

4322065.51

FCC Test report for Pulse II DUO

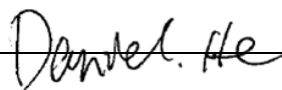
Models Guybrator

Guangzhou, date of issue: 2015-05-11

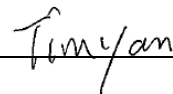
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1 CONCLUSION

The device under test (DUT) as mentioned in this report complies with the stated requirements of the FCC Part 15, Class B.

FCC ID: 2AEYM0013

The tested system is classified as Superheterodyne receiver, Class B, marketed for use in a residential environment notwithstanding use in commercial, business and industrial environment.

The conclusion and results stated in this test report are based on a non-recurrent examination of sample(s) provided by the applicant.

The tests described in this report do not result in the right to use any approval mark as conferred by DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch As far as the tests were based on certain specifications; these are mentioned in the report.

2 SUMMARY

This chapter presents an overview of standards and results. Refer to the next chapters for details of measured test results and applied test levels.

2.1 Applied standards

Standard	Year	Title
FCC part 15	2015	Federal Communications Commission (FCC) – Radio Frequency Devices

2.2 Reference standards

Standard	Year	Title
ANSI C63.4	2009	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz

2.3 Overview of results

Emission tests	Result
Conducted emission	PASS
Radiated emission	PASS

2.4 Overview of measurement uncertainty

Measurement	Uncertainty
Mains disturbance voltage (9 kHz – 30MHz)	± 1,66 dB
Radiated disturbance (30MHz– 1000MHz)	± 3,32 dB
Radiated disturbance (1GHz– 3GHz)	± 2,73 dB

3 CLASSIFICATION

This chapter presents an overview of the applicable classification.

Base on client's declaration, the following applicable Class has been selected:

	Class A : The intended user environment of the device under test is limited to industrial environments and classified as a digital device class A.
√	Class B : The intended user environment of the device under tests is in commercial and light-industrial environments and classified as a Superheterodyne receiver class B.

For the device under test the following measurement clauses are applicable:

√	47CFR Part 15 Subpart B Unintentional radiators.
	Section 15.107(b) Conducted emissions – Class A
√	Section 15.107(a) Conducted emissions – Class B
	Section 15.109(b) Radiated emissions – Class A
√	Section 15.109(a) Radiated emissions – Class B

4 GENERAL INFORMATION

4.1 Model description

The apparatus as supplied for the test is Pulse II DUO, model Guybrator (contains transmit and receiver) intended for residential use, the product contains electronic control circuitry and powered by 3Vdc (CR2032 Button cell Battery) for transmit, 3,7Vdc by rechargeable Lithium-ion for receiver.

For the transmitter, report 4322065.50 (FCC Part 15, subpart C) can be referred



Figure 1 receiver



Figure 2 the used adaptor on the testing

The operating mode as stated in the user manual is on (charging, motor running, receiving) mode and off mode.

Remark: the receiver will stop motor running and receiving, when it is charging.

4.2 Product Information

Equipment under test	Pulse II DUO
Trade mark	Hot Octopuss
Tested Type	Guybrator (the receiver part)
U nominal	3,7Vdc by rechargeable Lithium-ion or 120 Vac, 60 Hz
The highest frequency of the internal sources	Receiving frequency is 433.92 MHz (+/-500kHz)

4.3 Customer Information

Applicant/Manufacturer	JM Sunflower Ltd.
Contact person	Jiri Holoubek
Telephone	24288338
Telefax	/
Address	Rm01, 3/F, Fabrico factory Building, 78-84 Kwai Cheong Road, Kwai Chung Hong Kong

Factory	JM Sunflower Ltd.
Contact person	Jiri Holoubek
Telephone	24288338
Telefax	/
Address	Rm01, 3/F, Fabrico factory Building, 78-84 Kwai Cheong Road, Kwai Chung Hong Kong

4.4 **Product labeling**

According to section 15.19, the DUT shall have the following statement labeled to its housing on a conspicuous location:

“This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation”.

4.5 **User information**

The user- or instruction manual shall:

Contain the following statement in case of a Class B Superheterodyne receiver:

“This device has been tested and found to comply with the limits for a Class B Superheterodyne receiver, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

5 TEST INFORMATION

5.1 Test facility

The FCC has per public notice declared these measurement facilities to be reviewed and to be in compliance with the requirements of Section 2.948 of the FCC Rules.

The test laboratory DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch (Building A3, No.3 Qiyun Road, Science City, Guangzhou Hi-Tech Industrial Development Zone, Guangzhou, P.R. China)

5.2 Measurement procedure

The DUT was configured for testing in a typical user configuration. The maximum test configuration was put to the tests. The DUT was tested as complete system.

5.3 Test data

Location	DEKRA Testing and Certification (Shanghai) Ltd. Guangzhou Branch
FCC Registration Number	245651
Address	Building A3, No.3 Qiyun Road, Science City, Guangzhou Hi-Tech Industrial Development Zone, Guangzhou, P.R. China
Date	2015-04-15 to 2015-05-08
Supervised by	Daniel He

5.4 **Environmental conditions**

Tests have been performed in a controlled laboratory environment, where the environmental conditions are maintained within the applicable ranges.

Ambient temperature	15 °C – 25 °C
Relative Humidity air	30% - 60%

6 CONDUCTED EMISSIONS

6.1 Measurement procedure

In accordance with section 15.107(a) the conducted radio frequency disturbance voltages between each of the power lines (live and neutral) and the ground terminal are determined over the frequency range from 150 kHz to 30 MHz.

The test set-up is in accordance with the requirements of ANSI C63.4: 2009

The AC power line conducted emission measurements were performed at the line voltage of 120 V_{ac} and at the power frequency of 60 Hz.

The initial step in collecting conducted data is a peak scan measurement over the frequency range of interest. Significant peaks are marked, and these peaks are re-measured using a quasi peak and average detector. This procedure is implemented in the utilized test receiver by the incorporated EMI firmware. The test receiver used also meets the requirement as mentioned in section 15.35 “measurement detector functions and bandwidths”. The test receiver employs a CISPR quasi-peak detector function with a bandwidth of 9-10 kHz.

6.2 Measurement equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI receiver	R&S	ESCI	101206	2014-12-27	1 Year
2	LISN	R&S	ENV216	101336	2014-12-27	1 Year
3	High Voltage Probe	SCHWARZBECK	TK9421	9421-170	2015-01-16	1 Year
4	CABLE	R&S	3M	/	2015-01-16	/
5	Shielding room	Changzhou Feite	/	/	2014-11-22	/

6.3 Measurement data

Limits

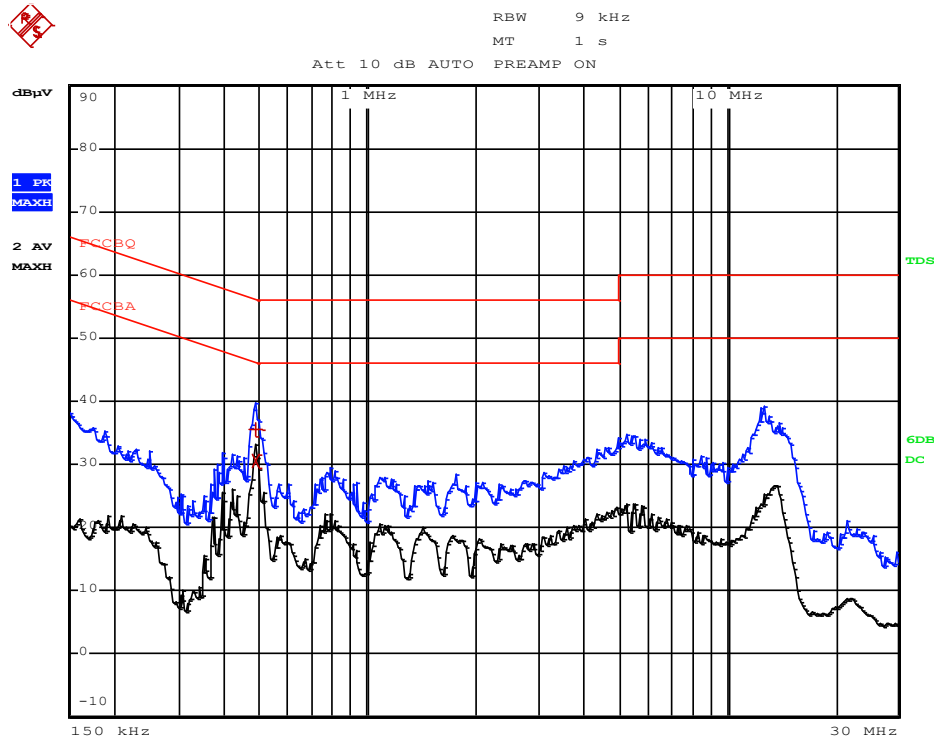
Standard	47CFR part 15 subpart B clause 15.107 (a) (Class B)	
Frequency [MHz]	Limit QP [dB(μV)]	Limit AV [dB(μV)]
0,15 – 0,50	66 to 56 *)	56 to 46 *)
0,50 – 5	56	46
5 – 30	60	50

*) Limits decreasing linearly with the logarithm of the frequency

Port	AC mains
Test method	LISN
Test-mode	Test the EUT in charging mode.

Results

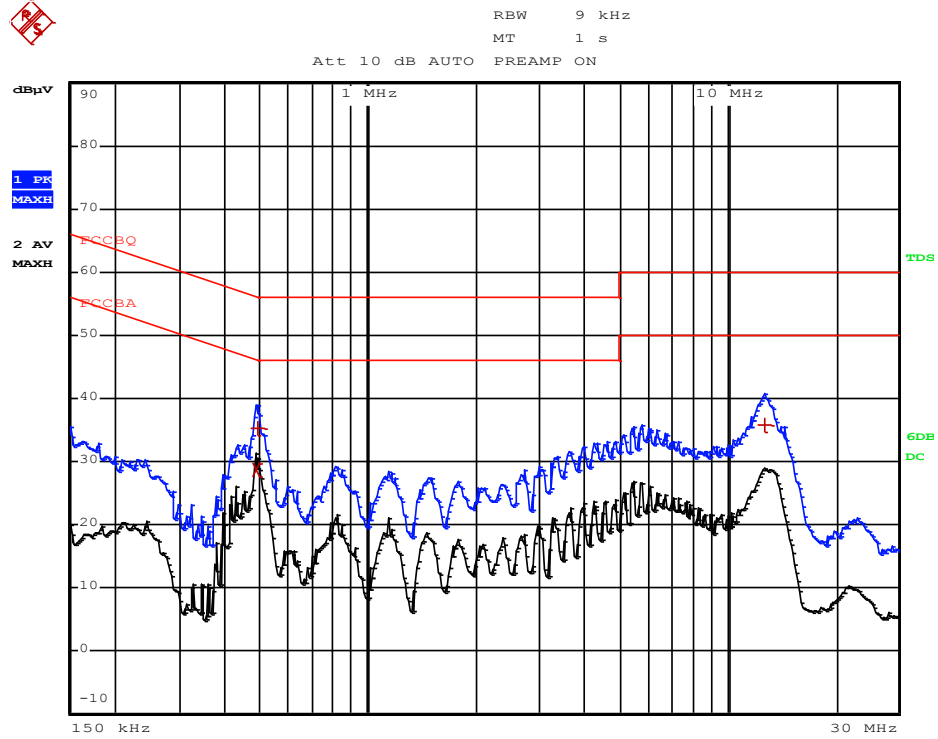
Line



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCCBQ		
Trace2:	FCCBA		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	490 kHz	30.42	-15.73
1 Quasi Peak	490 kHz	35.48	-20.68

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Neutral



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCCBQ		
Trace2:	FCCBA		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB
2 Average	490 kHz	28.81	-17.35
1 Quasi Peak	494 kHz	35.18	-20.91
1 Quasi Peak	12.706 MHz	35.71	-24.28

No other significant emissions were measured at the frequency range of interest employing both the QP and AV detectors.

Refer to chapter 8 for the test set-up.

Conclusion:

PASS

7 RADIATED EMISSIONS

7.1 Measurement procedure

In accordance with section 15.109(a) the field strength levels of radiated emissions from this digital device class B at a measurement distance of 3 meters were determined.

Frequency range of radiated emission measurements for unintentional radiators:

Except as otherwise indicated in FCC part 15 Section 15.33 paragraphs (b) (2) or (b) (3), for an unintentional radiator, including a digital device, the spectrum shall be investigated from the lowest radio frequency signal generated or used in the device, without going below the lowest frequency for which a radiated emission limit is specified, up to the frequency shown in the following table:

Highest frequency generated or used in the device or on which the device operates or tunes (MHz)	Upper frequency range of measurement
Below 1.705	30
1.705 - 108	1000
108 - 500	2000
500 - 1000	5000
Above 1000	5th harmonic of the highest frequency or 40 GHz, whichever is lower

The EUT receiving frequency: 433,17MHz, so it should be measured to 2GHz.

Below or equal to 1 GHz, preliminary radiation measurements are performed in a semi anechoic room at a 3 meter measurement distance. The measurement receiver calculates the resulting field strength using the correction factors for cable loss and antenna. The final measurements are performed in the semi anechoic room at a 3 meter measurement distance too. At those frequencies where relevant significant levels were detected during the pre-scan the actual field strength level is measured using the CISPR quasi-peak detector with bandwidth of 120 kHz.

Above 1GHz, preliminary radiation measurements are performed in a fully-anechoic room at a 3 meter measurement distance. The measurement receiver calculates the resulting field strength using the correction factors for cable loss and antenna. The final measurements are performed in the semi anechoic room at a 3 meter measurement distance too. At those frequencies where relevant significant levels were detected during the pre-scan the actual field strength level is measured using the Peak and Average detector with bandwidth of 1MHz.

The highest levels measured with horizontal or vertical polarization are mentioned on the next page.

7.2 Measurement equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1	EMI receiver	R&S	ESCI	101205	2013-12-27	1 Year
2	Antenna (30MHz-3GHz)	SCHWARZBECK	VULB9163	506	2014-01-06	1 Year
3	CABLE	SCHWARZBECK	10M	/	2014-01-16	/
4	Chamber	ETS.LINDGR EN	/	Euroshieldpn -CT000344- 1100	2013-12-29	/
5	Horn antenna	R&S	HF907	102306	2014-07-17	1 Year

7.3 Measurement data

Limits for below 1GHz

Standard	47CFR part 15 subpart B clause 15.109(a) (Class B)	
Measuring distance	3 meters	
Frequency [MHz]	Limits	
	QP [dB(μ V/m)]	microvolts/meter
30 – 88	40.0	100
88 – 216	43.5	150
216 – 960	46.0	200
> 960	54.0	500
Port	Enclosure with cabling	
Test set-up	3 m Semi-Anechoic chamber	
Test mode	Test the EUT in charging mode Test the EUT in motor running mode Test the EUT in receiving mode	

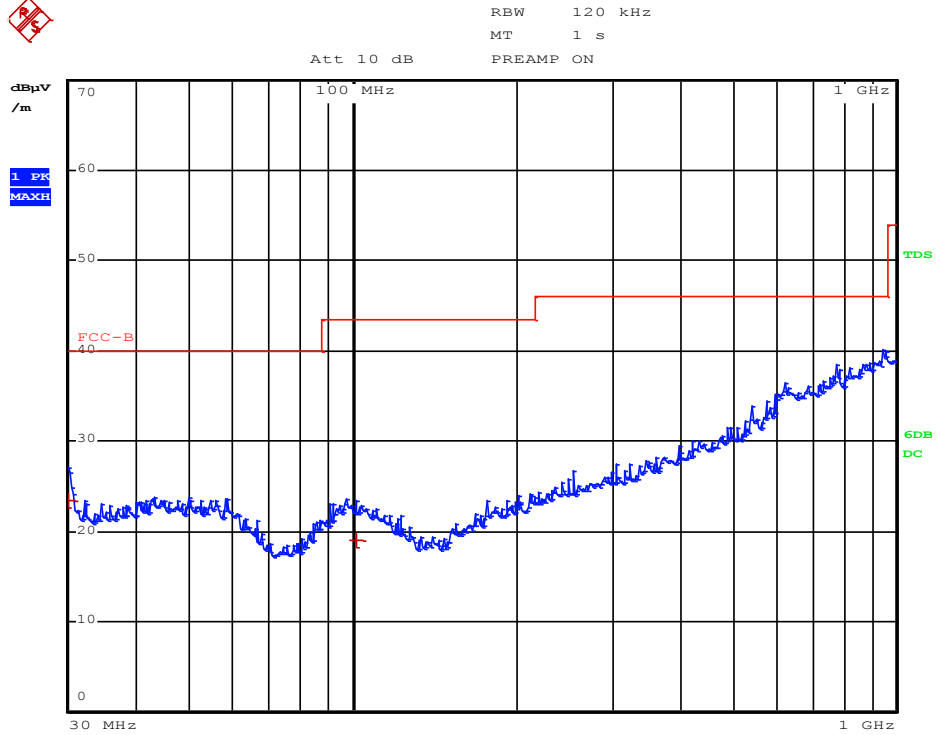
Limits for above 1GHz

Standard	47CFR part 15 subpart B clause 15.109(a) (Class B)	
Measuring distance	3 meters	
Frequency [MHz]	Limits	
	Peak [dB(μ V/m)]	Average[dB(μ V/m)]
1000 – 2000	74.0	54.0
Port	Enclosure with cabling	
Test set-up	3 m fully-anechoic chamber	
Test mode	Test the EUT in receiving mode	

Below 1GHz:

Results for test the EUT in charging mode

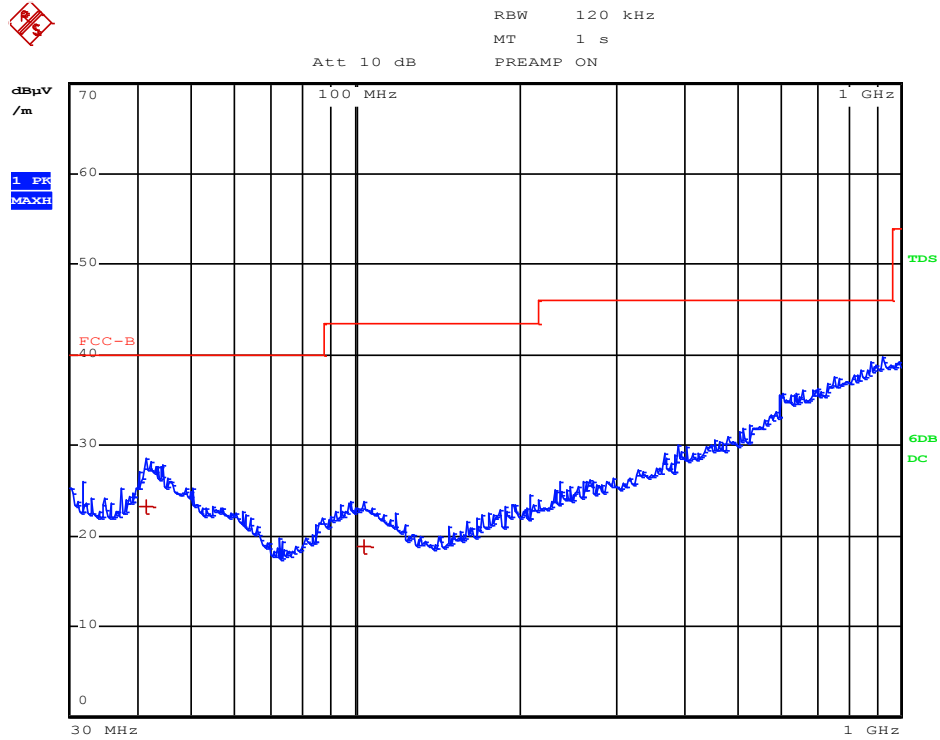
Horizontal



EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC-B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	30.04 MHz	23.36	-16.63
1 Quasi Peak	101.84 MHz	19.01	-24.48

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

Vertical

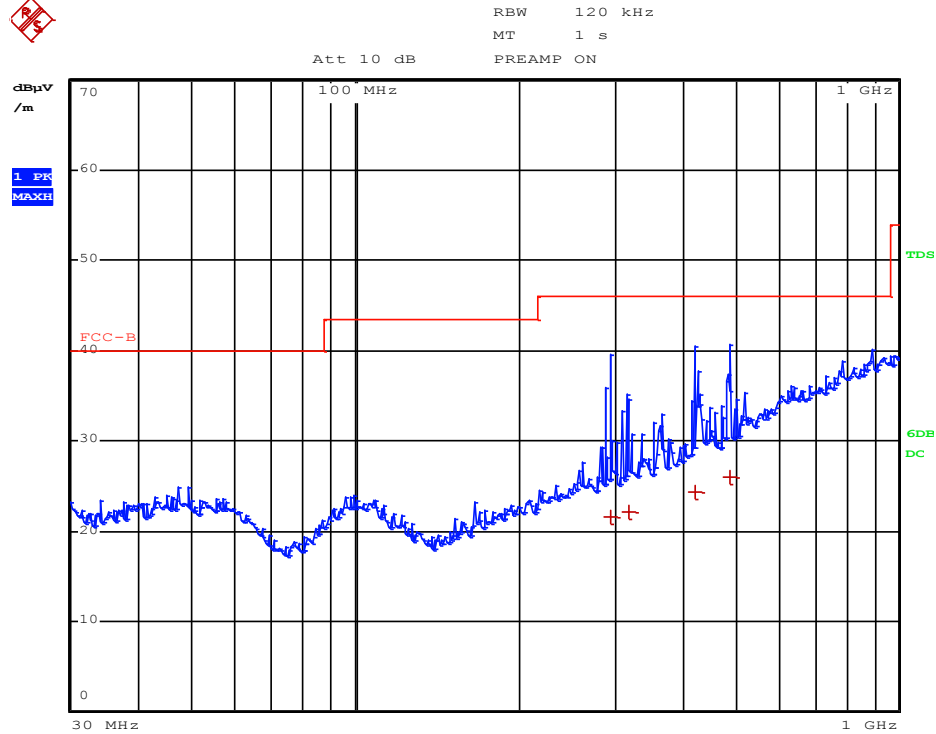


EDIT PEAK LIST (Final Measurement Results)			
Trace1:	FCC-B		
Trace2:	---		
Trace3:	---		
TRACE	FREQUENCY	LEVEL dBµV/m	DELTA LIMIT dB
1 Quasi Peak	41.52 MHz	23.31	-16.68
1 Quasi Peak	103.8 MHz	18.75	-24.74

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

Results for test the EUT in motor running mode

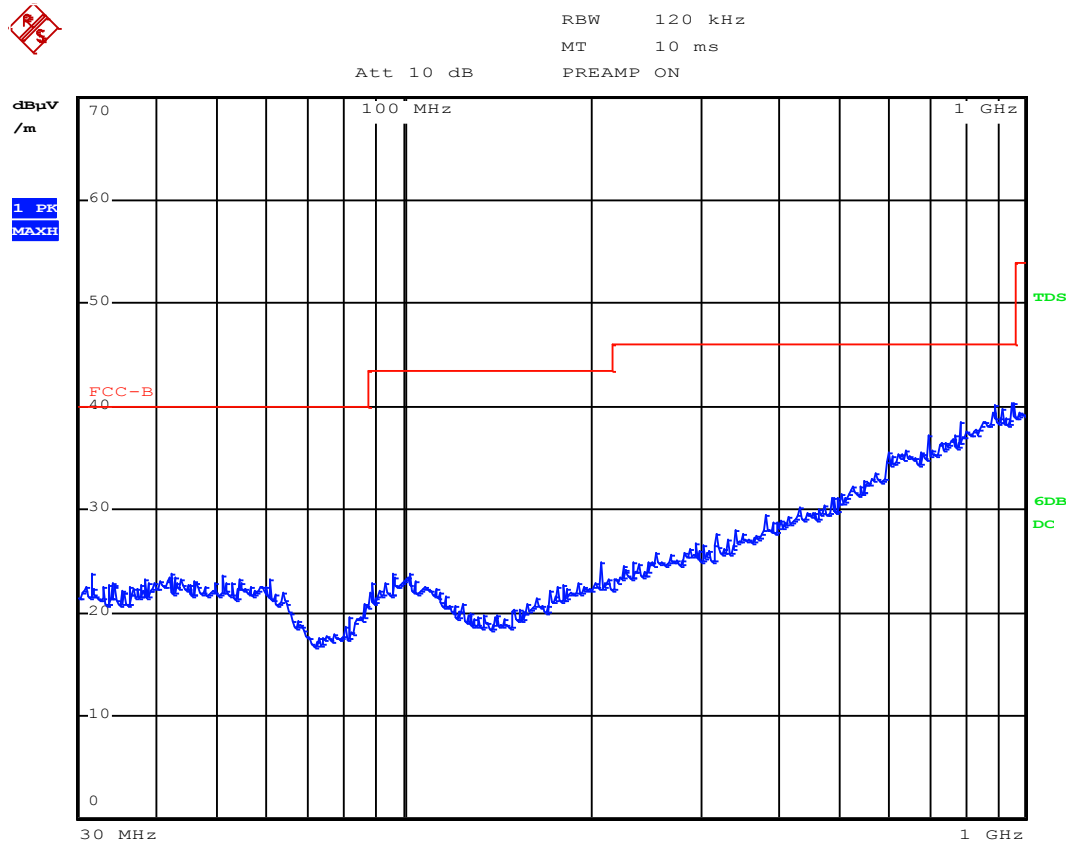
Horizontal



EDIT PEAK LIST (Final Measurement Results)			
TRACE		FREQUENCY	LEVEL dBµV/m
Trace1:	FCC-B		
Trace2:	---		
Trace3:	---		
1	Quasi Peak	489.52 MHz	25.92
1	Quasi Peak	420.88 MHz	24.32
1	Quasi Peak	318.12 MHz	22.20
1	Quasi Peak	294.24 MHz	21.54
			DELTA LIMIT dB
			-20.07
			-21.67
			-23.79
			-24.45

No other significant emissions were measured at the frequency range of interest employing the QP detectors.

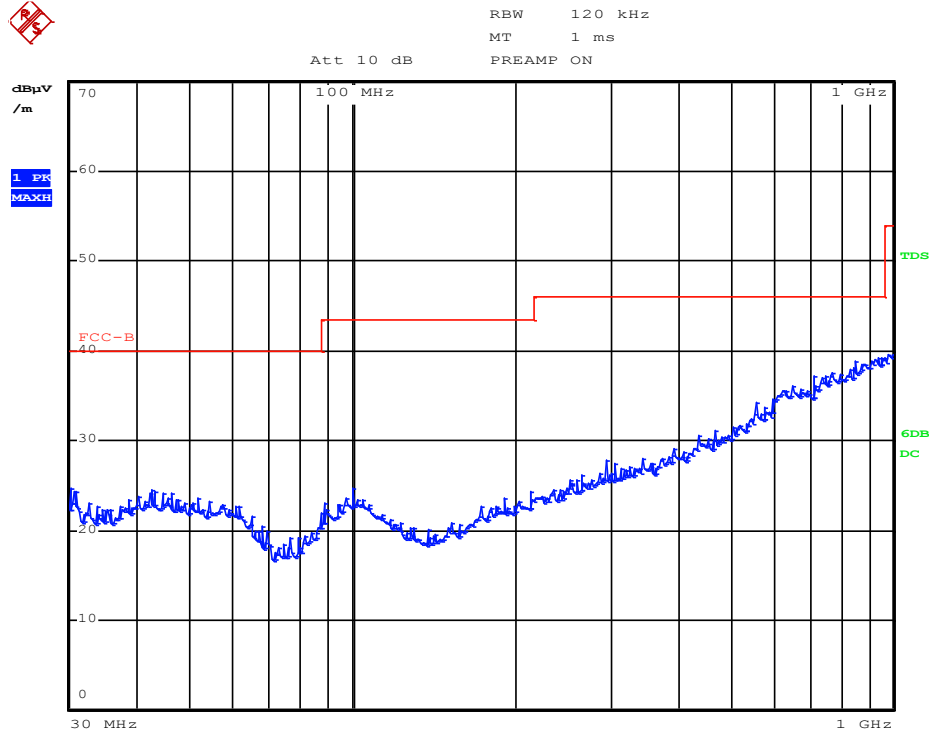
Vertical



No significant emissions were measured at the frequency range of interest employing the QP detectors (more than 20dB below the limits).

Results for test the EUT in receiving mode

Horizontal



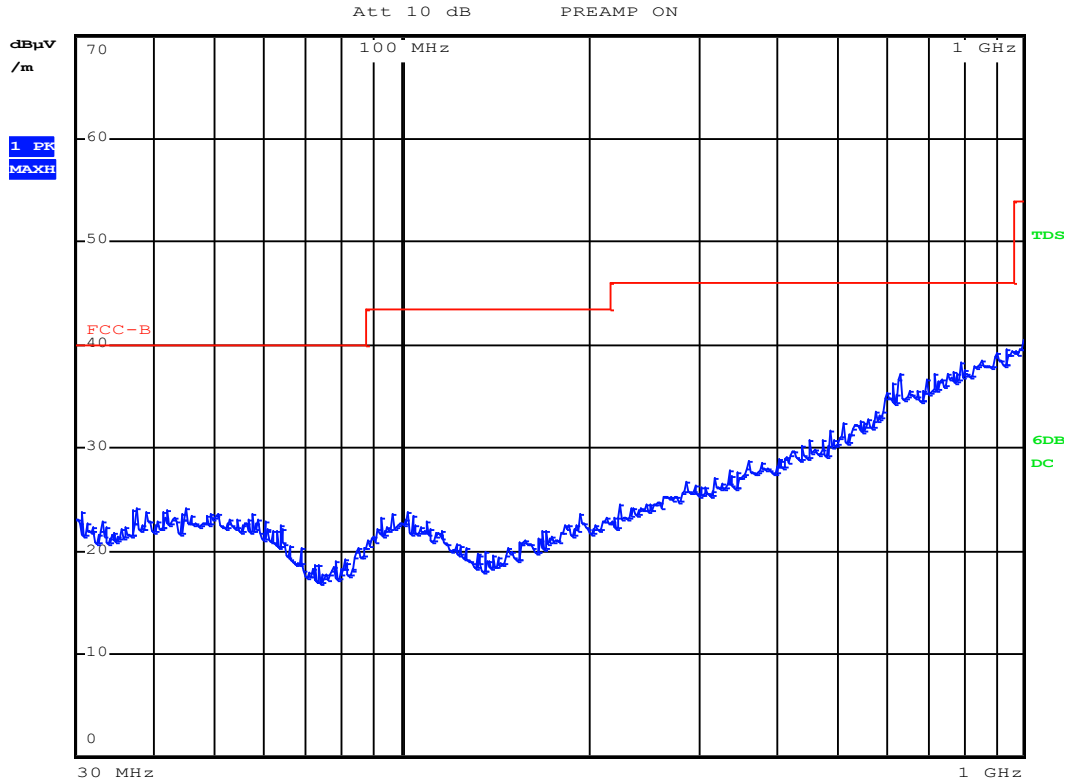
Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)
433.92	32.50	46.0
867.84	37.30	46.0

No other significant emissions were measured at the frequency range of interest employing the QP detectors (more than 20dB below the limits).

Vertical



RBW 120 kHz
 MT 1 ms
 PREAMP ON



Frequency (MHz)	Level (dBuV/m)	Limit (dBuV/m)
433.92	33.23	46.0
867.84	36.54	46.0

No other significant emissions were measured at the frequency range of interest employing the QP detectors (more than 20dB below the limits).

**Above 1GHz:
Results for test the EUT in receiving mode**

Since the peak emission level is lower than the average limit, the average emission level does not need to show.

antenna polarization	Test frequency	Measured field strength (dBuV/m)	AV Limit (dBuV/m)	Margin (dB)	Detector
Horizontal	1302.51	29.45	54.00	-24.55	PK
	1736.68	28.41	54.00	-25.59	PK
Vertical	1302.51	29.34	54.00	-24.66	PK
	1736.68	28.36	54.00	-25.64	PK

No other significant emissions were measured at the frequency range of interest employing the Peak detector.

Refer to chapter 8 for the test set-up.

Conclusion:

PASS

8 TEST SETUP AND ARRANGEMENT

The photograph shows the tested device.



Figure 3 Conducted Emission test setup

For test the EUT in charging mode:



Figure 4 Radiated emission below 1GHz test setup

For test the EUT in motor running and receiving mode



Figure 5 Radiated emission below 1GHz test setup

For test the EUT in receiving mode



Figure 6 Radiated emission above 1GHz test setup

9 **PRODUCT INTERNAL VIEW**





