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SAMMI

Dates of Tests: June 19 ~ July 07, 2006
Test Report S/N: LR500110607C
Test Site : LTA CO., LTD.

CERTIFICATIO OF COMPLIANCE

FCC ID. **RQKWMBGMR01**

APPLICANT **SAMMI Information Systems Co., Ltd.**

FCC Classification	:	**Digital Transmission System (DTS)**
		FCC Part 15 Spread Spectrum Transceiver (DSS)
Manufacturing Description	:	**802.11g Wireless LAN SiP Module**
Manufacturer	:	**Universal Scientific Industrial Co., Ltd.**
Model name	:	**WM-BG-MR-01**
Test Device Serial No.:	:	**8601-600160-30**
Rule Part(s)	:	**FCC Part 15.247 Subpart C; ANSI C-63.4-2003**
Frequency Range	:	**2412MHz ~ 2462MHz (DSSS/OFDM)**
		2402 ~ 2480MHz (Bluetooth)
Max. Output Power	:	**14.6dBm Peak Conducted (802.11b)**
		13.3dBm Peak Conducted (802.11g)
		1.52dBm Peak Conducted (bluetooth)
Data of issue	:	**July 7, 2006**

This test report is issued under the authority of:

Dong –Min JUNG, Technical Manager

The test was supervised by:

Kyung-Taek LEE, Test Engineer

This test result only responds to the tested sample. It is not allowed to copy this report even partly without the allowance of the test laboratory. This report must not be used by the applicant to claim product endorsement by any agency.

NVLAP®
NVLAP LAB Code.: 200723-0

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1. General information's

1-1 Test Performed

Company name : LTA Co., Ltd.
Address : 243, Jubug-ri,Yangji-Myeon,Youngin-Si, Kyunggi-Do, Korea. 449-822
Web site : http://www.ltalab.com
E-mail : chahn@ltalab.com
Telephone : +82-31-323-6008
Facsimile +82-31-323-6010

Quality control in the testing laboratory is implemented as per ISO/IEC 17025 which is the "General requirements for the competents of calibration and testing laboratory".

1-2 Accredited agencies

LTA Co., Ltd. is approved to perform EMC testing by the following agencies:

Agency	Country	Accreditation No.	Validity	Reference
NVLAP	U.S.A	200723-0	2006-09-30	ECT accredited Lab.
RRL	KOREA	KR0049	2007-07-13	EMC accredited Lab.
FCC	U.S.A	610755	2008-03-28	FCC filing
VCCI	JAPAN	R2133, C2307	2008-06-22	VCCI registration
IC	CANADA	IC5799	2008-04-23	IC filing

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2. Information's about test item

2-1 Client

Company name	:	SAMMI Information Systems Co., Ltd.
Address	:	496,wonchun-dong, yeongtong-ku, suwon, kyung ki-do, Korea
Tel / Fax	:	+82-31-217-8252 / +82-31-217-8254

2-2 Manufacturer

Company name	:	Universal Scientific Industrial Co., Ltd.
Address	:	141, Lane 351, Taiping Road, Sec. 1, Tsao-Tuen, Taiwan,

2-3 Equipment Under Test (EUT)

Trade name	:	802.11g Wireless LAN SiP Module
FCC ID	:	RQKWMBGMR01
Model name	:	WM-BG-MR-01
Serial number	:	8601-600160-30
Date of receipt	:	June 12, 2006
EUT condition	:	Production, not damaged
Antenna type	:	PIFA Antenna with 3.31dBi gain for 802.11B/G
		PIFA Antenna with 2.81dBi gain for Bluetooth
Frequency Range	:	2412MHz ~ 2462MHz (DSSS/OFDM)
		2402 ~ 2480MHz (Bluetooth)
RF output power Range	:	14.6 dBm Peak Conducted (802.11b)
		13.3 dBm Peak Conducted (802.11g)
		1.52 dBm Peak Conducted (Bluetooth)
Number of channels	:	11(DSSS/OFDM), 79(Bluetooth)
Type of Modulation	:	CCK, DQPSK, DBPSK for DSSS
		64QAM, 16QAM, QPSK, BPSK for OFDM
		GFSK for Bluetooth
Transfer Rate	:	11/5.5/2/1Mbps for 802.11b
		54/48/36/24/18/12/9/6Mbps for 802.11g
Duty cycle TX power	:	78.4% (Bluetooth)
Power Source	:	3.3Vdc from host equipment

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2-4 Tested frequency

	LOW	MID	HIGH
Frequency (MHz) for Bluetooth	2402	2441	2480
Frequency (MHz) for 802.11b	2412	2437	2462
Frequency (MHz) for 802.11g	2412	2437	2462

2-5 Ancillary Equipment

Equipment	Model No.	Serial No.	Manufacturer
Notebook	Latitude D505	8N29F1S	DELL
-	-	-	-

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3. Test Report

3.1 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	Carrier Frequency Separation	> 25 kHz	Conducted	C
15.247(a)	Number of Hopping Frequencies	> 75 hops		C
15.247(a)	20 dB Bandwidth	< 1 MHz		C
15.247	Dwell Time	< 0.4 seconds		C
15.247(b)	Transmitter Output Power	< 1Watt		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.247(a)	6 dB Bandwidth	> 500kHz		C
15.247(d)	Transmitter Power Spectral Density	< 8dBm @ 3kHz		C
15.209	Field Strength of Harmonics	< 54 dBuV (at 3m)	Radiated	C
15.207	AC Conducted Emissions	EN 55022	Line Conducted	C

Note 1: C=Complies NC=Not Complies NT=Not Tested NA=Not Applicable

Note 2: The data in this test report are traceable to the national or international standards.

The sample was tested according to the following specification:

FCC Parts 15.247; ANSI C-63.4-2003

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3.2 Technical Characteristics Test (Bluetooth)

3.2.1 Carrier Frequency Separation

Procedure:

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

After the trace being stable, the reading value between the peaks of the adjacent channels using the marker-delta function was recorded as the measurement results.

The spectrum analyzer is set to:

Span = 3 MHz (wide enough to capture the peaks of two adjacent channels)

RBW = 30 kHz (1% of the span or more) Sweep = auto

VBW = 30 kHz Detector function = peak

Trace = max hold

Measurement Data:

Test Results	
Carrier Frequency Separation (MHz)	**Result**
1.013	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

The EUT shall have hopping channel carrier frequencies separated by a minimum of 25kHz or the 20dB bandwidth of the hopping channel, whichever is greater.

Measurement Setup

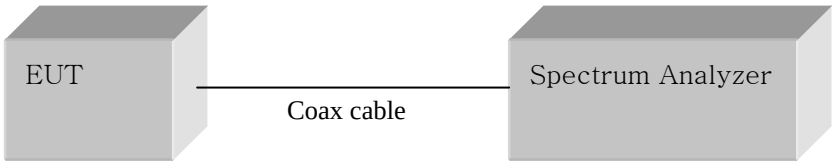

Figure 1: Measurement setup for the carrier frequency separation

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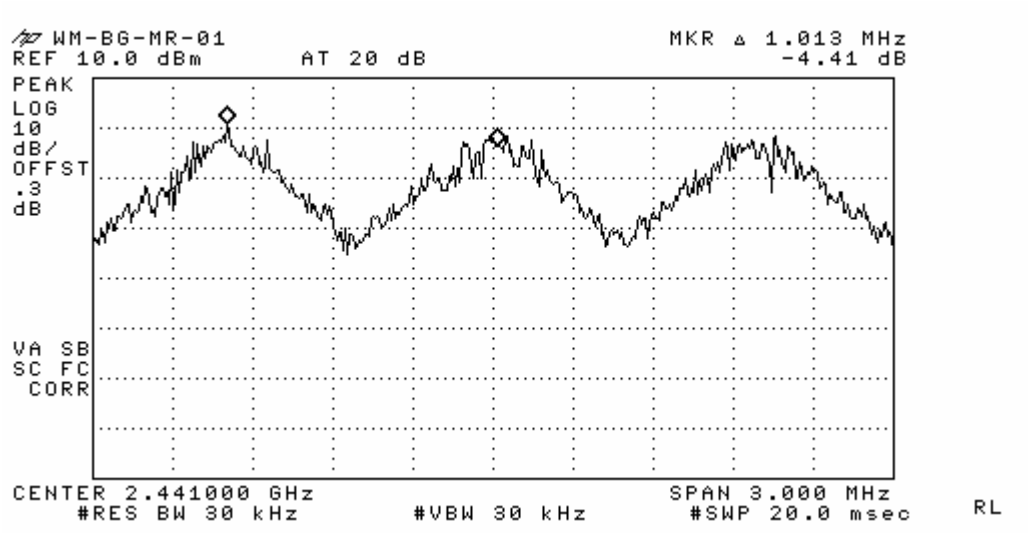
Carrier Frequency Separation



3.2.2 Number of Hopping Frequencies

Procedure:

The number of hopping frequencies was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

To get higher resolution, four frequency ranges within the 2400 ~ 2483.5 MHz FH band were examined.

The spectrum analyzer is set to:

Frequency range	1: Start = 2389.5MHz,	Stop = 2414.5 MHz
	2: Start = 2414.5MHz,	Stop = 2439.5 MHz
	3: Start = 2439.5MHz,	Stop = 2464.5 MHz
	4: Start = 2464.5MHz,	Stop = 2489.5 MHz

RBW = 300 kHz (1% of the span or more)	Sweep = auto
VBW = 300 kHz (VBW ≥ RBW)	Detector function = peak
Trace = max hold	Span = 25MHz

Measurement Data: Complies

Total number of Hopping Channels	79

- See next pages for actual measured spectrum plots.

Minimum Standard:

At least 75 hopes

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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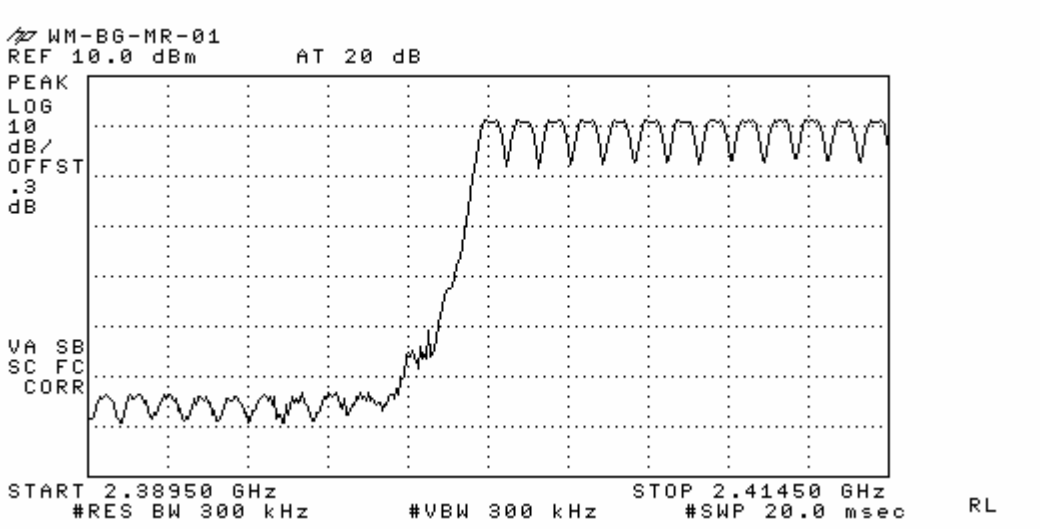
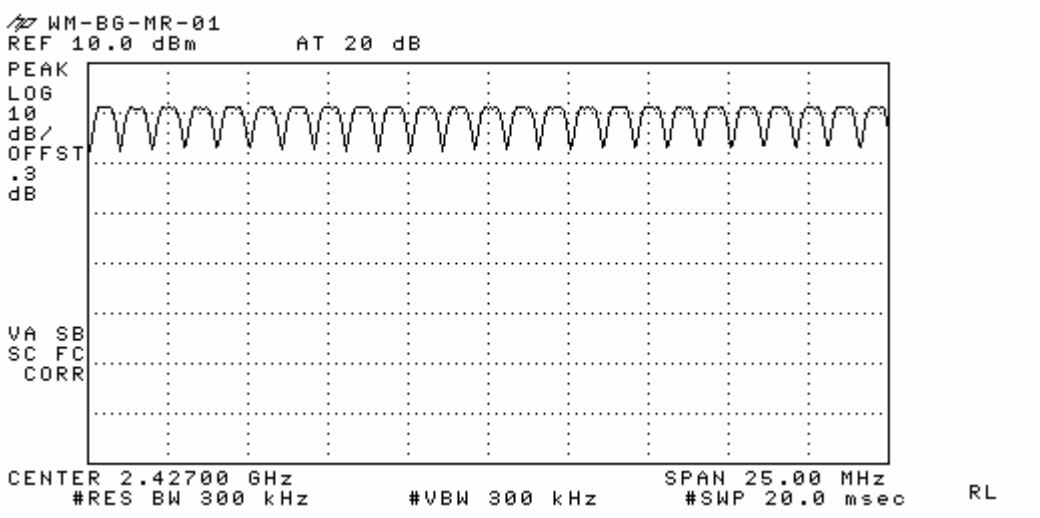
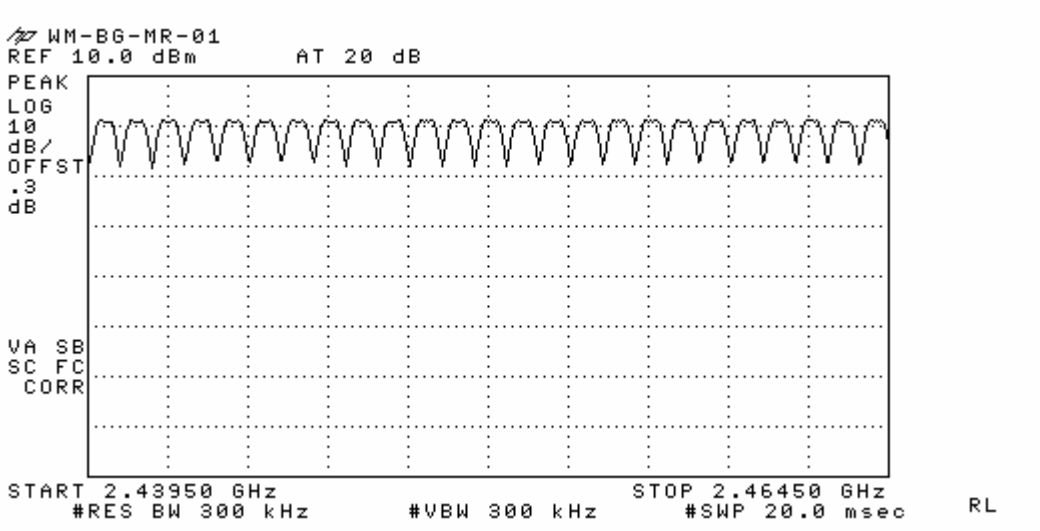
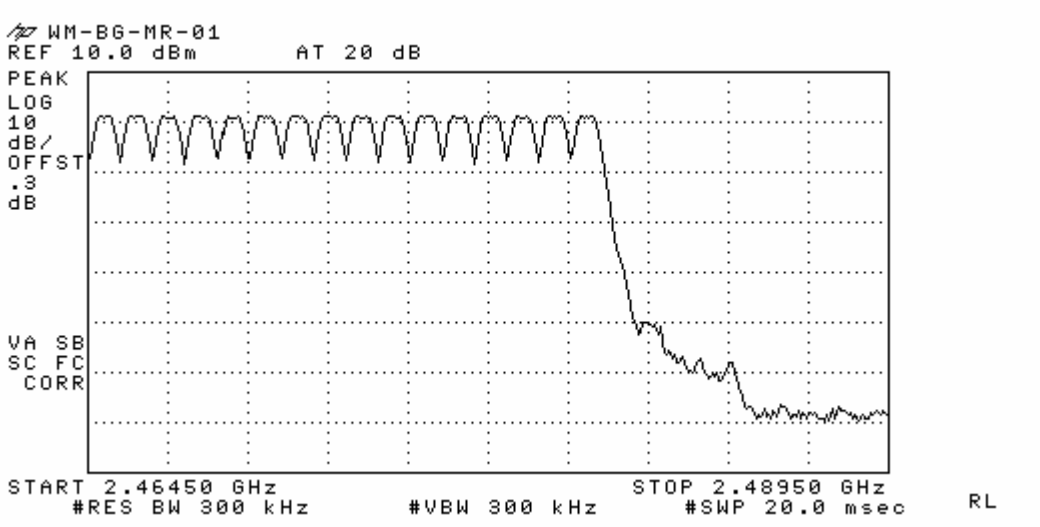
Number of Hopping Frequencies





Number of Hopping Frequencies





3.2.3 20 dB Bandwidth

Procedure:

The bandwidth at 20 dB below the highest inband spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 2 MHz (approximately 2 or 3 times of the 20 dB bandwidth)

RBW = 30 kHz

VBW = 30 kHz (VBW ≥ RBW)

Trace = max hold

Sweep = auto

Detector function = peak

Measurement Data:

Frequency (MHz)	Channel No.	Test Results	
		Measured Bandwidth (MHz)	Result
2441	**39**	**0.930**	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

The transmitter shall have a maximum 20dB bandwidth of 1 MHz.

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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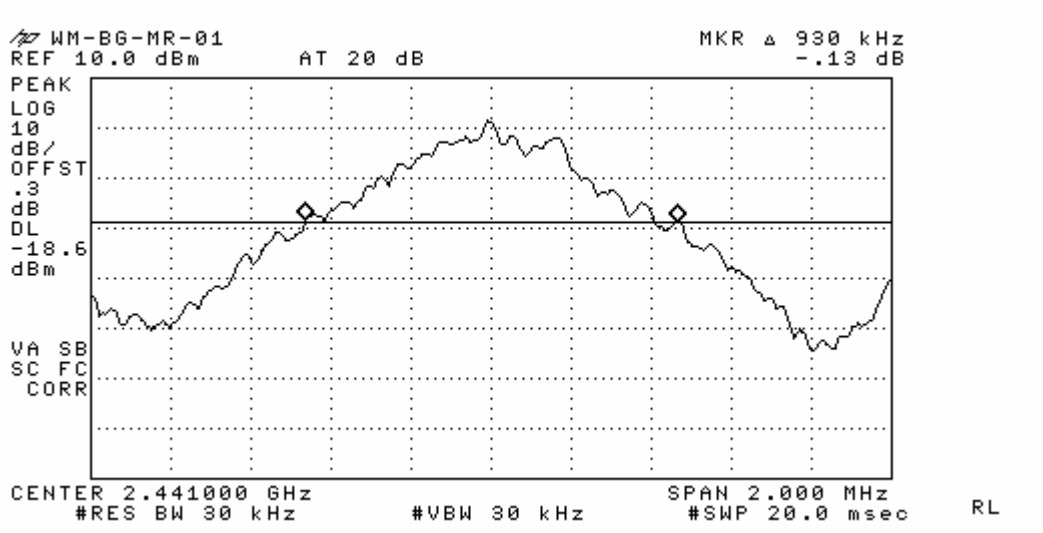
20 dB Bandwidth



3.2.4 Time of Occupancy (Dwell Time)

Procedure:

The dwell time was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function enabled.

The spectrum analyzer is set to:

Center frequency = 2441 MHz Span = zero

RBW = 1 MHz VBW = 1 MHz (VBW ≥ RBW)

Trace = max hold Detector function = peak

Measurement Data:

Channel Number	Channel Frequency (MHz)	Packet Type	Test Results	
			Dwell Time (ms)	Result
39	2441	DH 1	135.21	Complies
		DH 3	268.17	Complies
		DH 5	310.78	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

0.4 seconds within a 30 second period per any frequency

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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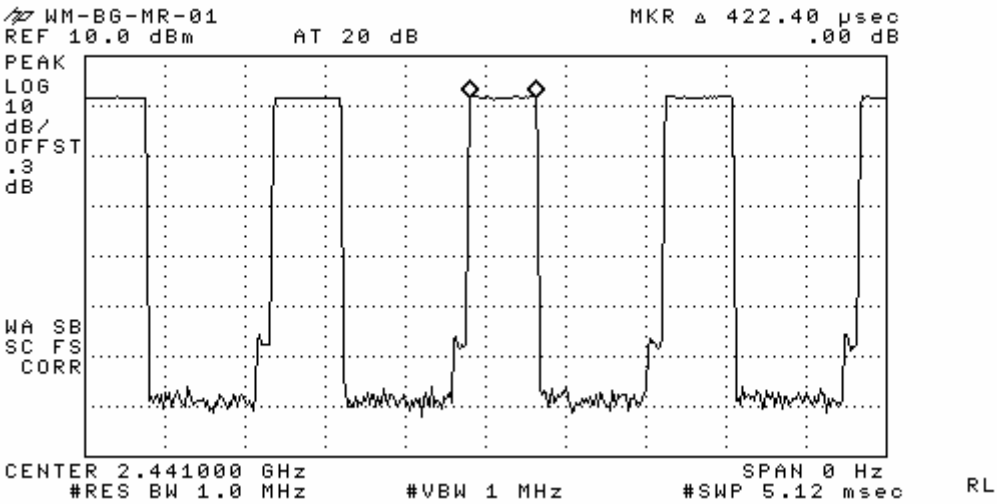
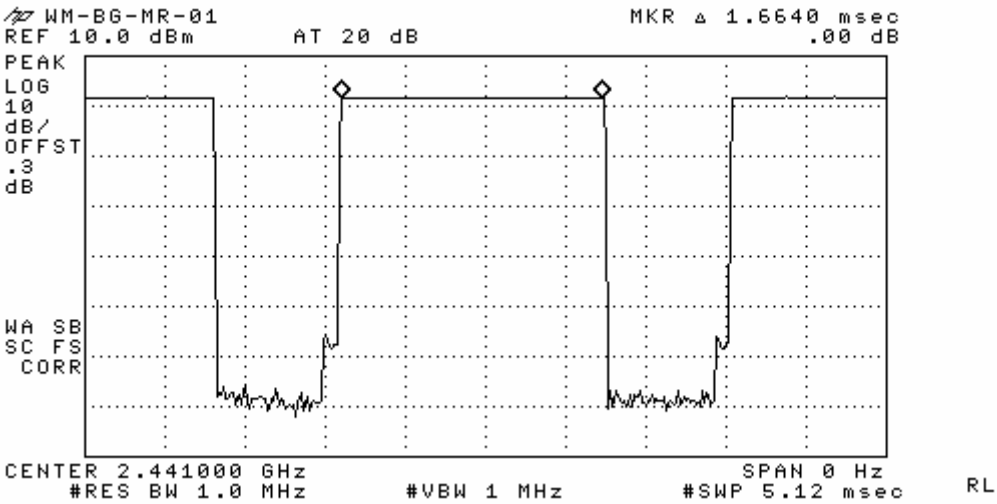
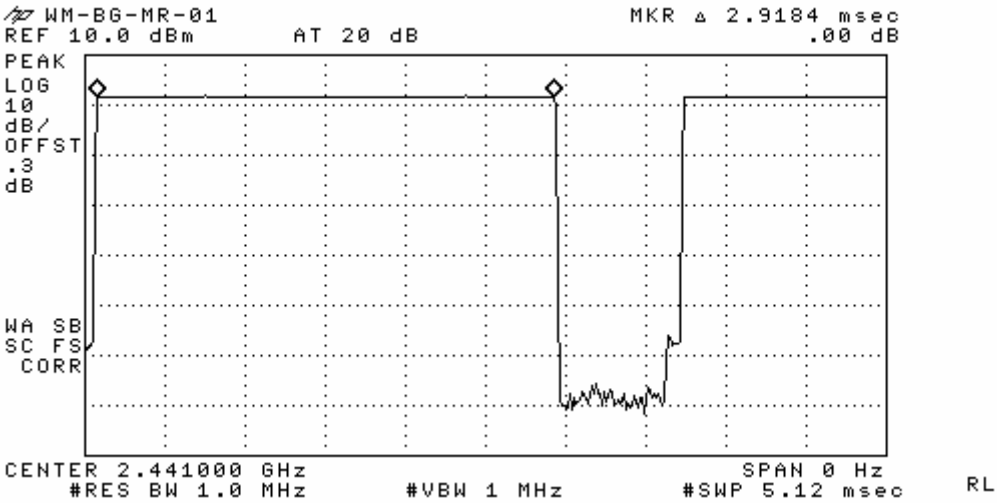
DH 1



DH 3



DH 5



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3.2.5 Transmitter Output Power

Procedure:

The peak output power was measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels..

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. The indicated level is the peak output power.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

Span = 5 MHz (approximately 5 times of the 20 dB bandwidth)

RBW = 1 MHz (greater than the 20dB bandwidth of the emission being measured)

VBW = 1 MHz (VBW ≥ RBW) Detector function = peak

Trace = max hold Sweep = auto

Measurement Data:

Frequency (MHz)	Ch.	Test Results		
		dBm	mW	Result
2402	0	**1.19**	**1.315**	Complies
2441	39	**1.52**	**1.419**	Complies
2480	78	**1.32**	**1.355**	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:	< 1W

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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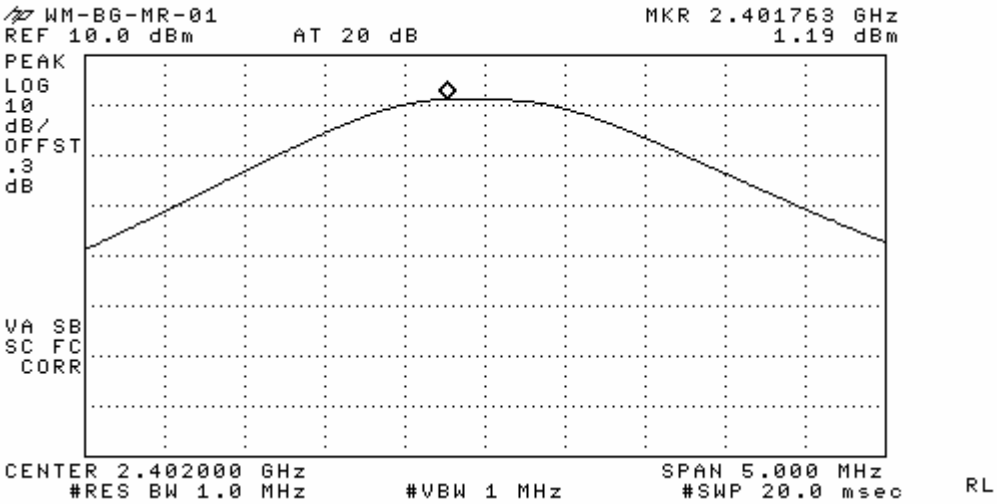
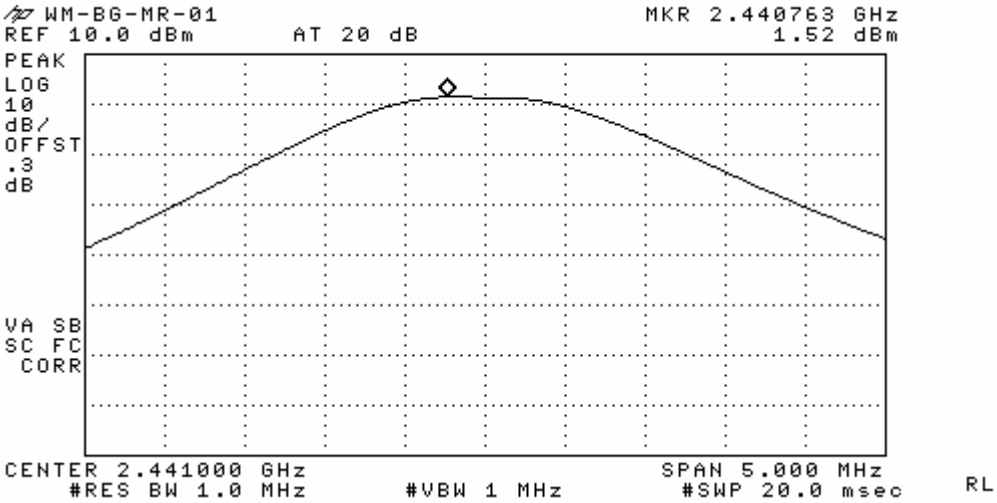
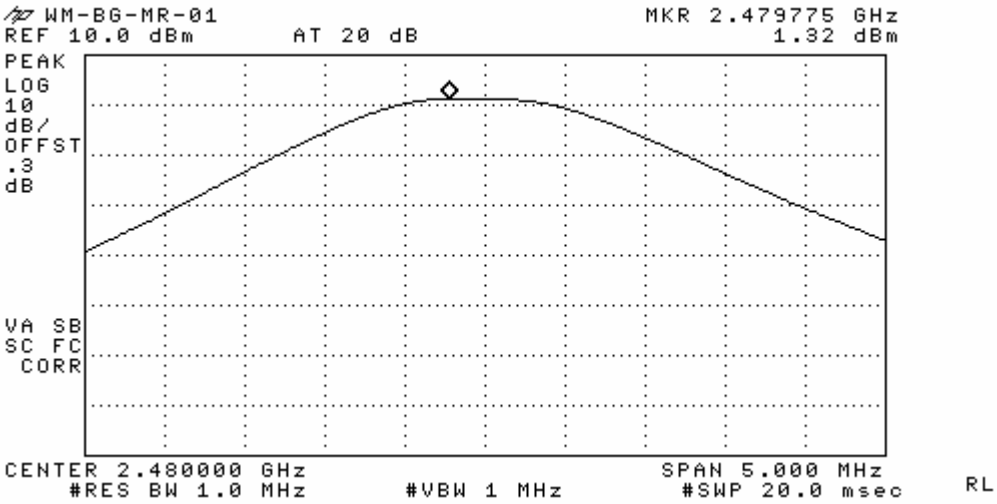
Peak Output Power







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3.2.6 Band - edge

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT had its hopping function disabled at the highest, middle and the lowest available channels.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz	VBW = 100 kHz
Span = 10 MHz	Detector function = peak
Trace = max hold	Sweep = auto

Measurement Data: Complies

- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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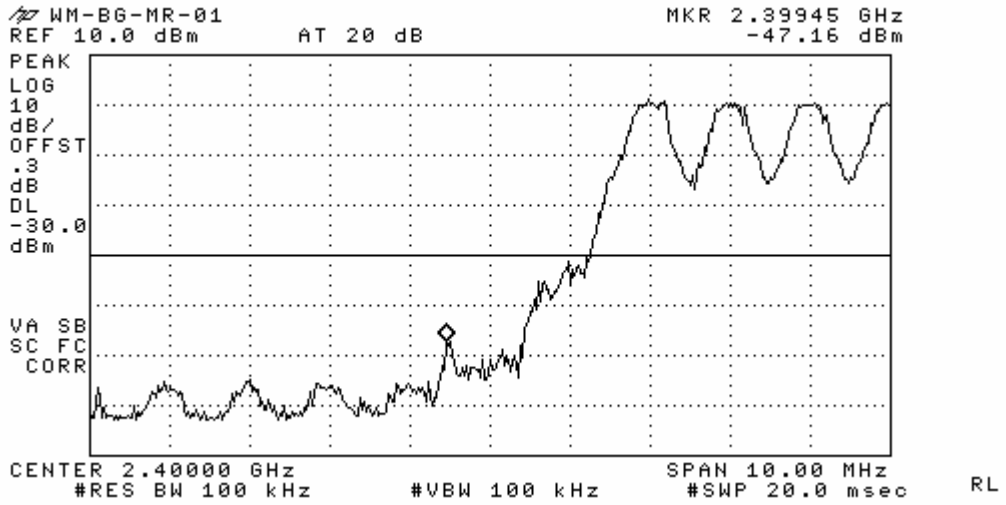
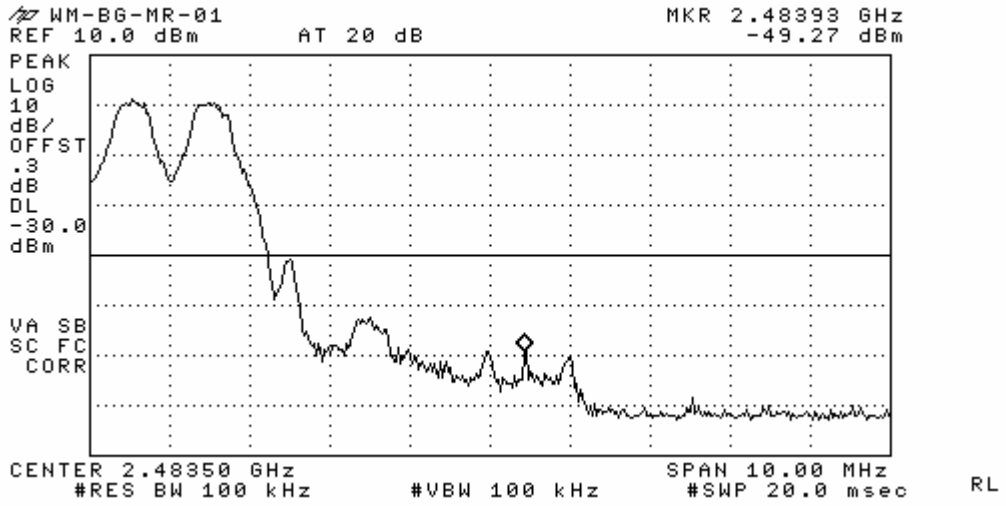
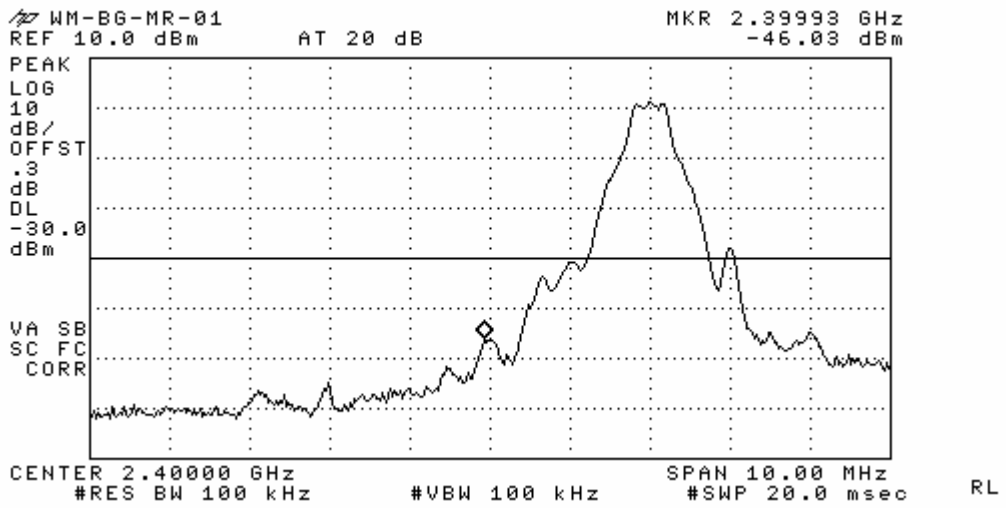
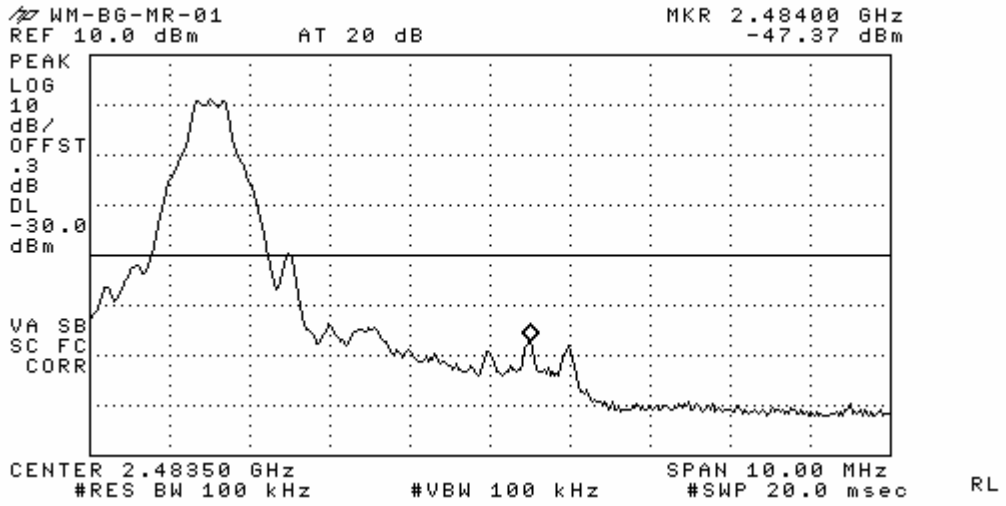
Band - edge (with Hopping)





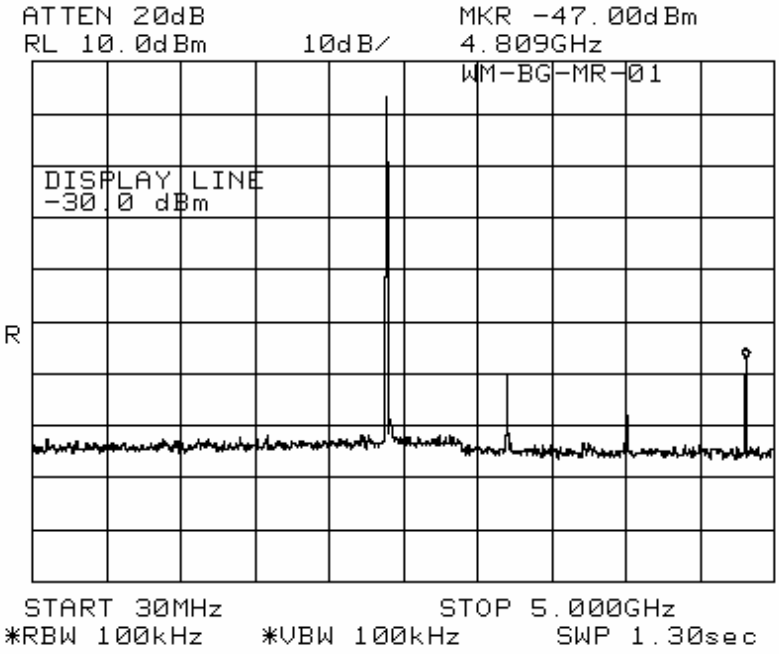
Band - edge (without Hopping)

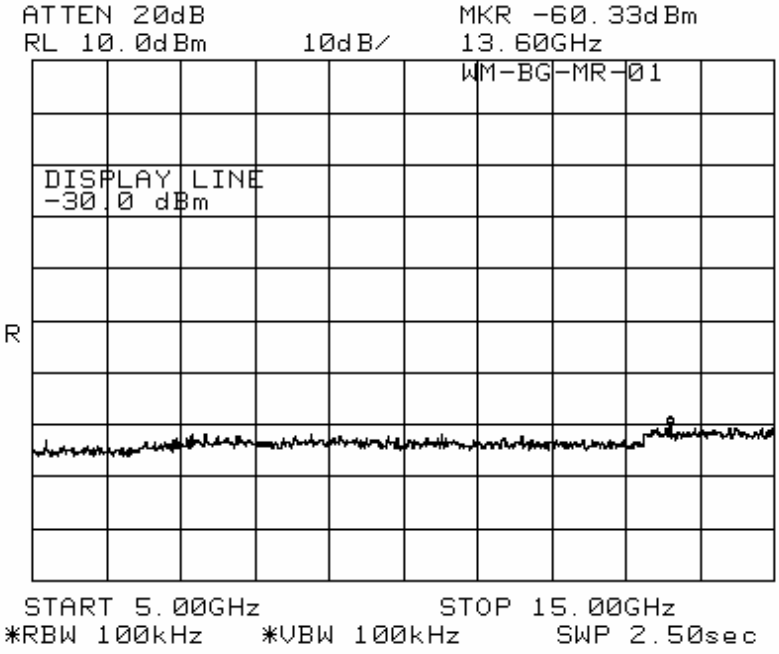




Band - edge (at 20 dB blow) – Low channel

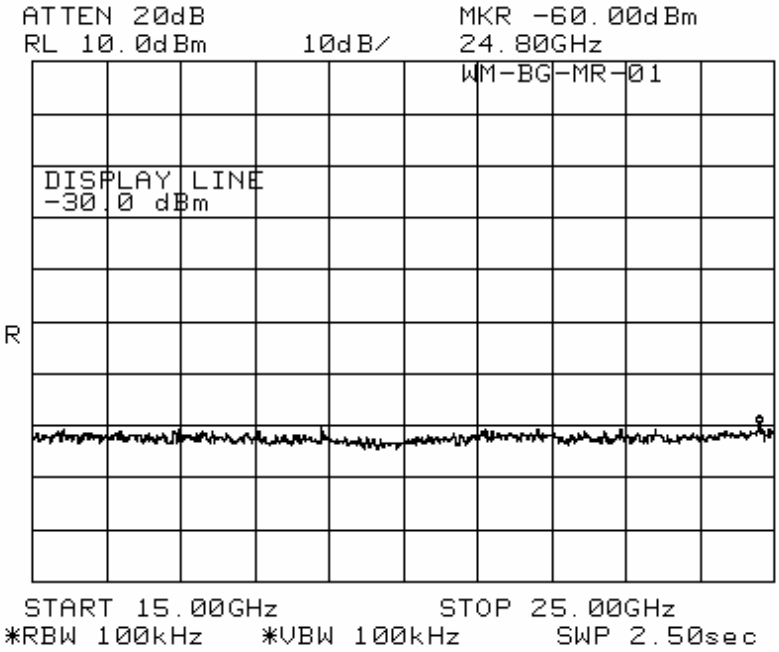
Frequency Range = 30 MHz ~ 10th harmonic.





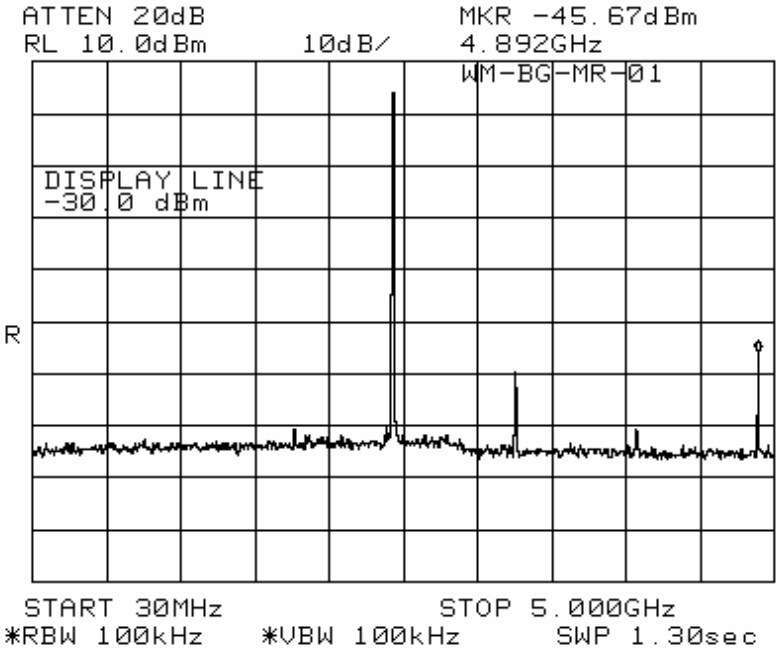
Band - edge (at 20 dB blow) – Low channel

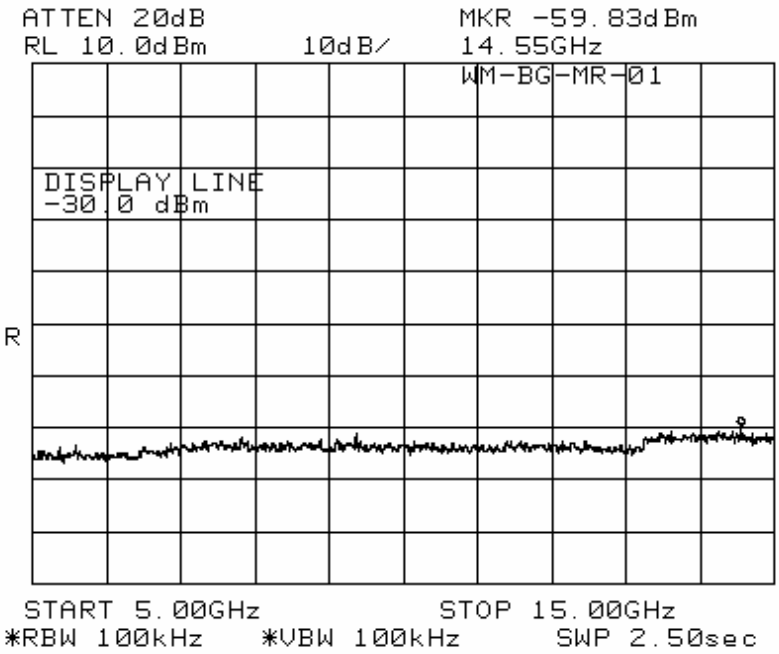
Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



Band - edge (at 20 dB blow) – Mid channel

Frequency Range = 30 MHz ~ 10th harmonic.





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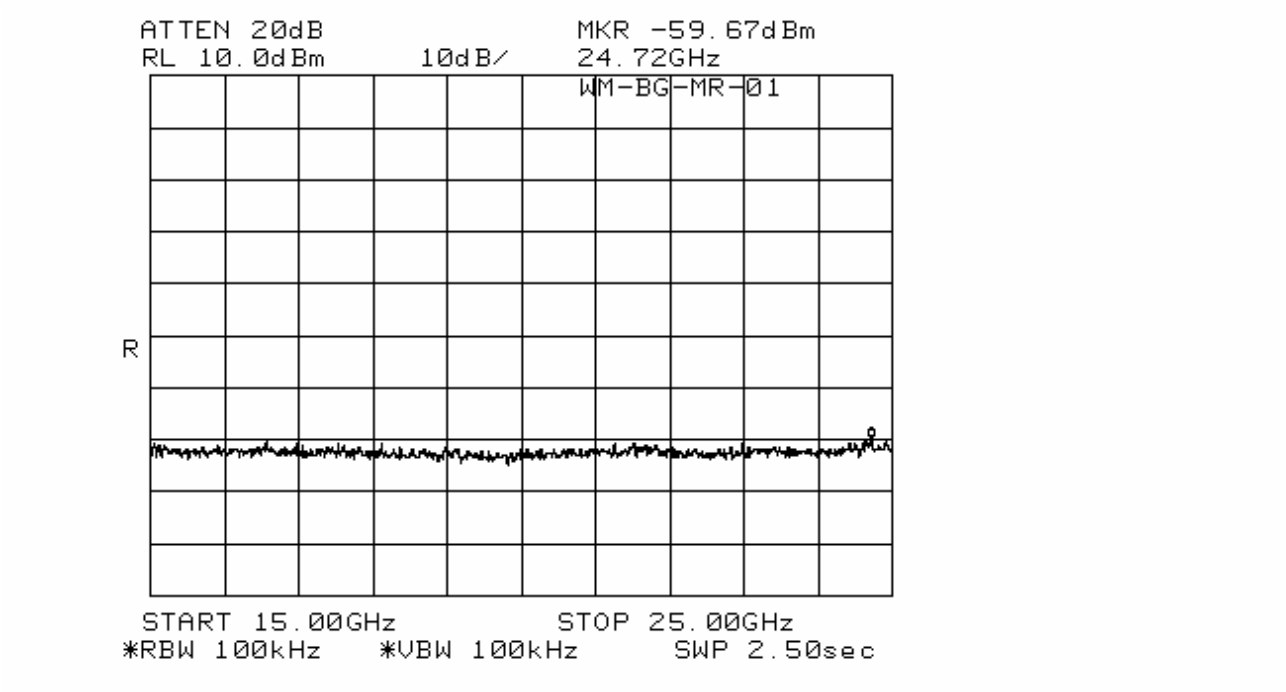
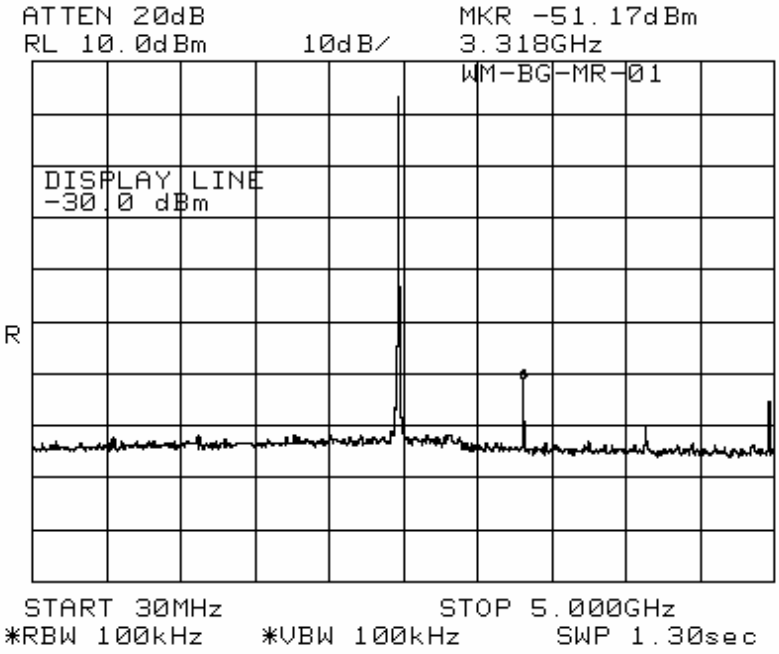
Band - edge (at 20 dB blow) – Mid channel

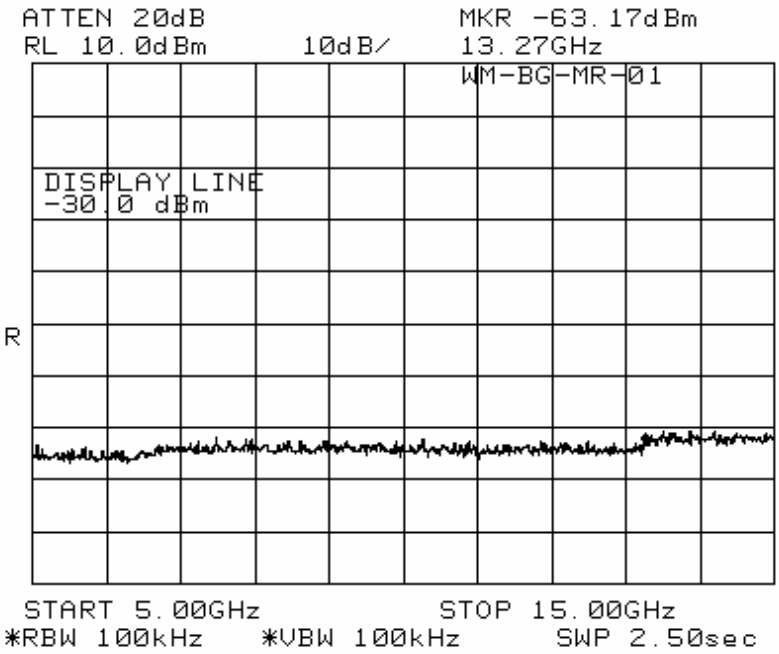
Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



Band - edge (at 20 dB blow) – High channel

Frequency Range = 30 MHz ~ 10th harmonic.





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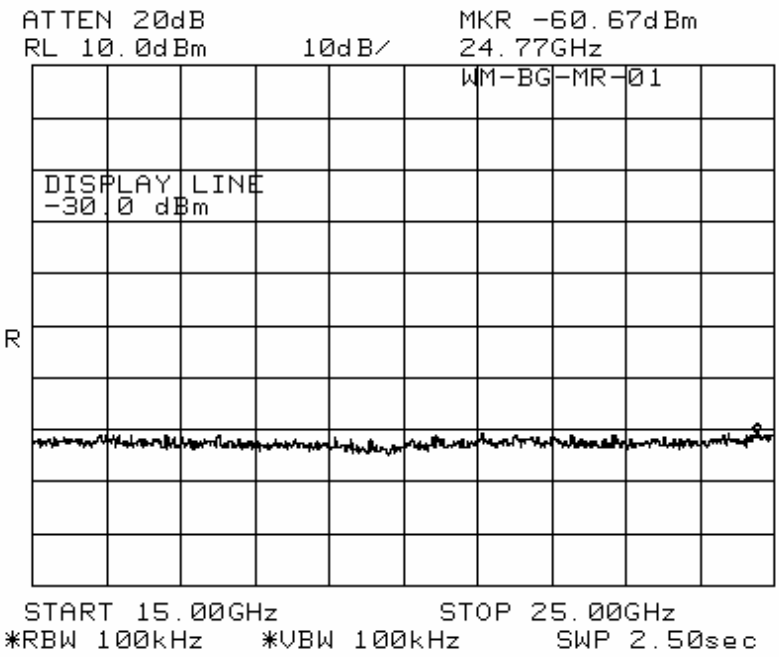
Band - edge (at 20 dB blow) – High channel

Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



3.2.7 Field Strength of Harmonics

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz Detector function = peak

Trace = max hold Sweep = auto

Measurement Data: Complies

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**
3211	**35.2**	**3269**	**37.1**	**3318**	**32.4**
4809	**39.7**	**4892**	**41.3**	**4967**	**34.7**
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

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3.2.8 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-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

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Bluetooth-AC Conducted Emissions –Line

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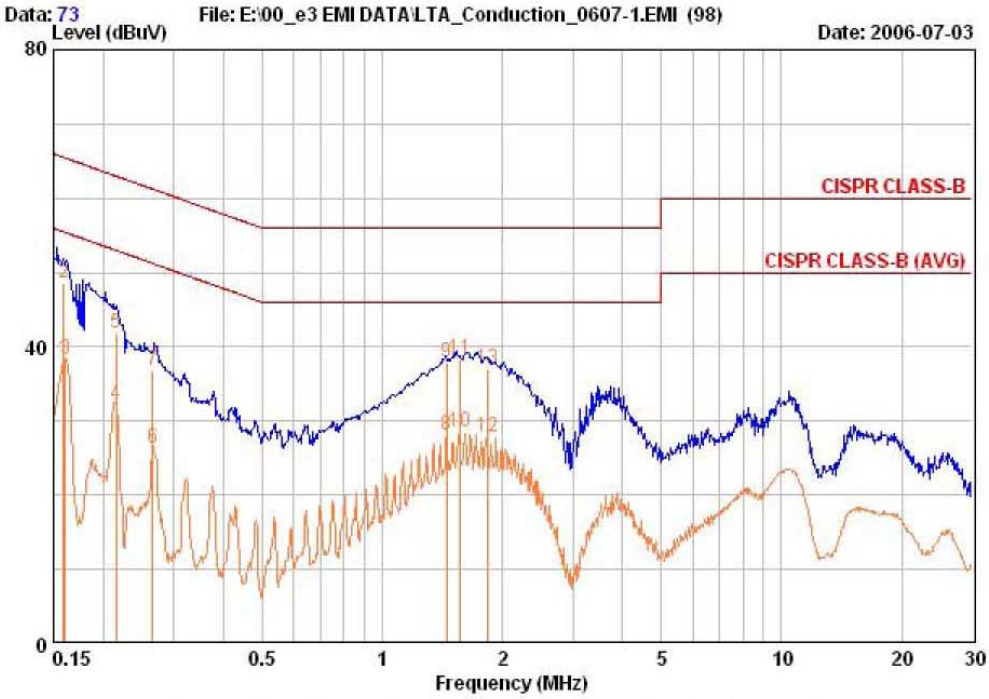
Tel :+82-31-323-6008
Fax:+82-31-323-6010

EUT / Model No.	: WM-BG-MR-01	Phase	: LINE
Test Mode	: BT Mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.16	48.00	37.91	0.51	48.51	38.42	65.52	55.52	17.00	17.09
0.16	---	37.91	0.50	0.00	38.41	0.00	55.43	0.00	17.02
0.22	41.70	32.08	0.20	41.90	32.28	63.01	53.01	21.11	20.73
0.27	36.50	26.22	0.25	36.75	26.47	61.25	51.25	24.50	24.78
1.45	37.50	27.80	0.36	37.86	28.16	56.00	46.00	18.14	17.84
1.56	38.00	28.10	0.38	38.38	28.48	56.00	46.00	17.62	17.52
1.83	36.60	27.54	0.41	37.01	27.95	56.00	46.00	18.99	18.05

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

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Bluetooth-AC Conducted Emissions –Neutral

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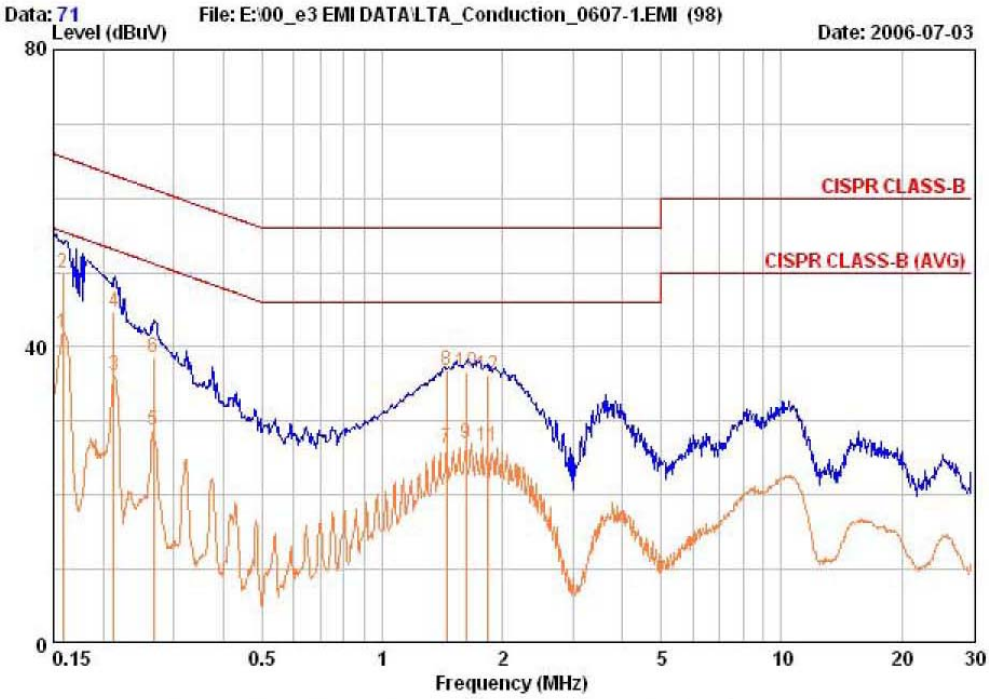
Fax:+82-31-323-6010

EUT / Model No.	: WM-BG-MR-01	Phase	: NEUTRAL
Test Mode	: BT Mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.16	49.50	41.40	0.51	50.01	41.91	65.56	55.56	15.55	13.65
0.21	44.60	35.98	0.19	44.79	36.17	63.10	53.10	18.30	16.92
0.27	38.30	28.55	0.25	38.55	28.80	61.20	51.20	22.66	22.41
1.45	36.40	26.09	0.35	36.75	26.44	56.00	46.00	19.25	19.56
1.62	36.30	26.74	0.37	36.67	27.11	56.00	46.00	19.33	18.89
1.84	35.80	26.15	0.39	36.19	26.54	56.00	46.00	19.81	19.46

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

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3.3 Technical Characteristics Test (802.11b/g)

3.3.1 6 dB Bandwidth

Procedure:

The bandwidth at 6dB below the highest in-band spectral density was measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 6dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 6 dB bandwidth of the emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz

Span = 40 MHz

VBW = 100 kHz (VBW ≥ RBW)

Sweep = auto

Trace = max hold

Detector function = peak

Measurement Data:

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	9.9	Complies
	2437	6	9.9	Complies
	2462	11	9.9	Complies
802.11g	2412	1	16.6	Complies
	2437	6	16.6	Complies
	2462	11	16.6	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth > 500kHz

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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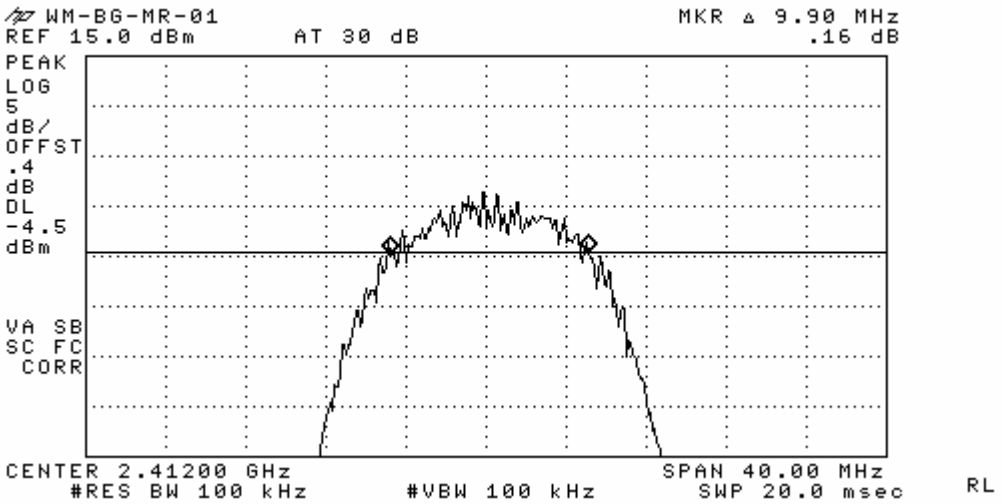
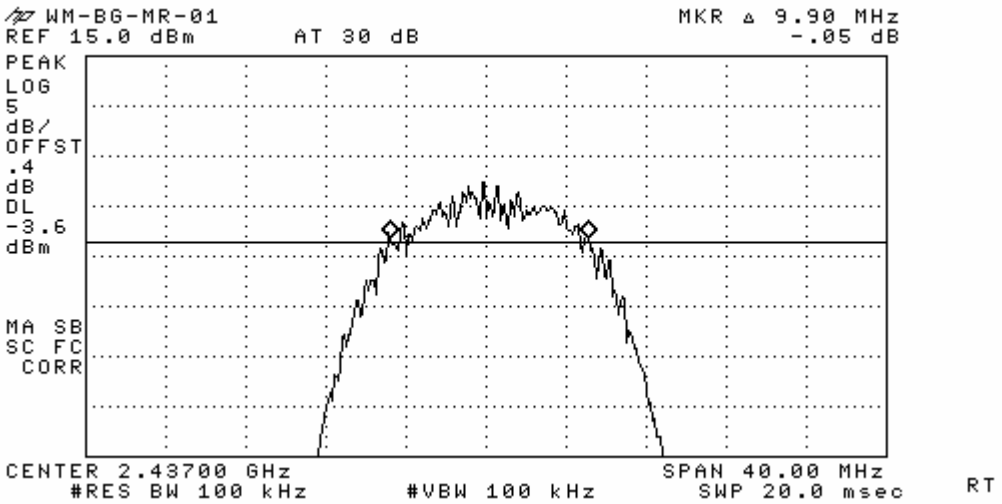
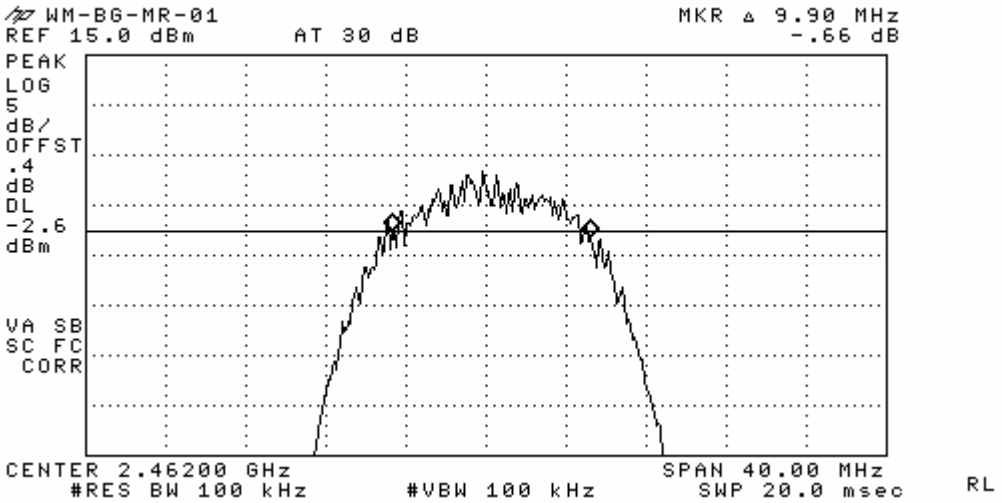
802.11b







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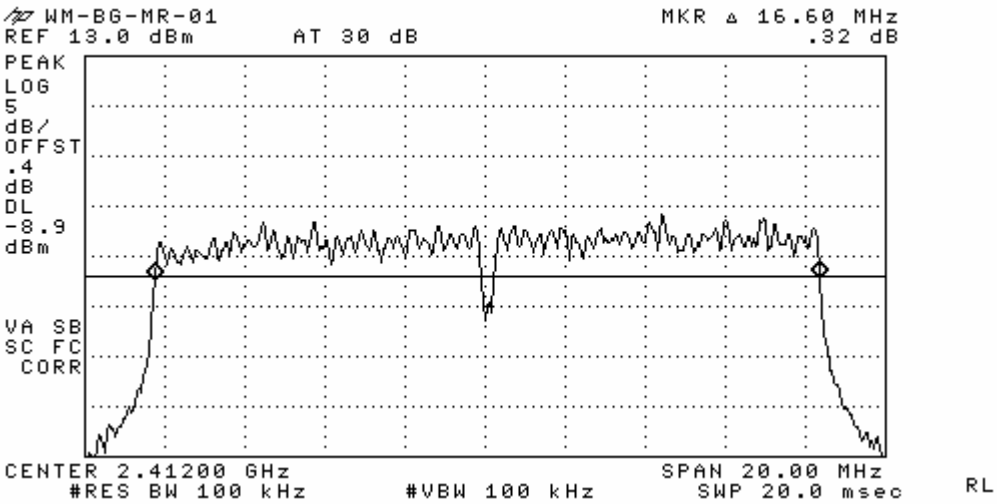
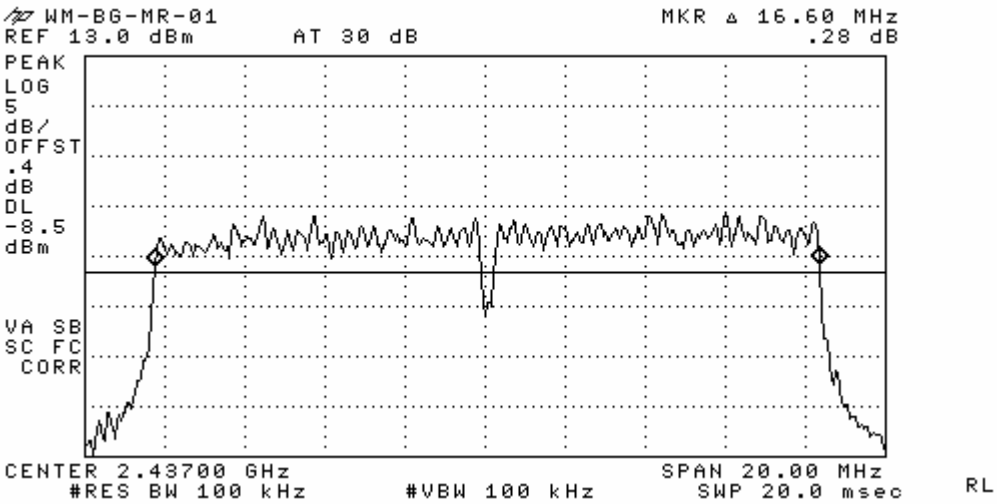
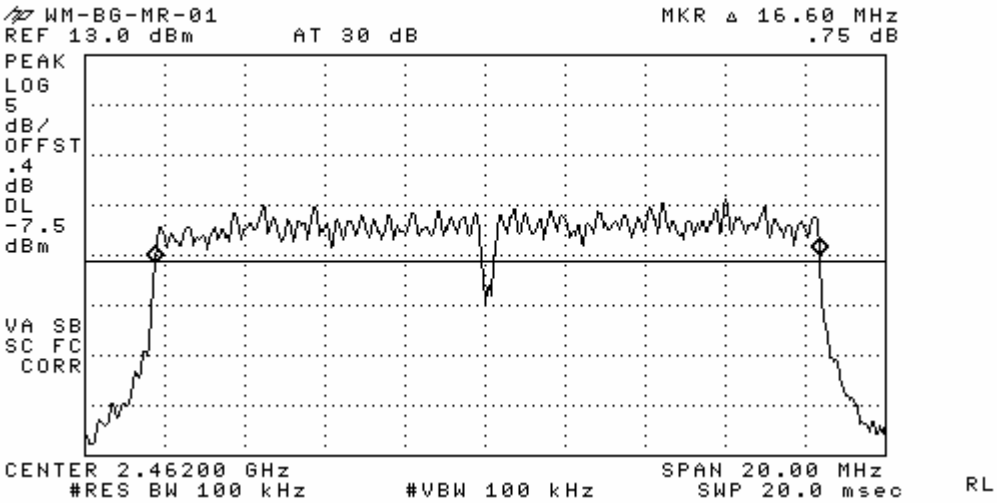
802.11g







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3.3.2 Output Power Measurement

Procedure:

A transmitter antenna terminal of EUT is connected to the input of a RF power sensor. Measurement is made while the EUT is operating in transmission mode at the appropriate frequencies.

Measurement Data:

- See next pages for actual measured data.

Minimum Standard:

	< 1W

Measurement Setup

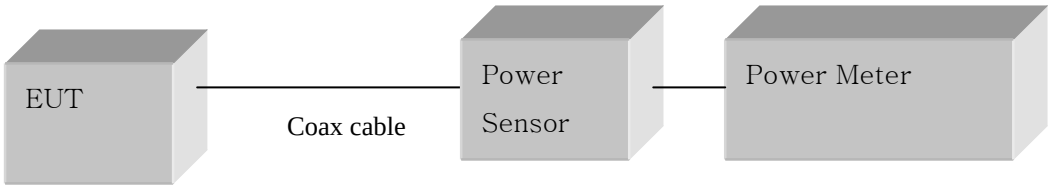

Figure 2

802.11b Output Power Measurement

Frequency (MHz)	Channel	Rate (MBps)	Power (dBm)
2412	1	1	13.4
		2	13.5
		5.5	13.4
		11	13.5
2437	6	1	13.8
		2	13.7
		5.5	13.8
		11	13.8
2462	11	1	14.6
		2	14.5
		5.5	14.5
		11	14.6

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802.11g Output Power Measurement

Frequency (MHz)	Channel	Rate (MBps)	Power (dBm)
2412	1	6	11.6
		9	11.6
		12	11.5
		18	11.5
		24	11.4
		36	11.3
		48	11.5
		54	11.5
2437	6	6	12.7
		9	12.0
		12	12.6
		18	12.2
		24	12.5
		36	12.0
		48	12.6
		54	11.9
2462	11	6	13.3
		9	13.2
		12	13.1
		18	13.3
		24	13.0
		36	12.7
		48	13.0
		54	12.7

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3.3.3 Power Spectral Density

Procedure:

The peak power density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating in transmission mode at the appropriate frequencies.

The spectrum analyzer is set to:

RBW = VBW = 3 kHz Span = 3 MHz

Sweep = 1000 sec Trace = max hold

Detector function = peak

Measurement Data:

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-10.85	Complies
	2437	6	-9.48	Complies
	2462	11	-8.93	Complies
802.11g	2412	1	-16.50	Complies
	2437	6	-15.93	Complies
	2462	11	-15.00	Complies

- See next pages for actual measured spectrum plots.

Minimum Standard:

Power Spectral Density	< 8dBm @ 3kHz BW

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

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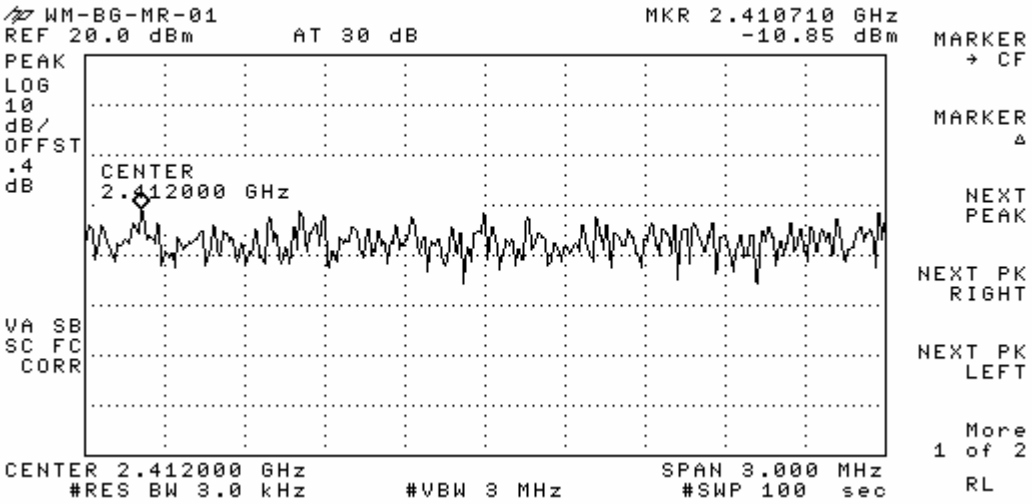
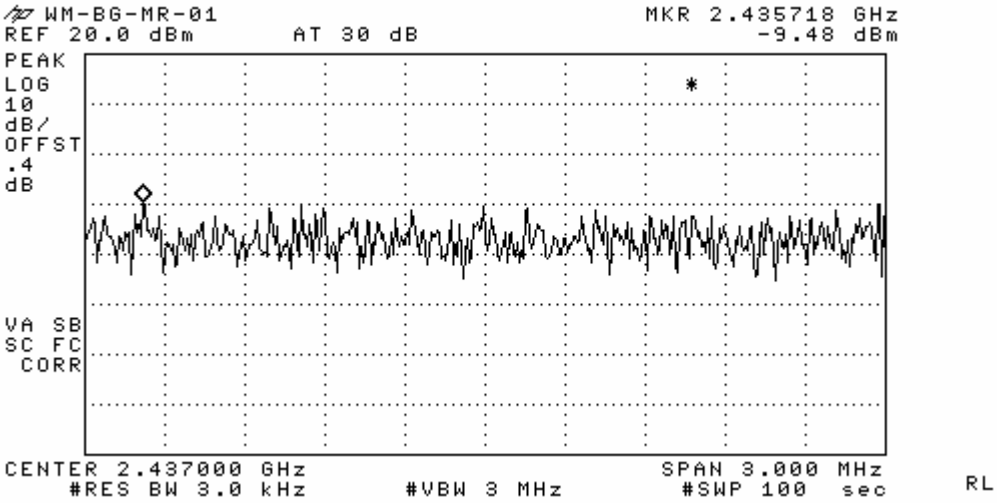
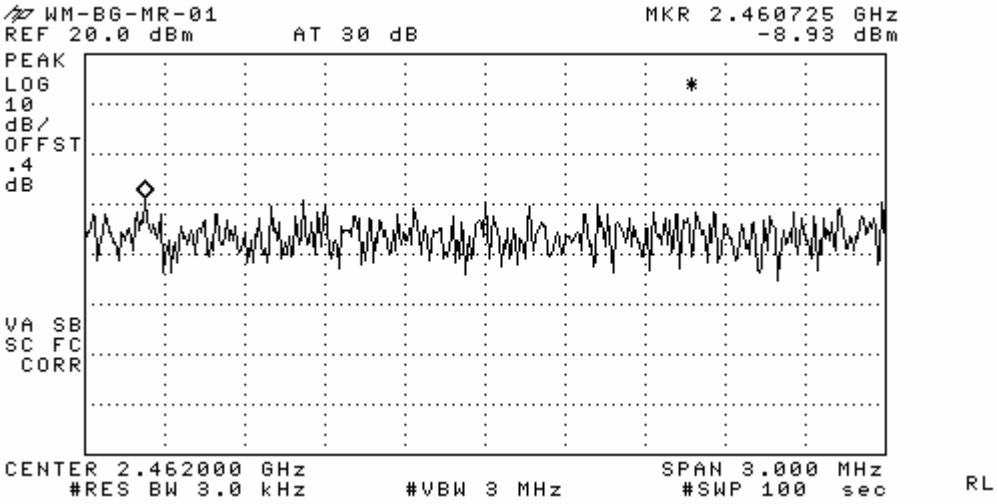
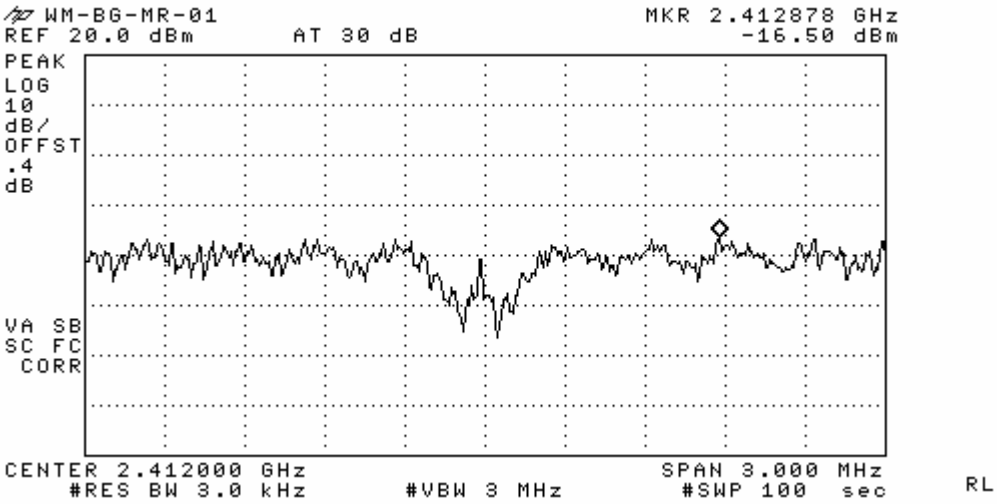
802.11b Power Density Measurement

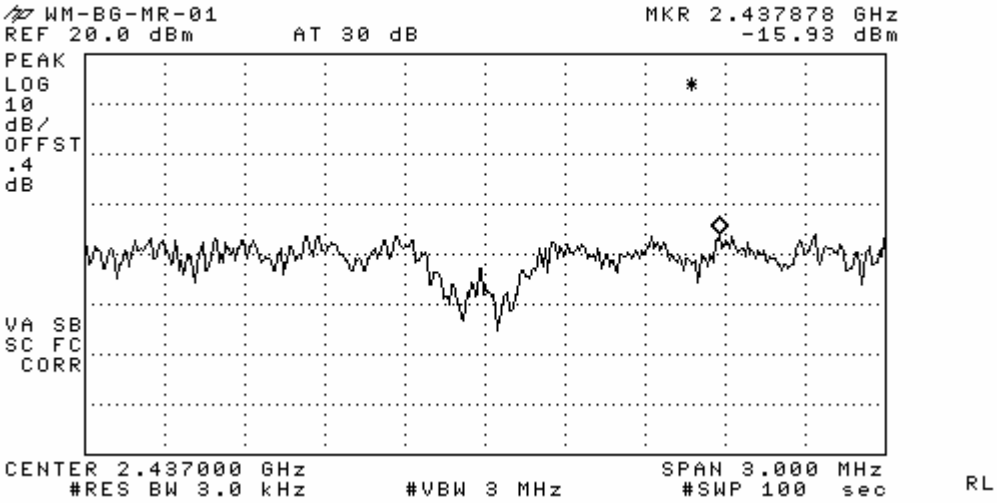


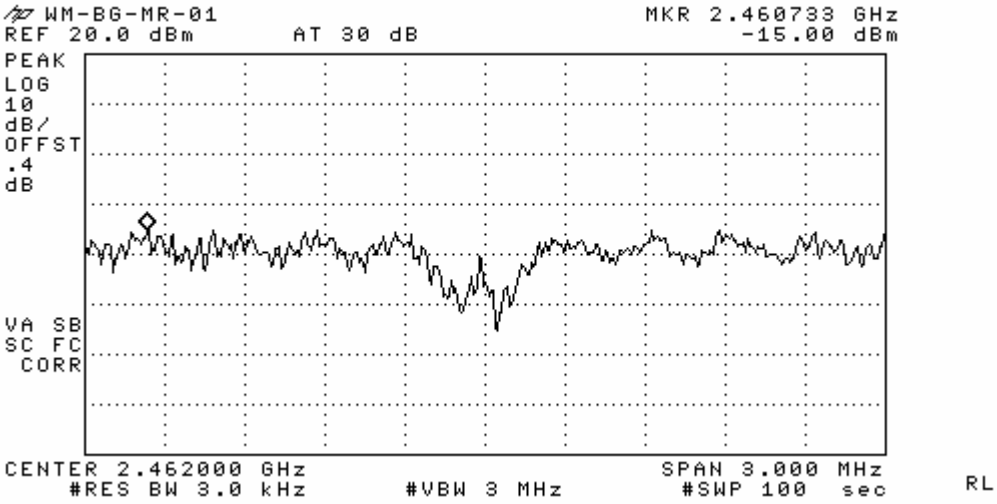




802.11g Power Density Measurement







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3.3.4 Band - edge

Procedure:

The bandwidth at 20dB down from the highest inband spectral density is measured with a spectrum analyzer connected to the antenna terminal, while EUT is operating in transmission mode at the appropriate frequencies.

After the trace being stable, Use the marker-to-peak function to measure 20 dB down both sides of the intentional emission.

The spectrum analyzer is set to:

Center frequency = the highest, middle and the lowest channels

RBW = 100 kHz	VBW = 100 kHz
Span = 40 MHz	Detector function = peak
Trace = max hold	Sweep = auto

Measurement Data: Complies

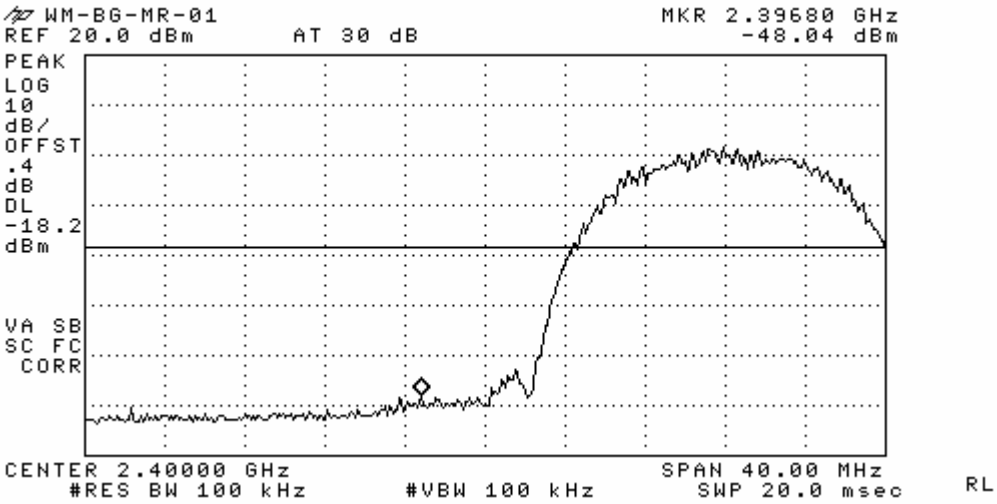
- All conducted emission in any 100kHz bandwidth outside of the spread spectrum band was at least 20dB lower than the highest inband spectral density. Therefore the applying equipment meets the requirement.
- See next pages for actual measured spectrum plots.

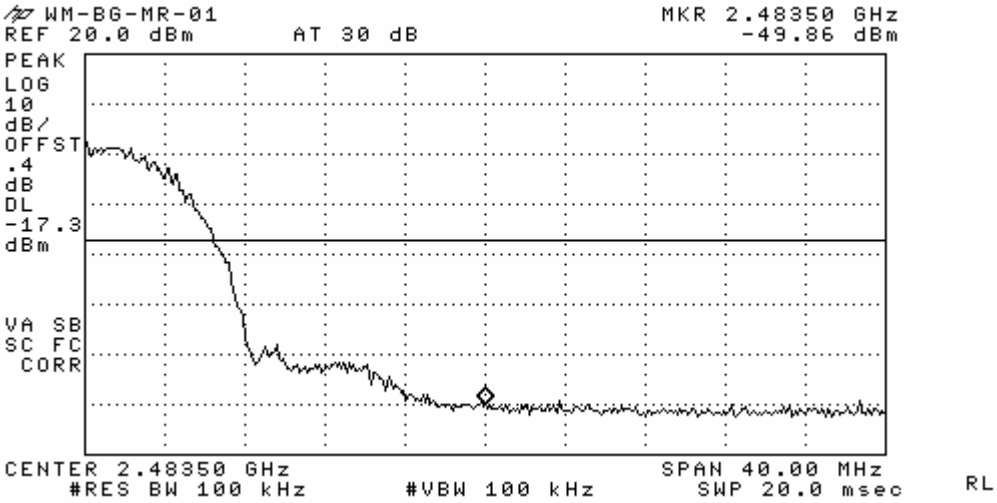
Minimum Standard:	> 20 dBc

Measurement Setup

Same as the Chapter 3.2.1 (Figure 1)

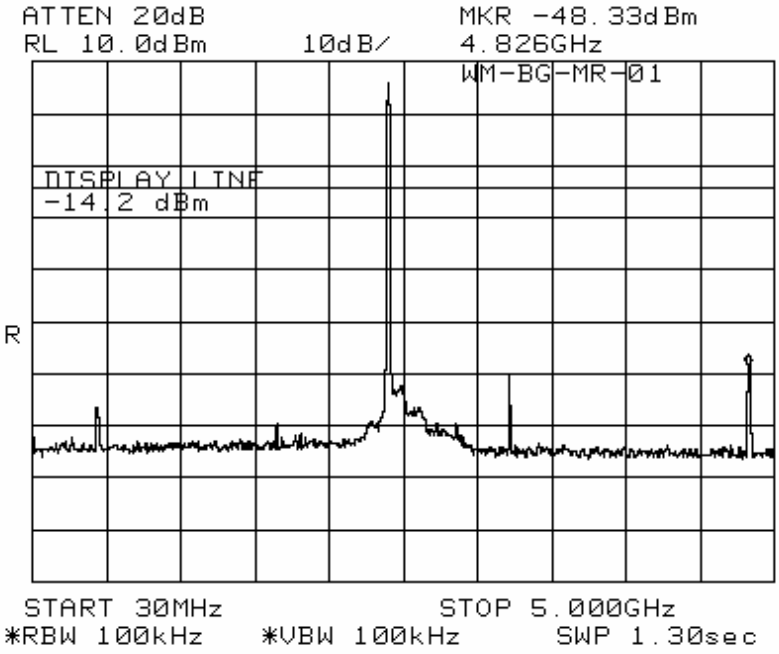
802.11b Band–edge Measurements

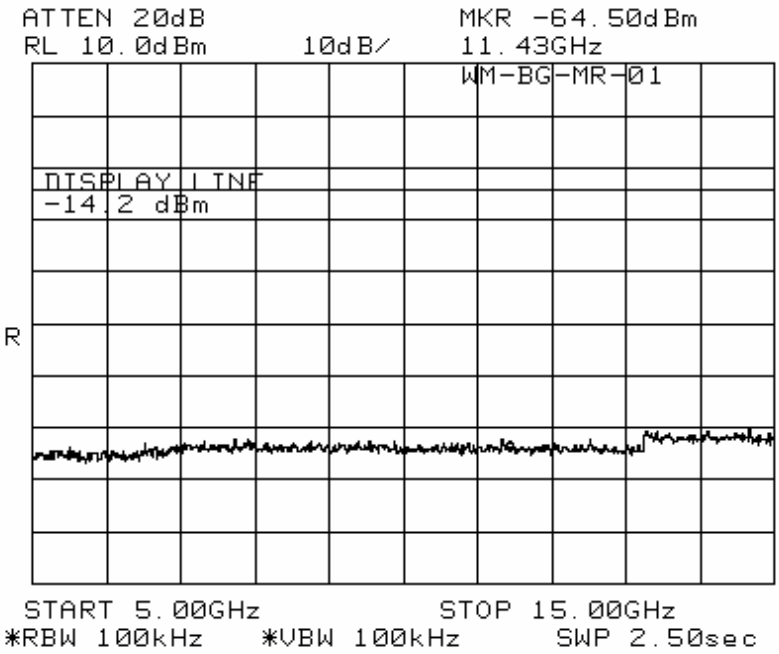




Band - edge (at 20 dB blow) – Low channel

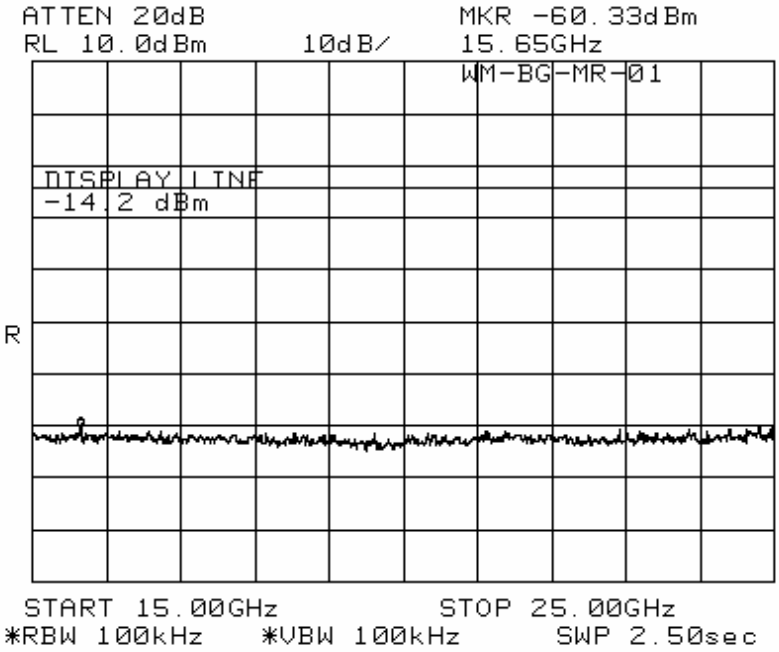
Frequency Range = 30 MHz ~ 10th harmonic.





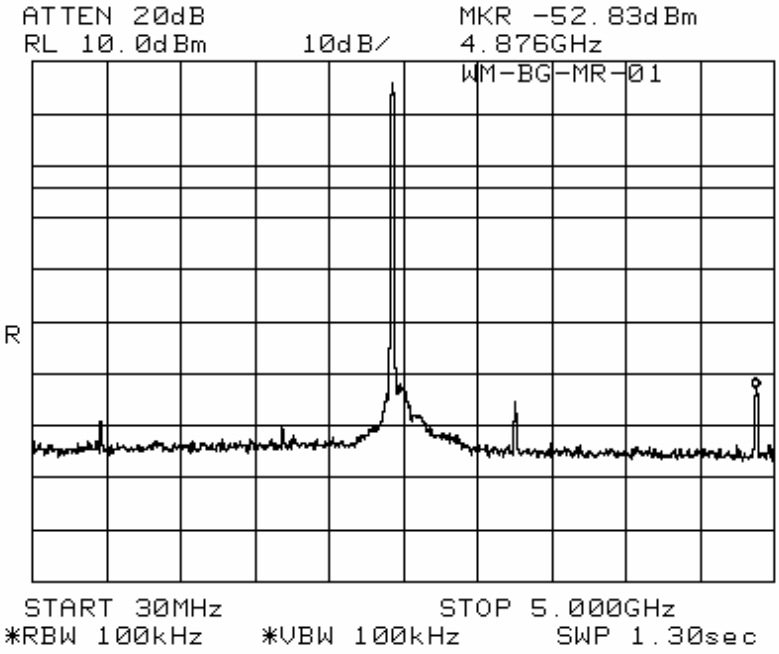
Band - edge (at 20 dB blow) – Low channel

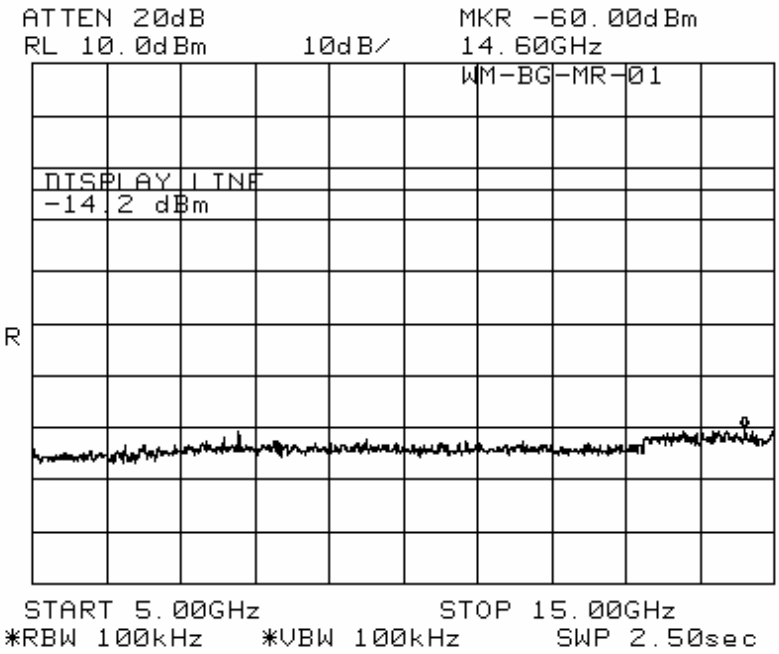
Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



Band - edge (at 20 dB blow) – Mid channel

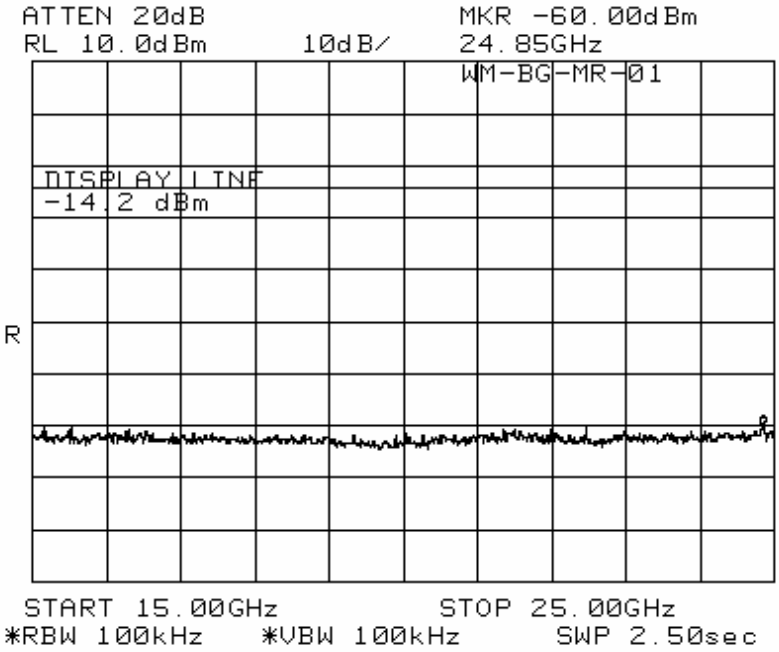
Frequency Range = 30 MHz ~ 10th harmonic.





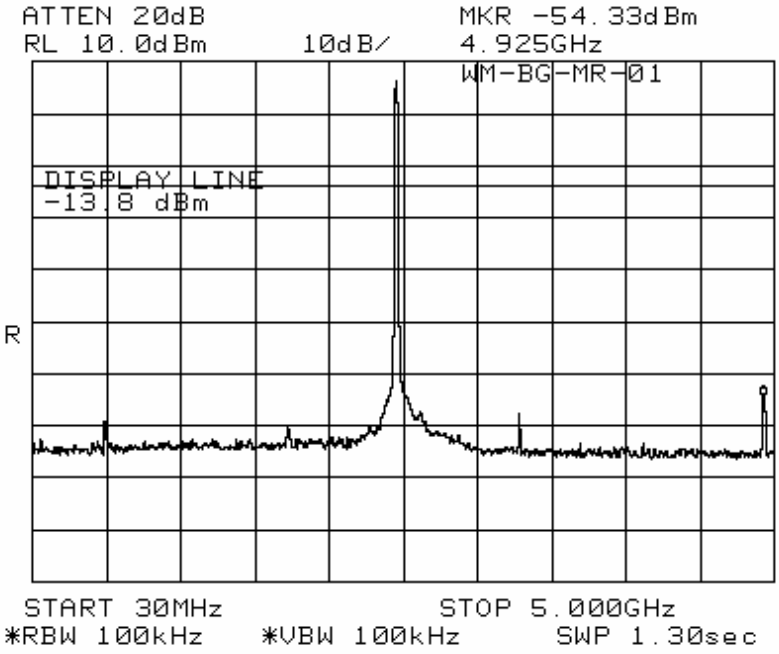
Band - edge (at 20 dB blow) – Mid channel

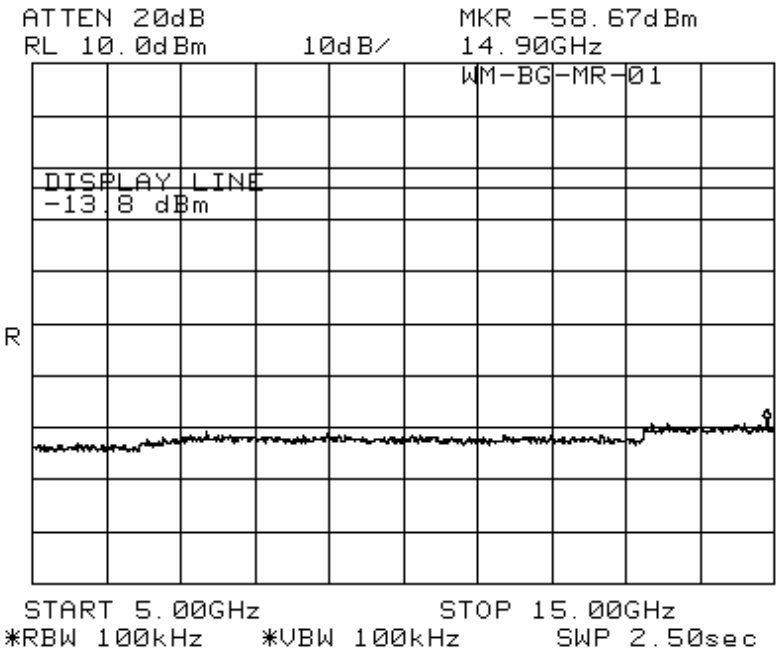
Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



Band - edge (at 20 dB blow) – High channel

Frequency Range = 30 MHz ~ 10th harmonic.





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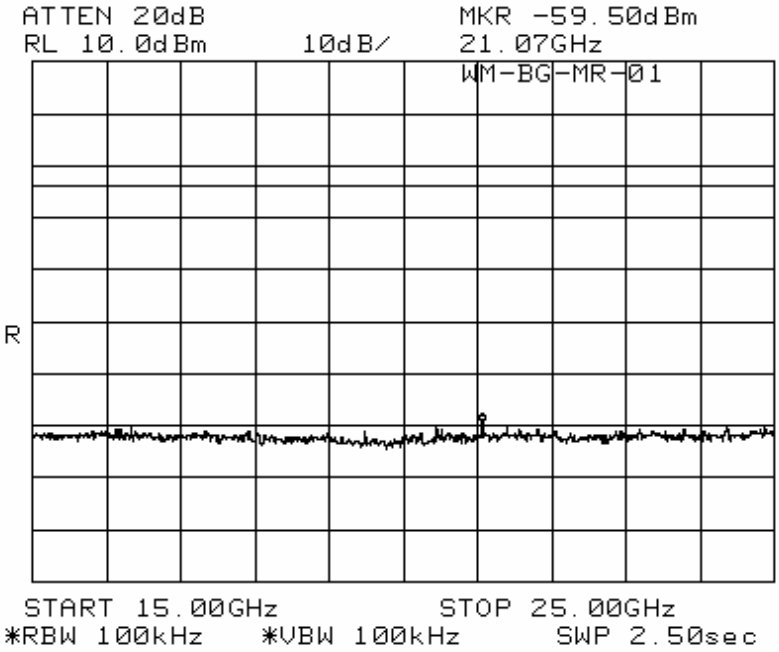
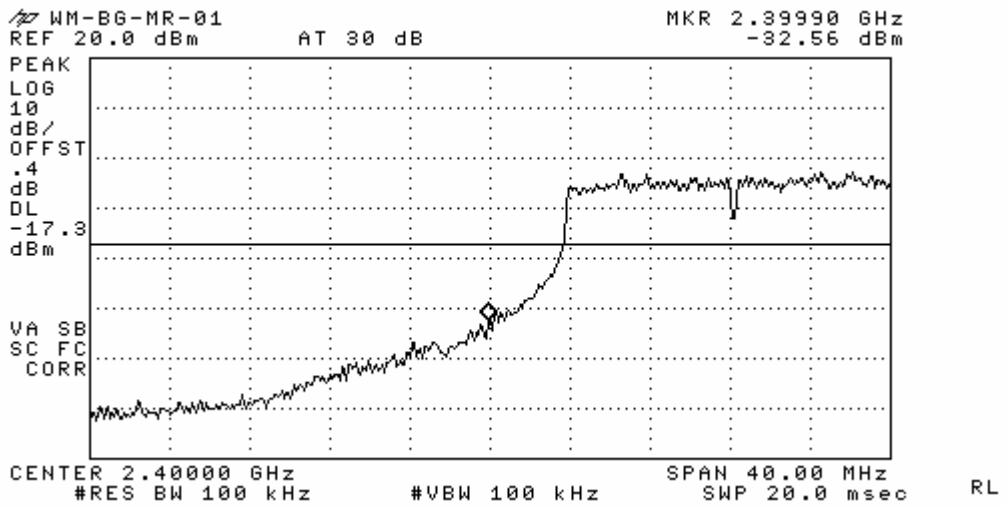
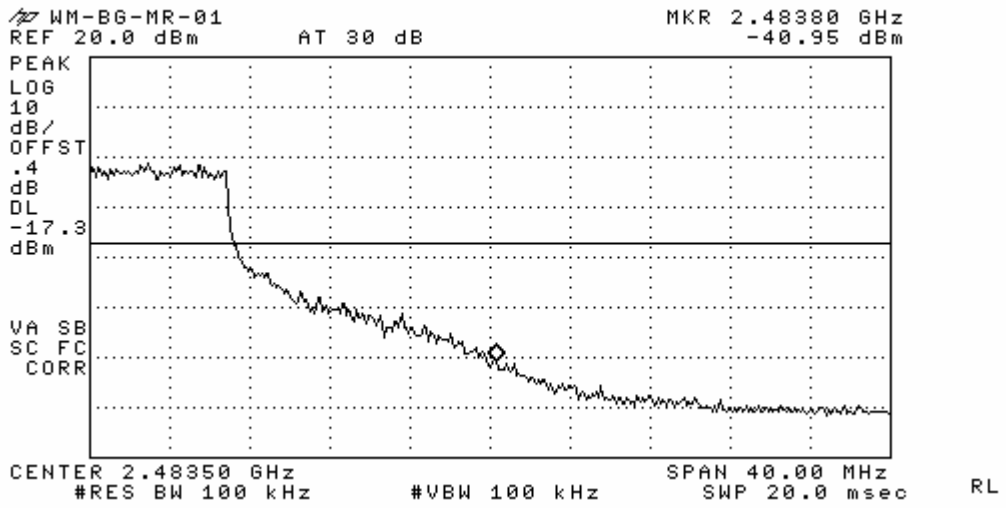
Band - edge (at 20 dB blow) – High channel

Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



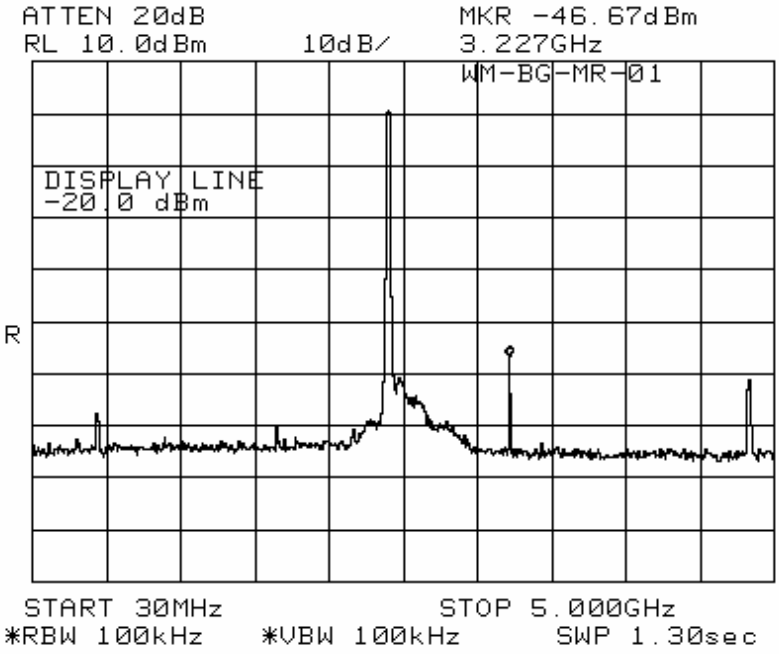
802.11g Band–edge Measurements

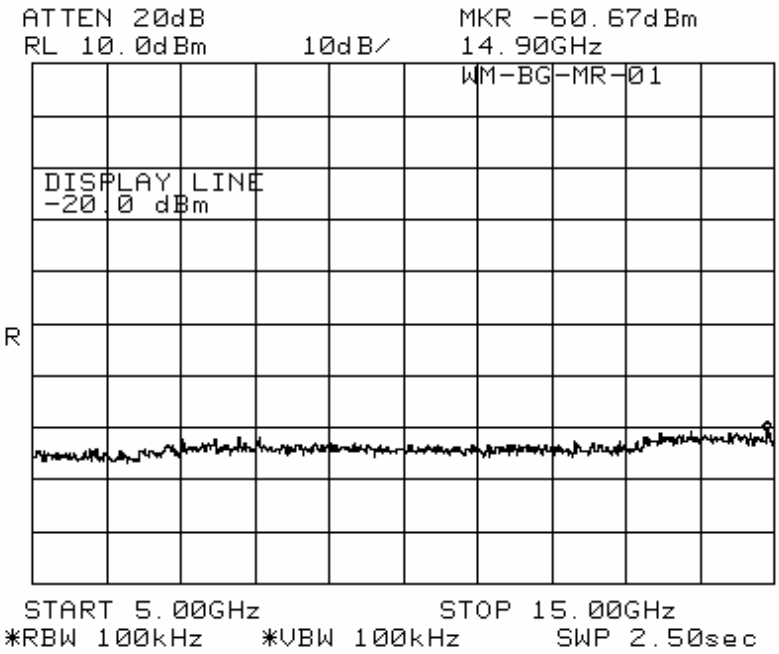




Band - edge (at 20 dB blow) – Low channel

Frequency Range = 30 MHz ~ 10th harmonic.





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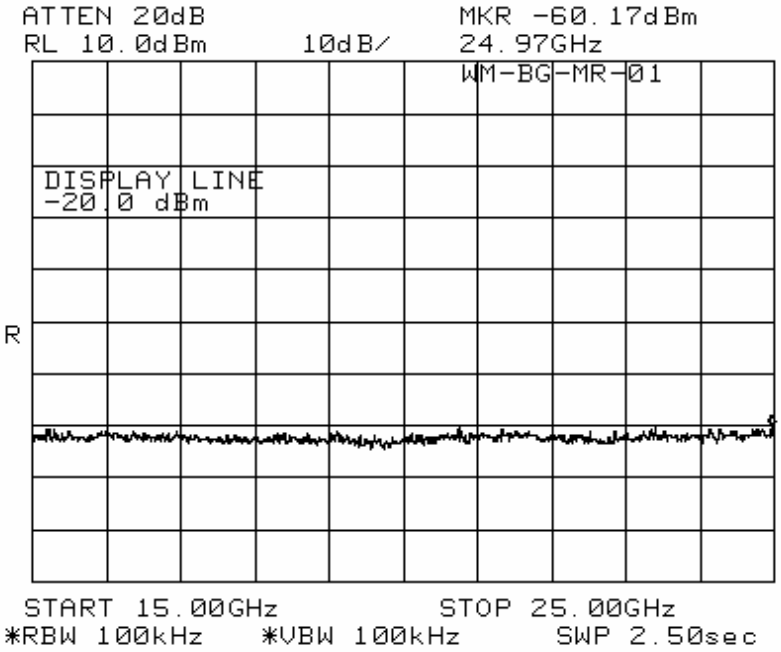
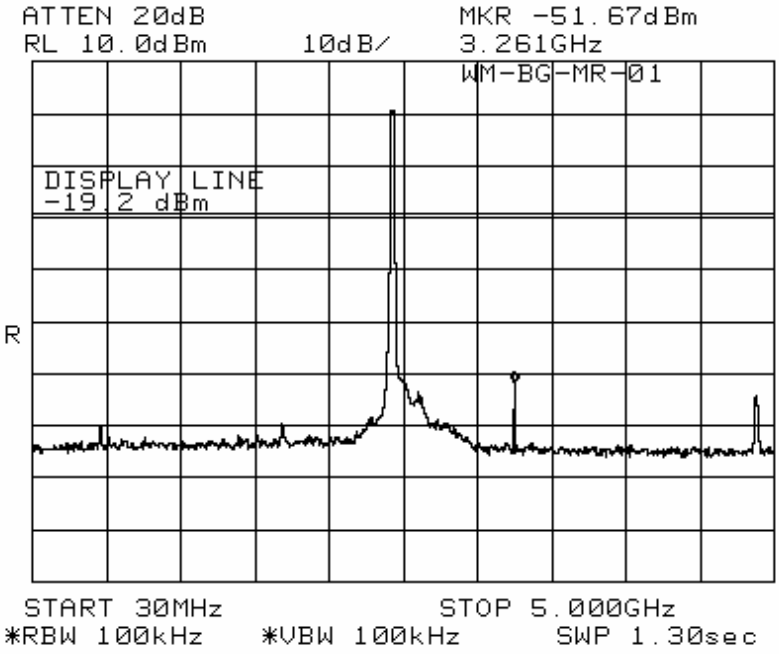
Band - edge (at 20 dB blow) – Low channel

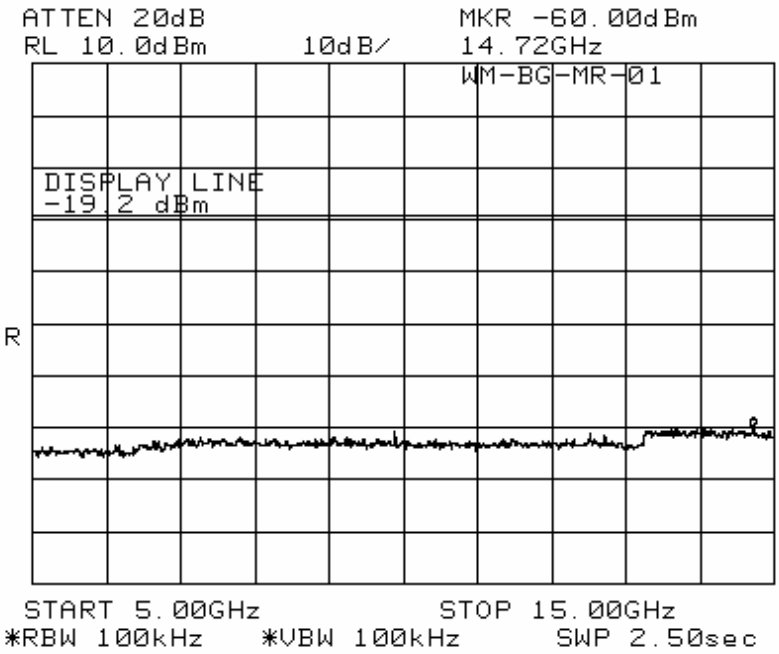
Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



Band - edge (at 20 dB blow) – Mid channel

Frequency Range = 30 MHz ~ 10th harmonic.





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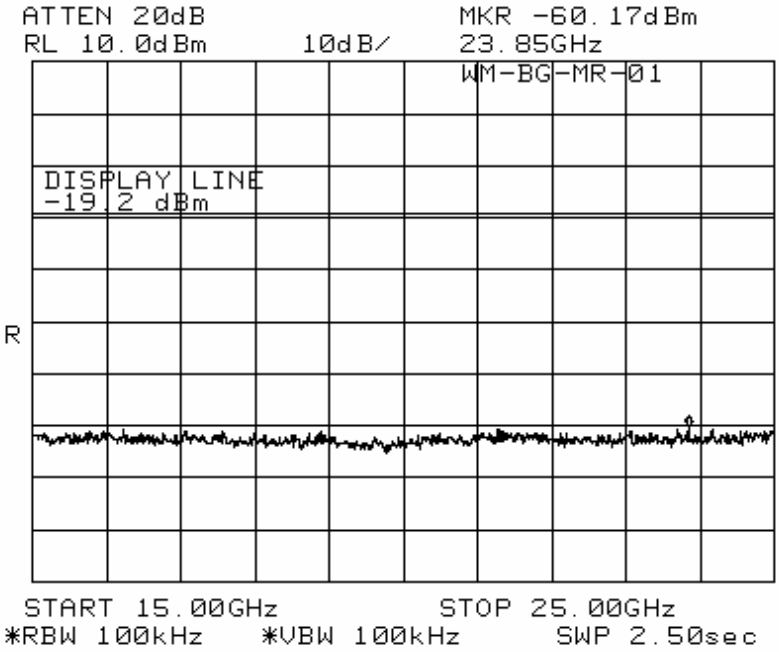
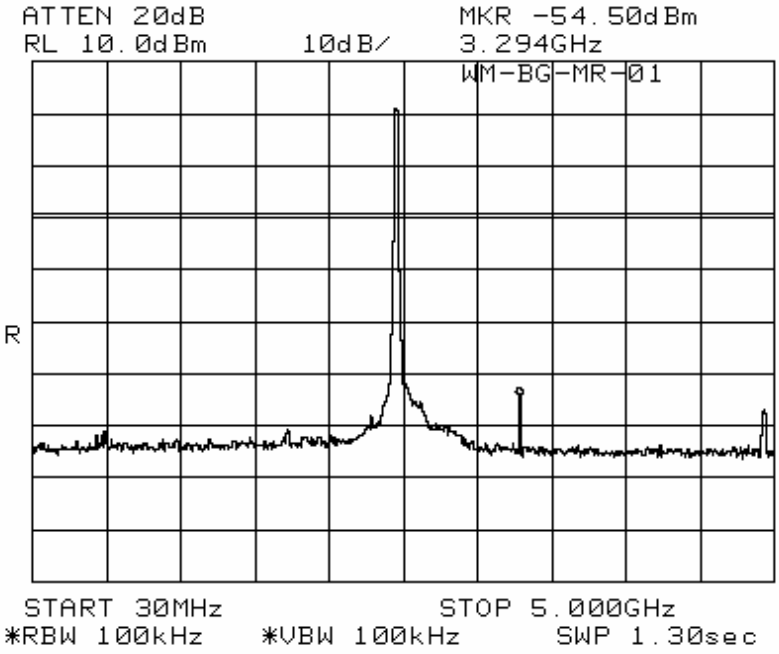
Band - edge (at 20 dB blow) – Mid channel

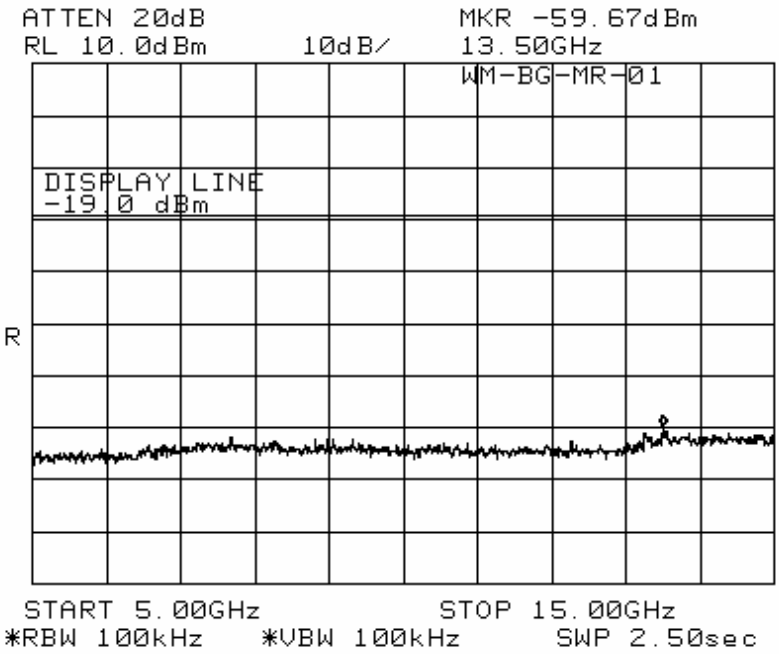
Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



Band - edge (at 20 dB blow) – High channel

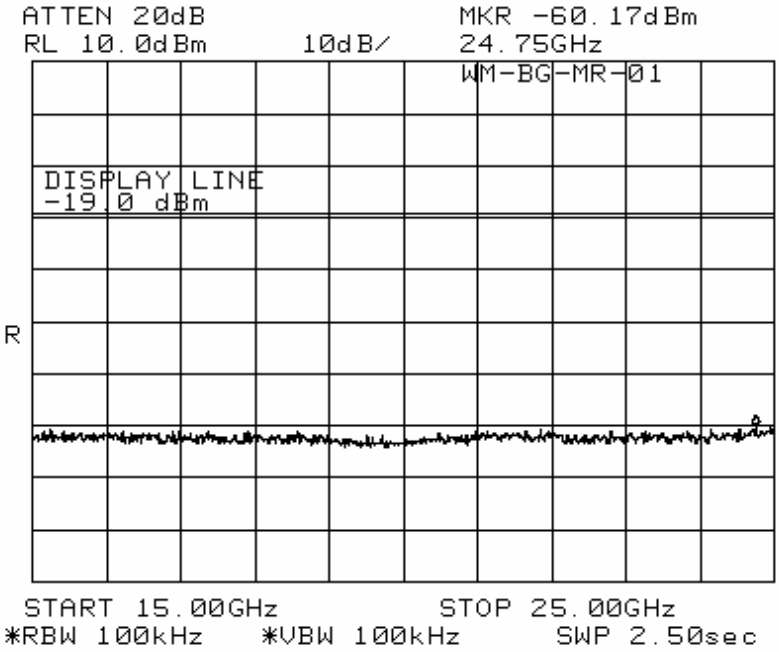
Frequency Range = 30 MHz ~ 10th harmonic.





Band - edge (at 20 dB blow) – High channel

Frequency Range = 30 MHz ~ 10th harmonics. **- Continues**



3.3.5 Field Strength of Harmonics

Procedure:

The EUT was placed on a 0.8m high wooden table inside a shielded enclosure. An antenna was placed near the EUT and measurements of frequencies and amplitudes of field strengths were recorded for reference during final measurements. For final radiated testing, measurements were performed in OATS. Measurements were performed with the EUT oriented in 3 orthogonal axis and rotated 360 degrees to determine worst-case orientation for maximum emissions.

The spectrum analyzer is set to:

Center frequency = the worst channel

Frequency Range = 30 MHz ~ 10th harmonic.

RBW = 100 kHz (30MHz ~ 1 GHz) VBW ≥ RBW

= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz Detector function = peak

Trace = max hold Sweep = auto

Measurement Data: Complies

- See next pages for actual measured data.

Minimum Standard: FCC Part 15.209(a)

Frequency (MHz)	Limit (uV/m) @ 3m
30 ~ 88	100 **
88 ~ 216	150 **
216 ~ 960	200 **
Above 960	500

** Except as provided in 15.209(g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88MHz, 174-216MHz or 470-806MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g. 15.231 and 15.241.

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802.11b Measurement Data:

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**
-	-	-	-	-	-
-	-	-	-	-	-
No emissions were detected at a level greater than 10dB below limit.					
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

802.11g Measurement Data:

Low channel		Mid channel		High channel	
Frequency (MHz)	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**	**Frequency (MHz)**	**Level (dBuV)**
-	-	-	-	-	-
-	-	-	-	-	-
No emissions were detected at a level greater than 10dB below limit.					
-	-	-	-	-	-
-	-	-	-	-	-
Measurement uncertainty		± 6 dB			

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3.3.6 AC Conducted Emissions

Procedure:

The conducted emissions are measured in the shielded room with a spectrum analyzer in peak hold. While the measurement, EUT had its hopping function disabled at the middle channels in line with Section 15.31(m). Emissions closest to the limit are measured in the quasi-peak mode (QP) with the tuned receiver using a bandwidth of 9 kHz. The emissions are maximized further by cable manipulation and Exerciser operation. The highest emissions relative to the limit are listed.

Measurement Data: Complies

- See next pages for actual measured spectrum plots.
- No emissions were detected at a level greater than 10dB below limit.

Minimum Standard: FCC Part 15.207(a)/EN 55022

Frequency Range (MHz)	Conducted Limit (dBuV)	
	Quasi-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

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AC Conducted Emissions –Line

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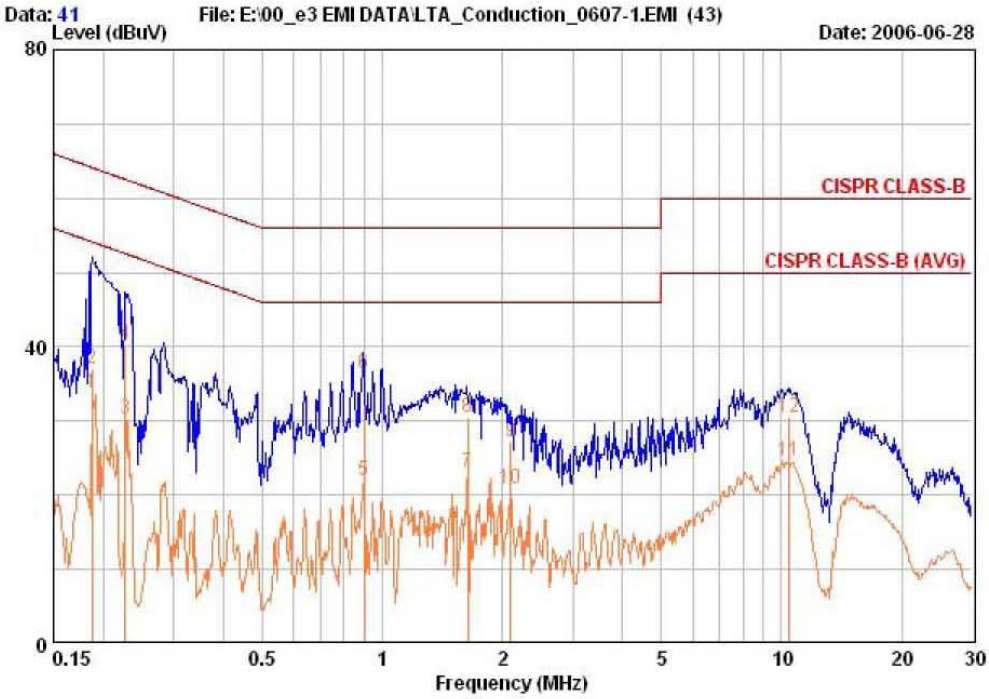
Fax:+82-31-323-6010

EUT / Model No.	: #1	Phase	: LINE
Test Mode	: Mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.19	36.70	33.55	0.28	36.98	33.83	64.15	54.15	27.17	20.32
0.23	40.20	30.18	0.21	40.41	30.39	62.57	52.57	22.16	22.18
0.90	36.10	21.63	0.41	36.51	22.04	56.00	46.00	19.49	23.96
1.64	30.20	22.62	0.39	30.59	23.01	56.00	46.00	25.41	22.99
2.10	26.70	20.37	0.45	27.15	20.82	56.00	46.00	28.85	25.18
10.40	29.60	23.72	0.92	30.52	24.64	60.00	50.00	29.48	25.36

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

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AC Conducted Emissions -Neutral

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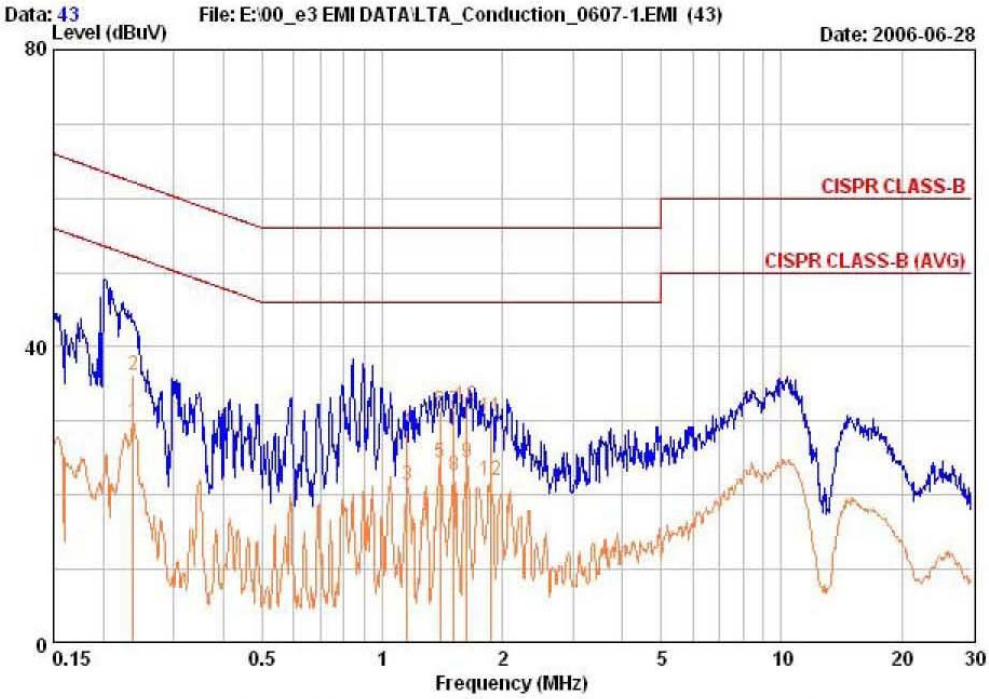
Fax:+82-31-323-6010

EUT / Model No.	: #1	Phase	: NEUTRAL
Test Mode	: Mode	Test Power	: 120 / 60
Temp./Humi.	: 24 / 77	Test Engineer	: K.T. LEE



Freq MHz	RD QP dBuV	RD AV dBuV	C.F dB	Result QP dBuV	Result AV dBuV	Limit QP dBuV	Limit AV dBuV	Margin QP dB	Margin AV dB
0.24	36.00	29.59	0.22	36.22	29.81	62.17	52.17	25.95	22.36
1.15	28.30	21.09	0.32	28.62	21.41	56.00	46.00	27.38	24.59
1.40	31.00	24.14	0.34	31.34	24.48	56.00	46.00	24.66	21.52
1.51	31.00	22.42	0.36	31.36	22.78	56.00	46.00	24.64	23.22
1.63	31.60	24.00	0.37	31.97	24.37	56.00	46.00	24.03	21.63
1.87	30.10	21.66	0.40	30.50	22.06	56.00	46.00	25.50	23.94

Remarks: C.F (Correction Factor) = Insertion loss + Cable loss

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APPENDIX

TEST EQUIPMENT USED FOR TESTS

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	Description	Model No.	Serial No.	Manufacturer	Next Cal. Date
1	Spectrum Analyzer	8594E	3649A03649	HP	Dec-06
2	Signal Generator	8657A	3430U02049	HP	Dec-06
3	Attenuator (3dB)	8491A	37822	HP	Dec-06
4	Attenuator (3dB)	8491A	28881	HP	Dec-06
5	EMI Test Receiver	ESVD	843748/001	R&S	Dec-06
6	Spectrum Analyzer	8591E	3649A05888	HP	Jan-07
7	Spectrum Analyzer	8563E	3425A02505	HP	Jan-07
8	RF Amplifier	8447D	2949A02670	HP	Jan-07
9	RF Amplifier	8447D	2439A09058	HP	Jan-07
10	RF Amplifier	8449B	3008A02126	HP	Jun-07
11	TRILOG Antenna	VULB 9160	9160-3172	SCHWARZBECK	Feb-07
12	Log.-Per. Antenna	VULP 9118	9118 A 401	SCHWARZBECK	Feb-07
13	Biconical Antenna	BBA 9106	VHA 9103-2315	SCHWARZBECK	Feb-07
14	Horn Antenna	3115	00055005	ETS LINDGREN	Jun-07
15	Horn Antenna	BBHA 9120D	0499	Schwarzbeck	Jun-07
16	Hygro-Thermograph	THB-36	0041557-01	ISUZU	Feb-07
17	Splitter (BNC)	ZFM-150	15542	Mini-Circuits	-
18	Splitter (SMA)	ZFSC-2-2500	SF617800326	Mini-Circuits	-
19	Power Divider	11636A	6243	HP	Apr-07
20	DC Power Supply	6622A	3448A03079	HP	Apr-07
21	Attenuator (30dB)	8498A	1801A06689	HP	Apr-07
22	Attenuator (10dB)	8491A	63196	HP	Apr-07
23	Power Meter	EPM-441A	GB32481702	HP	Apr-07
24	Power Sensor	8481A	2702A64048	HP	Apr-07
25	Audio Analyzer	8903B	3729A18901	HP	May-07
26	Modulation Analyzer	8901B	3749A05878	HP	May-07
27	Dipole Antenna	VHA9103	2116	Schwarzbeck	Oct-06
28	Dipole Antenna	VHA9103	2117	Schwarzbeck	Oct-06
29	Dipole Antenna	UHA9105	2261	Schwarzbeck	Oct-06
30	Dipole Antenna	UHA9105	2262	Schwarzbeck	Oct-06
31	Digital Multimeter	34401A	US36062141	HP	Apr-07
32	LISN	KNW-407	8-1430-1	Kyoritsu	Jan-07
33	Two-Line V-Network	ESH3-Z5	893045/017	R&S	Jan-07
34	Test Receiver	ESHS10	828404009	R&S	Jan-07
35	TEMP & HUMIDITY Chamber	YJ-500	L05022	JinYoung Tech	-

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