

1 May 2002.

TEST REPORT

According to FCC Part 95 Subparts E,G

For

LOW POWER RADIO SERVICES (LPRS)

TRANSMITTING SYSTEMS

MODEL:CONVERSOR

Prepared for:

**Sense-Sonic
King Edward House
1 Jordangate
Macclesfield, Cheshire
United Kingdom**

Prepared by:

**Cambridge Test & Measurement Ltd
Unit 3, Cardinal Park
Godmanchester
England**

The results in this report are for the tested unit only.

This report contains confidential information. The owner of this report may make duplicates of it, provided all pages are copied



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PREFACE

This report describes the results of measurements made on the Low Power Radio Service that falls under the class of intentional radiator by the FCC Part 95 Rules and regulations.

This EUT is designated: LPRS Transmitter – Assistive Listening System.

Model: CONVERSOR

The CONVERSOR .is designed and manufactured by Sense – Sonic Ltd

The EUT was tested in full compliance with the FCC Regulations using the methods of FCC Part 95 and Part 2 'Frequency Allocations and Radio Treaty Matters: General Rules and Regulations'. The results of the testing indicate that the CONVERSOR Transmitter. met the Part 95 limits and requirements.

Equipment Received 04/15/2002

Testing Started 04/22/2002

Testing Finished 04/25/2002

2.0 GENERAL INFORMATION

2.1 Client Information

Company Name: Sense-Sonic Ltd
Contact: John Houldcroft
Company Address: King Edward House
1 Jordangate
Macclesfield
Cheshire
SK10 1EE
United Kingdom
Phone: +44 (0) 1625 443333

2.2 Administrative Data

Device Tested: LPRS Transmitter
Model: CONVERSOR
Accessories: N/A
Expository Statement: This device was designed to
Operate as LPRS transmitter
Purpose of test Demonstrate compliance with
FCC Rules,CR47 Part 95,
Date of Test: 04/22/2002
Place of the test: Cambridge Test and
Measurement Services Ltd
3 Cardinal Park
Godmanchester
Huntington
Cambridgeshire
PE 29 2XN
United Kingdom
+44 (0) 1 480 436 436

3.0 EQUIPMENT UNDER TEST (EUT)

3.1 EUT Nomenclature

Manufacturer: Sense-Sonic Ltd
Model No. (type) CONVERSOR
Serial No: D02002
Equipment category LPRS Transmitter

3.2 Brief Description of EUT

The CONVERSOR is the LPRS Transmitter with RF frequency range 216.025 – 216.975 MHz designed to help enhance the ability to hear for hard of hearing people and to use for many other applications including tour group communications and language translation.

The CONVERSOR was configured as an independent module.

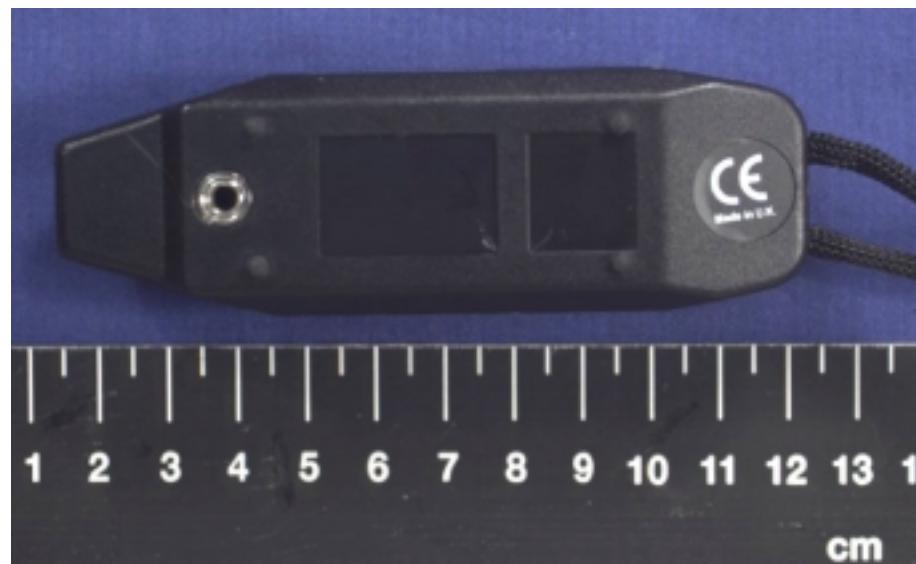
Operating Frequency: 216.025 – 216.975 MHz

Power Supply: Internal, 1.2vDC Rechargeable Battery.
AC Adapter 500mA supplied by Sense-Sonic.

3.3 Photographs of EUT



Photographs of EUT

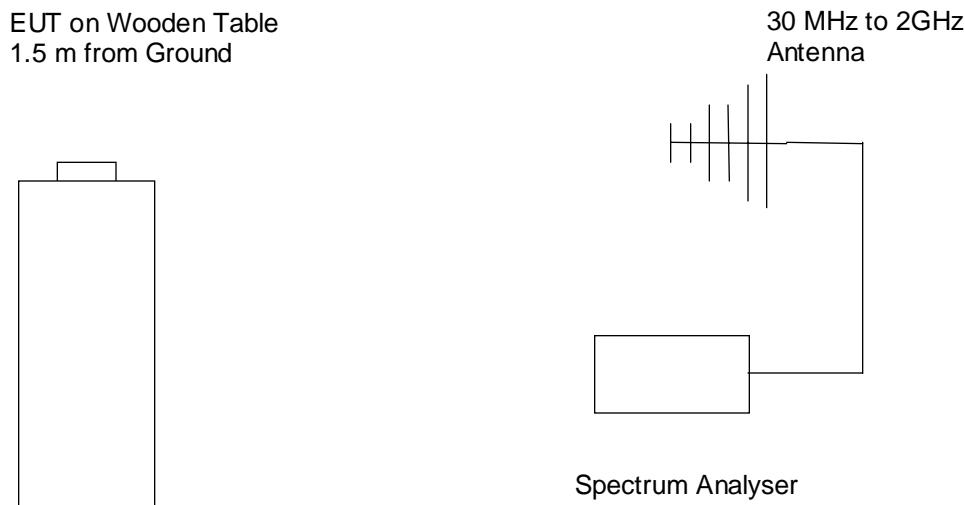


4.0 TEST PROCEDURE AND CONFIGURATION

4.1 Test Specifications

Specifications:	FCC 47 CFR, FCC Part 95
Title	Part 95 : Personal Radio Services
Specification:	FCC 47 CFR, FCC Part 2
Title:	Part 2 Frequency Allocations And Radio Treaty Matters, General Rules and Regulations

4.2 Block Diagram of EUT Set-up for the Test



4.3 Procedure of RF Power Output, Unwanted radiation, Radiation Emission, Modulation Characteristics, Spurious Emissions, Field Strength of Spurious Radiation, Occupied Bandwidth, Frequency Stability Tests.

The EMC test facility consists of a; shielded semi-anechoic chamber with attached shielded control room. A hybrid absorber combines high performance anechoic polyurethane foam with a ferrite tile base to achieve high levels of absorption and power dissipation capability all pre-scan tests were done in this room and them transferred to the out door test site for the radiated measurements.

The test site is designed according to the ANSI 63.4 – 1992. The test site description along with the site attenuation data has been filed with the FCC and a letter of compliance 93385.with the requirements of Section 2.948 of the FCC Rules was issued on August 20, 1998 by the FCC.

The EUT was tested in compliance with FCC Part 95 Subparts E and G requirements. All data was obtained via the Anritsu Spectrum Analyser MS 2602A, and Modulation Analyser HP8901B.

The CONVERSOR was an independent module and was tested as a stand-alone unit. The modulation frequency was provided by external Test Oscillator HP8903B (for all tests except RF Power Output and Unwanted Radiation).EUT operated as a Stationary LPRS Transmitters on the frequency of 216.0125 MHz

Field Strength of Spurious Radiation and Spurious Radiation tests were monitored from the EUT over a frequency range of 24 MHz to 2900 MHz.

Field Strength of Spurious Radiation test were monitored from the EUT over a frequency range of 30 MHz to 2900 MHz in horizontal polarisation with the scanning antenna repeatedly moving from 1 to 4 meters in elevation while the turntable rotated through a 360 degree arc. This procedure was then repeated in vertical polarisation to confirm the strongest signals and polarisation orientation.

Frequency stability test was done with variation of ambient temperature from -30deg to +50deg centigrade and with variation primary supply voltage from 85 to 115 per cent of the nominal DC value for the unit.

4.4 Test Equipment Used for the Results in this Report

Spectrum Analyser Anritsu MS2604A s/n MT88057
Antenna York EMC CB2614A s/n 9919
Modulation Analyser HP8901B s/n 2642A01009
Audio Analyser HP 8903B s/n 3011A09130
Off Air Standard Quartzlock 2A s/n 41125

4.5 Photographs of Test Set-up



5 TEST RESULTS

The measurements expanded uncertainty equals 2.0.dB with 95% confidence level.

Room Ambient Temperature 21degC +/- 1deg C.

Relative Humidity: 47% +/-5%

5.1 RF POWER OUTPUT TEST

This test was performed in compliance with FCC Regulations using the methods of 2.1046 FCC Part 2.

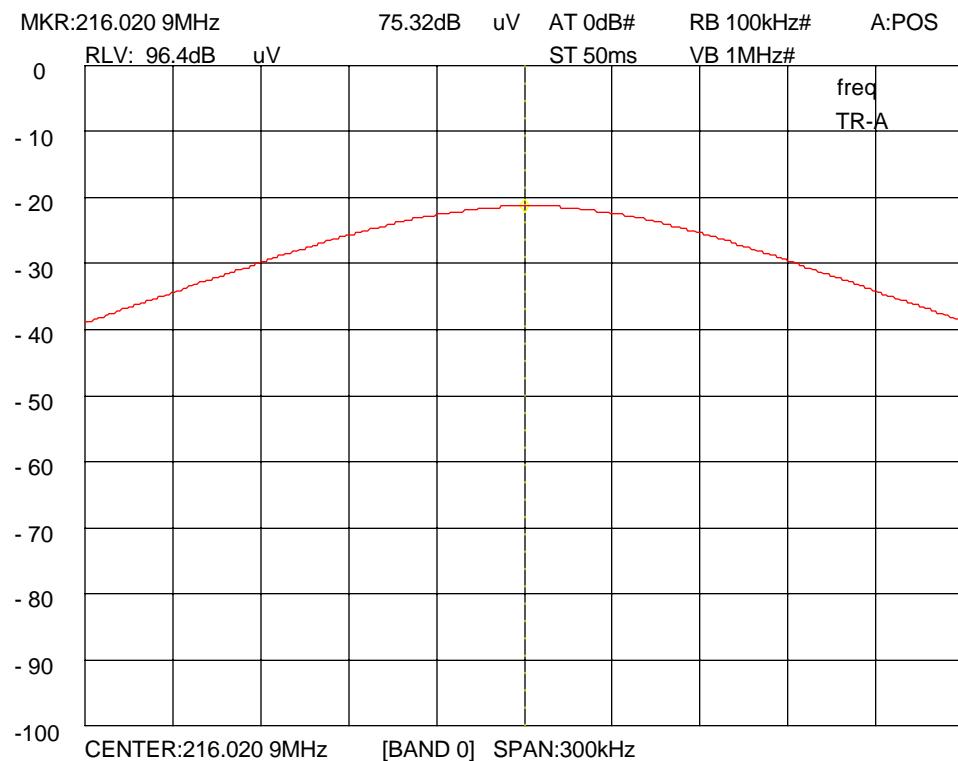
Below are the Peak measurements of the highest value RF POWER OUTPUT signal observed.

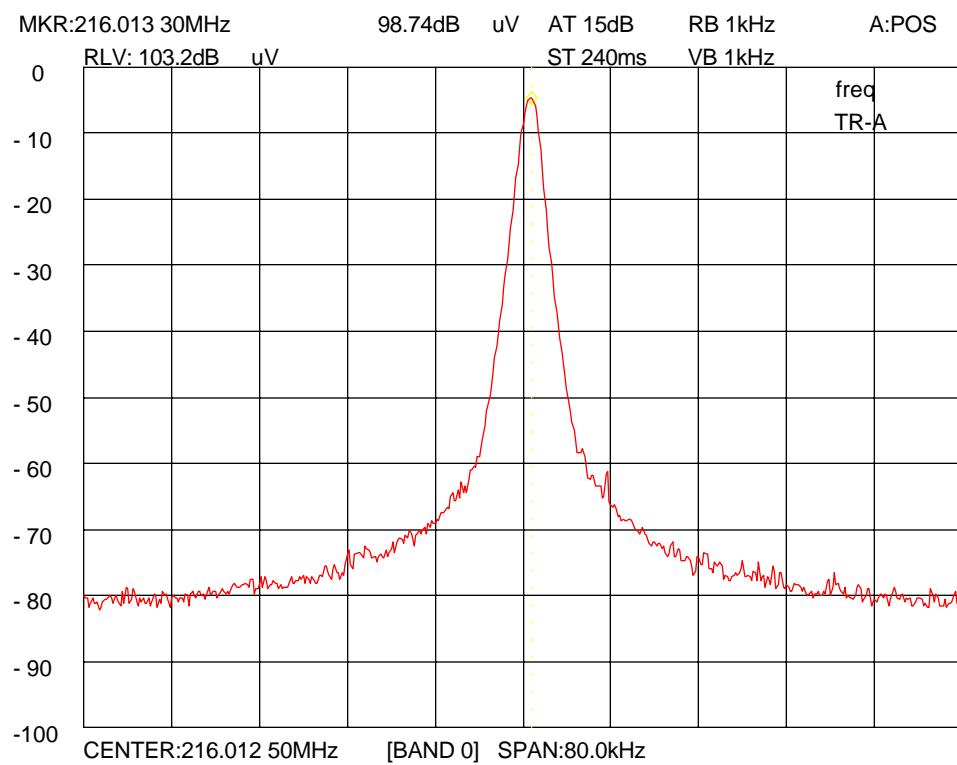
Channel 1A

Peak value

Frequency MHz	Peak dB μ /m	Status	Comment
216.0125	75.3	PASS	

RF Output





5.2 MODULATION CHARACTERISTICS TEST

This test was performed in compliance with FCC Regulations using the methods of 2.1047 FCC Part 2.

Below is the table of the TX Peak measurements of the emission value at 3dB level below Fpeak of the TX (transmitter).

- 1) Channel, Fc = 216.0125 MHz, RBW = 3 kHz

The modulation Frequency F mod Hz	The modulation Amplitude MV	Tx frequency F3dB at 3dB below Fpeak MHz	Deviation Fc – F3dB kHz
1000	50	216.015172	0.960
1500	50	216.014372	1.76
2000	50	216.013412	2.72
2500	50	216.015332	0.800
3000	50	216.015332	0.800
4000	50	216.011932	4.200
5000	50	216.008132	0.800
6000	50	216.008132	0.800
7000	50	216.015492	0.640
8000	50	216.015492	0.640
9000	50	216.015492	0.640
10000	50	216.015492	0.640

The frequency Fmod = 4000 Hz that had the highest deviation was chosen to define the amplitude for the Occupied Bandwidth Test.

5.3 OCCUPIED BANDWIDTH TEST

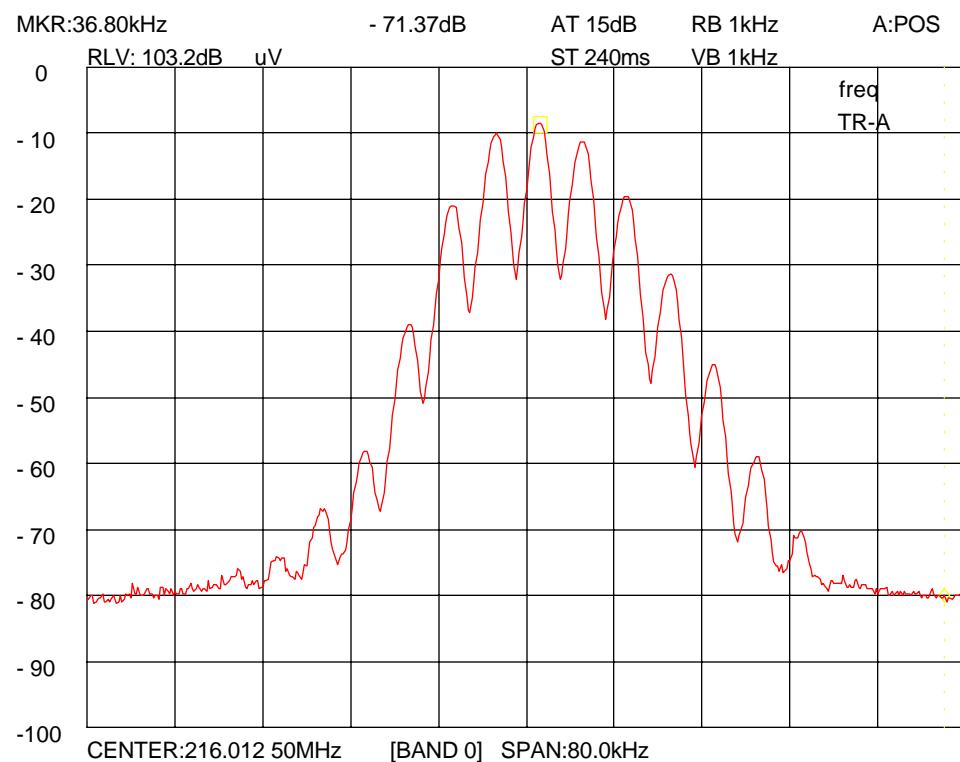
This test was performed in compliance with FCC Regulations using the methods of 2.1049 FCC Part 2 and Part 95 633 The OCCUPIED BANDWIDTH was measured at the level equal -20 dB of the frequency peak value.

OCCUPIED BANDWIDTH TEST was performed on the selected Standard band channel 1V and Extra band channel 2A.

5.3.1 216.0125 MHz

- 1) The following is the data of the modulation frequency amplitude definition.

Frequency fc at -20dB below Fc MHz	Frequency fc at -20dB above Fc MHz	Occupied bandwidth at 50% modulation kHz	Comment
216.007012	216.024932	17.92	



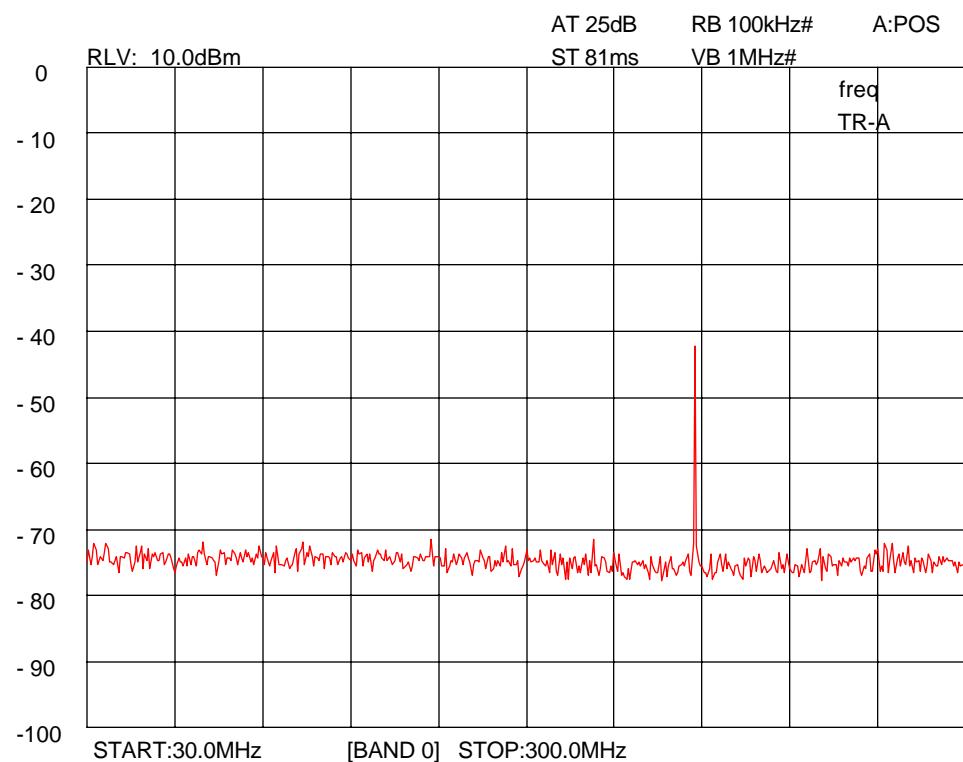
5.4. SPURIOUS EMISSIONS Radiated

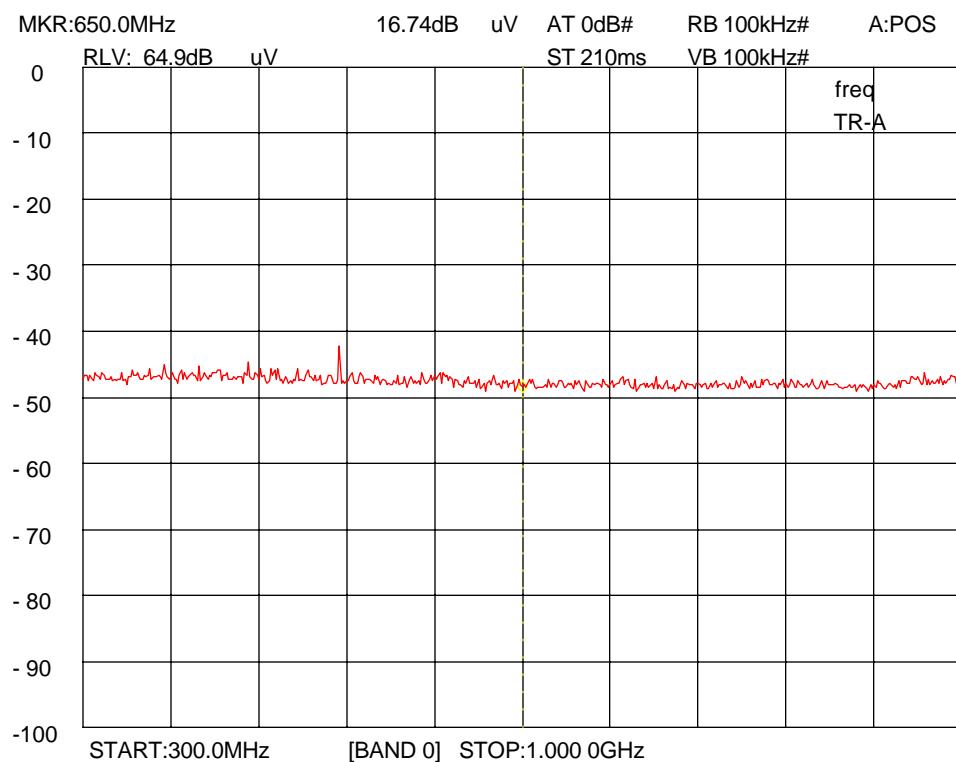
This test was performed in compliance with FCC Regulation using the methods of 2.1053 and 2.1057 FCC Part 2.

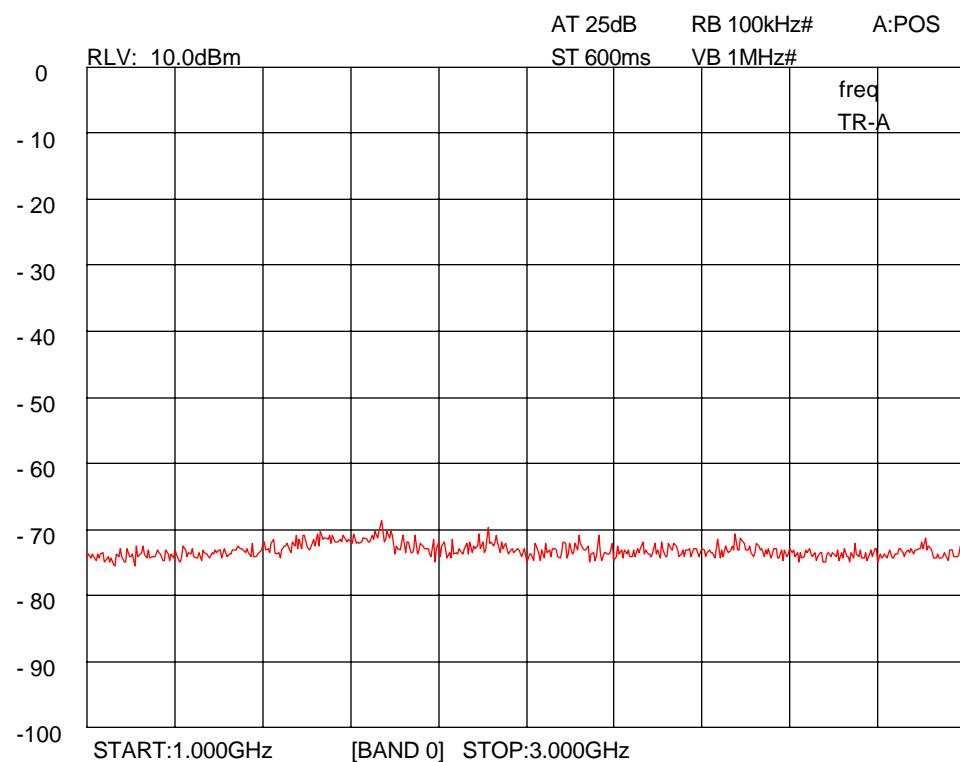
SPURIOUS EMISSIONS Radiated were performed on the channel 216.0125 the modulation frequency 4000 Hz, amplitude 0.050 V in the frequency range from 30 MHz to 2900 MHz in both the horizontal and vertical planes. The EUT was rotated 360 deg to find the highest peak.

Emission values of the unwanted frequencies.

Frequency MHz	Peak dBuV/m	Peak Lmt dBuV/m with A/F	Status	Comment
192.008	20.29	28.5	PASS	horizontal
240.010	18.50	26.5	PASS	horizontal
432.035	22.60	26.0	PASS	horizontal
504.037	22.80		PASS	horizontal







5.4 FREQUENCY STABILITY

The FREQUENCY STABILITY TEST was done:

- with variation of temperature from -30deg to +50deg centigrade
- with variation primary supply voltage from 85 to 115 percent of the nominal DC value for the selected.

Room ambient Temperature: 21 degC +/-5%

1) Channel (Fc) = 216.0125 MHz

Temperature Measured degC	Frequency Measured Fm MHz	Frequency Tolerance F=Fm-FC kHz	Frequency Stability Limit, Flim kHz	Status
-30	216.020575	+7.183	10.80	PASS
-20	216.020167	+6.775	10.80	PASS
-10	216.019389	+5.997	10.80	PASS
0	216.017874	+4.482	10.80	PASS
+10	216.016132	+2.740	10.80	PASS
+20	216.013392	0.0	10.80	PASS
+30	216.012207	-1.185	10.80	PASS
+40	216.009665-	-3.727	10.80	PASS
+50	216.007175	-6.217	10.80	PASS

Primary Supply Voltage	Frequency Measured Fm MHz	Frequency Tolerance F=Fm-FC kHz	Frequency Stability Limit, Flim kHz	Status
1.275	216.013449	0.949	10.8	PASS
1.50	216.013392	0.892	10.8	PASS
1.725	216.013350	0.085	10.8	PASS

CTMS LTD, Company Accreditations & Credentials

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UKAS Certificate

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United Kingdom Accreditation Service

ACCREDITATION CERTIFICATE



TESTING
No. 1831

Cambridge Test and Measurement Services Ltd
PO Box 465
St Andrews Road
Cambridge
CB4 1ZJ

is accredited to undertake Category C testing in the above named permanent laboratory as detailed in the schedule bearing the above accreditation number and NAMAS logo. From time to time this schedule may be revised and restated by the United Kingdom Accreditation Service.

This Accreditation shall remain in force until 10 June 2001 subject to continuing compliance with the NAMAS Accreditation Standard, NAMAS Association and any further requirements specified by the United Kingdom Accreditation Service. Accredited organizations meet the requirements of EN434D1, BS7000/IEC Guide 23 and the relevant requirements of the BS EN ISO 5000 series of standards, including those of the model described in BS EN 1603002 when acting as supplier producing test results.

Accreditation Manager, United Kingdom Accreditation Service

Issued on 12 October 1995

Initial Accreditation 11 June 1997

The Representative of National Institute of Testing has entered into an memorandum of understanding with the United Kingdom Accreditation Service (UKAS) through which UKAS is recognized as the national body responsible for providing National Accreditation of Measurement And Sampling (NAMAS).