

FCC Test Report

FCC ID: 2ABGW-AM2308G

Product : MID

Trade Name : ARTAB

Model Number : AM2308G

Serial Model : AM7001G

Report No. : NTEK-2014NT0416547F5

Prepared for

Hong Kong Topsky Technology Limited.

Unit 5, 27/F., Richmond Commercial Building, 109 Argyle Street,
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Prepared by

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TEST RESULT CERTIFICATION

Applicant's name : Hong Kong Topsky Technology Limited.
Address : Unit 5, 27/F., Richmond Commercial Building, 109 Argyle Street,
Mongkok, Kowloon, Hong Kong

Manufacturer's Name : Hong Kong Topsky Technology Limited.
Address : Unit 5, 27/F., Richmond Commercial Building, 109 Argyle Street,
Mongkok, Kowloon, Hong Kong

Product description

Product name : MID
Model and/or type reference : AM2308G
Standards : FCC Part15B:2012
ANSI C63.4:2003

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with Part 15 of FCC Rules. And it is applicable only to the tested sample identified in the report.

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Date of Test

Date (s) of performance of tests : 16 Apr. 2014 ~ 23 Apr. 2014
Date of Issue : 23 Apr. 2014
Test Result : **Pass**

Testing Engineer : Apple Huang
(Apple Huang)

Technical Manager : Brown Lu
(Brown Lu)

Authorized Signatory : Bovey Yang
(Bovey Yang)

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1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2012	Conducted Emission	Class B	PASS	
ANSI C63.4: 2003	Radiated Emission	Class B	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

1.1 TEST FACILITY

NTEK Testing Technology Co., Ltd

Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen P.R. China.

FCC Registration Number:238937; IC Registration Number:9270A-1

CNAS Registration Number:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of $k=2$, providing a level of confidence of approximately **95 %**.

A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	3.2	

B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U , (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	4.7	
		1GHz ~6GHz	5.0	

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	MID				
Model Name	AM2308G				
Additional Model Number(s)	AM7001G				
Model Difference	All the model are the same circuit and RF module, except the model name and colour.				
Product Description	<p>The EUT is a MID.</p> <table border="1"><tr><td>Operating frequency:</td><td>2402~2480 MHz</td></tr><tr><td>Connecting I/O port:</td><td>USB</td></tr></table> <p>Based on the application, features, or specification exhibited in User's Manual, the EUT is considered as an ITE/Computing Device. More details of EUT technical specification, please refer to the User's Manual.</p>	Operating frequency:	2402~2480 MHz	Connecting I/O port:	USB
Operating frequency:	2402~2480 MHz				
Connecting I/O port:	USB				
Power Source	DC Voltage				
Adapter	Mode: FLD710-5.0V1.5A Input: 100-240V~, 50/60Hz, 0.3AMAX Output: 5.0V---, 1.5A				
Battery	DC 3.7V, 2800mAh				

2.1.1 DESCRIPTION OF TEST MODES

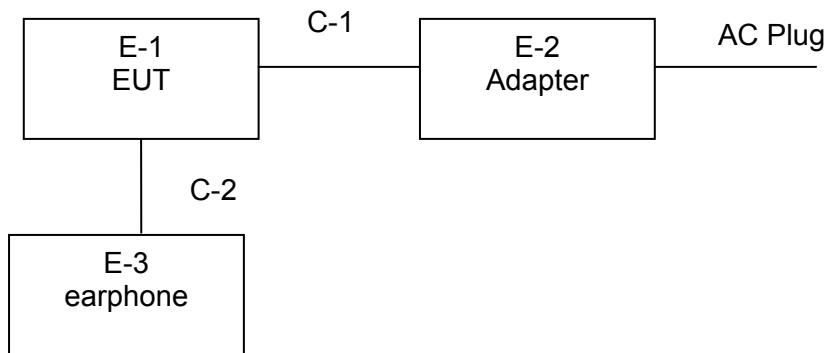
To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned above was evaluated respectively.

Pretest Mode	Description
Mode 1	Downloading

For Conducted Test	
Final Test Mode	Description
Mode 1	Downloading

For Radiated Test	
Final Test Mode	Description
Mode 1	Downloading

2.2 DESCRIPTION OF TEST SETUP



2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) "YES" means "shielded" "with core"; "NO" means "unshielded" "without core".

2.4 MEASUREMENT INSTRUMENTS LIST

2.4.1 CONDUCTED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	LISN	R&S	ENV216	101313	Jul. 06, 2013	Jul. 05, 2014	1 year
2	LISN	SCHWARZBECK	NNLK 8129	8129245	Dec. 25, 2013	Dec. 24, 2014	1 year
3	Pulse Limiter	SCHWARZBECK	VTSD 9561F	9716	Dec. 25, 2013	Dec. 24, 2014	1 year
4	50Ω Switch	ANRITSU CORP	MP59B	6200983704	Jul. 06, 2013	Jul. 05, 2014	1 year
5	Test Cable	N/A	C01	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
6	Test Cable	N/A	C02	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
7	Test Cable	N/A	C03	N/A	Jul. 06, 2013	Jul. 05, 2014	1 year
8	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2013	Jul. 05, 2014	1 year
9	Passive Voltage Probe	ESH2-Z3	R&S	100196	Jul. 06, 2013	Jul. 05, 2014	1 year
10	Triple-Loop Antenna	EVERFINE	LIA-2	11020003	Jul. 06, 2013	Jul. 05, 2014	1 year
11	Absorbing Clamp	R&S	MDS-21	100423	Jul. 08, 2013	Jul. 07, 2014	1 year

2.4.2 RADIATED TEST SITE

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Bilog Antenna	TESEQ	CBL6111D	31216	Jul. 06, 2013	Jul. 05, 2014	1 year
2	Test Cable	N/A	R-01	N/A	Dec. 25, 2013	Dec. 24, 2014	1 year
3	Test Cable	N/A	R-02	N/A	Dec. 25, 2013	Dec. 24, 2014	1 year
4	EMI Test Receiver	R&S	ESCI-7	101318	Jul. 06, 2013	Jul. 05, 2014	1 year
5	Antenna Mast	EM	SC100_1	N/A	N/A	N/A	N/A
6	Turn Table	EM	SC100	060531	N/A	N/A	N/A
7	50Ω Switch	Anritsu Corp	MP59B	6200983705	Jul. 06, 2013	Jul. 05, 2014	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06, 2013	Jul. 05, 2014	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06, 2013	Jul. 05, 2014	1 year
10	Amplifier	EM	EM-30180	060538	Jul. 06, 2013	Jul. 05, 2014	1 year

3. EMC EMISSION TEST

3.1 CONDUCTED EMISSION MEASUREMENT

3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 -0.5	79.00	66.00	66 - 56 *	56 - 46 *
0.50 -5.0	73.00	60.00	56.00	46.00
5.0 -30.0	73.00	60.00	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " * " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

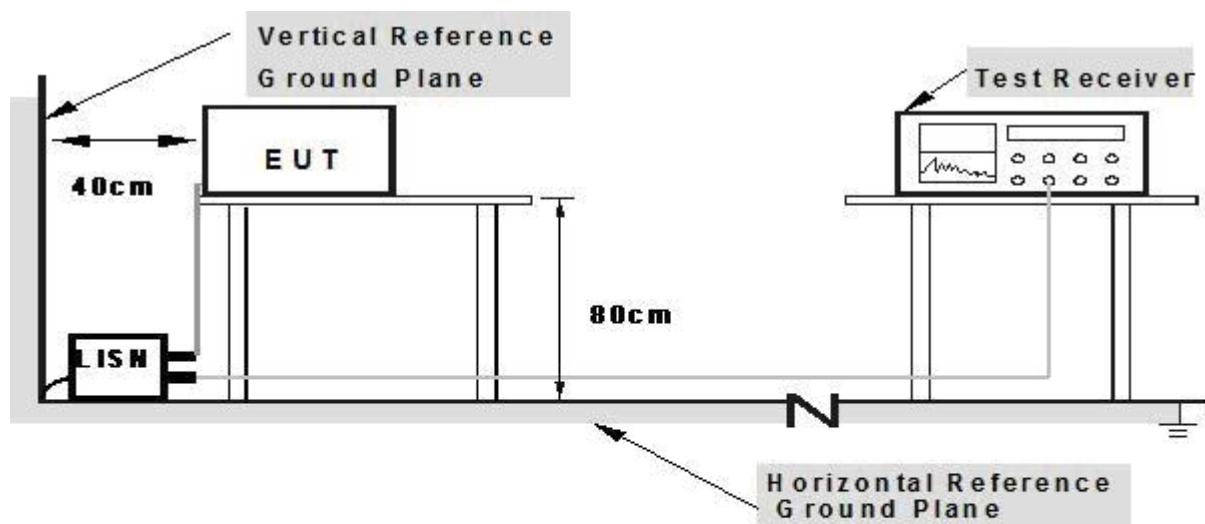
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

3.1.2 TEST PROCEDURE

- a. The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b. Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- c. I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- d. LISN at least 80 cm from nearest part of EUT chassis.
- e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.1.3 TEST SETUP



Note: 1. Support units were connected to second LISN.

2. Both of LISNs (A&B) are 80 cm from EUT and at least 80 cm from other units and other metal planes

3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

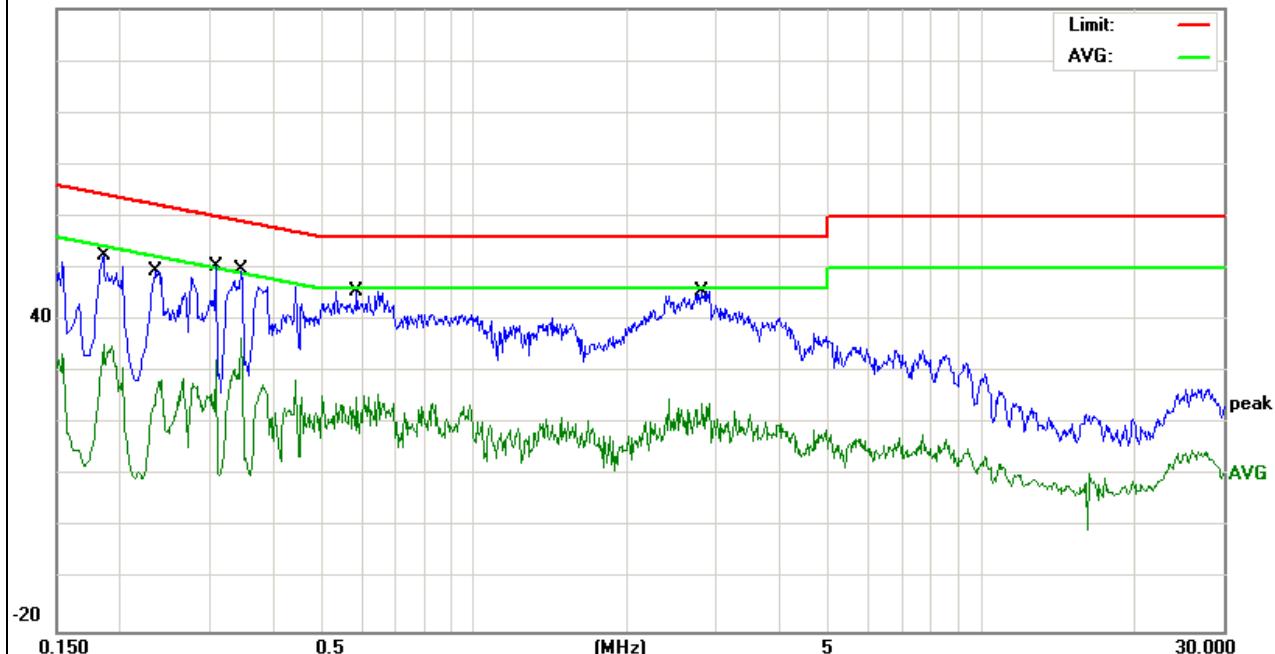
3.1.5 TEST RESULTS

EUT :	MID	Model Name. :	AM2308G
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-04-23
Test Mode :	Mode 1	Phase :	L
Test Voltage :	DC 5V From Adapter AC 120V/60Hz		

Frequency (MHz)	Reading Level (dB μ V)	Correct Factor (dB)	Measure-ment (dB μ V)	Limits (dB μ V)	Margin (dB)	Detector Type
						AVG
0.1859	43.07	9.53	52.60	64.21	-11.61	AVG
0.1859	25.69	9.53	35.22	54.21	-18.99	QP
0.2353	40.11	9.49	49.60	62.26	-12.66	QP
0.2353	18.85	9.49	28.34	52.26	-23.92	AVG
0.3099	40.90	9.50	50.40	59.97	-9.57	QP
0.3099	22.81	9.50	32.31	49.97	-17.66	AVG
0.3463	40.10	9.50	49.60	59.05	-9.45	QP
0.3463	26.95	9.50	36.45	49.05	-12.60	AVG
0.5859	36.09	9.51	45.60	56.00	-10.40	QP
0.5859	15.91	9.51	25.42	46.00	-20.58	AVG
2.8060	36.13	9.57	45.70	56.00	-10.30	QP
2.8060	14.53	9.57	24.10	46.00	-21.90	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

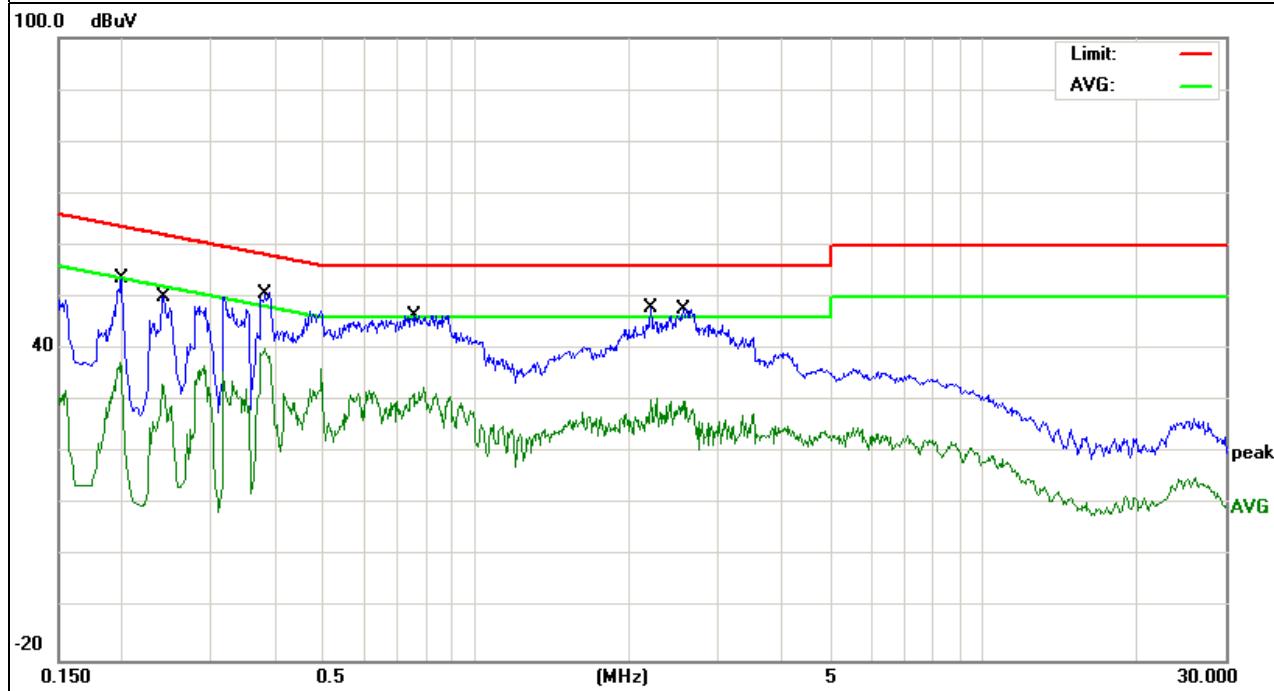
100.0 dB μ V

EUT :	MID	Model Name. :	AM2308G
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-04-23
Test Mode :	Mode 1	Phase :	N
Test Voltage :	DC 5V From Adapter AC 120V/60Hz		

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Detector Type
(MHz)	(dB μ V)	(dB)	(dB μ V)	(dB μ V)	(dB)	
0.1985	44.09	9.51	53.60	63.67	-10.07	QP
0.1985	28.08	9.51	37.59	53.67	-16.08	AVG
0.2391	40.70	9.50	50.20	62.12	-11.92	QP
0.2391	23.64	9.50	33.14	52.12	-18.98	AVG
0.3860	41.48	9.52	51.00	58.15	-7.15	QP
0.3860	29.34	9.52	38.86	48.15	-9.29	AVG
0.7539	37.06	9.54	46.60	56.00	-9.40	QP
0.7539	21.98	9.54	31.52	46.00	-14.48	AVG
2.2058	38.33	9.57	47.90	56.00	-8.10	QP
2.2058	20.84	9.57	30.41	46.00	-15.59	AVG
2.5619	38.23	9.57	47.80	56.00	-8.20	QP
2.5619	20.46	9.57	30.03	46.00	-15.97	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.2 RADIATED EMISSION MEASUREMENT

3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (at 10m)	Class B (at 3m)
	dBuV/m	dBuV/m
30 ~ 88	39.0	40.0
88 ~ 216	43.5	43.5
216 ~ 960	46.5	46.0
Above 960	49.5	54.0

Notes:

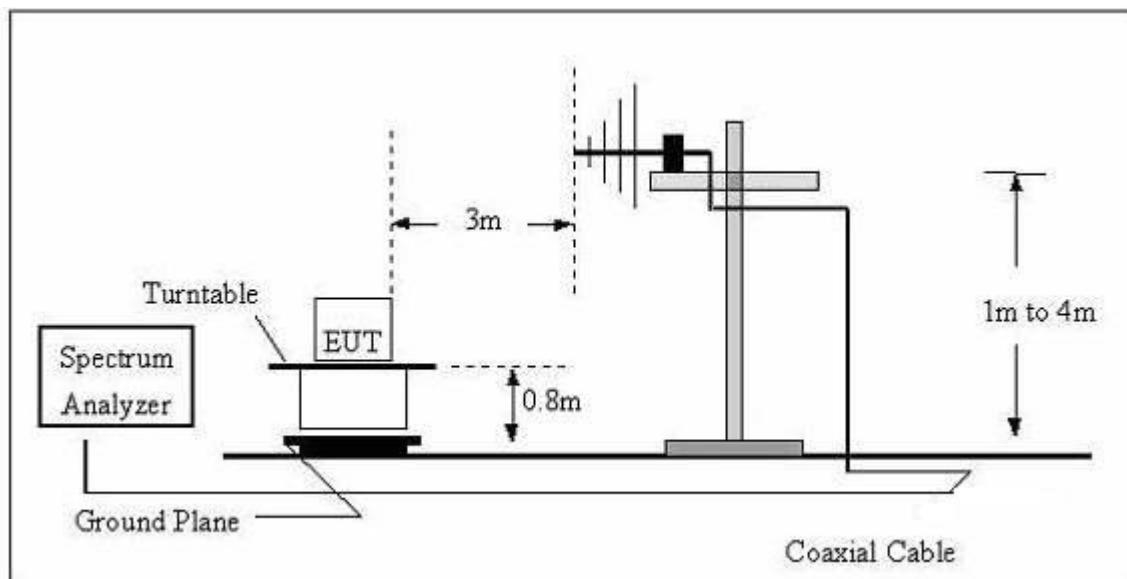
- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

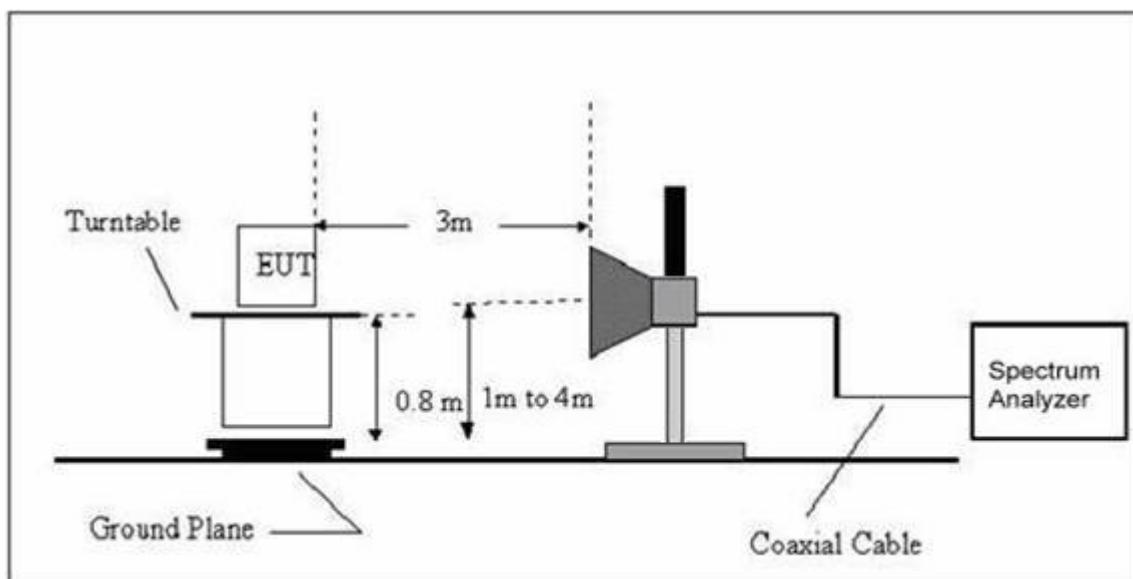
- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The height of the equipment or of the substitution antenna shall be 0.8 m; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured, above 1G Average detector mode will be instead.
- e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP(AV) Limits and then no additional QP Mode measurement performed.
- f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.2.3 TEST SETUP

(A) Radiated Emission Test Set-Up Frequency Below 1 GHz



(B) Radiated Emission Test Set-Up Frequency Above 1GHz



3.2.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

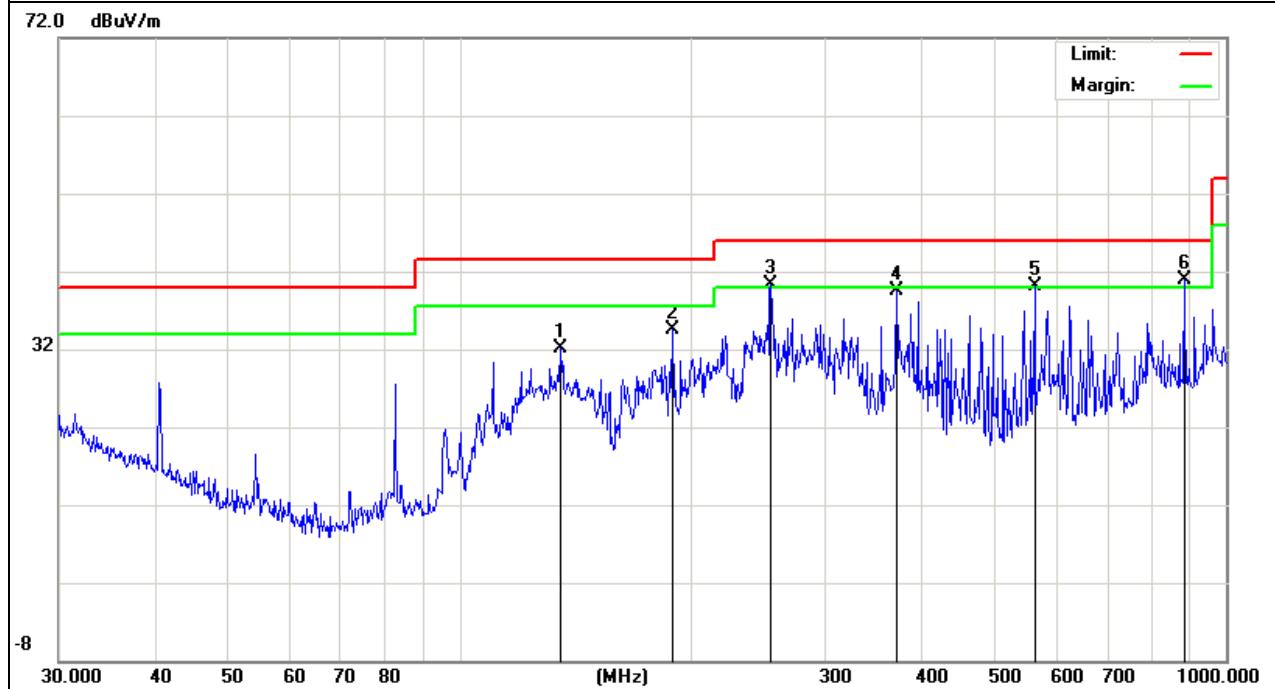
3.2.5 TEST RESULTS

EUT :	MID	Model Name :	AM2308G
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-04-23
Test Mode :	Mode 1	Polarization :	Horizontal
Test Power :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Detector
135.5062	20.58	11.44	32.02	43.50	-11.48	QP
189.7384	25.74	8.74	34.48	43.50	-9.02	QP
254.7282	28.25	12.07	40.32	46.00	-5.68	QP
372.0045	23.04	16.37	39.41	46.00	-6.59	QP
562.6624	19.59	20.52	40.11	46.00	-5.89	QP
881.4067	18.05	22.82	40.87	46.00	-5.13	QP

Remark:

1. Factor = Antenna Factor + Cable Loss - Amplifier.

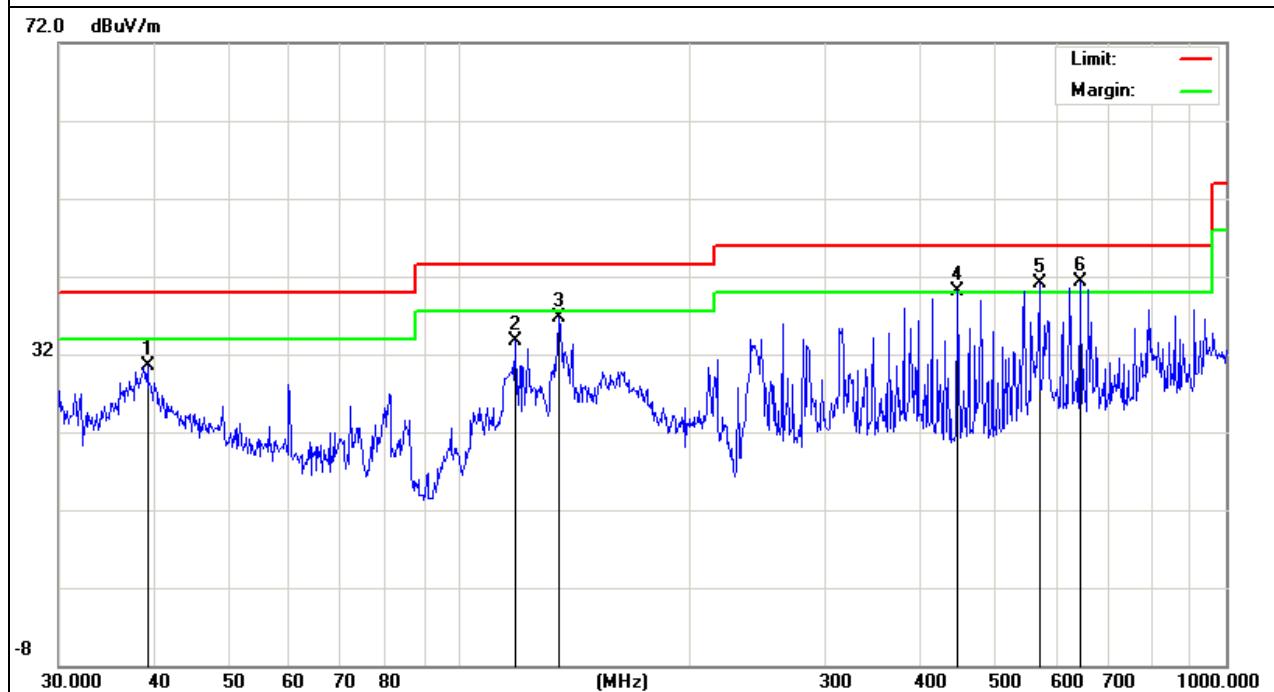


EUT :	MID	Model Name :	AM2308G
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-04-23
Test Mode :	Mode 1	Polarization :	Vertical
Test Power :	DC 5V From Adapter AC 120V/60Hz		

	Freq.	Reading	Factor	Measurement	Limit	Over	Detector
	(MHz)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	
	39.1613	16.17	14.35	30.52	40.00	-9.48	QP
	118.1860	20.87	12.74	33.61	43.50	-9.89	QP
	135.0319	25.29	11.45	36.74	43.50	-6.76	QP
	446.4141	24.07	16.10	40.17	46.00	-5.83	QP
	570.6100	20.71	20.41	41.12	46.00	-4.88	QP
	645.1195	22.17	19.20	41.37	46.00	-4.63	QP

Remark:

1. Factor = Antenna Factor + Cable Loss - Amplifier.

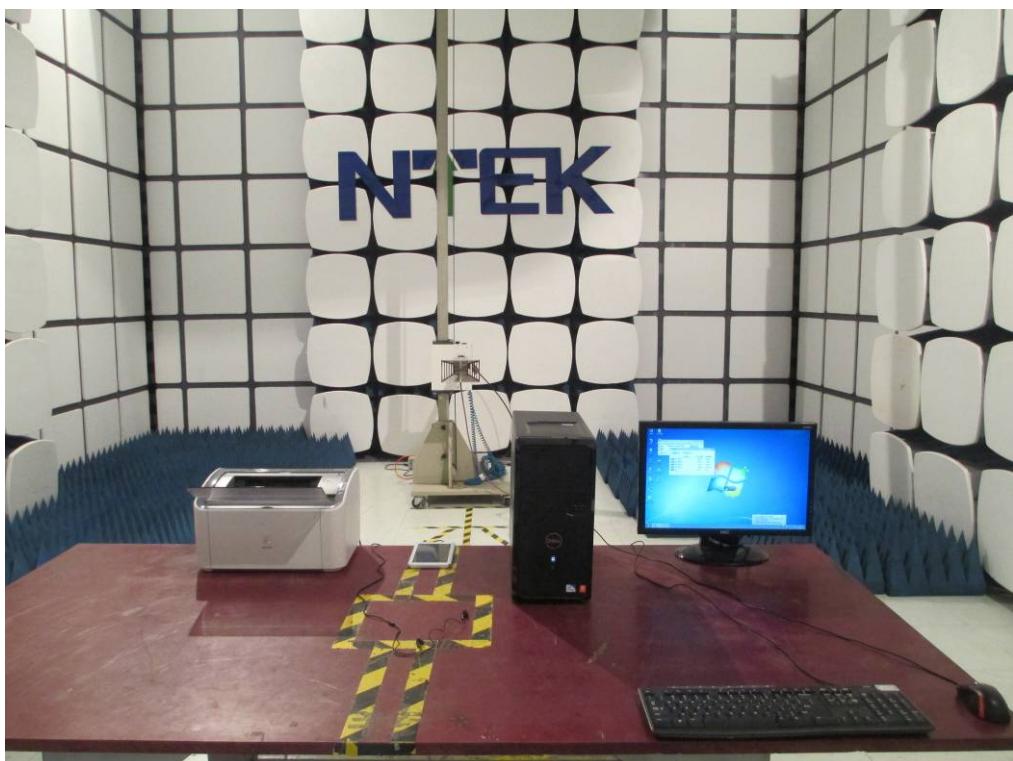
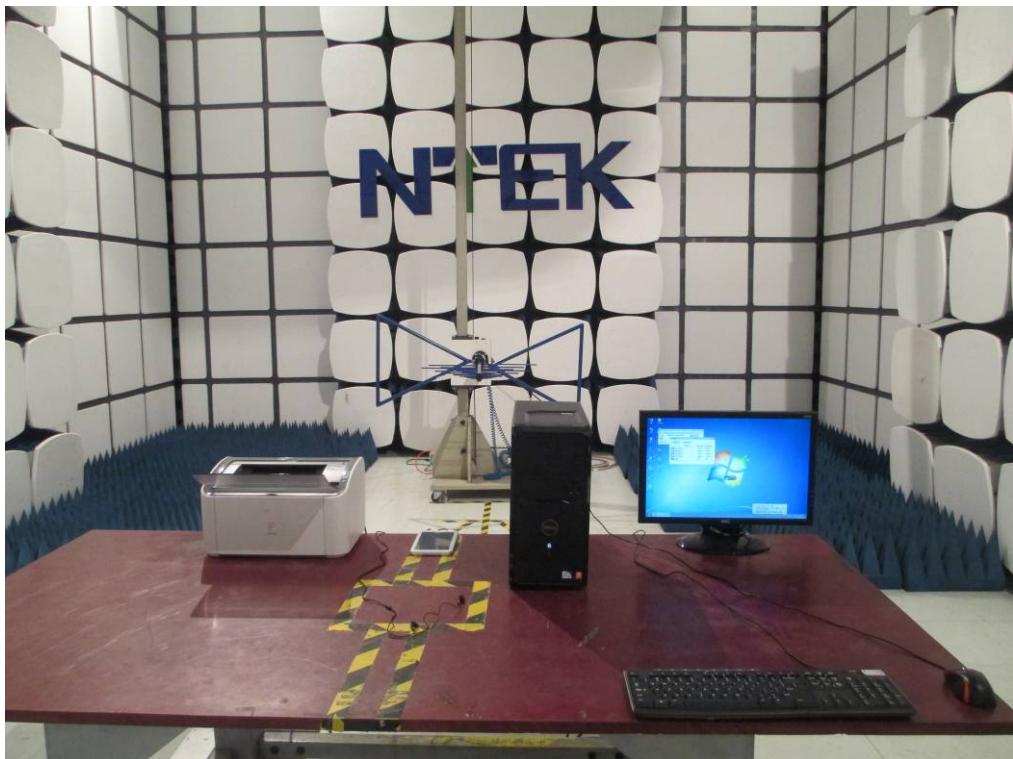


3.2.6 TEST RESULTS(Above 1GHz)

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
V	5335.000	55.75	-4.60	51.15	74.00	-22.85	peak
V	5335.000	34.16	-4.60	29.56	54.00	-24.44	AVG
V	7672.500	48.49	0.01	48.50	74.00	-25.50	peak
V	7672.500	31.28	0.01	31.29	54.00	-22.71	AVG
V	8735.000	49.29	0.96	50.25	74.00	-23.75	peak
V	8735.000	28.47	0.96	29.43	54.00	-24.57	AVG
V	10945.000	46.73	4.37	51.10	74.00	-22.90	peak
V	10945.000	26.09	4.37	30.46	54.00	-23.54	AVG
V	15875.000	44.30	4.50	48.80	74.00	-25.20	peak
V	15875.000	23.21	4.50	27.71	54.00	-26.29	AVG
V	17150.000	37.63	12.22	49.85	74.00	-24.15	peak
V	17150.000	15.74	12.22	27.96	54.00	-26.04	AVG
H	2360.000	66.31	-13.26	53.05	74.00	-20.95	peak
H	2360.000	43.07	-13.26	29.81	54.00	-24.19	AVG
H	4442.500	55.23	-5.58	49.65	74.00	-24.35	peak
H	4442.500	34.02	-5.58	28.44	54.00	-25.56	AVG
H	6057.500	53.58	-3.33	50.25	74.00	-23.75	peak
H	6057.500	32.92	-3.33	29.59	54.00	-24.41	AVG
H	7757.500	51.85	0.10	51.95	74.00	-22.05	peak
H	7757.500	29.36	0.10	29.46	54.00	-24.54	AVG
H	8862.500	50.59	1.01	51.60	74.00	-22.40	peak
H	8862.500	26.64	1.01	27.65	54.00	-26.35	AVG
H	13835.000	44.80	5.65	50.45	74.00	-23.55	peak
H	13835.000	23.24	5.65	28.89	54.00	-25.11	AVG

Remark:

Absolute Level= ReadingLevel+ Factor, Margin= Absolute Level - Limit

4. EUT TEST PHOTO**Radiated Measurement Photos**

Conducted Measurement Photos