

TEST REPORT

ACCORDING TO: FCC part 15 subpart C, §15.247 and subpart B

FOR:

Telematics Wireless Ltd.
Water Meter Reader
Model:EMMR

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1 Applicant information

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

2 Equipment under test attributes

Product name: Water meter reader
Product type: Transceiver
Model(s): EMMR
Serial number: 2015-00
Receipt date 3/15/2005

3 Manufacturer information

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

4 Test details

Project ID: 16373
Location: Hermon Laboratories Ltd. P.O.Box 23, Binyamina 30500, Israel
Test started: 3/15/2005
Test completed: 5/3/2005
Test specification(s): FCC part 15 subpart C §15.247; §15.207, subpart B §15.107, §15.109
Test suite: FCC_15.247_DTS_with_RF_connector (5/4/2004 10:53:46 AM, 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(b)5, RF exposure	Pass
Section 15.247(c), Conducted spurious emissions	Pass
Section 15.247(c), Radiated spurious emissions	Pass
Section 15.247(d), Peak power density	Pass
Section 15.207(a), Conducted emission	Pass
Section 15.203, Antenna requirement	Pass
Unintentional emissions	
Section 15.107, Conducted emission at AC power port	Pass
Section 15.109, Radiated emission	Pass
Section 15.111, Conducted emission at receiver antenna port	Not required

Testing was completed against all relevant requirements of the test standard. 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. A. Adelberg, test engineer	May 3, 2005	
Reviewed by:	Mrs. M. Cherniavsky, certification engineer	May 4, 2005	
	Mr. M. Nikishin, EMC group leader	May 4, 2005	
Approved by:	Mr. A. Usoskin, C.E.O.	May 5, 2005	

6 EUT description

6.1 General information

The EMMR is a compact RF receiver/transmitter unit operating at 900 MHz ISM band (multi frequency) and used for wireless data collection (transmitted from water meters). Following the data collection, the collected data is transmitted via the RF transmitter to another EMMR.

6.2 Ports and lines

Port type	Port description	Connected		Connector type	Qty.	Cable type	Cable length, m
		From	To				
Power	DC	EUT J7	charger	HRS 3-pin	1	unshielded	1.5
Power	DC in	EUT J5	Open circuit	Molex 4-pin	1	unshielded	1.5
Power	PWR out	EUTJ4	Open circuit	Molex 2-pin	1	unshielded	1.5
Signal	RS232	EUT P1	PC	D-type 9- pin	1	unshielded	1.5
Signal	USB	EUT J13	Open circuit	Type B	1	shielded	1.5
Signal (RF)	antenna	EUT J2	antenna	TNC	1	shielded	2.0

6.3 Support and test equipment

Description	Manufacturer	Model number	Serial number
Laptop	IBM	T42	2373-2VG99HN23W
DC adapter	IBM	08K8202	11S08K820221ZA5B
Charger	Telematics	FW75550/12	0505
Printer LX-810	Seiko Epson Corp.	P80SA	44B1127035
Mouse	Microsoft	52463-OEM	5835482-40000

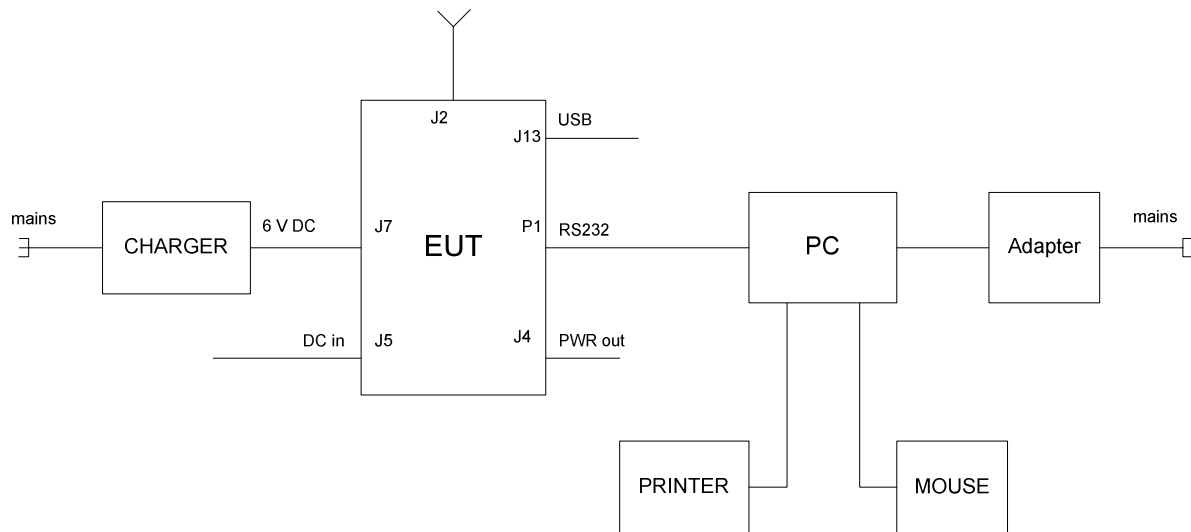
6.4 Operating frequencies

Source	Frequency, MHz		
Digital portion	0.32768(clock)	8 (clock)	14.487 (reference)
Transmitter	835 ÷ 853 (LO1)	766 (LO2)	836 (LO3)

6.5 Changes made in the EUT

No changes were implemented.

6.6 Test configuration





6.7 Transmitter characteristics

Type of equipment										
X	Stand-alone (Equipment with or without its own control provisions)									
	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					905.44 – 923.55 MHz					
RF channel spacing					3.62 MHz					
Maximum rated output power					At transmitter 50 Ω RF output connector				18.63 dBm (FSK)	
									19.93 dBm (PSK)	
					Effective radiated power (for equipment with no RF connector)					
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		X	standard connector TNC		integral		with temporary RF connector without temporary RF connector			
Antenna/s technical characteristics										
Type		Manufacturer		Model number		Gain				
Short		MAT		MA115V00		3 dBi				
Transmitter 99% power bandwidth					900 kHz (PSK modulated), 560 kHz (FSK modulated)					
Transmitter aggregate data rate/s					900 kbps (PSK modulated), 60 kbps (FSK modulated)					
Transmitter aggregate symbol (baud) rate/s					0.9 Msymbols (Mbaud) per second (PSK modulated)					
Type of modulation					PSK, FSK					
Type of multiplexing					NA					
Modulating test signal (baseband)					PRBS					
Maximum transmitter duty cycle in normal use			5 %	Tx ON time	msec	Period	msec			
Transmitter duty cycle supplied for test			100 %	Tx ON time	msec	Period	msec			
Transmitter power source										
	Battery	Nominal rated voltage	VDC	Battery type						
X	DC	Nominal rated voltage	6 VDC							
	AC mains	Nominal rated voltage	VAC	Frequency	Hz					
Common power source for transmitter and receiver					X	yes		no		



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:	3/28/2005 9:32:32 AM		
Temperature: 24 °C	Air Pressure: 1015 hPa	Relative Humidity: 46 %	Power Supply: 120 VAC
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. Specification test limits are given in Table 7.1.1.

Table 7.1.1 The 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.

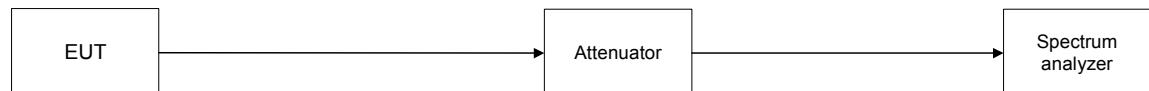
7.1.2 Test procedure

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, Table 7.1.3 and associated plots.

Figure 7.1.1 The 6 dB bandwidth test setup





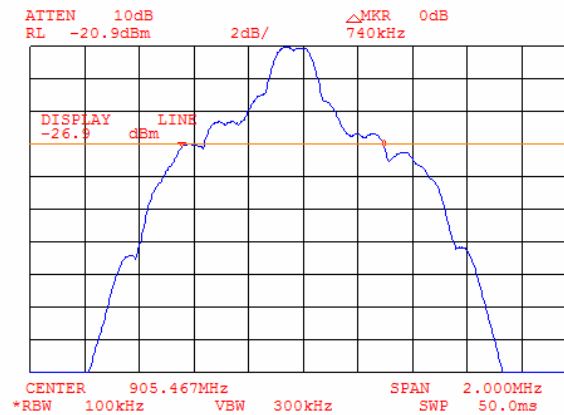
Test specification:	Section 15.247(a)2, 6 dB bandwidth			
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2			
Test mode:	Compliance	Verdict:		PASS
Date & Time:	3/28/2005 9:32:32 AM			
Temperature: 24 °C	Air Pressure: 1015 hPa	Relative Humidity: 46 %	Power Supply: 120 VAC	
Remarks:				

Table 7.1.2 The 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: 900 kbps

Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
Low frequency				
905.4375	740	500	240	Pass
Mid frequency				
916.3020	660	500	160	Pass
High frequency				
923.5462	653	500	153	Pass

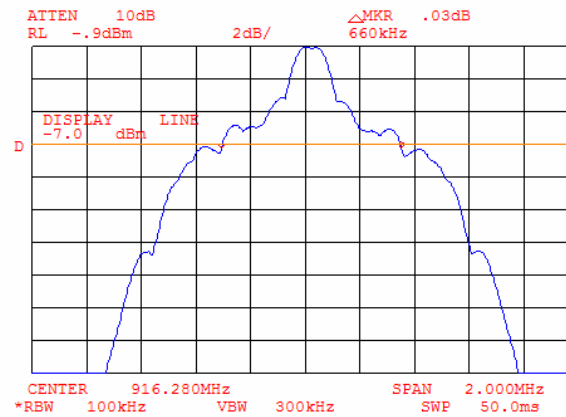
Plot 7.1.1 The 6 dB bandwidth test result at low frequency



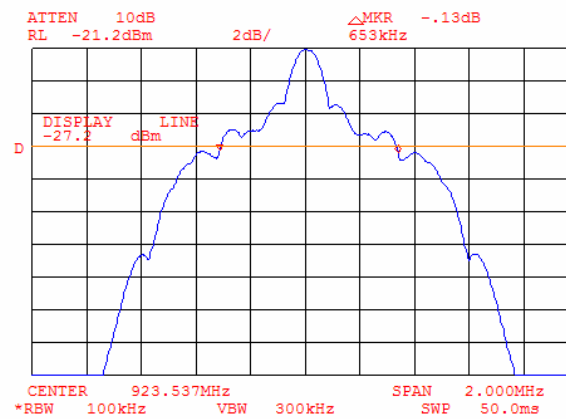


Test specification:	Section 15.247(a)2, 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:32:32 AM		
Temperature: 24 °C	Air Pressure: 1015 hPa	Relative Humidity: 46 %	Power Supply: 120 VAC
Remarks:			

Plot 7.1.2 The 6 dB bandwidth test result at mid frequency



Plot 7.1.3 The 6 dB bandwidth test result at high frequency





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:	3/28/2005 9:32:32 AM			
Temperature: 24 °C	Air Pressure: 1015 hPa	Relative Humidity: 46 %	Power Supply: 120 VAC	
Remarks:				

Table 7.1.3 The 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: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps

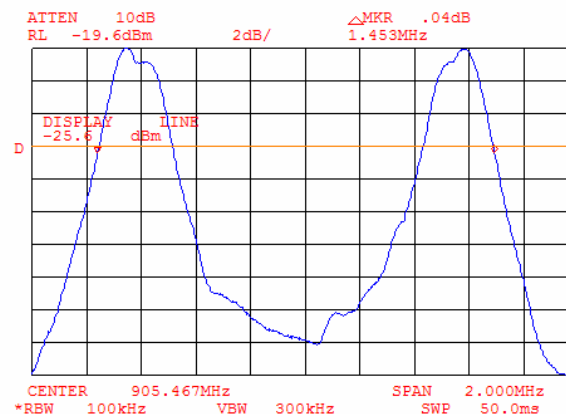
Carrier frequency, MHz	6 dB bandwidth, kHz	Limit, kHz	Margin, kHz	Verdict
Low frequency				
905.4375	1453	500	953	Pass
Mid frequency				
916.3020	1410	500	910	Pass
High frequency				
923.5462	1377	500	877	Pass

Reference numbers of test equipment used

HL 1424	HL 1651	HL 2399						
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Full description is given in Appendix A.

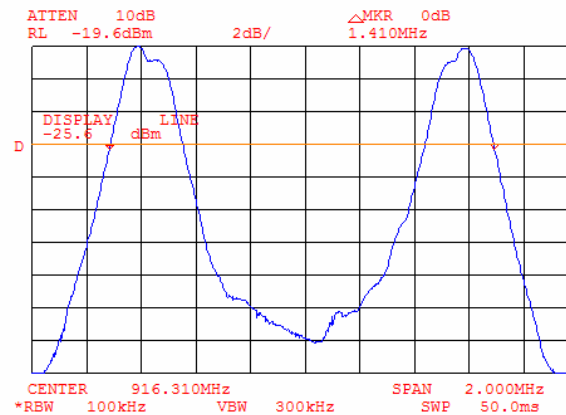
Plot 7.1.4 The 6 dB bandwidth test result at low frequency



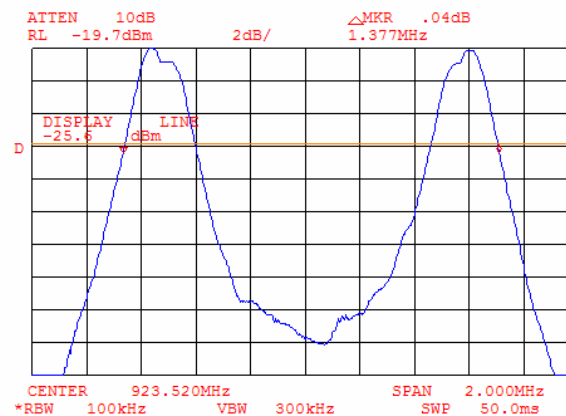


Test specification:	Section 15.247(a)2, 6 dB bandwidth		
Test procedure:	FR Vol.62, page 26243, Section 15.247(a)2		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:32:32 AM		
Temperature: 24 °C	Air Pressure: 1015 hPa	Relative Humidity: 46 %	Power Supply: 120 VAC
Remarks:			

Plot 7.1.5 The 6 dB bandwidth test result at mid frequency



Plot 7.1.6 The 6 dB bandwidth test result at high frequency





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:	3/28/2005 9:25:13 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

7.2 Peak output power

7.2.1 General

This test was performed to measure the maximum peak output power at the transmitter RF antenna connector. Specification test limits are given in Table 7.2.1.

Table 7.2.1 Peak output power limits

Assigned frequency range, MHz	Maximum antenna gain, dBi	Peak output power*	
		W	dBm
902.0 – 928.0	6.0	1.0	30.0
2400.0 – 2483.5			
5725.0 – 5850.0			

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

by 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.

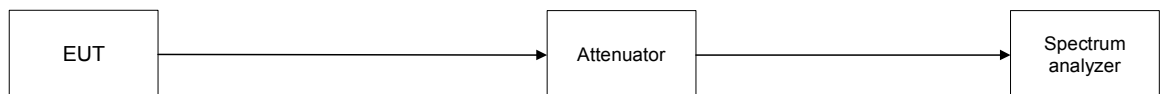
7.2.2 Test procedure

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 for 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 maximum peak output power was measured as provided in Table 7.2.2, Table 7.2.3 and associated plots.

Figure 7.2.1 Peak output power test setup





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:	3/28/2005 9:25:13 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

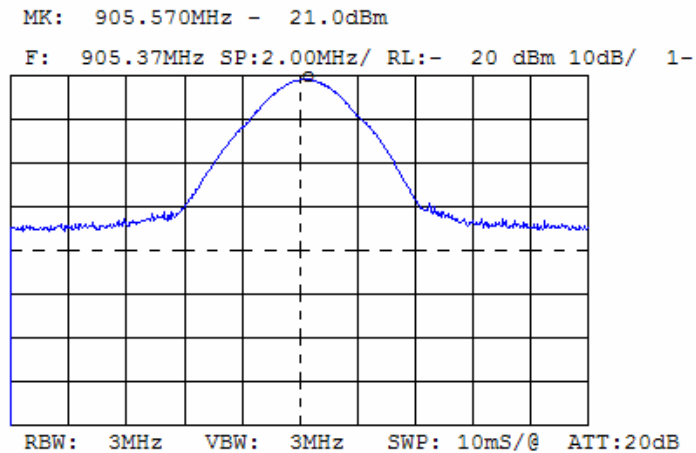
Table 7.2.2 Peak output power test results

ASSIGNED FREQUENCY: 902 - 928 MHz
 MODULATION: PSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 900 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 EUT 6 dB BANDWIDTH: 0.7 MHz
 RESOLUTION BANDWIDTH: 3 MHz
 VIDEO BANDWIDTH: 3 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
905.570	-21.00	40.00	0.93	19.93	30.00	-10.07	Pass
916.250	-21.10	40.00	0.93	19.83	30.00	-10.17	Pass
923.610	-21.20	40.00	0.93	19.73	30.00	-10.27	Pass

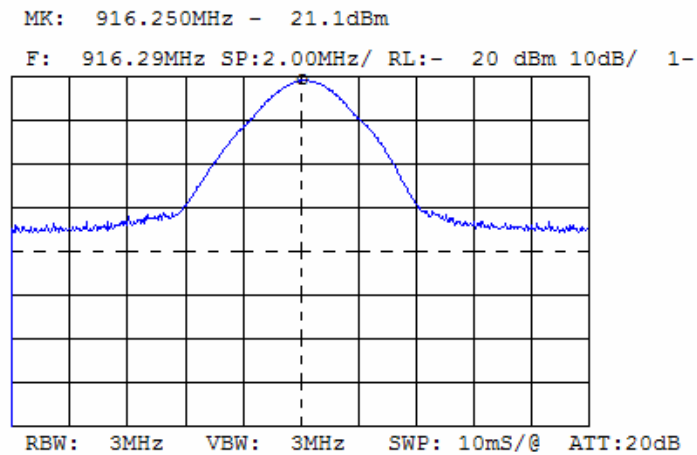
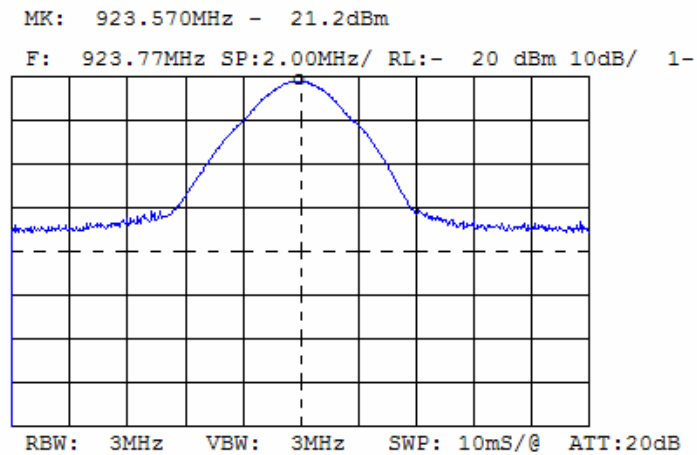
* - Margin = Peak output power – specification limit.

Plot 7.2.1 Peak output power at low frequency





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:	3/28/2005 9:25:13 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.2.2 Peak output power at mid frequency**Plot 7.2.3 Peak output power at high frequency**



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:	3/28/2005 9:25:13 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Table 7.2.3 Peak output power test results

ASSIGNED FREQUENCY: 902 - 928 MHz
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 DETECTOR USED: Peak
 EUT 6 dB BANDWIDTH: 1.4 MHz
 RESOLUTION BANDWIDTH: 2 MHz
 VIDEO BANDWIDTH: 3 MHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak output power, dBm	Limit, dBm	Margin*, dB	Verdict
904.93	-1.80	20.00	0.43	18.63	30.00	-11.37	Pass
915.81	-1.80	20.00	0.43	18.63	30.00	-11.37	Pass
923.01	-1.97	20.00	0.43	18.46	30.00	-11.54	Pass

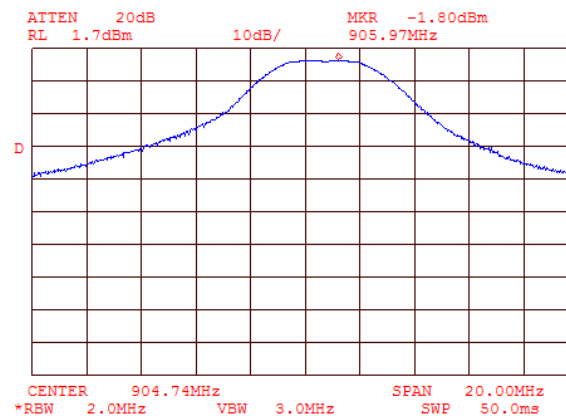
* - Margin = Peak output power – specification limit.

Reference numbers of test equipment used

HL 0025	HL 1651	HL 2399					
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Full description is given in Appendix A.

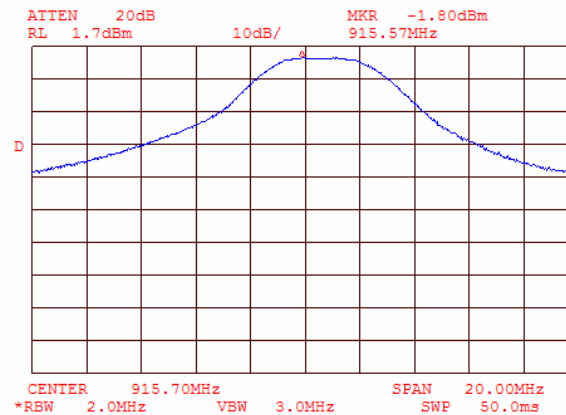
Plot 7.2.4 Peak output power at low frequency



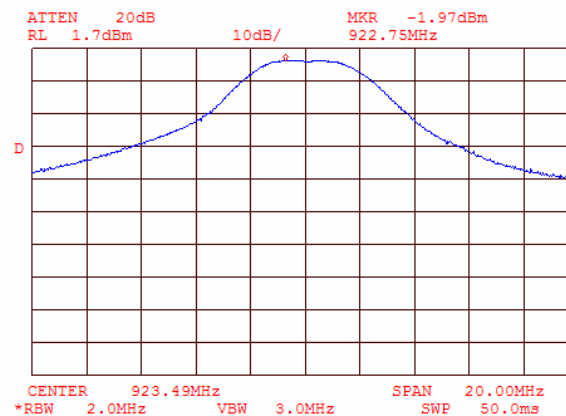


Test specification:	Section 15.247(b)3, Peak output power		
Test procedure:	FR Vol.62, page 26243, Section 15.247(b)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:25:13 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.2.5 Peak output power at mid frequency



Plot 7.2.6 Peak output power at high frequency





Test specification:	Section 15.247(b)5, RF exposure		
Test procedure:	47 CFR, Section 1.1307(b)1		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/21/2005 5:42:27 PM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

7.3 RF exposure

7.3.1 General

This test was performed to determine the minimum safe distance between the transmitter antenna and human to avoid public exposure in excess of limits for general population (uncontrolled exposure). Specification test limits are given in Table 7.3.1.

Table 7.3.1 RF exposure limits

Frequency range, MHz	Power density	
	mW/cm ²	W/m ²
902.0 – 928.0	0.60 – 0.62*	6.0 – 6.2
2400.0 – 2483.5	1.00	10.0
5725.0 – 5850.0	1.00	10.0

*- Power density limit within 300 - 1500 MHz was calculated according to the following equation: $S = F / 1500$, where S is power density in mW/cm² and F is frequency in MHz.

7.3.2 Power density calculation for mobile transmitter

The power density at the specified distance was calculated from the following equation as provided in Table 7.3.2:

$$S = P \times G / (4 \times \pi \times r^2),$$

where S is power density in W/m², P is the transmitter output power in W, G is the transmitter antenna numeric gain and r is distance to transmit antenna in m.

Table 7.3.2 Power density calculation

ASSIGNED FREQUENCY: 902 – 928 MHz
SPECIFIED DISTANCE: 0.20 m*
MODULATION: PSK

Carrier frequency, MHz	Peak output power, dBm	Antenna gain, dBi	EIRP		Power density, W/m ²	Limit, W/m ²	Margin, W/m ²	Verdict
			dBm	W				
905.4375	19.93	3.00	22.93	0.196	4.908	6.030	-1.122	Pass
916.3020	19.83	3.00	22.83	0.192	4.797	6.110	-1.313	Pass
923.5462	19.73	3.00	22.73	0.187	4.687	6.170	-1.483	Pass

ASSIGNED FREQUENCY: 902 – 928 MHz
SPECIFIED DISTANCE: 0.20 m*
MODULATION: FSK

Carrier frequency, MHz	Peak output power, dBm	Antenna gain, dBi	EIRP		Power density, W/m ²	Limit, W/m ²	Margin, W/m ²	Verdict
			dBm	W				
905.4375	18.63	3.00	21.63	0.146	3.639	6.030	-2.391	Pass
916.302	18.63	3.00	21.63	0.146	3.639	6.110	-2.471	Pass
923.5462	18.46	3.00	21.46	0.140	3.499	6.170	-2.671	Pass

* - The equipment deemed mobile as intended for use at a distance of more than 20 cm from humans.



Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

7.4 Spurious emissions at RF antenna connector

7.4.1 General

This test was performed to measure spurious emissions at RF antenna connector. Specification test limits are given in Table 7.4.1. The test results are provided in Table 7.4.2 and associated plots.

Table 7.4.1 Spurious emission limits

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

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

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

7.4.2 Test procedure

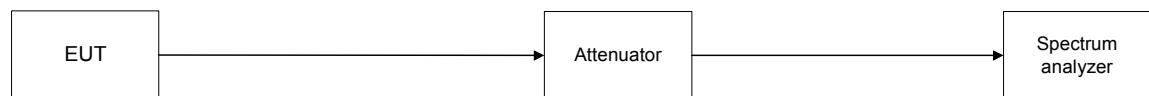
7.4.2.1 The EUT was set up as shown in Figure 7.4.1, energized and its proper operation was checked.

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

7.4.2.3 The highest emission level within the authorized band was measured.

7.4.2.4 The spurious emission was measured with spectrum analyzer as provided in Table 7.4.2 and associated plots and referenced to the highest emission level measured within the authorized band.

Figure 7.4.1 Spurious emission test setup





Test specification:		Section 15.247(c), Conducted spurious emissions			
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)			
Test mode:		Compliance	Verdict: PASS		
Date & Time:		3/28/2005 9:47:43 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %		Power Supply: 120 VAC	
Remarks:					

Table 7.4.2 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 902 – 928 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 10000 MHz
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 MODULATION: PSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 900 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 19.63 dBm at low carrier frequency
 19.53 dBm at mid carrier frequency
 19.37 dBm at high carrier frequency

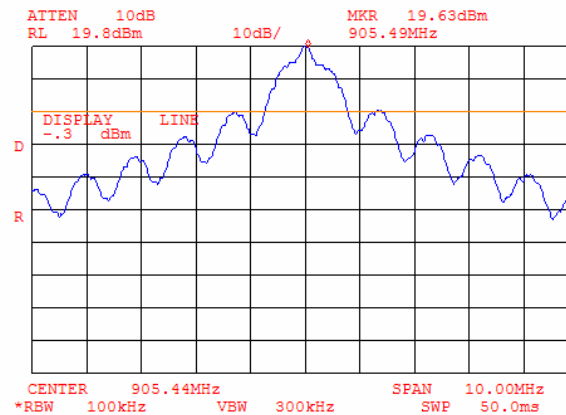
Frequency, MHz	Spurious emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency						
1810.9250	-34.60	19.63	54.23	20.00	34.23	Pass
2716.2050	-28.60		48.23		28.23	
5423.7760	-51.93		71.56		51.56	
6337.8630	-59.43		79.06		59.06	
Mid carrier frequency						
1832.5790	-35.60	19.53	55.13	20.00	35.13	Pass
2748.8730	-31.93		51.46		31.46	
5497.8200	-58.60		78.13		58.13	
6414.0560	-59.27		78.80		58.80	
High carrier frequency						
1847.1010	-36.10	19.37	55.47	20.00	35.47	Pass
2770.6300	-31.77		51.14		31.14	
5541.3440	-59.27		78.64		58.64	
6464.8150	-58.60		77.97		57.97	

*- Margin = Attenuation below carrier – specification limit.

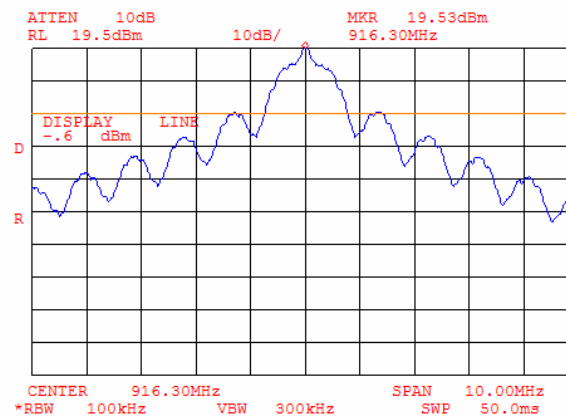


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.1 The highest emission level within the assigned band at low carrier frequency



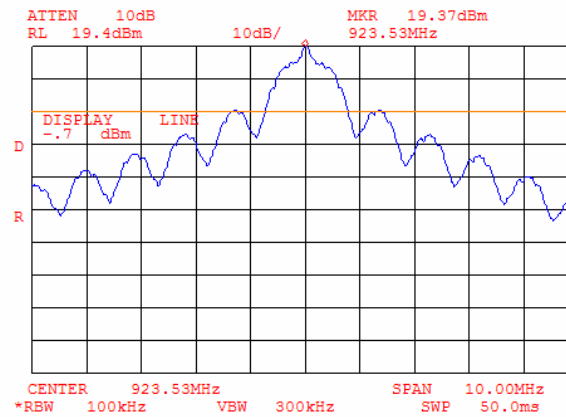
Plot 7.4.2 The highest emission level within the assigned band at mid carrier frequency





Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

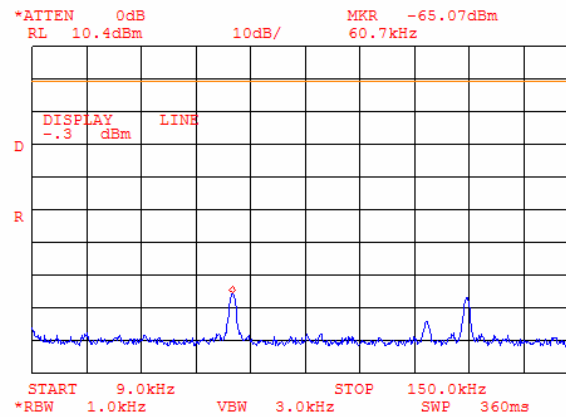
Plot 7.4.3 The highest emission level within the assigned band at high carrier frequency



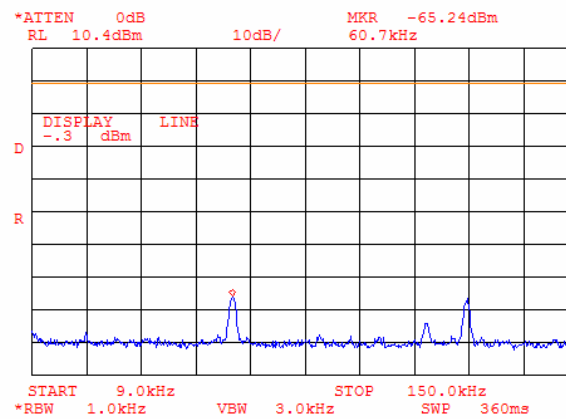


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.4 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency



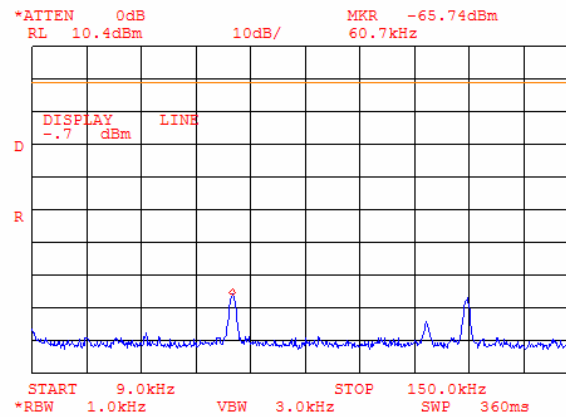
Plot 7.4.5 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency



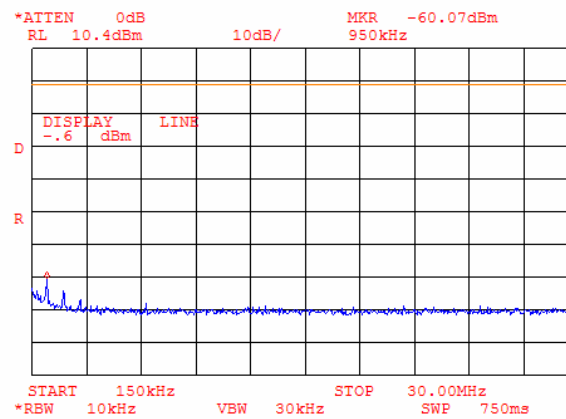


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.6 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency



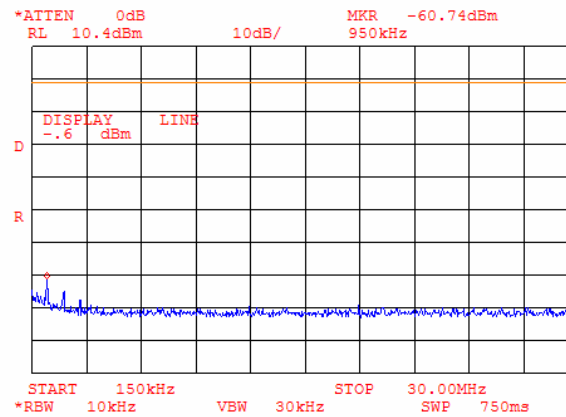
Plot 7.4.7 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency



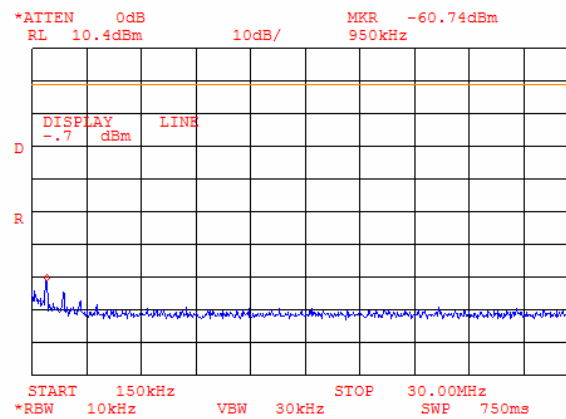


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.8 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency



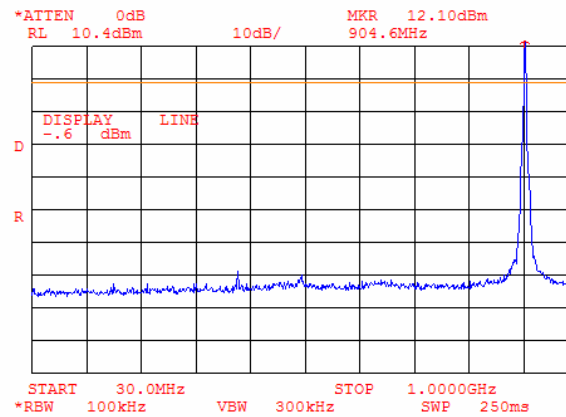
Plot 7.4.9 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency



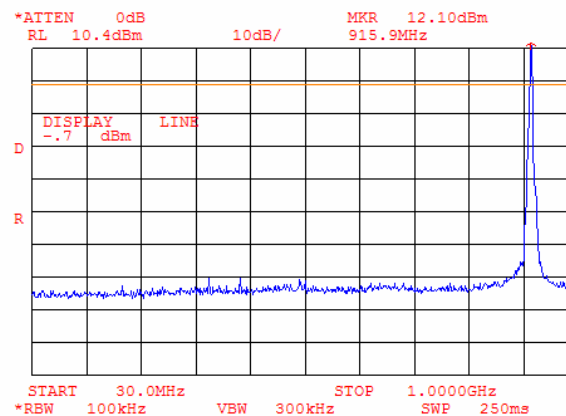


Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
Remarks:		Power Supply: 120 VAC	

Plot 7.4.10 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency



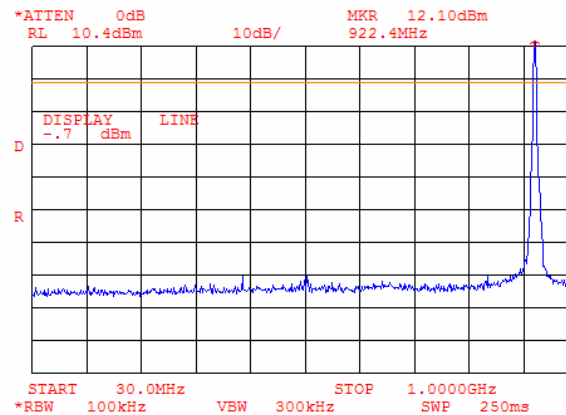
Plot 7.4.11 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency



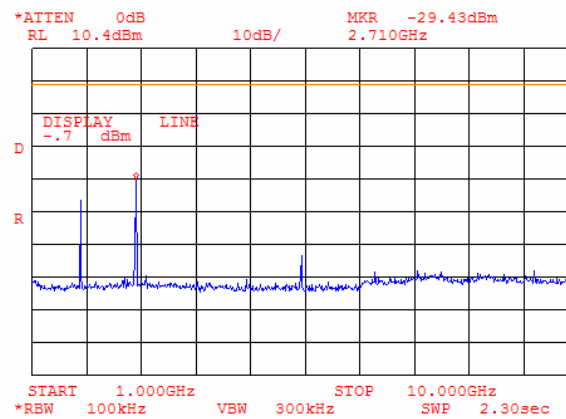


Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
Remarks:		Power Supply: 120 VAC	

Plot 7.4.12 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency



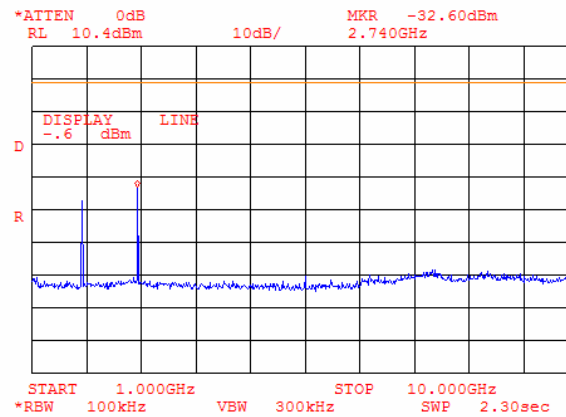
Plot 7.4.13 Spurious emission measurements in 1000 – 10000 MHz range at low carrier frequency



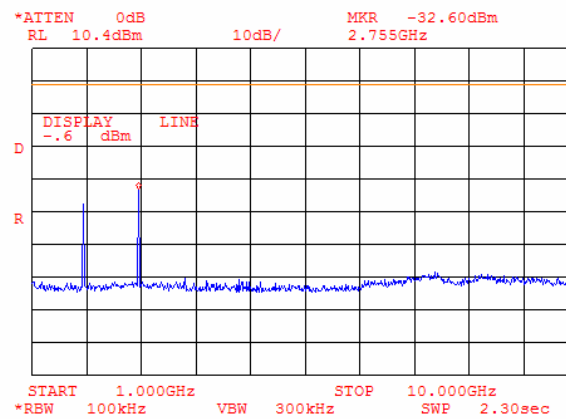


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.14 Spurious emission measurements in 1000 – 10000 MHz range at mid carrier frequency



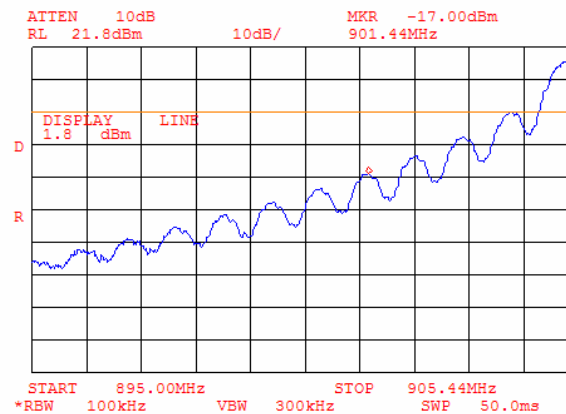
Plot 7.4.15 Spurious emission measurements in 1000 – 10000 MHz range at high carrier frequency



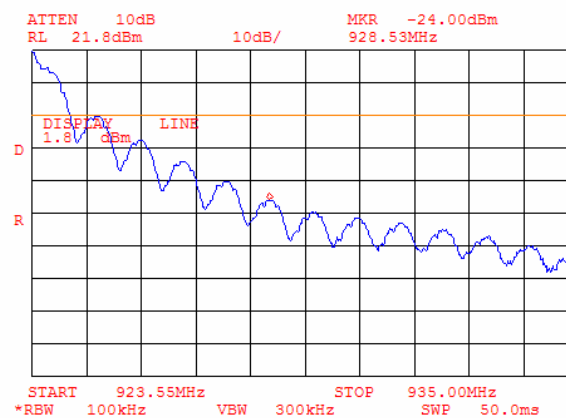


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.16 Spurious emission measurements band edge at low carrier frequency

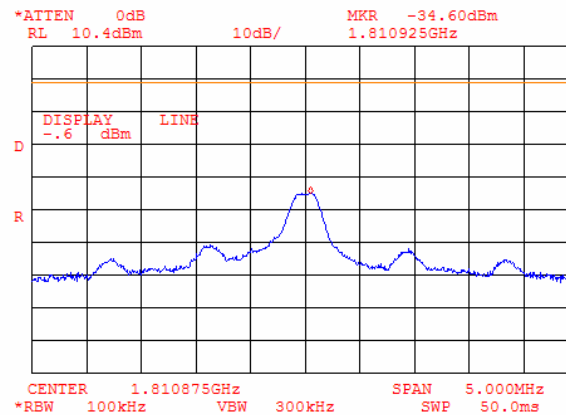
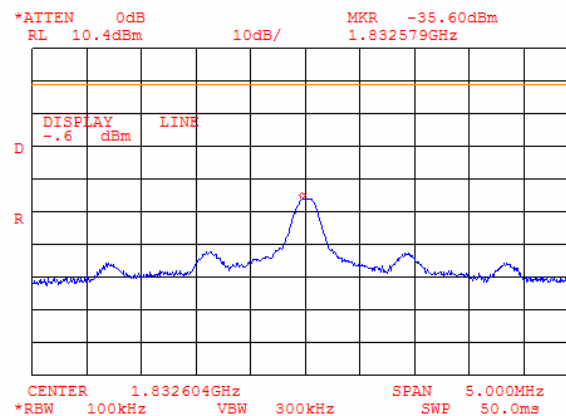


Plot 7.4.17 Spurious emission measurements band edge at high carrier frequency



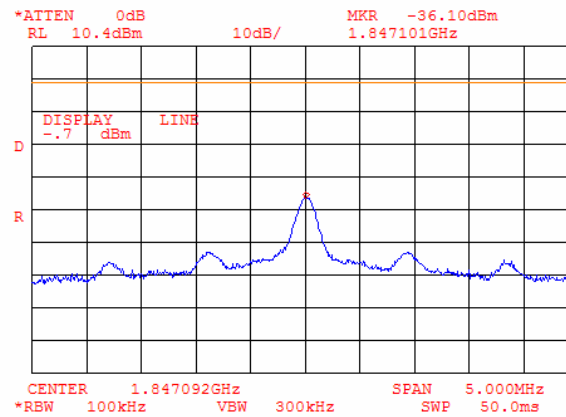
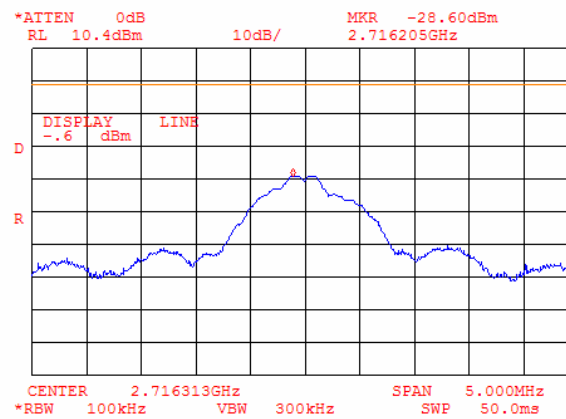


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.18 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequencyPlot 7.4.19 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency

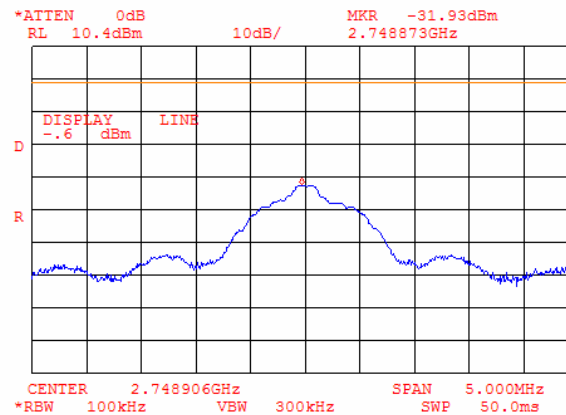
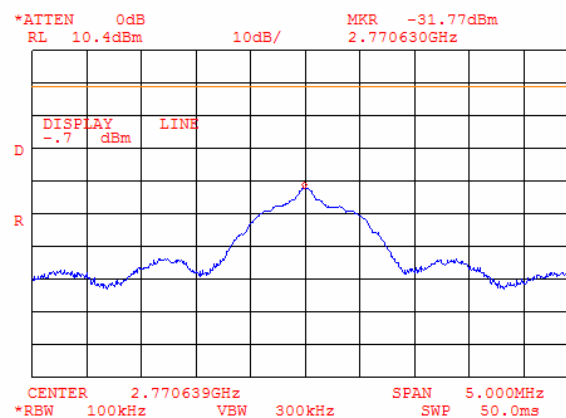


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.20 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequencyPlot 7.4.21 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency

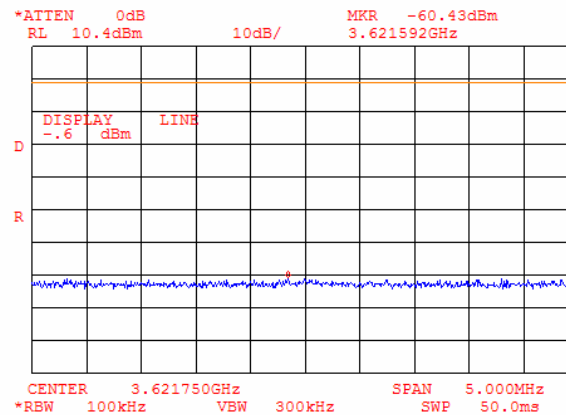
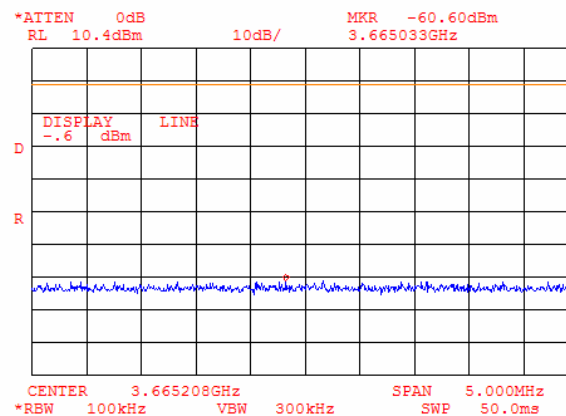


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.22 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequencyPlot 7.4.23 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency

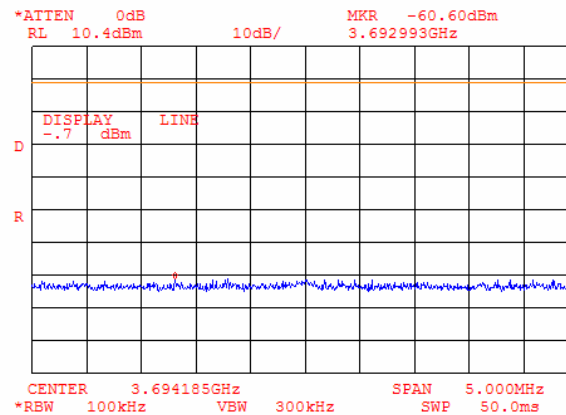
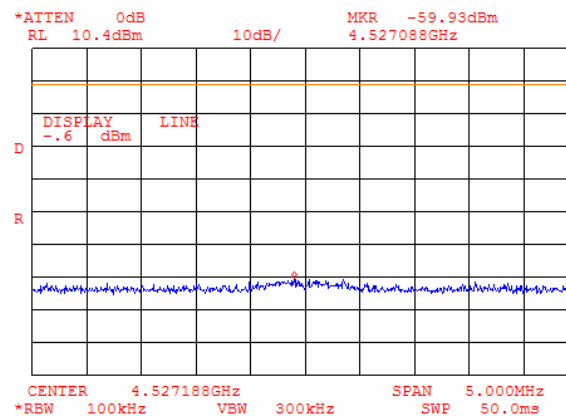


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.24 Conducted spurious emission measurements at the 4th harmonic of low carrier frequencyPlot 7.4.25 Conducted spurious emission measurements at the 4th harmonic of mid carrier frequency

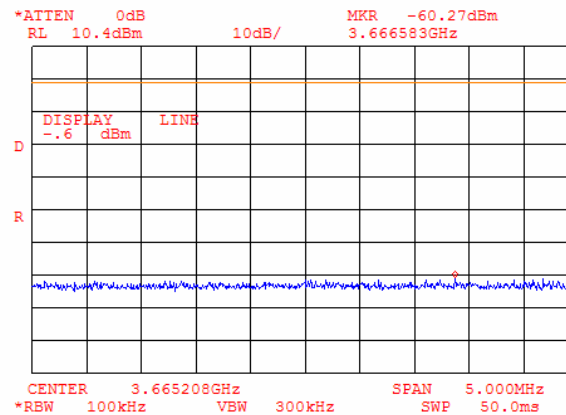
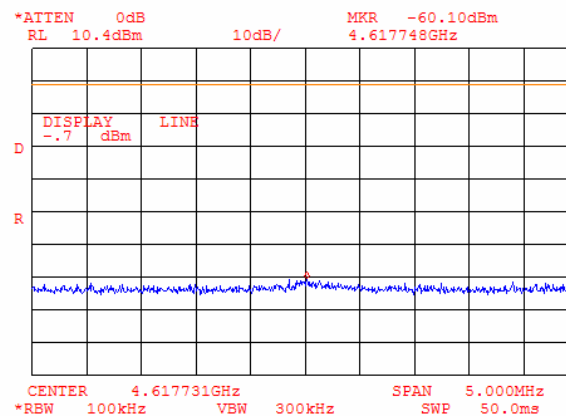


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.26 Conducted spurious emission measurements at the 4th harmonic of high carrier frequencyPlot 7.4.27 Conducted spurious emission measurements at the 5th harmonic of low carrier frequency

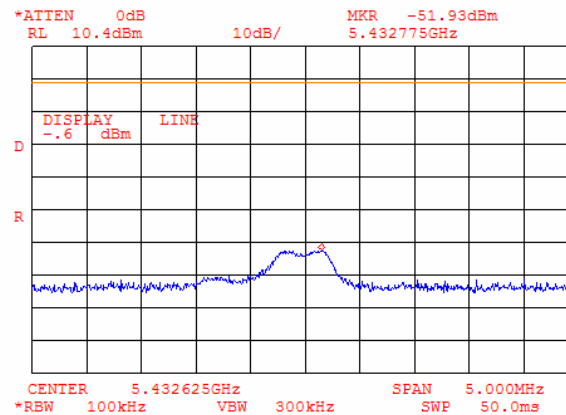
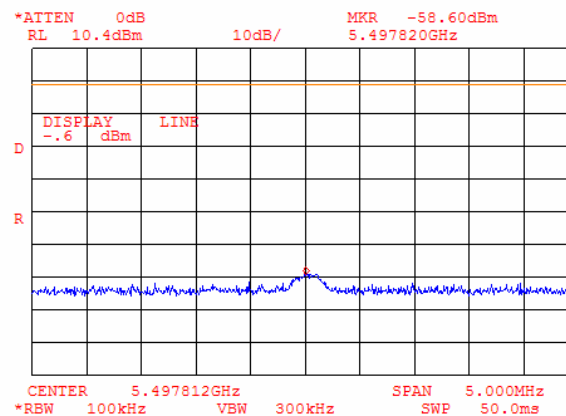


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.28 Conducted spurious emission measurements at the 5th harmonic of mid carrier frequencyPlot 7.4.29 Conducted spurious emission measurements at the 5th harmonic of high carrier frequency

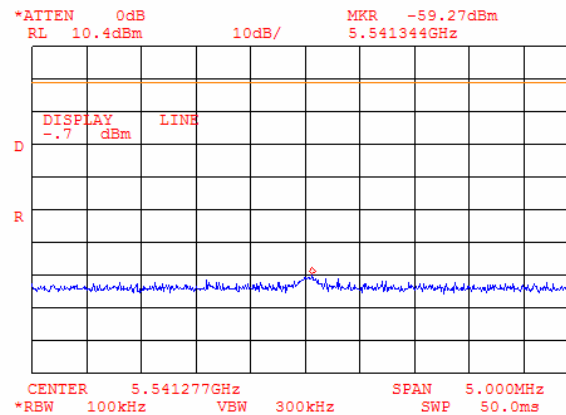
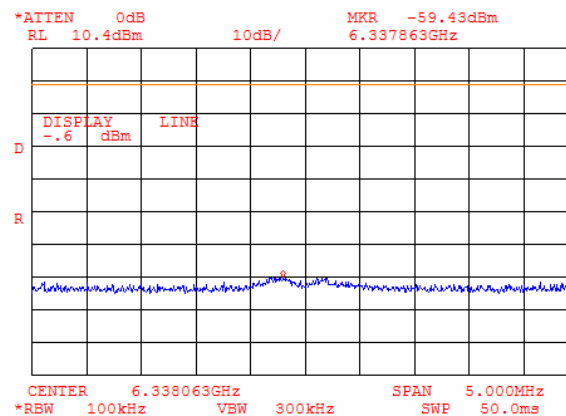


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.30 Conducted spurious emission measurements at the 6th harmonic of low carrier frequencyPlot 7.4.31 Conducted spurious emission measurements at the 6th harmonic of mid carrier frequency

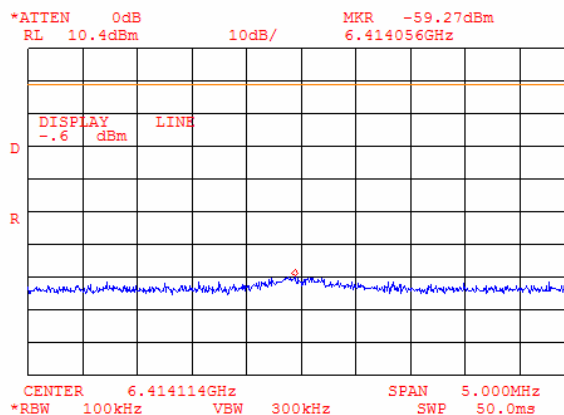
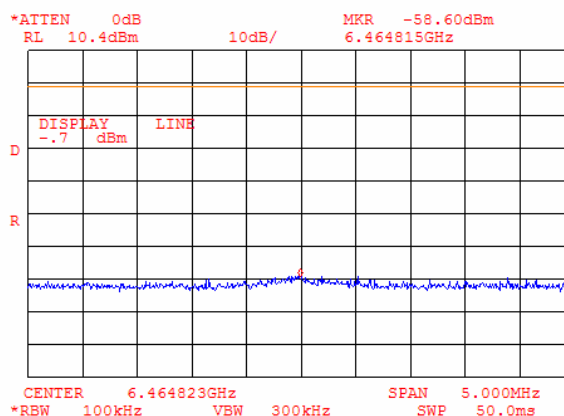


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.32 Conducted spurious emission measurements at the 6th harmonic of high carrier frequencyPlot 7.4.33 Conducted spurious emission measurements at the 7th harmonic of low carrier frequency

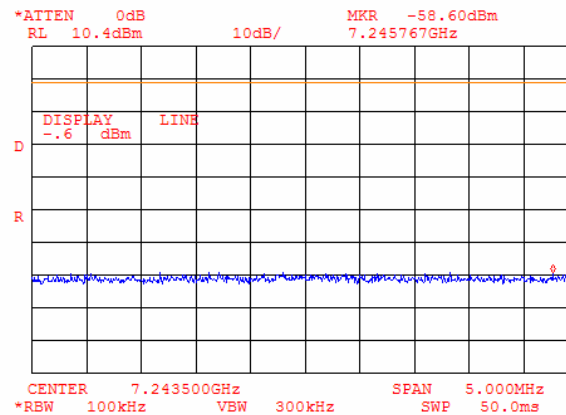
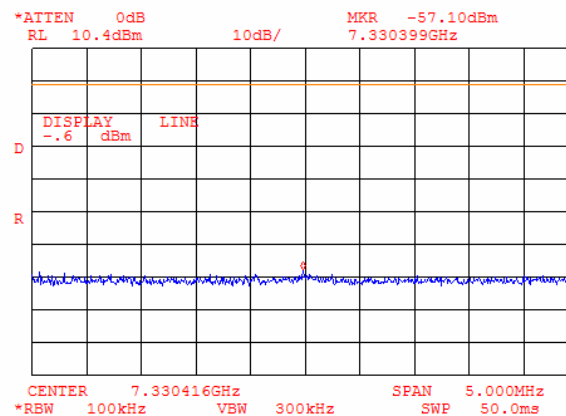


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.34 Conducted spurious emission measurements at the 7th harmonic of mid carrier frequencyPlot 7.4.35 Conducted spurious emission measurements at the 7th harmonic of high carrier frequency

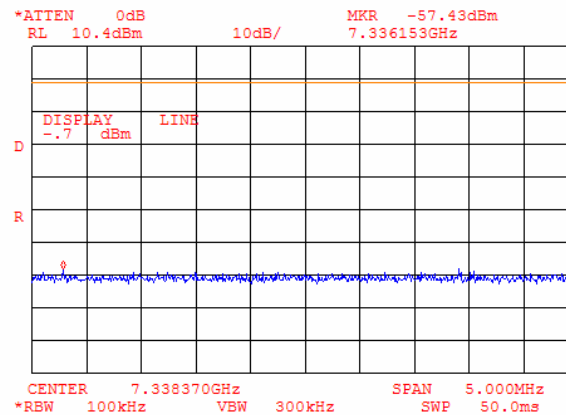
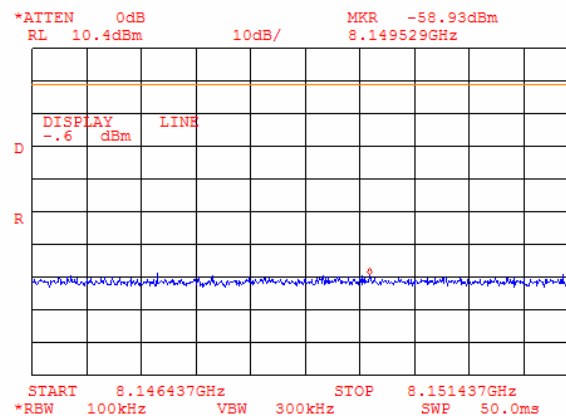


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.36 Conducted spurious emission measurements at the 8th harmonic of low carrier frequencyPlot 7.4.37 Conducted spurious emission measurements at the 8th harmonic of mid carrier frequency

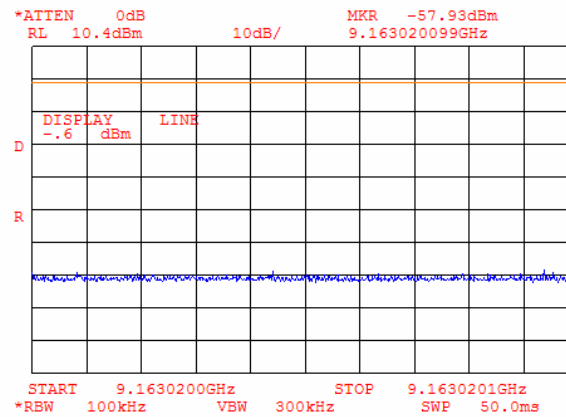
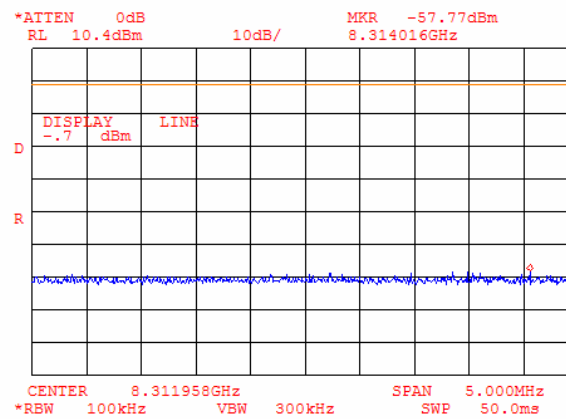


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.38 Conducted spurious emission measurements at the 8th harmonic of high carrier frequencyPlot 7.4.39 Conducted spurious emission measurements at the 9th harmonic of low carrier frequency

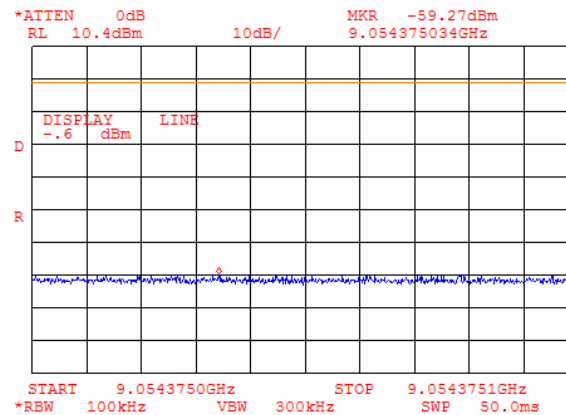
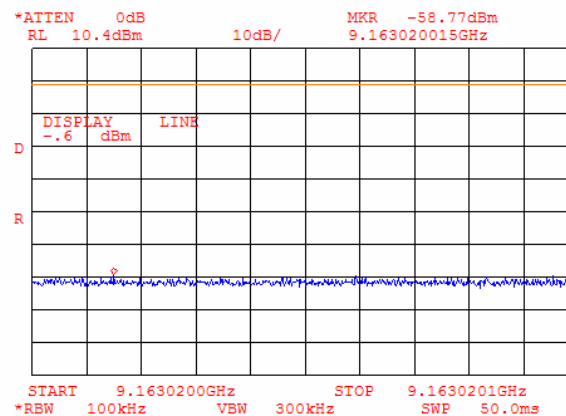


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.40 Conducted spurious emission measurements at the 9th harmonic of mid carrier frequencyPlot 7.4.41 Conducted spurious emission measurements at the 9th harmonic of high carrier frequency

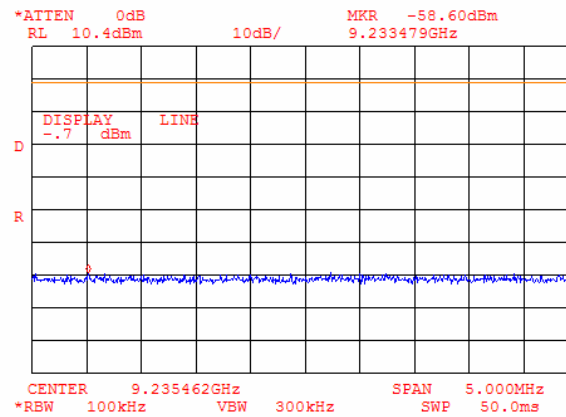


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.42 Conducted spurious emission measurements at the 10th harmonic of low carrier frequencyPlot 7.4.43 Conducted spurious emission measurements at the 10th harmonic of mid carrier frequency



Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
Remarks:		Power Supply: 120 VAC	

Plot 7.4.44 Conducted spurious emission measurements at the 10th harmonic of high carrier frequency



Test specification:		Section 15.247(c), Conducted spurious emissions			
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)			
Test mode:		Compliance	Verdict: PASS		
Date & Time:		3/28/2005 9:47:43 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %		Power Supply: 120 VAC	
Remarks:					

Table 7.4.3 Spurious emission test results

ASSIGNED FREQUENCY RANGE: 902 – 928 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 10000 MHz
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum

Frequency, MHz	Spurious emission, dBm	Emission at carrier, dBm	Attenuation below carrier, dBc	Limit, dBc	Margin, dB*	Verdict
Low carrier frequency						
1809.6250	-34.10	21.17	55.27	20.00	35.27	Pass
2714.4460	-27.10		48.27		28.27	
Mid carrier frequency						
1831.4120	-34.93	21.03	54.96	20.00	34.96	Pass
2747.0980	-30.60		50.63		30.63	
High carrier frequency						
1845.9260	-35.60	20.90	56.50	20.00	36.50	Pass
2772.4220	-30.43		51.33		31.33	

*- Margin = Attenuation below carrier – specification limit.

Reference numbers of test equipment used

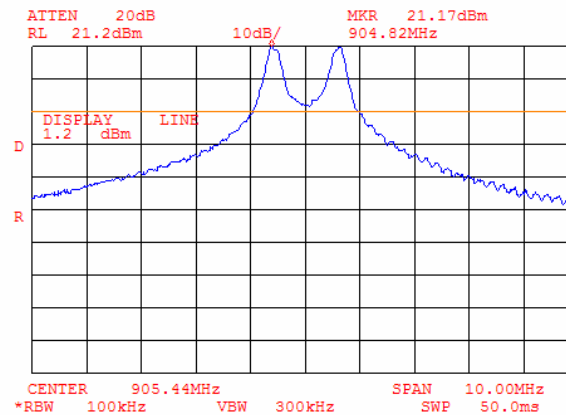
HL 1424	HL 1651	HL 2399					
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Full description is given in Appendix A.

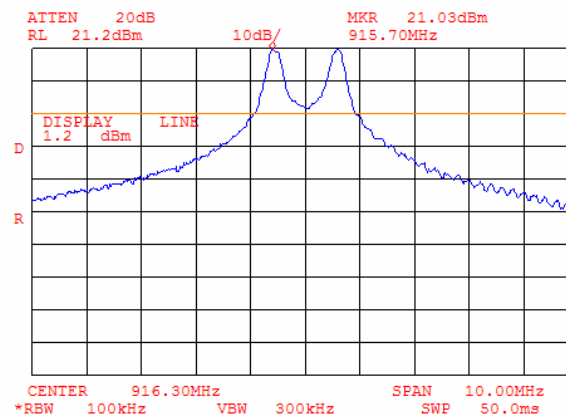


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.45 The highest emission level within the assigned band at low carrier frequency



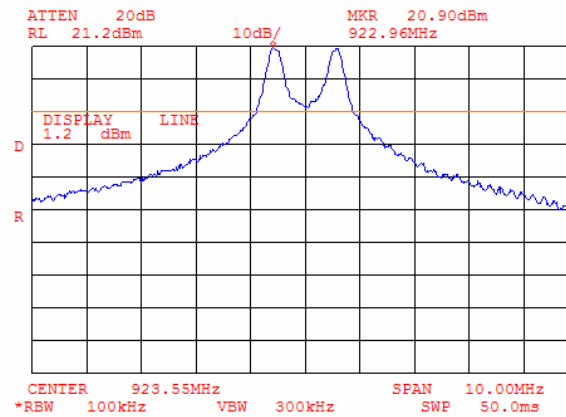
Plot 7.4.46 The highest emission level within the assigned band at mid carrier frequency





Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

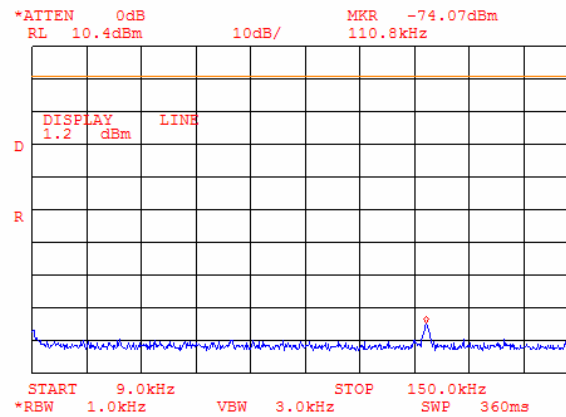
Plot 7.4.47 The highest emission level within the assigned band at high carrier frequency



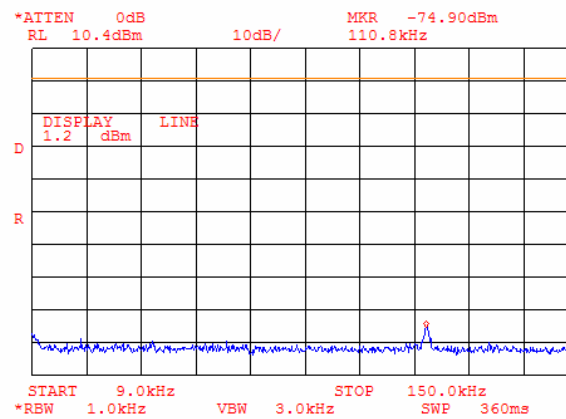


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.48 Spurious emission measurements in 9 - 150 kHz range at low carrier frequency



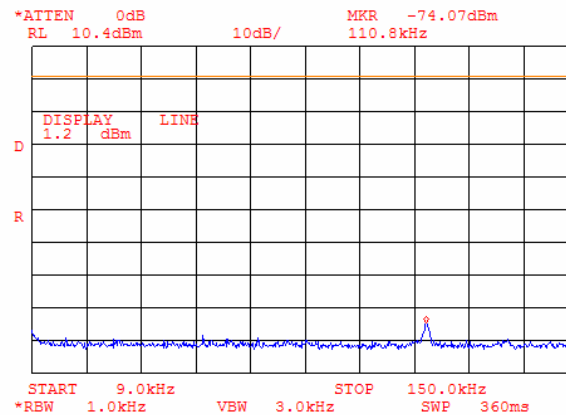
Plot 7.4.49 Spurious emission measurements in 9 - 150 kHz range at mid carrier frequency



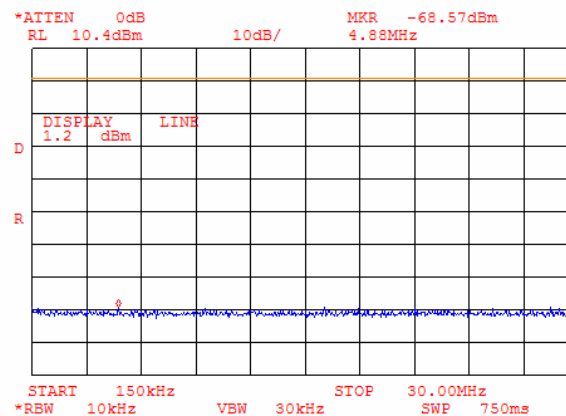


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.50 Spurious emission measurements in 9 - 150 kHz range at high carrier frequency



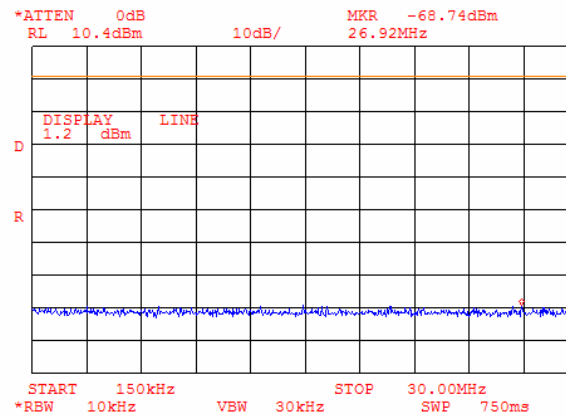
Plot 7.4.51 Spurious emission measurements in 0.15 - 30 MHz range at low carrier frequency



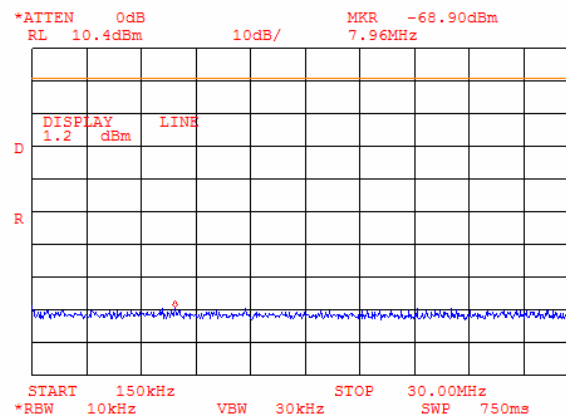


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.52 Spurious emission measurements in 0.15 - 30 MHz range at mid carrier frequency



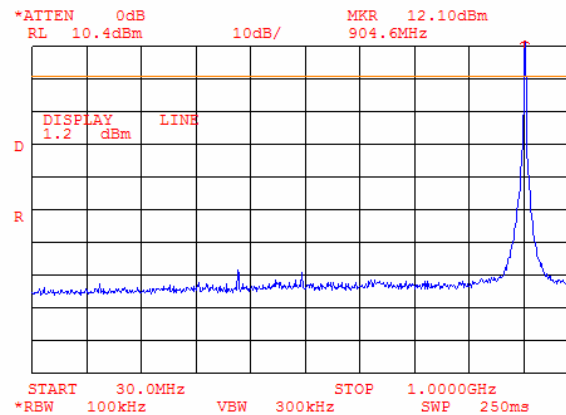
Plot 7.4.53 Spurious emission measurements in 0.15 - 30 MHz range at high carrier frequency



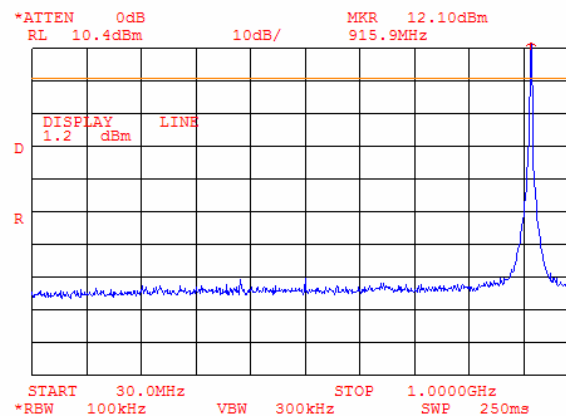


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.54 Spurious emission measurements in 30 - 1000 MHz range at low carrier frequency



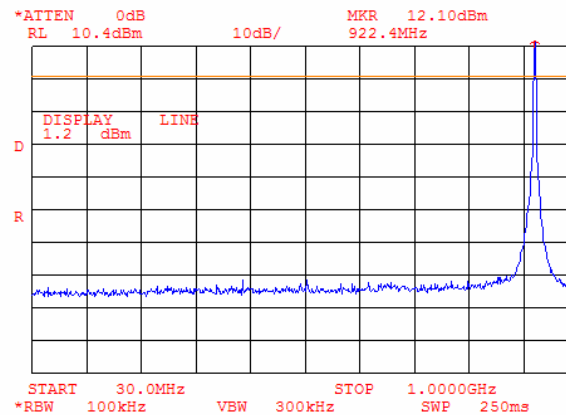
Plot 7.4.55 Spurious emission measurements in 30 - 1000 MHz range at mid carrier frequency



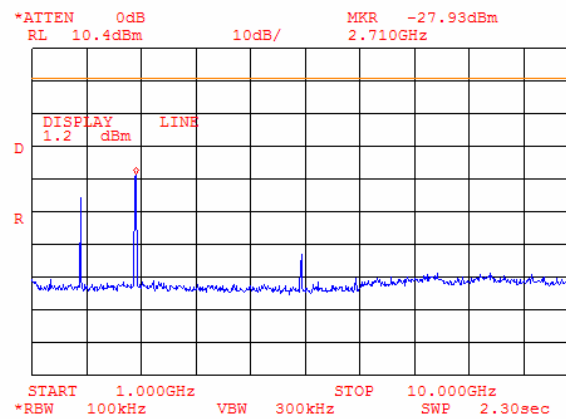


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.56 Spurious emission measurements in 30 - 1000 MHz range at high carrier frequency



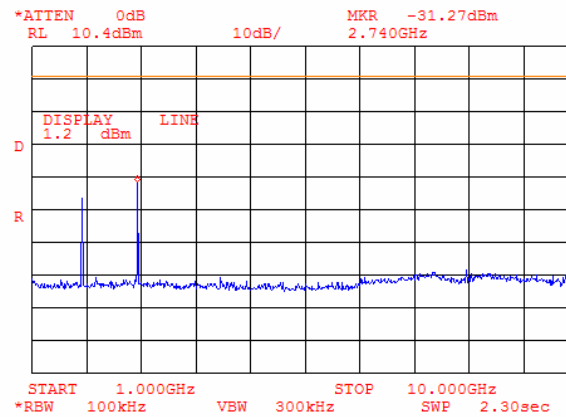
Plot 7.4.57 Spurious emission measurements in 1000 – 10000 MHz range at low carrier frequency



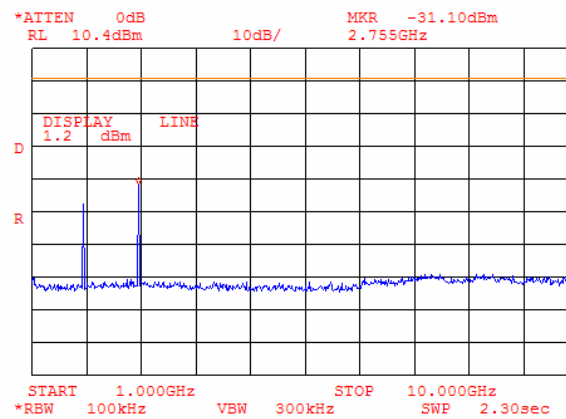


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.58 Spurious emission measurements in 1000 – 10000 MHz range at mid carrier frequency



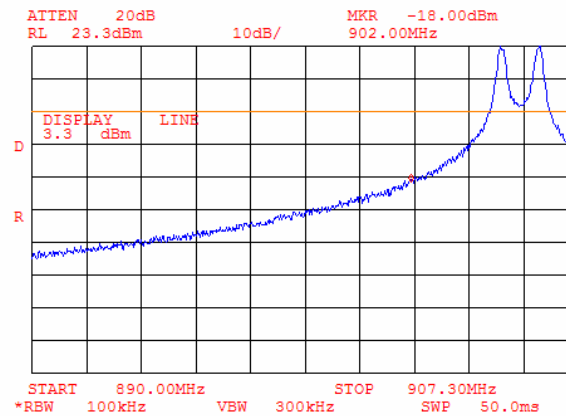
Plot 7.4.59 Spurious emission measurements in 1000 – 10000 MHz range at high carrier frequency



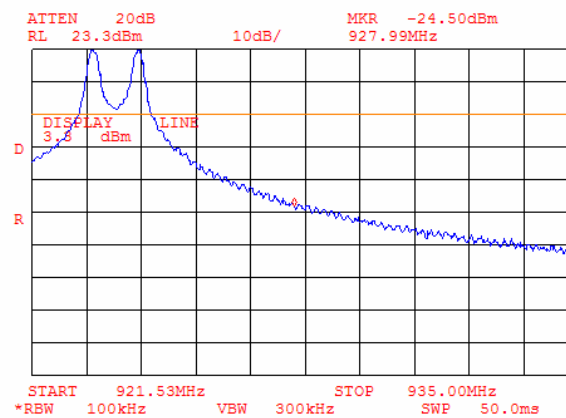


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.60 Spurious emission measurements band edge at low carrier frequency

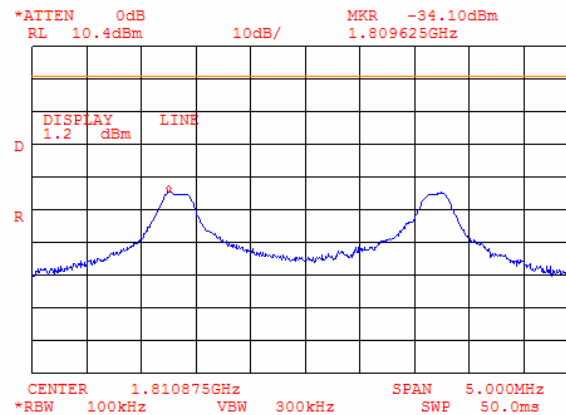
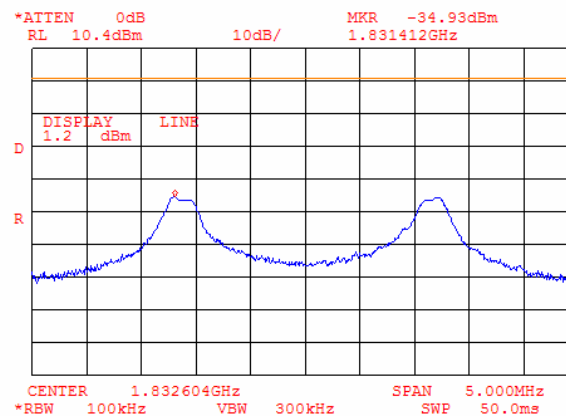


Plot 7.4.61 Spurious emission measurements band edge at high carrier frequency



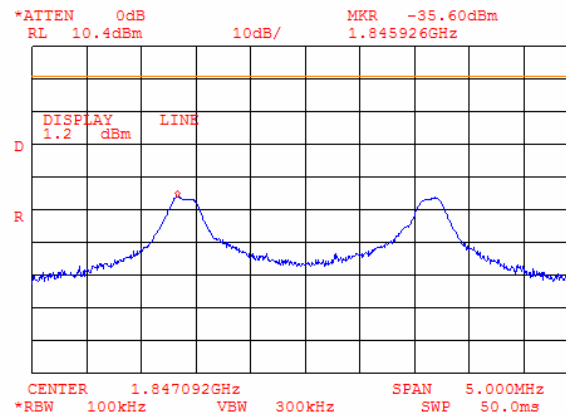
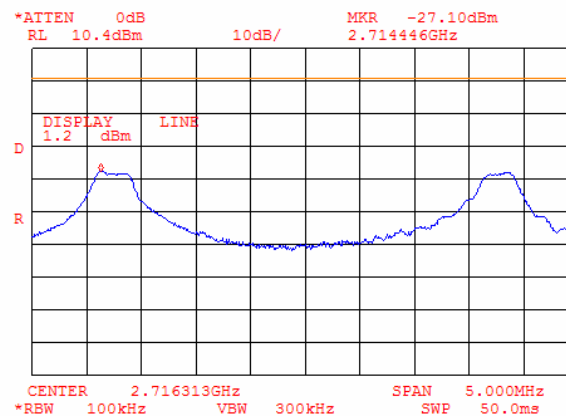


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.62 Conducted spurious emission measurements at the 2nd harmonic of low carrier frequencyPlot 7.4.63 Conducted spurious emission measurements at the 2nd harmonic of mid carrier frequency

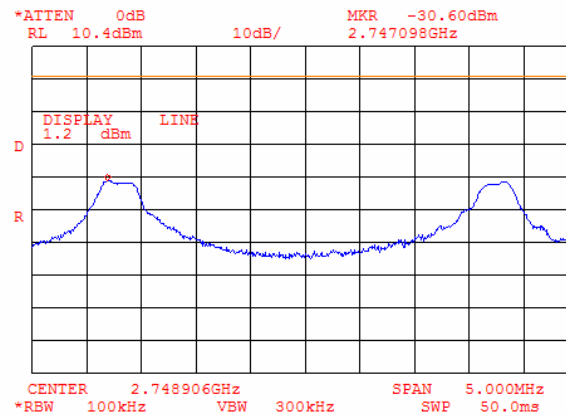
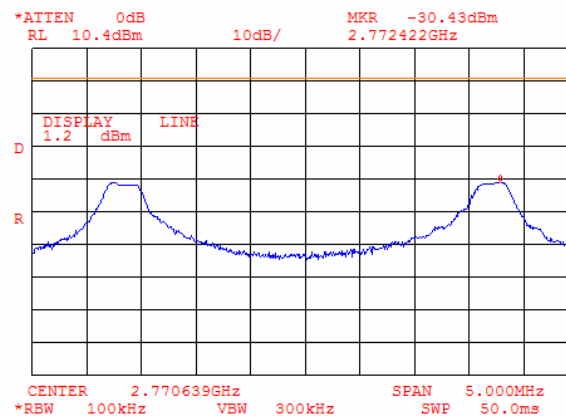


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.64 Conducted spurious emission measurements at the 2nd harmonic of high carrier frequencyPlot 7.4.65 Conducted spurious emission measurements at the 3rd harmonic of low carrier frequency

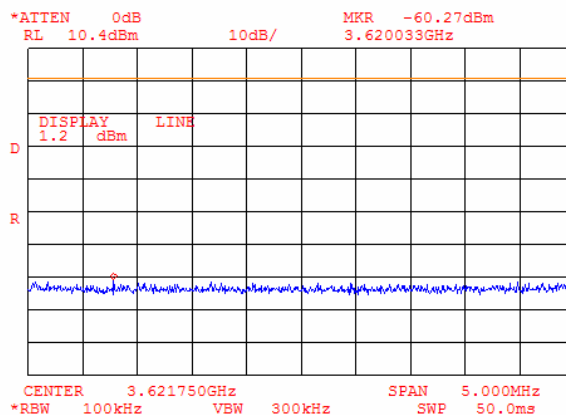
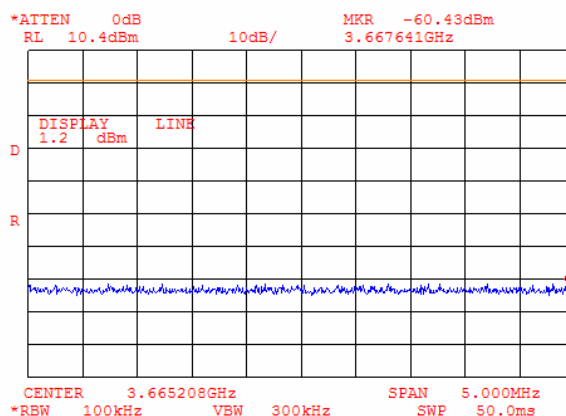


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.66 Conducted spurious emission measurements at the 3rd harmonic of mid carrier frequencyPlot 7.4.67 Conducted spurious emission measurements at the 3rd harmonic of high carrier frequency

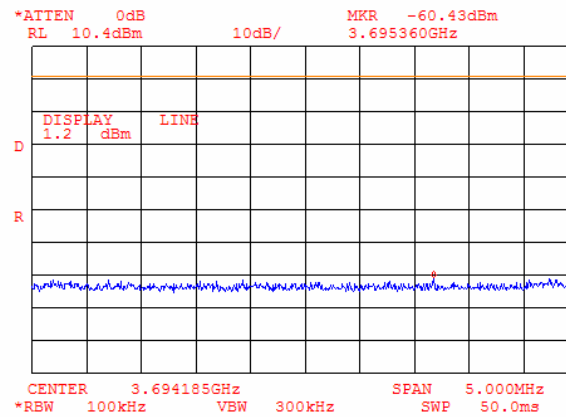
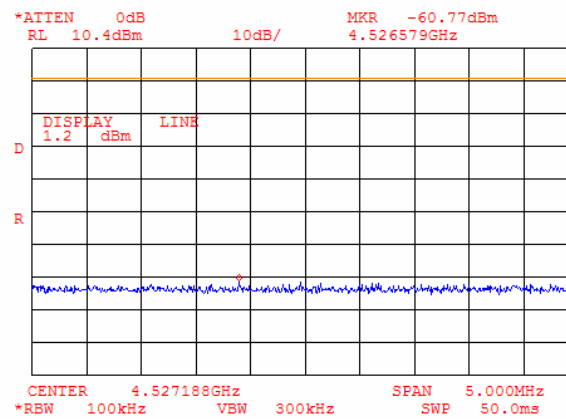


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.68 Conducted spurious emission measurements at the 4th harmonic of low carrier frequencyPlot 7.4.69 Conducted spurious emission measurements at the 4th harmonic of mid carrier frequency

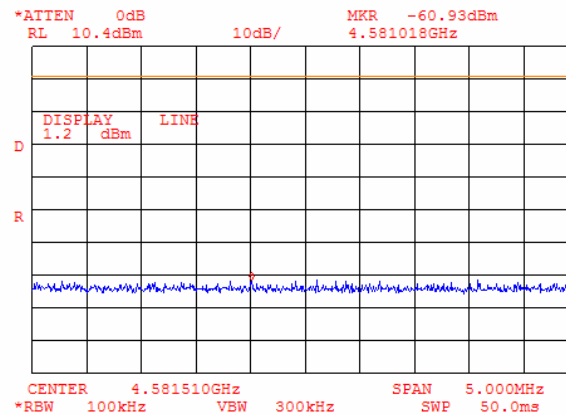
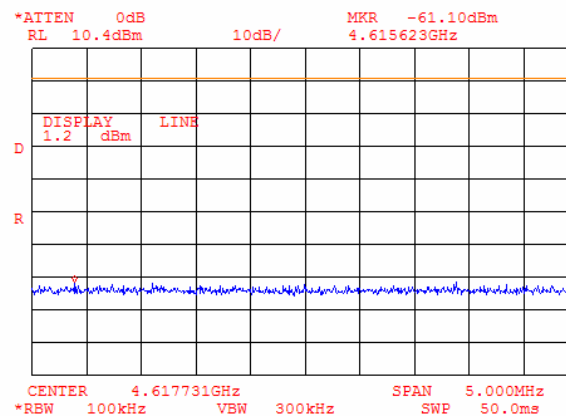


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.70 Conducted spurious emission measurements at the 4th harmonic of high carrier frequencyPlot 7.4.71 Conducted spurious emission measurements at the 5th harmonic of low carrier frequency

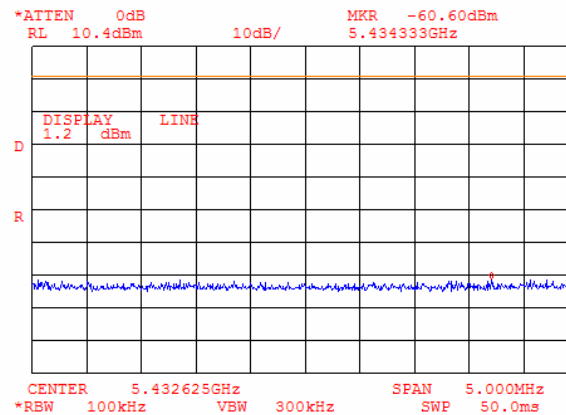
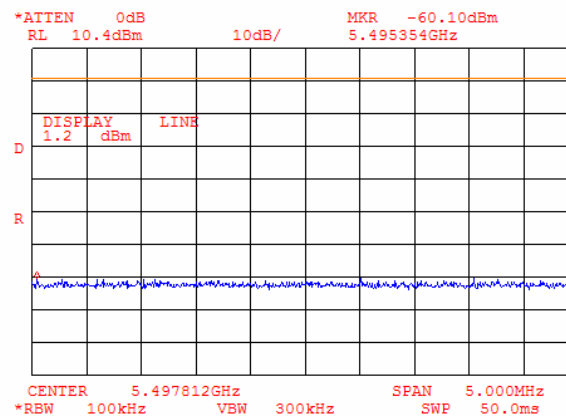


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.72 Conducted spurious emission measurements at the 5th harmonic of mid carrier frequencyPlot 7.4.73 Conducted spurious emission measurements at the 5th harmonic of high carrier frequency

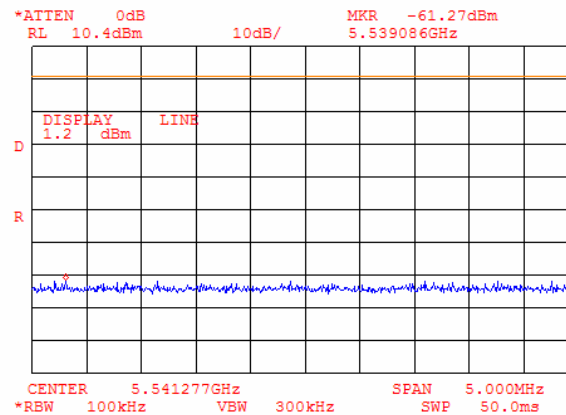
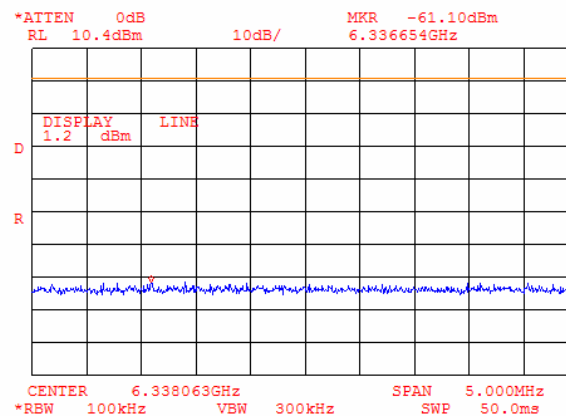


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.74 Conducted spurious emission measurements at the 6th harmonic of low carrier frequencyPlot 7.4.75 Conducted spurious emission measurements at the 6th harmonic of mid carrier frequency

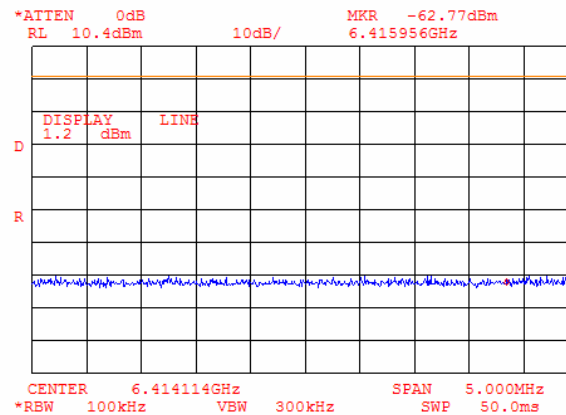
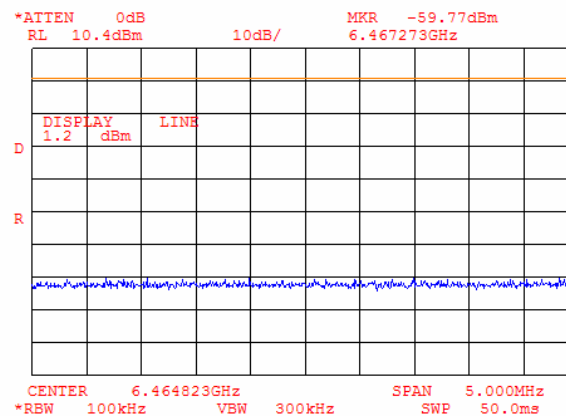


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.76 Conducted spurious emission measurements at the 6th harmonic of high carrier frequencyPlot 7.4.77 Conducted spurious emission measurements at the 7th harmonic of low carrier frequency

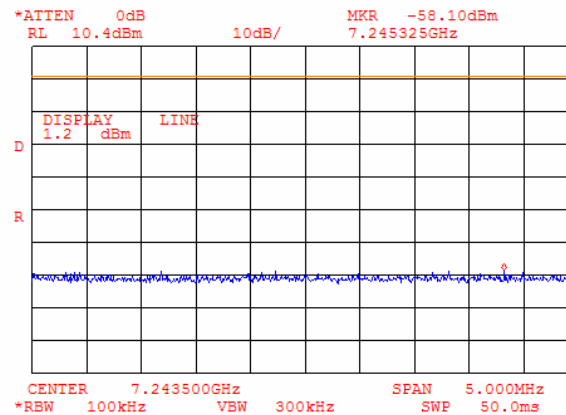
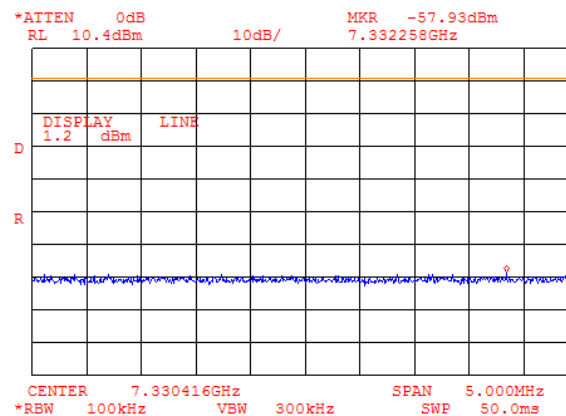


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.78 Conducted spurious emission measurements at the 7th harmonic of mid carrier frequencyPlot 7.4.79 Conducted spurious emission measurements at the 7th harmonic of high carrier frequency

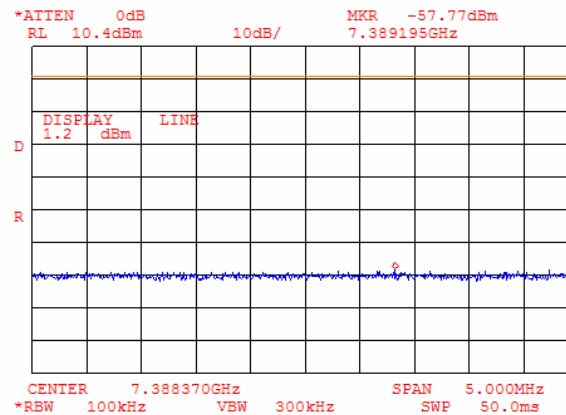
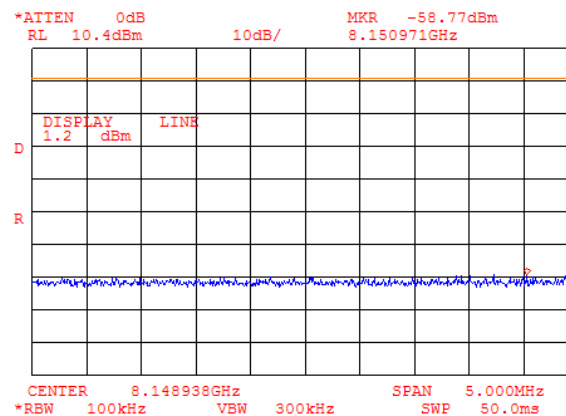


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.80 Conducted spurious emission measurements at the 8th harmonic of low carrier frequencyPlot 7.4.81 Conducted spurious emission measurements at the 8th harmonic of mid carrier frequency

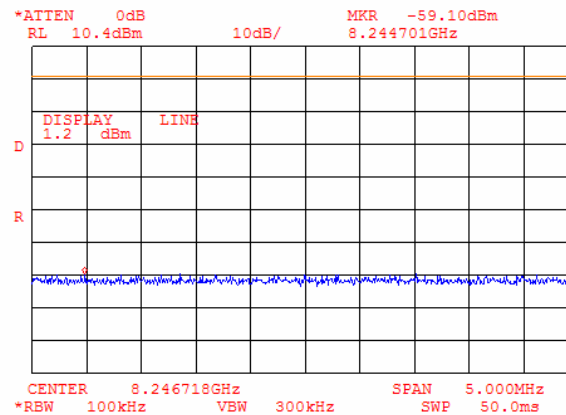
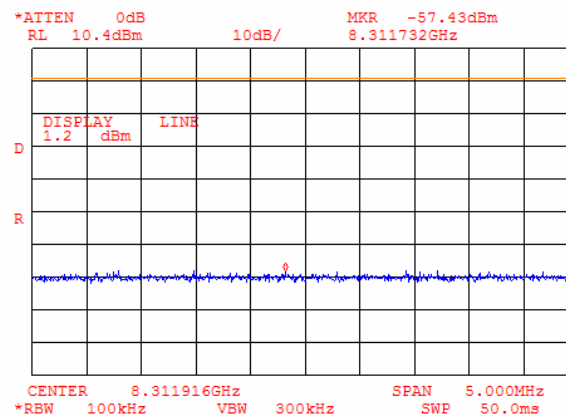


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.82 Conducted spurious emission measurements at the 8th harmonic of high carrier frequencyPlot 7.4.83 Conducted spurious emission measurements at the 9th harmonic of low carrier frequency

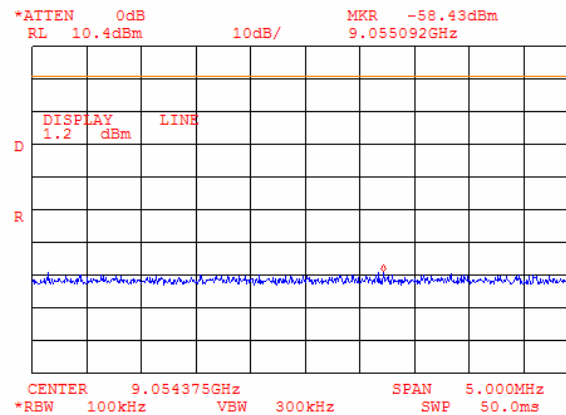
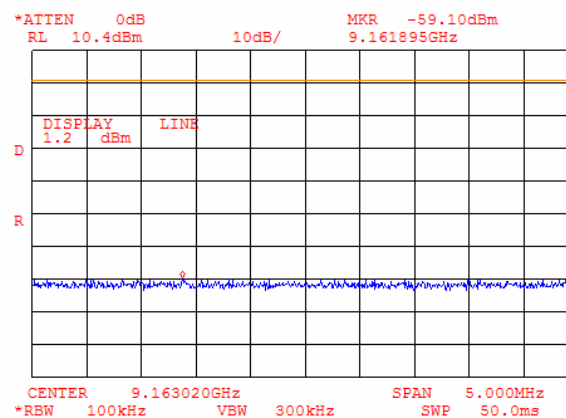


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.84 Conducted spurious emission measurements at the 9th harmonic of mid carrier frequencyPlot 7.4.85 Conducted spurious emission measurements at the 9th harmonic of high carrier frequency

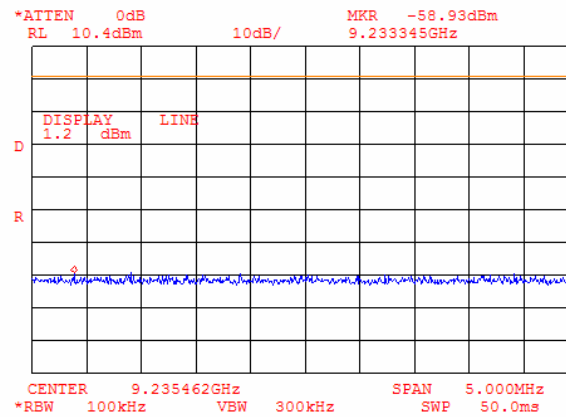


Test specification:	Section 15.247(c), Conducted spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:47:43 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.4.86 Conducted spurious emission measurements at the 10th harmonic of low carrier frequencyPlot 7.4.87 Conducted spurious emission measurements at the 10th harmonic of mid carrier frequency



Test specification:		Section 15.247(c), Conducted spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c)	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:47:43 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
			Power Supply: 120 VAC
Remarks:			

Plot 7.4.88 Conducted spurious emission measurements at the 10th harmonic of high carrier frequency



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

7.5 Field strength of spurious emissions

7.5.1 General

This test was performed to measure field strength of spurious emissions from the EUT. Specification test limits are given in Table 7.5.1.

Table 7.5.1 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:

$$\text{Lim}_{S2} = \text{Lim}_{S1} + 40 \log (S_1/S_2),$$

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

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

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

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

7.5.2.1 The EUT was set up as shown in Figure 7.5.1, energized and the performance check was conducted.

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

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

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

7.5.3.1 The EUT was set up as shown in Figure 7.5.2, energized and the performance check was conducted.

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

7.5.3.3 The worst test results (the lowest margins) were recorded 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:		Verdict: PASS	
Compliance			
Date & Time:		3/28/2005 10:24:57 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	
		Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Figure 7.5.1 Setup for spurious emission field strength measurements below 30 MHz

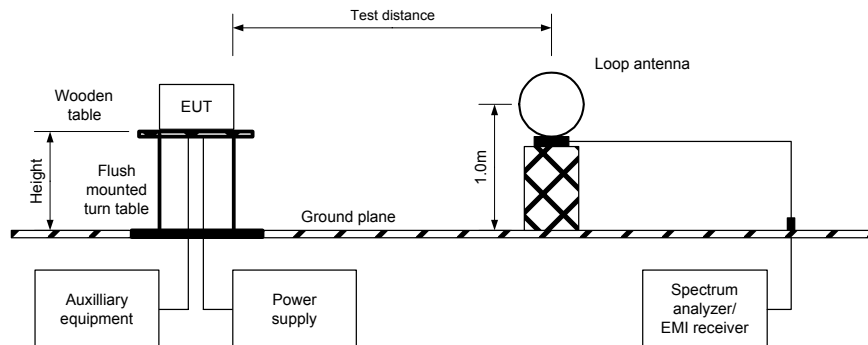
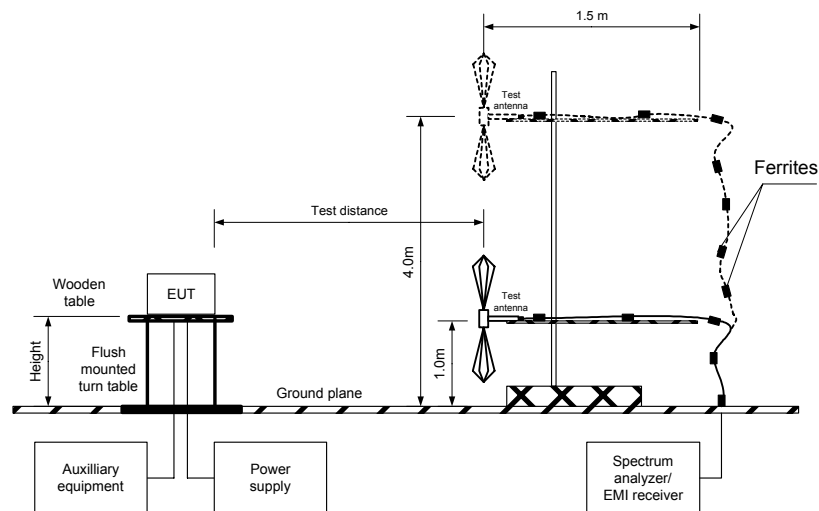


Figure 7.5.2 Setup for spurious emission field strength measurements above 30 MHz





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:	3/28/2005 10:24:57 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC	
Remarks:				

Table 7.5.2 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 902 MHz - 928 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 10000 MHz
 TEST DISTANCE: 3 m
 MODULATION: PSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 19.93 dBm at low carrier frequency
 19.83 dBm at mid carrier frequency
 19.73 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

Frequency, 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									
1810.9	43.34	Vertical	1.0	145	120.12	76.78	20.0	56.78	Pass
Mid carrier frequency									
1832.588	43.94	Vertical	1.0	112	119.82	75.88	20.0	55.88	Pass
5497.798	54.12	Vertical	1.0	185		65.70		45.70	
High carrier frequency									
1847.063	48.80	Vertical	1.0	122	119.69	70.89	20.0	50.89	Pass

*- 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:	3/28/2005 10:24:57 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC	
Remarks:				

Table 7.5.3 Field strength of emissions outside restricted bands

ASSIGNED FREQUENCY: 902 MHz - 928 MHz
 INVESTIGATED FREQUENCY RANGE: 0.009 – 10000 MHz
 TEST DISTANCE: 3 m
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 18.63 dBm at low carrier frequency
 18.63 dBm at mid carrier frequency
 18.46 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 100 kHz
 VIDEO BANDWIDTH: 300 kHz
 TEST ANTENNA TYPE: Active loop (9 kHz – 30 MHz)
 Biconilog (30 MHz – 1000 MHz)
 Double ridged guide (above 1000 MHz)

Frequency, 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									
1812.300	40.93	Vertical	1.0	201	122.76	81.83	20.0	61.83	Pass
Mid carrier frequency									
1833.675	40.81	Vertical	1.0	156	121.60	80.79	20.0	60.79	Pass
5494.273	53.79	Vertical	1.0	160		67.81		47.81	
High carrier frequency									
1848.288	42.56	Vertical	1.0	137	121.44	78.88	20.0	58.88	Pass

*- 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:	3/28/2005 10:24:57 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC	
Remarks:				

Table 7.5.4 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 902 MHz - 928 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 – 10000 MHz
 TEST DISTANCE: 3 m
 MODULATION: PSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 900 kbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 19.93 dBm at low carrier frequency
 19.83 dBm at mid carrier frequency
 19.73 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Low carrier frequency											
5432.650	Vertical	1.0	177	53.81	74.00	-20.19	45.11	45.11	54.00	-8.89	Pass
8150.830	Vertical	1.0	0	57.75	74.00	-16.25	45.35	45.35	54.00	-8.65	
9039.370	Vertical	1.0	0	57.73	74.00	-16.27	45.73	45.73	54.00	-8.27	
Mid carrier frequency											
8224.310	Vertical	1.0	0	59.35	74.00	-14.65	45.30	45.30	54.00	-8.70	Pass
9171.320	Vertical	1.0	0	57.93	74.00	-16.07	44.83	44.83	54.00	-9.17	
High carrier frequency											
2770.665	Vertical	1.0	101	48.40	74.00	-25.60	37.65	37.65	54.00	-16.35	Pass
3693.980	Vertical	1.0	188	48.72	74.00	-25.28	36.62	36.62	54.00	-17.38	
8287.210	Vertical	1.0	0	57.75	74.00	-16.25	45.35	45.35	54.00	-8.65	

*- 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:	3/28/2005 10:24:57 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC	
Remarks:				

Table 7.5.5 Field strength of spurious emissions above 1 GHz within restricted bands

ASSIGNED FREQUENCY: 902 MHz - 928 MHz
 INVESTIGATED FREQUENCY RANGE: 1000 – 10000 MHz
 TEST DISTANCE: 3 m
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps
 DUTY CYCLE: 100 %
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 18.63 dBm at low carrier frequency
 18.63 dBm at mid carrier frequency
 18.46 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 1000 kHz
 TEST ANTENNA TYPE: Double ridged guide

Frequency, MHz	Antenna		Azimuth, degrees*	Peak field strength(VBW=3 MHz)			Average field strength(VBW=10 Hz)				Verdict
	Polarization	Height, m		Measured, dB(μV/m)	Limit, dB(μV/m)	Margin, dB**	Measured, dB(μV/m)	Calculated, dB(μV/m)	Limit, dB(μV/m)	Margin, dB***	
Low carrier frequency											
5429.200	Vertical	1.0	161	56.51	74.00	-17.49	44.81	44.81	54.00	-9.19	Pass
8153.230	Vertical	1.0	0	57.85	74.00	-16.15	45.05	45.05	54.00	-8.95	
9065.270	Vertical	1.0	0	58.13	74.00	-15.87	45.63	45.63	54.00	-8.37	
Mid carrier frequency											
8247.710	Vertical	1.0	0	58.75	74.00	-15.25	45.95	45.95	54.00	-8.05	Pass
9166.820	Vertical	1.0	0	57.33	74.00	-16.67	44.83	44.83	54.00	-9.17	
High carrier frequency											
2772.415	Vertical	1.0	123	49.17	74.00	-24.83	37.26	37.26	54.00	-16.74	Pass
3696.488	Vertical	1.0	174	50.11	74.00	-23.89	36.80	36.80	54.00	-17.20	
8334.810	Vertical	1.0	0	57.25	74.00	-16.75	44.75	44.75	54.00	-9.25	

Table 7.5.6 Average factor calculation

Transmission pulse		Transmission burst		Transmission train duration, ms	Average factor, dB
Duration, ms	Period, ms	Duration, ms	Period, ms		
100%					0

*- Average factor was calculated as follows

for pulse train shorter than 100 ms:

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

for pulse train longer than 100 ms:

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



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:	3/28/2005 10:24:57 AM			
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC	
Remarks:				

Table 7.5.7 Field strength of spurious emissions below 1 GHz within restricted bands

ASSIGNED FREQUENCY:	902 MHz - 928 MHz
INVESTIGATED FREQUENCY RANGE:	0.009 – 1000 MHz
TEST DISTANCE:	3 m
MODULATION:	FSK / PSK
MODULATING SIGNAL:	PRBS
BIT RATE:	60 kbps
DUTY CYCLE:	100 %
TRANSMITTER OUTPUT POWER SETTINGS:	Maximum
TRANSMITTER OUTPUT POWER:	18.63 / 19.93 dBm at low carrier frequency 18.63 / 19.83 dBm at mid carrier frequency 18.46 / 19.73 dBm at high carrier frequency
RESOLUTION BANDWIDTH:	0.2 kHz (9 kHz – 150 kHz) 9.0 kHz (150 kHz – 30 MHz) 120 kHz (30 MHz – 1000 MHz)
VIDEO BANDWIDTH:	> Resolution bandwidth
TEST ANTENNA TYPE:	Active loop (9 kHz – 30 MHz) Biconilog (30 MHz – 1000 MHz)

Frequency, 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*				
128.875000	39.76	33.38	43.50	-10.12	V	1.2	110	Pass
168.014379	43.87	40.03	43.50	-3.47	V	1.1	212	

*- Margin = Measured emission - specification limit.

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

Table 7.5.8 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 0569	HL 0589	HL 0592	HL 0593
HL 0594	HL 0604	HL 0784	HL 0813	HL 1424	HL 1430	HL 1552	HL 1848
HL 1947	HL 1984	HL 2009	HL 2259				

Full description is given in Appendix A.



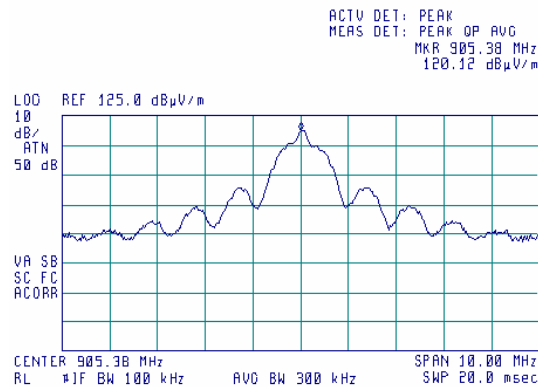
Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

PSK mode measurements

Plot 7.5.1 Radiated emission measurements at the low carrier frequency

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

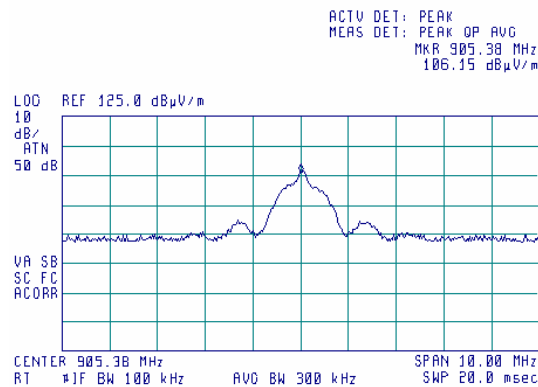
14:36:22 16 MAR 2005



Plot 7.5.2 Radiated emission measurements at the low carrier frequency

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

14:38:51 16 MAR 2005



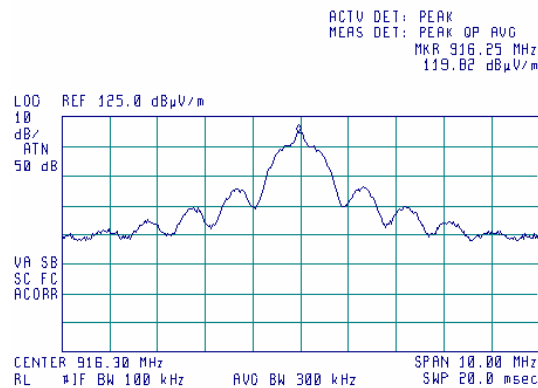


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.3 Radiated emission measurements at the mid carrier frequency

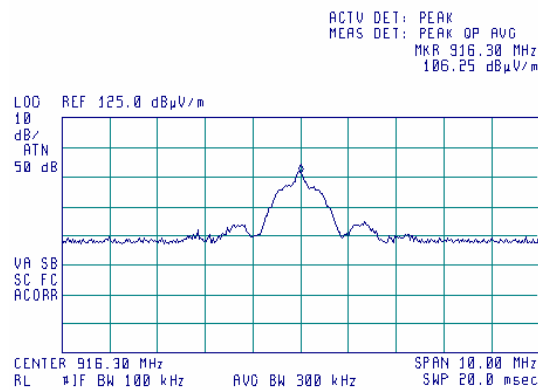
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

14:43:48 16 MAR 2005

**Plot 7.5.4 Radiated emission measurements at the mid carrier frequency**

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

14:41:59 16 MAR 2005



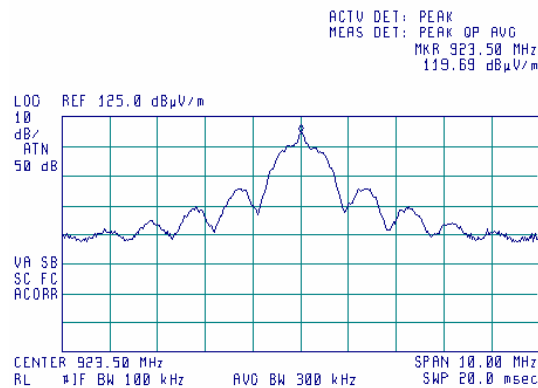


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.5 Radiated emission measurements at the high carrier frequency

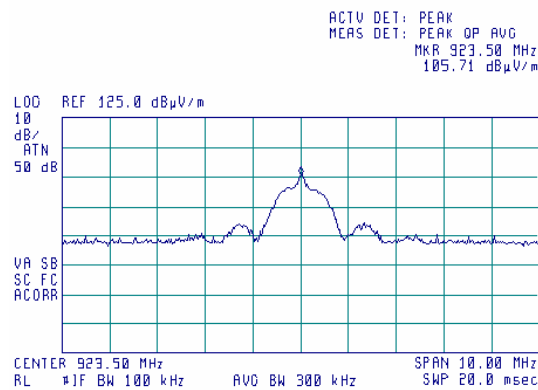
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

16:31:34 16 MAR 2005

**Plot 7.5.6 Radiated emission measurements at the high carrier frequency**

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

16:30:02 16 MAR 2005



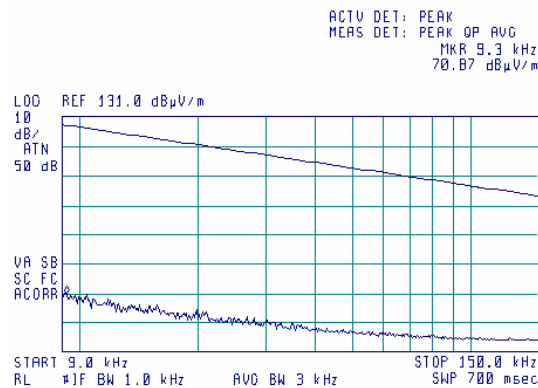


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.7 Radiated emission measurements from 9 to 150 kHz at the low carrier frequency

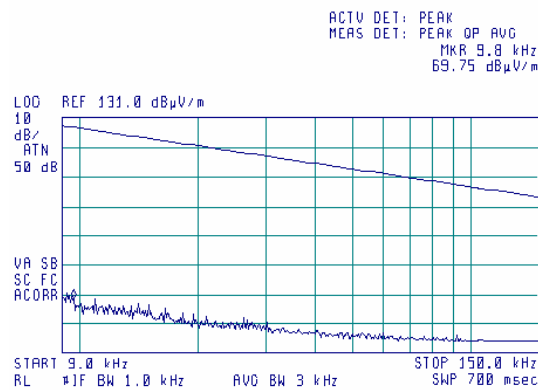
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

16:52:07 16 MAR 2005

**Plot 7.5.8 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

16:52:52 16 MAR 2005



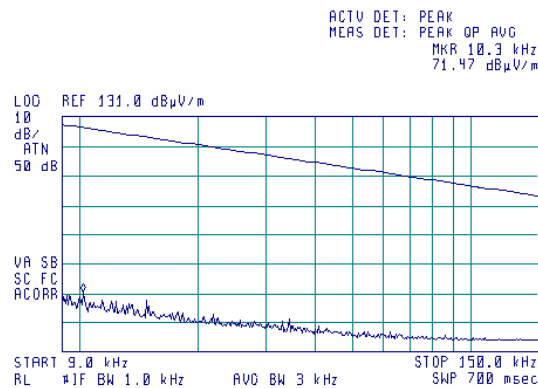


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.9 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

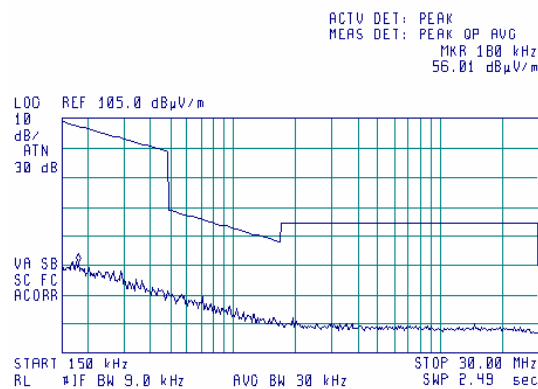
16:53:51 16 MAR 2005



Plot 7.5.10 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

17:10:01 16 MAR 2005



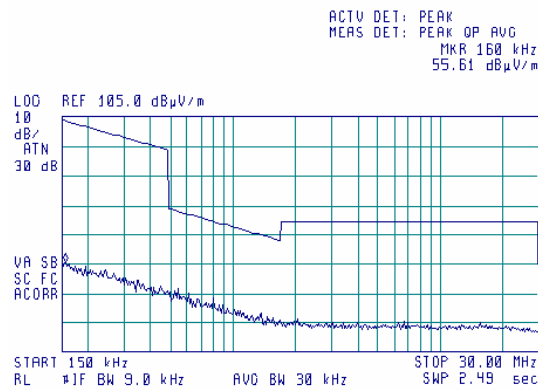


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.11 Radiated emission measurements from 0.15 to 30 MHz at the mid carrier frequency

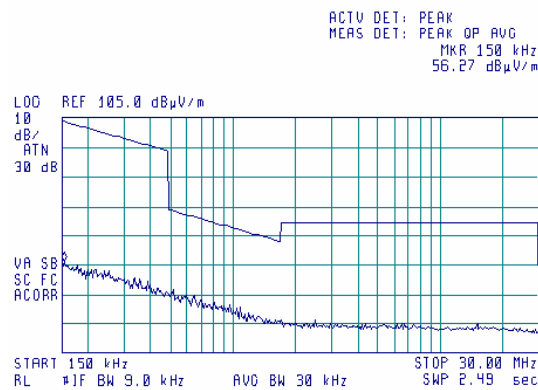
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

17:10:57 16 MAR 2005

**Plot 7.5.12 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

17:12:00 16 MAR 2005



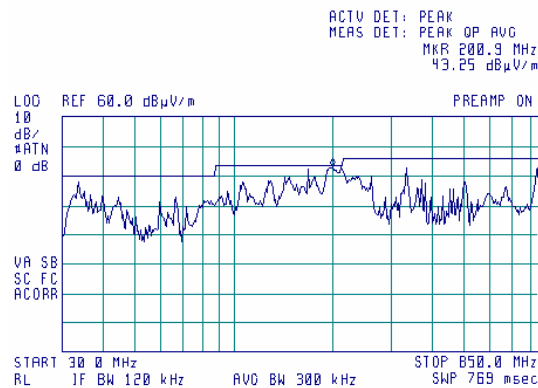


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.13 Radiated emission measurements from 30 to 850 MHz at the low carrier frequency

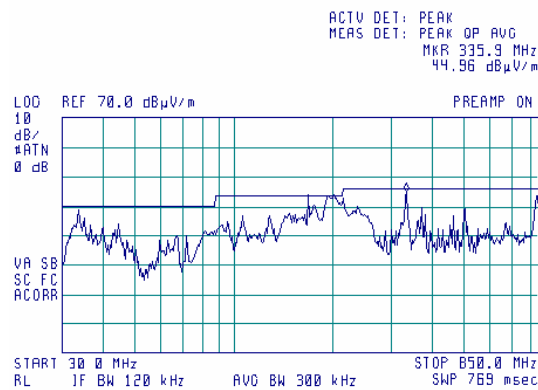
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

13:57:23 16 MAR 2005

**Plot 7.5.14 Radiated emission measurements from 30 to 850 MHz at the mid carrier frequency**

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

14:47:35 16 MAR 2005



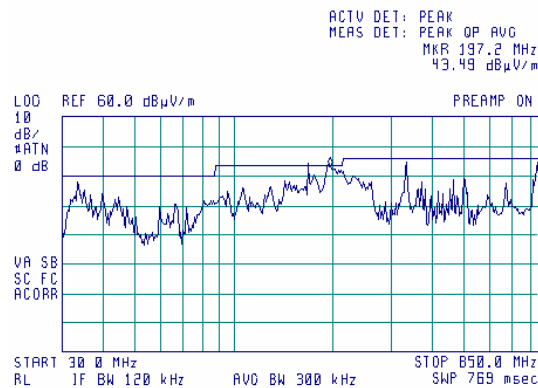


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.15 Radiated emission measurements from 30 to 850 MHz at the high carrier frequency

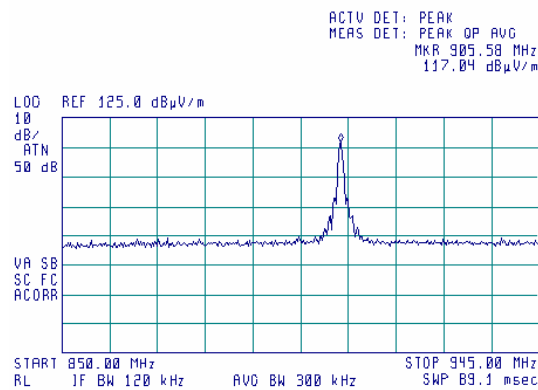
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

15:04:24 16 MAR 2005

**Plot 7.5.16 Radiated emission measurements from 850 to 945 MHz at the low carrier frequency**

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

14:56:02 16 MAR 2005





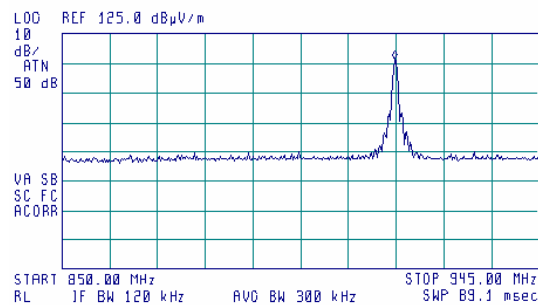
Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.17 Radiated emission measurements from 850 to 945 MHz at the mid carrier frequency

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

14:54:11 16 MAR 2005

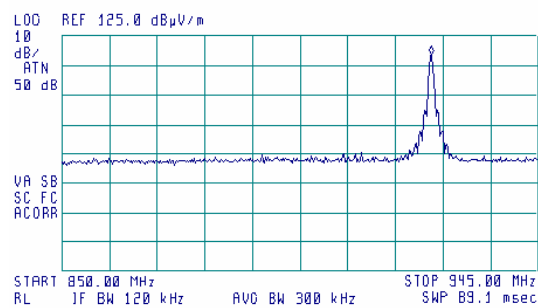
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 916.26 MHz
116.54 dBμV/m

**Plot 7.5.18 Radiated emission measurements from 850 to 945 MHz at the high carrier frequency**

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

17:36:16 16 MAR 2005

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 923.63 MHz
110.62 dBμV/m





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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

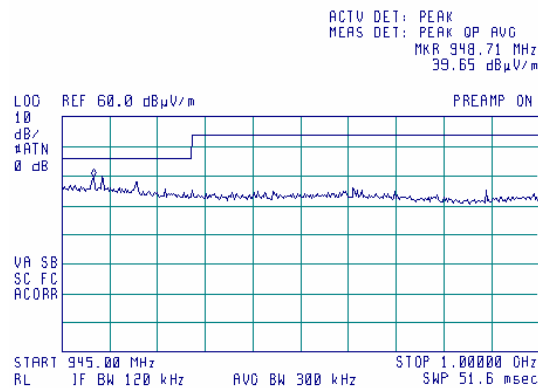
Plot 7.5.19 Radiated emission measurements from 945 to 1000 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(Q) 14:57:50 16 MAR 2005

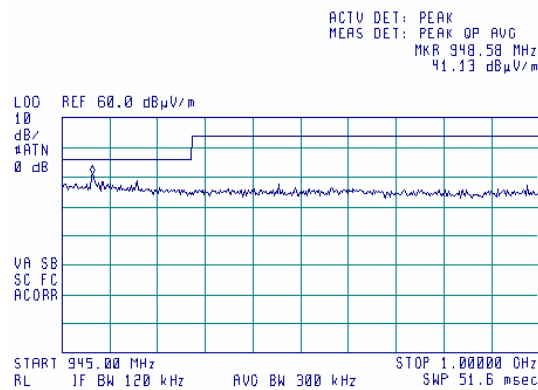
**Plot 7.5.20 Radiated emission measurements from 945 to 1000 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(Q) 14:51:59 16 MAR 2005



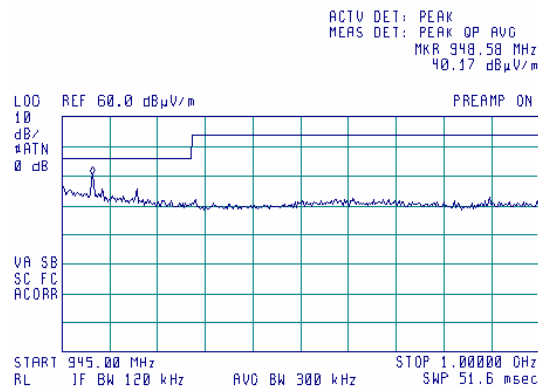


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.21 Radiated emission measurements from 945 to 1000 MHz at the high carrier frequency

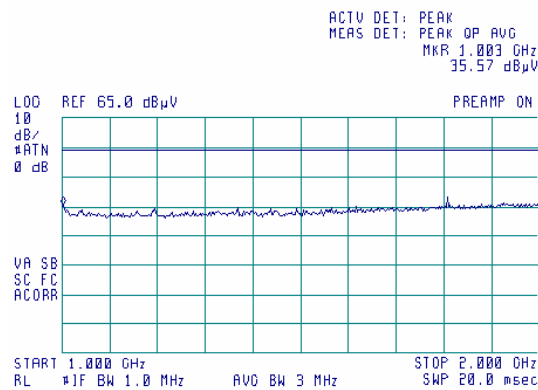
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

14:59:52 16 MAR 2005

**Plot 7.5.22 Radiated emission measurements from 1000 to 2000 MHz at the low carrier frequency**

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

09:04:30 16 MAR 2005



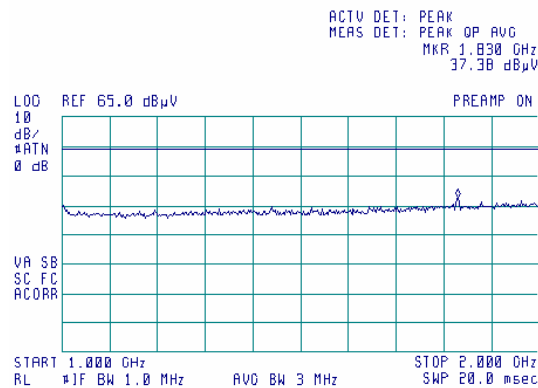


Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 10:24:57 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
Remarks:		Power Supply: 120 VAC	

Plot 7.5.23 Radiated emission measurements from 1000 to 2000 MHz at the mid carrier frequency

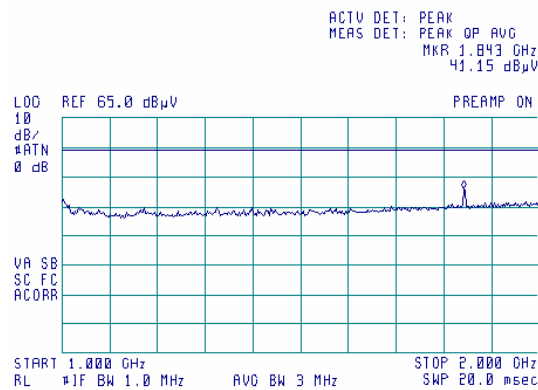
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

09:00:23 16 MAR 2005

**Plot 7.5.24 Radiated emission measurements from 1000 to 2000 MHz at the high carrier frequency**

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

09:10:11 16 MAR 2005



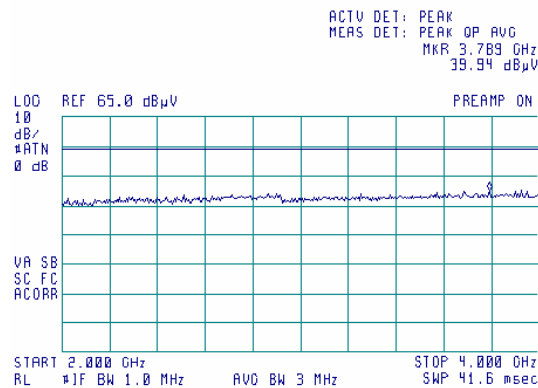


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.25 Radiated emission measurements from 2000 to 4000 MHz at the low carrier frequency

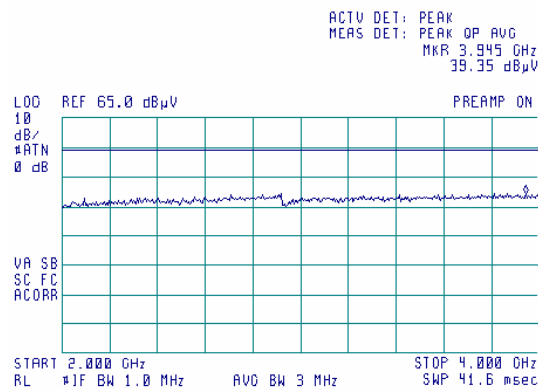
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

09:14:47 16 MAR 2005

**Plot 7.5.26 Radiated emission measurements from 2000 to 4000 MHz at the mid carrier frequency**

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

09:15:32 16 MAR 2005



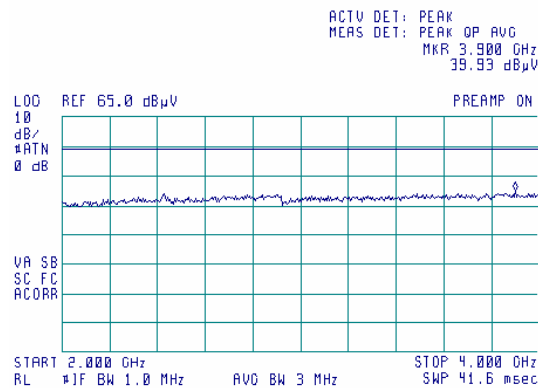


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.27 Radiated emission measurements from 2000 to 4000 MHz at the high carrier frequency

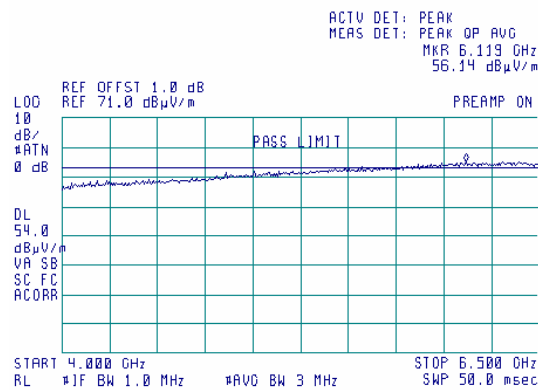
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

09:16:13 16 MAR 2005

**Plot 7.5.28 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency**

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

14:42:09 15 MAR 2005



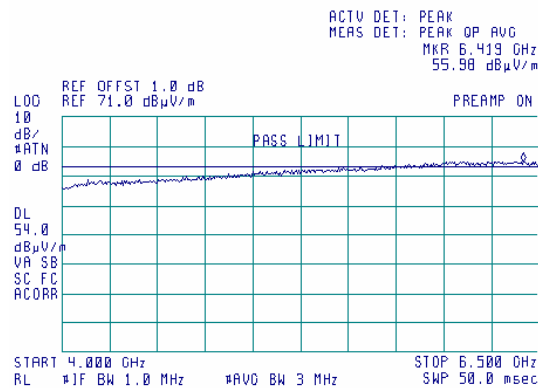


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.29 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency

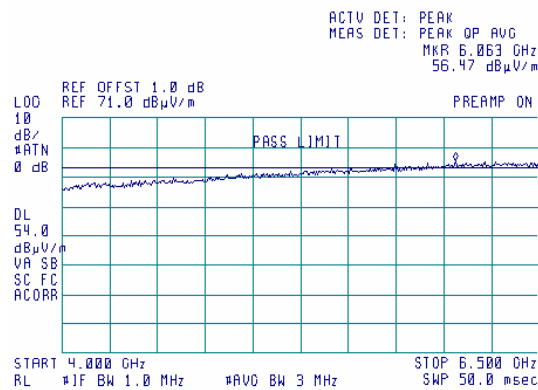
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

14:55:30 15 MAR 2005

**Plot 7.5.30 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency**

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

15:02:24 15 MAR 2005



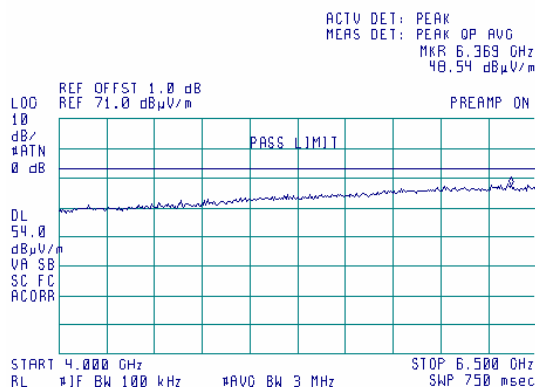


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.31 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
Resolution Bandwidth 100 kHz

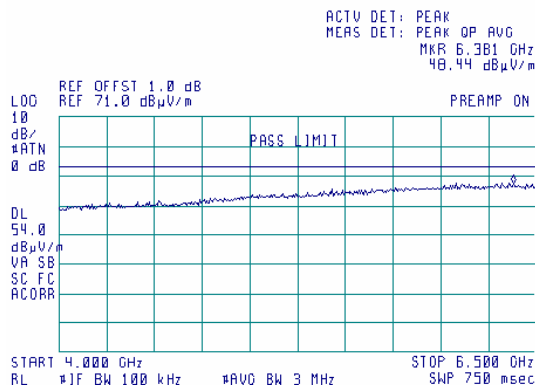
14:47:59 15 MAR 2005



Plot 7.5.32 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
Resolution Bandwidth 100 kHz

14:52:22 15 MAR 2005



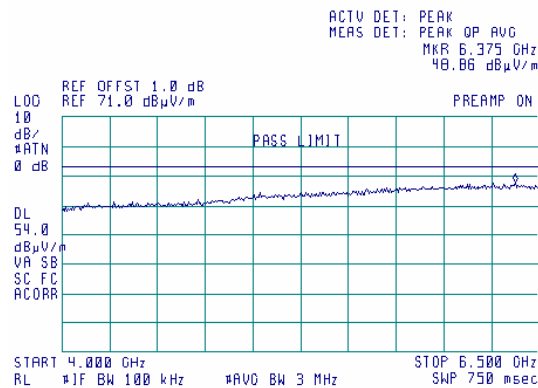


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

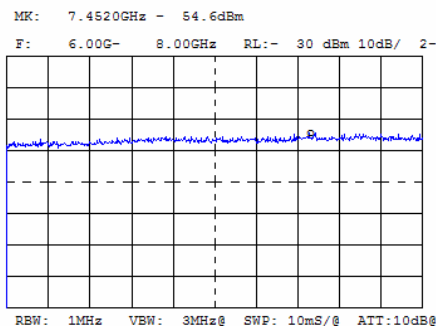
Plot 7.5.33 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
Resolution Bandwidth 100 kHz

15:05:20 15 MAR 2005

**Plot 7.5.34 Radiated emission measurements from 6.0 to 8.0 GHz, low frequency channel**

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -54.6 \text{ dBm} + 42.9 \text{ dB(1/m)} + 0.83 \text{ dB} - 43.22 \text{ dB} + 107 \text{ dB} = 52.91 \text{ dB}(\mu V/m)$$

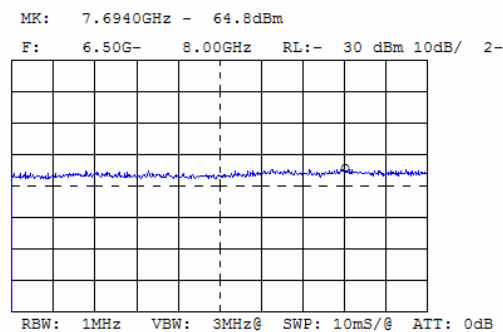
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:		3/28/2005 10:24:57 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.35 Radiated emission measurements from 6.5 to 8.0 GHz, mid frequency channel

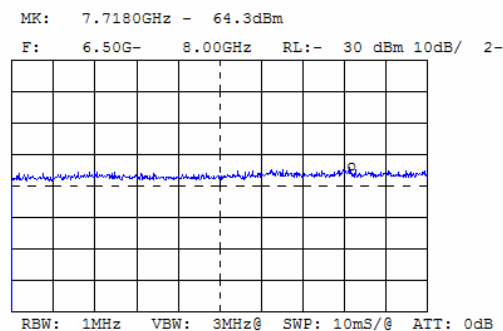
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -64.8 \text{ dBm} + 42.9 \text{ dB(1/m)} + 0.83 \text{ dB} - 43.22 \text{ dB} + 107 \text{ dB} = 42.71 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)

Plot 7.5.36 Radiated emission measurements from 6.5 to 8.0 GHz, high frequency channel

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



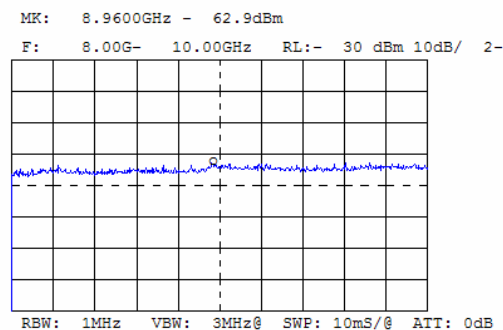
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -64.3 \text{ dBm} + 42.9 \text{ dB(1/m)} + 0.83 \text{ dB} - 43.22 \text{ dB} + 107 \text{ dB} = 43.21 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.37 Radiated emission measurements from 8.0 to 10.0 GHz, low frequency channel

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



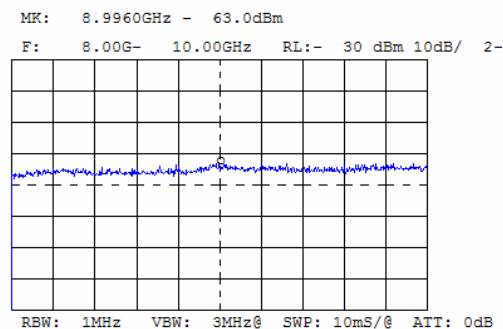
$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -62.9 \text{ dBm} + 42.8 \text{ dB(1/m)} + 0.83 \text{ dB} - 36.77 \text{ dB} + 107 \text{ dB} = 50.96 \text{ dB}(\mu V/m)$$

$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$

Plot 7.5.38 Radiated emission measurements from 8.0 to 10.0 GHz, mid frequency channel

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -63.0 \text{ dBm} + 42.8 \text{ dB(1/m)} + 0.83 \text{ dB} - 36.77 \text{ dB} + 107 \text{ dB} = 50.86 \text{ dB}(\mu V/m)$$

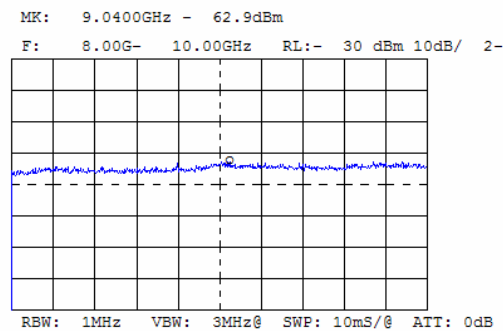
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.39 Radiated emission measurements from 8.0 to 10.0 GHz, high frequency channel

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



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -62.9 \text{ dBm} + 42.8 \text{ dB(1/m)} + 0.83 \text{ dB} - 36.77 \text{ dB} + 107 \text{ dB} = 50.96 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)

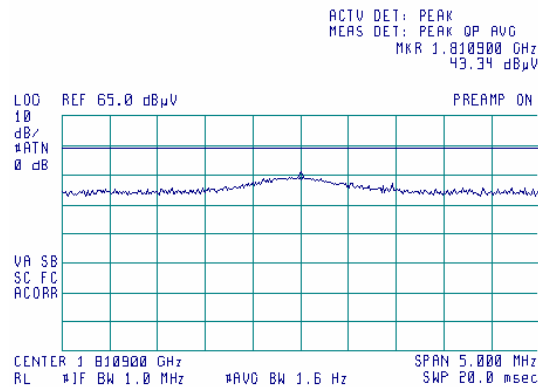


Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 10:24:57 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
Remarks:		Power Supply: 120 VAC	

Plot 7.5.40 Radiated emission measurements at the second harmonic of low carrier frequency

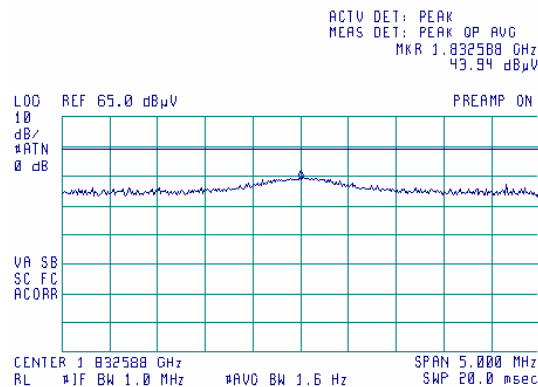
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

18:33:42 15 MAR 2005

**Plot 7.5.41 Radiated emission measurements at the second harmonic of mid carrier frequency**

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

18:29:25 15 MAR 2005





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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

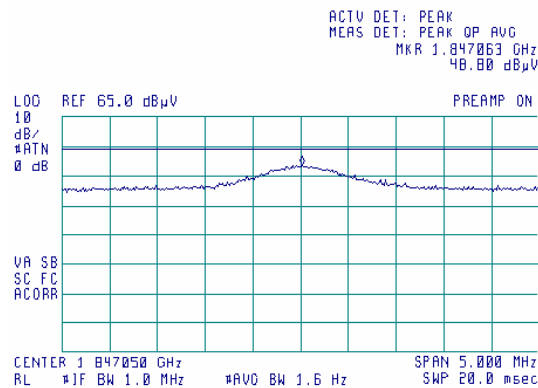
Plot 7.5.42 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(Q) 18:24:44 15 MAR 2005

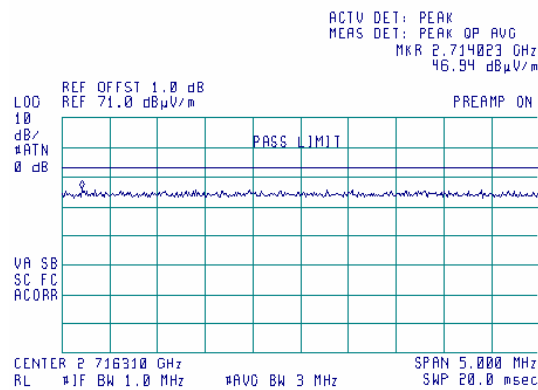
**Plot 7.5.43 Radiated emission measurements at the third harmonic of low carrier frequency**

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(Q) 17:53:04 15 MAR 2005



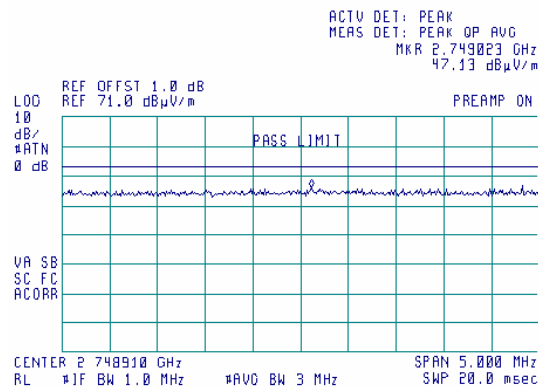


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.44 Radiated emission measurements at the third harmonic of mid carrier frequency

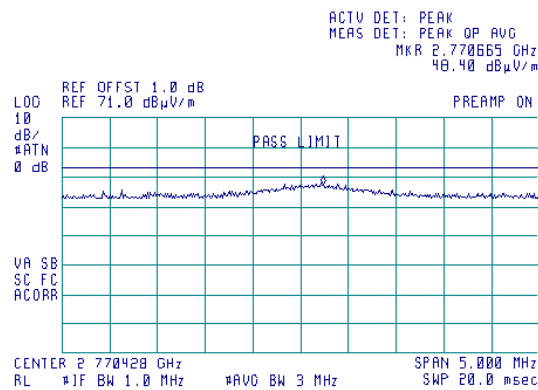
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

17:57:45 15 MAR 2005

**Plot 7.5.45 Radiated emission measurements at the third harmonic of high carrier frequency**

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

18:09:52 15 MAR 2005



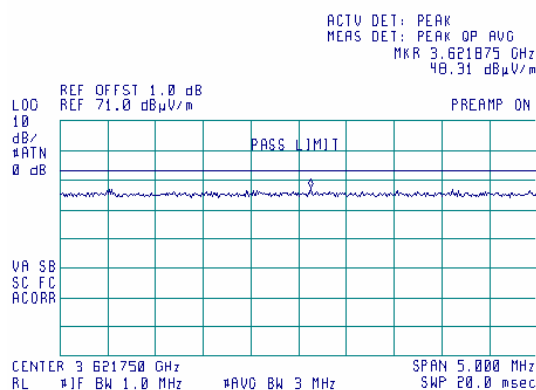


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.46 Radiated emission measurements at the forth harmonic of low carrier frequency

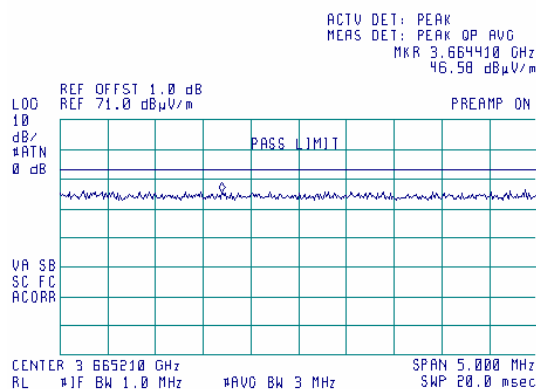
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

17:54:57 15 MAR 2005

**Plot 7.5.47 Radiated emission measurements at the forth harmonic of mid carrier frequency**

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

18:00:17 15 MAR 2005



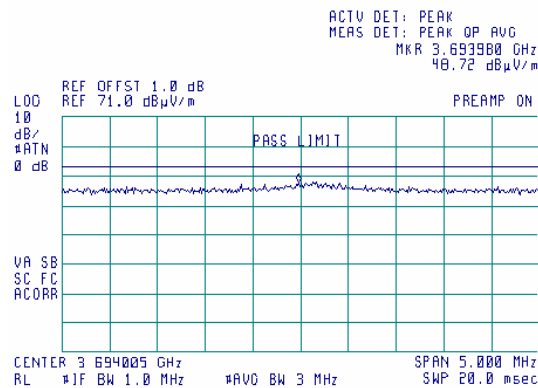


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.48 Radiated emission measurements at the forth harmonic of high carrier frequency

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

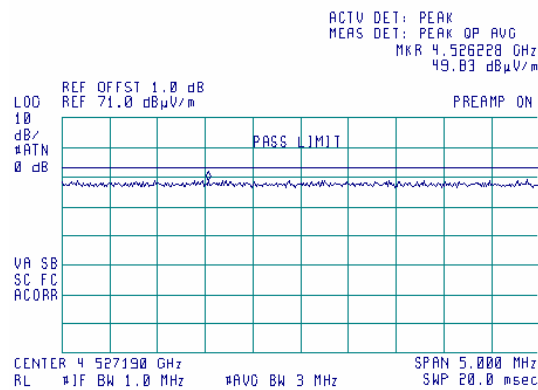
18:05:38 15 MAR 2005



Plot 7.5.49 Radiated emission measurements at the fifth harmonic of low carrier frequency

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

15:56:55 15 MAR 2005



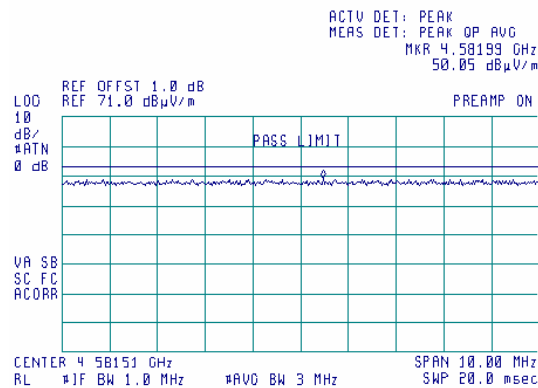


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.50 Radiated emission measurements at the fifth harmonic of mid carrier frequency

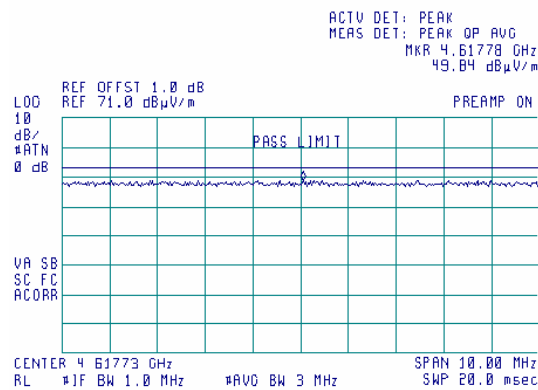
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

15:25:09 15 MAR 2005

**Plot 7.5.51 Radiated emission measurements at the fifth harmonic of high carrier frequency**

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

15:28:31 15 MAR 2005

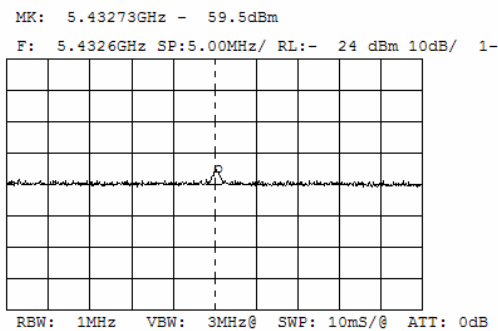




Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.52 Radiated emission measurements at the sixth harmonic of low carrier frequency

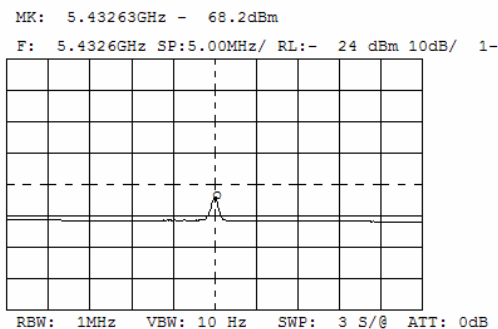
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.5 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 53.81 \text{ dB}(\mu V/m)$
Limit = 74 dB($\mu V/m$)

Plot 7.5.53 Radiated emission measurements at the sixth harmonic of low carrier frequency

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



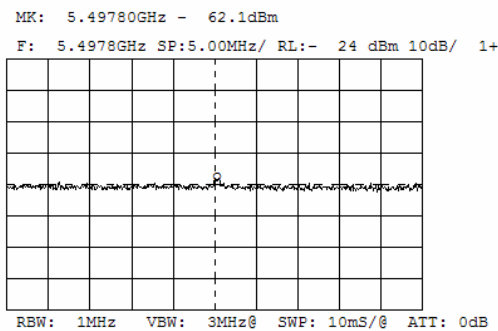
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -68.2 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 45.11 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.54 Radiated emission measurements at the sixth harmonic of mid carrier frequency

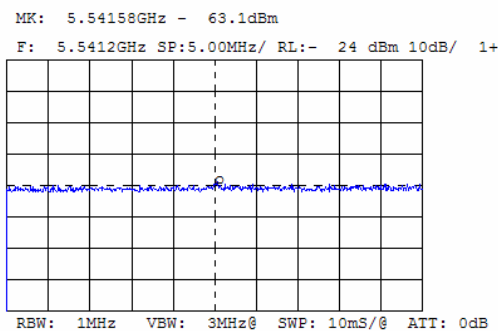
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -62.1 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 51.21 \text{ dB}(\mu V/m)$
Limit = $119.82 \text{ dB}(\mu V/m) - 20 \text{ dB} = 99.82 \text{ dB}(\mu V/m)$

Plot 7.5.55 Radiated emission measurements at the sixth harmonic of high carrier frequency

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



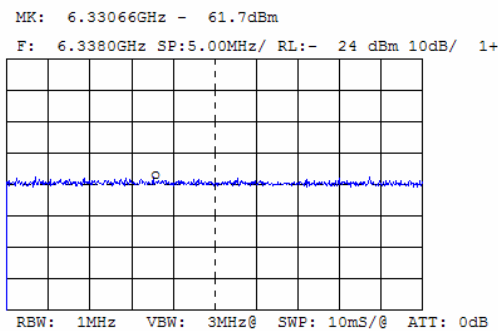
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -63.1 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 50.21 \text{ dB}(\mu V/m)$
Limit = $119.69 \text{ dB}(\mu V/m) - 20 \text{ dB} = 99.69 \text{ dB}(\mu V/m)$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.56 Radiated emission measurements at the seventh harmonic of low carrier frequency

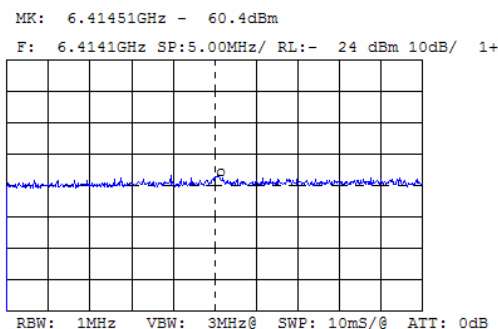
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -61.7 \text{ dBm} + 35.8 \text{ dB(1/m)} + 8.16 \text{ dB} - 38.93 \text{ dB} + 0.36 \text{ dB} + 107 \text{ dB} = 50.69 \text{ dB}(\mu V/m)$
Limit = $120.12 \text{ dB}(\mu V/m) - 20 \text{ dB} = 100.12 \text{ dB}(\mu V/m)$

Plot 7.5.57 Radiated emission measurements at the seventh harmonic of mid carrier frequency

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



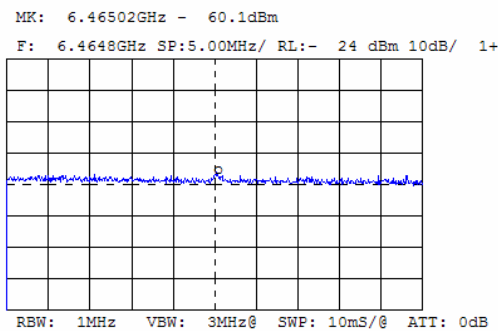
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.4 \text{ dBm} + 35.8 \text{ dB(1/m)} + 8.16 \text{ dB} - 38.93 \text{ dB} + 0.36 \text{ dB} + 107 \text{ dB} = 51.99 \text{ dB}(\mu V/m)$
Limit = $99.82 \text{ dB}(\mu V/m)$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.58 Radiated emission measurements at the seventh harmonic of high carrier frequency

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



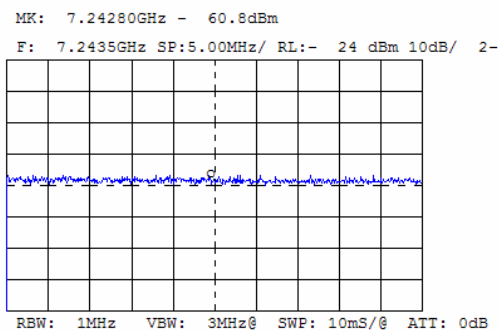
$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -60.1 \text{ dBm} + 35.8 \text{ dB(1/m)} + 8.16 \text{ dB} - 38.93 \text{ dB} + 0.36 \text{ dB} + 107 \text{ dB} = 52.29 \text{ dB}(\mu V/m)$$

$$\text{Limit} = 99.69 \text{ dB}(\mu V/m)$$

Plot 7.5.59 Radiated emission measurements at the eighth harmonic of low carrier frequency

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -60.8 \text{ dBm} + 36.2 \text{ dB(1/m)} + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 52.09 \text{ dB}(\mu V/m)$$

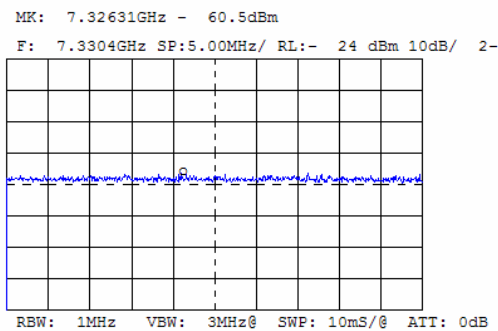
$$\text{Limit} = 100.12 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.60 Radiated emission measurements at the eighth harmonic of mid carrier frequency

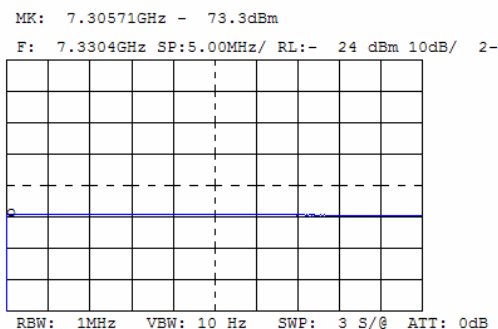
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = \text{SA reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.5 \text{ dBm} + 36.2\text{dB}(1/\text{m}) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 52.39 \text{ dB}(\mu V/\text{m})$
Limit = 74 dB($\mu V/\text{m}$)

Plot 7.5.61 Radiated emission measurements at the eighth harmonic of mid carrier frequency

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



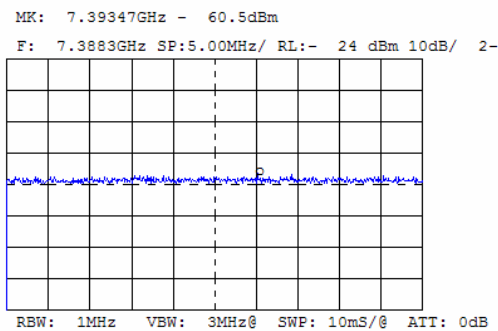
$E \{dB(\mu V/m)\} = \text{SA reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -73.3 \text{ dBm} + 36.2\text{dB}(1/\text{m}) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 39.59 \text{ dB}(\mu V/\text{m})$
Limit = 54 dB($\mu V/\text{m}$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.62 Radiated emission measurements at the eighth harmonic of high carrier frequency

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



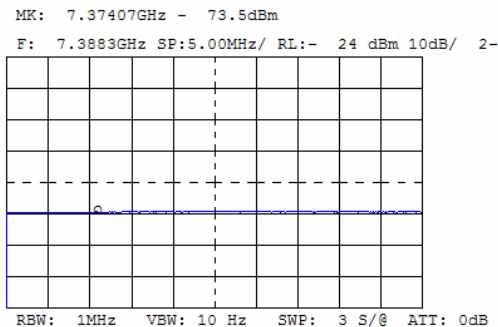
$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -60.5 \text{ dBm} + 36.2dB(1/m) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 52.39 \text{ dB}(\mu V/m)$$

$$\text{Limit} = 74 \text{ dB}(\mu V/m)$$

Plot 7.5.63 Radiated emission measurements at the eighth harmonic of high carrier frequency

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -73.5 \text{ dBm} + 36.2dB(1/m) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 39.33 \text{ dB}(\mu V/m)$$

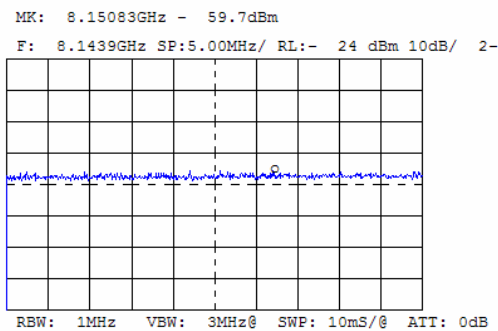
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.64 Radiated emission measurements at the ninth harmonic of low carrier frequency

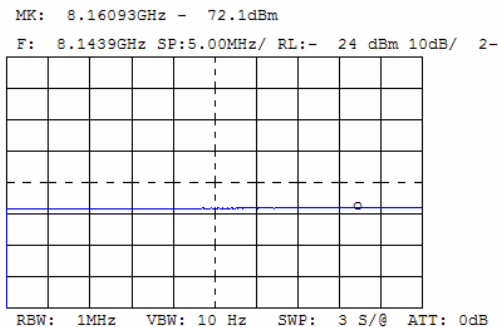
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.7 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 57.75 \text{ dB}(\mu V/m)$
Limit = 74 dB($\mu V/m$)

Plot 7.5.65 Radiated emission measurements at the ninth harmonic of low carrier frequency

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



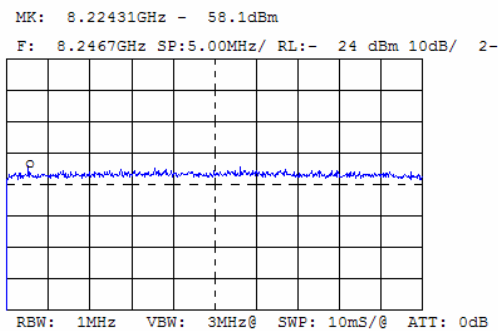
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.1 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 45.35 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.66 Radiated emission measurements at the ninth harmonic of mid carrier frequency

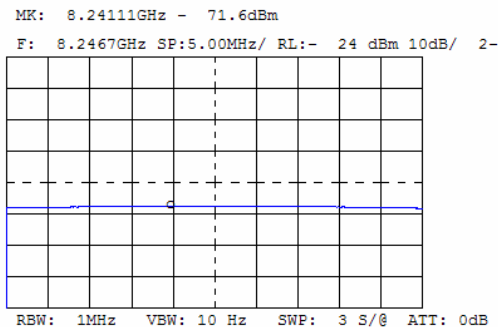
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -58.1 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 59.35 \text{ dB}(\mu V/m)$
 Limit = 74 dB($\mu V/m$)

Plot 7.5.67 Radiated emission measurements at the ninth harmonic of mid carrier frequency

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



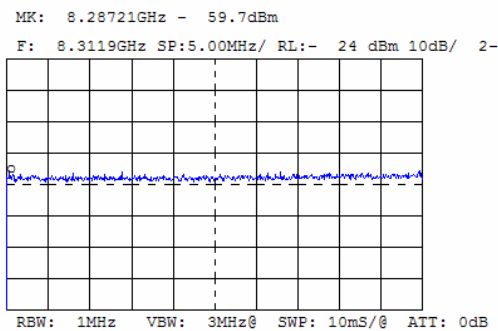
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.6 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 45.30 \text{ dB}(\mu V/m)$
 Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.68 Radiated emission measurements at the ninth harmonic of high carrier frequency

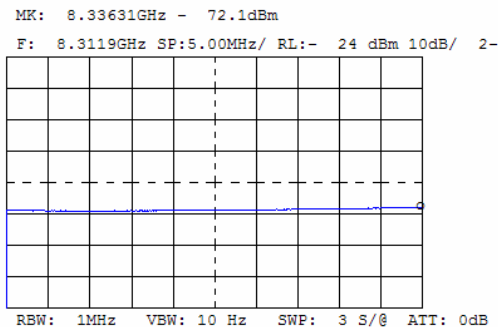
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.7 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 57.75 \text{ dB}(\mu V/m)$
Limit = 74 dB($\mu V/m$)

Plot 7.5.69 Radiated emission measurements at the ninth harmonic of high carrier frequency

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



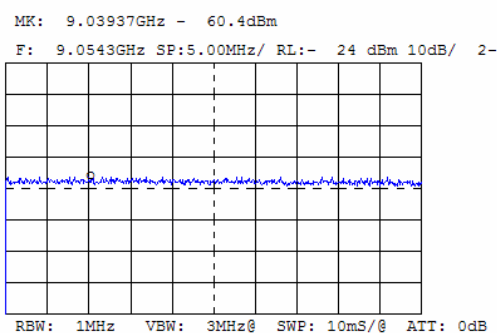
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.1 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 45.35 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.70 Radiated emission measurements at the tenth harmonic of low carrier frequency

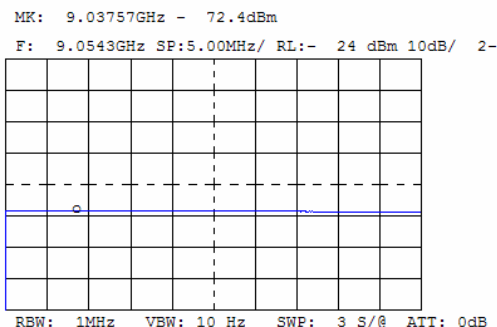
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.4 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 57.73 \text{ dB}(\mu V/m)$
 Limit = 74 dB($\mu V/m$)

Plot 7.5.71 Radiated emission measurements at the tenth harmonic of low carrier frequency

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



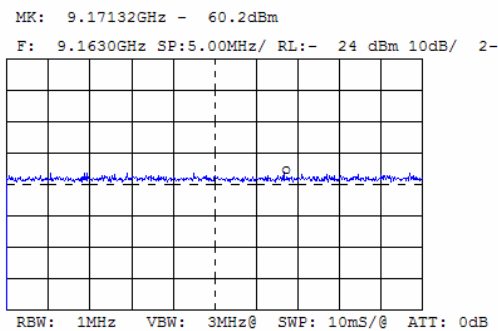
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.4 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 45.73 \text{ dB}(\mu V/m)$
 Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.72 Radiated emission measurements at the tenth harmonic of mid carrier frequency

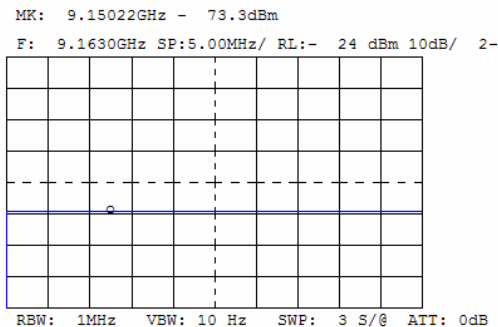
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.2 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 57.93 \text{ dB}(\mu V/m)$
 Limit = 74 dB($\mu V/m$)

Plot 7.5.73 Radiated emission measurements at the tenth harmonic of mid carrier frequency

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



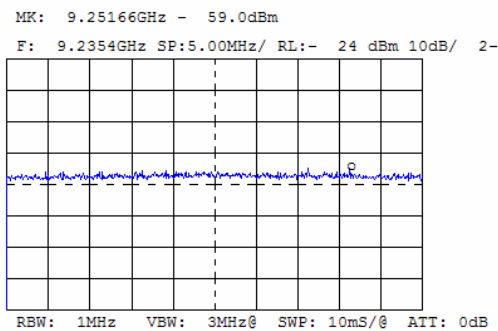
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -73.3 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 44.83 \text{ dB}(\mu V/m)$
 Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.74 Radiated emission measurements at the tenth harmonic of high carrier frequency

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



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.0 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 59.13 \text{ dB}(\mu V/m)$
 Limit = 99.69 dB($\mu V/m$)



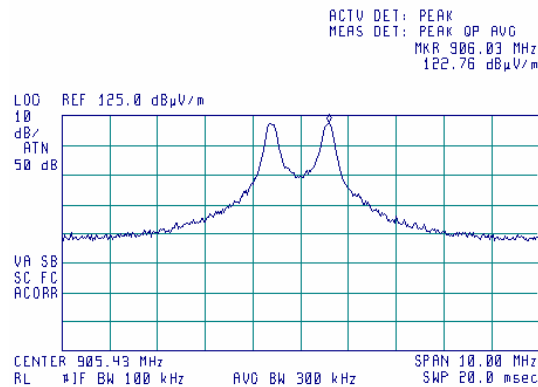
Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

FSK mode measurements

Plot 7.5.75 Radiated emission measurements at the low carrier frequency

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

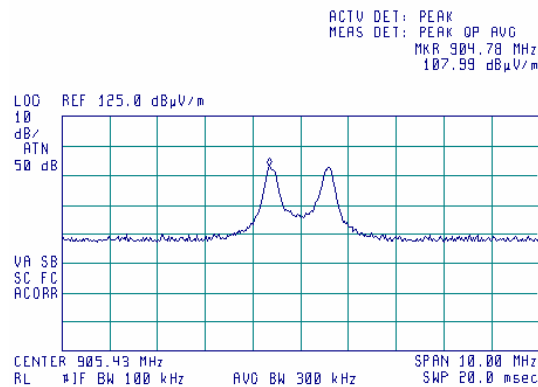
16:25:00 16 MAR 2005



Plot 7.5.76 Radiated emission measurements at the low carrier frequency

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

16:27:00 16 MAR 2005



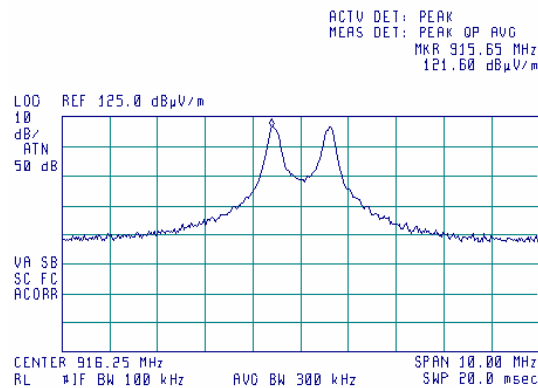


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.77 Radiated emission measurements at the mid carrier frequency

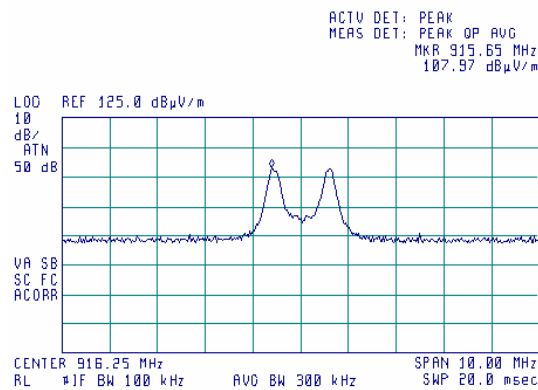
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

16:22:10 16 MAR 2005

**Plot 7.5.78 Radiated emission measurements at the mid carrier frequency**

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

16:20:24 16 MAR 2005



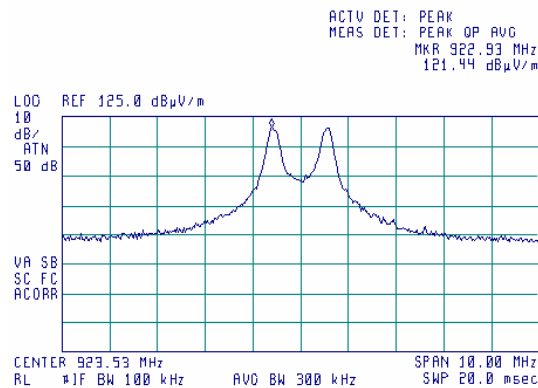


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.79 Radiated emission measurements at the high carrier frequency

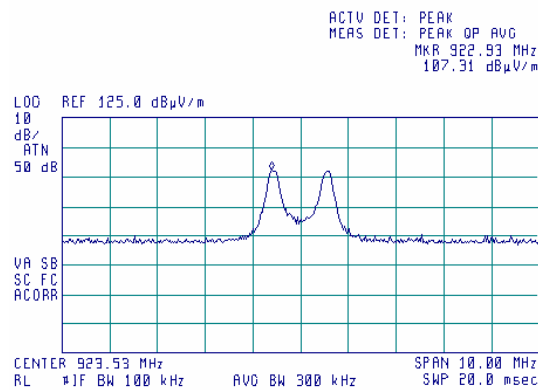
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

16:14:08 16 MAR 2005

**Plot 7.5.80 Radiated emission measurements at the high carrier frequency**

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

16:16:02 16 MAR 2005



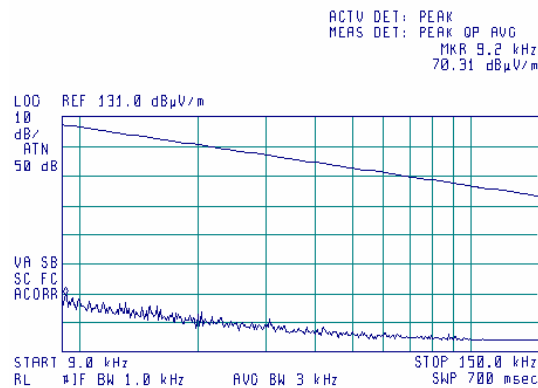


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.81 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

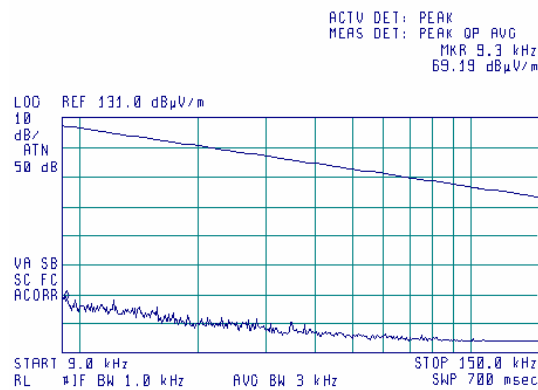
16:54:59 16 MAR 2005



Plot 7.5.82 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

16:55:46 16 MAR 2005



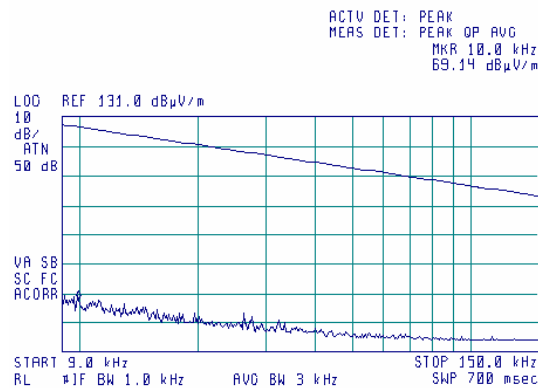


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.83 Radiated emission measurements from 9 to 150 kHz at the high carrier frequency

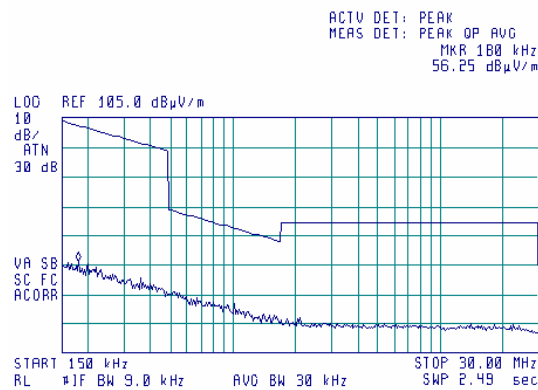
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical

16:56:32 16 MAR 2005

**Plot 7.5.84 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

16:58:29 16 MAR 2005



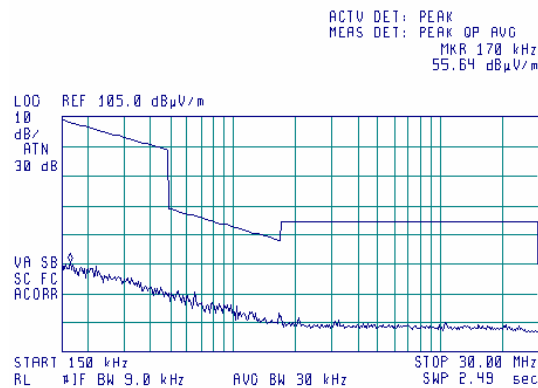


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.85 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

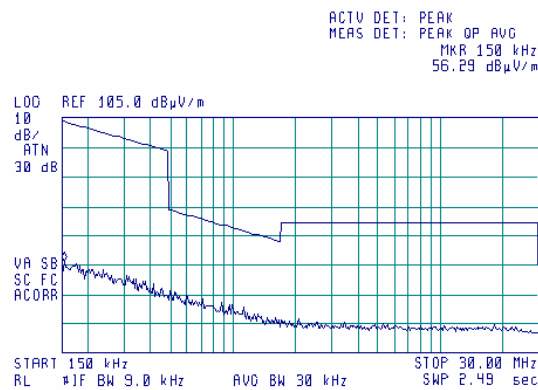
17:00:13 16 MAR 2005



Plot 7.5.86 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

17:01:06 16 MAR 2005



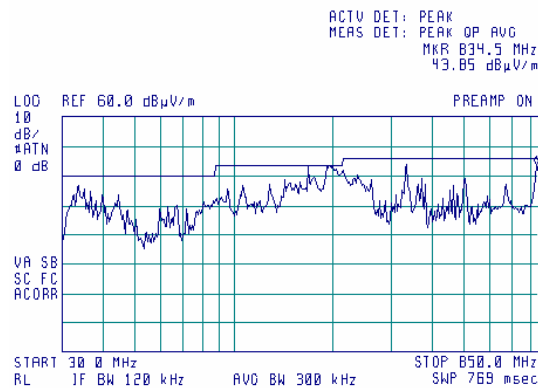


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.87 Radiated emission measurements from 30 to 850 MHz at the low carrier frequency

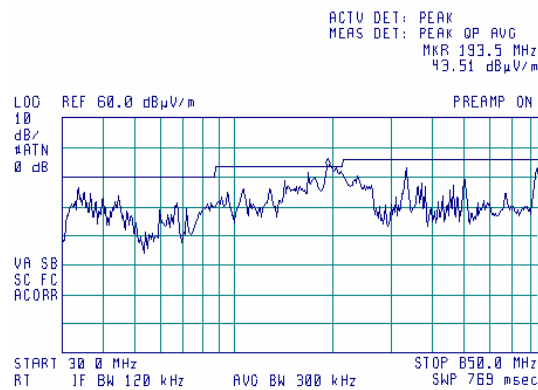
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

15:35:43 16 MAR 2005

**Plot 7.5.88 Radiated emission measurements from 30 to 850 MHz at the mid carrier frequency**

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

16:06:47 16 MAR 2005



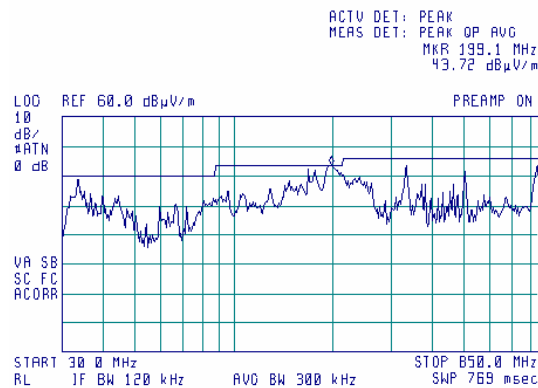


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.89 Radiated emission measurements from 30 to 850 MHz at the high carrier frequency

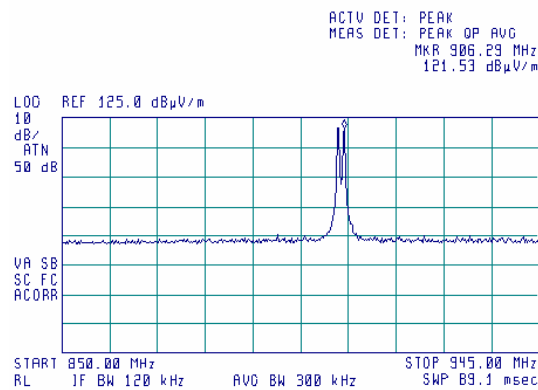
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

15:58:03 16 MAR 2005

**Plot 7.5.90 Radiated emission measurements from 850 to 945 MHz at the low carrier frequency**

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

15:49:17 16 MAR 2005



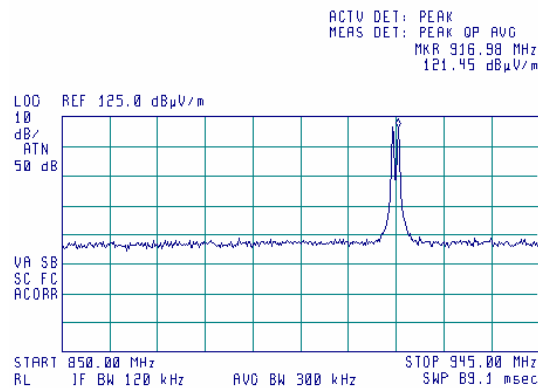


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.91 Radiated emission measurements from 850 to 945 MHz at the mid carrier frequency

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

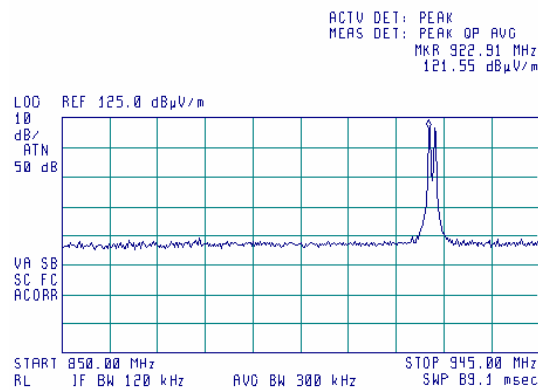
15:51:04 16 MAR 2005



Plot 7.5.92 Radiated emission measurements from 850 to 945 MHz at the high carrier frequency

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

15:53:29 16 MAR 2005



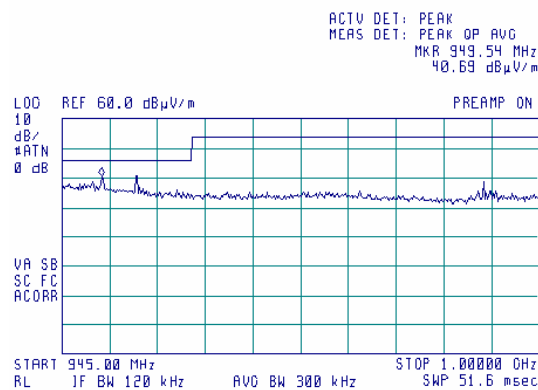


Test specification:		Section 15.247(c), Radiated spurious emissions	
Test procedure:		FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 10:24:57 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.93 Radiated emission measurements from 945 to 1000 MHz at the low carrier frequency

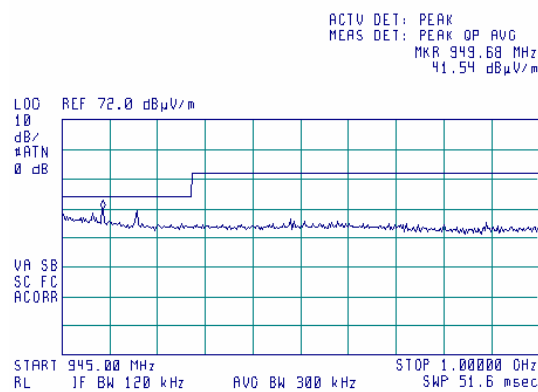
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

15:38:28 16 MAR 2005

**Plot 7.5.94 Radiated emission measurements from 945 to 1000 MHz at the mid carrier frequency**

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

16:08:23 16 MAR 2005





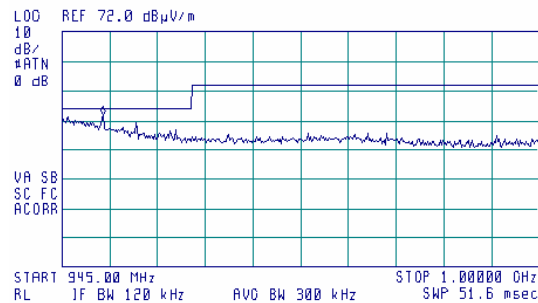
Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.95 Radiated emission measurements from 945 to 1000 MHz at the high carrier frequency

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

16:09:52 16 MAR 2005

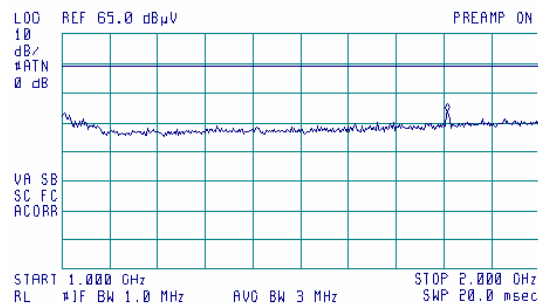
ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 949.68 MHz
43.68 dBμV/m

**Plot 7.5.96 Radiated emission measurements from 1000 to 2000 MHz at the low carrier frequency**

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

09:32:53 16 MAR 2005

ACTV DET: PEAK
MEAS DET: PEAK OP AVG
MKR 1.000 GHz
30.50 dBμV



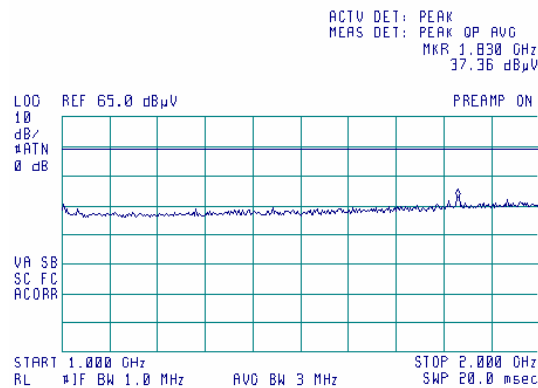


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.97 Radiated emission measurements from 1000 to 2000 MHz at the mid carrier frequency

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

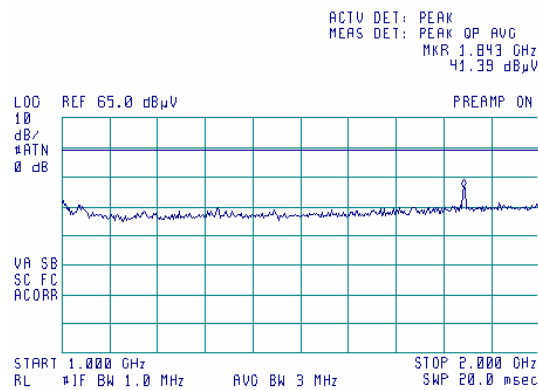
09:27:56 16 MAR 2005



Plot 7.5.98 Radiated emission measurements from 1000 to 2000 MHz at the high carrier frequency

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

09:30:15 16 MAR 2005



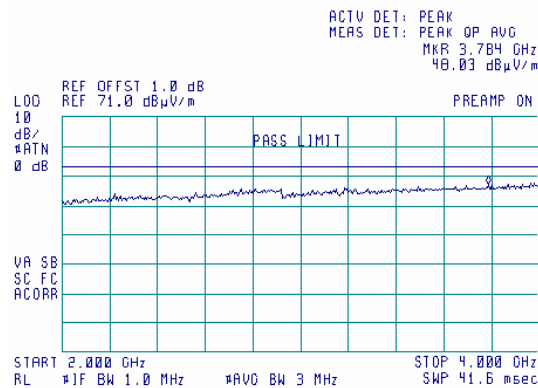


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.99 Radiated emission measurements from 2000 to 4000 MHz at the low carrier frequency

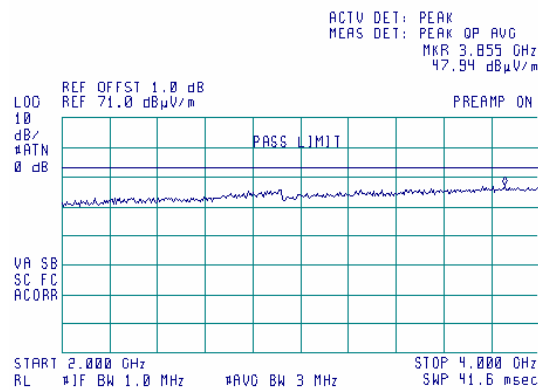
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

17:26:16 15 MAR 2005

**Plot 7.5.100 Radiated emission measurements from 2000 to 4000 MHz at the mid carrier frequency**

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

17:31:48 15 MAR 2005



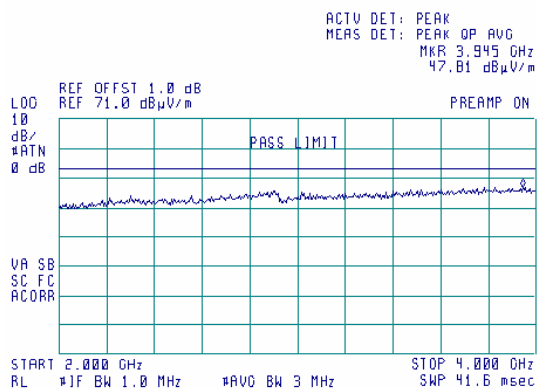


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.101 Radiated emission measurements from 2000 to 4000 MHz at the high carrier frequency

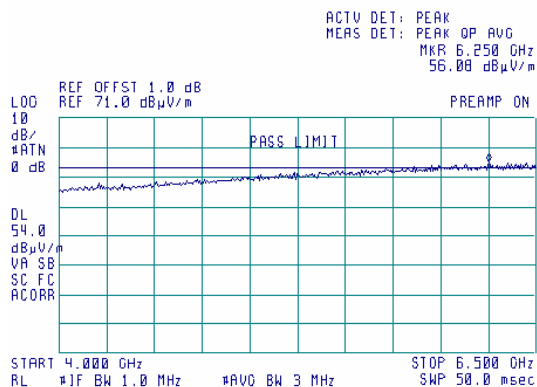
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

17:34:36 15 MAR 2005

**Plot 7.5.102 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency**

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

17:44:32 15 MAR 2005



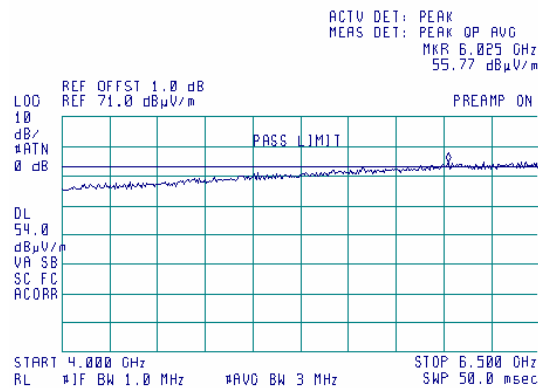


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.103 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency

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

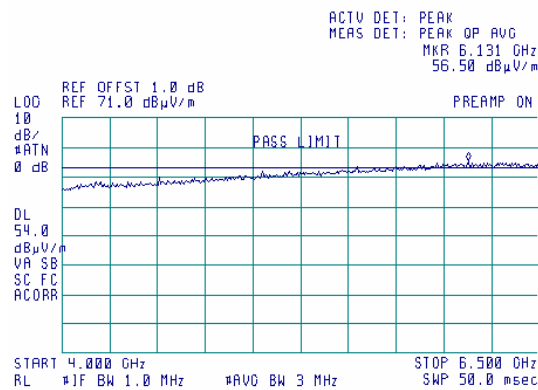
17:43:33 15 MAR 2005



Plot 7.5.104 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency

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

17:39:25 15 MAR 2005



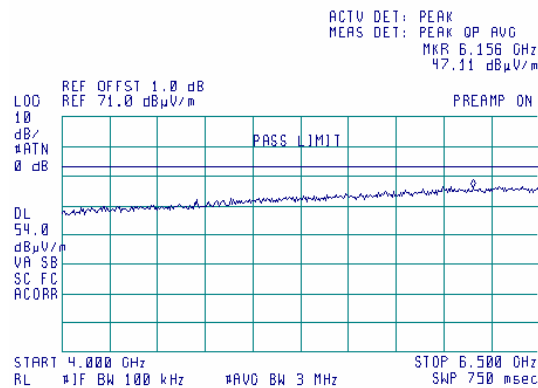


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.105 Radiated emission measurements from 4000 to 6500 MHz at the low carrier frequency

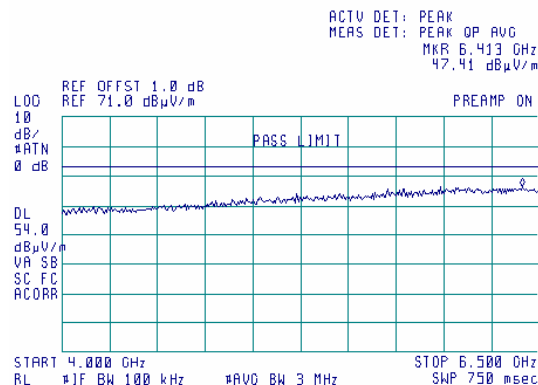
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
Resolution Bandwidth 100 kHz

17:42:28 15 MAR 2005

**Plot 7.5.106 Radiated emission measurements from 4000 to 6500 MHz at the mid carrier frequency**

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
Resolution Bandwidth 100 kHz

17:41:49 15 MAR 2005



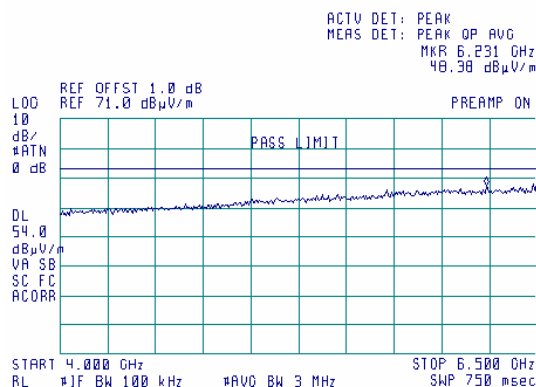


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

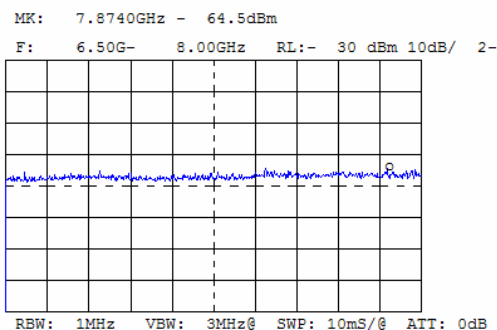
Plot 7.5.107 Radiated emission measurements from 4000 to 6500 MHz at the high carrier frequency

TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal
Resolution Bandwidth 100 kHz

17:41:06 15 MAR 2005

**Plot 7.5.108 Radiated emission measurements from 6.5 to 8.0 GHz, low frequency channel**

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -64.5 \text{ dBm} + 42.9 \text{ dB(1/m)} + 0.83 \text{ dB} - 43.22 \text{ dB} + 107 \text{ dB} = 43.01 \text{ dB}(\mu V/m)$$

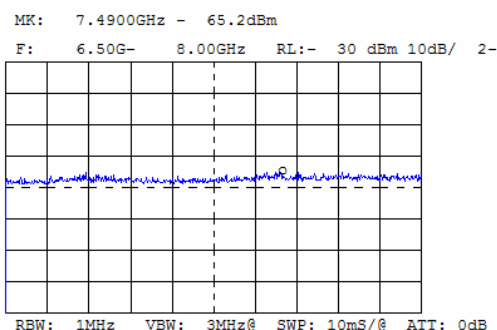
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.109 Radiated emission measurements from 6.5 to 8.0 GHz, mid frequency channel

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



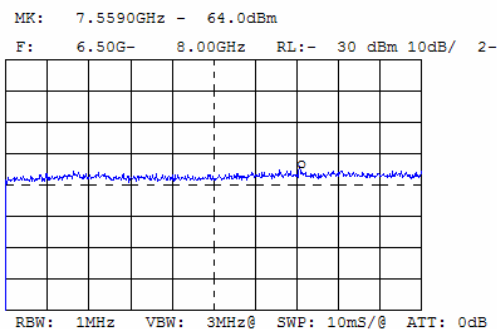
$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -65.2 \text{ dBm} + 42.9 \text{ dB(1/m)} + 0.83 \text{ dB} - 43.22 \text{ dB} + 107 \text{ dB} = 42.31 \text{ dB}(\mu V/m)$$

$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$

Plot 7.5.110 Radiated emission measurements from 6.5 to 8.0 GHz, high frequency channel

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -64.0 \text{ dBm} + 42.9 \text{ dB(1/m)} + 0.83 \text{ dB} - 43.22 \text{ dB} + 107 \text{ dB} = 43.51 \text{ dB}(\mu V/m)$$

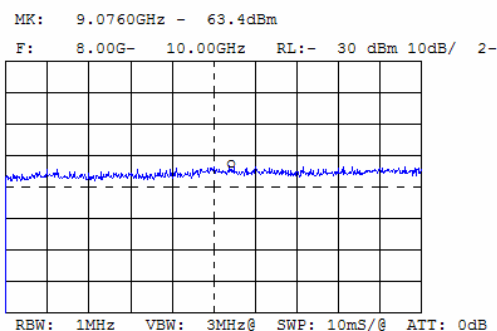
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.111 Radiated emission measurements from 8.0 to 10.0 GHz, low frequency channel

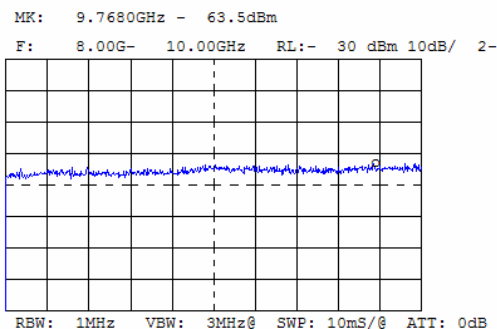
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -63.4 \text{ dBm} + 42.8 \text{ dB(1/m)} + 0.83 \text{ dB} - 36.77 \text{ dB} + 107 \text{ dB} = 50.46 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)

Plot 7.5.112 Radiated emission measurements from 8.0 to 10.0 GHz, mid frequency channel

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



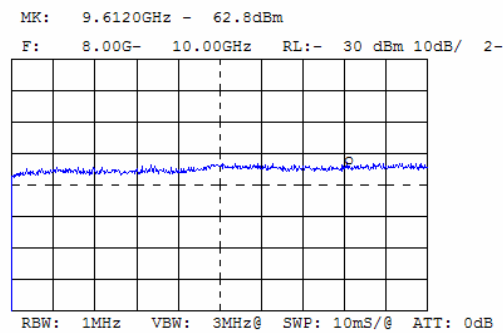
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -63.5 \text{ dBm} + 42.8 \text{ dB(1/m)} + 0.83 \text{ dB} - 36.77 \text{ dB} + 107 \text{ dB} = 50.36 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:		3/28/2005 10:24:57 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.113 Radiated emission measurements from 8.0 to 10.0 GHz, high frequency channel

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



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + 107 \text{ dB}$

$E \{dB(\mu V/m)\} = -62.8 \text{ dBm} + 42.8 \text{ dB(1/m)} + 0.83 \text{ dB} - 36.77 \text{ dB} + 107 \text{ dB} = 51.06 \text{ dB}(\mu V/m)$

Limit = 54 dB($\mu V/m$)

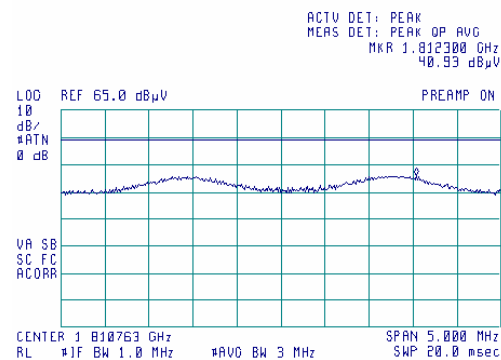


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.114 Radiated emission measurements at the second harmonic of low carrier frequency

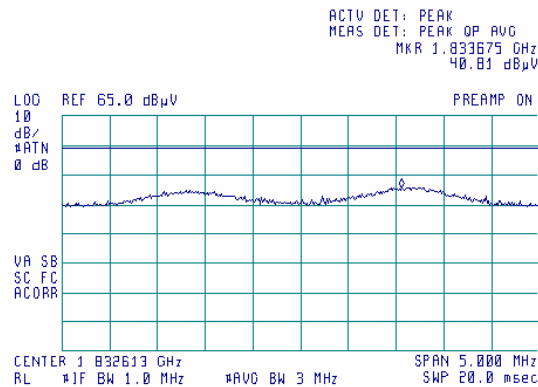
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

09:38:48 16 MAR 2005

**Plot 7.5.115 Radiated emission measurements at the second harmonic of mid carrier frequency**

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

09:41:12 16 MAR 2005





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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

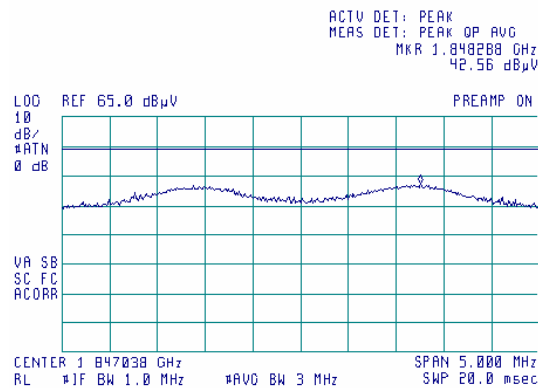
Plot 7.5.116 Radiated emission measurements at the second harmonic of high carrier frequency

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(09:43:01 16 MAR 2005

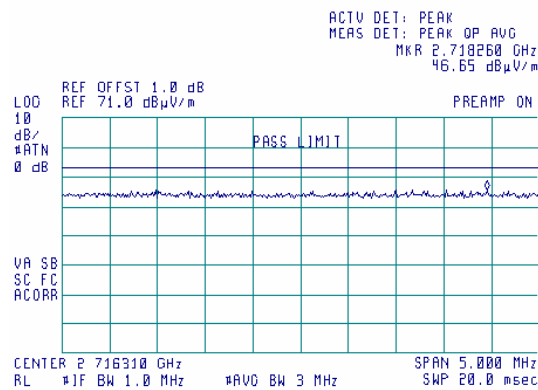
**Plot 7.5.117 Radiated emission measurements at the third harmonic of low carrier frequency**

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(17:20:01 15 MAR 2005





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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

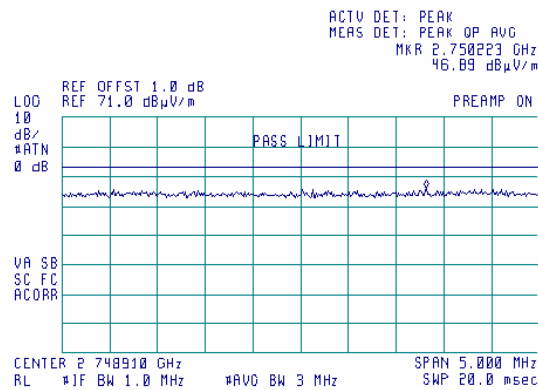
Plot 7.5.118 Radiated emission measurements at the third harmonic of mid carrier frequency

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(G) 17:16:17 15 MAR 2005

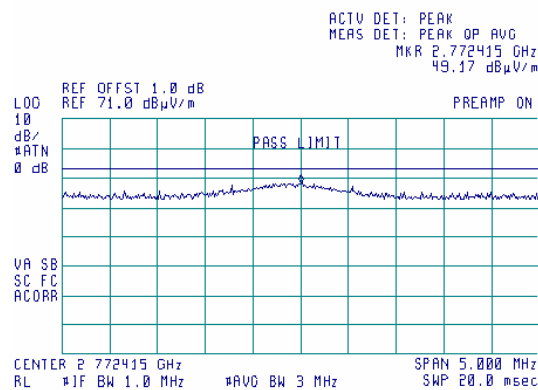
**Plot 7.5.119 Radiated emission measurements at the third harmonic of high carrier frequency**

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(G) 16:54:11 15 MAR 2005





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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

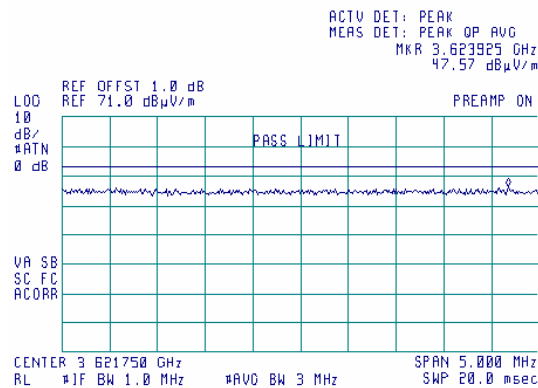
Plot 7.5.120 Radiated emission measurements at the forth harmonic of low carrier frequency

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(Q) 17:21:51 15 MAR 2005

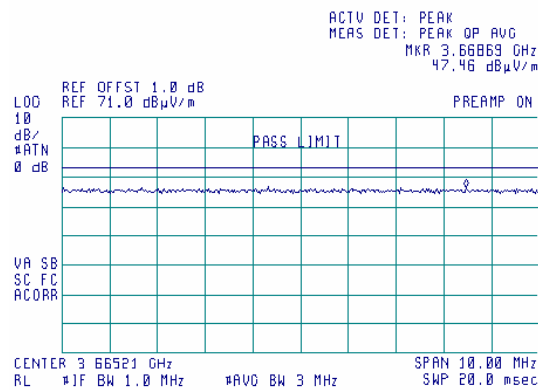
**Plot 7.5.121 Radiated emission measurements at the forth harmonic of mid carrier frequency**

TEST SITE: Semi anechoic chamber

TEST DISTANCE: 3 m

ANTENNA POLARIZATION: Vertical and Horizontal

(Q) 17:10:38 15 MAR 2005



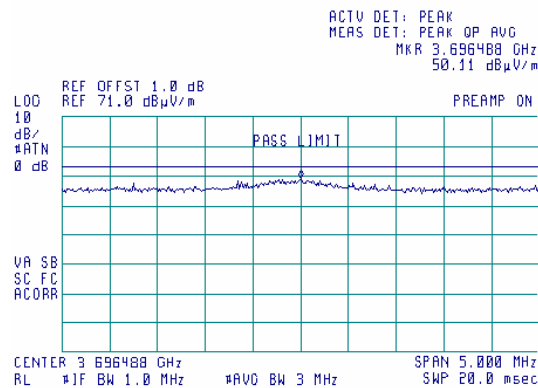


Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.122 Radiated emission measurements at the forth harmonic of high carrier frequency

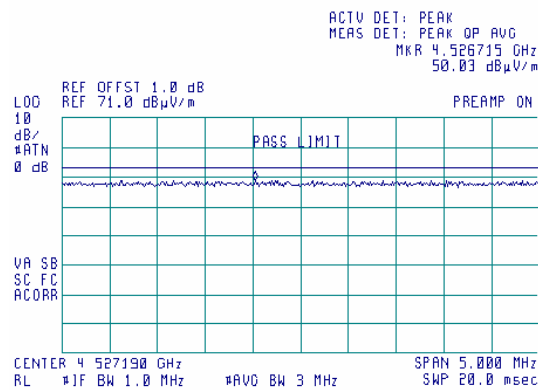
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal

17:02:23 15 MAR 2005

**Plot 7.5.123 Radiated emission measurements at the fifth harmonic of low carrier frequency**

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

16:03:09 15 MAR 2005





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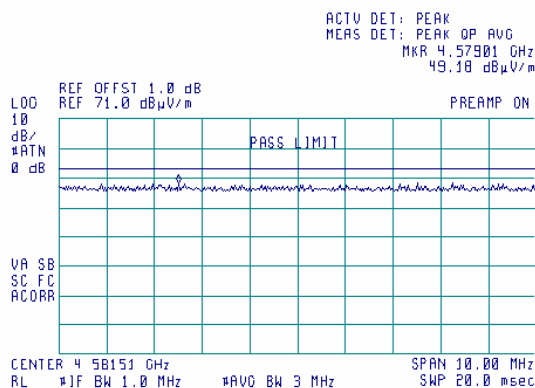
Report ID: TELRAD_FCC.16373.doc
Date of Issue: 4/8/2005

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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.124 Radiated emission measurements at the fifth harmonic of mid carrier frequency

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

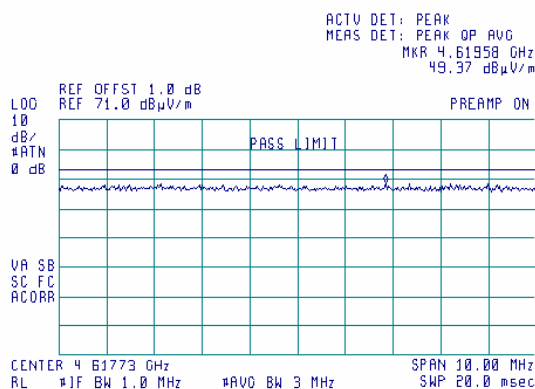
16:35:47 15 MAR 2005



Plot 7.5.125 Radiated emission measurements at the fifth harmonic of high carrier frequency

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

16:39:30 15 MAR 2005

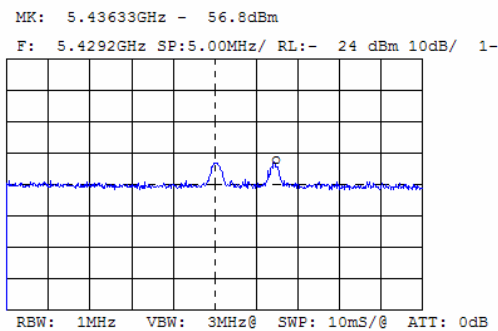




Test specification:	Section 15.247(c), Radiated spurious emissions		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(c) / ANSI C63.4, Section 13.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.126 Radiated emission measurements at the sixth harmonic of low carrier frequency

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



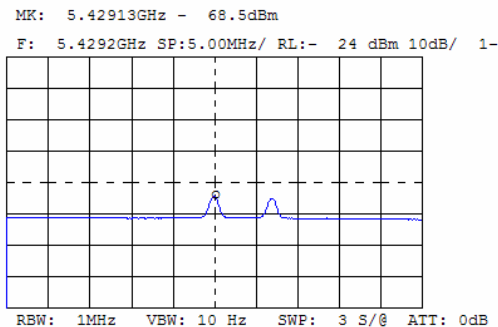
$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -56.8 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 56.51 \text{ dB}(\mu V/m)$$

$$\text{Limit} = 74 \text{ dB}(\mu V/m)$$

Plot 7.5.127 Radiated emission measurements at the sixth harmonic of low carrier frequency

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -68.5 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 44.81 \text{ dB}(\mu V/m)$$

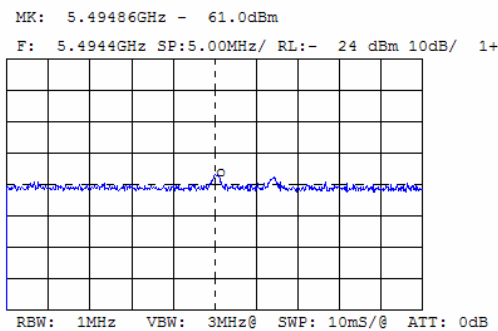
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.128 Radiated emission measurements at the sixth harmonic of mid carrier frequency

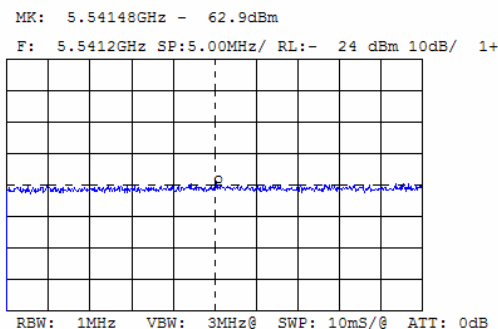
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -61.0 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 52.31 \text{ dB}(\mu V/m)$
Limit = $121.60 \text{ dB}(\mu V/m) - 20 \text{ dB} = 101.60 \text{ dB}(\mu V/m)$

Plot 7.5.129 Radiated emission measurements at the sixth harmonic of high carrier frequency

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



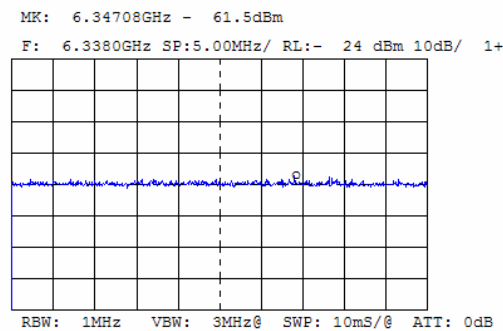
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -62.9 \text{ dBm} + 35.3 \text{ dB(1/m)} + 7.61 \text{ dB} - 36.77 \text{ dB} + 0.17 \text{ dB} + 107 \text{ dB} = 50.41 \text{ dB}(\mu V/m)$
Limit = $121.44 \text{ dB}(\mu V/m) - 20 \text{ dB} = 101.44 \text{ dB}(\mu V/m)$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.130 Radiated emission measurements at the seventh harmonic of low carrier frequency

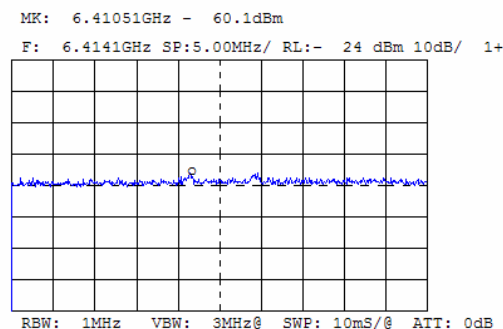
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -61.5 \text{ dBm} + 35.8 \text{ dB(1/m)} + 8.16 \text{ dB} - 38.93 \text{ dB} + 0.36 \text{ dB} + 107 \text{ dB} = 51.39 \text{ dB}(\mu V/m)$
Limit = $122.76 \text{ dB}(\mu V/m) - 20 \text{ dB} = 102.76 \text{ dB}(\mu V/m)$

Plot 7.5.131 Radiated emission measurements at the seventh harmonic of mid carrier frequency

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



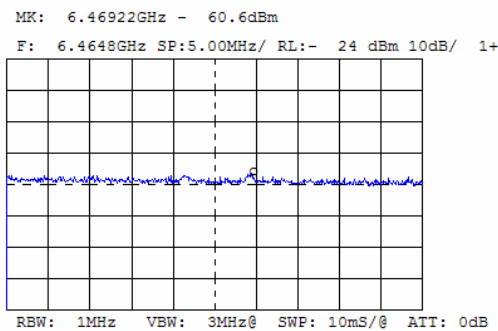
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.1 \text{ dBm} + 35.8 \text{ dB(1/m)} + 8.16 \text{ dB} - 38.93 \text{ dB} + 0.36 \text{ dB} + 107 \text{ dB} = 52.29 \text{ dB}(\mu V/m)$
Limit = $101.60 \text{ dB}(\mu V/m)$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.132 Radiated emission measurements at the seventh harmonic of high carrier frequency

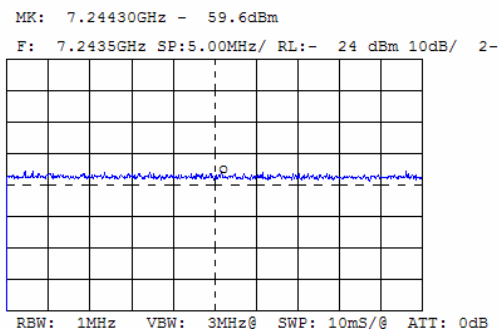
TEST SITE: Semi anechoic chamber
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.6 \text{ dBm} + 35.8 \text{ dB(1/m)} + 8.16 \text{ dB} - 38.93 \text{ dB} + 0.36 \text{ dB} + 107 \text{ dB} = 51.79 \text{ dB}(\mu V/m)$
Limit = 101.44 dB($\mu V/m$)

Plot 7.5.133 Radiated emission measurements at the eighth harmonic of low carrier frequency

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



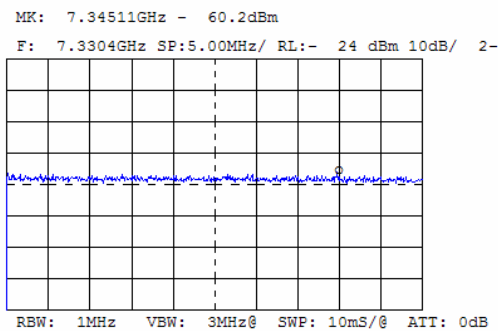
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.6 \text{ dBm} + 36.2 \text{ dB(1/m)} + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 53.29 \text{ dB}(\mu V/m)$
Limit = 102.76 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.134 Radiated emission measurements at the eighth harmonic of mid carrier frequency

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



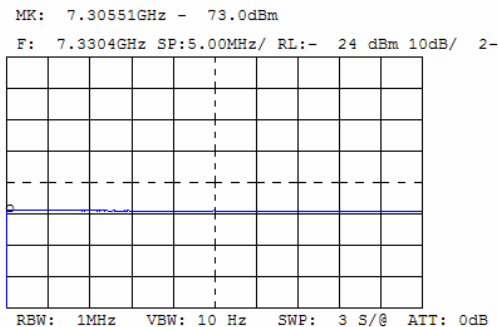
$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -60.2 \text{ dBm} + 36.2dB(1/m) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 52.69 \text{ dB}(\mu V/m)$$

$$\text{Limit} = 74 \text{ dB}(\mu V/m)$$

Plot 7.5.135 Radiated emission measurements at the eighth harmonic of mid carrier frequency

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



$$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -73.0 \text{ dBm} + 36.2dB(1/m) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 39.89 \text{ dB}(\mu V/m)$$

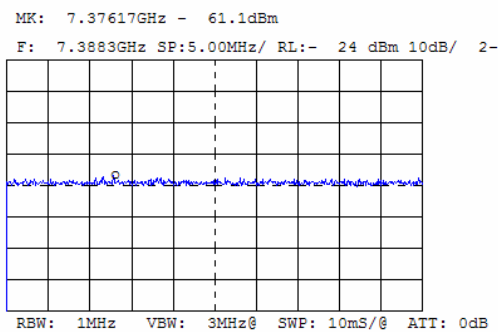
$$\text{Limit} = 54 \text{ dB}(\mu V/m)$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.136 Radiated emission measurements at the eighth harmonic of high carrier frequency

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



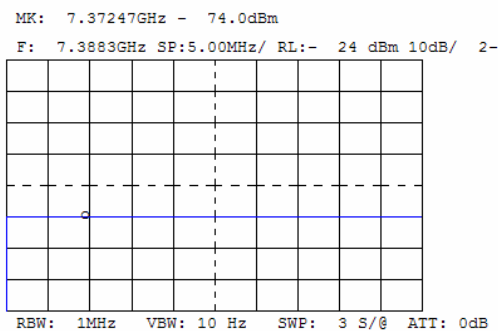
$$E \{dB(\mu V/m)\} = \text{SA reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -61.1 \text{ dBm} + 36.2\text{dB}(1/\text{m}) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 51.79 \text{ dB}(\mu V/\text{m})$$

$$\text{Limit} = 74 \text{ dB}(\mu V/\text{m})$$

Plot 7.5.137 Radiated emission measurements at the eighth harmonic of high carrier frequency

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



$$E \{dB(\mu V/m)\} = \text{SA reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$$

$$E \{dB(\mu V/m)\} = -74.0 \text{ dBm} + 36.2\text{dB}(1/\text{m}) + 8.8 \text{ dB} - 39.35 \text{ dB} + 0.24 \text{ dB} + 107 \text{ dB} = 38.89 \text{ dB}(\mu V/\text{m})$$

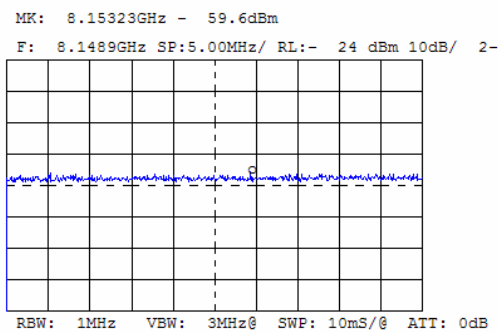
$$\text{Limit} = 54 \text{ dB}(\mu V/\text{m})$$



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.138 Radiated emission measurements at the ninth harmonic of low carrier frequency

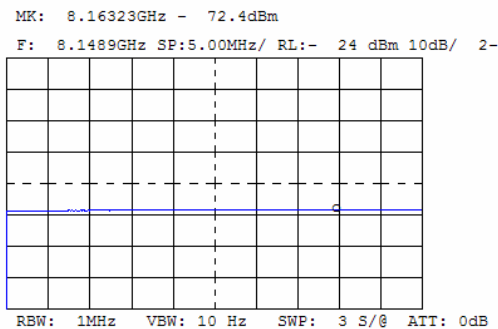
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.6 \text{ dBm} + 37.2\text{dB}(1/\text{m}) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 57.85 \text{ dB}(\mu V/\text{m})$
 Limit = 74 dB($\mu V/\text{m}$)

Plot 7.5.139 Radiated emission measurements at the ninth harmonic of low carrier frequency

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



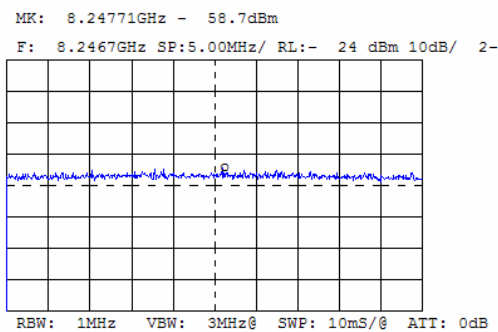
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.4 \text{ dBm} + 37.2\text{dB}(1/\text{m}) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 45.05 \text{ dB}(\mu V/\text{m})$
 Limit = 54 dB($\mu V/\text{m}$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.140 Radiated emission measurements at the ninth harmonic of mid carrier frequency

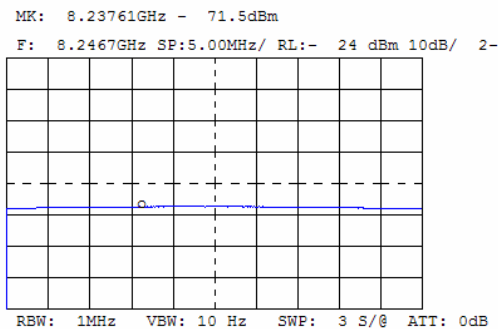
TEST SITE: OATS
 TEST DISTANCE: 3 m
 ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -58.7 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 58.75 \text{ dB}(\mu V/m)$
 Limit = 74 dB($\mu V/m$)

Plot 7.5.141 Radiated emission measurements at the ninth harmonic of mid carrier frequency

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



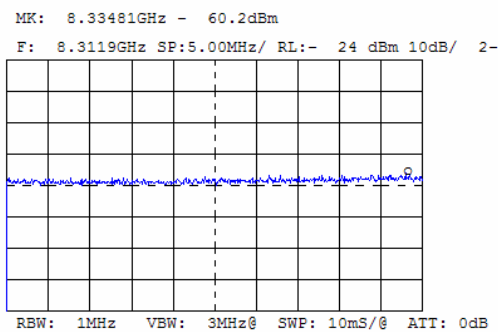
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -71.5 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 45.95 \text{ dB}(\mu V/m)$
 Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.142 Radiated emission measurements at the ninth harmonic of high carrier frequency

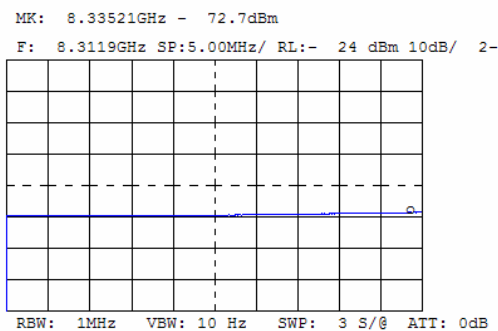
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.2 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 57.25 \text{ dB}(\mu V/m)$
Limit = 74 dB($\mu V/m$)

Plot 7.5.143 Radiated emission measurements at the ninth harmonic of high carrier frequency

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



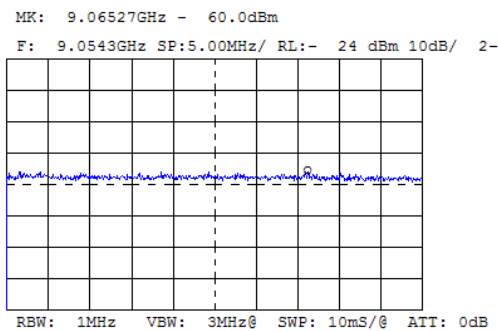
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.7 \text{ dBm} + 37.2dB(1/m) + 8.84 \text{ dB} - 38.34 \text{ dB} + 2.75 \text{ dB} + 107 \text{ dB} = 44.75 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.144 Radiated emission measurements at the tenth harmonic of low carrier frequency

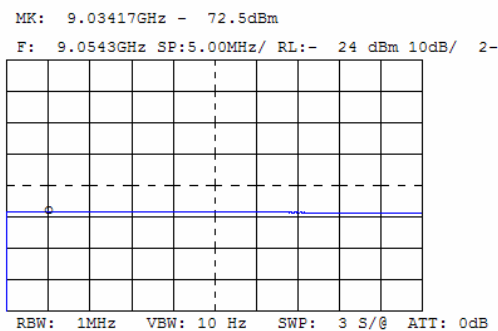
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.0 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 58.13 \text{ dB}(\mu V/m)$
Limit = 74 dB($\mu V/m$)

Plot 7.5.145 Radiated emission measurements at the tenth harmonic of low carrier frequency

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



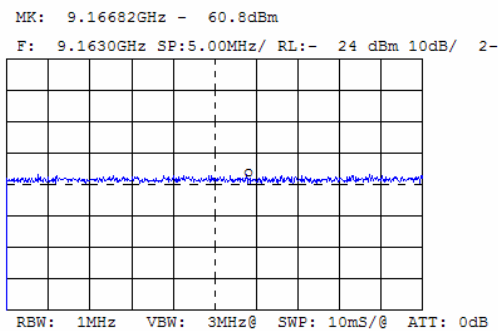
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -72.5 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 45.63 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:	3/28/2005 10:24:57 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.5.146 Radiated emission measurements at the tenth harmonic of mid carrier frequency

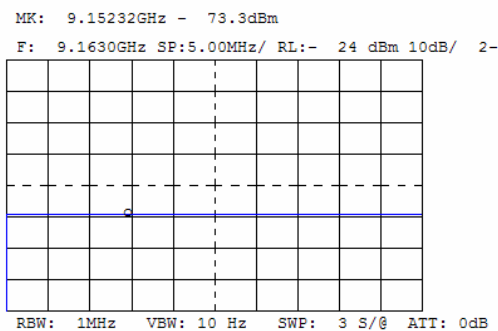
TEST SITE: OATS
TEST DISTANCE: 3 m
ANTENNA POLARIZATION: Vertical and Horizontal



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -60.8 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 57.33 \text{ dB}(\mu V/m)$
Limit = 74 dB($\mu V/m$)

Plot 7.5.147 Radiated emission measurements at the tenth harmonic of mid carrier frequency

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



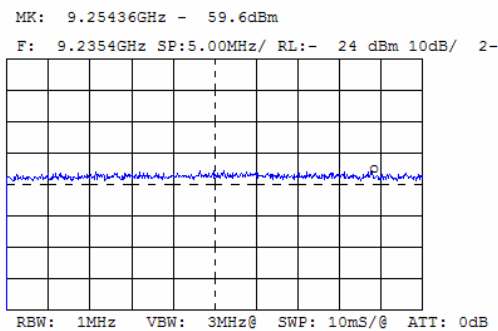
$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -73.3 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 44.83 \text{ dB}(\mu V/m)$
Limit = 54 dB($\mu V/m$)



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:		3/28/2005 10:24:57 AM	
Temperature: 26 °C		Air Pressure: 1015 hPa	Relative Humidity: 43 %
Remarks:		Power Supply: 120 VAC	

Plot 7.5.148 Radiated emission measurements at the tenth harmonic of high carrier frequency

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



$E \{dB(\mu V/m)\} = SA \text{ reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain} + \text{Quadroplexer Loss} + 107 \text{ dB}$
 $E \{dB(\mu V/m)\} = -59.6 \text{ dBm} + 38.6 \text{ dB(1/m)} + 9.5 \text{ dB} - 37.66 \text{ dB} + 0.69 \text{ dB} + 107 \text{ dB} = 58.53 \text{ dB}(\mu V/m)$
Limit = 101.44 dB($\mu V/m$)



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:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

7.6 Peak spectral power density

7.6.1 General

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

Table 7.6.1 Peak spectral power density limits

Assigned frequency range, MHz	Measurement bandwidth, kHz	Peak spectral power density, dBm
902 - 928	3.0	8.0

7.6.2 Test procedure

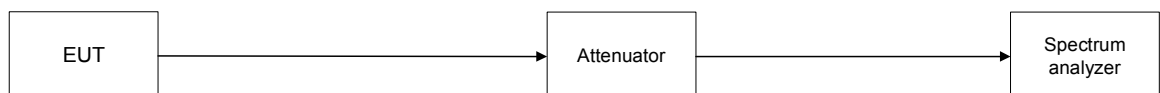
7.6.2.1 The EUT was set up as shown in Figure 7.6.1, energized and its proper operation was checked.

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

7.6.2.3 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.

7.6.2.4 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 7.6.2, Table 7.6.3 and associated plots.

Figure 7.6.1 Peak spectral power density test setup





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:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Table 7.6.2 Peak spectral power density test results

ASSIGNED FREQUENCY: 902 - 928 MHz
 MODULATION: PSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 900 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 19.93 dBm at low carrier frequency
 19.83 dBm at mid carrier frequency
 19.79 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 3 kHz
 VIDEO BANDWIDTH: 10 kHz

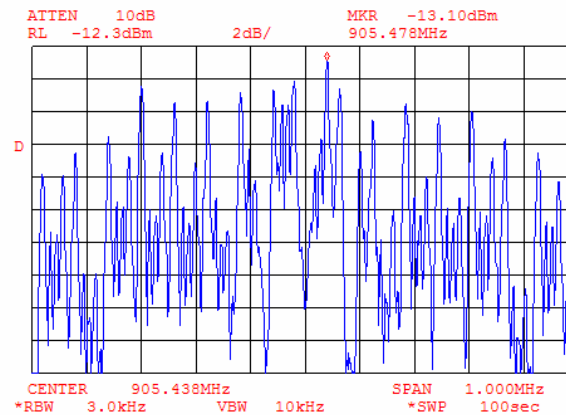
Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak power density, dB(mW/3 kHz)	Limit, dBm	Margin*, dB	Verdict
905.4375	-13.10	20.00	0.43	7.33	8.00	-0.67	Pass
916.3020	-12.83	20.00	0.43	7.60	8.00	-0.40	Pass
923.5462	-13.50	20.00	0.43	6.93	8.00	-1.07	Pass

* - Margin = Peak power density – specification limit.

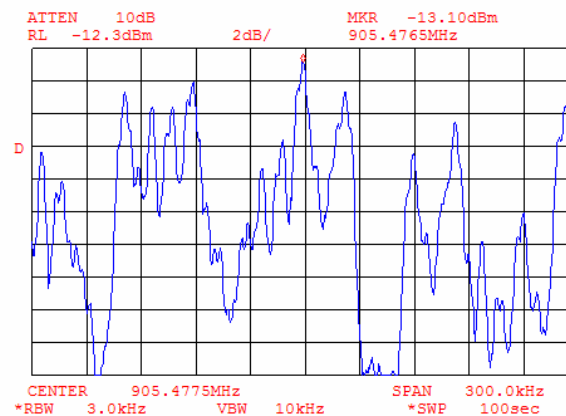


Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.6.1 Peak spectral power density at low frequency within 6 dB band



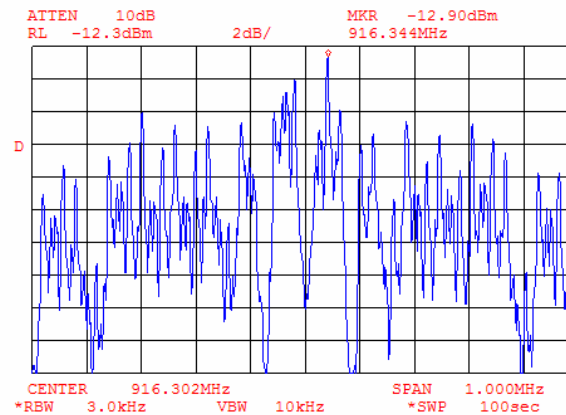
Plot 7.6.2 Peak spectral power density at low frequency zoomed at the peak



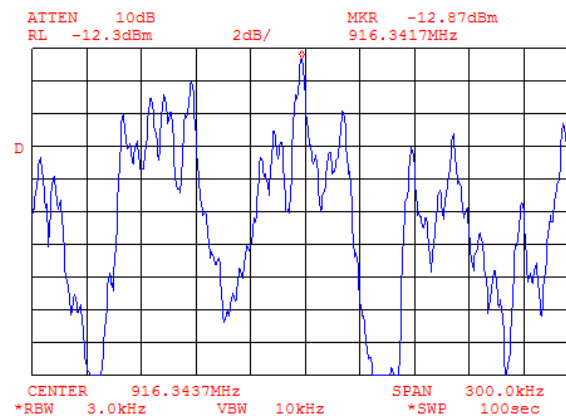


Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.6.3 Peak spectral power density at mid frequency within 6 dB band



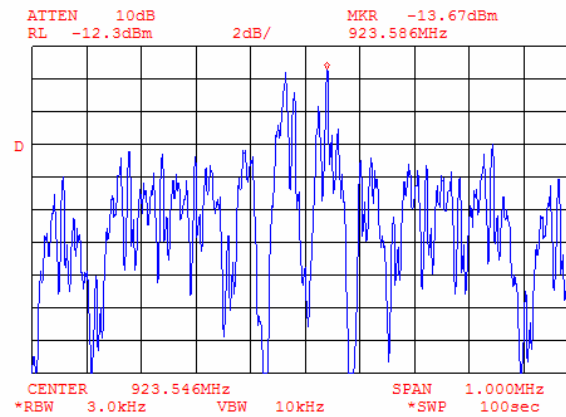
Plot 7.6.4 Peak spectral power density at mid frequency zoomed at the peak



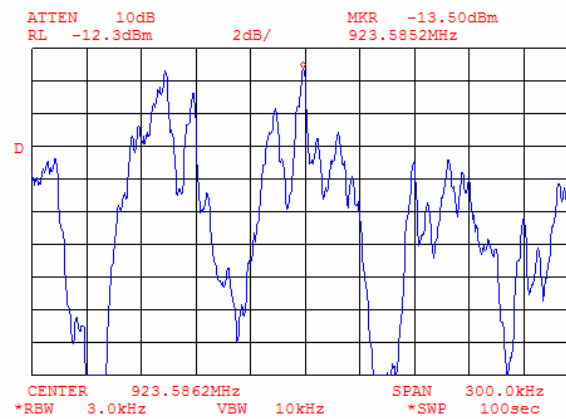


Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.6.5 Peak spectral power density at high frequency within 6 dB band



Plot 7.6.6 Peak spectral power density at high frequency zoomed at the peak





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:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Table 7.6.3 Peak spectral power density test results

ASSIGNED FREQUENCY: 902 - 928 MHz
 MODULATION: FSK
 MODULATING SIGNAL: PRBS
 BIT RATE: 60 kbps
 TRANSMITTER OUTPUT POWER SETTINGS: Maximum
 TRANSMITTER OUTPUT POWER: 18.63 dBm at low carrier frequency
 18.63 dBm at mid carrier frequency
 18.46 dBm at high carrier frequency
 DETECTOR USED: Peak
 RESOLUTION BANDWIDTH: 3 kHz
 VIDEO BANDWIDTH: 10 kHz

Carrier frequency, MHz	Spectrum analyzer reading, dBm	External attenuation, dB	Cable loss, dB	Peak power density, dB(mW/3 kHz)	Limit, dBm	Margin*, dB	Verdict
905.4375	-13.23	20.00	0.43	7.20	8.00	-0.80	Pass
916.3020	-12.83	20.00	0.43	7.60	8.00	-0.40	Pass
923.5462	-13.40	20.00	0.43	7.03	8.00	-0.97	Pass

* - Margin = Peak power density – specification limit.

Reference numbers of test equipment used

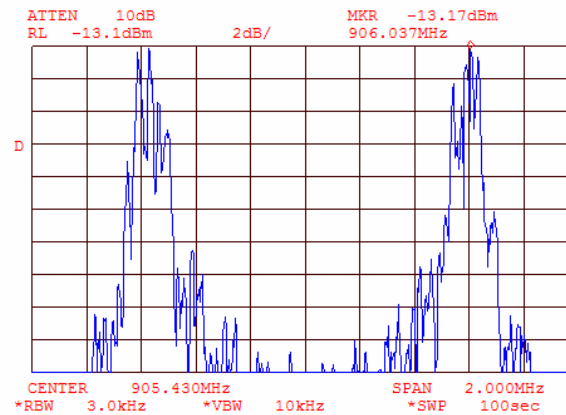
HL 1424	HL 1651	HL 2399					
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Full description is given in Appendix A.

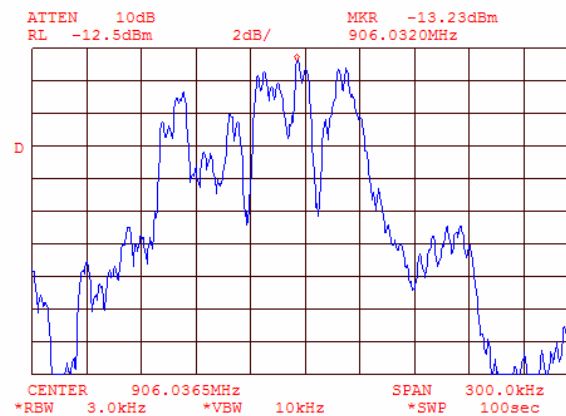


Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.6.7 Peak spectral power density at low frequency within 6 dB band



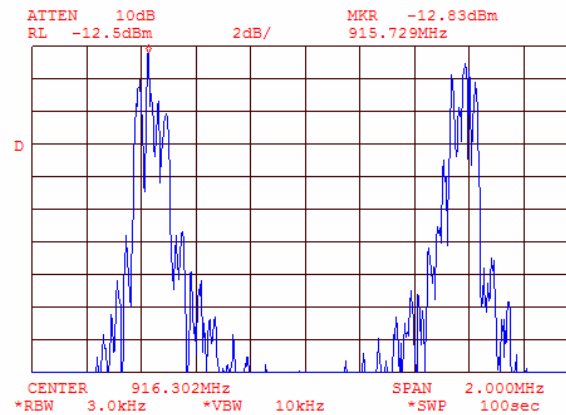
Plot 7.6.8 Peak spectral power density at low frequency zoomed at the peak



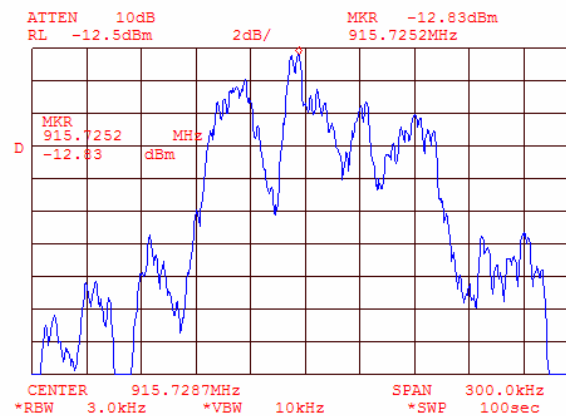


Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.6.9 Peak spectral power density at mid frequency within 6 dB band



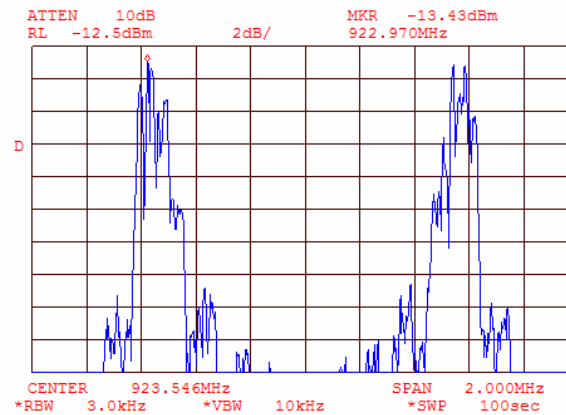
Plot 7.6.10 Peak spectral power density at mid frequency zoomed at the peak



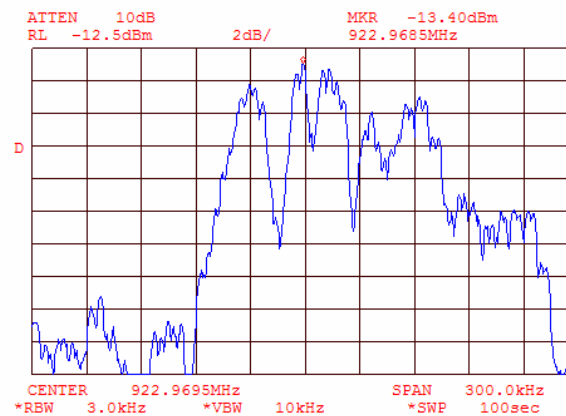


Test specification:	Section 15.247(d), Peak power density		
Test procedure:	FR Vol. 62, page 26243, Section 15.247(d)		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:31:08 AM		
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Plot 7.6.11 Peak spectral power density at high frequency within 6 dB band



Plot 7.6.12 Peak spectral power density at high frequency zoomed at the peak





Test specification:		Section 15.207(a), Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 10:33:36 PM	
Temperature: 23 °C	Air Pressure: 1014 hPa	Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:			

7.7 Conducted emissions

7.7.1 General

This test was performed to measure common mode conducted emissions at the power port. Specification test limits are given in Table 7.7.1. The worst test results (the lowest margins) were recorded in Table 7.7.2 and shown in the associated plots.

Table 7.7.1 Limits for conducted emissions

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

* The limit decreases linearly with the logarithm of frequency.

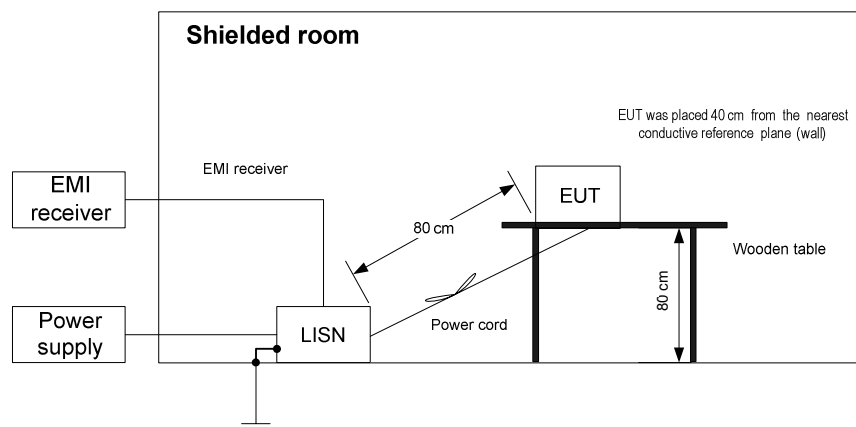
7.7.2 Test procedure

7.7.2.1 The EUT was set up as shown in Figure 7.7.1 and associated photographs, energized and the performance check was conducted.

7.7.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 7.7.2. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

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

Figure 7.7.1 Setup for conducted emission measurements, table-top equipment





Test specification:		Section 15.207(a), Conducted emission			
Test procedure:		ANSI C63.4, Section 13.1.3			
Test mode:		Compliance		Verdict: PASS	
Date & Time:		3/16/2005 10:33:36 PM			
Temperature: 23 °C		Air Pressure: 1014 hPa		Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:					

Table 7.7.2 Conducted emission test results

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

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
Laptop									
0.156978	60.08	54.72	65.66	-10.94	31.11	55.66	-24.55	L1	Pass
0.161120	58.90	55.91	65.46	-9.55	30.01	55.46	-25.45		
0.166467	58.66	56.58	65.20	-8.62	38.30	55.20	-16.90		
0.205976	56.08	52.07	63.42	-11.35	34.09	53.42	-19.33		
0.283066	51.12	48.50	60.79	-12.29	29.62	50.79	-21.17		
0.331216	43.86	39.93	59.47	-19.54	21.48	49.47	-27.99		
7.071343	43.51	38.00	60.00	-22.00	32.96	50.00	-17.04	L2	Pass
0.191457	54.70	53.25	63.98	-10.73	35.24	53.98	-18.74		
0.198210	54.10	49.43	63.72	-14.29	14.91	53.72	-38.81		
0.198834	54.07	50.11	63.70	-13.59	23.43	53.70	-30.27		
0.206866	53.43	51.41	63.39	-11.98	32.68	53.39	-20.71		
0.217441	52.82	49.77	62.98	-13.21	28.76	52.98	-24.22		
0.218063	53.16	49.55	62.96	-13.41	29.89	52.96	-23.07		
0.303656	49.70	46.74	60.16	-13.42	27.65	50.16	-22.51		
2.524231	47.13	39.01	56.00	-16.99	14.11	46.00	-31.89		
EUT									
0.172843	36.02	34.75	64.89	-30.14	21.28	54.89	-33.61	L1	Pass
0.173298	35.86	34.69	64.86	-30.17	21.17	54.86	-33.69		
0.230215	35.40	34.05	62.49	-28.44	18.63	52.49	-33.86		
0.269308	35.97	34.53	61.20	-26.67	19.05	51.20	-32.15		
0.307797	30.90	29.39	60.04	-30.65	14.65	50.04	-35.39		
0.499627	29.19	27.51	56.01	-28.50	15.18	46.01	-30.83		
0.172427	35.48	34.20	64.91	-30.71	19.66	54.91	-35.25	L2	Pass
0.230347	35.72	34.44	62.49	-28.05	20.73	52.49	-31.76		
0.365513	33.28	31.93	58.65	-26.72	20.10	48.65	-28.55		
0.365811	33.47	32.17	58.65	-26.48	20.37	48.65	-28.28		
0.539759	31.97	30.49	56.00	-25.51	15.61	46.00	-30.39		
0.673889	33.71	32.18	56.00	-23.82	26.33	46.00	-19.67		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0447	HL 0787	HL 1194	HL 1206	HL 1430	HL 1510			
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Full description is given in Appendix A.



Test specification:		Section 15.207(a), Conducted emission			
Test procedure:		ANSI C63.4, Section 13.1.3			
Test mode:		Compliance		Verdict: PASS	
Date & Time:		3/16/2005 10:33:36 PM			
Temperature: 23 °C		Air Pressure: 1014 hPa		Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:					

Table 7.7.3 Conducted emission test results

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

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
Laptop									
0.168462	57.58	55.14	65.10	-9.96	37.78	55.10	-17.32	L1	Pass
0.170219	57.76	55.90	65.01	-9.11	37.33	55.01	-17.68		
0.170330	57.39	56.09	65.01	-8.92	37.49	55.01	-17.52		
0.191984	55.34	51.33	63.96	-12.63	28.03	53.96	-25.93		
0.229529	53.36	49.49	62.52	-13.03	25.04	52.52	-27.48		
0.267611	51.87	48.93	61.25	-12.32	27.42	51.25	-23.83		
12.538540	42.20	37.81	60.00	-22.19	32.47	50.00	-17.53	L2	Pass
0.167144	57.69	55.29	65.16	-9.87	35.44	55.16	-19.72		
0.176295	57.05	53.67	64.72	-11.05	34.69	54.72	-20.03		
0.201672	55.10	51.94	63.59	-11.65	29.61	53.59	-23.98		
0.253704	52.14	48.50	61.68	-13.18	25.38	51.68	-26.30		
2.597423	43.76	34.42	56.00	-21.58	11.70	46.00	-34.30		
3.001728	38.77	32.97	56.00	-23.03	30.92	46.00	-15.08		
EUT									
0.174082	35.34	33.27	64.83	-31.56	18.38	54.83	-36.45	L1	Pass
0.232078	34.63	32.77	62.42	-29.65	16.78	52.42	-35.64		
0.271710	35.05	32.94	61.13	-28.19	16.67	51.13	-34.46		
0.309564	30.52	27.70	59.99	-32.29	12.06	49.99	-37.93		
0.367887	31.48	29.09	58.60	-29.51	14.33	48.60	-34.27		
0.413568	27.26	23.08	57.62	-34.54	9.54	47.62	-38.08		
0.173557	35.34	33.96	64.85	-30.89	18.98	54.85	-35.87	L2	Pass
0.233582	34.88	33.44	62.36	-28.92	19.71	52.36	-32.65		
0.406339	33.81	32.44	57.75	-25.31	21.04	47.75	-26.71		
0.503437	31.93	30.43	56.00	-25.57	17.73	46.00	-28.27		
0.540868	31.99	30.03	56.00	-25.97	15.37	46.00	-30.63		
0.676682	33.64	31.89	56.00	-24.11	26.33	46.00	-19.67		

HL 0447	HL 0787	HL 1194	HL 1206	HL 1430	HL 1510			
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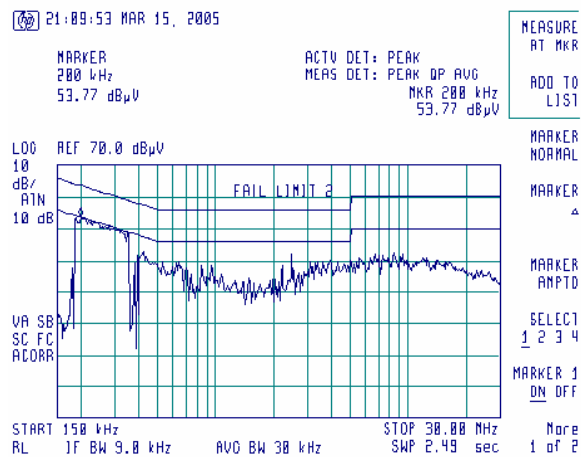
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Date of Issue: 4/8/2005

Test specification:		Section 15.207(a), Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 10:33:36 PM	
Temperature: 23 °C	Air Pressure: 1014 hPa	Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:			

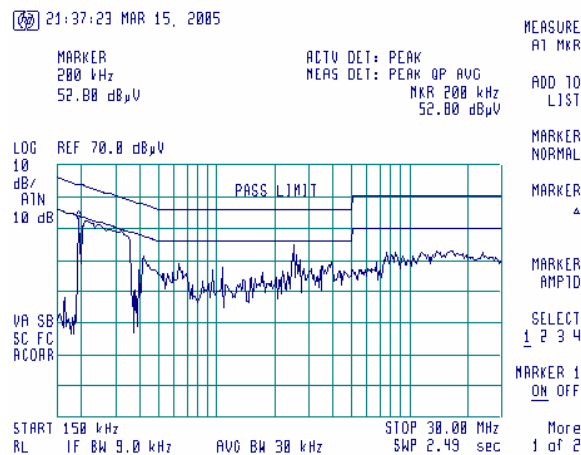
Plot 7.7.1 Conducted emission measurements at laptop power lines

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



Plot 7.7.2 Conducted emission measurements at laptop power lines

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





HERMON LABORATORIES

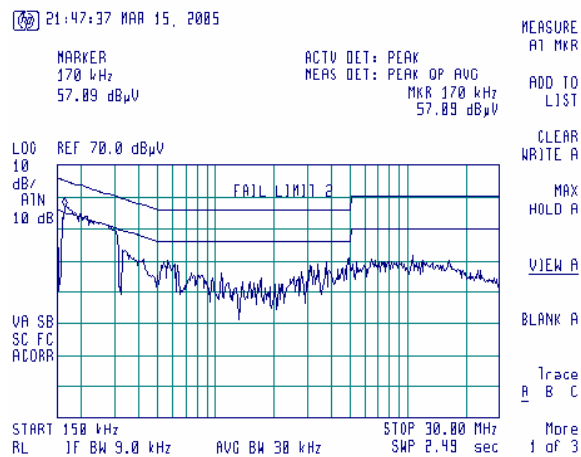
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Date of Issue: 4/8/2005

Test specification:		Section 15.207(a), Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 10:33:36 PM	
Temperature: 23 °C		Air Pressure: 1014 hPa	Relative Humidity: 44 %
Remarks:		Power Supply: 120 VAC	

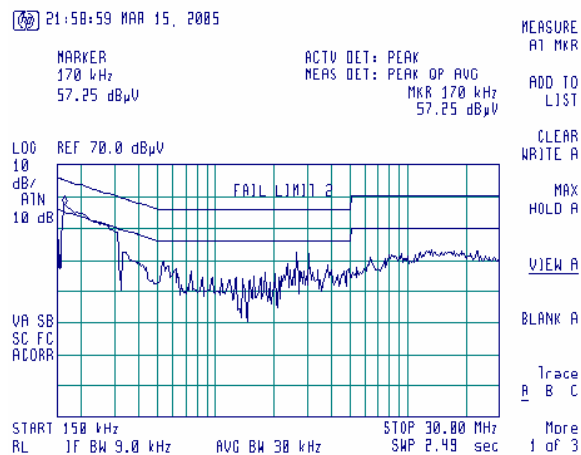
Plot 7.7.3 Conducted emission measurements at laptop power lines

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



Plot 7.7.4 Conducted emission measurements at laptop power lines

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

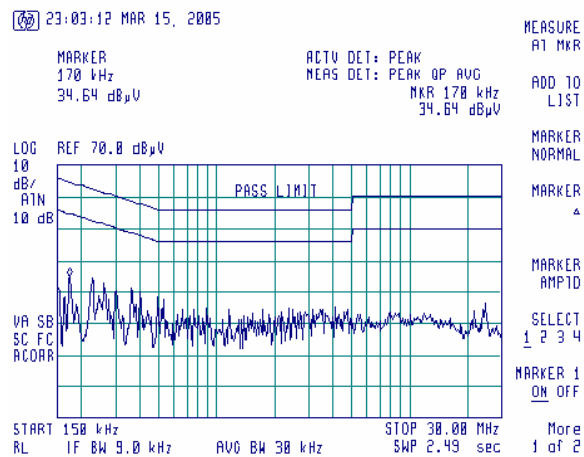




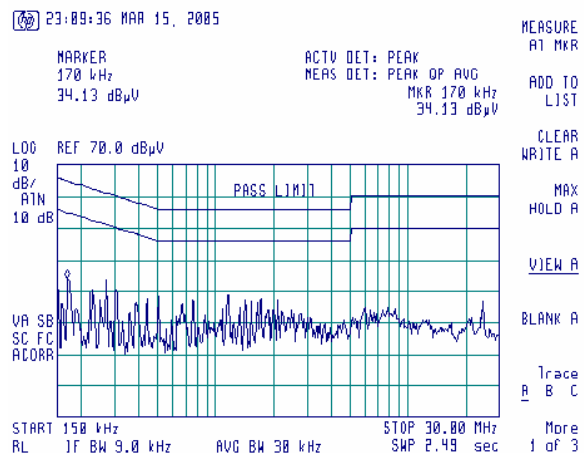
Test specification:		Section 15.207(a), Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 10:33:36 PM	
Temperature: 23 °C		Air Pressure: 1014 hPa	Relative Humidity: 44 %
Remarks:		Power Supply: 120 VAC	

Plot 7.7.5 Conducted emission measurements at EUT power lines

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

**Plot 7.7.6 Conducted emission measurements at EUT power lines**

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

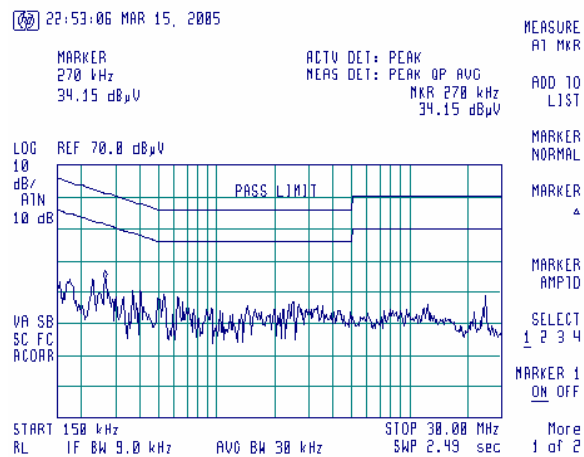




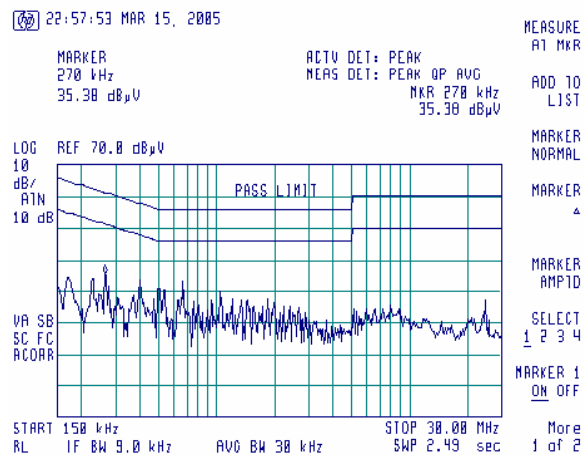
Test specification:		Section 15.207(a), Conducted emission	
Test procedure:		ANSI C63.4, Section 13.1.3	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 10:33:36 PM	
Temperature: 23 °C		Air Pressure: 1014 hPa	Relative Humidity: 44 %
Remarks:		Power Supply: 120 VAC	

Plot 7.7.7 Conducted emission measurements at EUT power lines

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

**Plot 7.7.8 Conducted emission measurements at EUT power lines**

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





Test specification:		Section 15.203, Antenna requirement	
Test procedure:		Visual inspection	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/20/2005 10:28:35 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

7.8 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 7.8.1.

Table 7.8.1 Antenna requirements

Requirement	Rationale	Verdict
The transmitter requires professional installation	Supplier declaration	Comply

Photograph 7.8.1 Antenna assembly





Test specification:		Section 15.203, Antenna requirement	
Test procedure:		Visual inspection	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/20/2005 10:28:35 AM	
Temperature: 26 °C	Air Pressure: 1015 hPa	Relative Humidity: 43 %	Power Supply: 120 VAC
Remarks:			

Photograph 7.8.2 Antenna assembly



Photograph 7.8.3 Antenna assembly





Test specification:		Section 15.107, Conducted emission at AC power port	
Test procedure:		ANSI C63.4, Sections 11.5 and 12.1.3	
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:34:10 AM		
Temperature: 23 °C	Air Pressure: 1014 hPa	Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:			

8 Emission tests according to 47CFR part 15 subpart B requirements

8.1 Conducted emissions

8.1.1 General

This test was performed to measure common mode conducted emissions at the mains power port. Specification test limits are given in Table 8.1.1. The worst test results (the lowest margins) were recorded in Table 8.1.2 and shown in the associated plots.

Table 8.1.1 Limits for conducted emissions

Frequency, MHz	Class B limit, dB(μ V)		Class A limit, dB(μ V)	
	QP	AVRG	QP	AVRG
0.15 - 0.5	66 - 56*	56 - 46*	79	66
0.5 - 5.0	56	46	73	60
5.0 - 30	60	50	73	60

* The limit decreases linearly with the logarithm of frequency.

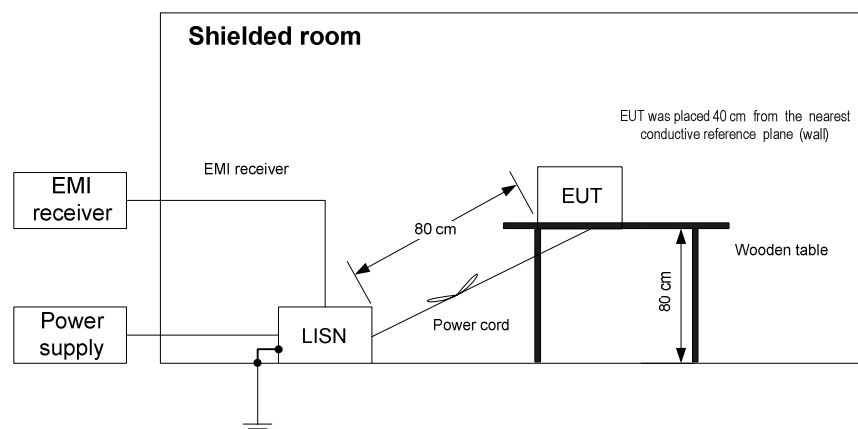
8.1.2 Test procedure

8.1.2.1 The EUT was set up as shown in Figure 8.1.1 and associated photographs, energized and the performance check was conducted.

8.1.2.2 The measurements were performed at power terminals with the LISN, connected to a spectrum analyzer in the frequency range referred to in Table 8.1.1. Unused coaxial connector of the LISN was terminated with 50 Ohm. Quasi-peak and average detectors were used throughout the testing.

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

Figure 8.1.1 Setup for conducted emission measurements, table-top equipment





Test specification:		Section 15.107, Conducted emission at AC power port			
Test procedure:		ANSI C63.4, Sections 11.5 and 12.1.3			
Test mode:		Compliance		Verdict: PASS	
Date & Time:		3/28/2005 9:34:10 AM			
Temperature: 23 °C		Air Pressure: 1014 hPa		Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:					

Table 8.1.2 Conducted emission test results

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

Frequency, MHz	Peak emission, dB(μV)	Quasi-peak			Average			Line ID	Verdict
		Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*	Measured emission, dB(μV)	Limit, dB(μV)	Margin, dB*		
Laptop									
0.163034	56.85	55.14	65.36	-10.22	34.97	55.36	-20.39	L1	Pass
0.167496	57.70	55.51	65.15	-9.64	35.81	55.15	-19.34		
0.167583	57.54	55.14	65.14	-10.00	35.49	55.14	-19.65		
0.190900	55.32	51.48	64.00	-12.52	28.02	54.00	-25.98		
0.204690	54.92	52.02	63.47	-11.45	29.83	53.47	-23.64		
0.251548	52.42	48.73	61.74	-13.01	25.70	51.74	-26.04		
0.286348	50.77	48.93	60.69	-11.76	30.34	50.69	-20.35	L2	Pass
0.167800	57.60	55.96	65.13	-9.17	36.70	55.13	-18.43		
0.213226	54.22	50.33	63.15	-12.82	28.15	53.15	-25.00		
0.241029	52.54	48.75	62.08	-13.33	26.02	52.08	-26.06		
0.266095	51.52	48.58	61.30	-12.72	27.82	51.30	-23.48		
0.309077	48.99	46.55	60.00	-13.45	25.57	50.00	-24.43		
0.319201	49.38	46.32	59.76	-13.44	28.15	49.76	-21.61		
EUT									
0.167281	36.27	31.47	65.16	-33.69	15.96	55.16	-39.20	L1	Pass
0.168538	36.03	32.97	65.10	-32.13	17.65	55.10	-37.45		
0.170092	35.08	32.89	65.02	-32.13	17.99	55.02	-37.03		
0.225218	36.73	34.92	62.68	-27.76	17.00	52.68	-35.68		
0.260632	34.87	31.78	61.47	-29.69	14.95	51.47	-36.52		
0.262582	35.66	33.63	61.41	-27.78	15.89	51.41	-35.52		
0.166665	35.41	30.73	65.19	-34.46	15.03	55.19	-40.16	L2	Pass
0.225379	37.53	35.55	62.68	-27.13	19.43	52.68	-33.25		
0.263105	36.66	34.74	61.39	-26.65	18.39	51.39	-33.00		
0.300269	32.29	26.69	60.26	-33.57	12.36	50.26	-37.90		
0.356884	34.92	33.01	58.86	-25.85	19.40	48.86	-29.46		
0.402569	34.51	24.88	57.82	-32.94	10.29	47.82	-37.53		

*- Margin = Measured emission - specification limit.

Reference numbers of test equipment used

HL 0447	HL 0787	HL 1194	HL 1206	HL 1430	HL 1510		
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Full description is given in Appendix A.



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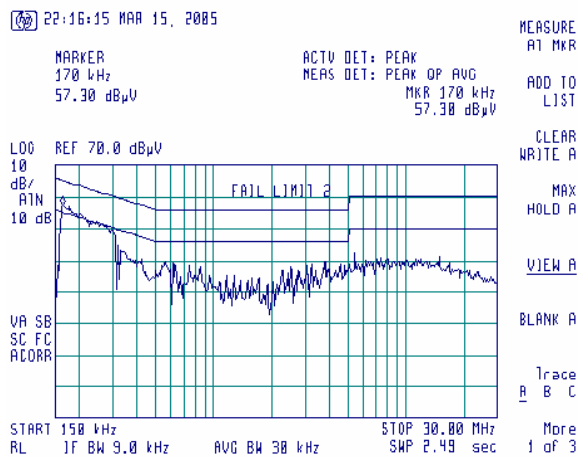
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Date of Issue: 4/8/2005

Test specification:		Section 15.107, Conducted emission at AC power port	
Test procedure:		ANSI C63.4, Sections 11.5 and 12.1.3	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/28/2005 9:34:10 AM	
Temperature: 23 °C	Air Pressure: 1014 hPa	Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:			

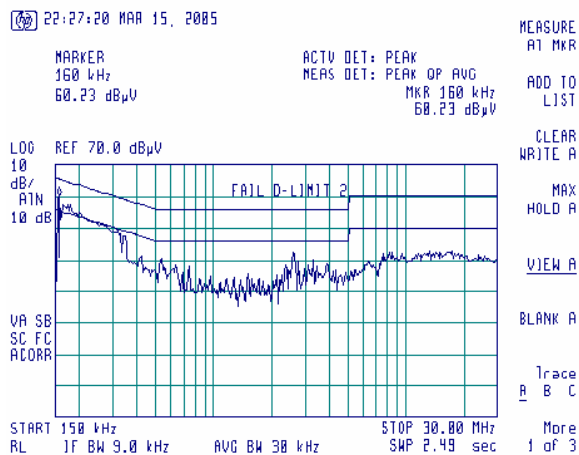
Plot 8.1.1 Conducted emission measurements at laptop power lines

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



Plot 8.1.2 Conducted emission measurements at laptop power lines

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

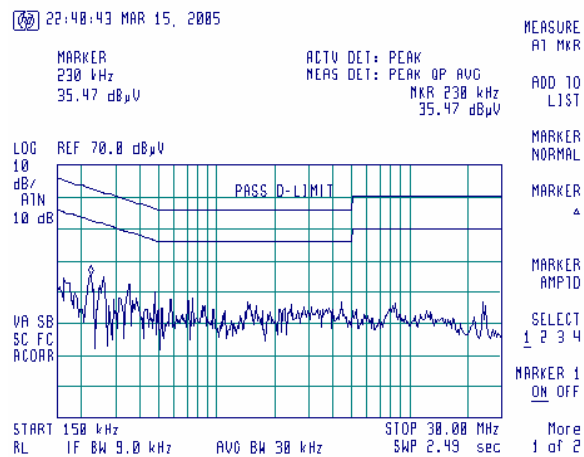




Test specification:	Section 15.107, Conducted emission at AC power port		
Test procedure:	ANSI C63.4, Sections 11.5 and 12.1.3		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/28/2005 9:34:10 AM		
Temperature: 23 °C	Air Pressure: 1014 hPa	Relative Humidity: 44 %	Power Supply: 120 VAC
Remarks:			

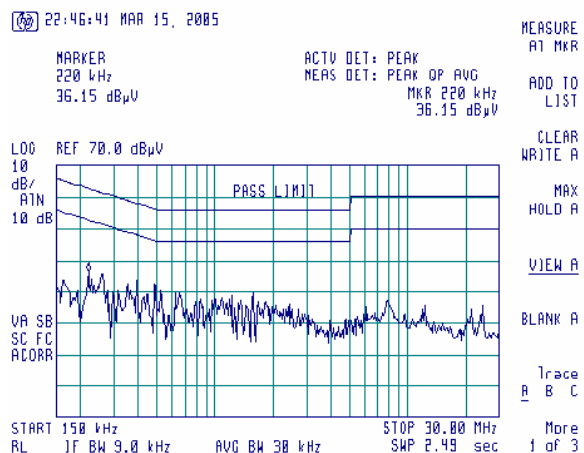
Plot 8.1.3 Conducted emission measurements at EUT power lines

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



Plot 8.1.4 Conducted emission measurements at EUT power lines

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





Test specification:	Section 15.109, Radiated emission		
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4		
Test mode:	Compliance	Verdict:	PASS
Date & Time:	3/16/2005 2:27:07 PM		
Temperature: 24 °C	Air Pressure: 1017 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

8.2 Radiated emission measurements

8.2.1 General

This test was performed to measure radiated emissions from the EUT enclosure. Specification test limits are given in Table 8.2.1.

Table 8.2.1 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: $\text{Lim}_{S_2} = \text{Lim}_{S_1} + 20 \log (S_1/S_2)$, where S_1 and S_2 – standard defined and test distance respectively in meters.

8.2.2 Test procedure for measurements in semi-anechoic chamber

8.2.2.1 The EUT was set up as shown in Figure 8.2.1 and associated photograph/s, energized and the performance check was conducted.

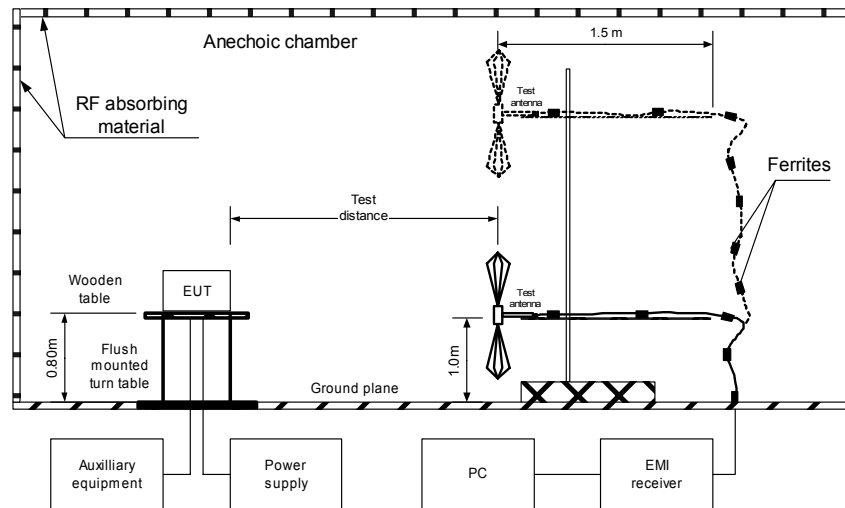
8.2.2.2 The specified frequency range was investigated with biconilog antenna connected to EMI receiver. To find maximum radiation the turntable was rotated 360°, the measuring antenna height was changed from 1 to 4 m, its polarization was switched from vertical to horizontal and the EUT cables position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

8.2.2.3 The worst test results (the lowest margins) were recorded in Table 8.2.2 and shown in the associated plots.



Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 2:27:07 PM	
Temperature: 24 °C	Air Pressure: 1017 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

Figure 8.2.1 Setup for radiated emission measurements in anechoic chamber, table-top equipment





Test specification:	Section 15.109, Radiated emission			
Test procedure:	ANSI C63.4, Sections 11.6 and 12.1.4			
Test mode:	Compliance	Verdict:		PASS
Date & Time:	3/16/2005 2:27:07 PM			
Temperature: 24 °C	Air Pressure: 1017 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC	
Remarks:				

Table 8.2.2 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
DETECTORS USED: PEAK / QUASI-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*				
33.966250	37.47	33.76	40.00	-6.24	V	1.0	115	Pass
95.785000	36.06	32.00	43.50	-11.50	V	1.0	218	
128.875000	39.76	33.38	43.50	-10.12	V	1.2	110	
168.014379	43.87	40.03	43.50	-3.47	V	1.1	212	
196.058631	45.40	42.53	43.50	-0.97	V	1.0	177	
337.562500	46.33	41.78	46.00	-4.22	V	1.0	171	
507.102500	43.86	38.80	46.00	-7.20	H	1.5	229	
835.854710	48.38	41.26	46.00	-4.74	H	1.0	129	
948.351250	43.30	37.31	46.00	-8.69	H	1.0	323	

TEST SITE: SEMI ANECHOIC CHAMBER
TEST DISTANCE: 3 m
DETECTORS USED: PEAK / AVERAGE
FREQUENCY RANGE: 1000 MHz – 6500 MHz
RESOLUTION BANDWIDTH: 1000 kHz

Frequency, MHz		Average			Antenna polarization	Antenna height, m	Turn-table position**, degrees	Verdict
Peak emission, dB(μV/m)	Measured emission, dB(μV/m)	Limit, dB(μV/m)	Margin, dB*					
Low carrier channel								
1198.04576	37.97	25.04	54.00	-28.96	H	1.0	189	Pass
2506.32562	43.98	37.84	54.00	-16.16	H	1.0	116	

*- 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 0592	HL 0593	HL 0594	HL 0604	HL 1947
HL 2009	HL 2432						

Full description is given in Appendix A.

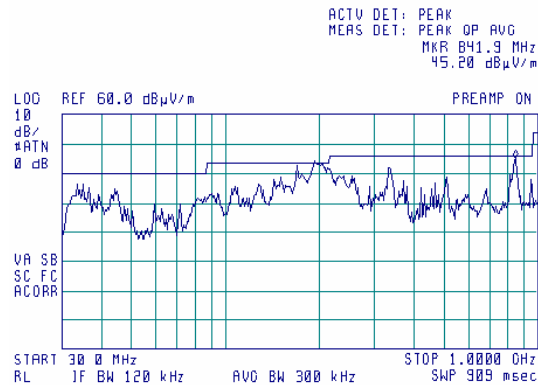


Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 2:27:07 PM	
Temperature: 24 °C		Air Pressure: 1017 hPa	Relative Humidity: 40 %
Remarks:		Power Supply: 120 VAC	

Plot 8.2.1 Radiated emission measurements in 30- 1000 MHz range, vertical and horizontal antenna polarization, low frequency channel

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

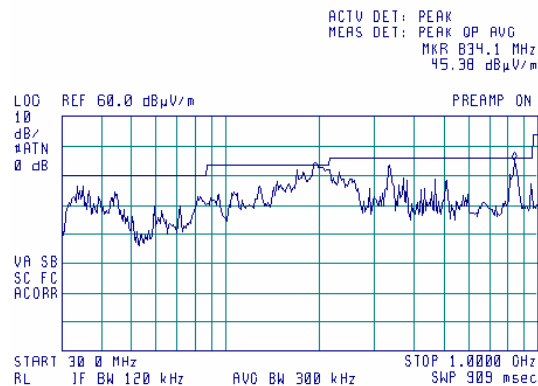
13:21:47 16 MAR 2005



Plot 8.2.2 Radiated emission measurements in 30- 1000 MHz range, vertical and horizontal antenna polarization, mid frequency channel

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

11:58:41 16 MAR 2005



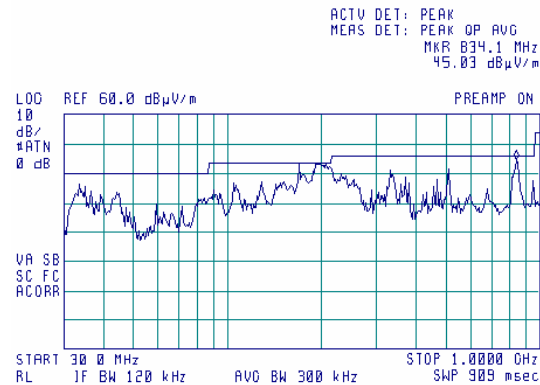


Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 2:27:07 PM	
Temperature: 24 °C	Air Pressure: 1017 hPa	Relative Humidity: 40 %	Power Supply: 120 VAC
Remarks:			

Plot 8.2.3 Radiated emission measurements in 30- 1000 MHz range, vertical and horizontal antenna polarization, high frequency channel

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

13:26:25 16 MAR 2005



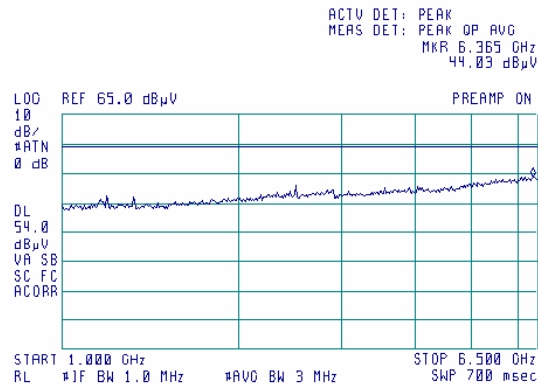


Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 2:27:07 PM	
Temperature: 24 °C		Air Pressure: 1017 hPa	Relative Humidity: 40 %
Remarks:		Power Supply: 120 VAC	

Plot 8.2.4 Radiated emission measurements above 1000 MHz, vertical and horizontal antenna polarization, low frequency channel

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

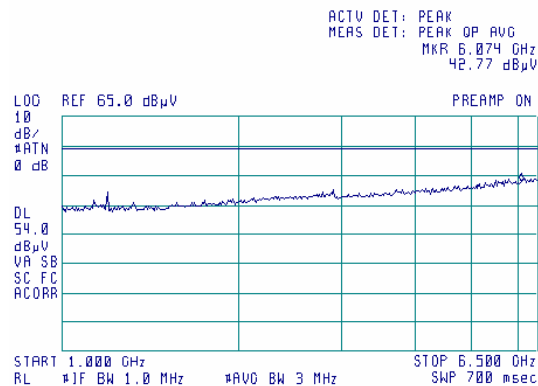
09:54:46 16 MAR 2005



Plot 8.2.5 Radiated emission measurements above 1000 MHz, vertical and horizontal antenna polarization, mid frequency channel

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

10:27:26 16 MAR 2005



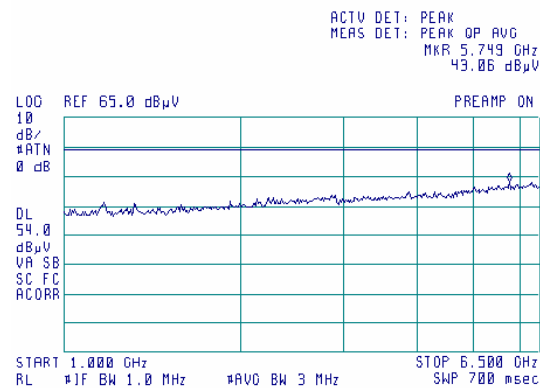


Test specification:		Section 15.109, Radiated emission	
Test procedure:		ANSI C63.4, Sections 11.6 and 12.1.4	
Test mode:		Compliance	Verdict: PASS
Date & Time:		3/16/2005 2:27:07 PM	
Temperature: 24 °C		Air Pressure: 1017 hPa	Relative Humidity: 40 %
Remarks:		Power Supply: 120 VAC	

Plot 8.2.6 Radiated emission measurements above 1000 MHz, vertical and horizontal antenna polarization, high frequency channel

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

10:45:26 16 MAR 2005





9 APPENDIX A Test equipment and ancillaries used for tests

HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
0025	Analyzer, Spectrum, 10 kHz - 23 GHz / 140 GHz	Anritsu	MS-710C	5837	25-Oct-04	25-Oct-05
0287	Turntable, Motorized Diameter, 2 m (OATS)	HL	TMD-2	042	11-Nov-04	11-Nov-05
0446	Antenna, Loop active, 10kHz-30MHz	EMCO	6502	2857	11-Nov-04	11-Nov-05
0447	LISN, 16/2, 300V RMS	HL	LISN 16 - 1	066	11-Nov-04	11-Nov-05
0465	Anechoic Chamber 9(L) x 6.5(W) x 5.5(H) m	HL	AC - 1	023	03-Nov-04	03-Nov-05
0521	EMI Receiver (Spectrum Analyzer) with RF filter section 9 kHz-6.5 GHz	Hewlett Packard	8546A	3617A 00319, 3448A002 53	10-Oct-04	10-Oct-05
0569	Antenna, Log Periodic, 200 - 1000 MHz	Electro-Metrics	LPA 25/30	1953	12-Jan-05	12-Jan-06
0589	Cable Coaxial, GORE A2P01POL118, 2.3 m	HL	GORE-3	176	02-Dec-04	02-Dec-05
0592	Position Controller	HL	L2-SR3000 (HL CRL-3)	100	02-Dec-04	02-Dec-05
0593	Antenna Mast, 1-4 m Pneumatic	Madgesh	AM-F1	101	03-Feb-05	03-Feb-06
0594	Turn Table FOR ANECHOIC CHAMBER flush mount d=1.2 m Pneumatic	HL	TT-WDC1	102	27-Jan-05	27-Jan-06
0604	Antenna BiconiLog Log-Periodic/T Bow-TIE 26 - 2000 MHz	EMCO	3141	9611-1011	27-Jan-05	27-Jan-06
0784	Antenna X-WING BILOG 20 MHz - 2 GHz	Schaffner-Chase EMC	CBL6140 A	1120	27-Jan-05	27-Jan-06
0787	Transient Limiter	Hewlett Packard	11947A	3107A018 77	27-Jan-05	27-Jan-06
0813	Cable Coax, RG-214, 12 m, N-type connectors	HL	C214-12	149	27-Jan-05	27-Jan-06
1194	Variac, 220 V/ 2.5 A	Matsunaga		2962	05-Jan-05	05-Jan-06
1206	One phase voltage regulator, 2kVA, 0-250V	HL	TDGC-2	142	02-Dec-04	02-Dec-05
1424	Spectrum Analyzer, 30 Hz- 40 GHz	Agilent Technologies (HP)	8564EC	3946A002 19	30-Aug-04	30-Aug-05
1430	EMI Receiver, 9 kHz - 2.9 GHz, System: HL1431, HL1432	Agilent Technologies (HP)	8542E	3807A002 62,3705A0 0217	01-Sep-04	01-Sep-05
1510	Cable RF, 8 m	Belden	M17/167 MIL-C-17	1510	02-Dec-04	02-Dec-05
1552	Cable RF, 8 m	Alpha Wire	RG-214	1552	02-Dec-04	02-Dec-05
1651	Attenuators Set (2, 3, 5, 20 dB), DC-18 GHz	M/A-COM	2082	1651	03-Jan-05	03-Jan-06
1848	Antenna mast 4m/6m with polarity control (OATS)	Sh. I. Machines	AM-5	1	03-Jan-05	03-Jan-06
1947	Cable 18GHz, 6.5 m, blue	Rhophase Microwave Limited	NPS-1803A-6500-NPS	T4974	17-Oct-04	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	22-Mar-06
2009	Cable RF, 8 m	Alpha Wire	RG-214	C-56	02-Dec-04	02-Dec-05



HL No	Description	Manufacturer	Model	Ser. No.	Last Cal.	Due Cal.
2259	Amplifier Low Noise 2-20 GHz	Sophia Wireless	LNA0220-C	0223	05-Nov-04	05-Nov-05
2399	Cable 40GHz, 1.5 m, blue	Rhophase Microwave Limited	KPS-1503A-1500-KPS	X2945	24-Jun-04	24-Jun-05
2432	Antenna, Double-Ridged Waveguide Horn 1-18 GHz	EMC Test Systems	3115	00027177	22-Mar-05	22-Mar-06



10 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.



11 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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website: www.hermonlabs.com

Person for contact: Mr. Alex Usoskin, CEO.

12 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: 2003	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz.



13 APPENDIX E Abbreviations and acronyms

A	ampere
AC	alternating current
A/m	ampere per meter
AM	amplitude modulation
AVRG	average (detector)
cm	centimeter
dB	decibel
dBm	decibel referred to one milliwatt
dB(μ V)	decibel referred to one microvolt
dB(μ V/m)	decibel referred to one microvolt per meter
dB(μ A)	decibel referred to one microampere
dB Ω	decibel referred to one Ohm
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
ITE	information technology equipment
k	kilo
kHz	kilohertz
LISN	line impedance stabilization network
LO	local oscillator
m	meter
MHz	megahertz
min	minute
mm	millimeter
ms	millisecond
μ s	microsecond
NA	not applicable
NT	not tested
OATS	open area test site
Ω	Ohm
PCB	printed circuit board
PM	pulse modulation
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
VA	volt-ampere

14 APPENDIX F Test equipment correction factors

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

Frequency, MHz	Correction factor, dB	Frequency, MHz	Correction factor, dB
0.01	5.0	3.0	0.1
0.02	2.2	4.0	0.1
0.03	1.1	5.0	0.1
0.04	0.7	6.0	0.2
0.05	0.5	10.0	0.3
0.1	0.2	12.0	0.4
0.2	0.1	16.0	0.5
0.4	0.1	18.0	0.6
0.6	0.1	20.0	0.7
0.8	0.1	25.0	0.9
1.0	0.1	28.0	1.2
2.0	0.1	30.0	1.3

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

Antenna factor
Active loop antenna
Model 6502, S/N 2857, HL 0446

Frequency, MHz	Magnetic antenna factor, dB	Electric antenna factor, dB
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	9.8
0.750	-41.9	9.7
1.000	-41.4	10.1
2.000	-41.5	10.0
3.000	-41.4	10.2
4.000	-41.4	10.1
5.000	-41.5	10.1
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(1/m) is to be added to receiver meter reading in dB(μ V) to convert it into field intensity in dB(μ V/m).



Log periodic antenna factor

Electro-Metrics, model LPA-25/30, serial number 1953, HL 0569

Frequency, MHz	Antenna factor, dB(1/m)	Frequency, MHz	Antenna factor, dB(1/m)
200	15.2	625	25.2
225	15.1	650	25.8
250	16.3	675	27.2
275	17.2	700	27.6
300	19.6	725	27.6
325	18.4	750	27.6
350	19.0	775	28.0
375	20.0	800	28.2
400	20.9	825	29.4
425	21.3	850	29.9
450	22.1	875	30.0
475	22.7	900	30.4
500	23.2	925	30.6
525	23.9	950	30.8
550	24.2	975	31.6
575	24.6	1000	32.1
600	24.7		

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

**Antenna factor****Biconilog antenna EMCO, model 3141, serial number 1011, HL 0604**

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(μ V) to convert it into field intensity in dB(μ V/m).

Biconilog antenna factor
Schaffner Chase EMC, model CBL 6140A, serial number 1120, HL 0784

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(μ V) to convert it into field intensity in dB(μ V/m).



Antenna factor
Double-ridged wave guide horn antenna
EMC Test Systems, model 3115, serial no: 9911-5964, HL 1984

Frequency, MHz	Antenna gain, dBi	Antenna factor. dB(1/m)
1000.0	5.8	24.5
1500.0	9.0	24.8
2000.0	8.6	27.7
2500.0	9.5	28.7
3000.0	8.9	30.8
3500.0	8.2	32.9
4000.0	9.6	32.7
4500.0	11.2	32.1
5000.0	10.6	33.6
5500.0	9.8	35.3
6000.0	10.1	35.7
6500.0	10.7	35.8
7000.0	10.9	36.2
7500.0	10.5	37.2
8000.0	11.1	37.2
8500.0	10.8	38.1
9000.0	10.7	38.6
9500.0	11.5	38.3
10000.0	11.8	38.4
10500.0	12.3	38.3
11000.0	12.3	38.8
11500.0	11.5	39.9
12000.0	12.2	39.6
12500.0	12.6	39.5
13000.0	12.0	40.5
13500.0	11.7	41.1
14000.0	11.7	41.5
14500.0	12.7	40.8
15000.0	14.2	39.5
15500.0	16.0	38.1
16000.0	16.2	38.1
16500.0	14.5	40.1
17000.0	12.2	42.6
17500.0	9.7	45.4
18000.0	6.6	48.7

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



Antenna factor
Double-ridged wave guide horn antenna
EMC Test Systems, model 3115, serial no: 00027177, HL 2432

Frequency, MHz	Antenna gain, dBi	Antenna factor. dB(1/m)
1000.0	5.5	24.7
1500.0	8.0	25.7
2000.0	8.4	27.8
2500.0	9.3	28.9
3000.0	9.0	30.7
3500.0	9.3	31.8
4000.0	9.3	33.0
4500.0	10.4	32.8
5000.0	10.0	34.2
5500.0	10.1	34.9
6000.0	10.6	35.2
6500.0	11.0	35.4
7000.0	10.8	36.3
7500.0	10.4	37.3
8000.0	10.8	37.5
8500.0	10.8	38.0
9000.0	11.0	38.3
9500.0	11.5	38.3
10000.0	11.5	38.7
10500.0	11.9	38.7
11000.0	12.2	38.9
11500.0	11.9	39.5
12000.0	12.3	39.5
12500.0	12.7	39.4
13000.0	12.0	40.5
13500.0	12.0	40.8
14000.0	11.6	41.5
14500.0	12.2	41.3
15000.0	13.6	40.2
15500.0	15.3	38.7
16000.0	15.8	38.5
16500.0	14.8	39.8
17000.0	12.9	41.9
17500.0	9.2	45.8
18000.0	6.2	49.1

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



Cable loss
Cable RG-214, HL 0813

No.	Frequency, MHz	Cable loss, dB
1	10	0.15
2	20	0.40
3	30	0.51
4	40	0.61
5	50	0.68
6	60	0.76
7	70	0.80
8	80	0.92
9	90	0.96
10	100	0.99
11	200	1.60
12	300	1.85
13	400	2.25
14	500	2.43
15	600	2.80
16	700	3.14
17	800	3.34
18	900	3.75
19	1000	4.05
20	1200	4.41
21	1400	4.81
22	1600	5.18
23	1800	5.58
24	2000	6.09
25	2500	7.27
26	2900	8.01

Cable loss

Cable Coaxial, GORE A2P01POL118, 2.3 m, model:GORE-3, HL 0589
+ Cable Coaxial, ANDREW PSWJ4, 6m, model: ANDREW-6, 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		±0.17
18	3300	3.47		
19	3600	3.62		
20	3900	3.84		
21	4200	3.92		
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 M17/167 MIL-C-17, HL 1510

No.	Frequency, MHz	Cable loss, dB
1	0.1	0.05
2	1	0.09
3	3	0.16
4	5	0.18
5	10	0.27
6	30	0.44
7	50	0.58
8	80	0.69
9	100	0.82
10	300	1.48
11	500	2.01
12	800	2.65
13	1000	3.12



Cable loss
RF cable 8 m, model RG-214, 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		

**Cable loss****Cable coaxial, 40GHz, 1.5 m, Blue, Rhopase Microwave Limited, model: KPS-1503A-1500-KPS,
HL 2399**

Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB	Frequency, GHz	Cable loss, dB
0.03	0.07	6.5	1.57	15.50	2.50
0.05	0.10	6.7	1.60	16.00	2.51
0.1	0.16	6.9	1.55	16.50	2.58
0.2	0.26	7.1	1.65	17.00	2.65
0.3	0.33	7.3	1.65	17.50	2.73
0.5	0.38	7.5	1.70	18.00	2.74
0.7	0.41	7.7	1.71	18.50	2.67
0.9	0.58	7.9	1.73	19.00	2.67
1.1	0.64	8.1	1.79	19.50	2.74
1.3	0.70	8.3	1.81	20.00	2.69
1.5	0.75	8.5	1.84	20.50	2.80
1.7	0.79	8.7	1.85	21.00	2.82
1.9	0.83	8.9	1.90	21.50	2.87
2.1	0.88	9.1	1.95	22.00	2.87
2.3	0.93	9.3	1.93	22.50	2.92
2.5	0.97	9.5	1.98	23.50	3.04
2.7	1.01	9.7	1.96	24.00	3.05
2.9	1.04	9.9	2.03	24.50	3.03
3.1	1.08	10.1	1.99	25.00	3.11
3.3	1.14	10.30	2.02	25.50	3.10
3.5	1.17	10.50	2.02	26.00	3.17
3.7	1.21	10.70	2.02	26.50	3.11
3.9	1.24	10.90	2.08	27.00	3.16
4.1	1.26	11.10	2.02	28.00	3.19
4.3	1.26	11.30	2.09	29.00	3.19
4.5	1.29	11.50	2.05	30.00	3.30
4.7	1.34	11.70	2.11	31.00	3.31
4.9	1.34	11.90	2.11	32.00	3.35
5.1	1.40	12.10	2.12	33.00	3.46
5.3	1.43	12.40	2.17	34.00	3.45
5.5	1.45	13.00	2.29	35.00	3.49
5.7	1.47	13.50	2.31	36.00	3.54
5.9	1.40	14.00	2.43	37.00	3.62
6.1	1.53	14.50	2.43	39.00	3.69
6.3	1.55	15.00	2.46	40.00	3.75