

## FCC TEST REPORT

### 47 CFR FCC Part 15 Subpart B

**Report Reference No.....:** MWR150500303

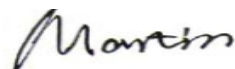
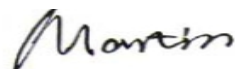

**FCC ID.....:** 2AE2X688I

Compiled by  
( position+printed name+signature)..: File administrators Martin Ao

Supervised by  
( position+printed name+signature)..: Test Engineer Martin Ao

Approved by  
( position+printed name+signature)..: Manager Dixon Hao

Date of issue.....: Jun 29, 2015

**Representative Laboratory Name.:** Maxwell International Co., Ltd.

Address.....: Room 509, Hongfa center building, Baoan District, Shenzhen, Guangdong, China

**Testing Laboratory Name.....:** Shenzhen CTL Testing Technology Co., Ltd.

Address.....: Floor 1-A, Baisha Technology Park, No. 3011, Shaheixi Road, Nanshan, Shenzhen, China

**Applicant's name.....:** AMS Communications Inc

Address.....: 11029 Harry Hines Blvd, Suite B 118, Dallas Tx 75229, USA

**Test specification.....:**

Standard.....: **47 CFR FCC Part 15 Subpart B - Unintentional Radiators**  
**ANSI C63.4: 2003**

TRF Originator.....: Maxwell International Co., Ltd.

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**Test item description.....:** 2G Smart Phone

Trade Mark.....: SOHO

**Manufacturer.....:** Begin Industrial(HK)CO.,Ltd

Model/Type reference.....: 688I

Listed Models .....: /

Rating.....: DC 3.70V

Adapter information.....: Model: 688I  
INPUT: 100-240V 50/60Hz 0.15A  
OUTPUT: DC 5.0V, 600mAh

Hardware version.....: T6\_T\_V9.18 2015-04-08

Software version .....: 688I\_V1.0

Result.....: **PASS**

**TEST REPORT**

<b>Test Report No. :</b>	<b>MWR150500303</b>	Jun 29, 2015
		Date of issue

Equipment under Test : 2G Smart Phone

Model /Type : 688I

Listed Models : /

**Applicant** : **AMS Communications Inc**

Address : 11029 Harry Hines Blvd, Suite B 118, Dallas Tx 75229, USA

**Manufacturer** : **Begin Industrial(HK)CO.,Ltd**

Address : 5 floor shanghe community no A111-0022, BAOAN DISTRICT,  
SHENZHEN CITY, CHINA

<b>Test Result:</b>	<b>PASS</b>
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The test report merely corresponds to the test sample.

It is not permitted to copy extracts of these test result without the written permission of the test laboratory.

## Contents

<b>1. TEST STANDARDS .....</b>	<b>4</b>
<b>2. SUMMARY .....</b>	<b>5</b>
2.1. General Remarks.....	5
2.2. Product Description.....	5
2.3. Equipment under Test.....	5
2.4. Short description of the Equipment under Test (EUT).....	5
2.5. EUT operation mode.....	6
2.6. Related Submittal(s) / Grant (s).....	6
2.7. Internal Identification of AE and EUT used during the test.....	6
2.8. Modifications.....	6
2.9. EUT configuration.....	6
2.10. Configuration of Tested System.....	6
2.11. NOTE.....	7
<b>3. TEST ENVIRONMENT .....</b>	<b>8</b>
3.1. Address of the test laboratory.....	8
3.2. Test Facility.....	8
3.3. Environmental conditions.....	8
3.4. Statement of the measurement uncertainty.....	8
3.5. Equipments Used during the Test.....	9
<b>4. TEST CONDITIONS AND RESULTS .....</b>	<b>10</b>
4.1. Conducted Emissions Test.....	10
4.2. Radiated Emission Test.....	13
<b>5. TEST SETUP PHOTOS OF THE EUT .....</b>	<b>19</b>

## 1. TEST STANDARDS

The tests were performed according to following standards:

[47 CFR FCC Part 15 Subpart B](#) - Unintentional Radiators

[ANSI C63.4: 2003](#) – 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 40GHz

## 2. SUMMARY

### 2.1. General Remarks

Date of receipt of test sample	:	May10, 2015
Testing commenced on	:	May11, 2015
Testing concluded on	:	Jun 28, 2015

### 2.2. Product Description

The **Begin Industrial(HK)CO.,Ltd**'s Model: 688I or the "EUT" as referred to in this report; more general information as follows, for more details, refer to the user's manual of the EUT.

Name of EUT	2G Smart Phone
Model Number	688I
FCC ID	2AE2X688I
Modulation Type	GMSK for GSM/GPRS;
Antenna Type	Internal
GSM/EDGE/GPRS	Supported GPRS
Extreme temp. Tolerance	-30°C to +50°C
Extreme vol. Limits	3.40VDC to 4.20VDC (nominal: 3.70VDC)
GSM Operation Frequency Band	GSM 850MHz/ PCS 1900MHz
GSM Release Version	R99
GPRS operation mode	Class B
GPRS Multislot Class	12
EGPRS Multislot Class	Only Downloading
WLAN	Supported 802.11b/802.11g/802.11n
WLAN FCC Modulation Type	IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK) IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n HT20: OFDM (64QAM, 16QAM, QPSK,BPSK)
the highest operating frequency	1GHz(DDR frequency)

### 2.3. Equipment under Test

#### Power supply system utilised

Power supply voltage	:	<input type="radio"/> 120V / 60 Hz	<input type="radio"/> 115V / 60Hz
		<input type="radio"/> 12 V DC	<input type="radio"/> 24 V DC
		<input checked="" type="radio"/> Other (specified in blank below)	

DC 3.70V

### 2.4. Short description of the Equipment under Test (EUT)

#### 2.4.1 General Description

688I is subscriber equipment in the GSM system. The GSM/GPRS frequency band includes GSM850 and GSM900 and DCS1800 and PCS1900, but only GSM850 and PCS1900 bands test data included in this report. The 2G Smart Phone implements such functions as RF signal receiving/transmitting, GSM/GPRS protocol processing, voice, video MMS service etc. Externally it provides micro SD card interface, earphone port (to provide voice service) and SIM card interface. It also provides WIFI function.

### 2.4.2 Test Environments

NOTE: The values used in the test report maybe stringent than the declared.

Environment Parameter	Selected Values During Tests		
NTNV	Temperature	Voltage	Relative Humidity
	Ambient	3.7VDC	Ambient

### 2.5. EUT operation mode

The EUT has been tested under typical operating condition.

### 2.6. Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: 2AE2X688I** filing to comply with the FCC Part 15, Subpart B Rules.

### 2.7. Internal Identification of AE and EUT used during the test

IMEI Code	
EUT	354769059067894
	354769059067895

### 2.8. Modifications

No modifications were implemented to meet testing criteria.

### 2.9. EUT configuration

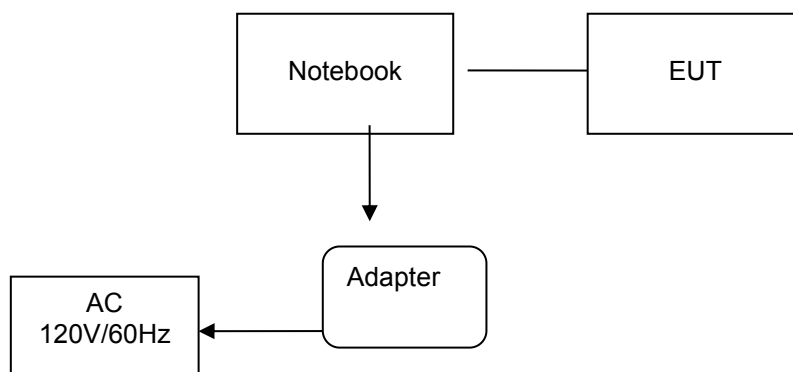
The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

<input type="radio"/>	Power Cable	Length (m) :	/
		Shield :	/
		Detachable :	/
<input type="radio"/>	Multimeter	Manufacturer :	/
		Model No. :	/

### 2.10. Configuration of Tested System

Configuration of Tested System



**Equipment Used in Tested System**

No.	Equipment	Manufacturer	Model No.	Serial No.	Length	shielded/unshielded	Notes
1	Notebook	DELL	INS14MD-1328S	1RNN42X	N/A	N/A	DOC
5	USB Cable (EUT to PC)	Genshuo	USB 2.0	N/A	0.60m	unshielded	N/A
7	Power line	N/A	N/A	N/A	1.00m	unshielded	N/A
8	Adapter	HIPRO	DELL-A0904A3	F1120709016S404	1.50m	unshielded	DOC

**2.11. NOTE**

1. The EUT is a 2G Smart Phone with GSM/GPRS and WIFI function, The functions of the EUT listed as below:

	Test Standards	Reference Report
GSM/GPRS	FCC Part 22/FCC Part 24	MWR150500301
WIFI	FCC Part 15 C 15.247	MWR150500302
USB Port	FCC Part 15 B	MWR150500303
SAR	FCC Part 2 §2.1093	MWR150500304

### 3. TEST ENVIRONMENT

#### 3.1. Address of the test laboratory

**Shenzhen CTL Testing Technology Co., Ltd.**

Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 (2003) and CISPR Publication 22.

#### 3.2. Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

#### FCC-Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, Dec 19, 2013

#### 3.3. Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	<u>15-35 ° C</u>
Humidity:	<u>30-60 %</u>
Atmospheric pressure:	<u>950-1050mbar</u>

#### 3.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for Shenzhen CTL Testing Technology Co., Ltd. is reported:

Test	Range	Measurement Uncertainty	Notes
Radiated Emission	30~1000MHz	4.24 dB	(1)
Radiated Emission	1~18GHz	5.16 dB	(1)
Radiated Emission	18-40GHz	5.54 dB	(1)
Conducted Disturbance	0.15~30MHz	3.39 dB	(1)

- (1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.



### 3.5. Equipments Used during the Test

AC Power Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Artificial Mains	Rohde&Schwarz	ENV216	101316	2014/07/02	2015/07/01
2	EMI Test Receiver	Rohde&Schwarz	ESCI3	103710	2014/07/02	2015/07/01
3	Pulse Limiter	Com-Power	LIT-153	53226	2014/07/01	2015/06/30
4	EMI Test Software	Rohde&Schwarz	ES-K1 V1.71	N/A	N/A	N/A
5	Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M (9KHz-26.5G)	3m	2014/10/19	2015/10/18

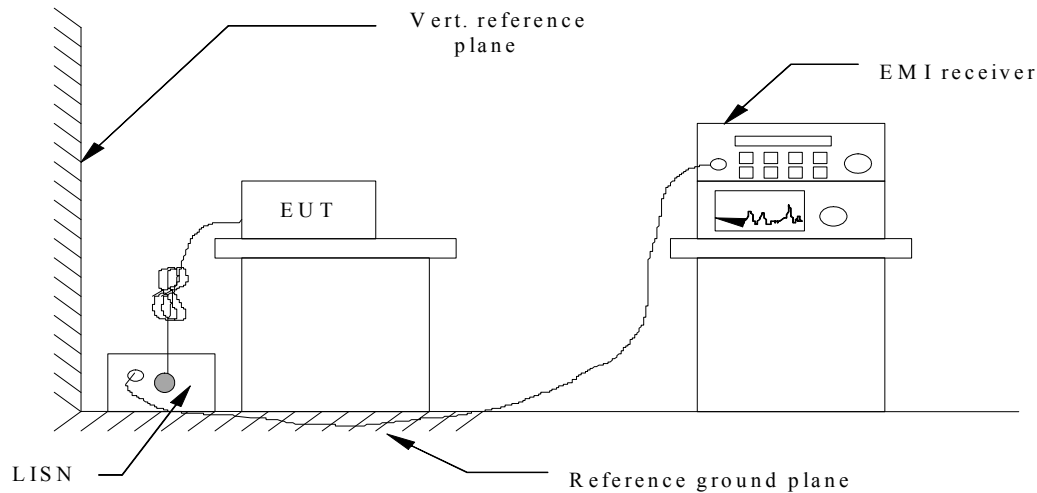
Radiated Emission						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal.Due
1	Bilog Antenna	Sunol Sciences Corp.	JB1	A061713	2014/07/12	2014/07/11
2	EMI TEST Receiver	Rohde&Schwarz	ESCI3	103710	2014/07/02	2015/07/01
3	EMI TEST Software	Audix	E3	N/A	N/A	N/A
4	EMI TEST Software	Rohde&Schwarz	ESK1	N/A	N/A	N/A
5	HORN ANTENNA	Sunol Sciences Corp.	DRH-118	A062013	2014/07/12	2015/07/11
6	Amplifier	HP	8447D	3113A07663	2014/10/22	2015/10/21
7	Preamplifier	HP	8349B	3155A00882	2014/07/03	2015/07/02
8	Amplifier	Compliance Direction systems	PAP1-4060	129	2014/07/03	2015/07/02
9	TURNTABLE	MATURO	TT2.0	----	N/A	N/A
10	ANTENNA MAST	UC	UC3000	----	N/A	N/A
11	Horn Antenna	SCHWARZBECK	BBHA9170	25849	2014/06/21 2015/05/19	2015/06/20 2016/05/18
12	Spectrum Analyzer	Rohde&Schwarz	FSU26	201148	2014/06/21 2015/05/20	2015/06/20 2016/05/19
13	Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-10M (9KHz-26.5G)	10m	2014/10/19	2015/10/18
14	Coaxial Cables	HUBER+SUHNER	SUCOFLEX 104PEA-3M (9KHz-26.5G)	3m	2014/10/19	2015/10/18

The Cal.Interval was one year

## 4. TEST CONDITIONS AND RESULTS

### 4.1. Conducted Emissions Test

#### TEST CONFIGURATION



#### TEST PROCEDURE

1. The equipment was set up as per the test configuration to simulate typical actual usage per the user's manual. The EUT is a tabletop system; a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4-2003.
2. Support equipment, if needed, was placed as per ANSI C63.4-2003.
3. All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4-2003.
4. The EUT received AC120V/60Hz power through a Line Impedance Stabilization Network (LISN) which supplied power source and was grounded to the ground plane.
5. All support equipments received AC power from a second LISN, if any.
6. The EUT test program was started. Emissions were measured on each current carrying line of the EUT using a spectrum Analyzer / Receiver connected to the LISN powering the EUT. The LISN has two monitoring points: Line 1 (Hot Side) and Line 2 (Neutral Side). Two scans were taken: one with Line 1 connected to Analyzer / Receiver and Line 2 connected to a 50 ohm load; the second scan had Line 1 connected to a 50 ohm load and Line 2 connected to the Analyzer / Receiver.
7. Analyzer / Receiver scanned from 150 KHz to 30MHz for emissions in each of the test modes.
8. During the above scans, the emissions were maximized by cable manipulation.

#### CONDUCTED POWER LINE EMISSION LIMIT

For unintentional device, according to § 15.107(a) Line Conducted Emission Limits is as following :

Frequency (MHz)	Maximum RF Line Voltage (dBμV)			
	CLASS A		CLASS B	
	Q.P.	Ave.	Q.P.	Ave.
0.15 - 0.50	79	66	66-56*	56-46*
0.50 - 5.00	73	60	56	46
5.00 - 30.0	73	60	60	50

\* Decreasing linearly with the logarithm of the frequency

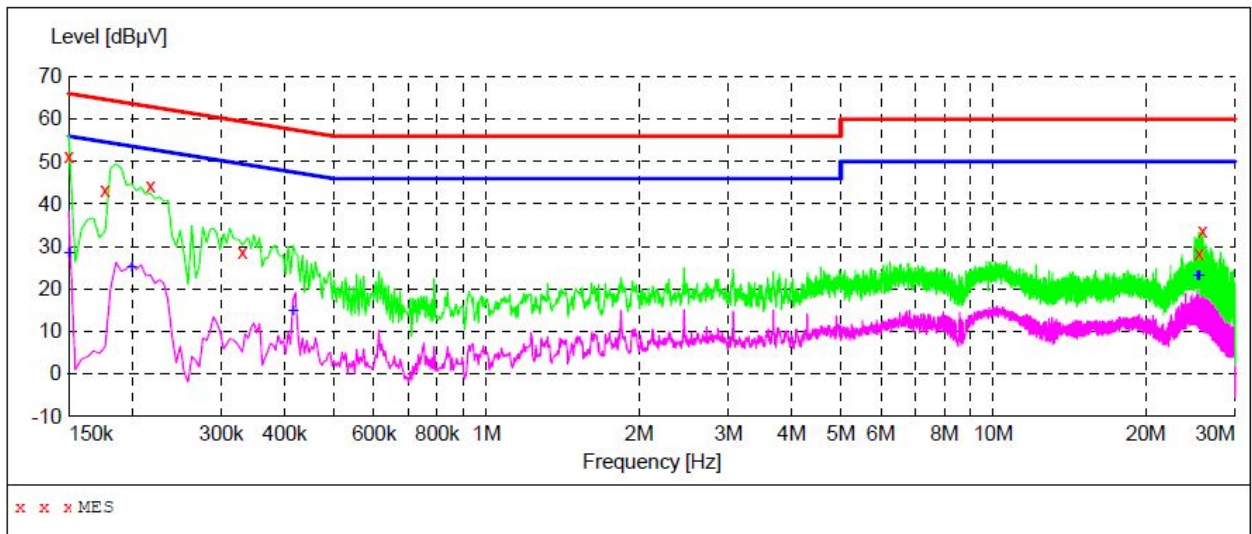
#### TEST RESULTS

Test Mode:Data transmission (Data transmission with a computer through a data cable)

Note:test voltage:120V/60Hz

**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT:**

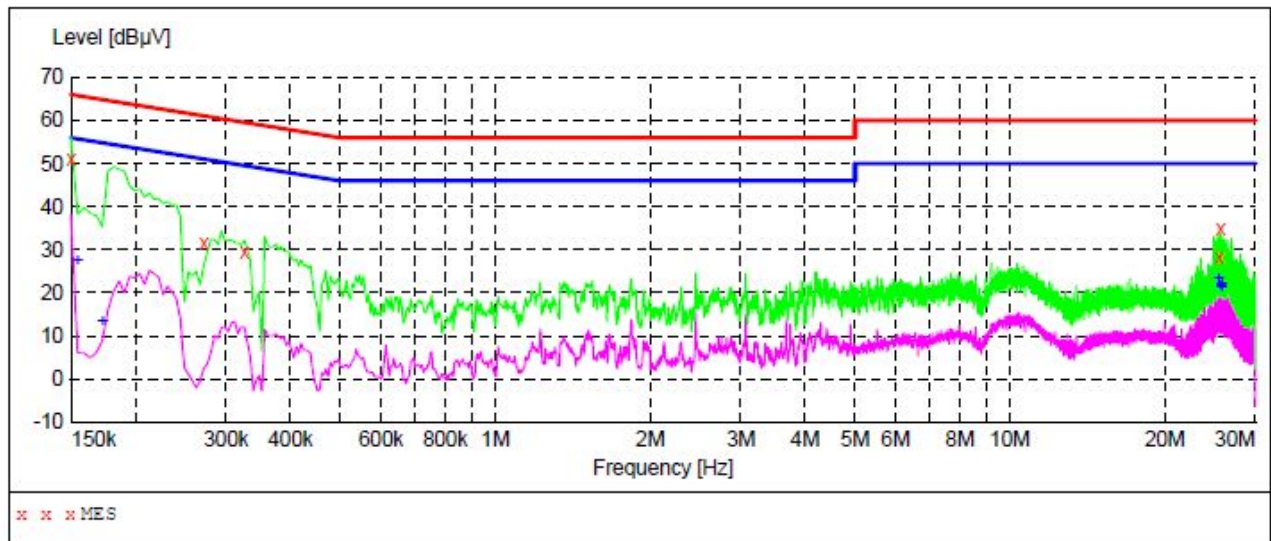
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	51.20	10.2	66	14.8	QP	N	GND
0.177000	43.40	10.2	65	21.2	QP	N	GND
0.217500	44.30	10.2	63	18.6	QP	N	GND
0.330000	28.50	10.2	60	31.0	QP	N	GND
25.453500	28.20	11.1	60	31.8	QP	N	GND
25.872000	33.70	11.1	60	26.3	QP	N	GND

**MEASUREMENT RESULT:**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	28.40	10.2	56	27.6	AV	N	GND
0.199500	24.90	10.2	54	28.7	AV	N	GND
0.415500	14.60	10.2	48	32.9	AV	N	GND
25.269000	23.10	11.1	50	26.9	AV	N	GND
25.449000	23.10	11.1	50	26.9	AV	N	GND
25.512000	22.90	11.1	50	27.1	AV	N	GND

**SCAN TABLE: "Voltage (9K-30M)FIN"**

Short Description: 150K-30M Voltage

**MEASUREMENT RESULT:**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.150000	51.20	10.2	66	14.8	QP	L1	GND
0.271500	31.70	10.2	61	29.4	QP	L1	GND
0.325500	29.50	10.2	60	30.1	QP	L1	GND
25.570500	28.10	11.1	60	31.9	QP	L1	GND
25.692000	34.70	11.1	60	25.3	QP	L1	GND

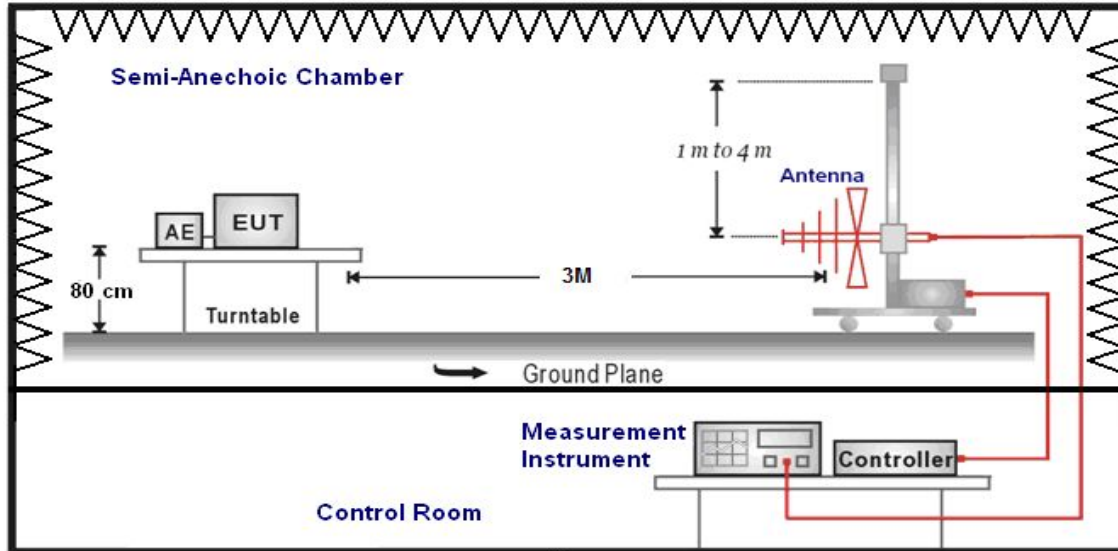
**MEASUREMENT RESULT:**

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.154500	27.50	10.2	56	28.3	AV	L1	GND
0.172500	13.40	10.2	55	41.4	AV	L1	GND
25.449000	23.10	11.1	50	26.9	AV	L1	GND
25.692000	21.50	11.1	50	28.5	AV	L1	GND
25.750500	22.10	11.1	50	27.9	AV	L1	GND
25.813500	21.40	11.1	50	28.6	AV	L1	GND

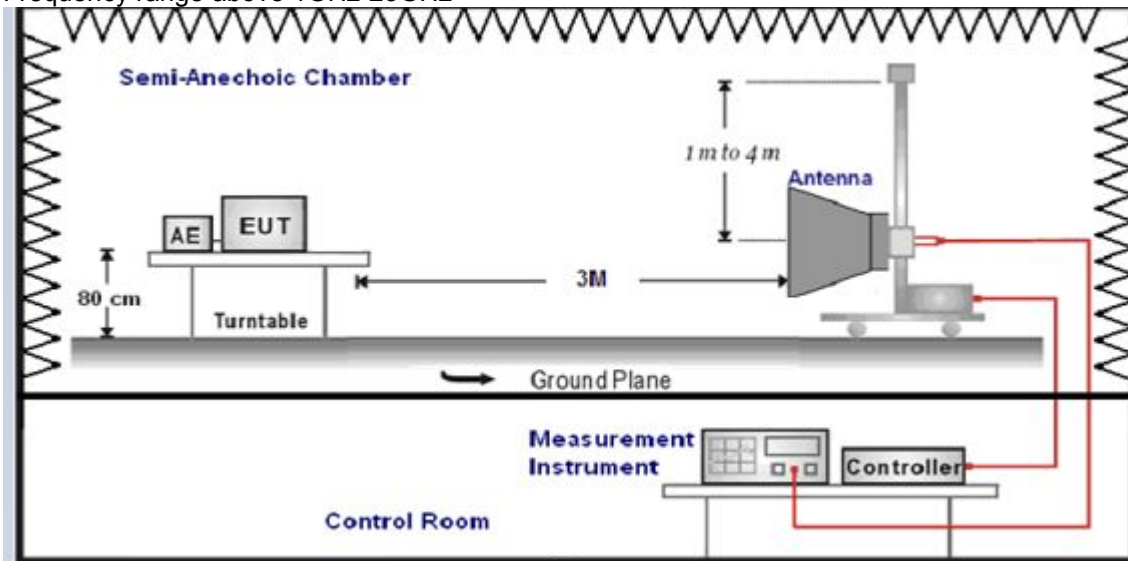
## 4.2. Radiated Emission Test

### TEST CONFIGURATION

Frequency range: 30MHz – 1000MHz



Frequency range above 1GHz-25GHz



### TEST PROCEDURE

1. The EUT is placed on a turntable, which is 0.8m above ground plane.
2. The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.
3. EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emissions.
4. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
5. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
6. Repeat above procedures until the measurements for all frequencies are complete.
7. The maximum operation frequency was 1GHz(DDR frequency) , the radiated emission test frequency from 9 KHz to 10GHz.

### FIELD STRENGTH CALCULATION

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the

Amplifier Gain and Duty Cycle Correction Factor (if any) from the measured reading. The basic equation with a sample calculation is as follows:

$$FS = RA + AF + CL - AG$$

Where FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
RA = Reading Amplitude	AG = Amplifier Gain
AF = Antenna Factor	

For example

Frequency (MHz)	FS (dBμV/m)	RA (dBμV/m)	AF (dB)	CL (dB)	AG (dB)	Transd (dB)
300.00	40	58.1	12.2	1.6	31.90	-18.1

$$\text{Transd} = \text{AF} + \text{CL} - \text{AG}$$

### RADIATION LIMIT

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance (Meters)	Radiated (dBμV/m)	Radiated (μV/m)
30-88	3	40.0	100
88-216	3	43.5	150
216-960	3	46.0	200
Above 960	3	54.0	500

### TEST RESULTS

**Test Mode:**Data transmission (Data transmission with a computer through a data cable)

Remark:1.test voltage:120V/60Hz

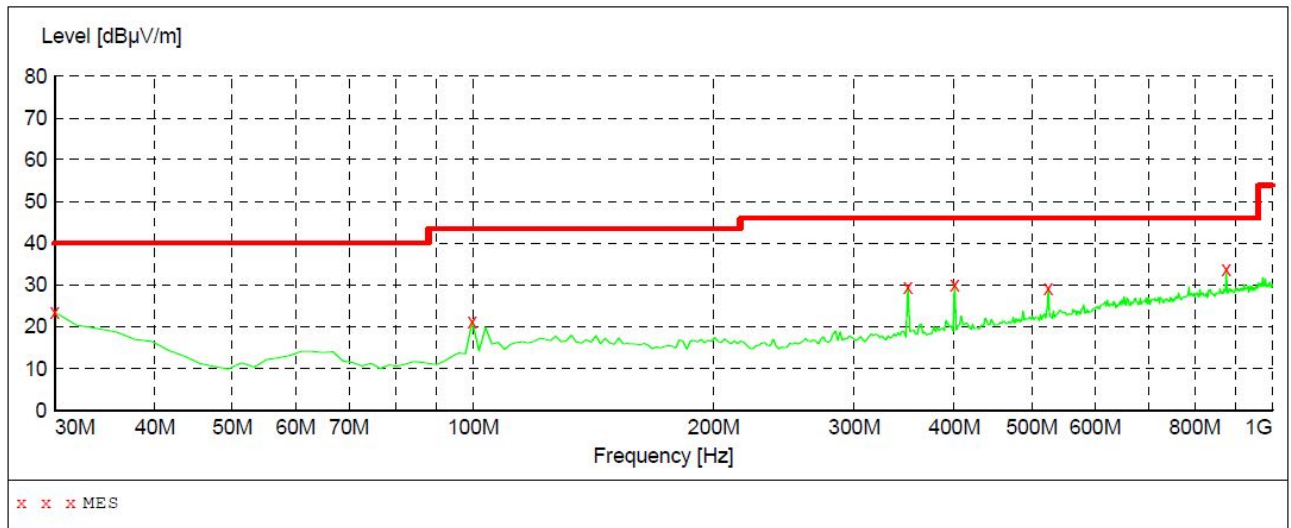
Remark: 2. We not recorded emission level for 6 GHz to 10GHz as emissiom level was at least 10dB below emission level.



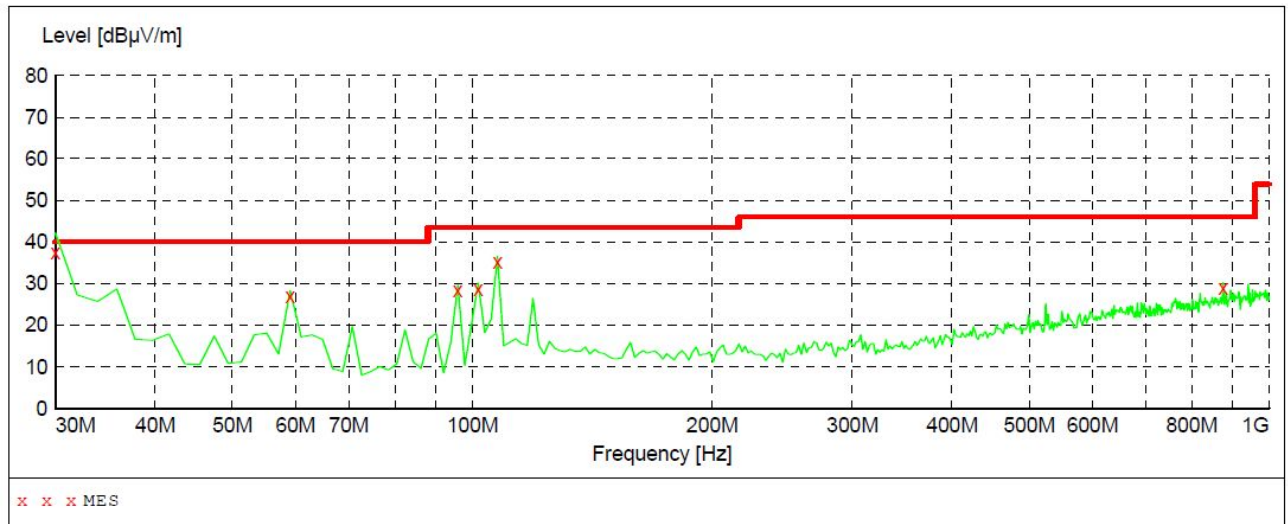
### For 9KHz to 30MHz

Frequency (MHz)	Corrected Reading (dB $\mu$ V/m)@3m	FCC Limit (dB $\mu$ V/m) @3m	Margin (dB)	Detector	Result
12.00	44.00	69.54	25.54	QP	PASS
24.00	46.24	69.54	23.30	QP	PASS

### For 30MHz-1GHz



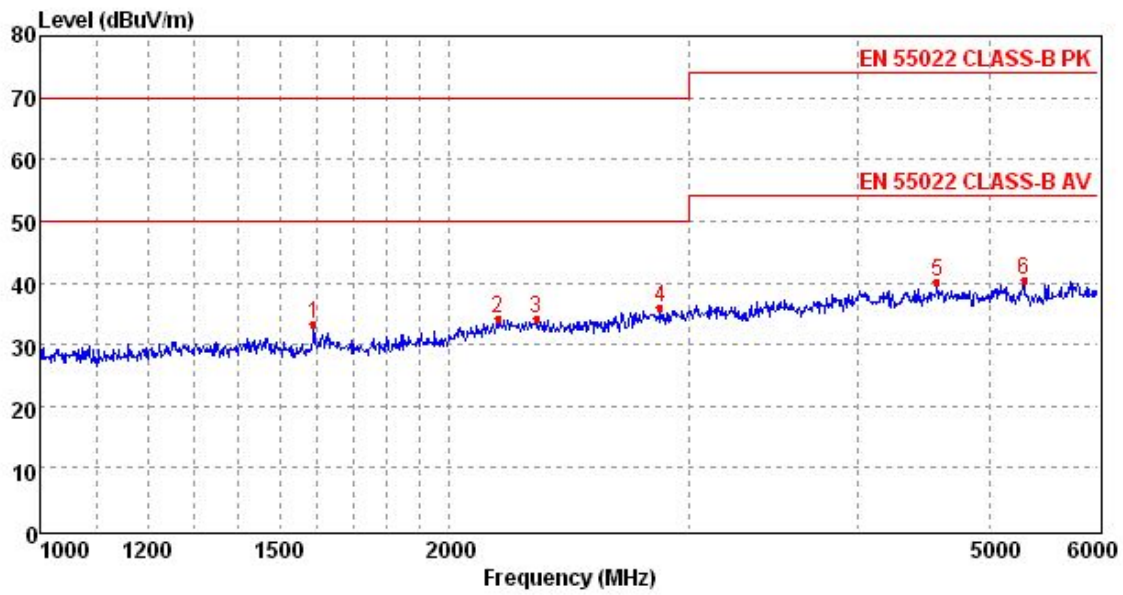
Frequency MHz	Level dB $\mu$ V/m	Transd dB	Limit dB $\mu$ V/m	Margin dB	Det	Polarization
30.000000	23.50	21.1	40.0	16.5	QP	HORIZONTAL
99.840000	21.40	11.5	43.5	22.1	Qp	HORIZONTAL
350.100000	29.50	16.9	46.0	16.5	Qp	HORIZONTAL
400.540000	30.20	18.1	46.0	15.8	Qp	HORIZONTAL
524.700000	29.30	20.5	46.0	16.7	Qp	HORIZONTAL
875.840000	33.80	25.6	46.0	12.2	Qp	HORIZONTAL



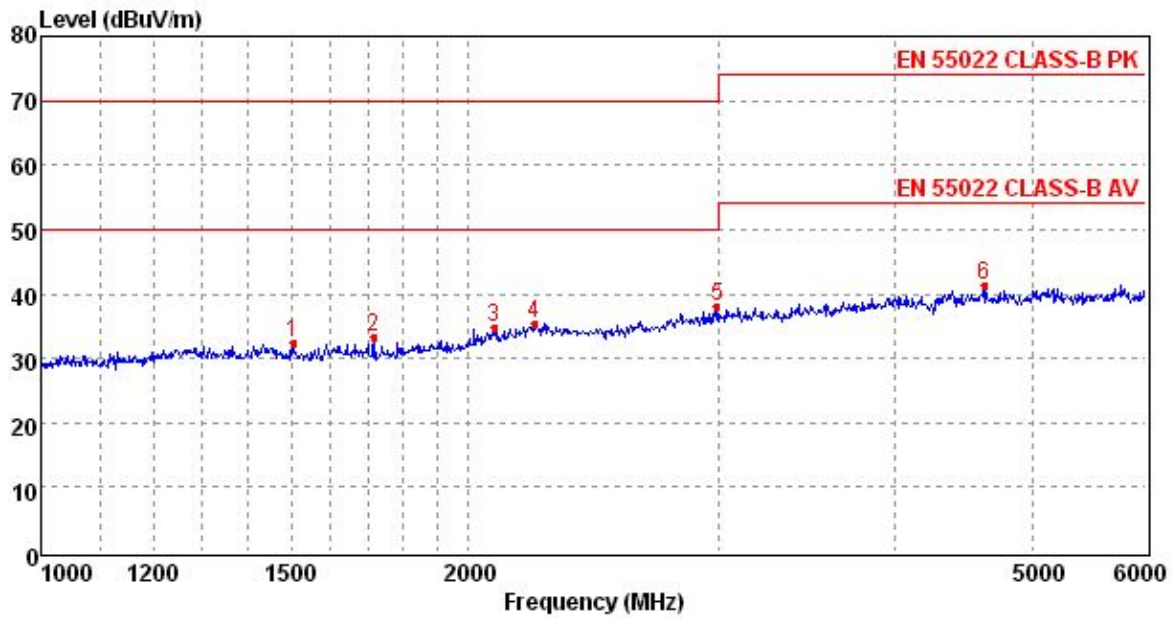
Frequency MHz	Level dBμV/m	Transd dB	Limit dBμV/m	Margin dB	Det	Polarization
30.000000	37.10	21.1	40.0	2.9	QP	VERTICAL
59.100000	27.30	8.3	40.0	12.7	QP	VERTICAL
95.960000	28.60	10.6	43.5	14.9	QP	VERTICAL
101.780000	29.10	12.0	43.5	14.4	QP	VERTICAL
107.600000	35.60	13.3	43.5	7.9	QP	VERTICAL
875.840000	29.30	25.6	46.0	16.7	QP	VERTICAL



For 1GHz-6GHz

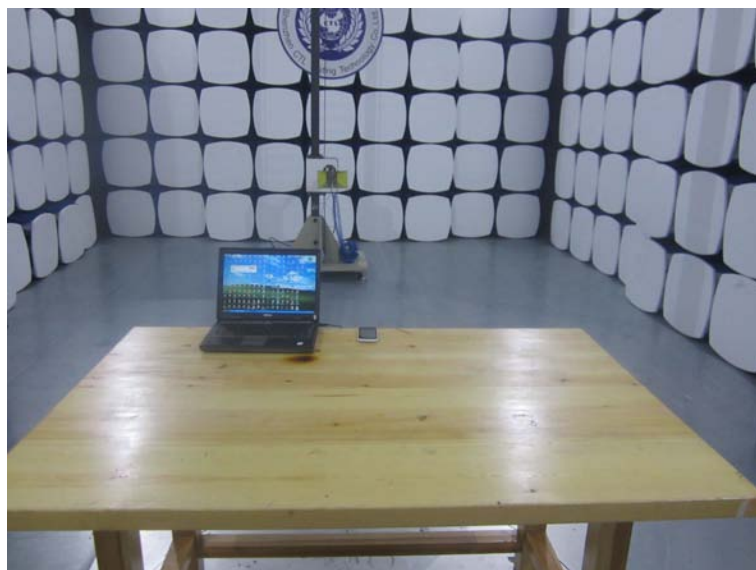


Mark	Frequency MHz	Level dBUV/m	Factor dB	Reading dBUV/m	Limit dBUV/m	Margin dB	Polarization	Det.
1	1590.53	33.35	-8.38	41.73	70.00	36.65	HORIZONTAL	Peak
2	2172.40	34.16	-5.19	39.35	70.00	35.84	HORIZONTAL	Peak
3	2317.14	34.12	-5.05	39.17	70.00	35.88	HORIZONTAL	Peak
4	2857.57	35.95	-3.54	39.49	70.00	34.05	HORIZONTAL	Peak
5	4569.54	40.17	1.31	38.86	74.00	33.83	HORIZONTAL	Peak
6	5292.74	40.37	2.76	37.61	74.00	33.63	HORIZONTAL	Peak



Mark	Frequency MHz	Level dBUV/m	Factor dB	Reading dBUV/m	Limit dBUV/m	Margin dB	Polarization	Det.
1	1504.59	32.54	-8.35	40.89	70.00	37.46	VERTICAL	Peak
2	1714.84	33.39	-8.38	41.77	70.00	36.61	VERTICAL	Peak
3	2084.69	34.86	-6.08	40.94	70.00	35.14	VERTICAL	Peak
4	2227.58	35.40	-4.95	40.35	70.00	34.60	VERTICAL	Peak
5	2993.84	38.10	-3.34	41.44	70.00	31.90	VERTICAL	Peak
6	4618.93	41.24	1.51	39.73	74.00	32.76	VERTICAL	Peak

## 5. Test Setup Photos of the EUT



.....End of Report.....