Advanced
Compliance Laboratory

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ELECTROMAGNETIC EMISSION COMPLIANCE REPORT

of

WIRELESS 2 WAY DOORBELL
MODEL: DB-016 (Hand-held Unit)
FCC ID: JGFDB016RX

October 20, 2004

This report concerns (check one): Original grant __x__ Class II change _____
Equipment type: Low Power Intentional Radiator

Deferred grant requested per 47 CF 0.457(d)(1)(ii)? yes _____ no __x__
If yes, defer until: _____ (date)
Company agrees to notify the Commission by _____ (date)
of the intended date of announcement of the product so that the grant can be issued on that date.

Transition Rules Request per 15.37? yes _____ no __x__
If no, assumed Part 15, Subpart B for unintentional radiators - the new 47 CFR [10-1-90 Edition] provision.

Report prepared for:	Invent-Tech Enterprise Ltd.
Report prepared by:	Advanced Compliance Lab
Report number:	0048-040810-02R

NVLAP®

The test result in this report IS supported and covered by the NVLAP accreditation

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1. GENERAL INFORMATION

1.1 Verification of Compliance

EUT:	Wireless 2 Way Doorbell
Model:	DB-016 (Hand-held Unit)
Applicant:	Invent-Tech Enterprise Ltd. Flat E, 2/F., 459-469 Castle Peak Rd., Tsuen Wan N.T., Hong Kong
Test Type:	FCC Part 15C CERTIFICATION
Result:	PASS
Tested by:	ADVANCED COMPLIANCE LABORATORY
Test Date:	Oct. 19, 2004
Report Number:	0048-040810-02R

The above equipment was tested by Compliance Laboratory, Advanced Technologies, Inc. for compliance with the requirement set forth in the FCC rules and regulations Part 15 subpart C. This said equipment in the configuration described in the report, shows the maximum emission levels emanating from equipment are within the compliance requirements.

The estimated uncertainty of the test result is given as following. The method of uncertainty calculation is provided in Advanced Compliance Lab. Doc. No. 0048-01-01.

	Prob. Dist.	Uncertainty(dB)	Uncertainty(dB)	Uncertainty(dB)
		30-1000MHz	1-6.5GHz	Conducted
Combined Std. Uncertainty u_c	norm.	±2.36	±2.99	±1.83

Wei Li
Lab Manager
Advanced Compliance Lab

Date: Oct. 20, 2004

1.2 Equipment Modifications

N/A

1.3 Product Information

System Configuration

ITEM	DESCRIPTION	FCC ID	CABLE
Product	Wireless 2 Way Doorbell DB-016 (Hand-held Unit)	JGFDB016RX	
Housing	PLASTICS		
Power Supply	9V DC Battery /AC-DC Adaptor		
Operation Freq.	49.86, 49.89 MHz		
Receiver	DB-016 (Outdoor Unit)		

(1) EUT submitted for grant.

1.4 Test Methodology

Radiated tests were performed according to the procedures in ANSI C63.4-2001 at an antenna to EUT distance of 3 meters.

1.5 Test Facility

The open area test site and conducted measurement facility used to collect the radiated and conducted data are located at Hillsborough, New Jersey. This site has been accepted by FCC to perform measurements under Part 15 or 18 in a letter dated May 19, 1997 (Refer to: 31040/PRV 1300F2). The NVLAP Lab code for accreditation of FCC EMC Test Method is: 200101-0.

1.6 Test Equipment

Manufacture	Model	Serial No.	Description	Last Cal dd/mm/yy	Cal Due dd/mm/yy
Hewlett-Packard	HP8546A	3625A00341	EMI Receiver	23/10/03	23/10/04
EMCO	3104C	9307-4396	20-300MHz Biconical Antenna	12/02/04	12/02/05
EMCO	3146	9008-2860	200-1000MHz Log-Periodic Antenna	09/02/04	09/02/05
Fischer Custom	LISN-2	900-4-0008	Line Impedance Stabilization Networks	03/07/04	03/07/05
Fischer Custom	LISN-2	900-4-0009	Line Impedance Stabilization Networks	03/07/04	03/07/05
EMCO	6502	2665	10KHz-30MHz Active Loop Antenna	27/02/04	27/02/05
EMCO	3115	4945	Double Ridge Guide Horn Antenna	15/09/04	15/09/05

All Test Equipment Used are Calibrated Traceable to NIST Standards.

1.7 Statement for the Document Use

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2. PRODUCT LABELING

FCC ID: JGFDB016RX

This device complies with part 15 of the FCC Rules. Operating is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Figure 2.1 FCC ID Label

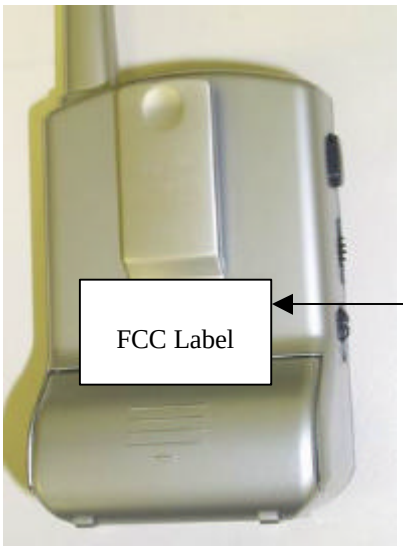

Figure 2.2 FCC ID Label Location

3. SYSTEM TEST CONFIGURATION

3.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it). And its antenna (coil) was permanently attached to the EUT with max length, 3in.

This manually operated (or voice-actived) transmitter will deactivate immediately after any control switch/signal was released.

Testing was performed at different setups/positions as EUT was operated at frequency channel A (49.86MHz) and channel B (49.89MHz) continuously. The worst case is the condition of AC/DC operated and Channel B.

3.2 Special Accessories

N/A

3.3 Configuration of Tested System

Figure 3.1 to Figure 3.4 illustrate this system, which is tested standing along.

Figure 3.1 Radiated Test Setup, Position X

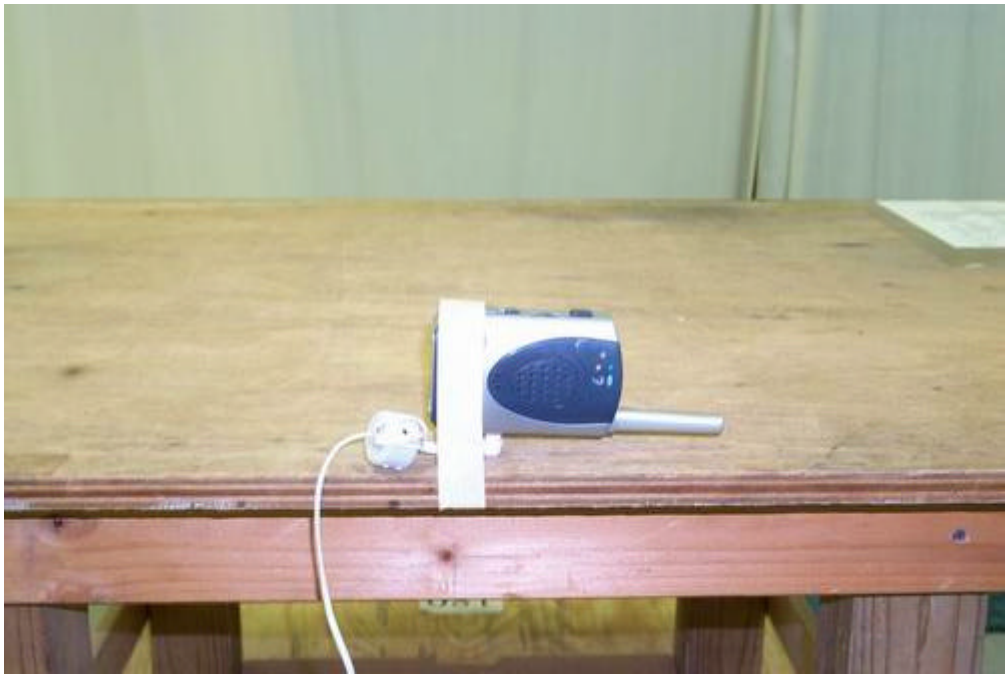

Figure 3.2 Radiated Test Setup, Position Y

Figure 3.3 Radiated Test Setup, Position Z

Figure 3.4 Conducted Test Setup

4. SYSTEM SCHEMATICS

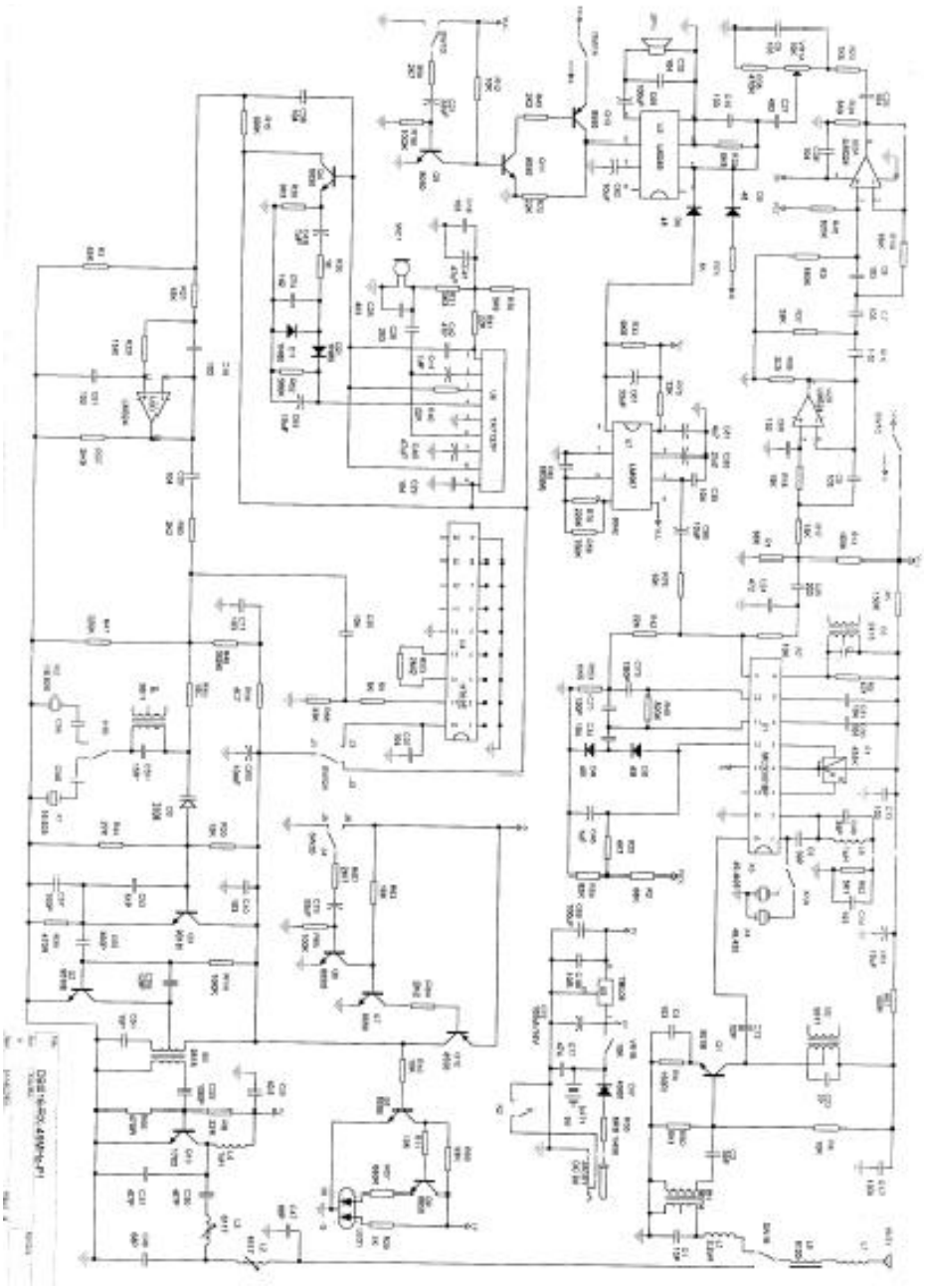

Figure 4.1 System Schematics

5. CONDUCTED EMISSION DATA

5.1 Test Methods and Conditions

The EUT was under normal operational mode during the conducted emission test. EMI Receiver was scanned from 150KHz to 30MHz with maximum hold mode for maximum emission. Recorded data was sent to the plotter to generate output in linear format. At the input of the spectrum analyzer, a HP transient limiter is inserted for protective purpose. This limiter has a 10 dB attenuation in the range of 150KHZ to 30MHZ. That factor was automatically compensated by the receiver, so the readings are the corrected readings. The reference of the plot is the CISPR 22 Class B limit in Figure 5.1 through Figure 5.2.

Conducted Emission Technical Requirements				
	Class A		Class B	
Frequency Range	Quasi-Peak dBuV	Average dBuV	Quasi-Peak DBuV	Average dBuV
150kHz –0.5MHz	79 (8912uV)	66 (1995uV)	66-56	56-46
0.5MHz-30MHz	73 (4467uV)	60 (1000uV)	---	---
0.5MHz- 5MHz	---	---	56	46 (250uV)
5MHz-30MHz	---	---	60	50

Emissions that have peak values close to the specification limit (if any) are also measured in the quasi-peak mode to determine compliance.

5.2 Test Data

Figure 5.1 through Figure 5.2 show the neutral and line conducted emissions for the standard operation mode.

Six Highest Data for AC Line Conducted Emissions						
Frequency (MHz)	0.22	0.22	0.30	0.74	-	-
Peak Reading (uV)	185.6	170.0	50.3	62.5	-	-

Test Personnel:

Tester Signature: _____ Date: October 19, 2004

Typed/Printed Name: Edward Lee

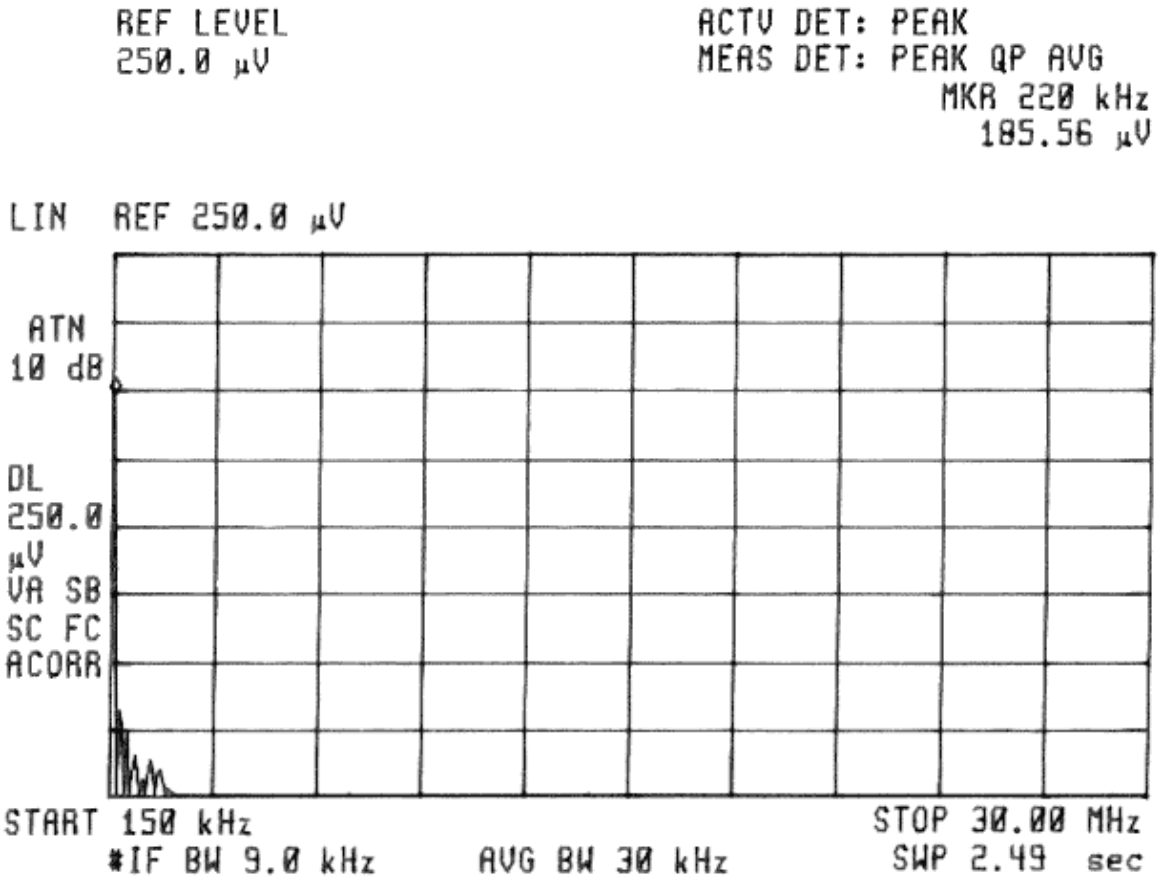

Figure 5.1 Line Conducted

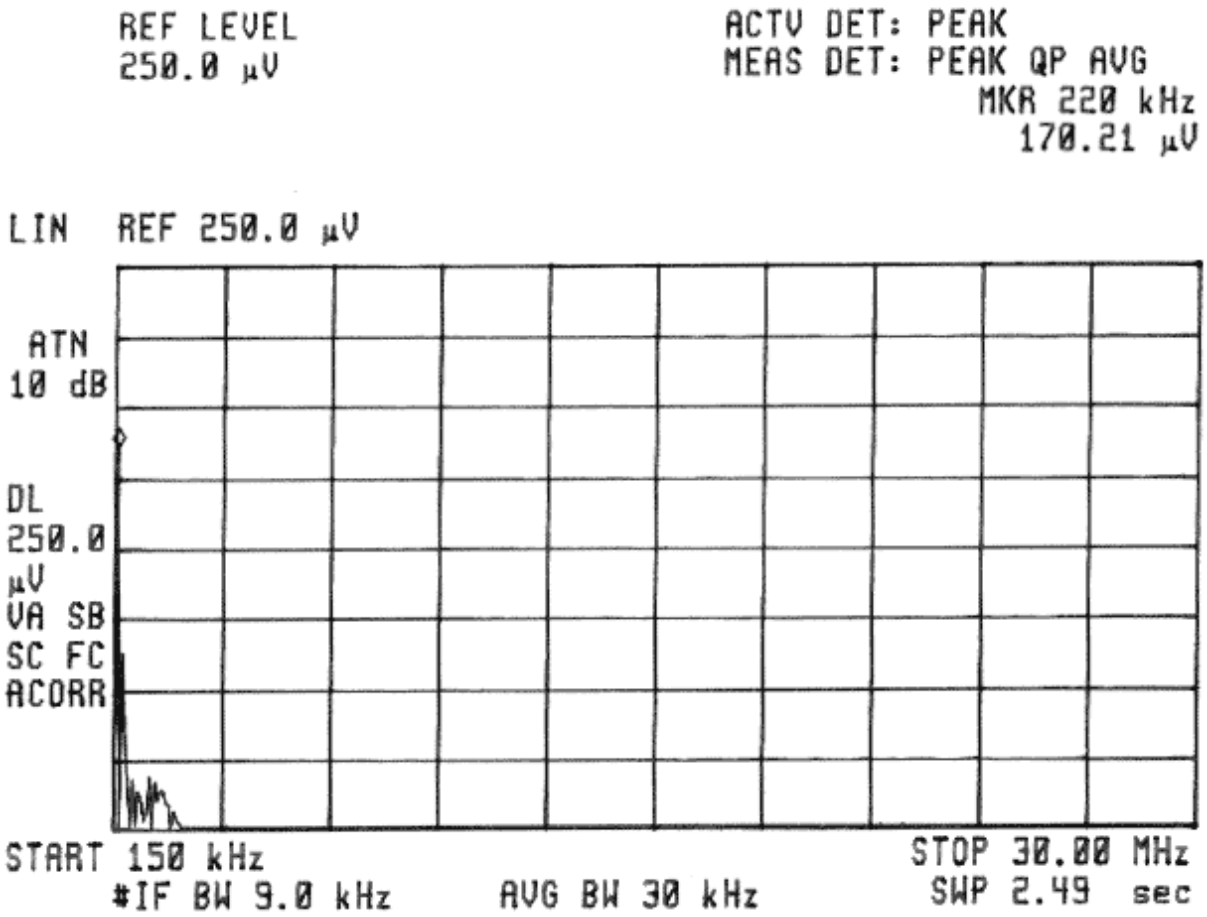

Figure 5.2 Neutral Conducted

6. RADIATED EMISSION DATA

6.1 Field Strength Calculation

The corrected field strength is automatically calculated by EMI Receiver using following:

$$FS = RA + AF + CF + AG$$

where FS: Corrected Field Strength in dBμV/m
RA: Amplitude of EMI Receiver before correction in dBμV
AF: Antenna Factor in dB/m
CF: Cable Attenuation Factor in dB
AG: Built-in Preamplifier Gain in dB (Stored in receiver as part of the calibration data)

6.2 Test Methods and Conditions

The initial step in collecting radiated data is a EMI Receiver scan of the measurement range below 30MHz using peak detector and 9KHz IF bandwidth / 30KHz video bandwidth. For the range 30MHz - 1GHz, 120KHz IF bandwidth / 120KHz video bandwidth are used. Both bandwidths are 1MHz for above 1GHz measurement. Up to 10^{th} harmonics were investigated.

6.3 Test Data

The following data lists the significant emission frequencies, polarity and position, peak reading of the EMI Receiver, the FCC limit, and the difference between the peak reading and the limit. Explanation of the correction and calculation are given in section 5.1.

Test Personnel: 

Typed/Printed Name: Edward Lee Date: Oct. 19, 2004

Radiated Test Data

Radiated Test Data (CH B-49.89MHz)

Frequency (MHz)	Polarity [H or V], Position (X,Y,Z)	Height (m)	Azimuth (Degree)	Peak Reading (dBμV/m)	FCC 3m Limit (dBμV/m)	Difference from limit (dB)
49.89	H,X	1.3	20	70.0	80	-10
99.8	H,X	1.3	20	35.8	43.5	-7.7
49.89	V,X	1.2	0	74.2	80	-5.8
99.8	V,X	1.2	0	36.0	43.5	-7.5
149.7	V,X	1.2	10	30.4	43.5	-13.1
49.89	H,Y	1.3	40	68.0	80	-12
99.8	H,Y	1.2	30	35.4	43.5	-8.1
49.89	V,Y	1.2	40	67.1	80	-12.9
99.8	V,Y	1.2	40	34.9	43.5	-8.6
49.89	H,Z	1.2	30	66.7	80	-13.3
99.8	H,Z	1.2	30	34.6	43.5	-8.9
49.89	V,Z	1.1	30	65.3	80	-14.7
99.8	V,Z	1.1	40	34.0	43.5	-9.5

(1) The limit for emissions within the 49.82-49.90MHz band is 10,000uV(80dB). Sec. 15.235. The limit for other emissions is defined in Sec. 15.209.
(2) If each peak reading is less than the FCC average limit, it'll be not necessary to show the (calculated) average reading.

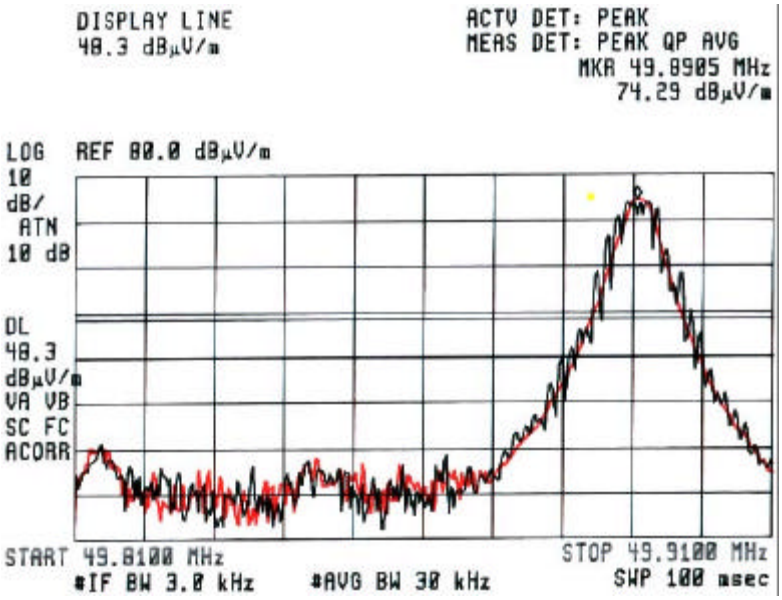

Figure 6.1 Bandwidth Plot (marker for un-modulated carrier)

7. PHOTOS OF TESTED EUT

The following photos show the inside details of the EUT.