FCC Part 15C Measurement and Test Report

For

Spheris Digital Ltd

Flat Rm A21, Blk A, 4/F, Sheung Shui Plaza, 3 Ka Fu Close, Sheung Shui,

Hong Kong

FCC ID: YHO-PXT51012

FCC Rules: FCC Part 15C

Product Description: Wireless Digital Display

Tested Model: PXT510WR02B

Report No.: <u>STR120882561</u>

Tested Date: <u>2012-08-19 to 2012-08-28</u>

Issued Date: <u>2012-09-01</u>

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Reviewed By: <u>Lahm Peng / EMC Manager</u>

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Note: This test report is limited to the above client company and the product model only. It may not be duplicated without prior permitted by SEM.Test Compliance Service Co., Ltd

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant: Spheris Digital Ltd

Address of applicant: Flat Rm A21, Blk A, 4/F, Sheung Shui Plaza, 3 Ka Fu

Close, Sheung Shui, Hong Kong

Manufacturer: Spheris Digital Ltd

Address of manufacturer: Flat Rm A21, Blk A, 4/F, Sheung Shui Plaza, 3 Ka Fu

Close, Sheung Shui, Hong Kong

General Description of EUT	
Product Name:	Wireless Digital Display
Trade Name:	Pix-Star
Model No.:	PXT510WR02B
Adding Model(s):	PXT510VR02B, PXT510GR02B, PXT510WR04B,
	PXT510VR04B, PXT510GR04B
Rated Voltage:	DC 5V
Davier Adamtas Madali	GFP151U-050250B-1
Power Adapter Model:	(Input: AC 100-240V, Output: DC 5V)
	•

Note: The test data is gathered from a production sample, provided by the manufacturer. The other model listed in the report has different appearance only of PXT510WR02B without circuit and electronic construction changed, declared by the manufacturer.

Technical Characteristics of EUT	
Support Standards:	802.11b/g/n
Frequency Range:	2412-2462MHz
RF Output Power:	7.78 dBm (Conducted)
Data Rate:	1-11Mbps, 6-54Mbps, up to 150Mbps
Modulation:	CCK, BPSK, QPSK, 16QAM, 64QAM
Quantity of Channels:	11
Channel Separation:	5MHz
Antenna Type:	Integral Antenna
Antenna Gain:	5.0 dBi
Lowest Internal Frequency of EUT:	32.768 kHz
Device Category:	Wideband transmission Device

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1.2 Test Standards

The following report is prepared on behalf of the Spheris Digital Ltd in accordance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

The objective is to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 of the Federal Communication Commissions rules.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz. The public notice KDB 558074 for digital transmission systems shall be performed also.

1.4 Test Facility

• FCC – Registration No.: 994117

SEM.Test Compliance Services Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files and the Registration is 994117.

• Industry Canada (IC) Registration No.: 7673A

The 3m Semi-anechoic chamber of SEM.Test Compliance Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 7673A.

• CNAS Registration No.: L4062

Shenzhen SEM.Test Electronics Service Co., Ltd. is a testing organization accredited by China National Accreditation Service for Conformity Assessment (CNAS) according to ISO/IEC 17025. The accreditation certificate number is L4062. All measurement facilities used to collect the measurement data are located at 3/F, Jinbao Commerce Building, Xin'an Fanshen Road, Bao'an District, Shenzhen, P.R.C (518101)

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1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode L	ist	
Test Mode	Description	Remark
TM1	802.11b	2412MHz, 2437MHz, 2462MHz
TM2	802.11g	2412MHz, 2437MHz, 2462MHz
TM3	802.11n-HT20	2412MHz, 2437MHz, 2462MHz
TM4	/	/

Special Cable List and I	Details		
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
DC Cable	1.2	Unshielded	With Ferrite

Auxiliary Equipment L	ist and Details		
Description	Manufacturer	Model	Serial Number
/	/	/	/

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2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item Resu	
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§ 15.207(a)	Conducted Emission	Compliant
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)(d)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

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3. Antenna Requirement

3.1 Standard Applicable

According to FCC Part 15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

3.2 Evaluation Information

This product has a permanent antenna, fulfill the requirement of this section.

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4. Power Spectral Density

4.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

4.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2012-03-28	2013-03-27
Attenuator	ATTEN	ATS100-4-20	/	2012-03-28	2013-03-27

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

4.3 Test Procedure

According to the KDB 558074, the test method of power spectral density as below:

- 1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 2. Set center frequency of spectrum analyzer = operating frequency.
- 3. Set the spectrum analyzer as RBW=100 kHz, VBW=300 kHz, Span 5-30 % greater than the EBW.
- 4. Repeat above procedures until all frequency measured was complete.
- 5. (BWCF) where BWCF = $10\log (3 \text{ kHz}/100\text{kHz} = -15.2 \text{ dB})$.

4.4 Environmental Conditions

Temperature:	20° C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

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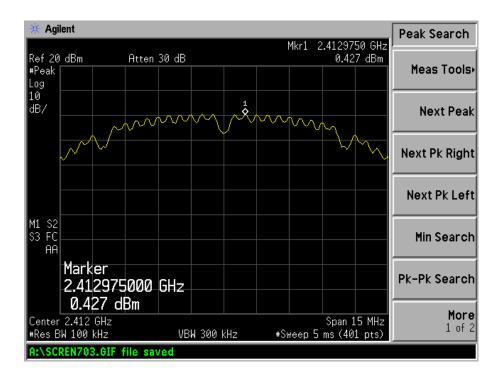
4.5 Summary of Test Results/Plots

Test Mode	Test Channel MHz	Power Spectral Density dBm/100kHz	BWCF	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
	2412	0.427	-15.2	-14.773	8
802.11b	2437	-0.077	-15.2	-15.277	8
	2462	-0.851	-15.2	-16.051	8
	2412	0.389	-15.2	-14.811	8
802.11g	2437	0.382	-15.2	-14.818	8
	2462	-1.577	-15.2	-16.777	8
	2412	-1.524	-15.2	-16.724	8
802.11n HT20	2437	-0.322	-15.2	-15.522	8
	2462	-1.577	-15.2	-16.777	8

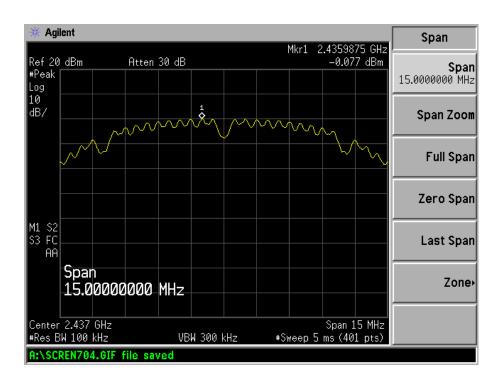
Please refer to the following test plots:

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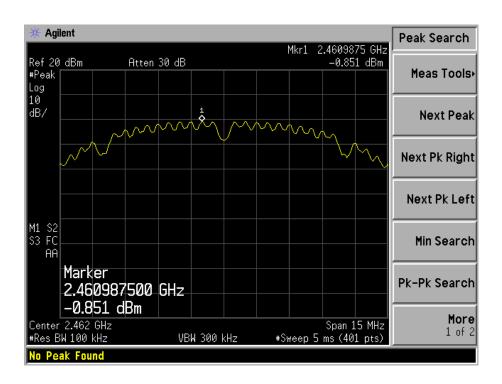
802.11b-Low Channel



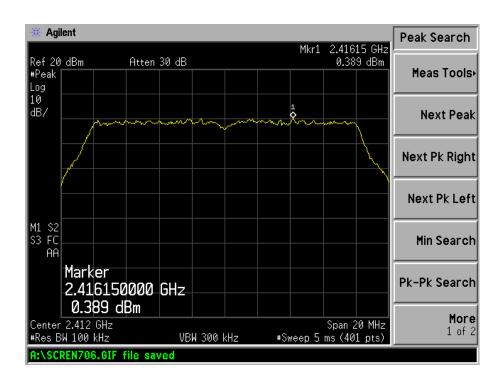
802.11b-Middle Channel



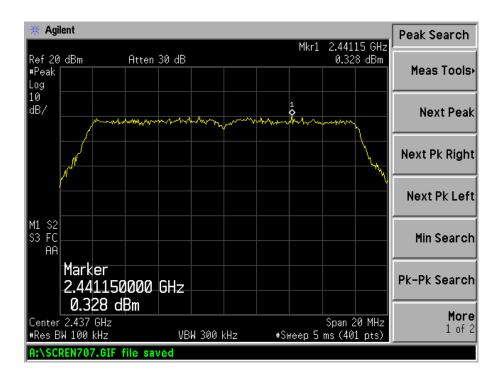
802.11b-High Channel



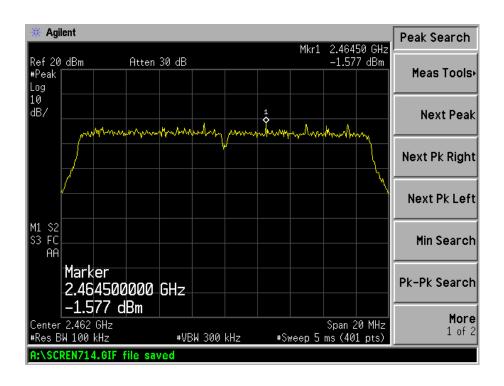
802.11g-Low Channel



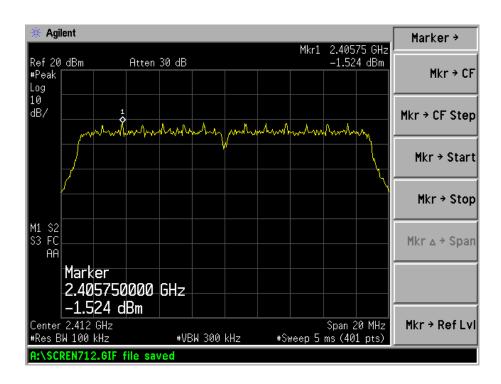
802.11g-Middle Channel



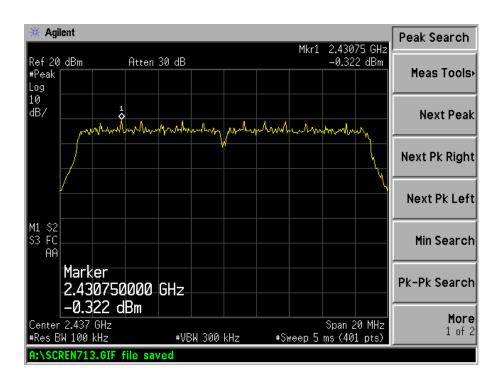
802.11g-High Channel



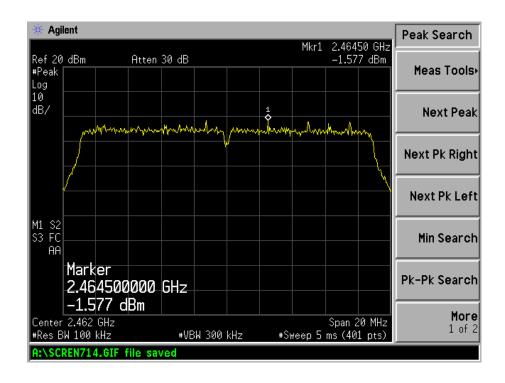
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



5. 6dB Bandwidth

5.1 Standard Applicable

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

5.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	Agilent	E4402B	US41192821	2012-03-28	2013-03-27
Attenuator	ATTEN	ATS100-4-20	/	2012-03-28	2013-03-27

5.3 Test Procedure

- 1. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
- 2. Set center frequency of spectrum analyzer = operating frequency.
- 3. The spectrum analyzer as RBW=300kHz (1 % of Bandwidth.), Sweep=auto
- 4. Mark the peak frequency and -6dB (upper and lower) frequency.

5.4 Environmental Conditions

Temperature:	24° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

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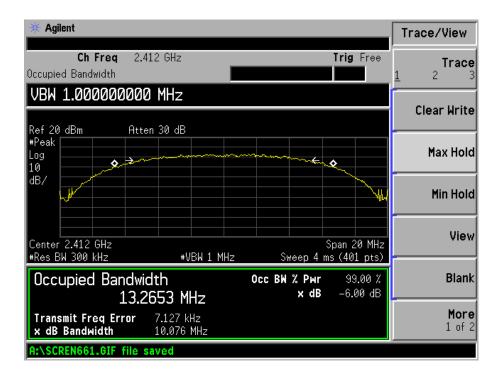
5.5 Summary of Test Results/Plots

Test Mode	Test Channel MHz	6 dB Bandwidth kHz	Limit kHz
	2412	10076	500
802.11b	2437	10213	500
	2462	10184	500
	2422	16578	500
802.11g	2437	16604	500
	2452	16517	500
	2412	17747	500
802.11n-HT20	2437	17783	500
	2462	17658	500

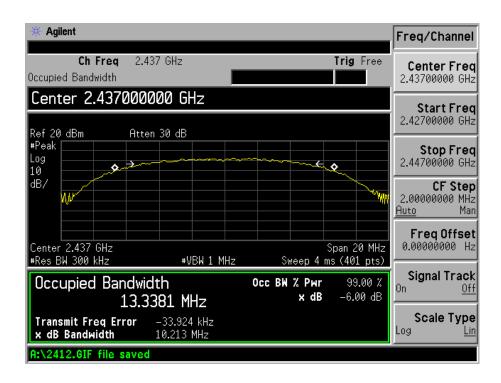
Please refer to the following test plots:

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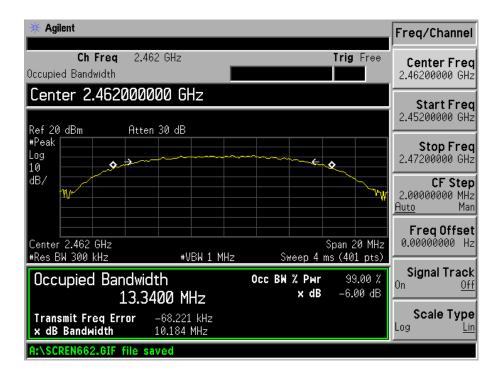
802.11b-Low Channel



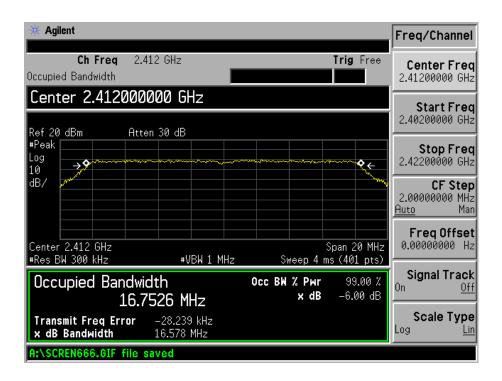
802.11b-Middle Channel



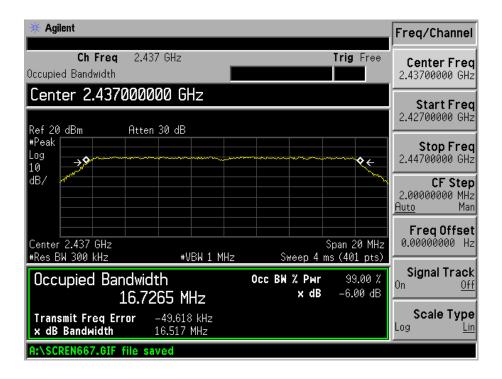
802.11b-High Channel



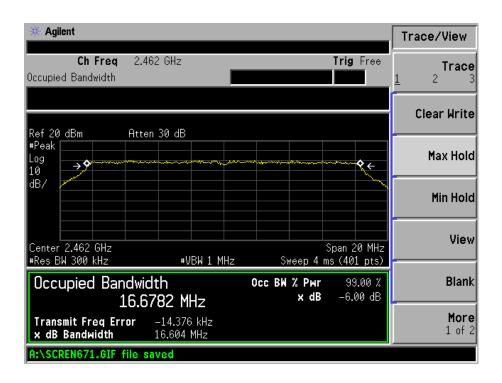
802.11g-Low Channel



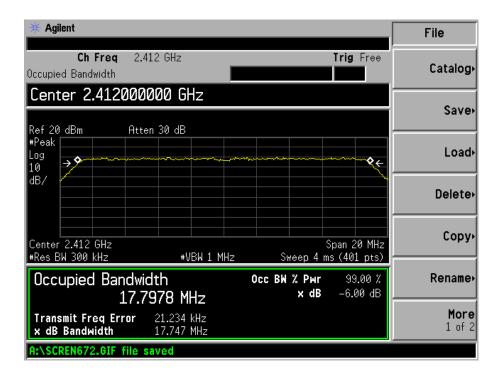
802.11g-Middle Channel



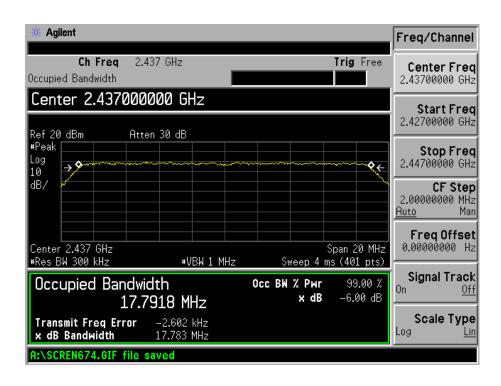
802.11g-High Channel



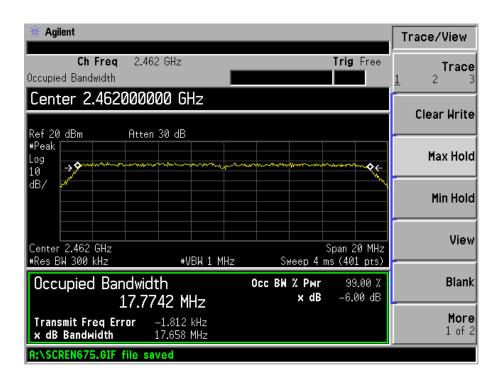
802.11n-HT20-Low Channel



802.11n-HT20-Middle Channel



802.11n-HT20-High Channel



6. RF Output Power

6.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

6.2 Test Equipment List and Details

Description	Manufacturer	Model	Model Serial Number		Due. Date
Spectrum Analyzer	Spectrum Analyzer Agilent Attenuator ATTEN		US41192821	2012-03-28	2013-03-27
Attenuator			/	2012-03-28	2013-03-27

Statement of Traceability: All calibrations have been performed per the NVLAP requirements traceable to the NIST.

6.3 Test Procedure

According to section 15.247(b)-power output of the KDB-558074 (2012),

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

6.4 Environmental Conditions

Temperature:	21° C
Relative Humidity:	55%
ATM Pressure:	1011 mbar

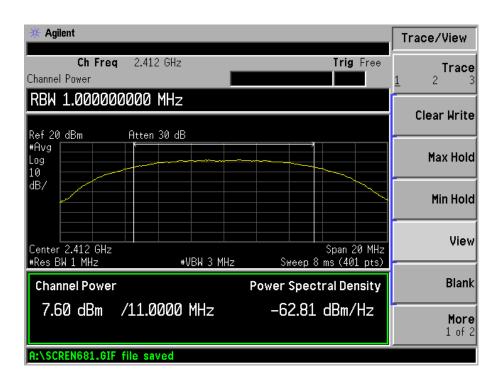
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6.5 Summary of Test Results/Plots

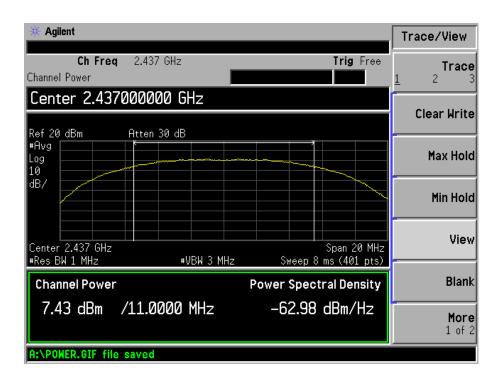
Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW	
	2412	7.60	5.75	1000	
802.11b _1Mbps	2437	7.43	5.53	1000	
	2462	7.66	5.83	1000	
	2412	7.51	5.64	1000	
802.11b _11Mbps	2437	7.48	5.60	1000	
	2462	7.35	5.43	1000	
	2412	7.33	5.41	1000	
802.11g_6Mbps	2437	7.20	5.25	1000	
	2462	7.66	5.83	1000	
	2412	7.67	5.85	1000	
802.11g_54Mbps	2437	7.32	5.40	1000	
	2462	7.63	5.79	1000	
	2412	7.71	5.90	1000	
802.11n HT20_MCS0	2437	7.78	6.00	1000	
	2462	7.55	5.69	1000	
	2412	7.69	5.87	1000	
802.11n HT20_MCS7	2437	7.02	5.04	1000	
	2462	7.28	5.34	1000	

Please refer to the following test plots:

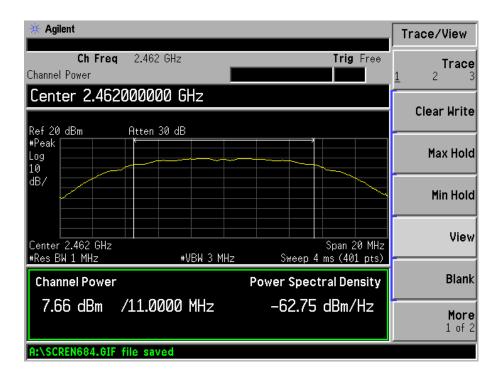
802.11b-1Mbps-Low Channel



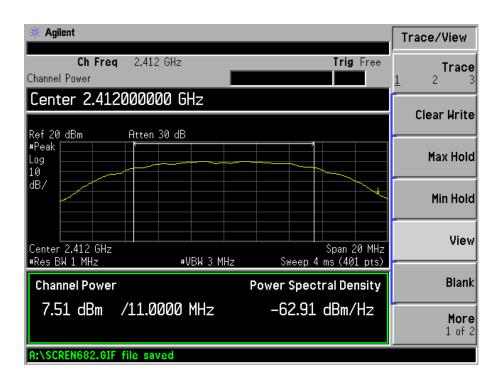
802.11b 1Mbps-Middle Channel



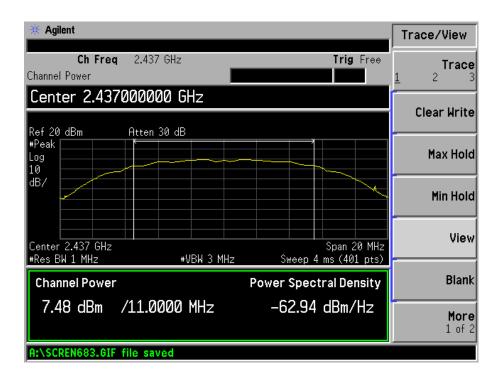
802.11b-1Mpbs-High Channel



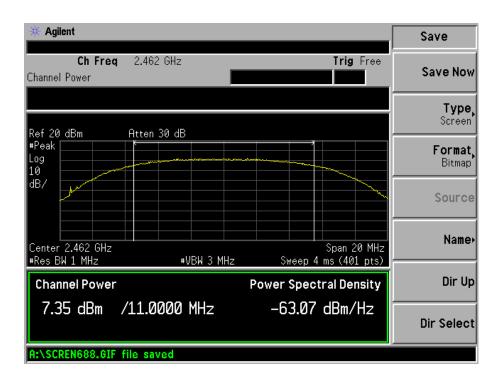
802.11b-11Mbps-Low Channel



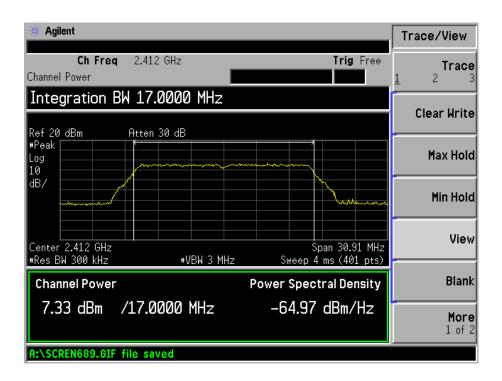
802.11b-11Mbps-Middle Channel



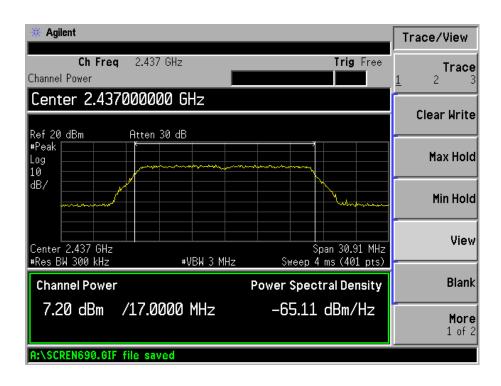
802.11b-11Mpbs-High Channel



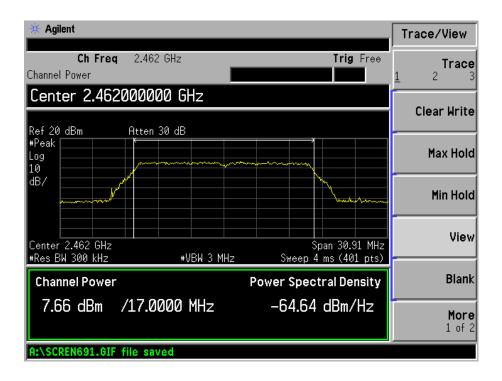
802.11g-6Mbps-Low Channel



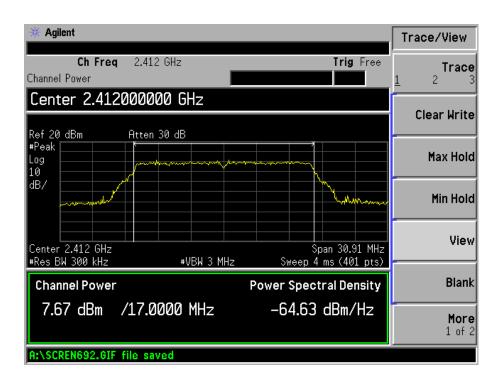
802.11g-6Mbps-Middle Channel



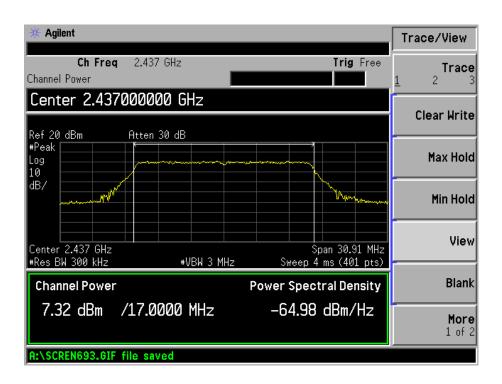
802.11g-6Mpbs-High Channel



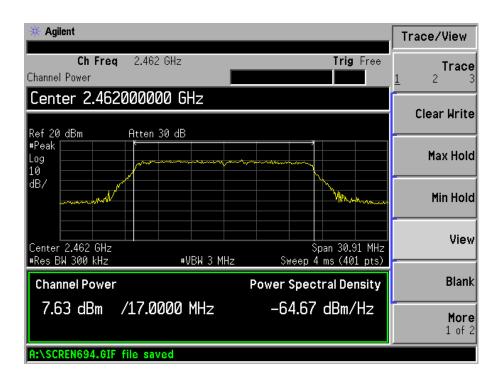
802.11g-54Mpbs -Low Channel



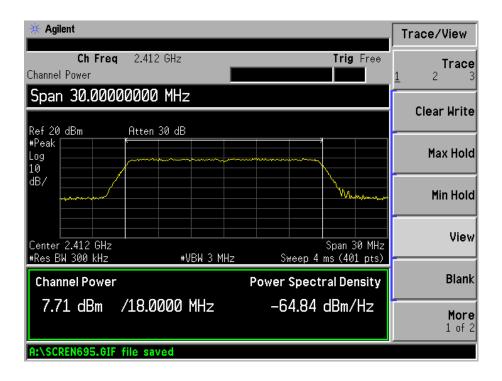
802.11g-54Mpbs -Middle Channel



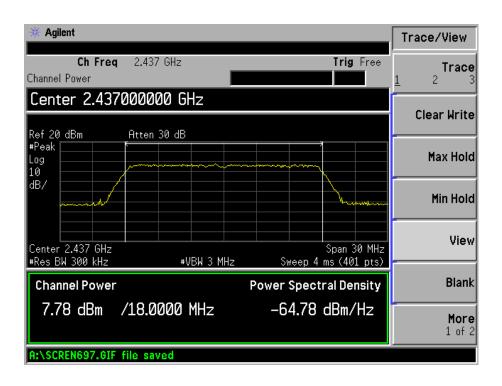
802.11g-54Mpbs -High Channel



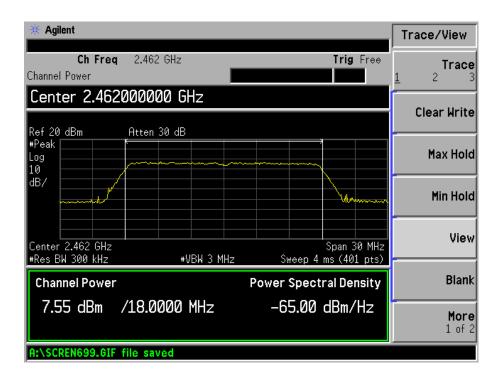
802.11n-HT20-MCS0-Low Channel



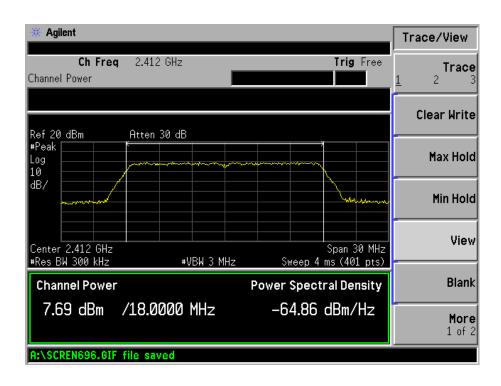
802.11n-HT20-MCS0-Middle Channel



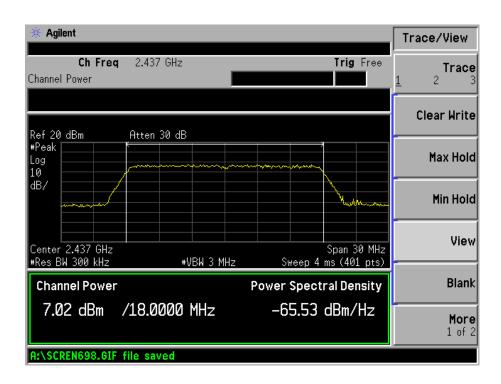
802.11n-HT20-MCS0-High Channel



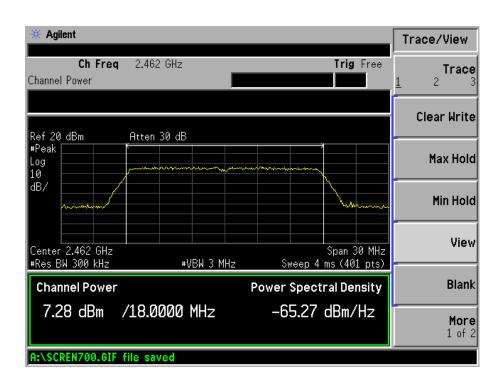
802.11n-HT20-MCS7-Low Channel



802.11n-HT20-MCS7-Middle Channel



802.11n-HT20-MCS7-High Channel



7. Field Strength of Spurious Emissions

7.1 Measurement Uncertainty

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement is ± 5.10 dB.

7.2 Standard Applicable

According to §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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

7.3 Test Equipment List and Details

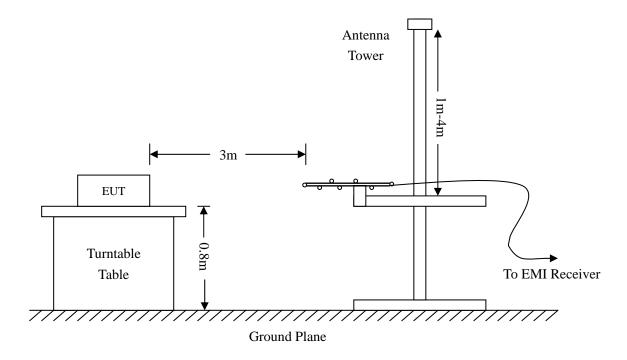
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24
Horn Antenna	ETS	3116B	00088203	2012-02-25	2013-02-24
Loop Antenna	SCHWARZECK	HFRA 5165	9365	2012-02-25	2013-02-24

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7.4 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.



7.5 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dB μ V means the emission is 6dB μ V below the maximum limit for Class B. The equation for margin calculation is as follows:

7.6 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

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7.7 Summary of Test Results/Plots

According to the data below, the FCC Part 15.205, 15.209 and 15.247 standards, and had the worst margin of:

 $\textbf{-2.30 dB} \mu V \text{ at } 301.4224 \text{ MHz in the } \textbf{Horizontal polarization for Playing Mode, 9kHz to 6 GHz, 3 Meters}$

-2.20 dB μ V at 401.8385 MHz in the Horizontal polarization for High Channel Transmitting Mode, 9kHz to 25 GHz, 3 Meters

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

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Plot of Radiated Emissions Test Data (30MHz to 1GHz)

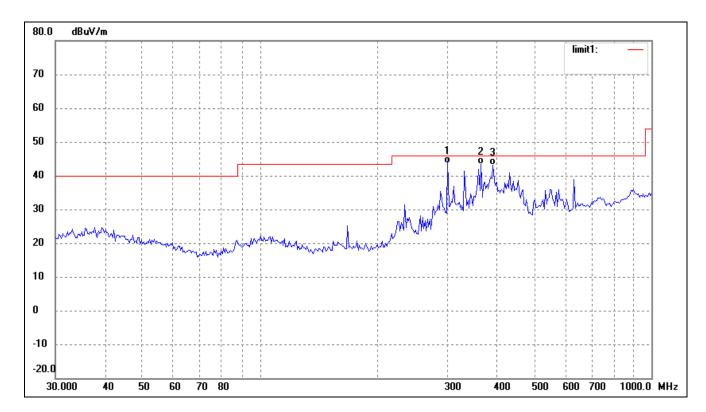
EUT: Wireless Digital Display

Tested Model: PXT510WR02B

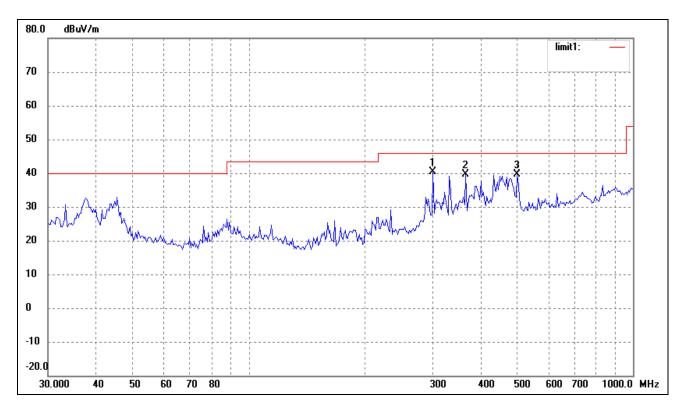
Operating Condition: Playing

Comment:

Test Specification: Horizontal



	No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
Ī		(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
Ī	1	301.4224	33.50	10.20	43.70	46.00	-2.30	261	100	QP
Ī	2	366.8231	32.59	10.67	43.26	46.00	-2.74	360	100	QP
	3	393.4724	31.94	11.24	43.18	46.00	-2.82	114	100	QP



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	30.16	10.20	40.36	46.00	-5.64	274	100	peak
2	366.8231	28.92	10.67	39.59	46.00	-6.41	225	200	peak
3	499.4247	27.43	12.18	39.61	46.00	-6.39	168	100	peak

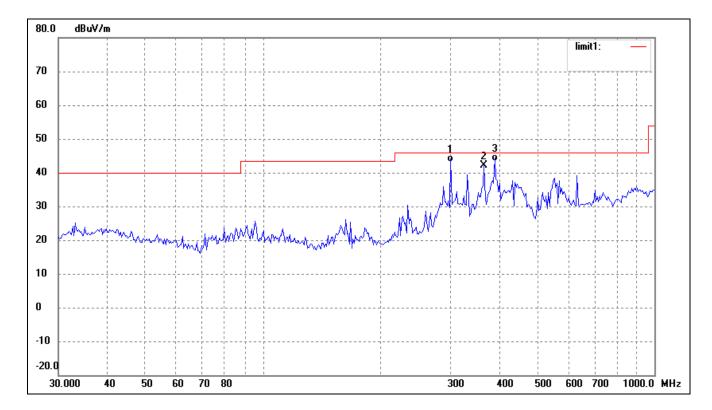
Plot of Radiated Emissions Test Data (30MHz to 1GHz)

EUT: Wireless Digital Display

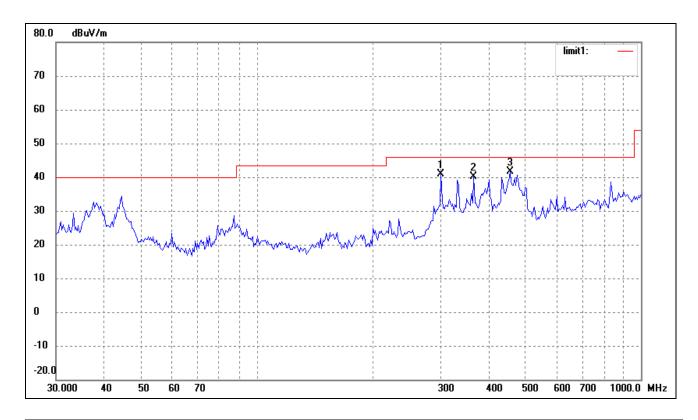
Tested Model: PXT510WR02B

Operating Condition: 802.11b Transmitting Low Channel-2412MHz

Comment:



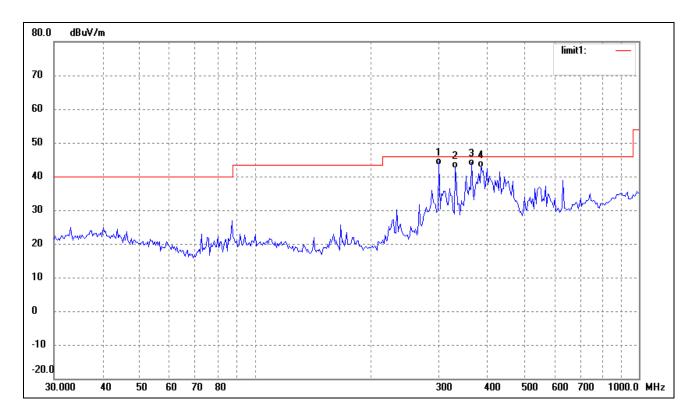
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	33.00	10.20	43.20	46.00	-2.80	224	100	QP
2	366.8231	31.50	10.67	42.17	46.00	-3.83	135	100	peak
3	390.7226	32.20	11.12	43.32	46.00	-2.68	100	200	QP



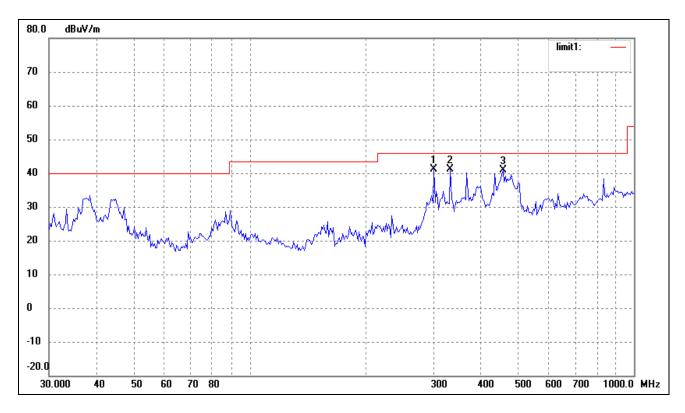
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	30.66	10.20	40.86	46.00	-5.14	168	100	peak
2	366.8231	29.57	10.67	40.24	46.00	-5.76	182	100	peak
3	455.9058	29.95	11.67	41.62	46.00	-4.38	360	100	peak

Operating Condition: 802.11b Transmitting Middle Channel-2437MHz

Comment:



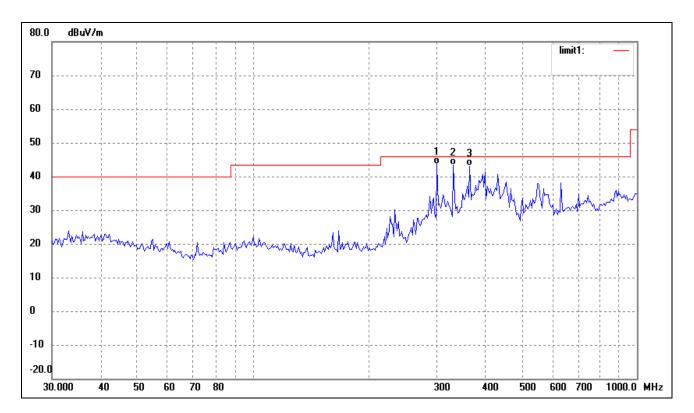
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	33.24	10.20	43.44	46.00	-2.56	275	100	QP
2	332.5187	32.10	10.24	42.34	46.00	-3.66	67	100	QP
3	366.8231	32.49	10.67	43.16	46.00	-2.84	116	200	QP
4	387.9920	31.60	10.99	42.59	46.00	-3.41	350	200	QP



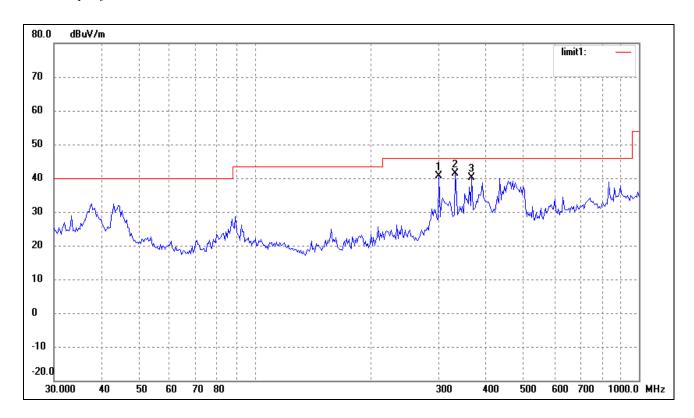
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	30.92	10.20	41.12	46.00	-4.88	251	100	peak
2	332.5187	30.99	10.24	41.23	46.00	-4.77	116	100	peak
3	455.9058	29.10	11.67	40.77	46.00	-5.23	37	100	peak

Operating Condition: 802.11b Transmitting High Channel-2462MHz

Comment:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	33.52	10.20	43.72	46.00	-2.28	257	100	QP
2	332.5187	33.12	10.24	43.36	46.00	-2.64	167	100	QP
3	366.8231	32.53	10.67	43.20	46.00	-2.80	180	100	QP



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	30.54	10.20	40.74	46.00	-5.26	64	100	peak
2	332.5187	31.06	10.24	41.30	46.00	-4.70	223	100	peak
3	366.8231	29.43	10.67	40.10	46.00	-5.90	180	100	peak

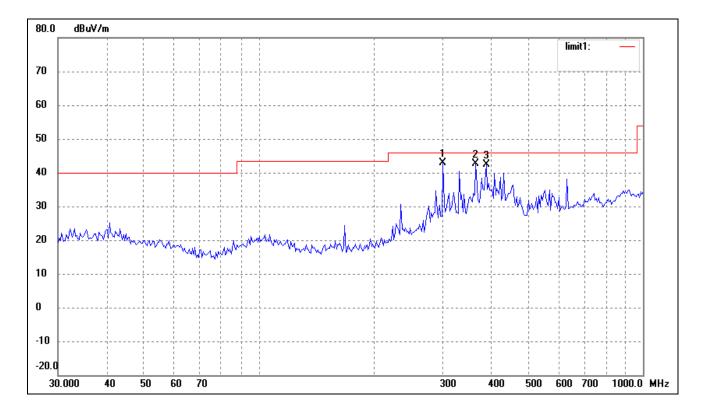
Plot of Radiated Emissions Test Data (30MHz to 1GHz)

EUT: Wireless Digital Display

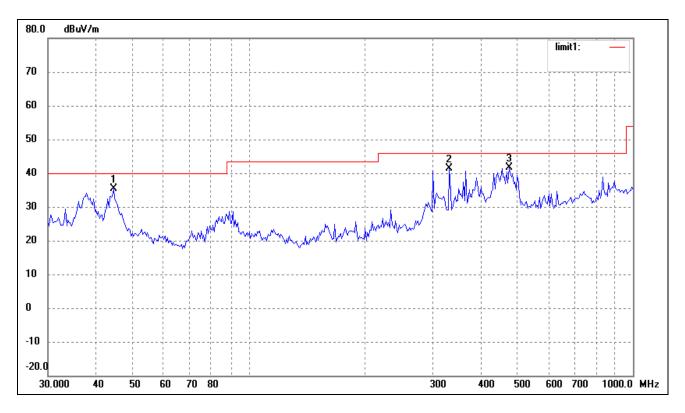
Tested Model: PXT510WR02B

Operating Condition: 802.11g Transmitting Low Channel-2412MHz

Comment:



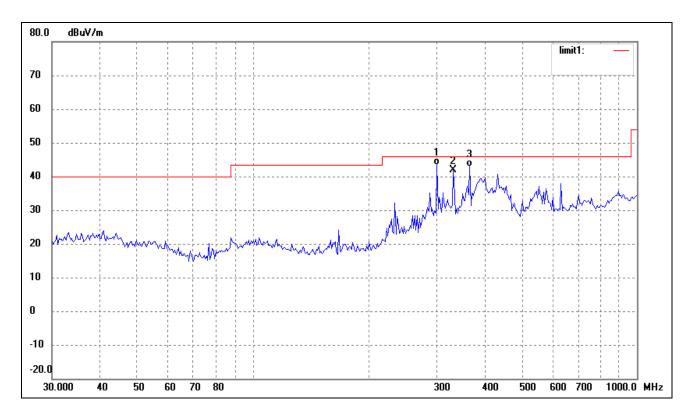
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	32.61	10.20	42.81	46.00	-3.19	338	100	peak
2	366.8231	32.05	10.67	42.72	46.00	-3.28	164	100	peak
3	390.7226	31.21	11.12	42.33	46.00	-3.67	270	100	peak



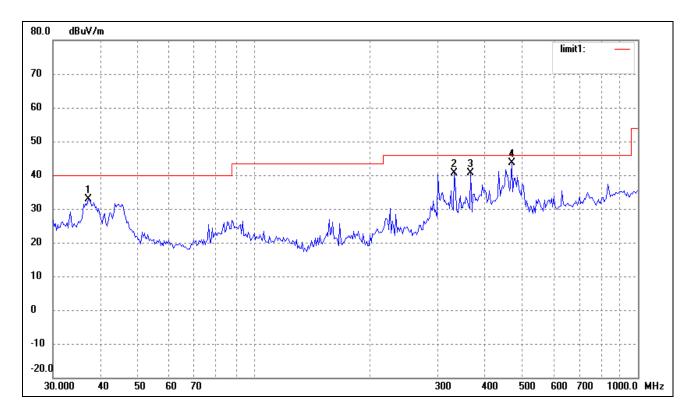
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	44.4308	27.10	8.33	35.43	40.00	-4.57	80	100	peak
2	332.5187	31.06	10.24	41.30	46.00	-4.70	66	100	peak
3	475.4991	30.06	11.49	41.55	46.00	-4.45	164	100	peak

Operating Condition: 802.11g Transmitting Midlle Channel-2437MHz

Comment:



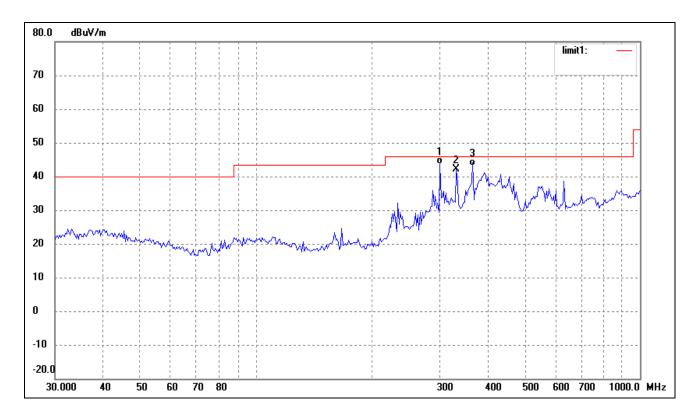
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	33.10	10.20	43.30	46.00	-2.70	180	100	QP
2	332.5187	31.74	10.24	41.98	46.00	-4.02	224	100	peak
3	366.8231	32.20	10.67	42.87	46.00	-3.13	168	100	QP



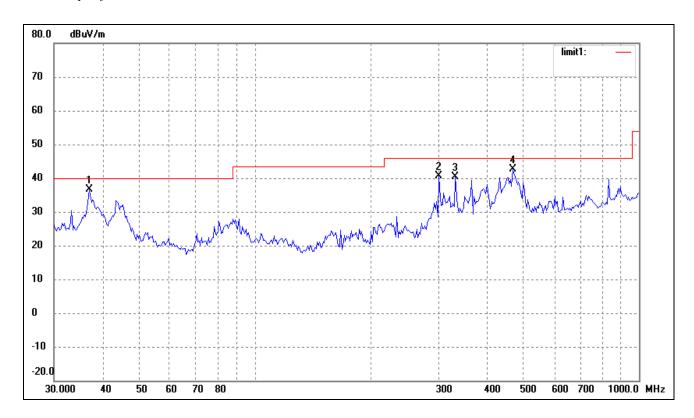
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	37.0249	23.67	9.21	32.88	40.00	-7.12	89	100	peak
2	332.5187	30.34	10.24	40.58	46.00	-5.42	116	100	peak
3	366.8231	29.96	10.67	40.63	46.00	-5.37	346	100	peak
4	468.8762	32.08	11.62	43.70	46.00	-2.30	44	100	peak

Operating Condition: 802.11 g Transmitting High Channel-2462MHz

Comment:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	33.45	10.20	43.65	46.00	-2.35	340	100	QP
2	332.5187	31.95	10.24	42.19	46.00	-3.81	180	100	peak
3	366.8231	32.34	10.67	43.01	46.00	-2.99	270	100	QP



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	37.0249	27.30	9.21	36.51	40.00	-3.49	260	100	peak
2	301.4224	30.49	10.20	40.69	46.00	-5.31	113	100	peak
3	332.5187	30.10	10.24	40.34	46.00	-5.66	38	100	peak
4	468.8762	31.12	11.62	42.74	46.00	-3.26	116	100	peak

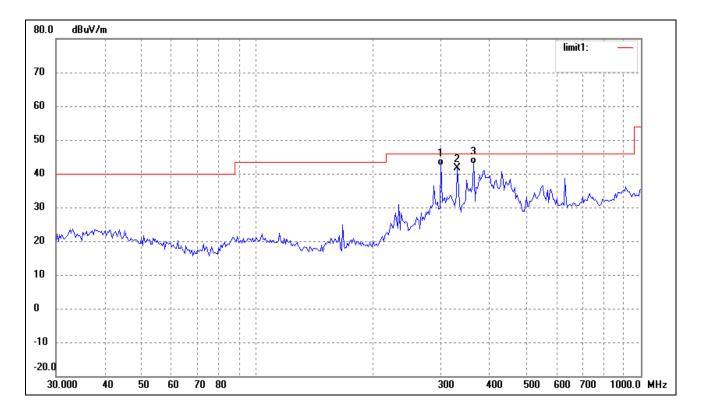
Plot of Radiated Emissions Test Data (30MHz to 1GHz)

EUT: Wireless Digital Display

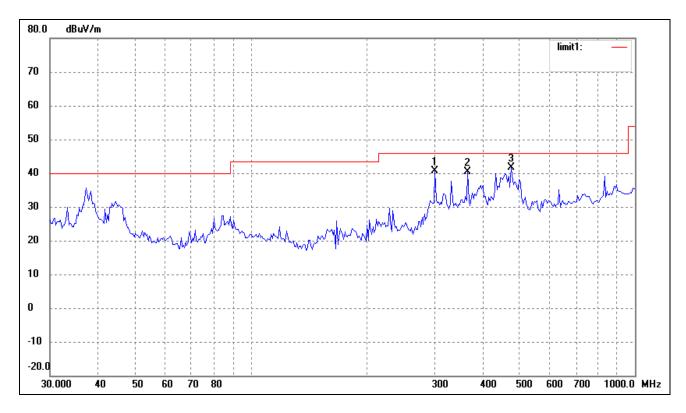
Tested Model: PXT510WR02B

Operating Condition: 802.11 n-HT20 Transmitting Low Channel-2412MHz

Comment:



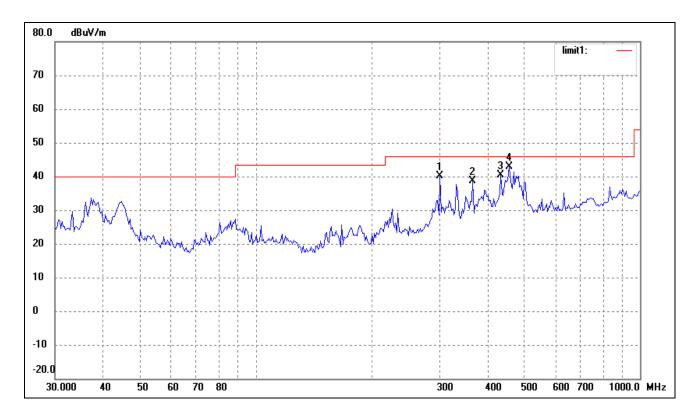
l	No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
ſ		(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
ſ	1	301.4224	32.30	10.20	42.50	46.00	-3.50	274	100	QP
ſ	2	332.5187	31.37	10.24	41.61	46.00	-4.39	116	100	peak
	3	366.8231	32.20	10.67	42.87	46.00	-3.13	35	200	QP



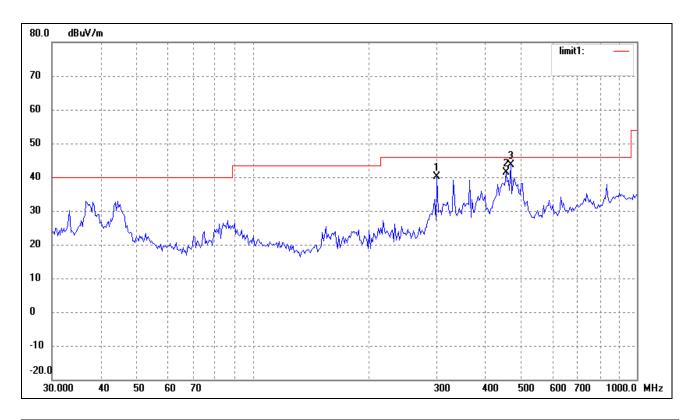
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	30.42	10.20	40.62	46.00	-5.38	340	100	peak
2	366.8231	29.82	10.67	40.49	46.00	-5.51	180	100	peak
3	475.4991	30.03	11.49	41.52	46.00	-4.48	272	100	peak

Operating Condition: 802.11 n-HT20 Transmitting Middle Channel-2437MHz

Comment:



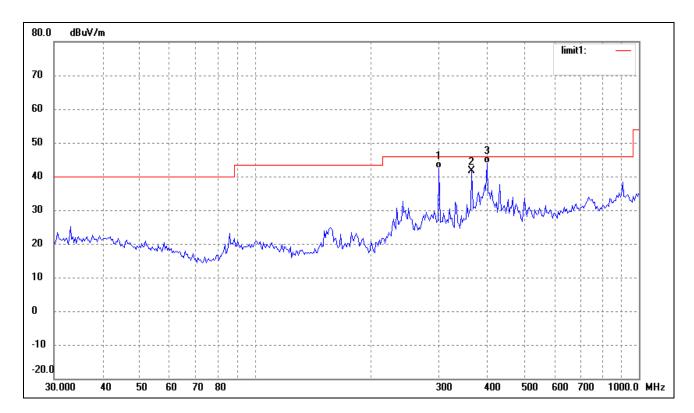
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	29.89	10.20	40.09	46.00	-5.91	116	100	peak
2	366.8231	27.99	10.67	38.66	46.00	-7.34	260	100	peak
3	434.0651	29.33	11.10	40.43	46.00	-5.57	113	100	peak
4	455.9058	31.22	11.67	42.89	46.00	-3.11	260	100	peak



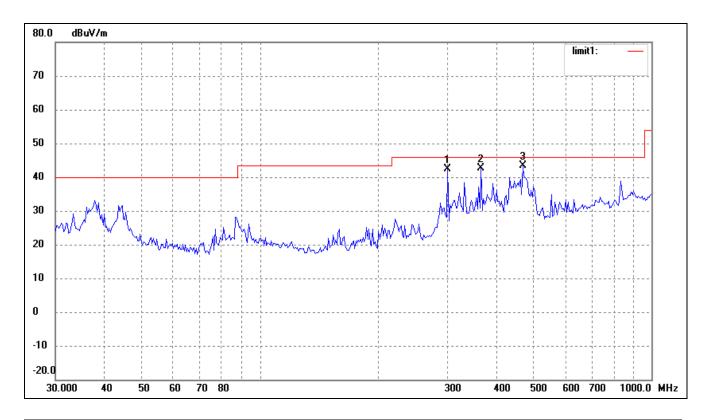
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	29.99	10.20	40.19	46.00	-5.81	25	100	peak
2	455.9058	29.65	11.67	41.32	46.00	-4.68	116	100	peak
3	468.8762	32.13	11.62	43.75	46.00	-2.25	180	200	peak

Operating Condition: 802.11n-HT20Transmitting High Channel-2462MHz

Comment:



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	32.24	10.20	42.44	46.00	-3.56	180	100	QP
2	366.8231	30.89	10.67	41.56	46.00	-4.44	274	100	peak
3	401.8385	32.33	11.47	43.80	46.00	-2.20	113	100	QP



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(•)	(cm)	
1	301.4224	32.18	10.20	42.38	46.00	-3.62	180	100	peak
2	366.8231	31.85	10.67	42.52	46.00	-3.48	330	100	peak
3	468.8762	31.35	11.62	43.47	46.00	-3.03	270	100	peak

Spurious Emissions Above 1GHz

Test Mode: 802.11b

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
			Low Chann	el-2412MHz			
4824.000	64.36	-3.87	60.49	74.00	-13.51	Н	PK
7236.000	49.28	0.12	49.40	74.00	-24.60	Н	PK
4824.000	50.87	-3.87	47.00	74.00	-27.00	V	PK
7236.000	47.58	0.22	47.80	74.00	-26.20	V	PK
4824.000	47.68	-3.87	43.81	54.00	-10.19	Н	AV
7236.000	36.00	0.06	36.06	54.00	-17.94	Н	AV
4824.000	37.41	-3.87	33.54	54.00	-20.46	V	AV
7236.000	35.90	0.06	35.96	54.00	-18.04	V	AV
			Middle Chan	nel-2437MHz			
4874.000	66.32	-3.74	62.58	74.00	-11.42	Н	PK
7311.000	63.22	0.06	63.28	74.00	-10.72	Н	PK
4874.000	57.23	-3.74	53.49	74.00	-20.51	V	PK
7311.000	58.47	0.06	58.53	74.00	-15.47	V	PK
4874.000	50.53	-3.74	46.79	54.00	-7.21	Н	AV
7311.000	43.84	0.06	43.90	54.00	-10.10	Н	AV
4874.000	47.25	-3.74	43.51	54.00	-10.49	V	AV
7311.000	42.02	0.06	42.08	54.00	-11.92	V	AV
			High Chann	el-2462MHz			
4924.000	65.78	-3.62	62.16	74.00	-11.84	Н	PK
7326.000	48.93	2.16	51.09	74.00	-22.91	Н	PK
4924.000	50.88	-3.62	47.26	74.00	-26.74	V	PK
7326.000	48.08	0.80	48.88	74.00	-25.12	V	PK
4924.000	48.94	-3.62	45.32	54.00	-8.68	Н	AV
7326.000	37.45	1.78	39.23	54.00	-14.77	Н	AV
4924.000	37.16	-3.62	33.54	54.00	-20.46	V	AV
7326.000	35.00	0.91	35.91	54.00	-18.09	V	AV

Test Mode: 802.11g

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
			Low Channe	el-2412MHz			
4824.000	64.43	-3.87	60.56	74.00	-13.44	Н	PK
7236.000	55.25	1.19	56.44	74.00	-17.56	Н	PK
4824.000	49.64	-3.87	45.77	74.00	-28.23	V	PK
7236.000	48.10	-0.06	48.04	74.00	-25.96	V	PK
4824.000	47.44	-3.87	43.57	54.00	-10.43	Н	AV
7236.000	39.58	1.19	40.77	54.00	-13.23	Н	AV
4824.000	37.25	-3.87	33.38	54.00	-20.62	V	AV
7236.000	35.78	0.00	35.78	54.00	-18.22	V	AV
			Middle Chan	nel-2437MHz			
4874.000	62.67	-3.74	58.93	74.00	-15.07	Н	PK
7311.000	56.64	1.49	58.13	74.00	-15.87	Н	PK
4874.000	48.19	-4.13	44.06	74.00	-29.94	V	PK
7311.000	47.31	0.33	47.64	74.00	-26.36	V	PK
4874.000	49.79	-3.74	46.05	54.00	-7.95	Н	AV
7311.000	41.19	1.49	42.68	54.00	-11.32	Н	AV
4874.000	35.38	-4.05	31.33	54.00	-22.67	V	AV
7311.000	35.02	0.52	35.54	54.00	-18.46	V	AV
			High Chann	el-2462MHz			
4924.000	49.28	-2.46	46.82	74.00	-27.18	Н	PK
7326.000	48.50	0.52	49.02	74.00	-24.98	Н	PK
4924.000	62.84	-3.55	59.29	74.00	-14.71	V	PK
7326.000	53.71	1.78	55.49	74.00	-18.51	V	PK
4924.000	35.95	-2.30	33.65	54.00	-20.35	Н	AV
7326.000	35.81	0.06	35.87	54.00	-18.13	Н	AV
4924.000	49.01	-3.62	45.39	54.00	-8.61	V	AV
7326.000	39.52	1.78	41.30	54.00	-12.70	V	AV

Test Mode: 802.11n-HT20

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	H/V	
			Low Chann	el-2412MHz			
4824.000	47.75	-3.11	44.64	74.00	-29.36	Н	PK
7236.000	47.19	1.49	48.68	74.00	-25.32	Н	PK
4824.000	47.90	-2.71	45.19	74.00	-28.81	V	PK
7236.000	48.26	1.58	49.84	74.00	-24.16	V	PK
4824.000	35.51	-3.27	32.24	54.00	-21.76	Н	AV
7236.000	35.75	1.58	37.33	54.00	-16.67	Н	AV
4824.000	35.63	-2.62	33.01	54.00	-20.99	V	AV
7236.000	35.67	1.67	37.34	54.00	-16.66	V	AV
			Middle Chan	nel-2437MHz			
4874.000	48.63	-2.23	46.40	74.00	-27.60	Н	PK
7311.000	47.97	2.25	50.22	74.00	-23.78	Н	PK
4874.000	48.01	-2.06	45.95	74.00	-28.05	V	PK
7311.000	48.01	1.97	49.98	74.00	-24.02	V	PK
4874.000	36.33	-2.13	34.20	54.00	-19.80	Н	AV
7311.000	35.56	2.25	37.81	54.00	-16.19	Н	AV
4874.000	36.04	-2.13	33.91	54.00	-20.09	V	AV
7311.000	35.68	2.25	37.93	54.00	-16.07	V	AV
			High Chann	el-2462MHz			
4924.000	63.06	-3.62	59.44	74.00	-14.56	Н	PK
7326.000	48.93	2.16	51.09	74.00	-22.91	Н	PK
4924.000	49.59	-3.62	45.97	74.00	-28.03	V	PK
7326.000	48.24	2.24	50.48	74.00	-23.52	V	PK
4924.000	48.73	-3.62	45.11	54.00	-8.89	Н	AV
7326.000	37.45	1.78	39.23	54.00	-14.77	Н	AV
4924.000	38.43	-3.62	34.81	54.00	-19.19	V	AV
7326.000	35.58	2.24	37.82	54.00	-16.18	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 5th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured. The measurements greater than 20dB below the limit from 9kHz to 30MHz..

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8. Out of Band Emissions

8.1 Standard Applicable

According to §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 a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

8.2 Test Equipment List and Details

Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
Spectrum Analyzer	R&S	FSP	836079/035	2012-03-28	2013-03-27
EMI Test Receiver	R&S	ESVB	825471/005	2012-03-28	2013-03-27
Pre-amplifier	Agilent	8447F	3113A06717	2012-03-28	2013-03-27
Pre-amplifier	Compliance Direction	PAP-0118	24002	2012-03-28	2013-03-27
Trilog Broadband Antenna	SCHWARZBECK	VULB9163	9163-333	2012-02-25	2013-02-24
Horn Antenna	ETS	3117	00086197	2012-02-25	2013-02-24

8.3 Test Procedure

According to the KDB 558074, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)

RBW = 1MHz, VBW = 1MHz for peak value measured

RBW = 1MHz, VBW = 10Hz for average value measured

Sweep = auto; Detector function = peak/average; Trace = max hold

All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation porduct outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205.

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8.4 Environmental Conditions

Temperature:	23°C
Relative Humidity:	54%
ATM Pressure:	1011 mbar

8.5 Summary of Test Results/Plots

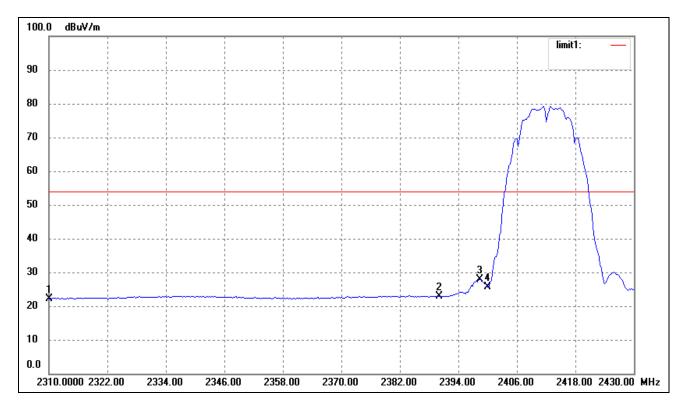
Test Mode	Test Frequency MHz	Limit dBuV / dBc	Result
	2390.00	<54 dBuV	Pass
802.11b	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
802.11g	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass
	2390.00	<54 dBuV	Pass
802.11n-HT20	2400.00	<54 dBuV	Pass
	2483.50	<54 dBuV	Pass

The edge emissions are below the FCC 15.209 Limits or complies with the 15.247(d) requirements.

Please refer to the test plots as below.

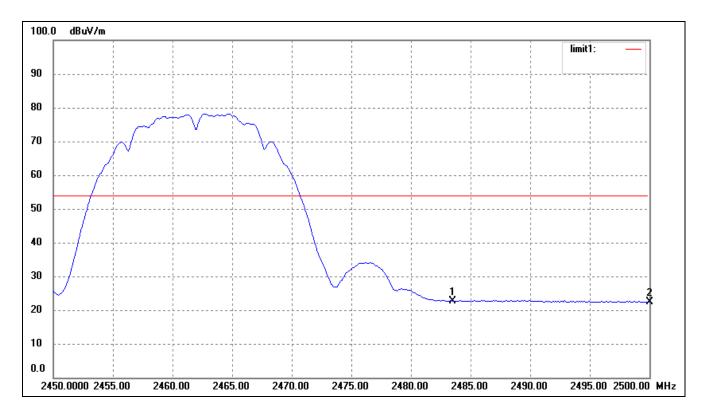
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802.11b-Lowest Bandedge



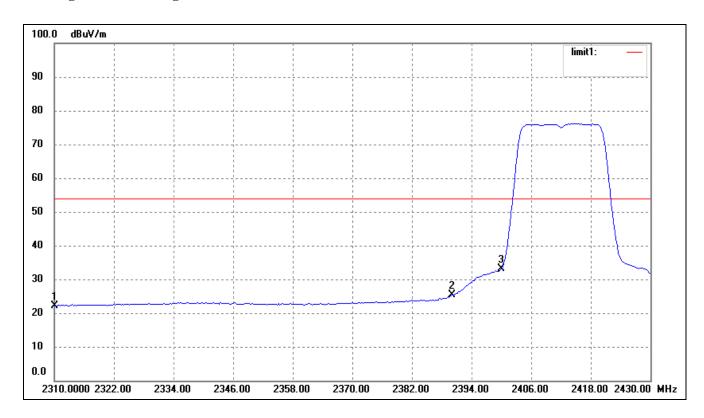
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	33.85	-11.72	22.13	54.00	-31.87	113	100	peak
	2310.000	45.21	-11.72	33.49	74.00	-40.51	113	100	Ave
2	2390.000	34.63	-11.75	22.88	54.00	-31.12	113	100	peak
	2390.000	46.79	-11.75	35.04	74.00	-38.96	113	100	Ave
3	2398.320	39.73	-11.75	27.98	54.00	-26.02	113	1001	Ave
4	2400.000	37.37	-11.75	25.62	54.00	-28.38	113	00	Ave

802.11b-Highest Bandedge



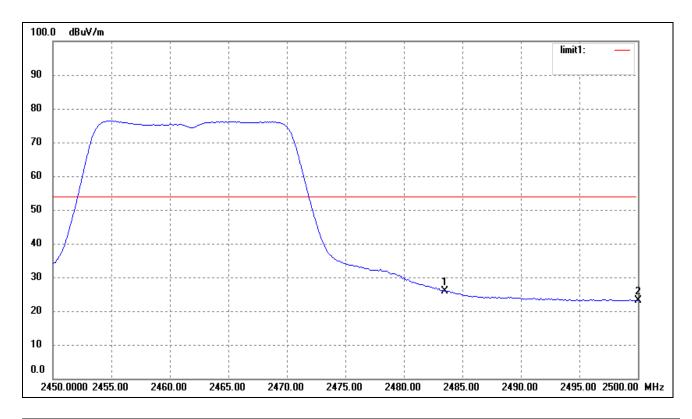
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	34.50	-11.78	22.72	54.00	-31.28	256	100	Ave
	2483.500	45.99	-11.78	34.21	74.00	-39.79	256	100	Peak
2	2500.000	34.15	-11.78	22.37	54.00	-31.63	256	100	Ave
	2500.000	46.17	-11.78	34.39	74.00	-39.61	256	100	Peak

802.11g-Lowest Bandedge



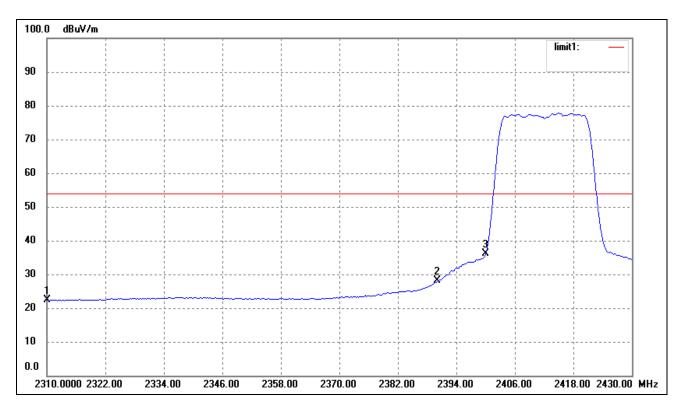
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	33.90	-11.72	22.18	54.00	-31.82	178	100	peak
	2310.000	44.21	-11.72	32.49	74.00	-41.51	178	100	Ave
2	2390.000	37.02	-11.75	25.27	54.00	-28.73	178	100	peak
	2390.000	44.79	-11.75	33.04	74.00	-40.96	178	100	Ave
3	2400.000	44.94	-11.75	33.19	54.00	-20.81	178	00	Ave

802.11g-Highest Bandedge



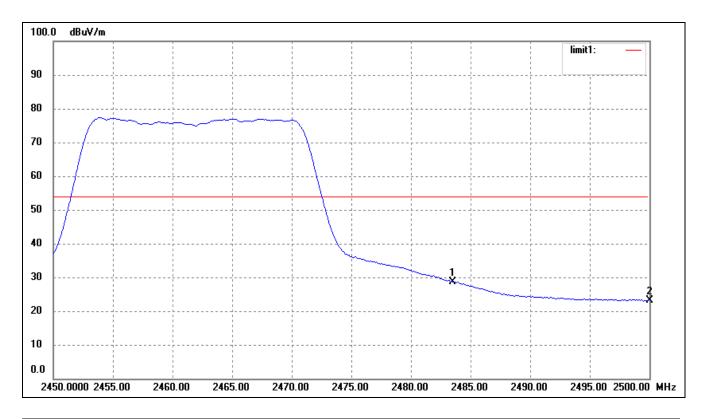
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	37.77	-11.78	25.99	54.00	-28.01	360	100	Ave
	2483.500	48.99	-11.78	37.21	74.00	-36.79	360	100	Peak
2	2500.000	34.88	-11.78	23.1	54.00	-30.9	360	100	Ave
	2500.000	49.17	-11.78	37.39	74.00	-36.61	360	100	Peak

802.11n-HT20-Lowest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2310.000	34.06	-11.72	22.34	54.00	-31.66	272	100	peak
	2310.000	45.21	-11.72	33.49	74.00	-40.51	272	100	Ave
2	2390.000	39.86	-11.75	28.11	54.00	-25.89	272	100	peak
	2390.000	46.65	-11.75	34.9	74.00	-39.1	272	100	Ave
3	2400.000	47.99	-11.75	36.24	54.00	-17.76	272	00	Ave

802.11n-HT20-Highest Bandedge



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	(°)	(cm)	
1	2483.500	40.48	-11.78	28.7	54.00	-25.3	282	100	Ave
	2483.500	50.21	-11.78	38.43	74.00	-35.57	282	100	Peak
2	2500.000	35.03	-11.78	23.25	54.00	-30.75	282	100	Ave
	2500.000	47.77	-11.78	35.99	74.00	-38.01	282	100	Peak

9. Conducted Emissions

9.1 Measurement Uncertainty

Base on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of any conducted emissions measurement is ± 2.88 dB.

9.2 Test Equipment List and Details

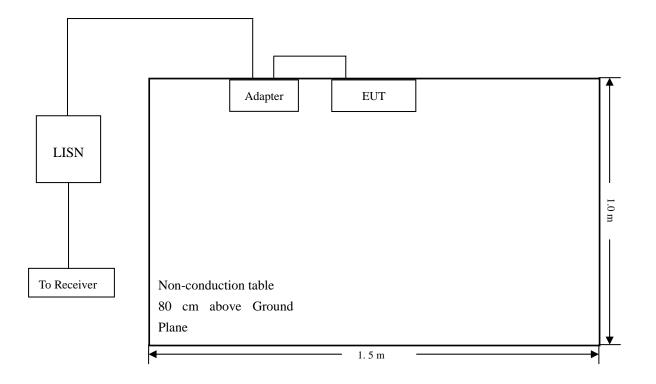
Description	Manufacturer	Model	Serial Number	Cal. Date	Due. Date
EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2012-03-28	2013-03-27
L.I.S.N	Schwarz beck	NSLK8126	8126-224	2012-03-28	2013-03-27
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2012-03-28	2013-03-27

9.3 Test Procedure

The setup of EUT is according with per ANSI C63.4-2003 measurement procedure. The specification used was with the FCC Part 15.207 Limit.

The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. The spacing between the peripherals was 10 cm.

9.4 Basic Test Setup Block Diagram



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9.5 Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52%
ATM Pressure:	1012 mbar

9.6 Test Receiver Setup

During the conducted emission test, the test receiver was set with the following configurations:

Start Frequency	. 150 kHz
Stop Frequency	.30 MHz
Sweep Speed	. Auto
IF Bandwidth	. 10 kHz
Quasi-Peak Adapter Bandwidth	.9 kHz
Quasi-Peak Adapter Mode	. Normal

9.7 Summary of Test Results/Plots

According to the data in section 3.8, the EUT <u>complied with the FCC Part 15.207</u> Conducted margin for a Class B device, with the *worst* margin reading of:

-7.38 dBµV at 0.174 MHz in the Line mode, Peak detector, 0.15-30MHz

9.8 Conducted Emissions Test Data

Plot of Conducted Emissions Test Data

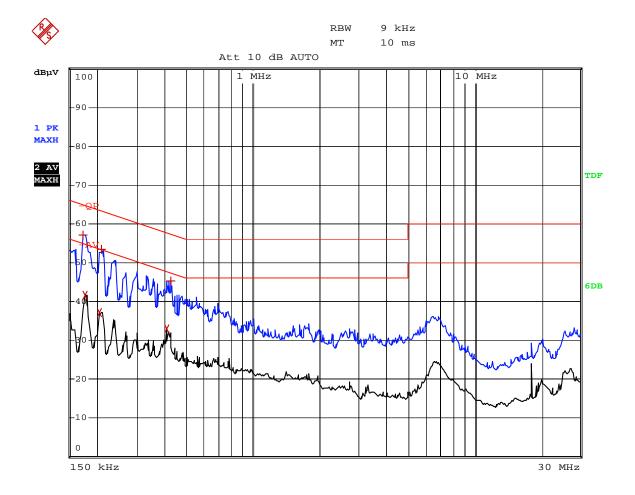
EUT: Wireless Digital Display

Tested Model: PXT510WR02B

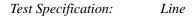
Operating Condition: Playing

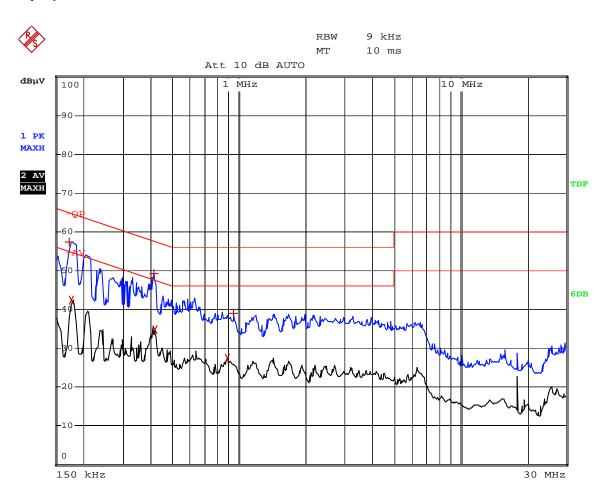
Comment:

Test Specification: Neutral



	EDIT PEAK LIST	EDIT PEAK LIST (Prescan Results)						
Tracel:	-QP	-QP						
Trace2:	-AV							
Trace3:								
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB					
1 Max Peak	174 kHz	57.10	-7.66					
2 Average	178 kHz	41.59	-12.98					
2 Average	206 kHz	37.17	-16.19					
1 Max Peak	210 kHz	53.33	-9.86					
2 Average	406 kHz	33.03	-14.69					
1 Max Peak	422 kHz	45.34	-12.06					





	EDIT PEAK LIST	(Prescan Results)				
Tracel: -QP						
Trace2: -AV						
Trace3:						
TRACE	FREQUENCY	LEVEL dBµV	DELTA LIMIT dB			
1 Max Peak	174 kHz	57.38	-7.38			
2 Average	178 kHz	42.37	-12.20			
1 Max Peak	410 kHz	49.14	-8.50			
2 Average	414 kHz	34.69	-12.87			
2 Average	886 kHz	27.44	-18.55			
1 Max Peak	946 kHz	38.88	-17.11			

***** END OF REPORT *****