] Other:			
Modules/parts:	Module/parts of test item	Туре	Manufacture	
	No Data Provided			
Accessories (not part of the test item)	Description	Туре	Manufacturer	
: :	Bench Setup + antenna			
	Cable Harness			
Documents as provided by the	Description	File name	Issue date	
applicant:	Declaration Equipment Data	FDT30_18 Declaration Equipment Data	04/30/2024	
	Copy of marking plate:			
	TOYOTA O1 86140 – BP010 O1 HARMAN 4070561 Model: TAS700 BRA B – Plat Type No.: T286 SW: 3.23.180 HW: D908 BT MAC: 6462206AC301 S/N:T2868HR037900009 06 02 2024 CNPJ xx.xxx.xxx/xxxx – xx Made in Hungary DC 12 V ——12A ANALYSIS SECTION NO. 12 TENNING NO. 12 T			

Identification of the client

Harman International Industries, Inc. 3001 Cabot Drive, Novi, MI 48377 USA



Testing period and place

Test Location	DEKRA Certification Inc.
Date (start)	04-30-2024
Date (finish)	05-01-2024

Document history

Report number	Date	Description
4415ERM.003	05-23-2024	First release
4415ERM.003A1	07-25-2024	Second release. On page 13 the antenna type information is updated. This modified report cancels and replaces the report 4415ERM.003.

Environmental conditions

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

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

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

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

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

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



Remarks and comments

1. The tests have been performed by the technical personnel: Wang Yuqi and Koji Nishimoto.

Testing verdicts

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

Summary

FCC PART 15 PARAGRAPH / RSS-247 (Bluetooth BR/EDR)							
Report Section			Test Description	Verdict	Remark		
-	§ 2.1049 & § 15.247 (a) (1)	RSS-247 5.1 (b)	20dB Emission Bandwidth, Occupied Bandwidth & Carrier Frequency Separation	N/M	Refer 1		
-	§ 15.247 (a) (1) (iii)	RSS-247 5.1 (d)	1 (d) Number of hopping channels		Refer 1		
-	§ 15.247 (a) (1) (iii)	RSS-247 5.1 (d)	Time of Occupancy (Dwell Time)	N/M	Refer 1		
-	§ 15.247 (b) (3)	RSS-247 5.4 (b)	Maximum peak conducted output power and antenna gain	N/M	Refer 1		
-	§ 15.247 (d)	RSS-247 5.5	Band-edge conducted emissions compliance (Transmitter)	N/M	Refer 1		
-	§ 15.247 (d)	RSS-247 5.5	Emission limitations Conducted (Transmitter)	N/M	Refer 1		
A.1	§ 15.247 (d)	RSS-247 5.5	Emission limitations Radiated (Transmitter)	Р	N/A		

Supplementary information and remarks:

1) Only multi-transmitter radiated spurious emission test was requested.



FCC PART 15 PARAGRAPH (Wi-Fi 2.4GHz)							
Report Section					Remark		
-	§ 2.1049 & §15.247 (a) (2)	RSS-247 5.2 (a)	99% Occupied Bandwidth & 6dB Bandwidth	N/M	Refer 1		
-	§ 15.247 (b)	RSS-247 5.4 (d)	Maximum Output Power and antenna gain	N/M	Refer 1		
-	§ 15.247 (d)	RSS-247 5.5	Band-edge conducted emissions compliance (Transmitter)	N/M	Refer 1		
-	§ 15.247 (e)	RSS-247 5.2 (b)	Power Spectral Density	N/M	Refer 1		
-	§15.247(d)	RSS-247 5.5	Emission limitations Conducted (Transmitter)	N/M	Refer 1		
A.1	§15.247 (d)	RSS-247 5.5	Emission limitations Radiated (Transmitter)	Р	N/A		

Supplementary information and remarks:

Report Section			Test Description	Verdict	Remark
	§ 15.403 KDB 789033 D02	RSS 247 6.2.4	26dB Emission Bandwidth & Occupied Bandwidth	N/M	Refer 1
	§ 15.407 (e)	RSS 247 6.2.4.1	6dB Bandwidth	N/M	Refer 1
	§ 15.407 (a)(3)	RSS 247 6.2.4.1	Power Limits. Maximum Output Power	N/M	Refer 1
	§ 15.407 (a)(3)	RSS-247 6.2.4.1	Maximum Power Spectral Density	N/M	Refer 1
	§ 15.407 (b)(4)	RSS-247 6.2.4.2	Band-edge conducted emissions compliance (Transmitter)	N/M	Refer 1
	§ 15.407 (b)(6) § 15.207	RSS-Gen 8.8	Emission limitations Conducted (Transmitter)	N/M	Refer 1
A.1	§ 15.407 (b)(1), (b)(4)(i) § 15.209 § 15.205	RSS-247 6.2.4.2 RSS-Gen 8.9 & 8.10	Undesirable radiated emissions (Transmitter)	Р	N/A
	§ 15.407 (g)	RSS-Gen 6.11 & 8.11	Frequency Stability	N/M	Refer

Supplementary information and remarks:

1) Only multi-transmitter radiated spurious emission test was requested.

¹⁾ Only multi-transmitter radiated spurious emission test was requested.



List of equipment used during the test

Radiated Measurements

CONTROL NUMBER	DESCRIPTION	MANUFACTURER	MODEL	LAST CALIBRATION	NEXT CALIBRATION
878	Power supply (AMETEK / PROG-DC-PS)	N/A	1707A01783	N/A	N/A
1012	EMI Test Receiver	Rohde & Schwarz	ESR26	2023-01-18	2025-01-18
1014	FSV40 Signal Analyzer 40GHz	Rohde & Schwarz	FSV40	2022-08-01	2024-08-01
1056	3116C Double-Ridged Waveguide Horn Antenna 18-40 GHz	ETS LINDGREN	213179	2023-02-23	2026-02-23
1058	3115 Double-Ridged Waveguide Horn Antenna 1-18 GHz	ETS LINDGREN	211373	2023-06-26	2026-06-26
1064	3142E Biconilog Antenna	ETS LINDGREN	208587	2021-12-13	2024-12-13
1108	Ethernet SNMP Thermometer- CR Room	HW Group	HWg-STE Plain	2022-10-18	2024-10-18
1111	Ethernet SNMP Thermometer	HW Group	HWg-STE Plain	2022-10-18	2024-10-18
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
1461	Low Noise Preamplifier (1- 18GHz)	Bonn Elektronik	2213857B	2022-06-01	2024-06-01



Appendix A: Test results (Multi-transmitter)



Appendix A Content

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PRODUCT INFORMATION

Information	Description
Modulation	BR/EDR: GFSK, π/4-DQPSK, 8-DPSK
	Wi-Fi 2.4 GHz: DSSS, OFDM, SISO-MCS3
	Wi-Fi 5 GHz: DSSS, OFDM, SISO-MCS3
Operation mode 1: Single Antenna Equipment	
- Operating Frequency Range	BR/EDR: 2400 - 2483.5 MHz
	Wi-Fi 2.4 GHz: 2.400 - 2.483.5 GHz
	Wi-Fi 5 GHz: 5.150 - 5.250 GHz
	5.725 - 5.875 GHz
- Nominal Channel Bandwidth	BR/EDR: 1 MHz
	Wi-Fi 2.4 GHz: 20MHz, 40MHz
	Wi-Fi 5 GHz: 20MHz, 40MHz, 80MHz
- RF Output Power	BR/EDR: 13.47 dBm
	Wi-Fi 2.4 GHz: 15 dBm
	Wi-Fi 5 GHz: 15 dBm
Antenna type	Internal PCB trace antenna
Antenna gain	BR/EDR: 3.82 dBi
	Wi-Fi 2.4 GHz: 3.15 dBi
	Wi-Fi 5 GHz: 5.75 dBi
Nominal Voltage	
- Supply Voltage	12 Vdc
- Type of power source	DC voltage
Equipment type	Bluetooth, Wi-Fi 2.4 GHz, and Wi-Fi 5 GHz
Geo-location capability	No



DESCRIPTION OF TEST CONDITIONS

TEST CONDITIONS	DESCRIPTION						
	Power s	supply (V):					
	DC 12 \	/					
	Test Fre	equencies for Radiated	tests:				
		Technology	Tested Frequency	BW (MHz)	Modulation	Mode	
TC#01 ⁽¹⁾	,	Bluetooth	2441	1	DSSS	GFSK	
		Wi-Fi 2.4 GHz SISO	2462	20	OFDM	b mode	
	Power supply (V): DC 12 V						
	Test Fre	equencies for Radiated	tests:				
		Technology	Tested Frequency	BW (MHz)	Modulation	Mode	
TC#02 ⁽¹⁾		Bluetooth	2441	1	DSSS	GFSK	
		Wi-Fi 5 GHz SISO	5180	20	MCS3	n mode	
	radios s the imp	t was performed with the imultaneously. These i act of the multi-transi neously.	measuremen	ts have be	en performed	in order to	

Note (1): Preliminary scan was performed to determine the worst case. The following tables and plots show the results for the worst case in SISO (2.4 GHz or 5 GHz) + BT.



TEST A.1: EMISSION LIMITATIONS RADIATED (TRANSMITTER)						
LIMITS:	Product standard:	Part 15 Subpart C §15.247, Part 15.31(h), 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 situated 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 360° and the antenna height was varied from 1 to 4 meters to find the maximum radiated emission.

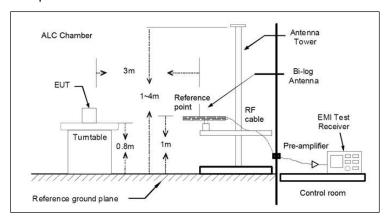
Measurements were made in both horizontal and vertical planes of polarization.

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.

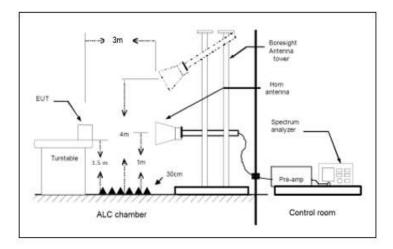


TEST SETUP (CONT.)

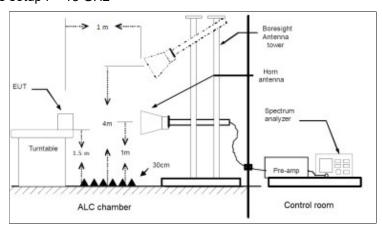
Radiated measurements Setup f < 1 GHz



Radiated measurements setup f: 1-18 GHz



Radiated measurements setup f > 18 GHz





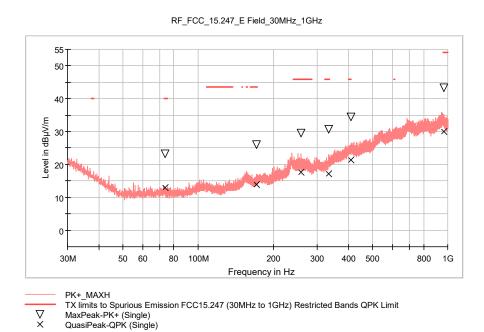
TESTED SAMPLES:	S/01
TESTED CONDITIONS MODES:	TC#01
TEST RESULTS:	30-1000 MHz

Frequency range 9KHz - 30 MHz

No radiofrequency signal generated in the device found below 10° sub-armonic, no further investigation required.

Frequency range 30 MHz - 1000 MHz

Results:



Final Result

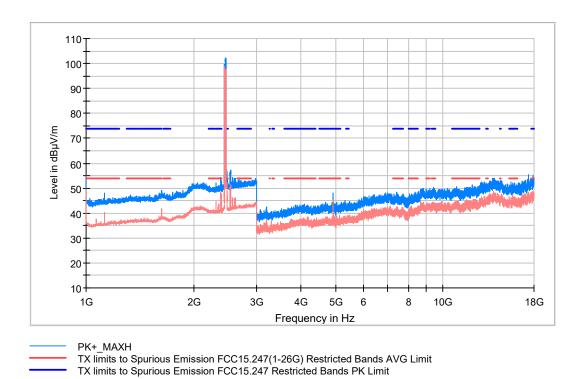
Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
73.795500	23.1	12.9	Н	27.1	40.0
170.941000	26.1	13.9	V	29.6	43.5
258.192500	29.5	17.6	V	28.4	46.0
332.979500	30.8	17.1	Н	28.9	46.0
408.736500	34.5	21.5	V	24.5	46.0
964.692000	43.3	30.0	Н	24.0	54.0



TEST RESULTS (Cont.):

RMS_MAXH

1-18 GHz



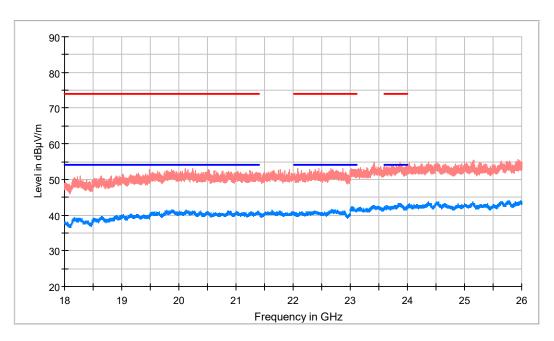
Final Result

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBμV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2441.000000	99.7	99.1	V			BT Fundamental
2461.500000	102.1	97.1	V			Wi-Fi Fundamental
4924.000000	48.1	45.0	V	9.0	54.0	2nd Harmonic-Wi-Fi
17924.500000	55.0	47.8	Н	6.2	54.0	



TEST RESULTS (Cont.):

18 – 26 GHz



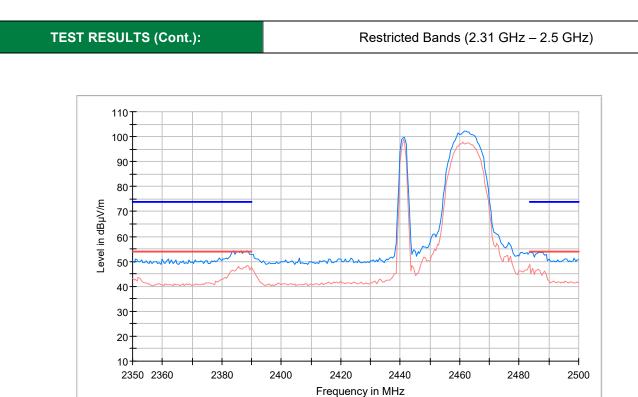
AVG_MAXH PK+_MAXH

TX limits to Spurious Emission FCC15.247(1-26G) Restricted Bands AVG Limit TX limits to Spurious Emission FCC15.247 Restricted Bands PK Limit

Final Result

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
19552.000000	50.5	40.7	V	13.3	54.0
20566.500000	49.7	40.6	V	13.4	54.0
23871.000000	52.9	43.3	V	10.7	54.0





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



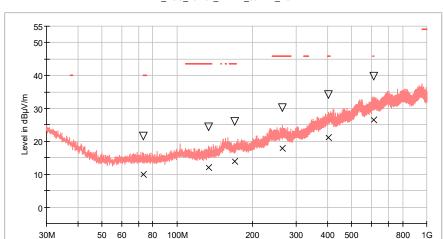
TESTED SAMPLES:	S/01		
TESTED CONDITIONS MODES:	TC#02		
TEST RESULTS :	30-1000 MHz		

Frequency range 9KHz - 30 MHz

No radiofrequency signal generated in the device found below 10° sub-armonic, no further investigation required.

Frequency range 30 MHz - 1000 MHz

Results:



RF_FCC_15.407_E Field_30MHz_1GHz

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

Final Result

Frequency in Hz

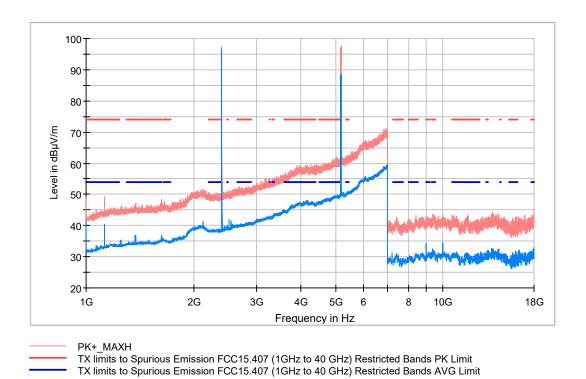
Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
73.407500	21.7	9.9	Н	30.2	40.0
133.838500	24.5	12.1	Н	31.5	43.5
169.971000	26.0	13.8	Н	29.7	43.5
264.643000	30.3	17.9	V	28.1	46.0
404.323000	34.2	21.3	V	24.7	46.0
612.873000	39.9	26.6	Н	19.4	46.0





AVG_MAXH

1-18 GHz



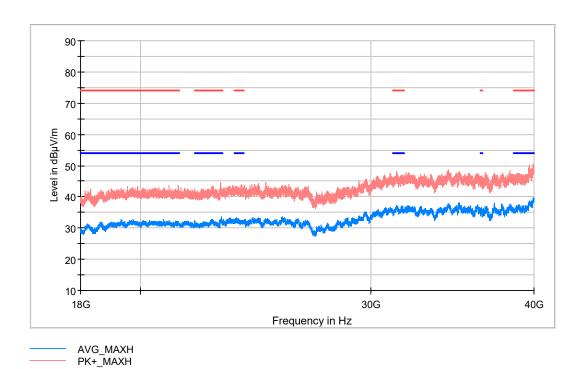
Final Result

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
1124.500000	48.2	40.3	V	13.7	54.0	
2441.500000	97.3	95.4	V			Fundamental-BT
5181.500000	97.6	87.5	V			Fundamental-Wi-Fi





18 – 40 GHz



Final Result

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

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
23058.625000	42.1	33.6	V	20.4	54.0
31427.562500	46.2	37.2	V	16.8	54.0



