TEST REPORT

OF

FCC Part 95, Part 2

FCC ID : RXUSG9000

Equipment Under Test	:	FRS/GMRS TRANSCEIVER
Model No.	:	SG9000
Serial No.	:	N/A
Applicant	:	MAXON CIC Corp.
Manufacturer	:	MAXON CIC Corp.
Date of Test(s)	:	2007-09-03 ~ 2007-09-19
Date of Issue	:	2007-09-21

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

Tested By:  **Date** **2007-09-21**

Feel Jeong

Approved By  **Date** **2007-09-21**

Denny Ham

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1. General Information

1-1. Testing Laboratory

SGS Testing Korea Co., Ltd.
Wireless Div. 2FL, 18-34, Sanbon-dong, Gunpo-si, Gyeonggi-do, Korea 435-040
www.electrolab.kr.sgs.com
Telephone : +82 +31 428 5700
FAX : +82 +31 427 2371

1-2. Details of Applicant

Applicant : MAXON CIC Corp.

Address : Chongho Bldg, #7-61, Yangjae-Dong, Seocho-Gu, Seoul, Korea

Contact Person : Philip Son
Phone No. : 82-2-3498-3185
Fax No. : 82-2-3498-3113

1-3 Description of EUT

Kind of Product	FRS/GMRS Transceiver
Model Name	SG9000
Serial Number	N/A
Power Supply	DC 7.4 V
Frequency Range	462.5625 MHz to 467.7125 MHz
Transmit Power	0.5 W/2 W/ 5 W GMRS, 0.5 W FRS
Modulation Technique	FM
Number of Channels	22 Total (7 FRS/GMRS, 7 FRS Only, 8GMRS Only)
Operating Conditions	-30 ~ 60 deg C
Antenna Type	Permanently attached

1-4 Details of modification

- N/A

1-5. Test Equipment List

EQUIPMENT	MANUFACTURER	MODEL	CAL DUE.
Signal Generator	Agilent	E4438C	May 2008
Spectrum Analyzer	Agilent	E4440A	May 2008
Audio Analyzer	H.P.	8903B	Dec.2007
Modulation Analyzer	H.P.	8901B	Dec.2007
DC Power Supply	Agilent	6674A	May 2008
Tem/Hum Chamber	Han-Gil	HGTP-4050	Oct. 2007
Power Sensor	Agilent	E9327A	May 2008
Power Meter	Agilent	4416A	May 2008
Attenuator	Weincshel	AZ3096	Dec.2007
Preamplifier	Agilent	8449B	May 2008
Preamplifier	Agilent	8447F	Jun.2008
Log-periodic	Rohde & Schwarz	UHALP9107	Jan.2008
Biconical Antenna	Schwarzbeck	VHA9103	Mar.2008
Horn Antenna	Rohde & Schwarz	HF906	Mar.2008
Test Receiver	R&S	ESIB 26	Apr.2008
Signal Generator	R&S	SMR 20	Dec.2007
Horn Antenna	R&S	HF906	Aug.2008
Ultra Broadband Antenna	R&S	HL562	Sep.2009
Turn Table	INN-CO	CT 0800	N.C.R
Antenna Mast	INN-CO	MA 2000	N.C.R
Turn Device	INN-CO	FSM 230-M	N.C.R
Controller	INN-CO	CO 2000	N.C.R
Anechoic Chamber	SY Corporation	10m x 5m x 5m	Feb. 2008

1.6 Summary of Test Results

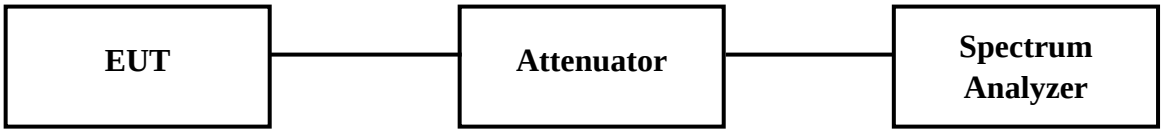
Description of Test	FCC Rule	Result
RF Power Output	FCC 2.1046	Complied
Radiated Spurious Emissions	FCC 2.1053(a), FCC 95.635(b)	Complied
Conducted Spurious Emissions	FCC 2.1051, FCC 95.635(b)	Complied
Occupied Bandwidth	FCC 2.1049	Complied
Audio Frequency Response	FCC 2.1.047(a)	Complied
Audio Low Pass Filter Frequency Response	FCC 2.1047(a), FCC 95.637(b)	Complied
Modulation Limiting	FCC 2.1047(b), FCC 95.637(a)	Complied
Frequency Stability	FCC2.1055,FCC95.621(b), FCC 95.627(b)	Complied

2. Test Procedure

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

2.1 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.

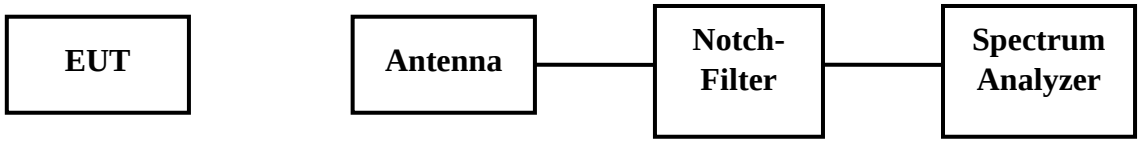


2.2 Effective Radiated Power (FCC 2.1046)

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.

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

The EUT was placed on motorized turntable for radiated testing on a 3-meter 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+10LOG(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.



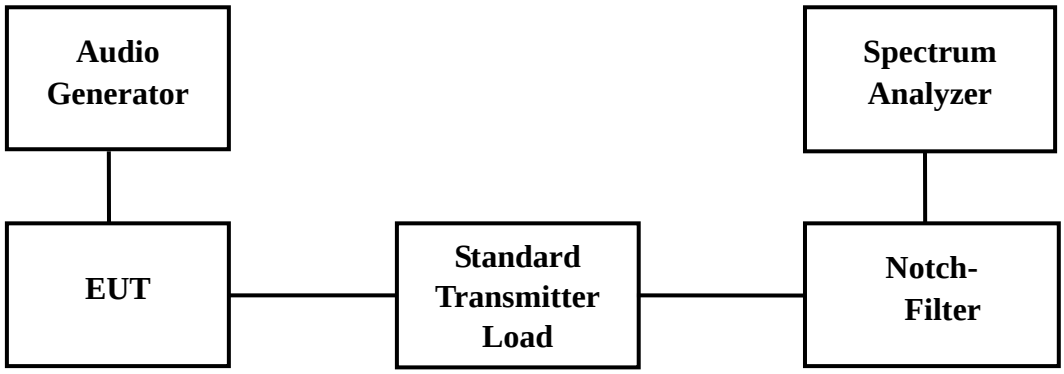
2.4 Conducted Spurious Emissions (FCC 2.1051 , 95.635(b))

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 + 10Log(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.

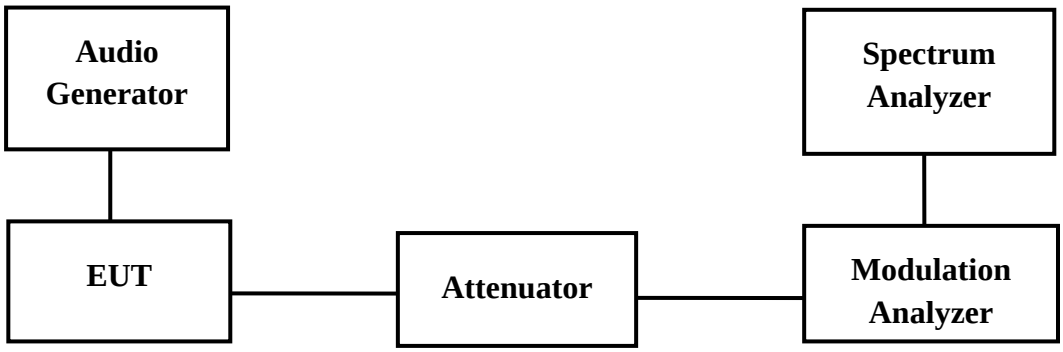


2.5 AC Line Conducted Emissions (FCC Part 15.107)

Not performed. The EUT is battery-powered.

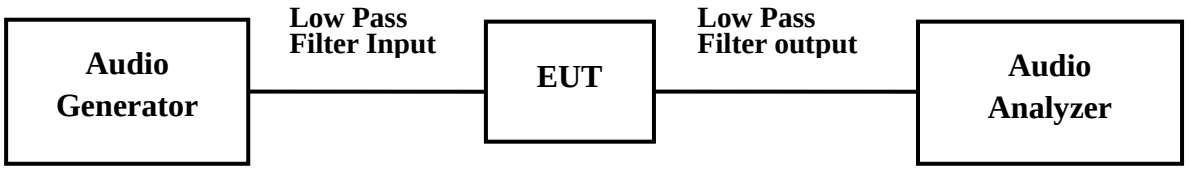
2.6 Audio Frequency Response (FCC 2.1047(a))

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=20log(DEV Freq / DEVref)



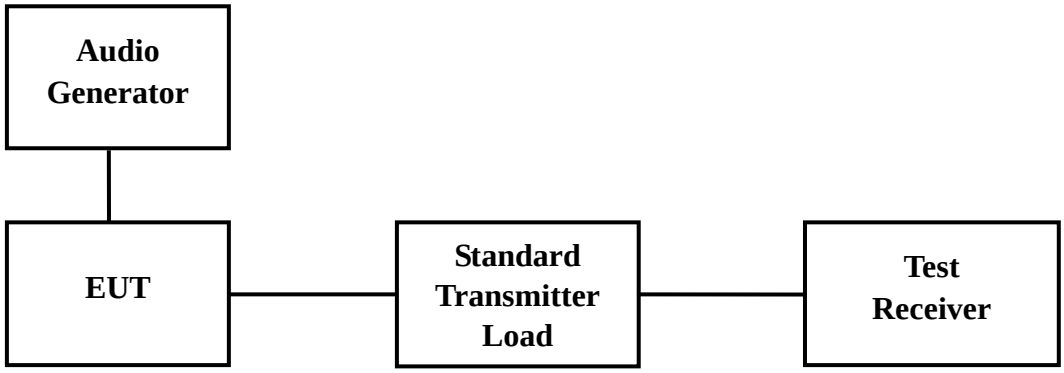
2.7 Audio Low Pass Filter Frequency Response (FCC 95.637(a))

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



2.8 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 perform for positive and negative modulation.

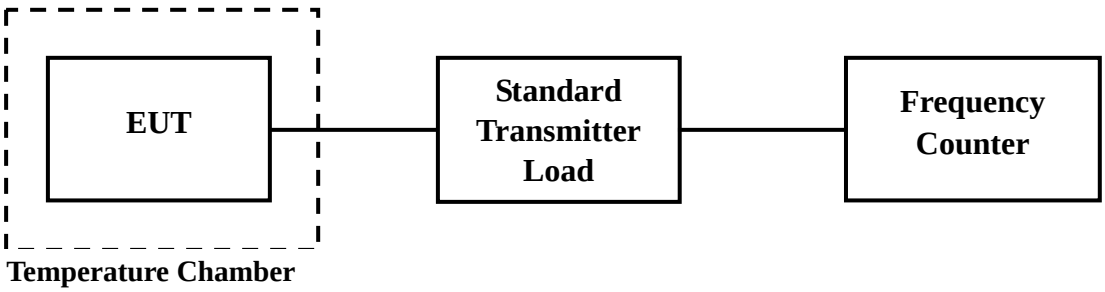


2.9 Occupied Bandwidth (FCC 2.1049)

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.

2.10 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℃.



TEST RESULT

3. RF Power Output FCC 2.1046

3.1 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)	22.67	0.185	0.5	50	Pass
Channel17-462.6000 MHz (GMRS)	30.33	1.08	2.0	50	Pass
Channel17-462.6000 MHz (GMRS)	33.01	2.00	5.0	50	Pass
Channel 8-467.5625 MHz (FRS)	21.40	0.138	0.5	0.5	Pass

3.2 Effective Radiated Power

Channel 17 @ 462.6000 MHz (GMRS)

Channel 8 @ 467.5625 MHz (FRS)

Frequency (MHz)	Ant. Pol. (H/V)	Amp (dBm)	S.G Power Level (dBm)	Antenna Gain (dB/dBi)	Cable Loss (dB)	E. R. P.	
						dBm	mW
462.6000	V	25.23	19.9	-10.48	0.1	34.55	2581
462.6000	V	25.23	16.88	-10.48	0.1	31.53	1422
462.6000	V	25.23	9.42	-10.48	0.1	24.07	255
467.5625	V	25.23	8.32	-10.50	0.1	22.95	197

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

Channel 17 @ 462.6000 MHz (GMRS)_5 W

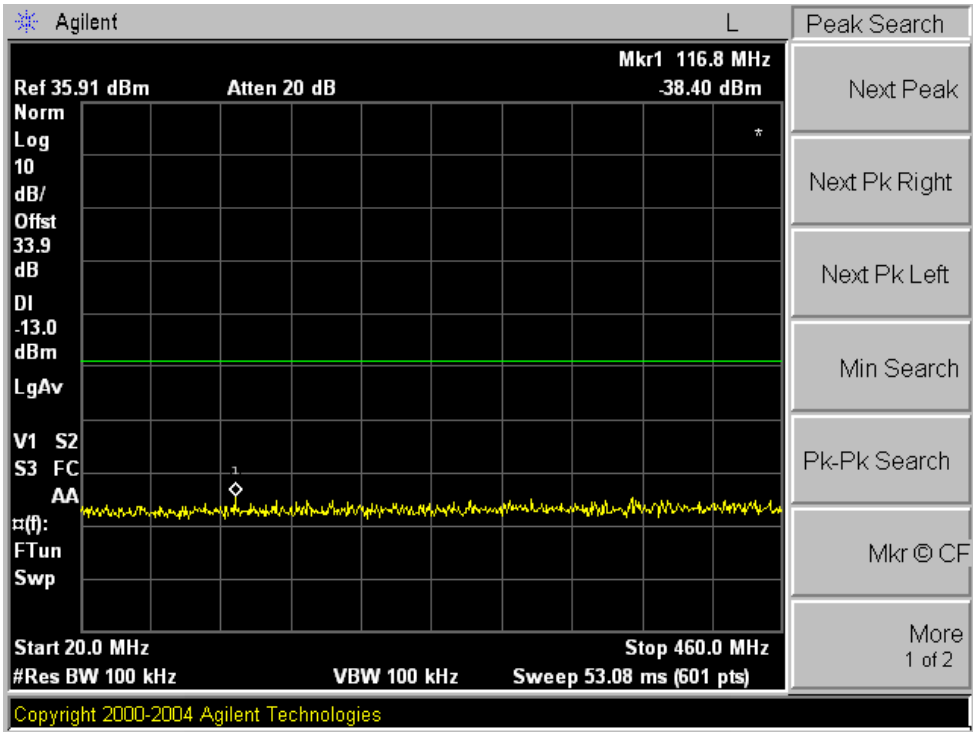
Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
925.2000	V	-15.11	-13	2.11
1387.8000	V	-27.90	-13	14.90
1850.4000	V	<-30	-13	>17
2313.0000	H	-21.53	-13	8.53
2775.6000	V	<-30	-13	>17
3238.2000	H	<-30	-13	>17
3700.8000	V	<-30	-13	>17
4163.4000	V	<-30	-13	>17
4626.0000	V	<-30	-13	>17

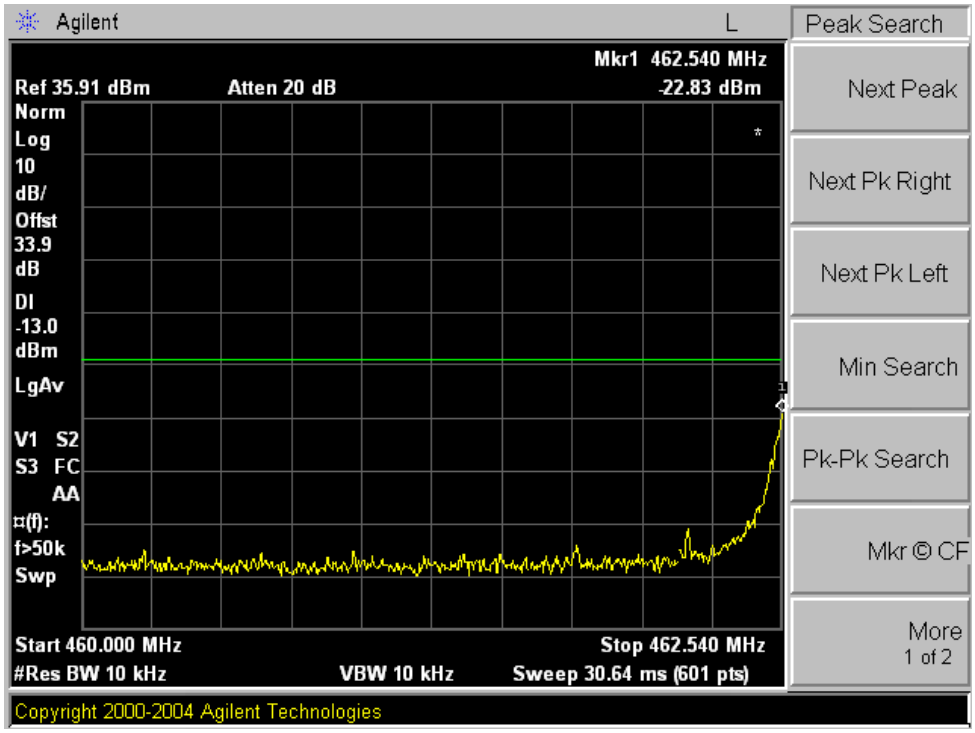
Channel 8 @ 467.5625 MHz (FRS)

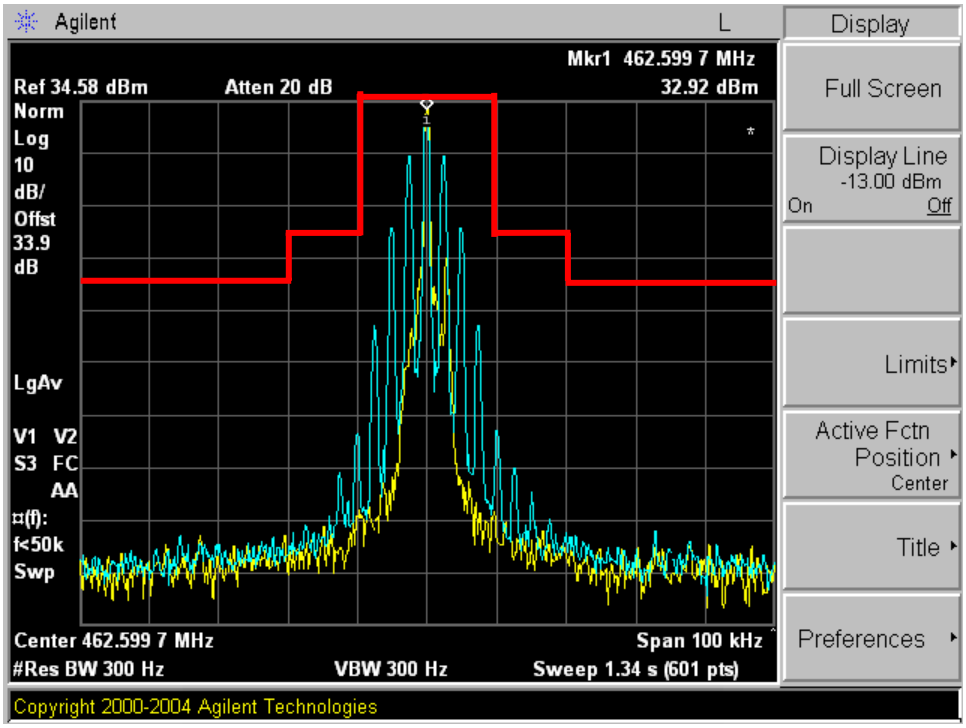
Frequency [MHz]	Polarization	Max. Power Value [dBm]	Specification Limit [dBm]	Margin [dB]
935.1250	V	-17.90	-13	4.9
1402.6875	V	<-30	-13	>17
1870.2500	V	<-30	-13	>17
2337.8125	V	<-30	-13	>17
2805.3750	V	<-30	-13	>17
3272.9375	V	<-30	-13	>17
3740.5000	V	<-30	-13	>17
4208.0625	V	<-30	-13	>17
4675.6250	V	<-30	-13	>17

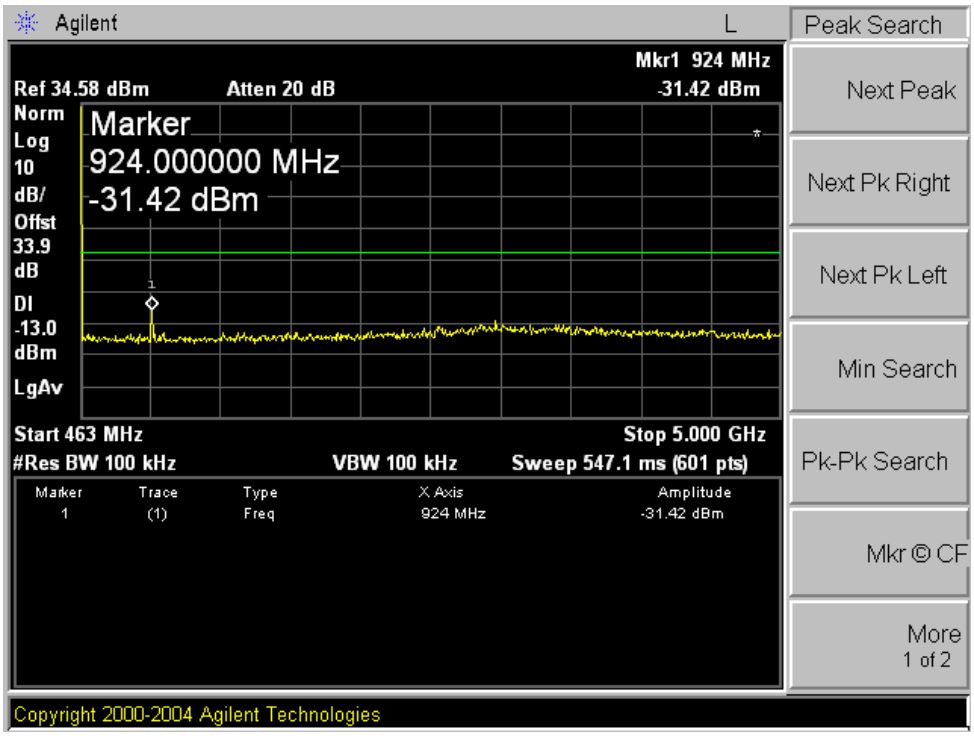
5. Conducted Spurious Emissions FCC 2.1051, FCC 95.635(b)

GMRS Mode_5 W

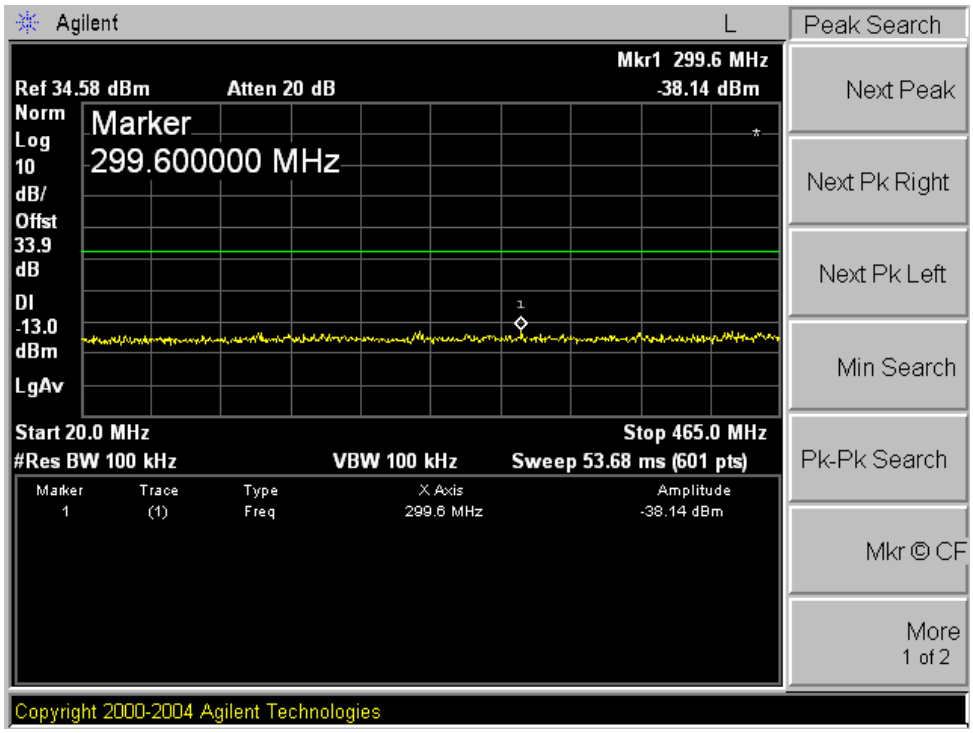


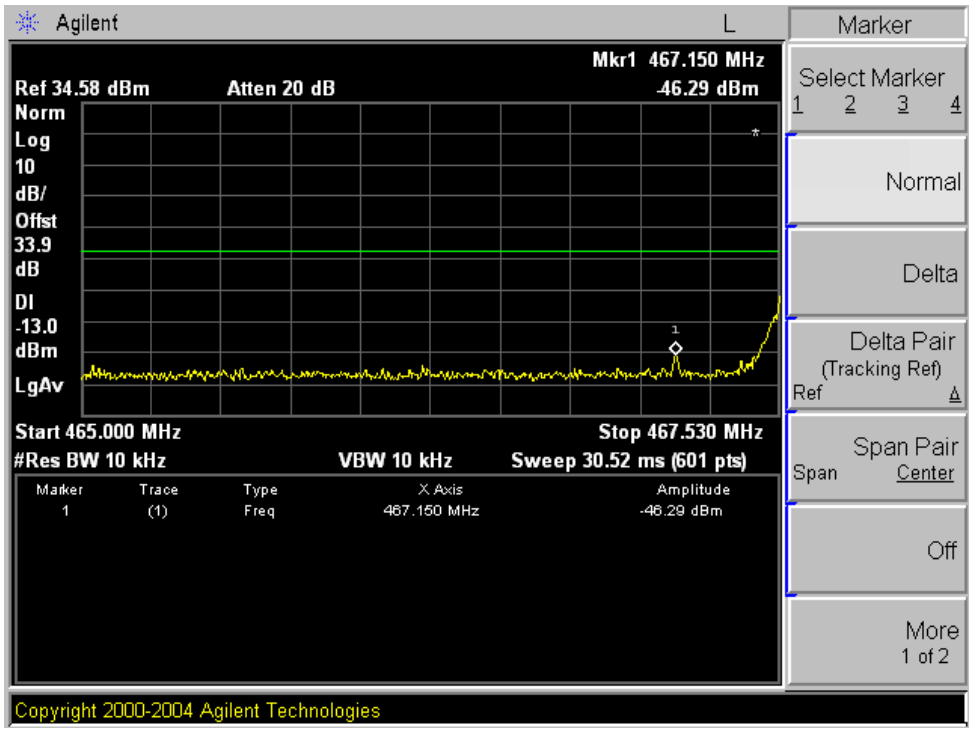


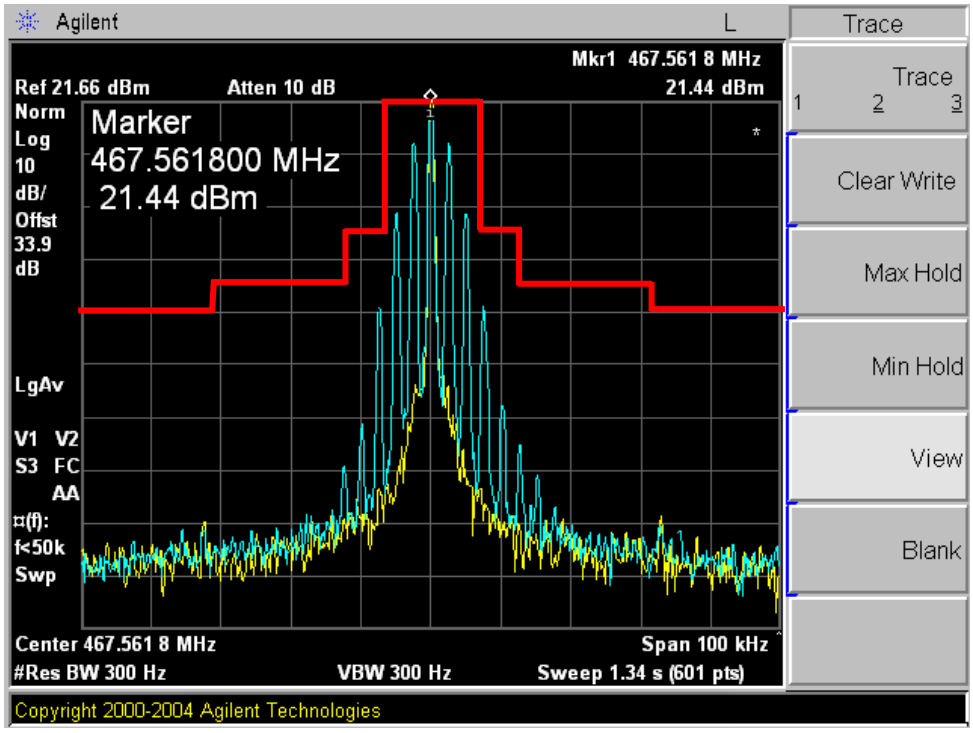


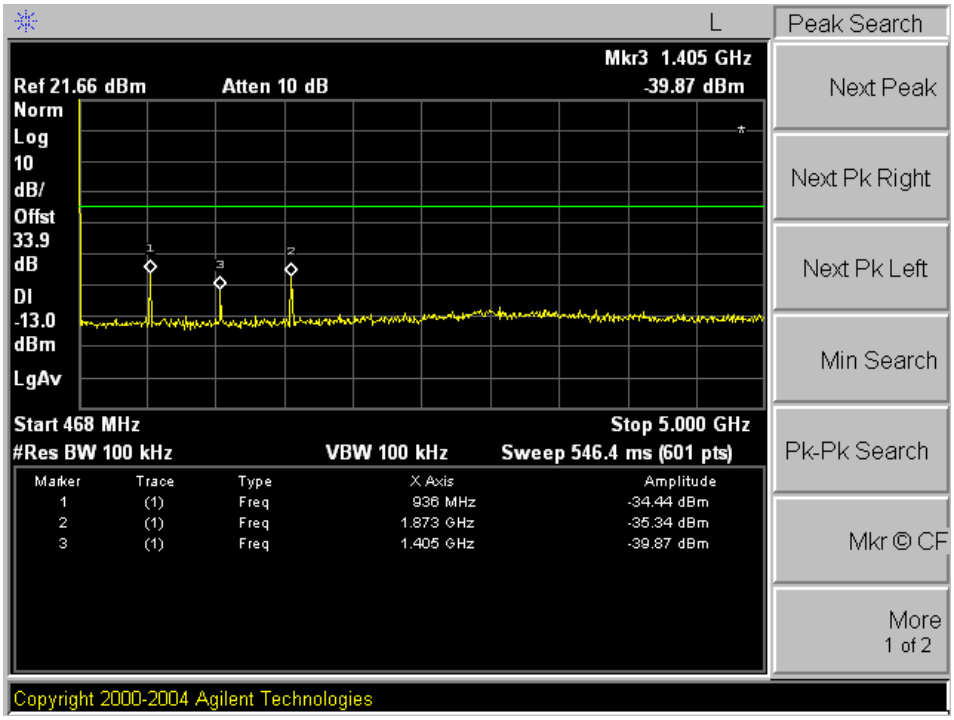


FRS Mode



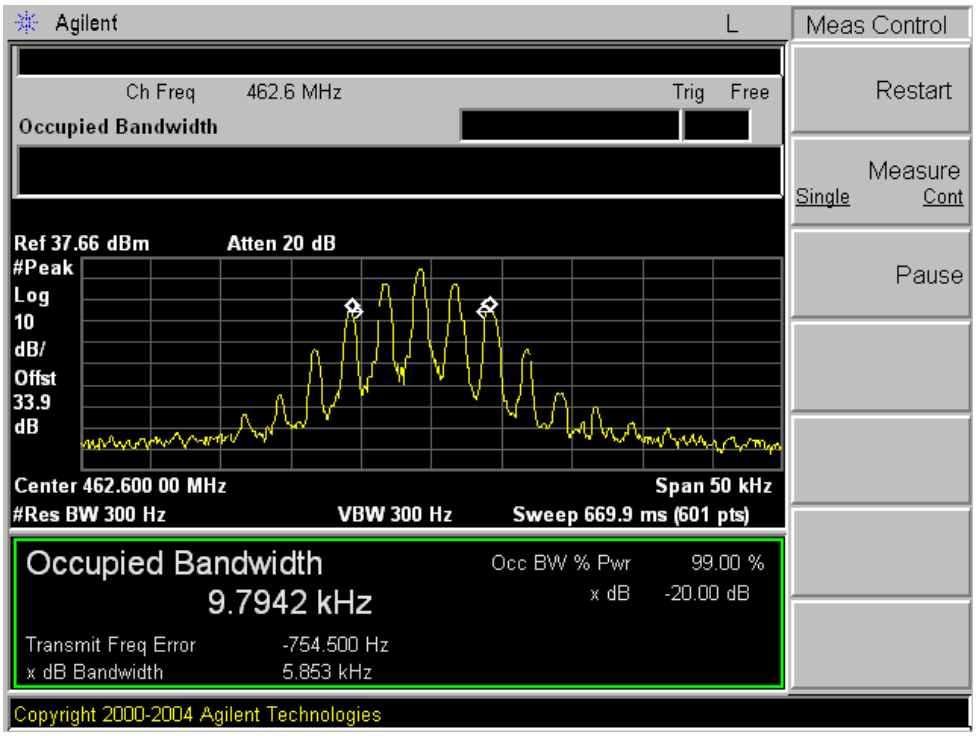




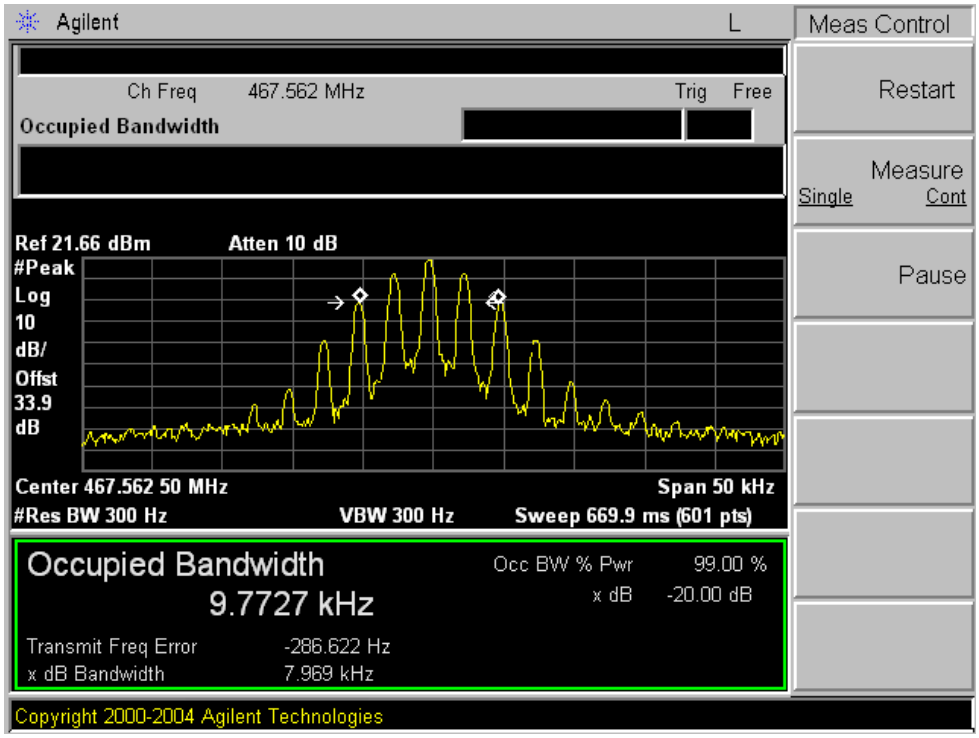


6. Occupied Bandwidth FCC 2.1049

GMRS Mode_5 W



FRS Mode



7. 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	0.10	-13.98
400	0.17	-9.37
500	0.24	-6.38
600	0.29	-4.73
700	0.35	-3.10
1000	0.50	0.00
1250	0.58	1.29
2000	0.76	3.64
2250	0.82	4.30
2750	0.92	5.30
3000	0.92	5.30
4000	0.49	-0.18
5000	0.26	-5.68
6000	0.17	-9.37

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

Channel 17 @ 462.6000 MHz (GMRS)_5W

Audio frequency [Hz]	GMRS Response [dB]
1000	0
2000	-1.77
3000	-3.53
4000	-12.53
5000	-21.23
6000	-28.50
7000	-34.45
8000	-39.52
9000	-43.24
10000	-46.49
11000	-50.07
12000	-52.69
13000	-55.20
14000	-58.96
15000	-61.68
20000	<-75.00

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

Channel 17 @ 462.6000 MHz (GMRS)_5 W

Channel 8 @ 467.5625 MHz (FRS)

Modulation Frequency [Hz]	GMRS	FRS
	Max. Deviation [kHz]	Max. Deviation [kHz]
100	0.18	0.11
150	0.20	0.10
200	0.14	0.09
250	1.63	0.15
300	1.97	0.44
400	2.14	2.05
500	2.04	2.10
700	1.63	1.99
750	1.65	1.94
1000	2.00	2.05
1100	2.06	2.02
1200	2.06	1.90
1300	1.98	1.84
1400	1.87	1.83
1500	1.83	1.86
1600	1.84	1.90
1700	1.85	1.95
1800	1.85	1.99
1900	1.87	2.02
2000	1.91	2.07
2100	1.94	2.10
2200	1.98	2.15
2300	2.00	2.19
2400	2.03	2.25
2500	2.06	2.28
2600	2.08	2.30
2700	2.08	2.32
2800	2.07	2.31
2900	2.05	2.31
3000	2.00	2.27
3100	1.90	2.17
3200	1.79	2.07
3300	1.68	1.94
3400	1.56	1.80
3500	1.43	1.65
4000	0.93	1.07
4500	0.63	0.70
5000	0.46	0.50

Channel 8 @ 467.5625 MHz (FRS)

Audio input level Relative[dB]	Positive peak deviation [kHz]			Negative peak deviation [kHz]		
	300 Hz	1000 Hz	3000 Hz	300 Hz	1000 0Hz	3000 Hz
-20	0.09	0.23	0.97	0.08	0.21	0.91
-15	0.11	0.33	1.66	0.12	0.31	1.61
-10	0.10	0.53	2.10	0.10	0.52	2.05
-5	0.10	0.87	2.25	0.10	0.88	2.21
0	0.11	1.50	2.28	0.11	1.48	2.24
5	0.14	1.82	2.28	0.14	1.81	2.26
10	0.20	2.02	2.29	0.18	2.00	2.24
15	0.27	2.07	2.29	0.24	2.02	2.25
20	0.43	2.03	2.28	0.40	2.01	2.25

Limits:

Channel spacing [kHz]	Rated frequency deviation [kHz]
12.5(FRS)	2.5
25.0(GMRS)	5.0

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

Channel 17 @ 462600000 Hz(GMRS)_5 W

Voltage [%]	Voltage [V]	Temperature [deg C]	Measured Frequency [Hz]	Frequency Error [Hz]
100	7.40	-30	462600784	784
100	7.40	-20	462600485	485
100	7.40	-10	462600354	354
100	7.40	0	462600125	125
100	7.40	10	462600072	72
100	7.40	20	462599780	-220
100	7.40	30	462599836	-164
100	7.40	40	462599267	-733
100	7.40	50	462599248	-752
85	6.29	20	462599662	-338
115	8.51	20	462599480	-520
Battery End Point	3.3	20	462599585	-415

Channel 8 @ 467562500 Hz (FRS)

Voltage [%]	Voltage [V]	Temperature [deg C]	Measured Frequency [Hz]	Frequency Error [Hz]
100	7.40	-30	467563429	929
100	7.40	-20	467563325	825
100	7.40	-10	467563152	652
100	7.40	0	467563012	512
100	7.40	10	467562812	312
100	7.40	20	467562480	-20
100	7.40	30	467562119	-381
100	7.40	40	467561886	-614
100	7.40	50	467561630	-870
85	6.29	20	467562554	54
115	8.51	20	467562582	82
Battery End Point	4.1	20	467562403	-97

Limits:

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

11. 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, Bn, is calculated as:

Bn = 2M +2DK

M = 3000

D = 2.5

K=1

Bn = (2 x 3000) + (2 x 2500) = 11k

Hence, the emission designator is: 11K0F3E

Appendix A – Photo of the test setup

Appendix B – Photos of the EUT

- **Front View of EUT**

- **Rear View of EUT**

- **Left View of EUT**

- **Right View of EUT**

- **Inner View of EUT**

- **Bottom View of PCB(with shield can)**

- **Bottom View of PCB(without shield can)**

- **Top View of PCB**