360 Herndon Parkway
Suite 1400
Herndon, VA 20170
http://www.rheintech.com

CERTIFICATE OF COMPLIANCE
FCC PART 80 CERTIFICATION & INDUSTRY CANADA CERTIFICATION

Test Lab:	Applicant Information:
Rhein Tech Laboratories, Inc. 360 Herndon Parkway Suite 1400 Herndon, VA 20170 Phone: 703-689-0368 Fax: 703-689-2056 Web Site: www.rheintech.com	ICOM Incorporated 12380 116th Avenue NE Bellevue, WA 98004 USA Phone: (425) 454-8155 (Masaaki Takahashi)

FCC ID:	AFJIC-M802	**FRN NUMBER:**	0005-8553-90
EQUIPMENT TYPE:	HF MARINE TRANSCEIVER	**MODEL(S):**	IC-M802
RTL WORK ORDER NUMBER:	2001335	**RTL QUOTE NUMBER:**	QRTL01-50DB
DATE OF TEST REPORT:	February 1, 2002		

FCC Classification:	☐ GHF– Part 80 HF Transmitter (GMDSS) ☐ GHH – Part 80 VHF Hand Held Transmitter (GMDSS) ☐ GMF – Part 80 MF Transmitter (GMDSS) ☐ GVH – Part 80 VHF Transmitter (GMDSS) ☐ MWR – Part 80 Marine Watch Receiver ☐ RNV – Part 80 Navtex Receiver ☒ TDC – Part 80 DSC Controller
FCC Rule Part(s):	Part 80: Stations in the Maritime Services Part 87: Aviation Services Part 90: Private Land Mobile Radio Services
Industry Canada Standard:	☐ RSS-117: Land and Coast Station Transmitters Using A1, A2, A3, A2H, or A3H Emissions Operating in the 200-535 kHz Band ☒ RSS-181: Coast and Ship Station Single Sideband Radiotelephone Transmitters and Receivers Operating in the 1 605-28000 kHz Band ☐ RSS-182: Maritime Radio Transmitters and Receivers in the Band 156-162.5 MHz ☐ RSS-188: Global Maritime Distress and Safety System (GMDSS)

Frequency Range (MHz)	**Output Power (W)**	**Freq. Tolerance (ppm, %, or Hz)**	**Emission Designator**
1600 – 27500 kHz	150W	6 Hz	2K80J3E
1600 – 27500 kHz	150W	6 Hz	2K80H3E
1600 – 27500 kHz	150W	6 Hz	2K80J2B

We, the undersigned, hereby declare that the equipment tested and referenced in this report conforms to the identified standard(s) as described in this test report. No modifications were made to the equipment during testing in order to achieve compliance with these standards.

Furthermore, there was no deviation from, additions to or exclusions from the FCC Part 2, FCC Part 80, FCC Part 87, FCC Part 90 and Industry Canada standard marked above, ANSI C63.4, ANSI/TIA/EIA603 and ANSI/TIA/EIA 603-1.

Signature: _____ Date: January 10, 2002

Typed/Printed Name: K. Franck Schuppius Position: Test Engineer

Signature: _____ Date: January 10, 2002

Typed/Printed Name: Desmond A. Fraser Position: President

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Suite 1400
Herndon, VA 20170
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1 GENERAL INFORMATION

1.1 SCOPE

FCC Rules Part 80: This subpart contains the procedures and requirements for the filing of applications for licenses to operate radio facilities in the maritime services.

FCC Rules Part 87: This subpart states the conditions under which radio stations may be licensed and used in the aviation services. These rules do not govern US Government radio stations.

FCC Rules Part 90: This subpart states the conditions under which radio communications systems may be licensed and used in the Public Safety, Special Emergency, Industrial, land Transportation, and Radiolocation Radio Services.

Industry Canada RSS-181: This specification sets forth the minimum performance standards required for the type-approval of radio-telephone non-multiplex coast and ship station sideband radiotelephone transmitters and receivers.

Industry Canada RSP-100: This Radio Standards Procedures describes the process to be followed and the information to be submitted by an applicant wishing to obtain certification of radio equipment.

All measurements contained in this application were conducted in accordance with the FCC Rules and Regulations CFR47, Industry Canada standards listed in this report and ANSI/TIA/EIA603-1992/-1-1998 Land Mobile FM or PM Communications Equipment Measurement and Performance Standards. The instrumentation utilized for the measurements conforms to the ANSI C63.4 standard for EMI and Field Strength Instrumentation. Calibration checks are performed regularly on the instruments, and all accessories including high pass filter, coaxial attenuator, preamplifier and cables.

1.2 TEST FACILITY

The open area test site and conducted measurement facility used to collect the radiated data is located at 360 Herndon Parkway, Suite 1400, Herndon, Virginia 20170. This site has been fully described in a report and approved by the Federal Communication Commission to perform AC line conducted and radiated emissions testing (ANSI C63.4 1992).

1.3 RELATED SUBMITAL (S)/GRANT(S)

This is an original application for Certification.

2 EQUIPMENT INFORMATION

2.1 APPLICANT AND EQUIPMENT INFORMATION

Test Lab:	Applicant Information:
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1600 – 27500 kHz	150W	6 Hz	2K80J2B

2.2 JUSTIFICATION

The transmitter was tested at a high, mid, and low channel in the following frequency range (1605-27500 kHz).- Each transmitter frequency was measured independently in 3 orthogonal planes at 360º rotation.
The final radiated data was taken with the EUT locked to a set frequency. A DoC report is on file for the receiver section and digital interface for the EUT. The IF, LO and up to the 2nd LO were investigated.

2.3 EXERCISING THE EUT

The IC-M802 was tested by turning the unit on and setting the channel frequency (High, Medium and Low power) to be tested. Other parameters required for testing, such as modulation type, frequency, and receive modes are set by the end user.

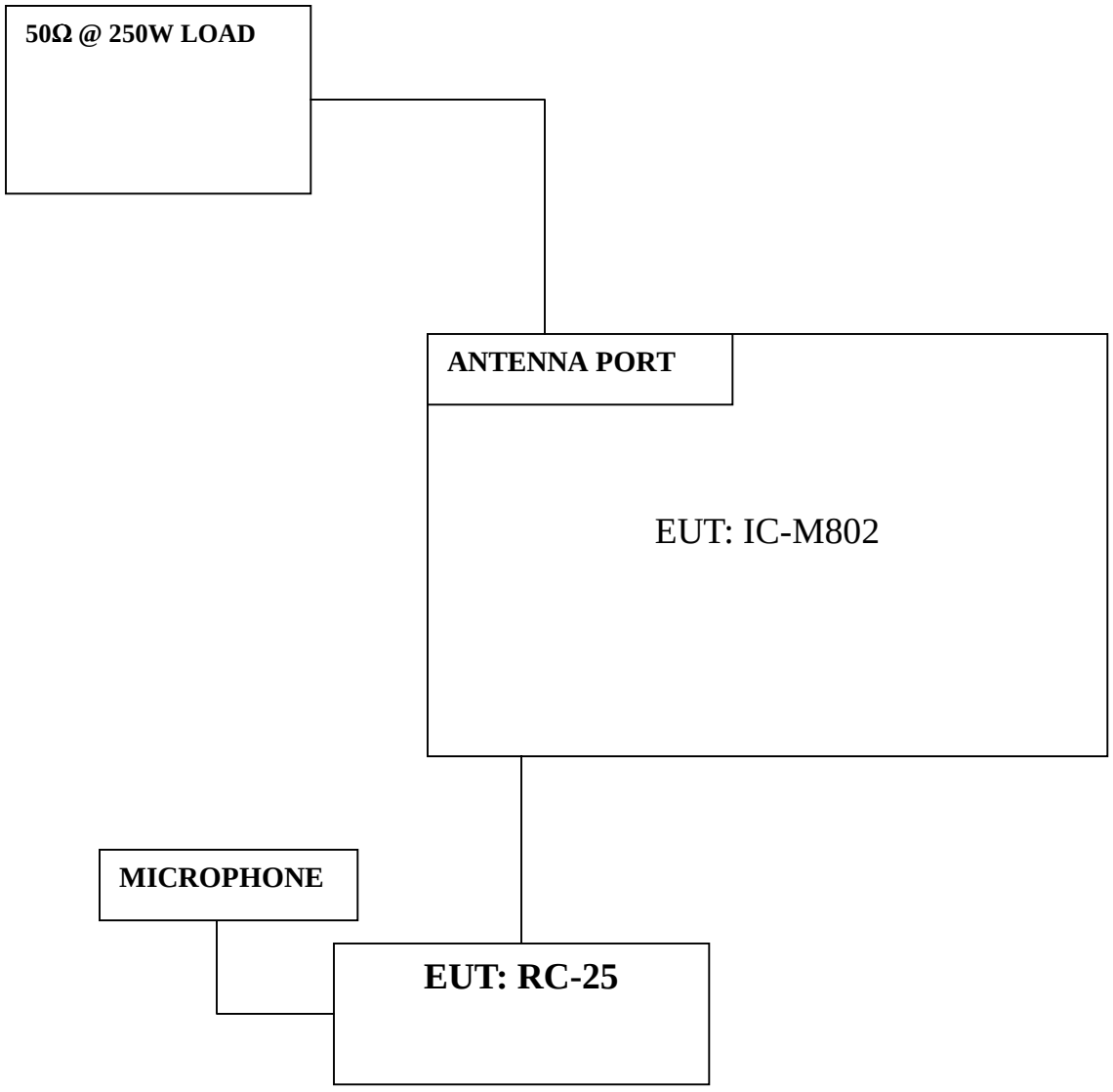
2.4 TEST SYSTEM DETAILS

The FCC Identifiers for all equipment, plus descriptions of all cables used in the tested system are:

TABLE 2-1: EQUIPMENT UNDER TEST (EUT)

PART	MANUFACTURER	MODEL	SERIAL NUMBER	FCC ID	CABLE DESCRIPTION	RTL BAR CODE
CONTROLLER (EUT)	ICOM AMERICA	RC-25	0001	N/A	UNSHIELDED I/O	013963
MAIN UNIT (EUT)	ICOM AMERICA	IC-M802	0001	AFJIC-M802	UNSHIELDED POWER	013962

2.5 CONFIGURATION DIAGRAM OF TESTED SYSTEM



3 NECESSARY BANDWIDTH AND EMISSION BANDWIDTH - §2.202

Type of Emission: J3E, H3E AND J2B

Necessary Bandwidth:
M = 2.8 kHz
Bn = M = 2.8 kHz

3.1 BANDWIDTHS - §80.205

§80.205 (a): An emission designator shows the necessary bandwidth for each class of emission of a station except that in ship earth stations it shows the occupied or necessary bandwidth, whichever is greater. The table in FCC Rules and Regulations 47 CFR Part 80 §80.205 gives the class of emission and corresponding emission designator and authorized bandwidth.

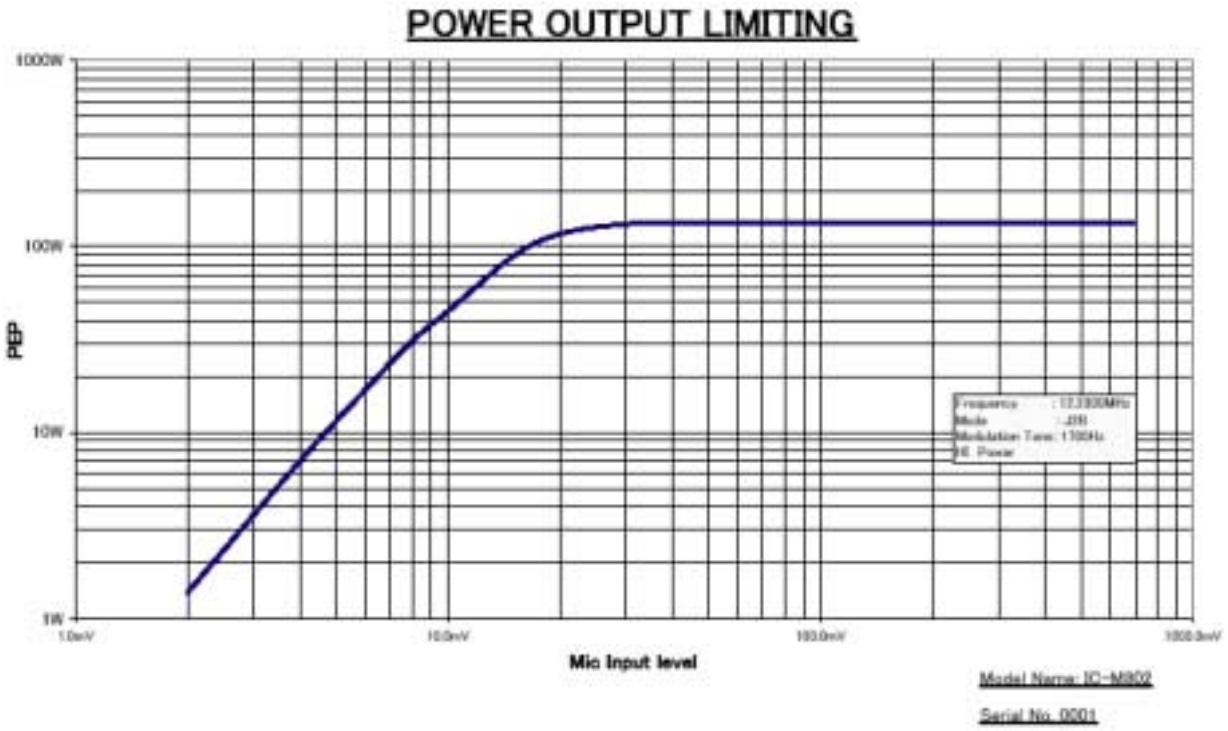
4 RF POWER OUTPUT - §2.1046

4.1 RF POWER OUTPUT TEST EQUIPMENT

TABLE 4-1: RF POWER OUTPUT TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
900770	Hewlett Packard	437B	Power Meter	2949A02966
901055	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2545A04102
900769	Hewlett Packard	8481B	Power Sensor	2702A05059
901055	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2545A04102

PLOT 4-1: RF OUTPUT POWER LIMITING



5 OCCUPIED BANDWIDTH - §2.1049

5.1 OCCUPIED BANDWIDTH - §80.211 TEST PROCEDURE

The antenna output terminal of the EUT was connected to the input of a 50W spectrum analyzer through a matched 40dB attenuator. The radio transmitter was operating at maximum output power with and without internal data modulation. 100% of the in-band modulation was below the specified mask per §80.211.
Specified Limits:

A. On any frequency removed from the assigned frequency by more than 50 percent up to and including 150 percent of the authorized bandwidth: At least 28 dB;

B. On any frequency removed from the assigned frequency by more than 150 percent up to and including 250 percent of the authorized bandwidth: At least 35 dB; and

C. On any frequency removed from the assigned frequency by more than 250 percent of the authorized bandwidth: At least 43 plus 10log10 (mean power in watts) dB

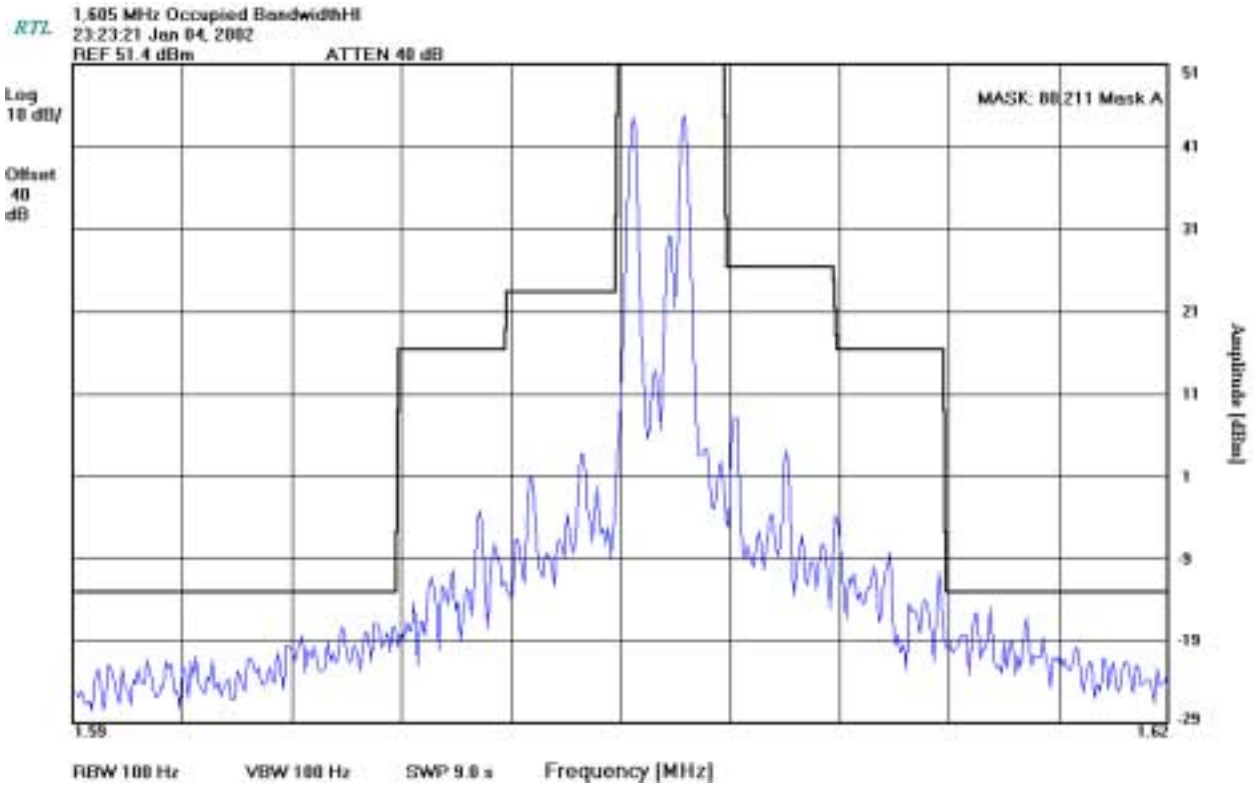
5.2 OCCUPIED BANDWIDTH TEST EQUIPMENT

TABLE 5-1: OCCUPIED BANDWIDTH TEST EQUIPMENT

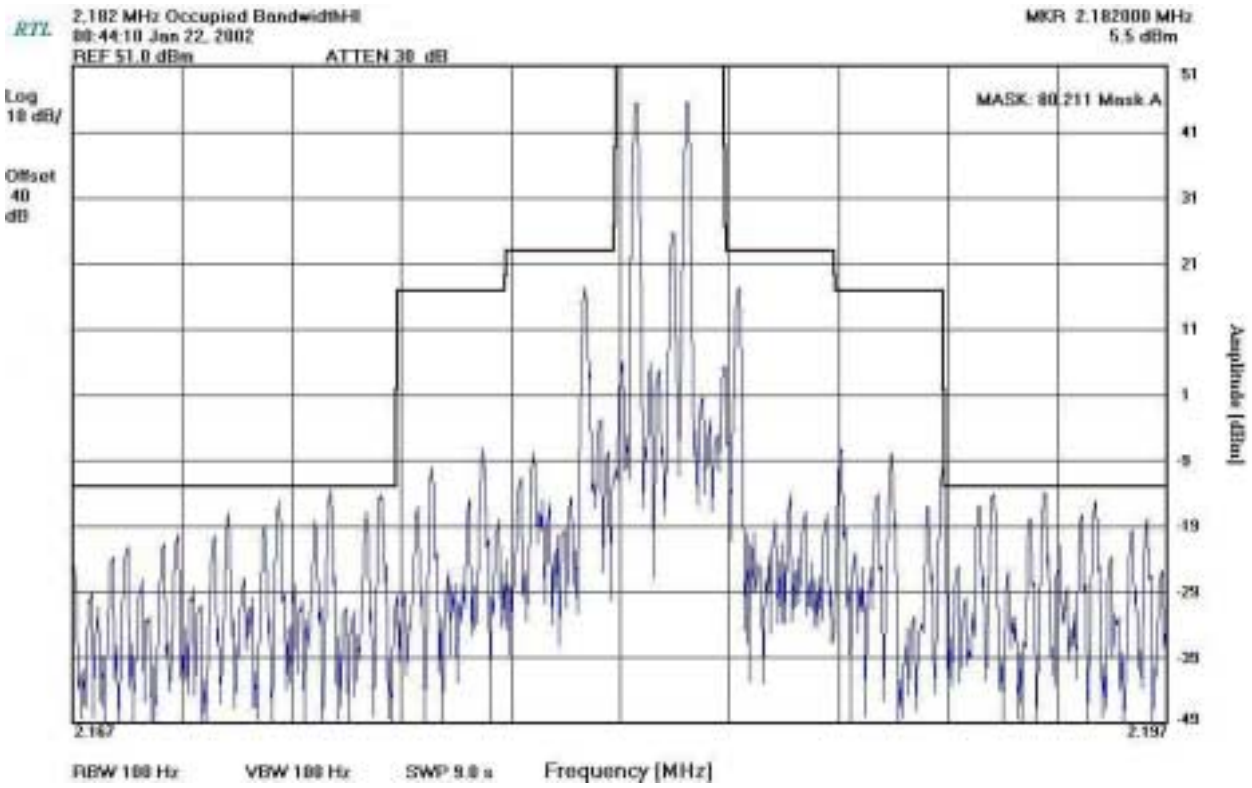
RTL Asset #	Manufacturer	Model	Part Type	Serial Number
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9kHz – 40 GHz)	3943A01719

5.3 OCCUPIED BANDWIDTH PLOTS FOR EMISSION TYPE J3E

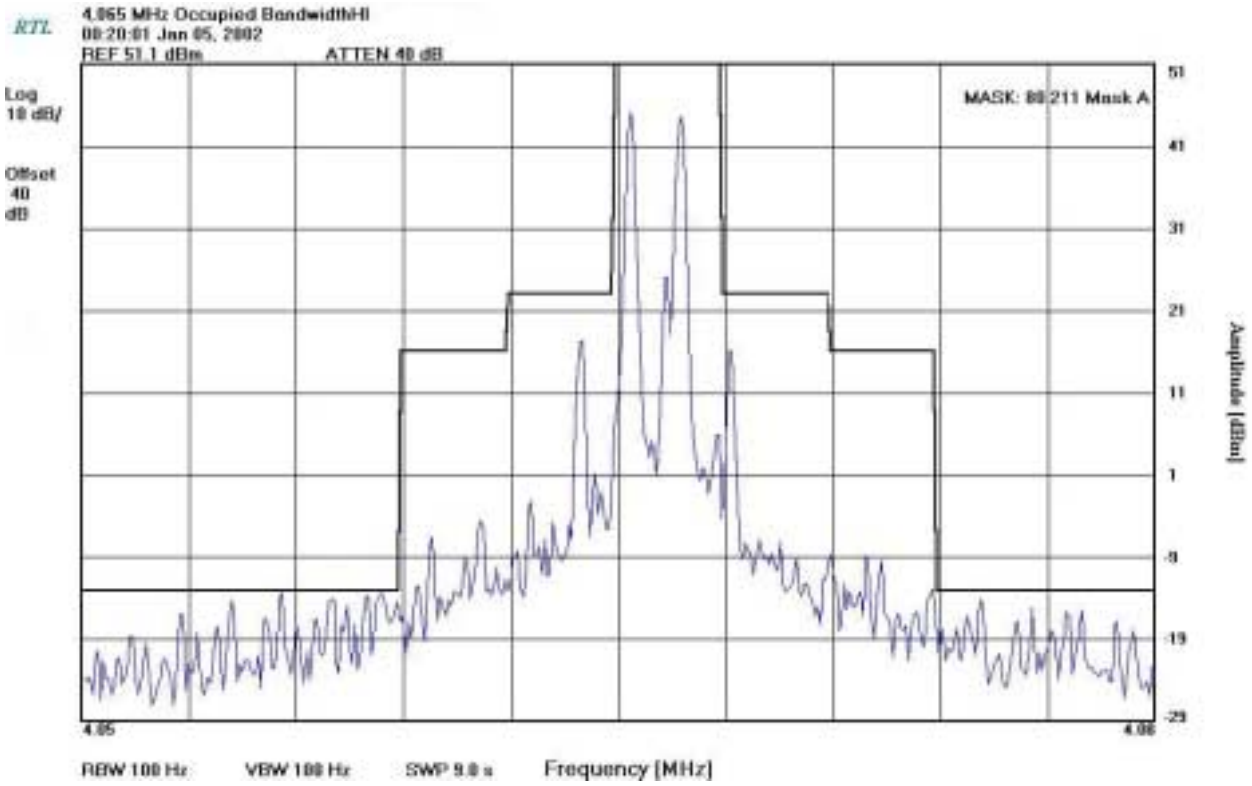
PLOT 5-1: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 1.605MHZ J3E



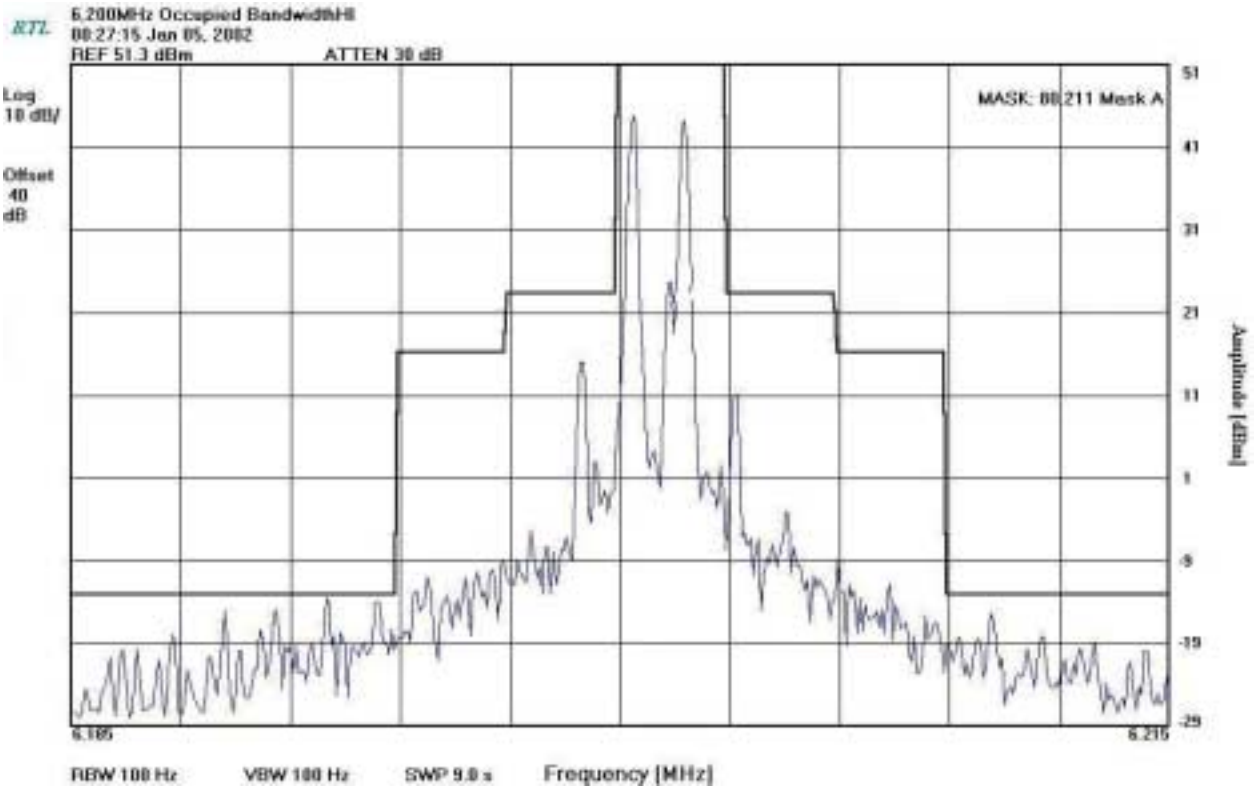
PLOT 5-2: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 2.182MHZ J3E



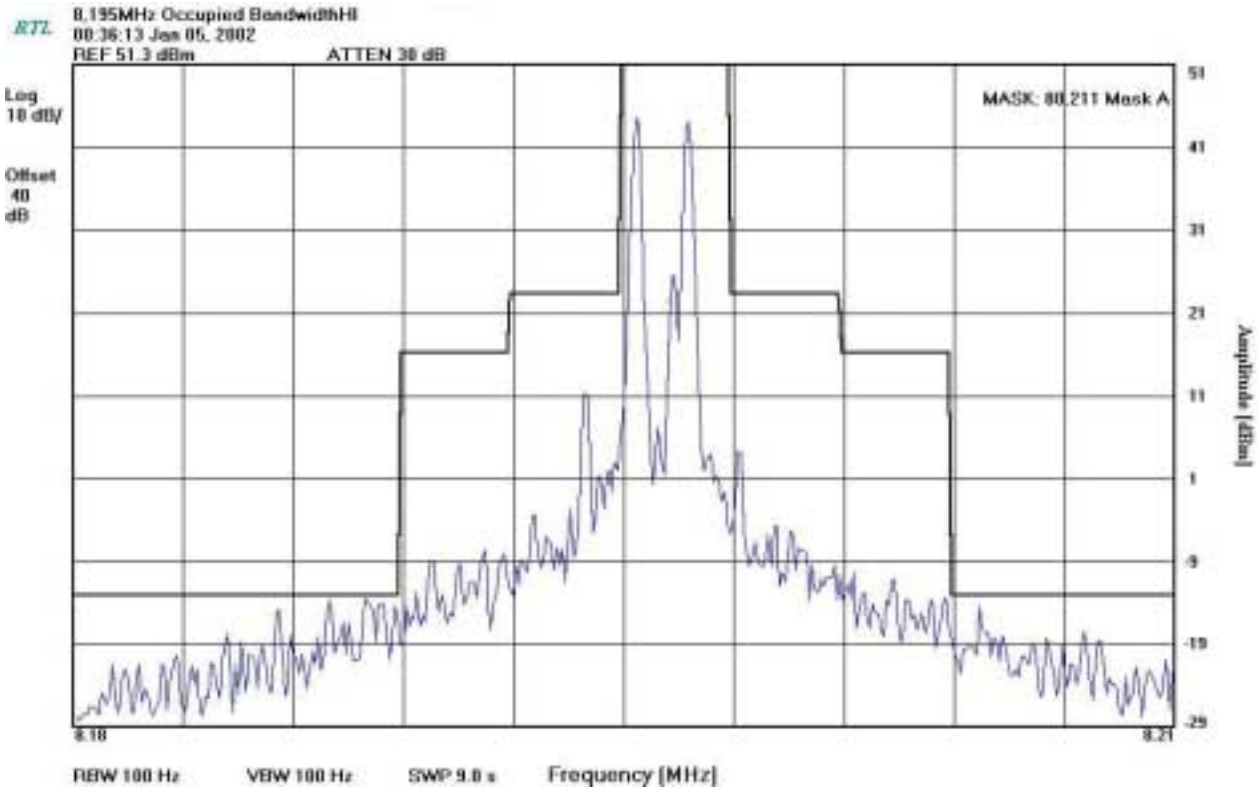
PLOT 5-3: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 4.065MHZ J3E



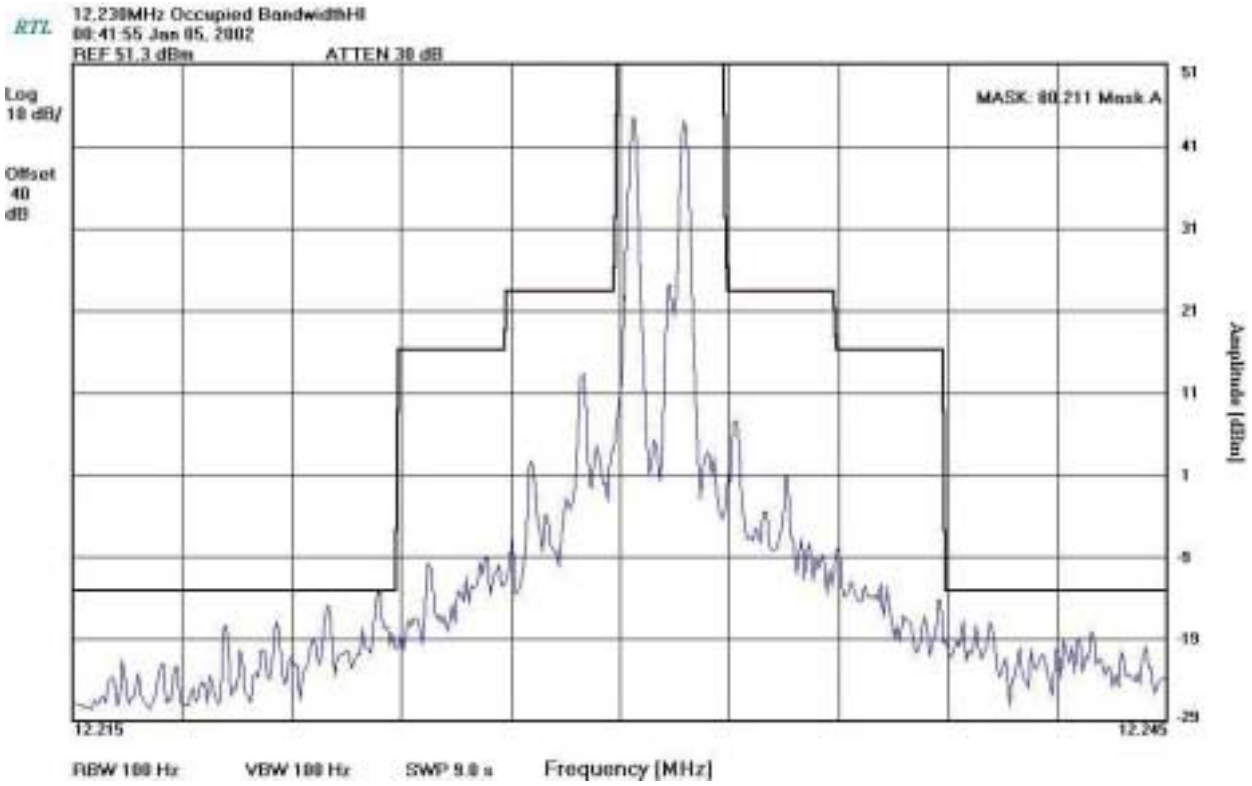
PLOT 5-4: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 6.200MHZ J3E



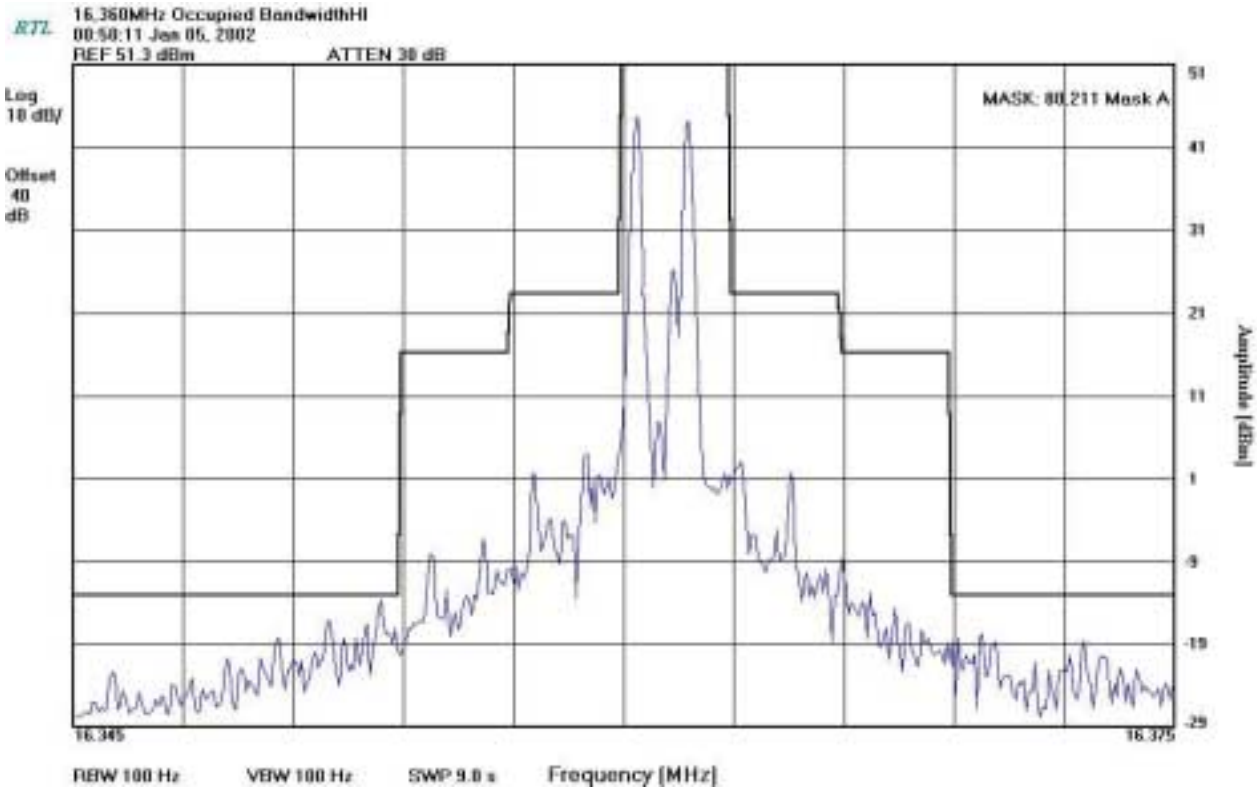
PLOT 5-5: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 8.195MHZ J3E



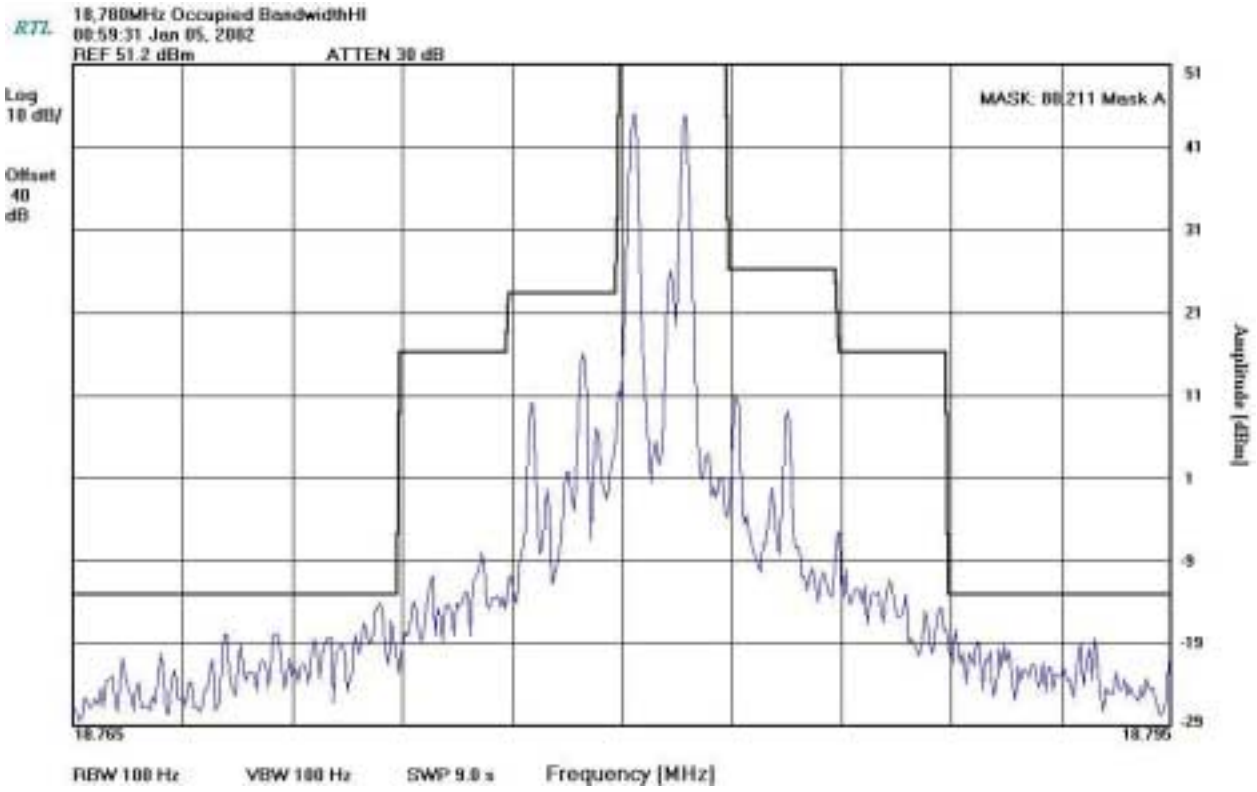
PLOT 5-6: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 12.230MHZ J3E



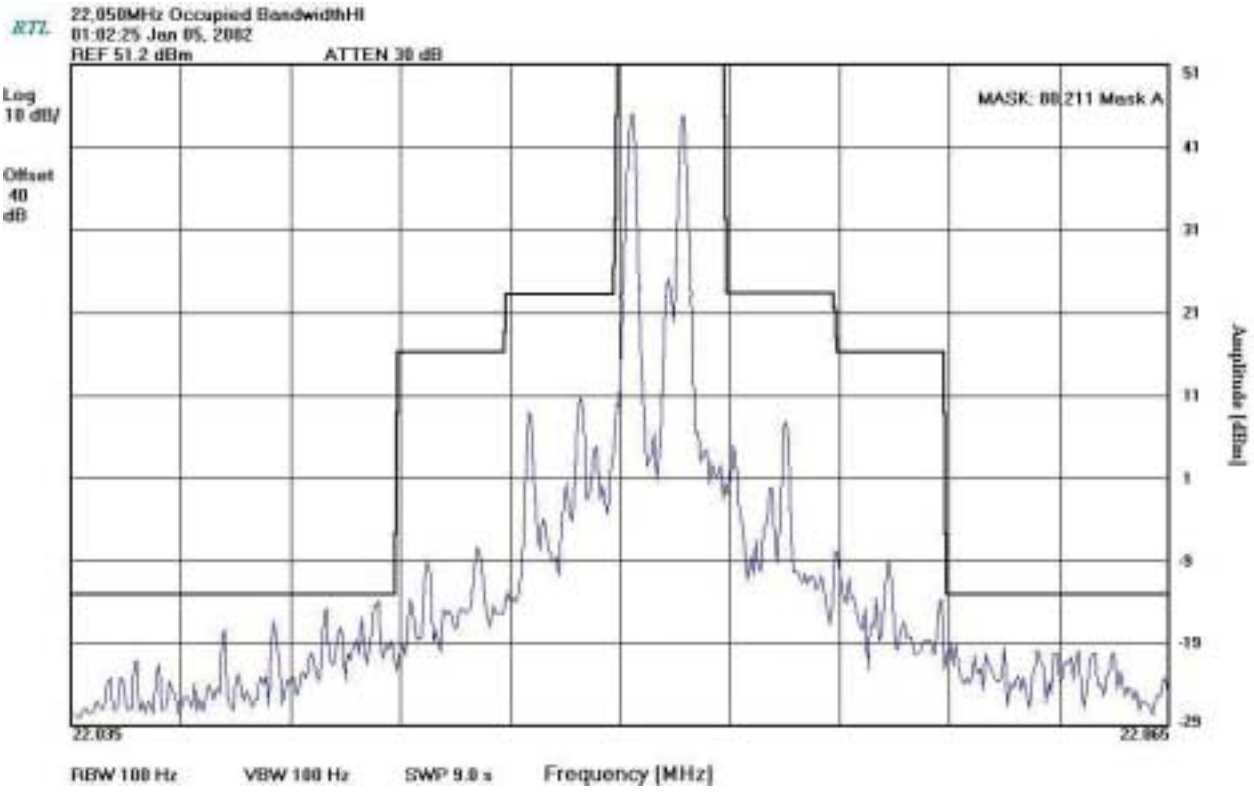
PLOT 5-7: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 16.360MHZ J3E



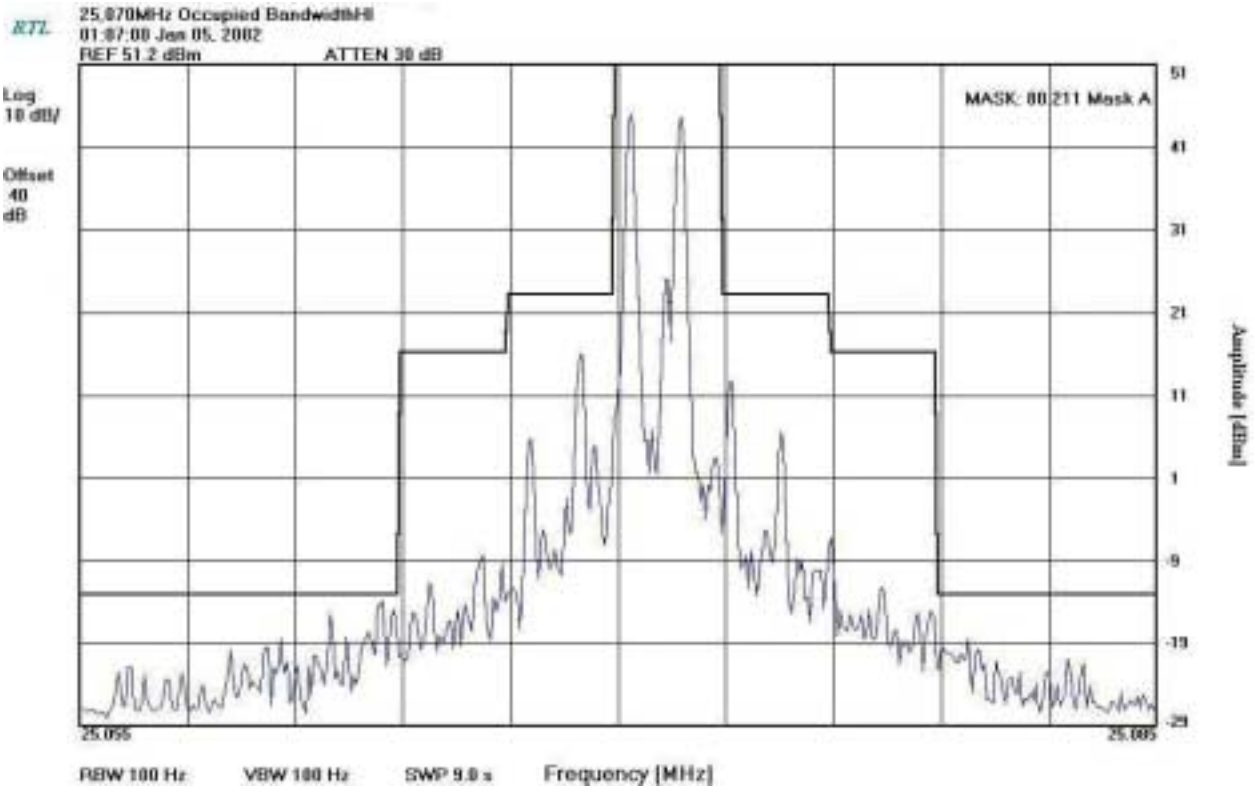
PLOT 5-8: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 18.780MHZ J3E



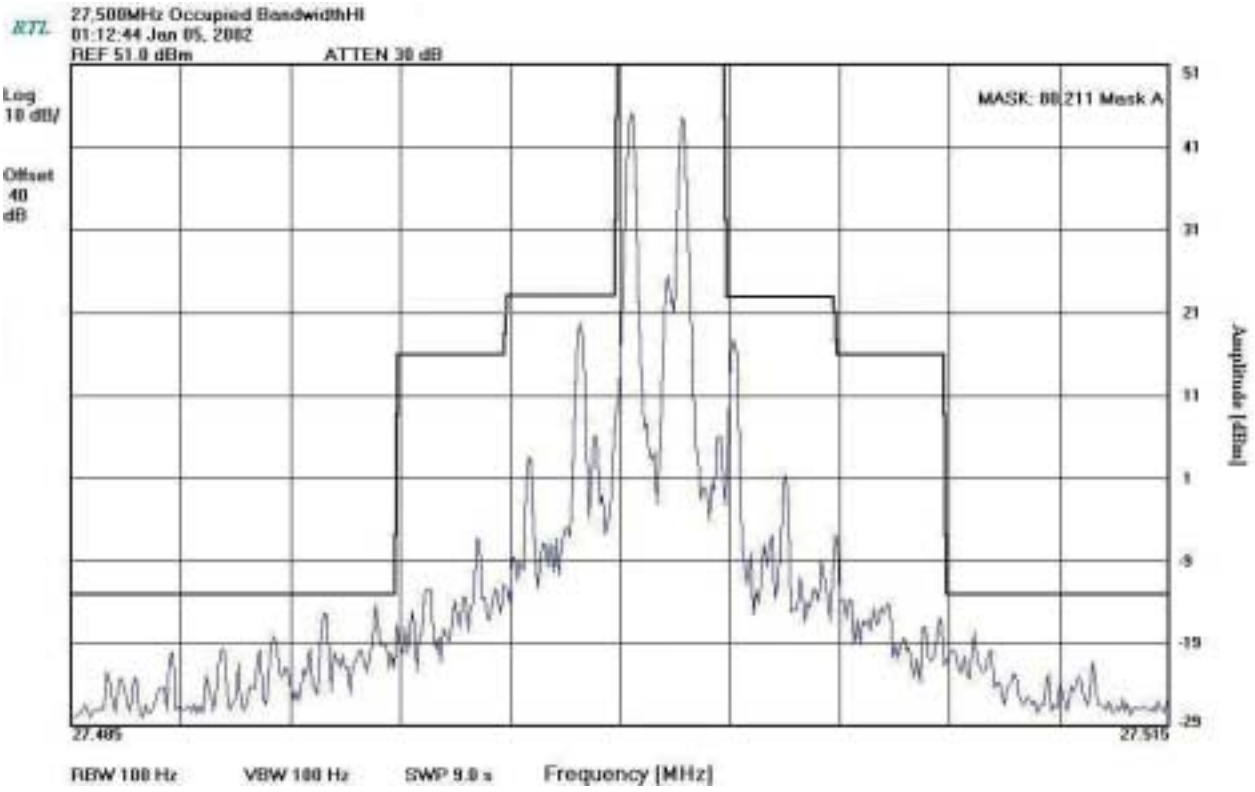
PLOT 5-9: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 22.050MHZ J3E



PLOT 5-10: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 25.050MHZ J3E

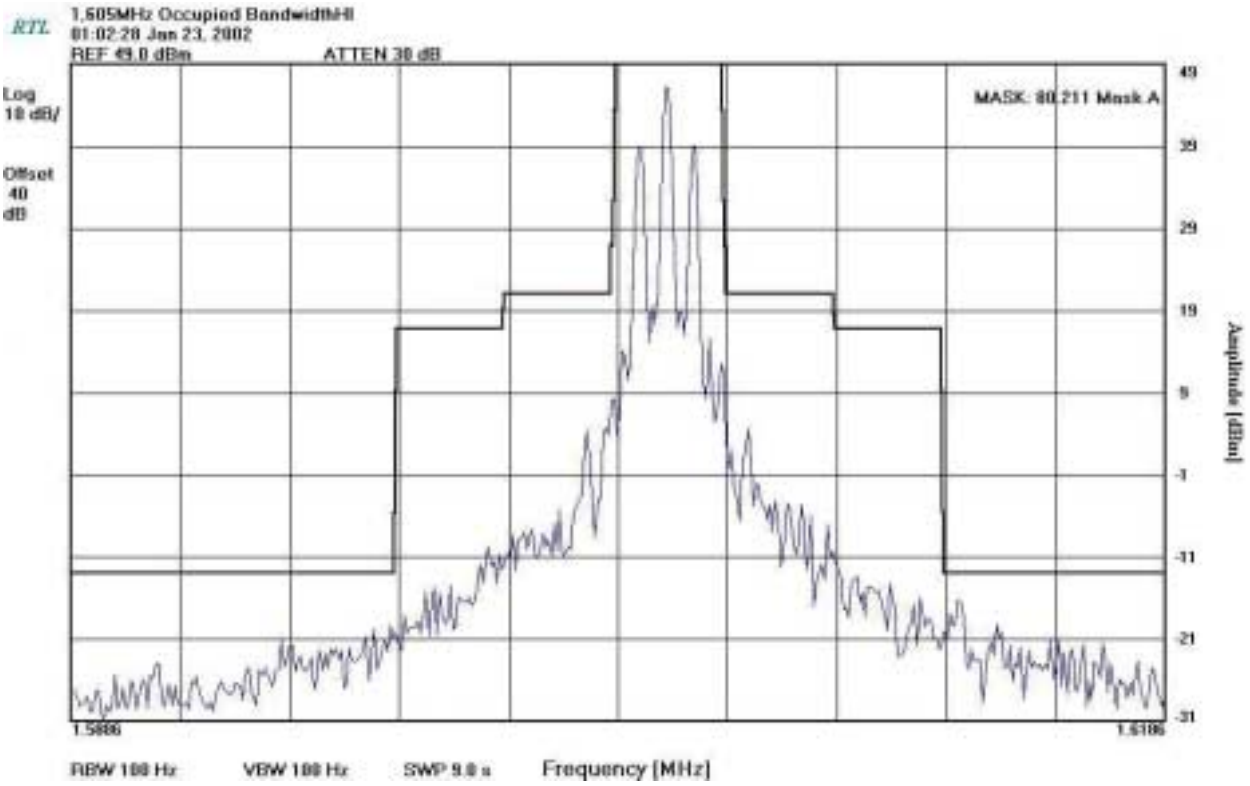


PLOT 5-11: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 27.500MHZ J3E

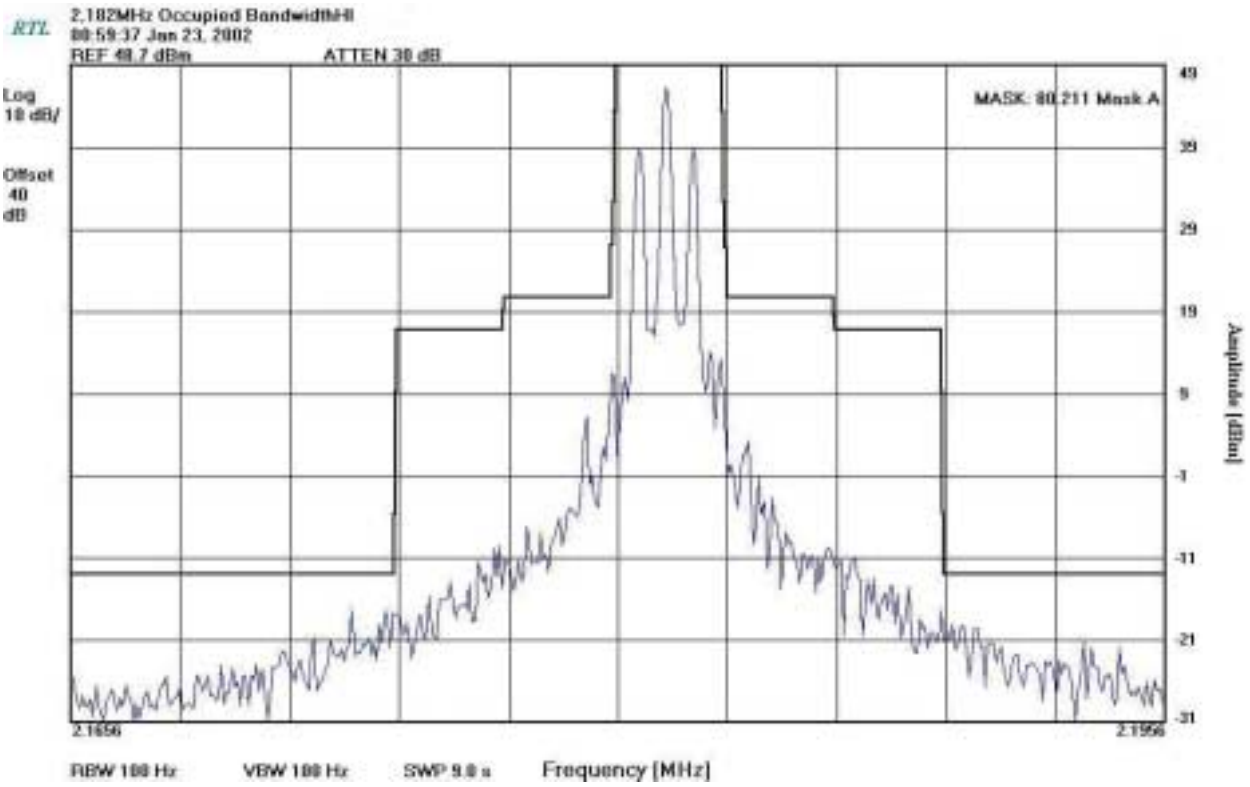


5.4 OCCUPIED BANDWIDTH PLOTS FOR EMISSION TYPE H3E

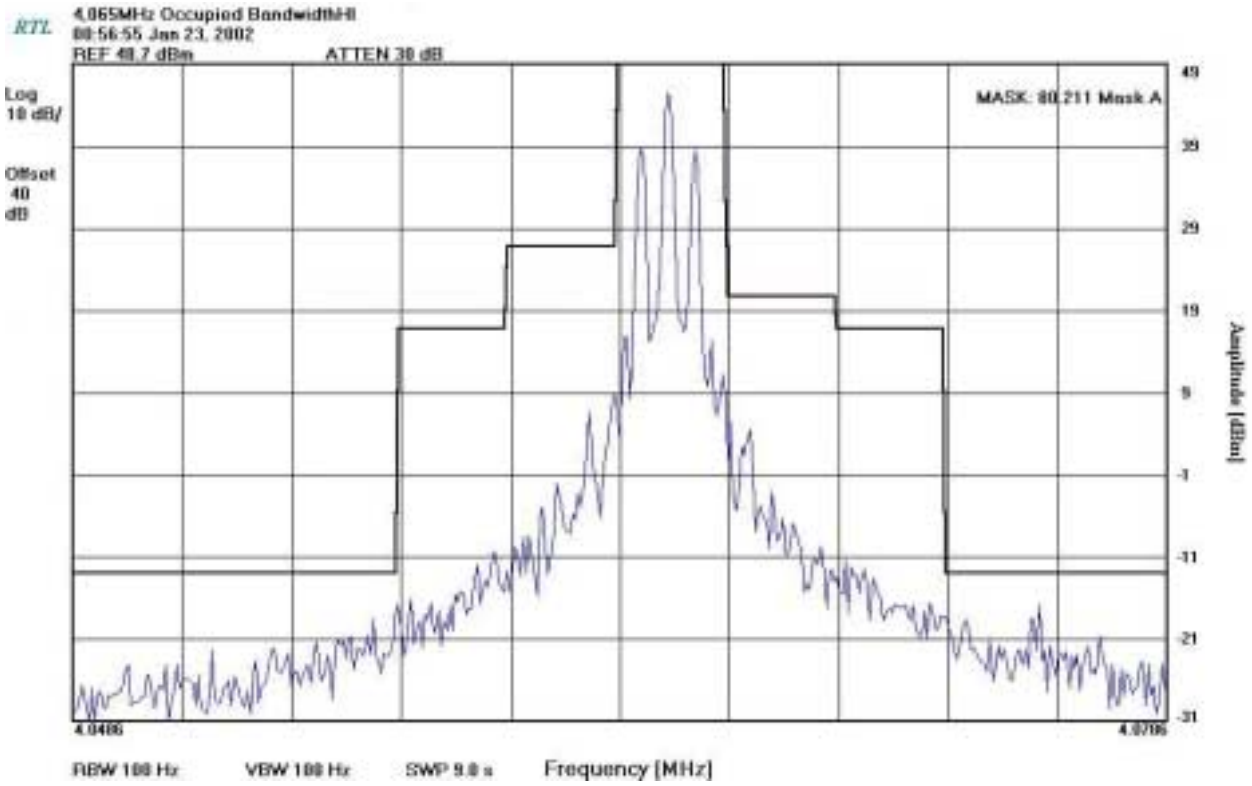
PLOT 5-12: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 1.605MHZ H3E



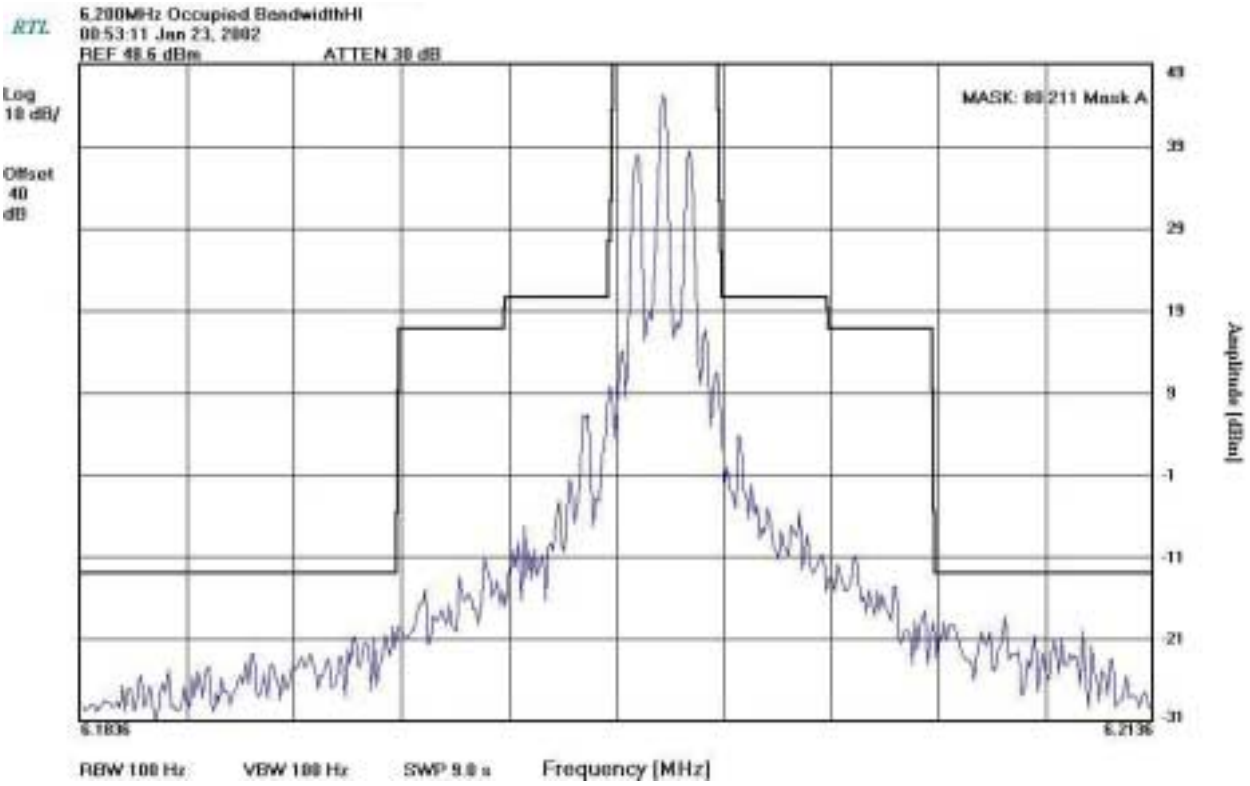
PLOT 5-13: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 2.182MHZ H3E



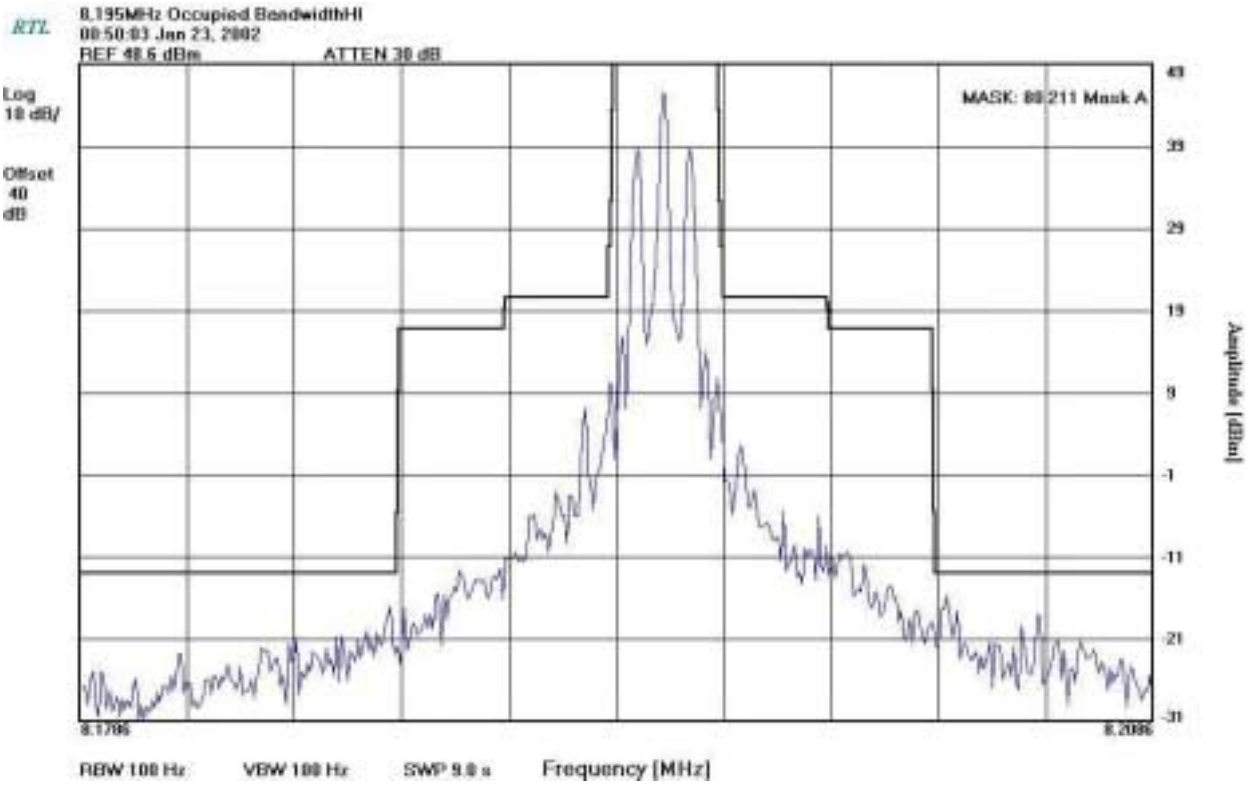
PLOT 5-14: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 4.065MHZ H3E



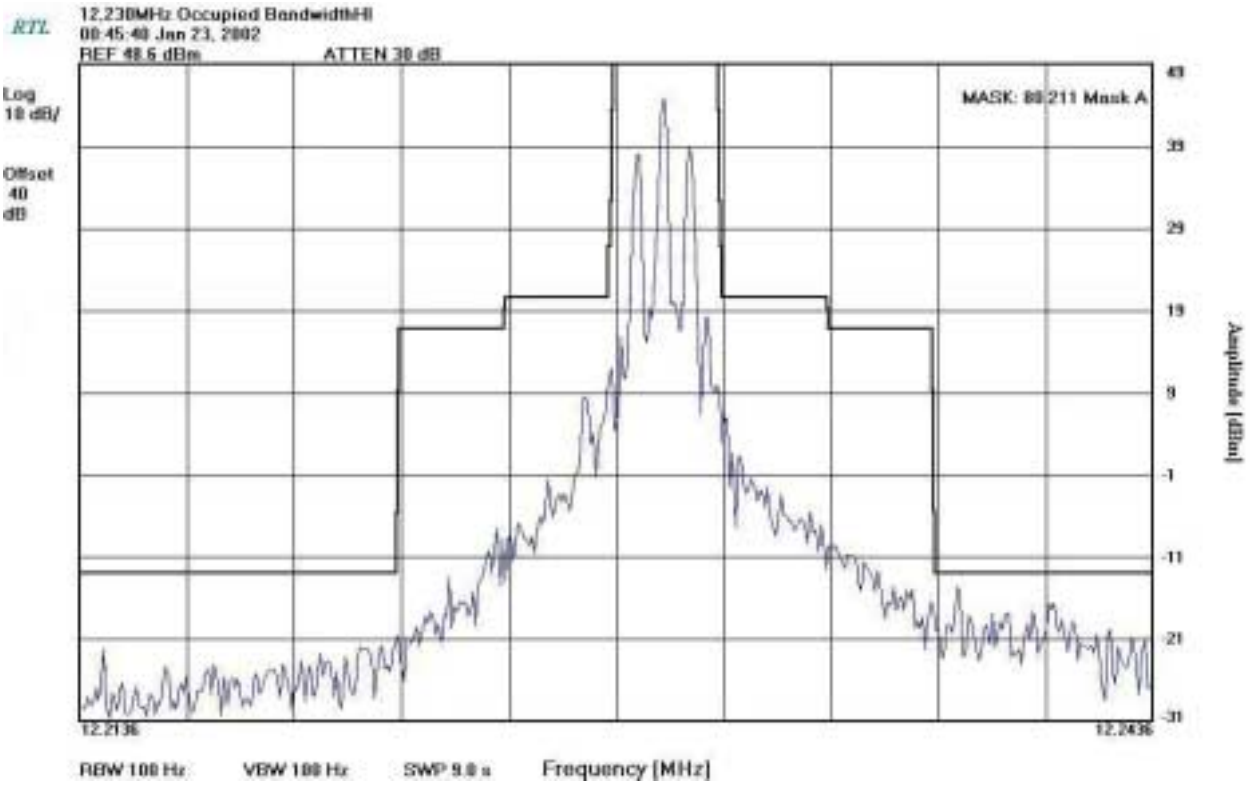
PLOT 5-15: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 6.200MHZ H3E



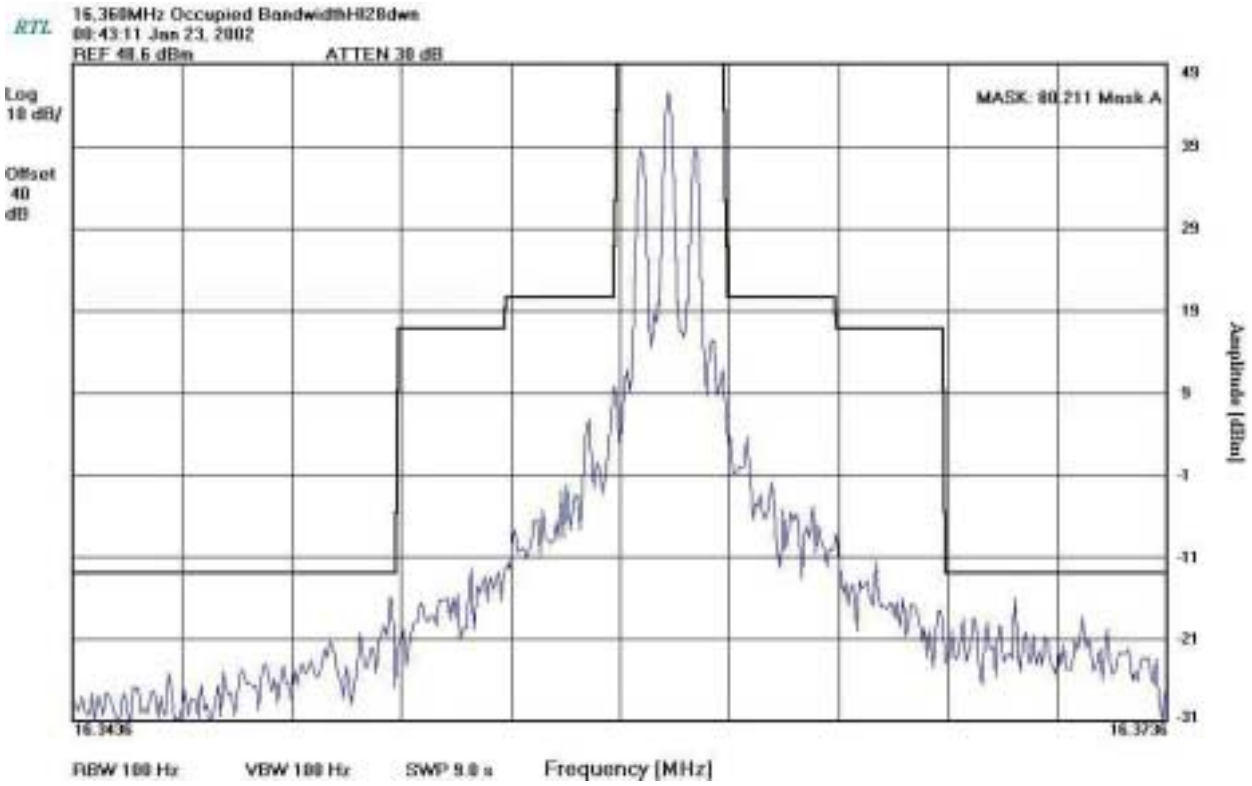
PLOT 5-16: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 8.195MHZ H3E



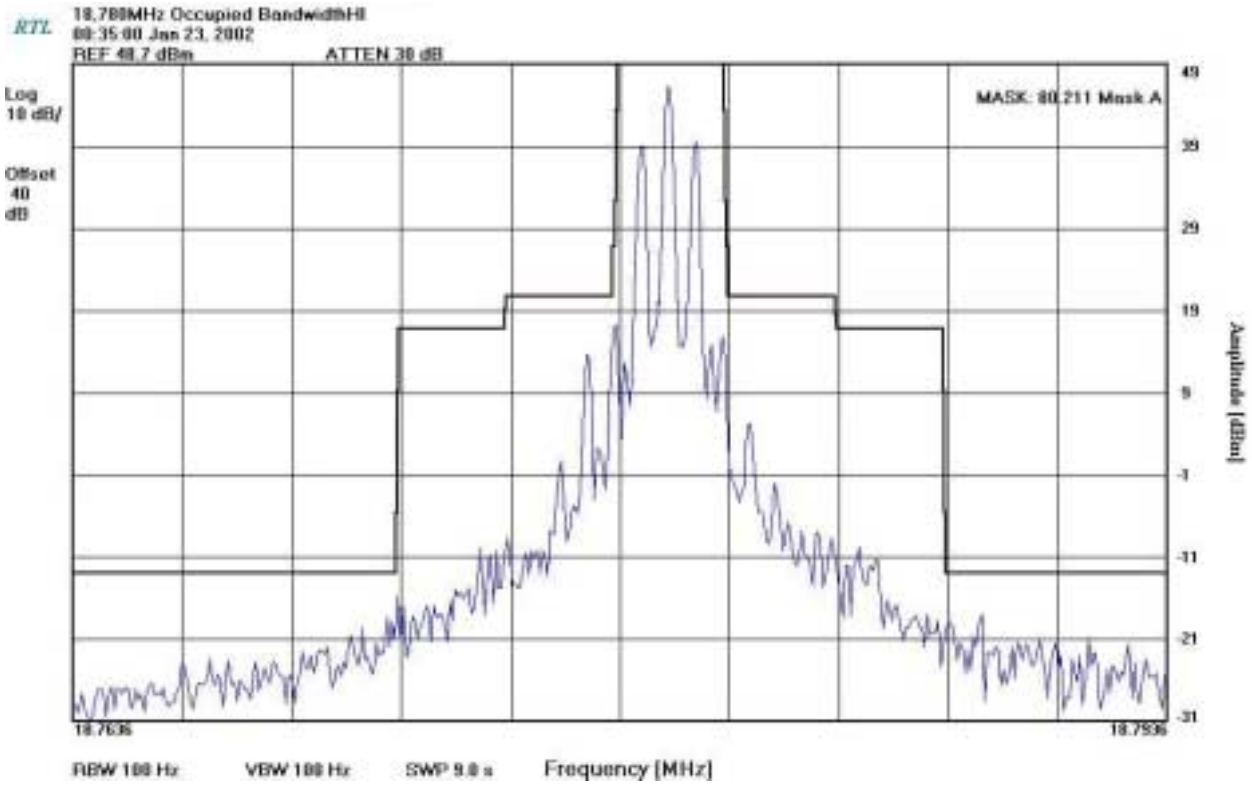
PLOT 5-17: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 12.230MHZ H3E



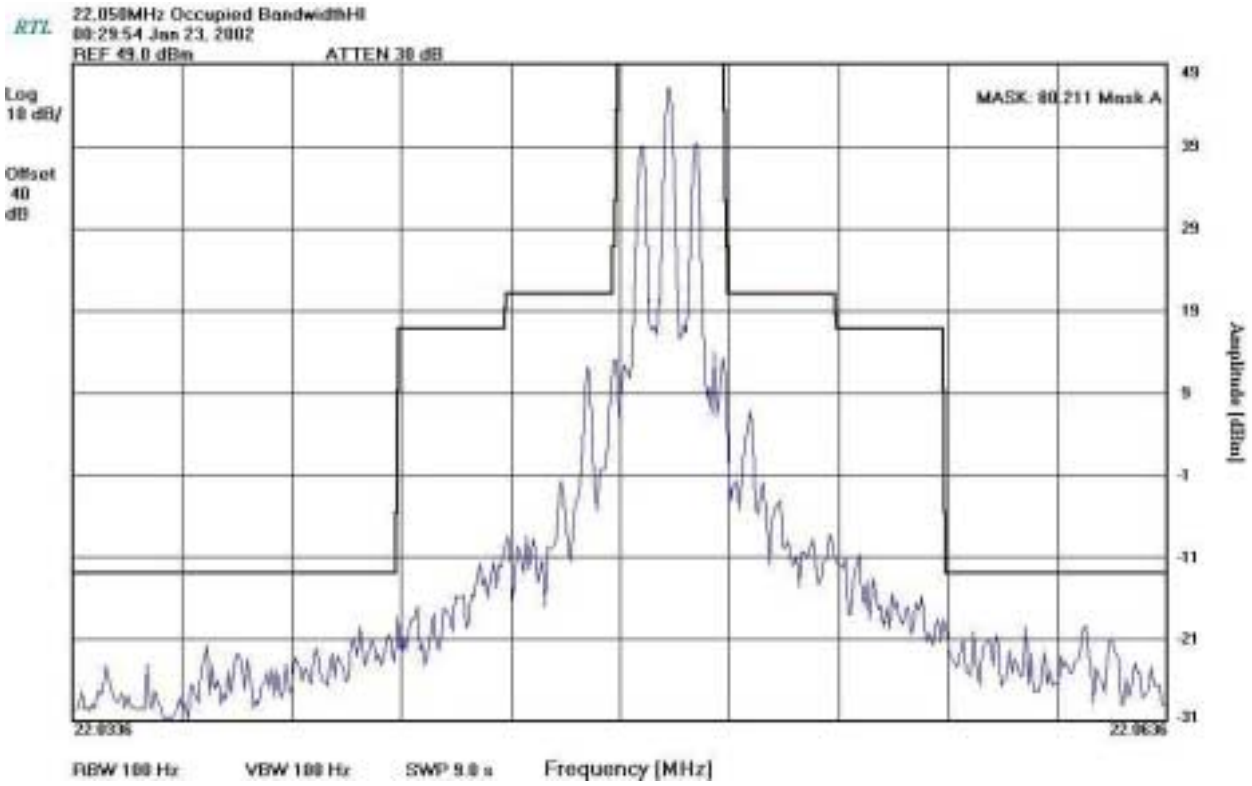
PLOT 5-18: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 16.360MHZ H3E



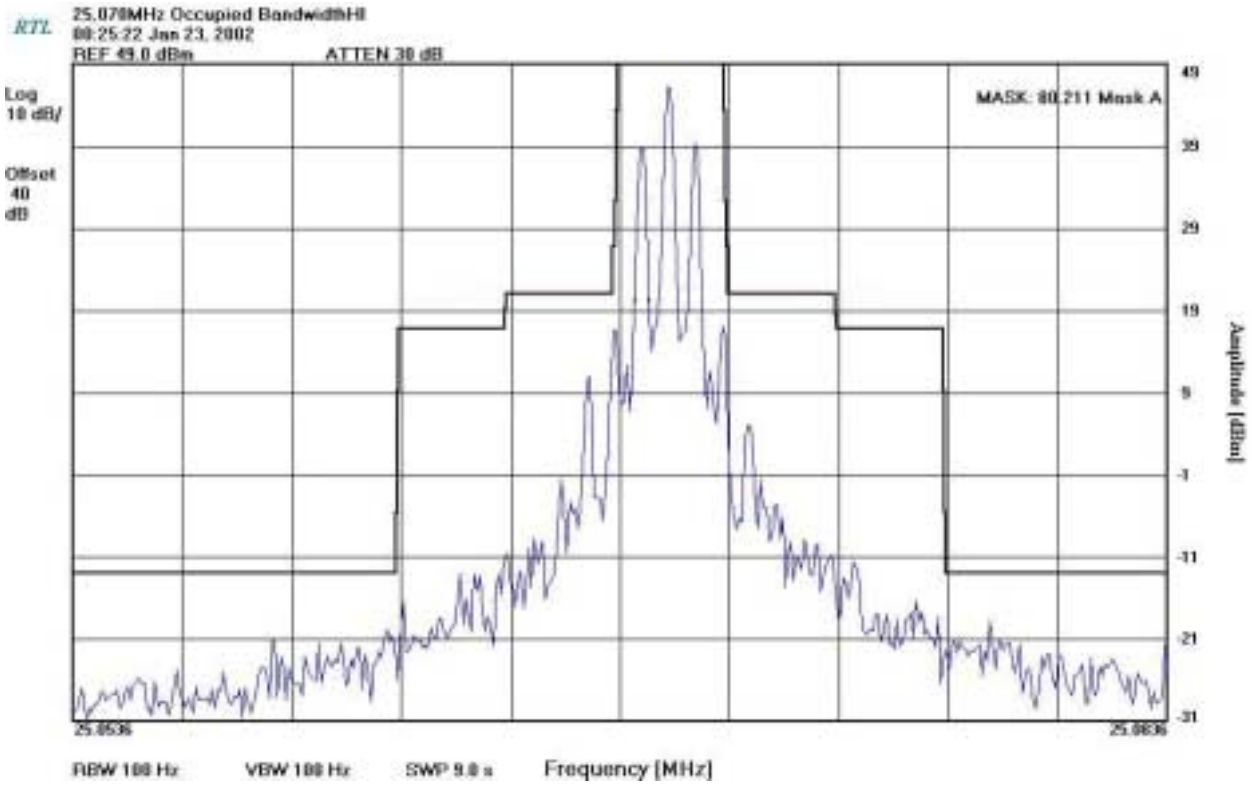
PLOT 5-19: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 18.780MHZ H3E



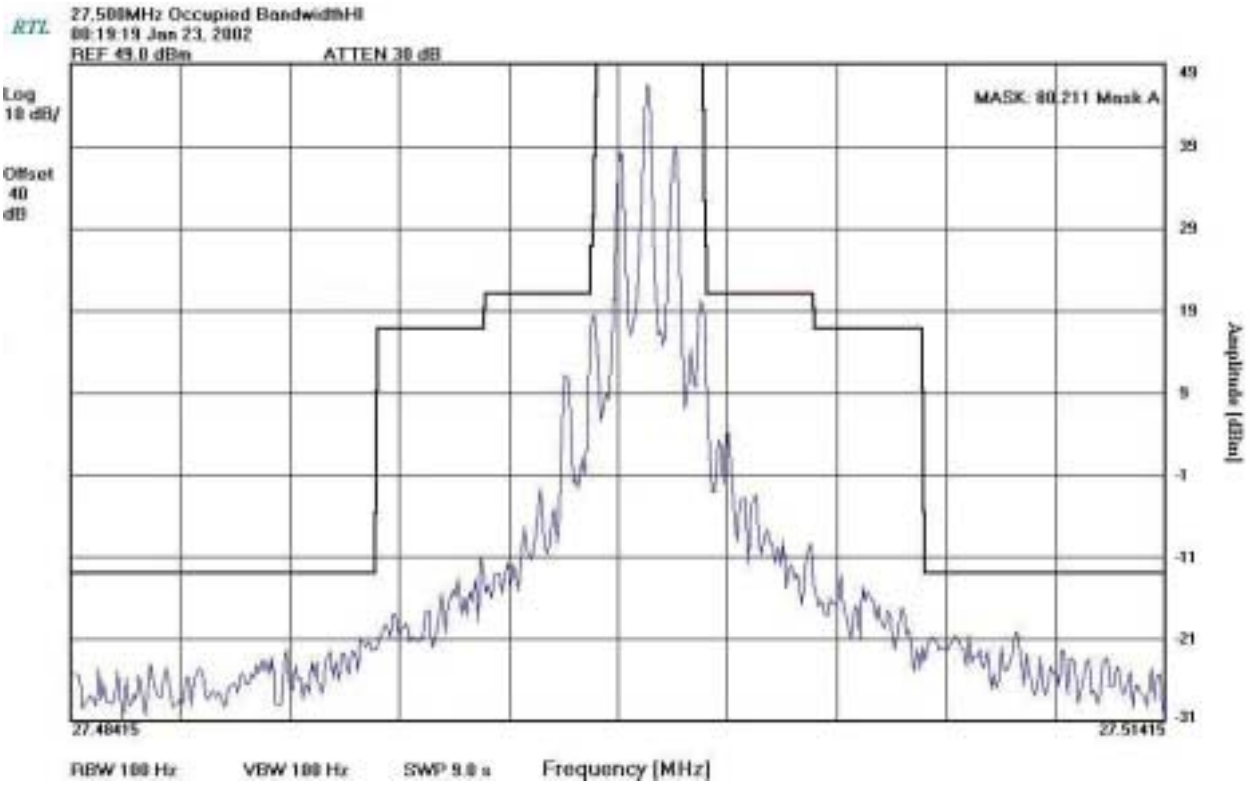
PLOT 5-20: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 22.050MHZ H3E



PLOT 5-21: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 25.050MHZ H3E

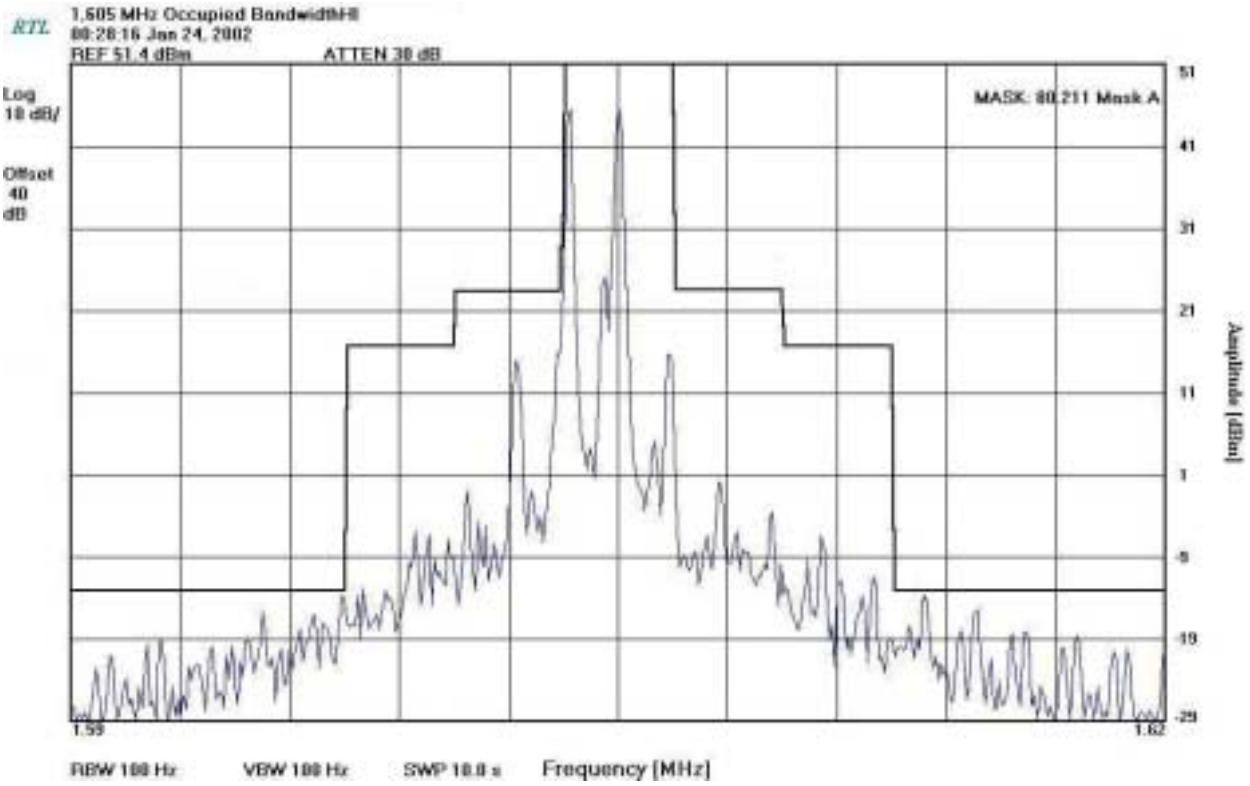


PLOT 5-22: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 27.500MHZ H3E

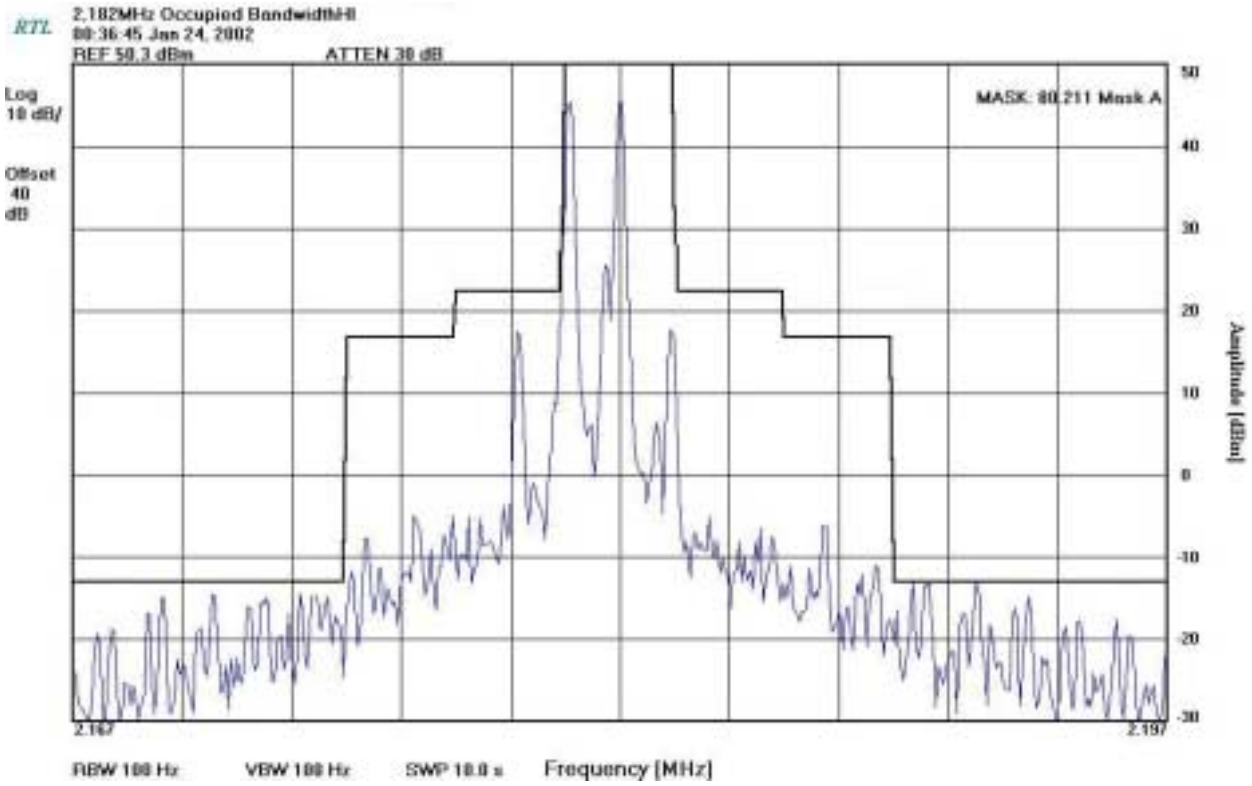


5.5 OCCUPIED BANDWIDTH PLOTS FOR EMISSION TYPE J2B

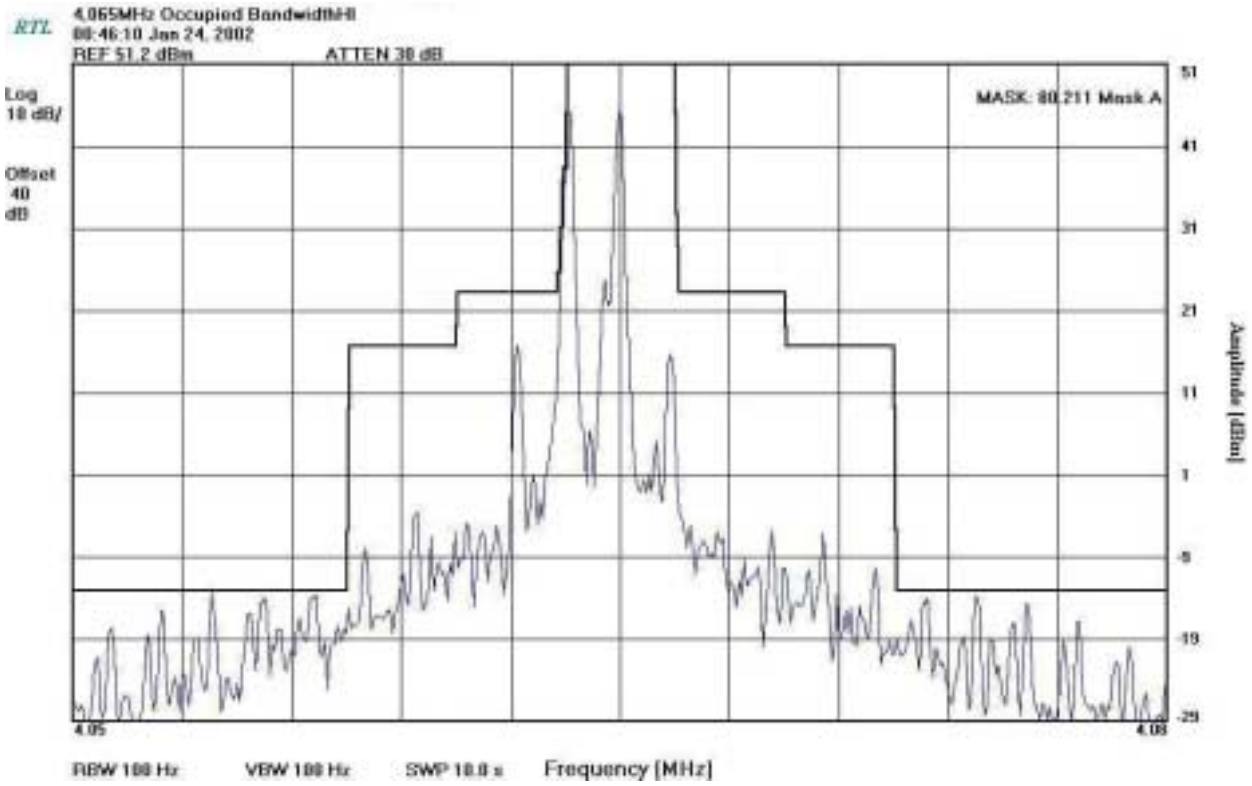
PLOT 5-23: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 1.605MHZ J2B



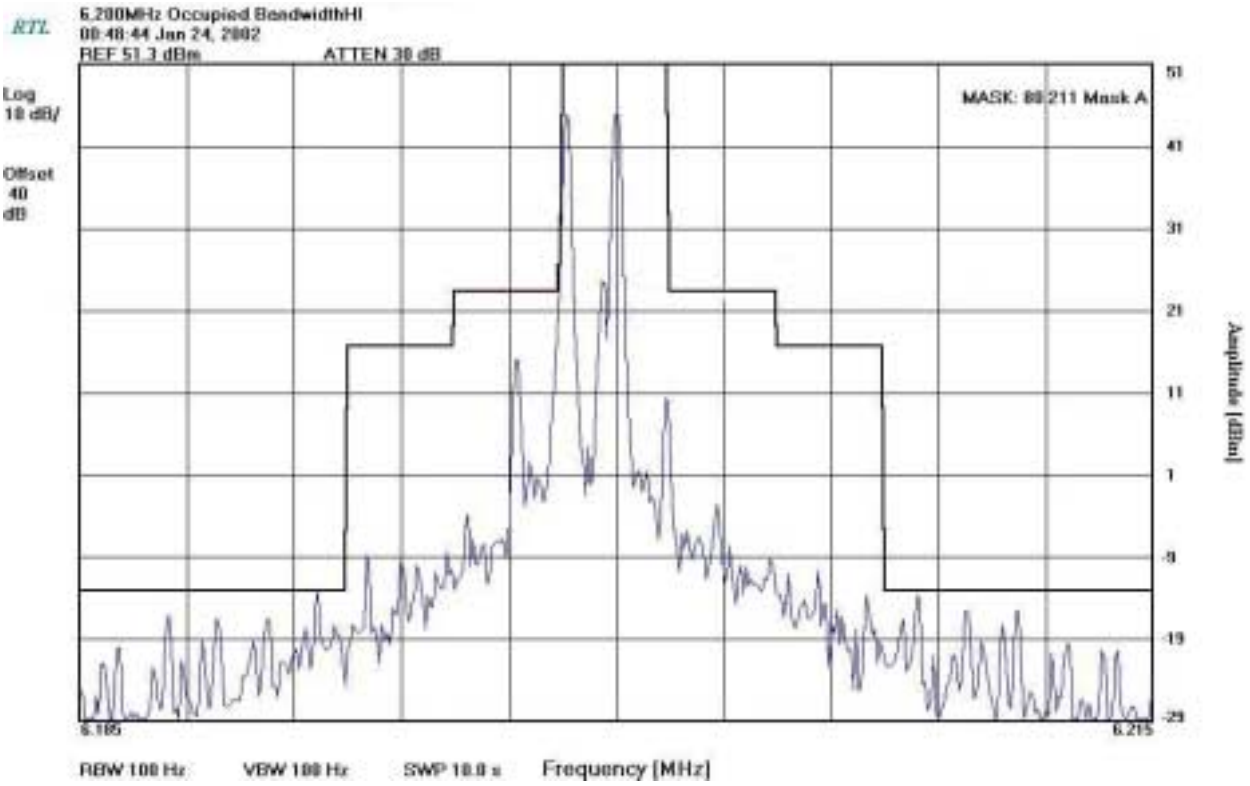
PLOT 5-24: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 2.182MHZ J2B



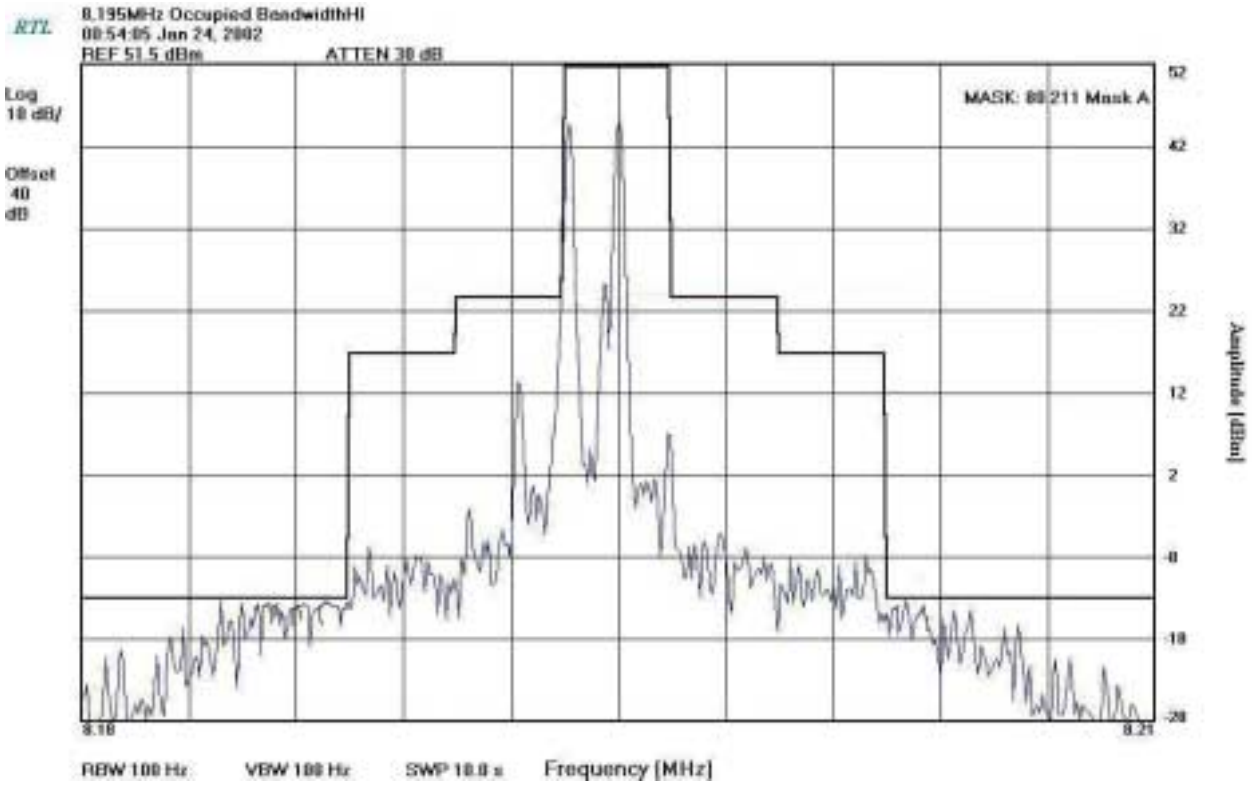
PLOT 5-25: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 4.065MHZ J2B



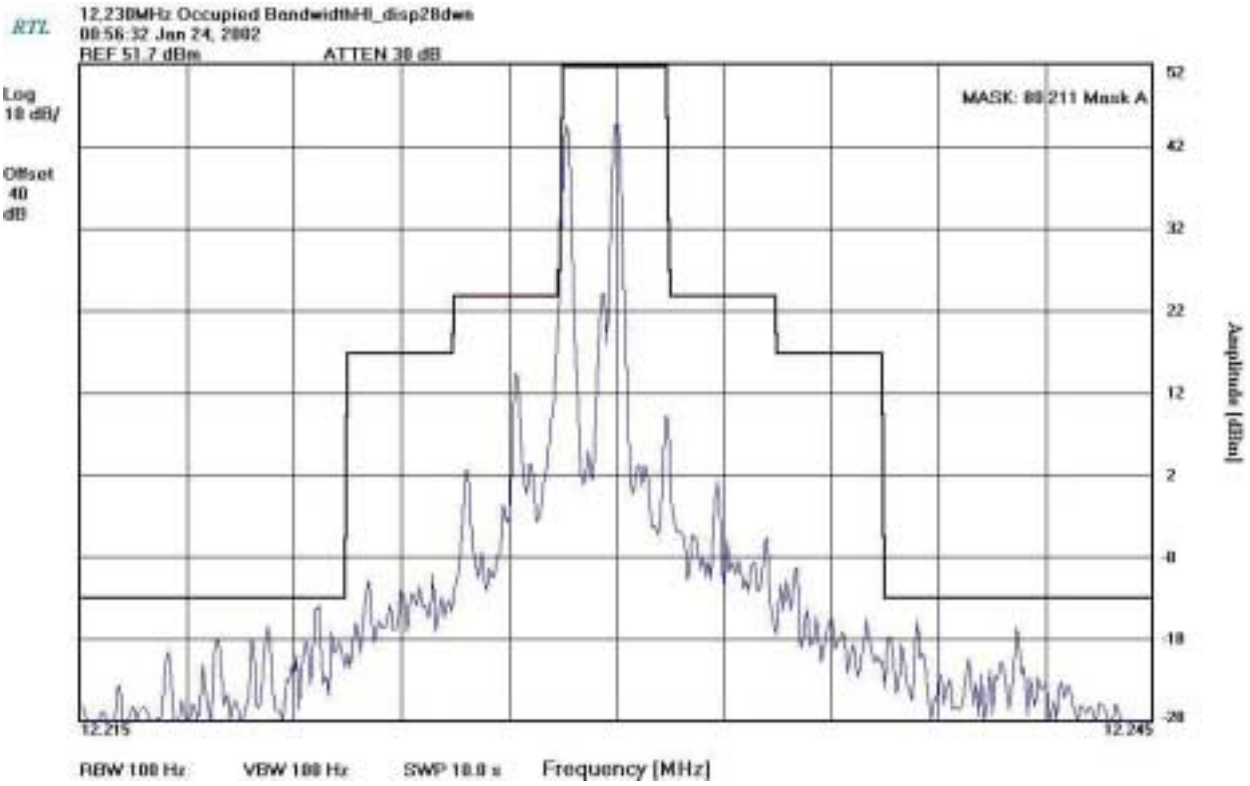
PLOT 5-26: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 6.200MHZ J2B



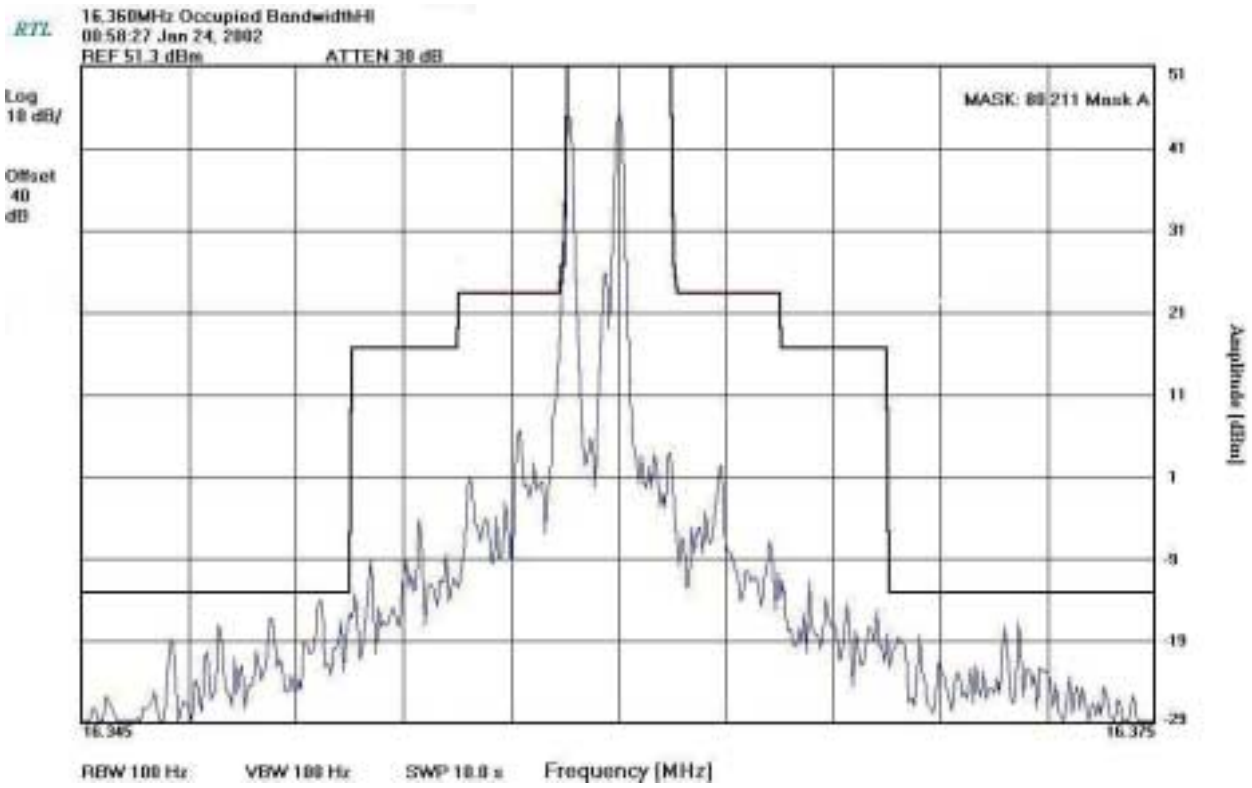
PLOT 5-27: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 8.195MHZ J2B



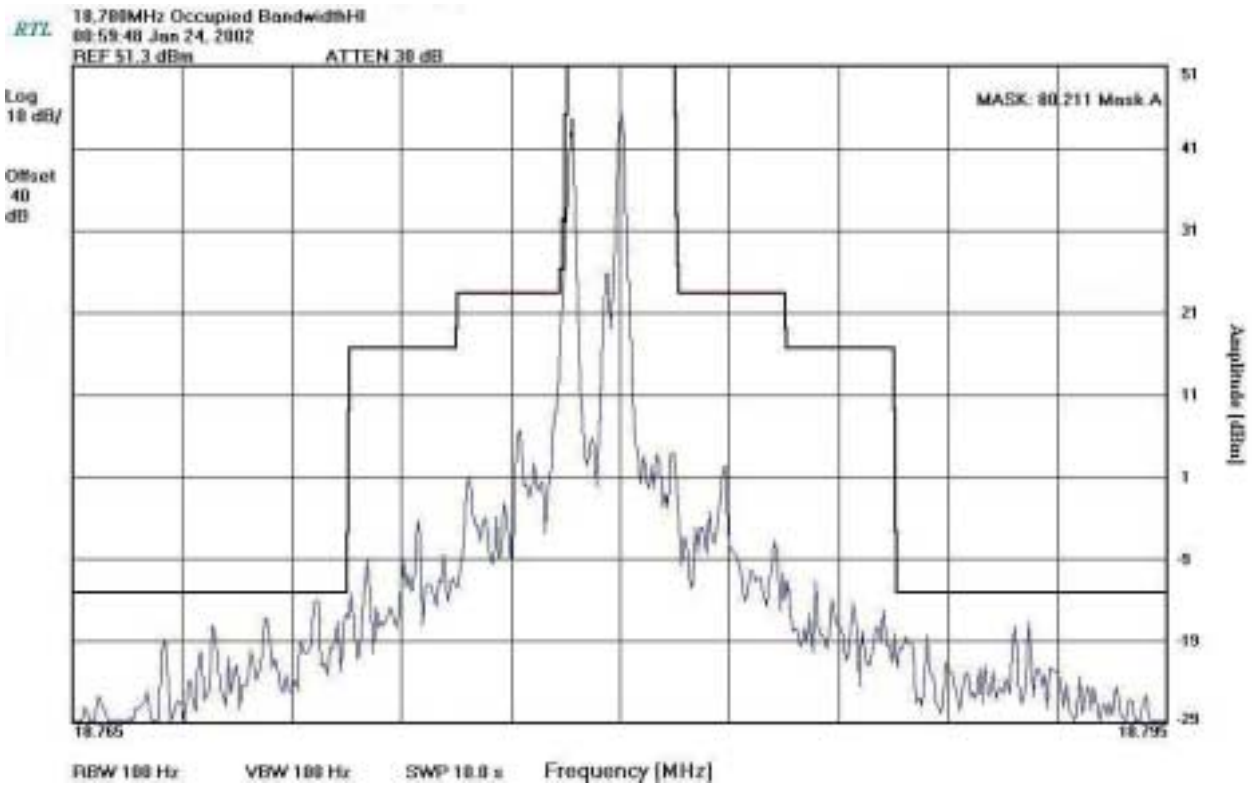
PLOT 5-28: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 12.230MHZ J2B



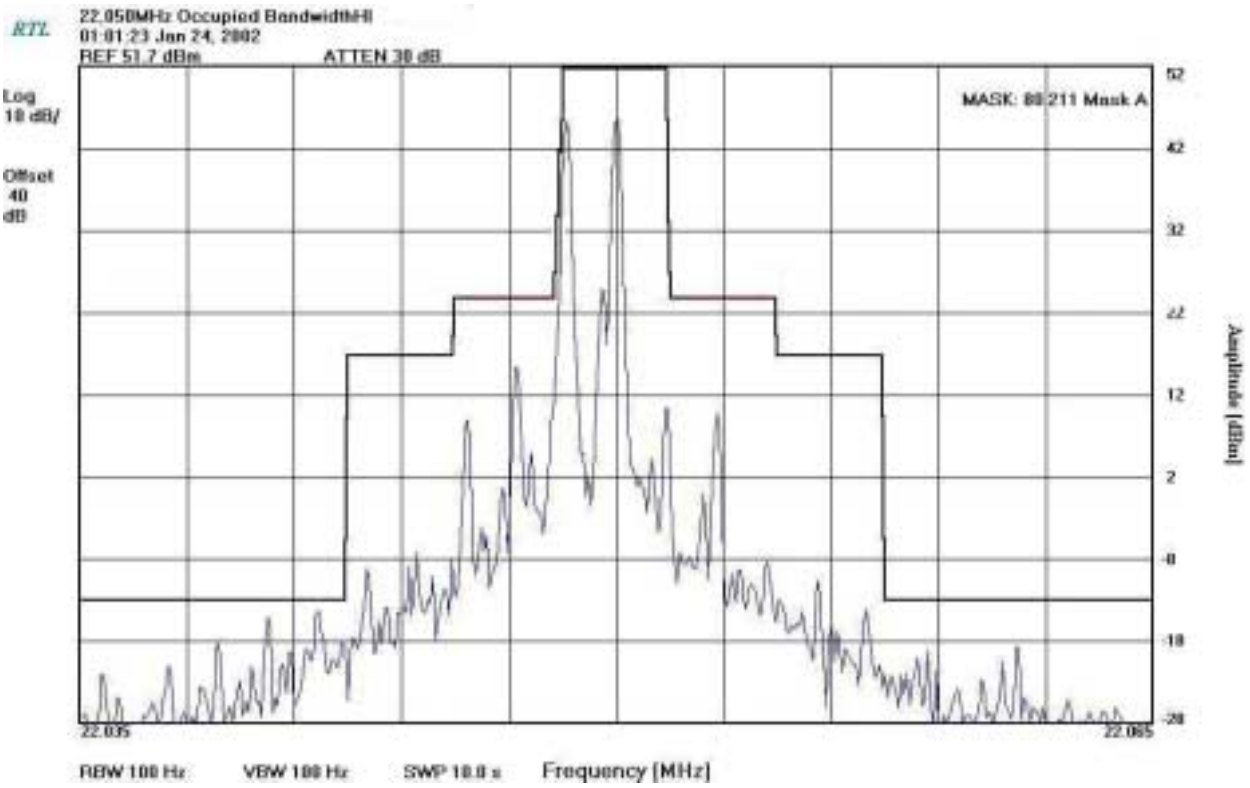
PLOT 5-29: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 16.360MHZ J2B



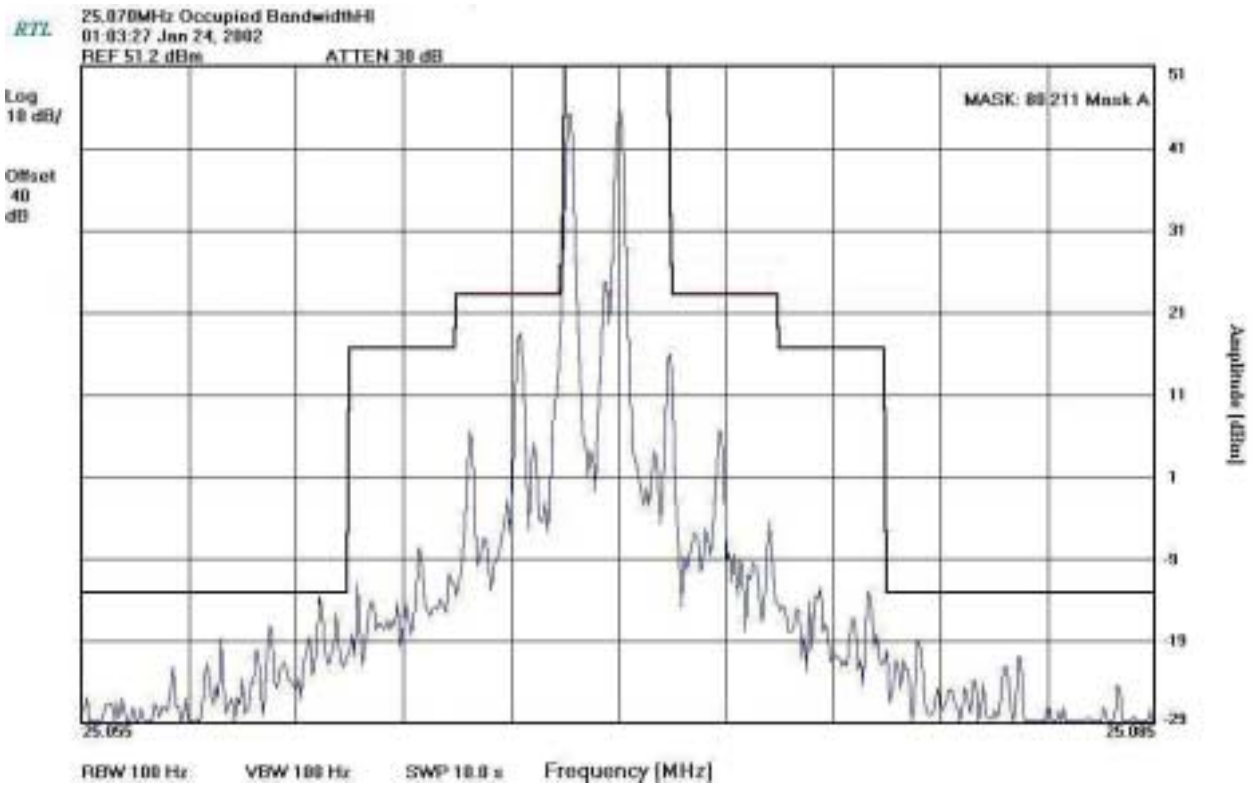
PLOT 5-30: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 18.780MHZ J2B



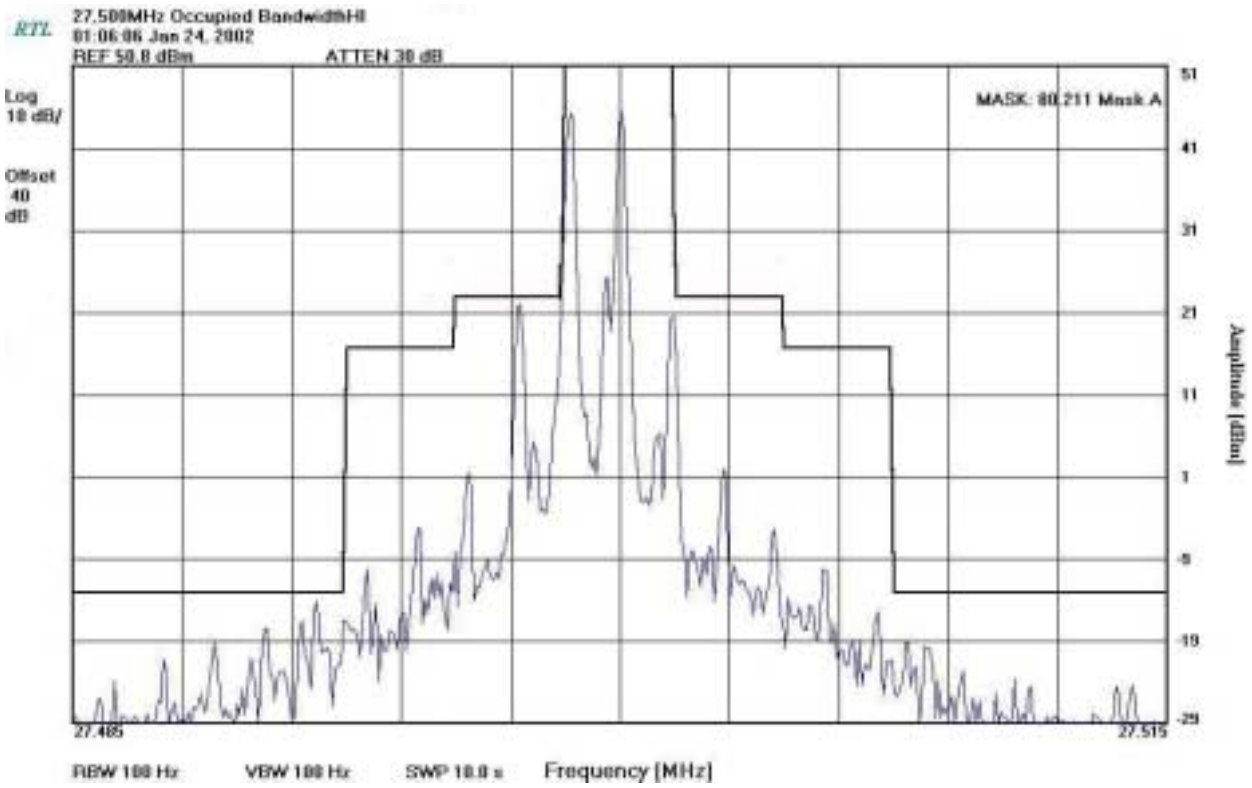
PLOT 5-31: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 22.050MHZ J2B



PLOT 5-32: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 25.050MHZ J2B



PLOT 5-33: OCCUPIED BANDWIDTH (3KHZ): CHANNEL FREQUENCY 27.500MHZ J2B



6 SPURIOUS EMISSIONS AT ANTENNA TERMINAL - §2.1051

6.1 SPURIOUS EMISSIONS TEST PROCEDURES

6.1.1 SPURIOUS EMISSIONS AT ANTENNA TERMINAL - §80.211

The level of the carrier and the various conducted spurious frequencies was measured by means of a calibrated spectrum analyzer. The antenna output terminal of the EUT was connected to the input of a 50 Ω spectrum analyzer through a matched 30dB attenuator and coaxial cable. The transmitter was operating at maximum power with internal data modulation.

6.1.2 MEASUREMENT PROCEDURE

The following spectrum analyzer bandwidth settings should be used for measurement of spurious emissions. When operating in the radiotelephony mode or the supervisory audio tone mode: (1) Any emission not more than 45 kHz removed from the carrier frequency, 300 Hz. (2) Any emission more than 45 kHz removed from the carrier frequency, 30 kHz. When operating in the wideband data mode or the signaling tone mode: (1) Any emission not more than 60 kHz removed from the carrier frequency, 300 Hz. (2) Any emission more than 60 kHz removed from the carrier frequency, 30 kHz.

6.1.3 EMISSION LIMITS - §80.211

The power of any emission shall be attenuated below the transmitter power, as measure in accordance with FCC §80.211

6.2 SPURIOUS EMISSIONS AT ANTENNA TERMINAL TEST EQUIPMENT

TABLE 6-1: SPURIOUS EMISSIONS AT ANTENNA TERMINAL TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
900927	Tektronix	ASG 100	Audio Signal Generator	B03274 V2.3
901020	Hewlett Packard	8564E	Portable Spectrum Analyzer (9 kHz - 40 GHz)	3943A01719
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585
901054	Hewlett Packard	HP 3586B	Selective Level Meter	1928A01892
900913	Hewlett Packard	85462A	EMI Receiver RF Section (9 KHz – 6.5 GHz)	3325A00159

6.3 SPURIOUS EMISSIONS TEST DATA J3E

(Worst case data is presented for J3E mode only)

	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)
FO	**1.605**	51.4	-	**2.182**	51.0	-	**4.065**	51.1	-
2FO	3.210	-14.2	-65.6	4.364	-15.7	-66.7	8.130	-15.2	-66.3
3FO	4.815	-14.1	-65.5	6.546	-16.0	-67.0	12.195	-15.4	-66.5
4FO	6.420	-14.8	-66.2	8.728	-15.7	-66.7	16.260	-15.2	-66.3
5FO	8.025	-15.5	-66.9	10.910	-15.7	-66.7	20.325	-15.3	-66.4
6FO	9.630	-15.0	-66.4	13.092	-14.8	-65.8	24.390	-14.4	-65.5
7FO	11.235	-15.2	-66.6	15.274	-16.0	-67.0	28.455	-15.5	-66.6
8FO	12.840	-15.3	-66.7	17.456	-15.4	-66.4	32.520	-14.7	-65.8
9FO	14.445	-15.7	-67.1	19.638	-15.1	-66.1	36.585	-14.5	-65.6
10FO	16.050	-14.5	-65.9	21.820	-14.9	-65.9	40.650	-14.3	-65.4
LIMIT			61.75dB			61.75dB			61.75dB

	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)
FO	**6.200**	51.3	-	**8.195**	51.3	-	**12.230**	51.3	-
2FO	12.400	-13.7	-65.0	16.390	-15.7	-67.0	24.460	-14.9	-66.2
3FO	18.600	-14.1	-65.4	24.585	-16.0	-67.3	36.690	-14.9	-66.2
4FO	24.800	-14.8	-66.1	32.780	-15.7	-67.0	48.920	-14.8	-66.1
5FO	31.000	-15.7	-67.0	40.975	-15.7	-67.0	61.150	-15.1	-66.4
6FO	37.200	-15.0	-66.3	49.170	-14.8	-66.1	73.380	-13.7	-65.0
7FO	43.400	-15.2	-66.5	57.365	-16.0	-67.3	85.610	-15.1	-66.4
8FO	49.600	-15.1	-66.4	65.560	-15.4	-66.7	97.840	-14.3	-65.6
9FO	55.800	-15.7	-67.0	73.755	-15.1	-66.4	110.070	-14.1	-65.4
10FO	62.000	-14.5	-65.8	81.950	-14.9	-66.2	122.300	-13.9	-65.2
LIMIT			61.75dB			61.75dB			61.75dB

	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)
FO	**16.360**	51.3	-	**18.780**	51.2	-	**22.050**	51.2	-
2FO	32.720	-13.7	-65.0	37.560	-14.8	-66.0	44.100	-14.9	-66.1
3FO	49.080	-14.1	-65.4	56.340	-15.1	-66.3	66.150	-15.1	-66.3
4FO	65.440	-14.8	-66.1	75.120	-15.3	-66.5	88.200	-14.8	-66.0
5FO	81.800	-15.9	-67.2	93.900	-14.9	-66.1	110.250	-14.9	-66.1
6FO	98.160	-15.5	-66.8	112.680	-14.2	-65.4	132.300	-14.1	-65.3
7FO	114.520	-16.1	-67.4	131.460	-15.2	-66.4	154.350	-14.7	-65.9
8FO	130.880	-15.5	-66.8	150.240	-14.0	-65.2	176.400	-14.0	-65.2
9FO	147.240	-16.2	-67.5	169.020	-14.2	-65.4	198.450	-14.1	-65.3
10FO	163.600	-14.10	-65.4	187.800	-14.0	-65.2	220.500	-13.5	-64.7
LIMIT			61.75dB			61.75dB			61.75dB

	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)	FREQ (MHz)	Measured Level (dBm)	Measured Level (dBc)
FO	**25.070**	51.2	-	**27.500**	51.0	-
2FO	50.140	-16.2	-67.4	55.000	-15.2	-66.2
3FO	75.210	-14.8	-66.0	82.500	-15.2	-66.2
4FO	100.280	-15.0	-66.2	110.000	-15.0	-66.0
5FO	125.350	-15.3	-66.5	137.500	-15.3	-66.3
6FO	150.420	-14.4	-65.6	165.000	-14.4	-65.4
7FO	175.490	-15.0	-66.2	192.500	-15.2	-66.2
8FO	200.560	-13.9	-65.1	220.000	-14.5	-65.5
9FO	225.630	-14.3	-65.5	247.500	-14.6	-65.6
10FO	250.700	-14.8	-66.0	275.000	-14.7	-65.7
LIMIT			61.75dB			61.75dB

7 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §2.1053

7.1 RADIATED SPURIOUS AND HARMONIC EMISSIONS - §80.211

Radiated and harmonic emissions above 1 GHz were measured at our 3-meter outdoor site. The EUT was placed on the turntable with the transmitter transmitting into a non-radiating load. A receiving antenna located 3 meters from the turntable received any signal radiated from the transmitter and its operating accessories. The receiving antenna was varied from 1 to 4 meters and the polarization was varied to determine the worst-case emission level.

7.2 RADIATED SPURIOUS TEST EQUIPMENT

FIGURE 1: RADIATED SPURIOUS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
901053	Schaffner Chase	CBL6112B	Bi-Log Antenna (20 MHz – 2 GHz)	2648
900905	RTL	PR-1040	AMPLIFIER	900905
900931	Hewlett Packard	8566B	Spectrum Analyzer (100 Hz – 22 GHz)	3138A07771
900969	Hewlett Packard	85650A	Quasi-Peak Adapter	2412A00414
900889	Hewlett Packard	85685A	RF Pre-selector for HP 8566B or 8568B (20Hz-2GHz)	3146A01309
901142	Hewlett Packard	HP8660C (9KHz-3200MHz)	Synthesized Signal Generator	1947A02956

7.3 FIELD STRENGTH OF SPURIOUS RADIATION TEST DATA - §80.211

(Worst case data is presented for J3E mode only)

FIGURE 2: CHANNEL FREQUENCY 1.605MHZ

Frequency (MHz)	Signal Generator Level (dBm)	cable loss (dB)*	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBc)	Margin (dB)	Detector
32.100	-75.3	0.2	-0.85	127.70	-63.3	Pk
33.705	-76.5	0.2	-0.85	128.90	-64.5	Pk
35.310	-77.3	0.3	-0.85	129.80	-65.4	Pk
36.915	-76.6	0.2	-0.85	129.00	-64.6	Pk
38.520	-78.3	0.1	-0.85	130.60	-66.2	Pk
40.125	-78.8	0.1	-0.85	131.10	-66.7	Pk
41.730	-76.7	0.0	-0.85	128.90	-64.5	Pk
43.335	-75.3	0.1	-0.85	127.60	-63.2	Pk
44.940	-73.8	0.4	-0.85	126.40	-62.0	Pk
46.545	-75.0	0.1	-0.85	127.30	-62.9	Pk
46.545	-84.5					Av
115.560	-77.7	0.1	-0.05	129.20	-64.8	Pk
115.560	-87.3					Av
211.860	-82.0	0.2	-0.65	134.20	-69.8	Pk
211.860	-88.6					Av
234.330	-79.8	0.1	-0.65	131.90	-67.5	Pk
234.330	-89.0					Av

FIGURE 3: CHANNEL FREQUENCY 16.360MHZ

Frequency (MHz)	Signal Generator Level (dBm)	cable loss (dB)*	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBc)	Margin (dB)	Detector
32.700	-75.6	0.2	-0.85	129.40	-63.3	Pk
32.700	-83.4					Av
49.100	-79.8	0.3	-0.85	129.40	-63.3	Pk
49.100	-90.6					Av
65.400	-79.6	0.1	-0.05	129.40	-63.3	Pk
65.400	-91.9					Av
81.800	-87.7	0.0	-0.05	129.40	-63.3	Pk
81.800	-96.2					Av
98.200	-79.7	0.4	-0.05	129.40	-63.3	Pk
98.200	-89.5					Av
114.500	-75.6	0.1	-0.05	129.40	-63.3	Pk
114.500	-86.0					Av
130.900	-79.8	0.2	-0.45	129.40	-63.3	Pk
130.900	-89.6					Av
147.200	-79.8	0.2	-0.05	129.40	-63.3	Pk
147.200	-91.3					Av
163.600	-78.7	0.2	-0.05	129.40	-63.3	Pk
163.600	-85.7					Av
180.000	-78.1	0.1	-0.45	129.40	-63.3	Pk
180.000	-84.9					Av
196.300	-78.8	0.1	-0.65	129.40	-63.3	Pk
196.300	-89.0					Av

FIGURE 4: CHANNEL OF FREQUENCY 27.500MHZ

Frequency (MHz)	Signal Generator Level (dBm)	Cable loss (dB)*	Corrected Antenna Gain (dB)	Corrected Signal Generator Level (dBc)	Margin (dB)	Detector
55.000	-81.95	0.6	-0.85	134.80	-70.4	Pk
55.000	-91.6					Av
82.500	-77.9	0.4	-0.05	129.70	-65.3	Pk
82.500	-85.9					Av
110.000	-77.0	0.1	-0.05	128.50	-64.1	Pk
110.000	-86.9					Av
137.500	-74.6	0.0	-0.45	126.40	-62.0	Pk
137.500	-84.7					Av
165.000	-79.1	0.1	-0.05	130.60	-66.2	Pk
165.000	-85.6					Av
192.500	-79.5	0.3	-0.45	131.60	-67.2	Pk
192.500	-86.7					Av
220.000	-78.5	0.2	-0.65	130.70	-66.3	Pk
220.000	-88.7					Av
247.500	-80.4	0.1	-0.55	132.40	-68.0	Pk
247.500	-87.8					Av
275.000	-77.3	0.2	-0.55	129.40	-65.0	Pk
275.000	-86.8					Av

*Cable loss from transmitting antenna to signal generator
Measurement accuracy is +/- .5 dB

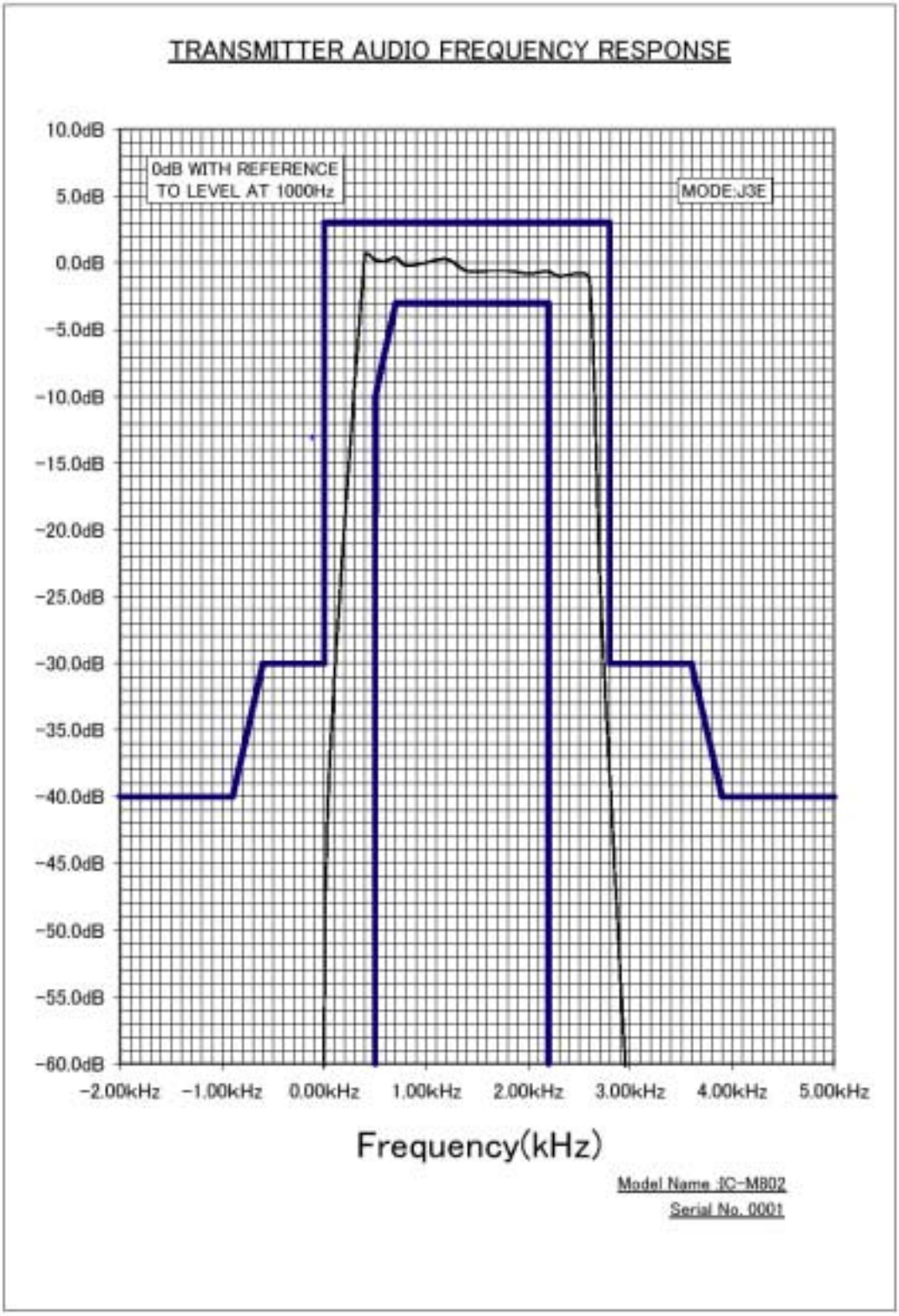
8 MODULATION CHARACTERISTICS - §2.1047

8.1 MODULATION REQUIREMENTS - §80.213 TEST PROCEDURE

8.2 MODULATION CHARACTERISTICS TEST EQUIPMENT

FIGURE 5: MODULATION CHARACTERISTICS TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
901055	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2545A04102
901057	Hewlett Packard	3336B	Synthesizer/Level Generator	2514A02585
901054	Hewlett Packard	HP 3586B	Selective Level Meter	1928A01892


TRANSMITTER AUDIO FREQUENCY RESPONSE
0dB WITH REFERENCE
TO LEVEL AT 1000Hz
MODE:J3E
10.0dB
5.0dB
0.0dB
-5.0dB
-10.0dB
-15.0dB
-20.0dB
-25.0dB
-30.0dB
-35.0dB
-40.0dB
-45.0dB
-50.0dB
-55.0dB
-60.0dB
-2.00kHz
-1.00kHz
0.00kHz
1.00kHz
2.00kHz
3.00kHz
4.00kHz
5.00kHz
Frequency(kHz)
Model Name :IC-M802
Serial No. 0001

9 FREQUENCY STABILITY / TEMPERATURE VARIATION - §2.1055

9.1 MEASUREMENT METHOD:

The frequency stability of the transmitter was measured by:

1. Temperature: The temperature was varied from -30°C to +60°C at intervals no more than 10°C throughout the temperature range using an environmental chamber. A period of time sufficient to stabilize all of the components in the equipment shall be allowed prior to each frequency measurement.
2. Primary Supply Voltage: The primary supply voltage was varied from 85% to 115% of the voltage normally at the input to the device or at the power supply terminals if cables are not normally supplied. The EUT was tested down to the battery endpoint.

9.2 TIME PERIOD AND PROCEDURE:

1. The carrier frequency of the transmitter was measured at room temperature (25°C to 27°C to provide a reference).
2. The equipment was subjected to an overnight “soak” at -30°C without any power applied.
3. After the overnight “soak” at -30°C, the measurement of the carrier frequency of the transmitter was made within a three-minute interval after applying power to the transmitter.
4. Frequency measurements were made at 10°C intervals up to +60°C, then back to room temperature. A minimum period of one hour was provided to allow stabilization of the equipment at each temperature level.

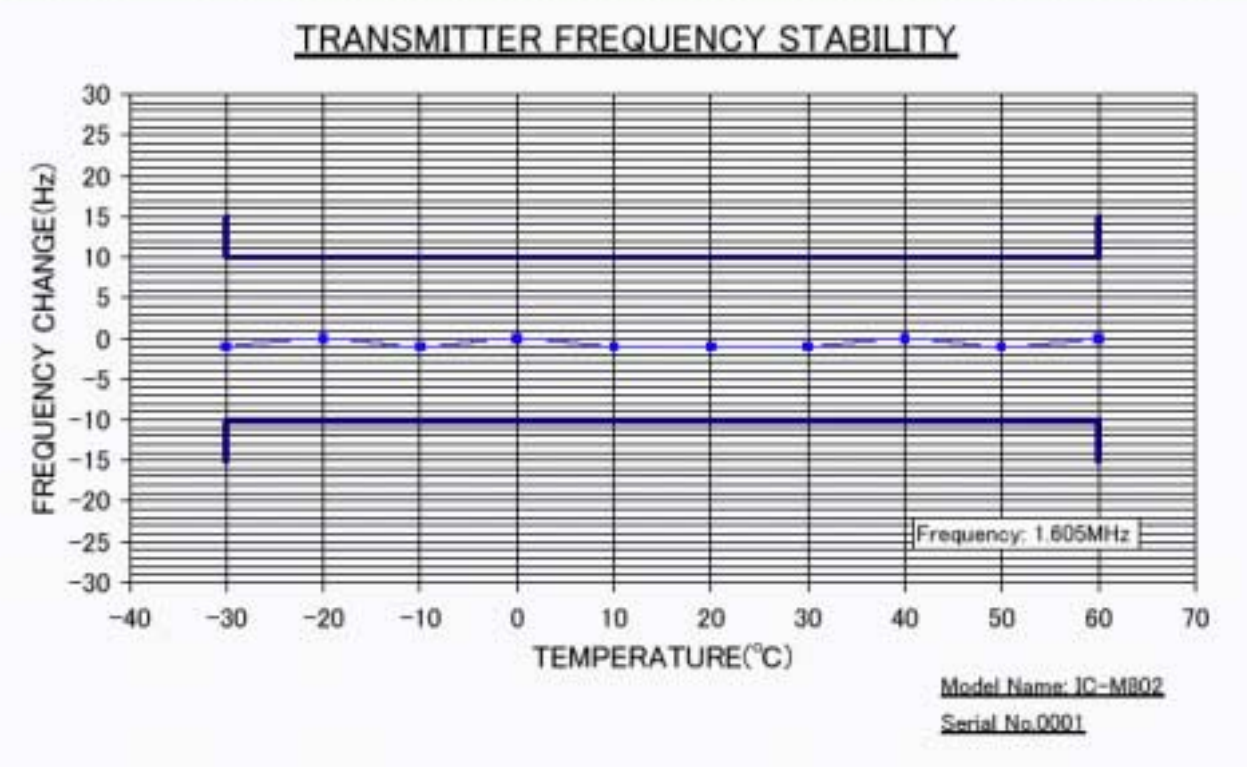
9.3 FREQUENCY TOLERANCE §80.209:

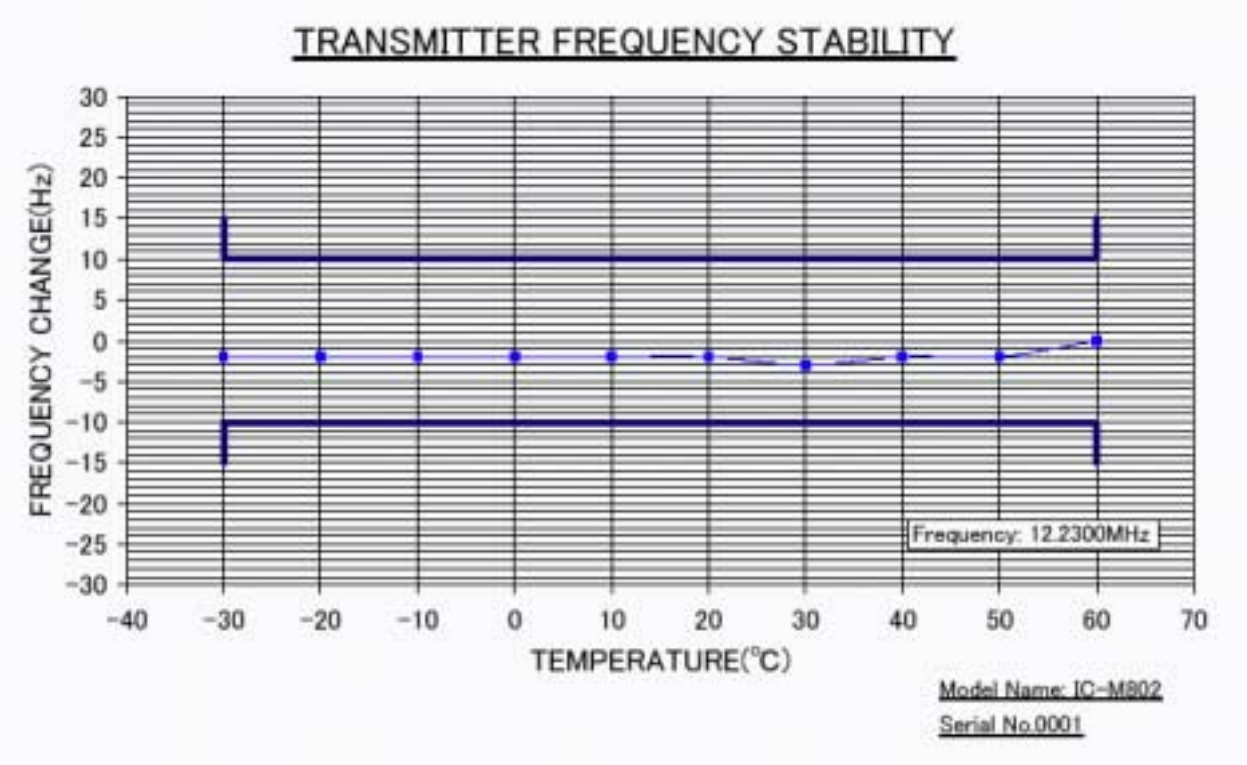
The minimum frequency stability shall be + 0.00005% (+300Hz) referenced to a received carrier frequency from a base station. This meets the requirement for operational accuracy of 0.00005% for digital mode.

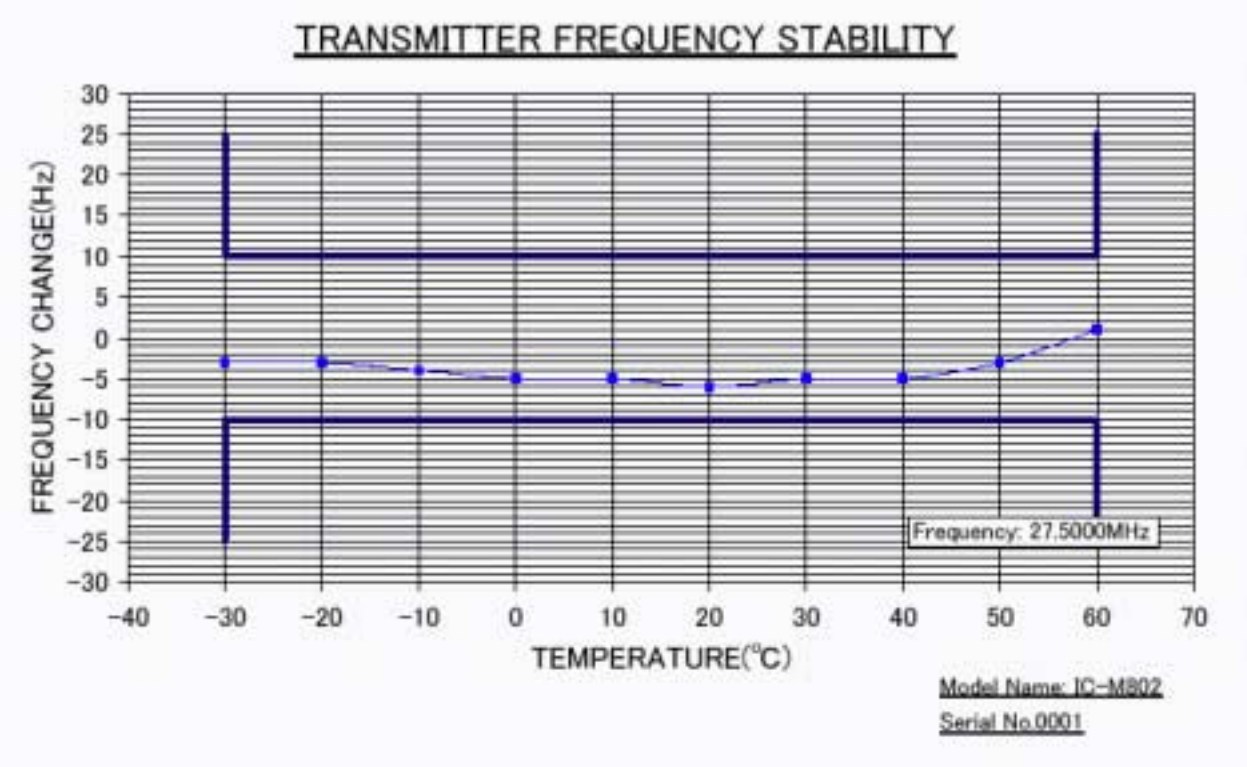
9.4 FREQUENCY STABILITY TEST EQUIPMENT

FIGURE 6: FREQUENCY STABILITY TEST EQUIPMENT

RTL Asset #	Manufacturer	Model	Part Type	Serial Number
900946	Tenney Engineering, Inc.	TH65	Temperature Chamber with Humidity	11380
901055	Hewlett Packard	8901A Opt. 002-003	Modulation Analyzer	2545A04102


TRANSMITTER FREQUENCY STABILITY
FREQUENCY CHANGE(Hz)
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-40
-30
-20
-10
0
10
20
30
40
50
60
70
TEMPERATURE(°C)
Frequency: 1.605MHz
Model Name: IC-M802
Serial No.0001


TRANSMITTER FREQUENCY STABILITY
FREQUENCY CHANGE(Hz)
30
25
20
15
10
5
0
-5
-10
-15
-20
-25
-30
-40
-30
-20
-10
0
10
20
30
40
50
60
70
TEMPERATURE(°C)
Frequency: 12.2300MHz
Model Name: IC-M802
Serial No.0001



TX FREQUENCY STABILITY-SUPPLY VOLTAGE **(FCC:2.1055 80.209)**
MODEL:IC-M802 **SERIAL NO.0001**

Test Freq.	27.5MHz		
	Frequency change		
Voltage	11.56V	13.60V	15.56V
Temperature			
-30•	-2	-3	-3
-20•	-3	-3	-3
-10•	-4	-4	-4
0•	-5	-5	-5
10•	-5	-5	-5
20•	-6	-6	-6
30•	-5	-5	-6
40•	-5	-5	-5
50•	-3	-3	-3
60•	1	1	1

10 CONCLUSION

Test Lab:	Applicant Information:
Rhein Tech Laboratories, Inc. Phone: 703-689-0368 360 Herndon Parkway Fax: 703-689-2056 Suite 1400 Web Site: www.rheintech.com Herndon, VA 20170	ICOM Incorporated 12380 116th Avenue NE Bellevue, WA 98004 USA Phone: (425) 454-8155 (Masaaki Takahashi)

FCC ID:	AFJIC-M802	**FRN NUMBER:**	0005-8553-90
EQUIPMENT TYPE:	HF MARINE TRANSCEIVER	**MODEL(S):**	IC-M802
RTL WORK ORDER NUMBER:	2001335	**RTL QUOTE NUMBER:**	QRTL01-50DB
DATE OF TEST REPORT:	February 1, 2002		

FCC Classification:	☐ GHF– Part 80 HF Transmitter (GMDSS) ☐ GHH – Part 80 VHF Hand Held Transmitter (GMDSS) ☐ GMF – Part 80 MF Transmitter (GMDSS) ☐ GVH – Part 80 VHF Transmitter (GMDSS) ☐ MWR – Part 80 Marine Watch Receiver ☐ RNV – Part 80 Navtex Receiver ☒ TDC – Part 80 DSC Controller
FCC Rule Part(s):	Part 80: Stations in the Maritime Services Part 87: Aviation Services Part 90: Private Land Mobile Radio Services
Industry Canada Standard:	☐ RSS-117: Land and Coast Station Transmitters Using A1, A2, A3, A2H, or A3H Emissions Operating in the 200-535 kHz Band ☒ RSS-181: Coast and Ship Station Single Sideband Radiotelephone Transmitters and Receivers Operating in the 1 605-28000 kHz Band ☐ RSS-182: Maritime Radio Transmitters and Receivers in the Band 156-162.5 MHz ☐ RSS-188: Global Maritime Distress and Safety System (GMDSS)

Frequency Range (MHz)	Output Power (W)	Freq. Tolerance (ppm, %, or Hz)	Emission Designator
1600 – 27500 kHz	150W	6 Hz	2K80J3E
1600 – 27500 kHz	150W	6 Hz	2K80H3E
1600 – 27500 kHz	150W	6 Hz	2K80J2B

The data in this measurement report complies with all the requirements of Parts 2 and 80 of the FCC Rules and Industry Canada standard marked above.