

TEST REPORT

ACCORDING TO: FCC 47CFR part 15 subpart C § 15.247 (FHSS)

FOR:

Arcadian Networks Inc.
Wireless Modem
Model:AE11GOW

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1 Applicant information

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E-mail: hillel.handler@arcadiannetworks.com
Contact name: Mr. Hillel Handler

2 Equipment under test attributes

Product name: Wireless modem
Model(s): AE11GOW
Serial number: H0090001
Hardware version: 01
Software release: 01
Receipt date 3/9/2010

3 Manufacturer information

Manufacturer name: Arcadian Networks Inc
Address: 400 Columbus Avenue, Suite 210E, Valhalla NY 10595, USA
Telephone: +972 3976 9847
Fax: +972 3976 9998
E-Mail: hillel.handler@arcadiannetworks.com
Contact name: Mr. Hillel Handler

4 Test details

Project ID: 20571
Location: Hermon Laboratories Ltd. Harakevet Industrial Zone, Binyamina 30500, Israel
Test started: 3/9/2010
Test completed: 3/18/2010
Test specification(s): FCC 47CFR part 15 subpart C §15.247



5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.247(a)1, 20 dB bandwidth	Pass
Section 15.247(a)1, Frequency separation	Pass
Section 15.247(a)1, Number of hopping frequencies	Pass
Section 15.247(a)1, Average time of occupancy	Pass
Section 15.247(b), Peak output power	Pass
Section 15.247(d), Emissions at band edges	Pass
Section 15.247(d), Radiated spurious emissions	Pass
Section 15.203, Antenna requirements	Pass
Section 15.207(a), Conducted emission	Pass
Section 15.247(i), RF exposure	Pass, the exhibit to the application of certification is provided

Testing was completed against all relevant requirements of the test standard. The results obtained indicate that the product under test complies in full with the requirements tested.

The test results relate only to the items tested. Pass/ fail decision was based on nominal values.

	Name and Title	Date	Signature
Tested by:	Mr. L. Markel, test engineer	March 18, 2010	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	March 22, 2010	
Approved by:	Mr. M. Nikishin, EMC and Radio group manager	March 23, 2010	

6 EUT description

6.1 General information

The EUT, AE11GOW wireless modem, includes one V487 module Tx/Rx (787.0-788.0/757.0-758.0 MHz), one 902-928 frequency hopping module and one licensed modem 890-902 & 928-960 MHz approved as a modular transmitter.

6.2 Ports and lines

Port type	Port description	Conn. from	Connected to	Qty.	Cable type	Cable length, m	Indoor / outdoor
Power	DC power	Power supply	EUT	1	Unshielded	1.5	Outdoor
RF 787-788 MHz	Antenna	EUT	Termination/Antenna	1	Coax	NA	Outdoor
Signal	Ethernet	PC	EUT	1	Shielded	15	Outdoor
Signal	RS-232	EUT	Not connected	1	NA	NA	For maintenance only
RF 902-928 MHz	Antenna	EUT	Antenna	1	Coax	1	Outdoor
RF 900 MHz	Antenna	EUT	Termination	1	Coax	NA	Outdoor

6.3 Support and test equipment

Description	Manufacturer	Model number	Serial number
PC	NA	NA	TZ02060330596

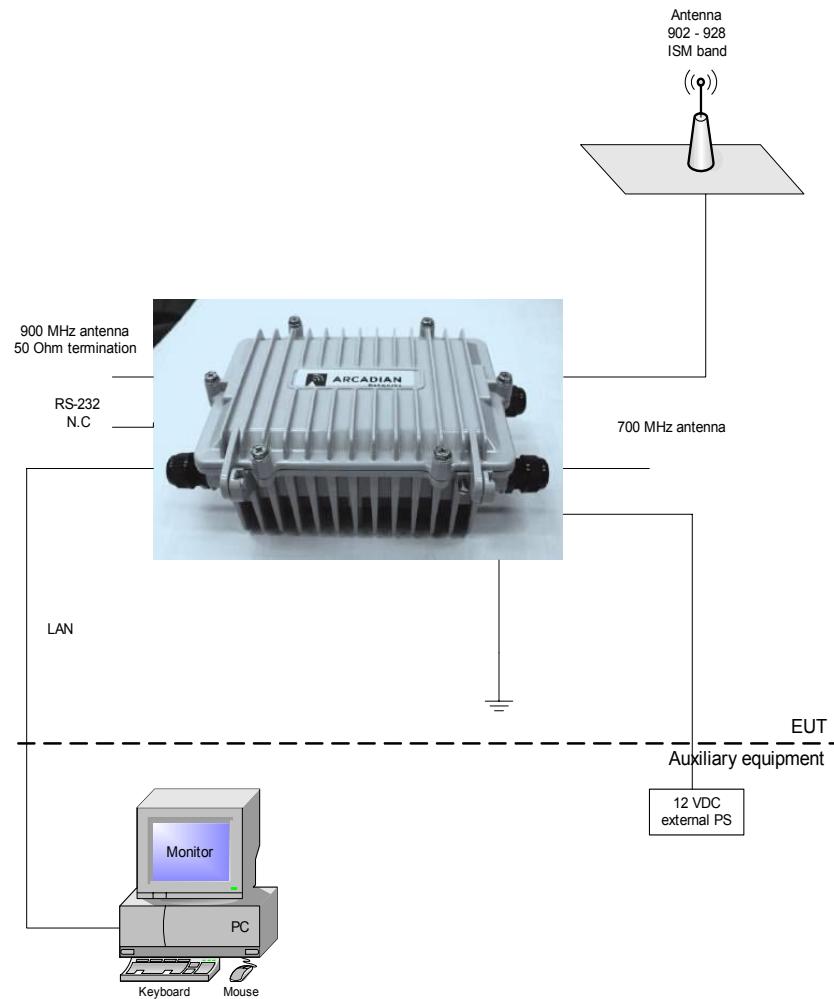
6.4 Operating frequencies

Source	Frequency, MHz
Tx	787.0 - 788.0
Rx	757.0 - 758.0
Tx/Rx	902.0 - 928.0
First LO	1302.0 - 1328.0
Clock	26, 24, 13 (TXCO), 16(XTAL)
LO	743.5

6.5 Changes made in the EUT

No changes were implemented.

6.6 Test configuration





6.7 Transmitter characteristics

Type of equipment				
<input type="checkbox"/> Stand-alone (Equipment with or without its own control provisions) <input checked="" type="checkbox"/> Combined equipment (Equipment where the radio part is fully integrated within another type of equipment) <input type="checkbox"/> Plug-in card (Equipment intended for a variety of host systems)				
Intended use		Condition of use		
<input checked="" type="checkbox"/> fixed		Always at a distance more than 2 m from all people		
mobile		Always at a distance more than 20 cm from all people		
portable		May operate at a distance closer than 20 cm to human body		
Assigned frequency range		902.0 – 928.0 MHz		
Receive frequency range		902.0 – 928.0 MHz		
Transmit frequency range		902.25 - 927.75 MHz		
Maximum rated output power		At transmitter 50 Ω RF output connector	24.9 dBm	
		Effective radiated power (for equipment with no RF connector)	NA	
Is transmitter output power variable?		<input checked="" type="checkbox"/> No		
		<input type="checkbox"/> Yes	continuous variable	
			Stepped variable with stepsize	
			minimum RF power	
			maximum RF power	24.92 dBm
Antenna connection				
unique coupling	<input checked="" type="checkbox"/>	standard N-type connector	integral	
			with temporary RF connector	
			without temporary RF connector	
Antenna/s technical characteristics				
Type	Manufacturer	Model number	Gain	
N mount Omnidirectional	Laird	TRA9023	3 dBi	
Transmitter 99% power bandwidth	Bit rate, kBps		Type of modulation	
98.3 kHz	19.2		2-FSK	
Type of multiplexing	FHSS			
Modulating test signal (baseband)	PRBS			
Maximum transmitter duty cycle supplied for test	100%			
RF channel spacing	Tested frequency channel			
	Low	Mid	High	
500 kHz	902.25	914.75	927.75	
Transmitter power source				
Battery	Nominal rated voltage	VDC	Battery type	
<input checked="" type="checkbox"/> DC	Nominal rated voltage	12 VDC		
AC mains	Nominal rated voltage	120 VAC	Frequency	
			60 Hz	
Common power source for transmitter and receiver		<input checked="" type="checkbox"/>	yes	
			no	

Test specification:	Section 15.247(a)1, (g), (h), Frequency hopping requirements		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:02:53 PM	Relative Humidity:	42 %
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Power Supply:	12 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C §15.247 (FHSS) requirements

7.1 Frequency hopping requirements

The EUT was verified for compliance with frequency hopping requirements listed below:

- The EUT shall hop to channel frequencies that are selected from a pseudorandomly ordered list;
- Each hopping frequency shall be used equally on the average;
- The EUT receiver shall have input bandwidth that match the hopping channel bandwidth of the corresponding transmitter and shall shift frequencies in synchronization with the transmitted signals;
- The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

The rationale for compliance with the above requirements was either test results or supplier declaration. The summary of results is provided in Table 7.1.1.

Table 7.1.1 Frequency hopping requirements

Requirement	Rationale	Verdict
The EUT shall hop to channel frequencies that are selected from a pseudorandom ordered list	Supplier declaration (refer to Table 7.1.2) There are 16 pseudorandom hopping super sequences in the protocol (see NOTE 1)	Comply
Each hopping frequency shall be used equally on the average	Supplier declaration	Comply
The EUT receiver shall have input bandwidth that match the hopping channel bandwidth of the corresponding transmitter	Supplier declaration In both the Front end as well as with the IF bandwidths	Comply
The EUT receiver shall shift frequencies in synchronization with the transmitted signals	Supplier declaration There is a sync system instigated from the meter perspective. See the revised document (see NOTE 2)	Comply
Each transmitter operates independently and there is no synchronization with other transmitters for purposes other than to avoid simultaneous channel occupancy	Supplier declaration	Comply



Test specification:	Section 15.247(a)1, (g), (h), Frequency hopping requirements				
Test procedure:	Public notice DA 00-705				
Test mode:	Compliance				Verdict: PASS
Date & Time:	3/16/2010 1:02:53 PM		Relative Humidity:	42 %	Power Supply: 12 VDC
Temperature: 24.1 °C	Air Pressure: 1014 hPa				
Remarks:					

Table 7.1.2 Frequency hopping sequence

Frequency [MHz]	Frequency Assignment	Frequency [MHz]	Frequency Assignment	Frequency [MHz]	Frequency Assignment
902.25	F1	912.25	F21	922.25	F41
902.75	F2	912.75	F22	922.75	F42
903.25	F3	913.25	F23	923.25	F43
903.75	F4	913.75	F24	923.75	F44
904.25	F5	914.25	F25	924.25	F45
904.75	F6	914.75	F26	924.75	F46
905.25	F7	915.25	F27	925.25	F47
905.75	F8	915.75	F28	925.75	F48
906.25	F9	916.25	F29	916.25	F49
906.75	F10	916.75	F30	916.75	F50
907.25	F11	917.25	F31	927.25	F51
907.75	F12	917.75	F32	927.75	F52
908.25	F13	918.25	F33		
908.75	F14	918.75	F34		
909.25	F15	919.25	F35		
909.75	F16	919.75	F36		
910.25	F17	920.25	F37		
910.75	F18	920.75	F38		
911.25	F19	921.25	F39		
911.75	F20	921.75	F40		

NOTE 1: Hopping algorithm explanation:

The LAN protocol defines the number of frequency channels to be used by the LAN radio as 52. These 52 channels are distributed evenly across the 900 - 928 MHz band with 500 kHz spacing. The frequency hopping system contains 16 pseudo-random super sequences of 52 channel hops per sequence. The frequency hopping timing is such that a data transmission can occur every 10 time slots (TS=150ms) which means that 1.5 s is the time between successive data transmissions at a minimum interval. Therefore, it would take as low as 124.8 s to progress through the full set of frequencies in the frequency hopping super sequence. The sequences dictate that the unit shall only transmit on the same channel every 7.8 s, which sets the dwell time within a 20 second time period.

NOTE 2: The receiver syncs based upon the following:

Upon initial placement, the Cell Relay RFLAN will listen as specified channels for endpoint fathers that are beacons through all of the 52 channels. When the Cell Relay RFLAN acquires a beacon from the endpoint, it will synchronize the endpoint with its generated hopping sequences and subsequently the endpoint fathers will address the children in the same manner.

Test specification:	Section 15.247(a)1, 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:34:51 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

7.2 20 dB bandwidth

7.2.1 General

This test was performed to measure 20 dB bandwidth of the transmitter-hopping channel. Specification test limits are given in Table 7.2.1.

Table 7.2.1 The 20 dB bandwidth limits

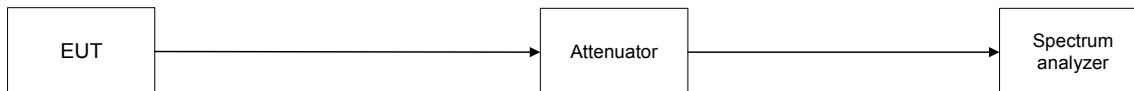
Assigned frequency, MHz	Maximum bandwidth, kHz	Modulation envelope reference points*, dBc
902.0 – 928.0	500	20

* - Modulation envelope reference points provided in terms of attenuation below the peak of modulated carrier.

7.2.2 Test procedure

- 7.2.2.1 The EUT was set up as shown in Figure 7.2.1, energized and its proper operation was checked.
- 7.2.2.2 The EUT was set to transmit modulated carrier at maximum data rate.
- 7.2.2.3 The transmitter bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.2.2 and the associated plot.
- 7.2.2.4 The test was repeated for each data rate and each modulation format.

Figure 7.2.1 The 20 dB bandwidth test setup





Test specification:	Section 15.247(a)1, 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:34:51 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.2.2 The 20 dB bandwidth test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 DETECTOR USED: Peak
 SWEEP TIME: Auto
 RESOLUTION BANDWIDTH: \geq 1% of the 20 dB bandwidth
 VIDEO BANDWIDTH: \geq RBW
 MODULATION ENVELOPE REFERENCE POINTS: 20.0 dBc
 MODULATING SIGNAL: PRBS
 FREQUENCY HOPPING: Disabled

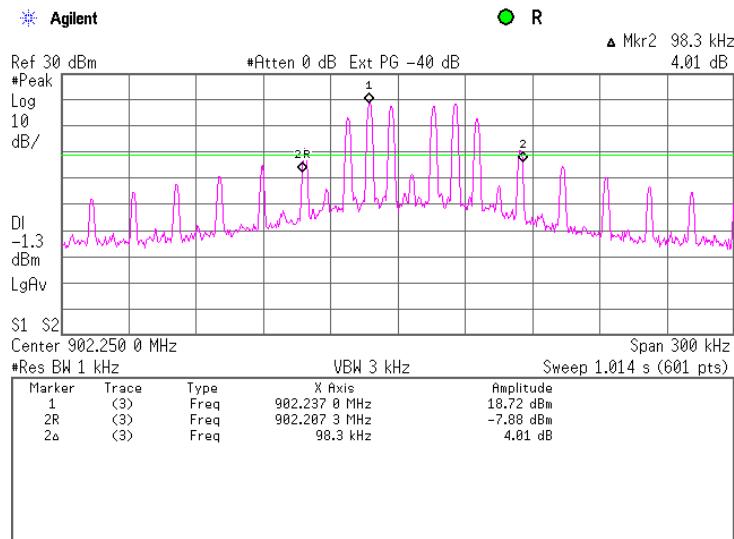
Carrier frequency, MHz	Type of modulation	Data rate, kbps	20 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
902.25	2-FSK	19.2	98.3	500	-401.7	Pass
914.75	2-FSK	19.2	97.6	500	-402.4	Pass
927.75	2-FSK	19.2	97.6	500	-402.4	Pass

Reference numbers of test equipment used

HL 2951	HL 3442	HL 3762	HL 3818				
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Full description is given in Appendix A.

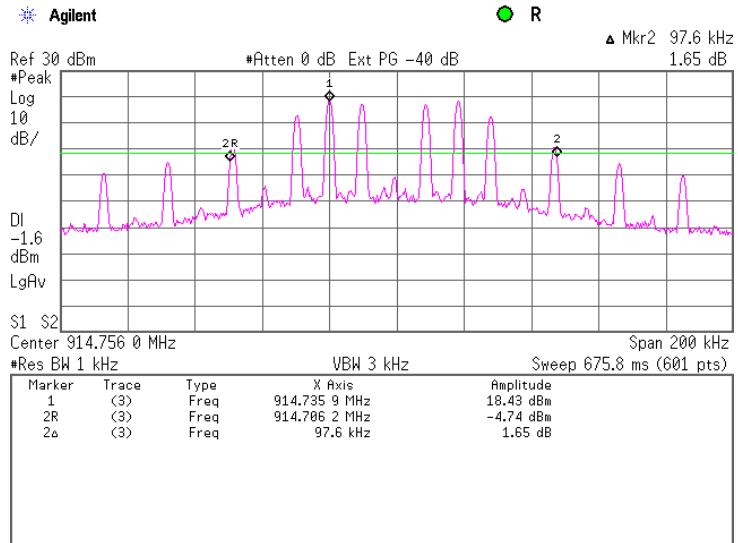
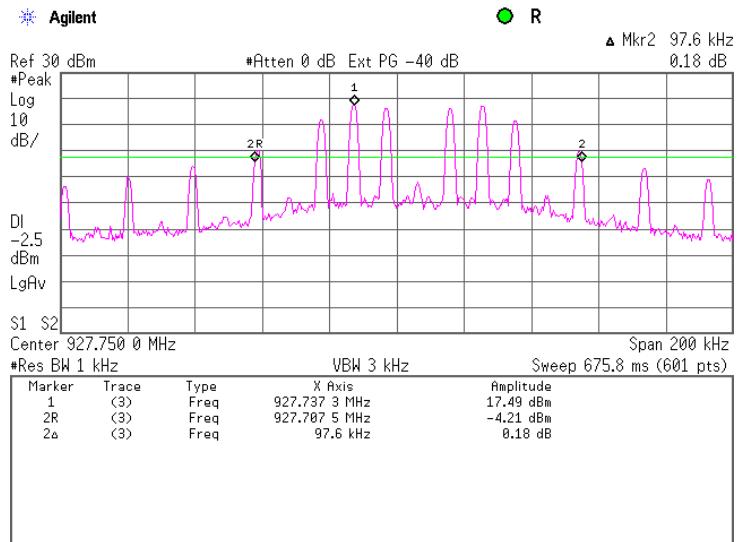
Plot 7.2.1 The 20 dB bandwidth test result at low frequency





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Test specification:	Section 15.247(a)1, 20 dB bandwidth		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:34:51 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.2.2 The 20 dB bandwidth test result at mid frequency**Plot 7.2.3 The 20 dB bandwidth test result at high frequency**



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Test specification:	Section 15.247(a)1, Frequency separation		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:35:33 PM	Relative Humidity:	42 %
Temperature:	24.3 °C	Air Pressure:	1014 hPa
Power Supply:	12 VDC		
Remarks:			

7.3 Carrier frequency separation

7.3.1 General

This test was performed to measure frequency separation between the peaks of adjacent channels. Specification test limits are given in Table 7.3.1.

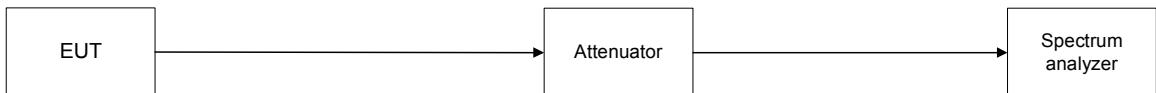
Table 7.3.1 Carrier frequency separation limits

Assigned frequency range, MHz	Minimum carrier frequency separation
902.0 – 928.0	25 kHz or 20 dB bandwidth of the hopping channel, whichever is greater

7.3.2 Test procedure

- 7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized with frequency hopping function enabled and its proper operation was checked.
- 7.3.2.2 The spectrum analyzer span was set to capture the carrier frequency and both of adjacent channels, the lower and the higher. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.3.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.
- 7.3.2.4 The frequency separation between the peaks of adjacent channels was measured as provided in Table 7.3.2 and the associated plots.

Figure 7.3.1 Carrier frequency separation test setup





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Test specification:	Section 15.247(a)1, Frequency separation		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:35:33 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.3.2 Carrier frequency separation test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 MODULATION: 2-FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 19.2 kbps
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: $\geq 1\%$ of the span
 VIDEO BANDWIDTH: \geq RBW
 FREQUENCY HOPPING: Enabled
 20 dB BANDWIDTH: 97.6 – 98.3 kHz

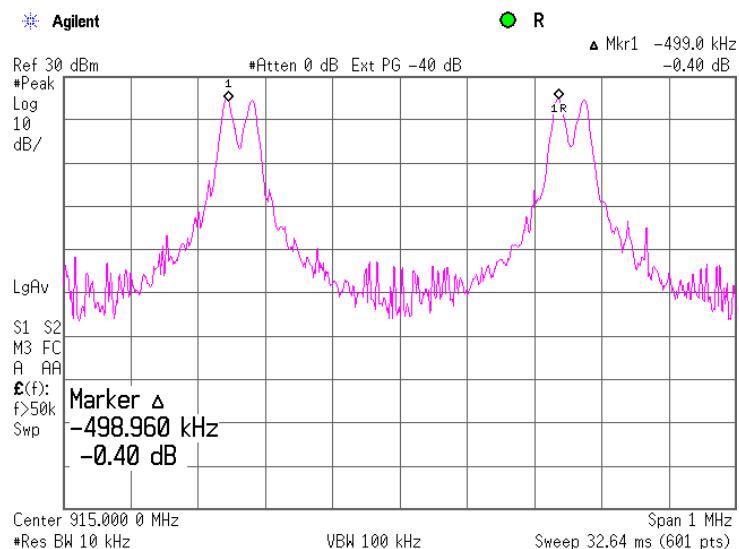
Carrier frequency separation, kHz	Limit, kHz	Margin*	Verdict
499.0	98.3	-400.7	Pass

* - Margin = Carrier frequency separation – specification limit.

Reference numbers of test equipment used

HL 2951	HL 3442	HL 3762	HL 3818			
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Full description is given in Appendix A.

Plot 7.3.1 Carrier frequency separation



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Test specification:	Section 15.247(a)1, Number of hopping frequencies		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:35:59 PM	Relative Humidity:	42 %
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Power Supply:	12 VDC
Remarks:			

7.4 Number of hopping frequencies

7.4.1 General

This test was performed to calculate the number of hopping frequencies used by the EUT. Specification test limits are given in Table 7.4.1.

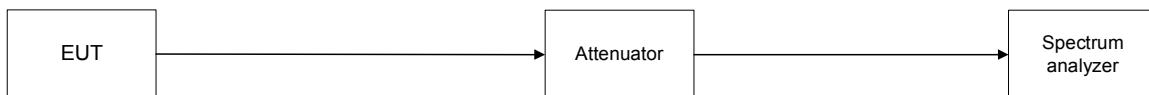
Table 7.4.1 Minimum number of hopping frequencies

Assigned frequency range, MHz	Number of hopping frequencies
902.0 – 928.0	50 (if the 20 dB bandwidth is less than 250 kHz)

7.4.2 Test procedure

- 7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized with frequency hopping function enabled and its proper operation was checked.
- 7.4.2.2 Initially the spectrum analyzer span was set equal to frequency band of operation and the resolution bandwidth was set wider than 1 % of the frequency span. If the separate hopping channels were not clearly resolved the frequency band of operation was broken to sections and the resolution bandwidth was set wider than 1 % of the frequency span of each section.
- 7.4.2.3 The spectrum analyzer was set in max hold mode and allowed trace to stabilize.
- 7.4.2.4 The number of frequency hopping channels was calculated as provided in Table 7.4.2 and associated plots.

Figure 7.4.1 Hopping frequencies test setup





Test specification:	Section 15.247(a)1, Number of hopping frequencies		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:35:59 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.4.2 Hopping frequencies test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 MODULATION: 2-FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 19.2 kbps
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: $\geq 1\%$ of the span
 VIDEO BANDWIDTH: \geq RBW
 FREQUENCY HOPPING: Enabled

Number of hopping frequencies	Minimum number of hopping frequencies	Margin*	Verdict
52	50	-2	Pass

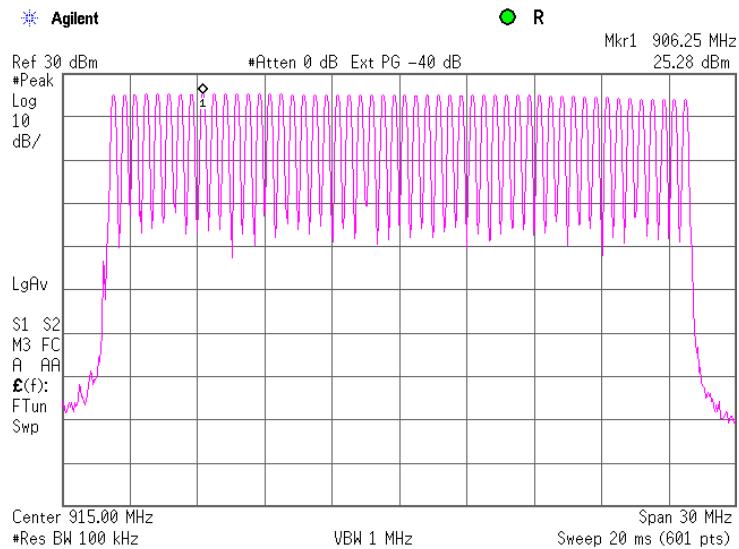
* - Margin = Number of hopping frequencies – Minimum number of hopping frequencies.

Reference numbers of test equipment used

HL 2951	HL 3762	HL 3442	HL 3818			
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Full description is given in Appendix A.

Plot 7.4.1 Number of hopping frequencies





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Test specification:	Section 15.247(a)1, Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:37:39 PM	Relative Humidity:	42 %
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Power Supply:	12 VDC
Remarks:			

7.5 Average time of occupancy

7.5.1 General

This test was performed to calculate the average time of occupancy (dwell time) on any frequency channel of the EUT. Specification test limits are given in Table 7.5.1.

Table 7.5.1 Average time of occupancy limits

Assigned frequency range, MHz	Maximum average time of occupancy, s	Investigated period, s	Number of hopping frequencies
902.0 – 928.0	0.4	20.0	≥ 50

7.5.2 Test procedure

- 7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized with frequency hopping function enabled and its proper operation was checked.
- 7.5.2.2 The spectrum analyzer span was set to zero centered on a hopping channel.
- 7.5.2.3 The single transmission duration and period were measured with oscilloscope.
- 7.5.2.4 The average time of occupancy was calculated as the single transmission time multiplied by the investigated period and divided by the single transmission period.
- 7.5.2.5 The test was repeated at each data rate and modulation type as provided in Table 7.5.2 and associated plots.

Figure 7.5.1 Average time of occupancy test setup





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Test specification:	Section 15.247(a)1, Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:37:39 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.5.2 Average time of occupancy test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 MODULATION: 2-FSK
 MODULATING SIGNAL: PRBS
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1 MHz
 VIDEO BANDWIDTH: 3 MHz
 NUMBER OF HOPPING FREQUENCIES: 52
 INVESTIGATED PERIOD: 20 s
 FREQUENCY HOPPING: Enabled (see NOTE1)

Carrier frequency, MHz	Single transmission duration, s	Single transmission period, s	Average time of occupancy*, s	Bit rate, Mbps	Limit, s	Margin, s**	Verdict
902.25	0.123	7.8	0.31538	19.2	0.4	-0.0846	Pass

* - Average time of occupancy = (Single transmission duration × Investigated period) / (Single transmission period).

** - Margin = Average time of occupancy – specification limit.

NOTE1: Special mode where only single channel is available in hopping sequence was used to measure transmission period. According to manufacturer declaration the minimum period in which EUT transmit again on the same channel is 7.8 s (refer to "Frequency hopping requirements" test results).

Reference numbers of test equipment used

HL 1424							
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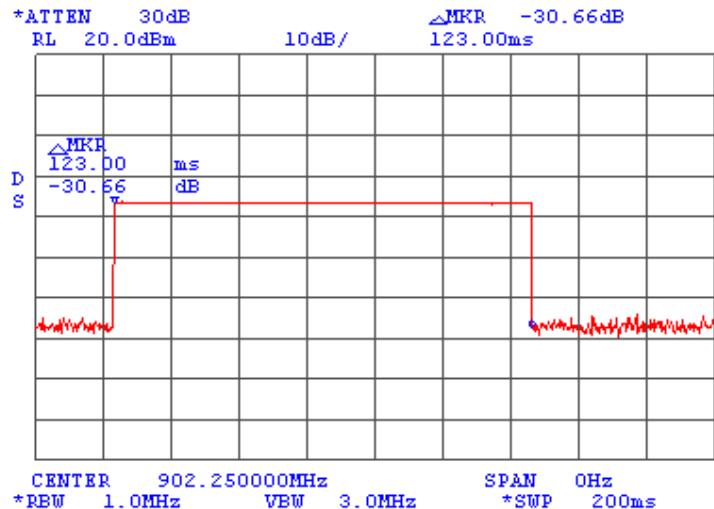
Full description is given in Appendix A.



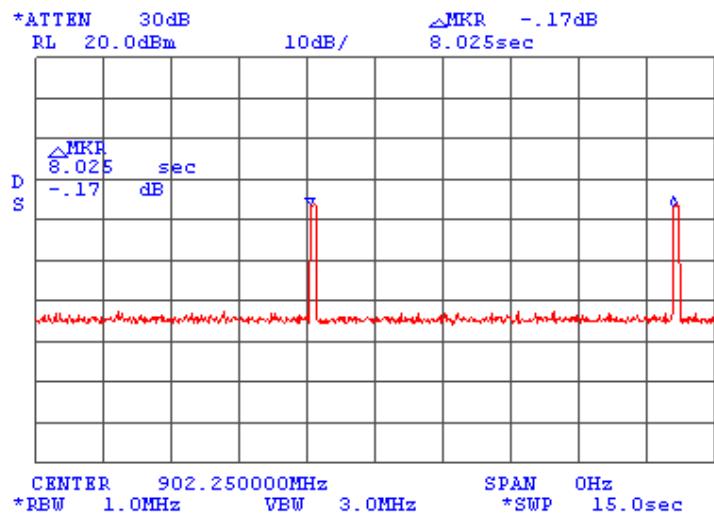
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Test specification:	Section 15.247(a)1, Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:37:39 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.5.1 Single transmission duration

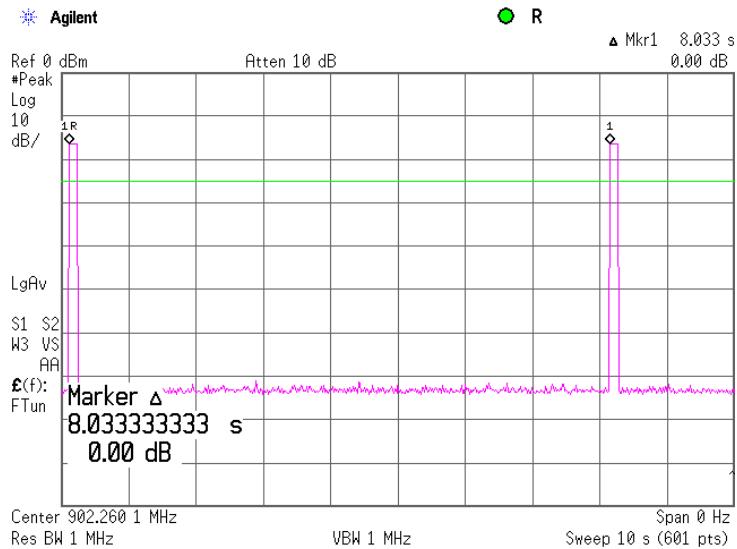


Plot 7.5.2 Single transmission period



Test specification:	Section 15.247(a)1, Average time of occupancy		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:37:39 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.5.3 Single transmission period





HERMON LABORATORIES

Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:38:20 PM	PASS	
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

7.6 Peak output power

7.6.1 General

This test was performed to measure the maximum peak output power at the transmitter RF antenna connector. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Peak output power limits

Assigned frequency range, MHz	Peak output power*		Maximum antenna gain, dBi
	W	dBm	
902.0 – 928.0	1.0	30.0	6.0*

* - If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power limit shall be reduced below the stated value as follows:

- by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

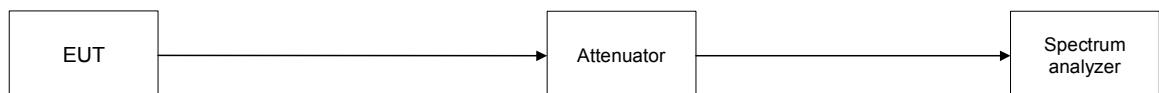
7.6.2 Test procedure

7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and its proper operation was checked.

7.6.2.2 The EUT was adjusted to produce maximum available for end user RF output power.

7.6.2.3 The frequency span of spectrum analyzer was set approximately 5 times wider than 20 dB bandwidth of the EUT and the resolution bandwidth was set wider than 20 dB bandwidth of the EUT. The spectrum analyzer trace was allowed to stabilize and the maximum peak output power was measured as provided in Table 7.6.2 and the associated plots.

Figure 7.6.1 Peak output power test setup





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Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance		Verdict:
Date & Time:	3/16/2010 1:38:20 PM		PASS
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

Table 7.6.2 Peak output power test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 MODULATION: 2-FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 19.2 kbps
 TRANSMITTER OUTPUT POWER SETTINGS:
 DETECTOR USED: Maximum
 Peak
 EUT 20 dB BANDWIDTH: 97.6 – 98.3 kHz
 RESOLUTION BANDWIDTH: 3 MHz
 VIDEO BANDWIDTH: 8 MHz
 FREQUENCY HOPPING: Disabled
 NUMBER OF FREQUENCY HOPPING CHANNELS: 52
 ANTENNA GAIN: 3 dBi

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation dB	Cable loss dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
902.25	24.92	Included	Included	24.92	30.0	-5.08	Pass
914.75	24.70	Included	Included	24.70	30.0	-5.30	Pass
927.75	23.48	Included	Included	23.48	30.0	-6.52	Pass

* - Margin = Peak output power – specification limit.

Note1: Maximum peak output power was obtained at Unom input power voltage.

Note2: As declared antenna gain is 3 dBi no reducing in limit value is required.

Reference numbers of test equipment used

HL 3442	HL 3762	HL 3818					
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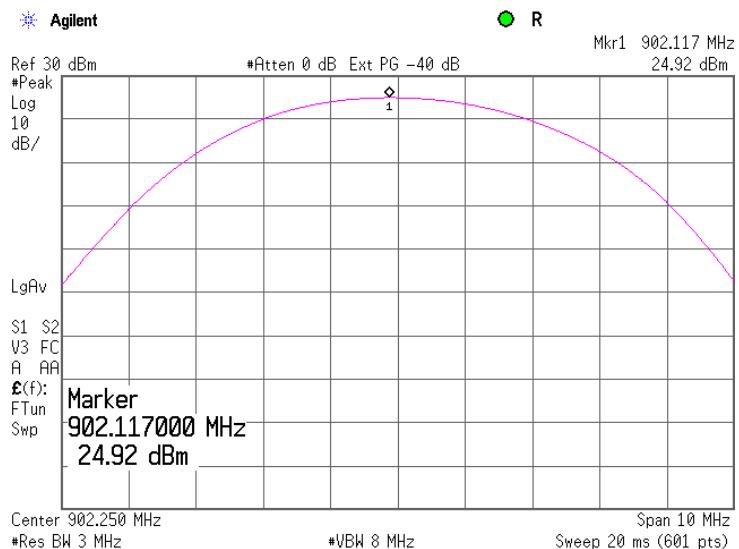
Full description is given in Appendix A.



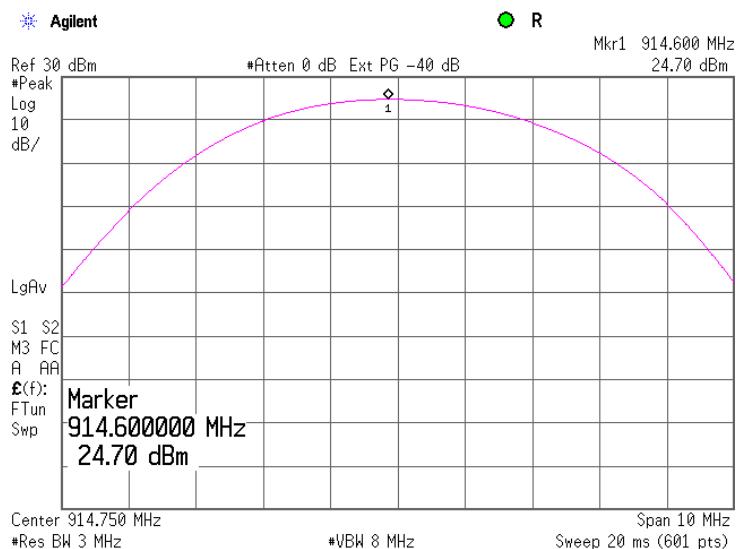
HERMON LABORATORIES

Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:38:20 PM	PASS	
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

Plot 7.6.1 Peak output power at low frequency and Unom



Plot 7.6.2 Peak output power at mid frequency and Unom

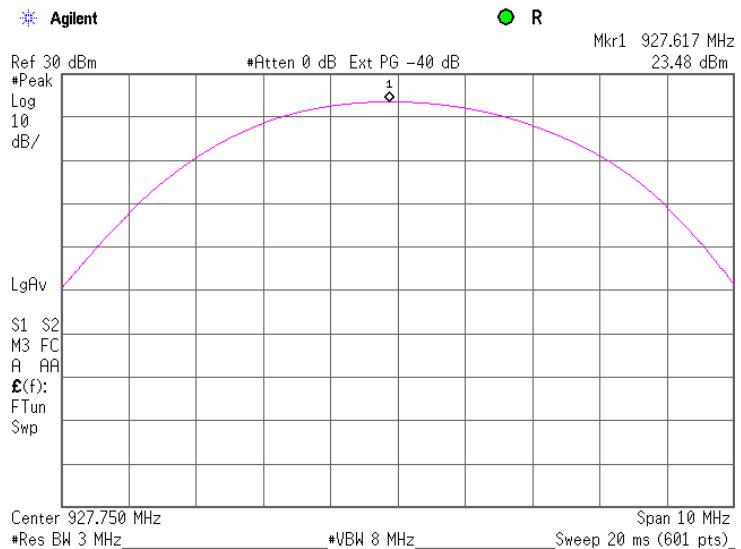




HERMON LABORATORIES

Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:38:20 PM	PASS	
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

Plot 7.6.3 Peak output power at high frequency and Unom

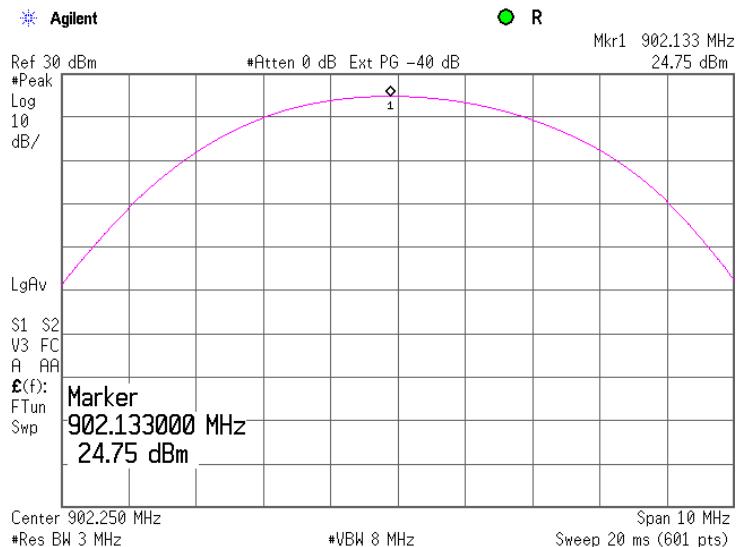




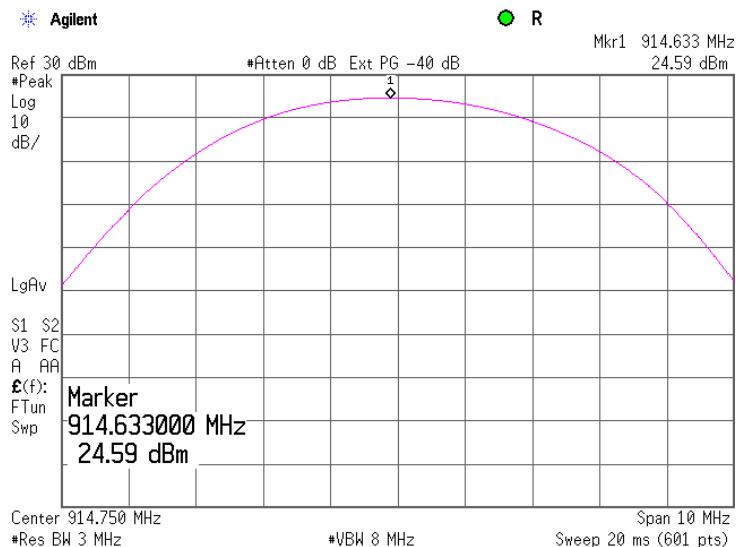
HERMON LABORATORIES

Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:38:20 PM	PASS	
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

Plot 7.6.4 Peak output power at low frequency and 115%Unom



Plot 7.6.5 Peak output power at mid frequency and 115%Unom

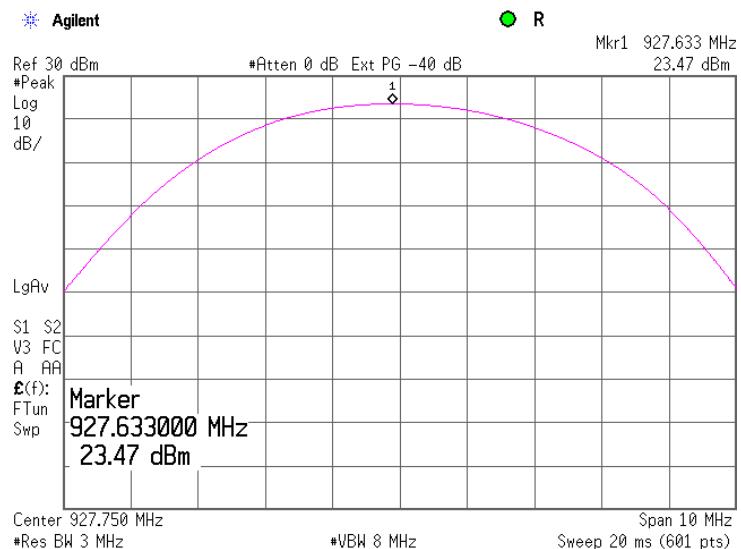




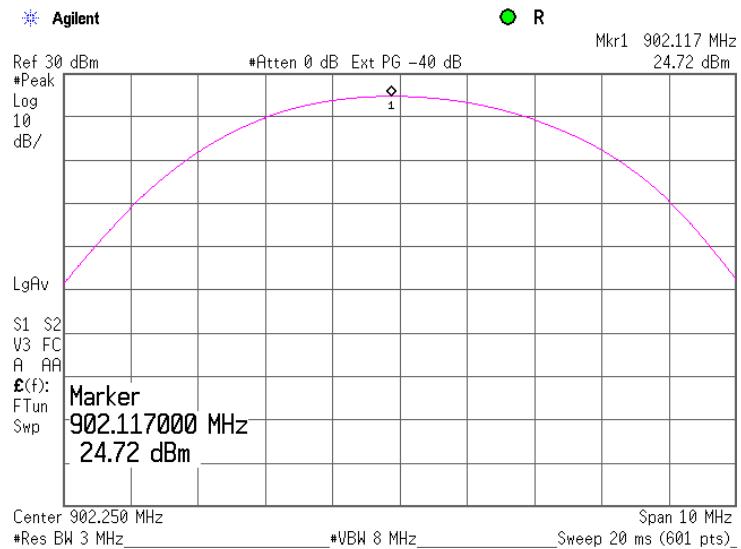
HERMON LABORATORIES

Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:38:20 PM	PASS	
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

Plot 7.6.6 Peak output power at high frequency and 115%Unom



Plot 7.6.7 Peak output power at low frequency and 85%Unom

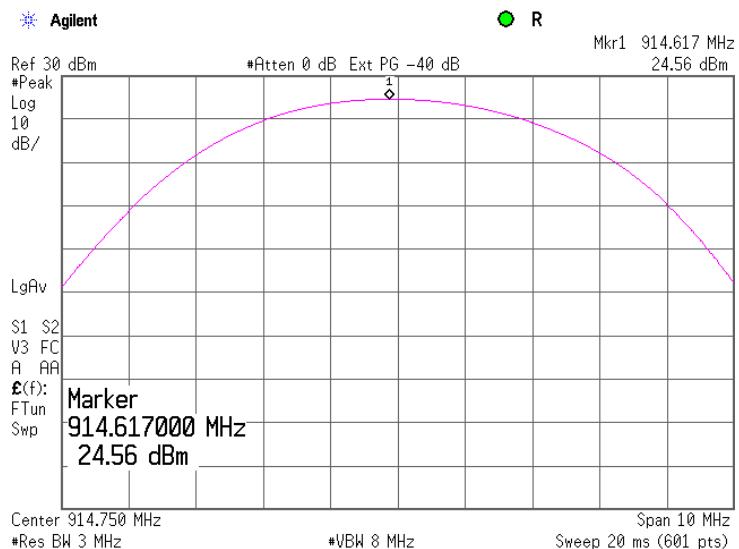




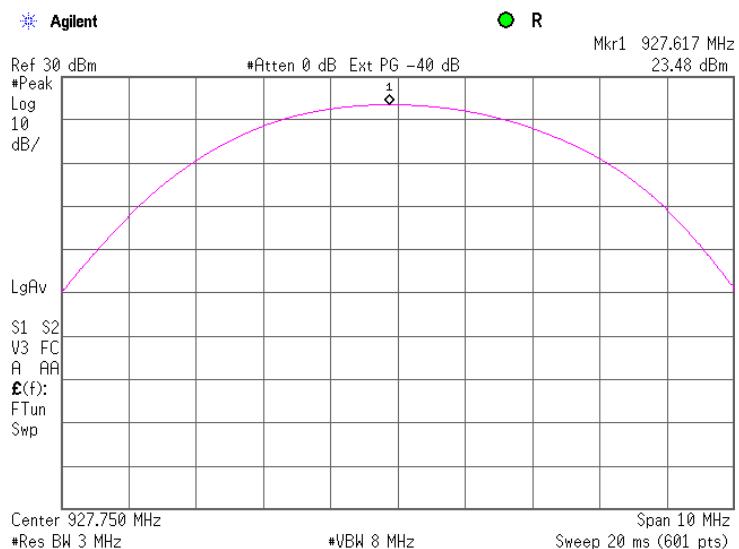
HERMON LABORATORIES

Test specification:	Section 15.247(b), Peak output power		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:38:20 PM	PASS	
Temperature: 23.4 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC +- 15%
Remarks:			

Plot 7.6.8 Peak output power at mid frequency and 85%Unom



Plot 7.6.9 Peak output power at high frequency and 85%Unom





HERMON LABORATORIES

Test specification:	Section 15.247(d), Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:39:16 PM	Relative Humidity:	42 %
Temperature: 23.1 °C	Air Pressure: 1014 hPa	Power Supply:	12 VDC
Remarks:			

7.7 Band edge emissions at RF antenna connector

7.7.1 General

This test was performed to measure band edge emissions at RF antenna connector. Specification test limits are given in Table 7.7.1.

Table 7.7.1 Band edge emission limits

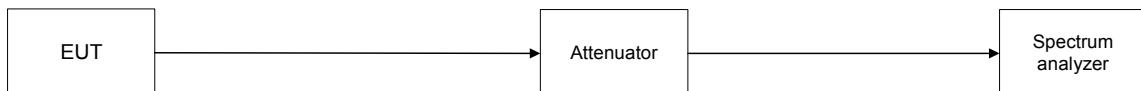
Assigned frequency, MHz	Attenuation below carrier*, dBc
902.0 – 928.0	20.0

* - Band edge emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.7.2 Test procedure

- 7.7.2.1 The EUT was set up as shown in Figure 7.7.1, energized normally modulated at the maximum data rate with its hopping function disabled and its proper operation was checked.
- 7.7.2.2 The EUT was adjusted to produce maximum available to end user RF output power at the lowest carrier frequency.
- 7.7.2.3 The spectrum analyzer span was set to capture the carrier frequency and associated modulation products. The resolution bandwidth was set wider than 1 % of the frequency span.
- 7.7.2.4 The spectrum analyzer was set in max hold mode and allowed trace to stabilize. The highest emission level within the authorized band was measured.
- 7.7.2.5 The maximum band edge emission and modulation product outside of the band were measured as provided in Table 7.7.2 and associated plots and referenced to the highest emission level measured within the authorized band.
- 7.7.2.6 The above procedure was repeated with the EUT adjusted to produce maximum RF output power at the highest carrier frequency.
- 7.7.2.7 The above procedure was repeated with the frequency hopping function enabled.

Figure 7.7.1 Band edge emission test setup





Test specification:	Section 15.247(d), Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:39:16 PM	PASS	
Temperature: 23.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.7.2 Band edge emission test results

ASSIGNED FREQUENCY RANGE: 902.0 – 928.0 MHz
 DETECTOR USED: Peak
 MODULATION: 2-FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 19.2 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 24.92 dBm at low carrier frequency
 23.48 dBm at high carrier frequency
 RESOLUTION BANDWIDTH: $\geq 1\%$ of the span
 VIDEO BANDWIDTH: \geq RBW

Frequency, MHz	Band edge emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Frequency hopping disabled						
902.00	-6.76	25.01	31.68	20.0	-11.68	Pass
928.00	-8.15	23.80	31.63		-11.63	
Frequency hopping enabled						
901.96	-2.94	25.01	27.95	20.0	-7.95	Pass
902.00	-7.29	25.01	32.30		-12.3	
928.00	-9.60	23.80	33.40		-13.4	
928.073	-6.97	23.80	30.77		-10.77	

*- Margin = Attenuation below carrier – specification limit.

Frequency hopping disabled

NOTE1: At the low carrier frequency the maximum band edge emission meets 20 dBc limit at 902.09 MHz

NOTE1: At the high carrier frequency the maximum band edge emission meets 20 dBc limit at 927.92 MHz

Reference numbers of test equipment used

HL 2951	HL 3442	HL 3762	HL 3818			
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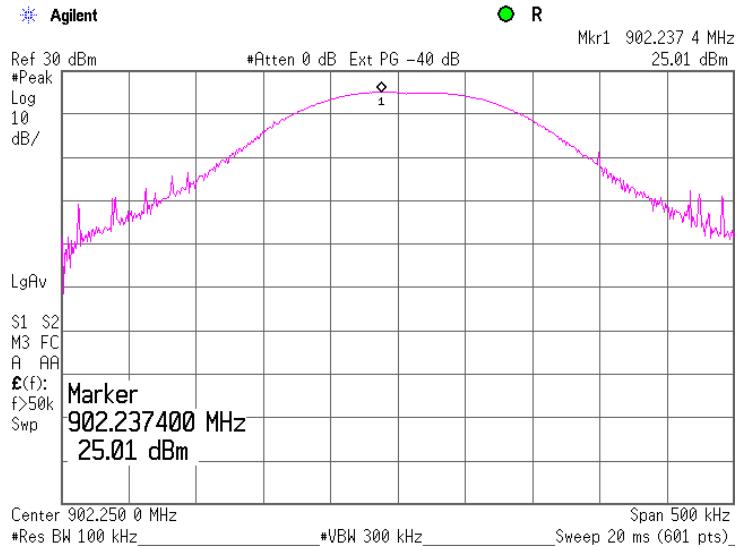
Full description is given in Appendix A.



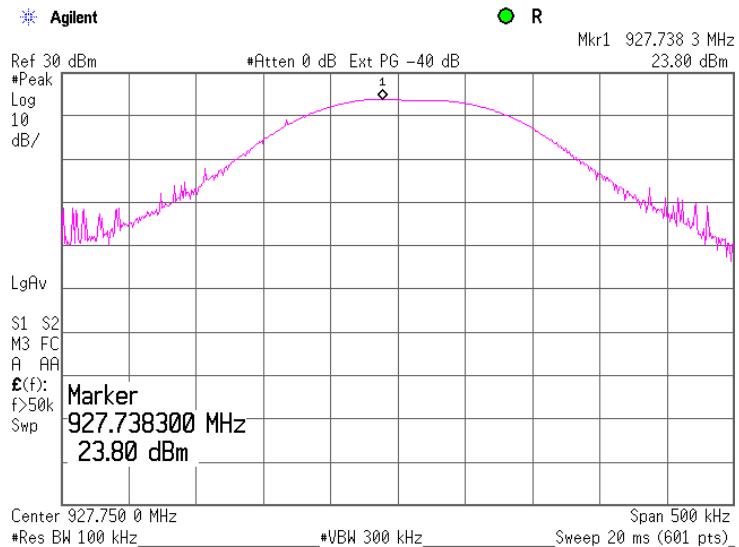
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Test specification:	Section 15.247(d), Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:39:16 PM	PASS	
Temperature: 23.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.7.1 The highest emission at low carrier frequency



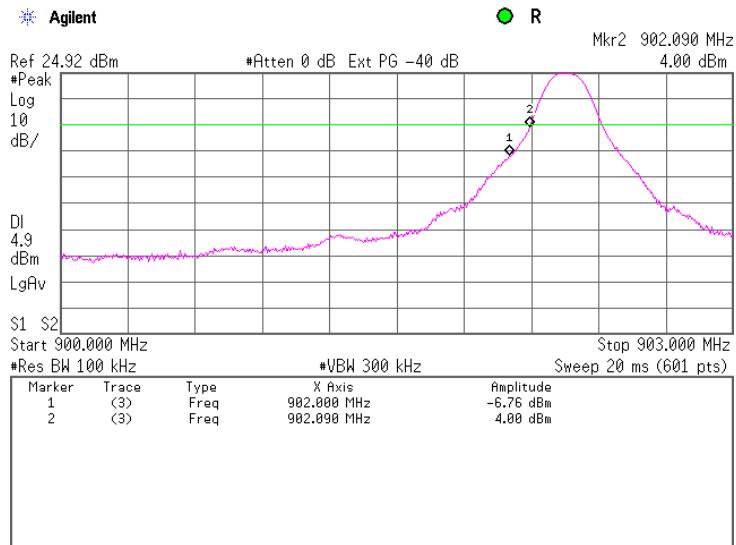
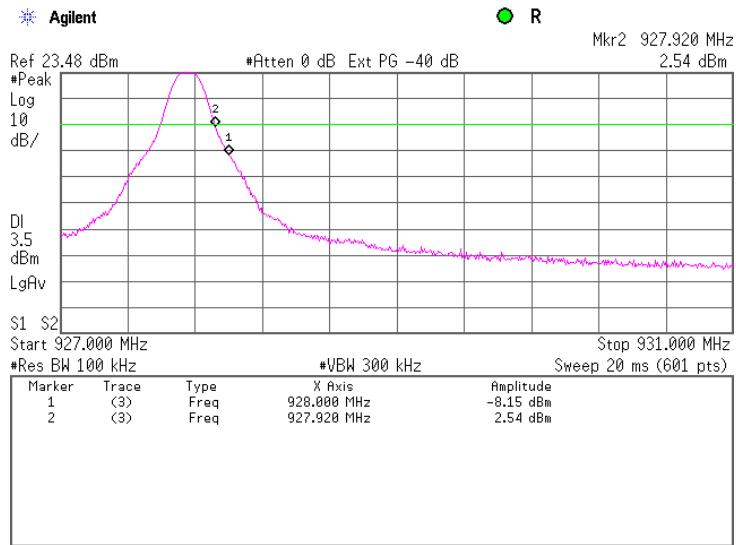
Plot 7.7.2 The highest emission at high carrier frequency





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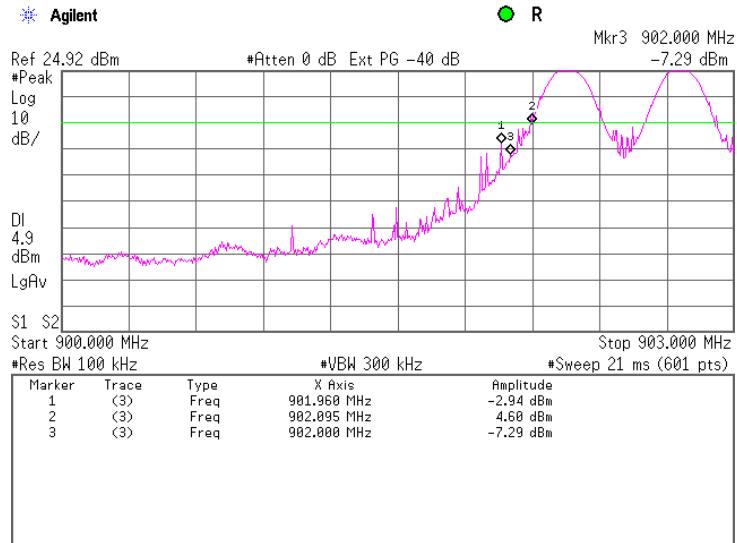
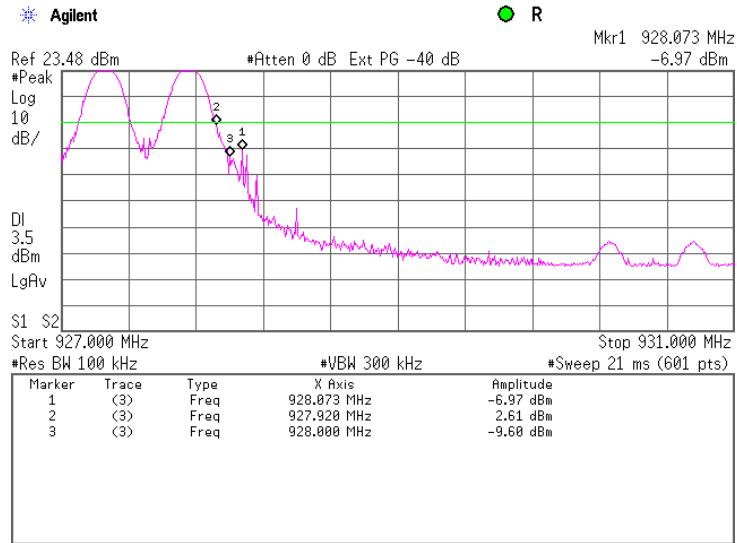
Test specification:	Section 15.247(d), Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:39:16 PM	PASS	
Temperature: 23.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.7.3 The highest band edge emission at low carrier frequency with hopping function disabled**Plot 7.7.4 The highest band edge emission at high carrier frequency with hopping function disabled**



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Test specification:	Section 15.247(d), Emissions at band edges		
Test procedure:	Public notice DA 00-705		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:39:16 PM	PASS	
Temperature: 23.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.7.5 The highest band edge emission at low carrier frequency with hopping function enabled**Plot 7.7.6 The highest band edge emission at high carrier frequency with hopping function enabled**



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Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance		Verdict: PASS
Date & Time:	3/16/2010 1:40:57 PM		
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

7.8 Field strength of spurious emissions

7.8.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.8.1.

Table 7.8.1 Radiated spurious emissions limits

Frequency, MHz	Field strength at 3 m within restricted bands, dB(µV/m)***			Attenuation of field strength of spurious versus carrier outside restricted bands, dBc***	
	Peak	Quasi Peak	Average		
0.009 – 0.090	148.5 – 128.5	NA	128.5 – 108.5**	20.0	
0.090 – 0.110	NA	108.5 – 106.8**	NA		
0.110 – 0.490	126.8 – 113.8	NA	106.8 – 93.8**		
0.490 – 1.705	NA	73.8 – 63.0**	NA		
1.705 – 30.0*		69.5			
30 – 88		40.0			
88 – 216		43.5			
216 – 960		46.0			
960 – 1000		54.0			
1000 – 10 th harmonic		74.0	NA		
			54.0		

* - The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows:

$$\text{Lim}_{S2} = \text{Lim}_{S1} + 40 \log \left(\frac{S_1}{S_2} \right)$$

where S_1 and S_2 – standard defined and test distance respectively in meters.

** - The limit decreases linearly with the logarithm of frequency.

*** - The field strength limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

7.8.2 Test procedure for spurious emission field strength measurements in 9 kHz to 30 MHz band

- 7.8.2.1 The EUT was set up as shown in Figure 7.8.1, energized and the performance check was conducted.
- 7.8.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360° and the measuring antenna was rotated around its vertical axis.
- 7.8.2.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.

7.8.3 Test procedure for spurious emission field strength measurements above 30 MHz

- 7.8.3.1 The EUT was set up as shown in Figure 7.8.2, energized and the performance check was conducted.
- 7.8.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.
- 7.8.3.3 The worst test results (the lowest margins) were recorded and shown in the associated plots.



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Report ID: ARCRAD_FCC.20571_FHSS.doc

Date of Issue: 3/18/2010

Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Figure 7.8.1 Setup for spurious emission field strength measurements below 30 MHz

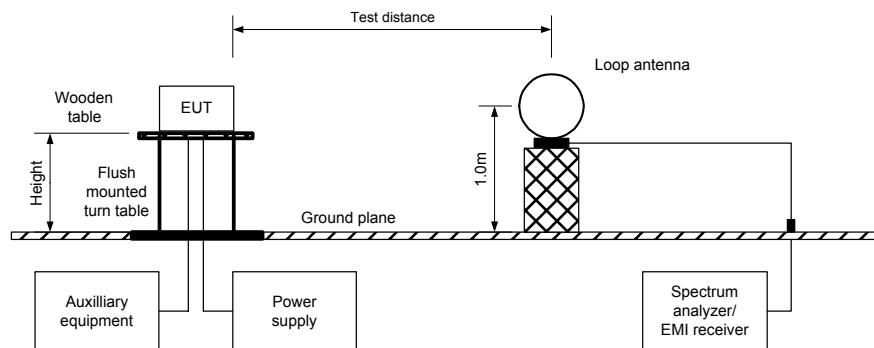
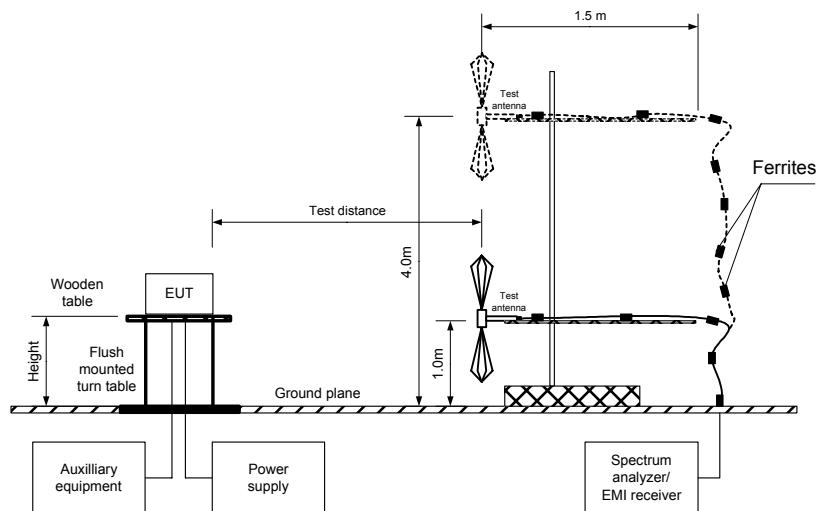


Figure 7.8.2 Setup for spurious emission field strength measurements above 30 MHz





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Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance		Verdict:
Date & Time:	3/16/2010 1:40:57 PM		PASS
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.8.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY RANGE:	902.0 – 928.0 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 10000 MHz
TEST DISTANCE:	3 m
MODULATION:	2-FSK
MODULATING SIGNAL:	PRBS
BIT RATE:	19.2 kbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
TRANSMITTER OUTPUT POWER:	24.92 dBm at low carrier frequency 24.70 dBm at mid carrier frequency 23.48 dBm at high carrier frequency
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz) Double ridged guide (above 1000 MHz)
FREQUENCY HOPPING:	Disabled

Frequency MHz	Field strength of spurious, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	Field strength of carrier, dB(µV/m)	Attenuation below carrier, dBc	Limit, dBc	Margin, dB**	Verdict
Low carrier frequency									
1855.48	54.63	V	1.35	290	122.37	67.11	20.0	-47.11	Pass

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin = Attenuation below carrier – specification limit.



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Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance		Verdict:
Date & Time:	3/16/2010 1:40:57 PM		PASS
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.8.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY RANGE: 902.0 - 928.0 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 - 10000 MHz
 TEST DISTANCE: 3 m
 MODULATION: 2-FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 19.2 kbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 24.92 dBm at low carrier frequency
 24.70 dBm at mid carrier frequency
 23.48 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide
 FREQUENCY HOPPING: Disabled

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*	Measured, dB(µV/m)	Calculated, dB(µV/m)	Limit, dB(µV/m)	Margin, dB***	
Low carrier frequency											
1004.47	V	1.10	020	45.10	74.00	-28.90	41.60	41.60	54.00	-12.40	Pass
1200.00	V	1.30	300	48.70	74.00	-25.30	45.90	45.90	54.00	-8.10	
1302.27	V	1.50	280	44.40	74.00	-29.60	39.50	39.50	54.00	-14.50	
3608.99	V	1.35	270	47.42	74.00	-26.58	36.08	36.08	54.00	-17.92	
Mid carrier frequency											
1029.400	V	1.50	010	45.00	74.00	-29.00	42.0	42.0	54.00	-12.00	Pass
1200.000	V	1.45	260	47.80	74.00	-26.20	45.9	45.9	54.00	-8.10	
1314.798	V	1.50	000	43.60	74.00	-30.40	38.2	38.2	54.00	-15.80	
High carrier frequency											
1005.72	V	1.50	330	44.20	74.00	-29.80	37.50	37.50	54.00	-16.50	Pass
1200.00	V	1.30	270	47.00	74.00	-27.00	41.80	41.80	54.00	-12.20	
1327.74	V	1.10	270	47.40	74.00	-26.60	41.20	41.20	54.00	-12.80	

*- EUT front panel refers to 0 degrees position of turntable.

**- Margin = Measured field strength - specification limit.

***- Margin = Calculated field strength - specification limit,

where Calculated field strength = Measured field strength + average factor.

Table 7.8.4 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
					0

*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

$$\text{Average factor} = 20 \times \log_{10} \left(\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{\text{Train duration}} \times \text{Number of bursts within pulse train} \right)$$

for pulse train longer than 100 ms:

$$\text{Average factor} = 20 \times \log_{10} \left(\frac{\text{Pulse duration}}{\text{Pulse period}} \times \frac{\text{Burst duration}}{100 \text{ ms}} \times \text{Number of bursts within 100 ms} \right)$$



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Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance		Verdict: PASS
Date & Time:	3/16/2010 1:40:57 PM		
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Table 7.8.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY RANGE:	902.0 – 928.0 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	2-FSK
MODULATING SIGNAL:	PRBS
BIT RATE:	19.2 kbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
TRANSMITTER OUTPUT POWER:	24.92 dBm at low carrier frequency 24.70 dBm at mid carrier frequency 23.48 dBm at high carrier frequency
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz), Biconilog (30 MHz – 1000 MHz)
FREQUENCY HOPPING:	Disabled

Frequency, MHz	Peak emission, dB(µV/m)	Quasi-peak			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
Low carrier frequency								
396.300	35.30	33.10	46.0	-12.90	V	1.2	000	Pass
399.989	36.00	36.00	46.0	-10.00	V	1.2	000	
980.200	44.30	42.50	54.0	-11.50	V	1.20	320	
Mid carrier frequency								
240.050	41.56	33.44	46.0	-12.56	H	1.20	030	Pass
396.298	32.40	29.60	46.0	-16.40	V	1.20	010	
400.010	33.70	30.50	46.0	-15.50	V	1.25	020	
992.777	45.10	42.70	54.0	-11.30	V	1.15	300	
High carrier frequency								
248.050	44.37	35.64	46.0	-10.36	H	1.3	300	Pass
396.300	36.90	35.00	46.0	-11.00	V	1.3	000	
400.000	35.60	33.50	46.0	-12.50	V	1.2	000	

*- Margin = Measured emission - specification limit.

**- EUT front panel refer to 0 degrees position of turntable.

Table 7.8.6 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2690 - 2900	10.6 - 12.7
0.495 - 0.505	8.41425 - 8.41475	74.8 - 75.2	608 - 614	3260 - 3267	13.25 - 13.4
2.1735 - 2.1905	12.29 - 12.293	108 - 121.94	960 - 1240	3332 - 3339	14.47 - 14.5
4.125 - 4.128	12.51975 - 12.52025	123 - 138	1300 - 1427	3345.8 - 3358	15.35 - 16.2
4.17725 - 4.17775	12.57675 - 12.57725	149.9 - 150.05	1435 - 1626.5	3600 - 4400	17.7 - 21.4
4.20725 - 4.20775	13.36 - 13.41	156.52475 - 156.52525	1645.5 - 1646.5	4500 - 5150	22.01 - 23.12
6.215 - 6.218	16.42 - 16.423	156.7 - 156.9	1660 - 1710	5350 - 5460	23.6 - 24
6.26775 - 6.26825	16.69475 - 16.69525	162.0125 - 167.17	1718.8 - 1722.2	7250 - 7750	31.2 - 31.8
6.31175 - 6.31225	16.80425 - 16.80475	167.72 - 173.2	2200 - 2300	8025 - 8500	36.43 - 36.5
8.291 - 8.294	25.5 - 25.67	240 - 285	2310 - 2390	9000 - 9200	Above 38.6
8.362 - 8.366	37.5 - 38.25	322 - 335.4	2483.5 - 2500	9300 - 9500	

Reference numbers of test equipment used

HL 0446	HL 0521	HL 0604	HL 1984	HL 3122	HL 3123	HL 3340	HL 3341
HL 3343	HL 3616	HL 3818	HL 3884				

Full description is given in Appendix A.



HERMON LABORATORIES

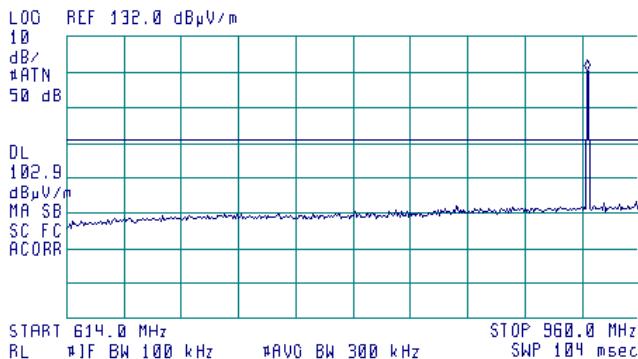
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date & Time:	3/16/2010 1:40:57 PM	Relative Humidity: 42 %	Power Supply: 12 VDC
Temperature: 24.3 °C	Air Pressure: 1014 hPa		
Remarks:			

Plot 7.8.1 Radiated emission measurements at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

14:00:12 MAR 11, 2010

ACTV DET: PEAK
MEAS DET: PEAK QP AVG
MKR 920.0 MHz
122.37 dB μ V/m



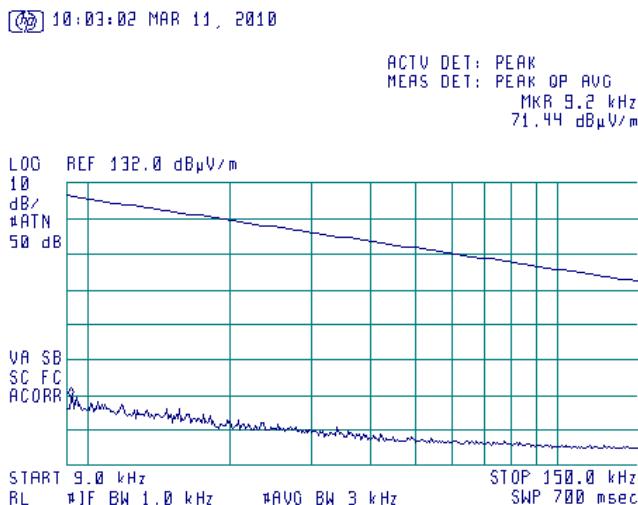


HERMON LABORATORIES

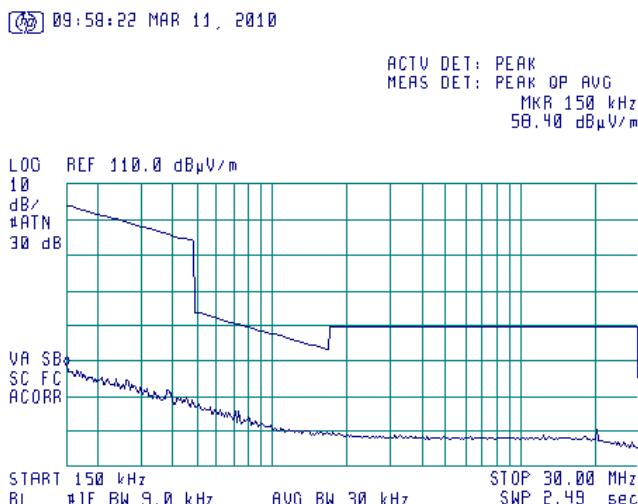
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Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.2 Radiated emission measurements from 9 to 150 kHz at the low, mid and high carrier frequencies

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical

**Plot 7.8.3 Radiated emission measurements from 0.15 to 30 MHz at the low, mid and high carrier frequencies**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical



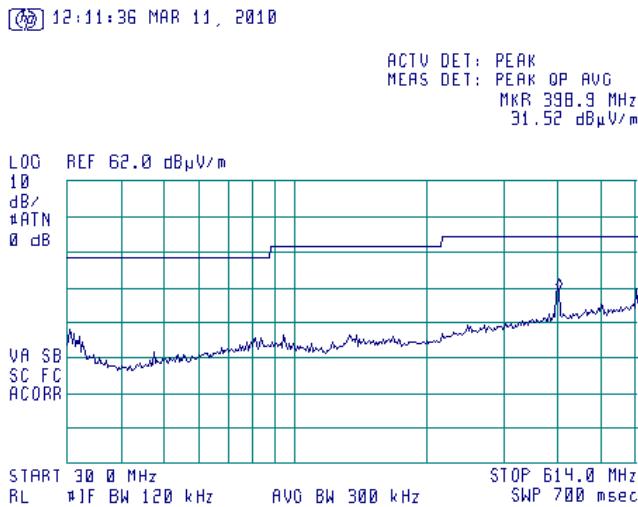


HERMON LABORATORIES

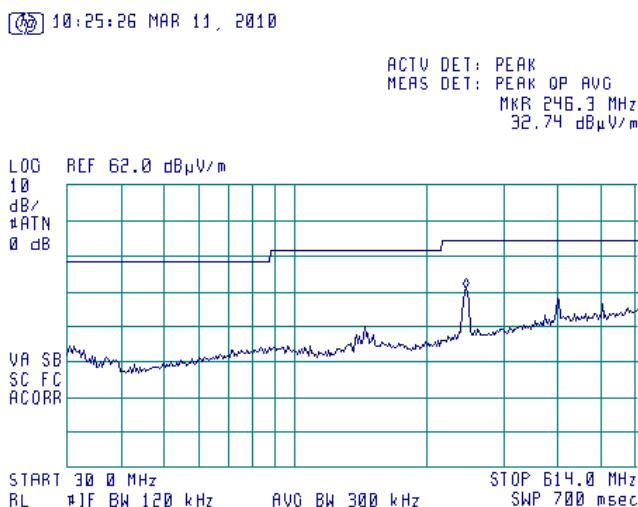
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.4 Radiated emission measurements from 30 to 614 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

**Plot 7.8.5 Radiated emission measurements from 30 to 614 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 MODE: 787.375 MHz – ON



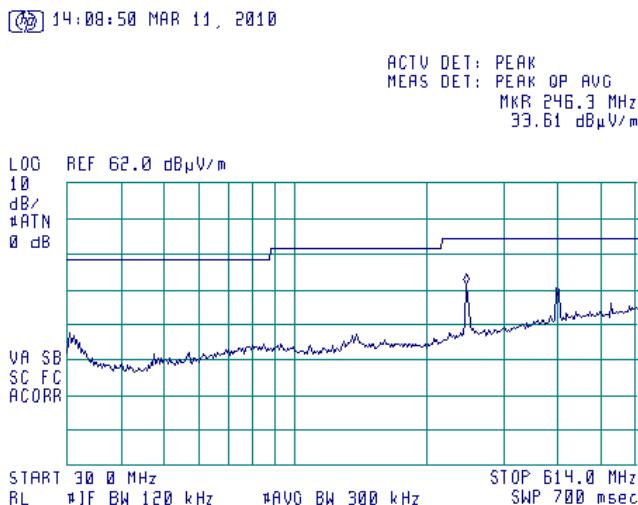


HERMON LABORATORIES

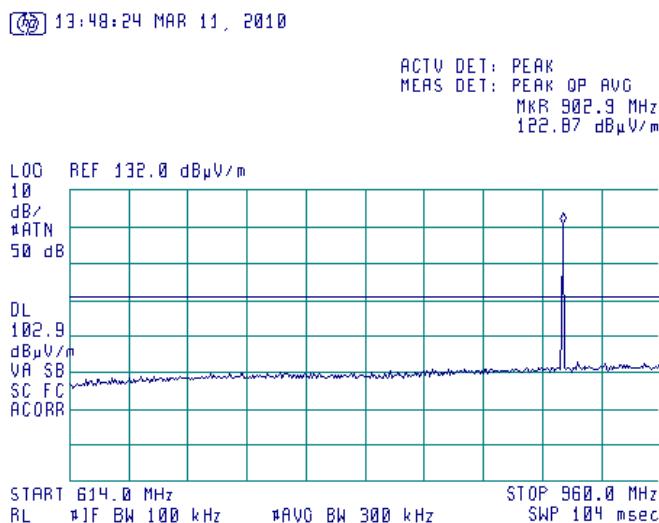
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.6 Radiated emission measurements from 30 to 614 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

**Plot 7.8.7 Radiated emission measurements from 614 to 960 MHz at the low carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



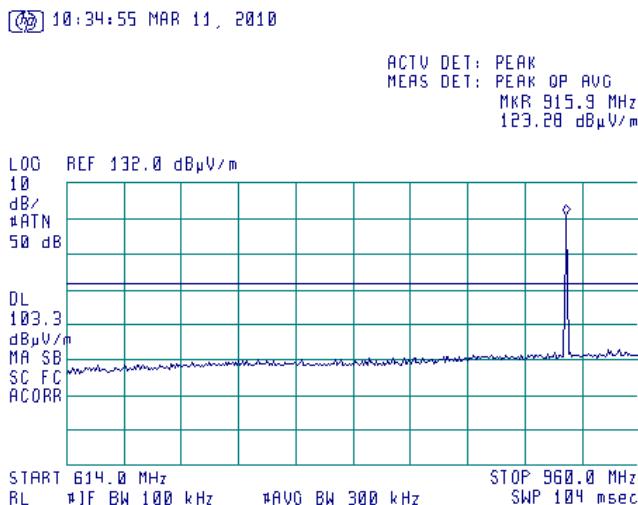


HERMON LABORATORIES

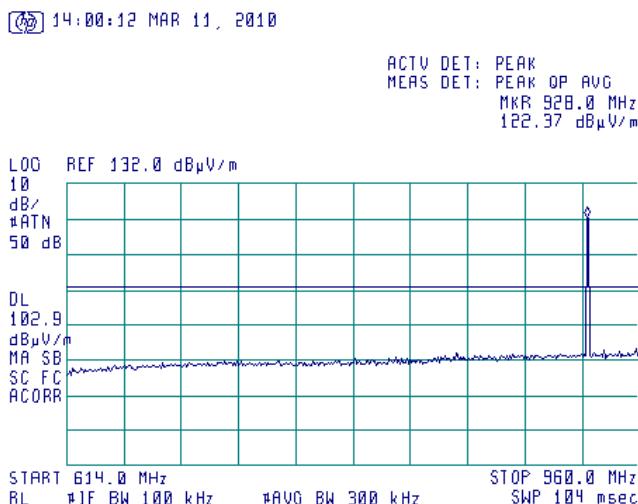
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.8 Radiated emission measurements from 614 to 960 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

**Plot 7.8.9 Radiated emission measurements from 614 to 960 MHz at the high carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



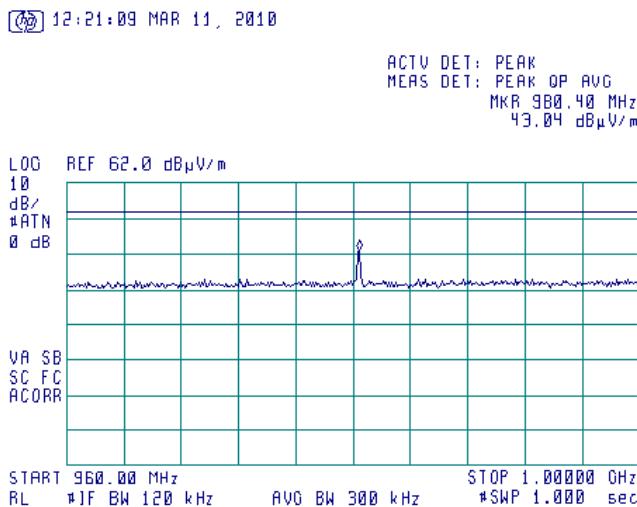


HERMON LABORATORIES

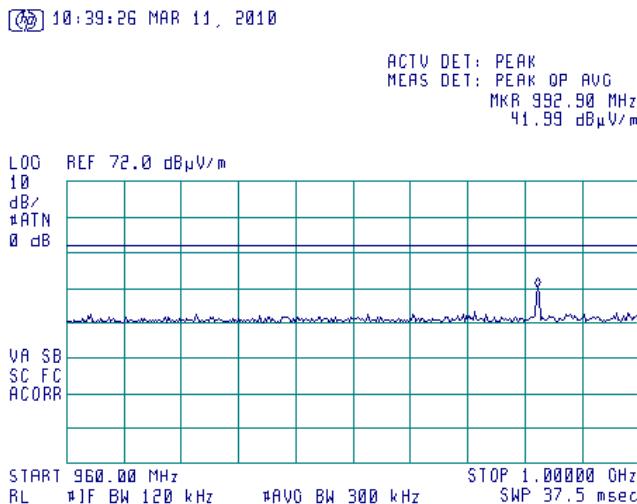
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.10 Radiated emission measurements from 960 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

**Plot 7.8.11 Radiated emission measurements from 960 to 1000 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



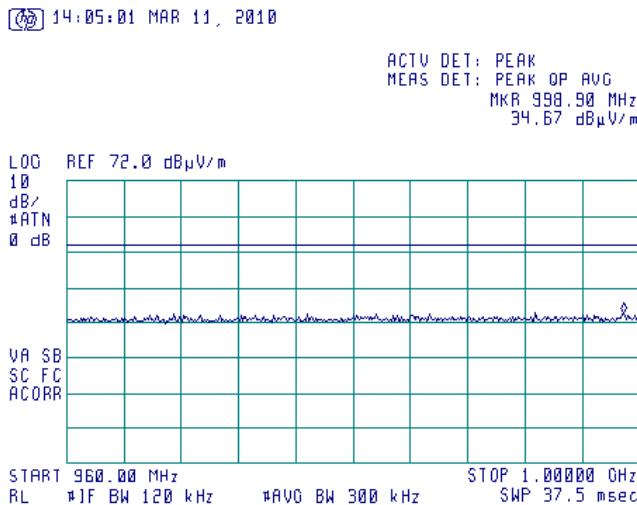


HERMON LABORATORIES

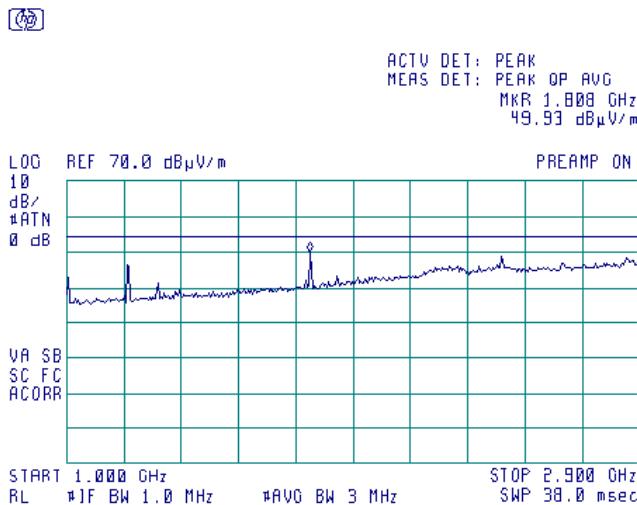
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.12 Radiated emission measurements from 960 to 1000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

**Plot 7.8.13 Radiated emission measurements from 1000 to 2900 MHz at the low carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



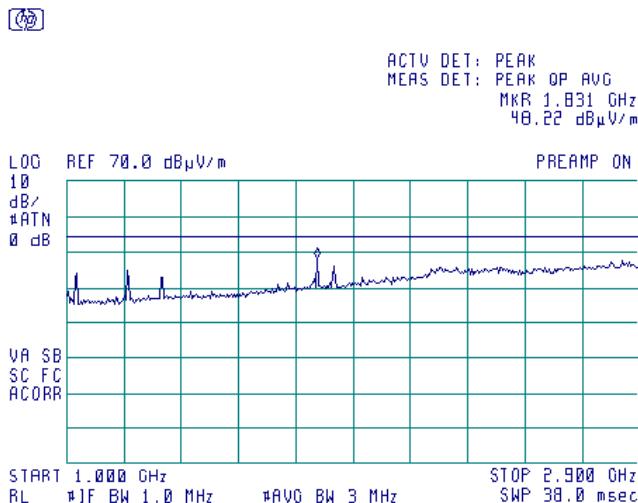


HERMON LABORATORIES

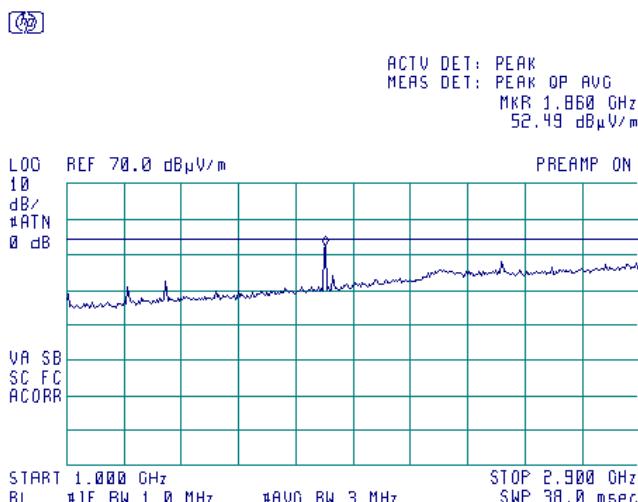
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.14 Radiated emission measurements from 1000 to 2900 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal

**Plot 7.8.15 Radiated emission measurements from 1000 to 2900 MHz at the high carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



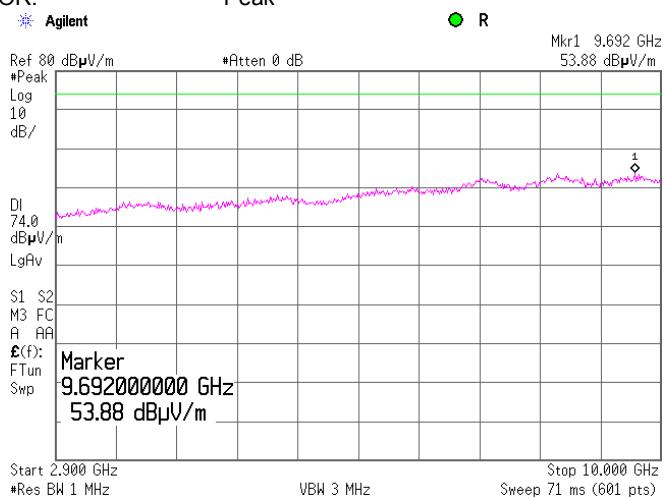


HERMON LABORATORIES

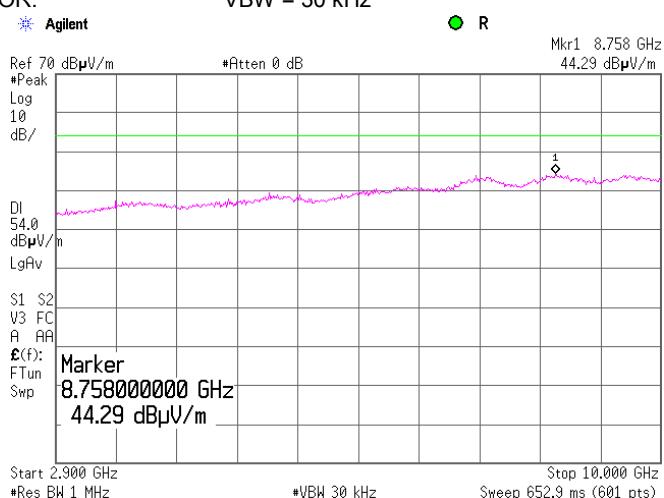
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.16 Radiated emission measurements from 2900 to 10000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: Peak

**Plot 7.8.17 Radiated emission measurements from 2900 to 10000 MHz at the low carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: VBW = 30 kHz



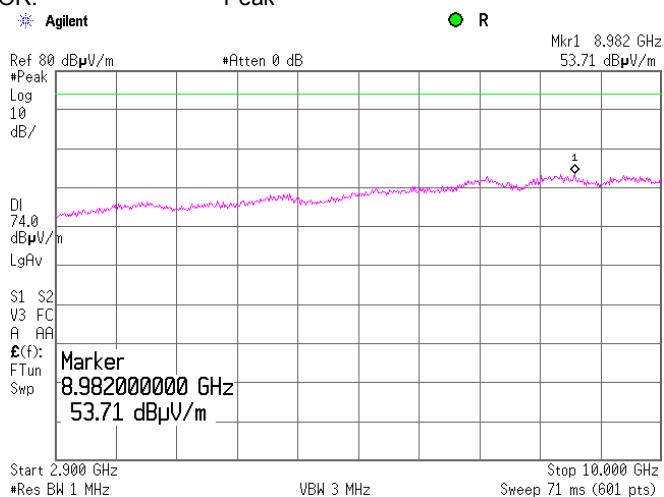


HERMON LABORATORIES

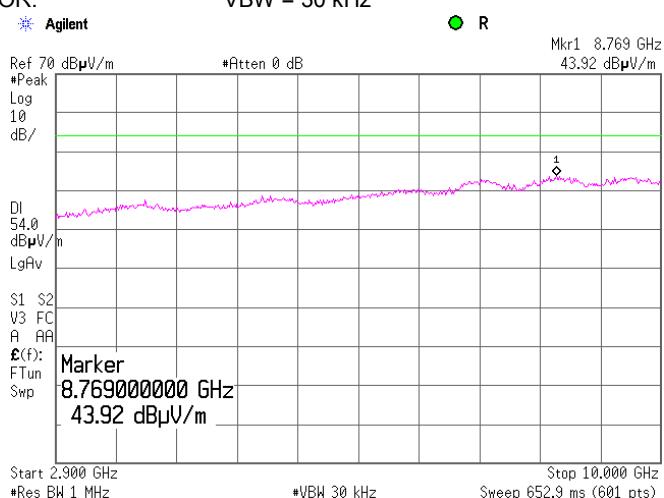
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.18 Radiated emission measurements from 2900 to 10000 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: Peak

**Plot 7.8.19 Radiated emission measurements from 2900 to 10000 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: VBW = 30 kHz



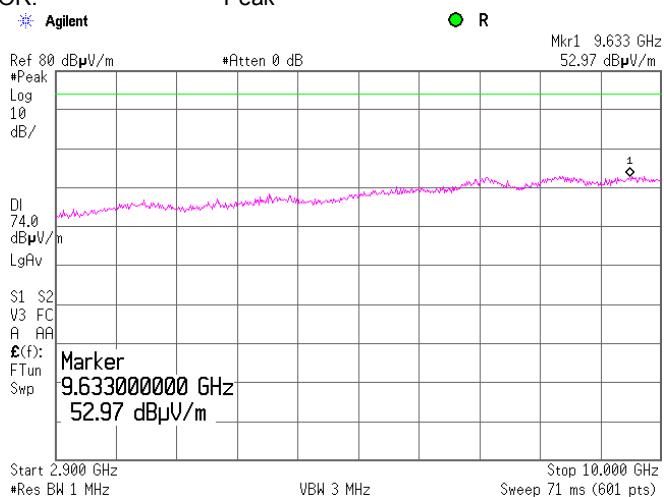


HERMON LABORATORIES

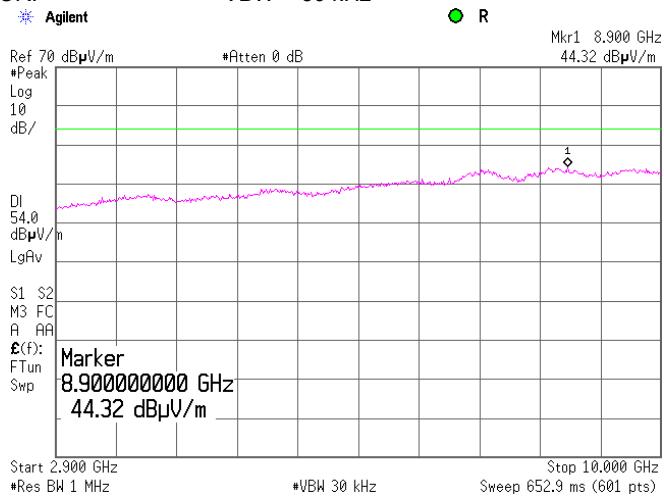
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance		
Date & Time:	3/16/2010 1:40:57 PM		
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.20 Radiated emission measurements from 2900 to 10000 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: Peak

**Plot 7.8.21 Radiated emission measurements from 2900 to 10000 MHz at the high carrier frequency**

TEST SITE: Semi anechoic chamber
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal
 DETECTOR: Peak
 DETECTOR: VBW = 30 kHz





HERMON LABORATORIES

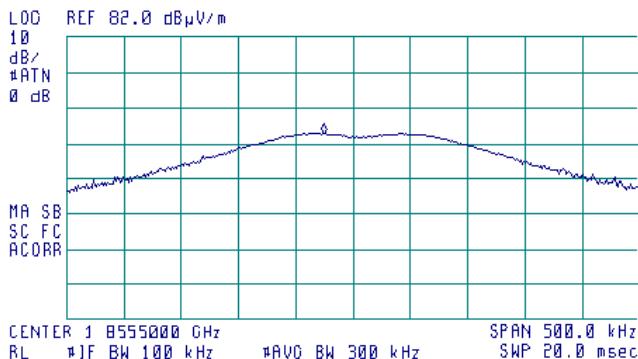
Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:40:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.22 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
DETECTOR: Peak



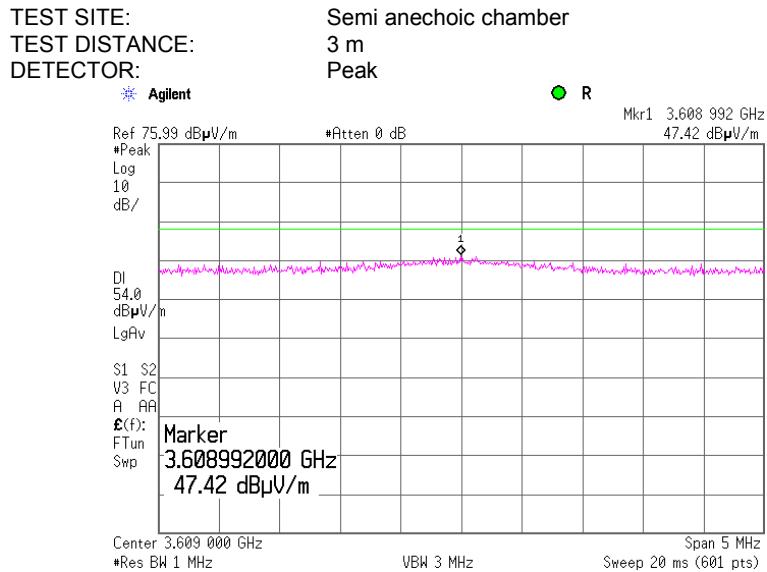
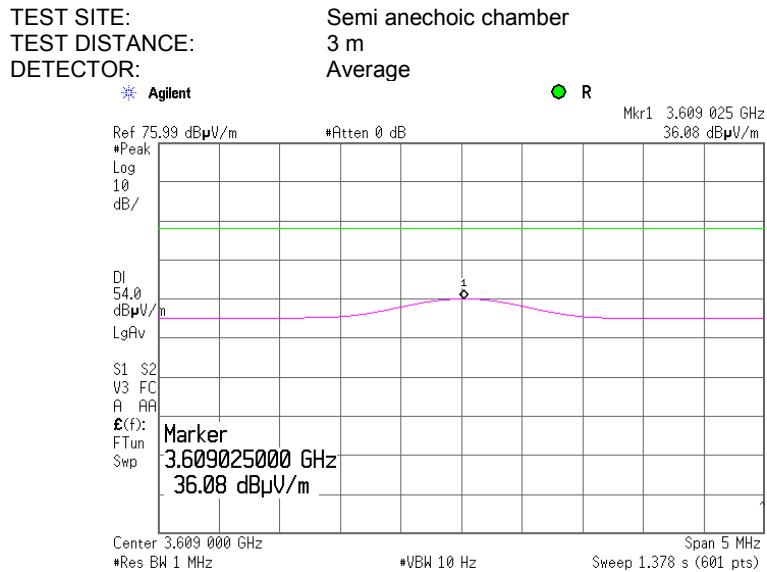
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MRR 1.8554750 GHz
54.63 dB μ V/m





HERMON LABORATORIES

Test specification:	Section 15.247(d), Radiated spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict: PASS	
Date & Time:	3/16/2010 1:40:57 PM		
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks:			

Plot 7.8.23 Radiated emission measurements at the fourth harmonic of low carrier frequency**Plot 7.8.24 Radiated emission measurements at the fourth harmonic of low carrier frequency**



HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

7.9 Spurious emissions at RF antenna connector

7.9.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.9.1. The test results are provided in Table 7.9.2 and associated plots.

Table 7.9.1 Spurious emission limits

Frequency*, MHz	Attenuation below carrier*, dBc
0.009 – 10 th harmonic	20.0

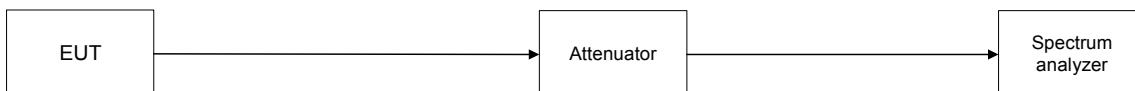
* - The above limits applied from the lowest radio frequency generated in the device, without going below 9 kHz up to the tenth harmonic of the highest fundamental frequency.

** - Spurious emission limit is provided in terms of attenuation below the peak of modulated carrier measured with the same resolution bandwidth.

7.9.2 Test procedure

- 7.9.2.1 The EUT was set up as shown in Figure 7.9.1, energized and its proper operation was checked.
- 7.9.2.2 The EUT was adjusted to produce maximum available to end user RF output power.
- 7.9.2.3 The highest emission level within the authorized band was measured.
- 7.9.2.4 The spurious emission was measured with spectrum analyzer as provided in Table 7.9.2 and associated plots and referenced to the highest emission level measured within the authorized band.

Figure 7.9.1 Spurious emission test setup





HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:42:00 PM		
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Table 7.9.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE:	902.0 – 928.0 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 10000 MHz
DETECTOR USED:	Peak
RESOLUTION BANDWIDTH:	100 kHz
VIDEO BANDWIDTH:	300 kHz
MODULATION:	2-FSK
MODULATING SIGNAL:	PRBS
BIT RATE:	19.2 kbps
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
TRANSMITTER OUTPUT POWER:	24.92 dBm at low carrier frequency 24.70 dBm at mid carrier frequency 23.48 dBm at high carrier frequency
FREQUENCY HOPPING:	Disabled

Frequency, MHz	Spurious emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency						
799.5	-35.67		60.23		-40.23	
930.5	-41.49	24.56	61.49	20.0	-41.49	Pass
Mid carrier frequency						
799.5	-37.41	24.44	61.85	20.0	-41.85	Pass
High carrier frequency						
799.5	-35.46	23.42	58.88	20.0	-38.88	Pass

*- Margin = Attenuation below carrier – specification limit.

Reference numbers of test equipment used

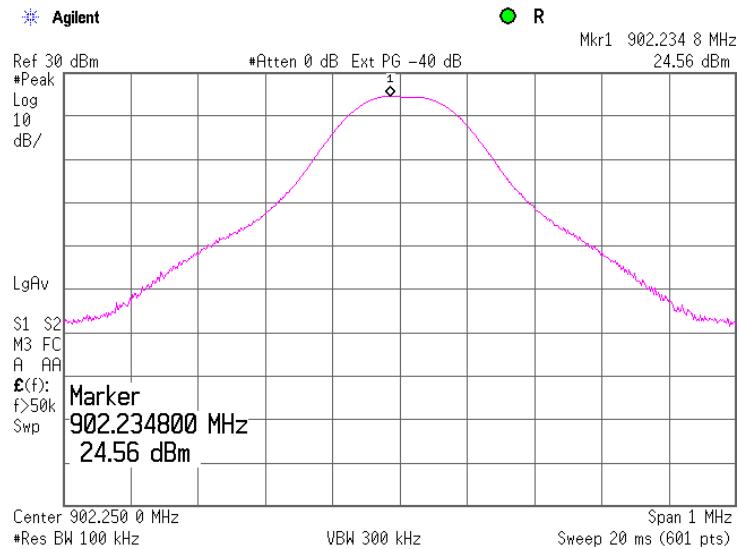
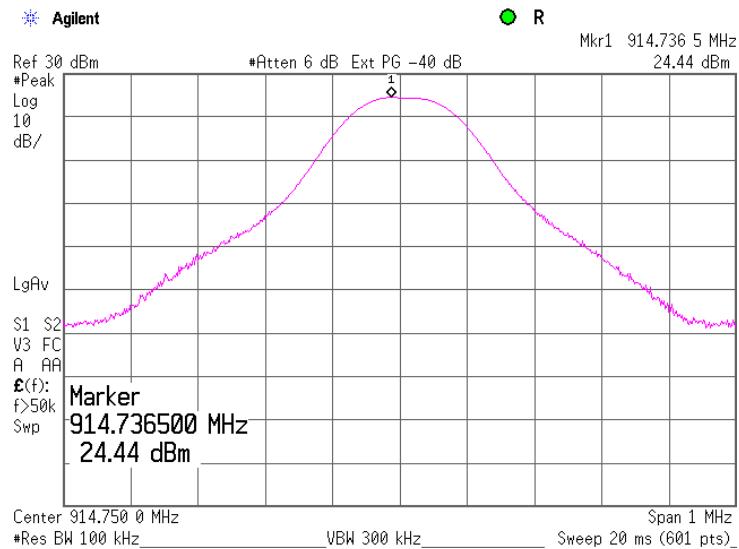
HL 2951 HL 3442 HL 3762 HL 3818

Full description is given in Appendix A.



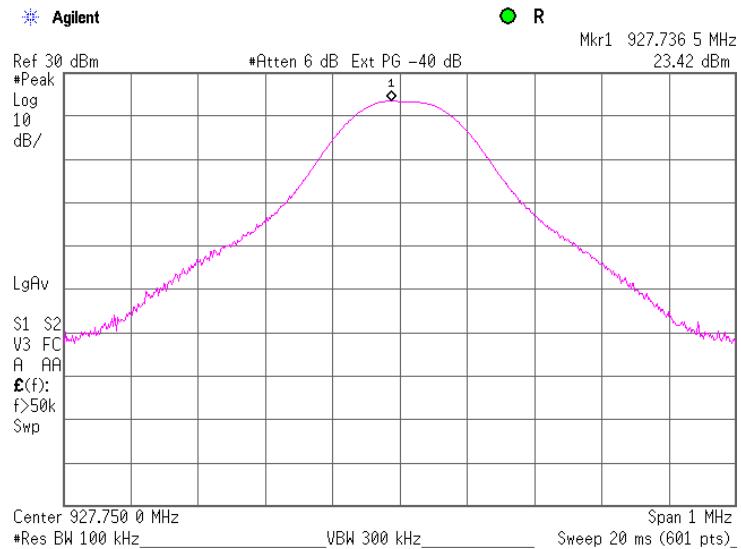
HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Plot 7.9.1 The highest emission level within the assigned band at low carrier frequency**Plot 7.9.2 The highest emission level within the assigned band at mid carrier frequency**

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Plot 7.9.3 The highest emission level within the assigned band at high carrier frequency

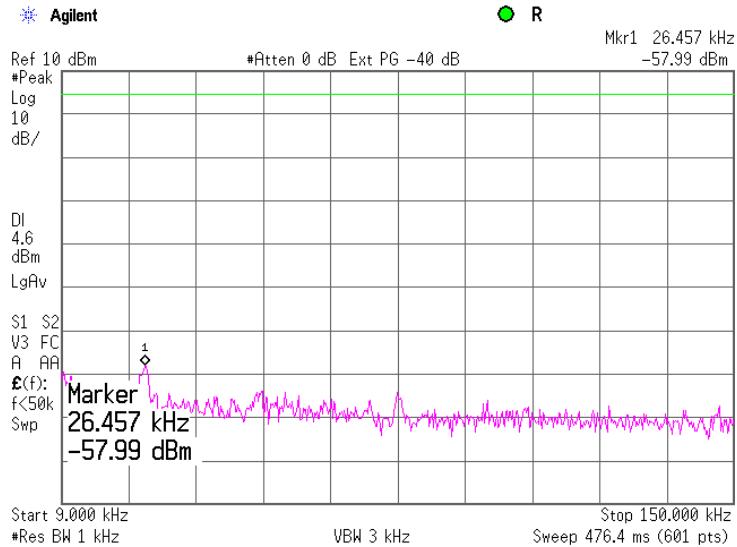




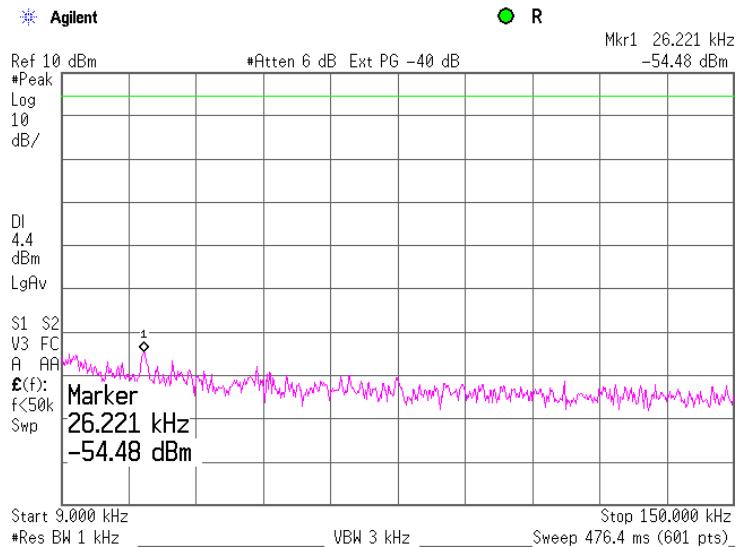
HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Plot 7.9.4 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency



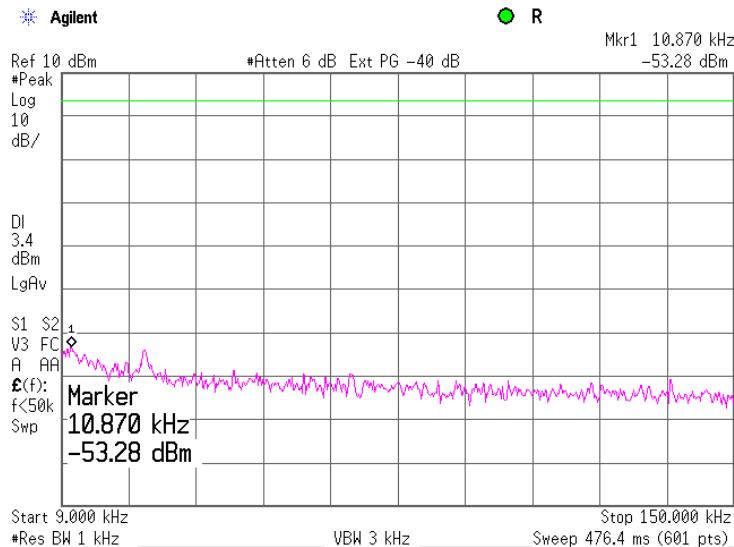
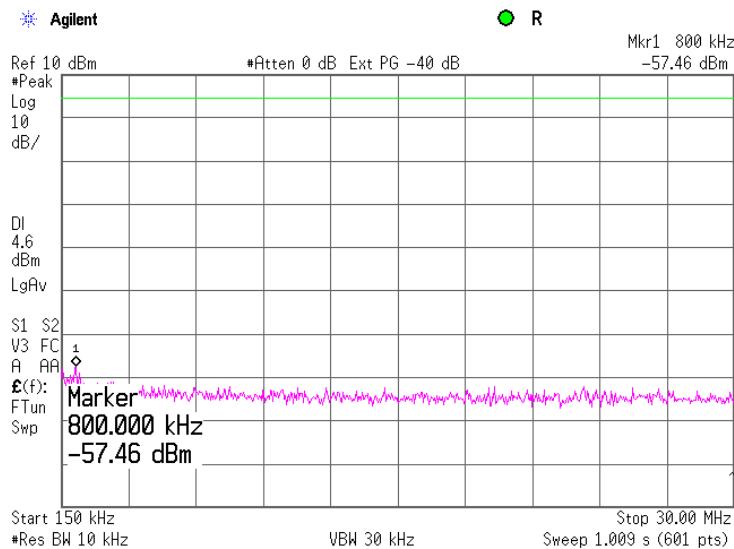
Plot 7.9.5 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency





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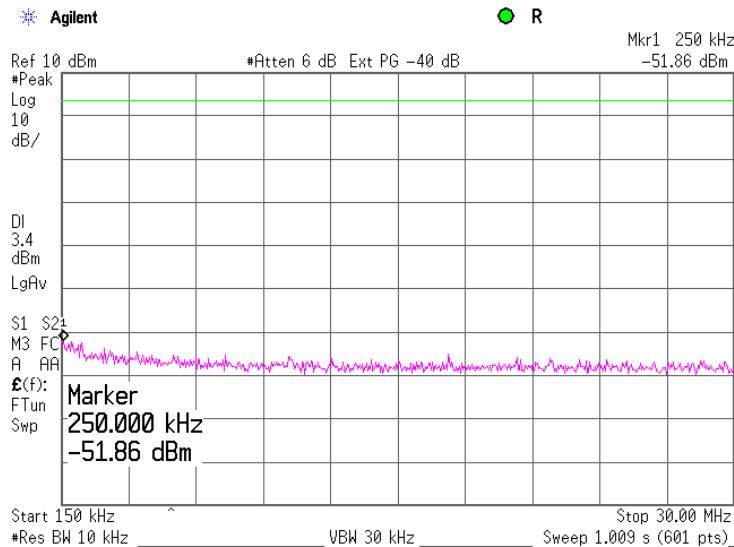
Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Plot 7.9.6 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency**Plot 7.9.7 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency**



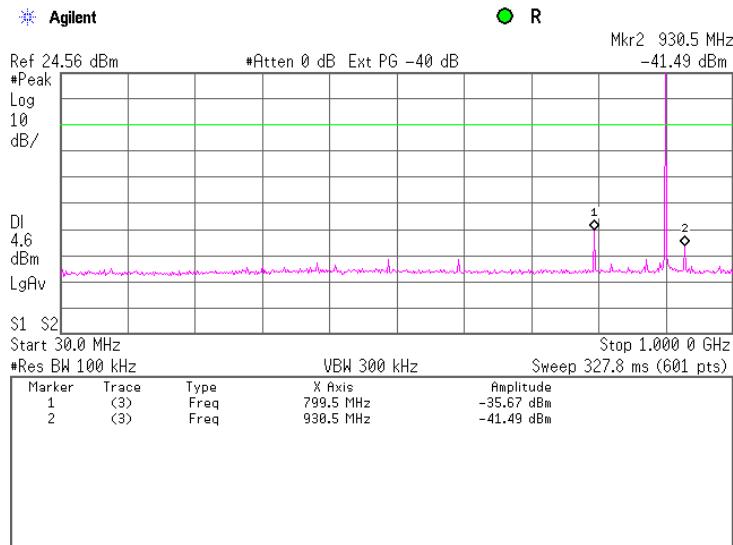
HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

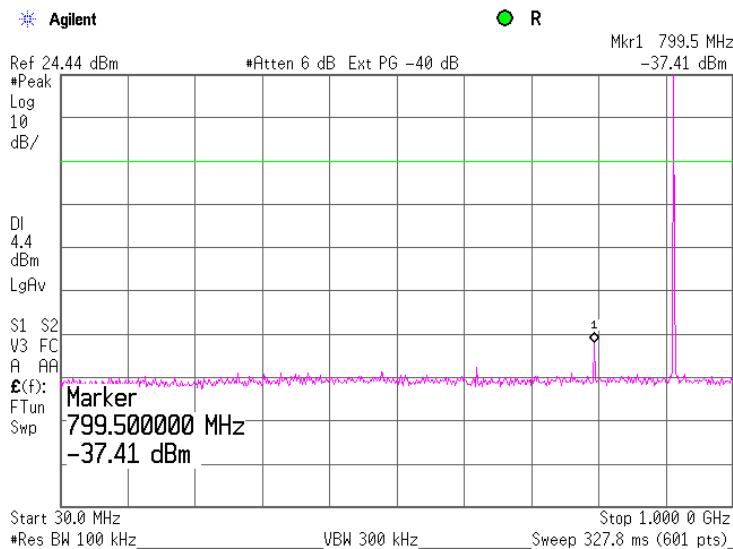
Plot 7.9.8 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency**Plot 7.9.9 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency**

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Plot 7.9.10 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency



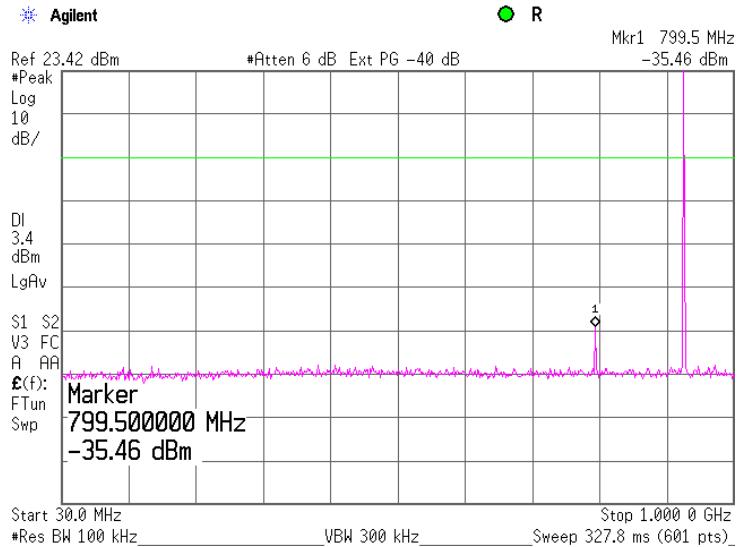
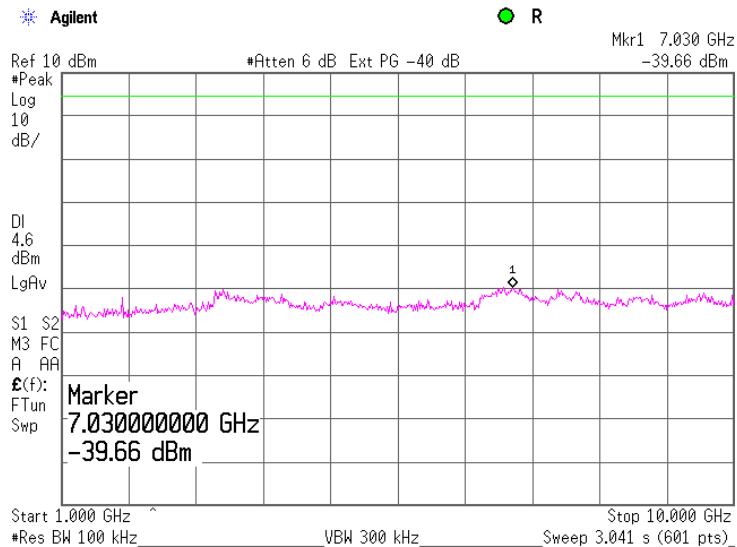
Plot 7.9.11 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency





HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

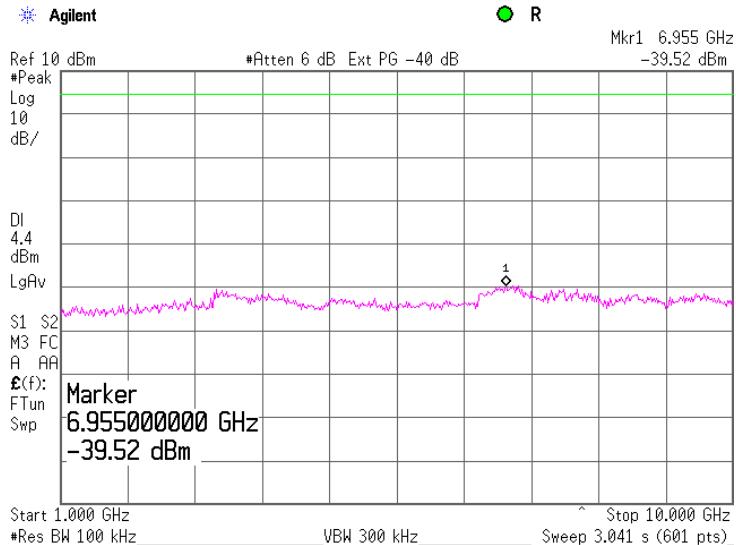
Plot 7.9.12 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency**Plot 7.9.13 Spurious emission measurements in 1000 – 10000 MHz range at low carrier frequency**



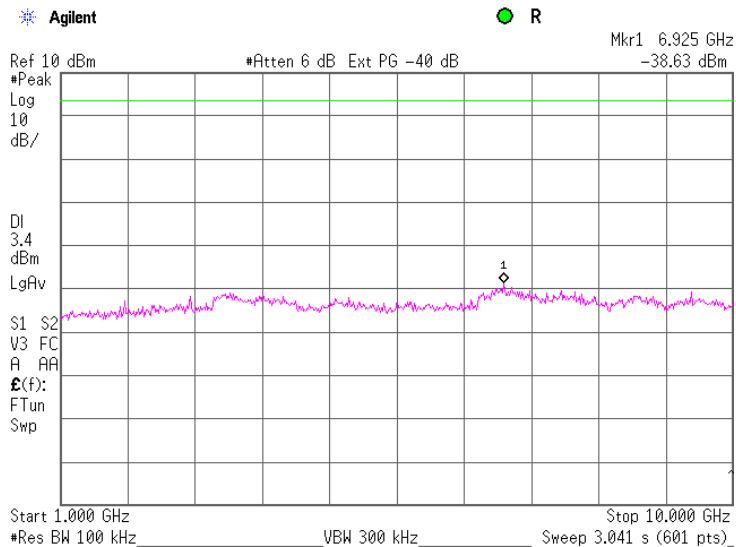
HERMON LABORATORIES

Test specification:	Section 15.247(d), Conducted spurious emissions		
Test procedure:	Public notice DA 00-705/ 47 CFR, Section 15.247(c)		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 1:42:00 PM	PASS	
Temperature: 24.1 °C	Air Pressure: 1014 hPa	Relative Humidity: 42 %	Power Supply: 12 VDC
Remarks: Outside restricted bands			

Plot 7.9.14 Spurious emission measurements in 1000 - 10000 MHz range at mid carrier frequency



Plot 7.9.15 Spurious emission measurements in 1000 - 10000 MHz range at high carrier frequency





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Test specification:	Section 15.203, Antenna requirements		
Test procedure:	Visual inspection		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2010 1:42:14 PM	Relative Humidity:	41 %
Temperature:	24.3 °C	Air Pressure:	1014 hPa
Power Supply:	12 VDC		
Remarks:			

7.10 Antenna requirements

The EUT was verified for compliance with antenna requirements. A transmitter shall be designed to ensure that no antenna other than that furnished by the responsible party will be used with the device. It may be either permanently attached or employs a unique antenna connector for every antenna proposed for use with the EUT. This requirement does not apply to professionally installed transmitters.

The rationale for compliance with the above requirements was either visual inspection results or supplier declaration. The summary of results is provided in Table 7.10.1.

Table 7.10.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	No	Comply
The transmitter employs a unique antenna connector	No	
The transmitter requires professional installation	Supplier declaration	

Photograph 7.10.1 Antenna assembly



787.0 – 788.0 MHz
antenna connector

902.0 – 928.0 MHz
antenna connector



Test specification:	Section 15.207(a), Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance		
Date & Time:	3/16/2010 4:36:57 PM		
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 41 %	Power Supply: 120 VAC
Remarks:			

7.11 Conducted emissions

7.11.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.11.1.

Table 7.11.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(µV)	
	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*
0.5 - 5.0	56	46
5.0 - 30	60	50

* The limit decreases linearly with the logarithm of frequency.

7.11.2 Test procedure

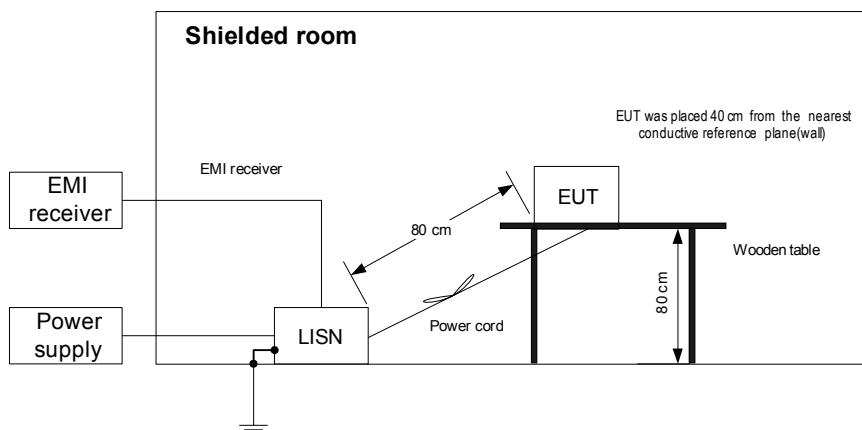
7.11.2.1 The EUT was set up as shown in Figure 7.11.1 and associated photograph, energized and the performance check was conducted.

7.11.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.11.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

7.11.2.3 The position of the device cables was varied to determine maximum emission level.

7.11.2.4 The worst test results (the lowest margins) were recorded in Table 7.11.2 and shown in the associated plots.

Figure 7.11.1 Setup for conducted emission measurements, table-top equipment





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Test specification:	Section 15.207(a), Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 4:36:57 PM	PASS	
Temperature: 24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 41 %	Power Supply: 120 VAC
Remarks:			

Table 7.11.2 Conducted emission test results

LINE: AC mains
 EUT OPERATING MODE: Transmit
 EUT SET UP: TABLE-TOP
 TEST SITE: SHIELDED ROOM
 DETECTORS USED: PEAK / QUASI-PEAK / AVERAGE
 FREQUENCY RANGE: 150 kHz - 30 MHz
 RESOLUTION BANDWIDTH: 9 kHz

Frequency, MHz	Peak emission, dB(µV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*	Measured emission, dB(µV)	Limit, dB(µV)	Margin, dB*		
0.150138	64.44	57.38	65.99	-8.61	24.39	55.99	-31.60	L1	Pass
0.160525	63.81	56.70	65.49	-8.79	23.66	55.49	-31.83		
0.170063	62.76	55.59	65.02	-9.43	22.77	55.02	-32.25		
0.431840	36.67	29.16	57.27	-28.11	0.82	47.27	-46.45		
6.614255	35.32	28.84	60.00	-31.16	16.09	50.00	-33.91		
21.663678	25.42	21.28	60.00	-38.72	15.55	50.00	-34.45		
0.159475	64.10	57.06	65.54	-8.48	24.09	55.54	-31.45		
0.170170	63.05	56.08	65.02	-8.94	23.21	55.02	-31.81		
0.179970	62.06	54.82	64.54	-9.72	21.84	54.54	-32.70		
0.350118	39.74	32.51	59.02	-26.51	2.15	49.02	-46.87		
0.370010	39.72	32.60	58.55	-25.95	2.13	48.55	-46.42		
6.651170	34.36	28.71	60.00	-31.29	15.14	50.00	-34.86		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0447	HL 0787	HL 1425	HL 1511	HL 2358	HL 3612	HL 3797
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Full description is given in Appendix A.

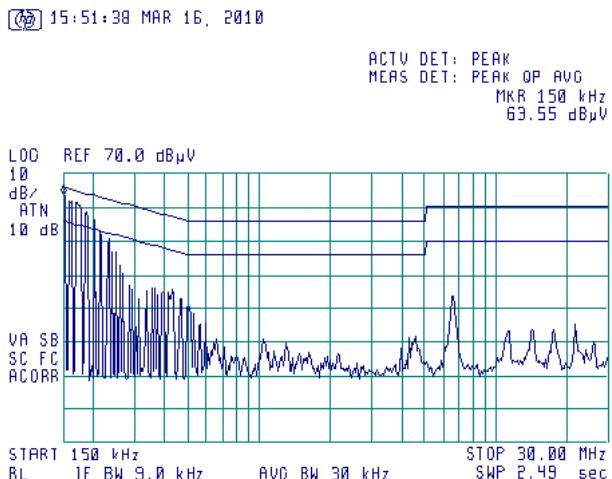


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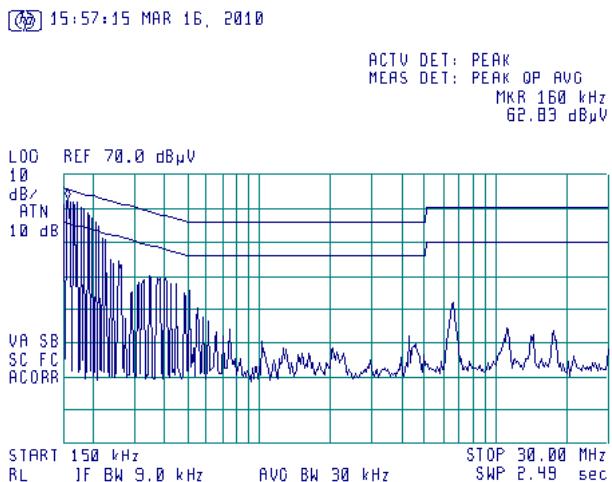
Test specification:	Section 15.207(a), Conducted emission		
Test procedure:	ANSI C63.4, Section 13.1.3		
Test mode:	Compliance	Verdict:	
Date & Time:	3/16/2010 4:36:57 PM	PASS	
Temperature:	24.3 °C	Air Pressure: 1014 hPa	Relative Humidity: 41 %
Remarks:			

Plot 7.11.1 Conducted emission measurements

LINE: L1
 EUT OPERATING MODE: Transmit
 LIMIT: QUASI-PEAK, AVERAGE
 DETECTOR: PEAK

**Plot 7.11.2 Conducted emission measurements**

LINE: L2
 EUT OPERATING MODE: Transmit
 LIMIT: QUASI-PEAK, AVERAGE
 DETECTOR: PEAK



8 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0446	Antenna, Loop, Active, 10 kHz - 30 MHz	EMCO	6502	2857	29-Jun-09	29-Jun-10
0447	LISN, 16/2, 300V RMS, 50 Ohm/50 uH + 5 Ohm, STD CISPR 16-1	Hermon Laboratories	LISN 16 - 1	066	05-Nov-09	05-Nov-10
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	27-Aug-09	27-Aug-10
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE, 26 - 2000 MHz	EMCO	3141	9611-1011	11-Jan-10	11-Jan-11
0787	Transient Limiter 9 kHz-200 MHz	Hewlett Packard	11947A	3107A018 77	18-Oct-09	18-Oct-10
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies	8564EC	3946A002 19	28-Aug-09	28-Aug-10
1425	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1426, HL1427	Agilent Technologies	8542E	3710A002 22, 3705A002 04	28-Aug-09	28-Aug-10
1511	Cable RF, 8 m, BNC/BNC	Belden	M17/167 MIL-C-17	1511	01-Jan-10	01-Jan-11
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W	EMC Test Systems	3115	9911-5964	29-Jan-10	29-Jan-11
2358	Power Supply, 2 X 0-36VDC / 5A, 5VDC / 5A	Horizon Electronics	DHR3655 D	767469	08-Mar-10	08-Mar-11
2951	Cable, RF, 18 GHz, 0.9 m, SMA-SMA	Gore	10020014	NA	05-Oct-09	05-Oct-10
3122	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3122	01-Jan-10	01-Jan-11
3123	Microwave Cable Assembly, 18 GHz, 6.4 m, SMA - SMA	Huber-Suhner	198-9155-00	3123	01-Jan-10	01-Jan-11
3340	High Pass Filter, 50 Ohm, 1000 to 3000 MHz	Mini-Circuits	SHP-1000+	NA	05-Oct-09	05-Oct-10
3341	High Pass Filter, 50 Ohm, 1400 to 5000 MHz	Mini-Circuits	VHF-1300+	NA	05-Oct-09	05-Oct-10
3343	High Pass Filter, 50 Ohm, 2650 to 6500 MHz	Mini-Circuits	VHF-2700+	NA	05-Oct-09	05-Oct-10
3442	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	07-Mar-10	07-Mar-11
3612	Cable RF, 17.5 m, N type-N type	Teldor	RG-214/U	NA	02-Dec-09	02-Dec-10
3616	Cable RF, 6.5 m, N type-N type, DC-6.5 GHz	Suhner Switzerland	Rg 214/U	NA	02-Dec-09	02-Dec-10
3762	Precision Fixed Attenuator, 50 Ohm, 5 W, 20 dB, DC to 18 GHz	Mini-Circuits	BW-S20W5+	NA	07-Dec-09	07-Dec-10
3797	Power Supply, 2 X 0-36VDC / 5A, 5VDC / 5A	Horizon Electronics	DHR3655 D-10	777494	20-Aug-09	20-Aug-10
3818	PSA Series Spectrum Analyzer, 3 Hz- 44 GHz	Agilent Technologies	E4446A	MY482502 88	25-Sep-09	25-Sep-10
3884	Preamplifier, 0.1 to 18 GHz, Gain 25 dB, N-type(f) in, N-type(m) out.	Agilent Technologies	87405C	MY470104 18	13-Jan-10	13-Jan-11

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Transmitter tests	
Carrier power conducted at antenna connector	± 1.7 dB
Carrier power radiated (substitution method)	± 4.5 dB
Occupied bandwidth	±8%
Conducted emissions at RF antenna connector	9 kHz to 2.9 GHz: ± 2.6 dB 2.9 GHz to 6.46 GHz: ± 3.5 dB 6.46 GHz to 13.2 GHz: ± 4.3 dB 13.2 GHz to 22.0 GHz: ± 5.0 dB 22.0 GHz to 26.8 GHz: ± 5.5 dB 26.8 GHz to 40.0 GHz: ± 4.8 dB
Spurious emissions radiated 30 MHz – 40 GHz (substitution method)	± 4.5 dB
Frequency error	30 – 300 MHz: ± 50.5 Hz (1.68 ppm) 300 – 1000 MHz: ± 168 Hz (0.56 ppm)
Transient frequency behaviour	187 Hz ± 13.9 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %

Hermon Laboratories is accredited by A2LA for calibration according to present requirements of ISO/IEC 17025 and NCSL Z540-1. The accreditation is granted to perform calibration of parameters that are listed in the Scope of Hermon Laboratories Accreditation.

Hermon Laboratories calibrates its reference and transfer standards by calibration laboratories accredited to ISO/IEC 17025 by a mutually recognized Accreditation Body or by a recognized national metrology institute. All reference and transfer standards used in the calibration system are traceable to national or international standards.

In-house calibration of all test and measurement equipment is performed on a regular basis according to Hermon Laboratories calibration procedures, manufacturer calibration/verification procedures or procedures defined in the relevant standards. The Hermon Laboratories test and measurement equipment is calibrated within the tolerances specified by the manufacturers and/or by the relevant standards.

10 APPENDIX C Test laboratory description

Tests were performed at Hermon Laboratories Ltd., which is a fully independent, private, EMC, safety, environmental and telecommunication testing facility.

Hermon Laboratories is listed by the Federal Communications Commission (USA) for all parts of Code of Federal Regulations 47 (CFR 47), Registration Numbers 90624 for OATS and 90623 for the anechoic chamber; by Industry Canada for electromagnetic emissions (file numbers IC 2186A-1 for OATS, IC 2186A-2 for anechoic chamber, IC 2186A-3 for full-anechoic chamber for RE measurements above 1 GHz), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, G-27 for full-anechoic chamber for RE measurements above 1 GHz, C-845 for conducted emissions site, T-1606 for conducted emissions at telecommunication ports), has a status of a Telefication - Listed Testing Laboratory, Certificate No. L138/00. The laboratory is accredited by American Association for Laboratory Accreditation (USA) according to ISO/IEC 17025 for electromagnetic compatibility, product safety, telecommunications testing and environmental simulation (for exact scope please refer to Certificate No. 839.01).

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Person for contact: Mr. Alex Usoskin, CEO.

11 APPENDIX D Specification references

FCC 47CFR part 15: 2009	Radio Frequency Devices.
FR Vol.62	Federal Register, Volume 62, May 13, 1997
FCC New Guidance:2004	FCC New Guidance on Measurements for DTS
FCC 47CFR part 1: 2009	Practice and procedure
FCC 47CFR part 2: 2009	Frequency allocations and radio treaty matters; general rules and regulations
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.

12 APPENDIX E Test equipment correction factors

Correction factor
Line impedance stabilization network
Model LISN 16 - 1
Hermon Laboratories, HL 0447

Frequency, kHz	Correction factor, dB
10	4.9
15	2.86
20	1.83
25	1.25
30	0.91
35	0.69
40	0.53
50	0.35
60	0.25
70	0.18
80	0.14
90	0.11
100	0.09
125	0.06
150	0.04

The correction factor in dB is to be added to meter readings of an interference analyzer or a spectrum analyzer.

Antenna Factor
Active Loop Antenna
EMC Test Systems, model 6502, S/N 2857, HL 0446

Frequency, MHz	Magnetic Antenna Factor, dB(S/m)	Electric Antenna Factor, dB(1/m)
0.009	-32.8	18.7
0.010	-33.8	17.7
0.020	-38.3	13.2
0.050	-41.1	10.4
0.075	-41.3	10.2
0.100	-41.6	9.9
0.150	-41.7	9.8
0.250	-41.6	9.9
0.500	-41.8	9.7
0.750	-41.9	9.6
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.1
4.000	-41.4	10.1
5.000	-41.5	10.0
10.000	-41.9	9.6
15.000	-41.9	9.6
20.000	-42.2	9.3
25.000	-42.8	8.7
30.000	-44.0	7.5

Antenna factor in dB(S/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ A/m). Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Antenna factor
Biconilog antenna EMCO Model 3141
Ser.No.1011, HL 0604

Frequency, MHz	Antenna Factor, dB(1/m)	Frequency, MHz	Antenna Factor, dB(1/m)
26	7.8	940	24.0
28	7.8	960	24.1
30	7.8	980	24.5
40	7.2	1000	24.9
60	7.1	1020	25.0
70	8.5	1040	25.2
80	9.4	1060	25.4
90	9.8	1080	25.6
100	9.7	1100	25.7
110	9.3	1120	26.0
120	8.8	1140	26.4
130	8.7	1160	27.0
140	9.2	1180	27.0
150	9.8	1200	26.7
160	10.2	1220	26.5
170	10.4	1240	26.5
180	10.4	1260	26.5
190	10.3	1280	26.6
200	10.6	1300	27.0
220	11.6	1320	27.8
240	12.4	1340	28.3
260	12.8	1360	28.2
280	13.7	1380	27.9
300	14.7	1400	27.9
320	15.2	1420	27.9
340	15.4	1440	27.8
360	16.1	1460	27.8
380	16.4	1480	28.0
400	16.6	1500	28.5
420	16.7	1520	28.9
440	17.0	1540	29.6
460	17.7	1560	29.8
480	18.1	1580	29.6
500	18.5	1600	29.5
520	19.1	1620	29.3
540	19.5	1640	29.2
560	19.8	1660	29.4
580	20.6	1680	29.6
600	21.3	1700	29.8
620	21.5	1720	30.3
640	21.2	1740	30.8
660	21.4	1760	31.1
680	21.9	1780	31.0
700	22.2	1800	30.9
720	22.2	1820	30.7
740	22.1	1840	30.6
760	22.3	1860	30.6
780	22.6	1880	30.6
800	22.7	1900	30.6
820	22.9	1920	30.7
840	23.1	1940	30.9
860	23.4	1960	31.2
880	23.8	1980	31.6
900	24.1	2000	32.0
920	24.1		

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).



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Report ID: ARCRAD_FCC.20571_FHSS.doc

Date of Issue: 3/18/2010

Antenna factor
Double-ridged wave guide horn antenna
Model 3115, S/N 9911-5964, HL1984

Frequency, MHz	Antenna factor, dB(1/m)
1000.0	24.7
1500.0	25.7
2000.0	27.6
2500.0	28.9
3000.0	31.2
3500.0	32.0
4000.0	32.5
4500.0	32.7
5000.0	33.6
5500.0	35.1
6000.0	35.4
6500.0	34.9
7000.0	36.1
7500.0	37.8
8000.0	38.0
8500.0	38.1
9000.0	39.1
9500.0	38.3
10000.0	38.6
10500.0	38.2
11000.0	38.7
11500.0	39.5
12000.0	40.0
12500.0	40.4
13000.0	40.5
13500.0	41.1
14000.0	41.6
14500.0	41.7
15000.0	38.7
15500.0	38.2
16000.0	38.8
16500.0	40.5
17000.0	42.5
17500.0	45.9
18000.0	49.4

Antenna factor in dB(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).

Cable loss
Cable coaxial, Gore, 18 GHz, 0.9 m, SMA-SMA, S/N 10020014
HL 2951

Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB	Frequency, MHz	Cable loss, dB
10	0.07	5750	0.77	12000	1.23
30	0.06	6000	0.78	12250	1.25
100	0.09	6250	0.81	12500	1.26
250	0.15	6500	0.83	12750	1.26
500	0.21	6750	0.84	13000	1.30
750	0.27	7000	0.85	13250	1.30
1000	0.31	7250	0.88	13500	1.30
1250	0.36	7500	0.88	13750	1.29
1500	0.38	7750	0.93	14000	1.23
1750	0.42	8000	0.92	14250	1.32
2000	0.44	8250	0.94	14500	1.27
2250	0.47	8500	0.99	14750	1.27
2500	0.50	8750	0.97	15000	1.34
2750	0.52	9000	1.01	15250	1.36
3000	0.54	9250	1.05	15500	1.35
3250	0.57	9500	1.08	15750	1.36
3500	0.58	9750	1.10	16000	1.43
3750	0.61	10000	1.09	16250	1.38
4000	0.63	10250	1.09	16500	1.42
4250	0.66	10500	1.07	16750	1.49
4500	0.68	10750	1.10	17000	1.53
4750	0.70	11000	1.09	17250	1.59
5000	0.71	11250	1.09	17500	1.65
5250	0.74	11500	1.13	17750	1.82
5500	0.77	11750	1.12	18000	2.09

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3122

Frequency, MHz	Cable loss, dB								
10	0.11	3600	2.08	7400	3.07	11200	3.92	15100	4.61
30	0.17	3700	2.12	7500	3.09	11300	3.95	15200	4.58
50	0.23	3800	2.15	7600	3.14	11400	3.93	15300	4.62
100	0.32	3900	2.18	7700	3.15	11500	3.93	15400	4.62
200	0.47	4000	2.21	7800	3.19	11600	3.94	15500	4.65
300	0.58	4100	2.24	7900	3.22	11700	3.97	15600	4.66
400	0.66	4200	2.27	8000	3.20	11800	3.98	15700	4.66
500	0.74	4300	2.31	8100	3.21	11900	4.08	15800	4.72
600	0.81	4400	2.31	8200	3.24	12000	4.03	15900	4.78
700	0.88	4500	2.36	8300	3.27	12100	4.06	16000	4.89
800	0.95	4600	2.37	8400	3.32	12200	4.05	16100	4.95
900	1.00	4700	2.40	8500	3.35	12300	4.16	16200	4.92
1000	1.06	4800	2.43	8600	3.35	12400	4.18	16300	4.95
1100	1.11	4900	2.45	8700	3.33	12500	4.20	16400	5.02
1200	1.16	5000	2.50	8800	3.37	12600	4.22	16500	5.04
1300	1.21	5100	2.51	8900	3.39	12700	4.23	16600	5.06
1400	1.26	5200	2.55	9000	3.45	12800	4.28	16700	5.17
1500	1.31	5300	2.56	9100	3.46	12900	4.26	16800	5.16
1600	1.35	5400	2.59	9200	3.47	13000	4.28	16900	5.19
1700	1.39	5500	2.62	9300	3.46	13100	4.28	17000	5.23
1800	1.44	5600	2.65	9400	3.50	13200	4.28	17100	5.30
1900	1.47	5700	2.67	9500	3.50	13300	4.29	17200	5.26
2000	1.52	5800	2.71	9600	3.53	13400	4.34	17300	5.30
2100	1.55	5900	2.72	9700	3.52	13500	4.31	17400	5.30
2200	1.60	6000	2.73	9800	3.54	13600	4.35	17500	5.36
2300	1.63	6100	2.76	9900	3.56	13700	4.36	17600	5.40
2400	1.67	6200	2.78	10000	3.57	13800	4.37	17700	5.47
2500	1.70	6300	2.81	10100	3.60	13900	4.41	17800	5.56
2600	1.74	6400	2.85	10200	3.69	14000	4.42	17900	5.45
2700	1.78	6500	2.87	10300	3.69	14100	4.45	18000	5.47
2800	1.83	6600	2.87	10400	3.67	14200	4.49		
2900	1.85	6700	2.90	10500	3.70	14300	4.55		
3000	1.89	6800	2.91	10600	3.70	14400	4.62		
3100	1.92	6900	2.96	10700	3.76	14600	4.54		
3200	1.96	7000	2.99	10800	3.88	14700	4.58		
3300	1.99	7100	3.01	10900	3.88	14800	4.57		
3400	2.03	7200	3.04	11000	3.85	14900	4.65		
3500	2.06	7300	3.08	11100	3.85	15000	4.64		

Cable loss
Microwave Cable Assembly, 18 GHz, 6.4 m, SMA – SMA, Huber-Suhner, model 198-9155-00
HL 3123

Frequency, MHz	Cable loss, dB								
10	0.11	3600	1.97	7400	3.12	11200	3.90	15100	4.74
30	0.17	3700	1.97	7500	3.13	11300	3.93	15200	4.70
50	0.25	3800	2.03	7600	3.16	11400	3.88	15300	4.73
100	0.32	3900	2.04	7700	3.18	11500	3.87	15400	4.78
200	0.46	4000	2.10	7800	3.20	11600	3.90	15500	4.75
300	0.58	4100	1.97	7900	3.23	11700	3.86	15600	4.76
400	0.65	4200	1.97	8000	3.25	11800	3.88	15700	4.75
500	0.74	4300	2.03	8100	3.26	11900	3.86	15800	4.78
600	0.82	4400	2.04	8200	3.28	12000	3.89	15900	4.79
700	0.89	4500	2.10	8300	3.31	12100	3.94	16000	4.73
800	0.95	4600	1.97	8400	3.31	12200	3.92	16100	4.78
900	1.01	4700	1.97	8500	3.32	12300	3.96	16200	4.84
1000	1.07	4800	2.03	8600	3.34	12400	4.01	16300	4.90
1100	1.11	4900	2.04	8700	3.35	12500	4.07	16400	4.87
1200	1.17	5000	2.10	8800	3.37	12600	4.08	16500	4.90
1300	1.22	5100	2.53	8900	3.39	12700	4.17	16600	4.98
1400	1.27	5200	2.55	9000	3.42	12800	4.26	16700	5.05
1500	1.29	5300	2.60	9100	3.43	12900	4.16	16800	5.04
1600	1.35	5400	2.61	9200	3.51	13000	4.21	16900	5.02
1700	1.40	5500	2.64	9300	3.52	13100	4.24	17000	5.09
1800	1.44	5600	2.70	9400	3.54	13200	4.27	17100	5.07
1900	1.51	5700	2.67	9500	3.63	13300	4.31	17200	5.10
2000	1.49	5800	2.71	9600	3.61	13400	4.33	17300	5.13
2100	1.55	5900	2.74	9700	3.71	13500	4.25	17400	5.23
2200	1.58	6000	2.80	9800	3.66	13600	4.27	17500	5.21
2300	1.62	6100	2.79	9900	3.77	13700	4.33	17600	5.22
2400	1.72	6200	2.81	10000	3.75	13800	4.33	17700	5.36
2500	1.76	6300	2.83	10100	3.77	13900	4.31	17800	5.35
2600	1.78	6400	2.86	10200	3.80	14000	4.30	17900	5.45
2700	1.80	6500	2.88	10300	3.79	14100	4.30	18000	5.43
2800	1.86	6600	2.90	10400	3.87	14200	4.31		
2900	1.90	6700	2.92	10500	3.83	14300	4.37		
3000	1.90	6800	2.98	10600	3.88	14400	4.35		
3100	1.97	6900	2.98	10700	3.86	14600	4.53		
3200	1.97	7000	3.00	10800	3.87	14700	4.50		
3300	2.03	7100	3.02	10900	3.90	14800	4.62		
3400	2.04	7200	3.04	11000	3.84	14900	4.65		
3500	2.10	7300	3.06	11100	3.88	15000	4.79		

Cable loss
Cable coaxial, RG-214/U, N type-N type, 17 m
Teldor, HL 3612

Frequency, GHz	Cable loss, dB
0.1	0.05
0.5	0.07
1	0.10
3	0.22
5	0.29
10	0.39
30	0.68
50	0.90
100	1.27
150	1.58
200	1.80
250	2.12
300	2.36
350	2.60
400	2.82
450	2.99
500	3.23
550	3.40
600	3.56
650	3.71
700	3.90
750	4.04
800	4.23
850	4.39
900	4.55
950	4.65
1000	4.79

Cable loss
Cable coaxial, RG-214/U, N type-N type, 6.5 m
Suhner Switzerland, HL 3616

Frequency, MHz	Cable loss, dB						
10	0.13	1750	2.66	3550	4.44	5350	6.08
30	0.25	1800	2.72	3600	4.46	5400	6.12
50	0.32	1850	2.78	3650	4.59	5450	6.17
100	0.48	1900	2.81	3700	4.60	5500	6.25
150	0.60	1950	2.86	3750	4.72	5550	6.31
200	0.71	2000	2.94	3800	4.72	5600	6.35
250	0.81	2050	2.97	3850	4.86	5650	6.41
300	0.91	2100	3.01	3900	4.85	5700	6.50
350	1.00	2150	3.06	3950	4.99	5750	6.52
400	1.07	2200	3.11	4000	4.90	5800	6.57
450	1.14	2250	3.16	4050	5.04	5850	6.61
500	1.23	2300	3.21	4100	5.01	5900	6.71
550	1.30	2350	3.26	4150	5.10	5950	6.70
600	1.37	2400	3.31	4200	5.08	6000	6.75
650	1.44	2450	3.35	4250	5.18	6050	6.74
700	1.50	2500	3.39	4300	5.14	6100	6.84
750	1.58	2550	3.46	4350	5.22	6150	6.87
800	1.64	2600	3.48	4400	5.21	6200	6.93
850	1.69	2650	3.55	4450	5.29	6250	6.96
900	1.77	2700	3.59	4500	5.31	6300	7.02
950	1.79	2750	3.66	4550	5.39	6350	7.04
1000	1.87	2800	3.68	4600	5.41	6400	7.10
1050	1.92	2850	3.75	4650	5.49	6450	7.11
1100	1.98	2900	3.79	4700	5.52	6500	7.19
1150	2.05	2950	3.86	4750	5.60		
1200	2.09	3000	3.89	4800	5.64		
1250	2.15	3050	3.94	4850	5.73		
1300	2.21	3100	3.98	4900	5.70		
1350	2.27	3150	4.03	4950	5.73		
1400	2.33	3200	4.06	5000	5.75		
1450	2.38	3250	4.12	5050	5.83		
1500	2.44	3300	4.14	5100	5.82		
1550	2.48	3350	4.22	5150	5.91		
1600	2.52	3400	4.24	5200	5.92		
1650	2.56	3450	4.31	5250	5.98		
1700	2.62	3500	4.35	5300	6.01		

13 APPENDIX F Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
BB	broadband
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(µV)	decibel referred to one microvolt
dB(µV/m)	decibel referred to one microvolt per meter
dB(µA)	decibel referred to one microampere
dBΩ	decibel referred to one Ohm
DC	direct current
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
ITE	information technology equipment
k	kilo
kHz	kilohertz
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
µs	microsecond
NA	not applicable
NB	narrowband
OATS	open area test site
Ω	Ohm
QP	quasi-peak
PCB	printed circuit board
PM	pulse modulation
PS	power supply
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt
VA	volt-ampere

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