

TEST REPORT

FCC Rules Part 95, Part 2

Equipment Under Test : FRS/GMRS TRANSCEIVER

Model No. : LXT-300

Serial No. : -

Applicant : Midland Radio Corporation

Manufacturer : Daxian Telecommunication Ltd.

Date of Test(s) : 2006. 01. 16 ~ 2006. 01.31

Date of Issue : 2006. 02. 02

In the configuration tested, the EUT complied with the standards specified above.

Remarks:

This report details the results of the testing carried out on one sample, the results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.

This report may only be reproduced and distributed in full. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS Testing Korea Co., Ltd. or testing done by SGS Testing Korea Co., Ltd. in connection with distribution or use of the product described in this report must be approved by SGS Testing Korea Co., Ltd. in writing.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

VERIFICATION OF COMPLIANCE

Applicant : Midland Radio Corporation
Kind of Product : FRS / GMRS Transceiver
Brand Name : MIDLAND
Model Name : LXT-300
Model Difference : -
Report File No. : STROR-06-008
Date of test : Jan. 16, 2006 ~ Jan. 31, 2006
Receiver EUT : -

APPLICABLE STANDARDS	
STANDARD	TEST RESULT
FCC RULES Part 95, Part 2	Complied

The above equipment was tested by SGS Testing Korea Co., Ltd. for compliance with the requirements set forth in the FCC Rules Part95, Part2. The results of testing in this report apply to the product system that was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Tested By:



Date

Feb. 02, 2006

Feel Jeong

Approved By



Date

Feb. 02, 2006

Albert Lim

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

INDEX

CONTENTS	Page
1. General Description of EUT	4
2. General Information of EUT	4
3. Test Procedure	5
4. Test Equipment List	9
TEST RESULT	
5. Output Power Conducted	10
6. Radiated Spurious Emissions	11
7. Conducted Spurious Emissions	12
8. Occupied Bandwidth	16
9. Audio Frequency Response	17
10. Audio Low Pass Filter Frequency Response	18
11. Modulation Limited	19
12. Frequency Stability	21
13. The Emission Designator	23
14. Attachment A – Photo of the Test Setup	24
15. Attachment B – Photos of the EUT	25

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

1. General Description of EUT

The Midland Radio Corporation LXT-300 FRS/GMRS Transceiver is a self-contained FRS/GMRS transceiver unit intended for use as a general communication tool. Per the FCC definition: GMRS is a land mobile radio service available to persons for short distance two-way communications to facilitate the activities of licensees and their immediate family members. The LXT-300 model has 22 channels of which channels 1-7 share the FRS channels 1-7.

2. General Information of EUT

Transceiver

ITEM	DESCRIPTION
Manufacturer	Daxian Telecommunication Ltd.
EUT Name	FRS/GMRS Transceiver
Model	LXT-300
FCC ID	MMALXT300
FCC Rule	Part 95
Frequency Range	462.5625 MHz to 467.7125 MHz
Maximum Output Power	1 W GMRS, 0.5 W FRS
Modulation	FM
Emission Type	11K0F3E
Type of Information	Voice
Number of Channels	22 Total (ch 1 - ch 7 and ch 15 – ch 22: GMRS, ch 8 - ch 14 : FRS)
Frequency Tolerance	GMRS : <0.0005 % FRS : <0.0025 %
Antenna Type	Permanently attached
Interface cables	External microphone input
Power Source & Voltage	6VDC via four “AAA” batteries

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3. Test Procedure

The test procedure is performed following the test stands ANSI/EIA-603, if applicable.

3.1 Output Power Conducted (FCC 2.1046)

The conducted RF output power is the available power at the output terminals of the transmitter when the output terminals are corrected to the standard transmitter load. The test sample is feeding a 50 ohm coaxial attenuator which is connected to a spectrum analyzer. The power output at the transmitter antenna port is determined by adding the value of the attenuator to the spectrum analyzer reading. The test are performed at the frequency(middle of the EUT operating band) and full rated power levels of the transmitter.



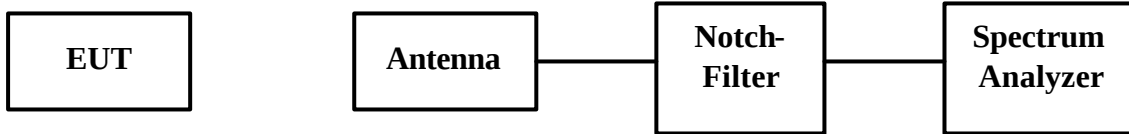
3.2 Effective Radiated Power(FCC 2.1046)

Effective radiated power was measured using the substitution method described in TIA/EIA-603. The unit was placed on an open area test site at a test distance of 3 m. The ERP level is determined using signal substitution and is referenced to the gain of a half-wave dipole. The unit was tested in three orthogonal planes to determine the highest power.

3.3 Radiated Spurious Emissions (FCC 2.1053 and FCC 95.635(b))

The EUT was placed on motorized turntable for radiated testing on a 3meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The Effective Radiated Power (ERP) levels were measured and compared with the limit of FCC 95.635(b). The limit of -13 dBm is derived from the formula of $43+10\text{LOG}(P)$ dB per FCC 95.635(b)(7). Emissions were scanned up to the 10th harmonic of the fundamental. Worst case measurements are reported. The signal substitution method procedure as given in TIA603 was used to obtain ERP levels.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.



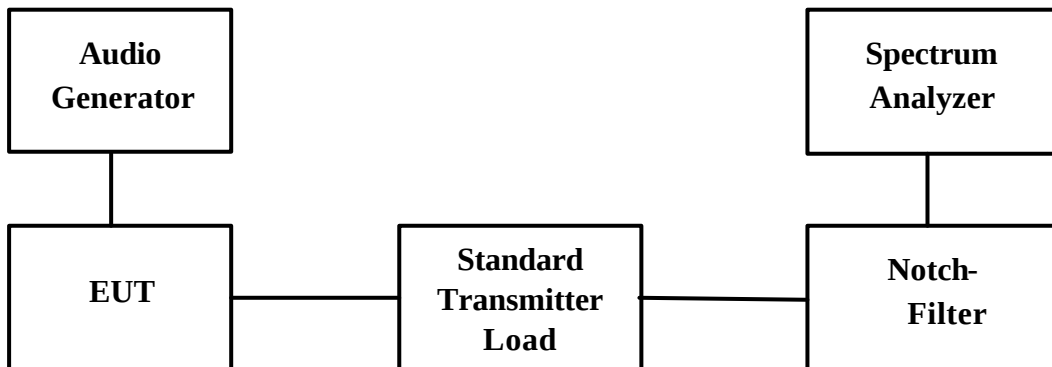
3.4 Conducted Spurious Emissions (FCC 2.1051 , 95.635(b))

The EUT must comply with requirements for spurious emissions at antenna terminals pre the requirements of FCC 95.635(b)(1)(3)(7). All emissions must be suppressed by:

FCC 95.635(b)(1): at least 25dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth,

FCC 95.635(b)(3): at least 35dB on any frequency removed from the center of the authorized bandwidth by more than 100% up to and including 250% of the authorized bandwidth,

FCC 95.635(b)(7): at least $43 + 10\log(T)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%. The unit with the connector in place of the antenna was connected via an attenuator to the input of the spectrum analyzer. The conducted spurious emissions were measured through the 10th harmonic of the fundamental.



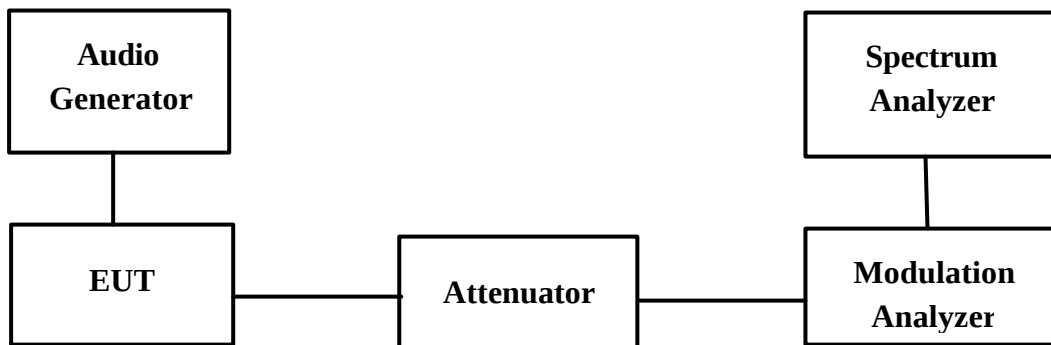
3.5 AC Line Conducted Emissions (FCC Part 15.107)

Not performed. The EUT is battery-powered.

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

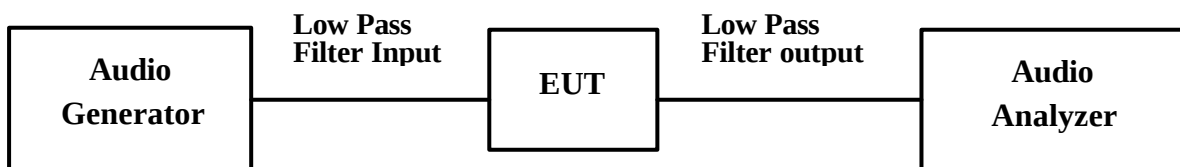
3.4 Audio Frequency Response (FCC 2.1047(a))

The audio frequency response is the degree of closeness to which the frequency deviation of the transmitter follows a prescribed characteristic. The frequency response of the audio modulation part is adjusted to get 20% of the rated system deviation. The deviations obtained over the frequency range from 300 Hz to 6000 Hz are recorded and compared with the reference deviation as follows: Audio Frequency Response = $20\log(\text{DEV Freq} / \text{DEVref})$



3.5 Audio Low Pass Filter Frequency Response (FCC 95.637(a))

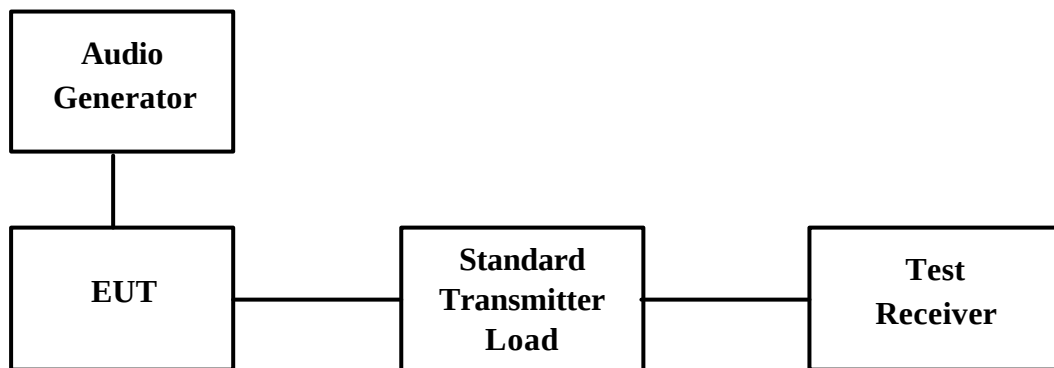
The audio low pass filter response is the frequency response of the post limits low pass filter circuit above 3000Hz. It is measured from 1 kHz(reference point) to 50kHz with test set-up below.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

3.6 Modulation Limiting (FCC 95.637(a))

Modulation limiting is the transmitter circuit's ability to limit the transmitter from producing deviations in excess of rated system deviation. The modulation response is measured at certain modulation frequencies, related to 1000Hz reference signal. The basic setting is 60% of full rated deviation which will be increased the audio generator level from -20 dB to 20 dB in nine steps. Tests are performed for positive and negative modulation.



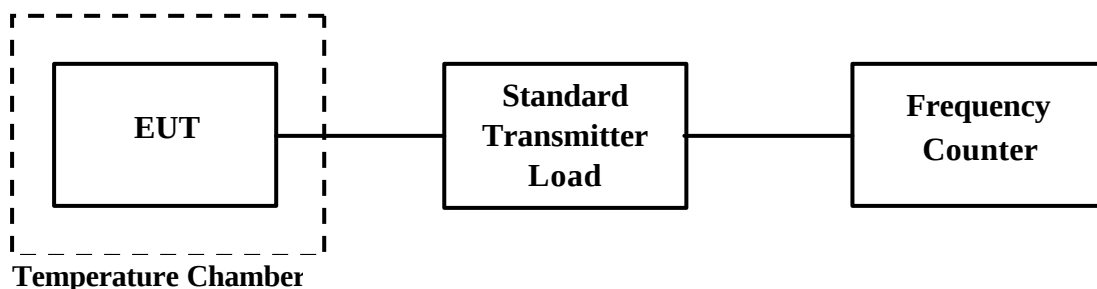
3.7 Occupied Bandwidth (FCC 2.1049)

The occupied bandwidth, that is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers radiated are each equal to 0.5 percent of the total mean power radiated by a given emission. The transmitter is modulated by a 2500 Hz tone at an input level 16 dB greater than that necessary to produce 50 percent modulation. The input level shall be established at the frequency of maximum response of the audio modulating circuit.

3.8 Frequency stability (FCC 2.1055, FCC 95.621(b))

The carrier frequency is the stability of the transmitter to maintain an assigned carrier frequency.

The frequency stability is measured with variation of ambient temperature from -30 to +50 °C.



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

4. Test Equipment List

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Spectrum Analyzer	Agilent	8565E	Dec. 2006
Spectrum Analyzer	Agilent	E4440A	May 2006
Signal Generator	Agilent	E4438C	May 2006
Signal Generator	Agilent	8648D	May 2006
Power Meter	Agilent	E4416A	May 2006
Attenuator	Agilent	8498A	Jun. 2006
Power Sensor	Agilent	E9327A	May 2006
DC Power Supply	Agilent	6674A	May 2006
Modulation Analyzer	Agilent	8901B	Dec. 2006
Audio Analyzer	Agilent	8903B	Dec. 2006
Function Generator	Agilent	33220A	May 2006
Frequency Counter	Anritsu	MF2414B	Dec. 2006
Dipole Antenna	Schwarzbeck Mess	UHAP	May 2006
Oscilloscope	Tektronix	TDS30548	May 2006
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2006
Horn Antenna	Schwarzbeck	BBHA9120A	Jul. 2006
Biconical Antenna	Schwarzbeck	VHA9103	Mar. 2006
Log-periodic	S/B	UHALP9107	Jun. 2006
Tunable Notch Filter	Wainwright Instrument GmbH	WRCA400/500 0.01/40-6SSK	May 2006
Temperature Chamber	Han-Gil Technique	HGTP-4050	Nov. 2006
Anechoic Chamber	Seo Young EMC	-	-

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

TEST RESULT

5. RF Power Output FCC 2.1046

5.1 Conducted Output Power

Channel 17 @ 462.6000 MHz (GMRS)

Channel 8 @ 467.5625 MHz (FRS)

Channel and/or Frequency	Measured Level (dBm)	Measured Level (Watts)	Rated (Watts)	Limit (Watts)	Pass/Fail
Channel17-462.6000 MHz (GMRS)	28.58	0.72	1.0	50	Pass
Channel 8-467.5625 MHz (FRS)	26.13	0.41	0.5	0.5	Pass

5.2 Effective Radiated Power

Channel 17 @ 462.6000 MHz (GMRS)

Channel 8 @ 467.5625 MHz (FRS)

Frequency (MHz)	Ant. Pol. (H/V)	S.P.A. Reading (dBuV)	Amp (dBm)	S.G Power Level (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	E. R. P.	
							dBm	mW
462.6000	V	103.35	28.8	9.1	-10.48	0.1	27.32	540
467.5625	V	100.59	28.6	6.4	-10.50	0.1	24.40	275

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

6. Radiated Spurious Emissions FCC 2.1053(a), FCC 95.635(b)

Channel 17 @ 462.6000 MHz (GMRS)

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
925.2000	V	-26.4	-13	13.3
1387.8000	V	< -30	-13	>17
1850.4000	H	-20.6	-13	7.6
2313.0000	H	< -30	-13	>17
2775.6000	H	-16.8	-13	3.8
3238.2000	H	-17.5	-13	4.5
3700.8000	H	< -30	-13	>17
4163.4000	-	-	-13	-
4626.0000	-	-	-13	-

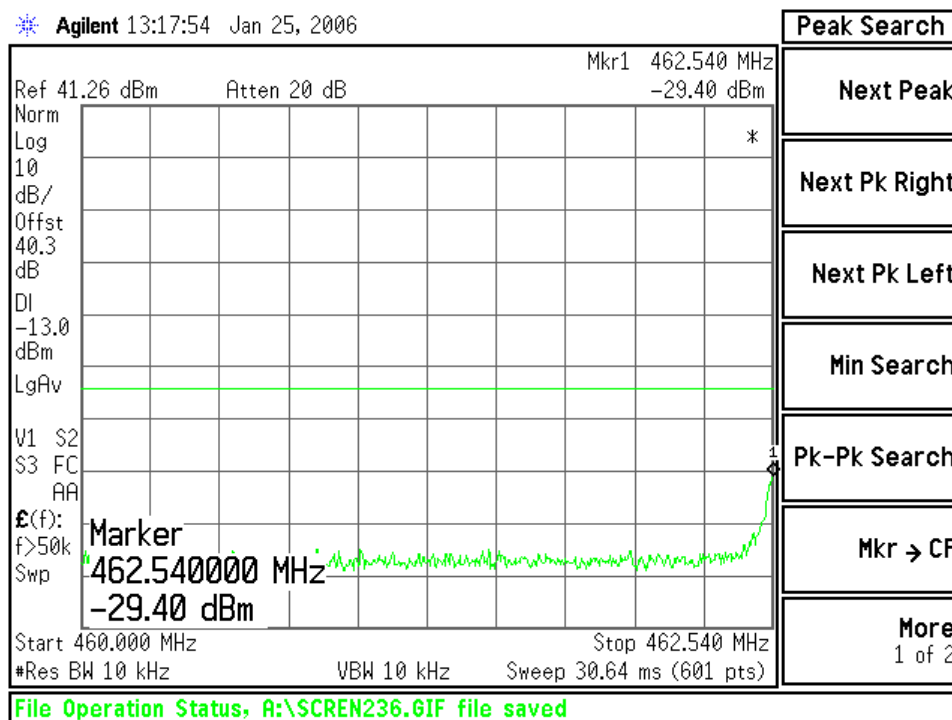
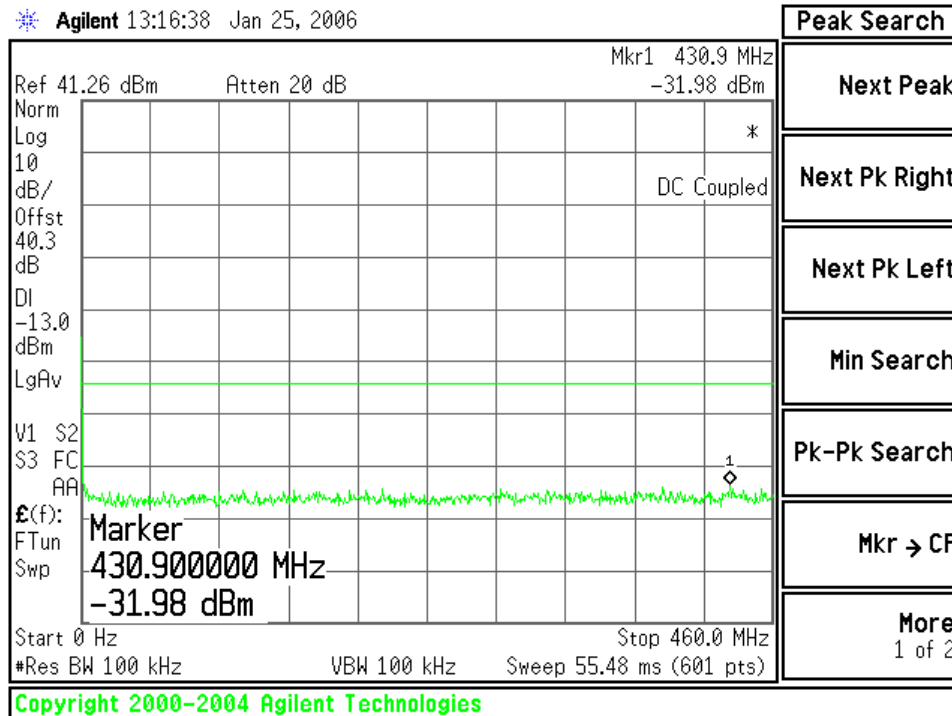
Channel 8 @ 467.5625 MHz (FRS)

Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
935.1250	V	-26.5	-13	13.5
1402.6875	V	-25.7	-13	12.7
1870.2500	H	<-30	-13	>17
2337.8125	H	-21.3	-13	8.5
2805.3750	H	-18.2	-13	5.2
3272.9375	V	-21.7	-13	8.7
3740.5000	H	<-30	-13	>17
4208.0625	H	<-30	-13	>17
4675.6250	H	-26.4	-13	13.4

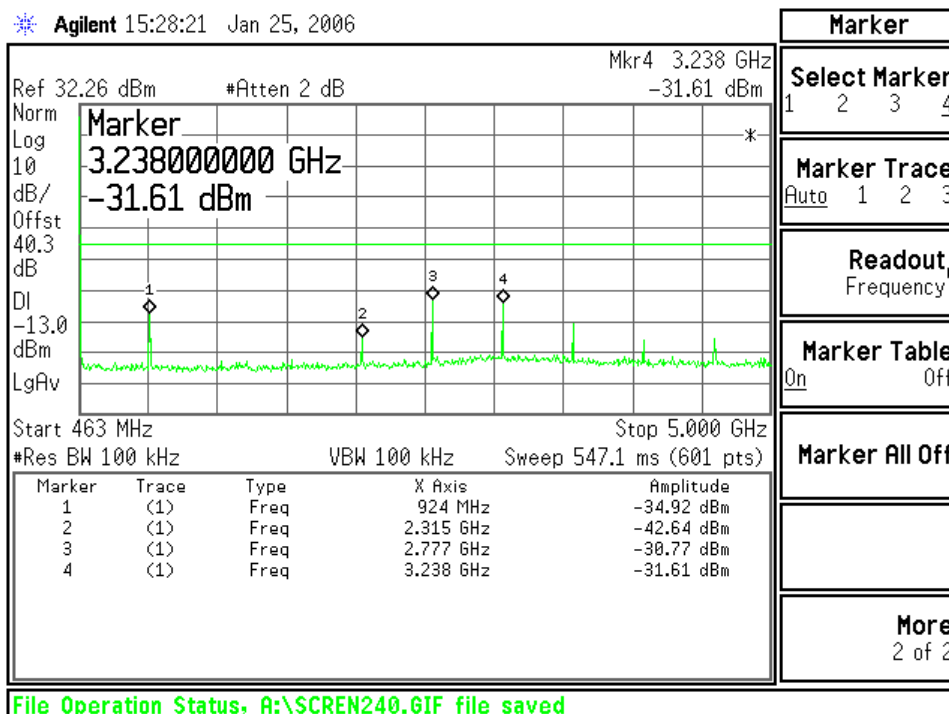
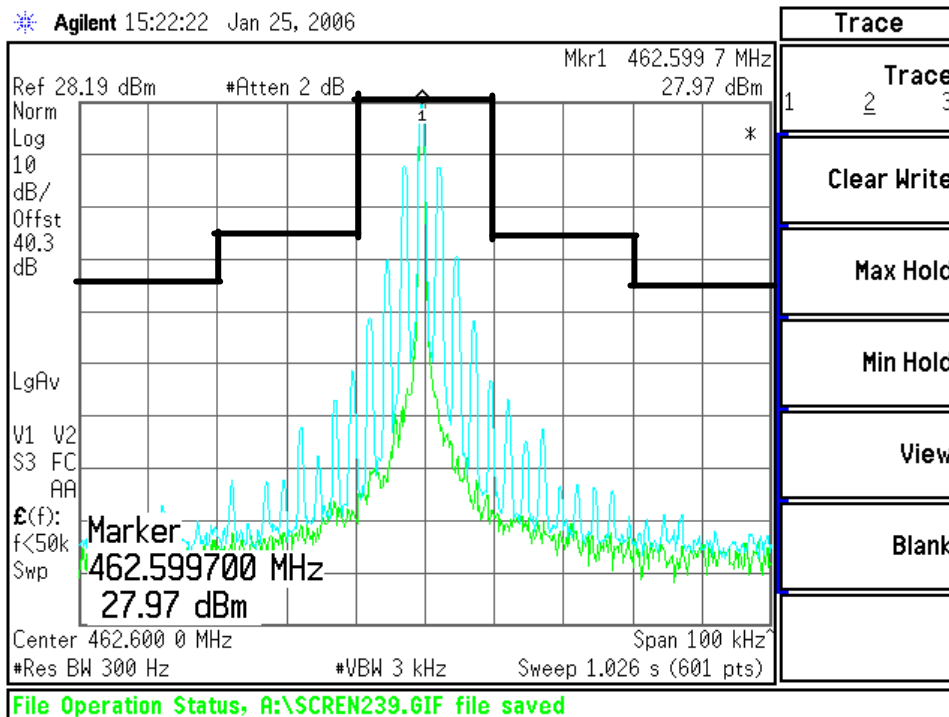
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

7. Conducted Spurious Emissions FCC 2.1051, FCC 95.635(b)

GMRS Mode



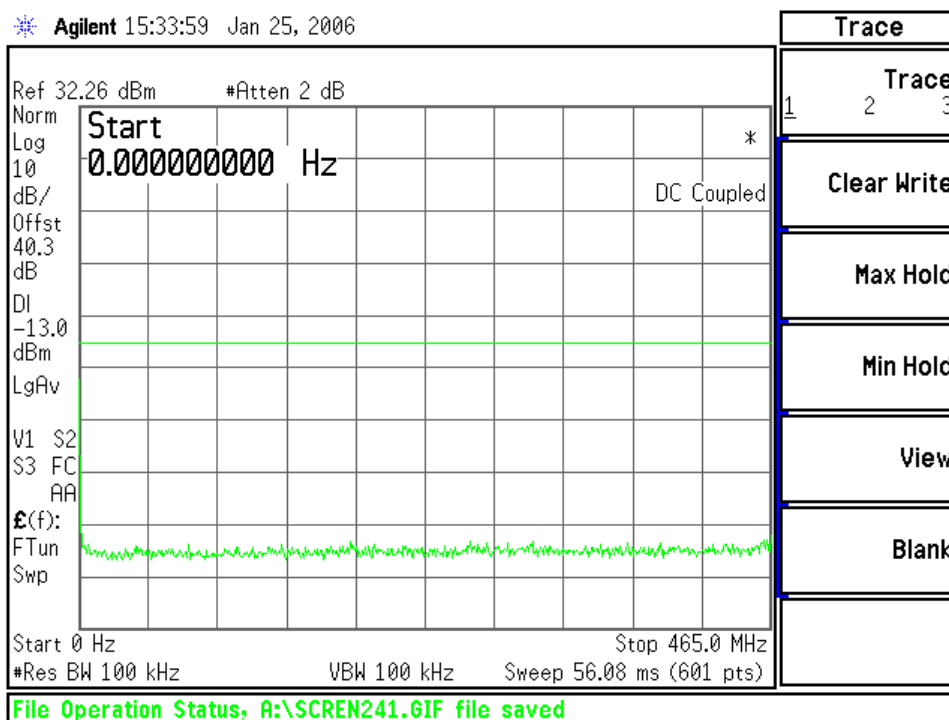
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.



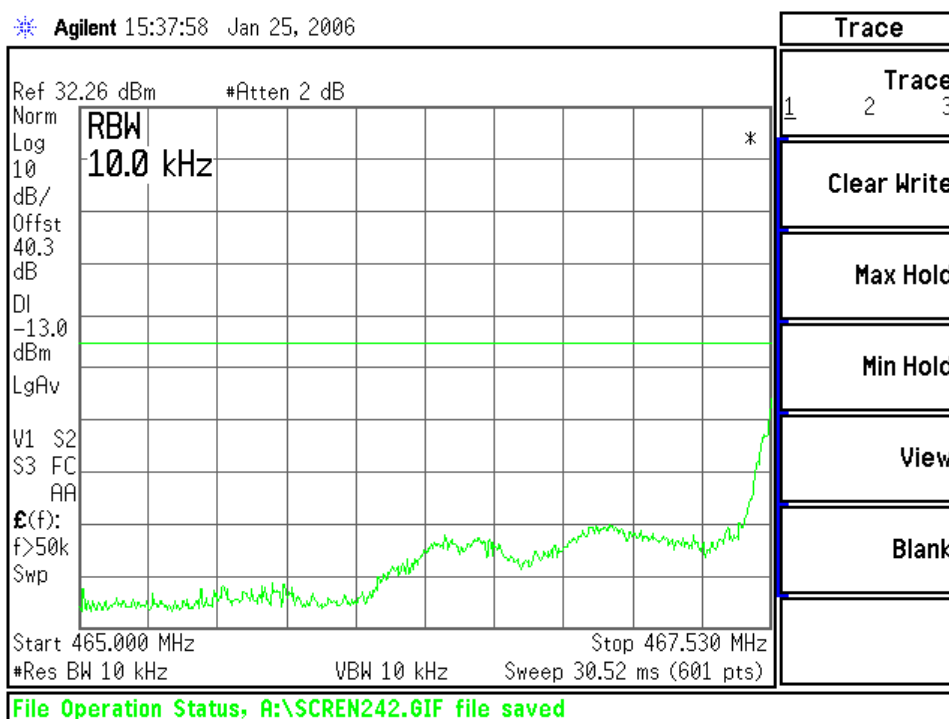
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

FRS Mode

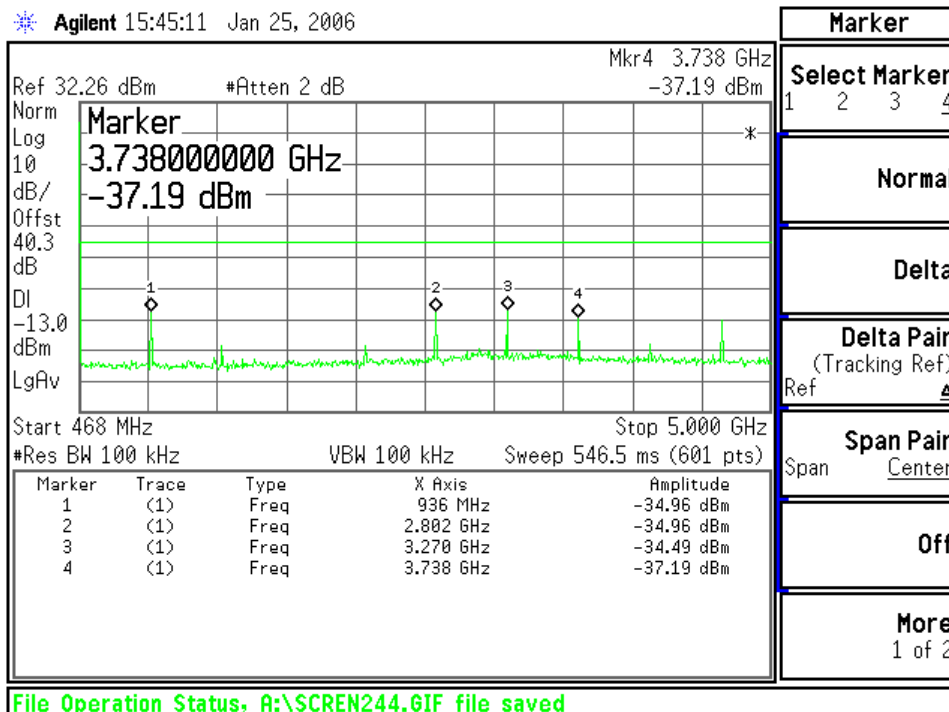
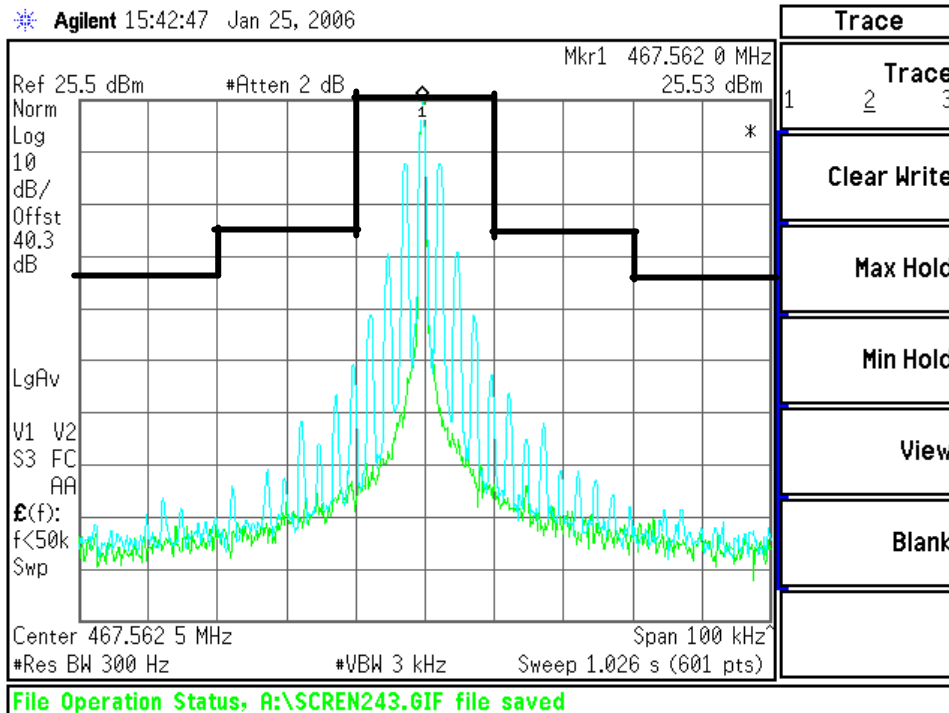
Agilent 15:33:59 Jan 25, 2006



Agilent 15:37:58 Jan 25, 2006



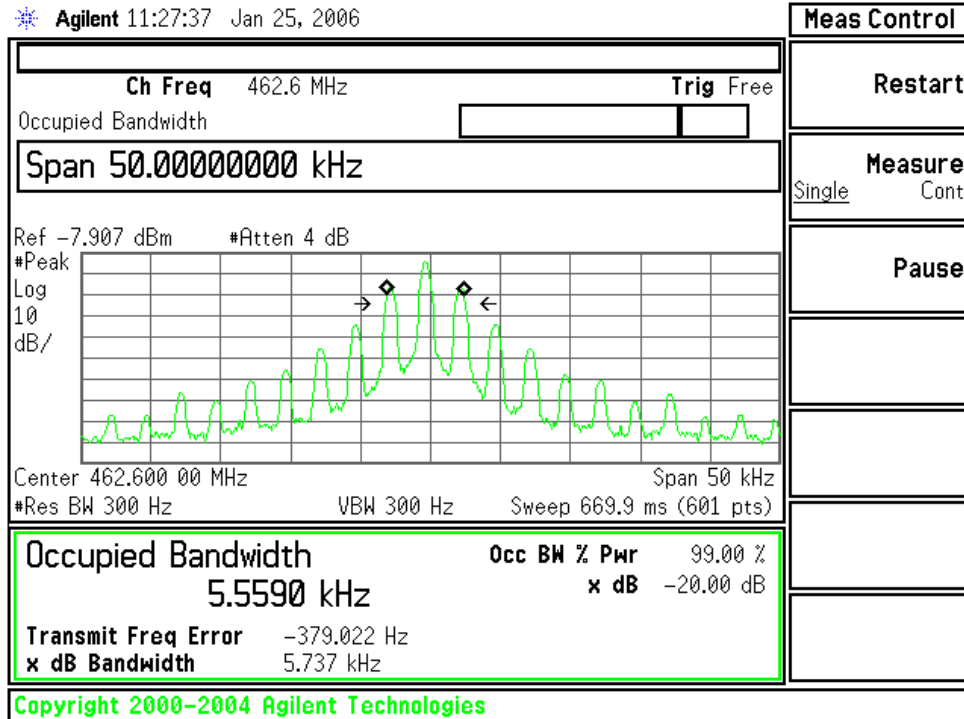
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.



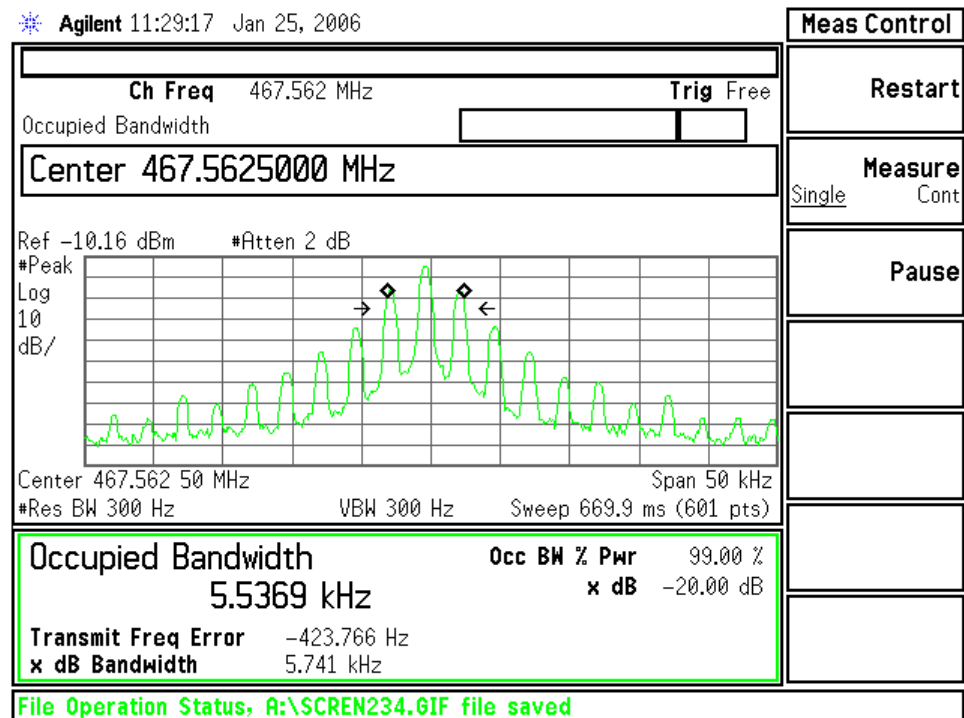
The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

8. Occupied Bandwidth FCC 2.1049

GMRS Mode



FRS Mode



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

9. Audio Frequency Response FCC 2.1.047(a)

Channel 8 @ 467.5625 MHz (FRS)

Audio frequency [Hz]	FRS	
	Measured Deviation [kHz]	Calculated Response [dB]
300	0.16	-9.74
400	0.23	-6.74
500	0.28	-5.07
600	0.33	-3.56
700	0.37	-2.64
1000	0.50	0.00
1250	0.55	0.83
2000	0.65	2.23
2250	0.66	2.46
2750	0.55	0.76
3000	0.53	0.49
4000	0.37	-2.62
5000	0.26	-5.55
6000	0.23	-6.78

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

10. Audio Low Pass Filter Frequency Response FCC 2.1047(a), FCC 95.637(b)

Channel 17 @ 462.6000 MHz (GMRS)

Audio frequency [Hz]	GMRS
	Response [dB]
1000	0.00
1250	0.79
2000	0.96
2250	0.01
2500	-1.03
2750	-2.38
3000	-3.78
4000	-9.79
5000	-15.64
6000	-20.38
7000	-24.32
8000	-28.67
9000	-31.97
10000	-35.21
15000	-46.30
20000	-61.10

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

11. Modulation Limiting FCC 2.1047(b), FCC 95.637(a)

Channel 17 @ 462.6000 MHz (GMRS)

Channel 8 @ 467.5625 MHz (FRS)

Modulation Frequency [Hz]	GMRS	FRS
	Response [dB]	Response [dB]
100	0.35	0.34
150	0.66	0.64
200	1.88	1.87
250	2.05	2.02
300	2.25	2.24
400	2.27	2.21
500	2.17	2.15
700	1.90	1.92
750	1.85	1.82
1000	1.63	1.67
1100	1.58	1.54
1200	1.52	1.51
1300	1.48	1.46
1400	1.44	1.42
1500	1.40	1.40
1600	1.38	1.38
1700	1.35	1.30
1800	1.33	1.32
1900	1.32	1.31
2000	1.34	1.33
2100	1.30	1.30
2200	1.32	1.31
2300	1.31	1.30
2400	1.30	1.29
2500	1.21	1.20
2600	1.20	1.19
2700	1.24	1.24
2800	1.23	1.22
2900	1.24	1.21
3000	1.20	1.18
3100	1.21	1.20
3200	1.20	1.19
3300	1.20	1.17
3400	1.21	1.20
3500	1.20	1.19
4000	1.01	1.00
4500	1.00	1.02
5000	1.01	1.00

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Channel 8 @ 467.5625 MHz (FRS)

Audio input level Relative[dB]	Positive peak deviation [kHz]			Negative peak deviation [kHz]		
	300 Hz	1500 Hz	2500 Hz	300 Hz	1500 0Hz	2500 Hz
-20	0.08	0.30	0.30	0.07	0.32	0.29
-15	0.09	0.51	0.51	0.07	0.52	0.50
-10	0.13	0.86	0.84	0.12	0.84	0.84
-5	0.19	1.31	1.25	0.18	1.30	1.24
0	0.31	1.44	1.26	0.31	1.43	1.25
5	0.51	1.44	1.26	0.53	1.43	1.25
10	0.88	1.45	1.26	0.89	1.44	1.25
15	1.21	1.45	1.26	1.20	1.44	1.25
20	1.83	1.45	1.26	1.82	1.44	1.26

Limits:

Channel spacing [kHz]	Rated frequency deviation [kHz]
12,5	2.5
25.0	5.0

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

12. Frequency Stability FCC2.1055, FCC 95.621(b), FCC 95.627(b)

Channel 17 @ 462600000 Hz(GMRS)

Voltage [%]	Voltage [V]	Temperature [deg C]	Measured Frequency [Hz]	Frequency Error [Hz]
100	6	-30	462599619	381
100	6	-20	462600115	-115
100	6	-10	462600363	-363
100	6	0	462600535	-535
100	6	10	462600385	-385
100	6	20	462599805	195
100	6	30	462599702	298
100	6	40	462599507	493
100	6	50	462599520	480
85	5.1	20	462599700	300
115	6.9	20	462599735	265
Battery End Point	2.7	20	462600162	-162

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

Channel 8 @ 467562500 Hz (FRS)

Voltage [%]	Voltage [V]	Temperature [deg C]	Measured Frequency [Hz]	Frequency Error [Hz]
100	6	-30	467562203	297
100	6	-20	467562202	298
100	6	-10	467562779	-279
100	6	0	467563039	-539
100	6	10	467562929	-429
100	6	20	467562164	336
100	6	30	467562225	275
100	6	40	467562009	491
100	6	50	467562019	481
85	5.1	20	467562149	351
115	6.9	20	467562190	310
Battery End Point	2.7	20	467562640	-140

Limits:

Frequency error	Limit	Hz
GMRS	0.0005 %	2313
FRS	0.00025 %	1169

The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.

13. The Emission Designator

The emission designator is determined from the necessary bandwidth, the type of modulation and the information conveyed in the signal.

For the subject unit, the following Emission Designator has been determined according to Section 2.201 of the FCC Rules.

- First Symbol, type of modulation of the main carrier: F-Frequency Modulation
- Second Symbol, nature of signal(s) modulating the main carrier: 3
- Third Symbol, type of information to be transmitted: E

The necessary bandwidth, B_n, is calculated as:

$$B_n = 2M + 2DK$$

$$M = 3000$$

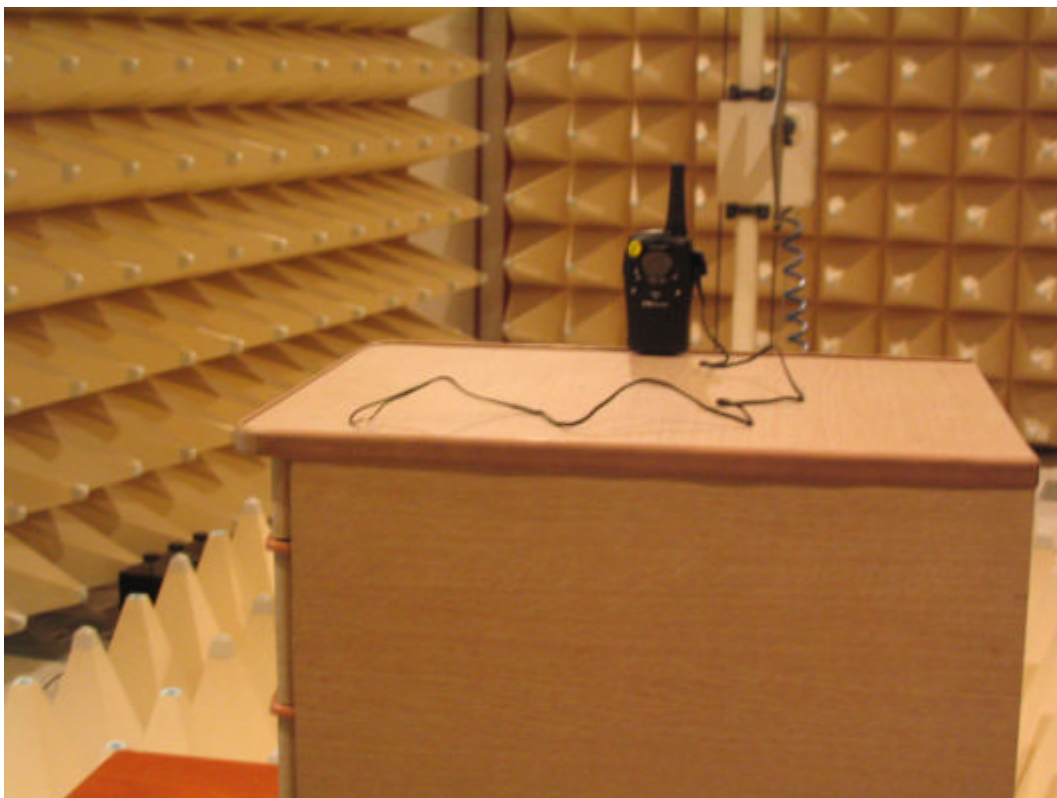
$$D = 2.5$$

$$K=1$$

$$B_n = (2 \times 3000) + (2 \times 2500) = 11k$$

Hence, the emission designator is: 11K0F3E

14. Attachment A – Photo of the test setup



The results shown in this test report refer only to the sample(s) tested unless otherwise stated. This test report cannot be reproduced, except in full, without prior written permission of the Company.