



Date: 2006-11-15
No.: 60.880.6.047.01

TEST REPORT

Applicant: Chaney Instrument Co.
AB 29/F Hai Ying Building, South Caitian Road,
Futian District, Shenzhen China

Description of Samples: Model name: Wireless Thermometer (Transmitter)
Brand name: Nil
Model no.: 00782
FCCID: RNE00782TXA1

Date Samples Received: 2006-10-25

Date Tested: 2006-10-25 to 2006-11-14

Investigation Requested: FCC Part 15 Subpart C, Section 15.231

Conclusions: The submitted product COMPLIED with the requirements of Federal Communications Commission [FCC] Rules and Regulations Part 15. The tests were performed in accordance with the standards described above and on Section 2.2 in this Test Report.

Remarks: ----
Checked by:

Approved by:-

Prudence Poon
Project Manager
Telecom department

Victor Kwan
Manager
Telecom department

CONTENT:

Cover	Page 1 of 23	
Content	Page 2-3 of 23	
<u>1.0</u>	<u>General Details</u>	
1.1	Test Laboratory	Page 4 of 23
1.2	Applicant Details	Page 4 of 23
1.3	Equipment Under Test [EUT]	Page 5-6 of 23
1.4	Related Submittal(s) Grants	Page 7 of 23
1.5	Submitted Samples	Page 7 of 23
1.6	Country of Origin	Page 7 of 23
<u>2.0</u>	<u>Technical Details</u>	
2.1	Investigations Requested	Page 8 of 23
2.2	Test Standards and Results Summary	Page 8 of 23
<u>3.0</u>	<u>Test Methodology</u>	
3.1	Radiated Emission	Page 9 of 23
3.2	Field Strength Calculation	Page 9 of 23
3.3	Conducted Emission	Page 9 of 23
<u>4.0</u>	<u>Test Results</u>	
4.1	Radiated Emission of Fundamental Frequency	Page 10-11 of 23
4.2	Spurious Radiated Emission	Page 12-19 of 23
4.3	Conducted Emission	Page 20 of 23
4.4	Bandwidth Measurement	Page 21-22 of 23

5.0 **List of Measurement Equipments**

Page 23 of 23

Appendix A

Photos of Test Setup

Appendix B

External EUT Photos

Appendix C

Internal EUT Photos

1.0 **General Details**

1.1 **Test Laboratory**

Hong Kong Productivity Council
HKPC Building, 78 Tat Chee Avenue, Kowloon Tong,
Hong Kong

Registration Number: 90656

1.2 **Applicant Details** **Applicant**

Chaney Instrument Co.
AB 29/F Hai Ying Building, South Caitian Road,
Futian District, Shenzhen, China

Manufacturer

Chaney Instrument Co.
AB 29/F Hai Ying Building, South Caitian Road, Futian
District, Shenzhen, China

1.3 Equipment Under Test [EUT]

Description of EUT

Model Name:	Wireless Thermometer (Transmitter)
Brand Name:	Nil
Model Number:	00782
FCCID:	RNE00782TXA1
Rating:	3.0Vd.c. (2x “ AAA” size batteries)
Antenna Type:	Integral
Operated Frequency:	433.900MHz
No. of Channel:	1
Accessories and Auxiliary Equipment:	None
EUT Exercising Software:	None

General Operation of EUT

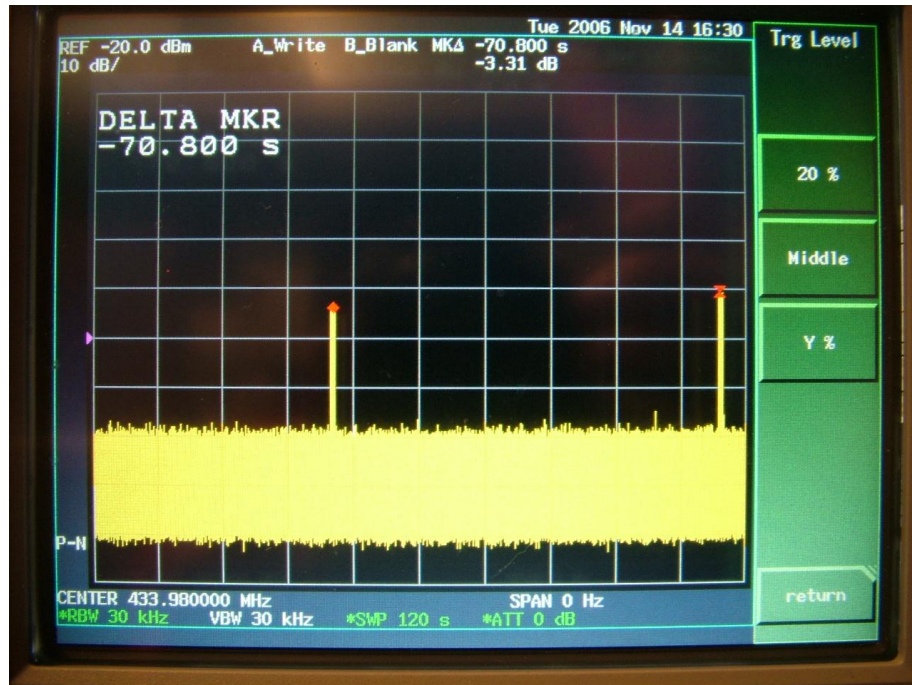
The Equipment Under Test (EUT) is a transmitter operated at 433.900MHz to detect temperature and transmit this signal to the wireless thermometer.

Periodic Operation of EUT

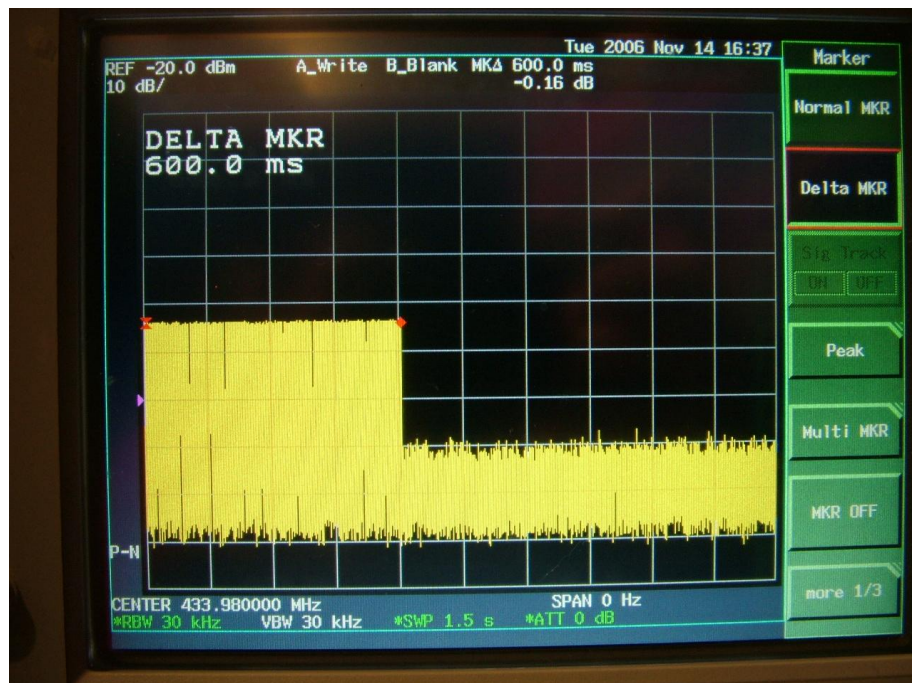
The transmitter transmits signal for every 71, 73, 79 or 81 seconds, that mean the silence period must not less than 70 seconds. Data packet is continuously transmitting for approximate 600ms in one transmission, therefore it activated automatically shall cease transmission within 2 seconds after activation.

So the EUT is deemed to fulfill FCC section 15.231(e).
According to section 15.231(e), the EUT shall be provided with a means for automatically limiting operation so that the duration of each transmission shall not be greater than one second and the silent period between transmissions shall be at least 30 times the duration of the transmission but in no case less than 10 seconds.

Refer to the next page for the figure of silence period and duration of each transmission.



Silence Period



Duration of each transmission

1.4 Related Submittal(s) Grants

This is a single application for certification of the transmitter.

1.5 Submitted Sample(s):

5 samples

1.6 Country of Origin

Nil

2.0 **Technical Details**

2.1 **Investigations Requested**

Perform ElectroMagnetic Interference measurement in accordance with FCC 47CFR [Codes of Federal Regulations] Part 15: 2005 and ANSI C63.4: 2003 for FCC Verification.

2.2 **Test Standards and Results Summary Tables**

EMISSION Results Summary						
Test Condition	Test Requirement	Test Method	Class / Severity	Test Result		
				Pass	Failed	N/A
Radiated Emission of Carrier Frequency	FCC 47CFR 15.231	ANSI C63.4:2003	N/A	☒	☐	☐
Radiated Emission, 30MHz to 5GHz	FCC 47CFR 15.231	ANSI C63.4:2003	Class B	☒	☐	☐
Conducted Emission on AC, 0.15MHz to 30MHz	FCC 47CFR 15.207	ANSI C63.4:2003	Class B	☐	☐	☒
Bandwidth Measurement	FCC 47CFR 15.231	ANSI C63.4:2003	N/A	☒	☐	☐

Note: N/A - Not Applicable

3.0 Test Methodology

3.1 Radiated Emission

The sample was placed 0.8m above the ground plane on a standard emission test site *. Measurements in both horizontal and vertical polarities were performed. During the test, each emission was maximized by: having the EUT continuously working, investigated all operating modes, rotated about all 3 axis (X, Y & Z) and considered typical configuration to obtain worst position, manipulating interconnecting cables, rotating turntable, varying antenna height from 1m to 4m in both horizontal and vertical polarizations. The emissions worst-case are shown in Test Results of the following pages.

*On a standard emission test site with a metal ground plane filed with the FCC pursuant to section 2.948 of the FCC rules, with Registration Number: 90656.

3.2 Field Strength Calculation

The field strength at 3 m was established by adding the meter reading of the spectrum analyzer to the factors associated with antenna correction factor, cable loss, preamplifiers and filter attenuation.

The equation is expressed as follow:

$$\begin{aligned} FS &= R + \text{System Factor} \\ \text{System Factor} &= AF + CF + FA - PA \end{aligned}$$

Where FS = Net Field Strength in dBuV/m at 3 meters.

R = Reading of Spectrum Analyzer / Test Receiver in dBuV.

AF = Antenna Factor in dB.

CF = Cable Attenuation Factor in dB.

FA = Filter Attenuation Factor in dB.

PA = Preamplifier Factor in dB.

FA and PA are only be used for the measuring frequency above 1 GHz.

3.3 Conducted Emissions

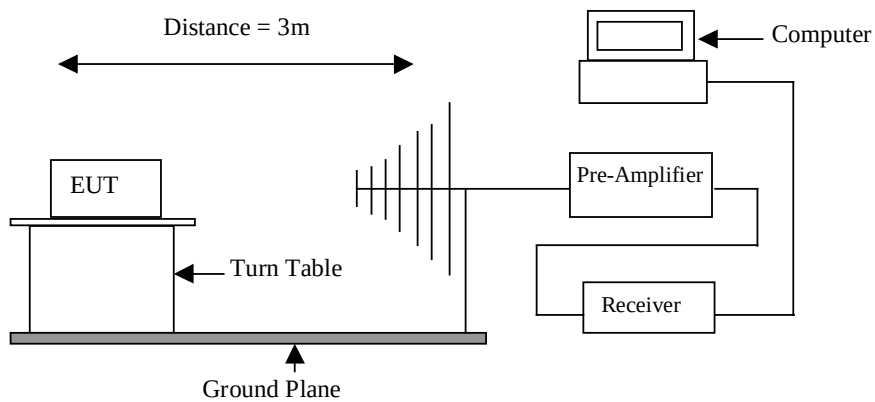
The test was performed in accordance with ANSI C63.4: 2003, with the following: initial measurements were performed in peak and average detection modes on the live line of personal computer, any emissions recorded within 30dB of the relevant limit lines were re-measured using quasi-peak and average detection on the live and neutral lines with the worst case recorded in the table of results.

4.0 Test Results

4.1 Radiated Emission of Fundamental Frequency

Test Requirement:	FCC part 15 section 15.231(e)
Test Method:	ANSI C63.4:2003
Test Date:	2006-11-01
Mode of Operation:	Transmitting mode.
Detector Function:	CISPR Quasi Peak
Measurement BW:	100 kHz

Test Setup:



Limits for Fundamental Frequency: [Section 15.231(e)]:

Fundamental Frequency [MHz]	Field Strength of Fundamental [$\mu\text{V/m}$]	Field Strength of Fundamental [dB $\mu\text{V/m}$]
433.900	4398.347	72.86

Compliance with the limits in the above table may be based on the use of measurement instrumentation with a CISPR quasi-peak detector.

Results: PASS

Radiated Emissions Quasi-Peak					
Emission Frequency MHz	E-Field Polarity	Reading dB $\mu\text{V/m}$	System Factor dB	Net Field Strength at 3m dB $\mu\text{V/m}$	Delta to Limit dB $\mu\text{V/m}$
433.9088	Vertical	49.90	18.20	68.10	-4.76
433.9088	Horizontal	32.39	18.20	52.80	-20.06

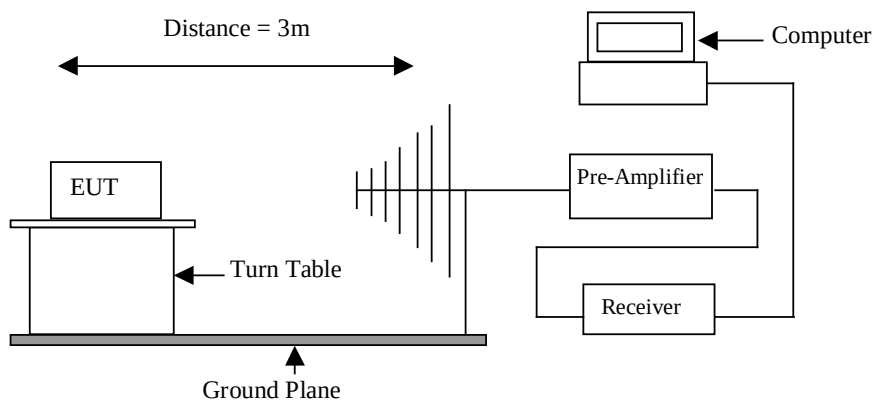
Remark:

Calculated measurement uncertainty: $\pm 5.0\text{dB}$

4.2 Spurious Radiated Emission

Test Requirement:	FCC part 15 section 15.231(e)
Test Method:	ANSI C63.4:2003
Test Date:	2006-11-01
Mode of Operation:	Transmitting mode.
Detector Function:	CISPR Quasi Peak
Measurement BW:	100 kHz

Test Setup:



Limits for Radiated Emission [Section 15.231(e)]:

Fundamental Frequency [MHz]	Field Strength of Spurious Emission [$\mu\text{V}/\text{m}$]	Field Strength of Spurious Emission [dB $\mu\text{V}/\text{m}$]
433.900	439.834	52.86

Spurious emissions shall be attenuated to the average (or, alternatively, CISPR quasi-peak) limits shown in this table or to the general limits shown in section 15.209, whichever permits a higher field strength.

Limit for Radiated Emission Falling in Restricted Bands [Section 15.209]:

Frequency (MHz)	Field Strength [$\mu\text{V/m}$]	Field Strength [dB $\mu\text{V/m}$]
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
960-2500	500	54.0

Radiated emissions, which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209.

The emission limits shown in the above table are based on measurement employing a CISPR quasi-peak detector and above 1000MHz are based on measurements employing an average detector.

Results: PASS

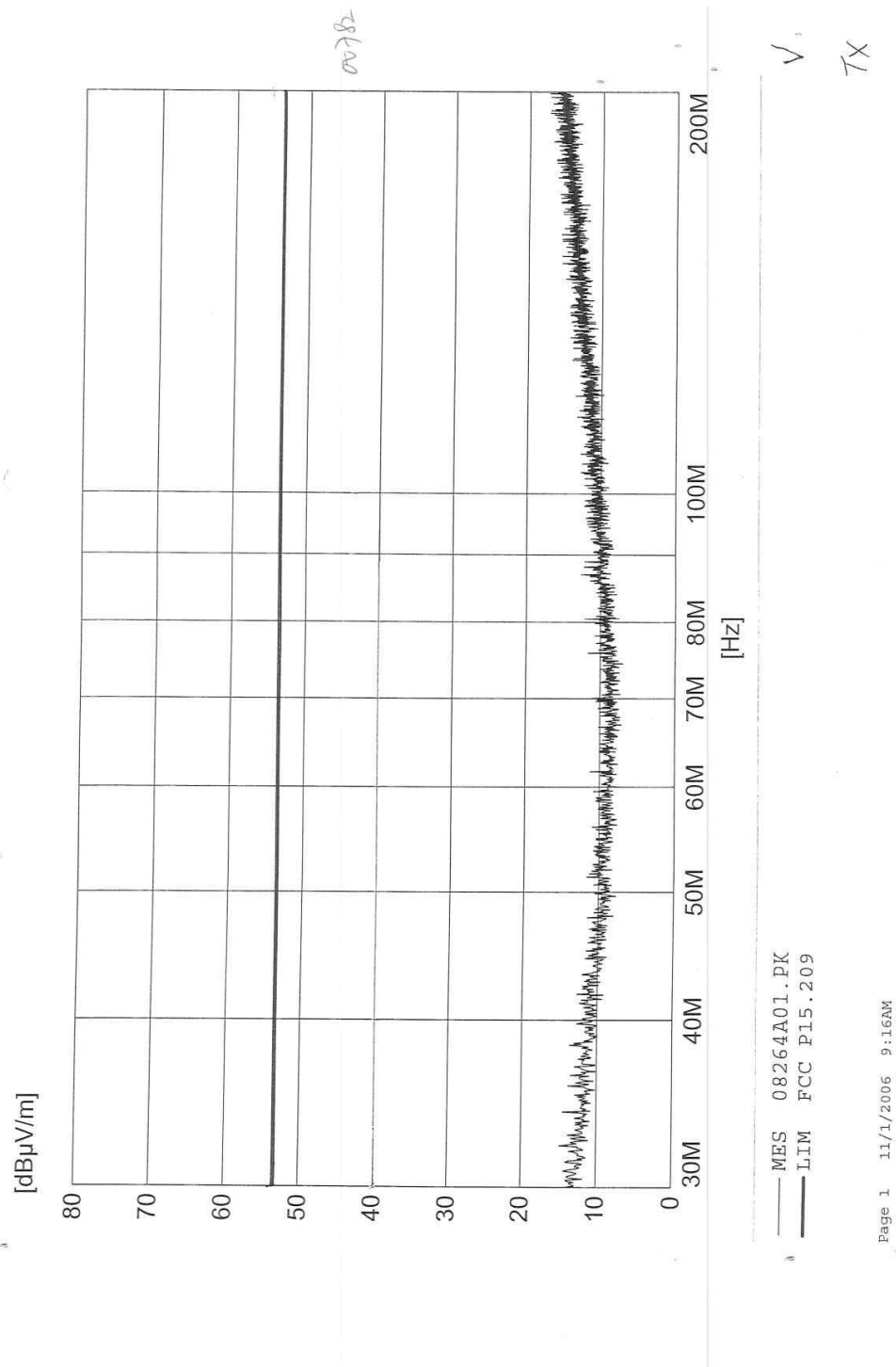
- Result data graph is attached at the next pages for reference.

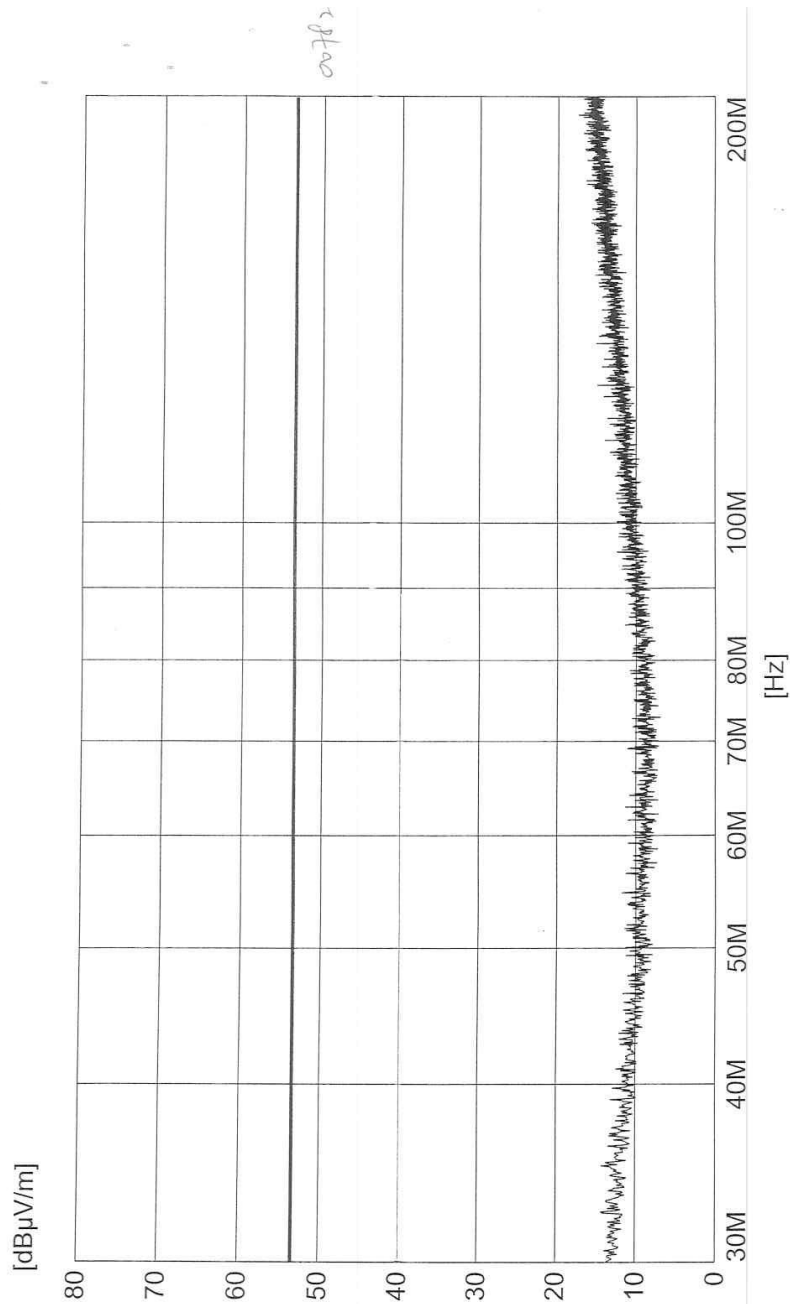
Radiated Emissions Quasi-Peak						
Emission Frequency MHz	E-Field Polarity	Reading dB $\mu\text{V/m}$	System Factor dB	Net Field Strength at 3m dB $\mu\text{V/m}$	Limit dB $\mu\text{V/m}$	Delta to limit dB $\mu\text{V/m}$
867.8176	Vertical	14.50	25.10	39.60	52.86	-13.26
1736.0000	Vertical	38.48	-6.09	32.39	54.00	-21.61
*2816.0000	Vertical	35.41	-1.86	33.55	54.00	-20.45
*3984.0000	Vertical	44.51	1.30	45.81	54.00	-8.19
867.8168	Horizontal	20.80	25.10	45.90	52.86	-6.96
1960.0000	Horizontal	39.03	-6.09	32.94	54.00	-21.06
*2776.0000	Horizontal	35.00	-1.86	33.14	54.00	-20.86
*3984.0000	Horizontal	43.99	1.30	45.29	54.00	-8.71

Remark (*) : Radiated emissions which fall in the restricted bands as defined in Section 15.205(a).

Remark:

Calculated measurement uncertainty: $\pm 5.0\text{dB}$





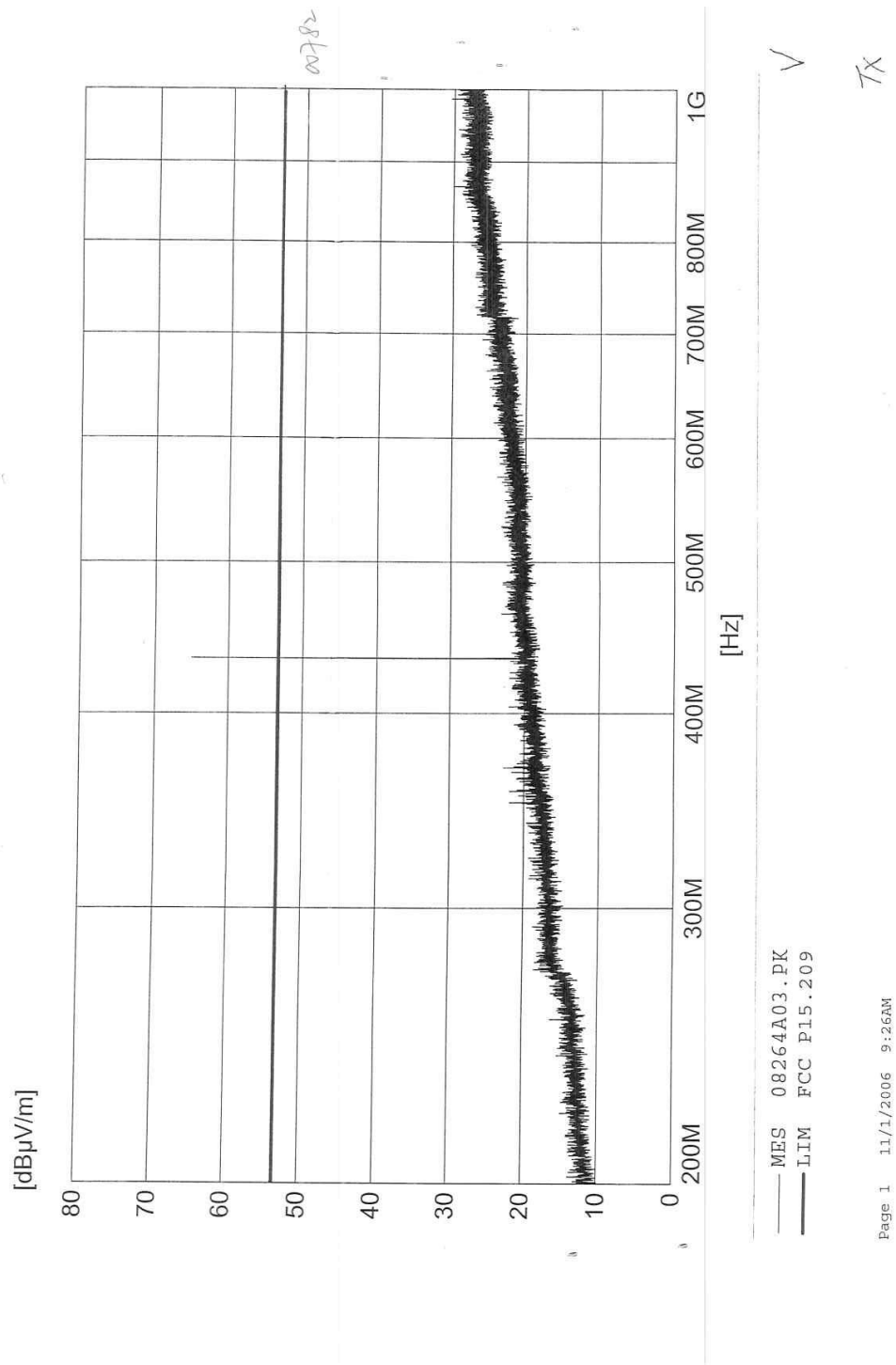
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 — LIM FCC P15.209

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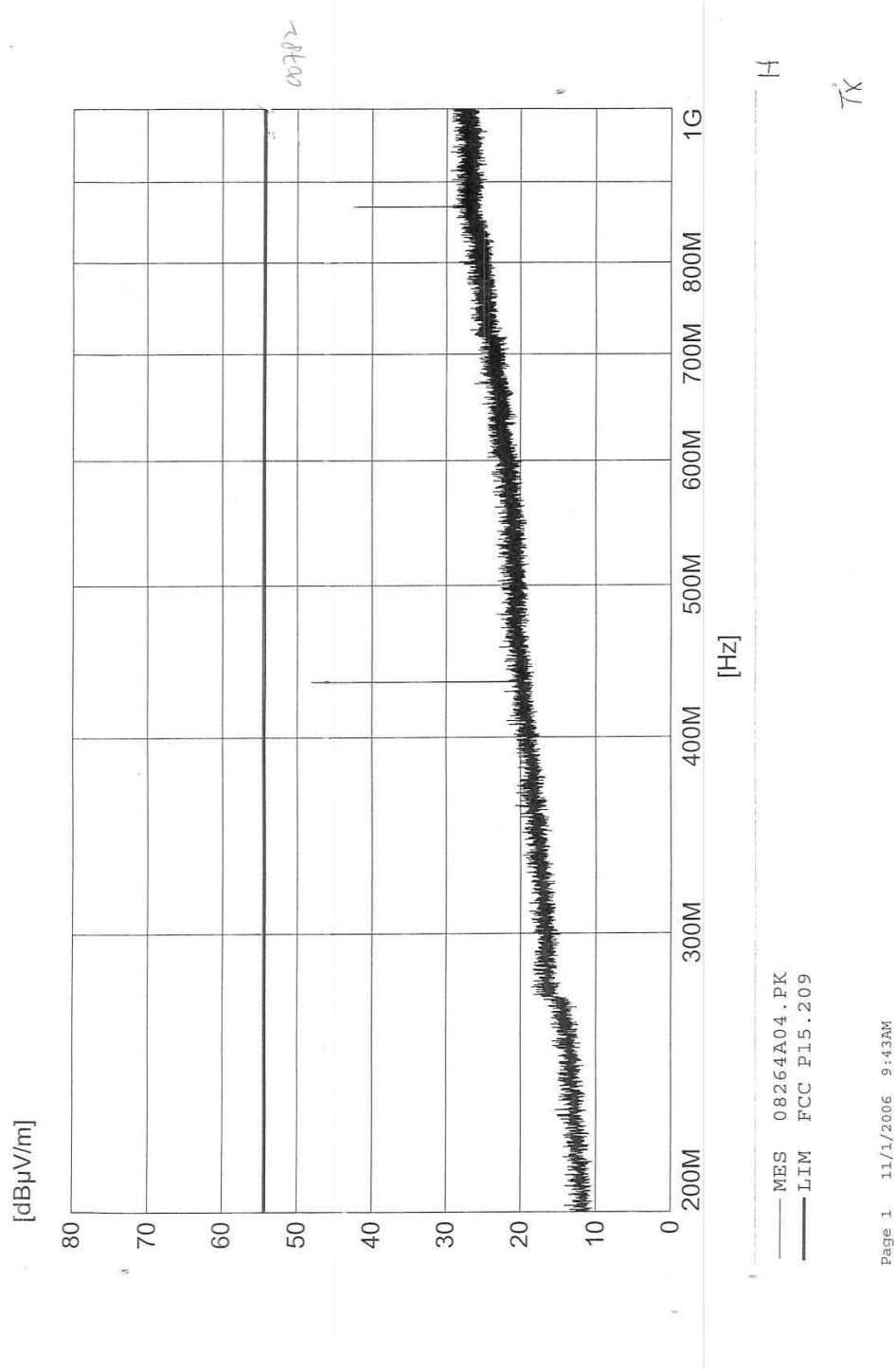
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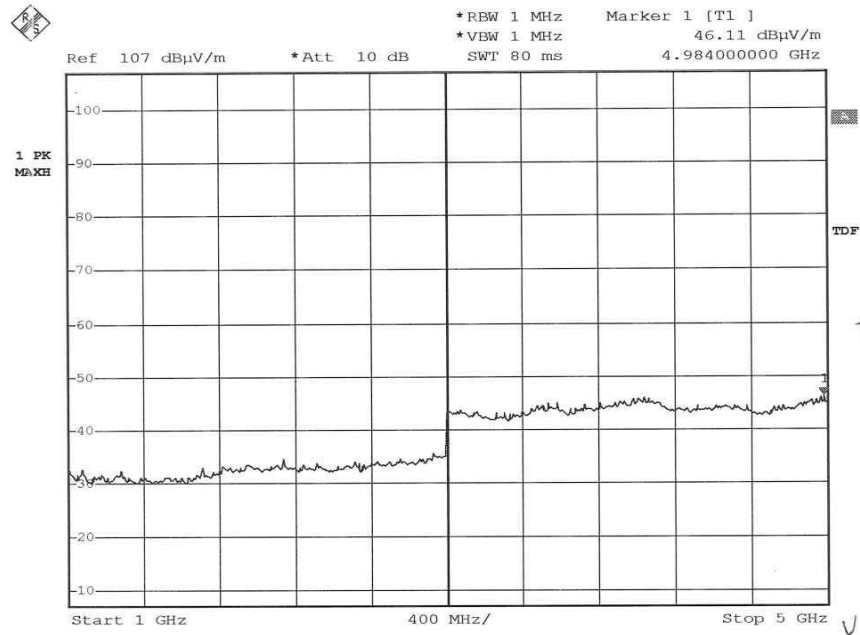


Page 1 11/1/2006 9:26AM



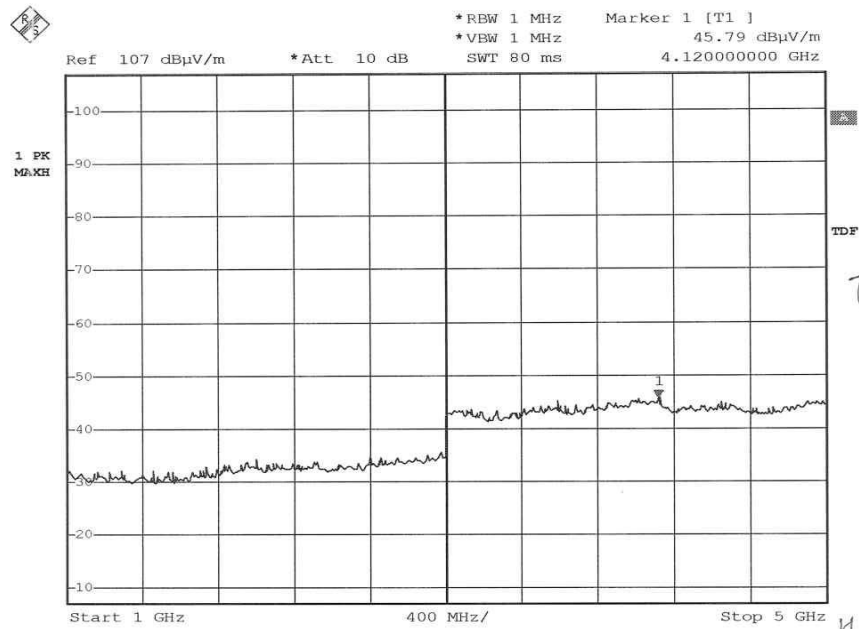
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4.3 Conducted Emissions (0.15MHz to 30MHz)

Test Requirement: FCC part 15 Section 15.207 Class B
Test Method: ANSI C63.4:2003
Test Date: ---
Mode of Operation: ---

Results: N/A

Note : This testing is not applicable for the battery operated EUT.

Limits for Conducted Emission [Section 15.207]:

Frequency Range [MHz]	Quasi-Peak Limit [dB μ V]	Average Limit [dB μ V]
0.15-0.5	66 to 56*	56 to 46*
0.5-5.0	56	46
5.0-30.0	60	50

* Decreases with the logarithm of the frequency.

Remarks:
Calculated measurement uncertainty: ± 2.8 dB

4.4 Bandwidth Measurement

Test Requirement:	FCC part 15 section 15.231 (c)
Test Method:	ANSI C63.4:2003
Test Date:	2006-11-01
Mode of Operation:	Transmitting mode.
Detector Function:	Peak

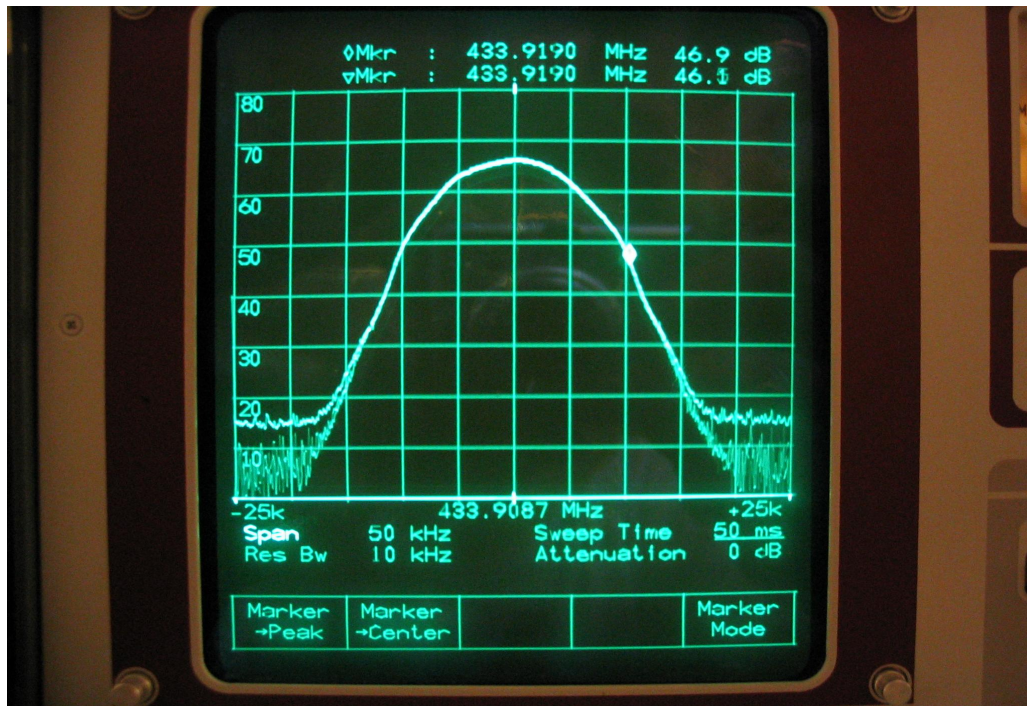
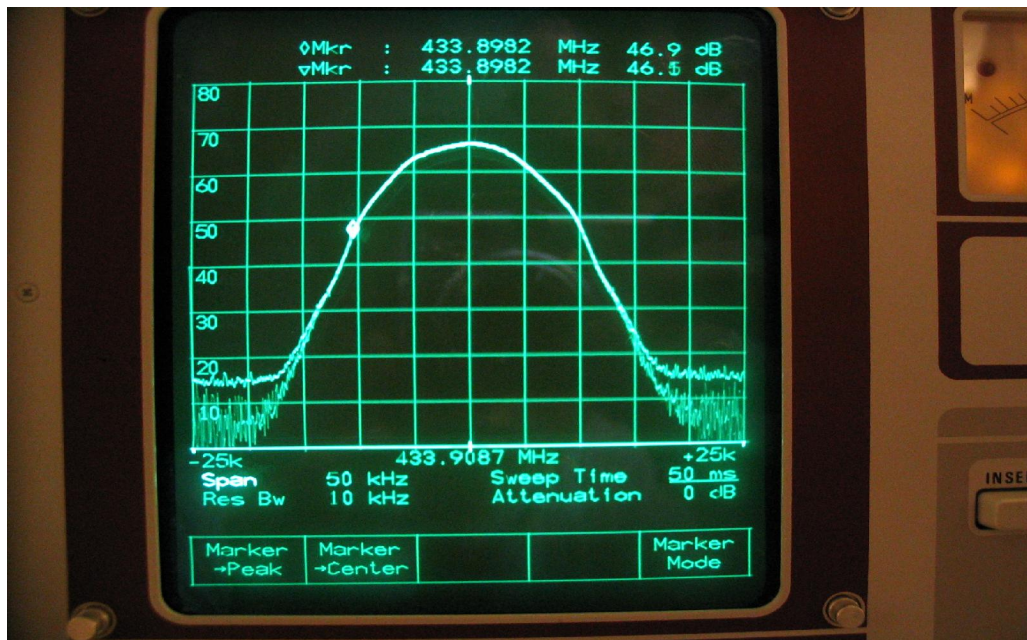
Results: PASS

Refer to the data graph, the 20dB points at lower edge and at higher edge are 433.8982MHz and 433.9190MHz, so that is 18.5KHz and 10.3KHz respectively apart from the centre modulated carrier, the bandwidth of the emission is 0.0066 % of the centre frequency. Therefore, the EUT meets the requirement of section 15.231(c).

Limit for Bandwidth [Section 15.231 (c)]

The bandwidth of the emission shall be no wider than 0.25% if the center frequency for devices operating above 70MHz and below 900MHz.

Test Result: Result data graph is shown at the next pages for reference.



5.0 List of Measurement Equipment

Radiated Emission and Bandwidth Measurement

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC209	Semi-anechoic Chamber	Frankonia	N/A	N/A	24-Feb-06	24-Feb-07
EMC017	Test Receiver	R & S	ESVS30	842807/009	25-Aug-06	25-Aug-07
EMC018	Spectrum Analyzer	R & S	FSP30	1093.4495 K30	20-Feb-06	20-Feb-07
EMC040	Bi-conical Antenna	R & S	HK116	841489/016	8-Feb-06	8-Feb-08
EMC045	Log Periodic Antenna	R & S	HL223	841516/020	3-Feb-06	3-Feb-08
EMC542	11M Coaxial Cable with ferrites	EMCO	C17105-01	N/A	15-Jul-06	15-Jul-07

Line Conducted

EQP NO.	DESCRIPTION	MANUFACTURER	MODEL NO.	SERIAL NO.	LAST CAL	CAL DUE
EMC384	Test Receiver	R&S	ESHS30	847115/005	25-Aug-06	25-Aug-07
EMC160	RF Voltage Probe	Schwarzbeck	TK9416	N/A	24-Feb-06	24-Feb-07
EMC407	LISN	R&S	ESH3-Z5	849876/027	17-Feb-06	17-Feb-07
EMC426	Double Shield Cable	Radiall	RG142	N/A	24-Aug-06	24-Aug-07

Remarks:

CM Corrective Maintenance
N/A Not Applicable or Not Available
TBD To Be Determined