



FCC LISTED, REGISTRATION NUMBER: 2764.01

ISED LISTED REGISTRATION

NUMBER: 23595-1

Test report No: 4606ERM.004A1

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: C-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 (06-1-20): Operation within the bands 902 - 928 MHz, 2400 -2483.5 MHz, and 5725 - 5850 MHz USA FCC Part 15.407 (03-28-24): 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	4415/09	Infotainment Unit - BRA C (Radiated)	TAS700	T2855HR046900002	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]	Attao durin	ched g test	Shielded		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		[]	[]		[]
	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 [] AC:			Reference poles				
				L1	L2	L3	N	
				[]	[]	[]	[]	
				[]	[]	[]	[]] []
	[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	Manufacturer	
	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 65 86140 - YY650 65 HARMAN 10			

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
4606ERM.004	05-23-2024	First release
4606ERM.004A1	07-25-2024	Second release. On page 13, antenna type information was updated. This modified report cancels and replaces the report 4606ERM.004.

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)	Number of hopping channels	N/M	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	15.247 Spec Clause	RSS Spec Clause	Test Description	Verdict	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:

UNII-1 5.150 - 5.250 GHz Band, UNII-3 5.725 - 5.825 GHz Band							
Report Section			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- MCS4
Operation mode 1: Single Antenna Equipment	Wi-Fi 5 GHz: DSSS, OFDM, SISO- MCS4
- 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: 4.17 dBi Wi-Fi 2.4 GHz: 4.53 dBi Wi-Fi 5 GHz: 5.74 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			DESCRIF	PTION					
	Power s	supply (V):							
	DC 12 \	V							
	Test Fre	equencies for Radiated	<u>l tests:</u>						
		Technology	Tested Frequency	BW (MHz)	Modulation	Mode			
TC#01 ⁽¹⁾		Bluetooth	2402	1	DSSS	GFSK			
		Wi-Fi 2.4 GHz SISO	2462	20	OFDM	b mode			
	Power s	supply (V): V							
	Test Frequencies for Radiated tests:								
		Technology	Tested Frequency	BW (MHz)	Modulation	Mode			
TC#02 ⁽¹⁾		Bluetooth	2441	1	DSSS	GFSK			
		Wi-Fi 5 GHz SISO	5795	40	MCS4	ac mode			
	radios s the imp	The test was performed with the equipment transmitting with Bluetooth and Wi-Fi 5GH radios simultaneously. These measurements have been performed in order to check the impact of the multi-transmitter of all radio interfaces that can be transmittin simultaneously.							

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.

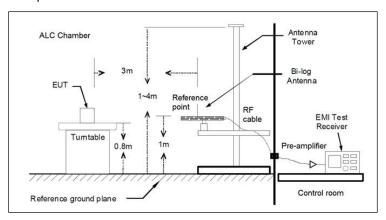
Measurements were made in both horizontal and vertical planes of polarization.

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.

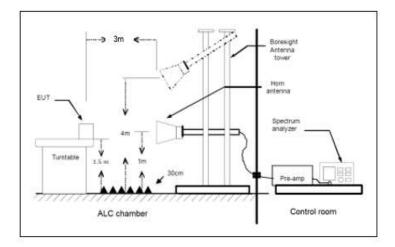


TEST SETUP (CONT.)

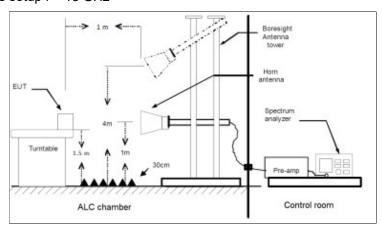
Radiated measurements Setup f < 1 GHz



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

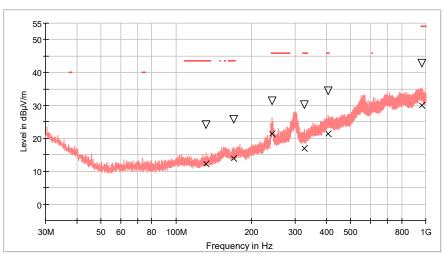
Frequency range 9KHz - 30 MHz

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

Frequency range 30 MHz - 1000 MHz

Results:





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

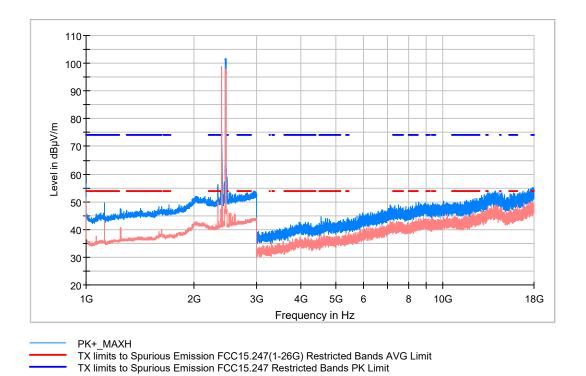
Frequency (MHz)	MaxPeak (dBμV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
131.995500	24.2	12.2	Н	31.3	43.5
170.165000	25.8	14.0	V	29.6	43.5
242.236000	31.4	21.3	Н	24.7	46.0
326.577500	30.2	17.0	Н	29.0	46.0
406.311500	34.5	21.4	Н	24.6	46.0
965.128500	42.9	30.1	V	24.0	54.0





RMS_MAXH

1-18 GHz

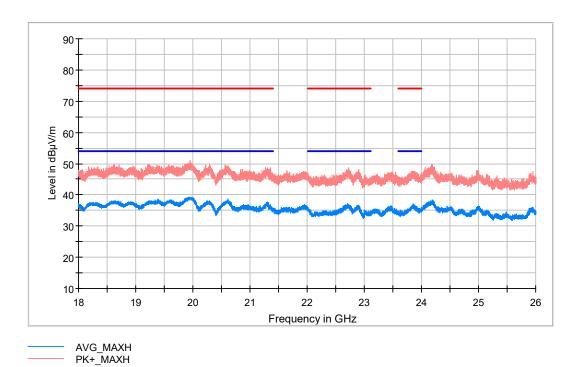


Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBμV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	98.8	98.2	V			BT Fundamental
2461.500000	101.8	98.0	Н			WIFI 2.4G Fundamental



TEST RESULTS (Cont.):

18 – 26 GHz

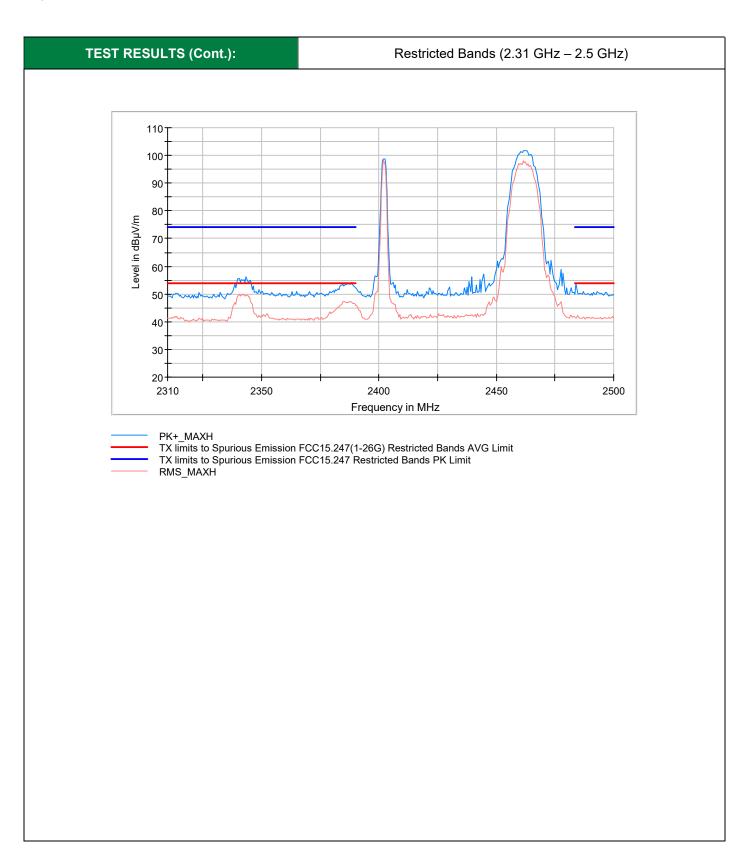


Final Result

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

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
20036.500000	48.4	38.1	Н	15.9	54.0
23846.000000	46.7	36.9	Н	17.1	54.0







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

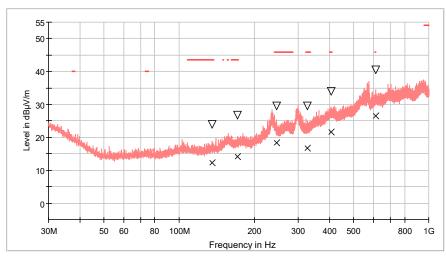
Frequency range 9KHz - 30 MHz

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

Frequency range 30 MHz - 1000 MHz

Results:





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

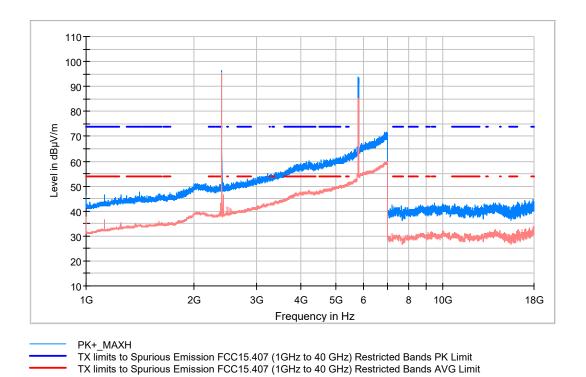
Frequency (MHz)	MaxPeak (dBµV/m)	QuasiPeak (dBµV/m)	Pol	Margin - QPK (dB)	Limit - QPK (dBµV/m)
135.730000	23.9	12.3	V	31.3	43.5
171.523000	26.8	14.1	Н	29.4	43.5
245.097500	29.6	18.4	V	27.6	46.0
326.674500	29.6	16.7	Н	29.3	46.0
406.505500	34.0	21.5	V	24.5	46.0
612.145500	40.6	26.6	Н	19.4	46.0





AVG_MAXH

1-18 GHz

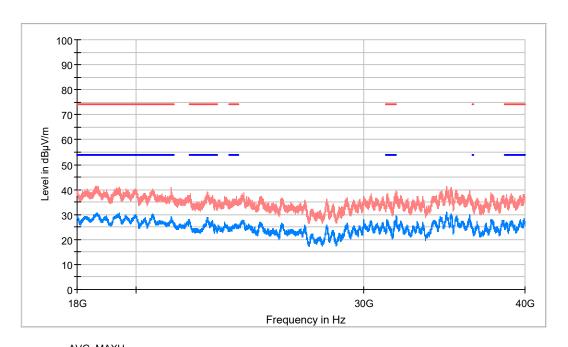


Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)	Comment
2402.000000	96.4	95.6	V			BT Fundamental
5780.500000	92.8	85.2	Н			WIFI 5G Fundamental
11910.583333	40.3	31.0	V	23.0	54.0	



TEST RESULTS (Cont.):

18 – 40 GHz



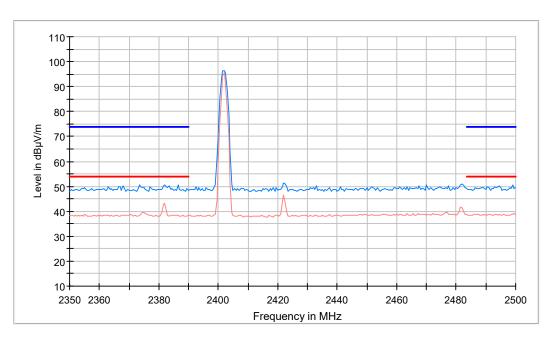
AVG_MAXH PK+_MAXH

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

Frequency (MHz)	PK+_MAXH (dBµV/m)	AVG_MAXH (dBµV/m)	Pol	Margin - AVG (dB)	Limit - AVG (dBµV/m)
19405.250000	39.7	30.6	Н	23.4	54.0
19986.875000	38.7	29.4	Н	24.6	54.0
31724.562500	35.7	27.5	Н	26.5	54.0







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



