

TABLE OF CONTENTS LIST

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

TEST REPORT:

PAGE	1.....COVER SHEET - GENERAL INFORMATION & TECHNICAL DESCR.
PAGE	2.....TECHNICAL DESCRIPTION CONTINUED
PAGE	3.....RF POWER OUTPUT
PAGE	4.....MODULATION CHARACTERISTICS
PAGE	5.....AUDIO FREQUENCY RESPONSE GRAPH
PAGE	6.....MODULATION LIMITING GRAPH - 300HZ
PAGE	7.....MODULATON LIMITING GRAPH - 1000HZ
PAGE	8.....MODULATION LIMITING GRAPH - 3000HZ
PAGE	9.....AUDIO LOW PASS FILTER GRAPH
PAGE	10.....OCCUPIED BANDWIDTH
PAGE	11.....OCCUPIED BANDWIDTH PLOT
PAGE	12.....OCCUPIED BANDWIDTH PLOT - CW
PAGE	13.....SPURIOUS EMISSIONS AT ANTENNA TERMINALS
PAGE	14.....UNWANTED RADIATION
PAGE	15.....METHOD OF MEASURING RADIATED SPURIOUS EMISSIONS
PAGE	16.....FREQUENCY STABILITY
PAGE	17.....LIST OF TEST EQUIPMENT

EXHIBITS CONTAINING:

EXHIBIT	1.....FCC ID LABEL SAMPLE & SKETCH OF LOCATION
EXHIBIT	2A.....EXTERNAL PHOTO - FRONT VIEW
EXHIBIT	2B.....EXTERNAL PHOTO - REAR VIEW - WITH CLIP
EXHIBIT	2C.....EXTERNAL PHOTO - REAR VIEW - W/OUT CLIP
EXHIBIT	2D.....EXTERNAL PHOTO - SIDE VIEW
EXHIBIT	2E.....EXTERNAL PHOTO - TOP VIEW
EXHIBIT	3A.....INTERNAL PHOTO - COMPONENT VIEW
EXHIBIT	3B.....INTERNAL PHOTO - COPPER VIEW
EXHIBIT	4.....BLOCK DIAGRAM
EXHIBIT	5.....SCHEMATICS
EXHIBIT	6.....USER'S MANUAL
EXHIBIT	7.....CIRCUIT DESCRIPTION
EXHIBIT	8.....TUNING PROCEDURE
EXHIBIT	9.....TEST SET UP PHOTO

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

TABLE OF CONTENTS

GENERAL INFORMATION REQUIRED
FOR CERTIFICATION

2.1033(c)(1)(2) SB TELCOM CO., LTD. will manufacture the
FCCID: OTVGMRS1100 GMRS CHANNELS
TRANSCEIVER in quantity, for use under FCC RULES
PART 95.

SB TELCOM CO., LTD.
#25-49, JUAN5-DONG, NAM-KU
INCHEON KOREA

2.1033 (c) TECHNICAL DESCRIPTION

2.1033(c)(3) Instruction book. A draft copy of the instruction
manual is included as EXHIBIT 6.

2.1033(c) (4) Type of Emission: 10K5F3E
95.631

$B_n = 2M + 2DK$

$M = 3000$

$D = 1.75K$

$K = 1$

$B_n = 2(3000) + 2(2250) = 10.5 \text{ k}$

GMRS Authorized Bandwidth 20.0 kHz

2.1033(c)(5) GMRS Frequency Range: 462.5500 - 462.7250 MHz
95.621

2.10311c)(6)(7) The Maximum Output Power Rating:

GMRS - .62 Watts

FRS - .23 Watts

FRS Authorized Bandwidth 12.5 kHz

2.1033(c)(5) FRS Frequency Range: 1. 462.5625 8. 467.5625
95.627 2. 462.5875 9. 467.5875
3. 462.6125 10. 467.6125
4. 462.6375 11. 467.6375
5. 462.6625 12. 467.6625
6. 462.6875 13. 467.6875
7. 462.7125 14. 467.7125 MHz

2.1033(c)(6)(7) Power Output shall not exceed 0.50 Watts effective
95.639 radiated power. There can be no provisions for
95.649 increasing the power or varying the power.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

2.1033(c)(8) DC Voltages and Current into Final Amplifier:
FINAL AMPLIFIER ONLY

FOR LOW POWER SETTING INPUT POWER: $(6.0V)(.210A) = 1.26$ Watts
FOR HIGH POWER SETTING INPUT POWER: $(6.0V)(.550A) = 3.30$ Watts

2.1033(c)(9) Tune-up procedure. The tune-up procedure is included as EXHIBIT # 8.

2.1033(c)(10) Complete Circuit Diagrams: The circuit diagram is included as EXHIBIT 5 of this report. The block diagrams are included as EXHIBIT 4 of this report.

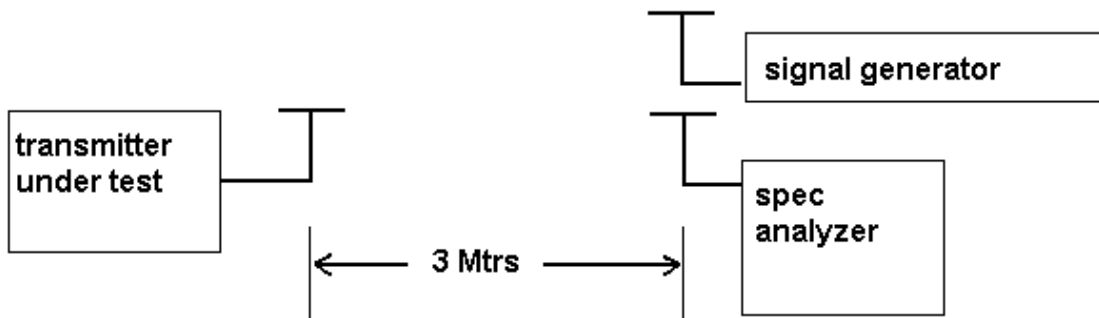
2.1033(c)(11) A photograph or a drawing of the equipment identification label is included as exhibit No. 1.

2.1033(c)(12) Photographs(8"X10") of the equipment of sufficient clarity to reveal equipment construction and layout, including meters, labels for controls, including any view under shields. See exhibits 2-3.

2.1033(c)(13) Digital modulation is not allowed.

2.1033(c)(14) The data required by 2.1046 through 2.1057 is submitted below.

- 95.639 Power Output shall not exceed 50.0 Watts effective radiated power. There can be no provisions for
- 95.649 increasing the power or varying the power. RF power output.
- 2.1046(a) RF power is measured by radiated field strength using the substitution method. With a nominal battery voltage of 6.0 V, and the transmitter properly adjusted the RF output measures:
- OUTPUT POWER: GMRS: .62 Watts ERP
FRS: .23 Watts ERP
- 2.1046(a) RF power output. The test procedure used was TIA/EIA-603 S2.2.1.



2.1047(a)(b) Modulation characteristics:

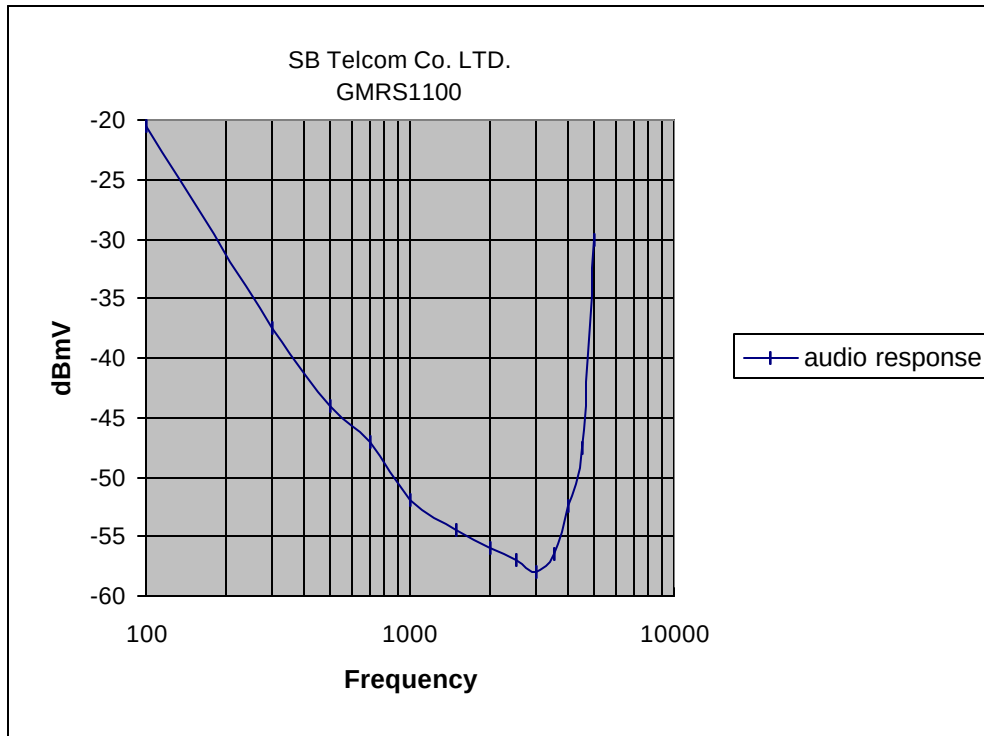
AUDIO FREQUENCY RESPONSE

The audio frequency response was measured in accordance with TIA/EIA Specification 603. The audio frequency response curve is shown on the next page. The audio signal was fed into a dummy microphone circuit and into the microphone connector. The input required to produce 30 percent modulation level was measured. See Page 5 of report.

2.1047(b) Audio input versus modulation

The audio input level needed for a particular percentage of modulation was measured in accordance with TIA/EIA Specification 603. The audio input curves versus modulation are on the following pages. Curves are provided for audio input frequencies of 300, 1000, and 3000 Hz. See Pages 6,7 & 8 of report.

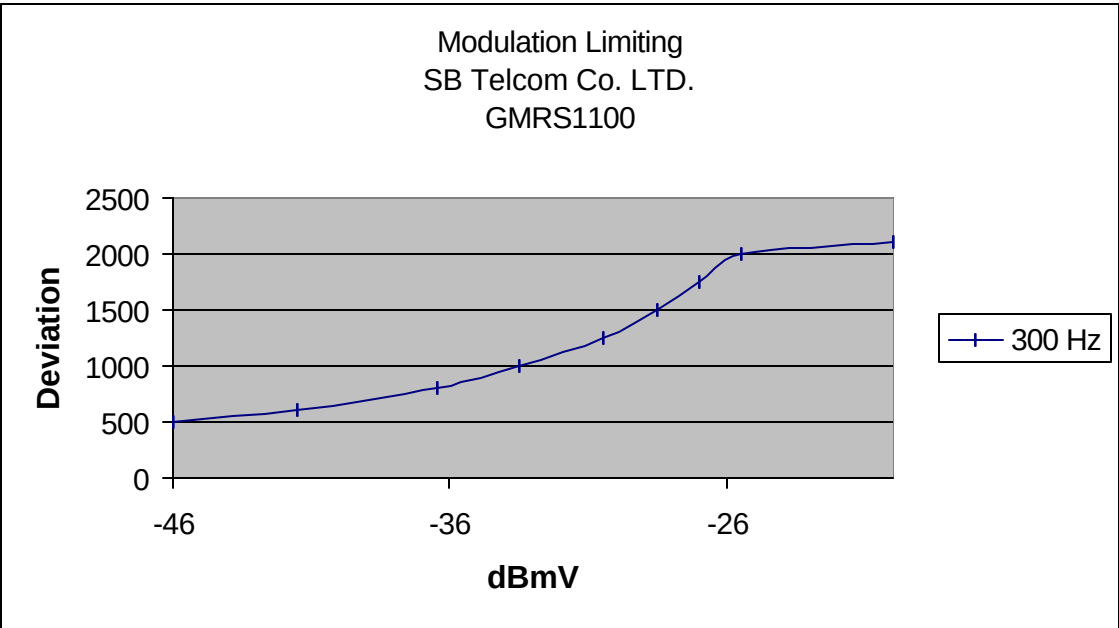
95.637 Post Limiter Filter Each GMRS transmitter, except a mobile station transmitter with a power of 2.5 Watts or less, must be equipped with an audio low pass filter. At any frequency between 3 & 20 kHz the filter must have an attenuation of $60\log(f/3)$ greater than the attenuation at 1 kHz. See Page 9 of report.

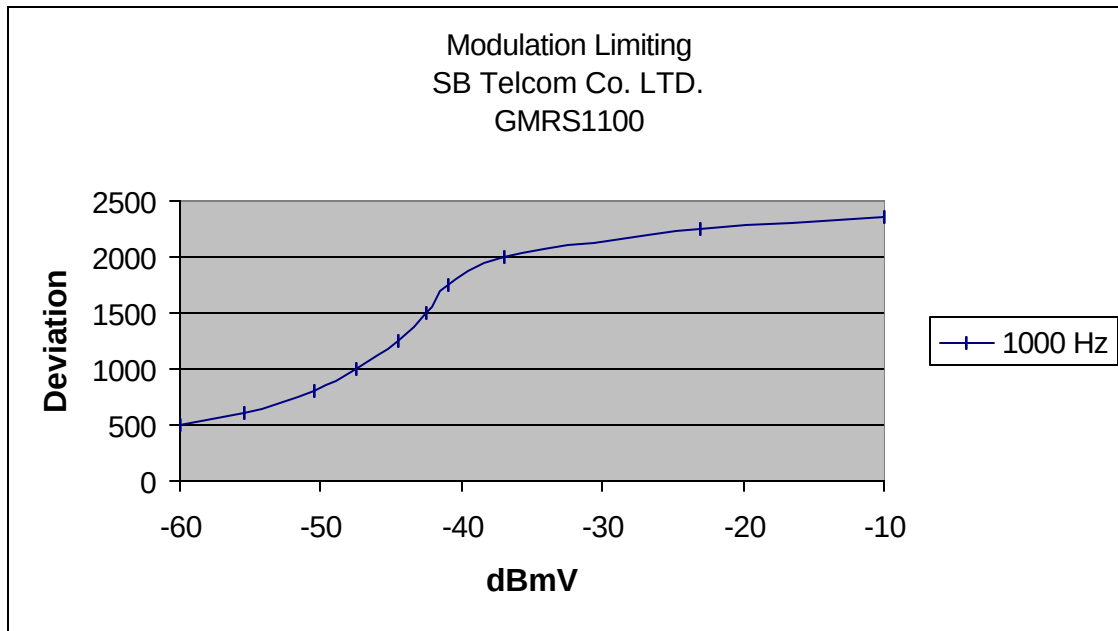


APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\S\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

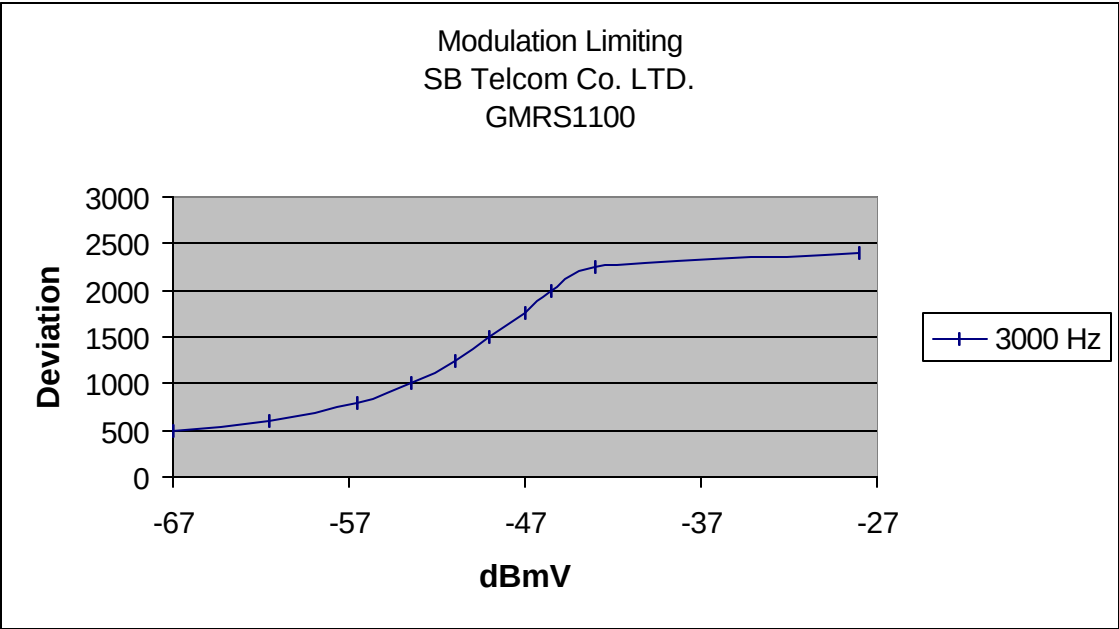


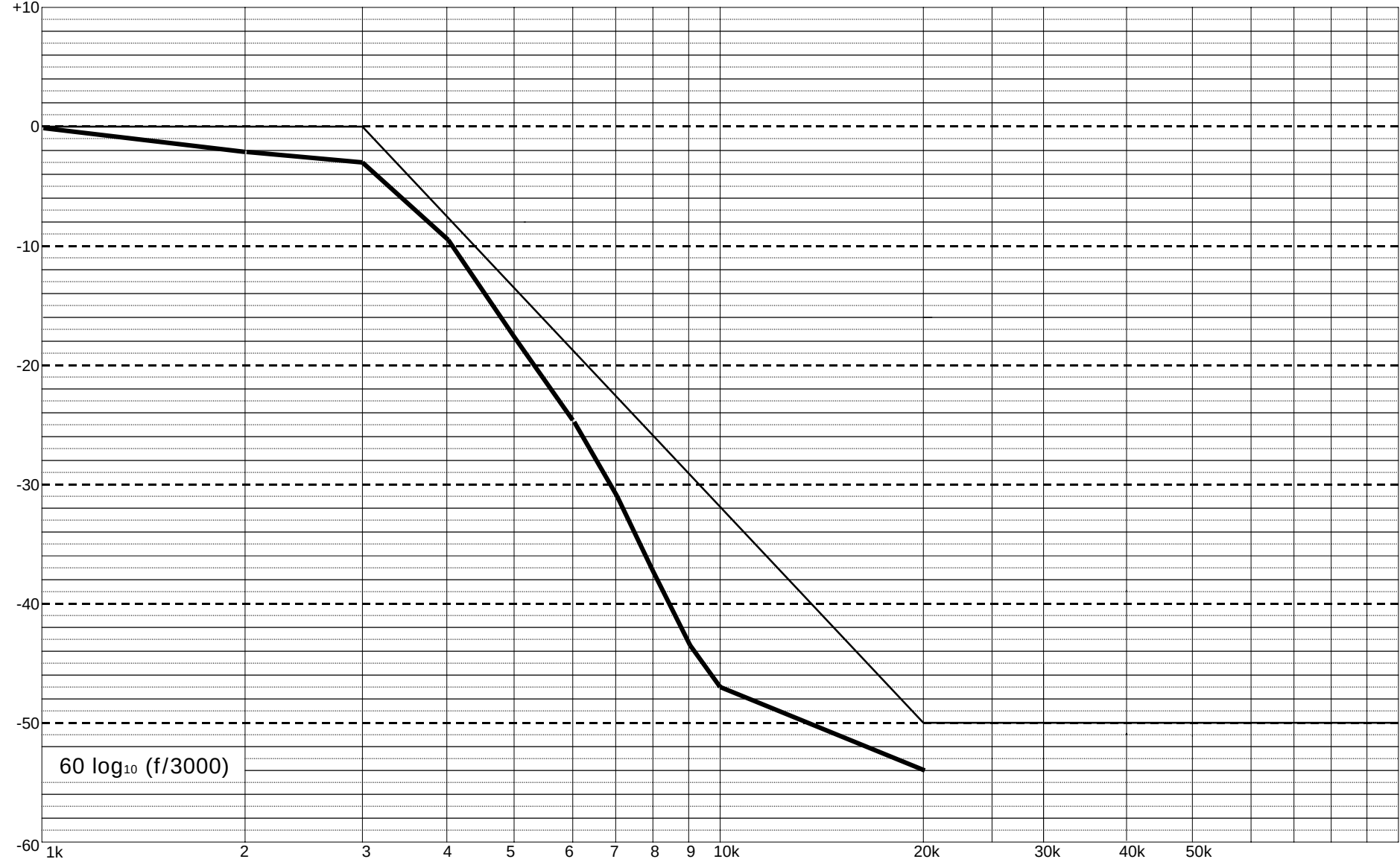


APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc



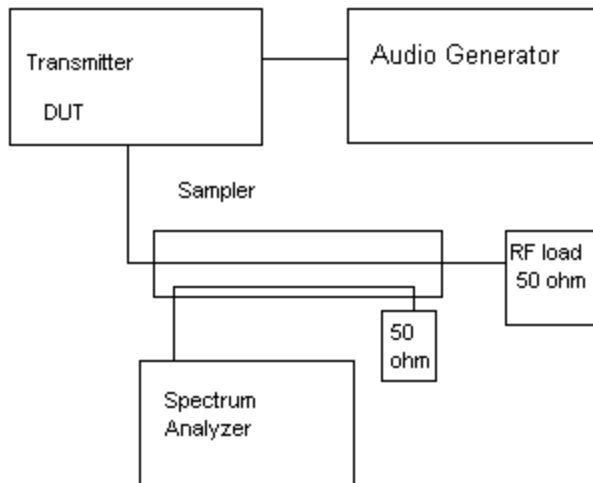


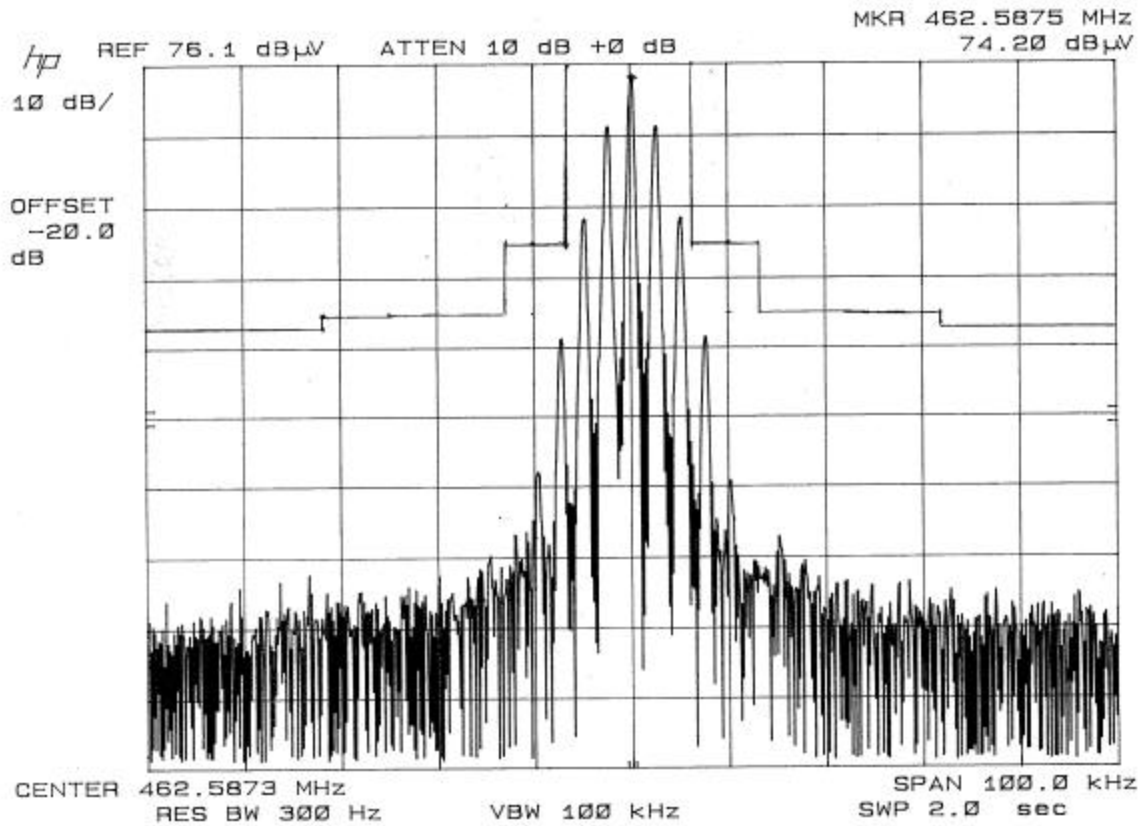
2.1049 Occupied bandwidth:

95.635(b)(1)(3)(7)

At least 25 dB on any frequency removed from the center of the authorized bandwidth by more than 50% up to and including 100% of the authorized bandwidth. At least 35 dB on any frequency removed from the center of the authorized BW by more than 100% up to and including 250% of the authorized BW. At least $43 + \log_{10}(TP)$ dB on any frequency removed from the center of the authorized bandwidth by more than 250%. See plots on pages 11 and 12.

Occupied BW Test Equipment Setup



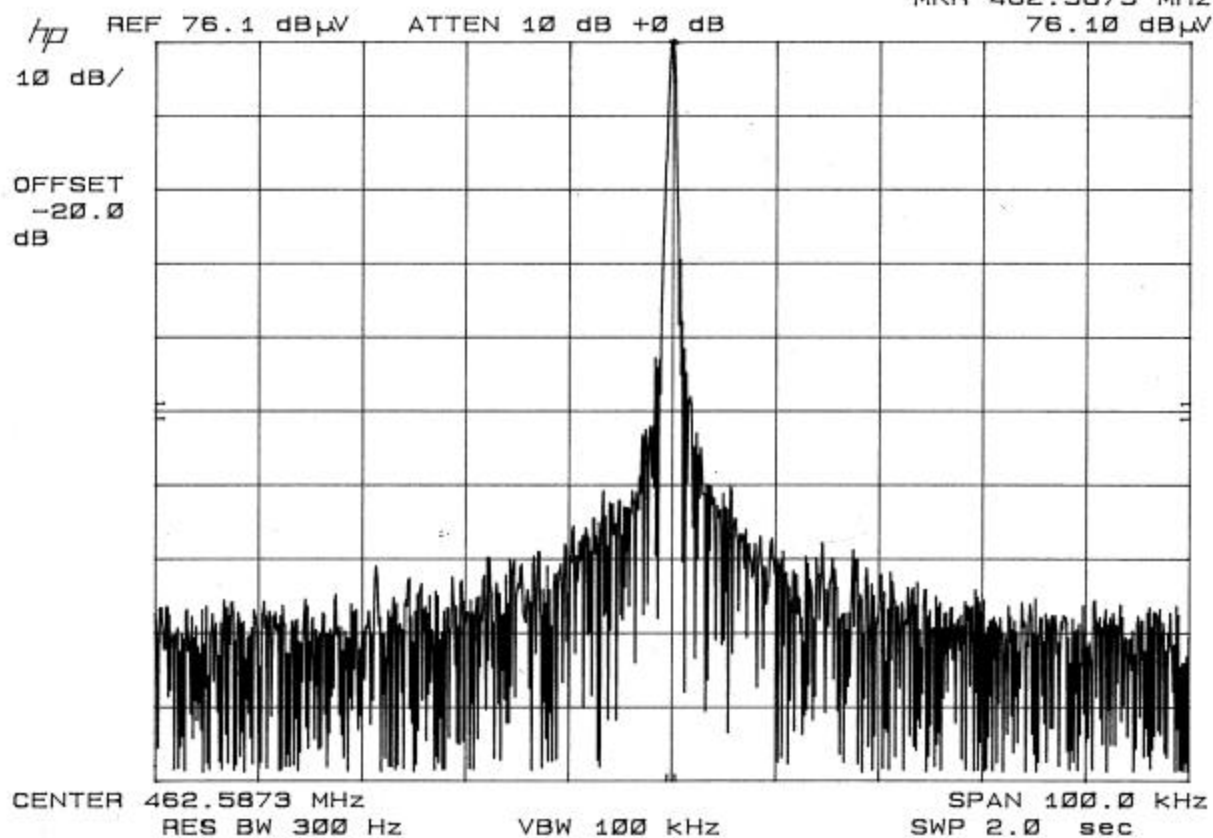


APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\SBS TELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

Page 11 of 17

MKR 462.5873 MHz
76.10 dB μ V

APPLICANT: SB TELCOM CO., LTD.

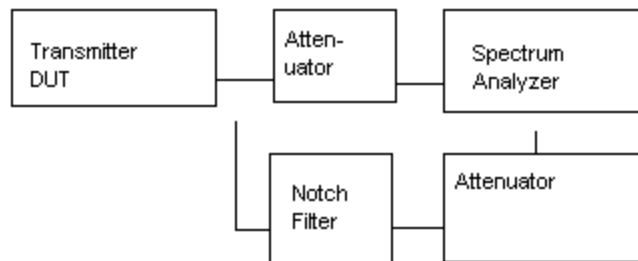
FCC ID: OTVGMRS1100

REPORT #: T:\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

2.1051

Spurious emissions at antenna terminals(conducted):
The following data shows the level of conducted spurious responses at the antenna terminal. The test procedure used was TIA/EIA 603 S2.2.13 with the exception that the emissions were recorded in dBc. The spectrum was scanned from 0.4 to at least the 10th harmonic of the fundamental.

Spurious Emissions at
Antenna Terminals



Method of Measuring Conducted Spurious Emissions

2.1051 Spurious emissions at the Antenna Terminals

NAME OF TEST: SPURIOUS EMISSIONS AT ANTENNA TERMINALS

2.1051 Not Applicable, no antenna terminal allowed.

2.1053
95.635(b)(7)

UNWANTED RADIATION:

The tabulated Data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 to at least the 10th harmonic of the fundamental. This test was conducted per ANSI C63.4-1992.

REQUIREMENTS: GMRS: $43 + 10\log(.62) = 41$ dB
FRS: $43 + 10\log(.23) = 37$ dB

TEST DATA:

Emission Frequency MHz	ATTN dBc	Margin dB
GMRS		
462.60	0.0	0.0
925.40	47	6
1,388.10	55	14
1,850.80	65	24
2,313.50	65	24
2,776.20	**	
3,238.90	60	19
3,701.60	70	29
4,164.30	60	19
4,627.10	66	25
FRS		
467.50	0.0	0.0
935.10	51	14
1,402.60	61	24
1,870.20	68	31
2,337.80	68	31
2,805.30	67	30
3,272.90	64	27
3,740.40	67	30
4,208.00	64	27
4,675.60	63	26

Note: ** Below the measurement capabilities. Measurement is >20 dB below FCC limit.

METHOD OF MEASUREMENT: The tabulated data shows the results of the radiated field strength emissions test. The spectrum was scanned from 30 to at least the tenth harmonic of the fundamental. This test was conducted per TIA/EIA STANDARD 603 using the substitution method. Measurements were made at the open field test site of TIMCO ENGINEERING, INC. located at 849 NW State Road 45, Newberry, FL 32669.

APPLICANT: SB TELCOM CO., LTD.

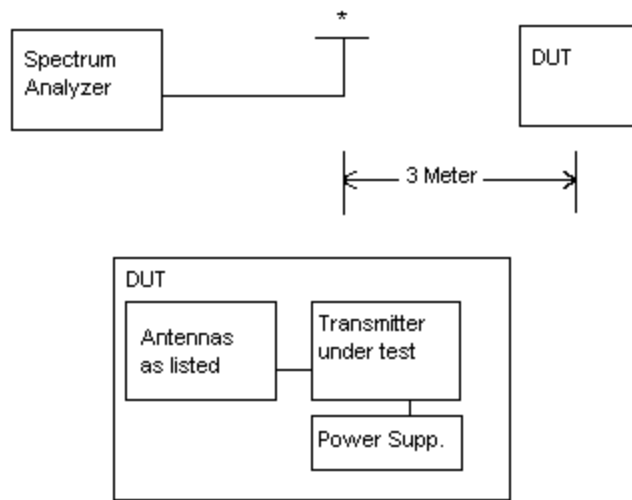
FCC ID: OTVGMRS1100

REPORT #: T:\S\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

APPLICANT : SB TELCOM CO., LTD.

FCC ID : OTVGMR51100

Method of Measuring Radiated Spurious Emissions



Equipment placed 80 cm above ground
on a rotatable platform.

* Appropriate antenna raised from 1 to 4 meters.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMR51100

REPORT #: T:\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

Page 15 of 17

2.1055
95.621(b)

Frequency stability:

Temperature and voltage tests were performed to verify that the frequency remains within the 0.0005%, 5 ppm specification limit. The test was conducted as follows: The transmitter was placed in the temperature chamber at 25 degrees C and allowed to stabilize for one hour. The transmitter was keyed ON for one minute during which four frequency readings were recorded at 15 second intervals. The worse case number was taken for temperature plotting. The assigned channel frequency was considered to be the reference frequency. The temperature was then reduced to -30 degrees C after which the transmitter was again allowed to stabilize for one hour. The transmitter was keyed ON for one minute, and again frequency readings were noted at 15 second intervals. The worst case number was recorded for temperature plotting. This procedure was repeated in 10 degree increments up to + 50 degrees C.

Readings were also taken at plus and minus 15% of the battery voltage of 6.0 VDC.

MEASUREMENT DATA:

Assigned Frequency (Ref. Frequency): 467.563 034

TEMPERATURE	CFREQUENCY_MHz	PPM
REFERENCE_____	467.563 034	00.00
-30C_____	467.561 140	-4.05
-20C_____	467.562 666	-0.79
-10C_____	467.463 571	1.15
0C_____	467.563 945	1.95
10C_____	467.563 705	1.44
20C_____	467.563 183	0.32
30C_____	467.562 585	-0.96
40C_____	467.562 146	-1.90
50C_____	467.562 130	-1.93

BATT. %	BATT. DATA	VOLTS	BATT. PPM
-15%	467.563 016	5.1	-0.04
+15%	467.563 072	6.9	0.08

RESULTS OF MEASUREMENTS: The maximum frequency variation over the temperature range was -4.05 to +1.95 ppm. The maximum frequency variation with voltage was -0.04 to +0.08 ppm.

Note: This EUT meets the frequency stability requirement for a FRS: +/- 2.5ppm over temp range of -20 degrees C to +50 degrees C. It also meets the GMRS frequency stability requirements: +/- 5ppm over the temp range -30 degrees C to +50 degrees C.

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\S\SBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc

APPLICANT: SB TELCOM CO., LTD.
FCC ID: OTVGMRS1100

TEST EQUIPMENT LIST

- 1._X_Spectrum Analyzer: HP 8566B-Opt 462, S/N 3138A07786, w/
preselector HP 85685A, S/N 3221A01400, Quasi-Peak Adapter
HP 85650A, S/N 3303A01690 & Preamplifier HP 8449B-OPT H02,
S/N 3008A00372 Cal. 8/31/01 Due 8/31/02
- 2.__ Biconnical Antenna: Eaton Model 94455-1, S/N 1057,
Cal. 10/1/01 Due 10/1/02
- 3.__ Biconnical Antenna: Electro-Metrics Model BIA-25, S/N 1171
Cal. 4/26/01 Due 4/26/03
- 4._X_Log-Periodic Antenna: Electro-Metrics Model EM-6950, S/N 632
Char. 10/15/01 Due 10/15/02
- 5.__ Log-Periodic Antenna: Electro-Metrics Model LPA-30, S/N 409
Char. 10/16/01 Due 10/16/02
- 6.__ Log-Periodic Antenna: Electro-Metrics Model LPA-25, S/N 1122
Char. 2/10/01 Due 3/10/02
- 7._X_Double-Ridged Horn Antenna: Electro-Metrics Model RGA-180,
1-18 GHz, S/N 2319 Cal. 12/19/01 Due 12/19/02
- 8.__ 18-26.3GHz Systron Donner Standard Gain Horn #DBE-520-20
No Cal Required
- 9.__ Horn 40-60GHz: ATM Part #19-443-6R No Cal Required
- 10.__ Line Impedance Stabilization Network: Electro-Metrics Model
EM-7820, w/NEMA Adapter S/N 2682 Cal. 3/16/01 Due 3/16/02
- 11._X_Temperature Chamber: Tenney Engineering Model TTRC, S/N 11717-7
Char. 1/27/01 Due 1/27/02
- 12._X_Frequency Counter: HP Model 5385A, S/N 3242A07460
Char. 12/11/01 Due 12/11/02
- 13.__ Peak Power Meter: HP Model 8900C, S/N 2131A00545
Char. 1/26/01 Due 1/26/02
- 14._X_Open Area Test Site #1-3meters Cal. 12/22/99
- 15.__ Signal Generator: HP 8640B, S/N 2308A21464
Cal. 11/15/01 Due 11/15/02
- 16.__ Passive Loop Antenna: EMC0 Model 6512, 9KHz to 30MHz, S/N
9706-1211 Char. 7/10/01 Due 7/10/02
- 17.__ Dipole Antenna Kit: Electro-Metrics Model TDA-30/1-4, S/N 152
Cal. 3/21/01 Due 3/21/02
- 18.__ AC Voltmeter: HP Model 400FL, S/N 2213A14499
Cal. 10/9/01 Due 10/09/02
- 19._X_Digital Multimeter: Fluke Model 77, S/N 35053830
Char. 1/11/01 Due 1/11/02
- 20.__ Oscilloscope: Tektronix Model 2230, S/N 300572
Char. 2/1/01 Due 2/1/02

APPLICANT: SB TELCOM CO., LTD.

FCC ID: OTVGMRS1100

REPORT #: T:\SBSBTELE\24akt2a\Corres-22785\MODIFmodifiedTESTREPORT.doc