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TEST REPORT For FCC

Test Report No. : CTK-2012-00697
Date of Issue : July 17, 2012
FCC ID : ORI-SPES70W
Model/Type No. : SPES 70W
Kind of Product : SPES
Applicant : KMW INC.
Applicant Address : 183-6 Youngchun-ro, Dongtan-myun, Hwasung-si, Kyungki-do, Republic of Korea
Manufacturer : KMW INC.
Manufacturer Address : 183-6 Youngchun-ro, Dongtan-myun, Hwasung-si, Kyungki-do, Republic of Korea
Contact Person : Sung Seok / Principal Research Engineer
Telephone : +82-31-370-8621
Received Date : March 27, 2012
Test period : Start : March 29, 2012 End : July 16, 2011
Test Results : ☒ In Compliance ☐ Not in Compliance

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

Tested by

Y. T. Lee

Young-taek, Lee
Test Engineer
Date: July 17, 2012

Reviewed by

Y. J. Park

Young-Joon, Park
Technical Manager
Date: July 17, 2012



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REPORT REVISION HISTORY

Date	Revision	Page No
July 17, 2012	Issued (CTK-2012-00697)	All

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1.0 General Product Description

Equipment model name	SPES 70W
Serial number	Prototype
EUT condition	Pre-production, not damaged
Frequency Range	2412 MHz - 2462 MHz
RF output power	802.11b : 14.12 dBm 802.11g : 10.41 dBm 802.11n : 9.93 dBm
Number of channels	11
Channel Spacing	5 MHz
Transfer Rate	802.11b : 11 / 5.5 / 2 / 1 Mbps 802.11g : 54 / 48 / 36 / 24 / 18 / 12 / 9 / 6 Mbps 802.11n : up to 300 Mbps
Type of Modulation	802.11b : DSSS 802.11g/n : OFDM
Duty cycle TX power	1.0
Power Source	DC 48 V
Antenna Type	Dipole antenna
Antenna Gain	Ant0, Ant1 : 5.57 dBi

1.1 Tested Frequency

802.11b, 802.11g, 802.11n (Ant0, Ant1)

	LOW	MID	HIGH
Frequency (MHz)	2412	2437	2462

1.2 Device Modifications

The following modifications were necessary for compliance and was applied by applicant.



	Core Manufacturer	Part No.	Number of turns
	TAEJIN INT	TR14-13-11	2 Turns
	Component Manufacturer	Part No.	Number of turns
	Dongiltech	CL2-F16-12R	PASS
	Ground reinforcement		



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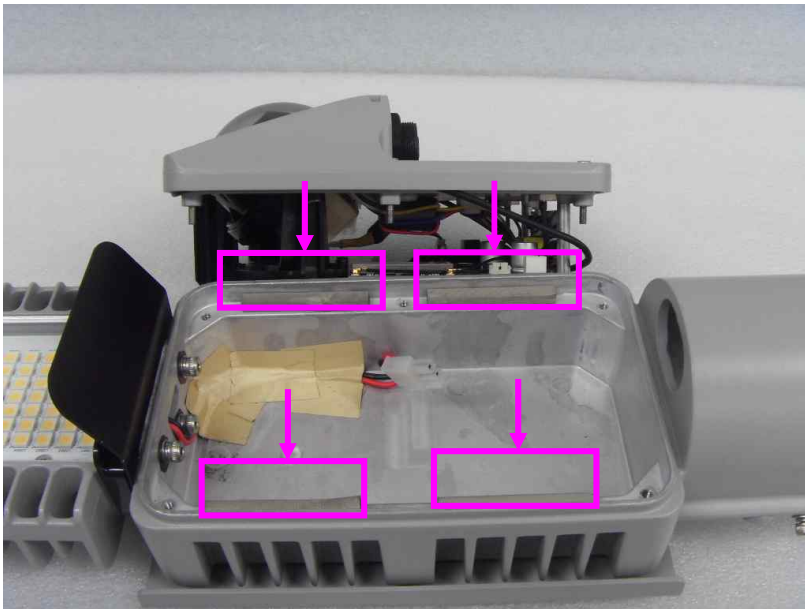
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Gasket tape



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1.3 Peripheral Devices

Device	Manufacturer	Model No.	Serial No.
AC/DC ADAPTOR1	MEAN WELL Enterprises Co., Ltd.	HLG-80H-24A	-
Note PC	Samsung Electronics Co., Ltd.	NT-R60Y	Z9GJ93GS302109B
AC/DC ADAPTOR2	Samsung ELECTRO-MECHANICS	AD-6019	-
PoE Switch	NETGEAR Inc.	FS108P	1DL29A3B007C9
PoE Switching Adapter	NETGEAR Inc.	DSA-0421S-50	-
Notebook Computer	Samsung Electronics Co., Ltd.	SP20	G86791BW400177
AC ADAPTER	DONGGUAN SAMSUNG ELECTRO-MECHANICS CO., LTD.	AD-9019M	-

1.4 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.

1.5 Test Facility

The measurement facility is located at 386-1, Ho-dong, Cheoin-gu, Yongin-si, Gyeonggi-do, 449-100, Korea. The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.



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1.6 Laboratory Accreditations and Listings

Country	Agency	Scope of Accreditation	Logo
USA	FCC	3 m & 10 m OATS, 3 m & 10 m SAC and Conducted Test Site to perform FCC Part 15/18 measurements	 805871
JAPAN	VCCI	10 m OATS, 3 m & 10 m SAC and Conducted Test Site	 R-948, C-986, T-1843
KOREA	KCC	EMI (10 m OATS, 10 m SAC and Conducted Test Site) EMS (ESD, RS, EFT/Burst, Surge, CS, Magnetic, Dips and Interruptions)	 No. 51, KR0025
International	KOLAS	EMC	



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2 Summary of tests

FCC Part Section(s)	Parameter	Limit	Test Condition	Status (note 1)
15.247(a)	6 dB Bandwidth	> 500 kHz	Conducted	C
15.247(b)	Maximum Output Power	< 1 Watt		C
15.247(d)	Conducted Spurious emission	> 20 dBc		C
15.247(d)	Band Edge	> 20 dBc		C
15.247(e)	Transmitter Power Spectral Density	< 8 dBm @ 3 kHz		C
				C
15.209	Field Strength of Harmonics	15.209(a)	Radiated	C
15.207	AC Conducted Emissions	15.207(a)	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

2.1.1 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:

Test mode : 802.11b

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11b	2412	1	11.20	Complies
	2437	6	11.53	Complies
	2462	11	11.54	Complies

Test mode : 802.11g

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11g	2412	1	16.40	Complies
	2437	6	16.41	Complies
	2462	11	16.41	Complies



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Test mode : 802.11n (Ant0)

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (Ant0)	2412	1	16.81	Complies
	2437	6	16.96	Complies
	2462	11	16.60	Complies

Test mode : 802.11n (Ant1)

Mode	Frequency (MHz)	Channel No.	Test Results	
			Measured Bandwidth (MHz)	Result
802.11n (Ant1)	2412	1	16.62	Complies
	2437	6	17.07	Complies
	2462	11	16.71	Complies

Minimum Standard:

6 dB Bandwidth > 500kHz

See next pages for actual measured spectrum plots.

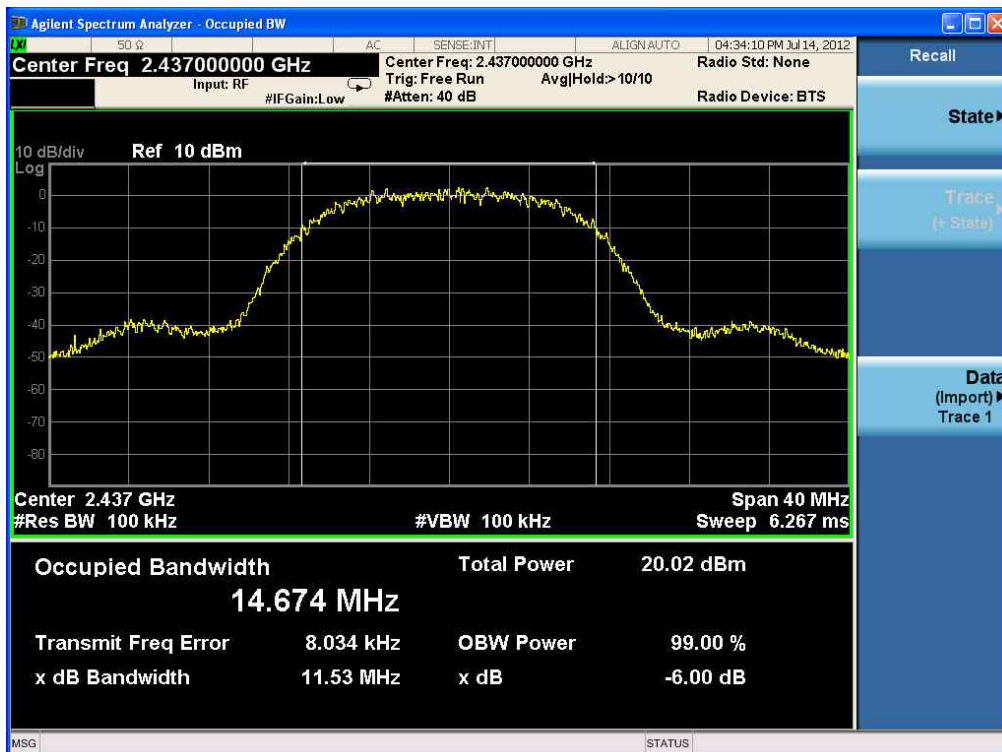
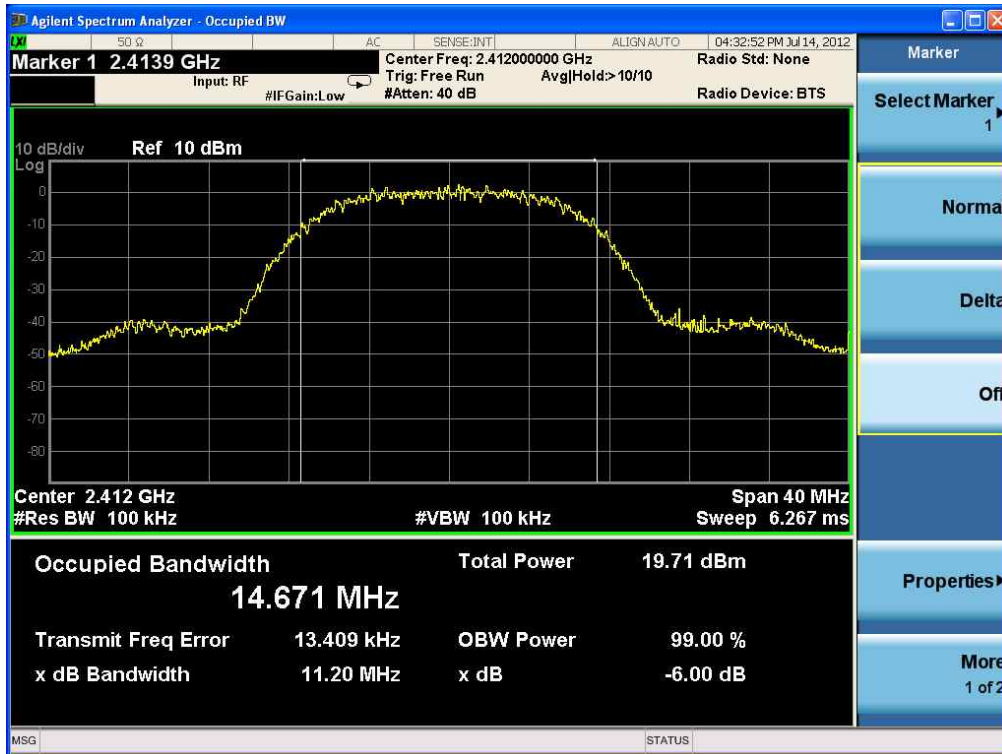


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802.11b



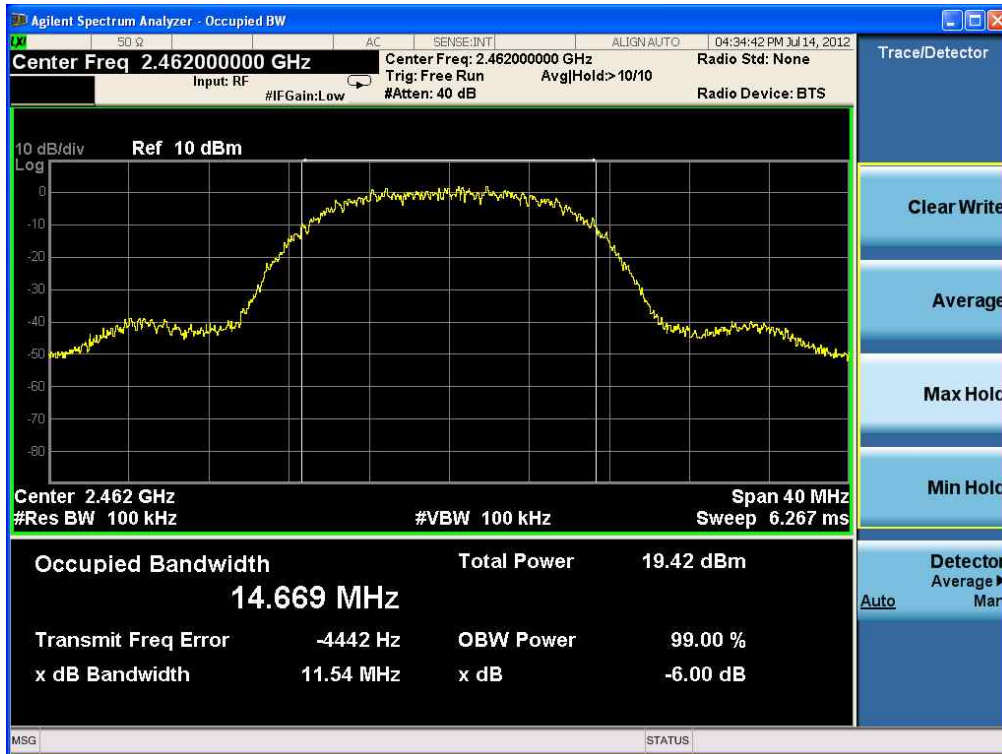


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802.11b



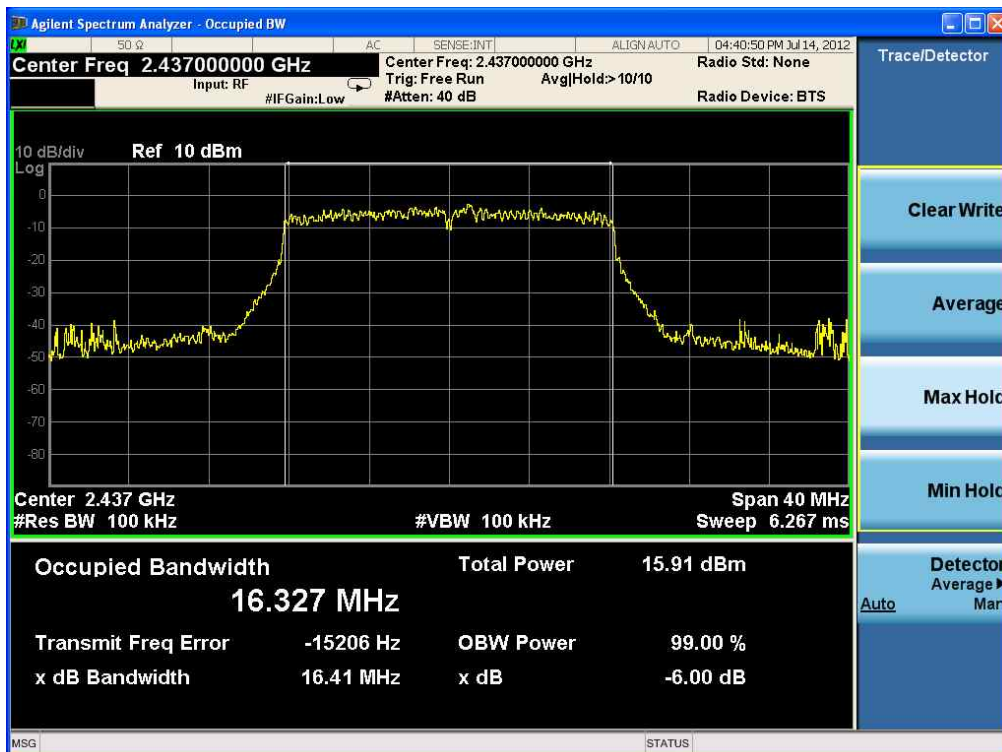
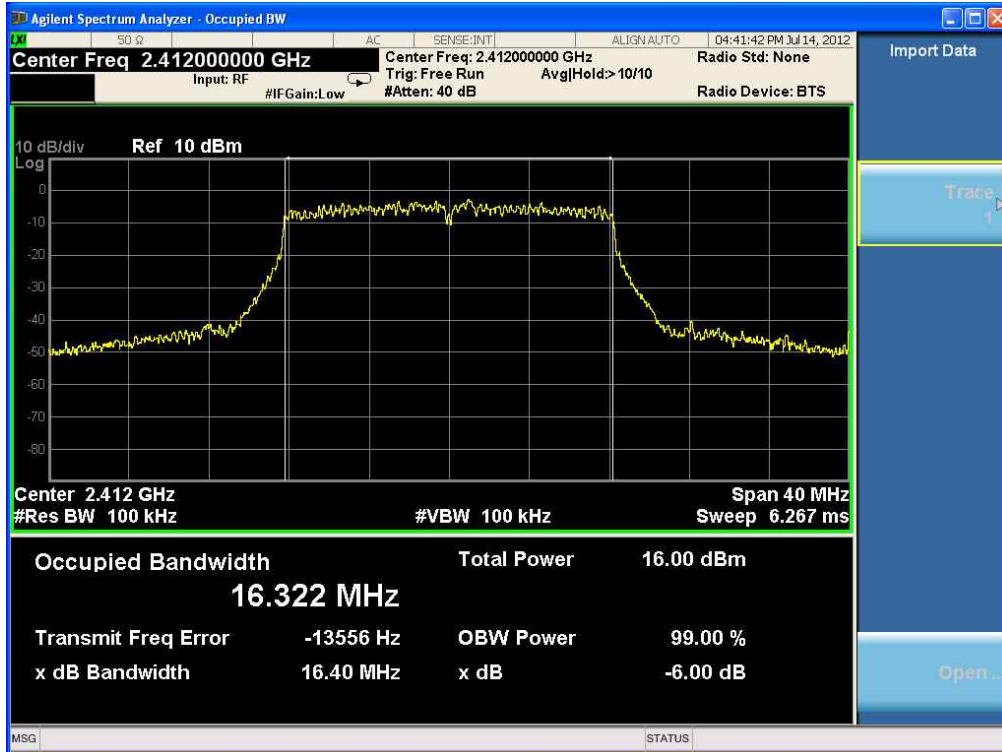


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802.11g



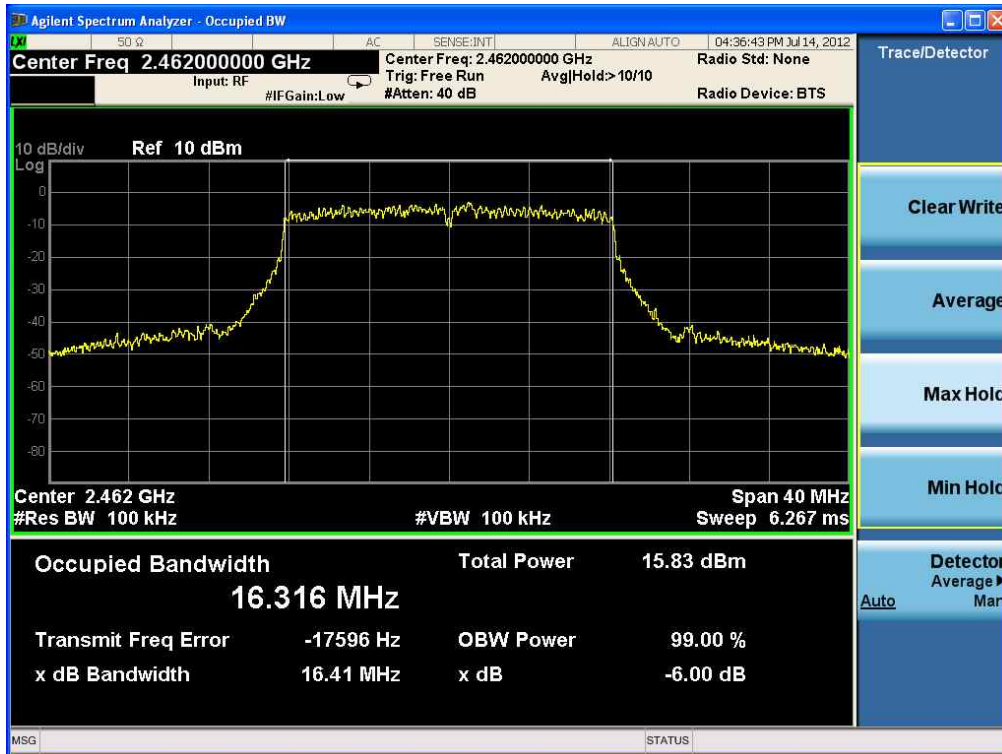


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802.11g



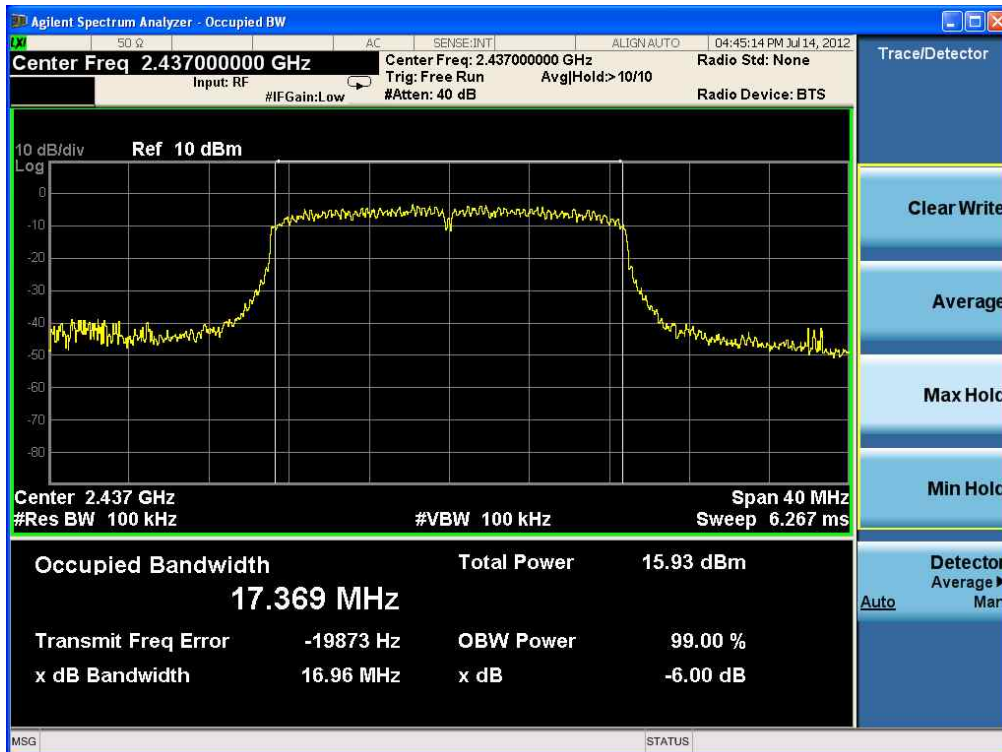
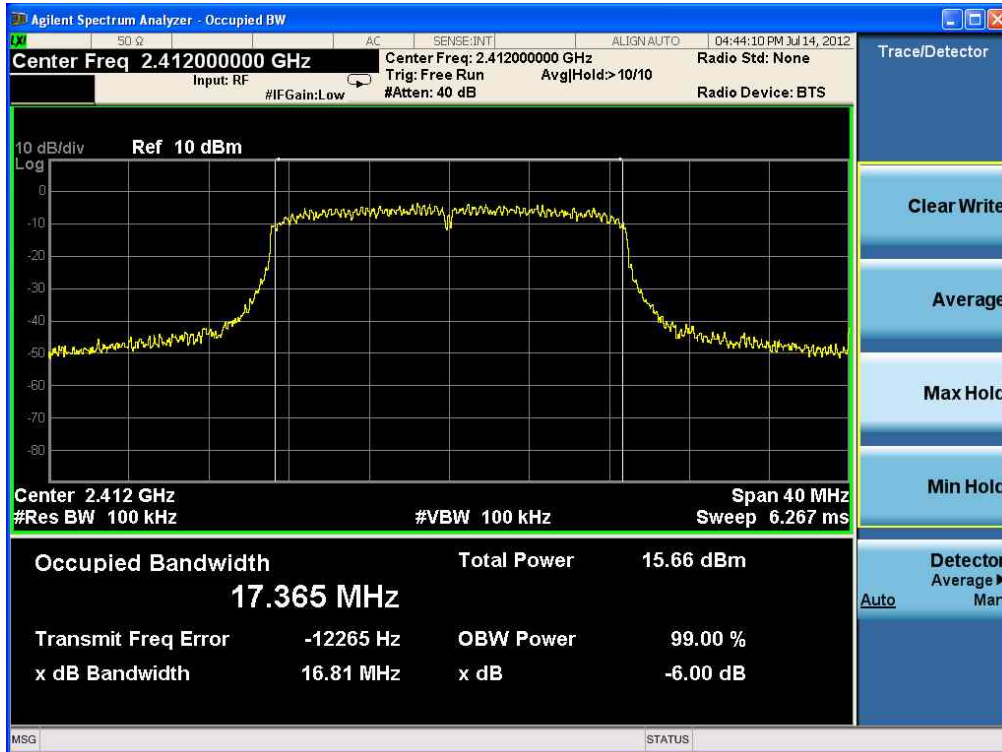


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802.11n (Ant0)



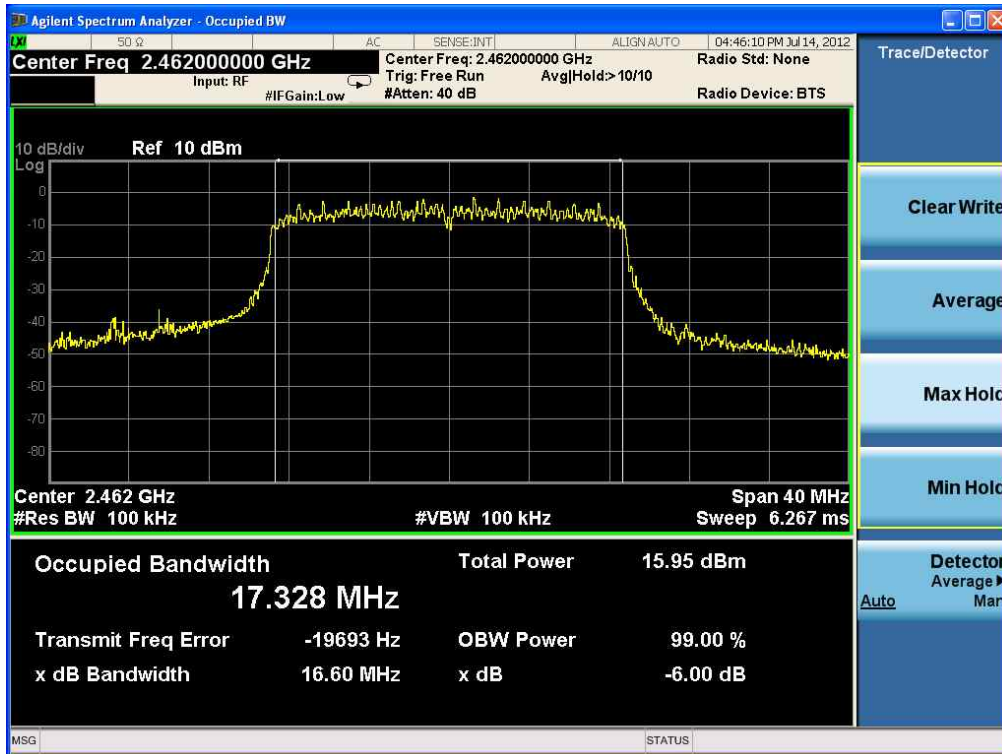


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802.11n (Ant0)



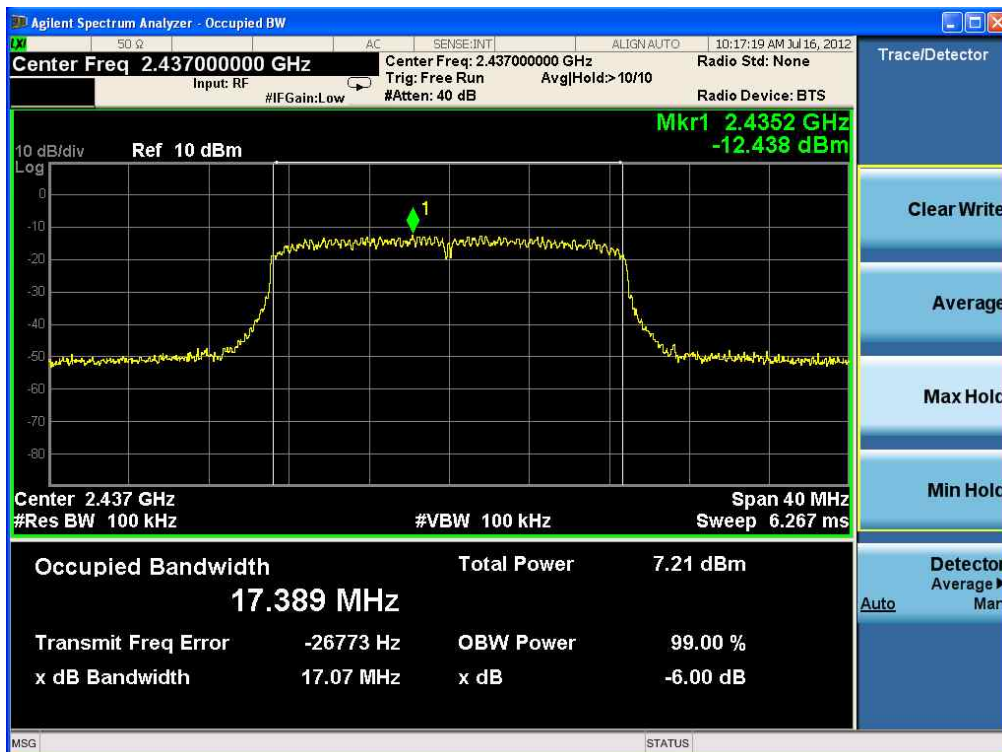
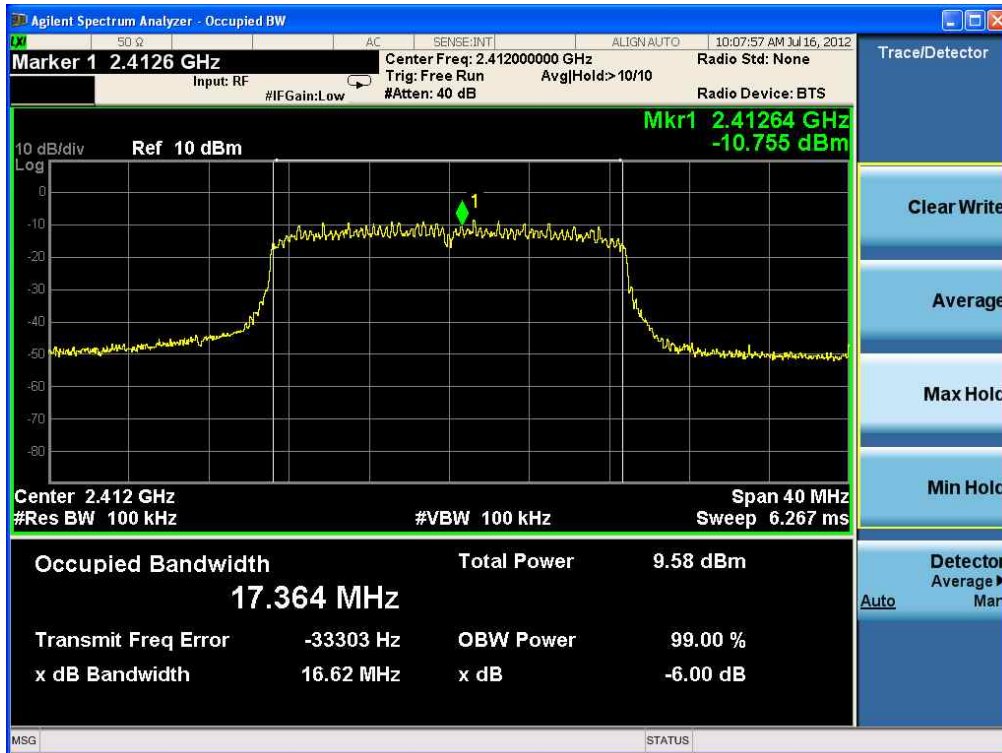


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802.11n (Ant1)



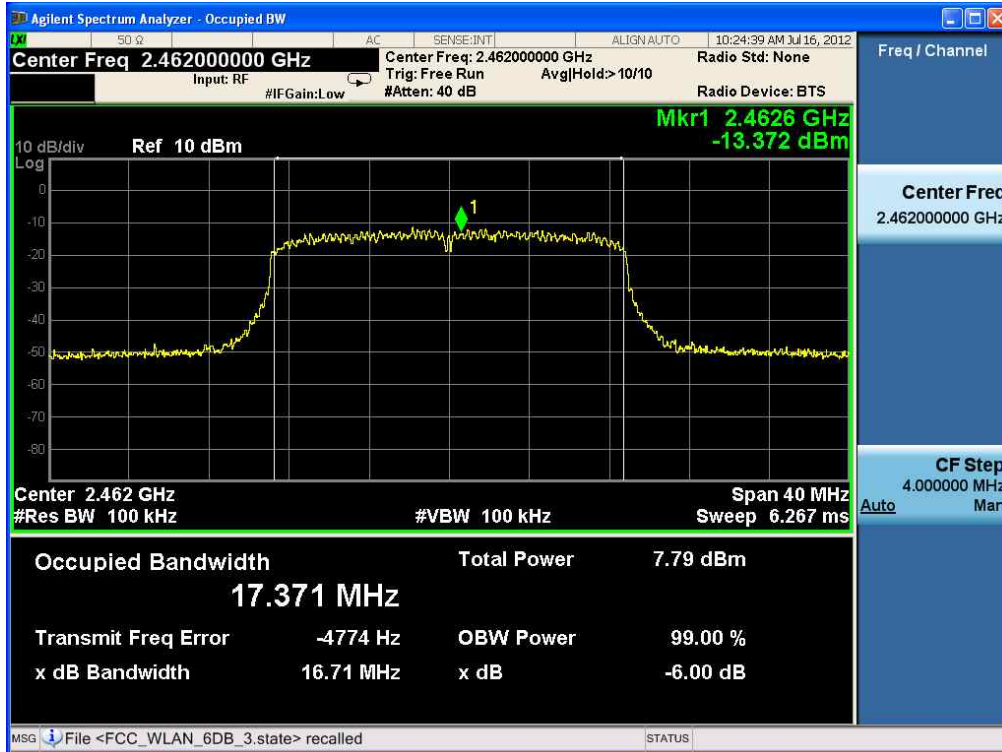


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802.11n (Ant1)



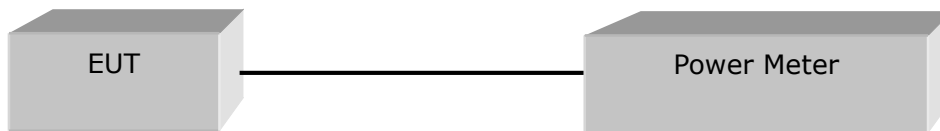
2.1.2 Maximum peak Conducted Output Power

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

Test mode : 802.11b - 11 Mbps

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	14.09	30dBm	Complies
2437	Middle	14.12	30dBm	Complies
2462	High	13.44	30dBm	Complies

Remark.

The 802.11b data rate were set in 11 Mbps, due to the highest RF output power.

Test mode : 802.11g - 18 Mbps

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	10.31	30dBm	Complies
2437	Middle	10.41	30dBm	Complies
2462	High	9.93	30dBm	Complies

Remark.

The 802.11g data rate were set in 18 Mbps, due to the highest RF output power.



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Test mode : 802.11n (Ant0) – MCS2

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	9.74	30dBm	Complies
2437	Middle	9.93	30dBm	Complies
2462	High	9.29	30dBm	Complies

Remark.

The 802.11n(Ant0) data rate were set in MCS2, due to the highest RF output power.

Test mode : 802.11n (Ant1) – MCS2

Frequency (MHz)	Channel No.	Peak output power(dBm)	Limit	Result
2412	Low	1.33	30dBm	Complies
2437	Middle	1.27	30dBm	Complies
2462	High	1.67	30dBm	Complies

Remark.

The 802.11n(Ant1) data rate were set in MCS2, due to the highest RF output power.



2.1.3 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 $\geq$ RBW)

Sweep = 100 s (Span/3 kHz)

Span = 300 kHz

Detector function = peak

Trace = max hold

Test Results

Test mode : 802.11b

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-9.829	Complies
	2437	6	-6.528	Complies
	2462	11	-7.058	Complies

Test mode : 802.11g

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11b	2412	1	-7.952	Complies
	2437	6	-7.914	Complies
	2462	11	-8.507	Complies



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Test mode : 802.11n(Ant0)

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (20 MHz, Ant0)	2412	1	-7.744	Complies
	2437	6	-7.609	Complies
	2462	11	-8.094	Complies

Test mode : 802.11n(Ant1)

Mode	Frequency (MHz)	Ch.	Test Results	
			dBm	Result
802.11n (20 MHz, Ant1)	2412	1	-16.578	Complies
	2437	6	-14.019	Complies
	2462	11	-13.369	Complies

Minimum Standard:

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

See next pages for actual measured spectrum plots.

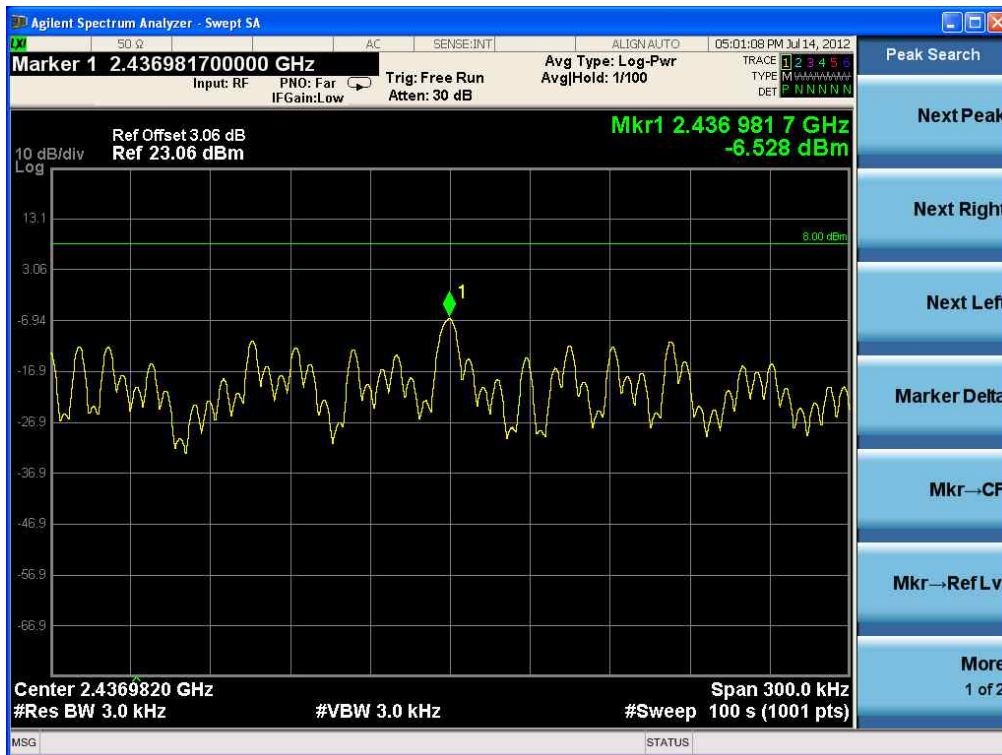


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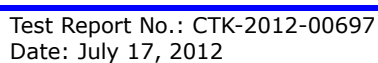
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802.11b Power Density Measurement

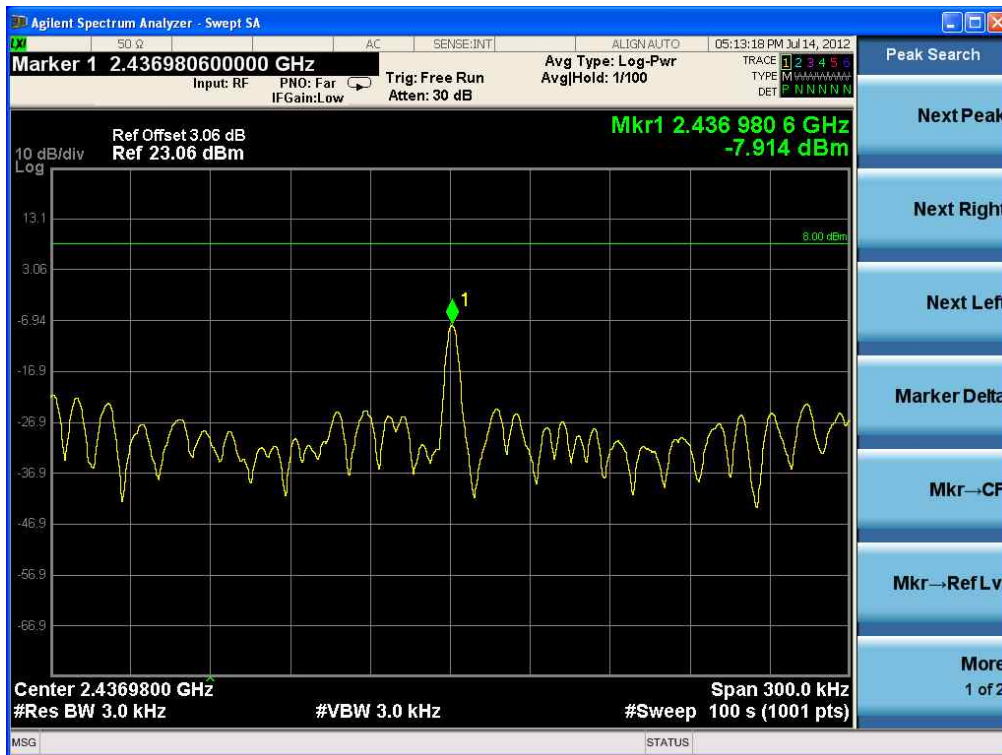
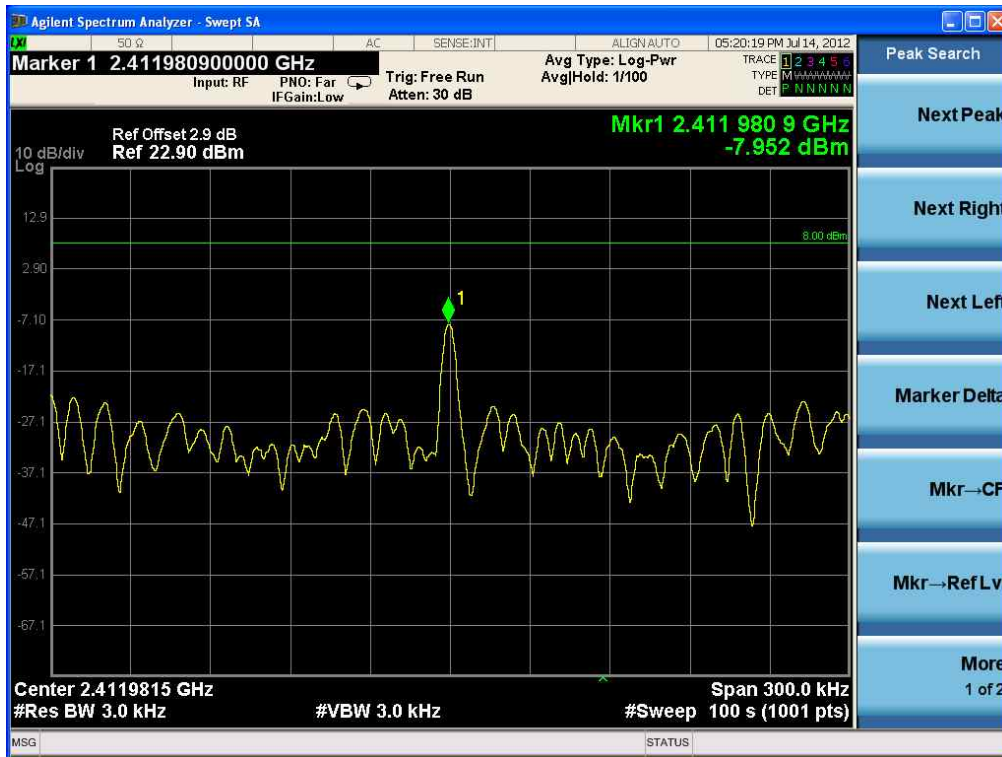




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802.11g Power Density Measurement

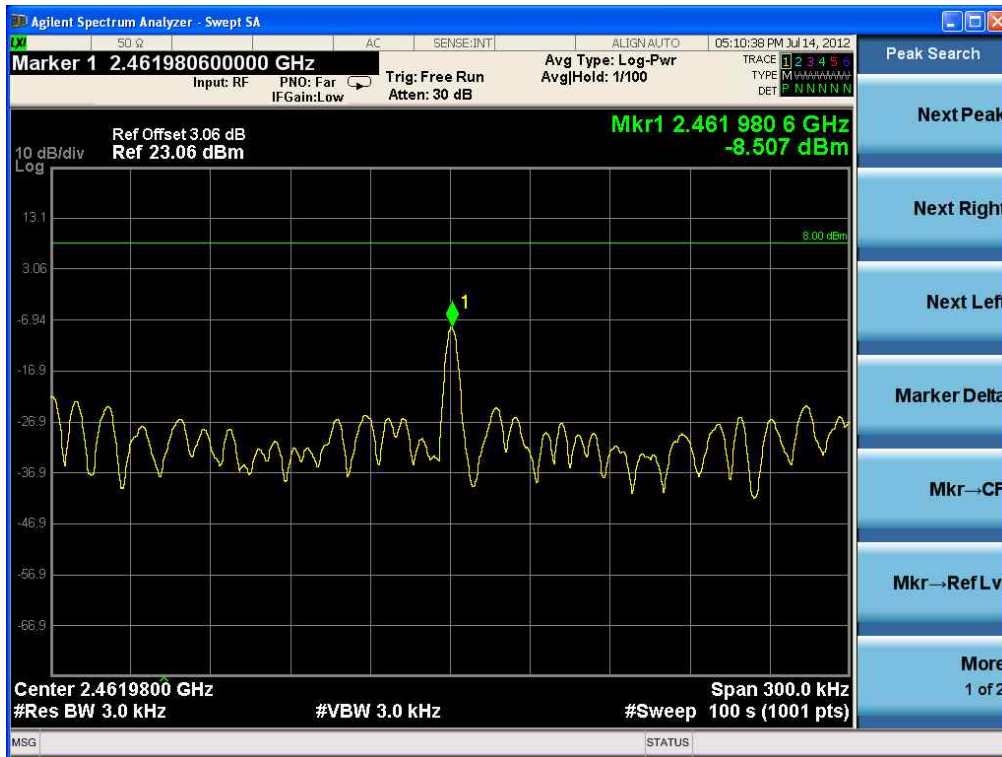




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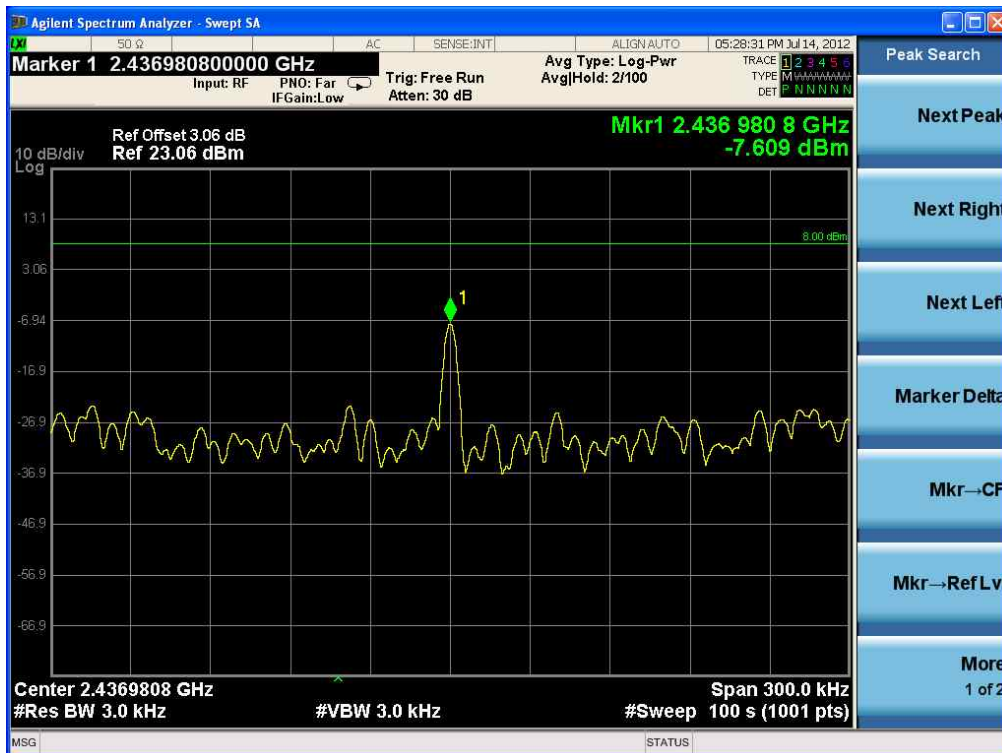
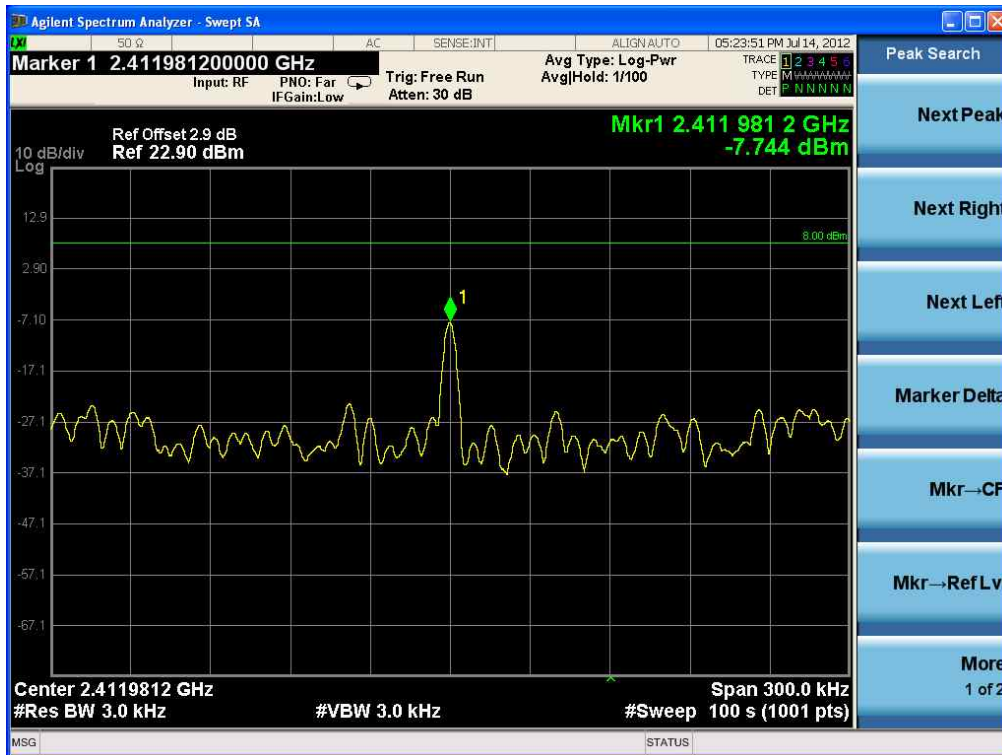


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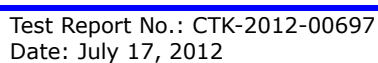
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802.11n(Ant0) Power Density Measurement





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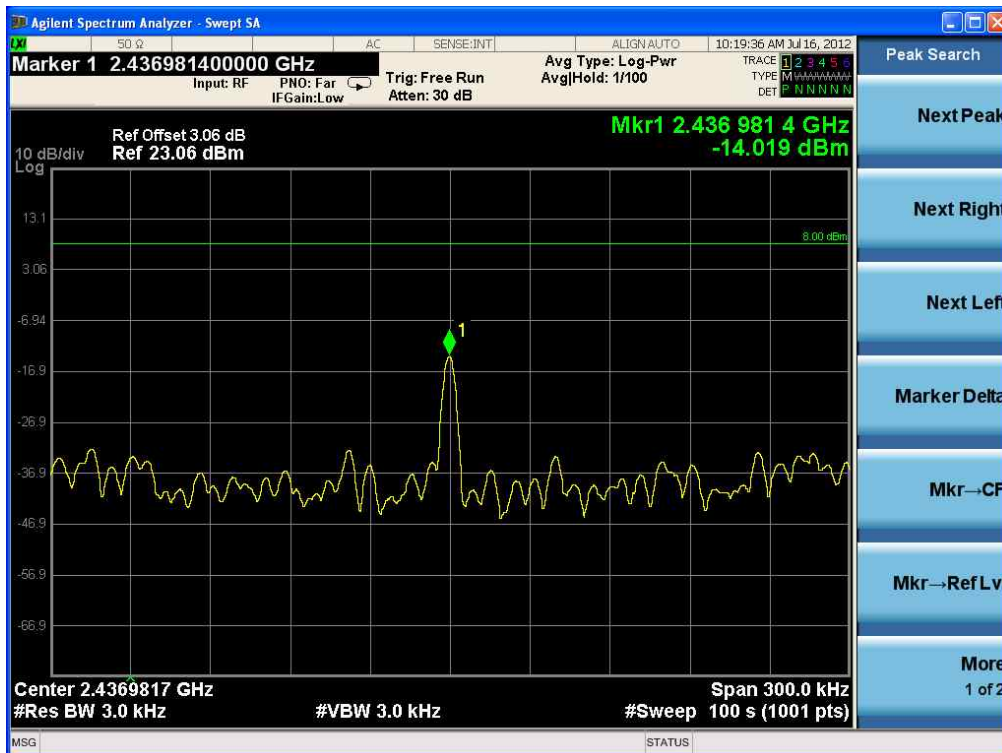


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802.11n(Ant1) Power Density Measurement

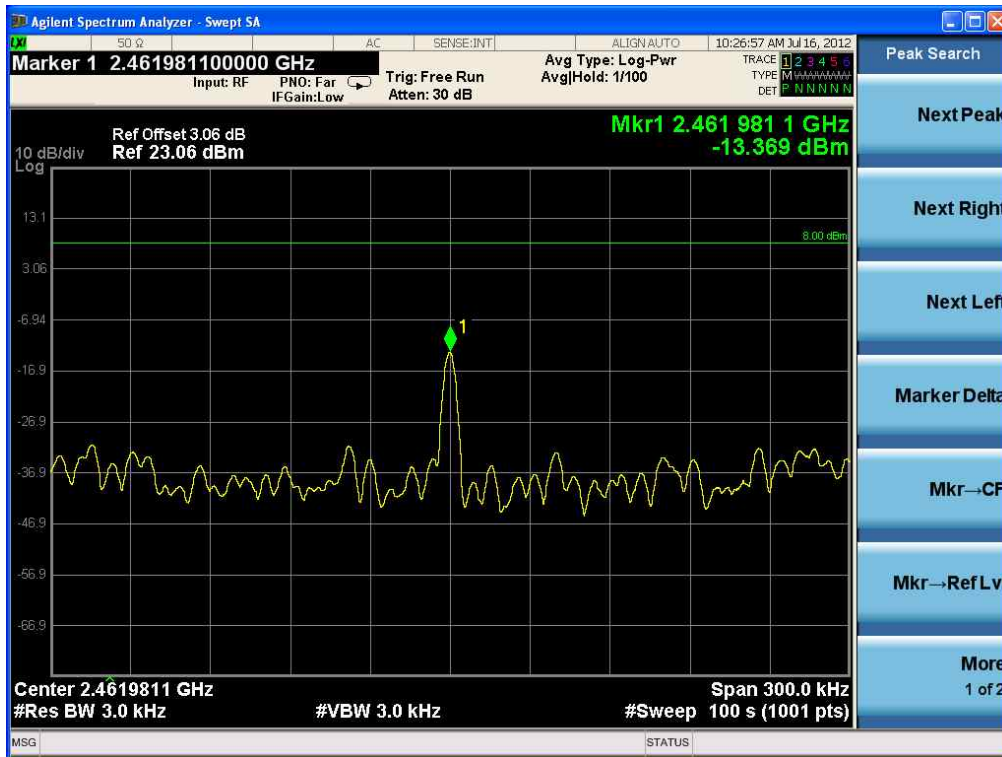




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2.1.4 Band - edge

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 = 50 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.

Minimum Standard:	> 20 dBc
--------------------------	----------

See next pages for actual measured spectrum plots.



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802.11b Band-edge Measurements





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



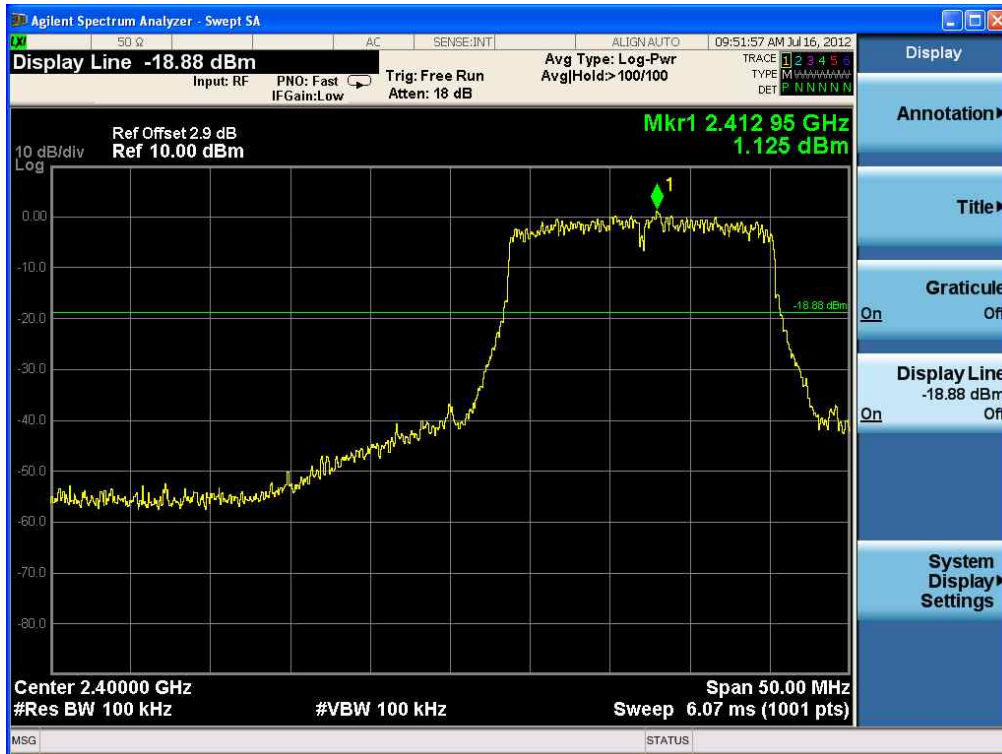


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802.11g Band-edge Measurements



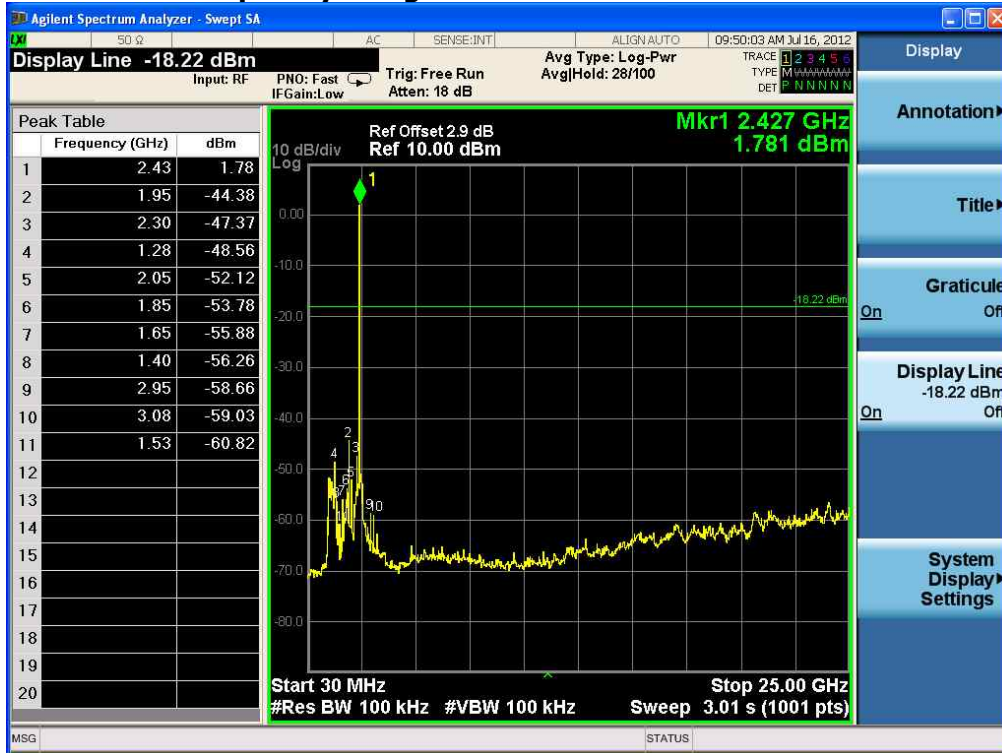


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Band – edge (at 20 dB blow) – Mid channel(802.11g) Frequency Range = 30 MHz ~ 10th harmonic





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





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802.11n(Ant0) Band-edge Measurements





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Band – edge (at 20 dB blow) – Low channel(802.11n(Ant0)) Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – Mid channel(802.11n(Ant0)) Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – High channel(802.11n(Ant0))
Frequency Range = 30 MHz ~ 10th harmonic



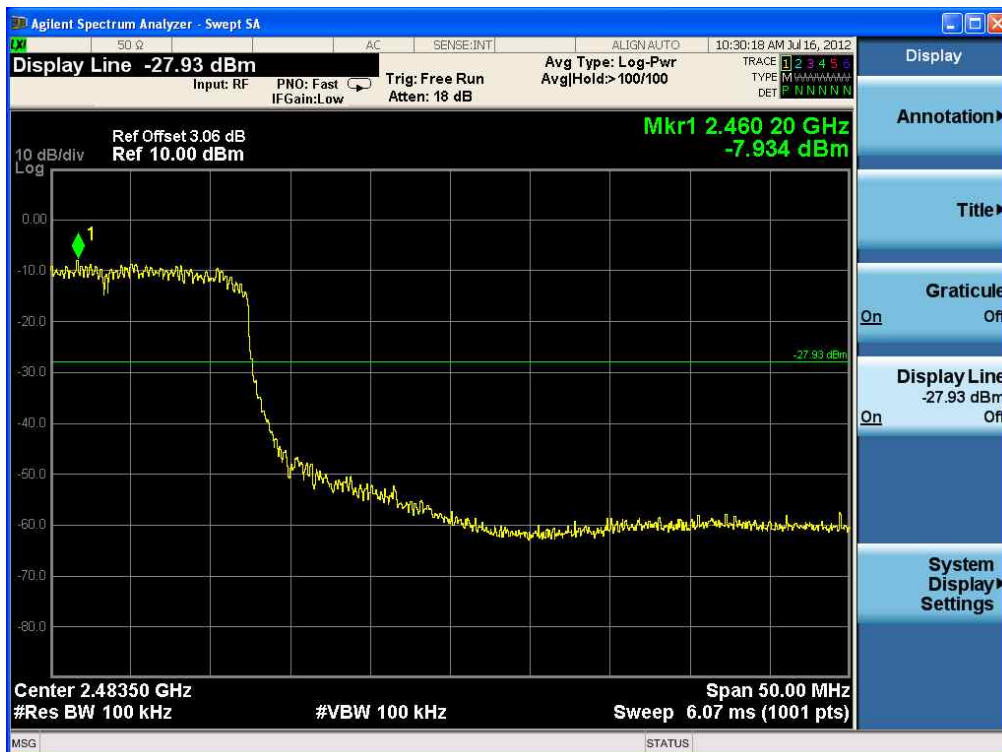
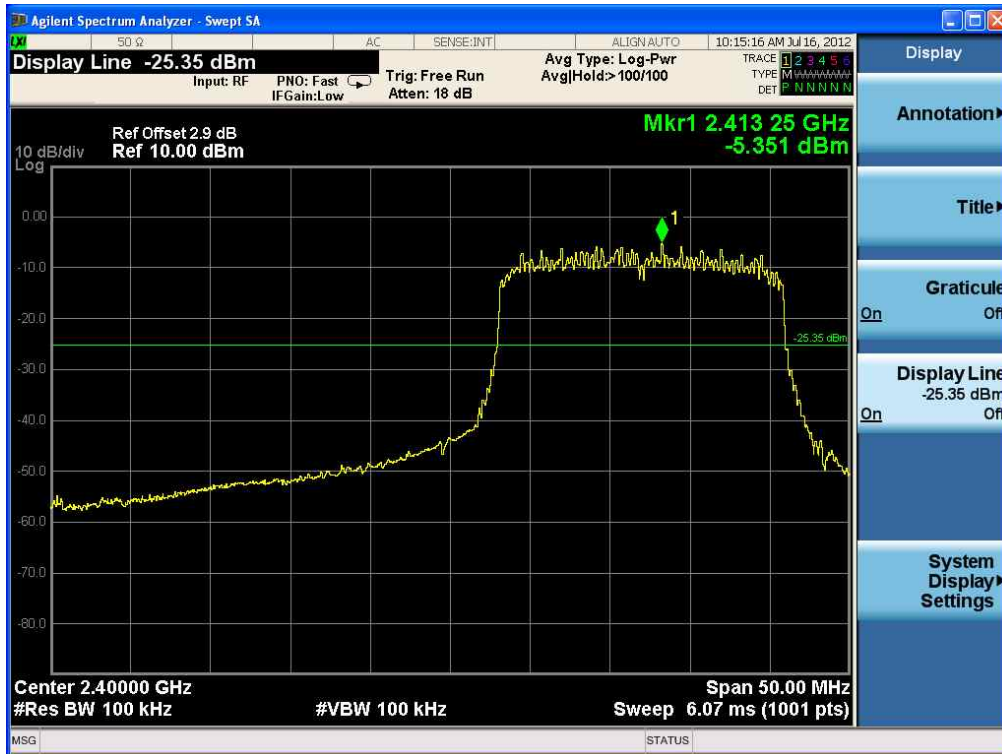


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802.11n(Ant1) Band-edge Measurements





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Band – edge (at 20 dB blow) – Low channel(802.11n(Ant1)) Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – Mid channel(802.11n(Ant1)) Frequency Range = 30 MHz ~ 10th harmonic



Band – edge (at 20 dB blow) – High channel(802.11n(Ant1))
Frequency Range = 30 MHz ~ 10th harmonic



2.1.5 Field Strength of Emissions

Test Location

☒ Testing was performed at a test distance of 3 meter SAC

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

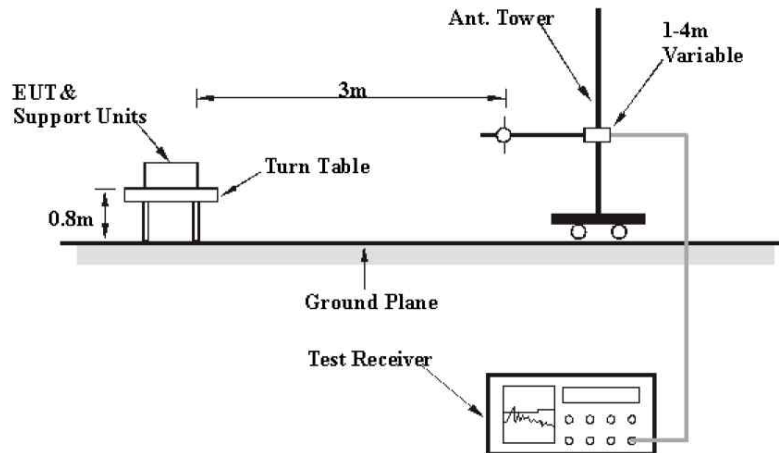
RBW = 120 kHz (30 MHz ~ 1 GHz) VBW ≥ RBW

= 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.



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Test Results

Test mode : 802.11b

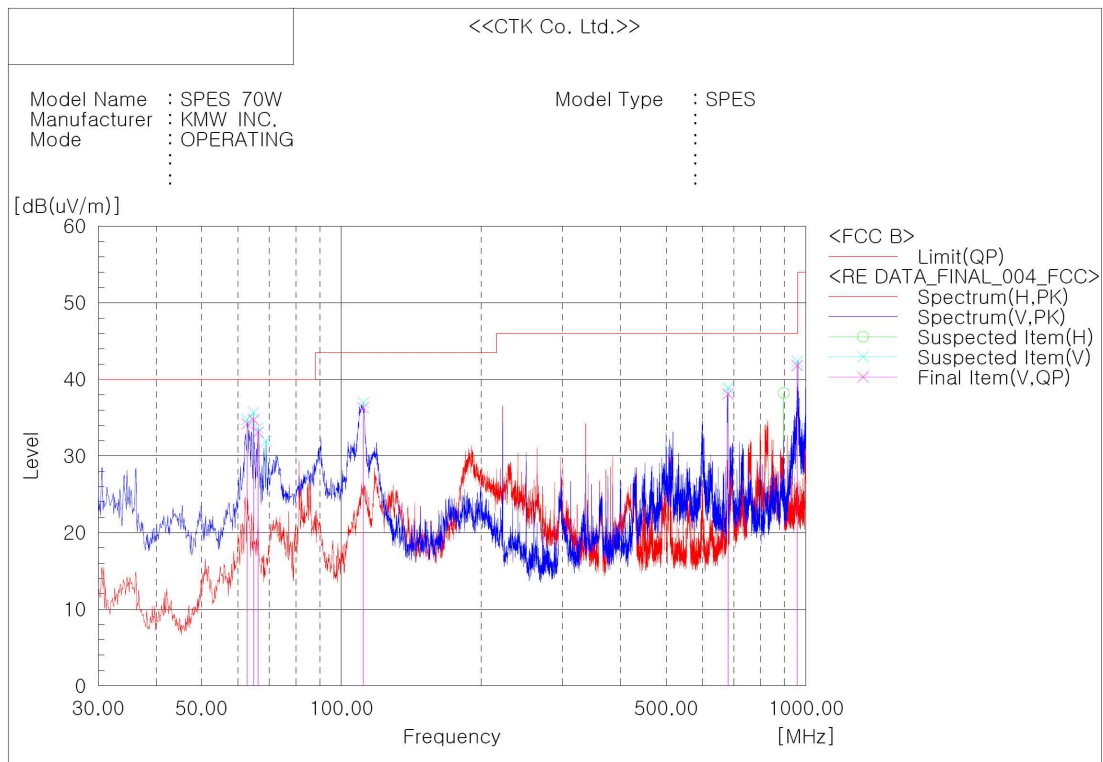
EUT	SPES	Measurement Detail	
Model	SPES 70W	Frequency Range	Below 1000MHz
Mode	802.11b(Worst Case)	Detector function	Quasi-Peak

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
957.32	41.8	4.2	Quasi-peak

Test Data



Final Result

No.	Frequency [MHz]	(P)	Reading QP [dB(uV)]	c.f [dB(1/m)]	Result QP [dB(uV/m)]	Limit QP [dB(uV/m)]	Margin QP [dB]	Height [cm]	Angle [deg]
1	62.738	V	60.2	-26.0	34.2	40.0	5.8	193.0	102.0
2	64.799	V	60.3	-25.6	34.7	40.0	5.3	100.0	70.0
3	66.254	V	58.4	-25.3	33.1	40.0	6.9	193.0	0.0
4	111.601	V	56.1	-19.8	36.3	43.5	7.2	100.0	144.0
5	679.536	V	45.3	-7.2	38.1	46.0	7.9	100.0	181.0
6	957.320	V	43.7	-1.9	41.8	46.0	4.2	100.0	0.0

Remark :

1. The field strength of spurious emission was measured in the following position: EUT stand-up position(Z axis), lie-down position(X,Y axis). The worst emission was found in stand-up position(X axis) and the worst case was recorded.



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Test Results

EUT	SPES	Measurement Detail	
Model	SPES 70W	Frequency Range	1-25GHz
Channel	Low Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2390	68.4	5.6	Peak

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4824.00	25.1 : 37.4	V	1.1	32.7	34.9	11.4	54.0 : 74.0	34.3 : 46.6	19.7 : 27.4

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4824.00	16.2 : 34.5	V	1.1	32.7	34.9	11.4	54.0 : 74.0	25.4 : 43.7	28.6 : 30.3

Test Data – 802.11n(Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak
				Antenna	Amp. Gain	Cable			
4824.00	15.7 : 31.7	V	1.1	32.7	34.9	11.4	54.0 : 74.0	24.9 : 40.9	29.1 : 33.1



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Restricted band edge test data

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

Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
2390.00	45.7	60.8	V	1.1	28.2	35.3	7.4	54.0	74.0	46.0	61.1	8.0	12.9

Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
2390.00	44.4	59.4	V	1.1	28.2	35.3	7.4	54.0	74.0	44.7	59.7	9.3	14.3

Test Data - 802.11n(Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
2390.00	45.7	68.1	V	1.1	28.2	35.3	7.4	54.0	74.0	46.0	68.4	8.0	5.6



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Test Results

EUT	SPES	Measurement Detail	
Model	SPES 70W	Frequency Range	1-25GHz
Channel	Mid Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
4874	33.9	20.1	Average

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable				
4874.00	24.7 : 37.0	V	1.1	32.7	34.9	11.4	54.0 : 74.0	33.9 : 46.2	20.1	27.8

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable				
4874.00	15.5 : 32.0	V	1.1	32.7	34.9	11.4	54.0 : 74.0	24.7 : 41.2	29.3	32.8

Test Data – 802.11n(Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak	Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak	Result [dBuV/m] AV / Peak	Margin [dB] AV / Peak	
				Antenna	Amp. Gain	Cable				
4874.00	15.4 : 32.2	V	1.1	32.7	34.9	11.4	54.0 : 74.0	24.6 : 41.4	29.4	32.6



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Test Results

EUT	SPES	Measurement Detail	
Model	SPES 70W	Frequency Range	1-25GHz
Channel	High Channel	Detector function	Peak

Remarks

We have tested three mode (X, Y, Z). The worst mode (X axis) for final test.

The requirements are:

☒ Complies

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
2483.5	67.1	6.9	Peak

Test Data – 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
4924.00	22.6	35.1	V	1.1	32.7	34.9	11.4	54.0	74.0	31.8	44.3	22.2	29.7

Test Data – 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
4924.00	15.2	32.9	V	1.1	32.7	34.9	11.4	54.0	74.0	24.4	42.1	29.6	31.9

Test Data – 802.11n(Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
4924.00	15.0	32.8	V	1.1	32.7	34.9	11.4	54.0	74.0	24.2	42.0	29.8	32.0



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Restricted band edge test data

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

Test data - 802.11b

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
2483.50	44.4	55.6	V	1.1	28.2	35.3	7.4	54.0	74.0	44.7	55.9	9.3	18.1

Test Data - 802.11g

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
2483.50	45.4	65.3	V	1.1	28.2	35.3	7.4	54.0	74.0	45.7	65.6	8.3	8.4

Test Data - 802.11n(Ant0 and Ant1)

Frequency [MHz]	Reading [dBuV/m] AV / Peak		Pol.	Height [m]	Correction Factor			Limits [dBuV/m] AV / Peak		Result [dBuV/m] AV / Peak		Margin [dB] AV / Peak	
					Antenna	Amp. Gain	Cable						
2483.50	46.6	66.8	V	1.1	28.2	35.3	7.4	54.0	74.0	46.9	67.1	7.1	6.9



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2.1.6 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

Test mode : 802.11b

Frequency (MHz)	Measured Data (dBuV/m)	Margin (dB)	Remark
0.150 000	48.4	17.6	Quasi-peak



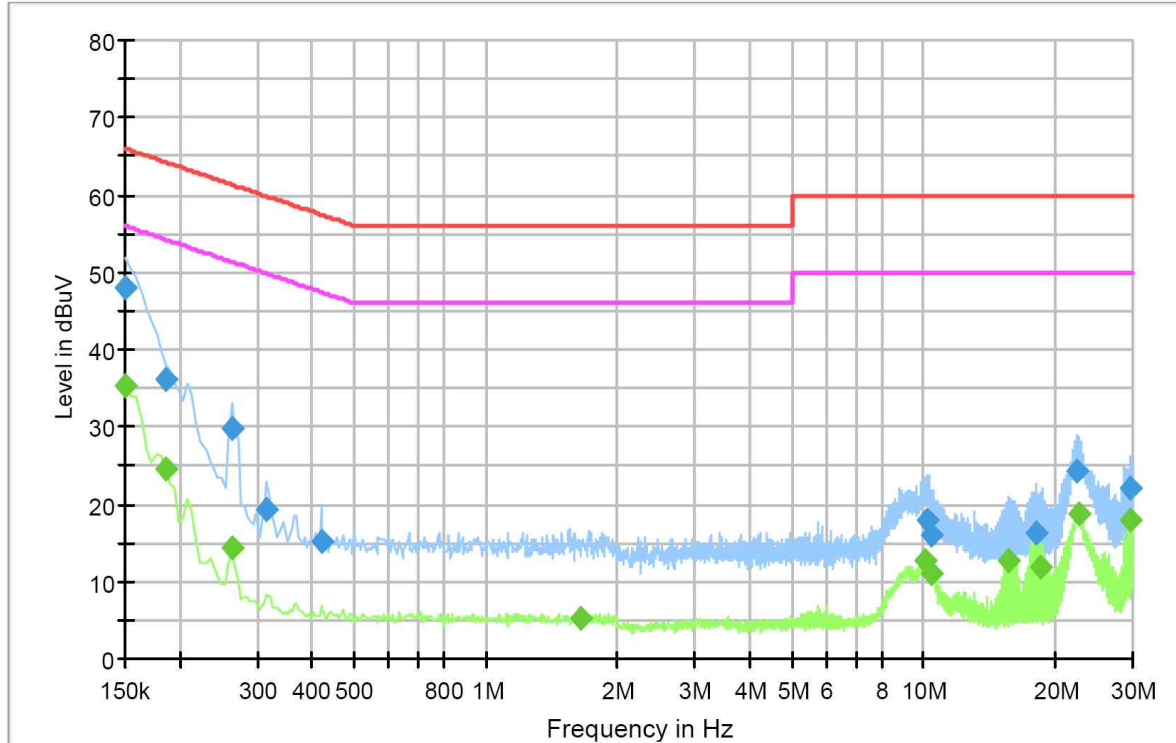
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Test Data

[HOT]



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	48.0	1000.0	9.000	On	L1	10.2	18.0	66.0
0.186000	36.1	1000.0	9.000	On	L1	10.0	28.1	64.2
0.262500	29.9	1000.0	9.000	On	L1	10.1	31.5	61.4
0.316500	19.4	1000.0	9.000	On	L1	10.0	40.4	59.8
0.420000	15.3	1000.0	9.000	On	L1	10.0	42.2	57.4
10.149000	17.8	1000.0	9.000	On	L1	9.7	42.2	60.0
10.437000	16.0	1000.0	9.000	On	L1	9.7	44.0	60.0
18.159000	16.2	1000.0	9.000	On	L1	9.8	43.8	60.0
22.353000	24.2	1000.0	9.000	On	L1	9.9	35.8	60.0
29.787000	22.1	1000.0	9.000	On	L1	10.0	37.9	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	35.3	1000.0	9.000	On	L1	10.2	20.7	56.0
0.186000	24.6	1000.0	9.000	On	L1	10.0	29.6	54.2
0.262500	14.2	1000.0	9.000	On	L1	10.1	37.1	51.4
1.639500	5.1	1000.0	9.000	On	L1	9.9	40.9	46.0
10.059000	12.6	1000.0	9.000	On	L1	9.7	37.4	50.0
10.468500	11.1	1000.0	9.000	On	L1	9.7	38.9	50.0
15.634500	12.7	1000.0	9.000	On	L1	9.8	37.3	50.0
18.415500	11.8	1000.0	9.000	On	L1	9.8	38.2	50.0
22.596000	18.9	1000.0	9.000	On	L1	9.9	31.2	50.0
29.782500	17.9	1000.0	9.000	On	L1	10.0	32.1	50.0

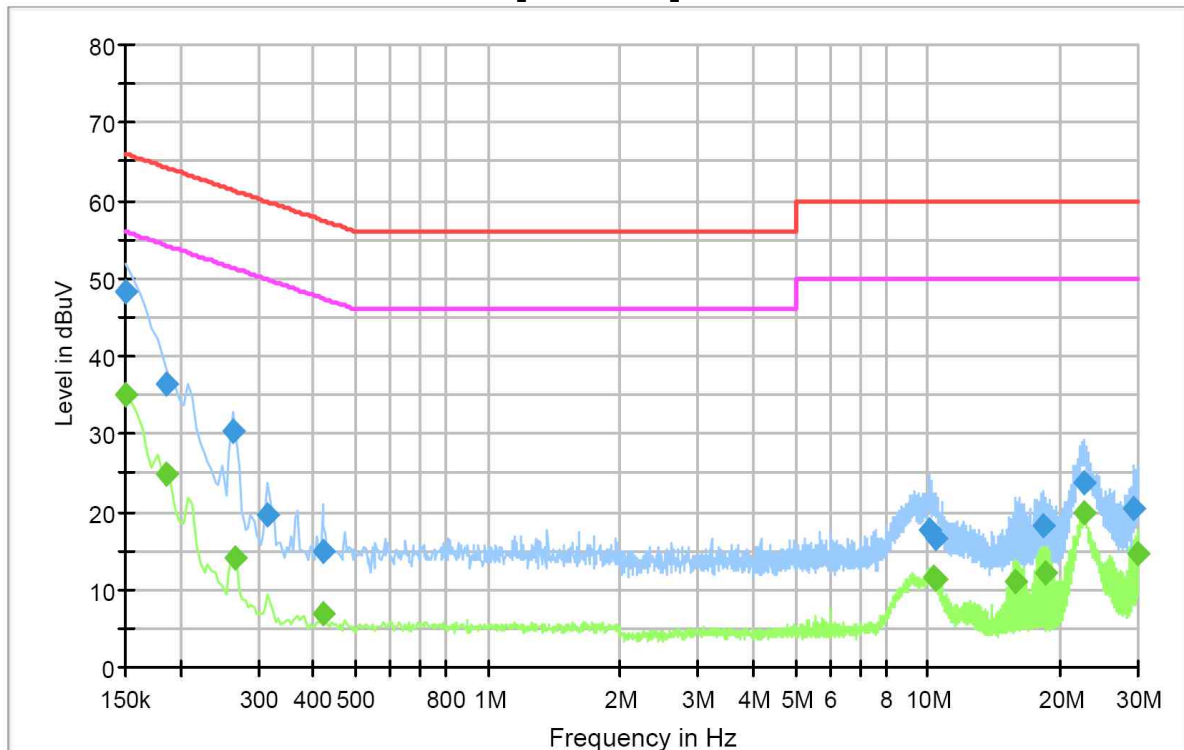


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[NEUTRAL]



Final Result 1

Frequency (MHz)	QuasiPeak (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	48.4	1000.0	9.000	On	N	10.2	17.6	66.0
0.186000	36.4	1000.0	9.000	On	N	10.1	27.8	64.2
0.262500	30.3	1000.0	9.000	On	N	10.1	31.1	61.4
0.316500	19.5	1000.0	9.000	On	N	10.0	40.3	59.8
0.420000	15.0	1000.0	9.000	On	N	10.0	42.5	57.4
10.054500	17.6	1000.0	9.000	On	N	9.7	42.4	60.0
10.414500	16.4	1000.0	9.000	On	N	9.7	43.6	60.0
18.357000	18.3	1000.0	9.000	On	N	9.9	41.7	60.0
22.762500	23.8	1000.0	9.000	On	N	10.0	36.2	60.0
29.278500	20.3	1000.0	9.000	On	N	10.2	39.7	60.0

Final Result 2

Frequency (MHz)	Average (dBuV)	Meas. Time (ms)	Bandwidth (kHz)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBuV)
0.150000	35.0	1000.0	9.000	On	N	10.2	21.0	56.0
0.186000	24.8	1000.0	9.000	On	N	10.1	29.4	54.2
0.267000	14.0	1000.0	9.000	On	N	10.1	37.2	51.2
0.420000	6.9	1000.0	9.000	On	N	10.0	40.6	47.4
10.324500	11.7	1000.0	9.000	On	N	9.7	38.3	50.0
10.410000	11.4	1000.0	9.000	On	N	9.7	38.6	50.0
15.774000	11.0	1000.0	9.000	On	N	9.8	39.0	50.0
18.424500	12.0	1000.0	9.000	On	N	9.9	38.0	50.0
22.555500	19.8	1000.0	9.000	On	N	10.0	30.2	50.0
29.994000	14.7	1000.0	9.000	On	N	10.2	35.3	50.0



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APPENDIX A – Test Equipment Used For Tests

	Name of Equipment	Manufacturer	Model No.	Serial No.	Due Date
1	Signal Analyzer	Agilent	N9020A	MY48011598	2012-11-10
2	Spectrum Analyzer	Rohde & Schwarz	FSP-30	100994	2012-11-10
3	EMI Test Receiver	Rohde & Schwarz	ESCI7	100814	2012-12-13
4	ULTRA Broadband Antenna	Rohde & Schwarz	HL562	100203	2013-07-05
5	LOOP ANTENNA	EMCO	6502	9107-2652	2012-10-29
6	Attenuator	HP	8494A	3308A33351	2012-11-14
7	EPM Series Power Meter	HP	E4418A	GB38272734	2012-11-10
8	Power Sensor	HP	8487A	3318A03524	2013-07-10
9	Audio Analyzer	HP	8903B	2747A03432	2012-11-10
10	ESG-D Series Signal Generator	Agilent	E4432B	US40054094	2012-11-21
11	SYNTHESIZED SWEEPER	HP	8341B	2819A01563	2012-11-10
12	Modulation Analyzer	HP	8901B	3438A05228	2012-11-18
13	Attenuator	BIRD	1000-WA-MFN-30	236	2012-11-14
14	Temp&Humi Chamber	Kunpoong	JT-TH-556-1	9QE5-002	2013-01-12
15	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
16	EMC Analyzer	Agilent	E7405A	MY45110859	2013-02-13
17	Horn Antenna	ETS-Lindgren	3115	00078894	2013-03-22
18	Horn Antenna	ETS-Lindgren	3115	00078895	2013-03-22
19	Dipole Antenna	SCHWARZBECK	VHA 9103	9103-2557	2013-11-04
20	Dipole Antenna	SCHWARZBECK	UHA 9105	9105-2417	2013-11-04
21	OPT H64 AMPLIFIER	HP	8447F	3113A06814	2013-03-27
22	PREAMPLIFIER	Agilent	8449B	3008A02307	2012-11-17
23	Radio Communication Tester	Rohde & Schwarz	CMU200	106765	2013-02-09
24	LISN	Rohde & Schwarz	ESH3-Z5	101235	2012-08-18
25	LISN	Rohde & Schwarz	ENV216	101236	2012-08-06
26	DC POWER SUPPLY	Agilent	E3632A	MY40011638	2012-11-10
27	EMI Test Receiver	Rohde & Schwarz	ESCI3	100032	2013-02-09
28	System Power Supply	HP	6032A	3440A-10521	2013-07-07