



SLG Asia Test Labs & Service (HK) Limited

Test Report

According to

FCC PART 15 Subpart C

FCC ID: S29TX5806

Test Report Number: H1M21302-0795-P-15



TEST REPORT Summary | FCC Part 15C

Test Report No.: H1M21302-0795-P-15
Date of issue.....: 15.04.2013

Testing Laboratory name: SLG Asia Test Labs & Service (HK) Limited
Address.....: 26/F., Tamson Plaza, 161 Wai Yip Street,
Kwun Tong, Kowloon, Hong Kong
Applicant's name: GuangZhou Walkera Technology Co., Ltd.
Address.....: Taishi Industrial Park, Dongchong Town, Panyu District, 511475
Guangzhou, China
Manufacturer's name: GuangZhou Walkera Technology Co., Ltd.
Address.....: Taishi Industrial Park, Dongchong Town, Panyu District, 511475
Guangzhou, China

Test specification

Standard(s) applied: FCC Rules 47 CFR Part 15 Subpart C

Test item description: 5.8G Video Transmitter

Brand Name: devention, WALKERA

Model and/or type reference.....: TX5806

Rating(s): 3.7V, 240mAh Li-Po battery

Summary of Test Results

Pass

The Summary of Test Results based on a technical opinion belongs to the applied standard(s).

Disclaimer

Further details of testing are provided in particular chapters of this Test Report.

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1 General Information

1.1 Test Report

Tested by:

15.04.2013

Mr. Karl Lau

Date

Test Engineer

Signature

Approved by:

15.04.2013

Mr. F. Schulz

Date

Laboratory Manager

Signature



1.2 Test Location

All tests were carrying by personnel from:

Name: SLG Asia Test Labs & Service (HK) Limited
Address: 26/F., Tamson Plaza, 161 Wai Yip Street
Kwun Tong, Kowloon, Hong Kong

Telephone: +852 2389 2200
Fax: +852 2389 3073

The Test facility for radiated measurements is located at:

Name : Hong Kong Productivity Council
Address: EMC Centre, LG1, HKPC Building, 78 Tat Chee Avenue
Kowloon, Hong Kong

The Hong Kong Laboratory Accreditation Scheme (HOKLAS)
Reg. No.082

FCC registered measurement facility
Reg. No.90656

1.3 Details of applicant

Name: GuangZhou Walkera Technology Co., Ltd.
Address: Taishi Industrial Park, Dongchong Town, Panyu District
511475 Guangzhou, China

Contact: Mr. Ya
Telephone: +86 20 8491 5116
Fax: +86 20 8491 5117

1.4 Manufacturer

Name: GuangZhou Walkera Technology Co., Ltd.
Address: Taishi Industrial Park, Dongchong Town, Panyu District
511475 Guangzhou, China

Contact: Mr. Ya
Telephone: +86 20 8491 5116
Fax: +86 20 8491 5117



1.5 Application details

Date of receipt of application: 05.02.2013
Date of receipt of test item: 05.02.2013
Date (s) of performance of tests: 05.02.2013 - 15.04.2013

1.6 Test item

Description of test item: 5.8G Video Transmitter
Type identification: TX5806
Brand Name: devention, WALKERA

Equipment category: Non specific SRD / FM Wide – band Video Transmitter
Equipment classification: Portable use
Permitted frequency range: 5725 - 5850 MHz
Operation frequency range: 5733 - 5847 MHz
Lowest Operation frequency: 5733 MHz
Middles Operation frequency: 5809 MHz
Highest Operation frequency: 5847 MHz
Number of Channel: 4 (5733MHz, 5771MHz, 5809MHz, 5847MHz)
Emission designator: F3F
Antenna gain: < 3 dBi
Type of modulation: FSK (Digital modulation)
Operation mode: simplex
Type of antenna: Integral (Antenna is fixed and not removable)
Power supply: 3.7V, 240mAh Li-Po battery

All information was provided by the applicant)



1.7 General Test Conditions

Environmental reference conditions

If not defined otherwise by the Technical Committee responsible for the generic standard and/or the product standard the climatic conditions during the tests are to be within the limits specified by the manufacturer for the operation of the EUT and the test equipment.

The climatic conditions during the tests were within the following limits:

Temperature	Humidity	Atmospheric pressure
15 °C - 35 °C	30 % - 60 %	860 hPa - 1060 hPa

If explicitly required in the test base (basic) the climatic values are recorded and documented separately for the respective test.

Calibration of measurement and test equipment

All measurement and testing equipment that has a significant influence on the accuracy of qualitative measurements and tests is subject to a periodical in-house system of calibration and servicing that is part of the quality management system of the EMC laboratory of SLG Asia Test Labs & Service (HK) Limited.

Measurement uncertainties

All tests are subject to measurement uncertainties. The overall measurement uncertainty of a measurement is defined as the range of which can be supposed that it contains the true value with a specified probability. This probability is 95 % for the generally specified measurement uncertainty (so-called expanded measurement uncertainty).

The limits for emission measurements and the test levels for immunity tests in the applied standards were defined taking into consideration the accuracy limits for measurement and testing equipment required by the basic standards.

All measurement and test results of the EMC laboratory of SLG Asia Test Labs & Service (HK) Limited fulfil the requirements for measurement uncertainties according to the standards applied.



2 Test result Summary

Digital Transmission system (5725-5850MHz)

Requirements according standard:				
FCC Rule	Test description	Results/Notes	Limits/Requirements	Verdict
15.247(a)	Digital modulation	System uses FSK techniques		P
15.247(a) (2)	6dB Bandwidth	> 3034 KHz	> 500kHz	P
15.247(b) (3)	Maximum peak E Power	-2.19 dBm (EIRP) (0.60 mW)	1W, EIRP limited to 4W	P
15.247(e)	Power Spectral Density	-4.97 dBm/3kHz	< 8dBm/3kHz	P
15.247(d) / 15.209, 15.205	Out-of-band Emission 30MHz – 40GHz	All signals below Limits	15.209, 15.205 restricted bands, all others < -20dBc	P
15.247(d)	Band-edge requirements in 100kHz Bandwidth	All frequencies inside the band	Within range 5725-5850 MHz	P
15.203	RF Connector	EUT has integral antenna		P
15.247 (b)/ 15.407 (f)	RF Exposure requirements	Exemption from Routine Evaluation Limits (Out power <10mW)	Refer to OET 65	P

Test case verdicts

- P* - Pass *Test item does meet the requirement*
F - Fail *Test item does not meet the requirement*
N.A. - Not Applicable *Test case does not apply to the test object*



3 Test results

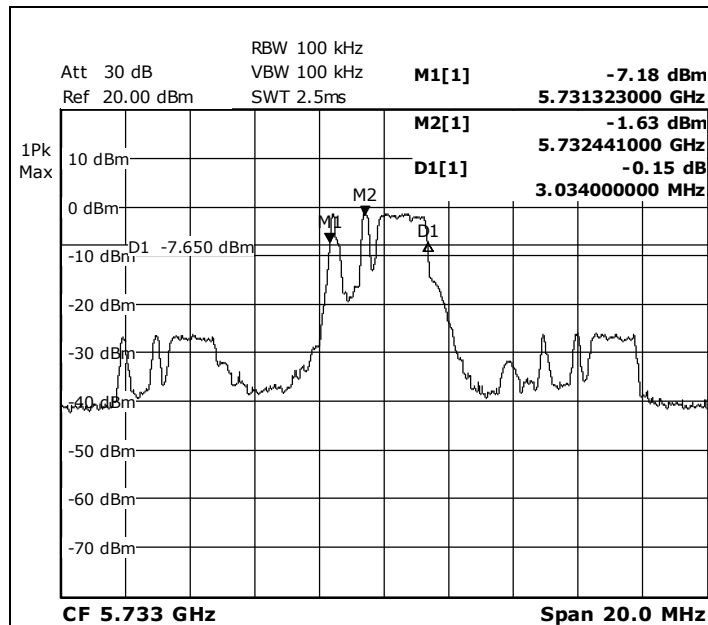
3.1. 6dB Bandwidth

Measurement Results:

FCC part 15.247 (a) (2): Signal Bandwidth

Frequency (MHz)	Resolution bandwidth	6dB bandwidth (kHz)	Limit (kHz)	Results
5733	100kHz	3034	>500	Pass
5809	100kHz	3393	>500	Pass
5847	100kHz	3433	>500	Pass

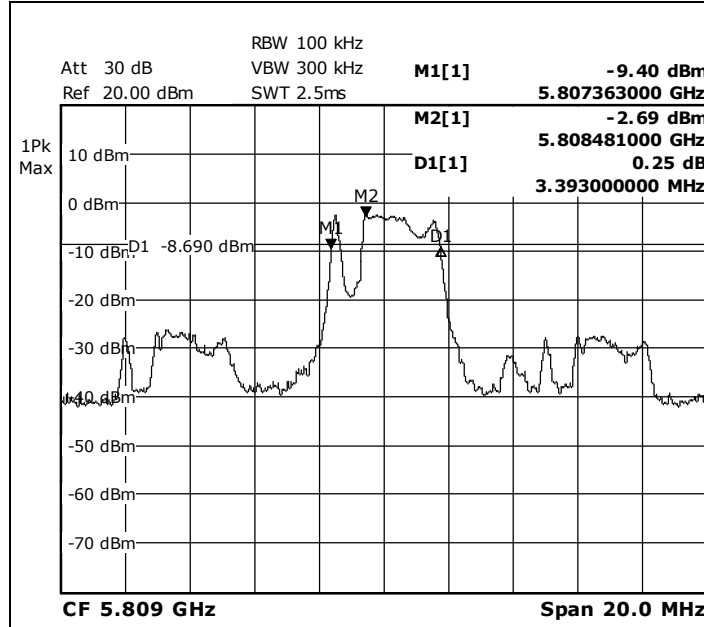
Lowest Operation frequency: 5733 MHz



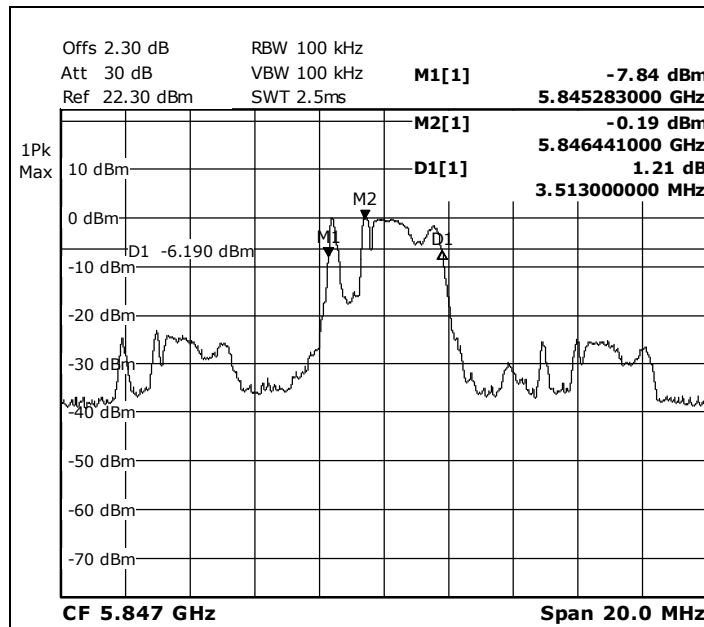
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Middles Operation frequency: 5809 MHz



Highest Operation frequency: 5847 MHz



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3.2. Output power

Measurement Results:

FCC part 15.247 (b) (3): Output Power

Frequency MHz	Output Power		Antenna Gain dBi	Results	EIRP	
	dBm	mW			dBm	mW
5733	-7.79	0.17	3	Pass	-4.79	0.33
5809	-5.19	0.30	3	Pass	-2.19	0.60
5847	-7.10	0.19	3	Pass	-4.10	0.39

All results were measured with peak power meter.

Measurement Equipment Used:

Test equipment	Type	S/N	Manufacturer	Cal Due Date
Spectrum Analyzer	FSEK 20	836043/003	Rohde & Schwarz	Sep 13



3.3. Power Spectral Density

Measurement Results:

FCC part 15.247 (e): Power spectral Density

Frequency MHz	PSD dBm/3kHz	Limit dBm/3kHz	Results
5733	-7.02	8	Pass
5809	-4.97	8	Pass
5847	-7.03	8	Pass

Note 1:	Power spectral density measured using RBW=3kHz, VBW=10kHz, analyzer with peak detector and with a sweep time set to ensure a dwell time of at least 1 second per 3kHz. The measurement is made at the frequency of PPSD determined from preliminary scans using
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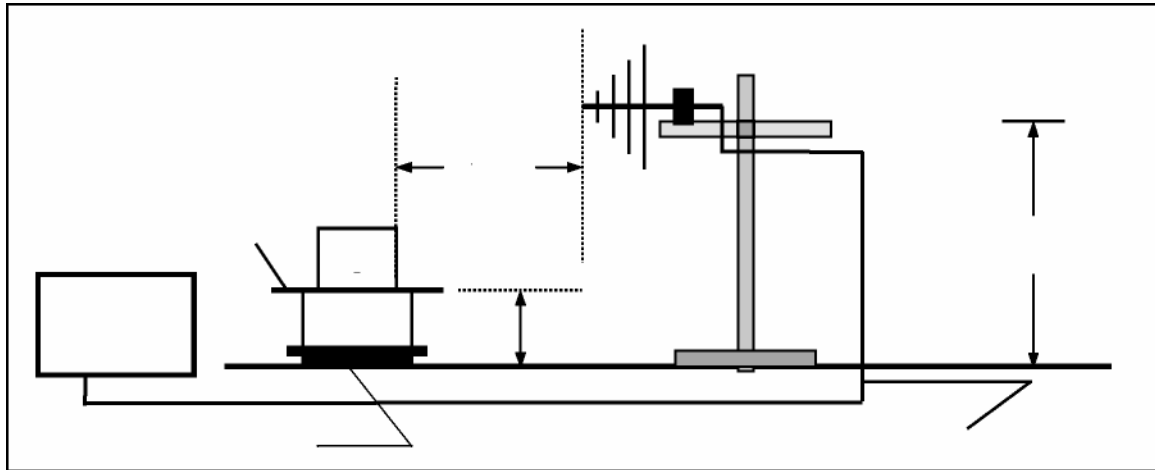
Measurement Equipment Used:

Test equipment	Type	S/N	Manufacturer	Cal Due Date
Spectrum Analyzer	FSEK 20	836043/003	Rohde & Schwarz	Sep 13



3.4. Out-of-band Emission

Measurement Procedure



The equipment under test is placed on a non metallic table with 0.8 m height. The power supply and the RF connection points are close to the equipment under test at the floor inside a connection box. The cables to this connection box are shielded and below the double floor. The receiving antenna is placed in a height at 1.0 m to 4.0 m and in a distance of 3 m.

Measurement Equipment Used:

Test equipment	Type	S/N	Manufacturer	Cal Due Date
Semi-anechoic Chamber	Nil	Nil	Frankonia	May 13
Test Receiver	ESU 26	100050	Rohde & Schwarz	Aug 13
Bi-conical Antenna	HK116	841489/016	Rohde & Schwarz	Mar 14
Log.-Periodic Antenna	HL223	841516/020	Rohde & Schwarz	Feb 14
Horn Antenna	3115	9002-3351	EMCO	Feb 14
Active Loop Antenna	6502	9107-2651	EMCO	Dec 13

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Measurement Results:

Low Frequency @ 5733 MHz

Fundamental emission level @3m in 100kHz RBV				90.44		dB μ V/m
Limit for emission outside of restricted bands:				70.44		dB μ V/m
Frequency	Level	Pol	15.209/15.247		Detector	Comments
MHz	dB μ V/m	V/H	Limit	Margin	Pk/QP/Avg	
154.689	29.21	V	70.44	41.23	Pk	RB/VB 100kHz
144.469	30.29	H	70.44	40.15	Pk	RB/VB 100kHz
405.210	24.56	V	46	21.44	Pk	RB/VB 100kHz
350.701	20.70	H	70.44	49.74	Pk	RB/VB 100kHz
3952	35.70	V	54	18.30	Pk	RB/VB 1MHz
3898	35.68	H	54	18.32	Pk	RB/VB 1MHz
6974	40.85	V	70.44	29.59	Pk	RB/VB 1MHz
6966	39.88	H	70.44	30.56	Pk	RB/VB 1MHz
11466	49.43	V	54	4.57	Avg	RB/VB 1MHz
11466	50.93	H	54	3.07	Avg	RB/VB 1MHz
17200	55.21	V	70.44	15.23	Avg	RB/VB 1MHz
17200	44.85	H	70.44	25.59	Avg	RB/VB 1MHz
25836	44.43	V	70.44	26.01	Pk	RB/VB 1MHz
25853	44.44	H	70.44	26.00	Pk	RB/VB 1MHz

For emission in restricted band, the limit of 15,209 was used. For all other emission, the limit was set 20dB below the level of fundamental and measured in 100kHz

Middle Frequency @ 5809 MHz

Fundamental emission level @3m in 100kHz RBV				93.04		dB μ V/m
Limit for emission outside of restricted bands:				73.04		dB μ V/m
Frequency	Level	Pol	15.209/15.247		Detector	Comments
MHz	dBmV/m	V/H	Limit	Margin	Pk/QP/Avg	
192.505	29.48	V	73.04	43.56	Pk	RB/VB 100kHz
147.535	30.32	H	73.04	42.72	Pk	RB/VB 100kHz
405.210	24.67	V	46	21.33	Pk	RB/VB 100kHz
248.096	22.33	H	46	23.67	Pk	RB/VB 100kHz
4000	35.29	V	54	18.71	Pk	RB/VB 1MHz
3964	35.28	H	54	18.72	Pk	RB/VB 1MHz
6717	40.45	V	73.04	32.59	Pk	RB/VB 1MHz
6990	40.24	H	73.04	32.80	Pk	RB/VB 1MHz
11618	51.30	V	54	2.70	Avg	RB/VB 1MHz
11618	52.40	H	54	1.60	Avg	RB/VB 1MHz
17428	51.47	V	73.04	21.57	Avg	RB/VB 1MHz
17428	44.02	H	73.04	29.02	Avg	RB/VB 1MHz
25904	44.34	V	73.04	28.70	Pk	RB/VB 1MHz
26313	44.62	H	73.04	28.42	Pk	RB/VB 1MHz

For emission in restricted band. the limit of 15.209 was used. For all other emission. the limit was set 20dB below the level of fundamental and measured in 100kHz

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High Frequency @ 5847 MHz

Fundamental emission level @3m in 100kHz RBV	91.13	dB μ V/m
Limit for emission outside of restricted bands:	71.13	dB μ V/m

Frequency MHz	Level dBmV/m	Pol V/H	15.209/15.247		Detector Pk/QP/Avg	Comments
			Limit	Margin		
146.172	29.31	V	71.13	41.82	Pk	RB/VB 100kHz
152.986	30.32	H	71.13	40.81	Pk	RB/VB 100kHz
405.210	24.81	V	46	21.19	Pk	RB/VB 100kHz
350.701	20.63	H	71.13	50.50	Pk	RB/VB 100kHz
4000	35.50	V	46	10.50	Pk	RB/VB 1MHz
4000	35.18	H	46	10.82	Pk	RB/VB 1MHz
6974	40.51	V	71.13	30.62	Pk	RB/VB 1MHz
6982	40.30	H	71.13	30.83	Pk	RB/VB 1MHz
11694	51.09	V	54	2.91	Avg	RB/VB 1MHz
11693	52.40	H	54	1.60	Avg	RB/VB 1MHz
17542	49.16	V	71.13	21.97	Avg	RB/VB 1MHz
17539	41.95	H	71.13	29.18	Avg	RB/VB 1MHz
25819	43.89	V	71.13	27.24	Pk	RB/VB 1MHz
25904	44.64	H	71.13	26.49	Pk	RB/VB 1MHz

For emission in restricted band the limit of 15.209 was used. For all other emission. the limit was set 20dB below the level of fundamental and measured in 100kHz

Note: Testing is carried out with frequency rang 30MHz to the tenth harmonics which above 5th Harmonics is close to the noise base even antenna close up to 1meter distance according the measurement of ANSI C63.4. Emissions 20dB lower than the limit are not reported.

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FCC Part 15. Subpart C. §15.209. Radiated Emission Limits

Frequency of Emission [MHz]	Field strength [$\mu\text{V/m}$]	Field Strength [$\text{dB}\mu\text{V/m}$]
30 – 88	100	40.0
88 – 216	150	43.5
216 – 960	200	46.0
Above 960	500	54.0

FCC Part 15. Subpart C. §15.205. Restricted bands of operation

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
10.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	
13.36-13.41			

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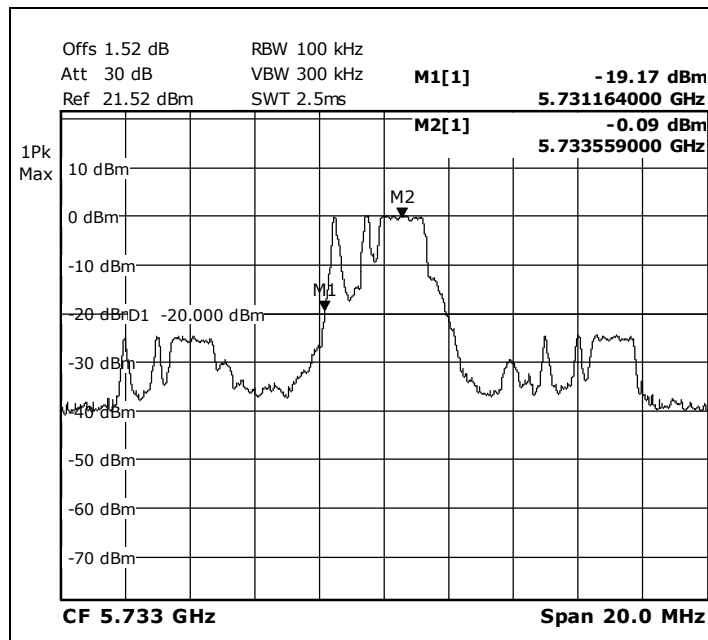
3.5. Band edge requirement

Measurement Results:

FCC part 15.247 (d): Band edge requirements

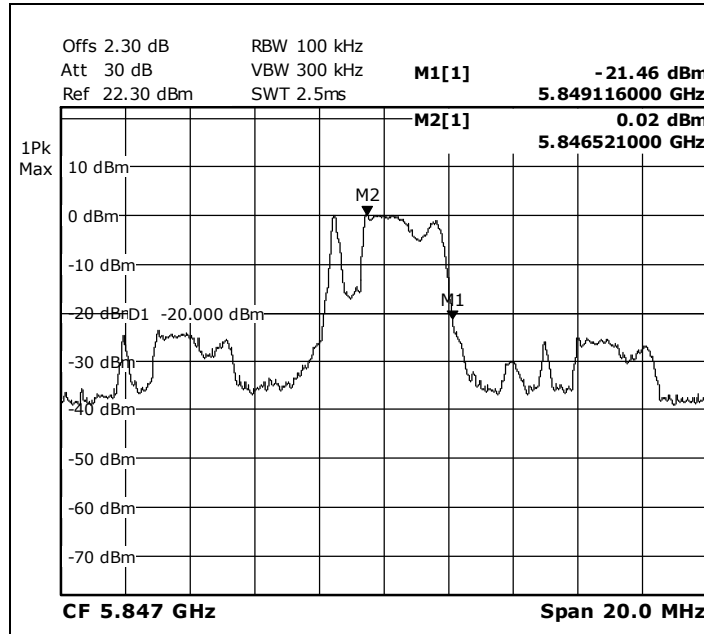
Frequency (MHz)	Resolution bandwidth	20 dB band edge (kHz)	Limit (MHz)	Results
5733	100kHz	5731.2	> 5725	Pass
5847	100kHz	5849.1	< 5850	Pass

Lowest Operation frequency: 5733 MHz





Highest Operation frequency: 5847 MHz





4 Normative references

- /1/ FCC Rules 47 CFR PART 15 Subpart: 2012
Radio Frequency Devices
- /2/ ANSI C63.4-2009
Methods of Measurement of Radio-Noise Emission from Low-Voltage Electrical and
Electronic Equipment in the Range of 9 kHz to 40 GHz



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5.1 Revision Notes

This revised Report replaces the all former Test Reports based on number H1M21302-0795-P-15. These former Test Reports are not longer valid. Every Revision of the original report is recorded below and identified by the || symbol beside the text.

Revision No.	Revision
H1M21302-0795-P-15	Original Test Report