TEST REPORT

FCC Part 15 Subpart C

 \boxtimes New Application; \square Class I PC; \square Class II PC

Product :	Wifi Dongle
Brand:	Mapower
Model:	WI22
Model Difference:	N/A
FCC ID:	LD3WIFIDON22
FCC Rule Part:	§15.247, Cat: DTS
Applicant:	Mapower Electronics Co.,Ltd
Address:	No.50, Minquan Rd.,Luzhu Shiang, Taoyuan County 33846, Taiwan

Test Performed by:

International Standards Laboratory

<Lung-Tan LAB> *Site Registration No. BSMI: SL2-IN-E-0013; MRA TW1036; TAF: 0997; IC: IC4067B-3; *Address: No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd. Lung-Tan Hsiang, Tao Yuan County 325, Taiwan *Tel : 886-3-407-1718; Fax: 886-3-407-1738 Report No.: **ISL-12LR145FC** Issue Date : **2012/09/25**



Test results given in this report apply only to the specific sample(s) tested and are traceable to national or international standard through calibration of the equipment and evaluating measurement uncertainty herein.

This report MUST not be used to claim product endorsement by TAF, NVLAP or any agency of the Government.

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FCC ID: LD3WIFIDON22

VERIFICATION OF COMPLIANCE

Applicant:	Mapower Electronics Co.,Ltd
Product Description:	Wifi Dongle
Brand Name:	Mapower
Model No.:	WI22
Model Difference:	N/A
FCC ID:	LD3WIFIDON22
Date of test:	2012/09/04 ~ 2012/09/20
Date of EUT Received:	2012/09/04

We hereby certify that:

All the tests in this report have been performed and recorded in accordance with the standards described above and performed by an independent electromagnetic compatibility consultant, International Standards Laboratory.

The test results contained in this report accurately represent the measurements of the characteristics and the energy generated by sample equipment under test at the time of the test. The sample equipment tested as described in this report is in compliance with the limits of above standards.

Test By:

Dion Chang / Engineer

Prepared By:

Eva Kao / Technical Supervisor

Approved By:

Date:

Date:

Date:

2012/09/25

2012/09/25

2012/09/25

Vincent Su / Technical Manager



Version

Version No.	Date	Description
00	2012/09/25	Initial creation of document

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1 GENERAL INFORMATION

General:

Product Name	Wifi Dongle	Wifi Dongle						
Brand Name	Mapower							
Model Name	WI22							
Model Difference	N/A							
	3.7Vdc from Li-ion Battery or 5Vdc by AC/DC power adapter							
Power Supply	Adapter: Model No.:WA-10L05RU							

WLAN:

Frequency Range:	802.11b/g/n HT20: 2412 – 2462MHz 802.11n HT40: 2422 – 2452MHz
Channel number:	802.11b/g/n HT20: 11 channels
Channel number.	802.11n HT40: 7 channels
	802.11 b mode: 13.71dBm (Peak)
Transmit Power:	802.11 g mode: 18.60dBm (Peak)
	802.11 n HT20 mode: 18.11dBm (Peak)
	802.11 n HT 40 mode: 17.75dBm (Peak)
Modulation Technology	11b/g: DSSS, OFDM
	11n: OFDM
Modulation type:	CCK, DQPSK, DBPSK for DSSS
	64QAM. 16QAM, QPSK, BPSK for OFDM
	802.11 b: 1/2/5.5/11 Mbps
Transition Rate:	802.11 g: 6/9/12/18/24/36/48/54 Mbps
	802.11 n HT20MHz: 6.5 – 65Mbps
	802.11 n HT40MHz: 13.5 – 135Mbps
Antenna Designation:	1TX, 1RX, Printed Antenna, 2.65dBi

The EUT is compliance with IEEE 802.11 b/g/n Standard.

Remark: The above DUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.



1.1 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for **FCC ID: <u>LD3WIFIDON22</u>** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. The composite system (digital device) is compliance with Subpart B is authorized under a DoC procedure.

1.2 Test Methodology

Both conducted and radiated testing were performed according to the procedures in ANSI C63.4 (2003). Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document:

558074 D01 DTS Meas Guidance v01

1.3 Test Facility

The measurement facilities used to collect the 3m Radiated Emission and AC power line conducted data are located on the address of **International Standards Laboratory** <Lung-Tan LAB> No. 120, Lane 180, San Ho Tsuen, Hsin Ho Rd., Lung-Tan Hsiang, Tao Yuan County 325, Taiwan which are constructed and calibrated to meet the FCC requirements in documents ANSI C63.4: 2003. FCC Registration Number is: TW1036, Canada Registration Number: 4067B-3.

1.4 Special Accessories

Not available for this EUT intended for grant.

1.5 Equipment Modifications

Not available for this EUT intended for grant.



2 SYSTEM TEST CONFIGURATION

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 EUT Exercise

The EUT (Transmitter) was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements.

2.3 Test Procedure

2.3.1 Conducted Emissions

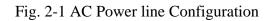
The EUT is a placed on as turn table which is 0.8 m above ground plane. According to the requirements in Section 7 and 13 of ANSI C63.4-2003.Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak and Average detector mode.

2.3.2 Radiated Emissions

The EUT is a placed on as turn table which is 0.8 m above ground plane. The turn table shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the max. emission, the relative positions of this hand-held transmitter(EUT) was rotated through three orthogonal axes according to the requirements in Section 8 and 13 of ANSI C63.4-2003.



2.4 Configuration of Tested System



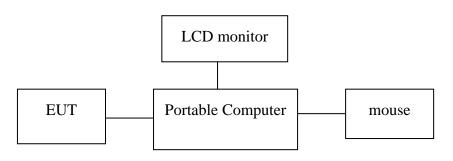
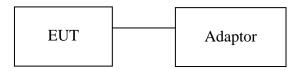


Fig. 2-2 Radiated Emission Configuration



Remote site



Table 1-1 Equipment Used in Tested System

Item	Item Equipment Mfr/Bra		Model/ Type No.	Series No.	Data Cable	Power Cord
1	Adapter	BUFFALO K. S.	BSIPA08	N/A	Un-shielding	Shielding
2	Portable Com- puter	Dell	P18S	6VWSKT1	Un-shielding	Shielding
3	mouse	DELL	MOC5UO	10000KY1	Un-shielding	N/A
4	LCD monitor	DELL	PP81L	N/A	Un-shielding	Shielding



FCC Rules	Description Of Test	Result
§15.207(a)	AC Power Line Conducted Emission	Compliant
§15.247(b) (3),(4)	Peak Output Power	Compliant
§15.247(a)(2)	6dB Bandwidth	Compliant
	100 KHz Bandwidth Of	
§15.247(d)	Frequency Band Edges	Compliant
§15.247(d)	Spurious Emission	Compliant
§15.247(e)	Peak Power Density	Compliant
§15.203	Antenna Requirement	Compliant

3 SUMMARY OF TEST RESULTS

4 DESCRIPTION OF TEST MODES

The EUT has been tested under engineering operating condition. Test program used to control the EUT for staying in continuous transmitting mode is programmed.

802.11 b mode: Channel low (2412MHz) v mid (2437MHz) and high (2462MHz) with 1Mbps

lowest data rate are chosen for full testing.

802.11 g mode: Channel low (2412MHz) \sim mid (2437MHz) and high (2462MHz) with 6Mbps lowest data rate are chosen for full testing.

802.11 n _20MHz: Channel low (2412MHz) \backsim mid (2437MHz) and high (2462MHz) with

6.5Mbps lowest data rate are chosen for full testing.

802.11 n_40MHz: Lowest (2422MHz), Mid (2437MHz) and Highest (2452MHz) with 13.5Mbps lowest data rate are chosen for full testing.





5 CONDUCTED EMISSION TEST

5.1 Standard Applicable:

According to \$15.207, frequency range within 150KHz to 30MHz shall not exceed the Limit table as below.

Frequency range		imits 3(uV)
MHz	Quasi-peak	Average
0.15 to 0.50	66 to 56	56 to 46
0.50 to 5	56	46
5 to 30	60	50
Note		
1. The lower limit shall apply at the t	ransition frequencies	
2. The limit decreases linearly with the	he logarithm of the frequency in the	range 0.15 MHz to 0.50 MHz.

5.2 Measurement Equipment Used:

Conducted Emission Test Site									
EQUIPMENT MFR		MODEL	MODEL SERIAL		CAL DUE.				
TYPE		NUMBER	NUMBER	CAL.					
Conduction 03 -1 Cable	WOKEN	CFD 300-NL	Conduction 0-1	06/28/2012	06/28/2013				
EMI Receiver 12	ROHDE & SCHWARZ	ESCI	100804	07/13/2012	07/13/2013				
LISN 07	FCC Inc.	FCC-LISN-50-100-4 -02	07040	07/13/2012	07/13/2013				
LISN 08	FCC	FCC-LISN50-25-2-0 1	07039	07/13/2012	07/13/2013				

5.3 EUT Setup:

- 1. The conducted emission tests were performed in the test site, using the setup in accordance with the ANSI C63.4-2003.
- 2. The AC/DC Power adaptor of EUT was plug-in LISN. The EUT was placed flushed with the rear of the table.
- 3. The LISN was connected with 120Vac/60Hz power source.





5.4 Measurement Procedure:

- 1. The EUT was placed on a table which is 0.8m above ground plane.
- 2. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 3. Repeat above procedures until all frequency measured were complete.

5.5 Measurement Result:

The initial step in collecting conducted data is a spectrum analyzer peak scan of the measurement range. Significant peaks are then marked as shown on the following data page, and these signals are then quasi-peaked.

Note: Refer to next page for measurement data and plots.



-	ation Mo	ode:	-	ter Mo	de					Test D	ate:	2012/	9/7
est	By:		Dino										
	87.0 d	BuV											
												QP: AVG:	2
	77				111								
	67	~					_						
	57		-	-	-		-						1
	47		-				-		-				
	37	ĂĂ.	×.										
		1.11	5./NIA							ş	Kapanimut		
	27	A.A.	MIL	机伊姆	MALANA	1 des			with the water	Mr. Way Marrieva	the working to	W.	M
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	1 -	-	_			-			11				
	-3							_					
	-13.0												
	0.150	-		0.5		- I:			5		In the t		30.00
	Conducti dition : FC		duction				Phase:		L1			nperature nidity	26 °C 54 %
No.	Freq.		ding_Le dBuV)	vel	Correct Factor	M	leasuren (dBuV)	ient	Lir (dB	nit uV)		rgin 1B)	
	MHz	Peak	QP	AVG	dB	peak	QP	AVG	P/Q	AVG	P/Q	AVG	P/F Comm
1	0.1660		31.02	21,15	9.59	41.43	40.61	30.74	65.16	55.16	-24.55	-24.42	
2	0.1940			22.17	9.60	42.03	41.33	31.77	63.86	53.86	-22.53	-22.09	
3*	0.2300		31.64	19.55	9.60	43.36	41.24	29.15	62.45	52,45	-21.21	-23.30	-
4	0.3140		28.30	15.52	9.60	40.51	37.90	25.12	59.86	49.86	-21.96	-24.74	
5	0.4660			11.04 7.24	9.61 9.72	34.08 30.37	30.70 25.71	20.65	56.58 60.00	46.58	-25.88	-25.93	

AC POWER LINE CONDUCTED EMISSION TEST DATA

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5

6

0.6140 22.40 19.54

3.5300 17.82 12.56

11.73

6.44

9.62

9.68

32.02

27.50

29.16

22.24

21.35

16.12

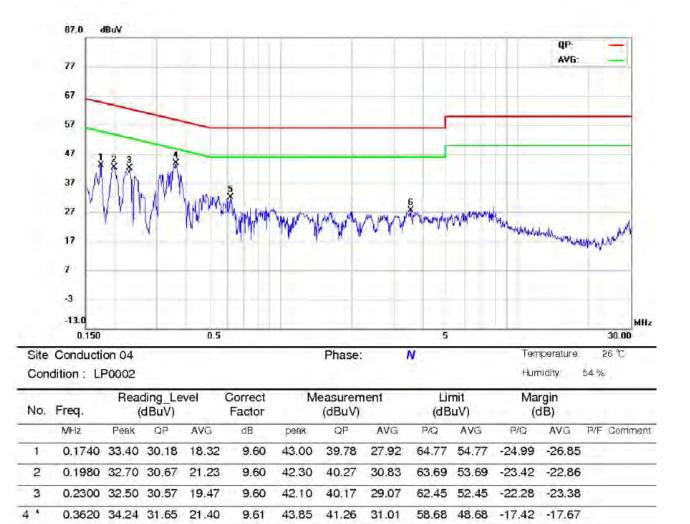
56.00 46.00

56.00 46.00

-26.84 -24.65

-29.88

-33.76



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6 PEAK /AVERAGE UTPUT POWER MEASUREMENT

6.1 Standard Applicable:

According to §15.247(b)(3),(4)

(b)

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

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

(c) Operation with directional antenna gains greater than 6 dBi.

(1) Fixed point-to-point operation:

(i) Systems operating in the 2400-2483.5 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

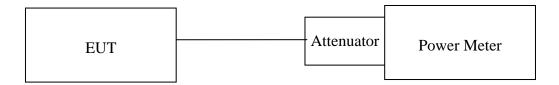
(ii) Systems operating in the 5725-5850 MHz band that are used exclusively for fixed, point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted output power.



Conducted Emission Test Site					
EQUIPMENT	MED	MODEL	SERIAL	LAST	CAL DUE
ТҮРЕ	MFR	NUMBER	NUMBER	CAL.	CAL DUE.
Power Meter 05	Anritsu	ML2495A	1116010	04/17/2012	04/16/2013
Power Sensor 05	Anritsu	MA2411B	34NKF50	04/16/2012	04/15/2013
Temperature Chamber	KSON	THS-B4H100	2287	03/03/2012	03/02/2013
DC Power supply	ABM	51850	N/A	06/17/2012	06/16/2013
AC Power supply	EXTECH	CFC105W	NA	12/19/2011	12/18/2012
Splitter	MCLI	PS4-199	12465	07/18/2012	07/17/2013
Spectrum analyzer	Agilent	N9030A	MY51360021	03/11/2012	03/10/2013

6.2 Measurement Equipment Used:

6.3 Test Set-up:



6.4 Measurement Procedure:

Refer to section 5.2.1.2 Measurement Procedure PK2:of KDB Document: 558074 D01 DTS Meas Guidance v01

- 1. This procedure provides an integrated measurement alternative when the maximum available RBW < EBW.
- 2. Set the RBW = 1 MHz.
- 3. Set the VBW = 3 MHz.
- 4. Set the span to a value that is 5-30 % greater than the EBW.
- 5. Detector = peak.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges (for some analyzers, this may require a manual override to ensure use of peak detector). If the spectrum analyzer does not have a band power function, sum the spectrum levels (in linear power units) at 1 MHz intervals extending across the EBW of the spectrum.



Refer to section 5.2.2.2 Measurement Procedure AVG2 (trace averaging over the EBW): of KDB Document: 558074 D01 DTS Meas Guidance v01

- 1. Set the analyzer span to 5-30% greater than the EBW.
- 2. Set the RBW = 1 MHz.
- 3. Set the VBW \geq 3 MHz.
- 4. Ensure that the number of measurement points in the sweep $\geq 2 x$ (span/RBW).
- 5. Sweep time = auto couple.
- 6. Detector = power averaging (RMS) or sample.
- 7. Employ trace averaging in power averaging (RMS) mode over a minimum of 100 traces.
- 8. Use the spectrum analyzer's integrated band power measurement function with band limits set equal to the EBW band edges to determine the maximum conducted output power of the EUT over the EBW. If the analyzer does not have a band power function, sum the spectral levels (in linear power units) at 1 MHz intervals extending across the entire EBW.



6.5 Measurement Result:

802.	.11b			
Cable l	oss = 0	Output Power		Limit
СН	Frequency	Detector		(dBm)
	(MHz)	РК	AV	
		(dBm)	(dBm)	
1	2412	13.71	11.36	
6	2437	13.01	10.89	30
11	2462	12.02	9.81	

802.11g

Cable lo	bss = 0	Output Power		Limit
СН	Frequency	Detector		(dBm)
	(MHz)	РК	AV	
		(dBm)	(dBm)	
1	2412	18.60	8.45	
6	2437	18.04	8.01	30
11	2462	17.35	6.54	

802.11N 20MHz

Cable loss $= 0$		Output Power		Limit
CH	Frequency	Detector		(dBm)
	(MHz)	РК	AV	
		(dBm)	(dBm)	
1	2412	18.11	9.89	
6	2437	17.42	8.02	30
11	2462	17.12	7.08	

802.11N 40MHz

Cable lo	oss = 0	Output Power		Limit
CH	Frequency	Detector		(dBm)
	(MHz)	РК	AV	
		(dBm)	(dBm)	
3	2422	17.75	8.5	
6	2437	17.42	8.32	30
9	2452	16.9	7.51	



7 6dB Bandwidth(EBW)

7.1 Standard Applicable:

According to §15.247(a)(2), Systems using digital modulation techniques may operate in the 902 - 928 MHz,2400 - 2483.5 MHz, and 5725 - 5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500kHz.

7.2 Measurement Equipment Used:

Refer to section 6.2 for details.

7.3 Test Set-up:

Refer to section 6.3 for details.

7.4 Measurement Procedure:

Refer to section 5.1.1 EBW Measurement Procedure of KDB Document: 558074 D01 DTS Meas Guidance v01

- 1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW). (802.11bgnHT20MHz =200KHz),(802.11Nht40=400KHz)
- 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. Compare the resultant bandwidth with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is 1-5 %.



7.5 Measurement Result:

802.11b

Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth (KHz)	Result
2412	12.11	> 500	PASS
2437	12.11	> 500	PASS
2462	12.11	> 500	PASS

802.11g

Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth (KHz)	Result
2412	16.48	> 500	PASS
2437	16.52	> 500	PASS
2462	16.54	> 500	PASS

802.11n_20M

Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth (KHz)	Result
2412	17.62	> 500	PASS
2437	17.61	> 500	PASS
2462	17.58	> 500	PASS

802.11n_40M

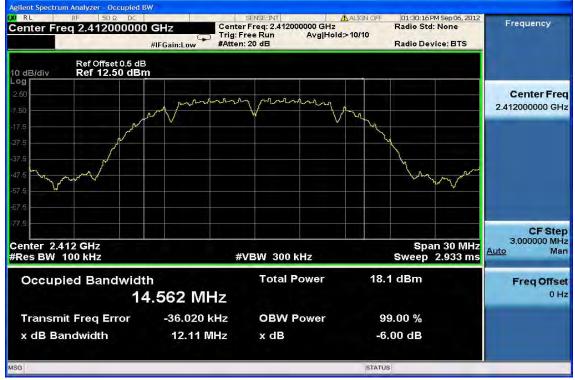
Frequency (MHz)	6 dB Bandwidth (MHz)	6 dB Bandwidth (KHz)	Result
2422	35.77	> 500	PASS
2437	35.75	> 500	PASS
2452	35.74	> 500	PASS

Note: Refer to next page for plots.



802.11b

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid





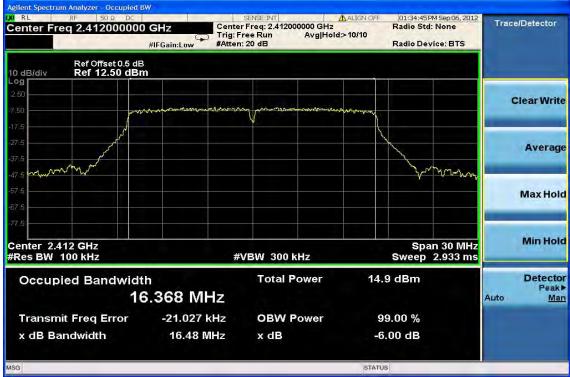
6dB Band Width Test Data CH-High



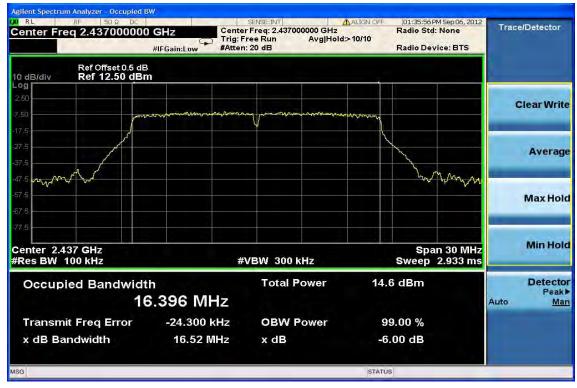


802.11g

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid





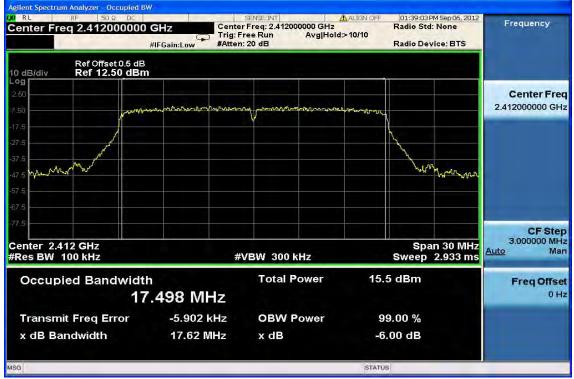
6dB Band Width Test Data CH-High



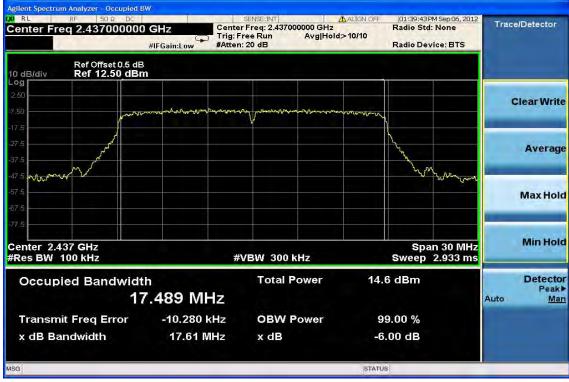


802.11n HT20

6dB Band Width Test Data CH-Low

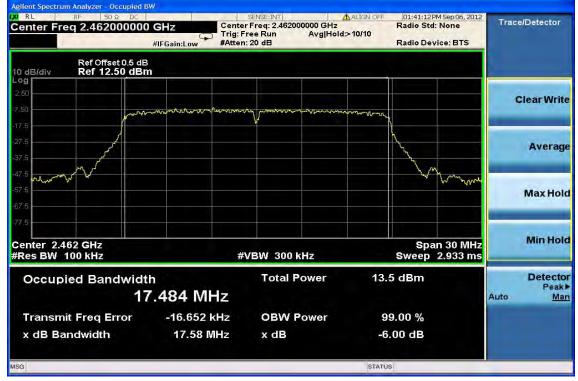


6dB Band Width Test Data CH-Mid





6dB Band Width Test Data CH-High





802.11n HT40

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid





6dB Band Width Test Data CH-High





8 100KHz BANDWIDTH OF BAND EDGES MEASUREMENT

8.1 Standard Applicable:

According to §15.247(c), in any 100 KHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100KHz bandwidth within the band that contains the highest level of the desired power, In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in15.209(a).

8.2 Measurement Equipment Used:

8.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

8.2.2 Radiated emission:

	Chamber 14(966)						
EQUIPMENT TYPE	MFR	MODEL NUMBER	SERIAL NUMBER	LAST CAL.	CAL DUE.		
Spectrum Analyzer 21(26.5GHz)	Agilent	N9010A	MY49060537	07/17/2012	07/16/2013		
Spectrum Analyzer 20(6.5GHz)	Agilent	E4443A	MY48250315	05/24/2012	05/23/2013		
Spectrum Analyzer 22(43GHz)	R&S	FSU43	100143	04/25/2012	04/24/2013		
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	02/28/2011	02/27/2013		
Bilog Antenna30-1G	Schaffner	CBL 6111B	2756	12/27/2011	12/26/2012		
Horn antenna1-18G	COM-POWER	AH118	2011071401	03/01/2012	02/29/2013		
Horn antenna1-18G(06)	EMCO	3117	0006665	09/21/2011	09/20/2012		
Horn antenna18-26G(04)	Com-power	AH-826	081001	05/04/2011	05/03/2013		
Preamplifier9-1000M	HP	8447D	NA	02/10/2012	02/09/2013		
Preamplifier1-18G	MITEQ	AFS44-001018 00-25-10P-44	1329256	07/23/2012	07/22/2013		
Preamplifier1-26G	EM	EM01M26G	NA	02/21/2012	02/20/2013		
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	02/10/2012	02/09/2013		
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	12/14/2011	12/13/2012		
SUCOFLEX 1GHz~40GHz cable	HUBER SUHNER	Sucoflex 102	27963/2&3742 1/2	09/21/2011	09/20/2012		
2.4G Filter	Micro-Tronics	Brm50702	76	10/22/2011	10/21/2012		



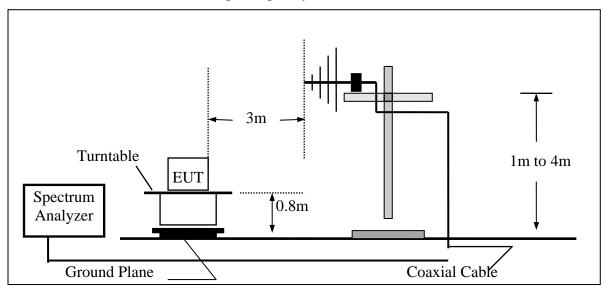
8.3 Test SET-UP:

8.3.1 Conducted Emission at antenna port:

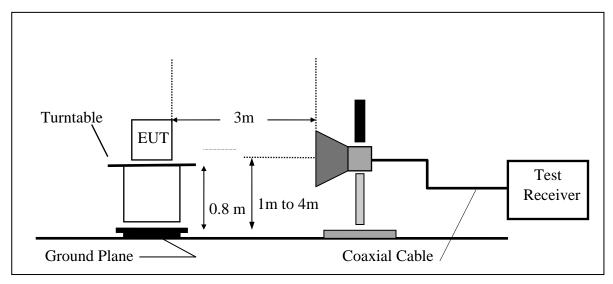
Refer to section 6.3 for details.

8.3.2 Radiated emission:

(A) Radiated Emission Test Set-Up, Frequency Below 1000MHz



(B) Radiated Emission Test Set-UP Frequency Over 1 GHz



-31 of 88-



8.4 Measurement Procedure:

- 1. Place the EUT on the table and set it in transmitting mode.
- 2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 3. Set center frequency of spectrum analyzer = operating frequency.
- 4. Set the spectrum analyzer as RBW, VBW=100KHz, Span=25MHz, Sweep = auto
- 5. Mark Peak, 2.390GHz and 2.4835GHz and record the max. level.
- 6. Repeat above procedures until all frequency measured were complete.

Refer to section 5.4.2 and 5.4.2.2.4 Band-Edge Measurements of KDB Document: 558074 D01 DTS Meas Guidance v01

The measurement of unwanted emissions at the edge of the authorized frequency bands can be complicated by the leakage of RF energy from the fundamental emission into the RBW passband. Thus, for measurements at the band edges, a narrower resolution bandwidth (no less than 10 kHz) can be used within the first 1 MHz beyond the fundamental emission, provided that that measured energy is subsequently integrated over the appropriate reference bandwidth (i.e., 100 kHz or 1 MHz). This integration can be performed using the band power function of the spectrum analyzer or by summing the spectral levels (in linear power units) over the appropriate reference bandwidth.

8.5 Field Strength Calculation:

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

$\mathbf{FS} = \mathbf{RA} + \mathbf{AF} + \mathbf{CL} - \mathbf{AG}$

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)
	RA = Reading Amplitude	AG = Amplifier Gain
	AF = Antenna Factor	

8.6 Measurement Result:

Note: Refer to next page spectrum analyzer data chart and tabular data sheets.



802.11b

Band Edges Test Data CH-Low



Band Edges Test Data CH-High





-33 of 88-

Radiated Emission: 802.11 b mode

Operation Mode	TX CH Low	Test Date	2012/09/04
Fundamental Frequency	2412 MHz	Test By	Dino
Temperature	25 °C	Humidity	60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2379.85	54.50	-11.51	42.99	74.00	-31.01	Peak	VERTICAL
2	2390.00	53.12	-11.48	41.64	74.00	-32.36	Peak	VERTICAL
1	2353.52	54.72	-11.58	43.14	74.00	-30.86	Peak	HORIZONTAL
2	2390.00	53.17	-11.48	41.69	74.00	-32.31	Peak	HORIZONTAL

Operation ModeTX CH HighFundamental Frequency2462 MHzTemperature25 °C

Test Date2012/09/04Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2483.50	52.71	-11.25	41.46	74.00	-32.54	Peak	VERTICAL
2	2496.56	54.72	-11.21	43.51	74.00	-30.49	Peak	VERTICAL
1	2483.50	52.56	-11.25	41.31	74.00	-32.69	Peak	HORIZONTAL
	2499.31	55.13	-11.21	43.92	74.00	-30.08	Peak	HORIZONTAL

Remark:

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



802.11g

Band Edges Test Data CH-Low

RL RF 50 Irker 1 2.4099040		Trig: Free Run #Atten: 30 dB	ALIGN OFF Avg Type: Log-Pwr Avg Hold:>10/10	03:22:15 PM Sep 06, 2012 TRACE 1 2 3 4 5 TYPE MWWWAWW DET P N N N N N	Peak Search
Ref Offset 0 dB/div Ref 20.50			Mkr	1 2.409 90 GHz -4.662 dBm	Next Peal
9 .6 .00				1 marine providence	Next Pk Righ
5 5				-24.66 dBm	Next Pk Lei
5 5		martine fuction of the second	and a second and a s		Marker Delt
art 2.31000 GHz es BW 100 kHz	#VB	W 300 kHz		Stop 2.42200 GHz 10.7 ms (1001 pts) FUNCTION VALUE	Mkr→C
N 1 f N 1 f	2.409 90 GHz 2.390 00 GHz	-4.662 dBm -55.279 dBm		FONCTION VALUE	_
					Mkr→RefLv
					Mor 1 of
			STATUS		

Band Edges Test Data CH-High





Radiated Emission: 802.11 g mode

Operation Mode Fundamental Frequency Temperature	TX CH Low 2412 MHz 25 °C		r	Fest Date Fest By Humidity	2012/09/04 Dino 60 %	
			0			

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2338.78	54.81	-11.61	43.20	74.00	-30.80	Peak	VERTICAL
2	2390.00	53.93	-11.48	42.45	74.00	-31.55	Peak	VERTICAL
1	2350.13	54.98	-11.58	43.40	74.00	-30.60	Peak	HORIZONTAL
2	2390.00	53.10	-11.48	41.62	74.00	-32.38	Peak	HORIZONTAL

Operation ModeTX CH HighFundamental Frequency2462 MHzTemperature25 °C

Test Date2012/09/04Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2483.50	53.30	-11.25	42.05	74.00	-31.95	Peak	VERTICAL
2	2499.26	55.05	-11.21	43.84	74.00	-30.16	Peak	VERTICAL
1	2483.50	54.57	-11.25	43.32	74.00	-30.68	Peak	HORIZONTAL
2	2499.79	55.42	-11.21	44.21	74.00	-29.79	Peak	HORIZONTAL

Remark:

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



802.11n_20M

Band Edges Test Data CH-Low

	RF 50 Ω	DC	SENSE:INT	ALIGN OFF	03:24:42 PM Sep 06, 2012	BIRDING
splay I	Line -24.30 c	Bm PNO: Fast IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold:>10/10	TRACE 1 2 3 4 5 5 TYPE M WATAWAY DET P N N N N N	Display
dB/div	Ref Offset 0.5 Ref 20.50 d			Mkr	1 2.406 54 GHz -4.304 dBm	Annotation
9 0.5 60					1	Title
9.5 9.5 9.5				*2 *	· · · · · · · · · · · · · · · · · · ·	Graticul On O
3.5 9.5 3.5 	adhalaya konan den amerik	yearder an time of a state of the	In the second	manus water		Display Lin -24.30 dBr
	1000 GHz 100 kHz	#VE	300 kHz		Stop 2.42200 GHz 10.7 ms (1001 pts)	
R MODE T	1 f	× 2.406 54 GHz 2.390 00 GHz	∀ -4.304 dBm -51.358 dBm	FUNCTION FUNCTION WIDTH	FUNCTION VALUE	
		2.390 00 GHZ	-01.000 UBIII			System Display
						Settings
						Settings

Band Edges Test Data CH-High





Radiated Emission: 802.11 n_20M mode

Operation Mode	TX CH Low		2012/09/04
Fundamental Frequency	2412 MHz		Dino
Temperature	25 °C	Humidity	60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2388.86	55.75	-11.48 44.27		74.00	-29.73 Peak		VERTICAL
2	2390.00	54.27	-11.48	42.79	74.00	-31.21	Peak	VERTICAL
1	2353.64	54.54	-11.58	42.96	74.00	-31.04	Peak	HORIZONTAL
2	2390.00	53.26	-11.48	41.78	74.00	-32.22	Peak	HORIZONTAL

Operation ModeTX CH HighFundamental Frequency2462 MHzTemperature25 °C

Test Date2012/09/04Test ByDinoHumidity60 %

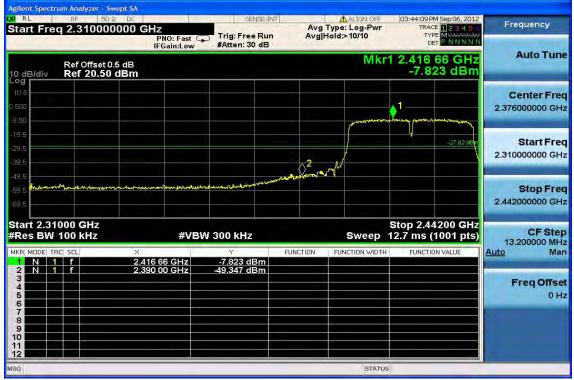
No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB dBuV/m dBu		dBuV/m	dB		V/H
1	2483.50	54.36	-11.25	43.11	74.00	-30.89	Peak	VERTICAL
1	2483.50	53.92	-11.25	42.67	74.00	-31.33	Peak	HORIZONTAL
2	2483.99	56.15	-11.25	44.90	74.00	-29.10	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



802.11n_40M

Band Edges Test Data CH-Low



Band Edges Test Data CH-High





Radiated Emission: 802.11 n_40M mode

Operation Mode	TX CH Low
Fundamental Frequency	2422 MHz
Temperature	25 °C

Test Date2012/09/04Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m dBuV/m		dB		V/H
1	2389.20	55.04	-11.48	43.56	74.00	-30.44	Peak	VERTICAL
2	2390.00	53.37	-11.48	41.89	74.00	-32.11	Peak	VERTICAL
1	2390.00	55.33	-11.48	43.85	74.00	-30.15	Peak	HORIZONTAL

Operation ModeTX CH HighFundamental Frequency2452 MHzTemperature25 °C

Test Date2012/09/04Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2483.50	56.56	-11.25	45.31	74.00	-28.69	Peak	VERTICAL
2	2484.63	57.91	-11.25	46.66	74.00	-27.34	Peak	VERTICAL
1	2483.50	56.73	-11.25	45.48	74.00	-28.52	Peak	HORIZONTAL
2	2484.70	34.70 57.32 -11.25		46.07	74.00	-27.93	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- 2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



9 SPURIOUS RADIATED EMISSION TEST

9.1 Standard Applicable

According to \$15.247(c), all other emissions outside these bands shall not exceed the general radiated emission limits specified in \$15.209(a). And according to \$15.33(a)(1), for an intentional radiator operates below 10GHz, the frequency range of measurements: to the tenth harmonic of the highest fundamental frequency or to 40GHz, whichever is lower.

9.2 Measurement Equipment Used:

9.2.1 Conducted Emission at antenna port:

Refer to section 6.2 for details.

9.2.2 Radiated emission:

Refer to section 7.2 for details.

9.3 Test SET-UP:

9.3.1 Conducted Emission at antenna port:

Refer to section 6.3 for details.

9.3.2 Radiated emission:

Refer to section 7.3 for details.

9.4 Measurement Procedure:

- 1. The EUT was placed on a turn table which is 0.8m above ground plane.
- 2. The turn table shall rotate 360 degrees to determine the position of maximum emission level.
- 3. EUT is set 3m away from the receiving antenna which varied from 1m to 4m to find out the highest emissions.
- 4. When measurement procedures for electric field radiated emissions above 1 GHz the EUT measurement is to be made "while keeping the antenna in the 'cone of radiation' from that area and pointed at the area both in azimuth and elevation, with polarization oriented for maximum response." is still within the 3dB illumination BW of the measurement antenna.
- 5. Maximum procedure was performed on the six highest emissions to ensure EUT compliance.
- 6. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical.
- 7. Repeat above procedures until all frequency measured were complete.

Refer to section 5.4.2 Unwanted Emissions into Restricted Frequency Bands of KDB Document: 558074 D01 DTS Meas Guidance v01



9.5 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor and subtracting the Amplifier Gain and Duty Cycle Correction Factor(if any) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CL - AG

Where	FS = Field Strength	CL = Cable Attenuation Factor (Cable Loss)					
	RA = Reading Amplitude	AG = Amplifier Gain					
	AF = Antenna Factor						

9.6 Measurement Result:

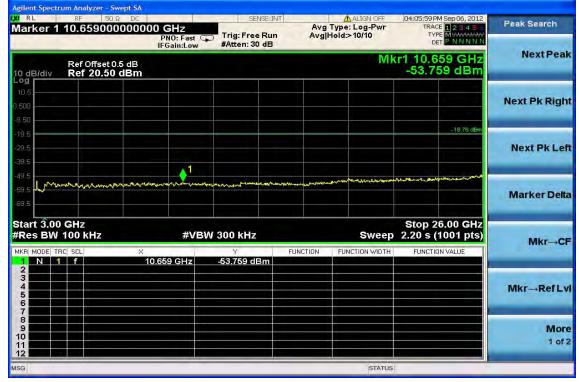
Note: Refer to next page spectrum analyzer data chart and tabular data sheets.



Conducted Spurious Emission Measurement Result (802.11b) Ch Low 30MHz – 3GHz

		ectru	m An	alyzer - S	wept S	A											
Disp		/ Li	RF	-18.76	Ω DO dBr	n P	NO: Fast Gain:Low		SEN Frig: Free Atten: 30			ALIGN OFF Type: Log-Pwr Hold:>10/10		TRACE 1 2 3 4 TYPE M WWW DET P N N N N		Display	
10 di	3/di	v		Offset 0 f 20.50										411 9 GH 1.239 dBi	lz m	Annotation	
Log 10.5 0.500													1-			Title	
-9.50														-18.76 dl	Bm)		
-19.5 -29.5 -39.5															<u>On</u>	Graticule Off	
-49.5 -59.5 -69.5	make	ومعلومه	-	menormal	aller	innerse	www.w	يە الألەپ م	ana ata Angol	luggado arti geleta				Ald Mind Berney, allowed		Display Line -18.76 dBm	
Star #Re				kHz			#VE	3W 30	00 kHz			Sweep		p 3.000 GF ns (1001 pt			
MKR 1	MODE		SCL			×	9 GHz		∀ 1.239 dE		INCTION	FUNCTION WID1	'H FL	NCTION VALUE			
2	N	1	f			2.411 2.293	1 GHz	-5	1.239 dE 5.588 dE	sm Sm						-	
3456																System Display Settings	
7 8 9																	
10 11 12																	
MSG												STAT	US				

Ch Low 3GHz – 26.5GHz





Ch Mid 30MHz – 3GHz

Agilent Spectrum Ana	alyzer - Swept SA							
Display Line		PNO: Fast G	SENSE: JI Trig: Free Run #Atten: 30 dB	Avg n Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	TRA(TY	M Sep 06, 2012 CE 1 2 3 4 5 5 PE M WWWWWW ET P N N N N N	Display
10 dB/div Ref	Offset 0.5 dB f 20.50 dBm			5 7 GHz 06 dBm	Annotation			
10.5 0,500						● ¹		Title
-19.5 -29.5 -39.5							-19.69 dBm	Graticule
-49.5 -59.5	and a start and a start of the	hunder and the strategy and		2 Lannar de alternité	and and a second and	Aurineenun	Taken Johnson	Display Line -19.69 dBm
Start 30 MHz #Res BW 100	kHz	#VBV	V 300 kHz		Sweep		8.000 GHz (1001 pts)	
MKR MODE TRC SCL	2.4	135 7 GHz 524 9 GHz	∀ 0.306 dBm -58.409 dBm	FUNCTION	FUNCTION WIDTH	FUNCTI	ON VALUE	
2 N 1 3 4 6 5 7 8 9 9 10 11 12			38.409 dbm					System Display Settings
MSG					STATUS	1		

Ch Mid 3GHz – 26.5GHz



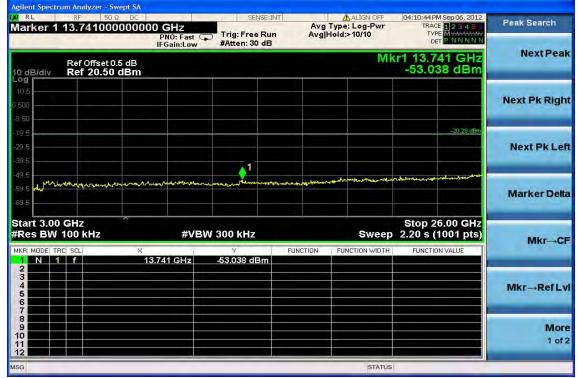




Ch High 30MHz – 3GHz

	rum Analyzer	Swept SA					
Start Fre	3,0	0Ω DC 000 MHz PNO: Fast IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	04:09:23 PM Sep 06, 2012 TRACE 1 2 3 4 5 TYPE M MAAAAAAA DET P N N N N N	Frequency
10 dB/div Log	Ref Offse Ref 20.5			r1 2.462 4 GHz -0.291 dBm	Auto Tune		
10.5 0.500 -9.50						↓ 1	Center Freq 1.515000000 GHz
-19.5 -29.5 -39.5						20.29 dBm	Start Freq 30.000000 MHz
-49.5 -59.5 -69.5	and an and a star	and the second	and the state of the	n Jayinan af Layaras		to between the second and the second se	Stop Freq 3.000000000 GHz
Start 30 N #Res BW		#VE	3W 300 kHz		Sweep	Stop 3.000 GHz 284 ms (1001 pts)	
MKR MODE TI	f	× 2.462 4 GHz	Y -0.291 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	<u>Auto</u> Man
2 N 1 3 4 5 6 7	f	2.352 5 GHz	-55.110 dBm				Freq Offset 0 Hz
8 9 10 11 12							
MSG					STATUS		

Ch High 3GHz – 26.5GHz

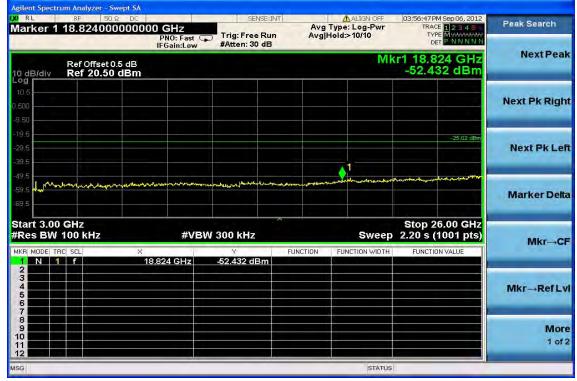




Conducted Spurious Emission Measurement Result (802.11g) Ch Low 30MHz – 3GHz

Agilen	t Spe	ectru	m An	alyzer - S	wept S	5A												
Disp		y Li	RF ne	-25.02	ΩD 2dB	m	PNO: F	ast 🕞				Avg Avg		LIGN OFF .og-Pwr 0/10	TR	PM Sep 06, 20 ACE 1 2 3 4 TYPE M WARA DET P N N N 1	55	Display
10 dE	3/di	v		Offset (20.50										Mk	r1 2.4 -5.	09 0 GH 019 dB	iz m	Annotation
Log 10.5 0,500 -9.50															1			Title
-9.50 -19.5 -29.5 -39.5																-25.02 d	Bm On	Graticule Off
-49.5 -59.5 -69.5	~~~	-	Where	البام مريد	บาโซี-ระจ	ulgette en en		anter allera	2	(مرمادروهرمرمادر)	Lathhalogha.	aglann an Anglidh		-and-mark	transmo		**	Display Line -25.02 dBm
Star #Re:				kHz			#	VBW	/ 300 kH	z				Sweep		3.000 GH (1001 pt		
MKB N	N	1	SCL f				9 0 GH		Y -5.019	dBm	FUNC	CTION	FUNCT	TION WIDTH	FUNC	TION VALUE		
3456	N	1	f			1.235	58GH		-60.977	dBm								System Display► Settings
7 8 9 10 11																		
12 MSG	-				-		-							STATUS				

Ch Low 3GHz – 26.5GHz

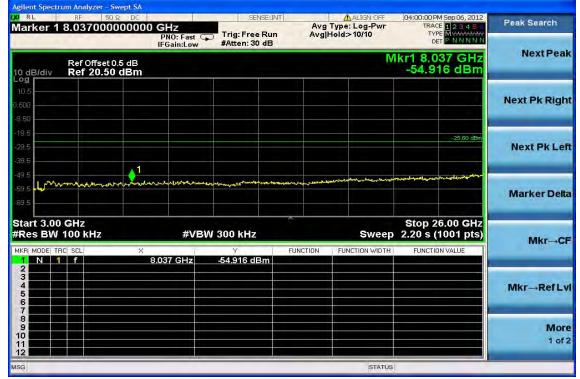




Ch Mid 30MHz – 3GHz

Agilent Spectrum Analyzer - Swept SA						
Display Line -25.60 dBm		SENSE:INT Trig: Free Run #Atten: 30 dB	Avg T	ALIGN OFF /pe: Log-Pwr ild:>10/10	03:57:43 PM Sep 06, 2012 TRACE 1 2 3 4 5 TYPE M WWWWW DET P N N N N	Display
Ref Offset 0.5 dB 10 dB/div Ref 20.50 dBm			Annotation			
Log 10.5 0.600					• ¹	Title►
-19.5					-25.60 dBm	Graticule On Off
-49.5 -59.5 -69.5	dryg af a state of a state of the	mound and a star	2 Strangenteren hannen	norman server have been a server have	alerhannen van der selver selven	Display Line -25.60 dBm
Start 30 MHz #Res BW 100 kHz	#VBW	300 kHz		Sweep	Stop 3.000 GHz 284 ms (1001 pts)	
MKR MODE TRC SCL X	2.435 7 GHz	Y -5.596 dBm -61.761 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
2 N 1 T 3 4 5 5 6 7 7 8 9 9 10	1.6219 GHZ	-61.761 GBM				System Display⊁ Settings
MSG				STATUS		

Ch Mid 3GHz – 26.5GHz

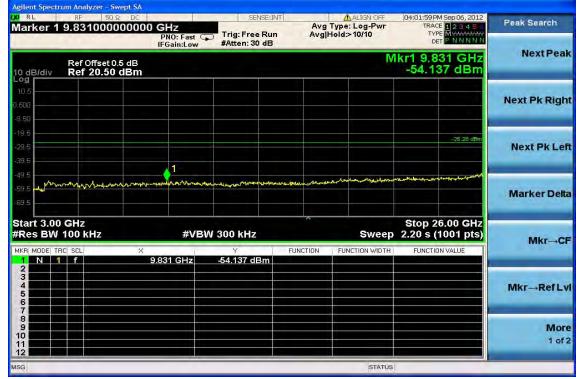




Ch High 30MHz – 3GHz

Agilent Spec										_	
Display	Line		Р	NO: Fast C Gain:Low	Trig: Free Rur #Atten: 30 dB	Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	TRA TY	PM Sep 06, 2012 CE 12345 PE M WWWWW PE P N N N N		Display
10 dB/div		Offset 0. f 20.50			Mkr1 2.462 4 GHz -6.282 dBm						Annotation
10.5								• ¹			Title
-19.5 -29.5 -39.5									-26.28 dBm	<u>On</u>	Graticule Off
-49.5 -59.5 -69.5	kazetom je	مەمەرىمەيەرلىرىر	ىرىمەر يەرىمەر يەرىمەر يەرىمەر يەرىمەر	ny ganaga galagang	nan dan san dara yan artigin arti	444844000 9 40 AP 10 MP	and the second	2) 1	Werning Land State		Display Line -26.28 dBm
Start 30 #Res BV		kHz		#VB	W 300 kHz		Sweep		3.000 GHz (1001 pts)		
MKR MODE	TRC SCL			4 GHz 3 GHz		FUNCTION	FUNCTION WIDTH	FUNCT	ION VALUE		
2 N 3 4 5 6 7 8 9 9 10 11 12			2.313		-30.337 UDIII						System Display Settings
MSG							STATUS				

Ch High 3GHz – 26.5GHz

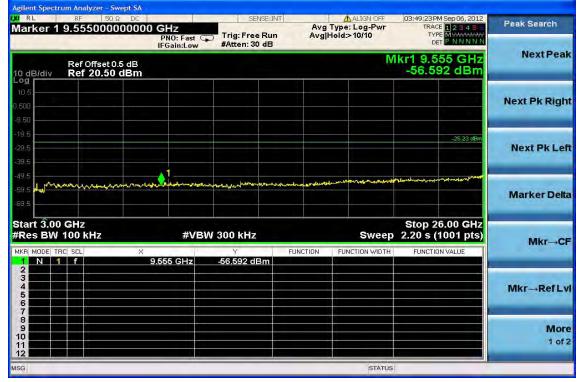




Conducted Spurious Emission Measurement Result (802.11n_20M) Ch Low 30MHz – 3GHz

		er - Swept SA							
splay L	ine -25	50 Ω DC .23 dBm	PNO: Fast C	SENSE: JA	Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	TRA TY	PM Sep 06, 2012 CE 1 2 3 4 5 5 PE M WWWWWW PE P N N N N N	Display
dB/div		set 0.5 dB 1.50 dBm				Mk	r1 2.40 -5.2	6 0 GHz 31 dBm	Annotation
g).5 10 50							1		Title
5								-25.23 dEm	Graticule
5 5 5	فلقحر الجري للمتوجب وساريا	ylando-de-odolada	ภาพระศาสตร์การการการ เราเรียง	naya adaalaa maaraya waxaa	unalung	man and a second and a second and a second a se	hand 2	d-fabrication, system, or	Display Line -25.23 dBm
urt 30 N es BW	1Hz 100 kH:	2	#VB	W 300 kHz		Sweep	Stop 3 284 ms (3.000 GHz (1001 pts)	
	C SCL	×	406 0 GHz	۲ -5.231 dBm	FUNCTION	FUNCTION WIDTH	FUNCTI	ON VALUE	
N 1	f		556 3 GHz	-57.131 dBm					System Display≯ Settings
						STATUS			-

Ch Low 3GHz – 26.5GHz

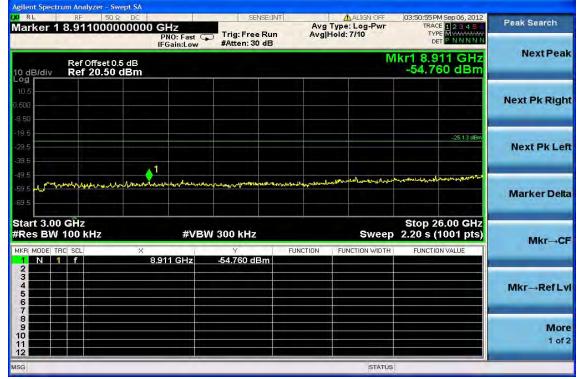




Ch Mid 30MHz – 3GHz

	trum Analyzer								
Display	RF Line -25.	50 Ω DC 13 dBm	PNO: Fast C	Trig: Free Run #Atten: 30 dB	Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	TRA TY	PM Sep 06, 2012 CE 1 2 3 4 5 5 (PE M WWWWWWW DET P. N.N.N.N.	Display
10 dB/div	Ref Offs Ref 20.	et 0.5 dB 50 dBm	II Odinie Ow		2 7 GHz 30 dBm	Annotation			
Log 10.5 0,500							¢ ¹		Title⊧
-19.5 -29.5 -39.5								-25 13 dBm	Graticule On Off
-49.5 -59.5 -69.5	agen Ballamarketaris	yangan dan sebesek	ar Brief, and an a faith or A		หางการประจารการการประเทศ	والقيد الإجراب والمالي	J belever and	normalization of the second se	Display Line -25.13 dBm
Start 30 #Res BW	MHz 100 kHz		#VB	W 300 kHz		Sweep		3.000 GHz (1001 pts)	
MKR MODE 1	1 f		32 7 GHz 35 7 GHz	Y -5.130 dBm -57.402 dBm	FUNCTION	FUNCTION WIDTH	FUNCT	ION VALUE	
2 N 3 4 5 5 6 7 8 9 10 11 12		<u>2,</u> i-		-31.4U2 dbm					System Display≯ Settings
MSG						STATUS	:		

Ch Mid 3GHz – 26.5GHz

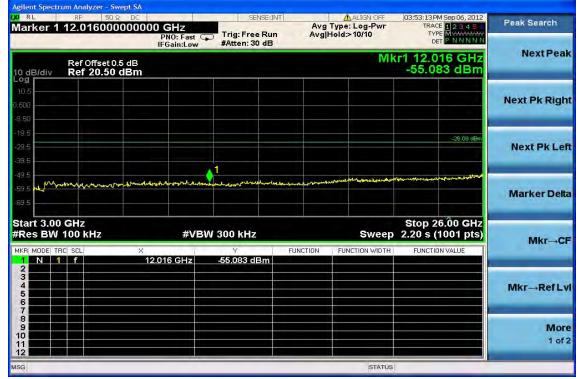




Ch High 30MHz – 3GHz

	trum Analyze									
N RL Display	RF Line -26	50 Ω DC .08 dBm	PNO: Fast C	Trig: Free Run #Atten: 30 dB	Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	TRA TY	PM Sep 06, 2012 CE 1 2 3 4 5 5 PE M WWWWW PET P N N N N N		Display
10 dB/div Log		set 0.5 dB 1.50 dBm				Mk	r1 2.45 -6.0	9 5 GHz 76 dBm		Annotation
10.5 0.500							• ¹			Title⊧
-19.5 -29.5 -39.5								-26.08 dBm	<u>On</u>	Graticule Off
-49.5 -59.5 -69.5	the second s	NUNEL-PARTY NEW PROPERTY	viran miliakan atara Stanton	ىلەرتورىنىيەتلەرلەرسەمەر _{كە} رلىرىم	an a	2 martines and a service	n Jenninger	mahatlan an a		Display Line -26.08 dBm
Start 30 #Res BW	MHz V 100 kHz	2	#VB	W 300 kHz		Sweep		3.000 GHz (1001 pts)		
	TRC SCL		459 5 GHz	Y -6.076 dBm	FUNCTION	FUNCTION WIDTH	FUNCTI	ON VALUE		
2 N 3 4 5 6 7 8 9 9 10 11 12			073 4 GHz	-57.890 dBm						System Display⊁ Settings
MSG						STATUS	5		-	

Ch High 3GHz – 26.5GHz





Conducted Spurious Emission Measurement Result (802.11n_40M) Ch Low 30MHz – 3GHz

ent Spectrum Analyze							
RL RF splay Line -28	50 Ω DC .69 dBm PNO: Fast J IFGain:Low	Trig: Free Run #Atten: 30 dB	Avg	ALIGN OFF Type: Log-Pwr Hold:>10/10	TYPE	ep 06, 2012	Display
dB/div Ref 20	set 0.5 dB			Mk	r1 2.411 9 -8.686		Annotation
9 .5 .0					1		Title
5						-28.69 dBm	Graticule 1 Of
5 5	an a faire in mark of the second second	president and the second	2			town parts	Display Line -28.69 dBm
art 30 MHz es BW 100 kHz	#VE	3W 300 kHz		Sweep	Stop 3.0 284 ms (10		
MODE TRC SCL	× 2.411 9 GHz	Y -8.686 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION	/ALUE	
<u>N 1</u> f	1.601 1 GHz	-61.590 dBm					System Display Settings
				STATUS	1		

Ch Low 3GHz – 26.5GHz

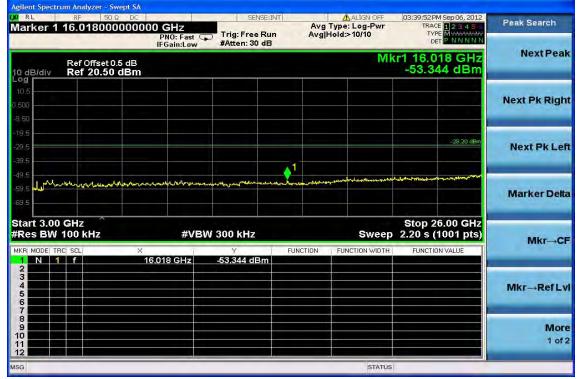




Ch Mid 30MHz – 3GHz

	rum Analyzer - S							
Display L	RF 50	Ω DC dBm PNO: Fast IFGain:Low	SENSE: IM Trig: Free Run #Atten: 30 dB	Avg	ALIGN OFF Type: Log-Pwr Hold>10/10	TRACI TYP	4 Sep 06, 2012 E 1 2 3 4 5 5 E M WWWWW T P N N N N N	Display
10 dB/div Log	Ref Offset 0 Ref 20.50				Mk	r1 2.432 -8.20	2 7 GHz 02 dBm	Annotation
10.5 0.500						<u>¢</u> 1		Title►
-19.5 -29.5 -39.5							-28 20 dBm	Graticule
-49.5 -59.5 -69.5	is the life of the second s	y]	white and the second second	~~~~~	anne an ann an an ann an an an an an an an a	Invenience	htterstationen Mathatala	Display Line -28.20 dBm
Start 30 N #Res BW		#VE	300 kHz		Sweep	Stop 3. 284 ms (′	.000 GHz 1001 pts)	
MKR MODE TR	n fil	× 2.432 7 GHz 1.449 7 GHz	Y -8.202 dBm -59.099 dBm	FUNCTION	FUNCTION WIDTH	FUNCTIO	N VALUE	
3 4 5 6 7 8								System Display► Settings
9 10 11 12 MSG					STATUS			

Ch Mid 3GHz – 26.5GHz

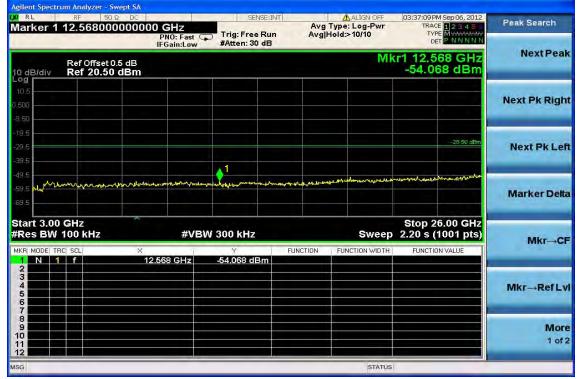




Ch High 30MHz – 3GHz

Agilent Spec												
Display	RF Line -2	50 Ω 28.50 d	IBm P	NO: Fast G Gain:Low	Trig: Free R #Atten: 30 d	lun Av	All vg Type: L vg Hold:>1		TRA	PM Sep 06, 2012 CE 1 2 3 4 5 5 (PE M M M M M M M DET P N N N N N		Display
10 dB/div		ffset 0.5 2 0.50 d	dB	Janeow				Mk	r1 2.46 -8.5	2 4 GHz 00 dBm		Annotation
Log 10.5 0,500 -9.60									↓ ¹			Title∙
-19.5 -29.5 -39.5										28.50 dBm	<u>On</u>	Graticule Off
-49.5	and the Caleboard	معاريريوليومو	المراجع	nde-hoursenergener	2	ىمەردىلەرلىرلىرىلىرىكى بەلىرىيە ئەردىلىرى	لايد المريد الم	rangeelichen	Luman	nanativana ana ana ana ana ana ana ana ana ana		Display Line -28.50 dBm
Start 30 #Res BW		Hz		#VB	W 300 kHz		s	Sweep		3.000 GHz (1001 pts)		
	TRC SCL			4 GHz 2 GHz	Y -8.500 dBm -60.581 dBm		I FUNCT	ION WIDTH	FUNCT	ION VALUE		
2 N 3 4 5 5 6 7 8 9 10 11 12			1.203		-0U.081 QB/T							System Display Settings
MSG								STATUS	1		-	

Ch High 3GHz – 26.5GHz





Operation Mode	802.11b TX CH Low	Test Date	2012/09/04
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 °C	Humidity	60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	71.71	55.31	-19.92	35.39	40.00	-4.61	Peak	VERTICAL
2	95.96	56.32	-16.24	40.08	43.50	-3.42	Peak	VERTICAL
3	143.49	54.10	-14.72	39.38	43.50	-4.12	Peak	VERTICAL
4	250.19	51.68	-12.92	38.76	46.00	-7.24	Peak	VERTICAL
5	359.80	52.44	-10.35	42.09	46.00	-3.91	Peak	VERTICAL
6	874.87	35.34	-4.53	30.81	46.00	-15.19	Peak	VERTICAL
1	95.96	57.12	-16.24	40.88	43.50	-2.62	Peak	HORIZONTAL
2	143.49	54.59	-14.72	39.87	43.50	-3.63	Peak	HORIZONTAL
3	250.19	53.65	-12.92	40.73	46.00	-5.27	Peak	HORIZONTAL
4	359.80	53.59	-10.35	43.24	46.00	-2.76	Peak	HORIZONTAL
5	480.08	44.34	-8.95	35.39	46.00	-10.61	Peak	HORIZONTAL
6	749.74	42.08	-5.89	36.19	46.00	-9.81	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Operation Mode	802.11b TX CH Mid	Test Date	2012/09/04
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 °C	Humidity	60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	57.84	-16.24	41.60	43.50	-1.90	Peak	VERTICAL
2	143.49	54.96	-14.72	40.24	43.50	-3.26	Peak	VERTICAL
3	250.19	50.60	-12.92	37.68	46.00	-8.32	Peak	VERTICAL
4	359.80	54.33	-10.35	43.98	46.00	-2.02	Peak	VERTICAL
5	749.74	44.03	-5.89	38.14	46.00	-7.86	Peak	VERTICAL
6	874.87	37.39	-4.53	32.86	46.00	-13.14	Peak	VERTICAL
1	95.96	57.33	-16.24	41.09	43.50	-2.41	Peak	HORIZONTAL
2	125.06	55.37	-13.76	41.61	43.50	-1.89	Peak	HORIZONTAL
3	144.46	55.06	-14.78	40.28	43.50	-3.22	Peak	HORIZONTAL
4	250.19	53.50	-12.92	40.58	46.00	-5.42	Peak	HORIZONTAL
5	359.80	53.64	-10.35	43.29	46.00	-2.71	Peak	HORIZONTAL
6	749.74	41.82	-5.89	35.93	46.00	-10.07	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Operation Mode	802.11b TX CH High	Test Date	2012/09/04
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 °C	Humidity	60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	71.71	54.18	-19.92	34.26	40.00	-5.74	Peak	VERTICAL
2	95.96	57.17	-16.24	40.93	43.50	-2.57	Peak	VERTICAL
3	120.21	51.69	-13.66	38.03	43.50	-5.47	Peak	VERTICAL
4	289.96	49.55	-11.99	37.56	46.00	-8.44	Peak	VERTICAL
5	600.36	41.76	-7.44	34.32	46.00	-11.68	Peak	VERTICAL
6	749.74	36.42	-5.89	30.53	46.00	-15.47	Peak	VERTICAL
1	77.53	55.67	-19.48	36.19	40.00	-3.81	Peak	HORIZONTAL
2	95.96	57.26	-16.24	41.02	43.50	-2.48	Peak	HORIZONTAL
3	143.49	54.63	-14.72	39.91	43.50	-3.59	Peak	HORIZONTAL
4	359.80	53.32	-10.35	42.97	46.00	-3.03	Peak	HORIZONTAL
5	600.36	40.65	-7.44	33.21	46.00	-12.79	Peak	HORIZONTAL
6	749.74	40.25	-5.89	34.36	46.00	-11.64	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Operation Mode	802.11g TX CH Low	Test Date	2012/09/04
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 °C	Humidity	60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	56.66	-16.24	40.42	43.50	-3.08	Peak	VERTICAL
2	143.49	54.44	-14.72	39.72	43.50	-3.78	Peak	VERTICAL
3	250.19	53.41	-12.92	40.49	46.00	-5.51	Peak	VERTICAL
4	359.80	53.05	-10.35	42.70	46.00	-3.30	Peak	VERTICAL
5	480.08	44.66	-8.95	35.71	46.00	-10.29	Peak	VERTICAL
6	749.74	41.76	-5.89	35.87	46.00	-10.13	Peak	VERTICAL
1	39.70	50.62	-12.94	37.68	40.00	-2.32	Peak	HORIZONTAL
2	95.96	56.62	-16.24	40.38	43.50	-3.12	Peak	HORIZONTAL
3	143.49	54.41	-14.72	39.69	43.50	-3.81	Peak	HORIZONTAL
4	250.19	51.20	-12.92	38.28	46.00	-7.72	Peak	HORIZONTAL
5	359.80	50.81	-10.35	40.46	46.00	-5.54	Peak	HORIZONTAL
6	719.67	40.45	-6.29	34.16	46.00	-11.84	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Radiated Spurious Lini	Radiated Sparrous Emission Measurement Result (below 10112)					
Operation Mode	802.11g TX CH Mid	Test Date	2012/09/04			
Fundamental Frequency	2437MHz	Test By	Dino			
Temperature	25 ℃	Pol	Ver./Hor			
Humidity	60 %					

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	62.98	56.41	-19.95	36.46	40.00	-3.54	Peak	VERTICAL
2	95.96	56.94	-16.24	40.70	43.50	-2.80	Peak	VERTICAL
3	143.49	54.30	-14.72	39.58	43.50	-3.92	Peak	VERTICAL
4	250.19	51.69	-12.92	38.77	46.00	-7.23	Peak	VERTICAL
5	359.80	53.50	-10.35	43.15	46.00	-2.85	Peak	VERTICAL
6	749.74	42.11	-5.89	36.22	46.00	-9.78	Peak	VERTICAL
1	39.70	49.94	-12.94	37.00	40.00	-3.00	Peak	HORIZONTAL
2	95.96	56.64	-16.24	40.40	43.50	-3.10	Peak	HORIZONTAL
3	143.49	54.77	-14.72	40.05	43.50	-3.45	Peak	HORIZONTAL
4	250.19	52.68	-12.92	39.76	46.00	-6.24	Peak	HORIZONTAL
5	359.80	54.01	-10.35	43.66	46.00	-2.34	Peak	HORIZONTAL
6	749.74	42.14	-5.89	36.25	46.00	-9.75	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Rudiated Sparrous Enn	ssion measurement result (below 1011	u)	
Operation Mode	802.11g TX CH High	Test Date	2012/09/04
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

Radiated St	purious Emission	Measurement	Result (below 1GHz)
Italianca D	purious Limboron	measur emene	Itcoult (

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	56.97	-16.24	40.73	43.50	-2.77	Peak	VERTICAL
2	143.49	54.27	-14.72	39.55	43.50	-3.95	Peak	VERTICAL
3	250.19	52.58	-12.92	39.66	46.00	-6.34	Peak	VERTICAL
4	359.80	53.41	-10.35	43.06	46.00	-2.94	Peak	VERTICAL
5	480.08	45.02	-8.95	36.07	46.00	-9.93	Peak	VERTICAL
6	749.74	42.28	-5.89	36.39	46.00	-9.61	Peak	VERTICAL
1	95.96	57.49	-16.24	41.25	43.50	-2.25	Peak	HORIZONTAL
2	143.49	54.52	-14.72	39.80	43.50	-3.70	Peak	HORIZONTAL
3	250.19	50.15	-12.92	37.23	46.00	-8.77	Peak	HORIZONTAL
4	359.80	53.48	-10.35	43.13	46.00	-2.87	Peak	HORIZONTAL
5	600.36	41.48	-7.44	34.04	46.00	-11.96	Peak	HORIZONTAL
6	874.87	39.46	-4.53	34.93	46.00	-11.07	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Kadiated Spurious Emission Measurement Result (below 10112)						
Operation Mode	802.11 n_20M TX CH Low	Test Date	2012/09/04			
Fundamental Frequency	2412MHz	Test By	Dino			
Temperature	25 °C	Pol	Ver./Hor			
Humidity	60 %					

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	96.93	57.40	-16.04	41.36	43.50	-2.14	Peak	VERTICAL
2	143.49	54.28	-14.72	39.56	43.50	-3.94	Peak	VERTICAL
3	250.19	54.05	-12.92	41.13	46.00	-4.87	Peak	VERTICAL
4	359.80	53.52	-10.35	43.17	46.00	-2.83	Peak	VERTICAL
5	480.08	45.13	-8.95	36.18	46.00	-9.82	Peak	VERTICAL
6	749.74	42.29	-5.89	36.40	46.00	-9.60	Peak	VERTICAL
1	60.07	54.85	-19.90	34.95	40.00	-5.05	Peak	HORIZONTAL
2	95.96	56.82	-16.24	40.58	43.50	-2.92	Peak	HORIZONTAL
3	143.49	54.09	-14.72	39.37	43.50	-4.13	Peak	HORIZONTAL
4	250.19	50.03	-12.92	37.11	46.00	-8.89	Peak	HORIZONTAL
5	359.80	52.13	-10.35	41.78	46.00	-4.22	Peak	HORIZONTAL
6	874.87	37.98	-4.53	33.45	46.00	-12.55	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Kaulateu Spurious Elinission Measurement Result (below 10112)						
Operation Mode	802.11 n_20M TX CH Mid	Test Date	2012/09/04			
Fundamental Frequency	2437MHz	Test By	Dino			
Temperature	25 ℃	Pol	Ver./Hor			
Humidity	60 %					
Humidity	60 %					

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	57.21	-16.24	40.97	43.50	-2.53	Peak	VERTICAL
2	143.49	53.99	-14.72	39.27	43.50	-4.23	Peak	VERTICAL
3	250.19	52.01	-12.92	39.09	46.00	-6.91	Peak	VERTICAL
4	359.80	53.44	-10.35	43.09	46.00	-2.91	Peak	VERTICAL
5	480.08	45.78	-8.95	36.83	46.00	-9.17	Peak	VERTICAL
6	749.74	43.64	-5.89	37.75	46.00	-8.25	Peak	VERTICAL
1	95.96	57.49	-16.24	41.25	43.50	-2.25	Peak	HORIZONTAL
2	143.49	55.25	-14.72	40.53	43.50	-2.97	Peak	HORIZONTAL
3	250.19	50.68	-12.92	37.76	46.00	-8.24	Peak	HORIZONTAL
4	359.80	53.68	-10.35	43.33	46.00	-2.67	Peak	HORIZONTAL
5	480.08	43.00	-8.95	34.05	46.00	-11.95	Peak	HORIZONTAL
6	874.87	40.18	-4.53	35.65	46.00	-10.35	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



ission weasarchicht Result (below 1011	L)	
802.11 n_20M TX CH High	Test Date	2012/09/04
2462MHz	Test By	Dino
25 ℃	Pol	Ver./Hor
60 %		
	802.11 n_20M TX CH High 2462MHz 25 ℃	2462MHzTest By25 ℃Pol

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	57.92	-16.24	41.68	43.50	-1.82	Peak	VERTICAL
2	144.46	54.86	-14.78	40.08	43.50	-3.42	Peak	VERTICAL
3	250.19	51.86	-12.92	38.94	46.00	-7.06	Peak	VERTICAL
4	359.80	54.44	-10.35	44.09	46.00	-1.91	Peak	VERTICAL
5	540.22	47.72	-7.95	39.77	46.00	-6.23	Peak	VERTICAL
6	749.74	44.88	-5.89	38.99	46.00	-7.01	Peak	VERTICAL
1	69.77	56.98	-20.05	36.93	40.00	-3.07	Peak	HORIZONTAL
2	95.96	57.46	-16.24	41.22	43.50	-2.28	Peak	HORIZONTAL
3	144.46	53.79	-14.78	39.01	43.50	-4.49	Peak	HORIZONTAL
4	250.19	49.95	-12.92	37.03	46.00	-8.97	Peak	HORIZONTAL
5	359.80	54.33	-10.35	43.98	46.00	-2.02	Peak	HORIZONTAL
6	600.36	40.62	-7.44	33.18	46.00	-12.82	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



	L)	
802.11 n_40M TX CH Low	Test Date	2012/09/04
2422MHz	Test By	Dino
25 °C	Pol	Ver./Hor
60 %		
	802.11 n_40M TX CH Low 2422MHz 25 ℃	2422MHzTest By25 °CPol

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	56.75	-16.24	40.51	43.50	-2.99	Peak	VERTICAL
2	143.49	54.67	-14.72	39.95	43.50	-3.55	Peak	VERTICAL
3	250.19	50.87	-12.92	37.95	46.00	-8.05	Peak	VERTICAL
4	359.80	53.61	-10.35	43.26	46.00	-2.74	Peak	VERTICAL
5	540.22	42.29	-7.95	34.34	46.00	-11.66	Peak	VERTICAL
6	749.74	41.40	-5.89	35.51	46.00	-10.49	Peak	VERTICAL
1	56.19	53.25	-19.16	34.09	40.00	-5.91	Peak	HORIZONTAL
2	95.96	56.73	-16.24	40.49	43.50	-3.01	Peak	HORIZONTAL
3	143.49	53.22	-14.72	38.50	43.50	-5.00	Peak	HORIZONTAL
4	250.19	50.20	-12.92	37.28	46.00	-8.72	Peak	HORIZONTAL
5	359.80	48.61	-10.35	38.26	46.00	-7.74	Peak	HORIZONTAL
6	874.87	36.37	-4.53	31.84	46.00	-14.16	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Radiated Spurious Enn	ission weasarchient Result (below 1011	L)	
Operation Mode	802.11 n_40M TX CH Mid	Test Date	2012/09/04
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	57.67	-16.24	41.43	43.50	-2.07	Peak	VERTICAL
2	145.43	55.07	-14.85	40.22	43.50	-3.28	Peak	VERTICAL
3	250.19	53.77	-12.92	40.85	46.00	-5.15	Peak	VERTICAL
4	359.80	54.32	-10.35	43.97	46.00	-2.03	Peak	VERTICAL
5	480.08	45.63	-8.95	36.68	46.00	-9.32	Peak	VERTICAL
6	749.74	42.75	-5.89	36.86	46.00	-9.14	Peak	VERTICAL
1	95.96	57.17	-16.24	40.93	43.50	-2.57	Peak	HORIZONTAL
2	143.49	53.06	-14.72	38.34	43.50	-5.16	Peak	HORIZONTAL
3	250.19	49.08	-12.92	36.16	46.00	-9.84	Peak	HORIZONTAL
4	359.80	48.87	-10.35	38.52	46.00	-7.48	Peak	HORIZONTAL
5	600.36	41.18	-7.44	33.74	46.00	-12.26	Peak	HORIZONTAL
6	749.74	37.10	-5.89	31.21	46.00	-14.79	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Radiated Spurious Enn	ission weasarchicht Result (below 1011	L)	
Operation Mode	802.11 n_40M TX CH High	Test Date	2012/09/04
Fundamental Frequency	2452MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	95.96	57.03	-16.24	40.79	43.50	-2.71	Peak	VERTICAL
2	150.28	55.78	-15.16	40.62	43.50	-2.88	Peak	VERTICAL
3	250.19	52.96	-12.92	40.04	46.00	-5.96	Peak	VERTICAL
4	359.80	52.46	-10.35	42.11	46.00	-3.89	Peak	VERTICAL
5	480.08	47.00	-8.95	38.05	46.00	-7.95	Peak	VERTICAL
6	749.74	42.51	-5.89	36.62	46.00	-9.38	Peak	VERTICAL
1	58.13	57.29	-19.54	37.75	40.00	-2.25	Peak	HORIZONTAL
2	95.96	57.06	-16.24	40.82	43.50	-2.68	Peak	HORIZONTAL
3	143.49	54.26	-14.72	39.54	43.50	-3.96	Peak	HORIZONTAL
4	250.19	50.60	-12.92	37.68	46.00	-8.32	Peak	HORIZONTAL
5	359.80	54.16	-10.35	43.81	46.00	-2.19	Peak	HORIZONTAL
6	749.74	39.05	-5.89	33.16	46.00	-12.84	Peak	HORIZONTAL

- 1 No further spurious emissions detected from the lowest internal frequency and 30MHz.
- 2 Measuring frequencies from the lowest internal frequency to the 1GHz.
- 3 Radiated emissions measured in frequency range from 9MHz to 1000MHz were made with an instrument detector setting 9-90KHz/110-490KHz using PK/AV and other Frequency Band using PK/QP
- 4 Measurement result within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 5 The IF bandwidth of SPA between 9kHz to 30MHz was 10kHz, VBW= 30kHz; between 30MHz to 1GHz was 100KHz, VBW=300KHz.



Radiated Spurious Enn		L)	
Operation Mode	802.11b TX CH Low	Test Date	2012/09/04
Fundamental Frequency	2412MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1553.00	59.00	-15.35	43.65	74.00	-30.35	Peak	VERTICAL
2	4824.00	54.74	-2.59	52.15	74.00	-21.85	Peak	VERTICAL
1	1994.00	55.94	-12.53	43.41	74.00	-30.59	Peak	HORIZONTAL
2	4824.00	52.32	-2.59	49.73	74.00	-24.27	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Kaulateu Spullous Elli		L)	
Operation Mode	802.11b TX CH Mid	Test Date	2012/09/04
Fundamental Frequency	2437MHz	Test By	Dino
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	4874.00	54.31	-2.42	51.89	54.00	-2.11	Average	VERTICAL
2	4874.00	56.03	-2.42	53.61	74.00	-20.39	Peak	VERTICAL
1	1994.00	56.28	-12.53	43.75	74.00	-30.25	Peak	HORIZONTAL
2	4874.00	51.37	-2.42	48.95	74.00	-25.05	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Sparrous Lini			
Operation Mode	802.11b TX CH High	Test Date	2012/09/04
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1994.00	63.30	-12.53	50.77	74.00	-23.23	Peak	VERTICAL
2	4924.00	54.94	-2.25	52.69	74.00	-21.31	Peak	VERTICAL
1	1994.00	56.73	-12.53	44.20	74.00	-29.80	Peak	HORIZONTAL
2	4924.00	52.07	-2.25	49.82	74.00	-24.18	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Kadiated Spurious Emission Measurement Result (above 10112)						
Operation Mode	802.11g TX CH Low	Test Date	2012/09/04			
Fundamental Frequency	2412MHz	Test By	Dino			
Temperature	25 ℃	Pol	Ver./Hor			
Humidity	60 %					

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1945.00	56.67	-12.84	43.83	74.00	-30.17	Peak	VERTICAL
2	4824.00	50.09	-2.59	47.50	74.00	-26.50	Peak	VERTICAL
1	1994.00	59.75	-12.53	47.22	74.00	-26.78	Peak	HORIZONTAL
2	4824.00	50.61	-2.59	48.02	74.00	-25.98	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Emission Measurement Result (above 10112)						
802.11g TX CH Mid	Test Date	2012/09/04				
2437MHz	Test By	Dino				
25 °C	Pol	Ver./Hor				
60 %						
	802.11g TX CH Mid 2437MHz 25 ℃	802.11g TX CH MidTest Date2437MHzTest By25 °CPol				

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2001.00	55.94	-12.50	43.44	74.00	-30.56	Peak	VERTICAL
2	4874.00	48.46	-2.42	46.04	74.00	-27.96	Peak	VERTICAL
1	1994.00	56.10	-12.53	43.57	74.00	-30.43	Peak	HORIZONTAL
2	4874.00	47.98	-2.42	45.56	74.00	-28.44	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Rudiated Sparrous Lini			
Operation Mode	802.11g TX CH High	Test Date	2012/09/04
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1994.00	63.10	-12.53	50.57	74.00	-23.43	Peak	VERTICAL
2	4924.00	48.63	-2.25	46.38	74.00	-27.62	Peak	VERTICAL
1	1623.00	56.88	-14.89	41.99	74.00	-32.01	Peak	HORIZONTAL
2	4924.00	47.75	-2.25	45.50	74.00	-28.50	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Kaulateu Spurious Elinission Measurement Result (above 10112)							
Operation Mode	802.11n_20M TX CH Low	Test Date	2012/09/04				
Fundamental Frequency	2412MHz	Test By	Dino				
Temperature	25 ℃	Pol	Ver./Hor				
Humidity	60 %						

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1917.00	58.68	-13.02	45.66	74.00	-28.34	Peak	VERTICAL
2	4824.00	51.42	-2.59	48.83	74.00	-25.17	Peak	VERTICAL
1	1994.00	57.57	-12.53	45.04	74.00	-28.96	Peak	HORIZONTAL
2	4824.00	48.39	-2.59	45.80	74.00	-28.20	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Kaulateu Spullous Elli	Radiated Spurious Emission Weasurement Result (above 10112)								
Operation Mode	802.11n_20M TX CH Mid	Test Date	2012/09/04						
Fundamental Frequency	2437MHz	Test By	Dino						
Temperature	25 °C	Pol	Ver./Hor						
Humidity	60 %								

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1560.00	61.70	-15.30	46.40	74.00	-27.60	Peak	VERTICAL
2	4874.00	48.71	-2.42	46.29	74.00	-27.71	Peak	VERTICAL
1	1203.00	61.20	-16.49	44.71	74.00	-29.29	Peak	HORIZONTAL
2	4874.00	47.74	-2.42	45.32	74.00	-28.68	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Lini			
Operation Mode	802.11n_20M TX CH High	Test Date	2012/09/04
Fundamental Frequency	2462MHz	Test By	Dino
Temperature	25 ℃	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1560.00	59.48	-15.30	44.18	74.00	-29.82	Peak	VERTICAL
2	4924.00	48.18	-2.25	45.93	74.00	-28.07	Peak	VERTICAL
1	1994.00	58.12	-12.53	45.59	74.00	-28.41	Peak	HORIZONTAL
2	4924.00	47.91	-2.25	45.66	74.00	-28.34	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Enn	Radiated Spurious Emission Measurement Result (above 10112)								
Operation Mode	802.11n_40M TX CH Low	Test Date	2012/09/04						
Fundamental Frequency	2422MHz	Test By	Dino						
Temperature	25 ℃	Pol	Ver./Hor						
Humidity	60 %								

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1994.00	63.44	-12.53	50.91	74.00	-23.09	Peak	VERTICAL
2	4844.00	48.39	-2.52	45.87	74.00	-28.13	Peak	VERTICAL
1	1994.00	57.40	-12.53	44.87	74.00	-29.13	Peak	HORIZONTAL
2	4844.00	47.13	-2.52	44.61	74.00	-29.39	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- 2 Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Emission measurement Result (above 10112)								
802.11n_40M TX CH Mid	Test Date	2012/09/04						
2437MHz	Test By	Dino						
25 °C	Pol	Ver./Hor						
60 %								
	802.11n_40M TX CH Mid 2437MHz 25 ℃	802.11n_40M TX CH MidTest Date2437MHzTest By25 ℃Pol						

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2001.00	58.20	-12.50	45.70	74.00	-28.30	Peak	VERTICAL
2	4874.00	47.66	-2.42	45.24	74.00	-28.76	Peak	VERTICAL
1	1679.00	57.98	-14.53	43.45	74.00	-30.55	Peak	HORIZONTAL
2	4874.00	48.03	-2.42	45.61	74.00	-28.39	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



Radiated Spurious Lini			
Operation Mode	802.11n_40M TX CH High	Test Date	2012/09/04
Fundamental Frequency	2452MHz	Test By	Dino
Temperature	25 °C	Pol	Ver./Hor
Humidity	60 %		

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	1994.00	60.21	-12.53	47.68	74.00	-26.32	Peak	VERTICAL
2	4904.00	47.57	-2.32	45.25	74.00	-28.75	Peak	VERTICAL
1	1623.00	58.00	-14.89	43.11	74.00	-30.89	Peak	HORIZONTAL
2	4904.00	47.13	-2.32	44.81	74.00	-29.19	Peak	HORIZONTAL

- 1 Measuring frequencies from the lowest internal frequency to the 10th of fundamental frequency
- ² Field strength limits for frequency above 1000MHz are based on average limits. However, Peak mode field strength shall not exceed the average limits specified plus 20dB.
- 3 Measurement of data within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.
- 4 Spectrum Peak mode IF bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, Sweep time= 200 ms., the VBW setting was 3 MHz.
- 5 Spectrum AV mode if bandwidth Setting : 1GHz- 26GHz, RBW= 1MHz, VBW= 10Hz, Sweep time= 200 ms.



10 Peak Power Spectral Density

10.1 Standard Applicable:

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

10.2 Measurement Equipment Used:

Refer to section 6.2 for details.

10.3 Test Set-up:

Refer to section 6.3 for details.

10.4 Measurement Procedure:

Refer to section 5.3.1 Measurement Procedure PKPSD:of KDB Document: 558074 D01 DTS Meas Guidance v01

- 1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
- 2. Set the RBW = 100 kHz.
- 3. Set the VBW \geq 300 kHz.
- 4. Set the span to 5-30 % greater than the EBW.
- 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 power level in any 100 kHz band segment within the fundamental EBW.
- 10. Scale the observed power level to an equivalent value in 3 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log (3 \text{ kHz}/100 \text{ kHz} = -15.2 \text{ dB})$.
- 11. The resulting peak PSD level must be ≤ 8 dBm.



10.5 Measurement Result:

802.11b Mode

Frequency	Power Density	BWCF	Power Density	Maximum Limit
MHz	Reading (dBm)/100KHz	(dB)	Level (dBm)/3KHz	(dBm)
2412	0.842	-15.2	-14.358	8
2437	1.215	-15.2	-13.985	8
2462	-0.405	-15.2	-15.605	8

BWCF(bandwidth correction factor)=10log (3 kHz/100KHz) kHz = -15.2 dB)

802.11g Mode

Frequency	•	BWCF	Power Density	Maximum Limit
MHz	Reading (dBm)/100KHz	(dB)	Level (dBm)/3KHz	(dBm)
2412	-4.417	-15.2	-19.617	8
2437	-5.159	-15.2	-20.359	8
2462	-5.527	-15.2	-20.727	8

BWCF(bandwidth correction factor)=10log (3 kHz/100KHz) kHz = -15.2 dB)

802.11n HT20 Mode

Frequency	Frequency Power Density		Power Density	Maximum Limit	
MHz	Reading (dBm)/100KHz	(dB)	Level (dBm)/3KHz	(dBm)	
2412	-4.698	-15.2	-19.898	8	
2437	-4.679	-15.2	-19.879	8	
2462	-5.05	-15.2	-20.25	8	

BWCF(bandwidth correction factor)=10log (3 kHz/100KHz) kHz = -15.2 dB)

802.11n HT40 Mode

Frequency MHz	•	BWCF	Power Density Level (dBm)/3KHz	Maximum Limit
ΜΠΖ	Reading (dBm)/100KHz	(dB)	Level (ubili)/3KHZ	(dBm)
2422	-6.648	-15.2	-21.848	8
2437	-7.476	-15.2	-22.676	8
2452	-7.725	-15.2	-22.925	8

BWCF(bandwidth correction factor)=10log (3 kHz/100KHz) kHz = -15.2 dB)



802.11b Power Spectral Density Test Plot (CH-Low)











802.11g Power Spectral Density Test Plot (CH-Low)











802.11n HT20 Power Spectral Density Test Plot (CH-Low)









802.11n HT40 Power Spectral Density Test Plot (CH-Low)

RL RF 50 Ω DC arker 1 2.416690000000	PNO: East	SENSE:INT Trig: Free Run #Atten: 30 dB	Avg Type: Log-Pwr Avg Hold:>10/10	04:23:44 PM Sep 06, 2012 TRACE 1 2 3 4 5 5 TYPE M WWWWW DET P N N N N N	Peak Search
Ref Offset 0.5 dB dB/div Ref 20.50 dBm	I Game ove		Mkr1	2.416 690 GHz -6.648 dBm	Next Peak
5					Next Pk Righ
n minnen	1	hangenting mining	unally have a large and	mmun	Next Pk Lef
5		γμ/			Marker Delta
5 Am					Mkr→Cł
5 					Mkr→RefLv
nter 2.42200 GHz es BW 100 kHz	#VBW 3	00 kHz	Sweep	Span 45.00 MHz 4.33 ms (1001 pts)	More 1 of 2









11 ANTENNA REQUIREMENT

11.1 Standard Applicable:

According to §15.203, Antenna requirement.

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this Section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited. This requirement does not apply to carrier current devices or to devices operated under the provisions of Sections 15.211, 15.213, 15.217, 15.219, or 15.221. Further, this requirement does not apply to intentional radiators that must be professionally installed, such as perimeter protection systems and some field disturbance sensors, or to other intentional radiators which, in accordance with Section 15.31(d), must be measured at the installation site. However, the installer shall be responsible for ensuring that the proper antenna is employed so that the limits in this Part are not exceeded.

11.2 Antenna Connected Construction:

The directional gins of antenna used for transmitting is 2.65 dBi, and the antenna connector is designed with unique type RF connector and no consideration of replacement. Please see EUT photo and antenna spec. for details.