HERMON LABORATORIES

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839.01
Electrical

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TEST REPORT

ACCORDING TO: FCC 47CFR part 15: 2004, subpart C (§§ 15.247, 15.209), subpart B (§ 15.109)

FOR:

Telematics Wireless Ltd.

Water reader

Model: ETMW

905.45 – 923.55 MHz

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1 Applicant information

Client name:	Telematics Wireless Ltd.
Address:	26 Hamelaha street, POB 1911, Holon, 58117, Israel
Telephone:	+972 3557 5767
Fax:	+972 3557 5753
E-mail:	slavas@telematics-wireless.com
Contact name:	Mr. Slava Snitkovsky

2 Equipment under test attributes

Product name:	Water reader
Model:	ETMW
Operating frequency range:	905.45 – 923.55 MHz
Hardware version:	B
Serial number:	03007944
Receipt date:	11/9/2004

3 Manufacturer information

Manufacturer name:	Telematics Wireless Ltd.
Address:	26 Hamelaha street, POB 1911, Holon, 58117, Israel
Telephone:	+972 3557 5767
Fax:	+972 3557 5753
E-Mail:	slavas@telematics-wireless.com
Contact name:	Mr. Slava Snitkovsky

4 Test details

Project ID:	16154
Location:	Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started:	11/9/2004
Test completed:	1/9/2005
Test specifications:	FCC 47CFR part 15: 2004, subpart C (§§ 15.247, 15.209), subpart B (§ 15.109)
Test suite:	FCC_15.247_DTS_without_RF_connector (5/3/2004 5:43:35 PM, modified)

5 Tests summary

Test	Status
Transmitter characteristics	
Section 15.247(a)2, 6 dB bandwidth	Pass
Section 15.247(b)3, Peak output power	Pass
Section 15.247(c), Radiated spurious emissions	Pass
Section 15.247(d), Peak power density	Pass
Section 15.207(a), Conducted emission	Not required
Unintentional emissions	
Section 15.107, Conducted emission at AC power port	Not required
Section 15.109, Radiated emission	Pass

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. B. Efros, test engineer	January 9, 2005	
Reviewed by:	Mr. M. Nikishin, EMC group leader	January 10, 2005	
Approved by:	Mr. A. Usoskin, CEO	January 10, 2005	

6 EUT description

6.1 General information

The ETMW is actually a water odometer, offering Automatic Meter Reading – AMR. The ETMW is 2-way RF communicator built-in water meter. The RF capabilities enable the transmission of the meter reading and some extra information to a collecting unit. In addition specific parameters can be programmed via the RF link.
The ETMW consists of the following units: RF transmitter & receiver with integral antenna that operate at 916.3 MHz and a microcontroller (plus simple Digital Logic), which control the operational modes of the unit.
The EUT is powered from 3.6 VDC supplied by two Ni-Cd internal batteries.

6.2 Operating frequencies

Source	Frequency, MHz			
Transmitter	905.45-923.55	NA	NA	NA
Receiver	916.468 (RF)	927.2 (LO)	NA	NA
Digital portion	0.032768 (clock)	14.487 (clock)	NA	NA

6.3 Changes made in the EUT

No changes were implemented.

6.4 EUT view

6.5 Transmitter characteristics

Type of equipment								
	Stand-alone (Equipment with or without its own control provisions)							
X	Combined equipment (Equipment where the radio part is fully integrated within another type of equipment)							
	Plug-in card (Equipment intended for a variety of host systems)							
Intended use		**Condition of use**						
	fixed	Always at a distance more than 2 m from all people						
X	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 - 928 MHz						
Operating frequency range		905.45 – 923.55 MHz						
RF channel spacing		3.62 MHz						
Maximum rated output power		At transmitter 50 Ω RF output connector				dBm		
		Effective radiated power (for equipment with no RF connector)				13.5 dBm (FSK) 19.0 dBm (PSK)		
Is transmitter output power variable?		X	No					
			Yes		continuous variable			
					stepped variable with stepsize	dB		
				minimum RF power		dBm		
				maximum RF power		dBm		
Antenna connection								
unique coupling	standard connector	X	integral		with temporary RF connector			
				X	without temporary RF connector			

Antenna/s technical characteristics			
Type	Manufacturer	Model number	Gain
Integral	Telematics Wireless	PIFA	3 dBi

Transmitter 99% power bandwidth	2 MHz (PSK modulated), 560 kHz (FSK modulated)				
Transmitter aggregate data rate/s	60 kBps (PSK modulated), 120 kBps (FSK modulated)				
Transmitter aggregate symbol (baud) rate/s	0.9 Msymbols (MBaud) per second (PSK modulated)				
Type of modulation	PSK, FSK				
Modulating test signal (baseband)	PRBS				
Maximum transmitter duty cycle in normal use	0.06 %	**Tx ON time**	3.6 ms	**Period**	6000 ms
Transmitter duty cycle supplied for test	7.1 % (PSK) 5.4 % (FSK)	**Tx ON time**	3.6 ms	**Period**	50.562 ms (PSK) 66.083 ms (FSK)

Transmitter power source						
X	Battery	**Nominal rated voltage**	3.6 VDC	Battery type	Ni-Cd	
	DC	**Nominal rated voltage**	VDC			
	AC mains	**Nominal rated voltage**	VAC	Frequency	Hz	

Common power source for transmitter and receiver	X	yes	no

Emission designator	2M00G1DAN (PSK modulated) 560KF1DAN (FSK modulated)	
Spread spectrum technique used		Frequency hopping (FHSS)
	X	Digital transmission system (DTS)
		Hybrid

Spread spectrum parameters for transmitters tested per FCC 15.247 only		
DSSS	Chip sequence length	15 bits
	Spectrum width	2 MHz
FHSS	Dwell time	
	Bandwidth per hop	
	Max. separation of hops	

Test specification:	Section 15.247(a)2, 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/15/2004 8:23:18 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

7 Transmitter tests according to 47CFR part 15 subpart C requirements

7.1 Minimum 6 dB bandwidth

7.1.1 General

This test was performed to measure 6 dB bandwidth of the EUT carrier frequency. The specification test limits are given in Table 7.1.1.

Table 7.1.1 6 dB bandwidth limits

Assigned frequency, MHz	Modulation envelope reference points*, dBc	Minimum bandwidth, kHz
902.0 – 928.0	6.0	500.0
2400.0 – 2483.5		
5725.0 – 5850.0		

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

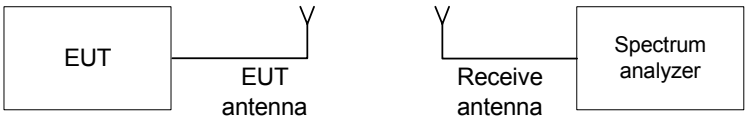
7.1.2 Test procedure

7.1.2.1 The EUT was set up as shown in Figure 7.1.1, energized and its proper operation was checked.

7.1.2.2 The EUT was set to transmit modulated carrier.

7.1.2.3 The transmitter minimum 6 dB bandwidth was measured with spectrum analyzer as frequency delta between reference points on modulation envelope and provided in Table 7.1.2 and associated plot.

Figure 7.1.1 6 dB bandwidth test setup



Test specification:	Section 15.247(a)2, 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/15/2004 8:23:18 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.1.2 6 dB bandwidth test results

ASSIGNED FREQUENCY BAND: 902 - 928 MHz
DETECTOR USED: Peak
SWEEP MODE: Single
SWEEP TIME: Auto
RESOLUTION BANDWIDTH: 100 kHz
VIDEO BANDWIDTH: 300 kHz
MODULATION ENVELOPE REFERENCE POINTS: 6.0 dBc

MODULATION: PSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kBps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
Low frequency				
905.462	665.0	500.0	165.0	Pass
Mid frequency				
916.310	660.0	500.0	160.0	Pass
High frequency				
923.500	635.0	500.0	135.0	Pass

MODULATION: FSK
MODULATING SIGNAL: PRBS
BIT RATE: 120 kBps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
Low frequency				
905.417	595.0	500.0	95.0	Pass
Mid frequency				
916.295	578.0	500.0	78.0	Pass
High frequency				
923.548	578.0	500.0	78.0	Pass

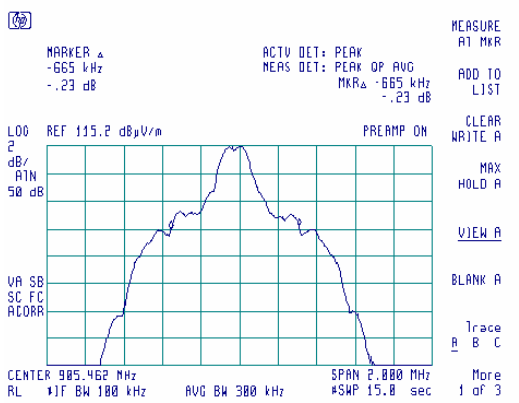
Reference numbers of test equipment used

HL 0465	HL 0521	HL 0589	HL 0593	HL 0594	HL 0604	HL 1004	HL 2009	

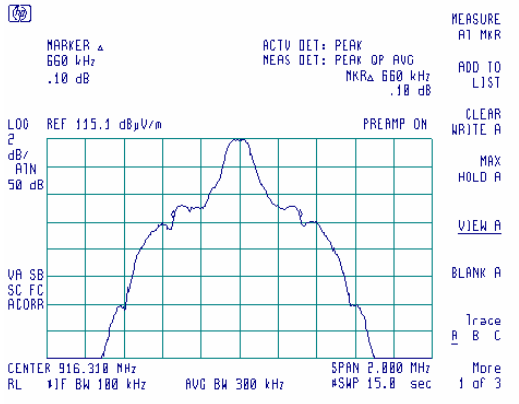
Full description is given in Appendix A.

Test specification:	Section 15.247(a)2, 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/15/2004 8:23:18 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

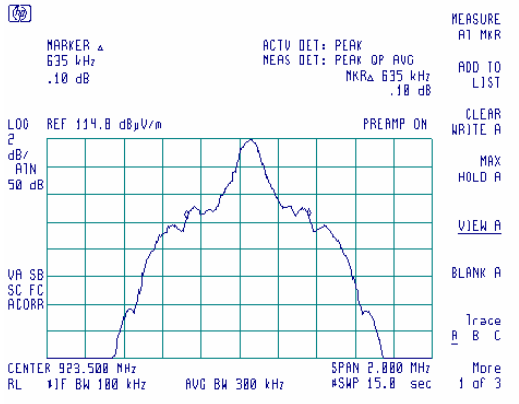
Plot 7.1.1 6 dB bandwidth test result at low frequency, PSK modulation



Plot 7.1.2 6 dB bandwidth test result at mid frequency, PSK modulation

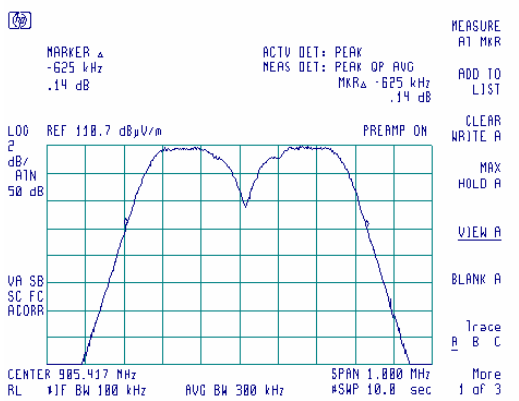


Plot 7.1.3 6 dB bandwidth test result at high frequency, PSK modulation

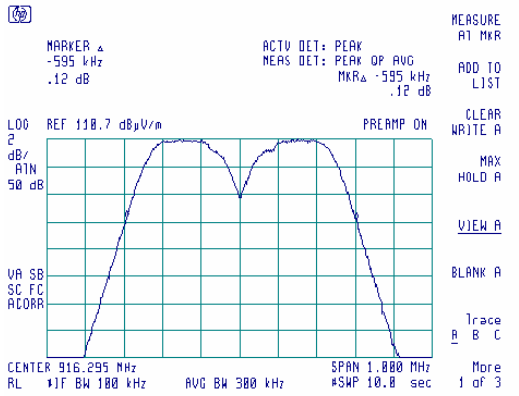


Test specification:	Section 15.247(a)2, 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/15/2004 8:23:18 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

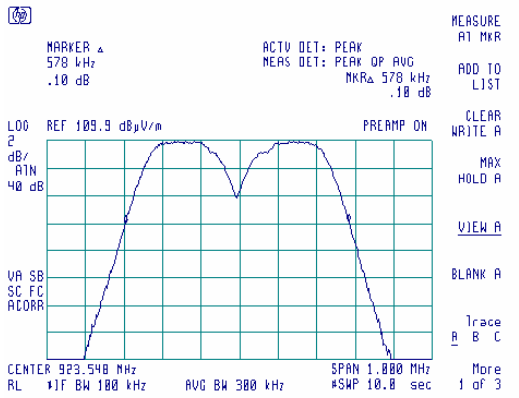
Plot 7.1.4 6 dB bandwidth test result at low frequency, FSK modulation



Plot 7.1.5 6 dB bandwidth test result at low frequency, FSK modulation



Plot 7.1.6 6 dB bandwidth test result at low frequency, FSK modulation



Test specification:	Section 15.247(b)3, Peak output power		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 7:53:00 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

7.2 Peak output power

7.2.1 General

This test was performed to measure the maximum peak output power radiated by transmitter. The specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

Assigned frequency range, MHz	Maximum antenna gain, dBi	Peak output power*		Equivalent field strength limit @ 3m, dB(μV/m)**
		W	dBm	
902.0 – 928.0	6.0	1.0	30.0	131.2
2400.0 – 2483.5				
5725.0 – 5850.0				

*- The limit is provided in terms of conducted RF power at the antenna connector. 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 1 dB for every 3 dB that the directional gain of antenna exceeds 6 dBi for fixed point-to-point transmitters operate in 2400-2483.5 MHz band;
without any corresponding reduction for fixed point-to-point transmitters operate in 5725-5850 MHz band;
by the amount in dB that the directional gain of antenna exceeds 6 dBi for the rest of transmitters.

**- Equivalent field strength limit was calculated from the peak output power as follows: E=sqrt(30×P×G)/r, where P is peak output power in Watts, r is antenna to EUT distance in meters and G is transmitter antenna gain in dBi.

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 adjusted to produce maximum available to end user RF output power.

7.2.2.3 The resolution bandwidth of spectrum analyzer was set wider than 6 dB bandwidth of the EUT and the field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.2.2.4 The maximum field strength of the EUT carrier frequency was measured as provided in Table 7.2.2 and associated plots.

7.2.2.5 The maximum peak output power was calculated from the field strength of carrier as follows:

$$P = (E \times d)^2 / (30 \times G),$$

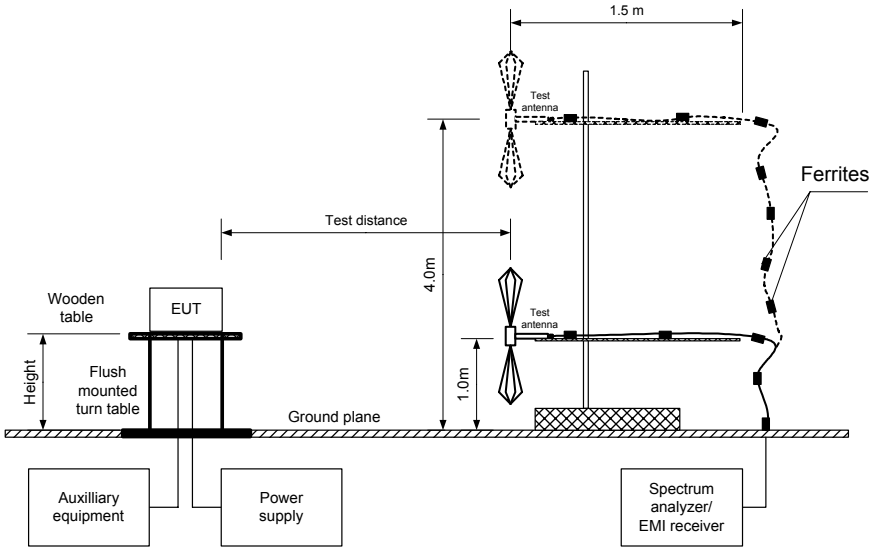
where P is the peak output power in W, E is the field strength in V/m, d is the test distance and G is the transmitter numeric antenna gain over an isotropic radiator.
The above equation was converted in logarithmic units for 3 m test distance:

Peak output power in dBm = Field strength in dB(μV/m) - Transmitter antenna gain in dBi – 95.2 dB

7.2.2.6 The worst test results (the lowest margins) were recorded in Table 7.2.2.

Test specification:	Section 15.247(b)3, Peak output power		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 7:53:00 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

Figure 7.2.1 Setup for carrier field strength measurements



Test specification:	**Section 15.247(b)3, Peak output power**		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2004 7:53:00 PM		
Temperature: 25 ºC	**Air Pressure:** 1010 hPa	**Relative Humidity:** 44 %	**Power Supply:** 3.6 VDC
Remarks:			

Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY: 902 - 928 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 0.8 m
DETECTOR USED: Peak
TEST ANTENNA TYPE: Biconilog (30 MHz – 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 3.0 MHz
VIDEO BANDWIDTH: 3.0 MHz

EUT 6 dB BANDWIDTH: 0.7 MHz
MODULATION: PSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kBps

Frequency, MHz	Field strength, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
905.45	116.99	Vertical	1.2	356	3	18.79	30.0	-11.21	Pass
916.30	117.00	Vertical	1.2	19	3	18.80	30.0	-11.20	Pass
923.55	116.49	Vertical	1.2	36	3	18.29	30.0	-11.70	Pass

EUT 6 dB BANDWIDTH: 0.6 MHz
MODULATION: FSK
MODULATING SIGNAL: PRBS
BIT RATE: 120 kBps

Frequency, MHz	Field strength, dB(µV/m)	Antenna polarization	Antenna height, m	Azimuth, degrees*	EUT antenna gain, dBi	Peak output power, dBm**	Limit, dBm	Margin, dB***	Verdict
905.45	111.50	Vertical	1.2	349	3	13.30	30.0	-16.70	Pass
916.30	111.63	Vertical	1.2	22	3	13.43	30.0	-16.57	Pass
923.55	110.88	Vertical	1.2	22	3	12.68	30.0	-17.20	Pass

*****- EUT front panel refer to 0 degrees position of turntable.
******- Peak output power was calculated from the field strength of carrier as follows: $P = (E \times d)^2 / (30 \times G)$,
where P is the peak output power in W, E is the field strength in V/m, d is the test distance in meters and G is the transmitter numeric antenna gain over an isotropic radiator. The above equation was converted in logarithmic units for 3 m test distance: *Peak output power in dBm = Field strength in dB(µV/m) - Transmitter antenna gain in dBi – 95.2 dB*
***- Margin = Peak output power – specification limit.

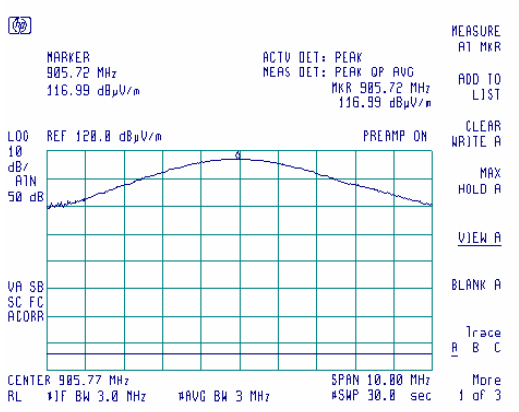
Reference numbers of test equipment used

HL 0465	HL 0521	HL 0589	HL 0593	HL 0594	HL 0604	HL 1004	HL 2009

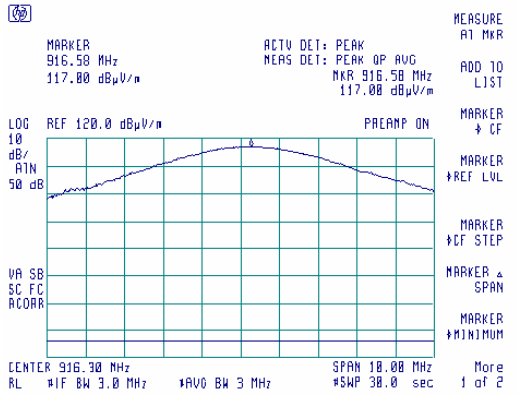
Full description is given in Appendix A.

Test specification:	Section 15.247(b)3, Peak output power		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 7:53:00 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

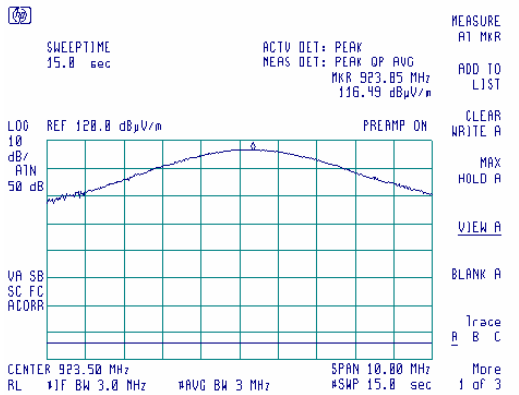
Plot 7.2.1 Field strength of carrier at low frequency, PSK modulation



Plot 7.2.2 Field strength of carrier at mid frequency, PSK modulation

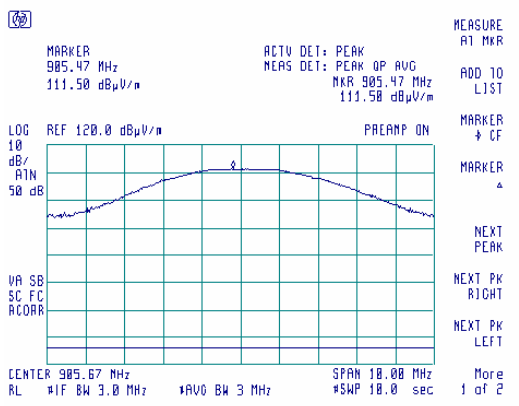


Plot 7.2.3 Field strength of carrier at high frequency, PSK modulation

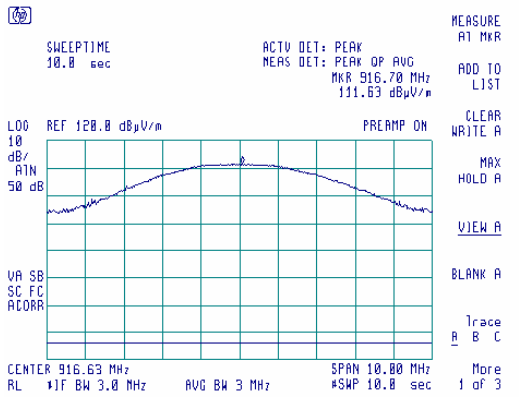


Test specification:	Section 15.247(b)3, Peak output power		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 7:53:00 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

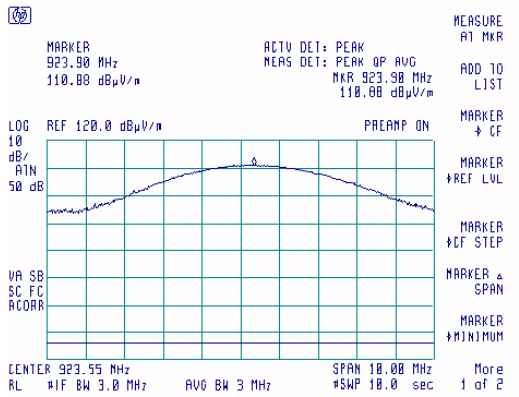
Plot 7.2.4 Field strength of carrier at low frequency, FSK modulation



Plot 7.2.5 Field strength of carrier at mid frequency, FSK modulation



Plot 7.2.6 Field strength of carrier at high frequency, FSK modulation



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

7.3 Field strength of spurious emissions

7.3.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.3.1.

Table 7.3.1 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 – 0.490*	NA	128.5 – 93.8**	NA	20.0
0.490 – 1.705*		73.8 – 63.0**		
1.705 – 30.0*		69.5**		
30 – 88		40.0		
88 – 216		43.5		
216 – 960		46.0		
960 - 1000		54.0		
Above 1000	74.0	NA	54.0	

*- The limit for 3 m test distance was calculated using the inverse square distance extrapolation factor as follows: LimS2 = LimS1 + 40 log (S1/S2),
where S1 and S2 – 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.

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

7.3.2.1 The EUT was set up as shown in Figure 7.3.1, energized and the performance check was conducted.

7.3.2.2 The specified frequency range was investigated with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna was rotated around its vertical axis.

7.3.2.3 The worst test results with respect to the limits were recorded in the associated tables and shown in the associated plots.

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

7.3.3.1 The EUT was set up as shown in Figure 7.3.2, energized and the performance check was conducted.

7.3.3.2 The specified frequency range was investigated with antenna connected to spectrum analyzer / EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal.

7.3.3.3 The worst test results with respect to the limits were recorded in the associated tables and shown in the associated plots.

Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Figure 7.3.1 Setup for spurious emission field strength measurements below 30 MHz

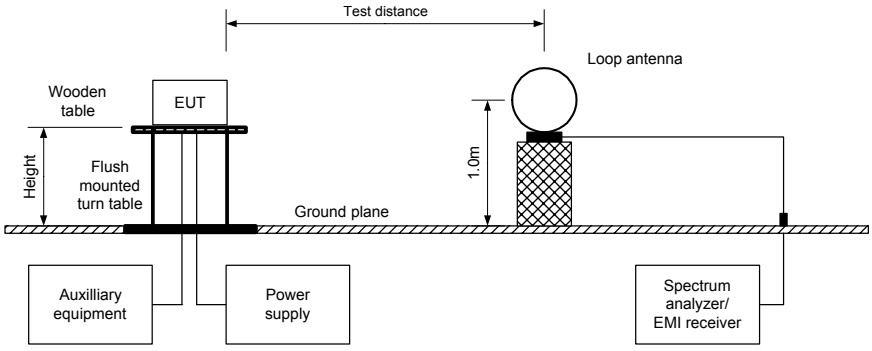
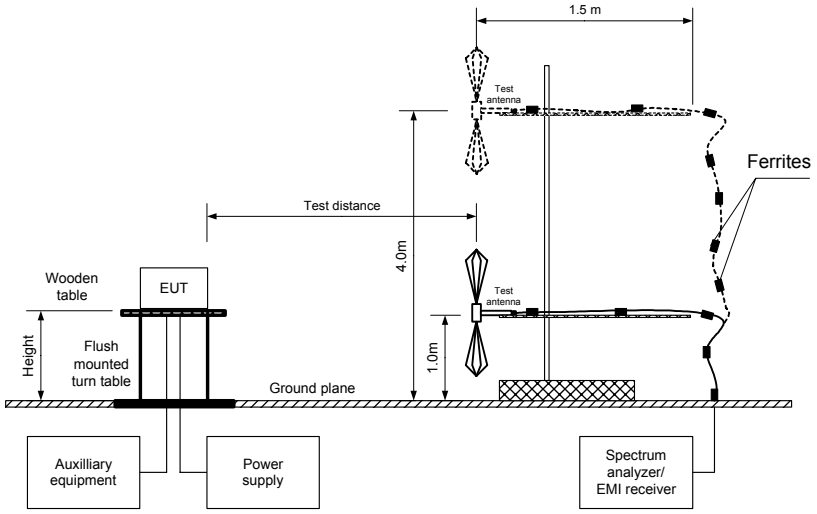


Figure 7.3.2 Setup for spurious emission field strength measurements above 30 MHz



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.3.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY RANGE: 902 - 928 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 - 9500 MHz
TEST DISTANCE: 3 m
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
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)

MODULATION: PSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kBps
DUTY CYCLE: 7.1 %
TRANSMITTER OUTPUT POWER: 18.79 dBm at low carrier frequency
18.80 dBm at mid carrier frequency
18.29 dBm at high carrier frequency

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									
1810.85	63.36	Vertical	1.4	185	115.1	51.74	20.00	-31.74	Pass
6338.05	42.33	Vertical	1.2	10		72.77		-52.77	
Mid carrier frequency									
1832.59	65.09	Horizontal	1.3	251	114.6	49.51	20.00	-29.51	Pass
5497.80	52.50	Horizontal	1.3	36		62.10		-42.10	
6414.08	44.67	Vertical	1.2	310		69.93		-49.93	
High carrier frequency									
1847.08	63.86	Horizontal	1.3	235	115.1	51.24	20.00	-31.24	Pass
5541.31	52.83	Horizontal	1.2	18		62.27		-42.27	
6464.76	48.50	Vertical	1.2	340		66.60		-46.60	

MODULATION: FSK
MODULATING SIGNAL: PRBS
BIT RATE: 120 kBps
DUTY CYCLE: 5.4 %
TRANSMITTER OUTPUT POWER: 13.30 dBm at low carrier frequency
13.43 dBm at mid carrier frequency
12.68 dBm at high carrier frequency

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									
1810.49	63.91	Vertical	1.4	185	116.6	52.69	20.00	-32.69	Pass
Mid carrier frequency									
1832.34	65.73	Horizontal	1.3	251	116.5	50.77	20.00	-30.77	Pass
5496.96	54.33	Horizontal	1.3	36		62.17		-42.17	
6413.07	49.33	Vertical	1.2	310		67.17		-47.17	
High carrier frequency									
1847.37	63.81	Horizontal	1.2	235	116.5	52.69	20.00	-32.69	Pass
5540.12	54.50	Horizontal	1.2	18		62.00		-42.00	
6463.68	50.67	Vertical	1.2	340		65.83		-45.83	

*- EUT front panel refers to 0 degrees position of turntable.
**- Margin = Attenuation below carrier – specification limit.

Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.3.3 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY RANGE: 902 – 928 MHz
INVESTIGATED FREQUENCY RANGE: 1000 - 9500 MHz
TEST DISTANCE: 3 m
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 1000 kHz
TEST ANTENNA TYPE: Double ridged guide

MODULATION: PSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kBps
DUTY CYCLE: 7.1 %
TRANSMITTER OUTPUT POWER: 18.79 dBm at low carrier frequency
18.80 dBm at mid carrier frequency
18.29 dBm at high carrier frequency

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=300 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											
2716.07	Vertical	1.4	185	58.17	74.00	-15.83	50.33	27.43	54.00	-26.57	Pass
3621.81	Vertical	1.2	199	60.33	74.00	-13.67	56.50	33.60	54.00	-20.40	
4526.99	Horizontal	1.1	0	56.00	74.00	-18.00	44.17	21.27	54.00	-32.73	
5432.62	Horizontal	1.0	30	52.33	74.00	-21.67	46.00	23.10	54.00	-30.90	
Mid carrier frequency											
2748.73	Horizontal	1.3	251	55.67	74.00	-18.33	42.85	19.95	54.00	-34.05	Pass
3665.18	Vertical	1.3	230	54.50	74.00	-19.50	50.00	27.10	54.00	-26.90	
4581.32	Horizontal	1.2	34	57.50	74.00	-16.50	43.50	20.60	54.00	-33.40	
High carrier frequency											
2770.51	Horizontal	1.5	235	54.67	74.00	-19.33	41.17	18.27	54.00	-35.73	Pass
3694.21	Vertical	1.3	44	53.33	74.00	-20.67	48.67	25.77	54.00	-28.23	
4617.88	Horizontal	1.1	12	57.33	74.00	-16.67	41.17	18.27	54.00	-35.73	

MODULATION: FSK
MODULATING SIGNAL: PRBS
BIT RATE: 120 kBps
DUTY CYCLE: 5.4 %
TRANSMITTER OUTPUT POWER: 13.30 dBm at low carrier frequency
13.43 dBm at mid carrier frequency
12.68 dBm at high carrier frequency

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=300 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											
2716.47	Vertical	1.4	185	59.33	74.00	-14.67	50.00	27.20	54.00	-26.80	Pass
3621.72	Vertical	1.2	199	67.33	74.00	-6.67	53.67	30.87	54.00	-23.13	
4527.11	Horizontal	1.1	0	56.33	74.00	-17.67	41.83	19.03	54.00	-34.97	
5431.95	Horizontal	1.0	30	54.83	74.00	-19.17	41.67	18.87	54.00	-35.13	
Mid carrier frequency											
2748.88	Horizontal	1.3	251	57.00	74.00	-17.00	41.83	19.03	54.00	-34.97	Pass
3665.29	Vertical	1.3	230	59.00	74.00	-15.00	46.67	23.87	54.00	-30.13	
4581.55	Horizontal	1.2	34	59.50	74.00	-14.50	42.17	19.37	54.00	-34.63	
High carrier frequency											
2770.67	Horizontal	1.5	235	56.00	74.00	-18.00	40.17	17.37	54.00	-36.63	Pass
3694.18	Vertical	1.3	44	55.67	74.00	-18.33	45.17	22.37	54.00	-31.63	
4617.69	Horizontal	1.1	12	61.67	74.00	-12.33	44.67	21.87	54.00	-32.13	

*****- 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.

Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.3.4 Average factor calculation

Transmission pulse		Average factor, dB
Duration, ms	Period, ms	
PSK modulated signal		
3.590	50.562	-22.8
FSK modulated signal		
3.642	66.083	-22.9

*- Average factor was calculated as follows

for pulse train shorter than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{Train\ duration} \times Number\ of\ bursts\ within\ pulse\ train\right)$$

for pulse train longer than 100 ms: $$Average\ factor = 20 \times \log_{10}\left(\frac{Pulse\ duration}{Pulse\ period} \times \frac{Burst\ duration}{100\,ms} \times Number\ of\ bursts\ within\ 100\,ms\right)$$

Table 7.3.5 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY RANGE: 902 – 928 MHz
INVESTIGATED FREQUENCY RANGE: 0.009 – 1000 MHz
TEST DISTANCE: 3 m
TRANSMITTER OUTPUT POWER SETTINGS: Maximum
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)
MODULATION: PSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kBps
DUTY CYCLE: 7.1 %
TRANSMITTER OUTPUT POWER: 18.79 dBm at low carrier frequency
18.80 dBm at mid carrier frequency
18.29 dBm at high carrier frequency

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								
No spurious emissions were found.								Pass
Mid carrier frequency								
No spurious emissions were found.								Pass
High carrier frequency								
No spurious emissions were found.								Pass

MODULATION: FSK
MODULATING SIGNAL: PRBS
BIT RATE: 120 kBps
DUTY CYCLE: 5.4 %
TRANSMITTER OUTPUT POWER: 13.30 dBm at low carrier frequency
13.43 dBm at mid carrier frequency
12.68 dBm at high carrier frequency

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								
No spurious emissions were found.								Pass
Mid carrier frequency								
No spurious emissions were found.								Pass
High carrier frequency								
No spurious emissions were found.								Pass

***- Margin = Measured emission - specification limit.
****- EUT front panel refer to 0 degrees position of turntable.

Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.3.6 Restricted bands

MHz	MHz	MHz	MHz	MHz	GHz
0.09 - 0.11	8.37625 - 8.38675	73 - 74.6	399.9 - 410	2655 - 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

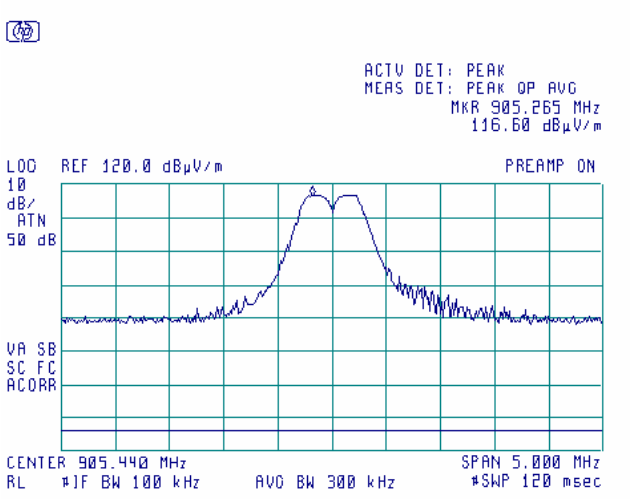
HL 0287	HL 0446	HL 0465	HL 0521	HL 0589	HL 0593	HL 0594	HL 0604
HL 0784	HL 0813	HL 1004	HL 1200	HL 1424	HL 1430	HL 1552	HL 1848
HL 1942	HL 1947	HL 1984	HL 2009	HL 2254	HL 2259		

Full description is given in Appendix A.

Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

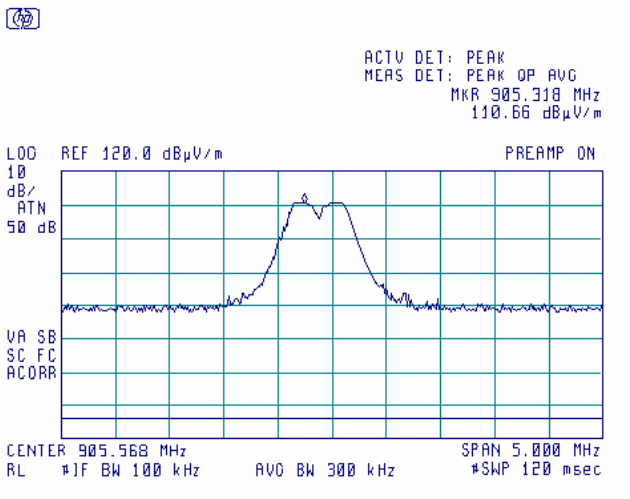
Plot 7.3.1 Field strength measurements at the low carrier frequency

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



Plot 7.3.2 Field strength measurements at the low carrier frequency

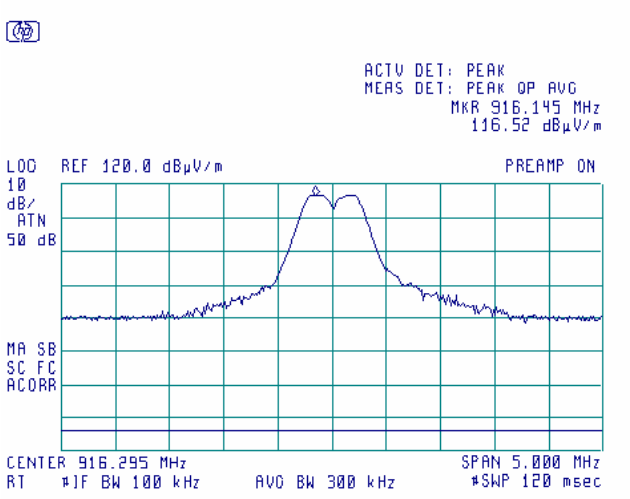
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

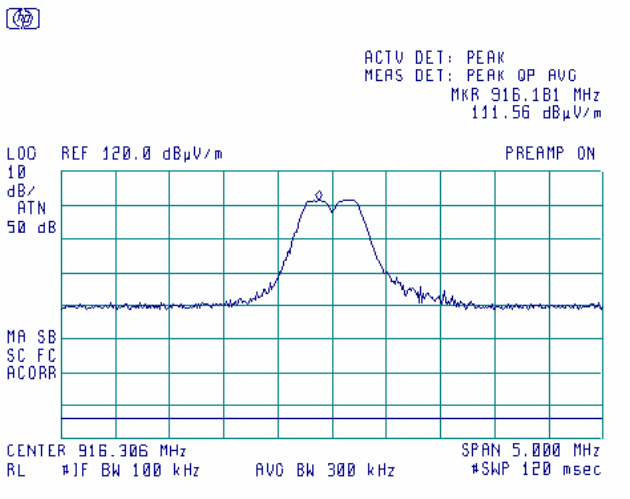
Plot 7.3.3 Field strength measurements at the mid carrier frequency

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



Plot 7.3.4 Field strength measurements at the mid carrier frequency

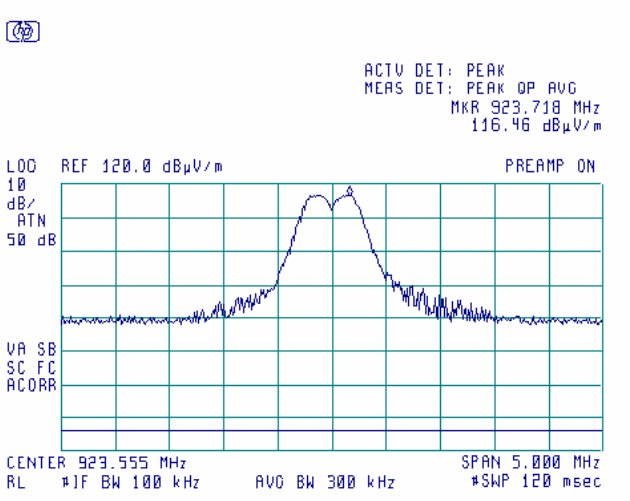
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

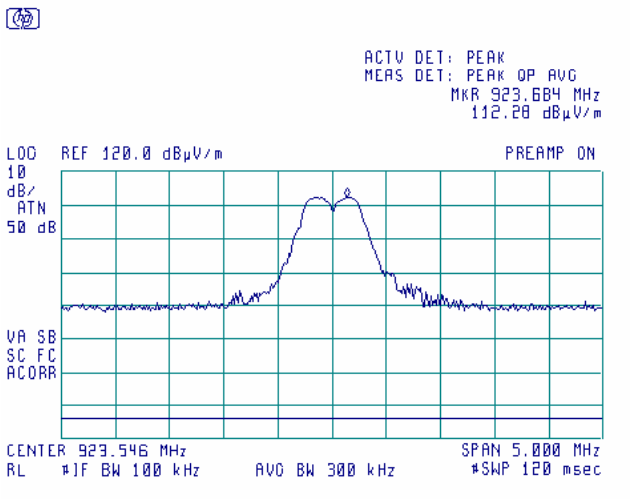
Plot 7.3.5 Field strength measurements at the high carrier frequency

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



Plot 7.3.6 Field strength measurements at the high carrier frequency

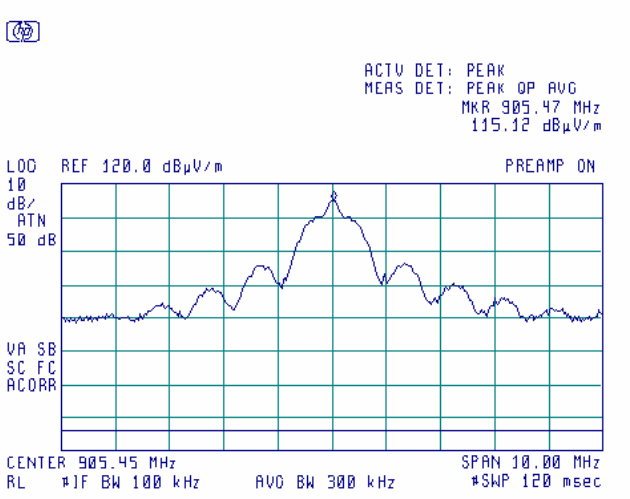
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

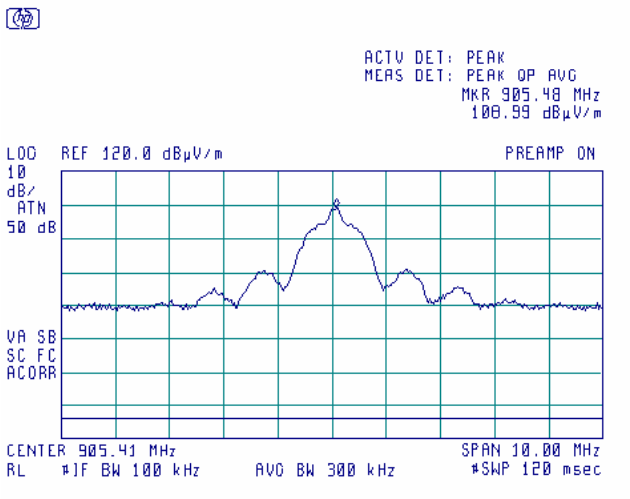
Plot 7.3.7 Field strength measurements at the low carrier frequency

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



Plot 7.3.8 Field strength measurements at the low carrier frequency

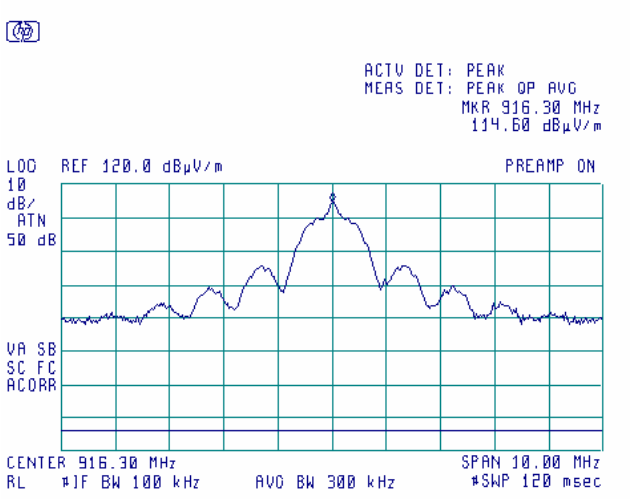
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

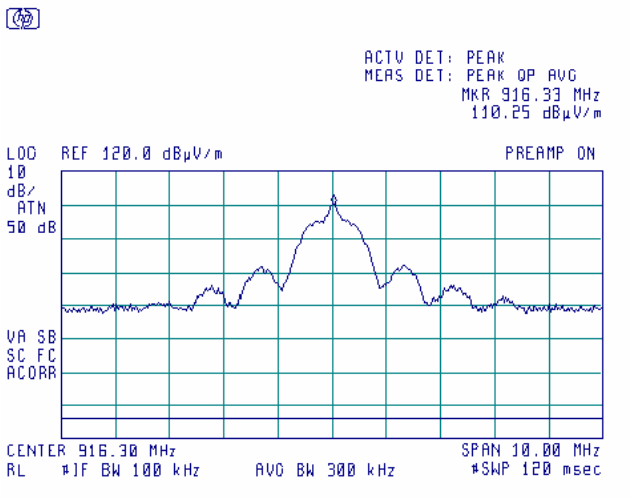
Plot 7.3.9 Field strength measurements at the mid carrier frequency

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



Plot 7.3.10 Field strength measurements at the mid carrier frequency

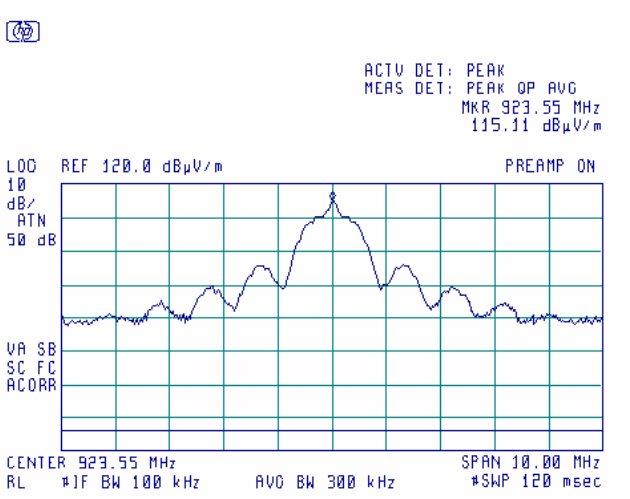
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

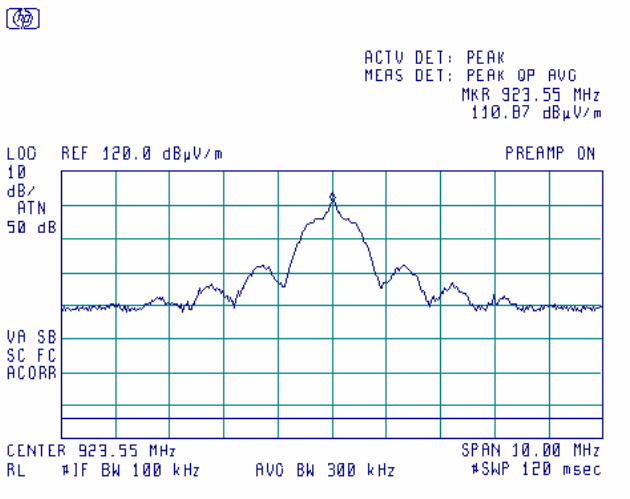
Plot 7.3.11 Field strength measurements at the high carrier frequency

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



Plot 7.3.12 Field strength measurements at the high carrier frequency

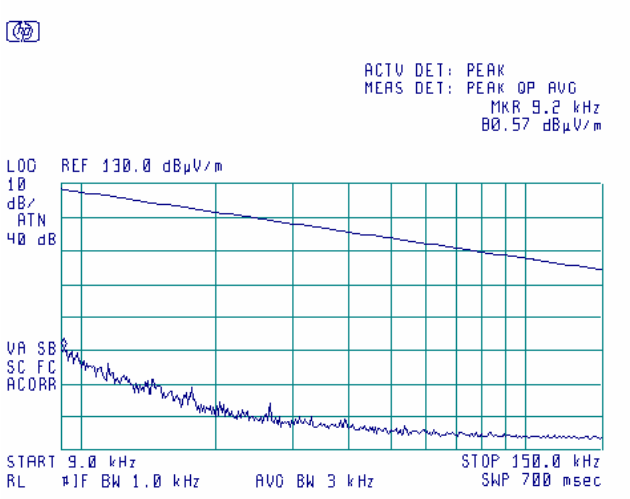
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

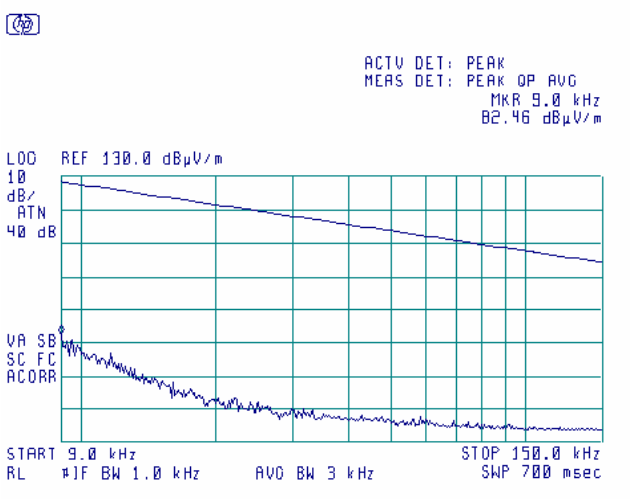
Plot 7.3.13 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

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



Plot 7.3.14 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

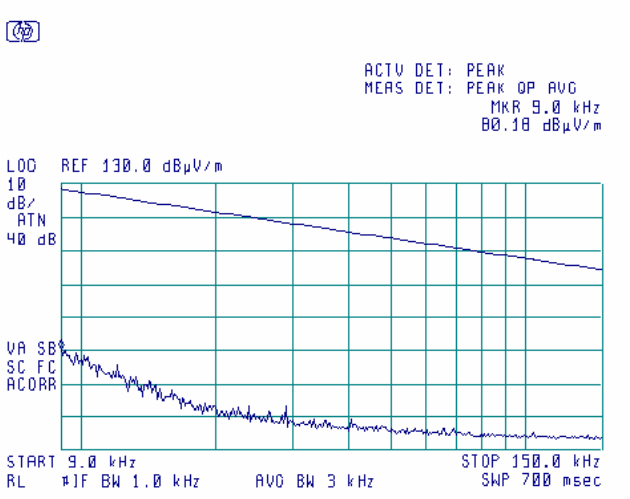
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

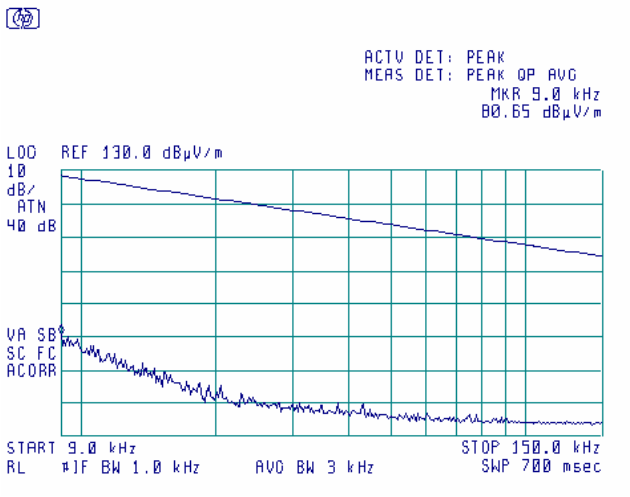
Plot 7.3.15 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

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



Plot 7.3.16 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

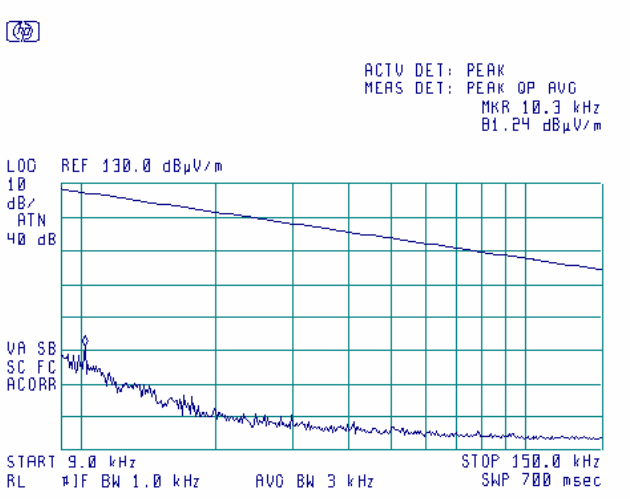
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

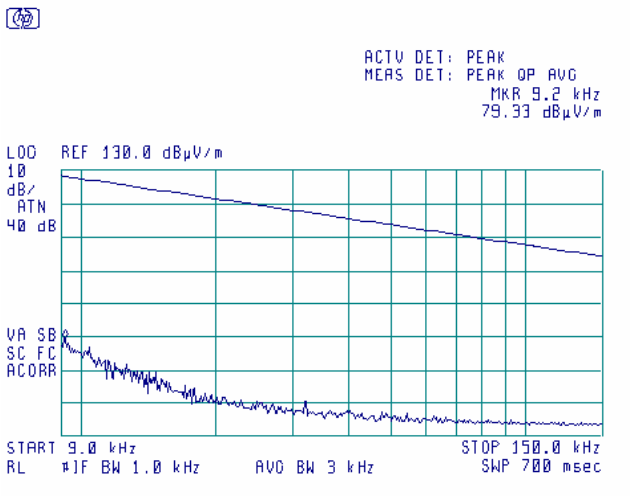
Plot 7.3.17 Radiated emission measurements from 9 to 150 kHz at the mid carrier frequency

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



Plot 7.3.18 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

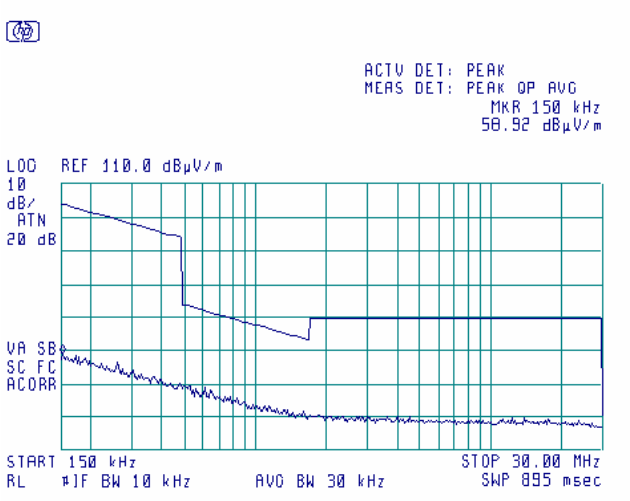
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

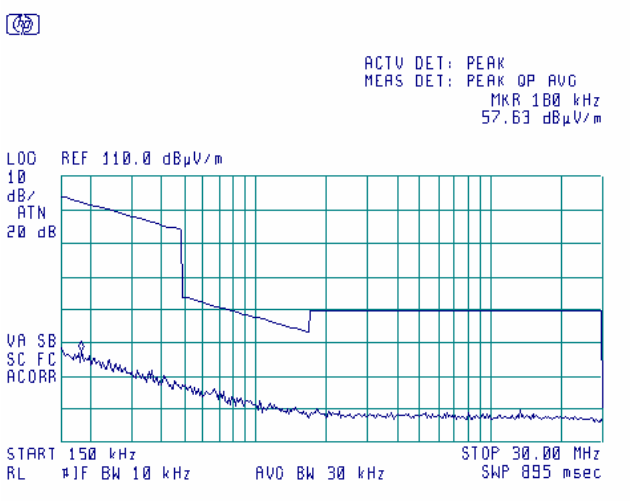
Plot 7.3.19 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

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



Plot 7.3.20 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

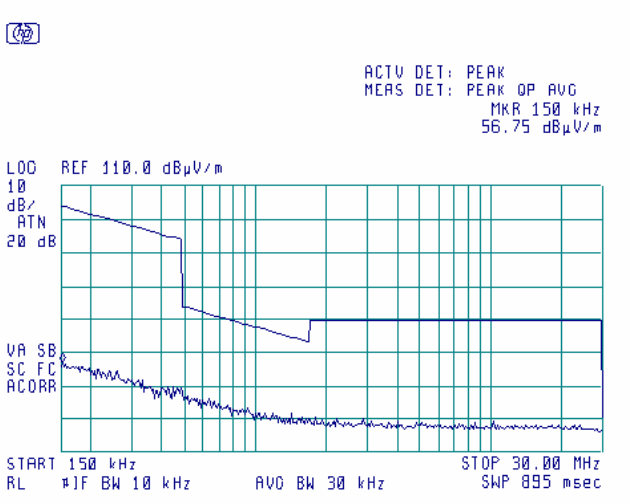
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

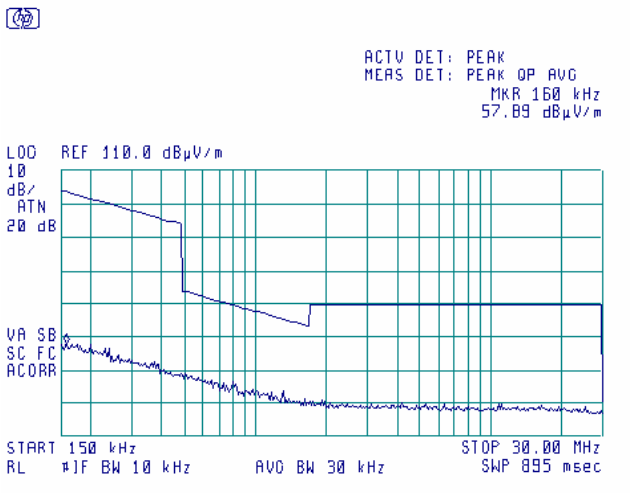
Plot 7.3.21 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

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



Plot 7.3.22 Radiated emission measurements from 0.15 to 30 MHz at the low carrier frequency

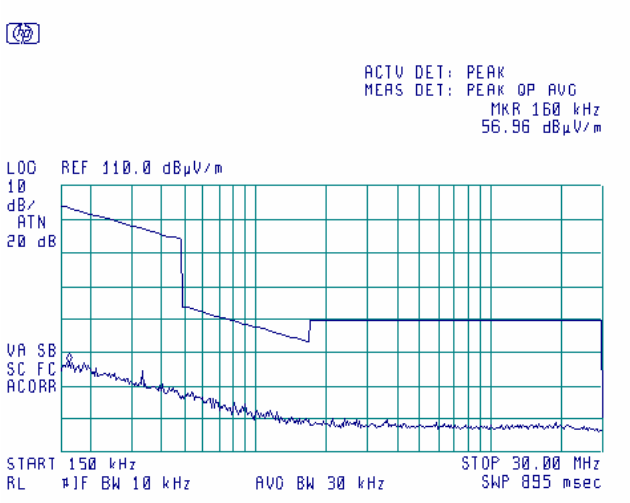
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

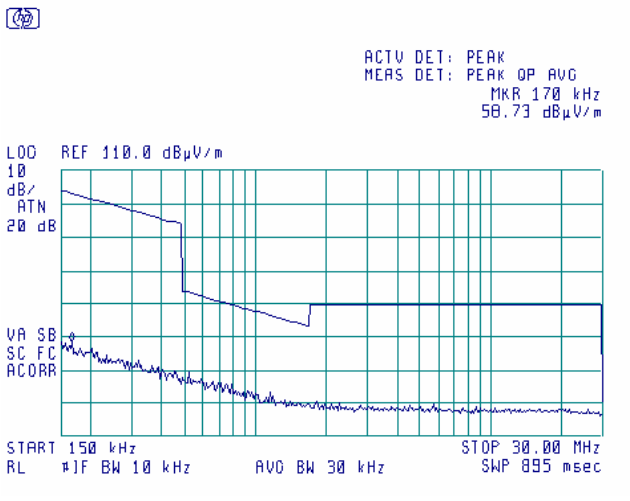
Plot 7.3.23 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

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



Plot 7.3.24 Radiated emission measurements from 0.15 to 30 MHz at the high carrier frequency

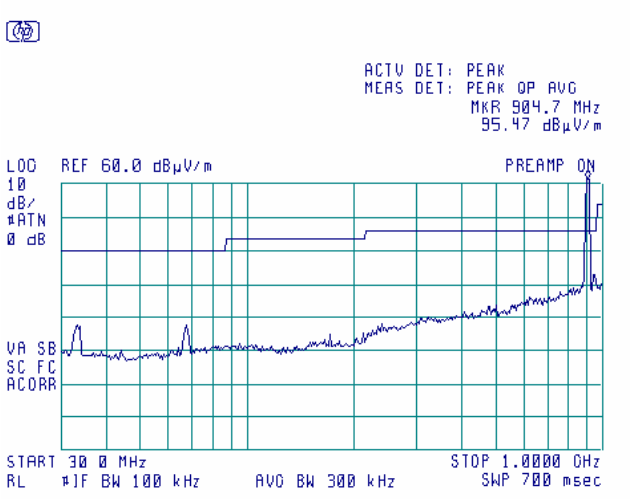
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

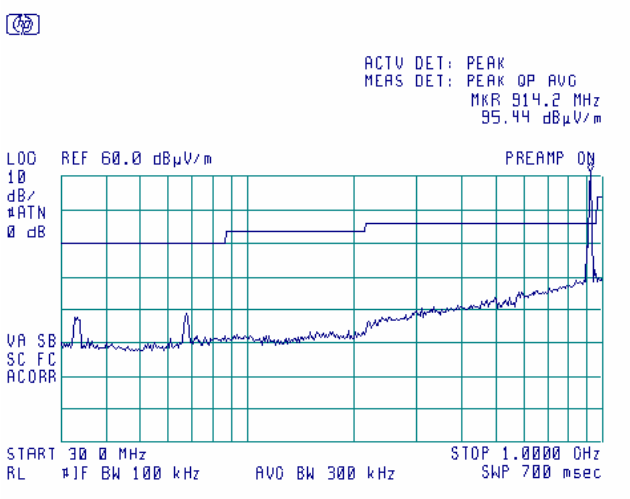
Plot 7.3.25 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

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



Plot 7.3.26 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

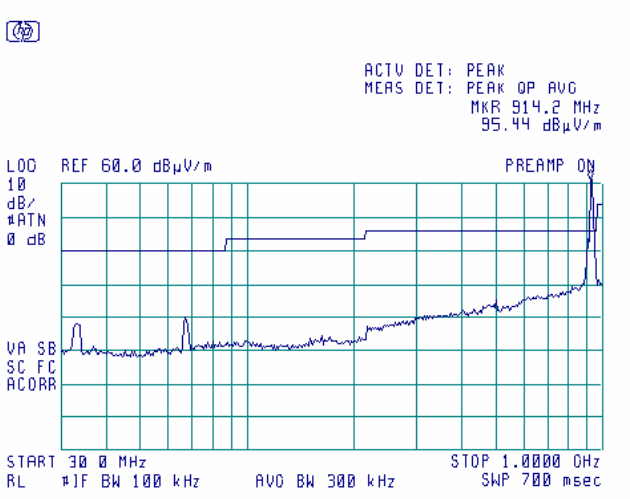
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

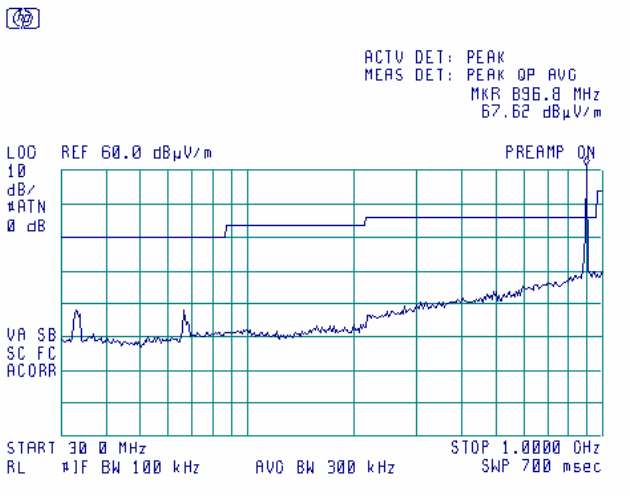
Plot 7.3.27 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

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



Plot 7.3.28 Radiated emission measurements from 30 to 1000 MHz at the low carrier frequency

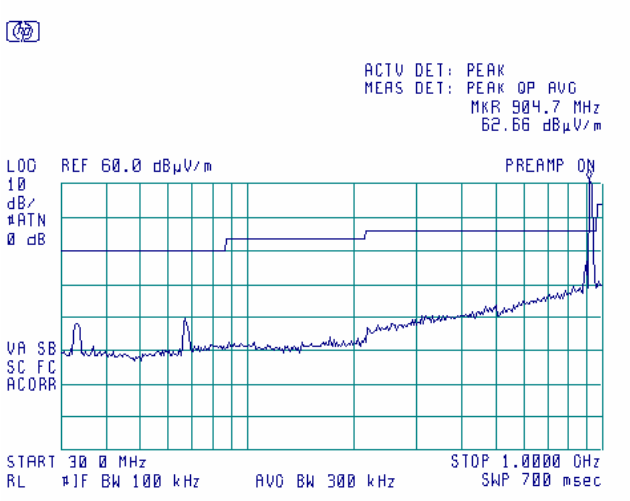
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

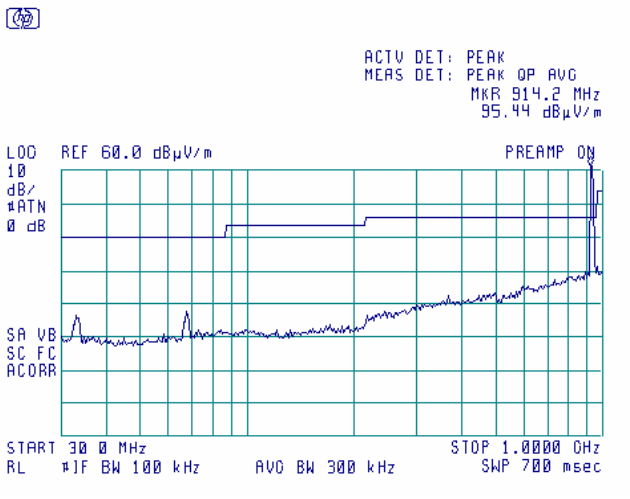
Plot 7.3.29 Radiated emission measurements from 30 to 1000 MHz at the mid carrier frequency

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



Plot 7.3.30 Radiated emission measurements from 30 to 1000 MHz at the high carrier frequency

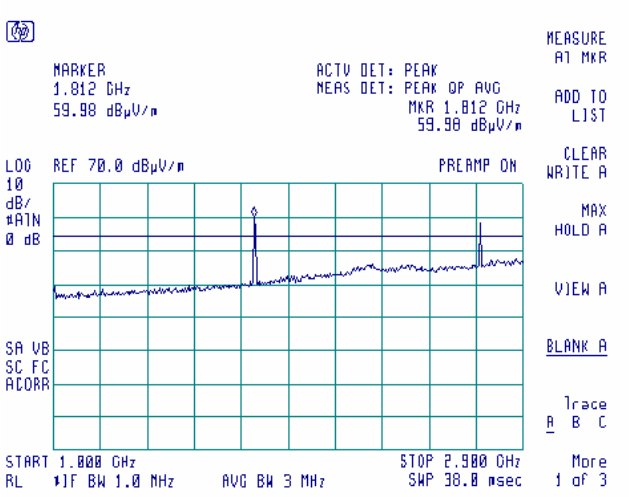
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

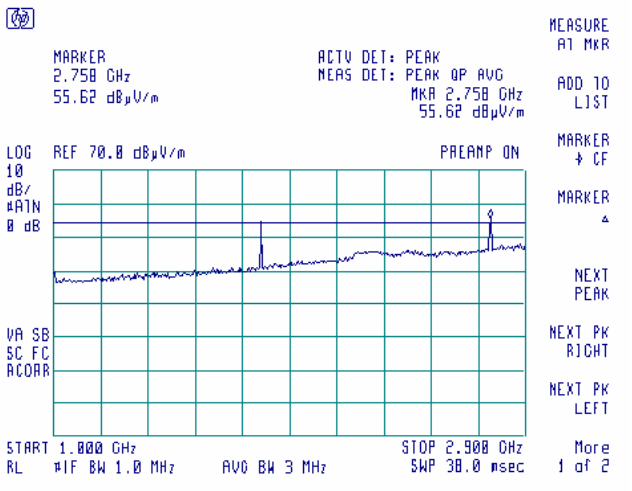
Plot 7.3.31 Radiated emission measurements from 1000 to 2900 MHz at the low carrier frequency

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



Plot 7.3.32 Radiated emission measurements from 1000 to 2900 MHz at the mid carrier frequency

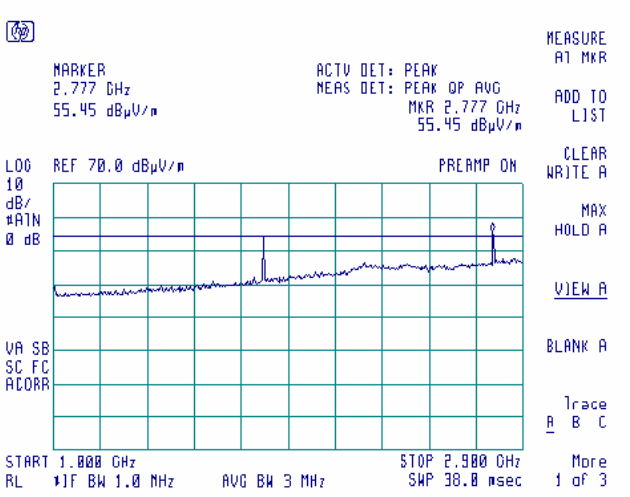
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

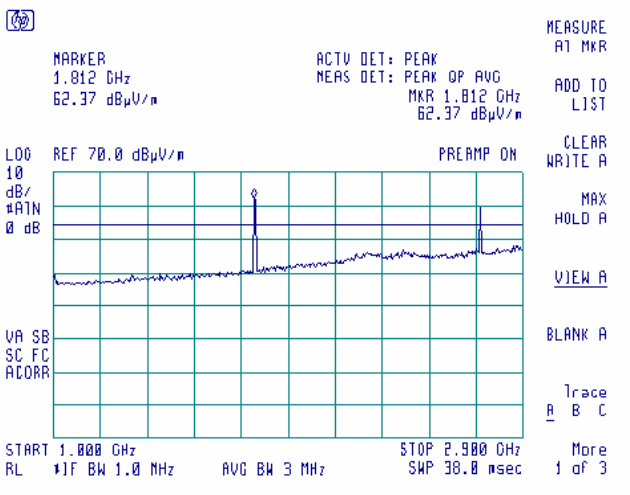
Plot 7.3.33 Radiated emission measurements from 1000 to 2900 MHz at the high carrier frequency

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



Plot 7.3.34 Radiated emission measurements from 1000 to 2900 MHz at the low carrier frequency

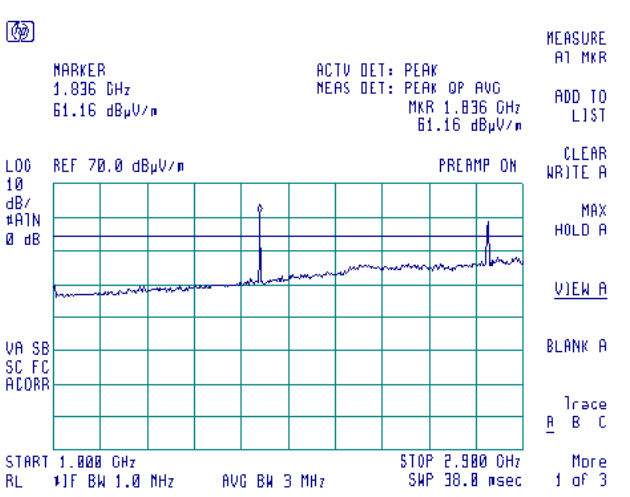
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

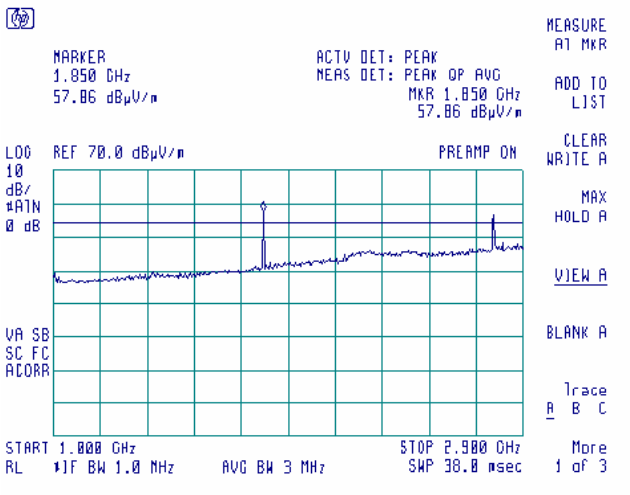
Plot 7.3.35 Radiated emission measurements from 1000 to 2900 MHz at the mid carrier frequency

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



Plot 7.3.36 Radiated emission measurements from 1000 to 2900 MHz at the high carrier frequency

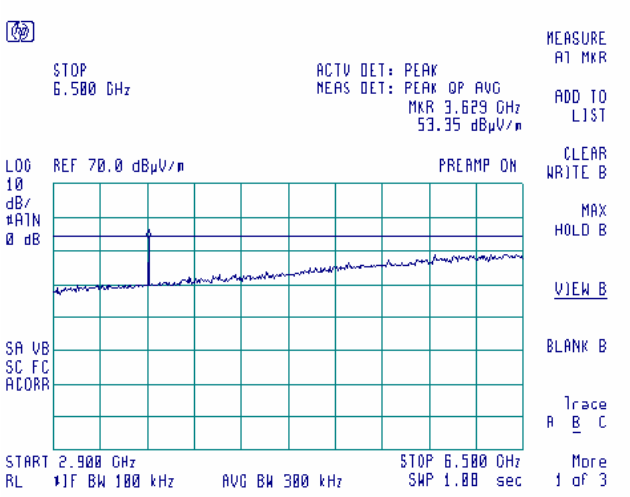
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

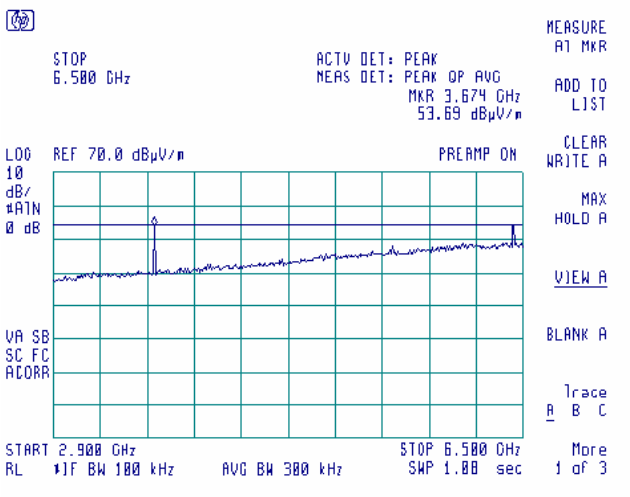
Plot 7.3.37 Radiated emission measurements from 2900 to 6500 MHz at the low carrier frequency

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



Plot 7.3.38 Radiated emission measurements from 2900 to 6500 MHz at the mid carrier frequency

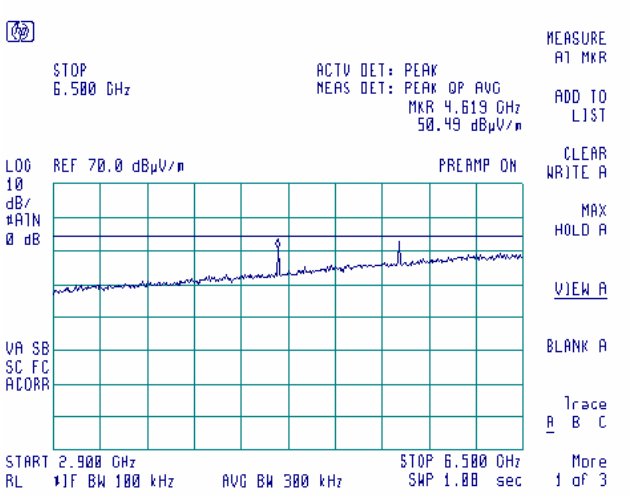
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

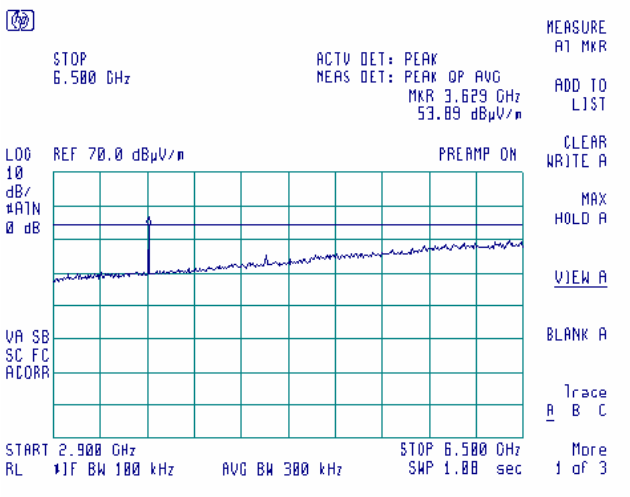
Plot 7.3.39 Radiated emission measurements from 2900 to 6500 MHz at the high carrier frequency

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



Plot 7.3.40 Radiated emission measurements from 2900 to 6500 MHz at the low carrier frequency

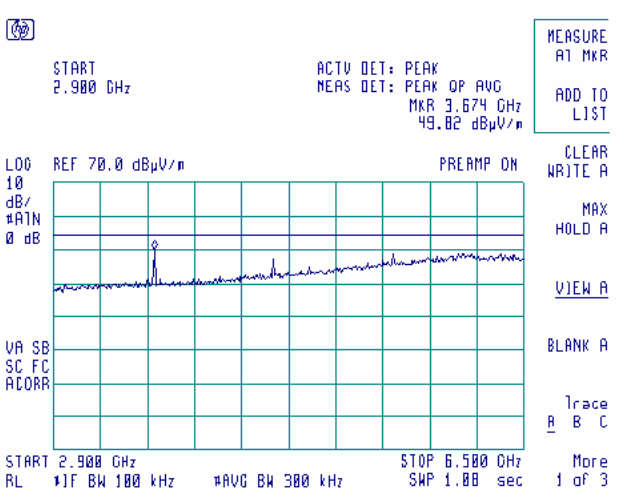
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

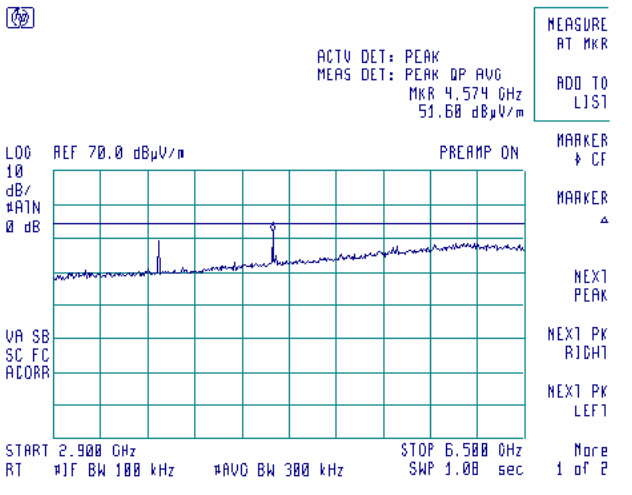
Plot 7.3.41 Radiated emission measurements from 2900 to 6500 MHz at the mid carrier frequency

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



Plot 7.3.42 Radiated emission measurements from 2900 to 6500 MHz at the high carrier frequency

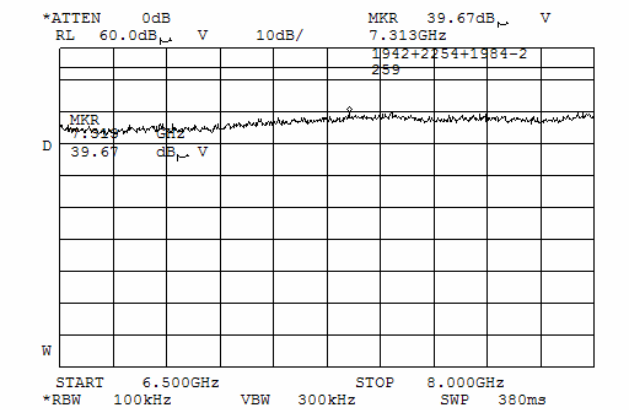
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

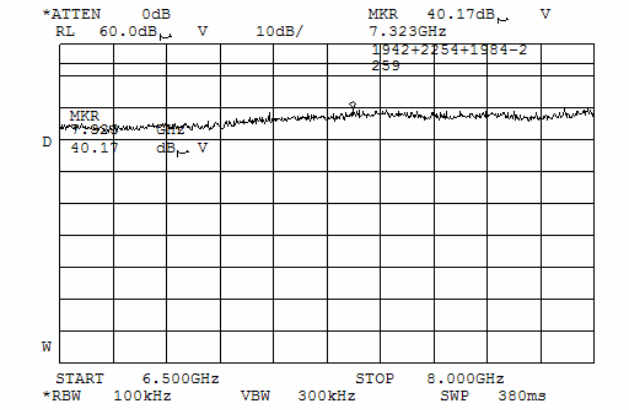
Plot 7.3.43 Radiated emission measurements from 6500 to 8000 MHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Plot 7.3.44 Radiated emission measurements from 6500 to 8000 MHz at the mid carrier frequency

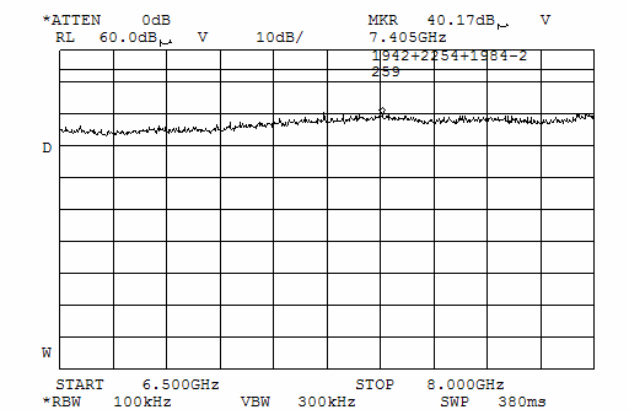
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

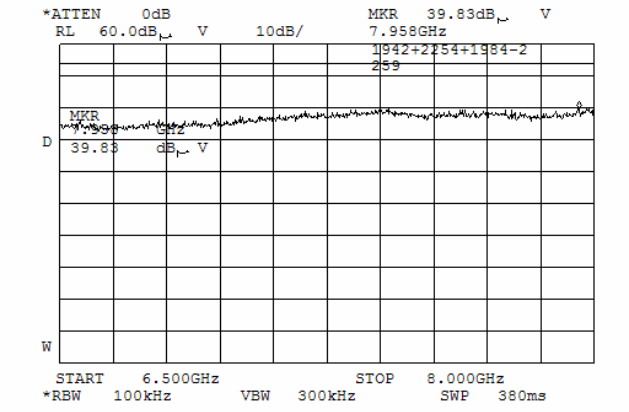
Plot 7.3.45 Radiated emission measurements from 6500 to 8000 MHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Plot 7.3.46 Radiated emission measurements from 6500 to 8000 MHz at the low carrier frequency

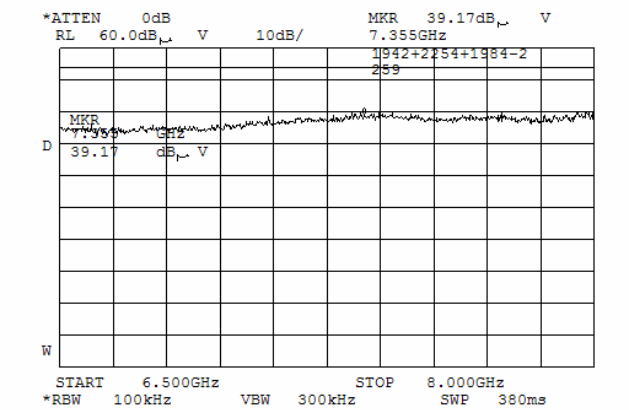
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

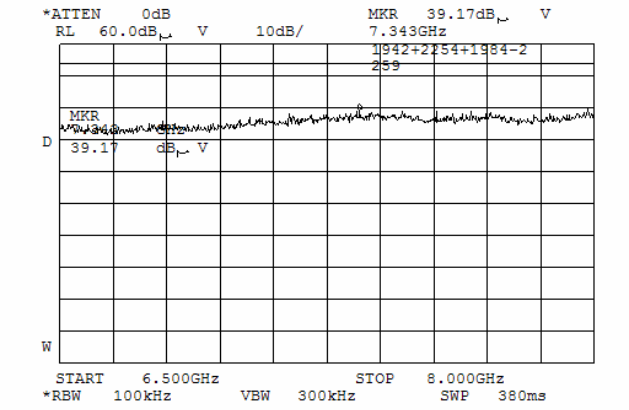
Plot 7.3.47 Radiated emission measurements from 6500 to 8000 MHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Plot 7.3.48 Radiated emission measurements from 6500 to 8000 MHz at the high carrier frequency

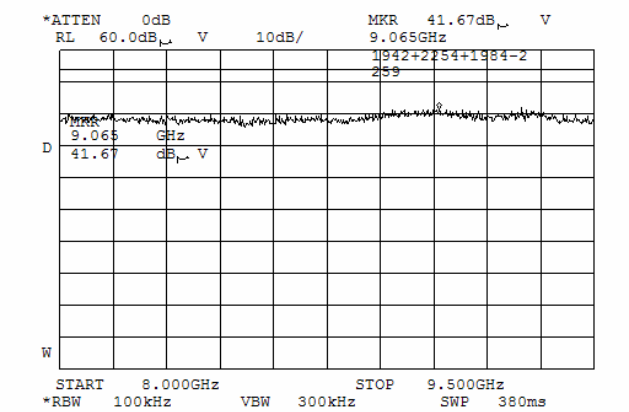
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

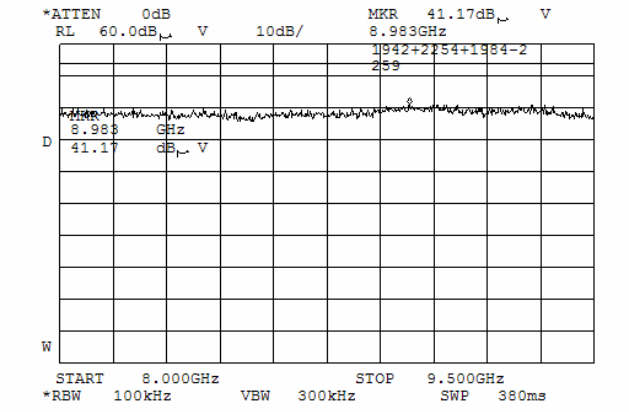
Plot 7.3.49 Radiated emission measurements from 8000 to 9500 MHz at the low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Plot 7.3.50 Radiated emission measurements from 8000 to 9500 MHz at the mid carrier frequency

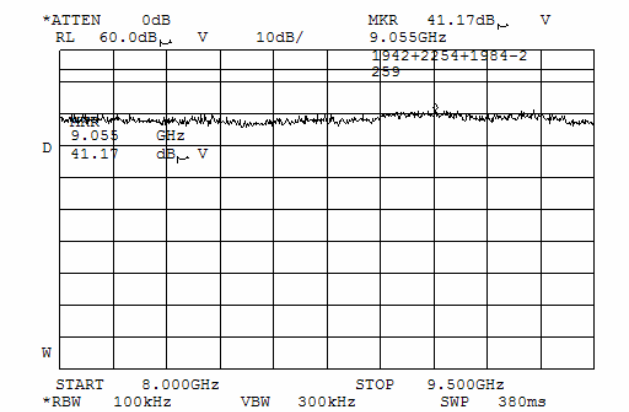
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

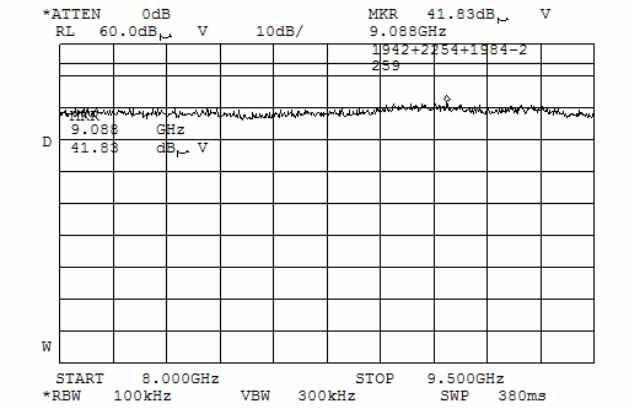
Plot 7.3.51 Radiated emission measurements from 8000 to 9500 MHz at the high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: PSK



Plot 7.3.52 Radiated emission measurements from 8000 to 9500 MHz at the low carrier frequency

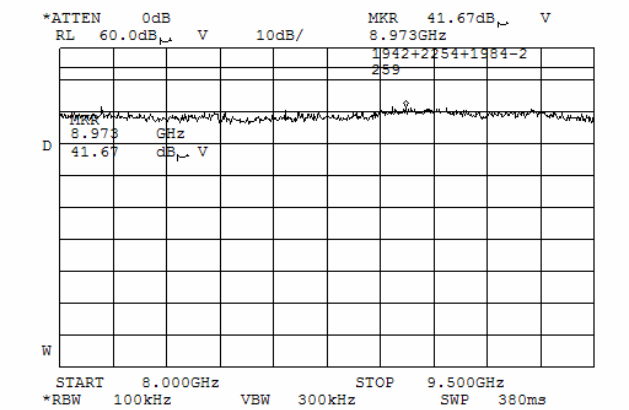
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

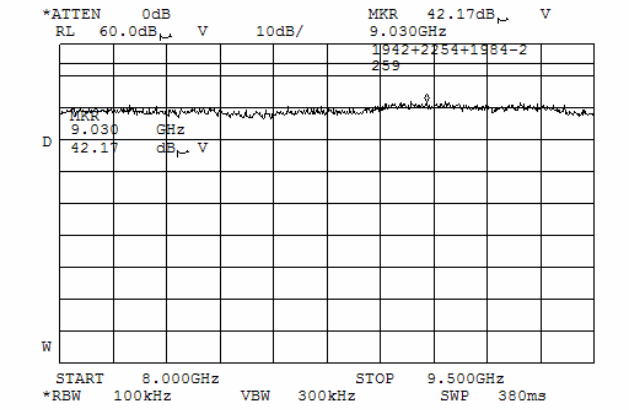
Plot 7.3.53 Radiated emission measurements from 8000 to 9500 MHz at the mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Plot 7.3.54 Radiated emission measurements from 8000 to 9500 MHz at the high carrier frequency

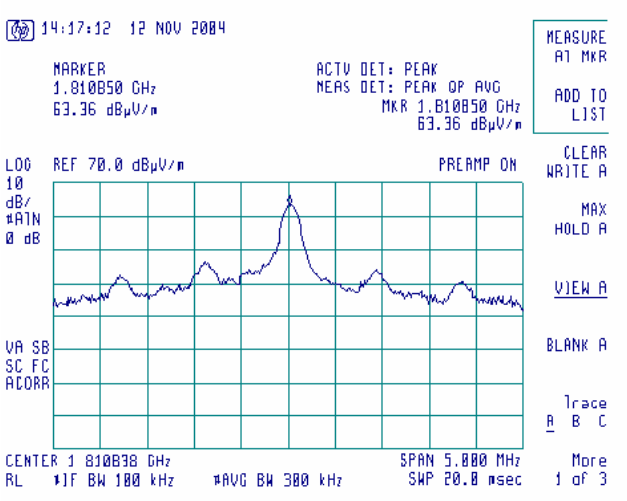
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

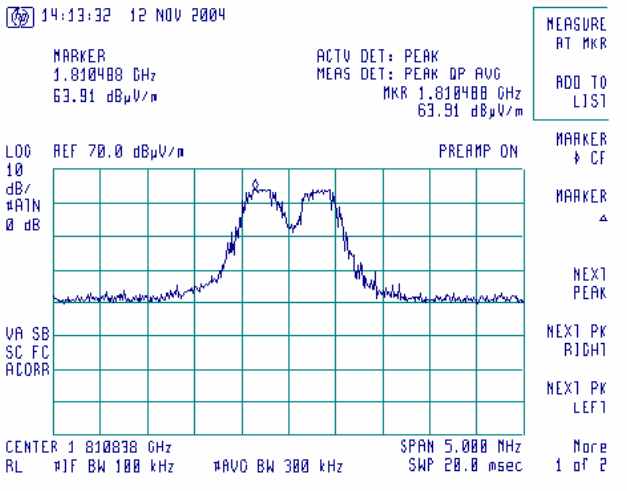
Plot 7.3.55 Radiated emission measurements at the second harmonic of low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.56 Radiated emission measurements at the second harmonic of low carrier frequency

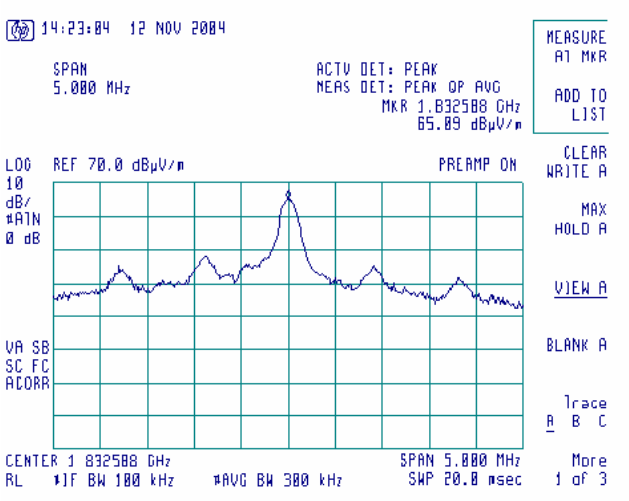
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

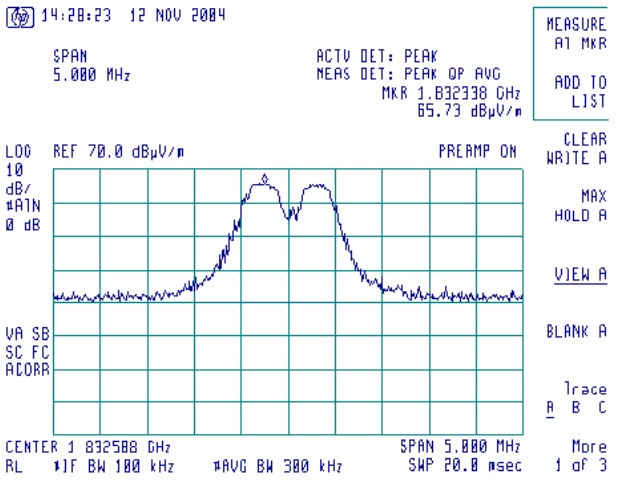
Plot 7.3.57 Radiated emission measurements at the second harmonic of mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.58 Radiated emission measurements at the second harmonic of mid carrier frequency

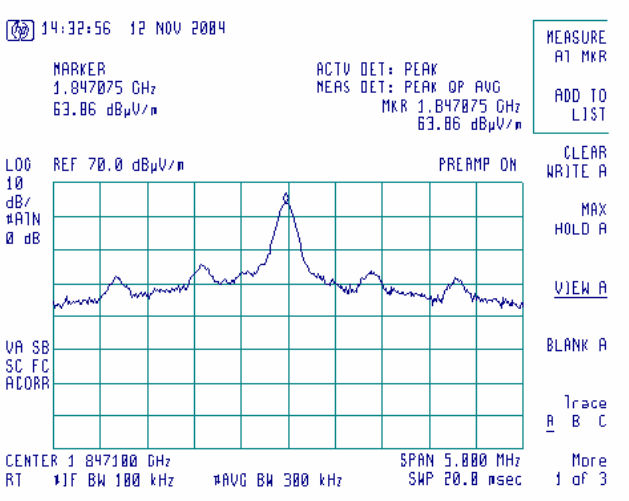
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

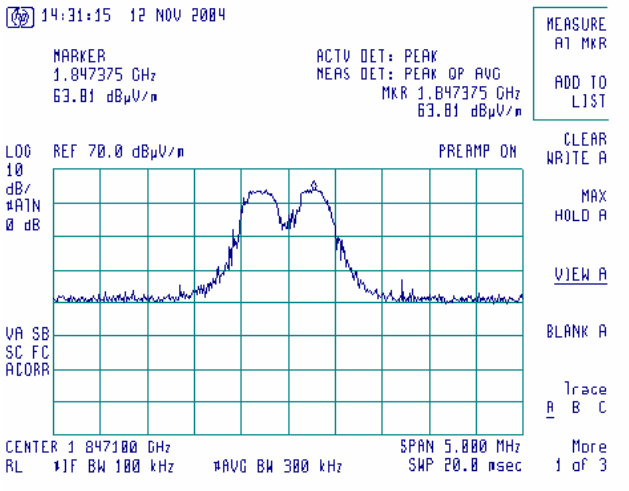
Plot 7.3.59 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.60 Radiated emission measurements at the second harmonic of high carrier frequency

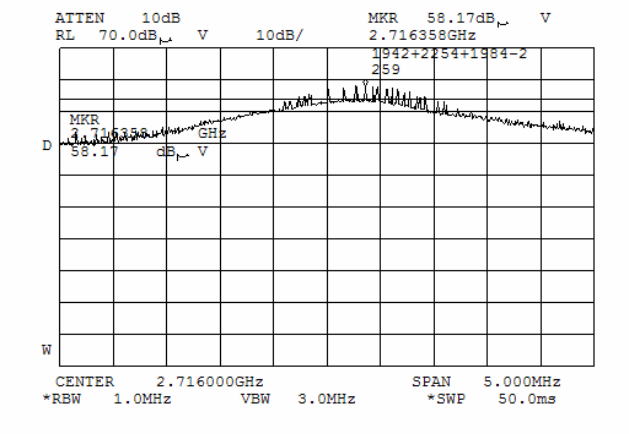
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

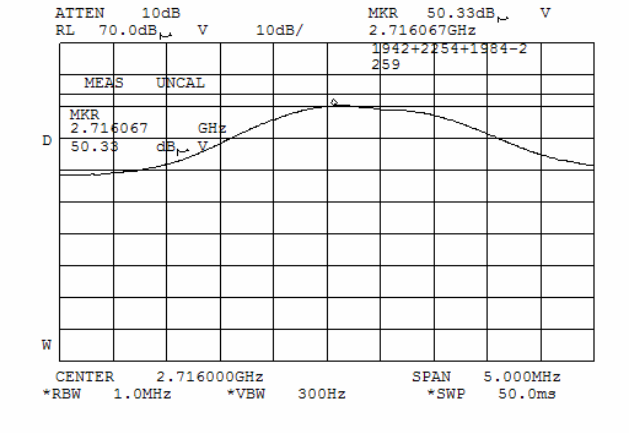
Plot 7.3.61 Radiated emission measurements at the third harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.62 Radiated emission measurements at the third harmonic of low carrier frequency

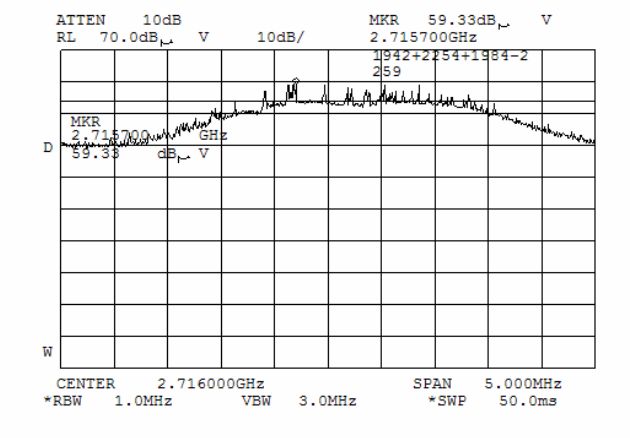
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

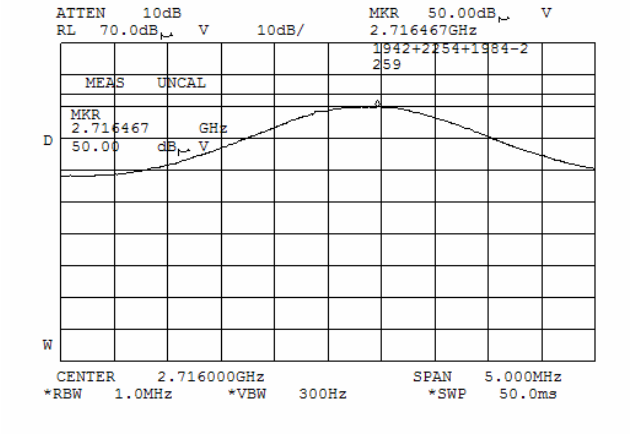
Plot 7.3.63 Radiated emission measurements at the third harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.64 Radiated emission measurements at the third harmonic of low carrier frequency

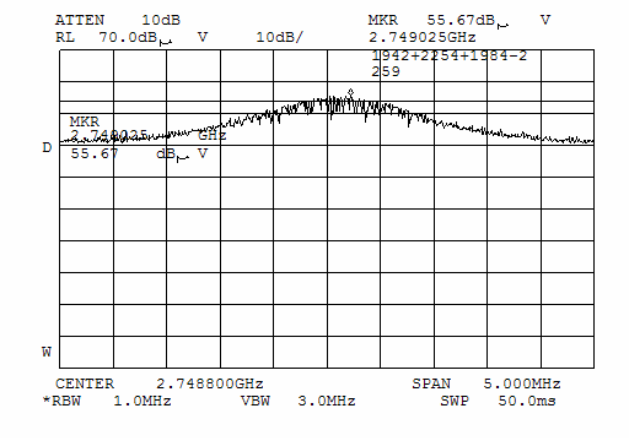
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

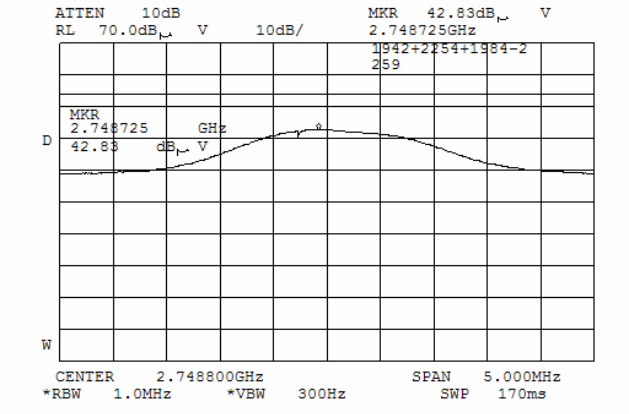
Plot 7.3.65 Radiated emission measurements at the third harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.66 Radiated emission measurements at the third harmonic of mid carrier frequency

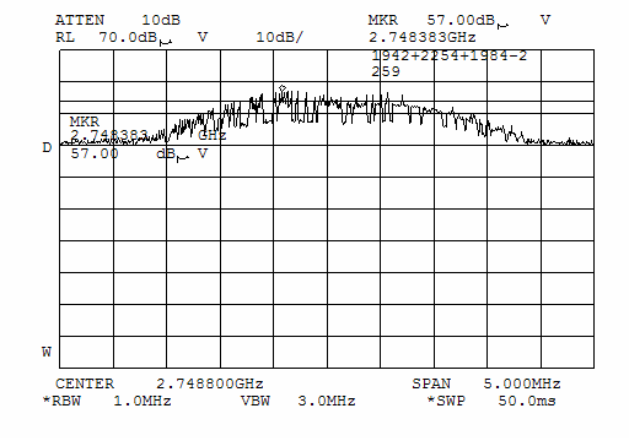
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

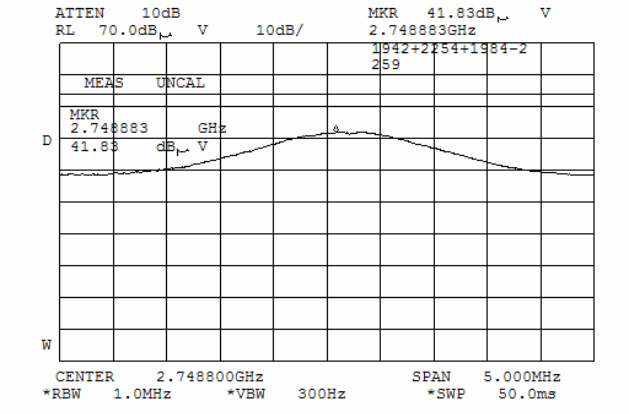
Plot 7.3.67 Radiated emission measurements at the third harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.68 Radiated emission measurements at the third harmonic of mid carrier frequency

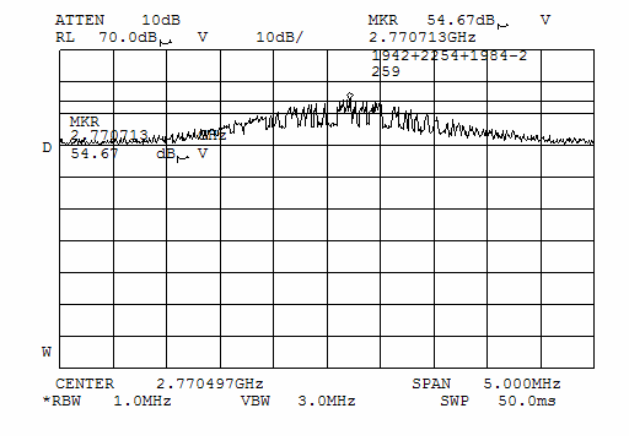
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

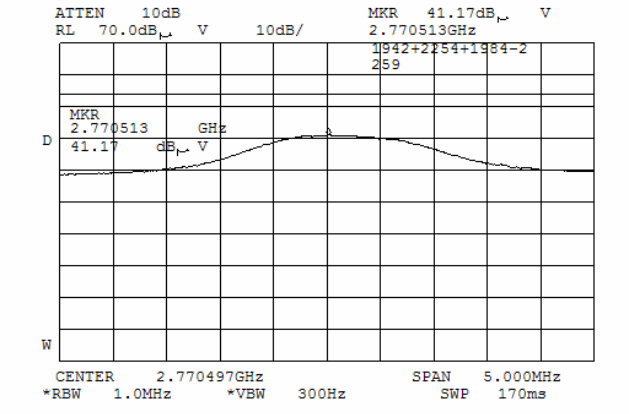
Plot 7.3.69 Radiated emission measurements at the third harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.70 Radiated emission measurements at the third harmonic of high carrier frequency

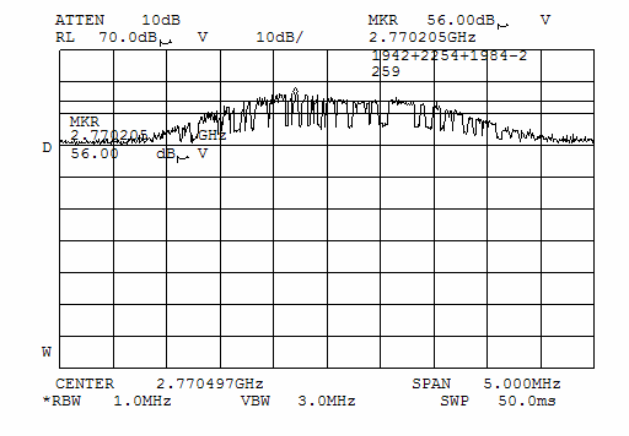
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

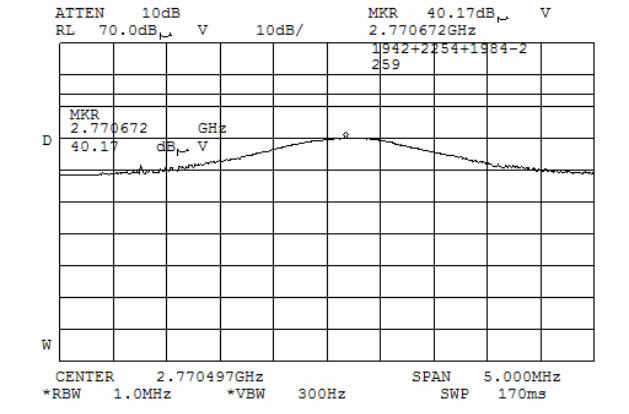
Plot 7.3.71 Radiated emission measurements at the third harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.72 Radiated emission measurements at the third harmonic of high carrier frequency

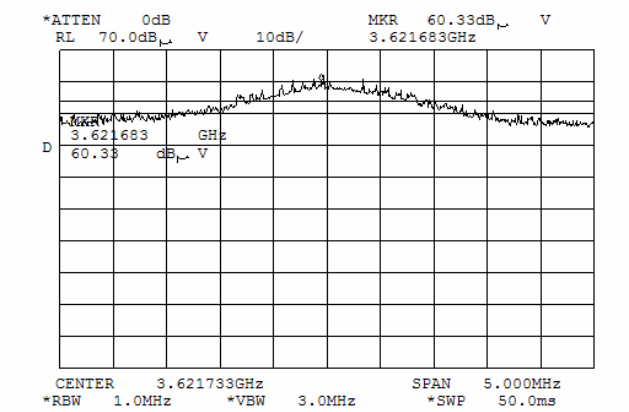
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

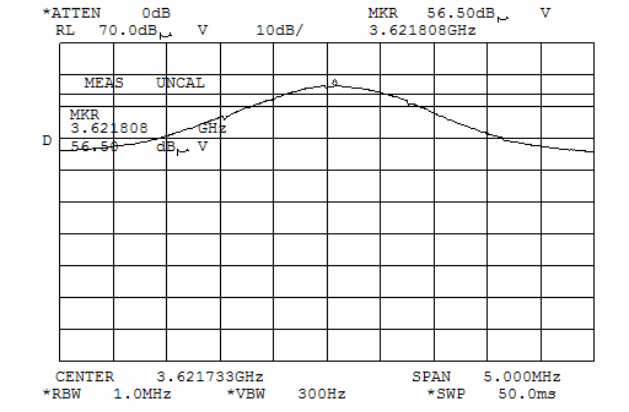
Plot 7.3.73 Radiated emission measurements at the forth harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.74 Radiated emission measurements at the forth harmonic of low carrier frequency

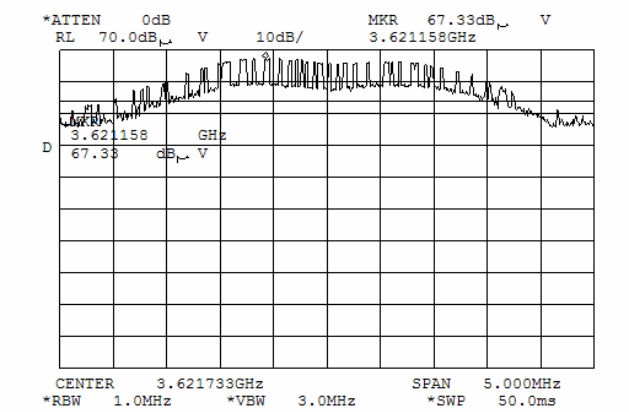
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

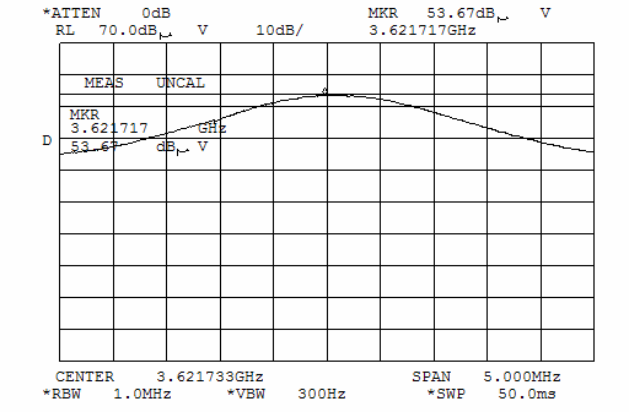
Plot 7.3.75 Radiated emission measurements at the forth harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.76 Radiated emission measurements at the forth harmonic of low carrier frequency

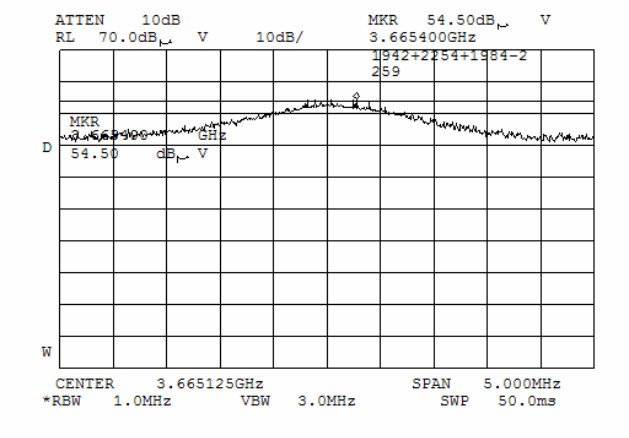
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

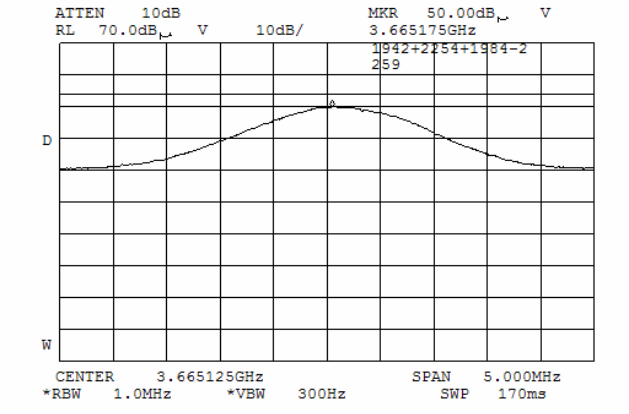
Plot 7.3.77 Radiated emission measurements at the forth harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.78 Radiated emission measurements at the forth harmonic of mid carrier frequency

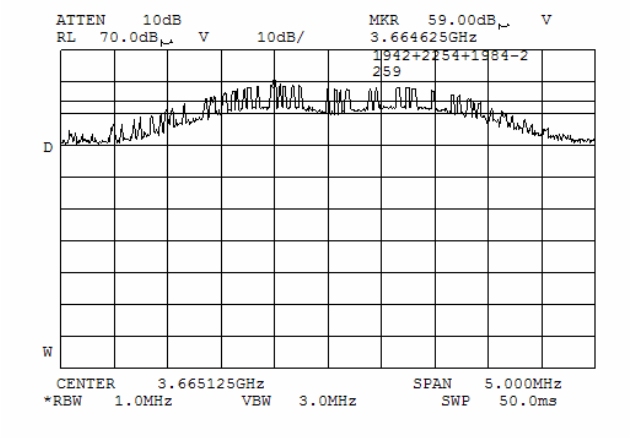
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

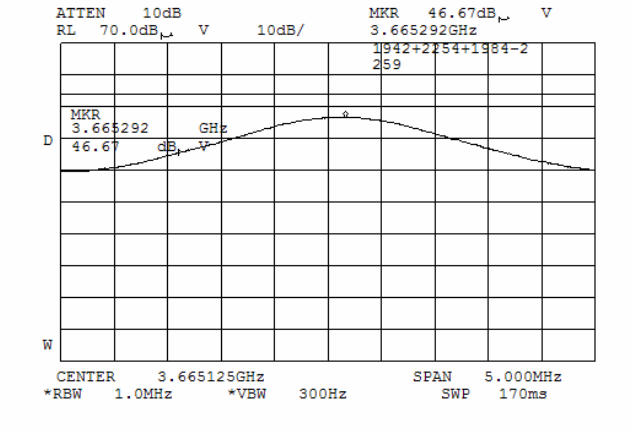
Plot 7.3.79 Radiated emission measurements at the forth harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.80 Radiated emission measurements at the forth harmonic of mid carrier frequency

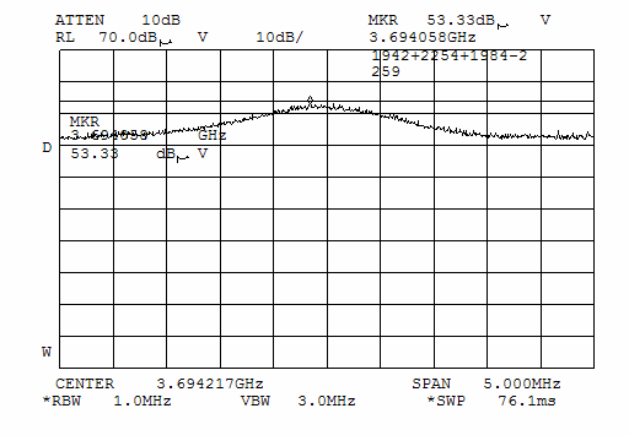
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

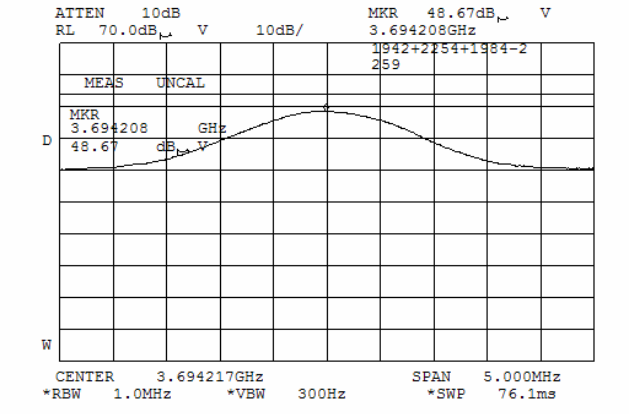
Plot 7.3.81 Radiated emission measurements at the forth harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.82 Radiated emission measurements at the forth harmonic of high carrier frequency

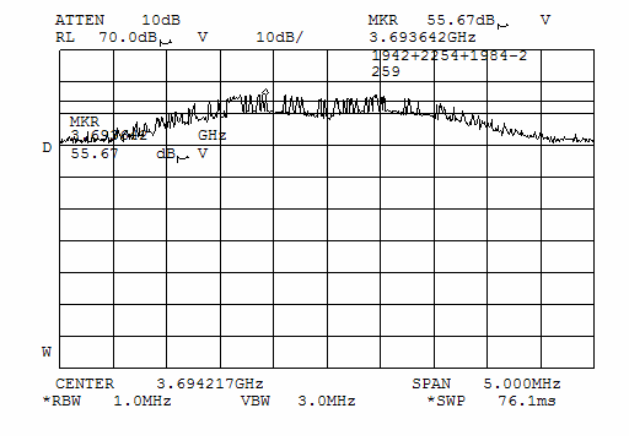
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

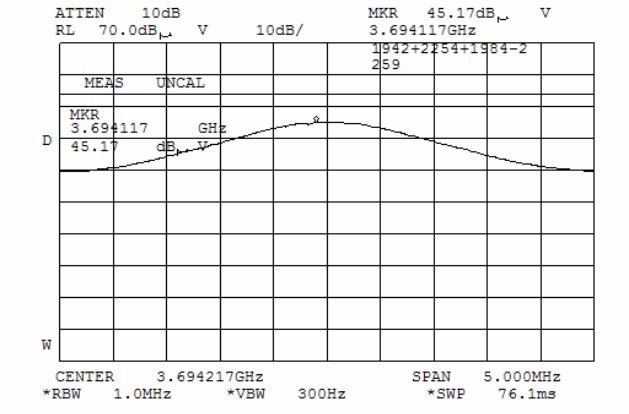
Plot 7.3.83 Radiated emission measurements at the forth harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.84 Radiated emission measurements at the forth harmonic of high carrier frequency

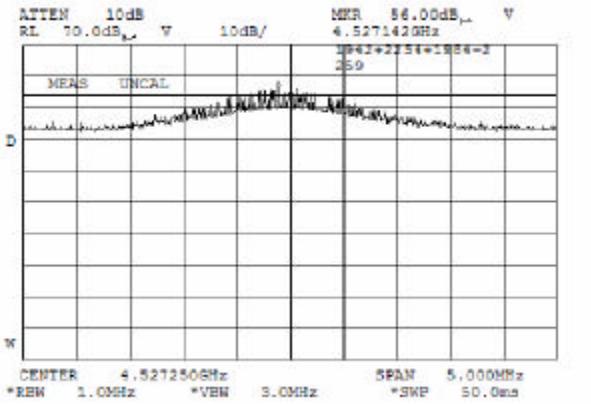
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

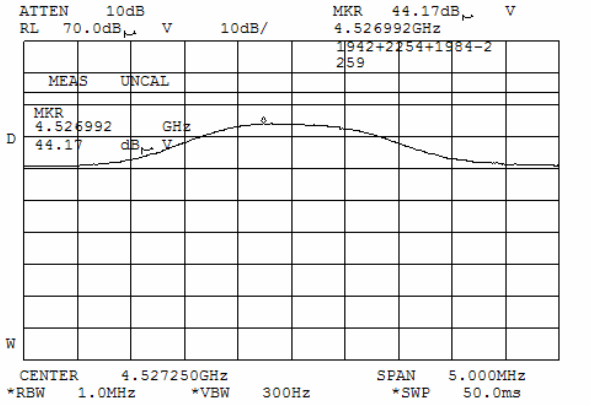
Plot 7.3.85 Radiated emission measurements at the fifth harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.86 Radiated emission me asurements at the fifth harmonic of low carrier frequency

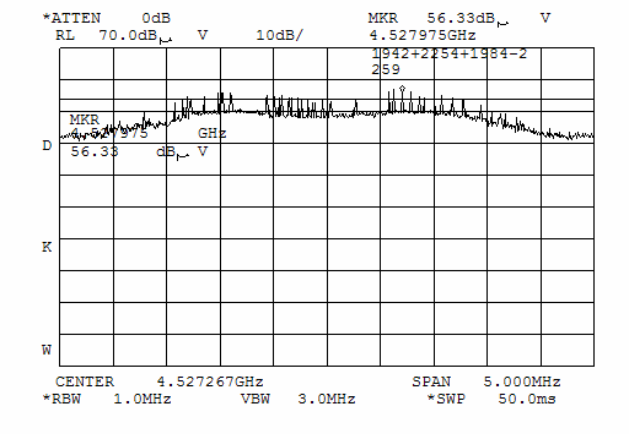
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

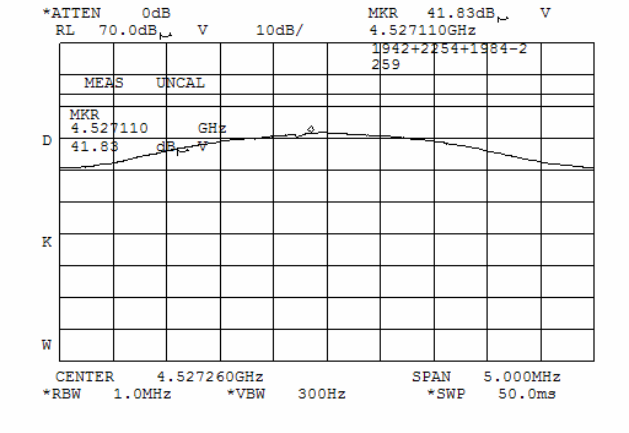
Plot 7.3.87 Radiated emission measurements at the fifth harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.88 Radiated emission measurements at the fifth harmonic of low carrier frequency

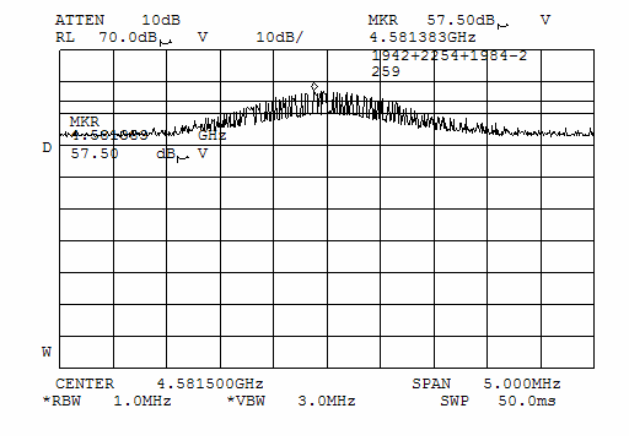
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

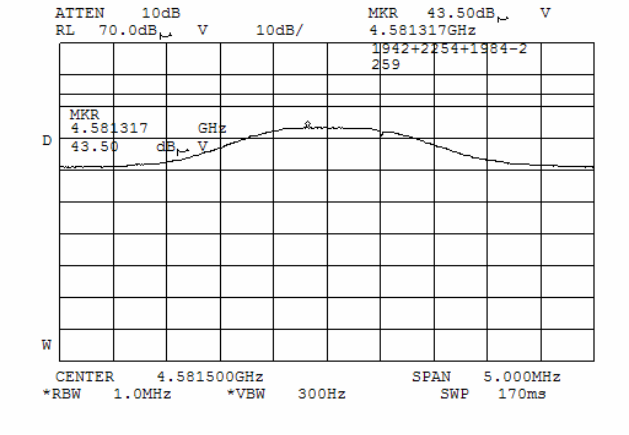
Plot 7.3.89 Radiated emission measurements at the fifth harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.90 Radiated emission measurements at the fifth harmonic of mid carrier frequency

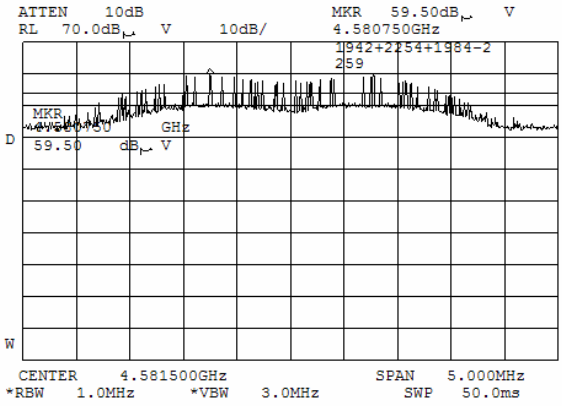
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

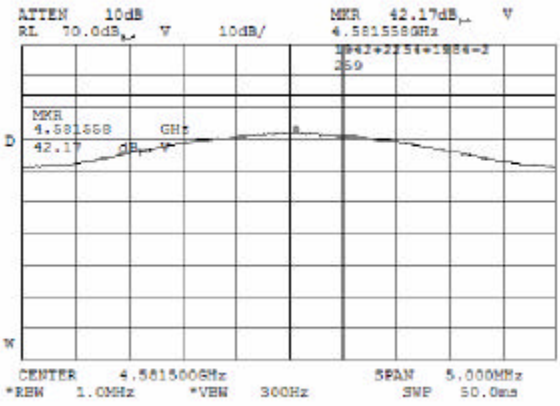
Plot 7.3.91 Radiated emission measurements at the fifth harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.92 Radiated emission measurements at the fifth harmonic of mid carrier frequency

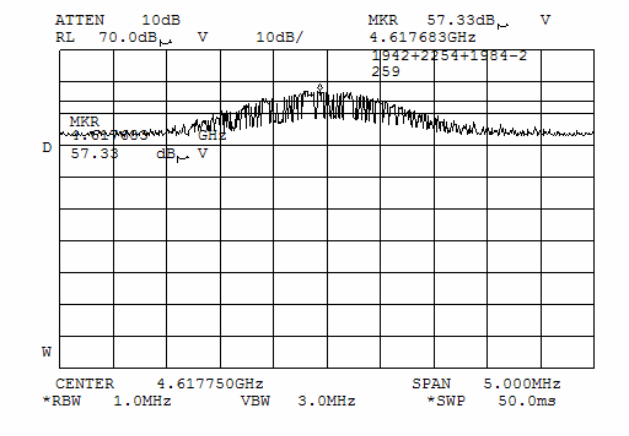
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

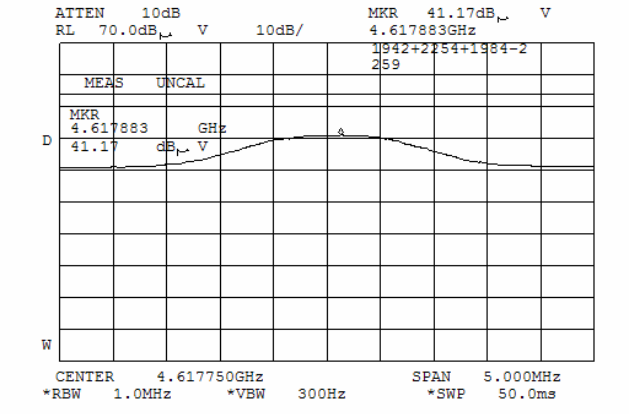
Plot 7.3.93 Radiated emission measurements at the fifth harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.94 Radiated emission measurements at the fifth harmonic of high carrier frequency

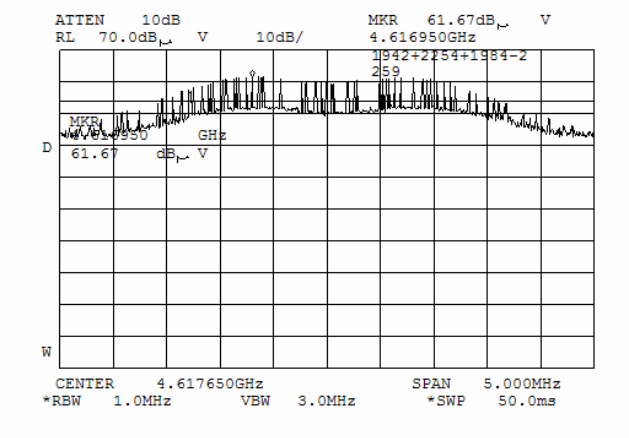
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

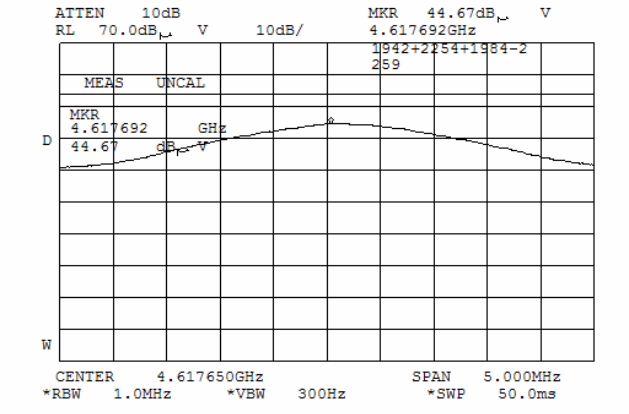
Plot 7.3.95 Radiated emission measurements at the fifth harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.96 Radiated emission measurements at the fifth harmonic of high carrier frequency

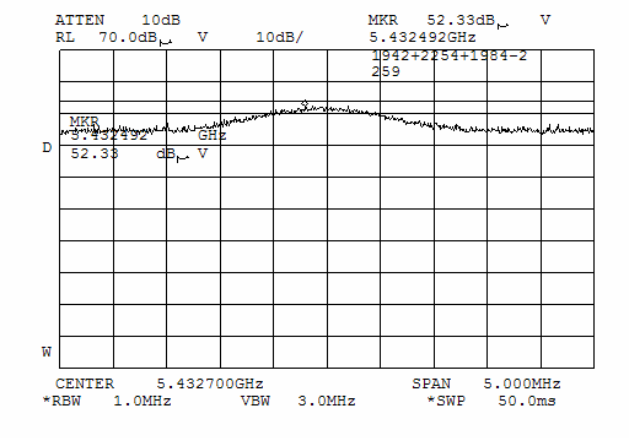
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

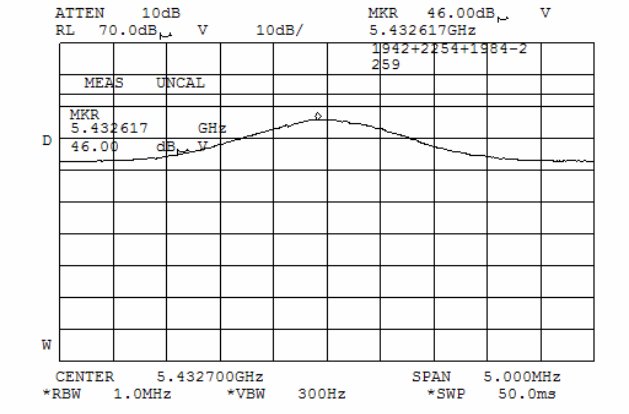
Plot 7.3.97 Radiated emission measurements at the sixth harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: PSK



Plot 7.3.98 Radiated emission measurements at the sixth harmonic of low carrier frequency

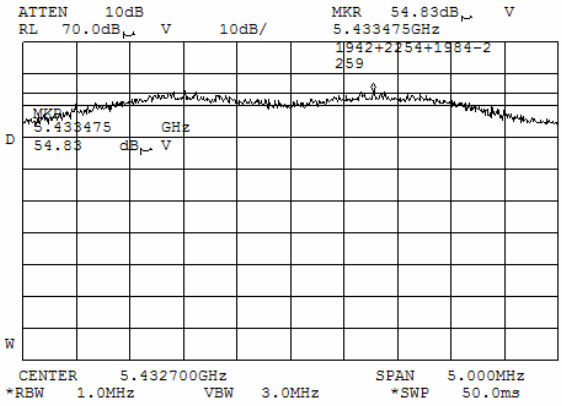
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 300 Hz
MODULATION: PSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

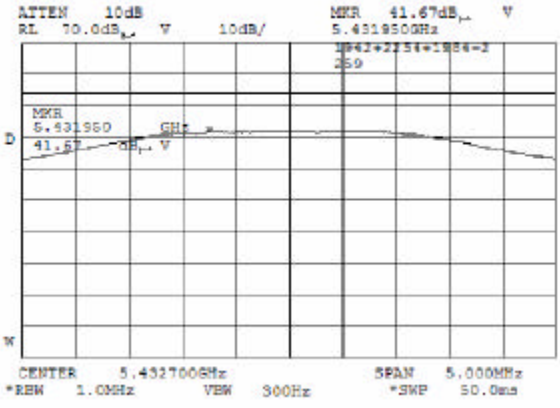
Plot 7.3.99 Radiated emission measurements at the sixth harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Plot 7.3.100 Radiated emission measurements at the sixth harmonic of low carrier frequency

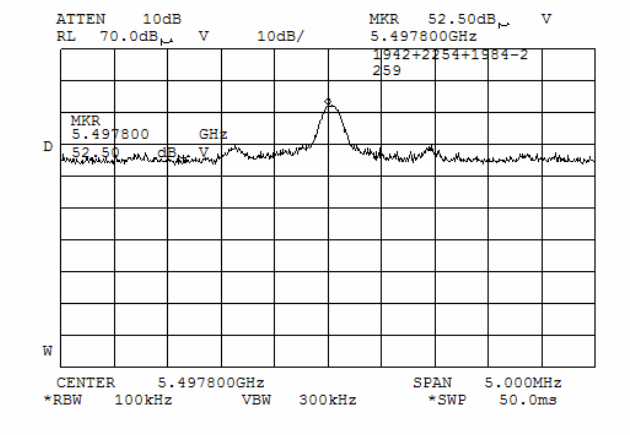
TEST SITE: OATS
TEST DISTANCE: 3 m
VIDEO BANDWIDTH: 3 MHz
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

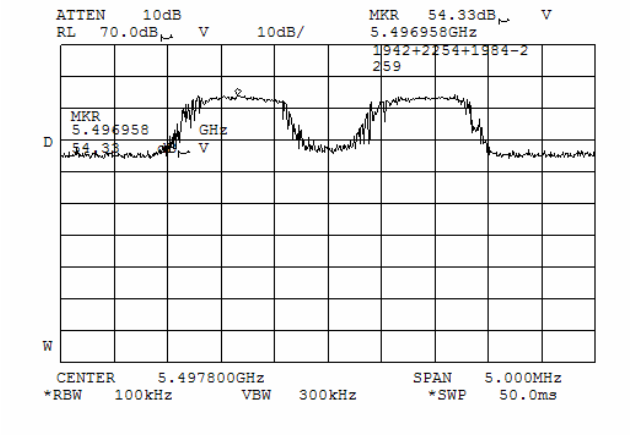
Plot 7.3.101 Radiated emission measurements at the sixth harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.102 Radiated emission measurements at the sixth harmonic of mid carrier frequency

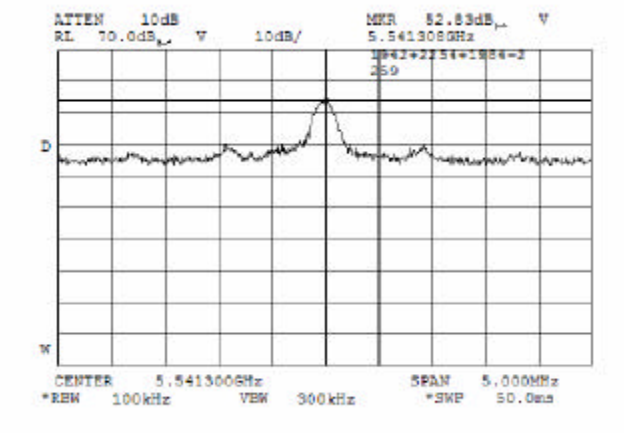
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

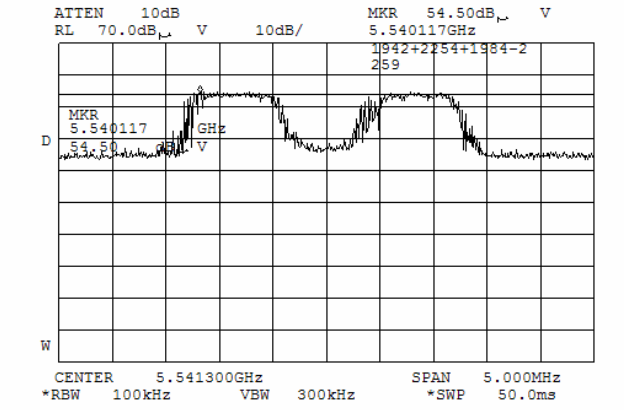
Plot 7.3.103 Radiated emission measurements at the sixth harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.104 Radiated emission measurements at the sixth harmonic of high carrier frequency

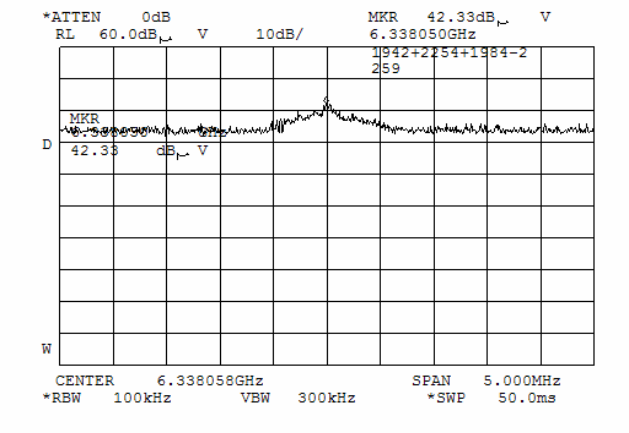
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

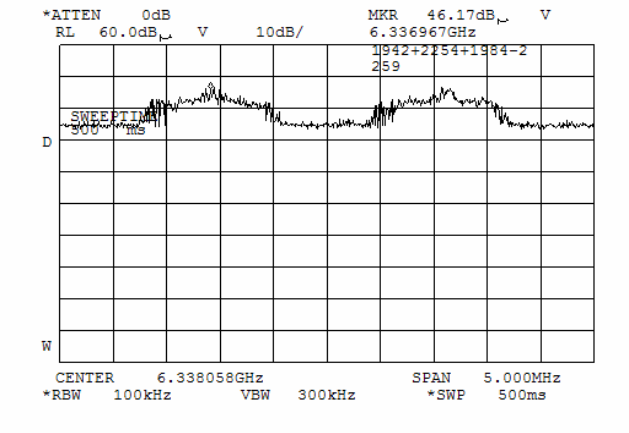
Plot 7.3.105 Radiated emission measurements at the seventh harmonic of low carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.106 Radiated emission measurements at the seventh harmonic of low carrier frequency

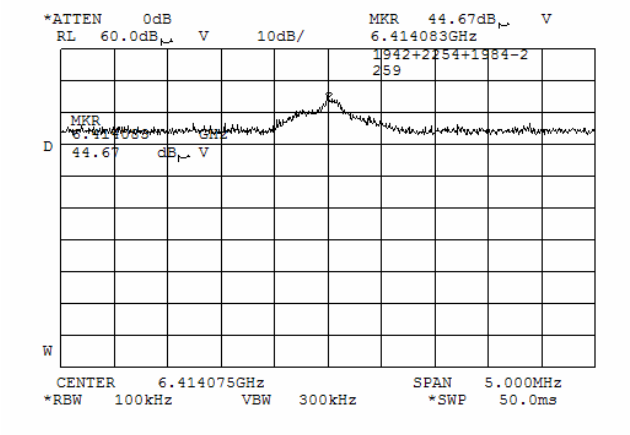
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

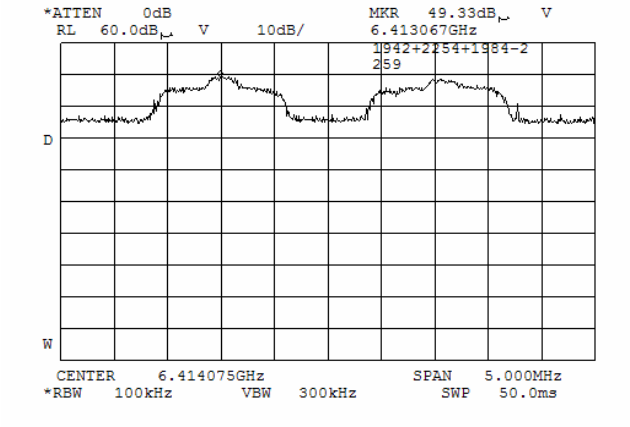
Plot 7.3.107 Radiated emission measurements at the seventh harmonic of mid carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.108 Radiated emission measurements at the seventh harmonic of mid carrier frequency

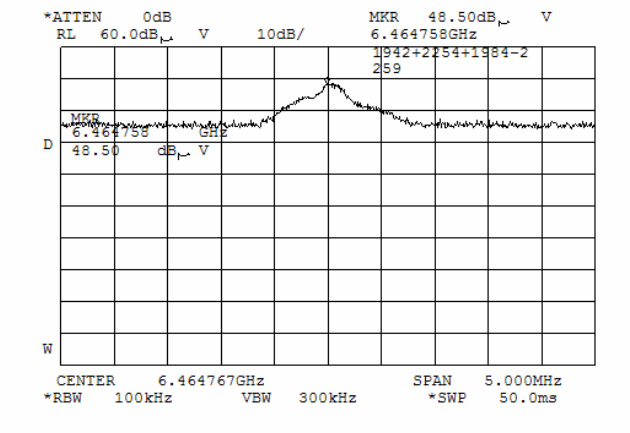
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

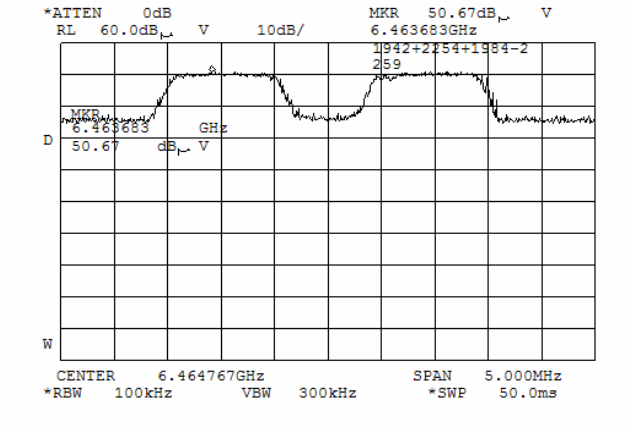
Plot 7.3.109 Radiated emission measurements at the seventh harmonic of high carrier frequency

TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: PSK



Plot 7.3.110 Radiated emission measurements at the seventh harmonic of high carrier frequency

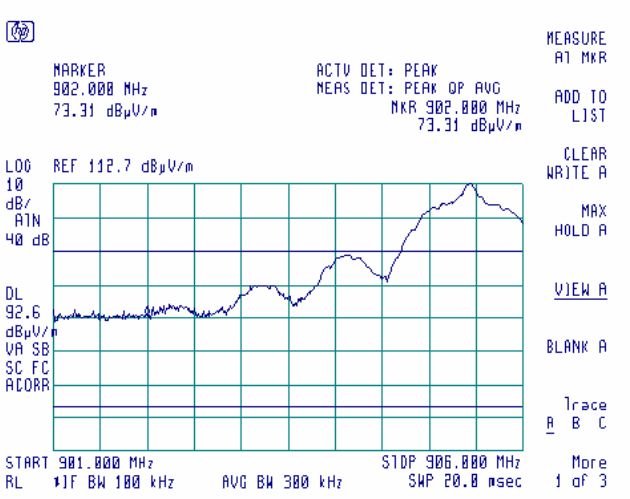
TEST SITE: OATS
TEST DISTANCE: 3 m
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

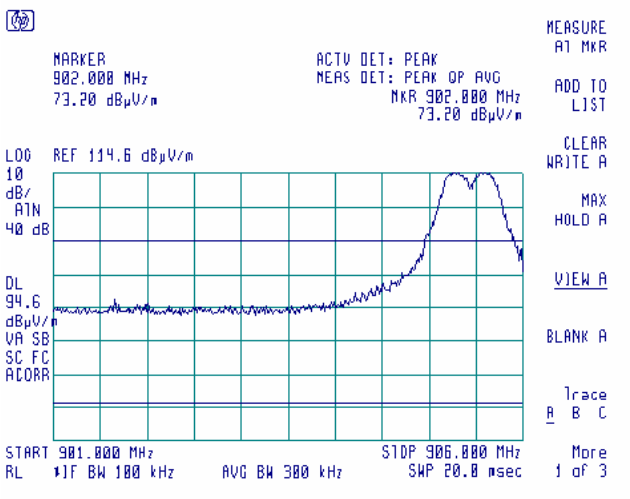
Plot 7.3.111 Radiated emission measurements from 901 to 905.55 MHz at the low carrier frequency

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



Plot 7.3.112 Radiated emission measurements from 901 to 905.55 MHz at the low carrier frequency

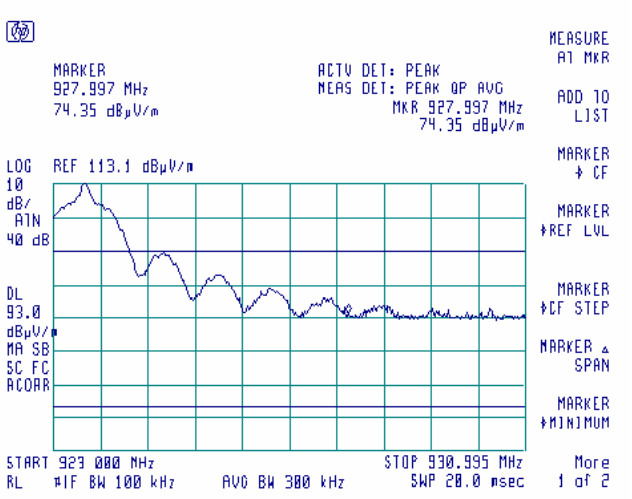
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

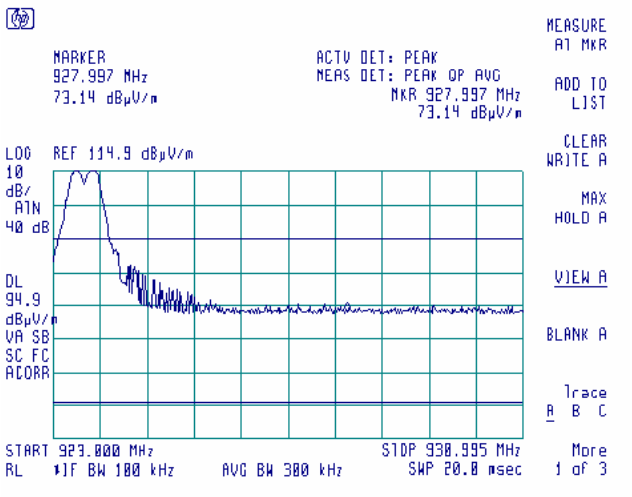
Plot 7.3.113 Radiated emission measurements from 923 to 929 MHz at the high carrier frequency

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



Plot 7.3.114 Radiated emission measurements from 923 to 929 MHz at the high carrier frequency

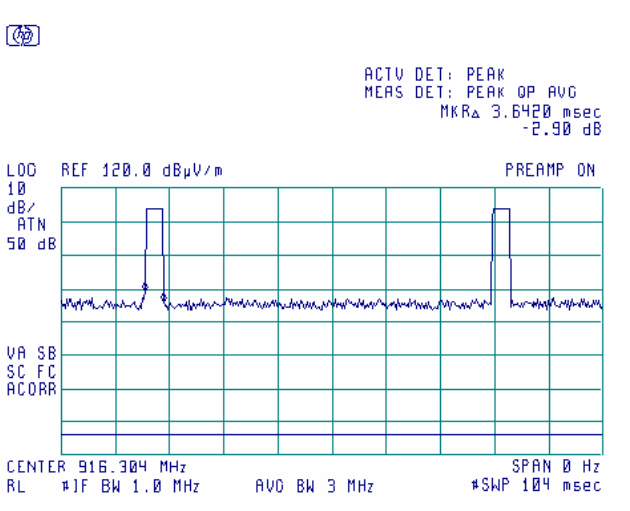
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

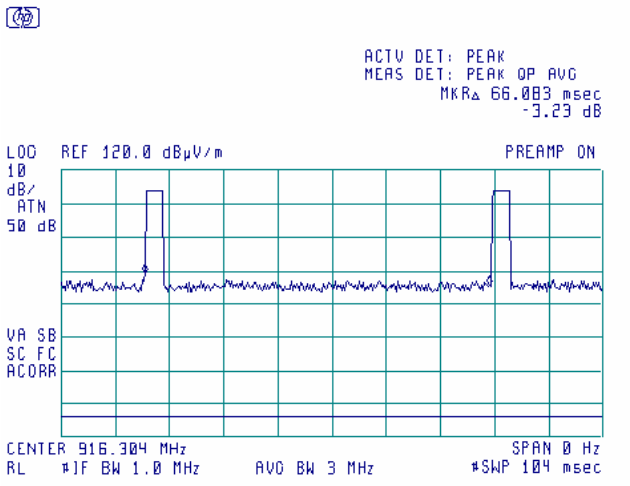
Plot 7.3.115 Transmission pulse duration

MODULATION: FSK



Plot 7.3.116 Transmission pulse period

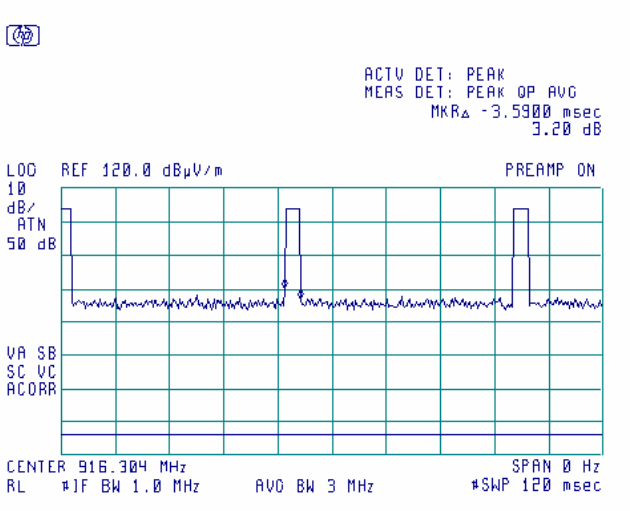
MODULATION: FSK



Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:40:24 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

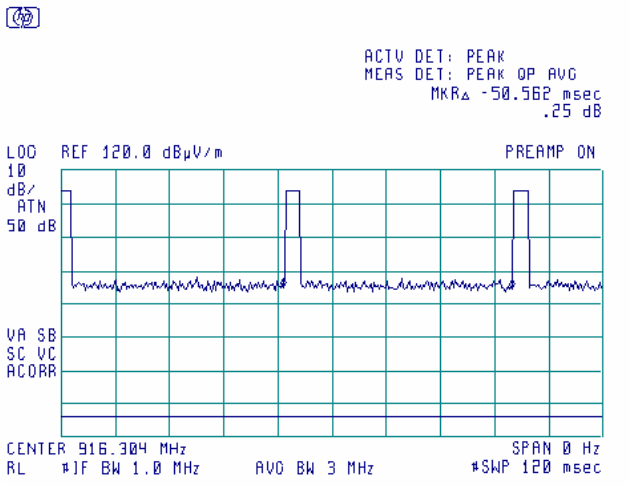
Plot 7.3.117 Transmission pulse duration

MODULATION: PSK



Plot 7.3.118 Transmission pulse period

MODULATION: PSK



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

7.4 Peak spectral power density

7.4.1 General

This test was performed to measure the peak spectral power density radiated by the transmitter RF antenna. Specification test limits are given in Table 7.4.1.

Table 7.4.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm	Equivalent field strength limit @ 3m, dB(µV/m)*
902.0 – 928.0	3.0	8.0	103.2
2400.0 – 2483.5			
5725.0 – 5850.0			

* - Equivalent field strength limit was calculated from the peak spectral power density as follows: E=sqrt(30×P)/r, where P is peak spectral power density and r is antenna to EUT distance in meters.

7.4.2 Test procedure for field strength measurements

7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.

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

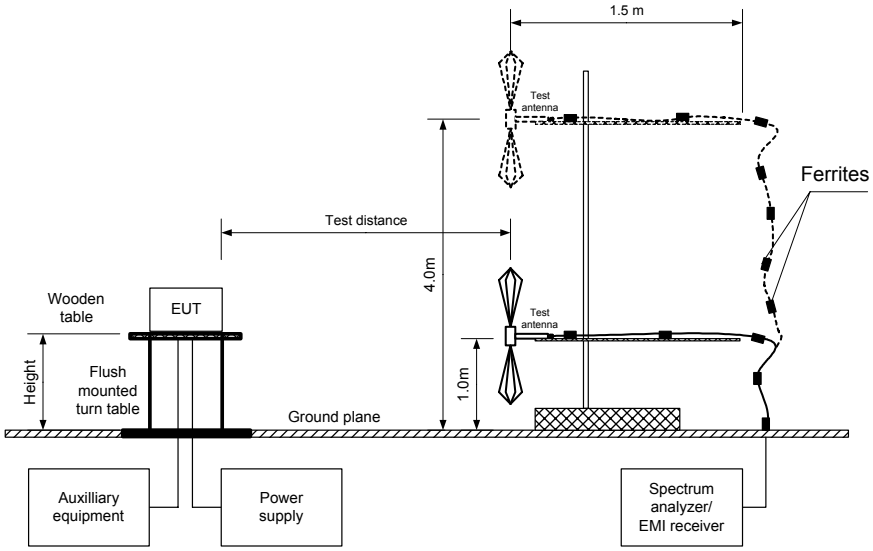
7.4.2.3 The field strength of the EUT carrier frequency was measured with antenna connected to spectrum analyzer/ EMI receiver. To find maximum radiation the turntable was rotated 360^0 and the measuring antenna height was swept in both vertical and horizontal polarizations.

7.4.2.4 The frequency span of spectrum analyzer was set to capture the entire 6 dB band of the transmitter, in peak hold mode with resolution bandwidth set to 3.0 kHz, video bandwidth wider than resolution bandwidth, auto sweep time and sufficient number of sweeps was allowed for trace stabilization. The spectrum lines spacing was verified to be wider than 3 kHz. Otherwise the resolution bandwidth was reduced until individual spectrum lines were resolved and the power of individual spectrum lines was integrated over 3 kHz band.

7.4.2.5 The peak of emission was zoomed with span set just wide enough to capture the emission peak area and sweep time was set equal to span width divided by resolution bandwidth. Spectrum analyzer was set in peak hold mode, sufficient number of sweeps was allowed for trace stabilization and peak spectral power density was measured as provided in Table 7.4.2 and the associated plots.

Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Figure 7.4.1 Setup for carrier field strength measurements



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.4.2 Field strength measurement of peak spectral power density

ASSIGNED FREQUENCY RANGE: 902 – 928 MHz
TEST DISTANCE: 3 m
TEST SITE: Semi anechoic chamber
EUT HEIGHT: 0.8 m
DETECTOR USED: Peak
RESOLUTION BANDWIDTH: 3 kHz
VIDEO BANDWIDTH: 10 kHz
TEST ANTENNA TYPE: Biconilog (30 MHz – 1000 MHz)
TRANSMITTER OUTPUT POWER SETTINGS: Maximum

MODULATION: PSK
MODULATING SIGNAL: PRBS
BIT RATE: 60 kbps
TRANSMITTER OUTPUT POWER: 18.79 dBm at low carrier frequency
18.80 dBm at mid carrier frequency
18.29 dBm at high carrier frequency

Frequency, MHz	Field strength, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees
905.619	105.91	3	103. 20	-0.29	Vertical	1.1	12
916.242	105.28	3	103. 20	-0.92	Vertical	1.2	3
923.456	105.12	3	103. 20	-1.08	Vertical	1.2	356

MODULATION: FSK
MODULATING SIGNAL: PRBS
BIT RATE: 120 kbps
TRANSMITTER OUTPUT POWER: 13.30 dBm at low carrier frequency
13.43 dBm at mid carrier frequency
12.68 dBm at high carrier frequency

Frequency, MHz	Field strength, dB(μV/m)	EUT antenna gain, dBi	Limit, dB(μV/m)	Margin, dB*	Antenna polarization	Antenna height, m	Turn-table position**, degrees
905.319	104.46	3	103.20	-1.74	Vertical	1.1	12
916.422	104.82	3	103. 20	-1.38	Vertical	1.2	3
923.666	104.13	3	103. 20	-2.07	Vertical	1.2	356

*- Margin = Field strength - EUT antenna gain - calculated field strength limit.
**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

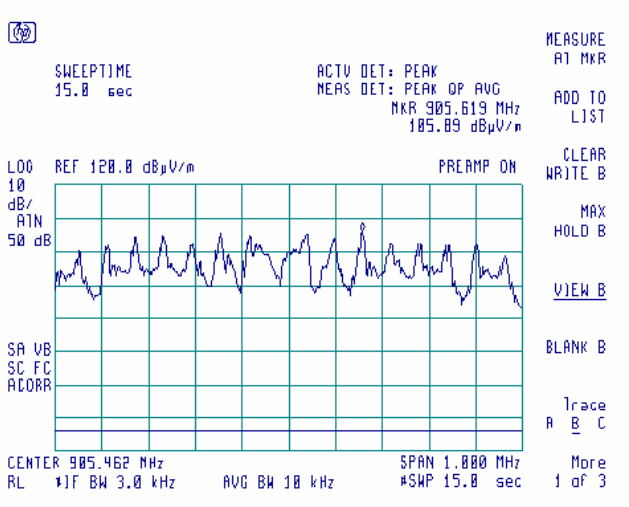
HL 0465	HL 0521	HL 0589	HL 0593	HL 0594	HL 0604	HL 1004	HL 2009

Full description is given in Appendix A.

Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

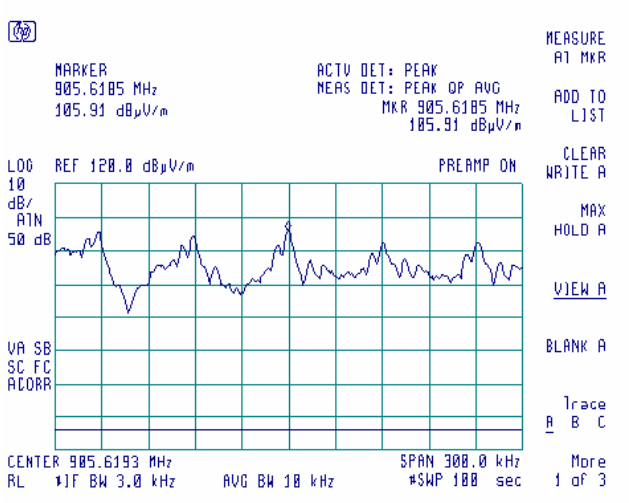
Plot 7.4.1 Peak spectral power density at low frequency within 6 dB band

MODULATION: PSK



Plot 7.4.2 Peak spectral power density at low frequency zoomed at the peak

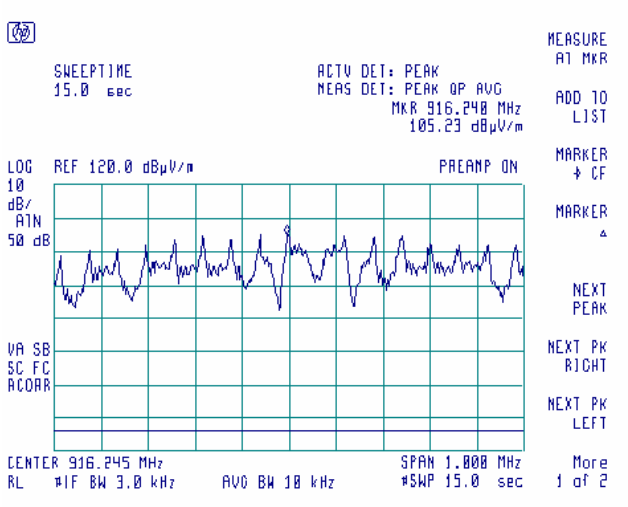
MODULATION: PSK



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

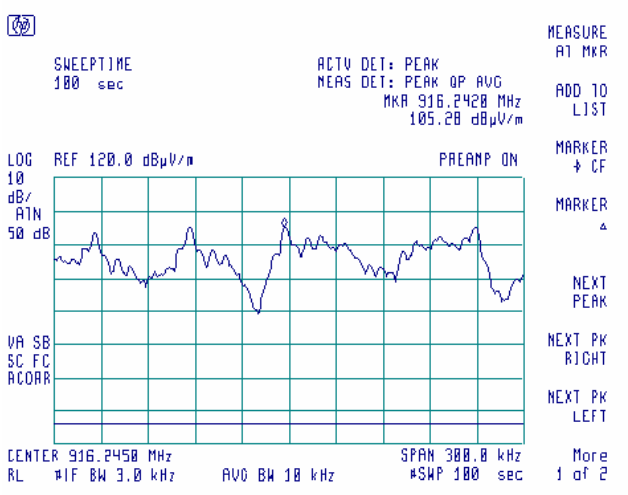
Plot 7.4.3 Peak spectral power density at mid frequency within 6 dB band

MODULATION: PSK



Plot 7.4.4 Peak spectral power density at mid frequency zoomed at the peak

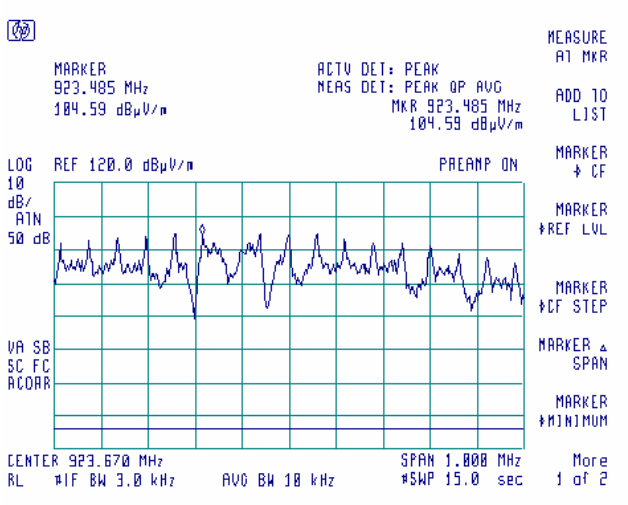
MODULATION: PSK



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

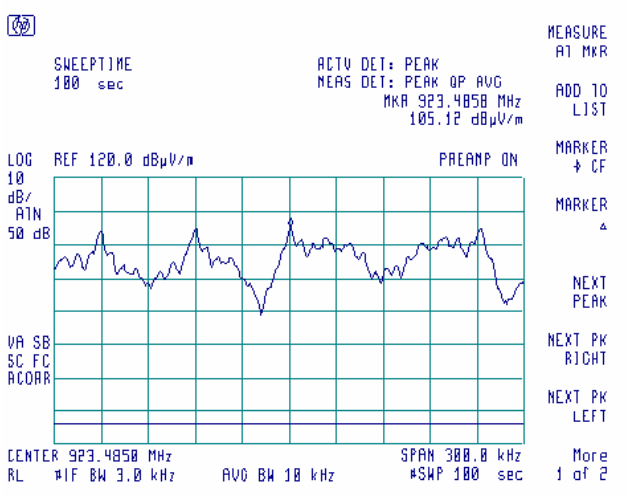
Plot 7.4.5 Peak spectral power density at high frequency within 6 dB band

MODULATION: PSK



Plot 7.4.6 Peak spectral power density at high frequency zoomed at the peak

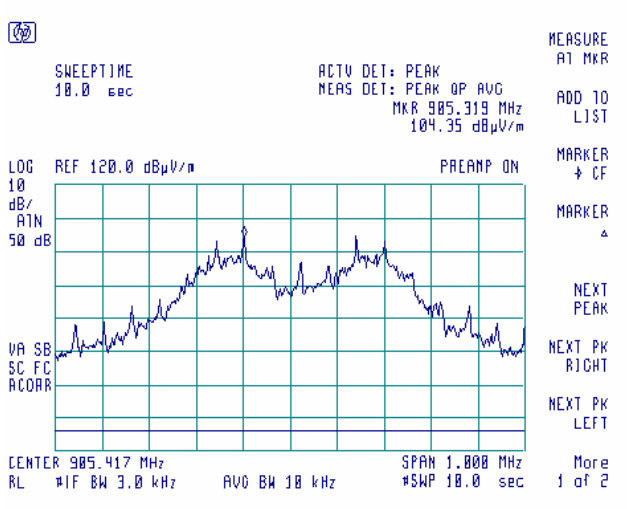
MODULATION: PSK



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

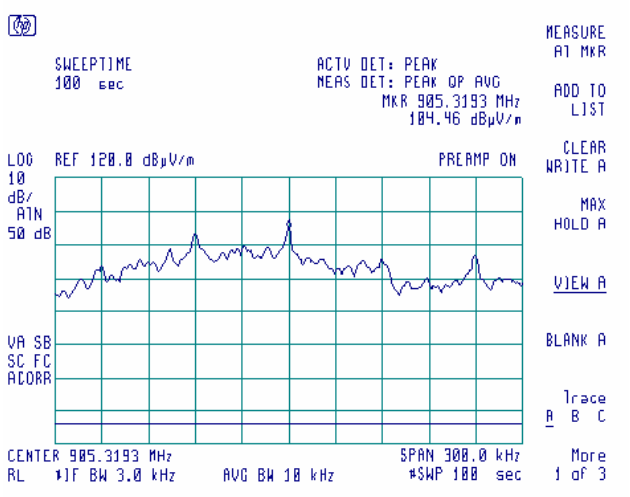
Plot 7.4.7 Peak spectral power density at low frequency within 6 dB band

MODULATION: FSK



Plot 7.4.8 Peak spectral power density at low frequency zoomed at the peak

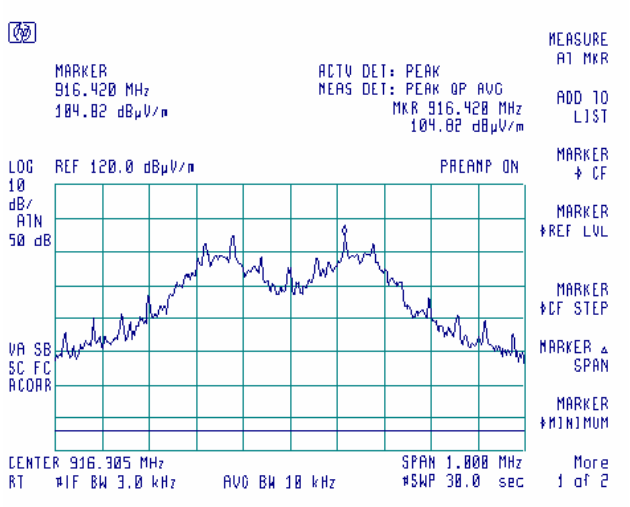
MODULATION: FSK



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

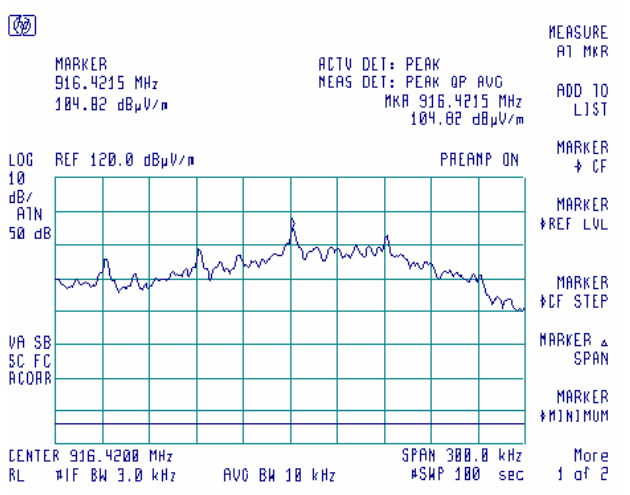
Plot 7.4.9 Peak spectral power density at mid frequency within 6 dB band

MODULATION: FSK



Plot 7.4.10 Peak spectral power density at mid frequency zoomed at the peak

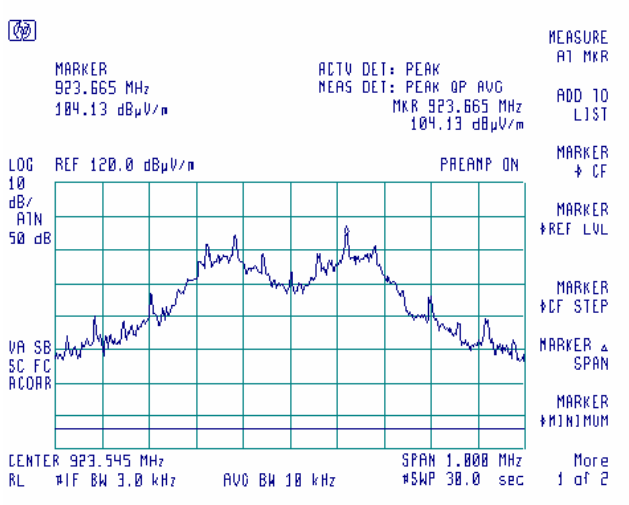
MODULATION: FSK



Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

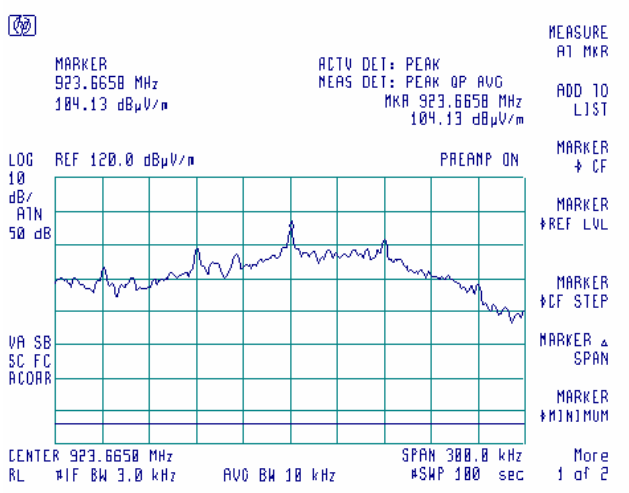
Plot 7.4.11 Peak spectral power density at high frequency within 6 dB band

MODULATION: FSK



Plot 7.4.12 Peak spectral power density at high frequency zoomed at the peak

MODULATION: FSK



Test specification:	Section 15.203, Antenna requirements		
Test procedure:	Visual inspection / supplier declaration		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/12/2004 8:11:52 PM		
Temperature: 25 ºC	Air Pressure: 1010 hPa	Relative Humidity: 48 %	Power Supply: 3.6 VDC
Remarks:			

7.5 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 7.5.1.

Table 7.5.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter antenna is permanently attached	Visual inspection	Comply
The transmitter employs a unique antenna connector	NA	
The transmitter requires professional installation	NA	

Test specification:	Section 15.109, Radiated emissions, Class B		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 9:06:32 PM		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

7.6 Radiated emission measurements

7.6.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 7.6.1.

Table 7.6.1 Radiated emission test limits

Frequency, MHz	Class B limit, dB(μV/m)		Class A limit, dB(μV/m)	
	10 m distance	3 m distance	10 m distance	3 m distance
30 - 88	29.5*	40.0	39.0	49.5*
88 - 216	33.0*	43.5	43.5	54.0*
216 - 960	35.5*	46.0	46.4	56.9*
Above 960	43.5*	54.0	49.5	60.0*

* The limit for test distance other than specified was calculated using the inverse linear distance extrapolation factor as follows: $Lim_{S2} = Lim_{S1} + 20 \log (S_1/S_2)$,
where S_1 and S_2 – standard defined and test distance respectively in meters.

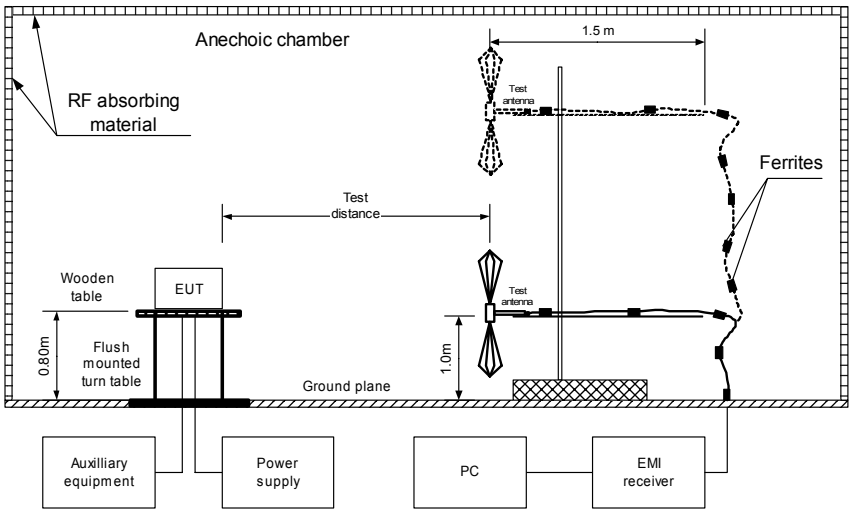
7.6.2 Test procedure

7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and the EUT performance was checked.

7.6.2.2 The specified frequency range was investigated with the antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360^0, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position was varied.

7.6.2.3 The worst test results with respect to the limits were recorded in Table 7.6.2 and shown in the associated plots.

Figure 7.6.1 Setup for radiated emission measurements in anechoic chamber, table-top EUT



Test specification:	Section 15.109, Radiated emissions, Class B		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	11/17/2004 9:06:32 PM		
Temperature: 24 ºC	Air Pressure: 1010 hPa	Relative Humidity: 44 %	Power Supply: 3.6 VDC
Remarks:			

Table 7.6.2 Radiated emission test results

EUT SET UP: TABLE-TOP
LIMIT: Class B
EUT OPERATING MODE: Receive / Stand-by
TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTOR USED: PEAK
FREQUENCY RANGE: 30 MHz – 1000 MHz
RESOLUTION BANDWIDTH: 120 kHz

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*				
No emissions were found.								Pass

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTOR USED: PEAK
FREQUENCY RANGE: 1000 MHz – 5000 MHz
RESOLUTION BANDWIDTH: 100 kHz

Frequency, MHz	Peak emission, dB(µV/m)	Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
		Measured emission, dB(µV/m)	Limit, dB(µV/m)	Margin, dB*				
No emissions were found.								Pass

*- Margin = Measured emission - specification limit.
**- EUT front panel refer to 0 degrees position of turntable.

Reference numbers of test equipment used

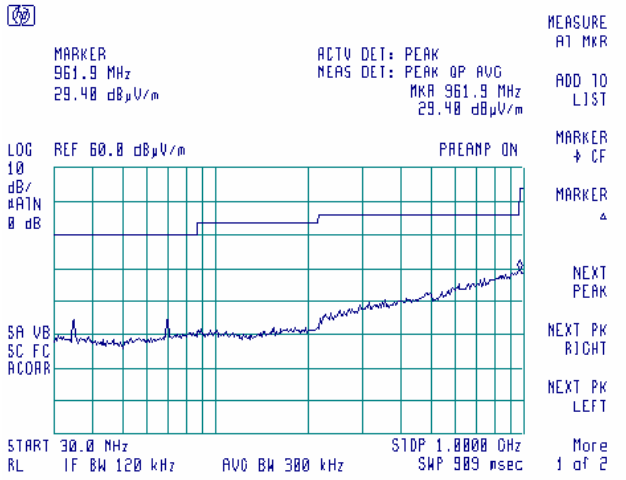
HL 0465	HL 0521	HL 0589	HL 0593	HL 0594	HL 0604	HL 1004	HL 1984
HL 2009							

Full description is given in Appendix A.

Test specification:	**Section 15.109, Radiated emissions, Class B**		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	**Verdict:**	PASS
Date & Time:	11/17/2004 9:06:32 PM		
Temperature: 24 °C	**Air Pressure:** 1010 hPa	**Relative Humidity:** 44 %	**Power Supply:** 3.6 VDC
Remarks:			

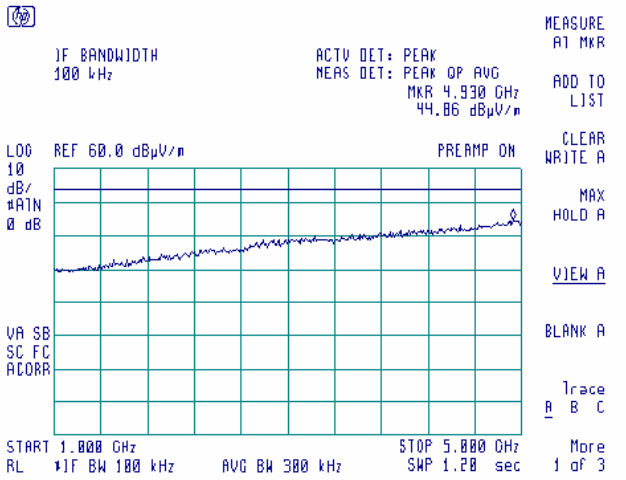
Plot 7.6.1 Radiated emission measurements in 30 - 1000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



Plot 7.6.2 Radiated emission measurements in 1000 - 5000 MHz range, vertical and horizontal antenna polarization

TEST SITE: Semi anechoic chamber
LIMIT: Class B
TEST DISTANCE: 3 m
EUT OPERATING MODE: Receive / Stand-by



8 APPENDIX A Test equipment and ancillaries used for tests

HL No.	Description	Manufacturer information			Due Calibr. Month/Year
		Name	Model No.	Serial No.	
0287	Turntable, Motorized Diameter, 2 m (OATS)	HL	TMD-2	042	11-Nov-05
0446	Antenna, Loop active, 10kHz-30MHz	EMCO	6502	2857	28-Jun-05
0465	Anechoic Chamber 9(L) x 6,5(W) x 5,5(H) m	HL	AC - 1	023	10-Oct-05
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-2.9 GHz	Hewlett Packard	8546A	3617A00319, 3448A00253	26-Sep-05
0589	Cable Coaxial, GORE A2P01POL118, 2.3 m	HL	GORE-3	176	02-Dec-05
0593	Antenna Mast, 1-4 m Pneumatic	Madgesh	AM-F1	101	03-Feb-05
0594	Turn Table for anechoic chamber flush mount d=1.2 m Pneumatic	HL	TT-WDC1	102	27-Jan-05
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz	EMCO	3141	9611-1011	10-Jan-05
0784	Antenna X-WING BILOG 20 MHz - 2 GHz	Schaffner-Chase EMC	CBL6140 A	1120	10-Jan-05
0813	Cable Coax, RG-214, 12 m, N-type connectors	HL	C214-12	149	02-Dec-05
1004	Cable Coaxial , ANDREW PSWJ4 , 6m	HL	ANDREW-6	163	02-Dec-05
1200	Quadruplexer 1-12 GHz (1-2 GHz; 2-4GHz;4-8 GHz; 8-12GHz)	Elettronica S.p.A. - Roma	UE 84	D/00240	10-Feb-05
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies (HP)	8564EC	3946A00219	30-Aug-05
1430	EMI Receiver, 9 kHz - 2.9 GHz	Agilent Technologies (HP)	8542E	3807A00262, 3705A00217	01-Sep-05
1552	Cable RF, 8 m	Alpha Wire	RG-214	1552	02-Dec-05
1848	Antenna mast 4m/6m with polarity control (OATS)	Sh. I. Machines	AM-5	1	19-Apr-05
1942	Cable 18GHz, 4 m, blue	Rhophase Microwave Limited	SPS-1803A-4000-NPS	T4658	17-Oct-05
1947	Cable 18GHz, 6.5 m, blue	Rhophase Microwave Limited	NPS-1803A-6500-NPS	T4974	17-Oct-05
1984	Antenna, Double-Ridged Waveguide Horn, 1-18 GHz, 300 W, N-type	EMC Test Systems	3115	9911-5964	22-Mar-05
2009	Cable RF, 8 m	Alpha Wire	RG-214	C-56	02-Dec-05
2254	Cable 40GHz, 0.8 m, blue	Rhophase Microwave Limited	KPS-1503A-800-KPS	W4907	24-Jun-05
2259	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0223	05-Nov-05

9 APPENDIX B Measurement uncertainties

Expanded uncertainty at 95% confidence in Hermon Labs EMC measurements

Test description	Expanded uncertainty
Conducted carrier power at RF antenna connector	Below 12.4 GHz: ± 1.7 dB 12.4 GHz to 40 GHz: ± 2.3 dB
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
Occupied bandwidth	± 8.0 %
Duty cycle, timing (Tx ON / OFF) and average factor measurements	± 1.0 %
Conducted emissions with LISN	9 kHz to 150 kHz: ± 3.9 dB 150 kHz to 30 MHz: ± 3.8 dB
Radiated emissions at 3 m measuring distance Horizontal polarization Vertical polarization	 Biconilog antenna: ± 5.3 dB Biconical antenna: ± 5.0 dB Log periodic antenna: ± 5.3 dB Double ridged horn antenna: ± 5.3 dB Biconilog antenna: ± 6.0 dB Biconical antenna: ± 5.7 dB Log periodic antenna: ± 6.0 dB Double ridged horn antenna: ± 6.0 dB

The test equipment has been calibrated according to its recommended procedures and is within the manufacturer's published limit of error. The standards and instruments used in the calibration system conform to the present requirements of ISO/IEC 17025 (or alternately ANSI/NCSL Z540-1).
The laboratory calibrates its measurement standards by a third party (traceable to NIST, USA) on a regular basis according to equipment manufacturer requirements. The Hermon Labs EMC measurements uncertainty is given in the table above.
Person for contact: Mr. Alex Usoskin, CEO.

10 APPENDIX C Test facility 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) and by Industry Canada for electromagnetic emissions (file numbers IC 2186-1 for OATS and IC 2186-2 for anechoic chamber), certified by VCCI, Japan (the registration numbers are R-808 for OATS, R-1082 for anechoic chamber, C-845 for conducted emissions site), assessed by TNO Certification EP&S (Netherlands) for a number of EMC, telecommunications, environmental, safety standards, and by AMTAC (UK) for safety of medical devices. 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

47CFR part 15: 2004	Radio Frequency Devices.
FR Vol.62	Federal Register, Volume 62, May 13, 1997
ANSI C63.2: 1996	American National Standard for Instrumentation-Electromagnetic Noise and Field Strength, 10 kHz to 40 GHz-Specifications.
ANSI C63.4: 2001	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 Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AVRG	average (detector)
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
DC	direct current
DTS	digital transmission system
EIRP	equivalent isotropically radiated power
ERP	effective radiated power
EUT	equipment under test
F	frequency
FHSS	frequency hopping spread spectrum
GHz	gigahertz
GND	ground
H	height
HL	Hermon laboratories
Hz	hertz
k	kilo
kHz	kilohertz
LISN	line impedance stabilization network
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μs	microsecond
NA	not applicable
OATS	open area test site
Ω	Ohm
PCB	printed circuit board
PS	power supply
ppm	part per million (10^{-6})
QP	quasi-peak
RE	radiated emission
RF	radio frequency
rms	root mean square
Rx	receive
s	second
T	temperature
Tx	transmit
V	volt

13 APPENDIX F Test equipment correction factors

Antenna Factor
Active Loop Antenna
EMC Test Systems, model 6502, serial number 2857

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

Antenna factor

Biconilog antenna EMCO, model 3141, serial number 1011

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

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

Biconilog antenna factor

Schaffner Chase EMC, model CBL 6140A, serial number 1120

Frequency, MHz	Antenna factor, dB(1/m)
20	12.1
22	8.8
24	5.5
26	3.0
28	2.8
30	3.9
40	8.4
50	9.3
60	9.7
70	9.3
80	7.5
90	6.8
100	7.6
110	6.6
120	6.9
140	7.6
160	11.6
170	8.3
190	9.2
200	9.9
220	10.5
240	11.2
260	12.9
280	12.1
300	12.9
320	13.2
340	13.9
360	15.2
380	15.3
400	15.7
420	16.6
440	16.8
460	17.6
480	18.3
500	18.0
520	18.0
540	18.7
560	19.2
580	19.0

Frequency, MHz	Antenna factor, dB(1/m)
600	19.1
620	19.8
640	20.6
660	20.7
680	20.9
700	21.0
720	21.4
740	21.7
760	21.6
780	21.6
800	21.9
820	22.2
840	22.6
860	22.7
880	22.7
900	22.9
920	23.2
940	23.7
960	24.3
980	24.6
1000	24.4
1.060	24.3
1.120	24.8
1.180	25.3
1.240	26.1
1.300	26.9
1.360	27.6
1.420	26.8
1.480	26.9
1.520	28.1
1.560	28.1
1.640	28.2
1.700	28.6
1.760	30.0
1.840	31.3
1.900	31.8
1.960	31.6
2.000	32.0

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

Antenna factor
Double-ridged wave guide horn antenna
EMC Test Systems, model 3115, serial no: 9911-5964

Frequency, MHz	Antenna factor (s/n 9911-5964), dB(1/m)	Antenna factor (s/n 00027177), dB(1/m)
1000.0	24.5	24.7
1500.0	24.8	25.7
2000.0	27.6	27.8
2500.0	28.7	28.9
3000.0	30.8	30.7
3500.0	32.9	31.8
4000.0	32.7	33.0
4500.0	32.0	32.8
5000.0	33.6	34.2
5500.0	35.3	34.9
6000.0	35.7	35.2
6500.0	35.8	35.4
7000.0	36.2	36.3
7500.0	37.2	37.3
8000.0	37.2	37.5
8500.0	38.1	38.0
9000.0	38.6	38.3
9500.0	38.3	38.3
10000.0	38.4	38.7
10500.0	38.3	38.7
11000.0	38.8	38.9
11500.0	39.9	39.5
12000.0	39.6	39.5
12500.0	39.5	39.4
13000.0	40.5	40.5
13500.0	41.1	40.8
14000.0	41.5	41.5
14500.0	40.8	41.3
15000.0	39.5	40.2
15500.0	38.1	38.7
16000.0	38.1	38.5
16500.0	40.1	39.8
17000.0	42.6	41.9
17500.0	45.4	45.8
18000.0	48.7	49.1

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

Cable loss
Cable coaxial, GORE A2P01POL118, 2.3 m, model GORE-3, serial number 176, HL 0589
+ Cable coaxial, ANDREW PSWJ4, 6 m, model: ANDREW-6, serial number 163, HL 1004

No.	Frequency, MHz	Cable loss, dB	Tolerance (Specification), dB	Measurement uncertainty, dB
1	30	0.33	≤ 6.5	±0.12
2	50	0.40		
3	100	0.57		
4	300	0.97		
5	500	1.25		
6	800	1.59		
7	1000	1.81		
8	1200	1.97		
9	1400	2.15		
10	1600	2.28		
11	1800	2.43		
12	2000	2.61		
13	2200	2.75		
14	2400	2.89		
15	2600	2.97		
16	2800	3.21	≤ 6.5	±0.12
17	3000	3.32		
18	3300	3.47		
19	3600	3.62		
20	3900	3.84		
21	4200	3.92		±0.17
22	4500	4.07		
23	4800	4.36		
24	5100	4.62		
25	5400	4.78		
26	5700	5.16		
27	6000	5.67		
28	6500	5.99		

Cable loss
Cable 18 GHz, 4 m, blue, model SPS-1803A-4000-NPS, serial number T4658, HL 1942

Frequency, GHz	Cable loss, dB
0.03	0.21
0.05	0.26
0.10	0.36
0.20	0.50
0.30	0.61
0.40	0.70
0.50	0.78
0.60	0.85
0.70	0.93
0.80	0.99
0.90	1.04
1.00	1.10
1.10	1.16
1.20	1.22
1.30	1.26
1.40	1.31
1.50	1.35
1.60	1.41
1.70	1.45
1.80	1.49
1.90	1.53
2.00	1.57
2.10	1.61
2.20	1.65
2.30	1.69
2.40	1.72
2.50	1.76
2.60	1.79
2.70	1.83
2.80	1.87
2.90	1.90
3.10	1.97
3.30	2.04
3.50	2.11
3.70	2.18
3.90	2.24
4.10	2.31
4.30	2.38
4.50	2.43
4.70	2.53
4.90	2.53
5.10	2.63
5.30	2.65
5.50	2.72
5.70	2.76
5.90	2.79

Frequency, GHz	Cable loss, dB
6.10	2.88
6.30	2.90
6.50	2.97
6.70	3.02
6.90	3.04
7.10	3.07
7.30	3.12
7.50	3.13
7.70	3.19
7.90	3.24
8.10	3.30
8.30	3.36
8.50	3.45
8.70	3.41
8.90	3.45
9.10	3.42
9.30	3.55
9.50	3.48
9.70	3.58
9.90	3.61
10.10	3.66
10.30	3.68
10.50	3.70
10.70	3.70
10.90	3.75
11.10	3.78
11.30	3.86
11.50	3.98
11.70	4.10
11.90	4.12
12.10	4.09
12.40	4.13
13.00	4.23
13.50	4.35
14.00	4.40
14.50	4.44
15.00	4.57
15.50	4.66
16.00	4.64
16.50	4.66
17.00	4.75
17.50	4.85
18.00	4.93

Cable 18 GHz, 6.5 m, blue, model NPS-1803A-6500-NPS, serial number T4974, HL 1947
Calibration data

Frequency, GHz	Insertion loss, dB
0.03	0.30
0.05	0.38
0.10	0.53
0.20	0.74
0.30	0.91
0.40	1.05
0.50	1.18
0.60	1.29
0.70	1.40
0.80	1.50
0.90	1.59
1.00	1.68
1.10	1.77
1.20	1.86
1.30	1.94
1.40	2.01
1.50	2.08
1.60	2.16
1.70	2.22
1.80	2.29
1.90	2.36
2.00	2.42
2.10	2.48
2.20	2.54
2.30	2.60
2.40	2.66
2.50	2.71
2.60	2.77
2.70	2.83
2.80	2.89
2.90	2.95
3.10	3.06
3.30	3.17
3.50	3.28
3.70	3.39
3.90	3.51
4.10	3.62
4.30	3.76
4.50	3.87
4.70	4.01
4.90	4.10
5.10	4.21
5.30	4.31
5.50	4.43
5.70	4.56
5.90	4.71

Frequency, GHz	Insertion loss, dB
6.10	4.87
6.30	4.95
6.50	4.94
6.70	4.88
6.90	4.87
7.10	4.83
7.30	4.85
7.50	4.86
7.70	4.91
7.90	4.96
8.10	5.03
8.30	5.08
8.50	5.13
8.70	5.21
8.90	5.22
9.10	5.34
9.30	5.35
9.50	5.52
9.70	5.51
9.90	5.66
10.10	5.70
10.30	5.78
10.50	5.79
10.70	5.82
10.90	5.86
11.10	5.94
11.30	6.06
11.50	6.21
11.70	6.44
11.90	6.61
12.10	6.76
12.40	6.68
13.00	6.66
13.50	6.81
14.00	6.90
14.50	6.90
15.00	6.97
15.50	7.17
16.00	7.28
16.50	7.27
17.00	7.38
17.50	7.68
18.00	7.92

Cable loss
RF cable 8 m, model RG-214, serial number C-56, HL 2009

No.	Frequency, MHz	Cable loss, dB	Tolerance (Specification), dB	Measurement uncertainty, dB
1	1	0.10	NA	±0.12
2	10	0.14		
3	30	0.25		
4	50	0.34		
5	100	0.53		
6	300	0.99		
7	500	1.31		
8	800	1.73		
9	1000	1.98		
10	1100	2.11		
11	1200	2.21		
12	1300	2.35		
13	1400	2.46		
14	1500	2.55		
15	1600	2.68		
16	1700	2.78		
17	1800	2.88		
18	1900	2.98		
19	2000	3.09		

Calibration data
RF cable 8 m, model RG-214, serial number 1552, HL 1552

No.	Parameter	Set, MHz	Measured, dB	Deviation, dB	Tolerance (Specification), dB	Meas. Uncert., dB
1	Insertion Loss	20	0.27	-	NA	±0.12
2		30	0.31	-		
3		50	0.40	-		
4		80	0.49	-		
5		100	0.55	-		
6		200	0.80	-		
7		300	0.99	-		
8		400	1.17	-		
9		500	1.32	-		
10		600	1.45	-		
11		700	1.60	-		
12		800	1.72	-		
13		900	1.84	-		
14		1000	2.00	-		
15		1200	2.19	-		
16		1400	2.40	-		
17		1500	2.51	-		
18		1600	2.61	-		
19		1800	2.82	-		
20		2000	3.00	-		

Cable 40 GHz, 0.8 m, blue, model KPS-1503A-800-KPS, serial number W4907 (HL 2254), insertion loss

Frequency, GHz	Insertion loss, dB
0.03	0.05
0.05	0.09
0.1	0.10
0.2	0.16
0.3	0.21
0.5	0.26
0.7	0.31
0.9	0.36
1.1	0.39
1.3	0.42
1.5	0.46
1.7	0.47
1.9	0.51
2.1	0.55
2.3	0.54
2.5	0.56
2.7	0.60
2.9	0.61
3.1	0.63
3.3	0.66
3.5	0.68
3.7	0.72
3.9	0.70
4.1	0.75
4.3	0.75
4.5	0.80
4.7	0.78
4.9	0.81
5.1	0.82
5.3	0.84
5.5	0.84
5.7	0.86
5.9	0.90
6.1	0.91
6.3	0.95
6.5	0.92
6.7	0.91
6.9	0.95
7.1	0.98
7.3	1.03
7.5	0.98
7.7	1.06
7.9	1.08
8.1	1.06
8.3	1.10
8.5	1.10
8.7	1.12
8.9	1.12
9.1	1.14
9.3	1.18
9.5	1.16
9.7	1.18
9.9	1.17
10.1	1.18

Frequency, GHz	Insertion loss, dB
10.30	1.20
10.50	1.22
10.70	1.30
10.90	1.21
11.10	1.19
11.30	1.26
11.50	1.25
11.70	1.23
11.90	1.29
12.10	1.25
12.40	1.33
13.00	1.41
13.50	1.42
14.00	1.61
14.50	1.53
15.00	1.63
15.50	1.53
16.00	1.53
16.50	1.54
17.00	1.67
17.50	1.88
18.00	1.76
18.50	2.03
19.00	1.66
19.50	1.71
20.00	1.65
20.50	1.87
21.00	1.75
21.50	1.86
22.00	1.81
22.50	2.03
23.00	1.91
23.50	1.87
24.00	1.97
24.50	1.85
25.00	2.01
25.50	2.02
26.00	2.15
26.50	2.11
27.00	2.00
28.00	2.04
29.00	1.97
30.00	1.97
31.00	2.31
32.00	2.24
33.00	2.31
34.00	2.36
35.00	2.33
36.00	2.47
37.00	2.56
38.00	2.45
39.00	2.68
40.00	2.60

Calibration data
RF cable 12 m, RG-214, model C214-12, serial number 149, HL 813

No.	Parameter	Set, MHz	Measured, dB	Deviation, dB	Tolerance (Specification), dB	Meas. Uncert., dB
1	Insertion Loss	20	0.43	-	NA	±0.12
2		30	0.53	-		
3		50	0.71	-		
4		80	0.92	-		
5		100	1.04	-		
6		200	1.51	-		
7		300	1.90	-		
8		400	2.26	-		
9		500	2.54	-		
10		600	2.83	-		
11		700	3.12	-		
12		800	3.37	-		
13		900	3.61	-		
14		1000	3.85	-		
15		1200	4.31	-		
16		1400	4.74	-		
17		1500	4.92	-		
18		1600	5.17	-		
19		1800	5.58	-		
20		2000	5.95	-		