



Radiated emissions

Test Number: 29621		Spec ID: 647		
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
Radiated Spurious Emissions	Enclosure	B	30MHz - 26.5GHz	CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039
Operating Mode	Mode : 1, Continuous transmit mode			
Power Input	5, DC (+/-20%)			
Overall Result	Pass			
Comments	No further comments			
Deviation	There were no deviations from the specification			

System Number	Description	Samples	System under test	Support equipment
2	Support equipment	S02, S03 and S04	<input type="checkbox"/>	<input checked="" type="checkbox"/>
4	Patch antenna test setup	S01 and S06	<input checked="" type="checkbox"/>	<input type="checkbox"/>

Subtest Number: 29621 - 1		Subtest Date: 03-Dec-2007
Engineer	Donald Foster	
Lab Information	Building P, 5m Anechoic	
Subtest Results		
Subtest Title	N/A	
Subtest Result	Pass	
Highest Frequency	N/A	
Lowest Frequency	N/A	
Comments on the above Test Results	No further comments	

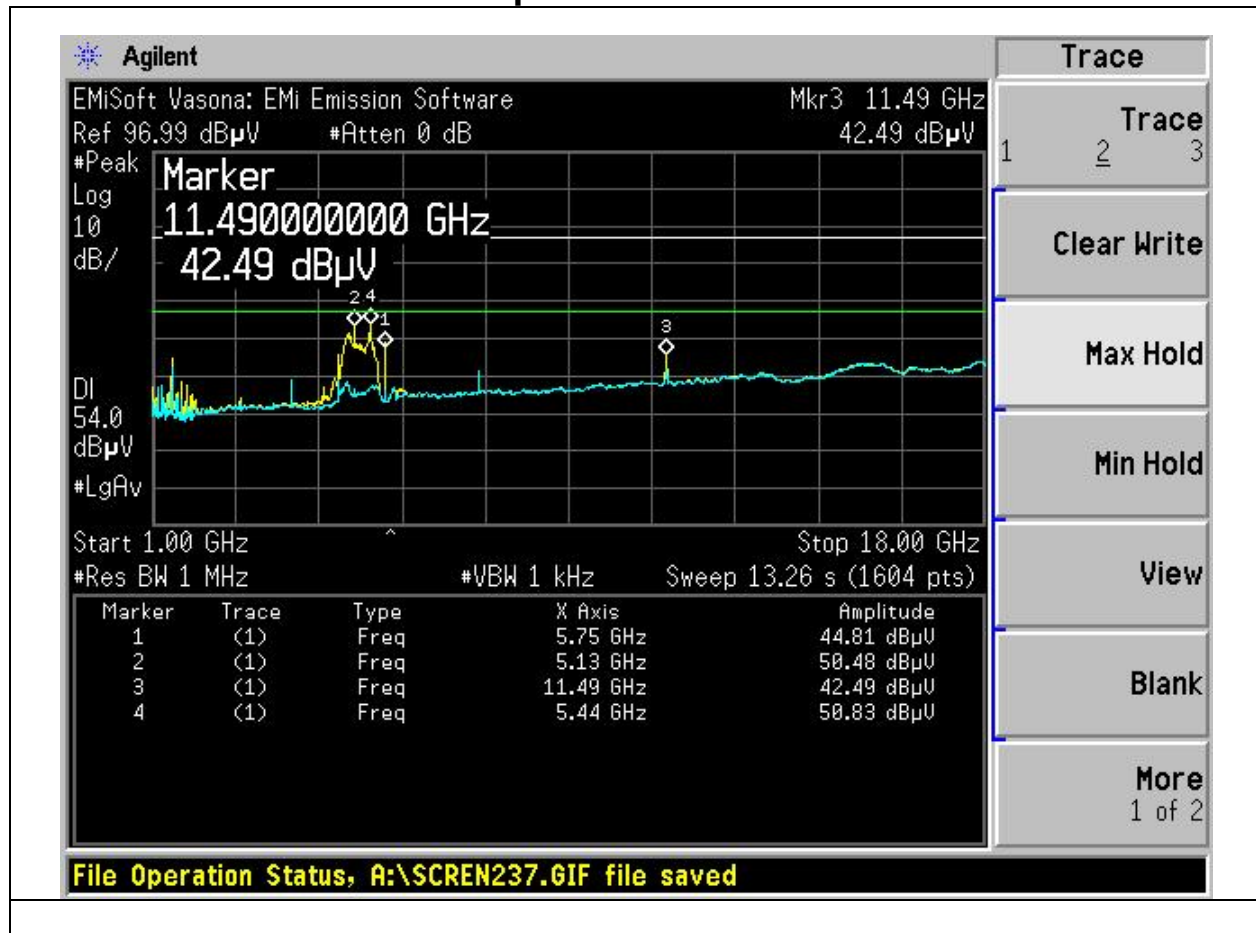
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements

There were no emissions above 18GHz. To record

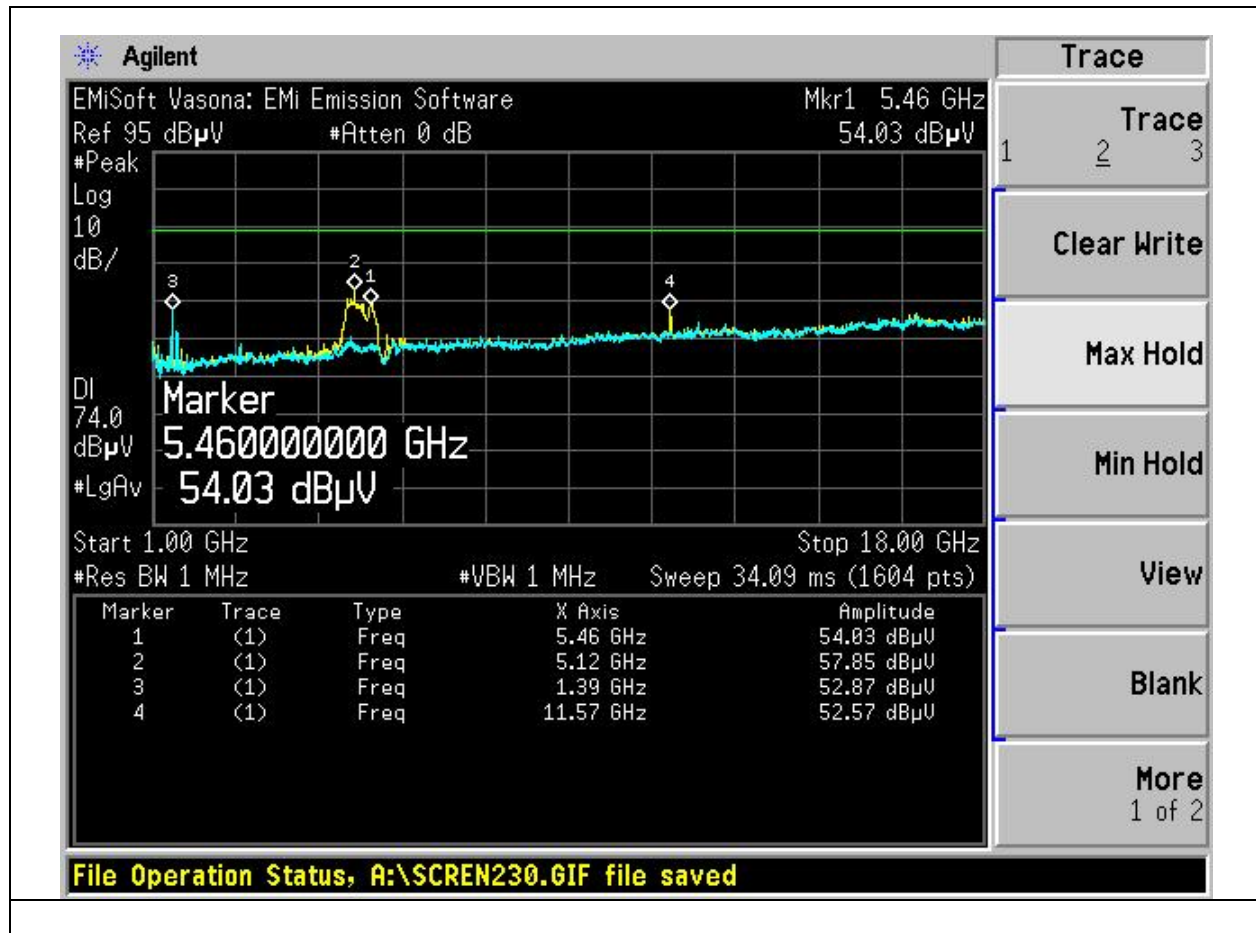


Radiated emissions at 36mbps and 16dbm for channel 5745 Ave

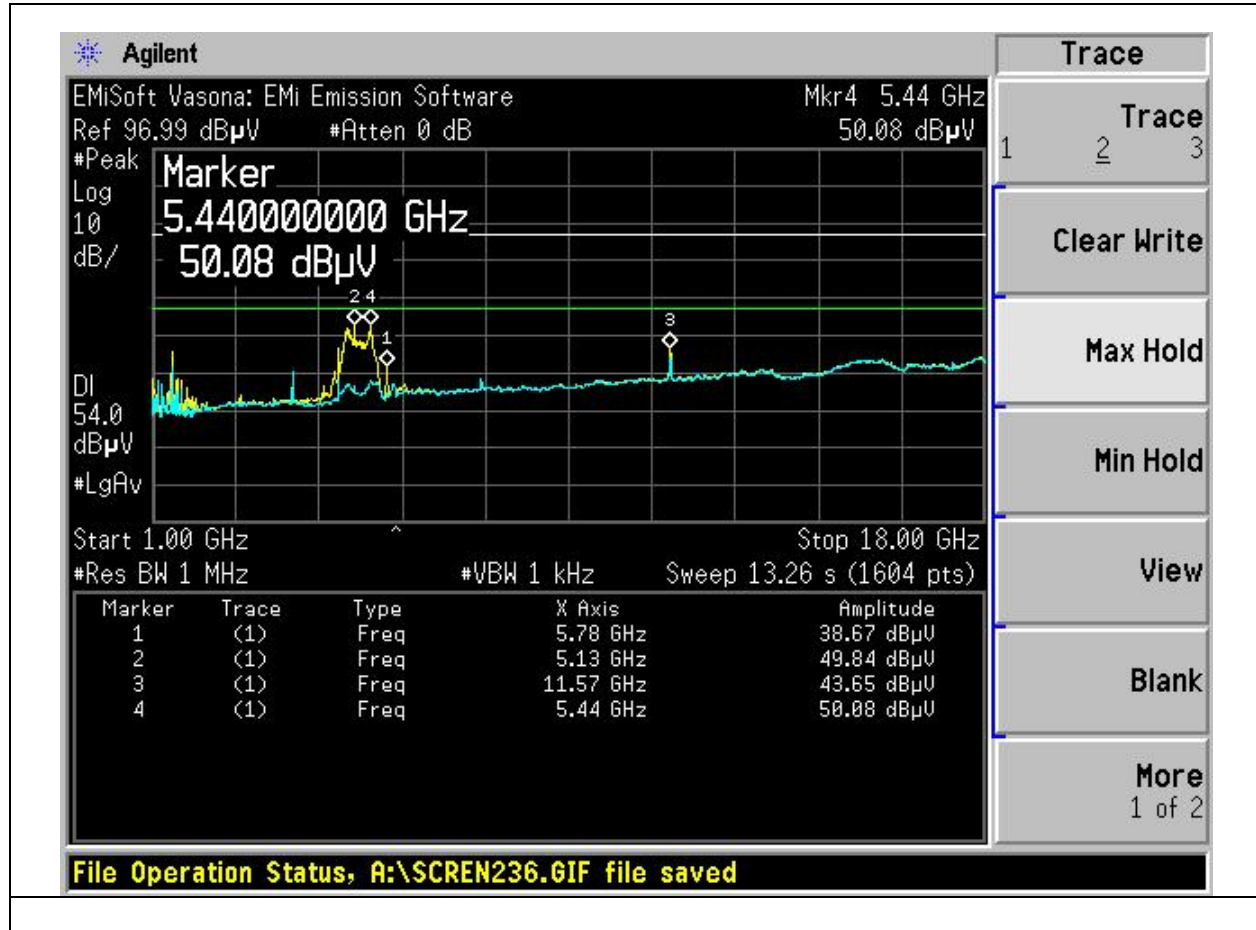




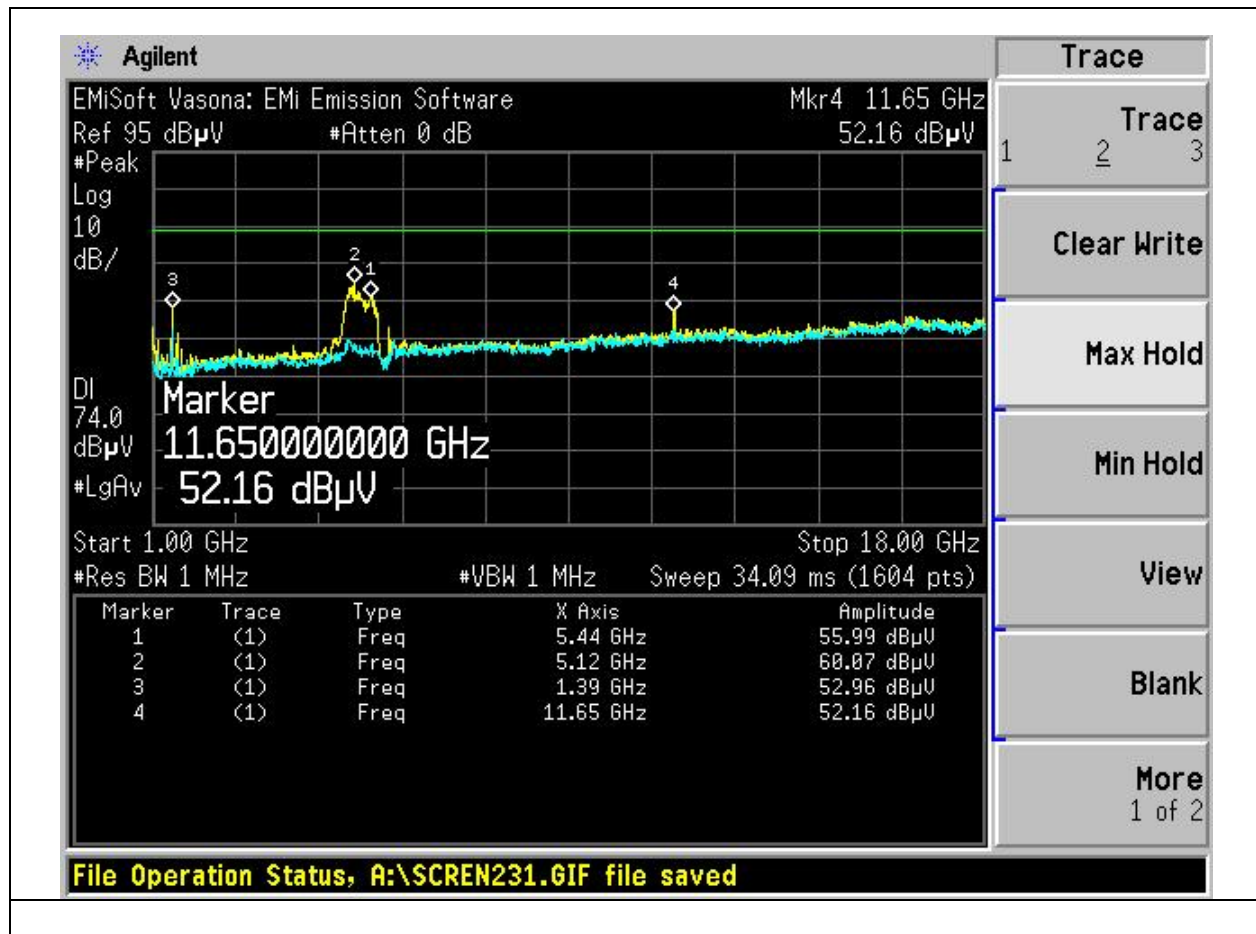
Radiated emissions at 36mbps and 16dbm for channel 5745 Peak



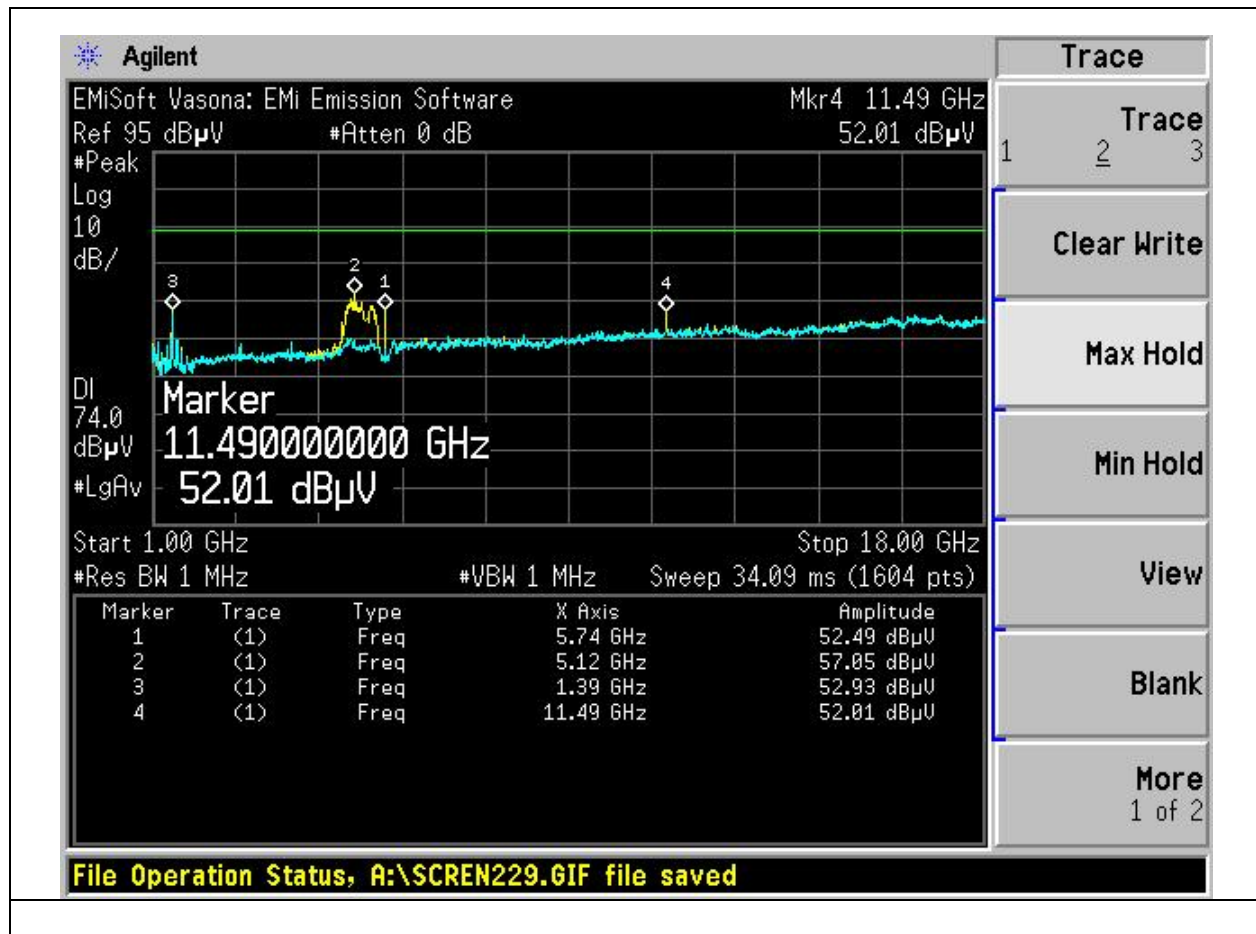
Radiated emissions at 36mbps and 16dbm for channel 5785 Ave



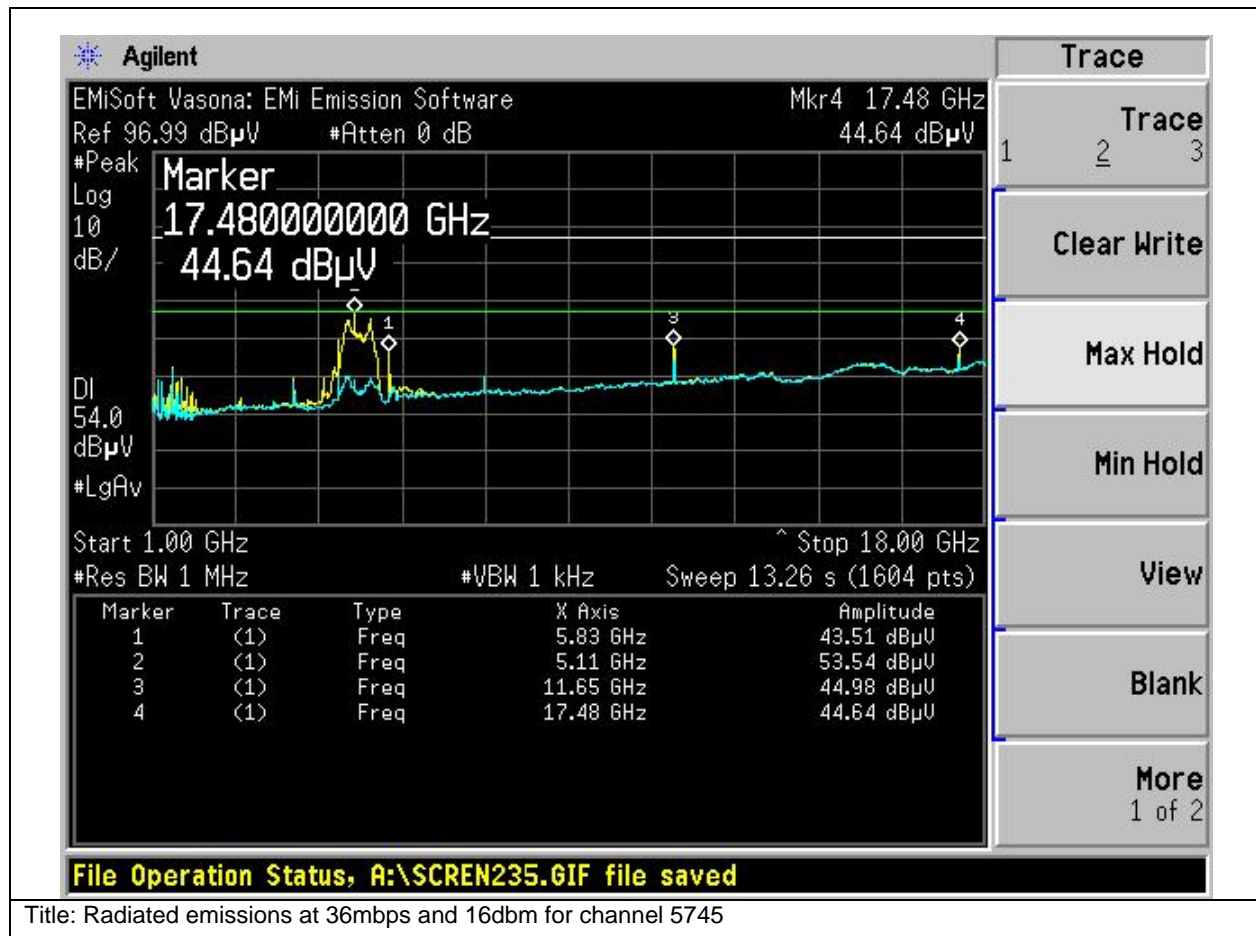
Radiated emissions at 36mbps and 16dbm for channel 5785 Peak



Radiated emissions at 36mbps and 16dbm for channel 5825 Peak



Radiated emissions at 36mbps and 16dbm for channel 5825 Ave

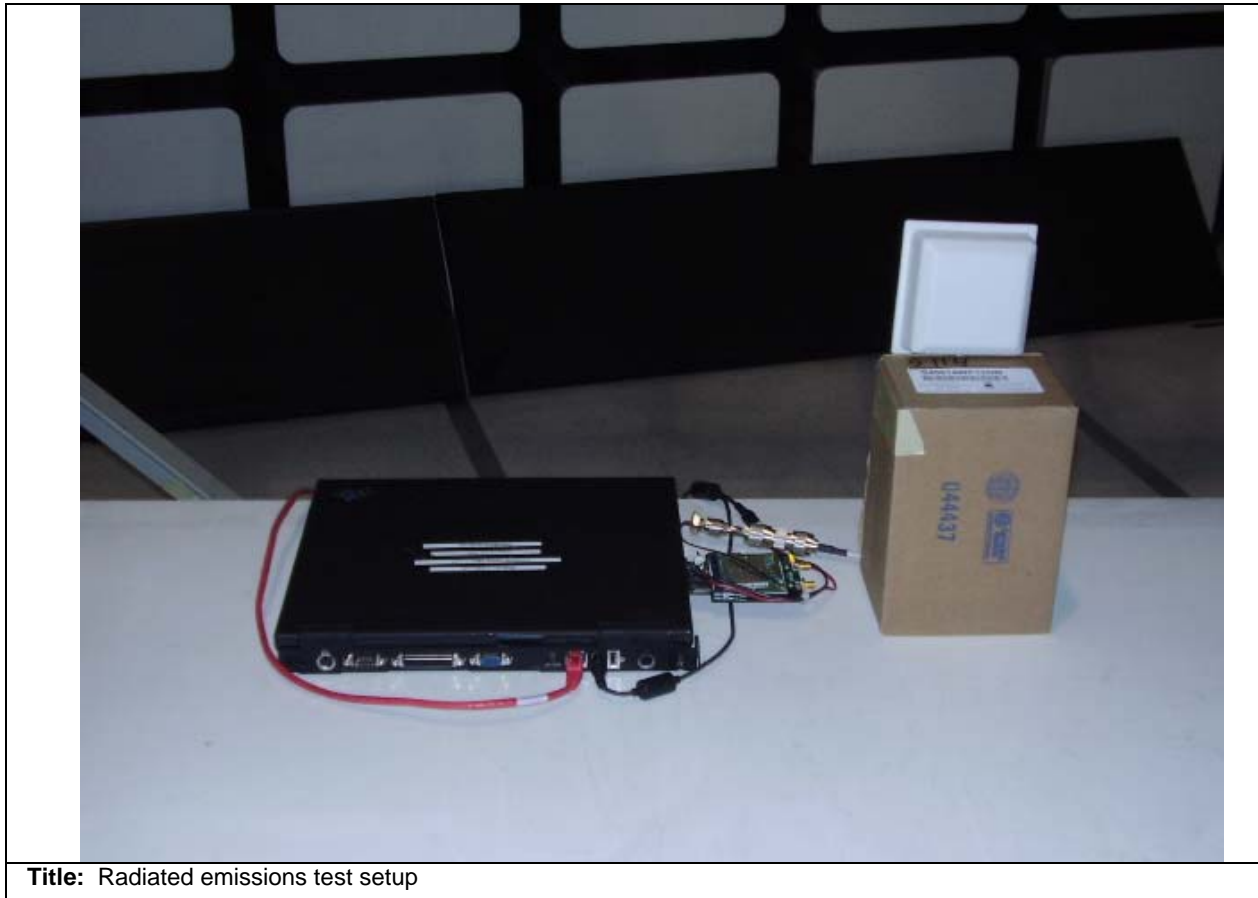


Physical Test arrangement Photograph:



Comments on the above Photograph:

No further comments



Comments on the above Photograph:

No further comments



Title: Radiated emissions test setup

Comments on the above Photograph:

No further comments



Radiated emissions

Test Number: 29607		Spec ID: 647		
Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
Radiated Spurious Emissions	Enclosure	B	30MHz - 26.5GHz	CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039
Operating Mode	Mode : 1, Continuous transmit mode			
Power Input	5, DC (+/-20%)			
Overall Result	Pass			
Comments	The emissions shown at 30-1000MHz. were caused by the extender card drawing out all the bus clocks and associated noise from the PC no signals were related to the operation of the radio. There were no emissions above 18GHz.			
Deviation	There were no deviations from the specification			

System Number	Description	Samples	System under test	Support equipment
1	EUT	S01	<input checked="" type="checkbox"/>	<input type="checkbox"/>
2	Support equipment	S02, S03 and S04	<input type="checkbox"/>	<input checked="" type="checkbox"/>
3	Omni antenna test setup	S01 and S05	<input checked="" type="checkbox"/>	<input type="checkbox"/>
5	Sector antenna test setup	S01 and S07	<input checked="" type="checkbox"/>	<input type="checkbox"/>

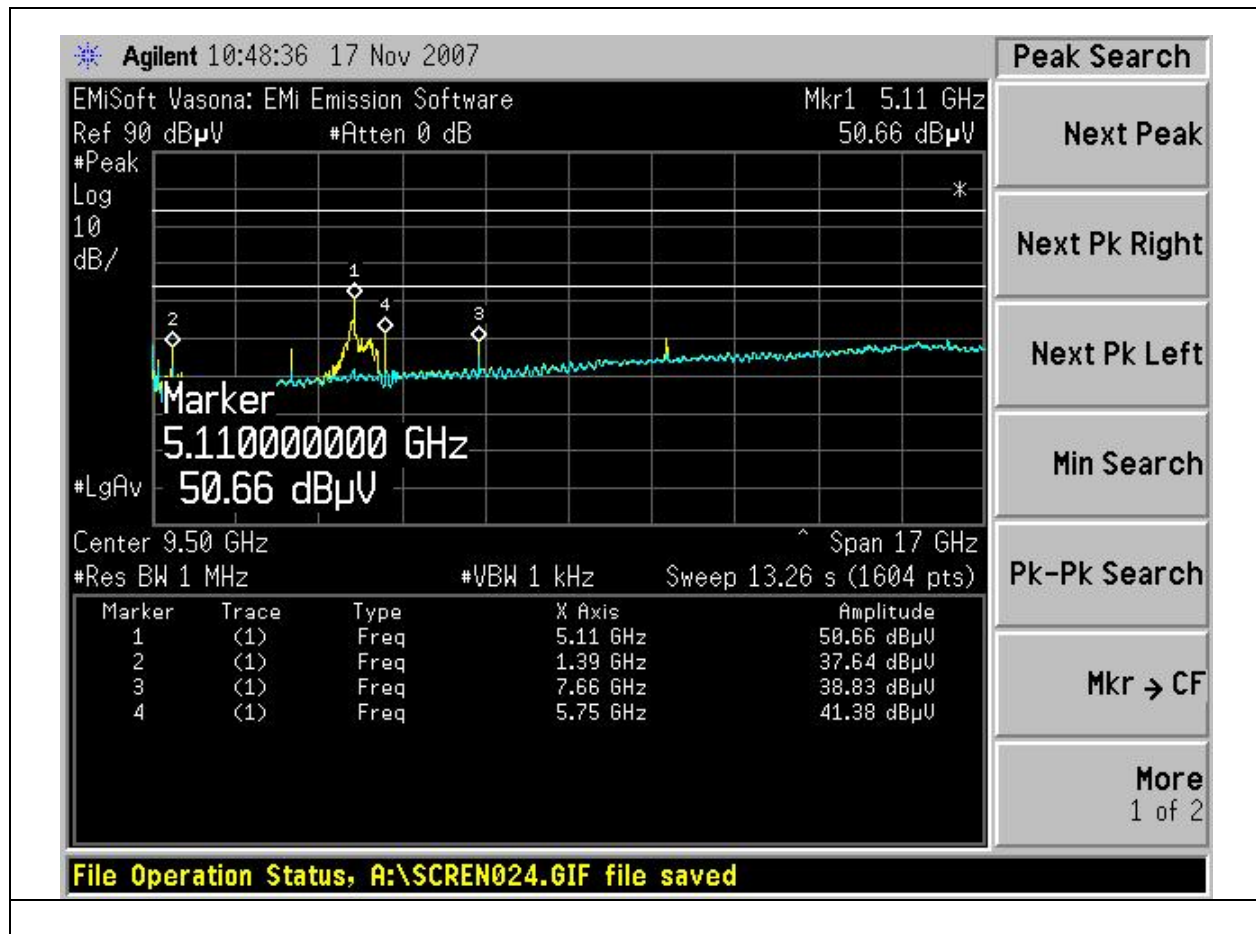
Subtest Number: 29607 - 1		Subtest Date: 03-Dec-2007
Engineer	Donald Foster	
Lab Information	Building P, 10m Anechoic	
Subtest Results		
Subtest Title	N/A	
Subtest Result	Pass	
Highest Frequency	N/A	
Lowest Frequency	N/A	
Comments on the above Test Results	17dbi sector antenna results	

Graphical Test Results

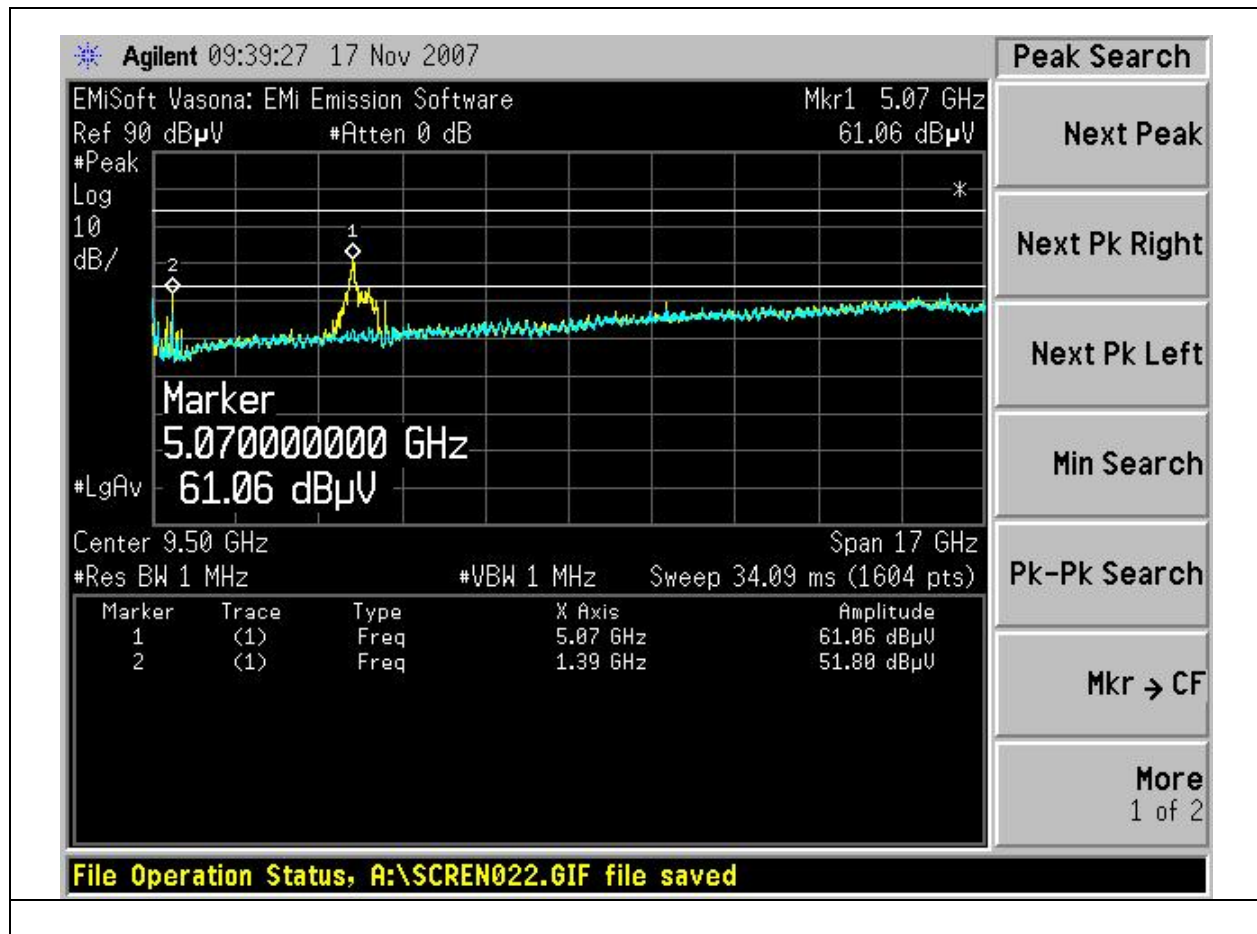
Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements

There were no emissions above 18GHz. To record

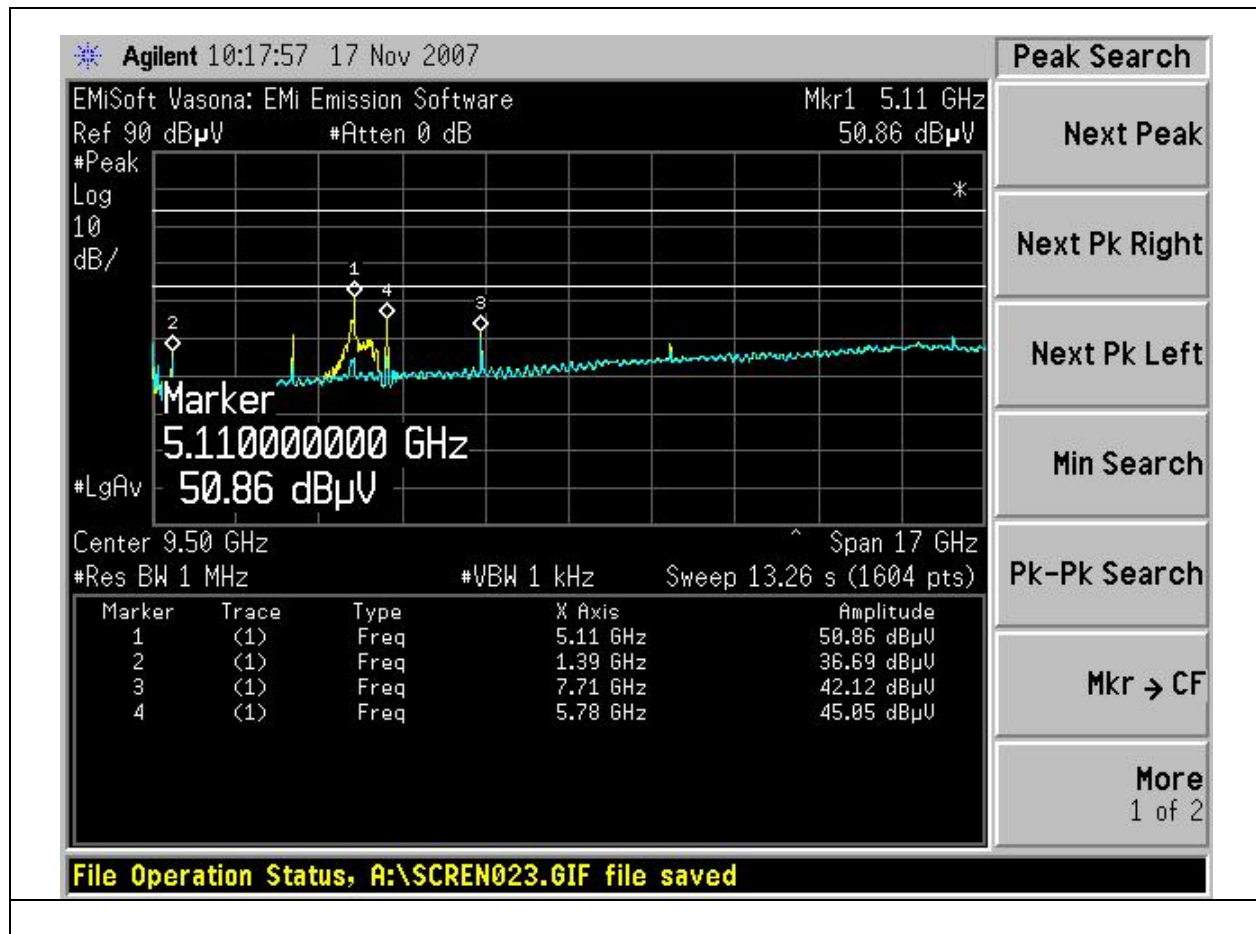
Radiated emissions 1-18GHz at 36mbps and 16dbm for the 17dbi sector antenna at channel 5745 Ave



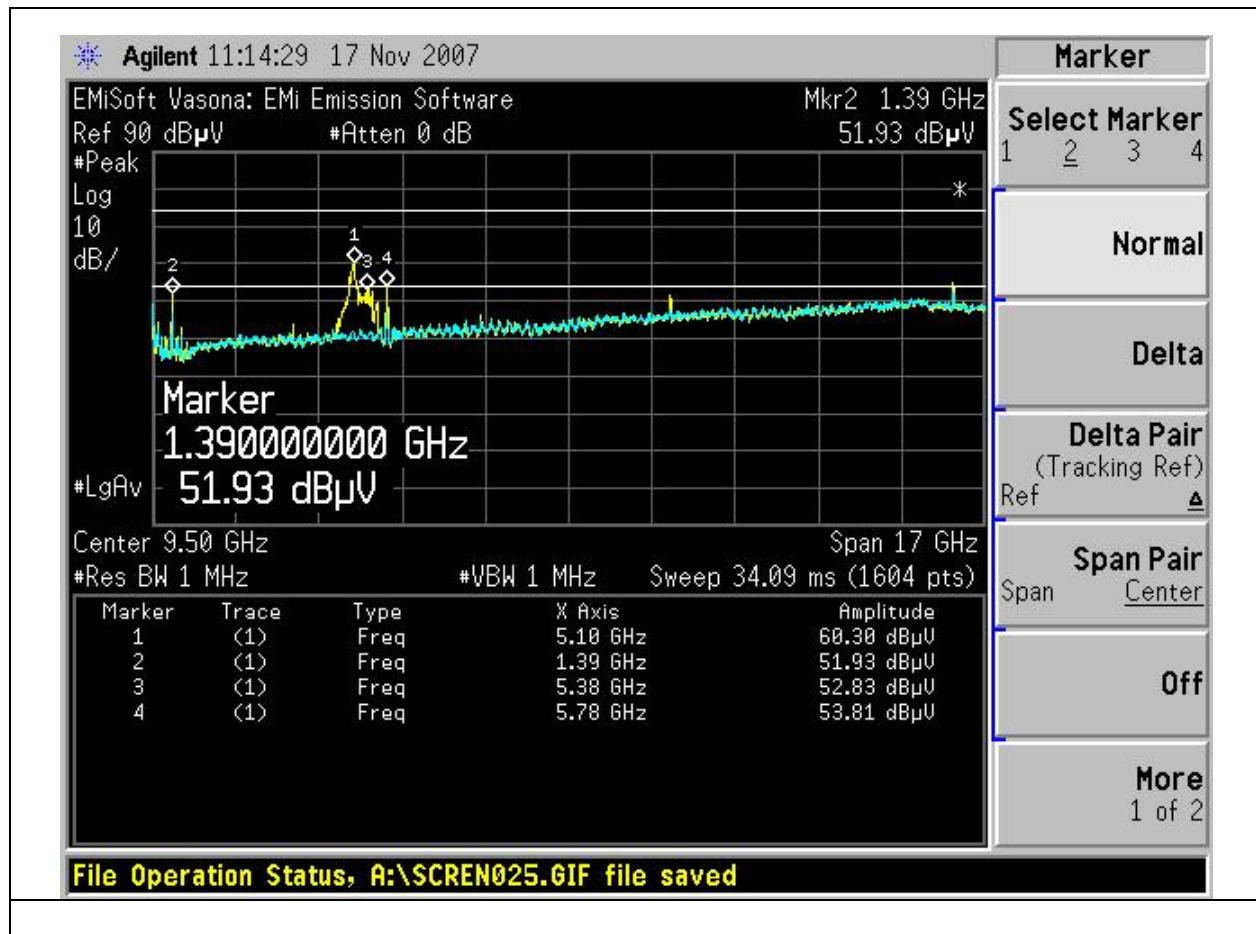
Radiated emissions 1-18GHz at 36mbps and 16dbm for the 17dbi sector antenna at channel 5745 Peak



Radiated emissions 1-18GHz at 36mbps and 16dbm for the 17dbi sector antenna at channel 5785 Ave

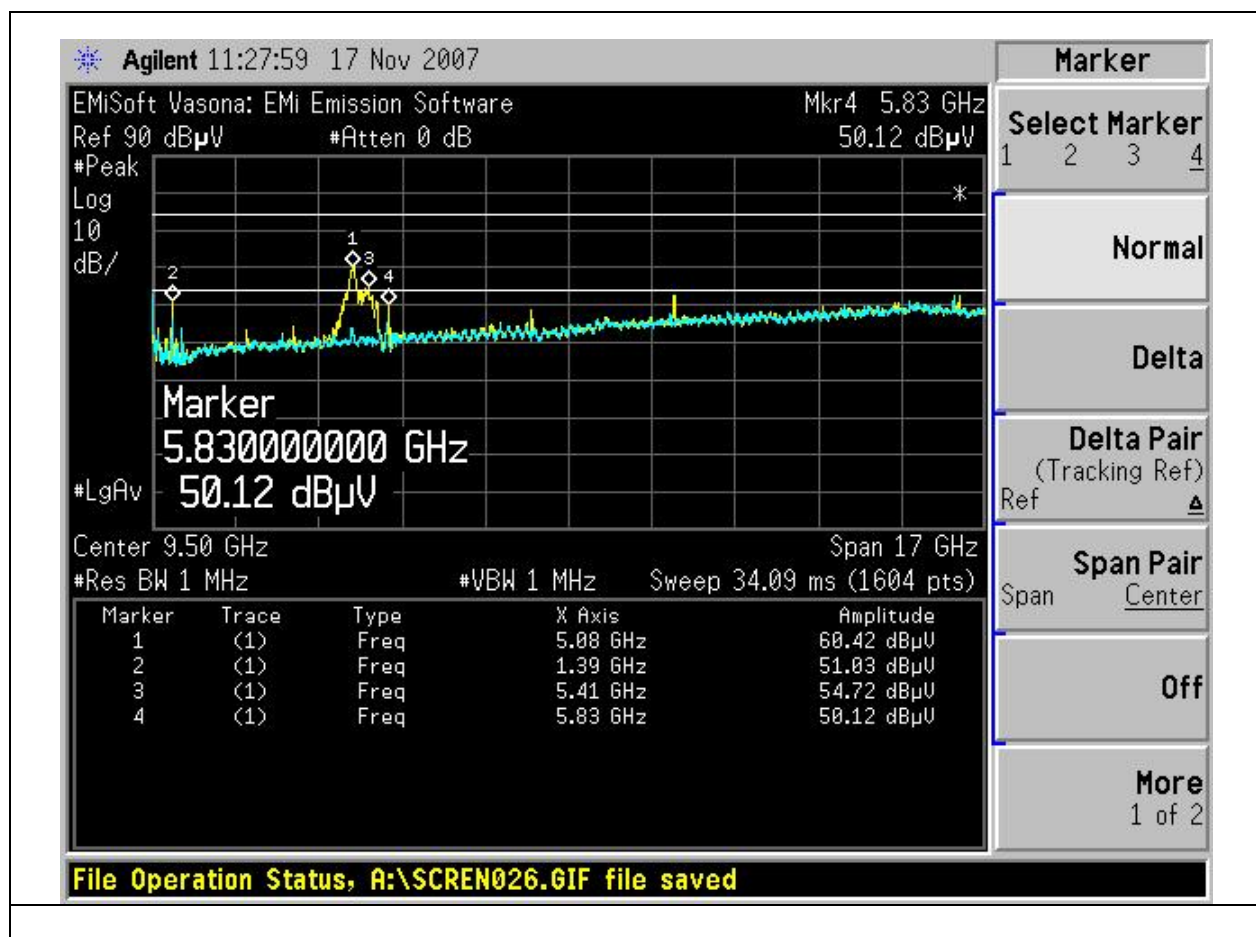


Radiated emissions 1-18GHz at 36mbps and 16dbm for the 17dbi sector antenna at channel 5785 Peak



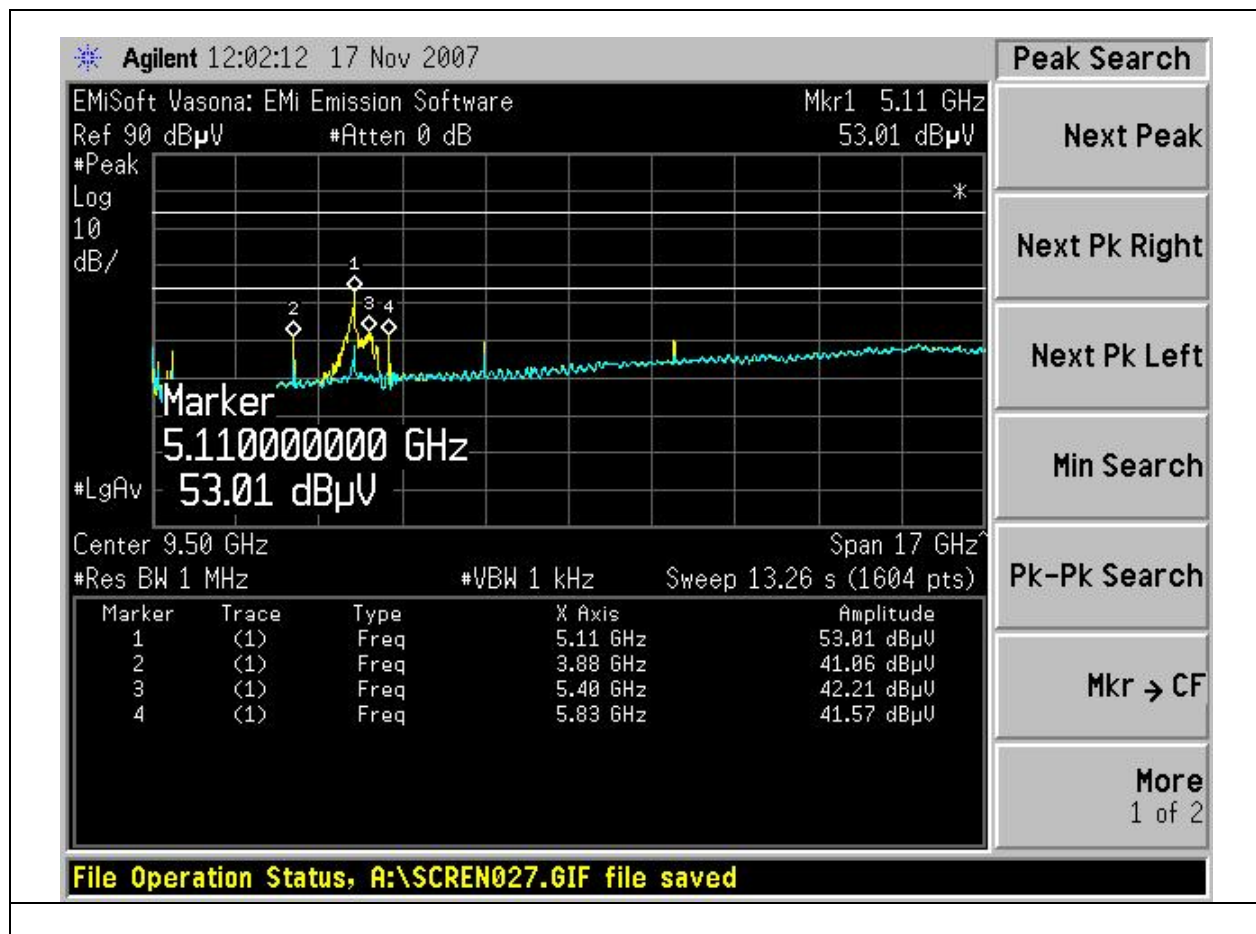


Radiated emissions 1-18GHz at 36mbps and 16dbm for the 17dbi sector antenna at channel 5825 Peak





Radiated emissions 1-18GHz at 36mbps and 16dbm for the 17dbi sector antenna at channel 5825 Ave





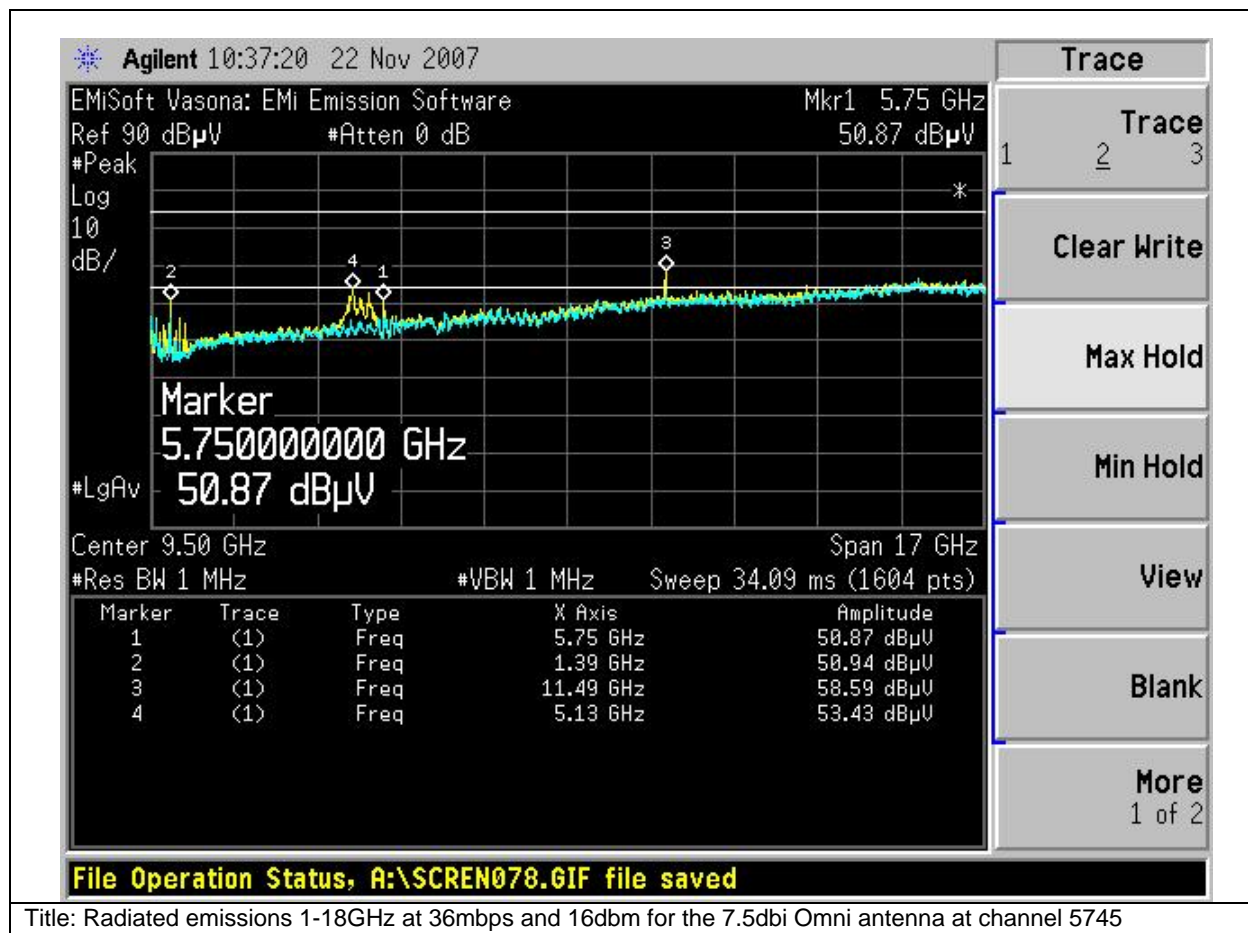
Subtest Number: 29607 - 2		Subtest Date: 03-Dec-2007	
Engineer	Donald Foster		
Lab Information	Building P, 10m Anechoic		
Subtest Results			
Subtest Title	N/A		
Subtest Result	Pass		
Highest Frequency	N/A		
Lowest Frequency	N/A		
Comments on the above Test Results	No further comments		

Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements



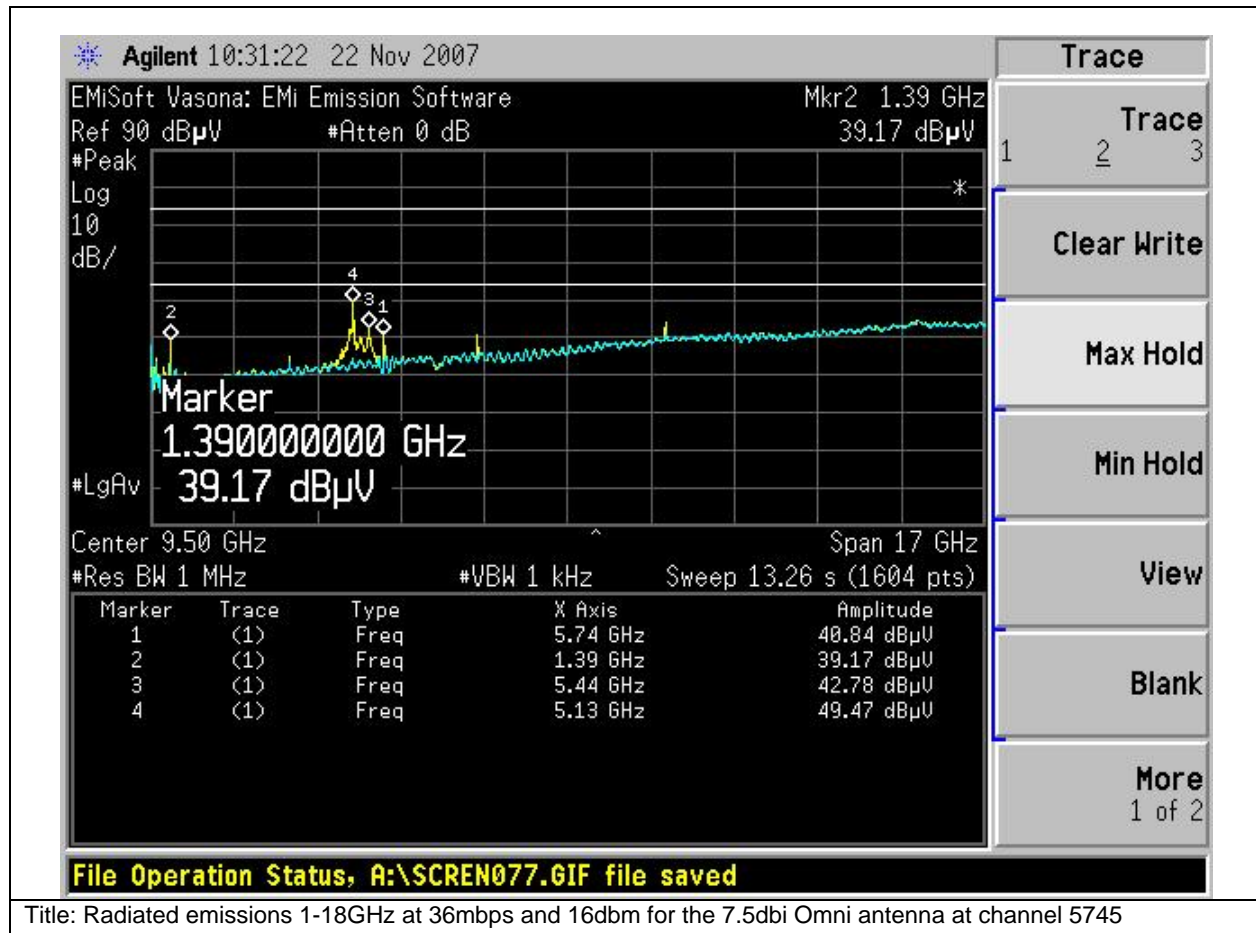
Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5745 Peak



Title: Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5745



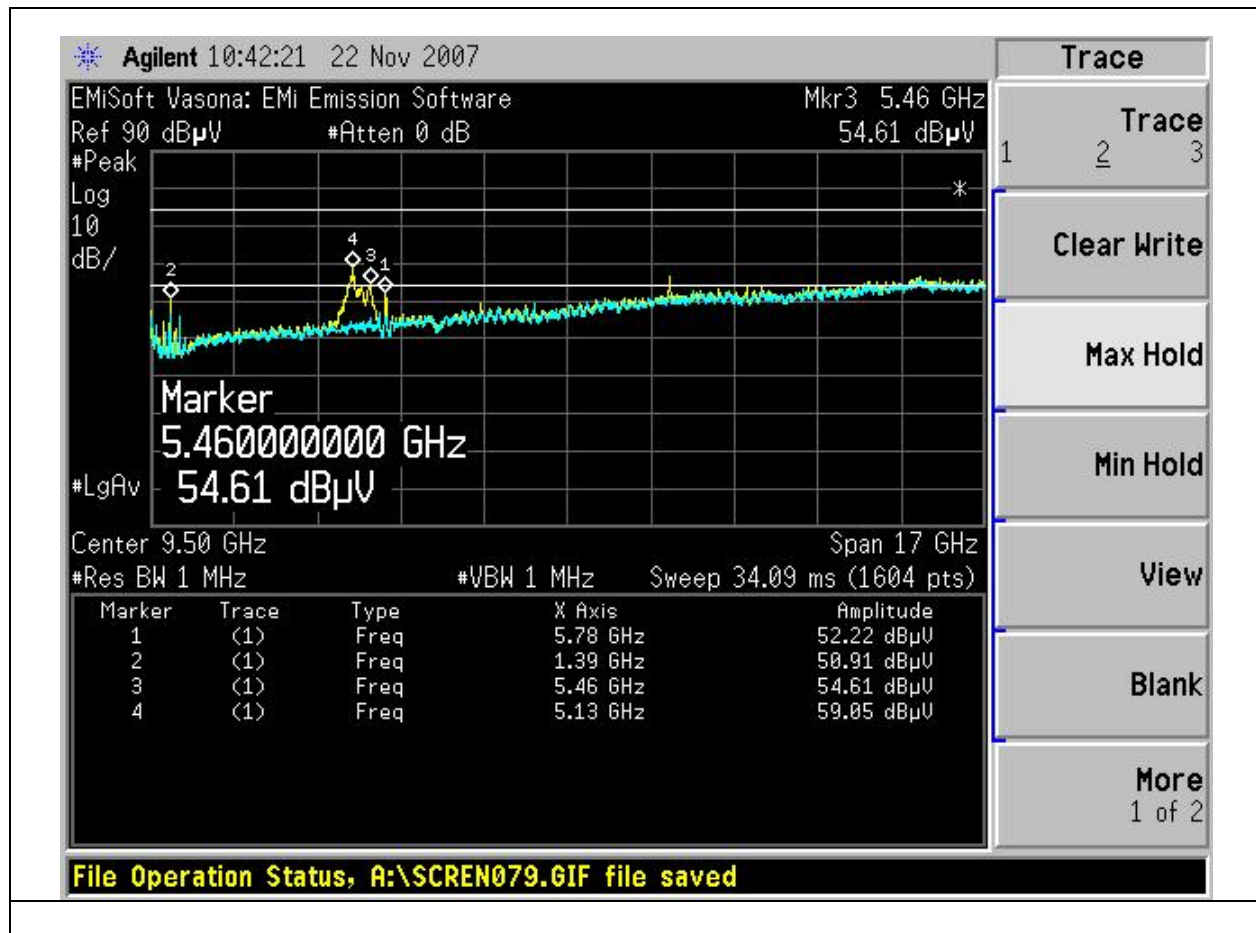
Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5745 Ave



Title: Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5745

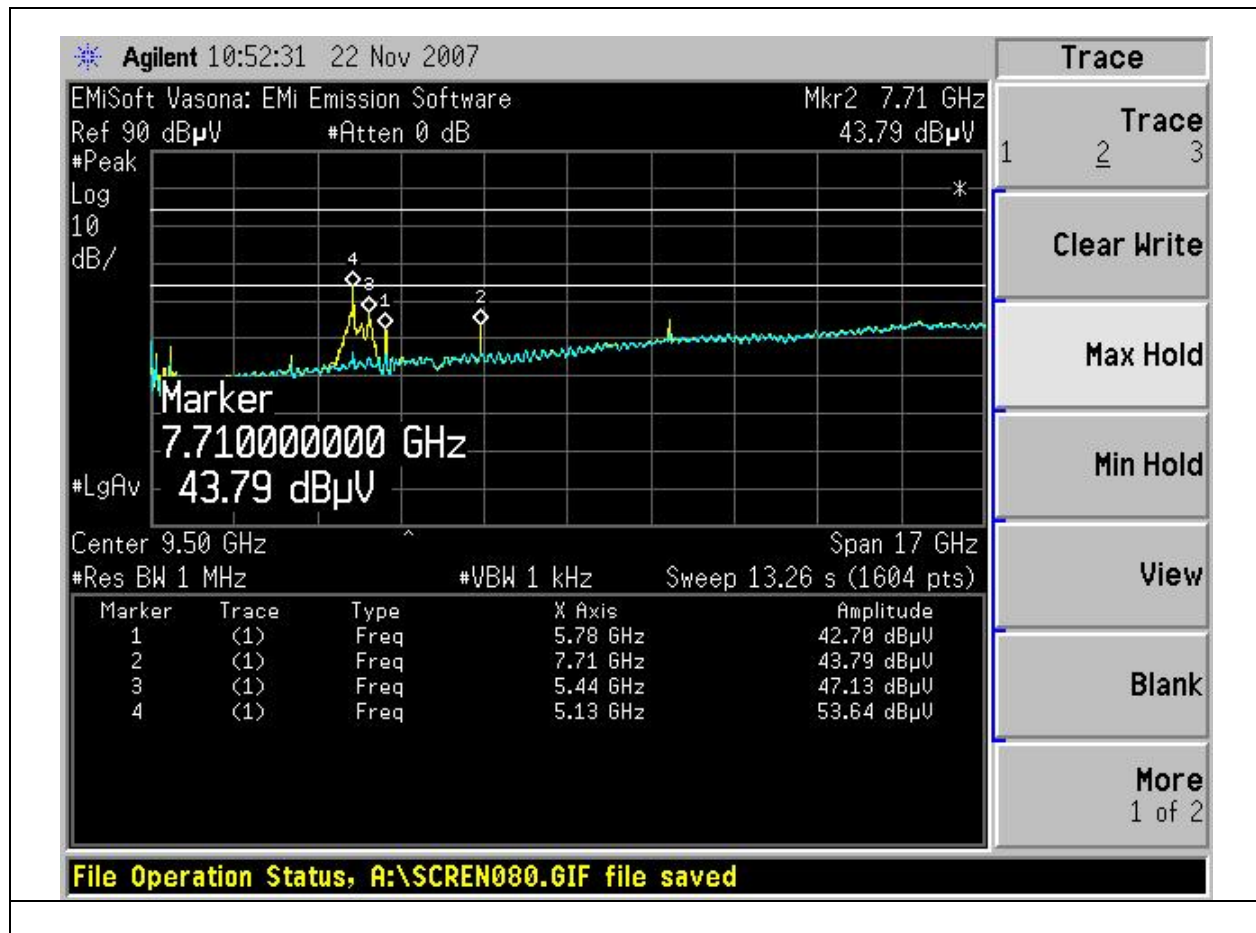


Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5785 Peak



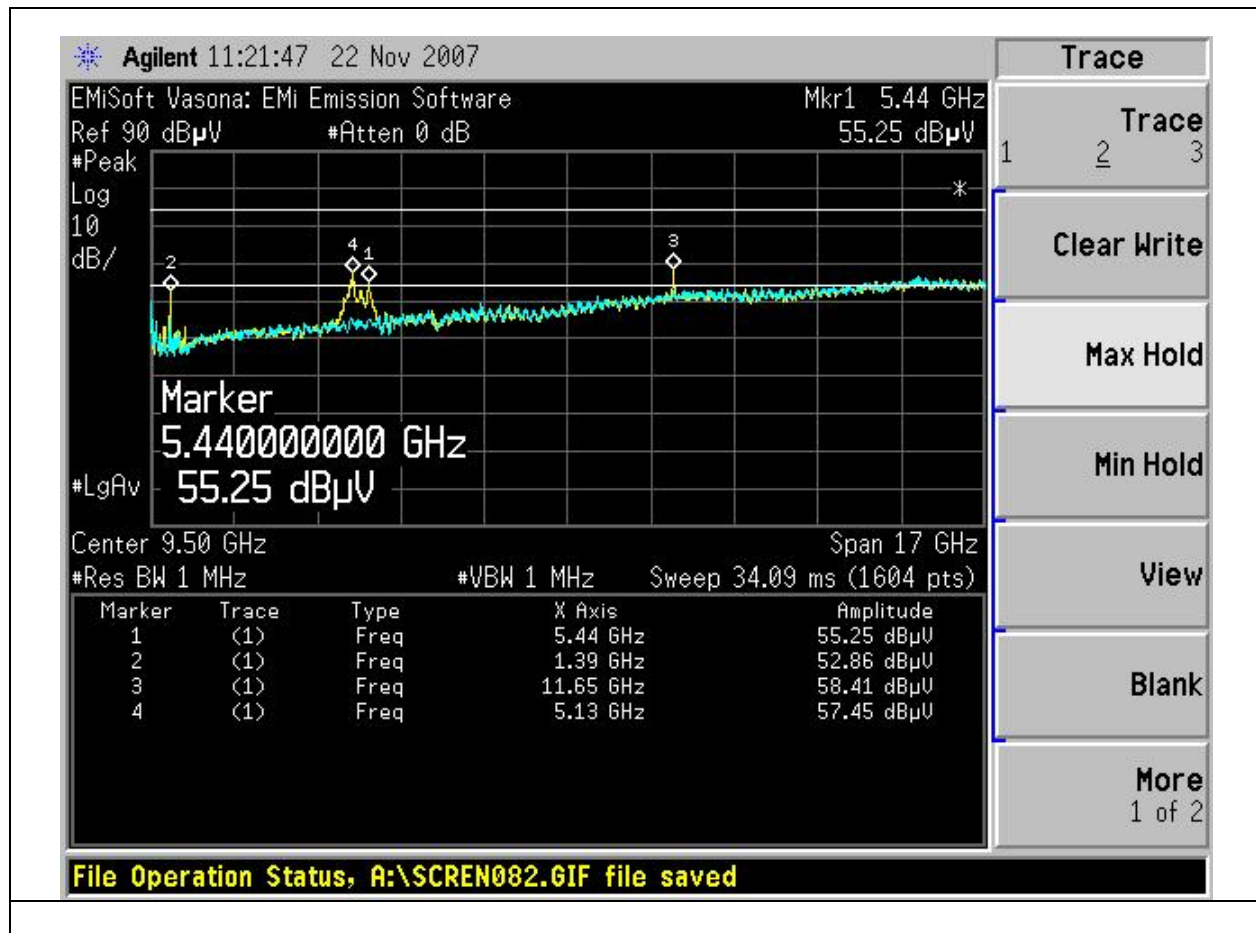


**Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi
 Omni antenna at channel 5785 Ave**



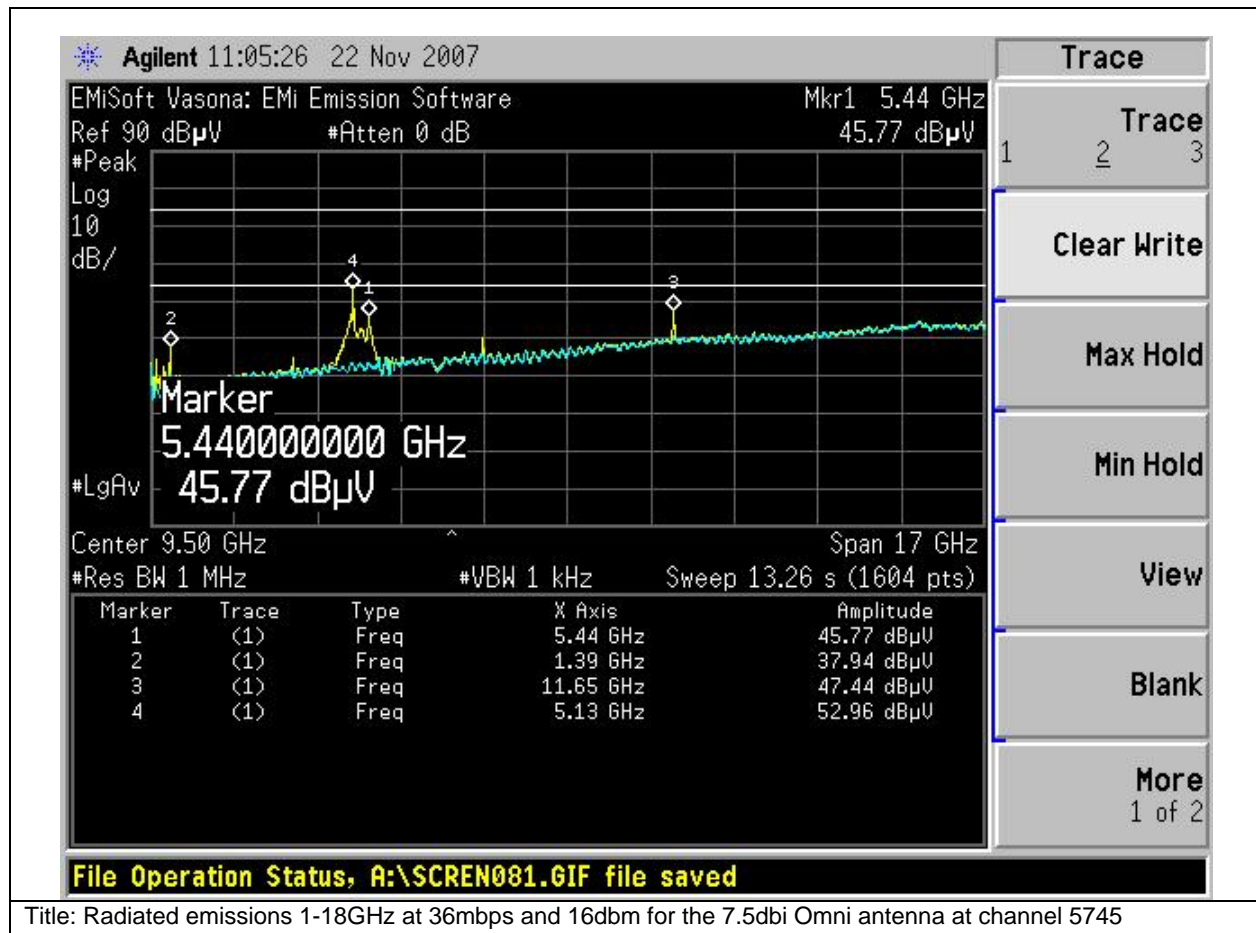


Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5825 Peak





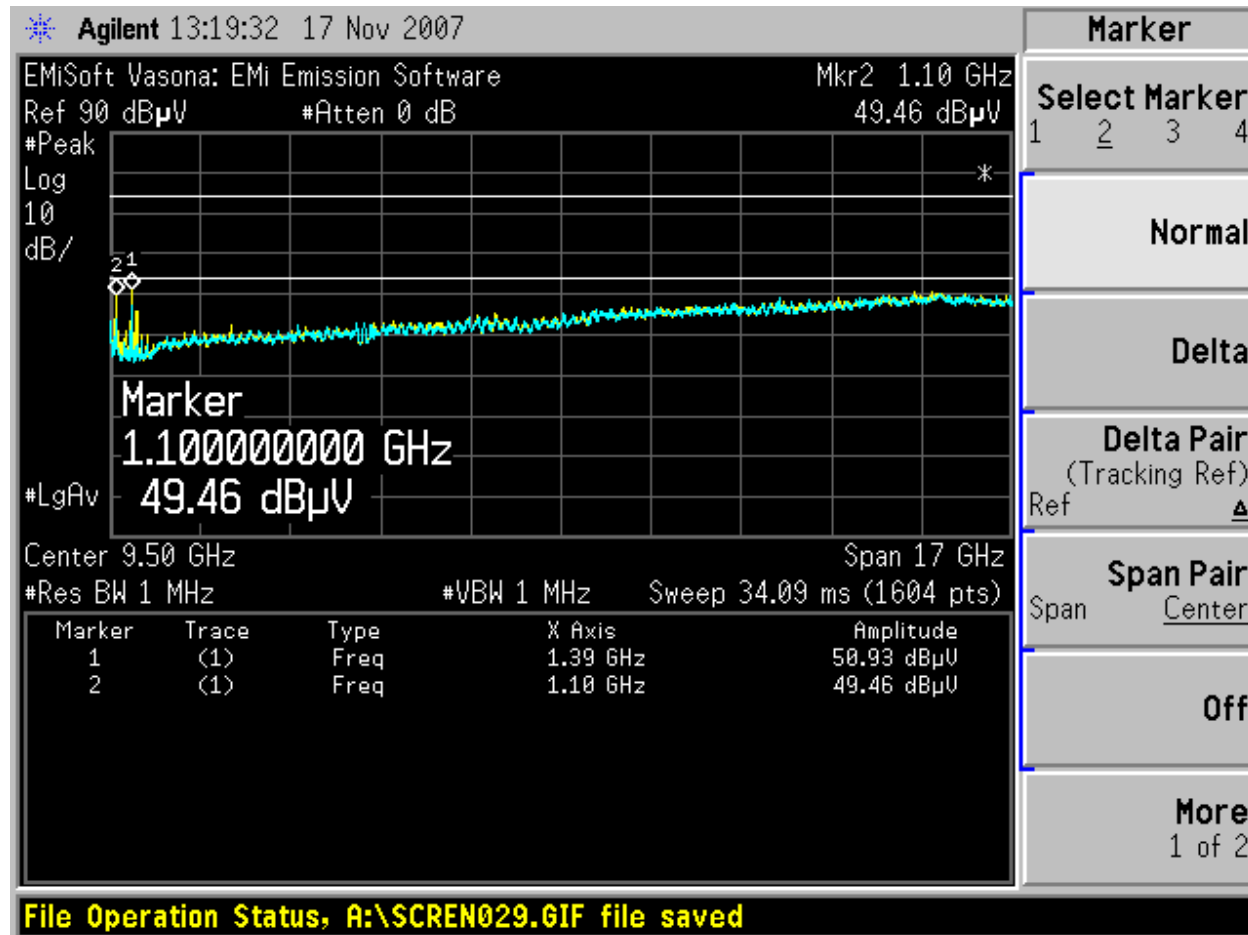
Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5825 Ave



Title: Radiated emissions 1-18GHz at 36mbps and 16dbm for the 7.5dbi Omni antenna at channel 5745

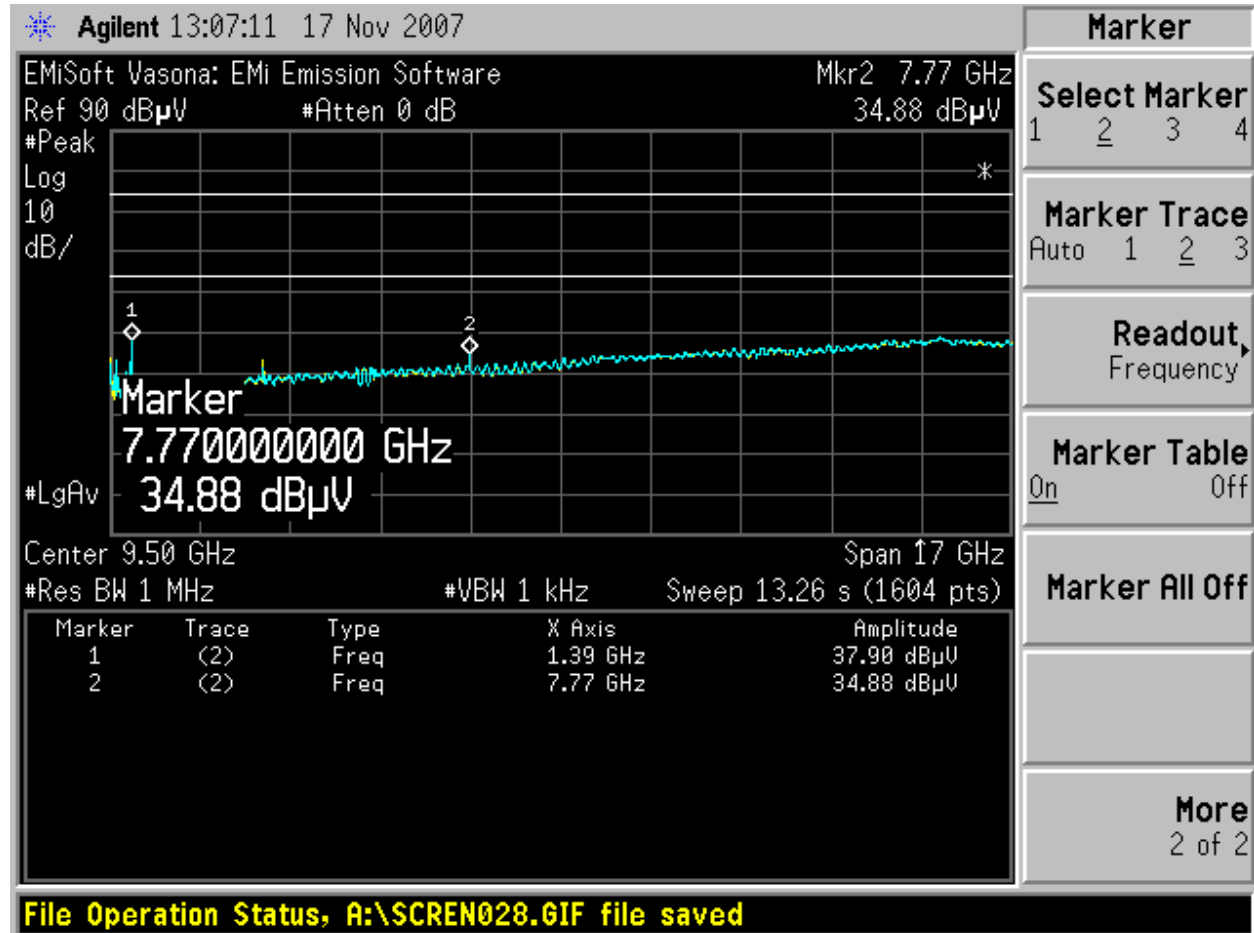


**Radiated emissions 1-18GHz in Recieve mode
 Peak**





Radiated emissions 1-18GHz Recieve mode Ave



Subtest Number: 29607 - 3		Subtest Date: 17-Dec-2007	
Engineer	Donald Foster		
Lab Information	Building P, 10m Anechoic		
Subtest Results			
Subtest Title	30-1000MHz.		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	No further comments		



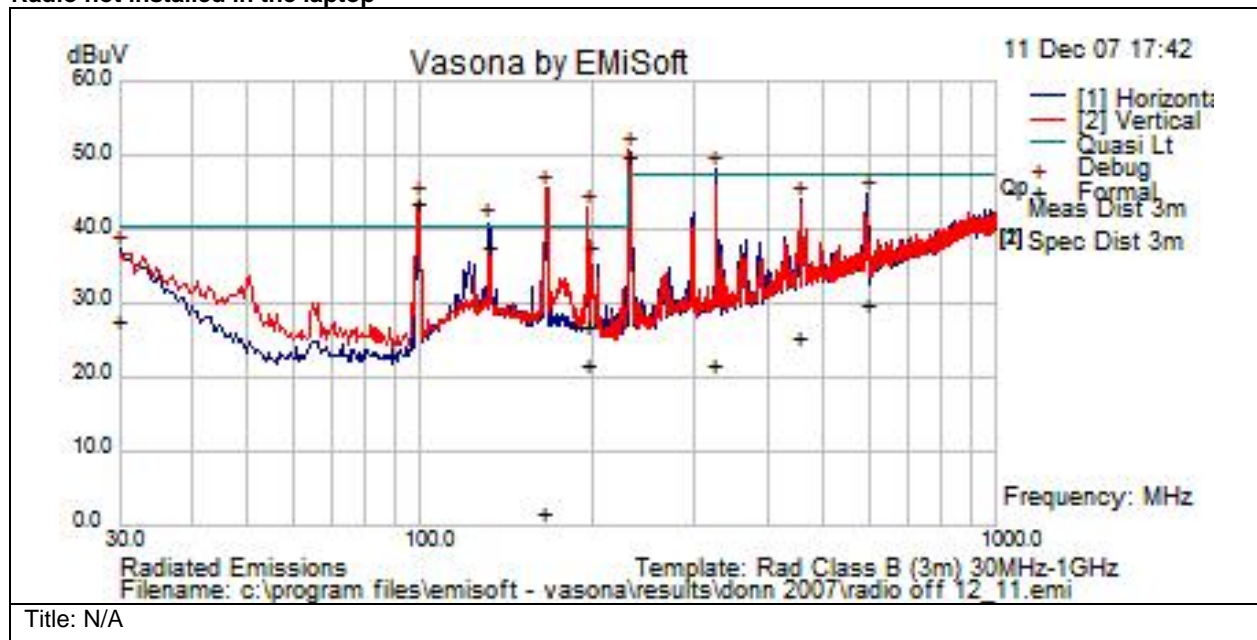
Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements

Note:

Due to the test jig architecture the internal signals from the PC were drawn out through the PCI slot which the test jig uses. The first scan is of the PC and test jig with the radio not running and the second scan shows how the PC noise is increased when the power to the radio is turned on. All the freqs. Shown are related to the PC and not the radio.

Radio not installed in the laptop



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
164.407	37.9	1.4	11.9	50.2	Qp	V	193	360	40.5	9.7	Fail	
99.828	30.6	1.1	10.2	41.8	Qp	V	120	291	40.5	1.3	Fail	
230.128	35.5	1.6	11.1	48.2	Qp	V	234	275	47.5	0.7	Fail	
195.403	6.6	1.5	12	20	Qp	V	185	0	40.5	-20.5	Pass	
326.414	4.1	1.9	13.9	19.9	Qp	H	208	333	47.5	-27.6	Pass	
131.521	21	1.2	13.8	36	Qp	H	224	1	40.5	-4.5	Pass	

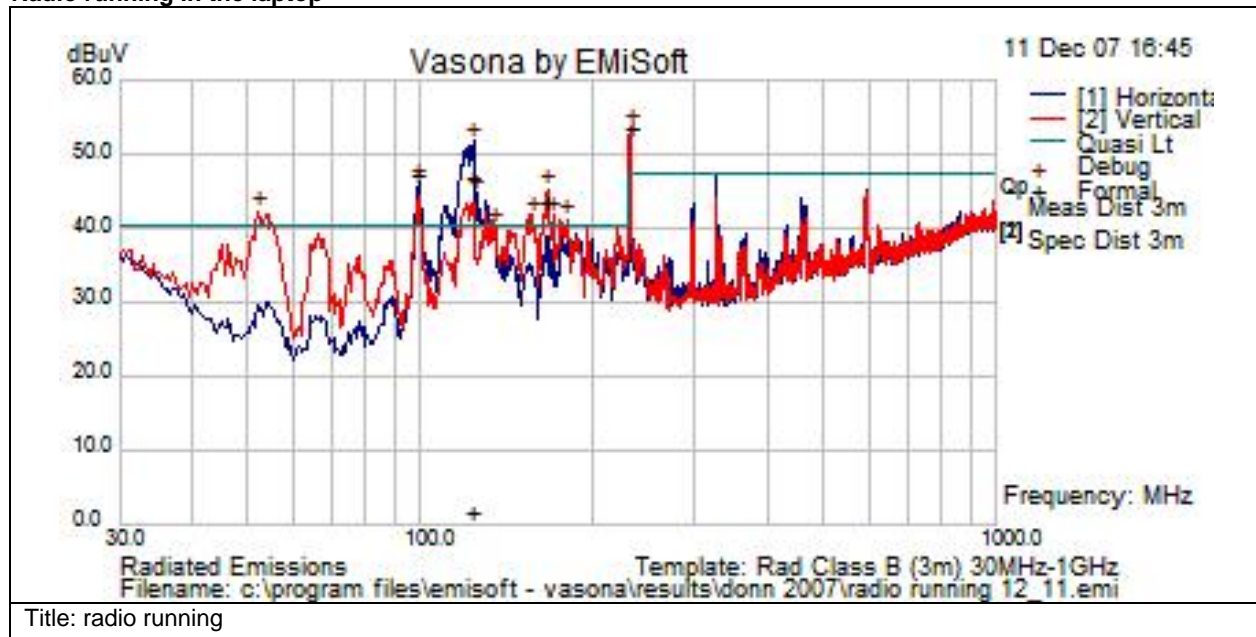
Subtest Number: 29607 - 4		Subtest Date: 17-Dec-2007	
Engineer	Donald Foster		
Lab Information	Building P, 10m Anechoic		
Subtest Results			
Subtest Title	30-1000MHz.		
Subtest Result	Pass		
Highest Frequency	1000.0		
Lowest Frequency	30.0		
Comments on the above Test Results	No further comments		



Graphical Test Results

Note that the data displayed on the plots detailed in this appendix were measured using a 'Peak Detector'. Please refer to the results table for the detectors used during formal measurements

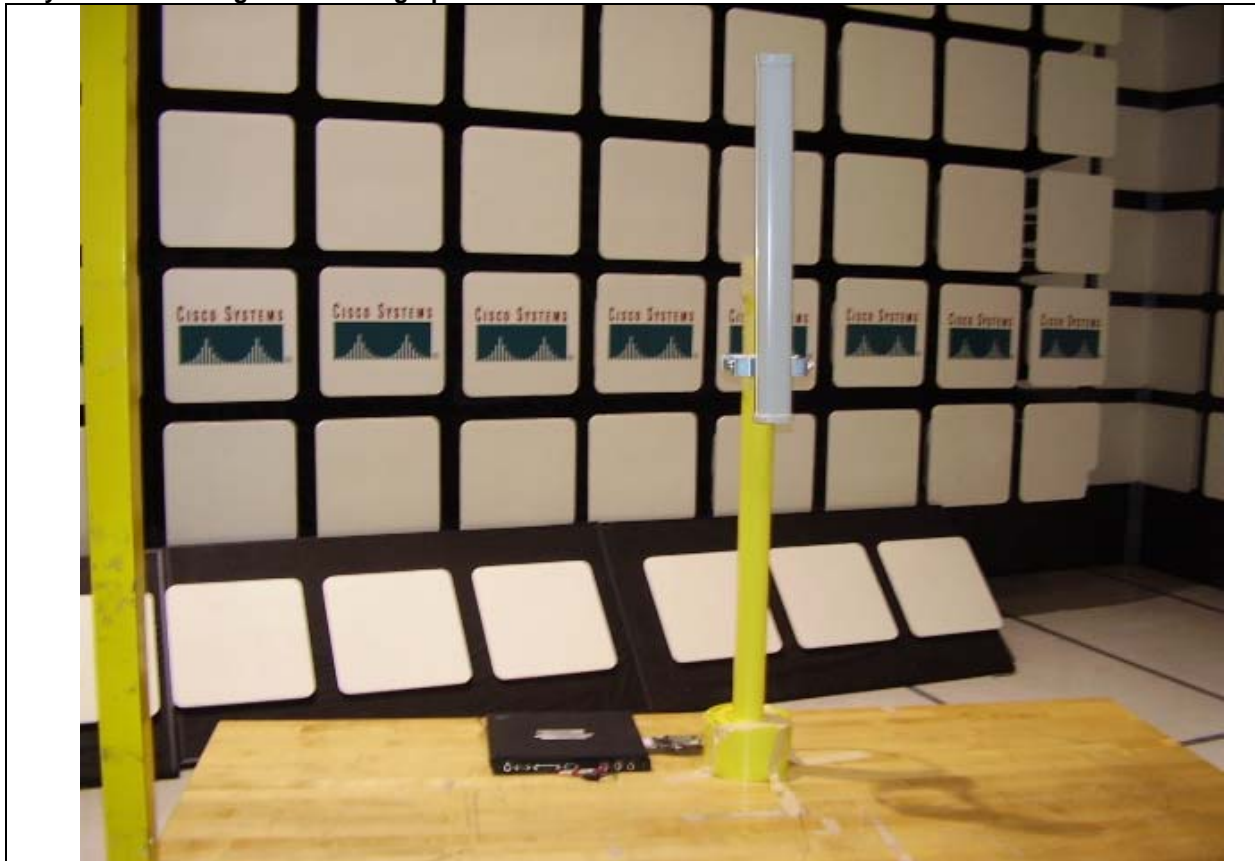
Radio running in the laptop



Test Results Table

Frequency MHz	Raw dBuV	Cable Loss	AF dB	Level dBuV	Measurement Type	Pol	Hgt cm	Azt Deg	Limit dBuV	Margin dB	Pass /Fail	Comments
123.726	30.1	1.2	14	45.2	Qp	H	199	361	40.5	4.7	Fail	
232.826	38.9	1.6	11.3	51.8	Qp	V	218	0	47.5	4.3	Fail	
99.762	34.2	1.1	10.1	45.4	Qp	H	161	320	40.5	4.9	Fail	
166.282	28.5	1.4	11.8	41.8	Qp	V	146	360	40.5	1.3	Fail	

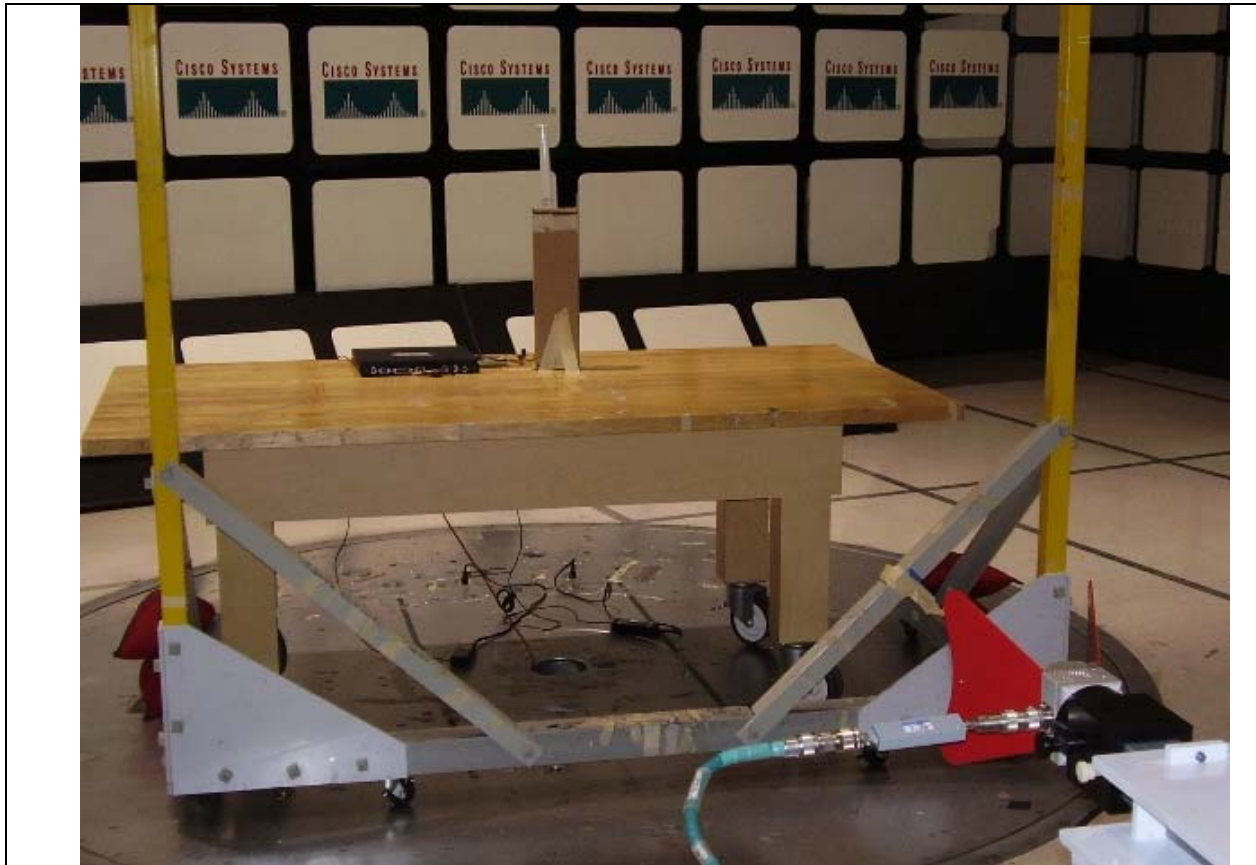
Physical Test arrangement Photograph:



Title: Radiated Emissions 30-1000 test setup

Comments on the above Photograph:

No further comments



Title: Radiated emissions test setup 7.5dbi Omni

Comments on the above Photograph:

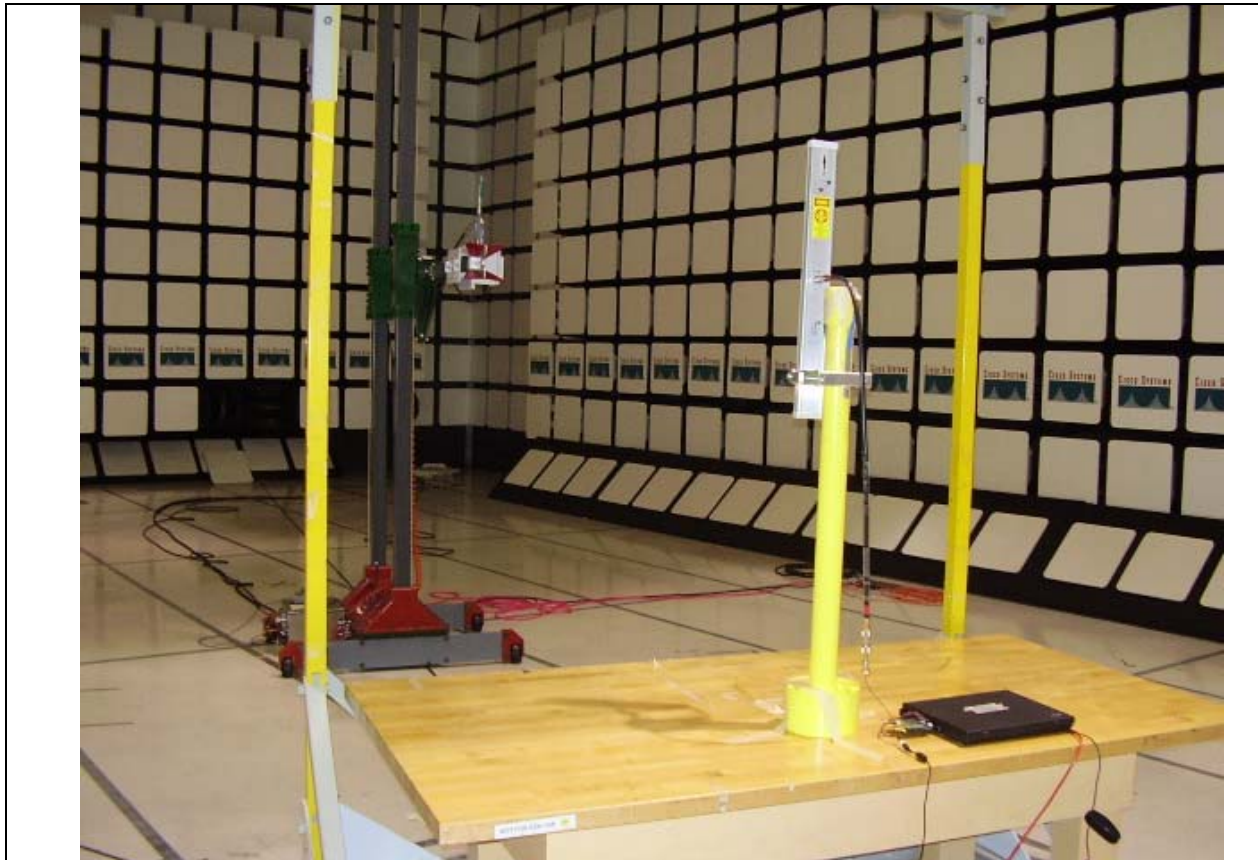
No further comments



Title: Radiated emissions test setup 17dbi sector

Comments on the above Photograph:

No further comments



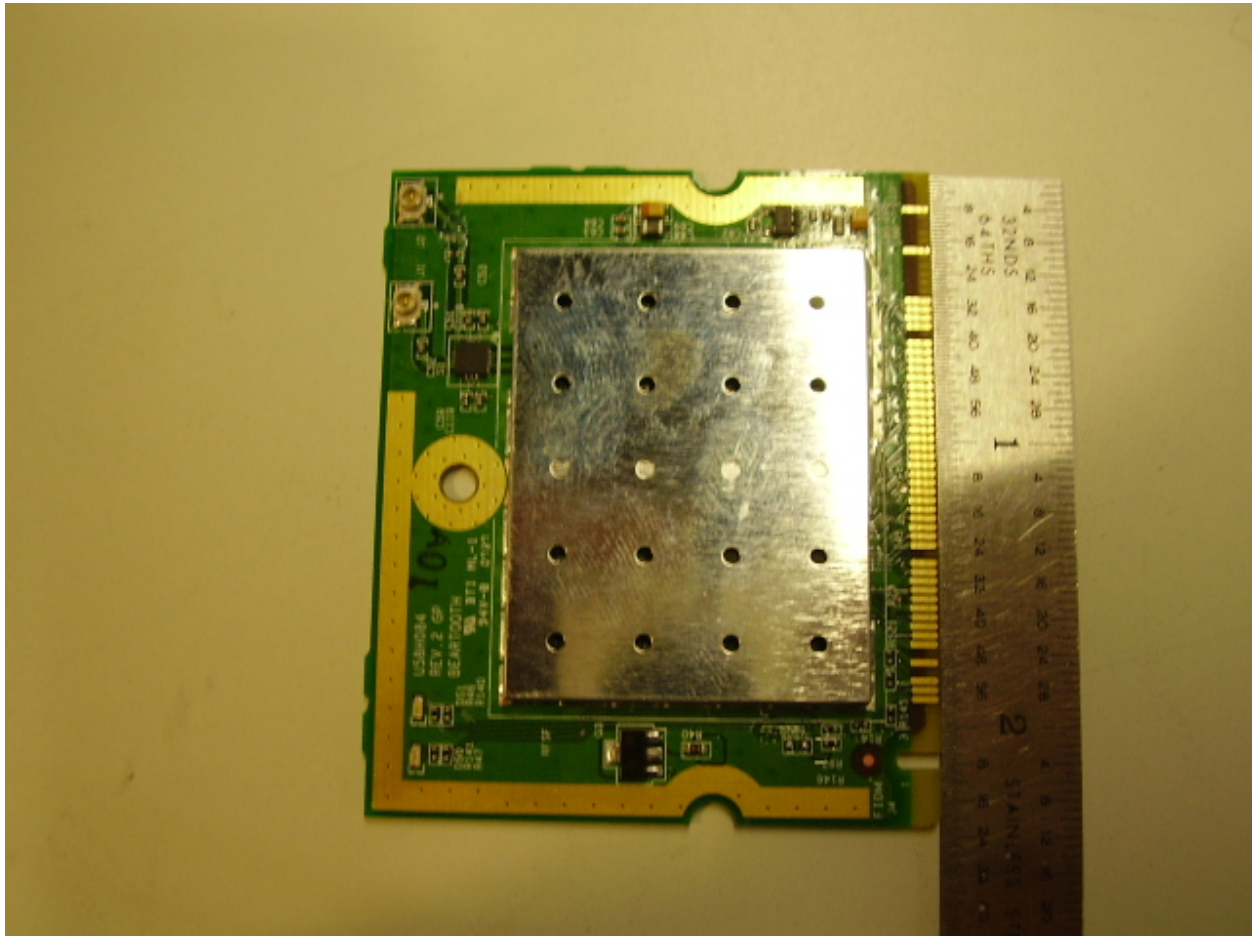
Title: Radiated emissions test setup 17dbi sector

Comments on the above Photograph:

No further comments

Photographs of the EUT

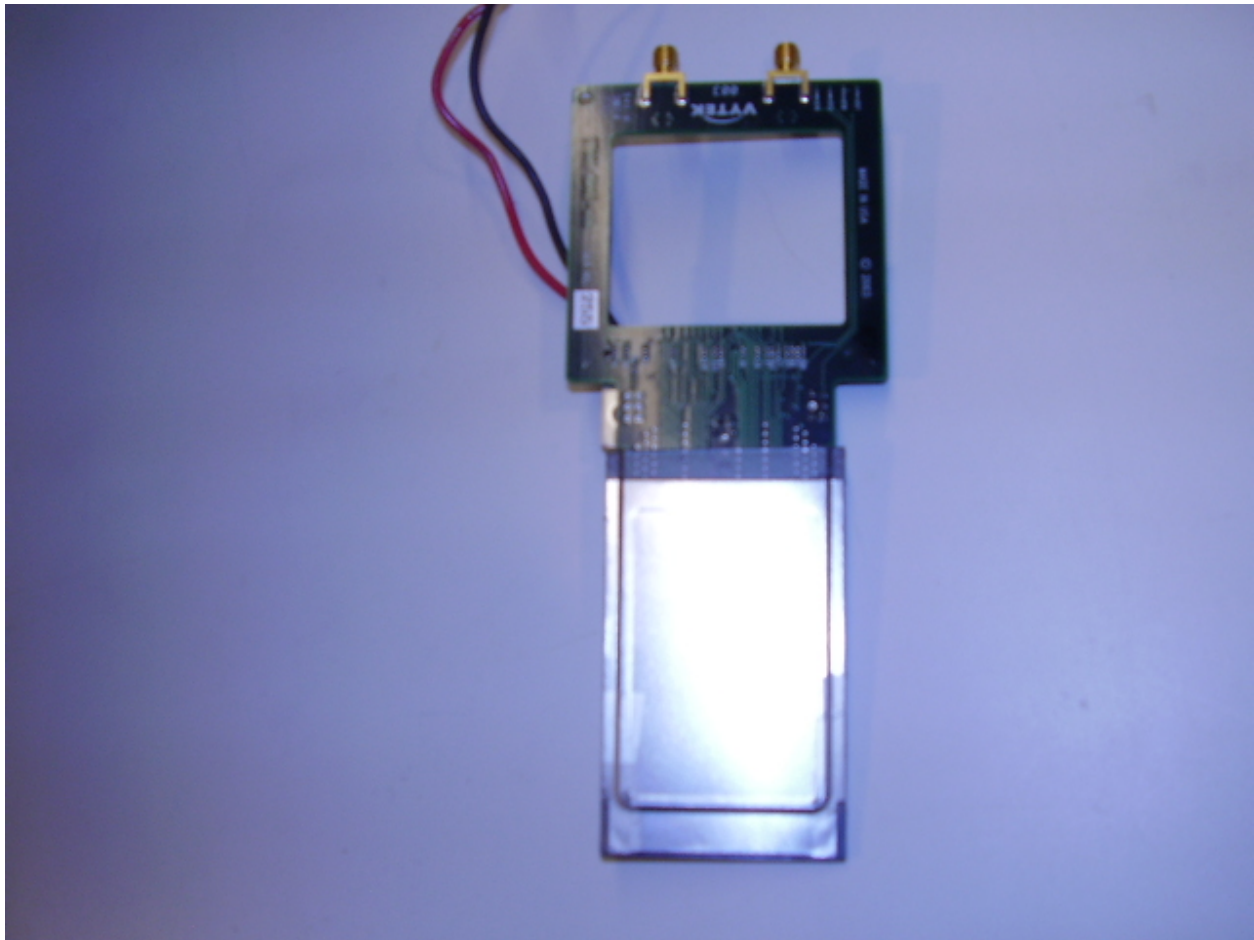
Radio Module Top



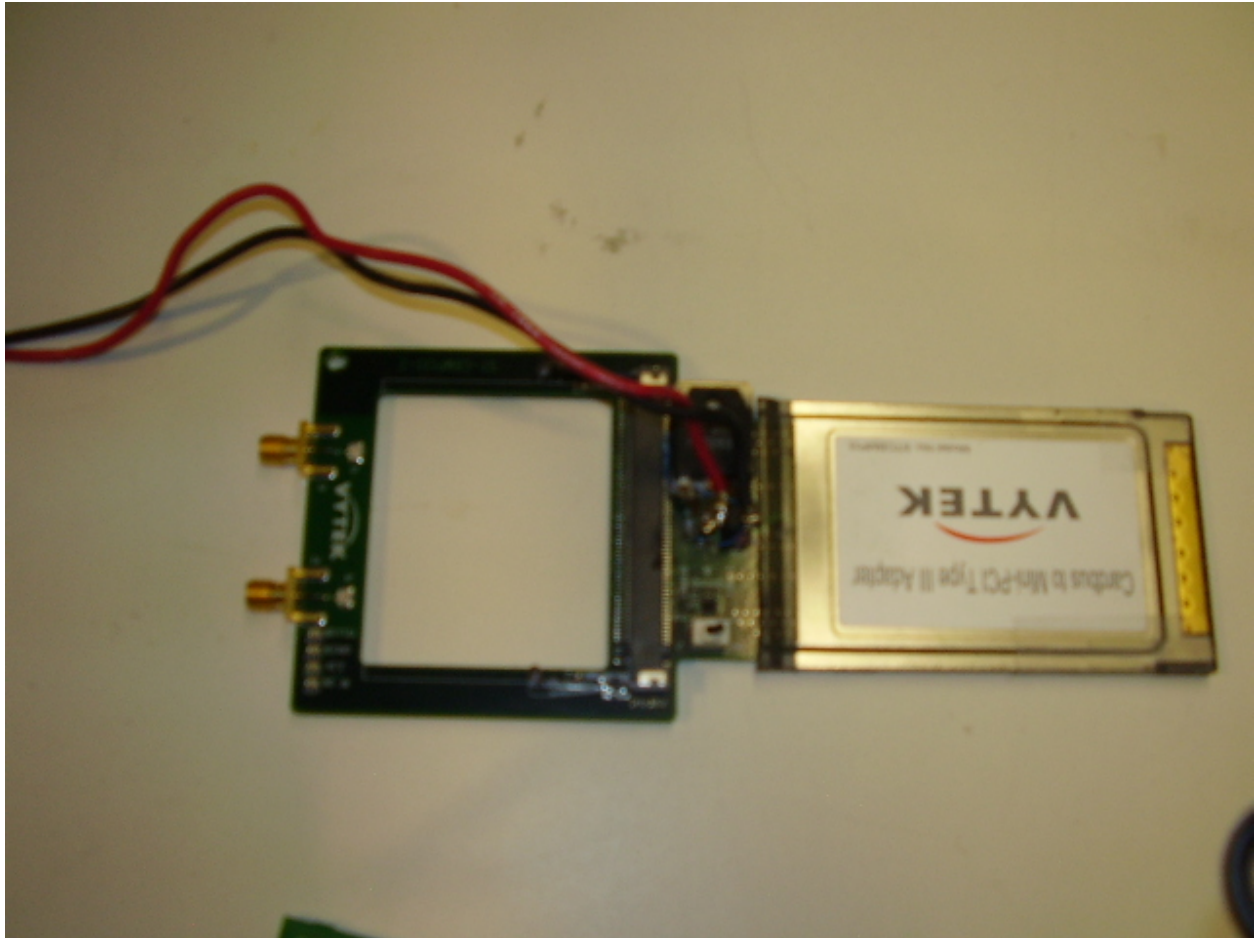
Radio Module Bottom



Test Jig



Test Jig





Appendix B: Abbreviation Key and Definitions

The following table defines abbreviations used within this test report.

Abbreviation	Description	Abbreviation	Description
EMC	Electro Magnetic Compatibility	°F	Degrees Fahrenheit
EMI	Electro Magnetic Interference	°C	Degrees Celsius
EUT	Equipment Under Test	Temp	Temperature
ITE	Information Technology Equipment	S/N	Serial Number
TAP	Test Assessment Schedule	Qty	Quantity
ESD	Electro Static Discharge	emf	Electromotive force
EFT	Electric Fast Transient	RMS	Root mean square
EDCS	Engineering Document Control System	Qp	Quasi Peak
Config	Configuration	Av	Average
CIS#	Cisco Number (unique identification number for Cisco test equipment)	Pk	Peak
Cal	Calibration	kHz	Kilohertz (1×10^3)
EN	European Norm	MHz	MegaHertz (1×10^6)
IEC	International Electro technical Commission	GHz	Gigahertz (1×10^9)
CISPR	International Special Committee on Radio Interference	H	Horizontal
CDN	Coupling/Decoupling Network	V	Vertical
LISN	Line Impedance Stabilization Network	dB	decibel
PE	Protective Earth	V	Volt
GND	Ground	kV	Kilovolt (1×10^3)
L1	Line 1	μ V	Microvolt (1×10^{-6})
L2	Line2	A	Amp
L3	Line 3	μ A	Micro Amp (1×10^{-6})
DC	Direct Current	mS	Milli Second (1×10^{-3})
RAW	Uncorrected measurement value, as indicated by the measuring device	μ S	Micro Second (1×10^{-6})
RF	Radio Frequency	μ S	Micro Second (1×10^{-6})
SLCE	Signal Line Conducted Emissions	m	Meter
Meas dist	Measurement distance	Spec dist	Specification distance
N/A or NA	Not Applicable	SL	Signal Line (or Telecom Line)
P	Power Line	L	Live Line
N	Neutral Line	R	Return
S	Supply	AC	Alternating Current



Appendix C: Scope of Accreditation (A2LA certificate number 1178-01)

The scope of accreditation of Cisco Systems, Inc. can be found on the A2LA web page at:

<http://www.a2la.org/scopepdf/1178-01.pdf>

Summary of accredited radio testing capabilities:

EMC/EMI

San Jose, CA, Building P:	LP0002: 2004 RRL no.2005-25
San Jose, CA, Building N:	LP0002: 2004 RRL no.2005-25
San Jose, CA, Building I:	LP0002: 2004 RRL no. 2005-25
San Jose, CA, Building B:	LP0002: 2004 (conducted measurements only) RRL no.2005-25 (conducted measurement only)



Appendix D: Test Equipment Used to perform the test

Equip#	Manufacturer/ Model	Description	Last Cal	Next Due	Test Number(s)
001435	HP/ 34401A	Multimeter	08-SEP-07	08-SEP-08	[29596]
004883	EMC Test Systems/ 3115	Double Ridged Guide Horn Antenna	15-MAY-07	15-MAY-08	[29607]
005691	Miteq/ NSP1800-25-S1	Broadband Preamplifier (1- 18GHz)	09-OCT-07	09-OCT-08	[29607], [29612], [29621]
020975	Micro-Coax/ UFB311A-0-1344- 520520	RF Coaxial Cable, to 18GHz, 134.4 in	16-MAR-07	16-MAR-08	[29607]
021116	Micro-Coax/ UFB311A-0-3540- 520520	RF Coaxial Cable, to 18GHz, 354 in	16-MAR-07	16-MAR-08	[29607]
021117	Micro-Coax/ UFB311A-0-2484- 520520	RF Coaxial Cable, to 18GHz, 248.4 in	19-AUG-07	19-AUG-08	[29612], [29621]
024905	Agilent/ E4440A	Precision Spectrum Analyzer	14-FEB-07	14-FEB-08	[29612], [29621]
030442	Micro-Coax/ UFB311A-0-4800- 520520	RF Coaxial Cable, to 18GHz, 480 In.	16-MAR-07	16-MAR-08	[29604]
030559	Micro-Coax/ UFB311A-1-0950- 504504	RF Coaxial Cable, to 18GHz, 95 in	16-MAR-07	16-MAR-08	[29604], [29607]
030564	Micro-Coax/ UFB311A-1-0950- 504504	RF Coaxial Cable, to 18GHz, 95 in	19-AUG-07	19-AUG-08	[29612], [29621]
030652	Sunol Sciences/ JB1	Combination Antenna, 30MHz-2GHz	16-JUL-07	16-JUL-08	[29607]
032544	ETS-Lindgren/ 3117	Double Ridged Waveguide Horn Antenna	11-JUL-07	11-JUL-08	[29604]
032671	Cisco/ TH0118	Mast Mount Preamplifier Array, 1-18GHz	08-OCT-07	08-OCT-08	[29604]
033988	Agilent/ E4446A	PSA Spectrum Analyzer	07-NOV-07	07-NOV-08	[29596], [29598], [29599], [29602], [29647]
034189	Micro-Tronics/ BRC50704-02	Notch Filter, SB:5.470- 5.725GHz, to 12GHz	16-JUL-07	16-JUL-08	[29607], [29621]
034974	Midwest Microwave/ ATT-0640-20-29M- 02	Attenuator, 20dB, DC-40GHz	14-MAY-07	14-MAY-08	[29604], [29612]
035038	Micro-Tronics/ BRC50703-02	Notch Filter, SB:5.150- 5.350GHz, to 11GHz	16-JUL-07	16-JUL-08	[29607], [29621]



035097	Micro-Coax/ UFA147A-0-0180- 110200	RF Coaxial Cable, to 40 GHz, 18 in	07-MAR-07	07-MAR-08	[29596], [29598], [29599], [29602], [29604], [29612], [29621]
037228	Micro-Tronics/ BRC50705	Notch Filter, SB:5.725- 5.875GHz, to 12 GHz	07-MAR-07	07-MAR-08	[29607], [29621]
040503	Agilent/HP/ E4440A	Precision Spectrum Analyzer	18-MAR-07	18-MAR-08	[29604], [29607], [29621]
040523	Rohde & Schwarz/ ESCI	EMI Test Receiver	01-JUN-07	01-JUN-08	[29607]
040547	Megaphase/ F230-NKNK-320	RF N Type cable 9KHz to 18GHz	13-JUL-07	13-JUL-08	[29607]
041202	ETS-Lindgren/ 3117	Double Ridged Horn Antenna	03-JUL-07	03-JUL-08	[29612], [29621]



Software used in the tests

A:Vasona File Version

Vasona File Version	Used in Subtests
5.028	[29607 - 3, 29607 - 4]

B:Other Software Used

Software Name	Version	Vendor	Description	Start Date	End Date
ECAT - BurstWare	4.23	Thermo Keytek	EFT/Burst Test Software	01-JAN-2000	Current
ECAT - PQFWare	2.1.3	Thermo Keytek	Voltage Dips and Interrupts Test Software	01-JAN-1997	Current
ECAT - SurgeWare	4.23	Thermo Keytek	Surge Test Software	01-JAN-2000	Current
ECAT - SurgeWare	5.30	Thermo Keytek	Voltage Protection Coordination Software	04-FEB-2004	Current
HFTS	B.00.01	Agilent Technologies	Harmonics/Flicker Test System Software	02-JUL-2001	Current
CTS	3.0.19	California Instruments	Harmonics/Flicker Test System Software	26-APR-2004	Current
CEWare32	4.00	Thermo Keytek	EMC Pro surge, EFT/B, VDI, Mag Immunity test software.	21-JUL-2004	Current



Appendix E: Test Procedures

Test procedures are summarized below

6dB Bandwidth	EDCS # - 422115
26dB Bandwidth	EDCS # - 422115
Average Output Power	EDCS # - 422117
Co-Located Transmitter	EDCS # - 422118
Conducted Spurious Test	EDCS # - 422119
Peak Transmit Power Measurement	EDCS # - 422123
Power Spectral Density	EDCS # - 422113
Peak Excursion Test	EDCS # - 422121
Radiated Band Edge	EDCS # - 422124
Radiated Spurious Test	EDCS # - 422125
Extreme Test Condition	EDCS # - 450056
Equivalent Isotropic Radiated Power	EDCS # - 450047
Frequency Tolerance	EDCS # - 462996
Power per MHz	EDCS # - 463000



Appendix F: Test Assessment Plan(TAP)

EMC Test Plan

EMC-4637

Code Name: Beartooth part 15.247 only

Systems to be Tested: C3205WMIC-A-K9

Cisco Systems

EMC Laboratory
170 West Tasman Drive
San Jose, CA 95134

Revision 3.0

Date 03-Dec-2007

Author Donald Foster

TAP Template Revision Number 27



Overview

This test plan is to detail the requirements for FCC radio certification of the WMIC module which will be used in the various 3200 series mobile routers. Testing will be conducted according to the procedures for the 5745-5825 band only and UNI I and II will be covered in a separate report.

Product Description

The C3205WMIC-A-K9 is a standalone A radio module that is installed in the 3200 series mobile router. The end user can stack several of these radios into a single chassis and build a point to point network with association to both client and Master devices.

This EMC testing is intended to cover:

- Radio Intentional.
- Comments : N/A

Testing will be performed:

- Internally. Cisco testing facility.

Specific Test Laboratory Requirements

Ensure that the Test Laboratory meets the following requirements (where appropriate)

BSMI (Taiwan)	Designated laboratory
Australia, New Zealand, Singapore	ISO Guide 17025 accredited laboratory [ie NVLAP, A2LA] or equivalent
USA DOC Process	NVLAP, A2LA (Note: The DOC process is for Class B PC peripherals only.)
VCCI (Japan)	VCCI Listed laboratory
Customer requirements (e.g. GR1089)	Customer recognized Laboratory



Equipment Classification (see EDCS-5770)

	Equipment Type	Requirements	
		Emissions	Immunity
<input type="checkbox"/>	Telecommunication Network Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 KN 22: 2005 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 EN300386: V1.3.3 : 2005 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04	EN300386: V1.3.3 : 2005 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001
<input type="checkbox"/>	Cable Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 KN 22: 2005 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 EN300386: V1.3.3 : 2005 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04	EN300386: V1.3.3 : 2005 CISPR24: 1997 + A1+ A2 EN55024: 1998 + A1+ A2 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001
<input type="checkbox"/>	ITE/TTE/LAN Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 KN 22: 2005 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04	CISPR24: 1997 + A1+ A2 EN55024: 1998 + A1+ A2 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001
<input type="checkbox"/>	Medical Devices Equipment	47 CFR Part 15: 2006 CISPR22: 2005 EN55022: 2006 EN61000-3-2: 2000 + A1 + A2 EN61000-3-3: 1995 + A1 ICES-003 Issue 4 : 2004 VCCI: V-3/2006.04 EN60601-1-2:2001	CISPR24: 1997 + A1+ A2 EN55024: 1998 + A1+ A2 EN50082-1: 1992 EN50082-1: 1997 EN61000-6-1: 2001 EN60601-1-2:2001
<input type="checkbox"/>	Radio (EMC)	CISPR22: 2005 EN55022: 2006 EN61000-3-2: 2000 EN61000-3-3: 1995 + A1	EN301 489-1 v1.4.1: 2002-08 EN301 489-17 v1.2.1: 2002-09 EN61000-6-1: 2001 EN50082-1: 1992 EN50082-1: 1997
<input checked="" type="checkbox"/>	Radio Intentional	EN300328 RSS-210 47CFR15 EN301893 LP0002 RRL No.2005-25	



		AS/NZS 4268 ARIB STD-T33 ARIB STD-T66 ARIB STD-T71	
<input type="checkbox"/>	Central Office Equipment [USA Only]	GR1089: Issue 4: June 2006 Applicable only if product requires NEBS compliance.	

Emissions Classification

- Class B (e.g. non- central office, domestic)

Immunity Classification

- Country Requirements (normal levels)

Power/ Interface Details

DC	Indoor Cables
RF Port	Indoor Cables

Chassis

- Desktop (Table Top)

Information for Test Personnel

Type of Emission	OFDM
Frequency Range	5725MHz to 5850MHz
Power Rating	*AIR-ANT5175V-N 7.5dbi omni 16/23.5dbm Air-ant 5180V-N 7.5dbi omni 16/23.5dbm AIR-ANT5160V-R 6dbi omni 16/23dbm *AIR-ANT5114P-N 14dbi patch 16/30dbm AIR-ANT5195P-R 9.5dbi patch 16/25.5dbm AIR-ANT5170P-R 7dbi patch 16/23dbm *AIR-ANT5117S-N 17dbi sector 16/33dbm AIR-ANT58G10SSA-N 9.5dbi sector 16/25.5dbm
Maximum Conducted Power Rating Allowed	16dbm
List Temperature	+5.0 V 0.4 amps 2.0 W ISA and PCI connectors +3.3 V 1.7 amps 5.6 W PCI connectors
Eut Description	This is a 5Ghz modular radio which is incorporated into the 3200 series mobile router
Tune up Procedures	ART instructions

Applicable Specifications testing required

Conducted emissions



Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
462	CFR47 Part 15.247b3 (LP0002 4.7.2)	RF Ports	N/A	5725MHz - 5850MHz	Peak Output Power: 1wattAlso complies with HKTA1039
652	Conducte d Spurious Emissions	RF Ports	N/A	30MHz - xGHz	Also complies with RSS 210, LP0002, HKTA1039
651	CFR47 Part 15.247(a)	RF Ports	N/A	2400MHz - 5850MHz	26dB Bandwidth also complies wiht RSS 210, LP0002, HKTA1039
800	CFR47 Part 15.247(a)(2)	RF Ports	B	5725MHz - 5850MHz	6dB Bandwidth also complies with LP0002, RSS210, HKTA1039
477	CFR47 Part 15.247a3 (LP0002 3.10.6.2.2, RSS210)	RF Ports	N/A	5725MHz - 5850MHz	Power Spectral DensityAlso complies with HKTA1039

Radiated emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments
648	Restricted Bandedge Measurements	Enclosure	B	2.4GHz - 5.825GHz	CFR47 Part 15.205,CFR47 Part 15.209,LP002, RSS210HKTA1039
647	Radiated Spurious Emissions	Enclosure	B	30MHz - 26.5GHz	CFR47 Part 15.109CFR47 Part 15.247, RSS-210, LP0002 HKTA1039

Customer Additional Specifications

N/A

Applicable Specifications testing not required

Conducted emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments	Justification
663	EN 300 893 clause 4.3.2.1 Power density	RF Ports	N/A	5150MHz - 5725MHz	The power density when configured to operateat the highest stated power level shall notexceed the levels given in table 2 overnormal and extreme test conditions.	1



662	EN 300 893 clause 4.3.2 RF output power and TPC	RF Ports	N/A	5150MHz - 5725MHz	The RF output power when configured shall not exceed the levels given in table 2 & 3 overnormal and extreme test conditions.	1
661	EN 300 893 clause 4.2 Carrier frequencies	RF Ports	N/A	5150MHz - 5725MHz	The actual carrier centre frequency for any given channel given in table 1 shall be maintained within the range ± 20 ppm over normal and extreme test conditions.	1
660	EN 300-328 clause 4.3.1 Effective radiated power	RF Ports	N/A	2.4GHz - 2.4835GHz	The effective radiated power shall be equal to or less than 20dBm (100 mW) e.i.r.p overnormal and extreme test conditions.	1
463	CFR47 Part 15.247b3 (LP0002 3.10.1.2)	RF Ports	N/A	2400MHz - 2483.5MHz	Peak Output Power: 1Watt Also complies with HKTA1039	2
659	EN 300-328 clause 4.3.2 Maximum spectral power density	RF Ports	N/A	2.4GHz - 2.4835GHz	For modulation other than FHSS, the maximum spectral power density shall be limited to -20 dBW (10 mW) per MHz e.i.r.p.	1
658	EN 300-328 clause 4.3.3 Frequency Range	RF Ports	N/A	2.4GHz - 2.4835GHz	For all equipment the frequency range shall lie within the band 2.4 GHz to 2.4835 GHz ($f_L > 2.4$ GHz and $f_H < 2.4835$ GHz). Normal and Extreme conditions apply.	1
657	EN 300-328 clause 4.3.5 Receiver Spurious Emissions	RF Ports	B & N/A	30MHz - 12.75GHz	802.11b,g	1
654	EN 300-328 clause 4.3.4 Transmitter Spurious Emissions	RF Ports	B & N/A	30MHz - 12.75GHz	802.11b,g	1
653	CFR47 Part 15.247a3 (LP0002 3.10.6.2.2, RSS210)	RF Ports	N/A	2400MHz - 2483.5MHz	Power Spectral Density, Also complies with HKTA1039	2



650	CFR47 Part 15.247(a)(2)	RF Ports	N/A	2400MHz - 2483.5MHz	6dB Bandwidth, aslo complies with RSS 210, LP0002, HKTA1039	2
649	CFR47 Part 15.407(a)6	RF Ports	N/A	5150MHz - 5725MHz	Peak Excursion also complies with LP0002, RSS 210, HKTA1039	2
805	DSPR (Japan) - Out-band Leakage Power	RF Ports	N/A	5150MHz - 5350MHz	DSPR(Japan) - 802.11a	1
804	DSPR (Japan) - Adjacent Channel Power	RF Ports	N/A	5150MHz - 5350MHz	DSPR (Japan)- 802.11A	1
803	DSPR (Japan) - Receiver Spurious Emissions	RF Ports	N/A	10MHz - 8GHz	DSPR (Japan) - 802.11b,g Rx mode	1
964	RRL no.2007-20 Rx Spurious Emissions	RF Ports	N/A	2400MHz - 5825MHz	Strength of radio waves additionally emittedfrom the receiving equipment (Article 9.1 ofregulations) -54dBmW	1
963	RRL no.2007-22 Tx Unwanted Emissions	RF Ports	N/A	2400MHz - 5825MHz	2.4GHz - Unwanted emission: less than -30dBmwhen measured using 100kHz of decompositionbandwidth. 5GHz - the frequency under table 1 should beless than -27dBm/MHz	1
801	DSPR (Japan) - Transmitter Spurious Emissions	RF Ports	N/A	5MHz - 15.75GHz	DSPR(Japan) - 802.11A Tx mode	1
962	RRL no.2007-22 Occupied Bandwidth	RF Ports	N/A	2400MHz - 5825MHz	Occupied Bandwidth: 26MHz	1
960	RRL no.2007-22 Frequency Tolerance	RF Ports	N/A	2400MHz - 5825MHz	Frequency tolerance (kHz): 50ppm	1
959	RRL no.2007-22 Power Density	RF Ports	N/A	2400MHz - 5825MHz	Power Density: WAS1 limit 2.5mW/MHz, WAS2limit 10mW/MHz, WAS3 limit 10mW/MHz.	1
892	EN 300 893 clause 4.3.2 Occupied Channel	RF Ports	N/A	5150- 5725MHz	The occupied channel bandwidth shall bebetween 80% to 100% of the declared nominalchannel bandwidth.	1



	Bandwidth					
674	DSPR (Japan) - Transmitter Spurious Emissions	RF Ports	N/A	10MHz - 8GHz	DSPR(Japan) 2400MHz-2483.5MHz	1
673	DSPR(Japan)- Channel Power	RF Ports	N/A	2400MHz - 5350MHz	DSPR(Japan)	1
672	DSPR(Japan)-Total Output Power	RF Ports	N/A	2400MHz - 5350MHz	DSPR(Japan)	1
478	CFR47 Part 15.407a (LP0002 4.7.2, RSS210)	RF Ports	N/A	5150MHz - 5725MHz	Peak Transmit Power (LP0002 limit 17dBm or formula from 5250-5350MHz), Also complieswith HKTA1039	2
671	DSPR (Japan) - Spread Band Width	RF Ports	N/A	2400MHz - 2483.5MHz	DSPR-(Japan) 802.11b,g	1
670	DSPR(Japan)- Occupied Bandwidth	RF Ports	N/A	2400MHz - 5350MHz	DSPR(Japan)- 802.11a,b,g	1
474	CFR47 Part 15.407a (LP0002 4.7.2, RSS210)	RF Ports	N/A	5150MHz - 5725MHz	Peak Power Spectral Density (LP0002 limit 4dBm from 5250-5350MHz)Also complies withHKTA1039	2
669	DSPR(Japan) - Frequency Tolerance	RF Ports	N/A	2400MHz - 5350MHz	DSPR (Japan)- 802.11a,b,g	1
667	EN 300 893 clause 4.5.2 Receiver spurious emissions	RF Ports	N/A	30MHz - 26.5GHz	The spurious emissions of the receiver shallnot exceed the limits given in table 5.	1
666	EN 300 893 clause 4.4.2 Transmitter unwanted emissions within 5GHz bands	RF Ports	N/A	5150MHz - 5725MHz	The average level of the transmitted spectrumwithin the 5 GHz RLAN bands shall not exceedthe limits given in figure 2.	1
664	EN 300 893	RF Ports	N/A	30MHz - 26.5GHz	The level of unwanted emission shall notexceed the limits given in	1



	clause 4.4.1 Transmitter unwanted emissions outside 5GHz bands				table 4.	
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Radiated emissions

Spec Id	Basic Standard	Applied to	Class	Freq Range	Test Details / Comments	Justification
656	EN 300-328 clause 4.3.5 Receiver Spurious Emissions	Enclosure	N/A	30MHz - 12.75GHz	802.11b,g	1
655	EN 300-328 clause 4.3.4 Transmitter Spurious Emissions	Enclosure	N/A	30MHz - 12.75GHz	802.11b,g	1
441	Co-located Transmitters	Enclosure	N/A	1GHz-1.0GHz	Compliance based upon meeting the emission levels for radiated spurious emissions as stated in RSS-210, FCC part 15.209 and HKTA1039. CISPR limits are not applicable for this test	1
966	Radiated Spurious Emissions	Enclosure	N/A	30MHz - 40GHz	CFR47 Part 15.109, CFR47 Part 15.407, RSS-210, LP0002 HKTA1039	2
965	Radiated Spurious Emissions	Enclosure	N/A	30MHz - 40GHz	CFR47 Part 15.109, CFR47 Part 15.407, RSS-210, LP0002 HKTA1039	2
668	EN 300 893 clause 4.5.2 Receiver spurious emissions	Enclosure	N/A	30MHz - 26.5GHz	The spurious emissions of the receiver shall not exceed the limits given in table 5.	1
860	Restricted Bandedge Measurements	Enclosure	N/A	2.4GHz - 5.825GHz	CFR47 Part 15.205, CFR47 Part 15.209, LP002, RSS210HKTA1039	2
665	EN 300 893 clause 4.4.1 Transmitter unwanted	Enclosure	N/A	30MHz - 26.5GHz	The level of unwanted emission shall not exceed the limits given in table 4.	1



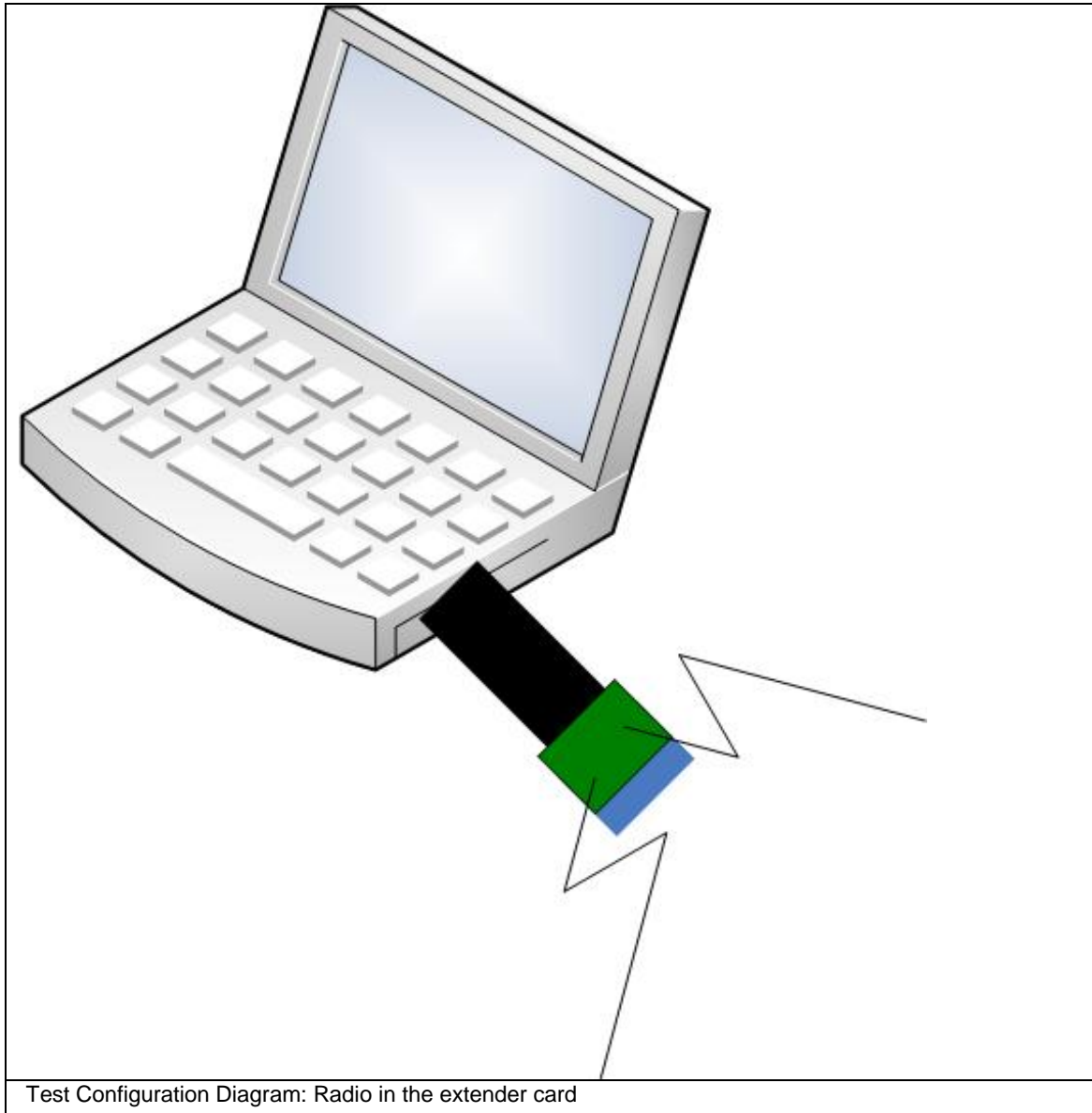
	emissions outside 5GHz bands					
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Justification(s)

- 1.The testing will cover only the requirements for 5GHz A bband radio for market in the USA.
- 2.Testing will be preformed to the rules for the band 5725-5850 only

Test configuration description:

The system will be configured as a standalone radio and will be running the ART diag to put the transmitter into contiuous transmit mode.



Justification of the worst case test configuration and mode of operation:

This configuration meets the requirements for testing to the applicable countries

Cabling Details and Block Diagram (Mandatory for VCCI and Korea)

Cable Letter	Connection	Manufacturer	Length	Shield	Remarks
A	Antenna port			Yes	

Copper Interfaces



Ref	Connecti on	Type	Shielded	Indoor/ Outdoor	CE	CI	EFT/B	Surge	Dips
A	Antenna port	RF Ports	Yes	Indoor	Yes	N/A	N/A	N/A	N/A

Legend

Indoor	Interface which is not intended to be directly connected to a cable that will leave the building e.g. Ethernet, RS232
Outdoor	Interfaces that can be directly connected to lines that leave the building e.g. POTS, DSL

Justifications For Not Testing An Interface