



## **FCC 47 CFR PART 15 SUBPART C**

### **TEST REPORT**

**For**

**PND (Personal Navigation Device)**

**Model: GO520, GO720**

**Trade Name: TomTom**

*Issued to*

**TomTom International BV  
Rembrandtplein 35 1017 CT Amsterdam The Netherlands**

*Issued by*



**Compliance Certification Services Inc.**  
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## 1. TEST RESULT CERTIFICATION

**Applicant:** TomTom International BV  
Rembrandtplein 35 1017 CT Amsterdam The Netherlands

**Equipment Under Test:** PND (Personal Navigation Device)

**Trade Name:** TomTom

**Model:** GO520, GO720

**Date of Test:** May 8 ~ 11, 2007

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC 47 CFR Part 15 Subpart C	No non-compliance noted

The above equipment was tested by Compliance Certification Services Inc. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.4: 2003 and the energy emitted by the sample EUT tested as described in this report is in compliance with conducted and radiated emission limits of FCC Rules Part 15.239.

The test results of this report relate only to the tested sample identified in this report.

*Approved by:*

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Johnny Liu  
Section Manager  
Compliance Certification Services Inc.

*Reviewed by:*

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Amanda Wu  
Section Manager  
Compliance Certification Services Inc.



## 2. EUT DESCRIPTION

<b>Product</b>	PND (Personal Navigation Device)
<b>Trade Name</b>	TomTom
<b>Model</b>	GO520, GO720
<b>Model Discrepancy</b>	All the specification and layout are identical except they come with different model numbers for marketing purposes.
<b>Power Supply</b>	1. Power Adapter: Tomtom / PSB05R-050Q I/P: AC 100~240V, 50-60 Hz; 200mA O/P: DC 5V, 1A MAX, 12-17VA 2. Car Charger: Model: 4N00. 007 I/P: 12-24V O/P: 5V, 2A 3. Battery: SONY / 503759 A8 I/P: 1320mAh 4. Power from host device via USB cable
<b>Operate Frequency</b>	88.1-107.9 MHz
<b>Modulation Technique</b>	FM
<b>Number of Channels</b>	199 Channels

**Remark:**

1. The sample selected for test was production product and was provided by manufacturer.
2. The product is a Transmitter. This submittal(s) (test report) is intended for FCC ID: **S4LGO520** filing to comply with Section 15.239 of the FCC Part 15 Subpart C Rules.



### **3. TEST METHODOLOGY**

The tests documented in this report were performed in accordance with ANSI C63.4 and FCC CFR 47 Part 15 Subpart C.

#### **3.1 EUT CONFIGURATION**

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner that intends to maximize its emission characteristics in a continuous normal application.

#### **3.2 EUT EXERCISE**

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

#### **3.3 GENERAL TEST PROCEDURES**

##### **Conducted Emissions**

The EUT is placed on the turntable, which is 0.8 m above ground plane. According to the requirements in Section 7.1 of ANSI C63.4. Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

##### **Radiated Emissions**

The EUT is placed on a turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in Section 13.1.4.1 of ANSI C63.4.



### 3.4 FCC PART 15.205 RESTRICTED BANDS OF OPERATIONS

- (a) Except as shown in paragraph (d) of this section, only spurious emissions are permitted in any of the frequency bands listed below:

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 -	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.52525	2655 - 2900	22.01 - 23.12
8.41425 - 8.41475	156.7 - 156.9	3260 - 3267	23.6 - 24.0
12.29 - 12.293	162.0125 - 167.17	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	167.72 - 173.2	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	240 - 285	3600 - 4400	( <sup>2</sup> )
13.36 - 13.41	322 - 335.4		

<sup>1</sup> Until February 1, 1999, this restricted band shall be 0.490-0.510 MHz.

<sup>2</sup> Above 38.6

- (b) Except as provided in paragraphs (d) and (e), the field strength of emissions appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000 MHz, compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000 MHz, compliance with the emission limits in Section 15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.



### **3.5 DESCRIPTION OF TEST MODES**

The EUT (model: GO520) had been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting mode was programmed.

Channel Low (88.1 MHz) · Mid (98.0 MHz) and High (107.9 MHz) was chosen for full testing.

Download the audio signal (MP3 songs) to the device, and then play MP3 songs during all test and the volume of audio was tuned to the max during the test.

The tuning controls were manually adjusted to verify maximum tuning range.

The field strength of spurious emission was measured in the following position: EUT stand-up position (Z axis), lie-down position (X, Y axis). The worst emission was found in lie-down position (X axis) and the worst case was recorded.



## 4. INSTRUMENT CALIBRATION

### 4.1 MEASURING INSTRUMENT CALIBRATION

The measuring equipment, which was utilized in performing the tests documented herein, has been calibrated in accordance with the manufacturer's recommendations for utilizing calibration equipment, which is traceable to recognized national standards

### 4.2 MEASUREMENT EQUIPMENT USED

#### Equipment Used for Emissions Measurement

**Remark:** Each piece of equipment is scheduled for calibration once a year.

Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	MY43360131	01/30/2008

3M Semi Anechoic Chamber				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
Spectrum Analyzer	Agilent	E4446A	US42510252	08/02/2007
Test Receiver	Rohde&Schwarz	ESCI	100064	11/13/2007
Switch Controller	TRC	Switch Controller	SC94050010	05/04/2008
4 Port Switch	TRC	4 Port Switch	SC94050020	05/04/2008
Horn-Antenna	TRC	HA-0502	06	06/06/2007
Horn-Antenna	TRC	HA-0801	04	05/04/2008
Horn-Antenna	TRC	HA-1201A	01	07/10/2007
Horn-Antenna	TRC	HA-1301A	01	07/18/2007
Bilog- Antenna	Sunol Sciences	JB3	A030205	03/29/2008
Turn Table	Max-Full	MFT-120S	T120S940302	N.C.R.
Antenna Tower	Max-Full	MFA-430	A440940302	N.C.R.
Controller	Max-Full	MF-CM886	CC-C-1F-13	N.C.R.
Site NSA	CCS	N/A	FCC: 965860 IC: IC 6106	09/25/2008
Test S/W	LABVIEW (V 6.1)			

**Remark:** The measurement uncertainty is less than  $\pm 2.0065\text{dB}$  (30MHz ~ 1GHz),  $\pm 3.0958\text{dB}$  (Above 1GHz) which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.

Powerline Conducted Emissions Test Site				
Name of Equipment	Manufacturer	Model	Serial Number	Calibration Due
EMI TEST RECEIVER 9kHz-30MHz	Rohde & Schwarz	ESHS30	828144/003	10/31/2007
TWO-LINE V-NETWORK 9kHz-30MHz	SCHAFFNER	NNB41	03/10013	06/14/2007
LISN 10kHz-100MHz	EMCO	3825/2	9106-1809	03/19/2008
Test S/W	LABVIEW (V 6.1)			

**Remark:** The measurement uncertainty is less than  $\pm 2.81\text{dB}$ , which is evaluated as per the NAMAS NIS 81 and CISPR/A/291/CDV.





## **5. FACILITIES AND ACCREDITATIONS**

### **5.1 FACILITIES**

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

☐ No.199, Chunghsen Road, Hsintien City, Taipei Hsien, Taiwan, R.O.C.

Tel: 886-2-2217-0894 / Fax: 886-2-2217-1029

☒ No.11, Wugong 6th Rd., Wugu Industrial Park, Taipei Hsien 248, Taiwan

Tel: 886-2-2299-9720 / Fax: 886-2-2298-4045

☒ No.81-1, Lane 210, Bade 2nd Rd., Luchu Hsiang, Taoyuan Hsien 338, Taiwan

Tel: 886-3-324-0332 / Fax: 886-3-324-5235

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

### **5.2 EQUIPMENT**








Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

### 5.3 TABLE OF ACCREDITATIONS AND LISTINGS

Country	Agency	Scope of Accreditation	Logo
USA	A2LA	EN 55011, EN 55014-1/2, CISPR 11, CISPR 14-1/2, EN 55022, EN 55015, CISPR 22, CISPR 15, AS/NZS 3548, VCCI V3 (2001), CFR 47, FCC Part 15/18, CNS 13783-1, CNS 13439, CNS 13438, CNS 13803, CNS 14115, EN 55024, IEC 801-2, IEC 801-3, IEC 801-4, IEC/EN 61000-3-2, EIC/EN 61000-3-3, IEC/EN 61000-4-2/3/4/5/6/8/11, EN 50081-1/ EN 61000-6-3, EN 50081-2/EN 61000-6-4, EN 50081-2/EN 61000-6-1: 2001	 0824-01
USA	FCC	3/10 meter Open Area Test Sites (93105, 90471) / 3M Semi Anechoic Chamber (965860) to perform FCC Part 15/18 measurements	 93105, 90471 965860
Japan	VCCI	3/10 meter Open Area Test Sites to perform conducted/radiated measurements	 R-393/1066/725/879 C-402/747/912
Norway	NEMKO	EN 50081-1/2, EN 50082-1/2, IEC 61000-6-1/2, EN 50091-2, EN 50130-4, EN 55011, EN 55013, EN 55014-1/2, EN 55015, EN 55022, EN 55024, EN 61000-3-2/3, EN 61326-1, IEC 61000-4-2/3/4/5/6/8/11, EN 60601-1-2, EN 300 328, EN 300 422-2, EN 301 419-1, EN 301 489-01/03/07/08/09/17, EN 301 419-2/3, EN 300 454-2, EN 301 357-2	 ELA 124a ELA 124b ELA 124c
Taiwan	TAF	EN 300 328, EN 300 220-1, EN 300 220-2, EN 300 220-3, 47 CFR FCC Part 15 Subpart C, EN 61000-3-2, EN 61000-3-3, CNS 13439, CNS 13783-1, CNS 14115, CNS 13438, AS/NZS CISPR 22, CNS 13022-1, IEC 61000-4-2/3/4/5/6/8/11, CNS 13022-2/3	
Taiwan	BSMI	CNS 13438, CNS 13783-1, CNS 13439, CNS 14115	 SL2-IS-E-0014 SL2-IN-E-0014 SL2-A1-E-0014 SL2-R1-E-0014 SL2-R2-E-0014 SL2-L1-E-0014
Canada	Industry Canada	3/10 meter Open Area Test Sites (IC 2324C-3, IC 2324C-5) / 3M Semi Anechoic Chamber (IC 6106) to perform RSS 212 Issue 1	 IC 2324C-3 IC 2324C-5 IC 6106

\* No part of this report may be used to claim or imply product endorsement by A2LA or any agency of the US Government.



## 6. SETUP OF EQUIPMENT UNDER TEST

### 6.1 SETUP CONFIGURATION OF EUT

See test photographs attached in Appendix I for the actual connections between EUT and support equipment.

### 6.2 SUPPORT EQUIPMENT

No.	Device Type	Brand	Model	Series No.	FCC ID	Data Cable	Power Cord
1.	Multimedia Earphone	Labtec	Axis-301	N/A	FCC DoC	Unshielded, 1.8m	N/A

**Remark:**

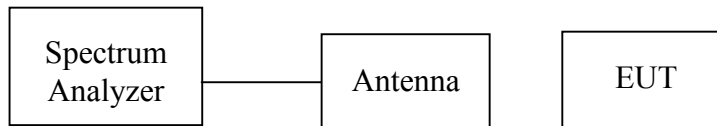
1. *All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.*
2. *Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.*



## 7. FCC PART 15.239 REQUIREMENTS

### 7.1 20 DB BANDWIDTH

#### Test Configuration



#### TEST PROCEDURE

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as RBW=10kHz, VBW = RBW, Span = 200kHz, Sweep = auto.
4. Mark the peak frequency and 20dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

#### TEST RESULTS

*No non-compliance noted*

#### Test Data

Channel	Frequency (MHz)	Bandwidth (kHz)
Low	88.10	101.9
Mid	98.00	100.3
High	107.90	100.2

**Test Plot****CH Low**

\* Agilent 15:17:22 May 11, 2007

R T

▲ Mkr2 101.9 kHz  
-0.10 dBRef 55.99 dB $\mu$ V

#Atten 0 dB

#Peak

Log

10

dB/

DI

10.7

dB $\mu$ V

LgAv

M1 S2

Center 88.100 0 MHz

Span 200 kHz

#Res BW 10 kHz

#VBW 10 kHz

Sweep 2.44 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	88.082 3 MHz	30.77 dB $\mu$ V
2R	(1)	Freq	88.051 5 MHz	10.59 dB $\mu$ V
2Δ	(1)	Freq	101.9 kHz	-0.10 dB

**CH Mid**

\* Agilent 15:30:16 May 11, 2007

R T

▲ Mkr2 100.3 kHz  
-0.04 dBRef 55.99 dB $\mu$ V

#Atten 0 dB

#Peak

Log

10

dB/

DI

21.6

dB $\mu$ V

LgAv

M1 S2

Center 98.000 0 MHz

Span 200 kHz

#Res BW 10 kHz

#VBW 10 kHz

Sweep 2.44 ms (601 pts)

Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	97.981 6 MHz	41.62 dB $\mu$ V
2R	(1)	Freq	97.950 8 MHz	21.30 dB $\mu$ V
2Δ	(1)	Freq	100.3 kHz	-0.04 dB



## CH High

Agilent 15:36:59 May 11, 2007

R T

▲ Mkr2 100.2 kHz  
-0.35 dB

Ref 55.99 dBμV

#Atten 0 dB

#Peak  
Log  
10  
dB/

DI  
19.1  
dBμV  
LgAv

M1 S2

Center 107.900 0 MHz

Span 200 kHz

#Res BW 10 kHz

#VBW 10 kHz

Sweep 2.44 ms (601 pts)

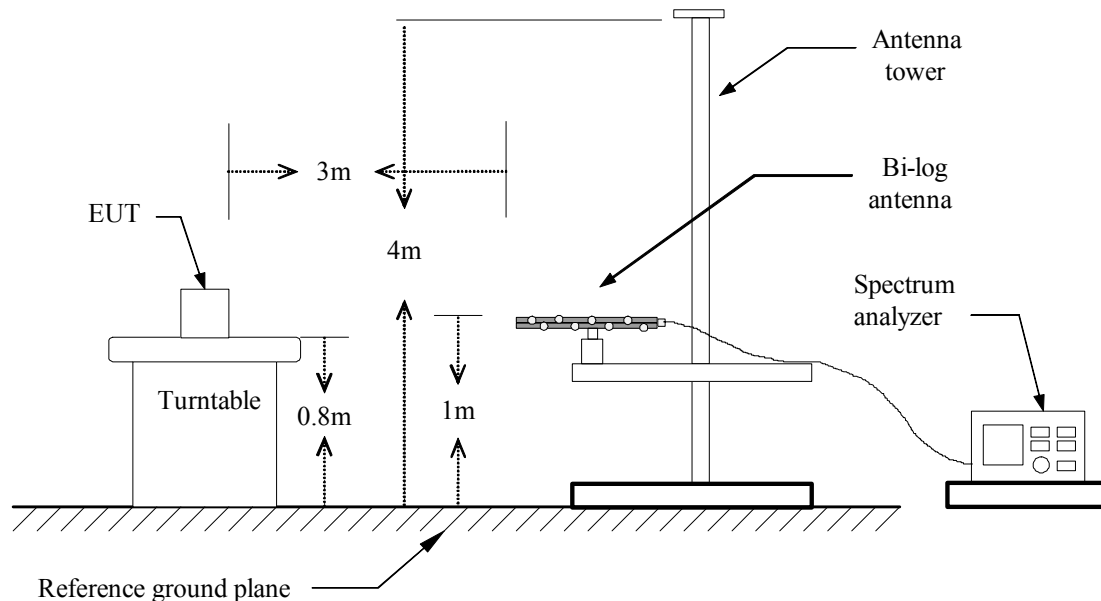
Marker	Trace	Type	X Axis	Amplitude
1	(1)	Freq	107.883 3 MHz	39.11 dBμV
2R	(1)	Freq	107.851 8 MHz	18.69 dBμV
2Δ	(1)	Freq	100.2 kHz	-0.35 dB

## 7.2 BAND EDGES MEASUREMENT

### LIMIT

According to §15.239(a), emissions from the intentional radiator shall be confined within a band 200kHz wide centered on the operating frequency. The 200kHz band shall lie wholly within the frequency range of 88-108MHz.

### Test Configuration



### TEST PROCEDURE

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure 1 and measurement the turn on the EUT. Then set it to any one measured frequency within its operating range and make sure the instrument is operated in its linear range.
3. Set both RBW and VBW of spectrum analyzer to 10kHz and 100kHz respectively with a convenient frequency span including 200kHz bandwidth of the emission.
4. Mark the bandwidth of 200kHz points and plot the graph on spectrum analyzer.
5. Repeat the procedures until all measured frequencies were complete.

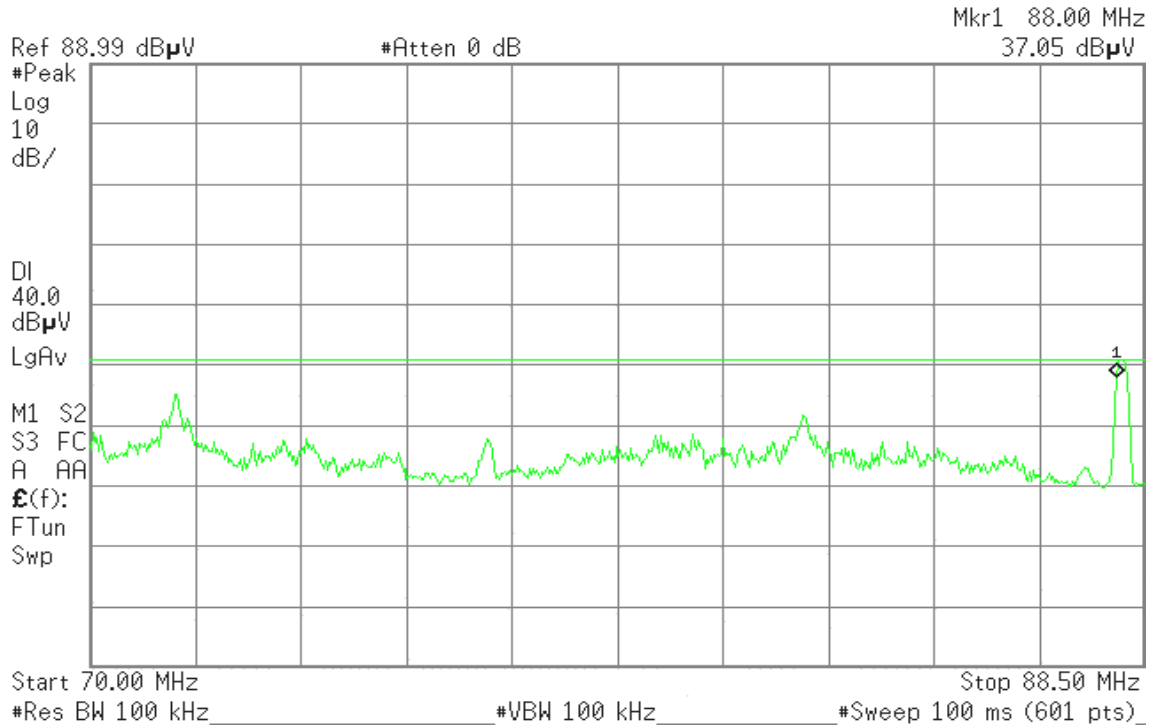
### TEST RESULTS

Refer to attach spectrum analyzer data chart.

**Band Edges (CH Low)****Polarity: Vertical**

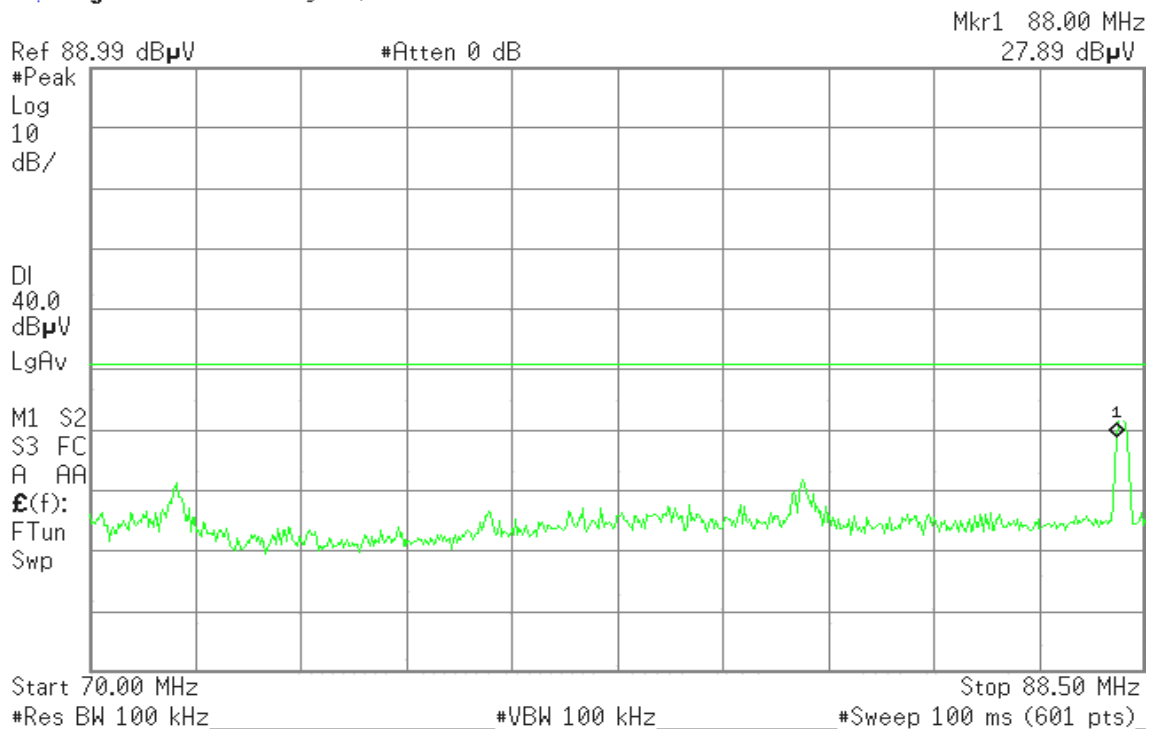
\* Agilent 15:04:00 May 11, 2007

R T

**Polarity: Horizontal**

\* Agilent 15:07:14 May 11, 2007

R T





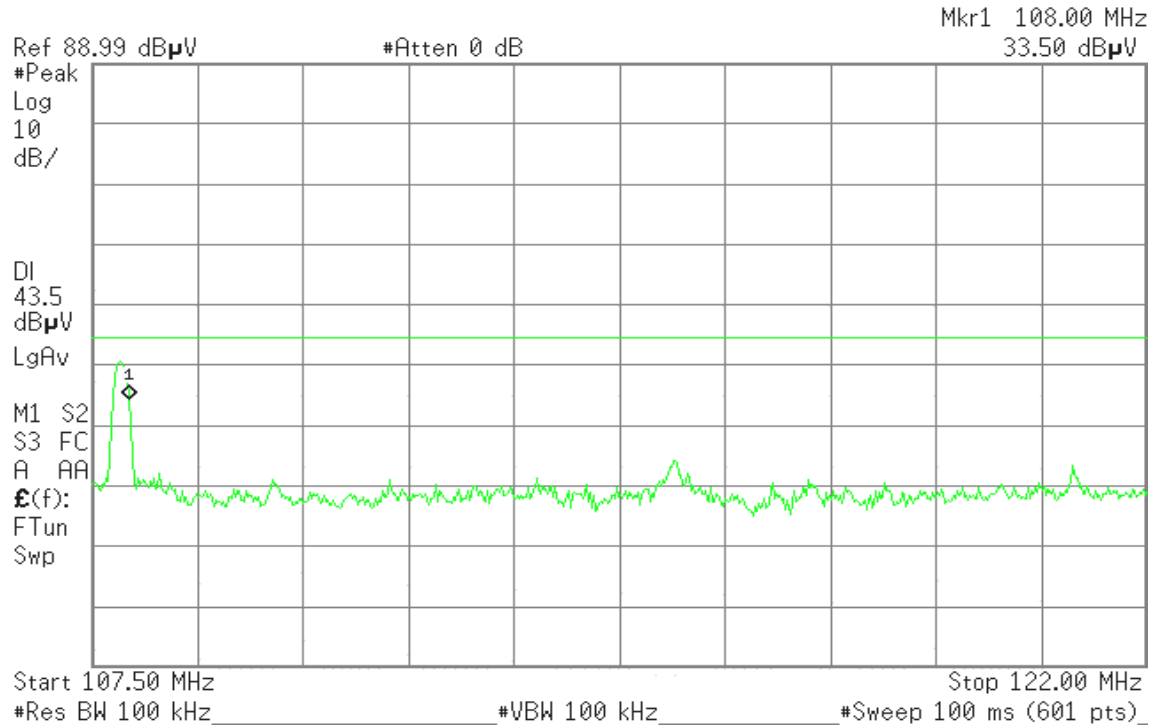


## Band Edges (CH High)

### Polarity: Vertical

Agilent 14:52:38 May 11, 2007

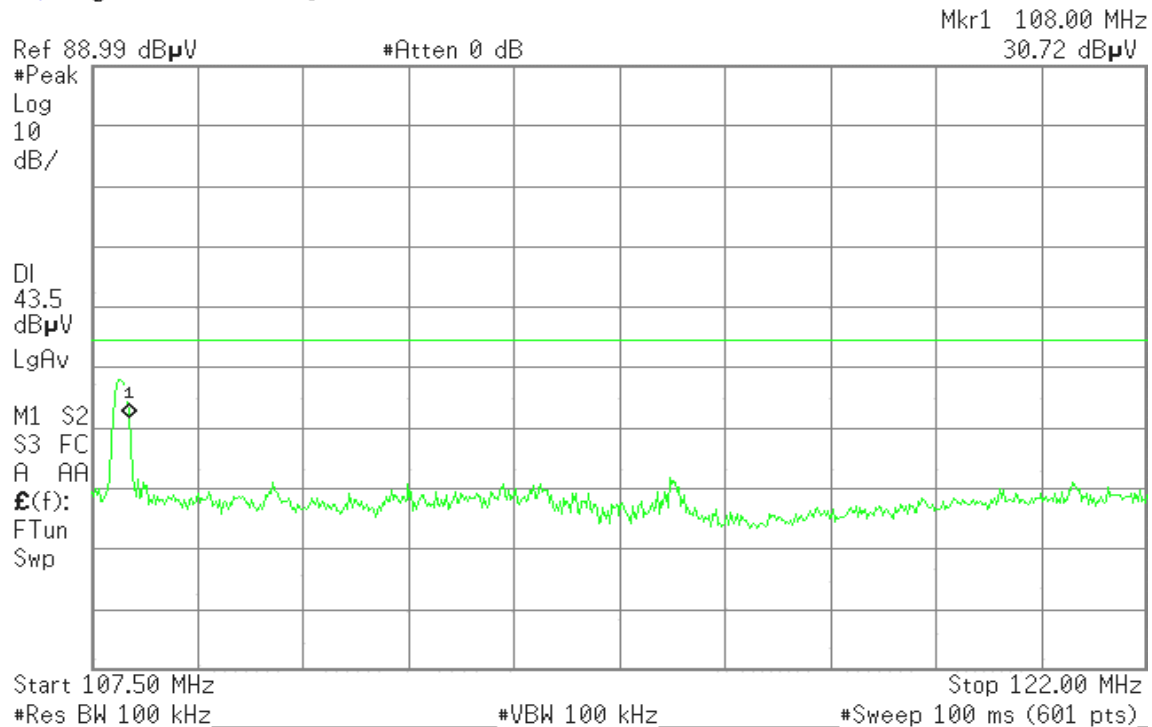
R T



### Polarity: Horizontal

Agilent 14:56:44 May 11, 2007

R T





## 7.3 RADIATED EMISSIONS

### LIMIT

1. The field strength of any emission within this band (section 15.239 frequency between 88 MHz –108 MHz) shall not exceed 250 microvolts /meter at 3 meters. (48dB $\mu$ V/m at 3m) The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in section 15.35 for limiting peak emissions apply.

The field strength of any emissions which appear outside of this band shall not exceed the general radiated emission limits in section 15.209(Intentional Radiators general limit), as below.

Frequency (MHz)	Field Strength (mV/m)	Measurement Distance (m)
1.705-30	30	30
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	500	3

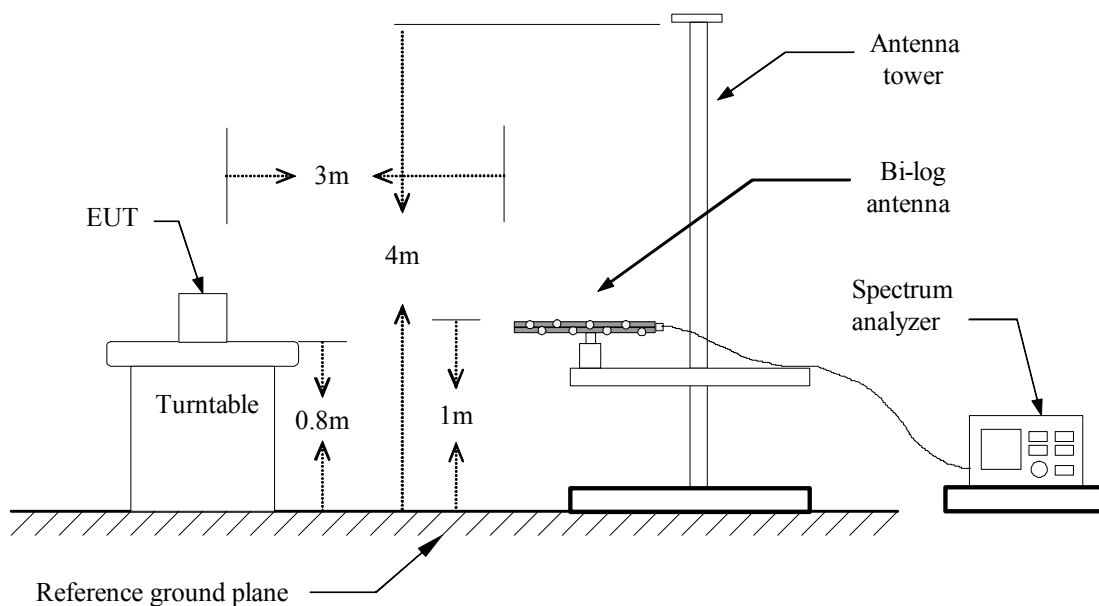
**Remark:** Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

2. In the above emission table, the tighter limit applies at the band edges.

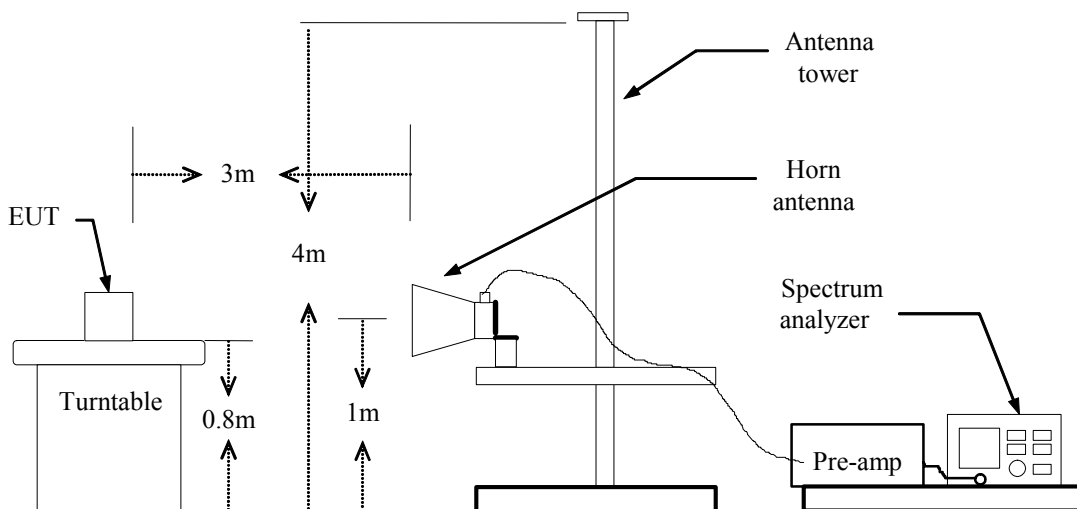
Frequency (MHz)	Field Strength ( $\mu$ V/m at 3-meter)	Field Strength (dB $\mu$ V/m at 3-meter)
1.705-30	30	69.54
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

## Test Configuration

### Below 1 GHz



### Above 1 GHz





## **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. Set the spectrum analyzer in the following setting as:  
Below 1GHz:  
RBW=100kHz / VBW=300kHz / Sweep=AUTO  
Above 1GHz:  
(a) PEAK: RBW=VBW=1MHz / Sweep=AUTO  
(b) AVERAGE: RBW=1MHz / VBW=10Hz / Sweep=AUTO
7. Repeat above procedures until the measurements for all frequencies are complete.



## **TEST RESULTS**

*No non-compliance noted*

### **Test Data**

**Operation Mode:** CH Low                      **Test Date:** May 11, 2007  
**Temperature:** 25°C                      **Tested by:** Wolf Huang  
**Humidity:** 50 % RH                      **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode
88.10	V	58.93	-19.33	39.60	48.00	-8.40	Peak
164.18	V	40.84	-14.51	26.33	43.50	-17.17	Peak
372.73	V	36.85	-10.23	26.63	46.00	-19.37	Peak
637.87	V	33.06	-5.28	27.78	46.00	-18.22	Peak
751.03	V	33.18	-4.11	29.07	46.00	-16.93	Peak
893.30	V	30.95	-2.20	28.74	46.00	-17.26	Peak
30.00	H	31.67	-4.65	27.02	40.00	-12.98	Peak
88.10	H	45.78	-19.33	26.45	48.00	-21.55	Peak
164.18	H	42.47	-14.51	27.96	43.50	-15.54	Peak
288.67	H	42.10	-12.69	29.42	46.00	-16.58	Peak
372.73	H	42.96	-10.23	32.74	46.00	-13.26	Peak
791.45	H	28.53	-3.20	25.32	46.00	-20.68	Peak

### ***Remark:***

- 1. Measuring frequencies from 30 MHz to the 1GHz.*
- 2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/Quasi-peak detector mode.*
- 3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
- 4. The IF bandwidth of SPA from 30MHz to 1GHz was 100 kHz.*



**Operation Mode:** CH Mid                      **Test Date:** May 11, 2007  
**Temperature:** 25°C                      **Tested by:** Wolf Huang  
**Humidity:** 50 % RH                      **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode
98.00	V	59.16	-17.35	41.82	48.00	-6.18	Peak
165.80	V	42.08	-14.55	27.54	43.50	-15.96	Peak
288.67	V	37.43	-12.69	24.75	46.00	-21.25	Peak
607.15	V	33.83	-5.97	27.85	46.00	-18.15	Peak
637.87	V	38.45	-5.28	33.16	46.00	-12.84	Peak
751.03	V	31.11	-4.11	27.00	46.00	-19.00	Peak
30.00	H	31.25	-4.65	26.60	40.00	-13.40	Peak
98.00	H	48.15	-17.35	30.80	48.00	-17.20	Peak
164.18	H	41.60	-14.51	27.09	43.50	-16.41	Peak
288.67	H	42.69	-12.69	30.01	46.00	-15.99	Peak
385.67	H	42.16	-10.06	32.10	46.00	-13.90	Peak
988.68	H	29.18	-0.70	28.48	54.00	-25.52	Peak

**Remark:**

1. *Measuring frequencies from 30 MHz to the 1GHz.*
2. *Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/Quasi-peak detector mode.*
3. *Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the background noise floor.*
4. *The IF bandwidth of SPA from 30MHz to 1GHz was 100 kHz.*



**Operation Mode:** CH High      **Test Date:** May 11, 2007  
**Temperature:** 25°C      **Tested by:** Wolf Huang  
**Humidity:** 50 % RH      **Polarity:** Ver. / Hor.

Frequency (MHz)	Ant. Pol. (H/V)	Reading (dBuV)	Correction Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector Mode
72.03	V	54.34	-19.06	35.28	40.00	-4.72	Peak
107.90	V	54.12	-14.67	39.44	48.00	-8.56	Peak
164.18	V	40.83	-14.51	26.32	43.50	-17.18	Peak
285.43	V	37.23	-12.68	24.54	46.00	-21.46	Peak
458.42	V	33.20	-8.37	24.83	46.00	-21.17	Peak
637.87	V	33.85	-5.28	28.56	46.00	-17.44	Peak
107.90	H	47.08	-14.67	32.41	48.00	-15.59	Peak
164.18	H	41.45	-14.51	26.95	43.50	-16.55	Peak
288.67	H	41.91	-12.69	29.22	46.00	-16.78	Peak
392.13	H	42.60	-10.01	32.58	46.00	-13.42	Peak
607.15	H	33.52	-5.97	27.55	46.00	-18.45	Peak
702.53	H	33.26	-4.89	28.36	46.00	-17.64	Peak

**Remark:**

1. Measuring frequencies from 30 MHz to the 1GHz.
2. Radiated emissions measured in frequency range from 30 MHz to 1000MHz were made with an instrument using Peak/Quasi-peak detector mode.
3. Measurements above show only up to 6 maximum emissions noted, or would be lesser, with " N/A " remark, if no specific emissions from the EUT are recorded (ie: margin>20dB from the applicable limit) and considered that's already beyond the backg(ground)round noise floor.
4. The IF bandwidth of SPA from 30MHz to 1GHz was 100 kHz.



## 7.4 POWERLINE CONDUCTED EMISSIONS

### **LIMIT**

According to §15.207(a), except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table, as measured using a 50  $\mu$ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency Range (MHz)	Limits (dB $\mu$ V)	
	Quasi-peak	Average
0.15 to 0.50	66 to 56*	56 to 46*
0.50 to 5	56	46
5 to 30	60	50

\* Decreases with the logarithm of the frequency.

### **Test Configuration**

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

### **TEST PROCEDURE**

1. The EUT was placed on a table, which is 0.8m above ground plane.
2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
3. Repeat above procedures until all frequency measured were complete.



**TEST RESULTS**

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

**Test Data**

**Operation Mode:** Normal Link      **Test Date:** May 8, 2007  
**Temperature:** 25°C      **Tested by:** Ryan Chen  
**Humidity:** 55% RH

Frequency (MHz)	QP Reading (dBuV)	AV Reading (dBuV)	Corr. factor (dB)	QP Result (dBuV)	AV Result (dBuV)	QP Limit (dBuV)	AV Limit (dBuV)	QP Margin (dB)	AV Margin (dB)	Note
0.168	53.190	46.620	0.164	53.354	46.784	65.059	55.059	-11.705	-8.275	L1
0.200	47.480	41.320	0.100	47.580	41.420	63.611	53.611	-16.031	-12.191	L1
0.465	34.890	33.330	0.100	34.990	33.430	56.603	46.603	-21.613	-13.173	L1
2.459	35.790	32.560	0.100	35.890	32.660	56.000	46.000	-20.110	-13.340	L1
4.127	27.540	24.680	0.113	27.653	24.793	56.000	46.000	-28.347	-21.207	L1
13.530	17.240	14.700	0.771	18.011	15.471	60.000	50.000	-41.989	-34.529	L1
0.165	51.490	44.940	0.170	51.660	45.110	65.208	55.208	-13.548	-10.098	L2
0.266	36.960	33.380	0.100	37.060	33.480	61.242	51.242	-24.182	-17.762	L2
0.333	33.190	32.130	0.100	33.290	32.230	59.376	49.376	-26.086	-17.146	L2
0.465	32.950	31.650	0.100	33.050	31.750	56.603	46.603	-23.553	-14.853	L2
2.459	32.800	30.270	0.100	32.900	30.370	56.000	46.000	-23.100	-15.630	L2
4.030	25.180	22.870	0.103	25.283	22.973	56.000	46.000	-30.717	-23.027	L2

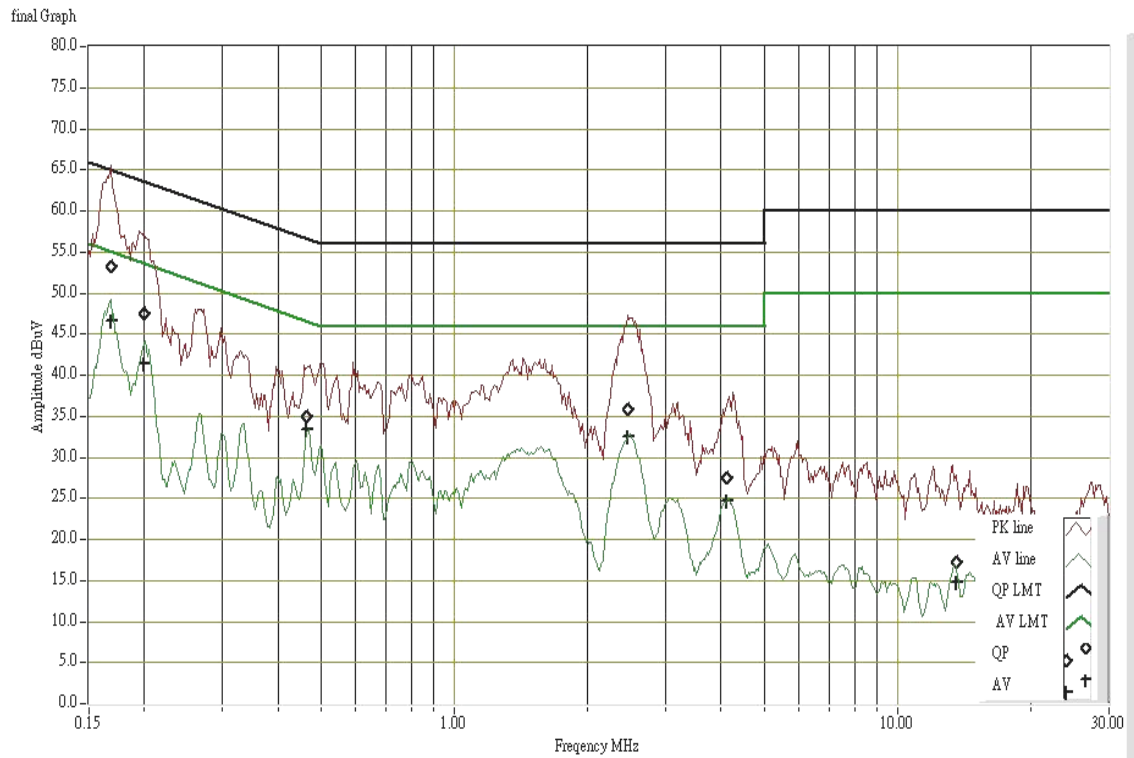
***Remark:***

- 1. Measuring frequencies from 0.15 MHz to 30MHz.*
- 2. The emissions measured in frequency range from 0.15 MHz to 30MHz were made with an instrument using Quasi-peak detector and average detector.*
- 3. The IF bandwidth of SPA between 0.15MHz to 30MHz was 10kHz; the IF bandwidth of Test Receiver between 0.15MHz to 30MHz was 9kHz.*
- 4. L1 = Line One (Live Line) / L2 = Line Two (Neutral Line)*



## Test Plots

### Conducted emissions (Line 1)



### Conducted emissions (Line 2)

