

FCC DOC TEST REPORT

Authorized under **Declaration of Conformity**

according to

47 CFR, Part 2, Part 15 and CISPR PUB. 22

Applicant	Firetide Inc.
Address	16795 Lark Ave., Ste. 200, Los Gatos, CA 95032
Equipment	HotPort Wireless Mesh Node
Model No.	HotPort3203
Trade Name	Firetide

Laboratory accreditation



1332

- The test result refers exclusively to the test presented test model / sample.
- Without written approval of **Exclusive Certification Corp.** the test report shall not be reproduced except in full.

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CERTIFICATE OF COMPLIANCE

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Applicant	Firetide Inc.
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Equipment	HotPort Wireless Mesh Node
Model No.	HotPort3203

I **HEREBY** CERTIFY THAT :

The measurements shown in this test report were made in accordance with the procedures given in **ANSI C63.4 – 2003** and the energy emitted by this equipment was **passed CISPR PUB. 22 and FCC Part 15** in both radiated and conducted emission class B limits. Testing was carried out on Jul. 13, 2005 at **Exclusive Certification Corp.**

Signature


Ahson Chou / Manager

1. Test Configuration of Equipment under Test

1.1. Feature of Equipment under Test

<p>Model HotPort 3203</p> <p>Protocol Firetide Mesh Routing Protocol (FMRP)</p> <p>Encryption</p> <ul style="list-style-type: none"> 40/64 bit, 104/128 bit WEP keys 128 bit, 256 bit AES keys <p>Wireless interface</p> <p>2.4 GHz spectrum</p> <ul style="list-style-type: none"> 2.400–2.497 GHz (actual channels available for use are subject to country-specific regulatory approvals) TX Power: Up to 4 W EIRP depending on country of operation and antenna configuration <p>5 GHz spectrum</p> <ul style="list-style-type: none"> 5.150 – 5.250 GHz 5.250 – 5.350 GHz 5.750 – 5.825 GHz (actual channels available for use are subject to country-specific regulatory approvals) TX Power: Up to 1 W EIRP depending on country of operation and antenna configuration <p>Dynamic Frequency Selection (DFS) Transmit Power Control (TPC)</p> <p>Network ports</p> <ul style="list-style-type: none"> Dual 10/100 Mbps Ethernet ports with circular, watertight IP67-rated connectors IEEE 802.3, 802.3u compliant CSMA/CD 10/100 autosense <p>Antennas</p> <ul style="list-style-type: none"> Two detachable, 6 dBi omni-directional, vertical polarization, dual spectrum antennas (included for network staging only) Single detachable 8 dBi omni-directional, vertical polarization antenna (order separately) <p>Note: antennas are spectrum specific</p> <ul style="list-style-type: none"> Spectrum: 2.4 GHz and 5 GHz Connectors: TNC reverse polarity Length: 16.5 in. (42 cm) Range: up to 2600 ft (800 m) depending on spectrum and environmental attenuation Gain: up to 8 dBi 	<p>Enclosure</p> <ul style="list-style-type: none"> Cast aluminum NEMA-4X/IP67 enclosure Two antenna connectors (TNC reverse polarity) One power connector Two circular, watertight IP67-rated Ethernet data connectors System indicator LEDs (power, status, fault) Physical security via lockable mounting bracket Weight: 4.85 lbs (2.2 Kg) with sun shield ⊗Dimensions: 9.812" x 7.812" x 2.687" (25 cm x 19.8 cm x 6.82 cm) <p>Power</p> <ul style="list-style-type: none"> Input voltage: 24 VDC Indoor-rated power supply (transformer): 90-240 VAC, 50/60 Hz Power consumption: 25 W nominal 802.3af compliant PoE (PD and PSE) Power transition cable: 32.8 ft (10 m) <p>Regulatory Agency Certifications Contact your Firetide dealer for product availability and certifications for your country</p> <p>Environmental specifications</p> <ul style="list-style-type: none"> Operating temperature: -40°C to +55 °C (-40° F to 131° F) Storage temperature: -40°C to +80°C (-40° F to 176° F) Humidity (non-condensing) 5% to 95% Storage humidity (non-condensing): 10% to 90% <p>Mesh Management Software Includes HotView mesh management software</p> <p>Warranty One year limited warranty (see warranty card for details)</p> <p>Included Accessories</p> <ul style="list-style-type: none"> Lockable bracket for pole and wall mounting Indoor-rated power supply Sun shield Weatherized Ethernet transition cable (circular, watertight IP67-rated connector to RJ-45 connector) Weatherized RJ-45 connector kit
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1.2. Test Mode and Test Software

The following test mode and test software was performed for conduction and radiation test:

- Link Mode (The function of EUT is data transmitting which can be operated by connecting with host through UTP cable and wireless.)
- During the test, "Ping.exe" was executive under WinXP to link with the remote workstation to transmit data by UTP cable and wireless.

The test mode including five kind of mode

Test mode 1: MIP24008XFPTRPC antenna.(Antenna gain : 08 dBi)

Test mode 2 : MFB24010 antenna (Antenna gain : 10 dBi)

Test mode 3::HG5812 antenna.(Antenna gain : 12 dBi)

Test mode 4 : MA0528-19AN antenna (Antenna gain : 19 dBi)

Test mode 5 : WISP4959018MBV antenna(Antenna gain : 18 dBi)

Test mode 4 for Conducted

Test mode 1, 2, 3, 4, 5 for Radiation

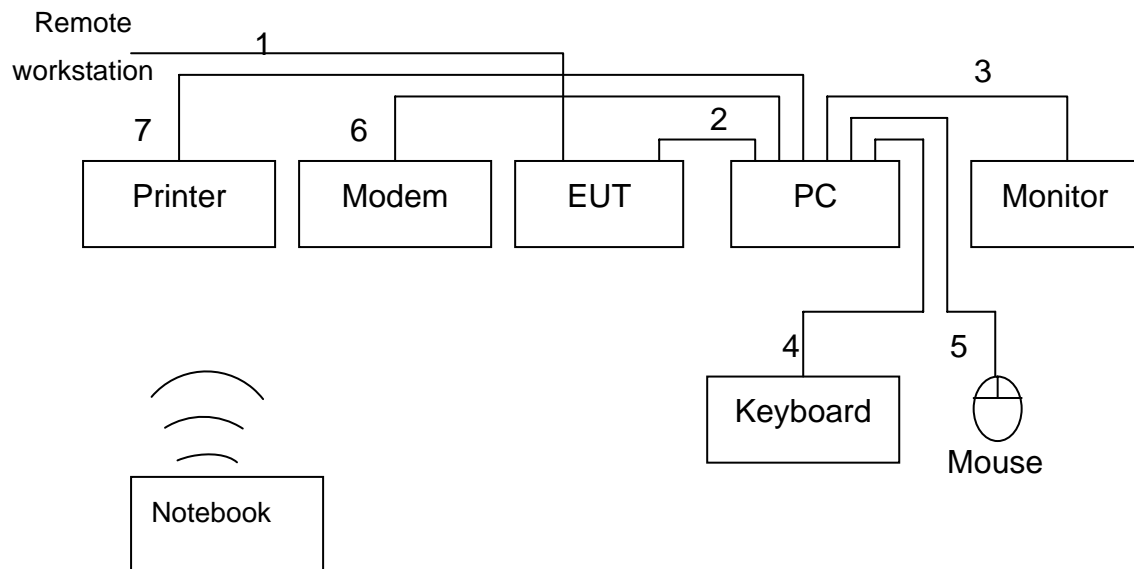
1.3. Description of Test System

Device	Manufacturer	Model No.	Description
PC	IBM	IGV	Power Cable, Unshielding 1.8 m
Monitor	SlimAGE	510A	Power Cable, Adapter Unshielding 1.8 m Data Cable, VGA shielding 1.35 m
Keyboard	IBM	KB-0225	Data Cable, PS2 shielding 1.85 m
Mouse	IBM	MO28VO	Data Cable, USB shielding 1.85 m
Modem	ACEXX	DM-1414	Power Cable, Adapter Unshielding 1.8 m Data Cable, RS232 Unshielding 1.35 m
Printer	HP	Desk Jet400	Power Cable, Adapter Unshielding 1.8 m Data Cable, PRINT shielding 1.6 m
Notebook (Remote site)	Dell	510m	Power Cable, Adapter Unshielding 1.8 m

Use Cable:

Cable	Description
LAN	Unshielding, 1.9m
LAN	Unshielding, 10m

1.4. Connection Diagram of Test System



1. The LAN cable is connected form remote workstation to the EUT.
2. The LAN cable is connected form PC to the EUT.
3. The I/O cable is connected from PC to the Monitor.
4. The I/O cable is connected from PC to the Keyboard.
5. The I/O cable is connected from PC to the Mouse.
6. The I/O cable is connected from PC to the MODEM
7. The I/O cable is connected from PC to the Printer.

1.5. General Information of Test

Test Site :	Exclusive Certification Corp. 4F-2, No. 28, Lane 78, Xing-Ai Rd. Nei-hu, Taipei City 114 Taiwan R.O.C.
Test Site Location (OATS1-SD):	No.68-1, Shihbachongsi, shihding Township, Taipei County 223, Taiwan, R.O.C.
Test Voltage:	AC 110V/ 60Hz
Test in Compliance with:	ANSI C63.4-2003 FCC Part 15 Subpart B
Frequency Range Investigated :	Conducted: from 150kHz to 30 MHz Radiation: from 30 MHz to 1,000 MHz
Test Distance :	The test distance of radiated emission from antenna to EUT is 10 M.

1.6. History of this test report

The Model No. HotPort3203 (Report No: CE05041202-A) and Model NO. HotPort3203 (Report No: CE05041202-B) are the same products, But B is added 8 of antennas as below

Antenna type 1 :MIP24008XFPTRPC antenna.(Antenna gain : 08 dBi)

Antenna type 2 : MFB24010 antenna (Antenna gain : 10 dBi)

Antenna type 3 :HG5812 antenna. (Antenna gain : 12 dBi)

Antenna type 4 : MA0528-19AN antenna (Antenna gain : 19 dBi)

Antenna type 5 : WISP4959018MBV antenna (Antenna gain : 18 dBi)

Antenna type 6 : R380-700.205 antenna (Antenna gain : 10 dBi)

Antenna type 7 : MFB51510 antenna (Antenna gain : 10 dBi)

Antenna type 8 : MFB49009 antenna (Antenna gain : 09 dBi)

2. Test of Conducted Emission

2.1. Test Limit

Conducted Emissions were measured from 150 kHz to 30 MHz with a bandwidth of 9 KHz on the 115 VAC power and return leads of the EUT according to the methods defined in ANSI C63.4-2003 Section 3.1. The EUT was placed on a nonmetallic stand in a shielded room 0.8 meters above the ground plane as shown in section 2.2. The interface cables and equipment positioning were varied within limits of reasonable applications to determine the position produced maximum conducted emissions.

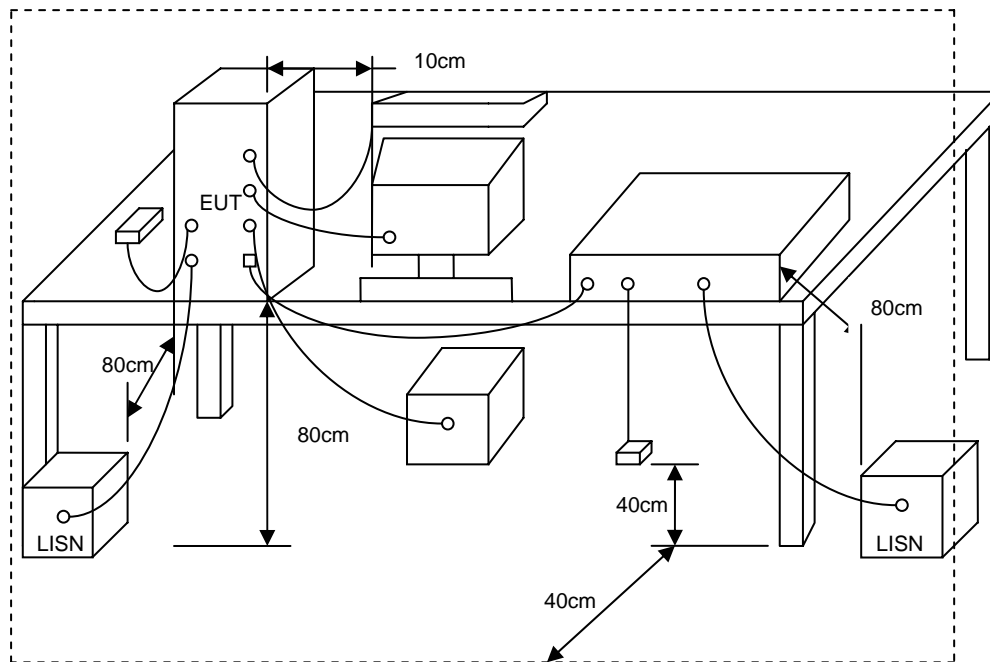
Frequency (MHz)	Quasi Peak (dB μ V)	Average (dB μ V)
0.15 – 0.5	66-56*	56-46*
0.5 – 5.0	56	46
5.0 – 30.0	60	50

*Decreases with the logarithm of the frequency.

2.2. Test Procedures

- a. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
- b. Connect EUT to the power mains through a line impedance stabilization network (LISN).
- c. All the support units are connecting to the other LISN.
- d. The LISN provides 50 ohm coupling impedance for the measuring instrument.
- e. The FCC states that a 50 ohm, 50 micro-henry LISN should be used.
- f. Both sides of AC line were checked for maximum conducted interference.
- g. The frequency range from 150 kHz to 30 MHz was searched.
- h. Set the test-receiver system to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

2.3. Typical test Setup



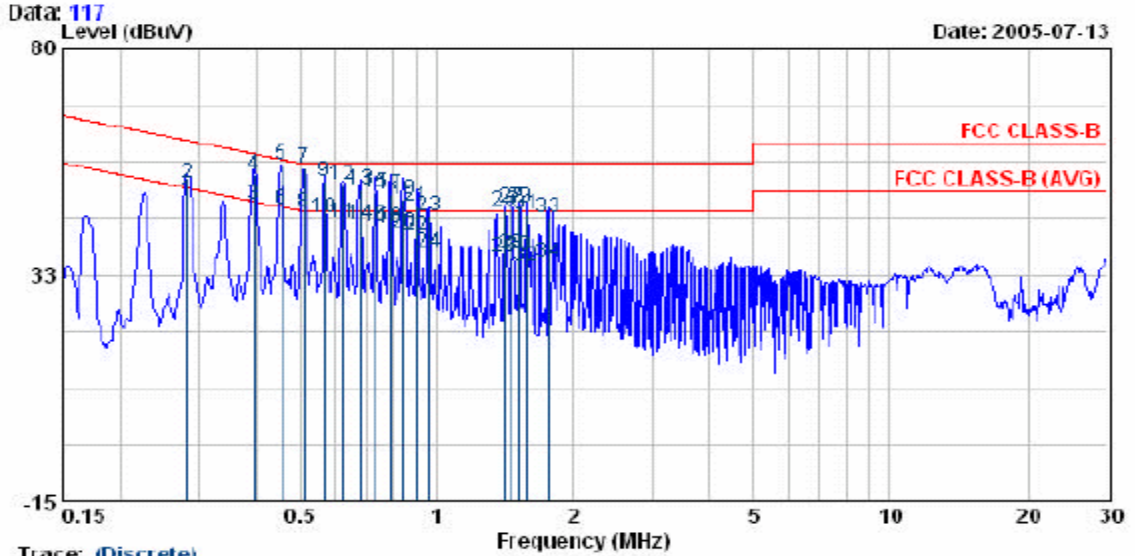
2.4. Measurement equipment

Instrument	Model No.	Manufacturer	Next Cal. Date
Receiver	Schaffner	SCR3501	2005/11/04
LISN	Mess TEC	NNB-2/16Z	2006/03/30
LISN	ROLF HEINE	NNB-2/16Z	2006/05/01

2.5. Test Result and Data

EUT : 3203
 Power : AC 120V
 Test Mode : LINK
 Memo :

Pol/Phase : NEUTRAL
 Temperature : 26 °C
 Humidity : 5% %

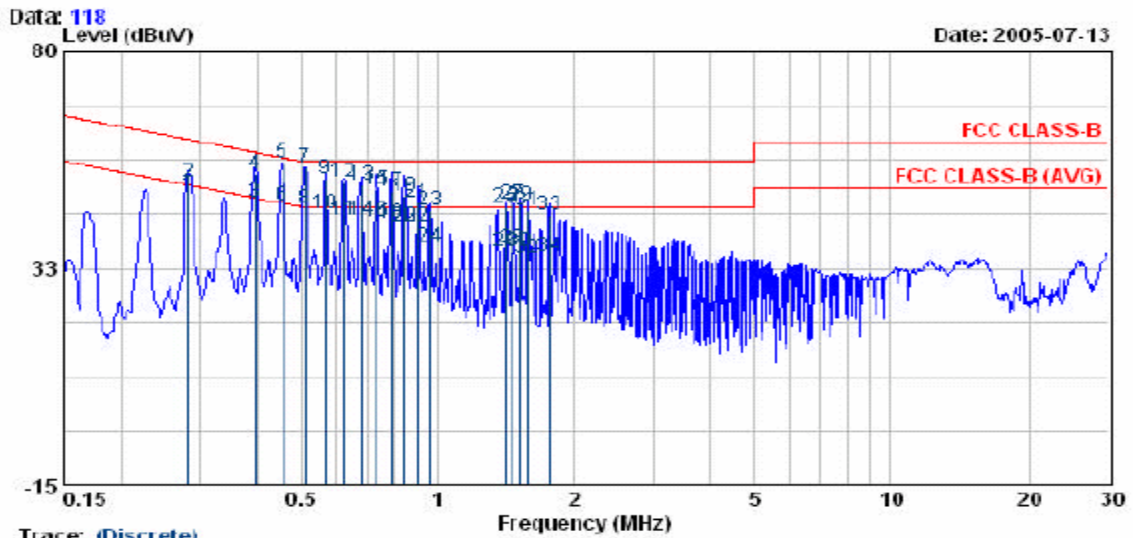


Freq MHz	Read Level dBuV	Factor dB	Level dBuV	Linit dBuV	Over Limit dBuV	Remark
0.28	48.12	0.35	48.47	50.76	-2.29	AVERAGE
0.28	51.31	0.35	51.66	60.76	-9.10	QP
0.40	46.75	0.50	47.25	47.95	-0.70	AVERAGE
0.40	52.97	0.50	53.47	57.95	-4.48	QP
0.45	55.19	0.49	55.68	56.80	-1.12	QP
0.45	45.80	0.49	46.29	46.80	-0.51	AVERAGE
0.51	54.31	0.47	54.78	56.00	-1.22	QP
0.51	45.10	0.47	45.57	46.00	-0.43	AVERAGE
0.56	51.85	0.46	52.31	56.00	-3.69	QP
0.56	43.98	0.46	44.44	46.00	-1.56	AVERAGE
0.62	42.87	0.45	43.32	46.00	-2.68	AVERAGE
0.62	50.96	0.45	51.41	56.00	-4.59	QP
0.68	50.12	0.44	50.56	56.00	-5.44	QP
0.68	42.75	0.44	43.19	46.00	-2.81	AVERAGE
0.73	49.36	0.43	49.79	56.00	-6.21	QP
0.73	42.21	0.43	42.64	46.00	-3.36	AVERAGE
0.79	48.95	0.43	49.38	56.00	-6.62	QP
0.79	41.95	0.43	42.38	46.00	-3.62	AVERAGE
0.85	47.91	0.42	48.33	56.00	-7.67	QP
0.85	41.12	0.42	41.54	46.00	-4.46	AVERAGE
0.90	46.51	0.41	46.92	56.00	-9.08	QP
0.90	40.31	0.41	40.72	46.00	-5.28	AVERAGE
0.96	44.50	0.40	44.90	56.00	-11.10	QP
0.96	36.80	0.40	37.20	46.00	-8.80	AVERAGE
1.42	45.36	0.45	45.81	56.00	-10.19	QP
1.42	35.78	0.45	36.23	46.00	-9.77	AVERAGE
1.47	46.12	0.46	46.58	56.00	-9.42	QP
1.47	36.34	0.46	36.80	46.00	-9.20	AVERAGE
1.53	45.98	0.46	46.44	56.00	-9.56	QP
1.53	35.87	0.46	36.33	46.00	-9.67	AVERAGE
1.59	44.87	0.47	45.34	56.00	-10.66	QP
1.59	34.12	0.47	34.59	46.00	-11.41	AVERAGE
1.76	43.89	0.48	44.37	56.00	-11.63	QP
1.76	34.71	0.48	35.19	46.00	-10.81	AVERAGE

Remarks: 1. Level = Read Level + Factor
 2. Factor = LISN(ISN) Factor + Cable Loss

EVT : 3203
 Power : AC 120V
 Test Mode : LINK
 Memo :

Pol/Phase : LINE
 Temperature : 26 °C
 Humidity : 5% %



Trace: (Discrete)

Freq	Read Level	Factor	Level	Linit	Over Limit	Remark
MHz	dBuV	dB	dBuV	dBuV	dBuV	
0.28	48.28	0.35	48.63	50.76	-2.13	AVERAGE
0.28	51.29	0.35	51.64	60.76	-9.12	QP
0.40	46.52	0.50	47.02	47.95	-0.93	AVERAGE
0.40	52.81	0.50	53.31	57.95	-4.64	QP
0.45	55.19	0.49	55.68	56.80	-1.12	QP
0.45	45.69	0.49	46.18	46.80	-0.62	AVERAGE
0.51	54.26	0.47	54.73	56.00	-1.27	QP
0.51	45.09	0.47	45.56	46.00	-0.44	AVERAGE
0.56	51.69	0.46	52.15	56.00	-3.85	QP
0.56	44.12	0.46	44.58	46.00	-1.42	AVERAGE
0.62	42.71	0.45	43.16	46.00	-2.84	AVERAGE
0.62	51.12	0.45	51.57	56.00	-4.43	QP
0.68	50.25	0.44	50.69	56.00	-5.31	QP
0.68	42.71	0.44	43.15	46.00	-2.85	AVERAGE
0.73	49.41	0.43	49.84	56.00	-6.16	QP
0.73	42.36	0.43	42.79	46.00	-3.21	AVERAGE
0.79	48.81	0.43	49.24	56.00	-6.76	QP
0.79	41.82	0.43	42.25	46.00	-3.75	AVERAGE
0.85	47.95	0.42	48.37	56.00	-7.63	QP
0.85	41.21	0.42	41.63	46.00	-4.37	AVERAGE
0.90	46.61	0.41	47.02	56.00	-8.98	QP
0.90	41.42	0.41	41.83	46.00	-4.17	AVERAGE
0.96	44.69	0.40	45.09	56.00	-10.91	QP
0.96	36.95	0.40	37.35	46.00	-8.65	AVERAGE
1.42	45.48	0.45	45.93	56.00	-10.07	QP
1.42	35.81	0.45	36.26	46.00	-9.74	AVERAGE
1.47	46.31	0.46	46.77	56.00	-9.23	QP
1.47	36.31	0.46	36.77	46.00	-9.23	AVERAGE
1.53	45.71	0.46	46.17	56.00	-9.83	QP
1.53	35.61	0.46	36.07	46.00	-9.93	AVERAGE
1.59	44.75	0.47	45.22	56.00	-10.78	QP
1.59	34.23	0.47	34.70	46.00	-11.30	AVERAGE
1.76	43.75	0.48	44.23	56.00	-11.77	QP
1.76	34.65	0.48	35.13	46.00	-10.87	AVERAGE

Remarks: 1. Level = Read Level + Factor
 2. Factor = LISN(ISN) Factor + Cable Loss

Test engineer: Gallanx

2.5.1 Photographs of Conducted Emission Test

Front View



Rear View



3. Test of Radiated Emission

3.1. Test Limit

Radiated emissions from 30 MHz to 1,000 MHz were measured with a bandwidth of 120 kHz according to the methods defines in ANSI C63.4-2003. The EUT was placed on a nonmetallic stand in the open-field site, 0.8 meter above the ground plane, as shown in section 3.2. The interface cables and equipment positions were varied within limits of reasonable applications to determine the positions producing maximum radiated emissions.

For unintentional device, according to § 15.109(a), except for Class A digital devices, the field strength of radiated emissions from unintentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Distance Meters	Radiated (μ V / M)	Radiated (dB μ V/ M)
30-88	3	100	40.0
88-216	3	150	43.5
216-960	3	200	46.0
Above 960	3	500	54.0

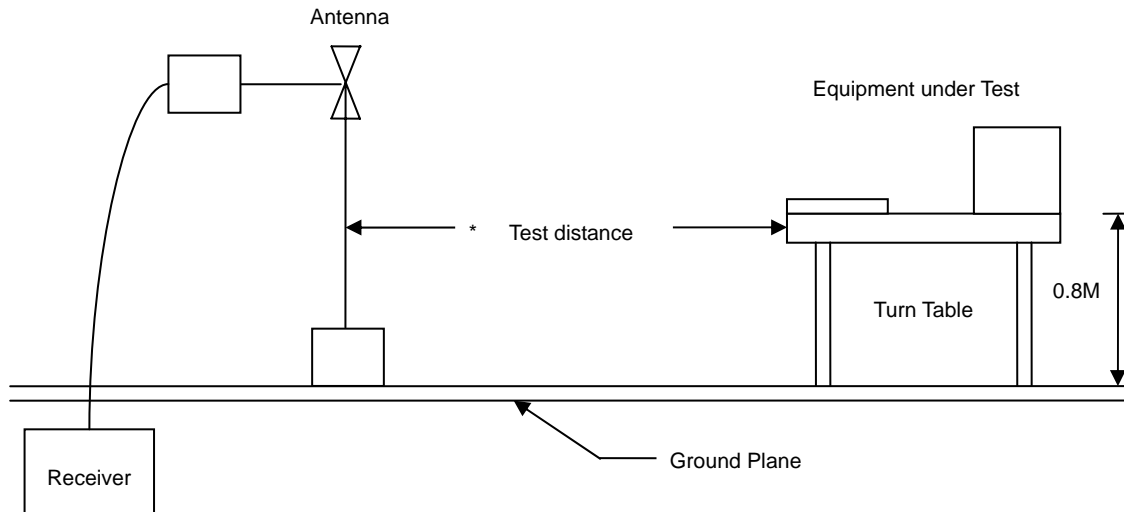
For unintentional device, according to CISPR PUB.22, for Class B digital devices, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 10 meters shall not exceed the above table.

Frequency (MHz)	Distance Meters	Radiated (dB μ V/ M)
30-230	10	30
230-1000	10	37

3.2. Test Procedures

- a. The EUT was placed on a Rota table top 0.8 meter above ground.
- b. The EUT was set 10 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
- c. The table was rotated 360 degrees to determine the position of the highest radiation.
- d. The antenna is a half wave dipole and its height is varied between one meter and four meters above ground to find the maximum value of the field strength both horizontal polarization and vertical polarization of the antenna are set to make the measurement.
- e. For each suspected emission the EUT was arranged to its worst case and then tune the antenna tower (from 1 M to 4 M) and turn table (from 0 degree to 360 degrees) to find the maximum reading.
- f. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 6 dB lower than the limit specified, then testing will be stopped and peak values of EUT will be reported, otherwise, the emissions which do not have 6 dB margin will be repeated one by one using the quasi-peak method and reported.

3.3. Typical test Setup



3.4. Measurement equipment

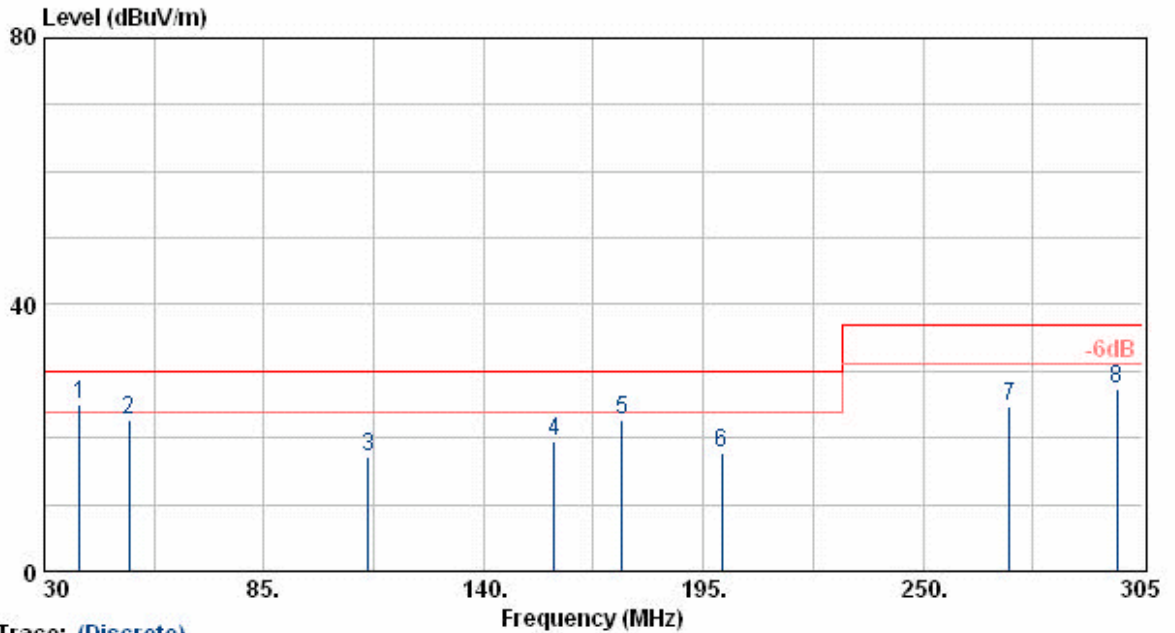
Instrument	Model No.	Manufacturer	Next Cal. Date
Bilog Antenna	CBL6111C	Schaffner	2006/02/14
Signal Generator	8648B	HP	2006/02/09
Amplifier	8447D	Agilent	2005/10/09
Amplifier	8447D	Agilent	2006/02/14
EMI Receiver	8546A	HP	2006/04/13
RF Filter Section	85460A	HP	2006/04/13
AC Power Converter	AFC-11005	APC	N/A

3.5. Test Result and Data

The test result including five kind of mode

Test mode 1

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 1 : MP24008XFPTRPC(8dBi)
 Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 62 %



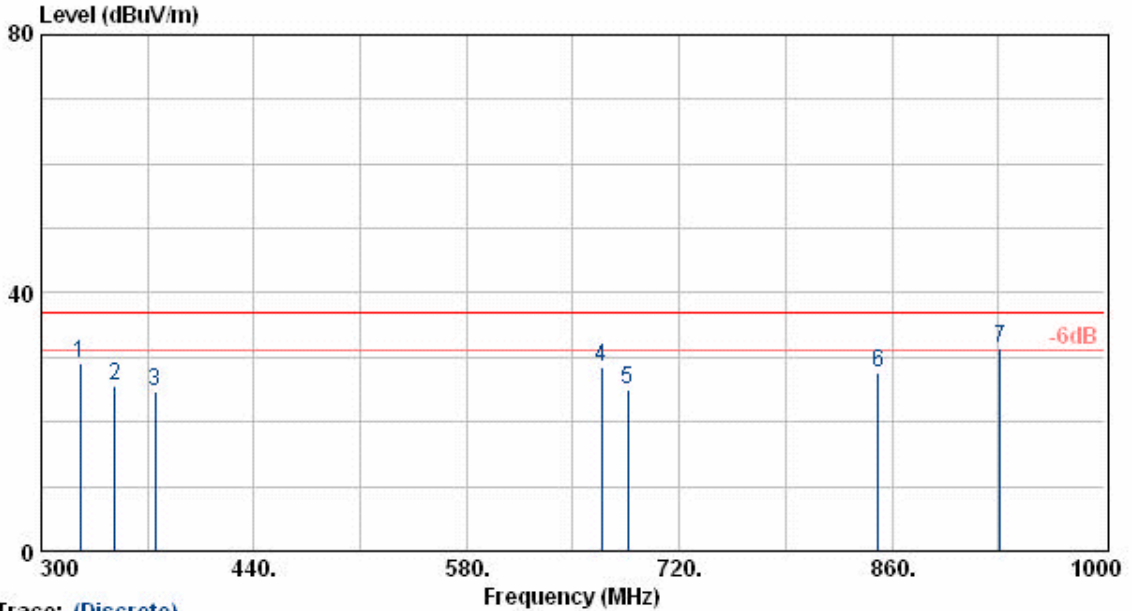
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
38.80	33.31	-8.18	25.13	30.00	-4.87	QP	100	0
51.18	38.13	-15.55	22.58	30.00	-7.42	Peak	100	0
111.13	34.43	-17.27	17.16	30.00	-12.84	Peak	100	0
157.60	34.78	-15.39	19.39	30.00	-10.61	Peak	100	0
174.65	39.70	-17.08	22.62	30.00	-7.38	Peak	100	0
199.68	34.77	-17.02	17.75	30.00	-12.25	Peak	100	0
271.73	36.62	-11.88	24.74	37.00	-12.26	Peak	100	0
298.68	38.32	-11.10	27.22	37.00	-9.78	Peak	100	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 1 : MP24008XFTRPC(8dBi)

Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 62 %



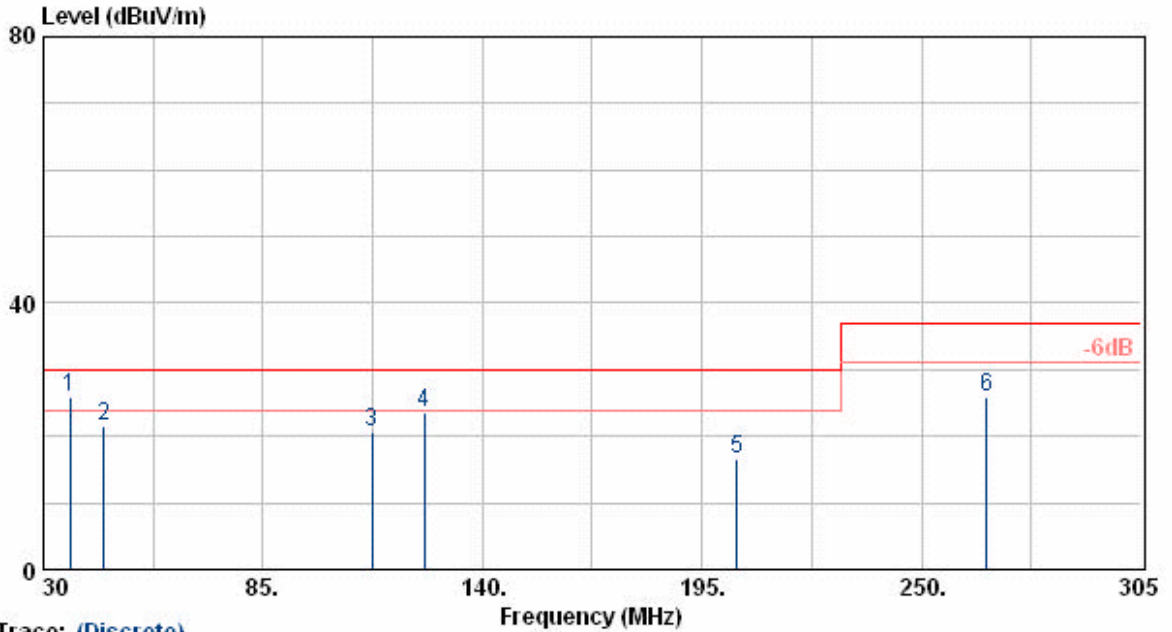
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
325.90	39.60	-10.63	28.96	37.00	-8.04	Peak	300	0
348.30	35.69	-10.21	25.48	37.00	-11.52	Peak	300	0
374.90	33.99	-9.29	24.70	37.00	-12.30	Peak	300	0
668.90	31.98	-3.46	28.52	37.00	-8.48	Peak	300	0
686.40	28.08	-3.05	25.03	37.00	-11.97	Peak	300	0
850.90	27.55	0.21	27.76	37.00	-9.24	Peak	300	0
931.40	28.98	2.33	31.31	37.00	-5.69	QP	300	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 1 : MP24008XFPTRPC(8dBi)

Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 62 %

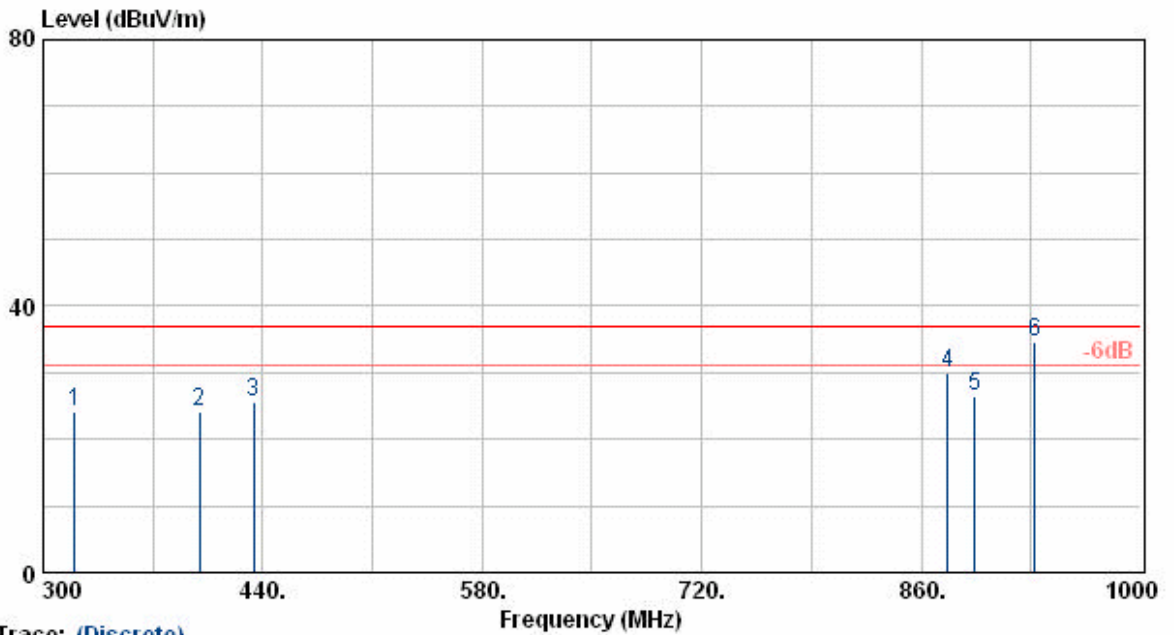


Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
36.60	32.33	-6.44	25.89	30.00	-4.11	QP	300	0
45.19	33.96	-12.52	21.45	30.00	-8.55	QP	300	0
112.23	37.93	-17.20	20.72	30.00	-9.28	Peak	300	0
125.43	39.49	-15.87	23.62	30.00	-6.38	Peak	300	0
203.80	33.82	-17.27	16.56	30.00	-13.44	Peak	300	0
266.23	37.98	-12.04	25.94	37.00	-11.06	Peak	300	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 1 : MP24008XFPTRPC(8dBi)
 Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 62 %



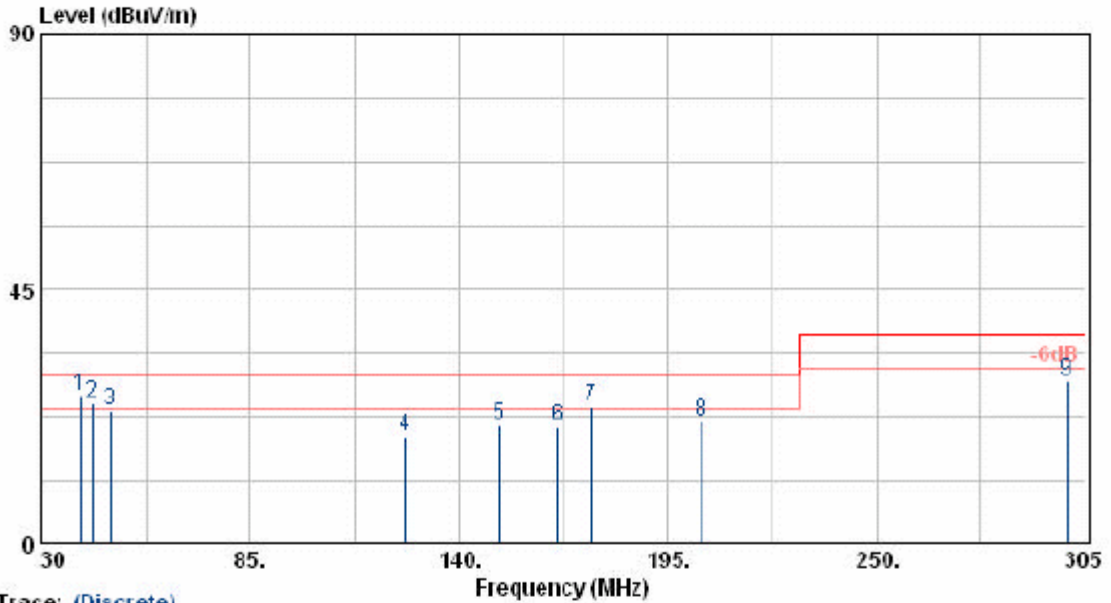
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
320.30	34.68	-10.68	24.01	37.00	-12.99	Peak	100	0
399.40	32.69	-8.61	24.08	37.00	-12.92	Peak	100	0
434.40	34.00	-8.47	25.53	37.00	-11.47	Peak	100	0
876.80	29.34	0.71	30.05	37.00	-6.95	Peak	100	0
894.30	25.59	0.97	26.56	37.00	-10.44	Peak	100	0
932.21	32.18	2.37	34.55	37.00	-2.45	QP	180	161

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

Test mode 2

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 2 : MFB24010(10dBi)
 Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %



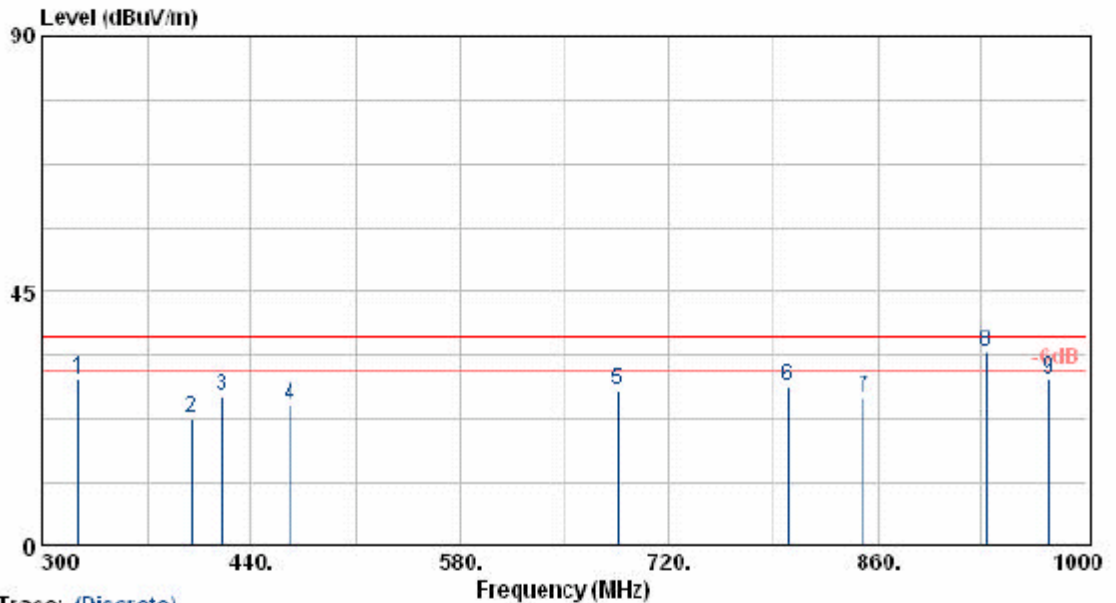
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
40.18	35.33	-9.24	26.09	30.00	-3.91	QP	200	360
43.48	36.19	-11.40	24.79	30.00	-5.21	QP	200	360
48.43	37.42	-13.98	23.44	30.00	-6.56	Peak	200	360
125.98	34.72	-15.78	18.94	30.00	-11.06	Peak	200	360
150.73	35.37	-14.50	20.87	30.00	-9.13	Peak	200	360
165.85	36.77	-16.22	20.55	30.00	-9.45	Peak	200	360
174.93	41.47	-17.10	24.37	30.00	-5.63	QP	200	360
203.80	38.84	-17.27	21.58	30.00	-8.42	Peak	200	360
300.05	39.89	-11.10	28.80	37.00	-8.20	Peak	200	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 2 : MFB24010(10dBi)

Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %

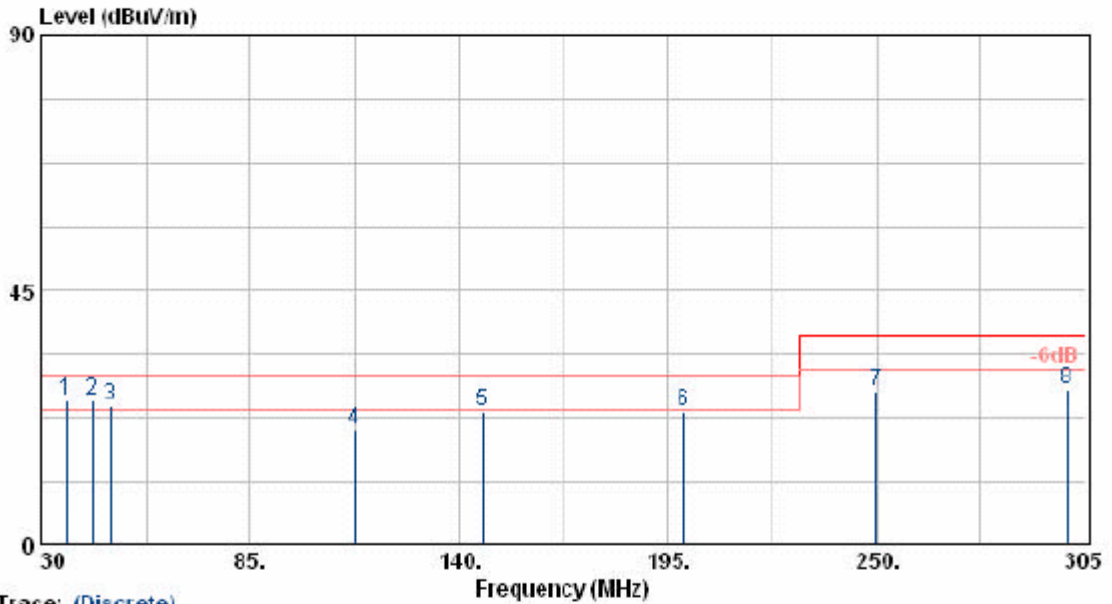


Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
323.80	39.97	-10.65	29.32	37.00	-7.68	Peak	400	0
399.40	31.05	-8.61	22.44	37.00	-14.56	Peak	400	0
420.40	34.86	-8.51	26.35	37.00	-10.65	Peak	400	0
465.90	32.75	-7.98	24.78	37.00	-12.22	Peak	400	0
686.40	30.48	-3.05	27.43	37.00	-9.57	Peak	400	0
799.80	29.02	-0.86	28.16	37.00	-8.84	Peak	400	0
850.90	25.13	0.21	26.34	37.00	-10.66	Peak	400	0
932.80	32.11	2.39	34.50	37.00	-2.50	QP	400	0
974.80	25.43	3.14	29.57	37.00	-7.43	Peak	400	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EVT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 2 : MFB24010(10dBi)
 Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %

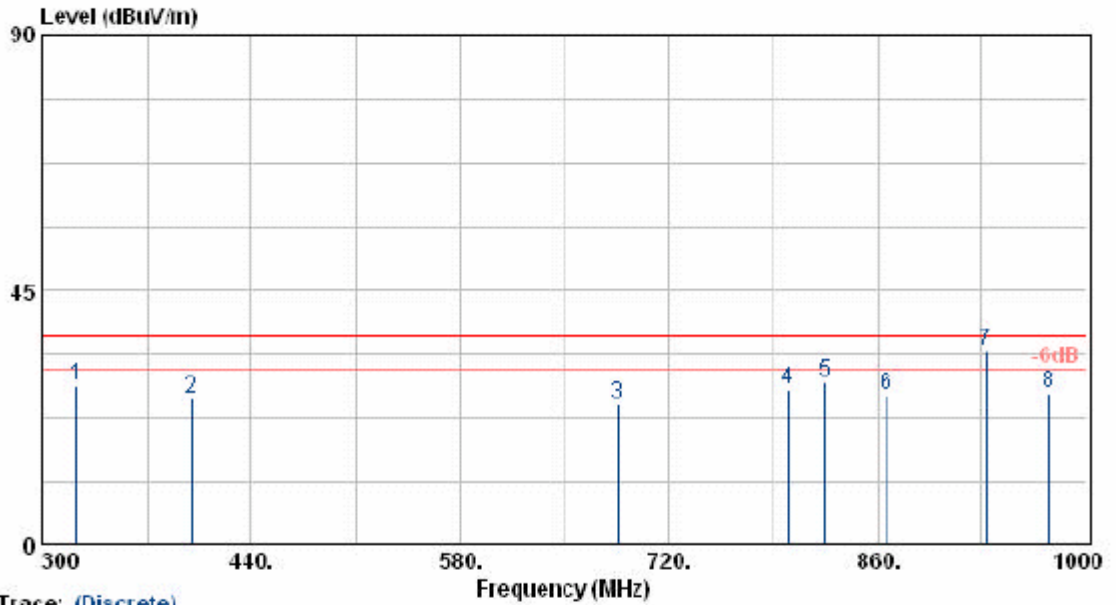


Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
36.60	31.97	-6.44	25.53	30.00	-4.47	QP	300	0
43.48	36.80	-11.40	25.39	30.00	-4.61	QP	300	0
48.43	38.38	-13.98	24.40	30.00	-5.60	QP	300	0
112.23	37.58	-17.20	20.37	30.00	-9.63	Peak	300	0
146.33	37.96	-14.40	23.56	30.00	-6.44	Peak	300	0
199.13	40.46	-17.02	23.44	30.00	-6.56	Peak	300	0
249.73	40.27	-13.22	27.05	37.00	-9.95	Peak	300	0
300.05	38.49	-11.10	27.39	37.00	-9.61	Peak	300	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 2 : MFB24010(10dBi)
 Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %



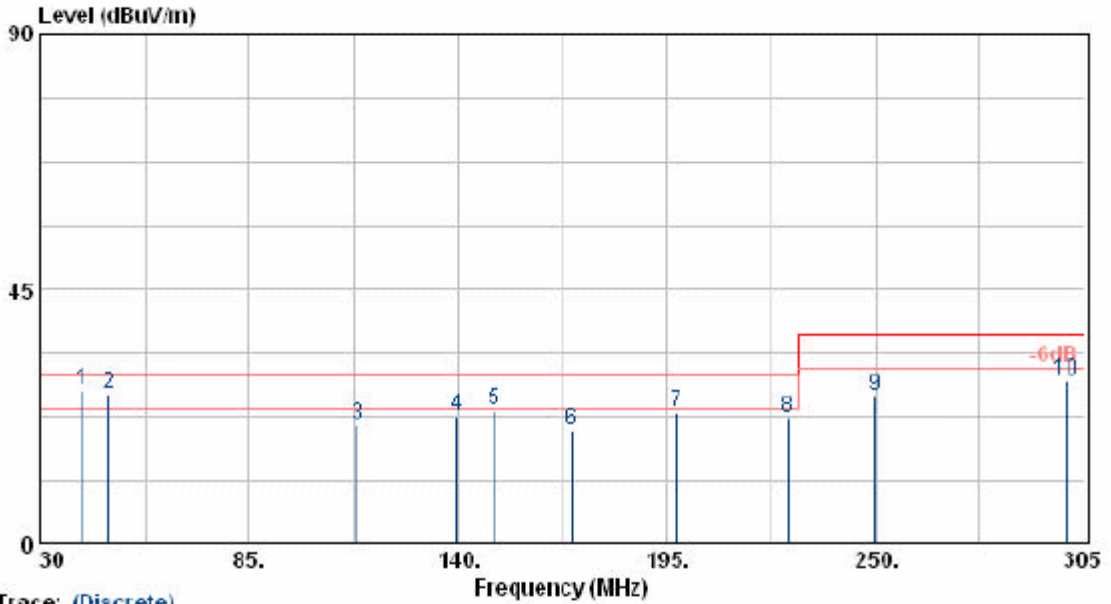
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
322.40	38.69	-10.65	28.03	37.00	-8.97	Peak	100	0
399.40	34.48	-8.61	25.87	37.00	-11.13	Peak	100	0
686.40	28.01	-3.05	24.96	37.00	-12.04	Peak	100	0
799.80	28.48	-0.86	27.62	37.00	-9.38	Peak	100	0
825.00	29.35	-0.48	28.88	37.00	-8.12	Peak	100	0
866.30	25.88	0.67	26.54	37.00	-10.46	Peak	100	0
932.80	32.11	2.39	34.49	37.00	-2.51	QP	100	0
974.80	23.74	3.14	26.89	37.00	-10.11	Peak	100	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

Test mode 3

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 3 : HG5812U(12dBi)
 Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %



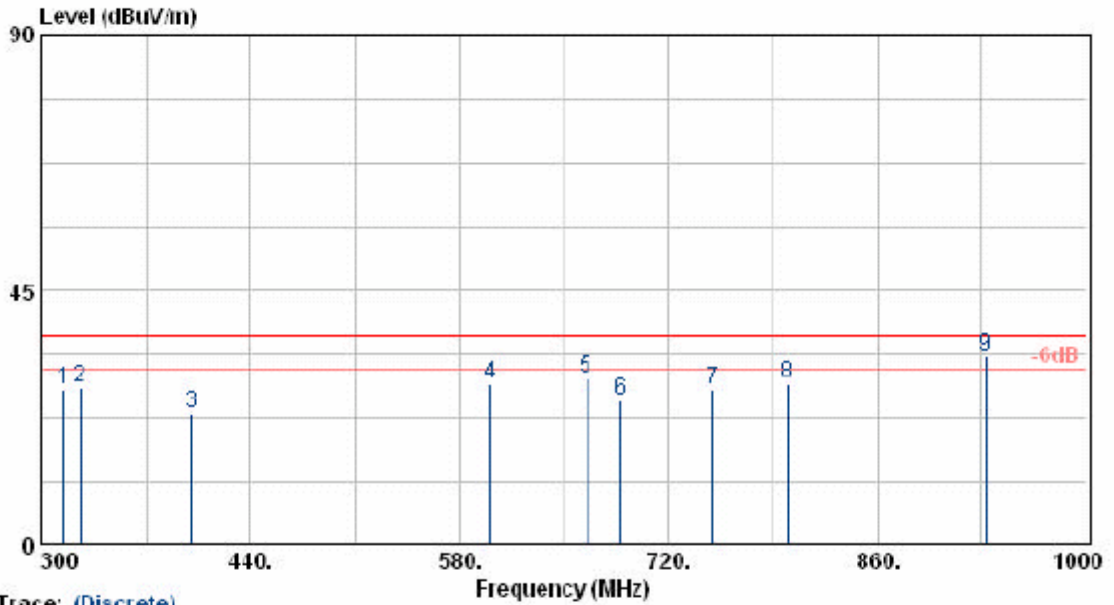
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
40.73	36.77	-9.62	27.16	30.00	-2.84	QP	200	360
48.15	40.25	-13.85	26.40	30.00	-3.60	QP	200	360
113.60	37.95	-17.12	20.83	30.00	-9.17	Peak	200	360
139.73	37.12	-14.47	22.65	30.00	-7.35	Peak	200	360
149.35	37.87	-14.40	23.47	30.00	-6.53	Peak	200	360
169.98	36.73	-16.74	20.00	30.00	-10.00	Peak	200	360
197.48	40.34	-17.02	23.32	30.00	-6.68	Peak	200	360
226.90	38.48	-16.24	22.24	30.00	-7.76	Peak	200	360
249.73	39.52	-13.22	26.29	37.00	-10.71	Peak	200	360
300.05	39.92	-11.10	28.82	37.00	-8.18	Peak	200	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 3 : HG5812U(12dBi)

Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %



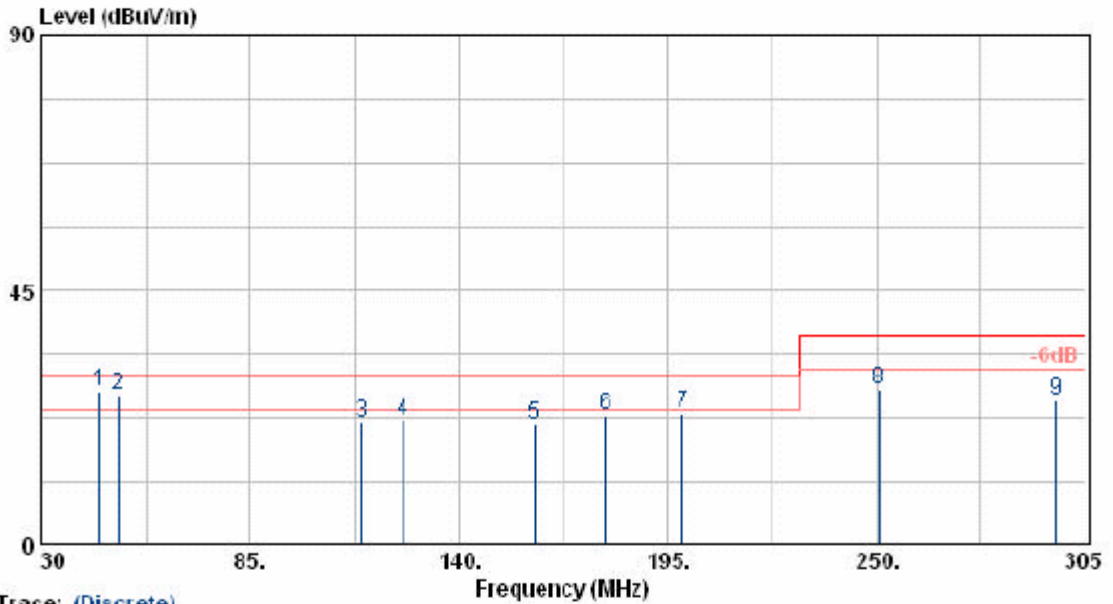
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
315.40	38.41	-10.81	27.60	37.00	-9.40	Peak	400	96
325.90	38.37	-10.63	27.74	37.00	-9.26	Peak	400	96
400.10	31.96	-8.59	23.37	37.00	-13.63	Peak	400	96
600.30	32.92	-4.39	28.53	37.00	-8.47	Peak	400	96
665.40	32.82	-3.41	29.41	37.00	-7.59	Peak	400	96
687.80	28.48	-3.03	25.46	37.00	-11.54	Peak	400	96
749.40	28.67	-1.07	27.60	37.00	-9.40	Peak	400	96
799.80	29.41	-0.86	28.54	37.00	-8.46	Peak	400	96
932.80	30.93	2.39	33.32	37.00	-3.68	QP	400	96

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 3 : HG5812U(12dBi)

Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %



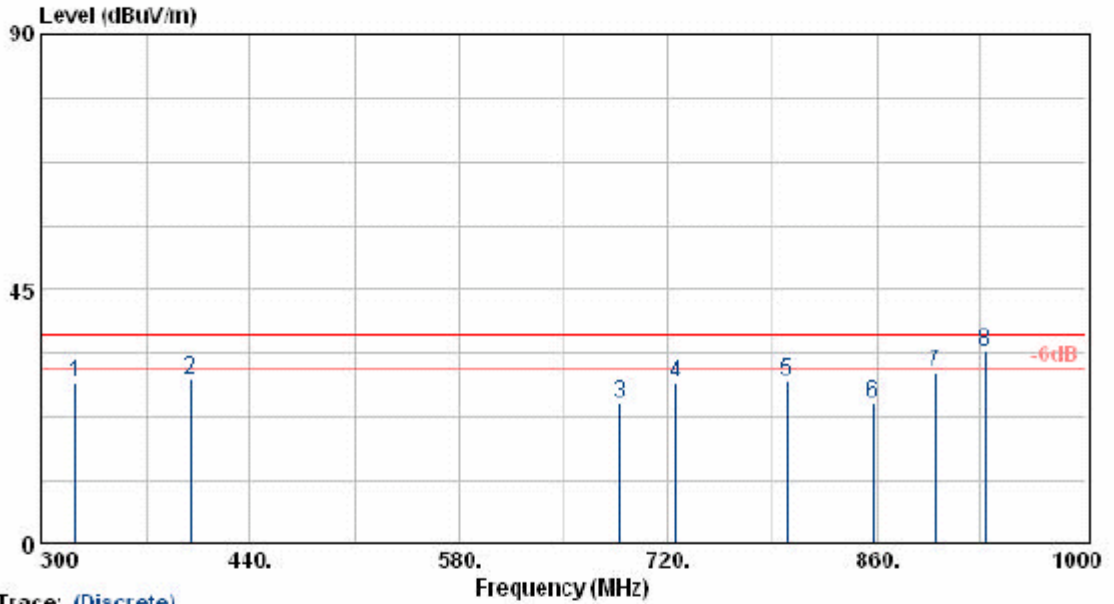
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
45.13	39.74	-12.48	27.25	30.00	-2.75	QP	100	360
50.35	41.63	-14.97	26.66	30.00	-3.34	QP	100	360
114.43	38.81	-17.08	21.73	30.00	-8.27	Peak	100	360
125.43	37.64	-15.87	21.77	30.00	-8.23	Peak	100	360
159.80	36.93	-15.65	21.28	30.00	-8.72	Peak	100	360
178.50	40.08	-17.30	22.79	30.00	-7.21	Peak	100	360
198.85	40.11	-17.02	23.09	30.00	-6.91	Peak	100	360
250.55	40.70	-13.13	27.57	37.00	-9.43	Peak	100	360
297.30	36.78	-11.11	25.67	37.00	-11.33	Peak	100	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 3 : HG5812U(12dBi)

Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %



Trace: (Discrete)

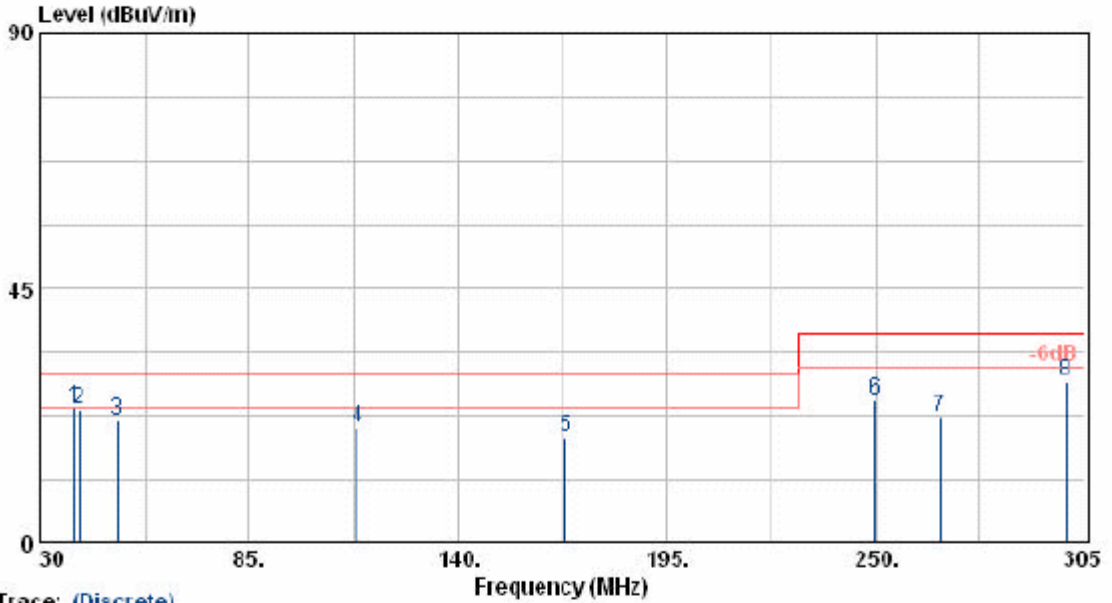
Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
322.40	39.15	-10.65	28.50	37.00	-8.50	Peak	300	360
399.40	37.89	-8.61	29.28	37.00	-7.72	Peak	300	360
687.80	27.77	-3.03	24.74	37.00	-12.26	Peak	300	360
724.90	30.37	-1.99	28.38	37.00	-8.62	Peak	300	360
799.80	29.65	-0.85	28.80	37.00	-8.20	Peak	300	360
857.90	24.51	0.45	24.96	37.00	-12.04	Peak	300	360
899.90	29.13	1.24	30.36	37.00	-6.64	Peak	300	360
932.80	31.58	2.39	33.97	37.00	-3.03	QP	300	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

Test mode 4

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 4 : MA0528-19AN(19dBi)

Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %

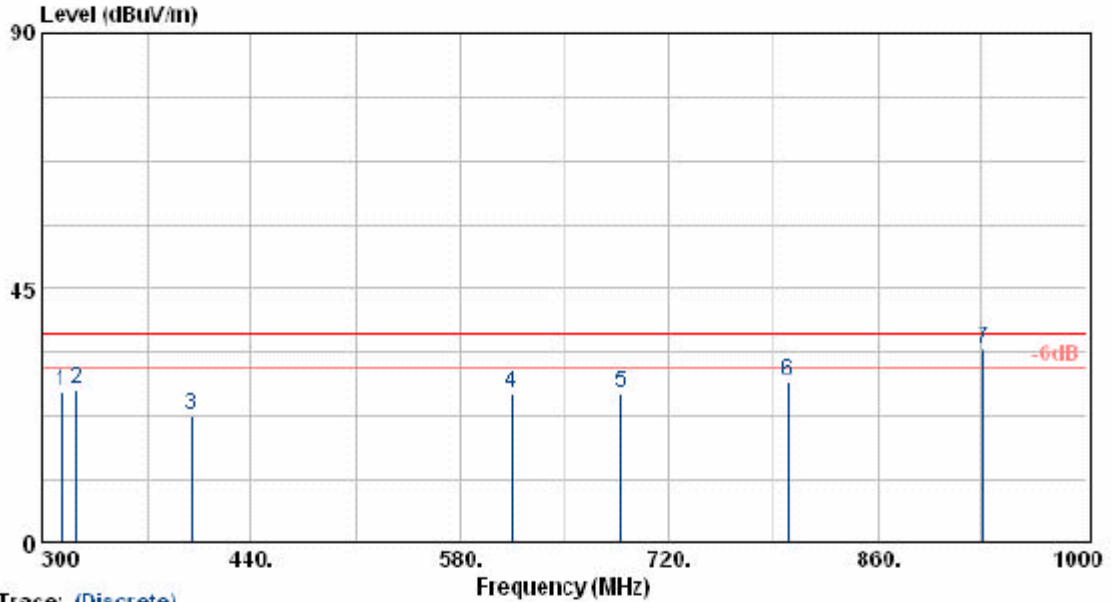


Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
38.80	32.11	-8.18	23.92	30.00	-6.08	Peak	400	360
40.18	32.73	-9.24	23.49	30.00	-6.51	Peak	400	360
50.35	36.44	-14.97	21.46	30.00	-8.54	Peak	400	360
113.60	37.52	-17.12	20.39	30.00	-9.61	Peak	400	360
168.33	35.17	-16.53	18.64	30.00	-11.36	Peak	400	360
249.73	38.36	-13.22	25.13	37.00	-11.87	Peak	400	360
267.05	34.11	-11.98	22.13	37.00	-14.87	Peak	400	360
300.05	39.61	-11.10	28.51	37.00	-8.49	Peak	400	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 4 : MA0528-19AF(19dB)
 Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %



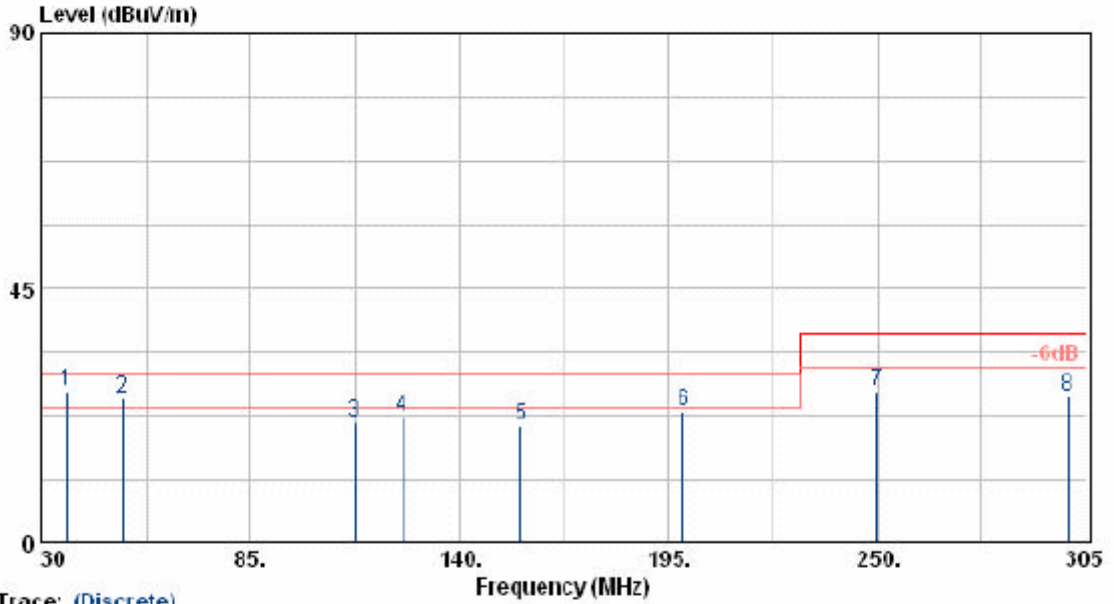
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
313.30	37.70	-10.87	26.83	37.00	-10.17	Peak	200	0
322.40	37.77	-10.66	27.11	37.00	-9.89	Peak	200	0
399.40	31.16	-8.61	22.55	37.00	-14.45	Peak	200	0
614.30	30.75	-4.33	26.43	37.00	-10.57	Peak	200	0
687.80	29.67	-3.03	26.65	37.00	-10.35	Peak	200	0
799.80	29.23	-0.85	28.37	37.00	-8.63	Peak	200	0
931.40	32.18	2.33	34.51	37.00	-2.49	QP	200	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 4 : MA0528-19AN(19dB:)

Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %

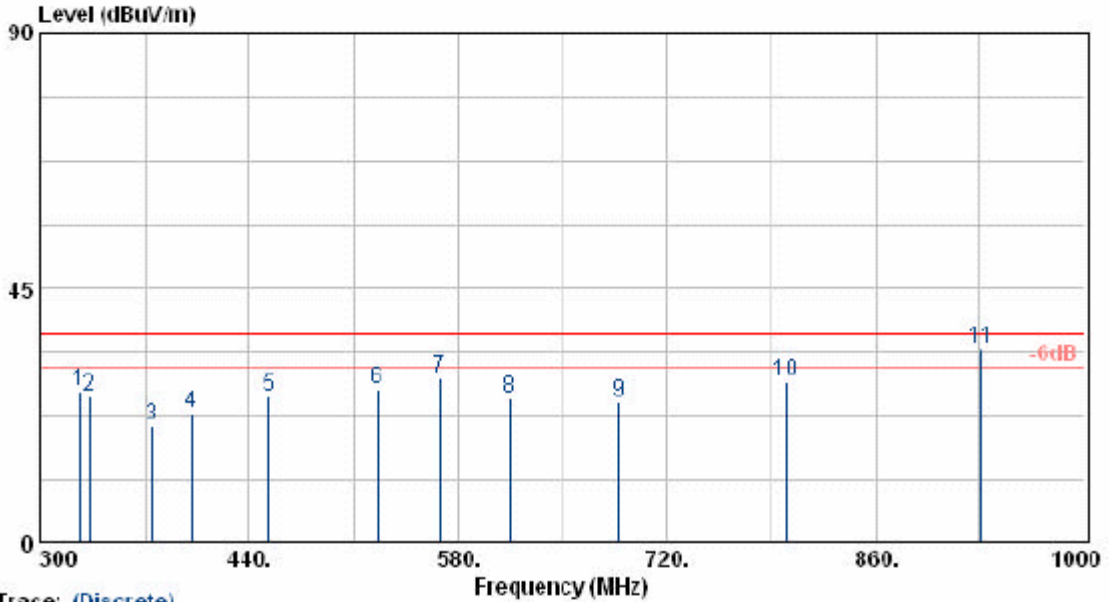


Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
36.60	33.28	-6.44	26.84	30.00	-3.16	QP	100	360
51.18	41.18	-15.55	25.63	30.00	-4.37	QP	100	360
112.23	38.57	-17.20	21.36	30.00	-8.64	Peak	100	360
124.88	38.07	-15.95	22.12	30.00	-7.88	Peak	100	360
156.23	35.90	-15.23	20.67	30.00	-9.33	Peak	100	360
198.85	40.30	-17.02	23.28	30.00	-6.72	Peak	100	360
249.73	40.05	-13.22	26.84	37.00	-10.16	Peak	100	360
300.05	36.81	-11.10	25.71	37.00	-11.29	Peak	100	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 4 : MA0528-19AV (19dB)
 Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %



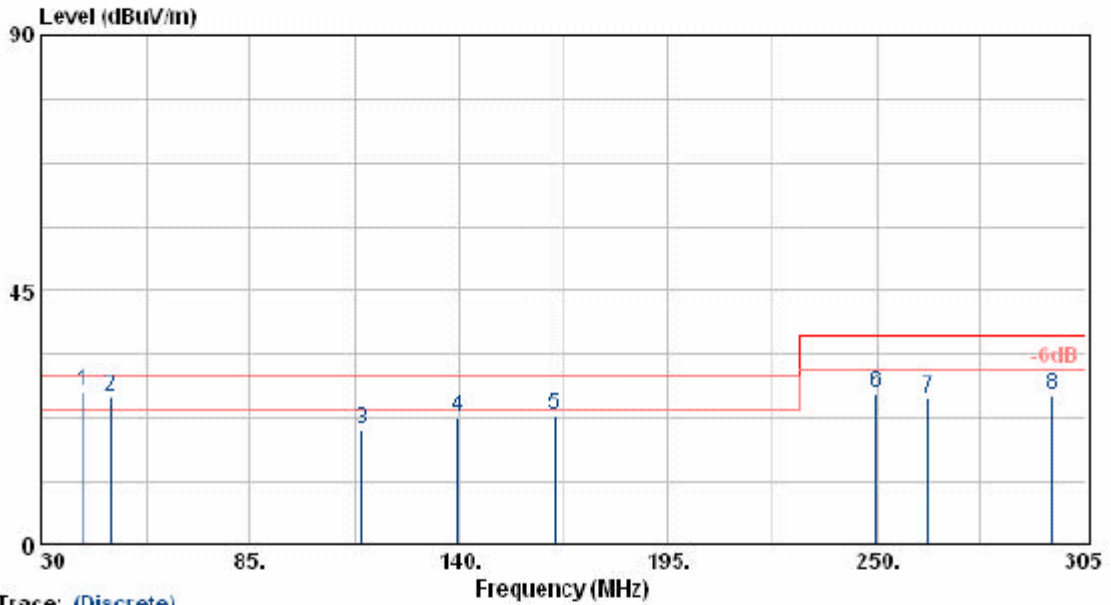
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
325.90	37.50	-10.63	26.87	37.00	-10.13	Peak	300	360
332.90	36.24	-10.52	25.72	37.00	-11.28	Peak	300	360
374.90	29.99	-9.29	20.70	37.00	-16.30	Peak	300	360
400.80	31.42	-8.58	22.84	37.00	-14.16	Peak	300	360
453.30	34.28	-8.41	25.87	37.00	-11.13	Peak	300	360
525.40	33.29	-5.96	27.32	37.00	-9.68	Peak	300	360
567.40	34.11	-4.88	29.23	37.00	-7.77	Peak	300	360
614.30	29.80	-4.33	25.47	37.00	-11.53	Peak	300	360
687.80	27.85	-3.03	24.82	37.00	-12.18	Peak	300	360
799.80	29.35	-0.86	28.49	37.00	-8.51	Peak	300	360
931.40	32.01	2.33	34.35	37.00	-2.65	QP	300	360

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

Test mode 5:

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 5 : WISP4959018MBV(18dBi)
 Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %

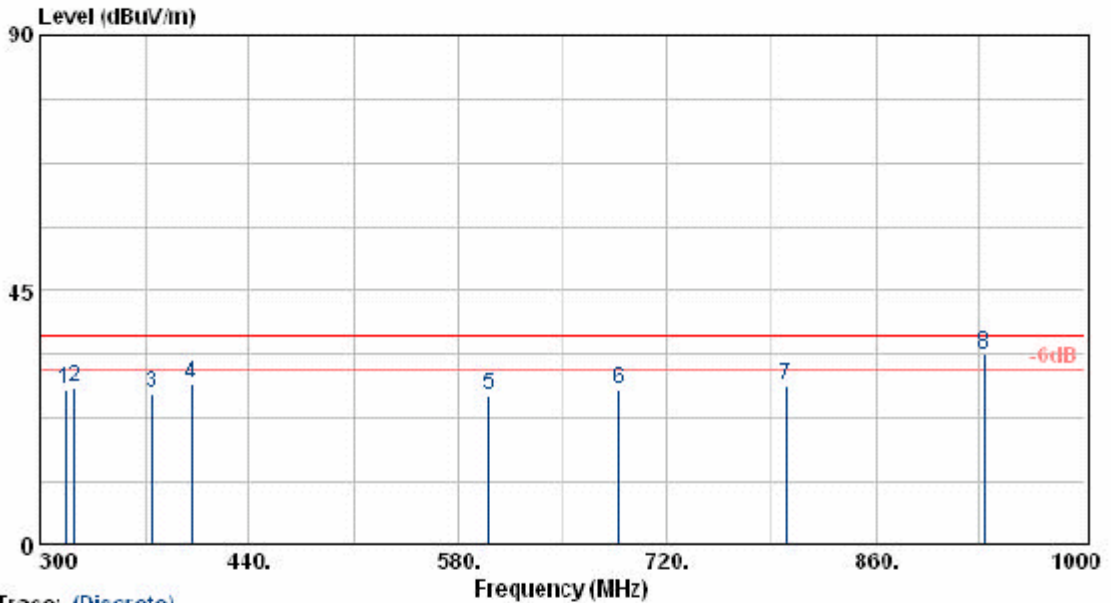


Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
41.00	37.08	-9.81	27.27	30.00	-2.73	QP	200	0
48.43	40.25	-13.98	26.27	30.00	-3.73	QP	200	0
114.43	37.50	-17.08	20.43	30.00	-9.57	Peak	200	0
139.73	37.08	-14.47	22.61	30.00	-7.39	Peak	200	0
165.30	38.97	-16.15	22.82	30.00	-7.18	Peak	200	0
249.73	40.22	-13.22	26.99	37.00	-10.01	Peak	200	0
263.48	38.02	-12.20	25.82	37.00	-11.18	Peak	200	0
296.48	37.68	-11.11	26.57	37.00	-10.43	Peak	200	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 5 : WISP4959018MBV(18dBi)
 Pol/Phase : HORIZONTAL
 Temperature : 31 °C
 Humidity : 65 %



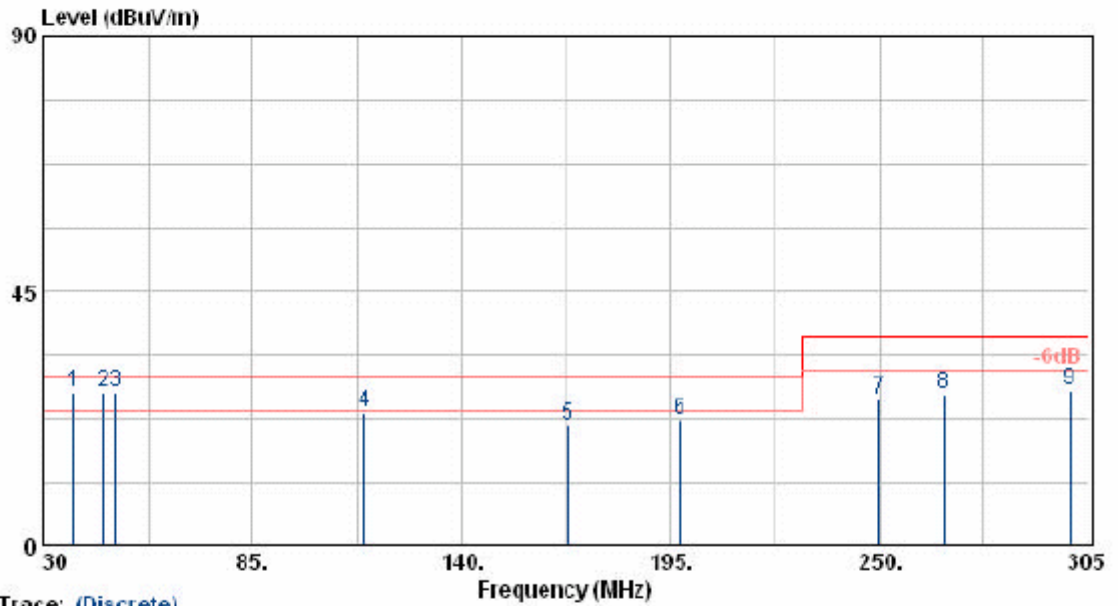
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
316.80	38.25	-10.77	27.49	37.00	-9.51	Peak	400	0
322.40	38.60	-10.66	27.94	37.00	-9.06	Peak	400	0
374.90	36.08	-9.29	26.79	37.00	-10.21	Peak	400	0
400.80	36.94	-8.58	28.36	37.00	-8.64	Peak	400	0
600.30	31.01	-4.39	26.62	37.00	-10.38	Peak	400	0
687.80	30.67	-3.03	27.64	37.00	-9.36	Peak	400	0
799.80	28.92	-0.86	28.06	37.00	-8.94	Peak	400	0
932.80	31.22	2.39	33.61	37.00	-3.39	QP	400	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 5 : WISP4959018MBV(18dBi)

Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %



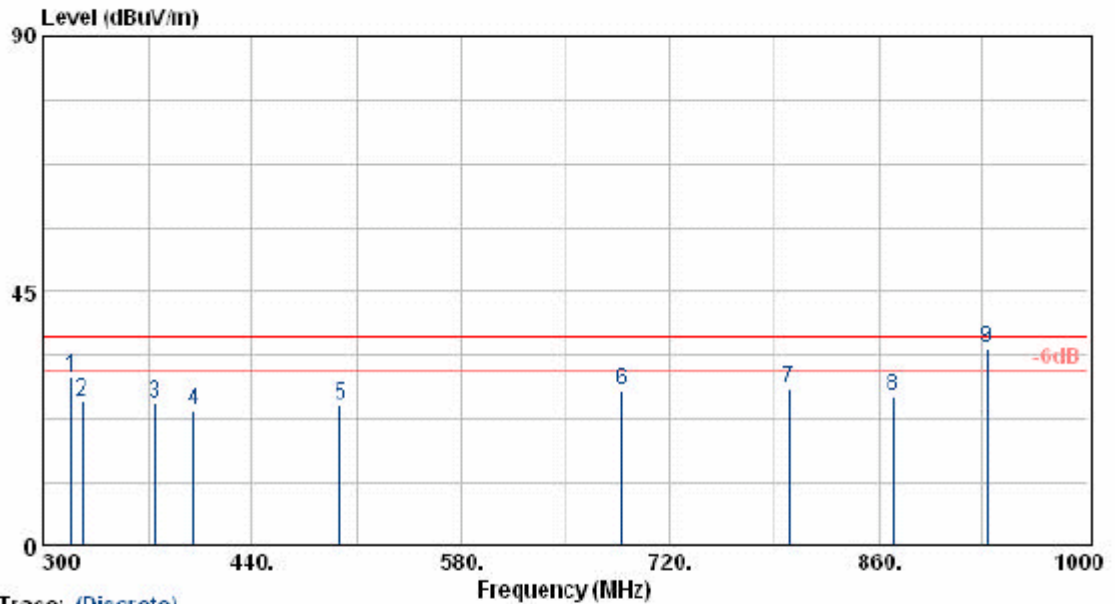
Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
37.98	34.69	-7.54	27.15	30.00	-2.85	QP	300	0
45.68	40.01	-12.76	27.24	30.00	-2.76	QP	300	0
48.98	41.29	-14.24	27.04	30.00	-2.96	QP	300	0
114.43	40.57	-17.08	23.49	30.00	-6.51	Peak	300	0
168.05	37.70	-16.50	21.20	30.00	-8.80	Peak	300	0
197.48	39.35	-17.02	22.33	30.00	-7.67	Peak	300	0
249.73	39.11	-13.22	25.88	37.00	-11.12	Peak	300	0
267.05	38.77	-11.98	26.79	37.00	-10.21	Peak	300	0
300.05	38.55	-11.10	27.46	37.00	-9.54	Peak	300	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

EUT : 3203
 Power : AC 120V
 Test Mode : Link
 Memo : Antenna 5 : WISP4059018MBV(18dBi)

Pol/Phase : VERTICAL
 Temperature : 31 °C
 Humidity : 65 %



Trace: (Discrete)

Freq	Read Level	Factor	Level	Limit	Over Limit	Remark	Ant Pos	Tab Pos
MHz	dBuV	dBuV/m	dBuV/m	dB	dB			
318.90	40.57	-10.71	29.86	37.00	-7.14	Peak	100	0
325.90	36.19	-10.63	25.56	37.00	-11.44	Peak	100	0
374.90	34.44	-9.29	25.15	37.00	-11.85	Peak	100	0
400.10	32.53	-8.59	23.94	37.00	-13.06	Peak	100	0
498.80	31.65	-6.81	24.84	37.00	-12.16	Peak	100	0
687.80	30.52	-3.03	27.49	37.00	-9.51	Peak	100	0
799.80	28.82	-0.86	27.96	37.00	-9.04	Peak	100	0
869.80	25.83	0.75	26.58	37.00	-10.43	Peak	100	0
932.80	32.54	2.39	34.93	37.00	-2.07	QP	100	0

Remarks: 1. Level = Read Level + factor
 2. Factor = Antenna factor + Cable loss - Amplifier factor

Test engineer: WJL

3.5.1 Test Photographs

Test mode 1

Front View



Rear View



Test mode 2

Front View



Rear View



Test mode 3

Front View



Rear View



Test mode 4

Front View

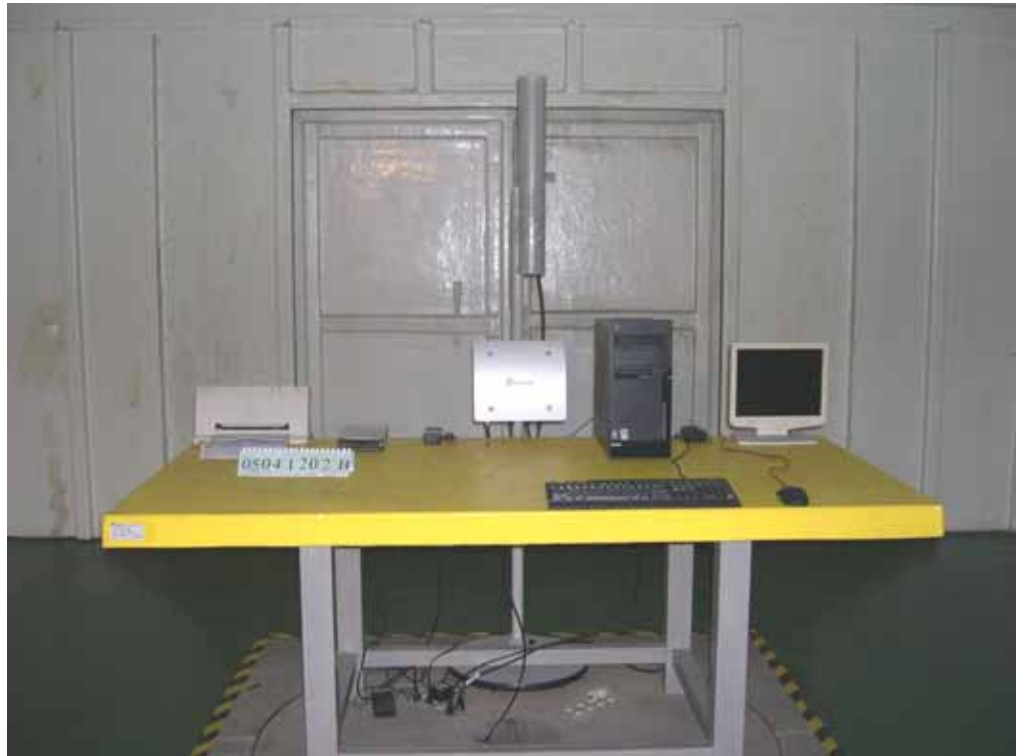


Rear View



Test mode 5

Front View



Rear View

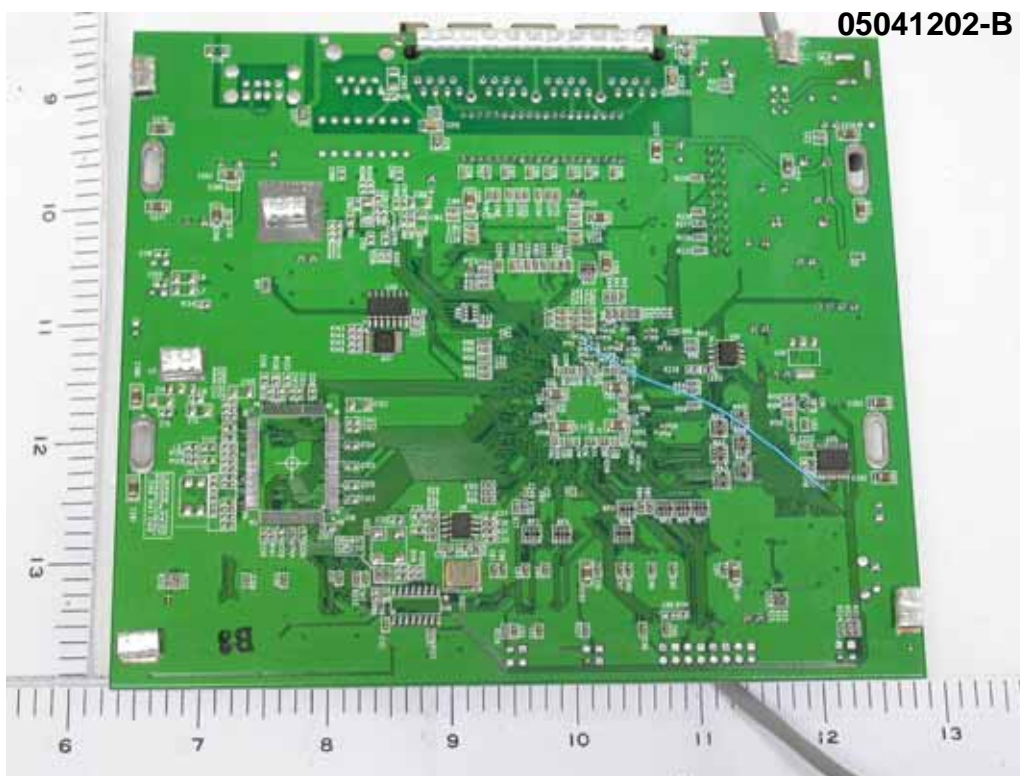


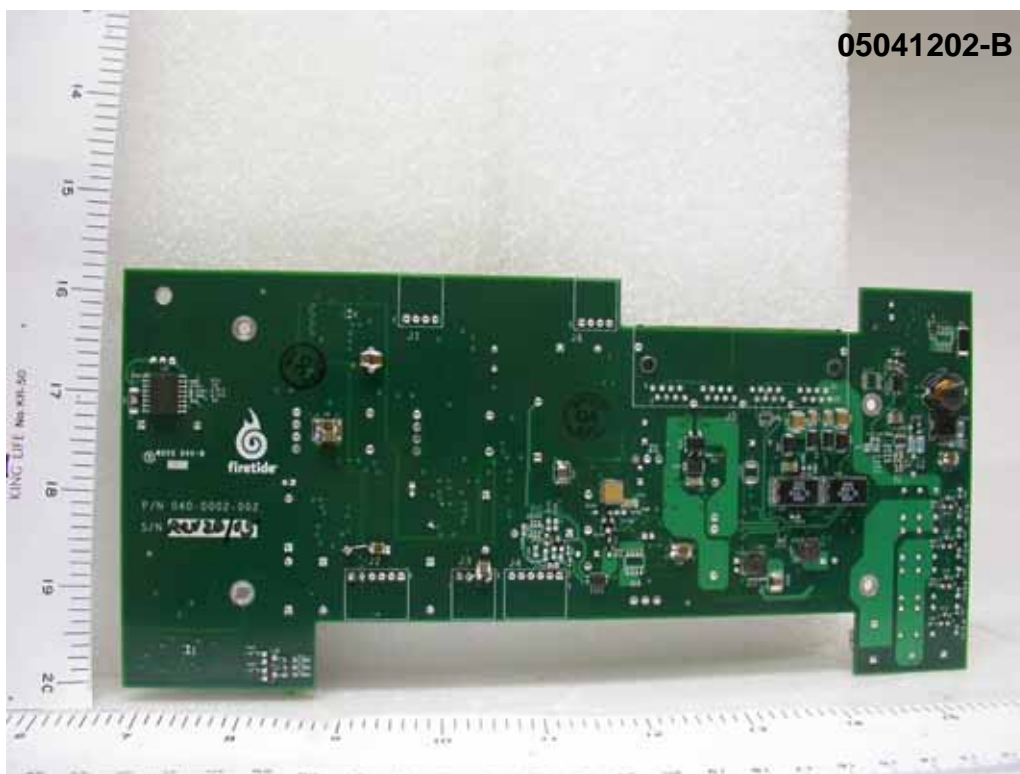
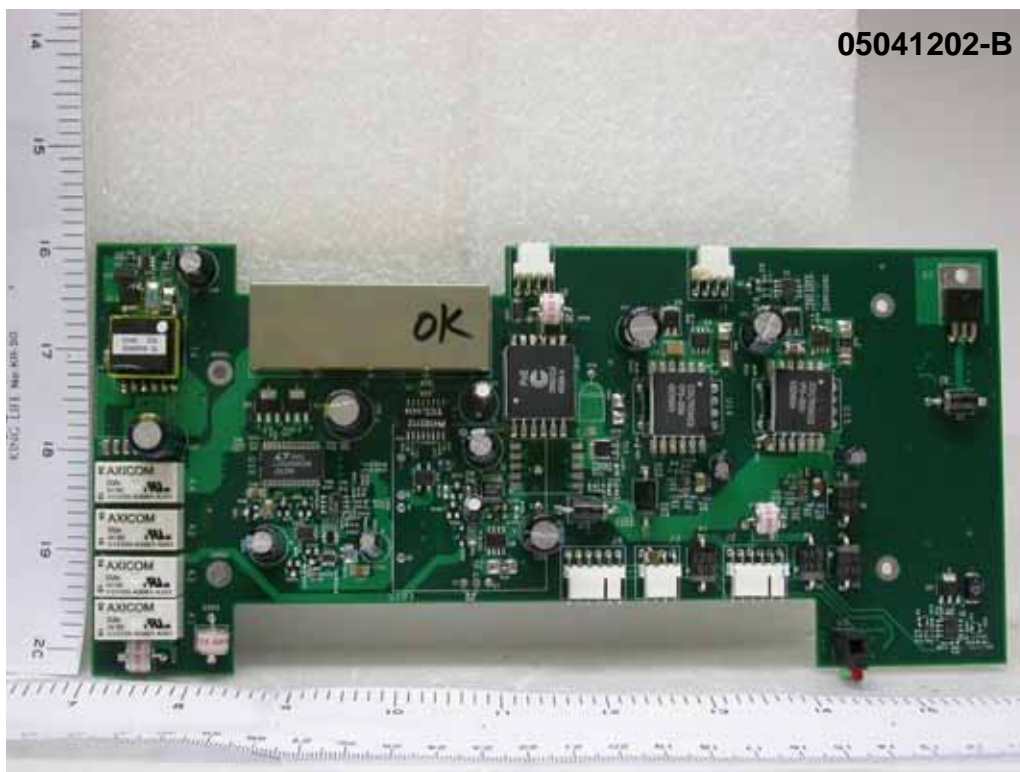
Appendix A. Photographs of EUT

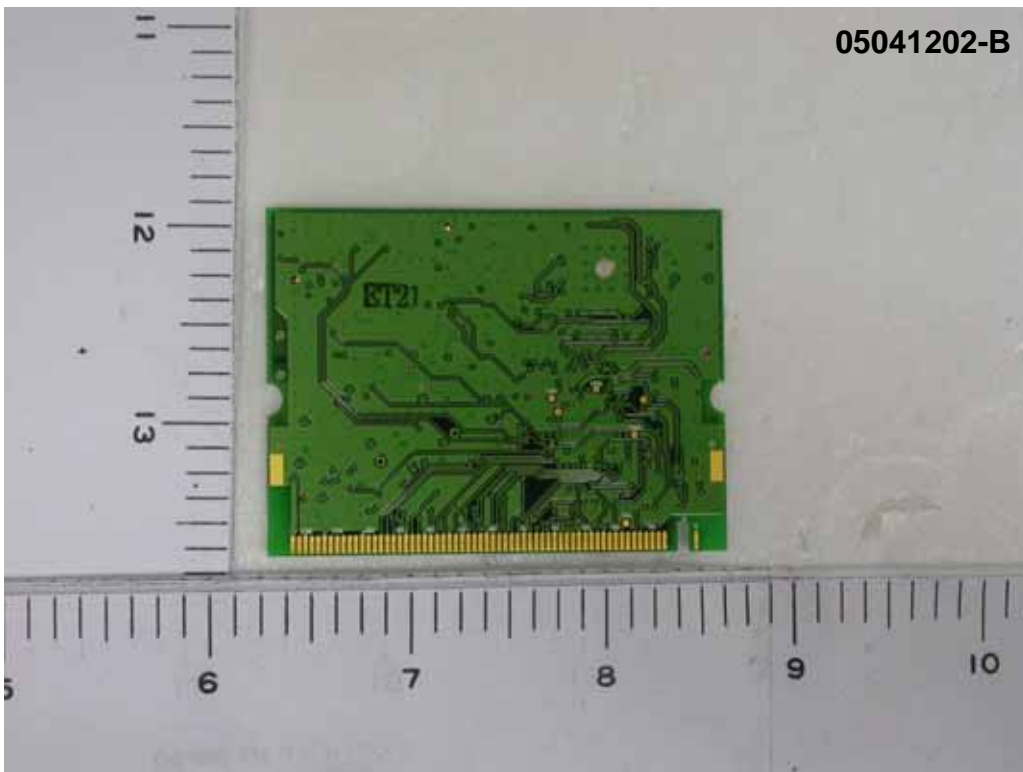
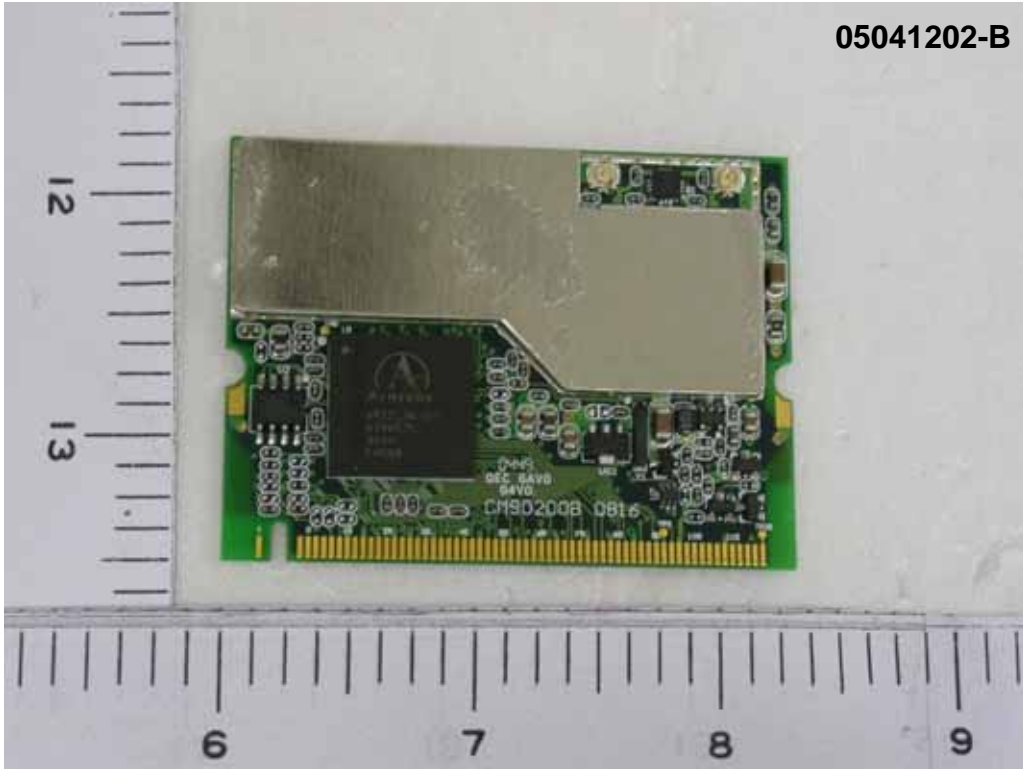












05041202-B



MP24008XFPTRPC-Antenna @8dBi

05041202-B



MFB24010-Antenna @10dBi

05041202-B



HG5812-Antenna @12dBi



MA0528-19AN-Antenna @19dBi



WISP4959018MBV-Antenna @18dBi

05041202-B



R380-700.205-Antenna @10dBi

05041202-B



MFB51510-Antenna @10dBi



MFB49009-Antenna @9dBi





