

FCC Test Report

FCC ID: 2ABGW-AM2308G

Product : MID

Trade Name : ARTAB

Model Number : AM2308G

Serial Model : AM7001G

Report No. : NTEK-2014NT12022115F5

Prepared for

Hong Kong Topsky Technology Limited.

Unit 5, 27/F., Richmond Commercial Building, 109 Argyle Street,
Mongkok, Kowloon, Hong Kong

Prepared by

Shenzhen NTEK Testing Technology Co., Ltd.

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

Tel.: +86-0755-61156588 Fax.: +86-0755-61156599
Website: www.ntek.org.cn

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
FCC Part15B:01 Oct.2014

Standards : 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.

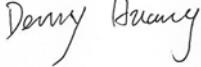
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Date of Test :

Date (s) of performance of tests : 02 Dec. 2014 ~ 11 Dec. 2014

Date of Issue : 11 Dec. 2014

Test Result : **Pass**

Testing Engineer : 

Denny Huang

Technical Manager : 

(Brown Lu)

Authorized Signatory : 

(Bill Yao)

Table of Contents	Page
1 . TEST SUMMARY	4
1.1 TEST FACILITY	5
1.2 MEASUREMENT UNCERTAINTY	5
2 . GENERAL INFORMATION	6
2.1 GENERAL DESCRIPTION OF EUT	6
2.2 DESCRIPTION OF TEST SETUP	8
2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL	9
2.4 MEASUREMENT INSTRUMENTS LIST	10
3 . EMC EMISSION TEST	11
3.1 CONDUCTED EMISSION MEASUREMENT	11
3.1.1 POWER LINE CONDUCTED EMISSION	11
3.1.2 TEST PROCEDURE	12
3.1.3 TEST SETUP	12
3.1.4 EUT OPERATING CONDITIONS	12
3.1.5 TEST RESULTS	13
3.2 RADIATED EMISSION MEASUREMENT	15
3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT	15
3.2.2 TEST PROCEDURE	15
3.2.3 TEST SETUP	16
3.2.4 EUT OPERATING CONDITIONS	16
3.2.5 TEST RESULTS	17
3.2.6 TEST RESULTS(Above 1GHz)	19
4 . EUT TEST PHOTO	20

1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission				
Standard	Test Item	Limit	Judgment	Remark
FCC Part15B:2014	Conducted Emission	Class B	PASS	
ANSI C63.4: 2003	Radiated Emission	Class B	PASS	

Note : 1.N/A=Not Applicable.

2.This C2PC testing , the changed is: Only change the shape of the Mainboard and layout of board, Circuit and RF module are the same.

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> <p>Connecting I/O port: USB, DC in ,HDMI</p> <p>Operation Frequency: BT:2402~2480 MHz WIFI: 802.11b/g/n(20MHz): 2412~2462MHz 802.11n(40MHz):2422~2452MHz</p> <p>Modulation Type: BT(1Mbps): GFSK BT EDR(2Mbps): $\pi/4$-DQPSK BT EDR(3Mbps): 8-DPSK WIFI: CCK/OFDM/DBPSK/DAPSK</p> <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>	
Power Source	DC Voltage	
Adapter	Mode: FJ-SW0501500UU Input: 100-240V~,50/60Hz,0.35AMAX Output: 5.0V---, 1500mAh	
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.

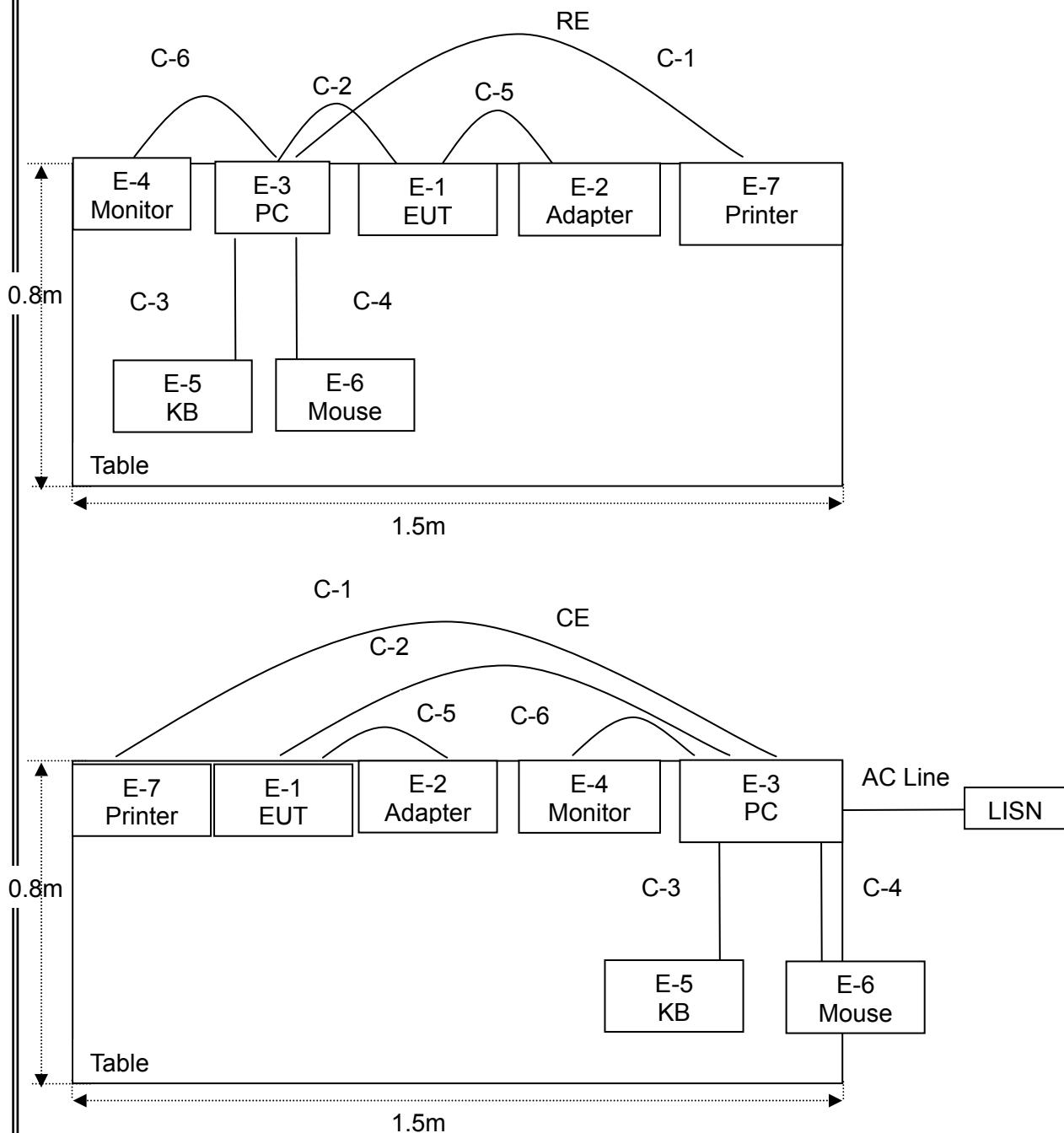
Pretest Mode	Description
Mode 1	Playing+chagring
Mode 2	HDMI
Mode 3	Data Exchange
Mode 4	REC Mode

For Conducted Test	
Final Test Mode	Description
Mode 1	Playing+chagring
Mode 2	HDMI
Mode 3	Data Exchange
Mode 4	REC Mode

For Radiated Test	
Final Test Mode	Description
Mode 1	Playing+chagring
Mode 2	HDMI
Mode 3	Data Exchange
Mode 4	REC Mode

Note: Final Test Mode: Through Pre-scan, find the mode 3 is the worse case.
Only the worst case mode is recorded in the report.

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.

Item	Equipment	Brand	Model/Type No.	Series No.	Note
E-1	MID	ARTAB	AM2308G	N/A	EUT
E-2	ADAPTER	N/A	FJ-SW0501500UU	N/A	
E-3	Personal computer	DELL	FT4Y23X	34413561645	
E-4	Monitor	DELL	IN2020MB	cn-0y6mhx-74261-11f-67es	
E-5	Keyboard	DELL	SK-8185	OY526KUS	
E-6	Mouse	DELL	MS111-P	cn-011d3v-71581-11e-1th7	
E-7	Printer	Canon	L11121E	LBP2900	

Item	Shielded Type	Ferrite Core	Length	Note
C-1	NO	NO	1.2m	
C-2	NO	NO	1.0m	
C-3	NO	NO	1.0m	
C-4	NO	NO	1.0m	
C-5	NO	NO	1.0m	
C-6	NO	NO	1.0m	

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, 2014	Jul. 05, 2015	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, 2014	Jul. 05, 2015	1 year
5	Test Cable	N/A	C01	N/A	Jul. 06, 2014	Jul. 05, 2015	1 year
6	Test Cable	N/A	C02	N/A	Jul. 06, 2014	Jul. 05, 2015	1 year
7	Test Cable	N/A	C03	N/A	Jul. 06, 2014	Jul. 05, 2015	1 year
8	EMI Test Receiver	R&S	ESCI	101160	Jul. 06, 2014	Jul. 05, 2015	1 year
9	Passive Voltage Probe	ESH2-Z3	R&S	100196	Jul. 06, 2014	Jul. 05, 2015	1 year
10	Absorbing Clamp	R&S	MDS-21	100423	Jul. 08, 2014	Jul. 07, 2015	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, 2014	Jul. 05, 2015	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, 2014	Jul. 05, 2015	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, 2014	Jul. 05, 2015	1 year
8	Spectrum Analyzer	Aglient	E4407B	MY45108040	Jul. 06, 2014	Jul. 05, 2015	1 year
9	Horn Antenna	EM	EM-AH-10180	2011071402	Jul. 06, 2014	Jul. 05, 2015	1 year
10	Amplifier	EM	EM-30180	060538	Jul. 06, 2014	Jul. 05, 2015	1 year
11	Loop Antenna	ARA	PLA-1030/B	1029	Jul. 06, 2014	Jul. 05, 2015	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.

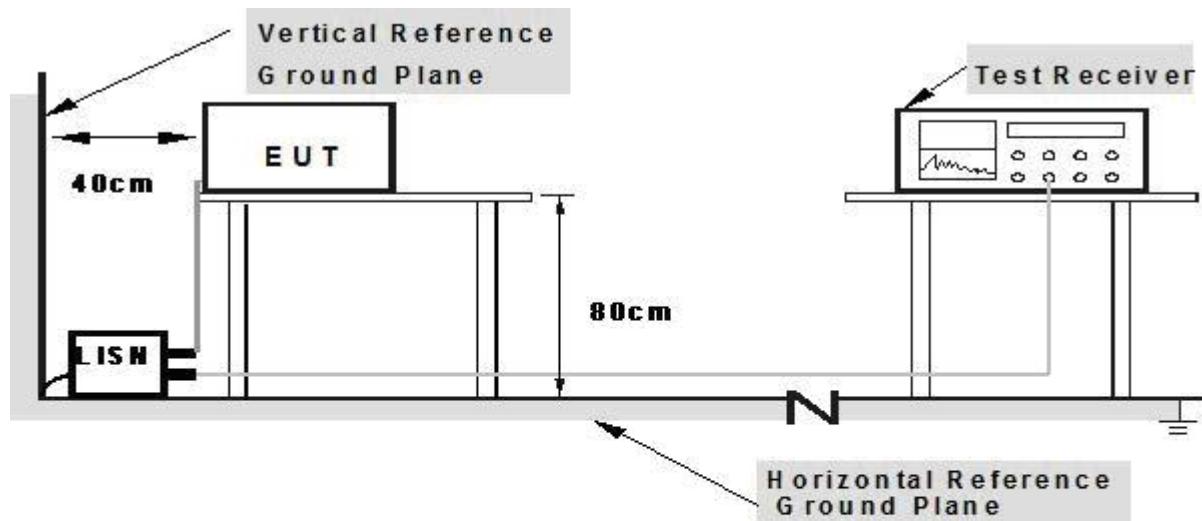
The following table is the setting of the receiver

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 M N) 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 :	2014-12-09
Test Mode :	Mode 3	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)	Remark
0.1547	35.59	9.61	45.20	65.74	-20.54	QP
0.1547	5.38	9.61	14.99	55.74	-40.75	AVG
0.2028	29.44	9.49	38.93	63.49	-24.56	QP
0.2028	26.83	9.49	36.32	53.49	-17.17	AVG
0.8059	8.52	9.53	18.05	56.00	-37.95	QP
0.8059	16.84	9.53	26.37	46.00	-19.63	AVG
1.5140	12.08	9.54	21.62	56.00	-34.38	QP
1.5140	16.95	9.54	26.49	46.00	-19.51	AVG
3.9700	34.78	9.59	44.37	56.00	-11.63	QP
3.9700	20.74	9.59	30.33	46.00	-15.67	AVG
24.5659	38.01	10.19	48.20	60.00	-11.80	QP
24.5659	22.74	10.19	32.93	50.00	-17.07	AVG

Remark:

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

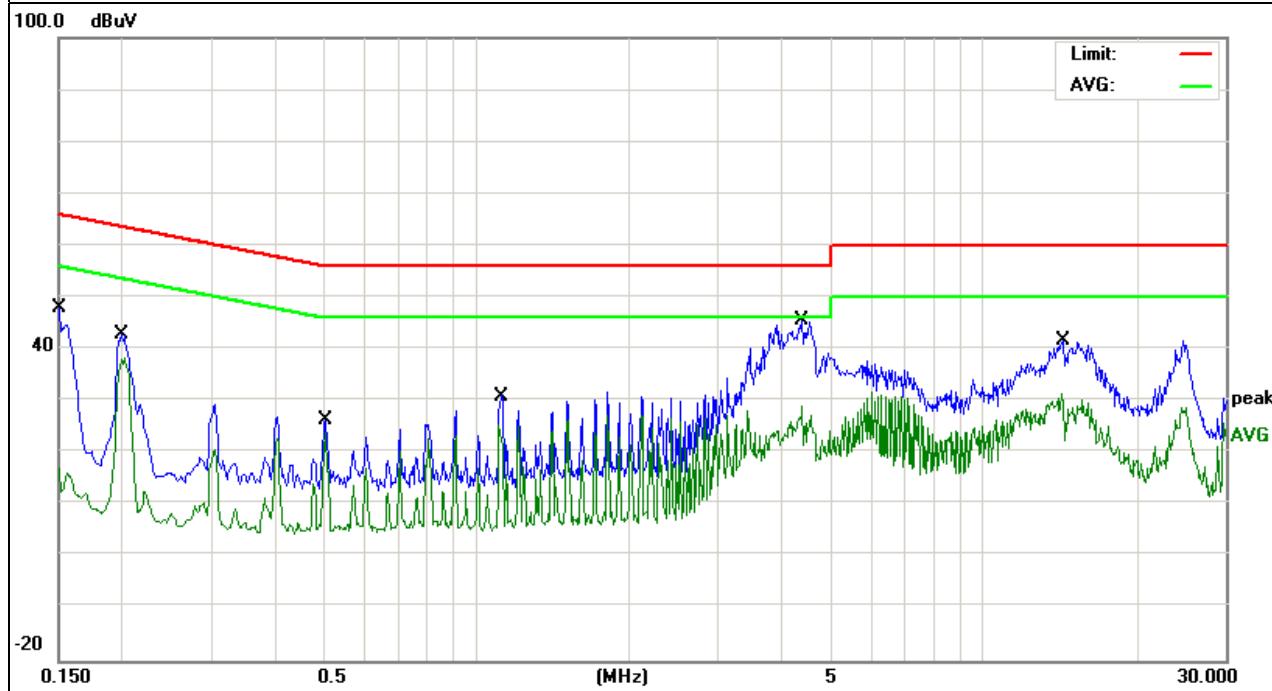
100.0 dB μ V

EUT :	MID	Model Name. :	AM2308G
Temperature :	26 °C	Relative Humidity :	54%
Pressure :	1010hPa	Test Date :	2014-12-09
Test Mode :	Mode 3	Phase :	N
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)	Remark
0.1500	38.22	9.66	47.88	65.99	-18.11	QP
0.1500	7.37	9.66	17.03	55.99	-38.96	AVG
0.2020	29.70	9.50	39.20	63.52	-24.32	QP
0.2020	28.84	9.50	38.34	53.52	-15.18	AVG
0.5060	16.79	9.53	26.32	56.00	-29.68	QP
0.5060	14.30	9.53	23.83	46.00	-22.17	AVG
1.1100	19.25	9.55	28.80	56.00	-27.20	QP
1.1100	16.01	9.55	25.56	46.00	-20.44	AVG
4.3939	33.49	9.60	43.09	56.00	-12.91	QP
4.3939	19.46	9.60	29.06	46.00	-16.94	AVG
14.2217	30.64	9.83	40.47	60.00	-19.53	QP
14.2217	21.68	9.83	31.51	50.00	-18.49	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:

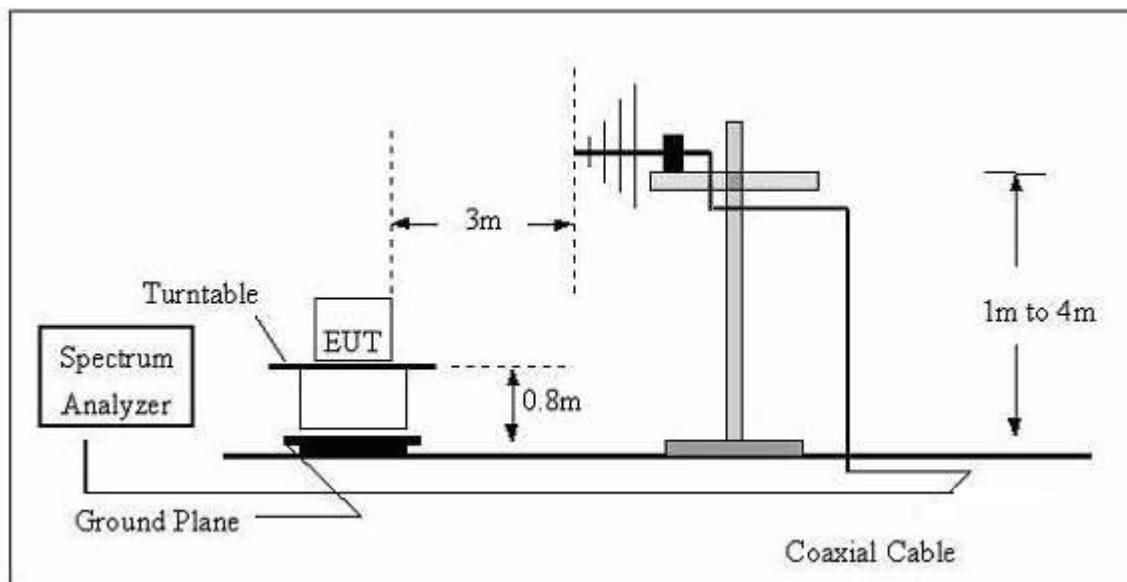
- (1) The limit for radiated test was performed according to as following:
FCC PART 15B /ICES-003.
- (2) The tighter limit applies at the band edges.
- (3) Emission level (dBuV/m)=20log Emission level (uV/m).

3.2.2 TEST PROCEDURE

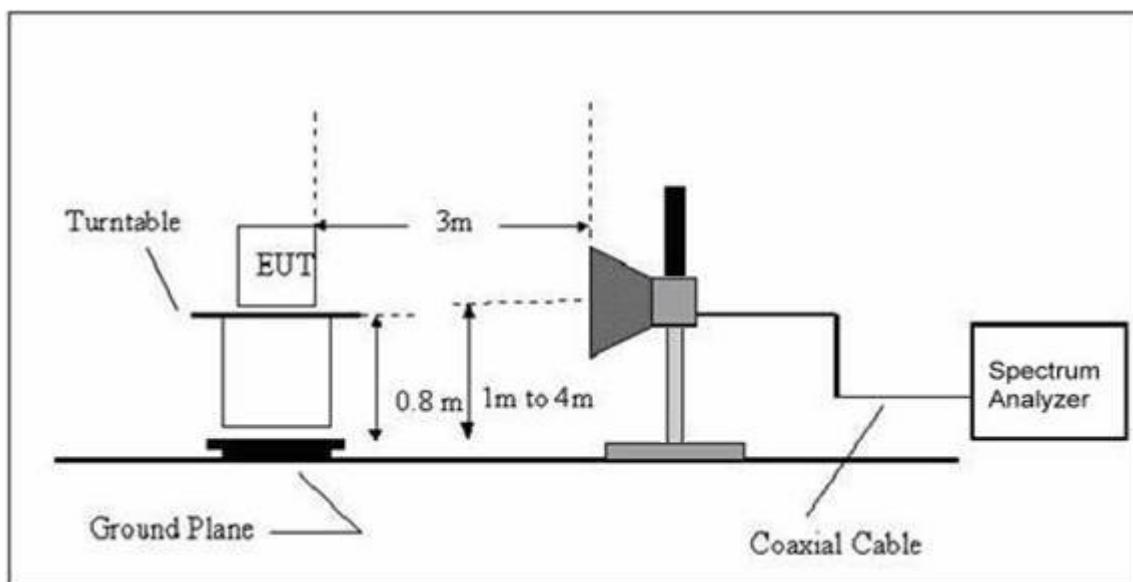
- a. The measuring distance of at 10 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
- b. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter open area test site. The table was rotated 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 :	2014-12-09
Test Mode :	Mode 3	Polarization :	Horizontal
Test Power :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Remark
39.8541	18.09	13.63	31.72	40.00	-8.28	QP
55.4147	24.36	9.14	33.50	40.00	-6.50	QP
139.3611	26.87	11.44	38.31	43.50	-5.19	QP
241.6761	25.70	13.50	39.20	46.00	-6.80	QP
480.5276	20.75	19.91	40.66	46.00	-5.34	QP
665.8034	18.10	23.85	41.95	46.00	-4.05	QP

Remark:

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

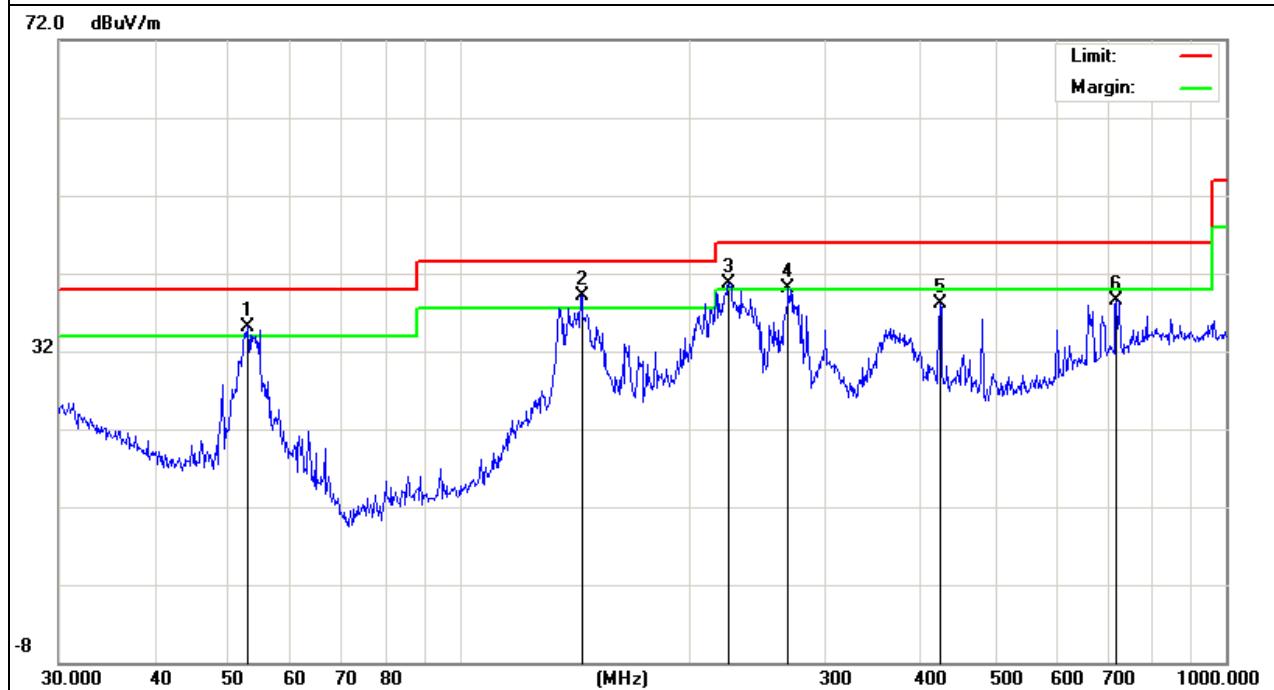


EUT :	MID	Model Name :	AM2308G
Temperature :	24 °C	Relative Humidity :	54%
Pressure :	1010 hPa	Test Date :	2014-12-09
Test Mode :	Mode 3	Polarization :	Vertical
Test Power :	DC 5V From Adapter AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV)	Factor (dBuV)	Measurement (dBuV)	Limit (dBuV)	Over (dB)	Remark
52.9453	25.35	9.85	35.20	40.00	-4.80	QP
144.3348	28.17	10.98	39.15	43.50	-4.35	QP
224.5192	28.29	12.44	40.73	46.00	-5.27	QP
268.4852	26.28	13.80	40.08	46.00	-5.92	QP
423.5403	19.40	18.78	38.18	46.00	-7.82	QP
719.1992	13.30	25.30	38.60	46.00	-7.40	QP

Remark:

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

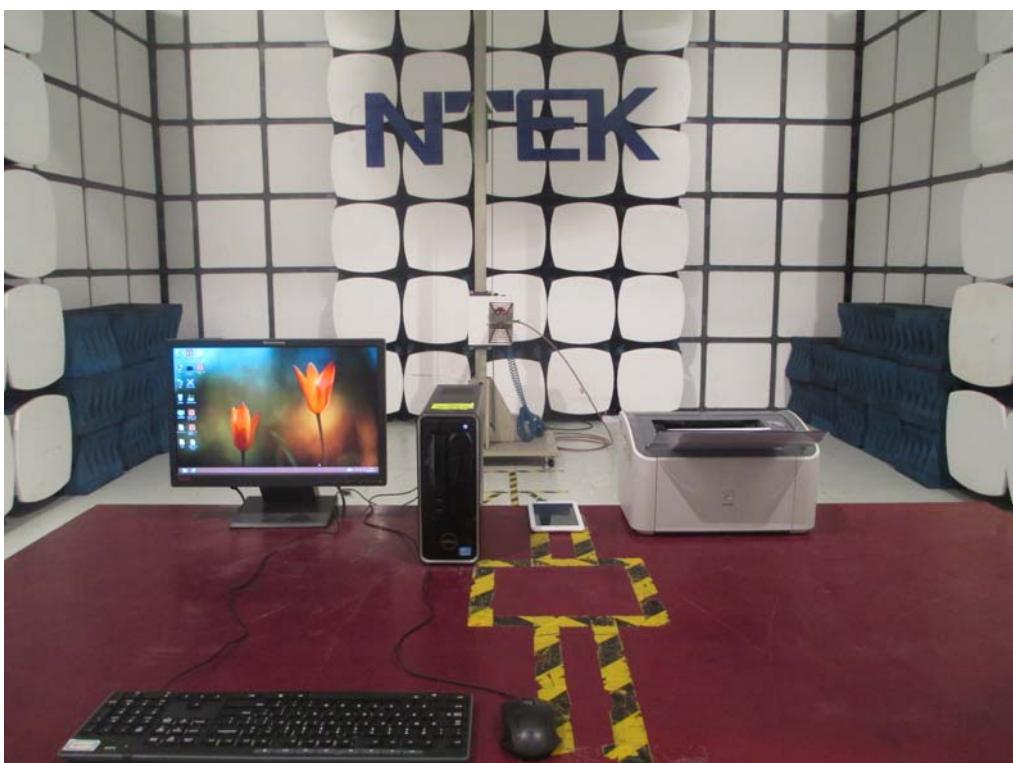


3.2.6 TEST RESULTS(Above 1GHz)

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
	(MHz)	(dBm)	(dB)	(dBm)	(dBm)	(dB)	
V	1168.704	64.01	-17.64	46.37	74	-27.63	peak
V	1168.704	41.61	-17.64	23.97	54	-30.03	AVG
V	1980.795	62.28	-12.67	49.61	74	-24.39	peak
V	1980.795	40.83	-12.67	28.16	54	-25.84	AVG
V	2306.181	61.82	-12.42	49.4	74	-24.6	peak
V	2306.181	39.23	-12.42	26.81	54	-27.19	AVG
V	2705.988	61.94	-11.15	50.79	74	-23.21	peak
V	2705.988	39.55	-11.15	28.4	54	-25.6	AVG
V	2906.076	61.25	-11.33	49.92	74	-24.08	peak
V	2906.076	41.19	-11.33	29.86	54	-24.14	AVG
V	4030.89	58.02	-5.35	52.67	74	-21.33	peak
V	4030.89	36.63	-5.35	31.28	54	-22.72	AVG
H	1369.194	58.84	-16.82	42.02	74	-31.98	peak
H	1369.194	38.65	-16.82	21.83	54	-32.17	AVG
H	1568.823	59.23	-15.87	43.36	74	-30.64	peak
H	1568.823	39.42	-15.87	23.55	54	-30.45	AVG
H	1980.709	57.61	-12.67	44.94	74	-29.06	peak
H	1980.709	37.03	-12.67	24.36	54	-29.64	AVG
H	2756.088	57.44	-10.98	46.46	74	-27.54	peak
H	2756.088	36.16	-10.98	25.18	54	-28.82	AVG
H	3843.873	54.08	-6.62	47.46	74	-26.54	peak
H	3843.873	32.48	-6.62	25.86	54	-28.14	AVG
H	4818.717	51.94	-2.92	49.02	74	-24.98	peak
H	4818.717	30.88	-2.92	27.96	54	-26.04	AVG

Remark:

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

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

Conducted Measurement Photos