FCC and IC Radio Test Report

Equipment	:	Cisco Aironet 700 Series Access Point
Brand Name	:	CISCO
Model No.	:	AIR-CAP702I-A-K9, AIR-SAP702I-A-K9, AIR-CAP702I-N-K9, AIR-SAP702I-N-K9, AIR-CAP702I-Z-K9, AIR-SAP702I-Z-K9
FCC ID	:	LDK102085
IC	:	2461B-102085
Standard	:	47 CFR FCC Part 15.247 IC RSS-210 Issue 8 and RSS-Gen Issue 3
Frequency Range	:	2400 MHz – 2483.5 MHz
Equipment Class	:	DTS
Applicant	:	CISCO System, Inc. 170 West Tasman Drive San Jose, CA 95134-1706
Manufacturer	:	Wistron NeWeb Corporation 20 Park Avenue II, Hsinchu Science Park, Hsinchu 308,Taiwan,R.O.C.

The product sample received on Oct. 05, 2012 and completely tested on Apr. 12, 2013. We, SPORTON, would like to declare that the tested sample has been evaluated in accordance with the procedures given in ANSI C63.10-2009 and shown compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Jordan Hsiao

Testing Laboratory
1190

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Summary of Test Result

Conformance Test Specifications						
Report Clause	**FCC Std. Clause**	**IC Std. Clause**	**Description**	**Measured**	**Limit**	**Result**
1.1.2	15.203	-	Antenna Requirement	Antenna connector mechanism complied	FCC 15.203	Complied
3.1	15.207	RSS-Gen 7.2.4	AC Power-line Conducted Emissions	[dBuV]: 21.169MHz 38.62 (Margin 11.38dB) - AV 40.70 (Margin 19.30dB) - QP	FCC 15.207 / RSS-Gen 7.2.4	Complied
3.2	15.247(a)	RSS-210 A8.2	6dB Bandwidth	6dB Bandwidth Unit [MHz] :17.68	≥500kHz	Complied
3.3	15.247	RSS-210	26dB Bandwidth	26dB Bandwidth [MHz]:25.24	Information only	Complied
3.4	15.247(b)	RSS-210 A8.4	RF Output Power (Maximum Conducted Output Power)	Power [dBm]:20.43	Power [dBm]:30	Complied
3.5	15.247(d)	RSS-210 A8.2	Power Spectral Density	PSD [dBm/3kHz]:-2.99	PSD [dBm/3kHz]:8	Complied
3.6	15.247(c)	RSS-210 A8.5	Transmitter Conducted Bandedge Emissions	[dBm]: -21.35 (Margin 0.10dB) - PK -41.37 (Margin 0.12dB) - AV	Restricted Bands: FCC 15.209 / RSS-Gen 7.2.5 PK: -21.25dBm AV: -41.25dBm	Complied
3.7	15.247(c)	RSS-210 A8.5	Transmitter Conducted Unwanted Emissions	45.04dB (Margin 15.04dB)	Non-Restricted Bands: > 30 dBc	Complied
3.8	15.247(c)	RSS-210 A8.5	Transmitter Radiated Unwanted Emissions	Restricted Bands [dBuV/m at 3m]: 41.09MHz 36.65 (Margin 3.35dB) - QP	Restricted Bands: FCC 15.209 / RSS-Gen 7.2.5	Complied

Revision History

Report No.	Version	Description	Issued Date
FR281405-03AA	Rev. 01	Initial issue of report	Apr. 17, 2013

1 General Description

1.1 Information

1.1.1 RF General Information

RF General Information				
Frequency Range (MHz)	**Operating Mode**	**Ch. Freq. (MHz)**	**Channel Number**	**Co-location**
2400-2483.5	Legacy CCK, 1 to 11Mbps	2412-2462	1-11 [11]	Yes
2400-2483.5	Non HT-20, 6 to 54Mbps	2412-2462	1-11 [11]	Yes
2400-2483.5	Non HT-20, Beam Forming, 6 to 54Mbps	2412-2462	1-11 [11]	Yes
2400-2483.5	HT-20, M0 to M15	2412-2462	1-11 [11]	Yes
2400-2483.5	HT-20, STBC, M0 to M7	2412-2462	1-11 [11]	Yes
2400-2483.5	HT-20, Beam Forming, M0 to M7	2412-2462	1-11 [11]	Yes
2400-2483.5	HT-20, Beam Forming, M8 to M15	2412-2462	1-11 [11]	Yes

Note 1: RF output power specifies that Maximum Conducted Output Power.

Note 2: Legacy CCK uses a combination of DSSS-DBPSK, DQPSK, CCK modulation.

Note 3: Non HT-20/HT-20 uses a combination of OFDM-BPSK, QPSK, 16QAM, 64QAM modulation.

Note 4: Co-location, Co-location is generally defined as simultaneously transmitting (co-transmitting) antennas within 20 cm of each other. (EUT has simultaneously co-transmitting that operating 2.4GHz and 5GHz.)

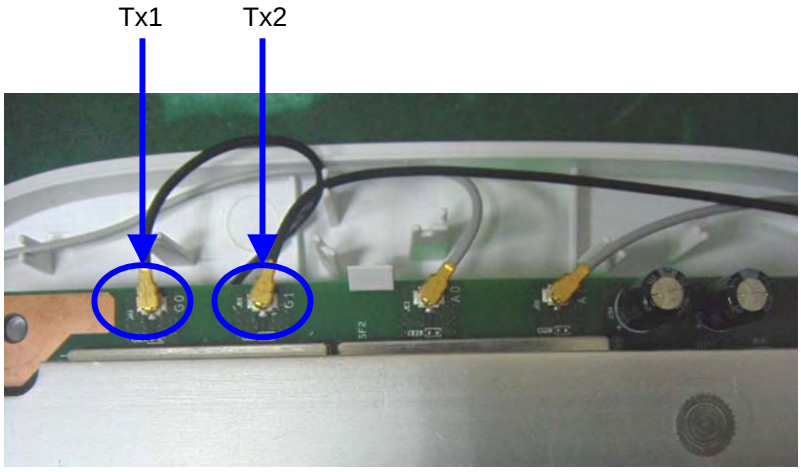
1.1.2 Antenna Information

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)
1	WNC	WNC	PIFA Antenna	I-PEX	3
2	WNC	WNC	PIFA Antenna	I-PEX	3

1.1.3 EUT Description

Operating Mode	Legacy CCK 1 to 11Mbps		Non HT-20 6 to 54Mbps		Non HT-20 BF 6 to 54Mpbs		HT-20 M0 to M15		HT-20 STBC M0 to M7		HT-20 BF M0 to M7		HT-20 BF M8 to M15	
Tx	1	2	1	2	1	2	1	2	1	2	1	2	1	2
Single (Tx)	V	-	V	-	-	-	V	-	-	-	-	-	-	-
Two (Tx)	V	V	V	V	V	V	V	V	V	V	V	V	V	V

Note: BF: Beam Forming



1.1.4 Type of EUT

Identify EUT	
EUT Serial Number	N/A
Presentation of Equipment	☐ Production ; ☒ Pre-Production ; ☐ Prototype
The EUT has six model names. All the models are identical; the different model names served as marketing strategy.	
Type of EUT	
☒	Stand-alone
☐	Combined (EUT where the radio part is fully integrated within another device) Combined Equipment – Brand Name / Model No.: -
☐	Plug-in radio (EUT intended for a variety of host systems) Host System – Brand Name / Model No.: -
☐	Other:

1.1.5 EUT Operational Condition

EUT Power Type	From Power Adapter / POE

1.2 Accessories

Accessories					
No.	Equipment Name	Brand Name	Model Name	Rating	Remark
1	AC Adapter	CISCO	AA25480L	INPUT: 100-240V ~ 600mA, 50/60Hz OUTPUT: 48V, 380mA	With power cable
2	AC Adapter	CISCO	EADP-18MB B	INPUT: 100-240V ~ 0.5A, 50-60Hz OUTPUT: 48V, 0.38A	With power cable

1.3 Support Equipment

Support Equipment				
No.	Equipment	Brand Name	Model Name	FCC ID
1	Notebook	DELL	M1330	E2KWM3945ABG
2	Notebook	DELL	E6220	E2KWM3945ABG
3	Notebook	DELL	E6220	E2KWM3945ABG
4	Notebook	DELL	E6400	E2KWM3945ABG
5	POE	CISCO	DPSN-35FB A	N/A
6	POE	CISCO	POE30U-560(G)	N/A
7	POE Switch	MOTOROLA	RFS-4010	N/A

1.4 Testing Applied Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- 47 CFR FCC Part 15
- ANSI C63.10-2009
- FCC KDB 558074
- FCC KDB 662911
- FCC KDB 412172

1.5 Testing Location Information

Testing Location					
☐	HWA YA	ADD : No. 52, Hwa Ya 1st Rd., Kwei-Shan Hsiang, Tao Yuan Hsien, Taiwan, R.O.C.			
		TEL : 886-3-327-3456	FAX : 886-3-318-0055		
☒	JHUBEI	ADD : No.8, Lane 724, Bo-ai St., Jhubei City, HsinChu County 302, Taiwan, R.O.C.			
		TEL : 886-3-656-9065	FAX : 886-3-656-9085		
Test Condition		**Test Site No.**		**Test Engineer**	**Test Environment**
RF Conducted		TH01-CB		Satoshi Yang	24°C / 60%
AC Conduction		CO01-CB		Sollo Luo	24°C / 64%
Radiated Emission		03CH01-CB		Satoshi Yang	24°C / 60%

1.6 Measurement Uncertainty

ISO/IEC 17025 requires that an estimate of the measurement uncertainties associated with the emissions test results be included in the report. The measurement uncertainties given below are based on a 95% confidence level (based on a coverage factor (k=2)

Measurement Uncertainty			
Test Item		**Uncertainty**	**Limit**
AC power-line conducted emissions		±2.26 dB	N/A
Emission bandwidth, 6dB bandwidth		±1.42 %	N/A
RF output power, conducted		±0.63 dB	N/A
Power density, conducted		±0.81 dB	N/A
Unwanted emissions, conducted	30 – 1000 MHz	±0.51 dB	N/A
	1 – 18 GHz	±0.67 dB	N/A
	18 – 40 GHz	±0.83 dB	N/A
	40 – 200 GHz	N/A	N/A
All emissions, radiated	30 – 1000 MHz	±2.56 dB	N/A
	1 – 18 GHz	±3.59 dB	N/A
	18 – 40 GHz	±3.82 dB	N/A
	40 – 200 GHz	N/A	N/A
Temperature		±0.8 °C	N/A
Humidity		±3 %	N/A
DC and low frequency voltages		±3 %	N/A
Time		±1.42 %	N/A
Duty Cycle		±1.42 %	N/A

2 Test Configuration of EUT

2.1 The Worst Case Modulation Configuration

Worst Modulation Used for Conformance Testing	
Operating Mode	**Worst Data Rate / MCS**
Legacy CCK, 1 to 11Mbps	11Mbps
Non HT-20, 6 to 54Mbps	6Mbps
Non HT-20, Beam Forming, 6 to 54Mbps	6Mbps
HT-20, M0 to M15	6.5Mbps (M0)
HT-20, STBC, M0 to M7	6.5Mbps (M0)
HT-20, Beam Forming, M0 to M7	6.5Mbps (M0)
HT-20, Beam Forming, M8 to M15	13Mbps (M8)
Note 1: IEEE Std. 802.11n modulation consists of HT-20 and HT-40 (HT: High Throughput). Then EUT support HT-20 only. Worst modulation mode of Guard Interval (GI) is 400ns. Note 2: Modulation modes consist below configuration: M: Modulation and Coding Scheme Note 3: RF output power specifies that Maximum Conducted Output Power.	

2.2 Test Channel Frequencies Configuration

Test Channel Frequencies Configuration	
Operating Mode	**Test Channel Frequencies (MHz)**
Legacy CCK, 1 to 11Mbps	2412, 2437, 2462
Non HT-20, 6 to 54Mbps	
Non HT-20, Beam Forming, 6 to 54Mbps	
HT-20, M0 to M15	
HT-20, STBC, M0 to M7	
HT-20, Beam Forming, M0 to M7	
HT-20, Beam Forming, M8 to M15	

2.3 The Worst Case Power Setting Parameter

The Worst Case Power Setting Parameter				
Test Software Version	ART 2 GUI:2.3			
Operating Mode	**N_{TX}**	**Test Frequency (MHz)**		
		2412 MHz	**2437 MHz**	**2462 MHz**
Legacy CCK, 1 to 11Mbps	2	17.5	17	17
Non HT-20, 6 to 54Mbps	1	16.5	-	17
Non HT-20, 6 to 54Mbps	2	16	16.5	15.5
Non HT-20, Beam Forming, 6 to 54Mbps	2	15.5	16.5	15
HT-20, M0 to M7	1	16.5	-	17
HT-20, M0 to M15 / HT-20, STBC, M0 to M7	2	16	16.5	15
HT-20, Beam Forming, M0 to M7	2	15.5	16.5	14.5
HT-20, Beam Forming, M8 to M15	2	15.5	16.5	15

2.4 Target Maximum Channel Power

		Target Maximum Channel Power (dBm)		
Operating Mode	**N_{TX}**	**Frequency (MHz)**		
		2412	**2437**	**2462**
Legacy CCK, 1 to 11Mbps	2	20.43	20.34	20.27
Non HT-20, 6 to 54Mbps	1	17.24	-	17.17
Non HT-20, 6 to 54Mbps	2	19.85	20.39	19.33
Non HT-20, Beam Forming, 6 to 54Mbps	2	19.30	20.42	18.96
HT-20, M0 to M7	1	17.17	-	17.35
HT-20, M0 to M15 / HT-20, STBC, M0 to M7	2	19.82	20.33	18.84
HT-20, Beam Forming, M0 to M7	2	19.16	20.36	18.29
HT-20, Beam Forming, M8 to M15	2	19.14	20.24	18.76

2.5 EUT Operation during Test

During the test, “ART 2 GUI:2.3” under WIN XP was executed the test program to control the EUT continuously transmit RF signal.

2.6 The Worst Case Measurement Configuration

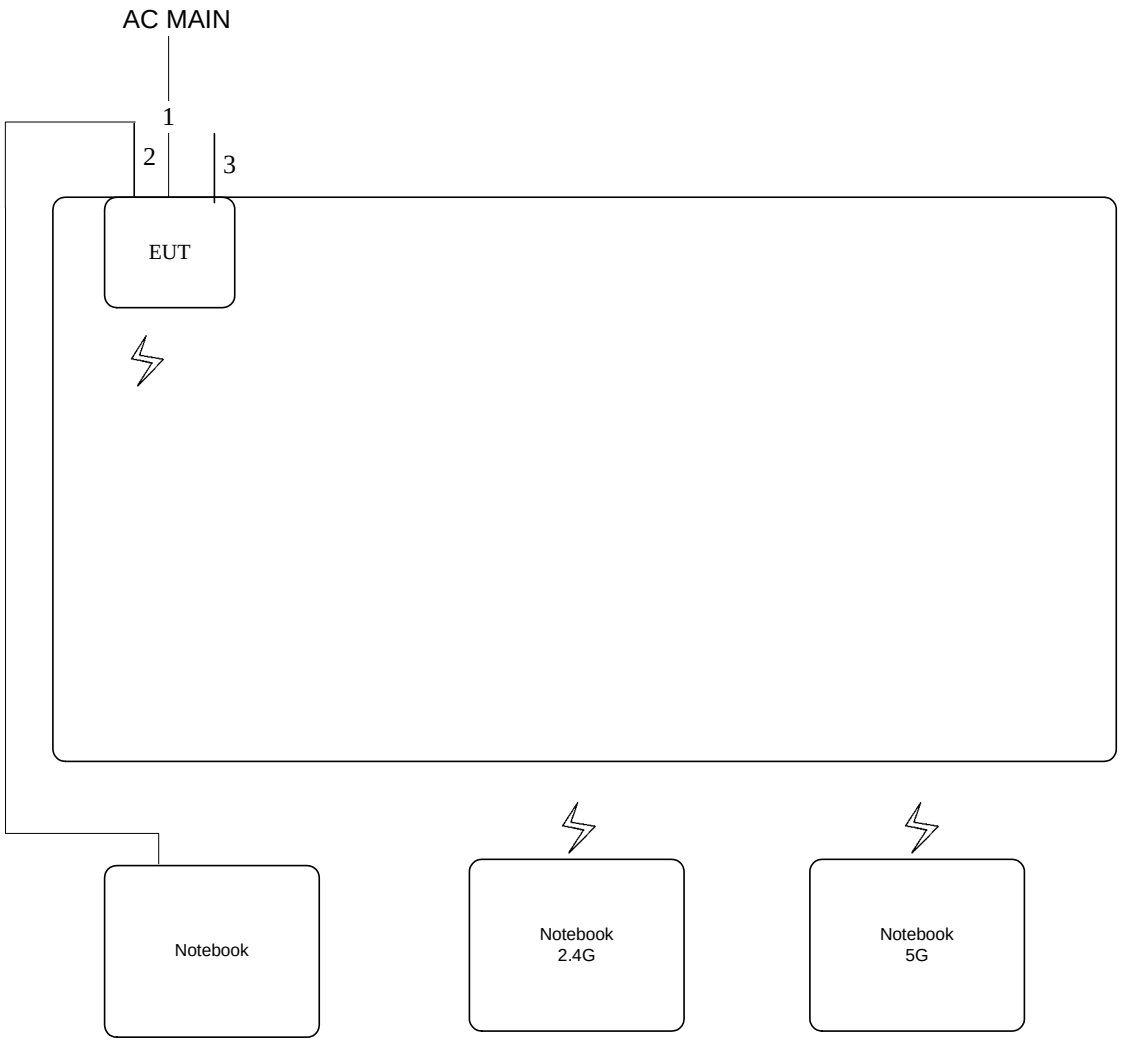
The Worst Case Mode for Following Conformance Tests	
Tests Item	AC power-line conducted emissions
Test Condition	AC power-line conducted measurement for line and neutral Test Voltage: 120Vac / 60Hz
Test Mode	Normal Link
1	EUT with AC Adapter 1 (CISCO AA25480L)
2	EUT with AC Adapter 2 (CISCO EADP-18MB B)
For test mode 2 is the worst case and it was record in this test report.	

The Worst Case Mode for Following Conformance Tests	
Tests Item	6 dB Bandwidth 26 dB Bandwidth RF Output Power Power Spectral Density Transmitter Conducted Bandedge Emissions Transmitter Conducted Unwanted Emissions
Test Condition	Conducted measurement at transmit chains
Operating Mode	Legacy CCK / Non HT-20 / Non HT-20, Beam Forming / HT-20 / HT-20, STBC / HT-20, Beam Forming

The Worst Case Mode for Following Conformance Tests	
Tests Item	Transmitter Radiated Unwanted Emissions
Test Condition	Radiated measurement
Test Mode < 1GHz	Normal Link
1	Stand-up of EUT with AC Adapter 1 (CISCO AA25480L)
2	Laying-flat of EUT with AC Adapter 1 (CISCO AA25480L)
Mode 1 has been evaluated to be the worst case, thus measurement will follow this same test mode.	
3	Stand-up of EUT with AC Adapter 2 (CISCO EADP-18MB B)
4	Stand-up of EUT with POE 1 (CISCO DPSN-35FB A)
5	Stand-up of EUT with POE 2 (CISCO POE30U-560(G))
6	Stand-up of EUT with POE Switch (MOTOROLA RFS-4010)
For test mode 4 is the worst case and it was record in this test report.	
Operating Mode	Legacy CCK / Non HT-20 / Non HT-20, Beam Forming / HT-20 / HT-20, STBC / HT-20, Beam Forming
Test Mode > 1GHz	Continuously transmit RF signal
1	Stand-up of EUT
2	Laying-flat of EUT
For test mode 2 is the worst case and it was record in this test report.	

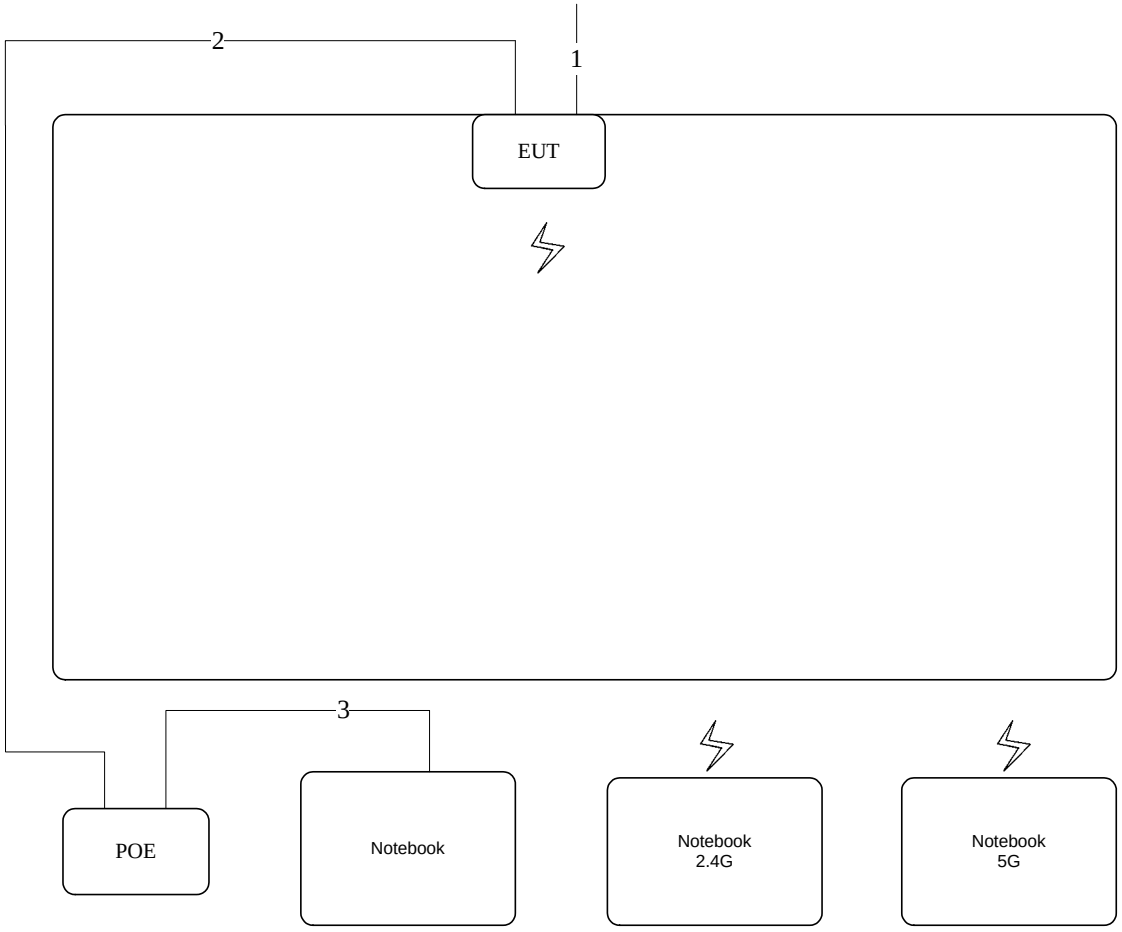
2.7 Test Setup Diagram

Test Setup Diagram – AC Line Conducted Emission Test	
Test Mode 2	EUT with AC Adapter 2 (CISCO EADP-18MB B)



Item	Connection	Shield	Length	Remark
1	Power Cable	No	1.8m	-
2	RJ-45 Cable	No	10m	-
3	RS-232 Cable	No	1.5m	-

Test Setup Diagram - Radiated Test	
Test Mode 4	Stand-up of EUT with POE 1 (CISCO DPSN-35FB A)



Item	Connection	Shield	Length	Remark
1	RS-232 Cable	No	1.5m	-
2	RJ-45 Cable	No	10m	-
3	RJ-45 Cable	No	1.5m	-

3 Transmitter Test Result

3.1 AC Power-line Conducted Emissions

3.1.1 AC Power-line Conducted Emissions Limit

AC Power-line Conducted Emissions Limit		
Frequency Emission (MHz)	**Quasi-Peak**	**Average**
0.15-0.5	66 - 56 *	56 - 46 *
0.5-5	56	46
5-30	60	50
Note 1: * Decreases with the logarithm of the frequency.		

3.1.2 Measuring Instruments

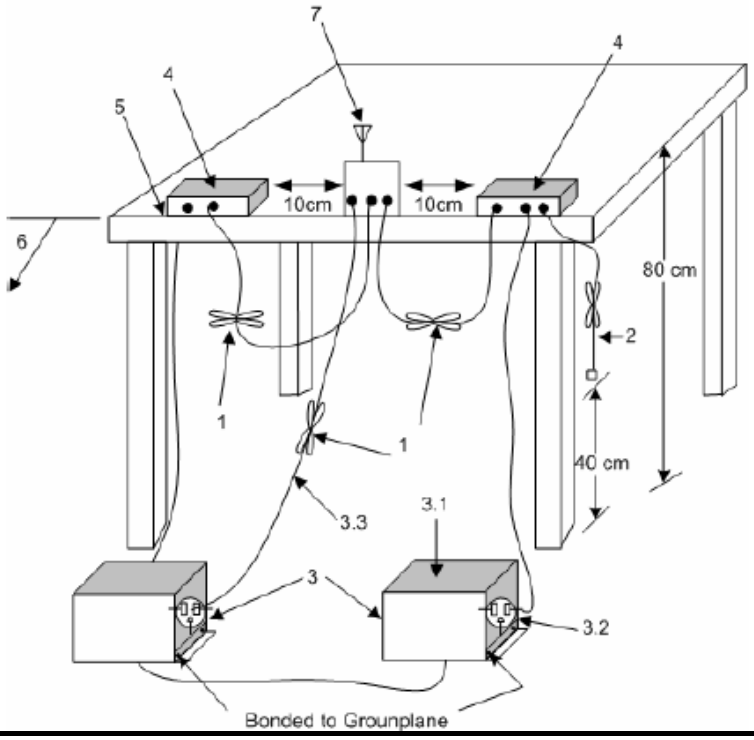
Refer a test equipment and calibration data table in this test report.

3.1.3 Test Procedures

Test Method
☒ Refer as ANSI C63.10-2009, clause 6.2 for AC power-line conducted emissions.

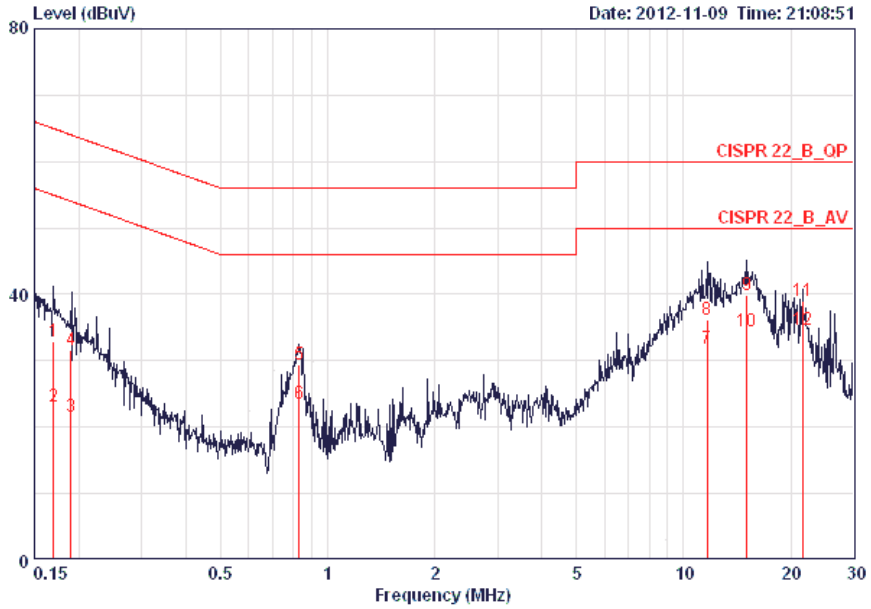
3.1.4 Test Setup

AC Power-line Conducted Emissions



3.1.5 Test Result of AC Power-line Conducted Emissions

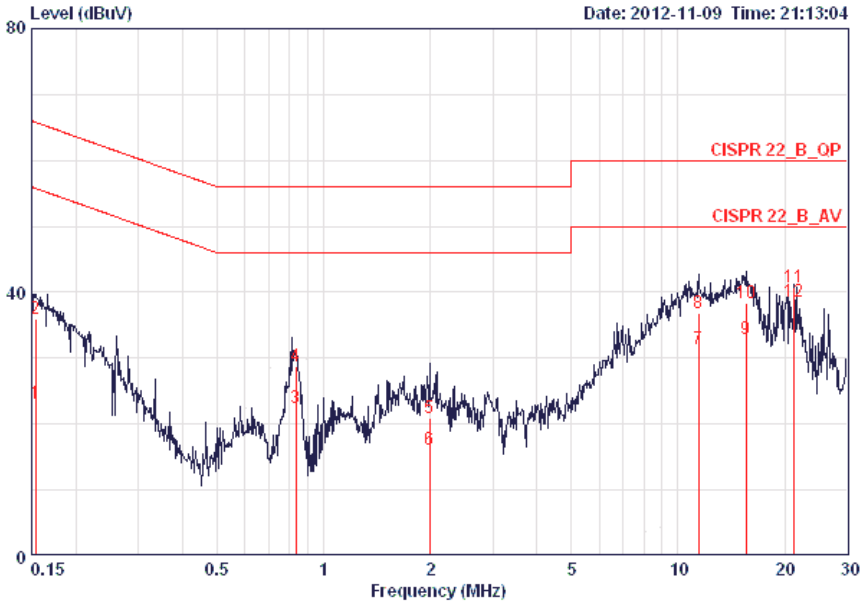
AC Power-line Conducted Emissions Result			
Test Mode	2	**Power Phase**	Neutral
Operating Function	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.16944	32.98	-32.01	64.99	32.70	0.08	0.20	NEUTRAL	QP
2	0.16944	23.05	-31.94	54.99	22.77	0.08	0.20	NEUTRAL	AVERAGE
3	0.18959	21.48	-32.57	54.05	21.20	0.08	0.20	NEUTRAL	AVERAGE
4	0.18959	31.50	-32.55	64.05	31.22	0.08	0.20	NEUTRAL	QP
5	0.83047	29.50	-26.50	56.00	29.21	0.09	0.20	NEUTRAL	QP
6	0.83047	23.49	-22.51	46.00	23.20	0.09	0.20	NEUTRAL	AVERAGE
7	11.621	31.73	-18.27	50.00	31.07	0.26	0.40	NEUTRAL	AVERAGE
8	11.621	36.29	-23.71	60.00	35.63	0.26	0.40	NEUTRAL	QP
9	15.066	39.92	-20.08	60.00	39.20	0.32	0.40	NEUTRAL	QP
10	15.066	34.55	-15.45	50.00	33.83	0.32	0.40	NEUTRAL	AVERAGE
11	21.662	38.91	-21.09	60.00	37.99	0.42	0.50	NEUTRAL	QP
12	21.662	34.57	-15.43	50.00	33.65	0.42	0.50	NEUTRAL	AVERAGE

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

AC Power-line Conducted Emissions Result			
Test Mode	2	**Power Phase**	Line
Operating Function	Normal Link		



	Freq	Level	Over Limit	Limit Line	Read Level	LISN Factor	Cable Loss	Pol/Phase	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	dB		
1	0.15403	23.07	-32.71	55.78	22.71	0.16	0.20	LINE	AVERAGE
2	0.15403	36.02	-29.76	65.78	35.66	0.16	0.20	LINE	QP
3	0.83337	22.47	-23.53	46.00	22.11	0.16	0.20	LINE	AVERAGE
4	0.83337	28.81	-27.19	56.00	28.45	0.16	0.20	LINE	QP
5	1.991	20.87	-35.13	56.00	20.48	0.19	0.20	LINE	QP
6	1.991	16.05	-29.95	46.00	15.66	0.19	0.20	LINE	AVERAGE
7	11.438	31.31	-18.69	50.00	30.55	0.36	0.40	LINE	AVERAGE
8	11.438	36.85	-23.15	60.00	36.09	0.36	0.40	LINE	QP
9	15.552	32.98	-17.02	50.00	32.16	0.42	0.40	LINE	AVERAGE
10	15.552	38.45	-21.55	60.00	37.63	0.42	0.40	LINE	QP
11	21.169	40.70	-19.30	60.00	39.70	0.50	0.50	LINE	QP
12 @	21.169	38.62	-11.38	50.00	37.62	0.50	0.50	LINE	AVERAGE

Note 1: “>20dB” means emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found emissions (No emissions were detected.)

3.2 6dB Bandwidth

3.2.1 6dB Bandwidth Limit

6dB Bandwidth Limit
6 dB bandwidth ≥ 500 kHz.

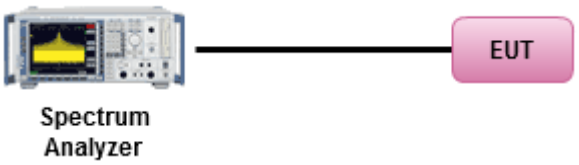
3.2.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.2.3 Test Procedures

Test Method	
☒	For the emission bandwidth shall be measured using one of the options below:
☒	Refer as FCC KDB 558074, clause 7.1 Option 1 for 6 dB bandwidth measurement.
☐	Refer as FCC KDB 558074, clause 7.2 Option 2 for 6 dB bandwidth measurement.
☐	Refer as ANSI C63.10, clause 6.9.1 for occupied bandwidth testing.

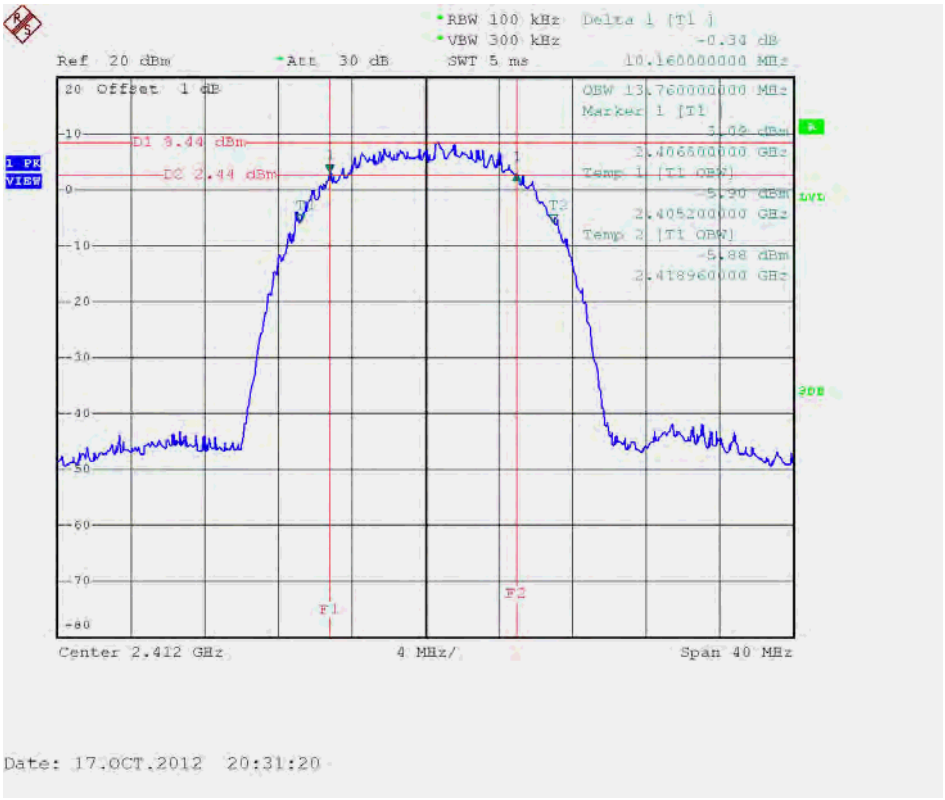
3.2.4 Test Setup

Emission Bandwidth


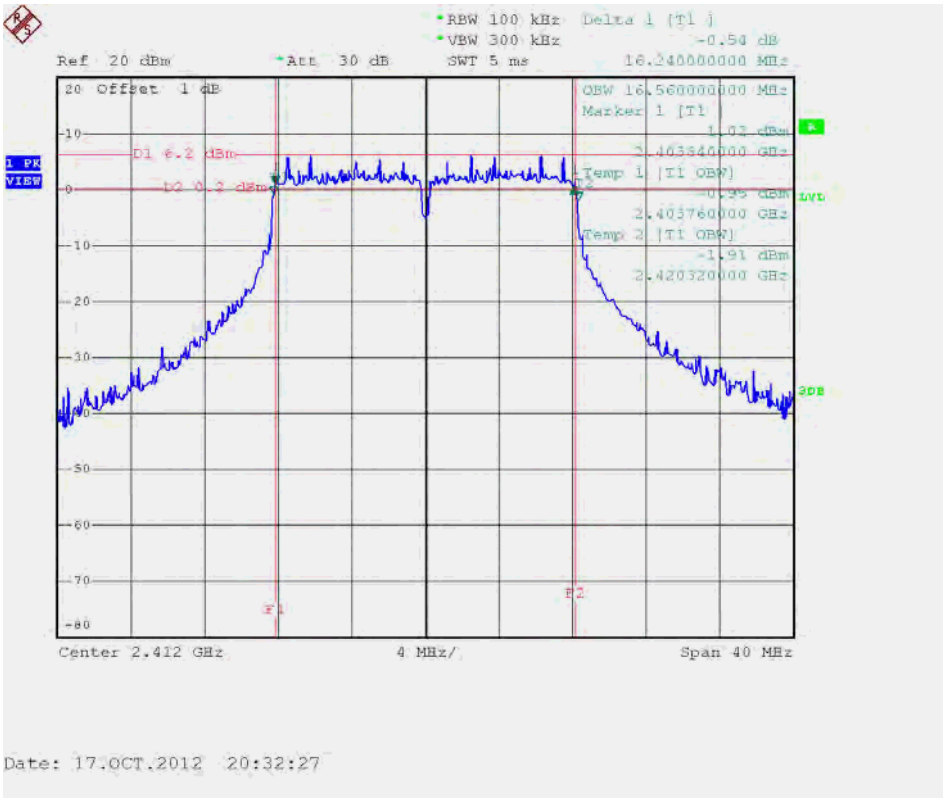
3.2.5 Test Result of Emission Bandwidth

Freq. (MHz)	Operating Mode	Data Rate (Mbps)	99% BW (MHz)	6dB BW (MHz)	Limit (kHz)	Margin (MHz)
2412	Legacy CCK, 1 to 11Mbps	11	13.76	10.16	>500	9.66
	Non HT-20, 6 to 54Mbps	6	16.56	16.24	>500	15.74
	Non HT-20, Beam Forming, 6 to 54Mbps	6	16.56	16.24	>500	15.74
	HT-20, M0 to M7	M0	17.68	17.6	>500	17.1
	HT-20, Beam Forming, M0 to M7	M0	17.68	17.6	>500	17.1
	HT-20, Beam Forming, M8 to M15	M8	17.84	17.68	>500	17.18
2437	Legacy CCK, 1 to 11Mbps	11	13.76	9.04	>500	8.54
	Non HT-20, Beam Forming, 6 to 54Mbps	6	16.56	16.28	>500	15.78
	HT-20, Beam Forming, M0 to M7	M0	17.76	17.52	>500	17.02
	HT-20, Beam Forming, M8 to M15	M8	17.76	17.64	>500	17.14
2462	Legacy CCK, 1 to 11Mbps	11	13.76	10.16	>500	9.66
	Non HT-20, 6 to 54Mbps	6	16.56	16.32	>500	15.82
	Non HT-20, Beam Forming, 6 to 54Mbps	6	16.56	16.32	>500	15.82
	HT-20, M0 to M7	M0	17.76	16.96	>500	16.45
	HT-20, Beam Forming, M0 to M7	M0	17.76	16.96	>500	16.46
	HT-20, Beam Forming, M8 to M15	M8	17.76	17.6	>500	17.1

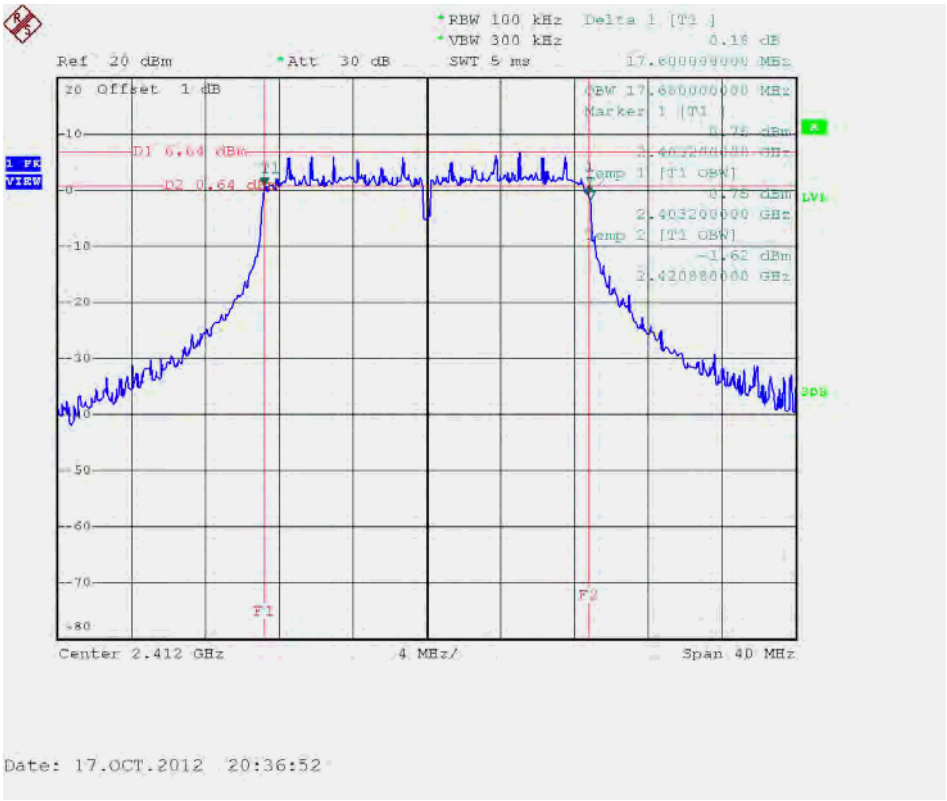
6 dB and 99% Bandwidth Plot on 2412 MHz, Legacy CCK, 11 Mbps



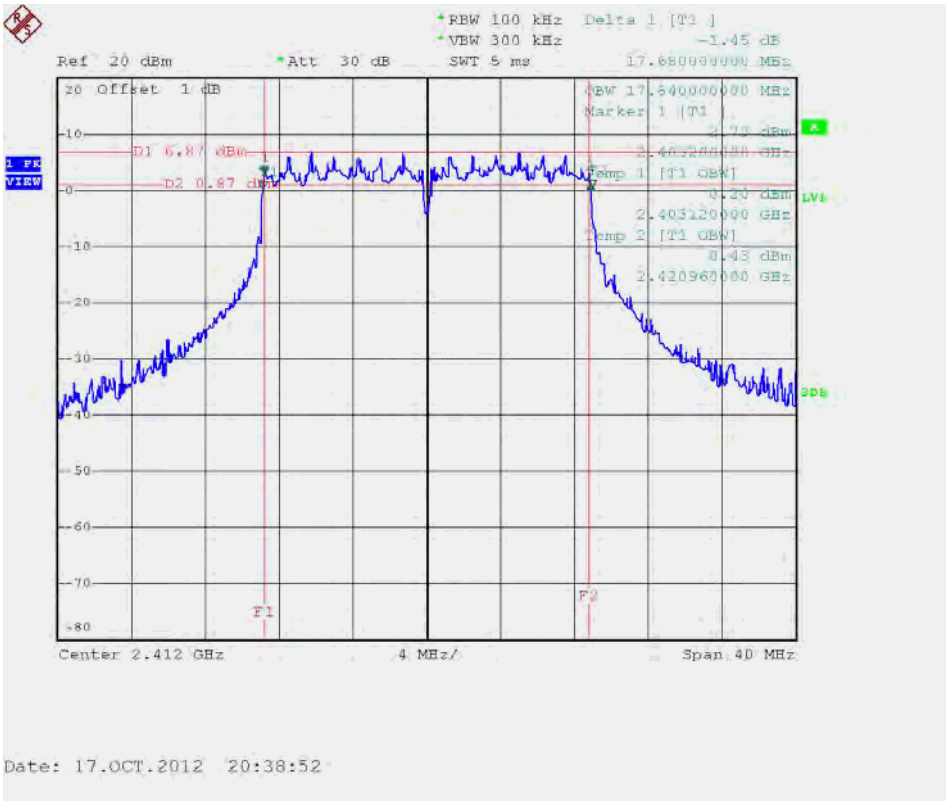
6 dB and 99% Bandwidth Plot on 2412 MHz, Non HT-20 / Non HT-20, Beam Forming, 6 Mbps



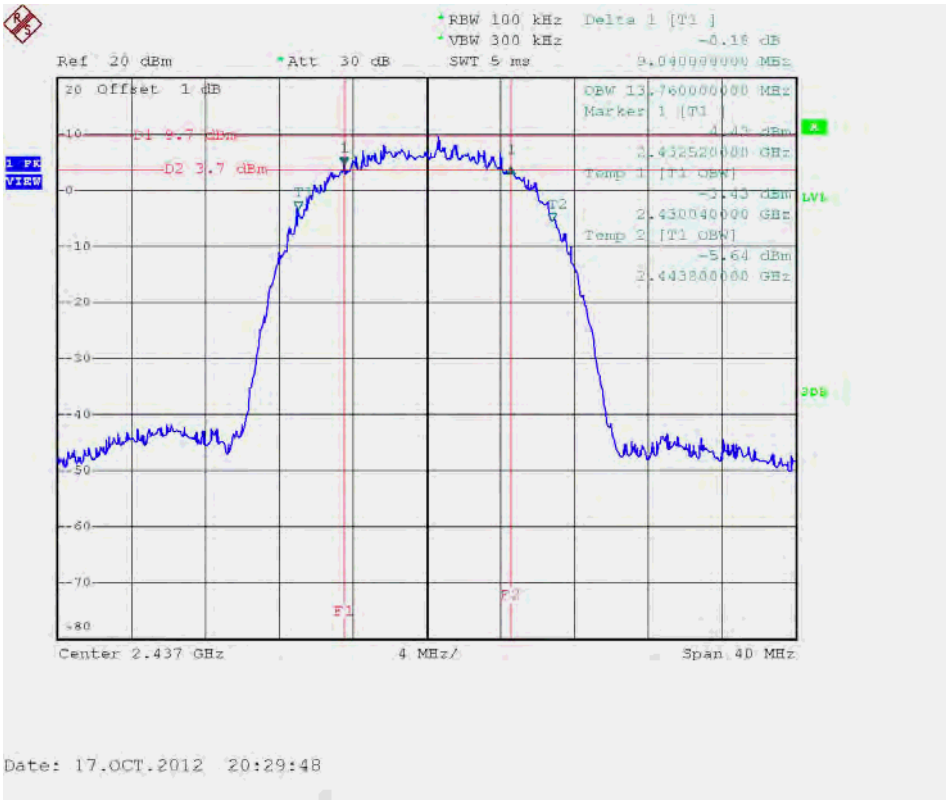
6 dB and 99% Bandwidth Plot on 2412 MHz, HT-20 / HT-20, Beam Forming, M0



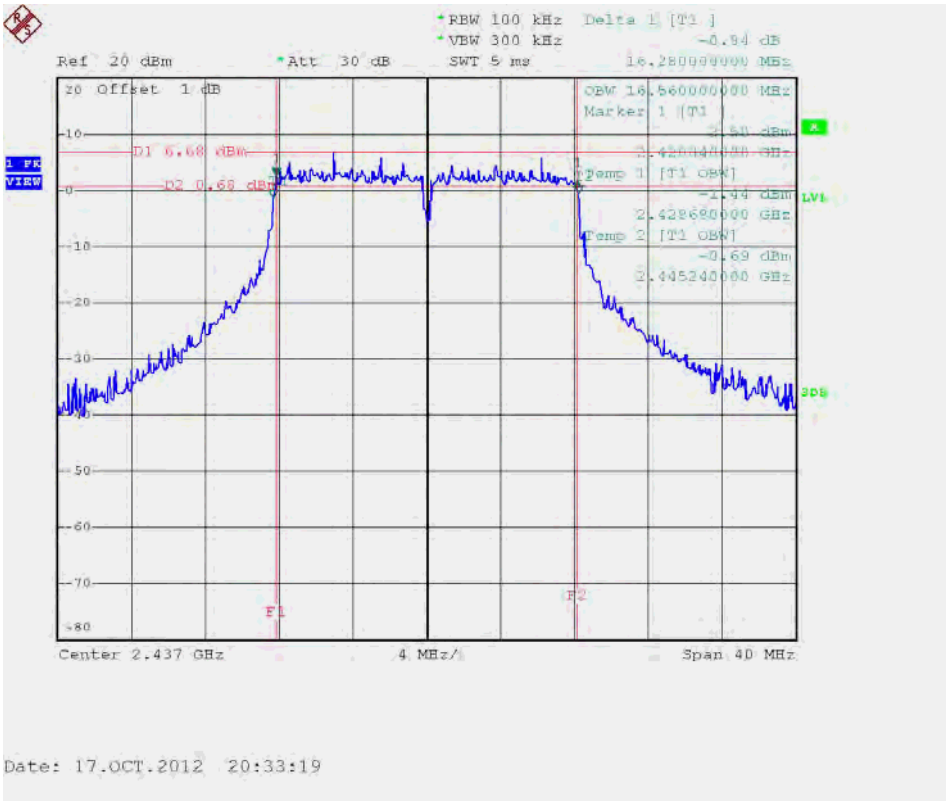
6 dB and 99% Bandwidth Plot on 2412 MHz, HT-20, Beam Forming, M8



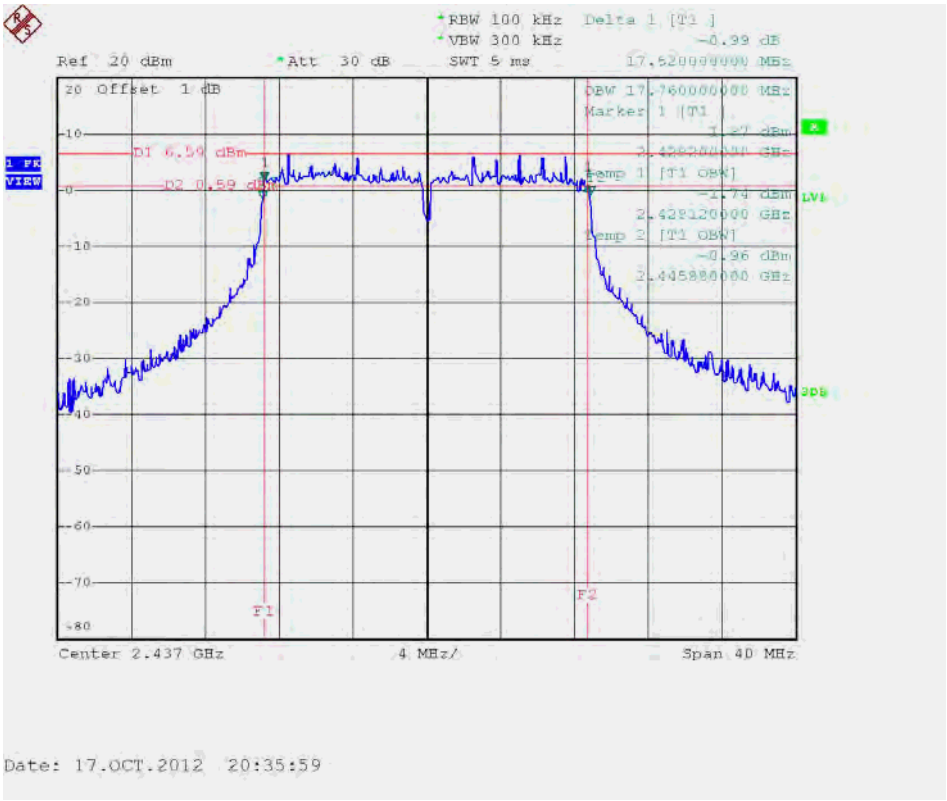
6 dB and 99% Bandwidth Plot on 2437 MHz, Legacy CCK, 11 Mbps



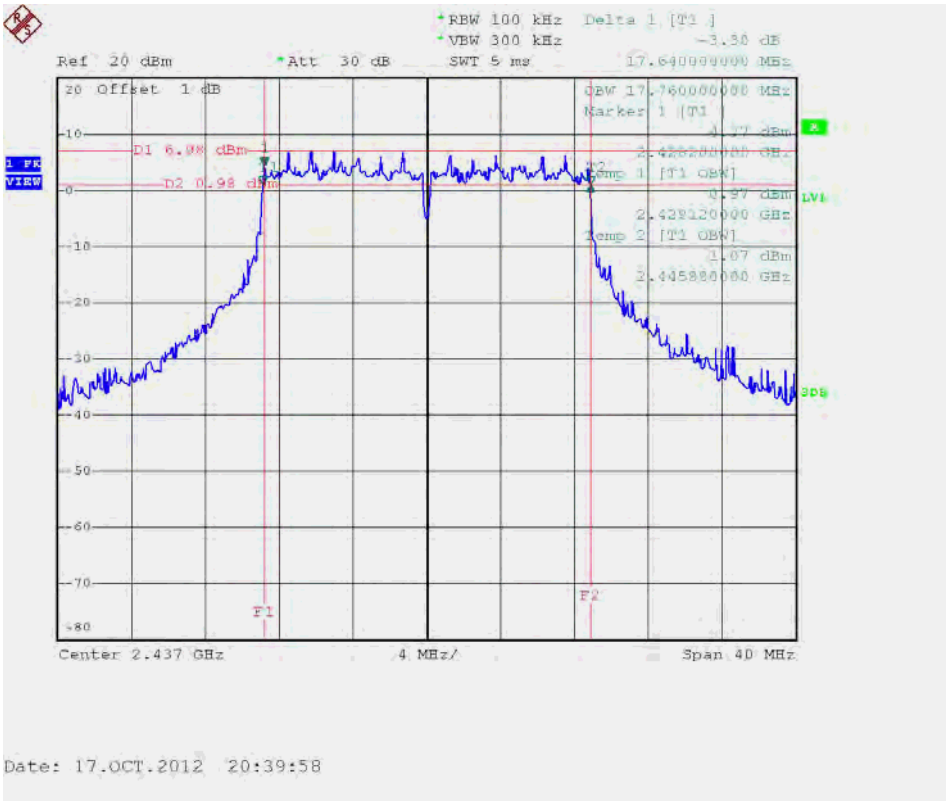
6 dB and 99% Bandwidth Plot on 2437 MHz, Non HT-20, Beam Forming, 6 Mbps



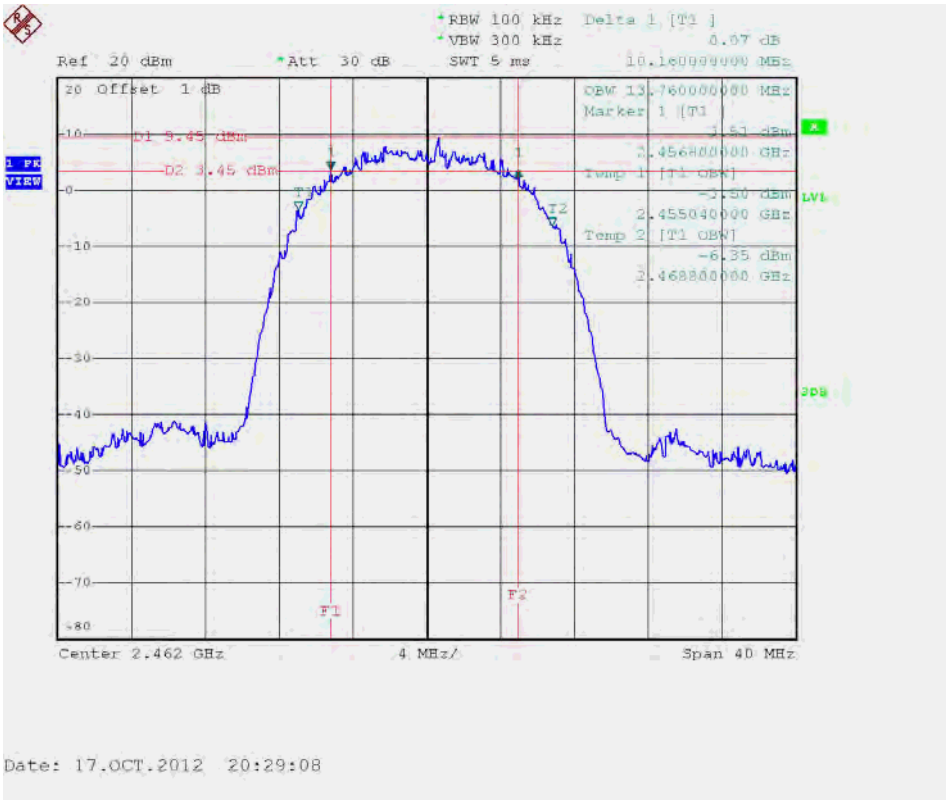
6 dB and 99% Bandwidth Plot on 2437 MHz, HT-20, Beam Forming, M0



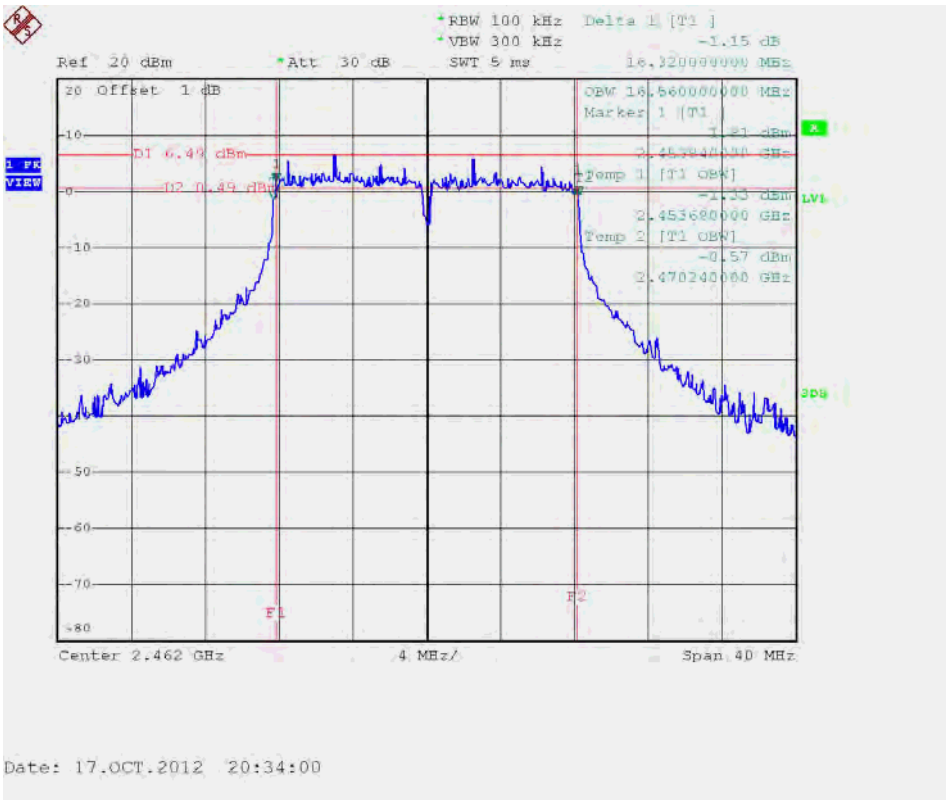
6 dB and 99% Bandwidth Plot on 2437 MHz, HT-20, Beam Forming, M8



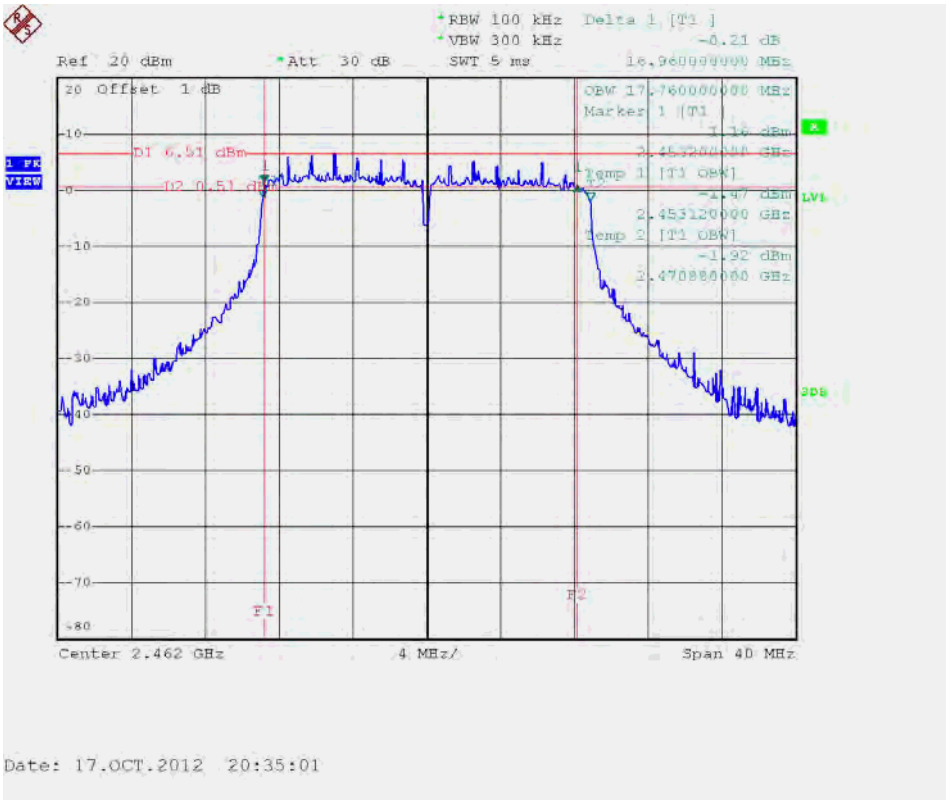
6 dB and 99% Bandwidth Plot on 2462 MHz, Legacy CCK, 11 Mbps



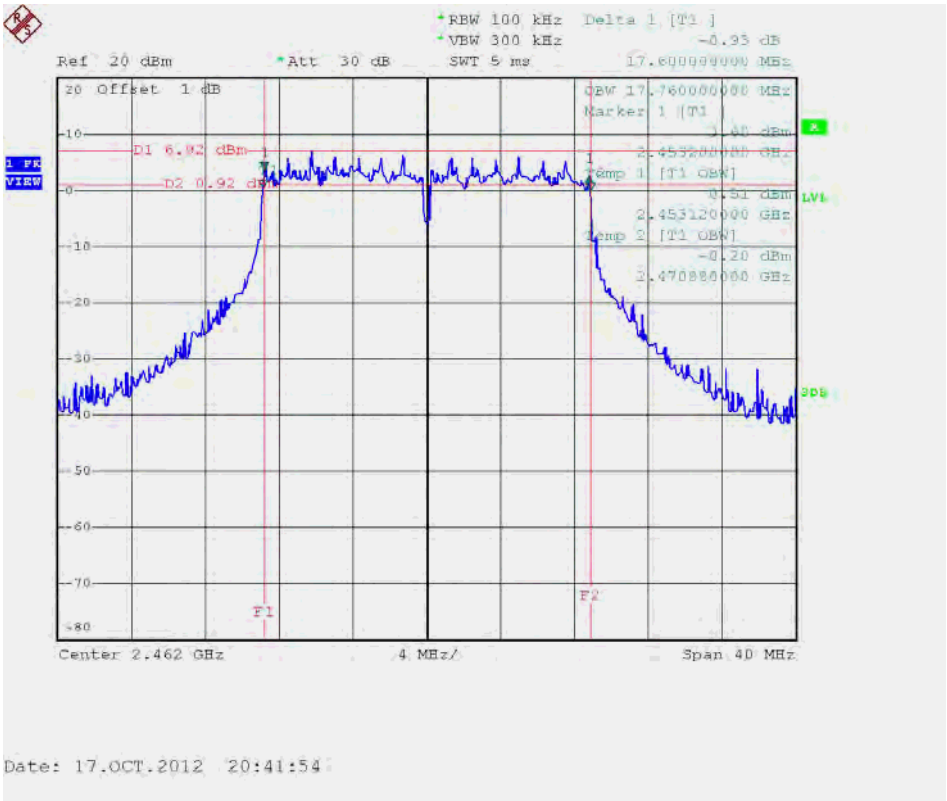
6 dB and 99% Bandwidth Plot on 2462 MHz, Non HT-20 / Non HT-20, Beam Forming, 6 Mbps



6 dB and 99% Bandwidth Plot on 2462 MHz, HT-20 / HT-20, Beam Forming, M0



6 dB and 99% Bandwidth Plot on 2462 MHz, HT-20, Beam Forming, M8



3.3 26dB Bandwidth

3.3.1 Measuring Instruments

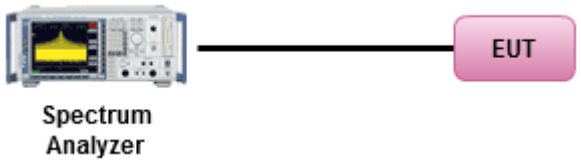
Refer a test equipment and calibration data table in this test report.

3.3.2 Test Procedures

Test Method			
For the emission bandwidth shall be measured using below:			
	Center Frequency	:	Frequency from table below
	Span	:	2 x Nominal Bandwidth (e.g. 40MHz for a 20MHz channel)
	Reference Level	:	20 dBm
	Attenuation	:	10 dB
	Sweep Time	:	5 s
	Resolution Bandwidth	:	1%-3% of 26 dB Bandwidth
	Video Bandwidth	:	≥Resolution Bandwidth
	X dB Bandwidth	:	26 dB
	Detector	:	Peak
	Trace	:	Single

3.3.3 Test Setup

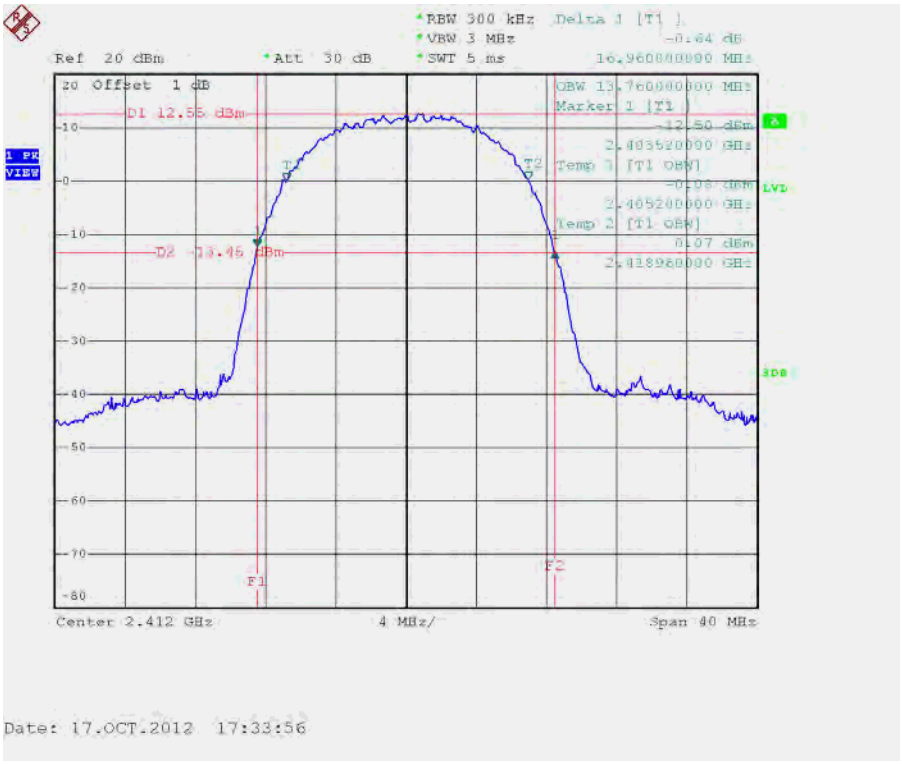
Emission Bandwidth



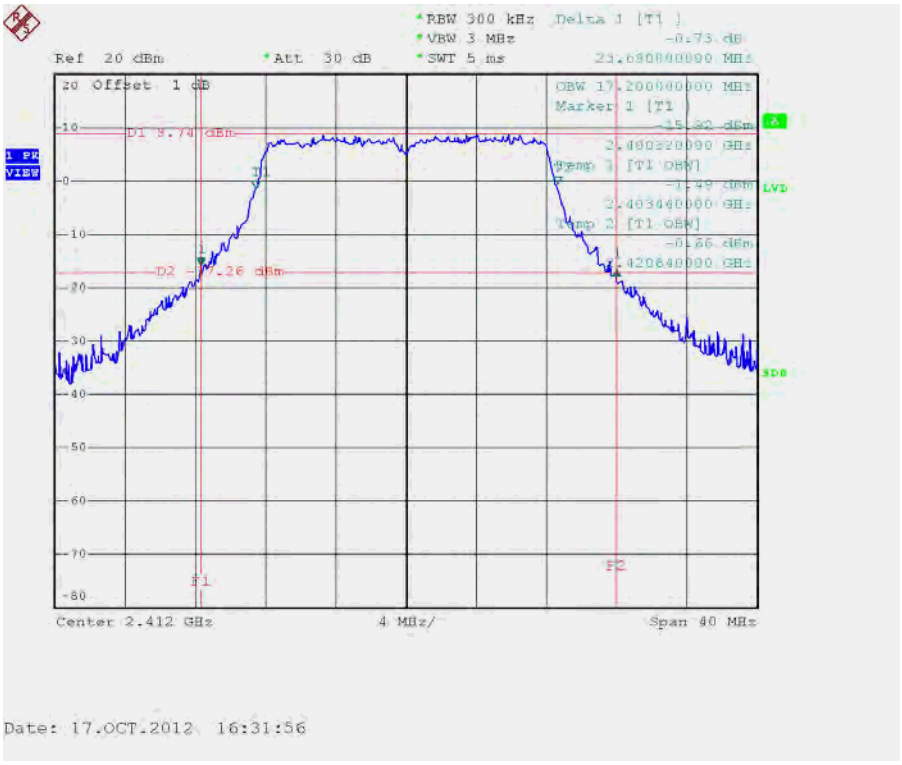
3.3.4 Test Result of Emission Bandwidth

Freq. (MHz)	Operating Mode	Data Rate (Mbps)	99% BW (MHz)	26dB BW (MHz)
2412	Legacy CCK, 1 to 11Mbps	11	13.76	16.96
	Non HT-20, 6 to 54Mbps	6	17.2	23.68
	Non HT-20, 6 to 54Mbps	6	17.2	23.68
	Non HT-20, Beam Forming, 6 to 54Mbps	6	17.2	23.68
	HT-20, M0 to M7	M0	18.4	24.72
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	18.4	24.72
	HT-20, Beam Forming, M0 to M7	M0	18.4	24.72
	HT-20, Beam Forming, M8 to M15	M8	18.4	24.72
2437	Legacy CCK, 1 to 11Mbps	11	13.84	17
	Non HT-20, 6 to 54Mbps	6	17.44	24.16
	Non HT-20, Beam Forming, 6 to 54Mbps	6	17.44	24.16
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	18.48	25.24
	HT-20, Beam Forming, M0 to M7	M0	18.48	25.24
	HT-20, Beam Forming, M8 to M15	M8	18.48	25.24
2462	Legacy CCK, 1 to 11Mbps	11	13.76	16.96
	Non HT-20, 6 to 54Mbps	6	17.28	24
	Non HT-20, 6 to 54Mbps	6	17.28	24
	Non HT-20, Beam Forming, 6 to 54Mbps	6	17.28	24
	HT-20, M0 to M7	M0	18.24	24.32
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	18.24	24.32
	HT-20, Beam Forming, M0 to M7	M0	18.24	24.32
	HT-20, Beam Forming, M8 to M15	M8	18.24	24.32

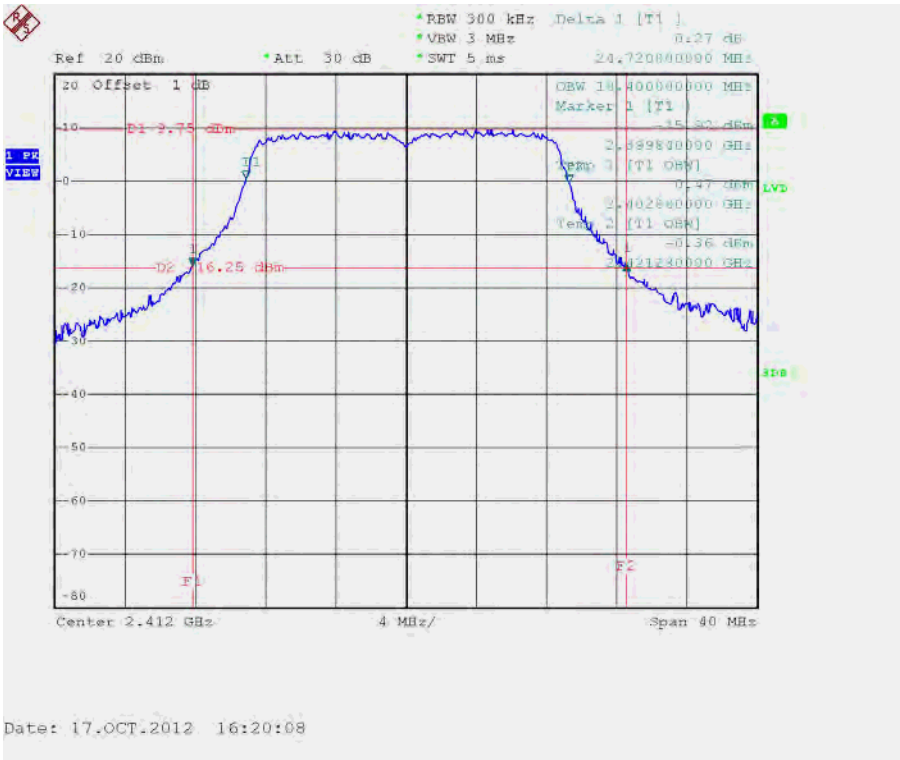
26 dB and 99% Bandwidth Plot on 2412 MHz, Legacy CCK, 11Mbps



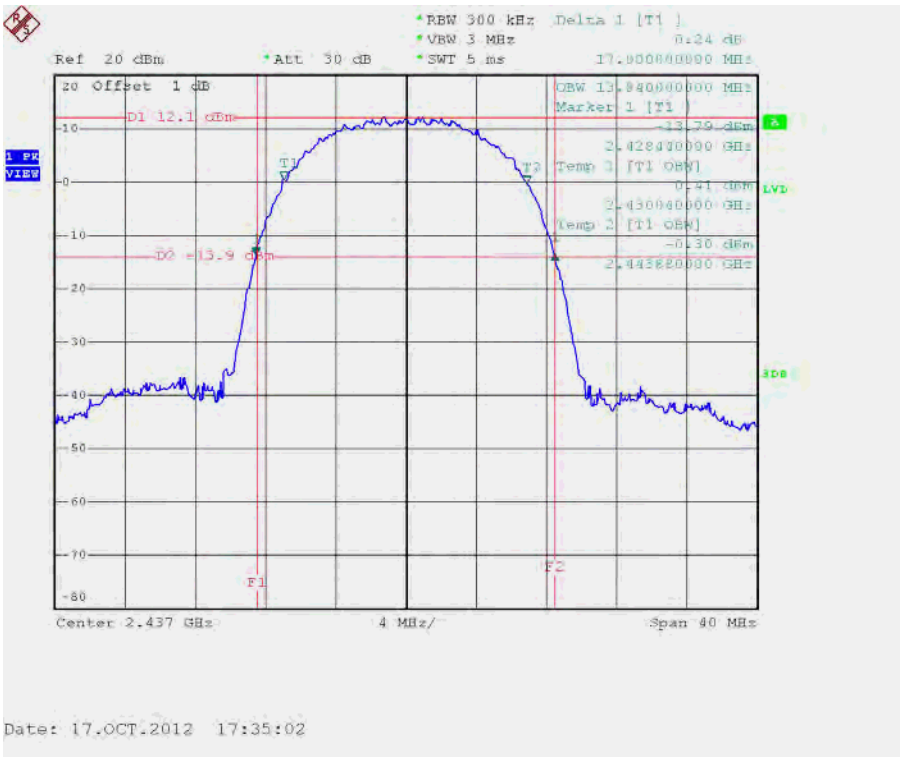
26 dB and 99% Bandwidth Plot on 2412 MHz, Non HT-20 / Non HT-20, Beam Forming, 6Mbps



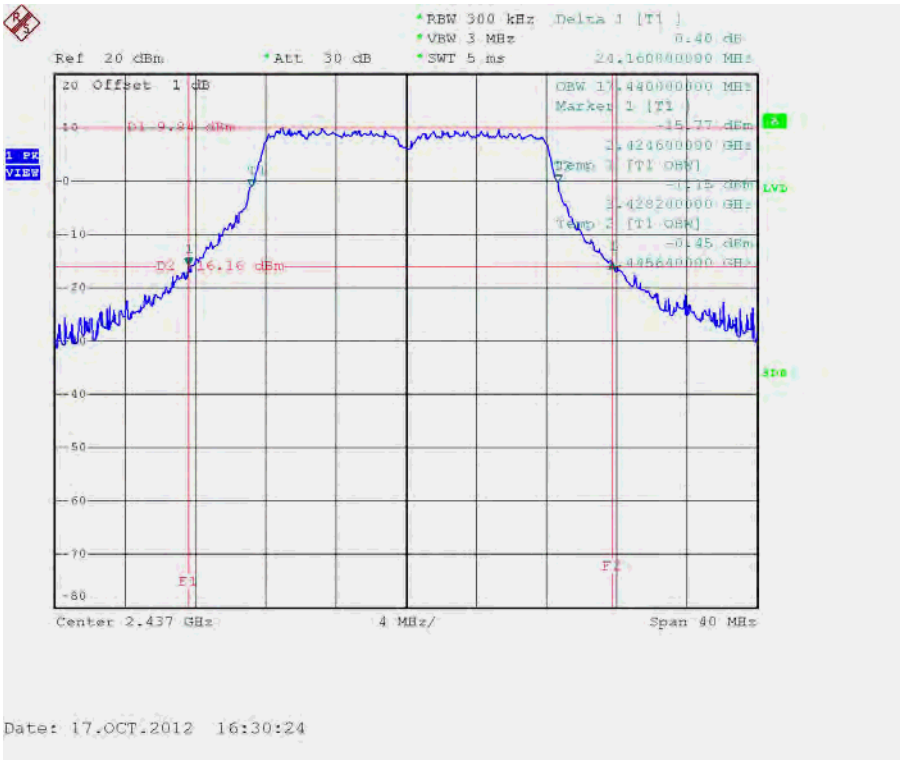
26 dB and 99% Bandwidth Plot on 2412 MHz, HT-20 / HT-20, STBC / HT-20, Beam Forming, M0, M8



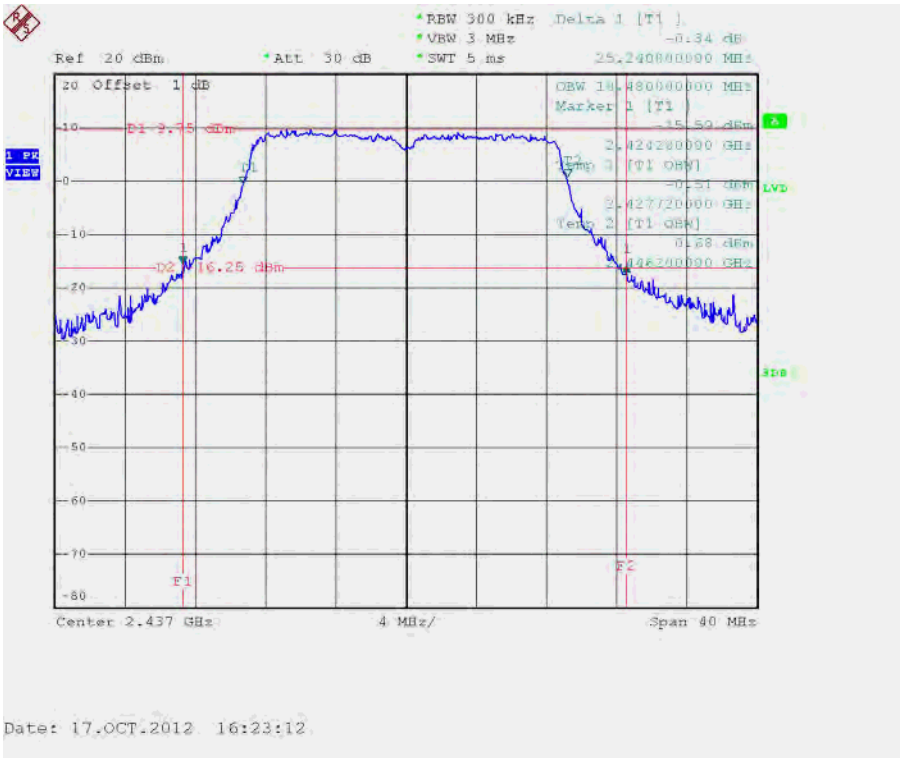
26 dB and 99% Bandwidth Plot on 2437 MHz, Legacy CCK, 11Mbps



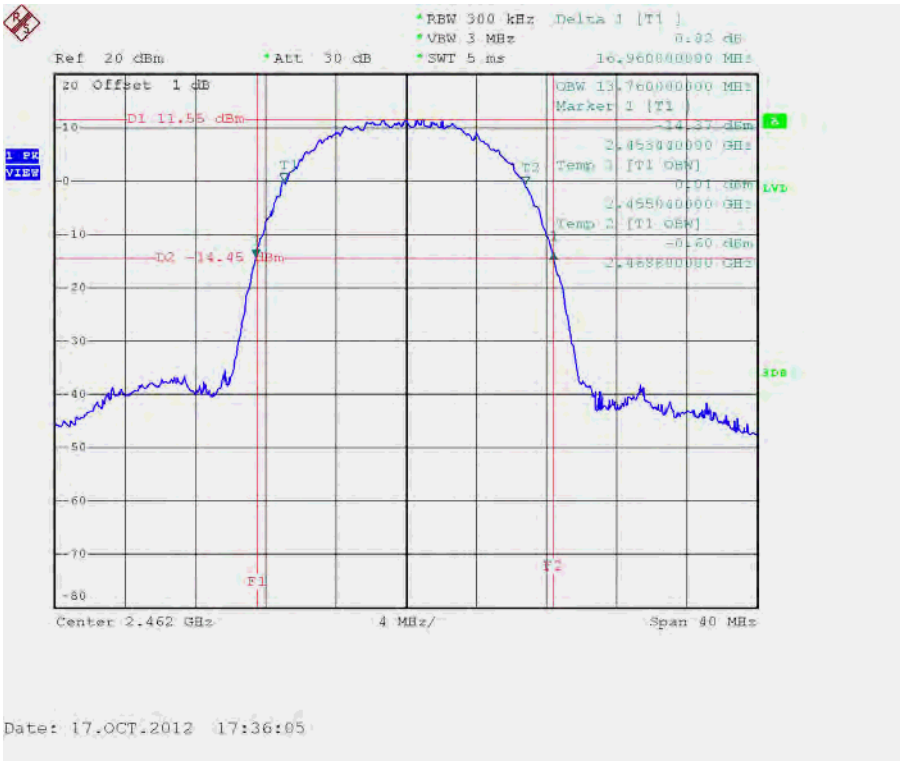
26 dB and 99% Bandwidth Plot on 2437 MHz, Non HT-20 / Non HT-20, Beam Forming, 6Mbps



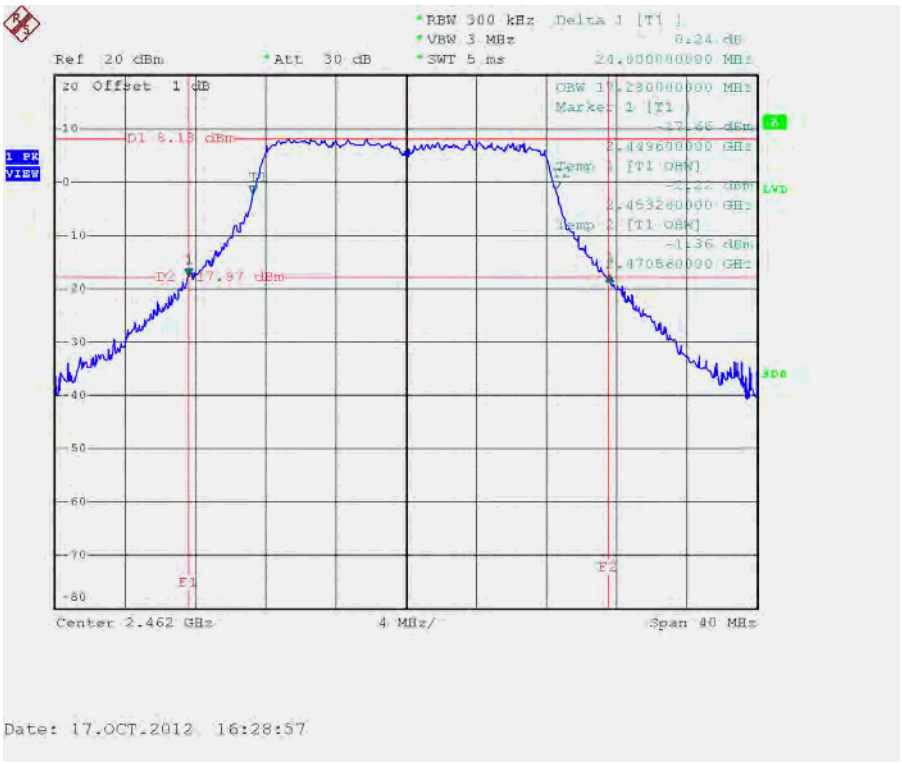
26 dB and 99% Bandwidth Plot on 2437 MHz, HT-20 / HT-20, STBC / HT-20, Beam Forming, M0, M8



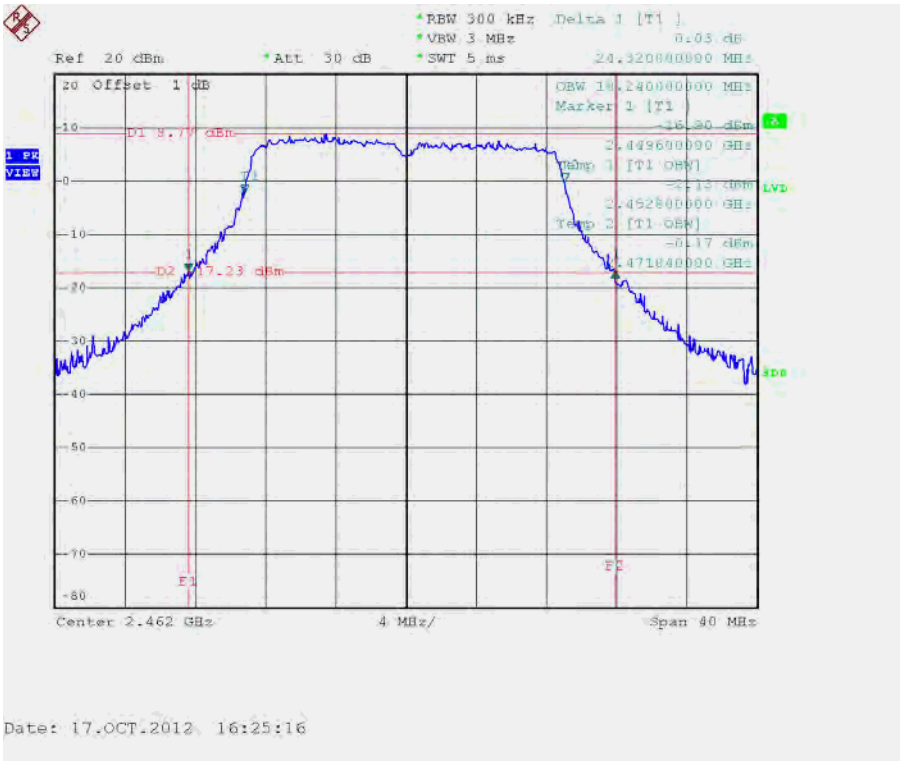
26 dB and 99% Bandwidth Plot on 2462 MHz, Legacy CCK, 11Mbps



26 dB and 99% Bandwidth Plot on 2462 MHz, Non HT-20 / Non HT-20, Beam Forming, 6Mbps



26 dB and 99% Bandwidth Plot on 2462 MHz, HHT-20 / HT-20, STBC / HT-20, Beam Forming, M0



3.4 RF Output Power

3.4.1 RF Output Power Limit

RF Output Power Limit			
Maximum Conducted Output Power Limit			
☒	2400-2483.5 MHz Band:		
	☒	If $G_{TX} \leq 6$ dBi, then $P_{Out} \leq 30$ dBm (1 W)	
	☒	Point-to-multipoint systems (P to M): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)$ dBm	
	☐	Point-to-point systems (P to P): If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm	
	☐	Smart antenna system (SAS):	
		☐	Single beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		☐	Overlap beam: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3$ dBm
		☐	Aggregate power on all beams: If $G_{TX} > 6$ dBi, then $P_{Out} = 30 – (G_{TX} – 6)/3 + 8$dB dBm
P_{Out} = maximum conducted output power in dBm, **G_{TX}** = the maximum transmitting antenna directional gain in dBi.			

3.4.2 Measuring Instruments

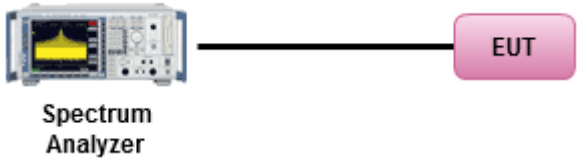
Refer a test equipment and calibration data table in this test report.

3.4.3 Test Procedures

Test Method		
☒	Maximum Conducted Output Power	
	☒	Refer as FCC KDB 558074, clause 8.2.1 Option 1 (spectral trace averaging).
	☐	Refer as FCC KDB 558074, clause 8.2.2 Option 2 (slow sweep speed).
	☐	Refer as FCC KDB 558074, clause 8.2.3 Option 3 (average power meter).
☒	For conducted measurement.	
	☒	The EUT supports multiple transmit chains using options given below: Refer as FCC KDB 662911, In-band power measurements. Using the measure-and-sum approach, measured all transmit ports individually. Sum the power (in linear power units e.g., mW) of all ports for each individual sample and save them.

3.4.4 Test Setup

RF Output Power (Spectrum Analyzer)



3.4.5 Test Result of Maximum Conducted Output Power

Freq. (MHz)	Operating Mode	N_{TX}	Correlated Antenna Gain (dBi)	Tx1 Output Power (dBm)	Tx2 Output Power (dBm)	Total Tx Channel Power (dBm)	Limit (dBm)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	2	3.00	17.19	17.33	20.27	30.00	9.73
	Non HT-20, 6 to 54Mbps	1	3.00	17.24	-	17.24	30.00	12.76
	Non HT-20, 6 to 54Mbps	2	3.00	16.98	16.7	19.85	30.00	10.15
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	16.54	16.03	19.30	29.99	10.69
	HT-20, M0 to M7	1	3.00	17.17	-	17.17	30.00	12.83
	HT-20, M0 to M15	2	3.00	17.01	16.61	19.82	30.00	10.18
	HT-20, STBC, M0 to M7	2	3.00	17.01	16.61	19.82	30.00	10.18
	HT-20, Beam Forming, M0 to M7	2	6.01	16.39	16	19.21	29.99	10.78
	HT-20, Beam Forming, M8 to M15	2	3.00	16.33	15.91	19.14	30.00	10.86
2437	Legacy CCK, 1 to 11Mbps	2	3.00	17.26	17.4	20.34	30.00	9.66
	Non HT-20, 6 to 54Mbps	2	3.00	17.56	17.19	20.39	30.00	9.61
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	17.5	17.31	20.42	29.99	9.57
	HT-20, M0 to M15	2	3.00	17.44	17.2	20.33	30.00	9.67
	HT-20, STBC, M0 to M7	2	3.00	17.44	17.2	20.33	30.00	9.67
	HT-20, Beam Forming, M0 to M7	2	6.01	17.47	17.23	20.36	29.99	9.63
	HT-20, Beam Forming, M8 to M15	2	3.00	17.37	17.09	20.24	30.00	9.76
2462	Legacy CCK, 1 to 11Mbps	2	3.00	17.08	17.73	20.43	30.00	9.57
	Non HT-20, 6 to 54Mbps	1	3.00	17.41	-	17.41	30.00	12.59
	Non HT-20, 6 to 54Mbps	2	3.00	16.1	16.53	19.33	30.00	10.67
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	15.85	16.05	18.96	29.99	11.03
	HT-20, M0 to M7	1	3.00	17.35	-	17.35	30.00	12.65
	HT-20, M0 to M15	2	3.00	15.72	15.94	18.84	30.00	11.16
	HT-20, STBC, M0 to M7	2	3.00	15.72	15.94	18.84	30.00	11.16
	HT-20, Beam Forming, M0 to M7	2	6.01	15.25	15.3	18.29	29.99	11.70
	HT-20, Beam Forming, M8 to M15	2	3.00	15.65	15.85	18.76	30.00	11.24

Note 1: For all transmitter outputs with equal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain = $G_{ANT} + 10 \log(N_{TX})$
All transmit signals are completely uncorrelated, Directional Gain = G_{ANT}

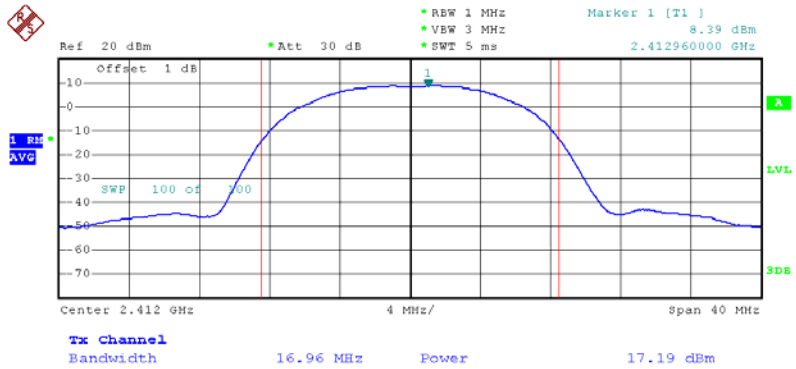
Note 2: For all transmitter outputs with unequal antenna gains, directional gain is to be computed as follows:
Any transmit signals are correlated, Directional Gain =$10 \log[(10^{G1/20} + \ldots + 10^{GN/20})^2 / N_{TX}]$
All transmit signals are completely uncorrelated, Directional Gain = $10 \log[(10^{G1/10} + \ldots + 10^{GN/10})/N_{TX}]$

Note 3: For Spatial Multiplexing, Directional Gain (DG) = $G_{ANT} + 10 \log(N_{TX}/N_{SS})$,
where Nss = the number of independent spatial streams data.

Note 4: For CDD transmissions, directional gain is calculated as power measurements:
Directional Gain (DG) = G_{ANT} + Array Gain, where Array Gain is as follows:
Array Gain = 0 dB (i.e., no array gain) for $N_{TX} \leq 4$;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{TX}

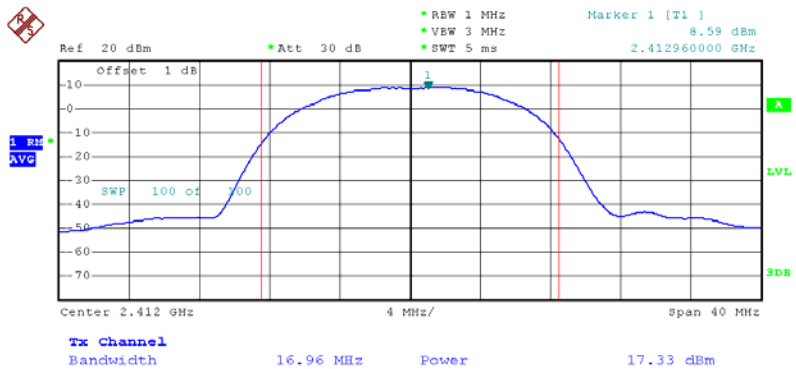
Maximum Conducted Output Power Plot on 2412 MHz, Legacy CCK, 11Mbps

Tx1



Date: 17.OCT.2012 17:41:54

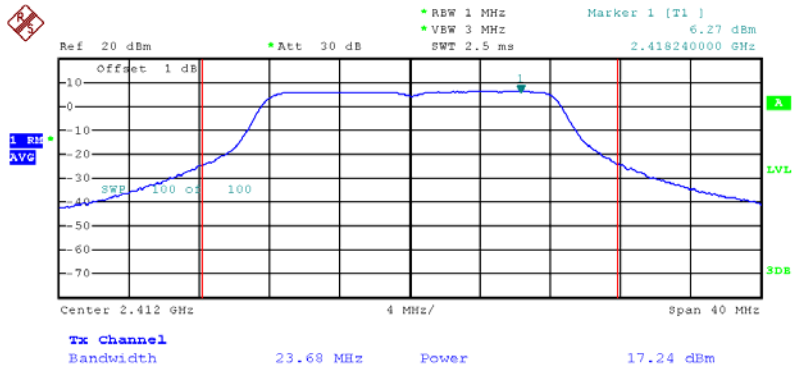
Tx2



Date: 17.OCT.2012 17:42:28

Maximum Conducted Output Power Plot on 2412 MHz, Non HT-20, 6Mbps

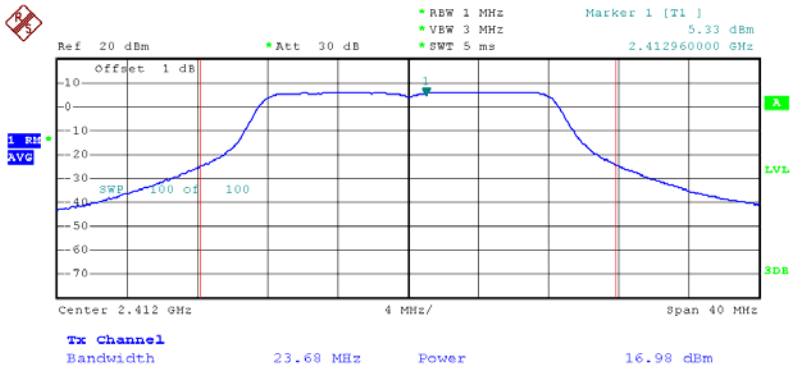
Tx1



Date: 1.NOV.2012 18:03:38

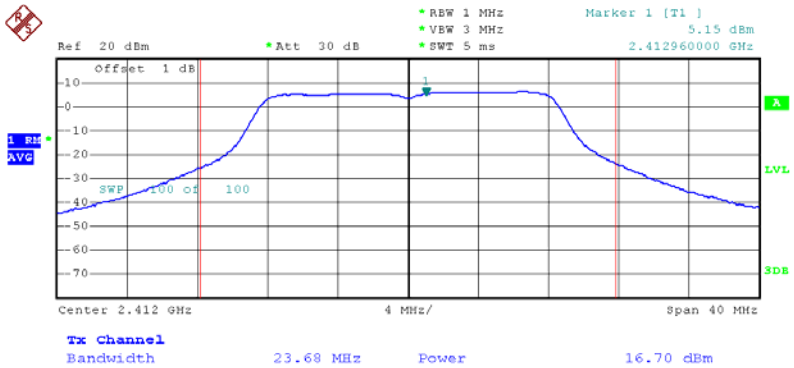
Maximum Conducted Output Power Plot on 2412 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 17:44:17

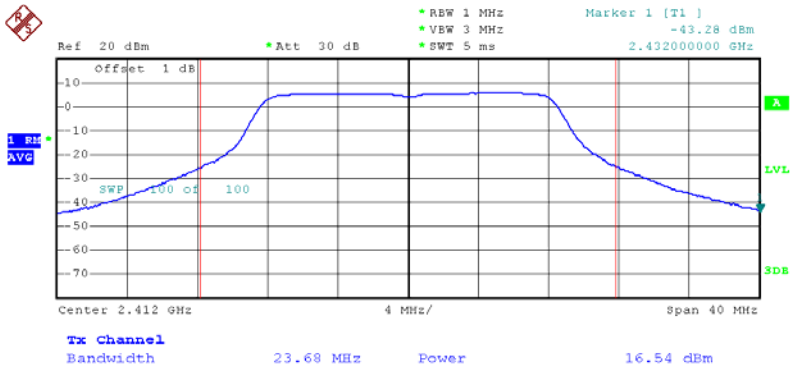
Tx2



Date: 17.OCT.2012 17:43:52

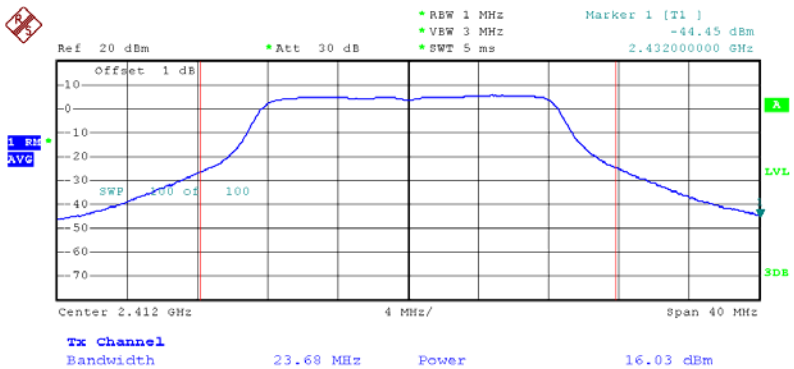
Maximum Conducted Output Power Plot on 2412 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



Date: 17.OCT.2012 17:49:51

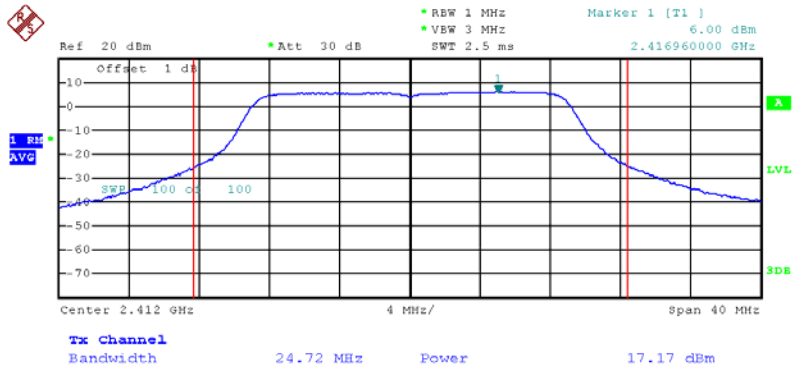
Tx2



Date: 17.OCT.2012 17:50:10

Maximum Conducted Output Power Plot on 2412 MHz, HT-20, M0

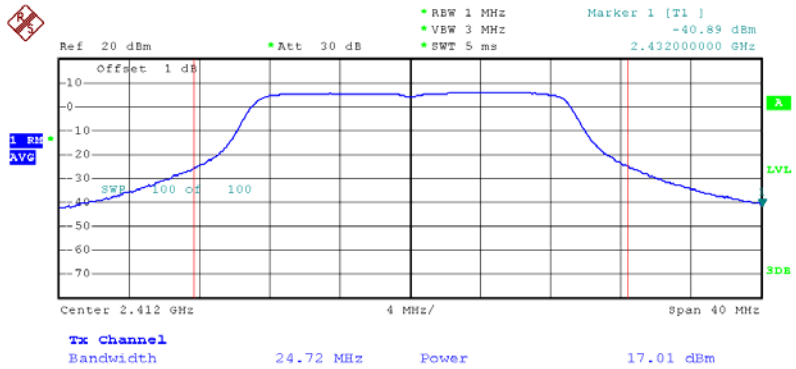
Tx1



Date: 1.NOV.2012 17:58:58

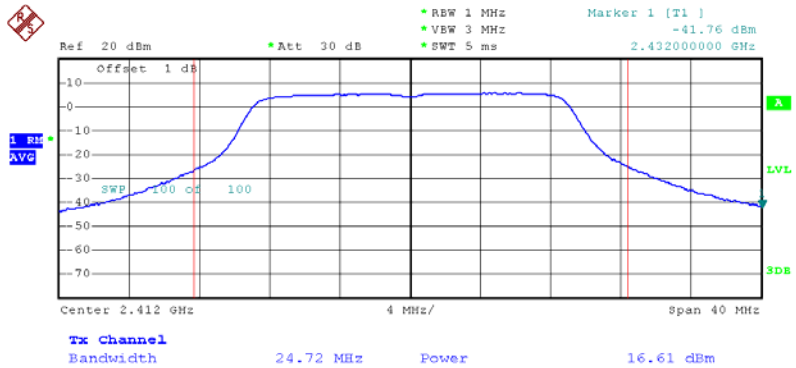
Maximum Conducted Output Power Plot on 2412 MHz, HT-20 / HT-20, STBC, M0

Tx1



Date: 17.OCT.2012 17:52:05

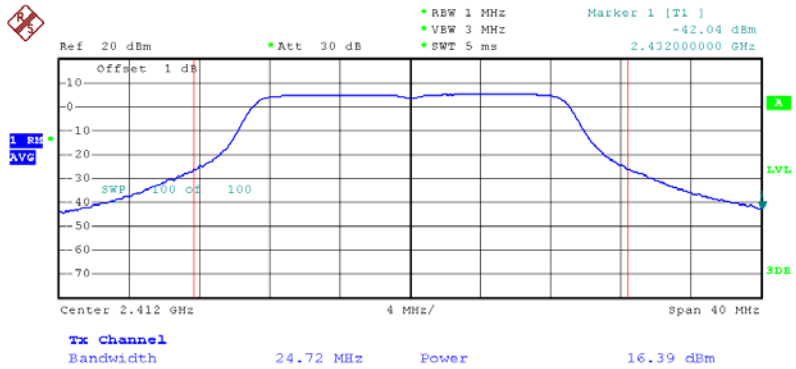
Tx2



Date: 17.OCT.2012 17:51:43

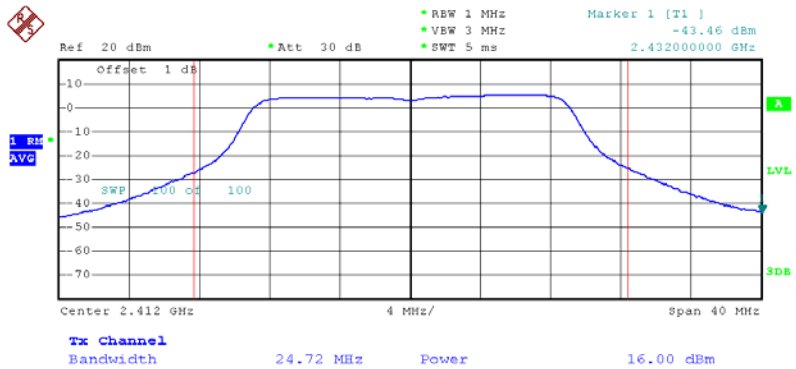
Maximum Conducted Output Power Plot on 2412 MHz, HT-20, Beam Forming, M0

Tx1



Date: 17.OCT.2012 17:56:41

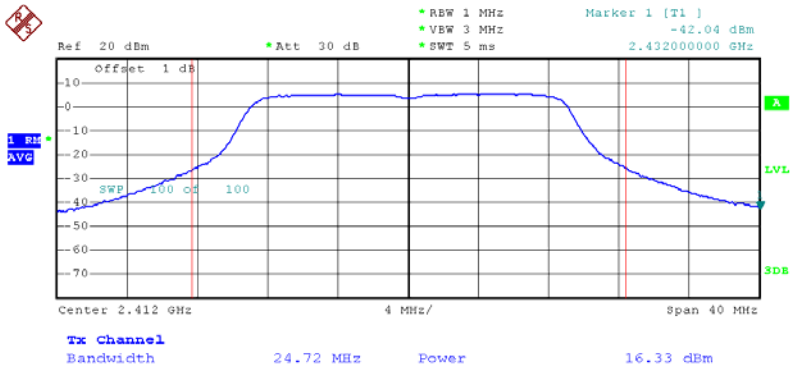
Tx2



Date: 17.OCT.2012 17:57:11

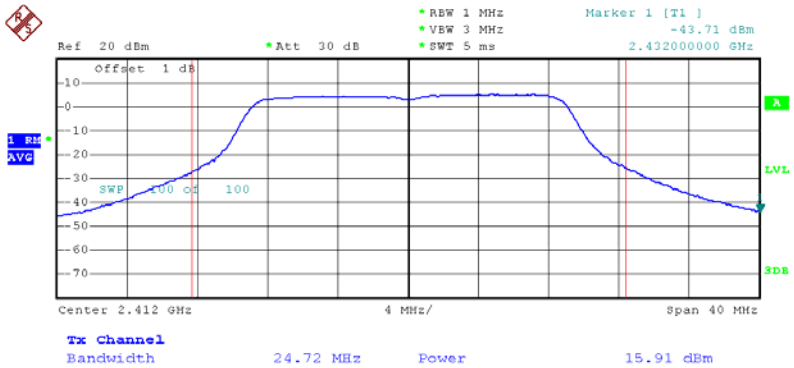
Maximum Conducted Output Power Plot on 2412 MHz, HT-20, Beam Forming, M8

Tx1



Date: 17.OCT.2012 18:00:43

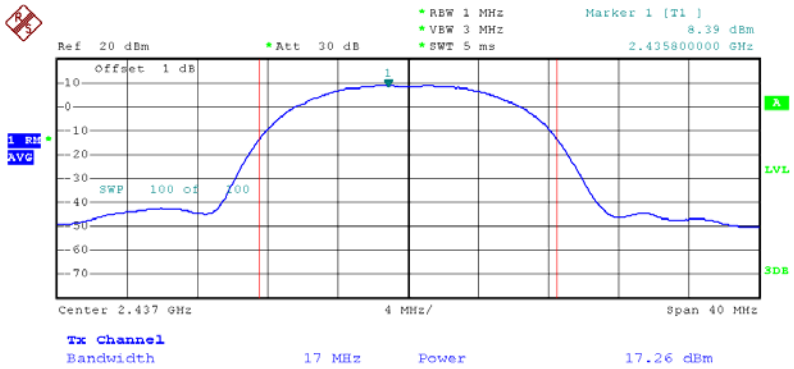
Tx2



Date: 17.OCT.2012 18:00:25

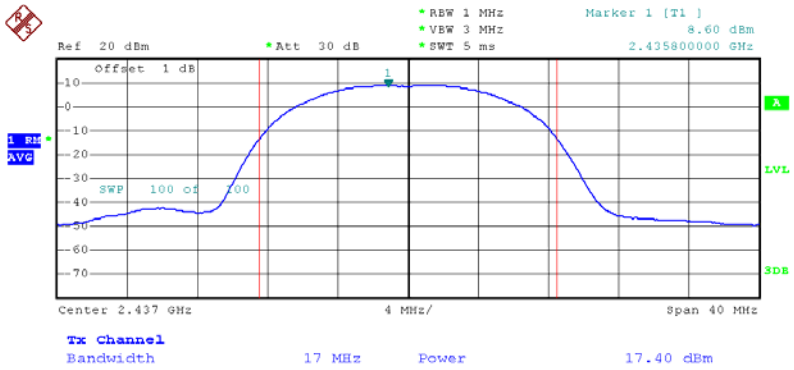
Maximum Conducted Output Power Plot on 2437 MHz, Legacy CCK, 11Mbps

Tx1



Date: 17.OCT.2012 17:40:42

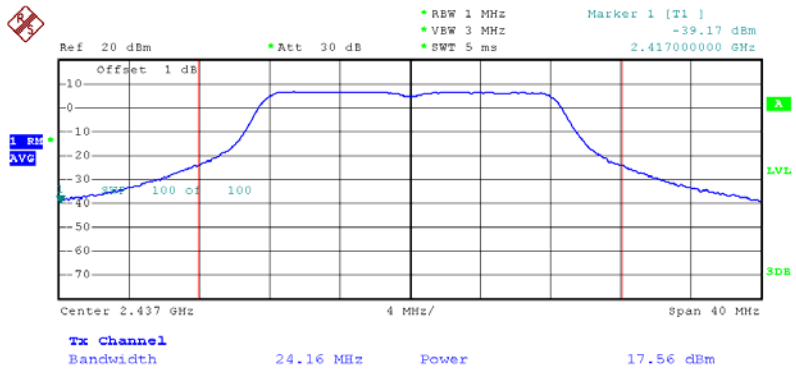
Tx2



Date: 17.OCT.2012 17:39:55

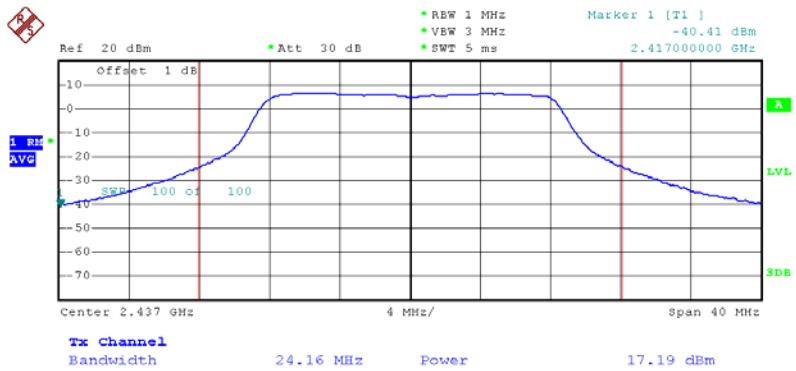
Maximum Conducted Output Power Plot on 2437 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 17:45:28

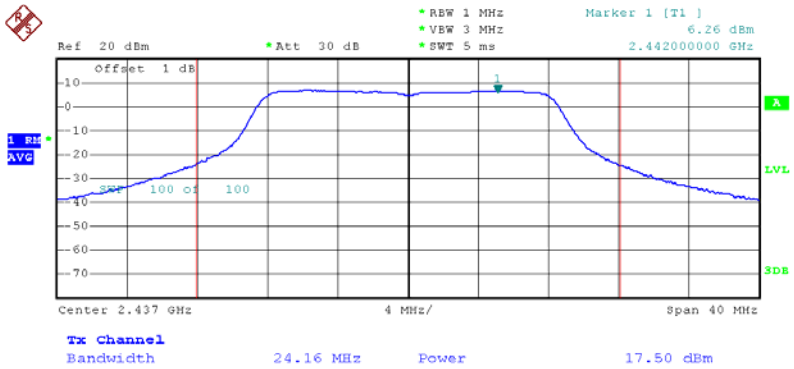
Tx2



Date: 17.OCT.2012 17:45:49

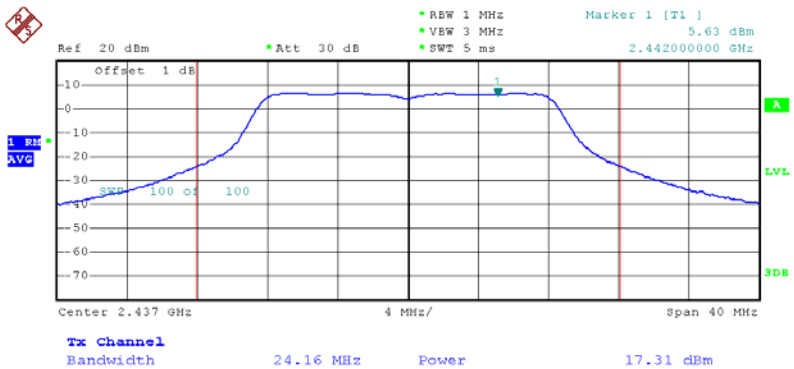
Maximum Conducted Output Power Plot on 2437 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



Date: 17.OCT.2012 17:48:54

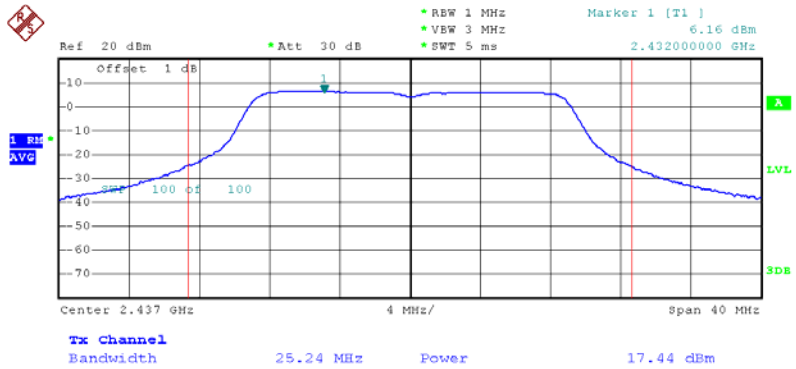
Tx2



Date: 17.OCT.2012 17:48:32

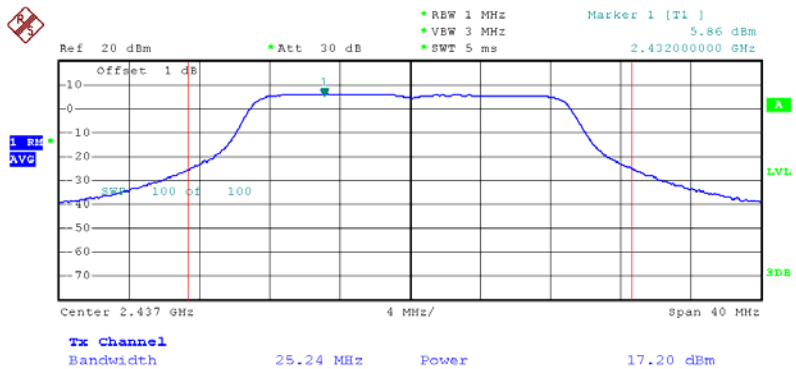
Maximum Conducted Output Power Plot on 2437 MHz, HT-20 / HT-20, STBC, M0

Tx1



Date: 17.OCT.2012 17:52:50

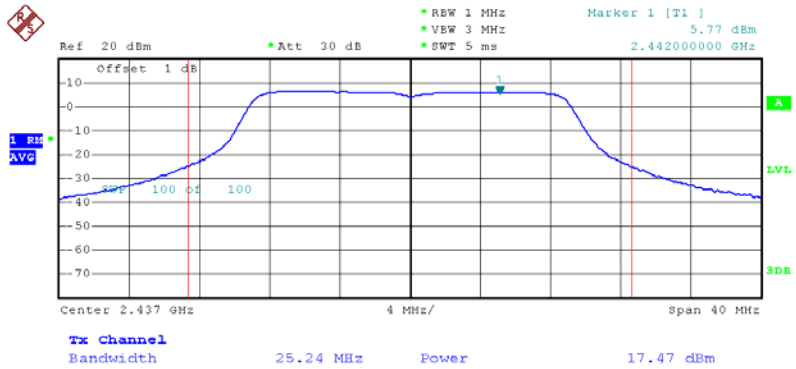
Tx2



Date: 17.OCT.2012 17:53:08

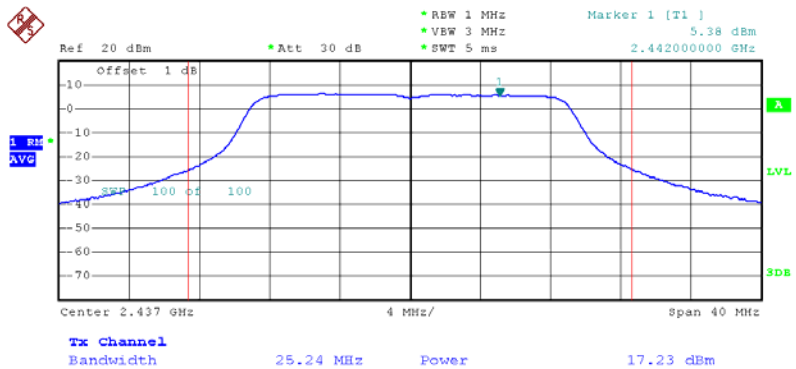
Maximum Conducted Output Power Plot on 2437 MHz, HT-20, Beam Forming, M0

Tx1



Date: 17.OCT.2012 17:56:05

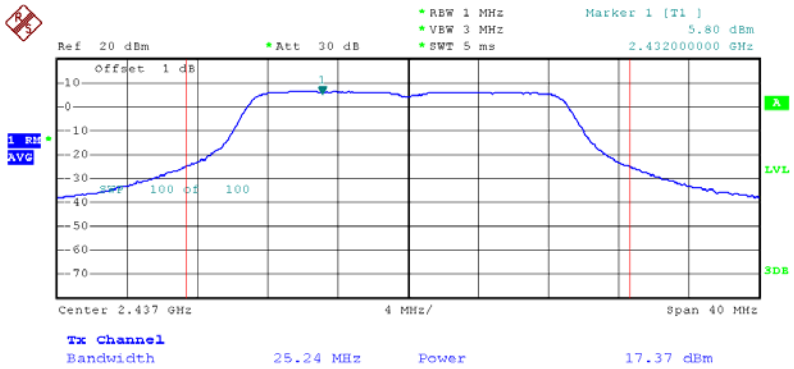
Tx2



Date: 17.OCT.2012 17:55:42

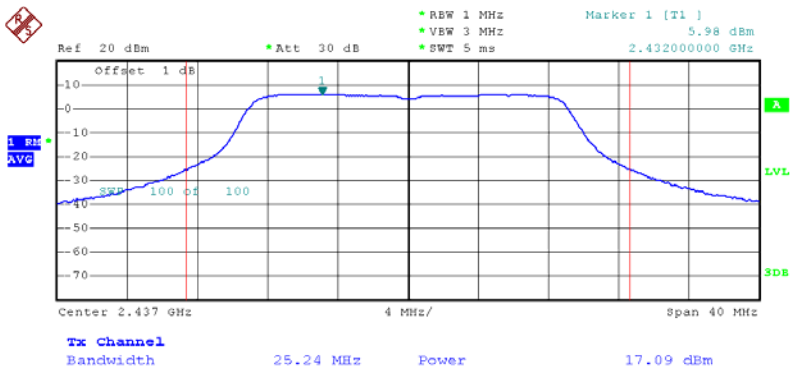
Maximum Conducted Output Power Plot on 2437 MHz, HT-20, Beam Forming, M8

Tx1



Date: 17.OCT.2012 18:01:08

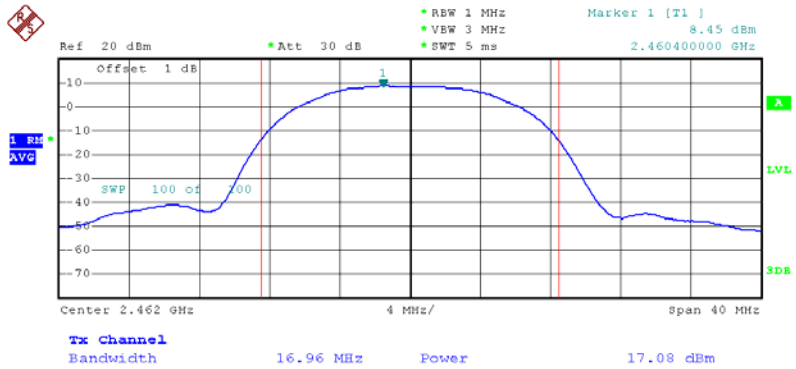
Tx2



Date: 17.OCT.2012 18:01:22

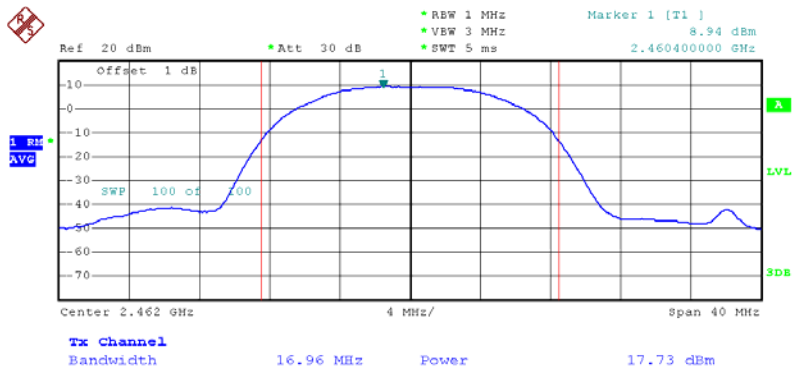
Maximum Conducted Output Power Plot on 2462 MHz, Legacy CCK, 11Mbps

Tx1



Date: 17.OCT.2012 17:37:02

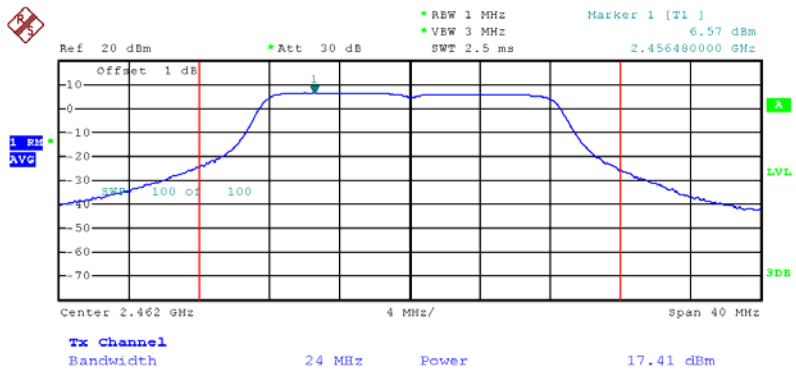
Tx2



Date: 17.OCT.2012 17:37:47

Maximum Conducted Output Power Plot on 2462 MHz, Non HT-20, 6Mbps

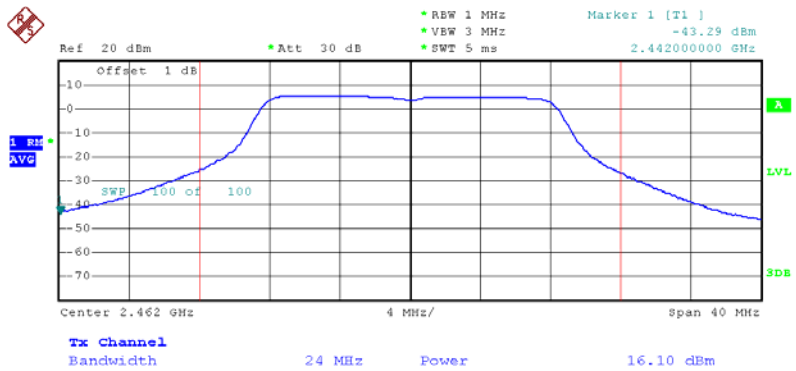
Tx1



Date: 1.NOV.2012 17:57:21

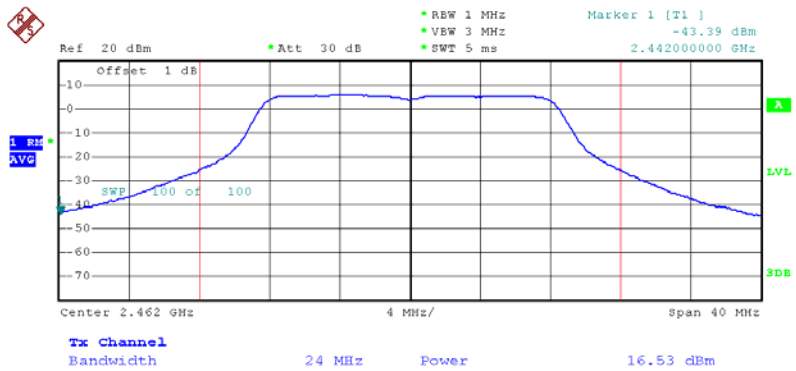
Maximum Conducted Output Power Plot on 2462 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 17:46:50

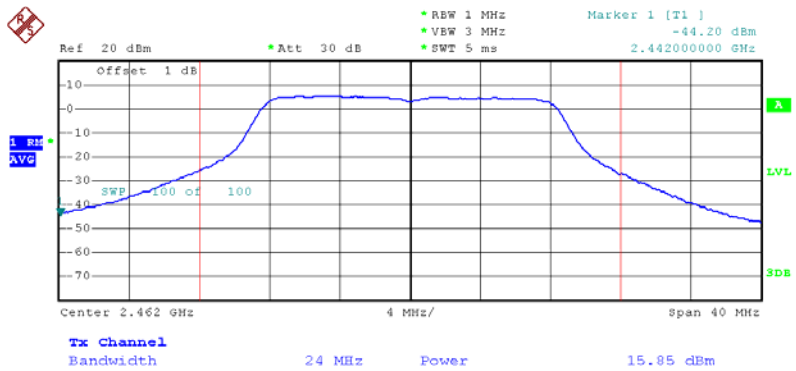
Tx2



Date: 17.OCT.2012 17:46:26

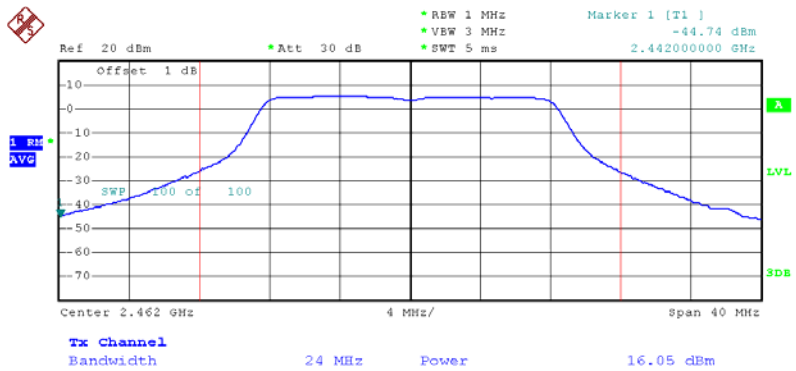
Maximum Conducted Output Power Plot on 2462 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



Date: 17.OCT.2012 17:47:32

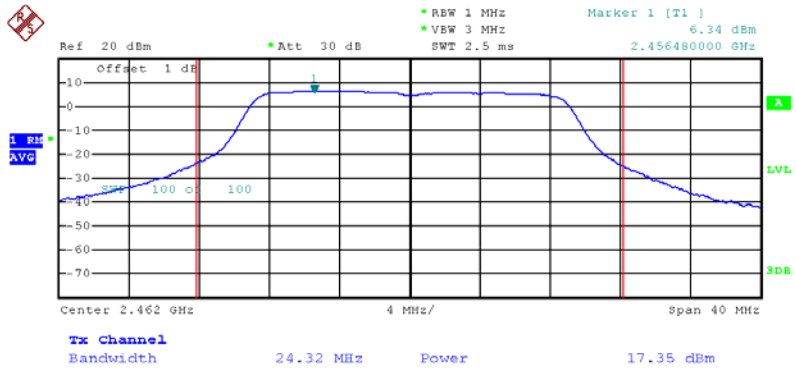
Tx2



Date: 17.OCT.2012 17:47:52

Maximum Conducted Output Power Plot on 2462 MHz, HT-20, M0

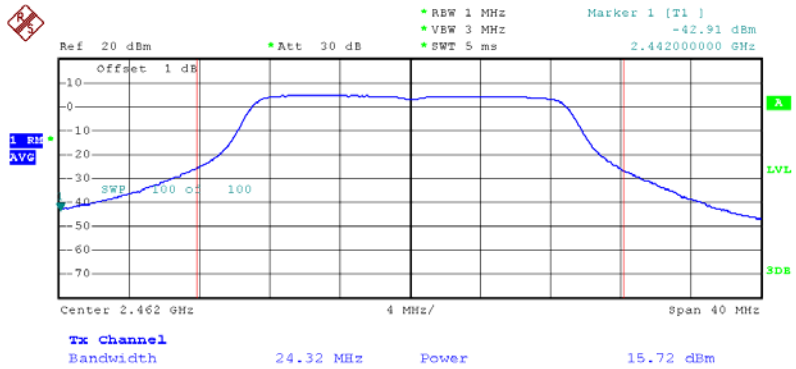
Tx1



Date: 1.NOV.2012 17:58:23

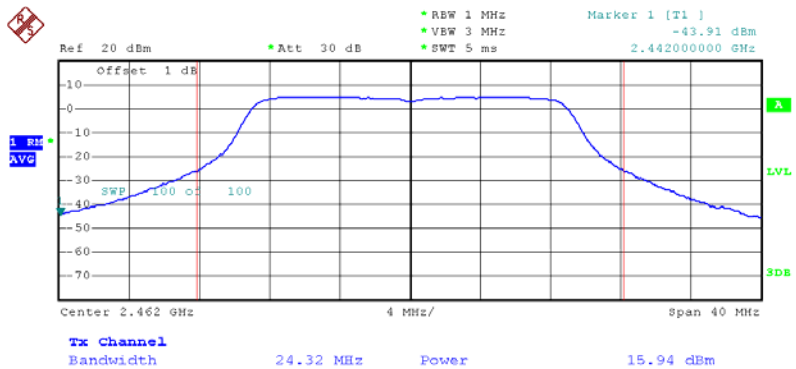
Maximum Conducted Output Power Plot on 2462 MHz, HT-20 / HT-20, STBC, M0

Tx1



Date: 17.OCT.2012 17:54:02

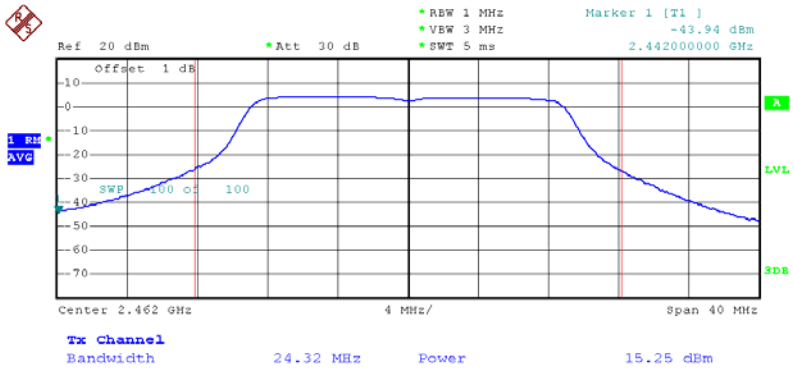
Tx2



Date: 17.OCT.2012 17:53:46

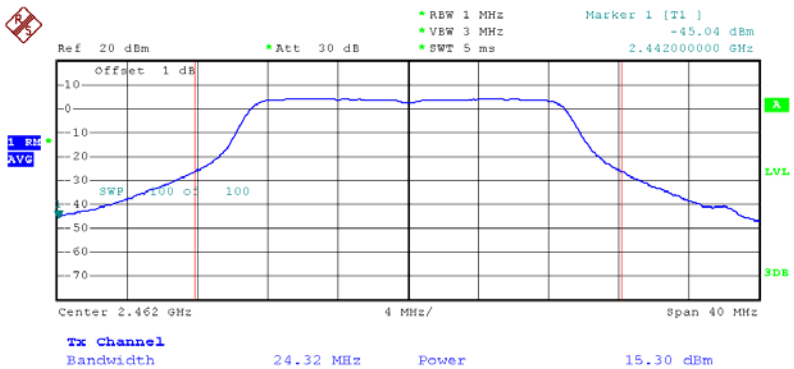
Maximum Conducted Output Power Plot on 2462 MHz, HT-20, Beam Forming, M0

Tx1



Date: 17.OCT.2012 17:54:45

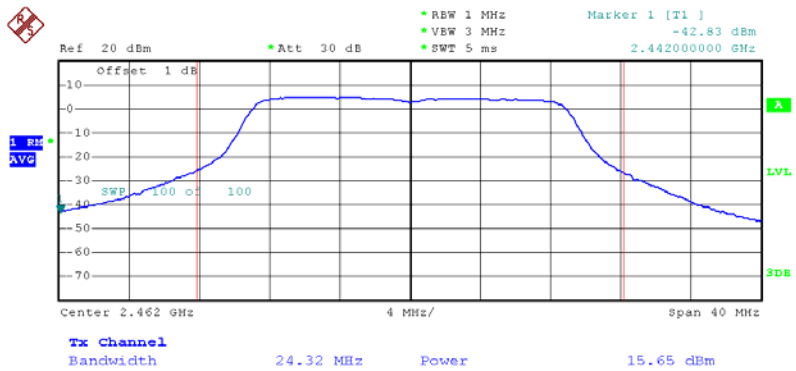
Tx2



Date: 17.OCT.2012 17:55:04

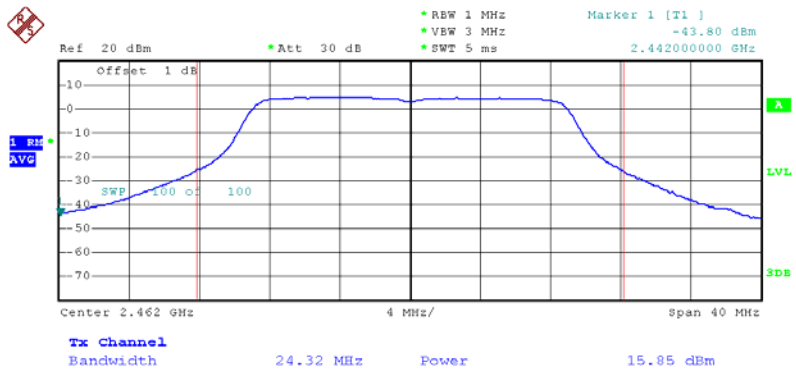
Maximum Conducted Output Power Plot on 2462 MHz, HT-20, Beam Forming, M8

Tx1



Date: 17.OCT.2012 18:02:09

Tx2



Date: 17.OCT.2012 18:01:56

3.5 Power Spectral Density

3.5.1 Power Spectral Density Limit

Power Spectral Density Limit
Power Spectral Density (PSD) ≤ 8 dBm/3kHz

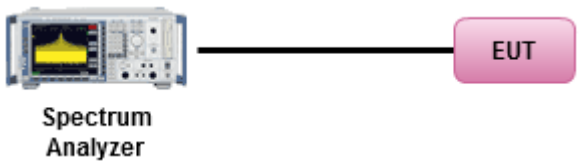
3.5.2 Measuring Instruments

Refer a test equipment and calibration data table in this test report.

3.5.3 Test Procedures

Test Method			
☒	Power spectral density procedures that the same method as used to determine the conducted output power shall be used to determine the power spectral density. In addition, the use of a peak PSD procedure will always result in a “worst-case” measured level for comparison to the limit. Therefore, whenever the DTS bandwidth exceeds 500 kHz, it is acceptable to utilize the peak PSD procedure to demonstrate compliance to the PSD limit, regardless of how the fundamental output power was measured. For the power spectral density shall be measured using below options:		
	☒	Refer as FCC KDB 558074, clause 9.1 Option 1 - (RBW≥3kHz; sweep=auto, detector=peak).	
	☐	Refer as FCC KDB 558074, clause 9.2 Option 2 - (RBW≥3kHz; sweep=auto, average=100).	
	☐	Refer as FCC KDB 558074, clause 9.3 Option 3 - (RBW≥3kHz; slow sweep speed).	
	☐	Refer as FCC KDB 558074, clause 9.4 Option 2 (average PSD; BWCF=-15.2dB).	
	☐	RBW>3kHz, add the bandwidth correction factor (BWCF) adjusting in PSD per 3kHz.	
☒	For conducted measurement.		
	☒	The EUT supports multiple transmit chains using options given below:	
		☐	Option 1: Measure and sum the spectra across the outputs. Refer as FCC KDB 662911, In-band power spectral density (PSD). Sample all transmit ports simultaneously using a spectrum analyzer for each transmit port. Where the trace bin-by-bin of each transmit port summing can be performed. (i.e., in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 and that from the first spectral bin of output 3, and so on up to the N_{TX} output to obtain the value for the first frequency bin of the summed spectrum.). Add up the amplitude (power) values for the different transmit chains and use this as the new data trace.
		☒	Option 2: Measure and add 10 log(N) dB, where N is the number of transmit chains. Refer as FCC KDB 662911, In-band power spectral density (PSD). Performed at each transmit chains and each transmit chains shall be compared with the limit have been reduced with 10 log(N). Or each transmit chains shall be add 10 log(N) to compared with the limit.

3.5.4 Test Setup

Power Spectral Density


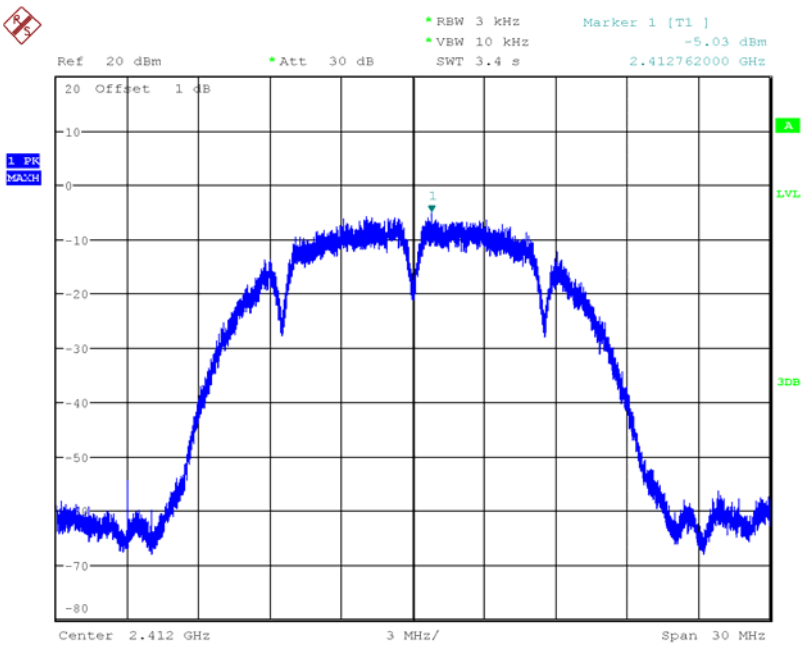
3.5.5 Test Result of Power Spectral Density

Freq. (MHz)	Operating Mode	N_{TX}	Data Rate (Mbps)	Tx1 PSD Antenna (dBm/3kHz)	Tx2 PSD Antenna (dBm/3kHz)	1Port Limit (dBm/3kHz)	1Port Margin (dB)	Total Tx PSD Antenna (dBm/3kHz)	Total Port Limit (dBm/3kHz)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	2	11	-5.03	-7.25	4.99	10.02	-2.99	8.00	10.99
	Non HT-20, 6 to 54Mbps	1	6	-8.25	-	-	-	-	8.00	16.25
	Non HT-20, 6 to 54Mbps	2	6	-8.33	-8.73	4.99	13.32	-5.52	8.00	13.52
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6	-8.85	-9.50	4.98	13.83	-6.15	7.99	14.14
	HT-20, M0 to M7	1	M0	-8.16	-	-	-	-	8.00	16.16
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	2	M0	-8.57	-8.93	4.99	13.56	-5.74	8.00	13.74
	HT-20, Beam Forming, M0 to M7	2	M0	-9.04	-8.93	4.98	13.91	-5.97	7.99	13.96
	HT-20, Beam Forming, M8 to M15	2	M8	-8.22	-8.89	4.99	13.21	-5.53	8.00	13.53
2437	Legacy CCK, 1 to 11Mbps	2	11	-5.89	-6.56	4.99	10.88	-3.20	8.00	11.20
	Non HT-20, 6 to 54Mbps	2	6	-7.16	-7.91	4.99	12.15	-4.51	8.00	12.51
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6	-6.73	-7.51	4.98	11.71	-4.09	7.99	12.08
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	2	M0	-6.45	-8.47	4.99	11.44	-4.33	8.00	12.33
	HT-20, Beam Forming, M0 to M7	2	M0	-6.62	-7.81	4.98	11.60	-4.16	7.99	12.15
	HT-20, Beam Forming, M8 to M15	2	M8	-4.87	-8.40	4.99	9.86	-3.28	8.00	11.28
2462	Legacy CCK, 1 to 11Mbps	2	11	-6.36	-6.63	4.99	11.35	-3.48	8.00	11.48
	Non HT-20, 6 to 54Mbps	1	6	-7.69	-	-	-	-	8.00	15.69
	Non HT-20, 6 to 54Mbps	2	6	-8.10	-8.63	4.99	13.09	-5.35	8.00	13.35
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6	-9.28	-9.74	4.98	14.26	-6.49	7.99	14.48
	HT-20, M0 to M7	1	M0	-7.32	-	-	-	-	8.00	15.32
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	2	M0	-8.92	-8.91	4.99	13.90	-5.90	8.00	13.90
	HT-20, Beam Forming, M0 to M7	2	M0	-9.30	-10.71	4.98	14.28	-6.94	7.99	14.93
	HT-20, Beam Forming, M8 to M15	2	M8	-9.25	-8.48	4.99	13.47	-5.84	8.00	13.84

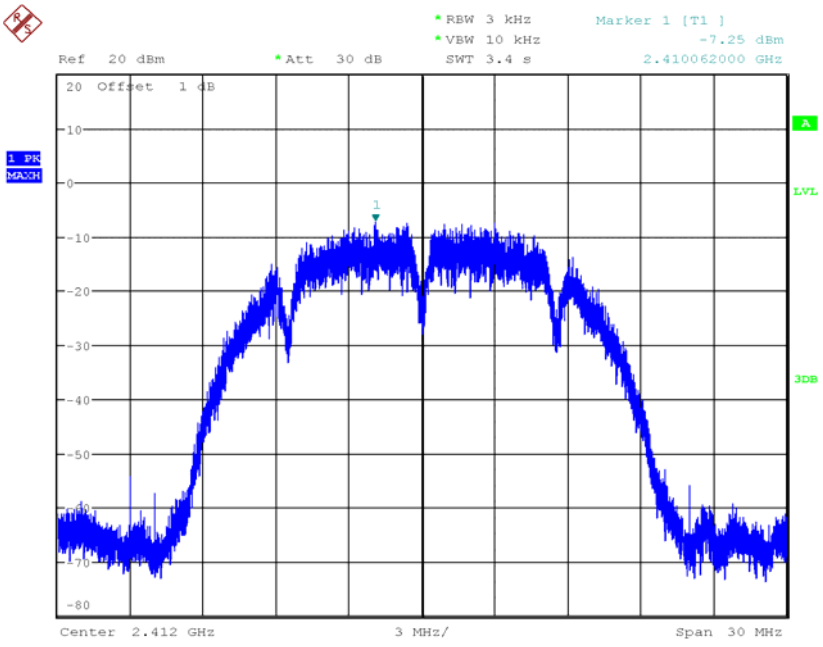
Note 1: PSD [dBm/3kHz] = each transmit chains PSD [dBm/3kHz] + $10\log N_{TX}$
Note 2: Power spectral density plots w/o [$10\log N_{TX}$] factor

Power Spectral Density Plot on 2412 MHz, Legacy CCK, 11Mbps

Tx1

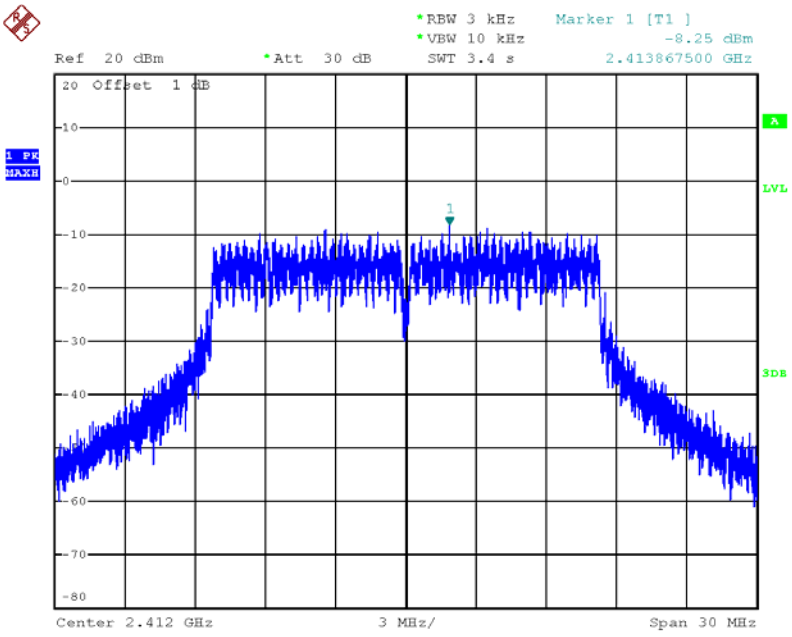


Tx2



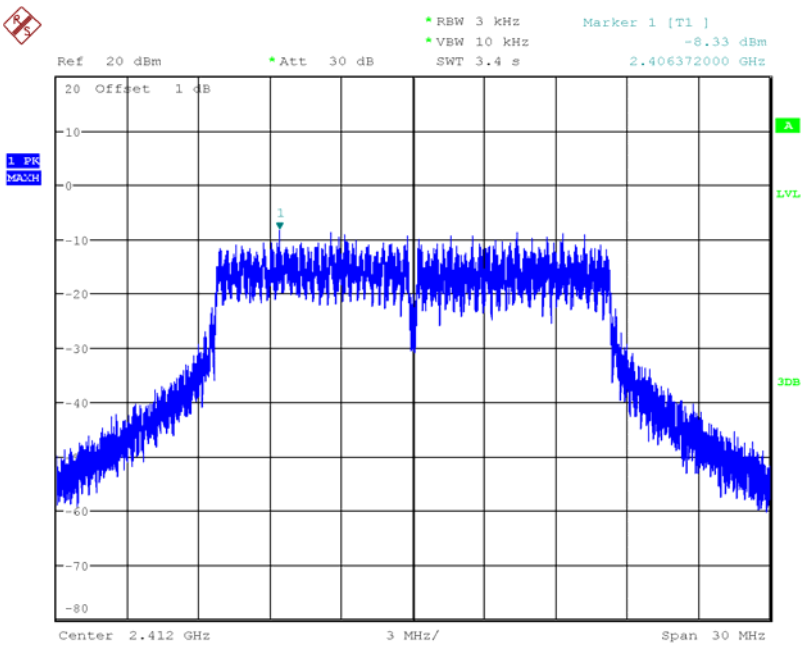
Power Spectral Density Plot on 2412 MHz, Non HT-20, 6Mbps

Tx1

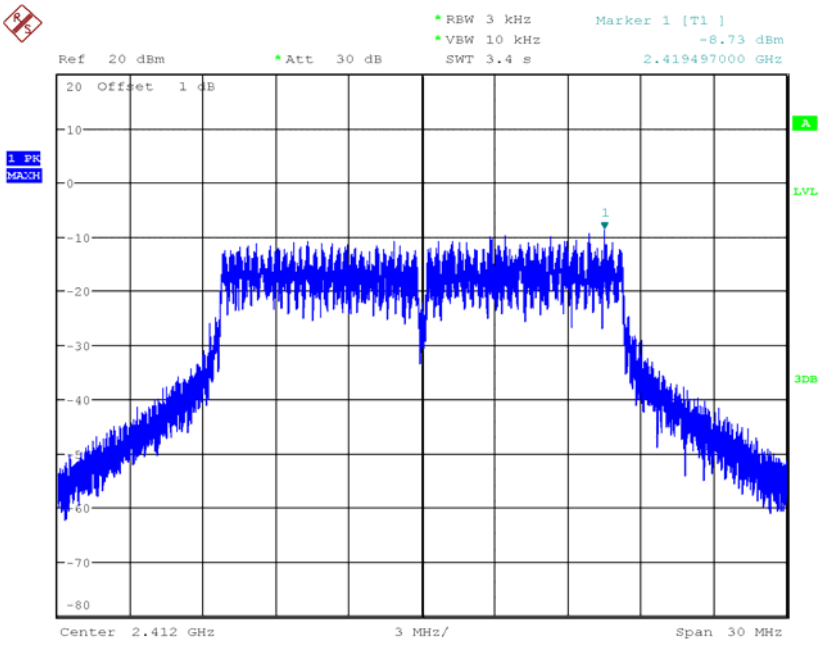


Power Spectral Density Plot on 2412 MHz, Non HT-20, 6Mbps

Tx1

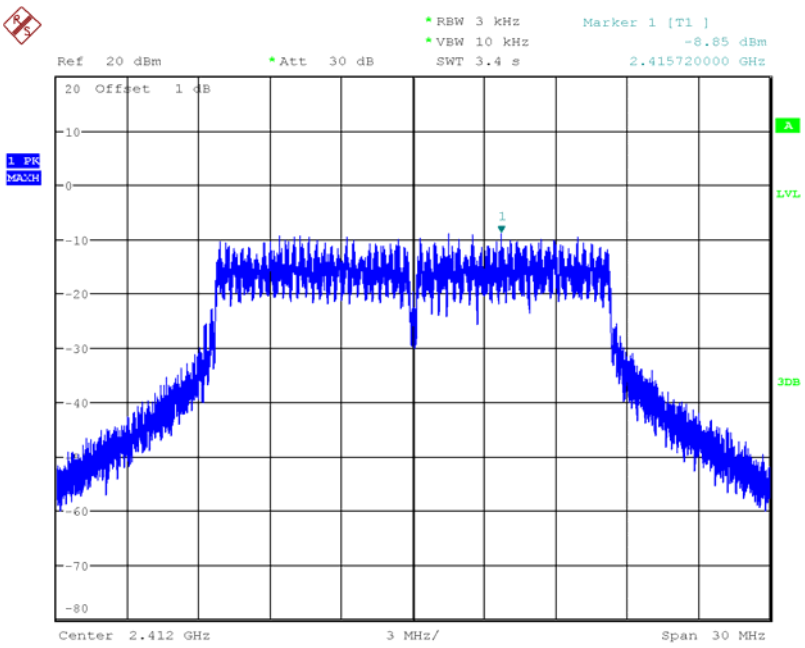


Tx2

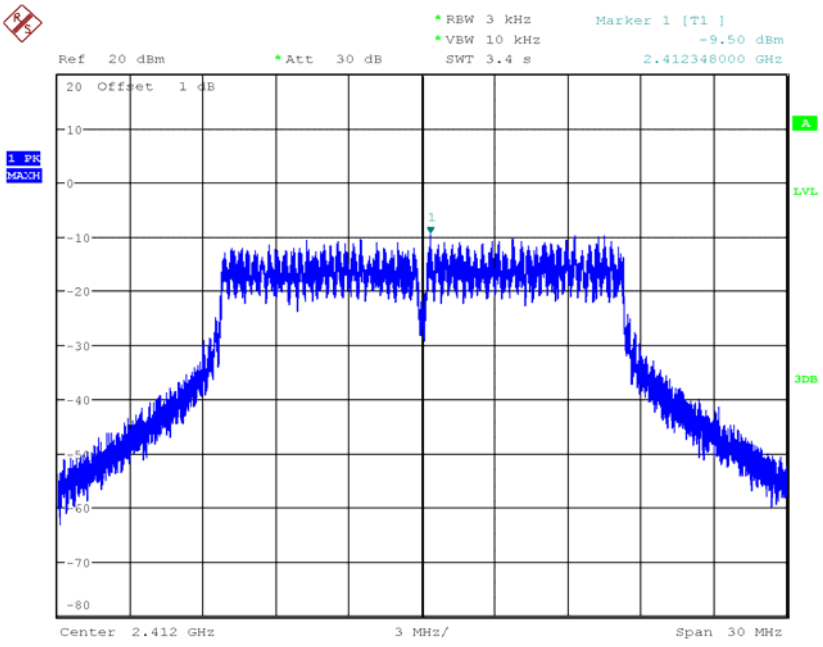


Power Spectral Density Plot on 2412 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1

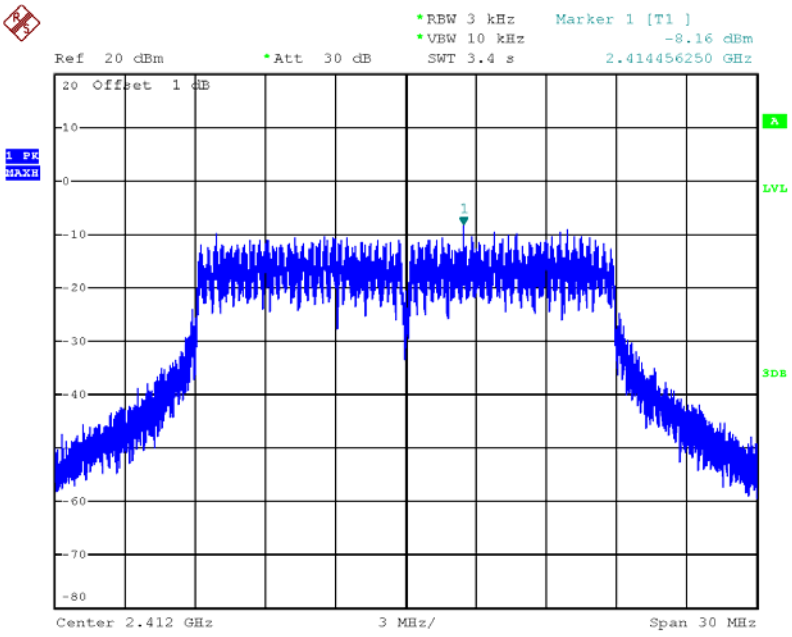


Tx2



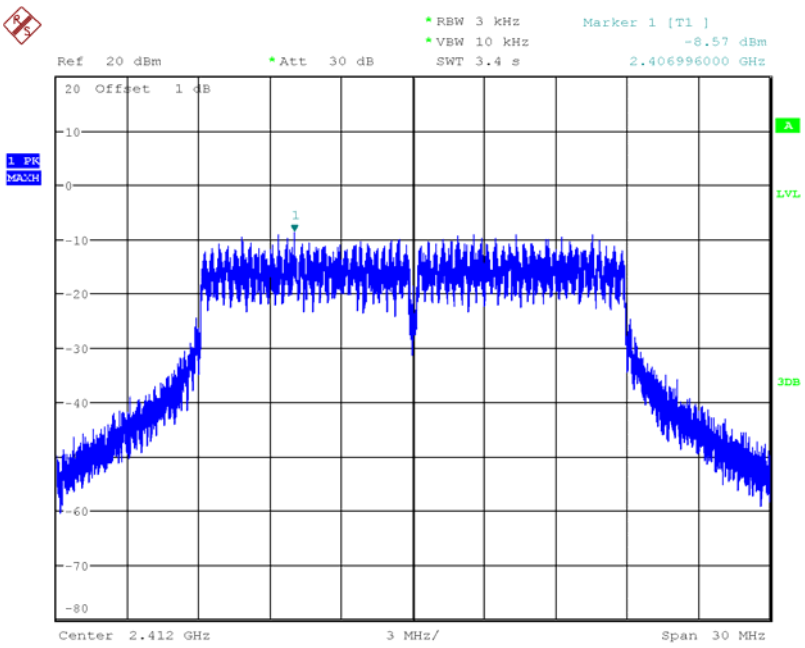
Power Spectral Density Plot on 2412 MHz, HT-20, M0

Tx1

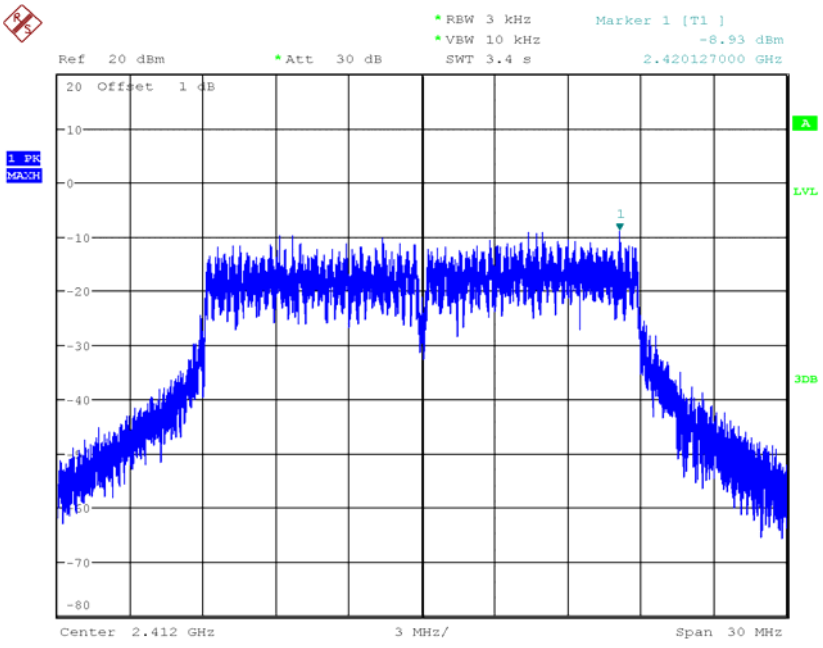


Power Spectral Density Plot on 2412 MHz, HT-20, M0 / HT-20, STBC, M0

Tx1

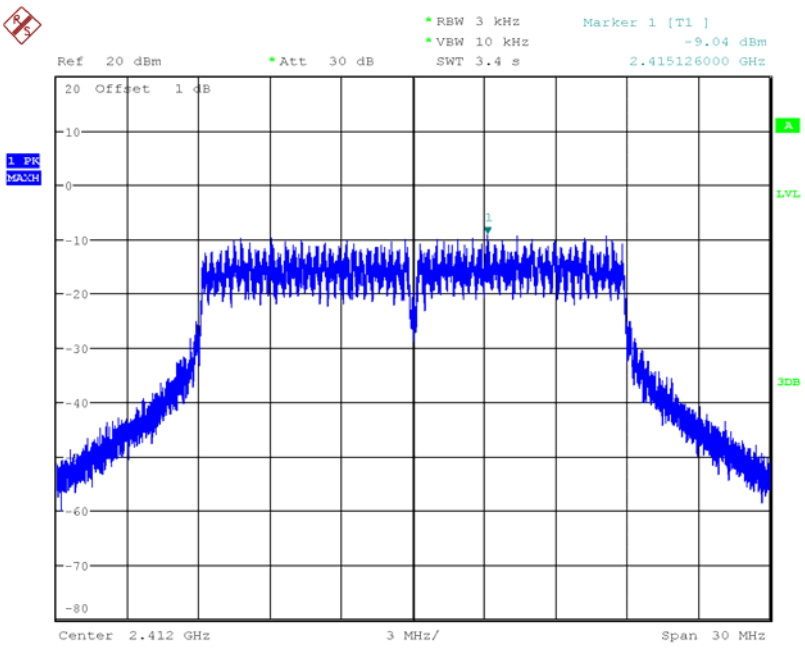


Tx2

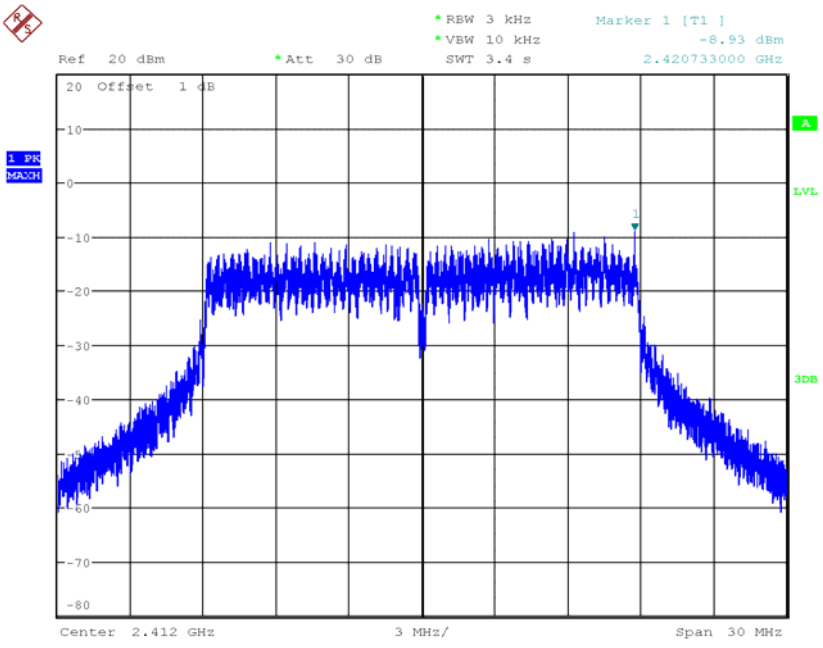


Power Spectral Density Plot on 2412 MHz, HT-20, Beam Forming, M0

Tx1

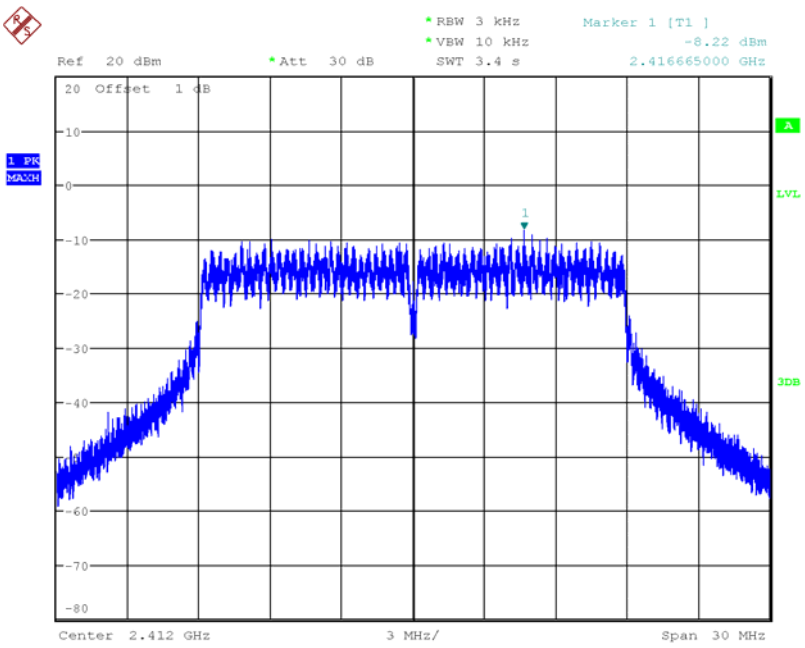


Tx2



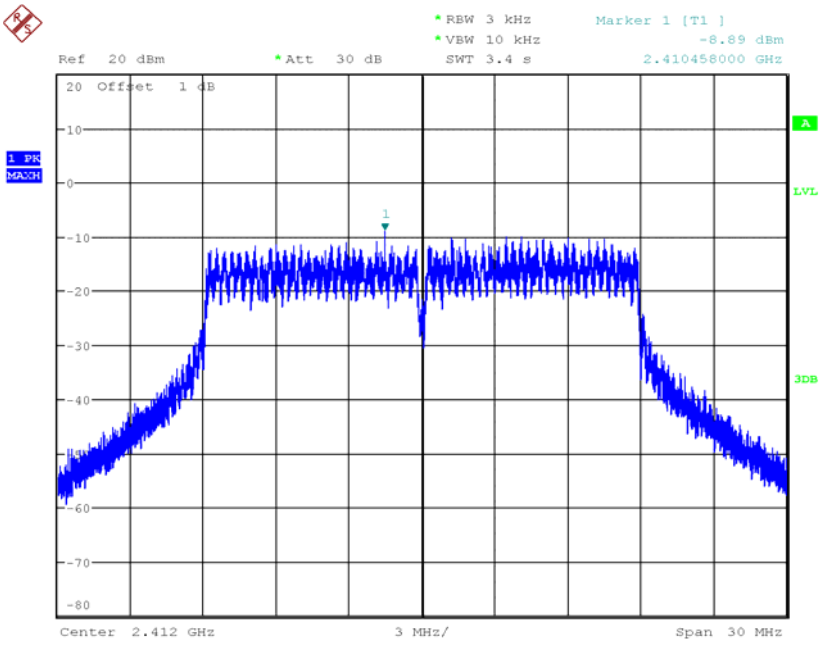
Power Spectral Density Plot on 2412 MHz, HT-20, Beam Forming, M8

Tx1



Date: 24.OCT.2012 21:20:54

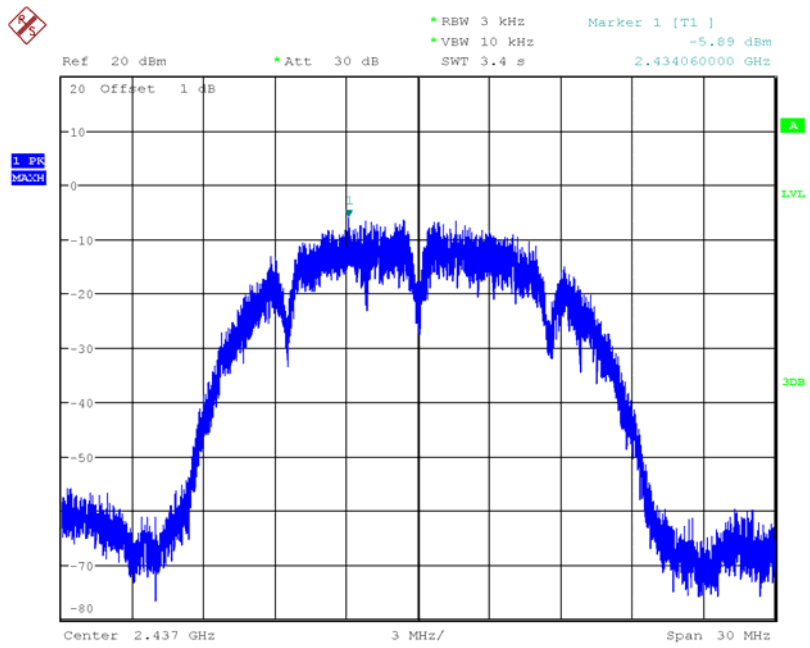
Tx2



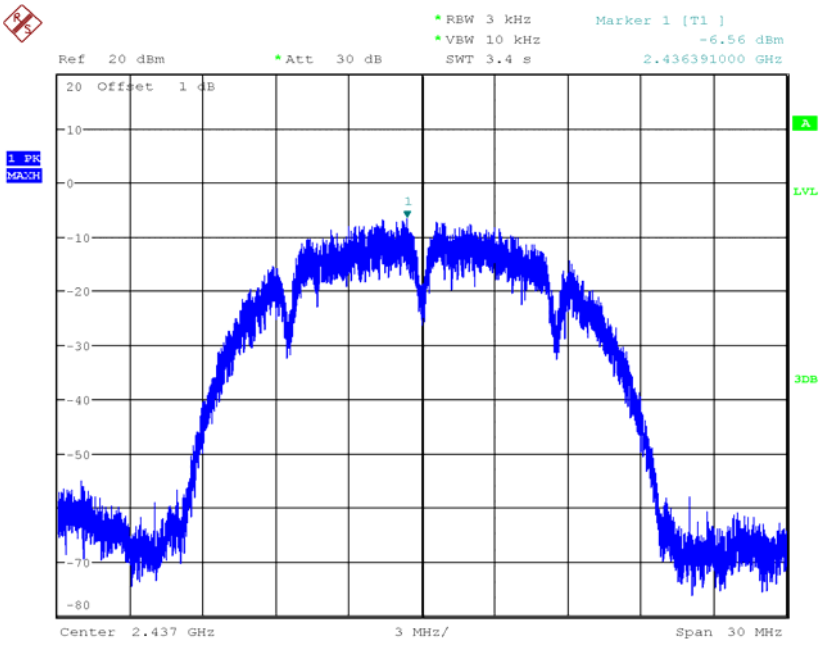
Date: 24.OCT.2012 21:42:52

Power Spectral Density Plot on 2437 MHz, Legacy CCK, 11Mbps

Tx1

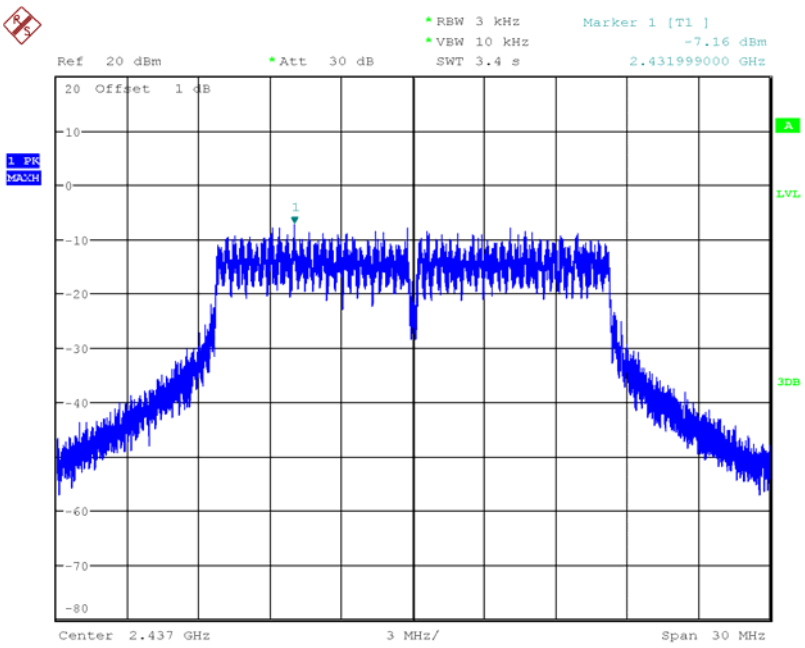


Tx2

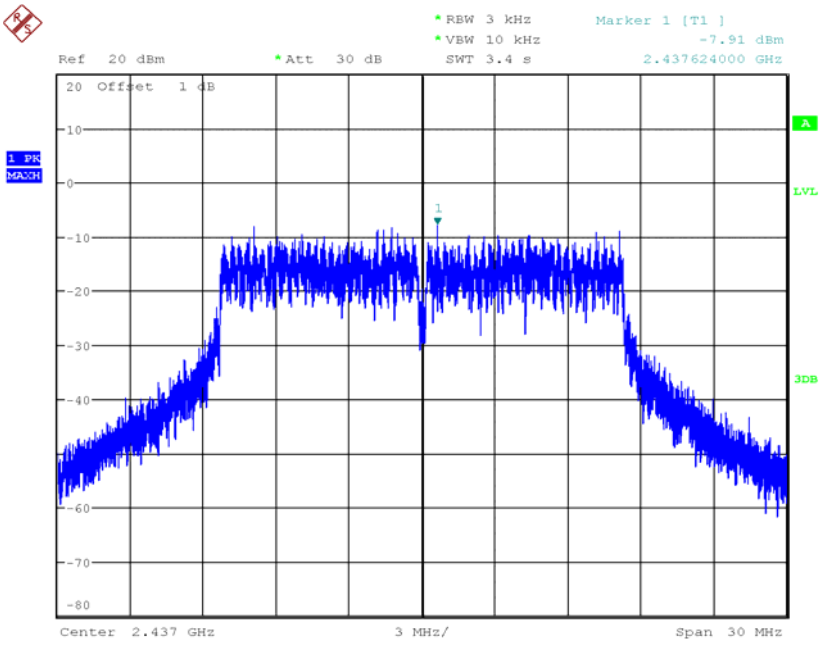


Power Spectral Density Plot on 2437 MHz, Non HT-20, 6Mbps

Tx1

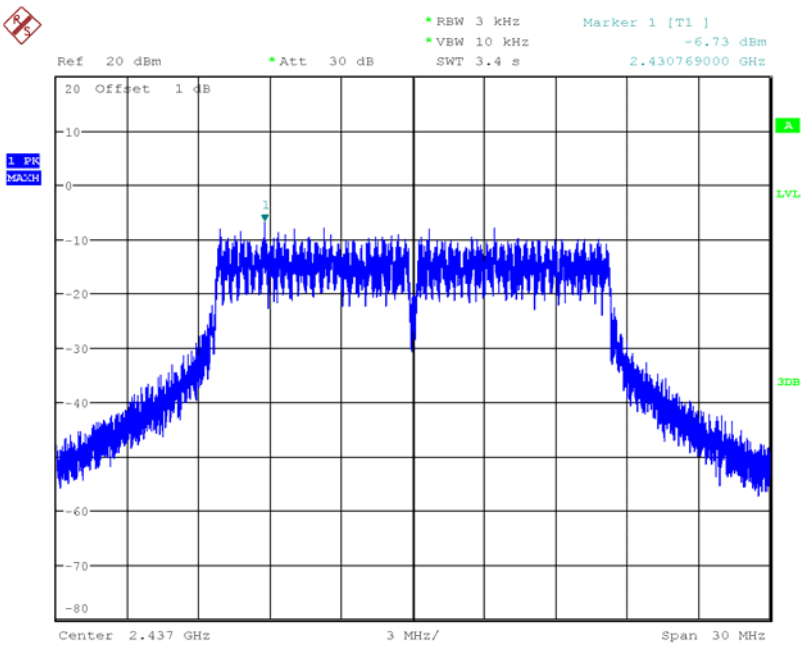


Tx2

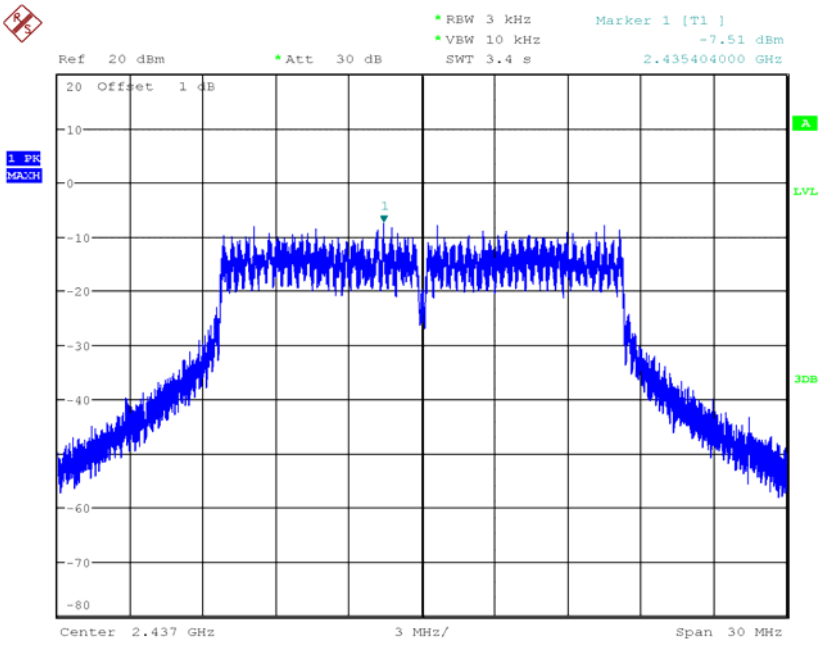


Power Spectral Density Plot on 2437 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1

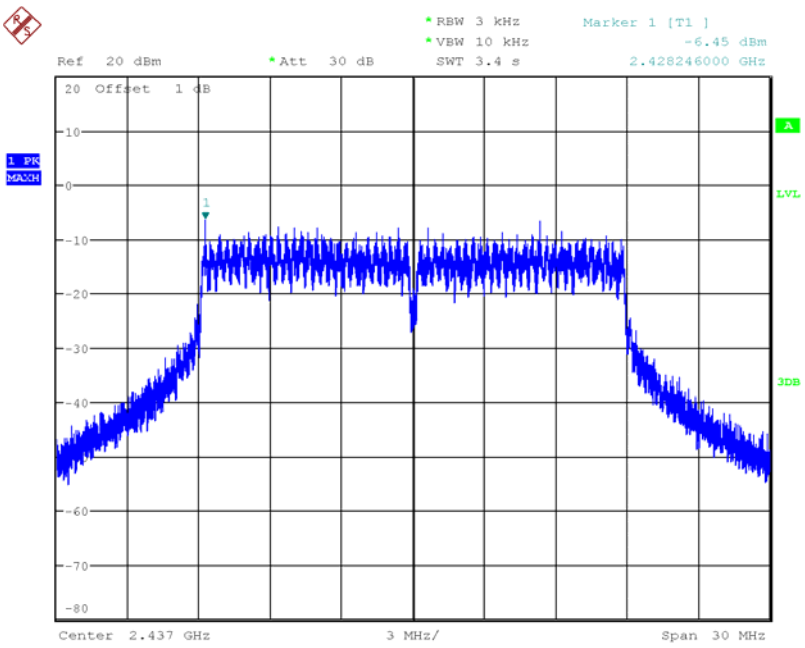


Tx2

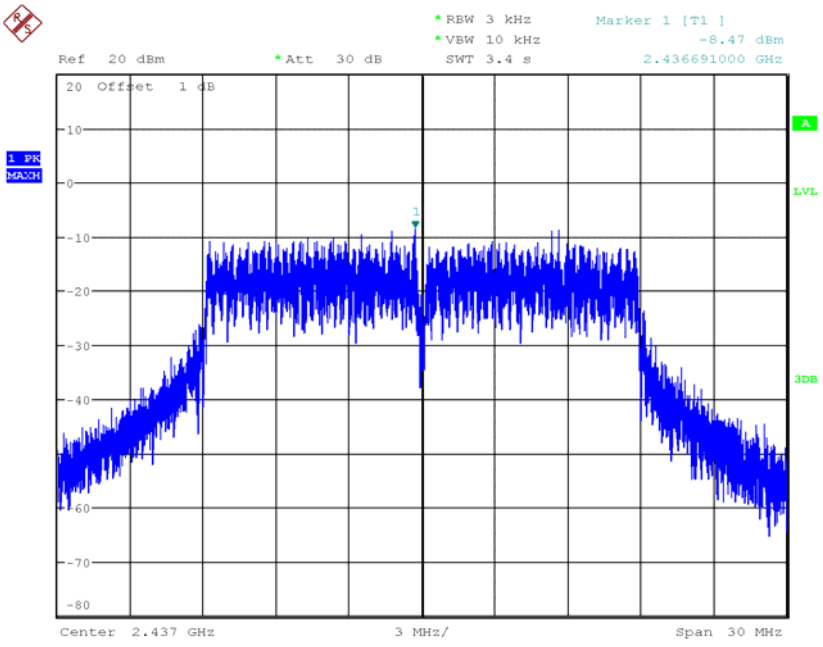


Power Spectral Density Plot on 2437 MHz, HT-20, M0 / HT-20, STBC, M0

Tx1

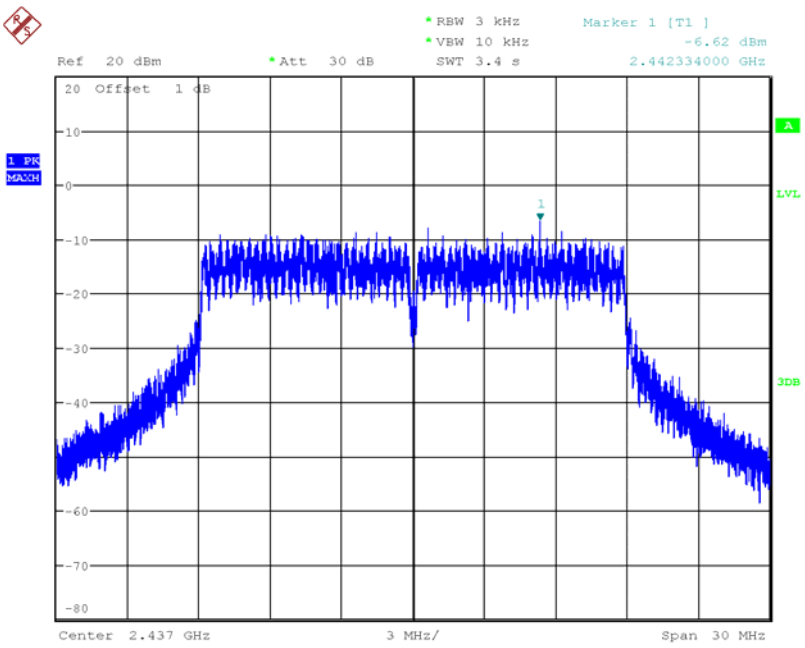


Tx2

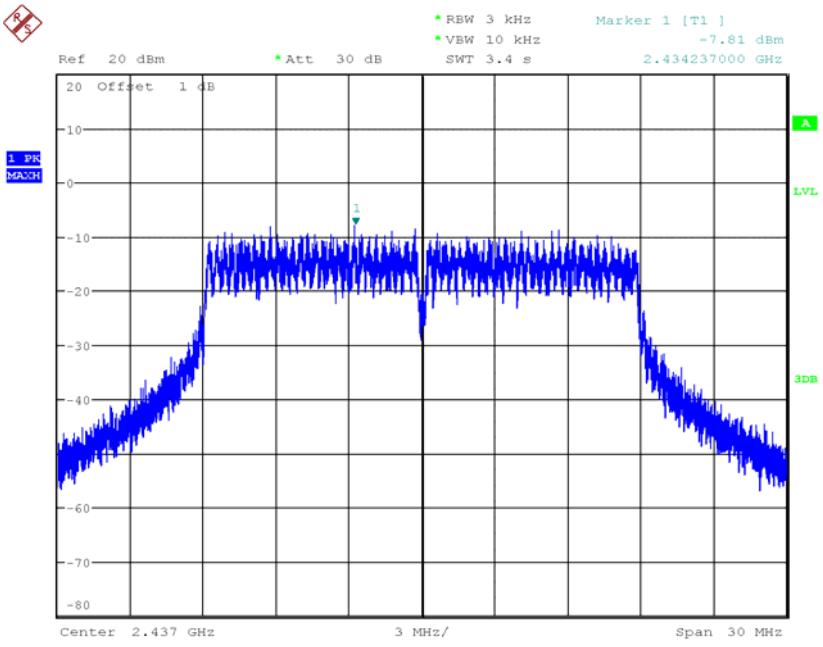


Power Spectral Density Plot on 2437 MHz, HT-20, Beam Forming, M0

Tx1

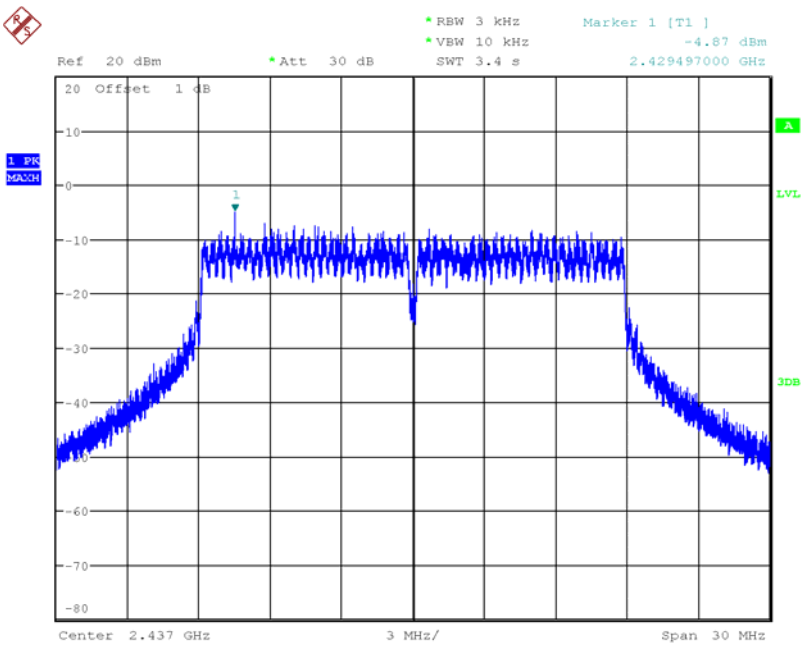


Tx2



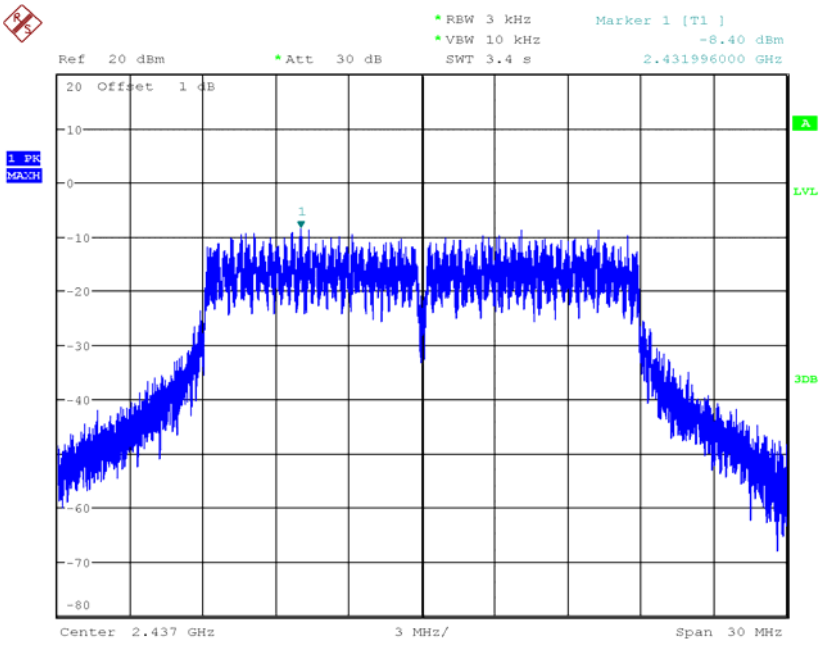
Power Spectral Density Plot on 2437 MHz, HT-20, Beam Forming, M8

Tx1



Date: 24.OCT.2012 21:22:46

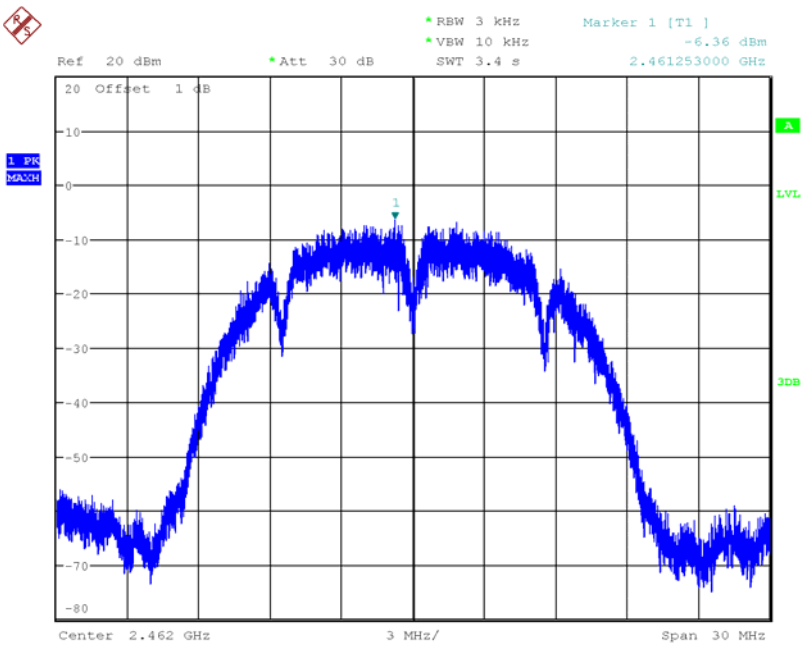
Tx2



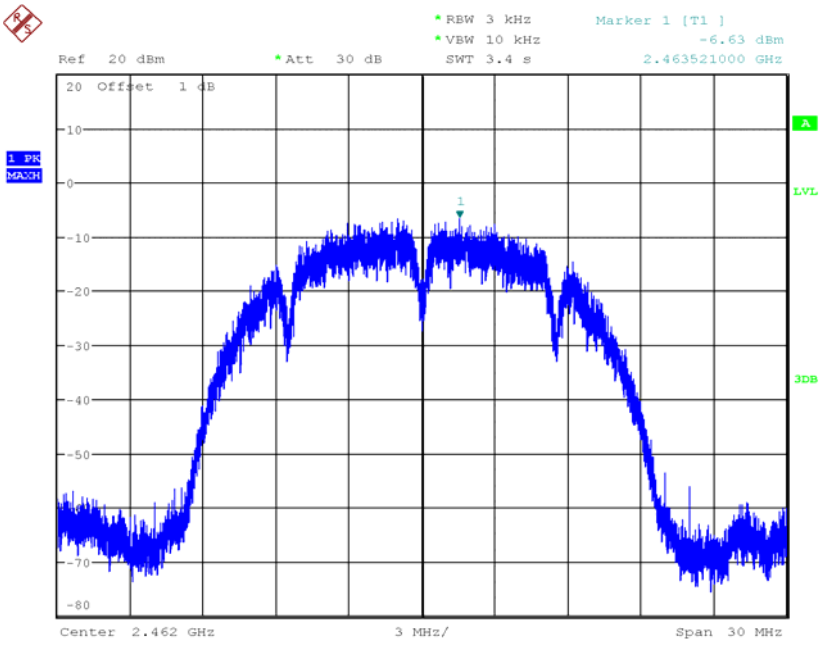
Date: 24.OCT.2012 21:38:48

Power Spectral Density Plot on 2462 MHz, Legacy CCK, 11Mbps

Tx1

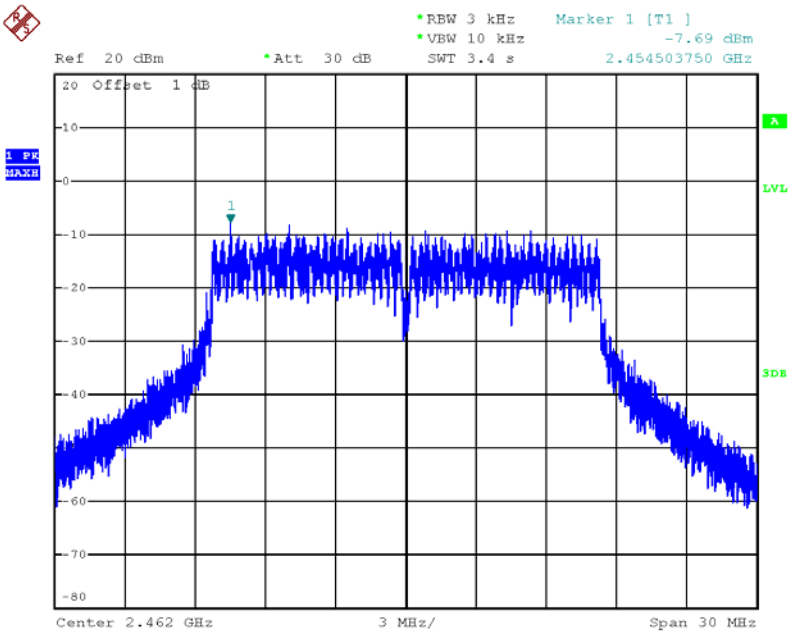


Tx2



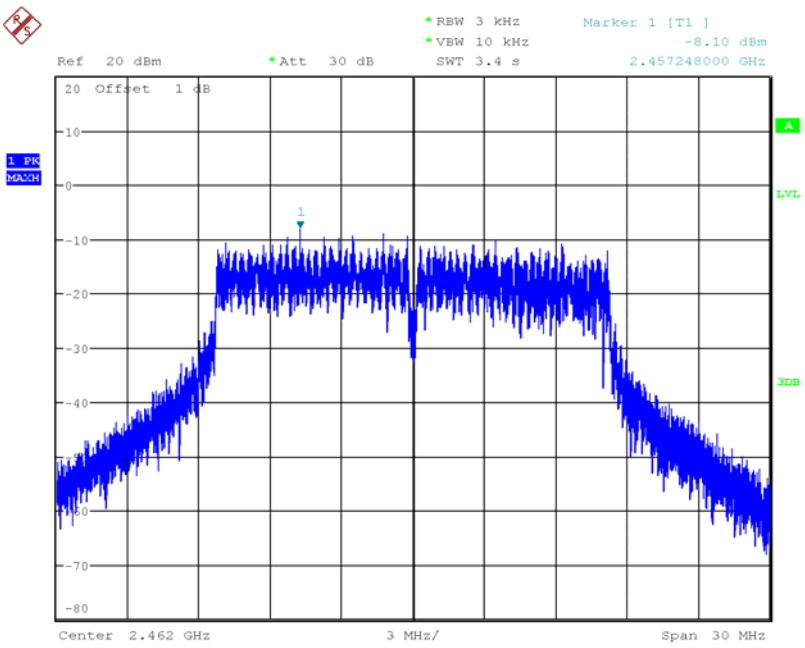
Power Spectral Density Plot on 2462 MHz, Non HT-20, 6Mbps

Tx1

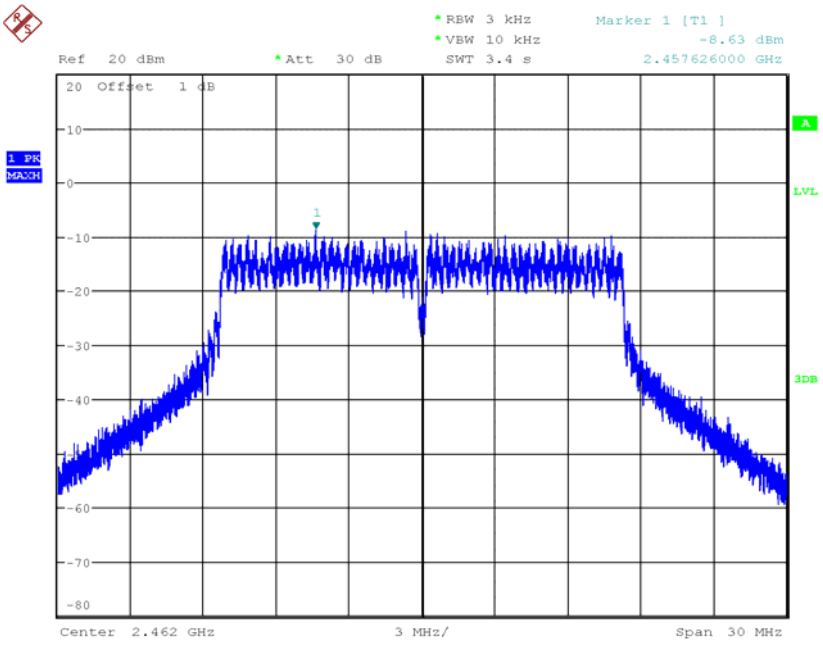


Power Spectral Density Plot on 2462 MHz, Non HT-20, 6Mbps

Tx1

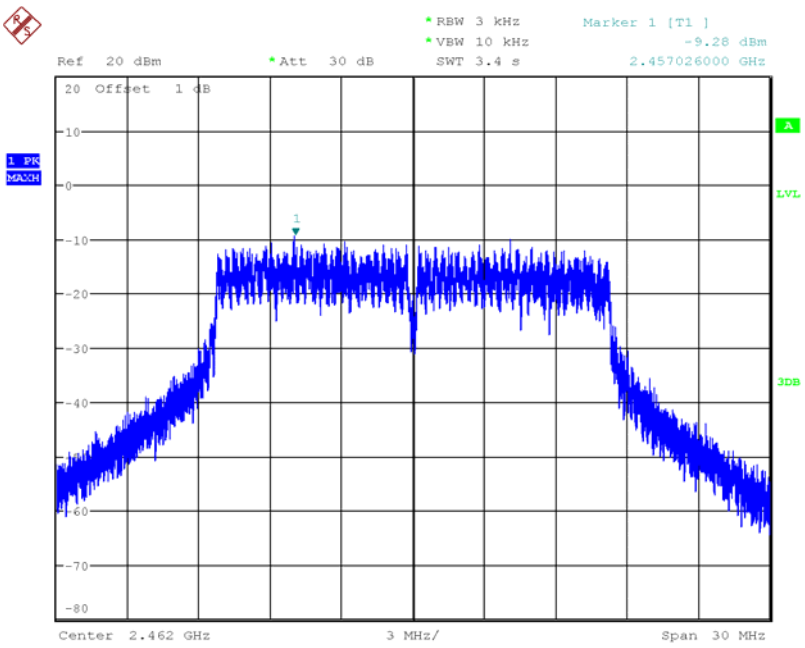


Tx2

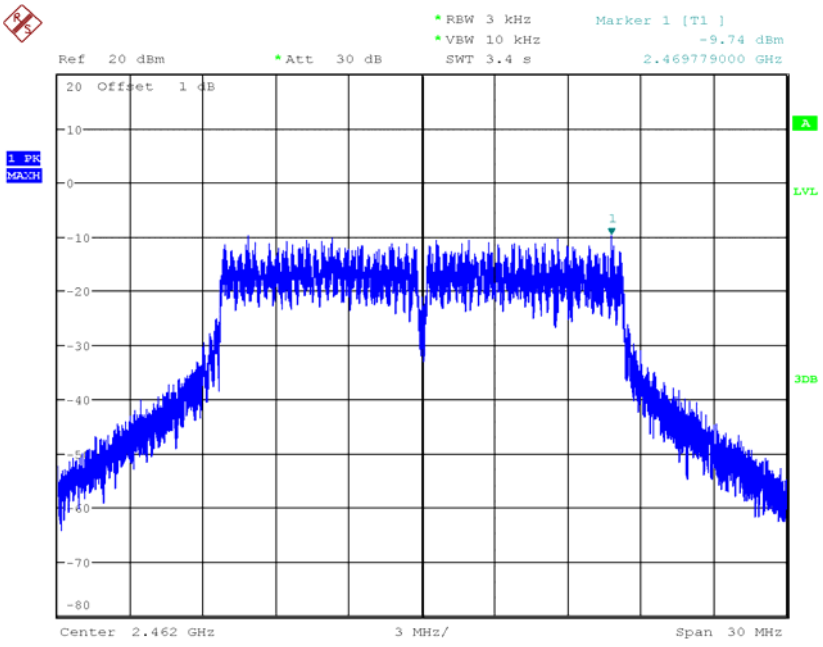


Power Spectral Density Plot on 2462 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1

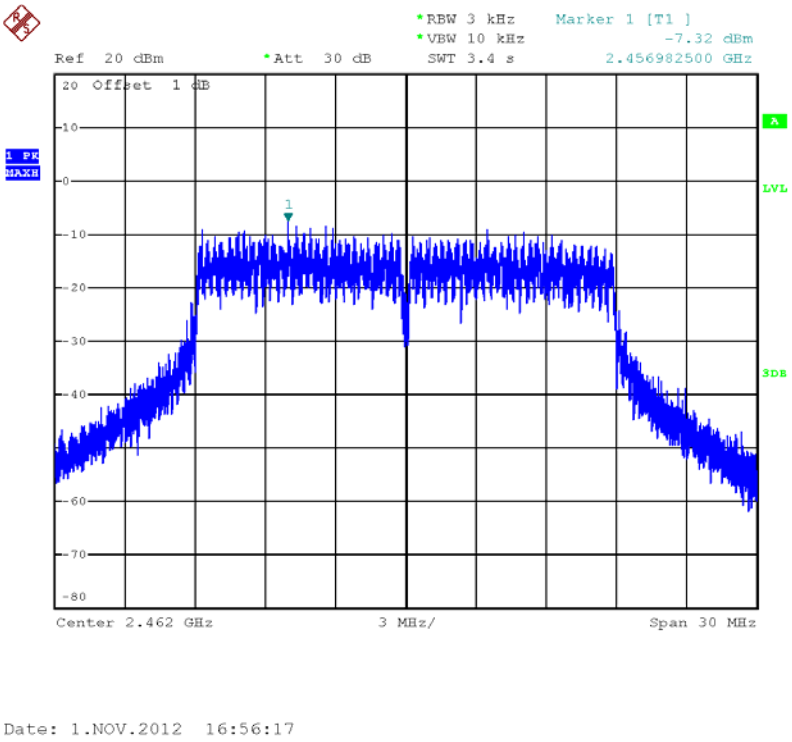


Tx2



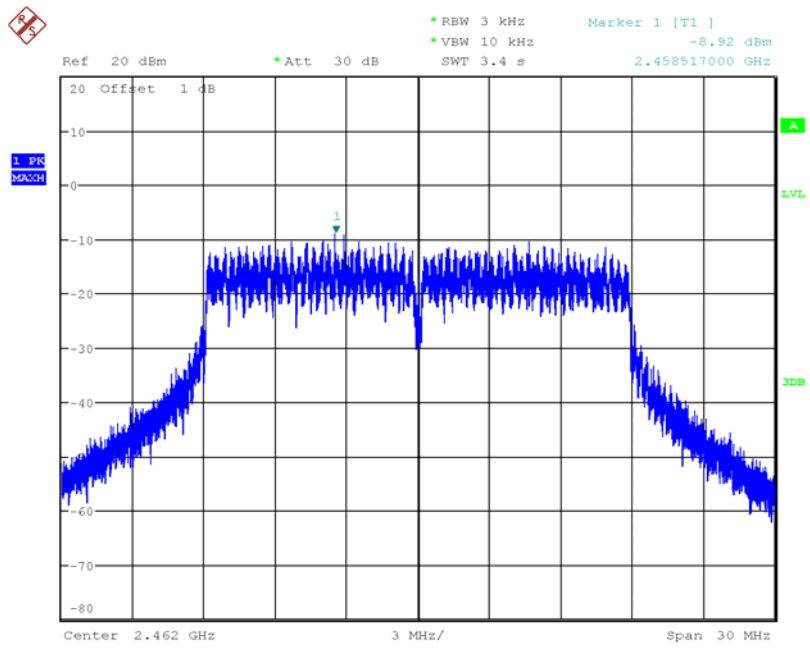
Power Spectral Density Plot on 2462 MHz, HT-20, M0

Tx1

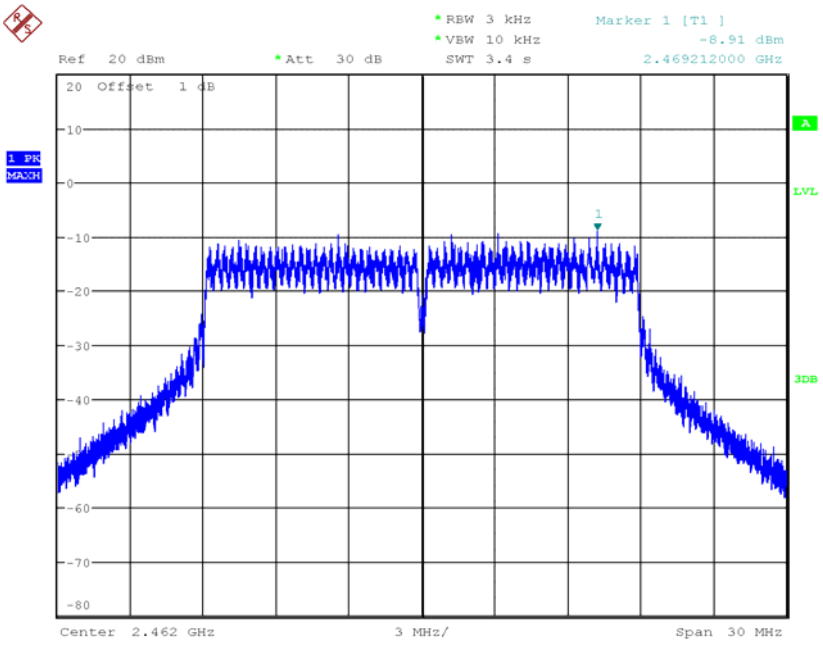


Power Spectral Density Plot on 2462 MHz, HT-20, M0 / HT-20, STBC, M0

Tx1

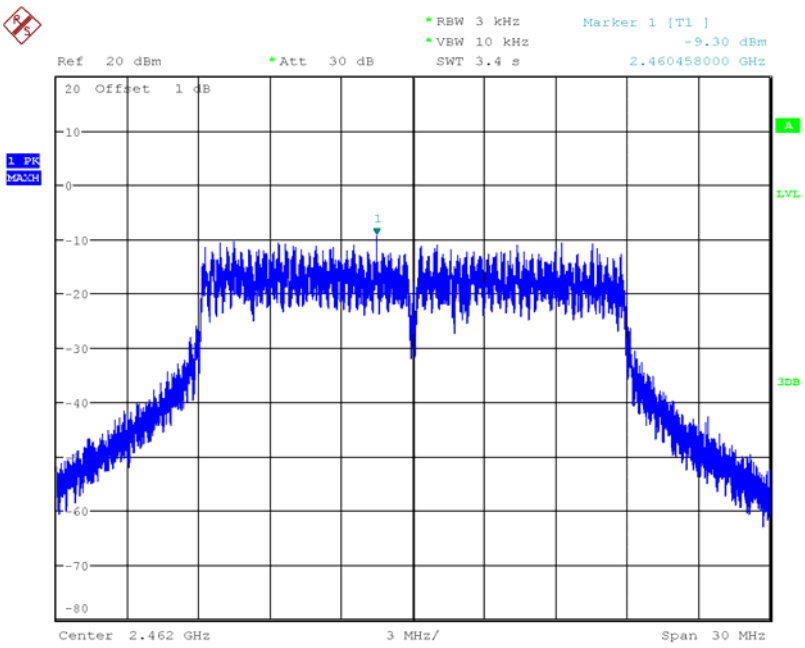


Tx2



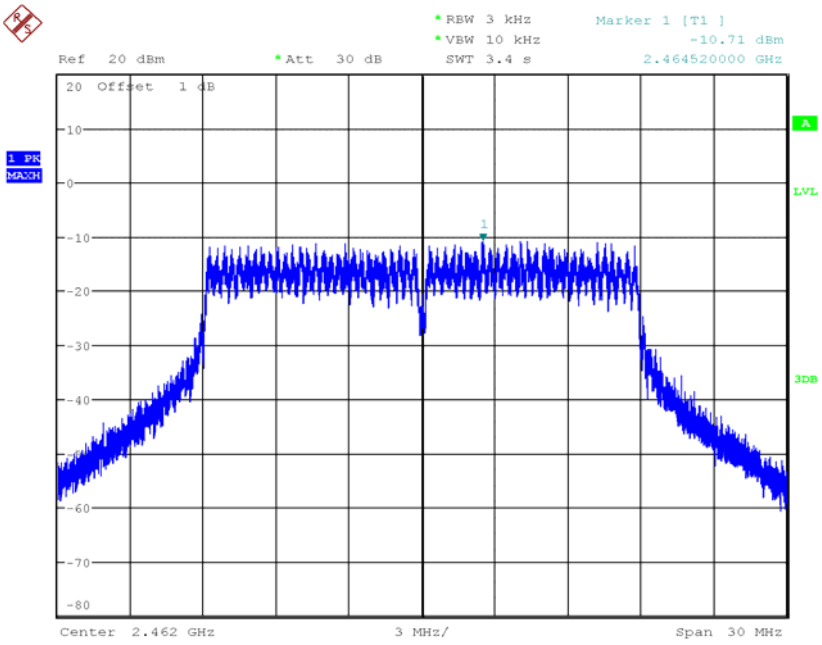
Power Spectral Density Plot on 2462 MHz, HT-20, Beam Forming, M0

Tx1



Date: 24.OCT.2012 21:30:02

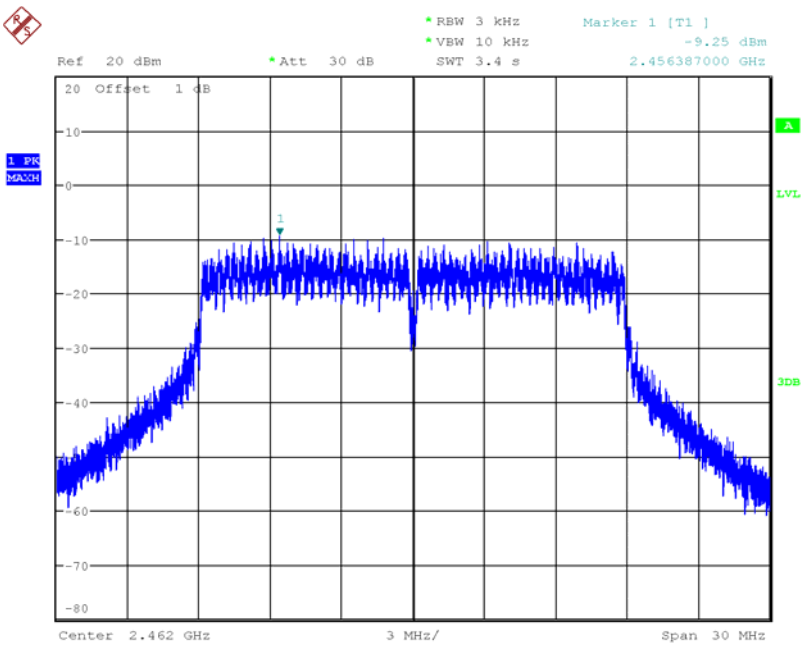
Tx2



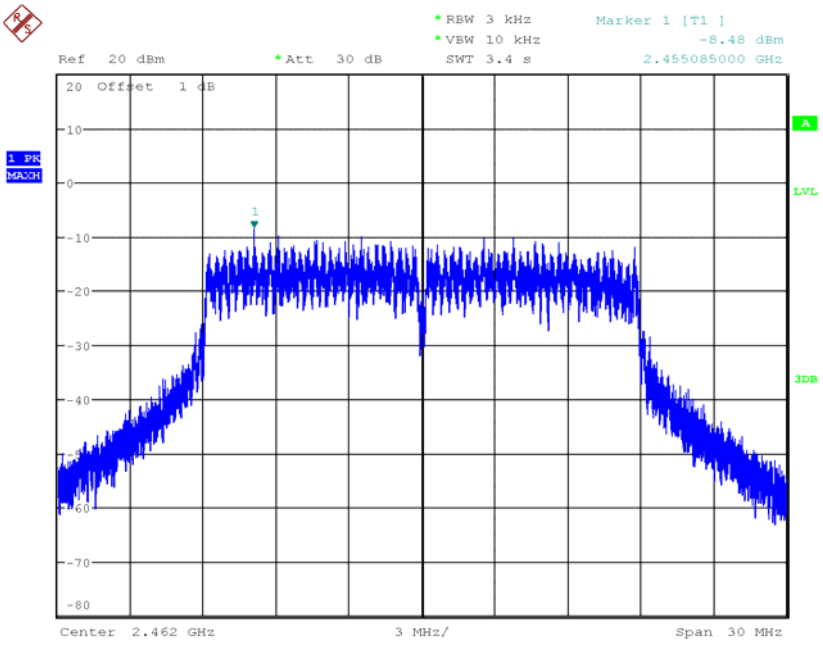
Date: 24.OCT.2012 21:33:38

Power Spectral Density Plot on 2462 MHz, HT-20, Beam Forming, M8

Tx1



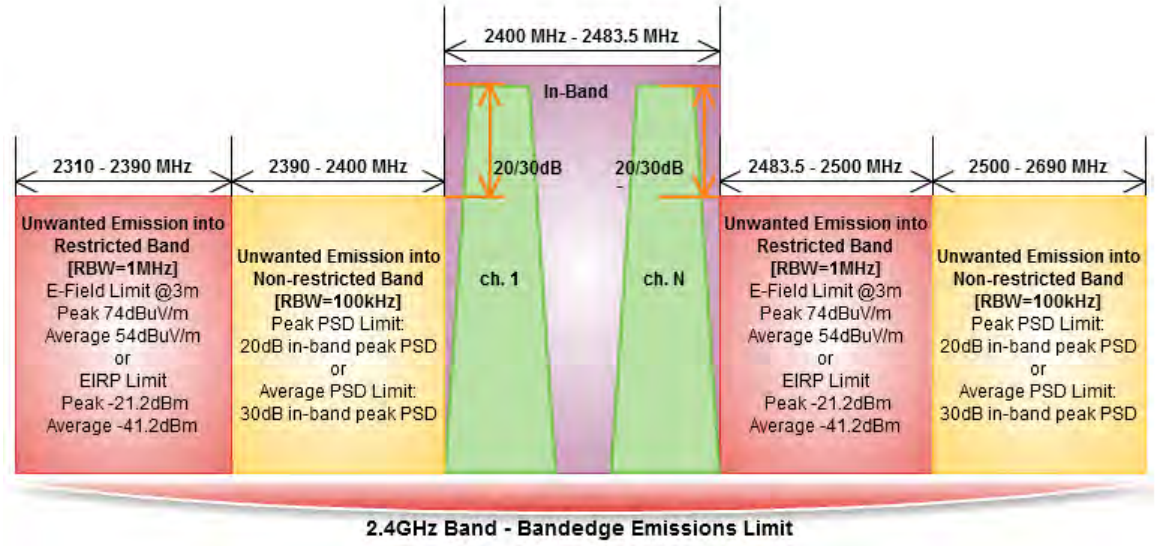
Tx2



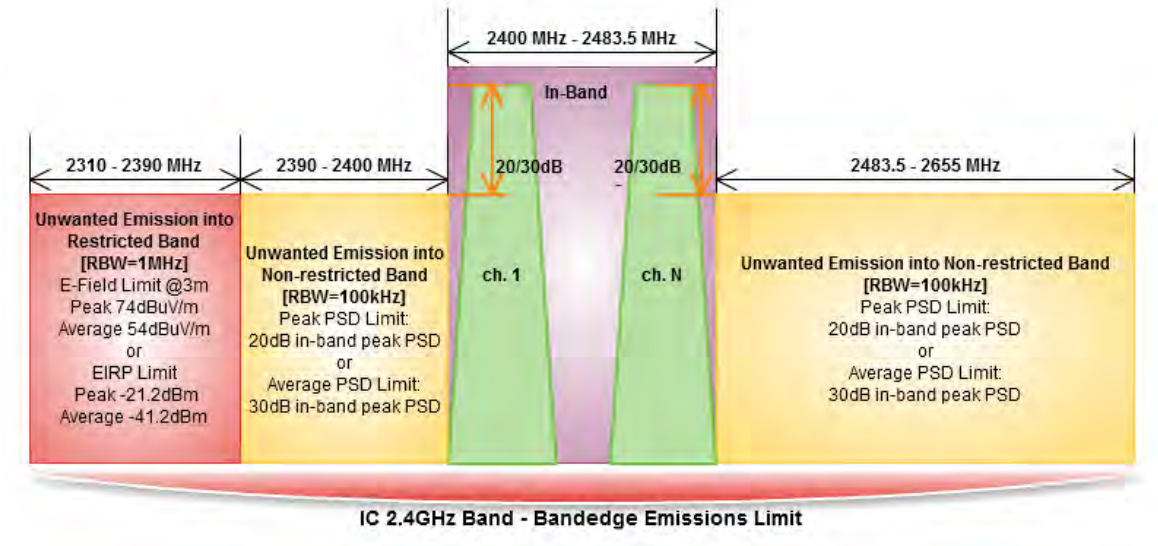
3.6 Transmitter Conducted Bandedge Emissions

3.6.1 Transmitter Conducted Bandedge Emissions Limit

Transmitter Conducted Bandedge Emissions Limit



IC Transmitter Conducted Bandedge Emissions Limit



3.6.2 Measuring Instruments

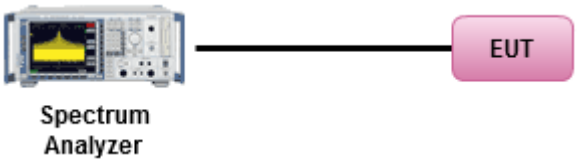
Refer a test equipment and calibration data table in this test report.

3.6.3 Test Procedures

Test Method		
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].	
☒	Refer as ANSI C63.10, clause 6.9.2.2 bandedge testing shall be performed at the lowest frequency channel and highest frequency channel within the allowed operating band.	
☒	For the transmitter unwanted emissions shall be measured using following options below:	
	☒	Refer as FCC KDB 558074, clause 10.1 for unwanted emissions into non-restricted bands.
	☒	Refer as FCC KDB 558074, clause 10.2 for unwanted emissions into restricted bands.
		☐ Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 1 (spectral trace averaging)
		☐ Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 2 (slow sweep speed).
		☒ Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW).
		☐ Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☒ Refer as FCC KDB 558074, clause 10.2.3.2 and 8.1.1 measurement procedure peak limit.
☒	For the transmitter bandedge emissions shall be measured using following options below:	
	☐	Refer as FCC KDB 558074, clause 10.2.5.2 for narrower resolution bandwidth using the band power and summing the spectral levels (i.e., 100 kHz or 1 MHz).
	☒	Refer as ANSI C63.10, clause 6.9.2 for band-edge testing.
	☐	Refer as ANSI C63.10, clause 6.9.3 for marker-delta method for band-edge measurements.
☐	For radiated measurement, refer as FCC KDB 558074, clause 10.2.1.	
☒	For conducted measurement, refer as FCC KDB 558074, clause 10.2.2.	

3.6.4 Test Setup

Transmitter Conducted Bandedge Emissions



3.6.5 Test Result of Transmitter Conducted Bandedge Emissions

Transmitter Conducted Bandedge Emissions Result – Average

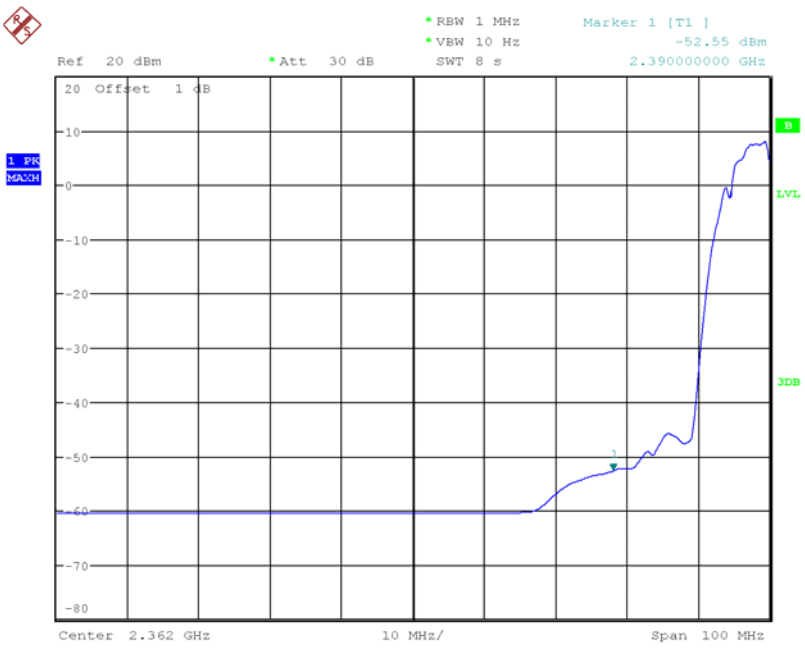
Freq. (MHz)	Operating Mode	N_{TX}	Correlated Antenna Gain (dBi)	TX1 Bandedge Level (dBm)	TX2 Bandedge Level (dBm)	Total TX Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	2	3.00	-52.55	-53.64	-47.05	-41.25	5.80
	Non HT-20, 6 to 54Mbps	1	3.00	-49.19	-	-46.19	-41.25	4.94
	Non HT-20, 6 to 54Mbps	2	3.00	-48.33	-48.67	-42.49	-41.25	1.24
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	-50.37	-51.51	-41.88	-41.25	0.63
	HT-20, M0 to M7	1	3.00	-48.83	-	-45.83	-41.25	4.58
	HT-20, M0 to M15/ HT-20, STBC, M0 to M7	2	3.00	-49.37	-49.68	-43.51	-41.25	2.26
	HT-20, Beam Forming, M0 to M7	2	6.01	-50.29	-51.33	-41.76	-41.25	0.51
	HT-20, Beam Forming, M8 to M15	2	3.00	-50.38	-51.59	-44.93	-41.25	3.68
2437	Legacy CCK, 1 to 11Mbps	2	3.00	-53.11	-53.96	-47.50	-41.25	6.25
	Non HT-20, 6 to 54Mbps	2	3.00	-52.49	-53.39	-46.91	-41.25	5.66
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	-52.01	-53.02	-43.47	-41.25	2.22
	HT-20, M0 to M15/ HT-20, STBC, M0 to M7	2	3.00	-52.51	-53.46	-46.95	-41.25	5.70
	HT-20, Beam Forming, M0 to M7	2	6.01	-51.99	-52.97	-43.43	-41.25	2.18
	HT-20, Beam Forming, M8 to M15	2	3.00	-52.27	-53.21	-46.70	-41.25	5.45
2462	Legacy CCK, 1 to 11Mbps	2	3.00	-52.48	-53.36	-46.89	-41.25	5.64
	Non HT-20, 6 to 54Mbps	1	3.00	-48.60	-	-45.60	-41.25	4.35
	Non HT-20, 6 to 54Mbps	2	3.00	-51.03	-50.46	-44.73	-41.25	3.48
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	-50.06	-50.74	-41.37	-41.25	0.12
	HT-20, M0 to M7	1	3.00	-48.34	-	-45.34	-41.25	4.09
	HT-20, M0 to M15/ HT-20, STBC, M0 to M7	2	3.00	-52.00	-51.10	-45.52	-41.25	4.27
	HT-20, Beam Forming, M0 to M7	2	6.01	-51.94	-51.02	-42.44	-41.25	1.19
	HT-20, Beam Forming, M8 to M15	2	3.00	-51.67	-50.88	-45.25	-41.25	4.00

Transmitter Conducted Bandedge Emissions Result – Peak

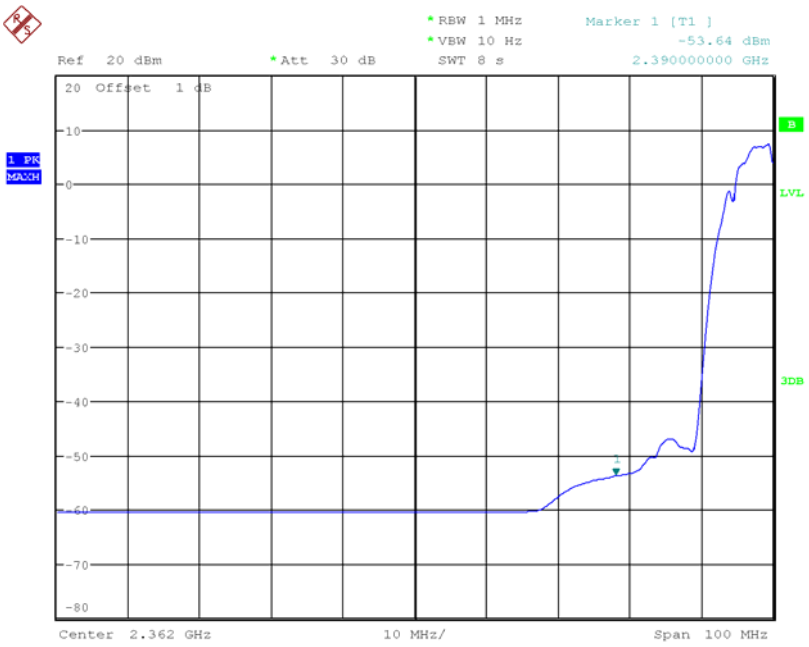
Freq. (MHz)	Operating Mode	N_{TX}	Correlated Antenna Gain (dBi)	TX1 Bandedge Level (dBm)	TX2 Bandedge Level (dBm)	Total TX Bandedge Level (dBm)	Limit (dBm)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	2	3.00	-41.49	-41.63	-35.55	-21.25	14.30
	Non HT-20, 6 to 54Mbps	1	3.00	-28.43	-	-25.43	-21.25	4.18
	Non HT-20, 6 to 54Mbps	2	3.00	-27.35	-27.51	-21.42	-21.25	0.17
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	-30.05	-30.61	-21.30	-21.25	0.05
	HT-20, M0 to M7	1	3.00	-27.87	-	-24.87	-21.25	3.62
	HT-20, M0 to M15/ HT-20, STBC, M0 to M7	2	3.00	-27.58	-27.51	-21.53	-21.25	0.28
	HT-20, Beam Forming, M0 to M7	2	6.01	-30.03	-31.67	-21.75	-21.25	0.50
	HT-20, Beam Forming, M8 to M15	2	3.00	-27.98	-26.67	-21.27	-21.25	0.02
2437	Legacy CCK, 1 to 11Mbps	2	3.00	-41.79	-40.77	-35.24	-21.25	13.99
	Non HT-20, 6 to 54Mbps	2	3.00	-39.19	-40.75	-33.89	-21.25	12.64
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	-39.35	-40.58	-30.90	-21.25	9.65
	HT-20, M0 to M15/ HT-20, STBC, M0 to M7	2	3.00	-41.46	-38.45	-33.69	-21.25	12.44
	HT-20, Beam Forming, M0 to M7	2	6.01	-39.77	-39.87	-30.80	-21.25	9.55
	HT-20, Beam Forming, M8 to M15	2	3.00	-38.72	-40.36	-33.45	-21.25	12.20
2462	Legacy CCK, 1 to 11Mbps	2	3.00	-42.39	-40.22	-35.16	-21.25	13.91
	Non HT-20, 6 to 54Mbps	1	3.00	-28.30	-	-25.30	-21.25	4.05
	Non HT-20, 6 to 54Mbps	2	3.00	-27.35	-27.71	-21.52	-21.25	0.27
	Non HT-20, Beam Forming, 6 to 54Mbps	2	6.01	-30.63	-30.13	-21.35	-21.25	0.10
	HT-20, M0 to M7	1	3.00	-28.28	-	-25.28	-21.25	4.03
	HT-20, M0 to M15/ HT-20, STBC, M0 to M7	2	3.00	-27.54	-27.86	-21.69	-21.25	0.44
	HT-20, Beam Forming, M0 to M7	2	6.01	-31.02	-30.18	-21.56	-21.25	0.31
	HT-20, Beam Forming, M8 to M15	2	3.00	-27.09	-28.54	-21.74	-21.25	0.49

Transmitter Conducted Bandedge Emissions Plot–Average on 2412 MHz, Legacy CCK, 11Mbps

Tx1

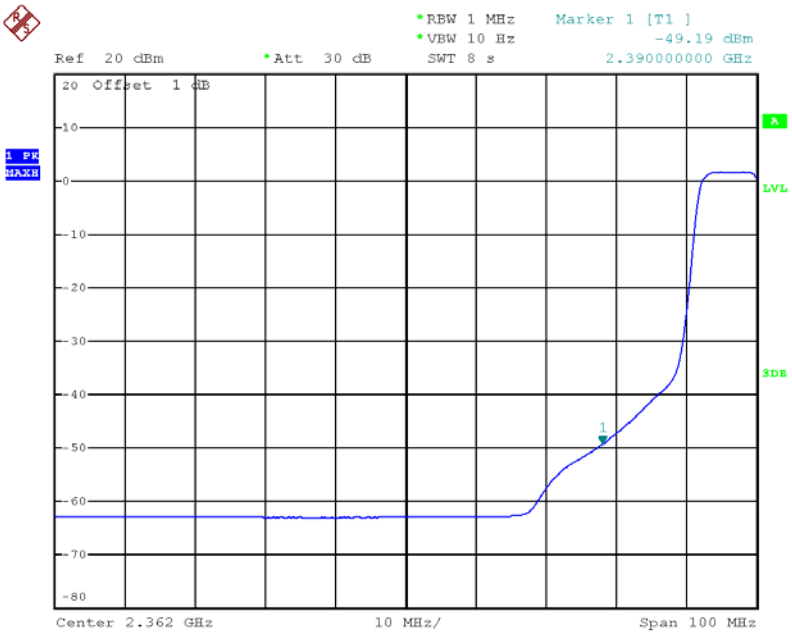


Tx2



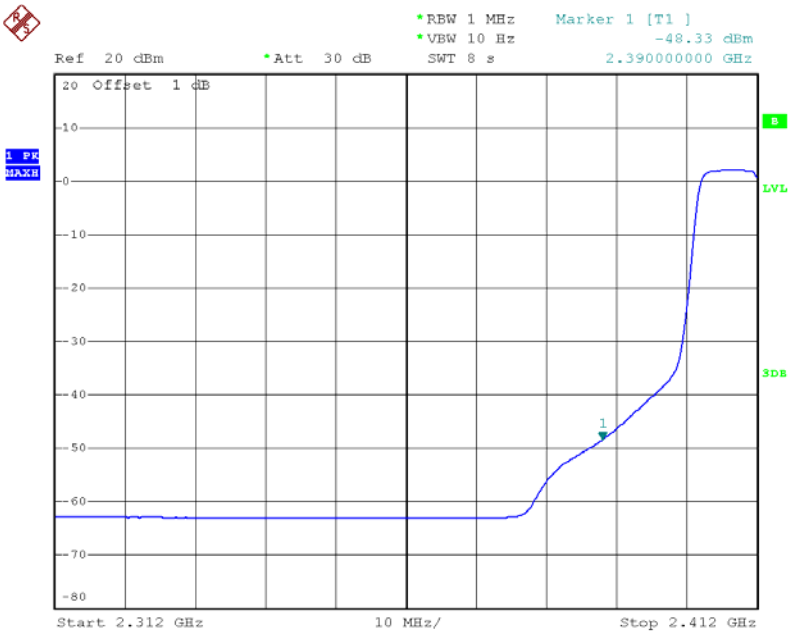
Transmitter Conducted Bandedge Emissions Plot–Average on 2412 MHz, Non HT-20, 6Mbps

Tx1



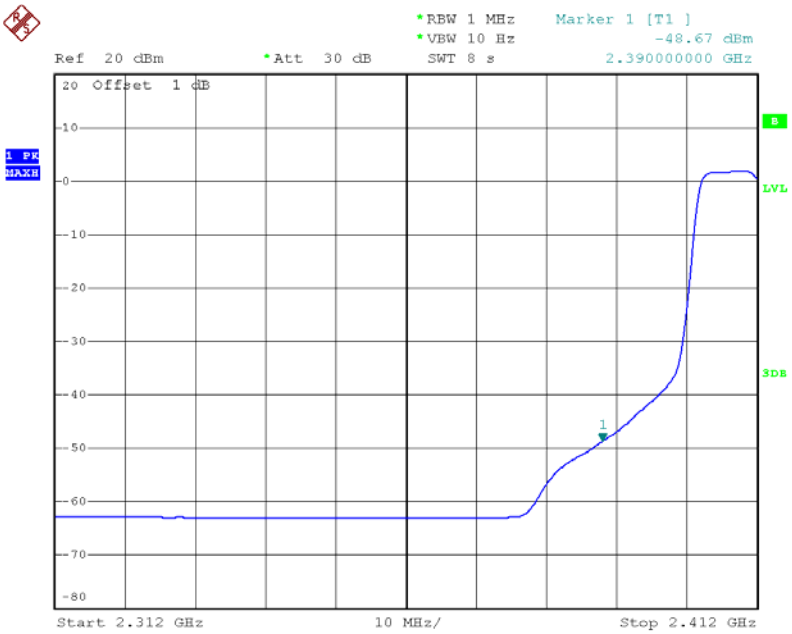
Transmitter Conducted Bandedge Emissions Plot–Average on 2412 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 15:23:03

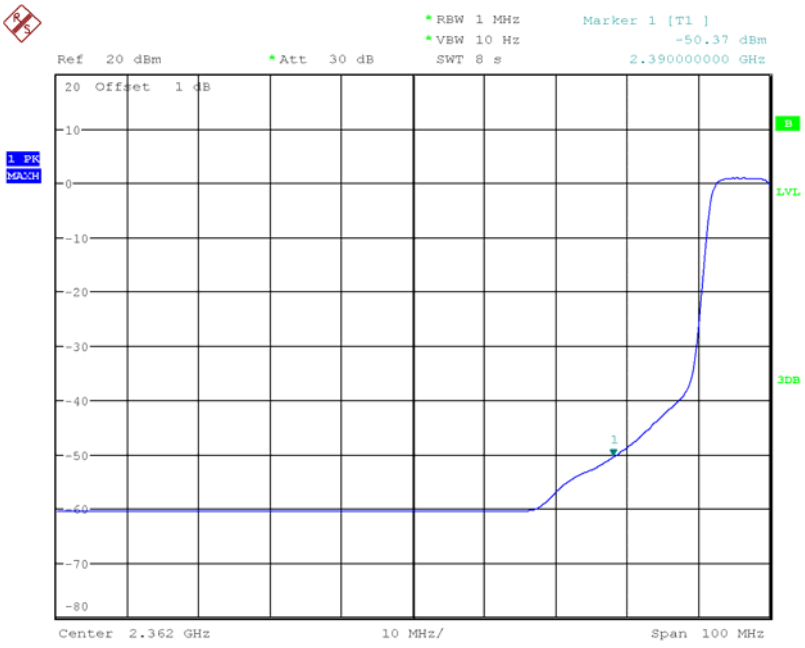
Tx2



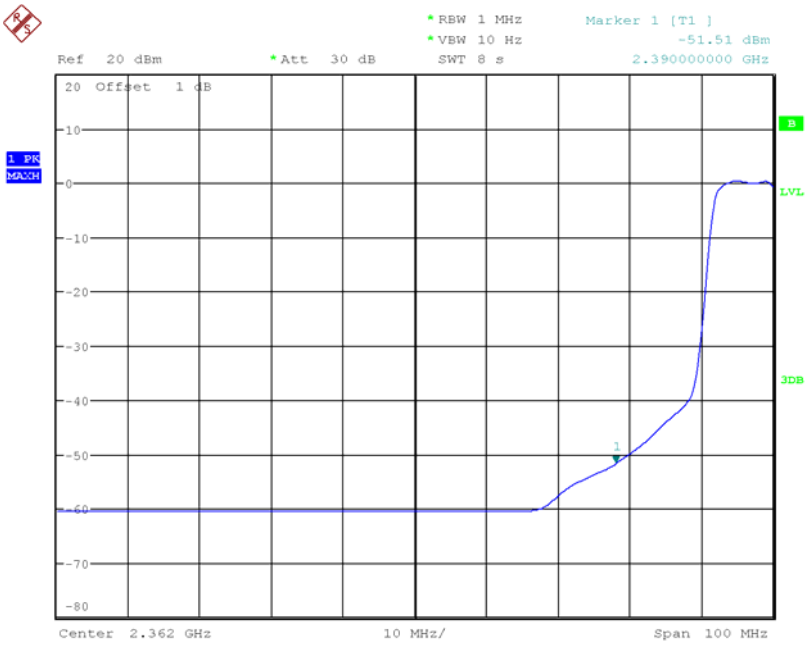
Date: 17.OCT.2012 15:22:06

Transmitter Conducted Bandedge Emissions Plot–Average on 2412 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



Tx2

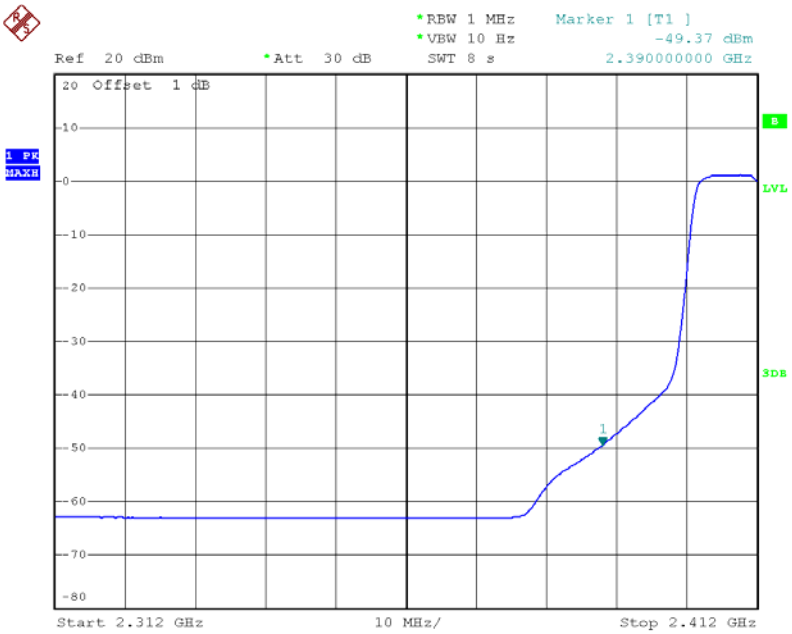


Transmitter Conducted Bandedge Emissions Plot – Average on 2412 MHz, HT-20, M0

Tx1

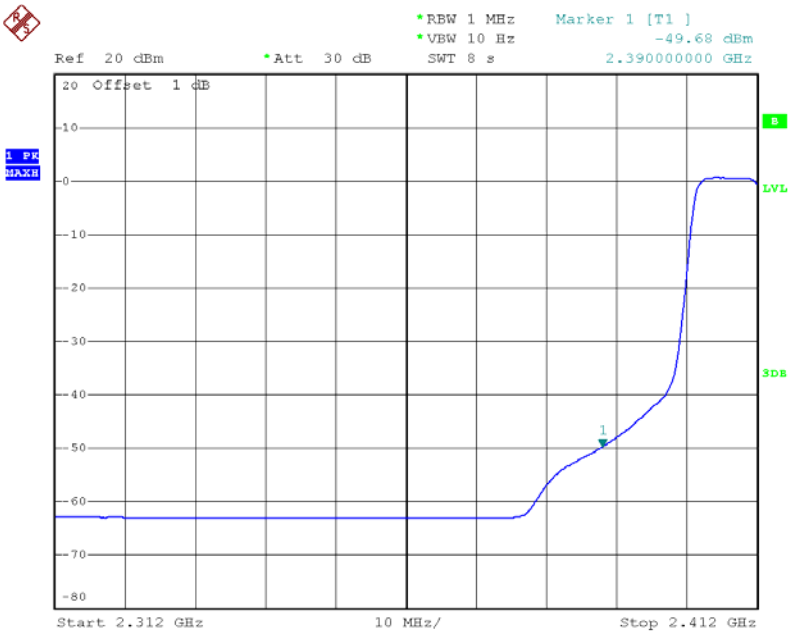
Transmitter Conducted Bandedge Emissions Plot–Average on 2412 MHz,HT-20/HT-20,STBC,M0

Tx1



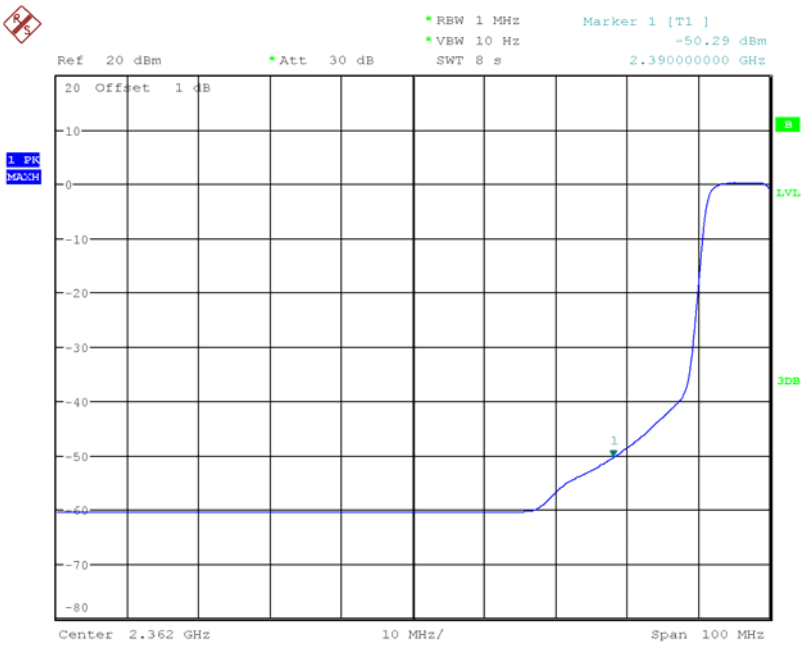
Date: 17.OCT.2012 15:50:59

Tx2

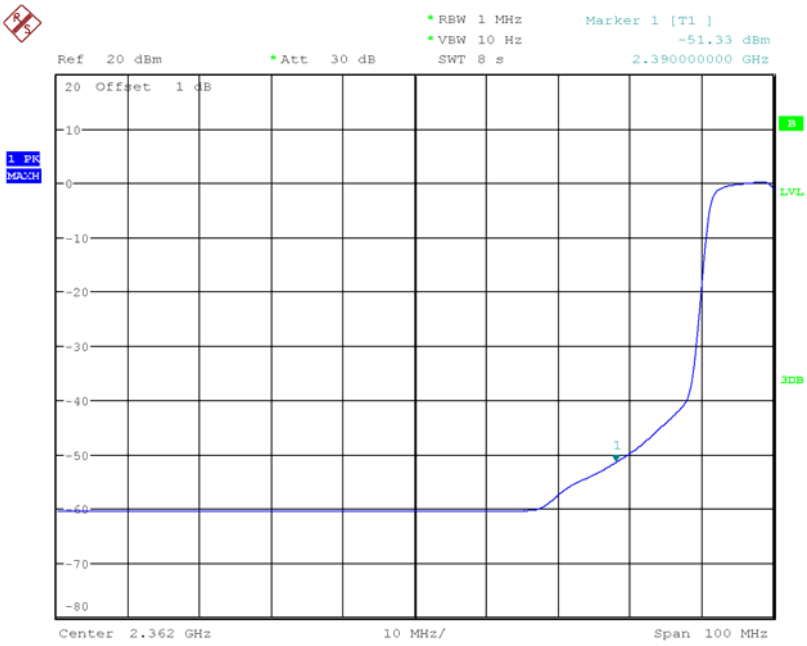


Date: 17.OCT.2012 15:51:25

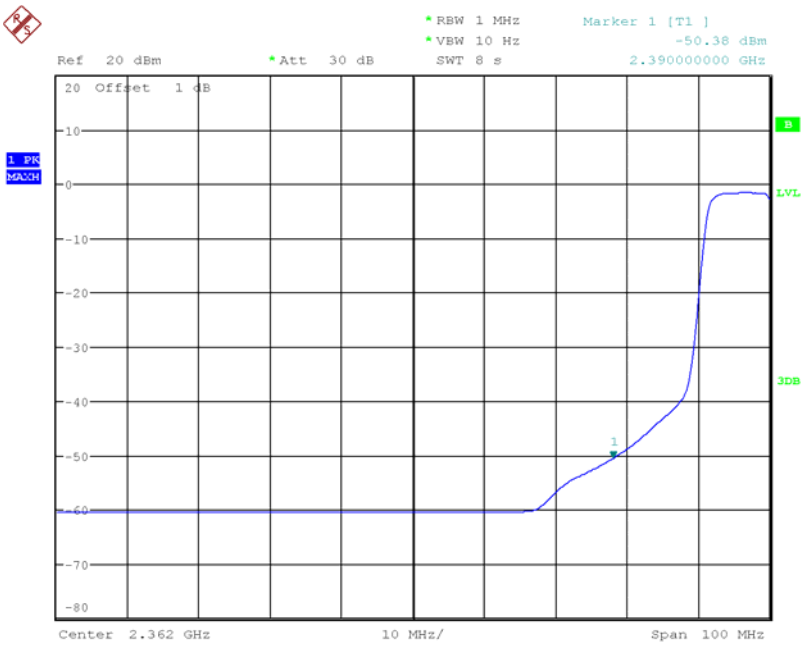
Transmitter Conducted Bandedge Emissions Plot–Average on 2412 MHz, HT-20, Beam Forming, M0
Tx1



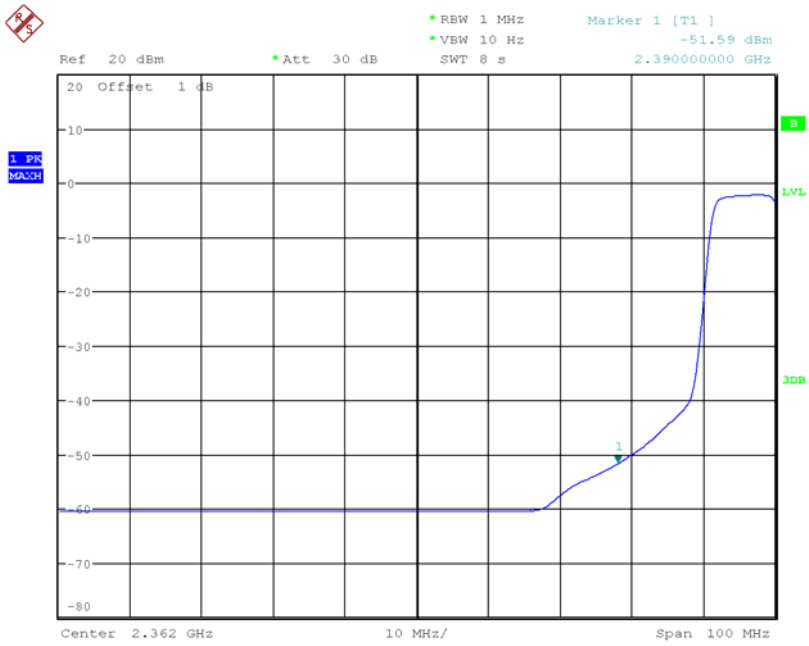
Tx2



Transmitter Conducted Bandedge Emissions Plot – Average on 2412 MHz, HT-20, Beam Forming, M8
Tx1

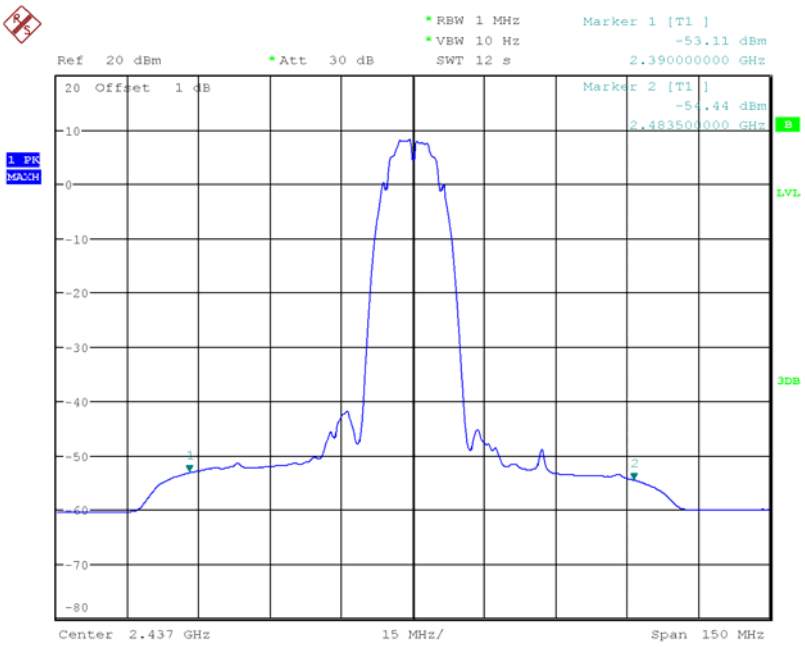


Tx2



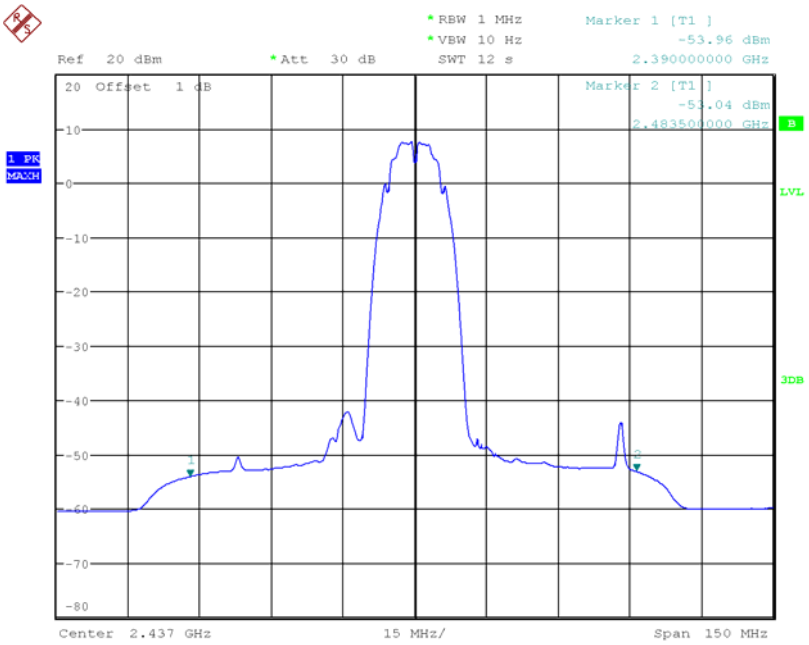
Transmitter Conducted Bandedge Emissions Plot–Average on 2437 MHz, Legacy CCK, 11Mbps

Tx1



Date: 6.OCT.2012 01:45:41

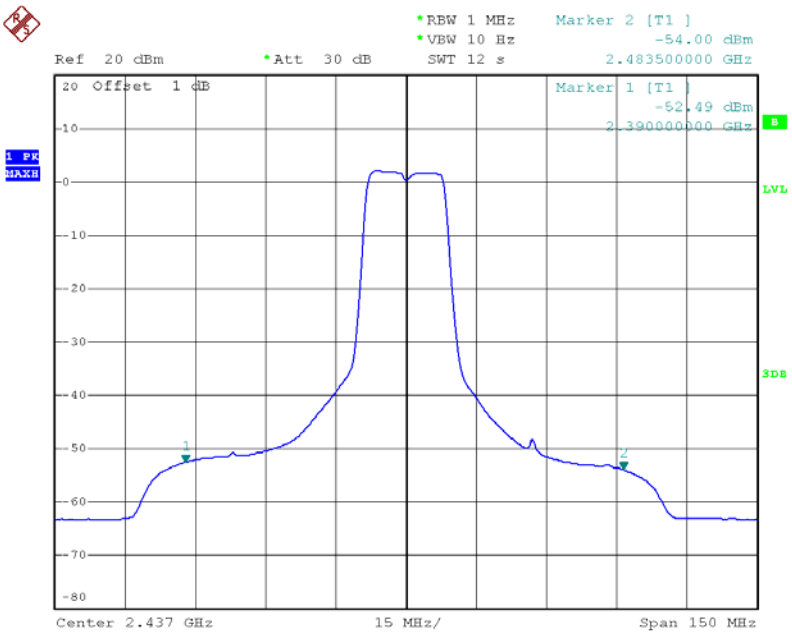
Tx2



Date: 6.OCT.2012 01:42:18

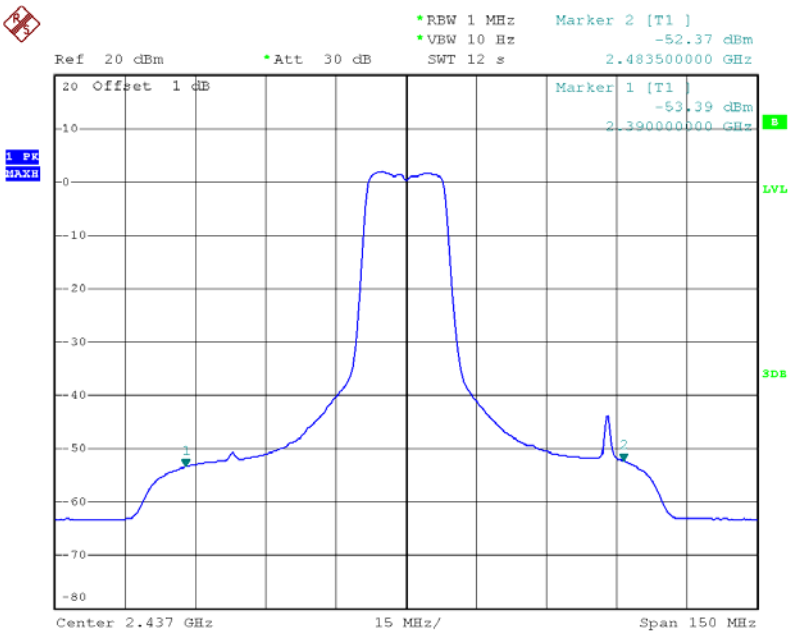
Transmitter Conducted Bandedge Emissions Plot – Average on 2437 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 15:27:27

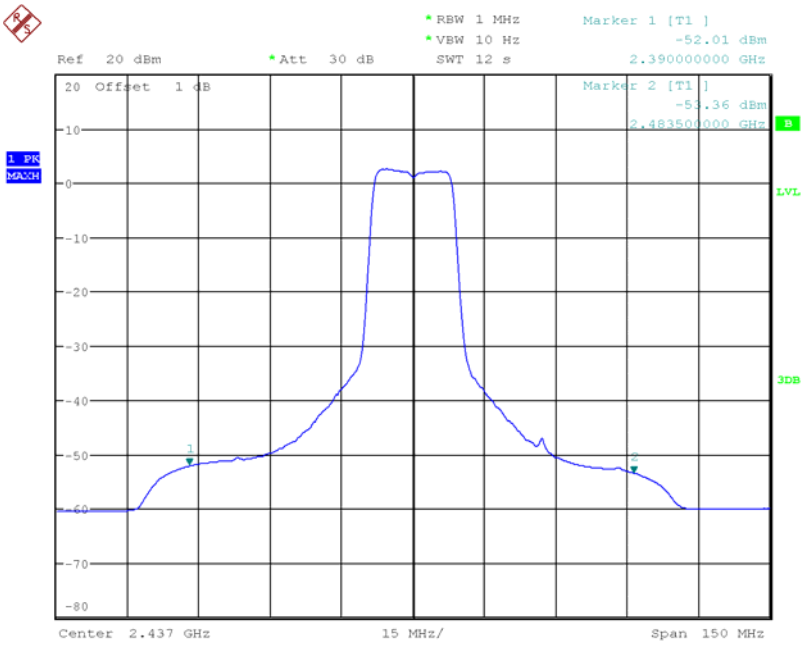
Tx2



Date: 17.OCT.2012 15:26:51

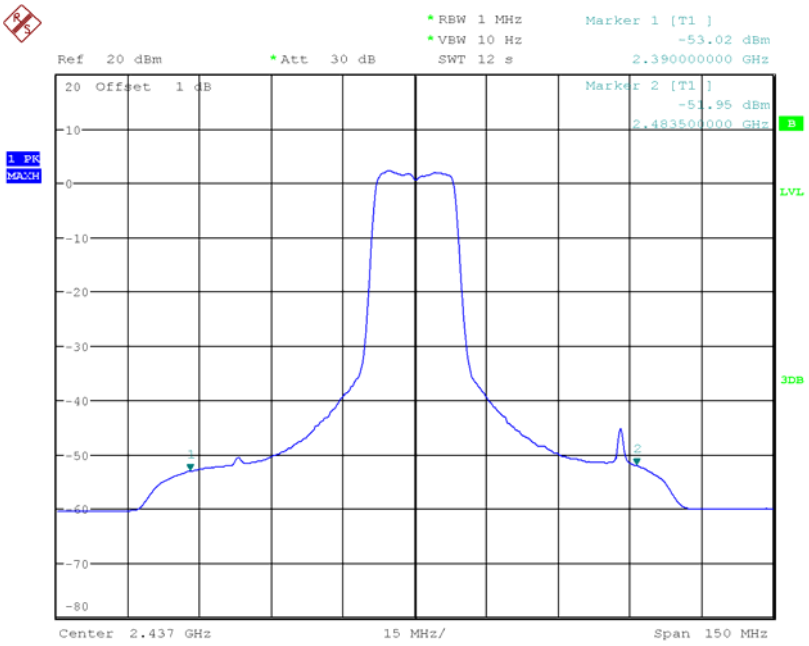
Transmitter Conducted Bandedge Emissions Plot – Average on 2437 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



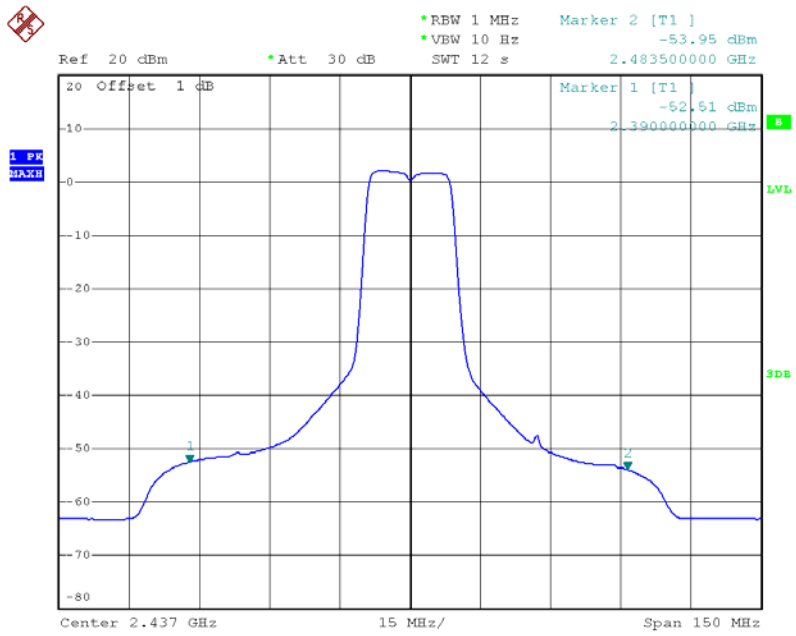
Date: 6.OCT.2012 01:47:33

Tx2



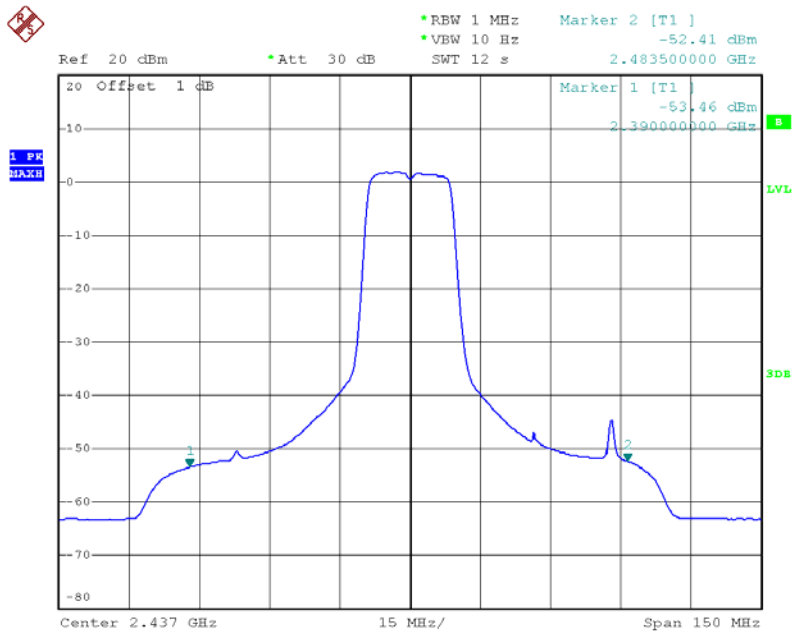
Date: 6.OCT.2012 01:49:48

Transmitter Conducted Bandedge Emissions Plot – Average on 2437 MHz, HT-20 / HT-20, STBC, M0
Tx1



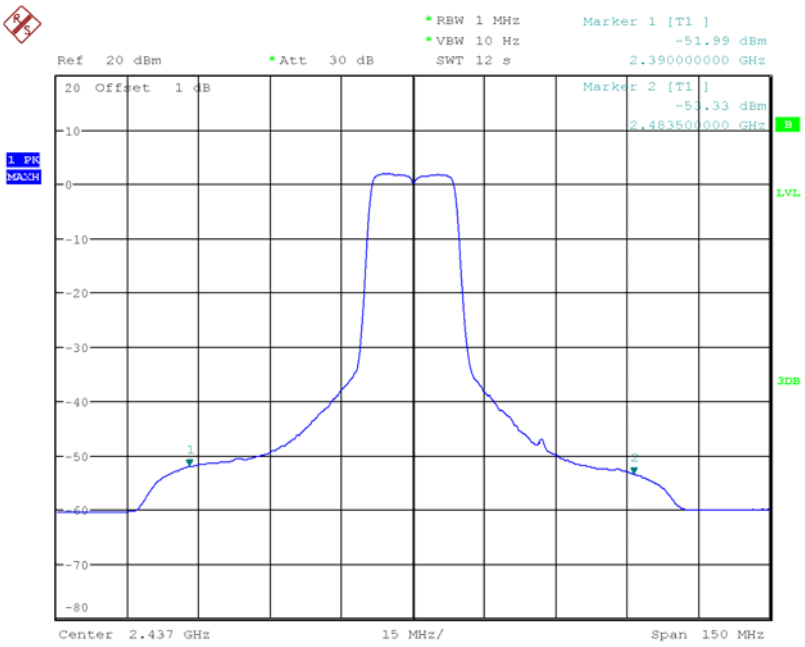
Date: 17.OCT.2012 15:43:29

Tx2



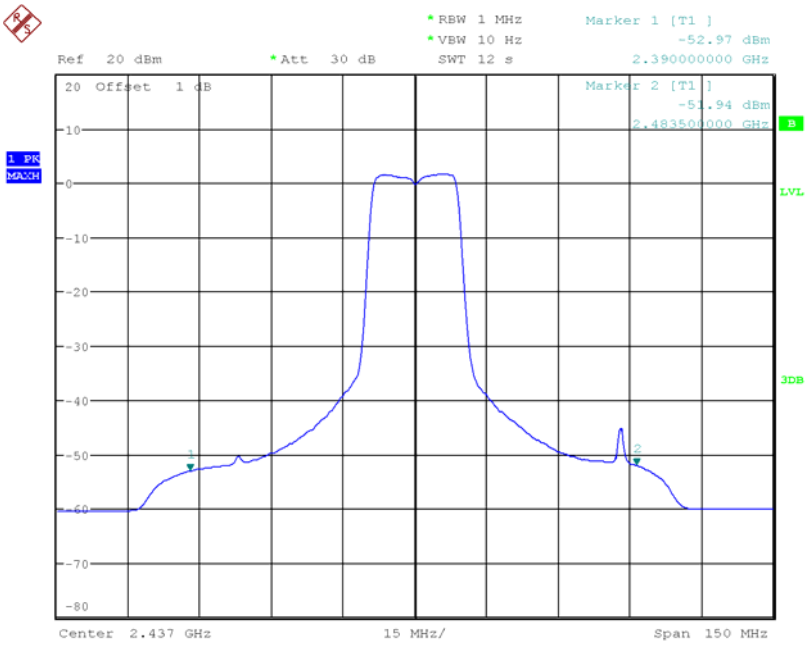
Date: 17.OCT.2012 15:43:51

Transmitter Conducted Bandedge Emissions Plot – Average on 2437 MHz, HT-20, Beam Forming, M0
Tx1



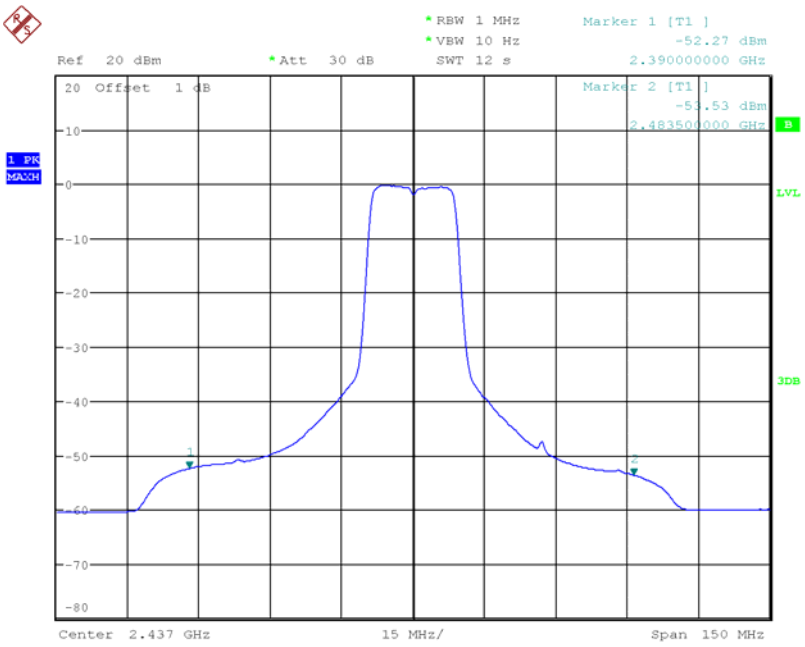
Date: 6.OCT.2012 01:53:34

Tx2



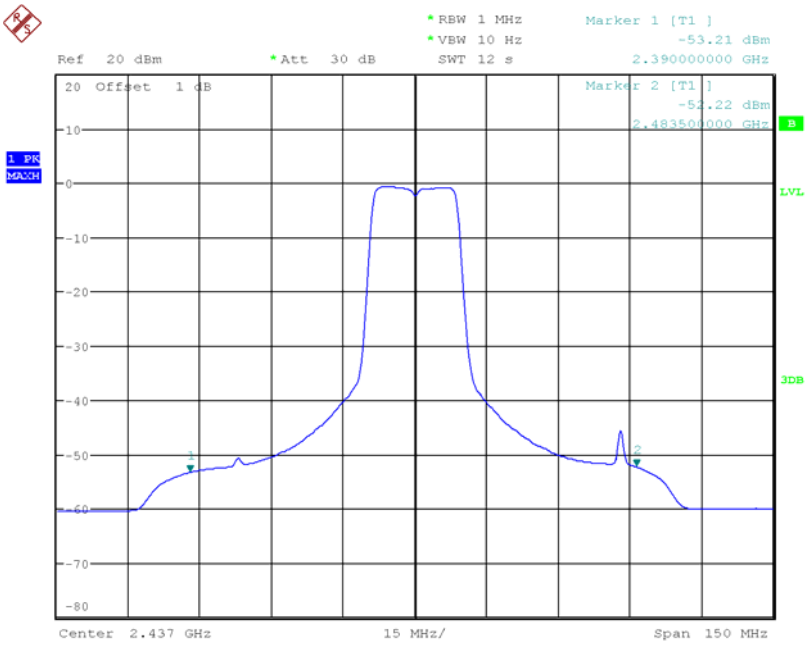
Date: 6.OCT.2012 01:51:26

Transmitter Conducted Bandedge Emissions Plot – Average on 2437 MHz, HT-20, Beam Forming, M8
Tx1



Date: 6.OCT.2012 01:55:22

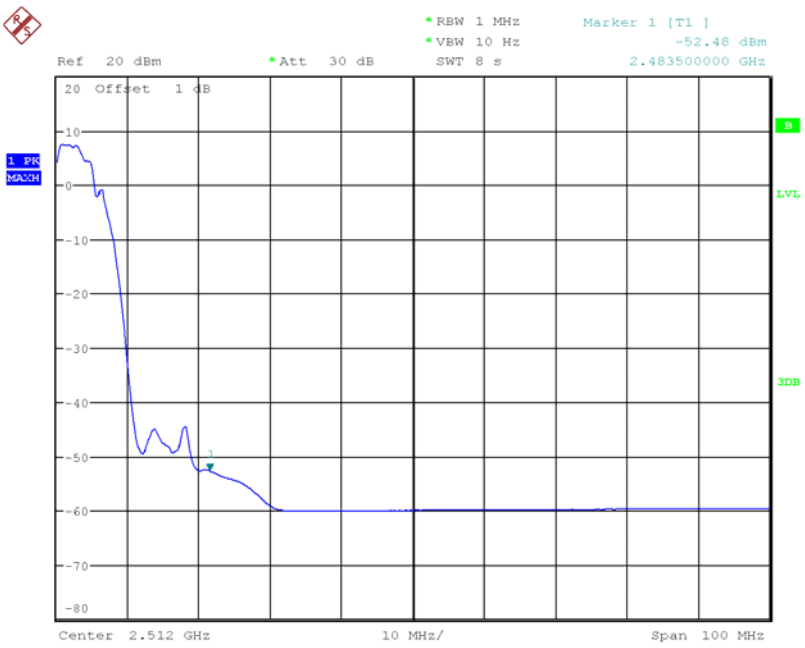
Tx2



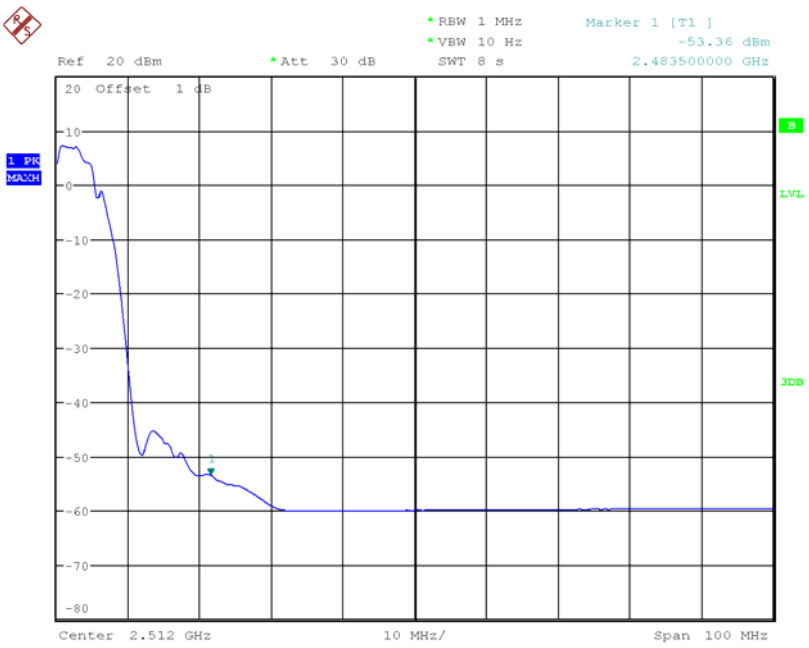
Date: 6.OCT.2012 01:56:47

Transmitter Conducted Bandedge Emissions Plot–Average on 2462 MHz, Legacy CCK, 11Mbps

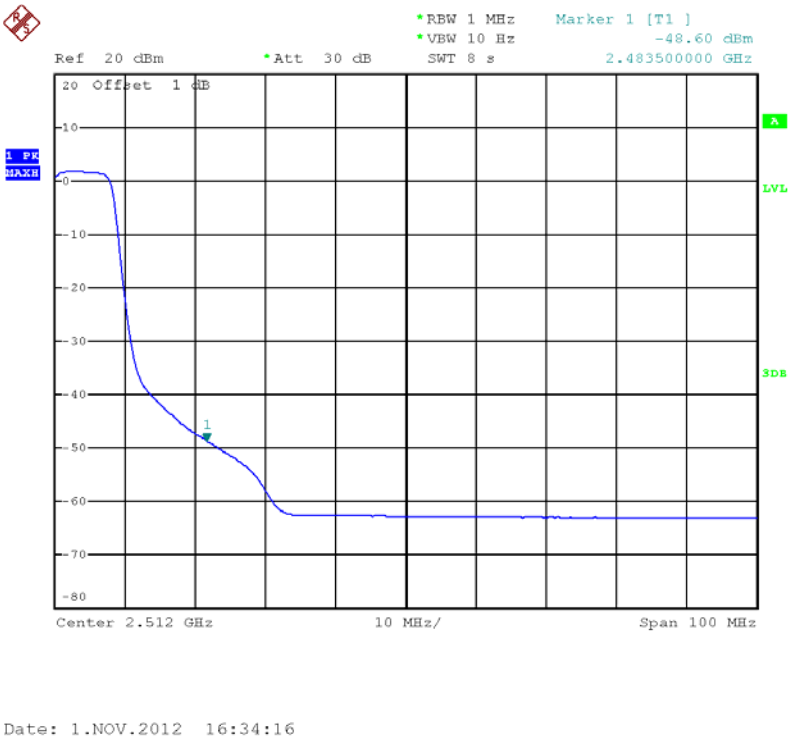
Tx1



Tx2

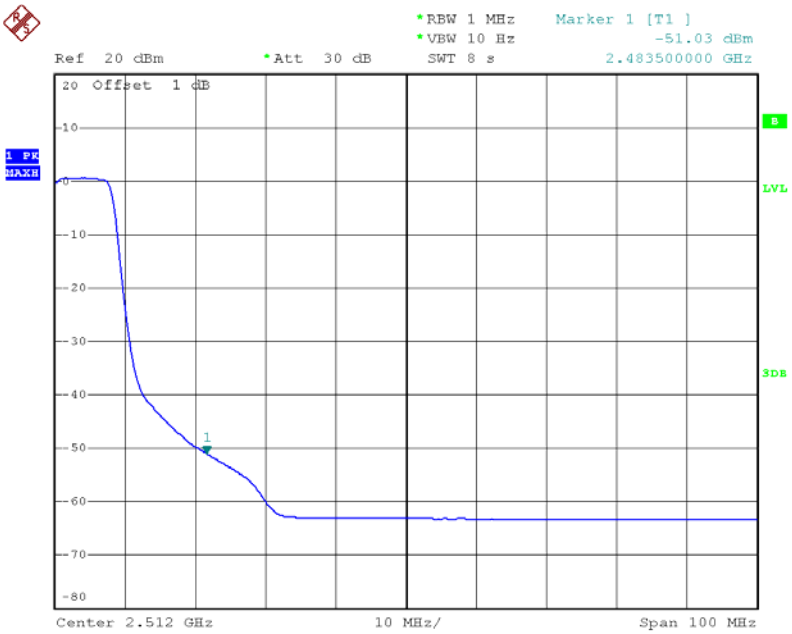


Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, Non HT-20, 6Mbps
Tx1



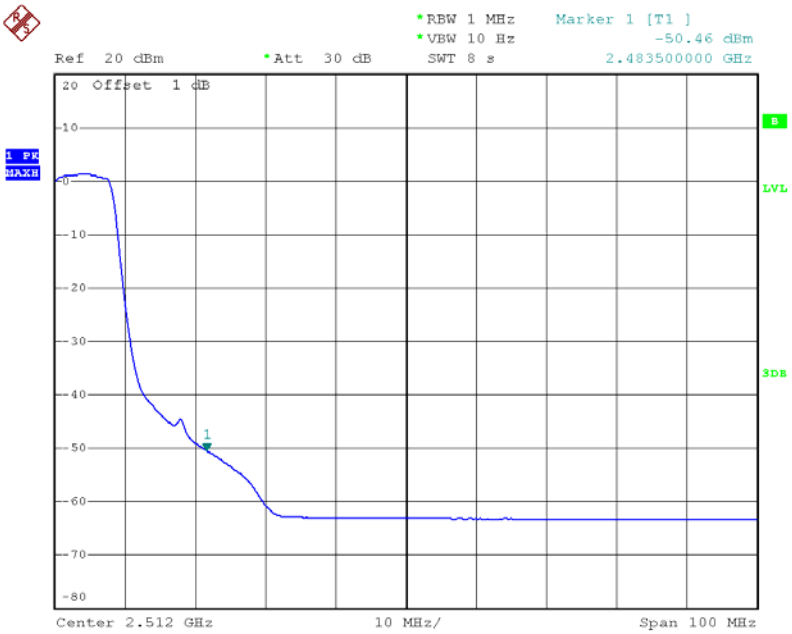
Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 15:36:04

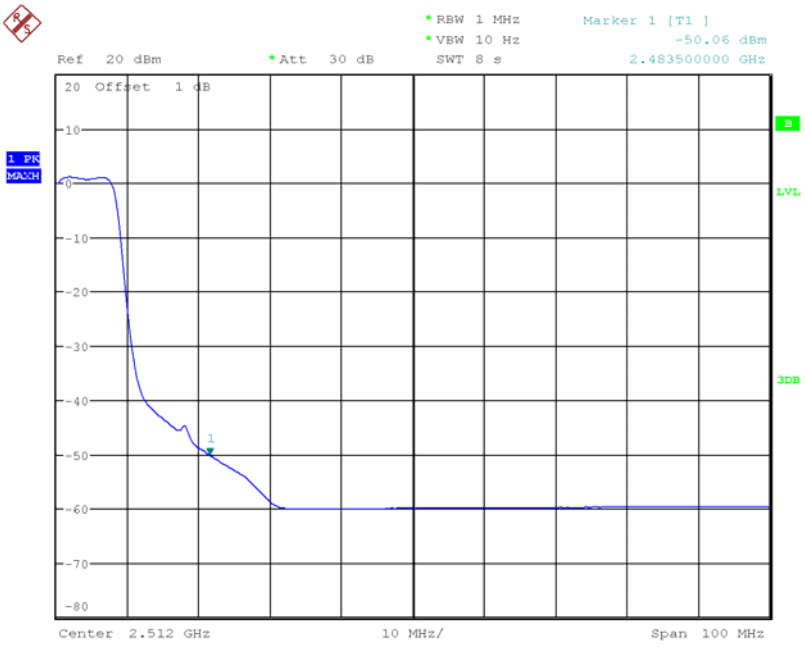
Tx2



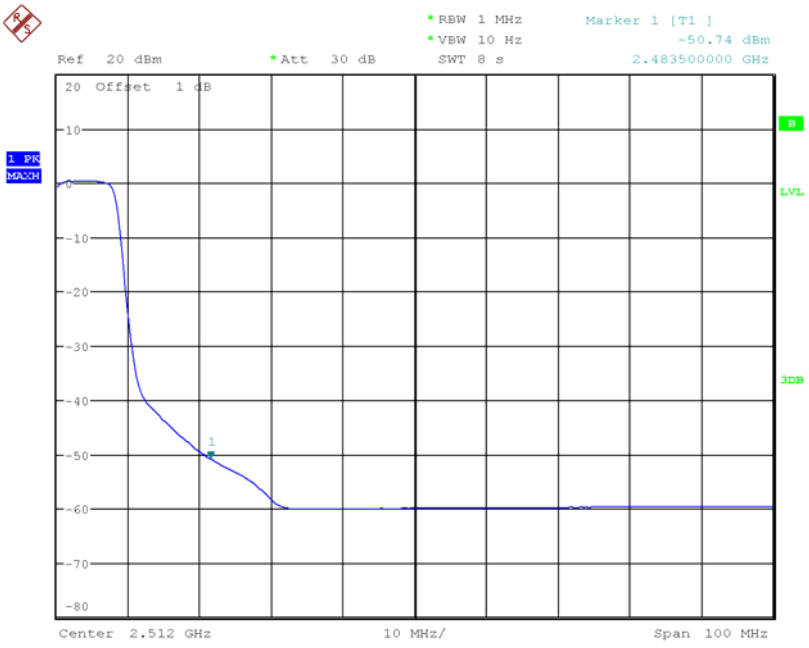
Date: 17.OCT.2012 15:36:25

Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



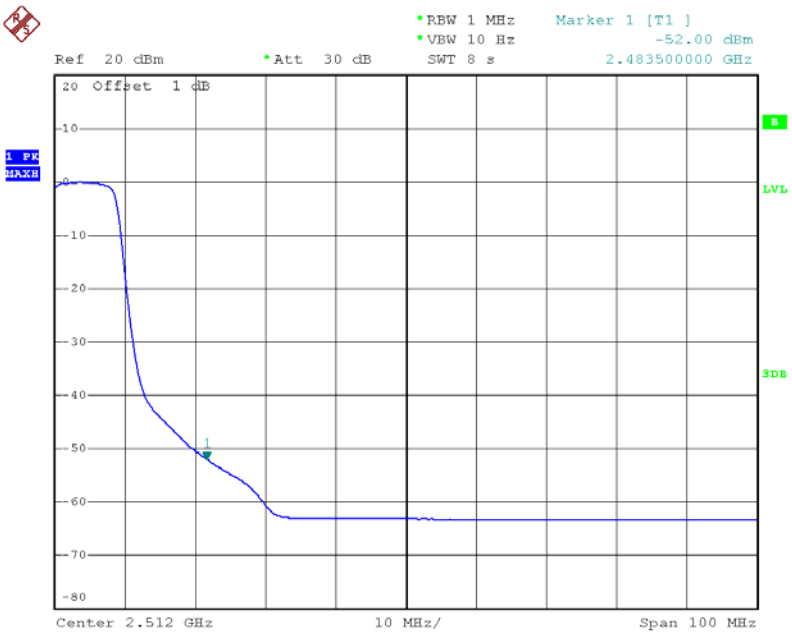
Tx2



Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, HT-20, M0

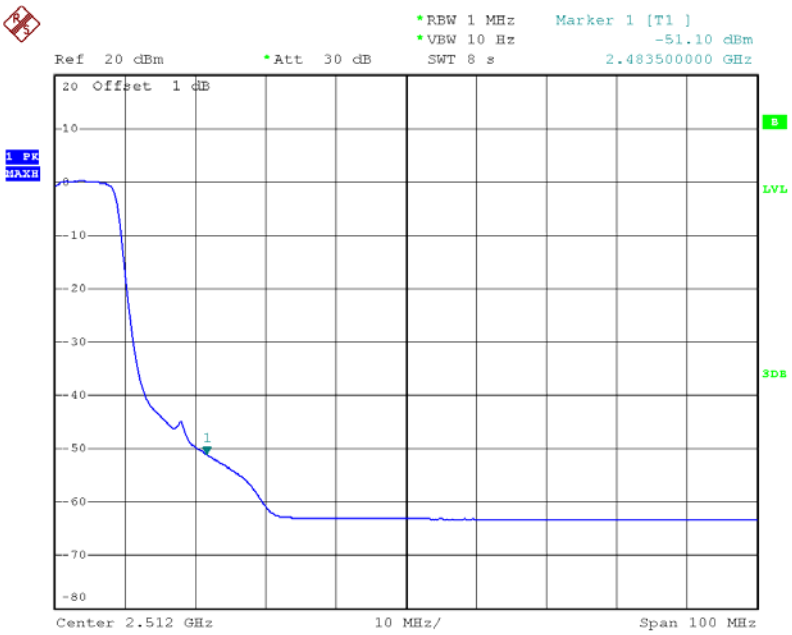
Tx1

Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, HT-20 / HT-20, STBC, M0
Tx1



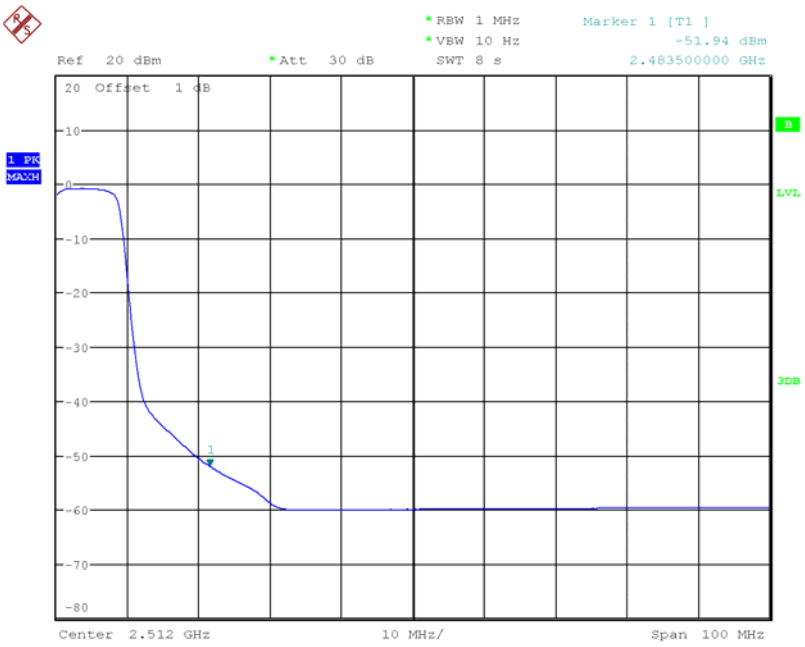
Date: 17.OCT.2012 15:39:25

Tx2

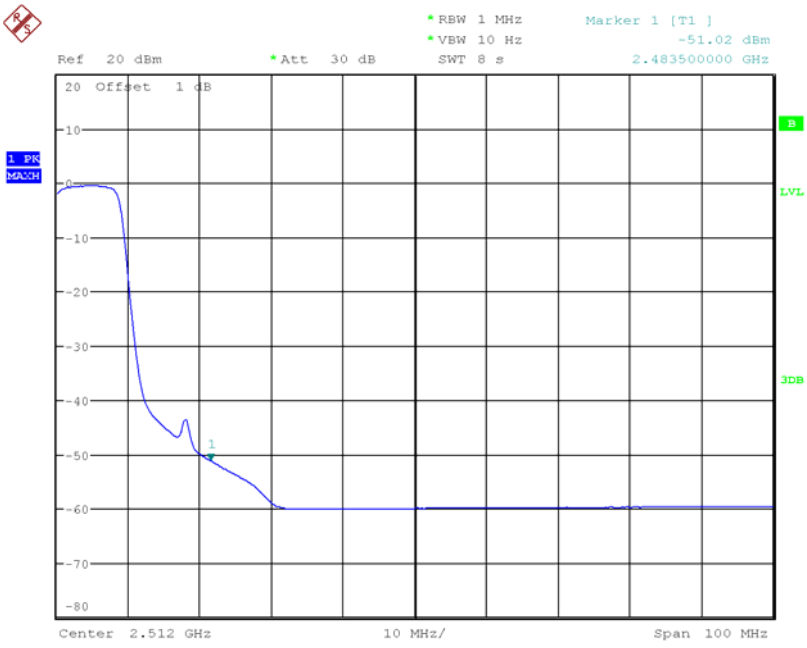


Date: 17.OCT.2012 15:40:04

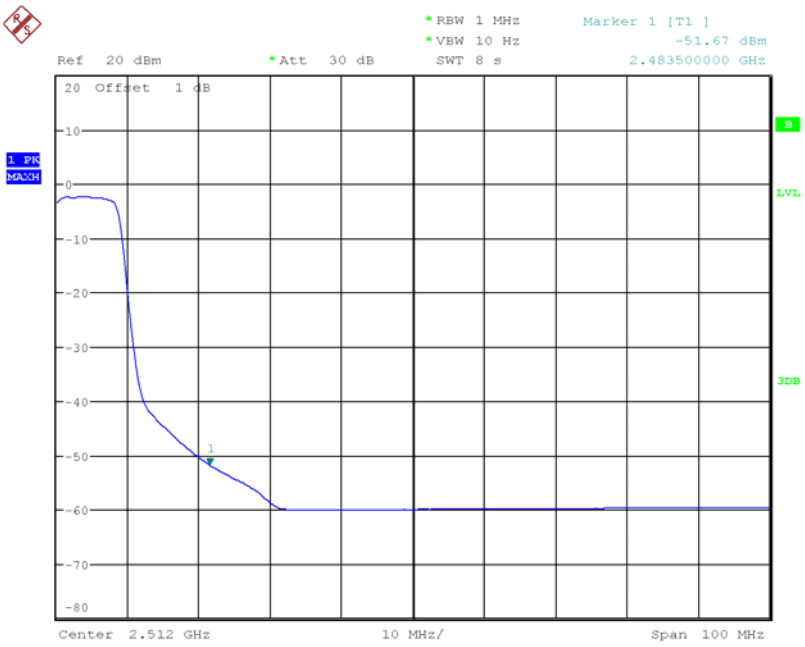
Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, HT-20, Beam Forming, M0
Tx1



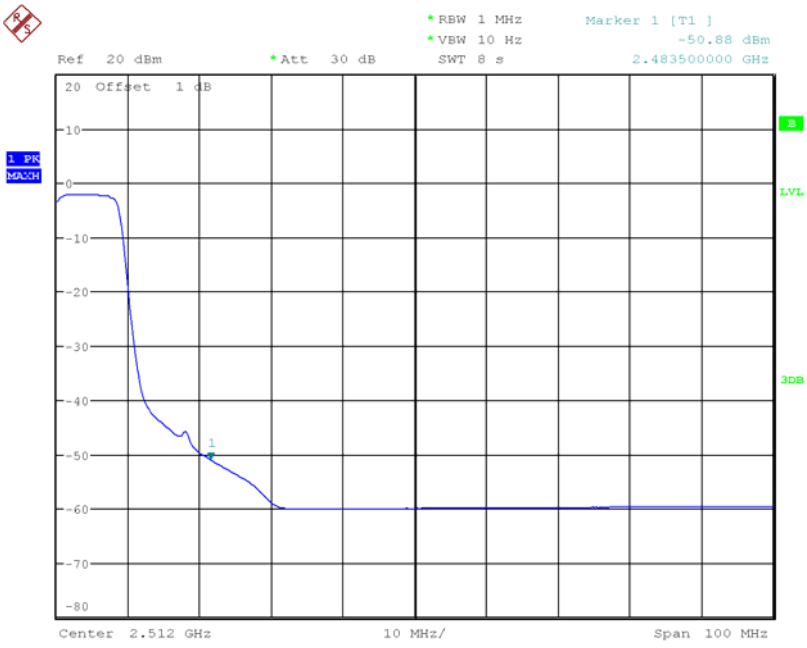
Tx2



Transmitter Conducted Bandedge Emissions Plot – Average on 2462 MHz, HT-20, Beam Forming, M8
Tx1

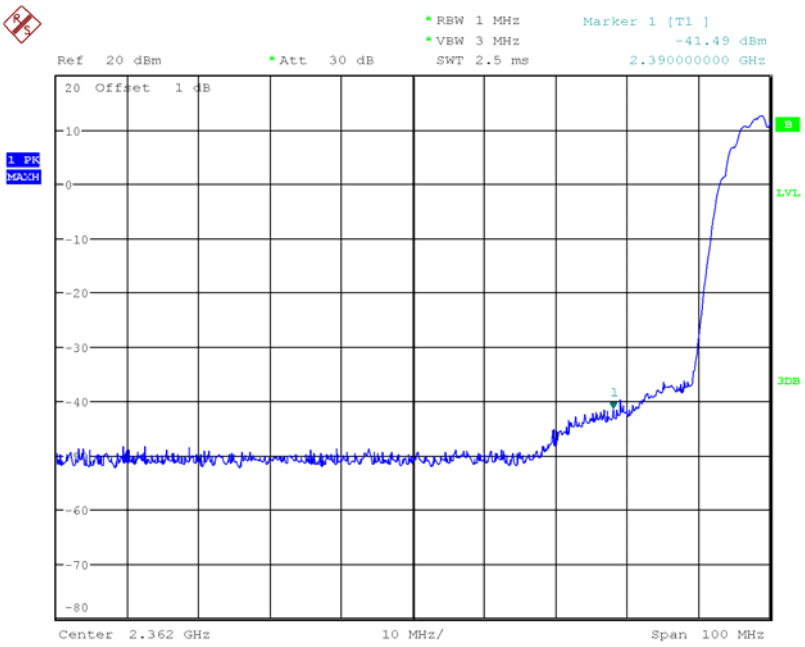


Tx2

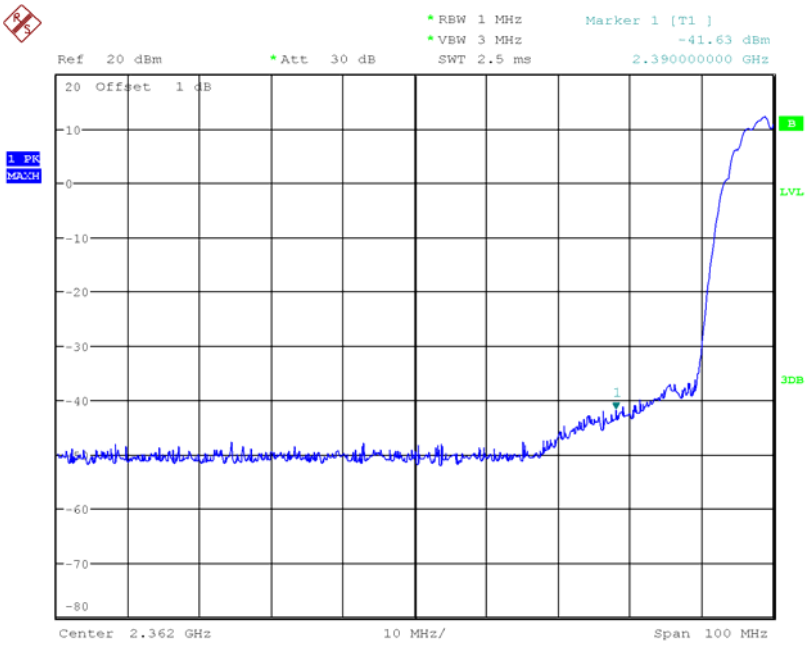


Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, Legacy CCK, 11Mbps

Tx1

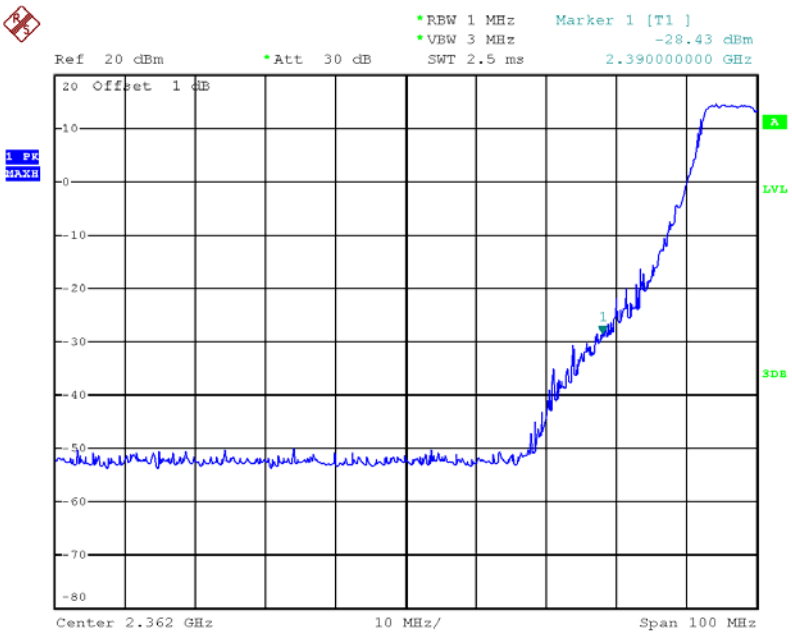


Tx2



Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, Non HT-20, 6Mbps

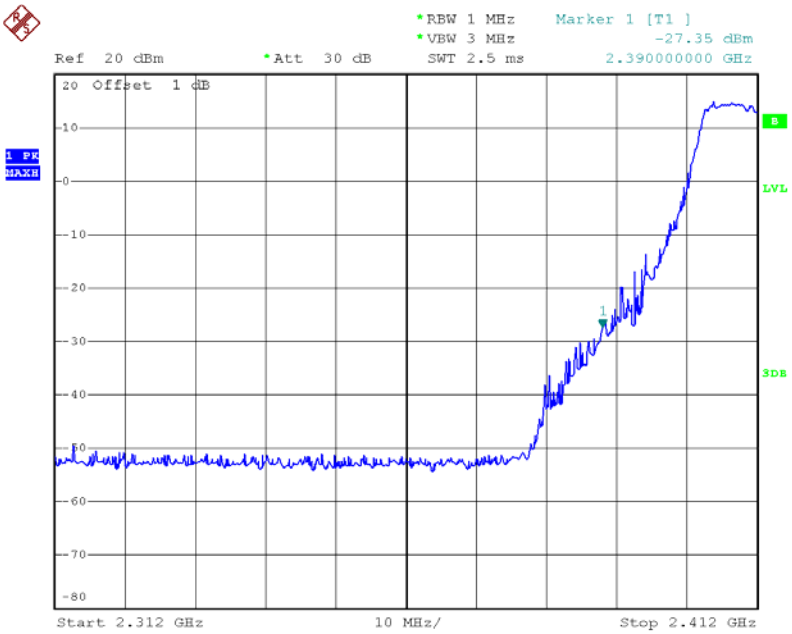
Tx1



Date: 1.NOV.2012 16:32:37

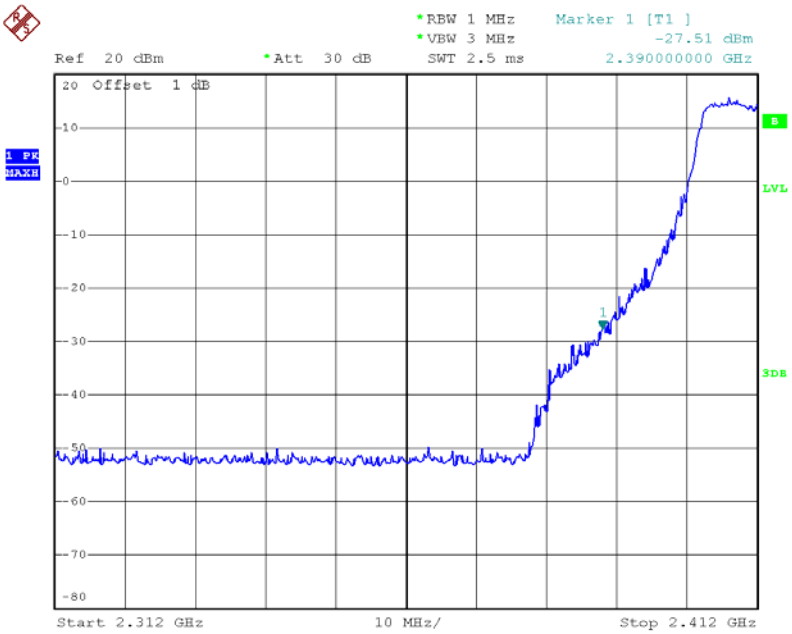
Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 15:19:52

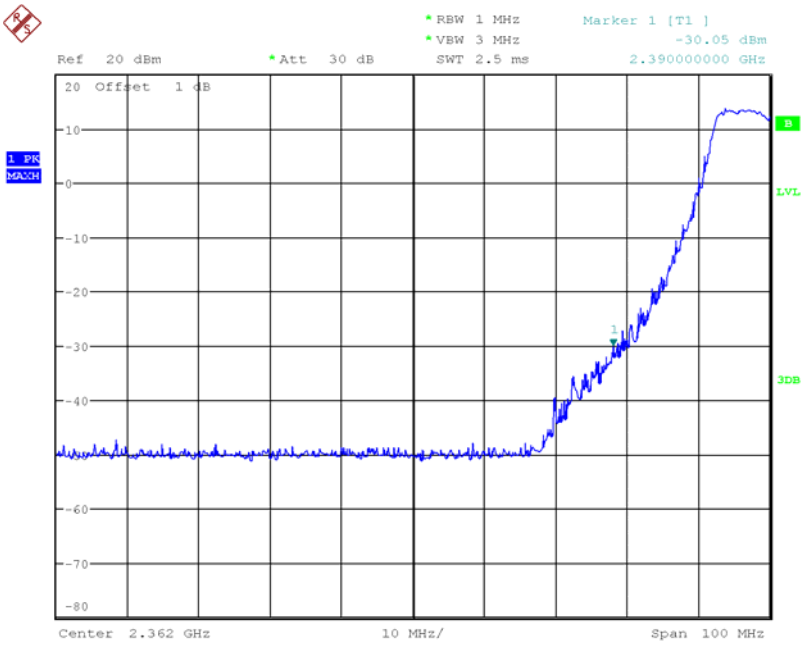
Tx2



Date: 17.OCT.2012 15:20:17

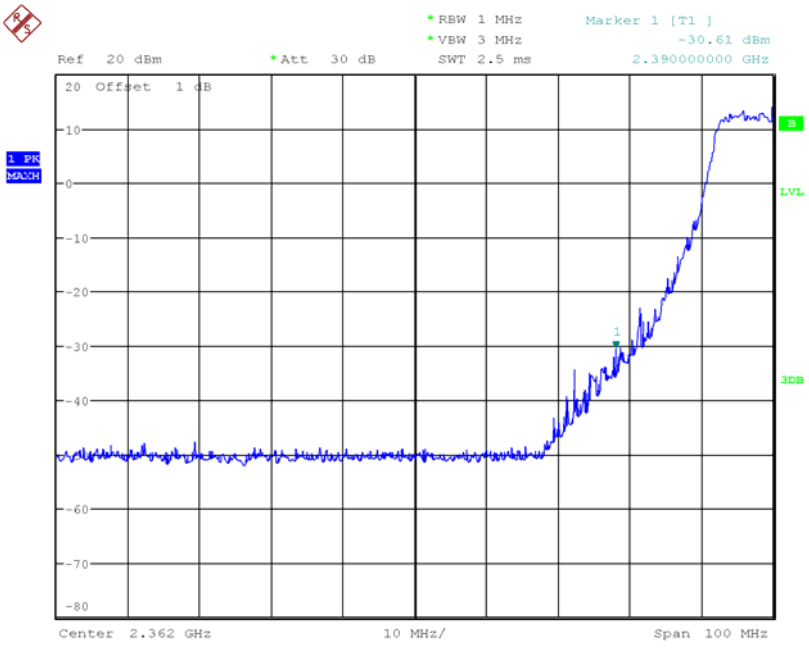
Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



Date: 5.OCT.2012 23:51:33

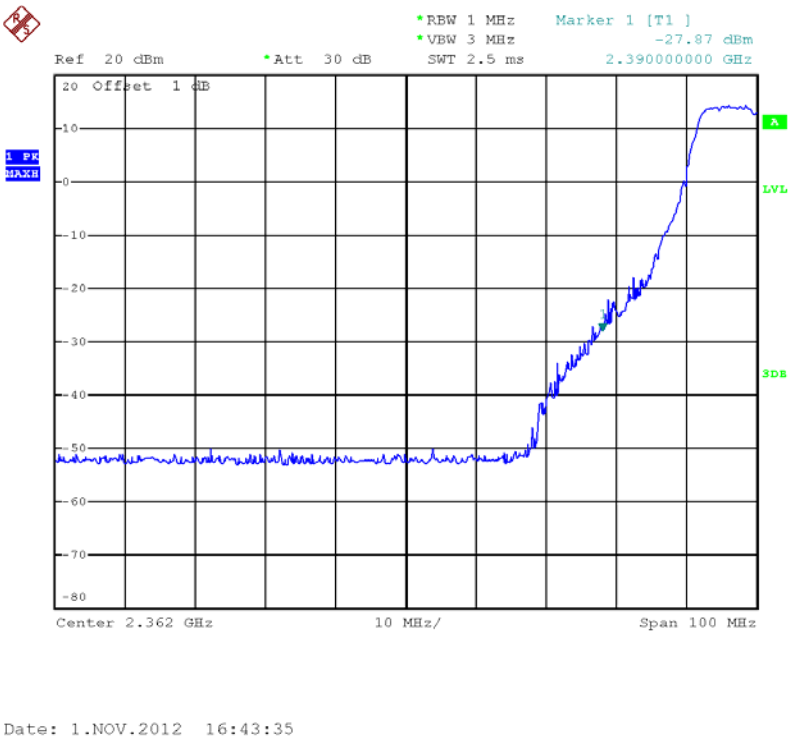
Tx2



Date: 5.OCT.2012 23:45:51

Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, HT-20, M0

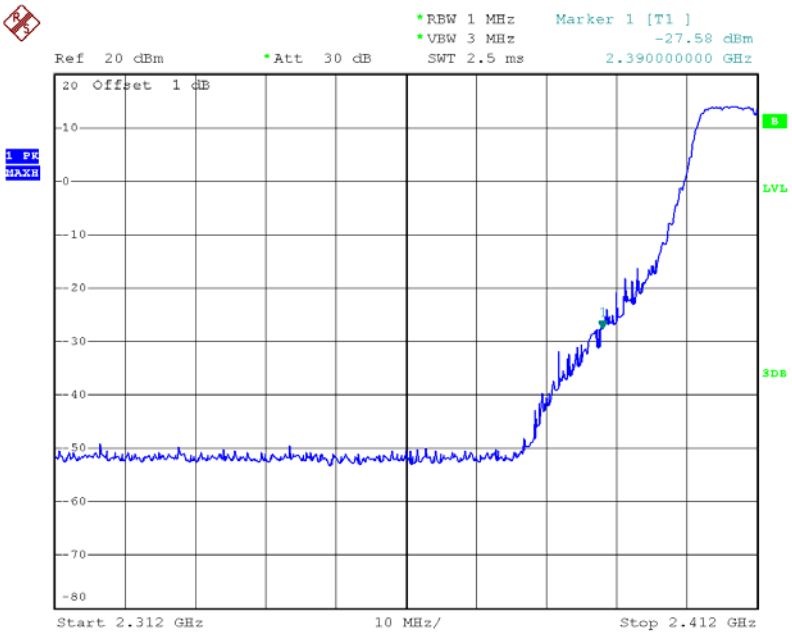
Tx1



Date: 1.NOV.2012 16:43:35

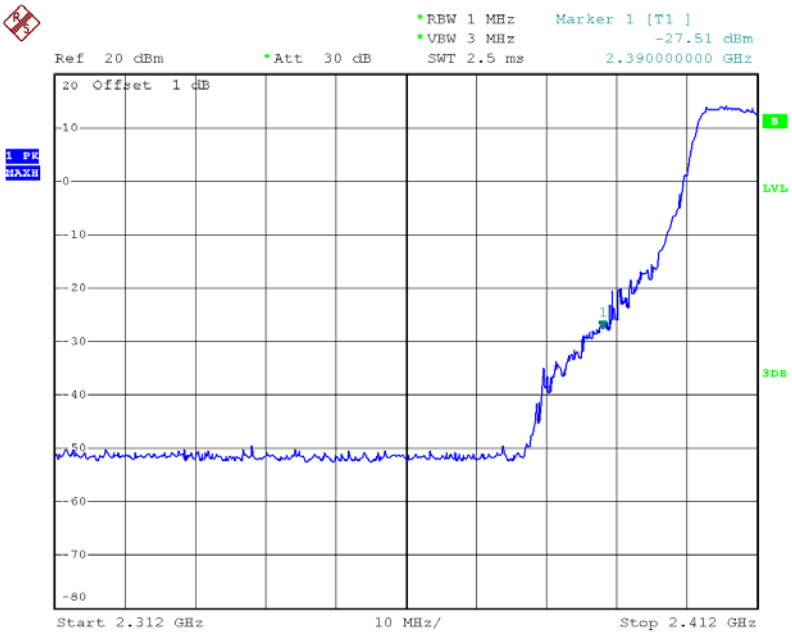
Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, HT-20 / HT-20, STBC, M0

Tx1



Date: 17.OCT.2012 15:50:27

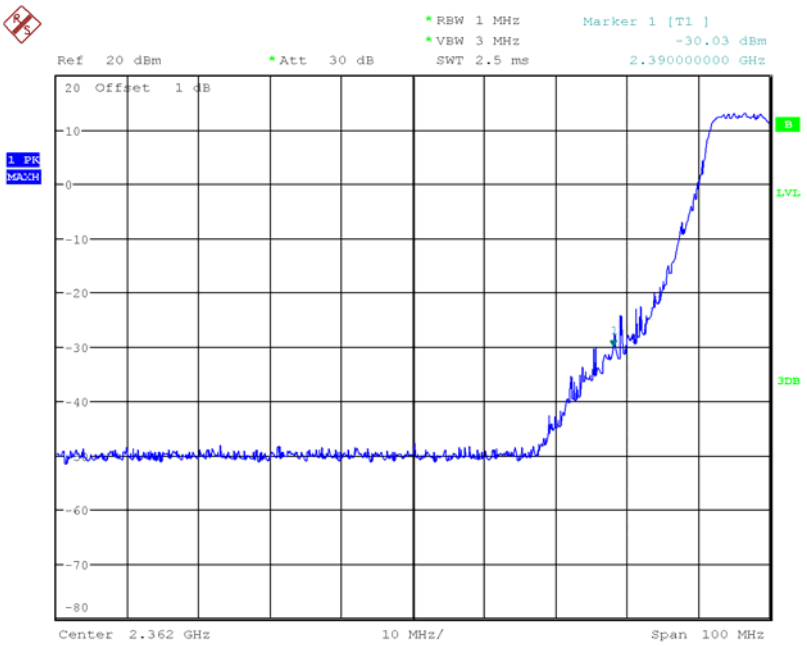
Tx2



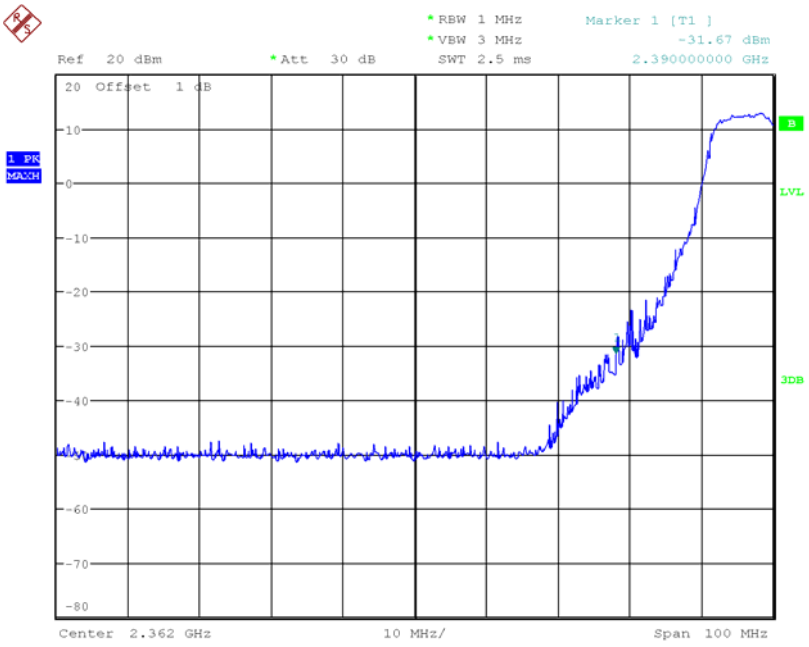
Date: 17.OCT.2012 15:49:36

Transmitter Conducted Bandedge Emissions Plot–Peak on 2412 MHz, HT-20, Beam Forming,M0

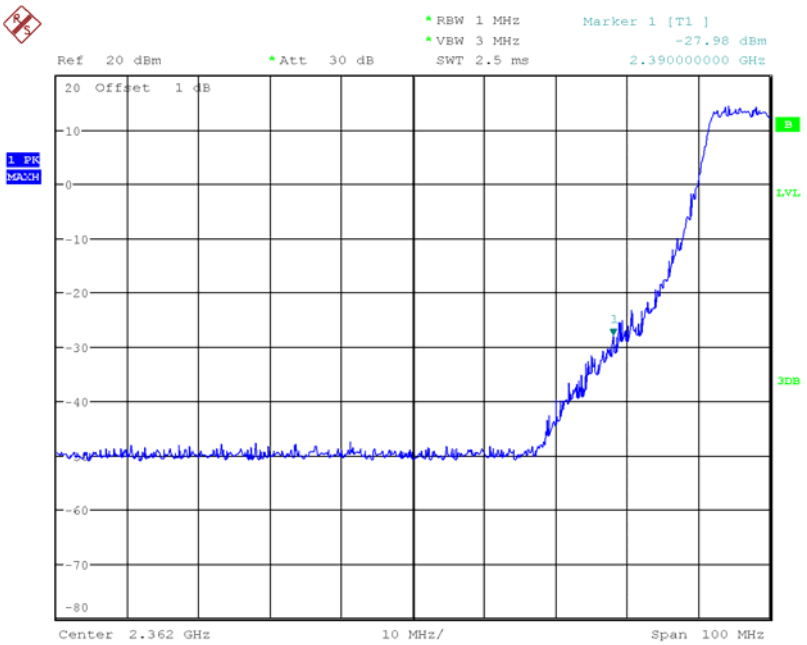
Tx1



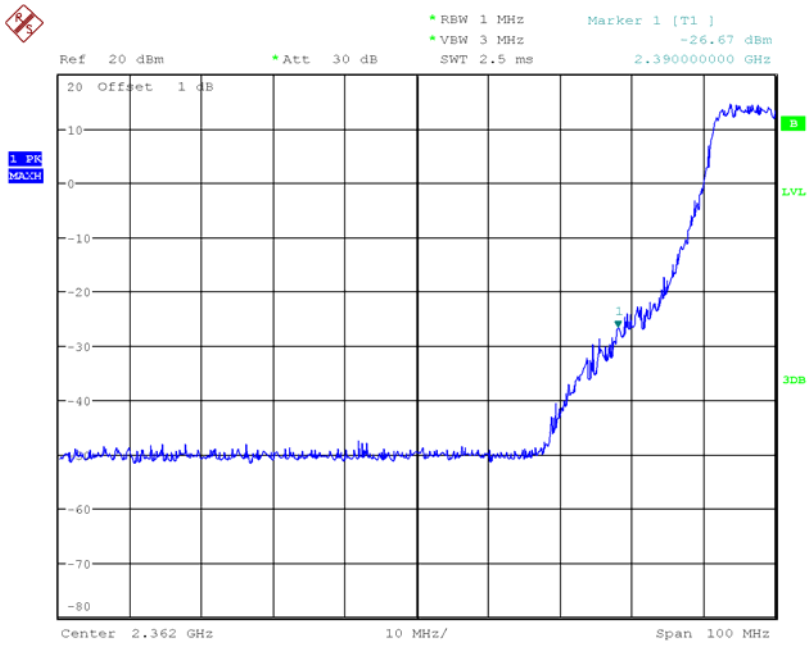
Tx2



Transmitter Conducted Bandedge Emissions Plot – Peak on 2412 MHz, HT-20, Beam Forming, M8
Tx1

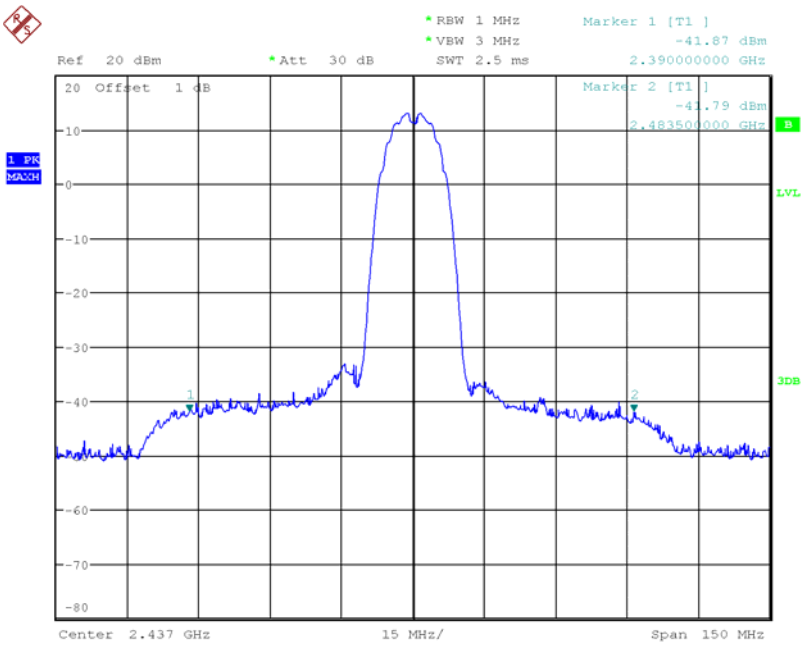


Tx2



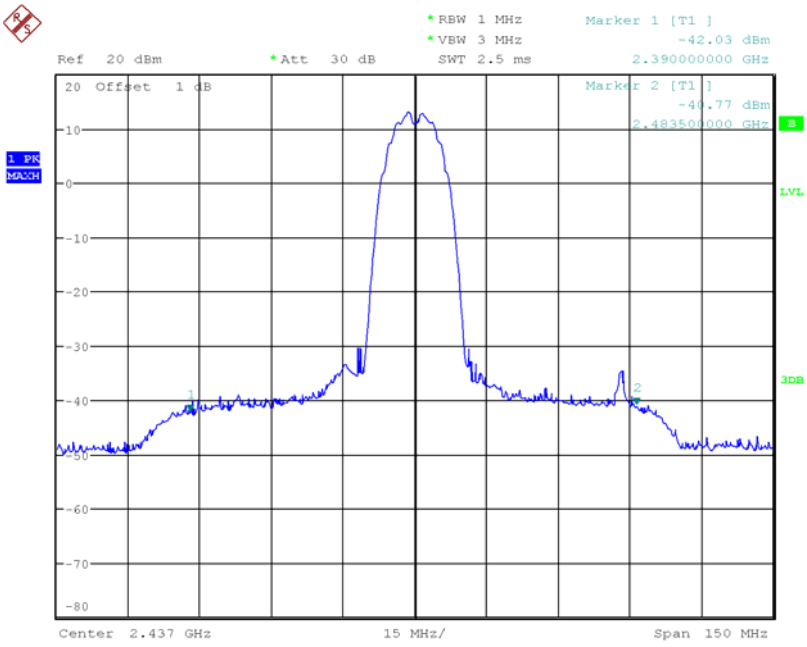
Transmitter Conducted Bandedge Emissions Plot – Peak on 2437 MHz, Legacy CCK, 11Mbps

Tx1



Date: 6.OCT.2012 01:45:02

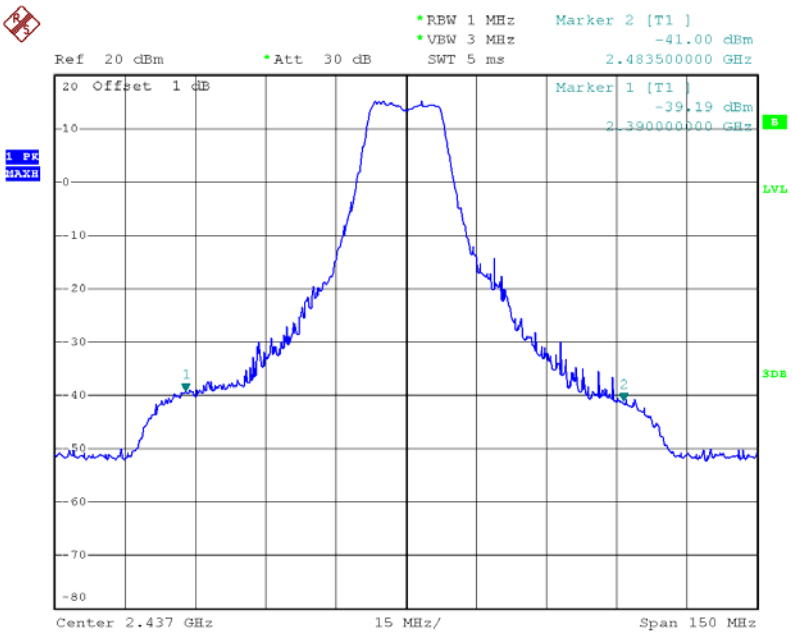
Tx2



Date: 6.OCT.2012 01:43:12

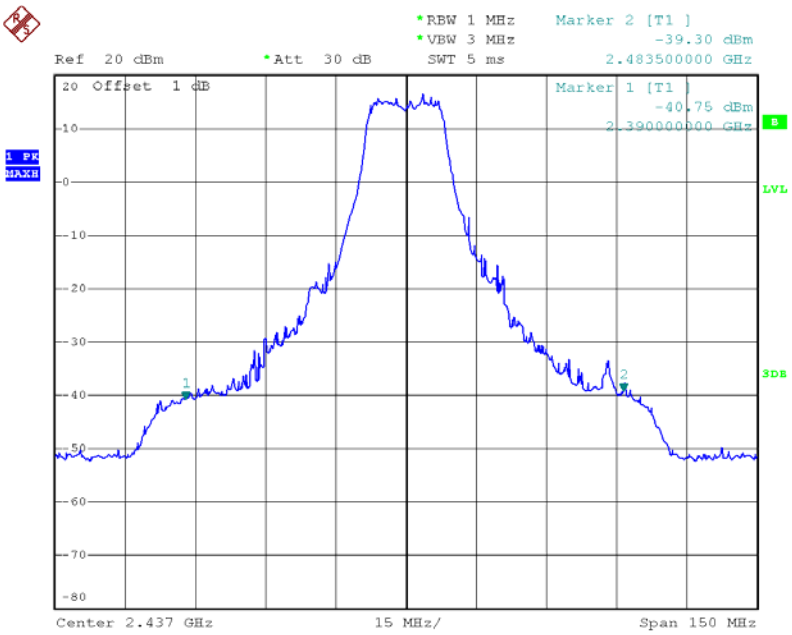
Transmitter Conducted Bandedge Emissions Plot – Peak on 2437 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 15:25:33

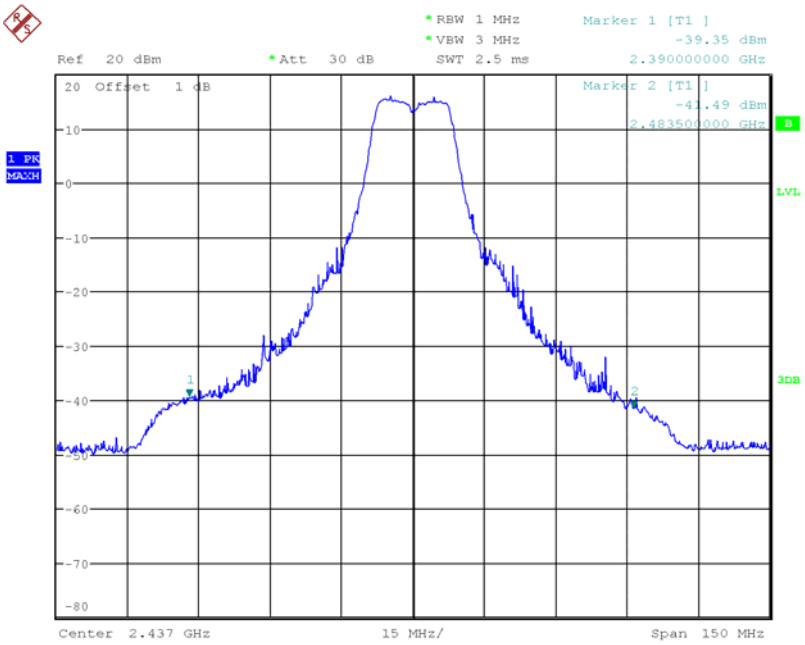
Tx2



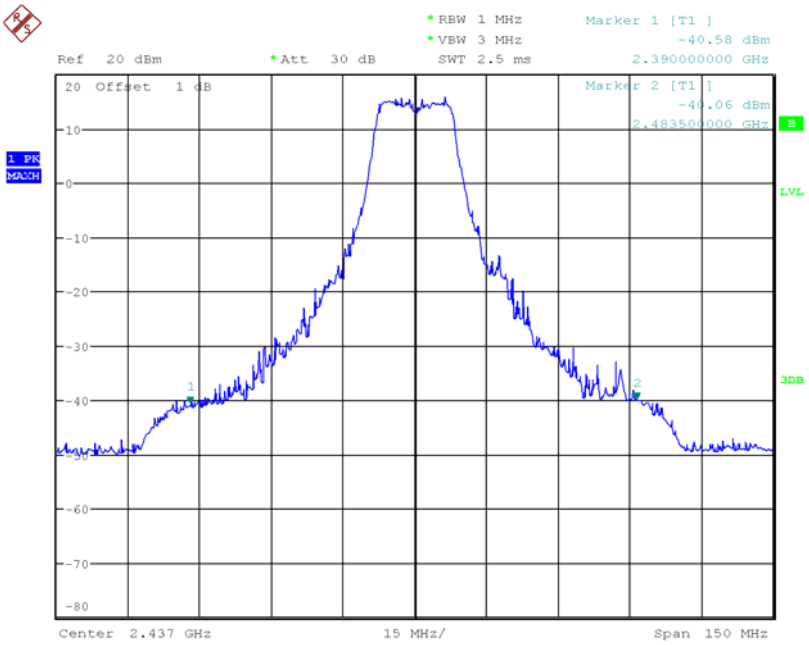
Date: 17.OCT.2012 15:26:15

Transmitter Conducted Bandedge Emissions Plot – Peak on 2437 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1

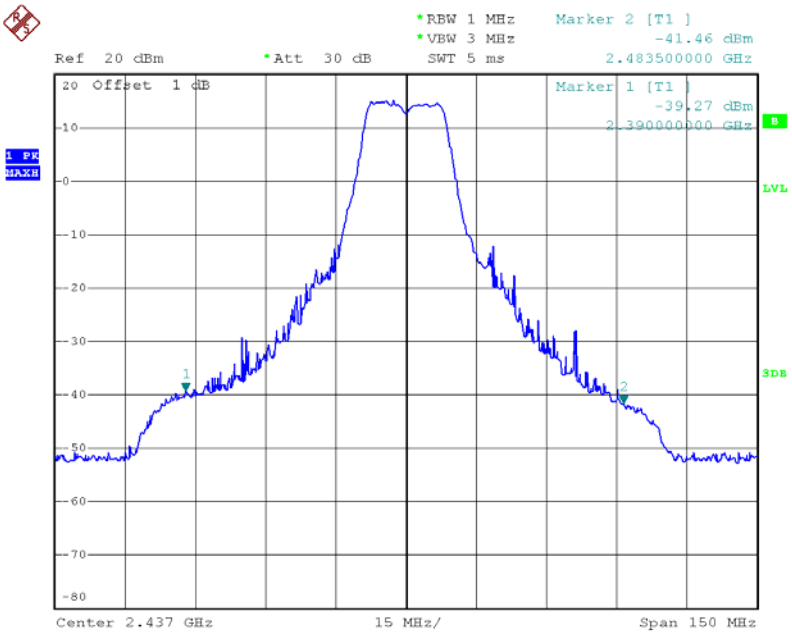


Tx2



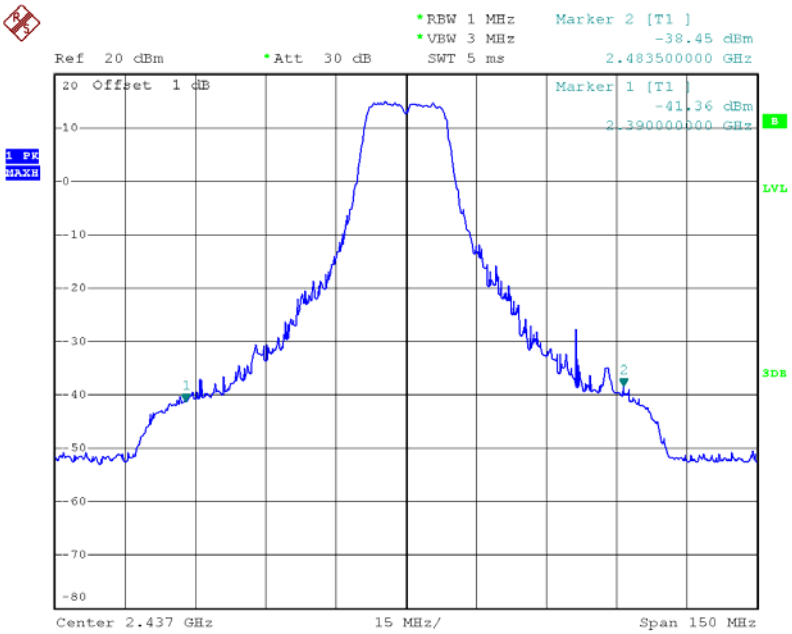
Transmitter Conducted Bandedge Emissions Plot – Peak on 2437 MHz, HT-20 / HT-20, STBC, M0

Tx1



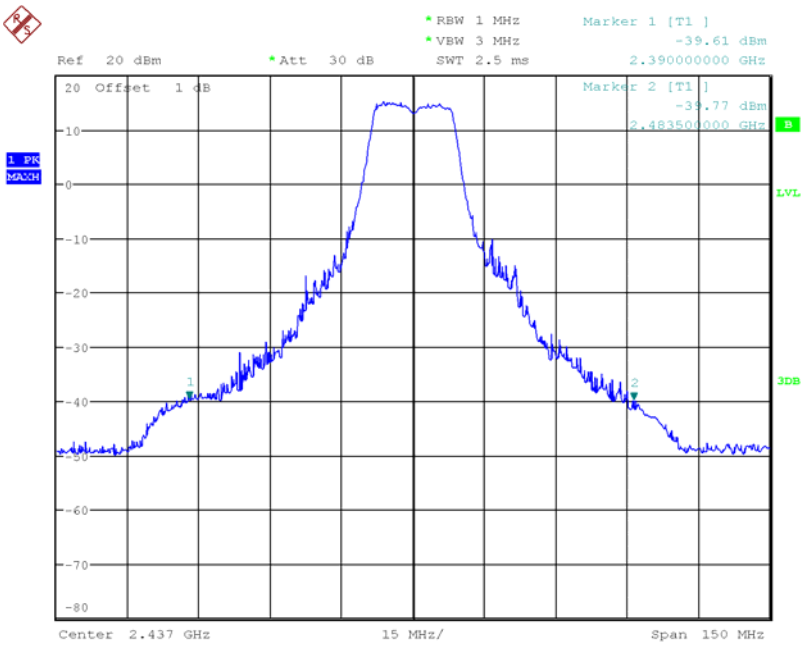
Date: 17.OCT.2012 15:41:47

Tx2



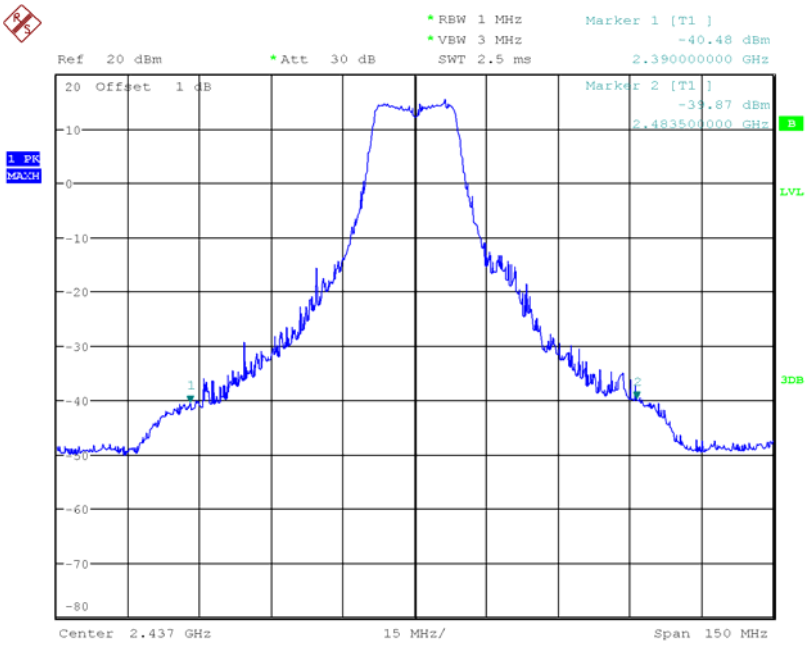
Date: 17.OCT.2012 15:41:28

Transmitter Conducted Bandedge Emissions Plot – Peak on 2437 MHz, HT-20, Beam Forming, M0
Tx1



Date: 6.OCT.2012 01:52:48

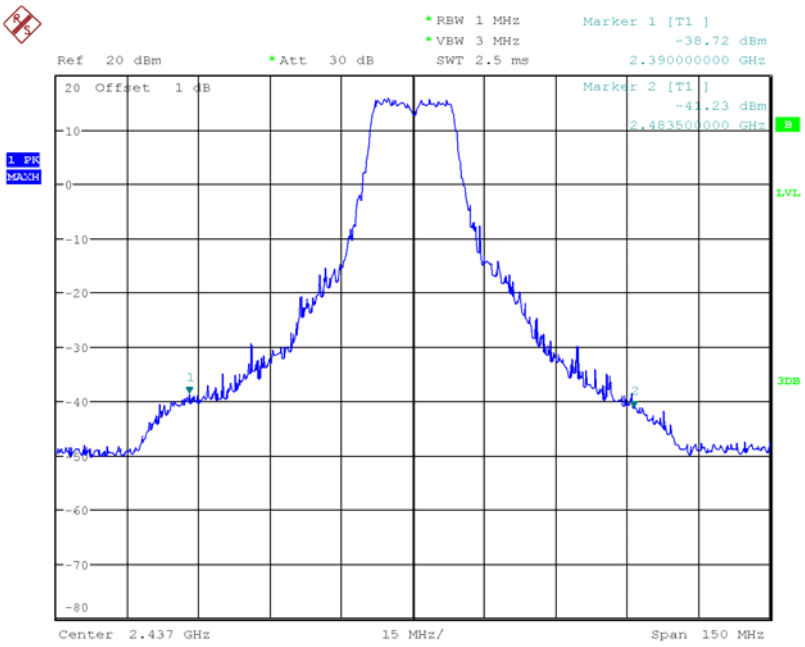
Tx2



Date: 6.OCT.2012 01:51:51

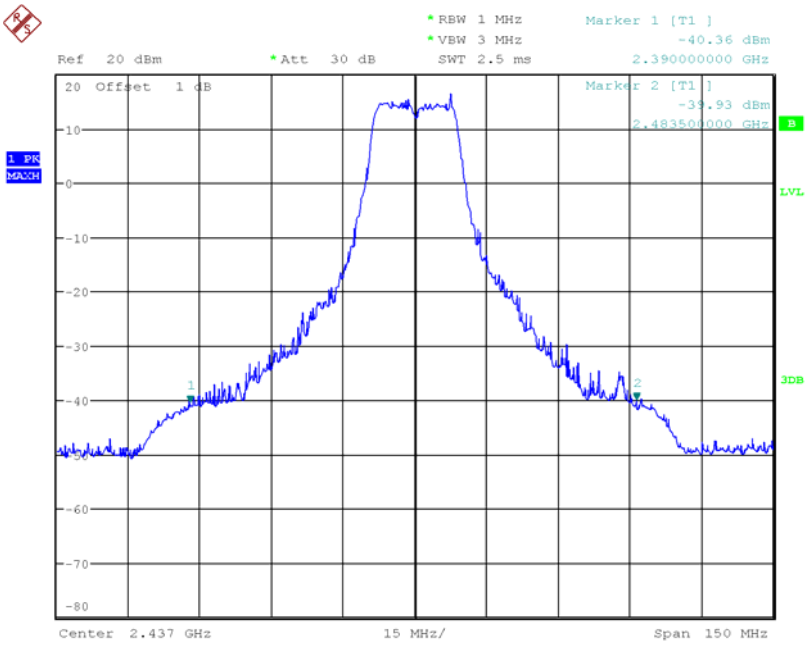
Transmitter Conducted Bandedge Emissions Plot – Peak on 2437 MHz, HT-20, Beam Forming, M8

Tx1



Date: 6.OCT.2012 01:55:47

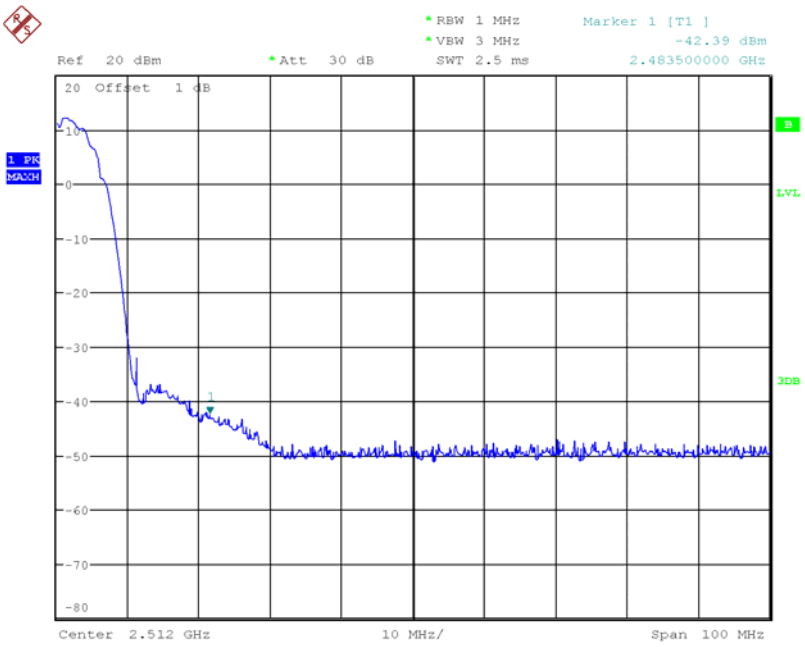
Tx2



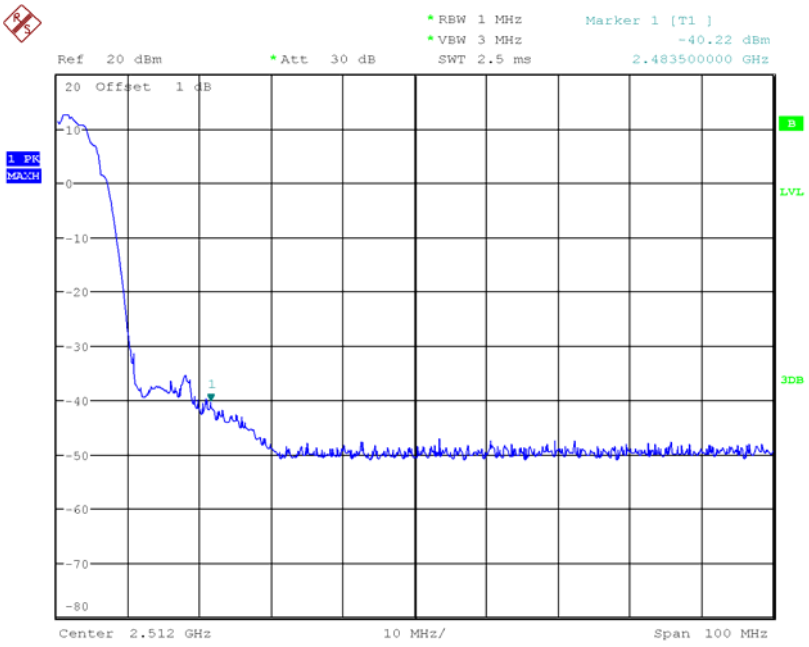
Date: 6.OCT.2012 01:56:22

Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, Legacy CCK, 11Mbps

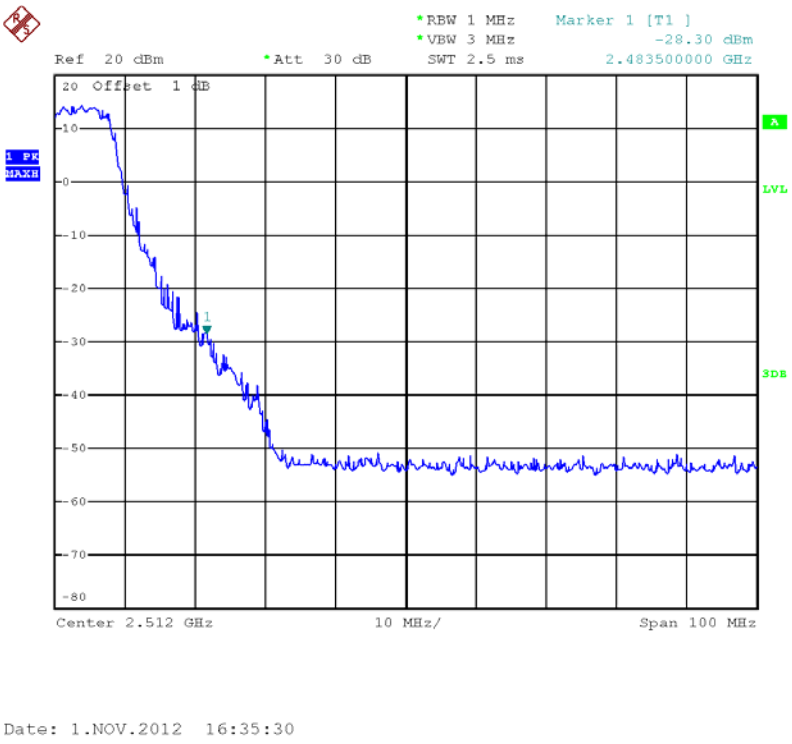
Tx1



Tx2

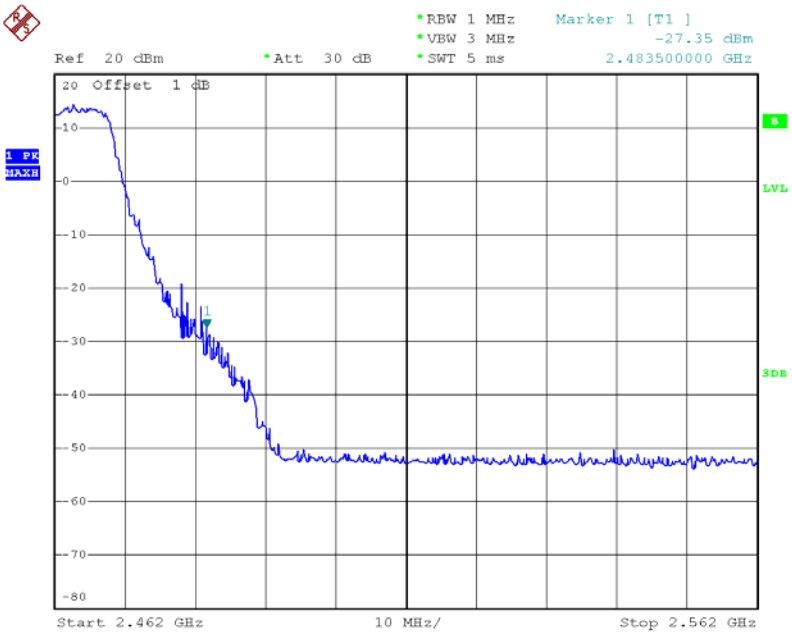


Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, Non HT-20, 6Mbps
Tx1



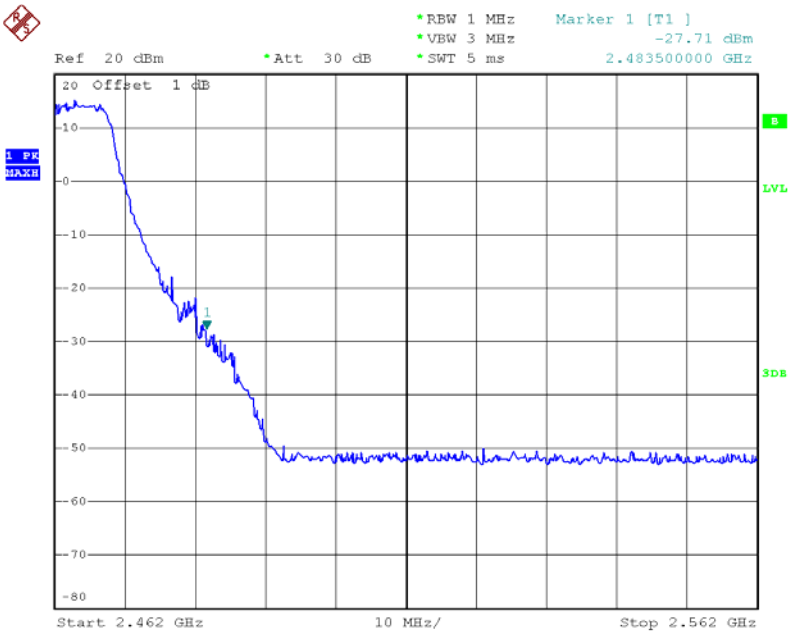
Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, Non HT-20, 6Mbps

Tx1



Date: 17.OCT.2012 15:35:05

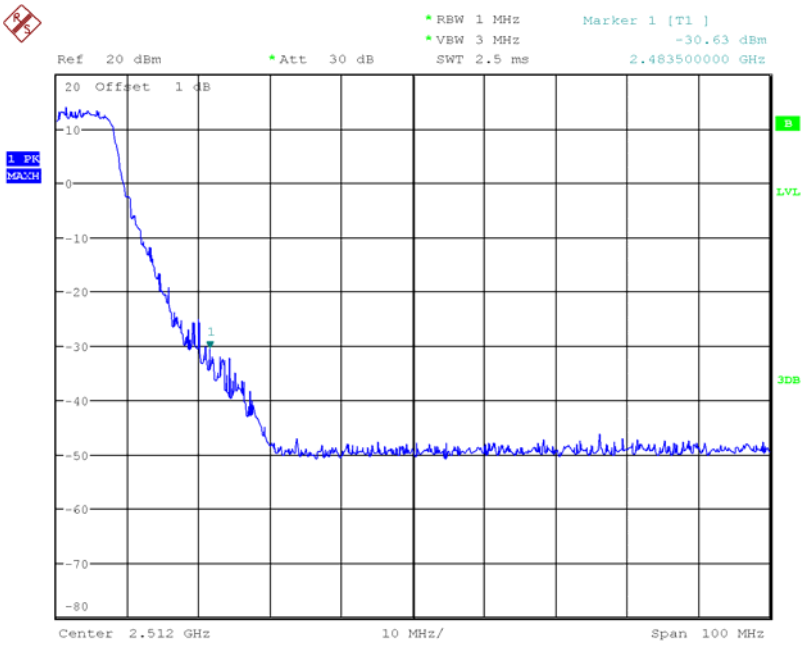
Tx2



Date: 17.OCT.2012 15:34:08

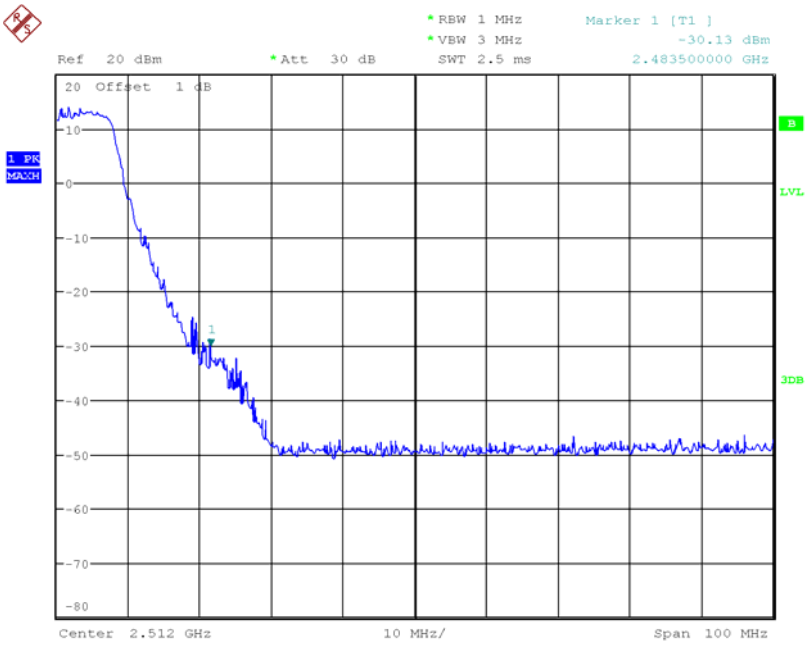
Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, Non HT-20, Beam Forming, 6Mbps

Tx1



Date: 6.OCT.2012 00:07:15

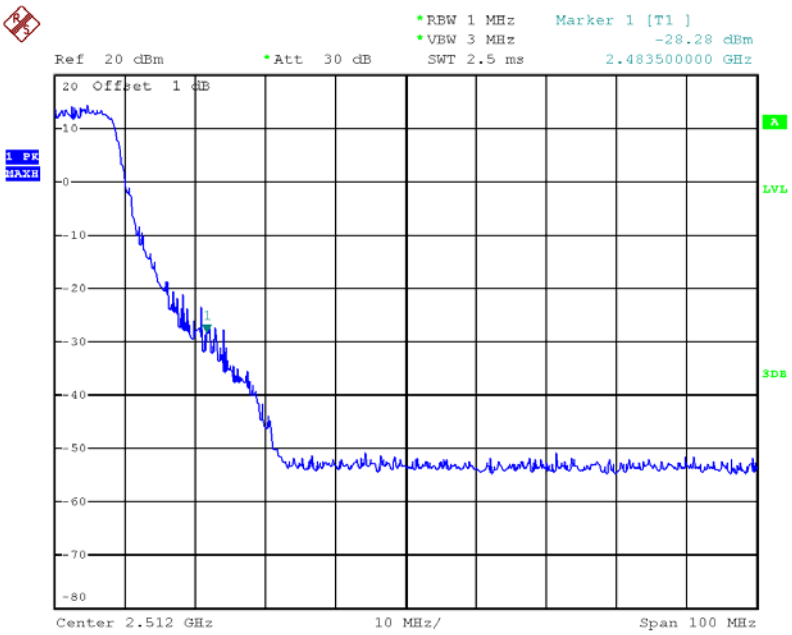
Tx2



Date: 6.OCT.2012 00:08:23

Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, HT-20, M0

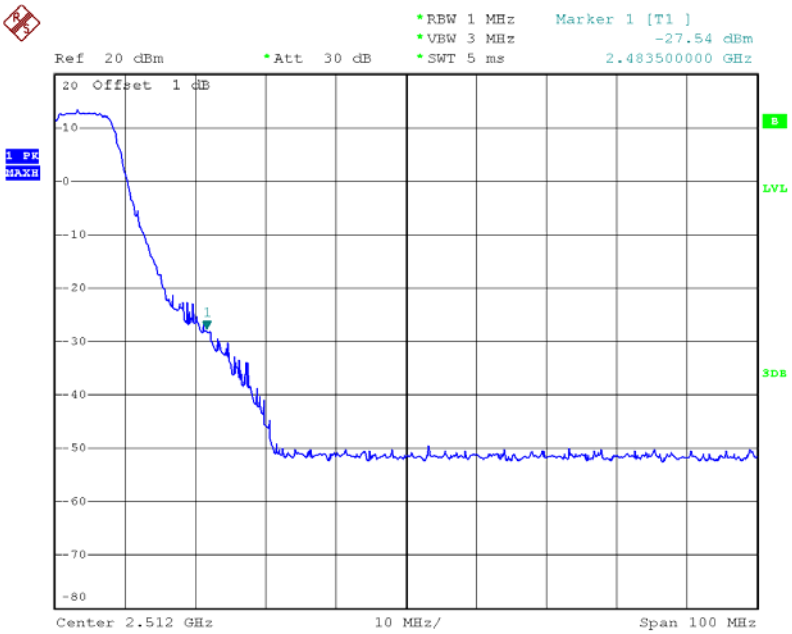
Tx1



Date: 1.NOV.2012 16:39:43

Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, HT-20 / HT-20, STBC, M0

Tx1



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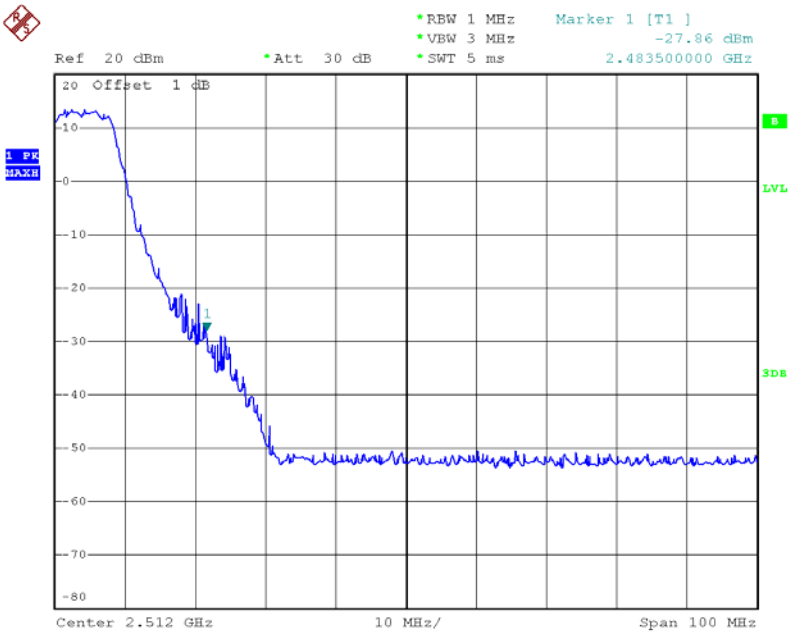
Tx2



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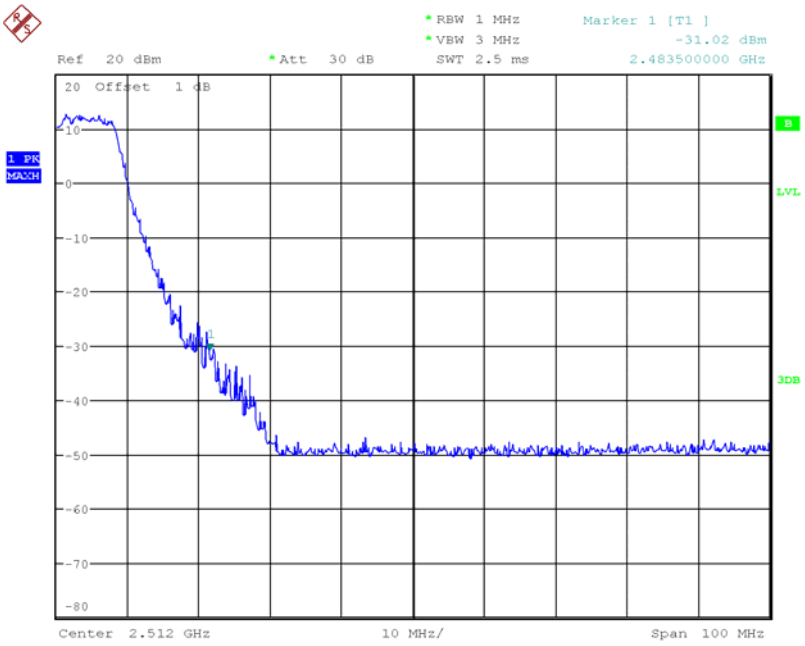
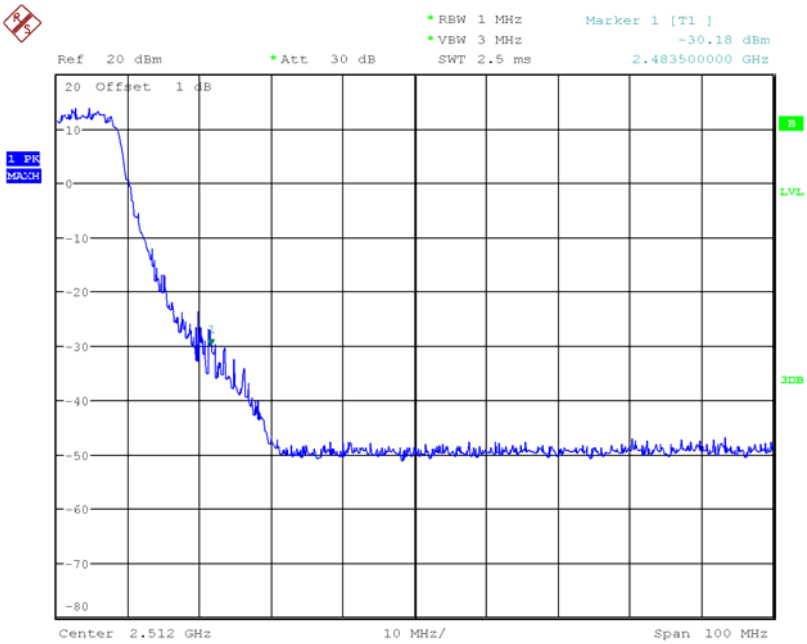
Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, HT-20, Beam Forming, M0
Tx1



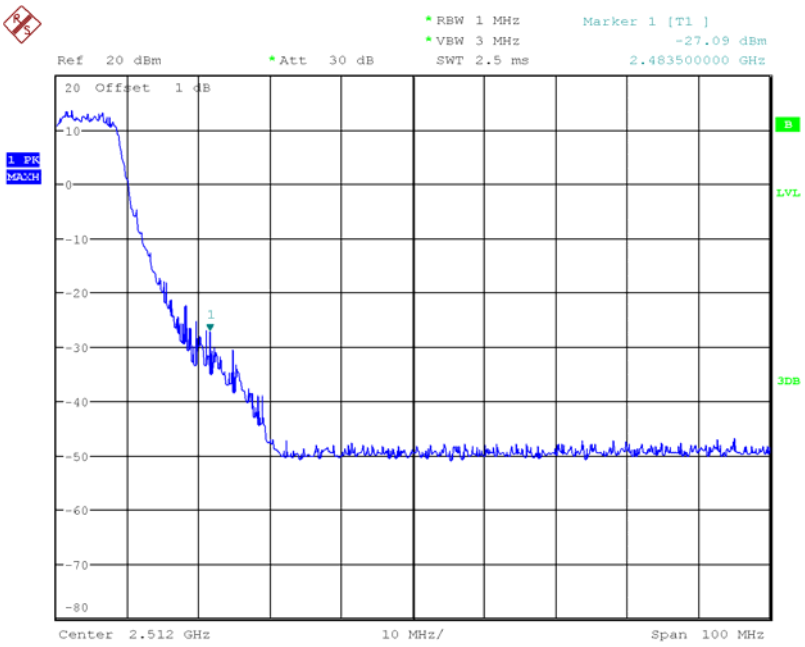
Date: 6.OCT.2012 01:12:17

Tx2

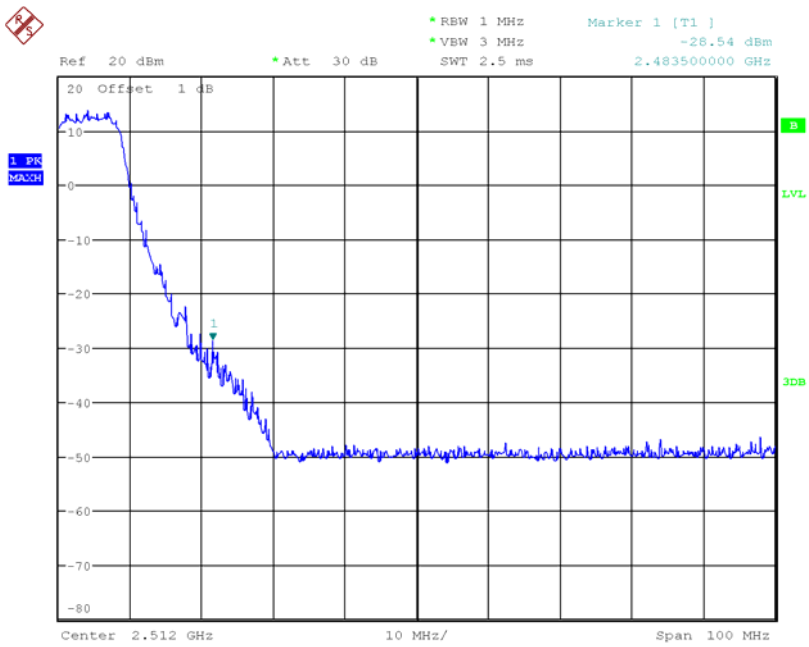


Date: 6.OCT.2012 01:24:15

Transmitter Conducted Bandedge Emissions Plot – Peak on 2462 MHz, HT-20, Beam Forming, M8
Tx1



Tx2



3.7 Transmitter Conducted Unwanted Emissions

3.7.1 Transmitter Conducted Unwanted Emissions Limit

Un-restricted Band Emissions Limit	
RF output power procedure	**Limit (dBc)**
Peak output power procedure	20
Average output power procedure	30

Note 1: If the peak output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the peak conducted output power measured within any 100 kHz outside the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum measured in-band peak PSD level.
Note 2: If the average output power procedure is used to measure the fundamental emission power to demonstrate compliance to requirements, then the power in any 100 kHz outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum measured in-band average PSD level.

3.7.2 Measuring Instruments

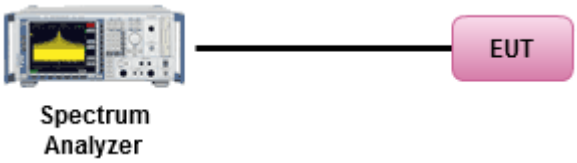
Refer a test equipment and calibration data table in this test report.

3.7.3 Test Procedures

Test Method	
☒	For the transmitter unwanted emissions shall be measured using following options below:
	☒ Refer as FCC KDB 558074, clause 10.1 for unwanted emissions into non-restricted bands.
☒	For conducted measurement, refer as FCC KDB 558074, clause 10.2.2.
	☒ For conducted unwanted emissions into non-restricted bands (relative emission limits). Devices with multiple transmit chains: Refer as FCC KDB 662911, when testing out-of-band and spurious emissions against relative emission limits, tests may be performed on each output individually without summing or adding 10 log(N) if the measurements are made relative to the in-band emissions on the individual outputs.

3.7.4 Test Setup

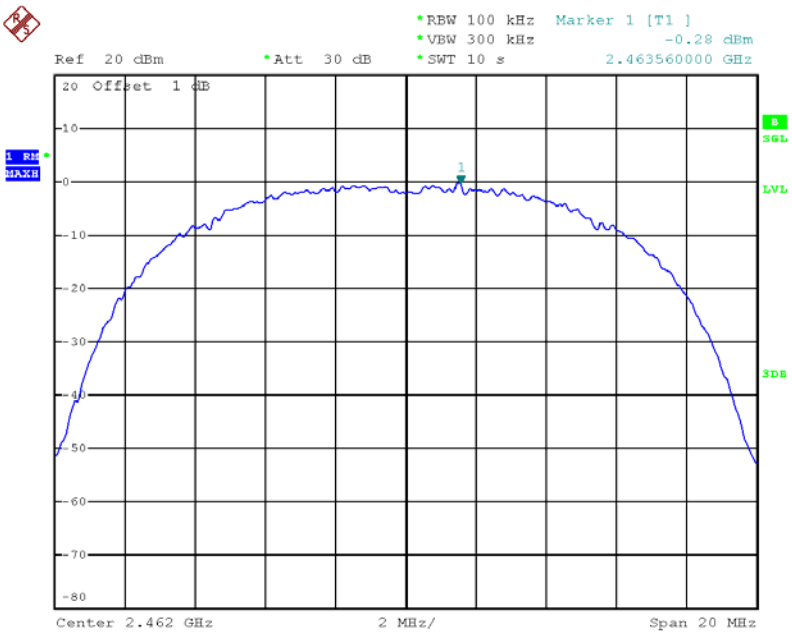
Transmitter Conducted Unwanted Emissions



3.7.5 Transmitter Conducted Unwanted Emissions

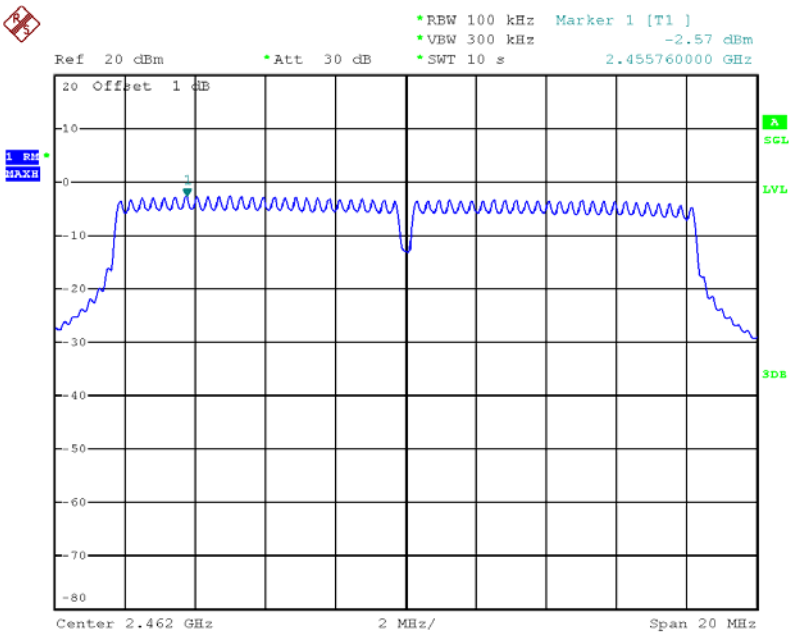
Freq. (MHz)	Operating Mode	Data Rate (Mbps)	Conducted Spur Delta (dB)	Limit (dBc)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	11	47.77	30	17.77
	Non HT-20, 6 to 54Mbps	6	46.32	30	16.32
	Non HT-20, 6 to 54Mbps	6	45.76	30	15.76
	Non HT-20, Beam Forming, 6 to 54Mbps	6	45.76	30	15.76
	HT-20, M0 to M7	M0	45.59	30	15.59
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	46.01	30	16.01
	HT-20, Beam Forming, M0 to M7	M0	46.01	30	16.01
	HT-20, Beam Forming, M8 to M15	M8	46.19	30	16.19
2437	Legacy CCK, 1 to 11Mbps	11	47.73	30	17.73
	Non HT-20, 6 to 54Mbps	6	46.22	30	16.22
	Non HT-20, Beam Forming, 6 to 54Mbps	6	46.22	30	16.22
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	45.19	30	15.19
	HT-20, Beam Forming, M0 to M7	M0	45.19	30	15.19
	HT-20, Beam Forming, M8 to M15	M8	46.92	30	16.92
2462	Legacy CCK, 1 to 11Mbps	11	48.27	30	18.27
	Non HT-20, 6 to 54Mbps	6	45.04	30	15.04
	Non HT-20, 6 to 54Mbps	6	46.25	30	16.25
	Non HT-20, Beam Forming, 6 to 54Mbps	6	46.25	30	16.25
	HT-20, M0 to M7	M0	45.93	30	15.93
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	46.47	30	16.47
	HT-20, Beam Forming, M0 to M7	M0	46.47	30	16.47
	HT-20, Beam Forming, M8 to M15	M8	46.32	30	16.32

Transmitter Conducted Unwanted Emissions Plot on Legacy CCK, 11Mbps / Reference Level



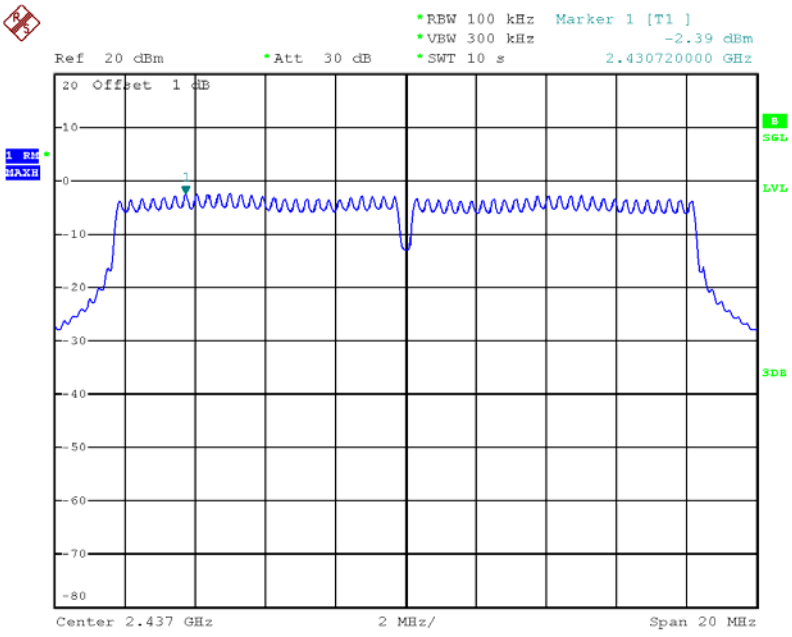
Date: 7.OCT.2012 09:18:57

Transmitter Conducted Unwanted Emissions Plot on Non HT-20, 6Mbps / Reference Level

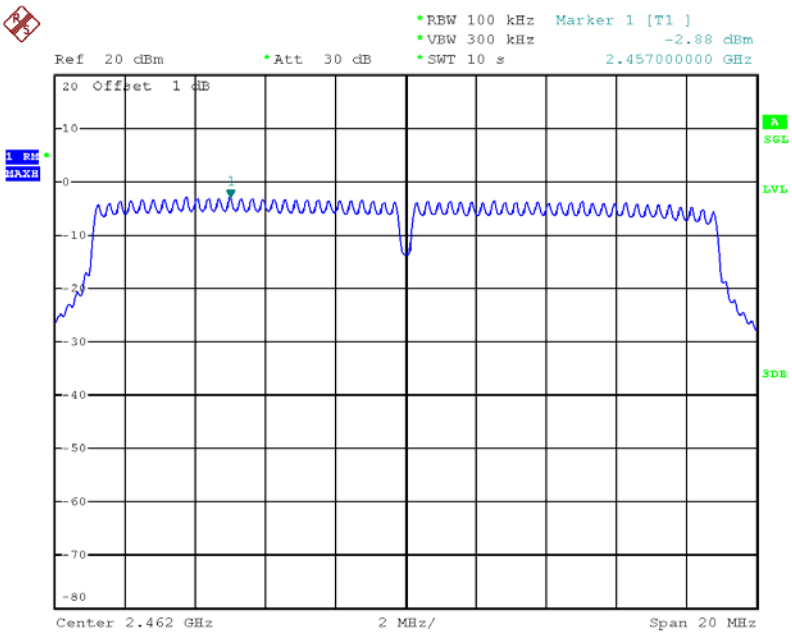


Date: 1.NOV.2012 17:15:27

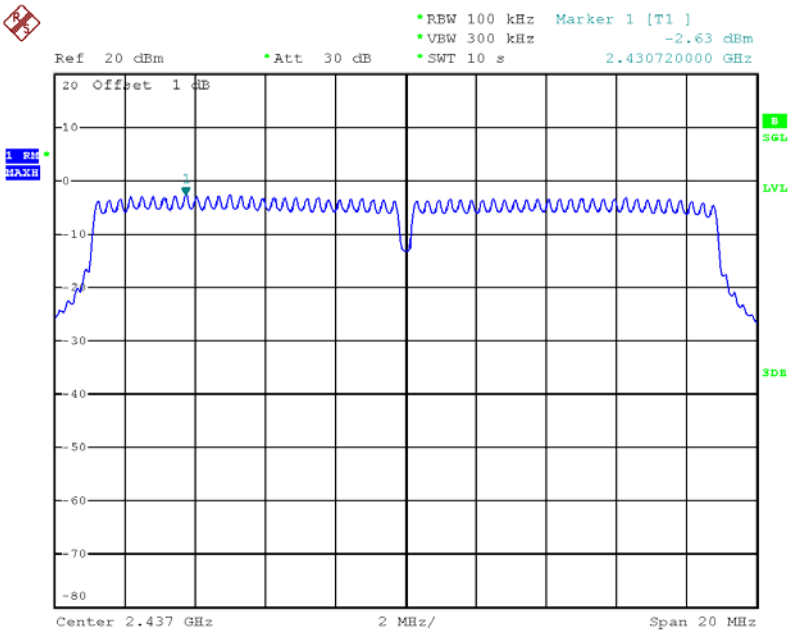
Transmitter Conducted Unwanted Emissions Plot on Non HT-20 / Non HT-20, Beam Forming, 6Mbps / Reference Level



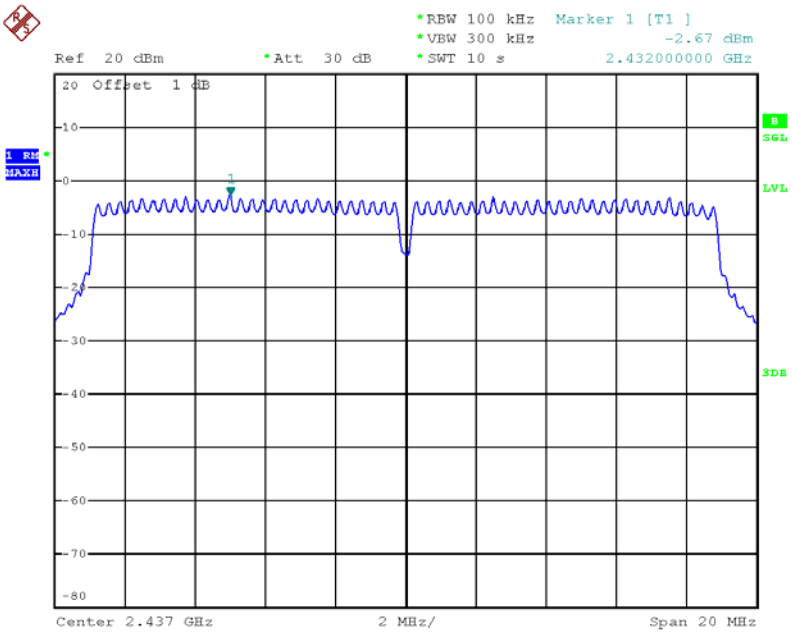
Transmitter Conducted Unwanted Emissions Plot on HT-20, M0 / Reference Level



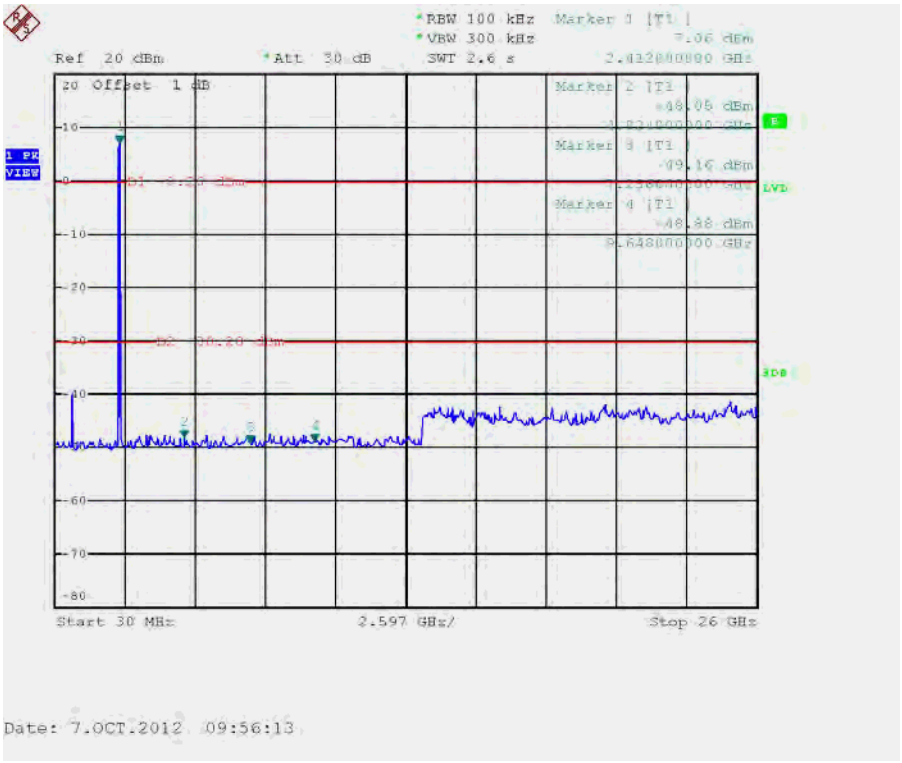
Transmitter Conducted Unwanted Emissions Plot on HT-20 / HT-20, STBC / HT-20, Beam Forming, M0 / Reference Level



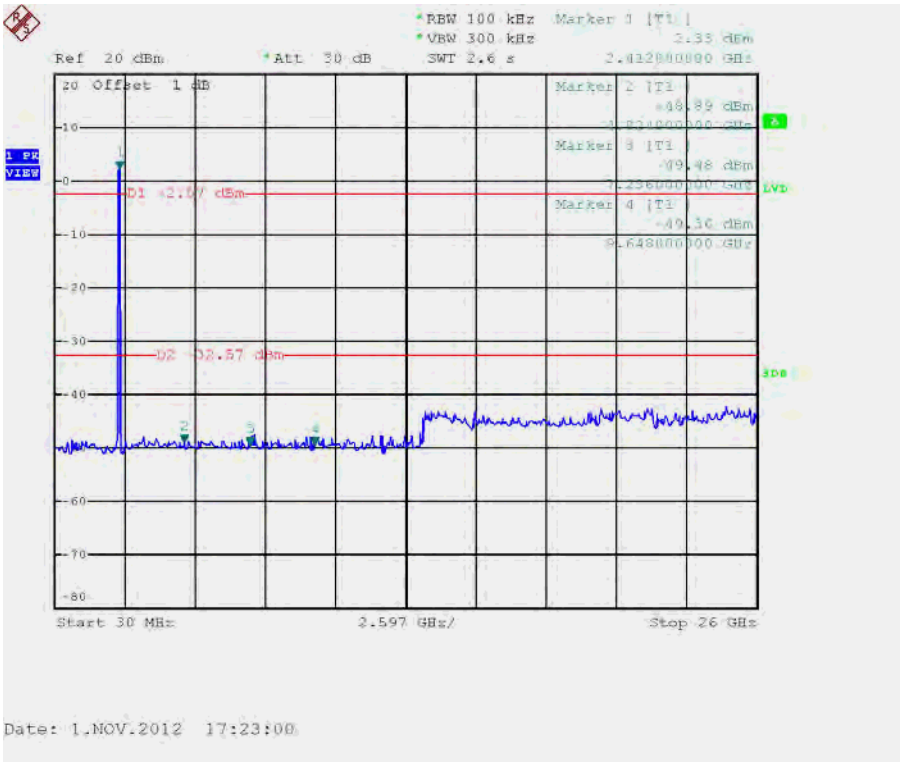
Transmitter Conducted Unwanted Emissions Plot on HT-20, Beam Forming, M8 / Reference Level



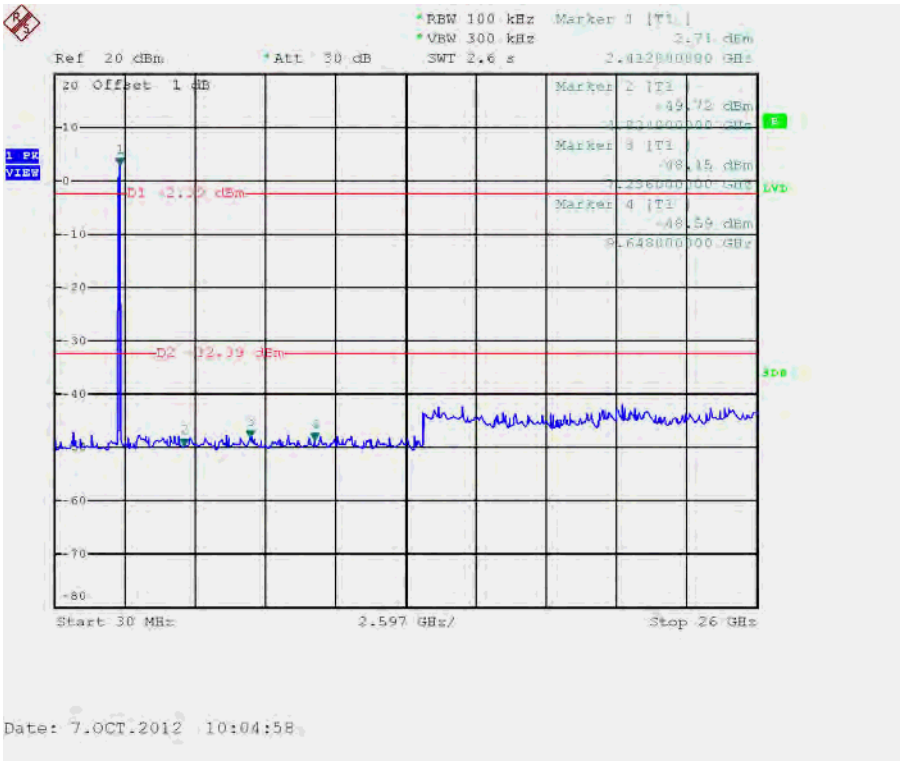
Transmitter Conducted Unwanted Emissions Plot on 2412 MHz, Legacy CCK, 11Mbps



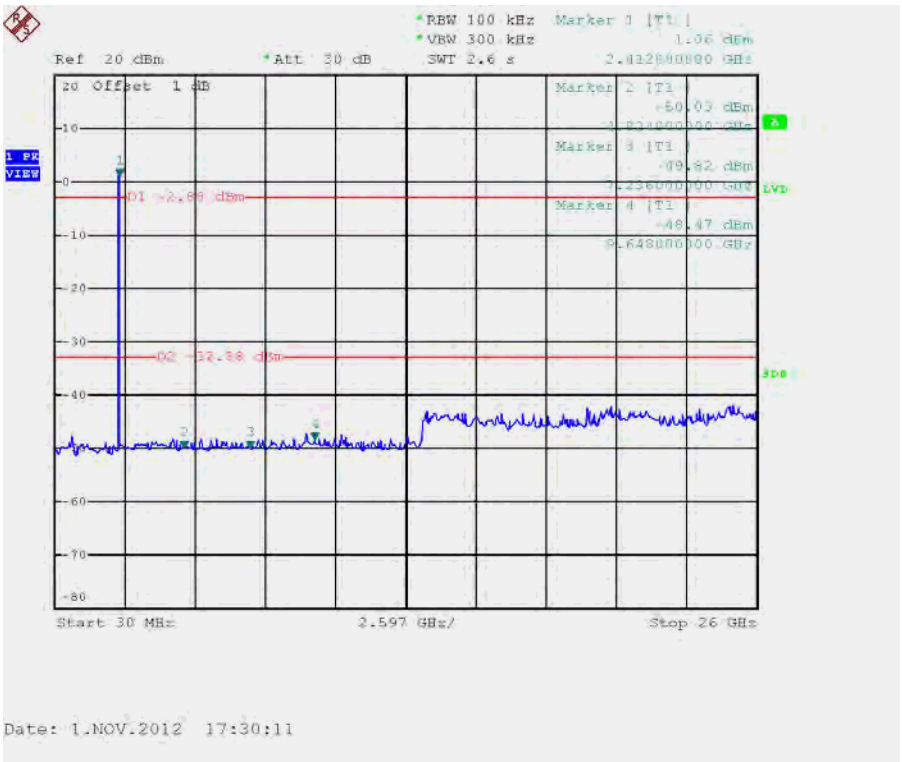
Transmitter Conducted Unwanted Emissions Plot on 2412 MHz, Non HT-20, 6Mbps



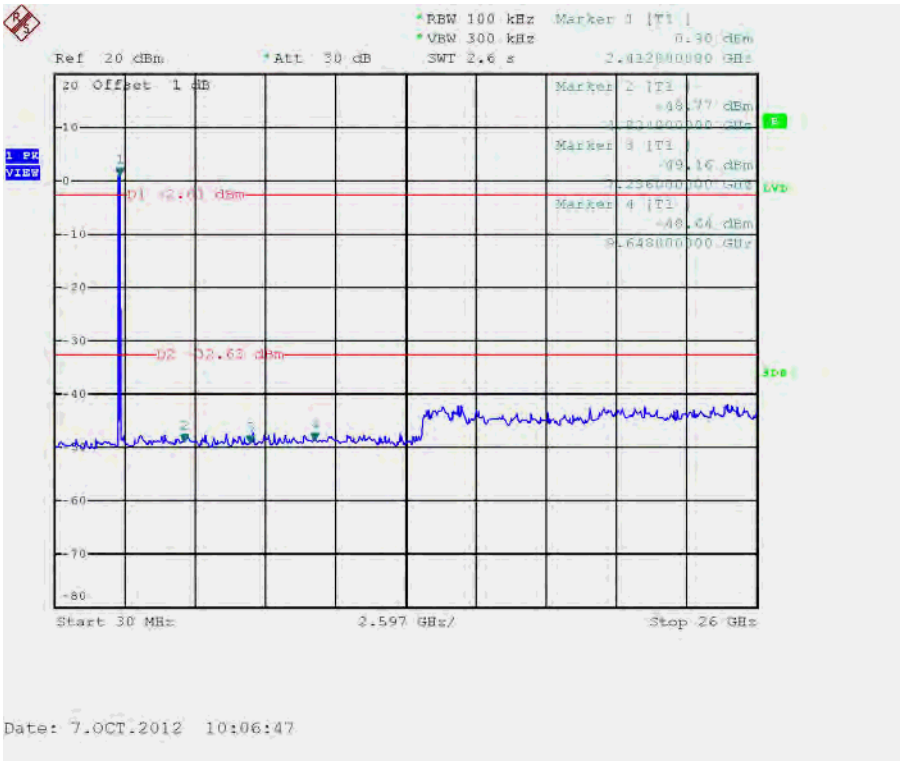
Transmitter Conducted Unwanted Emissions Plot on 2412 MHz, Non HT-20 / Non HT-20, Beam Forming, 6Mbps



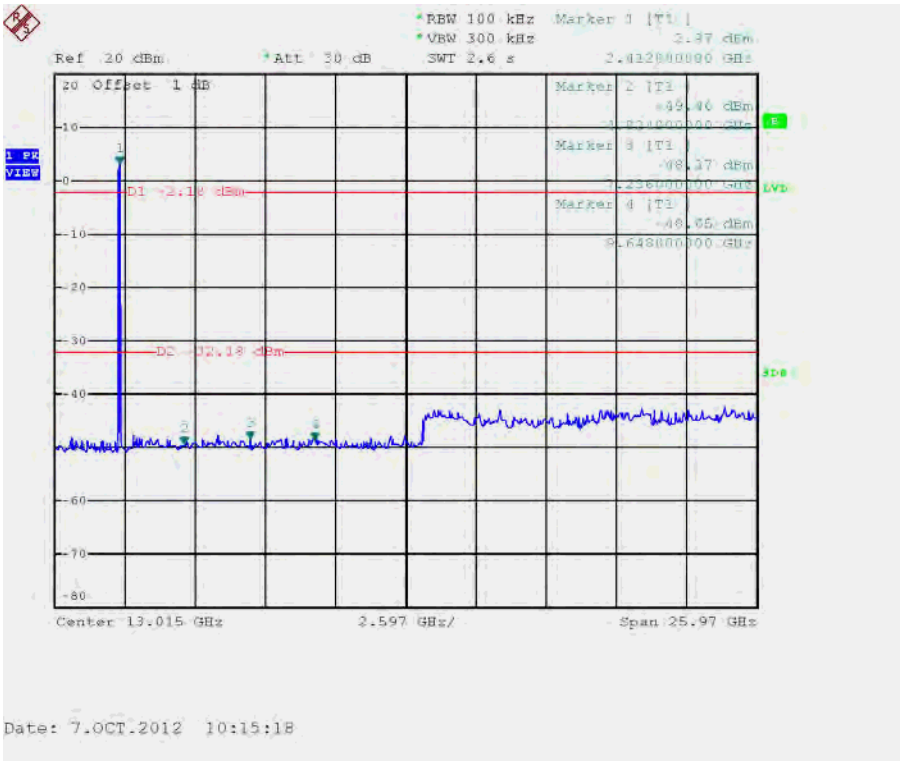
Transmitter Conducted Unwanted Emissions Plot on 2412 MHz, HT-20, M0



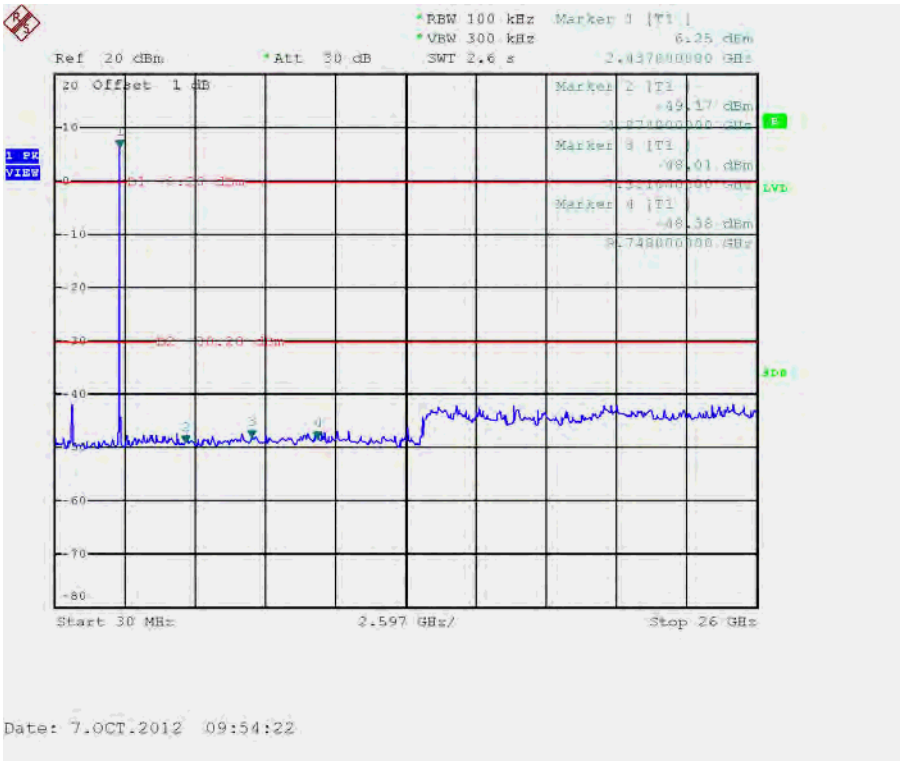
Transmitter Conducted Unwanted Emissions Plot on 2412 MHz, HT-20 / HT-20, STBC / HT-20, Beam Forming, M0



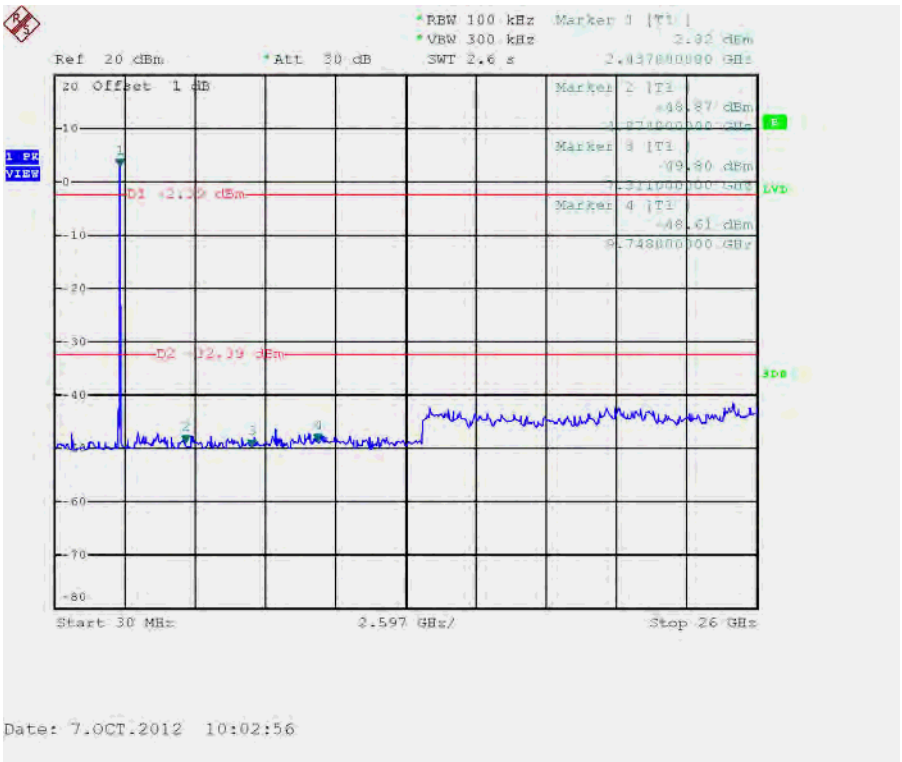
Transmitter Conducted Unwanted Emissions Plot on 2412 MHz, HT-20, Beam Forming, M8



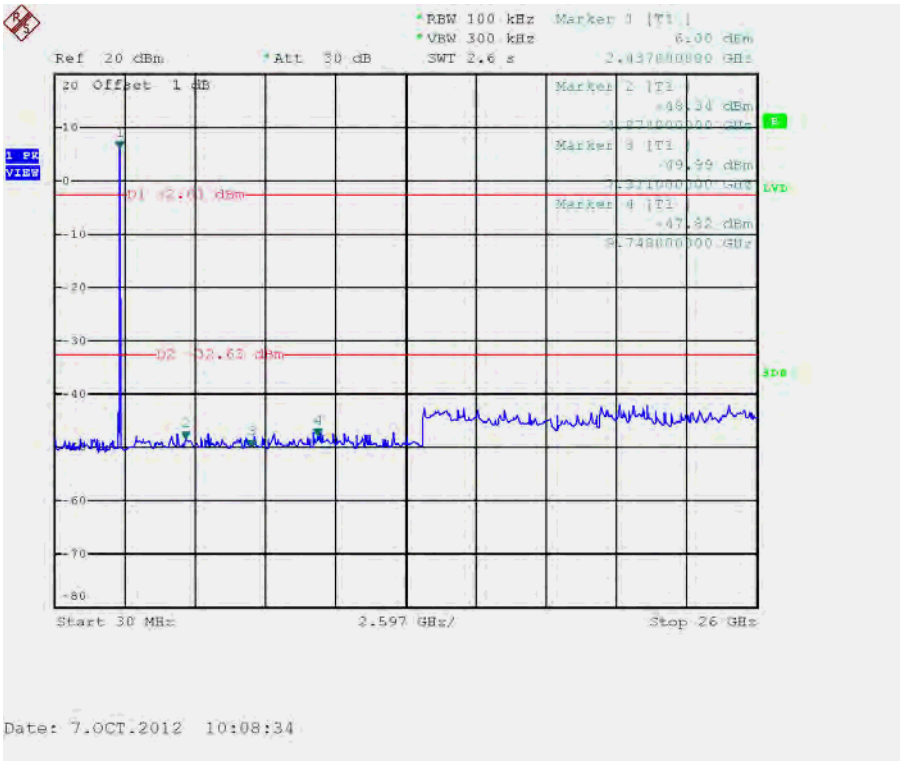
Transmitter Conducted Unwanted Emissions Plot on 2437 MHz, Legacy CCK, 11Mbps



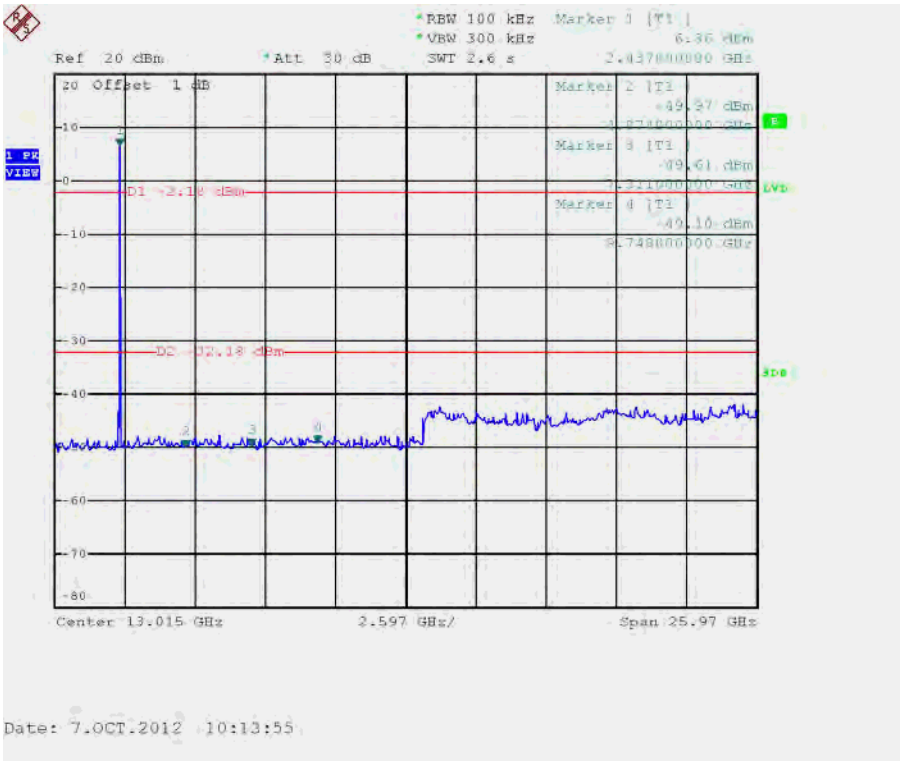
Transmitter Conducted Unwanted Emissions Plot on 2437 MHz, Non HT-20 / Non HT-20, Beam Forming, 6Mbps



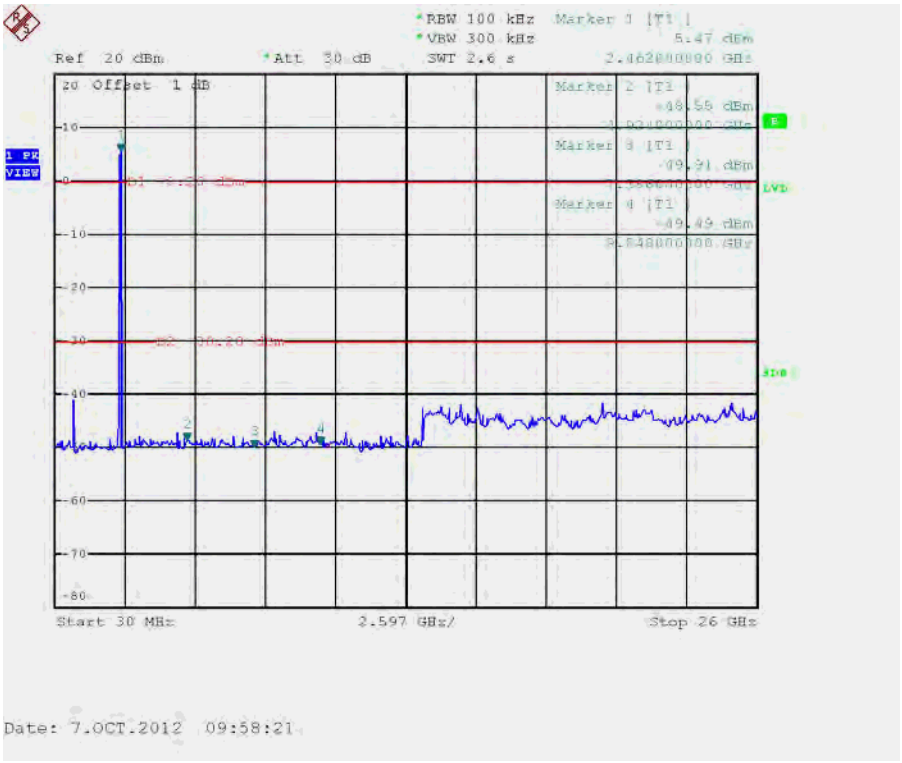
Transmitter Conducted Unwanted Emissions Plot on 2437 MHz, HT-20 / HT-20, STBC / HT-20, Beam Forming, M0



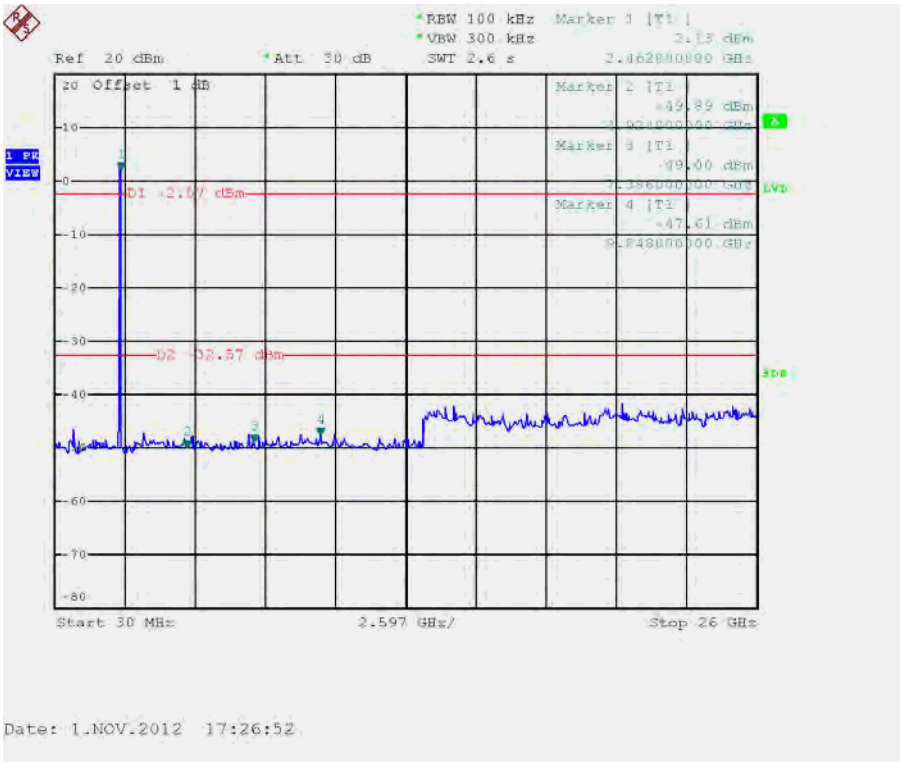
Transmitter Conducted Unwanted Emissions Plot on 2437 MHz, HT-20, Beam Forming, M8



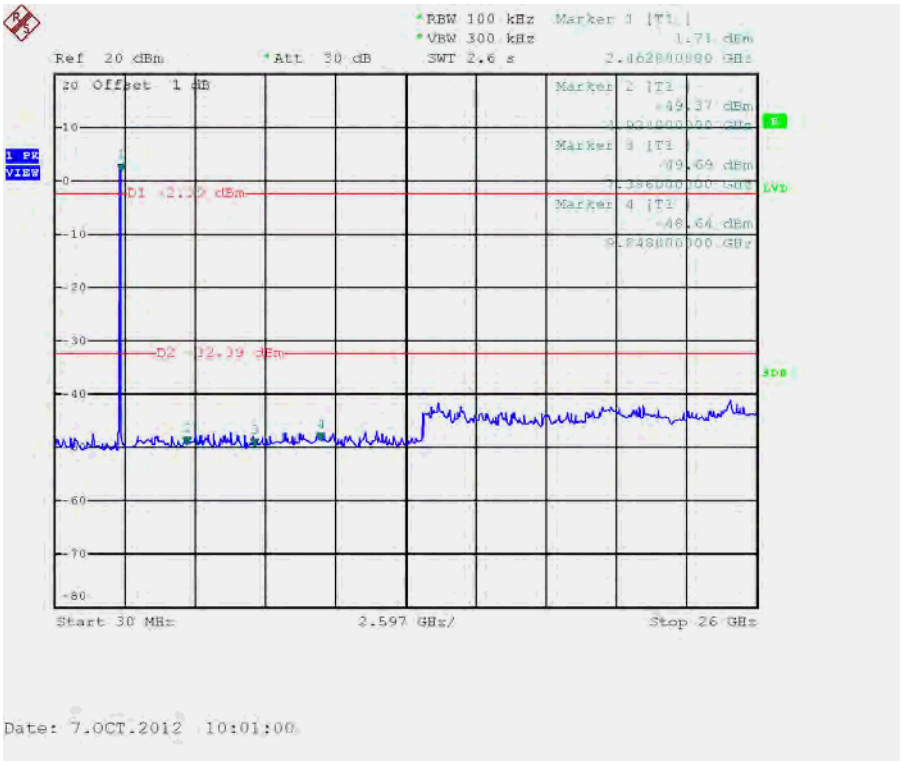
Transmitter Conducted Unwanted Emissions Plot on 2462 MHz, Legacy CCK, 11Mbps



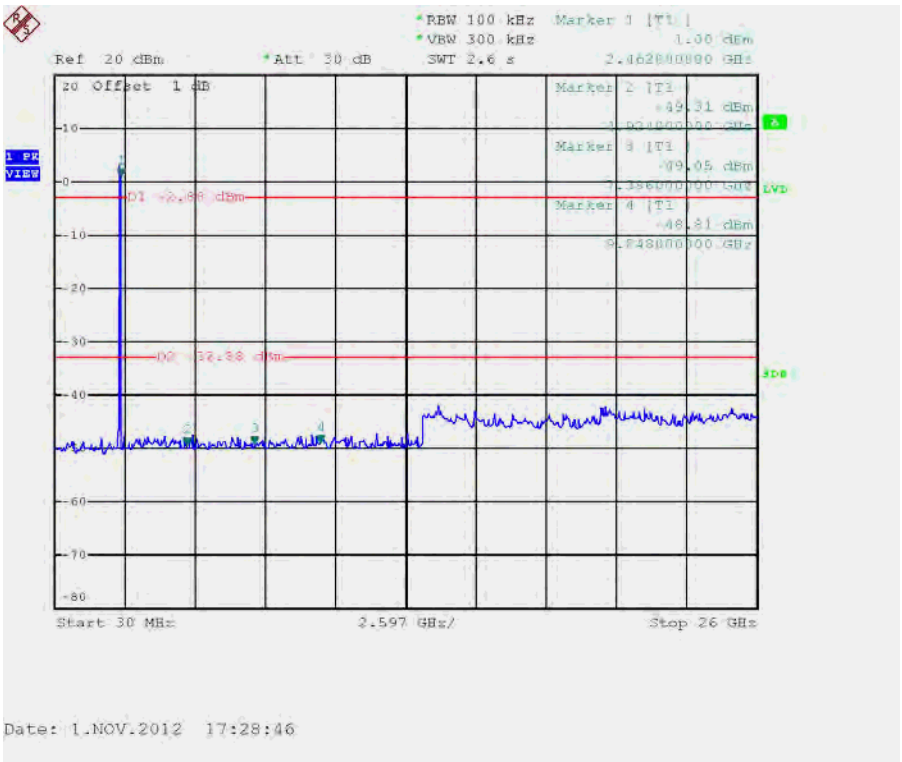
Transmitter Conducted Unwanted Emissions Plot on 2462 MHz, Non HT-20, 6Mbps



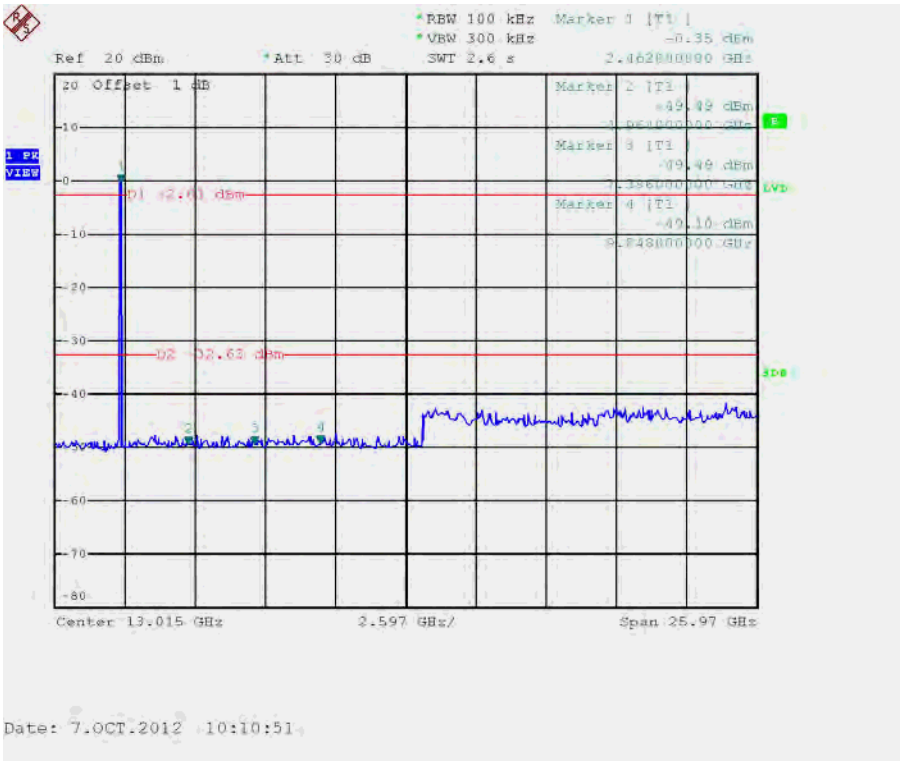
Transmitter Conducted Unwanted Emissions Plot on 2462 MHz, Non HT-20 / Non HT-20, Beam Forming, 6Mbps



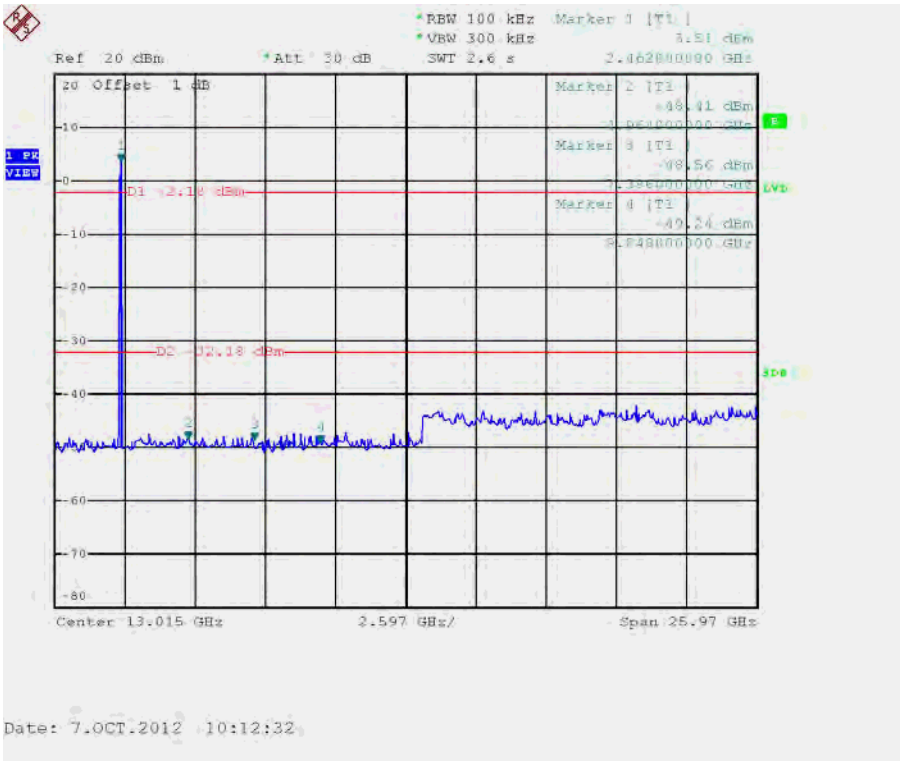
Transmitter Conducted Unwanted Emissions Plot on 2462 MHz, HT-20, M0



Transmitter Conducted Unwanted Emissions Plot on 2462 MHz, HT-20 / HT-20, STBC / HT-20, Beam Forming, M0



Transmitter Conducted Unwanted Emissions Plot on 2462 MHz, HT-20, Beam Forming, M8



3.8 Transmitter Radiated Unwanted Emissions

3.8.1 Transmitter Radiated Unwanted Emissions Limit

Restricted Band Emissions Limit			
Frequency Range (MHz)	**Field Strength (uV/m)**	**Field Strength (dBuV/m)**	**Measure Distance (m)**
0.009~0.490	2400/F(kHz)	48.5 - 13.8	300
0.490~1.705	24000/F(kHz)	33.8 - 23	30
1.705~30.0	30	29	30
30~88	100	40	3
88~216	150	43.5	3
216~960	200	46	3
Above 960	500	54	3

Note 1: Test distance for frequencies at or above 30 MHz, measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).

Note 2: Test distance for frequencies at below 30 MHz, measurements may be performed at a distance closer than the EUT limit distance; however, an attempt should be made to avoid making measurements in the near field. When performing measurements below 30 MHz at a closer distance than the limit distance, the results shall be extrapolated to the specified distance by either making measurements at a minimum of two or more distances on at least one radial to determine the proper extrapolation factor or by using the square of an inverse linear distance extrapolation factor (40 dB/decade). The test report shall specify the extrapolation method used to determine compliance of the EUT.

3.8.2 Measuring Instruments

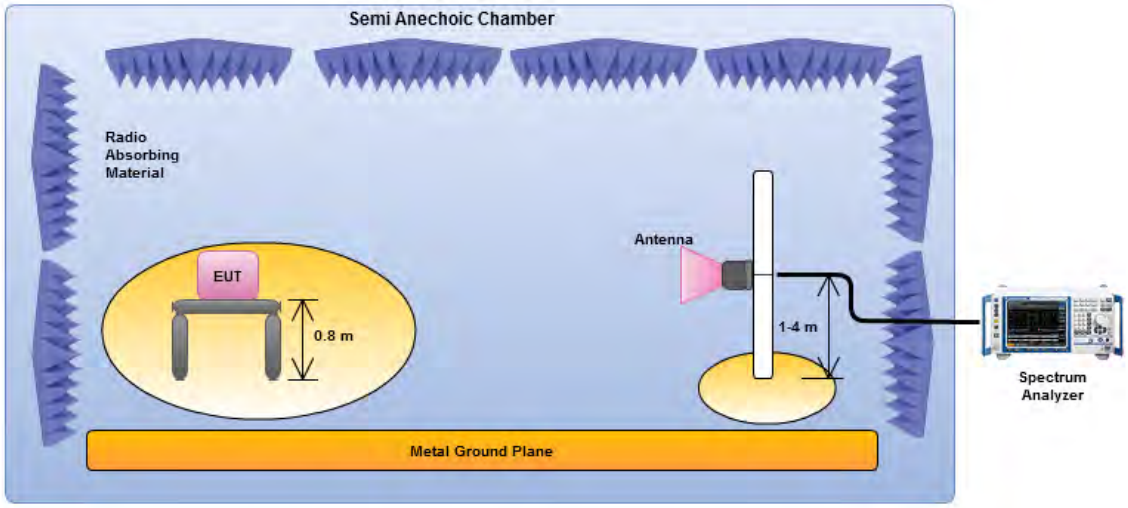
Refer a test equipment and calibration data table in this test report.

3.8.3 Test Procedures

Test Method			
☒	Measurements may be performed at a distance other than the limit distance provided they are not performed in the near field and the emissions to be measured can be detected by the measurement equipment. When performing measurements at a distance other than that specified, the results shall be extrapolated to the specified distance using an extrapolation factor of 20 dB/decade (inverse of linear distance for field-strength measurements, inverse of linear distance-squared for power-density measurements).		
	☒	Measurements in the frequency range above 1 GHz - 40GHz are typically made at a closer distance 3m, because the instrumentation noise floor is typically close to the radiated emission limit.	
☒	The average emission levels shall be measured in [duty cycle ≥ 98 or duty factor].		
☒	For the transmitter unwanted emissions shall be measured using following options below:		
	☒	Refer as FCC KDB 558074, clause 10.1 for unwanted emissions into non-restricted bands.	
	☒	Refer as FCC KDB 558074, clause 10.2 for unwanted emissions into restricted bands.	
		☐	Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 1 (spectral trace averaging)
		☐	Refer as FCC KDB 558074, clause 10.2.3.3 and 8.2.1 Option 2 (slow sweep speed).
		☒	Refer as ANSI C63.10, clause 4.2.3.2.3 (Reduced VBW) – Duty cycle ≥ 98%.
		☐	Refer as ANSI C63.10, clause 4.2.3.2.4 average value of pulsed emissions.
		☒	Refer as FCC KDB 558074, clause 10.2.3.2 and 8.1.1 measurement procedure peak limit.
		☐	Refer as FCC KDB 558074, clause 10.2.3.1 measurement procedure Quasi-Peak limit.
☒	For cabinet radiation radiated measurement, refer as FCC KDB 558074, clause 10.2.1.		
	☒	Refer as ANSI C63.10, clause 6.4 for radiated emissions from below 30 MHz.	
	☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from 30 MHz to 1000 MHz.	
	☒	Refer as ANSI C63.10, clause 6.5 for radiated emissions from above 1 GHz.	

3.8.4 Test Setup

Transmitter Radiated Unwanted Emissions



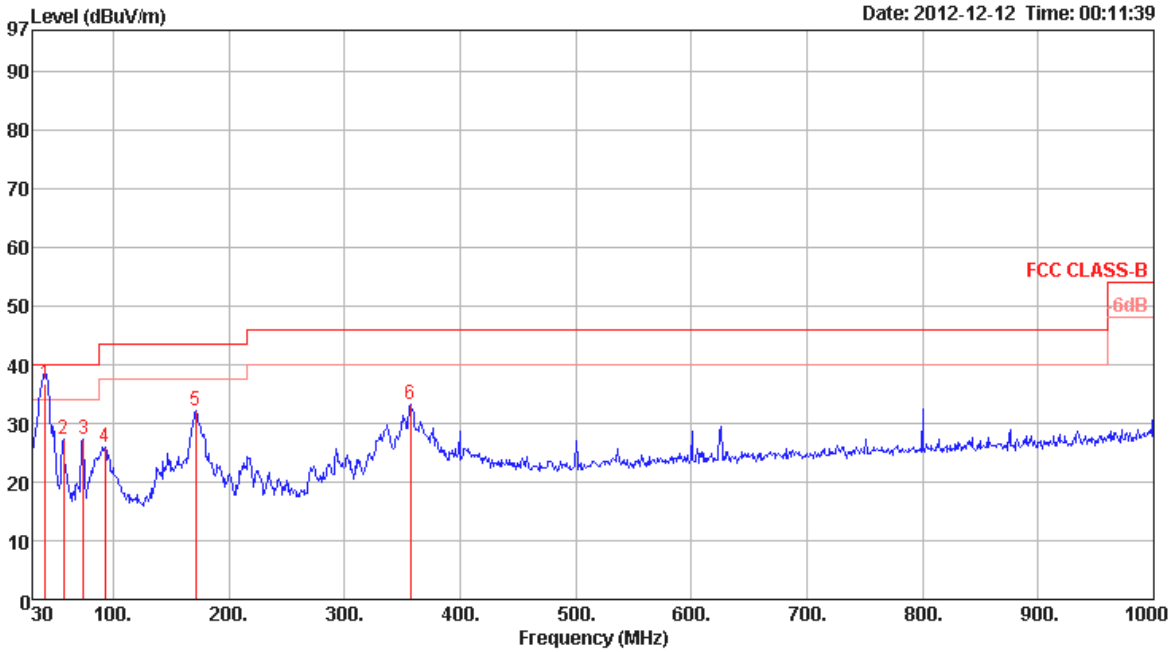
Magnetic field tests shall be performed in the frequency range of 9 kHz to 30 MHz using a calibrated loop antenna. Electric field tests shall be performed in the frequency range of 30 MHz to 1000 MHz using a calibrated bi-log antenna and the frequency range of 1 GHz to 40 GHz using a calibrated horn antenna.

3.8.5 Transmitter Radiated Unwanted Emissions (Below 30MHz)

All amplitude of spurious emissions that are attenuated by more than 20 dB below the permissible value has no need to be reported.

3.8.6 Transmitter Radiated Unwanted Emissions (Below 1GHz)

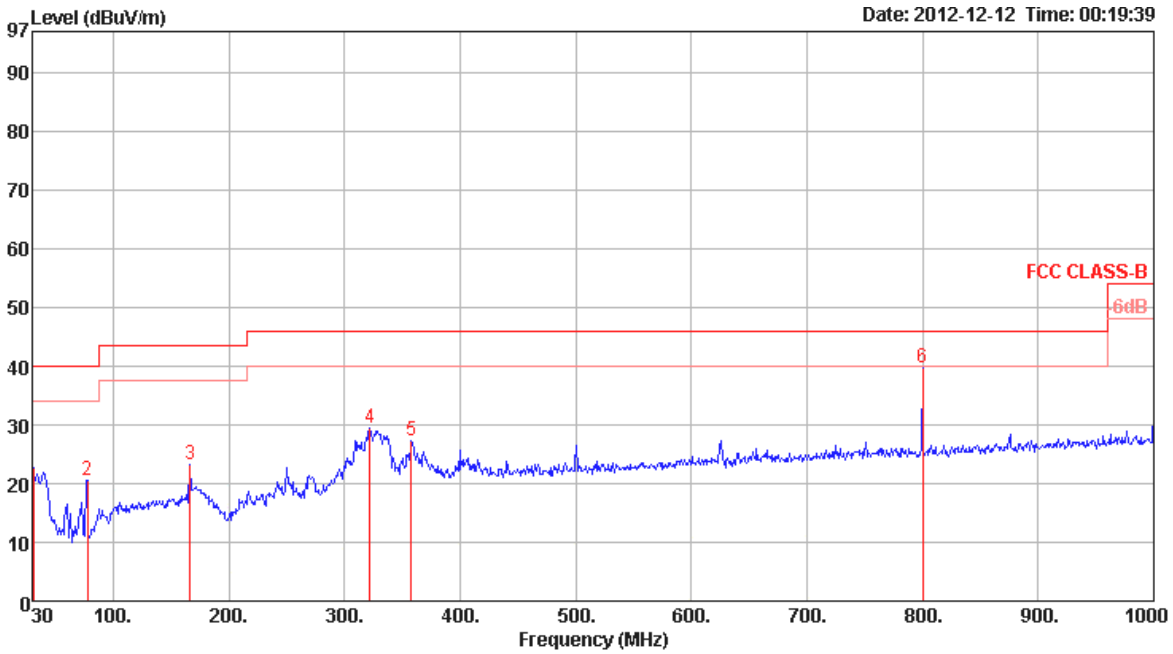
Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Test Mode	4	**Polarization**	Vertical
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	41.09	36.65	40.00	-3.35	51.20	0.70	12.55	27.80	QP	100	170	VERTICAL
2	57.16	27.32	40.00	-12.68	46.99	0.80	7.30	27.77	Peak	400	0	VERTICAL
3	74.62	27.20	40.00	-12.80	47.12	0.90	6.88	27.70	Peak	400	0	VERTICAL
4	93.05	26.03	43.50	-17.47	42.98	1.10	9.58	27.63	Peak	400	0	VERTICAL
5	171.62	32.09	43.50	-11.41	44.87	1.56	12.90	27.24	Peak	400	0	VERTICAL
6	356.89	33.36	46.00	-12.64	43.53	2.21	14.91	27.29	Peak	400	0	VERTICAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

Transmitter Radiated Unwanted Emissions (Below 1GHz)			
Test Mode	4	**Polarization**	Horizontal
Operating Function	Normal Link		



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	30.97	22.61	40.00	-17.39	31.69	0.50	18.22	27.80	Peak	100	0	HORIZONTAL
2	77.53	20.55	40.00	-19.45	40.21	1.00	7.03	27.69	Peak	100	0	HORIZONTAL
3	166.77	23.34	43.50	-20.16	36.54	1.53	12.54	27.27	Peak	100	0	HORIZONTAL
4	321.97	29.56	46.00	-16.44	40.51	2.14	13.96	27.05	Peak	100	0	HORIZONTAL
5	357.86	27.37	46.00	-18.63	37.52	2.22	14.93	27.30	Peak	100	0	HORIZONTAL
6	800.18	39.69	46.00	-6.31	44.22	3.30	19.77	27.60	Peak	100	0	HORIZONTAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)

3.8.7 Transmitter Radiated Unwanted Emissions (Above 1GHz)

Transmitter Radiated Unwanted Emissions Result - Average

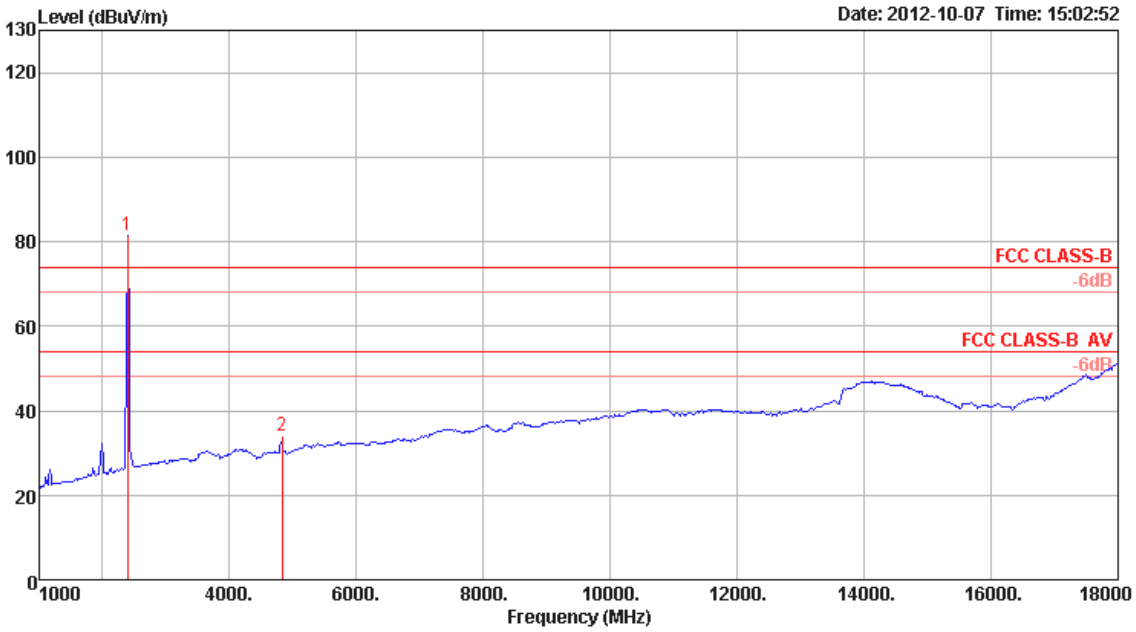
Freq. (MHz)	Operating Mode	Data Rate (Mbps)	Spurious Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	11	34.67	54	19.33
	Non HT-20, 6 to 54Mbps	6	34.67	54	19.33
	Non HT-20, 6 to 54Mbps	6	34.67	54	19.33
	Non HT-20, Beam Forming, 6 to 54Mbps	6	34.67	54	19.33
	HT-20, M0 to M7	M0	34.67	54	19.33
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	34.67	54	19.33
	HT-20, Beam Forming, M0 to M7	M0	34.67	54	19.33
	HT-20, Beam Forming, M8 to M15	M8	34.67	54	19.33
2437	Legacy CCK, 1 to 11Mbps	11	35.43	54	18.57
	Non HT-20, 6 to 54Mbps	6	35.43	54	18.57
	Non HT-20, Beam Forming, 6 to 54Mbps	6	35.43	54	18.57
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	35.43	54	18.57
	HT-20, Beam Forming, M0 to M7	M0	35.43	54	18.57
	HT-20, Beam Forming, M8 to M15	M8	35.43	54	18.57
2462	Legacy CCK, 1 to 11Mbps	11	34.81	54	19.19
	Non HT-20, 6 to 54Mbps	6	34.81	54	19.19
	Non HT-20, 6 to 54Mbps	6	34.81	54	19.19
	Non HT-20, Beam Forming, 6 to 54Mbps	6	34.81	54	19.19
	HT-20, M0 to M7	M0	34.81	54	19.19
	HT-20, M0 to M15 / HT-20, STBC, M0 to M7	M0	34.81	54	19.19
	HT-20, Beam Forming, M0 to M7	M0	34.81	54	19.19
	HT-20, Beam Forming, M8 to M15	M8	34.81	54	19.19

Transmitter Radiated Unwanted Emissions Result – Peak

Freq. (MHz)	Operating Mode	Data Rate (Mbps)	Spurious Emission (dBuV/m)	Limit (dBuV/m)	Margin (dB)
2412	Legacy CCK, 1 to 11Mbps	11	48.41	74	25.59
	Non HT-20, 6 to 54Mbps	6	48.41	74	25.59
	Non HT-20, Beam Forming, 6 to 54Mbps	6	48.41	74	25.59
	HT-20, M0 to M7	M0	48.41	74	25.59
	HT-20, Beam Forming, M0 to M7	M0	48.41	74	25.59
	HT-20, Beam Forming, M8 to M15	M8	48.41	74	25.59
2437	Legacy CCK, 1 to 11Mbps	11	49.33	74	24.67
	Non HT-20, Beam Forming, 6 to 54Mbps	6	49.33	74	24.67
	HT-20, Beam Forming, M0 to M7	M0	49.33	74	24.67
	HT-20, Beam Forming, M8 to M15	M8	49.33	74	24.67
2462	Legacy CCK, 1 to 11Mbps	11	48.59	74	25.41
	Non HT-20, 6 to 54Mbps	6	48.59	74	25.41
	Non HT-20, Beam Forming, 6 to 54Mbps	6	48.59	74	25.41
	HT-20, M0 to M7	M0	48.59	74	25.41
	HT-20, Beam Forming, M0 to M7	M0	48.59	74	25.41
	HT-20, Beam Forming, M8 to M15	M8	48.59	74	25.41

Transmitter Radiated Unwanted Emissions Worst Plots (Above 1GHz)
Only test maximum power of operating mode for low, middle, high channel.

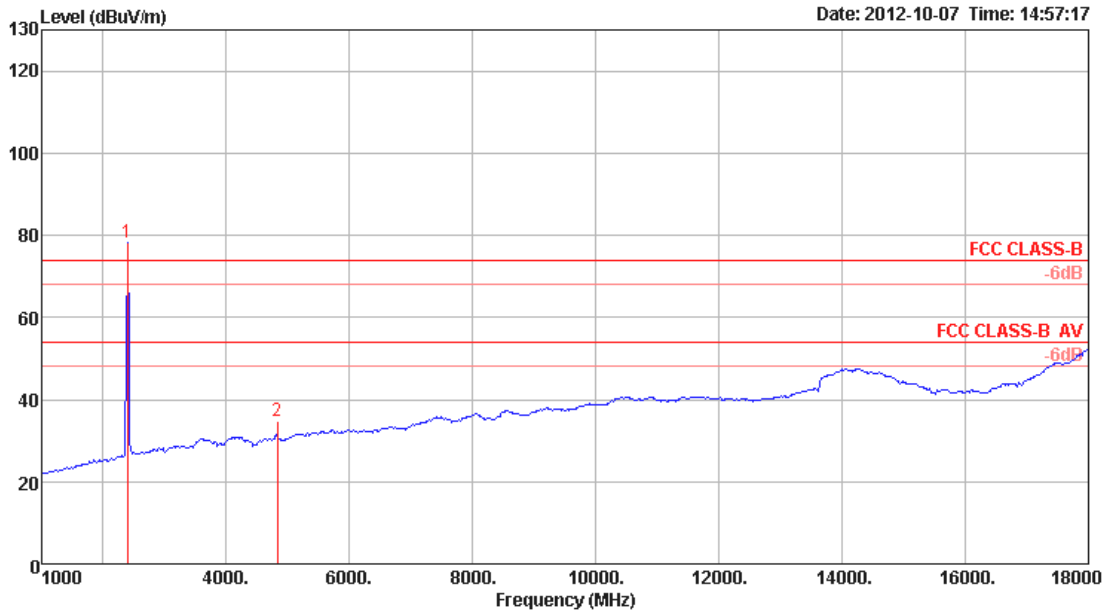
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2412	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2394.00	81.56	54.00	27.56	84.15	4.34	28.05	34.98	Average	100	360	VERTICAL
2	4823.98	34.10	54.00	-19.90	29.64	6.27	33.39	35.20	Average	100	270	VERTICAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

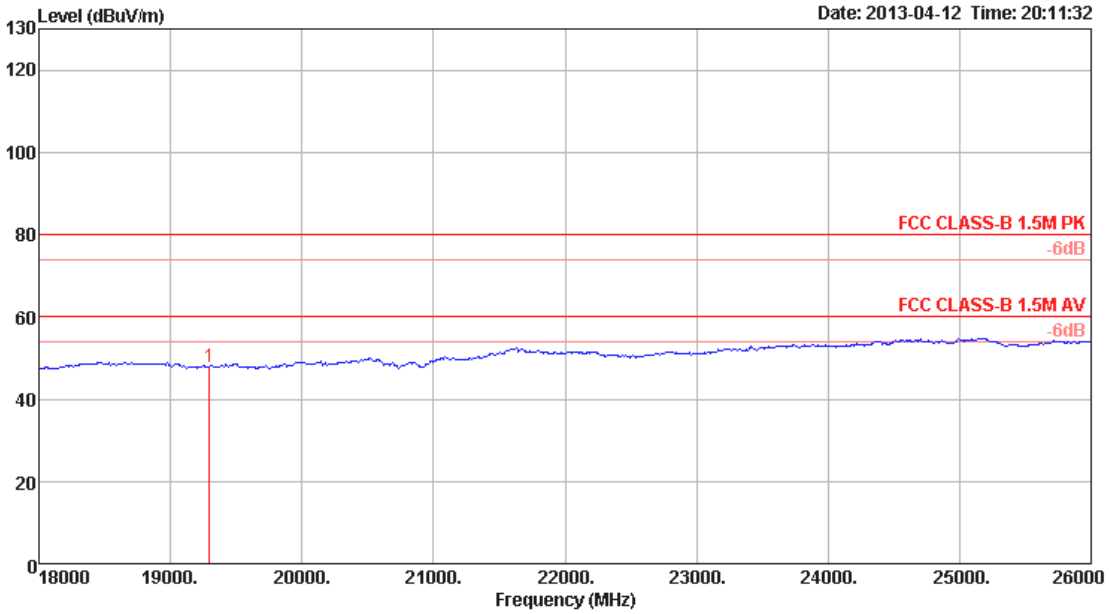
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2412	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2394.00	78.20	54.00	24.20	80.79	4.34	28.05	34.98	Average	100	360	HORIZONTAL
2	4823.96	34.67	54.00	-19.33	30.21	6.27	33.39	35.20	Average	100	314	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

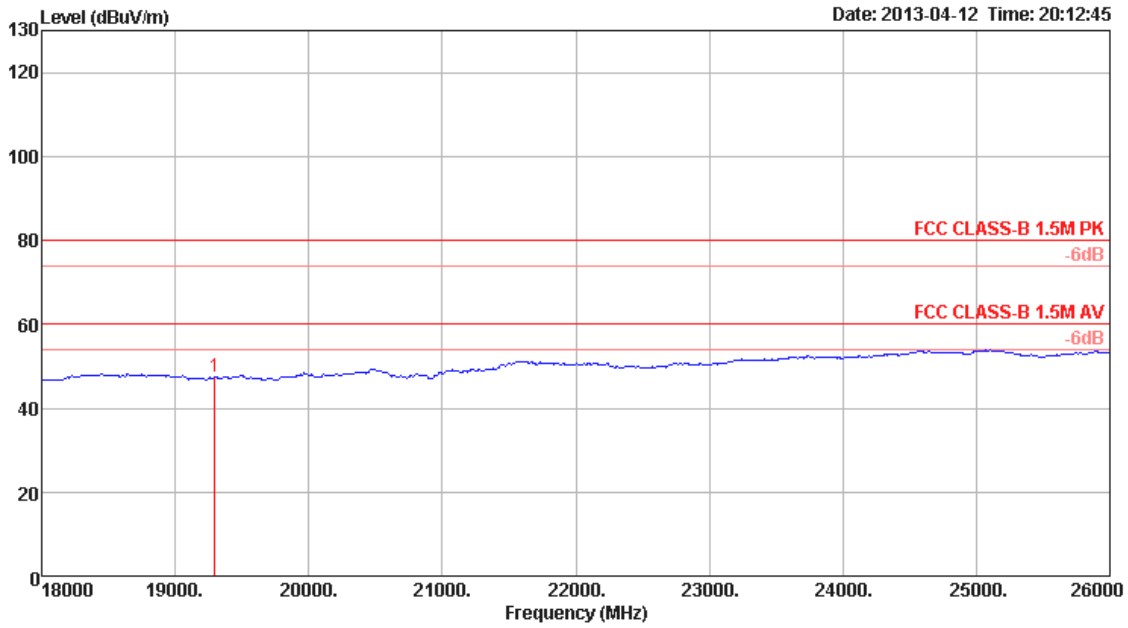
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2412	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19296.00	47.86	60.00	-12.14	31.72	13.84	37.28	34.98	Average	100	10	VERTICAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

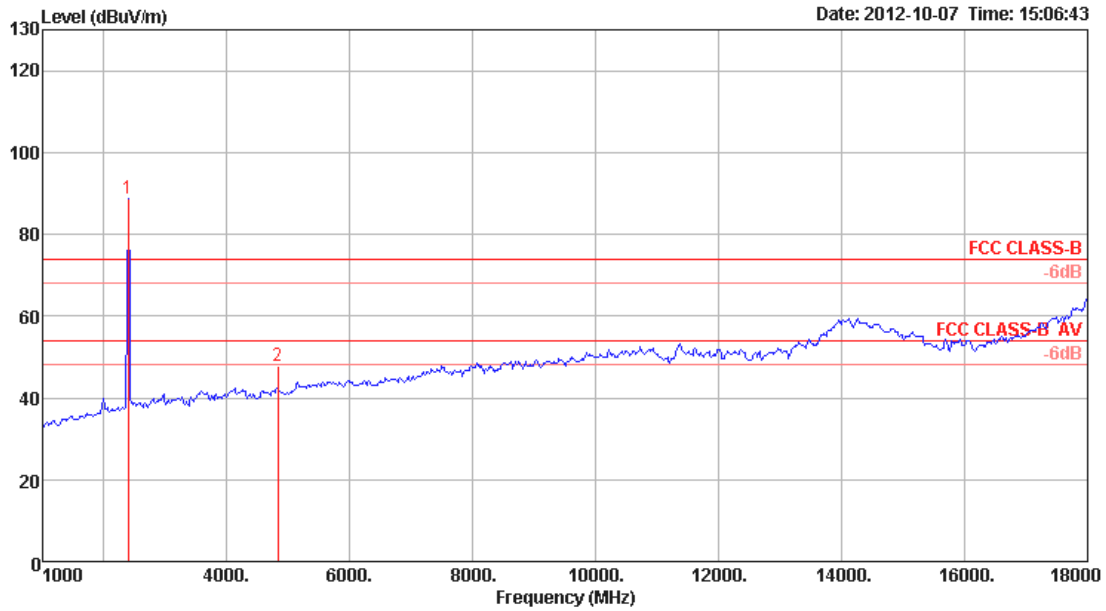
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2412	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19296.00	47.29	60.00	-12.71	31.15	13.84	37.28	34.98	Average	100	181	HORIZONTAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

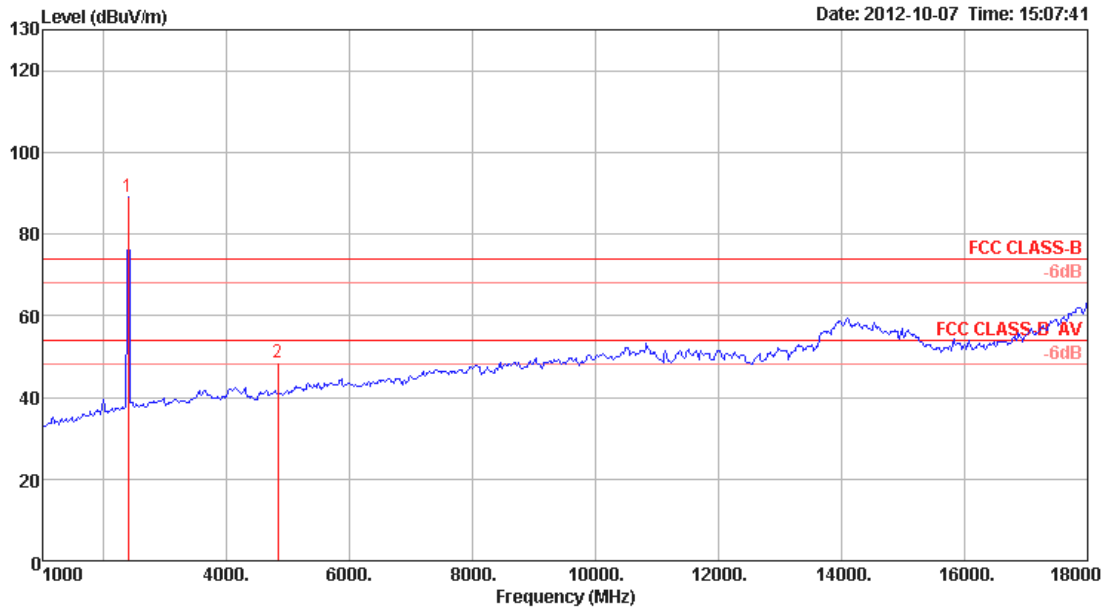
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2412	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2394.00	88.76	74.00	14.76	91.35	4.34	28.05	34.98	Peak	100	0	VERTICAL
2	4824.07	47.67	74.00	-26.33	43.21	6.27	33.39	35.20	Peak	100	270	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

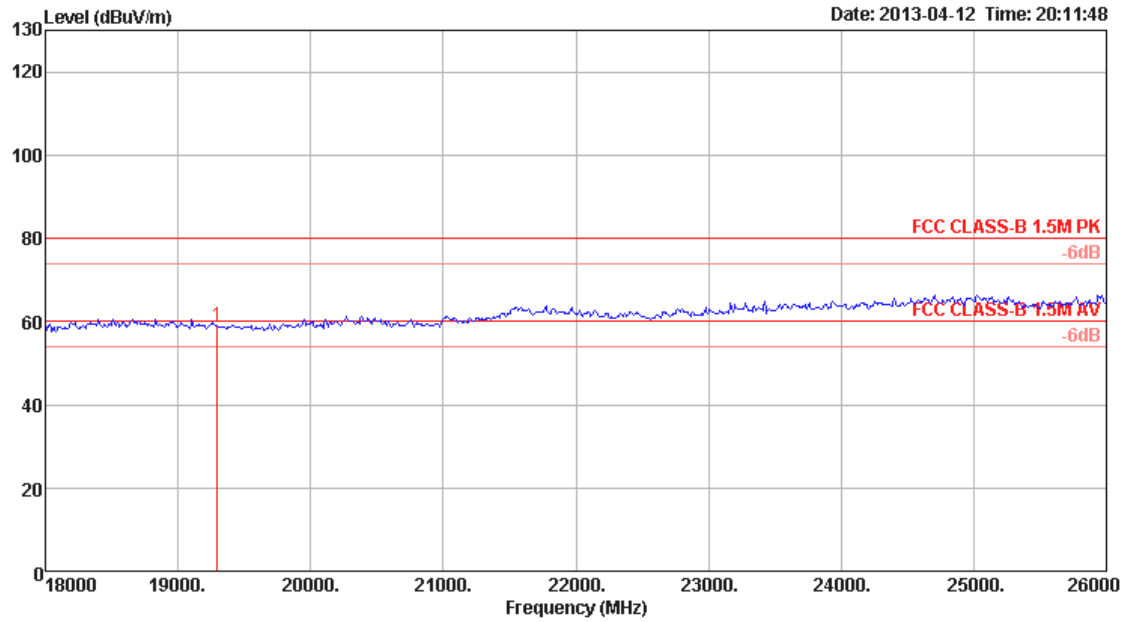
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2412	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2394.00	89.03	74.00	15.03	91.62	4.34	28.05	34.98	Peak	100	360	HORIZONTAL
2	4824.31	48.41	74.00	-25.59	43.95	6.27	33.39	35.20	Peak	100	314	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

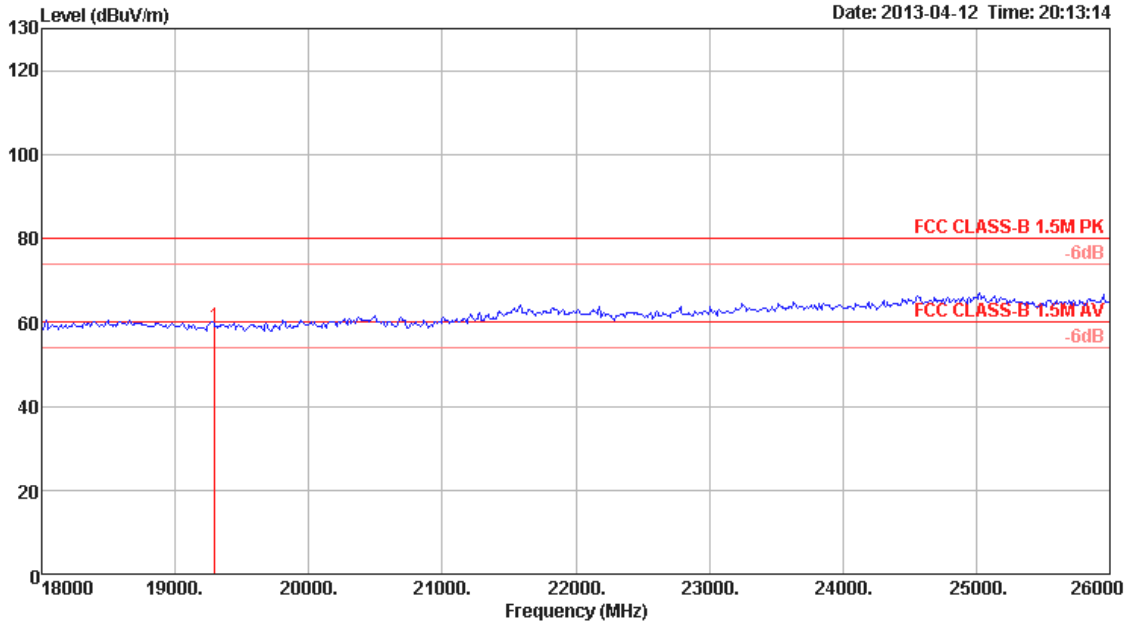
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2412	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19296.00	58.88	80.00	-21.12	42.74	13.84	37.28	34.98	Peak	100	10	VERTICAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

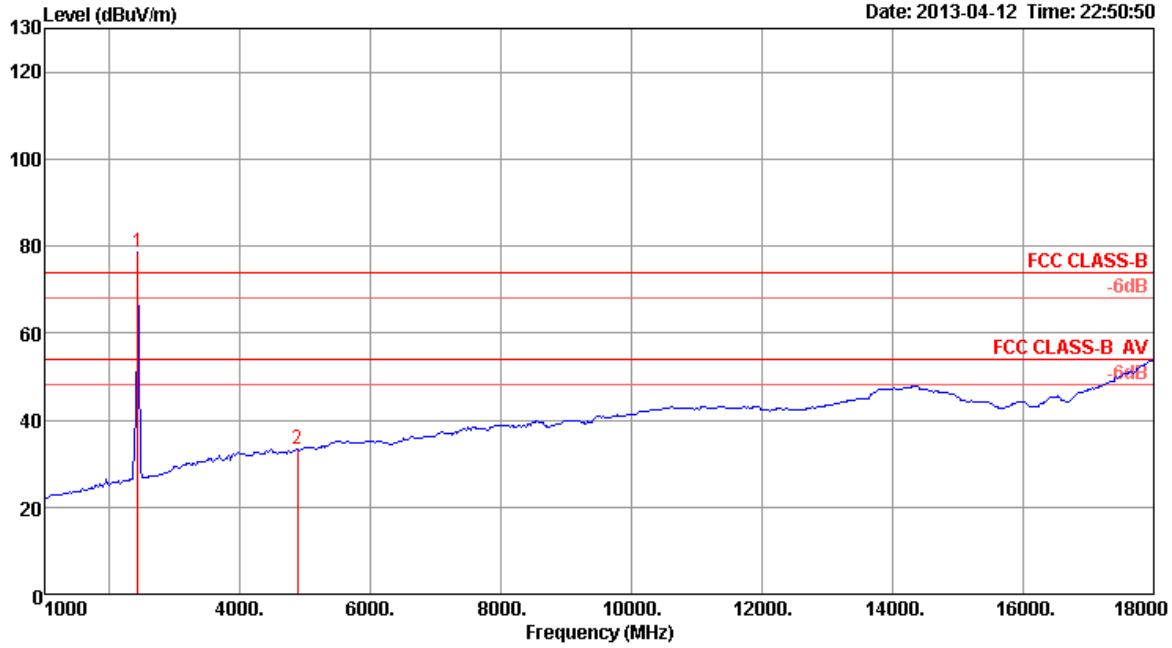
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2412	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19296.00	59.19	80.00	-20.81	43.05	13.84	37.28	34.98	Peak	100	181	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

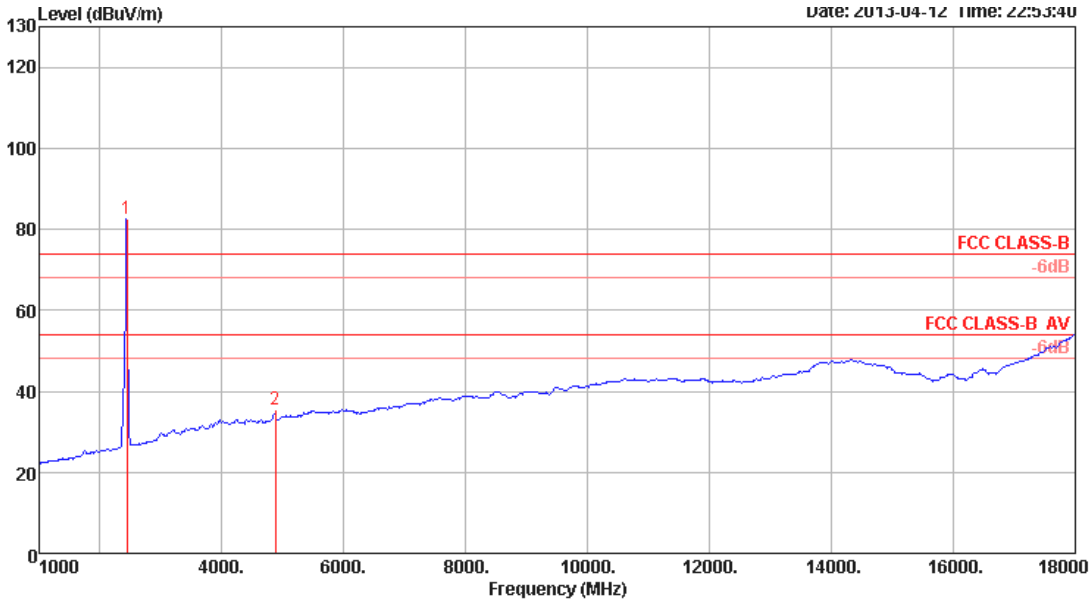
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Average		
Test Freq. (MHZ)	2437	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2428.00	78.66	54.00	24.66	81.15	4.36	28.13	34.98	Average	100	322	VERTICAL
2	4872.53	33.42	54.00	-20.58	28.83	6.31	33.48	35.20	Average	100	239	VERTICAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

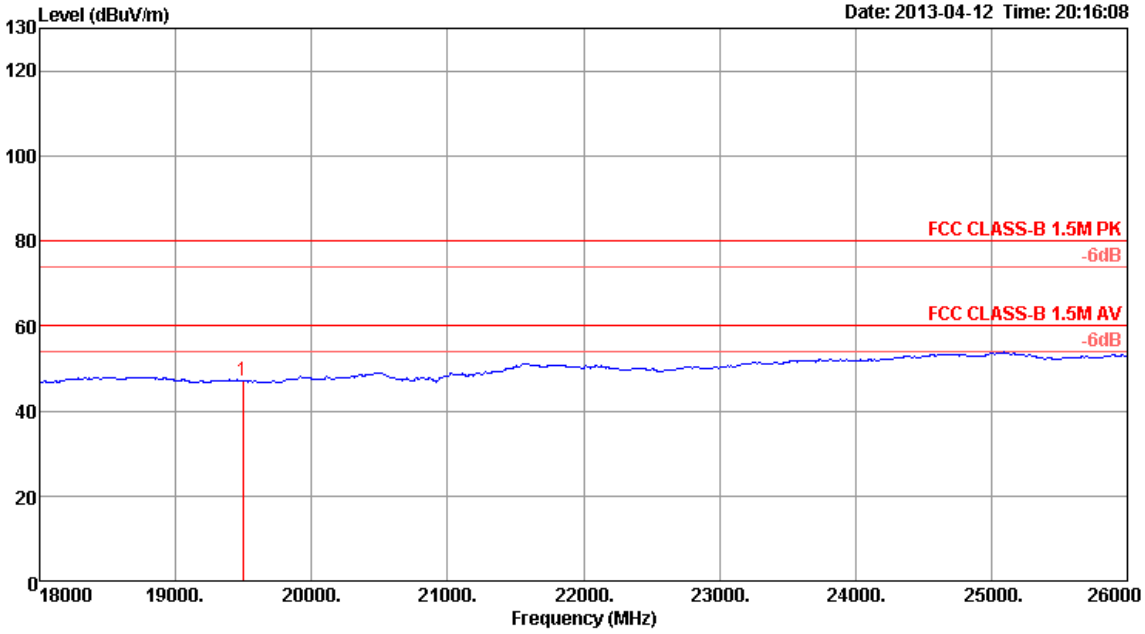
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Average		
Test Freq. (MHZ)	2437	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2438.88	82.53	54.00	28.53	84.96	4.38	28.18	34.99	Average	100	195	HORIZONTAL
2	4874.44	35.43	54.00	-18.57	30.84	6.31	33.48	35.20	Average	100	195	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

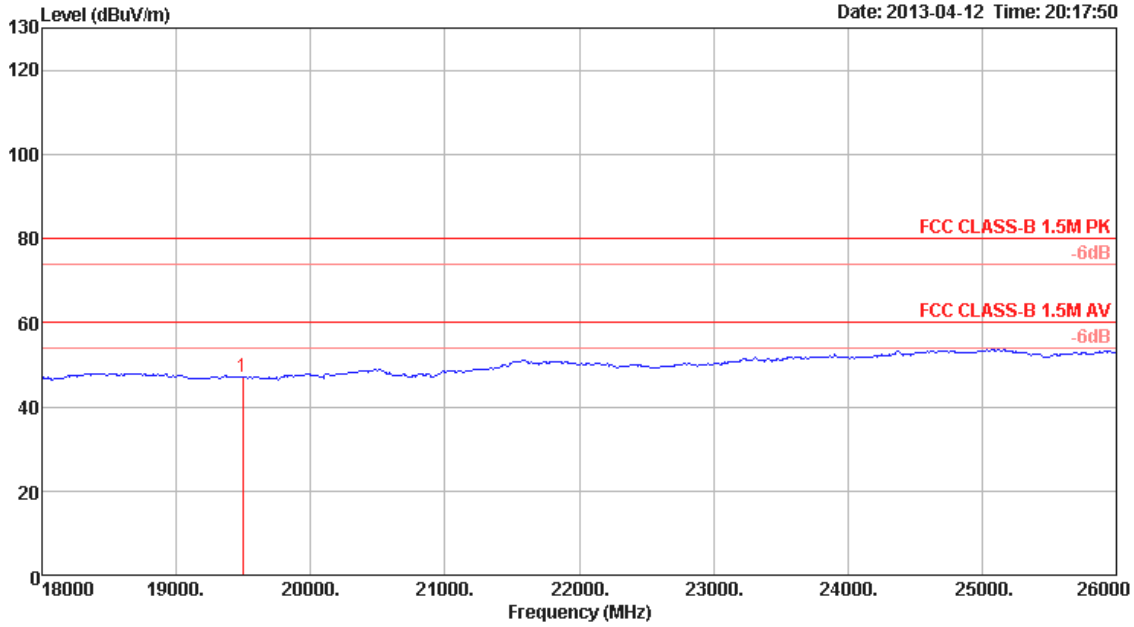
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Average		
Test Freq. (MHZ)	2437	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19496.00	47.21	60.00	-12.79	31.49	13.82	37.20	35.30	Average	100	354	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

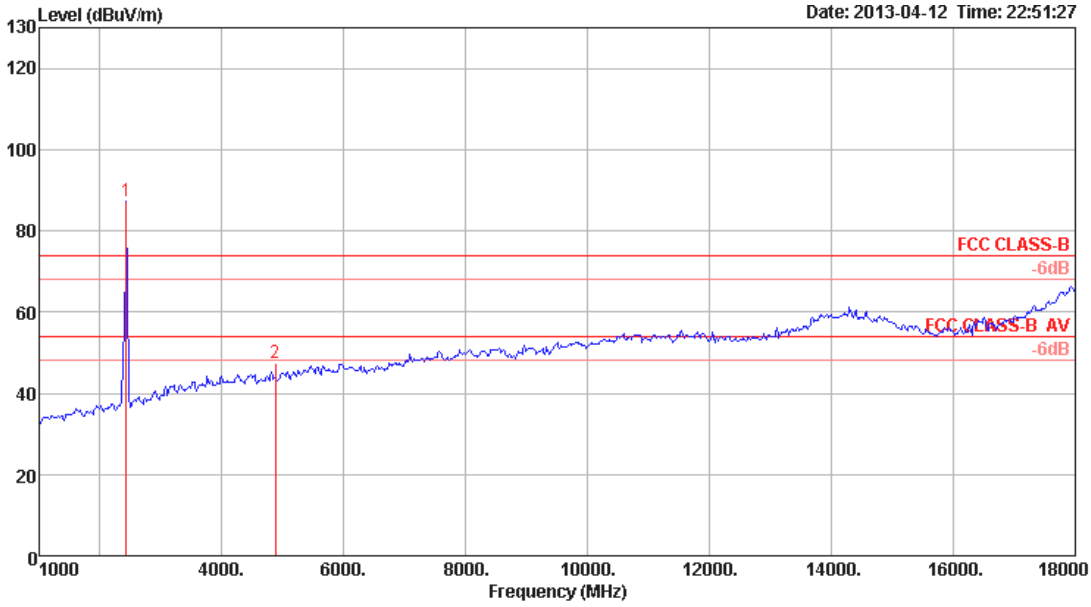
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Average		
Test Freq. (MHZ)	2437	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19496.00	47.20	60.00	-12.80	31.48	13.82	37.20	35.30	Average	100	230	HORIZONTAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

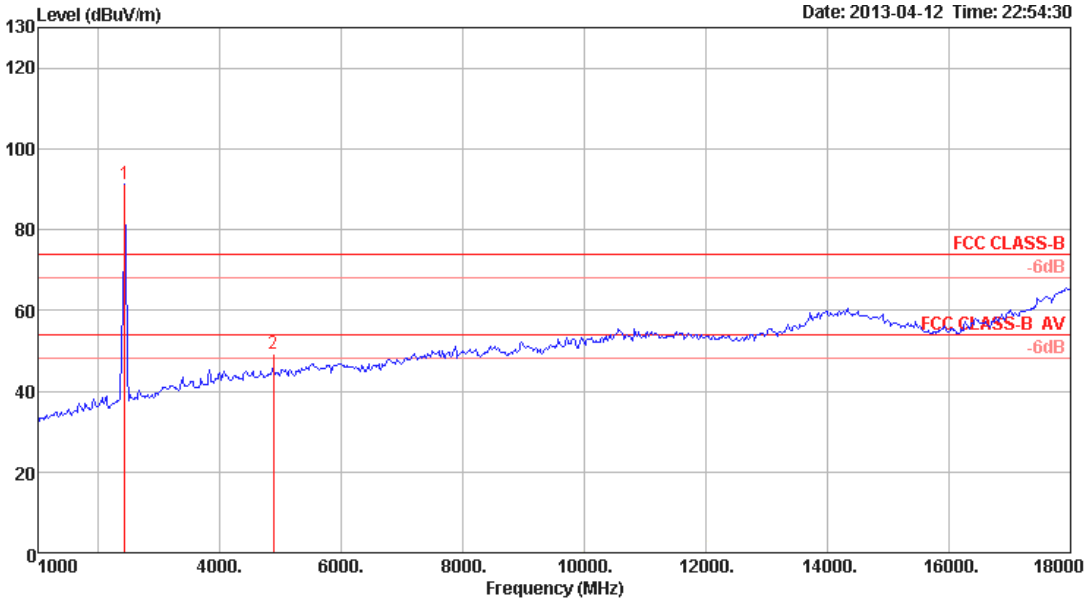
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Peak		
Test Freq. (MHZ)	2437	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2428.00	87.34	74.00	13.34	89.83	4.36	28.13	34.98	Peak	100	322	VERTICAL
2	4874.96	47.36	74.00	-26.64	42.77	6.31	33.48	35.20	Peak	100	239	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

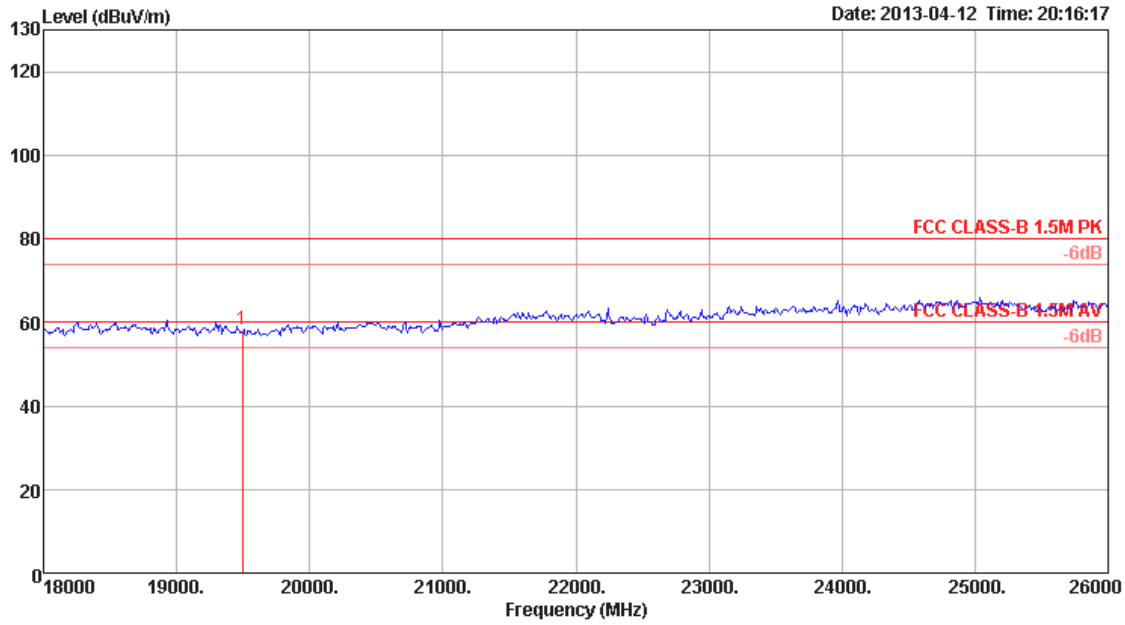
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Peak		
Test Freq. (MHZ)	2437	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2428.00	91.15	74.00	17.15	93.64	4.36	28.13	34.98	Peak	100	195	HORIZONTAL
2	4872.62	49.33	74.00	-24.67	44.74	6.31	33.48	35.20	Peak	100	195	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

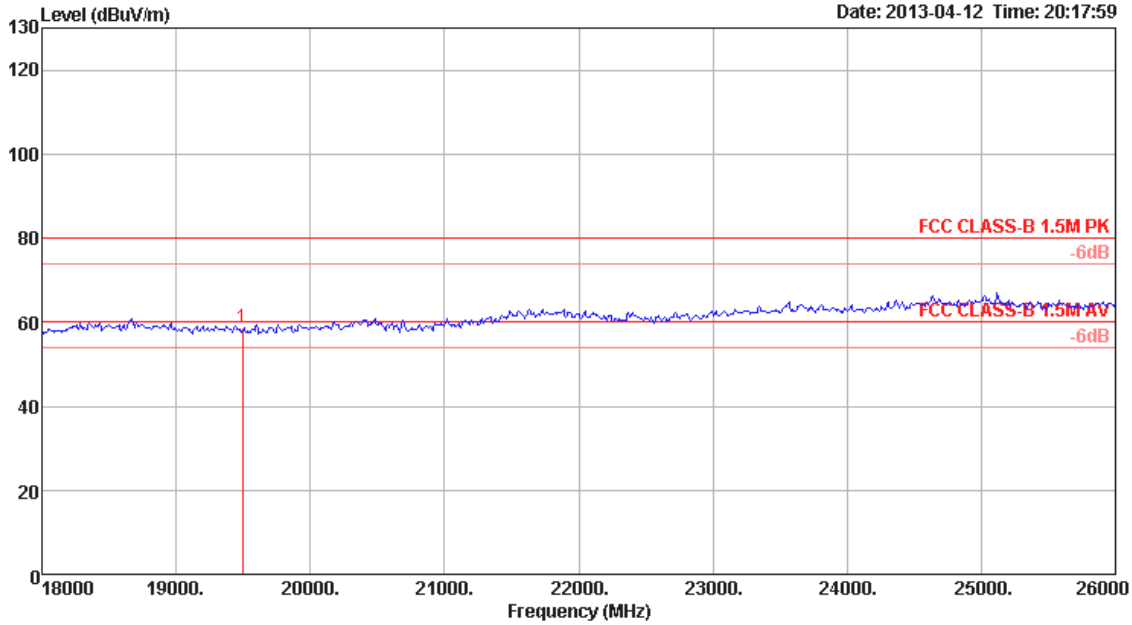
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Peak		
Test Freq. (MHZ)	2437	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19496.00	58.27	80.00	-21.73	42.55	13.82	37.20	35.30	Peak	100	354	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

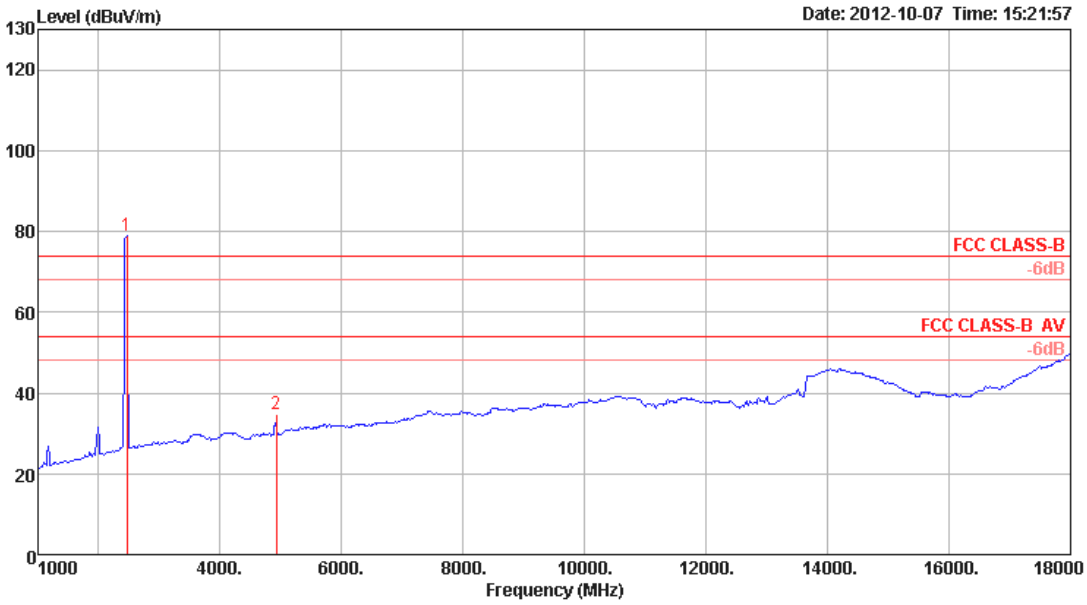
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Non HT-20, Beam Forming - Peak		
Test Freq. (MHZ)	2437	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19496.00	58.79	80.00	-21.21	43.07	13.82	37.20	35.30	Peak	100	230	HORIZONTAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

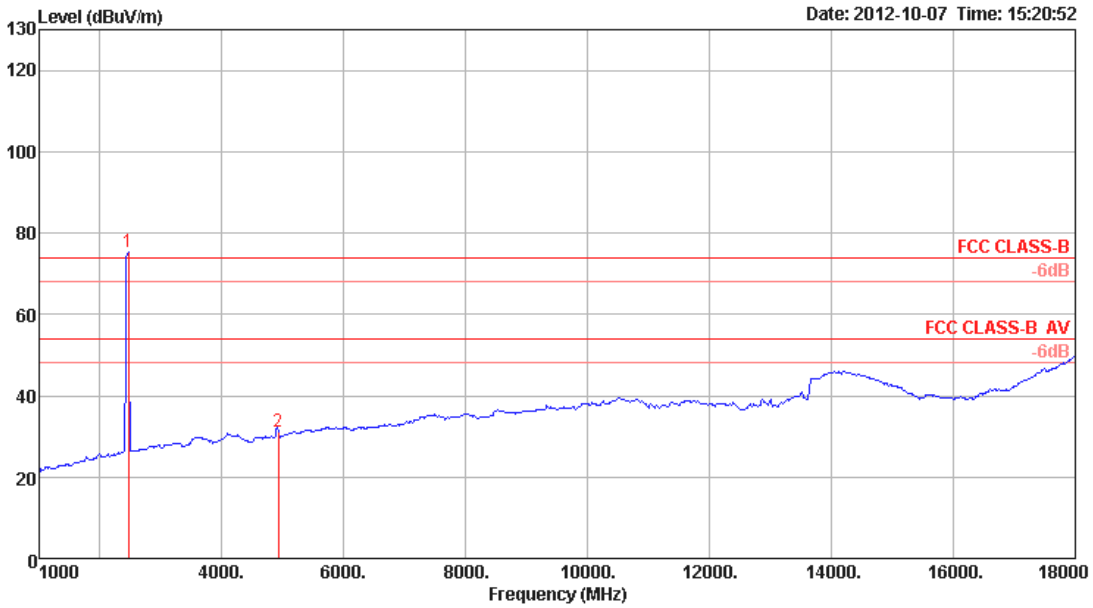
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2462	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2462.00	79.09	54.00	25.09	81.48	4.38	28.22	34.99	Average	100	0	VERTICAL
2	4923.94	34.81	54.00	-19.19	30.08	6.35	33.58	35.20	Average	100	269	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

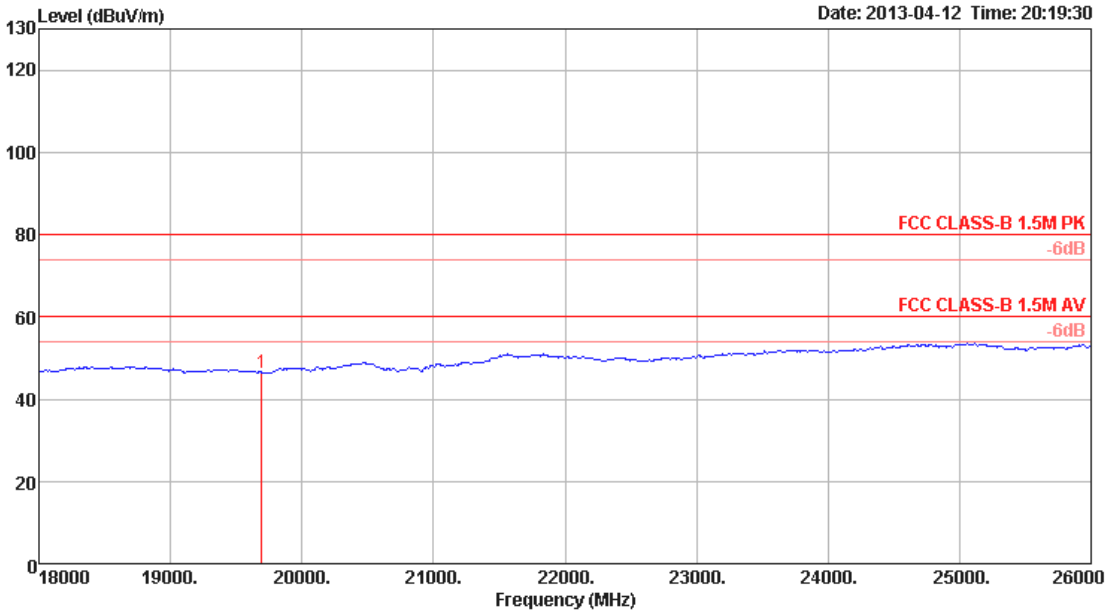
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2462	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2462.00	75.25	54.00	21.25	77.64	4.38	28.22	34.99	Average	100	360	HORIZONTAL
2	4924.01	31.00	54.00	-23.00	26.27	6.35	33.58	35.20	Average	101	328	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

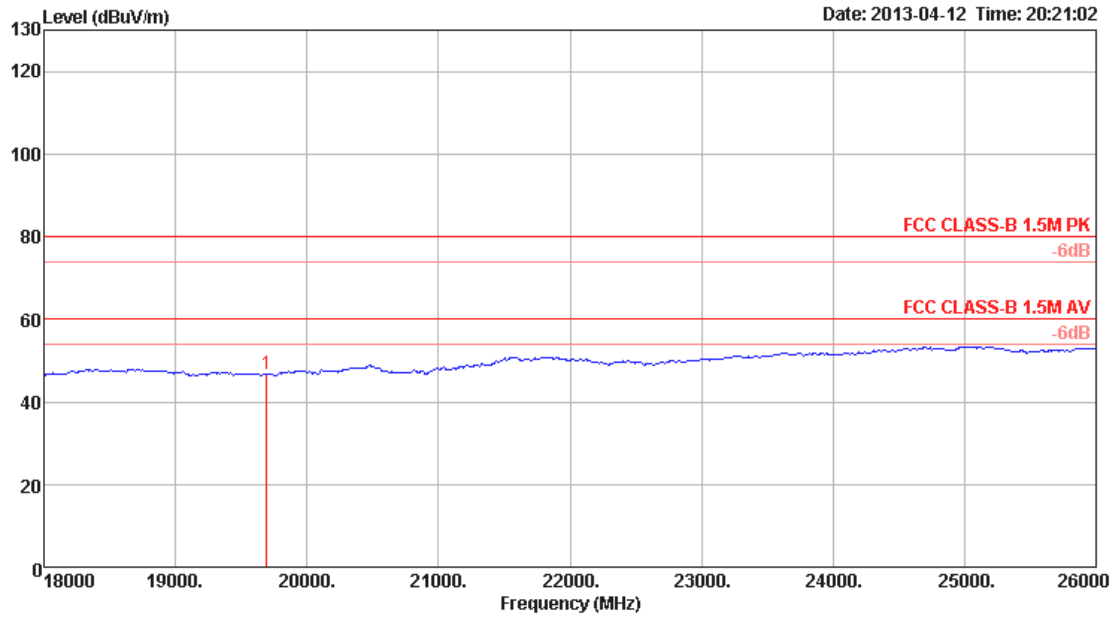
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2462	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19696.00	46.50	60.00	-13.50	30.97	13.80	37.20	35.47	Average	100	160	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

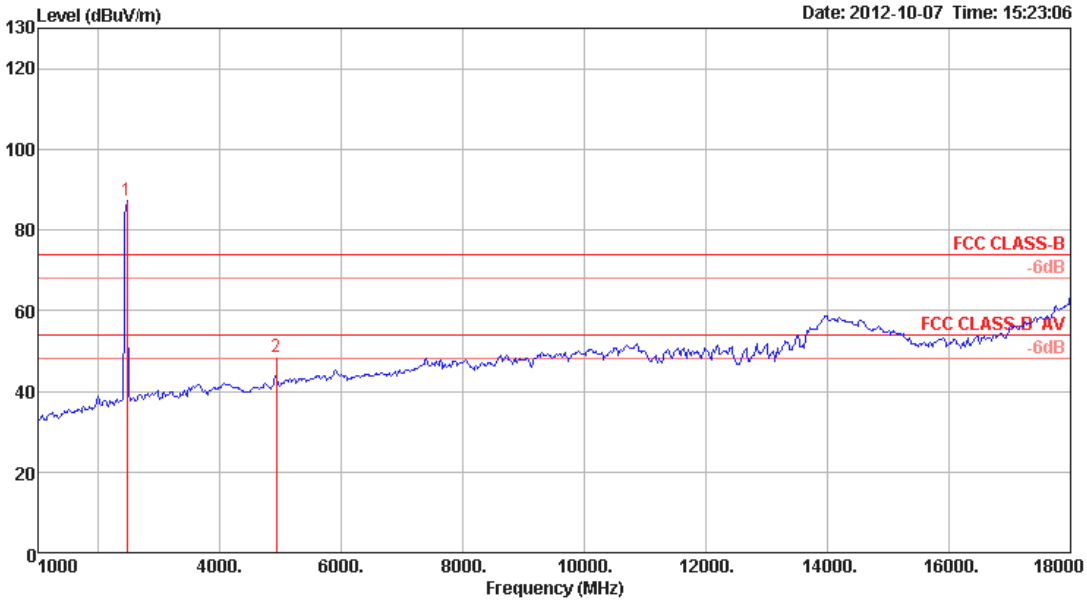
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Average		
Test Freq. (MHZ)	2462	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19696.00	46.60	60.00	-13.40	31.07	13.80	37.20	35.47	Average	100	295	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

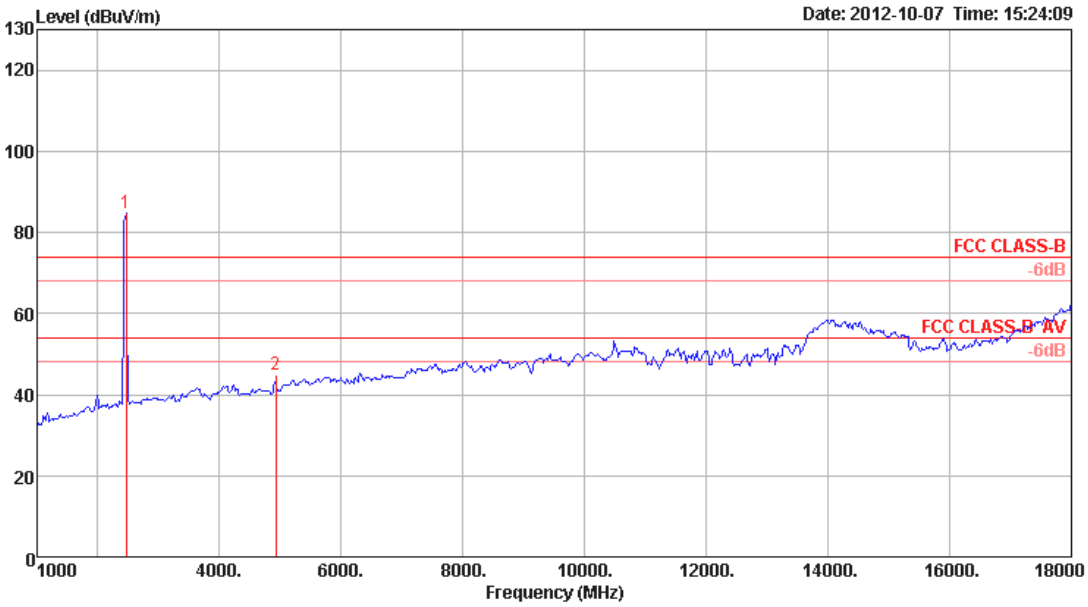
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2462	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2462.00	87.17	74.00	13.17	89.56	4.38	28.22	34.99	Peak	100	360	VERTICAL
2	4923.85	48.59	74.00	-25.41	43.86	6.35	33.58	35.20	Peak	100	269	VERTICAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

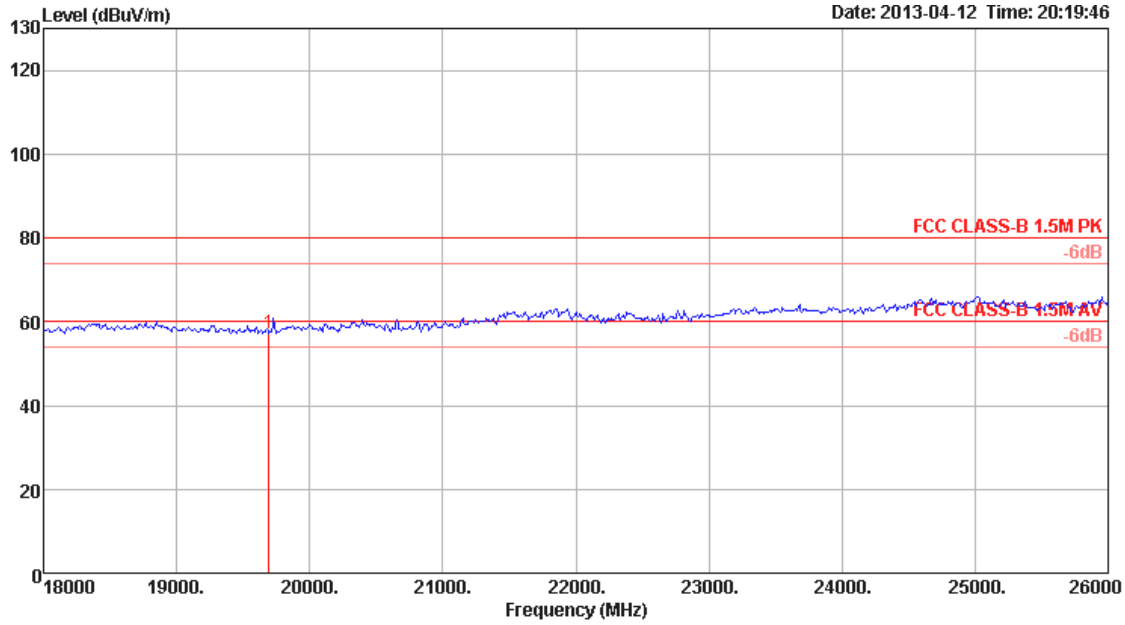
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2462	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	2462.00	84.84	74.00	10.84	87.23	4.38	28.22	34.99	Peak	100	0	HORIZONTAL
2	4923.74	44.92	74.00	-29.08	40.19	6.35	33.58	35.20	Peak	101	328	HORIZONTAL

Note 1: ">20dB" means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: "N/F" means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

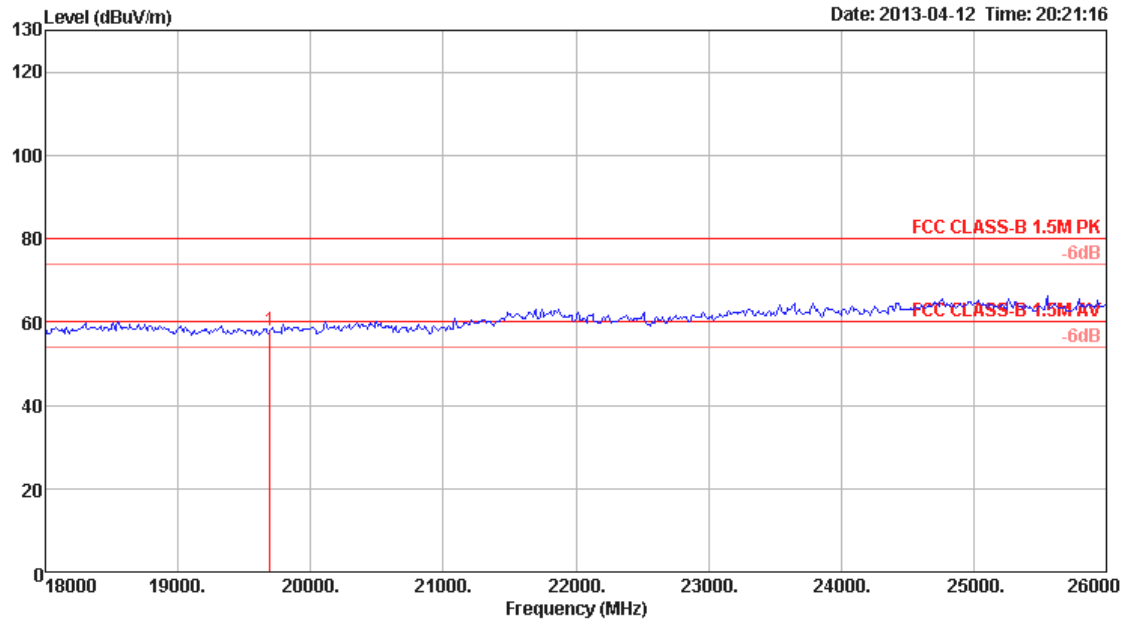
Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2462	**Polarization**	Vertical



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19696.00	57.16	80.00	-22.84	41.63	13.80	37.20	35.47	Peak	100	160	VERTICAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

Transmitter Radiated Unwanted Emissions (Above 1GHz)			
Operating Mode	Legacy CCK - Peak		
Test Freq. (MHZ)	2462	**Polarization**	Horizontal



	Freq	Level	Limit Line	Over Limit	Read Level	Cable Loss	Antenna Factor	Preamp Factor	Remark	A/Pos	T/Pos	Pol/Phase
	MHz	dBuV/m	dBuV/m	dB	dBuV	dB	dB/m	dB		cm	deg	
1	19696.00	57.82	80.00	-22.18	42.29	13.80	37.20	35.47	Peak	100	295	HORIZONTAL

Note 1: “>20dB” means spurious emission levels that exceed the level of 20 dB below the applicable limit.
Note 2: “N/F” means Nothing Found spurious emissions (No spurious emissions were detected.)
Note 3: Measurement receive antenna polarization: H (Horizontal), V (Vertical)
Note 4: For restricted bands, the peak measurement is fully sufficient, as the max field strength as measured with the Peak-Detector meets the AV-Limit so that the AV level does not need to be reported in addition.

4 Test Equipment and Calibration Data

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Remark
EMI Test Receiver	R&S	ESCS 30	100377	9kHz ~ 2.75GHz	Oct. 23, 2012	Conduction (CO01-CB)
LISN	F.C.C.	FCC-LISN-50-16-2	04083	150kHz ~ 100MHz	Nov. 14, 2011	Conduction (CO01-CB)
V- LISN	Schwarzbeck	NSLK 8127	8127-478	9K ~ 30MHz	Jun. 22, 2012	Conduction (CO01-CB)
PULSE LIMITER	R&S	ESH3-Z2	100430	9K~30MHz	Feb. 03, 2012	Conduction (CO01-CB)
Signal analyzer	R&S	FSV40	100979	9KHz~40GHz	Oct. 08, 2012	Conducted (TH01-CB)
Temp. and Humidity Chamber	Ten Billion	TTH-D3SP	TBN-931011	-30~100 degree	Jun. 05, 2012	Conducted (TH01-CB)
RF Power Divider	HP	11636A	00306	2GHz ~ 18GHz	N.C.R	Conducted (TH01-CB)
RF Power Splitter	Anaren	44100	1839	2GHz ~ 18GHz	N.C.R	Conducted (TH01-CB)
RF Power Splitter	Anaren	42100	17930	2GHz ~ 18GHz	N.C.R	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-7	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-8	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-9	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-10	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 17, 2011	Conducted (TH01-CB)
RF Cable-high	Woken	High Cable-11	-	1 GHz – 26.5 GHz	Nov. 19, 2012	Conducted (TH01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 11, 2012	Radiation (03CH01-CB)
BILOG ANTENNA	Schaffner	CBL6112D	22021	20MHz ~ 2GHz	Jan. 10, 2013	Radiation (03CH01-CB)
Horn Antenna	EMCO	3115	00075790	750MHz~18GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Horn Antenna	SCHWARZBEAK	BBHA 9170	BBHA9170252	15GHz ~ 40GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8447D	2944A10991	0.1MHz ~ 1.3GHz	Nov. 27, 2012	Radiation (03CH01-CB)
Pre-Amplifier	Agilent	8449B	3008A02310	1GHz ~ 26.5GHz	Nov. 23, 2012	Radiation (03CH01-CB)
Pre-Amplifier	WM	TF-130N-R1	923365	26.5GHz ~ 40GHz	Jul. 31, 2012	Radiation (03CH01-CB)

Instrument	Manufacturer	Model No.	Serial No.	Spec.	Calibration Date	Remark
Spectrum analyzer	R&S	FSP40	100056	9KHz~40GHz	Nov. 02, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 20, 2012	Radiation (03CH01-CB)
EMI Test Receiver	R&S	ESCS 30	100355	9KHz ~ 2.75GHz	Mar. 19, 2013	Radiation (03CH01-CB)
Loop Antenna	Teseq	HLA 6120	24155	9 kHz - 30 MHz	Oct. 29, 2012	Radiation (03CH01-CB)
Turn Table	INN CO	CO 2000	N/A	0 ~ 360 degree	N.C.R	Radiation (03CH01-CB)
Antenna Mast	INN CO	CO2000	N/A	1 m - 4 m	N.C.R	Radiation (03CH01-CB)
RF Cable-low	Woken	Low Cable-1	N/A	30 MHz - 1 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-1	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-2	N/A	1 GHz – 26.5 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-3	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)
RF Cable-high	Woken	High Cable-4	N/A	1 GHz - 40 GHz	Nov. 18, 2012	Radiation (03CH01-CB)

Note: Calibration Interval of instruments listed above is one year.
N.C.R. means Non-Calibration required.