

TEST REPORT For FCC

Test Report No. : 2007040005
Date of Issue : April 16, 2007
FCC ID : QJCV400
Model/Type No. : V400
Kind of Product : Braille PDA
Applicant : HIMS Korea Co., Ltd.
Applicant Address : 139-9, Gajung -dong, Yuseong -gu, Daejeon, KOREA
Manufacturer : HIMS Korea Co., Ltd.
Manufacturer Address : 139-9, Gajung -dong, Yuseong -gu, Daejeon, KOREA
Contact Person : Il Hyung, Kim / Team Leader
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Received Date : March 2, 2007
Test period : Start : March 05, 2007 End : April 14, 2007
Test Results : ☒ In Compliance ☐ Not in Compliance

The test results presented in this report relate only to the object tested.

CTK Co., Ltd. is accredited by Korea Laboratory Accreditation Scheme (KOLAS) which signed the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) for the above test item(s) and test method(s).

Tested by



Eun-Won, Lee
Test Engineer
Date: April 16, 2007

Reviewed by



Young-Joon, Park
Technical Manager
Date: April 16, 2007



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REPORT REVISION HISTORY

Date	Revision	Page No
April 16, 2007	Issued (2007040005)	All

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1.0 General Product Description

Equipment model name	: V400
Serial number	: Prototype
EUT condition	: Pre-production, not damaged
Antenna type	: Chip antenna with 0dBi Gain (Antenna type is the same)
Frequency Range	: 2412Mhz ~ 2462MHz(DSSS/OFDM) : 2402 ~ 2480 MHz(Bluetooth)
RF output power	: 8.8 dBm Peak Conducted (802.11b) : 5.9 dBm Peak Conducted (802.11g) : -1.83 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	: 78.6%(Bluetooth)
Power Source	: Internal Lithium ion Battery(rechargeable battery)

1.1 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



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1.2 Model Differences

Not applicable

1.3 Device Modifications

The following modifications were necessary for compliance:

Not applicable

1.4 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.	FCC ID or DoC
AC Adaptor	Dee Van Electronics(Shen Zhen)Co., Ltd.	DSA-10P-05 050100	3106	DoC
Personal Computer	Hewlett-Packard Company	Hp pavilion t000_Gruper	KRJ50403HK	DoC
CRT Monitor	SAMSUNG	CDP-17P	P156H8WN927327	DoC
Keyboard (PS/2 type)	SAMSUNG	SEM-DT35	33008106	DoC
Mouse (PS/2 type)	SAMSUNG	OMS3CB	0303009873	DoC






1.5 Calibration Details of Equipment Used for Measurement

Test equipment and test accessories are calibrated on regular basis. The maximum time between calibrations is one year or what is recommended by the manufacturer, whichever is less. All test equipment calibrations are traceable to the Korea Research Institute of Standards and Science (KRISS), therefore, all test data recorded in this report is traceable to KRISS.

1.6 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea.

1.7 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 & 10 meter Open Area Test Sites and one conducted site to perform FCC Part 15/18 measurements.	 93250
JAPAN	VCCI	10 meter Open Area Test Site and one conducted site.	 R-948, C-986
KOREA	MIC	EMI (10 meter Open Area Test Site and two conducted sites) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and interruptions)	 No. 51, KR0025
International	KOLAS	EMC	
Europe	GLAS	EMC EN 55011, EN 55022, EN 61000-6-3, EN 61000-6-4, EN 61000-3-2, EN 61000-3-3, EN 61000-6-1, EN 61000-6-2, EN 50130-4, EN 55024, EN 61204-3, EN 60601-1-2, EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11	 No.13000796-02

2.0 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 Part 15.247, ANSI C63.4-2003

2.1 Technical Characteristic Test(Bluetooth)

2.1.1 Carrier Frequency Separation

Test Location

RF Test Room

Test Procedures

The carrier frequency separation was measured with a spectrum analyzer connected to the antenna terminal, while EUT has 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) Sweep = auto
VBW = 30 kHz (RBW) Detector function = peak
Trace = max hold

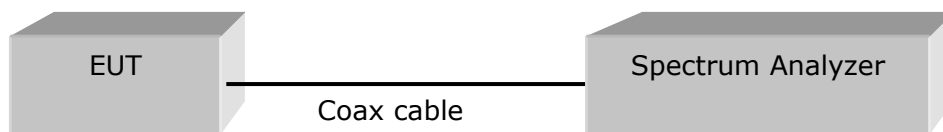


Figure 1 : Measurement setup for the carrier frequency separation

Limit

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

Test Results

Carrier Frequency Separation (MHz)	Result
1.020	Complies

See next pages for actual measured spectrum plots.



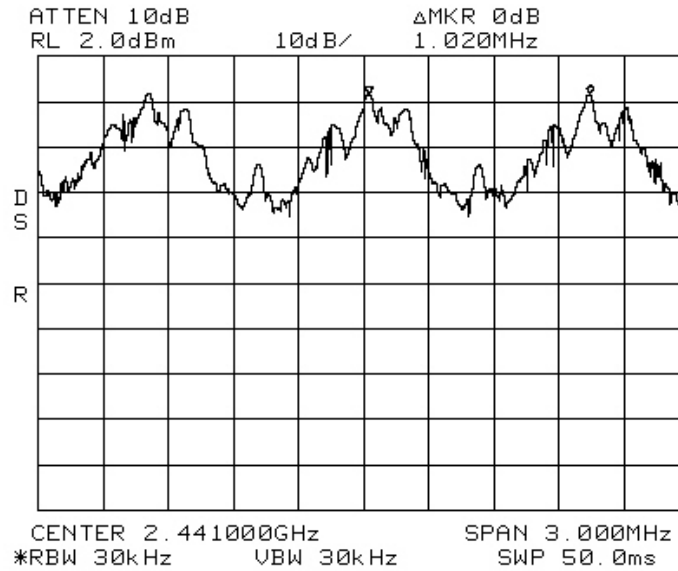
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Carrier Frequency Separation



2.1.2 Number of Hopping Frequencies

Test Location

RF Test Room

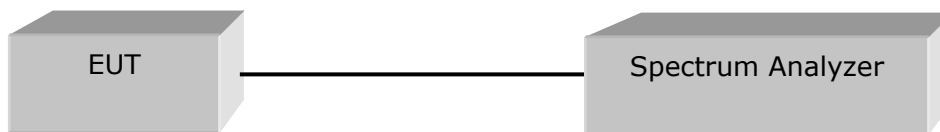
Test Procedures

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

The spectrum analyzer is set to:

Frequency range 1:Start = 2389.5 MHz, Stop = 2439.5 MHz
 2:Start = 2439.5 MHz, Stop = 2489.5 MHz

Span = 50 MHz
RBW = 300 kHz (1% of the span) Sweep = auto
VBW = 300 kHz (RBW) Detector function = peak
Trace = max hold



Limit

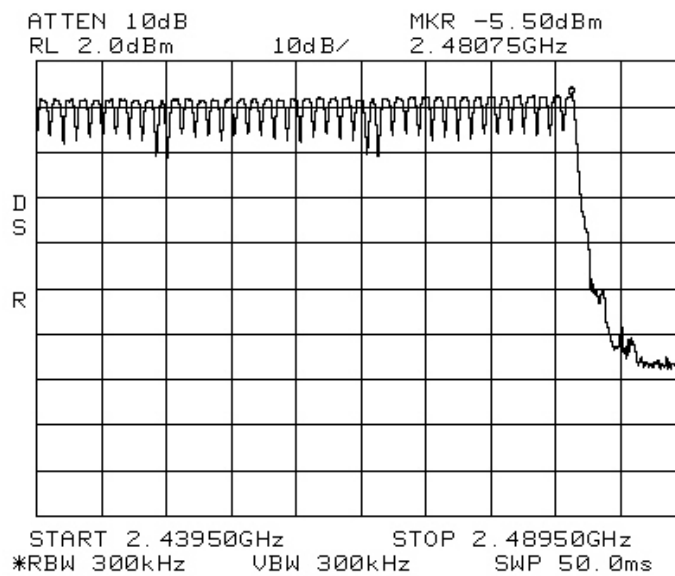
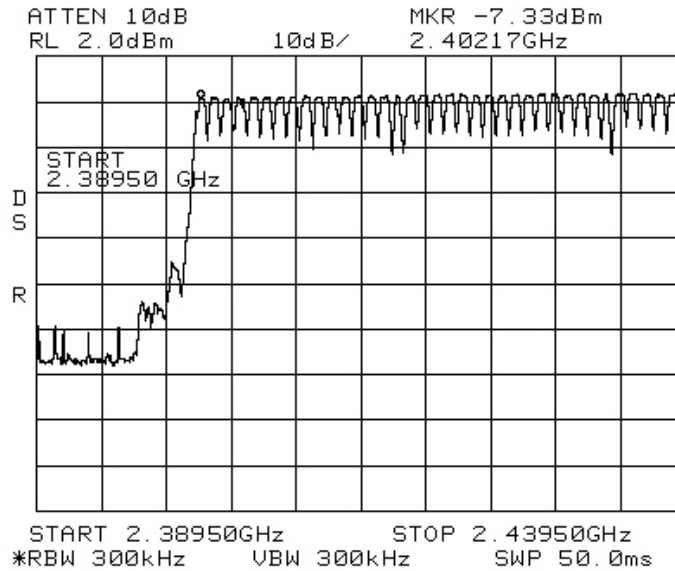
The EUT in the 2400-2483.5 MHz band shall use at least 75 channels.

Test Results

Total number of Hopping Channels	Result
79	Complies

See next pages for actual measured spectrum plots.

Number of Hopping Frequencies



2.1.3 20 dB bandwidth

Test Location

RF Test Room

Test Procedures

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 20 dB 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)

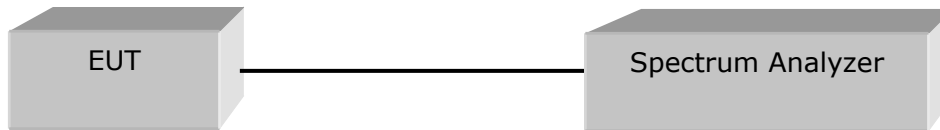
RBW = 30 kHz (1% of the span)

Sweep = auto

VBW = 30 kHz (RBW)

Detector function = peak

Trace = max hold



Limit

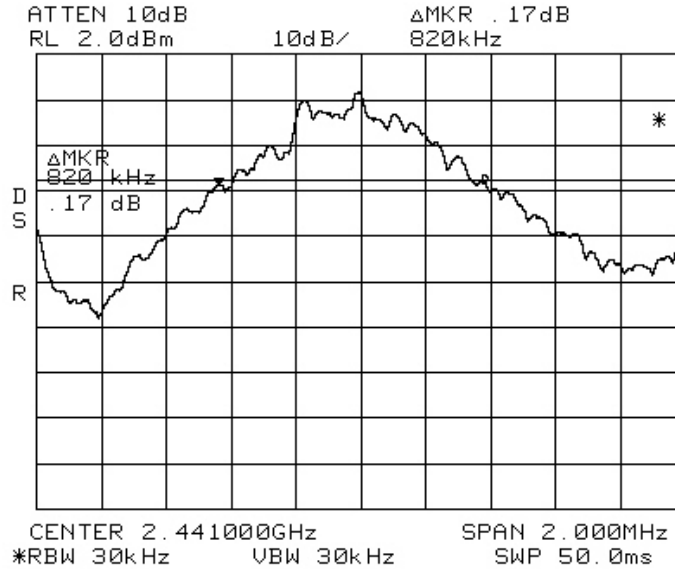
The Transmitter shall have a maximum 20 dB bandwidth of 1 MHz.

Test Results

Frequency (MHz)	Channel Number.	Measured Bandwidth (MHz)	Result
2441	0	0.820	Complies

See next pages for actual measured spectrum plots.(worst case)

20 dB Bandwidth



2.1.4 Time of Occupancy (Dwell Time)

Test Location

RF Test Room

Test Procedures

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

The spectrum analyzer is set to:

Center frequency = the highest, middle, and the lowest channels

Span = zero

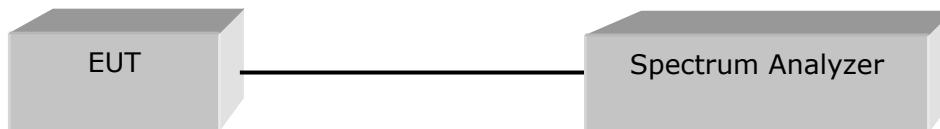
RBW = 1 MHz

Trace = max hold

VBW = 1 MHz (RBW)

Detector function = peak

Sweep = as necessary to capture the entire dwell time per hopping channel



Limit

The average time of occupancy on any channel shall not be greater than 0.4 seconds within a period of 0.4 seconds multiplied by the number of hopping channels employed.

Test Results

Channel Number	Channel Frequency (MHz)	Packet Type	Test Results	
			Dwell Time (ms)	Result
39	2441	DH 1	135.09	Complies
		DH 3	268.17	Complies
		DH 5	310.74	Complies

See next pages for actual measured spectrum plots.(Worst case)



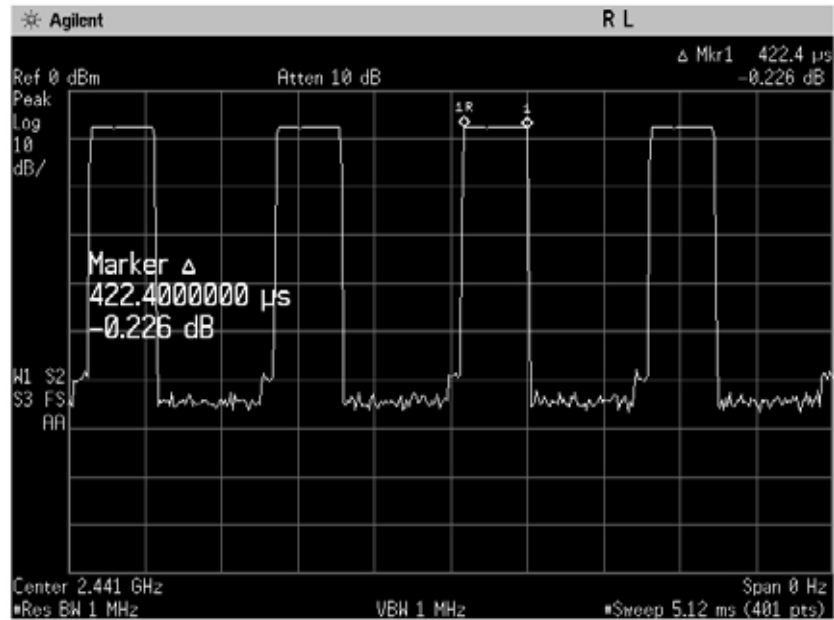
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Time of Occupancy for PACKET Type DH 1





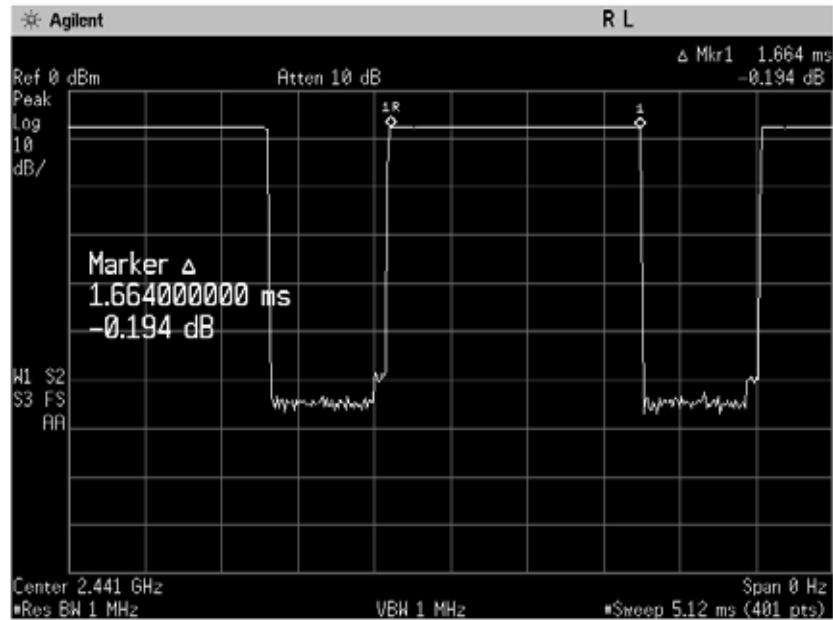
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Time of Occupancy for PACKET Type DH 3





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Time of Occupancy for PACKET Type DH 5



2.1.5 Maximum peak Conducted Output Power

Test Location

RF Test Room

Test Procedures

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

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)

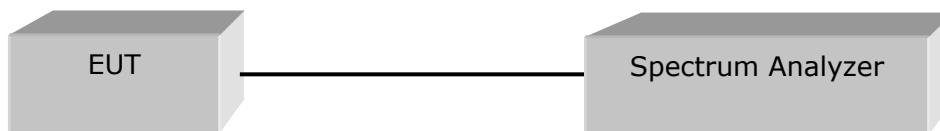
RBW = 1 MHz (greater than the 20 dB bandwidth of the emission being measured)

VBW = 1 MHz (RBW)

Detector function = peak

Trace = max hold

Sweep = auto



Limit

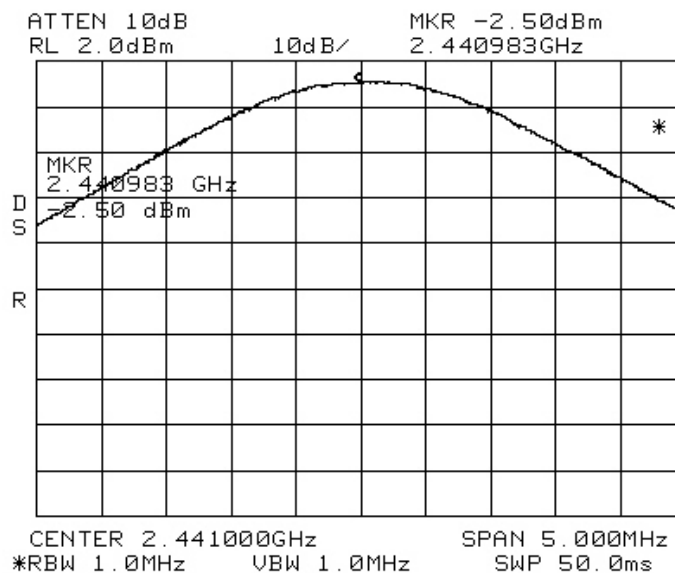
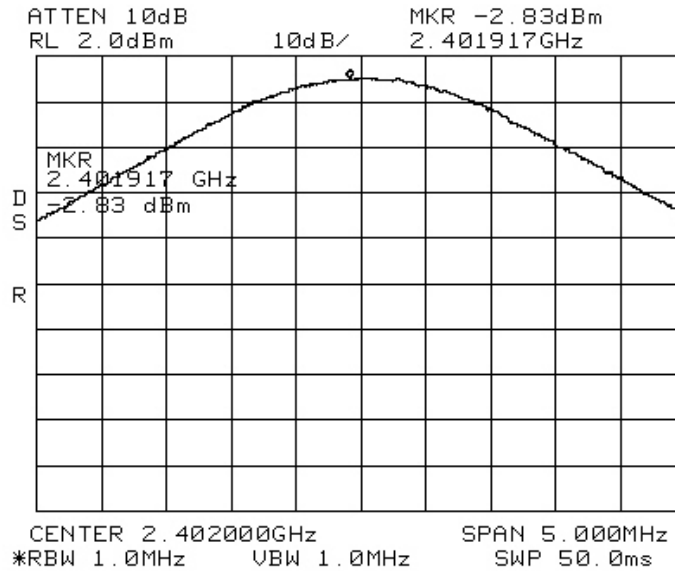
< 1 W

Test Results

Frequency (MHz)	Channel No.	Peak output power(dBm)	Peak output power(mW)	Result
2402	0	-2.83	0.521	Complies
2441	39	-2.50	0.562	Complies
2480	78	-1.83	0.656	Complies

See next pages for actual measured spectrum plots.

Maximum peak Conducted Output Power

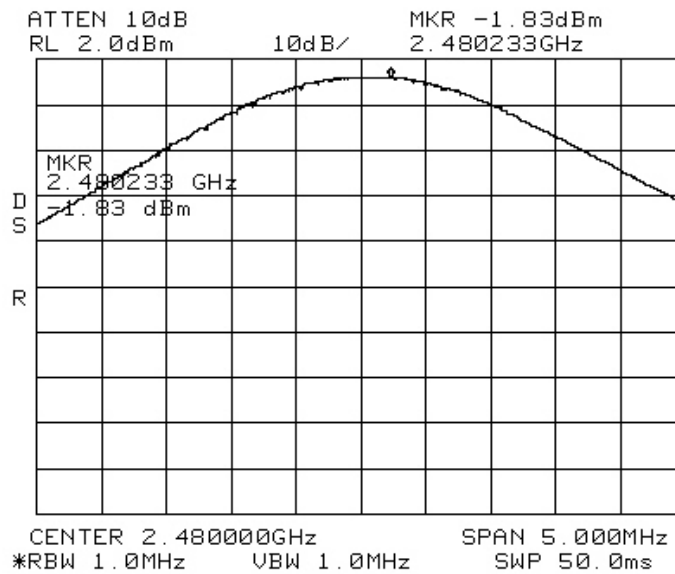




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2.1.6 Band-edge

Test Location

RF Test Room

Test Procedures

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

The spectrum analyzer is set to:

Center frequency = the highest, middle, and the lowest channels

RBW = 100 kHz

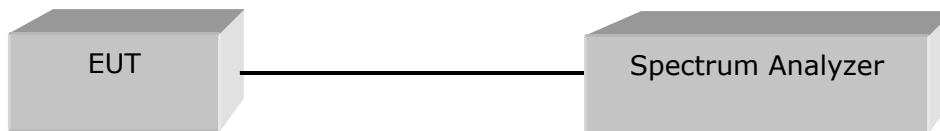
VBW = 100 kHz (RBW)

Span = 100 MHz

Trace = max hold

Detector function = peak

Sweep = auto



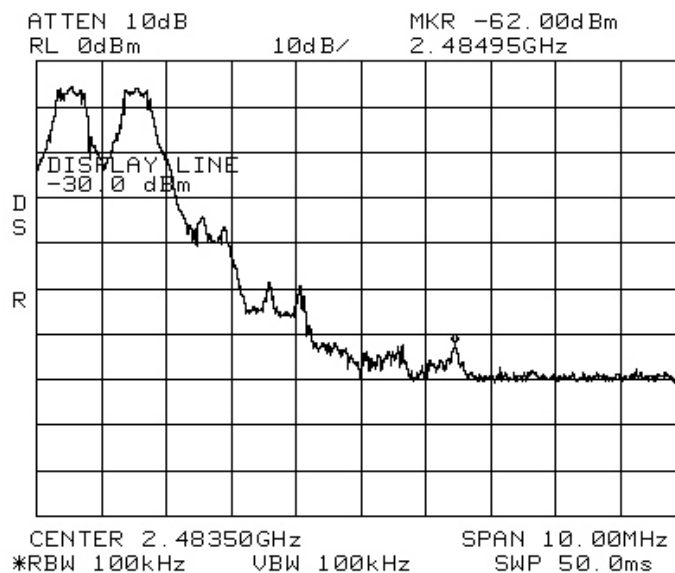
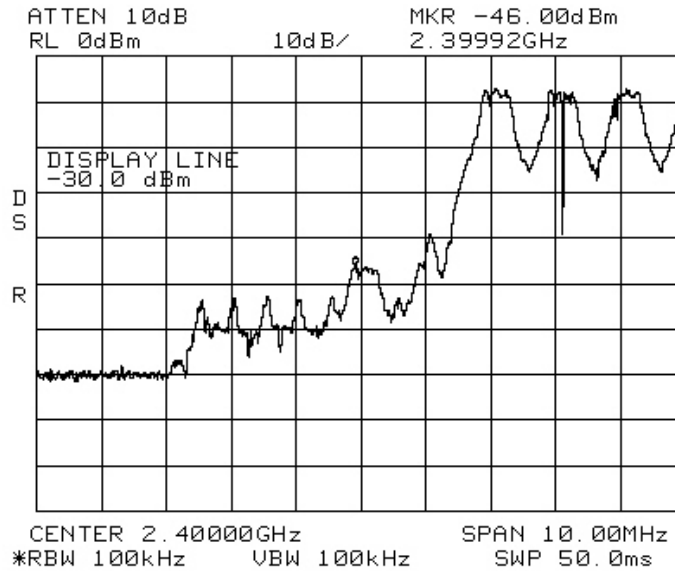
Limit

> 20 dBc

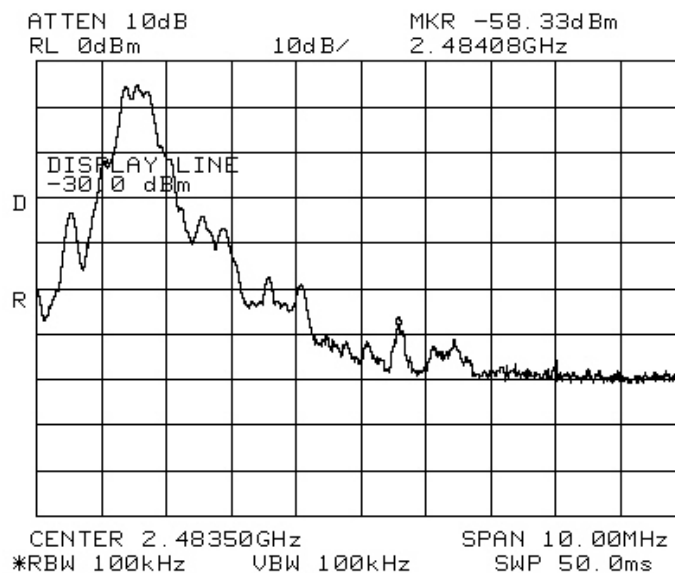
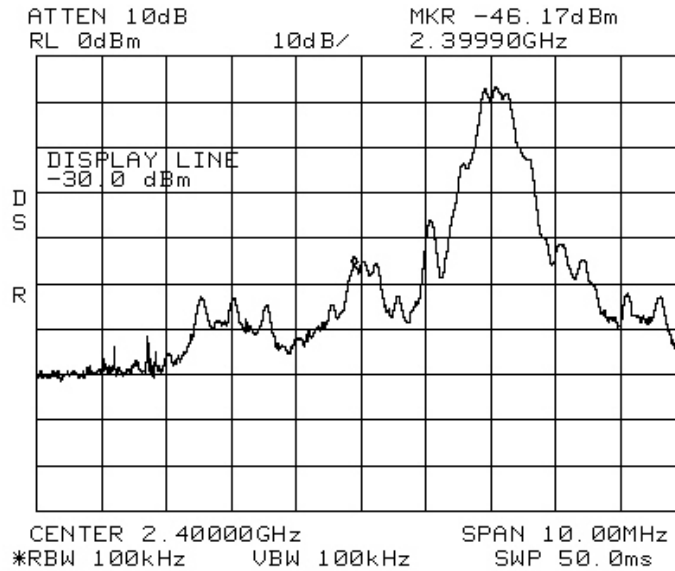
Test Results

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

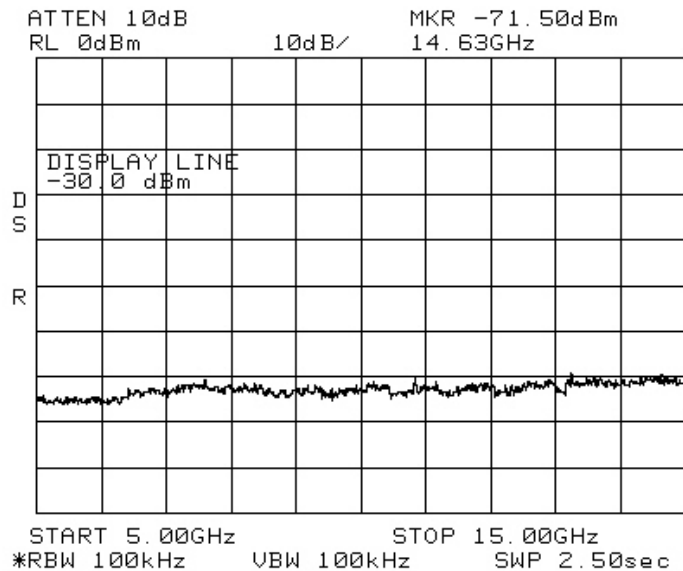
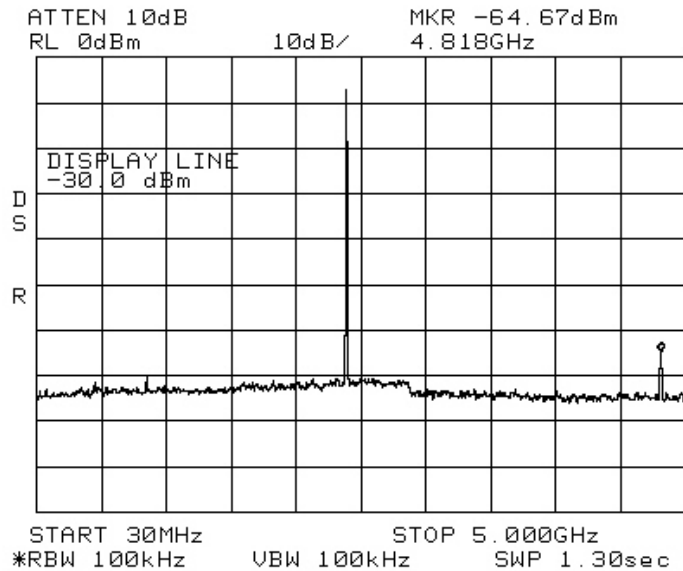
Band – edge (with Hopping)



Band – edge (without Hopping)



Band – edge (at 20 dB blow) – Low channel Frequency Range = 30 MHz ~ 10th harmonic





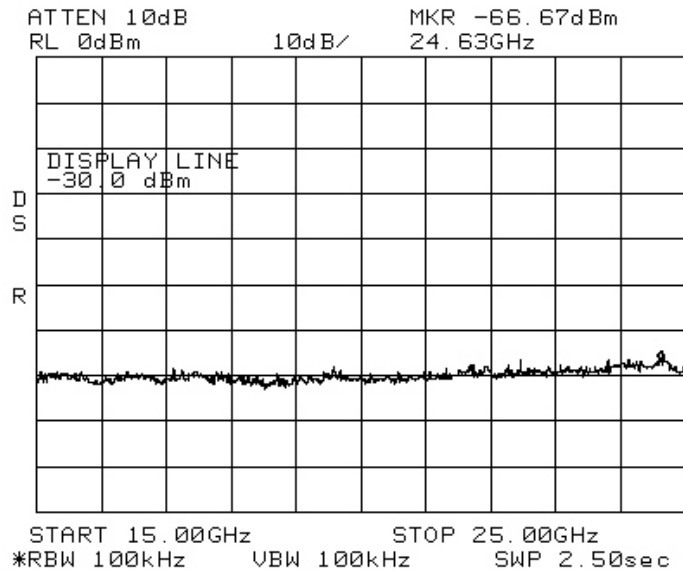
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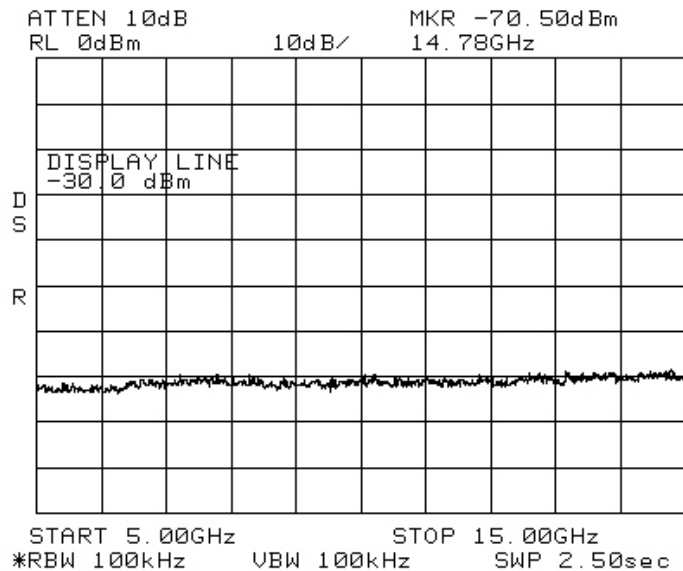
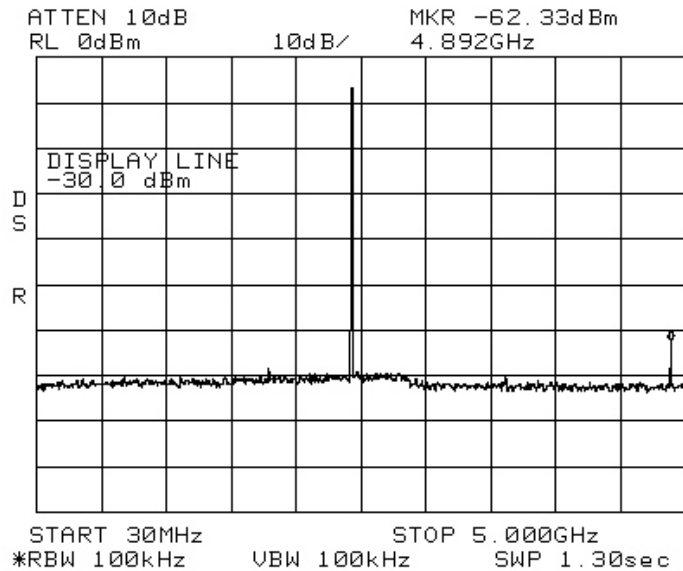
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Band – edge (at 20 dB blow) – Low channel Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – Mid channel
Frequency Range = 30 MHz ~ 10th harmonic





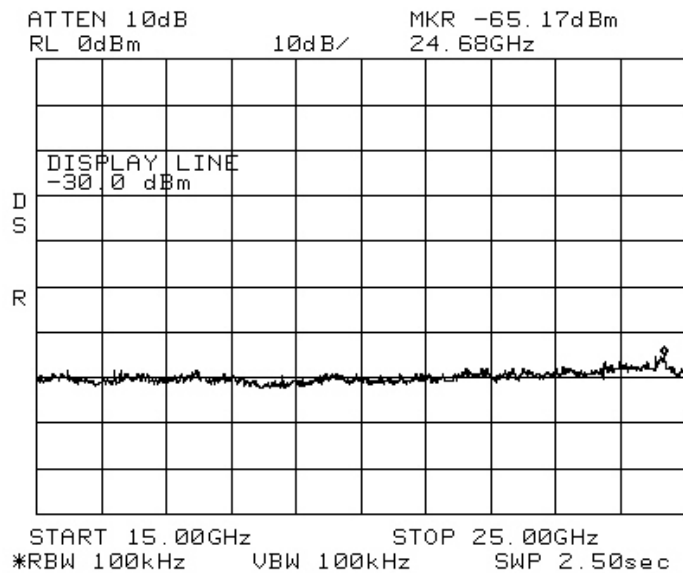
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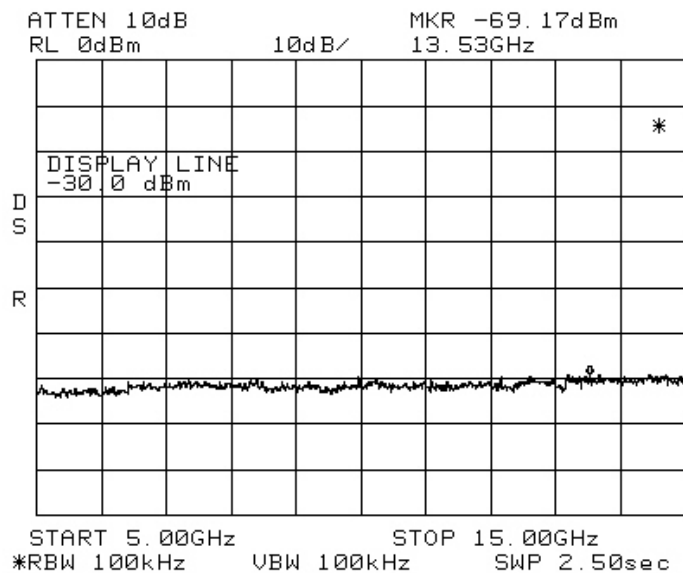
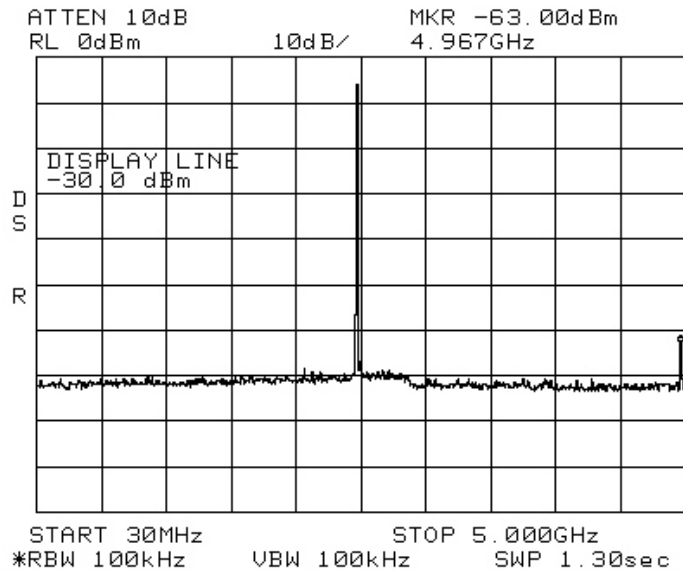
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Band – edge (at 20 dB blow) – Mid channel Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – High channel
Frequency Range = 30 MHz ~ 10th harmonic





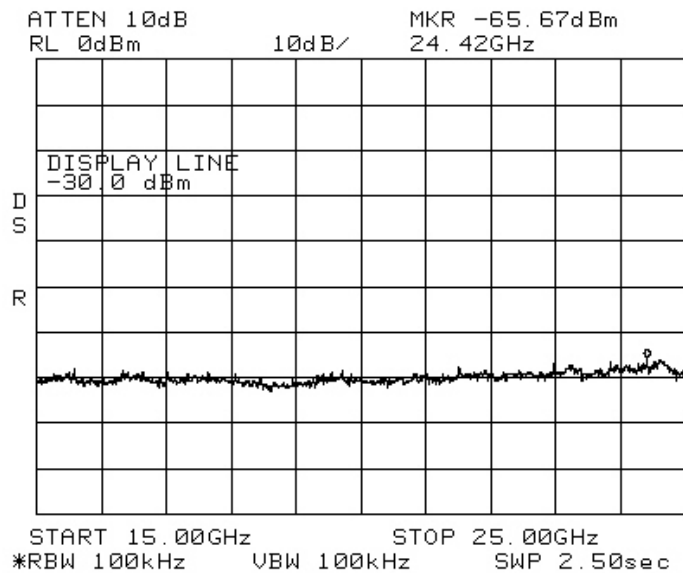
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Band – edge (at 20 dB blow) – High channel Frequency Range = 30 MHz ~ 10th harmonic



2.1.7 Field Strength of Emissions

Test Location

☒ Testing was performed at a test distance of 3 meter Open Area Test Site

Test Procedures

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

Center frequency = the worst channel

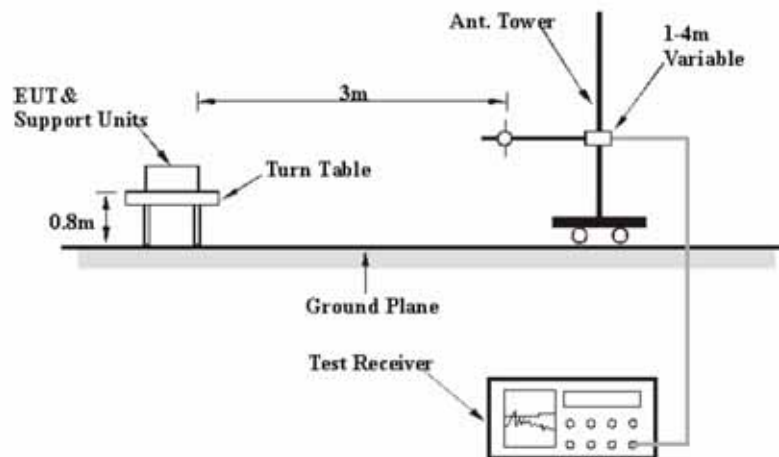
Frequency Range = 30 MHz ~ 10th harmonic

RBW = 120 kHz (30 MHz ~ 1 GHz) VBW RBW
= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

Detector function = Quasi-peak

Trace = max hold



Limit

- 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

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

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	Below 1000MHz
Channel	-	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
937.02	29.5	16.5	Quasi-Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
439.80	6.8	H	2.5	14.4		3.1	46.0	24.3	21.7
481.11	8.2	H	1.8	15.1		3.3	46.0	26.6	19.4
599.98	4.5	H	2.3	17.1		3.7	46.0	25.3	20.7
665.43	5.3	H	1.8	18.2		3.8	46.0	27.3	18.7
730.82	4.4	H	1.5	19.1		4.2	46.0	27.7	18.3
937.02	3.2	H	1.1	21.4		4.9	46.0	29.5	16.5

H: HORIZONTAL, V: VERTICAL

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	1-25GHz
Channel	Channel 0	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4812.00	44.9	9.1	Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
3323.00	39.6	V	1.0	29.9	35.5	9.1	54.0	43.1	10.9
4812.00	35.7	V	1.0	32.7	34.9	11.4	54.0	44.9	9.1

* No emissions were detected at a level greater than 20dB below limit

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
2378.70	40.5	V	1.0	28.2	35.3	7.4	54.0	40.8	13.2
2483.80	42.4	V	1.0	28.2	35.3	7.4	54.0	42.7	11.3

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	1-25GHz
Channel	Channel 39	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4885.00	44.7	9.3	Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
3324.00	39.5	V	1.0	29.9	35.5	9.1	54.0	43.0	11.0
4885.00	35.5	V	1.0	32.7	34.9	11.4	54.0	44.7	9.3

* No emissions were detected at a level greater than 20dB below limit

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	1-25GHz
Channel	Channel 78	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4967.00	45.9	8.1	Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
3325.00	40.1	V	1.0	29.9	35.5	9.1	54.0	43.6	10.4
4967.00	36.7	V	1.0	32.7	34.9	11.4	54.0	45.9	8.1

* No emissions were detected at a level greater than 20dB below limit

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
2378.80	39.8	V	1.0	28.2	35.3	7.4	54.0	40.1	13.9
2483.90	41.5	V	1.0	28.2	35.3	7.4	54.0	41.8	12.2



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2.1.8 AC Conducted Emissions

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (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.

Test Results

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
0.46	48.7	8.1	Quasi-peak



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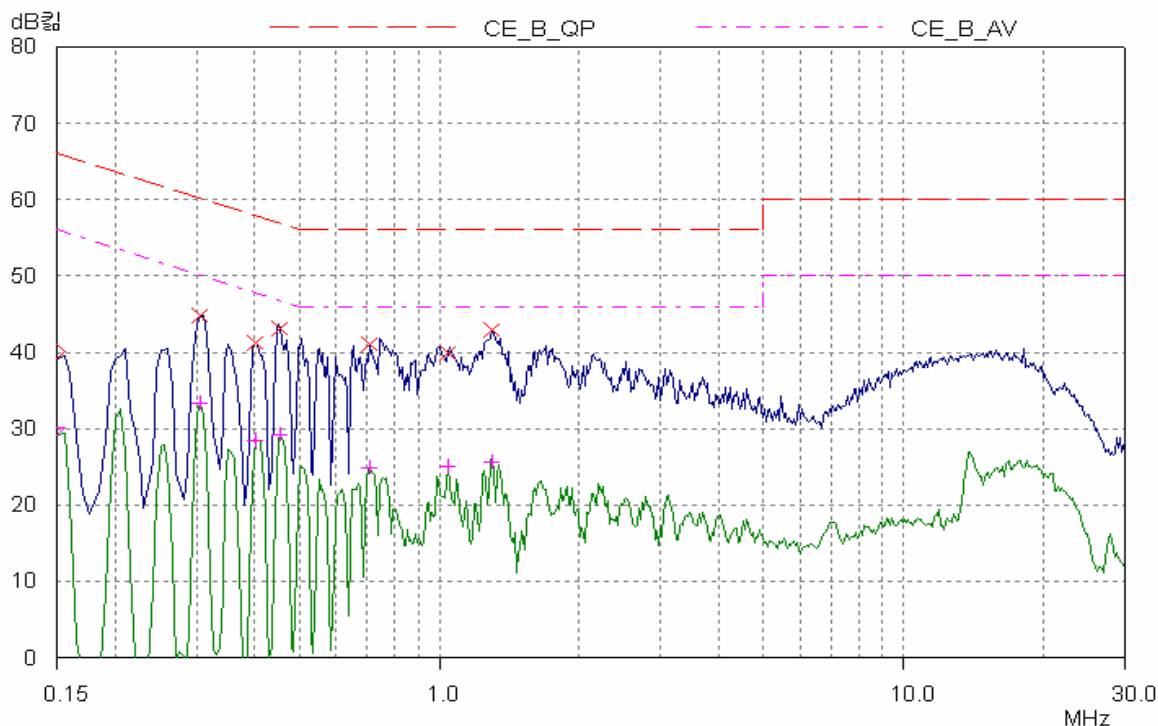


Test Data

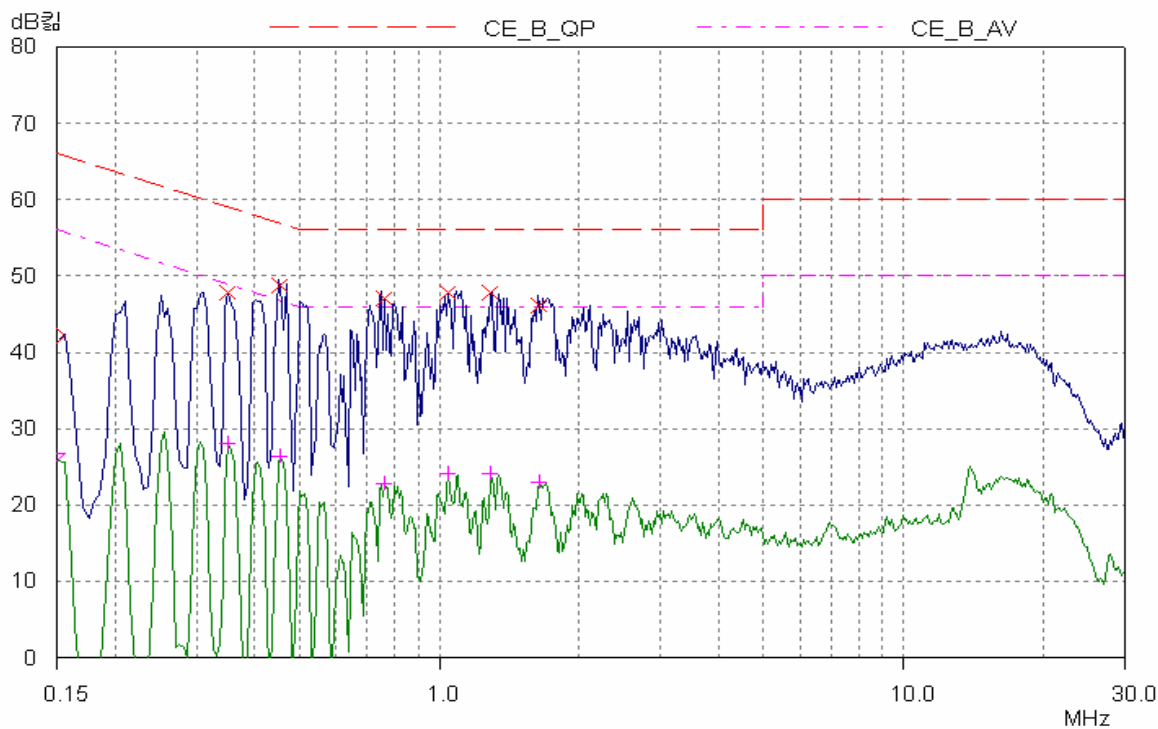
Frequency	Correction		Line	Quasi-peak				Average			
	Factor			Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable									
[MHz]											
0.35	0.2	0.2	N	59.0	47.3	47.7	11.2	49.0	27.7	28.1	20.8
0.46	0.2	0.2	N	56.8	48.3	48.7	8.1	46.8	26.0	26.4	20.4
0.76	0.2	0.2	N	56.0	46.7	47.1	8.9	46.0	22.5	22.9	23.1
1.05	0.2	0.2	N	56.0	47.4	47.8	8.2	46.0	23.8	24.2	21.8
1.29	0.2	0.2	N	56.0	47.4	47.8	8.2	46.0	23.8	24.2	21.9
1.65	0.2	0.2	N	56.0	45.7	46.1	9.9	46.0	22.6	23.0	23.0
										</	

H : HOT, N : NEUTRAL

[HOT]



[NEUTRAL]



3.1 Technical Characteristic Test (802.11b/g)

3.1.1 6dB 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	9.67	Complies
	2437	6	9.67	Complies
	2462	11	9.67	Complies
802.11g	2412	1	16.73	Complies
	2437	6	16.83	Complies
	2462	11	16.83	Complies

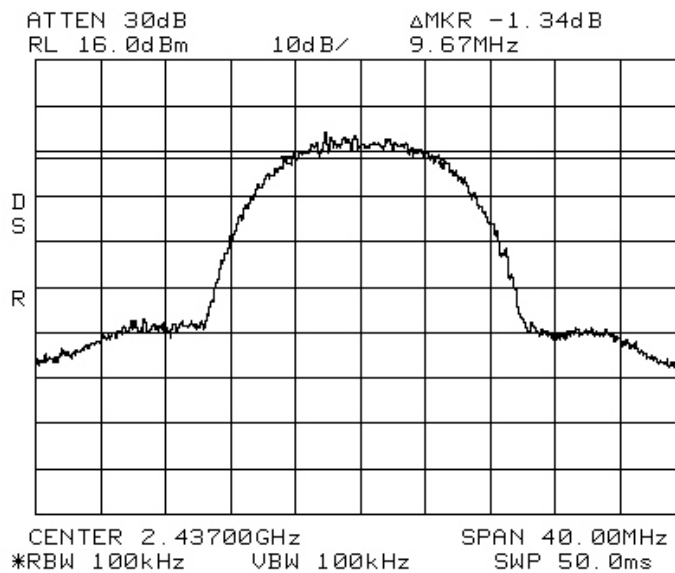
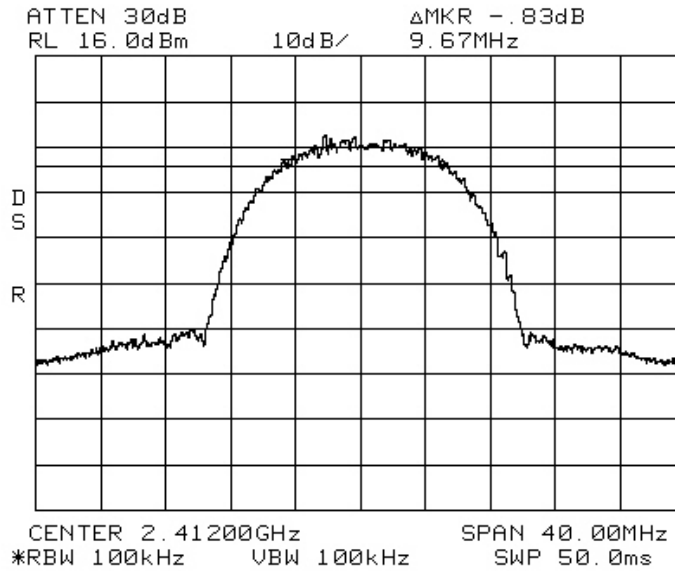
- See next pages for actual measured spectrum plots.

Minimum Standard:

6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.

802.11b





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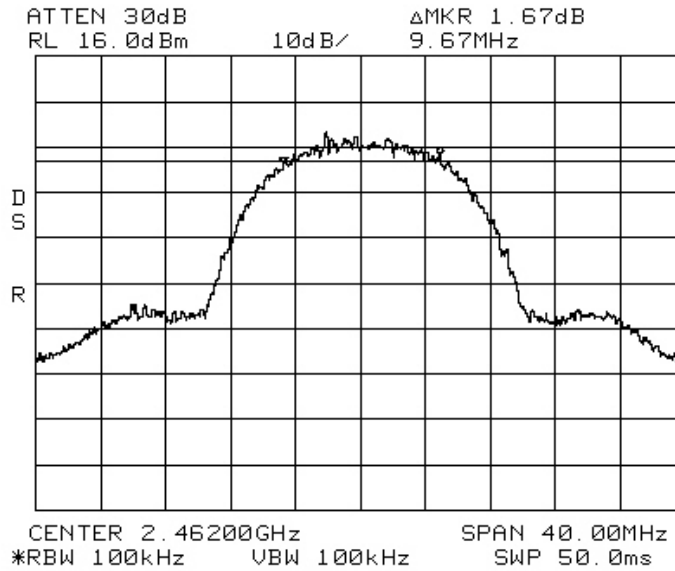
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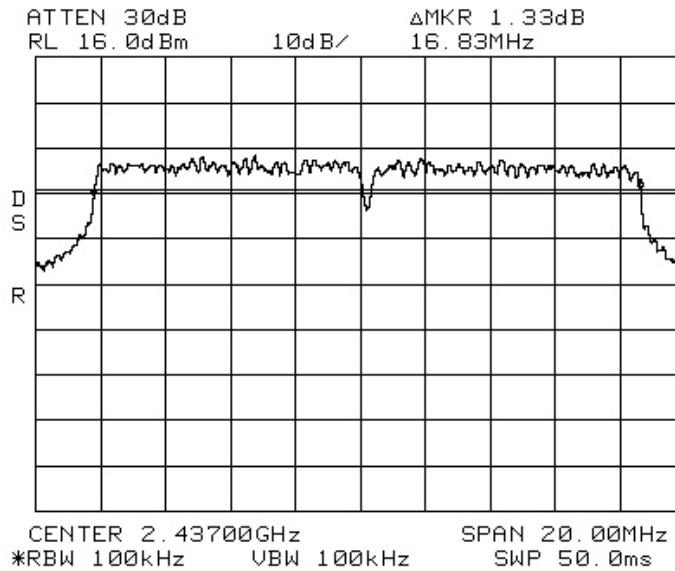
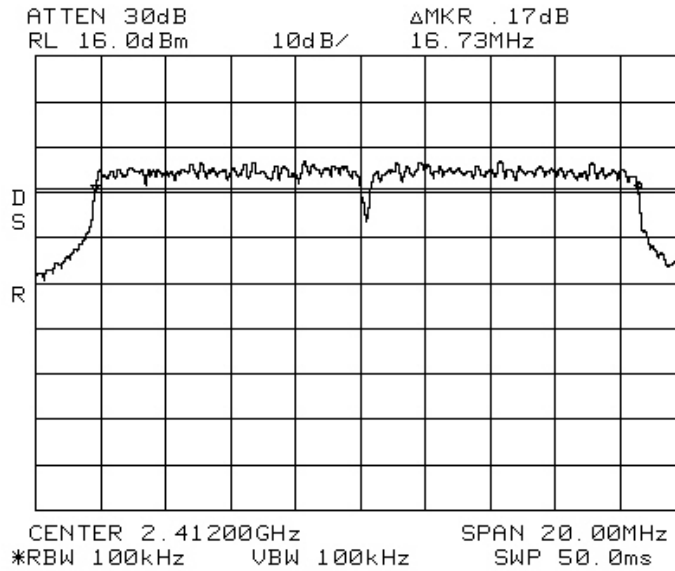
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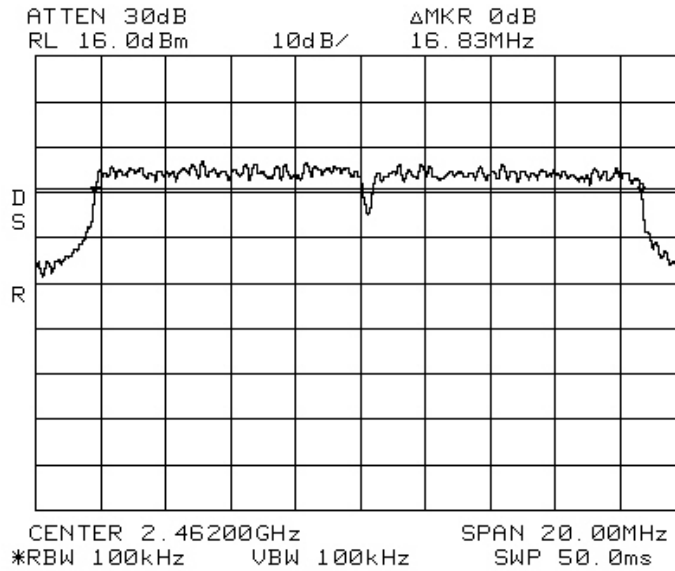
802.11b



802.11g



802.11g



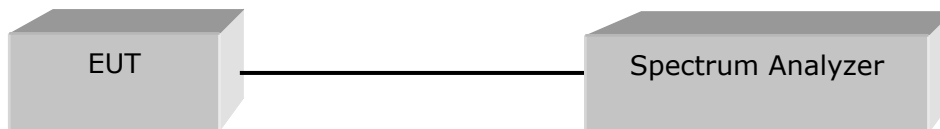
3.1.2 Maximum peak Conducted Output Power

Test Location

RF Test Room

Test Procedures

The transmitter output is connected to a spectrum analyzer and the analyzer's internal channel power integration function is used to integrate the power over a bandwidth greater than or equal to the 99% bandwidth.



Limit

< 1 W

Test Results

802.11b mode

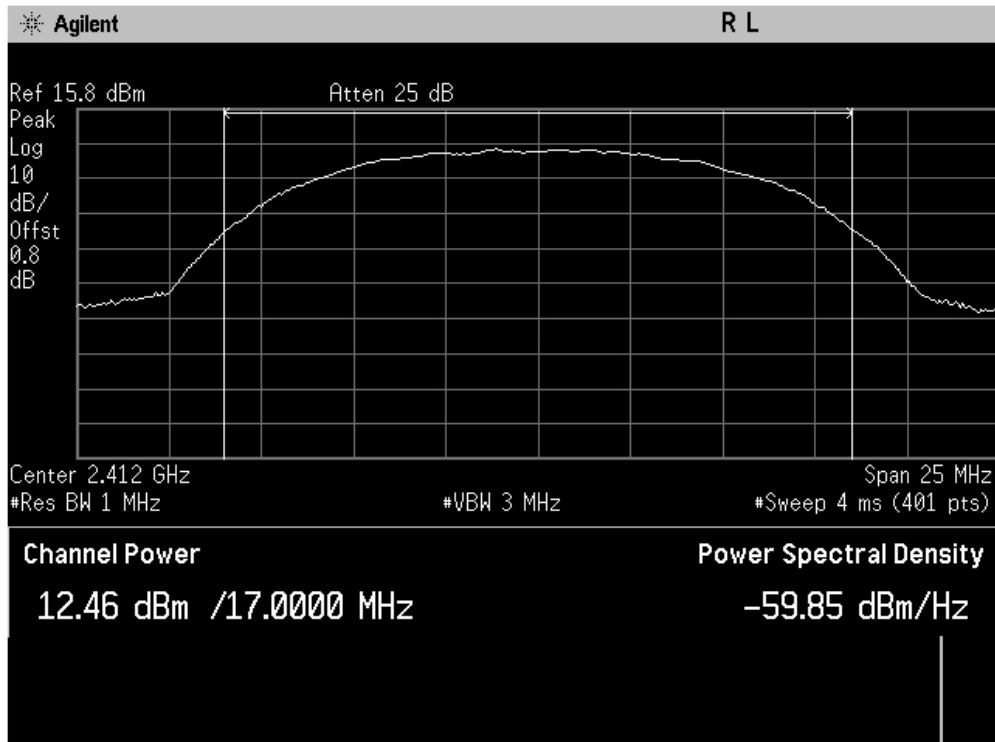
Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	12.46	30dBm	Complies
2437	Middle	12.86	30dBm	Complies
2462	High	12.88	30dBm	Complies

802.11g mode

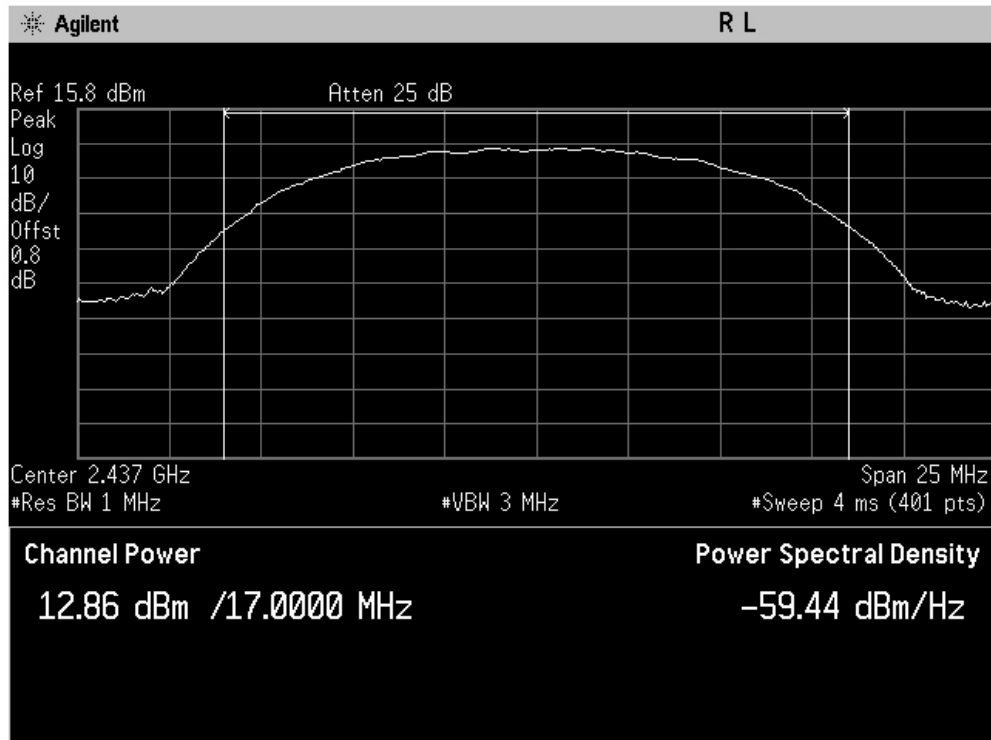
Frequency (MHz)	Channel No.	Peak output power(dBm)	Peak output power(mW)	Result
2412	Low	12.62	30dBm	Complies
2437	Middle	13.35	30dBm	Complies
2462	High	13.28	30dBm	Complies

See next pages for actual measured spectrum plots.

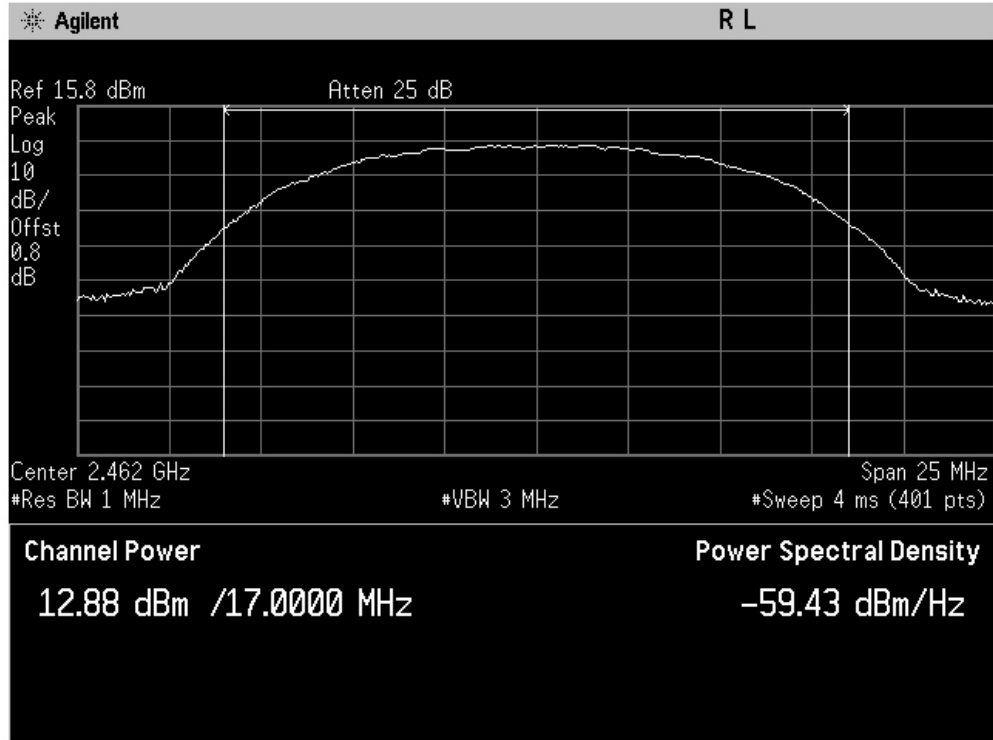
Peak Conducted Output Power low Ch – 802.11b



Peak Conducted Output Power middle Ch – 802.11b



Peak Conducted Output Power high Ch – 802.11b





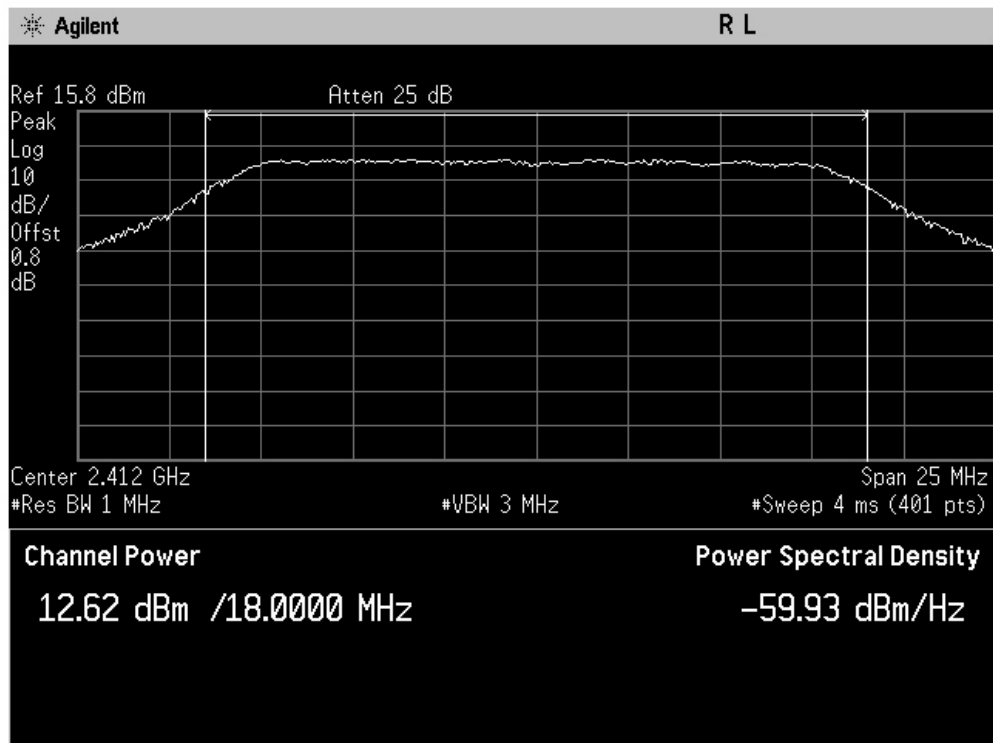
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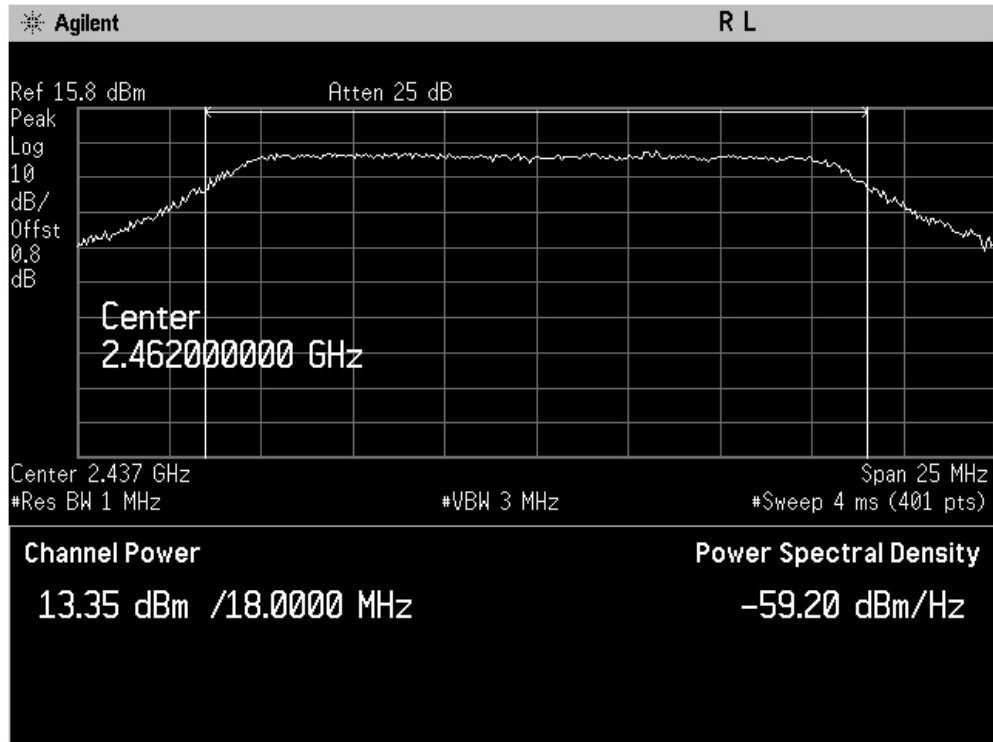
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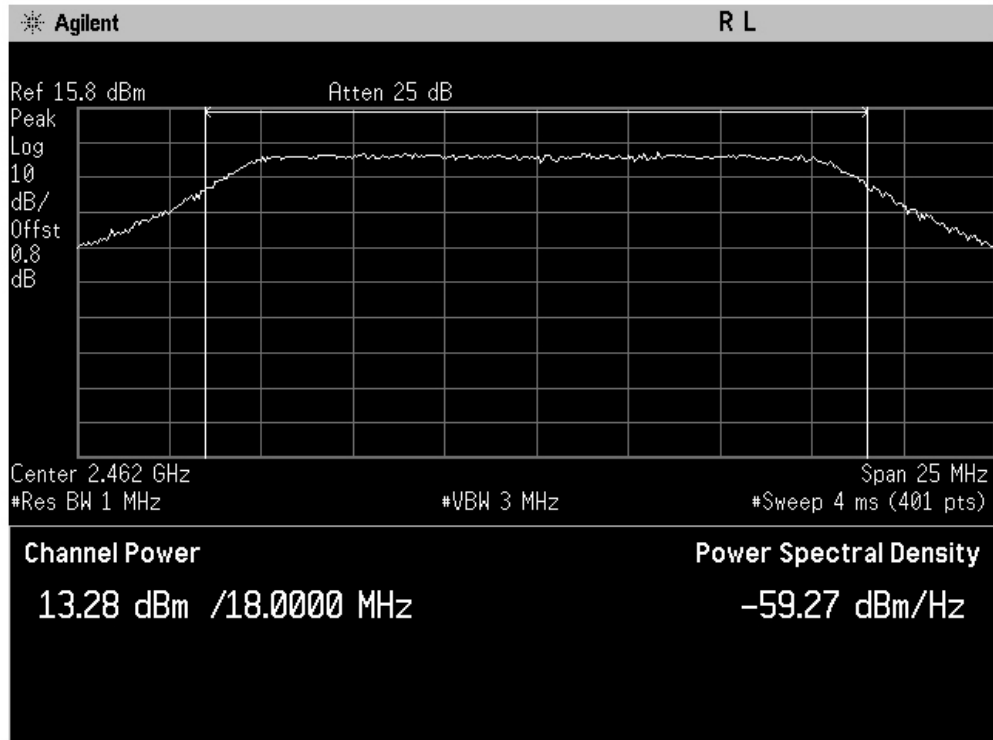
Peak Conducted Output Power low Ch – 802.11g



Peak Conducted Output Power middle Ch – 802.11g



Peak Conducted Output Power high Ch – 802.11g



3.1.3 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 = 3 kHz

VBW = (VBW ≥ RBW)

Sweep = 100KHz(Span/3KHz)

Span = 300 KHz

Detector function = peak

Trace = max hold

Measurement Data:

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-17.17	Complies
	2437	6	-18.83	Complies
	2462	11	-18.00	Complies
802.11g	2412	1	-28.83	Complies
	2437	6	-24.50	Complies
	2462	11	-25.67	Complies

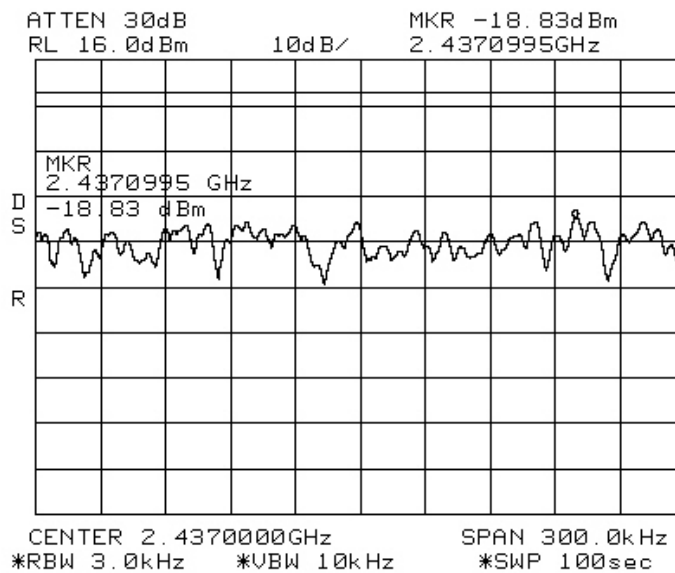
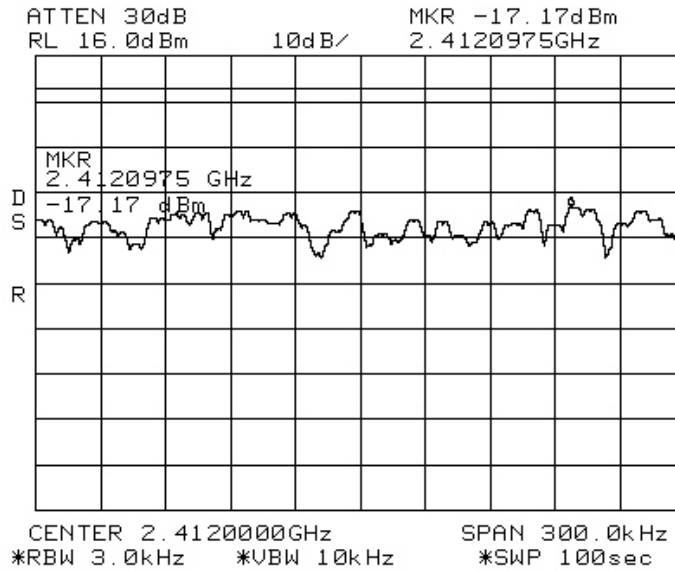
- See next pages for actual measured spectrum plots.

Minimum Standard:

Power Spectral Density	< 8dBm @ 3kHz BW
------------------------	------------------

See next pages for actual measured spectrum plots.

802.11b Power Density Measurement

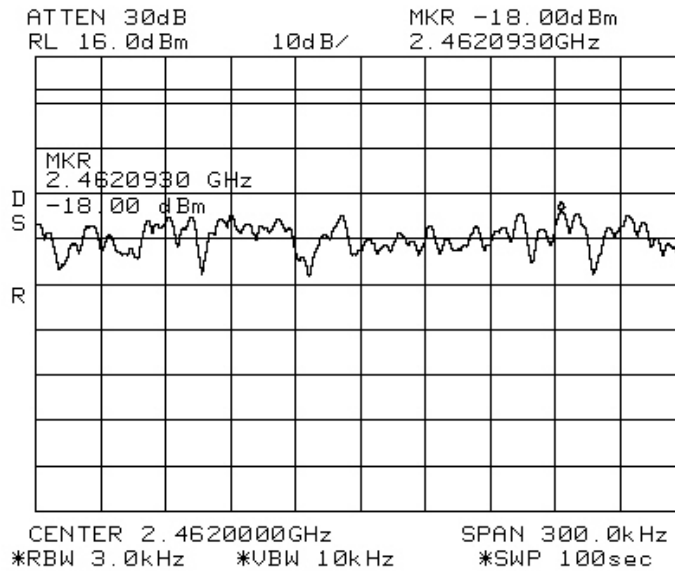




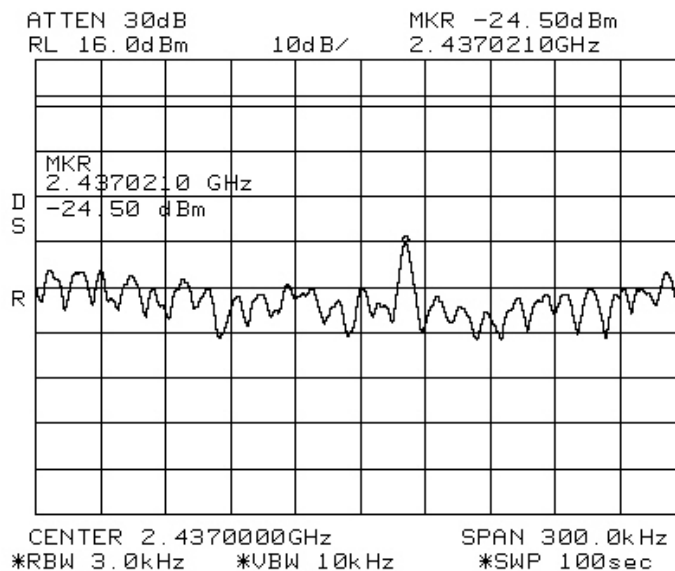
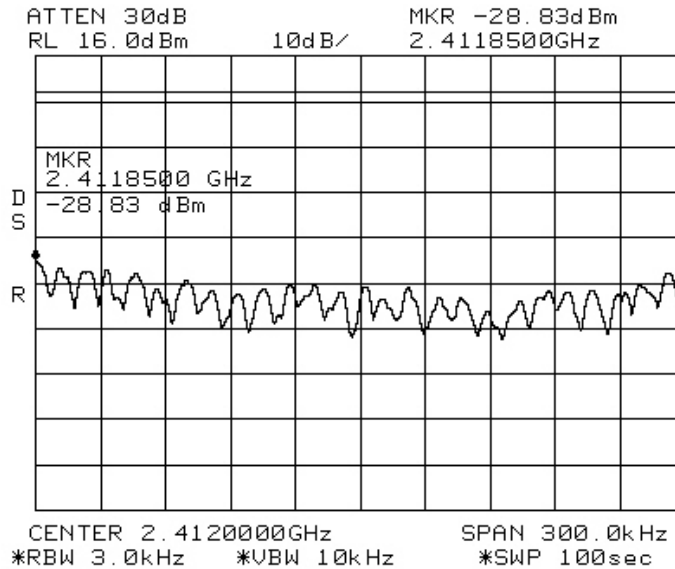
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802.11g Power Density Measurement

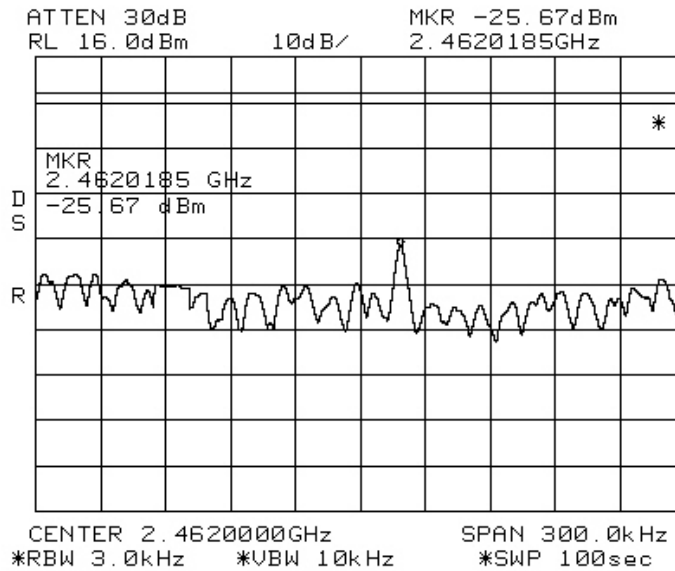




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3.1.4 Band - edge

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

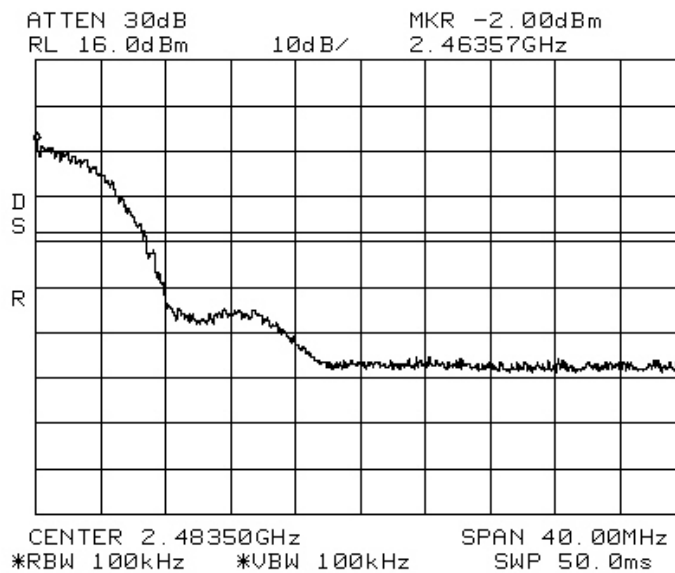
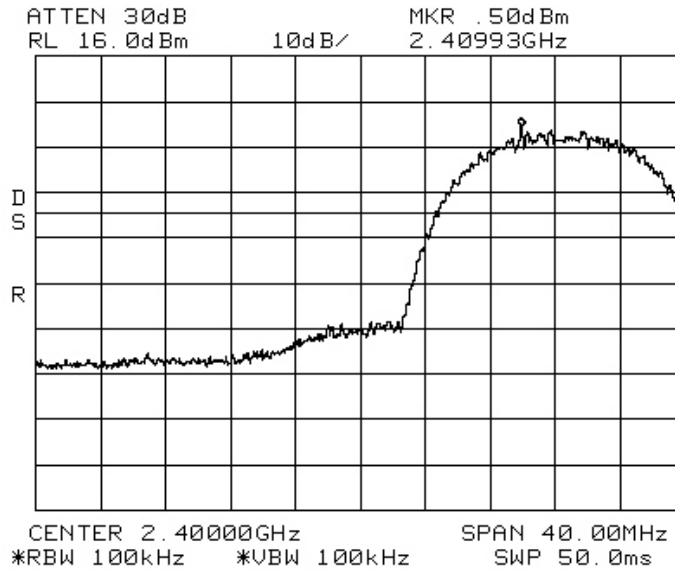
Measurement Data: Complies

- 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
-------------------	----------

See next pages for actual measured spectrum plots.

802.11b Band-edge Measurements





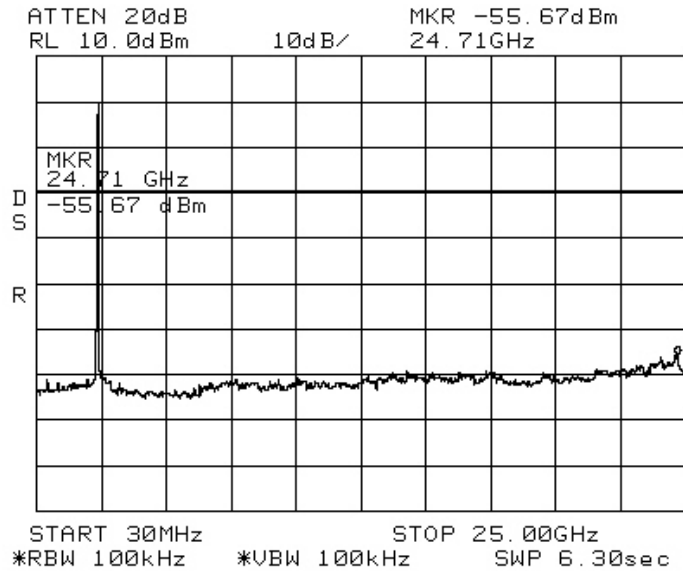
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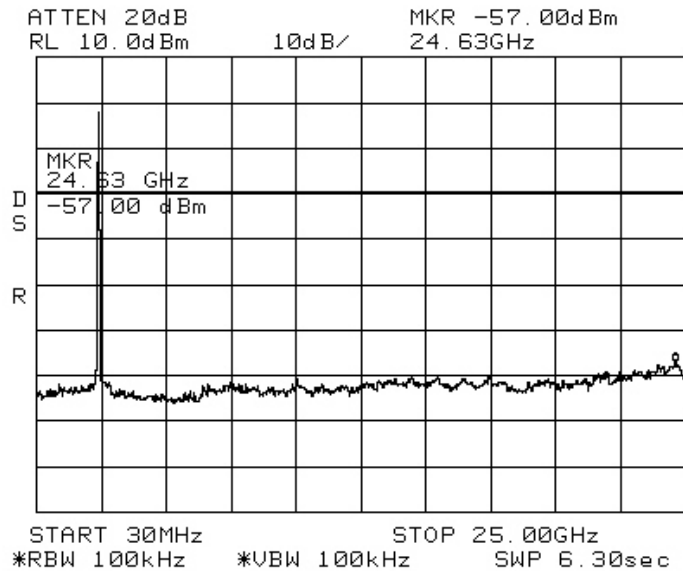
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Band – edge (at 20 dB blow) – Low channel (802.11b) Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – Mid channel (802.11b)
Frequency Range = 30 MHz ~ 10th harmonic





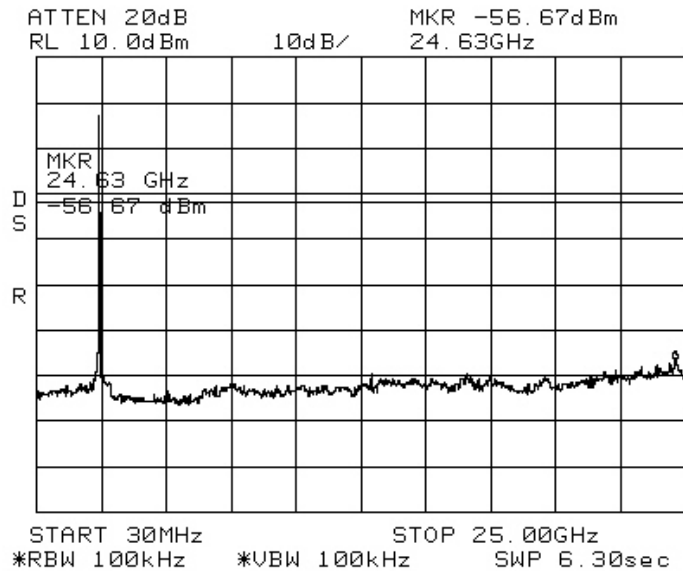
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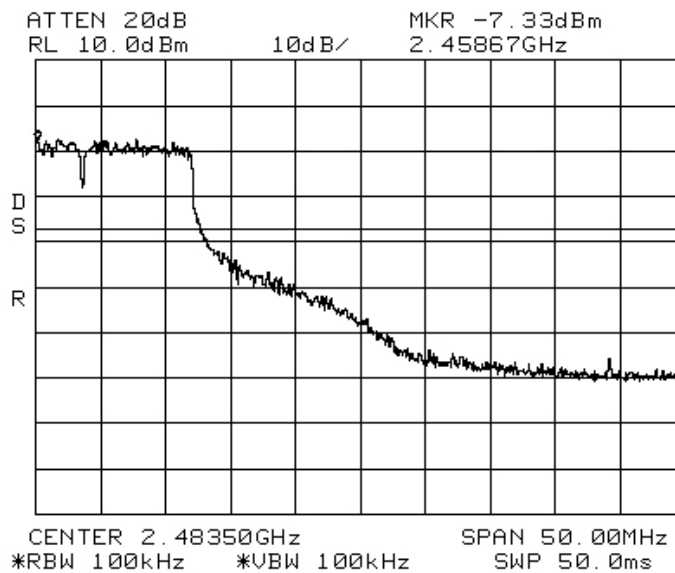
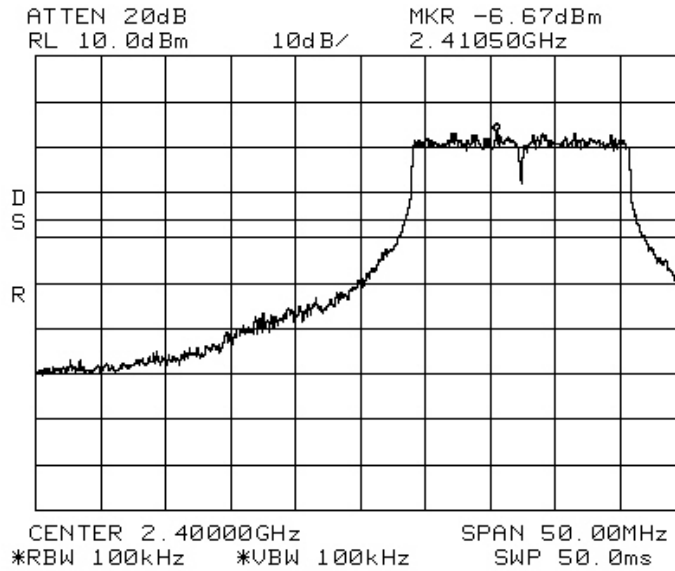
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Band – edge (at 20 dB blow) – High channel(802.11b) Frequency Range = 30 MHz ~ 10th harmonic



802.11g Band-edge Measurements





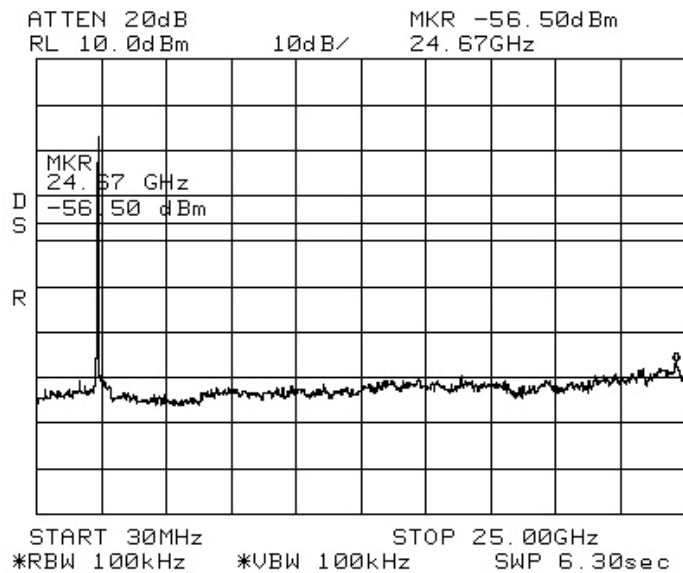
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Band – edge (at 20 dB blow) – Low channel (802.11g) Frequency Range = 30 MHz ~ 10th harmonic





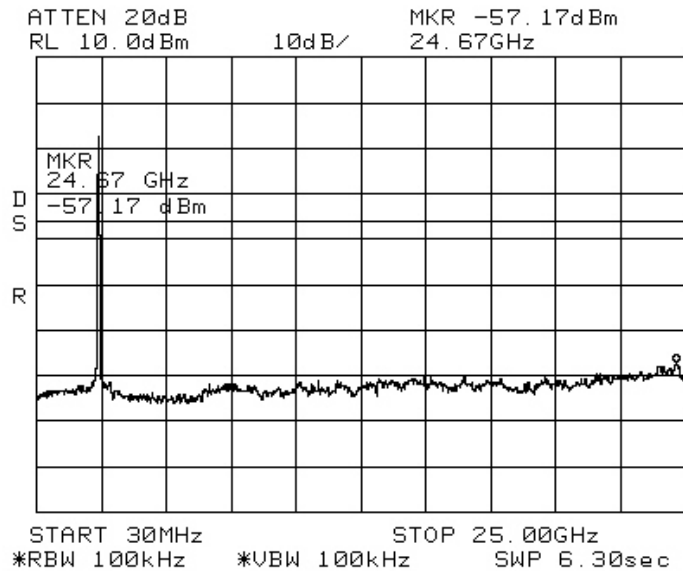
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Band – edge (at 20 dB blow) – Mid channel(802.11g)
Frequency Range = 30 MHz ~ 10th harmonic





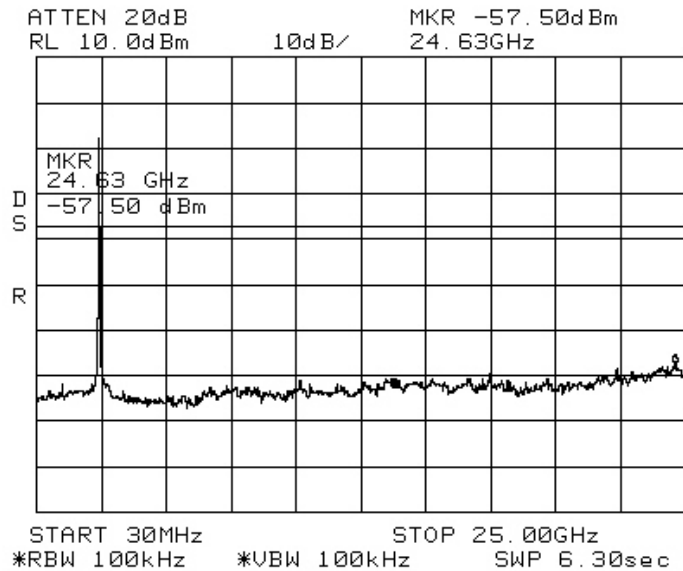
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Band – edge (at 20 dB blow) – High channel(802.11g) Frequency Range = 30 MHz ~ 10th harmonic



3.1.5 Field Strength of Emissions

Test Location

☒ Testing was performed at a test distance of 3 meter Open Area Test Site

Test Procedures

The height of the measuring antenna was varied between 1 to 4 m and the table was rotated a full revolution in order to obtain maximum values of the electric field intensity. The measurement was made in both the vertical and horizontal polarization, and the maximum value is presented in the report.

The spectrum analyzer is set to:

Center frequency = the worst channel

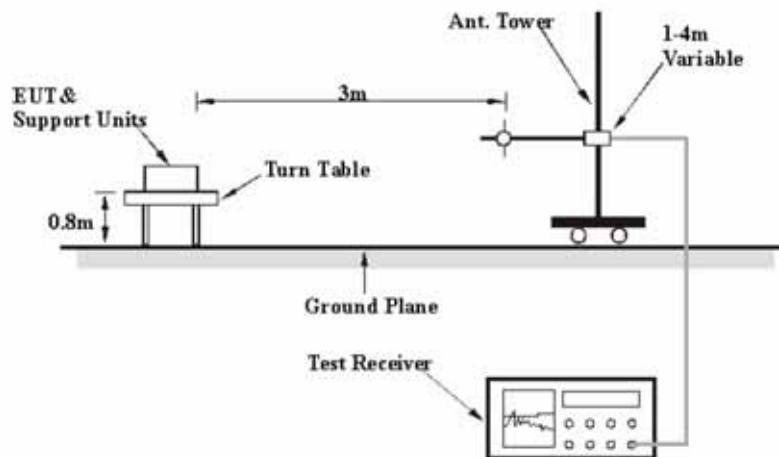
Frequency Range = 30 MHz ~ 10th harmonic

RBW = 120 kHz (30 MHz ~ 1 GHz) VBW RBW
= 1 MHz (1 GHz ~ 10th harmonic)

Span = 100 MHz

Detector function = Quasi-peak

Trace = max hold



Limit

- 15.209(a)

Frequency(MHz)	Field Strength uV/m@3m	Field Strength dBuV/m@3m
30-88	100**	40
88-216	150**	43.5
216-960	200**	46
Above 960	500	54

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

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	Below 1000MHz
Channel	-	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
937.04	30.2	15.8	Quasi-Peak

Test Data

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
439.82	7.1	H	2.8	14.4		3.1	46.0	24.6	21.4
481.12	8.3	H	2.3	15.1		3.3	46.0	26.7	19.3
599.97	5.1	H	2.1	17.1		3.7	46.0	25.9	20.1
665.41	5.5	H	1.8	18.2		3.8	46.0	27.5	18.5
730.82	4.8	H	1.5	19.1		4.2	46.0	28.1	17.9
937.04	3.9	H	1.1	21.4		4.9	46.0	30.2	15.8

H: HORIZONTAL, V: VERTICAL



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Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	1-25GHz
Channel	Channel 1	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2484.20	42.3	11.7	Peak

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emission were detected at a level greater than 20dB below limit									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emission were detected at a level greater than 20dB below limit									

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
2377.30	40.7	V	1.0	28.2	35.3	7.4	54.0	41.0	13.0
2484.20	42.0	V	1.0	28.2	35.3	7.4	54.0	42.3	11.7

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	1-25GHz
Channel	Channel 6	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
-	-	-	-

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emission were detected at a level greater than 20dB below limit									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emission were detected at a level greater than 20dB below limit									

Test Results

EUT	Braille PDA	Measurement Detail	
Model	V400	Frequency Range	1-25GHz
Channel	Channel 11	Detector function	Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2484.20	42.1	11.9	Peak

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emission were detected at a level greater than 20dB below limit									

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
No emission were detected at a level greater than 20dB below limit									

Restricted band edge test data

Measured frequency range : 2310-2390 MHz, 2483.5-2500 MHz

Frequency [MHz]	Reading [dBuV/m]	Pol.	Height [m]	Correction Factor			Limits [dBuV/m]	Result [dBuV/m]	Margin [dB]
				Antenna	Amp. Gain	Cable			
2377.50	40.5	V	1.0	28.2	35.3	7.4	54.0	40.8	13.2
2484.20	41.8	V	1.0	28.2	35.3	7.4	54.0	42.1	11.9



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3.1.6 AC Conducted Emissions

Test Location

Shielded Room

Frequency Range of Measurement

150 kHz to 30 MHz

Instrument Settings

IF Band Width: 9 kHz

Test Procedures

The EUT was placed on a non-metallic table 0.8m above the metallic, grounded floor and 0.4m from the reference ground plane wall. The distance to other metallic surfaces was at least 0.8m.

Amplitude measurements were performed with a quasi-peak detector and an average detector.

Limit

- 15.207(a)

Frequency (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.

Test Results

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
1.26	48.2	7.9	Quasi-peak



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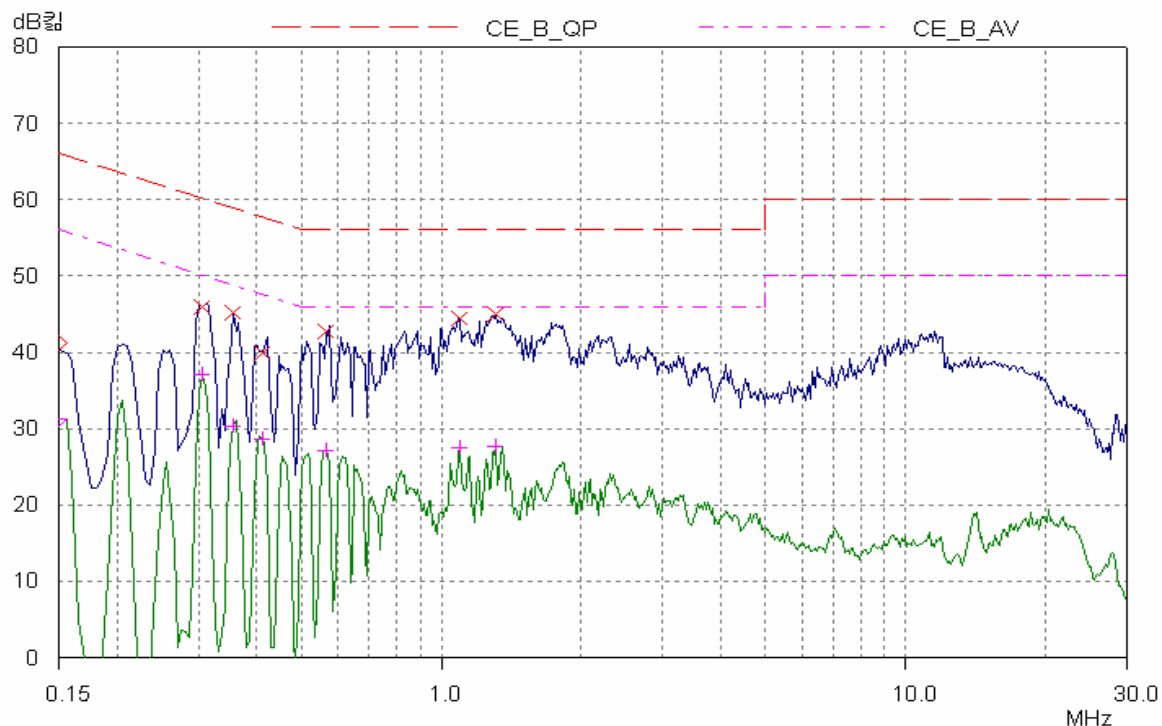


Test Data

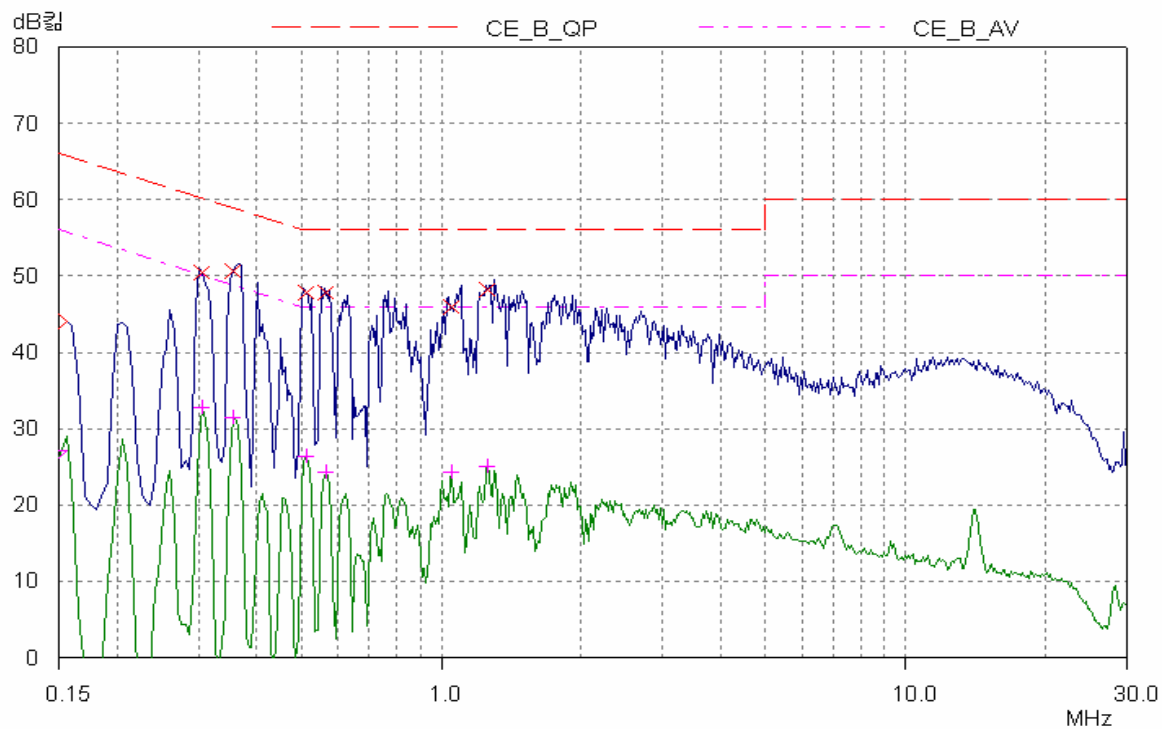
Frequency [MHz]	Correction Factor		Line	Quasi-peak				Average			
				Limit	Reading	Result	Margin	Limit	Reading	Result	Margin
	LISN	Cable		[dBuV]	[dBuV]	[dBuV]	[dB]	[dBuV]	[dBuV]	[dBuV]	[dB]
0.31	0.2	0.2	N	60.1	50.1	50.5	9.6	50.1	32.4	32.8	17.4
0.36	0.2	0.2	N	58.8	50.3	50.7	8.2	48.8	31.0	31.4	17.4
0.51	0.2	0.2	N	56.0	47.4	47.8	8.2	46.0	25.9	26.3	19.7
0.57	0.2	0.2	N	56.0	47.5	47.9	8.1	46.0	23.9	24.3	21.7
1.06	0.2	0.2	N	56.0	45.6	46.0	10.0	46.0	23.8	24.2	21.8
1.26	0.2	0.2	N	56.0	47.8	48.2	7.9	46.0	24.6	25.0	21.0

H : HOT, N : NEUTRAL

[HOT]



[NEUTRAL]





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APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Spectrum Analyzer	Agilent	8564E	3551A0041	2007-11-03
2	EMI Test Receiver	Rohde & Schwarz	ESVS30	826638/008	2007-04-25
3	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	361324/014	2007-06-12
4	Biconical Antenna	EMCO	3110	9202-1510	2007-04-25
5	Log-periodic Antenna	EMCO	3146	9607-4567	2007-04-25
6	Field Strength Meter	Rohde & Schwarz	ESHS30	828144/002	2008-02-15
7	LISN	EMCO	3825/2	9607-2575	2007-09-01
8	LISN	EMCO	3825/2	9409-2246	2007-09-01
9	Field Strength Meter	Rohde & Schwarz	ESHS30	862024/001	2008-03-07
10	System Power Supply	HP	6032A	3440A-10521	2007-07-06
11	EPM Series Power Meter	HP	E4418A	GB38272734	2007-11-03
12	Audio Analyzer	HP	8903B	2747A03432	2007-11-03
13	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2007-11-03
14	Modulation Analyzer	HP	8901B	3438A05228	2007-11-06
15	Attenuator	HP	8494A	3308A33351	2007-10-27
16	Attenuator	HP	8496A	3308A15142	2007-10-27
17	Temp&Humi Chamber	Kunpoong	KP-1000	2002KP050041	2008-01-15
18	EMC Analyzer	Agilent	E7403A	MY42000054	2007-10-18
19	Horn Antenna	ETS-Lindgren	3115	00078894	2008-11-29
20	Horn Antenna	ETS-Lindgren	3116	00062504	2008-11-27
21	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2008-03-03
22	PREAMPLIFIER	Agilent	8449B	3008A02307	2007-11-20
23	Spectrum Analyzer	Agilent	E4403B	US39440619	2007-09-01