EXHIBIT E: REPORT OF MEASUREMENTS [2.1033(B6)]

Test Report for FCC ID: FBRIQB500-9SC

FCC Part 2.1031, Part 15 Subpart C(15.247)

Report #0500751BF
Issued 01/10/05

FREQUENCY HOPPING TRANSCEIVER MODEL IQB500-9SS-C

Prepared for:

Mr. Harry Derks
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P.O. Box 1259
Holland, MI 49422-1259

Last Test Date(s): April 20, 2004

Report prepared by:

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Report reviewed by

Data recorded by:

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Ted Chaffee, NCE

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Statements Concerning this Report

NVLAP Accreditation: NVLAP Lab Code 200129-0

The scope of AHD accreditation is the conducted emissions, radiated emissions test methods of:

IEC/CISPR 22: Limits and methods measurement of radio disturbance characteristics of information technology equipment.
FCC Method – 47 CFT Part 15 – Digital Devices.
AS/NZS 3548: Electromagnetic Interference – Limits and Methods of Measurement of Information Technology Equipment.
IEC61000-4-2 and Amend.1: ElectroStatic Discharge Immunity
IEC61000-4-5: Surge Immunity

Test Data:

This test report contains data included in the scope of the NVLAP accreditation.

Subcontracted Testing:

This report contains data recorded at the University of Michigan Radiation Laboratory. The University of Michigan test facility is located at 8501 Beck Road, Belleville, Michigan 48111. This test facility has been fully described and accepted by the FCC and Industry Canada. This facility was utilized to measure emissions occurring at frequencies greater than 6GHz.

Test Traceability:

The calibration of all measuring and test equipment and the measured data using this equipment are traceable to the National Institute for Standards and Technology (NIST).

Limitations on results:

The test results contained in this report relate only to the Item(s) tested. Any electrical or mechanical modification made to the test item subsequent to the test date shall invalidate the data presented in this report. Any electrical or mechanical modification made to the test item subsequent to this test date shall require an evaluation to verify continued compliance.

Limitations on copying:

This report shall not be reproduced, except in full, without the written approval of AHD.

Limitations of the report:

This report shall not be used to claim product endorsement by NVLAP, FCC, or any agency of the US Government.

Statement of Test Results Uncertainty: Following the guidelines of NAMAS publication NIS81 and NIST Technical Note 1297, the Measurement Uncertainty at a 95% confidence level is determined to be: ± 1.4 dB

Manufacturer/Applicant [2.1033(b1)]

The manufacturer and applicant:

FLEETWOOD GROUP Inc.
P.O. Box 1259
Holland, Michigan 49422-1259

Measurement/Test Site Facility & Equipment

Test Site [2.948, 2.1033(b6)]

SITE 1.

The AHD test facility is centered on 9 acres of rural property near Sister Lakes, Michigan. The mailing address is 92723 M-152, Dowagiac, Michigan 49047. This test facility is NVLAP accredited (LabCode 200129-0). It has been fully described in a report filed with the FCC (No.90413) and Industry Canada (file:IC3161).

SITE 2.

The University of Michigan test facility is located at 8501 Beck Road, Belleville, Michigan 48111. This test facility has been fully described and accepted by the FCC and Industry Canada. This facility was utilized to measure emissions occurring at frequencies greater than 6GHz.

Measurement Equipment Used [2.947(d), 15.31(b)]

SITE 1.

Equipment	Model	S/N	Last Cal Date	Calibration Interval
HP EMI Receiver system	HP 8546A			
RF Filter Section	HP-85460A	3448A00283	26-Aug-04	12 months
RF Receiver Section	HP-85462A	3625A00342	26-Aug-04	12 months
Solar LISN	8012-50-R-24-BNC	962137	24-Aug-04	12 months
Solar LISN	8012-50-R-24-BNC	962138	24-Aug-04	12 months
(LCI) Double shielded 50ohm Coax	RG58/U	920809	29-Nov-04	12 months
(3-M) LMR-400 Ultra Flex	LMR400	9812-11	25-Oct-04	6 months
(10-M) Amelco 50ohm Coax	RG213/U	9903-10ab	25-Oct-04	6 months
Double Ridged Horn	ONO91202-2	A00329	06-Jun-04*	physical
*inspection				

SITE 2.

Equipment	Model	S/N	Last Cal Date	Calibration Interval
C-Band Std. Gain Horn	UM NRL design		calibration by design	
XN-Band Std. Gain Horn	UM NRL design		calibration by design	
X-Band Std. Gain Horn	SA 12-8.2	730	calibration by design	
Avantek RF amplifier	AFT-12665		06-July-04	12 months
3ft LowLoss coax	RG142	-	with Avantek amp	
Spectrum Analyzer	HP 8593E	3412A01131	06-July-04	12 months

Measurement Environment

The tests were performed with the equipment under test, and measurement equipment inside the all-weather enclosure. Ambient temperature was 22deg.C., the relative humidity 35%.

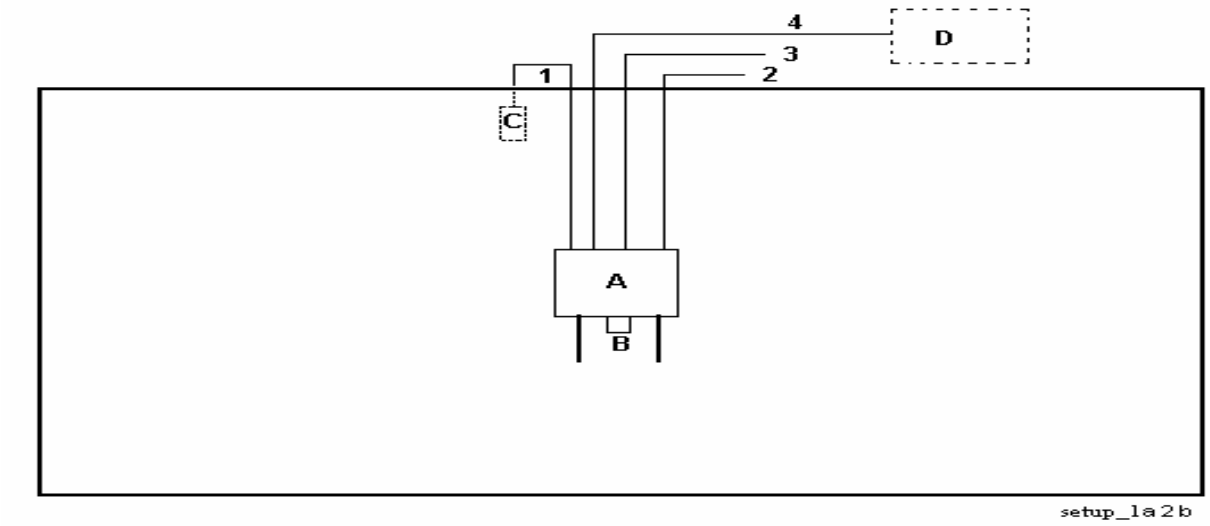
Tested Configuration /Setup: [2.1033(b8)]

Support Equipment & Cabling

Setup Diagram Legend	Description	Model	Serial No. / Part No.	EMC Consideration
A	[EUT] Reply IQ Base Transceiver	[Fleetwood Group] IQB500-9SS-C	preproduction	FCC ID: FBRIQB500-9SC
B	Reply IQ Feature Module	[Fleetwood Group] -	Eng unit	Plugged into Base at front of unit.
C	12V Power supply	[Phi hong] PSA11R-120	-	Located at 120VAC power main under turntable.
D	Remote Network hub	[Linksys] EW10HUB	836000596	FCC ID: KFYLEHA
1	DC cable		2 meter	Unshielded, permanently connected to power supply
2	Coax cable	RG223/U	10 meter	Terminated into 50ohm. Routed to below ground plane.
3	RS232 cable		2 meter	Shielded, unterminated, bundled to 40cm above ground.
4	Ethernet cable	CAT5	16 meters	Unshielded. Routed to below ground plane. Connected into network hub.

Setup Diagram

Note: Setup photographs are located in Attached Electronic File, Exhibit E.



BASIC EUT SETUP
(Legend designation is above)

Summary of Results:

1. This test series evaluated the Equipment Under Test to FCC Part 15, SubPart C.

2. The system tested is compliant to the requirement of CFR 47, FCC Part 15, SubPart C for Frequency Hopping operation in the 902-928MHz frequency band, (Part 15.247).

3. The equipment under test was received on February 10, 2003 and this test series commenced on February 10, 2003. Additional testing related to occupied bandwidth frequencies of the hopping channels commenced on April 8, 2004.

5. Three frequencies were selected for final evaluation. One near the low band edge of 902MHz. One near the center of the 902 to 928MHz band. One near the high band edge of 928MHz. This is in accordance with 47 CFR 15.31(m). The product went through two test cycles. During the first test cycle (Feb-May2003) the three frequencies selected for final evaluation included 902.5MHz, 915MHz, and 927.5MHz. During the second test cycle (April2004) the three frequencies selected for final evaluation included 902.6MHz, 915MHz, and 927.4MHz. This report includes data from both test dates.

5. In 120VAC 60Hz operation, the conducted emission level nearest the limit occurred at 259KHz. The signal was measured to be 13.7dB below the Class B Average limit when measuring phase to ground.

6. The Occupied Bandwidth was greatest using the 99% method, with approximately 1-3% RBW, and while observing 902.6MHz. The occupied bandwidth was determined to be 192.5KHz which is less than the limit of 500KHz.

7. The Band Edge measurements: Outside the lower band edge (902MHz) the level was observed to be 30.5dB below the in-band transmitter level. Outside the upper band edge (928MHz) the level was observed to be 29.5dB below the in-band transmitter level. The FCC limit (15.247c) is 20dB below the transmitter carrier level while hopping.

8. The output level of the fundamental was measured for 902.5MHz, 915MHz, and 927.5MHz. Directly connected to the output showed the emission nearest the limit occurred while operating near the upper band edge. This 927.5MHz signal was measured with a Peak detection and observed to be 22.2dB below the peak power limit of 1Watt.

   The field strength level of the fundamental was measured for 902.5MHz, 915MHz, and 927.5MHz at 3 meter distance. The evaluation showed the emission nearest the limit occurred while operating at 902.5MHz. The antennae of the EUT were positioned on the 'horizontal' and the receive antenna oriented in the horizontal polarization. This signal was measured with a Peak detection and the calculated EIRP was determined to be 10.8dB below the peak power limit of 1Watt.

[continued next page]

9. The evaluation of the field strength levels of the transmitter harmonics showed the emission nearest the limit occurred while transmitting on 927.5MHz. The antennae of the EUT was configured in the 'vertical' position, and the receive antenna oriented in the vertical polarization. The emission at 2782.5MHz was calculated to be 13.8dB below the average limit of 54dBuV/m (500uV/m).

10. The measurement of the field strength level of the Local Oscillator showed the emission nearest the limit occurred while transmitting on 915MHz. The antennae of the EUT were positioned on the 'vertical' and the receive antenna oriented in the vertical polarization. This signal was measured to be 7.6dB below the quasi-peak limit of 46dBuV/m (200uV/m).

11. The evaluation of the field strength levels of the Local Oscillator harmonics showed the measurable emission nearest the limit occurred while transmitting on 927.5MHz. The antenna of the EUT was configured in the 'vertical' position, and the receive antenna oriented in the vertical polarization. This signal, at 1.855GHz, was measured to be 15.2dB below the average limit of 54dBuV/m (500uV/m). All other emissions were within the background RF noise of the system.

12. Spurious emissions in Transmit Mode and Receive Mode were similar. The spurious emission level nearest the limit was measured while in transmitting mode. This emission, at 200MHz, was measured to be 39.7dBuV/m Quasi-Peak which is 3.8dB below the limit of 43.52dBuV/m (150uV/m). The receive antenna was horizontally polarized.

Changes made to achieve compliance

1. Digital and RF ground foils are bonded together on the top and bottom sides of the printed circuit board.
2. A metal standoff replaces plastic standoff for the Lantronics PCB.

Standards Applied to Test: [2.1033(b6)]

ANSI C63.4
CFR47 FCC Part 2, Part 15, SubPart C, 15.247 Intentional Radiator; SubPart B, Digital Device
AHD test procedures TP0101-01, TP0102-01

Test Methodology: [2.1033(b6)]

The system was placed at the center of the table 80cm above the ground plane pursuant to ANSI C63.4 for stand-alone equipment. The setup pictures in this report indicate the maximum configurations of testing for this product.

The product was evaluated for emissions in both transmit and a receive modes. The transmitted power output is set in firmware and the user does not have access to this location. The receiver uses a 0 Hz IF. The local oscillator is at the same frequency as the incoming transmitted signal.

This product contains two Fleetwood RF module_FW1202 transceiver modules each with its own antenna connected using a reverse SMA style connection. Both modules were evaluated, one at a time in transmit mode. During evaluation in the receive mode, both modules were set to receive. There was no attempt to distinguish the individual module, if any, emitting spurious rf during receive mode.

The two antennas of the unit were adjusted both vertical and horizontal during testing to determine the worst case emission profile.

Most of the evaluations in transmit mode were performed with the frequency hopping function disabled. In this mode the EUT was setup up to transmit continuously, with an FSK modulation, at a single frequency (near 902MHz, 915MHz, or 928MHz). The measurements of the fundamental were recorded with Peak detection and the results compared to the Peak power limit of section 15.247. The measurements of the fundamental harmonics, greater than 1GHz, were mathematically averaged over a 100mSec period.

In receive mode evaluation the EUT was setup to receive at a single frequency (near 902MHz, 915MHz, or 928MHz). In initial tests, an external RF source sent information to the receiver. Because of the 0-Hz IF, measurements could only be made with the external RF source deactivated. Final measurements were made without an external RF source.

It was judged the high-speed network communication to have higher emissions than the RS232 communication. Throughout testing the unit communicated with a remote computer via the network cable. A program which ‘pinged’ the network port was being sent continuously to that port during the testing. The RS232 port was connected to a serial cable 2meters in length. The two communication ports can not be used at the same time.

The feature module was installed during the testing to terminate this feature port. The BNC ‘Sync’ port, used only when multiple base units (master/slave) are in service, was terminated with a 3 meter coaxial cable. This coax was terminated into a resistive 50ohms.

Line Conducted

Line conducted emission evaluation for this device was performed with the unit transmitting.

The system was placed upon a 1 x 1.5 meter non-metallic table 80cm from the ground floor and 40cm from the vertical conducting plane in the prescribed setup per ANSI C63.4, Figure 9(a). This table is housed in a shielded enclosure to prevent the detection of unwanted ambients.

The mains power is nominally 120VAC, 60Hz, but may also be tested at other requested voltage/frequency combinations.

The EUT, or host unit if applicable, was connected to the LISN being monitored by the EMI Receiver. The remaining support devices requiring mains ac power were connected to a second LISN.

The EUT was continuously exercised as suggested by the manufacturer.

While monitoring the display of the EMI Receiver, via remote video monitor, the cables were manipulated to determine a position that maximized the emissions being observed. Once the highest amplitude relative to the limit was determined for the Phase current carrying line the procedure was repeated for the Neutral current carrying line.

The configuration that created an emission closest to the limit was used during the course of taking final measurements. Pictures of this final configuration are recorded in this report.

The principal settings of the EMI Receiver for line conducted testing include:

Bandwidth = 9KHz

Detector Function: scanning and signal search = Peak Detection Mode
measurements = Quasi Peak Detection and Average Detection

The cable losses of the coax used in line conducted testing is charted in this appendix.

Radiated

The system was placed upon a 1 x 1.5 meter non-metallic table 80cm above the open field site ground plane in the prescribed setup per ANSI C63.4, Figure 9(c).

The table sits upon a remote controlled turntable. The receiving antenna, located at the appropriate standards distance of 3 or 10 meters from the table center, is also remote controlled.

The principle settings of the EMI Receiver for radiated testing include:

IF Bandwidth: 120KHz for frequencies less than 1GHz.
1 MHz for frequencies greater than 1GHz.

Detector Function: Peak Mode for transmitter fundamental.
Quasi-Peak for emissions < 1000MHz
Average for emissions > 1000MHz

Occupied Bandwidth settings:
RBW: 1% to 3% of emission width.
The RBW is adjusted during the evaluation of the emission width.
This product's emission bandwidth justified a 3KHz RBW.
VBW: 3 times the RBW

At frequencies up to 1000MHz a BiconiLog broadband antenna was used for measurements.

At frequencies above 1000MHz a double-ridge Horn broadband antenna was used for measurements.

During the transmitter evaluation the EUT was transmitting continuously.

The turntable was rotated 360 degrees and the receiving antenna height varied from 1 to 4 meters to search out the highest emissions.

The final measurements were made at a low band frequency, a mid band frequency, and a high band frequency pursuant to the requirements of 47CFR 15.31(m). The antennas of the unit were adjusted to both a vertical and a horizontal orientation during testing. Measurements were recorded with the receive antenna in vertical and horizontal positions.

The unit was evaluated up to the tenth harmonic of the transmit fundamental, up to the tenth harmonic of the receive local oscillator, and up to 2000MHz for other spurious signals.

FORMULAS AND SAMPLE CALCULATIONS:

THE HP8546A EMI Receiver has stored in memory the antenna and coax correction factors used in this test. The resultant Field Strength (FS) in dBuV/m presented by the HP8546A is the summation in decibels (dB) of the Received Level (RF), the Antenna Correction Factor (AF), and the Cable Loss Factor (CF).

Formula 1: Field Strength FS(dBuV/m) = RF(dBuV) + AF(dB/m) +CF(dB)

With the EUT transmitting the resultant Field Strength measurement is recorded using the peak hold detector of the HP8546A.

Formula 2: Effective Radiated Power $PG = \frac{(E*d)^2}{30}$

E = 10^(FS(dBuV/m)/ 20) / 1000000
d = 3 meter

This recorded level is further corrected, by calculation, using a duty cycle correction factor. The duty cycle factor is determined by:

Formula 3: Duty Cycle factor DC factor (dB) = 20*LOG(dwell time / 100mSec).

When the dwell time is determined to be less than 10mSec, the duty cycle factor to apply is determined to be 20dB. [duty cycle factor(dB) = 20*Log(0.1) = -20.0 dB]

Where it was necessary to move the EUT to 1 meter distance to take measurements a 'dB' factor which adjusts for this distance variance is used before comparing the emission level to the FCC limits. This factor is determined by the following formula.

Formula 4: Distance factor(dB) = 20*Log(3meter/1meter) = 20*Log(3) = 9.54dB.

Test Data [2.1033(b6)]

Antenna Characteristics [15.203, 15.204]

The antenna is an ¼ wavelength monopole attached to the antenna ports via a "reverse SMA" type threaded connection. This connection type is unique so that the product complies with the antenna requirement of 15.203. No other type antenna can be connected to the device.

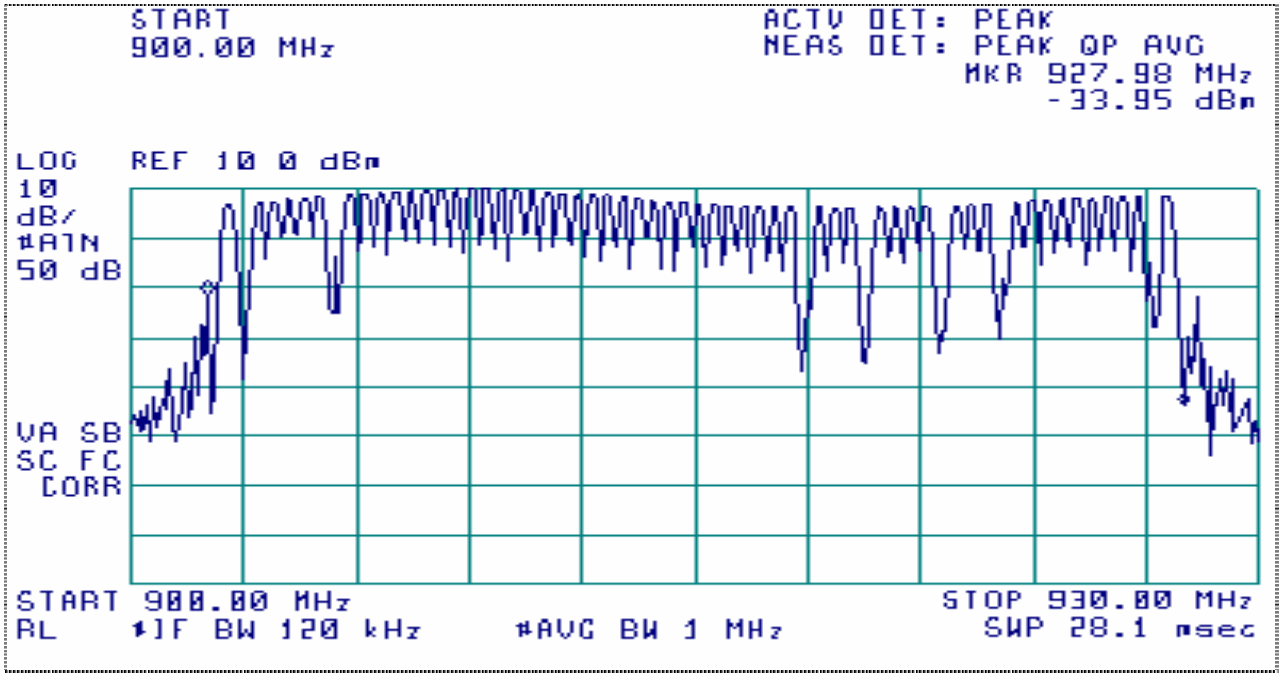
Modulation Characteristics

The transmitter is FSK modulated.
Modulation. F1 represents the bit "1", F2 represents the bit "0". F1 and F2 are separated by 75KHz. Data rate is 38.4KB/sec

Frequency Hopping Characteristics

Number of Hopping Frequencies [15.247a1i]

Sixty three (63) frequencies from 902.6MHz through 927.4MHz are available for this base transceiver to utilize. The base unit selects 56 from the set of 63 frequencies as the set of hopping frequencies. Refer to Exhibit B for a detailed operational description.



Plot scan of the FHSS profile. Fifty six transmitted frequencies can be discerned. In this hopping sequence, the seven available frequencies not used include – 903.0, 905.4, 917.8, 919.4, 921.4, 923.0, and 927.0MHz.

Carrier Frequency 20dB bandwidth [15.247a1i]

The occupied bandwidth was measured first with the unit hopping function disabled. The transmitter is FSK modulated at its 50% duty cycle.

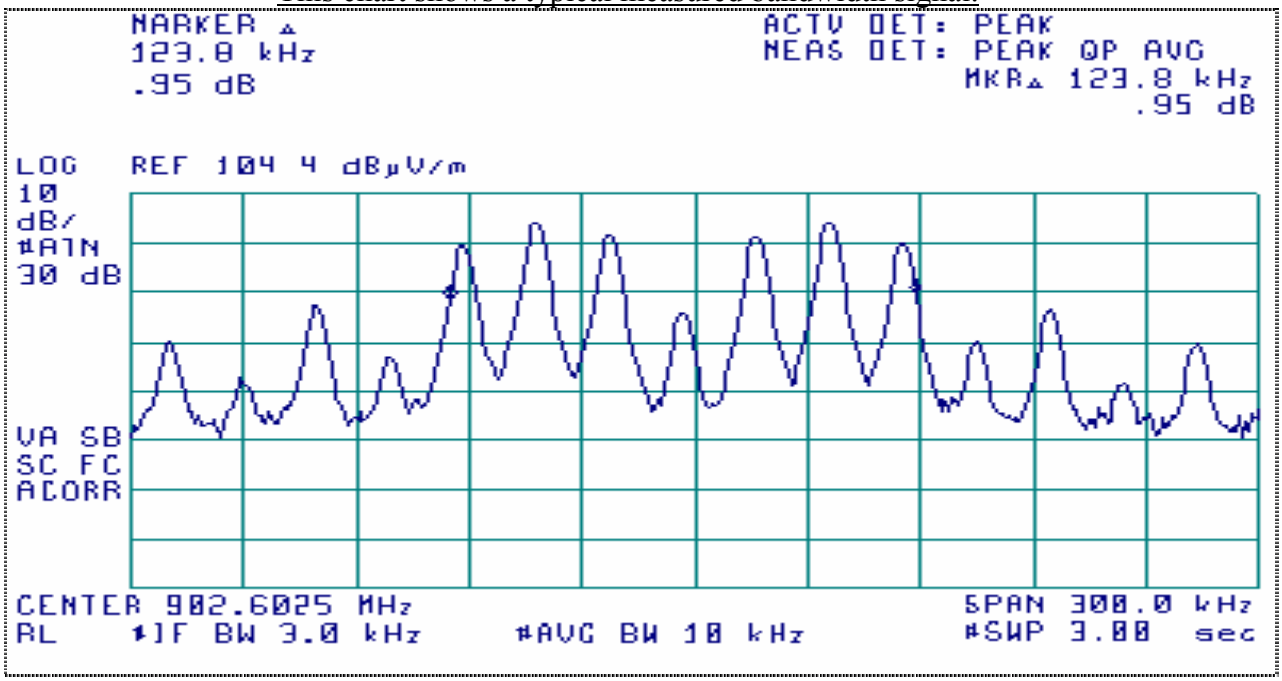
Two methods were used to determine occupied bandwidth. The measurement procedure of both methods, the 99% method and the 20dB method with the RBW of the measurement equipment is set at 1%-3% of viewed occupied bandwidth, are described in the paper "A Discussion on the Measurement of Occupied Bandwidth" authored by Brian Kasper.

The 99% method utilized a routine which had been programmed into the HP8546A EMI Receiver by the manufacturer.

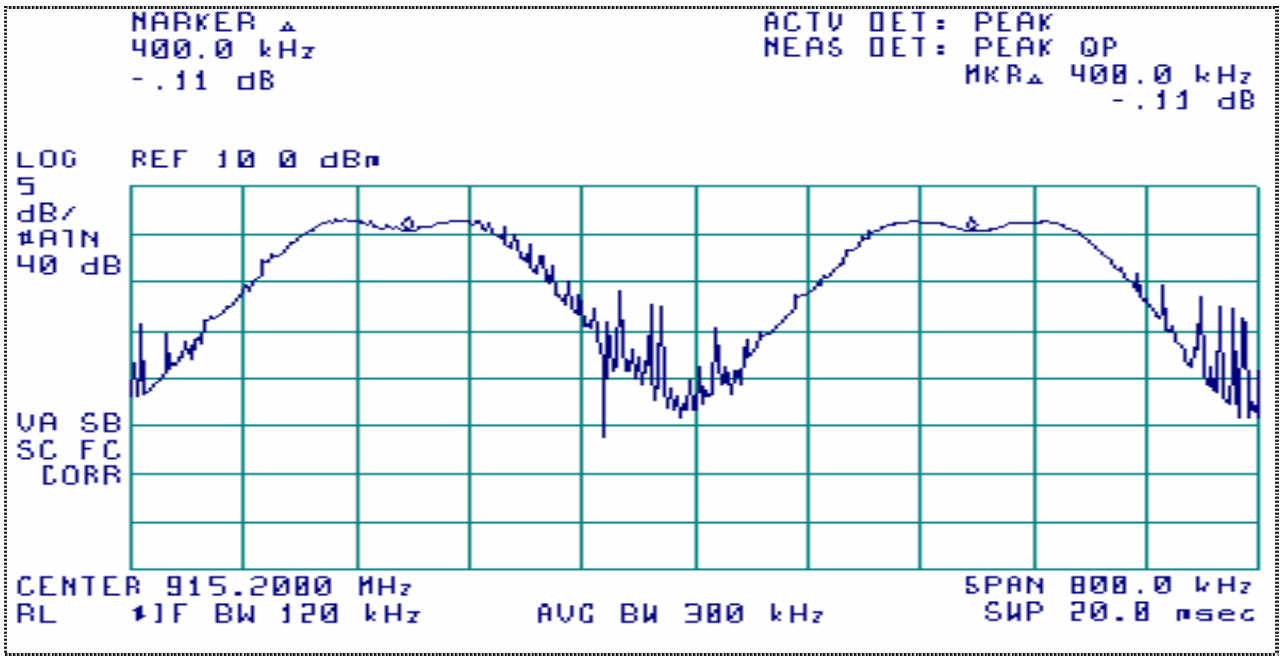
Fundamental (MHz)	TX Module #1		TX Module #2		LIMIT
	99% method	20dB method	99% method	20dB method	15.247(a1i)
902.6	192.5KHz	123.8KHz	192KHz	*158KHz	500 KHz
915		*132.8KHz		*132KHz	500 KHz
927.4	126.0KHz	123.8KHz	126.0KHz	*129KHz	500 KHz

*20dB procedure performed while EUT was hopping through frequency set.

This chart shows a typical measured bandwidth signal.

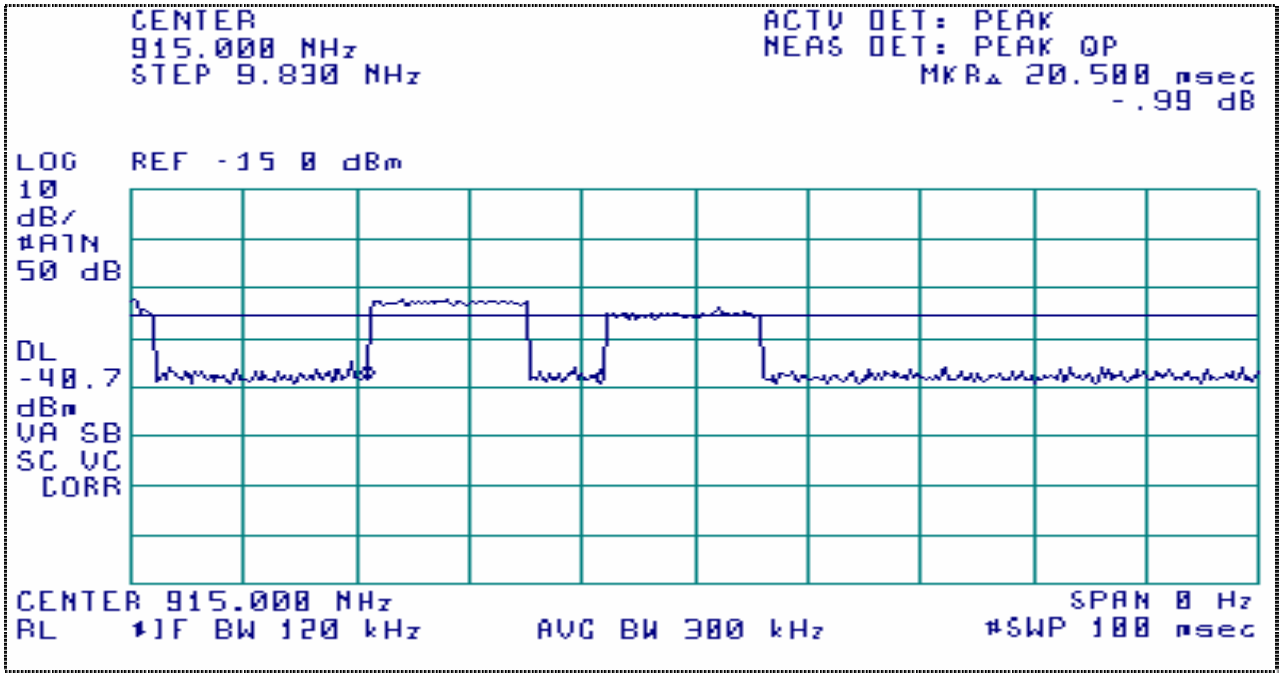


Carrier Frequency Separation [15.247a1]



Each Hopping channel is separated by 400KHz. This is greater than the minimum requirement of 25KHz or 20dB bandwidth. Refer to Exhibit B 'operational description' for the list of frequencies available.

Carrier Frequency Dwell Time [15.247a1i]



The Dwell Time of this hopping frequency was measured to be approximately 28mSec (2x14mS two modules at 14mS each). The unit firmware allows the dwell time to be 13.6mSec transmit module #1 plus 13.6mSec transmit module #2 for a total dwell time of 27.2mSec. Refer to Exhibit B 'operational description' for a table showing dwell times of the system operations.

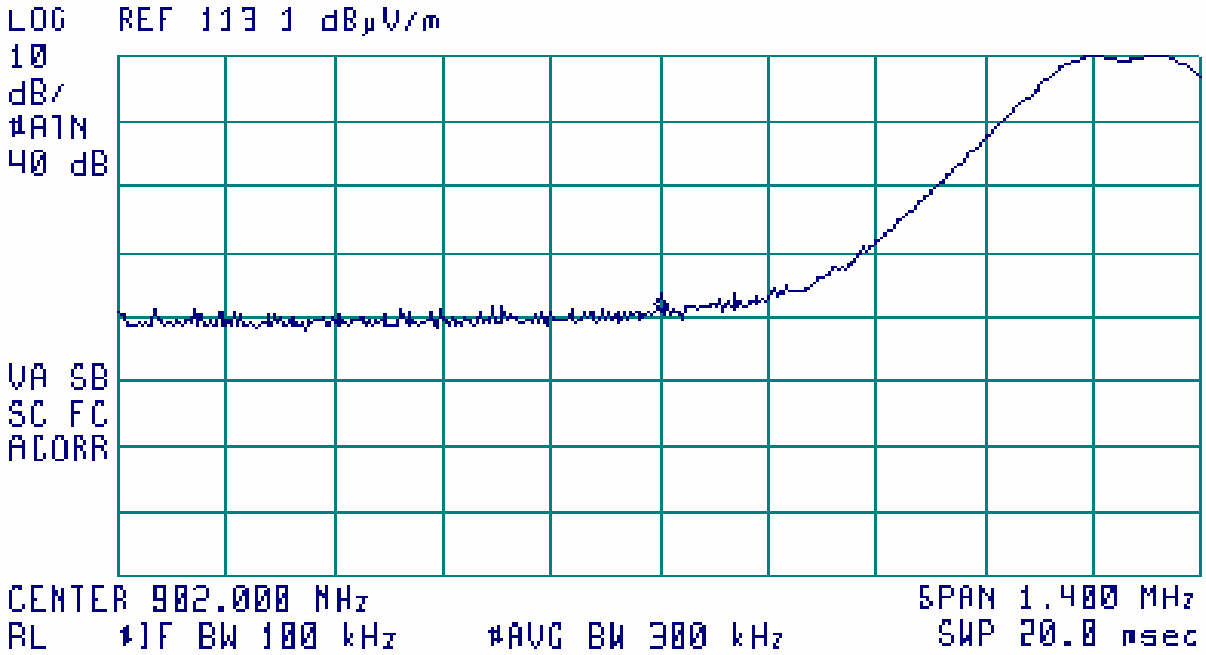
Band Edges [15.247(c)]

The emissions outside the 902-928MHz band are to be either 20dB below the level of the fundamental or the limits of section 15.209.

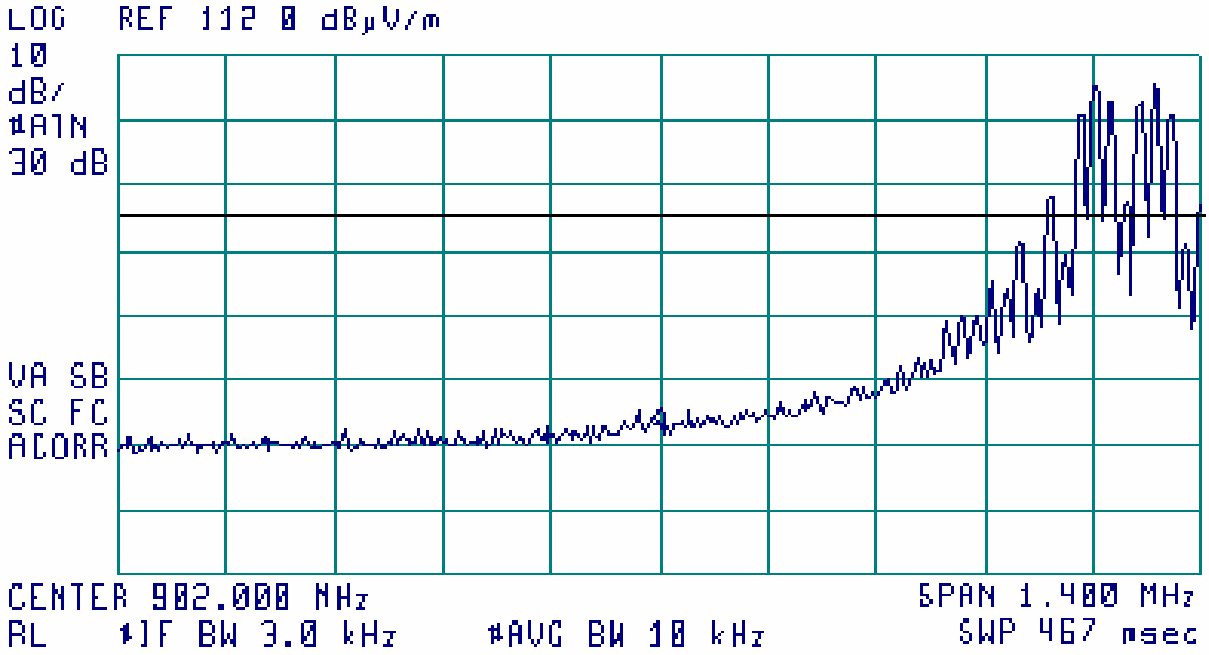
902MHz Band Edge. EUT transmitting at lowest frequency of 902.6MHz.

Hopping Disabled

Measurement equipment RBW = 100KHz

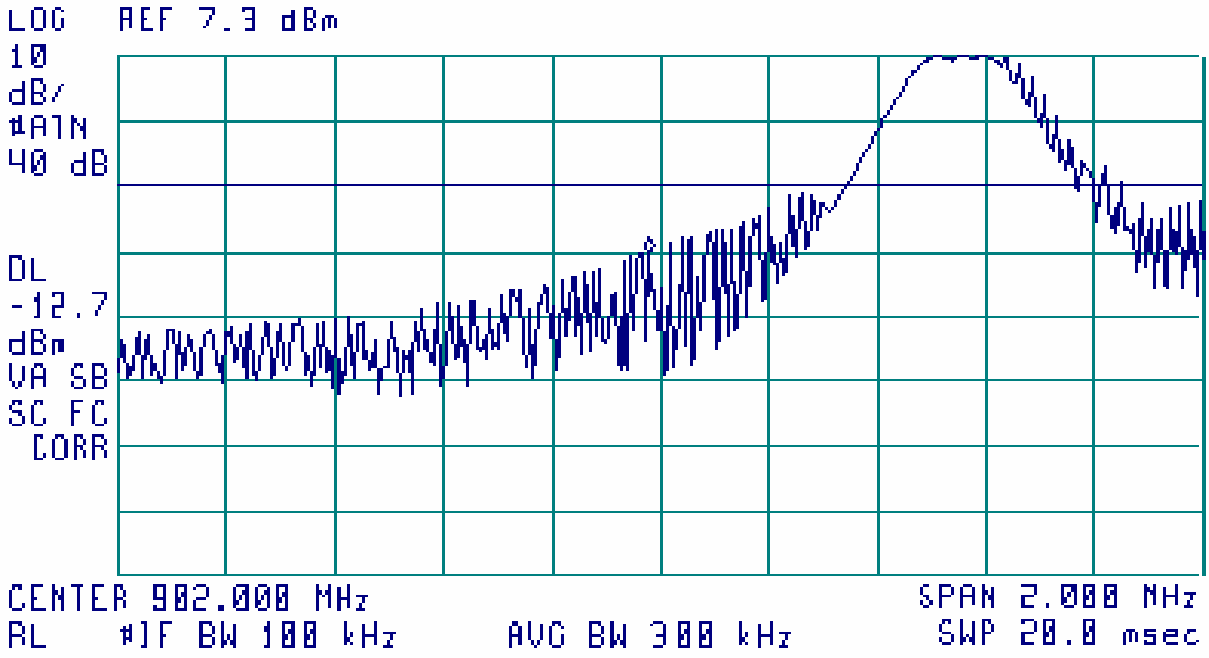


Measurement equipment RBW = 3.0KHz



Hopping Enabled

Measurement equipment RBW = 100KHz



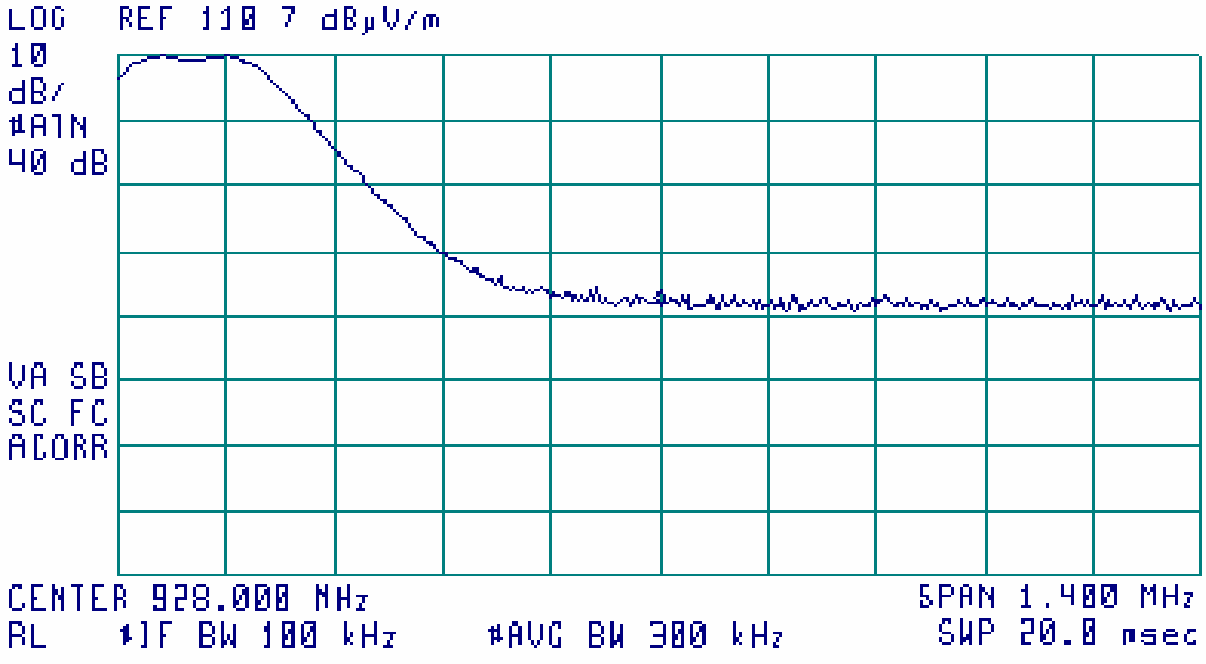
Measurement equipment RBW = 100KHz

Fundamental (MHz)	Delta dBc without hopping	Delta dBc with hopping	dBc LIMIT 15.247c	
902.6	-39dB	-30.5 dB	-20 dB	Pass

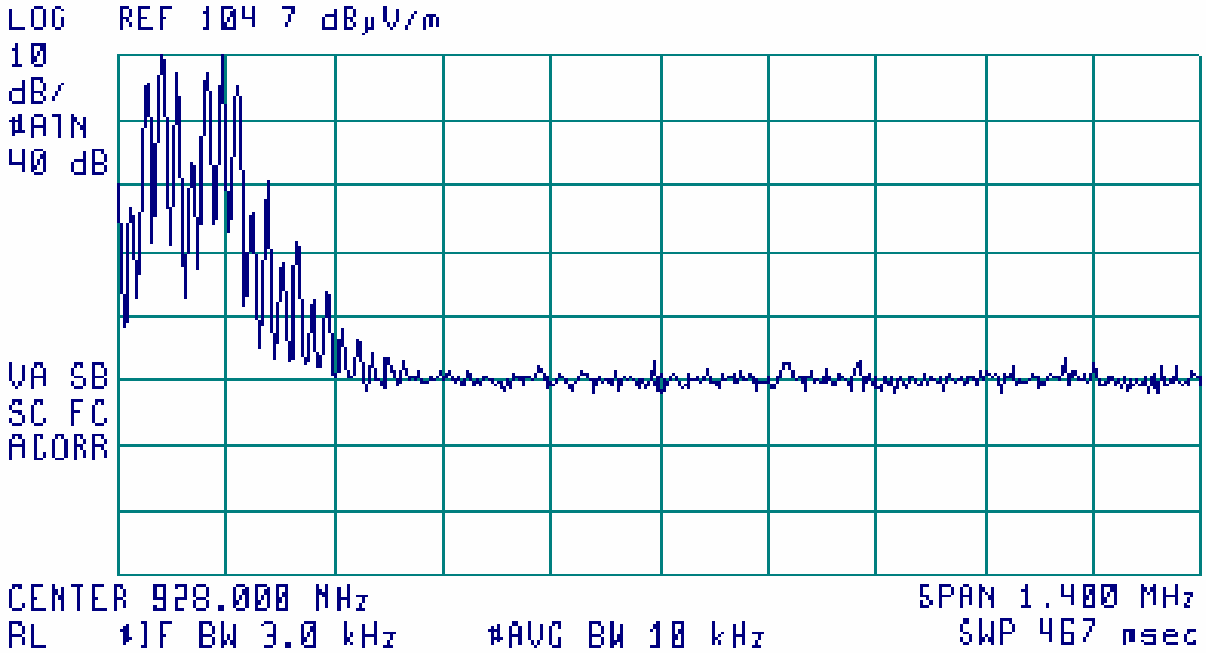
928MHz Band Edge. EUT transmitting at highest frequency of 927.4MHz.

Hopping Disabled

Measurement equipment RBW = 100KHz

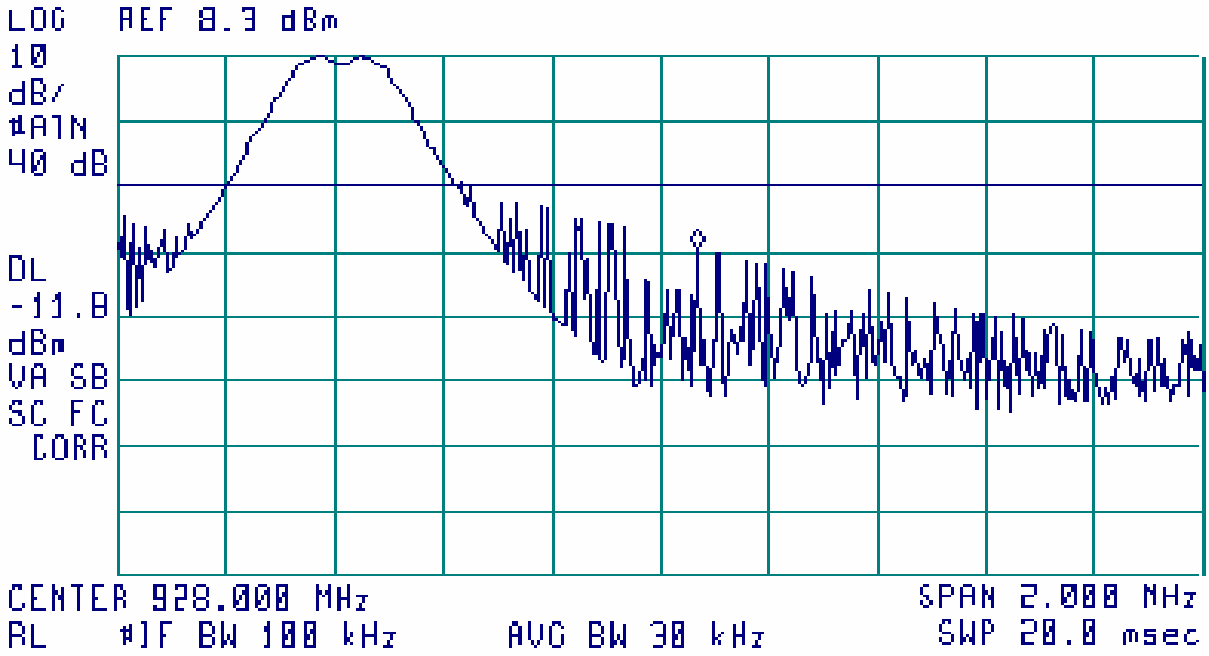


Measurement equipment RBW = 3.0KHz



Hopping Enabled

Measurement equipment RBW = 100KHz



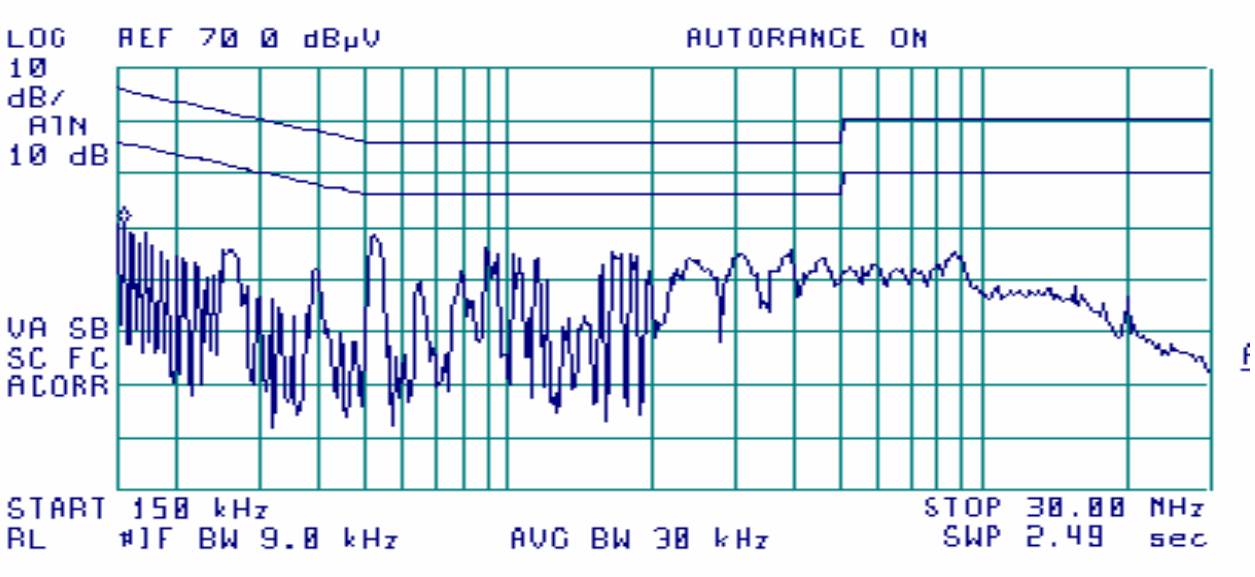
Measurement equipment RBW = 100KHz

Fundamental (MHz)	Delta dBc without hopping	Delta dBc with hopping	dBc LIMIT 15.247c	
927.4	-38.6dB	-29.5dB	-20 dB	Pass

Line Conducted Measurements: [15.207(a)]

Line Conducted 120VAC / 60Hz.

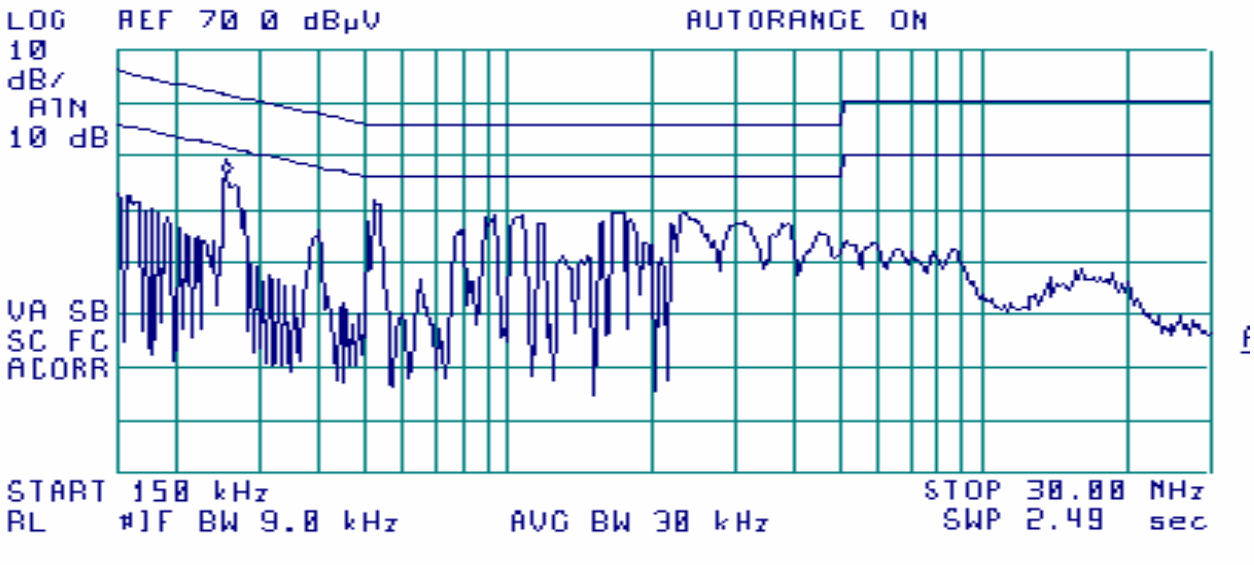
NEUTRAL to Ground Measurement.
Class B
Plot of Peak Values



Tabulated Quasi-Peak/Average Measurements.

Frequency	dBuV Reading		FCC / EN55022 dBuV Class B Limit		dB Margin	
MHz	QP	Avg	QP	Avg	**QP**	**Avg**
0.150	37.74	12.48	66.00	56.00	**28.26**	**43.52**
0.266	35.77	30.60	61.23	51.23	**25.46**	**20.63**
0.515	37.56	24.09	56.00	46.00	**18.44**	**21.91**
0.900	34.38	17.73	56.00	46.00	**21.62**	**28.27**
1.735	32.60	11.62	56.00	46.00	**23.40**	**34.38**
3.932	32.78	13.78	56.00	46.00	**23.22**	**32.22**
8.811	33.56	17.17	60.00	50.00	**26.44**	**32.83**
19.999	26.95	23.71	60.00	50.00	**33.05**	**26.29**

PHASE to Ground Measurement.
Class B
Plot of Peak Values



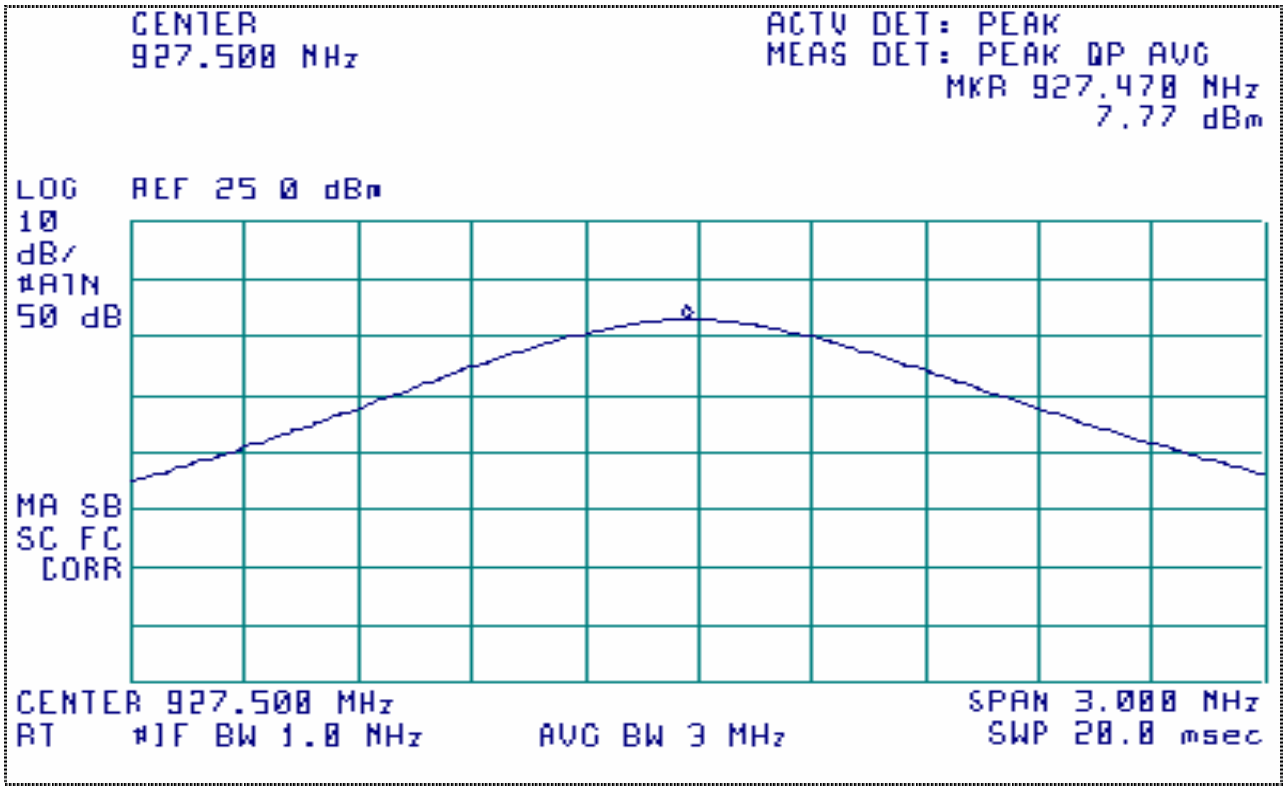
Tabulated Quasi-Peak/Average Measurements.

Frequency	dBuV Reading		FCC / EN55022 dBuV Class B Limit		dB Margin	
MHz	QP	Avg	QP	Avg	**QP**	**Avg**
0.150	37.74	10.84	66.00	56.00	**28.26**	**45.16**
0.259	44.16	37.79	61.47	51.47	**17.31**	**13.68**
0.515	41.05	28.65	56.00	46.00	**14.95**	**17.35**
0.898	37.55	18.81	56.00	46.00	**18.45**	**27.19**
1.025	36.48	16.19	56.00	46.00	**19.52**	**29.81**
1.667	37.37	14.42	56.00	46.00	**18.63**	**31.58**
2.307	36.94	16.51	56.00	46.00	**19.06**	**29.49**

Peak Output Power: [15.247(b)]

MEASUREMENT PROCEDURE: Direct Connect to antenna output.
Transmit Mode. Fundamental

Frequency MHz	Module #1 Direct Connect PEAK Measurement dBm	Module #2 Direct Connect PEAK Measurement dBm	FCC Limit 15.247b =1 Watt	Margin dB
902.50	6.71	7.22	30dBm	22.8 at module #2
915.05	6.93	6.16	30dBm	23.1 at module #1
927.48	7.77	6.81	30dBm	22.2 at module #1



Highest level recorded directly connected to antenna output port. Module #1. 927.5MHz

Radiated Field Strength Measurements: [15.209, 15.247(b,c)]

Field Strength Measurements of Fundamental & LO: [15.247(a), 15.209]

OATS MEASUREMENTS

MEASUREMENT PROCEDURE:
1. The EUT was trained to one of the three test frequencies.
2. The EUT antennae were setup to vertical and horizontal positions.
3. The receive antenna was set to vertical and horizontal positions.
4. Steps 1-3 were repeated to cover all positions, and frequencies.

Transmit Mode. Fundamental

Frequency	Corrected PEAK Measurement	Included Cable+Antenna Factors	Turntable Azimuth	Antenna Height	Calculated EIRP	FCC Limit 15.247b	Margin	EUT antenna position	Ant Pol.
MHz	dBuV/m	dB+dB/m	deg	Mtr	mW	mWatt	dB		
902.50	114.4	26.19	170	1.0	82.6	1000	**10.8**	H	H
915.05	113.4	26.30	170	1.0	65.6	1000	**11.8**	H	H
927.48	111.8	26.42	0	1.0	45.4	1000	**13.8**	V	V

Receive Mode. Local Oscillator

Frequency	Corrected Quasi-Peak Measurement	Included Cable+Antenna Factors	Turntable Azimuth	Antenna Height	FCC Limit Quasi-Peak	Margin	EUT antenna position	Ant Pol.
MHz	dBuV/m	dB+dB/m	deg	Mtr	dBuV/m	dB		
902.50	36.7	26.19	190	1.2	46.00	**9.3**	V	V
915.05	38.4	26.30	170	1.1	46.00	**7.6**	V	V
927.48	37.4	26.42	190	1.0	46.00	**8.6**	V	V

Field Strength Measurements of Fundamental & LO Harmonics: [15.247(b,c)]

MEASUREMENT PROCEDURE:

1. The EUT was trained to one of the three test frequencies.
2. The EUT antennae were setup to vertical and horizontal positions.
3. The receive antenna was set to vertical and horizontal positions.
4. Steps 1-3 were repeated to cover all positions, and frequencies.

DUTY CYCLE [on time per 100mSec]

The dwell time is a maximum of 27.2mSec in an approximately 605mSec period.
The on time in a 100mSec period provides a duty cycle factor of 20Log(27.2/100) = -11.3dB.
This factor is used for the averaging calculations of emission levels above 1000MHz.

Transmit Mode. Fundamental harmonics

Freq	Measurement	27.2% Duty Cycle factor	Calculated Level w. Duty Cycle	Turntable Azimuth	Antenna Height	FCC Avg Limit 15.209 or -20dBc	**Margin**	Ant Pol.	Included Cable+Antenna Factors
MHz	dBuV/m	dB	dBuV/m	deg	Mtr	dBuV/m	**dB**		dB+dB/m
902.50									
1805	69.9	11.3	58.6	80	1.0	94.4#	**35.8**	V	31.30
2707.5	41.8	11.3	30.5	90	1.0	54.00	**23.5**	V	35.40
3610	49.2	11.3	37.9	0	1.1	54.00	**16.1**	V	37.93
4512.5	41.6	11.3	30.3	80	1.0	54.00	**23.7**	V	38.42
5415	39**	11.3	27.7	-	1.0	54.00	**26.3**	V	41.64
915.00									
1830	66.5	11.3	55.2	90	1.0	93.4#	**38.2**	V	31.39
2745	50.1	11.3	38.8	270	1.0	54.00	**15.2**	V	35.62
3660	47.0	11.3	35.7	160	1.1	54.00	**18.3**	H	37.91
4575	41.8	11.3	30.5	80	1.6	54.00	**23.5**	H	38.59
5490	40**	11.3	28.7	-	1.0	93.4#	**64.7**	V	41.97
927.50									
1855	67.4	11.3	56.1	90	1.0	91.8#	**35.7**	V	33.60
2782.5	51.5	11.3	40.2	330	1.0	54.00	**13.8**	V	35.84
3710	45.0	11.3	33.7	270	1.1	54.00	**20.3**	V	37.90
4637.5	42.2	11.3	30.9	270	1.0	54.00	**23.1**	V	38.77
5565	39**	11.3	27.7	90	1.0	91.8#	**64.1**	H	42.07

Limits determined by 20dBc below the measured fundamental level.
**These levels are at the noise floor of the measurement systems.

Transmit Mode. Fundamental harmonics

The following transmitter harmonic measurements were taken at the UM Radiation Lab facility. The distance between the EUT and Horn antenna is 1 meter.

The term in the column "calculated average level" is determined by
SA Peak Measurement + Ant Factor – Amp Factor – Distance Factor – Duty Cycle

Freq	S.A. PEAK Measurement	Antenna Correction Factor	RF Amp Factor	1 meter Distance factor	27.2% Duty Cycle factor	Calculated Average Level	FCC Avg Limit	**Margin**
MHz	dBuV/m	dB/m	dB	dB	dB	dBuV/m	dBuV/m	**dB**
902.50								
6317.5	57.0	24.1	38.0	9.5	11.3	22.3	94.4#	**72.1**
7220	51.0	24.9	36.4	9.5	11.3	18.7	94.4#	**75.7**
8122.5	48**	27.0	36.1	9.5	11.3	18.1	54	**35.9**
9025	51.0	27.4	36.9	9.5	11.3	20.7	54	**33.3**
915.00								
6405	55.0	24.2	37.6	9.5	11.3	20.8	93.4#	**72.6**
7320	55.0	25.0	36.3	9.5	11.3	22.9	54	**31.1**
8235	49**	27.1	36.0	9.5	11.3	19.3	54	**34.7**
9150	49**	27.5	36.9	9.5	11.3	18.8	54	**35.2**
927.50								
6492.5	57.2	24.3	37.5	9.5	11.3	22.9	91.8#	**68.9**
7420	55.6	25.1	36.1	9.5	11.3	23.8	54	**30.2**
8347.5	50.0	27.2	36.1	9.5	11.3	20.3	54	**33.7**
9275	49**	27.6	37.0	9.5	11.3	18.8	91.8#	**73.0**

Limits determined by 20dBc below the measured fundamental level.
**These levels are at the noise floor of the measurement systems.

Receive Mode. Local Oscillator harmonics

Frequency	Corrected Average Measurement	Turntable Azimuth	Antenna Height	FCC Limit Average	**Margin**	EUT Antenna position	Ant Pol.	Included Cable+Antenna Factors
MHz	dBuV/m	deg	Mtr	dBuV/m	**dB**			dB+dB/m
902.5								
1805	37.1	90	1.0	54	**16.9**	V	V	31.30
2707.5	33**	-	-	54	**>21**	-	-	35.40
3610	34**	-	-	54	**>20**	-	-	37.93
4512.5	36**	-	-	54	**>18**	-	-	38.42
5415	39**	-	-	54	**>15**	-	-	41.64
915.0								
1830	38.7	90	1.0	54	**15.3**	V	V	31.39
2745	34**	-	-	54	**>20**	-	-	35.62
3660	35**	-	-	54	**>19**	-	-	37.91
4575	35**	-	-	54	**>19**	-	-	38.59
5490	40**	-	-	54	**>14**	-	-	41.97
927.5								
1855	38.8	90	1.0	54	**15.2**	V	V	33.60
2782.5	34**	-	-	54	**>20**	-	-	35.84
3710	35**	-	-	54	**>19**	-	-	37.90
4637.5	36**	-	-	54	**>18**	-	-	38.77
5565	39**	-	-	54	**>15**	-	-	42.07

**These levels are at the noise floor of the measurement systems.

Receive Mode. Local Oscillator harmonics

The following LO harmonic measurements were taken at the UM Radiation Lab facility
The distance between the EUT and Horn antenna is 1 meter.

The term in the column "calculated PEAK level" is determined by
SA Peak Measurement + Ant Factor – Amp Factor – Distance Factor.
This peak level is compared to the FCC average limit.

Frequency	S.A. PEAK Measurement	Antenna Correction Factor	RF Amp Factor	1 meter Distance factor	Calculated PEAK Level	FCC Avg Limit	**Margin**
MHz	dBuV/m	dB/m	dB	dB	dBuV/m	dBuV/m	**dB**
902.5							
6317.5	44.9**	24.1	38.0	9.5	21.5**	54	**>32.5**
7220	48.3**	24.9	36.4	9.5	27.3**	54	**>26.7**
8122.5	48.8**	27.0	36.1	9.5	30.2**	54	**>23.8**
9025	49.1**	27.4	36.9	9.5	30.1**	54	**>23.9**
915.0							
6405	45.1**	24.2	37.6	9.5	22.2**	54	**>31.8**
7320	47.3**	25.0	36.3	9.5	26.5**	54	**>27.5**
8235	48.3**	27.1	36.0	9.5	29.9**	54	**>24.1**
9150	47.4**	27.5	36.9	9.5	28.5**	54	**>25.5**
927.5							
6492.5	44.4**	24.3	37.5	9.5	21.7**	54	**>32.3**
7420	47.1**	25.1	36.1	9.5	26.6**	54	**>27.4**
8347.5	47.6**	27.2	36.1	9.5	29.2**	54	**>24.8**
9275	48.6**	27.6	37.0	9.5	29.7**	54	**>24.3**

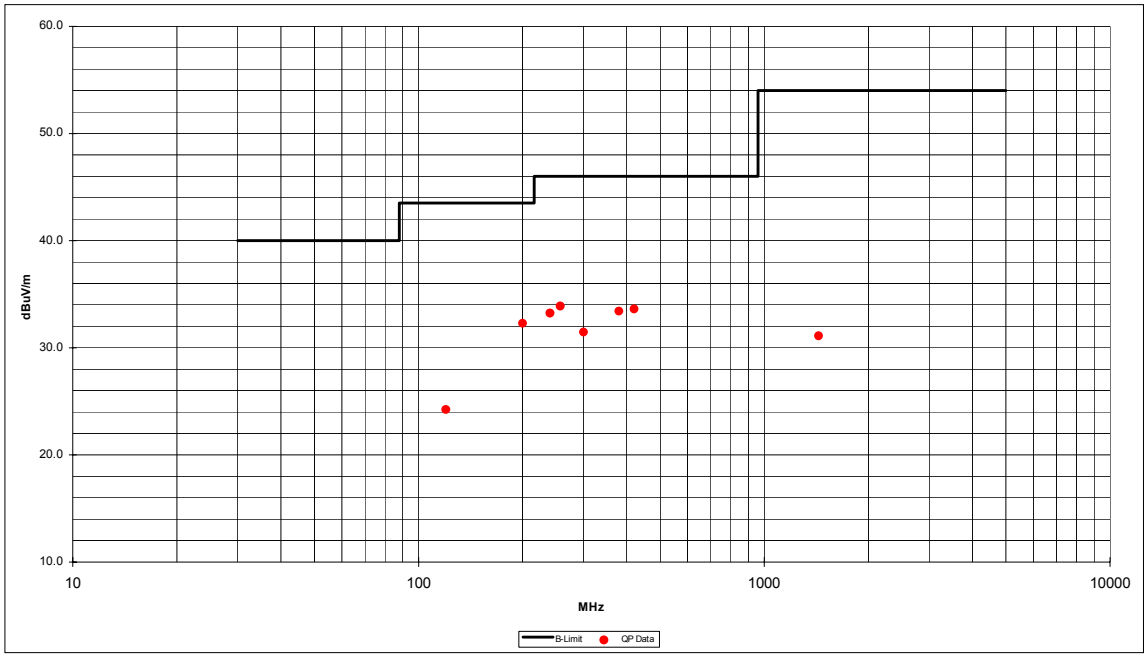
**These levels are at the noise floor of the measurement systems.

Spurious Emissions: [15.247c]

A scan of the IQB500-9SS-C was made in a shielded room to study the emission profile of the EUT. These scans indicate spurious emissions from the unit other than the fundamental and its associated harmonics. These suspect signals were measured at the 3-meter open area test site.

Transmit Mode and Receive Mode. Same spurious profile

Graph of Quasi-Peak Measurements Vertically polarized



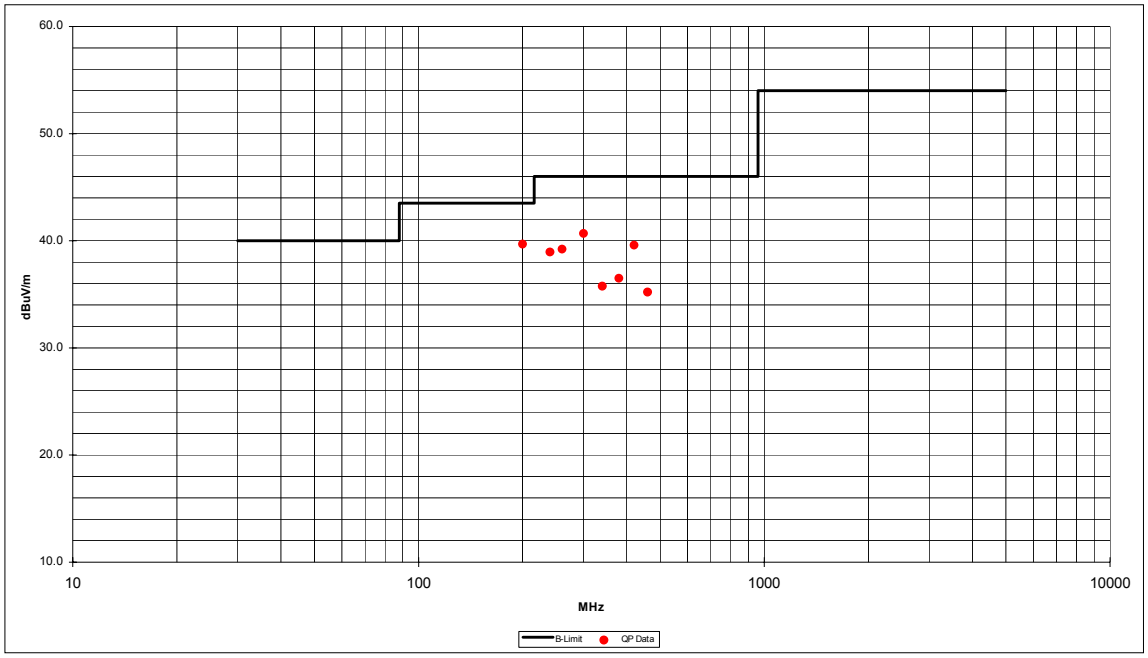
Tabulated Quasi-Peak Measurements.

Frequency MHz	Corrected Quasi Peak Measurement dBuV/m	Included Cable+Antenna Factors dB+dB/m	Turntable Azimuth deg	Antenna Height Mtr	FCC Class B Limit dBuV/m	**Margin dB**
200.01	32.29	12.11	80	1.8	43.50	**11.21**
240.02	33.23	13.32	180	1.7	46.00	**12.77**
257.14	33.88	13.78	190	1.0	46.00	**12.12**
300.01	31.46	14.82	180	1.0	46.00	**14.54**
380.02	33.42	18.24	120	1.0	46.00	**12.58**
420.02	33.62	19.00	120	1.0	46.00	**12.38**

The frequencies for measurements were determined by the suspect list generated from the shielded room prescan of 30MHz through 5GHz.

All other spurious emission are greater than 15dB below limits.

Spurious Emissions
Graph of Quasi-Peak Measurements – horizontally polarized



Tabulated Quasi-Peak Measurements.

Frequency	Corrected Quasi Peak Measurement	Included Cable+Antenna Factors	Turntable Azimuth	Antenna Height	FCC Class B Limit	**Margin**
MHz	dBuV/m	dB+dB/m	deg	Mtr	dBuV/m	**dB**
200.02	39.69	12.11	330	1.6	43.50	**3.81**
240.02	38.95	13.32	180	1.3	46.00	**7.05**
260.03	39.21	13.86	10	1.0	46.00	**6.79**
300.01	40.67	14.82	160	1.0	46.00	**5.33**
340.02	35.76	16.63	0	1.1	46.00	**10.24**
380.04	36.50	18.24	180	1.0	46.00	**9.50**
420.02	39.58	19.00	300	1.0	46.00	**6.42**
460.03	35.21	19.49	300	1.0	46.00	**10.79**

The frequencies for measurements were determined by the suspect list generated from the shielded room prescan of 30MHz through 5GHz.
**Measurement made with average detector and 1MHz IF bandwidth.
All other spurious emission are greater than 10dB below limits.