TEST REPORT

FCC Part 15 Subpart C AND CANADA RSS-210

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

Product :	Thin Client
Brand:	acer
Model:	Veriton N2010G
Model Difference:	N/A
FCC ID:	HLZFX1
IC:	1754F-FX1
FCC Rule Part:	§15.247, Cat: DTS
IC Rule Part:	RSS-210 issue 8 :2010, Annex 8
Applicant:	Acer Incorporated
Address:	8F, 88, Sec 1, Hsin Tai Wu Rd, Hsichih, New Taipei City 22181. Taiwan, R.O.C.

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-13LR036FC** Issue Date : **2013/03/21**



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.

This test report shall not be reproduced except in full, without the written approval of International Standards Laboratory.



VERIFICATION OF COMPLIANCE

Applicant:	Acer Incorporated
Product Description:	Thin Client
Brand Name:	acer
Model No.:	Veriton N2010G
Model Difference:	N/A
FCC ID:	HLZFX1
IC:	1754F-FX1
FCC Rule Part:	§15.407
IC Rule Part	RSS-210 issue 8:2010, Annex 8
Date of test:	2013/03/04 ~ 2013/03/21
Date of EUT Received:	2013/03/04

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:	DinoChen	Date:	2013/03/21
	Dion Chang / Engineer		
Prepared By:	Gigi Jeh	Date:	2013/03/21
	Gigi Yeh / Specialist		
Approved By:	Timent du	Date:	2013/03/21
	Vincent Su / Technical Manager		



Version

Version No.	Date	Description		
00 2013/03/21		Initial creation of document		

Table of Contents

1	GEN	ERAL INFORMATION	6
	1.1	Related Submittal(s) / Grant (s)	8
	1.2	Test Methodology	8
	1.3	Test Facility	8
	1.4	Special Accessories	8
	1.5	Equipment Modifications	8
2	SYST	TEM TEST CONFIGURATION	.9
	2.1	EUT Configuration	9
	2.2	EUT Exercise	9
	2.3	Test Procedure	9
	2.4	Configuration of Tested System	10
3	SUM	MARY OF TEST RESULTS	11
4	DES	CRIPTION OF TEST MODES	11
5	CON	DUCTED EMISSION TEST	12
5	51	Standard Applicable:	12
	5.1	Measurement Equipment Used:	12
	53	EUT Setun	13
	5.4	Measurement Procedure:	13
	5.5	Measurement Result:	13
6	PEA	K /AVERAGE UTPUT POWER MEASUREMENT	18
U	61	Standard Applicable:	18
	6.2	Measurement Equipment Used	19
	6.3	Test Set-un:	19
	6.4	Measurement Procedure:	19
	6.5	Measurement Result:	20
7	6dB	Bandwidth & 99% Bandwidth	22
•	7.1	Standard Applicable:	22
	7.2	Measurement Equipment Used:	22
	7.3	Test Set-up:	22
	7.4	Measurement Procedure:	22
	7.5	Measurement Result:	23
8	100K	Hz BANDWIDTH OF BAND EDGES MEASUREMENT	35
	8.1	Standard Applicable:	35
	8.2	Measurement Equipment Used:	35
	8.3	Test SET-UP:	37
	8.4	Measurement Procedure:	38
	8.5	Field Strength Calculation:	38
	8.6	Measurement Result:	38
9	SPU	RIOUS RADIATED EMISSION TEST	49
	9.1	Standard Applicable	49
	9.2	Measurement Equipment Used:	49
	9.3	Test SET-UP:	49
	9.4	Measurement Procedure:	50
	9.5	Field Strength Calculation	50
	9.6	Measurement Result:	50



78 78 78
70
/ð
78
79
91
91
91
92
92
93
•



1 GENERAL INFORMATION

General:

Product Name	Thin Client
Brand Name	acer
Model Name	Veriton N2010G
Model Difference	N/A
	12Vdc from AC/DC adapter
Power Supply	1. Adapter model: PA-1051-0, Supple: LITEON
	 Adapter model: Au-799ln, Supple: Elementech International Co., Ltd.
Hardware Version:	N/A
Software Version:	N/A
Adhoc Mode	No
DFS Mode	Client(without radar detection)
TPC	No
Operation Environment	Indoor



WLAN: 1TX/1RX

Wi-Fi	Frequency Range (MHz)	Channels	Peak Rated Power	Modulation Technology	
802.11b	2412 - 2462(DTS)	11	20.40dBm	DSSS	
802.11g	2412 - 2462(DTS)	11	23.61dBm	DSSS/OFDM	
802.11n	HT20 2412 - 2462(DTS)	11	23.02dBm	OFDM	
	5180 - 5320(NII)	8	12.53dBm		
802.11a	5500 - 5700(NII)	8	12.16dBm	OFDM	
	5745 – 5825(DTS)	5	17.46dBm		
	HT20 5180 – 5320(NII)	8	12.43dBm		
802.11n	HT20 5500 – 5700(NII)	8	12.05dBm	OFDM	
	HT20 5745 - 5825(DTS)	5	17.53dBm		
Modulation type		CCK, DQPSK, DBPSK for DSSS 64QAM. 16QAM, QPSK, BPSK for OFDM		or OFDM	
Transition Rate:		Upto 65Mbps			
Antenna Designation:		PIFA Antenna 2412 – 2462MHz: -2.07dBi 5180 – 5320MHz: -0.03dBi 5500 – 5700MHz: 0.25dBi 5745 – 5825MHz: 0.7dBi			

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

This report applies for frequency bands 2412-2464MHz and 5745-5825MHz.

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>HLZFX1</u>** filing to comply with Section 15.247 of the FCC Part 15, Subpart C Rules. And **IC: <u>1754F-FX1</u>** filing to comply with Industry Canada RSS-210 issue 8: 2010 Annex 8. 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). and RSS-Gen: 2010. Radiated testing was performed at an antenna to EUT distance 3 meters. Radiated testing was performed at an antenna to EUT distance 3 meters.

KDB Document:

558074 D01 DTS Meas Guidance v02

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 and 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. According to the requirements in Section 8 and 13 and Subclause 8.3.1.2 of ANSI C63.4-2003.



2.4 Configuration of Tested System

Fig. 2-1 Configuration of Tested System



Table 2-1 Equipment Used in Tested System

Item	Equipment	Mfr/Brand	Model/ Type No.	Series No.	Data Cable	Power Cord
1	Monitor	DELL	2408	N/A	Shielding	No- Shielding
2	Keyboard	DELL	SK-8115	N/A	Shielding	N/A
3	Mouse	DELL	MO56UC	N/A	Shielding	N/A
4	Test Software	LINUX	N/A	N/A	N/A	N/A



3 SUMMARY OF TEST RESULTS

FCC /IC Rules	Description Of Test	Result
§15.207(a)/	AC Power Line Conducted Emission	Compliant
RSS-Gen §7.2.4		
§15.247(b) (3),(4))/	Peak Output Power	Compliant
RSS-210 §A8.4(4)		
§15.247(a)(2)	6dB Bandwidth	Compliant
§A8.2(a)	&	
RSS-Gen §4.6.1	99% Power Bandwidth	
§15.247(d)/	100 KHz Bandwidth Of	Compliant
RSS-210 §A8.5	Frequency Band Edges	
§15.247(d)/	Spurious Emission	Compliant
RSS-210 §A8.5		
§15.247(e)/	Peak Power Density	Compliant
RSS-210 §A8.2(b) &		
§A8.3(2)		
§15.203/	Antenna Requirement	Compliant
RSS-210 issue 8,§A8.4		
MPE	Maximum Permissible Exposure	Compliant

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.

2.4GHz:

802.11 b mode: Channel low (2412MHz) \cdot mid (2437MHz) and high (2462MHz) with 1Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

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

802.11 n HT20: Channel low (2412MHz) \cdot mid (2437MHz) and high (2462MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

5745-5825MHz:

802.11a mode: Channel low (5745MHz) \cdot mid (5785MHz) and high (5825MHz) with 6Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

802.11 n HT20: Channel low (5745MHz) \cdot mid (5785MHz) and high (5825MHz) with 6.5Mbps lowest data rate are chosen for pre-test testing of radiated emissions.

The worst case 802.11g 2412MHz-2462MHz was reported for Radiated Spurious Emission.



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.

	Limits			
Frequency range	dB(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 transition frequencies				

2.The limit decreases linearly with the 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	SERIAL	LAST	CAL DUE.	
ТҮРЕ		NUMBER	NUMBER	CAL.		
Conduction 03						
EMI Receiver 11	ROHDE & SCHWARZ	ESCI	100568	07/16/2012	07/16/2013	
ISNT2-02	FCC	FCC-TLISN-T2-02	20413	07/22/2012	07/22/2013	
ISNT4-02	FCC	FCC-TLISN-T4-02	20575	07/22/2012	07/22/2013	
ISNT8-04	FCC	FCC-TLISN-T8-09	101192	09/29/2012	09/29/2013	
LISN 07	FCC Inc.	FCC-LISN-50-100- 4-02	07040	07/23/2012	07/23/2013	
LISN 08	FCC	FCC-LISN50-25-2- 01	07039	07/23/2012	07/23/2013	
Conduction 03 -1 Cable	WOKEN	CFD 300-NL	Conduction 03 -1	06/28/2012	06/28/2013	



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.



AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2013/03/21
Adapter model:	Au-799ln	Test By:	Dino



Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1540	0.15	46.36	65.78	-19.42	31.98	55.78	-23.80	
2	0.1860	0.14	40.81	64.21	-23.40	26.76	54.21	-27.45	
3	0.2180	0.14	31.02	62.89	-31.87	11.30	52.89	-41.59	
4	0.2660	0.14	32.60	61.24	-28.64	19.91	51.24	-31.33	
5	3.5140	0.22	16.80	56.00	-39.20	6.62	46.00	-39.38	
6	13.3740	0.37	29.45	60.00	-30.55	22.35	50.00	-27.65	





Limit: CISPR22 Class B Conduction

<u>ــــــــــــــــــــــــــــــــــــ</u>									
No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1900	0.07	38.89	64.04	-25.15	26.69	54.04	-27.35	
2	0.2460	0.07	24.64	61.89	-37.25	4.17	51.89	-47.72	
3	0.3740	0.06	25.76	58.41	-32.65	20.40	48.41	-28.01	
4	0.4660	0.07	19.35	56.58	-37.23	4.68	46.58	-41.90	
5	6.7140	0.17	16.66	60.00	-43.34	8.52	50.00	-41.48	
6	13.0580	0.25	29.45	60.00	-30.55	22.34	50.00	-27.66	

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road,Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.



AC POWER LINE CONDUCTED EMISSION TEST DATA

Operation Mode:	Operation Mode	Test Date:	2013/03/11
Adapter model:	PA-1051-0	Test By:	Dino



No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1580	0.15	48.40	65.57	-17.17	28.99	55.57	-26.58	
2	0.1700	0.15	46.92	64.96	-18.04	28.06	54.96	-26.90	
3	0.2140	0.14	40.43	63.05	-22.62	21.87	53.05	-31.18	
4	0.3020	0.13	29.88	60.19	-30.31	12.44	50.19	-37.75	
5	0.6140	0.15	27.76	56.00	-28.24	20.91	46.00	-25.09	
6	14.1340	0.39	29.63	60.00	-30.37	24.82	50.00	-25.18	





Site: Conduction 03 Limit: CISPR22 Class B Conduction

No.	Frequency (MHz)	Correct Factor (dB)	QP Emission (dBuV)	QP Limit (dBuV)	QP Margin (dB)	AVG Emission (dBuV)	AVG Limit (dBuV)	AVG Margin (dB)	Note
1	0.1700	0.08	46.27	64.96	-18.69	27.53	54.96	-27.43	
2	0.1900	0.07	41.53	64.04	-22.51	23.85	54.04	-30.19	
3	0.2100	0.07	40.00	63.21	-23.21	23.12	53.21	-30.09	
4	0.2740	0.07	33.80	61.00	-27.20	21.66	51.00	-29.34	
5	6.8700	0.17	21.36	60.00	-38.64	15.50	50.00	-34.50	
6	13.2820	0.25	31.26	60.00	-28.74	25.76	50.00	-24.24	

Phase:

Ν

Address:No.120,Lane 180,San Ho Tsuen,Hsin Ho Road,Lung-Tan Hsiang, Tao Yuan Conty, Taiwan R.O.C.



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.

According to RSS-210 issue 8,§A8.4(4), For systems employing digital modulation techniques operating in the bands 902-928 MHz, 2400-2483.5 MHz and 5725-5850 MHz, the maximum peak conducted output power shall not exceed 1 W. Except as provided in Section A8.4(5), the e.i.r.p. shall not exceed 4 W.



Conducted Emission Test Site								
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.			
ТҮРЕ		NUMBER	NUMBER	CAL.				
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	03/15/2013	03/14/2014			
DC Power supply	ABM	51850	N/A	06/17/2012	06/16/2013			
AC Power supply	EXTECH	CFC105W	NA	12/19/2012	12/18/2013			
Splitter	MCLI	PS4-199	12465	07/18/2012	07/17/2013			
Spectrum analyzer	Agilent	N9030A	MY51360021	03/11/2013	03/10/2014			

6.2 Measurement Equipment Used:

6.3 Test Set-up:



6.4 Measurement Procedure:

Refer to section 8.1 and 8.2 of KDB Document: 558074 D01 DTS Meas Guidance v02



6.5 Measurement Result:

802	.11b			
Cable loss $= 0$		Output	Limit	
СН	Frequency	Dete	ector	(dBm)
	(MHZ)	РК	AV	
		(dBm)	(dBm)	
1	2412	20.05	17.84	
6	2437	20.25	18.09	30
11	2462	20.40	18.16	
802	11σ			

802.11g

Cable lo	DSS = 0	Output	Output Power			
СН	Frequency	Dete	Detector			
	(MHZ)	PK AV				
		(dBm)	(dBm)			
1	2412	23.35	13.62			
6	2437	23.52	13.50	30		
11	2462	23.61	13.67			

802.11N 20MHz (2.4G)

Cable loss $= 0$		Output	Limit			
СН	Frequency	Dete	Detector			
	(MHZ)	PK AV				
		(dBm)	(dBm)			
1	2412	22.73	12.32			
6	2437	23.02	12.31	30		
11	2462	22.84	12.52			



802.11a (5G)

Cable lo	DSS = 0	Output	Limit		
СН	Frequency	Dete	Detector		
	(MHz)	РК	AV		
		(dBm)	(dBm)		
149	5745	17.46	11.83		
157	5785	16.95	11.62	30	
165	5825	17.15	12.02		

802.11n 20MHz (5G)

Cable lo	DSS = 0	Output	Limit	
СН	Frequency	Dete	(dBm)	
	(MHZ)	РК	AV	
		(dBm)	(dBm)	
149	5745	17.53	11.76	
157	5785	16.88	11.52	30
165	5825	17.11	11.84	



7 6dB Bandwidth & 99% Bandwidth

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.

According to RSS 210 issue 8, §8.2(a) Systems employing digital modulation techniques (which includes direct sequence) can now be certified under RSS-210 provided they comply with the following requirements: The minimum -6 dB bandwidth shall be at least 500 kHz.

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 7.0 6dB EBW Measurement Procedure of KDB Document: 558074 D01 DTS Meas Guidance v02

- 1. Set resolution bandwidth (RBW) = 1-5 % of the emission bandwidth (EBW). ($802.11b/g/n_HT20MHz = 200KHz$),($802.11n_HT40 = 400KHz$)
- 2. Set the video bandwidth (VBW) \ge 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:

2.4GHz

802.11b

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	9.141	13.932	> 500	PASS
2437	9.143	13.952	> 500	PASS
2462	9.144	13.952	> 500	PASS

802.11g

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	16.18	16.528	> 500	PASS
2437	16.19	16.526	> 500	PASS
2462	16.16	16.519	> 500	PASS

802.11n_20M

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
2412	17.33	17.703	> 500	PASS
2437	17.34	17.722	> 500	PASS
2462	17.24	17.696	> 500	PASS



5 G	Hz

802.11a

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	16.21	16.652	> 500	PASS
5785	16.28	16.672	> 500	PASS
5825	16.3	16.736	> 500	PASS

802.11n 20MHz

Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Bandwidth (KHz)	Result
5745	17.17	17.804	> 500	PASS
5785	17.17	17.775	> 500	PASS
5825	17.22	17.976	> 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

Agilent Spectrum Analyzer - Occupi	ied BW				
LXIRL RF 50 Q D		SENSE:INT	ALIGNAUTO 12:25:11	PM Mar 05, 2013	Trees/Detector
Center Freg 2.462000	000 GHz Cente	r Freq: 2.462000000 GHz	Radio Std	: None	Trace/Delector
	Trig: F	ree Run Avg Hold	d:>10/10		
	#IFGain:Low #Atten	:30 dB	Radio Dev	/ice: BTS	
Ref Offset 1 c	dB				
10 dB/div Ref 21.00 c	dBm				
Log					
11.0					
					Clear Write
1.00	and the second and the second	ma manana manana	mun		
		V	A COLORED TO A COL		
-9.00					
19.0			hanne		
- 19.0			and the second s		Average
-29.0				and my more	
- astrone				- AND	
-39.0					
-49.0					Max Hold
59.0					
-35.0					
-69.0		<u>.</u>			
				0.0.0.00	Min Hold
Center 2.462 GHz			spa	IN 30 WINZ	
#Res BW 200 kHz	#	VBW 620 kHz	Swe	eep 1 ms	
Occupied Bandwi	idth	Total Power	19.9 dBm		Detector
Cocapica Ballaw	latin				Average ►
	16 519 MHz				Auto Man
Transmit Fred Error	7/ 935 kHz	OBM Power	99.00.%		
Fransmit Freq Error	74.333 KHZ	OBATOWEI	35.00 %		
x dB Bandwidth	16.16 MHz	x dB	-6.00 dB		
			0.00 42		
1100			OTATIO		
MSG			STATUS		



802.11n_20M for 2.4GHz 6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid





6dB Band Width Test Data CH-High





802.11a

6dB Band Width Test Data CH-Low



6dB Band Width Test Data CH-Mid

Agilent Spectrum Analyzer - Occup	vied BW					
XM RL RF 50 x I Center Freq 5.7850000 I <thi< th=""> I I I<td>000 GHz #IFGain:Low</td><td>SENSE:INT Center Freq: 5.78500 Trig: Free Run #Atten: 30 dB</td><td>ALIGNAUT 0000 GHz Avg Hold:>10/10</td><td> 12:07:16 PM M. Radio Std: No Radio Device: </td><td>lar 05, 2013 one : BTS</td><td>Frequency</td></thi<>	000 GHz #IFGain:Low	SENSE:INT Center Freq: 5.78500 Trig: Free Run #Atten: 30 dB	ALIGNAUT 0000 GHz Avg Hold:>10/10	 12:07:16 PM M. Radio Std: No Radio Device: 	lar 05, 2013 one : BTS	Frequency
10 dB/div Ref 12.00	dB dBm					
2.00	provide and the souther souther and the souther souther and the souther souther and the souther and the souther souther and the souther souther and the southe	man intre protocolores	with marked and the second			Center Freq 5.785000000 GHz
-18.0 -28.0				he was white the	what	
-38.0						
-48.0						
-68.0						
-78,0						CF Step 3.000000 MHz
Center 5.785 GHz #Res BW 200 kHz		#VBW 620 k	Hz	Span 3 Sweep	30 MHz 1 ms	<u>Auto</u> Man
Occupied Bandw	ridth	Total P	ower 16	6.1 dBm		Freq Offset
	16.672 MI	lz				0 Hz
Transmit Freq Error	25.592	Hz OBW P	ower	99.00 %		
x dB Bandwidth	16.28 N	IHz xdB		6.00 dB		
MSG			STAT	rus		



6dB Band Width Test Data CH-High

Agilent Spectrum Analyzer - Occupied	BW				
LX/RL RF 50 Q DC	9	ENSE:INT	ALIGN AUTO 12:08:15	PM Mar 05, 2013	Fragulanav
Center Freq 5.82500000	0 GHz Center	Freq: 5.825000000 GHz	Radio Ste	l: None	requeitcy
		e Run Avg Hole	d:>10/10	ulas. BTC	
	#IFGain:Low #Atten:	30 ab	Radio De	VICE: BIS	
Rof Offect 1 dR					
10 dB/div Ref 12 00 dB	m				
Log					
2.00					Contor From
2.00	no proper syndromatic from	> managementerstand			Center Frey
-8.00	house he are a second s	¥.	a a survey and		5.825000000 GHz
			h.		
-18.0			N Werburn		
-28.0 whent the transmithe				northe barrena	
-38.0					
48.0					
*+0.0					
-58.0		-		-	
-68.U					
-78.0				<u>.</u>	
					CF Step
Center 5 925 CHz			Sn	an 30 MHz	3.000000 MHz
#Bac BW 200 kHz	-#\/	BW 620 KH2	op.	an John 1 mc	<u>Auto</u> Man
#Res BW 200 KH2	#0		3₩	eep rms	
October in all Development	A1-	Total Bawar	45.0 dBm		
Occupied Bandwid	un	Total Fower	15.6 UBIII		Freq Offset
1	6 736 MHz				0 Hz
	0.700 10112				
Transmit Fred Error	67 117 kHz	OBW Power	99 00 %		
Fransinie Frog Error		OBN I OWCI	00.00 /0		
x dB Bandwidth	16.30 MHz	x dB	-6.00 dB		
MSG			STATUS		



802.11n_20M for 5GHz 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).

According to RSS-210 issue 8, §A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3.

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:

	Ch	amber 14(966))		
EQUIPMENT	MFR	MODEL	SERIAL	LAST	CAL DUE.
TYPE		NUMBER	NUMBER	CAL.	
Spectrum Analyzer	Agilent	N9010A	MY49060537	07/17/2012	07/16/2013
21(26.5GHz)					
Spectrum Analyzer	Agilent	E4443A	MY48250315	05/24/2012	05/23/2013
20(6.5GHz)					
Spectrum Analyzer	R&S	FSU43	100143	04/25/2012	04/24/2013
22(43GHz)					
Dipole antenna	SCHWARZBECK	VHAP,30-300	919	11/16/2011	11/15/2013
Dipole antenna	SCHWARZBECK	UHAP,300-100 0	1195	10/25/2011	10/24/2013
Loop Antenna9K-30M	A.H.SYSTEM	SAS-564	294	02/27/2013	02/26/2014
Bilog Antenna30-1G	Schaffner	CBL 6111B	2756	01/13/2013	01/12/2014
Horn antenna1-18G	COM-POWER	AH118	2011071401	03/01/2013	02/29/2014
Horn antenna1-18G(06)	EMCO	3117	0006665	10/15/2012	10/14/2013
Horn antenna26-40G(05)	Com-power	AH-640	100A	01/09/2013	01/08/2015
Horn antenna18-26G(04)	Com-power	AH-826	081001	05/04/2011	05/03/2013
Preamplifier9-1000M	HP	8447D	NA	02/10/2013	02/09/2014
Preamplifier1-18G	MITEQ	AFS44-001018 00-25-10P-44	1329256	07/23/2012	07/22/2013
Preamplifier1-26G	EM	EM01M26G	NA	02/26/2013	02/25/2014
Preamplifier26-40G	MITEQ	JS-26004000-2 7-5A	818471	05/21/2011	05/20/2013
Cable1-18G	HUBER SUHNER	Sucoflex 106	NA	09/07/2012	09/06/2013
Cable UP to 1G	HUBER SUHNER	RG 214/U	NA	10/08/2012	10/07/2013
SUCOFLEX 1GHz~40GHz cable	HUBER SUHNER	Sucoflex 102	27963/2&3742 1/2	09/21/2011	09/20/2013
Signal Generator	R&S	SMU200A	102330	02/19/2013	02/18/2014
Signal Generator	Anritsu	MG3692A	20311	09/18/2012	09/17/2013
2.4G Filter	Micro-Tronics	Brm50702	76	12/27/2012	12/26/2013
5G Filter	Micro-Tronics	Brm50716	005	12/27/2012	12/26/2013



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





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 10.2.5 Band-Edge Measurements of KDB Document: 558074 D01 DTS Meas Guidance v02

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 pass band. 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





Radiated Emission: 802.11b mode

Operation Mode	TX CH Low	Test Date	2013/03/11
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	2386.72	61.91	-11.26	50.65	74.00	-23.35	Peak	VERTICAL
2	2390.00	59.71	-11.25	48.46	74.00	-25.54	Peak	VERTICAL
1	2371.71	61.31	-11.30	50.01	74.00	-23.99	Peak	HORIZONTAL
2	2390.00	59.62	-11.25	48.37	74.00	-25.63	Peak	HORIZONTAL

Operation ModeTX CH HighFundamental Frequency2462 MHzTemperature25 °C

Test Date2013/03/11Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2483.50	60.64	-11.01	49.63	74.00	-24.37	Peak	VERTICAL
2	2487.71	59.33	-11.00	48.33	54.00	-5.67	Average	VERTICAL
3	2487.71	65.75	-11.00	54.75	74.00	-19.25	Peak	VERTICAL
1	2483.50	59.23	-11.01	48.22	74.00	-25.78	Peak	HORIZONTAL
2	2487.09	62.40	-11.00	51.40	74.00	-22.60	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



Band Edges Test Data CH-High





Radiated Emission: 802.11g mode

Operation Mode	TX CH Low	Test Date	2013/03/11
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	2390.00	56.74	-11.25	45.49	54.00	-8.51	Average	VERTICAL
2	2390.00	75.08	-11.25	63.83	74.00	-10.17	Peak	VERTICAL
1	2390.00	51.80	-11.25	40.55	54.00	-13.45	Average	HORIZONTAL
2	2390.00	68.08	-11.25	56.83	74.00	-17.17	Peak	HORIZONTAL

Operation Mode	TX CH High
Fundamental Frequency	2462 MHz
Temperature	25 °C

Test Date2013/03/11Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2483.50	63.00	-11.01	51.99	54.00	-2.01	Average	VERTICAL
2	2483.50	81.21	-11.01	70.20	74.00	-3.80	Peak	VERTICAL
1	2483.50	58.95	-11.01	47.94	54.00	-6.06	Average	HORIZONTAL
2	2483.50	73.41	-11.01	62.40	74.00	-11.60	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 for 2.4GHz Conducted Band Edges Test Data CH-Low



Band Edges Test Data CH-High





Opera Funda Temp	ation Mode amental Fre erature	equency 24 25	Test Date2013/03/11Test ByDinoHumidity60 %					
No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2390.00	55.49	-11.25	44.24	54.00	-9.76	Average	VERTICAL
2	2390.00	71.29	-11.25	60.04	74.00	-13.96	Peak	VERTICAL
1	2389.41	62.86	-11.25	51.61	74.00	-22.39	Peak	HORIZONTAL
2	2390.00	62.37	-11.25	51.12	74.00	-22.88	Peak	HORIZONTAL

Radiated Emission: 802.11 n_20M mode

Operation ModeTX CH HighFundamental Frequency2462 MHzTemperature25 °C

Test Date2013/03/11Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	2483.50	61.26	-11.01	50.25	54.00	-3.75	Average	VERTICAL
2	2483.50	77.07	-11.01	66.06	74.00	-7.94	Peak	VERTICAL
1	2483.50	56.22	-11.01	45.21	54.00	-8.79	Average	HORIZONTAL
2	2483.50	72.23	-11.01	61.22	74.00	-12.78	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.



802.11a

Band Edges Test Data CH-Low



Band Edges Test Data CH-High





Radiated Emission: 802.11a mode

Operation Mode	TX CH Low	Test Date	2013/03/11
Fundamental Frequency	5745 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	5724.31	47.99	0.23	48.22	74.00	-25.78	Peak	VERTICAL
2	5725.00	46.40	0.23	46.63	74.00	-27.37	Peak	VERTICAL
1	5709.12	46.98	0.19	47.17	74.00	-26.83	Peak	HORIZONTAL
2	5725.00	45.23	0.23	45.46	74.00	-28.54	Peak	HORIZONTAL

Operation ModeTX CH HighFundamental Frequency5825 MHzTemperature25 °C

Test Date2013/03/11Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	5850.00	44.05	0.56	44.61	74.00	-29.39	Peak	VERTICAL
2	5893.29	45.94	0.67	46.61	74.00	-27.39	Peak	VERTICAL
1	5850.00	43.37	0.56	43.93	74.00	-30.07	Peak	HORIZONTAL
2	5889.12	45.84	0.66	46.50	74.00	-27.50	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 for 5GHz, Conducted Band Edges Test Data CH-Low



Band Edges Test Data CH-High





Opera Funda Temp	ation Mode amental Fre erature	equency 57 25	X CH Low 745 MHz 5 ℃	Test Date2013/03/11Test ByDinoHumidity60 %				
No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	5693.78	46.18	0.15	46.33	74.00	-27.67	Peak	VERTICAL
2	5725.00	44.50	0.23	44.73	74.00	-29.27	Peak	VERTICAL
1	5683.55	46.60	0.13	46.73	74.00	-27.27	Peak	HORIZONTAL
2	5725.00	43.65	0.23	43.88	74.00	-30.12	Peak	HORIZONTAL

Radiated Emission: 802.11 n_20M mode

Operation ModeTX CH HighFundamental Frequency5825 MHzTemperature25 °C

Test Date2013/03/11Test ByDinoHumidity60 %

No	Freq	Reading	Factor	Level	Limit	Over Limit	Remark	Pol
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB		V/H
1	5850.00	44.30	0.56	44.86	74.00	-29.14	Peak	VERTICAL
2	5861.58	45.85	0.58	46.43	74.00	-27.57	Peak	VERTICAL
1	5850.00	43.71	0.56	44.27	74.00	-29.73	Peak	HORIZONTAL
2	5873.65	45.80	0.62	46.42	74.00	-27.58	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.



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.

According to RSS-210 issue 8, §A8.5, In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated device is operating, the radio frequency power that is produced shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under section A8.4(4), the attenuation required shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in Tables 2 and 3 is not required. In addition, radiated emissions which fall in the restricted bands of Table 1 must also comply with the radiated emission limits specified in Tables 2 and 3

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 10 Maximum Unwanted Emissions level of KDB Document: 558074 D01 DTS Meas Guidance v02

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



Ch Low 3GHz – 26.5GHz

Agilent Spectrum Analyzer - Swept SA				
XI RL RF 50 Ω DC Marker 1 9 647000000000	GH7 SENSI	EINT ALIGN AU Avg Type: Log-P	JTO 02:48:21 PM Mar 05, 2013 Wr TRACE 1 2 3 4 5 6	Peak Search
	PNO: Fast IFGain:Low #Atten: 30 d	un AvgjHoid:>10/10 B	TYPE M WWWWW DET P N N N N N	Next Peak
Ref Offset 1 dB 10 dB/div Ref 20.00 dBm			Mkr1 9.647 GHz -51.276 dBm	
10.0				Next Bk Bight
-10.00			-12.08 dBm	NEXT FK RIGHT
-20.0				
-30.0				Next Pk Left
-40.0				
-60.0 m Marina Marina	and the second and the second	way and the age and the second and		Marker Delta
-70.0				indition D ond
Start 3.00 GHz #Res BW 100 kHz	#VBW 300 kHz	Sw	Stop 26.00 GHz eep 2.20 s (1001 pts)	Mkr→CF
MKR MODE TRC SCL X	9 647 GHz -51 276 dBn	FUNCTION FUNCTION W	IDTH FUNCTION VALUE	
2 3				
4 5				Mkr→RefLvl
				C
9				More
11 12				1 of 2
MSG		ST	ATUS	

Ch Mid 30MHz – 3GHz

Agilent Spectrum Analyzer - Swep	ot SA						
M RL RF 50 Ω Display Line -11.99 d	Bm	SENSE:IN	T Avg Ty	ALIGNAUTO pe: Log-Pwr	02:49:56 PM TRACE	Mar 05, 2013	Display
Ref Offset 1 di	PNO: Fast C IFGain:Low B	Trig: Free Run #Atten: 30 dB	Avg Ho	ld:>10/10 Mk	r1 2.435 8.01	7 GHz 5 dBm	Annotation►
					1	-11.99 dBm	Title►
-20.0						<u>^2</u>	Graticule <u>On</u> Off
-50.0 -60.0 -70.0	مىيەر يۇرۇر ئۇرىيە كۈچۈنى بىرىنى ب مەرىپىلەر بىرىنى بىرى	مور المراجعة والمحافظة المراجعة المراجعة المراجعة المراجعة المراجعة والمراجعة المراجعة المراجعة المراجعة المراجع	tester and the tester	~~~~~	- Weddelmanne		Display Line -11.99 dBm
Start 30 MHz #Res BW 100 kHz	#VB	W 300 kHz		Sweep	Stop 3.0 284 ms (1	000 GHz 001 pts)	
MKR MODE TRC SCL	× 2.435 7 GHz	¥ 8.015 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION	VALUE	
2 N I I 3 4 5 5 6 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	2.042 0 GH2	-55.364 00111					System Display▶ Settings
7 8 9 10 11							
MSG				STATUS			

Ch Mid 3GHz – 26.5GHz

Agilent Spectrum Analyzer - Swept SA					
Marker 1 9.740000000000	GHz	ENSE:INT Avg Ty; e Run AvgHol	ALIGNAUTO be: Log-Pwr d:>10/10	02:50:56 PM Mar 05, 2013 TRACE 1 2 3 4 5 6 TYPE M WWWWWW	Peak Search
Ref Offset 1 dB	IFGain:Low #Atten: 3	0 dB	N	/kr1 9.74 GHz -50.146 dBm	Next Peak
10.0 0.00 -10.0				-11.99 dBm	Next Pk Right
-20.0					Next Pk Left
-50.0 -60.0 -70.0		and a second and a second s	lan ding juli ang malakan din	and the second	Marker Delta
Start 6.00 GHz #Res BW 100 kHz MKR MODE TRC SCL X 1 N 1 f	#VBW 300 kHz	FUNCTION F	Sweep	Stop 26.00 GHz 1.91 s (1001 pts) FUNCTION VALUE	Mkr→CF
2 3 4 5 6 7					Mkr→RefLvl
8 9 10 11 11 12					More 1 of 2
MSG			STATUS		



Ch High 30MHz – 3GHz

Agilent Spectrum Analyzer - Swept SA						
V RL RF 50 Ω DC Display Line -11.88 dBm	1	SENSE:IN	Avg	ALIGNAUTO	02:52:40 PM Mar 05, 201: TRACE 1 2 3 4 5	3 Display
Ref Offset 1 dB	PNO: Fast G	#Atten: 30 dB	Avg	Hold:>10/10	r1 2.462 4 GHz 8.121 dBm	Annotation►
10.0 0.00 -10.0					1 -11.88 dBm	Title►
-20.0					2 . ↓	Graticule On Off
-50.0 -60.0 -70.0	Anthe-manager and a state of the state of th	and a set of the set o	ender inswird	and the second s	Mundelson	Display Line -11.88 dBm
Start 30 MHz #Res BW 100 kHz	#VBV	V 300 kHz		Sweep	Stop 3.000 GHz 284 ms (1001 pts)	
MKR MODE TRC SCL X	2.462 4 GHz	Y 8.121 dBm	FUNCTION	FUNCTION WIDTH	FUNCTION VALUE	
2 N T T 3 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	2.619 8 GHZ	-49.351 dBm				System Display▶ Settings
7 8 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9 9						
MSG				STATUS		

Ch High 3GHz – 26.5GHz

Agilent Spect	rum Analyzer - Sw	vept SA					
Marker 1	RF 50 Q	2 DC 0000000 GHz	SENSE:	INT Avg T	ALIGNAUTO	02:54:17 PM Mar 05, 2013 TRACE 1 2 3 4 5 6	Peak Search
10 dB/div	Ref Offset 1	PNO: Fast IFGain:Low dB dBm	/ Trig: Free Ru / #Atten: 30 dB	n Avg Ho	MI	(r1 13.626 GHz -53.733 dBm	Next Peak
Log 10.0 -10.0						-11.88 dBm	Next Pk Right
-20.0 -30.0 -40.0			1				Next Pk Left
-50.0 -60.0	nother of the stand of	n na han a	r Hauranan an Indonesia an	knowledge of a second	مر موادر _{ما} ر میل مندم پاریس	موانية من المريقة من المريضية المريضية المريضية من الموانية من الموانية المريضية المريضية المريضية المريضية ال المريضية المريضية الم	Marker Delta
Start 3.00 #Res BW	9 GHz 100 kHz RC SCL 1 f	#V × 13.626 GHz	BW 300 kHz Y -53.733 dBm	FUNCTION	Sweep	Stop 26.00 GHz 2.20 s (1001 pts) FUNCTION VALUE	Mkr→CF
2 3 4 5 6 7							Mkr→RefLvl
8 9 10 11 12							More 1 of 2
MSG					STATUS		



Conducted Spurious Emission Measurement Result 802.11g

Ch Low 30MHz – 3GHz



Ch Low 3GHz – 26.5GHz





Ch Mid 30MHz – 3GHz

Agilent Spectr	rum Analyzer - S	Swept SA								
Display I	RF 50			SENSE	INT	ALIGNAUTO	02:59:08 F	PM Mar 05, 2013		Display
Dispidy .		r abin	PNO: Fast IFGain:Low	Trig: Free Ru #Atten: 30 dB	un Avg B	Hoid:>10/10				Annotation►
10 dB/div Log	Ref Offset Ref 20.00	1 dB D dBm					1.2	65 dBm		
10.0							• 1 1			Title►
-20.0 -30.0								-18.74 dBm	0.5	Graticule
-40.0 -50.0							<u> </u>	<mark>2</mark>		
-60.0	and an and a second	يەلەردىرىمەرمەرىمەرىمەر مۇسۇن	oraha gungdataan gi	and and a second se	-ไระข้องสูงสุขามสุขามระ <i>จะสม</i> าย	Harven Astrony and a star		martine		Display Line -18.74 dBm
Start 30 M #Res BW	/IHz 100 kHz		#VB	W 300 kHz		Sweep	Stop 3 284 ms (3.000 GHz (1001 pts)		
MKR MODE TI	RC SCL f	× 2.4 2.8	35 7 GHz	Y 1.265 dBm 53.031 dBm	FUNCTION	FUNCTION WIDTH	FUNCTI	ON VALUE		
3 4 5 6		2.0								System Display► Settings
7 8 9 10										
11 12 MSG						STATUS				

Ch Mid 3GHz – 26.5GHz

Agilen	t Spec	ctrun	i Ana	lyzer -	Swep	it SA													
IXI RI Mari	ker	11	RF 5.5	5800	ດ 200	DC 0000	10 G	Hz		Tria: F	SENSE		Ave	g Type	ALIGNAUTO	03:01:00 TR	5 PM Mar 05, 201 ACE 12345	3	Peak Search
10 dE	3/div		Ref Ref	Offset 20.0	1 di 0 di	3 3m	IFGa	U: Fast ain:Low	, ,	#Atten	: 30 dl	3		Inora	M	kr1 15. -55.0	558 GH2 049 dBm		Next Peak
10.0 0.00 -10.0																			Next Pk Right
-20.0 -30.0 -40.0																	-18.74 dBr		Next Pk Left
-50.0 -60.0 -70.0	and and	halany	~~~	h.M. Hoken and	1.~tv	-	hann	৵ঀ ৻ ৸ঀ৾৾৾ ৻৻৻৻	Jone seal	Angeleten [nd	n fair and a star			مەمىمەرىمەن مەرىمەرىمەن	n/onderendenser	Juli Karada	and the second		Marker Delta
Star #Res	t 3.0 s BV	00 G N 10	SHZ	٢Hz		×		#VI	вw	300 ki Y	Ηz	FL	INCTION	FU	Sweep	Stop 2.20 s	26.00 GH: (1001 pts		Mkr→CF
1 2 3 4 5 6 7	N	1	f			1	5.558	GHz		-55.049	dBm								Mkr→RefLvl
7 9 10 11 12																			More 1 of 2
MSG Q	Alig	gnm	ent	Comp	leted										STATUS				

Ch High 30MHz – 3GHz

Agilent Spect	rum Analyzer - S	Swept SA							
LXI RL	RF 50	Ω DC		SENSE:I	NT	ALIGN AUTO	03:04:07 F	M Mar 05, 2013	Markar
Marker 1	2.468370	000000 G	Hz	Trim Free Du	Avg	Type: Log-Pwr	TRAC		Warker
		P	NO:Fast 🕞 Gain:Low	#Atten: 30 dB	n Avgi	1010.210710	D	PNNNN	O alla at Marilean
			Gam.Low			D.4.L	4.0.40		Select Marker
	Ref Offset	1 dB				IVIK	r1 2.46	34 GHZ	1
10 dB/div	Ref 20.00) dBm					0.1	44 aBm	
							10.40		
10.0									Normal
0.00							1		Norma
-10.0									
-20.0								-19.86 dBm	
20.0							14		D -14-
-30.0									Deita
-40.0									
-50.0									
60.0							of manhore	allelevely home	
whenters	and and the second second	1 to a second and a second	- Joseph Jolly Park	and the second					Fixed⊳
-70.0									
Stort 20 I							Oton 3	000 CH-	
#Pac BW			#\/D\/	1 300 kHz		Sween	294 mc (1000 GH2	
#Res Dw	TOO KHZ		# V D V	V 300 KHZ		aweep	204 1115 (roor prsj	Off
MKR MODE T	RC SCL	×	1	Y	FUNCTION	FUNCTION WIDTH	FUNCTI	ON VALUE	
	1 f	2.468	4 GHz	0.144 dBm					
3		2.581	ZGHZ	-52.000 aBm					
4									Properties ►
5									
7									
8									
9									More
10									1 of 2
12									
MSG						STATUS			
DOM						STATUS			

Ch High 3GHz – 26.5GHz

