



Product Name	Slate PC
Model No.	S1080XX, R2005XX(X=0-9,A-Z,a-z or blank)
FCC ID.	JCK-S2005

Applicant	GIGA-BYTE TECHNOLOGY CO., LTD
Address	No.6, Bao Chiang Road, Hsin-Tien Dist., New Taipei City
	231,Taiwan

Date of Receipt	Mar. 03, 2011
Issued Date	Apr. 15, 2011
Report No.	113054R-RFUSP43V01
Report Version	V1.0

The Test Results relate only to the samples tested.

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# Test Report Certification

Issued Date: Apr. 15, 2011

Report No.: 113054R-RFUSP43V01



Product Name	Slate PC
Applicant	GIGA-BYTE TECHNOLOGY CO., LTD
Address	No.6, Bao Chiang Road, Hsin-Tien Dist., New Taipei City 231, Taiwan
Manufacturer	GIGA-BYTE TECHNOLOGY CO., LTD
Model No.	S1080XX, R2005XX(X=0-9,A-Z,a-z or blank)
FCC ID.	JCK-S2005
EUT Rated Voltage	AC 100-240 V, 50-60 Hz
EUT Test Voltage	AC 120V/ 60Hz
Trade Name	GIGABYTE
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010
	ANSI C63.4: 2009
Test Result	Complied

The Test Results relate only to the samples tested.

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Testing Laboratory

Approved By

(Manager / Vincent Lin )



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Attachment 1: EUT Test Photographs
Attachment 2: EUT Detailed Photographs



# 1. GENERAL INFORMATION

# **1.1.** EUT Description

Product Name	Slate PC		
Trade Name	GIGABYTE		
Model No.	S1080XX, R2005XX(X=0-9,A-Z,a-z or blank)		
FCC ID.	JCK-S2005		
Frequency Range	2402 – 2480MHz		
Channel Number	79		
Type of Modulation	FHSS: GFSK(1Mbps) / π /4DQPSK(2Mbps) / 8DPSK(3Mbps)		
Antenna Type	Printed on PCB		
Channel Control	Auto		
Antenna Gain	Refer to the table "Antenna List"		
Power Adapter	MFR: DELTA, M/N: ADP-40PH BB		
	Input: AC 100-240V, 50-60Hz, 1.2A		
	Output: DC 19V, 2.1A		
	Cable Out: Non-shielded, 1.8m, with one ferrite core bonded.		
Contain Module	Realtek / RTL8188CEBT		

# Antenna List

No.	Manufacturer	Part No.	Antenna Type	Peak Gain
1	GIGA-BYTE	WLAN-BT	Printed on PCB	1.9dBi

Note: The antenna of EUT is conform to FCC 15.203



# Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2422 MHz	Channel 40:	2442 MHz	Channel 60:	2462 MHz
Channel 01:	2403 MHz	Channel 21:	2423 MHz	Channel 41:	2443 MHz	Channel 61:	2463 MHz
Channel 02:	2404 MHz	Channel 22:	2424 MHz	Channel 42:	2444 MHz	Channel 62:	2464 MHz
Channel 03:	2405 MHz	Channel 23:	2425 MHz	Channel 43:	2445 MHz	Channel 63:	2465 MHz
Channel 04:	2406 MHz	Channel 24:	2426 MHz	Channel 44:	2446 MHz	Channel 64:	2466 MHz
Channel 05:	2407 MHz	Channel 25:	2427 MHz	Channel 45:	2447 MHz	Channel 65:	2467 MHz
Channel 06:	2408 MHz	Channel 26:	2428 MHz	Channel 46:	2448 MHz	Channel 66:	2468 MHz
Channel 07:	2409 MHz	Channel 27:	2429 MHz	Channel 47:	2449 MHz	Channel 67:	2469 MHz
Channel 08:	2410 MHz	Channel 28:	2430 MHz	Channel 48:	2450 MHz	Channel 68:	2470 MHz
Channel 09:	2411 MHz	Channel 29:	2431 MHz	Channel 49:	2451 MHz	Channel 69:	2471 MHz
Channel 10:	2412 MHz	Channel 30:	2432 MHz	Channel 50:	2452 MHz	Channel 70:	2472 MHz
Channel 11:	2413 MHz	Channel 31:	2433 MHz	Channel 51:	2453 MHz	Channel 71:	2473 MHz
Channel 12:	2414 MHz	Channel 32:	2434 MHz	Channel 52:	2454 MHz	Channel 72:	2474 MHz
Channel 13:	2415 MHz	Channel 33:	2435 MHz	Channel 53:	2455 MHz	Channel 73:	2475 MHz
Channel 14:	2416 MHz	Channel 34:	2436 MHz	Channel 54:	2456 MHz	Channel 74:	2476 MHz
Channel 15:	2417 MHz	Channel 35:	2437 MHz	Channel 55:	2457 MHz	Channel 75:	2477 MHz
Channel 16:	2418 MHz	Channel 36:	2438 MHz	Channel 56:	2458 MHz	Channel 76:	2478 MHz
Channel 17:	2419 MHz	Channel 37:	2439 MHz	Channel 57:	2459 MHz	Channel 77:	2479 MHz
Channel 18:	2420 MHz	Channel 38:	2440 MHz	Channel 58:	2460 MHz	Channel 78:	2480 MHz
Channel 19:	2421 MHz	Channel 39:	2441 MHz	Channel 59:	2461 MHz		

- 1. This device is a Slate PC, Contains functions and so on WiFi Bluetooth, This report for Bluetooth.
- 2. These tests were conducted on a sample for the purpose of demonstrating compliance of Bluetooth transmitter with Part 15 Subpart C Paragraph 15.247 for spread spectrum devices.
- 3. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.



### 1.2. Operational Description

The EUT is a Slate PC with built-in 2.4GHz Bluetooth V3.0+EDR transceiver. The number of the channels is 79 in 2402-2480MHz. The device adapts the frequency hopping spread spectrum modulation. The antenna is chip antenna and provides diversity function to improve the receiving function.

The system receivers have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shift frequencies in synchronization with the transmitted signals

Frequency hopping spread spectrum systems are not required to employ all available hopping channels during each transmission. The transmitter is presented with a continuous data stream. In addition, a system employing short transmission bursts must comply with the definition of a frequency hopping system and must distribute its 79 channels and over the minimum number of hopping channels (75 channels).

The incorporation of intelligence within a frequency hopping spread spectrum system that permits the system to recognize other users within the spectrum band so that it individually and independently chooses and adapts its hopsets to avoid hopping on occupied channels is permitted. The coordination of frequency hopping systems in any other manner for the express purpose of avoiding the simultaneous occupancy of individual hopping frequencies by multiple transmitters is not permitted.

This device use WLAN and Bluetooth combo module which not transmit simultaneous.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK)
	Mode 2: Transmit - 3Mbps (8DPSK)



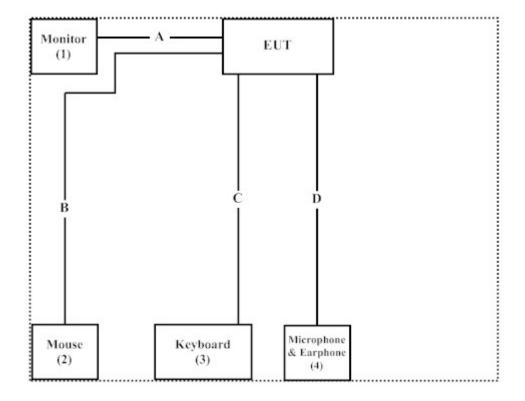
# 1.3. Tested System Details

The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Pro	duct	Manufacturer	Model No.	Serial No.	FCC ID	Power Cord
1	Monitor	Dell	2407WFPb	CN-0FC255-46633-67T-0	DoC	Non-Shielded, 1.8m
				4GS		
2	USB Mouse	DELL	M056U0A	F0Y01YEQ	DoC	N/A
3	Keyboard	DELL	SK-8115	MY-0DJ325-71619-7A2-	DoC	N/A
				0330		
4	Microphone &	Ergotech	ET-E201	N/A	N/A	N/A
	Earphone					

	Signal Cable Type	Signal cable Description		
A VGA Cable 5		Shielded, 1.8m, with two ferrite cores bonded.		
В	USB Mouse Cable	Shielded, 1.8m		
С	USB Keyboard Cable	Shielded, 1.8m		
D	Microphone & Earphone Cable	Non-Shielded, 1.8m		

# 1.4. Configuration of Tested System





# 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in Section 1.4.
- (2) Execute software on the EUT.
- (3) Configure the test mode, the test channel, and the data rate.
- (4) Press "OK" to start the continuous Transmit.
- (5) Verify that the EUT works properly.



# 1.6. Test Facility

Ambient conditions in the laboratory:

Items	Required (IEC 68-1)	Actual
Temperature (°C)	15-35	20-35
Humidity (%RH)	25-75	30-65
Barometric pressure (mbar)	860-1060	950-1000

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# 2. Conducted Emission

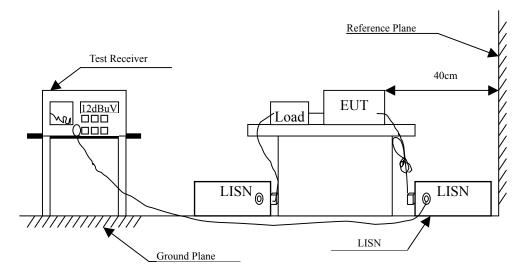
# 2.1. Test Equipment

The following test equipment are used during the conducted emission test:

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	Remark
1	Test Receiver	R & S	ESCS 30/825442/014	Feb., 2011	
2	L.I.S.N.	R & S	ESH3-Z5/825562/002	Feb., 2011	EUT
3	L.I.S.N.	R & S	ENV4200/848411/010	Feb., 2011	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2/100410	July, 2010	
5	No.1 Shielded Room	N/A			

Note: All instruments are calibrated every one year.

# 2.2. Test Setup





#### 2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit				
Frequency	Limits			
MHz	QP	AV		
0.15 - 0.50	66-56	56-46		
0.50-5.0	56	46		
5.0 - 30	60	50		

Remarks: In the above table, the tighter limit applies at the band edges.

#### 2.4. Test Procedure

The EUT and Peripherals are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm /50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs.)

Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all the interface cables must be changed according to ANSI C63.4: 2009 on conducted measurement.

Conducted emissions were invested over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9kHz.

The EUT was setup to ANSI C63.4, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

# 2.5. Uncertainty

± 2.26 dB



# 2.6. Test Result of Conducted Emission

Product : Slate PC

Test Item : Conducted Emission Test

Power Line : Line 1

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	uency Correct Reading Measurement		Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.162	9.750	45.670	55.420	-10.237	65.657
0.185	9.719	40.400	50.119	-14.881	65.000
0.240	9.680	33.370	43.050	-20.379	63.429
0.306	9.650	25.280	34.930	-26.613	61.543
0.338	9.650	23.840	33.490	-27.139	60.629
0.771	9.648	20.850	30.498	-25.502	56.000
Average					
0.162	9.750	23.900	33.650	-22.007	55.657
0.185	9.719	18.790	28.509	-26.491	55.000
0.240	9.680	14.000	23.680	-29.749	53.429
0.306	9.650	6.920	16.570	-34.973	51.543
0.338	9.650	7.140	16.790	-33.839	50.629
0.771	9.648	10.370	20.018	-25.982	46.000

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " " means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



Test Item : Conducted Emission Test

Power Line : Line 2

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.170	9.743	44.880	54.623	-10.806	65.429
0.201	9.716	38.200	47.916	-16.627	64.543
0.306	9.660	24.980	34.640	-26.903	61.543
0.435	9.648	20.310	29.958	-27.899	57.857
0.787	9.670	18.820	28.490	-27.510	56.000
18.545	10.030	17.710	27.740	-32.260	60.000
Average					
0.170	9.743	23.580	33.323	-22.106	55.429
0.201	9.716	16.750	26.466	-28.077	54.543
0.306	9.660	6.480	16.140	-35.403	51.543
0.435	9.648	7.480	17.128	-30.729	47.857
0.787	9.670	9.600	19.270	-26.730	46.000
18.545	10.030	11.630	21.660	-28.340	50.000

- 1. All Reading Levels are Quasi-Peak and average value.
- 2. " " means the worst emission level.
- 3. Measurement Level = Reading Level + Correct Factor



# 3. Peak Power Output

# 3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2010
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2010

Note: 1. All equipments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

# 3.2. Test Setup



# **3.3.** Limit

The maximum peak power shall be less 1Watt.

# 3.4. Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

# 3.5. Uncertainty

± 1.27 dB



# **3.6.** Test Result of Peak Power Output

Product : Slate PC

Test Item : Peak Power Output

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	2.57	1 Watt= 30 dBm	Pass
Channel 39	2441.00	3.13	1 Watt= 30 dBm	Pass
Channel 78	2480.00	3.43	1 Watt= 30 dBm	Pass



Test Item : Peak Power Output

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency	Measurement	Required Limit	Result
	(MHz)	(dBm)		
Channel 00	2402.00	3.09	1 Watt= 30 dBm	Pass
Channel 39	2441.00	2.69	1 Watt= 30 dBm	Pass
Channel 78	2480.00	2.02	1 Watt= 30 dBm	Pass



#### 4. Radiated Emission

# 4.1. Test Equipment

The following test equipments are used during the radiated emission test:

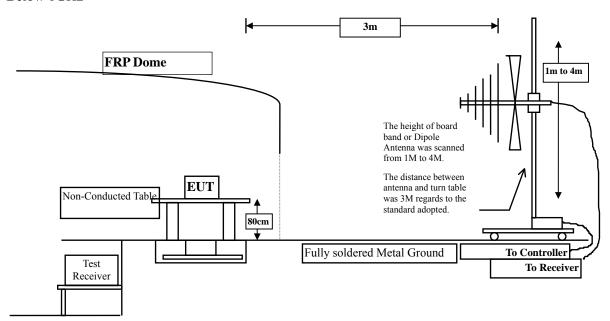
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
⊠Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2010
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2010
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2010
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2010
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

Note: 1. All equipments are calibrated every one year.

2. The test instruments marked by "X" are used to measure the final test results.

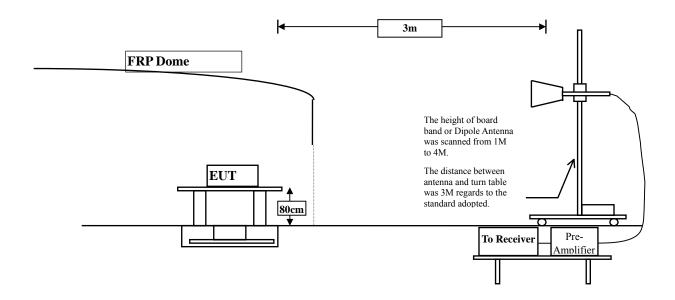
# 4.2. Test Setup

Below 1GHz





Above 1GHz



# 4.3. Limits

#### **➤** General Radiated Emission Limits

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 20dB below the level of the fundamental or to the general radiated emission limits in paragraph 15.209, whichever is the lesser attenuation.

FCC Part 15 Subpart C Paragraph 15.209 Limits					
Frequency MHz	uV/m @3m	dBuV/m@3m			
30-88	100	40			
88-216	150	43.5			
216-960	200	46			
Above 960	500	54			

Remarks:

- 1. RF Voltage  $(dBuV) = 20 \log RF \text{ Voltage } (uV)$
- 2. In the Above Table, the tighter limit applies at the band edges.
- 3. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system.



#### 4.4. Test Procedure

The EUT was setup according to ANSI C63.4, 2009 and tested according to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

The EUT is placed on a turn table which is 0.8 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.4:2009 on radiated measurement.

The resolution bandwidth below 1GHz setting on the field strength meter is 120 kHz and above 1GHz is 1MHz.

Radiated emission measurements below 1GHz are made using broadband Bilog antenna and above 1GHz are made using Horn Antennas.

The measurement is divided into the Preliminary Measurement and the Final Measurement.

The suspected frequencies are searched for in Preliminary Measurement with the measurement antenna kept pointed at the source of the emission both in azimuth and elevation, with the polarization of the antenna oriented for maximum response. The antenna is pointed at an angle towards the source of the emission, and the EUT is rotated in both height and polarization to maximize the measured emission. The emission is kept within the illumination area of the 3 dB bandwidth of the antenna. The worst radiated emission is measured on the Final Measurement.

The measurement frequency range form 30MHz - 10th Harmonic of fundamental was investigated.

# 4.5. Uncertainty

- ± 3.9 dB above 1GHz
- ± 3.8 dB below 1GHz



#### 4.6. Test Result of Radiated Emission

Product : Slate PC

Test Item : Harmonic Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.327	43.980	47.307	-26.693	74.000
7206.000	10.136	38.260	48.396	-25.604	74.000
9608.000	13.706	37.020	50.726	-23.274	74.000
Average					
<b>Detector:</b>					
Vertical					
Peak Detector:					
4804.000	6.638	43.170	49.807	-24.193	74.000
7206.000	11.005	38.660	49.665	-24.335	74.000
9608.000	14.103	37.110	51.213	-22.787	74.000
Average					
<b>Detector:</b>					

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : Harmonic Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
<b>Peak Detector:</b>					
4882.000	3.001	44.110	47.111	-26.889	74.000
7323.000	11.846	37.640	49.487	-24.513	74.000
9764.000	12.563	37.820	50.383	-23.617	74.000
Average					
<b>Detector:</b>					
Vertical					
Peak Detector:					
4882.000	5.713	48.071	53.784	-19.716	74.000
7323.000	12.727	37.780	50.508	-23.492	74.000
9764.000	13.028	37.470	50.498	-23.502	74.000
Average					
<b>Detector:</b>					

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : Harmonic Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	2.760	41.670	44.430	-29.570	74.000
7440.000	12.567	35.990	48.556	-25.444	74.000
9920.000	13.456	36.620	50.076	-23.924	74.000
Average					
<b>Detector:</b>					
Vertical					
<b>Peak Detector:</b>					
4960.000	5.557	44.310	49.867	-24.133	74.000
7440.000	13.426	35.690	49.115	-24.885	74.000
9920.000	13.958	37.300	51.258	-22.742	74.000
Average					
<b>Detector:</b>					

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : Harmonic Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.327	42.380	45.707	-28.293	74.000
7206.000	10.136	37.970	48.106	-25.894	74.000
9608.000	13.706	37.140	50.846	-23.154	74.000
Average					
<b>Detector:</b>					
Vertical					
Peak Detector:					
4804.000	6.638	42.610	49.247	-24.753	74.000
7206.000	11.005	37.540	48.545	-25.455	74.000
9608.000	14.103	37.960	52.063	-21.937	74.000
Average					
<b>Detector:</b>					

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : Harmonic Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.001	40.470	43.471	-30.529	74.000
7323.000	11.846	36.460	48.307	-25.693	74.000
9764.000	12.563	37.590	50.153	-23.847	74.000
Average					
<b>Detector:</b>					
Vertical					
<b>Peak Detector:</b>					
4882.000	5.713	45.480	51.194	-22.806	74.000
7323.000	12.727	35.800	48.528	-25.472	74.000
9764.000	13.028	37.250	50.278	-23.722	74.000
Average					
<b>Detector:</b>					

--

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : Harmonic Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	2.760	38.010	40.770	-33.230	74.000
7440.000	12.567	35.490	48.056	-25.944	74.000
9920.000	13.456	36.490	49.946	-24.054	74.000
Average					
<b>Detector:</b>					
Vertical					
Peak Detector:					
4960.000	5.557	42.580	48.137	-25.863	74.000
7440.000	13.426	35.480	48.905	-25.095	74.000
9920.000	13.958	36.120	50.078	-23.922	74.000
Average					
<b>Detector:</b>					

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : General Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
132.820	-10.230	47.440	37.210	-6.290	43.500
270.560	-5.007	39.791	34.784	-11.216	46.000
431.580	-2.099	36.361	34.262	-11.738	46.000
594.540	3.927	31.181	35.108	-10.892	46.000
757.500	4.361	36.446	40.807	-5.193	46.000
809.880	5.049	35.365	40.414	-5.586	46.000
Vertical					
377.260	-1.765	39.419	37.654	-8.346	46.000
431.580	-9.509	38.009	28.500	-17.500	46.000
540.220	0.121	32.361	32.482	-13.518	46.000
648.860	-4.832	39.323	34.491	-11.509	46.000
757.500	2.921	39.369	42.290	-3.710	46.000
809.880	3.279	35.677	38.956	-7.044	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



Test Item : General Radiated Emission

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
	Factor	Level	Level		
MHz	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
140.580	-10.471	48.004	37.533	-5.967	43.500
377.260	-1.115	35.818	34.703	-11.297	46.000
540.220	2.551	33.468	36.019	-9.981	46.000
594.540	3.927	29.834	33.761	-12.239	46.000
648.860	2.038	29.707	31.745	-14.255	46.000
757.500	4.361	37.207	41.568	-4.432	46.000
Vertical					
377.260	-1.765	36.599	34.834	-11.166	46.000
540.220	0.121	32.035	32.156	-13.844	46.000
648.860	-4.832	39.709	34.877	-11.123	46.000
703.180	0.139	34.352	34.490	-11.510	46.000
757.500	2.921	39.976	42.897	-3.103	46.000
918.520	4.126	35.689	39.815	-6.185	46.000

- 1. All Readings below 1GHz are Quasi-Peak, above 1GHz are performed with peak and/or average measurements as necessary.
- 2. Peak measurements: RBW = 1MHz, VBW = 3 MHz, Sweep: Auto.
- 3. Average measurements: RBW = 1MHz, VBW = 10 Hz, Sweep: Auto.
- 4. Measurement Level = Reading Level + Correct Factor.
- 5. Correct Factor = Antenna factor + Cable loss Amplifier gain.
- 6. The average measurement was not performed when the peak measured data under the limit of average detection.
- 7. The emission levels of other frequencies are very lower than the limit and not show in test report.



#### 5. RF Antenna Conducted Test

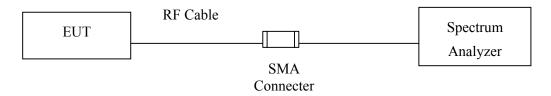
# 5.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011

Note: 1. All equipments are calibrated every one year.

2. The test instruments Marked "X" are used to measure the final test results.

#### 5.2. Test Setup



#### 5.3. Limits

According to FCC Section 15.247(d). In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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 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, the attenuation required under this paragraph shall be 30 dB instead of 20 dB.

#### **5.4.** Test Procedure

The EUT was setup to ANSI C63.4, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

# 5.5. Uncertainty

± 150Hz



#### **5.6.** Test Result of RF Antenna Conducted Test

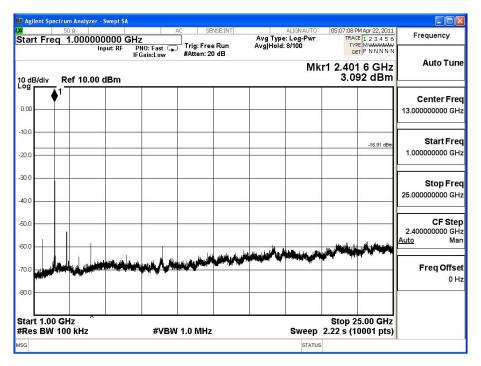
Product : Slate PC

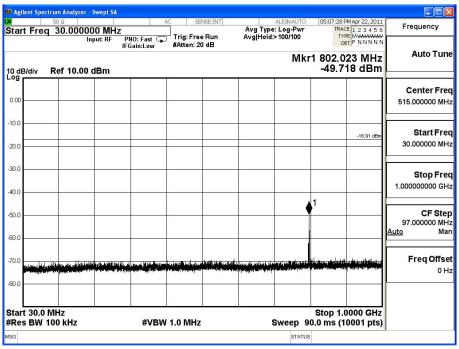
Test Item : RF Antenna Conducted Test

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 00: 30MHz-25GHz





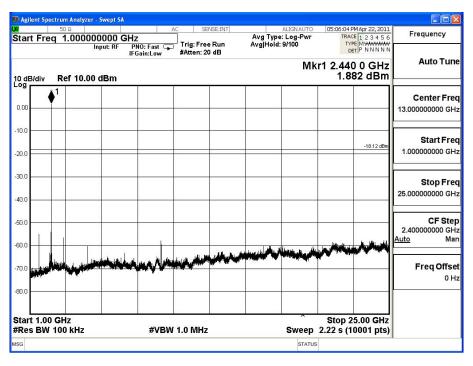


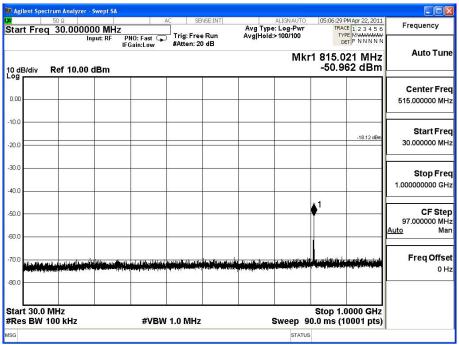
Test Item : RF Antenna Conducted Test

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Figure Channel 39: 30MHz-25GHz





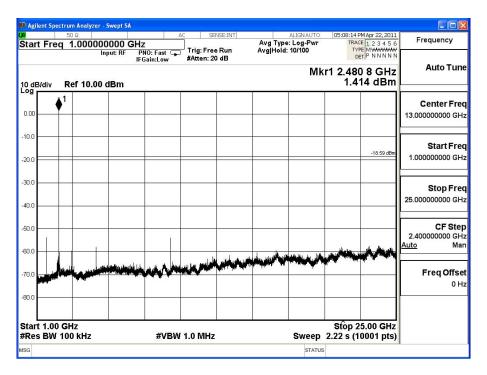


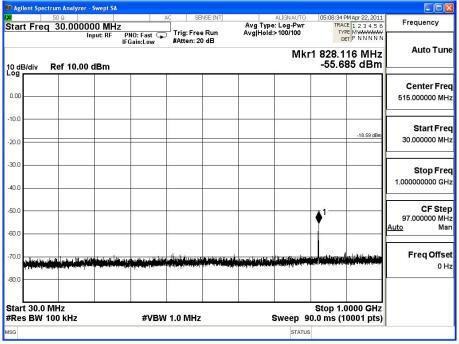
Test Item : RF Antenna Conducted Test

Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

#### Figure Channel 78: 30MHz-25GHz





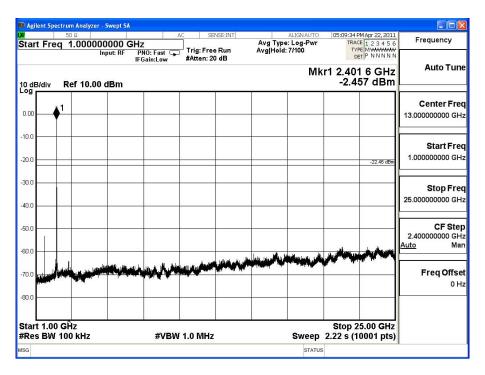


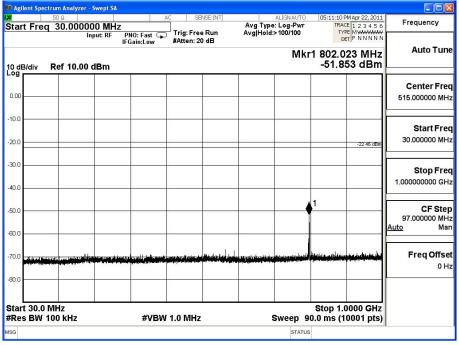
Test Item : RF Antenna Conducted Test

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

### Figure Channel 00: 30MHz-25GHz





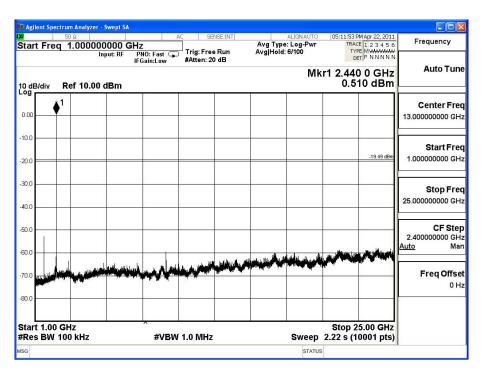


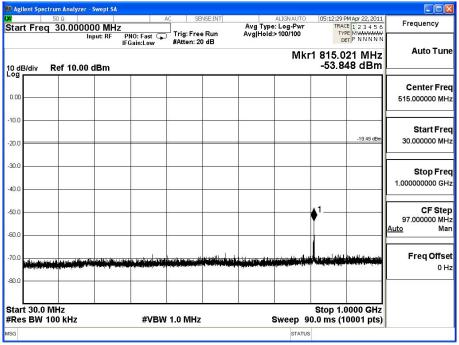
Test Item : RF Antenna Conducted Test

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

# Figure Channel 39: 30MHz-25GHz





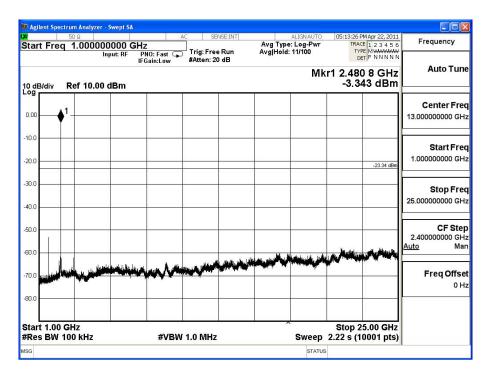


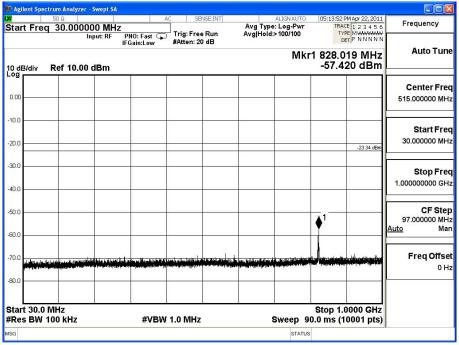
Test Item : RF Antenna Conducted Test

Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

#### Figure Channel 78: 30MHz-25GHz







# 6. Band Edge

# 6.1. Test Equipment

# **RF Conducted Measurement**

The following test equipments are used during the band edge tests:

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.	
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2010	_
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2010	
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2011	

#### **RF Radiated Measurement:**

The following test equipments are used during the band edge tests:

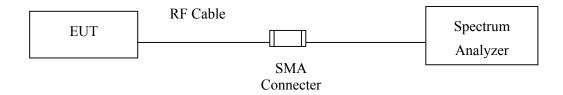
Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
⊠Site # 3		Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2010
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2010
		Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2010
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2010
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2010
		Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2010
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2011
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

- 1. All equipments are calibrated every one year.
- 2. The test instruments marked by "X" are used to measure the final test results.



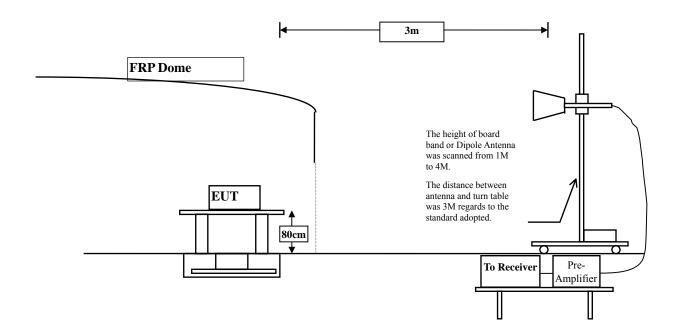
# 6.2. Test Setup

# **RF Conducted Measurement**



# **RF Radiated Measurement:**

Above 1GHz





#### **6.3.** Limit

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator 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. Attenuation below the general limits specified in Section 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Section 15.205(a), must also comply with the radiated emission limits specified in Section 15.209(a) (see Section 15.205(c)).

#### **6.4.** Test Procedure

The EUT and its simulators are placed on a turn table which is 0.8 meter above ground. The turn table can rotate 360 degrees to determine the position of the maximum emission level. The EUT was positioned such that the distance from antenna to the EUT was 3 meters.

The antenna can move up and down between 1 meter and 4 meters to find out the maximum emission level.

Both horizontal and vertical polarization of the antenna are set on measurement. In order to find the maximum emission, all of the interface cables must be manipulated according to ANSI C63.4:2009 on radiated measurement.

The bandwidth below 1GHz setting on the field strength meter is 120 kHz, above 1GHz are 1 MHz. The EUT was setup to ANSI C63.4, 2009; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

# 6.5. Uncertainty

- ± 3.9 dB above 1GHz
- + 3.8 dB below 1GHz



# 6.6. Test Result of Band Edge

Product : Slate PC
Test Item : Band Edge
Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2402	31.573	61.4	92.974	Peak
Horizontal	2402	31.573	36.01	67.584	Average
Vertical	2402	30.917	66.5	97.417	Peak
Vertical	2402	30.917	38.35	69.267	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz Average detector: RBW=1MHz, VBW=10Hz

Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ ( <b>dB</b> )	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2381.9	92.974	51.511	41.463	Peak
Horizontal	2390	67.584	32.093	35.491	Average
Vertical	2381.9	97.417	51.511	45.906	Peak
Vertical	2390	69.267	32.093	37.174	Average

#### Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

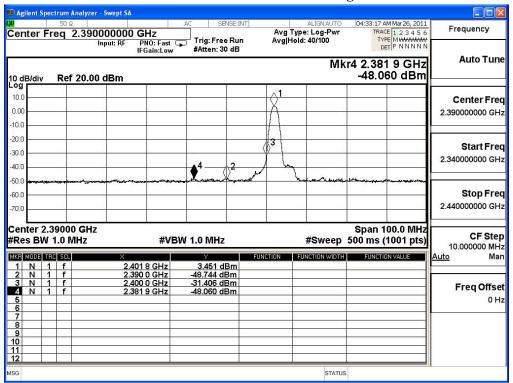
Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

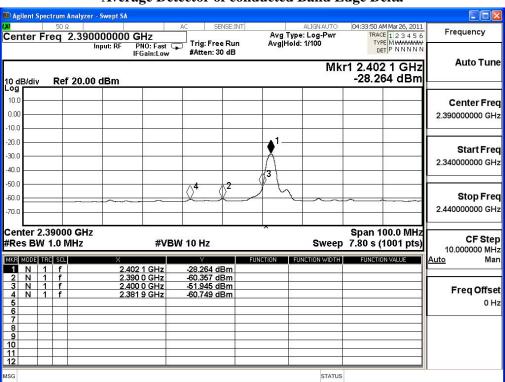
 $\Delta$  = Conducted Band Edge Delta (Peak or Average)



### Peak Detector of conducted Band Edge Delta



#### **Average Detector of conducted Band Edge Delta**





Product : Slate PC
Test Item : Band Edge
Test Site : No.3 OATS

Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

# Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dB(uV/m)]	Detector
Horizontal	2480	32.155	61.26	93.416	Peak
Horizontal	2480	32.155	35.22	67.376	Average
Vertical	2480	31.412	63.52	94.932	Peak
Vertical	2480	31.412	37.38	68.792	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz Average detector: RBW=1MHz, VBW=10Hz

#### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ ( <b>dB</b> )	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.5	93.416	42.55	50.866	Peak
Horizontal	2481.4	67.376	26.218	41.158	Average
Vertical	2483.5	94.932	42.55	52.382	Peak
Vertical	2481.4	68.792	26.218	42.574	Average

#### Note:

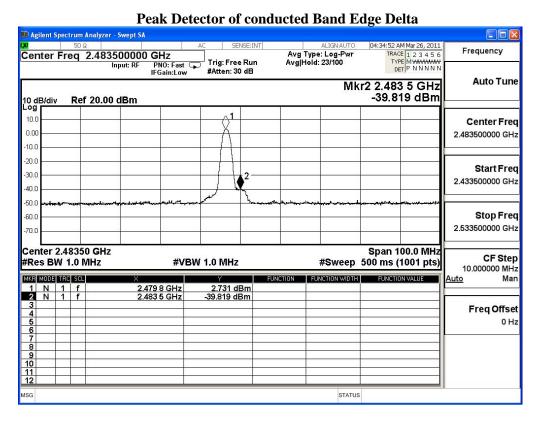
The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

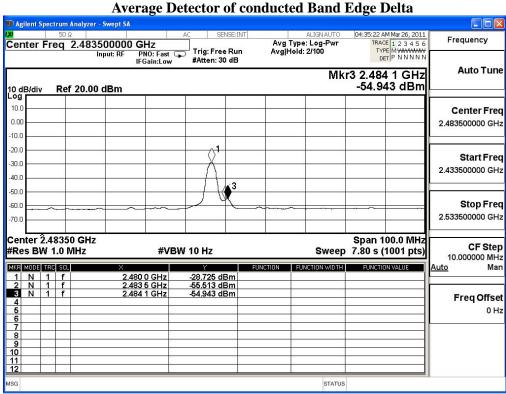
Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

 $\Delta$  = Conducted Band Edge Delta (Peak or Average)









Product : Slate PC
Test Item : Band Edge
Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

# Fundamental Filed Strength

Antenna	Frequency	<b>Correction Factor</b>	Reading Level	<b>Emission Level</b>	Detector
Pole	[MHz]	[dB/m]	[dBuV]	[dBuV/m]	
Horizontal	2402	31.573	60.81	92.384	Peak
Horizontal	2402	31.573	34.27	65.844	Average
Vertical	2402	30.917	66.57	97.487	Peak
Vertical	2402	30.917	36.33	67.247	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz Average detector: RBW=1MHz, VBW=10Hz

#### Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ ( <b>dB</b> )	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2390	92.384	50.025	42.359	Peak
Horizontal	2385.9	65.844	30.765	35.079	Average
Vertical	2390	97.487	50.025	47.462	Peak
Vertical	2385.9	67.247	30.765	36.482	Average

### Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

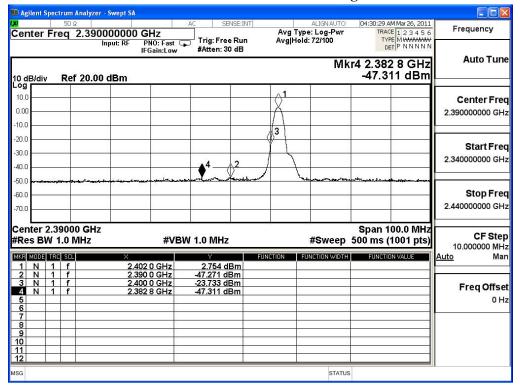
Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

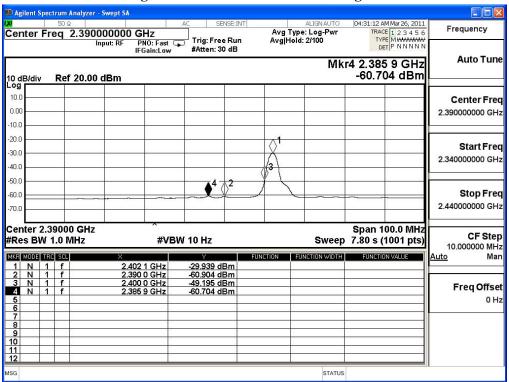
 $\Delta$  = Conducted Band Edge Delta (Peak or Average)



#### **Peak Detector of conducted Band Edge Delta**



#### Average Detector of conducted Band Edge Delta





Product : Slate PC
Test Item : Band Edge
Test Site : No.3 OATS

Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

# Fundamental Filed Strength

Antenna	Frequency	<b>Correction Factor</b>	Reading Level	<b>Emission Level</b>	Detector
Pole	[MHz]	[dB/m]	[dBuV]	[dB(uV/m)]	
Horizontal	2480	32.155	59.45	91.606	Peak
Horizontal	2480	32.155	33.49	65.646	Average
Vertical	2480	31.412	62.29	93.702	Peak
Vertical	2480	31.412	34.61	66.022	Average

Note: 1:Spectrum Analyzer setting:

Peak detector: RBW=1MHz, VBW=1MHz Average detector: RBW=1MHz, VBW=10Hz

# Band Edge Test Data

Antenna Pole	Test Frequency (MHz)	Fundamental (dBuV/m)	Δ ( <b>dB</b> )	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.5	91.606	36.081	55.525	Peak
Horizontal	2483.5	65.646	23.177	42.469	Average
Vertical	2483.5	93.702	36.081	57.621	Peak
Vertical	2483.5	66.022	23.177	42.845	Average

#### Note:

The Band Edge Field Strength was calculated using the Fundamental and Conducted Band Edge measurements per the Marker-Delta Method with the following formula:

Band Edge field Strength =  $F - \Delta$ 

F = Fundamental field Strength (Peak or Average)

 $\Delta$  = Conducted Band Edge Delta (Peak or Average)



