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FCC REPORT

Application No:	SZEMO100905833RF
Applicant/Manufacturer:	Altec Lansing, LLC
Factory:	Dong Guan Tai Sing Manufacturing Factory
Product Name:	inMotion Air
Allowable Frequency Range:	2400MHz to 2483.5MHz
FCC ID:	VJS-IMW725
Standards:	FCC CFR Title 47 Part 15 C Section 15.247: 2009
Date of Receipt:	2010-09-10
Date of Test:	2010-09-10 to 2010-09-29
Date of Issue:	2010-10-18
Test Result :	PASS *

In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

Jack Zhang

Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.



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3 Test Summary

Test Item	Section in CFR 47	Result
Antenna Requirement	15.203/15.247 (c)	Pass
AC Power Line Conducted Emission	15.207	Pass
Conducted Peak Output Power	15.247 (b)(1)	Pass
20dB Occupied Bandwidth	15.247 (a)(1)	Pass
Carrier Frequencies Separation	15.247 (a)(1)	Pass
Hopping Channel Number	15.247 (b)	Pass
Dwell Time	15.247 (a)(1)	Pass
Pseudorandom Frequency Hopping Sequence	15.247(b)(4)&TCB Exclusion List (7 July 2002)	Pass
Radiated Emission	15.205/15.209	Pass
Band Edge	15.247(d)	Pass

Remark: Passed: The EUT complies with the essential requirements in the standard.

Failed: The EUT does not comply with the essential requirements in the standard.



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4 General Information

4.1 Client Information

Applicant/Manufacturer:	Altec Lansing, LLC	
Factory: Dong Guan Tai Sing Manufacturing Factory		
Address of Applicant:	535 Routes 6 & 209, Milford, PA 18337, USA	
Address of Manufacturer:	535 Routes 6 & 209, Milford, PA 18337, USA	
Address of Factory:	Tai Sing Industrial Road, Bai Zhou Bian Village, Dong Cheng, Dongguan City, Guangdong Province 523113, P.R. China	

4.2 General Description of E.U.T.

Product Name:	inMotion Air
Item No.:	iMW725
Trade mark:	ALTEC LANSING
Allowable Frequency Range:	2400MHz~2483.5MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, Pi/4QPSK, 8DPSK
Antenna Type:	Integral
Antenna gain:	1.11dBi
EUT Power Supply:	AC/ DC adapter:
	Input Voltage:100-240V a.c.
	Output Voltage:6.0V d.c.
Power Cord:	<3 m



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Operation Frequency each of channel							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2402MHz	21	2422MHz	41	2442MHz	61	2462MHz
2	2403MHz	22	2423MHz	42	2443MHz	62	2463MHz
3	2404MHz	23	2424MHz	43	2444MHz	63	2464MHz
4	2405MHz	24	2425MHz	44	2445MHz	64	2465MHz
5	2406MHz	25	2426MHz	45	2446MHz	65	2466MHz
6	2407MHz	26	2427MHz	46	2447MHz	66	2467MHz
7	2408MHz	27	2428MHz	47	2448MHz	67	2468MHz
8	2409MHz	28	2429MHz	48	2449MHz	68	2469MHz
9	2410MHz	29	2430MHz	49	2450MHz	69	2470MHz
10	2411MHz	30	2431MHz	50	2451MHz	70	2471MHz
11	2412MHz	31	2432MHz	51	2452MHz	71	2472MHz
12	2413MHz	32	2433MHz	52	2453MHz	72	2473MHz
13	2414MHz	33	2434MHz	53	2454MHz	73	2474MHz
14	2415MHz	34	2435MHz	54	2455MHz	74	2475MHz
15	2416MHz	35	2436MHz	55	2456MHz	75	2476MHz
16	2417MHz	36	2437MHz	56	2457MHz	76	2477MHz
17	2418MHz	37	2438MHz	57	2458MHz	77	2478MHz
18	2419MHz	38	2439MHz	58	2459MHz	78	2479MHz
19	2420MHz	39	2440MHz	59	2460MHz	79	2480MHz
20	2421MHz	40	2441MHz	60	2461MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel for testing see below:

Channel	Frequency
lowest channel	2402MHz
middle channel	2441MHz
highest channel	2480MHz



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4.3 E.U.T Operation mode

Operating Environment:	
Temperature:	25.0 °C
Humidity:	50 % RH
Atmospheric Pressure:	1010 mBar
Test mode:	
Transmitting mode	Keep the EUT Transmitted the continuous modulation signal at the specific channel(s).





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4.4 Test Facility

The test facility is recognized, certified, or accredited by the following organizations: **CNAS (No. CNAS L2929)**

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

VCCI

The 3m Semi-anechoic chamber and Shielded Room (7.5m x 4.0m x 3.0m) of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-2197 and C-2383 respectively.

Date of Registration: September 29, 2008. Valid until September 28, 2011.

FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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. Registration 556682, June 27, 2008.

Industry Canada (IC)

The 3m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1.

4.5 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch E&E Lab No. 1 Workshop, M-10, Middle section, Science & Technology Park, Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Fax: +86 (0) 755 2671 0594 No tests were sub-contracted.

4.6 Other Information Requested by the Customer

None.



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4.7 Test Instruments list

RE in Chamber								
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)		
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEL0017	2010-06-17	2011-06-17		
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEL0023	2009-11-05	2010-11-05		
3	EMI Test software	AUDIX	E3	SEL0050	N/A	N/A		
4	Coaxial cable	SGS	N/A	SEL0028	2008-06-18	2011-06-18		
5	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEL0015	2009-11-05	2010-11-05		
6	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEL0006	2009-11-10	2010-11-10		
7	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEL0076	2009-11-10	2010-11-10		
8	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEL0053	2010-06-02	2011-06-02		
9	Pre-Amplifier (0.1-26.5GHz)	Compliance Directions Systems Inc.	PAP-0126	SEL0168	2009-12-18	2010-12-18		
10	Pre-amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	SEL0080	2010-06-04	2011-06-04		
11	Band filter	Amindeon	82346	SEL0094	2010-06-02	2011-06-02		

Con	Conducted Emission							
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)		
1	Shielding Room	ZhongYu Electron	GB-88	SEL0042	N/A	N/A		
2	LISN	ETS-LINDGREN	3816/2	SEL0021	2010-06-02	2011-06-02		
3	Two-Line V-Network	Rohde & Schwarz	ENV216	SEL0152	2009-10-22	2010-10-22		
4	EMI Test Receiver	Rohde & Schwarz	ESCI	SEL0022	2010-06-02	2011-06-02		
5	Coaxial Cable	SGS	N/A	SEL0024	2008-06-18	2011-06-18		



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RF c	RF conducted							
ltem	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)		
1	Spectrum Analyzer	Rohde & Schwarz	FSP 30	SEL0154	2009-10-22	2010-10-22		
2	Coaxial cable	SGS	N/A	SEL0028	2008-06-18	2011-06-18		



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5 Test results and Measurement Data

5.1 Antenna requirement:

Standard requirement: FCC Part15 C Section 15.203 /247(c)

15.203 requirement:

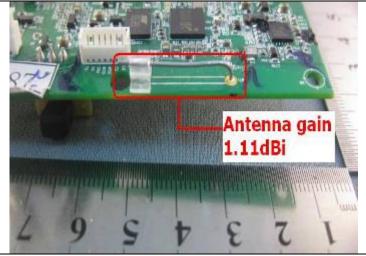
An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(c) (1)(i) requirement:

(i) Systems operating in the 2400-2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6dBi.

E.U.T Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best gain of the antenna is 1.11dBi.



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Test Requirement:	FCC Part15 C Section 15.207				
Test Method:	ANSI C63.10: 2009				
Test Frequency Range:	150kHz to 30MHz				
Class / Severity:	Class B				
Limit:	Frequency range (MHz)	Limit (c	dBuV)		
		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 The E.U.T and simulators are				
	impedance stabilization network(L.I.S.N.). The provide a 50ohm/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 C63.10: 2009 on conducted measurement.				
Test setup:	Reference Plane				
	Test table/Insulation pla	B0cm J.T Ine	er – AC power		
	E.U.T: Equipment Under Test LISN: Line Impedence Stabilization Network Test table height=0.8m				
Test Instruments:	Refer to section 4.7 for details				
Test mode:	Transmitting mode				
Test result:	Pass				

5.2 Conducted Emissions

Measurement Data

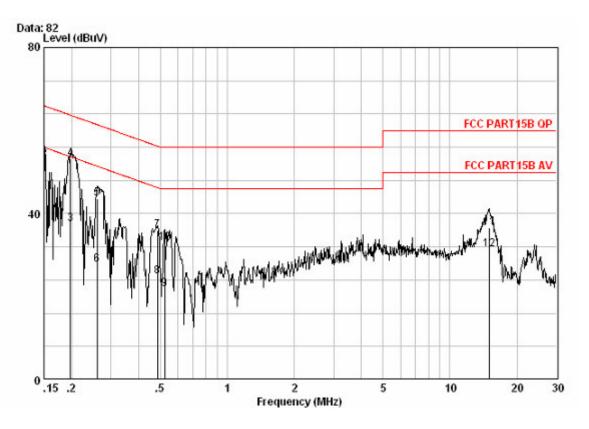
An initial pre-scan was performed on the live and neutral lines with peak detector.

Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission were detected.



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Live line:



		Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
		MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1		0.15000	0.04	-0.05	33.90	33.89	56.00	-22.11	Average
2	0	0.15000	0.04	-0.05	52.90	52.89	66.00	-13.11	QP
3		0.19700	0.04	-0.05	37.60	37.59	53.74	-16.14	Average
4	0	0.19700	0.04	-0.05	53.20	53.19	63.74	-10.54	QP
5		0.26000	0.05	-0.04	43.60	43.60	61.43	-17.83	QP
6		0.26000	0.05	-0.04	27.70	27.70	51.43	-23.73	Average
7		0.48600	0.06	-0.04	35.90	35.92	56.24	-20.32	QP
8		0.48600	0.06	-0.04	24.80	24.82	46.24	-21.42	Average
9		0.52300	0.06	-0.04	21.80	21.82	46.00	-24.18	Average
10		0.52300	0.06	-0.04	32.90	32.92	56.00	-23.08	QP
11		14.960	0.25	-0.50	36.90	36.65	60.00	-23.35	QP
12		14.960	0.25	-0.50	31.70	31.45	50.00	-18.55	Average

Notes:

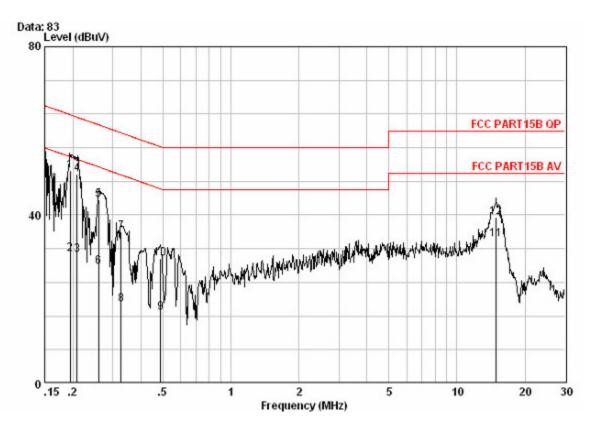
1. The following Quasi-Peak and Average measurements were performed on the EUT:

2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.



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Neutral line:



	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
10	0.19400	0.04	-0.04	50.60	50.60	63.86	-13.27	QP
2	0.19400	0.04	-0.04	30.70	30.70	53.86	-23.17	Average
3	0.20900	0.04	-0.04	30.60	30.60	53.24	-22.64	Average
4	0.20900	0.04	-0.04	49.80	49.80	63.24	-13.44	QP
5	0.26000	0.05	-0.04	43.50	43.51	61.43	-17.92	QP
6	0.26000	0.05	-0.04	27.60	27.61	51.43	-23.82	Average
7	0.32600	0.05	-0.04	35.90	35.91	59.55	-23.64	QP
8	0.32600	0.05	-0.04	18.80	18.81	49.55	-30.74	Average
9	0.48800	0.06	-0.04	16.70	16.72	46.20	-29.48	Average
10	0.48800	0.06	-0.04	29.60	29.62	56.20	-26.58	QP
11	14.900	0.25	-0.45	34.50	34.30	50.00	-15.70	Average
12	14.900	0.25	-0.45	39.60	39.40	60.00	-20.60	QP

Notes:

The following Quasi-Peak and Average measurements were performed on the EUT:
 Final Test Level =Receiver Reading + LISN Factor + Cable Loss.



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5.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(1)		
Test Method:	ANSI C63.10:2009 and KDB DA00-705		
Limit:	30dBm		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table		
	Ground Reference Plane		
	Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.		
Test Instruments:	Refer to section 4.7 for details		
Test state:	Non-hopping transmitting with all kinds of modulation.		
Test results:	Pass		

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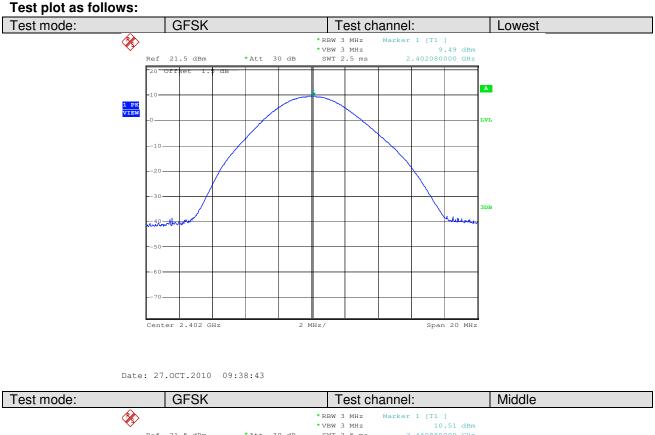
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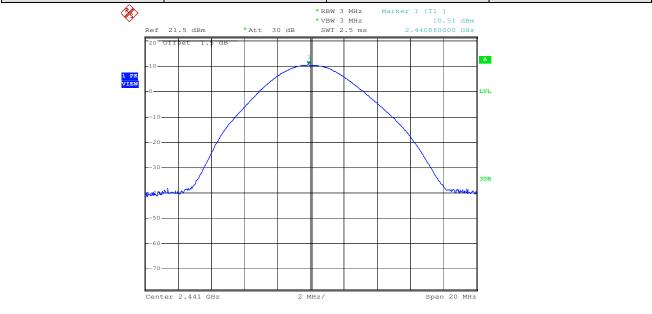
Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
Lowest	9.49	30.00	Pass	
Middle	10.51	30.00	Pass	
Highest	9.11	30.00	Pass	
	Pi/4QPSK m	ode		
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
Lowest	3.52	30.00	Pass	
Middle	5.66	30.00	Pass	
Highest	4.85	30.00	Pass	
	8DPSK mo	de		
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
Lowest	4.08	30.00	Pass	
Middle	6.18	30.00	Pass	
Highest	5.18	30.00	Pass	



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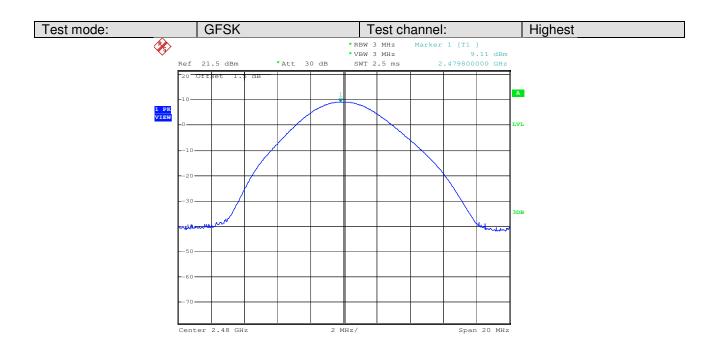




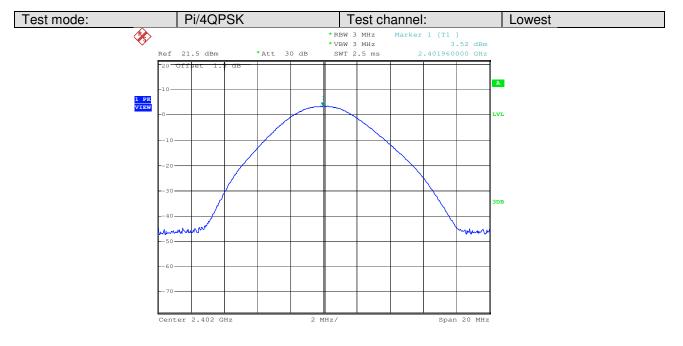
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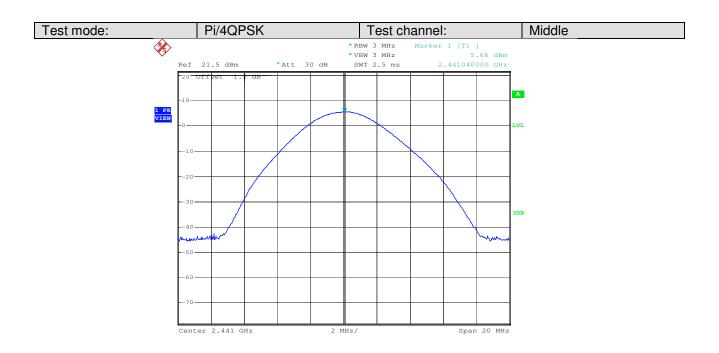
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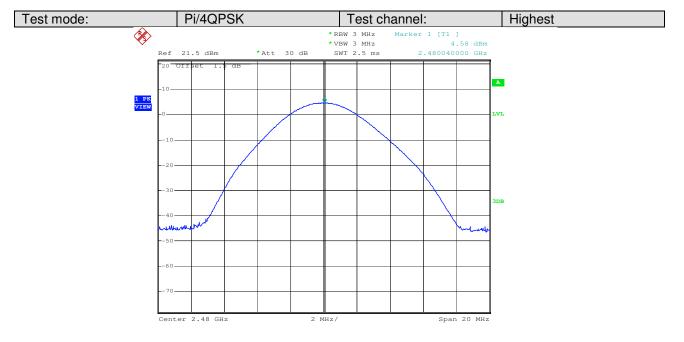
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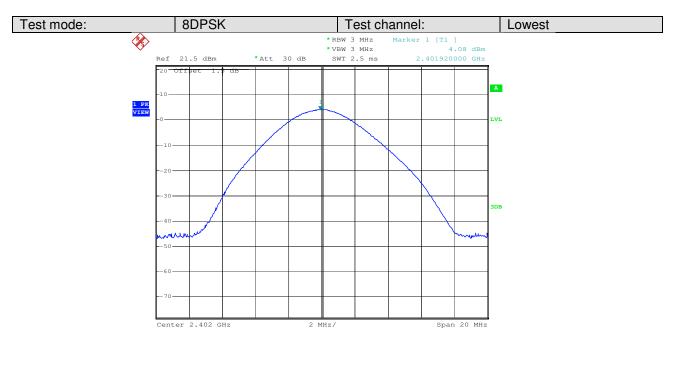
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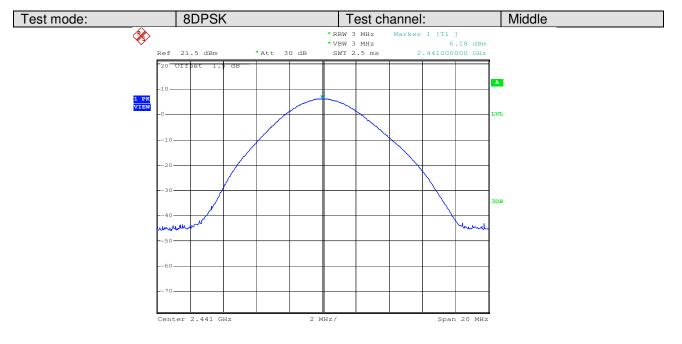
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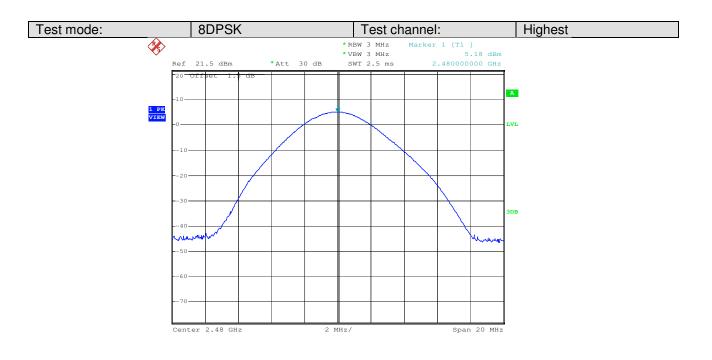
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Date: 16.SEP.2010 15:18:37



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Date: 16.SEP.2010 15:25:45



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5.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10:2009 and KDB DA00-705		
Limit:	NA		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	Refer to section 4.7 for details		
Test state:	Non-hopping transmitting with all kind of modulation.		
Test results:	Pass		

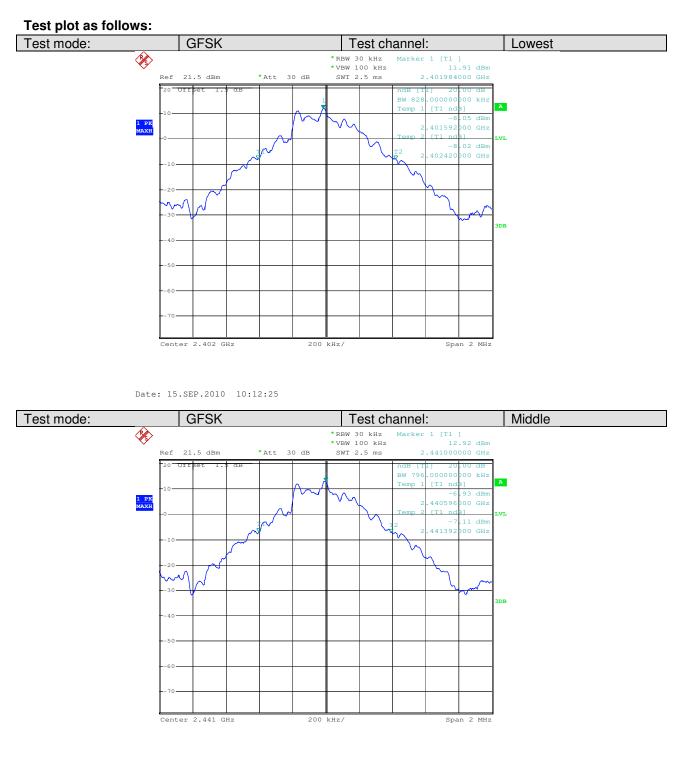
Measurement Data

T	20	dB Occupy Bandwidth (KH	z)
Test channel	GFSK	Pi/4QPSK	8DPSK
Lowest	828	1220	1212
Middle	796	1220	1212
Highest	804	1216	1220

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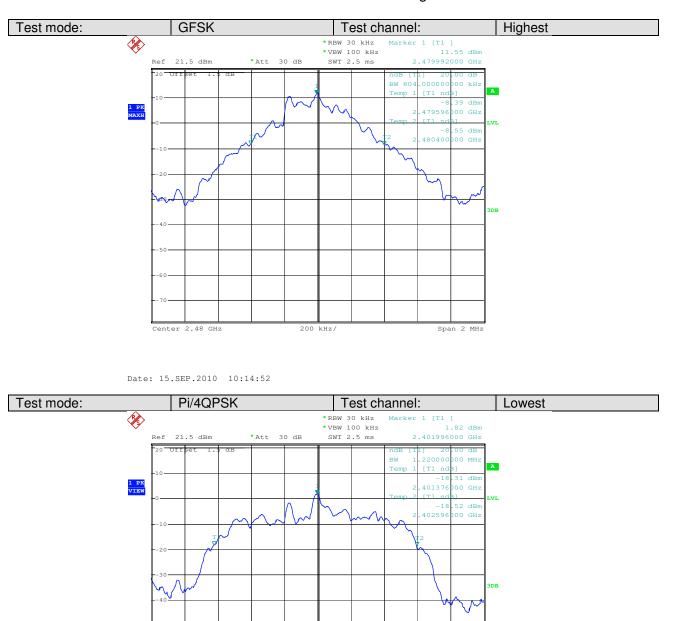
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Date: 15.SEP.2010 10:20:31



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Date: 16.SEP.2010 13:55:07

Center 2.402 GHz

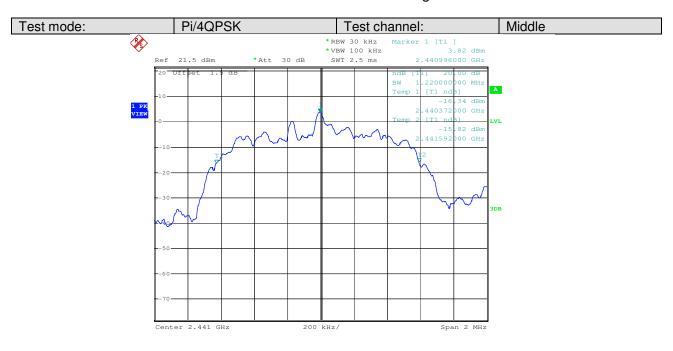
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200 kHz/

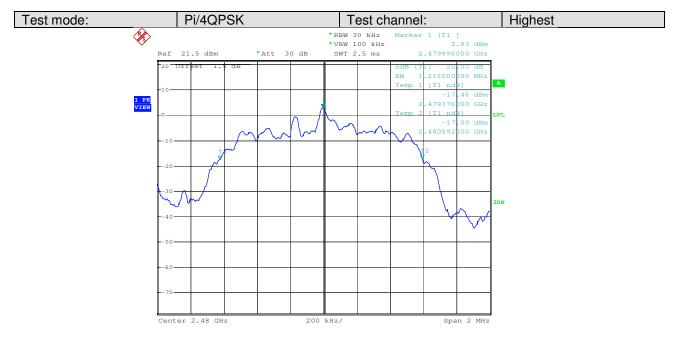
Span 2 MHz



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Date: 16.SEP.2010 14:11:25



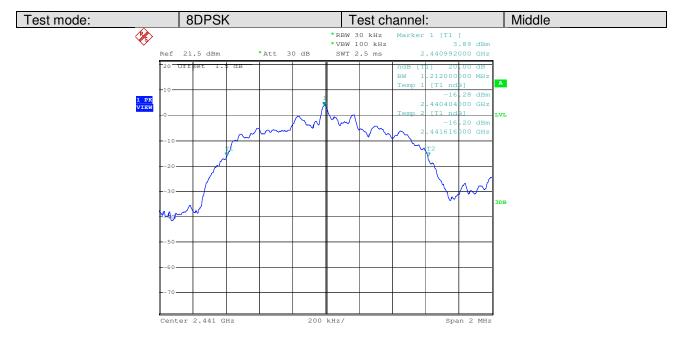
Date: 16.SEP.2010 14:17:40



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Date: 16.SEP.2010 15:10:20



Date: 16.SEP.2010 15:17:35



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Date: 16.SEP.2010 15:20:44



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5.5 Carrier Frequencies Separation

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10:2009 and KDB DA00-705		
Test state:	Hopping transmitting with all kind of modulation.		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane		
Test Instruments:	Refer to section 4.7 for details		
Limit:	0.025MHz or 2/3 of the 20dB bandwidth (whichever is greater)		
Test results:	Pass		



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Measurement Data

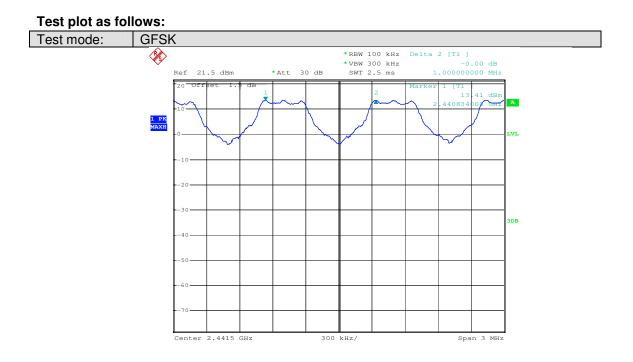
GFSK mode				
Carrier Frequencies Separation (KHz)	Limit (KHz)	Result		
1000	813.3	Pass		
	Pi/4QPSK mode			
Carrier Frequencies Separation (KHz)	Limit (KHz)	Result		
1000	813.3	Pass		
8DPSK mode				
Carrier Frequencies Separation (KHz)	Limit (KHz)	Result		
1000	813.3	Pass		

Note: According to section 5.4,

Mode	20dB bandwidth (KHz) (worse case)	Limit (KHz) (Carrier Frequencies Separation)
GFSK	828	552.0
PI/4QPSK	1220	813.3
8DPSK	1220	813.3



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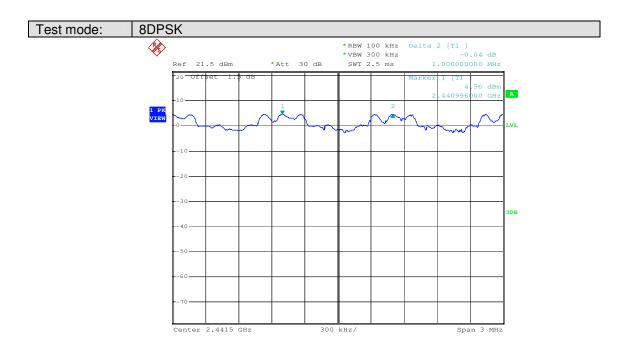
Date: 15.SEP.2010 10:41:05



Date: 16.SEP.2010 15:04:35



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Date: 16.SEP.2010 15:44:06



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Test Requirement: FCC Part15 C Section 15.247 (b) Test Method: ANSI C63.10:2009 and KDB DA00-705 **Requirement:** \geq 75 channels Test setup: Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Refer to section 4.7 for details Test Instruments: Hopping transmitting with all kind of modulation. Test state: Pass Test results:

5.6 Hopping Channel Number

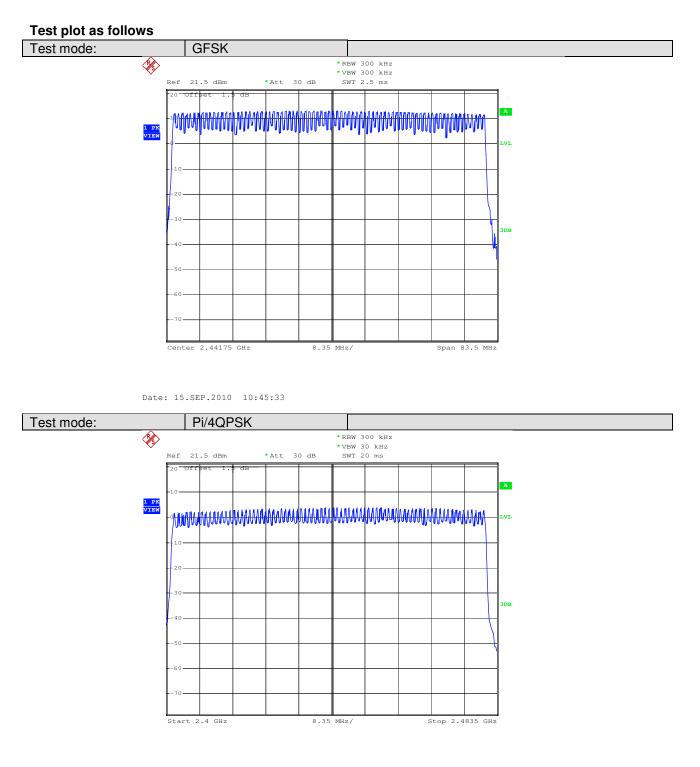
Measurement Data

Mode	Hopping channel	Requirement			
GFSK	79	≥75			
Pi/4QPSK	79	≥75			
8DPSK	79	≥75			

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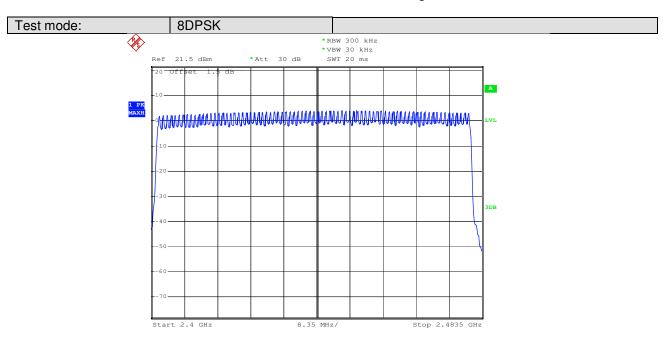
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Date: 16.SEP.2010 13:42:02



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Date: 16.SEP.2010 15:52:42



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5.7 Dwell Time

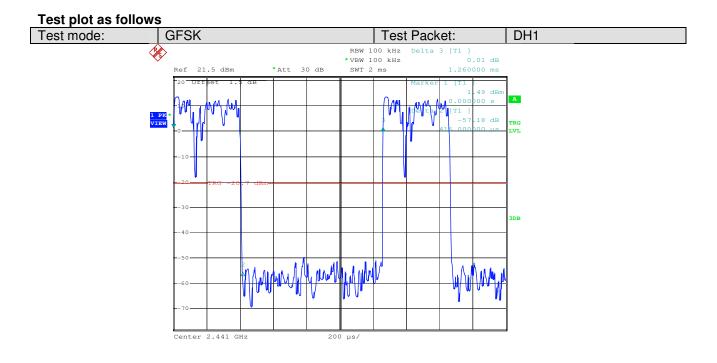
Test Requirement:	FCC Part15 C Section 15.247 (a)(1)		
Test Method:	ANSI C63.10:2009 and KDB DA00-705		
Limit:	≤ 0.4 Second		
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table		
Test Instruments:	Ground Reference Plane Refer to section 4.7 for details		
Test state:	Hopping transmitting with all kind of modulation.		
Test results:	Pass		

Measurement Data

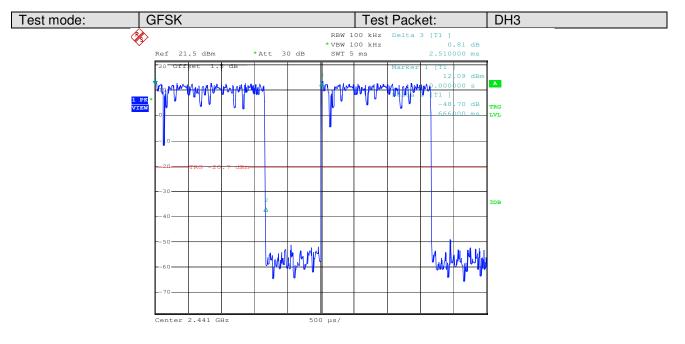
Mode	Packet	Dwell time (second)	Limit (second)
GFSK	DH1	0.1331	≪0.4
	DH3	0.2666	≪0.4
	DH5	0.3105	≪0.4
Pi/4QPSK	2-DH1	0.1370	≪0.4
	2-DH3	0.2719	≪0.4
	2-DH5	0.3143	≪0.4
8DPSK	3-DH1	0.1382	≪0.4
	3-DH3	0.2691	≪0.4
	3-DH5	0.3138	≪0.4



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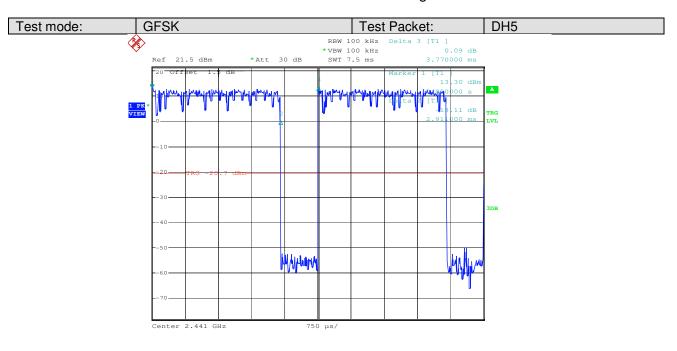
Date: 16.SEP.2010 13:22:30



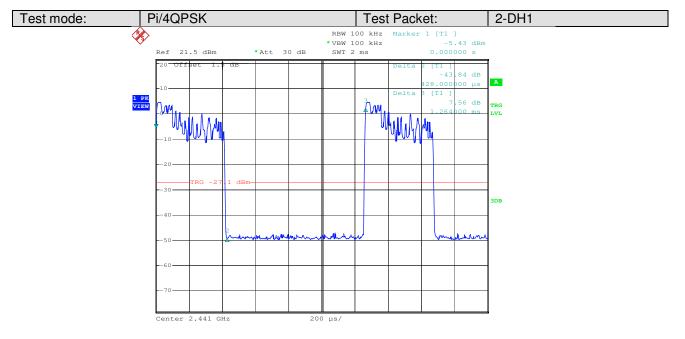
Date: 16.SEP.2010 13:24:04



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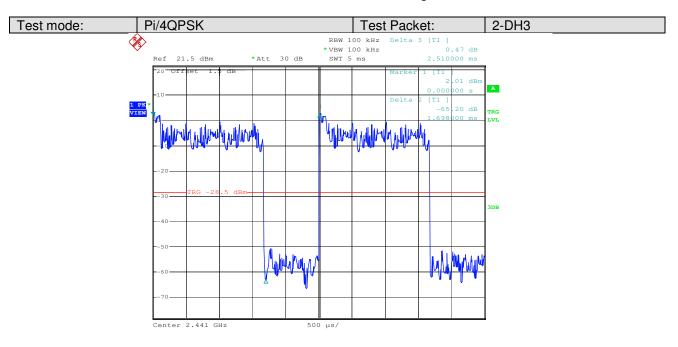
Date: 16.SEP.2010 13:25:35



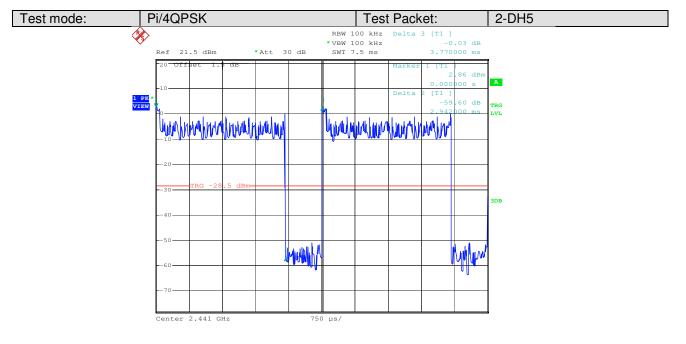
Date: 16.SEP.2010 14:37:07



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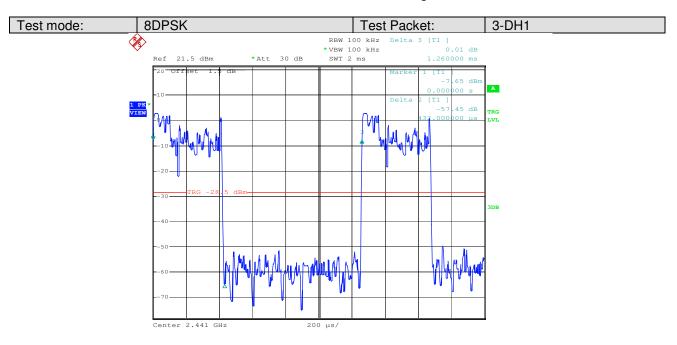
Date: 27.SEP.2010 16:07:14



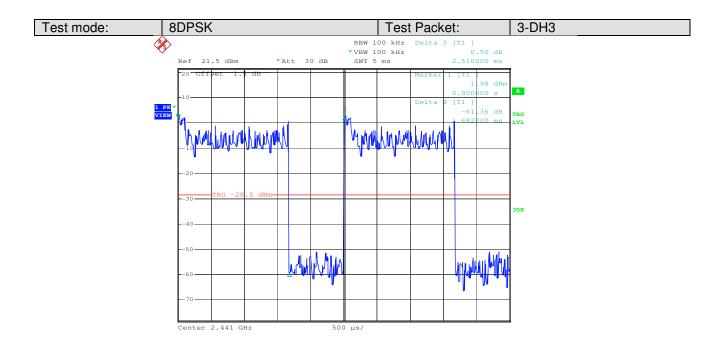
Date: 27.SEP.2010 16:12:03



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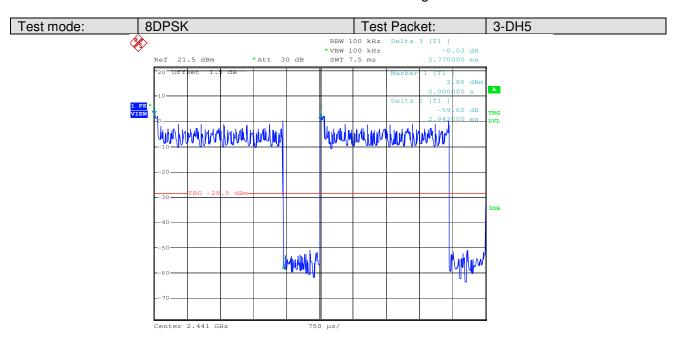
Date: 27.SEP.2010 16:10:21



Date: 27.SEP.2010 16:11:12



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Date: 27.SEP.2010 16:12:03



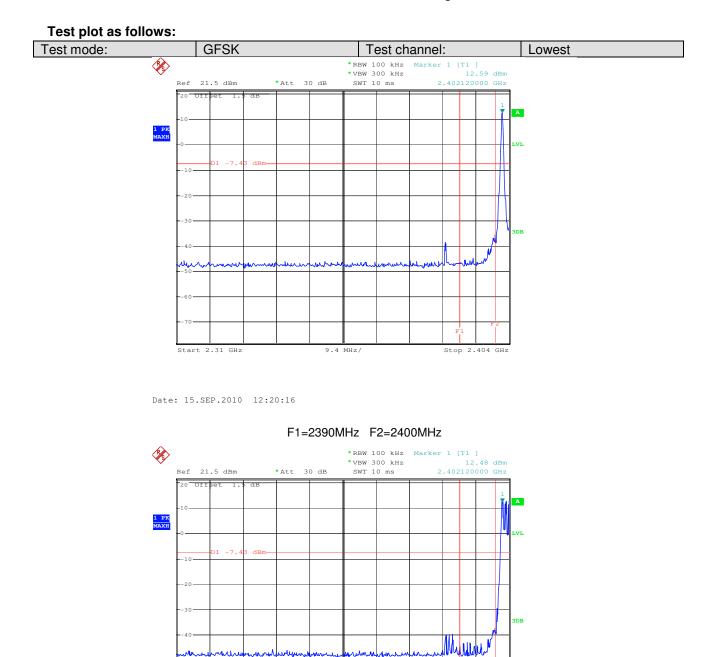
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5.8 Band Edge

Test Requirement:	FCC Part15 C Section 15.247 (d)							
Test Method:	ANSI C63.10:2009 and KDB DA00-705							
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency bower 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.							
Test setup:								
	Spectrum Analyzer							
	E.U.T							
	Ground Reference Plane							
	<i>Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.</i>							
Test Instruments:	Refer to section 4.7 for details							
Test state:	Hopping transmitting with all kinds of modulation.							
Test results:	Pass							



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Date: 15.SEP.2010 12:22:20

Start 2.31 GHz

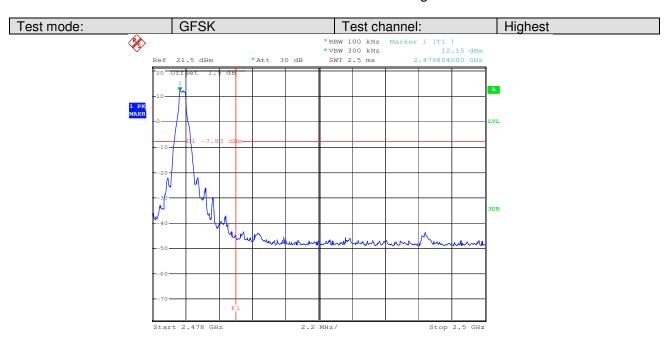
F1=2390MHz F2=2400MHz

Stop 2.404 GHz

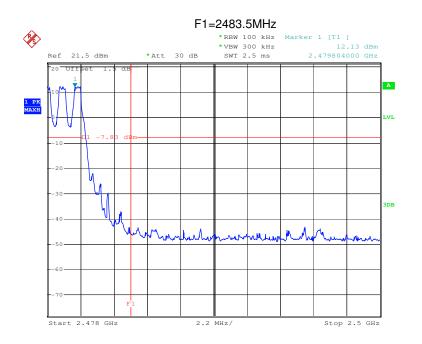
9.4 MHz/



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Date: 15.SEP.2010 12:49:49

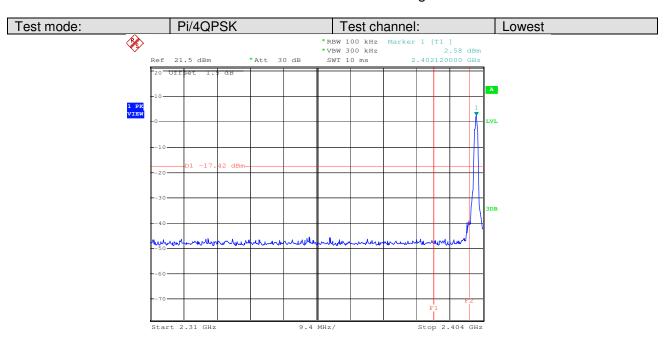


Date: 15.SEP.2010 12:51:50

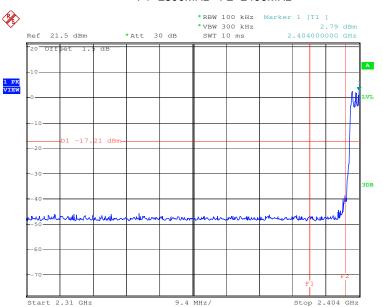
F1=2483.5MHz



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Date: 16.SEP.2010 13:58:12



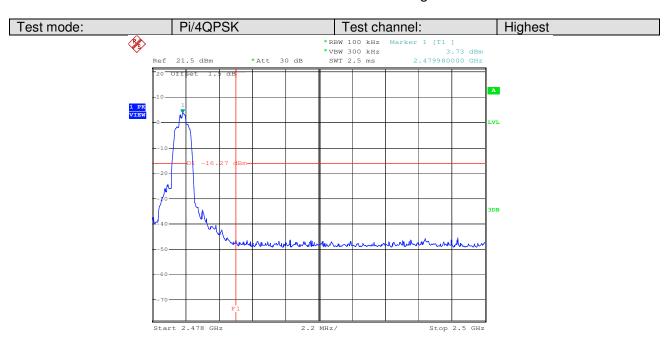
F1=2390MHz F2=2400MHz

Date: 16.SEP.2010 14:02:23

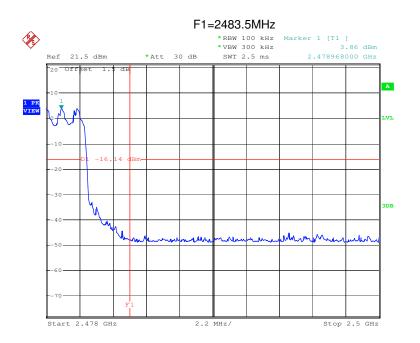
F1=2390MHz F2=2400MHz



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Date: 16.SEP.2010 14:21:06

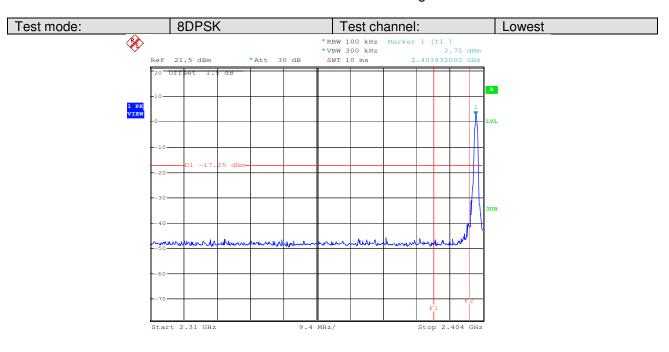


Date: 16.SEP.2010 14:23:58

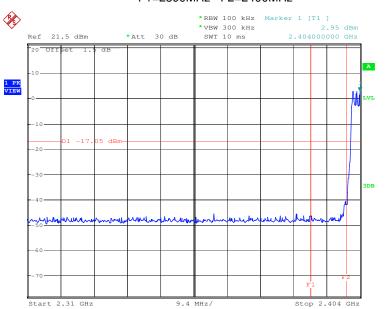
F1=2483.5MHz



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Date: 16.SEP.2010 15:12:13



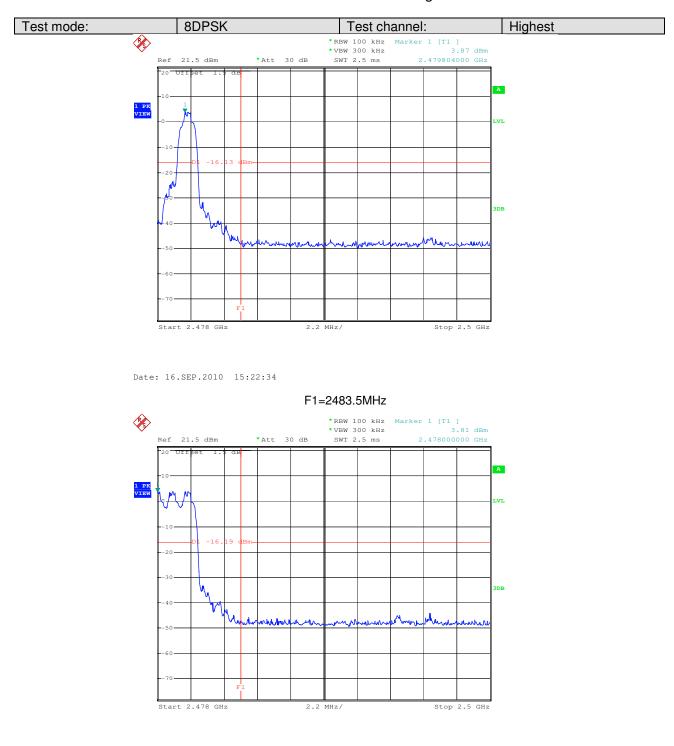
F1=2390MHz F2=2400MHz

Date: 16.SEP.2010 15:13:52

F1=2390MHz F2=2400MHz



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Date: 16.SEP.2010 15:24:26

F1=2483.5MHz



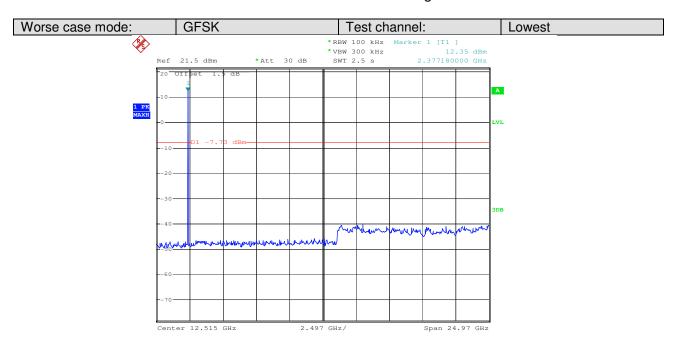
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5.9 RF Antenna Conducted spurious emissions

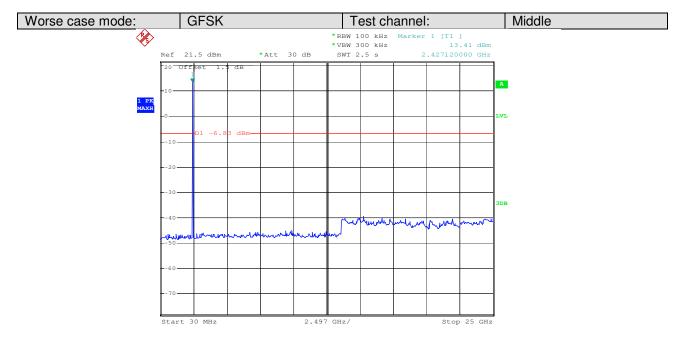
Test Requirement:	FCC Part15 C Section 15.247 (d)						
Test Method:	ANSI C63.10:2009 and KDB DA00-705						
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.						
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane Remark: Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.						
Test Instruments:	Refer to section 4.7 for details						
Test results:	Pass						



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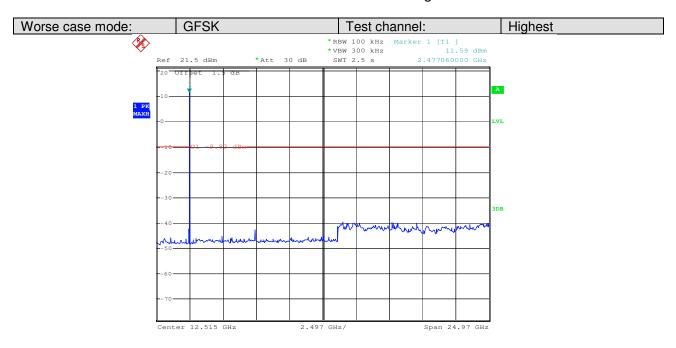
Date: 15.SEP.2010 12:14:53



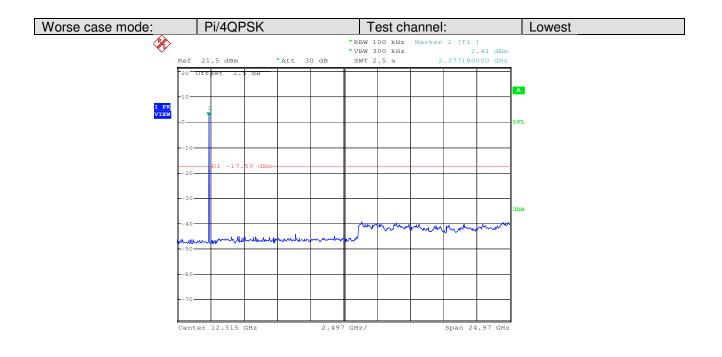
Date: 15.SEP.2010 12:54:28



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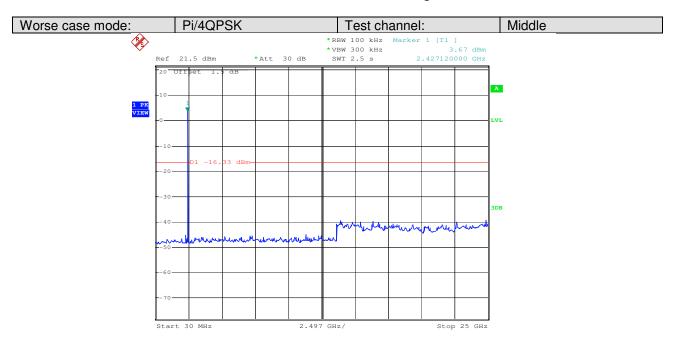
Date: 15.SEP.2010 12:56:21



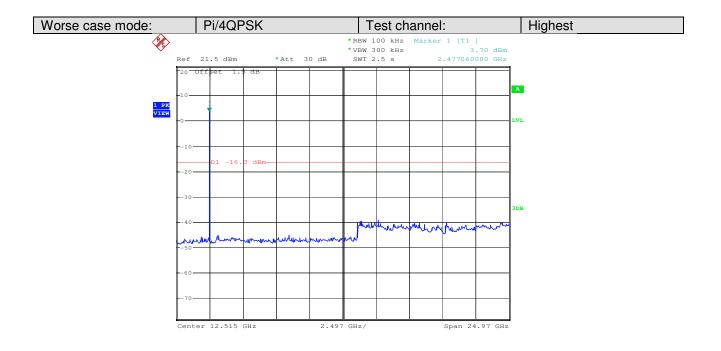
Date: 16.SEP.2010 14:55:10



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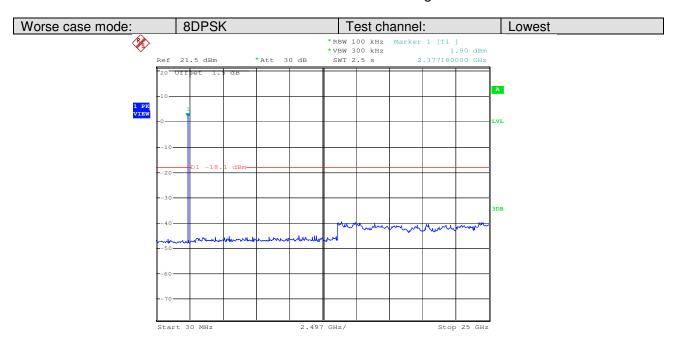
Date: 16.SEP.2010 14:48:25



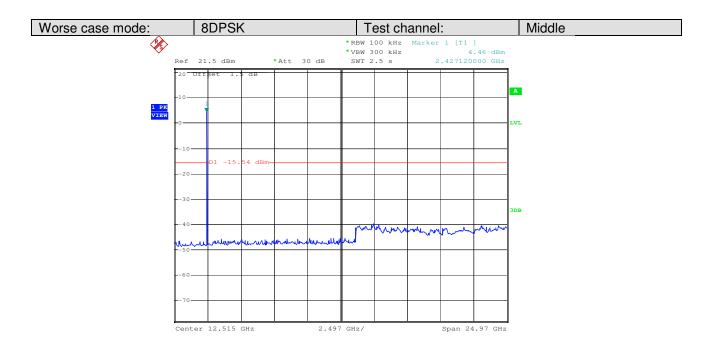
Date: 16.SEP.2010 14:50:06



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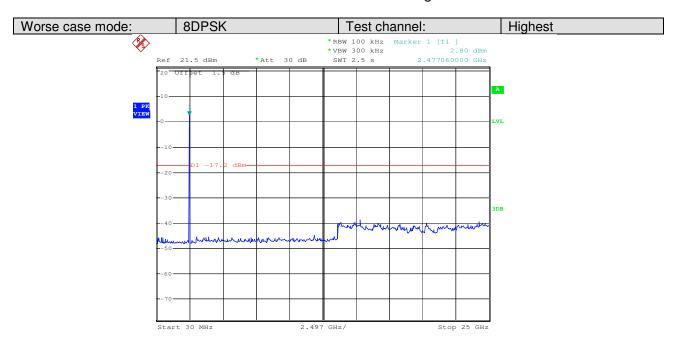
Date: 16.SEP.2010 15:37:43



Date: 16.SEP.2010 15:38:55



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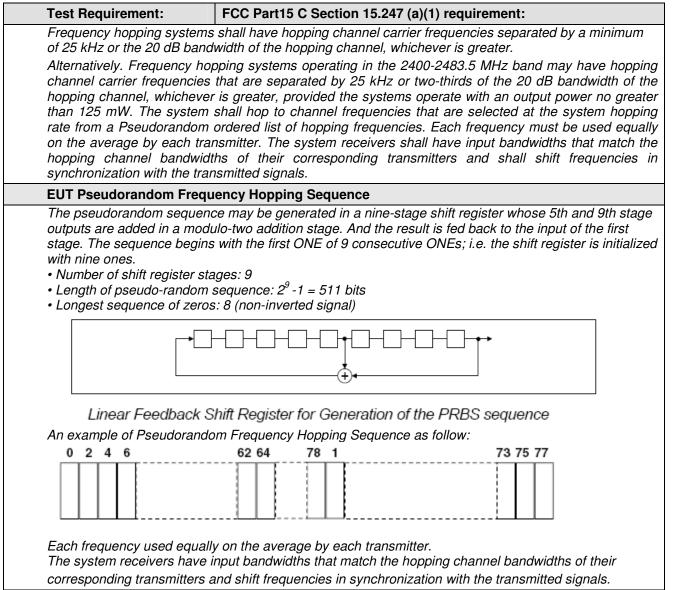


Date: 16.SEP.2010 15:41:33



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5.10 Pseudorandom Frequency Hopping Sequence



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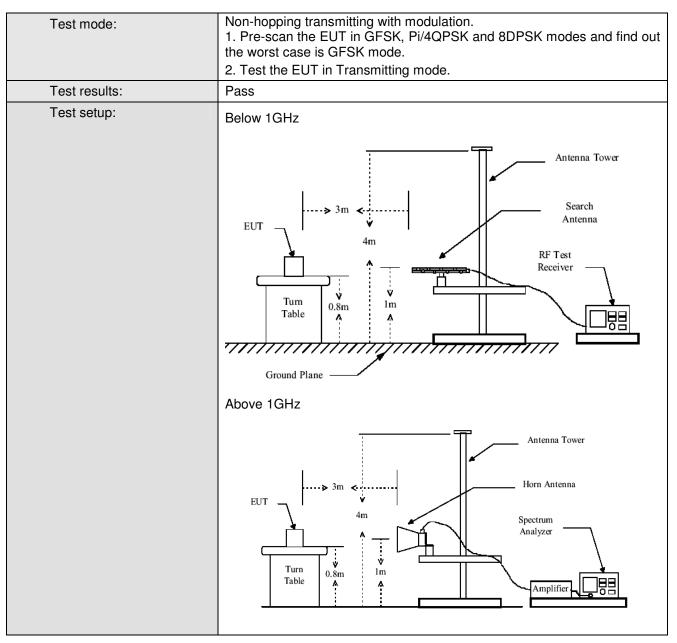
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5.11 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209 and 15.205									
Test Method:	ANSI C63.10: 2	009								
Test Frequency Range:	30MHz to 25GH	lz								
Test site:	Measurement D	istance: 3m (S	emi-Anecho	ic Chambe	r)					
Receiver setup:		, , , , , , , , , , , , , , , , , , ,			,					
	Frequency	Detector	RBW	VBW	Remark					
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value					
		Peak	1MHz	3MHz	Peak Value					
	Above 1GHz Peak		1MHz	10Hz	Average Value					
Limit:										
	Freque	ncy	Limit (dBuV	/m @3m)	Remark					
	30MHz-8	8MHz	40.0)	Quasi-peak Value					
	88MHz-21	Quasi-peak Value								
	216MHz-960MHz 46.0 Quasi-peak Val									
	960MHz-	1GHz	54.0		Quasi-peak Value					
	Above 1	GHz	54.0 74.0		Average Value					
Test Procedure:		Peak Value								
	 a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation. b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement. d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasipeak or average method as specified and then reported in a data sheet. 									
		Only the worst	case is sho	wn in the re	eport.					
Test Instruments:	Refer to section	4./ for details								



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Note:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

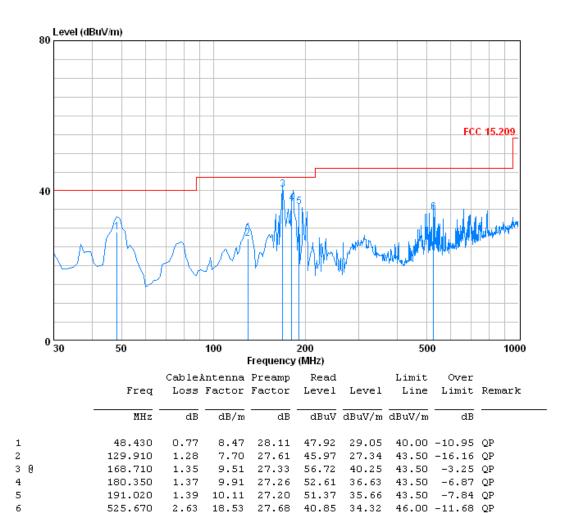
Final Test Level =Receiver Reading + Antenna Factor + Cable Factor – Preamplifier Factor



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5.11.1 Radiated emission below 1GHz

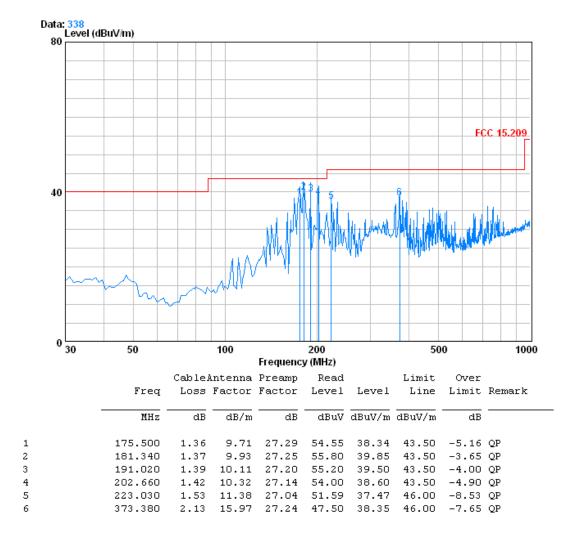
Vertical





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Horizontal





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Worse case r	Norse case mode: GFSK		Test	Test channel:		Rema	ark:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Emission Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna polarization
4804	9.36	34.04	41.53	58.00	59.87	74.00	-14.13	Vertical
7206	13.38	36.33	40.98	50.30	59.03	74.00	-14.97	Vertical
9608	13.39	36.99	37.56	47.15	59.97	74.00	-14.03	Vertical
12010	16.45	38.80	39.09	47.00	63.16	74.00	-10.84	Vertical
14412	17.44	39.40	44.77	48.60	60.67	74.00	-13.33	Vertical
4804	9.36	34.04	41.53	61.21	63.08	74.00	-10.92	Horizontal
7206	13.38	36.33	40.98	53.32	62.05	74.00	-11.95	Horizontal
9608	13.39	36.99	37.56	47.43	60.25	74.00	-13.75	Horizontal
12010	16.45	38.80	39.09	46.18	62.34	74.00	-11.66	Horizontal
14412	17.44	39.40	44.77	48.39	60.46	74.00	-13.54	Horizontal

5.11.2 Transmitter emission above 1GHz

Worse case r	Worse case mode: GF		Test	channel:	Lowest	Rem	ark:	Average
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna polarization
4804	9.36	34.04	41.53	45.75	47.62	54.00	-6.38	Vertical
7206	13.38	36.33	40.98	38.16	46.89	54.00	-7.11	Vertical
9608	13.39	36.99	37.56	34.26	47.08	54.00	-6.92	Vertical
12010	16.45	38.80	39.09	30.46	46.62	54.00	-7.38	Vertical
14412	17.44	39.40	44.77	34.90	46.97	54.00	-7.03	Vertical
4804	9.36	34.04	41.53	48.81	50.68	54.00	-3.32	Horizontal
7206	13.38	36.33	40.98	41.89	50.62	54.00	-3.38	Horizontal
9608	13.39	36.99	37.56	34.59	47.41	54.00	-6.59	Horizontal
12010	16.45	38.80	39.09	31.60	47.76	54.00	-6.24	Horizontal
14412	17.44	39.40	44.77	36.20	48.27	54.00	-5.73	Horizontal



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Worse case	mode:	GFSK	Tes	t channel:	Middle	Rem	ark:	ark: Peak		
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Emission Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna polarization		
4882	10.57	34.02	40.33	57.25	61.51	74.00	-12.49	Vertical		
7323	12.91	36.10	40.40	50.48	59.09	74.00	-14.91	Vertical		
9764	13.89	37.10	37.94	47.59	60.64	74.00	-13.36	Vertical		
12205	17.95	38.93	39.30	46.58	64.16	74.00	-9.84	Vertical		
14646	17.18	39.63	45.96	49.00	59.85	74.00	-14.15	Vertical		
4882	10.57	34.02	40.33	58.29	62.55	74.00	-11.45	Horizontal		
7323	12.91	36.10	40.40	53.03	61.64	74.00	-12.36	Horizontal		
9764	13.89	37.10	37.94	47.22	60.27	74.00	-13.73	Horizontal		
12205	17.95	38.93	39.30	46.84	64.42	74.00	-9.58	Horizontal		
14646	17.18	39.63	45.96	47.30	58.15	74.00	-15.85	Horizontal		

Worse case	Worse case mode: GFSK			t channel:	Middle	Rem	ark:	Average
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna polarization
4882	10.57	34.02	40.33	45.11	49.37	54.00	-4.63	Vertical
7323	12.91	36.10	40.40	39.56	48.17	54.00	-5.83	Vertical
9764	13.89	37.10	37.94	34.19	47.24	54.00	-6.76	Vertical
12205	17.95	38.93	39.30	30.58	48.16	54.00	-5.84	Vertical
14646	17.18	39.63	45.96	35.33	46.18	54.00	-7.82	Vertical
4882	10.57	34.02	40.33	46.49	50.75	54.00	-3.25	Horizontal
7323	12.91	36.10	40.40	40.26	48.87	54.00	-5.13	Horizontal
9764	13.89	37.10	37.94	34.02	47.07	54.00	-6.93	Horizontal
12205	17.95	38.93	39.30	30.05	47.63	54.00	-6.37	Horizontal
14646	17.18	39.63	45.96	35.48	46.33	54.00	-7.67	Horizontal



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Worse case	mode:	GFSK	Test	t channel:	Highest	Rem	ark:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Emission Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna polarization
4960	10.43	34.01	41.03	57.36	60.77	74.00	-13.23	Vertical
7440	12.72	35.91	40.01	49.36	57.98	74.00	-16.02	Vertical
9920	14.24	37.23	37.78	48.60	62.29	74.00	-11.71	Vertical
12400	17.55	39.04	39.48	46.77	63.88	74.00	-10.12	Vertical
14880	16.69	39.80	46.61	48.51	58.39	74.00	-15.61	Vertical
4960	10.43	34.01	41.03	60.03	63.44	74.00	-10.56	Horizontal
7440	12.72	35.91	40.01	53.14	61.76	74.00	-12.24	Horizontal
9920	14.24	37.23	37.78	46.99	60.68	74.00	-13.32	Horizontal
12400	17.55	39.04	39.48	47.14	64.25	74.00	-9.75	Horizontal
14880	16.69	39.80	46.61	48.60	58.48	74.00	-15.52	Horizontal

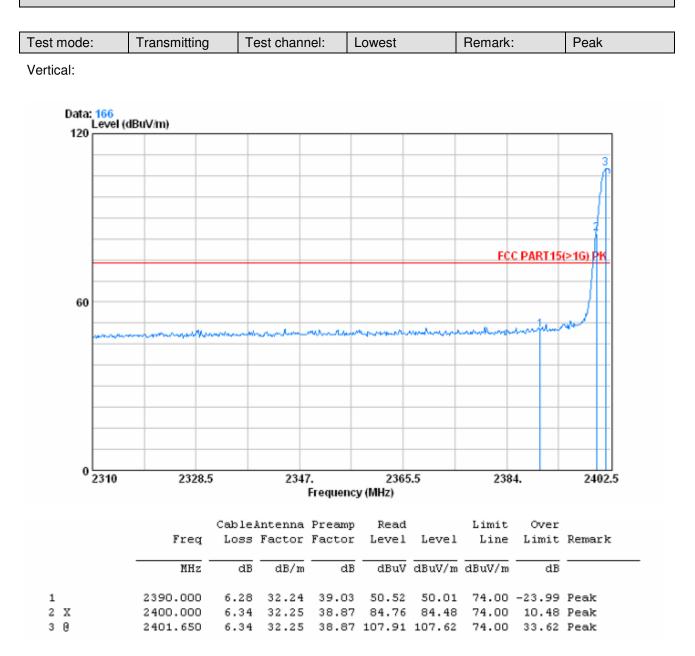
Worse case	Worse case mode: GFSK			t channel:	Highest	Rem	ark:	Average
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Antenna polarization
4960	10.43	34.01	41.03	45.00	48.41	54.00	-5.59	Vertical
7440	12.72	35.91	40.01	40.00	48.62	54.00	-5.38	Vertical
9920	14.24	37.23	37.78	33.03	46.72	54.00	-7.28	Vertical
12400	17.55	39.04	39.48	30.99	48.10	54.00	-5.90	Vertical
14880	16.69	39.80	46.61	35.01	44.89	54.00	-9.11	Vertical
4960	10.43	34.01	41.03	47.16	50.57	54.00	-3.43	Horizontal
7440	12.72	35.91	40.01	40.02	48.64	54.00	-5.36	Horizontal
9920	14.24	37.23	37.78	34.27	47.96	54.00	-6.04	Horizontal
12400	17.55	39.04	39.48	30.06	47.17	54.00	-6.83	Horizontal
14880	16.69	39.80	46.61	35.80	45.68	54.00	-8.32	Horizontal

Remark: The disturbance above 13GHz was very low, and the above harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.



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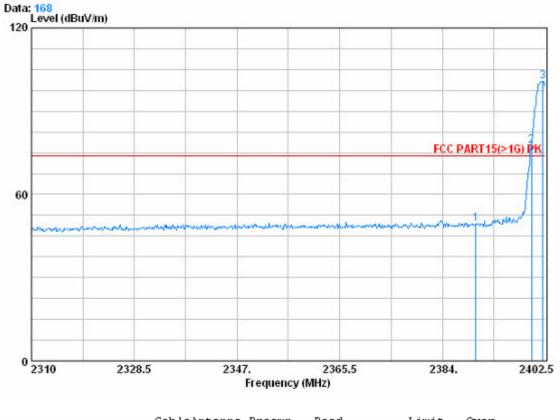
5.11.3 Band edge (Radiated Emission)





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Horizontal:



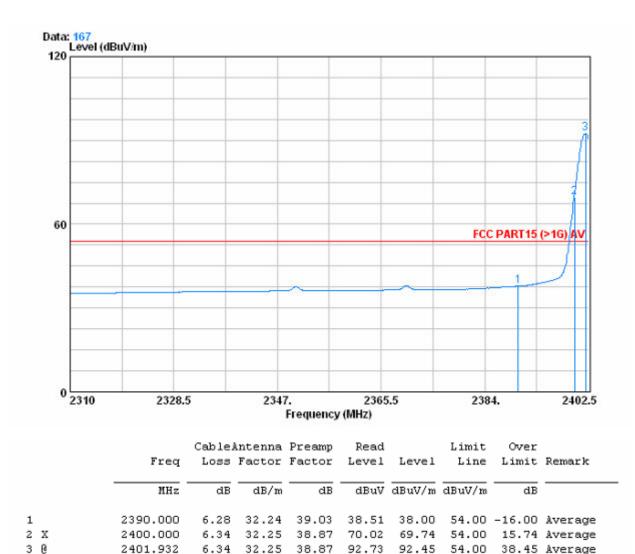
	Freq			-		Level		Over Limit	Remark
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2 X	2390.000 2400.000 2402.026	6.34	32.25	38.87	77.64	49.52 77.36 100.72	74.00	3.36	Peak



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Test mode: Transmitting	Test channel:	Lowest	Remark:	Average
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Vertical:

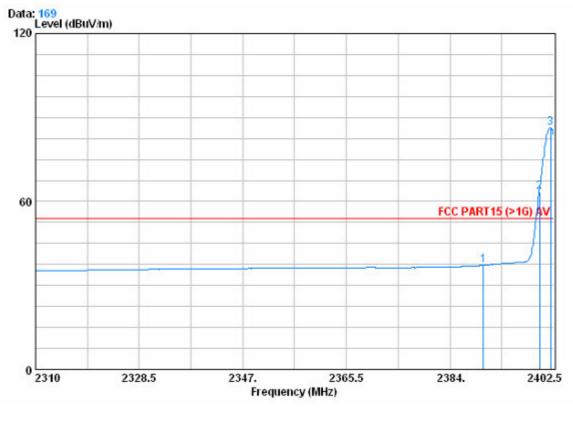


38.87



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Horizontal:



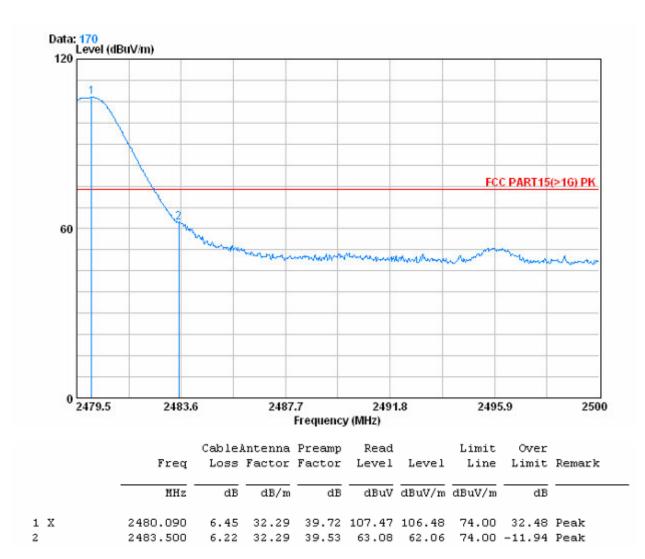
	Freq			Preamp Factor			Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 2 X 3 X	2390.000 2400.000 2401.932	6.34	32.25	38.87	63.82	63.53	54.00	9.53	Àverage Àverage Àverage



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Test mode: Transmitting Test channel: Highest Remark: Peak	
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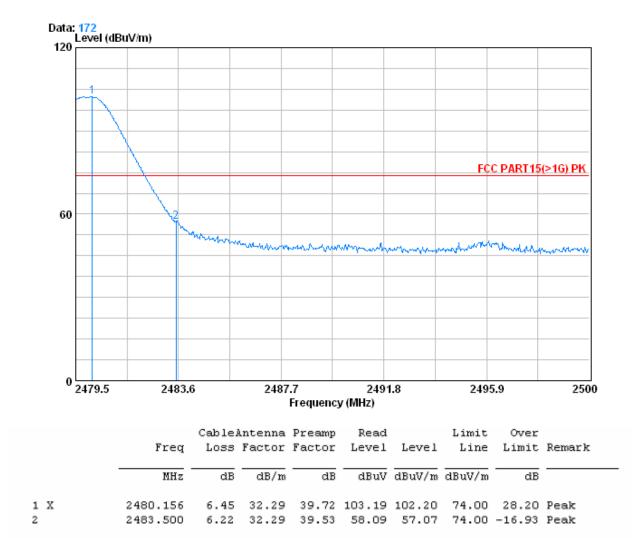
Vertical:





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Horizontal:

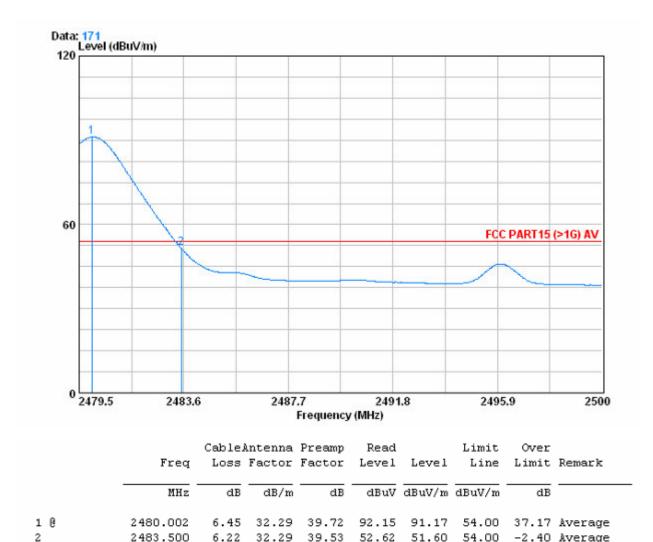




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Test mode:TransmittingTest channel:HighestRemark:Average	
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Vertical:





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Horizontal:

