



CERTIFICATION TEST REPORT

Applicant: 2GIG TECHNOLOGIES
3262 GREY HAWK COURT
Carlsbad, CA, 92008

Equipment Under Test (EUT): WIRELESS TOUCHSCREEN KEYPAD
Model number: 2GIG-TS1

FCC ID: WDQ-TS1Y
IC: 7794A-TS1Y

In Accordance With: FCC Part 15 Subpart C, 15.247
IC RSS-210 Issue 8 December 2010
IC RSS-Gen Issue 3 December 2010

Report Number: 2013 06236870 EMC

Project Number: 10242595

Nex Number: 236870

Date: JUNE 7, 2013

Total Number of Pages: 28



2.1. Applicant Affirmation

Verdin Orozco representing 2GIG Technologies hereby affirms:

- a) That he/she has reviewed and concurs that the test shown in this report are reflective of the operational characteristics of the device for which certification is sought;
- b) That the device in this test report will be representative of production units;
- c) That all changes (in hardware and software/firmware) to the subject device will be reviewed.
- d) That any changes impacting the attributes, functionality or operational characteristics documented in this report will be communicated to the body responsible for approving (certifying) the subject equipment.

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Verdin Orozco

Printed name of official

Signature of official

3262 Grey Hawk Court

Address

June 7, 2013

Date

619-250-4697

Telephone number

vorozco@2gig.com

Email address of official

NOTE—This affirmation must be signed by the responsible party before it is submitted to a regulatory body for approval.



Section 1. Summary of Test Results

1.1 General

All measurements are traceable to national standards

These tests were conducted on a sample of the equipment for the purpose of demonstrating compliance with Part 15; Subpart C and RSS-210, Issue 8 December 2010. Radiated tests were conducted in accordance with ANSI C63.4-2003. Radiated emissions are made in a Semi-Anechoic Chamber. A description of the test facility is on file with the FCC and IC.

The assessment summary is as follows:

Apparatus Assessed:	2GIG-TS1
Specifications:	FCC Part 15 Subpart C, 15.247 IC RSS-210 Issue 8 December 2010
Date Received in Laboratory:	MAY 30, 2013
Compliance Status:	Complies
Exclusions:	None
Non-compliances:	None



1.2 Report Release History:

REVISION	DATE	COMMENTS
-	JUNE 7, 2013	Prepared By: MARK PHILLIPS
-	JUNE 7, 2013	Initial Release: ALAN LAUDANI

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Note that the results contained in this report relate only to the items tested and were obtained in the period between the date of initial receipt of samples and the date of issue of the report.

This test report has been completed in accordance with the requirements of ISO/IEC 17025.

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TESTED BY:  Date: June 7, 2013
MARK PHILLIPS, EMC Test Engineer


Senior RF/EMC Engineer
Test Report Vericator

TABLE OF CONTENTS

2.1. Applicant Affirmation	2
Section 1. Summary of Test Results	3
1.1 General	3
1.2 Report Release History:.....	4
Section 2: Equipment Under Test	6
2.1 Product Identification	6
2.2 Theory of Operation	6
2.3 Technical Specifications of the EUT	7
Section 3: Test Conditions	8
3.1 Specifications	8
3.3 Test Environment.....	8
3.4 Test Equipment.....	9
Section 4: Observations	9
4.1 Modifications Performed During Assessment.....	9
4.2 Record Of Technical Judgments	9
4.3 EUT Parameters Affecting Compliance	9
4.4 Deviations From Laboratory Test Procedures	9
4.5 Test Deleted	9
4.6 Additional Observations.....	9
Section 5: Results Summary	10
5.1 Test Results	10
Appendix A: Test Results	11
Power Line Conducted Emissions	11
20 dB Bandwidth	14
Frequency Hopping Systems Operating in the 902-928 MHz Band	17
Frequency Plan- Number of Hopping Channels	20
Radiated Emissions within Restricted Bands.....	21
Bandedge Measurements	23
Peak Output Power and Radiated Spurious Emissions.....	24
Receiver Spurious Emissions	27



Section 2: Equipment Under Test

2.1 Product Identification

DEVICE	MANUFACTURER MODEL # SERIAL #	POWER CABLE
EUT - Wireless Touchscreen Keypad	2GIG Technologies Model: 2GIG-TS1 Serial #: 1316150001880313	1.8m, 2 wire, 18 AWG, screw terminals
EUT – Power Supply	ZB Model: ZB-A140017 Serial #: none	2 Prong Wall Mount Adapter
Support – Control Panel	2GIG Technologies Model: 2GIG-GCX Serial #: 1252120001320936	1.8m, 2 wire, 18AWG, screw terminals
Support – Power Supply	ZB Model: ZB-A140017 Serial #: none	2 Prong Wall Mount Adapter

CONNECTION	I/O CABLE
No I/O connections	

2.2 Theory of Operation

THE 2GIG-TS1 is a Wireless Touchscreen Keypad for use in a home security system. It was exercised by communicating with a control panel for normal hopping mode and standby mode or placed in continuous transmit mode for low, middle and high channels using firmware commands from a remote terminal to a board mounted service port. The 2GIG-TS1 has no software.

The EUT's performance during test was evaluated against the performance criterion specified by applicable test standards. Performance results are detailed in the test results section of this report.



2.3 Technical Specifications of the EUT

Manufacturer:	2GIG Technologies
Operating Frequency:	910.200 to 919.872 MHz in the 902-928 MHz Band
Number of Operating Frequencies:	25
Output Power:	278 mW
Modulation:	FSK
Antenna Data:	Wire antenna
Antenna Connector:	None
Power Source:	120 Vac 60Hz



Section 3: Test Conditions

3.1 Specifications

The apparatus was assessed against the following specifications:

FCC Part 15 Subpart C, 15.247

Operation within the bands 902-928 MHz, 2400-2483.5 MHz, 5725-5850 MHz and 24.0-24.25 GHz bands.

IC RSS-210 Issue 8 December 2010

Low-power Licence-exempt Radio-communication Devices (All Frequency Bands): Category I Equipment. Annex 8 - Frequency Hopping and Digital Modulation Systems Operating in the Bands 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz

IC RSS-Gen Issue 3 December 2010

General Requirements and Information for the Certification of Radio-communication Equipment

3.3 Test Environment

All tests were performed under the following environmental conditions:

Temperature range	:	15.6 – 23.3 °C
Humidity range	:	26 - 65 %
Pressure range	:	86 - 106 kPa
Power supply range	:	+/- 1% of rated voltages



3.4 Test Equipment

Nemko ID	Device	Manufacturer	Model	Serial Number	Cal Date	Cal Due Date
111	Antenna, LPA	EMCO	3146	1382	09-Jan-2013	09-Jan-2014
133	Antenna, loop	Electro-Metrics	ALR-25M	678	18-Jul-2011	18-Jul-2013
529	Antenna, DRWG	EMCO	3115	2505	31-Oct-2012	31-Oct-2014
835	Spectrum Analyzer	Rohde & Schwarz	RHDFSEK	829058/005	06-Sep-2012	06-Sep-2013
901	Preamplifier	Sonoma	310 N	130607	15-Oct-2012	15-Oct-2013
911	Spectrum Analyzer	Agilent	E4440A	US41421266	15-Oct-2012	15-Oct-2013
E1029	Preamplifier (20MHz to 18GHz)	A.H. Systems, Inc.	PAM-0118	343	21-Jan-2013	21-Jan-2014
E1046	Biconical Antenna	A.H. Systems Inc.	SAS-540	736	22-Apr-2013	22-Apr-2014
E1017	9kHz to 7GHz Spectrum Analyzer	Rohde & Schwarz	FSP7	839337/0022	18-Jun-2013	18-Jun-2014
E1019	Two Line V-Network	Rohde & Schwarz	ENV216	101045	13-Apr-2013	13-Apr-2014

Registration of the Semi-Anechoic Chamber is on file with the Federal Communications Commission and with Industry Canada under Site Number 2040B-3.

Section 4: Observations

4.1 Modifications Performed During Assessment

No modifications were performed during assessment.

4.2 Record Of Technical Judgments

No technical judgements were made during the assessment.

4.3 EUT Parameters Affecting Compliance

The user of the apparatus could not alter parameters that would affect compliance.

4.4 Deviations From Laboratory Test Procedures

No deviations from Laboratory Test Procedure

4.5 Test Deleted

No Tests were deleted from this assessment.

4.6 Additional Observations

There were no additional observations made during this assessment.



Section 5: Results Summary

This section contains the following:

Test Results

The column headed “Required” indicates whether the associated clauses were invoked for the apparatus under test. The following abbreviations are used:

- N No: not applicable / not relevant
- Y Yes: Mandatory i.e. the apparatus shall conform to these test.
- N/T Not Tested, mandatory but not assessed. (See section 4.4 Test deleted)

The results contained in this section are representative of the operation of the apparatus as originally submitted.

5.1 Test Results

Part 15	RSS-210	Test Description	Required	Result
15.207 (a)	RSS-Gen 7.2.2	Conducted Emission Limit	Y	Pass
15.247 a1i	A81(3)	20dB & 99% Bandwidth	Y	Pass
12.247a1	A81(3)	Channel Separation Average time of occupancy	Y	Pass
15.247a1i	A81(3)	Number of Hopping Channels	Y	Pass
15.247 b1	A81(2)	Peak Output Power	Y	Pass
15.209 a 15.247d	A81(3), A2.9	Radiated Emissions within Restricted Bands	Y	Pass
15.247d	A2.9	Bandedge	Y	Pass
15.109	RSS-GEN 4.10	Receiver Spurious Emissions	Y	Pass



Appendix A: Test Results

Power Line Conducted Emissions

15.207(a) Except as shown in paragraphs (b) and (c) of this section, for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 kHz to 30 MHz, shall not exceed the limits in the following table, as measured using a 50 μ H/50 ohms line impedance stabilization network (LISN). Compliance with the provisions of this paragraph shall be based on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower limit applies at the boundary between the frequency ranges.

Frequency of emission (MHz)	Conducted limit (dB μ V)	
	Quasi-peak	Average
0.15–0.5	66 to 56*	56 to 46*
0.5–5	56	46
5–30	60	50

*Decreases with the logarithm of the frequency.

Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	20°C
Date:	5/31/2013	Humidity:	31 %
Modification State:	Low Channel, Receive mode	Tester:	Mark Phillips
		Laboratory:	Nemko SR2

Test Results: EUT complies

See attached plots

Test Parameters

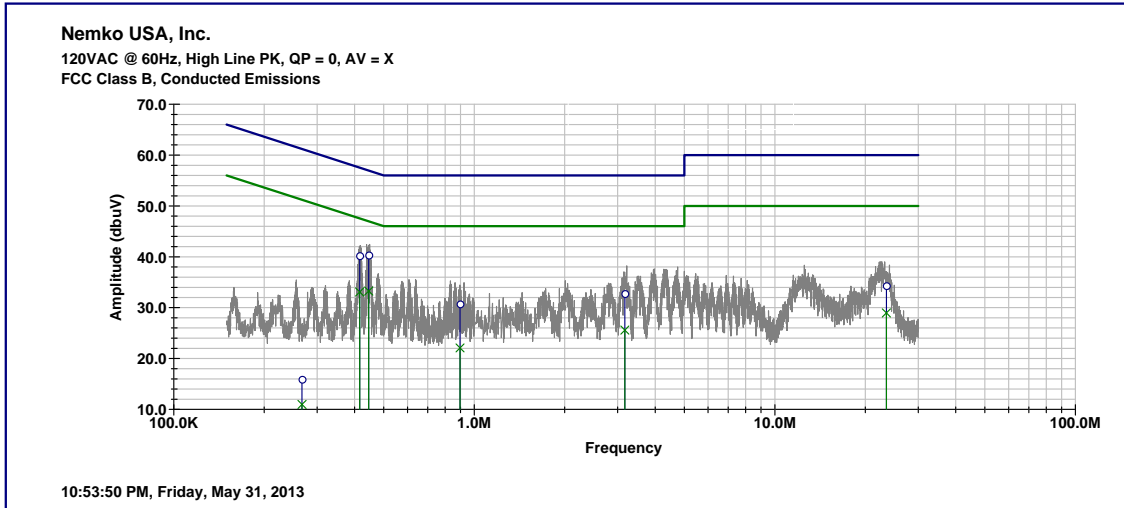
Peak RBW: 100kHz VBW: 100kHz

Quasi-Peak: RBW 9kHz, VBW 30 kHz

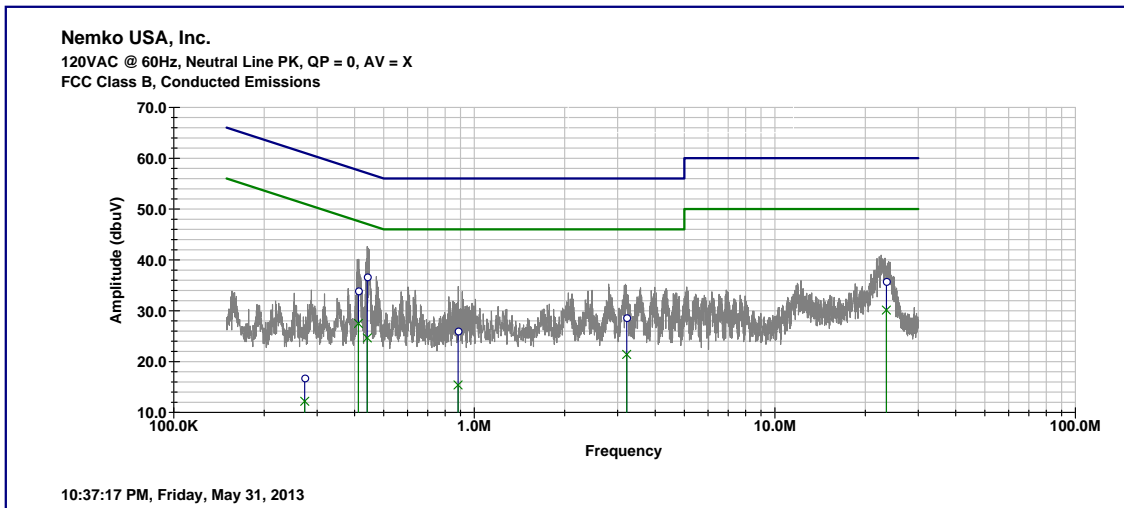
Average: RBW 9kHz, VBW 30 kHz

Quasi-Peak Limit Blue Line, Average Limit Green Line

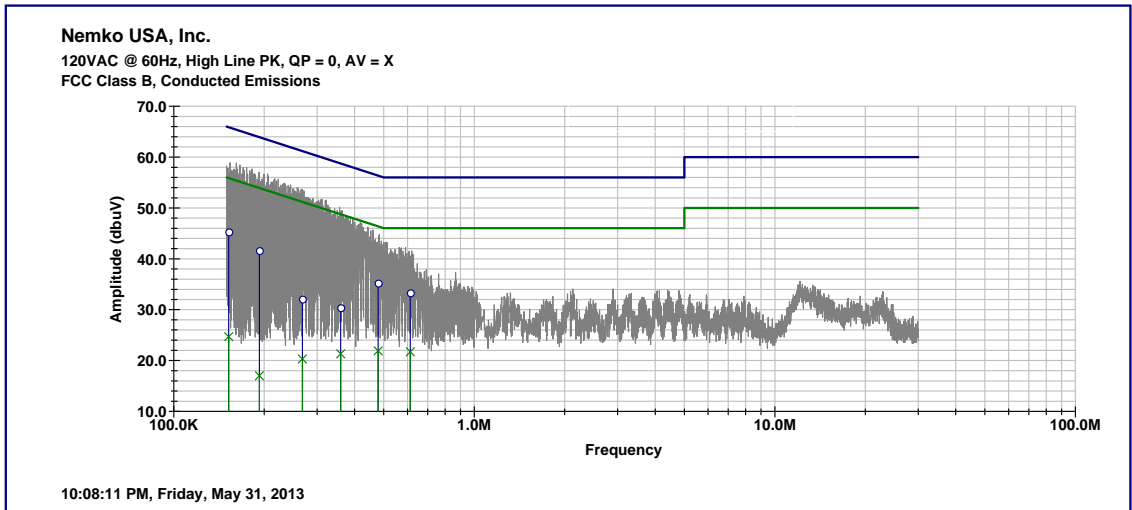
Low channel (worst case)



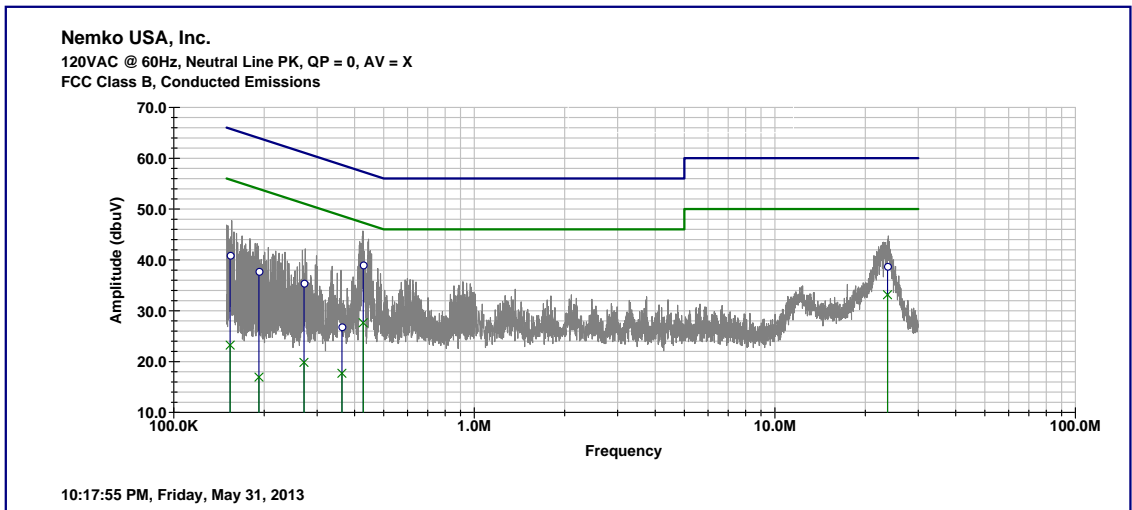
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Receive Mode



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20 dB Bandwidth

Clause 15.247(a)(1)(i)

(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500kHz.

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Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	20°C
Date:	5/6/2013	Humidity:	31 %
Modification State:	Lo/Mid/High Channels	Tester:	Mark Phillips
		Laboratory:	Nemko GP1

Test Results: EUT complies

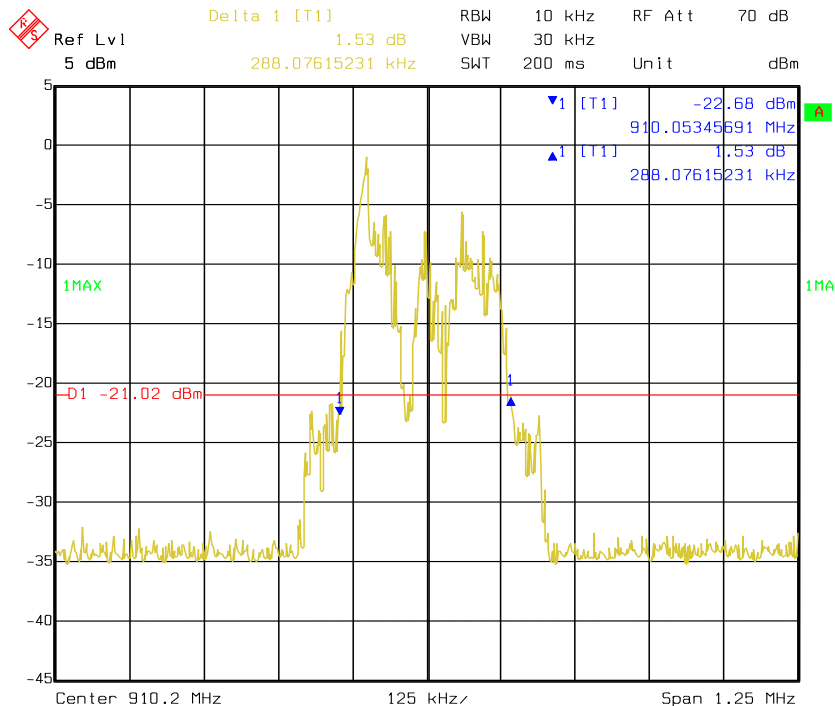
- This was a conducted test.
- Span is wide enough to capture the channel transmission
- RBW is 1% of the span
- VBW is 3X RBW
- Sweep is auto
- Detector is Peak
- Trace is Max Hold
- 99% bandwidth: Used Spectrum Analyzer's programmed function.
- 20 dB bandwidth: A peak output max hold reading was taken, a display line was drawn 20 dB lower than peak level. The 20 dB bandwidth was determined from where the channel output spectrum intersected the display line.
- Observed maximum 20 dB BW is 288 kHz (low channel).
- Observed maximum 20 dB BW is 280 kHz (high channel).
- 910.200 MHz – (288/2) kHz = 910.066 MHz (within the frequency band)
- 915.876 MHz + (280/2) kHz = 917.016 MHz (within the frequency band)

Channel Range	20dB Bandwidth	99% Bandwidth
Low (910.200 MHz)	288 kHz	431 kHz
Mid (915.036 MHz)	388 kHz	463 kHz
High (919.876 MHz)	280 kHz	443 kHz



20dB Bandwidth

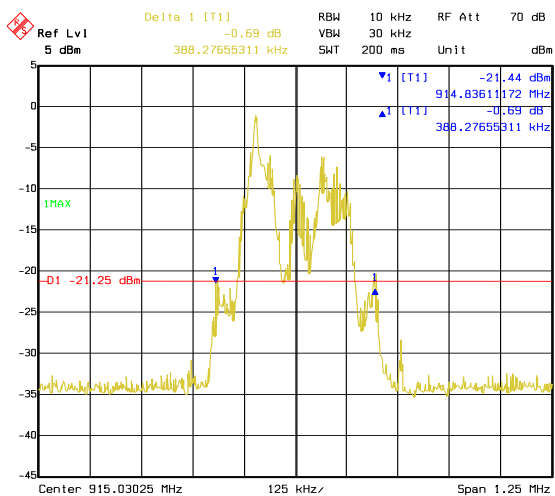
Low Channel



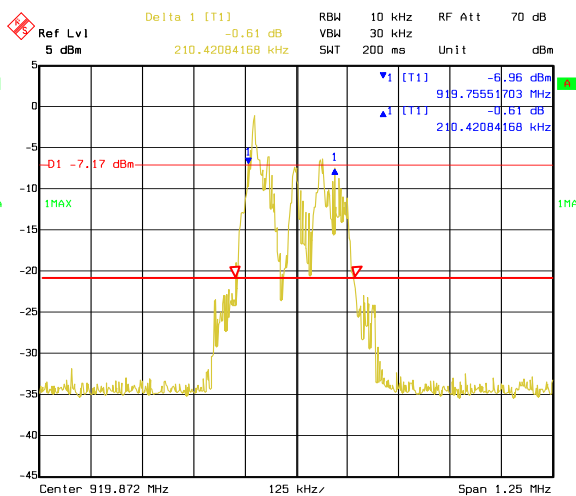
Date: 06.MAY 2013 12:58:49

Mid Channel

High Channel



Date: 06.MAY 2013 12:53:47

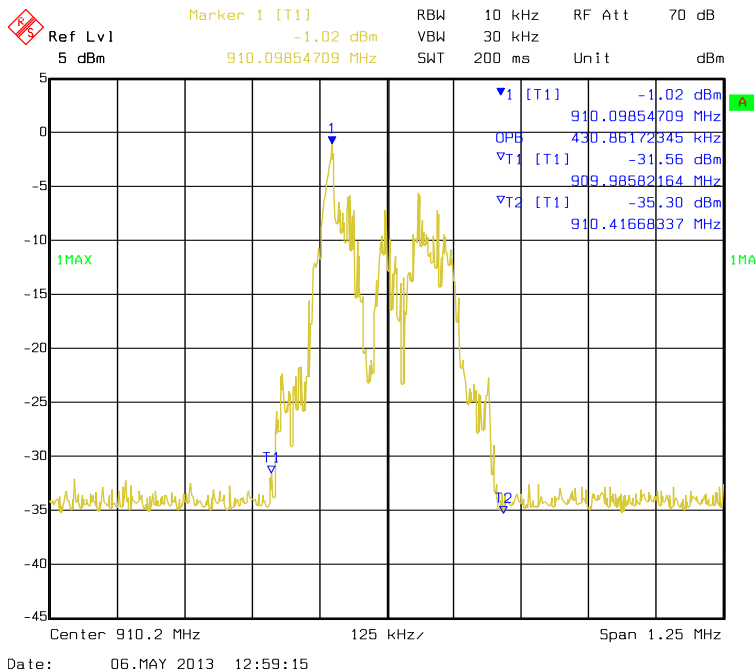


Date: 06.MAY 2013 13:01:36

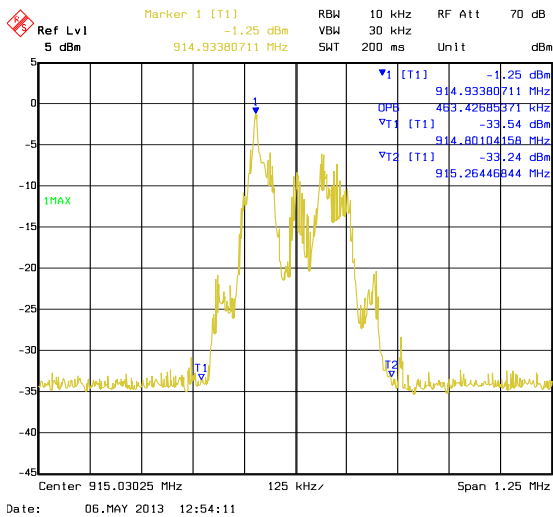
20 dB bandwidth ~280 kHz

99% Bandwidth

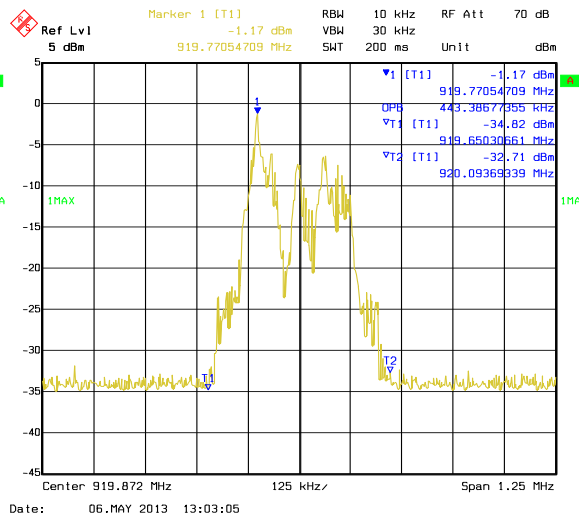
Low Channel



Mid Channel



High Channel



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Frequency Hopping Systems Operating in the 902-928 MHz Band

Clause 15.247(a)(1)(i) For frequency hopping systems operating in the 902-928 MHz band: if the 20 dB bandwidth of the hopping channel is less than 250 kHz, the system shall use at least 50 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 20 second period; if the 20 dB bandwidth of the hopping channel is 250 kHz or greater, the system shall use at least 25 hopping frequencies and the average time of occupancy on any frequency shall not be greater than 0.4 seconds within a 10 second period. The maximum allowed 20 dB bandwidth of the hopping channel is 500 kHz.

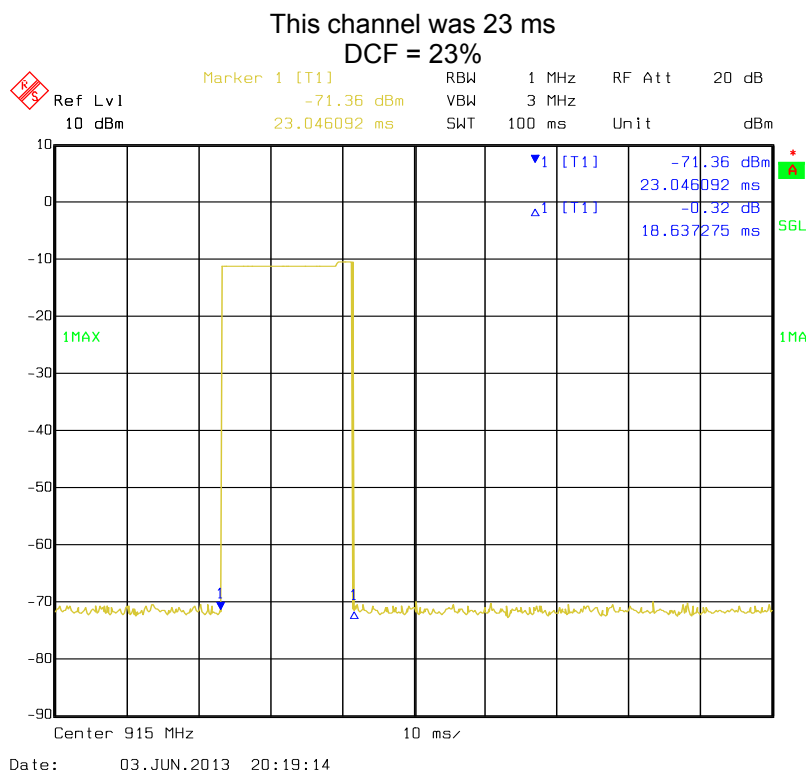
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Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	20°C
Date:	7/3/2013	Humidity:	31 %
Modification State:	Hopping	Tester:	Mark Phillips
		Laboratory:	Nemko

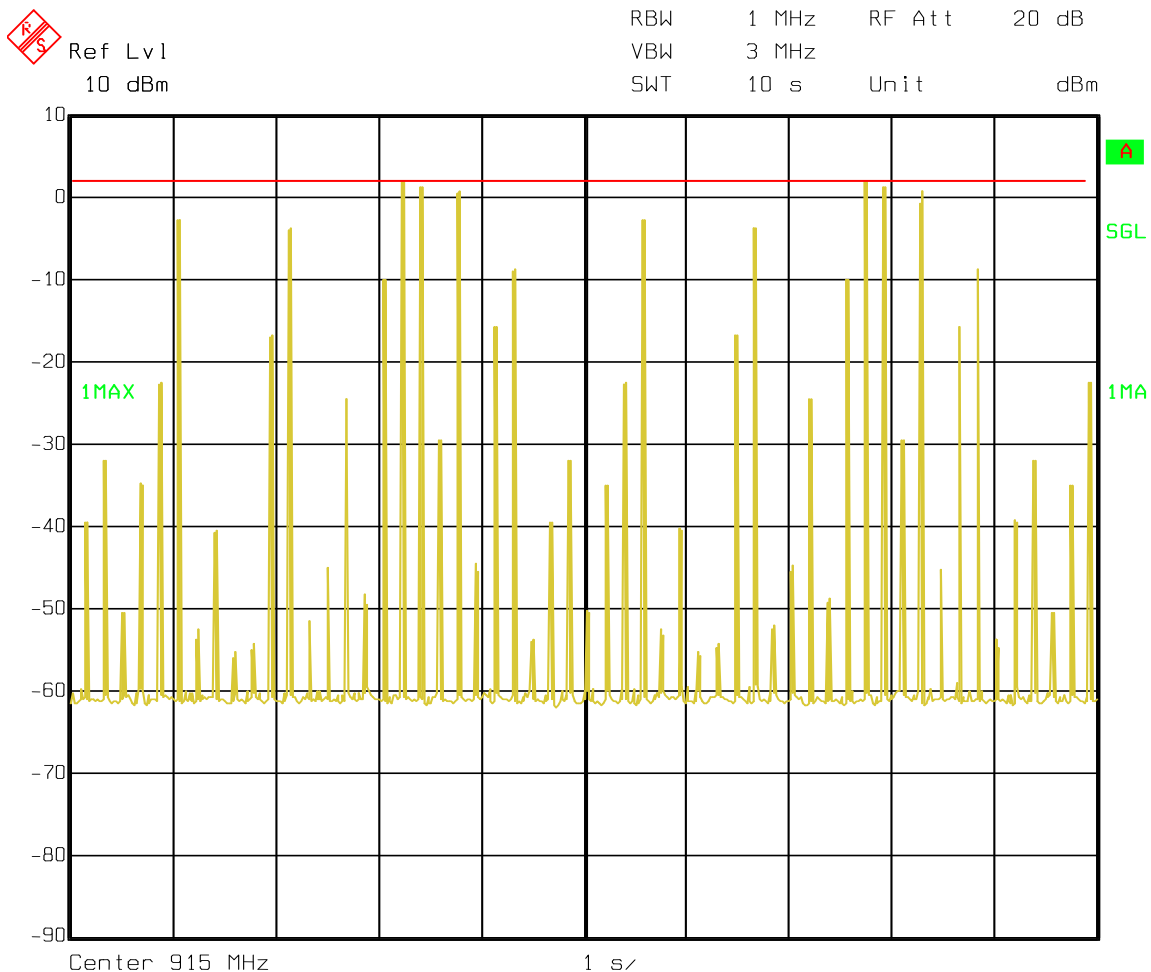
Test Results: EUT complies

Duty Cycle



Dwell time:

Channel repeats twice in 10 seconds.
2 x 23 ms in 10 seconds < 0.4 seconds



Date: 03.JUN.2013 20:21:16

Channel Separation

Clause 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

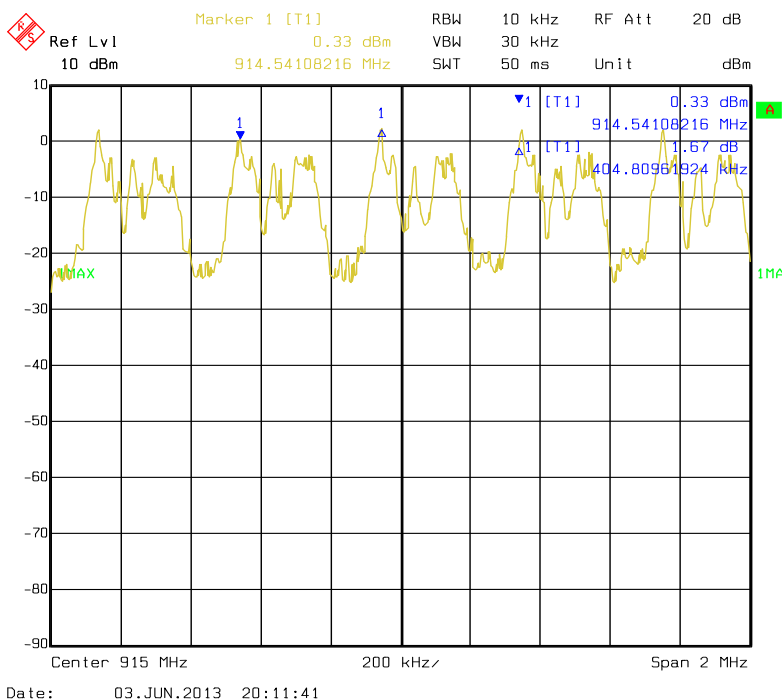
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Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	20°C
Date:	6/3/2013	Humidity:	31 %
Modification State:	Hopping	Tester:	Mark Phillips
		Laboratory:	Nemko

Test Results: EUT Complies

- The Spectrum Analyzer RES BW was set to 10 kHz.
- Detector was peak, max hold.
- The test sample was set to hopping mode and the frequency span was set to a value to capture two or more hopping channels.
- Marker delta shows frequency separation.



Channel Separation equal to the 20 dB bandwidth: 300 kHz



Frequency Plan- Number of Hopping Channels

Clause 15.247(a)(1) Frequency hopping systems shall have hopping channel carrier frequencies separated by a minimum of 25 kHz or the 20 dB bandwidth of the hopping channel, whichever is greater. Alternatively, frequency hopping systems operating in the 2400-2483.5 MHz band may have hopping channel carrier frequencies that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the hopping channel, whichever is greater, provided the systems operate with an output power no greater than 125 mW. The system shall hop to channel frequencies that are selected at the system hopping rate from a pseudo randomly ordered list of hopping frequencies. Each frequency must be used equally on the average by each transmitter. The system receivers shall have input bandwidths that match the hopping channel bandwidths of their corresponding transmitters and shall shift frequencies in synchronization with the transmitted signals.

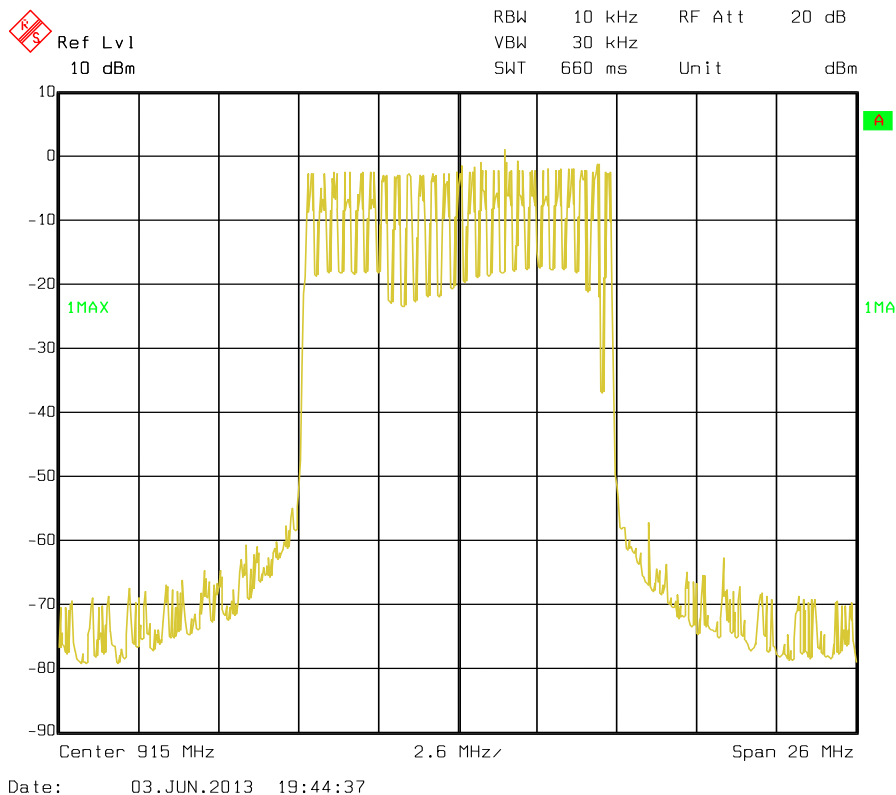
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Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	20°C
Date:	6/3/2013	Humidity:	31 %
Modification State:	Hopping	Tester:	Mark Phillips
		Laboratory:	Nemko

Test Results: The Frequency Plan is discussed in the Technical Description exhibit and was reviewed by this test engineer and was found to comply.

- 25 channels: channel 0 at 910.200 to channel 24 at 918.872
- Psuedo-Random Hopping Sequence:
20, 17, 2, 15, 12, 11, 6, 13, 3, 8, 9, 0, 19, 18, 21, 5, 7, 10, 22, 4, 24, 23, 16, 14, 1





Radiated Emissions within Restricted Bands

Clause 15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/meter)	Measurement Distance (meter)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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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 Sec. 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a) must also comply with the radiated emission limits specified in Sec. 15.209(a) (see Sec. 15.205(c)).

Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	17 °C
Date:		Humidity:	46 %
Modification State:	Low and High Channels	Tester:	Mark Phillips
		Laboratory:	SOATS

Test Results:

See Table Below.

Additional Observations:

- The Spectrum was searched from 30 MHz to the 10th Harmonic.
- Measurements below 1GHz were performed at 3m with a Quasi-Peak detector while Peak, Max hold was used above 1GHz.
- As the emission is pulsing, a duty cycle factor was introduced to spurious harmonics. See calculation in section on Time of Occupancy.
- All other emissions were found to be more than 20dB below the limit and have not been reported per FCC rule 15.31(o)."

Math: Corrected Reading =
Max of Vertical or Horizontal measured + Antenna Factor + Cable Loss – preamplifier (if used). – Duty Cycle Factor

CR/SL Dif = Limit – Corrected Reading. Pass if result is negative.

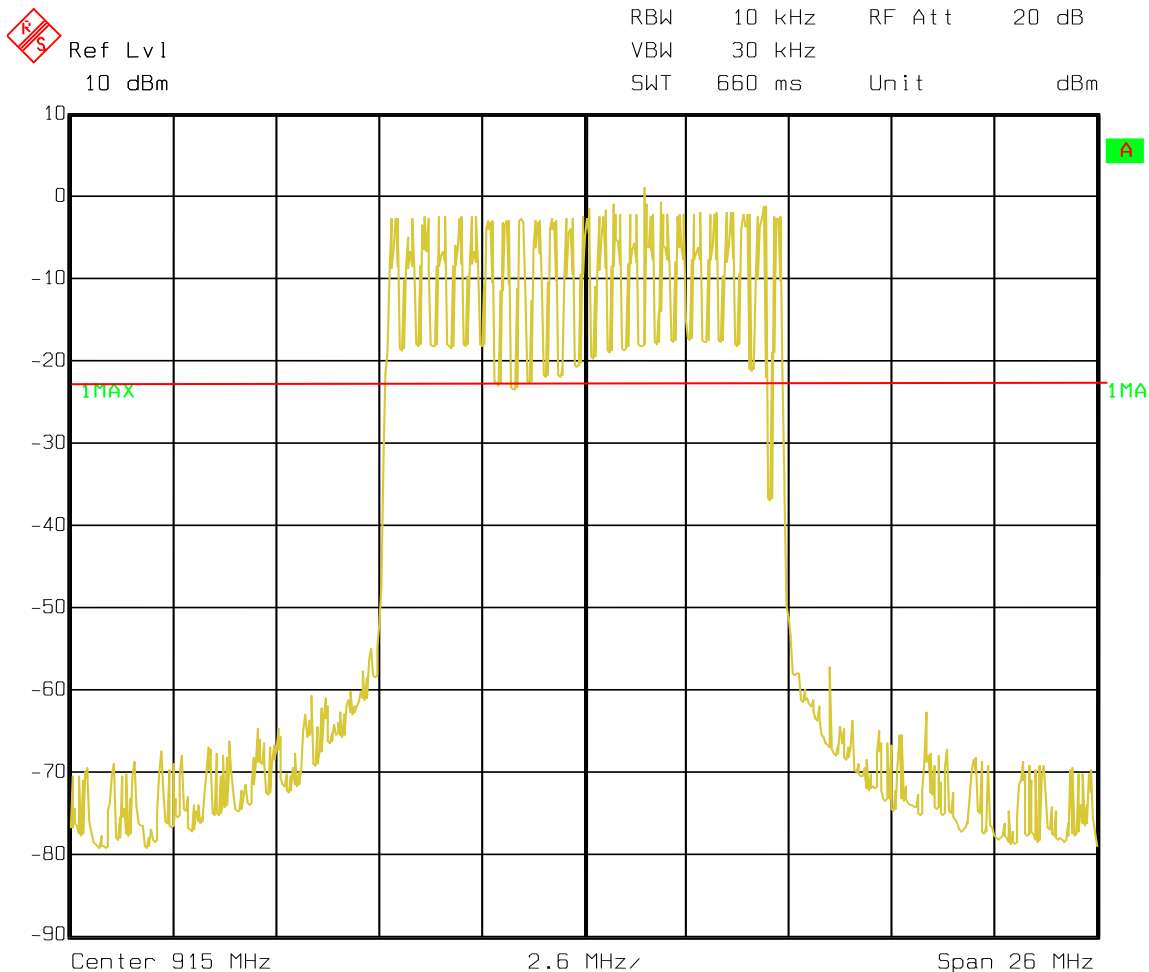
At 2730.6 MHz Peak: 59.6 = 62.4 + 9.2 + 9.4 – 41.4
Average = 59.6 – 12.8 = 46.9

Radiated Emissions 30 MHz to 1000 MHz

Radiated Emissions Data												
Job # :	10242595		Date :	5-16-2013		Page	1		of	1		
NEX# :	236870		Time :	8:30								
			Staff :	AAL								
Client Name :	2GIG					EUT Voltage :						
EUT Name :	Wireless Touchscreen Keypad, wall mount					EUT Frequency :	N/A					
EUT Model # :	2GIG-TS1					Phase :	N/A					
EUT Serial # :	1316150001880310											
EUT Config. :	Low & High Channels- Transmit											
Specification :	CFR47 Part 15, Subpart C 15.247, 205					Distance < 1000 MHz:	3 m					
Loop Ant. # :	133					Distance > 1000 MHz:	3 m					
Bicon Ant. # :	N/A					Temp. (°C) :		22				
Log Ant. # :	111_3m					Humidity (%) :		54				
DRG Ant. # :	529					Spec Analyzer #:		911				
Cable LF#:	SAC10m					Analyzer Display #:		911				
Cable HF#:	WCC					Quasi-Peak Detector #:		911				
Preamp LF#:	901					Duty Cycle (%):		23.00				
Preamp HF#:	E1029											
						Quasi-Peak		RBW: 120 kHz				
						Video Bandwidth		300 kHz				
						Peak		RBW: 1 MHz				
						Video Bandwidth		3 MHz				
						Average = Peak + Duty Cycle Factor						
						DCF = 20 x log(duty cycle)						
Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated. Measurements above 1 GHz are Average values, unless otherwise stated.												
Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side DEG	Ant. Height cm	Max. Reading (dBµV)	Corrected Reading dBm	Spec. limit dBm	CR/SL Diff. (dB)	Pass Fail	Comment	
1820.400	55.5	63.2	P	133	142	63.2	57.5	74.0	-16.4	Pass		
1820.400	55.5	63.2	A	133	142	63.2	44.8	54.0	-9.2	Pass		
2730.600	59.5	62.4	P	210	110	62.4	59.6	74.0	-14.4	Pass		
2730.600	59.5	62.4	A	210	110	62.4	46.9	54.0	-7.1	Pass		

Bandedge Measurements

Detector is Peak, Trace is Max Hold



Date: 03.JUN.2013 19:44:37

Scan from 902 to 928 MHz, redline 20 dBc



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Peak Output Power and Radiated Spurious Emissions

Clause 15.247(b)(2) For frequency hopping systems operating in the 902-928 MHz band: 1 watt for systems employing at least 50 hopping channels; and, 0.25 watts for systems employing less than 50 hopping channels, but at least 25 hopping channels, as permitted under paragraph (a)(1)(i) of this section.

Radiated Emissions within Restricted Bands

Clause 15.209(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field Strength (uV/meter)	Measurement Distance (meter)
0.009-0.490	2400/F (kHz)	300
0.490-1.705	24000/F (kHz)	30
1.705-30.0	30	3
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3

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 Sec. 15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in Sec. 15.205(a) must also comply with the radiated emission limits specified in Sec. 15.209(a) (see Sec. 15.205(c)).

Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	22°C
Date:	5/16/2013	Humidity:	54 %
Modification State:	Low and High Channels	Tester:	A. Laudani
		Laboratory:	Nemko



Test Results: EUT complies.

- The EUT may be powered by a Wall Pack at 120 VAC 60 Hz or battery powered. Input to the Wall Pack was varied +/-15% from 102 to 138 VAC. No significant change in output power was noted.
- RBW is 120 kHz: VBW is 300 kHz
- Detector is Quasi-Peak, Trace is Max Hold
- Harmonics measured at RBW 1MHz, VBW 3 MHz, max hold
- All other emissions were found to be more than 20dB below the limit and have not been reported per FCC rule 15.31(o).
- Antenna Gain: -10.17 dBi

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Conducted Peak Output Power Calculated from Field Strength:

Frequency	Peak Output Field Strength dBuV/m	Calculated Output Power (W)
910.200 MHz	108.8	
919.872 MHz	109.5	0.278

Power fomula:	Field Strength in V/m = (5.5 * sqrt (Power in Watts *ant. gain)) / distance						
	Power in Watts = (field strength * distance) ² /5.5/antfac						-10.17 gain dBi
	109.5	dBuV/m	0.298538	Volts/m	0.2782	Watts	24.44 dBm
	3	m					0.096161 gain analogue
	0.10	gain					

Radiated Emissions Data

Job # : 10242595 Date : 5-16-2013 Page 1 of 1
 NEX # : 236870 Time : 8:30
 Staff : AAL

Client Name : 2GIG EUT Voltage : _____
 EUT Name : Wireless Touchscreen Keypad, wall mount EUT Frequency : N/A
 EUT Model # : 2GIG-TS1 Phase: N/A
 EUT Serial # : 1316150001880310
 EUT Config. : Low & High Channels- Transmit

Specification : CFR47 Part 15, Subpart C 15.247, 205
 Loop Ant. # : 133
 Bicon Ant.#: N/A Temp. (°C) : 22
 Log Ant.#: 111_3m Humidity (%) : 54
 DRG Ant. # : 529 Spec Analyzer #: 911
 Cable LF#: SAC10m Analyzer Display #: 911
 Cable HF#: WCC Quasi-Peak Detector #: 911
 Preamp LF#: 901 Duty Cycle (%): _____
 Preamp HF# : E1029

Distance < 1000 MHz: 3 m
 Distance > 1000 MHz: 3 m

Quasi-Peak	RBW: 120 kHz
	Video Bandwidth 300 kHz
Peak	RBW: 1 MHz
	Video Bandwidth 3 MHz
Average = Peak + Duty Cycle Factor	
DCF = 20 x log(duty cycle)	

Measurements below 1 GHz are Quasi-Peak values, unless otherwise stated.
 Measurements above 1 GHz are Average values, unless otherwise stated.

Meas. Freq. (MHz)	Meter Reading Vertical	Meter Reading Horizontal	Det.	EUT Side DEG	Ant. Height cm	Max. Reading (dB?V)	Corrected Reading dBm	Spec. limit dBm	CR/SL Diff. (dB)	Pass Fail	Comment
910.200	82.4	80.2	Q	300	120	82.4	108.8				
919.872	83.1	81.7	Q	300	121	83.1	109.5				

83.1 dBuV + 20.3 dB/m ant factor + 6.1 dB cable loss = 109.5 dBuV/m Field Strength

Receiver Spurious Emissions

The following receiver spurious emission limits shall be complied with:
 (a) If a radiated measurement is made, all spurious emissions shall comply with the limits of Table 1.

Table 1 - Spurious Emission Limits for Receivers

Spurious Frequency (MHz)	Field Strength (microvolt/m at 3 meters)
30-88	100
88-216	150
216-960	200
Above 960	500

Test Conditions:

Sample Number:	2GIG-TS1	Temperature:	21°C
Date:	5/31/2013	Humidity:	39 %
Modification State:	Receive Mid Channel	Tester:	Mark Phillips
		Laboratory:	10m Chamber

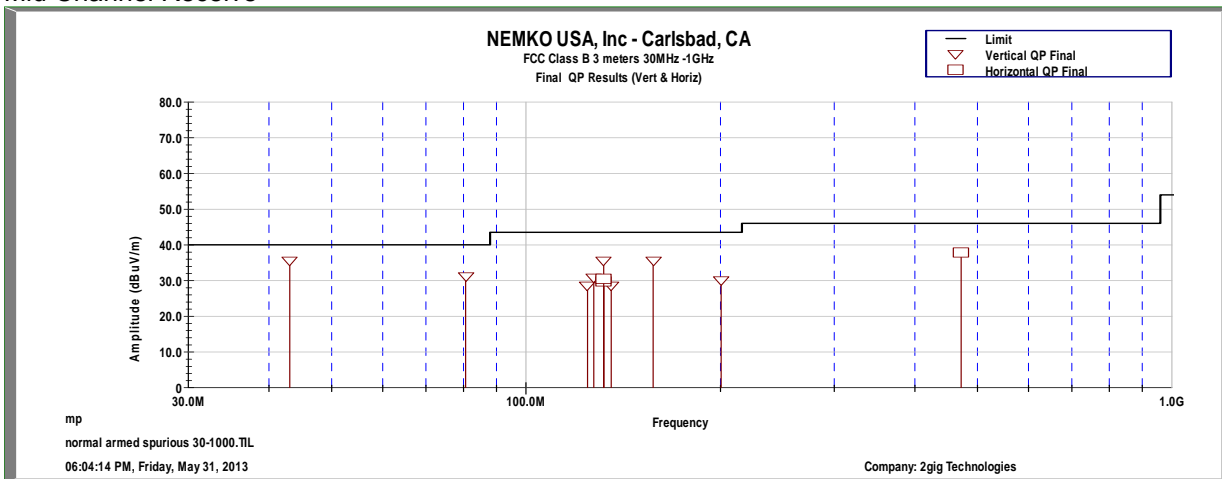
Test Results:

See attached test result.

Additional Observations:

- The Spectrum was searched from 30 MHz to 9500 MHz using a computer to control sweep time, ranges and record peak hold data. RBW = 100 kHz, VBW = 300 kHz.
- Below 1GHz measurements are measured using CISPR quasi-peak detector while above 1GHz are measured using average detector with 1MHz RBW.
- No other emissions within 20 dB of the limit were detected.

Mid Channel Receive



Frequency MHz	QP Measured dBuV	Adjustments dB/m	Ant. Ht. cm	EUT Rotation degrees	Final Result dBuV/m	Limit dBuV/m	QP Margin dB
Vertical							
43.064	55.3	-19.8	129	3	35.4	40.0	-4.6
80.633	53.1	-22.0	108	3	31.1	40.0	-8.9
124.500	47.2	-18.8	111	3	28.4	43.5	-15.1
127.279	49.3	-18.7	108	2	30.6	43.5	-12.9
131.865	54.2	-18.5	111	119	35.7	43.5	-7.8
135.533	46.9	-18.3	109	6	28.6	43.5	-14.9
157.289	53.3	-17.8	108	80	35.5	43.5	-8.0
200.522	47.1	-17.0	102	272	30.0	43.5	-13.5
horizontal							
131.872	48.3	-18.5	111	6	29.8	43.5	-13.7
131.880	48.9	-18.5	109	1	30.4	43.5	-13.1
471.864	48.3	-10.6	108	110	37.7	46.0	-8.3

Average amplitude: 2.5 GHz; 45.9 dBuV/m at 3m