FCC TEST REPORT

Test report No.:	**EMC- FCC- R0012**
FCC ID:	**W9UMP100**
Type of equipment:	**PORABLE NETWORK DEVICE(MINIPAD)**
Model Name:	**MP100**
Brand Name:	**-**
Applicant:	**MINTPASS CO.,LTD.**
FCC Rule Part(s):	**FCC Part 15 Subpart C 2008 Section 15.203, Section 15.247**
Frequency Range:	**2412 MHz ~ 2462 MHz**
Test result:	**Complied**

The above equipment was tested by EMC compliance Testing Laboratory for compliance with the requirements of FCC Rules and Regulations.
The results of testing in this report apply to the product/system which was tested only. Other similar equipment will not necessarily produce the same results due to production tolerance and measurement uncertainties.

Date of test: April 6, 2009 ~ April 13 , 2009

Issued date: ~ April 17 , 2009

Tested by: NA, KAB JIN

Approved by: YOO, SUNG YOUNG .

82-1 Jeil-ri, Yangji-myun, Churingu, Yongin-city, Kyungki-do,Korea 449-825,
82 31 336 9919 (Main) 82 31 336 4767 (Fax)

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1. Client information

Applicant:	MINTPASS CO.,LTD.
Address:	10F, Kangnam meto bldg, 1339-9 Seocho-dong, Seocho-gu Seoul, Korea, 137-070
Telephone number:	+82-70-7500-9951
Facsimile number :	+82-2-523-9369
Contact person:	JO JAEHWAN / Manager

Manufacturer:	IRIVER CHINA CO.,LTD
Address:	SSL Sic & Tech North Industry Park Dongguan, Guangdong, China 523-808
Telephone number:	+82-70-7500-9951
Facsimile number :	+82-2-523-9369
Contact person:	JO JAEHWAN/ Manager

2. Laboratory information

Address
EMC Compliance Ltd.
82-1, JEIL-RI, YANGJI-MYUN, CHURINGU, YONGIN-CITY, KYUNGGI-DO,
KOREA 449-825
Telephone Number: 82 31 336 9919 Facsimile Number: 82 31 336 4767

Certificate
CBTL Testing Laboratory, KOLAS NO.: 231
FCC Filing No.: 793334
VCCI Registration No.: C-1713, R-1606, T-258

SITE MAP

3. Description of E.U.T.

3.1 Basic description

Applicant :	MINTPASS CO.,LTD.
Address of Applicant:	10F, Kangnam meto bldg, 1339-9 Seocho-dong, Seocho-gu Seoul, Korea, 137-070
Manufacturer:	IRIVER CHINA CO.,LTD
Address of Manufacturer:	SSL Sic & Tech North Industry Park Dongguan, Guangdong, China 523-808
Type of equipment:	PORTABLE NETWORK DEVICE(mintpad)
Basic Model:	MP100
Brand Name:	-
Serial number:	Proto Type

3.2 General description

Frequency Range	2412~2462 MHz
RF Output Power	17dBm (declared by the applicant)
Modulation Type	BPSK, QPSK, CCK, 16QAM, 64QAM
Modulation Technology	DSSS, OFDM
Tansfer Rate	802.11 b: 11.0/5.5/2.0/1.0 Mbps 802.11 g: 54.0/48.0/36.0/24.0/18.0/12.0/9.0/6.0 Mbps
Number of Channel	11
Channel Spacing	5 MHz
Type of Antenna	Chip ANTENNA with -3 dBi antenna gain
Power supply	DC 3.7 V
Operating temperature	-10 ~50
Dimension	78.3mm(H)X68.8mm(W)X15.3mm(T)
Weight	90g

NOTE :

1. The EUT operates in the 2.4GHz frequency spectrum with throughput of up to 54Mbps.

2. The EUT complies with IEEE 802.11g standards, and backwards compatible with IEEE 802.11b products.

3. The above EUT information was declared by the manufacturer and for detailed features description, please refers to the manufacturer's specifications or user's Manual.

4. The EUT provides one completed transmitter and one receiver.

MODULATION	TX/RX FUNCTION
802.11b	1TX / 1RX
802.11g	1TX / 1RX

3.3 Description of Test modes

Operated in 2400 ~ 2483.5 MHz band :
For 802.11b/g : Eleven channels are provided to this EUT

Channel	Frequency	Channel	Frequency
1	2412 MHz	7	2442 MHz
2	2417 MHz	8	2447 MHz
3	2422 MHz	9	2452 MHz
4	2427 MHz	10	2457 MHz
5	2432 MHz	11	2462 MHz
6	2437 MHz		

3.4 Table of Parameters of Test Software Setting

During testing, Channel & Power Controlling Software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final and product.

Power Parameters of IEEE 802.11b/g

Frequency	2412 MHz	2442 MHz	2462 MHz
IEEE 802.11 b	7	7	7
IEEE 802.11 g	8	8	8

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4. Summary of test results

4.1 Standards & results

Rule Reference	Parameter	Report Section	Test Result
15.247(a)(2)	6dB bandwidth	5.1	C
15.247(b)(3)	Maximum Peak Output Power	5.2	C
15.247(e)	Power Density	5.3	C
15.247(d)	Restricted Band Edge	5.4	C
15.247(d) 15.209(a)	Spurious Emission	5.4	C
15.203	Antenna Requirement	5.5	C
15.207(a)	Conducted Emissions	5.6	C

Note: C=complies
NC= Not complies
NT=Not tested
NA=Not Applicable

4.2 Uncertainty

Measurement Item	Combined Standard Uncertainty Uc	Expanded Uncertainty U = KUc (K = 2)
Conducted RF power	± 0.272 dB	± 0.544 dB
Radiated disturbance	± 1.943 dB	± 3.886 dB
Conducted disturbance	± 1.265 dB	± 2.53 dB

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5. Test results

5.1 6dB bandwidth

5.1.1 Regulation

Systems using digital modulation techniques may operate in the 902 - 928 MHz, 2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

5.1.2 Measurement procedure

The antenna output of the EUT was connected to the spectrum analyzer. The resolution bandwidth is set to 100 kHz, and peak detection was used. The 6dB bandwidth is defined as the total spectrum over which the power is higher than the peak power minus 6dB.

5.1.3 Test Result

- Complied

Test Mode : 802.11b

Channel	Frequency [MHz]	6dB bandwidth [kHz]	Limit [kHz]	Margin[KHz]
1 (Low)	2412	13040	500	12540
7 (Middle)	2442	13020	500	12520
11 (High)	2462	13020	500	12520

Test Mode : 802.11g

Channel	Frequency [MHz]	6dB bandwidth [kHz]	Limit [kHz]	Margin[KHz]
1 (Low)	2412	16500	500	16000
7 (Middle)	2442	16580	500	16080
11 (High)	2462	16500	500	16000

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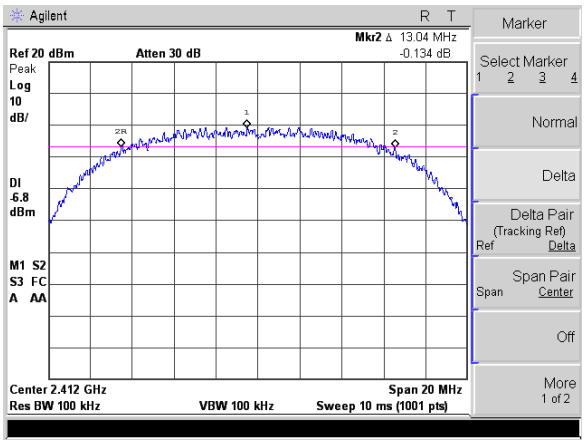
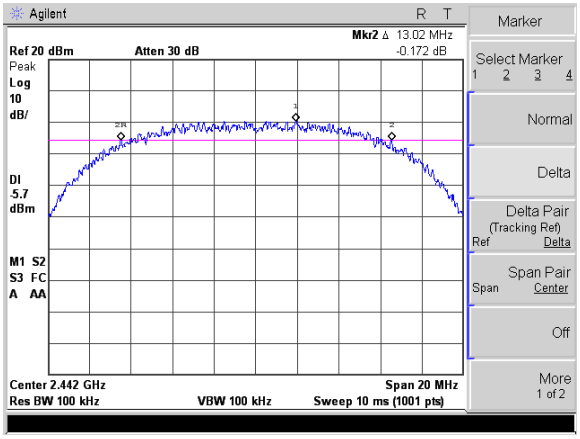
5.1.4 Test Plot

Figure 1. Plot of the 6dB bandwidth (Conducted)

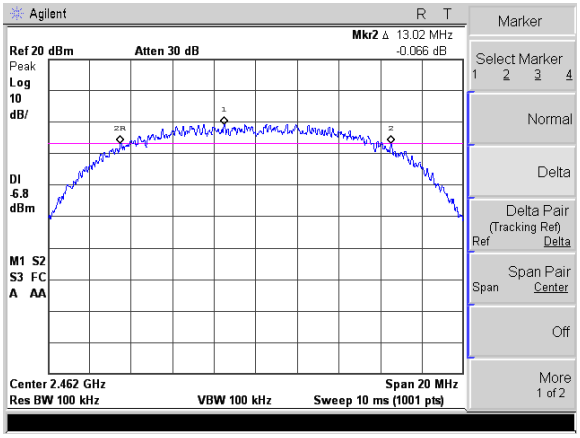
Test Mode : 802.11b mode CH 1(2412MHz)



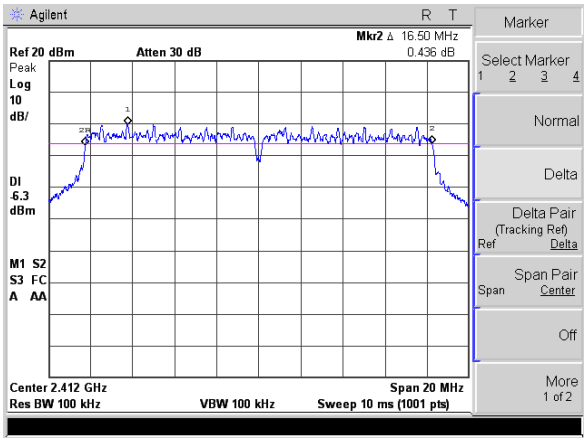
Test Mode : 802.11b mode CH 7(2442 MHz)



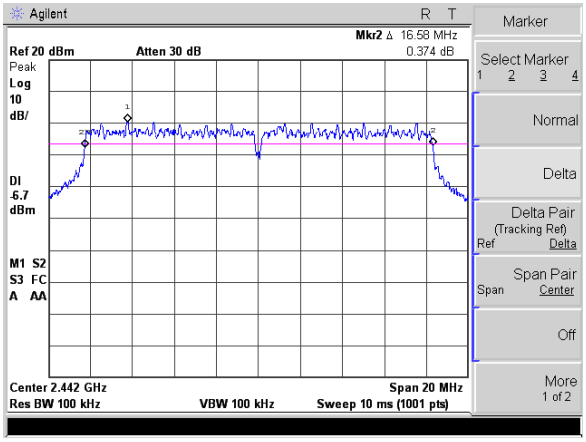
Test Mode : 802.11b mode CH 11(2462MHz)



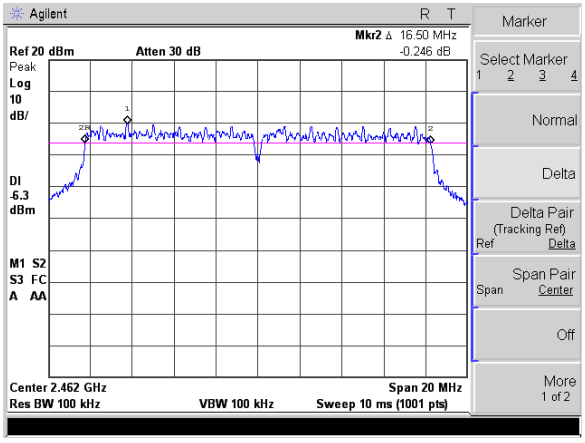
Test Mode : 802.11g mode CH 1(2412MHz)



Test Mode : 802.11g mode CH 7(2442 MHz)



Test Mode : 802.11g mode CH 11(2462MHz)



5.2 Maximum Peak Output Power

5.2.1 Regulation

According to §15.247(b)(3), For systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

According to §15.247(b)(4) The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.2.2 Measurement Procedure

Power Output Option 1 Set the RBW greater than 6 dB bandwidth of the emission or use a peak power meter.

Power Output Option 2

Power output measurement allowed per Section 15.247(b)(3). In the following, "T" is the transmission pulse duration over which the transmitter is on and transmitting at its maximum power control level. Measurements are performed with a spectrum analyzer. Three methods are provided to accommodate measurement limitations of the spectrum analyzer depending on signal parameters. Set resolution bandwidth (RBW) = 1 MHz. Set span to encompass the entire emission bandwidth (EBW) of the signal. Use automatic setting for analyzer sweep time (except in Method #2). Check the sweep time to determine which procedure to use.

Method #3

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set sweep trigger to "free run".
3. Set RBW = 1 MHz. Set VBW ≥ 1/T
4. Use linear display mode.
5. Use sample detector mode if bin width (i.e., span/number of points in spectrum) < 0.5 RBW. Otherwise use peak detector mode.
6. Set max hold.
7. Allow max hold to run for 60 seconds.
8. Compute power by integrating the spectrum across the 26 dB EBW or apply a bandwidth correction factor of 10 log (EBW/1 MHz) to the spectral peak of the emission. The integration can be performed using the spectrum analyzer's band power measurement function with band limits set equal to the EBW band edges or by summing power levels in each 1 MHz band in linear power terms. The 1 MHz band power levels to be summed can be obtained by averaging, in linear power terms, power levels in each frequency bin across the 1 MHz.

5.2.3 Test Result

-Complied

Test Mode : 802.11b

Channel	Frequency [MHz]	Result [dBm]	Limit [dBm]	Margin [dB]
1 (Low)	2412	14.13	30	15.87
7 (Middle)	2442	15.19	30	14.81
11 (High)	2462	14.62	30	15.38

Test Mode : 802.11g

Channel	Frequency [MHz]	Result [dBm]	Limit [dBm]	Margin [dB]
1 (Low)	2412	15.74	30	14.26
7 (Middle)	2442	16.44	30	13.56
11 (High)	2462	16.25	30	13.75

NOTE:

1. Since the directional gain of the integral antenna declared by the manufacturer (G_{ANT} = -3 dBi) does not exceed 6.0 dBi, there was no need to reduce the output power.
2. We took the insertion loss of the cable loss into consideration within the measuring instrument.

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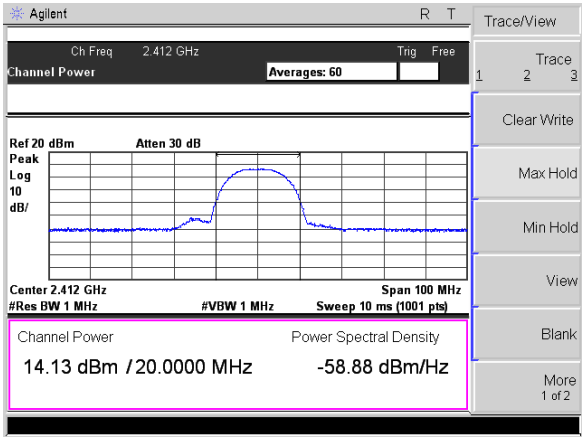
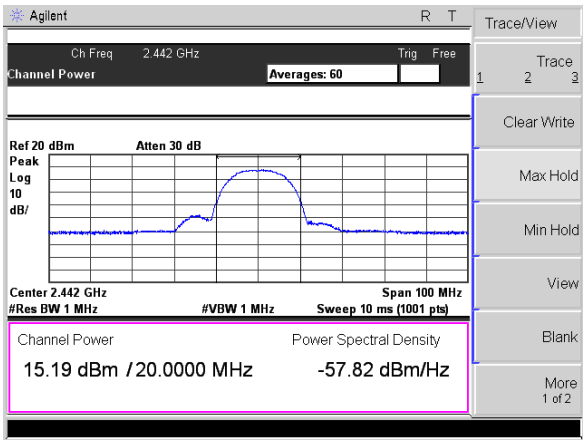
5.2.4 Test Plot

Figure 2. Plot of the Maximum Peak output power (Conducted)

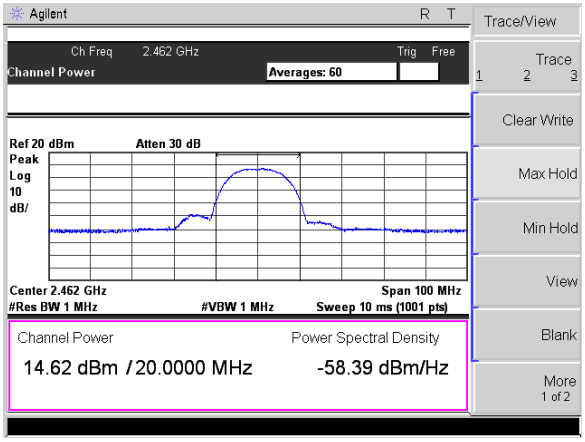
Test Mode : 802.11b mode CH 1(2412MHz)



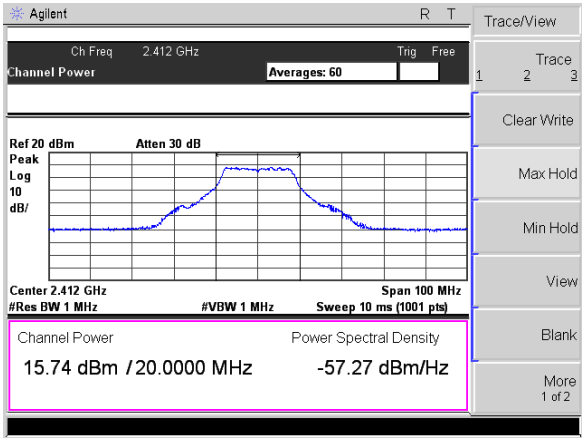
Test Mode : 802.11b mode CH 7(2442 MHz)



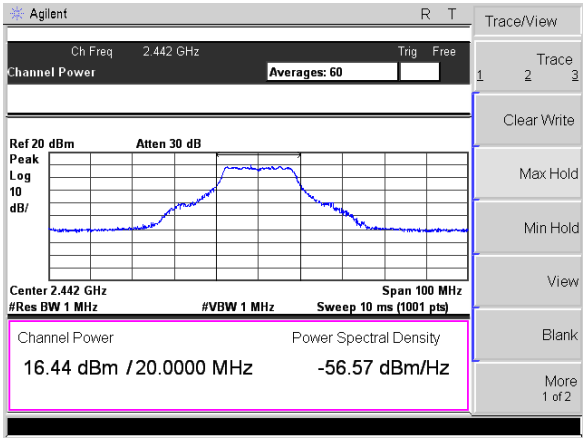
Test Mode : 802.11b mode CH 11(2462MHz)



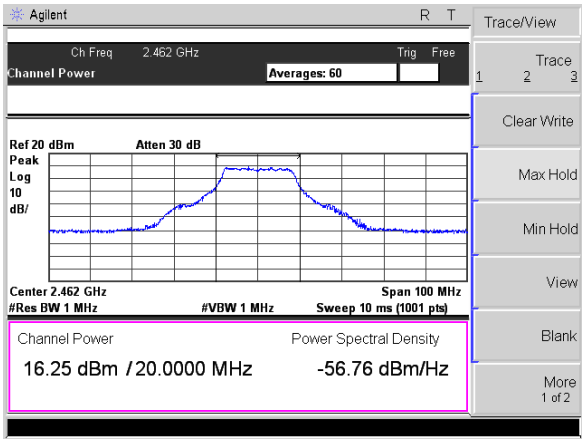
Test Mode : 802.11g mode CH 1(2412MHz)



Test Mode : 802.11g mode CH 7(2442 MHz)



Test Mode : 802.11g mode CH 11(2462MHz)



5.3 Power Density

5.3.1 Regulation

According to §15.247(e), for digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.3.2 Measurement Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Connect the antenna port of the EUT to RF input on the spectrum analyzer via a low loss cable and attenuator.
3. Turn on the EUT and set it to any one measured frequency within its operating range by controlling it via UART interface and make sure the spectrum analyzer is operated in its linear range.
4. Set the spectrum analyzer to MAX HOLD mode with RBW = 3kHz.
5. Measure the highest amplitude appearing on spectral display and record the level to calculate results.
6. Repeat above procedures until all frequencies measured were complete.

5.3.3 Test Result

-Complied

Test Mode : 802.11b

Channel	Frequency [MHz]	Result [dBm]	Limit [dBm]	Margin [dB]
1 (Low)	2412	-15.85	8	23.85
7 (Middle)	2442	-14.88	8	22.88
11 (High)	2462	-15.61	8	23.61

Test Mode : 802.11g

Channel	Frequency [MHz]	Result [dBm]	Limit [dBm]	Margin [dB]
1 (Low)	2412	-18.48	8	26.48
7 (Middle)	2442	-17.18	8	25.18
11 (High)	2462	-19.23	8	27.23

NOTE: We took the insertion loss of the cable loss into consideration with in the measuring instrument.

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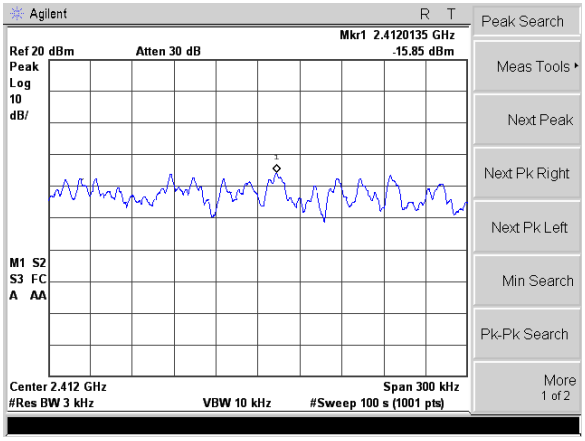
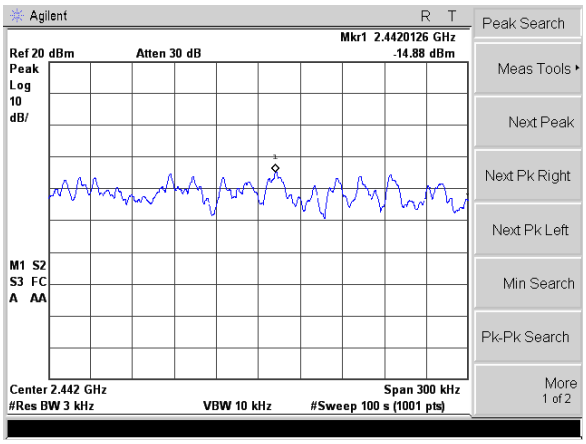
5.3.4 Test Plot

Figure 3. Plot of the PSD (Conducted)

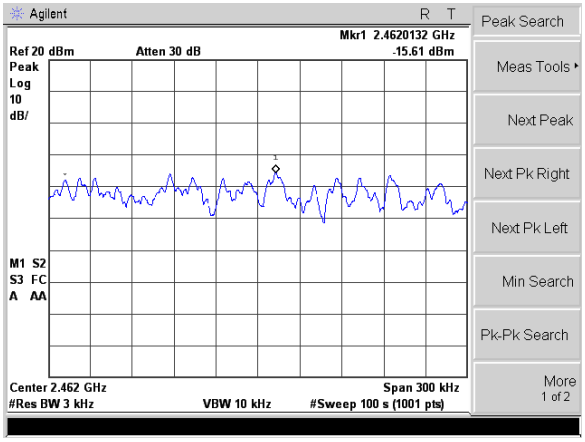
Test Mode : 802.11b mode CH 1(2412MHz)



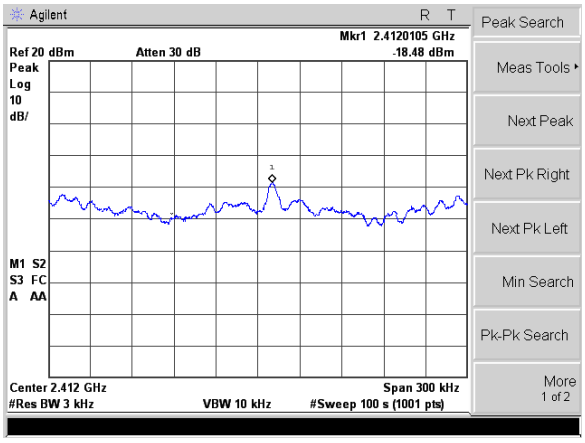
Test Mode : 802.11b mode CH 7(2442 MHz)



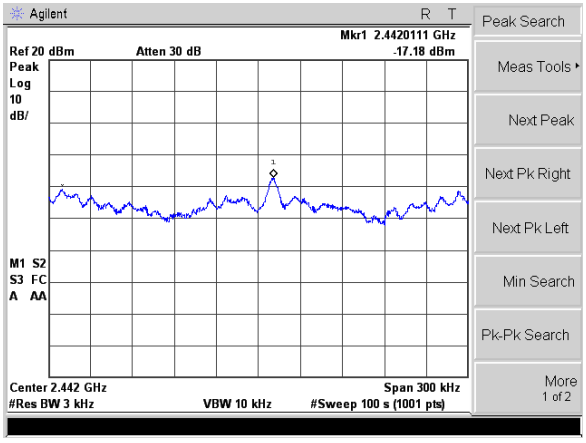
Test Mode : 802.11b mode CH 11(2462MHz)



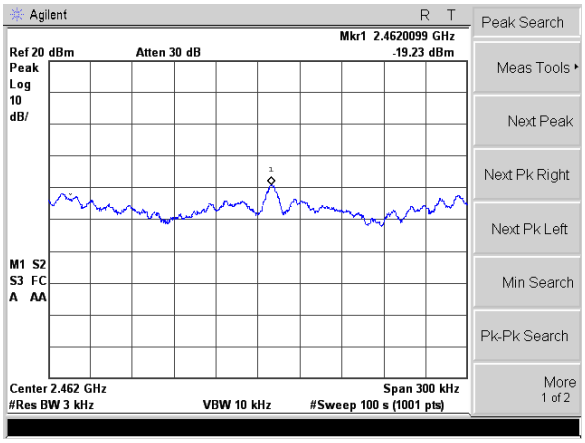
Test Mode : 802.11g mode CH 1(2412MHz)



Test Mode : 802.11g mode CH 7(2442 MHz)



Test Mode : 802.11g mode CH 11(2462MHz)



5.4 SPURIOUS EMISSION, BAND EDGE, AND RESTRICTED BANDS

5.4.1 Regulation

According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

According to §15.209(a), for an intentional device, the general requirement of field strength of radiated emissions from intentional radiators at a distance of 3 meters shall not exceed the following values:

Frequency (MHz)	Field strength (uV/m @ 3m)	Field strength (dBuV/m @ 3m)
30-88	100	40.0
88-216	150	43.5
216-960	200	46.0
Above 960	500	54.0

According to §15.109(a), for an unintentional device, 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 above table.

** The emission limits shown in the above table are based on measurement instrumentation employing a CISPR quasi-peak detector and above 1000 MHz are based on the average value of measured emissions.

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5.4.2 Measurement Procedure

1) Band-edge Compliance of RF Conducted Emissions

1. Set the spectrum analyzer as follows:
   Span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation
   RBW ≥ 1% of the span
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
2. Allow the trace to stabilize. Set the marker on the emission at the band-edge, or on the highest modulation product outside of the band, if this level is greater than that at the band-edge. Enable the marker-delta function, and then use the marker-to-peak function to move the marker to the peak of the in-band emission.
3. Now, using the same instrument settings, enable the hopping function of the EUT. Allow the trace to stabilize. Follow the same procedure listed above to determine if any spurious emissions caused by the hopping function also comply with the specified limit

2) Spurious RF Conducted Emissions:

1. Set the spectrum analyzer as follows:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz
   VBW ≥ RBW
   Sweep = auto
   Detector function = peak
   Trace = max hold
2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.

a 4 × 4 meter at the Open Area Test Site. The EUT was tested at a distance 3 meters.

5. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.

3) Spurious Radiated Emissions:

1. The preliminary radiated measurements were performed to determine the frequency producing the maximum emissions in an anechoic chamber at a distance of 3 meters.
2. The EUT was placed on the top of the 0.8-meter height, 1 × 1.5 meter non-metallic table. To find the maximum emission levels, the height of a measuring antenna was changed and the turntable was rotated 360°.
3. The antenna polarization was also changed from vertical to horizontal. The spectrum was scanned from 30 to 1000 MHz using the TRILOG broadband antenna, and from 1000 MHz to 18000 MHz using the horn antenna.
4. To obtain the final measurement data, the EUT was arranged on a turntable situated on a 4 × 4 meter at the Open Area Test Site. The EUT was tested at a distance 3 meters.
5. Each frequency found during preliminary measurements was re-examined and investigated. The test-receiver system was set up to average, peak, and quasi-peak detector function with specified bandwidth.
6. Measuring Setting

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1 GHz
Stop Frequency	10 th carrier harmonic
RBW / VBW(Emission in restricted band)	1MHz / 1MHz for Peak 1MHz / 10 Hz for Average

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5.4.3 Test Result

-complied

1. Band edge compliance of RF Conducted Emissions was shown in Figure 4.
2. Band edge compliance of RF Radiated Emissions was shown in Figure 5.
3. Spurious RF conducted Emissions were shown in the Figure 6.
   Note: We took the insertion loss of the cable into consideration within the measuring instrument.
4. Measured value of the Field strength of spurious Emissions (Radiated)

- Test mode : 802.11b mode CH 1 (2412MHz)

Frequency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Amp Gain [dB]	AF [dB(1/m)]	CL [dB]	Limit [dB(μV/m)]	Result [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 1GHz								
163.81	15.4	H	-	12.55	2.33	43.5	30.28	13.22
195.01	13.9	H	-	11.10	2.61	43.5	27.61	15.89
266.02	12.9	H	-	12.98	3.12	46.0	29.00	17.00
Peak DATA. Emissions above 1GHz								
*2412.00	95.2	V	34.82	28.45	7.34	-	96.17	-
2343.28	60.4	V	34.79	28.21	7.12	74.0	60.90	13.10
2346.64	59.2	V	34.79	28.21	7.12	74.0	59.75	14.25
3216.00	46.7	V	35.00	30.40	9.00	74.0	51.05	22.95
4824.00	53.0	V	34.92	33.12	11.34	74.0	62.53	11.47
Average DATA. Emissions above 1GHz								
*2412.00	88.2	V	34.82	28.45	7.34	-	89.15	-
2343.28	41.3	V	34.79	28.21	7.12	54.0	41.83	12.17
2346.64	39.7	V	34.79	28.21	7.12	54.0	40.22	13.78
3216.00	33.6	V	35.00	30.40	9.00	54.0	38.02	15.98
4824.00	40.5	V	34.92	33.12	11.34	54.0	50.03	3.97

Remarks :

1. Margin (dB) = Limit – Result
   [Result = Reading – Amp Gain + Attenuator + AF + CL]
2. H = Horizontal, V = Vertical
3. ATT = Attenuation (10dB pad and/or Insertion Loss of HPF), AF/CL = Antenna Factor and Cable Loss
4. "*" : Fundamental frequency

* The spurious emission at the frequency does not fall in the restricted bands.

NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

- Test mode : 802.11b mode CH 7 (2442MHz)

Frequency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Amp Gain [dB]	AF [dB(1/m)]	CL [dB]	Limit [dB(μV/m)]	Result [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 1GHz								
163.81	15.2	H	-	12.55	2.33	43.5	30.08	13.42
195.01	13.2	H	-	11.10	2.61	43.5	26.91	16.59
266.01	11.5	H	-	12.98	3.12	46.0	27.60	18.40
Peak DATA. Emissions above 1GHz								
*2442.00	97.2	V	34.82	28.45	7.34	-	95.88	-
3255.96	45.3	V	35.00	30.53	9.10	74.0	49.96	24.04
4884.13	51.0	V	34.92	33.16	11.39	74.0	60.61	13.39
Average DATA. Emissions above 1GHz								
*2442.00	90.2	V	34.82	28.45	7.34	-	91.12	-
3255.96	32.9	V	35.00	30.53	9.10	54.0	37.53	16.47
4884.13	39.3	V	34.92	33.16	11.39	54.0	48.88	5.12

Remarks :

1. Margin (dB) = Limit – Result
   [Result = Reading – Amp Gain + Attenuator + AF + CL]
2. H = Horizontal, V = Vertical
3. ATT = Attenuation (10dB pad and/or Insertion Loss of HPF), AF/CL = Antenna Factor and Cable Loss
4. "*" : Fundametal frequency

* The spurious emission at the frequency does not fall in the restricted bands.

NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

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- Test mode : 802.11b mode CH 11 (2462MHz)

Frequency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Amp Gain [dB]	AF [dB(1/m)]	CL [dB]	Limit [dB(μV/m)]	Result [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 1GHz								
163.81	14.9	H	-	12.55	2.33	43.5	29.78	13.72
193.24	13.7	H	-	11.10	2.58	43.5	27.38	16.12
266.01	12.2	H	-	12.98	3.12	46.0	28.30	17.70
Peak DATA. Emissions above 1GHz								
*2462.00	95.9	V	34.84	28.57	7.44	-	97.03	-
2486.77	53.7	V	34.84	28.57	7.44	74.0	54.89	19.11
2487.03	53.9	V	34.84	28.57	7.44	74.0	55.05	18.95
2488.37	53.5	V	34.84	28.57	7.44	74.0	54.71	19.29
3282.79	46.2	V	35.00	30.53	9.10	74.0	50.83	23.17
4924.13	49.2	V	34.91	33.20	11.45	74.0	58.91	15.09
Average DATA. Emissions above 1GHz								
*2462.00	89.2	V	34.84	28.57	7.44	-	90.41	-
2486.77	36.3	V	34.84	28.57	7.44	54.0	37.44	16.56
2487.03	36.3	V	34.84	28.57	7.44	54.0	37.44	16.56
2488.37	36.3	V	34.84	28.57	7.44	54.0	37.42	16.58
3282.79	33.5	V	35.00	30.53	9.10	54.0	38.13	15.87
4924.13	38.0	V	34.91	33.20	11.45	54.0	47.73	6.27

Remarks :

1. Margin (dB) = Limit – Result
   [Result = Reading – Amp Gain + Attenuator + AF + CL]
2. H = Horizontal, V = Vertical
3. ATT = Attenuation (10dB pad and/or Insertion Loss of HPF), AF/CL = Antenna Factor and Cable Loss
4. "*" : Fundametal frequency

* The spurious emission at the frequency does not fall in the restricted bands.

NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

82-1 Jeil-ri, Yangji-myun, Churingu, Yongin-city, Kyungki-do,Korea 449-825,
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- Test mode : 802.11g mode CH 1 (2412MHz)

Frequency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Amp Gain [dB]	AF [dB(1/m)]	CL [dB]	Limit [dB(μV/m)]	Result [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 1GHz								
163.81	15.2	H	-	12.55	2.33	43.5	30.08	13.42
195.00	13.7	H	-	11.10	2.58	43.5	27.41	16.09
266.01	12.2	H	-	12.98	3.12	46.0	28.30	17.70
Peak DATA. Emissions above 1GHz								
*2412.00	99.5	V	34.82	28.45	7.34	-	100.42	-
2342.96	58.8	V	34.79	28.21	7.12	74.0	59.29	14.71
2343.52	60.6	V	34.79	28.21	7.12	74.0	61.13	12.87
2348.16	55.6	V	34.81	28.33	7.23	74.0	56.12	17.88
3216.23	46.4	H	35.00	30.40	9.00	74.0	50.77	23.23
4818.00	51.6	V	34.92	33.12	11.34	74.0	61.18	12.82
Average DATA. Emissions above 1GHz								
*2412.00	87.4	V	34.84	28.45	7.34	-	88.41	-
2342.96	39.7	V	34.79	28.21	7.12	54.0	40.20	13.80
2343.52	39.3	V	34.79	28.21	7.12	54.0	39.86	14.14
2348.16	38.2	V	34.81	28.33	7.23	54.0	38.73	15.27
3216.23	33.6	H	35.00	30.40	9.00	54.0	38.00	16.00
4818.00	37.7	V	34.92	33.12	11.34	54.0	47.23	6.77

Remarks :

1. Margin (dB) = Limit – Result
   [Result = Reading – Amp Gain + Attenuator + AF + CL]
2. H = Horizontal, V = Vertical
3. ATT = Attenuation (10dB pad and/or Insertion Loss of HPF), AF/CL = Antenna Factor and Cable Loss
4. "*" : Fundametal frequency

* The spurious emission at the frequency does not fall in the restricted bands.

NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

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- Test mode : 802.11g mode CH 7 (2442MHz)

Frequency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Amp Gain [dB]	AF [dB(1/m)]	CL [dB]	Limit [dB(μV/m)]	Result [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 1GHz								
163.81	15.1	H	-	12.55	2.33	43.5	39.98	13.52
195.01	13.3	H	-	11.10	2.61	43.5	27.01	16.49
266.01	12.7	H	-	12.98	3.12	46.0	28.80	17.20
Peak DATA. Emissions above 1GHz								
*2442.00	99.7	V	34.82	28.45	7.34	-	100.64	-
3256.10	48.7	H	35.00	30.53	9.10	74.0	53.23	20.72
4877.50	51.0	V	34.92	33.16	11.39	74.0	60.64	13.36
Average DATA. Emissions above 1GHz								
*2442.00	88.8	V	34.84	28.45	7.34	-	89.72	-
3256.10	33.7	H	35.00	30.53	9.10	54.0	38.37	15.63
4877.50	39.0	V	34.92	33.16	11.39	54.0	48.58	5.42

Remarks :

1. Margin (dB) = Limit – Result
   [Result = Reading – Amp Gain + Attenuator + AF + CL]
2. H = Horizontal, V = Vertical
3. ATT = Attenuation (10dB pad and/or Insertion Loss of HPF), AF/CL = Antenna Factor and Cable Loss
4. "*" : Fundametal frequency

* The spurious emission at the frequency does not fall in the restricted bands.

NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

82-1 Jeil-ri, Yangji-myun, Churingu, Yongin-city, Kyungki-do,Korea 449-825,
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- Test mode : 802.11g mode CH 11 (2462MHz)

Frequency [MHz]	Reading [dB(μV)]	Pol. [V/H]	Amp Gain [dB]	AF [dB(1/m)]	CL [dB]	Limit [dB(μV/m)]	Result [dB(μV/m)]	Margin [dB]
Quasi-Peak DATA. Emissions below 1GHz								
163.81	14.0	H	-	12.55	2.33	43.5	28.88	14.62
193.24	13.4	H	-	11.10	2.58	43.5	27.08	16.42
266.01	12.0	H	-	12.98	3.12	46.0	28.10	17.90
Peak DATA. Emissions above 1GHz								
*2462.00	98.7	V	34.84	28.57	7.44	-	99.85	-
2486.80	55.4	V	34.84	28.57	7.44	74.0	56.53	17.47
2489.84	53.8	V	34.84	28.57	7.44	74.0	54.99	19.01
3282.68	46.1	V	35.00	30.53	9.10	74.0	50.73	23.27
4924.25	47.5	V	34.91	33.20	11.45	74.0	57.19	16.81
Average DATA. Emissions above 1GHz								
*2462.00	87.4	V	34.84	28.57	7.44	-	88.55	-
2486.80	35.4	V	34.84	28.57	7.44	54.0	36.56	17.44
2489.84	35.7	V	34.84	28.57	7.44	54.0	36.91	17.09
3282.68	33.3	V	35.00	30.53	9.10	54.0	37.93	16.07
4924.25	36.0	V	34.91	33.20	11.45	54.0	45.69	8.31

Remarks :

1. Margin (dB) = Limit – Result
   [Result = Reading – Amp Gain + Attenuator + AF + CL]
2. H = Horizontal, V = Vertical
3. ATT = Attenuation (10dB pad and/or Insertion Loss of HPF), AF/CL = Antenna Factor and Cable Loss
4. "*" : Fundametal frequency

* The spurious emission at the frequency does not fall in the restricted bands.

NOTE: All emissions not reported were more than 20 dB below the specified limit or in the noise floor.

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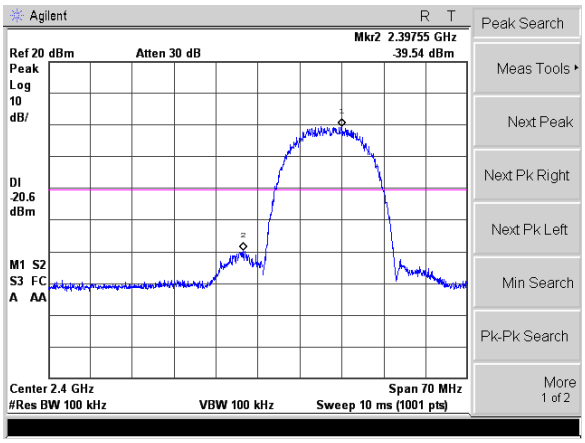
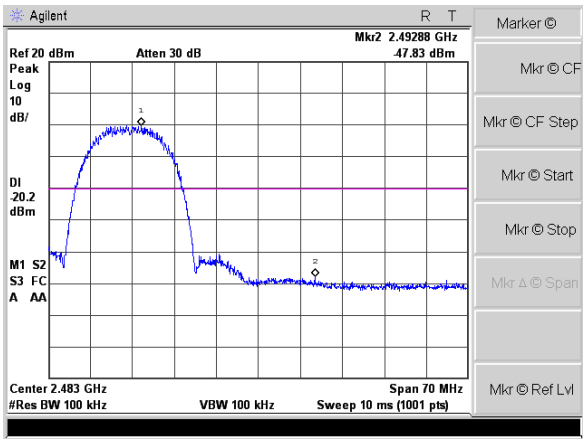
5.4.4 Test Plot

Figure 4. Plot of the Bandedge Compliance(Conducted)

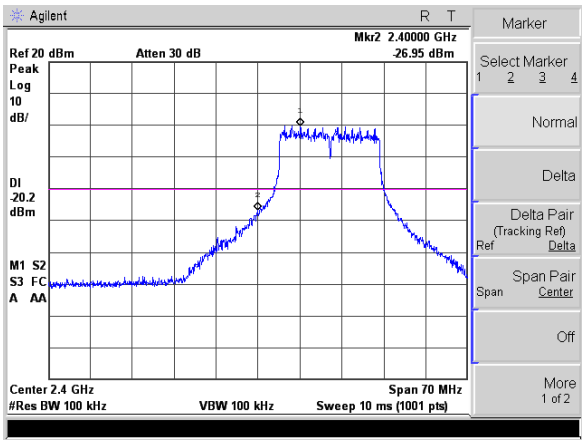
Test Mode : 802.11b mode CH 1(2412MHz)



Test Mode : 802.11b mode CH 11(2462MHz)



Test Mode : 802.11g mode CH 1(2412MHz)



Test Mode : 802.11g mode CH 11(2462MHz)

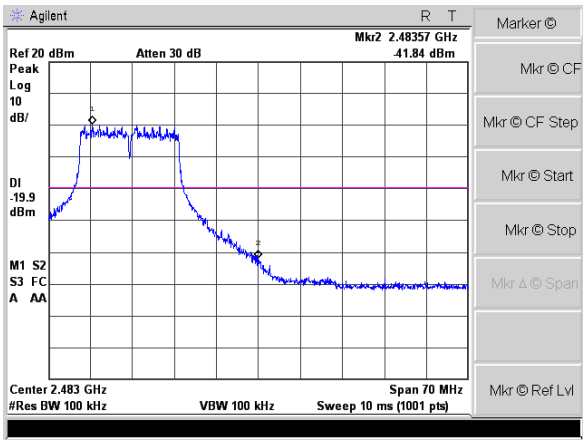
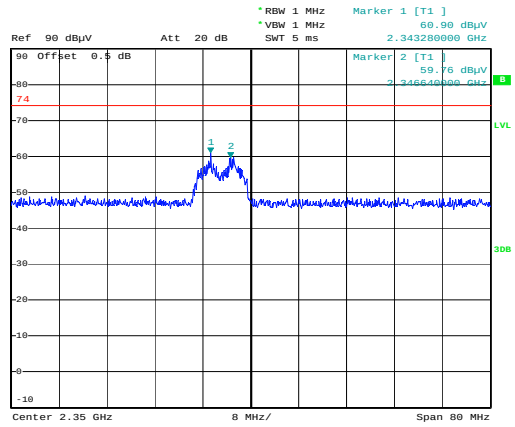


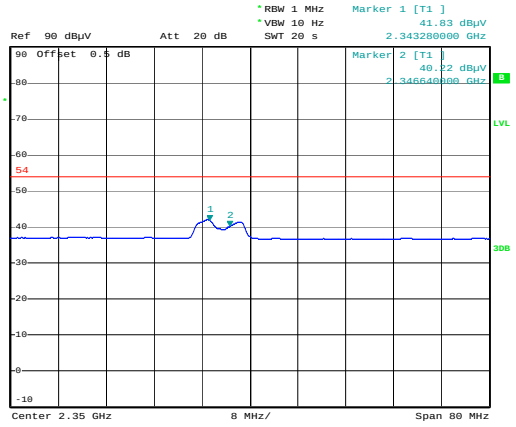
Figure 5. Plot of the Bandedge Compliance(Radiated)

Test Mode : 802.11b CH 1(2412MHz)-Peak



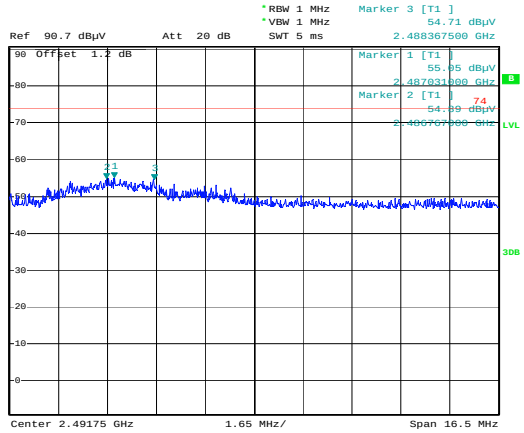
: 1.MAY.2008 19:16:56

Test Mode : 802.11b CH 1(2412MHz)-Average



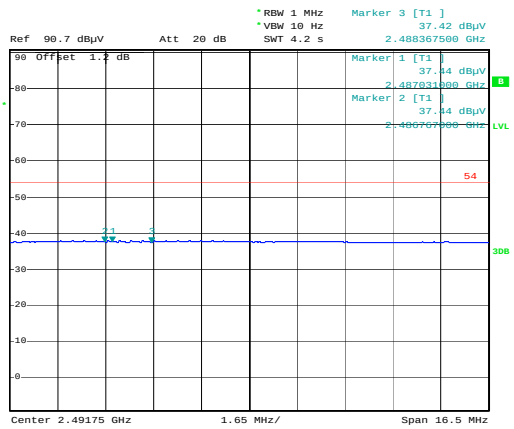
: 1.MAY.2008 19:17:45

Test Mode : 802.11b CH 11(2462MHz)-Peak



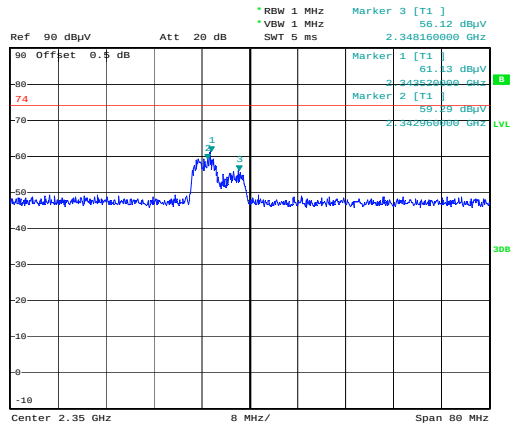
: 1.MAY.2008 19:02:13

Test Mode : 802.11b CH 11(2462MHz)-Average



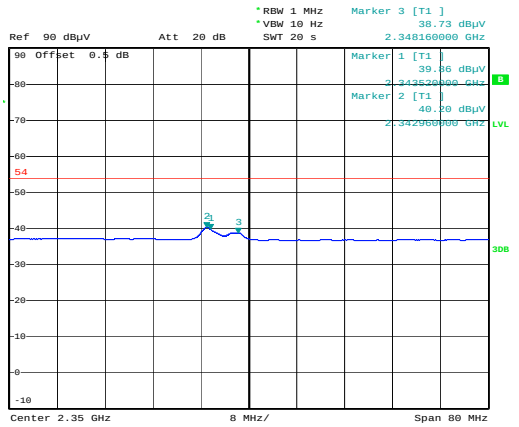
: 1.MAY.2008 19:03:28

Test Mode : 802.11g CH 1(2412MHz)-Peak



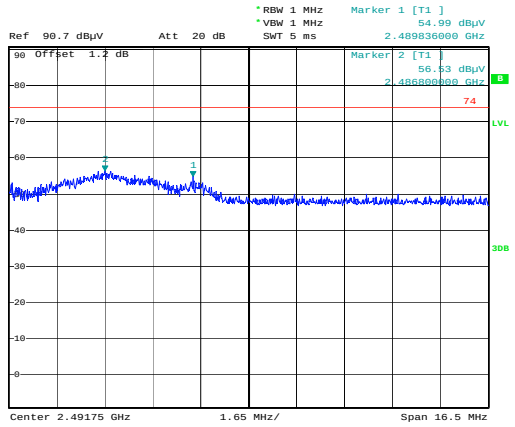
: 1.MAY.2008 19:11:13

Test Mode : 802.11g CH 1(2412MHz)-Average



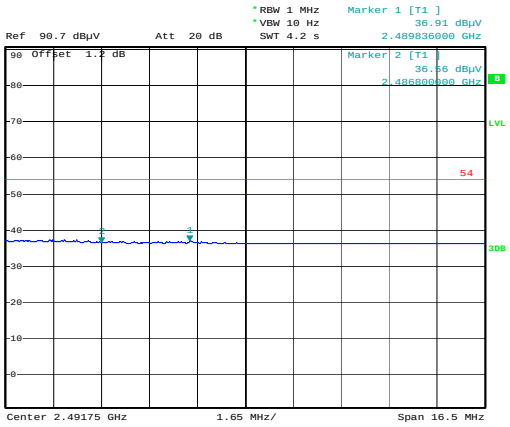
: 1.MAY.2008 19:11:57

Test Mode : 802.11g CH 11(2462MHz)-Peak



: 1.MAY.2008 18:57:26

Test Mode : 802.11g CH 11(2462MHz)-Average



: 1.MAY.2008 18:59:25

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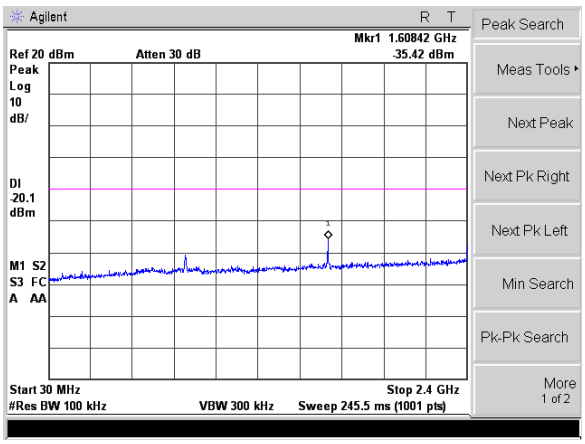
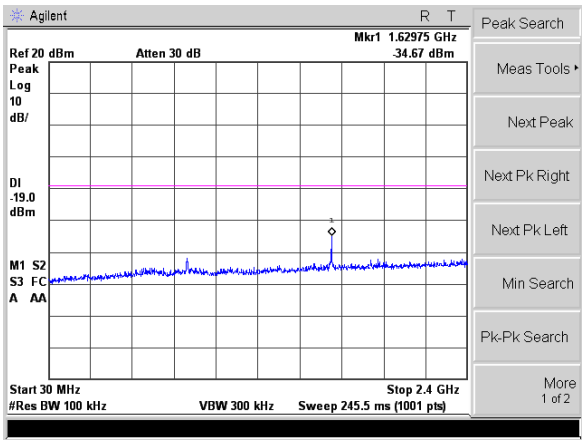
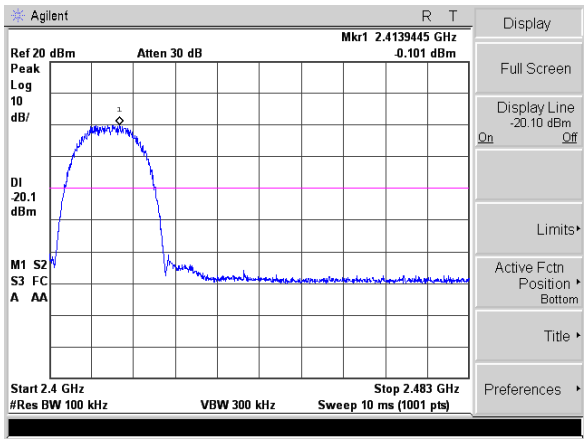
Figure 6. Plot of the Spurious Emission(Conducted)

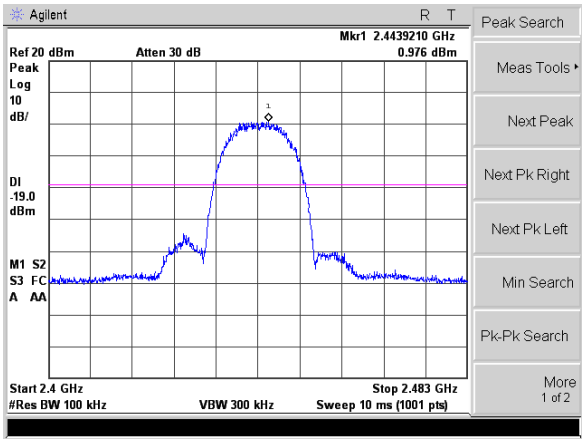
Test Mode : 802.11b mode CH 1(2412MHz)

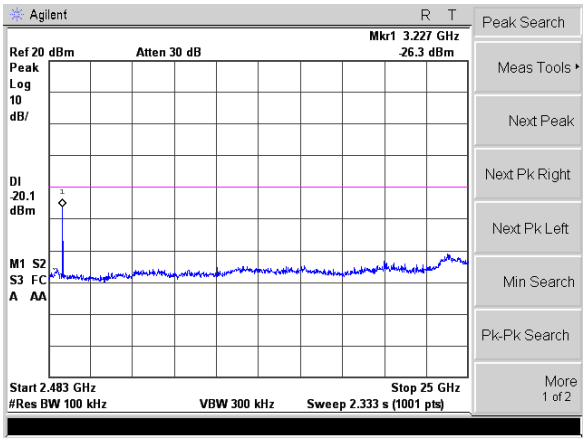


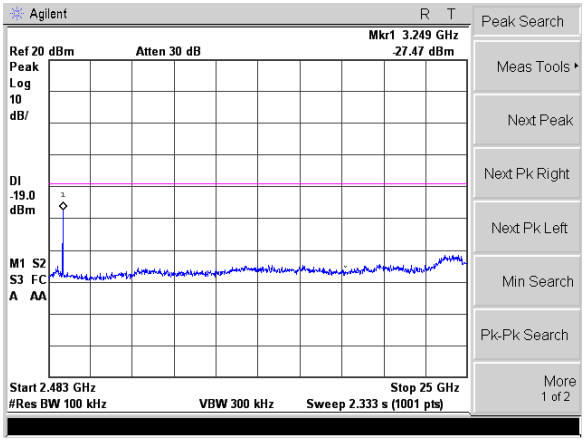
Test Mode : 802.11b mode CH 7(2442MHz)











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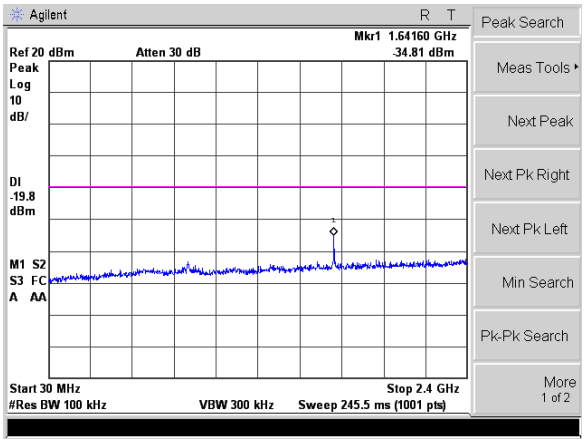
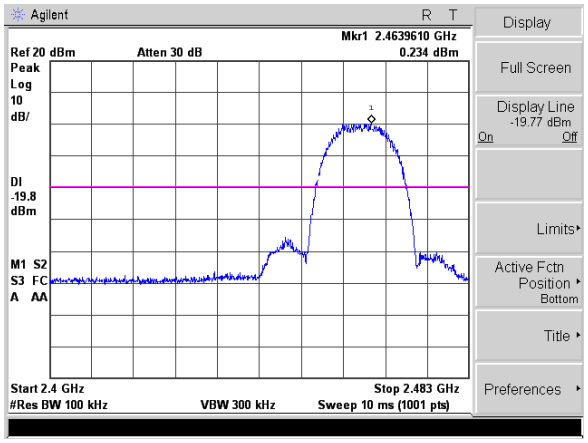
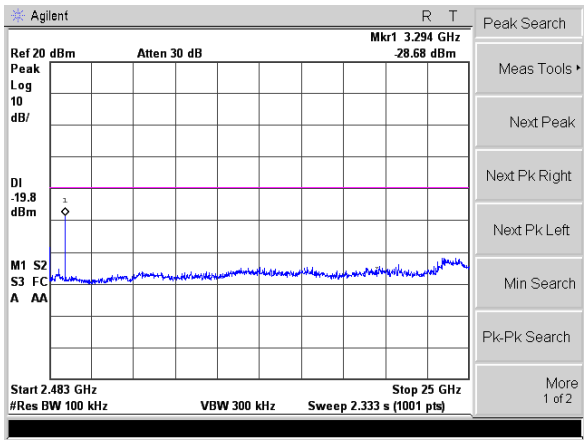
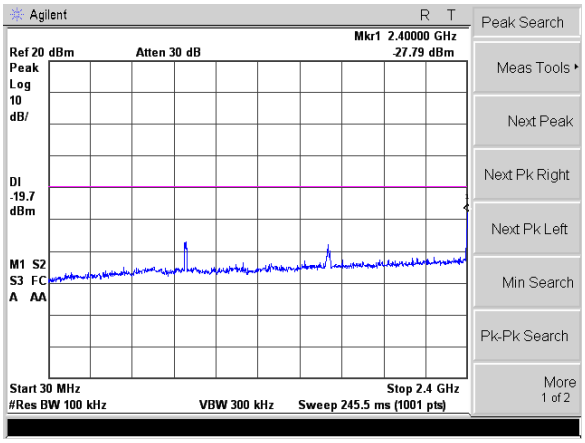
Test Mode : 802.11b mode CH 11(2462MHz)

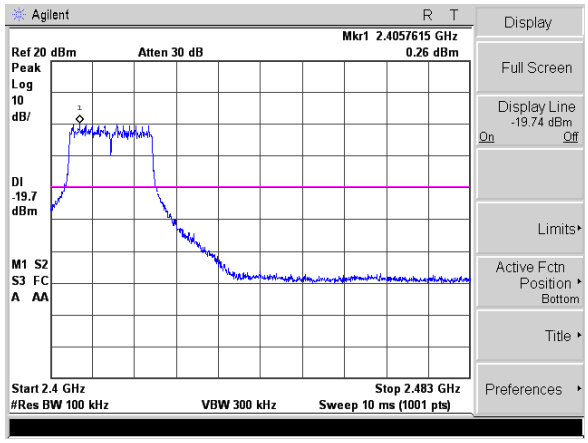


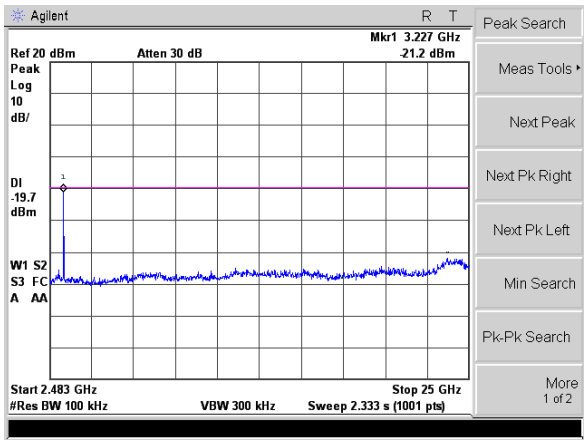




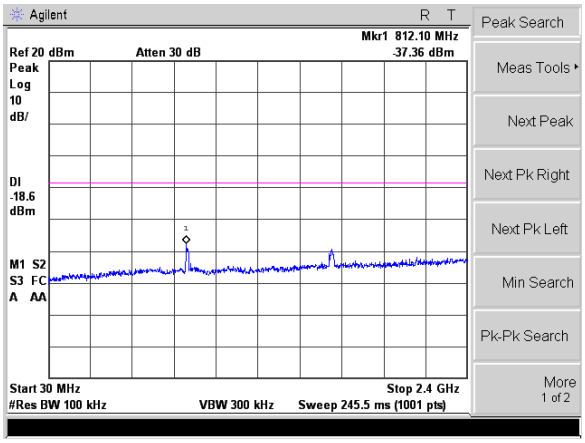
Test Mode : 802.11g mode CH 1(2412MHz)

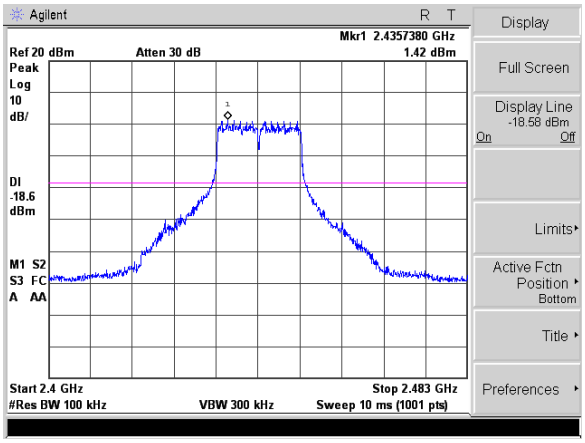


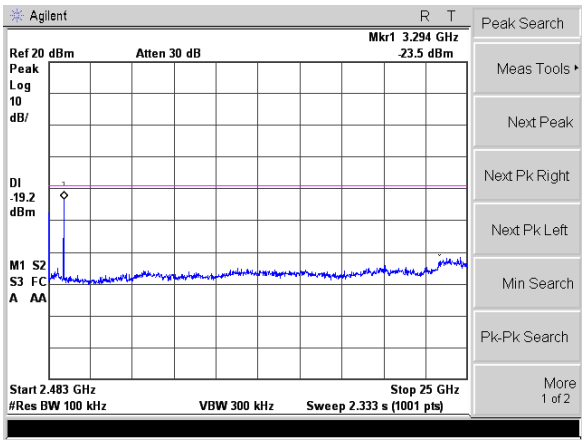




Test Mode : 802.11g mode CH 7(2442MHz)







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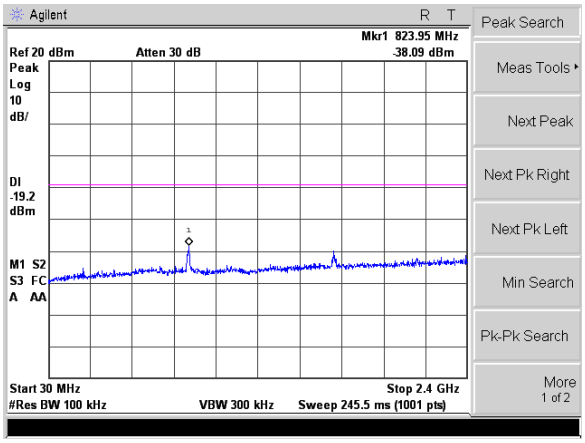
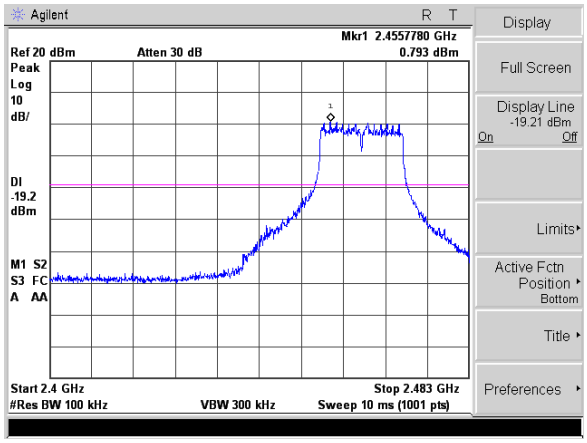
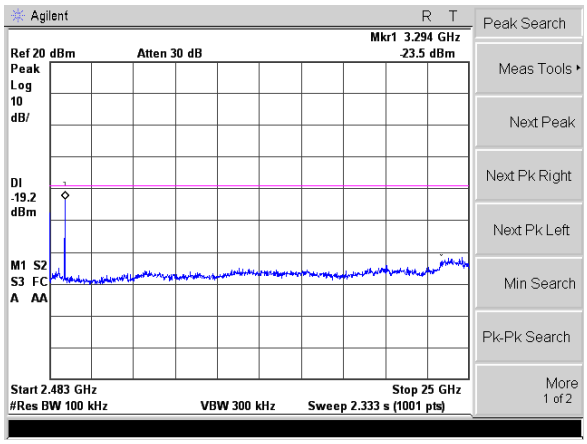
Test Mode : 802.11g mode CH 11(2462MHz)







5.5 Antenna Requirement

5.5.1 Regulation

According to §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

And according to §15.247(b)(4), the conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

5.5.2 Result

-Complied

The transmitter has an integral Chip antenna. The directional gain of the antenna is -3 dBi.

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5.6 Conducted Emission

5.6.1 Regulation

According to §15.207(a), for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50μH/50Ω line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Qausi-peak	Average
0.15 – 0.5	66 to 56 *	56 to 46 *
0.5 – 5	56	46
5 – 30	60	50

* Decreases with the logarithm of the frequency.

According to §15.107(a), for unintentional device, except for Class A digital devices, line conducted emission limits are the same as the above table.

5.6.2 Measurement Procedure

1. The EUT was placed on a wooden table of size, 1 m by 1.5 m, raised 80 cm in which is located 40 cm away from the vertical wall and 1.5m away from the side wall of the shielded room.
2. Each current-carrying conductor of the EUT power cord was individually connected through a 50Ω/50μH LISN, which is an input transducer to a Spectrum Analyzer or an EMI/Field Intensity Meter, to the input power source.
3. Exploratory measurements were made to identify the frequency of the emission that had the highest amplitude relative to the limit by operating the EUT in a range of typical modes of operation, cable position, and with a typical system equipment configuration and arrangement. Based on the exploratory tests of the EUT, the one EUT cable configuration and arrangement and mode of operation that had produced the emission with the highest amplitude relative to the limit was selected for the final measurement.
4. The final test on all current-carrying conductors of all of the power cords to the equipment that comprises the EUT (but not the cords associated with other non-EUT equipment is the system) was then performed over the frequency range of 0.15 MHz to 30 MHz.
5. The measurements were made with the detector set to PEAK amplitude within a bandwidth of 10 kHz or to QUASI-PEAK and AVERAGE within a bandwidth of 9 kHz. The EUT was in transmitting mode during the measurements.

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5.6.3 Test Result

-Complied

Frequency	Correction Factor		Line	Quasi-Peak			Average		
[MHz]	LISN	Cable		Limit [dBuV]	Reading [dBuV]	Result [dBuV]	Limit [dBuV]	Reading [dBuV]	Result [dBuV]
0.204	0.09	0.2	H	63.45	40.12	40.41	53.45	38.69	38.98
0.288	0.07	0.5	N	60.58	34.68	35.25	50.58	32.56	33.13
0.339	0.09	0.5	H	59.23	43.42	44.01	49.23	40.71	41.30
0.405	0.08	0.4	N	57.75	39.79	40.27	47.75	38.80	39.28
0.432	0.10	0.4	H	57.21	44.21	44.71	47.21	43.03	43.53
0.474	0.10	0.4	H	56.44	39.00	39.50	46.44	37.91	38.41
0.540	0.10	0.4	H	56.00	39.52	40.02	46.00	38.16	38.66
0.609	0.11	0.4	H		42.86	43.37		41.95	42.46
0.675	0.11	0.4	H		41.71	42.22		40.17	40.68
0.678	0.09	0.4	N		39.67	40.16		38.00	38.49
0.879	0.12	0.5	H		37.90	38.52		37.10	37.72
1.149	0.12	0.5	H		33.09	33.71		32.07	32.69
13.600	0.70	0.5	H	60.00	35.48	36.68	50.00	33.47	34.67
13.800	0.53	0.5	N		35.23	36.26		33.79	34.82

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5.6.4 Test Plots

Figure 6. Plot of the Conducted Emission

EMC Compliance LTD

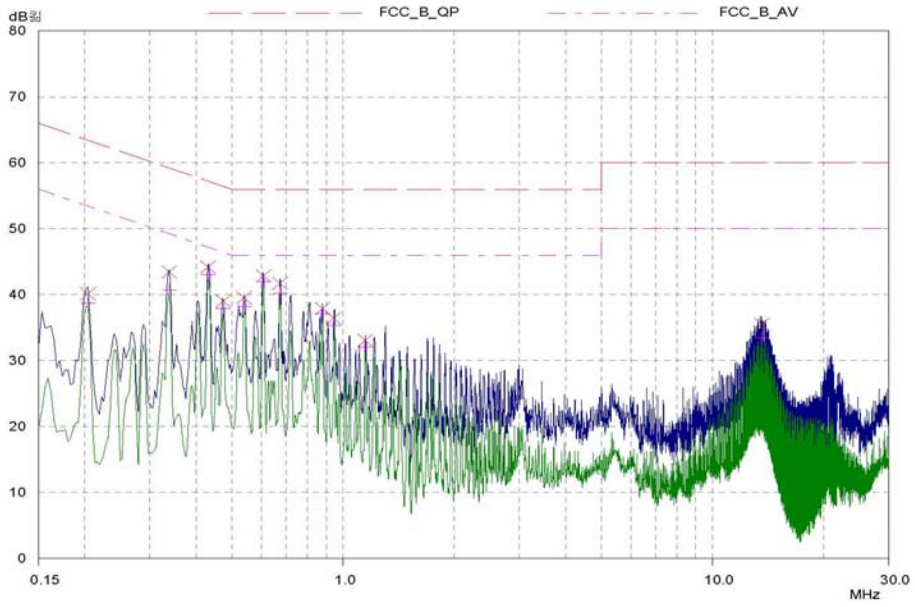
EUT:	MP100
Manuf:	MINTPASS CO.,LTD
Op Cond:	H
Operator:	
Test Spec:	FCC Class B Conducted Emission
Comment:	

Result File: 04010_~1.dat : MINTPASS_PORTABLE NETWORK DEVICE_MP100

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	2msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



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EMC Compliance LTD

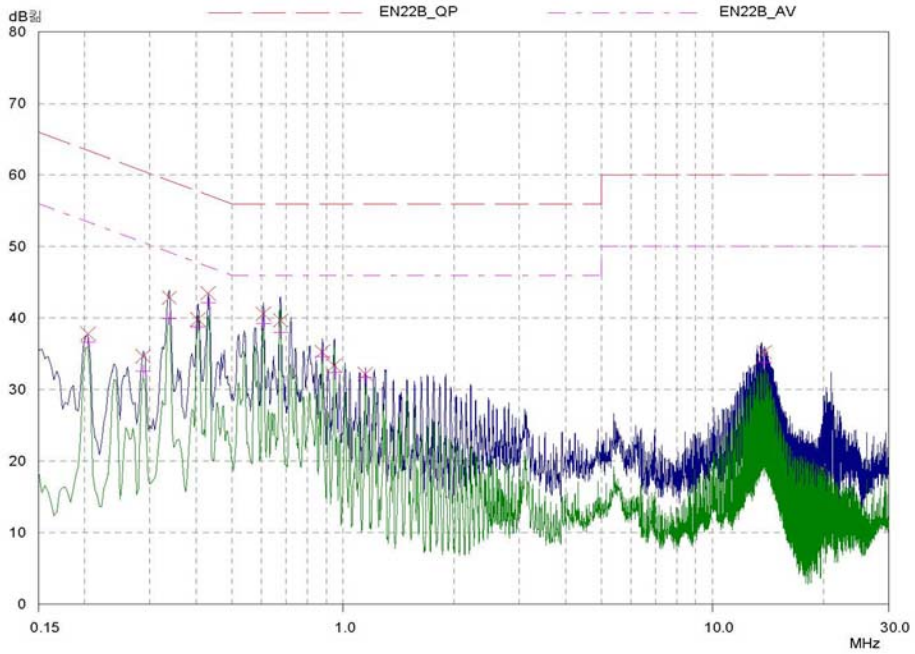
EUT: MP100
Manuf: MINTPASS CO.,LTD
Op Cond: N
Operator:
Test Spec: EN55022 Class B Conducted Emission
Comment:

Result File: 04010_~2.dat : MINTPASS_PORTABLE NETWORK DEVICE_MP100

Scan Settings (2 Ranges)

Frequencies			Receiver Settings					
Start	Stop	Step	IF BW	Detector	M-Time	Atten	Preamp	OpRge
150kHz	3MHz	3kHz	10kHz	PK+AV	5msec	Auto	OFF	60dB
3MHz	30MHz	10kHz	10kHz	PK+AV	2msec	Auto	OFF	60dB

Final Measurement: Detectors: X QP / + AV
Meas Time: 1sec
Peaks: 8
Acc Margin: 25 dB



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6. Test equipment used for test

	Description	Manufacture	Model No.	Serial No.	Next Cal Date.
☐	Temp & humidity chamber	taekwang	TK-04	TK001	09.12.11
☐	Temp & humidity chamber	taekwang	TK-500	TK002	09.09.09
■	Power Meter	Agilent	E4416A	GB41292365	09.10.30
■	Frequency Counter	HP	5351B	3049A01295	09.10.30
■	Spectrum Analyzer	Agilent	E4407B	US39010142	09.10.30
■	Spectrum Analyzer	R & S	FSP40	100209	09.10.30
■	Signal Generator	HP	E4432B	GB39340611	09.10.30
☐	Modulation Analyzer	HP	8901B	3538A05527	09.11.07
☐	Function Generator	Agilent	33120A	US36018826	09.01.25
☐	Audio Analyzer	HP	8903B	3729A18248	09.10.30
☐	AC Power Supply	KIKUSUI	PCR2000W	GB001619	09.10.30
■	DC Power Supply	Tektronix	PS2520G	TW50517	10.02.17
☐	DC Power Supply	Tektronix	PS2521G	TW53135	09.10.30
☐	Dummy Load	BIRD	8141	7560	-
☐	Dummy Load	BIRD	8401-025	799	-
■	EMI Test Receiver	R&S	ESCI	100001	09.08.18
■	Attenuator	HP	8494A	2631A09825	09.11.03
■	Attenuator	HP	8496A	3308A16640	09.11.03
■	Attenuator	R&S	RBS1000	D67079	09.11.04
☐	Attenuator	BIRD	50-A-MFN-20	0403002	09.11.03
■	Attenuator	HP	11581A	29738	09.01.10
■	Power sensor	Agilent	E9321A	US40390422	09.11.03
☐	Power sensor	Agilent	E9325A		09.11.03
☐	LOOP Antenna	EMCO	EMCO6502	9205-2745	09.05.28
■	BILOG Antenna	Schwarzbeck	VULB 9160	3138	10.02.21
■	HORN Antenna	ETS	3115	00062589	09.12.26
■	HORN Antenna	ETS	3116	00086632	09.12.20
■	Power Divider	HP	11636A	05441	09.08.21
■	Signal Generator	HP	E4421B	GB40052295	09.10.30
■	Signal Generator	IFR	IFR2023A	202304/278	09.10.30
☐	Power Divider	Weinschel	1580-1	NX375	09.08.21
☐	Power Divider	Weinschel	1580-1	NX380	09.08.21
☐	Power Divider	Weinschel	1594	671	09.08.21
■	Test Receiver	R&S	ESHS10	843276/003	09.05.29
■	LISN	R&S	ESH3-Z5	100267	09.07.04
■	LISN	PMM	L2-16A	0000J10705	-

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