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FCC REPORT

Application No:	SZEMO100704568RF
Applicant:	Scosche Industries Inc
Product Name:	Bluetooth Hands-free & streaming car kit
Operation Frequency:	2.402GHz to 2.480GHz
FCC ID:	IKQBTAXS
Standards:	FCC CFR Title 47 Part 15 Subpart C Section 15.247: 2008
Date of Receipt:	2010-07-21
Date of Test:	2010-07-22 to 2010-08-03
Date of Issue:	2010-08-04
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)	Passed
AC Power Line Conducted Emission	15.207	Passed
Conducted Peak Output Power	15.247 (b)(1)	Passed
20dB Occupied Bandwidth	15.247 (a)(1)	Passed
Carrier Frequencies Separation	15.247 (a)(1)	Passed
Hopping Channel Number	15.247 (b)	Passed
Dwell Time	15.247 (a)(1)	Passed
Pseudorandom Frequency Hopping Sequence	15.247(b)(4)&TCB Exclusion List (7 July 2002)	Passed
Radiated Emission	15.205/15.209	Passed
Band Edge	15.247(d)	Passed

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:	Scosche Industries Inc		
Address of Applicant:	1550 Pacific Ave Oxnard,CA 93033,USA		
Manufacturer/ Factory:	Sunitec Enterprise Co.,Ltd		
Address of Manufacturer/ Factory:	No.2, Qilin Road 2, RunTang Ind, Dan-Keng Village Fu MinCommunity, Guan-Lan Town, BaoAn District, Shenzhen Guangdong China		

4.2 General Description of E.U.T.

Product Name:	Bluetooth Hands-free & streaming car kit
Item No.:	BTAXS
Operation Frequency:	2402MHz~2480MHz
Channel numbers:	79
Channel separation:	1MHz
Modulation type:	GFSK, Pi/4QPSK, 8DPSK
Antenna Type:	Integral
Antenna gain:	0dBi
Power supply:	Type: Li- ion charge battery
	Voltage: 3.7V 130mAh
USB charger line:	< 3m

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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 see below:

Channel	Frequency
The lowest channel	2402MHz
The middle channel	2441MHz
The Highest channel	2480MHz

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Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.
Charger +Bluetooth mode+ AUX out mode	Keep EUT in charger and communication with other Bluetooth devices and AUX out connect other speaker
Bluetooth mode	Keep EUT in communication with other Bluetooth devices
Bluetooth + AUX out mode	Keep EUT in communication with other Bluetooth devices and AUX out connect other speaker

4.3 E.U.T Operation mode



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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							
ltem	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 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 case gain of the antenna is 0dBi.

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5.2 Conducted Emissions			
Test Requirement:	FCC Part15 C Section 15.207		
Test Method:	ANSI C63.4: 2003		
Test Frequency Range:	150KHz to 30MHz		
Class / Severity:	Class B		
Limit:	Frequency range (MHz)	Limit (c	lBuV)
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
Test procedure	* 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 refer to the block diagram of the test setup and photographs). Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4: 2003 on conducted measurement.		
Test setup:	Reference Plane		
	LISN 40cm 80cm LISN Filter AC power Equipment E.U.T Test table/Insulation plane Remark		er – AC power
	E.U.T: Equipment Under Test LISN: Line Impedence Stabilizatio Test table height=0.8m		
Test Instruments:	Refer to section 4.7 for details		
Testmeder	Charger +Bluetooth mode+ AUX out mode		
Test mode:	Charger + Didelootin mode+ AC		

5.2 Conducted Emissions

Measurement Data

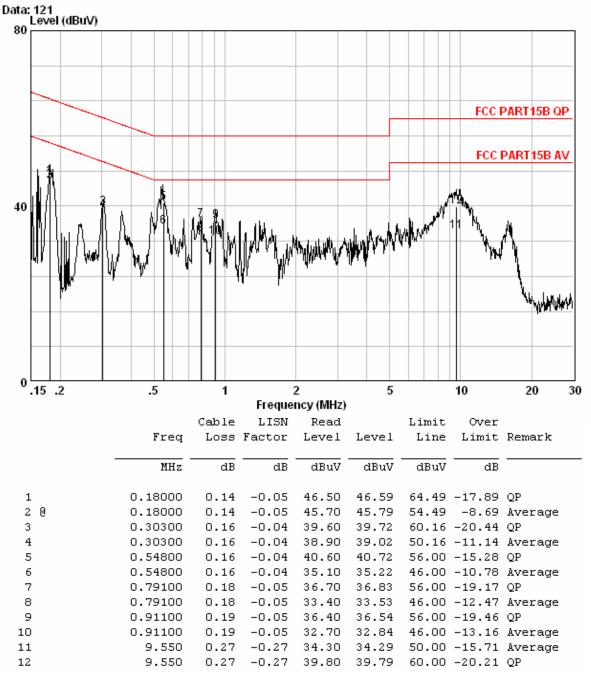
An initial pre-scan was performed on the live and neutral lines with peak detector.

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



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Live line:



Notes:

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

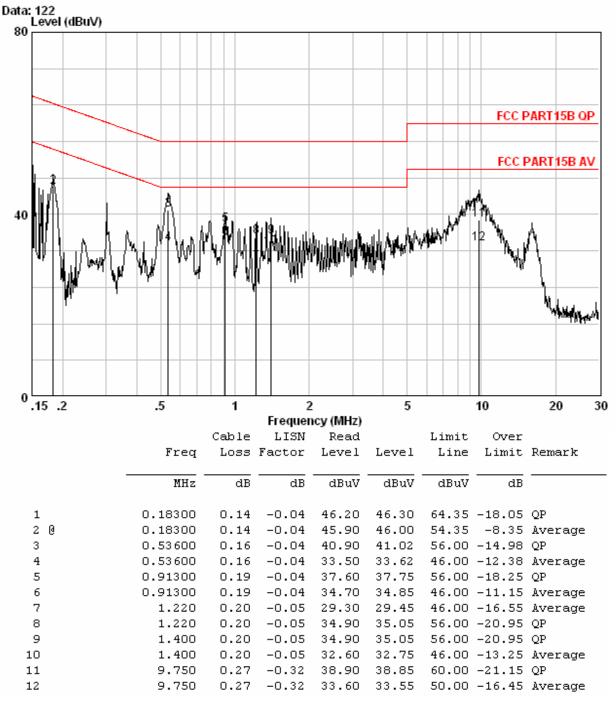
2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.

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Neutral line:



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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5.3 Conducted Peak Output Power

Test Requirement:	FCC Part15 C Section 15.247 (b)(1)	
Test Method:	ANSI C63.4:2003 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:	Passed	

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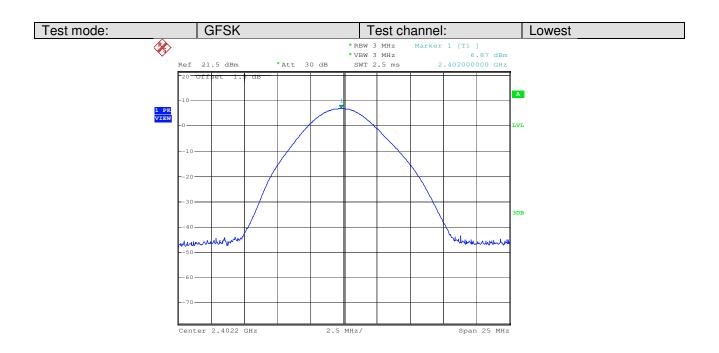
Measurement Data

GFSK mode				
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
Lowest	6.87	30.00	Pass	
Middle	7.50	30.00	Pass	
Highest	6.88	30.00	Pass	
	Pi/4QPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
Lowest	5.18	30.00	Pass	
Middle	5.71	30.00	Pass	
Highest	5.41	30.00	Pass	
	8DPSK mode			
Test channel	Peak Output Power (dBm)	Limit (dBm)	Result	
Lowest	5.54	30.00	Pass	
Middle	6.12	30.00	Pass	
Highest	5.92	30.00	Pass	

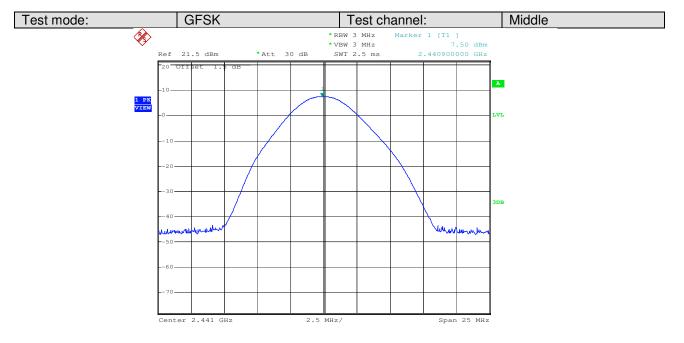
Test plot as follows:



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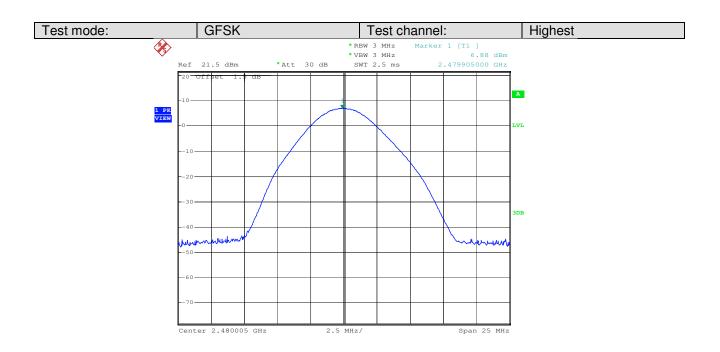
Date: 25.JUL.2010 09:36:00



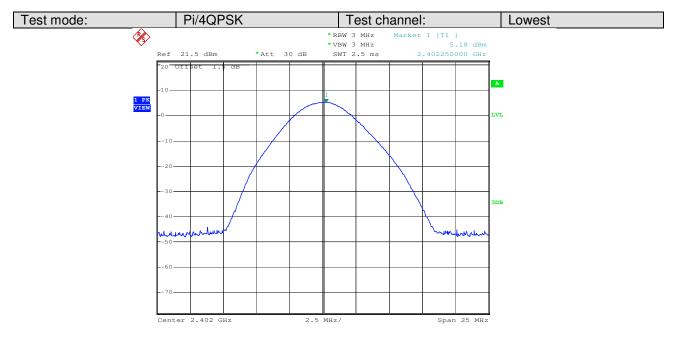
Date: 25.JUL.2010 09:39:53



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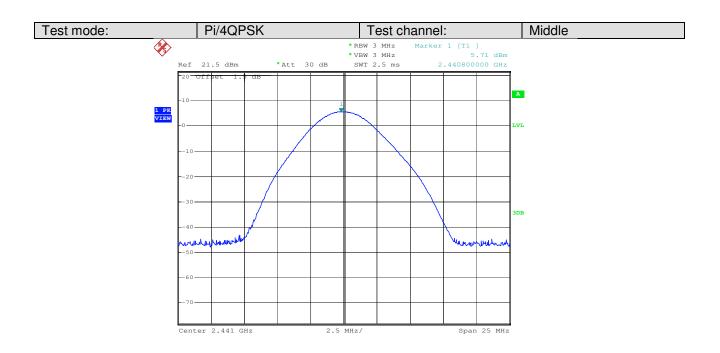
Date: 25.JUL.2010 09:54:24



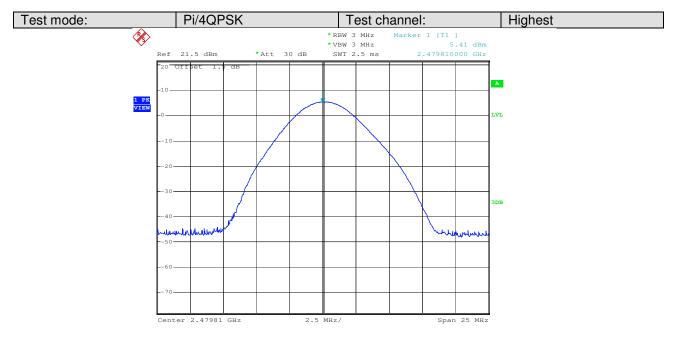
Date: 25.JUL.2010 10:25:11



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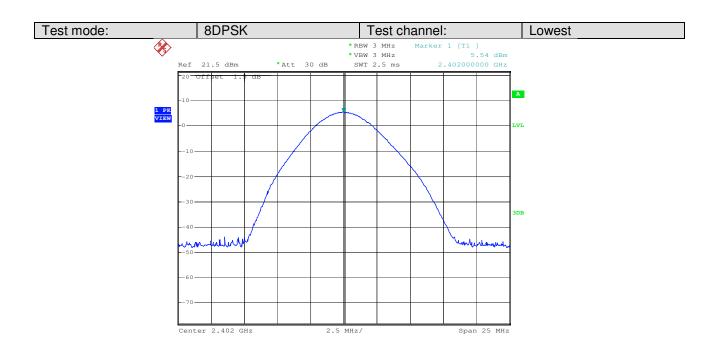
Date: 25.JUL.2010 10:09:50



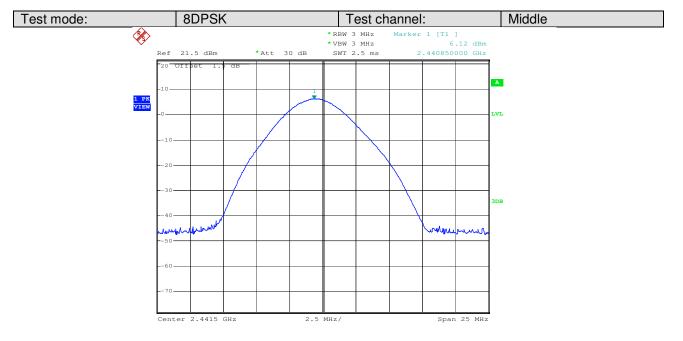
Date: 25.JUL.2010 10:09:12



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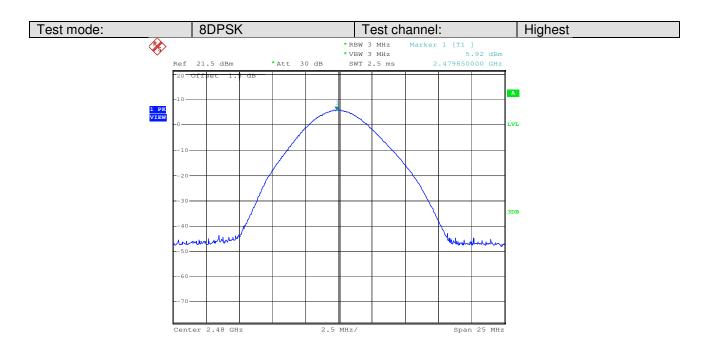
Date: 25.JUL.2010 10:33:28



Date: 25.JUL.2010 10:45:25



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Date: 25.JUL.2010 10:45:51



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5.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.4:2003 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:	Passed	

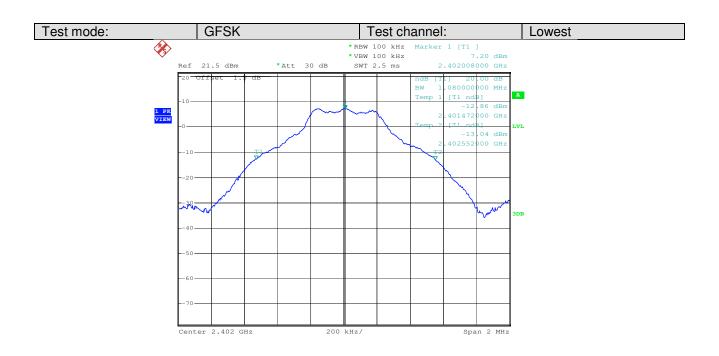
Measurement Data

Test channel	20	dB Occupy Bandwidth (KH	lz)
	GFSK	Pi/4QPSK	8DPSK
Lowest	1080	1364	1336
Middle	1084	1352	1340
Highest	1085	1360	1340

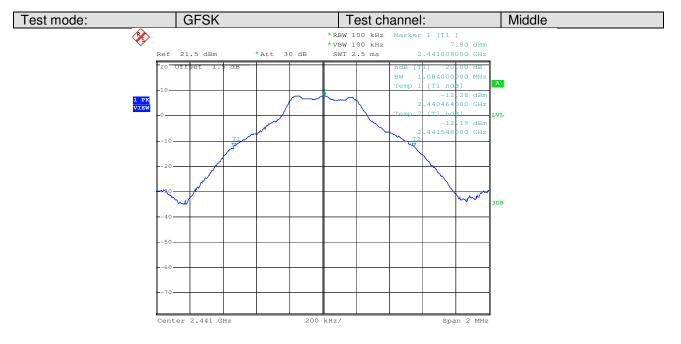
Test plot as follows:



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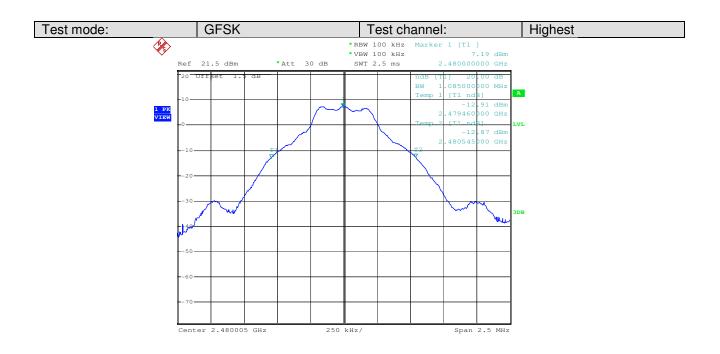
Date: 25.JUL.2010 09:29:08



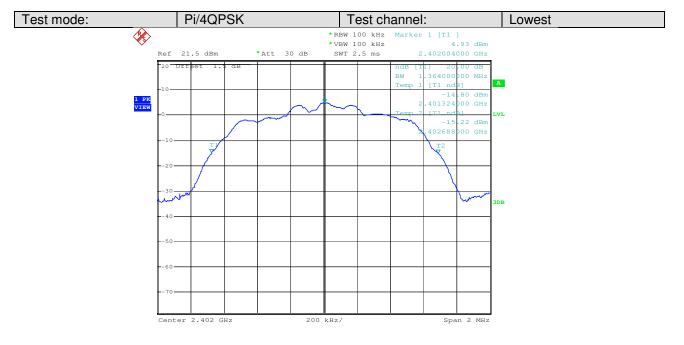
Date: 25.JUL.2010 09:40:21



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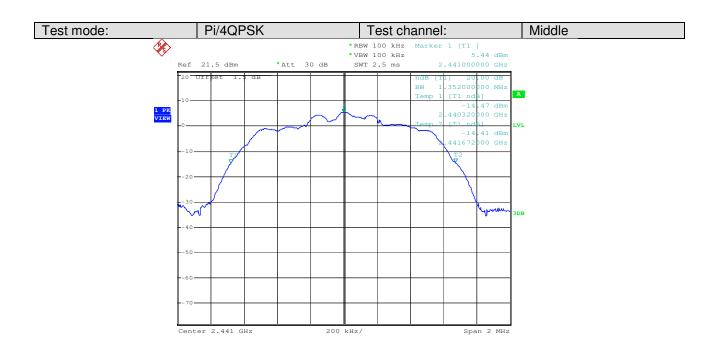
Date: 25.JUL.2010 09:53:57



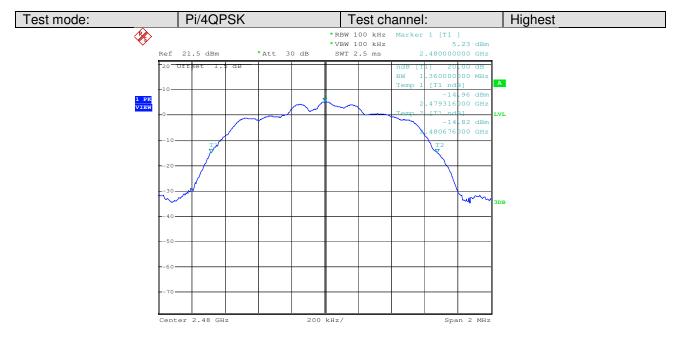
Date: 25.JUL.2010 10:20:46



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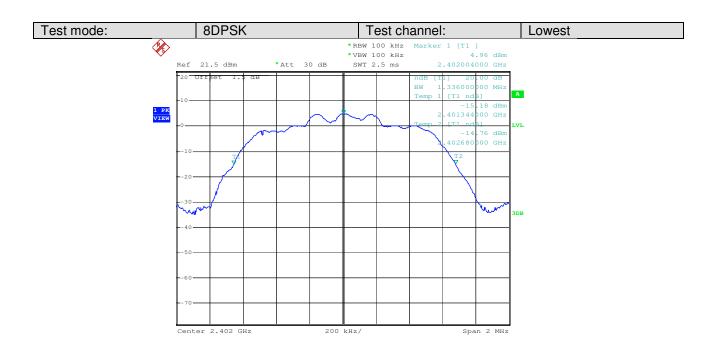
Date: 25.JUL.2010 10:10:38



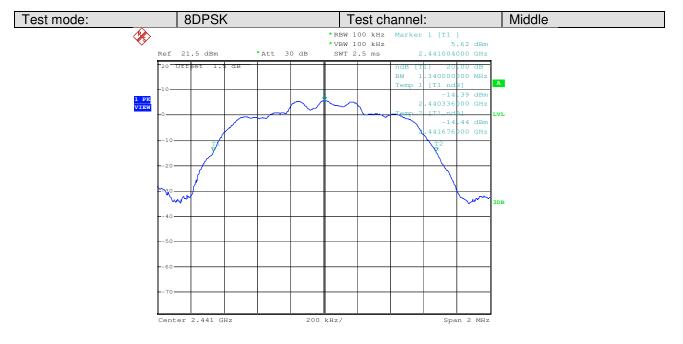
Date: 25.JUL.2010 10:02:26



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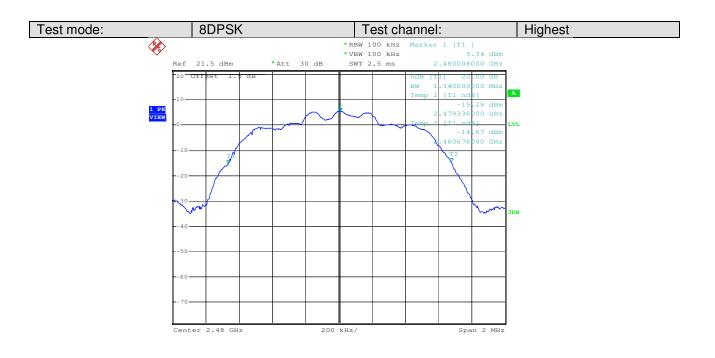
Date: 25.JUL.2010 10:34:20



Date: 25.JUL.2010 10:43:32



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Date: 25.JUL.2010 10:46:43



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5.5 Carrier Frequencies Separation

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)	
Test Method:	ANSI C63.4:2003 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:	Passed	

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Measurement Data

GFSK mode				
Test channel	Carrier Frequencies Separation (KHz)	Limit (KHz)	Result	
Lowest	1005	909	Pass	
Middle	1005	909	Pass	
Highest	1005	909	Pass	
	1005Pi/4QPSK mode			
Test channel	Carrier Frequen1005cies Separation (KHz)1005	Limit (KHz)	Result	
Lowest	1005	909	Pass	
Middle	1005	909	Pass	
Highest	1005	909	Pass	
	8DPSK mo	de		
Test channel	Carrier Frequencies Separation (KHz)	Limit (KHz)	Result	
Lowest	1005	909	Pass	
Middle	1005	909	Pass	
Highest	1010	909	Pass	

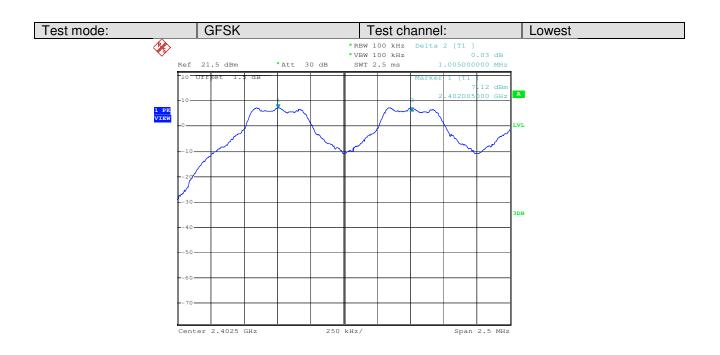
Note: According to section 5.4,

Mode	20dB bandwidth (KHz) (worse case)	Limit (KHz) (Carrier Frequencies Separation)
GFSK	1085	723
PI/4QPSK	1364	909
8DPSK	1340	893

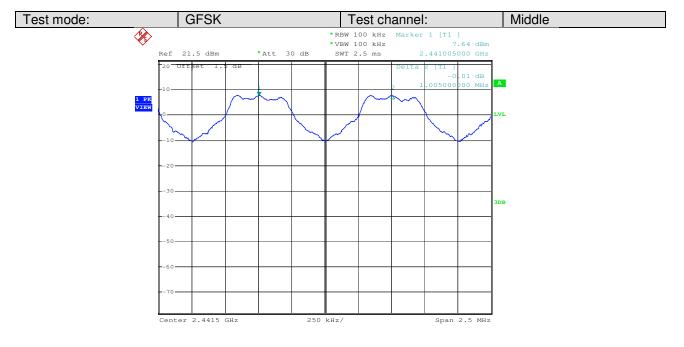
Test plot as follows:



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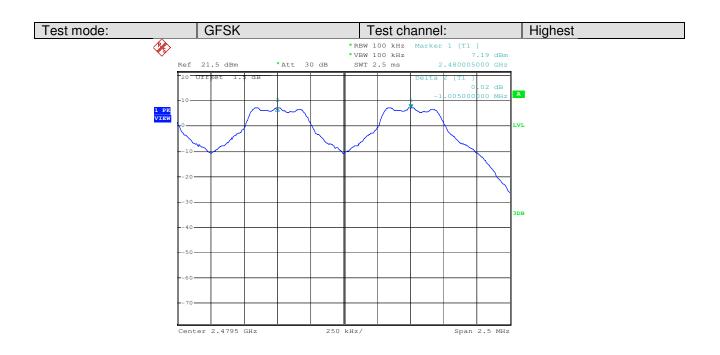
Date: 25.JUL.2010 09:30:53



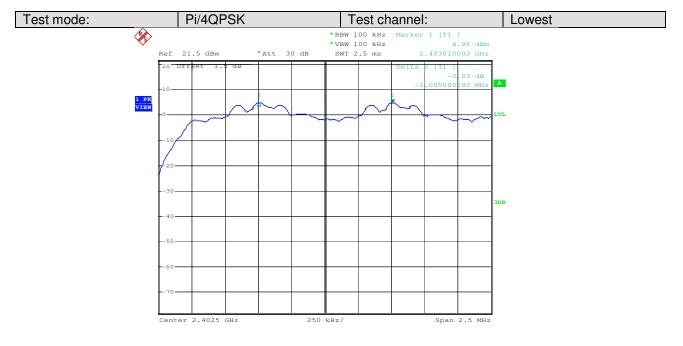
Date: 25.JUL.2010 09:43:10



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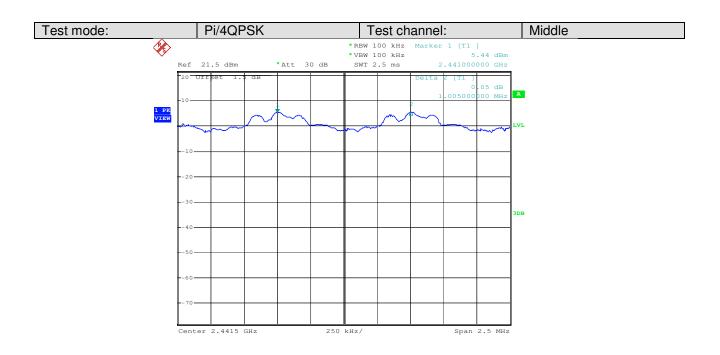
Date: 25.JUL.2010 09:52:49



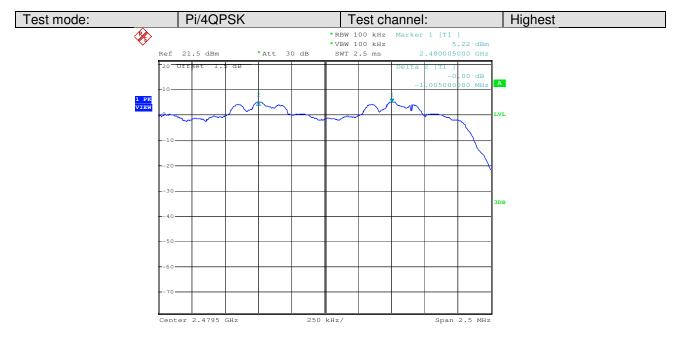
Date: 25.JUL.2010 10:22:34



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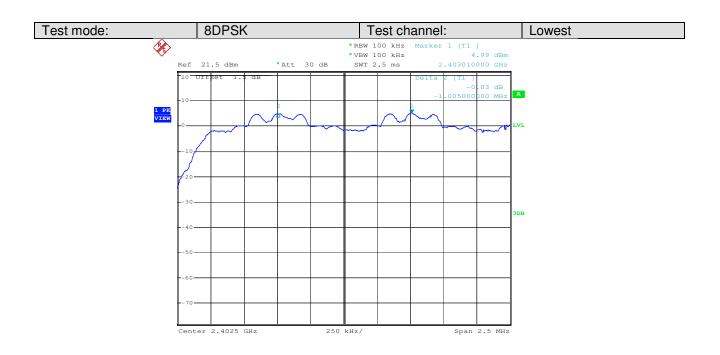
Date: 25.JUL.2010 10:12:02



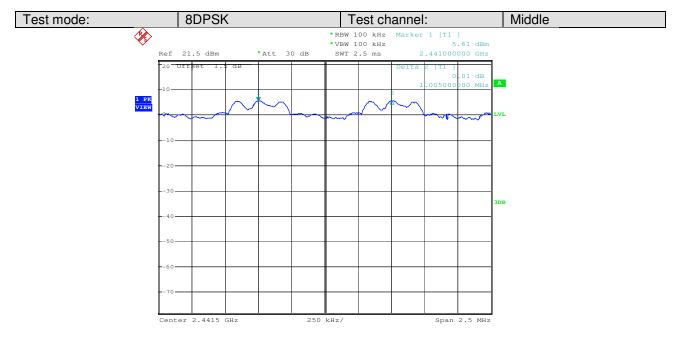
Date: 25.JUL.2010 10:03:37



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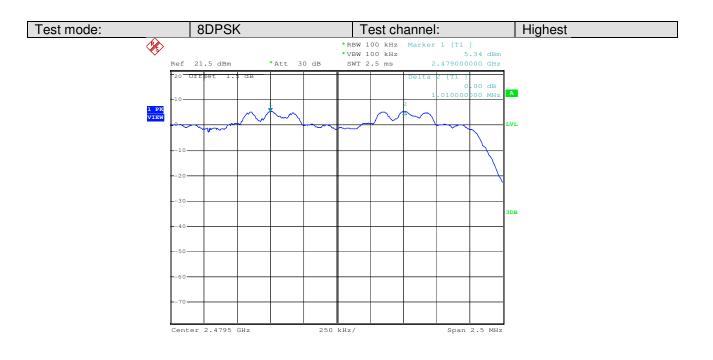
Date: 25.JUL.2010 10:35:41



Date: 25.JUL.2010 10:44:52



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Date: 25.JUL.2010 10:48:00



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Test Requirement: FCC Part15 C Section 15.247 (b) Test Method: ANSI C63.4:2003 and KDB DA00-705 Limit: 75channels Test setup: Spectrum Analyzer E.U.T G Non-Conducted Table **Ground Reference Plane Test Instruments:** Refer to section 4.7 for details Hopping transmitting with all kind of modulation. Test state: Passed Test results:

5.6 Hopping Channel Number

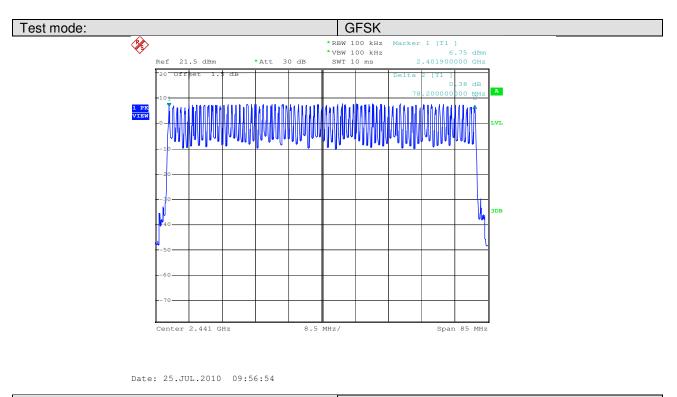
Measurement Data

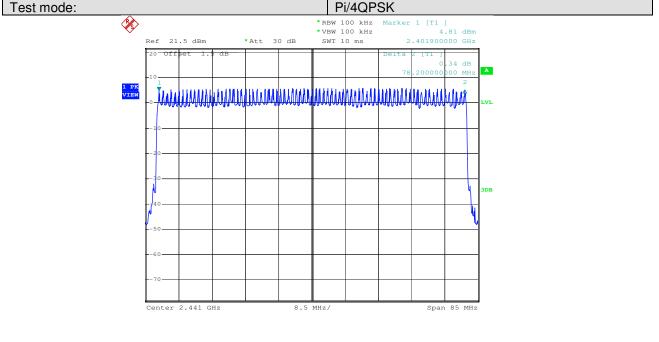
Mode	Hopping channel numbers	Limit
GFSK	79	75
Pi/4QPSK	79	75
8DPSK	79	75

Test plot as follows



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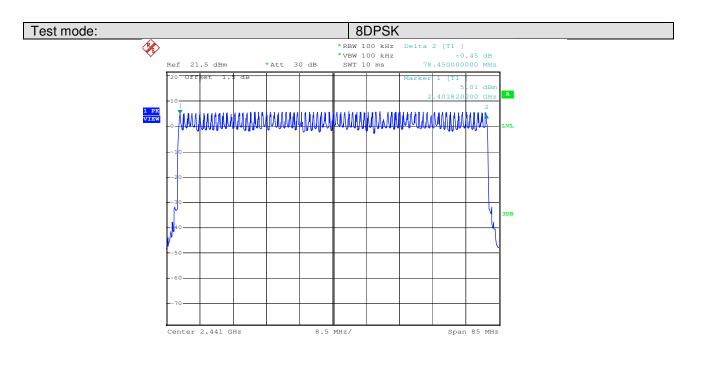




Date: 25.JUL.2010 10:01:15



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Date: 25.JUL.2010 10:57:44



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5.7 Dwell Time

Test Requirement:	FCC Part15 C Section 15.247 (a)(1)
Test Method:	ANSI C63.4:2003 and KDB DA00-705
Limit:	0.4 Second
Test setup:	Spectrum Analyzer E.U.T Non-Conducted Table Ground Reference Plane
Test Instruments:	Refer to section 4.7 for details
Test state:	Hopping transmitting with all kind of modulation.
Test results:	Passed

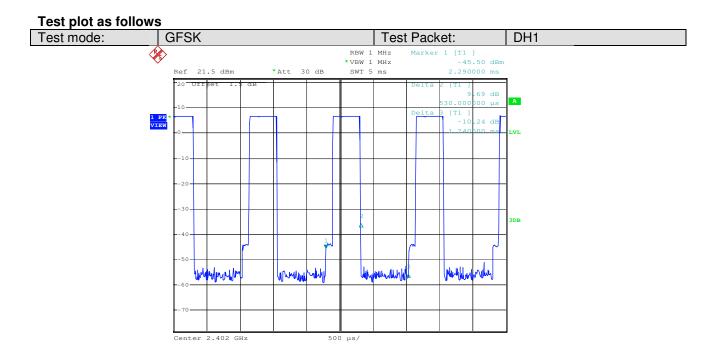
Measurement Data

Mode	Packet	Dwell time (second)	Limit (second)
	DH1	169.6	0.4
GFSK	DH3	286.4	0.4
	DH5	323.0	0.4
	2-DH1	172.8	0.4
Pi/4QPSK	2-DH3	288.0	0.4
	2-DH5	196.1	0.4
	3-DH1	172.8	0.4
8DPSK	3-DH3	288.0	0.4
	3-DH5	326.2	0.4

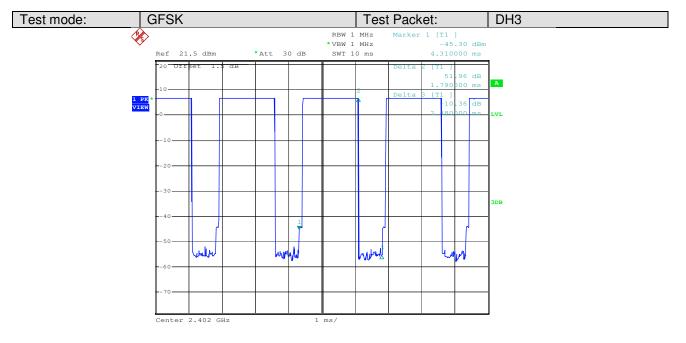
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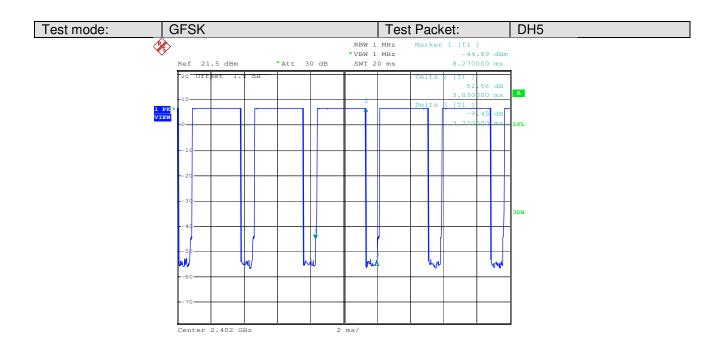
Date: 25.JUL.2010 09:36:59



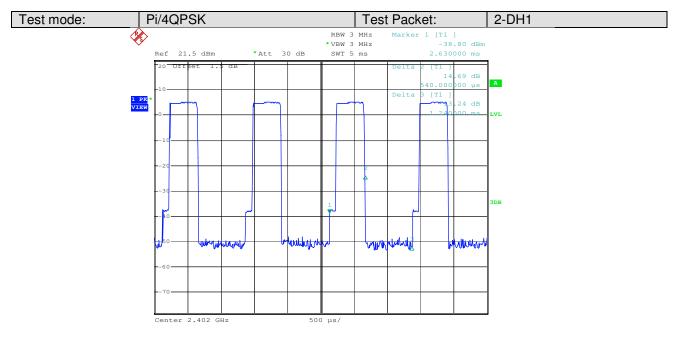
Date: 25.JUL.2010 09:37:46



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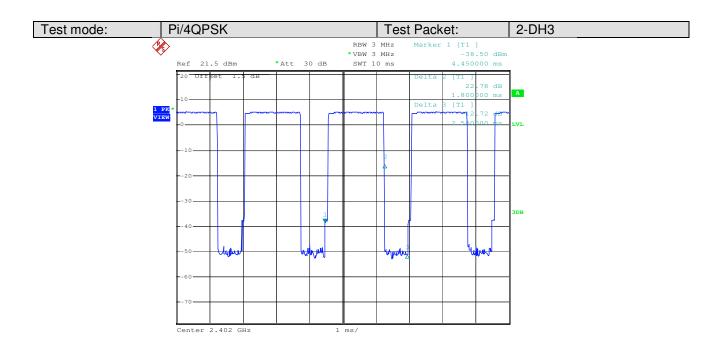
Date: 25.JUL.2010 09:38:34



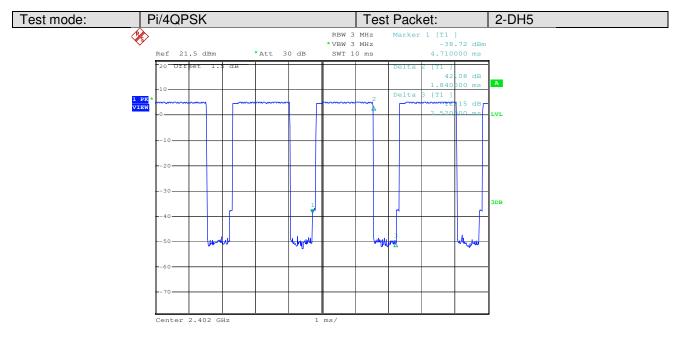
Date: 25.JUL.2010 10:26:08



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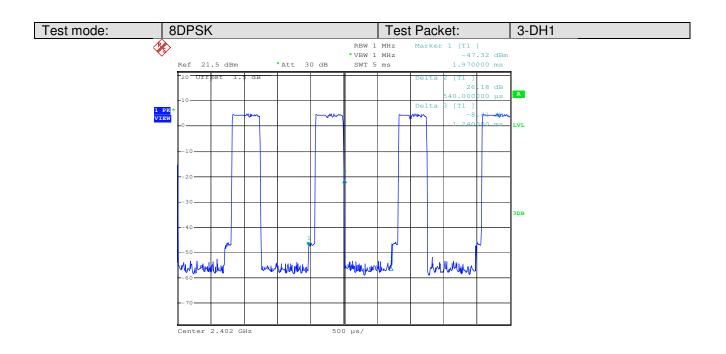
Date: 25.JUL.2010 10:26:59



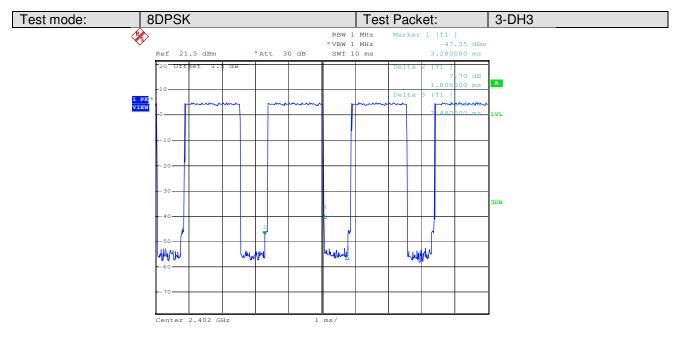
Date: 25.JUL.2010 10:27:41



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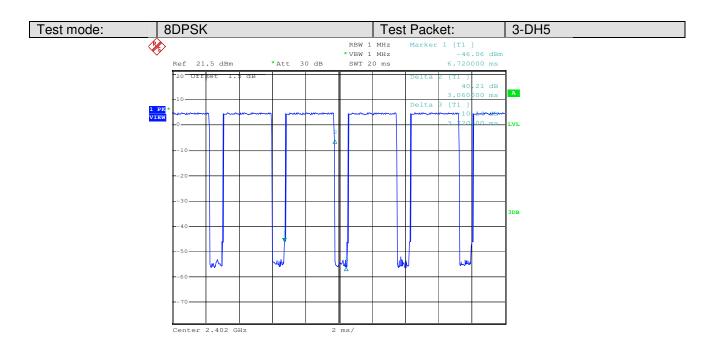
Date: 25.JUL.2010 10:33:06



Date: 25.JUL.2010 10:32:28



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Date: 25.JUL.2010 10:31:46



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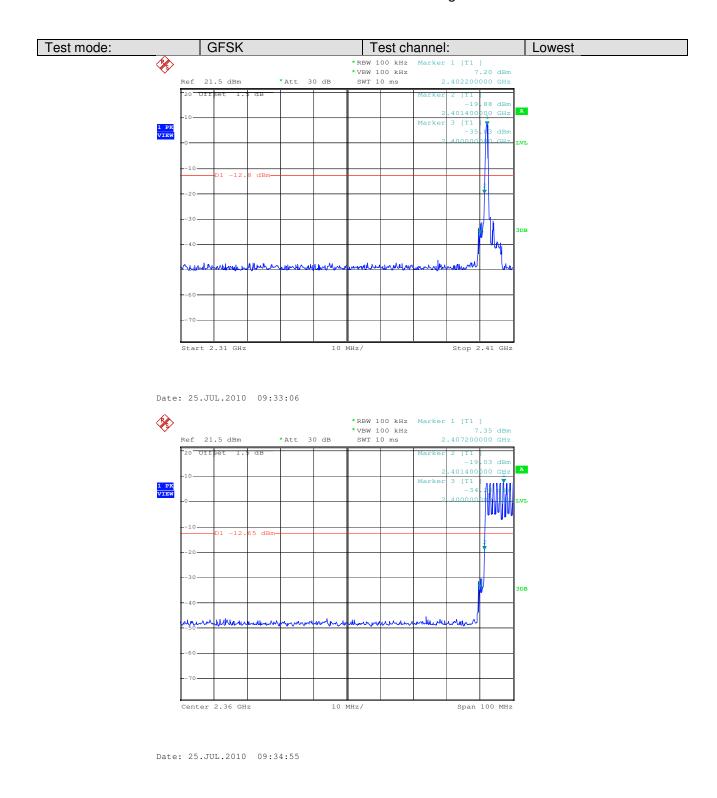
5.8 Band Edge

-	
Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 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 state:	Hopping transmitting with all kinds of modulation.
Test results:	Passed

Test plot as follows:

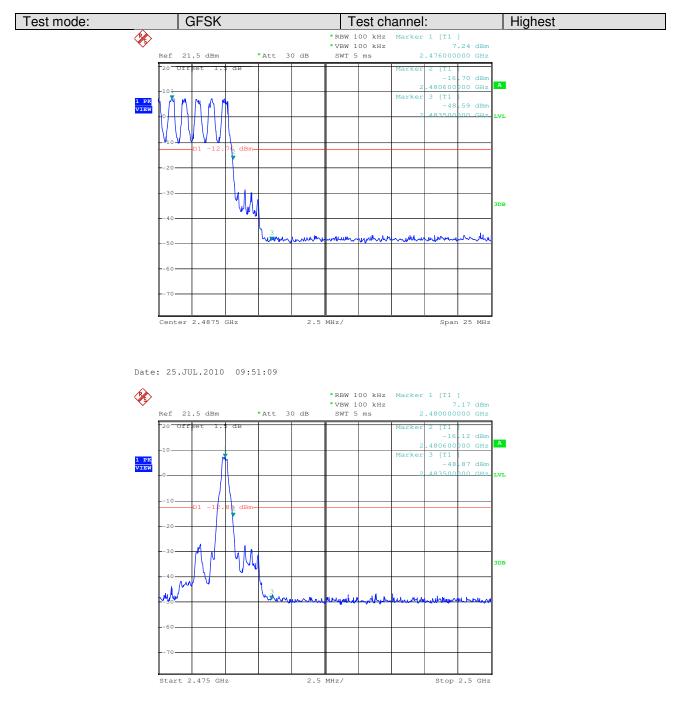


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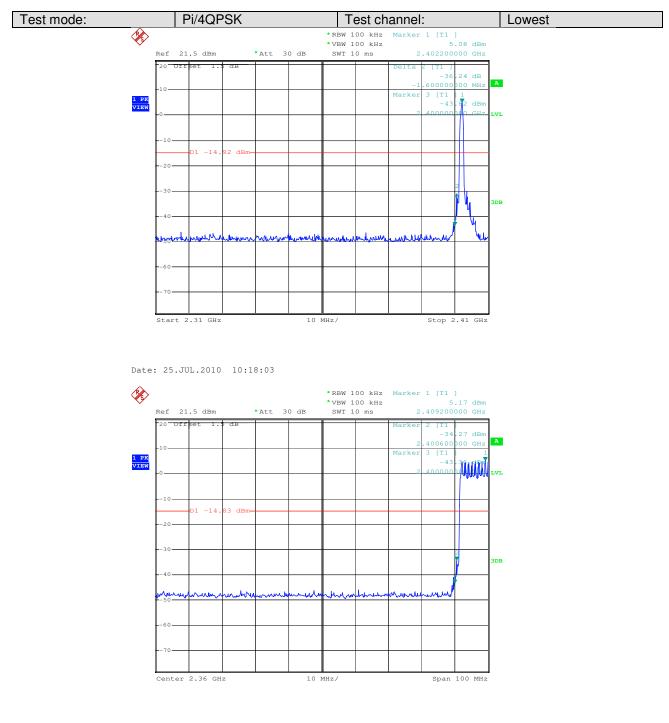
Report No.: SZEMO10070456801 Page: 45 of 70



Date: 25.JUL.2010 09:48:19



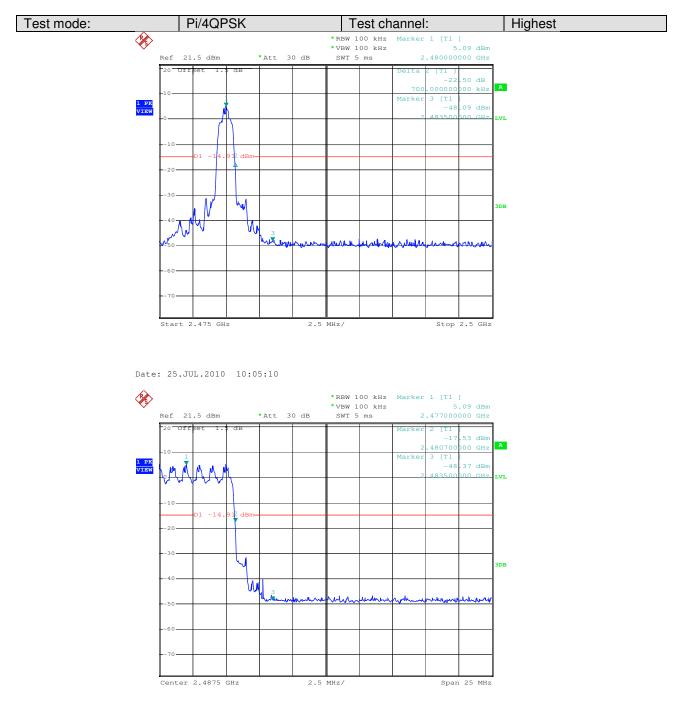
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Date: 25.JUL.2010 10:19:57



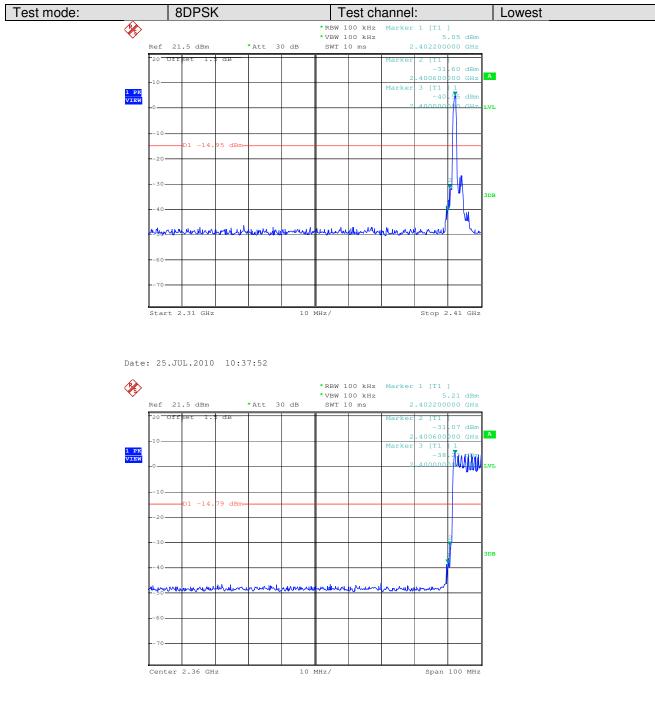
Report No.: SZEMO10070456801 Page: 47 of 70



Date: 25.JUL.2010 10:06:59



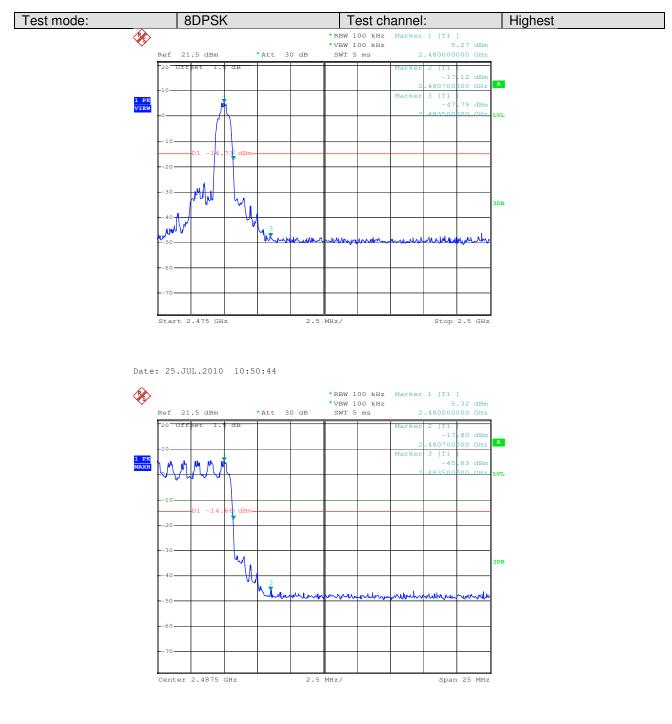
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Date: 25.JUL.2010 10:39:10



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Date: 25.JUL.2010 10:52:42



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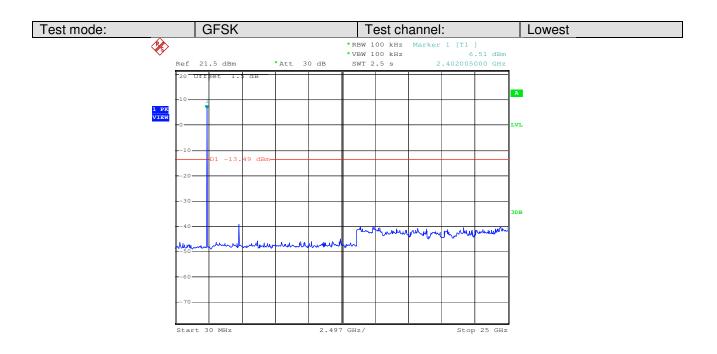
5.9 RF Antenna Conducted spurious emissions

Test Requirement:	FCC Part15 C Section 15.247 (d)
Test Method:	ANSI C63.4:2003 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 Image: Description For the High Engineering on the spectrum
Test Instruments:	Offset the High-Frequency cable loss 1.5dB in the spectrum analyzer.Refer to section 4.7 for details
Test results:	Passed

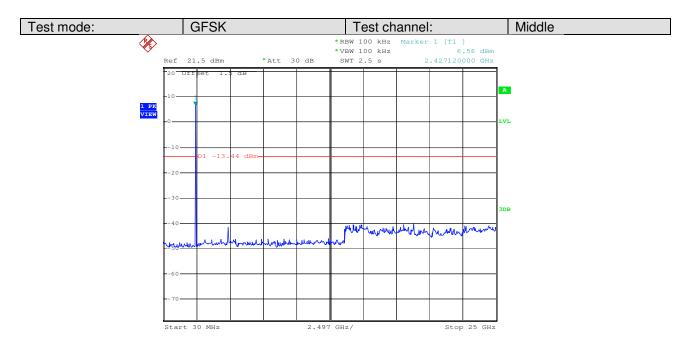
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Date: 25.JUL.2010 09:32:10

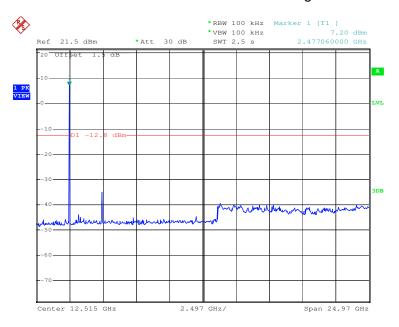


Date: 25.JUL.2010 09:44:10

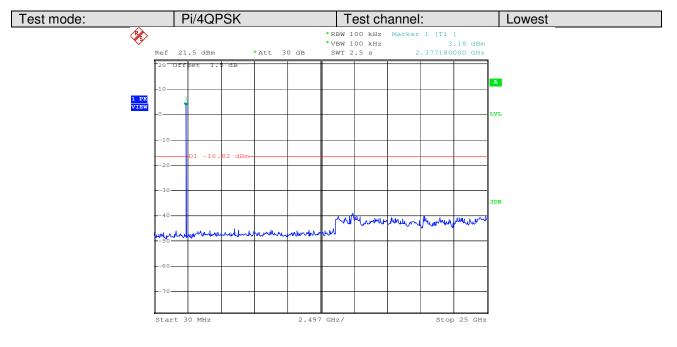
Test mode: GFSK Test channel: Highest	Test mode:	GFSK	l lest channel:	Highest
---------------------------------------	------------	------	-----------------	---------



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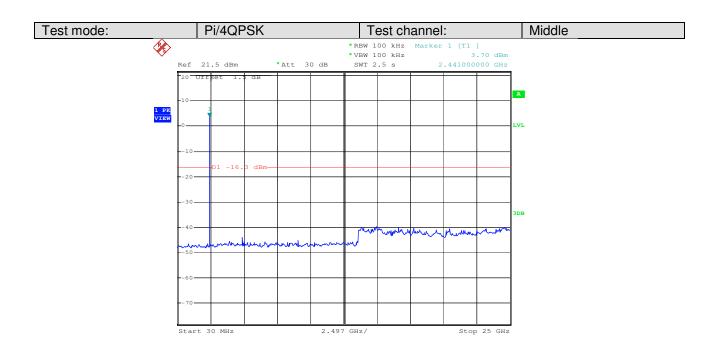
Date: 25.JUL.2010 09:47:08



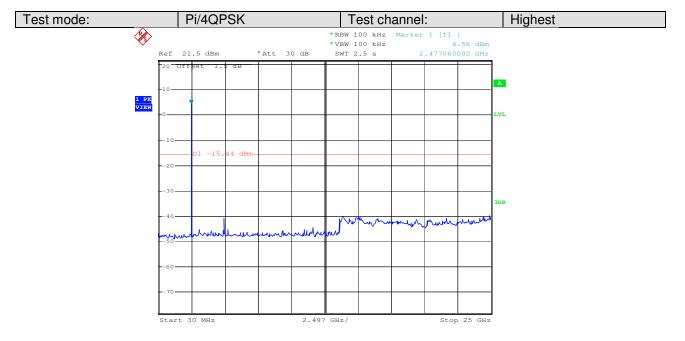
Date: 25.JUL.2010 10:24:40



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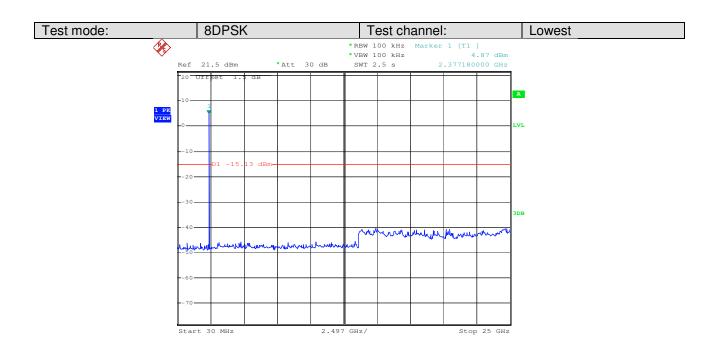
Date: 25.JUL.2010 10:15:25



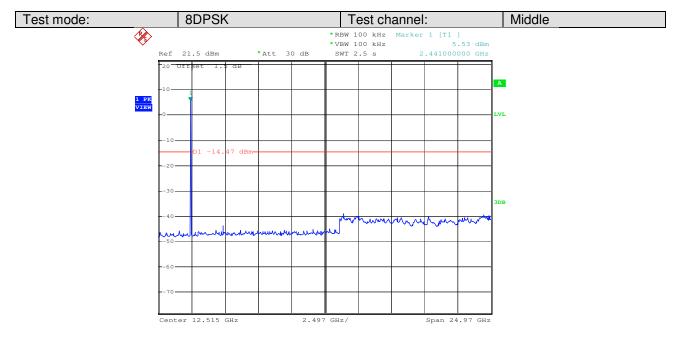
Date: 25.JUL.2010 10:08:30



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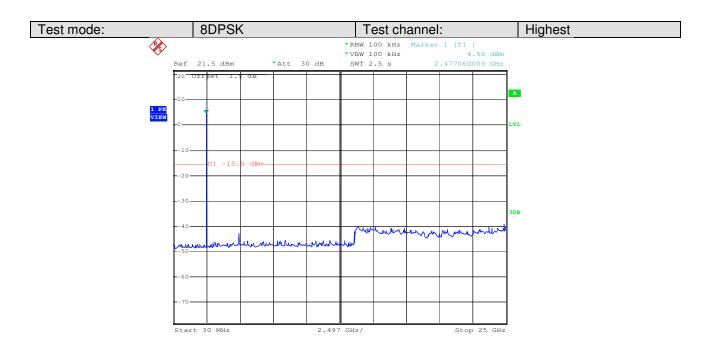
Date: 25.JUL.2010 10:36:48



Date: 25.JUL.2010 10:43:00



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Date: 25.JUL.2010 10:49:40



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5.10 Pseudorandom Frequency Hopping Sequence

Test Requirement:	FCC Part15 C Section 15.247 (a)(1) requirement:
	shall have hopping channel carrier frequencies separated by a minimum width of the hopping channel, whichever is greater.
channel carrier frequencies hopping channel, whichever than 125 mW. The system rate from a Pseudorandom on the average by each trar	pping systems operating in the 2400-2483.5 MHz band may have hopping that are separated by 25 kHz or two-thirds of the 20 dB bandwidth of the is greater, provided the systems operate with an output power no greater shall hop to channel frequencies that are selected at the system hopping ordered list of hopping frequencies. Each frequency must be used equally nsmitter. The system receivers shall have input bandwidths that match the hs of their corresponding transmitters and shall shift frequencies in psmitted signals.
EUT Pseudorandom Frequ	ency Hopping Sequence
outputs are added in a modu	sequence: $2^9 - 1 = 511$ bits
	+
Linear Feedback S	hift Register for Generation of the PRBS sequence
	m Frequency Hopping Sequence as follow:
0 2 4 6	<u>62 64 78 1</u> 73 75 77
The system receivers have in	y on the average by each transmitter. nput bandwidths that match the hopping channel bandwidths of their and shift frequencies in synchronization with the transmitted signals.

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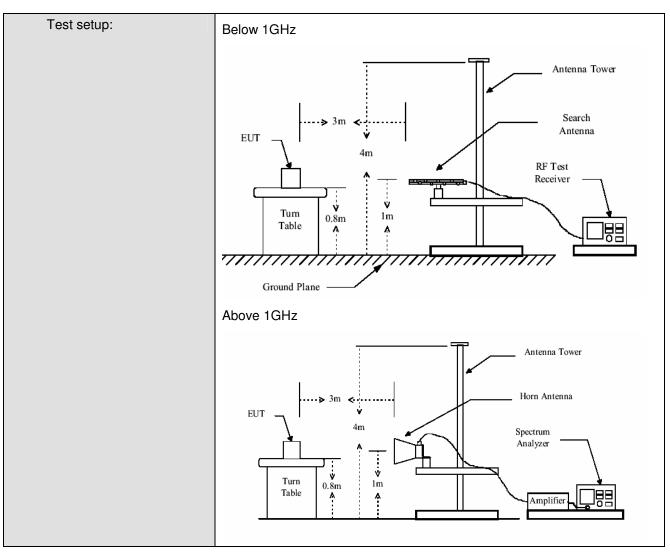
5.11 Radiated Emis	FCC Part15 C S	Castion 15 000	and 15 005		
Test Requirement:			and 15.205		
Test Method:	ANSI C63.4: 20				
Test Frequency Range:	30MHz to 25GH				
Test site:	Measurement D	oistance: 3m (Se	emi-Anecho	ic Chambe	r)
Receiver setup:					
	Frequency	Detector	RBW	VBW	Remark
	30MHz-1GHz	Quasi-peak	100KHz	300KHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		Peak	1MHz	10Hz	Average Value
Limit:					
	Freque	ncy	Limit (dBuV	- 1	Remark
	30MHz-8		40.0		Quasi-peak Value
	88MHz-21		43.		Quasi-peak Value
	216MHz-9		46.0		Quasi-peak Value
	960MHz-	1GHz	54.0		Quasi-peak Value
	Above 1	GHz -	54.0		Average Value
			74.(Peak Value
Test Procedure:					0.8 meters above
		at a 3 meter sei			
		degrees to dete	ermine the p	position of t	he highest
	radiation.				
	b. The EUT wa	as set 3 meters	away from	the interfere	ence-receiving
	antenna, wł	nich was mount	ed on the to	p of a varia	ble-height antenna
	tower.			•	U U
		a height is varie	ed from one	meter to fo	ur meters above the
					ld strength. Both
					a are set to make
	the measure				
	d. For each su		on the EUT	was arran	and to its worst
					rom 1 meter to 4
		the rotatable ta			
					degrees to 500
		find the maximu		al Datast I	-unation and
		eiver system w			
		andwidth with N			
					s 10dB lower than
					and the peak values
					ssions that did not
					using peak, quasi-
	peak or ave	rage method as	s specified a	and then rep	ported in a data
	sheet.				
Test Instruments:	Refer to section	4.7 for details			
Test mode:	Non-hopping tra	ansmitting with r	modulation.		
		-		18DPSK m	odes and find out
	the worst case				
					+Bluetooth mode+
					oth mode and then
					th mode+ AUX out
			0		
	mode.				
		ase mode was	displayed h	elow.	
Test results:	mode. Only the worst of Passed	case mode was	displayed b	elow.	

5.11 Radiated Emission

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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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			Charge+Blu	etooth mod	le+AUX out me	ode		
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
31.940	0.60	14.43	28.17	29.10	15.96	40.00	-24.04	Vertical
75.590	0.97	7.37	28.00	34.31	14.65	40.00	-25.35	Vertical
249.220	1.67	12.27	26.92	33.81	20.83	46.00	-25.17	Vertical
478.140	2.52	17.80	27.65	33.38	26.05	46.00	-19.95	Vertical
749.740	3.06	21.70	27.11	34.83	32.48	46.00	-13.52	Vertical
908.820	3.61	23.24	26.43	32.82	33.24	46.00	-12.76	Vertical
230.790	1.58	11.70	27.00	36.60	22.88	46.00	-23.12	Horizontal
249.220	1.67	12.27	26.92	39.18	26.20	46.00	-19.80	Horizontal
261.830	1.73	12.55	26.87	38.18	25.59	46.00	-20.41	Horizontal
285.110	1.84	13.26	26.77	35.55	23.88	46.00	-22.12	Horizontal
749.740	3.06	21.70	27.11	36.82	34.47	46.00	-11.53	Horizontal
797.270	3.19	22.09	26.95	37.96	36.29	46.00	-9.71	Horizontal

5.11.1 Radiated emission below 1GHz



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Worse case n	node:	GFSK	Test	channel:	Lowest	Rema	ark:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1587.500	5.08	27.40	38.94	46.52	40.06	74.00	-33.94	Vertical
4783.500	9.45	34.23	41.50	51.08	53.26	74.00	-20.74	Vertical
7215.750	13.30	37.24	40.88	44.15	53.81	74.00	-20.19	Vertical
9577.500	13.46	37.98	37.49	43.36	57.31	74.00	-16.69	Vertical
11892.250	16.02	39.02	38.96	43.86	59.94	74.00	-14.06	Vertical
1587.500	5.08	27.40	38.94	46.52	40.06	74.00	-33.94	Vertical
1587.500	5.08	27.40	38.94	48.43	41.97	74.00	-32.03	Horizontal
4842.250	11.47	34.30	41.59	45.55	49.73	74.00	-24.27	Horizontal
7206.000	13.38	37.23	40.98	47.95	57.58	74.00	-16.42	Horizontal
9608.000	13.39	37.99	37.56	41.25	55.07	74.00	-18.93	Horizontal
12010.000	16.45	39.10	39.09	41.32	57.78	74.00	-16.22	Horizontal
1587.500	5.08	27.40	38.94	48.43	41.97	74.00	-32.03	Horizontal

5.11.2 Transmitter emission above 1GHz

Worse case mode: GFSK Test channel:

annel: Lowest

Remark:

Average

Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over limit	polarization
1599.250	5.11	27.43	38.85	36.14	29.83	54.00	-24.17	Vertical
4804.000	9.36	34.25	41.53	34.95	37.03	54.00	-16.97	Vertical
7206.000	13.38	37.23	40.98	31.92	41.55	54.00	-12.45	Vertical
9608.000	13.39	37.99	37.56	28.61	42.43	54.00	-11.57	Vertical
12010.000	16.45	39.10	39.09	28.98	45.44	54.00	-8.56	Vertical
1599.250	5.11	27.43	38.85	36.14	29.83	54.00	-24.17	Vertical
1599.250	5.11	27.43	38.85	37.56	31.25	54.00	-22.75	Horizontal
4877.500	10.36	34.34	39.89	43.69	48.50	54.00	-5.50	Horizontal
7206.000	13.38	37.23	40.98	32.01	41.64	54.00	-12.36	Horizontal
9608.000	13.39	37.99	37.56	28.73	42.55	54.00	-11.45	Horizontal
12010.000	16.45	39.10	39.09	28.78	45.24	54.00	-8.76	Horizontal
1599.250	5.11	27.43	38.85	37.56	31.25	54.00	-22.75	Horizontal



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Worse case	mode:	GFSK	Tes	t channel:	Middle	Rem	ark:	Peak
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1599.250	5.11	27.43	38.85	52.02	45.71	74.00	-28.29	Vertical
4877.500	10.36	34.34	39.89	56.73	61.54	74.00	-12.46	Vertical
7323.000	12.91	37.31	40.40	45.08	54.90	74.00	-19.10	Vertical
9764.000	13.89	38.03	37.94	41.21	55.19	74.00	-18.81	Vertical
12205.000	17.95	39.23	39.30	42.70	60.58	74.00	-13.42	Vertical
1599.250	5.11	27.43	38.85	50.70	44.39	74.00	-29.61	Horizontal
4877.500	10.36	34.34	39.89	58.98	63.79	74.00	-10.21	Horizontal
7323.000	12.91	37.31	40.40	45.89	55.71	74.00	-18.29	Horizontal
9764.000	13.89	38.03	37.94	40.74	54.72	74.00	-19.28	Horizontal
12205.000	17.95	39.23	39.30	43.62	61.50	74.00	-12.50	Horizontal
Worse case	mode:	GFSK	Tes	t channel:	Middle	Rem	ark:	Average
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over limit	polarization
1599.250	5.11	27.43	38.85	42.04	35.73	54.00	-18.27	Vertical
4877.500	10.36	34.34	39.89	43.71	48.52	54.00	-5.48	Vertical
7323.000	12.91	37.31	40.40	33.41	43.23	54.00	-10.77	Vertical
9764.000	13.89	38.03	37.94	28.42	42.40	54.00	-11.60	Vertical
12205.000	17.95	39.23	39.30	30.20	48.08	54.00	-5.92	Vertical
1599.250	5.11	27.43	38.85	37.15	30.84	54.00	-23.16	Horizontal
	0.11							
4877.500	10.36	34.34	39.89	38.87	43.68	54.00	-10.32	Horizontal
4877.500 7323.000			39.89 40.40	38.87 32.76	43.68 42.58	54.00 54.00	-10.32 -11.42	Horizontal Horizontal
	10.36	34.34						
7323.000	10.36 12.91	34.34 37.31	40.40	32.76	42.58	54.00	-11.42	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)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
1812.000	5.63	28.03	38.86	48.91	43.71	74.00	-30.29	Vertical
4960.000	10.43	34.45	41.03	53.62	57.47	74.00	-16.53	Vertical
7440.000	12.72	37.37	40.01	47.98	58.06	74.00	-15.94	Vertical
9920.000	14.24	38.08	37.78	39.98	54.52	74.00	-19.48	Vertical
12400.000	17.55	39.34	39.48	41.83	59.24	74.00	-14.76	Vertical
1812.000	5.63	28.03	38.86	48.05	42.85	74.00	-31.15	Horizontal
4960.000	10.43	34.45	41.03	53.40	57.25	74.00	-16.75	Horizontal
7440.000	12.72	37.37	40.01	45.98	56.06	74.00	-17.94	Horizontal
9920.000	14.24	38.08	37.78	39.82	54.36	74.00	-19.64	Horizontal
12400.000	17.55	39.34	39.48	42.98	60.39	74.00	-13.61	Horizontal
Worse case								
	mode:	GFSK	Test	t channel:	Highest	Rem	ark:	Average
	mode:	GFSK	Tes	t channel:	Highest	Rem	ark:	Average
Frequency (MHz)	Cable loss (dB)	GFSK Antenna factors (dB/m)	Preamp factor (dB)	t channel: Reading Level (dBµV)	Highest Emission Level (dBµV/m)	Limit (dBµV/m)	ark: Over limit	Average
Frequency	Cable loss	Antenna factors	Preamp factor	Reading Level	Emission Level	Limit	Over	
Frequency (MHz)	Cable loss (dB)	Antenna factors (dB/m)	Preamp factor (dB)	Reading Level (dBµV)	Emission Level (dBµV/m)	Limit (dBµV/m)	Over limit	polarization
Frequency (MHz) 1644.000	Cable loss (dB) 5.10	Antenna factors (dB/m) 27.57	Preamp factor (dB) 39.32	Reading Level (dBµV) 36.28	Emission Level (dBµV/m) 29.63	Limit (dBµV/m) 54.00	Over limit -24.37	polarization Vertical
Frequency (MHz) 1644.000 4960.000	Cable loss (dB) 5.10 10.43	Antenna factors (dB/m) 27.57 34.45	Preamp factor (dB) 39.32 41.03	Reading Level (dBµV) 36.28 46.69	Emission Level (dBµV/m) 29.63 50.54	Limit (dBµV/m) 54.00 54.00	Over limit -24.37 -3.46	polarization Vertical Vertical
Frequency (MHz) 1644.000 4960.000 7440.000	Cable loss (dB) 5.10 10.43 12.72	Antenna factors (dB/m) 27.57 34.45 37.37	Preamp factor (dB) 39.32 41.03 40.01	Reading Level (dBμV) 36.28 46.69 32.62	Emission Level (dBµV/m) 29.63 50.54 42.70	Limit (dBµV/m) 54.00 54.00 54.00	Over limit -24.37 -3.46 -11.30	polarization Vertical Vertical Vertical
Frequency (MHz) 1644.000 4960.000 7440.000 9920.000	Cable loss (dB) 5.10 10.43 12.72 14.24	Antenna factors (dB/m) 27.57 34.45 37.37 38.08	Preamp factor (dB) 39.32 41.03 40.01 37.78	Reading Level (dBµV) 36.28 46.69 32.62 27.44	Emission Level (dBµV/m) 29.63 50.54 42.70 41.98	Limit (dBµV/m) 54.00 54.00 54.00 54.00	Over limit -24.37 -3.46 -11.30 -12.02	polarization Vertical Vertical Vertical Vertical
Frequency (MHz) 1644.000 4960.000 7440.000 9920.000 12400.000	Cable loss (dB) 5.10 10.43 12.72 14.24 17.55	Antenna factors (dB/m) 27.57 34.45 37.37 38.08 39.34	Preamp factor (dB) 39.32 41.03 40.01 37.78 39.48	Reading Level (dBμV) 36.28 46.69 32.62 27.44 29.62	Emission Level (dBµV/m) 29.63 50.54 42.70 41.98 47.03	Limit (dBµV/m) 54.00 54.00 54.00 54.00 54.00	Over limit -24.37 -3.46 -11.30 -12.02 -6.97	polarization Vertical Vertical Vertical Vertical Vertical
Frequency (MHz) 1644.000 4960.000 7440.000 9920.000 12400.000 1644.000	Cable loss (dB) 5.10 10.43 12.72 14.24 17.55 5.10	Antenna factors (dB/m) 27.57 34.45 37.37 38.08 39.34 27.57	Preamp factor (dB) 39.32 41.03 40.01 37.78 39.48 39.32	Reading Level (dBμV) 36.28 46.69 32.62 27.44 29.62 37.57	Emission Level (dBµV/m) 29.63 50.54 42.70 41.98 47.03 30.92	Limit (dBµV/m) 54.00 54.00 54.00 54.00 54.00 54.00	Over limit -24.37 -3.46 -11.30 -12.02 -6.97 -23.08	polarization Vertical Vertical Vertical Vertical Vertical Horizontal
Frequency (MHz) 1644.000 4960.000 7440.000 9920.000 12400.000 1644.000 4960.000	Cable loss (dB) 5.10 10.43 12.72 14.24 17.55 5.10 10.43	Antenna factors (dB/m) 27.57 34.45 37.37 38.08 39.34 27.57 34.45	Preamp factor (dB) 39.32 41.03 40.01 37.78 39.48 39.32 41.03	Reading Level (dBµV) 36.28 46.69 32.62 27.44 29.62 37.57 44.72	Emission Level (dBµV/m) 29.63 50.54 42.70 41.98 47.03 30.92 48.57	Limit (dBµV/m) 54.00 54.00 54.00 54.00 54.00 54.00 54.00	Over limit -24.37 -3.46 -11.30 -12.02 -6.97 -23.08 -5.43	polarization Vertical Vertical Vertical Vertical Vertical Horizontal 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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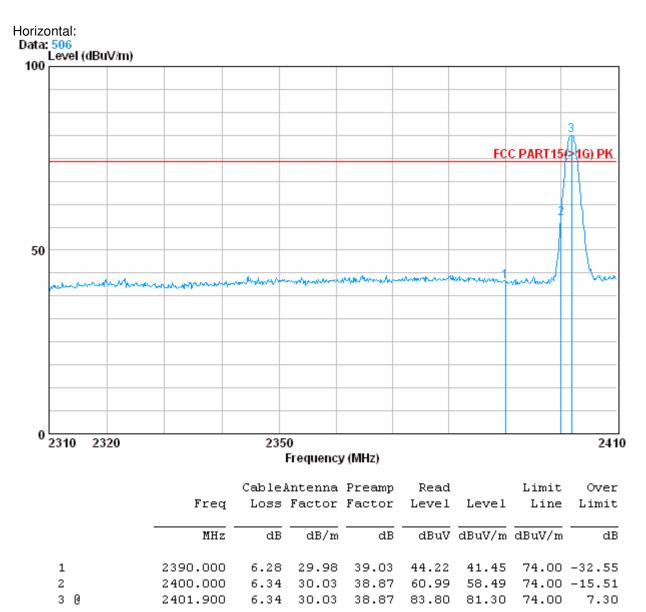


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st mode: Tran		nsmitting	Test channel:		Lowest		Remark:	1	Peak	
tical: ta: 507 Level (d	BuV/m)									
									3	
							FC	C PART 15	ß	
								O PAINTS		
0										
home	manda	and a server and a server and the	man	mohum	at more that	mm	when and	whent	hand	
0 2310	2320		23	50					2410	
2010	2020		20.	Frequenc	y (MHz)				2410	
			Ceblei	Antenna	Dreemn	Read		Limit	Over	
		Freq			Factor		Level	Line	Limit	
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2390.000	6.28	29.98	39.03	44.24	41.47	74.00	-32.53	
2 30		2400.000 2401.800	6.34 6.34	30.03 30.03	38.87 38.87	62.80 85.46	60.30 82.96	74.00 74.00	-13.70	



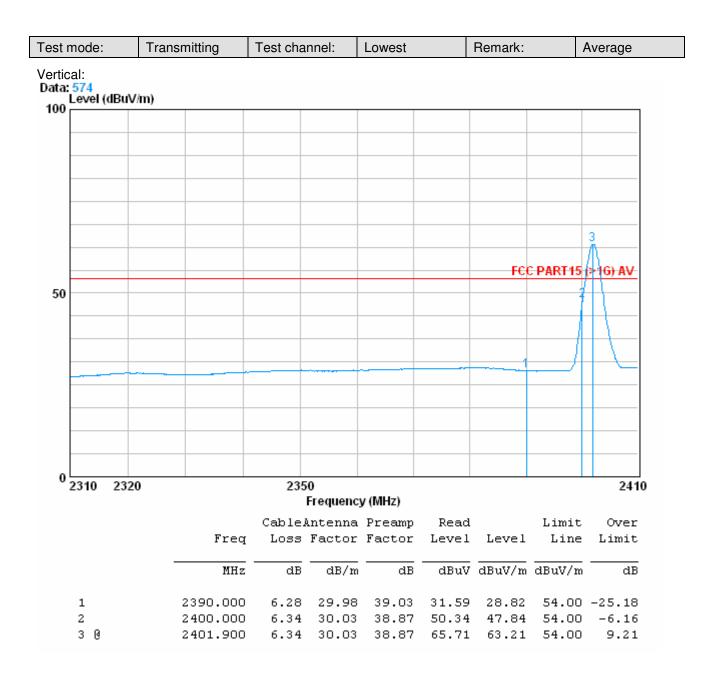
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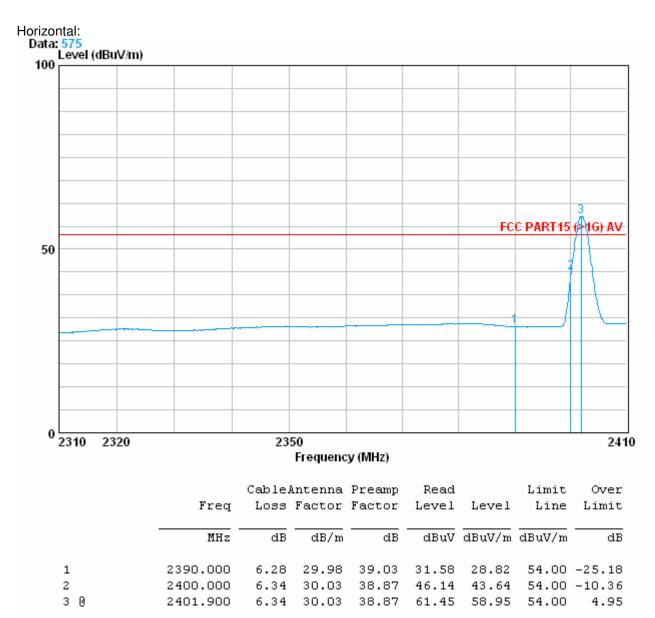
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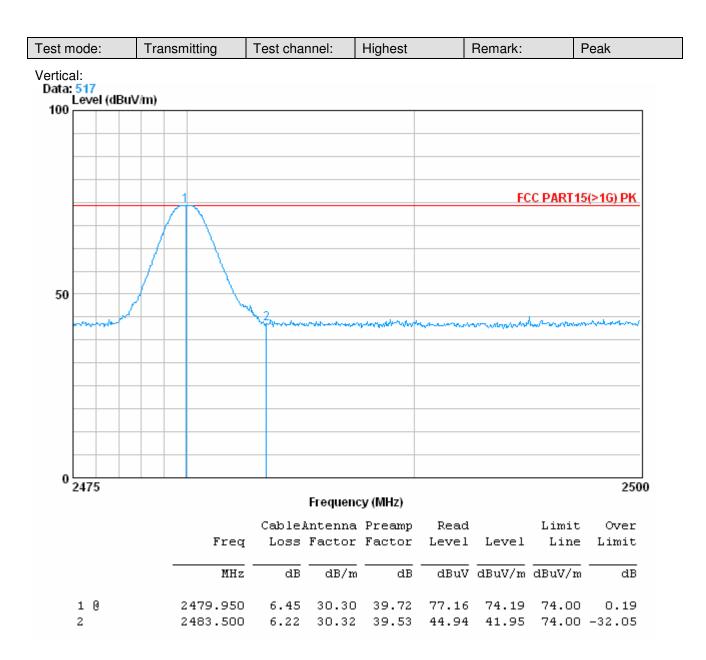
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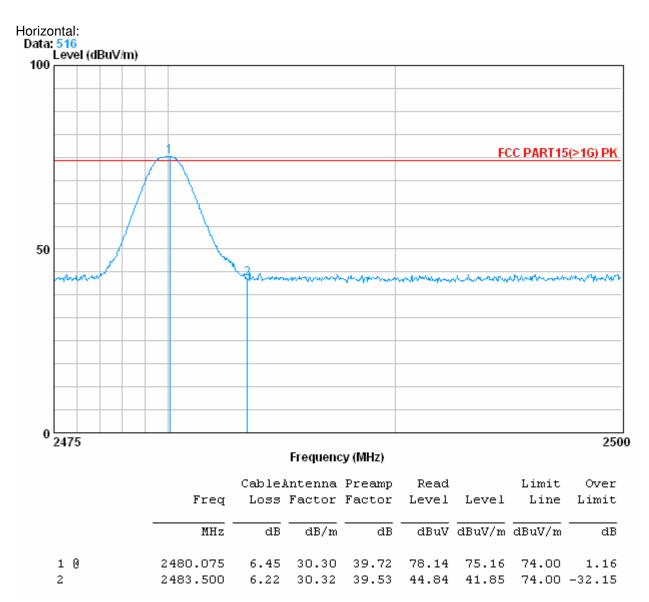


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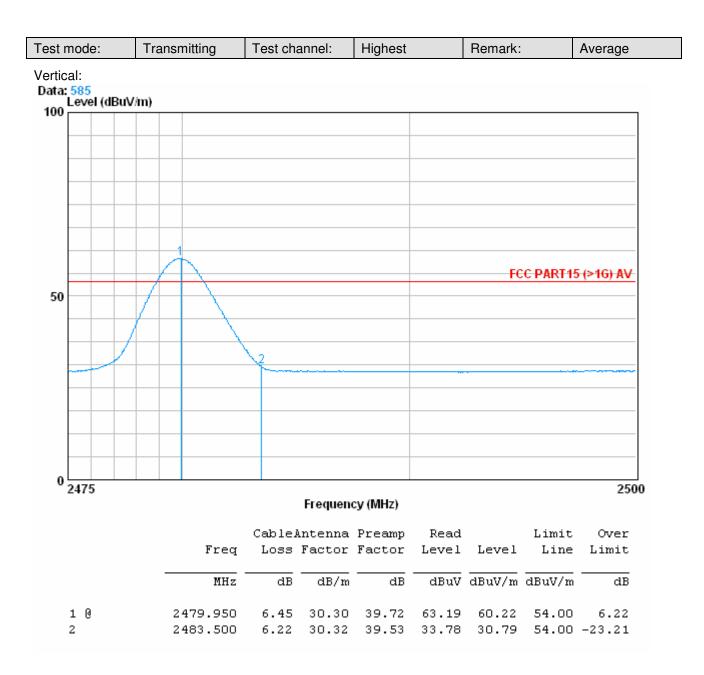


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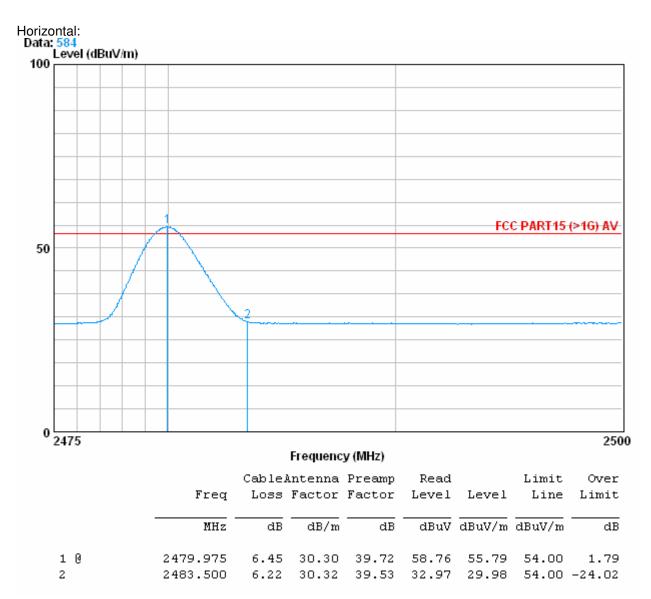
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