



## Test Report

Product Name	PX3 TX
Model No	TB300-2241-01
FCC ID.	XGB-TB2241

Applicant	Voyetra Turtle Beach, Inc.
Address	150 Clearbrook Rd Suite 162 Elmsford, NY 10523 U.S.A.

Date of Receipt	March 24, 2011
Issue Date	April 27, 2011
Report No.	113382R-RFUSP28V01
Report Version	V1.0

The test results relate only to the samples tested.

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# Test Report Certification

Issue Date: April 27, 2011

Report No.: 113382R-RFUSP28V01



**Accredited by NIST (NVLAP)**  
 NVLAP Lab Code: 200533-0

Product Name	PX3 TX
Applicant	Voyetra Turtle Beach, Inc.
Address	150 Clearbrook Rd Suite 162 Elmsford, NY 10523 U.S.A.
Manufacturer	Voyetra Turtle Beach, Inc.
Model No.	TB300-2241-01
EUT Rated Voltage	DC 5V (via USB)
EUT Test Voltage	AC 120V/60Hz
Trade Name	TURTLE BEACH
Applicable Standard	FCC CFR Title 47 Part 15 Subpart C: 2010 ANSI C63.4: 2009
Test Result	Complied



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 ( Manager / Vincent Lin )

Testing Laboratory  
**0914**

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## 1. GENERAL INFORMATION

### 1.1. EUT Description

Product Name	PX3 TX
Trade Name	TURTLE BEACH
Model No.	TB300-2241-01
FCC ID.	XGB-TB2241
Frequency Range	2405-2477MHz
Number of Channels	37CH
Channel Separation	2MHz
Type of Modulation	$\pi/4$ DQPSK (Differential Quadrature Phase Shift Keying)
Antenna Type	Printed on PCB
Antenna Gain	Refer to the table "Antenna List"
Channel Control	Auto
RCA to Audio Cable	Non-Shielded, 2.2m
USB Cable	Non-Shielded, 2.0m
USB Cable	Non-Shielded, 4.0m

#### Antenna List

No.	Manufacturer	Part No.	Peak Gain
1	Voyetra Turtle Beach, Inc.	N/A	2.8dBi for 2.4 GHz

Note: The antenna of EUT is conform to FCC 15.203

## Center Frequency of Each Channel:

Channel	Frequency	Channel	Frequency	Channel	Frequency
Channel 2:	2405 MHz	Channel 3:	2407 MHz	Channel 4:	2409 MHz
Channel 5:	2411 MHz	Channel 6:	2413 MHz	Channel 7:	2415 MHz
Channel 8:	2417 MHz	Channel 9:	2419 MHz	Channel 10:	2421 MHz
Channel 11:	2423 MHz	Channel 12:	2425 MHz	Channel 13:	2427 MHz
Channel 14:	2429 MHz	Channel 15:	2431 MHz	Channel 16:	2433 MHz
Channel 17:	2435 MHz	Channel 18:	2437 MHz	Channel 19:	2439 MHz
Channel 20:	2441 MHz	Channel 21:	2443 MHz	Channel 22:	2445 MHz
Channel 23:	2447 MHz	Channel 24:	2449 MHz	Channel 25:	2451 MHz
Channel 26:	2453 MHz	Channel 27:	2455 MHz	Channel 28:	2457 MHz
Channel 29:	2459 MHz	Channel 30:	2461 MHz	Channel 31:	2463 MHz
Channel 32:	2465 MHz	Channel 33:	2467 MHz	Channel 34:	2469 MHz
Channel 35:	2471 MHz	Channel 36:	2473 MHz	Channel 37:	2475 MHz
Channel 38:	2477 MHz				

## Note:

1. The EUT is a PX3 TX with a built-in 2.4GHz transceiver.
2. Regarding to the operation frequency, the lowest, middle and highest frequency are selected to perform the test.
3. These tests are conducted on a sample for the purpose of demonstrating compliance of 2.4GHz transmitter with Part 15 Subpart C Paragraph 15.247 of spread spectrum devices
4. The radiation measurements are performed in X, Y, Z axis positioning. Only the worst case is shown in the report.

## 1.2. Operational Description

The EUT is a PX3 TX with a built-in 2.4GHz transceiver, It uses the latest 2.4GHz wireless audio solution which can provide high quality wide-band audio and robust wireless audio transmission. Total numbers of channels supported by this device are 37 channels operating from 2405 to 2477MHz with 2MHz channel spacing. The antenna type is Printed antenna and the modulation type is  $\pi/4$  DQPSK (Differential Quadrature Phase Shift Keying).

The device can transmit wireless signal and receive signal for associate device.

Test Mode:	Mode 1: Transmit
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### 1.3. Tested System Details

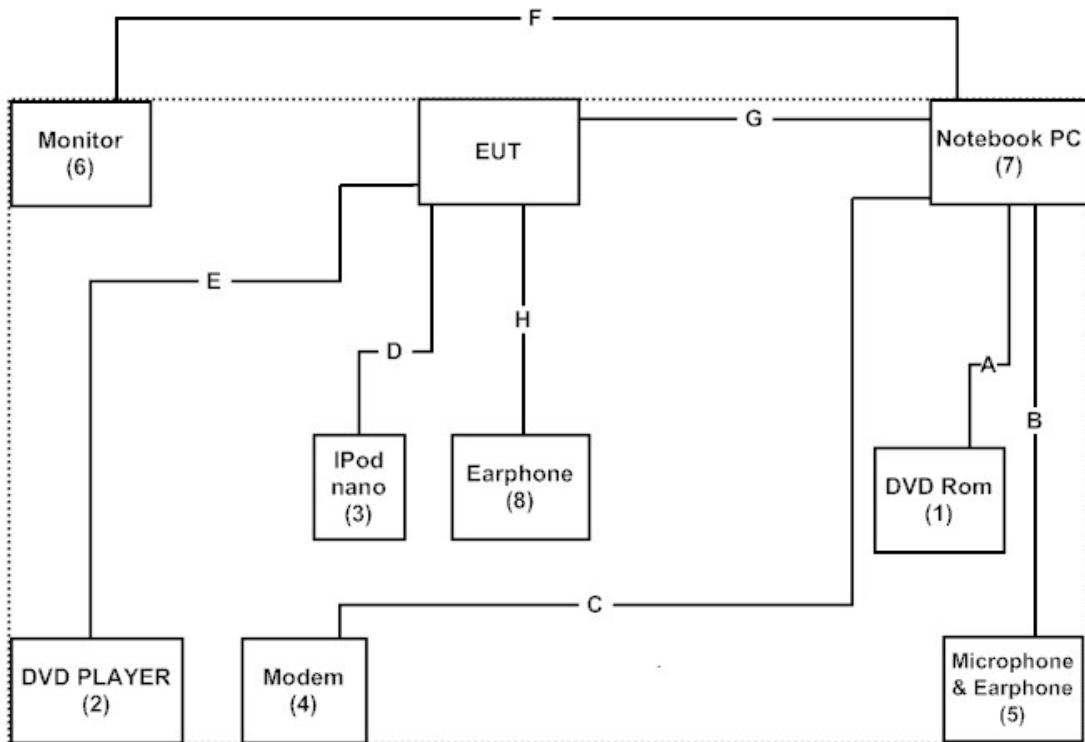
The types for all equipment, plus descriptions of all cables used in the tested system (including inserted cards) are:

Product	Manufacturer	Model No.	Serial No.	Power Cord
1 DVD Rom	DELL	P01S	P0690A01	N/A
2 DVD PLAYER	Pioneer	DV-600AV	GHKD003531 LS	Non-Shielded, 1.8m
3 iPod nano	Apple	A1199	YM709RBUVQ5	N/A
4 Modem	ACEEX	DM-1414	0102027532	Non-Shielded, 1.8m
5 Microphone & Earphone	Ergotech	ET-E201	N/A	N/A
6 Monitor	Dell	2407WFPb	CN-0FC255-46633-67T-04AS	Non-Shielded, 1.8m
7 Notebook PC	DELL	PPT	N/A	Non-Shielded, 0.8m
8 Earphone	TATUNG	TB300-2240-01	N/A	N/A

	Signal Cable Type	Signal cable Description
A	DVD Rom Cable	Shielded, 1.0m
B	Microphone & Earphone Cable	Non-Shielded, 1.0m
C	Modem Cable	Shielded, 1.0m
D	Audio Cable	Shielded, 2.0m
E	RCA to Audio Cable	Non-Shielded, 2.2m
F	VGA Cable	Shielded, 1.8m, with two ferrite cores bonded.
G	USB Cable	Non-Shielded, 2.0m
H	USB Cable	Non-Shielded, 4.0m



### 1.4. Configuration of Tested System



## 1.5. EUT Exercise Software

- (1) Setup the EUT as shown in section 1.4.
- (2) Connect the EUT to a notebook via a USB cable.
- (3) Execute AWAflash.exe on the notebook.
- (4) Double-click “AV7211” and select USB as a primary connection interface.
- (5) Setup the test channel.
- (6) Press “Apply” to start the continuous transmission.
- (7) Verify that the EUT works correctly.

**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	50-65
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  
 Federal Communications Commission  
 FCC Engineering Laboratory  
 7435 Oakland Mills Road  
 Columbia, MD 21046  
 Registration Number: 92195



Accreditation on NVLAP  
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FCC Accreditation Number: TW1014



## 2. Conducted Emission

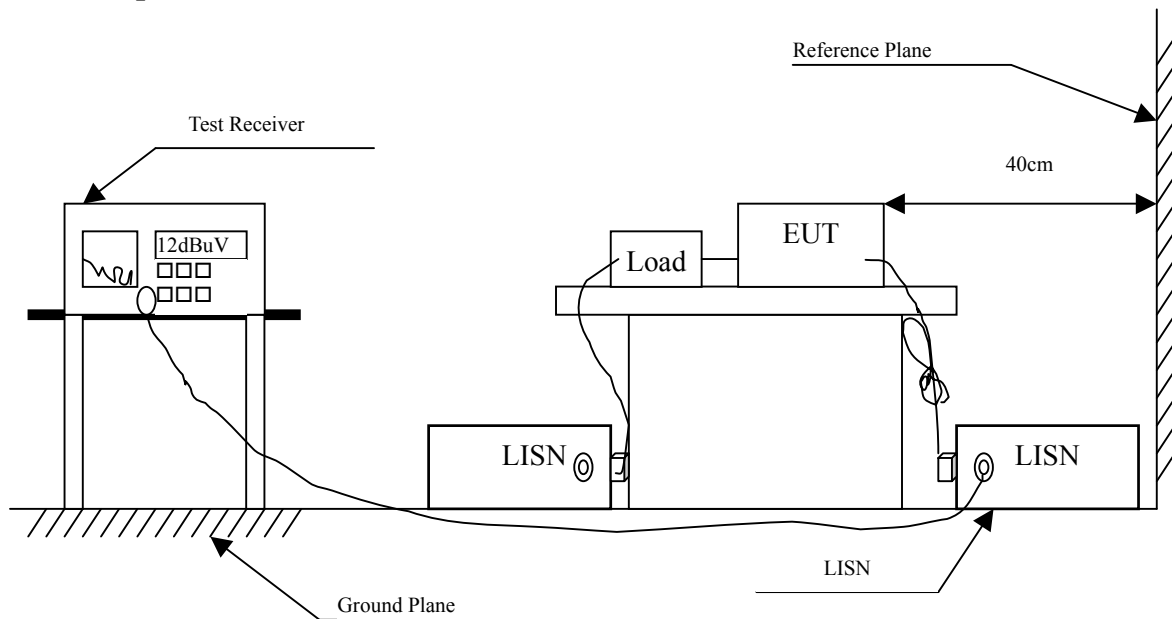
### 2.1. Test Equipment

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 30/825442/17	May, 2010	
2	L.I.S.N.	R & S	ESH3-Z5/825016/6	May, 2010	EUT
3	L.I.S.N.	Kyoritsu	KNW-407/8-1420-3	May, 2010	Peripherals
4	Pulse Limiter	R & S	ESH3-Z2	May, 2010	
5	No.1 Shielded Room			N/A	

Note: All instruments are calibrated every one year.

### 2.2. Test Setup



**2.3. Limits**

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

**2.4. Test Procedure**

The EUT and simulators 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 refers 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 of 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.

**2.5. Uncertainty**

± 2.26 dB

## 2.6. Test Result of Conducted Emission

Product : PX3 TX  
 Test Item : Conducted Emission Test  
 Power Line : Line 1  
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 1</b>					
<b>Quasi-Peak</b>					
0.185	9.719	35.560	45.279	-19.721	65.000
0.244	9.679	32.680	42.359	-20.955	63.314
0.302	9.650	28.570	38.220	-23.437	61.657
0.361	9.650	23.220	32.870	-27.101	59.971
1.759	9.680	19.680	29.360	-26.640	56.000
4.002	9.700	26.870	36.570	-19.430	56.000
<b>Average</b>					
0.185	9.719	27.010	36.729	-18.271	55.000
0.244	9.679	26.710	36.389	-16.925	53.314
0.302	9.650	21.240	30.890	-20.767	51.657
0.361	9.650	16.450	26.100	-23.871	49.971
1.759	9.680	17.290	26.970	-19.030	46.000
4.002	9.700	19.030	28.730	-17.270	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 : PX3 TX  
 Test Item : Conducted Emission Test  
 Power Line : Line 2  
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV	Margin dB	Limit dBuV
<b>LINE 2</b>					
<b>Quasi-Peak</b>					
0.181	9.732	38.770	48.502	-16.612	65.114
0.244	9.689	32.800	42.489	-20.825	63.314
0.365	9.651	24.970	34.621	-25.236	59.857
0.849	9.674	19.320	28.994	-27.006	56.000
1.939	9.680	19.500	29.180	-26.820	56.000
3.759	9.700	25.750	35.450	-20.550	56.000
<b>Average</b>					
0.181	9.732	29.890	39.622	-15.492	55.114
0.244	9.689	27.110	36.799	-16.515	53.314
0.365	9.651	18.620	28.271	-21.586	49.857
0.849	9.674	12.150	21.824	-24.176	46.000
1.939	9.680	17.380	27.060	-18.940	46.000
3.759	9.700	18.470	28.170	-17.830	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

**3. Peak Power Output**

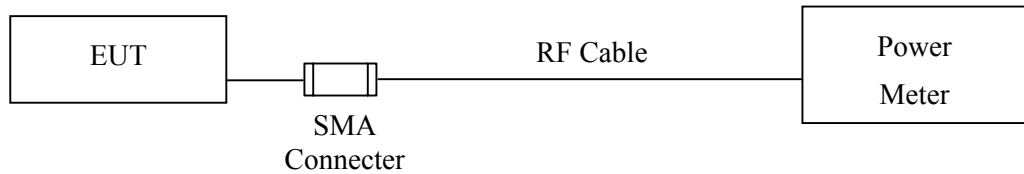
**3.1. Test Equipment**

	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 instruments are calibrated every one year.  
 2. The test instruments marked by “X” are used to measure the final test results.

**3.2. Test Setup**

Conducted Measurement



**3.3. Limits**

The maximum peak power shall be less 1 Watt.

**3.4. Test Procedure**

The EUT was tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

**3.5. Uncertainty**

± 1.27 dB



### 3.6. Test Result of Peak Power Output

Product : PX3 TX  
Test Item : Peak Power Output Data  
Test Site : No.3 OATS  
Test Mode : Mode 1: Transmit

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
02	2405	0.51	<30dBm	Pass
20	2441	0.01	<30dBm	Pass
38	2477	-0.77	<30dBm	Pass

Note: Peak Power Output Value =Reading value on peak power meter + cable loss

#### 4. Radiated Emission

##### 4.1. Test Equipment

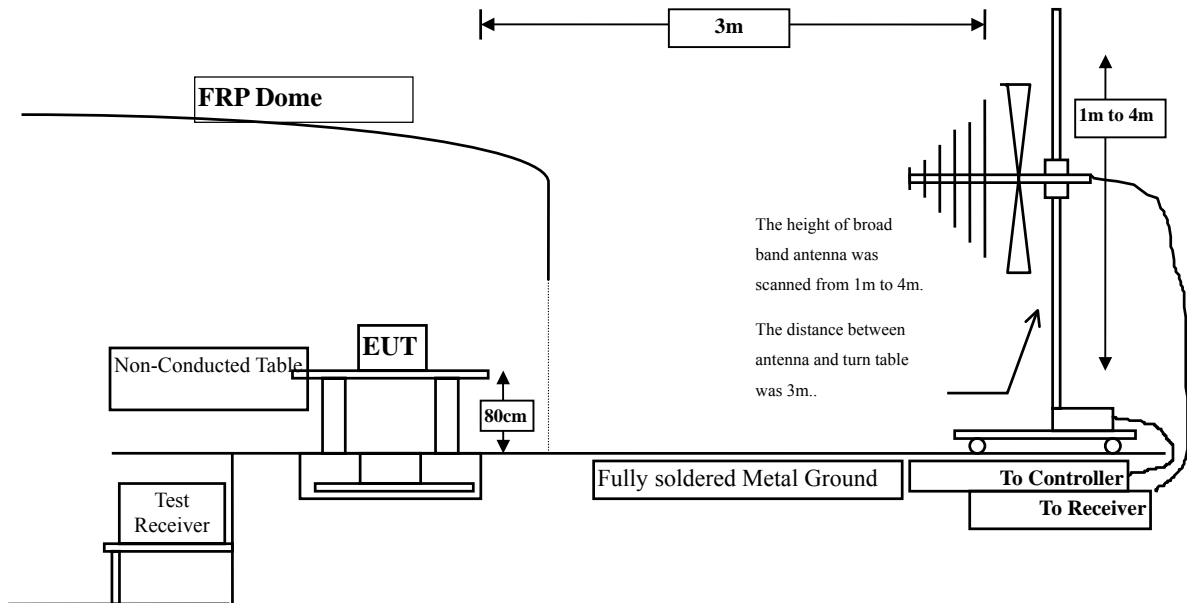
The following test equipment are used during the radiated emission test:

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

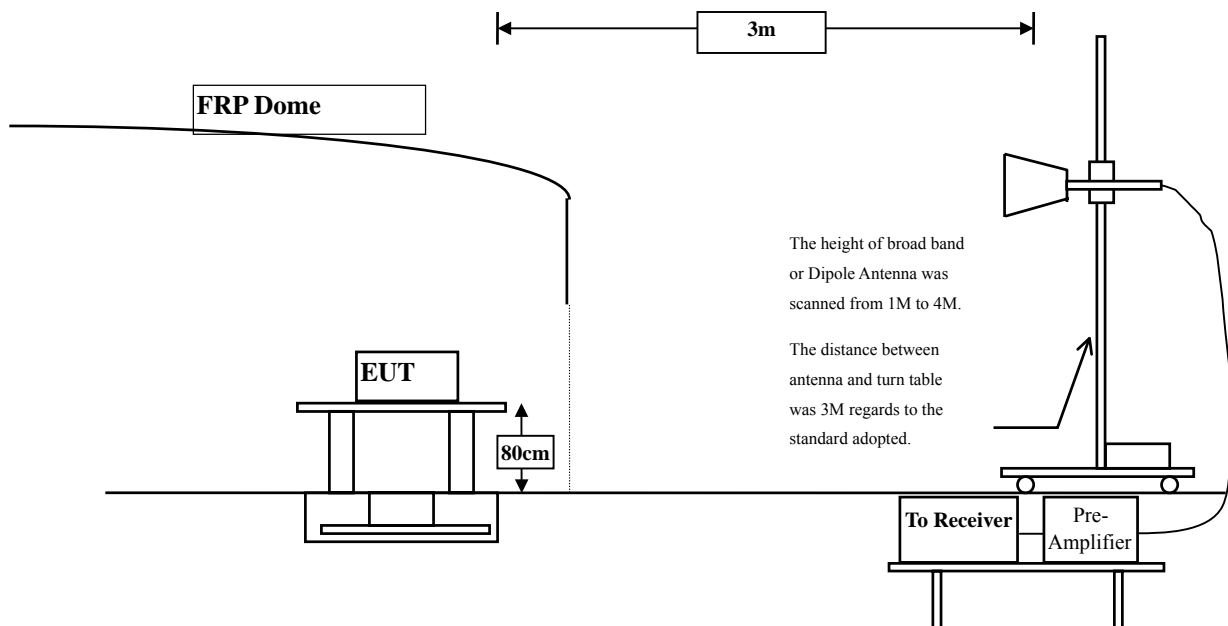
- Note:
1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with “X” are used to measure the final test results.

## 4.2. Test Setup

### Radiated Emission Below 1GHz



### Radiated Emission Above 1GHz



### 4.3. 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.

<b>FCC Part 15 Subpart C Paragraph 15.209(a) Limits</b>		
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: E field strength (dBuV/m) = 20 log E field strength (uV/m)

### 4.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of Mar. 2005 KDB558074 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 between 1 meter and 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 in the Open Area Test Site 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 : PX3 TX  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
1864.000	-4.222	55.580	51.358	-22.642	74.000
4810.000	0.532	51.920	52.452	-21.548	74.000
7215.000	7.411	39.900	47.311	-26.689	74.000
9620.000	8.282	39.920	48.202	-25.798	74.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
1864.000	-3.967	58.240	54.273	-19.727	74.000
4810.000	0.927	47.700	48.627	-25.373	74.000
7215.000	7.895	39.510	47.405	-26.595	74.000
9620.000	8.760	40.340	49.100	-24.900	74.000
<b>Average Detector:</b>					
1864.000	-3.967	53.950	49.983	-4.017	54.000

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : PX3 TX  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
1888.000	-5.297	58.260	52.963	-21.037	74.000
4882.000	0.025	53.380	53.405	-20.595	74.000
7323.000	7.762	40.210	47.971	-26.029	74.000
9764.000	7.682	39.330	47.011	-26.989	74.000
<b>Average Detector:</b>					
--					
<b>Vertical</b>					
<b>Peak Detector:</b>					
1888.000	-5.313	61.230	55.916	-18.084	74.000
4882.000	0.488	47.930	48.418	-25.582	74.000
7323.000	8.375	39.070	47.444	-26.556	74.000
9764.000	8.315	39.050	47.365	-26.635	74.000
<b>Average Detector:</b>					
1888.000	-5.313	56.840	51.526	-2.474	54.000

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : PX3 TX  
 Test Item : Harmonic Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
<b>Peak Detector:</b>					
1935.000	-6.444	61.280	54.836	-19.164	74.000
4954.000	0.522	54.290	54.813	-19.187	74.000
7431.000	8.520	38.790	47.310	-26.690	74.000
9908.000	8.187	39.540	47.727	-26.273	74.000
<b>Average Detector:</b>					
1935.000	-6.444	57.270	50.826	-3.174	54.000
4954.000	0.522	45.640	46.162	-7.838	54.000
<b>Vertical</b>					
<b>Peak Detector:</b>					
1935.000	-6.031	62.590	56.559	-17.441	74.000
4954.000	1.305	49.180	50.485	-23.515	74.000
7431.000	9.222	39.990	49.211	-24.789	74.000
9908.000	9.240	39.720	48.960	-25.040	74.000
<b>Average Detector:</b>					
1935.000	-6.031	58.340	52.309	-1.691	54.000

Note:

1. Correct factor = Antenna Factor + Cable Loss – Pre-amplifier Gain
2. The average measurement was not performed when the peak measured data under the limit of average detection. If the readings given are average, peak measurement should also be supplied.

Product : PX3 TX  
 Test Item : General Radiated Emission Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2441MHz)

Frequency MHz	Correct Factor dB	Reading Level dBuV	Measurement Level dBuV/m	Margin dB	Limit dBuV/m
<b>Horizontal</b>					
202.660	-10.183	45.361	35.179	-8.321	43.500
297.720	-4.756	32.004	27.248	-18.752	46.000
511.120	3.173	25.159	28.332	-17.668	46.000
709.000	3.624	30.163	33.787	-12.213	46.000
823.460	7.241	21.438	28.679	-17.321	46.000
930.160	7.530	22.795	30.325	-15.675	46.000
<b>Vertical</b>					
111.480	-3.439	40.399	36.961	-6.539	43.500
177.440	-1.248	38.108	36.860	-6.640	43.500
338.460	-1.640	29.632	27.991	-18.009	46.000
509.180	0.804	29.074	29.878	-16.122	46.000
617.820	0.958	28.830	29.788	-16.212	46.000
875.840	0.516	28.210	28.726	-17.274	46.000

Note:

1. All Readings below 1GHz are Quasi-Peak, above are performed with peak and/or average measurements as necessary.
2. "■" means the worst emission level.
3. Measurement Level = Reading Level + Correct Factor



**5. RF antenna conducted test**

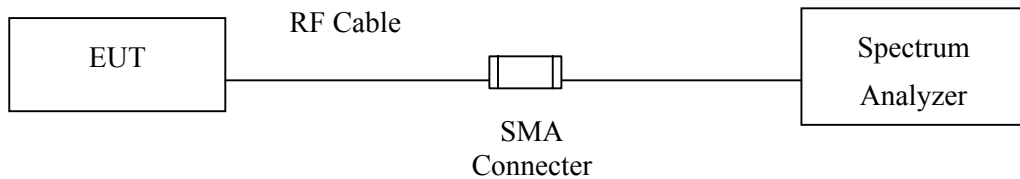
**5.1. Test Equipment**

	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 with traceable calibrations. Each calibration is traceable to the national or international standards.
  2. The test instruments marked with “X” are used to measure the final test results.

**5.2. Test Setup**

**RF antenna Conducted Measurement:**



**5.3. Limits**

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)).

#### 5.4. Test Procedure

The EUT was tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Set VBW > RBW, scan up through 10th harmonic.

#### 5.5. Uncertainty

The measurement uncertainty

Conducted is defined as  $\pm 1.27\text{dB}$

**5.6. Test Result of RF antenna conducted test**

Product : PX3 TX  
 Test Item : RF antenna conducted test  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit

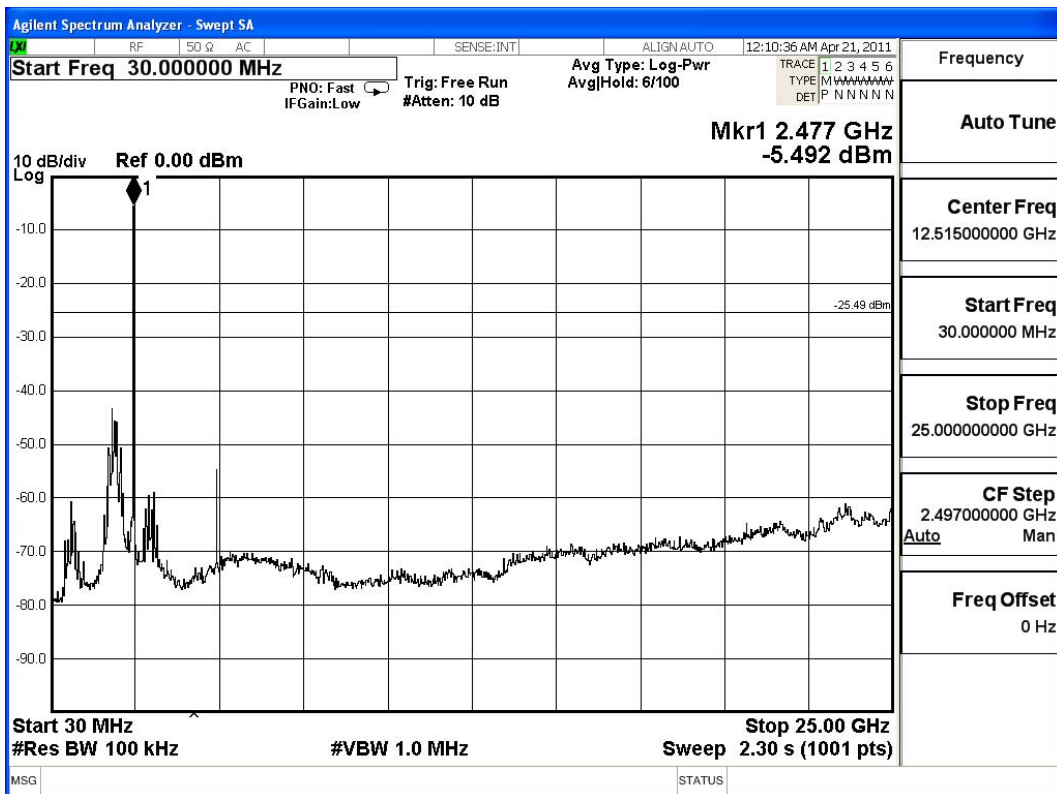
**Channel 02 (2405MHz) 30M-25GHz**



**Channel 20 (2441MHz) 30M-25GHz**



**Channel 38 (2477MHz) 30M-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

Note:

1. All equipments are calibrated with traceable calibrations. Each calibration is traceable to the national or international standards.
2. The test instruments marked with “X” are used to measure the final test results.

#### RF Radiated Measurement:

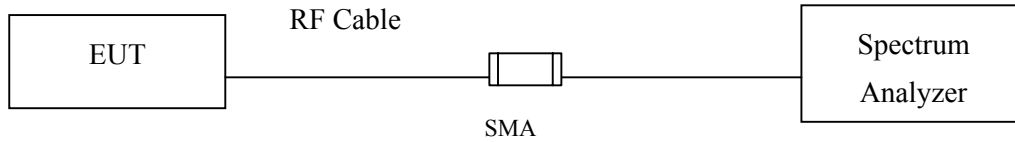
The following test equipments are used during the band edge tests:

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

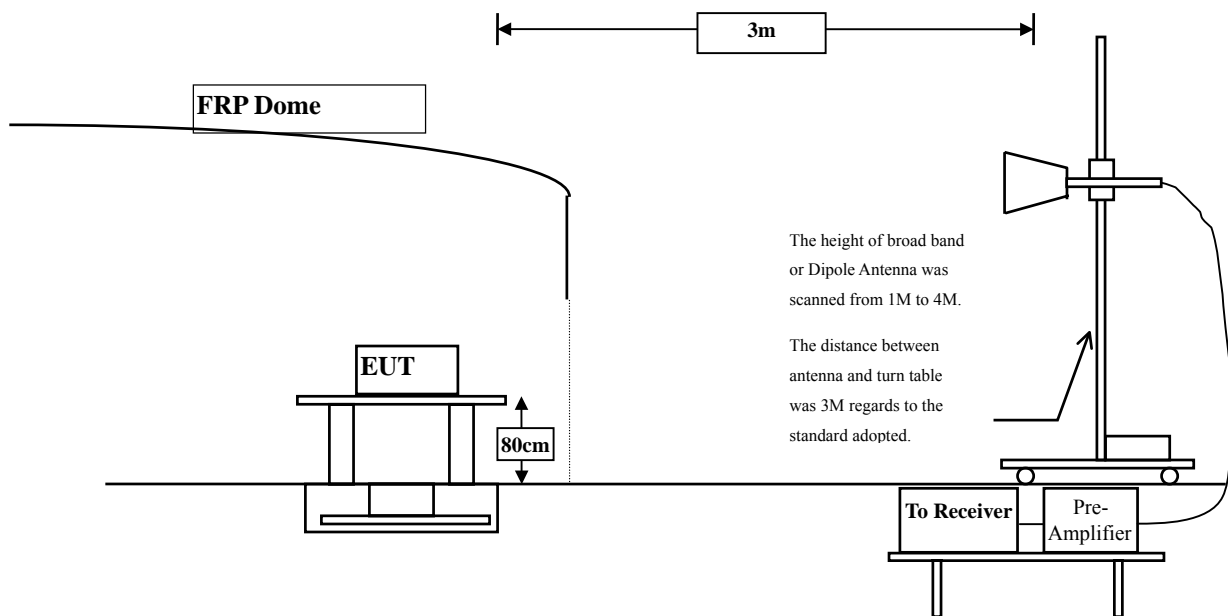
- Note:
1. All instruments are calibrated every one year.
  2. The test instruments marked by “X” are used to measure the final test results.

## 6.2. Test Setup

### RF Conducted Measurement



### RF Radiated Measurement:



## 6.3. 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.

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

The EUT was setup according to ANSI C63.4: 2009 and tested according to DTS test procedure of Mar. 2005 KDB558074 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.

#### **6.5. Uncertainty**

± 3.9 dB above 1GHz

± 3.8 dB below 1GHz

## 6.6. Test Result of Band Edge

Product : PX3 TX  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2405	31.759	63.82	95.579	Peak
Horizontal	2405	31.759	60.69	92.449	Average
Vertical	2405	30.242	58.96	89.202	Peak
Vertical	2405	30.242	55.46	85.702	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)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2389.5	95.579	52.121	43.458	Peak
Horizontal	2389.1	92.449	57.441	35.008	Average
Vertical	2389.5	89.202	52.121	37.081	Peak
Vertical	2389.1	85.702	57.441	28.261	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 -  $\Delta$

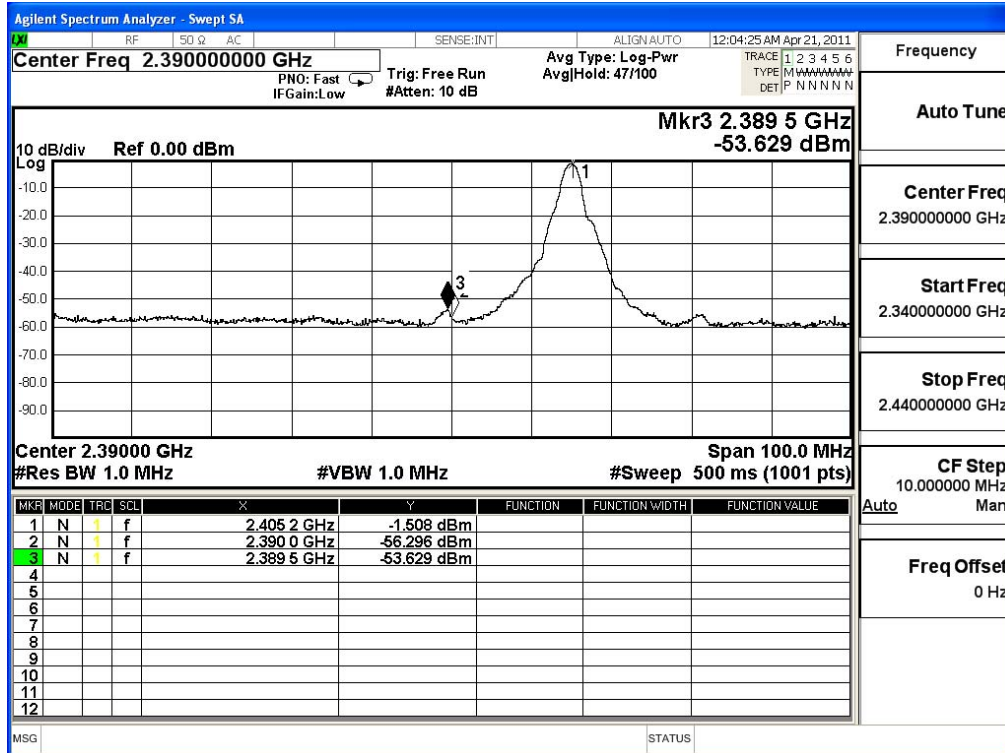
F = Fundamental field Strength (Peak or Average)

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

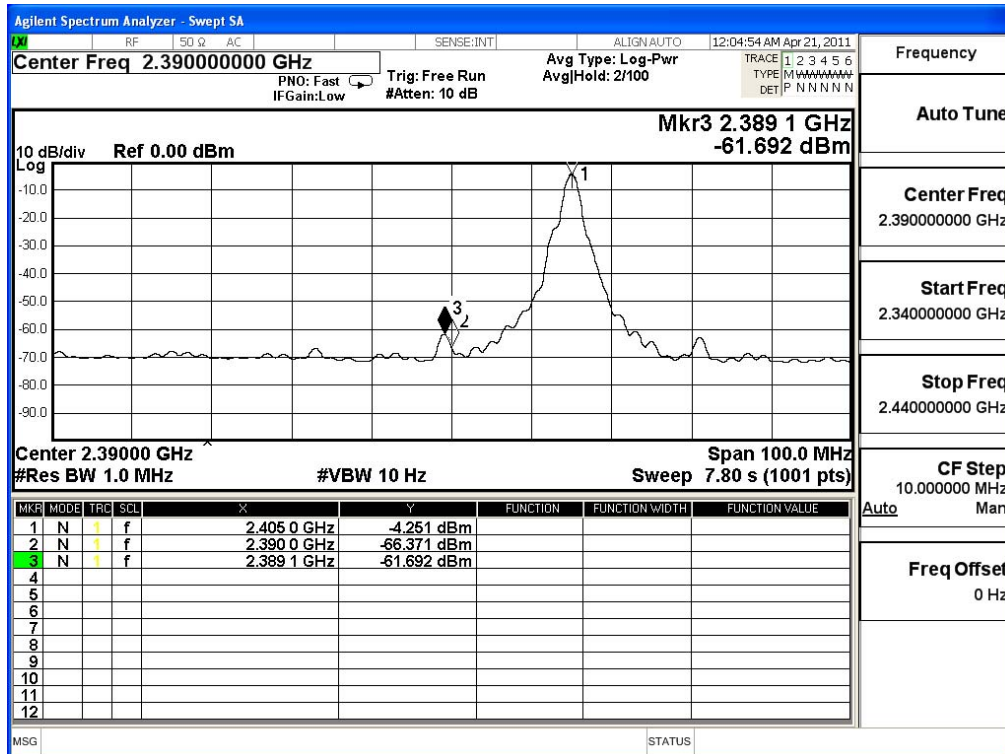
Peak limit = 74dBuV/m, Average limit = 54dBuV/m



### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



Product : PX3 TX  
 Test Item : Band Edge Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit

### Fundamental Filed Strength

Antenna Pole	Frequency [MHz]	Correction Factor [dB/m]	Reading Level [dBuV]	Emission Level [dBuV/m]	Detector
Horizontal	2477	31.933	62.22	94.153	Peak
Horizontal	2477	31.933	58.9	90.833	Average
Vertical	2477	30.553	56.69	87.243	Peak
Vertical	2477	30.553	53.68	84.233	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)	$\Delta$ (dB)	Band Edge Field Strength (dBuV/m)	Detector
Horizontal	2483.5	94.153	49.401	44.752	Peak
Horizontal	2483.5	90.833	55.278	35.555	Average
Vertical	2483.5	87.243	49.401	37.842	Peak
Vertical	2483.5	84.233	55.278	28.955	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:

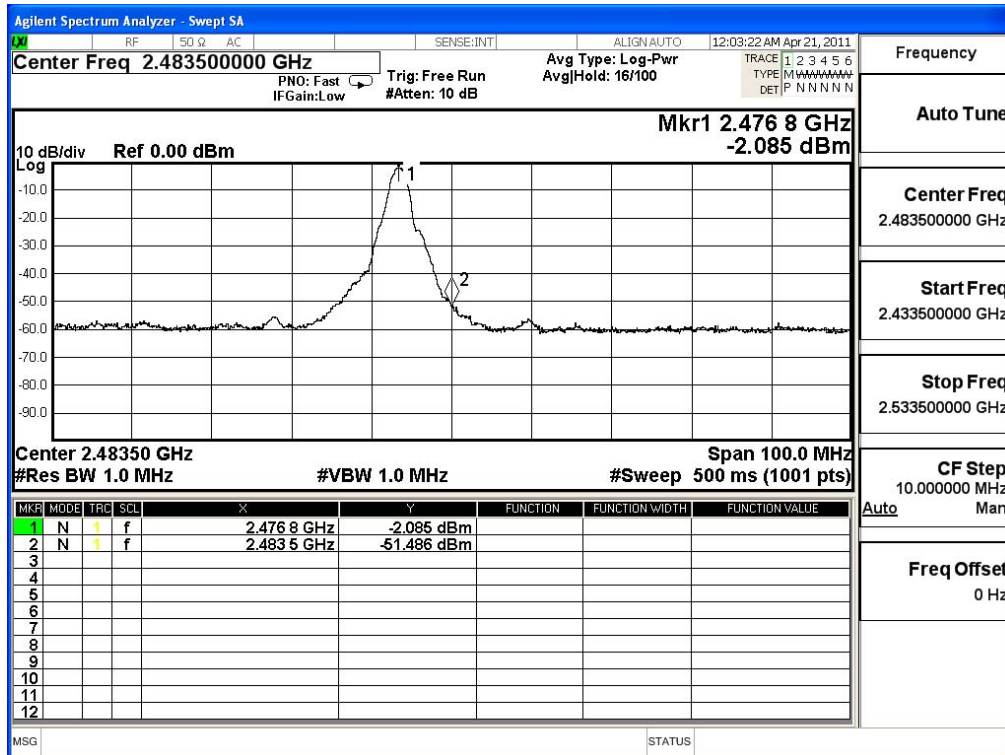
Band Edge field Strength = F -  $\Delta$

F = Fundamental field Strength (Peak or Average)

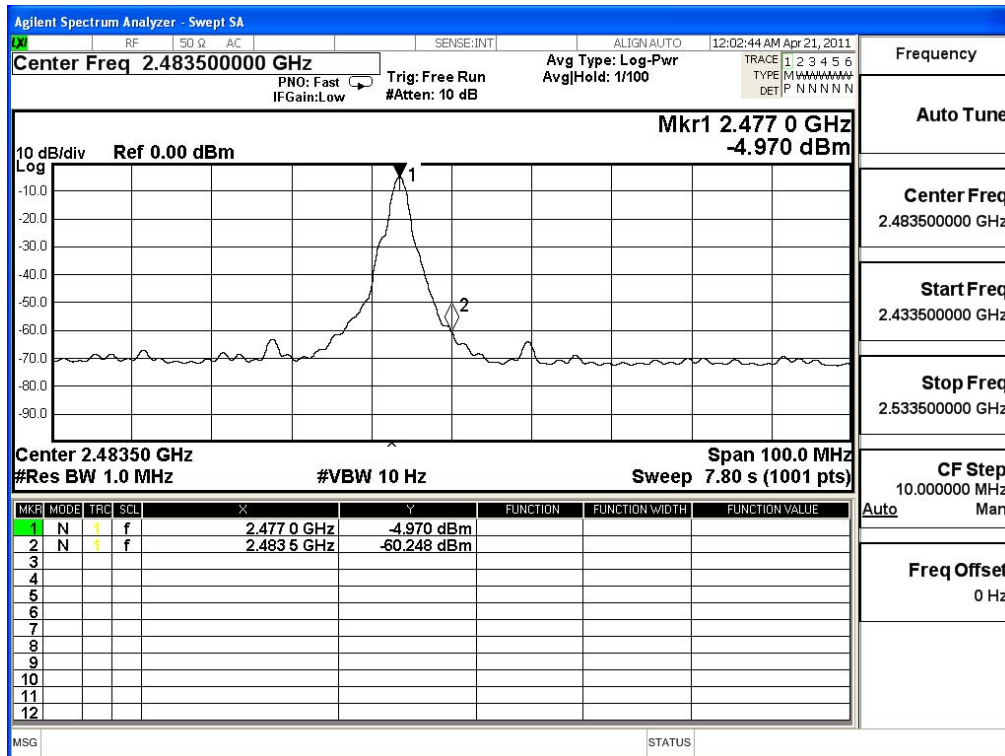
$\Delta$  = Conducted Band Edge Delta (Peak or Average)

Peak limit = 74dBuV/m, Average limit = 54dBuV/m

### Peak Detector of conducted Band Edge Delta



### Average Detector of conducted Band Edge Delta



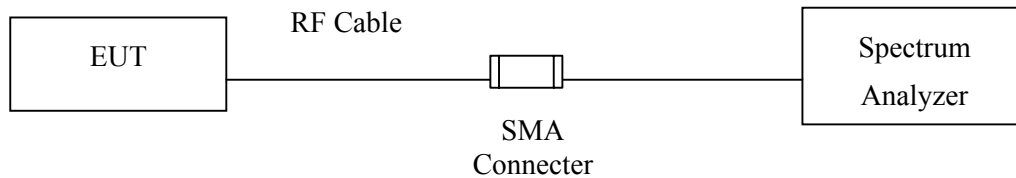
## 7. Occupied Bandwidth

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

### 7.2. Test Setup



### 7.3. Limits

The minimum bandwidth shall be at least 500 kHz.

### 7.4. Test Procedure

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.

Set RBW = 100 kHz, Span greater than RBW.

### 7.5. Uncertainty

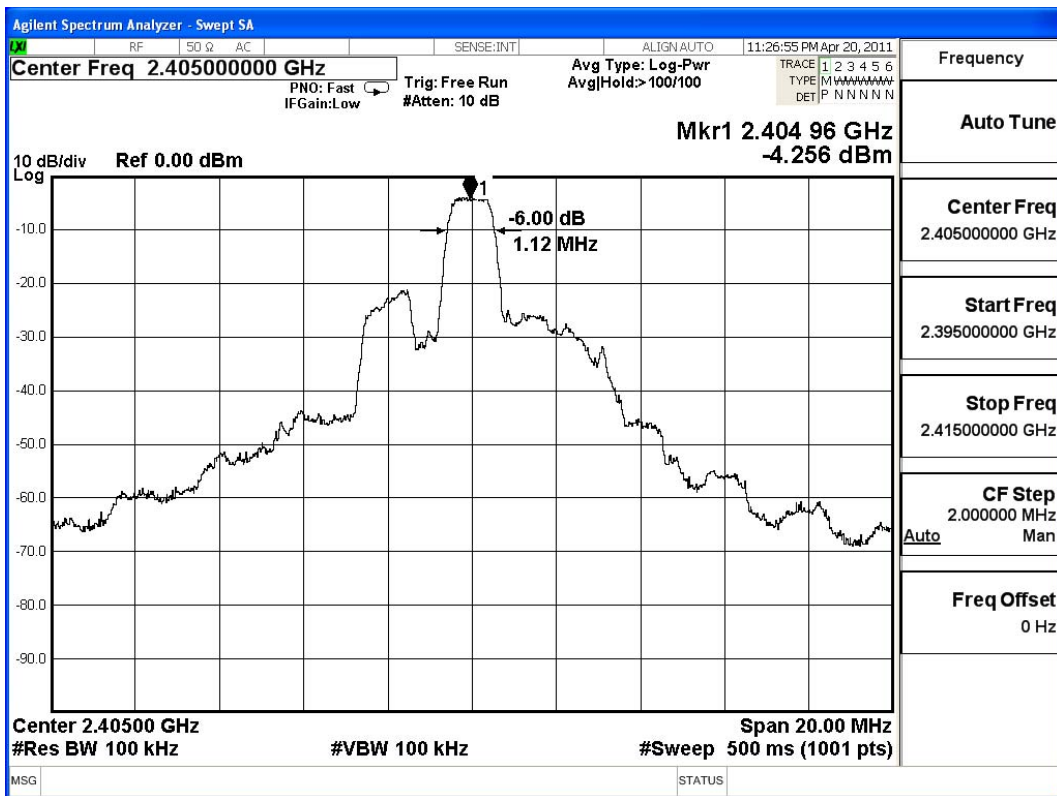
± 150Hz

### 7.6. Test Result of Occupied Bandwidth

Product : PX3 TX  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2405MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
02	2405.00	1120	>500	Pass

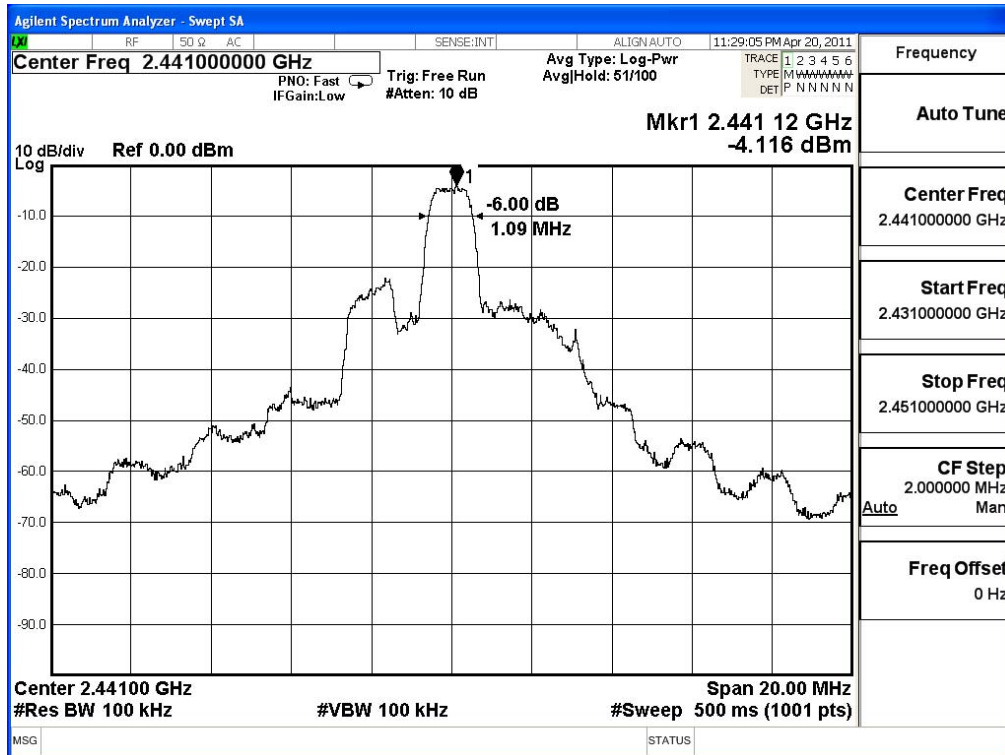
Figure Channel 02:



Product : PX3 TX  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
20	2441.00	1090	>500	Pass

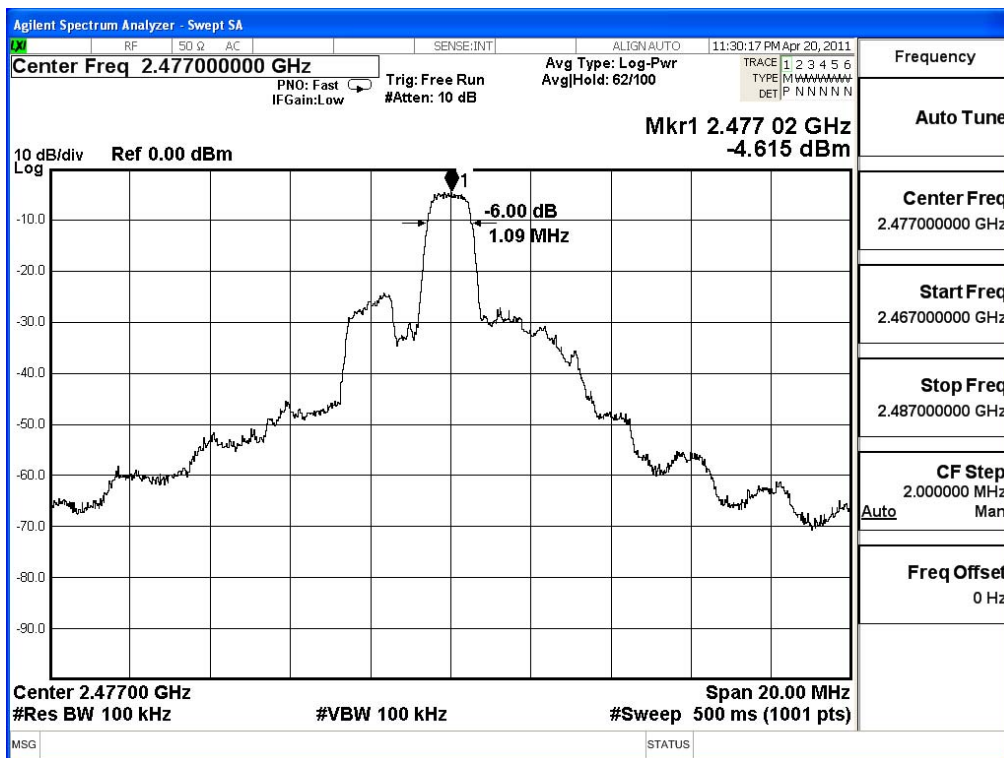
**Figure Channel 20:**



Product : PX3 TX  
 Test Item : Occupied Bandwidth Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477MHz)

Channel No.	Frequency (MHz)	Measurement Level (kHz)	Required Limit (kHz)	Result
38	2477.00	1150	>500	Pass

**Figure Channel 38:**



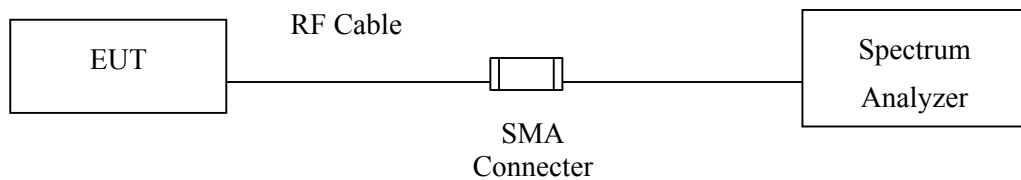
**8. Power Density**

**8.1. 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 by “X” are used to measure the final test results.

**8.2. Test Setup**



**8.3. Limits**

The transmitted power density averaged over any 1 second interval shall not be greater +8dBm in any 3kHz bandwidth.

**8.4. Test Procedure**

The EUT was setup according to ANSI C63.4: 2009; tested according to DTS test procedure of Mar. 2005 KDB558074 for compliance to FCC 47CFR 15.247 requirements.  
 Set RBW= 3 kHz, VBW=10KHz, Sweep time=(SPAN/3KHz), detector=Peak detector

**8.5. Uncertainty**

± 1.27 dB

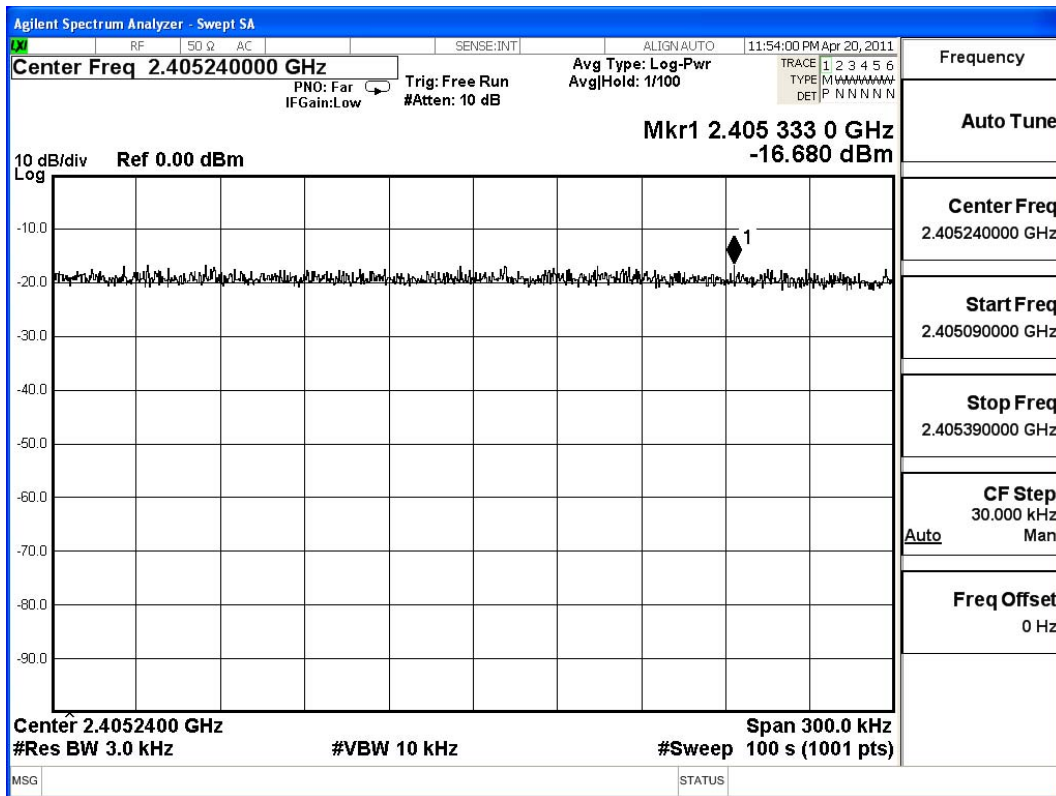


**8.6. Test Result of Power Density**

Product : PX3 TX  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit(2405MHz)

Channel No.	Frequency (MHz)	Measure Level (dBm)	Limit (dBm)	Result
02	2405.00	-16.680	< 8dBm	Pass

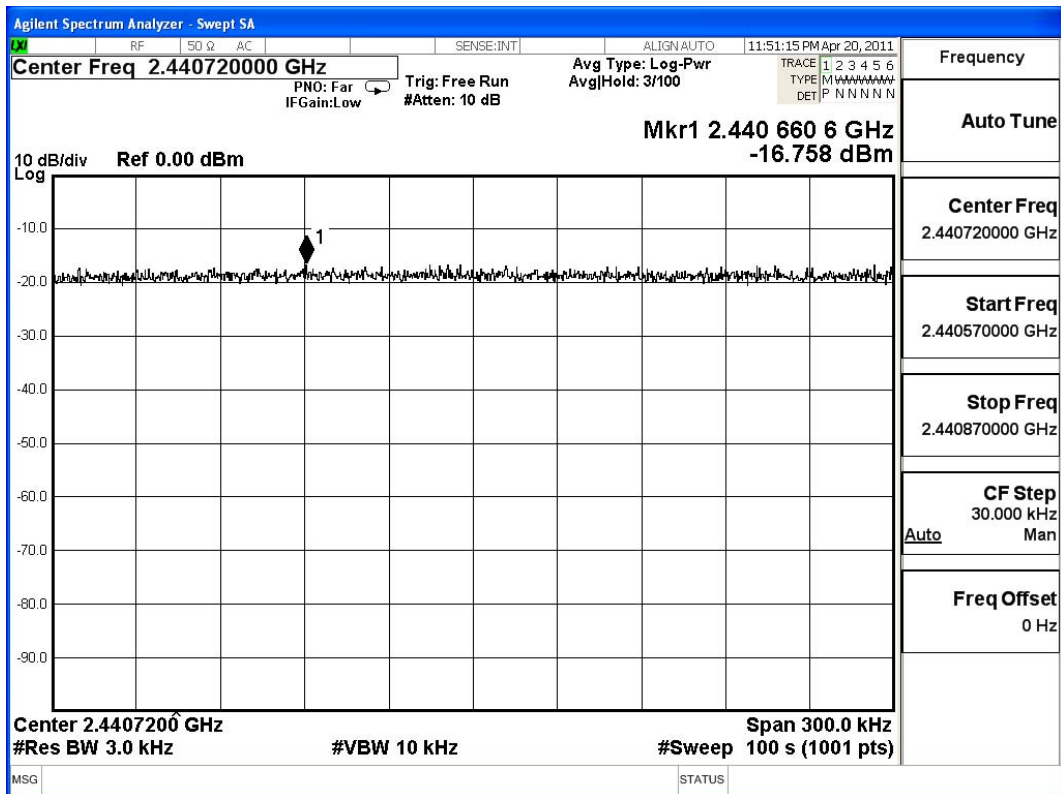
**Figure Channel 02:**



Product : PX3 TX  
 Test Item : Power Density Data  
 Test Site : No.3OATS  
 Test Mode : Mode 1: Transmit (2441MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
20	2441.00	-16.758	< 8dBm	Pass

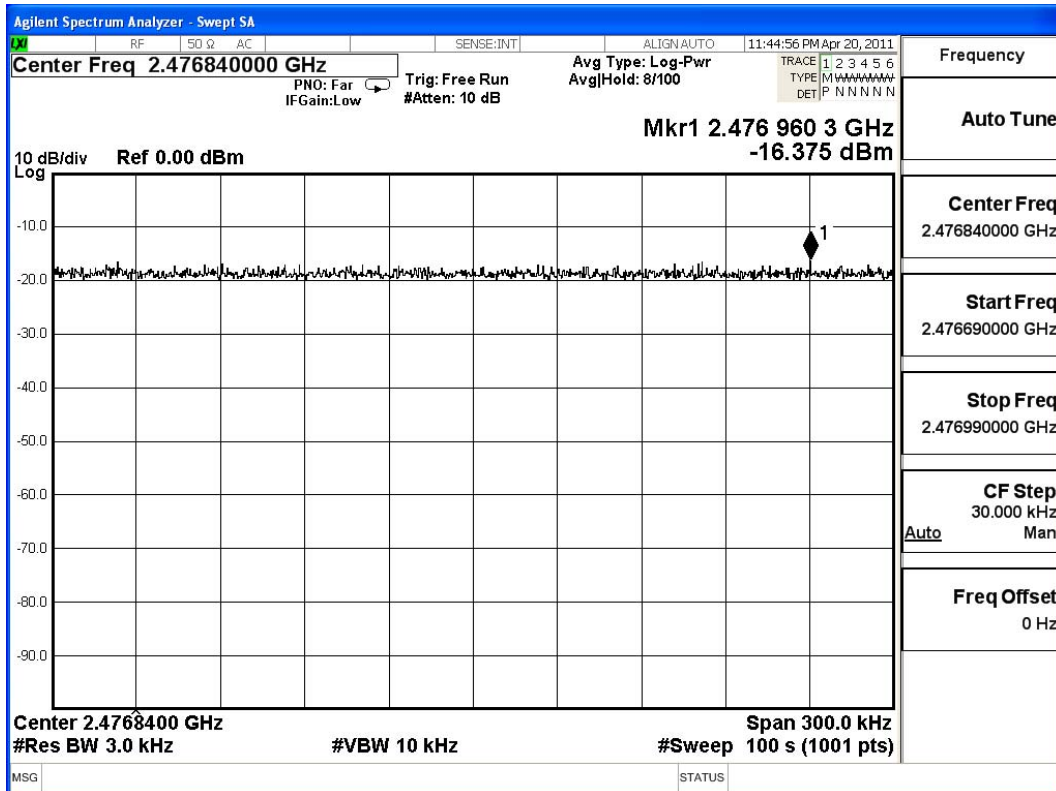
**Figure Channel 20:**



Product : PX3 TX  
 Test Item : Power Density Data  
 Test Site : No.3 OATS  
 Test Mode : Mode 1: Transmit (2477MHz)

Channel No.	Frequency (MHz)	Measurement Level (dBm)	Required Limit (dBm)	Result
38	2477.00	-16.375	< 8dBm	Pass

**Figure Channel 38:**



## 9. EMI Reduction Method During Compliance Testing

No modification was made during testing.

## Attachment 1: EUT Test Photographs

## Attachment 2: EUT Detailed Photographs