Prüfbericht-Nr.: *Test Report No.:*	**17038645 002**	**Auftrags-Nr.:** *Order No.:*	164011268	Seite 1 von 39 *Page 1 of 39*
Kunden-Referenz-Nr.: *Client Reference No.:*	N/A	**Auftragsdatum:** *Order date:*	25.02.2014	
Auftraggeber: *Client:*	JDSU Uniphase Corporation, 1100 Perimeter Park Drive, Suite 101, Morrisville, NC 27560			
Prüfgegenstand: *Test item:*	SmartClass TPS			
Bezeichnung / Typ-Nr.: *Identification / Type No.:*	SCTPS-AB-CU, CSC-TPSVW-CU, SCTPS-AB, CSC-TPSVW			
Auftrags-Inhalt: *Order content:*	FCC approval			
Prüfgrundlage: *Test specification:*	CFR47 FCC Part 15: Subpart C Section 15.247 CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109			

Wareneingangsdatum: *Date of receipt:*	28.02.2014
Prüfmuster-Nr.: *Test sample No.:*	A000039287-001, A000039287-002
Prüfzeitraum: *Testing period:*	14.03.2014 - 22.05.2014
Ort der Prüfung: *Place of testing:*	Accurate Technology Co., Ltd.
Prüflaboratorium: *Testing laboratory:*	TÜV Rheinland (Shenzhen) Co., Ltd.
Prüfergebnis*: *Test result*:*	Pass

geprüft von / *tested by:*

Datum *Date*	Name / Stellung *Name / Position*	Unterschrift *Signature*
19.06.2014	Tom Wang / Assistant Project Manager	

kontrolliert von / *reviewed by:*

Datum *Date*	Name / Stellung *Name / Position*	Unterschrift *Signature*
23.06.2014	Sam Lin / Senior Project Manager	

Sonstiges / *Other:*
This report is for DTS equipment class.

Zustand des Prüfgegenstandes bei Anlieferung: Prüfmuster vollständig und unbeschädigt
Condition of the test item at delivery: *Test item complete and undamaged*

* Legende:	1 = sehr gut	2 = gut	3 = befriedigend	4 = ausreichend	5 = mangelhaft
	P(ass) = entspricht o.g. Prüfgrundlage(n)		F(ail) = entspricht nicht o.g. Prüfgrundlage(n)	N/A = nicht anwendbar	N/T = nicht getestet
Legend:	*1 = very good*	*2 = good*	*3 = satisfactory*	*4 = sufficient*	*5 = poor*
	P(ass) = passed a.m. test specification(s)		*F(ail) = failed a.m. test specification(s)*	*N/A = not applicable*	*N/T = not tested*

Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens.
This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.
VD4

TEST SUMMARY

5.1.1 ANTENNA REQUIREMENT
RESULT: Passed

5.1.2 PEAK OUTPUT POWER
RESULT: Passed

5.1.3 6DB BANDWIDTH AND 99% BANDWIDTH
RESULT: Passed

5.1.4 CONDUCTED SPURIOUS EMISSIONS MEASURED IN 100 KHZ BANDWIDTH
RESULT: Passed

5.1.5 POWER SPECTRAL DENSITY
RESULT: Passed

5.1.6 SPURIOUS EMISSIONS
RESULT: Passed

5.1.7 RADIATED EMISSIONS
RESULT: Passed

5.1.8 CONDUCTED EMISSIONS
RESULT: Passed

6.1.1 MAXIMUM PERMISSIBLE EXPOSURE
RESULT: Passed

Contents

1. GENERAL REMARKS 4
1.1 COMPLEMENTARY MATERIALS 4
2. TEST SITES 4
2.1 TEST FACILITIES 4
2.2 LIST OF TEST AND MEASUREMENT INSTRUMENTS 5
2.3 TRACEABILITY 6
2.4 CALIBRATION 6
2.5 MEASUREMENT UNCERTAINTY 6
2.6 LOCATION OF ORIGINAL DATA 6
2.7 STATUS OF FACILITY USED FOR TESTING 6
3. GENERAL PRODUCT INFORMATION 7
3.1 PRODUCT FUNCTION AND INTENDED USE 7
3.2 RATINGS AND SYSTEM DETAILS 8
3.3 INDEPENDENT OPERATION MODES 11
3.4 NOISE GENERATING AND NOISE SUPPRESSING PARTS 11
3.5 SUBMITTED DOCUMENTS 11
4. TEST SET-UP AND OPERATION MODES 12
4.1 PRINCIPLE OF CONFIGURATION SELECTION 12
4.2 TEST OPERATION AND TEST SOFTWARE 12
4.3 SPECIAL ACCESSORIES AND AUXILIARY EQUIPMENT 13
4.4 COUNTERMEASURES TO ACHIEVE EMC COMPLIANCE 13
4.5 TEST SETUP DIAGRAM 14
5. TEST RESULTS 16
5.1 TRANSMITTER REQUIREMENT & TEST SUITES 16
5.1.1 Antenna Requirement 16
5.1.2 Peak Output Power 17
5.1.3 6dB Bandwidth and 99% Bandwidth 20
5.1.4 Conducted Spurious Emissions measured in 100 kHz Bandwidth 24
5.1.5 Power spectral density 29
5.1.6 Spurious Emissions 32
5.1.7 Radiated emissions 33
5.1.8 Conducted emissions 34
6. SAFETY HUMAN EXPOSURE 35
6.1 RADIO FREQUENCY EXPOSURE COMPLIANCE 35
6.1.1 Maximum Permissible Exposure 35
7. PHOTOGRAPHS OF THE TEST SET-UP 36
8. LIST OF TABLES 39

9. LIST OF PHOTOGRAPHS 39

1. General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Test Results

2. Test Sites

2.1 Test Facilities

Accurate Technology Co., Ltd.
(FCC Registration No.: 752051 & IC Registration Number: 5077A-2)

F1, Bldg A, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen, 518057, P.R. China

The tests at the test site have been conducted under the supervision of a TÜV engineer.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Kind of Equipment	Manufacturer	Type	S/N	Calibrated until
Radio Spectrum Test				
EMI Test Receiver	Rohde & Schwarz	ESPI-3	100396/003	2015-01-11
Spectrum Analyzer	Agilent	E7405A	MY45115511	2015-01-11
Conducted emissions				
EMI Test Receiver	Rohde & Schwarz	ESCS30	100307	2015-01-11
LISN	Schwarzbeck	NLSK8126	8126431	2015-01-10
Radiated emissions				
Spectrum Analyzer	Agilent	E7405A	MY45115511	2015-01-11
EMI Test Receiver	Rohde & Schwarz	ESPI3	101526/003	2015-01-11
Pre-Amplifier	Rohde & Schwarz	CBLU1183540-01	3791	2015-01-11
Loop Antenna	Schwarzbeck	FMZB1516	1516131	2015-01-11
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	2015-01-11
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	2015-01-11
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	2015-01-11

2.3 Traceability

All measurement equipment calibrations are traceable to NIST or where calibration is performed outside the United States, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basics using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table,

Items		Extended Uncertainty
CE	Disturbance Voltage (dBuV)	U=1.94dB, k=2, σ=95%
RE (9kHz-30MHz)	Field strength (dBuV/m)	U=3.08dB, k=2, σ=95%
RE (30-1000MHz)	Field strength (dBuV/m)	U=4.42dB, k=2, σ=95%
RE (above 1000MHz)	Field strength (dBuV/m)	U=4.06dB, k=2, σ=95%

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix1 of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The Accurate Technology Co., Ltd. facility located at F1, Bldg A, Changyuan New Material Port, Keyuan Rd., Science & Industry Park, Nanshan District, Shenzhen, 518057, P.R. China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3. General Product Information

3.1 Product Function and Intended Use

The EUTs are an all-in-one tool that fully tests the access network as well as broadband services. It helps field technicians who roll out broadband access networks and services deliver a pristine cooper access infrastructure that can support triple-play services and meet critical quality of service (QoS) and quality of experience (QoE) requirements. It can test copper, fiber asymmetrical and very high speed digital subscriber lines including bonded VDSL2 pairs internet protocol (IP) data, voice over IP (VoIP), and IP video with straightforward pass/fail results and detailed analysis of physical-and application-layer-related problems.

It contains the Wi-Fi USB dongle, model name EW-7811Un (FCC ID: NDD9578111008) that manufactured by EDIMAX. Wi-Fi USB dongle supports 802.11 b/g/n 20MHz and 40MHz bandwidth. It supports Bluetooth function, the Bluetooth core specification is Bluetooth 4.0 dual mode.

These four models are identical in main board, copper board and enclosure except for DSL modem board. The EUTs belong to Class A equipment. Details of difference refer to table as below.

Difference				
Model	SCTPS-AB-CU	CSC-TPSVW-CU	SCTPS-AB	CSC-TPSVW
Digital board	√	√	√	√
Copper board	√	√	Removed, add metal shield	Removed, add metal shield
Modem board	√	√	Remove POTS feature	Remove POTS feature

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

Technical Specification	Value
Kind of Equipment:	SmartClass TPS
Type Designation:	SCTPS-AB-CU, CSC-TPSVW-CU, SCTPS-AB, CSC-TPSVW
FCC ID:	WUW22060931
IC:	9613A-22060931
Type of Equipment:	Class A digital equipment
Equiupment Class:	DTS and DSS
Wireless Technology:	Bluetooth 4.0 and Wi-Fi
Operating Frequency Range:	2402-2480MHz for Bluetooth 2412-2462Mhz for Wi-Fi
Channel Number:	79 channels for Bluetooth 4.0 40 channels for Bluetooth 4.0 Low Energy 11 channels for Wi-Fi (802.11b/g/n) 7 channels for Wi-Fi (802.11n HT40 model only)
Channel Separation:	1MHz for Bluetooth 4.0 2MHz for Bluetooth 4.0 Low Energy 5MHz for Wi-Fi
Type of Modulation:	GFSK, 8PSK, π/4QDPSK for Bluetooth 4.0 GFSK for Bluetooth 4.0 Low Energy DSSS for Wi-Fi 802.11b OFDM for Wi-Fi 802.11g/n
Operating Voltage:	DC 12V via marketed AC/DC adapter DC 7.2V via Lithium-ion battery
Operating Temperature Range:	0℃ to 40℃
Antenna Type:	Ceramic Chip Antenna for Bluetooth Printed Antenna for Wi-Fi
Smart Antenna Systems:	Not Applicable
Number of Antenna:	1 for Bluetooth 1 for Wi-Fi
Antenna Gain:	Max. 1.7 dBi for Bluetooth Max. 3.0 dBi for Wi-Fi

Table 3: Marketed AC/DC adapter

Description	Manufacturer	Model	S/N	Rating
AC/DC adapter	Advanced Power Solutions	KSAS02512 00250D5	--	Input: AC 100-240V, 50/60Hz, 0.9A; Output: DC 12V, 2.5A

Table 4: List of Radio Frequency Channel, Bluetooth 4.0

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402.00	21	2423.00	42	2444.00	63	2465.00
1	2403.00	22	2424.00	43	2445.00	64	2466.00
2	2404.00	23	2425.00	44	2446.00	65	2467.00
3	2405.00	24	2426.00	45	2447.00	66	2468.00
4	2406.00	25	2427.00	46	2448.00	67	2469.00
5	2407.00	26	2428.00	47	2449.00	68	2470.00
6	2408.00	27	2429.00	48	2450.00	69	2471.00
7	2409.00	28	2430.00	49	2451.00	70	2472.00
8	2410.00	29	2431.00	50	2452.00	71	2473.00
9	2411.00	30	2432.00	51	2453.00	72	2474.00
10	2412.00	31	2433.00	52	2454.00	73	2475.00
11	2413.00	32	2434.00	53	2455.00	74	2476.00
12	2414.00	33	2435.00	54	2456.00	75	2477.00
13	2415.00	34	2436.00	55	2457.00	76	2478.00
14	2416.00	35	2437.00	56	2458.00	77	2479.00
15	2417.00	36	2438.00	57	2459.00	78	2480.00
16	2418.00	37	2439.00	58	2460.00	--	--
17	2419.00	38	2440.00	59	2461.00	--	--
18	2420.00	39	2441.00	60	2462.00	--	--
19	2421.00	40	2442.00	61	2463.00	--	--
20	2422.00	41	2443.00	62	2464.00	--	--

Table 5: List of Radio Frequency Channel, Bluetooth 4.0 Low Energy

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
0	2402.00	11	2424.00	22	2446.00	33	2468.00
1	2404.00	12	2426.00	23	2448.00	34	2470.00
2	2406.00	13	2428.00	24	2450.00	35	2472.00
3	2408.00	14	2430.00	25	2452.00	36	2474.00
4	2410.00	15	2432.00	26	2454.00	37	2476.00
5	2412.00	16	2434.00	27	2456.00	38	2478.00
6	2414.00	17	2436.00	28	2458.00	39	2480.00
7	2416.00	18	2438.00	29	2460.00	--	--
8	2418.00	19	2440.00	30	2462.00	--	--
9	2420.00	20	2442.00	31	2464.00	--	--
10	2422.00	21	2444.00	32	2466.00	--	--

Table 6: List of Radio Frequency Channel, Wi-Fi 802.11 b/g/n 20M bandwidth

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
1	2412.00	5	2432.00	9	2452.00
2	2417.00	6	2437.00	10	2457.00
3	2422.00	7	2442.00	11	2462.00
4	2427.00	8	2447.00	--	--

Table 7: List of Radio Frequency Channel, Wi-Fi 802.11 n 40M bandwidth

RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)	RF Channel	Frequency (MHz)
3	2422.00	6	2437.00	9	2452.00
4	2427.00	7	2442.00	--	--
5	2432.00	8	2447.00	--	--

Table 8: Frequency hopping information

Technical Specification	**Description**
Hopping Range	Hereby we declare that the maximum frequency of this device is: 2402-2480MHz. This is according the Bluetooth Core Specification for devices which will be operated in the USA. This was checked during the Bluetooth Qualification tests (Test Case: TRM/CA/04-E).
Hopping Sequence	Example of a 79 hopping sequence in data mode: 33,04,21,44,23,42,53,46,55,48,40,59,72,29,76,31,08,73, 07,75,09,45,60,39,58,13,47,11,77,52,35,50,65,54,67,56, 69,62,71,64, 7,25,27,66,57,70,74,61,78,63,10,41,05,43, 15,44,64,68,02,70,06,01,51,03,55,05,03,66,53,49,36,47,
Receiver input bandwidth	The input bandwidth of the receiver is 1MHz. In every connection one Bluetooth device is the master and the other one is the slave. The master determines the hopping sequence. The slave follows this sequence. Both devices shift between RX and TX time slot according to the clock of the master. Additionally the type of connection is set up at the beginning of the connection. The master adapts its hopping frequency and its TX/RX timing according to the packet type of the connection. Also the slave of the connection will use these settings. Repeating of a packer has no influence on the hopping sequence. The hopping sequence generated by the master of the connection will be followed in any case. That means a repeated packet will not be send on the same frequency, it is send on the next frequency of the hopping sequence.

3.3 Independent Operation Modes

The basic operation modes are:

A. Transmitting
    1. Wi-Fi function
        a. Low Channel
        b. Mid Channel
        c. High Channel
    2. Bluetooth function
        a. Low Channel
        b. Mid Channel
        c. High Channel

B. Receiving
C. Standby
D. Ethernet TE testing
E. DSL testing
F. IP Data testing
G. VoIP testing
H. IP Video testing
I. Copper testing
J. Battery Charging
K. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to the Circuit Diagram.

3.5 Submitted Documents

- Bill of Material	- Circuit Diagram
- PCB Layout	- Instruction Manual
- Photo Document	- Rating Label

4. Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5.

During testing, test software BlueSuite provided by the applicant was used to control the operating channel as well as output power for Bluetooth operation. Test software RTL11n provided by the applicant was used to control the operating channels as well as output power for Wi-Fi operation.

Due to descriptions in clause 3.1, all tests were applied on model SCTPS-AB-CU, but only radiated emissions and conducted emissions were applied on both models.

Table 9: Power level setting of Wi-Fi in test software

Power Level Setting in Test Software				
Channel	802.11b	802.11g	802.11n HT20	802.11n HT40
Low	39	42	41	41
Middle	39	42	41	41
High	39	43	41	41

Table 10: List of Frequencies under Test, Bluetooth operation

RF Channel of Bluetooth 4.0 Low Energy (LE)		
Channel	Channel number	Frequency (MHz)
Low	0	2402.00
Middle	19	2440.00
High	39	2480.00

Table 11: List of Frequencies under Test, Wi-Fi operation

RF Channel of 802.11 b, 802.11g and 802.11n (HT20)		
Channel	Channel number	Frequency (MHz)
Low	1	2412.00
Middle	6	2437.00
High	11	2462.00
RF Channel of 802.11n (HT40)		
Channel	Channel number	Frequency (MHz)
Low	3	2422.00
Middle	6	2437.00
High	9	2452.00

4.3 Special Accessories and Auxiliary Equipment

Table 12: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Notebook PC	Lenovo	4290-RT8	R9-FW93G	--
Printer	HP	HP Laserjet 1015	CNFG030424	--
Telephone	TCL	HCD868(37) TSD	010YOB20A30811 003108	--
Telephone PAXB System	XINLITONG	108B	--	--
Wireless Router	D-Link	DIR-605L	PK331BC000582	--
VDSL2 CO	Aware	VERITAS 3	ADS-020011001	Input: DC 48V

4.4 Countermeasures to achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Constructional Data Form or the Technical Construction File. No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test

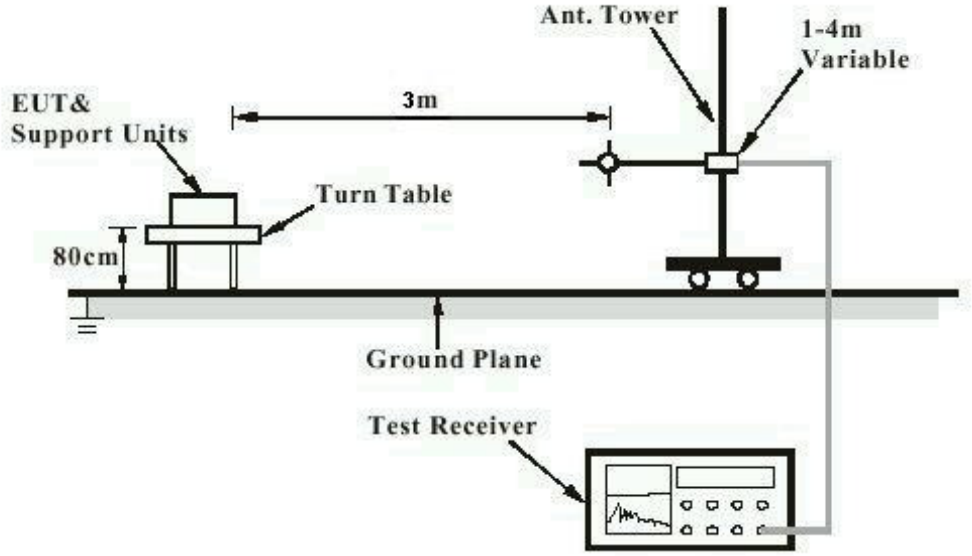


Diagram of Measurement Equipment Configuration for Conduction Measurement

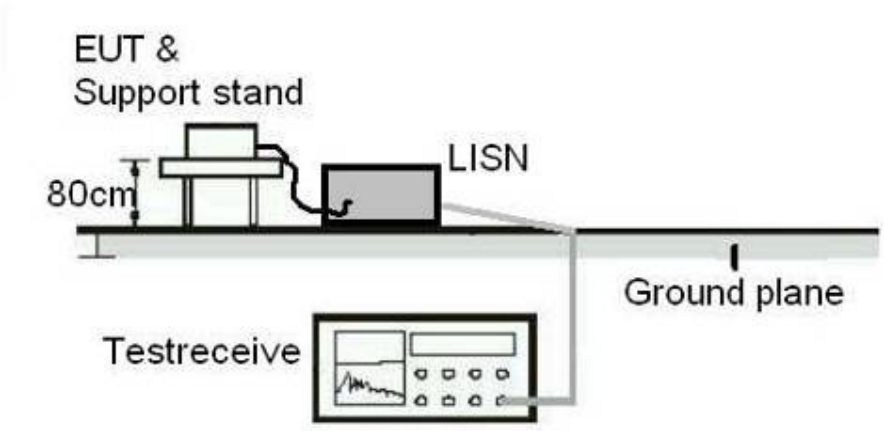
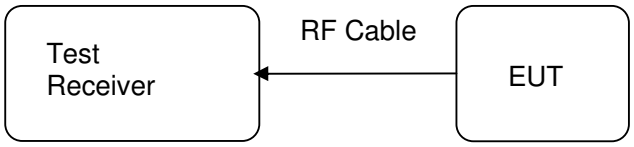


Diagram of Measurement Equipment Configuration for Transmitter Measurement



5. Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT: **Passed**

Test date	:	2014-03-14 to 2014-05-22
Test standard	:	FCC Part 15.247(b)(4) and Part 15.203
Limit	:	the use of antennas with directional gains that do not exceed 6 dBi

According to the manufacturer declared, the EUT has an internal antenna, the directional gain of antenna is 1.7dBi for Bluetooth and 3.0dBi for WiFi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to compliance the provision.

Refer to EUT photo for details.

5.1.2 Peak Output Power

RESULT: **Passed**

Test date	:	2014-03-14 to 2014-05-22
Test standard	:	FCC Part 15.247(b)(3) RSS-210 A8.4(4)
Basic standard	:	ANSI C63.4: 2009 FCC KDB 558074 v03r01
Limit	:	1Watt
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A.1 & A.2
Ambient temperature	:	22℃
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

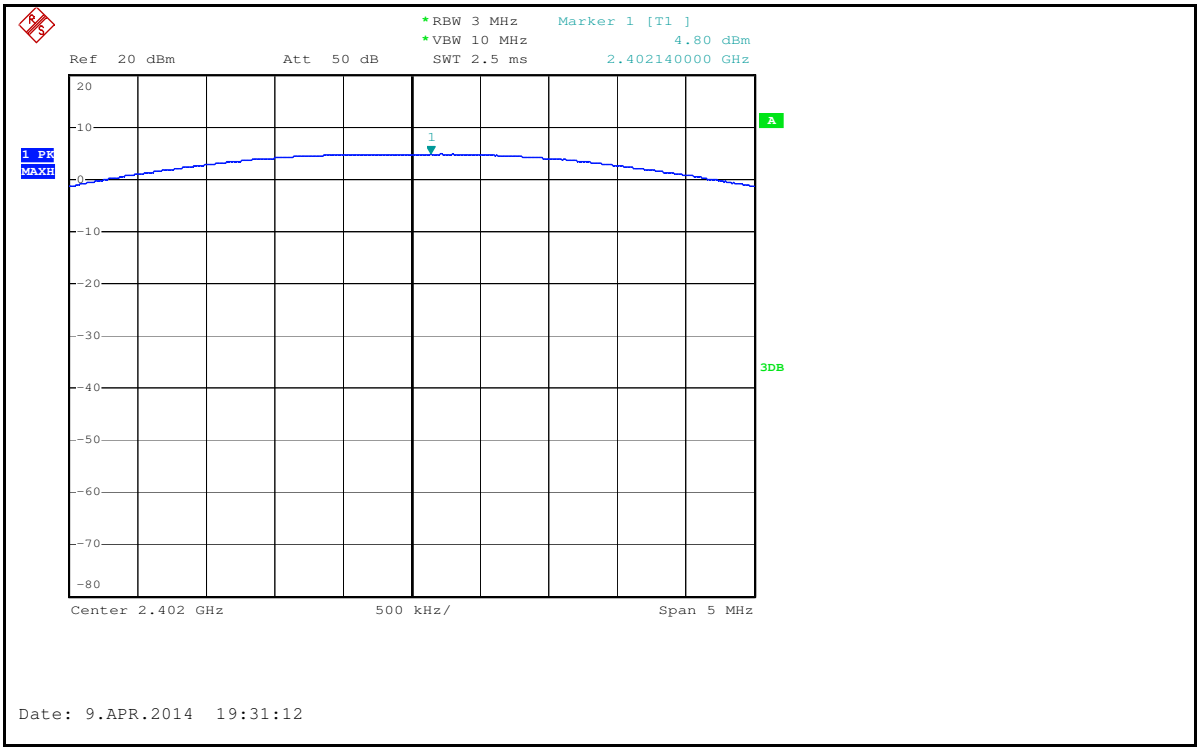
Table 13: Test result of Peak Output Power, Bluetooth Low Energy operation

Channel	**Channel Frequency (MHz)**	**Bluetooth 4.0 Low Energy**		
		Peak Output Power		**Limit**
		(dBm)	(W)	(W)
Low Channel	2402	4.80	0.00302	1
Middle Channel	2440	6.36	0.00433	1
High Channel	2480	7.46	0.00557	1

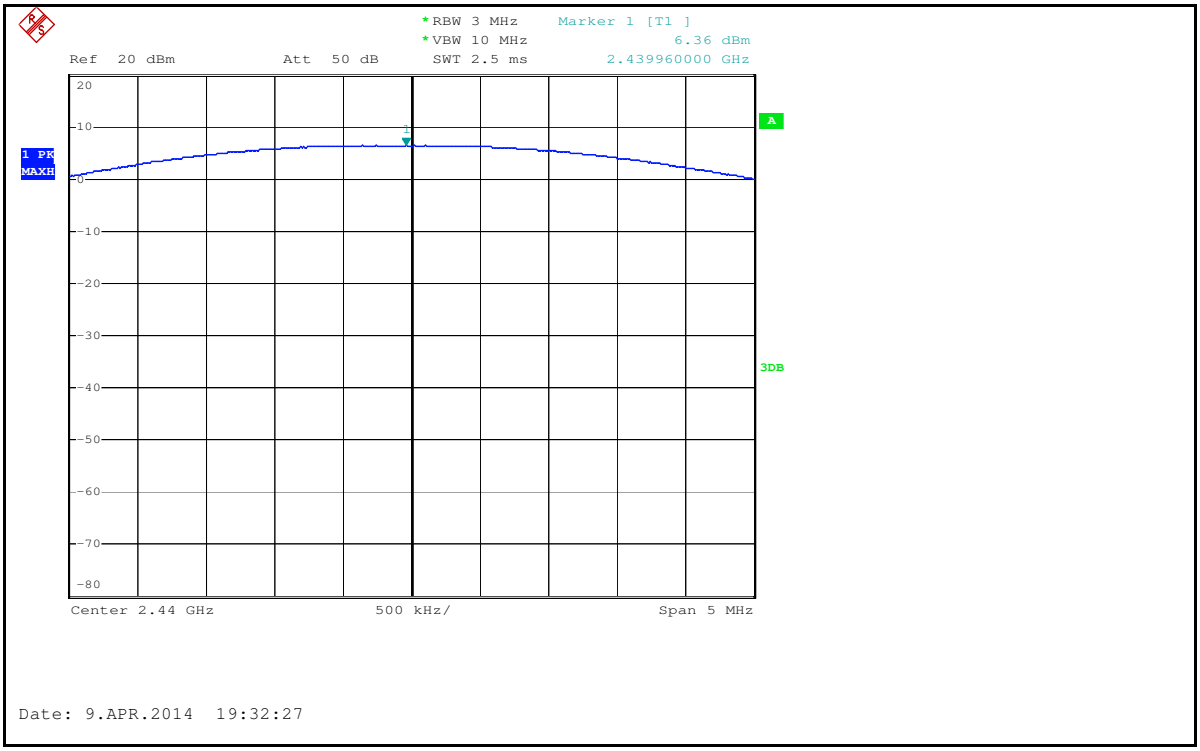
Refer to attached Appendix A to Appendix D for details of test results of Wi-Fi operation.

Test Graph of Peak Output Power, Bluetooth 4.0 Low Energy mode

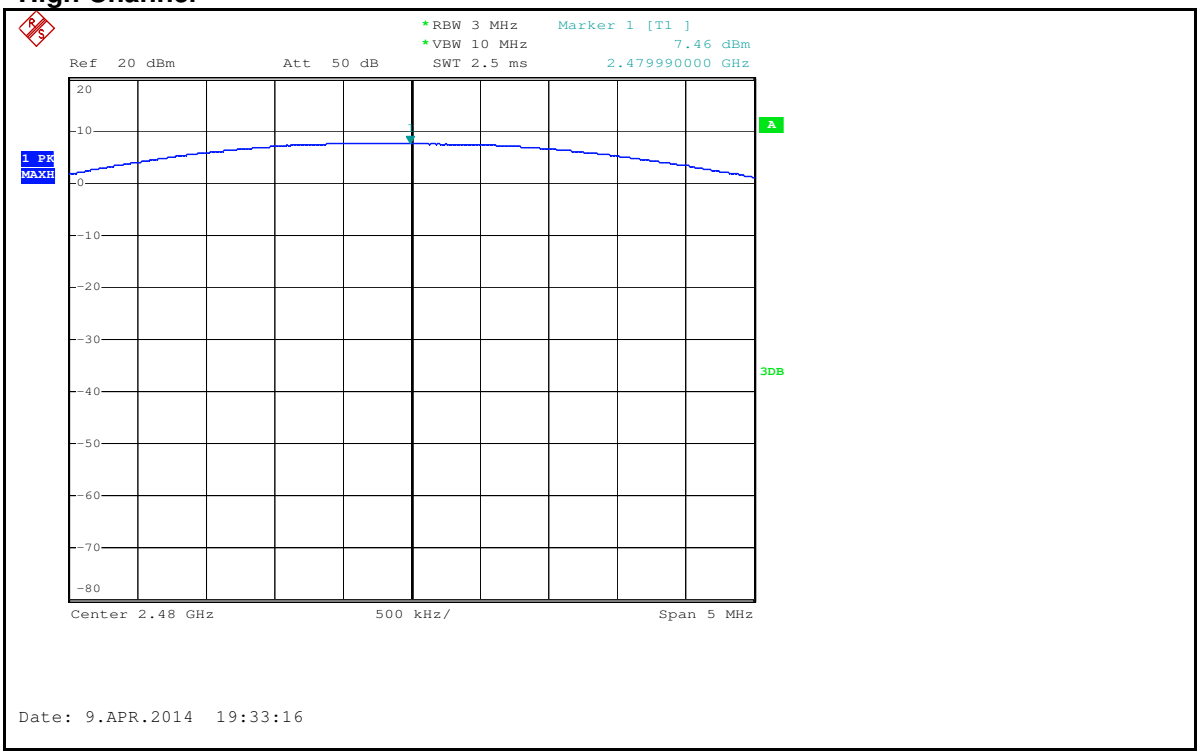
Low Channel



Middle Channel



High Channel



5.1.3 6dB Bandwidth and 99% Bandwidth

RESULT: **Passed**

Date of testing	:	2014-03-14 to 2014-05-22
Test standard	:	FCC Part 15.247(a)(2) RSS-210 A8.2(a)
Basic standard	:	ANSI C63.4: 2009 FCC KDB 558074 v03r01
Kind of test site	:	Shielded room

Test setup

Test Channel	:	Low/ Middle/ High
Operation Mode	:	A..1 & A.2
Ambient temperature	:	22℃
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

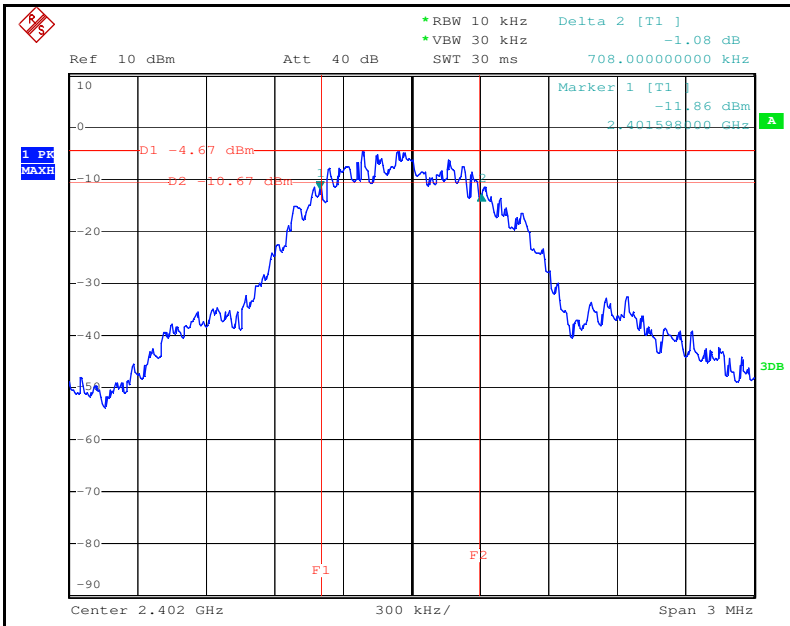
Table 14: Test result of 6dB Bandwidth and 99% Bandwidth, Bluetooth Low Energy operation

Bluetooth 4.0 Low Energy				
Channel	**Channel Frequency (MHz)**	**6dB Bandwidth (kHz)**	**99% Bandwidth (kHz)**	**Result**
Low Channel	2402	708	1068	Pass
Mid Channel	2440	708	1074	Pass
High Channel	2480	708	1080	Pass

Refer to attached Appendix A to Appendix D for details of test results of Wi-Fi operation.

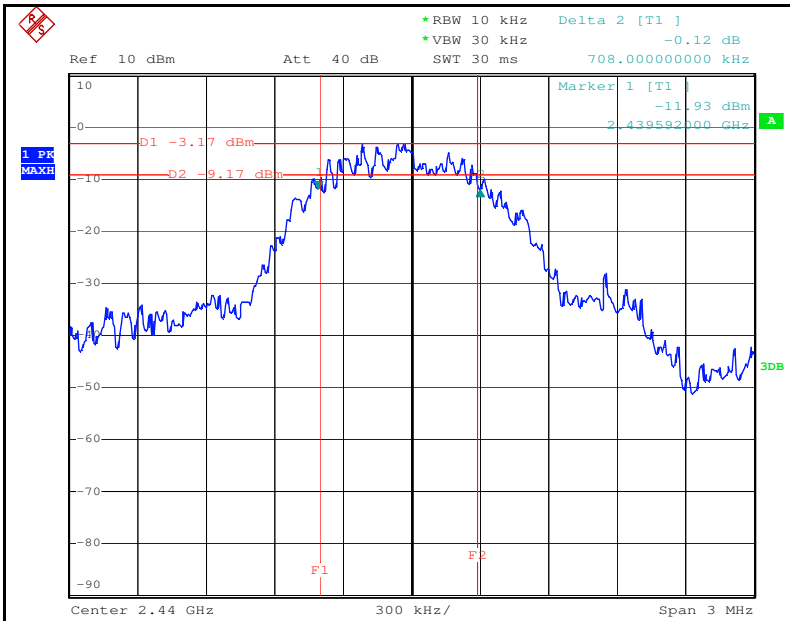
Test Graph of 6dB Bandwidth, Bluetooth 4.0 Low Energy mode

Low Channel



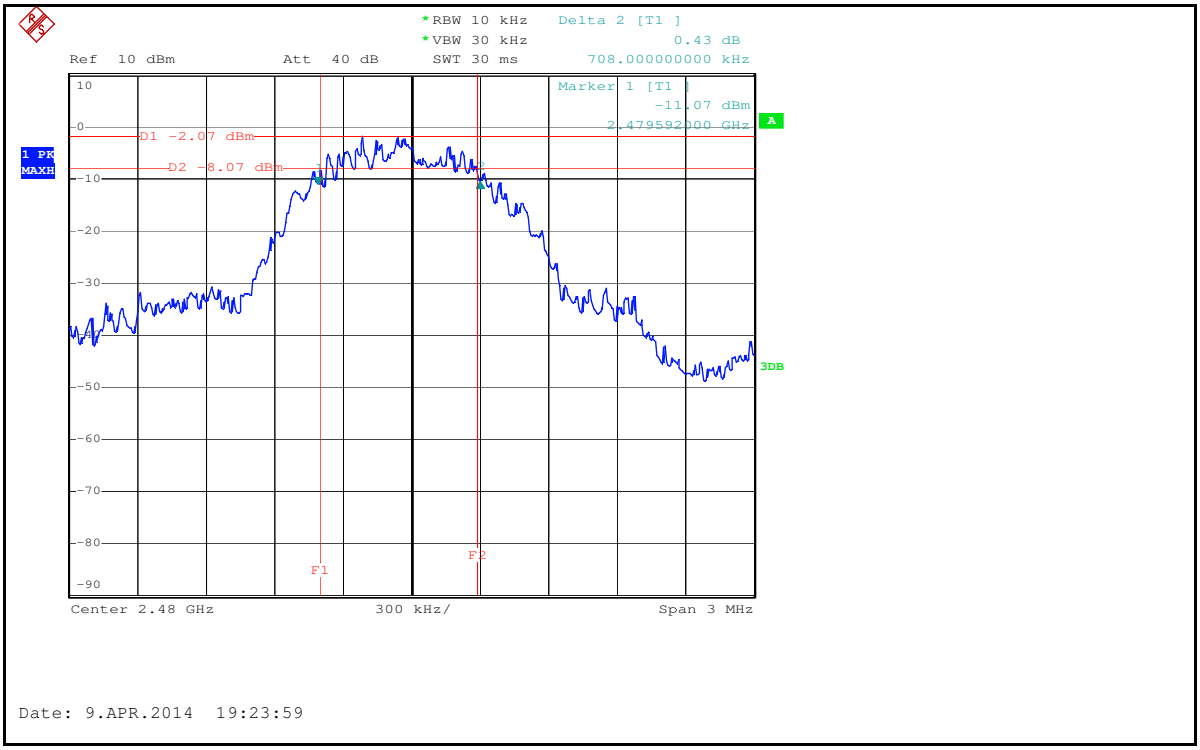
Date: 9.APR.2014 19:19:36

Middle Channel



Date: 9.APR.2014 19:22:31

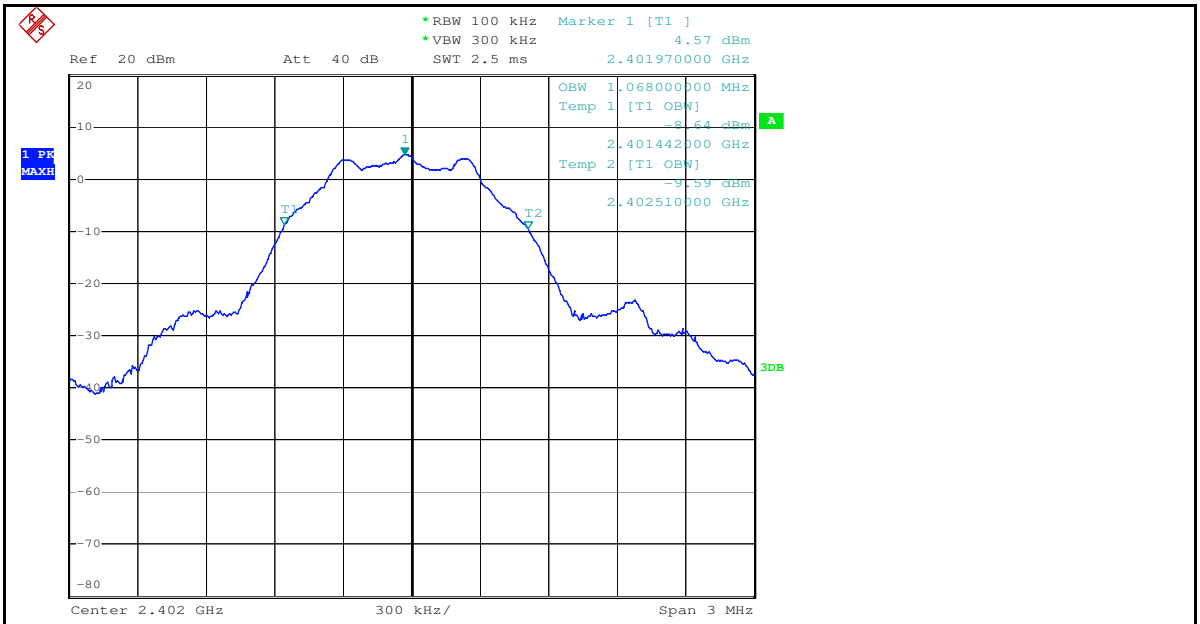
High Channel



Date: 9.APR.2014 19:23:59

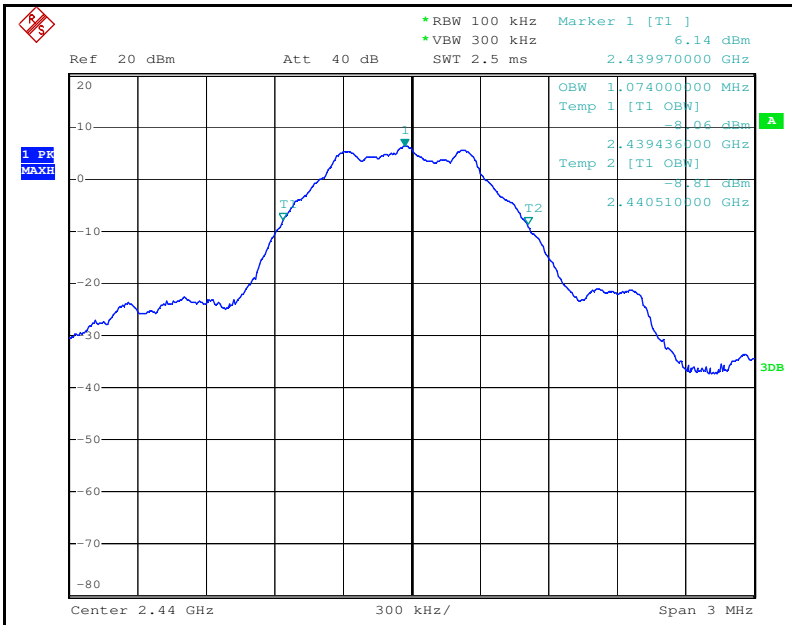
Test Graph of 99% Bandwidth, Bluetooth 4.0 Low Energy mode

Low Channel



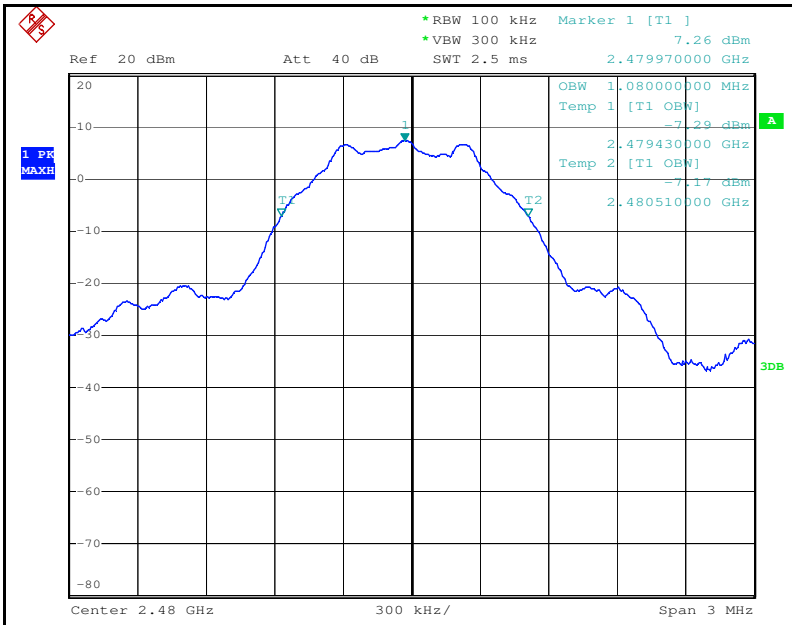
Date: 9.APR.2014 19:28:18

Middle Channel



Date: 9.APR.2014 19:27:08

High Channel



Date: 9.APR.2014 19:25:57

5.1.4 Conducted Spurious Emissions measured in 100 kHz Bandwidth

RESULT: **Passed**

Date of testing	:	2012-03-23 to 2012-05-04
Test standard	:	FCC part 15.247(d) RSS-210 A8.5
Basic standard	:	ANSI C63.4: 2009 FCC KDB 558074 v03r01
Limit	:	20dB (below that in the 100kHz bandwidth within the band that contains the highest level of the desired power); In addition, radiated emissions which fall in the restricted bands, must also comply with the radiated emission limits specified in 15.209(a)
Kind of test site	:	Shield room

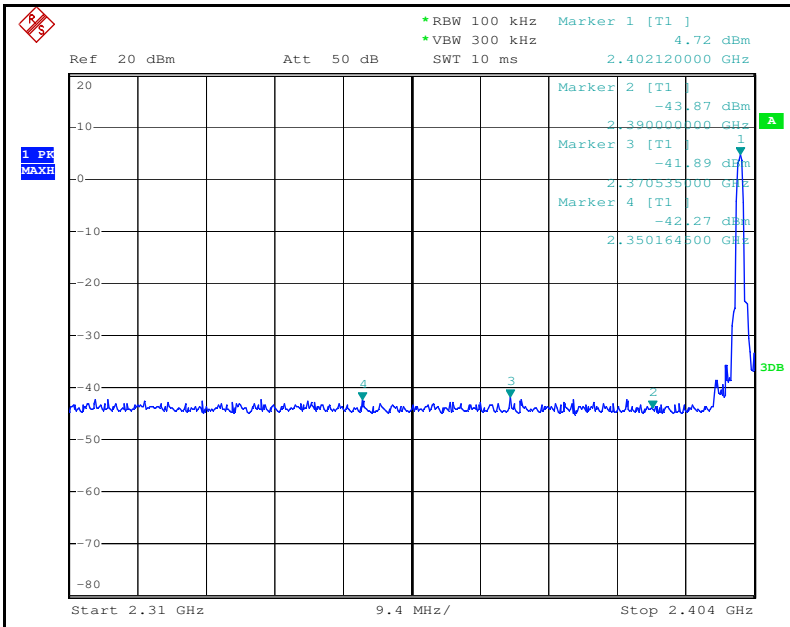
Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A..1 & A.2
Ambient temperature	:	22℃
Relative humidity	:	51%
Atmospheric pressure	:	101.0 kPa

Test results of 100kHz Bandwidth of Frequency Band Edge by Conducted method refer to following test graph, and compliance is achived as well.

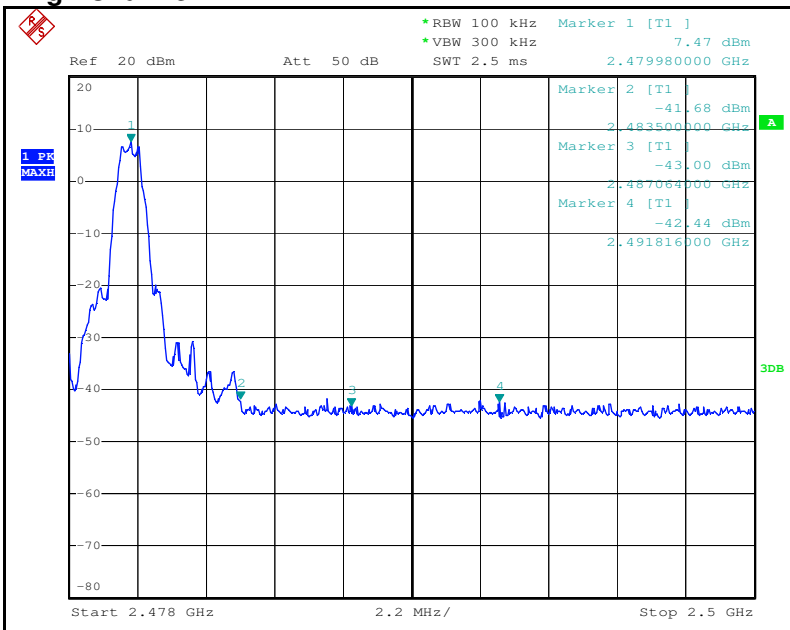
Test Graph of 100 kHz Bandwidth of Frequency Band Edge, Bluetooth 4.0 Low Energy mode

Low Channel



Date: 9.APR.2014 19:40:29

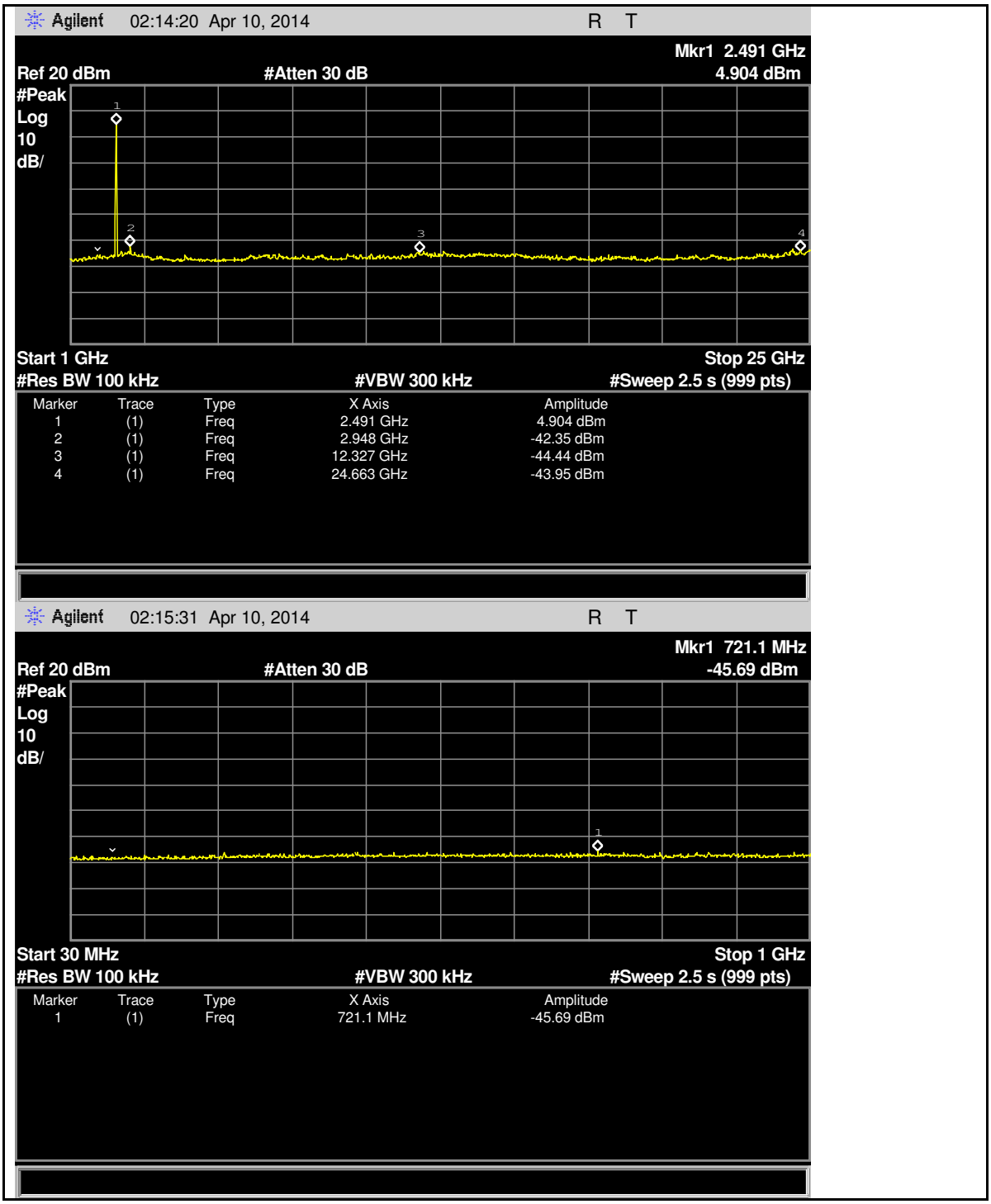
High Channel



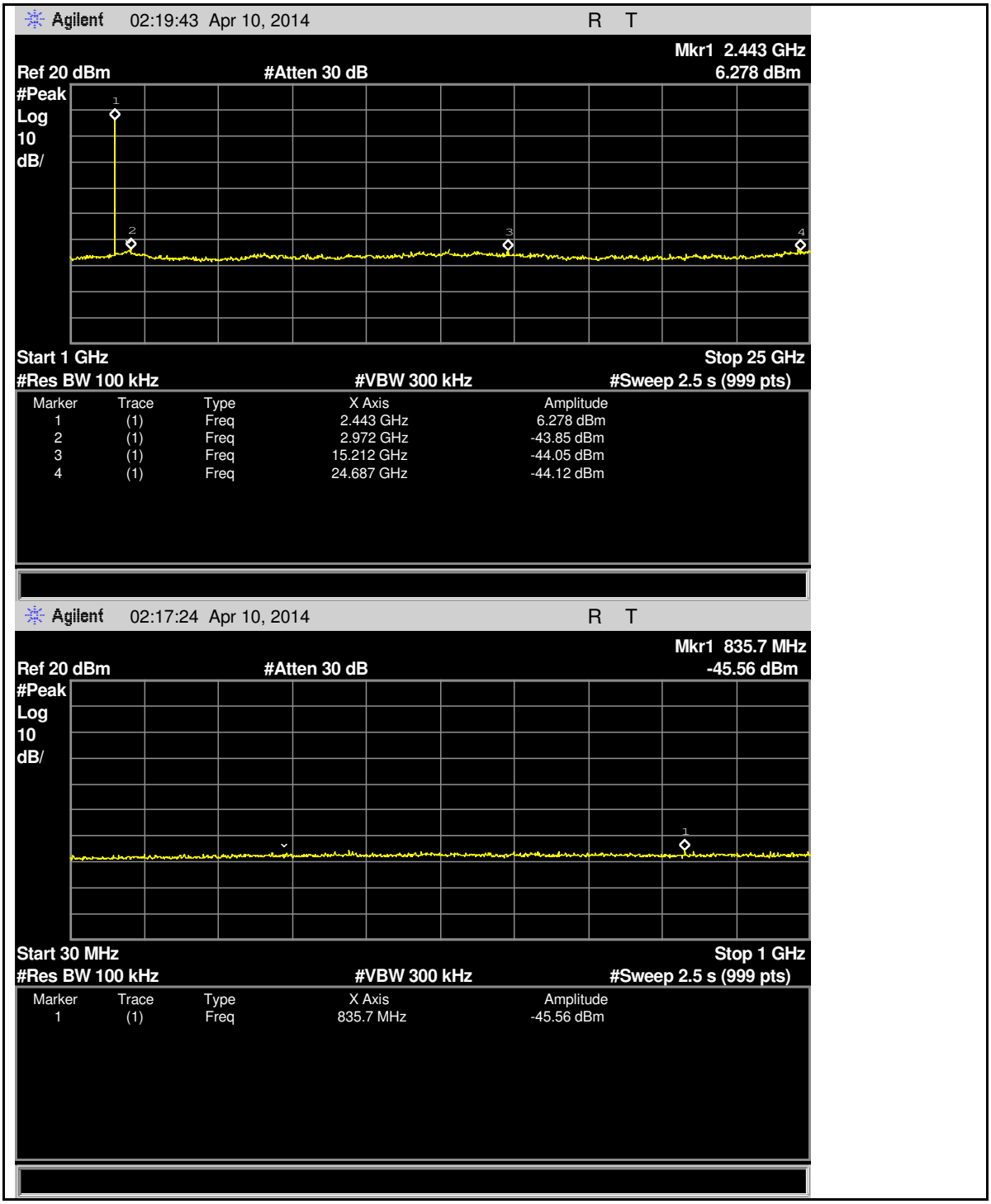
Date: 9.APR.2014 19:42:26

Test Graph of Conducted spurious emissions measured in 100 kHz Bandwidth, Bluetooth 4.0 Low Energy mode

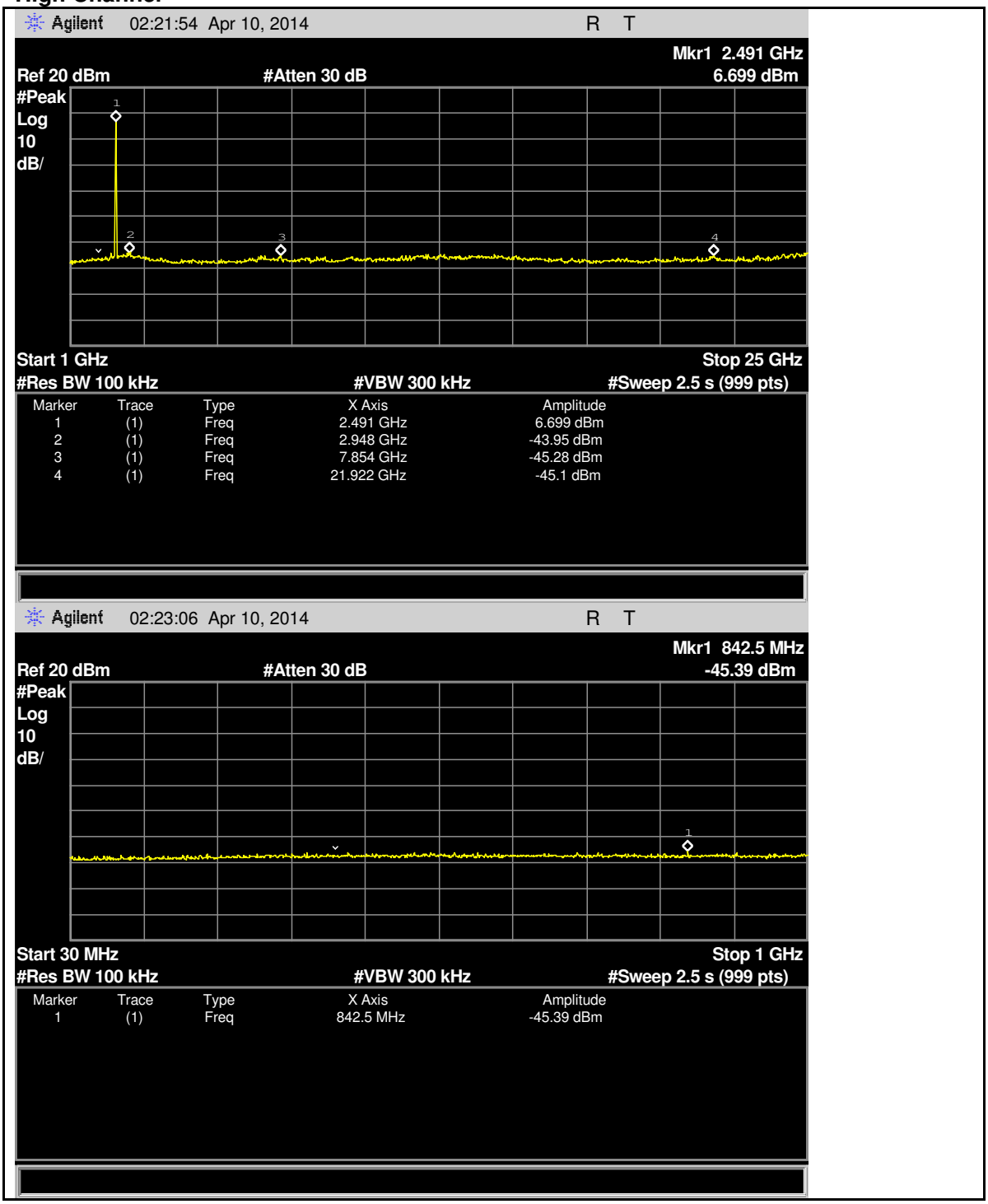
Low Channel



Middle Channel



High Channel



5.1.5 Power spectral density

RESULT: **Passed**

Date of testing	:	2014-03-14 to 2014-05-22
Test standard	:	FCC part 15.247(e) RSS-210 A8.2
Basic standard	:	ANSI C63.4: 2009 FCC KDB 558074 v03r01
Limit	:	8dBm/3kHz
Kind of test site	:	Shield room

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A..1 & A.2
Ambient temperature	:	23℃
Relative humidity	:	48%
Atmospheric pressure	:	101kPa

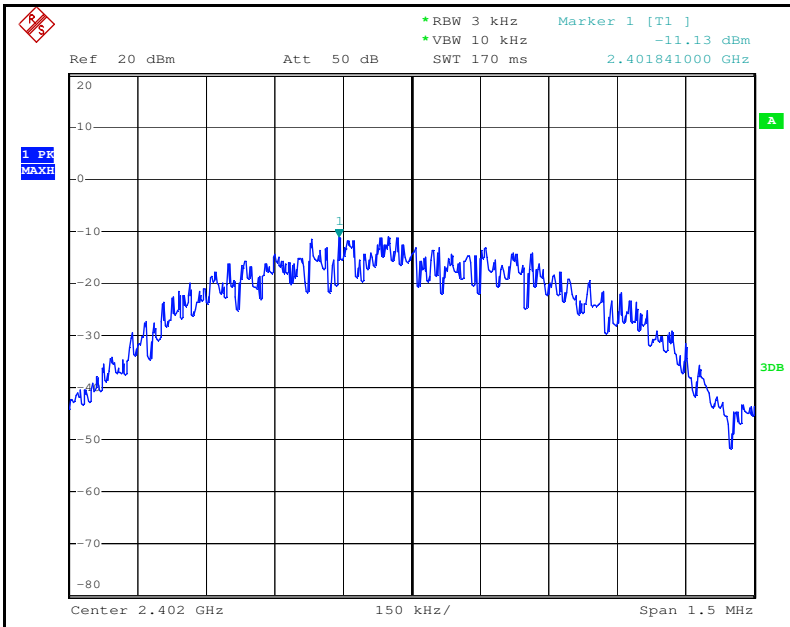
Table 15: Test result of power spectral density, Bluetooth Low Energy operation

Operation Mode	Channel (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Conclusion
Bluetooth 4.0 Low Energy	2402	-11.13	8	Pass
	2440	-9.41	8	Pass
	2480	-8.31	8	Pass

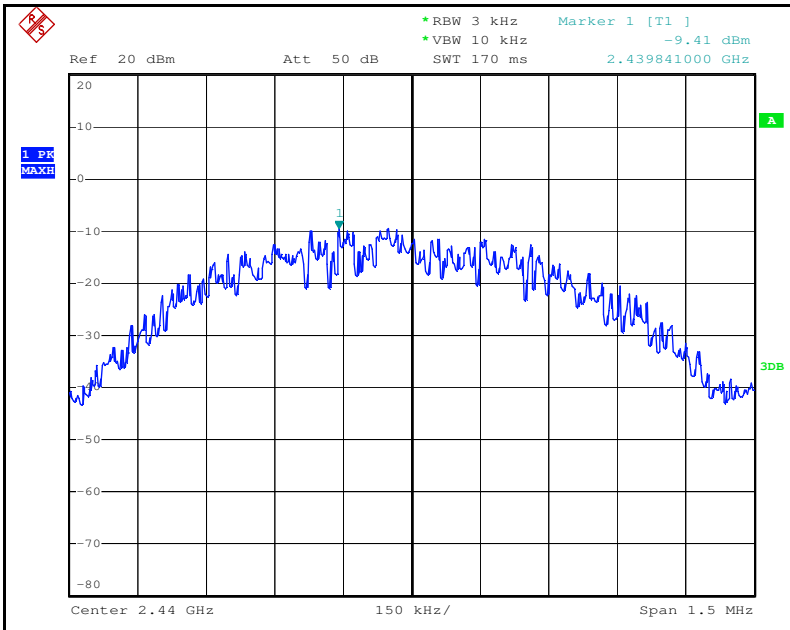
Refer to attached Appendix A to Appendix D for details of test results of Wi-Fi operation.

Test Graph of Power Spectral Density, Bluetooth 4.0 Low Energy mode

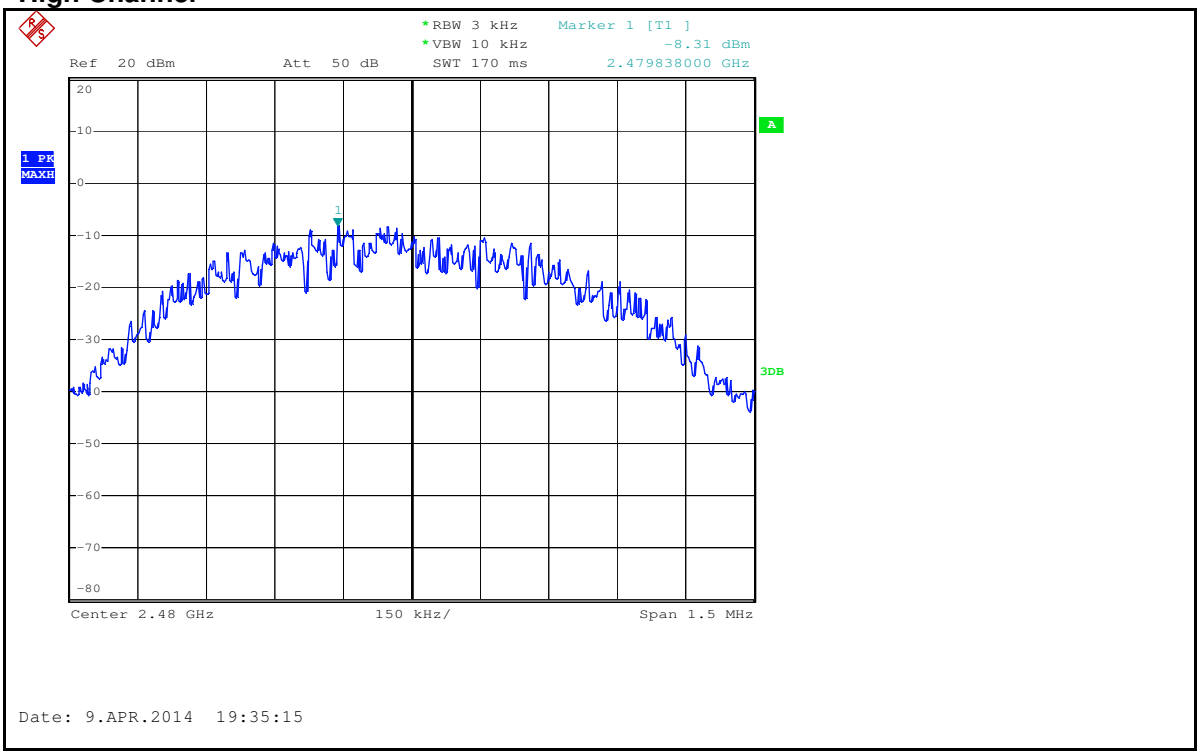
Low Channel



Middle Channel



High Channel



5.1.6 Spurious Emissions

RESULT: **Passed**

Date of testing	:	2014-03-14 to 2014-05-22
Test standard	:	FCC part 15.247(d)
Basic standard	:	ANSI C63.4: 2009
Limits	:	Refer to 15.209(a) RSS-210 Clause 2.5
Kind of test site	:	3m Semi-Anechoic Chamber

Test setup

Test Channel	:	Low/ Middle/ High
Operation mode	:	A..1 & A.2
Ambient temperature	:	23℃
Relative humidity	:	48%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix E for details.

5.1.7 Radiated emissions

RESULT: **Passed**

Date of testing	:	2014-03-14 to 2014-05-22
Test standard	:	FCC Part 15.109 RSS-Gen 7.1.4
Basic standard	:	ANSI C63.4: 2009
Frequency range	:	30 – 6000MHz
Limits	:	FCC Part 15.109(a) ICES-003
Kind of test site	:	3m Semi-Anechoic Chamber

Test Setup

Input Voltage	:	DC 12V (via AC/DC adapter)
Operation Mode	:	A+B, D, E, F, G, H, I, J
Ambient temperature	:	23℃
Relative humidity	:	48%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix E for details.

5.1.8 Conducted emissions

RESULT: **Passed**

Date of testing	:	2014-03-14 to 2014-05-22
Test standard	:	FCC Part 15.207 FCC Part 15.107 RSS-210 Clause 2.6
Basic standard	:	ANSI C63.4: 2009
Frequency range	:	0.15MHz – 30MHz
Limits	:	FCC Part 15.207(a) FCC Part 15.107(a) Table 4 of RSS Gen
Kind of test site	:	Shield Room

Test Setup

Input Voltage	:	DC 12V (via AC/DC adapter)
Operation Mode	:	A+B, D, E, F, G, H, I, J
Ambient temperature	:	24℃
Relative humidity	:	50%
Atmospheric pressure	:	101.0 kPa

Refer to attached Appendix E for details.

6. Safety Human exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Maximum Permissible Exposure

RESULT: **Passed**

Test standard : RSS-102 Issue 4
FCC KDB Publication 447498
FCC 1.1310

MPE Calculation

According to the formula $Pd = \frac{Pout * G}{4R^2\pi}$

Where

Pd = power density in mW/cm^2
Pout = output power to antenna in mW
G = Antenna gain in numeric
π = 3.14159
R = Distance between observation point and the center of radiator in cm

The antenna of this product, under normal use condition, is at least 20cm away form the body of the user. Warning statement to the user for keeping the safety distance from the antenna should be included in the user manual.

The highest measured power is 21.04dBm at 2462 MHz for Wi-Fi operation and 7.46dBm at 2480MHz for Bluetooth Low Energy operation, hence the Maximum Permissible Exposure (MPE) value:

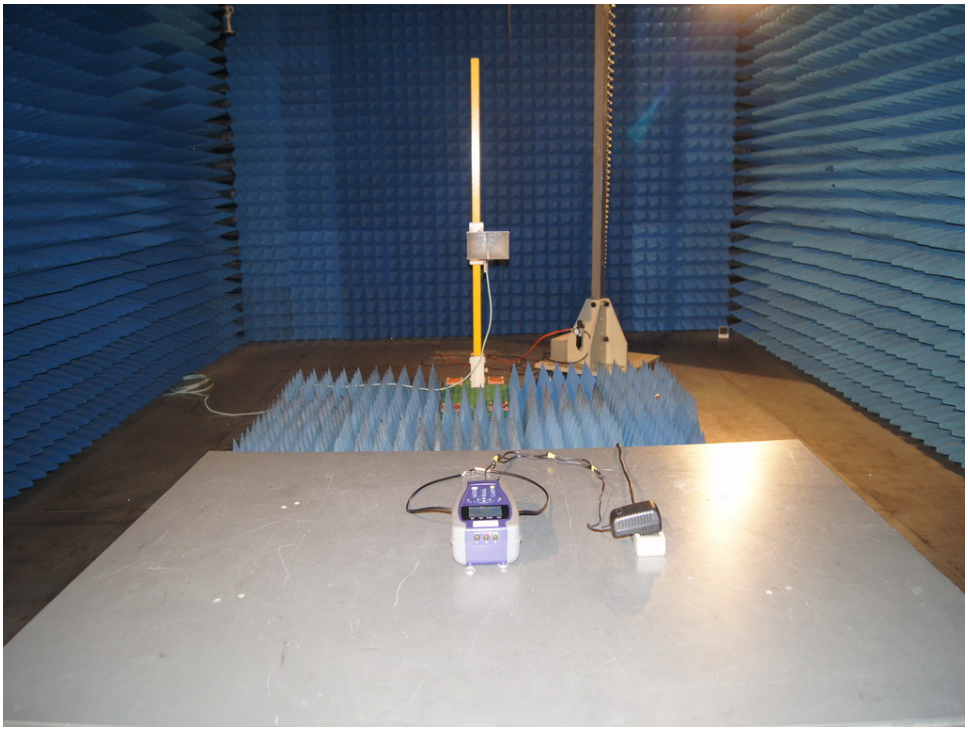
Wi-Fi operation: $Pd = \frac{Pout * G}{4R^2\pi} = \frac{127.057 * 1.995}{4 * 20^2 * 3.14159} = 0.0504 mW / cm^2$ < 1mW/cm^2

Bluetooth Low Energy operation: $Pd = \frac{Pout * G}{4R^2\pi} = \frac{5.572 * 1.479}{4 * 20^2 * 3.14159} = 0.000164 mW / cm^2$ < 1mW/cm^2

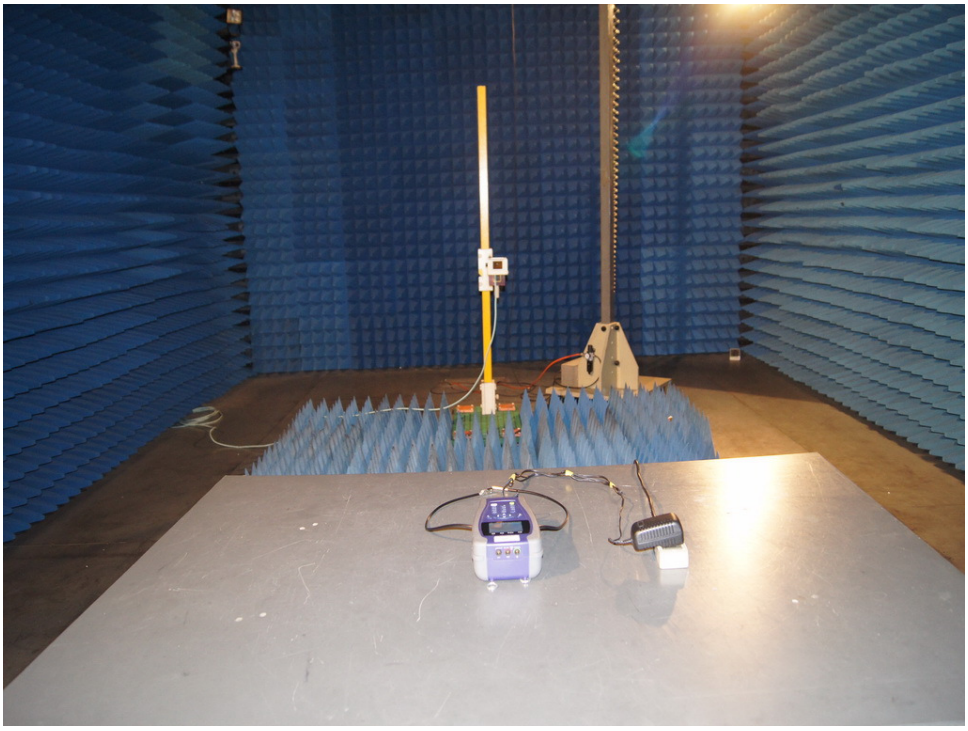
The summed maximum permissible exposure (MPE) level is 0.05204mW/cm^2. It is less than MPE limit 1mW/cm^2, therefore the device is exclusion from SAR test, and compliance with MPE limit.

7. Photographs of the Test Set-Up

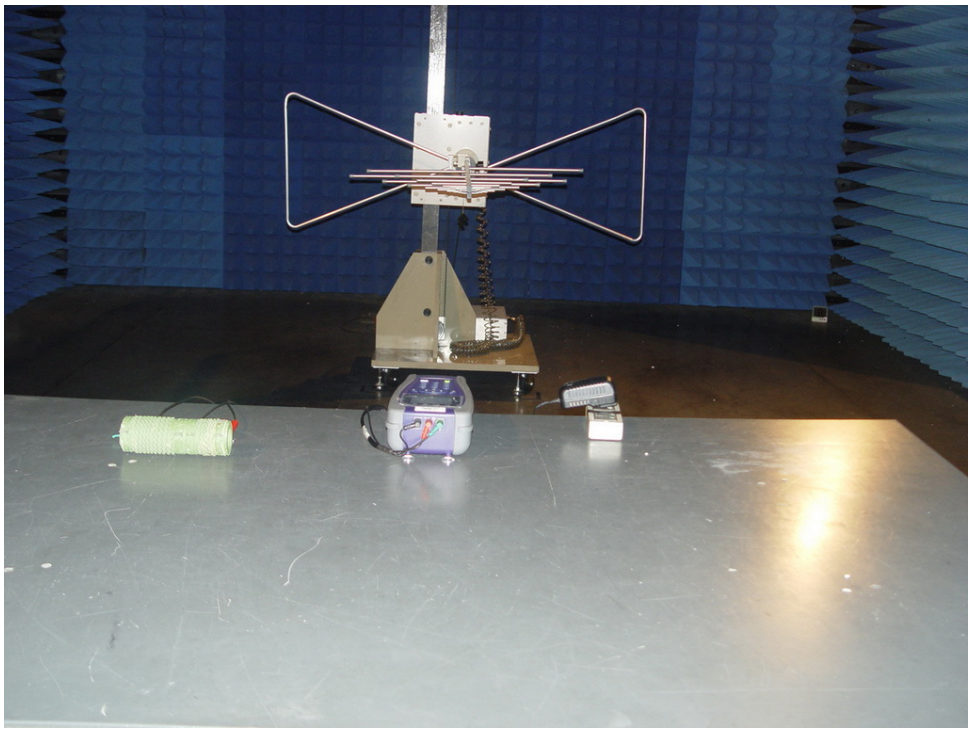
Photograph 1: Set-up for Spurious Emissions (1GHz-18GHz)



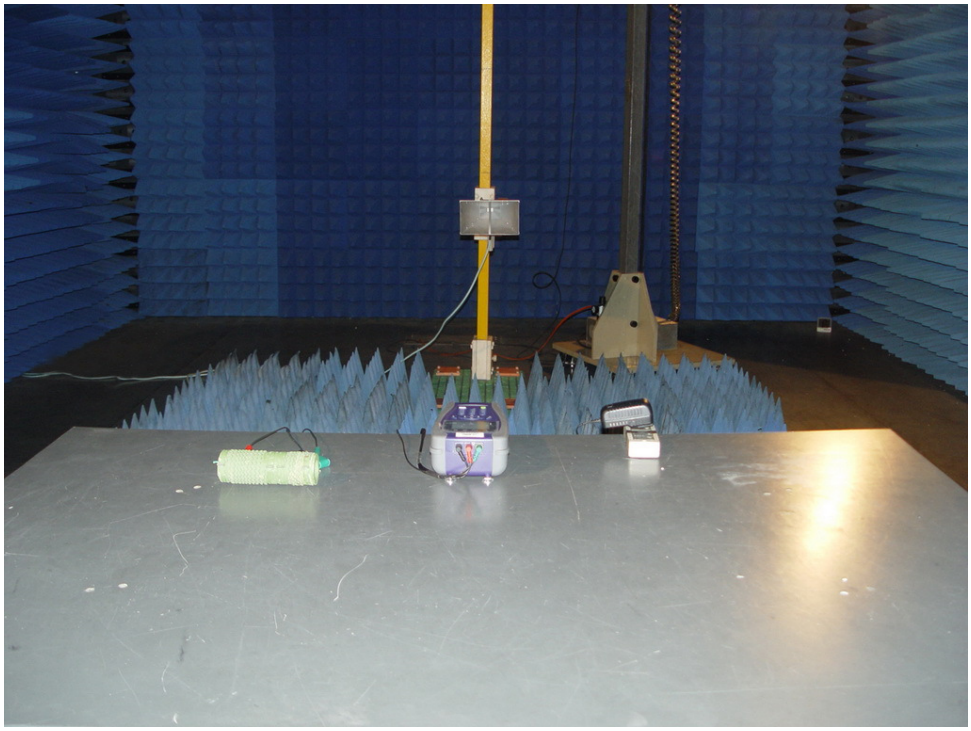
Photograph 2: Set-up for Spurious Emissions (18GHz-26GHz)



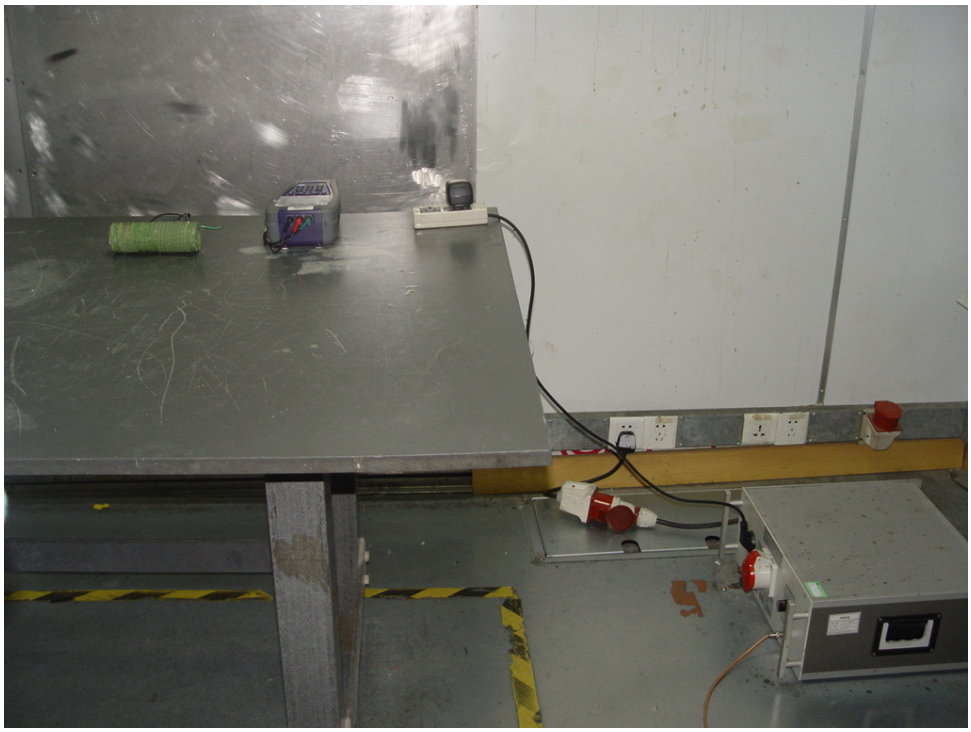
Photograph 3: Set-up for Radiated emissions, below 1GHz



Photograph 4: Set-up for Radiated emissions, above 1GHz



Photograph 5: Set-up for Conducted emissions



8. List of Tables

Table 1: List of Test and Measurement Equipment 5
Table 2: Technical Specification of EUT 8
Table 3: Marketed AC/DC adapter 8
Table 4: List of Radio Frequency Channel, Bluetooth 4.0 9
Table 5: List of Radio Frequency Channel, Bluetooth 4.0 Low Energy 9
Table 6: List of Radio Frequency Channel, Wi-Fi 802.11 b/g/n 20M bandwidth 10
Table 7: List of Radio Frequency Channel, Wi-Fi 802.11 n 40M bandwidth 10
Table 8: Frequency hopping information 10
Table 9: Power level setting of Wi-Fi in test software 12
Table 10: List of Frequencies under Test, Bluetooth operation 12
Table 11: List of Frequencies under Test, Wi-Fi operation 13
Table 12: List of Accessories and Auxiliary Equipment 13
Table 13: Test result of Peak Output Power, Bluetooth Low Energy operation 17
Table 14: Test result of 6dB Bandwidth and 99% Bandwidth, Bluetooth Low Energy operation 20
Table 15: Test result of power spectral density, Bluetooth Low Energy operation 29

9. List of Photographs

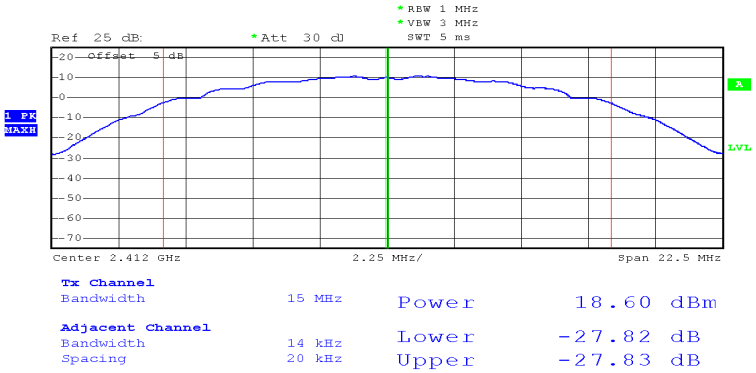
Photograph 1: Set-up for Spurious Emissions (1GHz-18GHz) 36
Photograph 2: Set-up for Spurious Emissions (18GHz-26GHz) 36
Photograph 3: Set-up for Radiated emissions, below 1GHz 37
Photograph 4: Set-up for Radiated emissions, above 1GHz 37
Photograph 5: Set-up for Conducted emissions 38

Test Results of 802.11b mode

Appendix A.1: Test Results of Peak Output Power

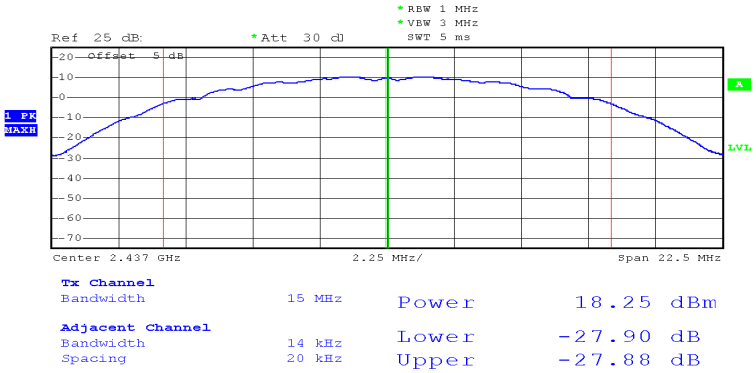
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Conclusion
Low Channel	2412	18.60	30	Pass
Middle Channel	2437	18.25	30	Pass
High Channel	2462	18.15	30	Pass

Low Channel



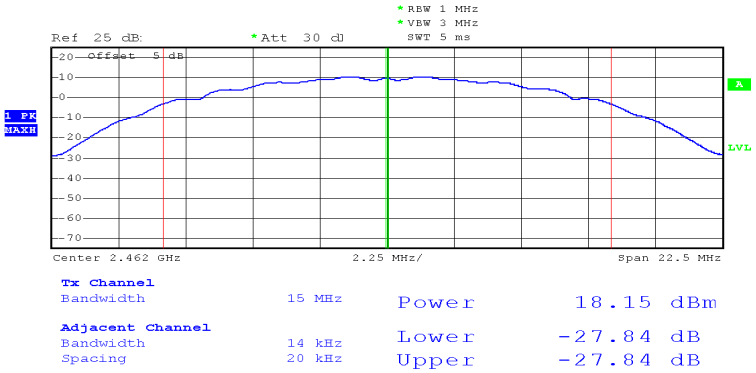
Date: 12.APR.2014 08:32:27

Middle Channel



Date: 12.APR.2014 08:37:59

High Channel



Tx Channel
Bandwidth 15 MHz
Power 18.15 dBm

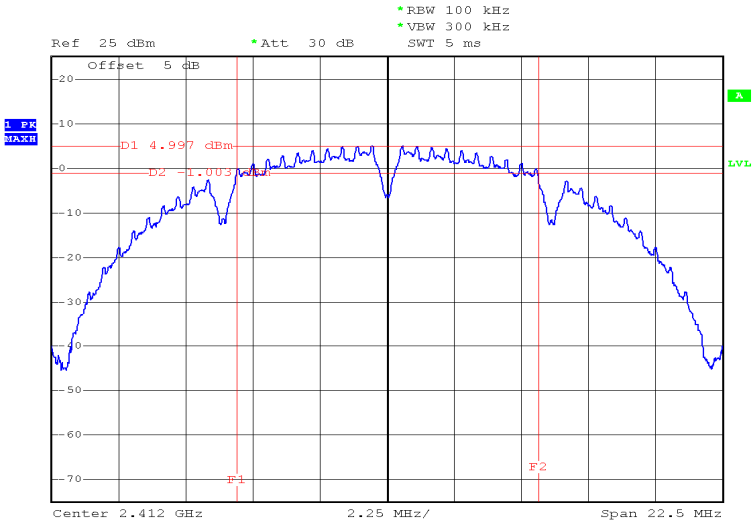
Adjacent Channel
Bandwidth 14 kHz
Spacing 20 kHz
Lower -27.84 dB
Upper -27.84 dB

Date: 12.APR.2014 08:47:38

Appendix A.2: Test Results of 6dB Bandwidth and 99% Bandwidth

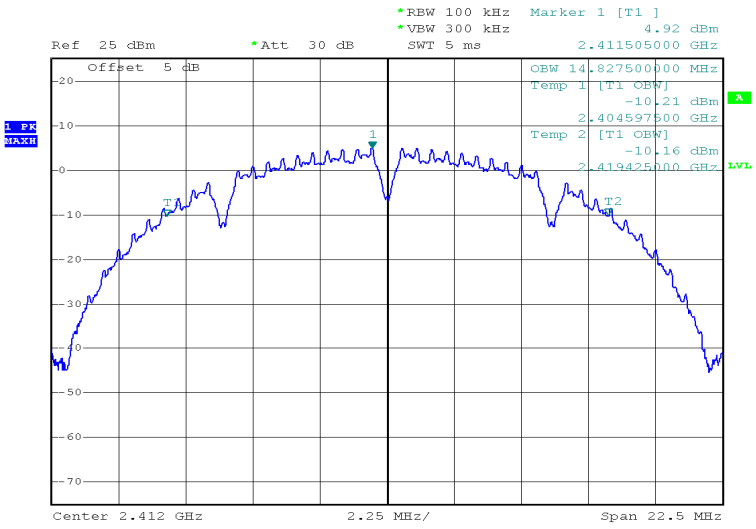
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Conclusion
Low Channel	2412	10.08	14.83	Pass
Middle Channel	2437	10.10	14.85	Pass
High Channel	2462	10.10	14.83	Pass

Low Channel 6dB Bandwidth



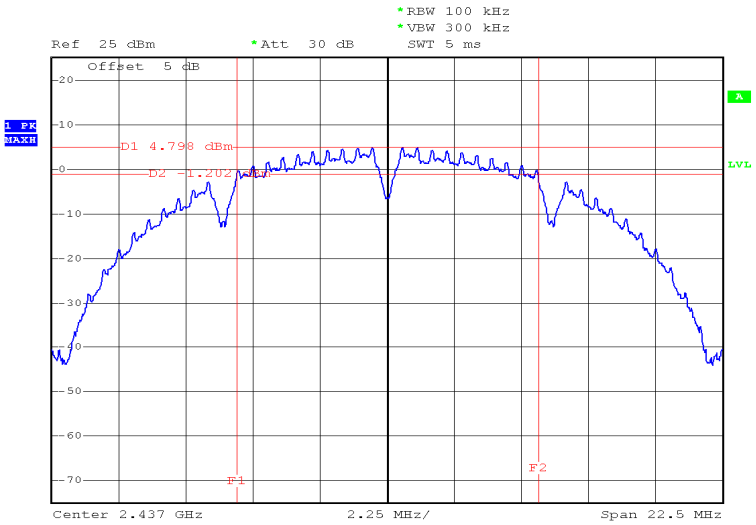
Date: 12.APR.2014 08:32:50

Low Channel 99% Bandwidth



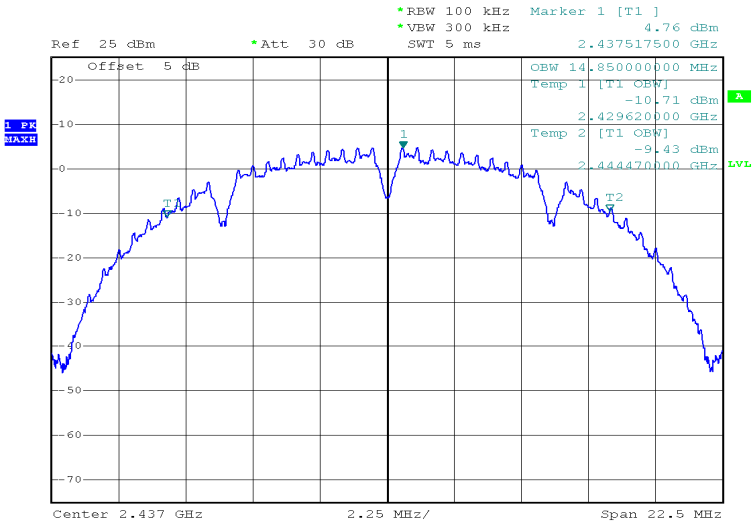
Date: 12.APR.2014 08:33:08

Middle Channel 6dB Bandwidth



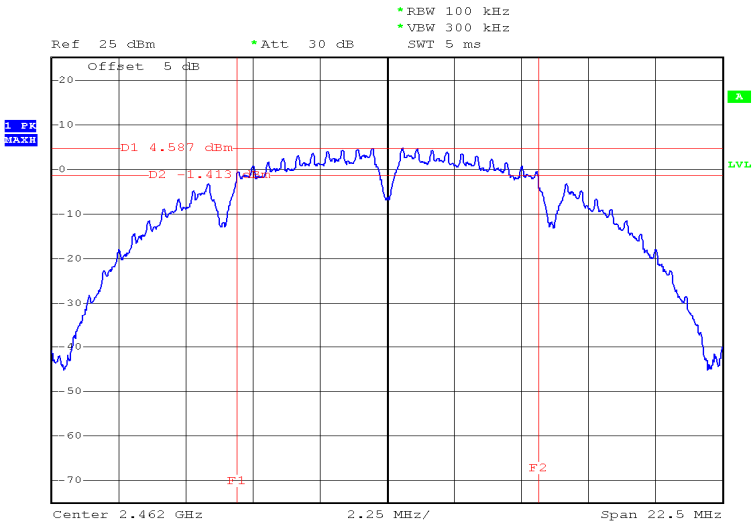
Date: 12.APR.2014 08:38:58

Middle Channel 99% Bandwidth



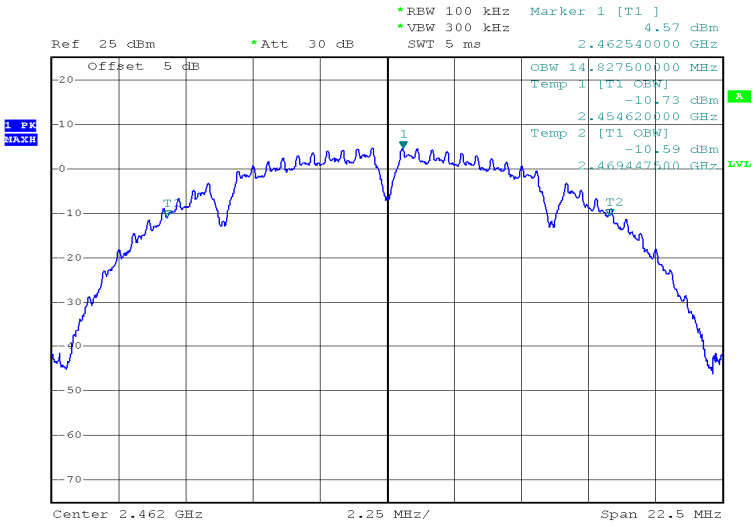
Date: 12.APR.2014 08:39:15

High Channel 6dB Bandwidth



Date: 12.APR.2014 08:48:01

High Channel 99% Bandwidth



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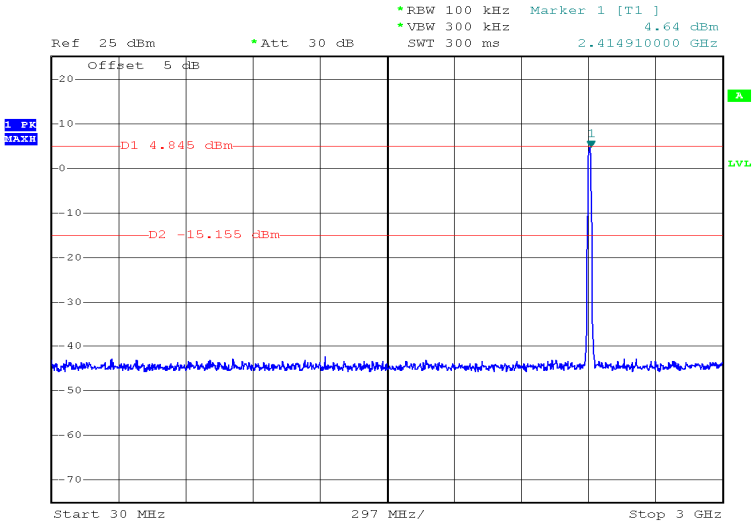
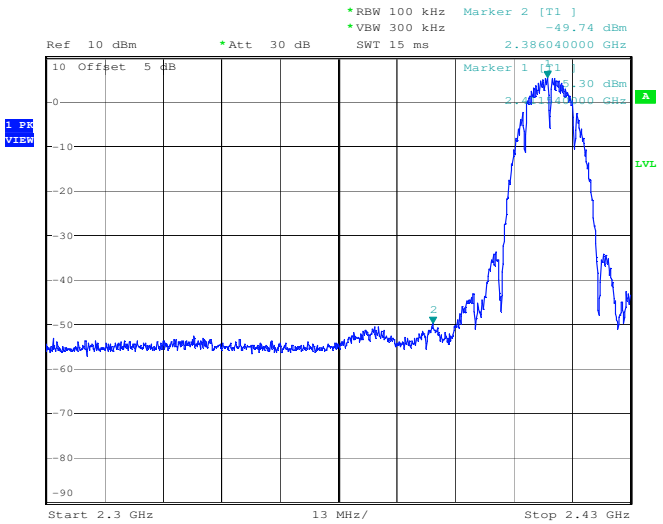
Appendix A.3: Test Results of Conducted Spurious Emissions measured in 100kHz Bandwidth

Low Channel 1

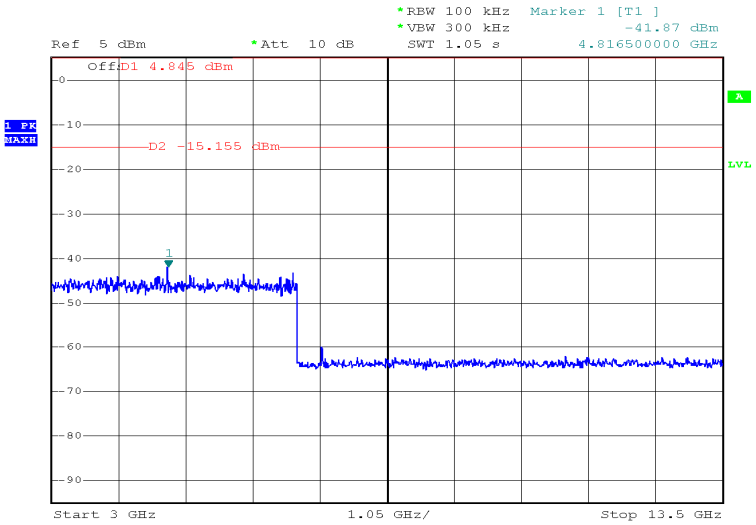


Date: 12.APR.2014 08:34:23



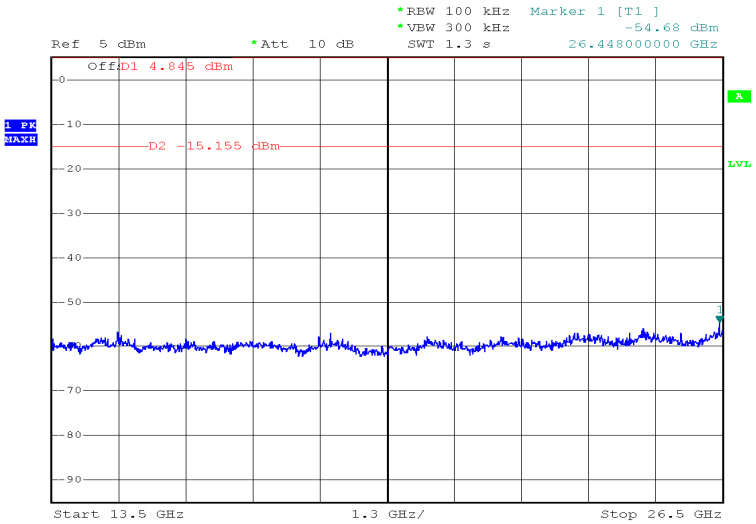
Date: 12.APR.2014 10:21:59

Low Channel 2



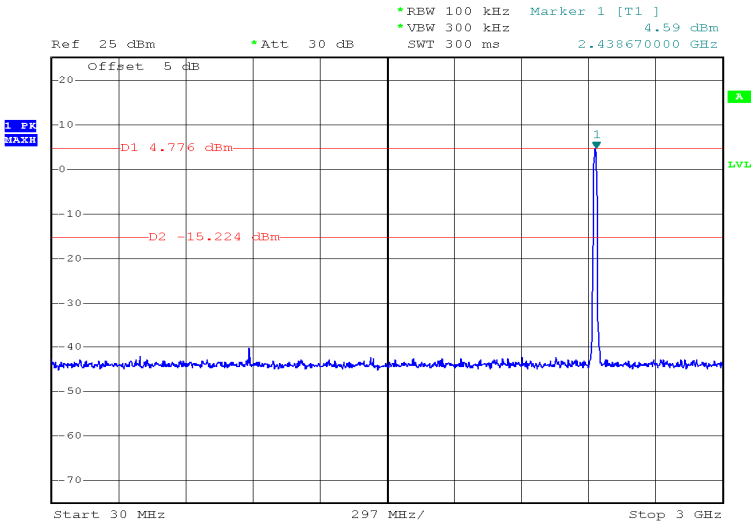
Date: 12.APR.2014 08:35:30

Low Channel 3



Date: 12.APR.2014 08:35:52

Middle Channel 1



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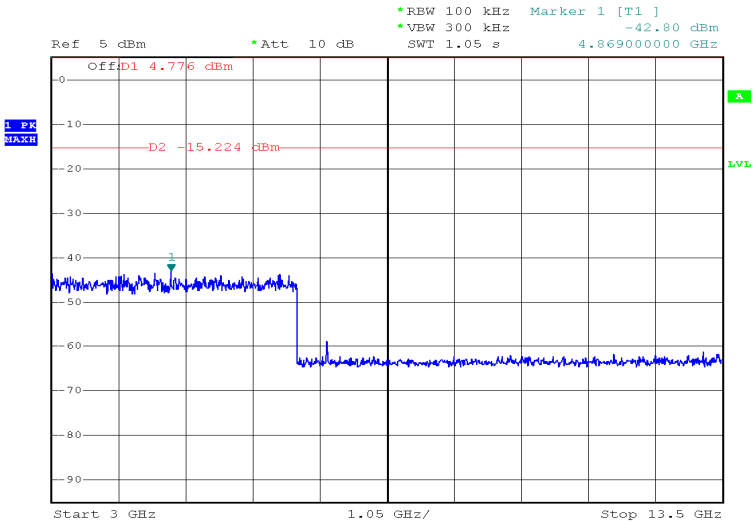
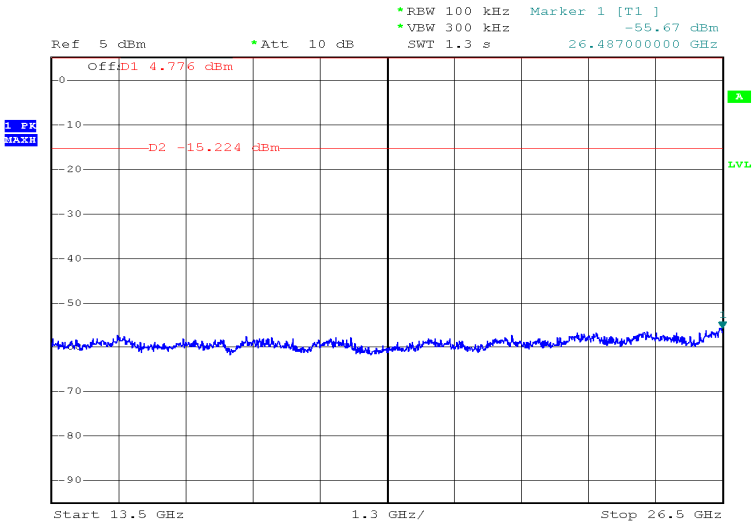
Middle Channel 2



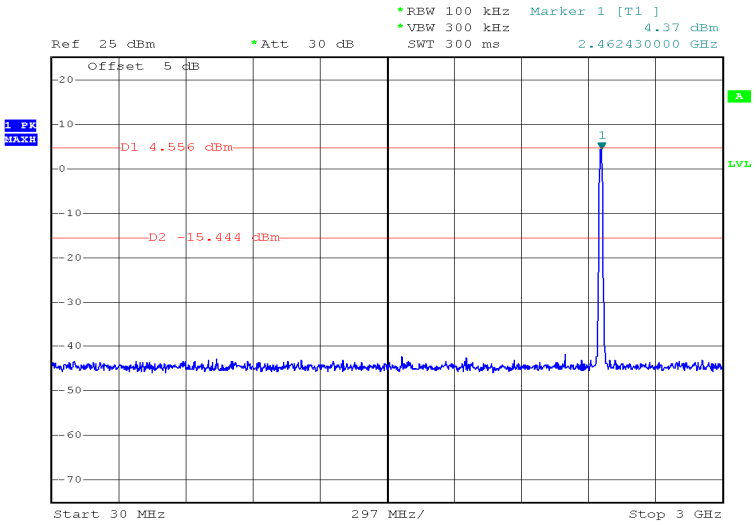
Date: 12.APR.2014 08:44:44

Middle Channel 3

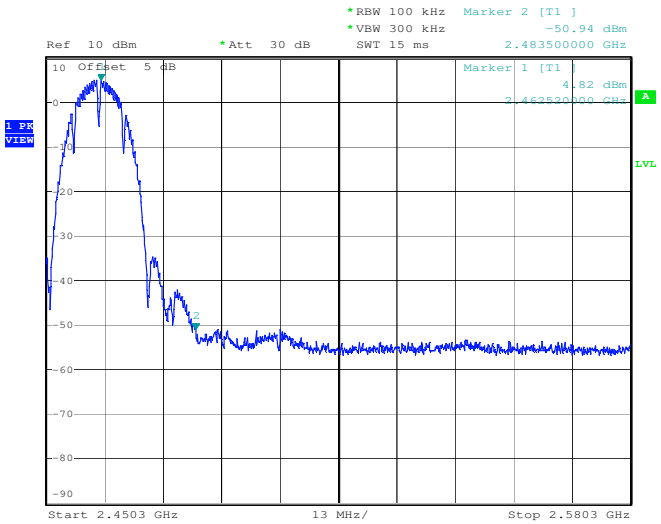


Date: 12.APR.2014 08:45:40

High Channel 1

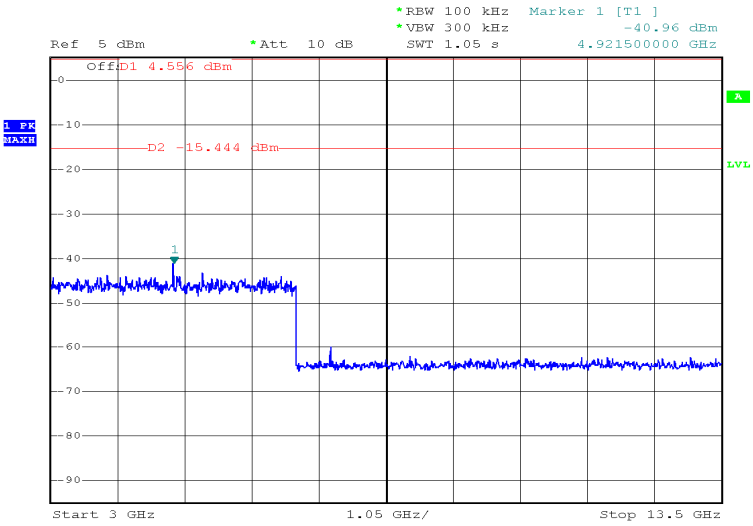


Date: 12.APR.2014 08:49:31



Date: 12.APR.2014 10:23:50

High Channel 2



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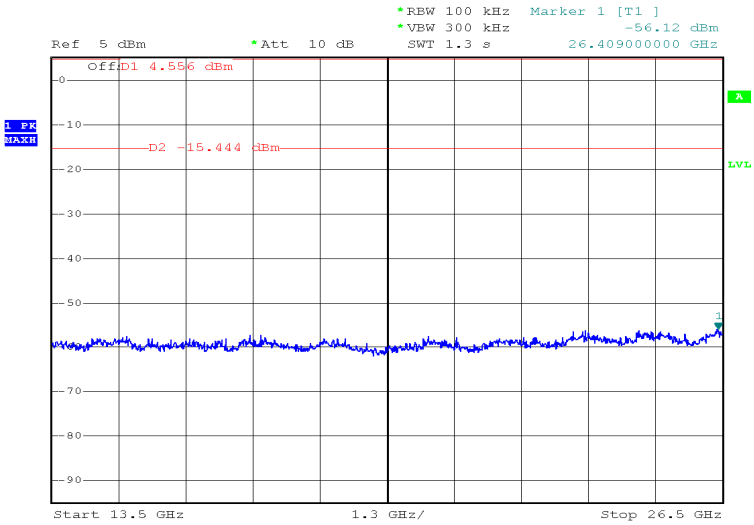
High Channel 3

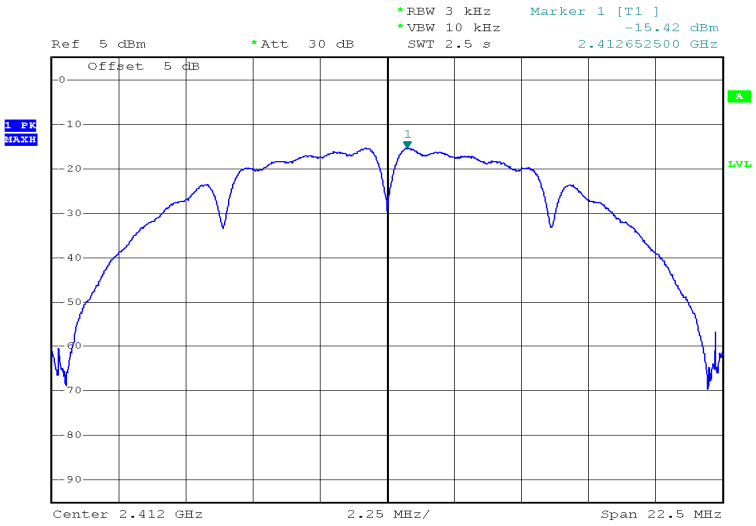


Date: 12.APR.2014 08:51:03

Appendix A.4: Test Results of Power spectral density

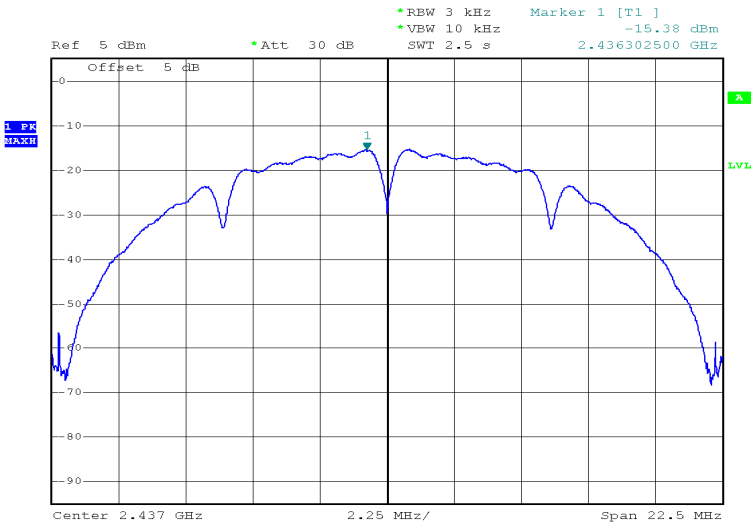
Channel (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Conclusion
2412	-15.42	8	Pass
2437	-15.38	8	Pass
2462	-15.50	8	Pass

2412 MHz



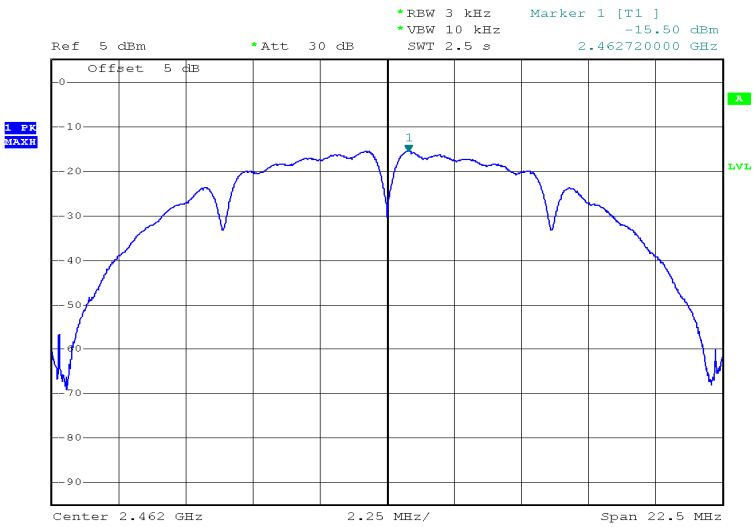
Date: 12.APR.2014 08:36:17

2437 MHz



Date: 12.APR.2014 08:46:04

2462 MHz



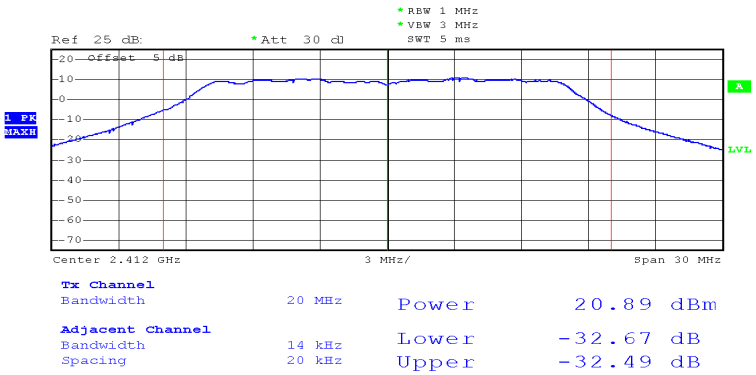
Date: 12.APR.2014 08:51:27

Test Results of 802.11g mode

Appendix B.1: Test Results of Peak Output Power

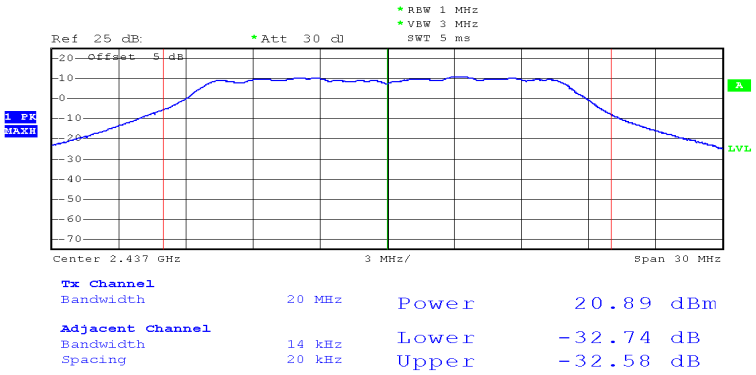
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Conclusion
Low Channel	2412	20.89	30	Pass
Middle Channel	2437	20.89	30	Pass
High Channel	2462	21.04	30	Pass

Low Channel



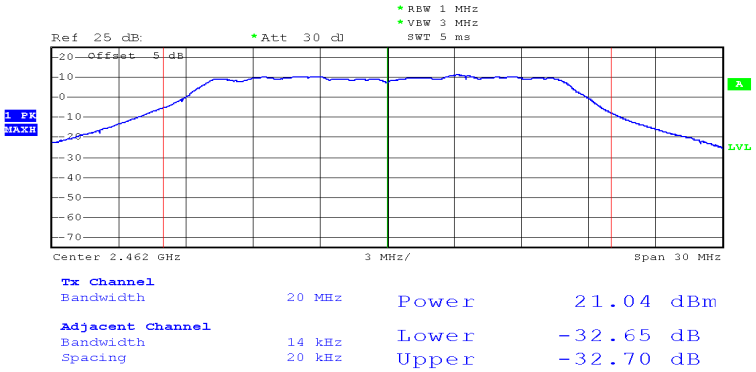
Date: 12.APR.2014 09:05:28

Middle Channel



Date: 12.APR.2014 08:59:52

High Channel

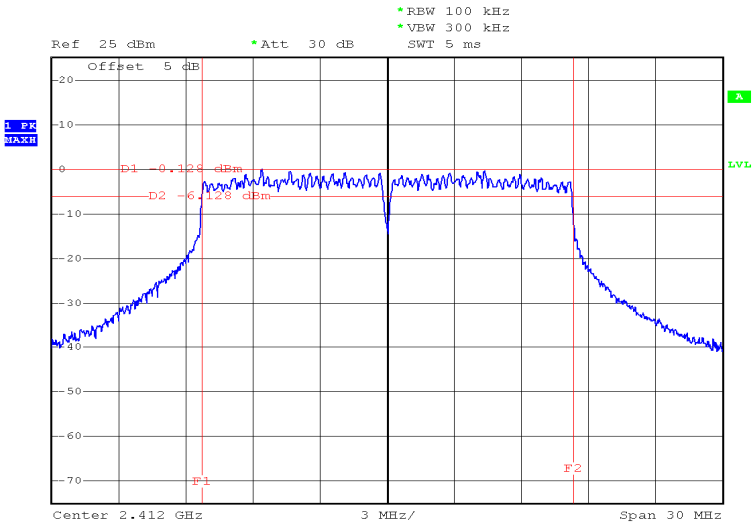


Date: 12.APR.2014 08:53:36

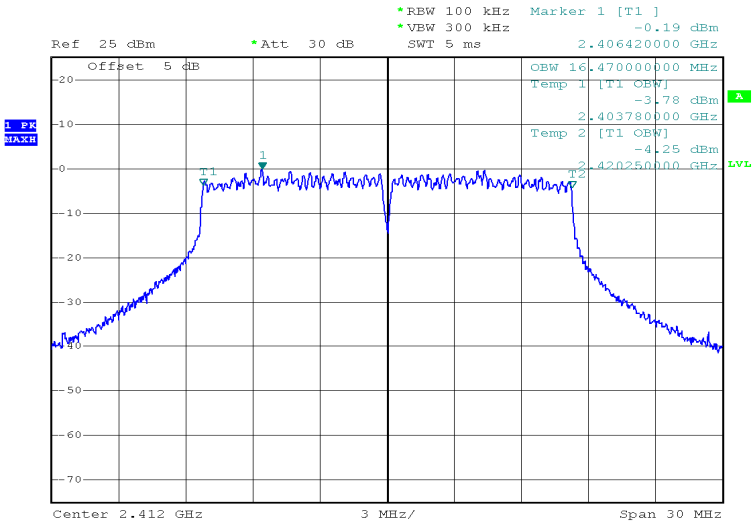
Appendix B.2: Test Results of 6dB Bandwidth and 99% Bandwidth

Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Conclusion
Low Channel	2412	16.56	16.47	Pass
Middle Channel	2437	16.53	16.47	Pass
High Channel	2462	16.56	16.47	Pass

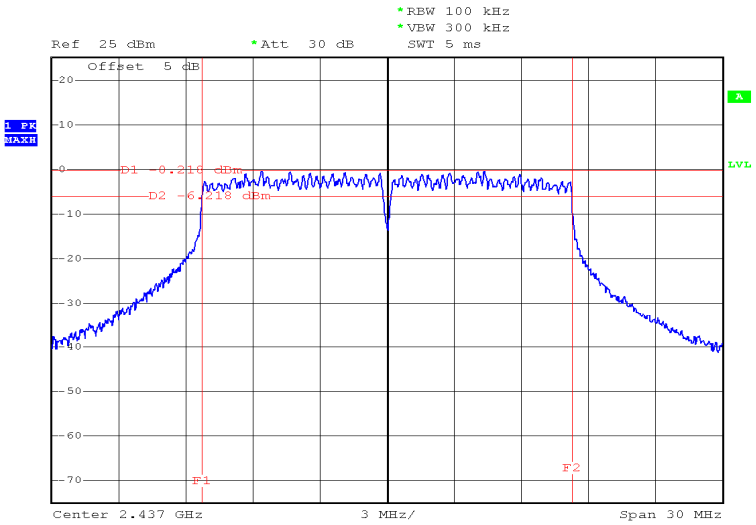
Low Channel 6dB Bandwidth



Low Channel 99% Bandwidth

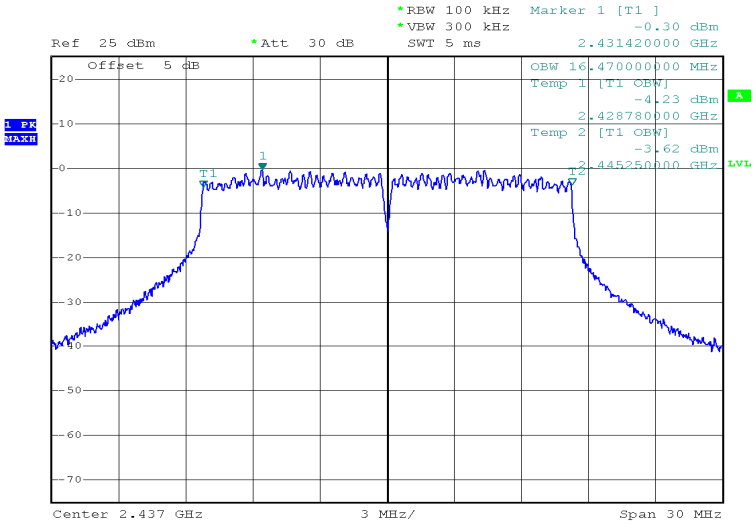


Middle Channel 6dB Bandwidth



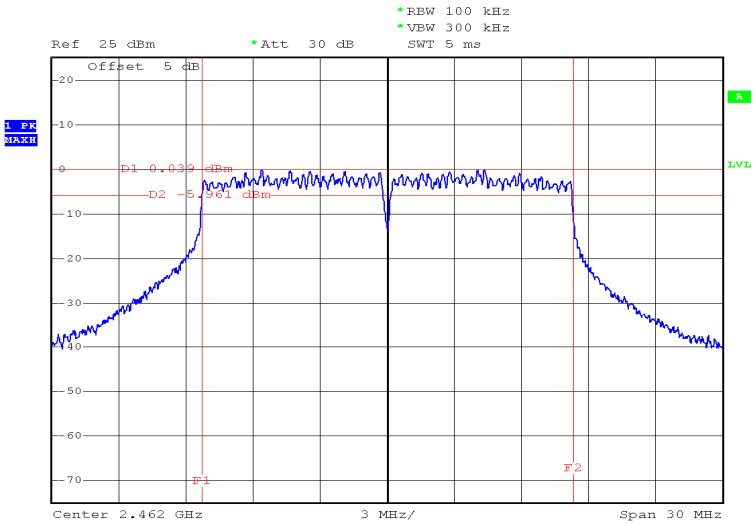
Date: 12.APR.2014 09:00:15

Middle Channel 99% Bandwidth



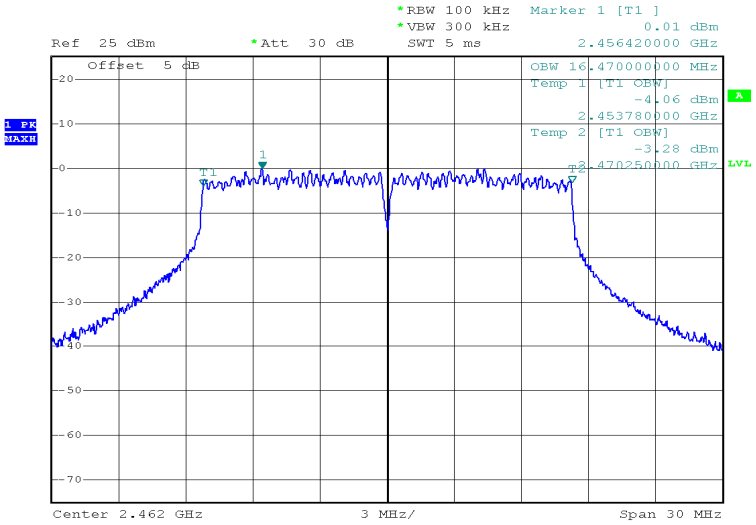
Date: 12.APR.2014 09:00:32

High Channel 6dB Bandwidth



Date: 12.APR.2014 08:53:59

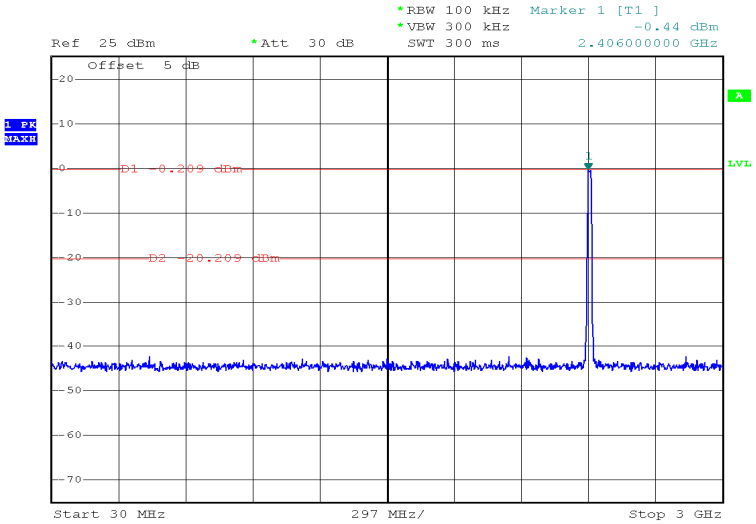
High Channel 99% Bandwidth



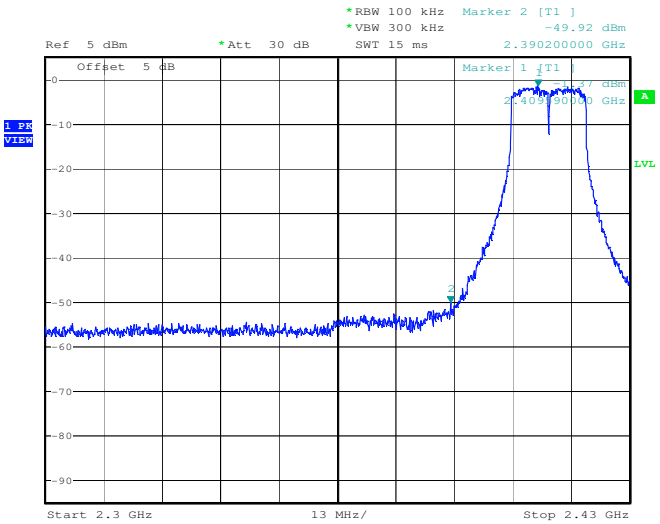
Date: 12.APR.2014 08:54:17

Appendix B.3: Test Results of Conducted Spurious Emissions measured in 100kHz Bandwidth

Low Channel 1

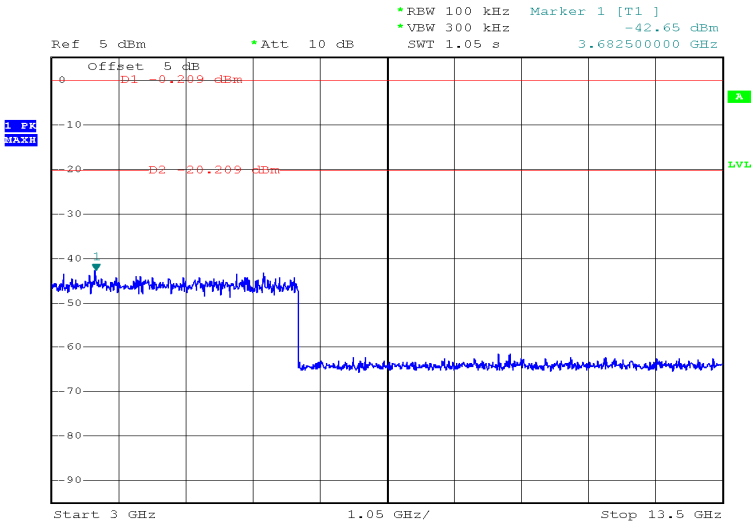


Date: 12.APR.2014 09:07:26



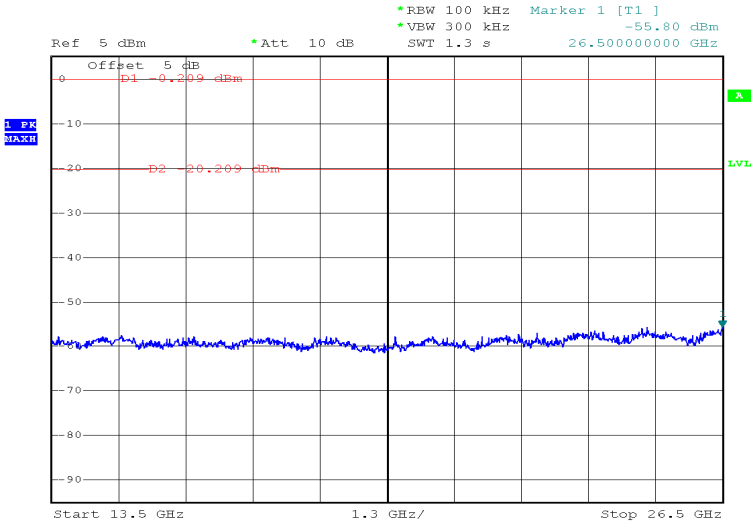
Date: 12.APR.2014 10:20:34

Low Channel 2



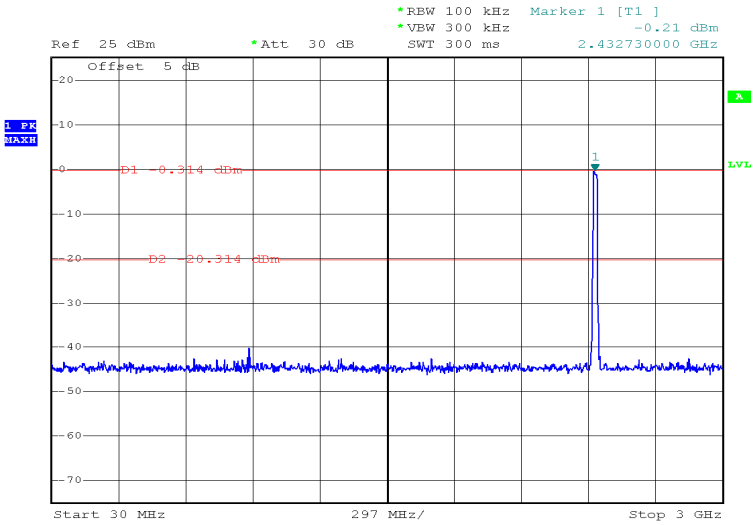
Date: 12.APR.2014 09:07:55

Low Channel 3



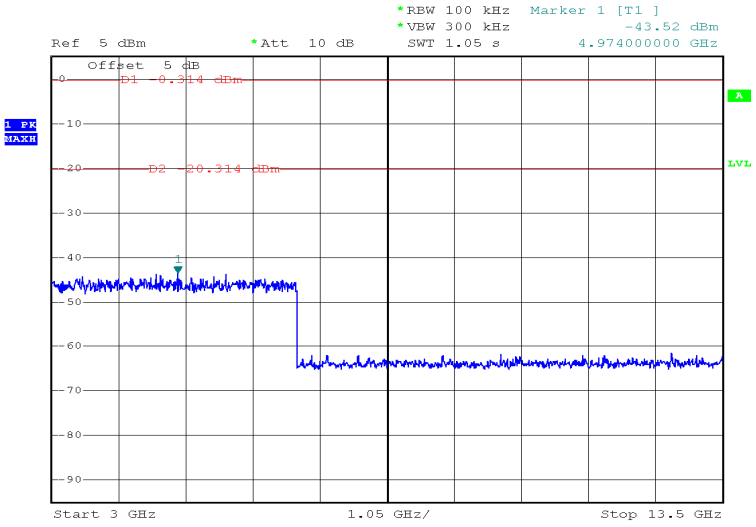
Date: 12.APR.2014 09:09:15

Middle Channel 1



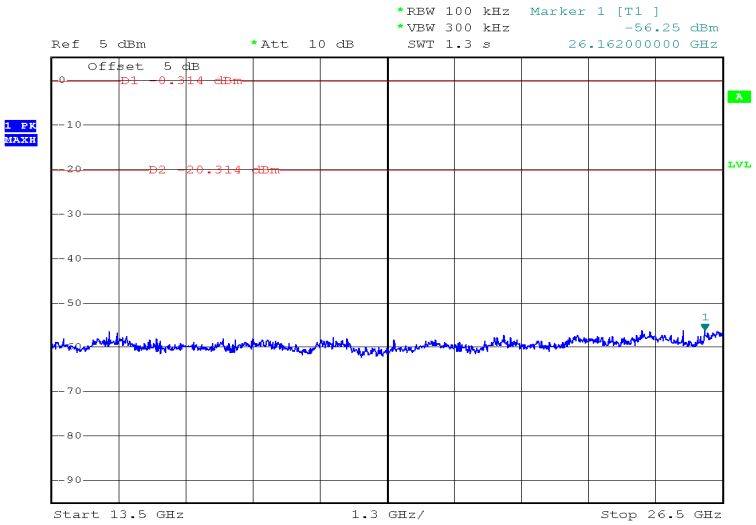
Date: 12.APR.2014 09:01:37

Middle Channel 2



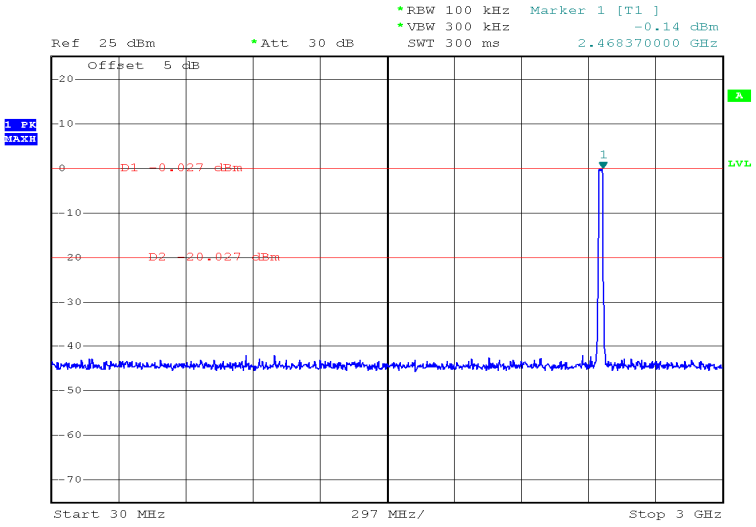
Date: 12.APR.2014 09:02:22

Middle Channel 3

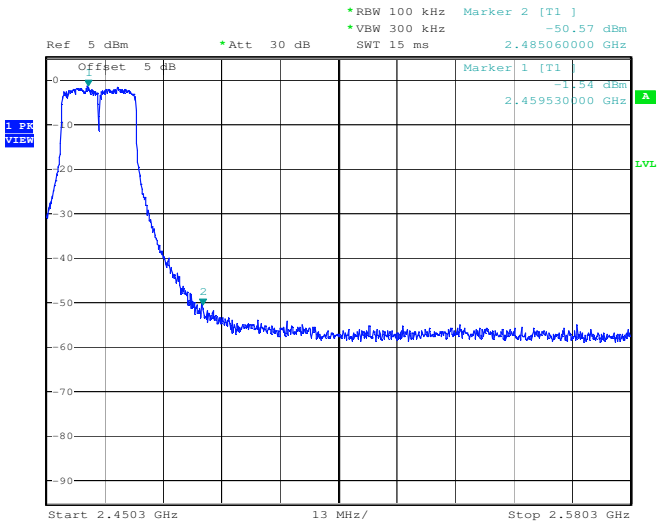


Date: 12.APR.2014 09:02:56

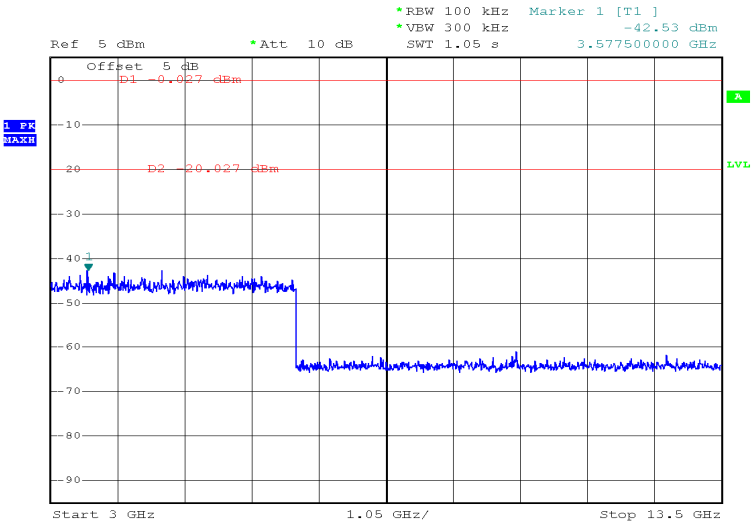
High Channel 1



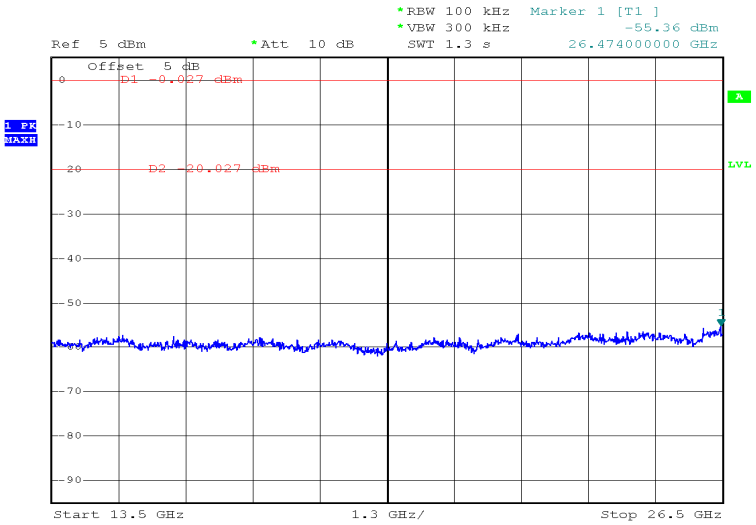
Date: 12.APR.2014 08:56:00



High Channel 2



High Channel 3

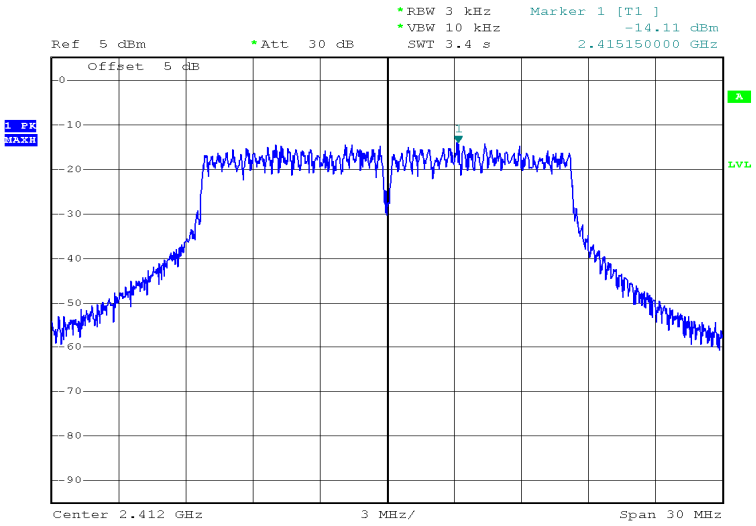


Date: 12.APR.2014 08:57:35

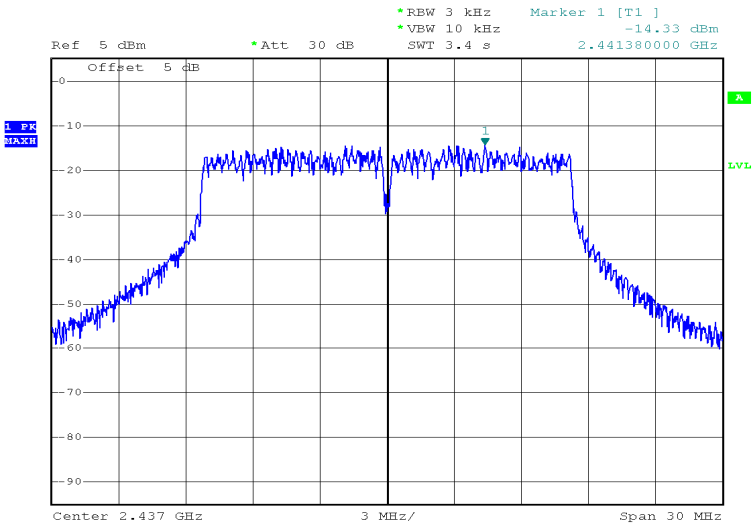
Appendix B.4: Test Results of Power spectral density

Channel (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Conclusion
2412	-14.11	8	Pass
2437	-14.33	8	Pass
2462	-13.75	8	Pass

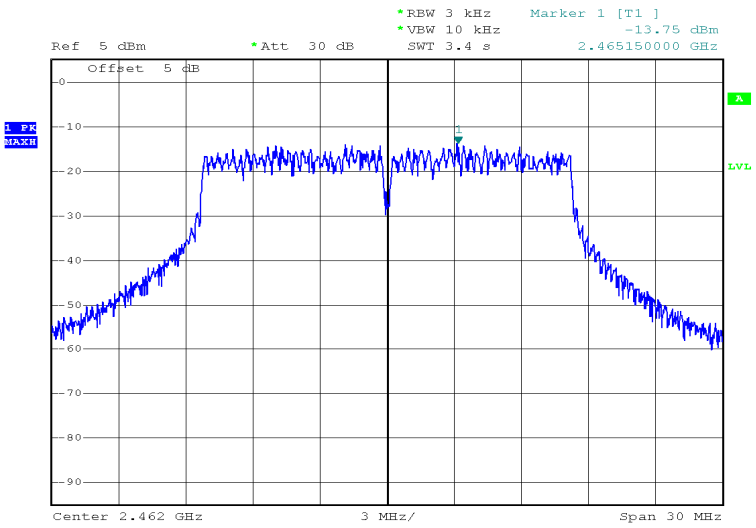
2412 MHz



2437 MHz



2462 MHz



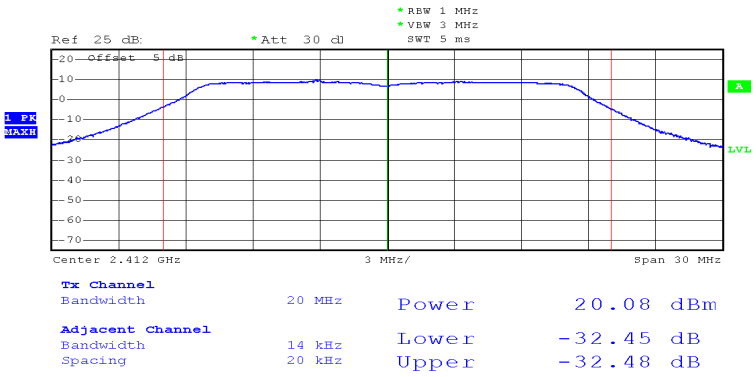
Date: 12.APR.2014 08:58:00

Test Results of 802.11n HT20 mode

Appendix C.1: Test Results of Peak Output Power

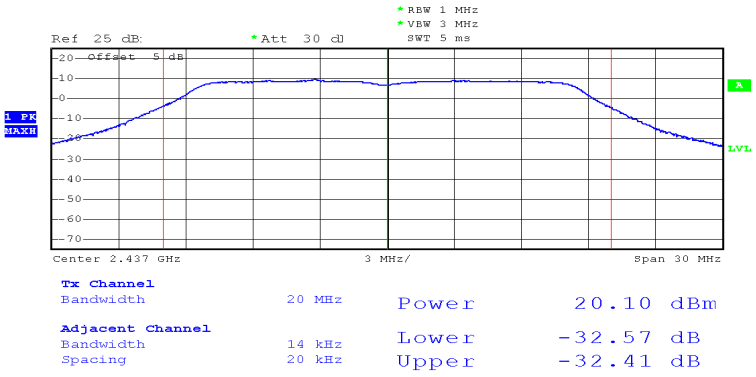
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit (dBm)	Conclusion
Low Channel	2412	20.08	30	Pass
Middle Channel	2437	20.10	30	Pass
High Channel	2462	19.65	30	Pass

Low Channel



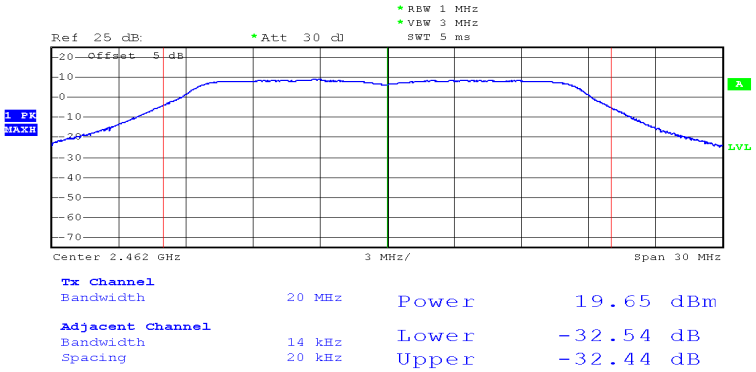
Date: 12.APR.2014 09:12:40

Middle Channel



Date: 12.APR.2014 09:17:24

High Channel

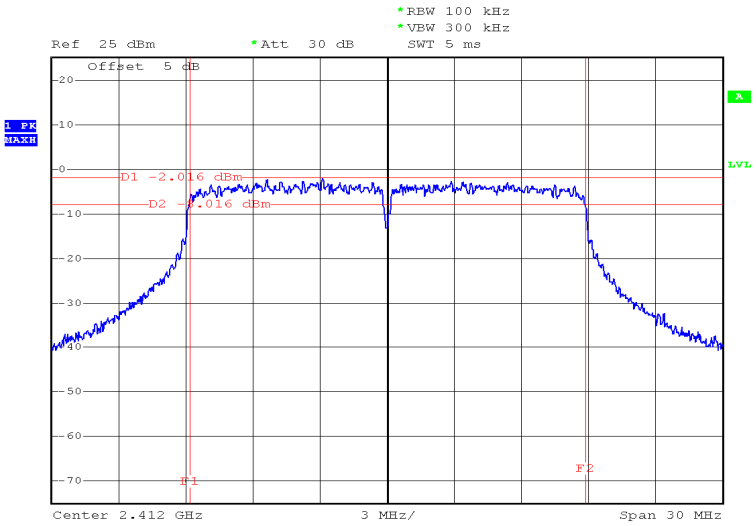


Date: 12.APR.2014 09:23:59

Appendix C.2: Test Results of 6dB Bandwidth and 99% Bandwidth

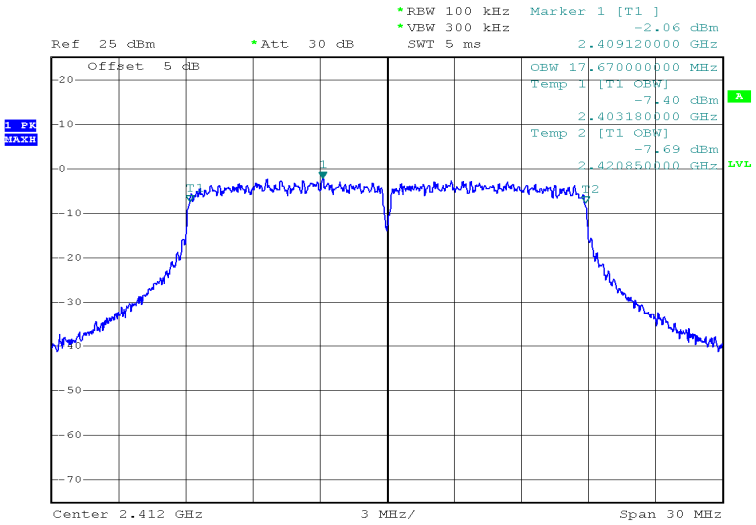
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Conclusion
Low Channel	2412	17.70	17.67	Pass
Middle Channel	2437	17.67	17.67	Pass
High Channel	2462	17.67	17.67	Pass

Low Channel 6dB Bandwidth



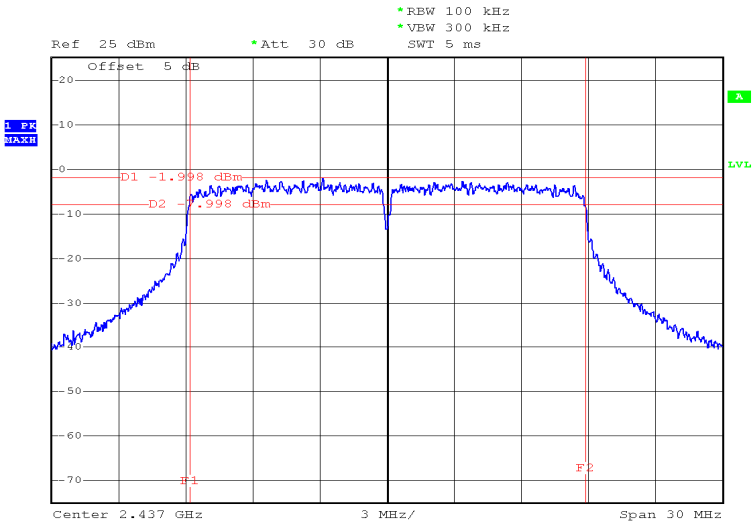
Date: 12.APR.2014 09:13:03

Low Channel 99% Bandwidth

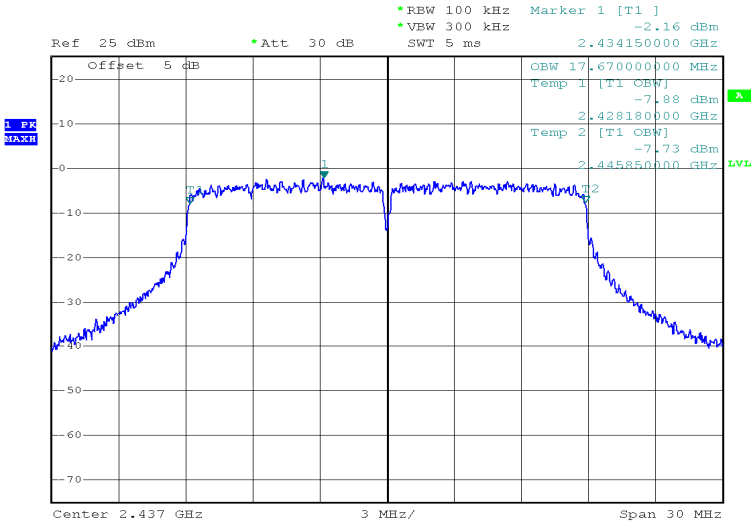


Date: 12.APR.2014 09:13:20

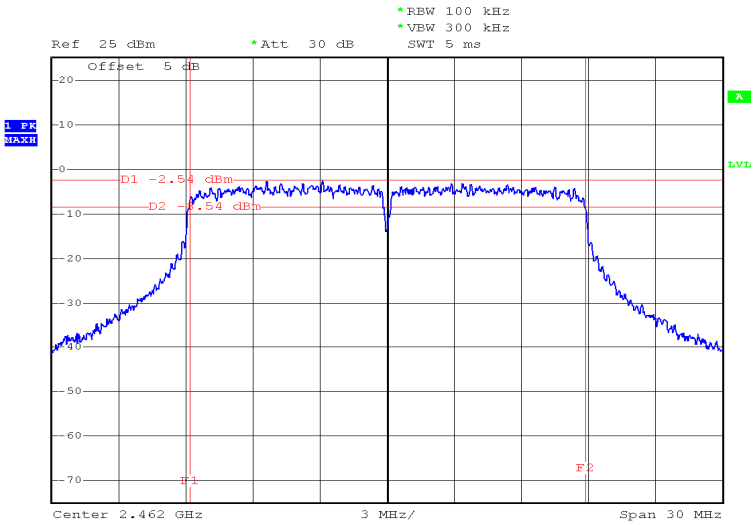
Middle Channel 6dB Bandwidth



Middle Channel 99% Bandwidth

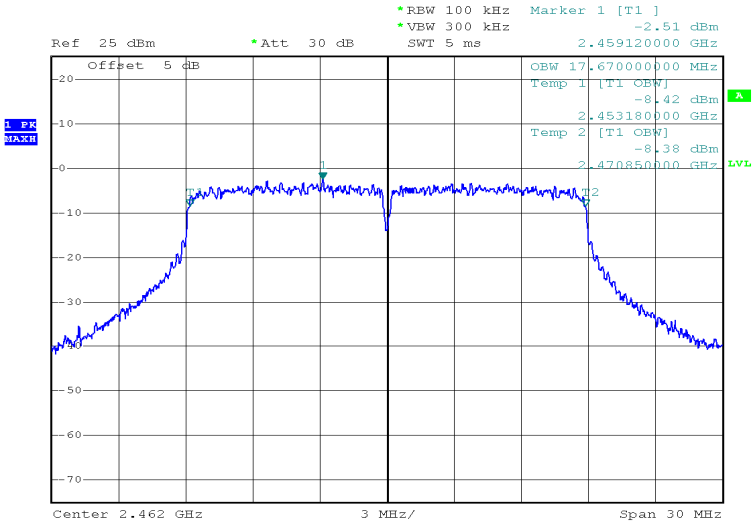


High Channel 6dB Bandwidth



Date: 12.APR.2014 09:24:22

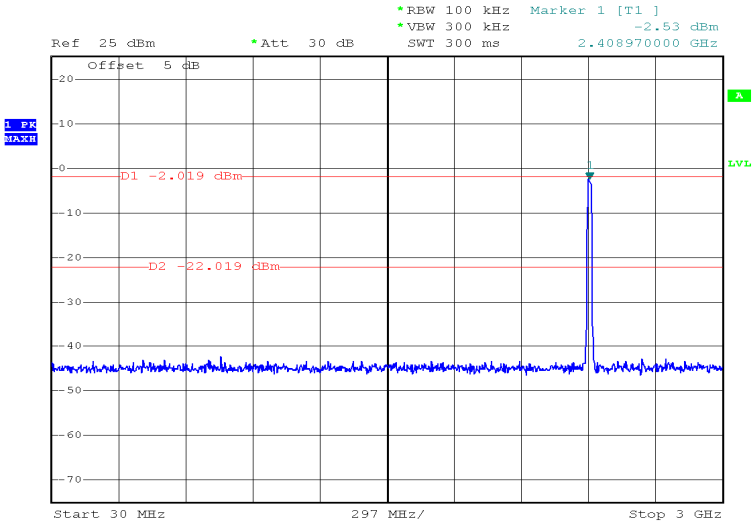
High Channel 99% Bandwidth



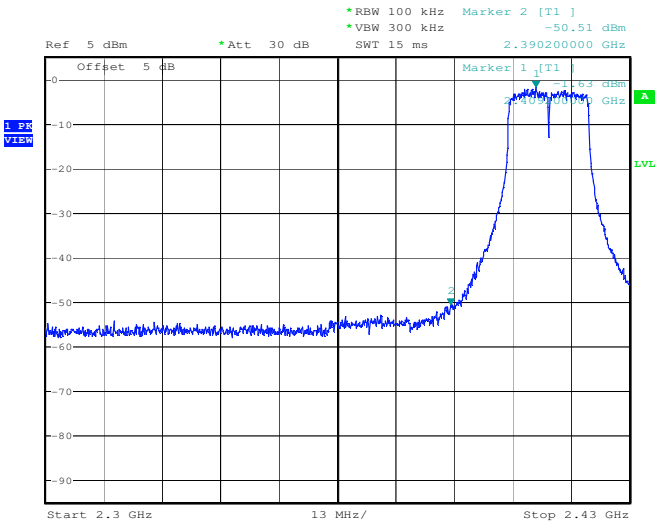
Date: 12.APR.2014 09:24:40

Appendix C.3: Test Results of Conducted Spurious Emissions measured in 100kHz Bandwidth

Low Channel 1

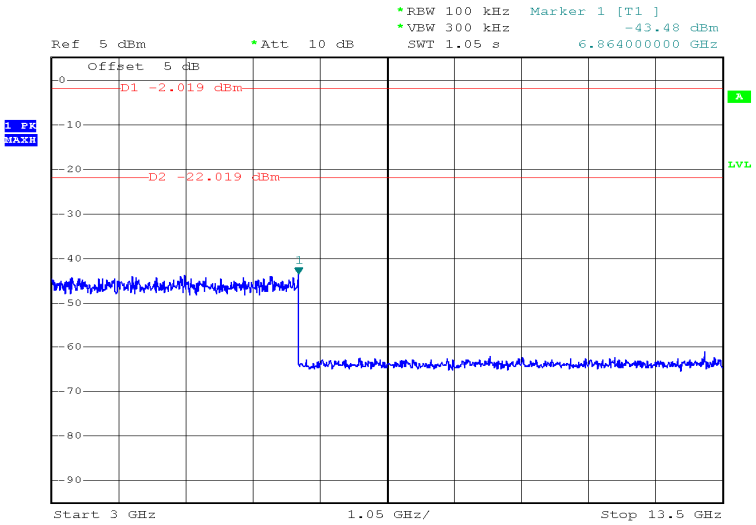


Date: 12.APR.2014 09:14:14



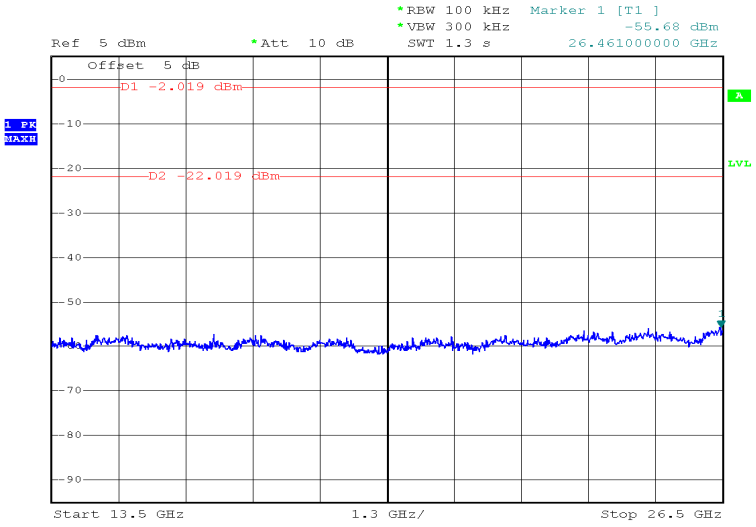
Date: 12.APR.2014 10:19:12

Low Channel 2



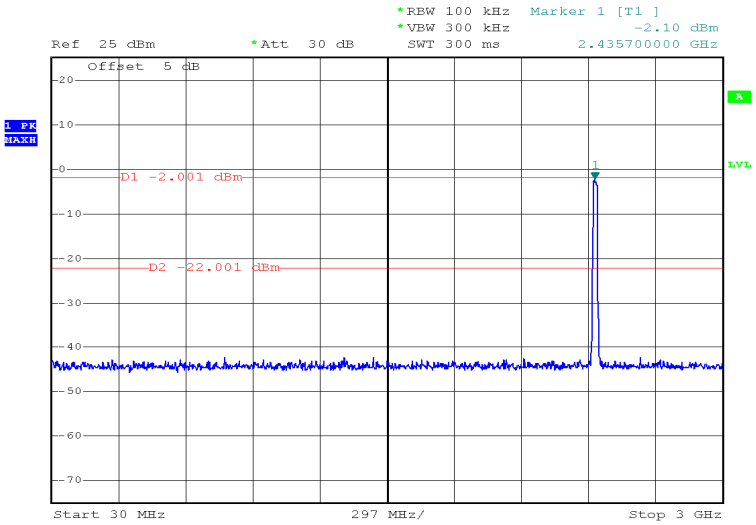
Date: 12.APR.2014 09:15:05

Low Channel 3



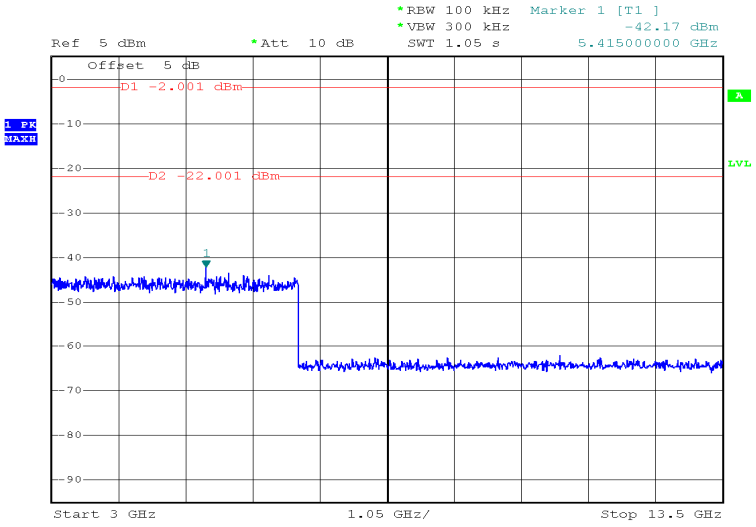
Date: 12.APR.2014 09:15:53

Middle Channel 1



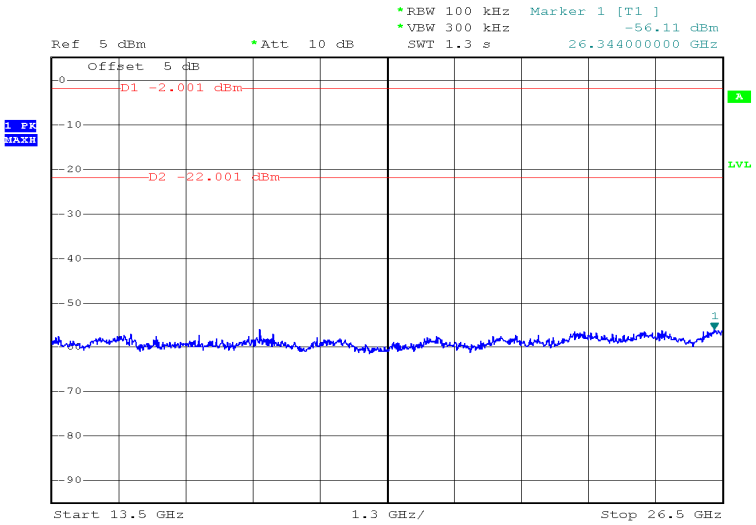
Date: 12.APR.2014 09:20:09

Middle Channel 2



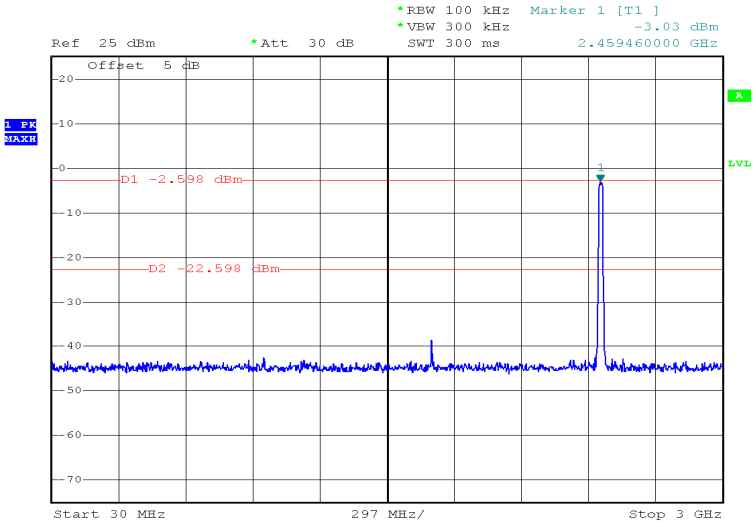
Date: 12.APR.2014 09:20:31

Middle Channel 3

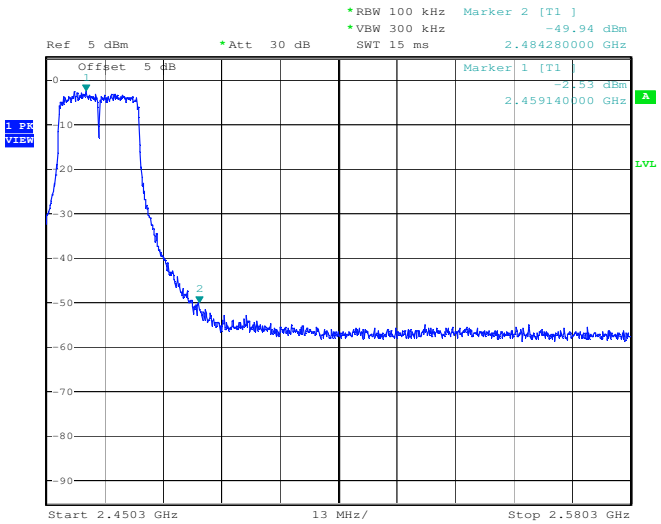


Date: 12.APR.2014 09:22:08

High Channel 1

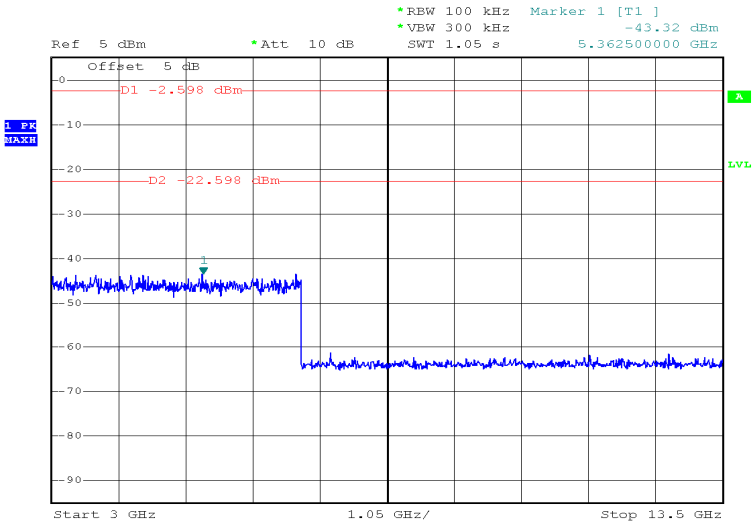


Date: 12.APR.2014 09:25:39



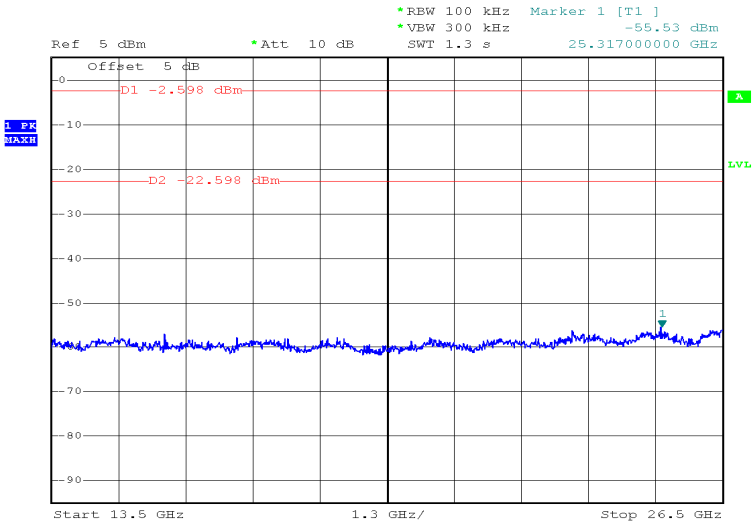
Date: 12.APR.2014 10:26:58

High Channel 2



Date: 12.APR.2014 09:26:27

High Channel 3

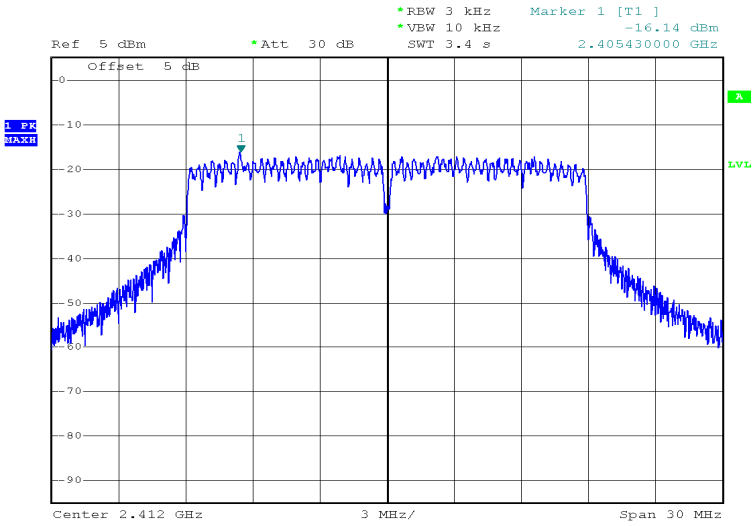


Date: 12.APR.2014 09:27:17

Appendix C.4: Test Results of Power spectral density

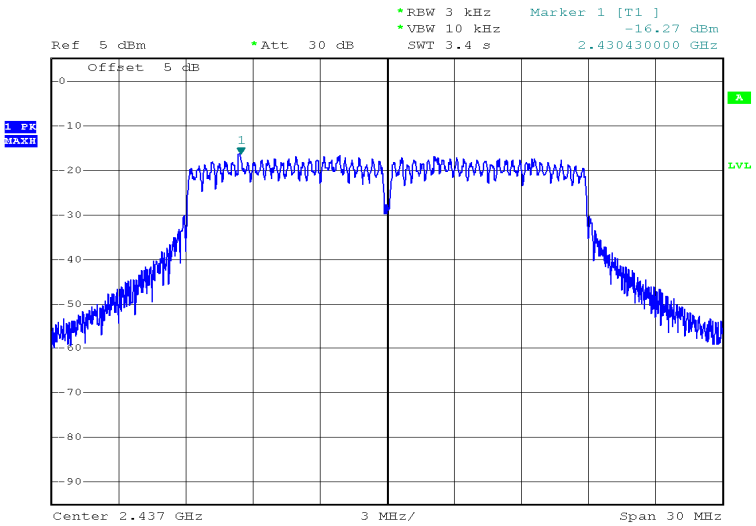
Channel (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Conclusion
2412	-16.14	8	Pass
2437	-16.27	8	Pass
2462	-16.78	8	Pass

2412 MHz



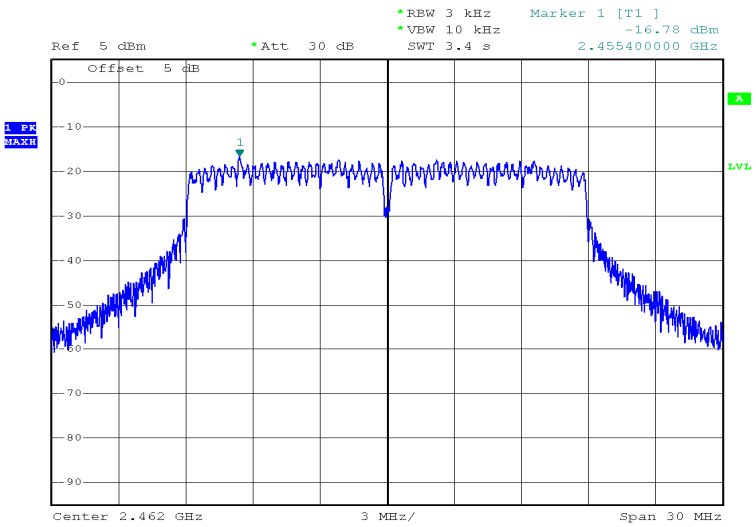
Date: 12.APR.2014 09:16:18

2437 MHz



Date: 12.APR.2014 09:22:33

2462 MHz



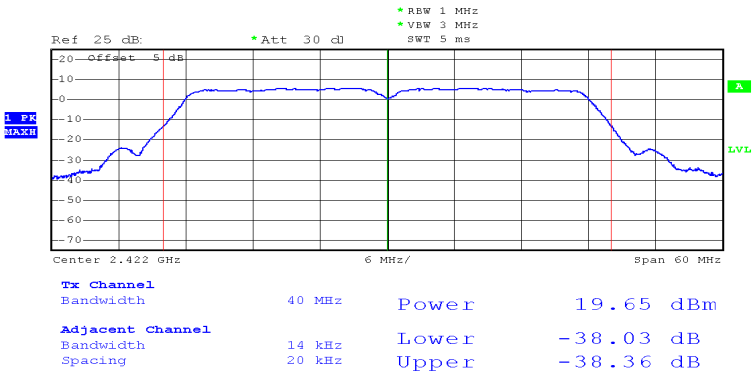
Date: 12.APR.2014 09:27:41

Test Resutls of 802.11n HT40 mode

Appendix D.1: Test Results of Peak Output Power

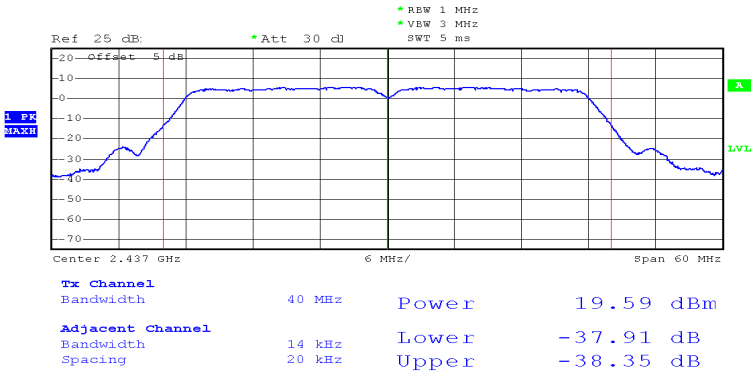
Channel	Channel Frequency (MHz)	Peak Output Power (dBm)	Limit(dBm)	Conclusion
Low Channel	2422	19.61	30	Pass
Middle Channel	2437	19.59	30	Pass
High Channel	2452	19.59	30	Pass

Low Channel



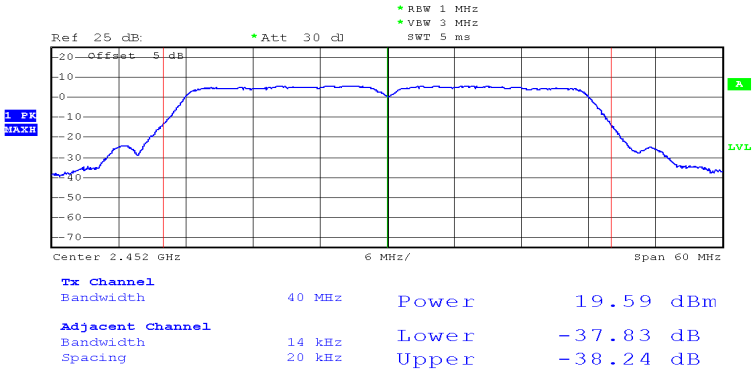
Date: 12.APR.2014 09:55:06

Middle Channel



Date: 12.APR.2014 10:03:41

High Channel

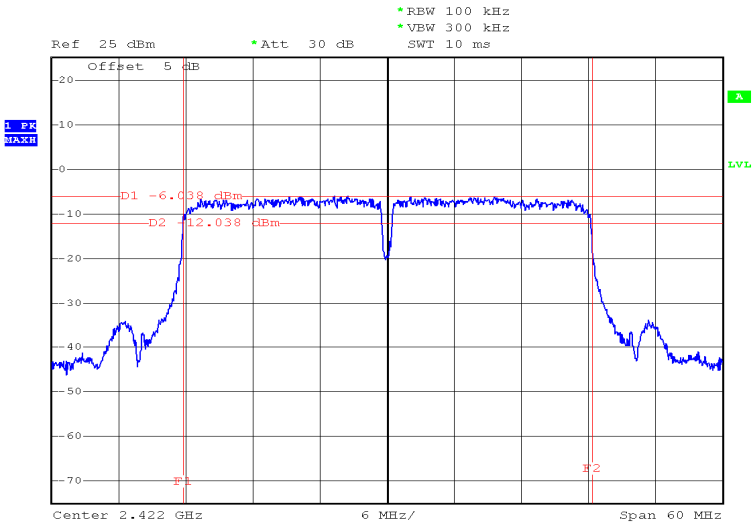


Date: 12.APR.2014 10:07:51

Appendix D.2: Test Results of 6dB Bandwidth and 99% Bandwidth

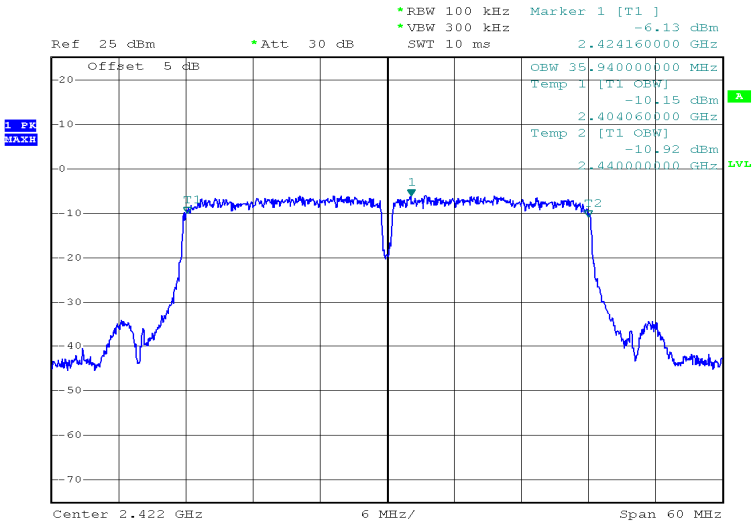
Channel	Channel Frequency (MHz)	6dB Bandwidth (MHz)	99% Bandwidth (MHz)	Conclusion
Low Channel	2422	36.48	35.94	Pass
Middle Channel	2437	36.48	35.94	Pass
High Channel	2452	36.42	36.00	Pass

Low Channel 6dB Bandwidth



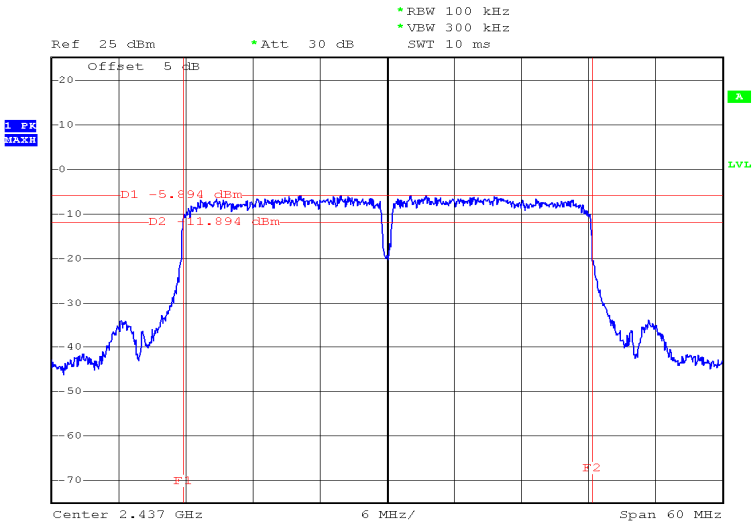
Date: 12.APR.2014 09:55:29

Low Channel 99% Bandwidth



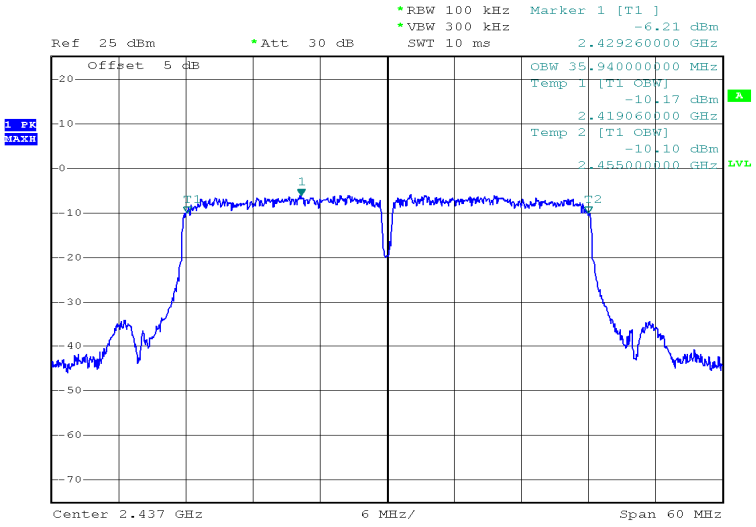
Date: 12.APR.2014 09:55:46

Middle Channel 6dB Bandwidth



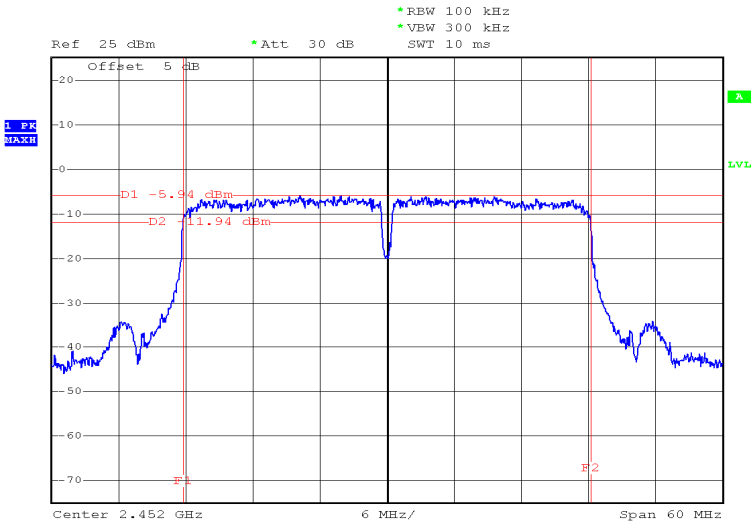
Date: 12.APR.2014 10:04:04

Middle Channel 99% Bandwidth



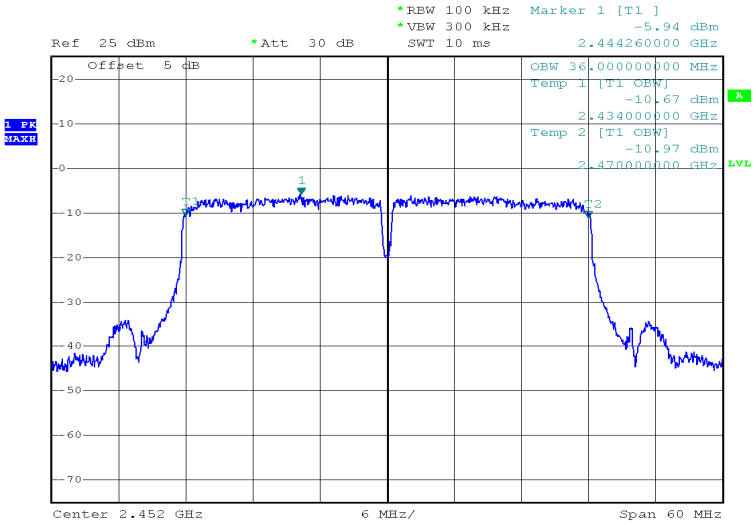
Date: 12.APR.2014 10:04:21

High Channel 6dB Bandwidth



Date: 12.APR.2014 10:08:14

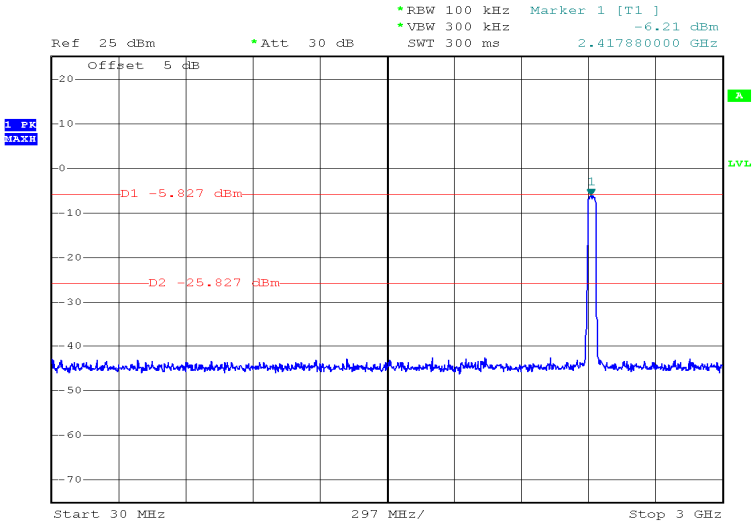
High Channel 99% Bandwidth



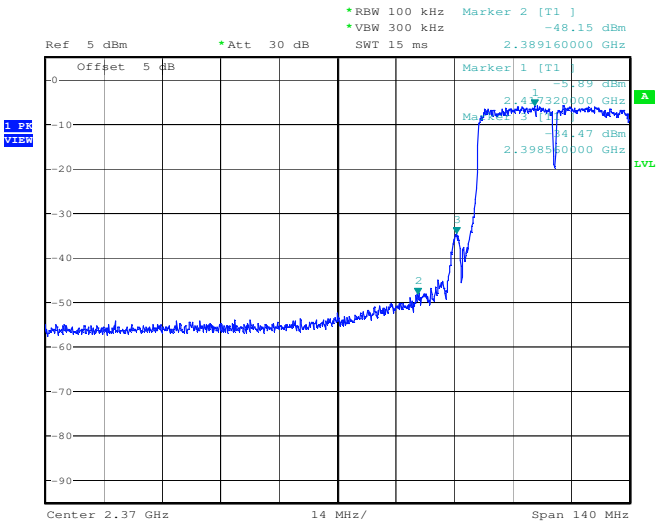
Date: 12.APR.2014 10:08:32

Appendix D.3: Tet Results of Conducted Spurious Emissions measured in 100kHz Bandwidth

Low Channel 1

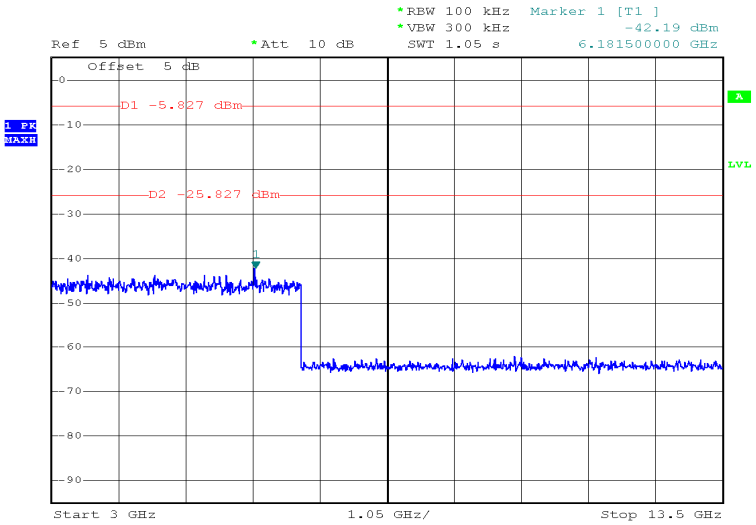


Date: 12.APR.2014 09:56:52



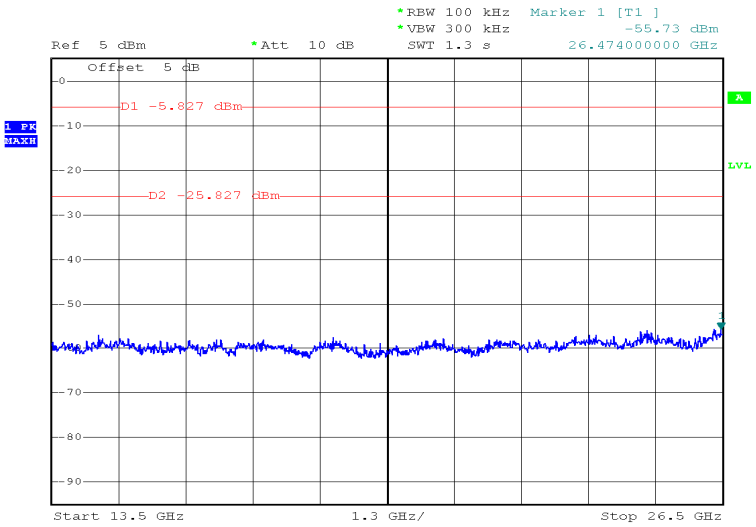
Date: 12.APR.2014 10:17:25

Low Channel 2



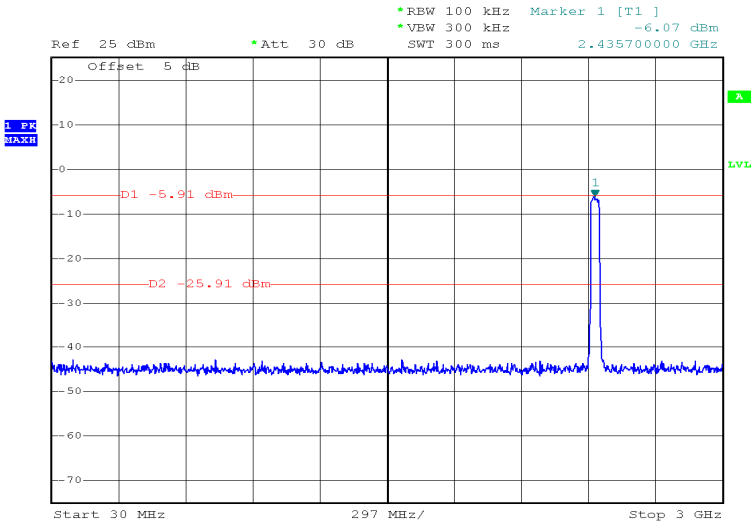
Date: 12.APR.2014 09:57:15

Low Channel 3



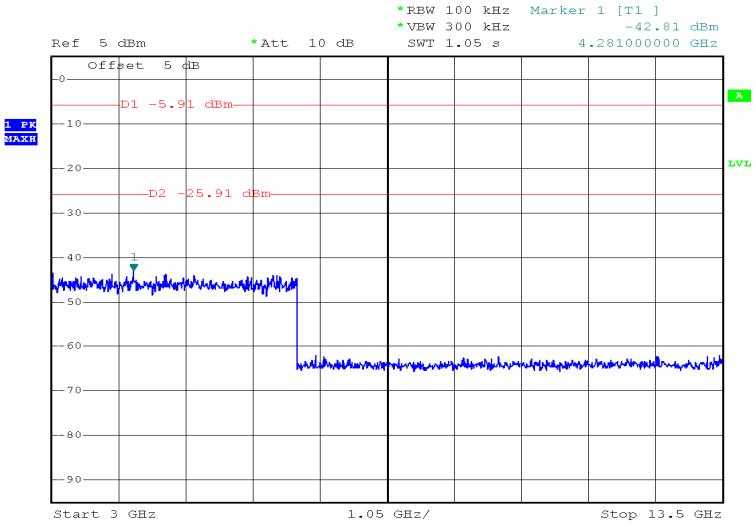
Date: 12.APR.2014 09:57:38

Middle Channel 1



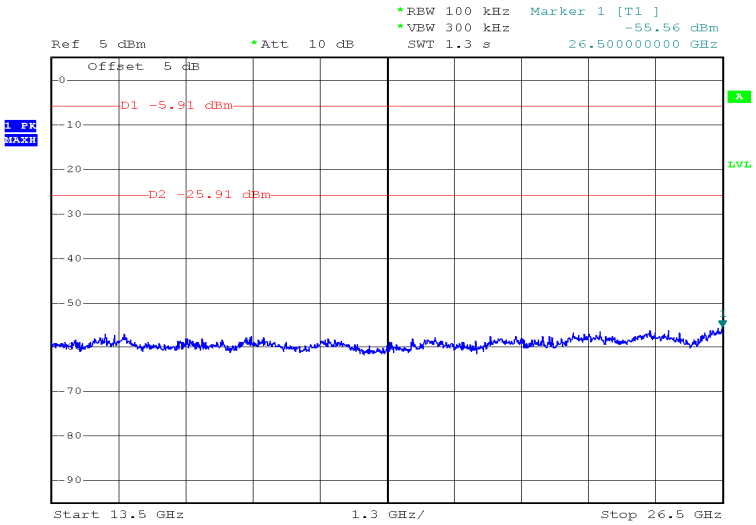
Date: 12.APR.2014 10:05:08

Middle Channel 2



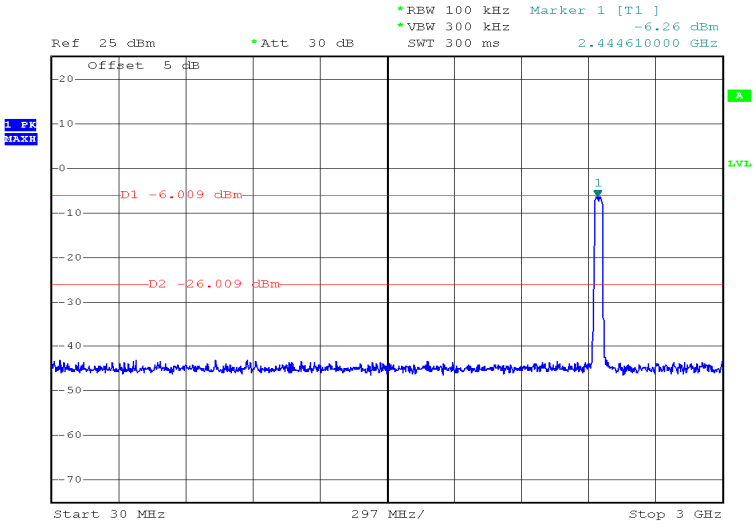
Date: 12.APR.2014 10:05:36

Middle Channel 3

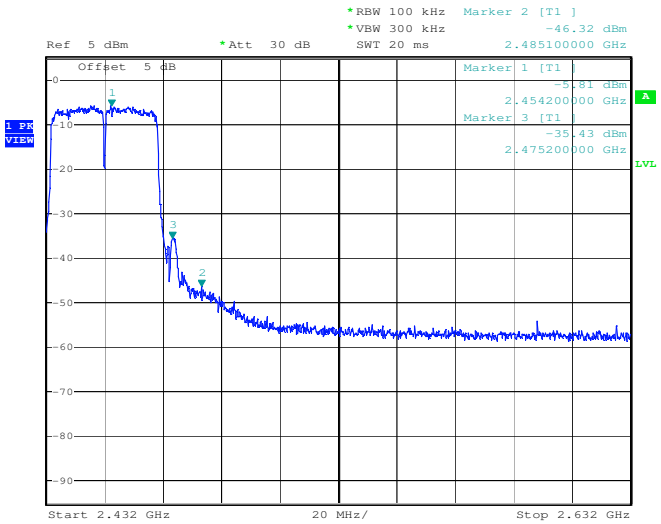


Date: 12.APR.2014 10:06:31

High Channel 1

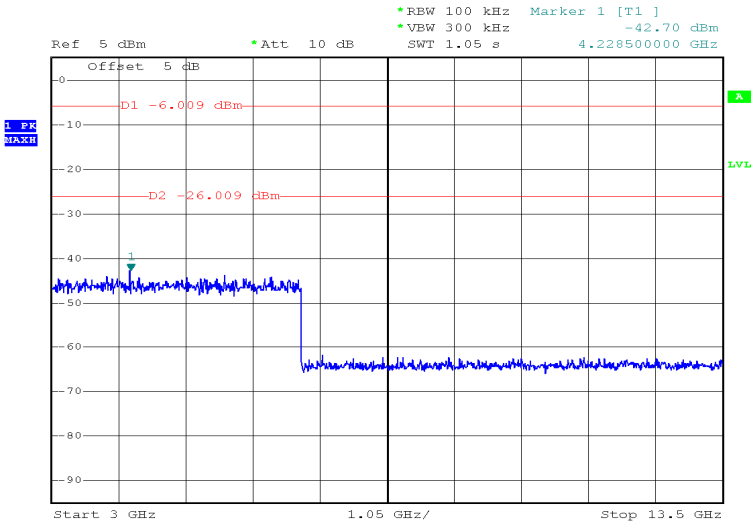


Date: 12.APR.2014 10:09:20



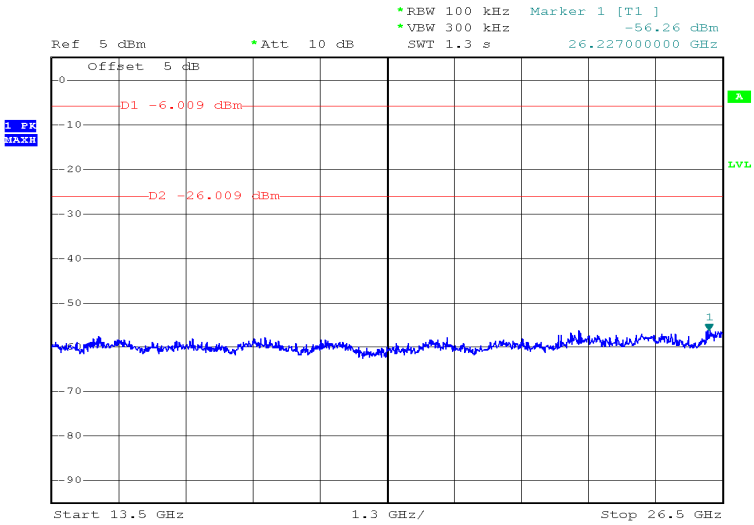
Date: 12.APR.2014 10:15:00

High Channel 2



Date: 12.APR.2014 10:09:48

High Channel 3

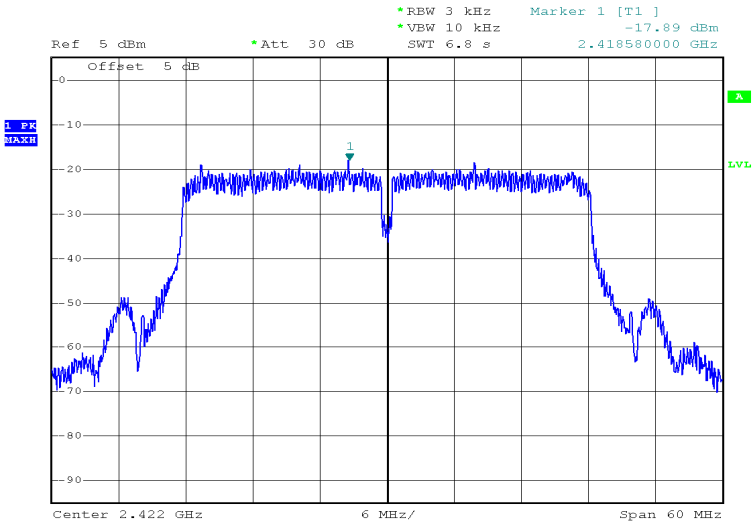


Date: 12.APR.2014 10:10:10

Appendix D.4: Test Results of Power spectral density

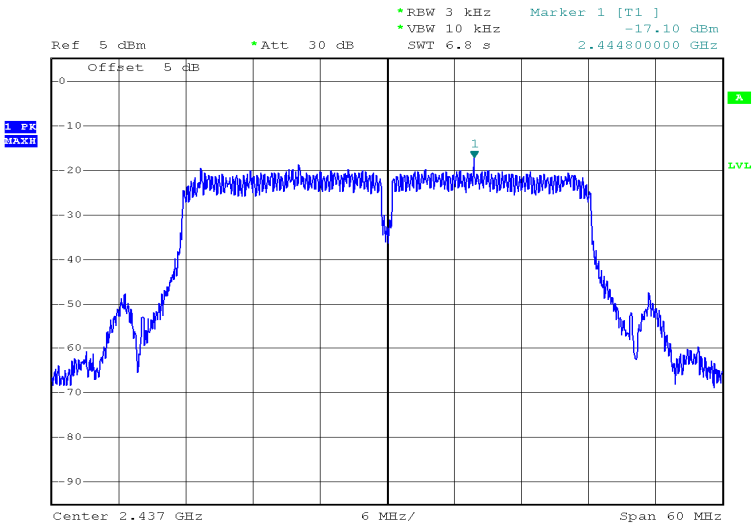
Channel (MHz)	Result (dBm/3kHz)	Limit (dBm/3kHz)	Conclusion
2422	-17.89	8	Pass
2437	-17.10	8	Pass
2452	-19.35	8	Pass

2422 MHz



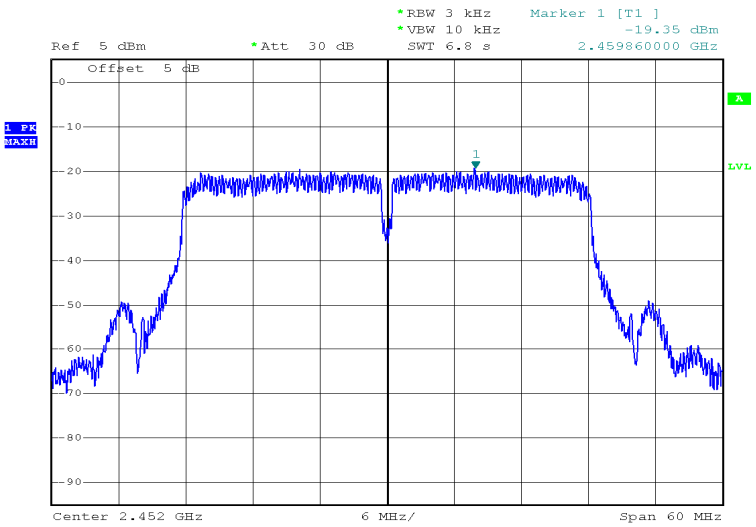
Date: 12.APR.2014 09:58:03

2437 MHz



Date: 12.APR.2014 10:06:55

2452 MHz



Date: 12.APR.2014 10:10:34

Test Results of Spurious Emissions; model SCTPS-AB-CU, Bluetooth4.0 Low Energy operation

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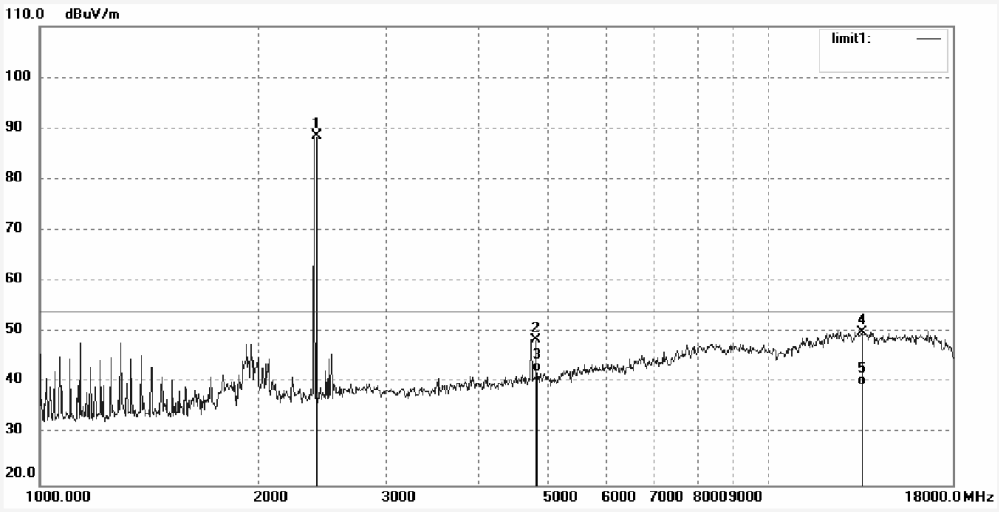
Fax:+86-0755-26503396

Job No.: PHY #891	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2014/03/30
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: SmartClass TPS	Engineer Signature: PEI
Mode: TX 2402MHz	Distance: 3m
Model: SCTPS-AB-CU	
Manufacturer: JDSU	

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	95.98	-7.45	88.53	/	/	peak			
2	4804.011	48.71	-0.30	48.41	74.00	-25.59	peak			
3	4804.011	42.56	-0.30	42.26	54.00	-11.74	AVG			
4	13493.496	10.47	39.59	50.06	74.00	-23.94	peak			
5	13493.496	-0.03	39.59	39.56	54.00	-14.44	AVG			

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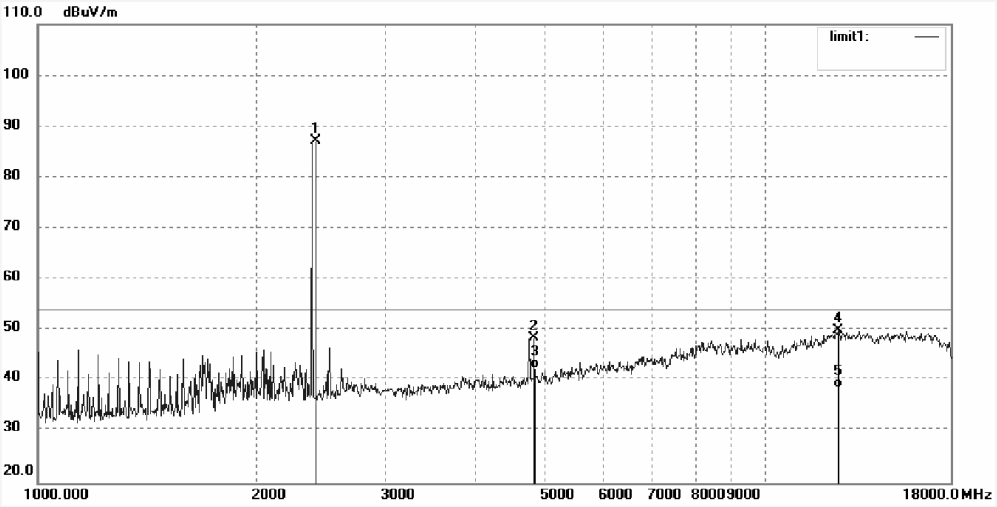
Fax:+86-0755-26503396

Job No.: PHY #892
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: SmartClass TPS
Mode: TX 2402MHz
Model: SCTPS-AB-CU
Manufacturer: JDSU

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2014/03/30
Time:
Engineer Signature: PEI
Distance: 3m

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2402.000	94.56	-7.45	87.11	/	/	peak			
2	4804.014	48.65	-0.30	48.35	74.00	-25.65	peak			
3	4804.014	42.73	-0.30	42.43	54.00	-11.57	AVG			
4	12583.040	11.44	38.50	49.94	74.00	-24.06	peak			
5	12583.040	0.00	38.50	38.50	54.00	-15.50	AVG			

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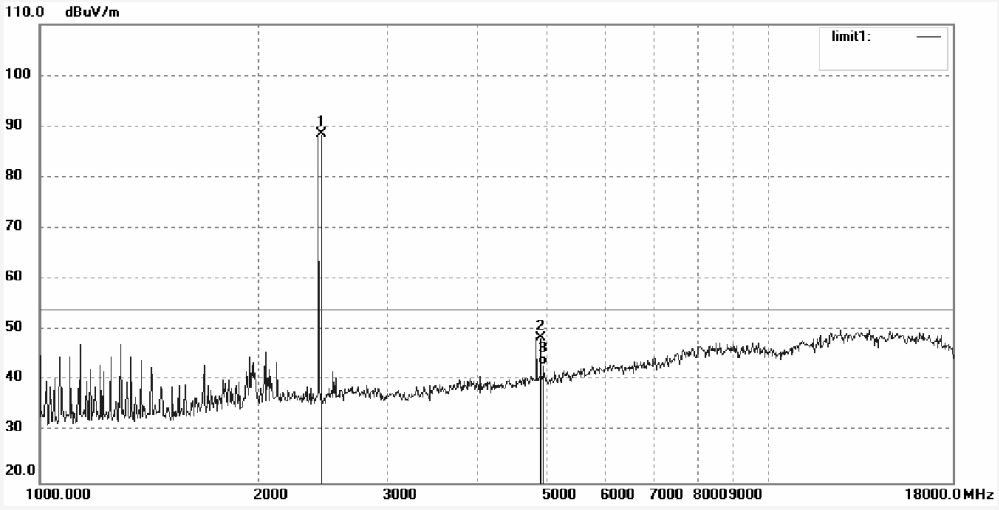
Fax:+86-0755-26503396

Job No.: PHY #895	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2014/03/30
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: SmartClass TPS	Engineer Signature: PEI
Mode: TX 2440MHz	Distance: 3m
Model: SCTPS-AB-CU	
Manufacturer: JDSU	

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	95.90	-7.36	88.54	/	/	peak			
2	4880.026	48.38	0.13	48.51	74.00	-25.49	peak			
3	4880.026	42.96	0.13	43.09	54.00	-10.91	AVG			

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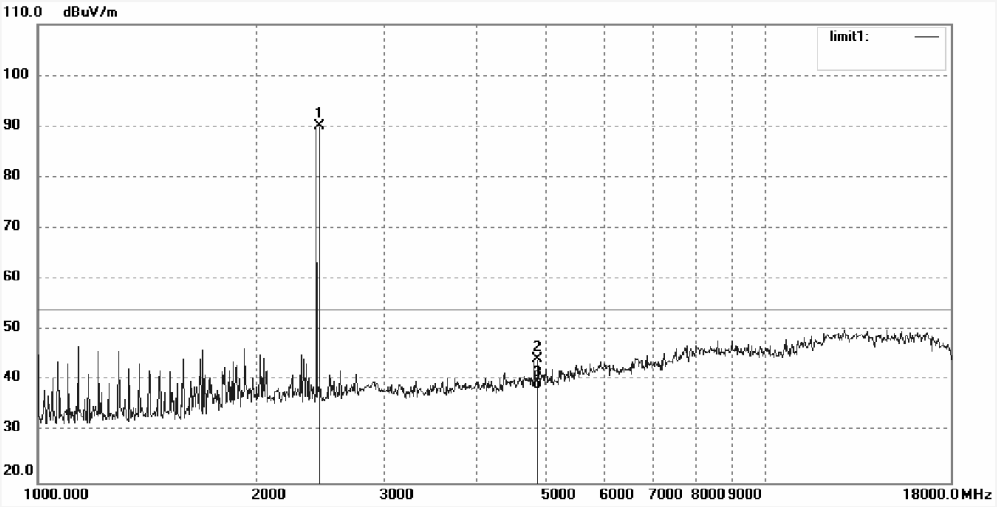
Fax:+86-0755-26503396

Job No.: PHY #896
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: SmartClass TPS
Mode: TX 2440MHz
Model: SCTPS-AB-CU
Manufacturer: JDSU

Polarization: Vertical
Power Source: AC 120V/60Hz
Date: 2014/03/30
Time:
Engineer Signature: PEI
Distance: 3m

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2440.000	97.35	-7.36	89.99	/	/	peak			
2	4880.018	44.04	0.13	44.17	74.00	-29.83	peak			
3	4880.018	38.25	0.13	38.38	54.00	-15.62	AVG			

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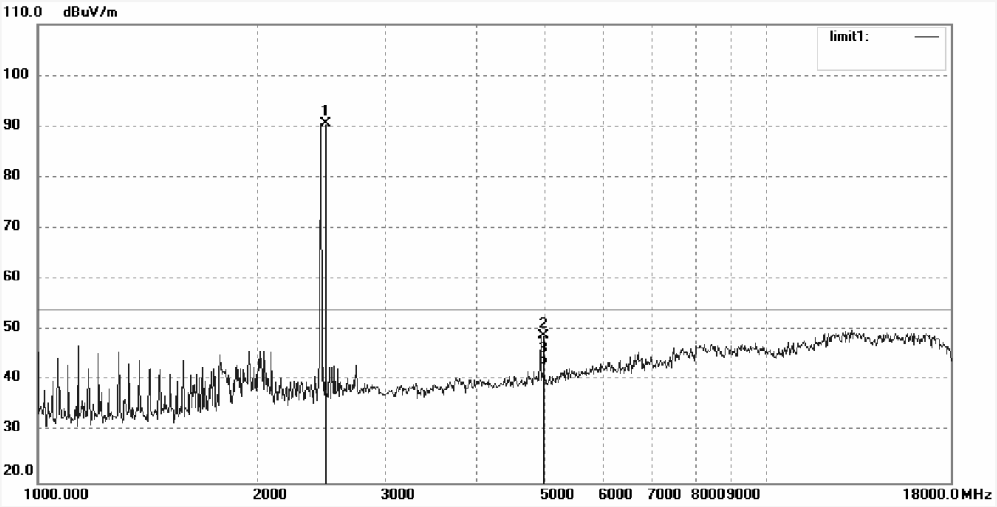
Fax:+86-0755-26503396

Job No.: PHY #897	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2014/03/30
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: SmartClass TPS	Engineer Signature: PEI
Mode: TX 2480MHz	Distance: 3m
Model: SCTPS-AB-CU	
Manufacturer: JDSU	

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	97.81	-7.37	90.44	/	/	peak			
2	4960.027	48.38	0.52	48.90	74.00	-25.10	peak			
3	4960.027	42.65	0.52	43.17	54.00	-10.83	AVG			

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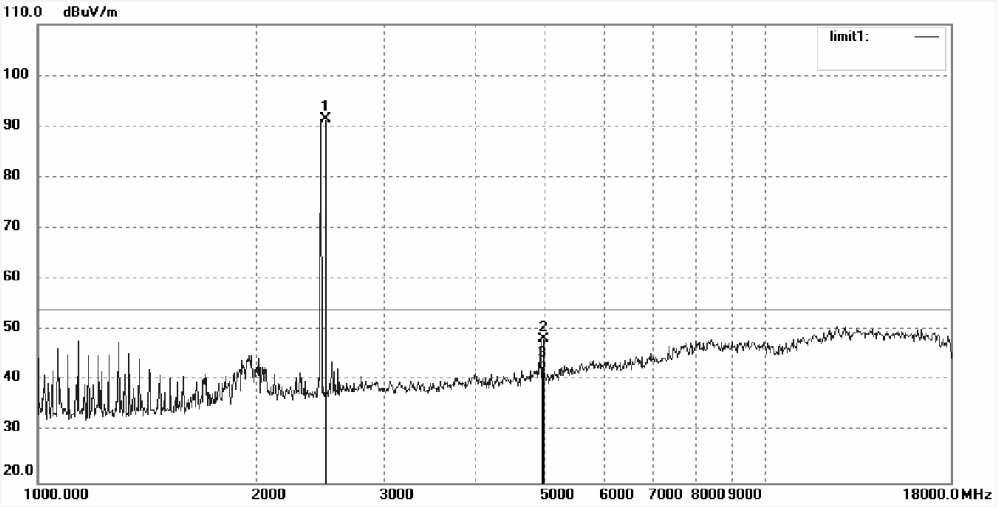
Job No.: PHY #898
Standard: FCC Class B 3M Radiated
Test item: Radiation Test
Temp.(C)/Hum.(%) 23 C / 48 %
EUT: SmartClass TPS
Mode: TX 2480MHz
Model: SCTPS-AB-CU
Manufacturer: JDSU

Polarization: Horizontal
Power Source: AC 120V/60Hz
Date: 2014/03/30
Time:
Engineer Signature: PEI
Distance: 3m

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	2480.000	98.83	-7.37	91.46	/	/	peak			
2	4960.023	47.63	0.52	48.15	74.00	-25.85	peak			
3	4960.023	41.57	0.52	42.09	54.00	-11.91	AVG			

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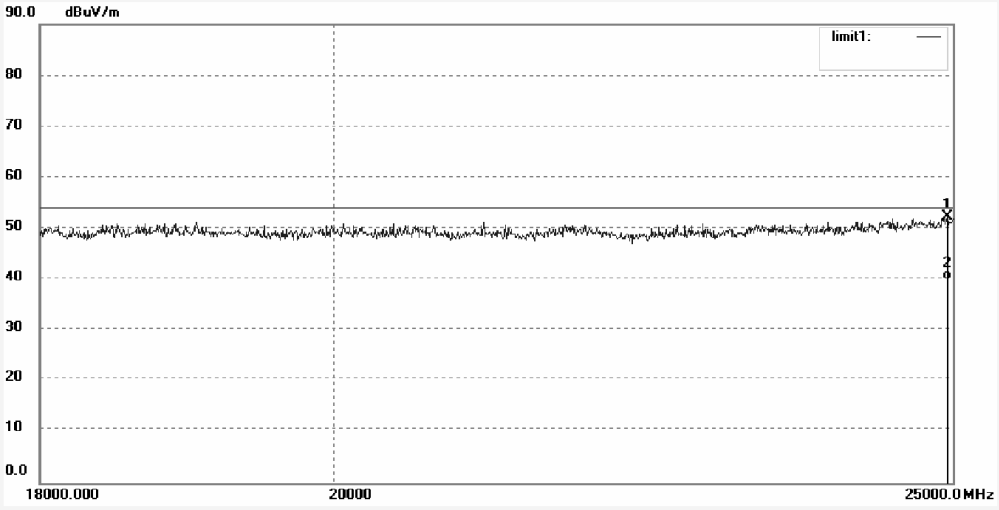
Fax:+86-0755-26503396

Job No.: PHY #1065	Polarization: Vertical
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2014/04/09
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: SmartClass TPS	Engineer Signature: PEI
Mode: TX 2402MHz	Distance: 3m
Model: SCTPS-AB-CU	
Manufacturer: JDSU	

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	24950.674	33.56	18.83	52.39	74.00	-21.61	peak			
2	24950.674	21.10	18.83	39.93	54.00	-14.07	AVG			

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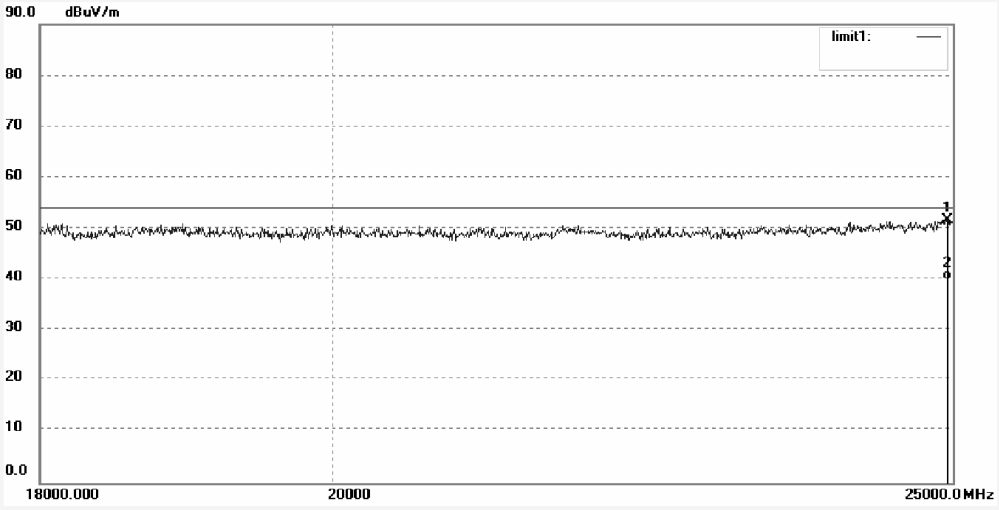
Fax:+86-0755-26503396

Job No.: PHY #1066	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2014/04/09
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: SmartClass TPS	Engineer Signature: PEI
Mode: TX 2402MHz	Distance: 3m
Model: SCTPS-AB-CU	
Manufacturer: JDSU	

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	24950.674	32.92	18.83	51.75	74.00	-22.25	peak			
2	24950.674	21.22	18.83	40.05	54.00	-13.95	AVG			

ACCURATE TECHNOLOGY CO., LTD.
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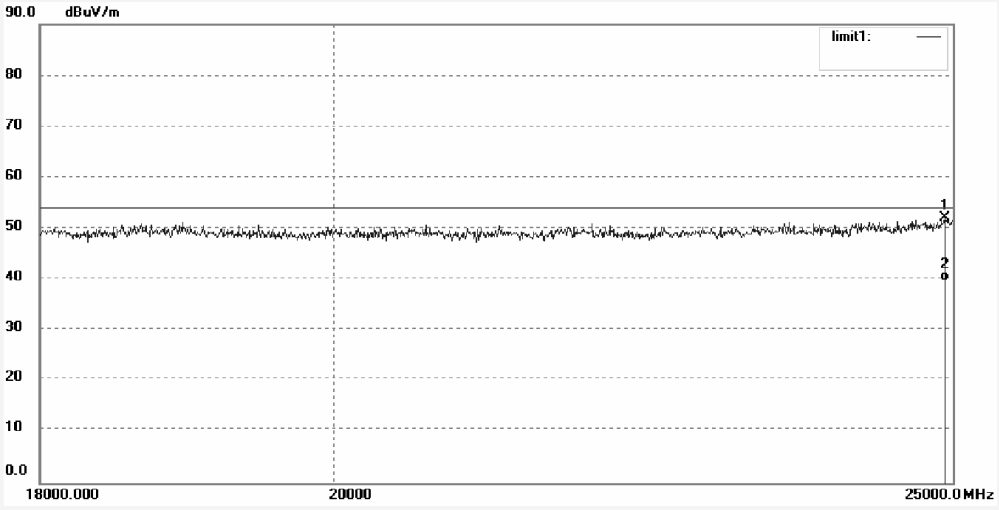
Science & Industry Park,Nanshan Shenzhen,P.R.China

Site: 2# Chamber
Tel:+86-0755-26503290
Fax:+86-0755-26503396

Job No.: PHY #1067	Polarization: Horizontal
Standard: FCC Class B 3M Radiated	Power Source: AC 120V/60Hz
Test item: Radiation Test	Date: 2014/04/09
Temp.(C)/Hum.(%) 23 C / 48 %	Time:
EUT: SmartClass TPS	Engineer Signature: PEI
Mode: TX 2440MHz	Distance: 3m
Model: SCTPS-AB-CU	
Manufacturer: JDSU	

Note: Bluetooth 4.0



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	24926.048	33.27	18.80	52.07	74.00	-21.93	peak			
2	24926.048	20.98	18.80	39.78	54.00	-14.22	AVG			