







ISO/IEC17025Accredited Lab.

Report No: FCC 1212122
File reference No: 2012-12-25

Applicant: Haier International(hk) Limited

Product: MID

Model No: S701-R2A-1

Trademark: AVATAR

Test Standards: FCC Part 15 Subpart C, Paragraph 15.247

Test result:

It is herewith confirmed and found to comply with the

requirements set up by ANSI C63.4 and FCC Part 15 Subpart C, Paragraph 15.247 regulations for the evaluation of

electromagnetic compatibility

Approved By

Jack Chung

Jack Chung Manager

Dated: Dec 25, 2012

Results appearing herein relate only to the sample tested The technical reports is issued errors and omissions exempt and is subject to withdrawal at

SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD

5/F, Block 4, Anhua Industrial Zone., No.8 TaiRan Rd.CheGongMiao, FuTian District, Shenzhen, CHINA.

Tel (755) 83448688 Fax (755) 83442996

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Date: 2012-12-25



Special Statement:

The testing quality ability of our laboratory meet with "Quality Law of People's Republic of China" Clause 19.

The testing quality system of our laboratory meet with ISO/IEC-17025 requirements, which is approved by CNAL. This approval result is accepted by MRA of APLAC.

Our test facility is recognized, certified, or accredited by the following organizations:

CNAL-LAB Code: L2292

The EMC Laboratory has been assessed and in compliance with CNAL/AC01:2002 accreditation criteria for testing Laboratories (identical to ISO/IEC 17025:1999 General Requirements) for the Competence of testing Laboratories.

FCC-Registration No.: 899988

The EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 899988.

IC- Registration No.: IC5205A-02

The EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration IC No.: 5205A-02.

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Test Report Conclusion

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1.0 General Details

1.1 Test Lab Details

Name: SHENZHEN TIMEWAY TECHNOLOGY CONSULTING CO., LTD

Address: 5/F,Block 4, Anhua Industrial Zone.,No.8 TaiRan Rd.CheGongMiao,FuTian District,

Shenzhen, CHINA.

Telephone: (755) 83448688 Fax: (755) 83442996

Site on File with the Federal Communications Commission – United Sates

Registration Number: 899988

For 3m & 10 m OATS

Site Listed with Industry Canada of Ottawa, Canada

Registration Number: IC: 5205A-02

For 3m & 10 m OATS

1.2 Applicant Details

Applicant: Haier International (hk) Limited

Address: No.1 Haier Road, 702B, Chuang Pai Mansion South, Qingdao 266101, P.R. China

Telephone: 0532-88937841 Fax: 0532-88937816

1.3 Description of EUT

Product: MID

Manufacturer: Haier International (hk) Limited

Address: No.1 Haier Road,702B,Chuang Pai Mansion South, Qingdao 266101, P.R.

China

Brand Name: AVATAR
Model Number: S701-R2A-1

Additional Model Number: N/A

Type of Modulation IEEE 802.11b : DSSS (CCK, QPSK, DBPSK)

IEEE 802.11g/n (HT20): OFDM(64QAM, 16QAM, QPSK, BPSK)

Frequency range IEEE 802.11b/g/n (HT20) : 2412-2462MHz;

Channel Spacing IEEE 802.11b/g/n (HT20) : 5MHz
Air Data Rate IEEE 802.11b : 11, 5.5, 2, 1 Mbps

IEEE 802.11g: 54, 48,36, 24, 18, 12, 9, 6 Mbps

IEEE 802.11n HT20: 150, 117, 104, 78, 65, 58.5, 52, 39, 26, 19.5, 13, 6 Mbps

Frequency Selection By software

Channel Number IEEE 802.11b/g/n (HT20) : 11 Channels
Antenna: Integral Antenna with maximum gain 2.0dBi

The report refers only to the sample tested and does not apply to the bulk.

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Power Supply:

Model No.: ASSA1A-050200

Input: 100-240V, 50/60Hz, 0.45A; Output: 5.0V, 2000mA

1.4 Submitted Sample: 2 Samples

1.5 Test Duration

2012-12-17 to 2012-12-25

1.6 Test Uncertainty

Conducted Emissions Uncertainty =3.6dB

Radiated Emissions Uncertainty =4.7dB

1.7 Test Engineer

Terry Tang

The sample tested by

Print Name: Terry Tang

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2.0	2.0 Test Equipments				
Instrument Type	Manufacturer	Model	Serial No.	Date of Cal.	Due Date
ESPI Test Receiver	ROHDE&SCHWARZ	ESPI 3	100379	2012-04-21	2013-04-20
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100294	2012-04-21	2013-04-20
TWO Line-V-NETW	ROHDE&SCHWARZ	EZH3-Z5	100253	2012-04-21	2013-04-20
Ultra Broadband ANT	ROHDE&SCHWARZ	HL562	100157	2012-04-21	2013-04-20
ESDV Test Receiver	ROHDE&SCHWARZ	ESDV	100008	2012-04-21	2013-04-20
Impuls-Begrenzer	ROHDE&SCHWARZ	ESH3-Z2	100281	2012-04-21	2013-04-20
System Controller	CT	SC100	-		
Printer	EPSON	РНОТО ЕХЗ	CFNH234850		
Computer	IBM	8434	1S8434KCE99BLXL O*	-	-
Loop Antenna	EMCO	6502	00042960	2012-04-21	2013-04-20
ESPI Test Receiver	ROHDE&SCHWARZ	ESI26	838786/013	2012-04-21	2013-04-20
3m OATS			N/A	2012-04-21	2013-04-20
Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170265	2012-04-21	2013-04-20
Horn Antenna	SCHWARZBECK	BBHA 9120D	9120D-631	2012-04-21	2013-04-20
Power meter	Anritsu	ML2487A	6K00003613	2012-04-21	2013-04-20
Power sensor	Anritsu	MA2491A	32263	2012-04-21	2013-04-20
Bilog Antenna	Schwarebeck	VULB9163	9163/340	2012-04-21	2013-04-20
LISN	AFJ	LS16C	10010947251	2012-04-21	2013-04-20
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2012-04-21	2013-04-20
9*6*6 Anechoic			N/A	2012-04-21	2013-04-20
EMI Test Receiver	RS	ESCS30	100139	2012-04-21	2013-04-20
LISN	AFJ	LS16C	10010947251	2012-04-21	2013-04-20
LISN (Three Phase)	Schwarebeck	NSLK 8126	8126453	2012-04-21	2013-04-20

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2.1 **Auxiliary Equipment**

Name	Model No.	Serial No.	Manufacturer	Cable	FCC ID/DOC
TF Card			Kingston		
Earphone					
LCD Monitor	PH3450		SAMSUNG		

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3. DESCRIPTION OF TEST MODES

IEEE 802.11b, 802.11g, 802.11n (HT20) mode

The EUT had been tested under operating condition. There are three channels have been tested as following:

Channel	Frequency (MHz)
Low	2412
Middle	2437
High	2462

IEEE 802.11b mode: 11Mbps data rate (worst case) was chosen for full testing. IEEE 802.11g mode: 54Mbps data rate (worst case) was chosen for full testing. IEEE 802.11n (HT20) mode: 65Mbps data rate (worst case) were chosen for full testing

The worst-case data rates are determined according to the description above, based on the investigations by measuring the PSD and average power across all the data rates, bandwidths, modulations and spatial stream modes.



3.0 **Technical Details**

3.1 **Summary of test results**

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107	Conducted Emission Test	PASS	Complies
& 15.207			
	Spectrum bandwidth of a		Complies
FCC Part 15 Subpart C	Orthogonal Frequency		
Paragraph 15.247(a)(2) Limit	Division Multiplex System	PASS	
Taragraph 13.247(a)(2) Ellint	Limit: 6dB		
	bandwidth>500kHz		
FCC Part 15, Paragraph	Maximum peak output		
15.247(b)	power	PASS	Complies
13.247(0)	Limit: max. 30dBm		
FCC Part 15, Paragraph	Transmitter Radiated	PASS	Complies
15.109,15.205 & 15.209	Emission		
	Limit: Table 15.209		
FCC Part 15, Paragraph	Power Spectral Density	PASS	Complies
15.247(e)	Limit: max. 8dBm		
FCC Part 15, Paragraph	Out of Band Emission and	PASS	Complies
15.247(d)	Restricted Band		
	Radiation		
	Limit: 20dB less than		
	peak value of fundamental		
	frequency		
	Restricted band limit:		
	Table 15.209		

3.2 **Test Standards**

FCC Part 15 Subpart & Subpart C, Paragraph 15.247

EUT Modification 4.0

No modification by Shenzhen Timeway Technology Consulting Co., Ltd

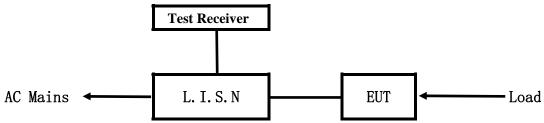
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5. Power Line Conducted Emission Test

5.1 Schematics of the test

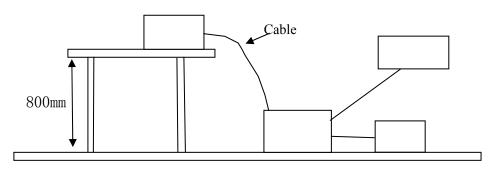


EUT: Equipment Under Test

5.2 Test Method and test Procedure

The EUT was tested according to ANSI C63.4-2003. The Frequency spectrum From 0.15MHz to 30MHz was investigated. The LISN used was 50ohm/50uH as specified by section 5.1 of ANSI C63.4 –2003.

Test Voltage: 120V~, 60Hz Block diagram of Test setup



5.3 Configuration of The EUT

The EUT was configured according to ANSI C63.4-2003. All interface ports were connected to the appropriate peripherals. All peripherals and cables are listed below.

A. EUT

Device	Device Manufacturer		FCC ID
MID	MID Haier International (hk) Limited		RH2-S701-R2A-1

B. Internal Device

De	vice	Manufacturer	Model	FCC ID/DOC
N	/A			

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C. Peripherals

Device	Manufacturer	Model	FCC ID/DOC	Cable
N/A				

5.4 EUT Operating Condition

Operating condition is according to ANSI C63.4 -2003.

- A Setup the EUT and simulators as shown on follow
- B Enable AF signal and confirm EUT active to normal condition

5.5 Power line conducted Emission Limit according to Paragraph 15.207.

	<u> </u>				
Frequency	Class A Lim	its (dB µ V)	Class B Lim	nits (dB µ V)	
(MHz)	Quasi-peak Level	Average Level	Quasi-peak Level	Average Level	
$0.15 \sim 0.50$	79.0	66.0	66.0~56.0*	56.0~46.0*	
$0.50 \sim 5.00$	73.0	60.0	56.0	46.0	
5.00 ~ 30.00	73.0	60.0	60.0	50.0	

Notes:

- 1. *Decreasing linearly with logarithm of frequency.
- 2. The tighter limit shall apply at the transition frequencies

5.6 Test Results

The frequency spectrum from 0.15MHz to 30MHz was investigated. All reading are quasi-peak values with a resolution bandwidth of 9kHz.

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A: Conducted Emission on Live Terminal (150kHz to 30MHz)

EUT Operating Environment

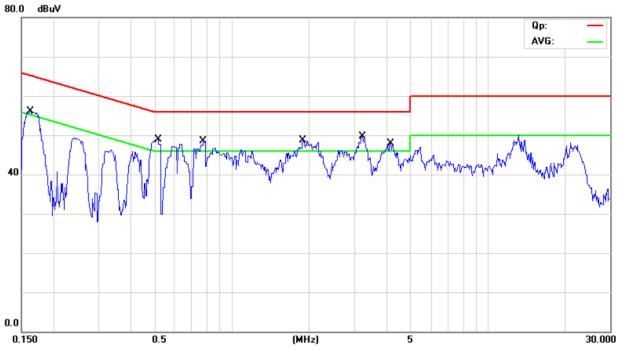
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Keep transmitting

Equipment Level: Class B

Results: PASS

Please refer to following diagram for individual



Frequency	Line	Reading(dBμV)	Limit(dBμV)
(MHz)	Line	Quasi-peak	Average	Quasi-peak	Average
0.161	Live	51.71	33.61	65.39	55.39
0.513	Live	47.28	31.98	56.00	46.00
3.210	Live	44.28	34.28	56.00	46.00
1.895	Live	44.82	32.48	56.00	46.00
0.781	Live	47.60	32.23	56.00	46.00
4.145	Live	47.61	33.51	56.00	46.00

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B: Conducted Emission on Neutral Terminal (150kHz to 30MHz)

EUT Operating Environment

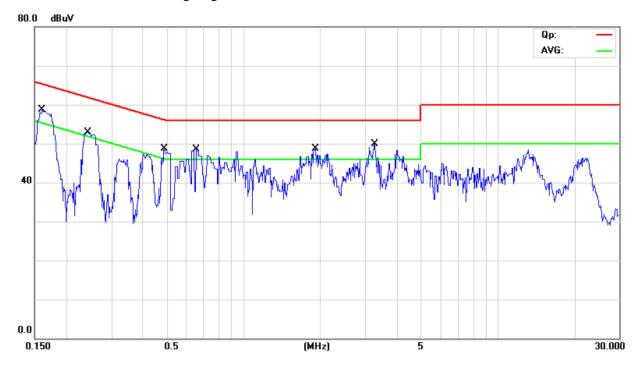
Temperature: 26°C Humidity: 65%RH Atmospheric Pressure: 101 KPa

EUT set Condition: Charging and Keep transmitting

Equipment Level: Class B

Results: Pass

Please refer to following diagram for individual



Frequency	Lina	Reading(dBμV)		Limit(dBµV)	
(MHz)	Line	Quasi-peak	Average	Quasi-peak	Average
0.161	Neutral	57.69	32.59	65.40	55.40
0.242	Neutral	52.85	31.44	62.01	52.01
0.486	Neutral	47.77	31.73	56.24	46.24
0.657	Neutral	47.60	31.57	56.00	46.00
1.917	Neutral	47.72	32.58	56.00	46.000
3.267	Neutral	44.31	49.93	56.00	46.00

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6 Radiated Emission Test

- 6.1 Test Method and test Procedure:
- (1) The EUT was tested according to ANSI C63.4 –2003. The radiated test was performed at Timeway Laboratory. This site is on file with the FCC laboratory division, Registration No.899988
- (2) The EUT, peripherals were put on the turntable which table size is 1m x 1.5 m, table high 0.8 m. All set up is according to ANSI C63.4-2003.
- (3) The frequency spectrum from 30 MHz to 25 GHz was investigated. All readings from 30 MHz to 1 GHz are Quasi-peak values with a resolution bandwidth of 120 kHz. For measurement above 1GHz, peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector. Measurements were made at 3 meters.
- (4) The antenna high is varied from 1 m to 4 m high to find the maximum emission for each frequency.
- (5) Maximizing procedure was performed on the six (6) highest emissions to ensure EUT compliance is with all installation combinations. All data was recorded in the peak detection mode. Quasi-peak readings was performed only when an emission was found to be marginal (within -4 dB of specification limit), and are distinguished with a "QP" in the data table.
- (6) The antenna polarization : Vertical polarization and Horizontal polarization.

Block diagram of Test setup Distance = 3m Computer Pre -Amplifier Furn-table Receiver

- 6.2 Configuration of The EUT

 Same as section 5.3 of this report
- 6.3 EUT Operating Condition
 Same as section 5.4 of this report.

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6.4 Radiated Emission Limit

All emission from a digital device, including any network of conductors and apparatus connected thereto, shall not exceed the level of field strength specified below:

Frequencies in restricted band are complied to limit on Paragraph 15.209

		E 1
Frequency Range (MHz)	Distance (m)	Field strength (dB µ V/m)
30-88	3	40.0
88-216	3	43.5
216-960	3	46.0
Above 960	3	54.0

Note:

- 1. RF Voltage $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2. In the Above Table, the higher limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the EUT
- 4. This is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), After pre-test. It was found that the worse radiated emission was get at the lying position.

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Test result

General Radiated Emission Data and Harmonics Radiated Emission Data

Radiated Emission In Horizontal (30MHz----1000MHz)

EUT set Condition: Charging and Keep transmitting

Results: Pass

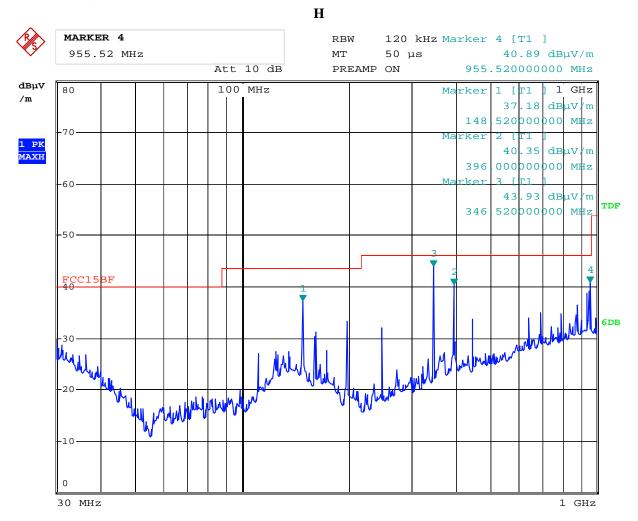
Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB μ V/m) 43.50	
148.520	37.18	Н		
396.000	396.000 40.35		46.00	
346.520	43.93	Н	46.00	
955.520	40.89	Н	46.00	
73.280	33.02	V	40.00	
600.000 39.24		V	46.00	
825.120	44.12	V	46.00	
950.280	41.45	V	46.00	

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Test Figure:



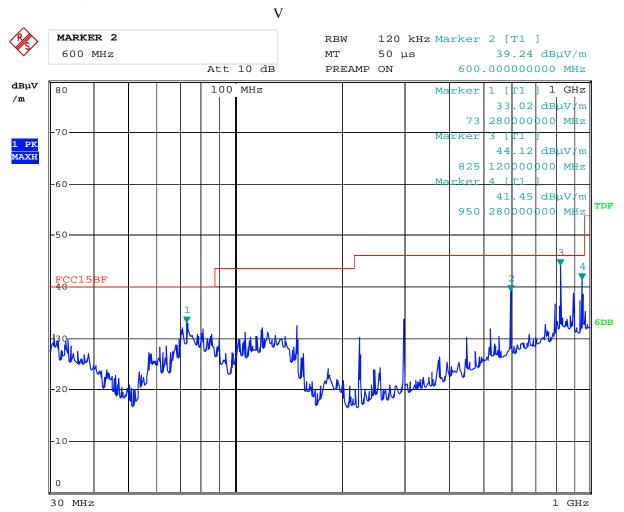
Date: 25.DEC.2012 15:09:34

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Test Figure:



Date: 25.DEC.2012 14:58:44

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Operation Mode: Transmitting & Receiving under CH01 for 11g at 54Mbps

	0 0		_
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \u03b4 V/m)
2412.00	92.39 (PK)	Н	Even dominantal Engaviores
2412.00	93.19 (PK)	V	Fundamental Frequency
4824.00	47.78 (PK)	Н	74(Peak)/ 54(AV)
4824.00		V	74(Peak)/ 54(AV)
7236.00		H/V	74(Peak)/ 54(AV)
9648.00		H/V	74(Peak)/ 54(AV)
12060		H/V	74(Peak)/ 54(AV)
14472		H/V	74(Peak)/ 54(AV)
16884		H/V	74(Peak)/ 54(AV)
19296		H/V	74(Peak)/ 54(AV)
21708		H/V	74(Peak)/ 54(AV)
24120		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

^{2.} Remark "---" means that the emissions level is too low to be measured

^{3.} For 802.11g mode 54Mbps

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Operation Mode: Transmitting & Receiving under CH06 for 11g at 54Mbps

	0 0		_
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
2437.00	90.47 (PK)	Н	Eundamental Eragueney
2437.00	92.44 (PK)	V	Fundamental Frequency
4874.00	46.97 (PK)	Н	74(Peak)/ 54(AV)
4874.00	47.20 (PK)	V	74(Peak)/ 54(AV)
7311.00		H/V	74(Peak)/ 54(AV)
9748.00		H/V	74(Peak)/ 54(AV)
12185	-	H/V	74(Peak)/ 54(AV)
14622	-	H/V	74(Peak)/ 54(AV)
17059		H/V	74(Peak)/ 54(AV)
19496		H/V	74(Peak)/ 54(AV)
21933		H/V	74(Peak)/ 54(AV)
24370		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11g mode 54 Mbps

Operation Mode: Transmitting & Receiving under CH11 for 11g at 54Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \(\mu \)V/m)	
2462.00	91.93 (PK)	Н	Fundamental Frequency	
2462.00	92.75 (PK)	V	Fundamental Frequency	
4924	45.08 (PK)	Н	74(Peak)/ 54(AV)	
4924	48.14 (PK)	V	74(Peak)/ 54(AV)	
7368	-	H/V	74(Peak)/ 54(AV)	
9848	1	H/V	74(Peak)/ 54(AV)	
12310	-	H/V	74(Peak)/ 54(AV)	
14772	-	H/V	74(Peak)/ 54(AV)	
17234	-	H/V	74(Peak)/ 54(AV)	
19696	96 H/V		74(Peak)/ 54(AV)	
22158		H/V	74(Peak)/ 54(AV)	
24620		H/V	74(Peak)/ 54(AV)	

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11g mode at 54 Mbps

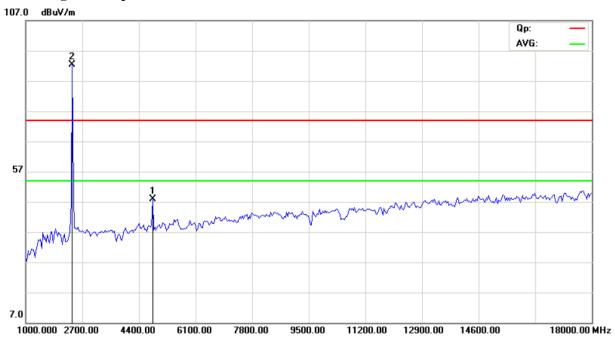
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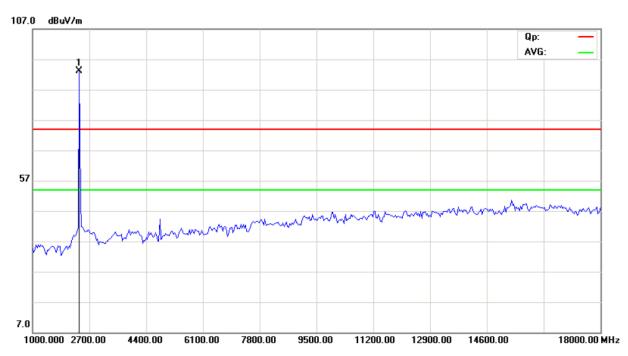


Please refer to the following test plots for details:

CH01 for 11g at 54Mbps: Horizontal



CH01 for 11g at 54Mbps: Vertical

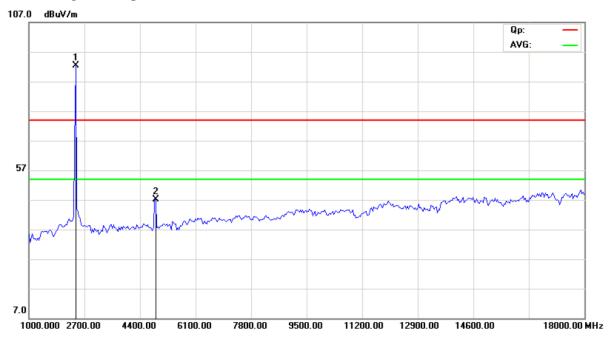


The report refers only to the sample tested and does not apply to the bulk.

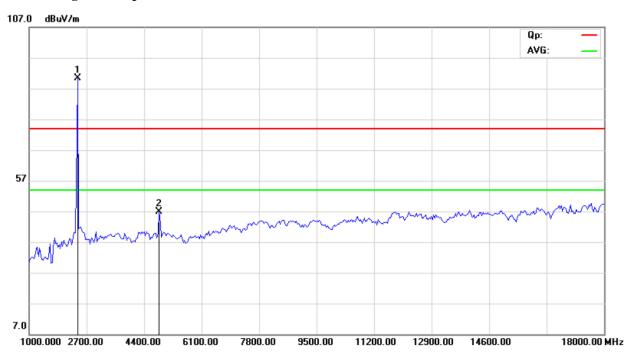
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CH06 for 11g at 54Mbps: Vertical

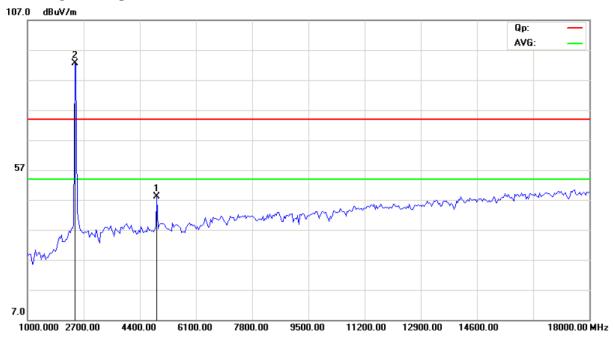


CH06 for 11g at 54Mbps: Horizontal

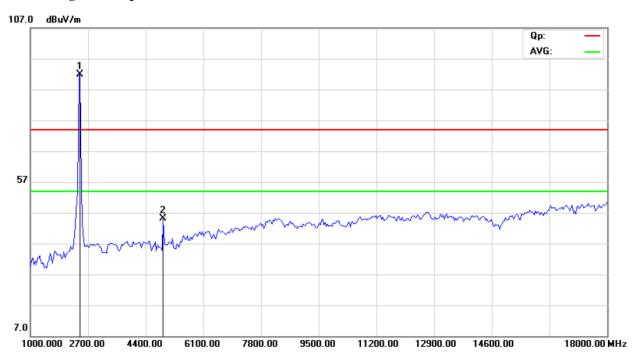




CH11 for 11g at 54Mbps: Vertical



CH11 for 11g at 54Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

Date: 2012-12-25



Operation Mode: Transmitting & Receiving under CH01 for 11b at 11Mbps

	0 0		_
Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
2412.00	91.79 (PK)	V	Eundamental Eragueney
2412.00	93.26 (PK)	Н	Fundamental Frequency
4824.00	46.32 (PK)	Н	74(Peak)/ 54(AV)
4824.00	46.59 (PK)	V	74(Peak)/ 54(AV)
7236.00		H/V	74(Peak)/ 54(AV)
9648.00	-	H/V	74(Peak)/ 54(AV)
12060	-	H/V	74(Peak)/ 54(AV)
14472	-	H/V	74(Peak)/ 54(AV)
16684		H/V	74(Peak)/ 54(AV)
19296		H/V	74(Peak)/ 54(AV)
21708		H/V	74(Peak)/ 54(AV)
24120		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11b mode 11Mbps

Operation Mode: Transmitting & Receiving under CH06 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \(\mu \)V/m)	
2437.00	91.63 (PK)	Н	Fundamental Frequency	
2437.00	93.65 (PK)	V	Fundamental Frequency	
4874.00	48.13 (PK)	Н	74(Peak)/ 54(AV)	
4874.00	47.50 (PK)	V	74(Peak)/ 54(AV)	
7311.00	-	H/V	74(Peak)/ 54(AV)	
9748.00	1	H/V	74(Peak)/ 54(AV)	
12185	•	H/V	74(Peak)/ 54(AV)	
14622	-	H/V	74(Peak)/ 54(AV)	
17059	ı	H/V	74(Peak)/ 54(AV)	
19496	96 H/V		74(Peak)/ 54(AV)	
21933		H/V	74(Peak)/ 54(AV)	
24370		H/V	74(Peak)/ 54(AV)	

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11b mode 11Mbps

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Operation Mode: Transmitting & Receiving under CH11 for 11b at 11Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB \mu V/m)
2462.00	93.88 (PK)	Н	Fundamental Frequency
2462.00	94.17 (PK)	V	Fundamental Frequency
4924	46.79 (PK)	Н	74(Peak)/ 54(AV)
4924	48.13 (PK)	V	74(Peak)/ 54(AV)
7368		H/V	74(Peak)/ 54(AV)
9848		H/V	74(Peak)/ 54(AV)
12310		H/V	74(Peak)/ 54(AV)
14772		H/V	74(Peak)/ 54(AV)
17234		H/V	74(Peak)/ 54(AV)
19696		H/V	74(Peak)/ 54(AV)
22158		H/V	74(Peak)/ 54(AV)
24620		H/V	74(Peak)/ 54(AV)

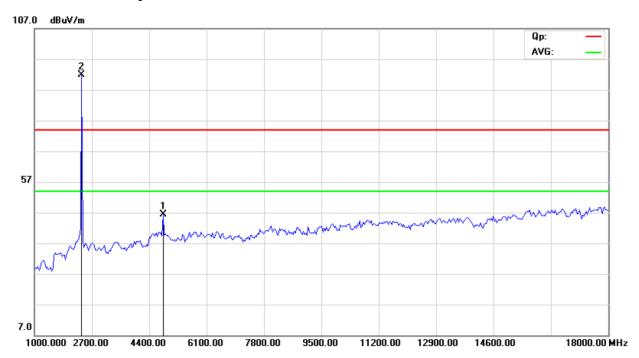
Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11b mode at 11Mbps

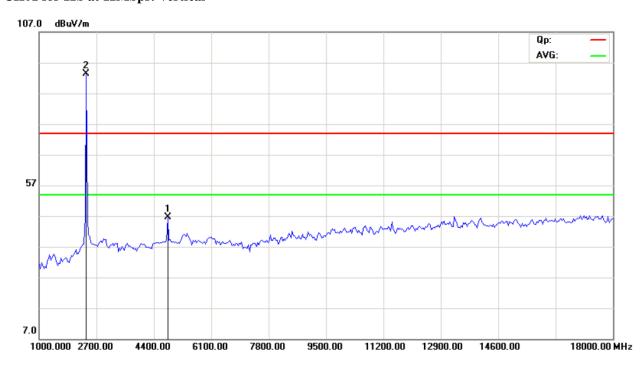


Please refer to the following test plots for details:

CH01 for 11b at 11Mbps: Horizontal



CH01 for 11b at 11Mbps: Vertical



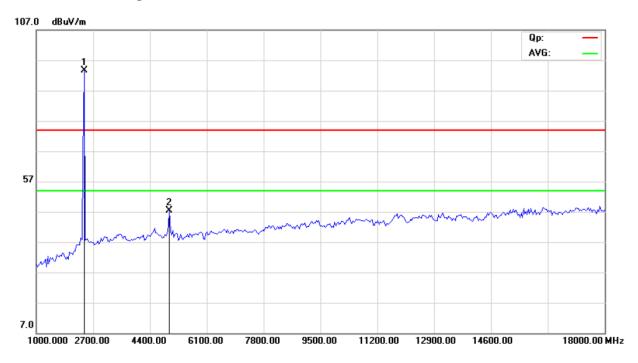
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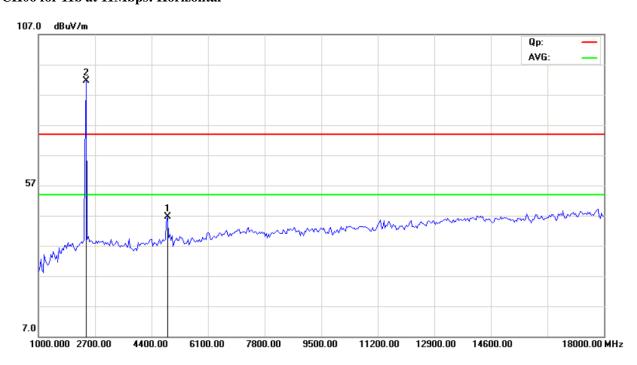
In the event of the improper use of the report. The Shenzhen Timeway Technology Consulting co .,Ltd reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



CH06 for 11b at 11Mbps: Vertical



CH06 for 11b at 11Mbps: Horizontal

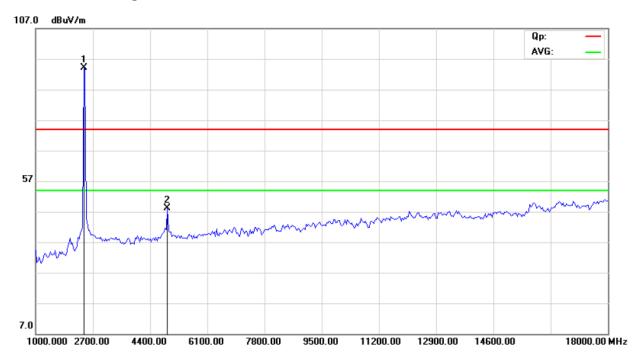


The report refers only to the sample tested and does not apply to the bulk.

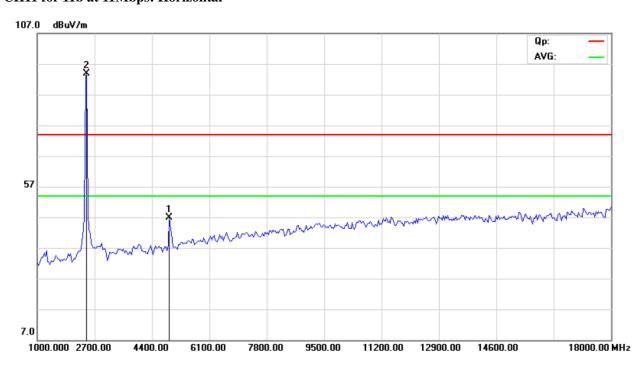
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CH11 for 11b at 11Mbps: Vertical



CH11 for 11b at 11Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

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Operation Mode: Transmitting & Receiving under CH01 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dB \u03ba V/m)	Antenna Polarity	Limit@3m (dB \(\mu \)V/m)
2412.00	90.36 (PK)	Н	Fundamental Frequency
2412.00	91.42 (PK)	V	Fundamental Frequency
4824.00	46.35 (PK)	Н	74(Peak)/ 54(AV)
4824.00		V	74(Peak)/ 54(AV)
7236.00		H/V	74(Peak)/ 54(AV)
9648.00		H/V	74(Peak)/ 54(AV)
12060		H/V	74(Peak)/ 54(AV)
14472	-	H/V	74(Peak)/ 54(AV)
16684		H/V	74(Peak)/ 54(AV)
19296		H/V	74(Peak)/ 54(AV)
21708		H/V	74(Peak)/ 54(AV)
24120		H/V	74(Peak)/ 54(AV)

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11n (HT20) mode 65Mbps

Operation Mode: Transmitting & Receiving under CH06 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dB μ V/m)	Antenna Polarity	Limit@3m (dB \(\mu \) V/m)	
2437.00	89.05 (PK)	Н	Fundamental Frequency	
2437.00	91.01 (PK)	V	Tundamental Frequency	
4874.00	45.60 (PK)	Н	74(Peak)/ 54(AV)	
4874.00	44.19 (PK)	V	74(Peak)/ 54(AV)	
7311.00		H/V	74(Peak)/ 54(AV)	
9748.00		H/V	74(Peak)/ 54(AV)	
12185		H/V	74(Peak)/ 54(AV)	
14622		H/V	74(Peak)/ 54(AV)	
17059		H/V	74(Peak)/ 54(AV)	
19496		H/V	74(Peak)/ 54(AV)	
21933		H/V	74(Peak)/ 54(AV)	
24370		H/V	74(Peak)/ 54(AV)	

Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11n (HT20) mode 65Mbps

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Operation Mode: Transmitting & Receiving under CH11 for 11n HT20 at 65Mbps

Frequency (MHz)	Level@3m (dB \u03b4 V/m)	Antenna Polarity	Limit@3m (dB µ V/m)
2462.00	88.62 (PK)	Н	Eundomontal Eroguanov
2462.00	88.32 (PK)	V	Fundamental Frequency
4924		Н	74(Peak)/ 54(AV)
4924	45.46 (PK)	V	74(Peak)/ 54(AV)
7368		H/V	74(Peak)/ 54(AV)
9848		H/V	74(Peak)/ 54(AV)
12310		H/V	74(Peak)/ 54(AV)
14772		H/V	74(Peak)/ 54(AV)
17234		H/V	74(Peak)/ 54(AV)
19696		H/V	74(Peak)/ 54(AV)
22158		H/V	74(Peak)/ 54(AV)
24620		H/V	74(Peak)/ 54(AV)

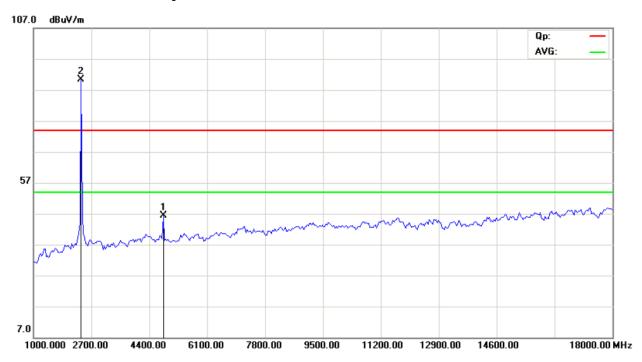
Note: 1. Level = Reading + AF + Cable - Preamp + Filter - Dist, Margin = Level - Limit

- 2. Remark "---" means that the emissions level is too low to be measured
- 3. For 802.11n (HT20) mode 65Mbps

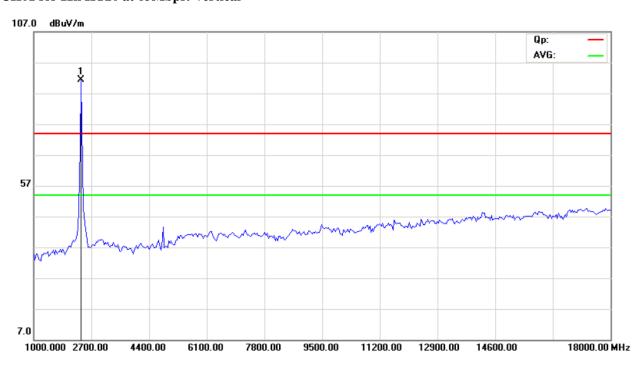


Please refer to the following test plots for details:

CH01 for 11n HT20 at 65Mbps: Horizontal



CH01 for 11n HT20 at 65Mbps: Vertical



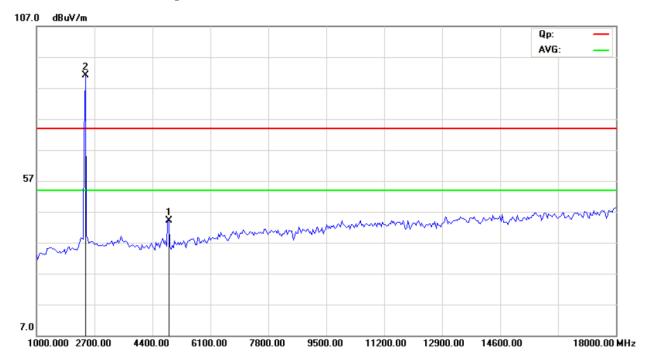
The report refers only to the sample tested and does not apply to the bulk.

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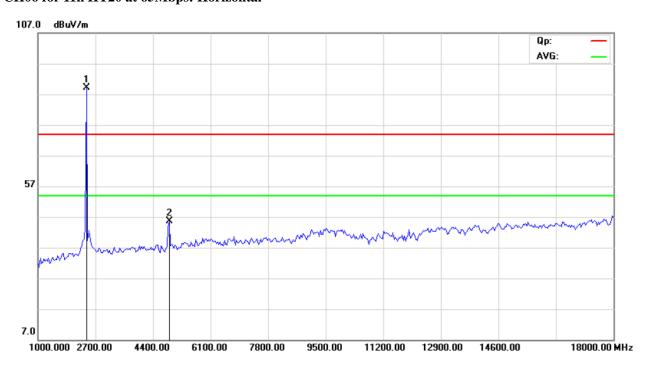
In the event of the improper use of the report. The Shenzhen Timeway Technology Consulting co .,Ltd reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



CH06 for 11n HT20 at 65Mbps: Vertical



CH06 for 11n HT20 at 65Mbps: Horizontal



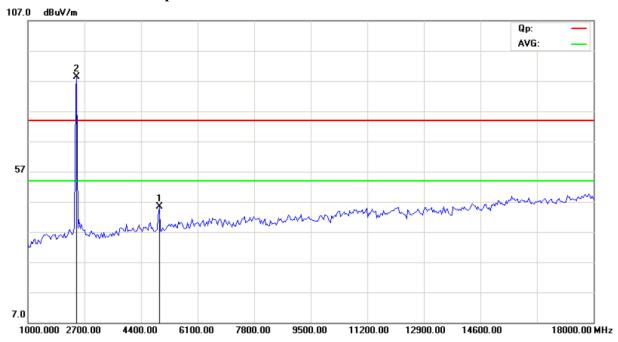
The report refers only to the sample tested and does not apply to the bulk.

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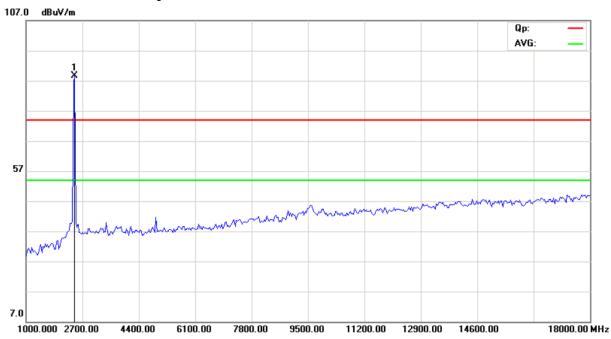
In the event of the improper use of the report. The Shenzhen Timeway Technology Consulting co .,Ltd reserves the rights to withdraw it and to adopt any other remedies which may be appropriate.



CH11 for 11n HT20 at 65Mbps: Vertical



CH11 for 11n HT20 at 65Mbps: Horizontal



Note: For radiated Emissions from 18-25GHz, it is only the floor noise.

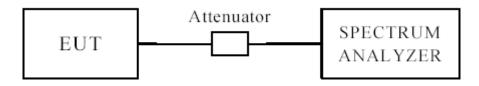
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7.0 6dB Bandwidth Measurement

7.1 Test Setup



7.2 Limits of 6dB Bandwidth Measurement

The minimum of 6dB Bandwidth Measurement is >500 kHz

7.3 Test Procedure

- 1. Set resolution bandwidth (RBW) = 100 kHz
- 2. Set the video bandwidth (VBW) \geq 3 x RBW.
- 3. Detector = Peak.
- 4. Trace mode = max hold.
- 5. Sweep = auto couple.
- 6. Allow the trace to stabilize.
- 7. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

7.4 Test Result

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6dB Occupied Bandwidth

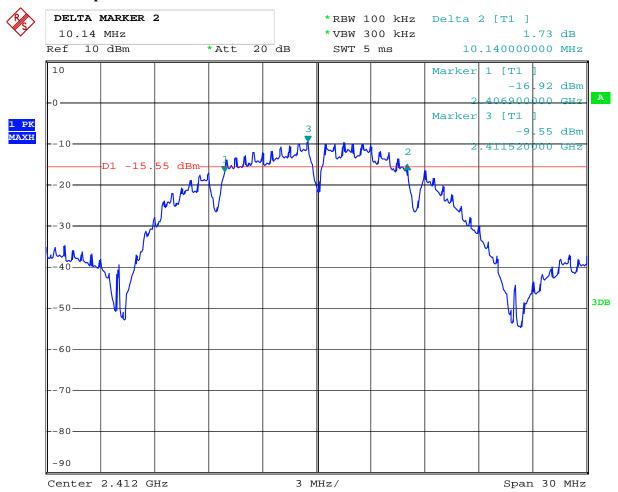
EUT MID			Model		S701-R2A-1		
Mode 802.118)	Input Voltage		AC 120V		
Temperati	ure	24 deg. C,		Humidity		56% RH	
Channel		el Frequency (MHz)	Data Transfer Rate (Mbps)	6 dB Bandwidth (MHz)		mum Limit MHz)	Pass/ Fail
1		2412	1	10.14		0.5	Pass
6		2437	1	10.14		0.5	Pass
11		2462	1	10.14		0.5	Pass
1		2412	11	11.10		0.5	Pass
6		2437	11	11.10		0.5	Pass
11		2462	11	11.10		0.5	Pass

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1. 802.11b at 1Mbps of CH01



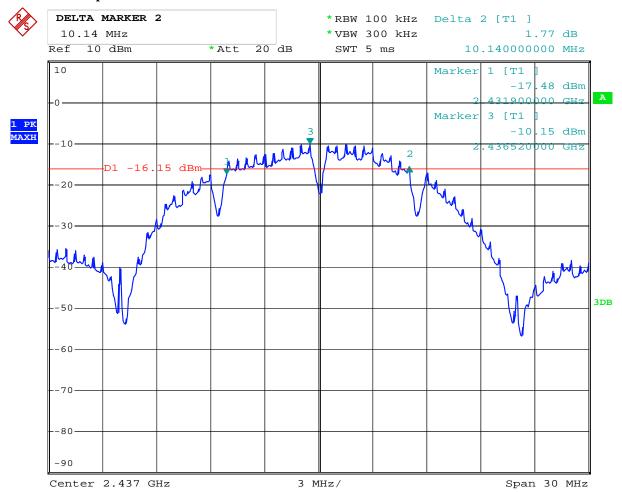
Date: 24.DEC.2012 10:08:30

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2. 802.11b at 1Mbps of CH06



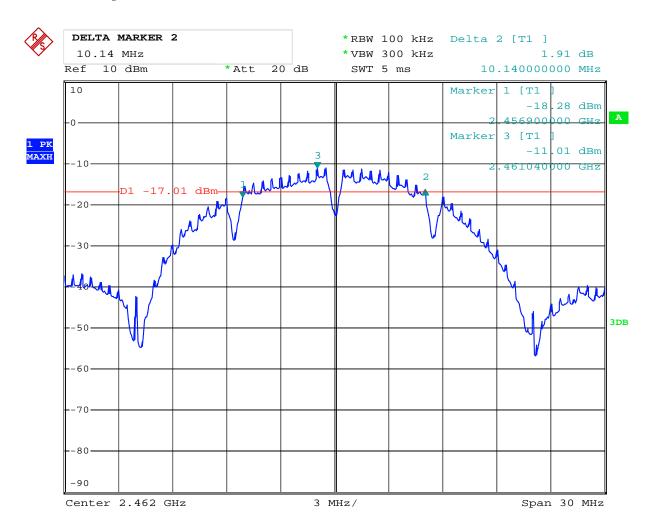
Date: 24.DEC.2012 10:09:23

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3. 802.11b at 1Mbps of CH11



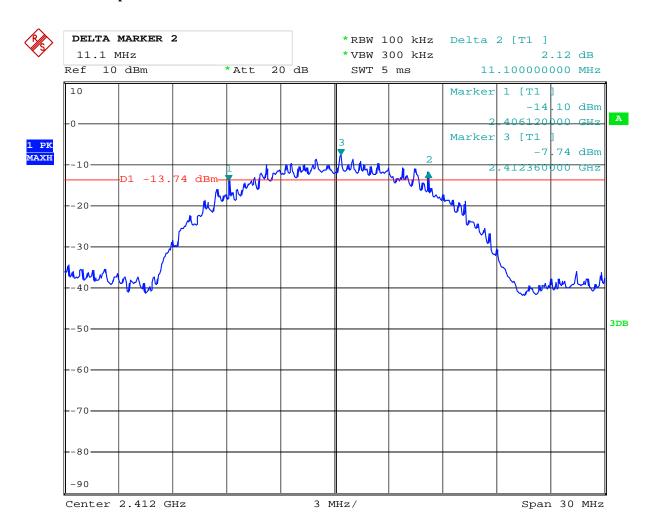
Date: 24.DEC.2012 10:12:27

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4. 802.11b at 11Mbps of CH01



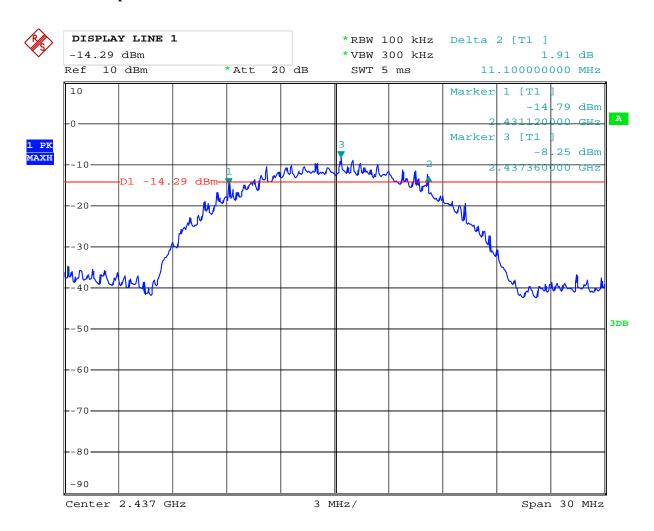
Date: 24.DEC.2012 10:17:51

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5. 802.11b at 11Mbps of CH06



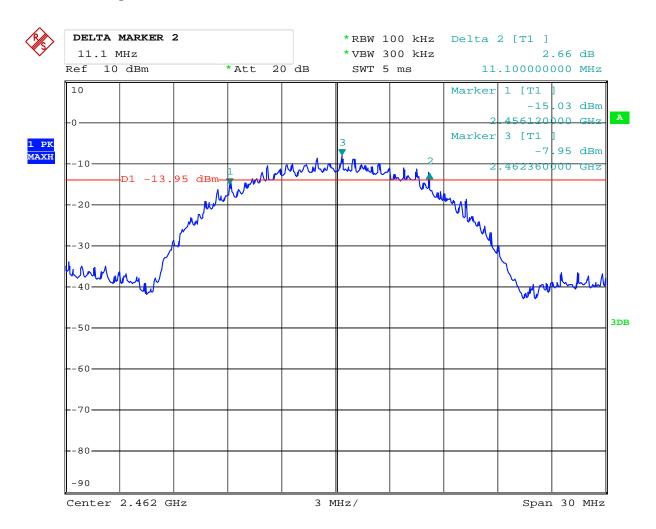
Date: 24.DEC.2012 10:15:58

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6. 802.11b at 11Mbps of CH11



Date: 24.DEC.2012 10:14:23

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6dB Occupied Bandwidth

EUT	EUT MID		Model		S701-R2A-1				
Mode		802.11g	Input Voltag	e	AC 120V				
Temperat	ure	24 deg. C,	Humidity			56% RH			
Channel	Chanr	nel Frequency (MHz)	Data Transfer Rate (Mbps)	Baı	6 dB ndwidth MHz)	Minimum Limit (MHz)	Pass/ Fail		
1	2412		6		16.44	0.5	Pass		
6		2437	6	16.44		0.5	Pass		
11		2462	6		16.44	0.5	Pass		

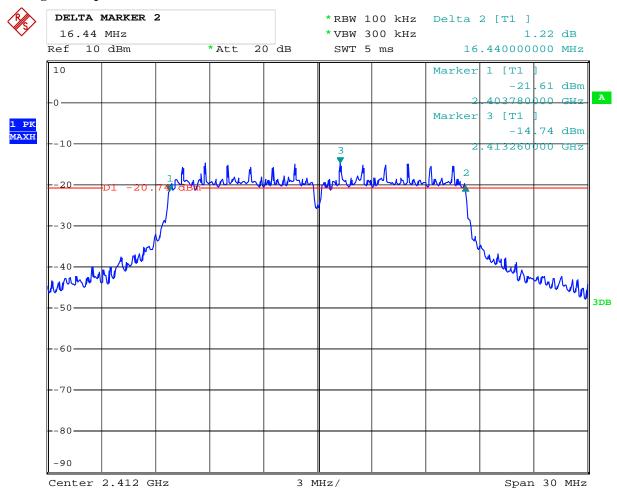
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Test Plots:

1. 802.11g at 6Mbps of CH01



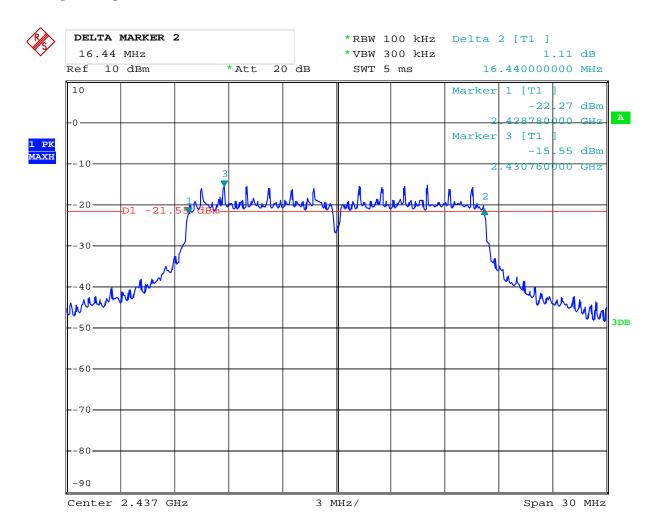
Date: 24.DEC.2012 09:59:22

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2. 802.11g at 6Mbps of CH06



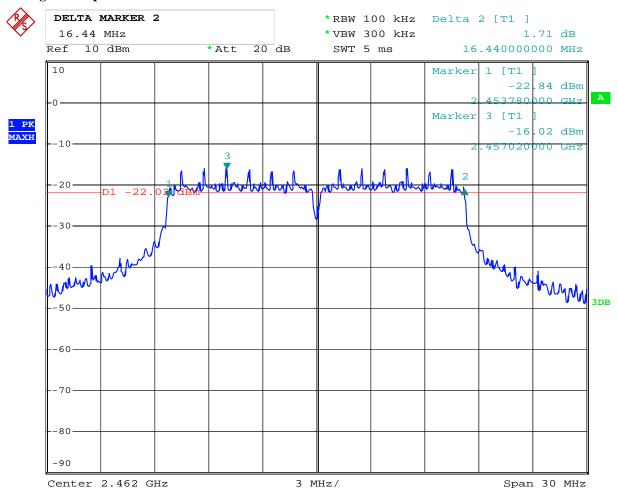
Date: 24.DEC.2012 10:00:56

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3. 802.11g at 6Mbps of CH11



Date: 24.DEC.2012 10:02:14

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6dB Occupied Bandwidth

EUT			MID			Model		S701-R2A-1	
Mode			802.11n		Input Vol	tage		AC 120V	
Temperat	ure		24 deg. C,		Humidity	·		56% RH	
Channel	Channel Frequency Data Transfer 6 dB Bandwidth (MHz) Rate (Mbps) (MHz)			imum Limit (MHz) Pass/ Fail					
1	2412		HT20	17.64			0.5	Pass	
6	2437 H		HT20	17.64			0.5	Pass	
11	2462		HT20	17.64			0.5	Pass	

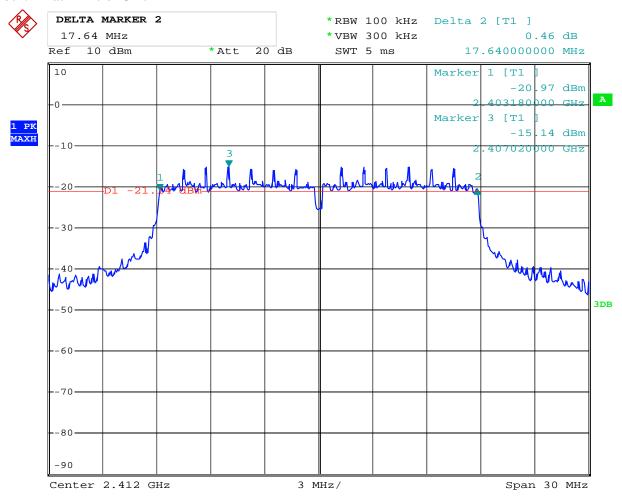
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Test Plots:

1. 802.11n at HT20 of CH01



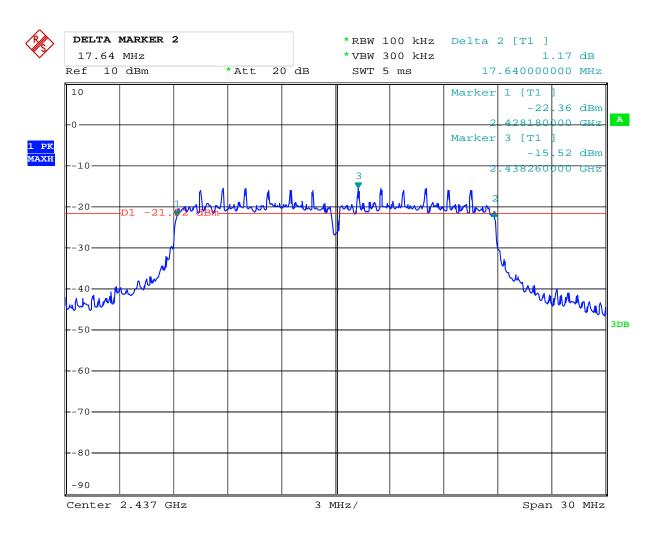
Date: 24.DEC.2012 10:06:41

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2. 802.11n at HT20 of CH06



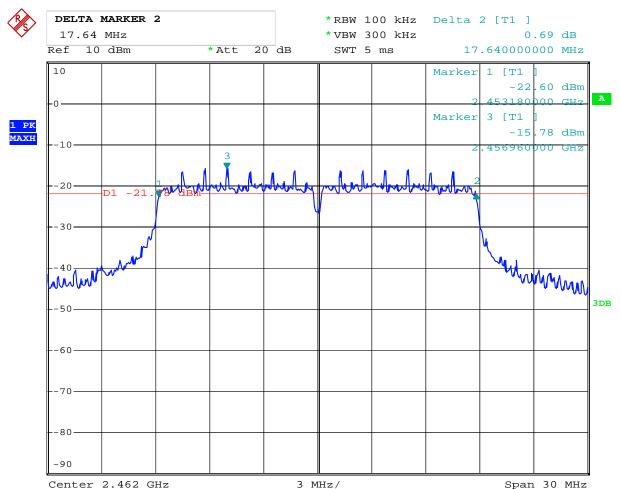
Date: 24.DEC.2012 10:04:57

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3. 802.11n at HT20 of CH11



Date: 24.DEC.2012 10:03:48

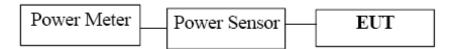
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8. Maximum Peak Output Power

8.1 Test Setup



8.2 Limits of Maximum Peak Output Power

The Maximum Peak Output Power Measurement is 30dBm.

8.3 Test Procedure

The RF power output was measured with a Power meter connected to the RF Antenna connector (conducted measurement) while EUT was operating in transmit mode at the appropriate centre frequency.

Note: the peak power was measured

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8.4Test Results

EUT	Γ MID		Model			S701-R2A-1	
Mode	Mode 802.11b		Input Voltage		ge	AC 120V	
Temperati	Temperature 24 deg. C		C, Humidity			56% RH	
Channel	Channel Frequency (MHz)			ower Output dBm)		Peak Power Limit (dBm)	Pass/ Fail
1		2412		9.79		30	Pass
6		2437		9.46		30	Pass
11		2462		8.87		30	Pass

Note: 1. At finial test to get the worst-case emission at 11Mbps for CH01, CH06 and CH11

2. The result basic equation calculation as follow:

Peak Power Output = Peak Power Reading + Cable loss + Attenuator

3. The test voltage varied from AC102V-138V. The worse case was recorded

EUT	MID Model					S701-R2A-1		
Mode	Mode 802.11g Input Voltage					AC 120V		
Temperati	Temperature 24 deg. C, Humidity					56% RH		
Channel	Cha	annel Frequency		Peak Power Output	Pea	ak Power Limit	Pass/ Fail	
Chamier		(MHz)		(dBm)		(dBm)		
1		2412		6.29		30	Pass	
6		2437		5.16		30	Pass	
11	2462			3.73		30	Pass	

Note: 1. At finial test to get the worst-case emission at 54Mbps for CH01, CH06 and CH11

- 2. The result basic equation calculation as follow:
 - Peak Power Output = Peak Power Reading + Cable loss + Attenuator
- 3. The test voltage varied from AC102V-138V. The worse case was recorded

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EUT	EUT MID		Model			S701-R2A-1		
Mode	Mode 802.11n (HT20)) Input Voltage			AC 120V		
Temperati	Temperature 24 deg. C, Humidity			56% RH				
Channel	Channel Frequency (MHz)		Pe	ak Power Output (dBm)	Peak Power Limit (dBm)	Pass/ Fail		
1		2412		4.53	30	Pass		
6		2437		4.21	30	Pass		
11		2462		3.63	30	Pass		

Note: 1. At finial test to get the worst-case emission at 11n HT20 for CH01, CH06 and CH11

- 2. The result basic equation calculation as follow:

 Peak Power Output = Peak Power Reading + Cable loss + Attenuator
- 3. The test voltage varied from AC102V-138V. The worse case was recorded

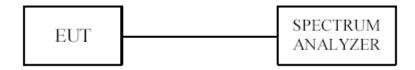
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9. Power Spectral Density Measurement

9.1 Test Setup



9.2 Limits of Power Spectral Density Measurement

The Maximum Power Spectral Density Measurement is 8dBm.

9.3 Test Procedure

- 1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
- 2. Set the RBW = 10 kHz.
- 3. Set the VBW \geq 30 kHz.
- 4. Set the span to 1.5 times the DTS channel bandwidth.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.
- 11. The resulting peak PSD level must be ≤ 8 dBm.

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9.4Test Result

EUT	EUT MID		Model			S701-R2A-1	
Mode	Mode 802.11b 11Mbp		lbps	Input Voltag	e	AC 120V	
Temperat	Temperature 24 deg. C		Humidity			56% RH	
Channel	Channel Frequency (MHz)			Final RF Power Level (dBm)		Pass/ Fail	
				11Mbps			
1		2412		-17.34	8	Pass	
6		2437		-18.50	8	Pass	
11		2462		-18.93	8	Pass	

EUT	EUT MID		Model			S701-R2A-1
Mode	Mode 802.11b 1M		bps Input Voltage		•	AC 120V
Temperati	ure	24 deg. C	,	Humidity		56% RH
Channel	Cha	annel Frequency (MHz)		RF Power	Maximum Limit (dBm)	Pass/ Fail
				1Mbps		
1		2412 -		-18.65	8	Pass
6		2437 -		-19.05	8	Pass
11		2462		-19.87	8	Pass

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EUT	EUT		MID Model		S701-R2A-1		
Mode		802.11g 6Mbps	Input Voltage		AC 120V		
Temperature	;	24 deg. C,	Humidity		56% RH		
Channel	Ch	annel Frequency (MHz)	Final RF Power Level (dBm)	Power Level Limit		Pass/ Fail	
			6Mbps				
1	2412		-22.53		8	Pass	
6	2437		-22.56		8	Pass	
11		2462	-23.19		8	Pass	

EUT	EUT MID		Model		S701-R2A-1		
Mode	Mode 802.11n HT20		Input Voltage		AC 120V		
Temperati	ure	24 deg. C,	Humidity		56% RH		
Channel	Channel Frequency (MHz)		Final RF Power Level (dBm)	M	(dBm)	Pass/ Fail	
			HT20				
1		2412	-21.20		8	Pass	
6		2437	-21.97		8	Pass	
11		2462	-22.04		8	Pass	

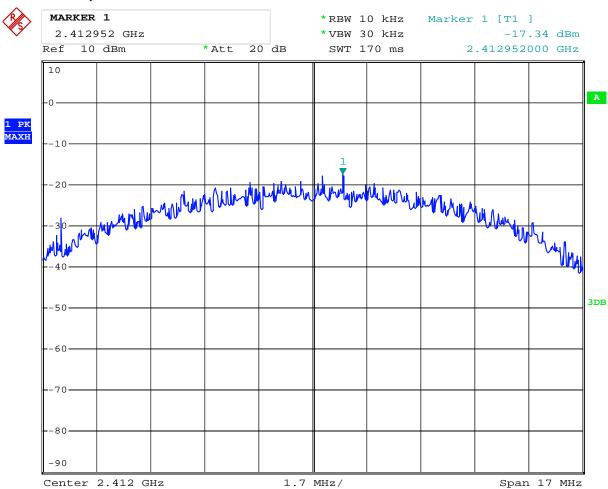
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9.5 Photo of Power Spectral Density Measurement

1.802.11b at 11Mbps of CH01



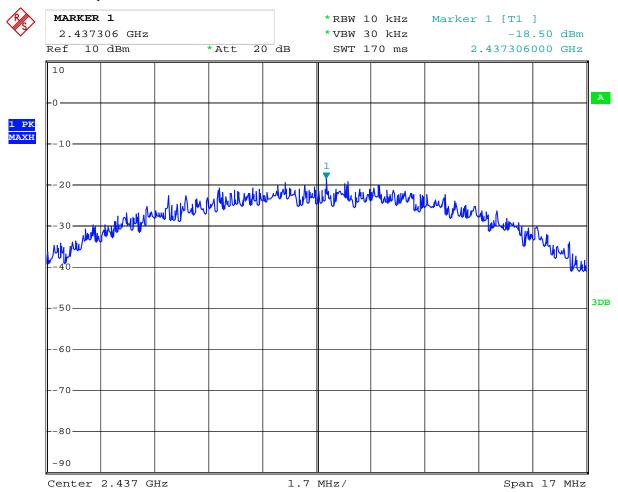
Date: 24.DEC.2012 10:19:26

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2. 802.11b at 11Mbps at CH06



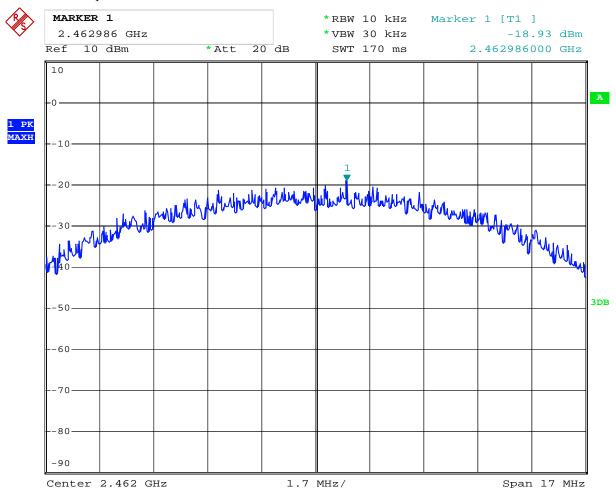
Date: 24.DEC.2012 10:20:19

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3. 802.11b at 11Mbps of CH11



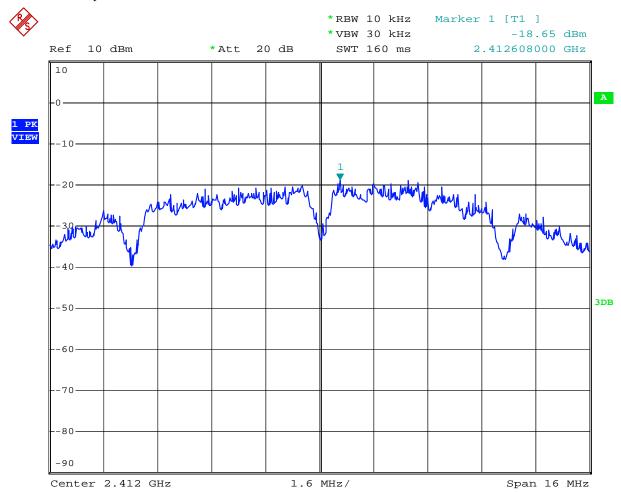
Date: 24.DEC.2012 10:21:08

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4. 802.11b at 1Mbps of CH1



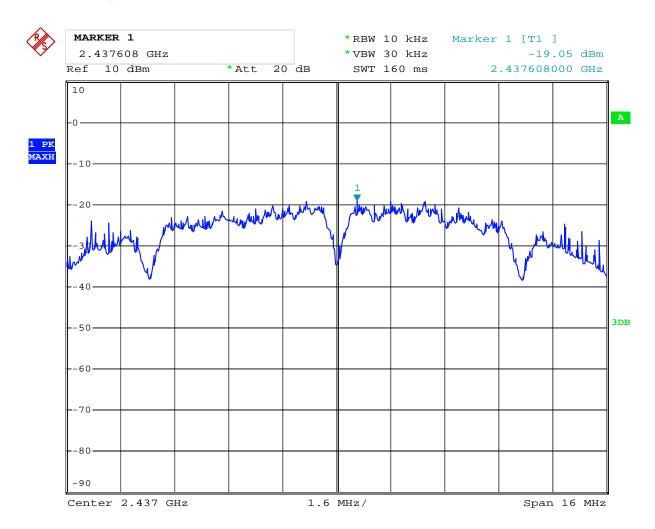
Date: 24.DEC.2012 10:25:20

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5. 802.11b at 1Mbps of CH6



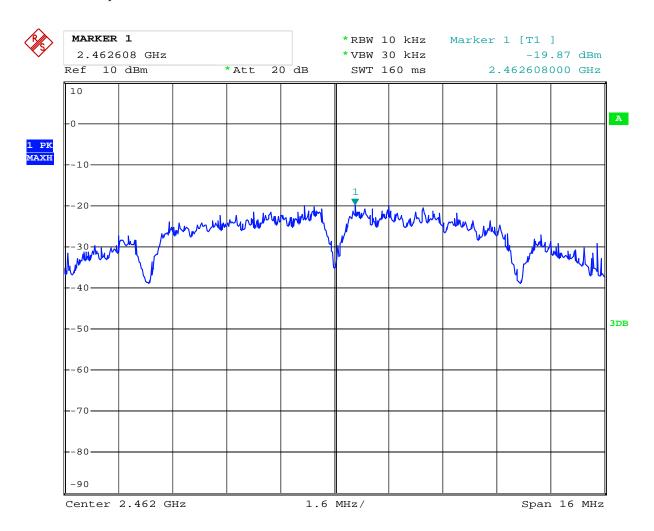
Date: 24.DEC.2012 10:22:56

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6. 802.11b at 1Mbps of CH11



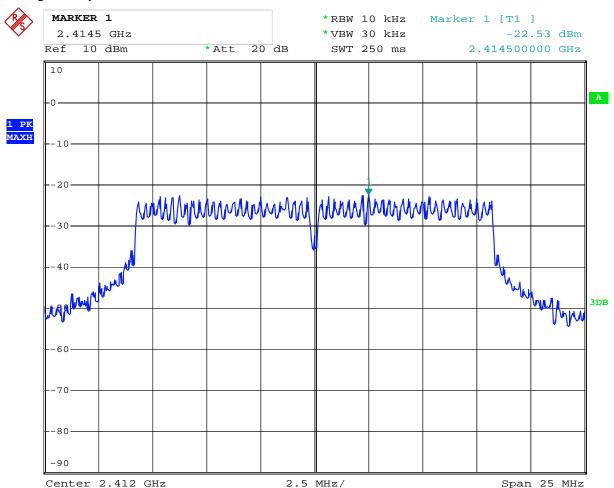
Date: 24.DEC.2012 10:22:11

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7. 802.11g at 6Mbps of CH1



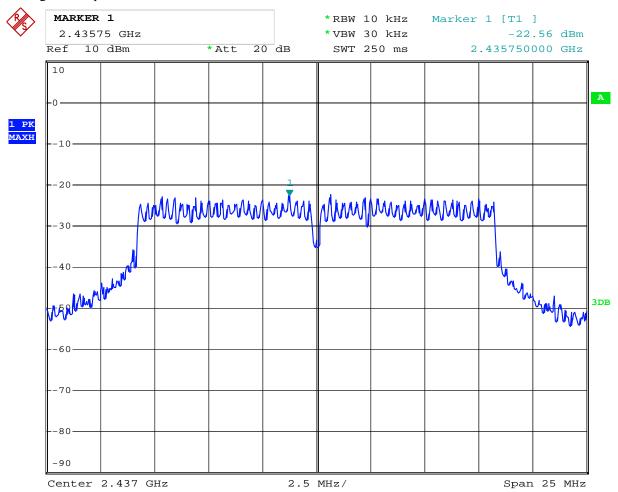
Date: 24.DEC.2012 10:27:44

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8. 802.11g at 6 Mbps of CH6



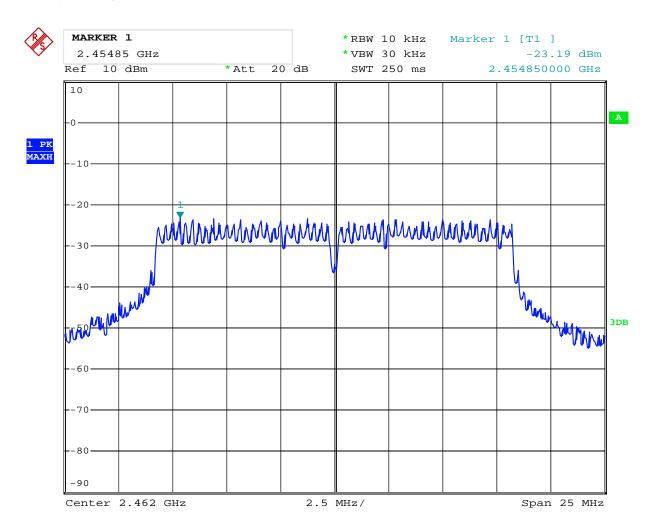
Date: 24.DEC.2012 10:28:49

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9. 802.11g at 6 Mbps of CH11



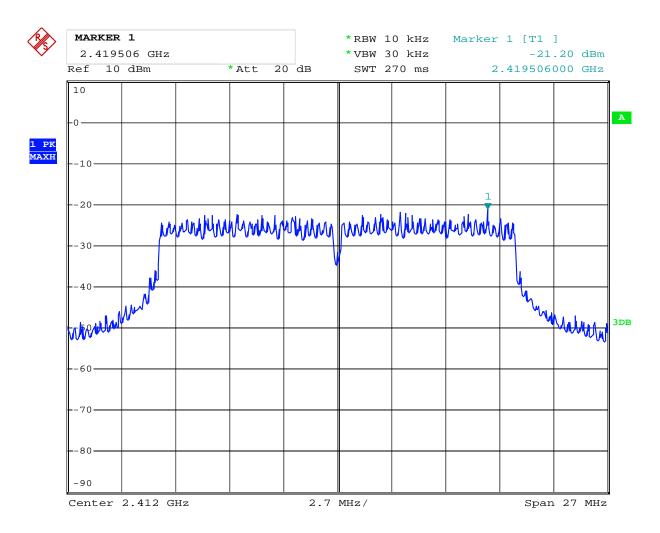
Date: 24.DEC.2012 10:29:27

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10. 802.11n at HT20 of CH01



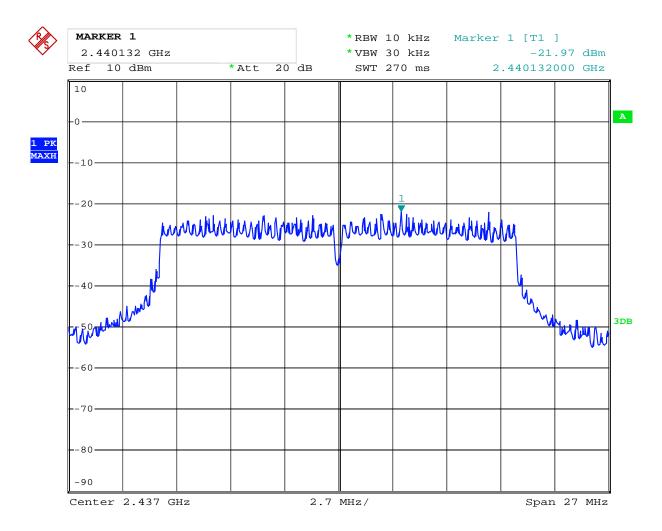
Date: 24.DEC.2012 10:32:37

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11. 802.11n at HT20 of CH06



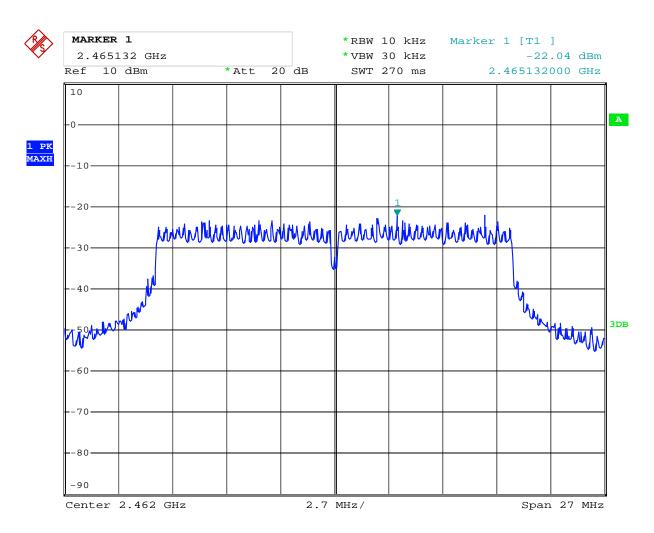
Date: 24.DEC.2012 10:31:13

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12. 802.11n at HT20 of CH11



Date: 24.DEC.2012 10:30:30

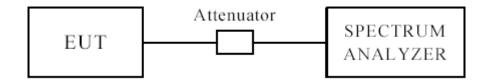
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10 Out of Band Measurement

10.1 Test Setup for band edge



The restricted band requirement based on radiated emission test; please see the clause 6 for the test setup

10.2 Limits of Out of Band Emissions Measurement

- 1. Below –20dB of the highest emission level of operating band (in 100kHz Resolution Bandwidth).
- 2. Fall in the restricted bands listed in section 15.205. The maximum permitted average field strength is listed in section 15.209.

10.3 Test Procedure

For signals in the restricted bands above and below the 2.4-2.483GHz allocated band a measurement was made of radiated emission test.(Peak values with RBW=VBW=1MHz and PK detector. AV value with RBW=1MHz, VBW=10Hz and PK detector)

For bandage test, the spectrum set as follows: RBW=VBW=100 kHz. A conducted measurement used

10.4 Test Result

Please see next pages

Note: 1. this is a handhold device. The radiated emissions should be tested under 3-axes position (Lying, Side, and Stand), after pre-test. It was found that the worse radiated emission was get at the lying position. the worse case was recorded

2. For band-edge measurement, the frequency from 30MHz-25GHz was tested. And It met the FCC rule.

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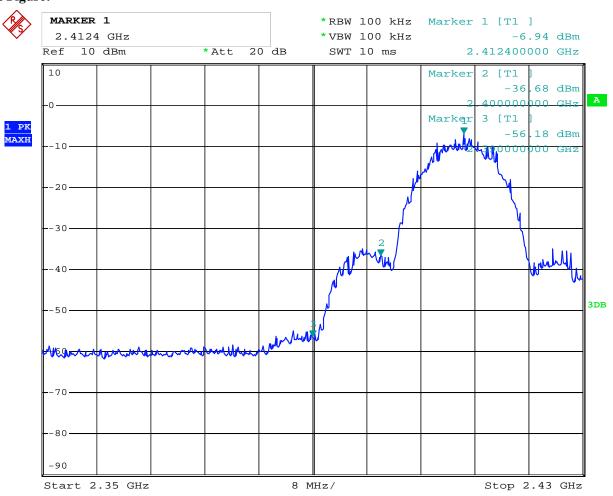
For 802.11b mode

CH01 at 11Mbps

10.4 Band-edge and Restricted band Measurement

	2 mile 1									
EUT		MID	Model	S701-R2A-1						
Mode	Keeping	g Transmitting	Input Voltage	AC 120V						
Temperature	24	deg. C,	Humidity	56% RH						
Test Result:		Pass	Detector	PK						
2400	PK (dBµV/m)	58.19	T ::4	$74(dB\mu V/m)$						
	AV (dBμV/m)	44.07	Limit	$54(dB\mu V/m)$						
2390	PK (dBµV/m)	40.12	Limit	$74(dB\mu V/m)$						
	AV (dBμV/m)		Limit	$54(dB\mu V/m)$						

Test Figure:



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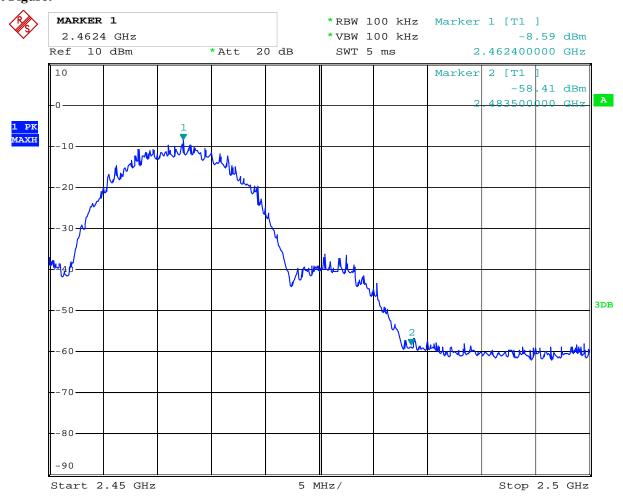


CH11 at 11Mbps

10.4 Band-edge and Restricted band Measurement

EUT		MID	Model	S701-R2A-1
Mode	Keeping	g Transmitting	Input Voltage	AC 120V
Temperature	24	4 deg. C,	Humidity	56% RH
Test Result:		Pass	Detector	PK
2483.5	PK (dBμV/m) 41.12 AV (dBμV/m)		T **4	74(dBμV/m)
			Limit	54(dBμV/m)

Test Figure:



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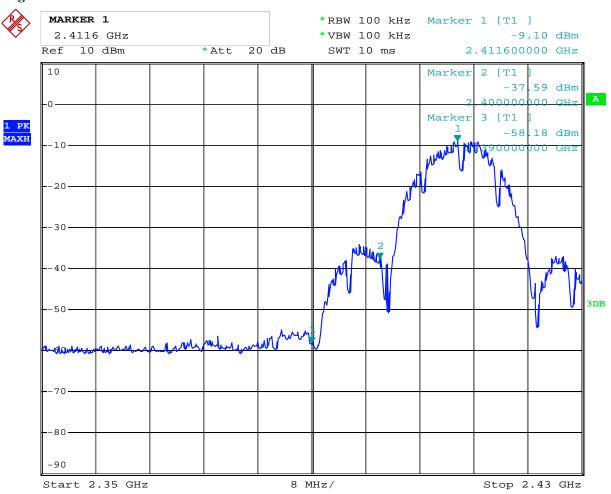
For 802.11b mode

CH01 at 1Mbps

10.4 Band-edge and Restricted band Measurement

	2 mile 1									
EUT		MID	Model	S701-R2A-1						
Mode	Keeping	g Transmitting	Input Voltage	AC 120V						
Temperature	24	deg. C,	Humidity	56% RH						
Test Result:		Pass	Detector	PK						
2400	PK (dBµV/m)	56.03	T ::4	$74(dB\mu V/m)$						
	AV (dBμV/m)	42.26	Limit	54(dBμV/m)						
2390	PK (dBμV/m)	40.33	Limit	74(dBμV/m)						
	AV (dBμV/m)		Limit	54(dBμV/m)						

Test Figure:



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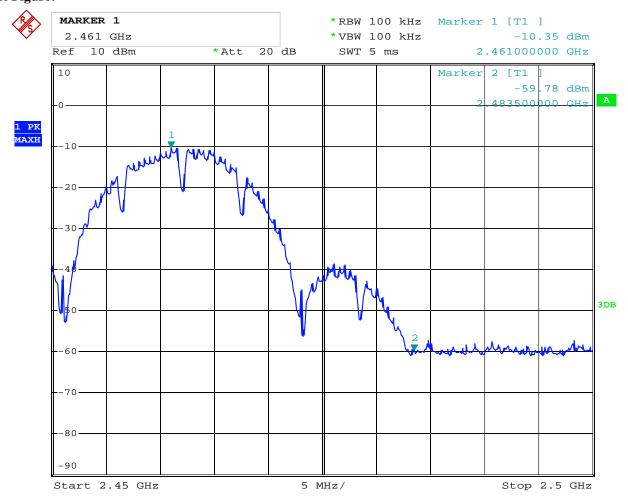


CH11 at 1Mbps

10.4 Band-edge and Restricted band Measurement

EUT	MID		Model	S701-R2A-1
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBµV/m)	40.19	Limit	74(dBμV/m)
	AV (dBμV/m)			54(dBμV/m)

Test Figure:



Date: 24.DEC.2012 10:41:02

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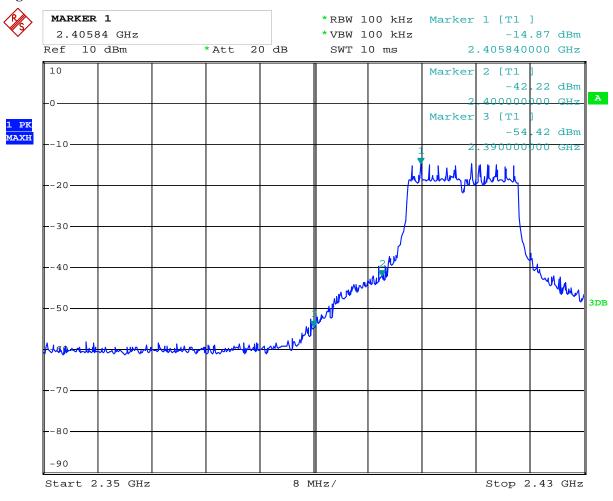
For 802.11g mode

CH01 at 6Mbps

10.4 Band-edge and Restricted band Measurement

EUT	MID		Model	S701-R2A-1
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400	PK (dBμV/m)	54.67	T ::4	$74(dB\mu V/m)$
	AV (dBμV/m)	41.20	Limit	$54(dB\mu V/m)$
2390	PK (dBμV/m)	42.29	Limit	74(dBμV/m)
	AV (dBμV/m)		Limit	54(dBμV/m)

Test Figure:



Date: 24.DEC.2012 10:38:28

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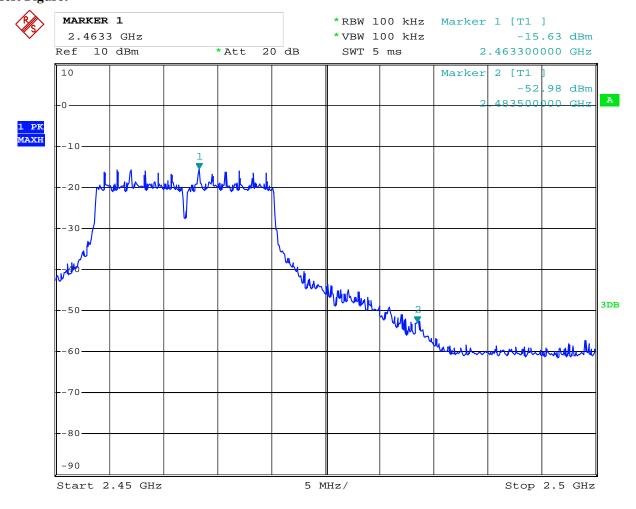


CH11 at 6Mbps

10.4 Band-edge and Restricted band Measurement

EUT		MID	Model		S701-R2A-1
Mode	Keeping Transmitting		Input Voltage		AC 120V
Temperature	24 deg. C,		Humidity		56% RH
Test Result:	Pass		Detec	ctor	PK
2483.5	PK (dBµV/m)	41.93	T 1 14	74(dBµV/m)	
	AV (dBμV/m)		Limit		$54(dB\mu V/m)$

Test Figure:



Date: 24.DEC.2012 10:39:22

Report No: 1212122 Date: 2012-12-25



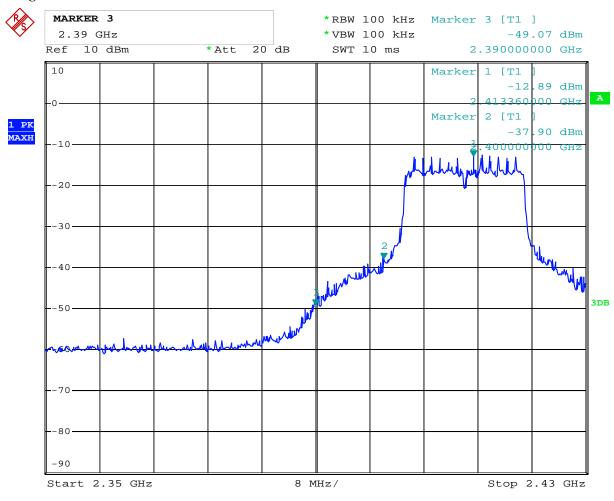
For 802.11n (HT20) mode

CH01 at 65Mbps

10.4 Band-edge and Restricted band Measurement

EUT	MID		Model	S701-R2A-1
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2400	PK (dBµV/m)	55.16	Limit	74(dBμV/m)
	AV (dBμV/m)	41.06	Limit	54(dBμV/m)
2390	PK (dBµV/m)	42.37	Limit	74(dBµV/m)
	AV (dBμV/m)		Limit	54(dBµV/m)

Test Figure:



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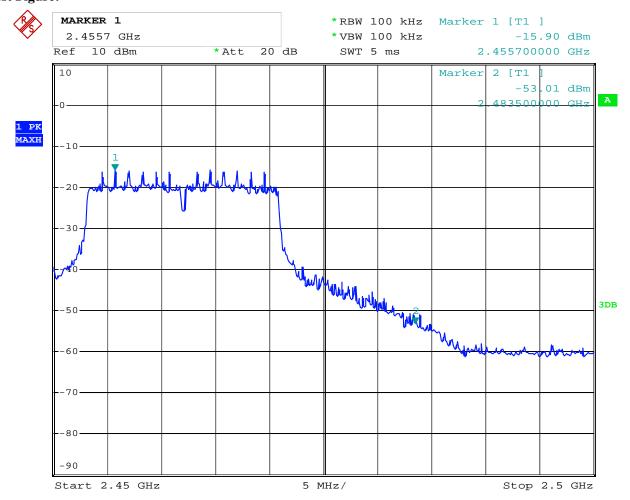


CH11 at 65Mbps

10.4 Band-edge and Restricted band Measurement

EUT		MID	Model	S701-R2A-1
Mode	Keeping Transmitting		Input Voltage	AC 120V
Temperature	24 deg. C,		Humidity	56% RH
Test Result:	Pass		Detector	PK
2483.5	PK (dBμV/m)	40.52	T in it	$74(dB\mu V/m)$
	AV (dBμV/m)		Limit	54(dBμV/m)

Test Figure:



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11.0 Antenna Requirement

11.1 Standard Applicable

For intentional device, according to FCC 47 CFR Section 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

And according to FCC 47 CFR Section 15.247 (b), if transmitter antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the mount in dB that the directional gain of the antenna exceeds 6 dBi.

11.2 Antenna Connected construction

Integral Antenna used. The maximum Gain of the antennas is 2.0dBi.

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12.0 FCC ID Label

FCC ID: RH2-S701-R2A-1

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

The label must not be a stick-on paper label. The label on these products must be permanently affixed to the product and readily visible at the time of purchase and must last the expected lifetime of the equipment not be readily detachable.

Mark Location:



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13.0 **Photo of testing**

Conducted Emission Test Setup:



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Radiated Emission Test Setup:



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Photographs - EUT

Outside view





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Outside view





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Outside view





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Inside view





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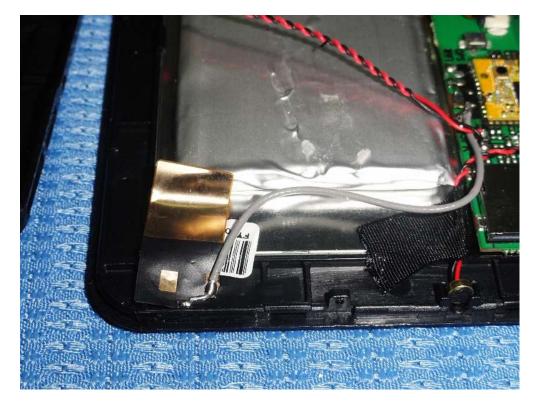
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Inside view





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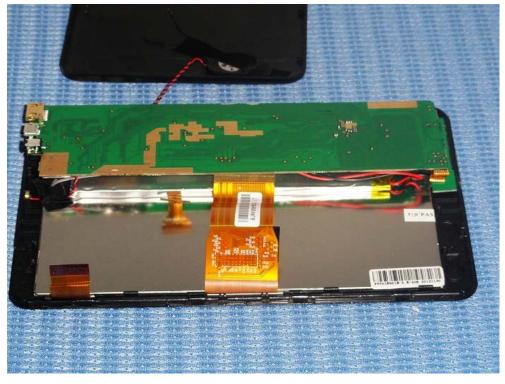
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Inside view





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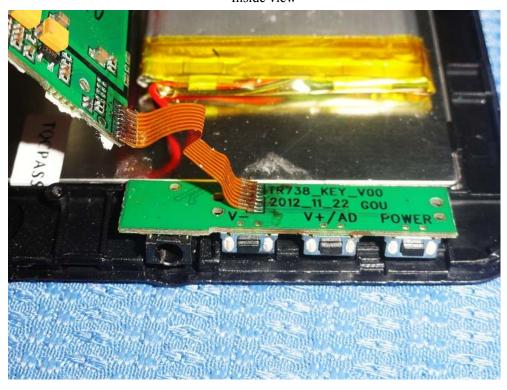
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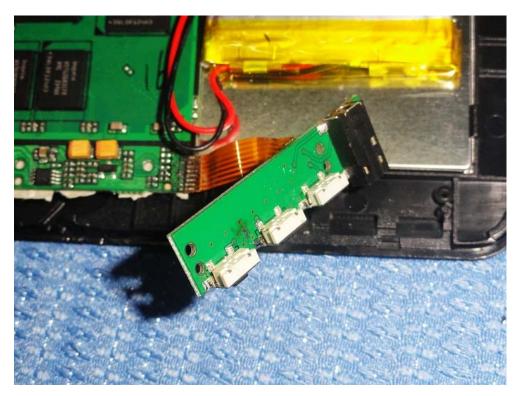
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Inside view





The report refers only to the sample tested and does not apply to the bulk.

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Inside view





End of the report

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