FCC PART 15

EMI MEASUREMENT AND TEST REPORT

For

POPSPA(HK) LIMITED

Room 1308,Nanyang Plaza,57 Hung To Road,Kwun Tong,Kowloon, HONG KONG

FCC ID: SBTFMTRANS

July 22, 2004

This Report Concerns:	Equipment Type:
☒ Original Report	FM Transmitter

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Report No.:	RSZ04070207
Test Date:	July 17-19, 2004
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GENERAL INFORMATION

Product Description for Equipment Under Test (EUT)

The *POPSPA(HK) LIMITED*'s product, model number: FM-812 or the "EUT" as referred to in this report is a FM Transmitter. The EUT is measured approximately 10.0"L x 5.0"W x 3.5"H. rated input voltage: DC 12V Battery.

** The test data gathered are from production sample, serial number: 040709, 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 - 2001.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.209, 15.35 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 - 2001, 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 Laboratory, Corp. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Test Facility

Test site at Bay Area Compliance Laboratory Corporation has been fully described in reports submitted to the Federal Communication Commission (FCC) and Voluntary Control Council for Interference (VCCI). The details of these reports has been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on February 11 and December 10, 1997 and Article 8 of the VCCI regulations on December 25, 1997. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2001.

The Federal Communications Commission and Voluntary Control Council for Interference has the reports on file and is listed under FCC file 31040/SIT 1300F2 and VCCI Registration No.: C-1298 and R-1234. The test site has been approved by the FCC and VCCI for public use and is listed in the FCC Public Access Link (PAL) database.

Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
NANYAN	Audio Generator	NY2201	019829	N/A

External I/O Cable

Cable Description	Length (M)	From/Port	To
Unshielded Audio Input Cable	0.40	EUT	Audio Generator

SYSTEM TEST CONFIGURATION

Description of Test Configuration

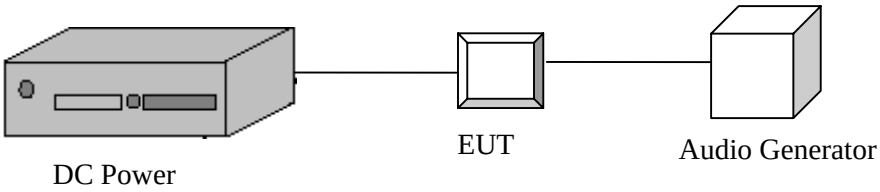
The EUT was configured for testing according to ANSI C63.4-2001.

The final qualification test was performed with the EUT operating at normal mode

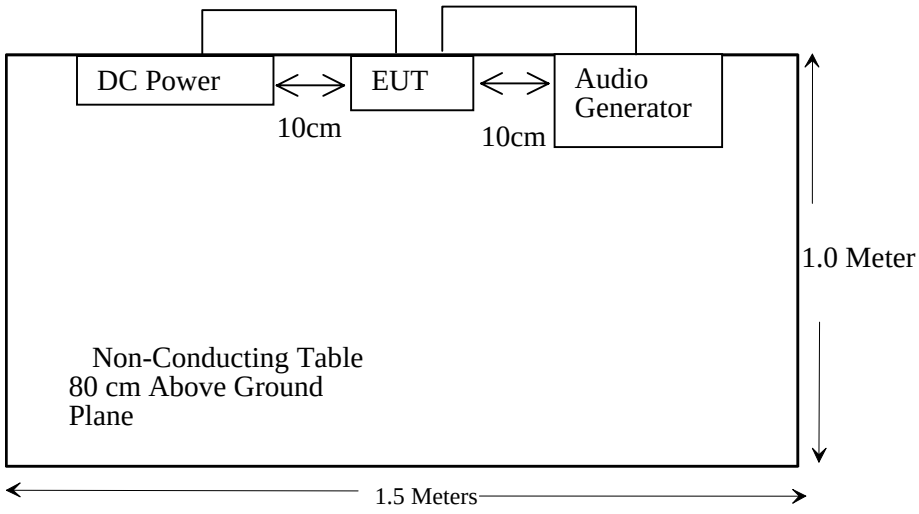
Equipment Modifications

No modifications were made to the EUT.

Configuration of Test System



Test Setup Block Diagram



SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.209/ §15.35/§15.239	Radiated Emission	Pass
§15.239	Frequency range	Pass

§15.209/§15.35/§15.239 - RADIATED EMISSION

Standard Applicable

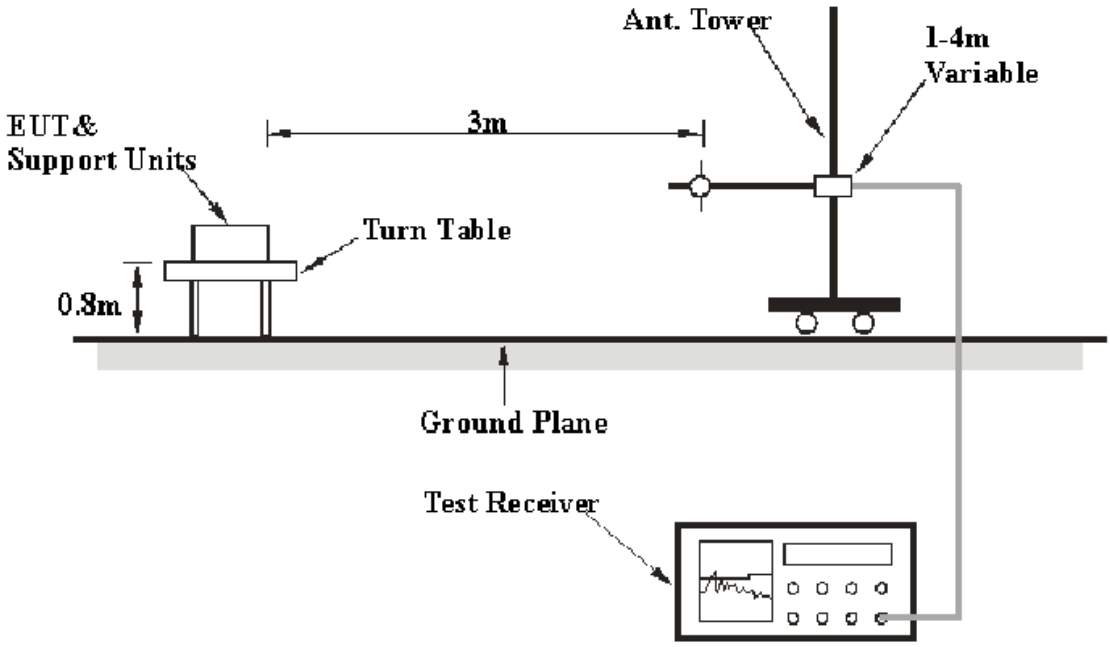
The field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply.

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 open area 3-meter test site, using the setup accordance with the ANSI C63.4-2001. The specification used was the FCC 15.209 and 15.239 limits.

Spectrum Analyzer Setup

The system was investigated from 30MHz to 1GHz.

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

Frequency Range	***RBW***	***Video B/W***
30 – 1000MHz	100KHz	100KHz

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
R/S	Spectrum Analyzer	FSEM	849720/019	2003-10-30	2004-10-29
HP	Amplifier	8447D	2944A09795	2003-8-5	2004-8-4
ETS	Log Periodic Antenna	3146	9603-4421	2003-8-5	2004-8-4
ETS	Biconical Antenna	3110B	3360	2003-8-5	2004-8-4
YOKOROWA	Coaxial Cable 1#	N/A	NO: 001	2003-8-5	2004-8-4
YOKOROWA	Coaxial Cable 1#	N/A	NO: 002	2003-8-5	2004-8-4

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

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

All data was recorded in the Quasi-peak detection mode.

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:

Corr. Ampl. = Indicated Reading + Antenna Factor + Cable Factor - Amplifier Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dBμV means the emission is 7dBμV below the maximum limit for Class B. The equation for margin calculation is as follows:

Margin = Corr. Ampl. –Limit

Test Data

Date of Test	:	July 17-19, 2004	Temperature	:	25℃
EUT	:	FM Transmitter	Humidity	:	45%
M/N	:	FM-812	Operating Mode	:	Transmitting
S/N	:	040709	Test Engineer:		Willian Chan

INDICATED			TABLE	ANTENNA		CORRECTION FACTOR			CORRECTED AMPLITUDE	FCC PART 15	
Frequency MHz	Ampl. dBμV/m	Comments	Angle Degree	Height Meter	Polar H/ V	Antenna dBμV/m	Cable DB	Amp. dB	Corr. Ampl. dBμV/m	Limit dBμV/m	Margin dB
Channel 88											
352.470	43.65	PEAK	270	1.0	h	14.9	1.5	25.09	40.0	46.0	-11.0
176.250	42.35	PEAK	45	1.0	v	13.4	0.1	25.30	40.5	43.5	-13.0
176.250	41.59	PEAK	45	1.0	h	13.4	0.1	25.30	40.1	43.5	-13.7
352.470	40.97	PEAK	45	1.2	v	14.9	1.5	25.09	38.7	46.0	-13.7
264.350	43.05	PEAK	60	1.2	h	11.7	1.3	24.74	37.7	46.0	-14.7
264.350	42.11	PEAK	60	1.0	v	11.7	1.3	24.74	39.5	46.0	-15.6
88.100	40.38	AVE	45	1.0	v	9.7	0.9	25.94	25.0	48.0	-23.0
88.100	39.14	AVE	180	1.2	h	9.7	0.9	25.94	23.8	48.0	-24.2
88.100	46.78	PEAK	180	1.2	h	9.7	0.9	25.94	31.4	68.0	-36.6
88.100	45.70	PEAK	45	1.0	v	9.7	0.9	25.94	30.4	68.0	-37.6
Channel 98											
178.250	43.51	PEAK	45	1.0	h	13.4	0.1	25.30	38.4	43.5	-11.8
178.250	43.21	PEAK	45	1.0	v	13.4	0.1	25.30	39.3	43.5	-12.1
267.350	43.03	PEAK	60	1.2	h	11.7	1.3	24.06	37.6	46.0	-14.0
267.350	42.57	PEAK	60	1.0	v	11.7	1.3	24.06	37.6	46.0	-14.5
356.450	40.12	PEAK	45	1.2	v	14.9	1.5	25.09	41.1	46	-14.6
356.450	39.08	PEAK	270	1.0	h	14.9	1.5	25.09	40.1	46.0	-15.6
89.100	40.33	AVE	45	1.0	v	9.7	0.9	25.94	25.0	48.0	-23.0
89.100	39.12	AVE	180	1.2	h	9.7	0.9	25.94	23.8	48.0	-24.2
89.100	45.12	PEAK	45	1.0	v	9.7	0.9	25.94	29.8	68.0	-38.2
89.100	44.75	PEAK	180	1.2	h	9.7	0.9	25.94	29.4	68.0	-38.6
Channel 108											
180.220	43.52	PEAK	45	1.0	v	13.6	1.0	25.24	40.5	43.5	-10.6
180.220	42.98	PEAK	45	1.0	h	13.6	1.0	25.24	39.6	43.5	-11.2
360.450	41.27	PEAK	45	1.2	v	14.9	1.5	25.09	40.1	46.0	-13.4
360.450	41.13	PEAK	270	1.0	h	14.9	1.5	25.09	38.6	46.0	-13.6
270.330	42.01	PEAK	60	1.0	v	11.7	1.4	24.70	38.1	46.0	-15.6
270.330	41.69	PEAK	60	1.2	h	11.7	1.4	24.70	36.5	46.0	-15.9
90.100	41.08	AVE	180	1.2	h	10.0	1.0	25.89	26.2	48.0	-21.8
90.100	40.11	AVE	45	1.0	v	10.0	1.0	25.89	25.2	48.0	-22.8
90.100	45.95	PEAK	180	1.2	h	10.0	1.0	25.89	31.1	68.0	-36.9
90.100	44.37	PEAK	45	1.0	v	10.0	1.0	25.89	29.5	68.0	-38.5

Test Result: Pass

§15.239 - Frequency range

Standard Applicable

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
R/S	Spectrum Analyzer	FSEM	849720/019	2003-5-8	2004-5-7
HP	Amplifier	8447D	2944A09795	2003-5-8	2004-5-8
ETS	Log Periodic Antenna	3146	9603-4421	2003-5-9	2004-5-7
ETS	Biconical Antenna	3110B	3360	2003-5-8	2004-5-7
FLUKE	True RMS Multimeter	187	78540402	2004-3-24	2004-3-23
HP	Amplifier (1-26.5GHz)	8449B	3147A00400	2003-11-5	2004-11-4
A.H.System	Horn Antenna (700MHz-18GHz)	SAS-200/571	261	2003-11-5	2004-11-4

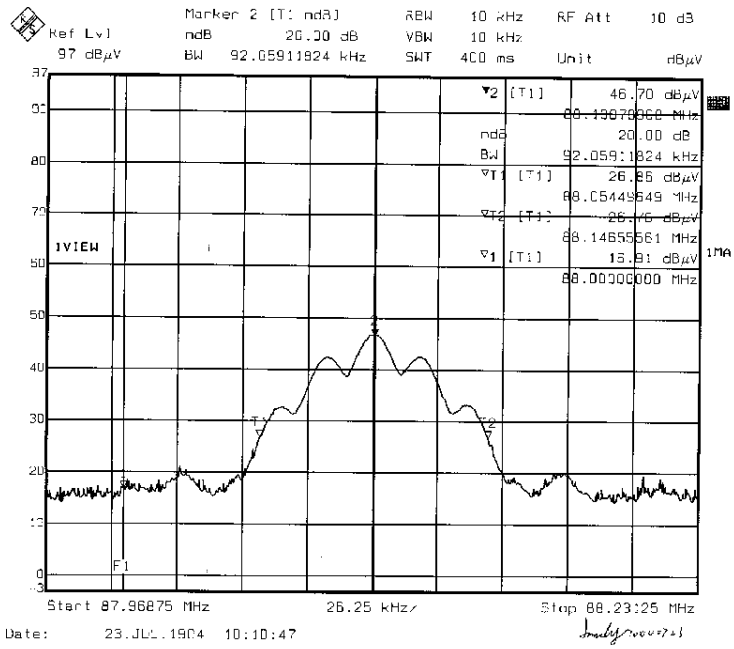
*** Statement of Traceability: BACL Corp.** attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

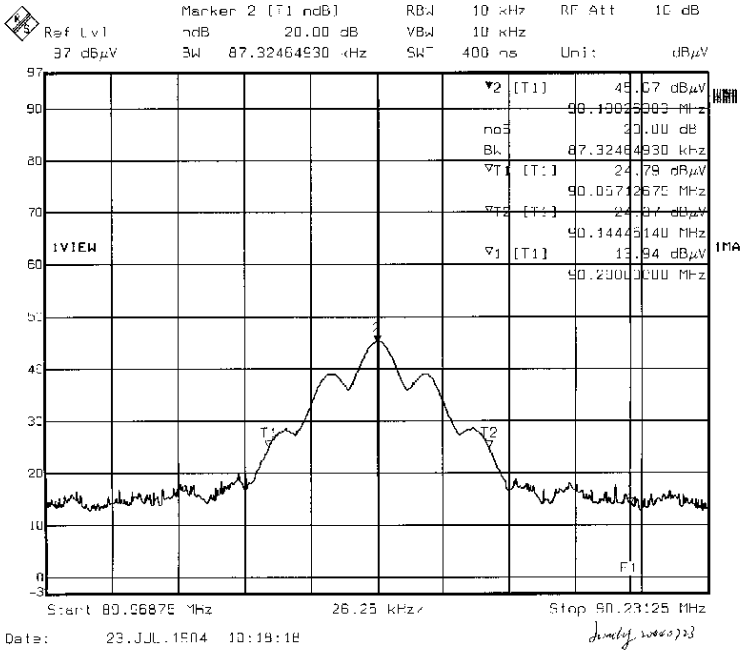
Environmental Conditions

Temperature:	24 °C
Relative Humidity:	59%
ATM Pressure:	1178mbar

Test Result: Pass

Refer to the attached plots.


Marker 2 [T1 ndB]
RBW 10 kHz
RF Att 10 dB
Ref Lvl
ndB 20.00 dB
VBW 10 kHz
97 dBµV
BW 92.05911824 kHz
SWT 400 ms
Unit dBµV
▼2 [T1] 46.70 dBµV
88.13870060 MHz
ndB 20.00 dB
BW 92.05911824 kHz
▽T1 [T1] 26.85 dBµV
88.05449649 MHz
▽T2 [T1] 26.76 dBµV
88.14655661 MHz
▽1 [T1] 15.91 dBµV
88.00000000 MHz
1VIEW
1MA
Start 87.96875 MHz
26.25 kHz/
Stop 88.23125 MHz
Date: 23.JUL.1904 10:10:47


Marker 2 [T1 ndB]
RBW 10 kHz
RF Att 10 dB
Ref Lvl
ndB 20.00 dB
VBW 10 kHz
97 dBµV
BW 87.32464930 kHz
SWT 400 ms
Unit dBµV
▼2 [T1] 45.07 dBµV
90.13035303 MHz
ndB 20.00 dB
BW 87.32464930 kHz
▽T1 [T1] 24.79 dBµV
90.05712675 MHz
▽T2 [T1] 24.87 dBµV
90.14465140 MHz
▽1 [T1] 13.94 dBµV
90.20000000 MHz
1VIEW
1MA
Start 80.96875 MHz
26.25 kHz/
Stop 90.23125 MHz
Date: 23.JUL.1904 10:19:18