

FCC PART 15.239
EMI MEASUREMENT AND TEST REPORT

For

Dongguan Peng Da Electronic Co., Ltd.

Bao tun Industrial Area, Houjie Town, Dongguan City, Guangdong Province, P.R. China

FCC ID: TAM18231770001

May 26, 2005

This Report Concerns: ☒ Original Report	Equipment Type: Low Power Transmitter
Test Engineer: Sam Lin 	
Report No.: RSZ05050901	
Test Date: May 25, 2005	
Reviewed By: Chris Zeng 	
Prepared By: Bay Area Compliance Lab Corp. (ShenZhen) 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China Tel: +86-755-33320018 Fax: +86-755-33320008	

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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The Dongguan Peng Da Electronic Co., Ltd.'s product, model 18231770001: or the "EUT" as referred to in this report is a 3in1 FM Transmitter, the frequency range is 88.3 MHz to 88.9 MHz, which measures approximately 4.5cm L x 6.8cm W x 2.0cm H, rated input voltage: DC 12V.

** The test data gathered are from an engineering sample, serial number: 0505002, provided by the manufacturer.*

Objective

This document is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4 - 2003.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.209, 15.205 and 15.239 rules.

Related Submittal(s)/Grant(s)

No Related Submittals

Test Methodology

All measurements contained in this report were conducted with 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 40 GHz.

All radiated and conducted emissions measurement was performed at Bay Area Compliance Lab Corp. (ShenZhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

The Test site used by Bay Area Compliance Lab Corp. (ShenZhen) to collect radiated and conducted emission measurement data is located in the 6/F, the 3rd Phase of WanLi Industrial Building, ShiHua Road, FuTian Free Trade Zone, ShenZhen, Guangdong 518038, P.R.China.

Test site at Bay Area Compliance Lab Corp. (ShenZhen) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 04, 2004. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 382179. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

Additionally, BACL is a National Institute of Standards and Technology (NIST) accredited laboratory, under the National Voluntary Laboratory Accredited Program (Lab Code 200707-0). The current scope of accreditations can be found at <http://ts.nist.gov/ts/htdocs/210/214/scopes/2007070.htm>

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
NANYAN	Signal Generator	NY2201	007727	DoC
CONSENT	DC Power	12M12LC	N/A	N/A

External I/O Cable

Cable Description	Length (M)	From/Port	To
Shielded Undetachable Audio Input Cable	0.15	EUT	Signal Generator

SYSTEM TEST CONFIGURATION

Description of Test Configuration

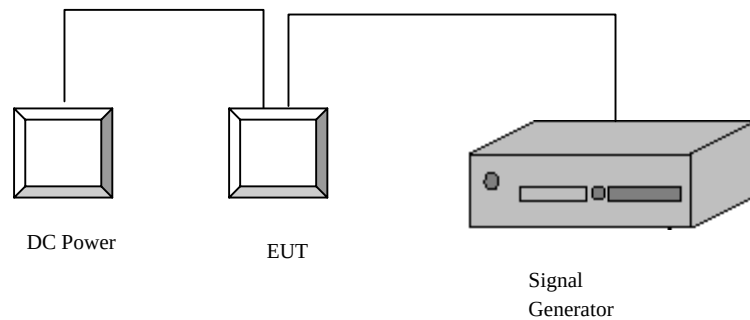
The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

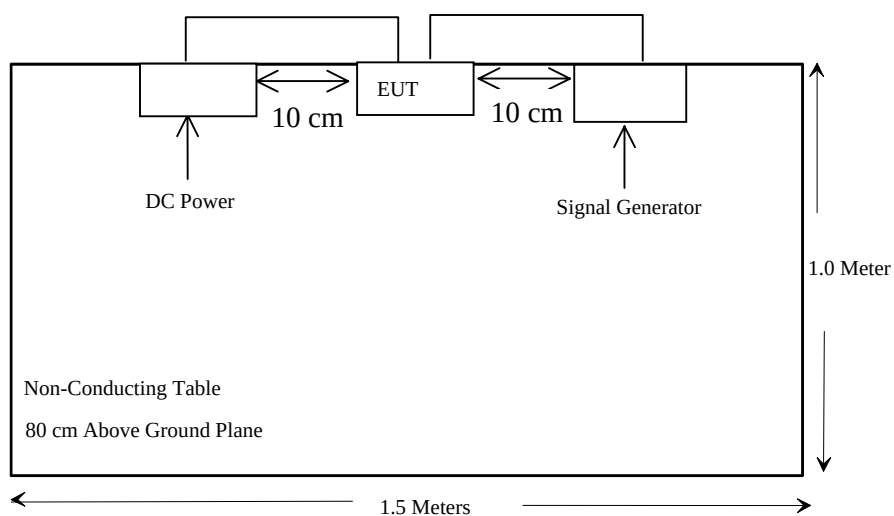
BACL has not done any modification on the EUT.

Configuration of Test Setup

.



Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.203	Antenna equipment	Compliant
§15.205	Restricted Band of operation	Compliant
§15.209/§15.239	Radiated Emission	Compliant
§15.239	Frequency range	Compliant

§15.203 - ANTENNA APPLICATION

Standard Applicable

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

This product has a permanent antenna, fulfill the requirement of this section.

Test Result: Pass

§15.209/§15.239- RADIATED EMISSION

Standard Applicable

The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

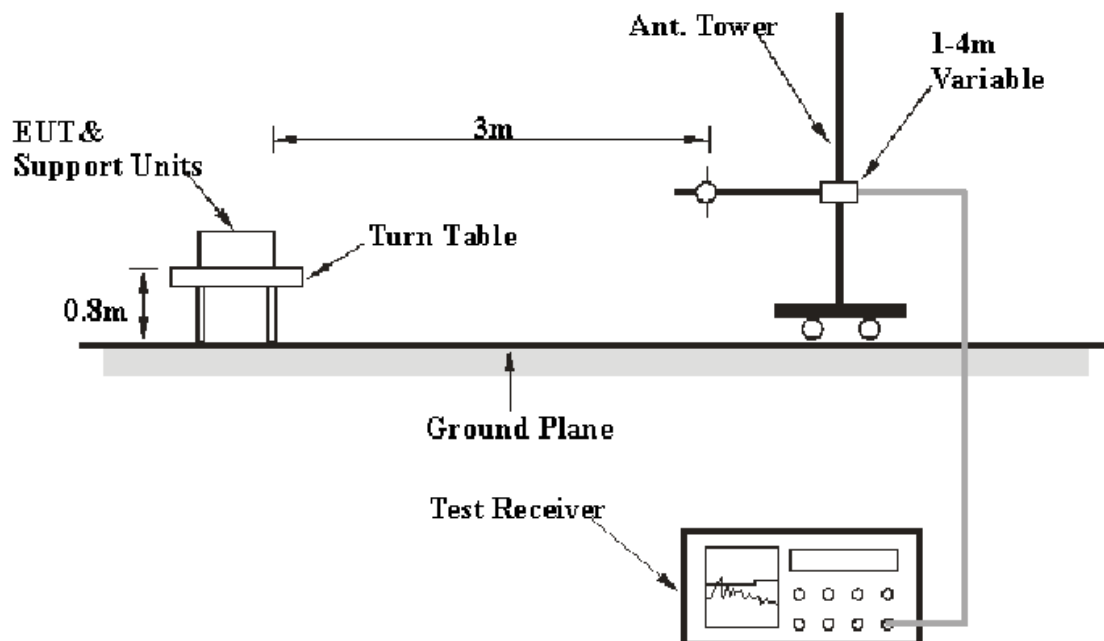
The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in §15.209.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at BACL is ± 4.0 dB.

EUT Setup



The radiated emission tests were performed in the 3-meter chamber B, using the setup accordance with the ANSI C63.4 - 2003. The specification used was the FCC 15.209 and 15.239 Limits.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.

The spacing between the peripherals was 10 cm.

Test Receiver Setup

The system was investigated from 30 MHz to 1 GHz.

During the radiated emission test, the test receiver was set with the following configurations:

<i>Frequency Range</i>	<i>RB/W</i>	<i>VB/W</i>	<i>IF B/W</i>
30 – 1000 MHz	100 kHz	100 kHz	120kHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447D	2994A09795	2004-9-1	2005-8-31
Rohde & Schwarz	Test Receiver	ESCI	100028	2004-9-6	2005-9-5
Sunol Sciences	Bilog Antenna	JB1	A040904-1	2004-4-19	2005-4-18

*** Statement of Traceability:** BACL attests that all calibrations have been performed per the NVLAP requirements, traceable to NIST.

Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Loss} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of –7dB means the emission is 7dB below the maximum limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Corr. Ampl.} - \text{Limit}$$

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Part 15.239, with the worst margin reading of:

-6.2 dB at 88.70 MHz in the vertical conductor mode.

Test Data**Environmental Conditions**

Temperature:	18 °C
Relative Humidity:	53 %
ATM Pressure:	1015 mbar

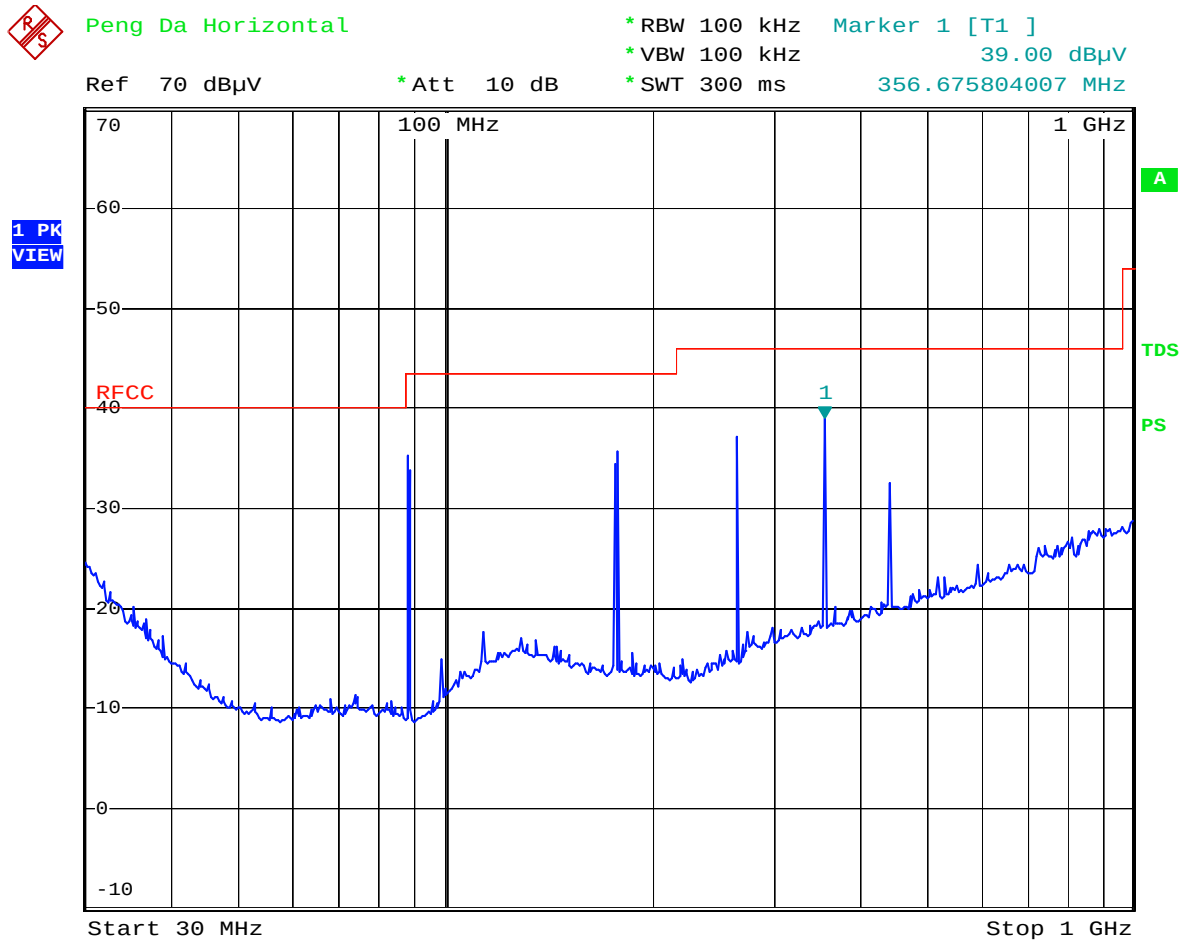
The testing was performed by Sam Lin on 2005-5-25.

Frequency	Meter Reading	Detector	Direction	Height	Polar	Antenna Loss	Cable loss	Amplifier Gain	Correction Factor	FCC 15.239 Limit	FCC 15.239 Margin
MHz	dBuV/m	PK/AV	Degree	Meter	H / V	dB/m	dB	dB	dBuV/m	dBuV/m	dB
88.70	58.3	AV (FUND)	289	1.0	V	8.1	1.6	26.11	41.8	48.0	-6.2
356.67	46.7	PK	180	1.2	H	15.0	2.4	25.15	39.0	46.0	-7.0
178.10	47.6	PK	45	1.2	H	11.9	1.8	25.69	35.6	43.5	-7.9
265.67	47.7	PK	90	1.2	H	12.3	2.3	25.23	37.1	46.0	-8.9
900.14	35.1	PK	60	1.2	V	22.9	3.4	25.56	35.9	46.0	-10.1
443.29	39.2	PK	0	1.0	H	16.8	2.6	25.94	32.6	46.0	-13.4
88.70	50.8	AV (FUND)	35	3.8	H	8.1	1.6	26.11	34.3	48.0	-13.7
443.29	38.2	PK	45	1.0	V	16.8	2.6	25.94	31.7	46.0	-14.4
178.13	40.2	PK	60	1.0	V	11.9	1.8	25.69	28.2	43.5	-15.3
265.68	40.6	PK	45	1.2	V	12.3	2.3	25.23	30.0	46.0	-16.0
531.96	34.1	PK	45	1.0	V	18.6	2.6	26.15	29.1	46.0	-16.9
356.68	34.8	PK	180	1.2	V	15.0	2.4	25.15	27.1	46.0	-18.9
88.70	58.7	PK (FUND)	289	1.0	V	8.1	1.6	26.11	42.2	68.0	-25.8
88.70	51.7	PK (FUND)	35	3.8	H	8.1	1.6	26.11	35.2	68.0	-32.8

Plot(s) of Test Data

Plot(s) of Test Data is presented hereinafter as reference.

Horizontal:



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Vertical:



Peng Da Vertical

* RBW 100 kHz Marker 1 [T1]

* VBW 100 kHz

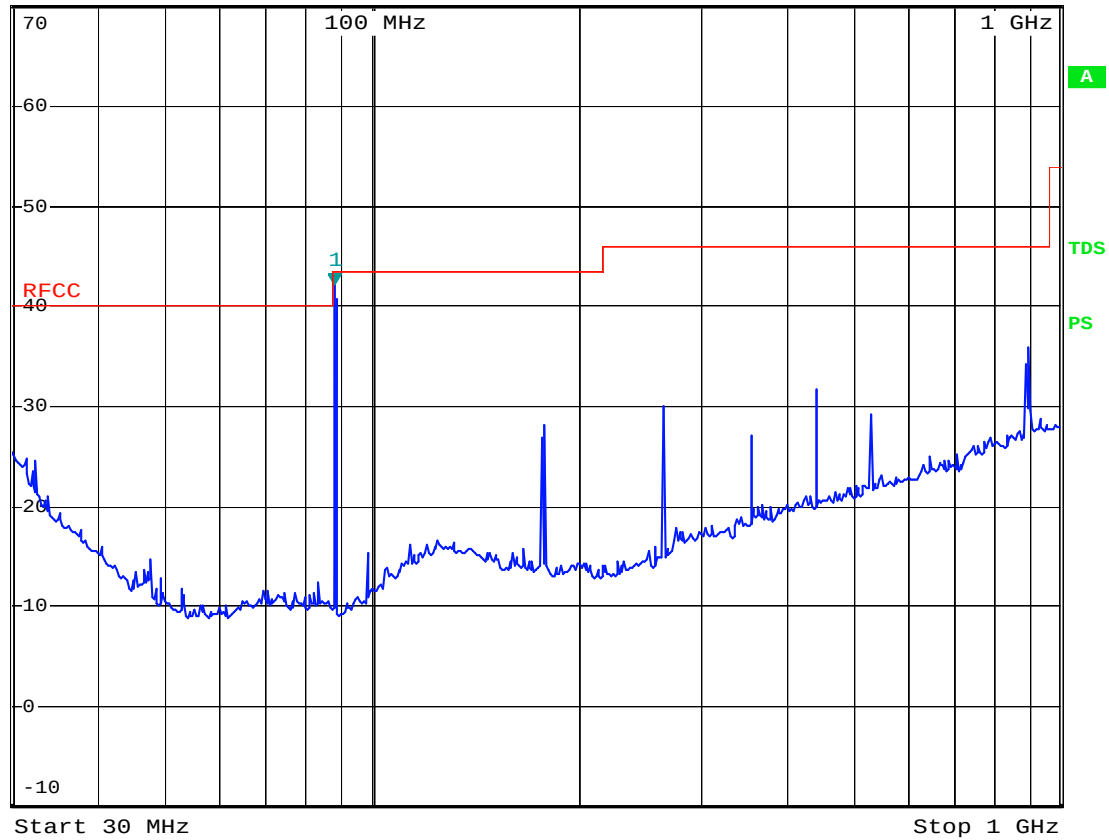
42.20 dBμV

Ref 70 dBμV

* Att 10 dB

* SWT 300 ms

88.342138549 MHz

1 PK
VIEW

Date: 25.MAY.2005 15:37:46

§15.239 –FREQUENCY RANGE

Measurement Uncertainty

Emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. The 200 kHz band shall lie wholly within the frequency range of 88–108 MHz.

The field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in §15.209.

Test Procedure

With the EUT's antenna attached, the EUT's radiated emission power was received by the test antenna which was connected to the spectrum analyzer with the START and STOP frequencies set to the EUT's operation band.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Sunol Sciences	Bilog Antenna	JB1	A040904-1	2004-4-19	2005-4-18
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-9
Rohde & Schwarz	Spectrum Analyzer	FSEM30	849720/019	2004-11-10	2005-11-9
HP	Amplifier	8447E	1937A01046	2004-9-1	2005-8-31

* **Statement of Traceability:** BACL attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Data

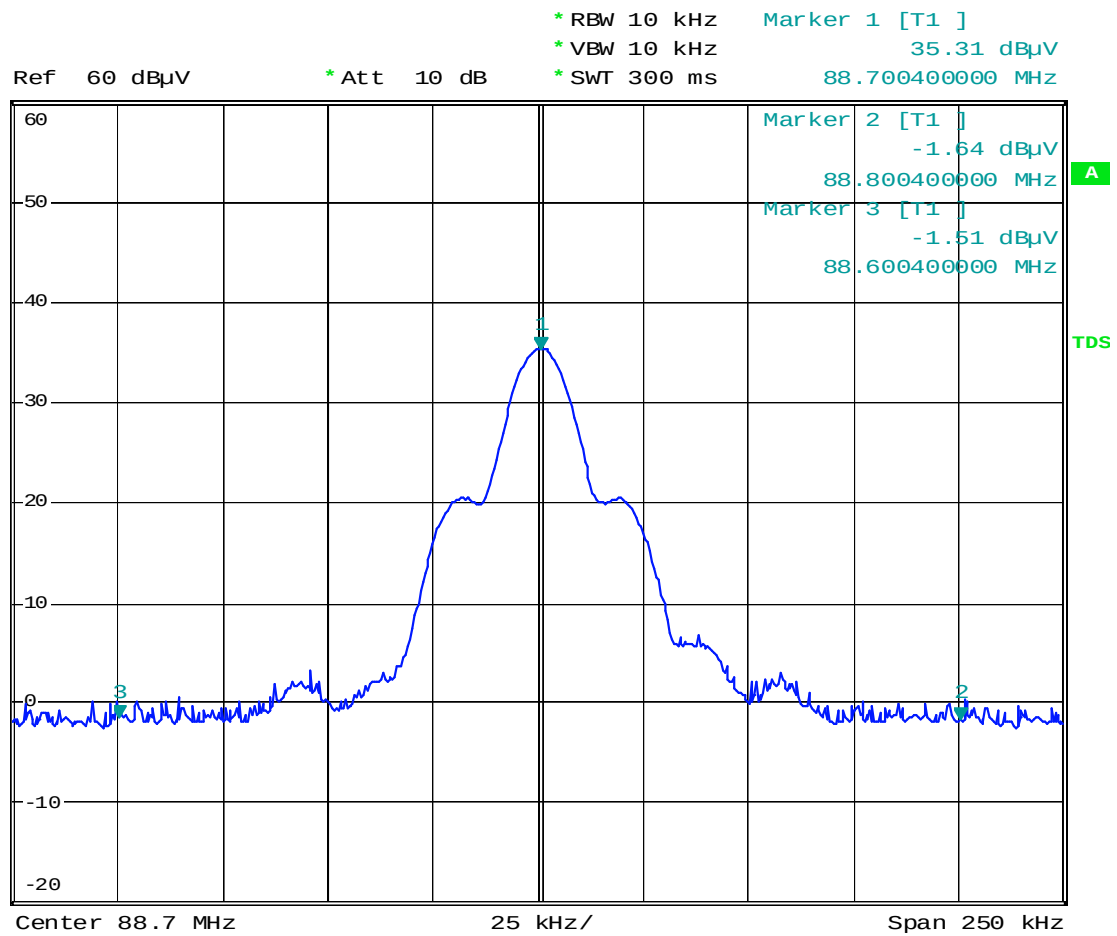
Environmental Conditions

Temperature:	16° C
Relative Humidity:	85%
ATM Pressure:	1016 mbar

The testing was performed by Sam Lin on 2005-5-25

Plot(s) of Test Data is presented hereinafter as reference.

Test Result: Pass

1 PK
VIEW

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