

FC

Test Report

Product Name	Notebook PC
Model No.	TAICHI21
FCC ID.	MSQTAICHI21

Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.

Date of Receipt	Aug. 20, 2012
Issued Date	Sep. 28, 2012
Report No.	128392R-RFUSP43V01
Report Version	V1.0



The Test Results relate only to the samples tested.

The test report shall not be reproduced except in full without the written approval of QuieTek Corporation.

This report must not be used to claim product endorsement by NVLAP any agency of the U.S. Government

Test Report Certification

Issued Date: Sep. 28, 2012

Report No.: 128392R-RFUSP43V01



Product Name	Notebook PC
Applicant	ASUSTeK COMPUTER INC.
Address	4F, No. 150, Li-Te Rd., Peitou, Taipei, Taiwan, R.O.C.
Manufacturer	1. PEGATRON CORPORATION Taoyuan Mfg 2. Protek (Shanghai) Limited. 3. Tech-Com(Shanghai) Computer Co. Ltd. 4. Tech-Front (Chongqing) Computer Co.,Ltd. 5. Compal Information Technology (Kunshan) Co., Ltd 6. Digitek (Chongqing) Limited
Model No.	TAICHI21
FCC ID.	MSQTAICHI21
EUT Rated Voltage	AC 100-240V, 50-60Hz
EUT Test Voltage	AC 120V/60Hz
Trade Name	ASUS
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 ANSI C63.4: 2003
Test Result	Complied

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1. GENERAL INFORMATION

1.1. EUT Description

Product Name	Notebook PC
Trade Name	ASUS
Model No.	TAICHI21
FCC ID.	MSQTAICHI21
Frequency Range	2402 – 2480MHz
Channel Number	V3.0+HS, V2.1+EDR: 79CH V4.0: 40CH
Type of Modulation	V3.0+HS, V2.1+EDR: GFSK(1Mbps) / π / 4DQPSK(2Mbps) / 8DPSK(3Mbps) V4.0: GFSK (1Mbps)
Antenna Type	PIFA
Channel Control	Auto
Antenna Gain	Refer to the table “Antenna List”
Power Adapter	MFR: Delta (ASUS), M/N: ADP-45AW A Input: AC 100-240V~1.2A, 50-60Hz Output: DC 19V, 2.37A Cable Out: Non-shielded, 2.5m
Battery	ASUS, C32-TAICHI21 (+11.1V, 3200mAh, 32Wh)
Contain Module	Intel / 6235ANHMW

Antenna List

No.	Manufacturer	Model No.	Peak Gain
1	INPAQ	WA-F-LB-04-004	2.61dBi For 2.4GHz
2	Foxconn	WDAN-IJU26V01-DH	2.77dBi For 2.4GHz

Note:

1. The antenna of EUT is conform to FCC 15.203
2. Only the higher gain antenna was tested and recorded in this report.

Frequency of Each Channel: (For V3.0+HS, V2.1+EDR)

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		

Frequency of Each Channel: (For V4.0)

Channel	Frequency	Channel	Frequency
Channel 00:	2402 MHz	Channel 20:	2442 MHz
Channel 01:	2404 MHz	Channel 21:	2444 MHz
Channel 02:	2406 MHz	Channel 22:	2446 MHz
Channel 03:	2408 MHz	Channel 23:	2448 MHz
Channel 04:	2410 MHz	Channel 24:	2450 MHz
Channel 05:	2412MHz	Channel 25:	2452 MHz
Channel 06:	2414 MHz	Channel 26:	2454 MHz
Channel 07:	2416 MHz	Channel 27:	2456 MHz
Channel 08:	2418 MHz	Channel 28:	2458 MHz
Channel 09:	2420 MHz	Channel 29:	2460 MHz
Channel 10:	2422 MHz	Channel 30:	2462 MHz
Channel 11:	2424 MHz	Channel 31:	2464 MHz
Channel 12:	2426 MHz	Channel 32:	2466 MHz
Channel 13:	2428 MHz	Channel 33:	2468 MHz
Channel 14:	2430 MHz	Channel 34:	2470 MHz
Channel 15:	2432 MHz	Channel 35:	2472 MHz
Channel 16:	2434 MHz	Channel 36:	2474 MHz
Channel 17:	2436 MHz	Channel 37:	2476 MHz
Channel 18:	2438 MHz	Channel 38:	2478 MHz
Channel 19:	2440 MHz	Channel 39:	2480 MHz

Note:

1. The EUT is a Notebook PC with a built-in WLAN 、Bluetooth and NFC transceiver, 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.
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.
5. At result of pretests, EUT support NB mode and PAD mode, only the worst case (NB mode) is shown in the report.

Test Mode	Mode 1: Transmit - 1Mbps (GFSK) Mode 2: Transmit - 3Mbps (8DPSK) Mode 3: Transmit - BLE (GFSK)
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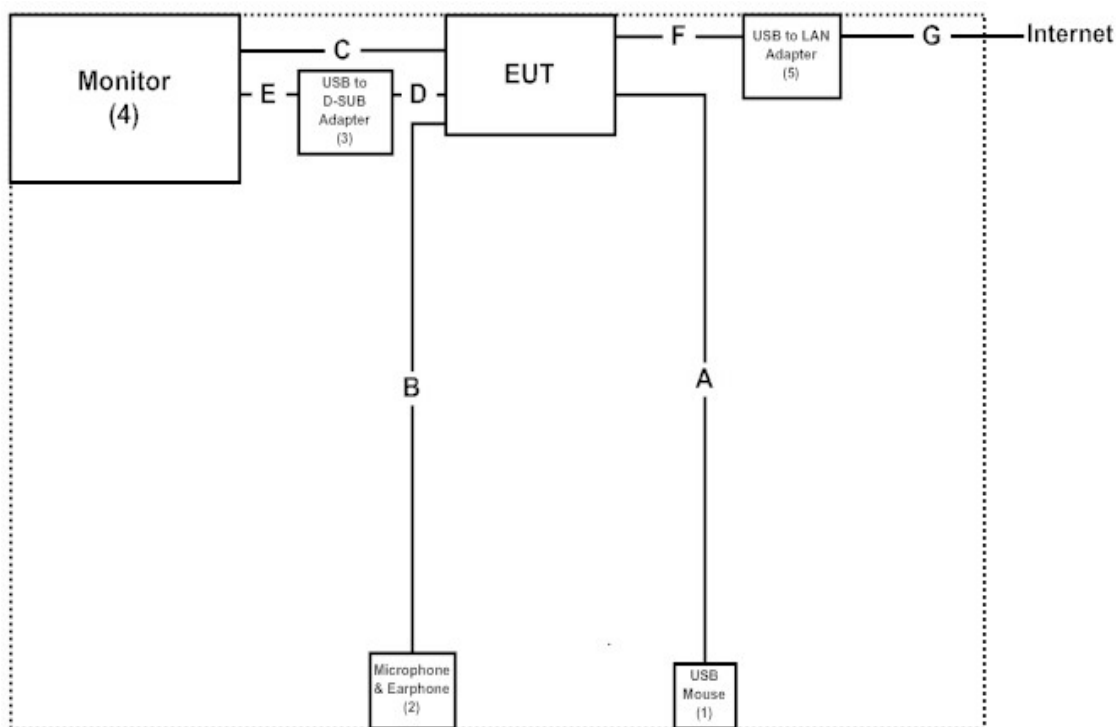
1.3. Tested System Details

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

Product	Manufacturer	Model No.	Serial No.	Power Cord
(1) USB Mouse	DELL	MO56UOA	G0Y02ERZ	N/A
(2) Microphone & Earphone	Ergotech	ET-E201	N/A	N/A
(3) USB to D-SUB Adapter	ASUS	N/A	N/A	N/A
(4) Monitor	DELL	ST2320LF	CN-OM2NN6-72872-22I-C9VS	Non-Shielded, 1.8m
(5) USB to LAN Adapter	ASUS	N/A	N/A	N/A

Signal Cable Type	Signal cable Description
A Mouse Cable	Non-Shielded, 1.8m
B Earphone & Microphone Cable	Non-Shielded, 1.8m
C HDMI Cable	Non-Shielded, 1.7m
D USB to D-SUB Cable	Non-Shielded, 0.025m
E D-SUB Cable	Non-Shielded, 1.7m
F USB to LAN Cable	Non-Shielded, 0.08m
G LAN Cable	Non-Shielded, 2.0m

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

The related certificate for our laboratories about the test site and management system can be downloaded from Quietek Corporation's Web Site: <http://www.quietek.com/tw/ctg/cts/accreditations.htm>
The address and introduction of Quietek Corporation's laboratories can be founded in our Web site: <http://www.quietek.com/>

Site Description: File on
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Accreditation on NVLAP
NVLAP Lab Code: 200533-0

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FCC Accreditation Number: TW1014

2. Conducted Emission

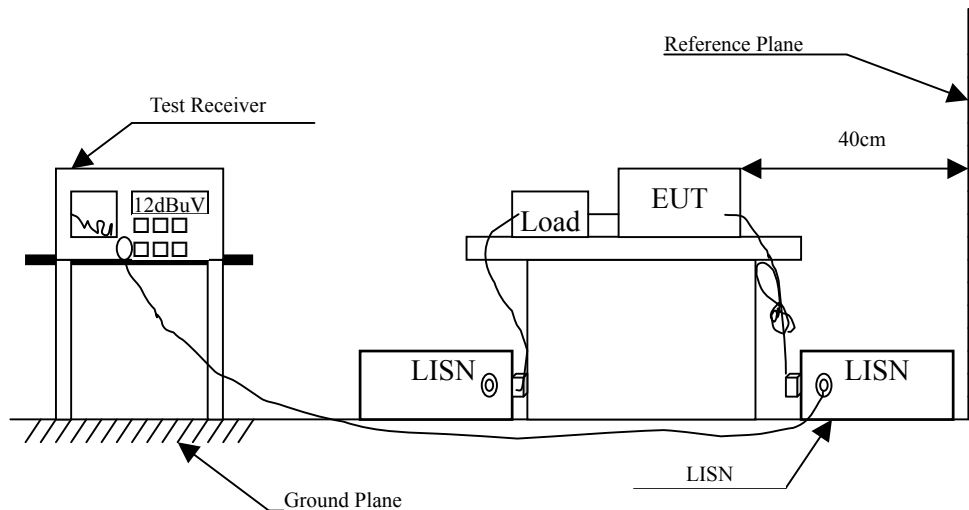
2.1. Test Equipment

	Equipment	Manufacturer	Model No. / Serial No.	Last Cal.	Remark
X	Test Receiver	R & S	ESCS 30 / 825442/018	Sep., 2012	
X	Artificial Mains Network	R & S	ENV4200 / 848411/10	Feb., 2012	Peripherals
X	LISN	R & S	ESH3-Z5 / 825562/002	Feb., 2012	EUT
	DC LISN	Schwarzbeck	8226 / 176	Mar, 2012	EUT
X	Pulse Limiter	R & S	ESH3-Z2 / 357.8810.52	Feb., 2012	
	No.1 Shielded Room				

Note:

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

2.2. Test Setup



2.3. Limits

FCC Part 15 Subpart C Paragraph 15.207 (dBuV) Limit		
Frequency MHz	Limits	
	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: 2003 on conducted measurement.

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

The EUT was setup to ANSI C63.4, 2003; 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 : Notebook PC
 Test Item : Conducted Emission Test
 Power Line : Line 1
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
LINE 1					
Quasi-Peak					
0.150	9.830	37.510	47.340	-18.660	66.000
0.185	9.830	30.550	40.380	-24.620	65.000
0.232	9.830	26.280	36.110	-27.547	63.657
0.295	9.830	19.630	29.460	-32.397	61.857
0.427	9.830	22.090	31.920	-26.166	58.086
1.564	9.840	19.790	29.630	-26.370	56.000
Average					
0.150	9.830	21.240	31.070	-24.930	56.000
0.185	9.830	16.010	25.840	-29.160	55.000
0.232	9.830	14.630	24.460	-29.197	53.657
0.295	9.830	9.430	19.260	-32.597	51.857
0.427	9.830	17.180	27.010	-21.076	48.086
1.564	9.840	15.630	25.470	-20.530	46.000

Note:

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

Product : Notebook PC
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 2					
Quasi-Peak					
0.166	9.838	37.180	47.018	-18.525	65.543
0.193	9.830	31.610	41.440	-23.331	64.771
0.244	9.830	25.180	35.010	-28.304	63.314
0.435	9.840	22.850	32.690	-25.167	57.857
1.361	9.850	17.750	27.600	-28.400	56.000
10.392	10.069	16.270	26.339	-33.661	60.000
Average					
0.166	9.838	22.600	32.438	-23.105	55.543
0.193	9.830	16.740	26.570	-28.201	54.771
0.244	9.830	10.970	20.800	-32.514	53.314
0.435	9.840	16.980	26.820	-21.037	47.857
1.361	9.850	13.590	23.440	-22.560	46.000
10.392	10.069	11.300	21.369	-28.631	50.000

Note:

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

Product : Notebook PC
Test Item : Conducted Emission Test
Power Line : Line 1
Test Mode : Mode 3: Transmit - BLE (GFSK) (2442MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV	dB	dBuV
LINE 1					
Quasi-Peak					
0.181	9.830	31.930	41.760	-23.354	65.114
0.228	9.830	26.580	36.410	-27.361	63.771
0.252	9.830	23.730	33.560	-29.526	63.086
0.283	9.830	20.280	30.110	-32.090	62.200
0.455	9.830	22.650	32.480	-24.806	57.286
1.720	9.840	18.050	27.890	-28.110	56.000
Average					
0.181	9.830	16.470	26.300	-28.814	55.114
0.228	9.830	14.500	24.330	-29.441	53.771
0.252	9.830	11.890	21.720	-31.366	53.086
0.283	9.830	9.020	18.850	-33.350	52.200
0.455	9.830	18.040	27.870	-19.416	47.286
1.720	9.840	13.880	23.720	-22.280	46.000

Note:

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

Product : Notebook PC
 Test Item : Conducted Emission Test
 Power Line : Line 2
 Test Mode : Mode 3: Transmit - BLE (GFSK) (2442MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level	dB	dBuV
	dB	dBuV	dBuV		
LINE 2					
Quasi-Peak					
0.150	9.840	39.730	49.570	-16.430	66.000
0.181	9.833	32.990	42.823	-22.291	65.114
0.244	9.830	25.900	35.730	-27.584	63.314
0.435	9.840	23.050	32.890	-24.967	57.857
1.505	9.859	17.540	27.399	-28.601	56.000
10.412	10.069	16.120	26.189	-33.811	60.000
Average					
0.150	9.840	21.660	31.500	-24.500	56.000
0.181	9.833	16.470	26.303	-28.811	55.114
0.244	9.830	11.360	21.190	-32.124	53.314
0.435	9.840	17.330	27.170	-20.687	47.857
1.505	9.859	13.120	22.979	-23.021	46.000
10.412	10.069	11.260	21.329	-28.671	50.000

Note:

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

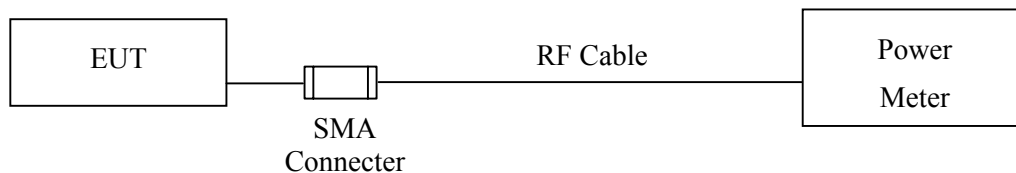
3. Peak Power Output

3.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
X	Power Meter	Anritsu	ML2495A/6K00003357	May, 2012
X	Power Sensor	Anritsu	MA2411B/0738448	Jun, 2012

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, 2003; 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 : Notebook PC
Test Item : Peak Power Output
Test Site : No.3 OATS
Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	4.87	1 Watt= 30 dBm	Pass
Channel 39	2441.00	5.40	1 Watt= 30 dBm	Pass
Channel 78	2480.00	5.98	1 Watt= 30 dBm	Pass

Product : Notebook PC
Test Item : Peak Power Output
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	3.08	1 Watt= 30 dBm	Pass
Channel 39	2441.00	4.16	1 Watt= 30 dBm	Pass
Channel 78	2480.00	4.93	1 Watt= 30 dBm	Pass

Product : Notebook PC
Test Item : Peak Power Output
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit - BLE (GFSK)

Channel No.	Frequency (MHz)	Measurement (dBm)	Required Limit	Result
Channel 00	2402.00	4.47	1 Watt= 30 dBm	Pass
Channel 19	2440.00	5.19	1 Watt= 30 dBm	Pass
Channel 39	2480.00	5.57	1 Watt= 30 dBm	Pass

4. Radiated Emission

4.1. Test Equipment

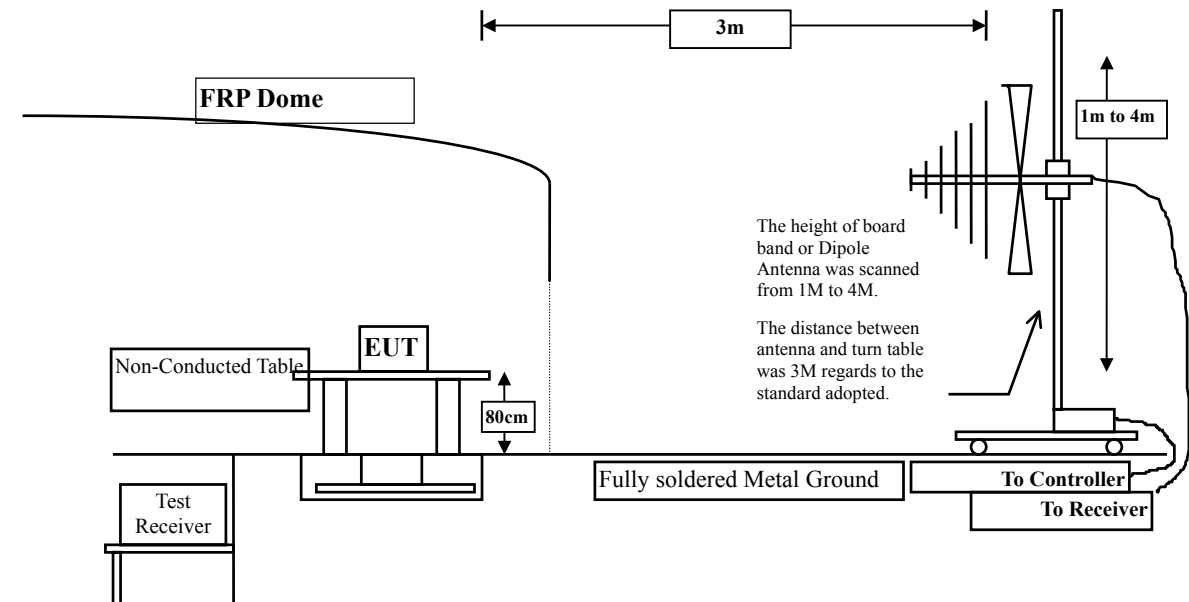
The following test equipments are used during the radiated emission test:

Test Site		Equipment	Manufacturer	Model No./Serial No.	Last Cal.
☒ Site # 3	X	Bilog Antenna	Schaffner Chase	CBL6112B/2673	Sep., 2012
	X	Horn Antenna	Schwarzbeck	BBHA9120D/D305	Sep., 2012
	X	Horn Antenna	Schwarzbeck	BBHA9170/208	Jul., 2012
	X	Pre-Amplifier	Agilent	8447D/2944A09549	Sep., 2012
	X	Spectrum Analyzer	Agilent	E4407B / US39440758	May, 2012
	X	Test Receiver	R & S	ESCS 30/ 825442/018	Sep., 2012
	X	Coaxial Cable	QuieTek	QTK-CABLE/ CAB5	Feb., 2012
	X	Controller	QuieTek	QTK-CONTROLLER/ CTRL3	N/A
	X	Coaxial Switch	Anritsu	MP59B/6200265729	N/A

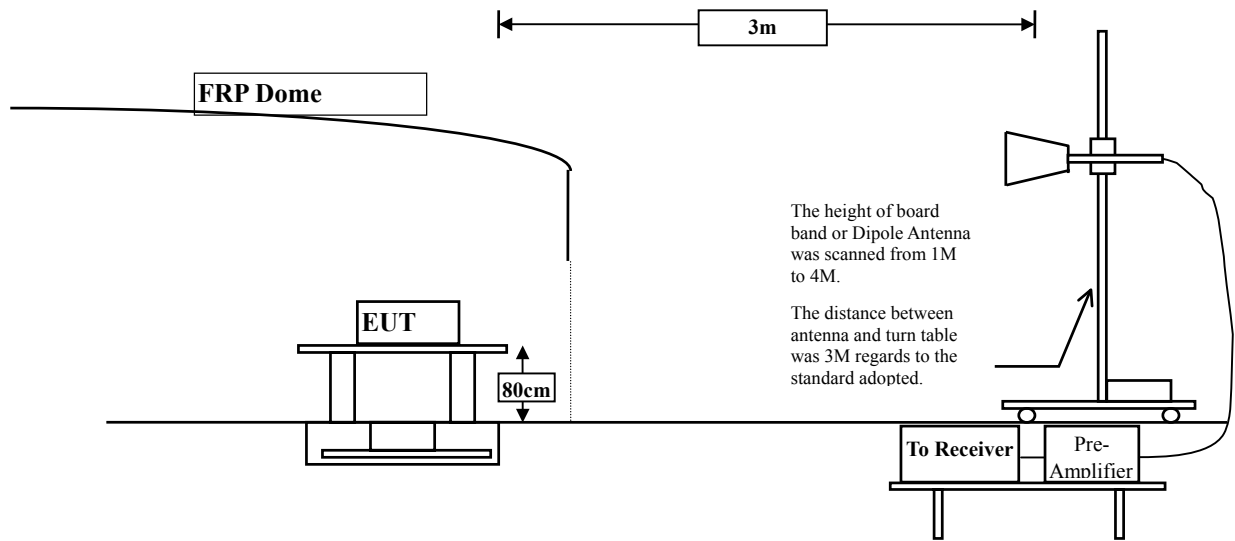
- Note: 1. All equipments are calibrated every one year.
2. The test instruments marked by "X" are used to measure the final test results.

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 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, 2003 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 C63.4:2003 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 from 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 : Notebook 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	39.730	43.057	-30.943	74.000
7206.000	10.136	36.260	46.396	-27.604	74.000
9608.000	13.706	35.890	49.596	-24.404	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4804.000	6.638	41.020	47.657	-26.343	74.000
7260.000	11.885	36.550	48.435	-25.565	74.000
9608.000	14.103	35.980	50.083	-23.917	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.001	39.940	42.941	-31.059	74.000
7323.000	11.846	36.460	48.307	-25.693	74.000
9764.000	12.563	36.030	48.593	-25.407	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4882.000	5.713	40.430	46.144	-27.856	74.000
7323.000	12.727	36.720	49.448	-24.552	74.000
9764.000	13.028	35.990	49.018	-24.982	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)(2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	2.760	36.820	39.580	-34.420	74.000
7440.000	12.567	35.780	48.346	-25.654	74.000
9920.000	13.456	35.790	49.246	-24.754	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4960.000	5.557	40.780	46.337	-27.663	74.000
7440.000	13.426	36.210	49.635	-24.365	74.000
9920.000	13.958	35.450	49.408	-24.592	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.327	40.870	44.197	-29.803	74.000
7206.000	10.136	36.910	47.046	-26.954	74.000
9608.000	13.706	35.700	49.406	-24.594	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4804.000	6.638	41.020	47.657	-26.343	74.000
7206.000	11.005	36.100	47.105	-26.895	74.000
9608.000	14.103	35.700	49.803	-24.197	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4882.000	3.001	40.840	43.841	-30.159	74.000
7323.000	11.846	36.530	48.377	-25.623	74.000
9764.000	12.563	36.430	48.993	-25.007	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4882.000	5.713	41.130	46.844	-27.156	74.000
7323.000	12.727	36.240	48.968	-25.032	74.000
9764.000	13.028	35.940	48.968	-25.032	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	2.760	40.380	43.140	-30.860	74.000
7440.000	12.567	35.560	48.126	-25.874	74.000
9920.000	13.456	35.490	48.946	-25.054	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4960.000	5.557	40.750	46.307	-27.693	74.000
7440.000	13.426	36.500	49.925	-24.075	74.000
9920.000	13.958	35.950	49.908	-24.092	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
Test Item : Harmonic Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 3: Transmit - BLE (GFSK)(2402MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4804.000	3.327	36.240	39.567	-34.433	74.000
7206.000	10.136	35.480	45.616	-28.384	74.000
9608.000	13.706	35.880	49.586	-24.414	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4804.000	6.638	36.520	43.157	-30.843	74.000
7206.000	11.005	36.650	47.655	-26.345	74.000
9608.000	14.103	35.960	50.063	-23.937	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - BLE (GFSK) (2440MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4880.000	3.010	36.560	39.570	-34.430	74.000
7320.000	11.833	36.450	48.284	-25.716	74.000
9760.000	12.580	35.980	48.561	-25.439	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4880.000	5.738	36.330	42.068	-31.932	74.000
7320.000	12.703	35.210	47.913	-26.087	74.000
9760.000	13.052	36.880	49.932	-24.068	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : Harmonic Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - BLE (GFSK) (2480MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
Peak Detector:					
4960.000	2.760	35.980	38.740	-35.260	74.000
7440.000	12.567	35.650	48.216	-25.784	74.000
9920.000	13.456	36.010	49.466	-24.534	74.000
Average					
Detector:					
--					
Vertical					
Peak Detector:					
4960.000	5.557	36.980	42.537	-31.463	74.000
7440.000	13.426	35.180	48.605	-25.395	74.000
9920.000	13.958	36.580	50.538	-23.462	74.000
Average					
Detector:					
--					

Note:

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.

Product : Notebook PC
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
198.780	-10.661	37.354	26.693	-16.807	43.500
284.140	-4.894	39.174	34.280	-11.720	46.000
388.900	-1.684	38.318	36.634	-9.366	46.000
584.840	3.391	30.421	33.812	-12.188	46.000
714.820	3.562	25.775	29.337	-16.663	46.000
802.120	5.091	31.189	36.280	-9.720	46.000
Vertical					
39.700	-1.056	35.037	33.981	-6.019	40.000
198.780	-8.221	37.973	29.752	-13.748	43.500
276.380	-8.653	37.186	28.533	-17.467	46.000
388.900	-3.064	36.838	33.774	-12.226	46.000
518.880	-0.546	26.895	26.349	-19.651	46.000
802.120	3.161	27.847	31.008	-14.992	46.000

Note:

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.

Product : Notebook PC
Test Item : General Radiated Emission
Test Site : No.3 OATS
Test Mode : Mode 2: Transmit - 3Mbps (8DPSK) (2441MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
39.700	-3.616	31.888	28.272	-11.728	40.000
282.200	-5.211	38.791	33.580	-12.420	46.000
388.900	-1.684	35.963	34.279	-11.721	46.000
418.000	-3.234	32.094	28.860	-17.140	46.000
584.840	3.391	29.194	32.585	-13.415	46.000
802.120	5.091	31.819	36.910	-9.090	46.000
Vertical					
39.700	-1.056	37.890	36.834	-3.166	40.000
198.780	-8.221	36.779	28.558	-14.942	43.500
388.900	-3.064	36.297	33.233	-12.767	46.000
482.020	-3.985	28.868	24.883	-21.117	46.000
677.960	0.527	23.833	24.360	-21.640	46.000
802.120	3.161	27.399	30.560	-15.440	46.000

Note:

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.

Product : Notebook PC
 Test Item : General Radiated Emission
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - BLE (GFSK) (2440MHz)

Frequency	Correct	Reading	Measurement	Margin	Limit
MHz	Factor	Level	Level		
	dB	dBuV	dBuV/m	dB	dBuV/m
Horizontal					
80.440	-12.510	35.068	22.558	-17.442	40.000
299.660	-3.585	39.074	35.489	-10.511	46.000
418.000	-3.234	33.479	30.245	-15.755	46.000
584.840	3.391	30.795	34.186	-11.814	46.000
644.980	1.552	28.804	30.356	-15.644	46.000
802.120	5.091	32.372	37.463	-8.537	46.000
Vertical					
64.920	-5.683	33.449	27.766	-12.234	40.000
198.780	-8.221	37.808	29.587	-13.913	43.500
388.900	-3.064	35.963	32.899	-13.101	46.000
499.480	-0.852	27.216	26.364	-19.636	46.000
703.180	0.139	27.816	27.954	-18.046	46.000
802.120	3.161	26.529	29.690	-16.310	46.000

Note:

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.

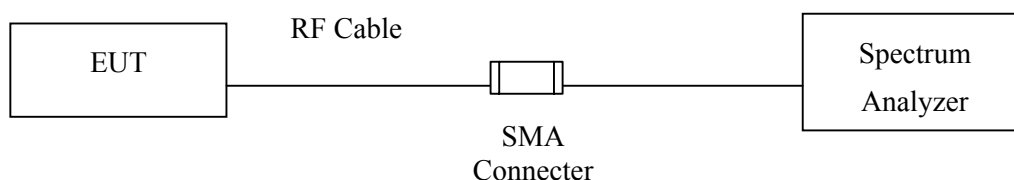
5. RF Antenna Conducted Test

5.1. Test Equipment

	Equipment	Manufacturer	Model No./Serial No.	Last Cal.
	Spectrum Analyzer	R&S	FSP40 / 100170	Jun, 2012
	Spectrum Analyzer	Agilent	E4407B / US39440758	Jun, 2012
X	Spectrum Analyzer	Agilent	N9010A / MY48030495	Apr., 2012

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, 2003; tested to FHSS test procedure of FCC Public Notice DA 00-705 for compliance to FCC 47CFR 15.247 requirements.

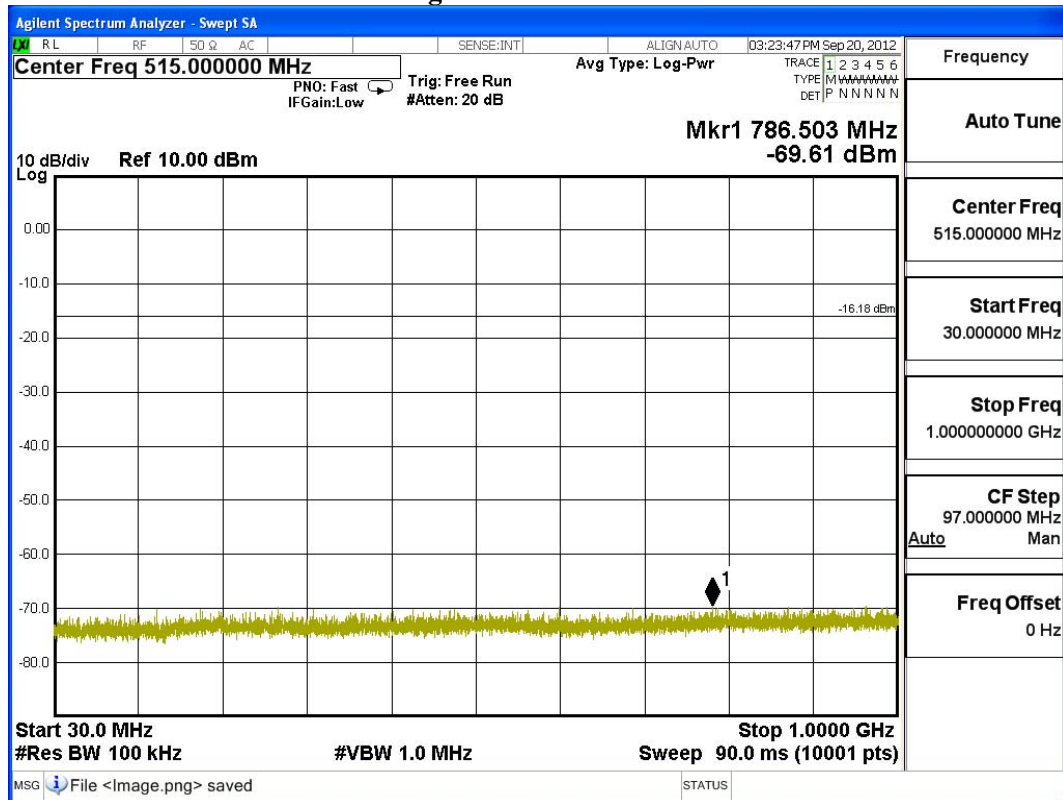
5.5. Uncertainty

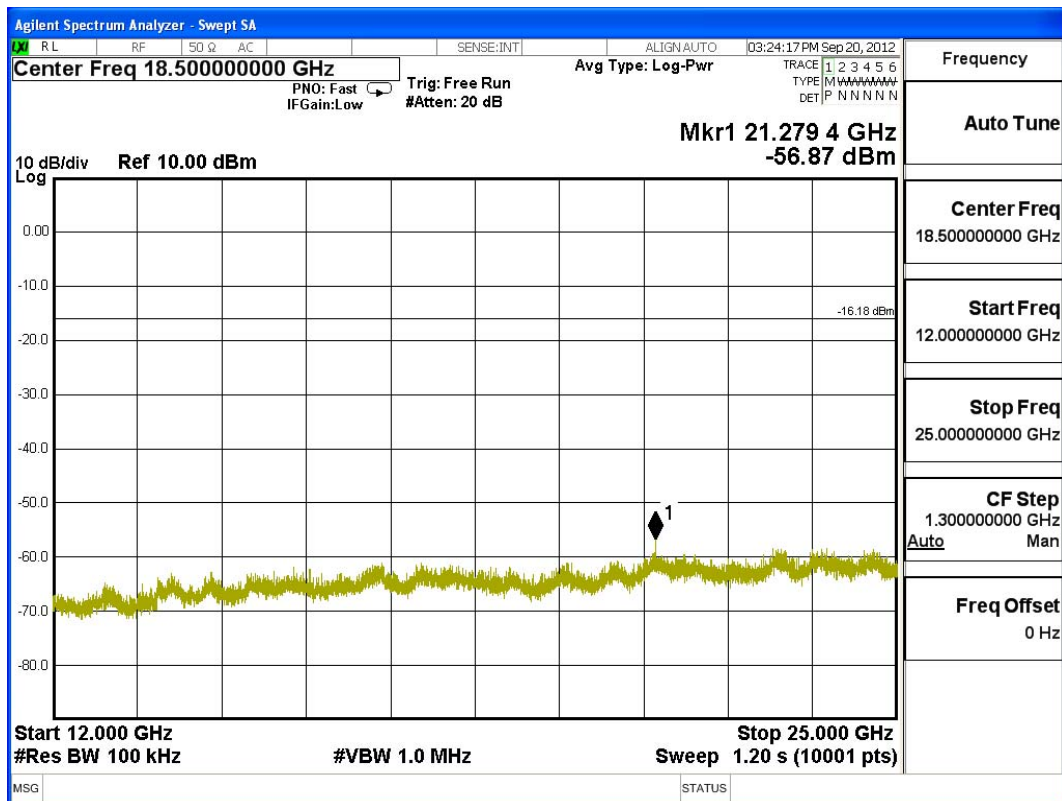
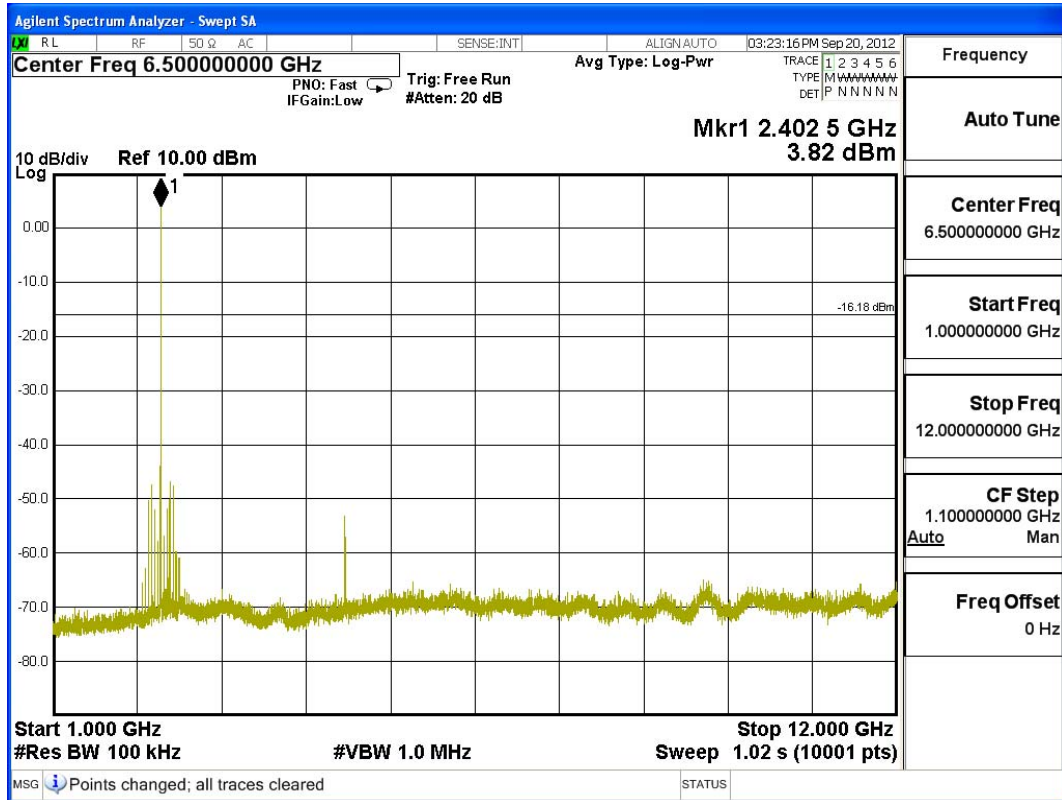
± 150Hz

5.6. Test Result of RF Antenna Conducted Test

Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

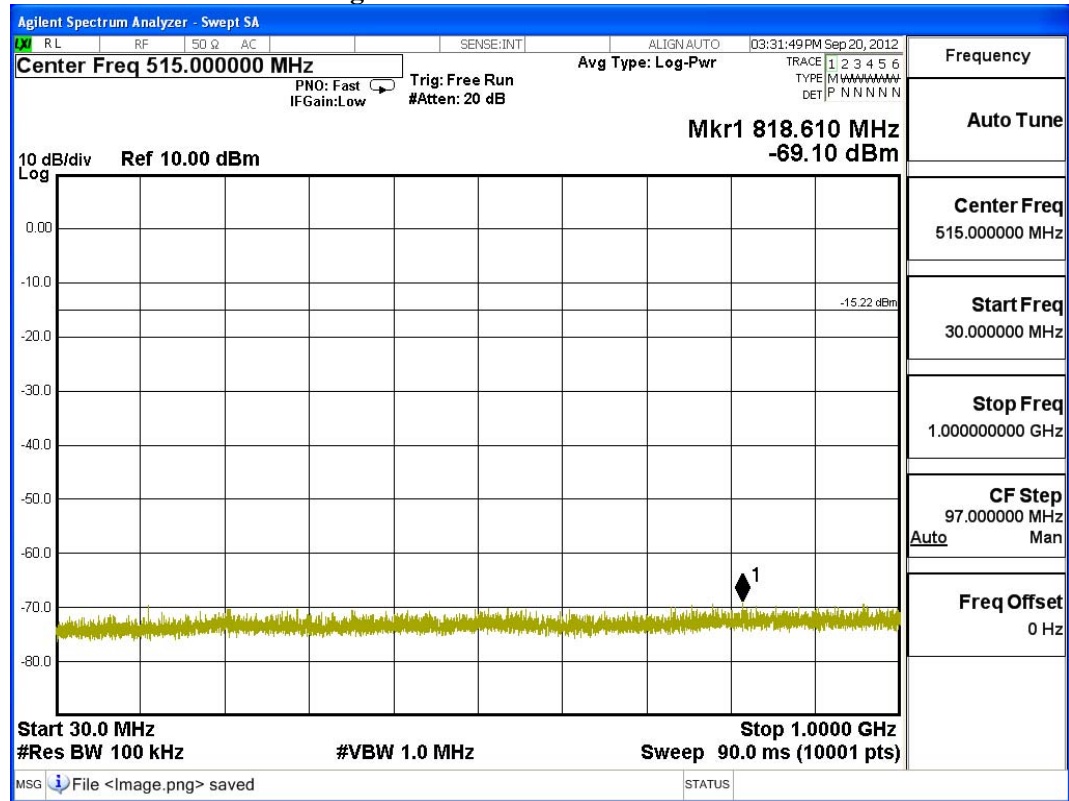
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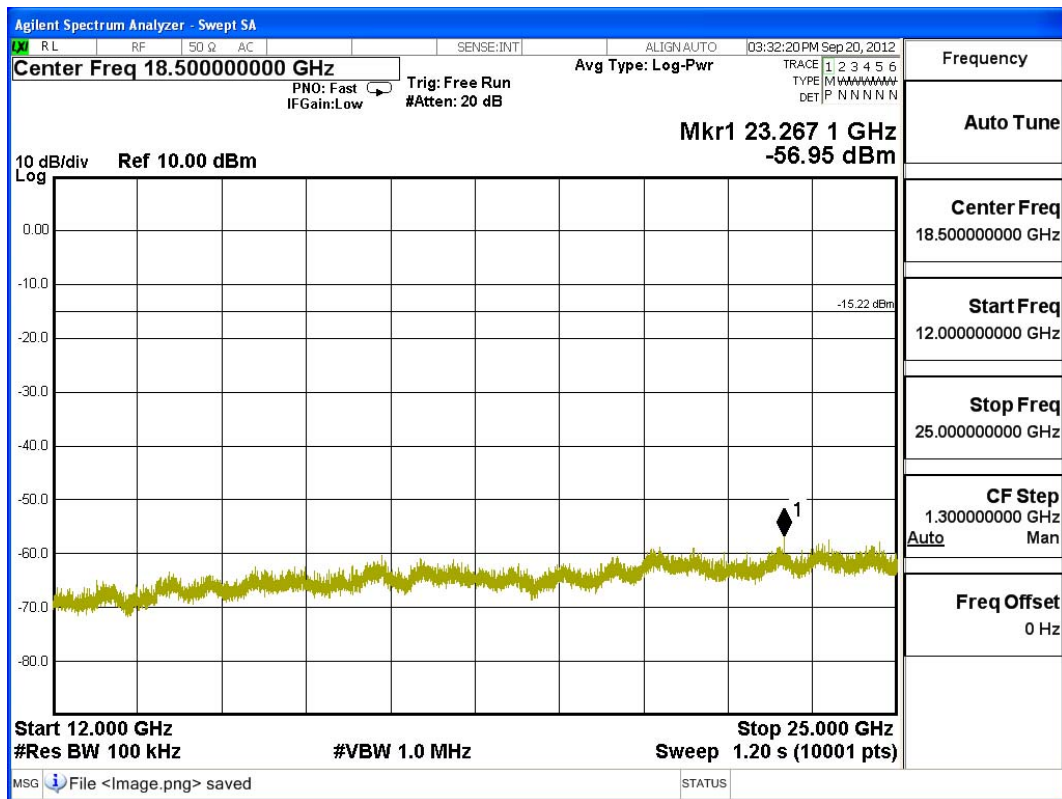
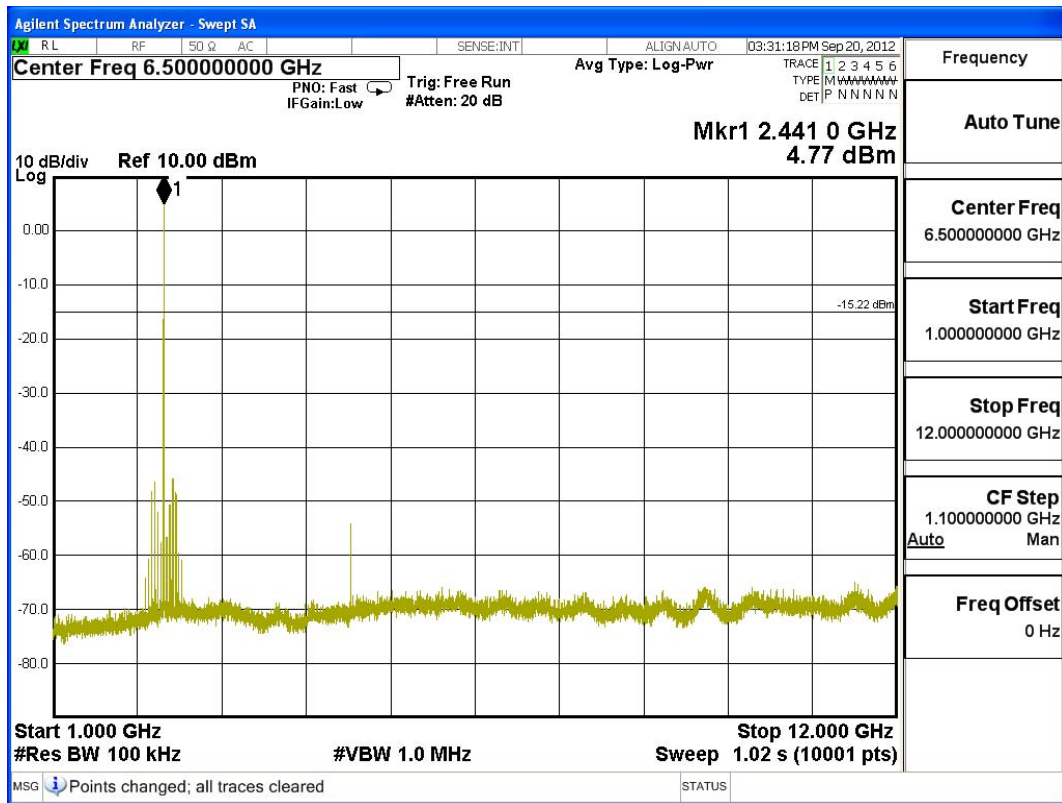




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

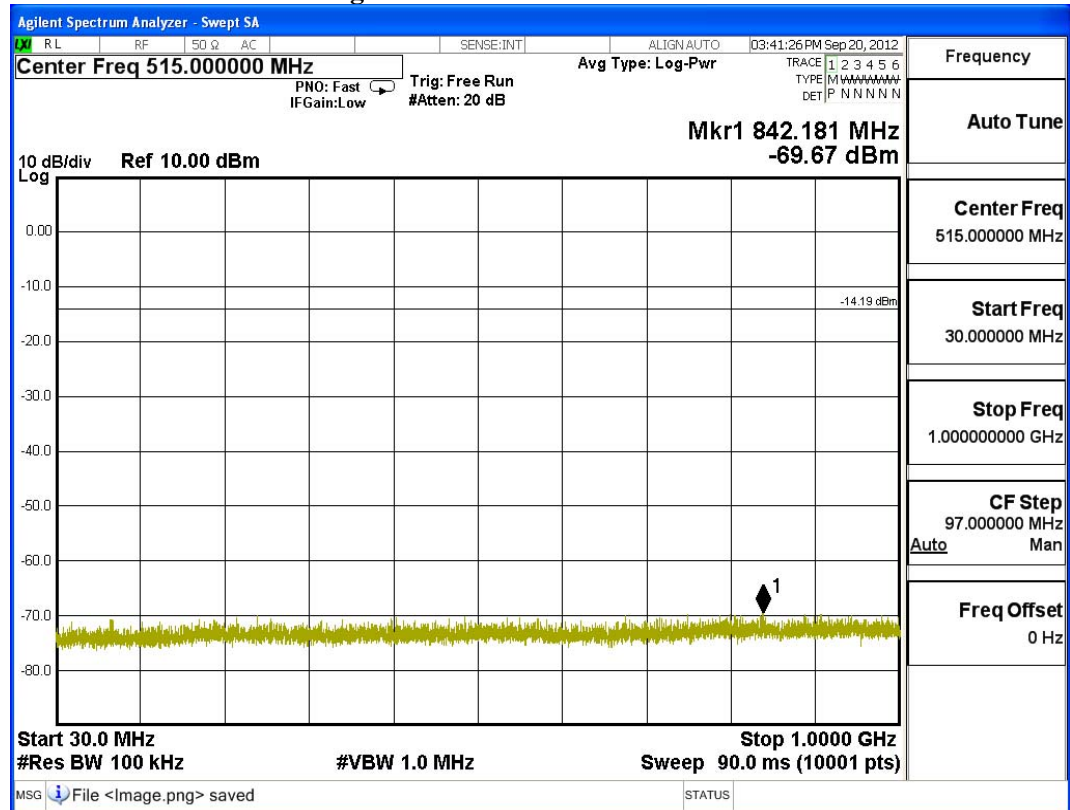
Figure Channel 39:

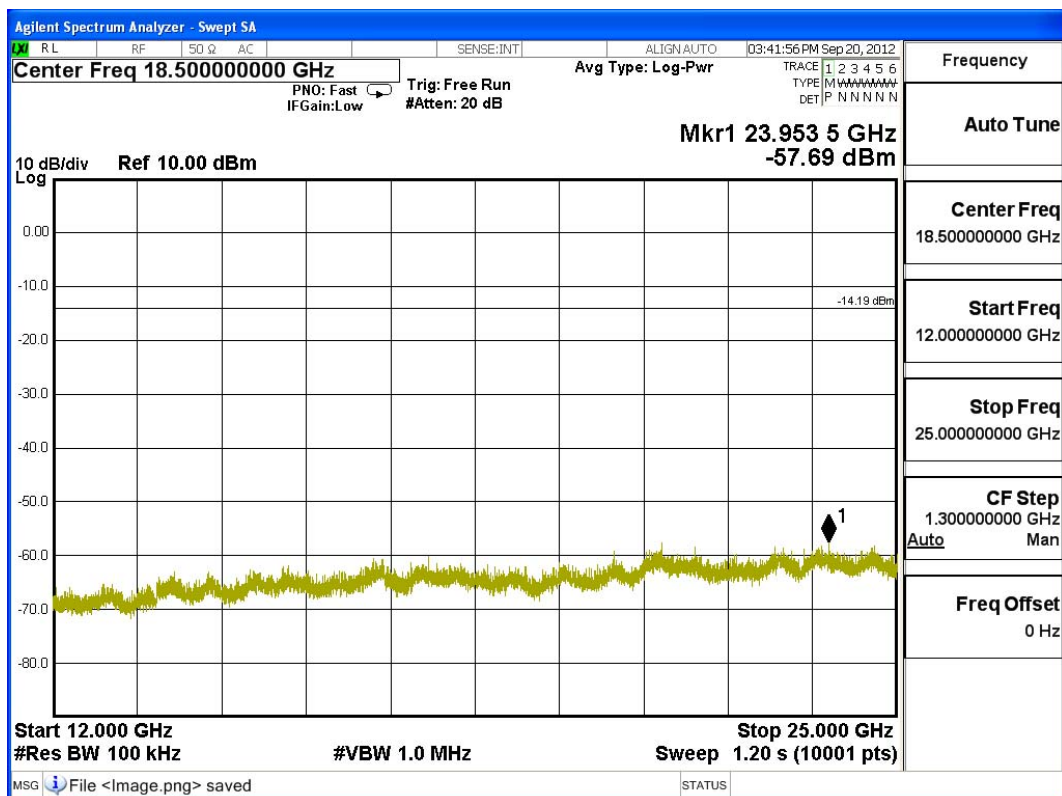
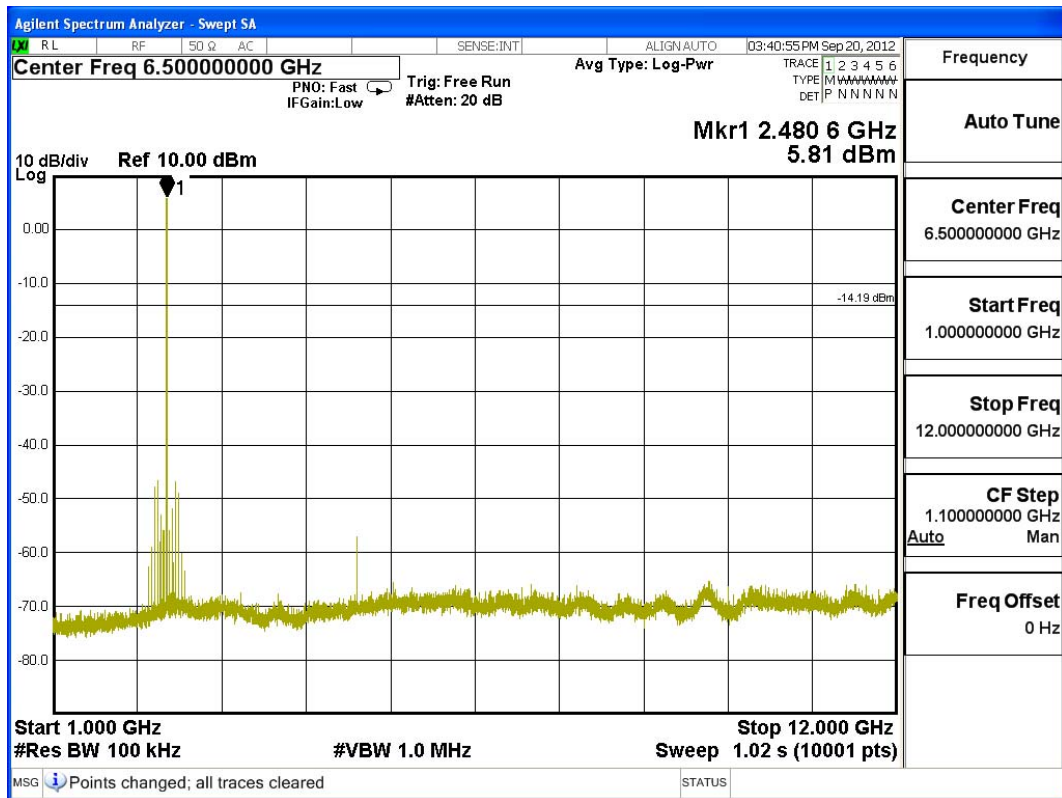




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 1: Transmit - 1Mbps (GFSK)

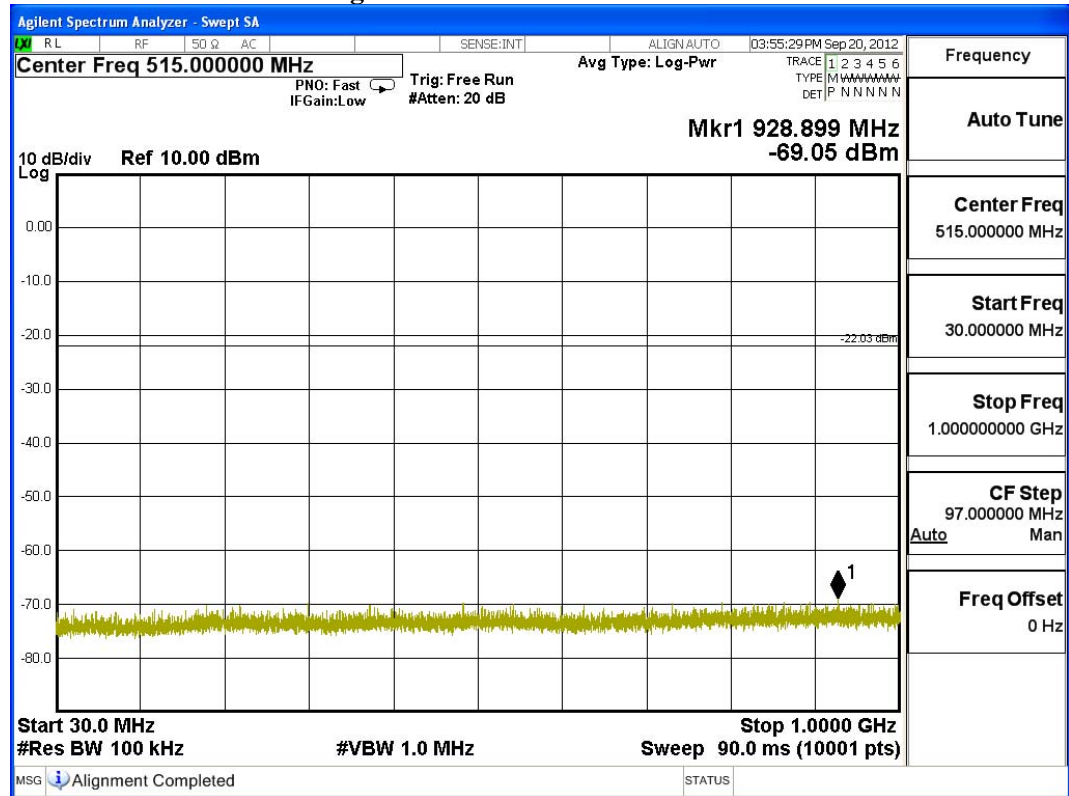
Figure Channel 78:

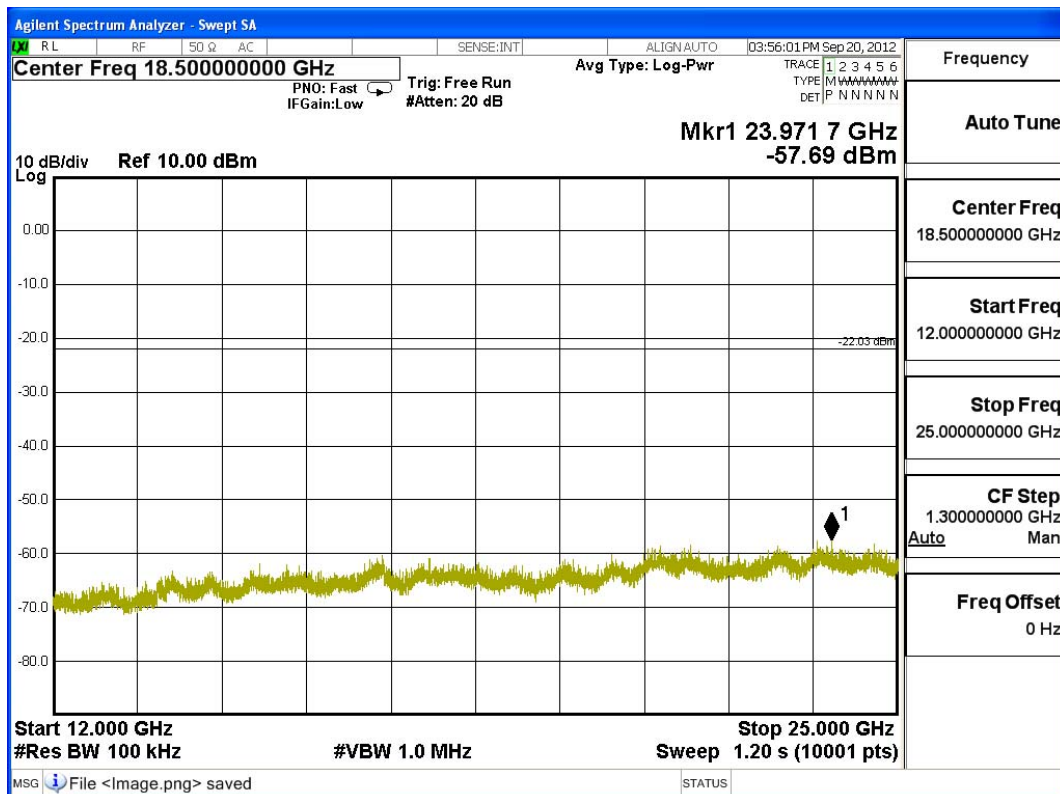
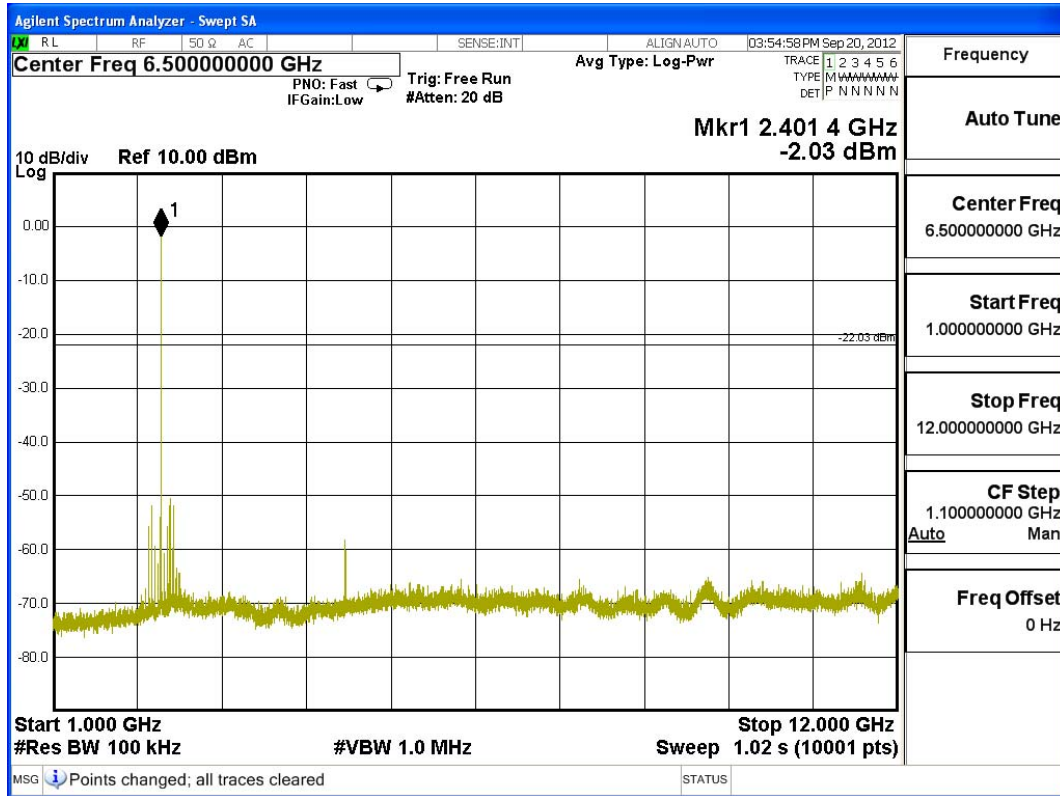




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

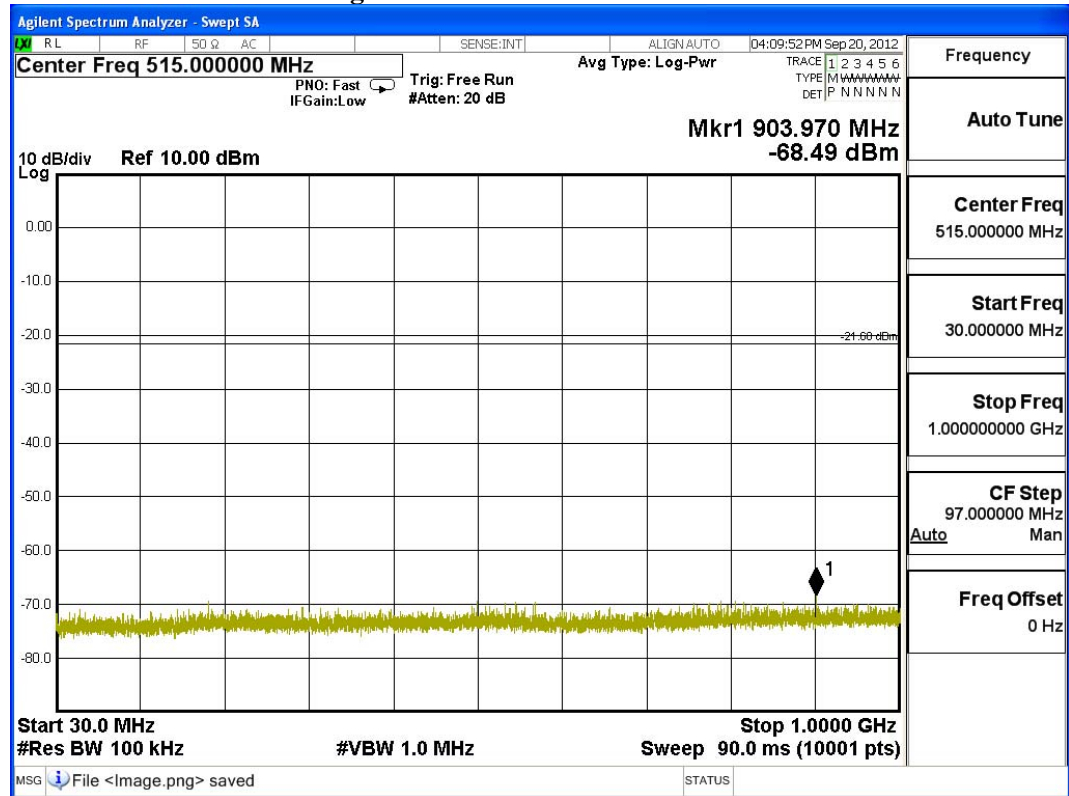
Figure Channel 00:

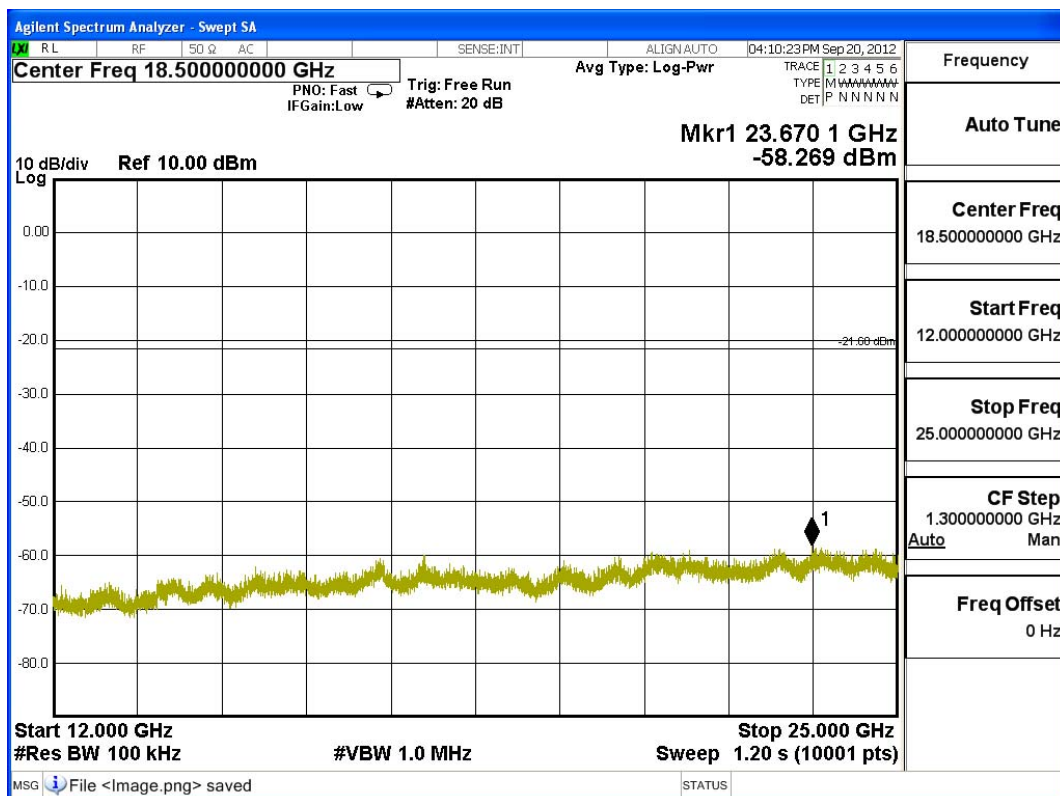
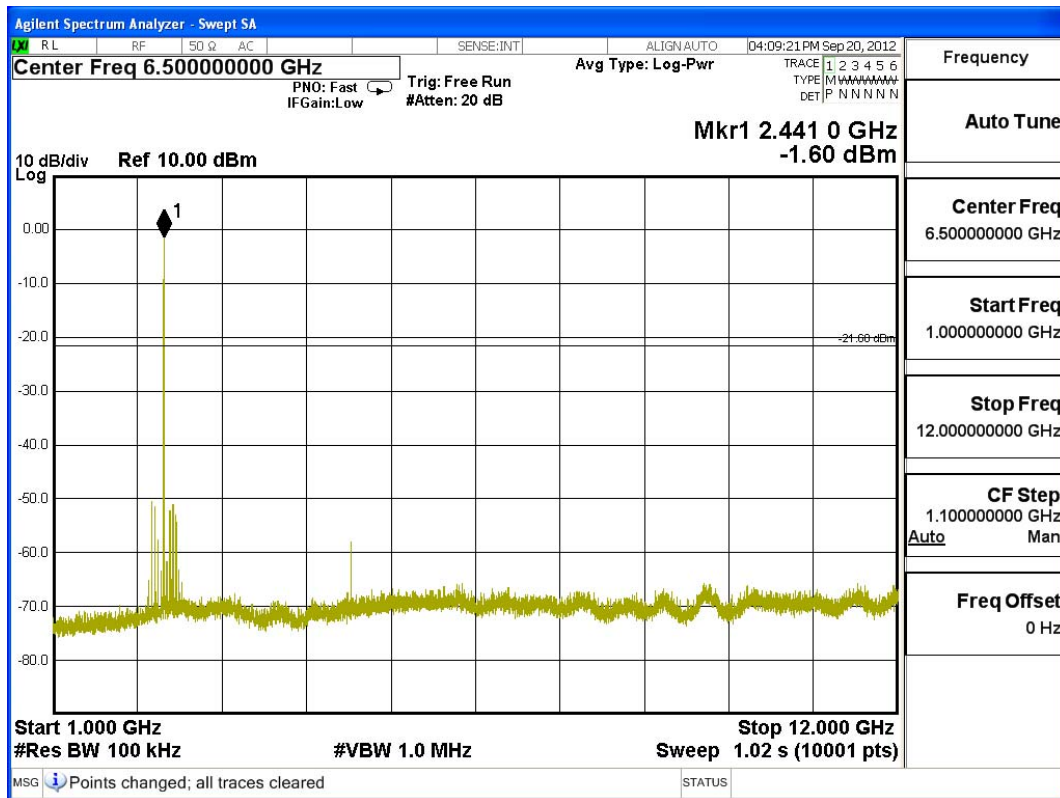




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

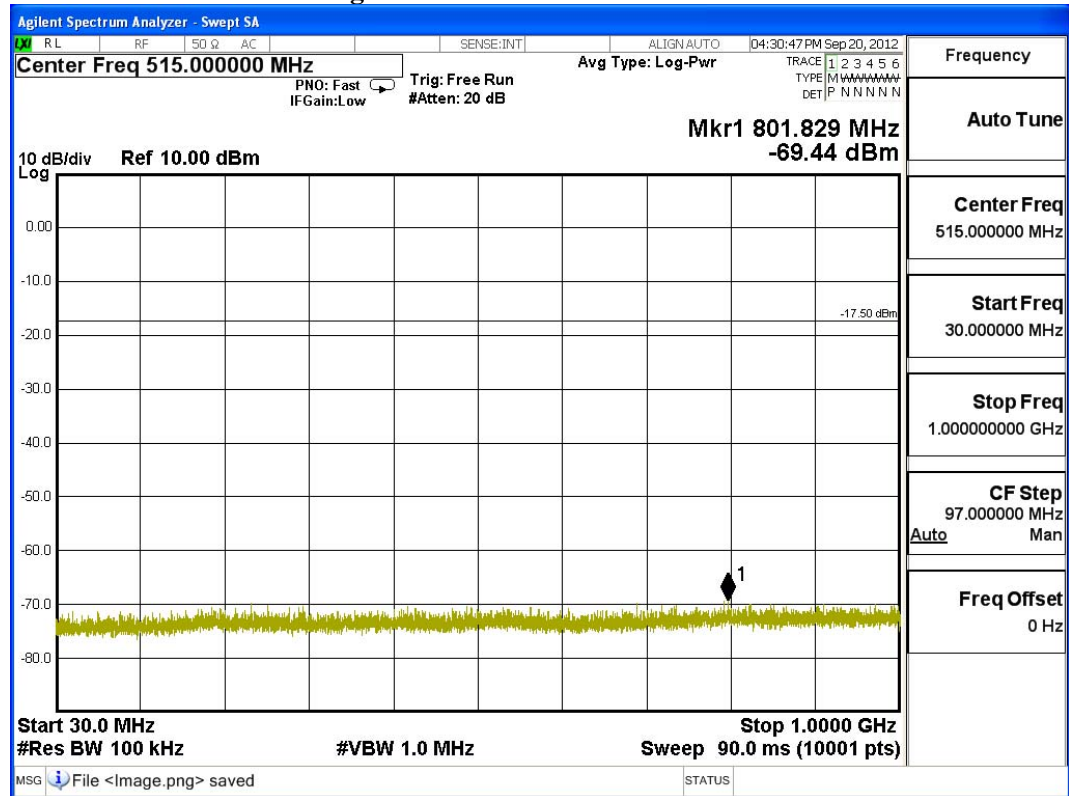
Figure Channel 39:

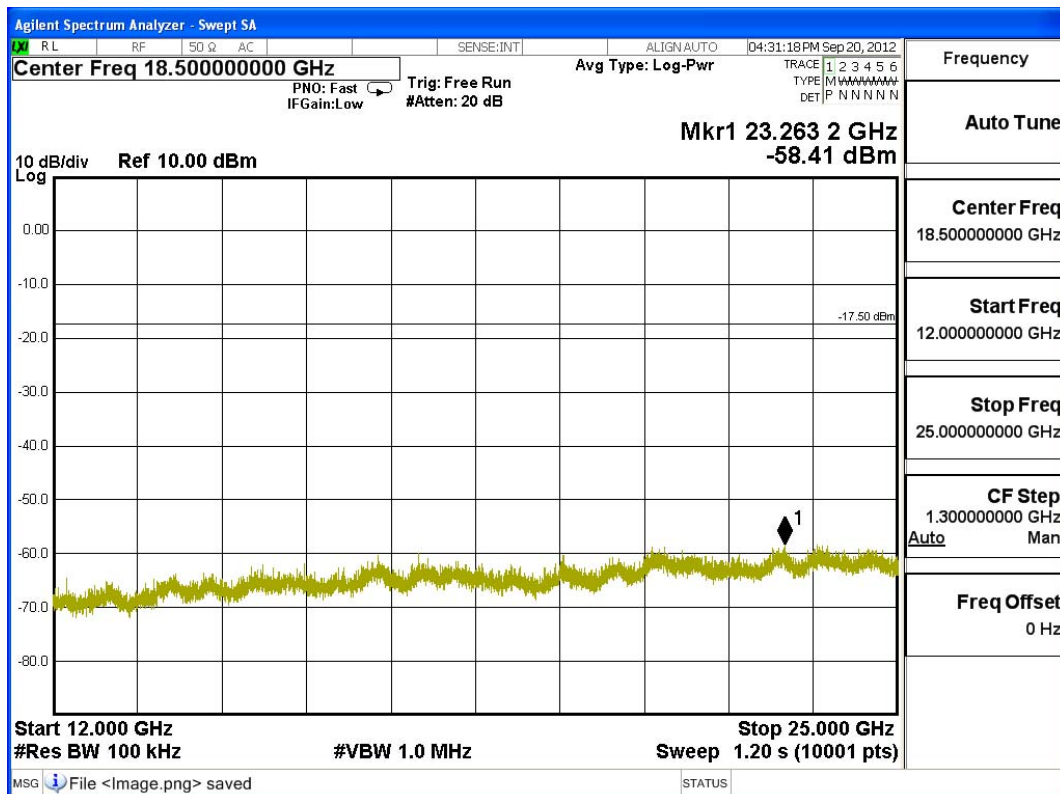
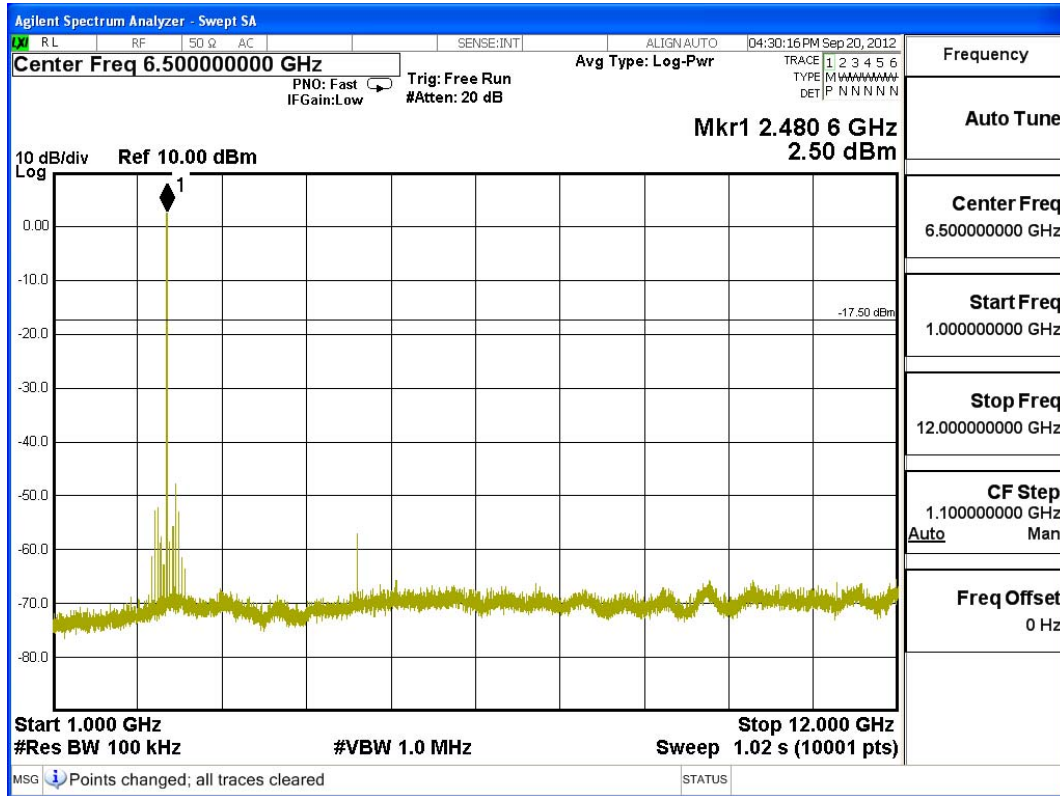




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 2: Transmit - 3Mbps (8DPSK)

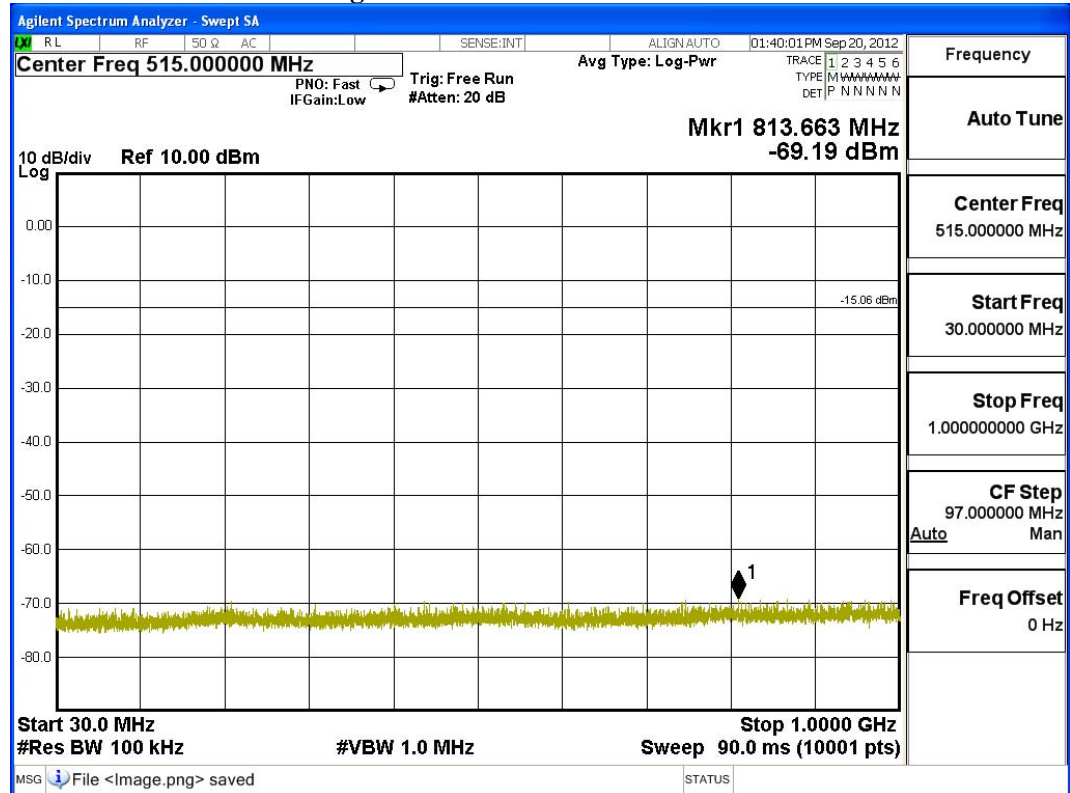
Figure Channel 78:

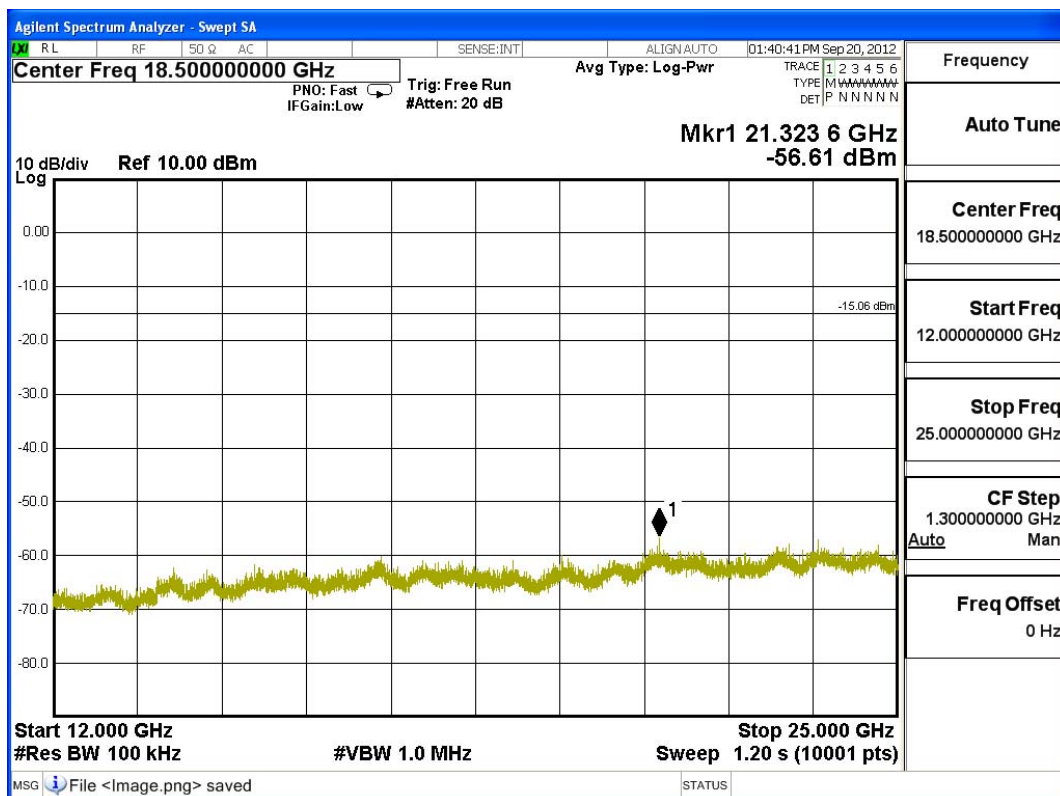
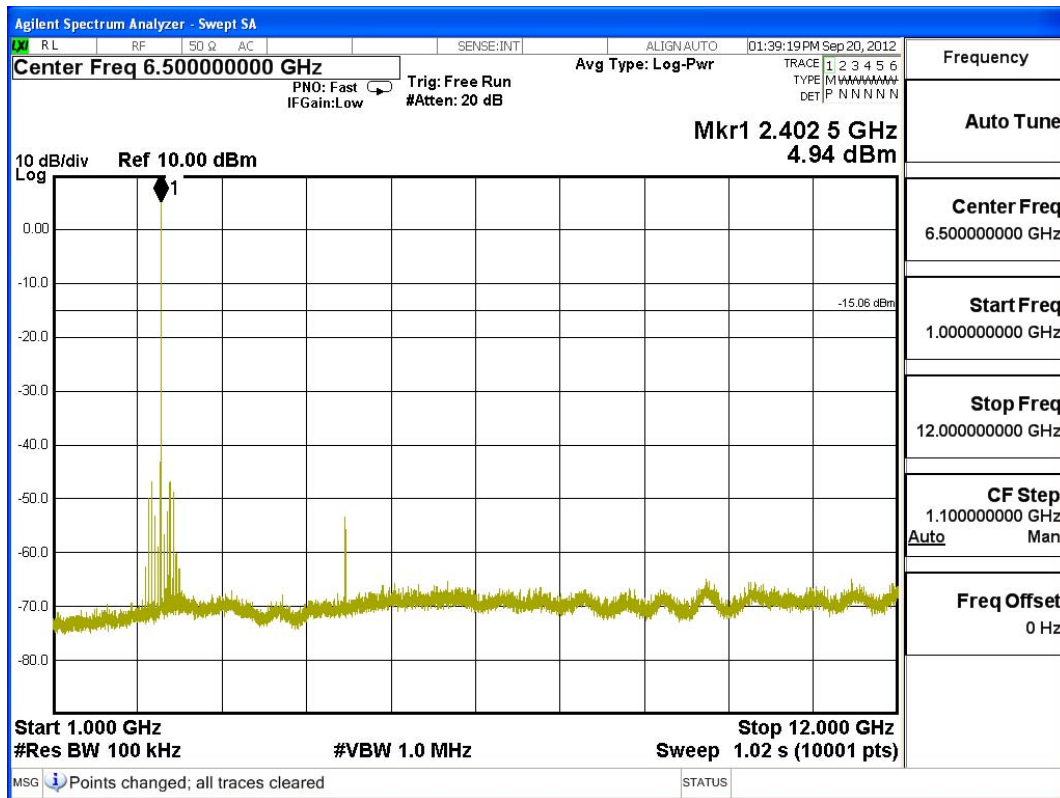




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - BLE (GFSK)

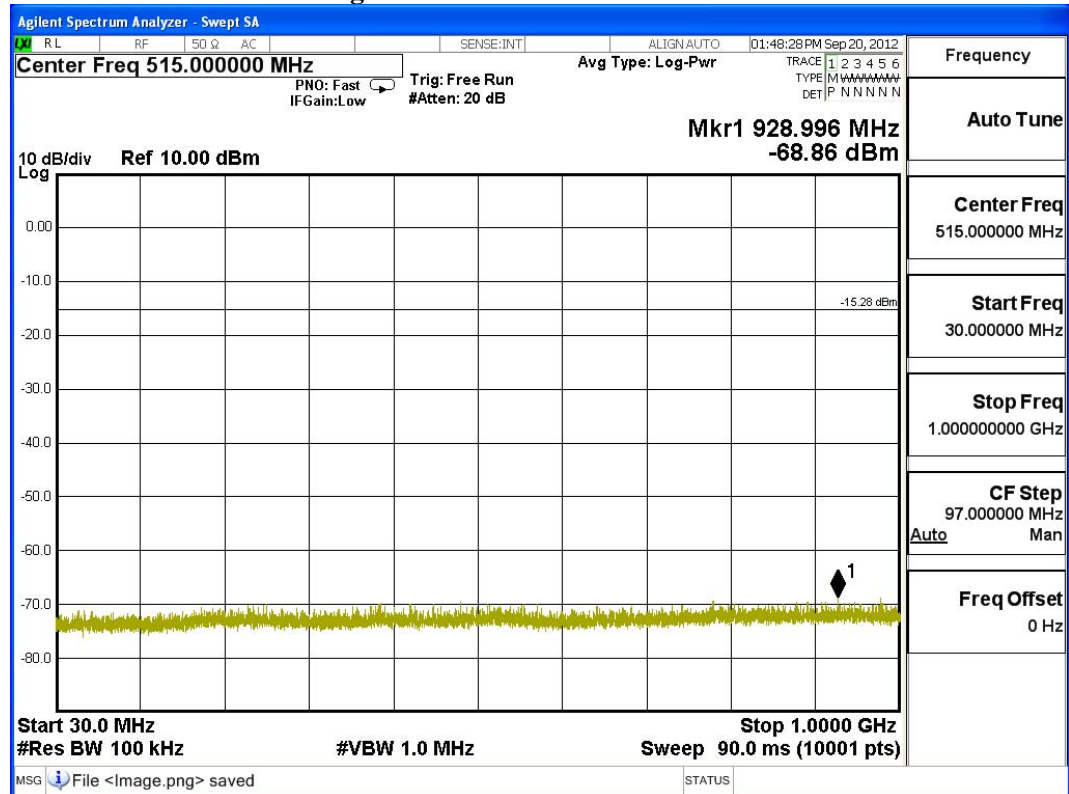
Figure Channel 00:

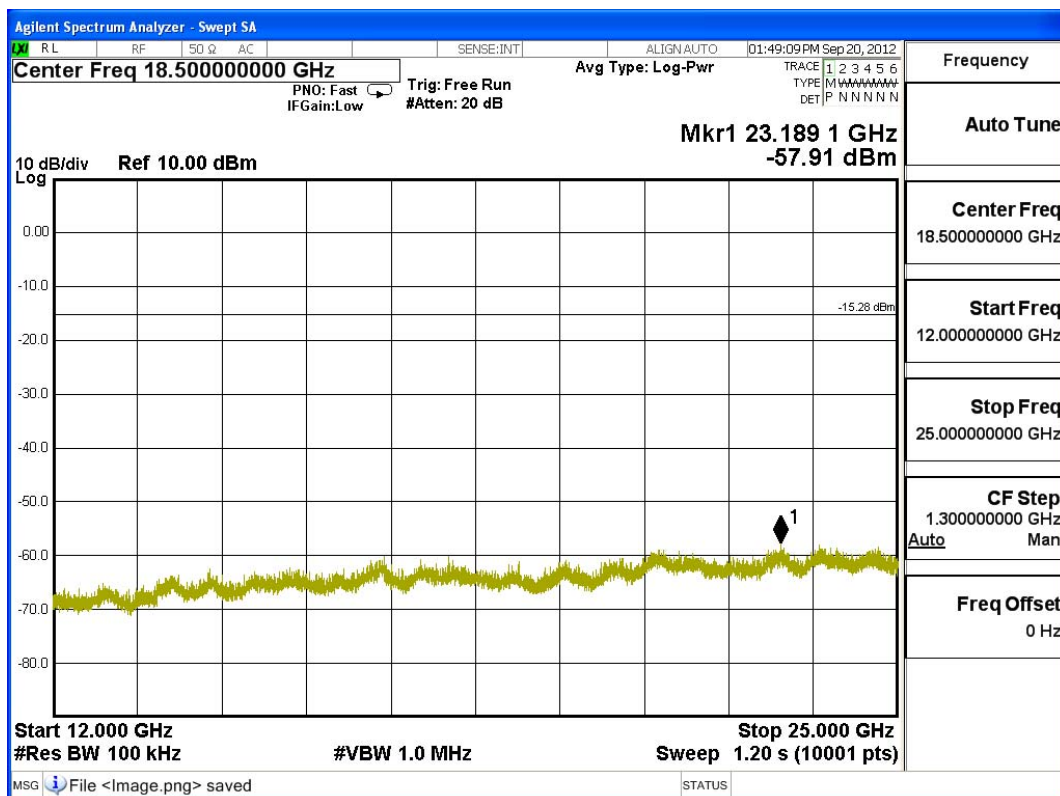
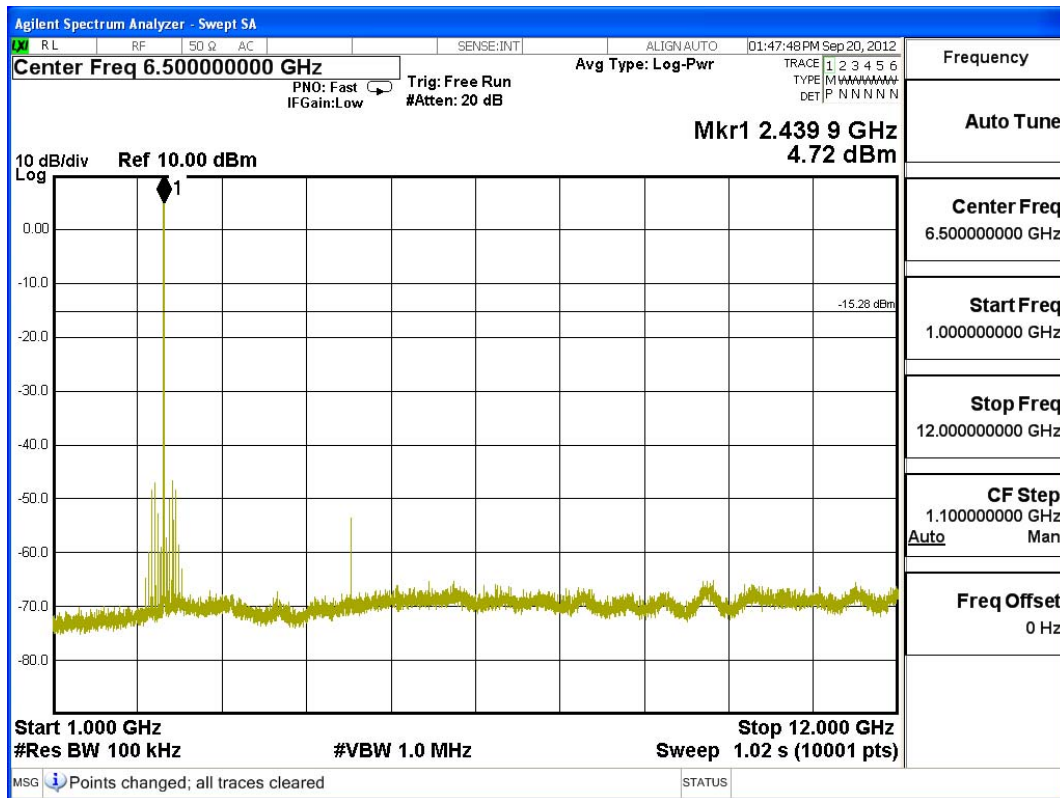




Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - BLE (GFSK)

Figure Channel 19:





Product : Notebook PC
 Test Item : RF Antenna Conducted Test
 Test Site : No.3 OATS
 Test Mode : Mode 3: Transmit - BLE (GFSK)

Figure Channel 39:

