



# FCC 47 CFR PART 15 SUBPART B TEST REPORT

for

**LTE LGA Module**

**MODEL: LM177**

Test Report Number:  
T140403L06-B-D

Issued for

**Quanta Computer Inc.**

No. 188, Wen Hwa 2nd RD., Kuei Shan Hsiang, Taoyuan Hsien, Taiwan, R.O.C.

Issued By:

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**Revision History**

Rev.	Issue Date	Revisions	Effect Page	Revised By
00	April 25, 2014	Initial Issue	ALL	Kelly Cheng



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APPENDIX 1 - PHOTOGRAPHS OF EUT



# 1 TEST RESULT CERTIFICATION

<b>Product:</b>	LTE LGA Module
<b>Model:</b>	LM177
<b>Brand:</b>	Quanta
<b>Applicant:</b>	<b>Quanta Computer Inc.</b> No. 188, Wen Hwa 2nd RD., Kuei Shan Hsiang, Taoyuan Hsien, Taiwan, R.O.C.
<b>Manufacturer:</b>	<b>Quanta Computer Inc.</b> No. 188, Wen Hwa 2nd RD., Kuei Shan Hsiang, Taoyuan Hsien, Taiwan, R.O.C.
<b>Tested:</b>	April 24, 2014
<b>Test Voltage:</b>	120Vac, 60Hz

EMISSION			
Standard	Item	Result	Remarks
FCC 47 CFR Part 15 Subpart B, ICES-003 Issue 5-2012 ANSI C63.4-2009	Conducted (Power Port)	PASS	Meet Class B limit
	Radiated	PASS	Meet Class B limit

*Note:* 1. The statements of test result on the above are decided by the request of test standard only; the measurement uncertainties are not factored into this compliance determination.  
2. The information of measurement uncertainty is available upon the customer's request.

Deviation from Applicable Standard
None

The above equipment has been tested by Compliance Certification Services Inc., and found compliance with the requirements set forth in the technical standards mentioned above. The results of testing in this report apply only to the product/system, which was tested. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

**Approved by:**

Gary Wu  
Section Manager

**Reviewed by:**

Angel Cheng  
Section Manager



## 2 EUT DESCRIPTION

<b>Product</b>	LTE LGA Module
<b>Brand Name</b>	Quanta
<b>Model</b>	LM177
<b>Applicant</b>	Quanta Computer Inc.
<b>Identify Number</b>	T140403L06-B
<b>Received Date</b>	April 3, 2014
<b>EUT Power Rating</b>	Powered from host device

### I/O Port

<b>I/O PORT TYPES</b>	<b>Q'TY</b>	<b>TESTED WITH</b>
1). USB Port	1	1
2). Antenna Port	1	1
3). SIM Card Port	1	1



### 3 TEST METHODOLOGY

#### 3.1. DECISION OF FINAL TEST MODE

1. The following test modes were scanned during the preliminary test:

Pre-Test Mode
<b>Mode 1:</b> LTE Band 4
<b>Mode 2:</b> LTE Band13

2. After the preliminary scan, the following test mode was found to produce the highest emission level.

Final Test Mode		
Emission	Conducted Emission	<b>Mode 1,2</b>
	Radiated Emission	<b>Mode 1,2</b>

Then, the above highest emission mode of the configuration of the EUT and cable was chosen for all final test items.

#### 3.2. EUT SYSTEM OPERATION

1. Setup the EUT and simulators as shown on 4.2.
2. Turn on the power of all equipment.
3. Turn on the hyper terminal and enter the script.
4. The EUT will receive the LTE signal source and sustained Link.
5. Adjust to the test mode, and begin the test.

*Note: Test program is self-repeating throughout the test.*



## 4 SETUP OF EQUIPMENT UNDER TEST

### 4.1. DESCRIPTION OF SUPPORT UNITS

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.

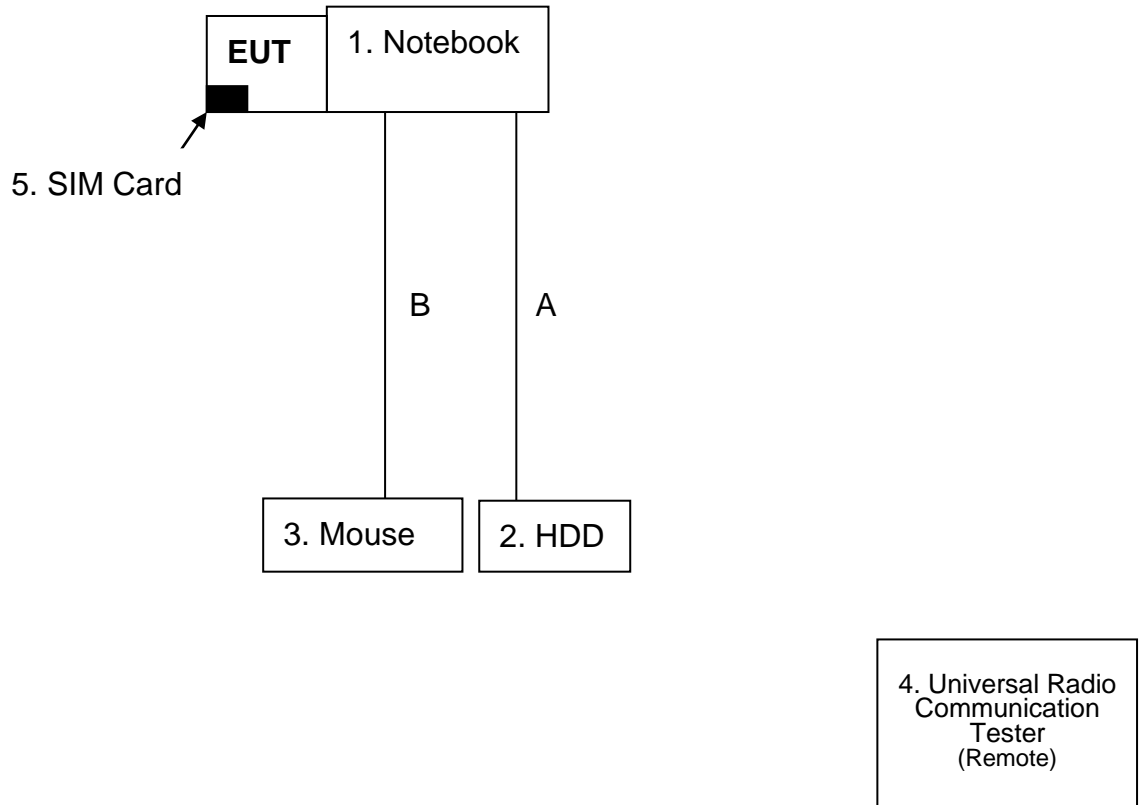
No.	Equipment	Trade Name	Model No.	Serial No.	FCC ID / BSMI ID	Power Cord
1	NB	HP	Pavilion dv6	CNF9491GLJ	R33022	Unshielded, 2.0m
2	HDD	Buffalo	HD-PNTU3	79712024311016	D33093	Unshielded, 1.5m
3.	Mouse	DELL	OXN867	J0206CRS	R41108	N/A
4	Universal Radio Communication Tester (Remote)	R&S	CMW500	N/A	NA	N/A
5	SIM Card	N/A	N/A	N/A	N/A	N/A

No.	Cable Name	Unit	Shielded	Length	With Core
(A)	USB Cable	1	<input checked="" type="checkbox"/> Shielded, <input type="checkbox"/> Non	1.8 m	<input type="checkbox"/> With Corex , <input checked="" type="checkbox"/> Non
(B)	Mouse Cable	1	<input type="checkbox"/> Shielded, <input checked="" type="checkbox"/> Non	1.8 m	<input type="checkbox"/> With Corex , <input checked="" type="checkbox"/> Non

**Note:** Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



## 4.2. CONFIGURATION OF SYSTEM UNDER TEST







## 5 FACILITIES AND ACCREDITATIONS

### 5.1. FACILITIES

All measurement facilities used to collect the measurement data are located at:

- No.11, Wugong 6th Rd., Wugu Dist., New Taipei City 24891, Taiwan. (R.O.C.)
- No.139, Wugong Rd., Wugu Dist., New Taipei City 24891, Taiwan (R.O.C.)
- No.81-1, Lane 210, Bade 2nd Rd., Lujhu Township, Taoyuan County 33841, TAIWAN, R.O.C.
- No.163-1, Jhongsheng Rd., Sindian City, Taipei County 23151, Taiwan.

The sites are constructed in conformance with the requirements of ANSI C63.4 and CISPR 22. All receiving equipment conforms to CISPR 16-1-1, CISPR 16-1-2, CISPR 16-1-3, CISPR 16-1-4, CISPR 16-1-5.

### 5.2. ACCREDITATIONS

Our laboratories are accredited and approved by the following approval agencies according to ISO/IEC 17025.

<b>Taiwan</b>	TAF (TAF 1309)
<b>USA</b>	A2LA (0824.01)

The measuring facility of laboratories has been authorized or registered by the following approval agencies.

<b>Canada</b>	Industry Canada (3M Semi Anechoic Chamber: IC 2324G-1 / IC 2324G-2 / 2324J-1 / 2324J-2 to perform)
<b>Norway</b>	Nemko
<b>Japan</b>	VCCI 966 Chamber C: Radiated emissions: 30 MHz -1000 MHz: R-3282 / Above 1GHz: G-146 10M Chamber: Radiated emissions: 30 MHz -1000 MHz: R-3283 / Above 1GHz: G-147 Conducted Emission B: C-3700 / T-1839
<b>USA</b>	FCC (3M Semi Anechoic Chamber (FCC MRA: TW1039) to perform FCC Part 15 measurements)

Copies of granted accreditation certificates are available for downloading from our web site, <http://www.ccsrf.com>



### 5.3. MEASUREMENT UNCERTAINTY

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Uncertainty
Conducted emissions	9kHz~30MHz	$\pm 1.2575$ dB
Radiated emissions	30~200MHz	$\pm 3.9163$ dB
	200~1000MHz	$\pm 3.9030$ dB
	Above 1GHz	$\pm 2.5208$ dB

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

Consistent with industry standard (e.g. CISPR 22:2008, clause 11, Measurement Uncertainty) determining compliance with the limits shall be based on the results of the compliance measurement. Consequently the measured emissions being less than the maximum allowed emission result in this being a compliant test or passing test.

The acceptable measurement uncertainty value without requiring revision of the compliance statement is based on conducted and radiated emissions being less than  $U_{CISPR}$  which is 3.6dB and 5.2dB respectively. CCS values (called  $U_{Lab}$  in CISPR 16-4-2) is less than  $U_{CISPR}$  as shown in the table above. Therefore, MU need not be considered for compliance.



## 6 CONDUCTED EMISSION MEASUREMENT

### 6.1. LIMITS OF CONDUCTED EMISSION MEASUREMENT

FREQUENCY (MHz)	Class A (dBuV)		Class B (dBuV)	
	Quasi-peak	Average	Quasi-peak	Average
0.15 - 0.5	79	66	66 - 56	56 - 46
0.50 - 5.0	73	60	56	46
5.0 - 30.0	73	60	60	50

**NOTE:**

- (1) The lower limit shall apply at the transition frequencies.
- (2) The limit decreases in line with the logarithm of the frequency in the range 0.15 to 0.50 MHz.
- (3) All emanations from a class A/B digital device or system, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strengths specified above.

### 6.2. TEST INSTRUMENTS

Conducted Emission Room				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI Test Receiver	R&S	ESCI	101073	07/30/2014
LISN	R&S	ENV216	101054	06/05/2014
LISN	EMCO	3825/2	9106-1809	07/02/2014
Capacitive Voltage Probe	FCC	F-CVP-1	100185	03/23/2015
Test S/W	CCS-3A1-CE			

**Note:**

1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.



### **6.3. TEST PROCEDURES** (please refer to measurement standard or CCS SOP PA-031)

#### **Procedure of Preliminary Test**

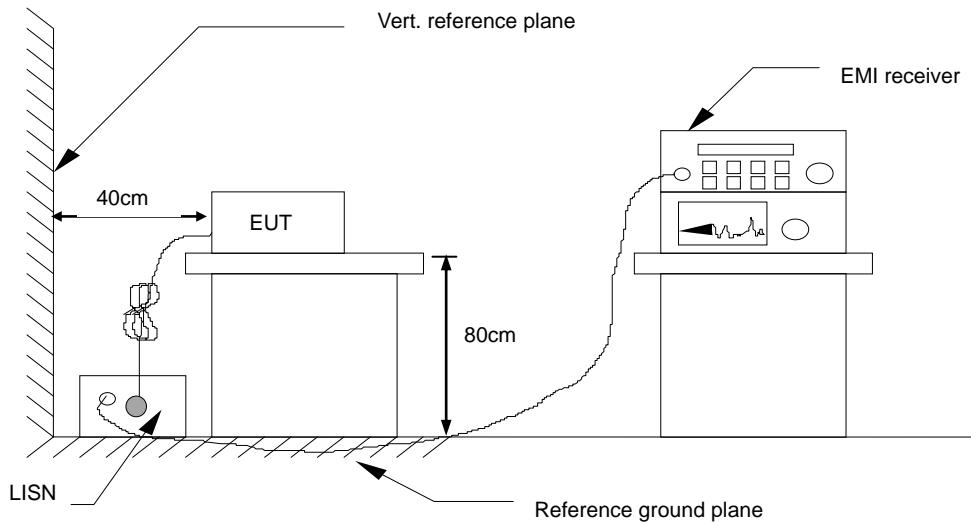
- The EUT and support equipment, if needed, were set up as per the test configuration to simulate typical usage per the user's manual. When the EUT is a tabletop system, a wooden table with a height of 0.8 meters is used and is placed on the ground plane as per ANSI C63.4 (see Test Facility for the dimensions of the ground plane used). When the EUT is a floor standing equipment, it is placed on the ground plane, which has a 12 mm non-conductive covering to insulate the EUT from the ground plane.
- All I/O cables were positioned to simulate typical actual usage as per ANSI C63.4.
- The test equipment EUT installed by AC 120VAC/60Hz main power, through a Line Impedance Stabilization Network (LISN), which was supplied power source and was grounded to the ground plane.
- All support equipment power by from a second LISN.
- The test program of the EUT was started. Emissions were measured on each current carrying line of the EUT using an EMI Test Receiver connected to the LISN powering the EUT.
- The Receiver scanned from 150kHz to 30MHz for emissions in each of the test modes.
- During the above scans, the emissions were maximized by cable manipulation.
- The test mode(s) described in Item 3.1 were scanned during the preliminary test.
- After the preliminary scan, we found the test mode described in Item 3.1 producing the highest emission level.
- The worst configuration of EUT and cable of the above highest emission level were recorded for reference of the final test.

#### **Procedure of Final Test**

- EUT and support equipment were set up on the test bench as per the configuration with highest emission level in the preliminary test.
- A scan was taken on both power lines, Line 1 and Line 2, recording at least the six highest emissions. Emission frequency and amplitude were recorded into a computer in which correction factors were used to calculate the emission level and compare reading to the applicable limit.
- The test data of the worst-case condition(s) was recorded.



### 6.4. TEST SETUP



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.

### 6.5. DATA SAMPLE:

Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correctrion factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak. limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark
x.xx	43.95	33.00	10.00	53.95	43.00	56.00	46.00	-2.05	-3.00	Pass

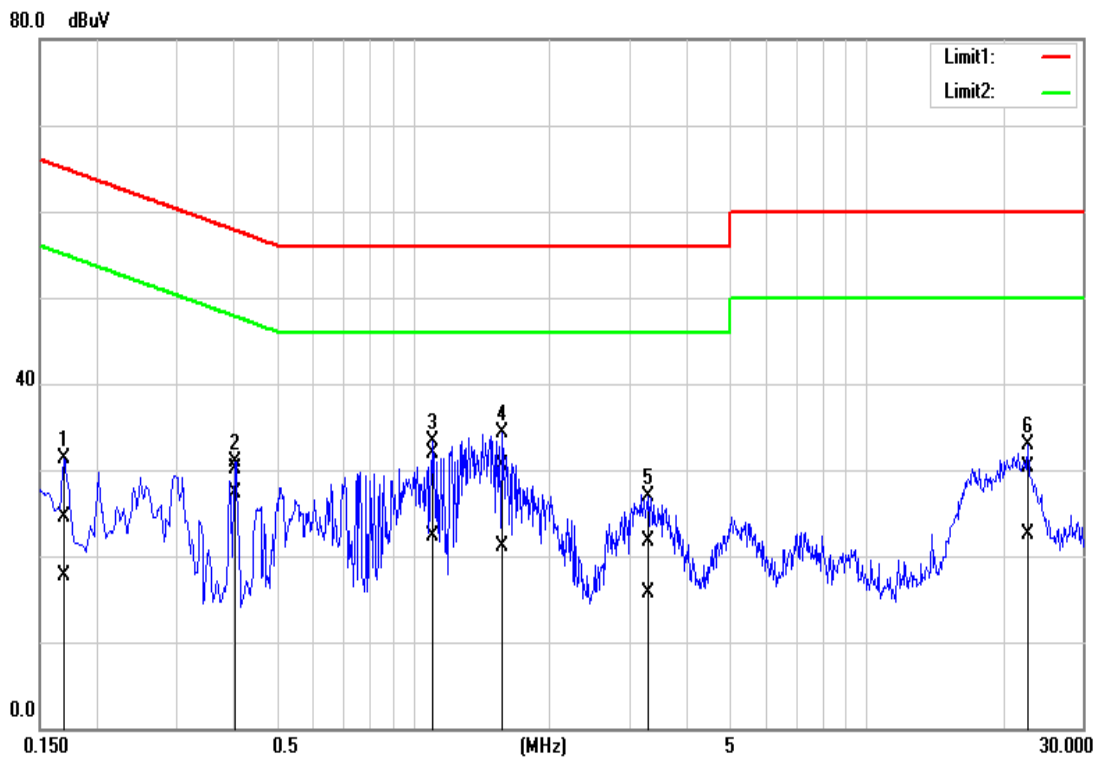
Frequency (MHz) = Emission frequency in MHz  
 Reading (dBuV) = Uncorrected Analyzer/Receiver reading + Insertion loss of LISN, if it > 0.5 dB  
 Correction Factor (dB) = LISN Factor + Cable Loss  
 Result (dBuV) = Raw reading converted to dBuV and CF added  
 Limit (dBuV) = Limit stated in standard  
 Margin (dB) = Result (dBuV) – Limit (dBuV)



### 6.6. TEST RESULTS

#### CCS Conduction Test

<b>Model No.</b>	LM177	<b>Test Date</b>	2014/4/24
<b>Environmental Conditions</b>	24°C, 50% RH	<b>Test Mode</b>	Mode 1
<b>Tested by</b>	Moore Cheng	<b>Line</b>	L1



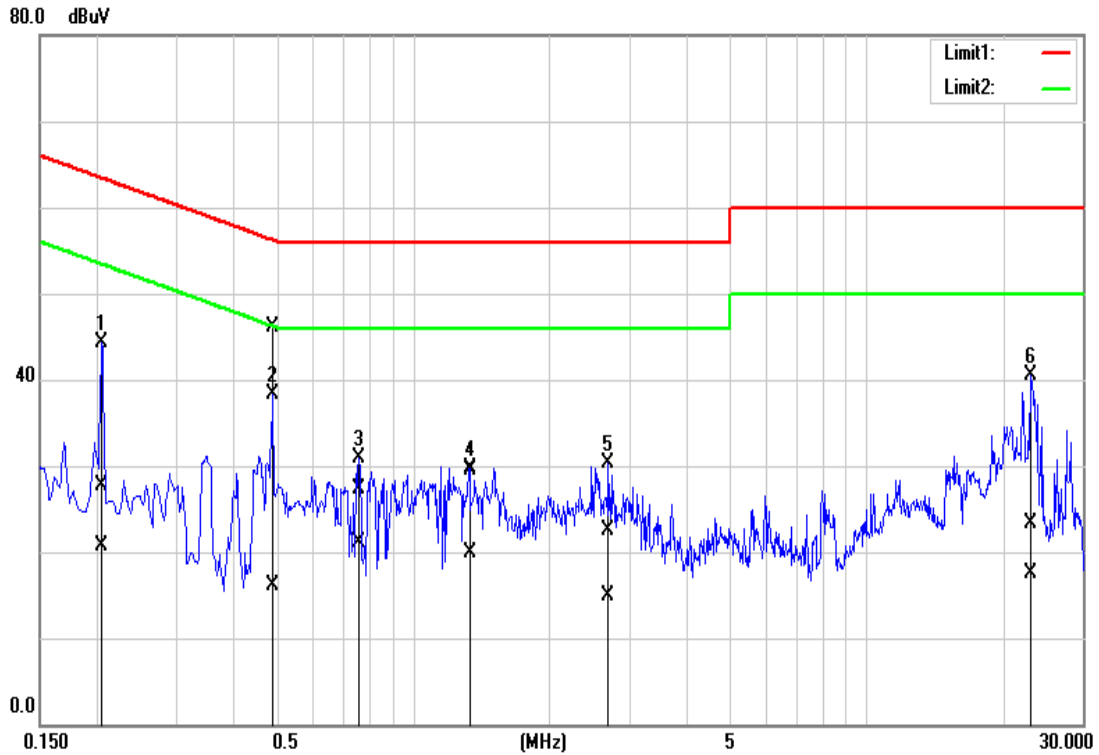
NO.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark (Pass/Fail)
1*	0.1700	14.83	8.03	9.61	24.44	17.64	64.96	54.96	-40.52	-37.32	Pass
2	0.4060	20.41	17.78	9.62	30.03	27.40	57.73	47.73	-27.70	-20.33	Pass
3	1.1100	22.23	12.62	9.65	31.88	22.27	56.00	46.00	-24.12	-23.73	Pass
4	1.5740	20.79	11.47	9.66	30.45	21.13	56.00	46.00	-25.55	-24.87	Pass
5	3.3060	11.99	6.00	9.71	21.70	15.71	56.00	46.00	-34.30	-30.29	Pass
6	22.7139	20.42	12.56	9.96	30.38	22.52	60.00	50.00	-29.62	-27.48	Pass

REMARKS: L1 = Line One (Live Line)



CCS Conduction Test

Model No.	LM177	Test Date	2014/4/24
Environmental Conditions	24°C, 50% RH	Test Mode	Mode 1
Tested by	Moore Cheng	Line	L2



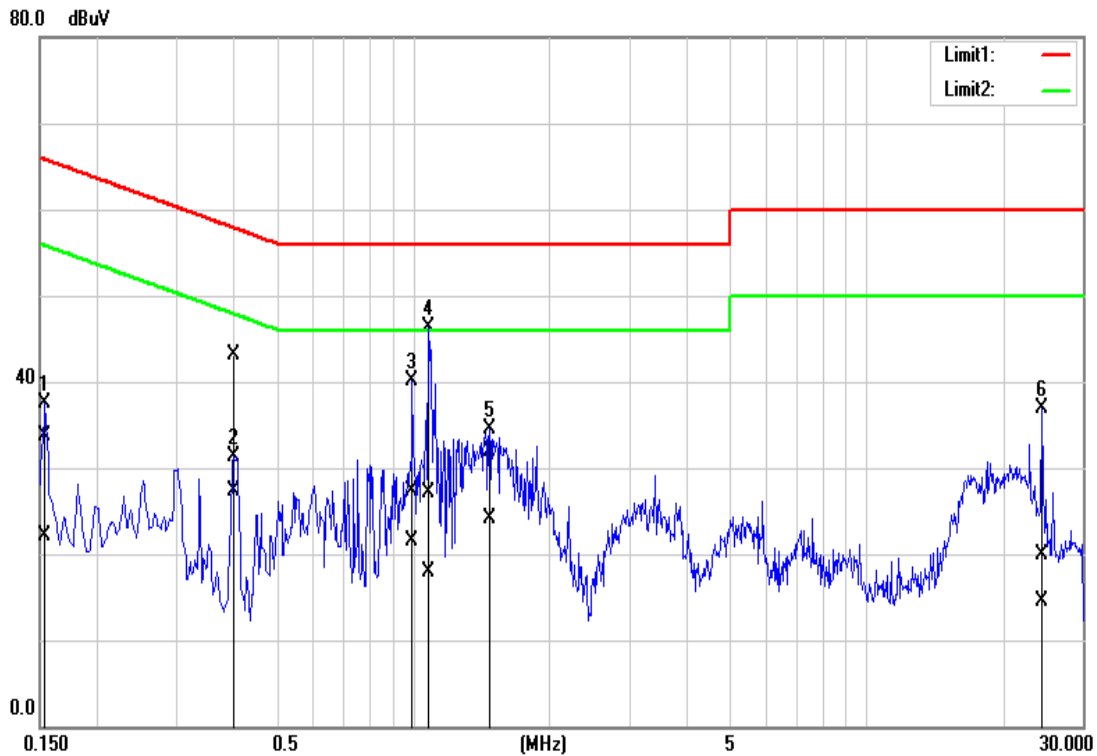
NO.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark (Pass/Fail)
1	0.2060	18.11	11.12	9.67	27.78	20.79	63.36	53.37	-35.58	-32.58	Pass
2*	0.4900	36.48	6.36	9.67	46.15	16.03	56.17	46.17	-10.02	-30.14	Pass
3	0.7620	17.54	11.49	9.69	27.23	21.18	56.00	46.00	-28.77	-24.82	Pass
4	1.3300	19.72	10.14	9.71	29.43	19.85	56.00	46.00	-26.57	-26.15	Pass
5	2.7060	12.67	5.17	9.74	22.41	14.91	56.00	46.00	-33.59	-31.09	Pass
6	23.1220	13.31	7.46	10.02	23.33	17.48	60.00	50.00	-36.67	-32.52	Pass

REMARKS: L2 = Line Two (Neutral Line)



CCS Conduction Test

<b>Model No.</b>	LM177	<b>Test Date</b>	2014/4/24
<b>Environmental Conditions</b>	24°C, 50% RH	<b>Test Mode</b>	Mode 2
<b>Tested by</b>	Moore Cheng	<b>Line</b>	L1



NO.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark (Pass/Fail)
1*	0.1539	24.10	12.53	9.61	33.71	22.14	65.78	55.79	-32.07	-33.65	Pass
2	0.4020	33.45	17.69	9.62	43.07	27.31	57.81	47.81	-14.74	-20.50	Pass
3	0.9980	17.57	11.87	9.65	27.22	21.52	56.00	46.00	-28.78	-24.48	Pass
4	1.0820	17.43	8.23	9.65	27.08	17.88	56.00	46.00	-28.92	-28.12	Pass
5	1.4780	22.32	14.54	9.66	31.98	24.20	56.00	46.00	-24.02	-21.80	Pass
6	24.3740	9.98	4.56	9.96	19.94	14.52	60.00	50.00	-40.06	-35.48	Pass

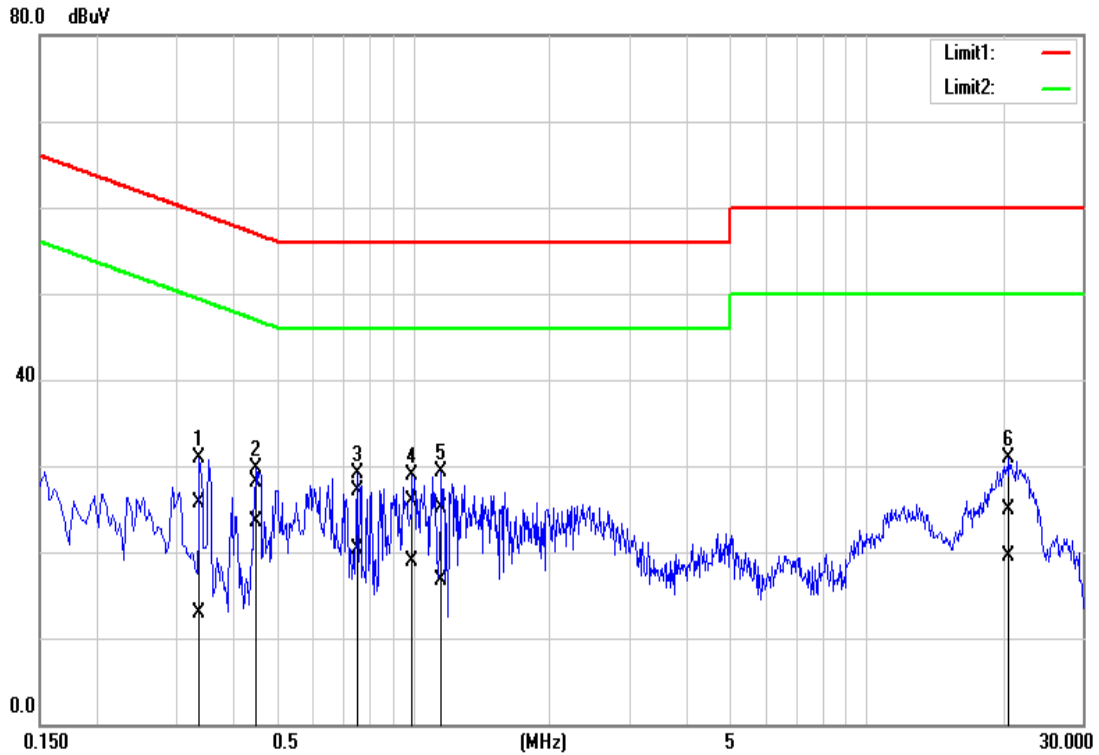
REMARKS: L1 = Line One (Live Line)





CCS Conduction Test

Model No.	LM177	Test Date	2014/4/24
Environmental Conditions	24°C, 50% RH	Test Mode	Mode 2
Tested by	Moore Cheng	Line	L2



NO.	Frequency (MHz)	QuasiPeak reading (dBuV)	Average reading (dBuV)	Correction factor (dB)	QuasiPeak result (dBuV)	Average result (dBuV)	QuasiPeak limit (dBuV)	Average limit (dBuV)	QuasiPeak margin (dB)	Average margin (dB)	Remark (Pass/Fail)
1	0.3379	16.10	3.30	9.67	25.77	12.97	59.25	49.25	-33.48	-36.28	Pass
2*	0.4500	18.42	13.81	9.67	28.09	23.48	56.87	46.88	-28.78	-23.40	Pass
3	0.7539	17.34	10.62	9.69	27.03	20.31	56.00	46.00	-28.97	-25.69	Pass
4	0.9980	16.14	9.25	9.70	25.84	18.95	56.00	46.00	-30.16	-27.05	Pass
5	1.1539	15.32	7.03	9.70	25.02	16.73	56.00	46.00	-30.98	-29.27	Pass
6	20.6060	15.00	9.43	10.00	25.00	19.43	60.00	50.00	-35.00	-30.57	Pass

REMARKS: L2 = Line Two (Neutral Line)



## 7 RADIATED EMISSION MEASUREMENT

### 7.1. LIMITS OF RADIATED EMISSION MEASUREMENT

According to FCC Part 15.33 (b), 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 of measurement range (MHz)
Below 1.75	30
1.75-108	1000
108-500	2000
500-1000	5000
Above 1000	5 <sup>th</sup> harmonic of the highest frequency or 40GHz, whichever is lower

#### Below 1GHz (for digital device)

FREQUENCY (MHz)	dBuV/m (At 10m)	
	Class A	Class B
30 ~ 230	40	30
230 ~ 1000	47	37

#### Limit tables for non-digital device:

##### Class A Radiated Emission limit at 10m (for others)

Frequency (MHZ)	Field Strength Limit (uV/m)Q.P.	Field Strength Limit (dBuV/m)Q.P.
30 - 88	90	39
88 - 216	150	43.5
216 – 960	210	46.4
Above 960	300	49.5

##### Class B Radiated Emission limit at 3m (for others)

Frequency (MHZ)	Field Strength Limit (uV/m)Q.P.	Field Strength Limit (dBuV/m)Q.P.
30 - 88	100	40
88 - 216	150	43.5
216 – 960	200	46
Above 960	500	54



**Above 1GHz (for all device)**

Frequency (MHZ)	Class A (dBuV/m) (At 10m)		Class B (dBuV/m) (At 3m)	
	Average	Peak	Average	Peak
Above 1000	49.5	69.5	54	74

- NOTE:** (1) The lower limit shall apply at the transition frequencies.  
(2) Emission level (dBuV/m) = 20 log Emission level (uV/m).  
(3) The measurement above 1GHz is at close-in distances 3m, and determine the limit **L2** corresponding to the close-in distance **d2** by applying the following relation:  $L2 = L1 (d1/d2)$ , where **L1** is the specified limit in microvolts per metre (**uV/m**) at the distance **d1** (**10m**), **L2** is the new limit for distance **d2** (**3m**).  
So the new Class A limit above 1GHz at 3m is as following table:

Frequency (MHZ)	Class A (dBuV/m) (At 3m)	
	Average	Peak
Above 1000	60	80



7.2. TEST INSTRUMENTS

Wugu 10M Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY48250297	10/02/2014
EMI Test Receiver	R&S	ESCI	100961	09/04/2014
EMI Test Receiver	R&S	ESCI	100962	09/04/2014
Pre-Amplifier	HP	8447D	2944A07754	05/06/2014
Pre-Amplifier	HP	8447D	2944A08150	05/06/2014
Pre-Amplifier	EMC	EMC012645	980056	05/06/2014
Pre-Amplifier	MITEQ	AMF-6F-260400-40-8P	985646	08/08/2014
Bilog Antenna	TESEQ	CBL 6112D	31674	09/09/2014
Bilog Antenna	TESEQ	CBL6112D	31675	09/09/2014
Horn Antenna	EMCO	3117	55167	01/08/2015
Horn Antenna	EMCO	3116	26370	01/06/2015
Coaxial Cable	Huber+Suhner	104PEA	33948/4PEA	05/06/2014
Coaxial Cable	Huber+Suhner	104PEA	33949/4PEA	05/06/2014
Coaxial Cable	Huber+Suhner	104	330026/4	05/06/2014
Coaxial Cable	Huber+Suhner	104	330029/4	05/06/2014
Coaxial Cable	Huber+Suhner	104	329382/4	05/06/2014
Coaxial Cable	Huber+Suhner	104	330028/4	05/06/2014
Turn Table	CCS	CC-T-1F	N/A	N.C.R
Antenna Tower	CCS	CC-A-1F	N/A	N.C.R
Controller	CCS	CC-C-1F	N/A	N.C.R
Antenna Tower	Sunol Sciences	TLT2	031010-5	N.C.R
Controller	Sunol Sciences	SC104V	031010-1	N.C.R
Site NSA	CCS	N/A	N/A	11/22/2014
Site VSWR	CCS	N/A	N/A	11/28/2014
Test S/W	EZ-EMC (CCS-3A1RE)			

**NOTE:** 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.

2. N.C.R = No Calibration Request.



### 7.3. TEST PROCEDURES (please refer to measurement standard or CCS SOP PA-031)

The basic test procedure was in accordance with ANSI C63.4-2009 and ICES-003: 2004.

#### Frequency range 30MHz ~ 1GHz

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 10 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position.
2. The EUT was set 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
3. The height of antenna is varied from one meter to four meter above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was turned to heights for 1 meter to 4 meters and the turn table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1GHz.

NOTE: The resolution bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.

#### Frequency range above 1GHz

1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic chamber room. The table was rotated 360 degrees to determine the position.
2. The EUT was set 3 meters away from the directional antenna, which was pointed towards the source of the emission within the EUT. This could be done by either pointing the antenna at an angle towards the source of the emission, or by rotating the EUT, in both height and polarization, to maximize the measured emission.
3. The height of antenna can be varied from one meter to four meters, the height of adjustment depends on the EUT height and the antenna 3 dB beamwidth both, to detect the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was turned to heights and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
5. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1GHz.

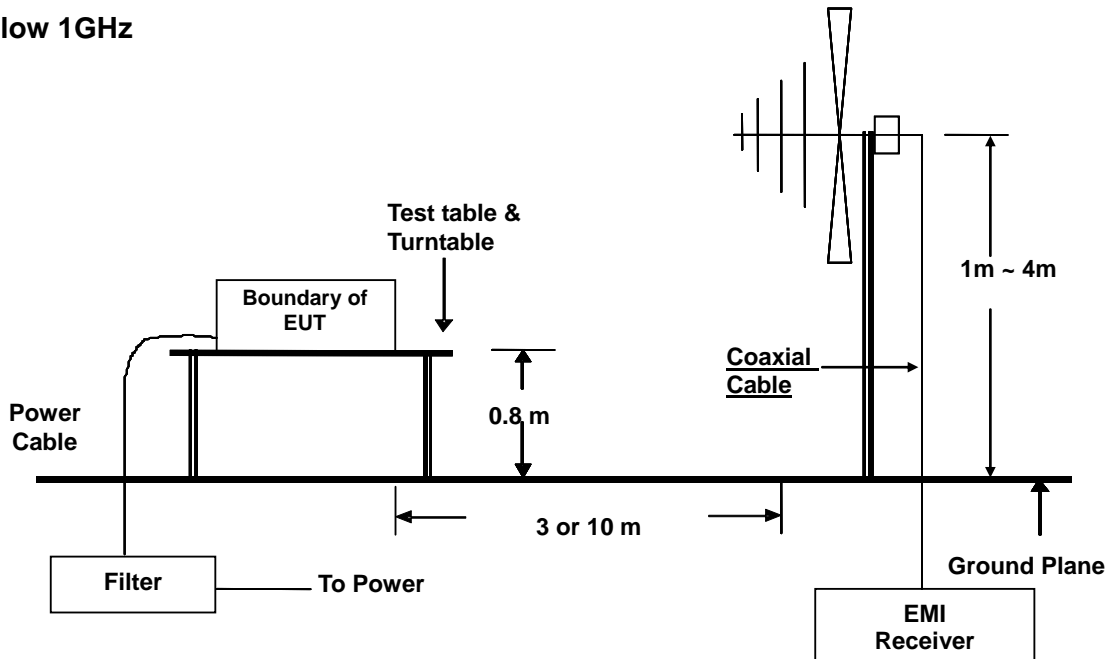
NOTE:

1. The resolution bandwidth is 1MHz and video bandwidth of test spectrum analyzer is 1 MHz for peak detection at above 1GHz. The resolution bandwidth is 1MHz and video bandwidth of test spectrum analyzer is 100Hz for average detection at frequency above 1 GHz.
2. For measurement of frequency above 1GHz, the EUT was set 3 meters away from the directional antenna.

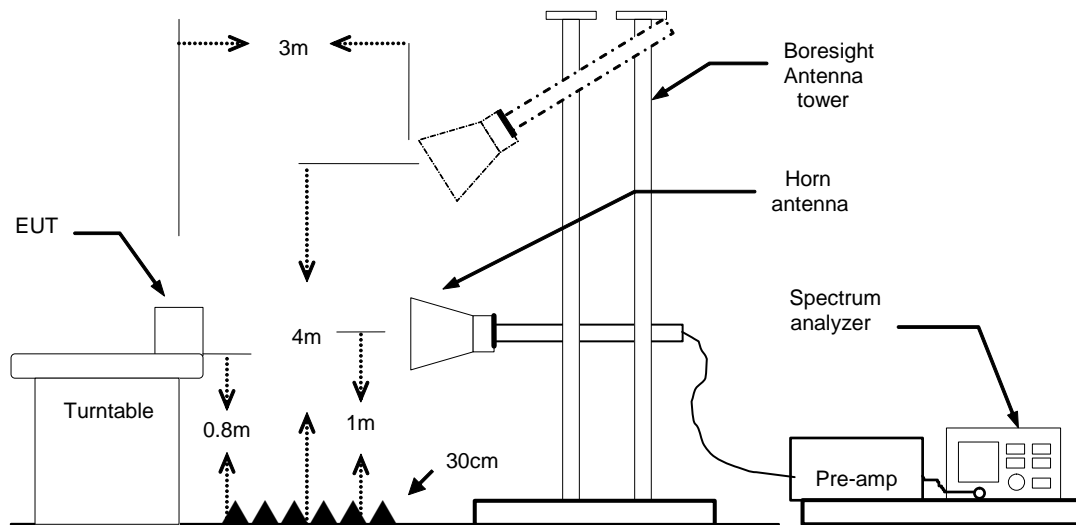


## 7.4. TEST SETUP

### Below 1GHz



### Above 1GHz



- For the actual test configuration, please refer to the related item – Photographs of the Test Configuration.



### 7.5. DATA SAMPLE:

#### Below 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
xx.xx	16.49	9.86	26.35	30.00	-3.65	116.00	101.00	QP

#### Above 1GHz

Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
xx.xx	60.80	-14.59	46.21	74.00	-27.79	200	351	peak
xx.xx	52.05	-13.17	38.88	54.00	-15.12	200	135	AVG

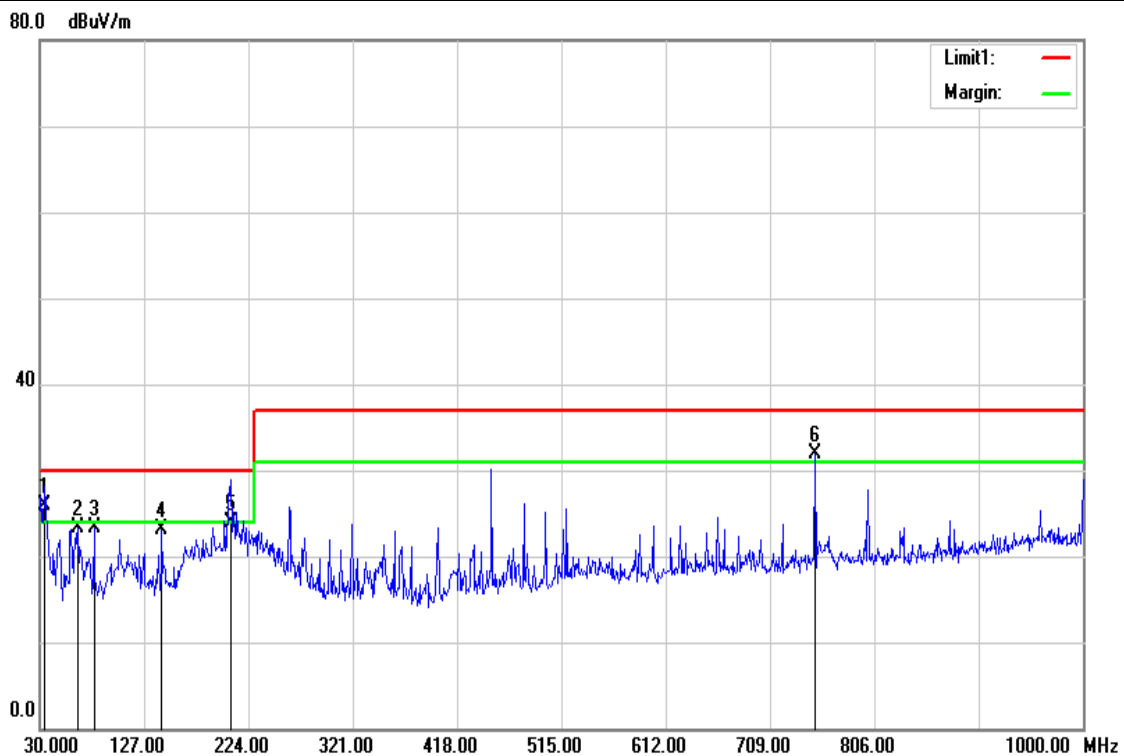
Frequency (MHz) = Emission frequency in MHz  
Reading (dBuV) = Uncorrected Analyzer / Receiver reading  
Correction Factor (dB/m) = Antenna factor + Cable loss – Amplifier gain  
Result (dBuV/m) = Reading (dBuV) + Corr. Factor (dB/m)  
Limit (dBuV/m) = Limit stated in standard  
Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)  
Q.P. = Quasi-Peak



## 7.6. TEST RESULTS

### Below 1000MHz

<b>Model No.</b>	LM177	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Date</b>	2014/4/24
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	10m
<b>Detector Function</b>	Quasi-peak.	<b>Tested by</b>	Moore Cheng
<b>Standard</b>	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	34.8500	36.46	-10.62	25.84	30.00	-4.16	100	94	QP
2	65.8900	42.82	-19.46	23.36	30.00	-6.64	100	29	QP
3	80.4400	41.51	-18.21	23.30	30.00	-6.70	100	56	QP
4	143.4900	37.10	-13.91	23.19	30.00	-6.81	112	0	QP
5	207.5100	38.76	-14.87	23.89	30.00	-6.11	100	317	QP
6	750.7100	34.98	-3.03	31.95	37.00	-5.05	230	0	QP

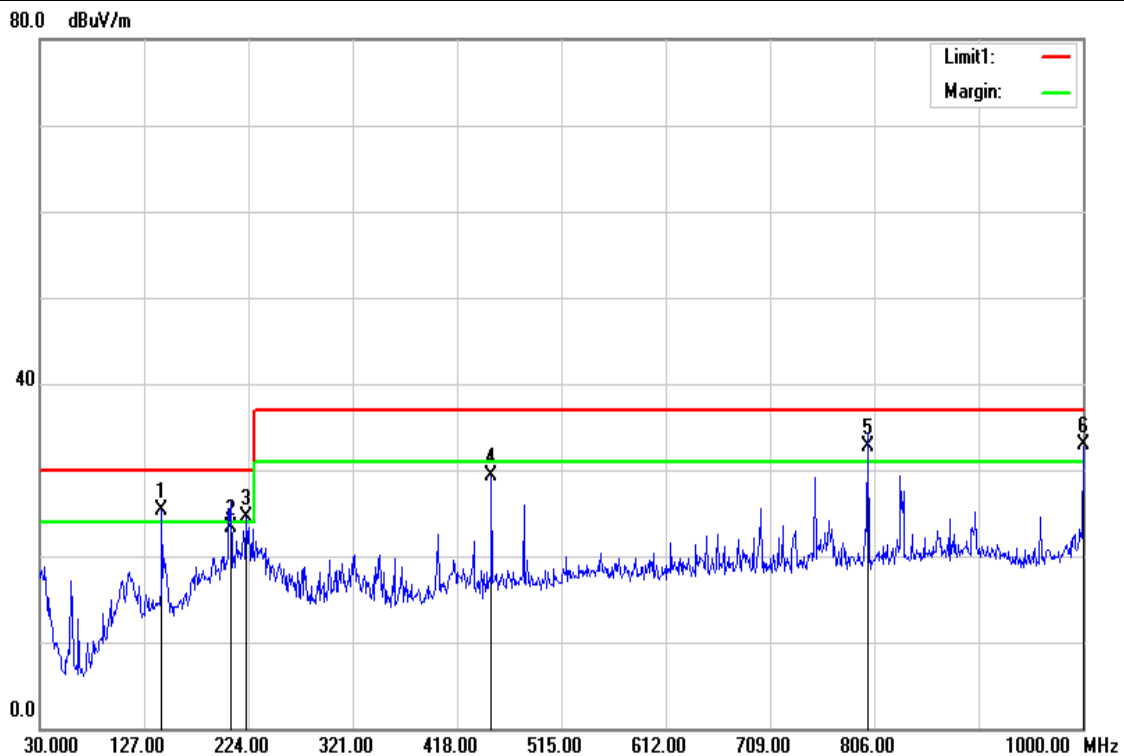
**REMARKS:** 1. The other emission levels were very low against the limit.  
2. 30MHz to 1000MHz test is Applicable CISPR 22 standard.





Below 1000MHz

<b>Model No.</b>	LM177	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Date</b>	2014/4/24
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	10m
<b>Detector Function</b>	Quasi-peak.	<b>Tested by</b>	Moore Cheng
<b>Standard</b>	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



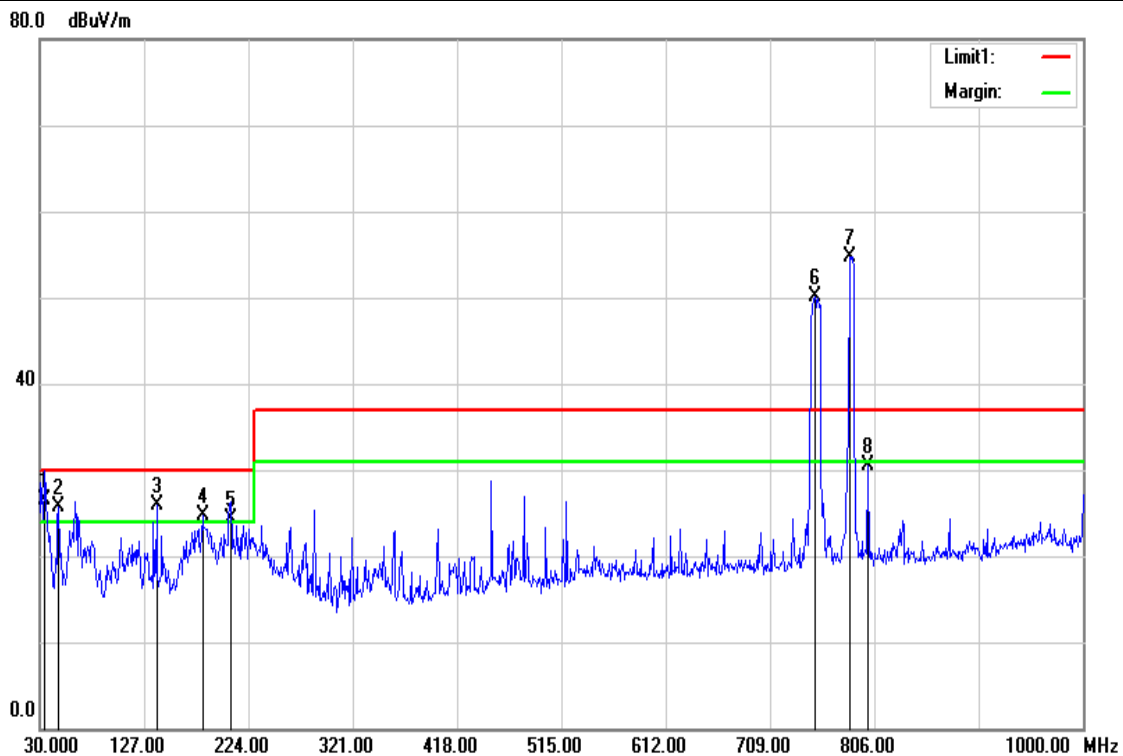
No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	143.4900	39.70	-14.36	25.34	30.00	-4.66	399	75	QP
2	207.5100	38.87	-15.48	23.39	30.00	-6.61	399	317	QP
3	222.0600	39.70	-15.24	24.46	30.00	-5.54	399	298	QP
4	450.0100	37.14	-7.88	29.26	37.00	-7.74	100	138	QP
5	800.1800	36.23	-3.56	32.67	37.00	-4.33	100	212	QP
6	1000.0000	33.60	-0.72	32.88	37.00	-4.12	100	175	QP

**REMARKS:** 1. The other emission levels were very low against the limit.  
2. 30MHz to 1000MHz test is Applicable CISPR 22 standard.



Below 1000MHz

Model No.	LM177	Test Mode	Mode 2
Environmental Conditions	26°C, 60% RH	Test Date	2014/4/24
Antenna Pole	Vertical	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Moore Cheng
Standard	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	34.8500	37.10	-10.62	26.48	30.00	-3.52	100	152	QP
2	47.4600	42.76	-17.14	25.62	30.00	-4.38	100	168	QP
3	138.6400	39.63	-13.68	25.95	30.00	-4.05	100	88	QP
4	181.3200	39.98	-15.22	24.76	30.00	-5.24	100	360	QP
5	207.5100	39.25	-14.87	24.38	30.00	-5.62	100	281	QP
6	750.7100	53.21	-3.03	50.18	37.00	13.18	254	360	DL
7	782.7200	57.35	-2.59	54.76	37.00	17.76	221	360	UL
8	800.1800	32.77	-2.35	30.42	37.00	-6.58	225	360	QP

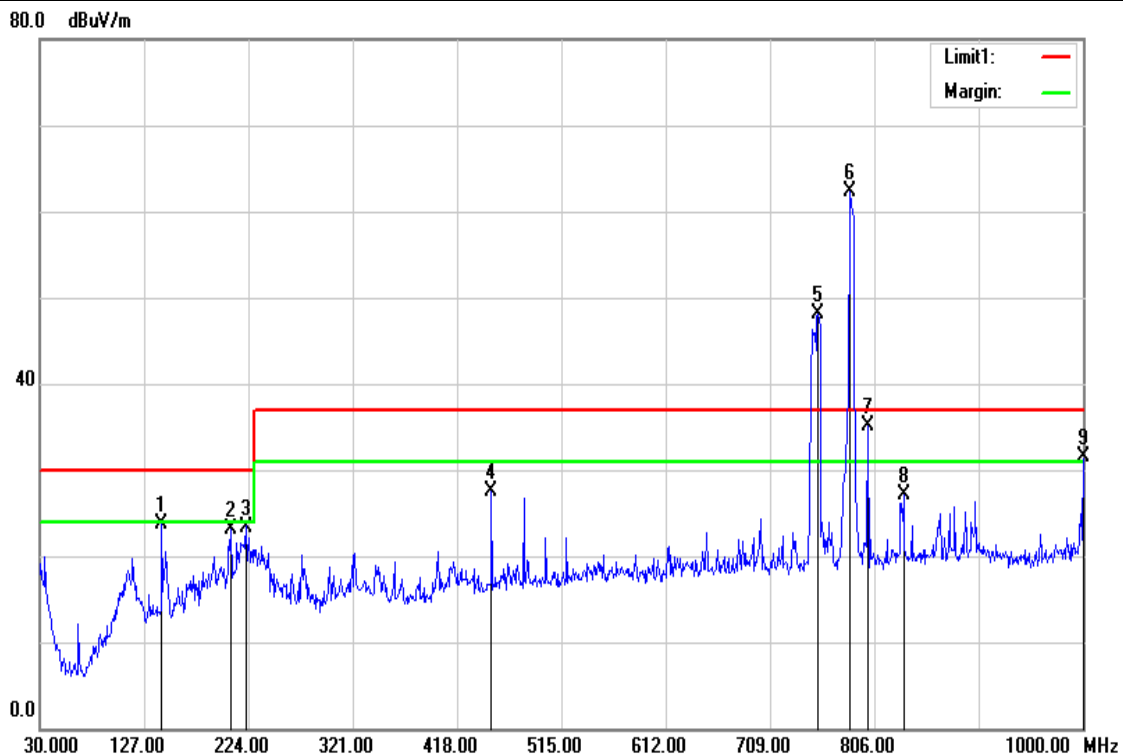
**REMARKS:**

1. The other emission levels were very low against the limit.
2. 30MHz to 1000MHz test is Applicable CISPR 22 standard
3. UL: the transmitting signal of Universal Radio Communication Tester
4. DL: the receiving signal of Universal Radio Communication Tester.



Below 1000MHz

Model No.	LM177	Test Mode	Mode 2
Environmental Conditions	26°C, 60% RH	Test Date	2014/4/24
Antenna Pole	Horizontal	Antenna Distance	10m
Detector Function	Quasi-peak.	Tested by	Moore Cheng
Standard	FCC CLASS B W/ CISPR 22 CLASS B LIMIT		



No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	143.4900	38.13	-14.36	23.77	30.00	-6.23	399	50	QP
2	207.5100	38.54	-15.48	23.06	30.00	-6.94	399	281	QP
3	222.0600	38.64	-15.24	23.40	30.00	-6.60	399	281	QP
4	450.0100	35.30	-7.88	27.42	37.00	-9.58	100	214	QP
5	753.6200	52.11	-4.03	48.08	37.00	11.08	100	158	DL
6	783.6900	66.03	-3.73	62.30	37.00	25.30	100	233	UL
7	800.1800	38.57	-3.56	35.01	37.00	-1.99	100	3	QP
8	833.1600	30.11	-3.02	27.09	37.00	-9.91	100	214	QP
9	1000.0000	32.15	-0.72	31.43	37.00	-5.57	100	236	QP

**REMARKS:**

1. The other emission levels were very low against the limit.
2. 30MHz to 1000MHz test is Applicable CISPR 22 standard.
3. UL: the transmitting signal of Universal Radio Communication Tester
4. DL: the receiving signal of Universal Radio Communication Tester..



Above 1000MHz

<b>Model No.</b>	LM177	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Date</b>	2014/4/24
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	3m
<b>Highest frequency generated or used</b>	2.155GHz	<b>Upper frequency</b>	10.775GHz
<b>Detector Function</b>	Average & Peak	<b>Tested by</b>	Moore Cheng

No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	3448.000	65.58	-15.40	50.18	74.00	-23.82	202	148	peak
2	3448.000	60.71	-15.40	45.31	54.00	-8.69	214	156	AVG
3	14353.500	56.92	-2.62	54.30	74.00	-19.70	100	66	peak
4	14353.500	44.87	-2.62	42.25	54.00	-11.75	105	84	AVG
5	15110.000	56.77	-0.93	55.84	74.00	-18.16	300	360	peak
6	15110.000	44.92	-0.93	43.99	54.00	-10.01	281	349	AVG
7	15815.500	55.37	-0.59	54.78	74.00	-19.22	100	296	peak
8	15815.500	44.08	-0.59	43.49	54.00	-10.51	109	308	AVG
9	16657.000	55.57	-0.06	55.51	74.00	-18.49	202	0	peak
10	16657.000	43.91	-0.06	43.85	54.00	-10.15	213	18	AVG
11	17558.000	55.85	-0.01	55.84	74.00	-18.16	202	347	peak
12	17558.000	44.62	-0.01	44.61	54.00	-9.39	194	351	AVG

**REMARKS:**

1. The other emission levels were very low against the limit.
2. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)



<b>Model No.</b>	LM177	<b>Test Mode</b>	Mode 1
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Date</b>	2014/4/24
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	3m
<b>Highest frequency generated or used</b>	2.155GHz	<b>Upper frequency</b>	10.775GHz
<b>Detector Function</b>	Average & Peak	<b>Tested by</b>	Moore Cheng

No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	12407.000	55.42	-3.66	51.76	74.00	-22.24	100	58	peak
2	12407.000	46.14	-3.66	42.48	54.00	-11.52	102	67	AVG
3	14379.000	55.95	-2.54	53.41	74.00	-20.59	136	360	peak
4	14379.000	45.18	-2.54	42.64	54.00	-11.36	139	351	AVG
5	15186.500	55.52	-0.84	54.68	74.00	-19.32	400	360	peak
6	15186.500	43.96	-0.84	43.12	54.00	-10.88	395	348	AVG
7	16104.500	55.66	-0.54	55.12	74.00	-18.88	100	343	peak
8	16104.500	44.65	-0.54	44.11	54.00	-9.89	108	324	AVG
9	16759.000	55.57	-0.07	55.50	74.00	-18.50	200	255	peak
10	16759.000	44.01	-0.07	43.94	54.00	-10.06	228	243	AVG
11	17379.500	55.15	-0.06	55.09	74.00	-18.91	300	64	peak
12	17379.500	44.64	-0.06	44.58	54.00	-9.42	307	50	AVG

**REMARKS:**

1. The other emission levels were very low against the limit.
2. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)



Above 1000MHz

<b>Model No.</b>	LM177	<b>Test Mode</b>	Mode 2
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Date</b>	2014/4/24
<b>Antenna Pole</b>	Vertical	<b>Antenna Distance</b>	3m
<b>Highest frequency generated or used</b>	2.155GHz	<b>Upper frequency</b>	10.775GHz
<b>Detector Function</b>	Average & Peak	<b>Tested by</b>	Moore Cheng

No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	10120.500	58.21	-6.27	51.94	74.00	-22.06	100	182	peak
2	10120.500	46.33	-6.27	40.06	54.00	-13.94	112	194	AVG
3	12747.000	56.62	-3.51	53.11	74.00	-20.89	100	229	peak
4	12747.000	46.95	-3.51	43.44	54.00	-10.56	108	234	AVG
5	14991.000	55.96	-1.08	54.88	74.00	-19.12	197	145	peak
6	14991.000	44.56	-1.08	43.48	54.00	-10.52	184	152	AVG
7	16011.000	55.95	-0.65	55.30	74.00	-18.70	300	59	peak
8	16011.000	43.97	-0.65	43.32	54.00	-10.68	314	67	AVG
9	16861.000	55.41	-0.08	55.33	74.00	-18.67	197	0	peak
10	16861.000	44.59	-0.08	44.51	54.00	-9.49	203	12	AVG
11	17456.000	57.56	-0.06	57.50	74.00	-16.50	400	360	peak
12	17456.000	45.43	-0.06	45.37	54.00	-8.63	383	351	AVG

**REMARKS:**

1. The other emission levels were very low against the limit.
2. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)



<b>Model No.</b>	LM177	<b>Test Mode</b>	Mode 2
<b>Environmental Conditions</b>	26°C, 60% RH	<b>Test Date</b>	2014/4/24
<b>Antenna Pole</b>	Horizontal	<b>Antenna Distance</b>	3m
<b>Highest frequency generated or used</b>	2.155GHz	<b>Upper frequency</b>	10.775GHz
<b>Detector Function</b>	Average & Peak	<b>Tested by</b>	Moore Cheng

No.	Frequency (MHz)	Reading (dBuV)	Correction Factor(dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Height (cm)	Degree (°)	Remark
1	12526.000	56.45	-3.41	53.04	74.00	-20.96	400	0	peak
2	12526.000	46.30	-3.41	42.89	54.00	-11.11	379	15	AVG
3	14370.500	56.42	-2.58	53.84	74.00	-20.16	202	0	peak
4	14370.500	45.61	-2.58	43.03	54.00	-10.97	214	12	AVG
5	15127.000	56.16	-0.91	55.25	74.00	-18.75	100	88	peak
6	15127.000	44.45	-0.91	43.54	54.00	-10.46	117	69	AVG
7	15798.500	55.84	-0.58	55.26	74.00	-18.74	100	316	peak
8	15798.500	44.76	-0.58	44.18	54.00	-9.82	103	341	AVG
9	16699.500	55.15	-0.06	55.09	74.00	-18.91	300	294	peak
10	16699.500	44.09	-0.06	44.03	54.00	-9.97	302	301	AVG
11	17456.000	55.40	-0.06	55.34	74.00	-18.66	202	263	peak
12	17456.000	44.85	-0.06	44.79	54.00	-9.21	194	284	AVG

**REMARKS:**

1. The other emission levels were very low against the limit.
2. Margin (dB) = Result (dBuV/m) – Limit (dBuV/m)



## 8 PHOTOGRAPHS OF THE TEST CONFIGURATION

### CONDUCTED EMISSION TEST

Mode 1~ 2



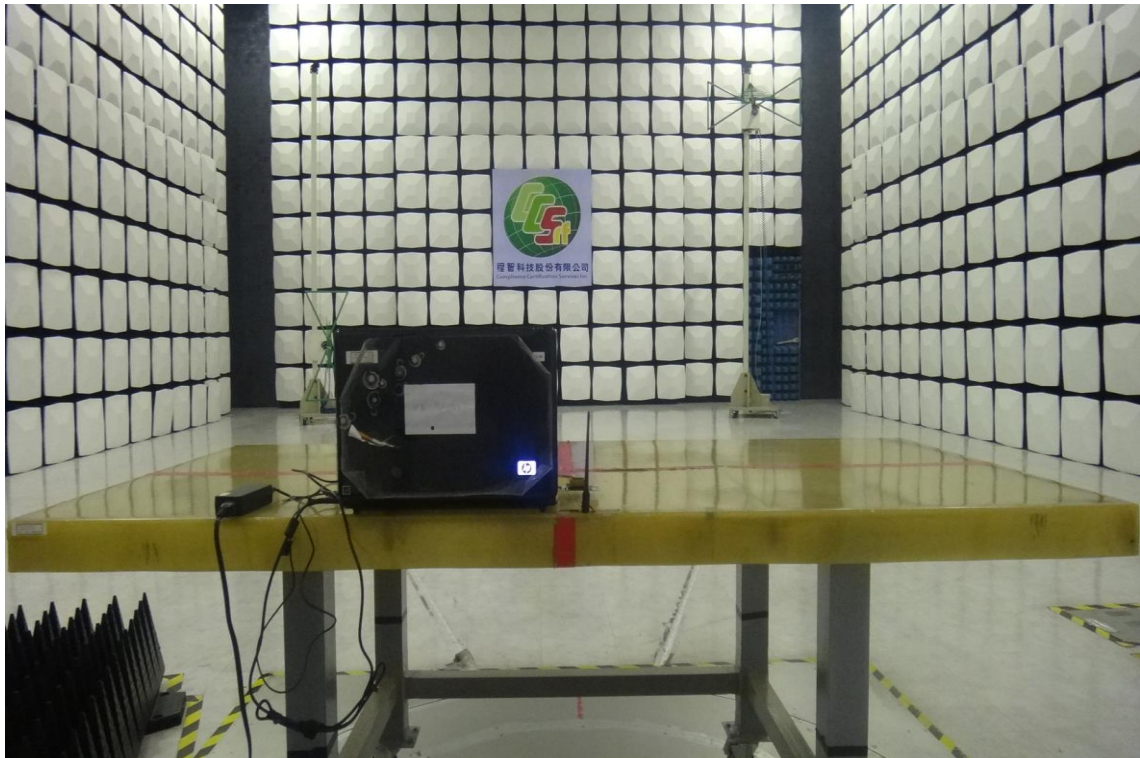




**RADIATED EMISSION TEST**

**Below 1GHz**

**Mode 1~ 2**





**Above 1GHz**

**Mode 1~ 2**

