



EMC Test Report

Product Name: Smart Phone

Model Number: H1511

Report No: SYBH(Z-EMC)068082015-2

FCC ID: QISH1511

Reliability Laboratory of Huawei Technologies Co., Ltd.

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Applicant: Huawei Technologies Co., Ltd.
Address: Administration Building, Headquarters of Huawei Technologies Co., Ltd., Bantian, Longgang District, Shenzhen, 518129, P.R.C

Date of Receipt Test Item: July.06.2015
Start Date of Test: July.10.2015
End Date of Test: July.17.2015

Test Result: Pass

**Approved By
(Lab Manager)**

2015-8-29
Date

Liuchunlin
Name

Signature

Operator

2015-8-29
Date

Wangzhiheng
Name

Signature

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1 General Information

1.1 EUT Description

EUT Description	
Product Name	Smart Phone
Model Number	H1511
Input voltage	DC 3.8V
TX Frequency	GSM 850: 824MHz to 849MHz GSM 1900: 1850MHz to 1910MHz WCDMA Band II: 1850MHz to 1910MHz WCDMA Band IV: 1710MHz to 1755MHz WCDMA Band V: 824MHz to 849MHz CDMA BC0: 824MHz to 849MHz CMDA BC1: 1850MHz to 1910MHz CDMA BC10: 806MHz to 824MHz LTE BAND 2: 1850MHz to 1910MHz LTE BAND 4: 1710MHz to 1755MHz LTE BAND 5: 824MHz to 849MHz LTE BAND 7: 2500MHz to 2570MHz LTE BAND 12: 699MHz to 716MHz LTE BAND 13: 777MHz to 787MHz LTE BAND 17: 704MHz to 716MHz LTE BAND 25: 1850MHz to 1915MHz LTE BAND 26: 814MHz to 849MHz LTE BAND 30: 2305MHz to 2315MHz LTE BAND 41: 2496MHz to 2690MHz Bluetooth: 2402MHz to 2480MHz WIFI 2.4G: 2412MHz to 2462MHz WIFI 5G: 5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz NFC: 13.56MHz
RX Frequency	GSM 850: 869MHz to 894MHz GSM 1900: 1930MHz to 1990MHz WCDMA Band II: 1930MHz to 1990MHz WCDMA Band IV: 2110MHz to 2155MHz WCDMA Band V: 869MHz to 894MHz CDMA BC0: 869MHz to 894MHz CMDA BC1: 1930MHz to 1990MHz CDMA BC10: 851MHz to 869MHz LTE BAND 2: 1930MHz to 1990MHz LTE BAND 4: 2110MHz to 2155MHz LTE BAND 5: 869MHz to 894MHz LTE BAND 7: 2620MHz to 2690MHz LTE BAND 12: 729MHz to 746MHz LTE BAND 13: 746MHz to 756MHz LTE BAND 17: 734MHz to 746MHz LTE BAND 25: 1930MHz to 1995MHz LTE BAND 26: 859MHz to 894MHz LTE BAND 29: 717MHz to 728MHz LTE BAND 30: 2350MHz to 2360MHz LTE BAND 41: 2496MHz to 2690MHz

	Bluetooth: 2402MHz to 2480MHz WIFI 2.4G:2412MHz to 2462MHz WIFI 5G:5150MHz to 5350MHz 5470MHz to 5725MHz 5725MHz to 5850MHz NFC:13.56MHz GPS: 1575.42MHz
S/N	84B0115623000336
HW Version	User release M MDA
SW Version	HL1NINAMH
EUT Accessory	
Data cable	Data Cable USB A Male to Micro USB, shielded
Adapter	Brand: HUAWEI Model: HW-050300U00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V === 3A Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd
Adapter	Brand: HUAWEI Model: HW-050300E00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V === 3A Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd
Adapter	Brand: HUAWEI Model: HW-050300B00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V === 3A Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd
Adapter	Brand: HUAWEI Model: HW-050300A00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V === 3A Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd
Adapter	Brand: HUAWEI Model: HW-050300J00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V === 3A

	<p>Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd</p>
Adapter	<p>Brand: HUAWEI Model: HW-050300R00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V  3A Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd</p>
Adapter	<p>Brand: HUAWEI Model: HW-050300I00 Input voltage: 100-240V 50/60Hz 0.5A Output voltage: 5V  3A Rated Power: 5W manufacturer: BYD Electronics Co., Ltd Phltek electronics Co., Ltd Salcomp Co., Ltd</p>
Rechargeable Li-ion	<p>Brand: HUAWEI Battery Model: HB416683ECW Rated capacity: 3450mAh Nominal Voltage:  +3.8V Charging Voltage:  +4.35V</p>

Remark: The above EUT's information is declared by manufacturer. Please refer to the specifications or user's manual for more detailed information.

1.2 Test Site Information

Test Site 1:	Reliability Laboratory of BTL Inc.
Test Site Location:	No.3,Jinshagang 1st Road,ShiXia,Dalang Town,DongGuan,China.

1.3 Applied Standards

APPLIED STANDARD

47 CFR FCC Part 15:2014

2 Summary of Results

Summary of Results				
Test Items	Test Mode	Performance Class & Required Performance Criteria	Result	Site
<u>Radiated Emissions</u> Enclosure Port	Mode1- Mode2 Mode 4	CLASS B	Pass	Site1
<u>Conducted Emissions</u> <input checked="" type="checkbox"/> DC Power Port <input checked="" type="checkbox"/> AC Power Port <input type="checkbox"/> Telecommunication Ports	Mode 1- Mode 4	CLASS B	Pass	Site1
Note: 1, Measurement taken is within the measurement uncertainty of measurement system. 2, <input checked="" type="checkbox"/> The item has been tested; <input type="checkbox"/> The item has not been tested				

During the measurement, the environmental conditions complied with the range listed as below.

Item	Required
Ambient temperature	15°C ~ 35°C
Relative humidity	25% ~ 75%
Atmospheric pressure	86kPa ~ 106kPa

3 System Configuration during EMC Test

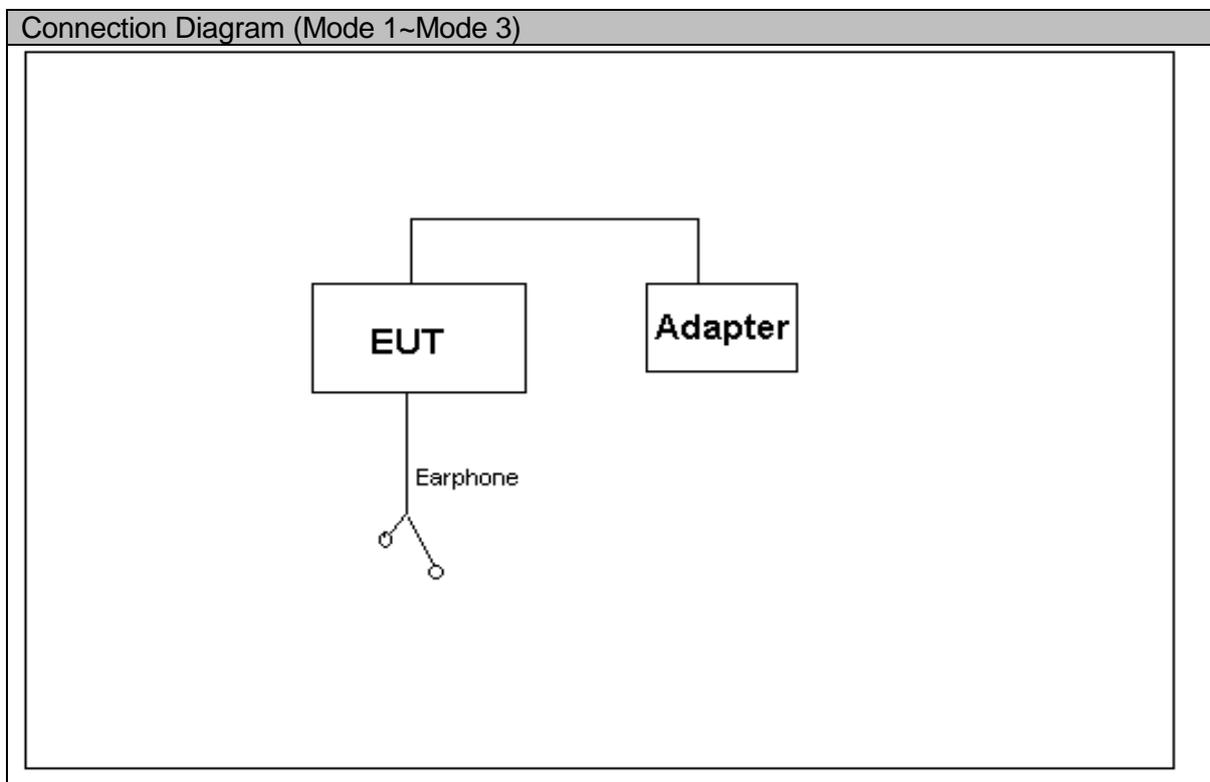
3.1 Test Mode

The EUT was configured, installed, arranged and operated in a manner consistent with typical application. The following mode(s) were applied during the compliance test.

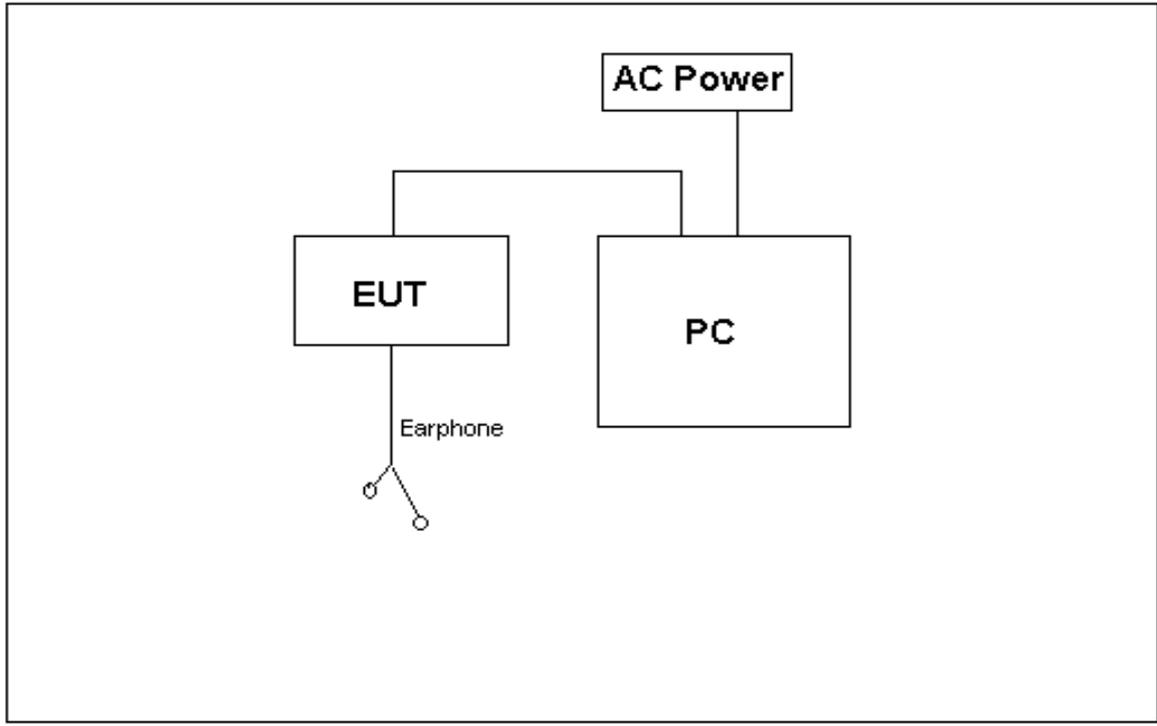
Test Mode	
Mode 1:	Adapter + earphone + Camera On + Idle
Mode 2:	Adapter + earphone + Playing + Idle
Mode 3:	Adapter + earphone + Traffic
Mode 4:	USB Copy(EUT with PC) + earphone + Idle

Remark: If there is more than one adapter, each one should be applied throughout the compliance test respectively, however, only the worst case will be recorded in this report.

3.2 Test System Configuration



Connection Diagram (Mode 4)



3.3 Cables Used during Test

Cable	Quantity	Length	Type of Cable
USB	1	<3m	Shielded
Earphone	1	<3m	Unshielded

3.4 Associated Equipment Used during Test

Name	Model	Manufacturer	S/N	Calibrated Deadline	Cal interval
Radio Communication Tester	CMU200	R&S	3607033573	2015-09-12	12
Radio Communication Tester	MT8820C	R&S	A110518805	2016-06-15	12
Notebook	X230	ThinkPad	A140110698	/	/

4 Electromagnetic Interference (EMI)

4.1 Radiated Disturbance 30MHz to 18GHz

4.1.1 Test Procedure

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4dB according to the standards: ANSI C63.4-2009. The test distance was 3m. The set-up and test methods were according to ANSI C63.4-2009.

A preliminary scan and a final scan of the emissions were made from 30 MHz to 18 GHz by using test script of software; The emissions were measured using Quasi-Peak Detector (30MHz~1GHz) and AV/PK detector (above 1GHz). The maximal emission value was acquired by adjusting the antenna height, polarisation and turntable azimuth in accordance with the software setup. Normally, the height range of antenna was 1m to 4m. The azimuth range of turntable was 0° to 360°. The receiving antenna has two polarizations V and H.

Measurement bandwidth (RBW) for 30MHz to 1000 MHz: 120 kHz;

Measurement bandwidth (RBW) for 1000MHz to 18000 MHz: 1MHz;

EUT was configured in idle mode and the test performed at worst emission state.

4.1.2 Test setup

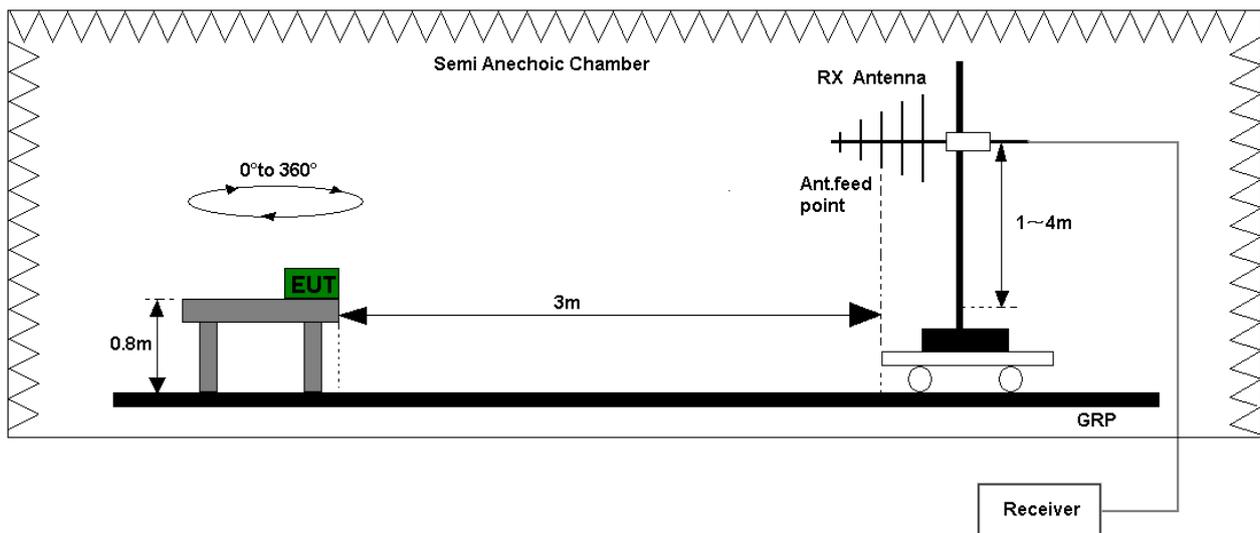


Figure 1. Test set-up of radiated disturbance(30MHz-1GHz)

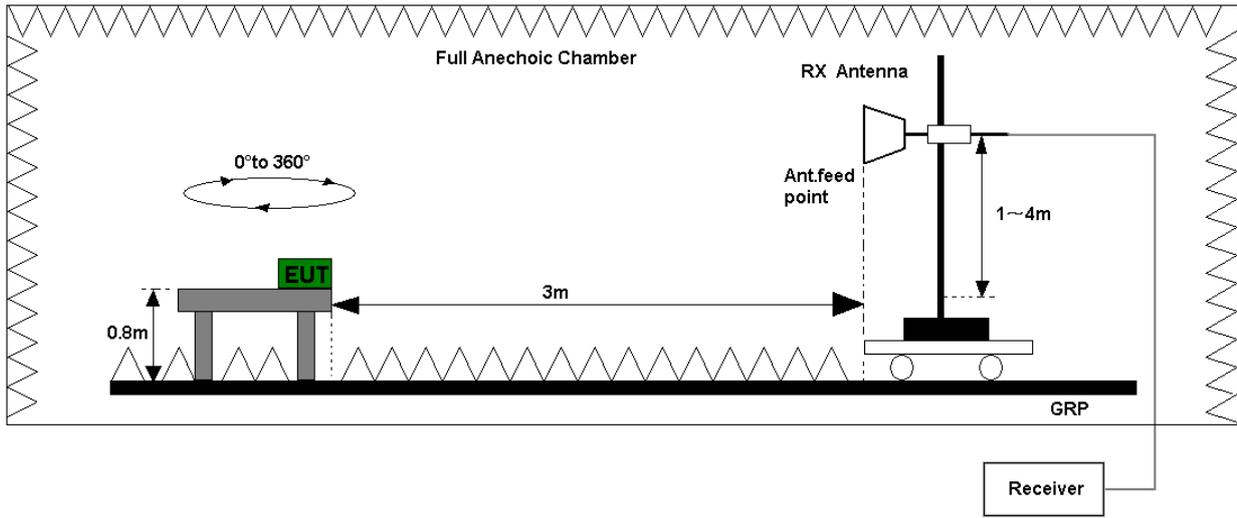


Figure 2. Test set-up of radiated disturbance(above 1GHz)

4.1.3 Test Results

The EUT has met the requirements for Radiated Emission of enclosure port.
Refer to the section 7 of this report for test data.

Test Limits (Class B)				
Frequency of Emission (MHz)	Radiated Limit			
	Unit(μ V/m)		Unit(dB μ V/m)	
30-88	100		40	
88-216	150		43.5	
216-960	200		46	
Above 960	500		54	
Above 1000	AV	PK	AV	PK
	500	5000	54	74

4.2 Conducted Disturbance 0.15 MHz to 30MHz

4.2.1 Test Procedure

The Table-top EUT was placed upon a non-metallic table 0.8 m above the horizontal metal reference ground plane. EUT was connected to LISN and LISN was connected to reference Ground Plane. EUT was 80cm away from LISN. The set-up and test methods were according to ANSI C63.4-2009. Conducted Disturbance at AC Port measurements were undertaken on the L and N Lines. The emissions were measured using a Quasi-Peak Detector and Average Detector. EUT was communicated with the simulator through Air interface, the simulator controls the EUT to transmitter the maximum power which defined in specification of product. The EUT operated on the typical channel.

Measurement bandwidth (RBW) for 150 kHz to 30 MHz: 9 kHz;

The EUT was set in the shielded chamber and operated under nominal conditions.

4.2.2 Test Setup

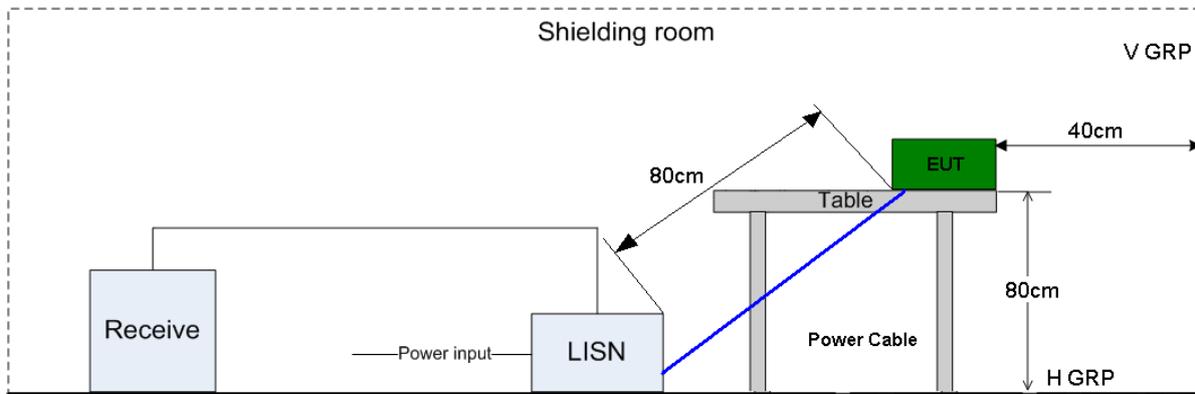


Figure 3. Test Set-up of conducted disturbance

4.2.3 Test Results

The EUT has met requirements for Conducted disturbance of power lines.

Refer to the section 7 of this report for test data.

Test Limit of AC Power Port		
Frequency range	150kHz ~ 30MHz	
Frequency	Voltage limits	
	QP (dB μ V)	AV (dB μ V)
0.15MHz~0.5MHz	66-56	56-46
0.5MHz-5MHz	56	46
5MHz~30MHz	60	50

5 Main Test Instruments

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Calibrated until
RE	Antenna	EMCO	3142C	66462	Mar. 28, 2016
	Antenna	EMCO	3142C	66464	Mar. 28, 2016
	Amplifier	Agilent	8447D	2944A11203	Nov.02, 2015
	Amplifier	Agilent	8447D	2944A11204	Nov. 02, 2015
	Spectrum Analyzer	Agilent	E4443A	MY48250370	Nov. 02, 2015
	RF Pre-selector	Agilent	N9039A	MY46520201	Nov. 02, 2015
	Test Cable	N/A	Cable_5m_8m_15m	N/A	Jan. 04, 2016
	Test Cable	N/A	Cable_5m_11m_15m	N/A	Jan. 04, 2016
	EMI Test Receiver	R&S	ESR3	101862	Jan.02, 2016
	Spectrum Analyzer	R&S	FSP40	100185	Nov. 02, 2015
	RF Pre-selector	Agilent	N9039A	MY46520214	Nov. 02, 2015
	Multi-Device Controller	ETS-Lindgren	2090	N/A	N/A
CE	Artificial-Mains Network	SCHWARZBECK	NSLK 8127	8127685	Dec. 05, 2015
	LISN	R&S	ENV216	100526	Mar. 28, 2016
	Test Cable	N/A	RG400 12m	N/A	Mar. 13, 2016
	EMI Test Receiver	R&S	ESCS30	826547/022	Mar. 28, 2016
	50Ω Terminator	SHX	TF2-3G-A	8122901	Mar. 28, 2016

Item	Kind of Equipment	Version
RE	EZ-EMC	BTL-2ANT-1
CE	EZ-EMC	NB-03A1-01

6 System Measurement Uncertainty

For a 95% confidence level, the measurement expanded uncertainties for defined systems, in accordance with the recommendations of ISO 17025 were:

System Measurement Uncertainty		
	Items	Extended Uncertainty
RE(30MHz-1GHz)	30MHz ~ 200MHz	U=3.80dB; k=2
	200MHz ~ 1,000MHz	U=4.05dB; k=2
RE(1GHz-6GHz)	Field strength (dB μ V/m)	U=4.51dB; k=2
CE	Disturbance Voltage (dB μ V)	U=3.4dB; k=2



7 Test Data and Graph

Only the worst test results were shown

7.1 Radiated Disturbance

7.1.1 30MHz~1GHz

Site: DG-CB02	Polarization: Vertical	Temperature: 24 (C)
Limit: FCC Class B 3m Radiation	Power:	Humidity: 52 %
EUT: Nina-A1	Distance: 3m	
M/N: RE	Mode:	
Note:		

Radiated Emission Measurement



MEASUREMENT RESULT:

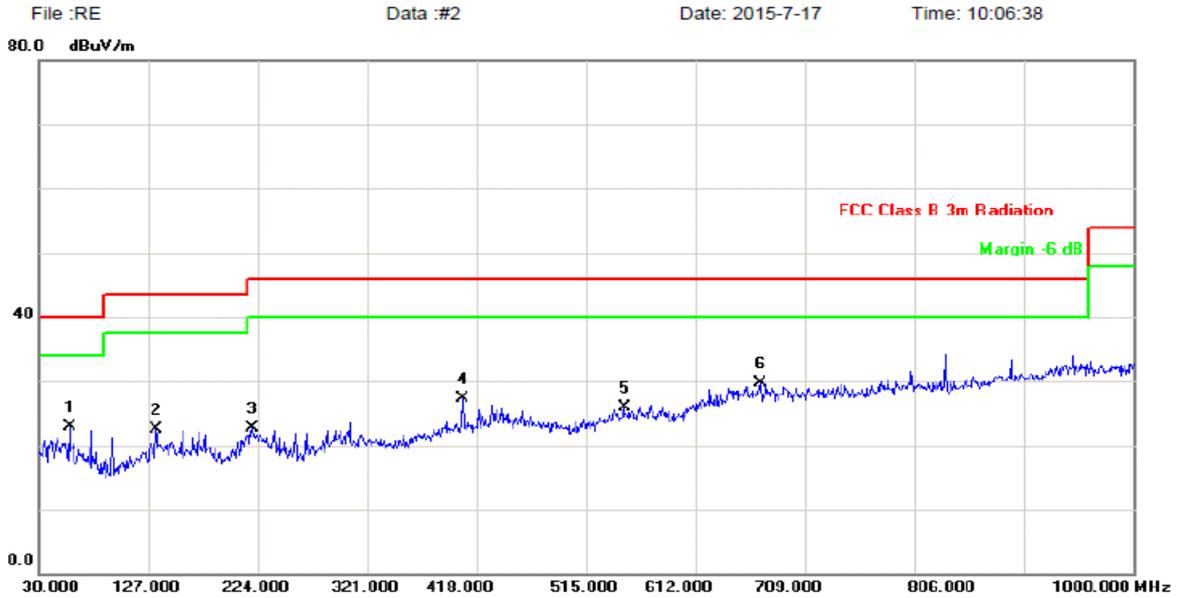
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		139.6100	36.94	-11.56	25.38	43.50	-18.12	QP	
2		243.4000	35.23	-12.49	22.74	46.00	-23.26	QP	
3		405.3900	35.95	-7.12	28.83	46.00	-17.17	QP	
4		567.3800	31.24	-4.63	26.61	46.00	-19.39	QP	
5		637.2200	32.52	-2.41	30.11	46.00	-15.89	QP	
6	*	834.1300	33.89	0.14	34.03	46.00	-11.97	QP	



Site: DG-CB02
Limit: FCC Class B 3m Radiation
EUT: Nina-A1
M/N: RE
Note:

Polarization: *Horizontal*
Power:
Distance: 3m
Mode:
Temperature: 24 (C)
Humidity: 52 %

Radiated Emission Measurement



MEASUREMENT RESULT: QP Detector

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		57.1600	36.01	-13.03	22.98	40.00	-17.02	QP	
2		133.7900	33.94	-11.53	22.41	43.50	-21.09	QP	
3		219.1500	36.17	-13.42	22.75	46.00	-23.25	QP	
4		405.3900	34.37	-7.12	27.25	46.00	-18.75	QP	
5		548.9500	30.54	-4.67	25.87	46.00	-20.13	QP	
6	*	669.2300	31.26	-1.57	29.69	46.00	-16.31	QP	

Note:

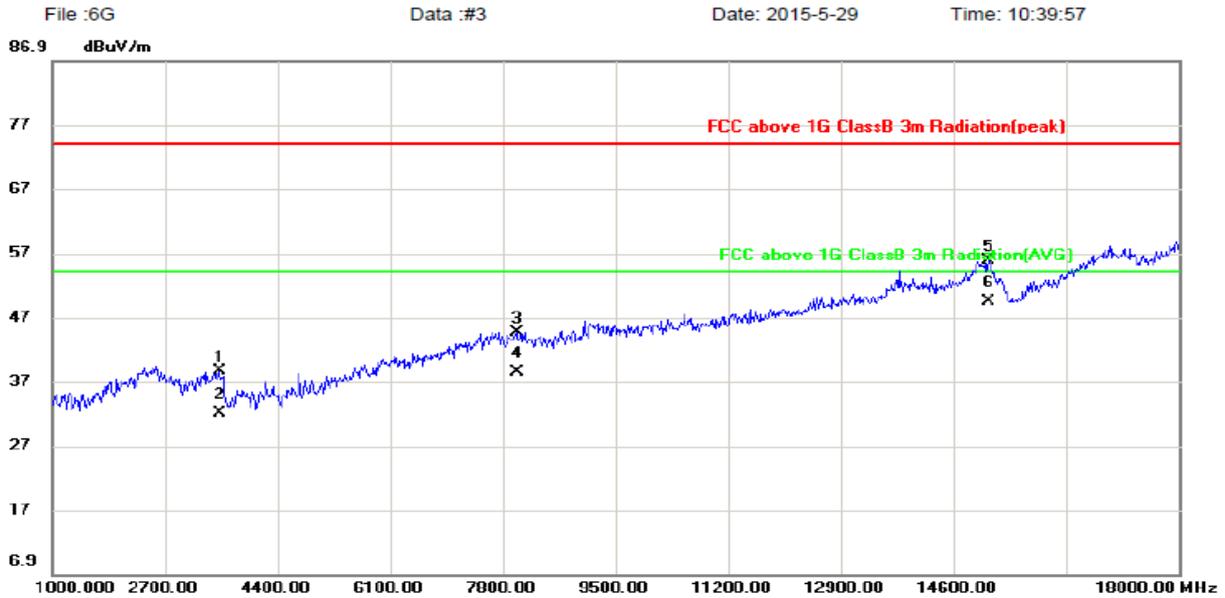
Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.



7.1.2 1GHz~18GHz

Site: DG-CB02	Polarization: Vertical	Temperature: 24 (C)
Limit: FCC above 1G ClassB 3m Radiation(peak)	Power:	Humidity: 52 %
EUT: Nina-A1	Distance: 3m	
M/N: RE-RZ	Mode:	
Note:		

Radiated Emission Measurement



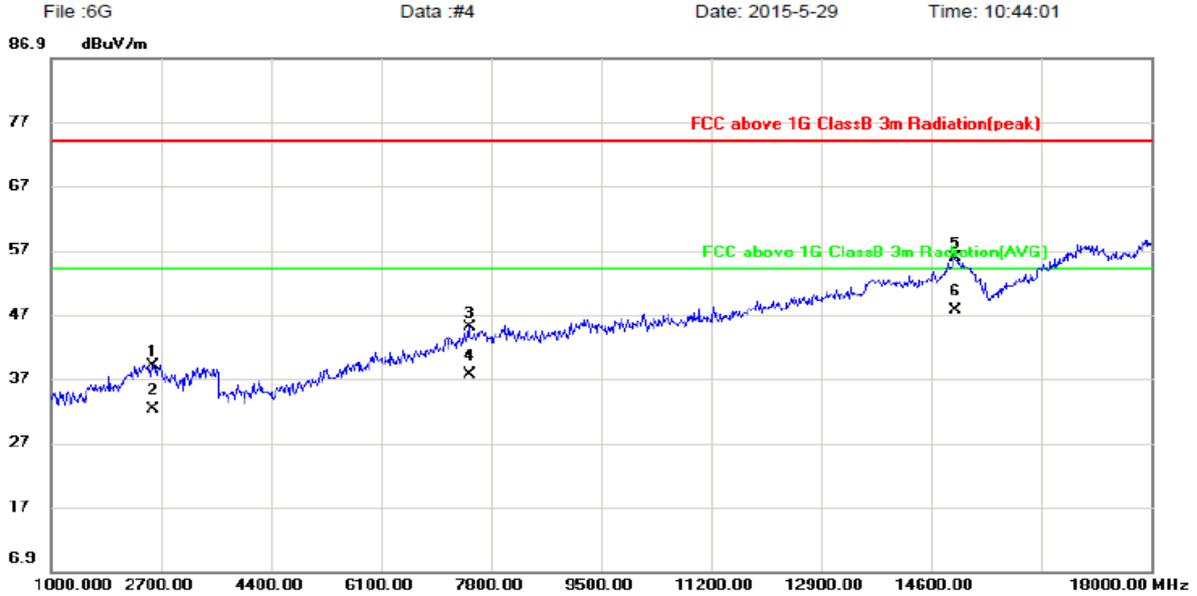
MEASUREMENT RESULT:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		3516.000	35.41	3.27	38.68	74.00	-35.32	peak	
2		3516.000	28.73	3.27	32.00	54.00	-22.00	AVG	
3		8004.000	29.18	15.45	44.63	74.00	-29.37	peak	
4		8004.000	22.89	15.45	38.34	54.00	-15.66	AVG	
5		15127.00	32.25	23.55	55.80	74.00	-18.20	peak	
6	*	15127.00	25.79	23.55	49.34	54.00	-4.66	AVG	



Site: DG-CB02	Polarization: <i>Horizontal</i>	Temperature: 24 (C)
Limit: FCC above 1G ClassB 3m Radiation(peak)	Power:	Humidity: 52 %
EUT: Nina-A1	Distance: 3m	
M/N: RE-RZ	Mode:	
Note:		

Radiated Emission Measurement



MEASUREMENT RESULT:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV/m	Limit dBuV/m	Margin dB	Detector	Comment
1		2564.000	37.08	1.99	39.07	74.00	-34.93	peak	
2		2564.000	30.29	1.99	32.28	54.00	-21.72	AVG	
3		7460.000	30.98	14.05	45.03	74.00	-28.97	peak	
4		7460.000	23.65	14.05	37.70	54.00	-16.30	AVG	
5		14974.00	30.73	25.03	55.76	74.00	-18.24	peak	
6	*	14974.00	22.66	25.03	47.69	54.00	-6.31	AVG	

Note:

Level = Reading level by receiver + Transd (Antenna factor + cable loss – preamplifier gain)
The reading level is calculated by software which is not shown in the sheet.

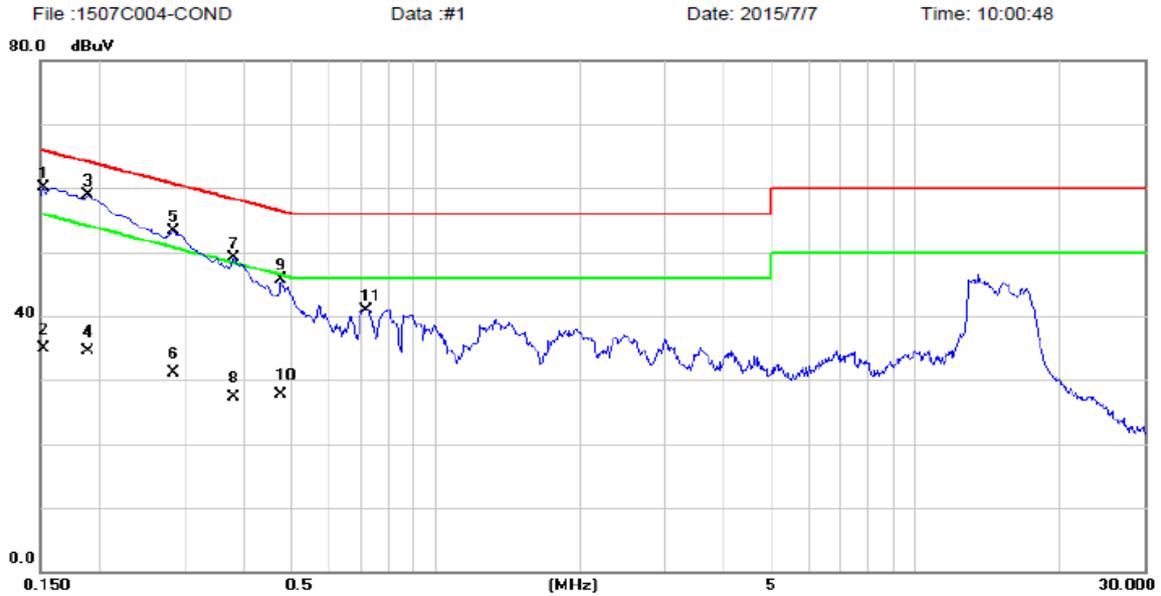


7.2 Conducted Disturbance

7.2.1 AC Port Test Data

Site: DG-C01	Phase: L1	Temperature: 21 (C)
Limit: FCC Class B Conduction(QP)	Power: AC 120V/60Hz	Humidity: 51 %
EUT: Nina-A1	Distance:	
M/N: Nina-A1	Mode:	
Note: 1#		

Conducted Emission Measurement



MEASUREMENT RESULT:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1		0.1522	50.53	9.67	60.20	65.88	-5.68	peak	
2		0.1522	25.30	9.67	34.97	55.88	-20.91	AVG	
3	*	0.1883	49.16	9.70	58.86	64.11	-5.25	peak	
4		0.1883	24.80	9.70	34.50	54.11	-19.61	AVG	
5		0.2850	43.48	9.75	53.23	60.67	-7.44	peak	
6		0.2850	21.40	9.75	31.15	50.67	-19.52	AVG	
7		0.3795	39.26	9.80	49.06	58.29	-9.23	peak	
8		0.3795	17.50	9.80	27.30	48.29	-20.99	AVG	
9		0.4762	35.93	9.82	45.75	56.41	-10.66	peak	
10		0.4762	17.80	9.82	27.62	46.41	-18.79	AVG	
11		0.7192	31.06	9.91	40.97	56.00	-15.03	peak	

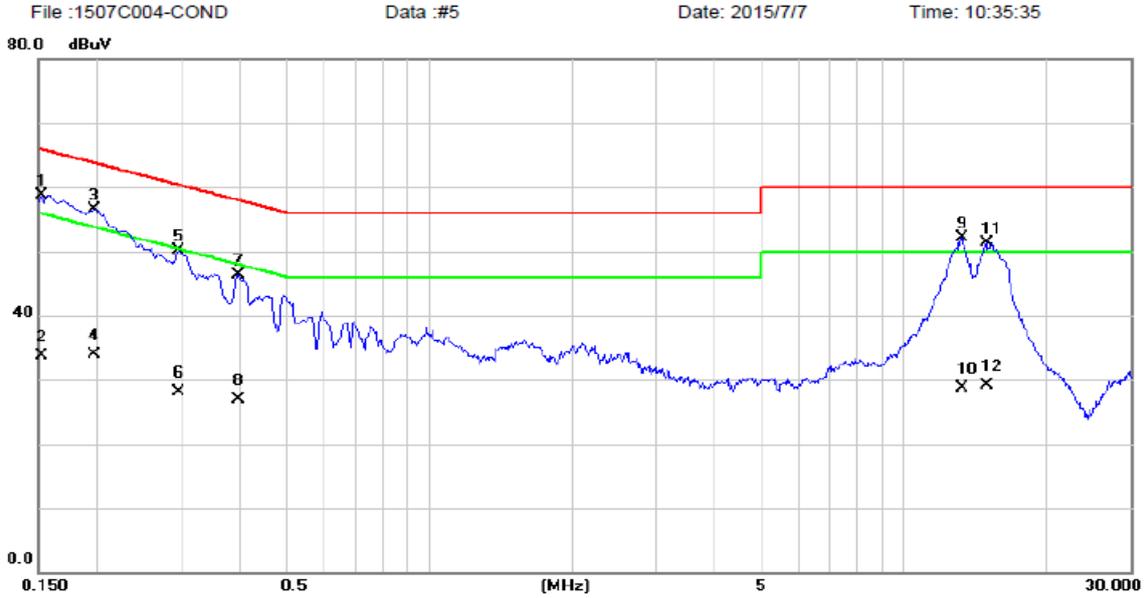


Site: DG-C01
Limit: FCC Class B Conduction(QP)
EUT: Nina-A1
M/N: Nina-A1
Note: 2#

Phase: **N**
Power: AC 120V/60Hz
Distance:
Mode:

Temperature: 21 (C)
Humidity: 51 %

Conducted Emission Measurement



MEASUREMENT RESULT:

No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Margin dB	Detector	Comment
1	*	0.1522	49.15	9.59	58.74	65.88	-7.14	peak	
2		0.1522	24.10	9.59	33.69	55.88	-22.19	AVG	
3		0.1973	46.97	9.61	56.58	63.72	-7.14	peak	
4		0.1973	24.20	9.61	33.81	53.72	-19.91	AVG	
5		0.2962	40.48	9.63	50.11	60.35	-10.24	peak	
6		0.2962	18.50	9.63	28.13	50.35	-22.22	AVG	
7		0.3952	36.66	9.63	46.29	57.95	-11.66	peak	
8		0.3952	17.30	9.63	26.93	47.95	-21.02	AVG	
9		13.2450	41.96	10.18	52.14	60.00	-7.86	peak	
10		13.2450	18.50	10.18	28.68	50.00	-21.32	AVG	
11		14.9393	40.97	10.27	51.24	60.00	-8.76	peak	
12		14.9393	18.80	10.27	29.07	50.00	-20.93	AVG	

END