EMC
TEST REPORT

Report No.: **TS13070032-EME**
Model No.: **K110**
Issued Date: **Jul. 25, 2013**

Applicant: **Kobo Inc**
135 Liberty Street, Suite 101, Toronto, Ontario, M6K1A7 Canada

Test Method / Standard: **CFR 47 FCC Part 15.247 & ANSI C63.4 2003**

Test By: **Intertek Testing Services Taiwan Ltd.**
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1. Summary of Test Data

Test/Requirement Description	Applicable Rule	Result
- 6dB Bandwidth	15.247(a)(2)	Pass
Maximum Output Power	15.247(b)	Pass
Power Spectral Density	15.247(e)	Pass
RF Antenna Conducted Spurious	15.247(d)	Pass
Radiated Spurious Emission	15.247(d), 15.205, 15.209	Pass
Emission on the Band Edge	15.247(d)	Pass
AC Power Line Conducted Emission	15.207	Pass

2. General Information

Identification of the EUT

Product:	Tablet
Model No.:	K110
FCC ID.:	ZJLKOBOK110
Frequency Range:	1. 2412 MHz ~ 2462 MHz for 802.11b, 802.11g, 802.11n HT20 2. 2422 MHz ~ 2452 MHz for 802.11n HT40
Channel Number:	1. 11 channels for 2412 MHz ~ 2462 MHz 2. 7 channels for 2422 MHz ~ 2452 MHz
Frequency of Each Channel:	1. 2412+5 k, k＝0~10 for 802.11b, 802.11g, 802.11n HT20 2. 2422+5 k, k＝0~6 for 802.11n HT40
Type of Modulation:	DSSS, OFDM
Rated Power:	1. DC 5.35 V from adapter 2. DC 3.7 V from battery
Power Cord:	N/A
Data Cable:	USB shielded cable 1 meter × 1
Sample Received:	Jun. 03, 2013
Test Date(s):	Jun. 08, 2013~Jul. 23, 2013
Note 1:	This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.
Note 2:	When determining the test conclusion, the Measurement Uncertainty of test has been considered.

Description of EUT

The EUT is Tablet, and was defined as information technology equipment.

For more detail features, please refer to User's manual as file name “Installation guide.pdf”

Adapter information

The EUT will be supplied with a power supply from below list:

No.	Brand	Model no.	Specification
Adapter	kobo	PSAI10R-050Q	I/P: 100-240V~, 0.3A, 50-60Hz O/P: 5.35V, 2.0A

Antenna description

1. Chain 0: AUX Antenna

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 3.24dBi
Antenna Type : PIFA Antenna
Connector Type : I-PEX

2. Chain 1: Main Antenna

The antenna is affixed to the EUT using a unique connector, which allows for replacement of a broken antenna, but DOES NOT use a standard antenna jack or electrical connector.

Antenna Gain : 2.85dBi
Antenna Type : PIFA Antenna
Connector Type : I-PEX

Operation mode

The EUT is supplied with DC 3.7 V from battery for all test items except for conducted emission test.

The EUT is supplied with DC 5.35 V from adapter (Test voltage: 120VAC, 60Hz) for conducted emission test.

The EUT executes test by “MS-DOS” and key-in commands provided by Wistron.

The signal is maximized through rotation and placement in the three orthogonal axes (The EUT configuration refers to the “Spurious set-up photo.pdf”).
After verifying three axes, we found the maximum electromagnetic field was occurred at X axis. The final test data was executed under this configuration.

With individual verifying, the maximum output power was found out 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT 20 mode and 13.5 Mbps data rate for 802.11n HT 40 mode.

The final tests were executed under these conditions recorded in this report individually.

Please refer the details below:

Chain 0: 802.11b channel 6	
Data rate (Mbps)	PK(dBm)
1	18.61
2	18.59
5.5	18.57
11	18.45

Chain 1: 802.11b channel 6	
Data rate (Mbps)	PK(dBm)
1	18.65
2	18.61
5.5	18.58
11	18.49

Chain 0: 802.11g channel 6	
Data rate (Mbps)	PK(dBm)
6	19.89
9	19.8
12	19.78
18	19.69
24	19.65
36	19.67
48	19.5
54	19.52

Chain 1: 802.11g channel 6	
Data rate (Mbps)	PK(dBm)
6	19.93
9	19.88
12	19.79
18	19.59
24	19.68
36	19.68
48	19.52
54	19.69

Chain 0+1: 802.11n HT20 channel 6	
Data rate (Mbps)	PK(dBm)
6.5	19.24
13	19.2
19.5	19.18
26	19.15
39	19.11
52	19.1
58.5	19.09
65	19.08

Chain 0+1: 802.11n HT40 channel 6	
Data rate (Mbps)	PK(dBm)
13.5	19.24
27	19.25
40.5	19.11
54	19.19
81	19.13
108	19.17
121.5	19.09
135	19.01

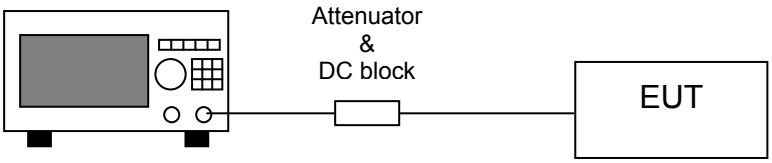
3. - 6dB Bandwidth

Name of Test	- 6dB Bandwidth
Base Standard	FCC 15.247 (a)(2)

Test Result: Complies
Measurement Data: See Table & plots below
Test Date: Jul. 01, 2013

Method of Measurement:
Reference FCC document: KDB558074 D01
Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100kHz, video bandwidth (VBW) ≥ 3 x RBW. In order to make an accurate measurement, set the span greater than DTS channel bandwidth. The - 6dB bandwidth must be greater than 500 kHz.

Test Diagram:



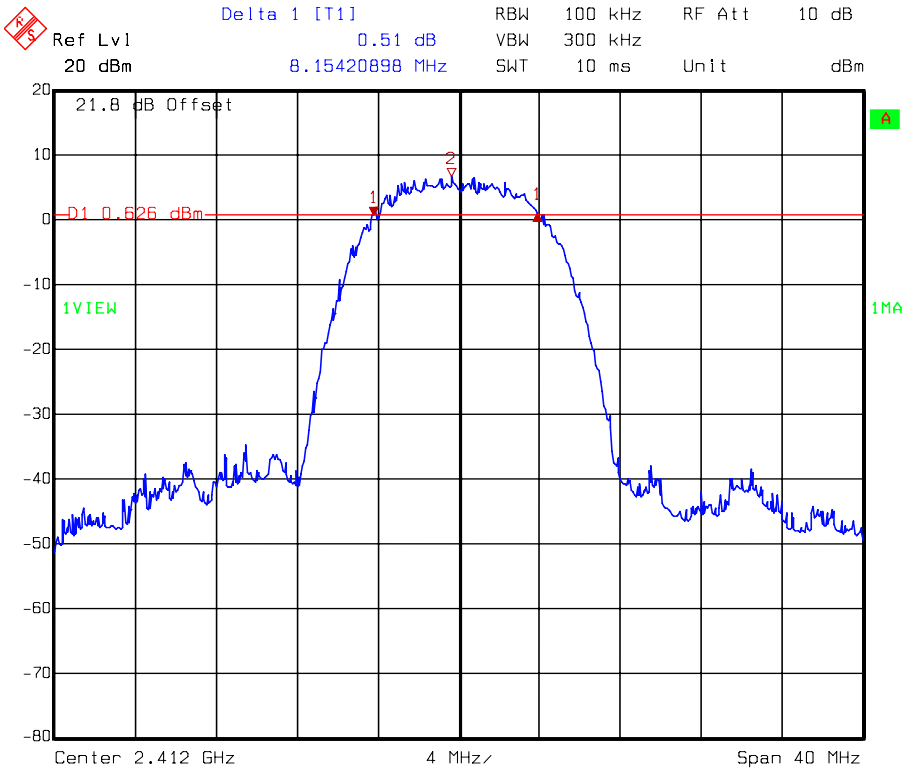
Spectrum Analyzer

Note: The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

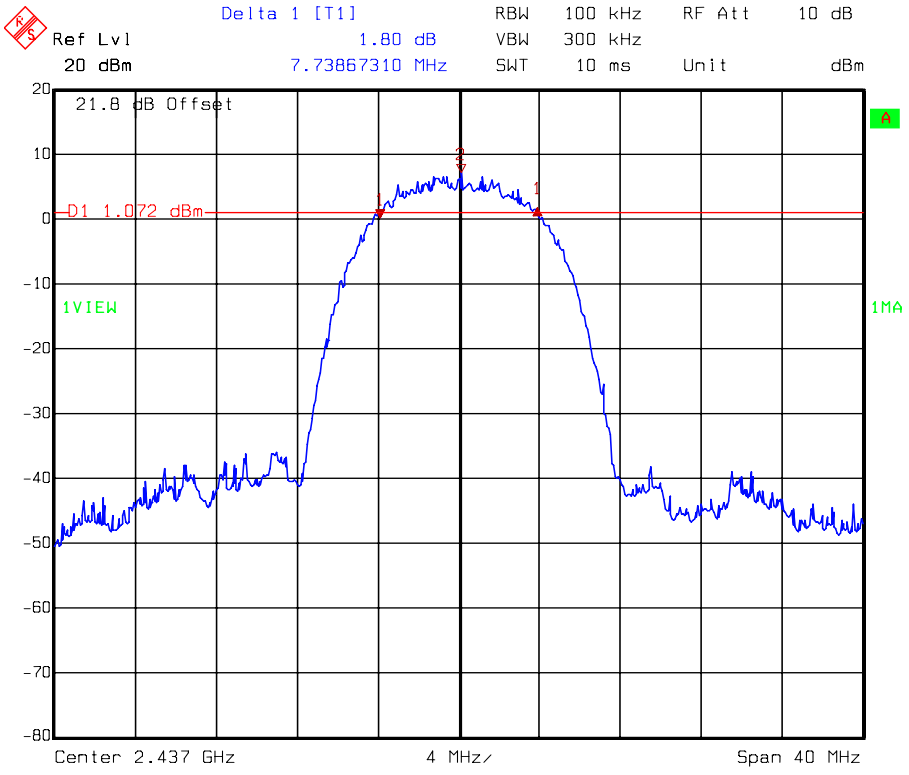
Table: - 6dB Bandwidth

1TX Mode	Channel	Frequency (MHz)	- 6dB Bandwidth (MHz)		Min. Limit (MHz)	Pass/Fail
			Chain 0	Chain 1		
802.11b	1	2412	8.154	8.341	0.5	Pass
	6	2437	7.738	8.328	0.5	Pass
	11	2462	8.64	8.807	0.5	Pass
802.11g	1	2412	15.34	15.575	0.5	Pass
	6	2437	15.77	15.665	0.5	Pass
	11	2462	15.807	15.365	0.5	Pass
2TX Mode	**Channel**	**Frequency (MHz)**	**- 6dB Bandwidth (MHz)**		**Min. Limit (MHz)**	**Pass/Fail**
			Chain 0	**Chain 1**		
802.11n HT20	1	2412	16.619	16.686	0.5	Pass
	6	2437	16.366	16.941	0.5	Pass
	11	2462	16.912	16.656	0.5	Pass
802.11n HT40	3	2422	36.453	36.402	0.5	Pass
	6	2437	36.47	36.44	0.5	Pass
	9	2452	36.461	36.434	0.5	Pass

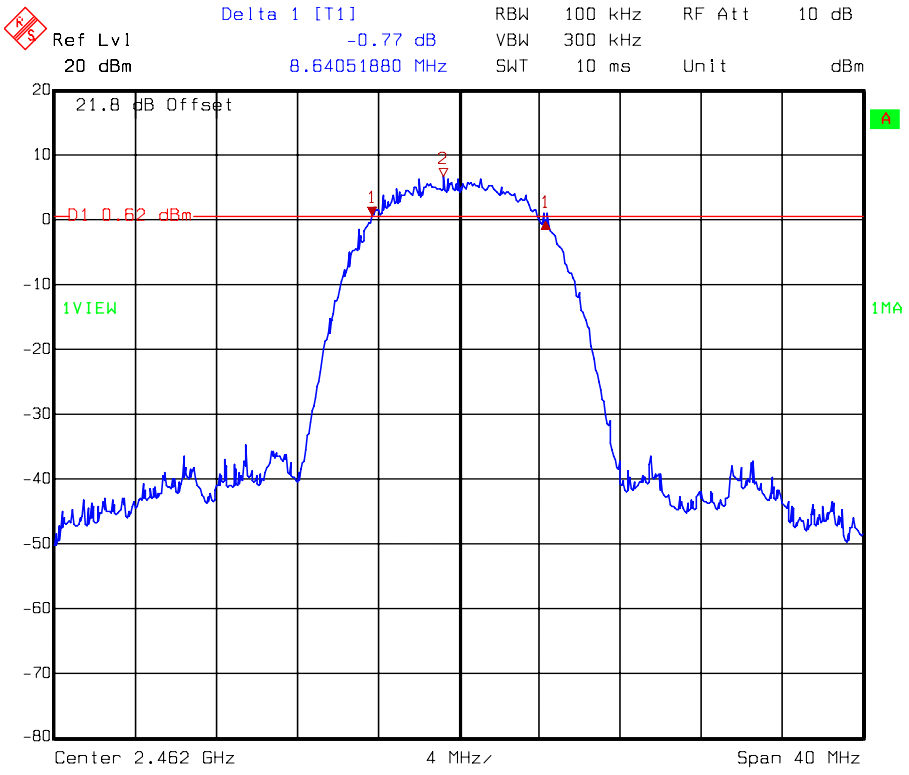
Chain 0: - 6dB Bandwidth @ 802.11b mode Channel 1



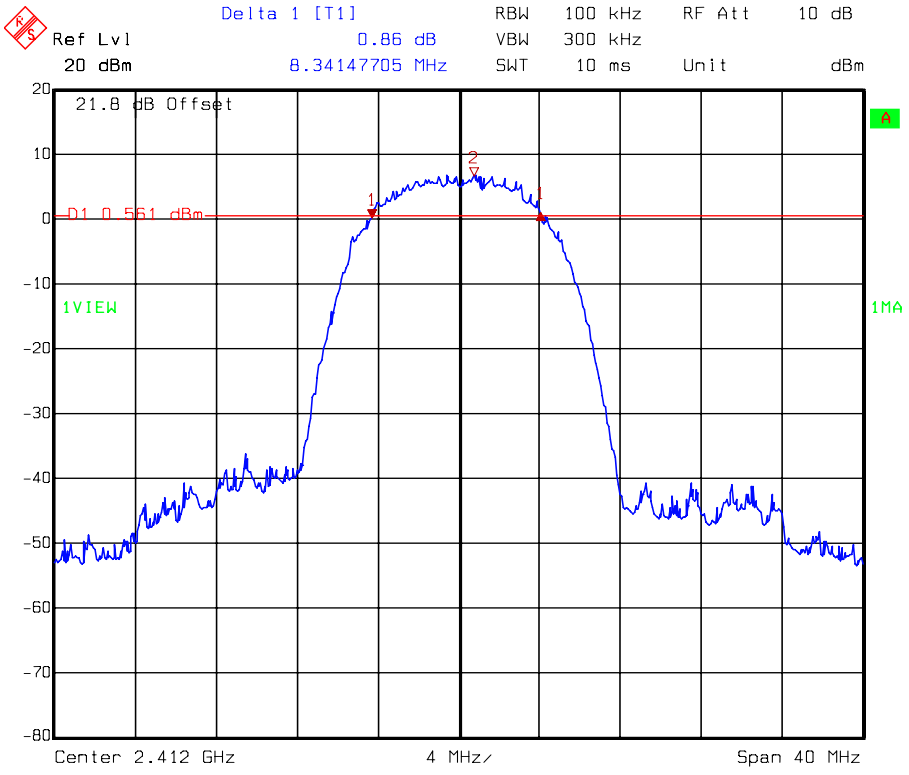
Chain 0: - 6dB Bandwidth @ 802.11b mode Channel 6



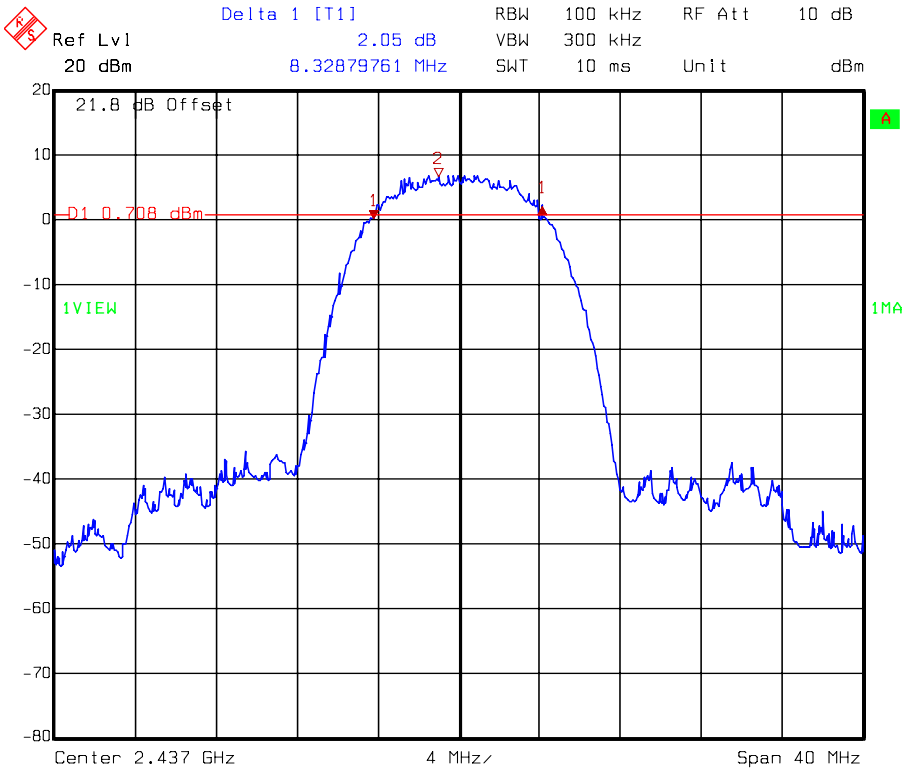
Chain 0: - 6dB Bandwidth @ 802.11b mode Channel 11



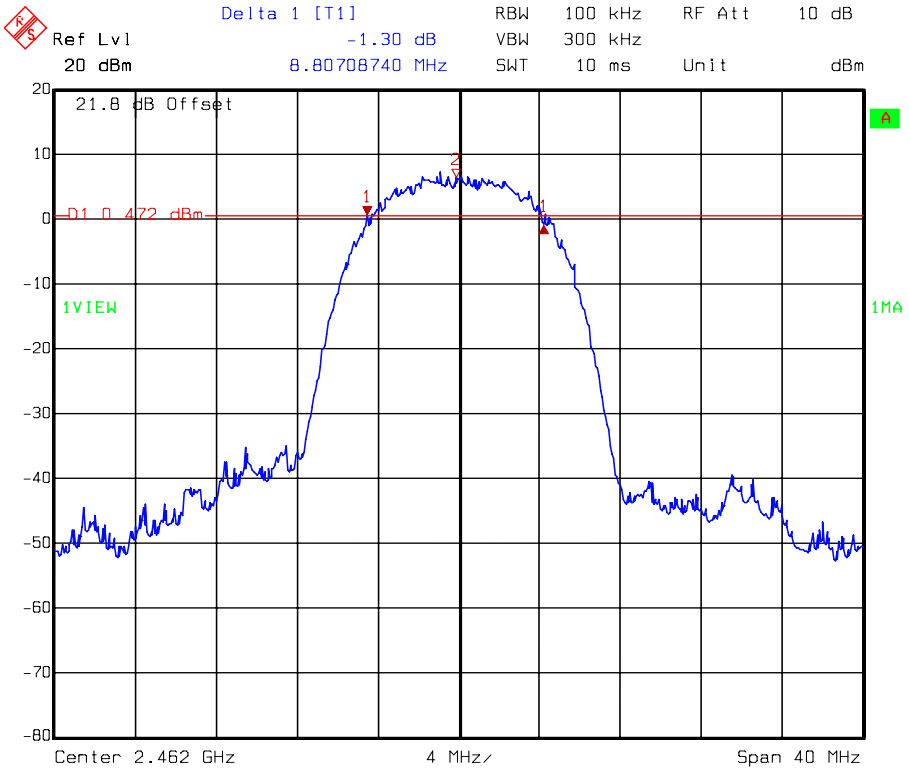
Chain 1: - 6dB Bandwidth @ 802.11b mode Channel 1



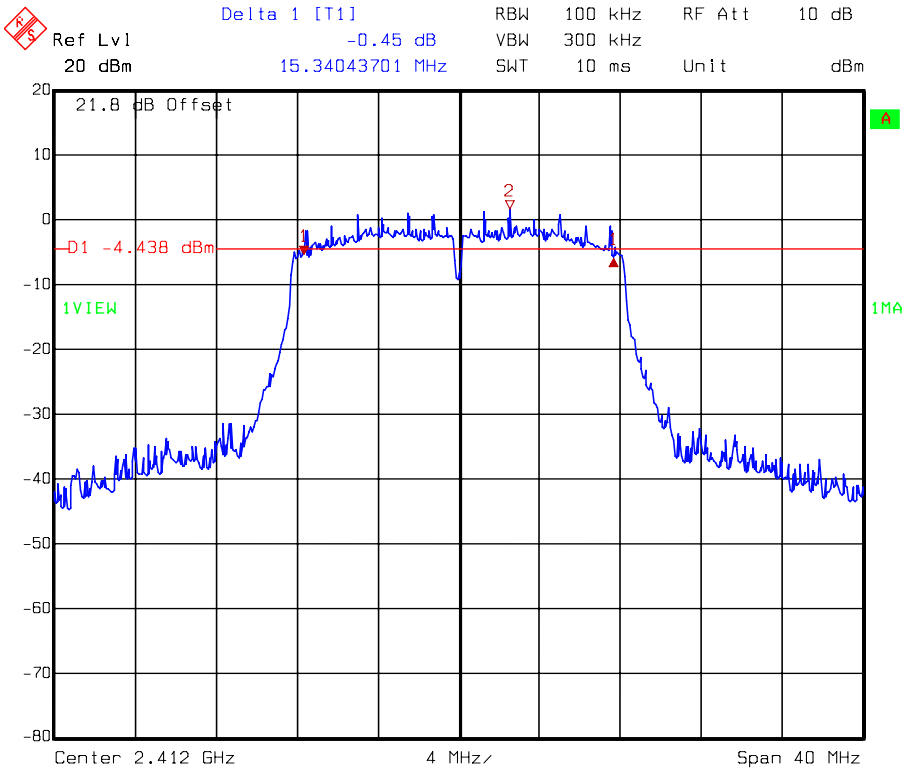
Chain 1: - 6dB Bandwidth @ 802.11b mode Channel 6



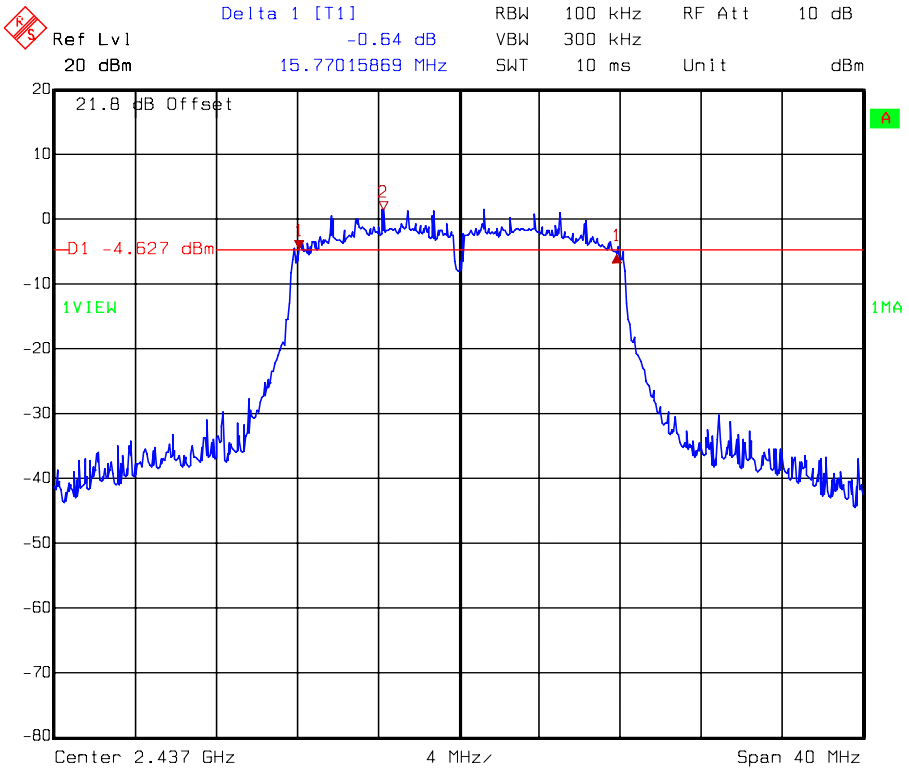
Chain 1: - 6dB Bandwidth @ 802.11b mode Channel 11



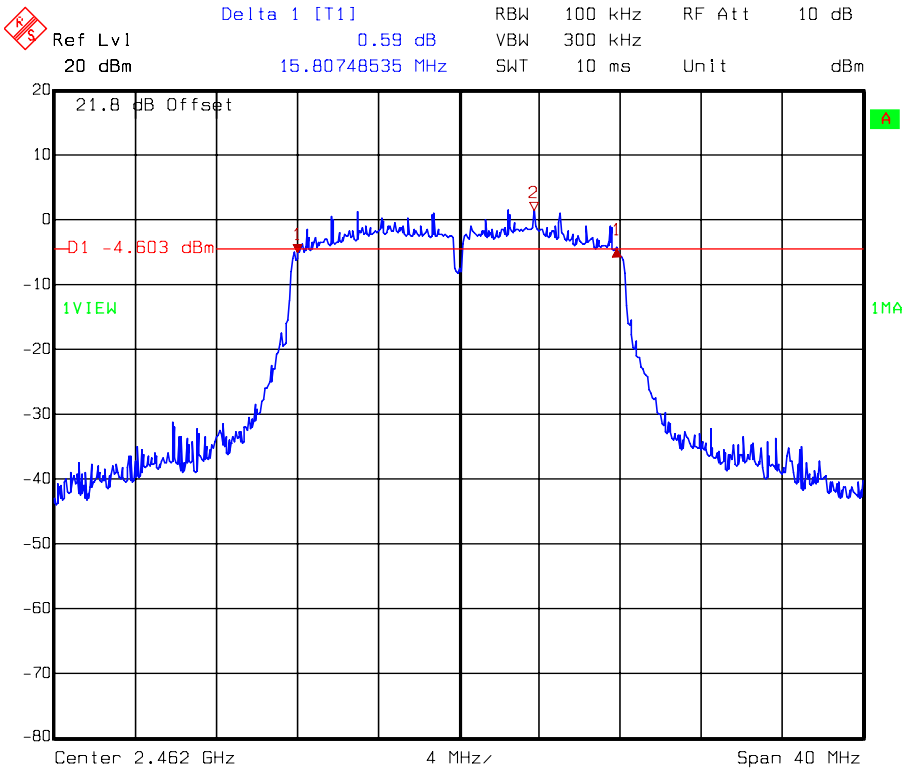
Chain 0: - 6dB Bandwidth @ 802.11g mode Channel 1



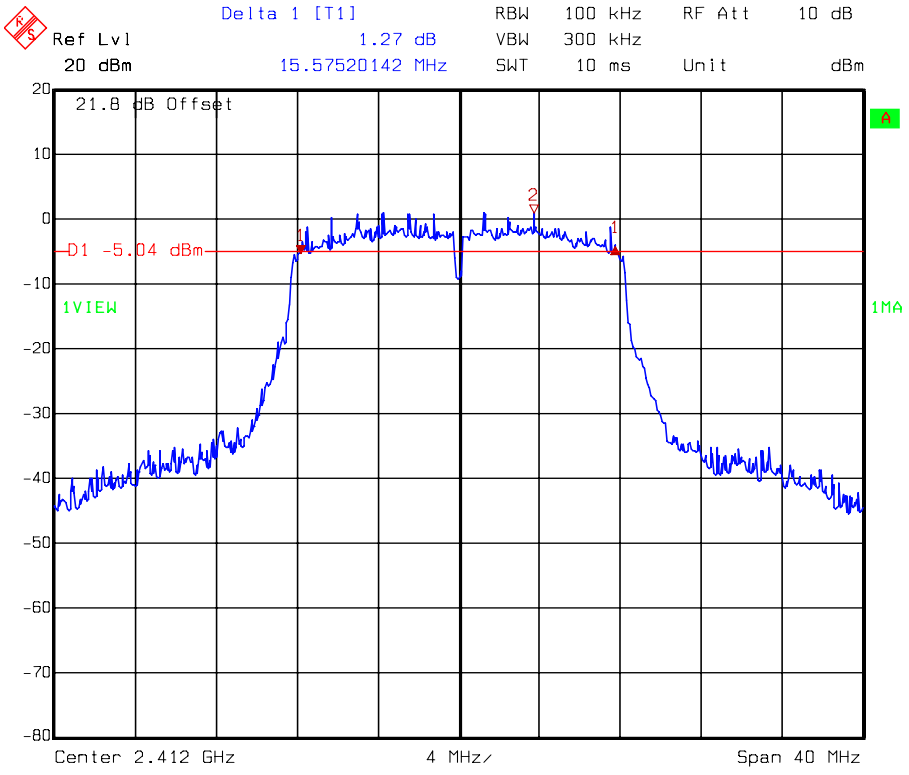
Chain 0: - 6dB Bandwidth @ 802.11g mode Channel 6



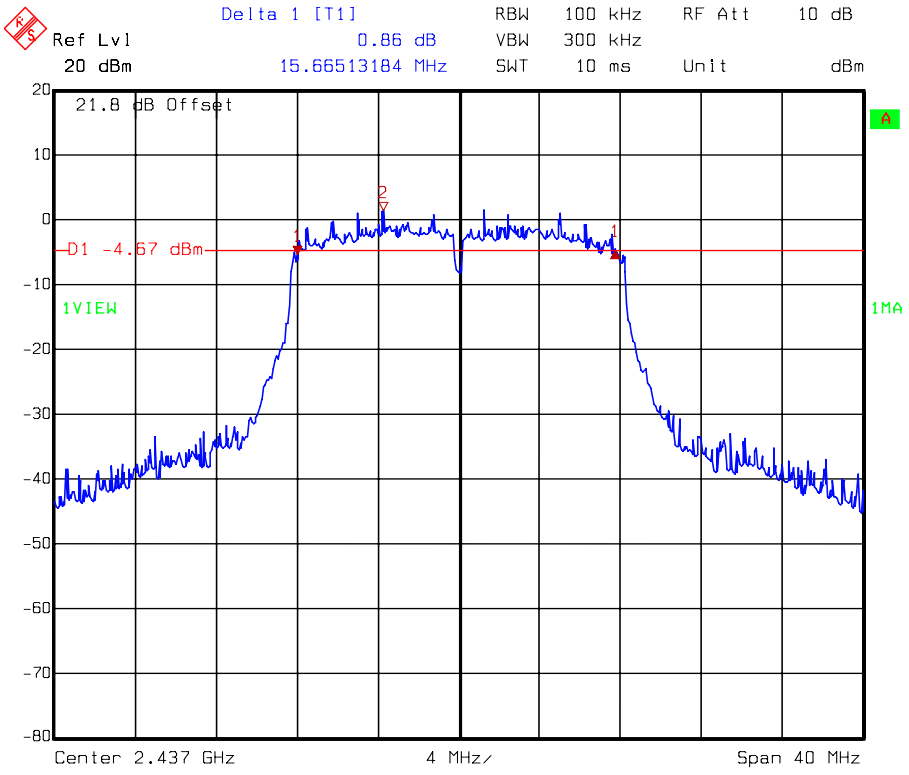
Chain 0: - 6dB Bandwidth @ 802.11g mode Channel 11



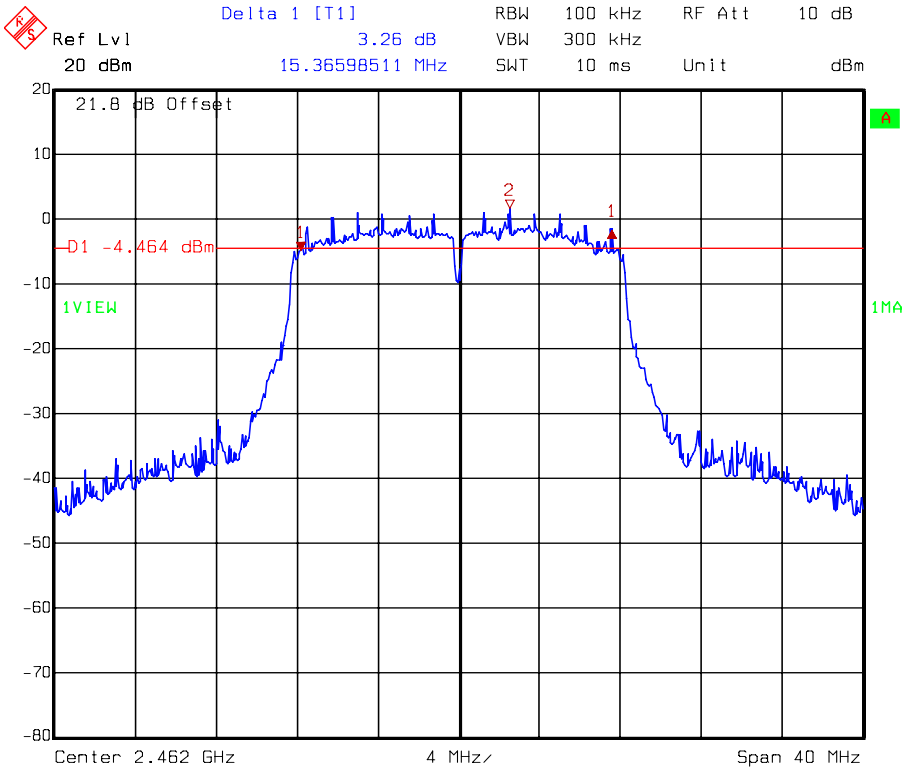
Chain 1: - 6dB Bandwidth @ 802.11g mode Channel 1



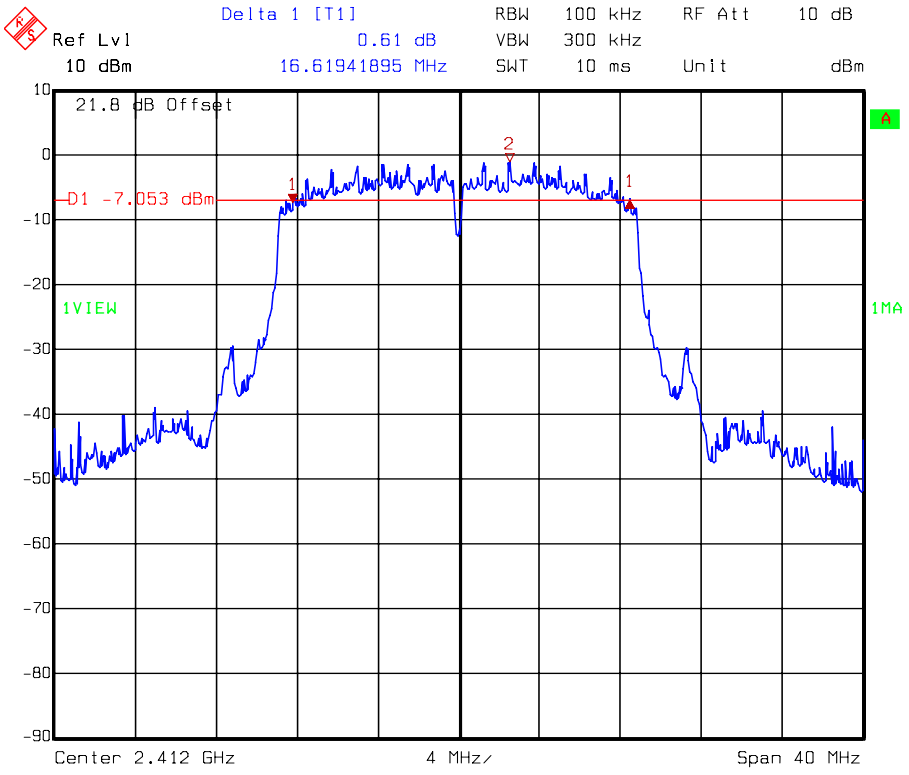
Chain 1: - 6dB Bandwidth @ 802.11g mode Channel 6



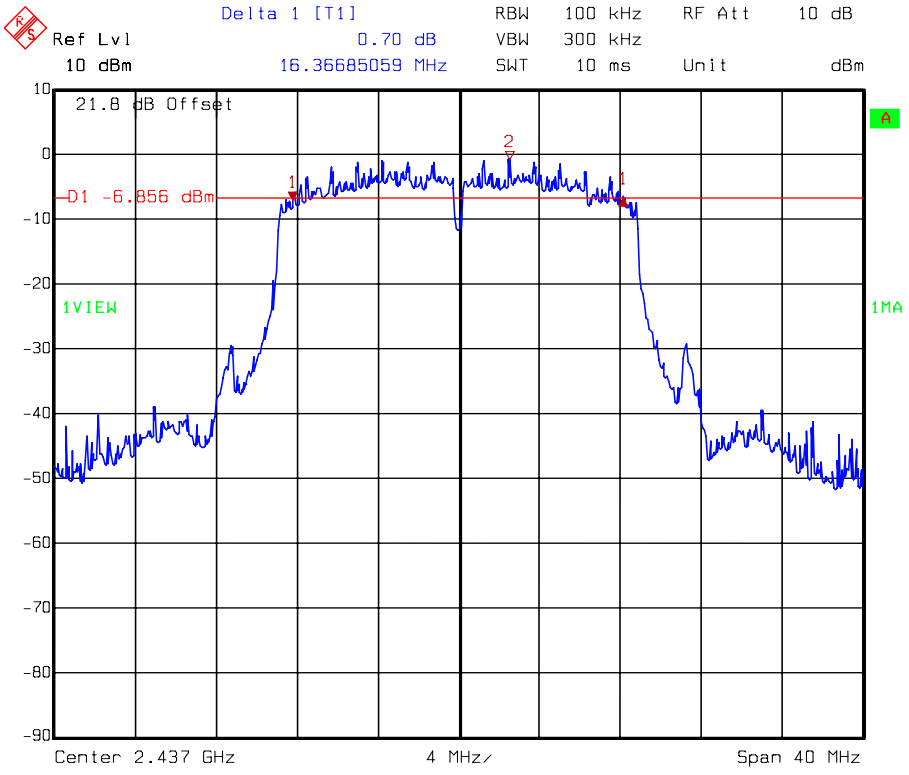
Chain 1: - 6dB Bandwidth @ 802.11g mode Channel 11



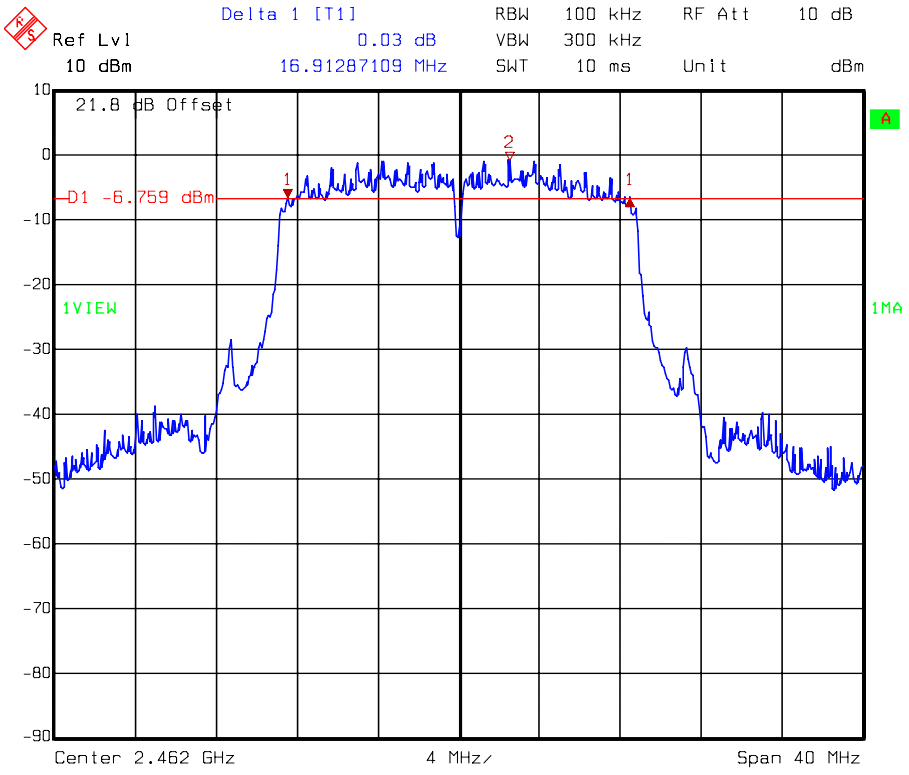
Chain 0: - 6dB Bandwidth @ 802.11n HT20 mode Channel 1



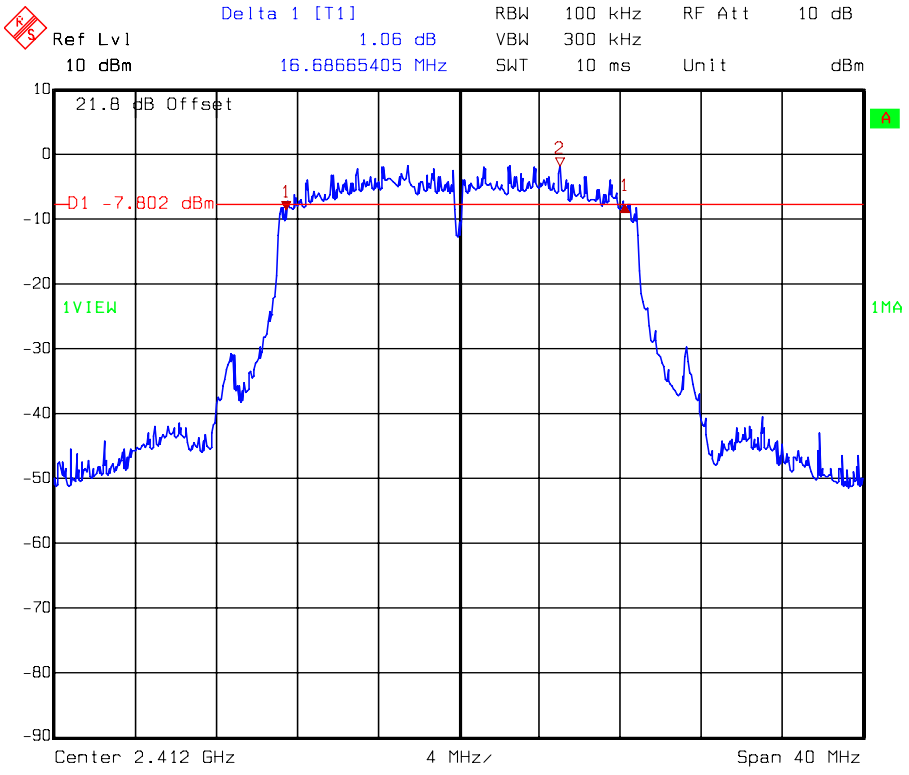
Chain 0: - 6dB Bandwidth @ 802.11n HT20 mode Channel 6



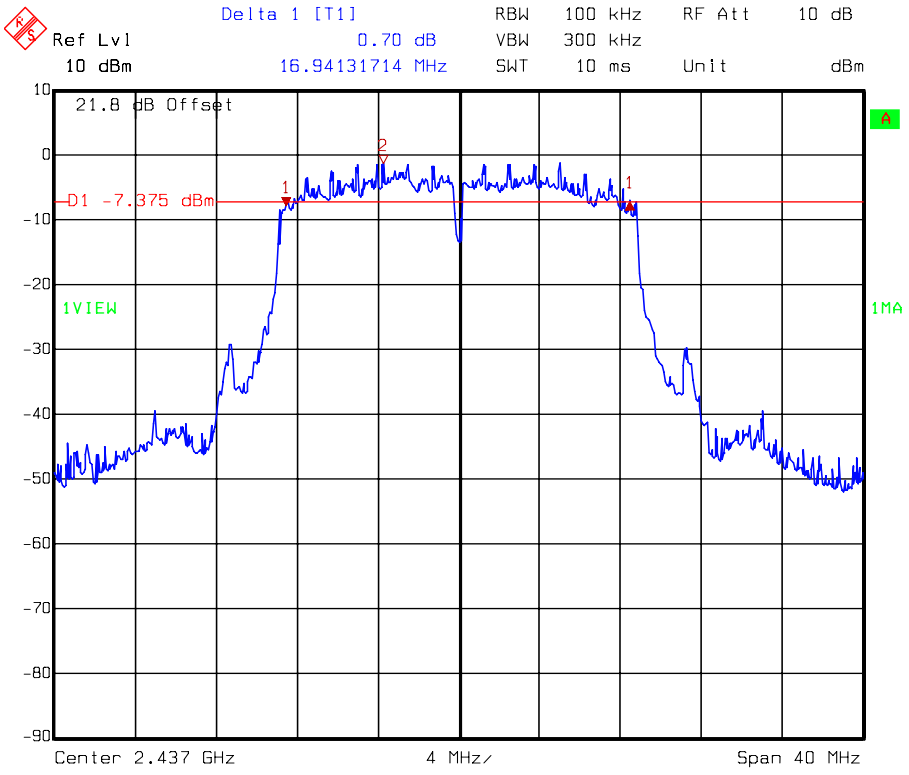
Chain 0: - 6dB Bandwidth @ 802.11n HT20 mode Channel 11



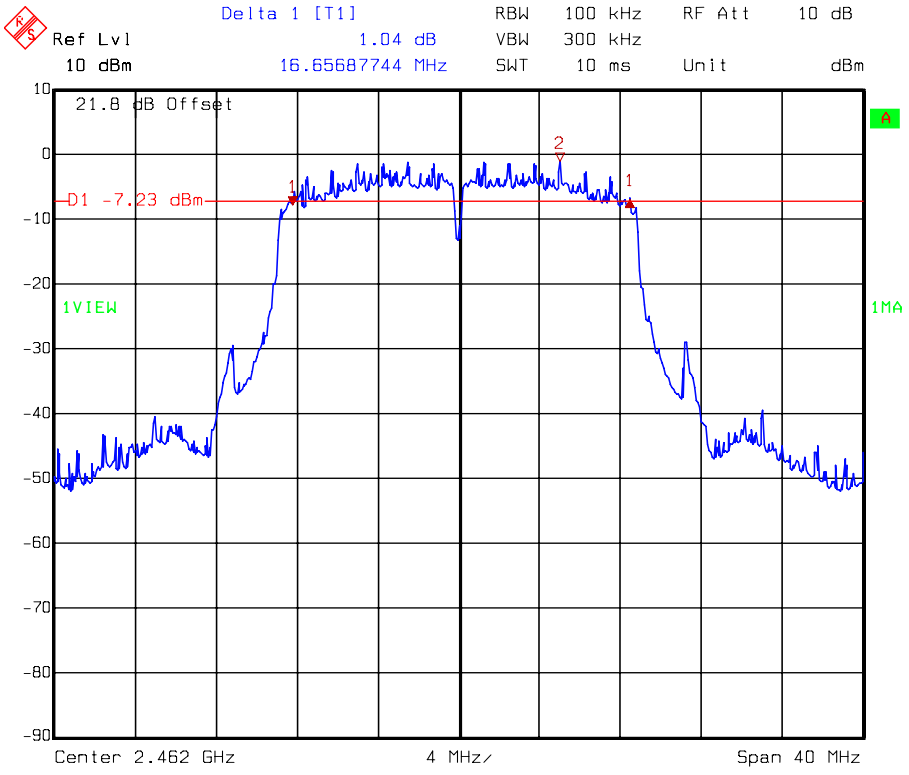
Chain 1: - 6dB Bandwidth @ 802.11n HT20 mode Channel 1



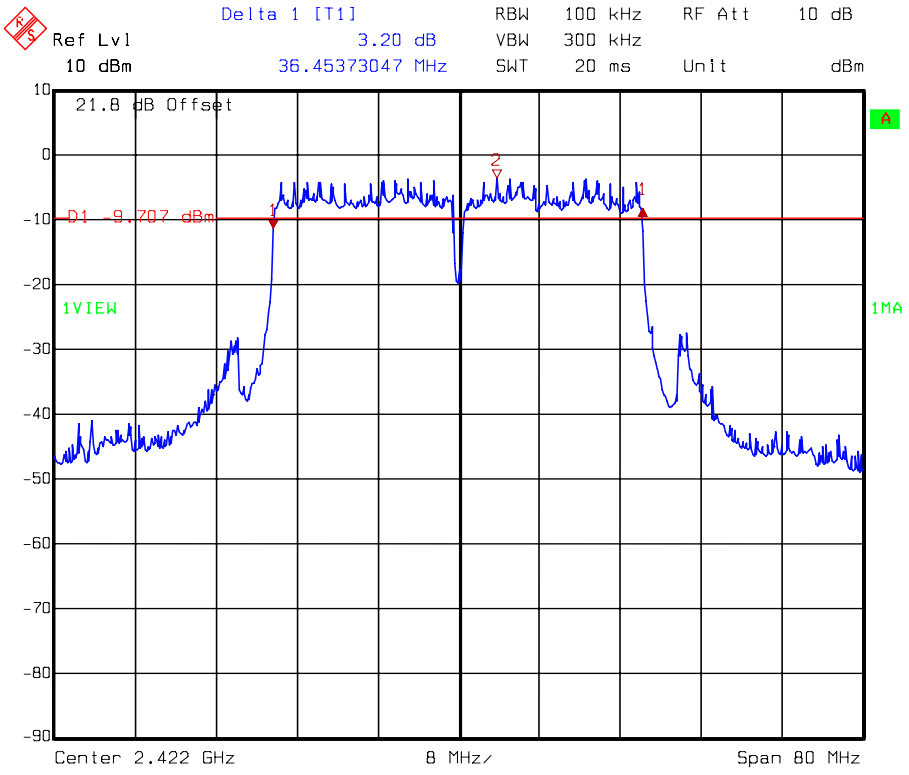
Chain 1: - 6dB Bandwidth @ 802.11n HT20 mode Channel 6



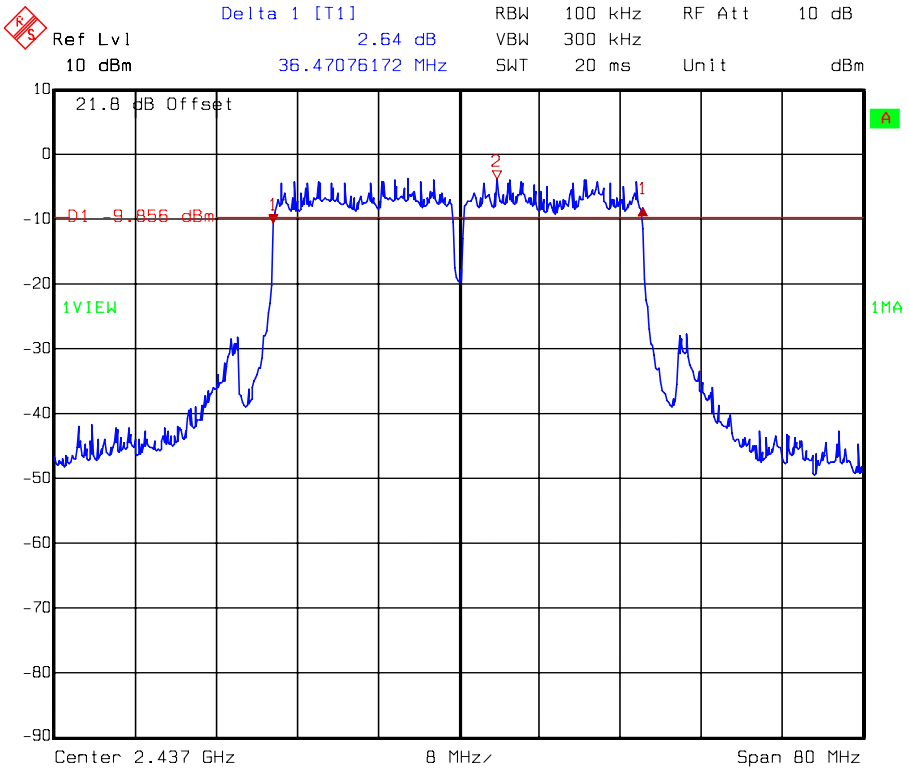
Chain 1: - 6dB Bandwidth @ 802.11n HT20 mode Channel 11



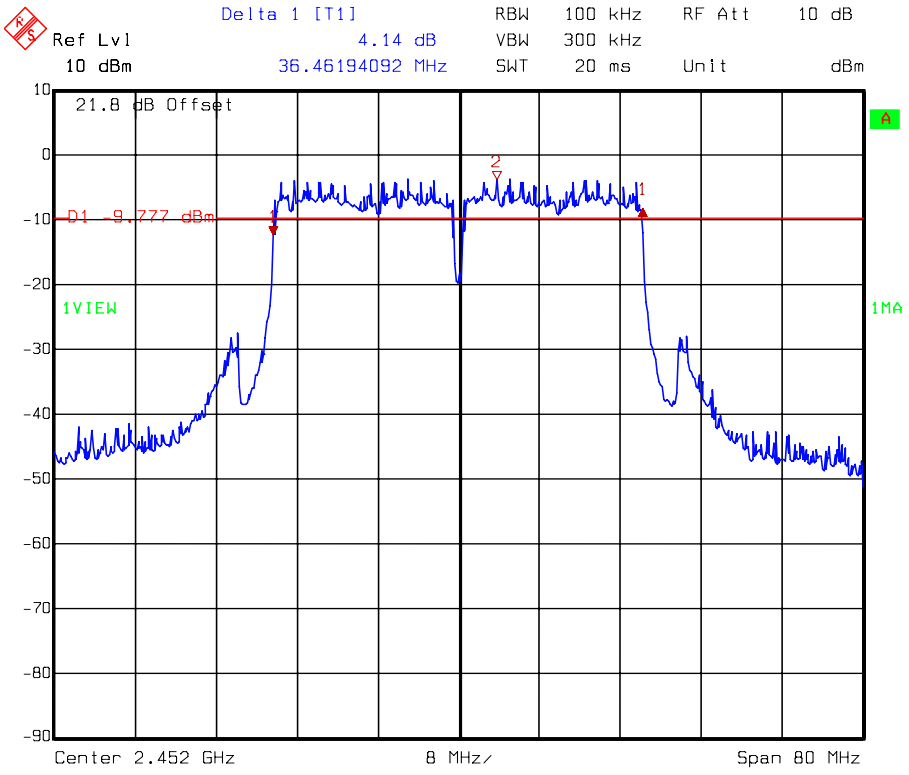
Chain 0: - 6dB Bandwidth @ 802.11n HT40 mode Channel 3



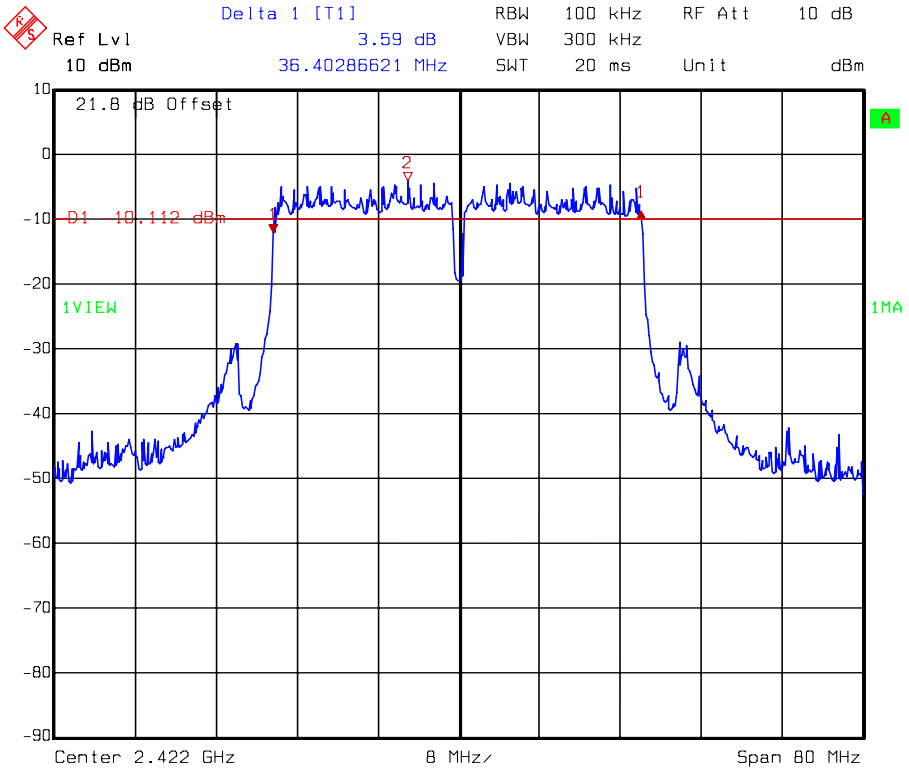
Chain 0: - 6dB Bandwidth @ 802.11n HT40 mode Channel 6



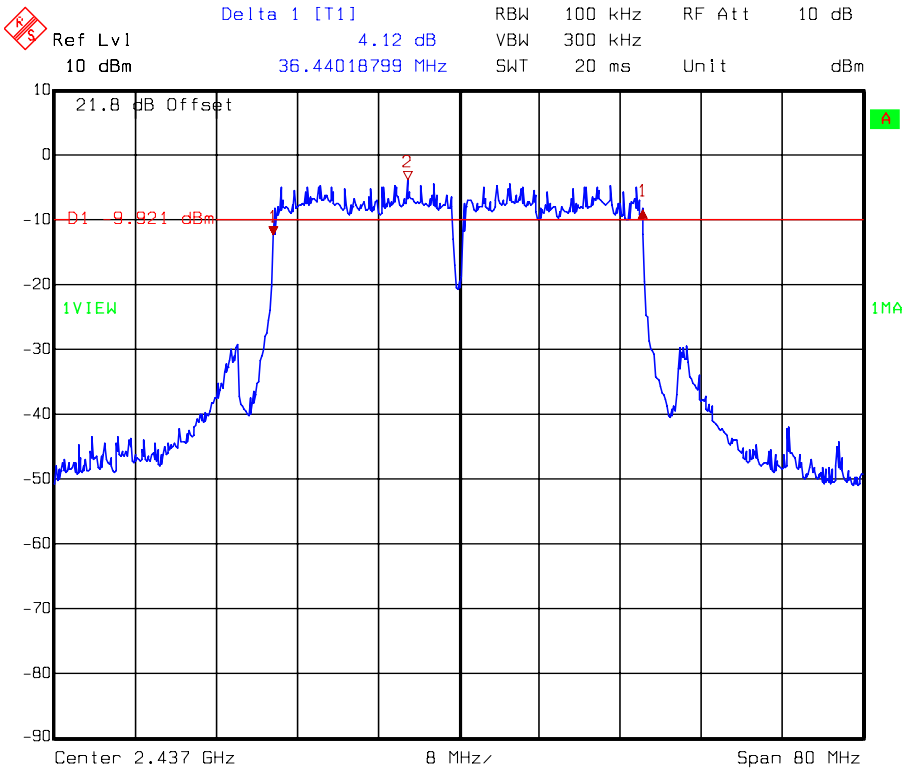
Chain 0: - 6dB Bandwidth @ 802.11n HT40 mode Channel 9



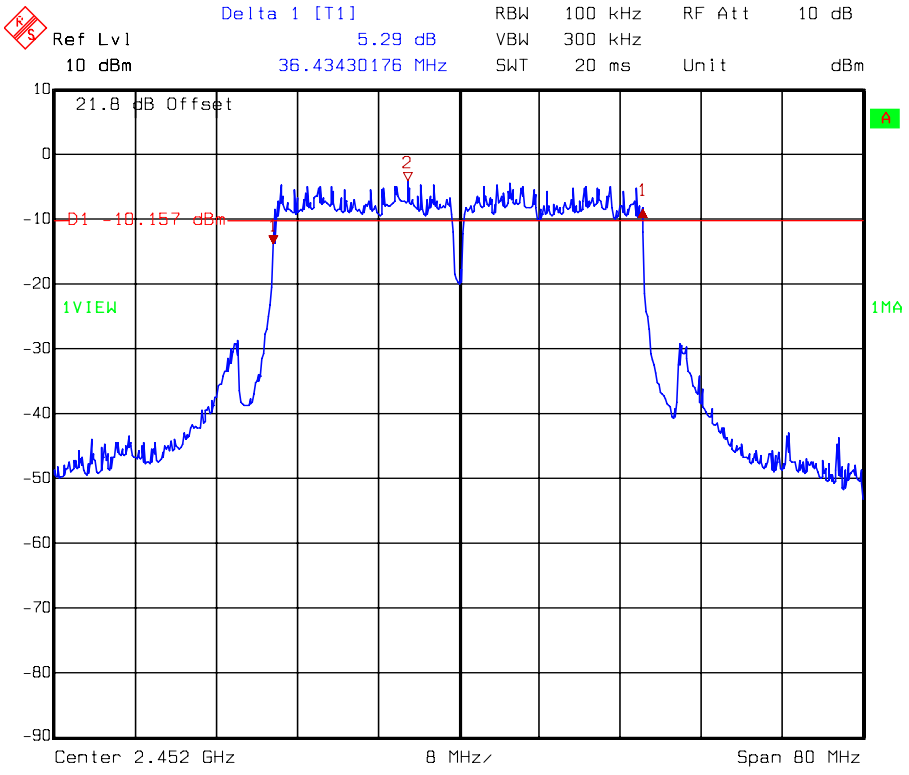
Chain 1: - 6dB Bandwidth @ 802.11n HT40 mode Channel 3



Chain 1: - 6dB Bandwidth @ 802.11n HT40 mode Channel 6



Chain 1: - 6dB Bandwidth @ 802.11n HT40 mode Channel 9



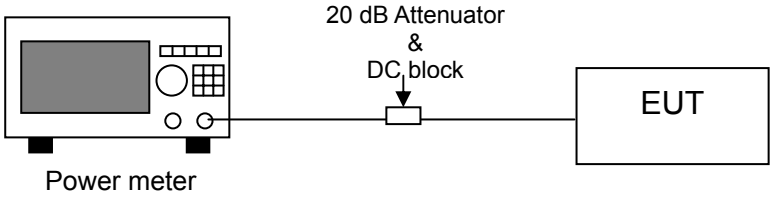
4. Maximum Output Power

Name of Test	Maximum output power
Base Standard	FCC 15.247(b)

Measurement Uncertainty: ±0.392 dB (k=2)
Test Result: Complies
Measurement Data: See Table below
Test Date: Jul. 23, 2013

Method of Measurement:
Reference FCC document: KDB558074 D01
The power output was measured on the EUT using a 50 ohm SMA Cable connected to peak and average power meter via power sensor. Connect the 20 dB attenuator and DC block at the input port of the power sensor. Measure the conducted transmitting power at each antenna port. Power output was measured with the maximum rated input level.

Test Diagram:



Note 1: §15.247 (b) (4) Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antennas of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Table: Maximum output power

1TX Mode	Channel	Frequency (MHz)	Output Power (dBm) PK	Total Calculated Power (mW) PK	Limit (dBm)	Margin (dB)
802.11b Chain 0	1	2412	18.56	71.78	30	-11.44
	6	2437	18.61	72.61	30	-11.39
	11	2462	18.71	74.30	30	-11.29
802.11b Chain 1	1	2412	18.89	77.45	30	-11.11
	6	2437	18.65	73.28	30	-11.35
	11	2462	19.03	79.98	30	-10.97
802.11g Chain 0	1	2412	20.09	102.09	30	-9.91
	6	2437	19.89	97.50	30	-10.11
	11	2462	20.19	104.47	30	-9.81
802.11g Chain 1	1	2412	19.61	91.41	30	-10.39
	6	2437	19.93	98.40	30	-10.07
	11	2462	19.88	97.27	30	-10.12

2TX Mode	Channel	Frequency (MHz)	Output Power (dBm) (PK)		Total Calculated Power (PK)		Limit (dBm)	Margin (dB)
			Chain 0	Chain 1	(dBm)	(mW)		
802.11n HT20	1	2412	16.57	15.85	19.24	83.85	30	-10.76
	6	2437	17.96	17.58	20.78	119.80	30	-9.22
	11	2462	16.35	15.72	19.06	80.48	30	-10.94
802.11n HT40	3	2422	16.79	15.1	19.04	80.11	30	-10.96
	6	2437	18.46	16.04	20.43	110.32	30	-9.57
	9	2452	16.94	17.77	20.39	109.27	30	-9.61

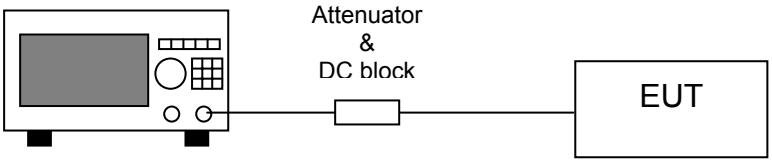
5. Power Spectral Density

Name of Test	Power Spectral Density
Base Standard	FCC 15.247(e)

Test Result: Complies
Measurement Data: See Table & plots below
Test Date: Jul. 01, 2013~Jul. 23, 2013

Method of Measurement:
Reference FCC document: KDB558074 D01
The power spectrum density was measured from the antenna port of the EUT using a 50 ohm spectrum analyzer. Set RBW = 100 kHz, VBW ≥ 300 kHz, sweep= auto couple. The peak level measured must be no greater than + 8 dBm. Power spectrum density was read directly and cable loss (1 dB)/external attenuator (20 dB) correction was added to the reading to obtain power at the EUT antenna terminals.

Test Diagram:



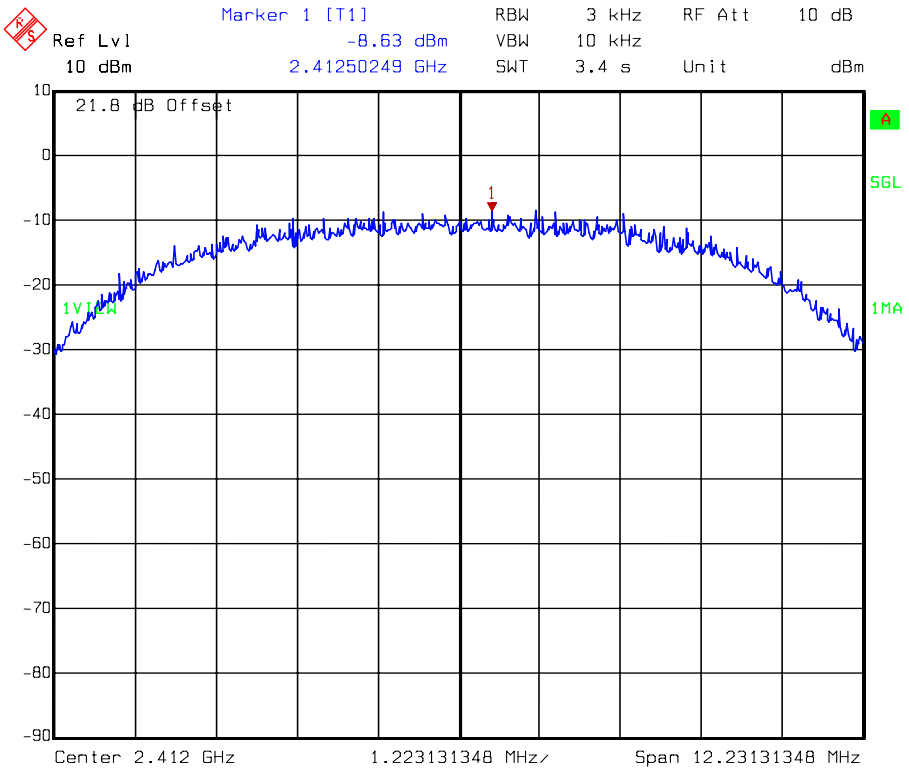
Spectrum Analyzer

Table: Power Spectral Density

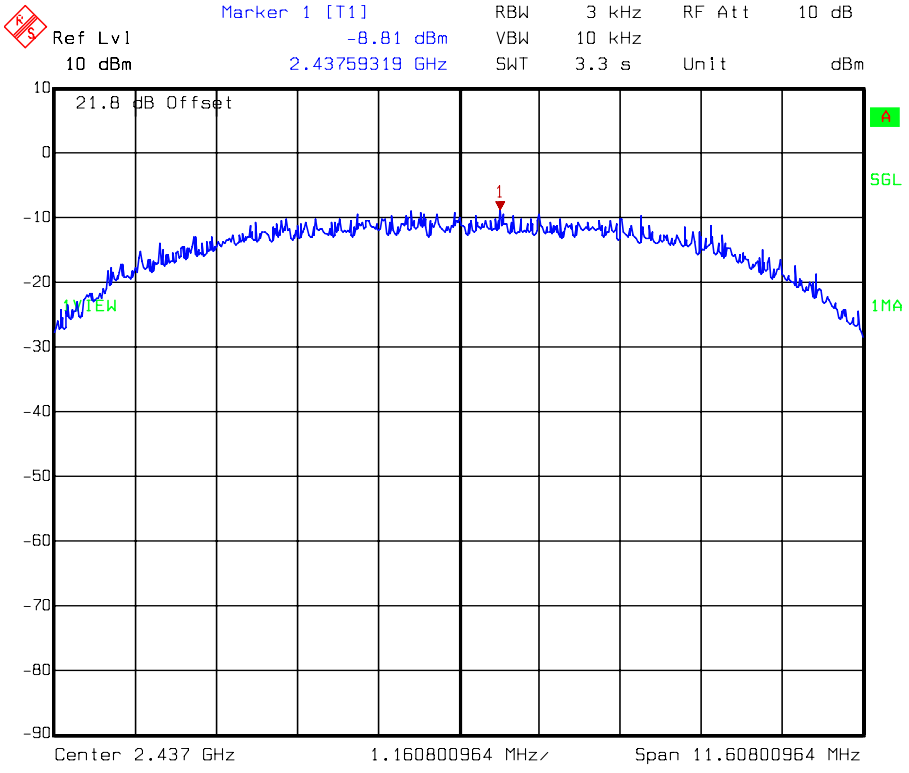
1TX Mode	Channel	Frequency (MHz)	PSD (dBm)	PSD (mW)	Limit (dBm)	Margin (dB)
802.11b Chain 0	1	2412	-8.63	0.14	8	-16.63
	6	2437	-8.81	0.13	8	-16.81
	11	2462	-8.81	0.13	8	-16.81
802.11b Chain 1	1	2412	-7.84	0.16	8	-15.84
	6	2437	-7.78	0.17	8	-15.78
	11	2462	-7.63	0.17	8	-15.63
802.11g Chain 0	1	2412	-12.94	0.05	8	-20.94
	6	2437	-12.68	0.05	8	-20.68
	11	2462	-12.91	0.05	8	-20.91
802.11g Chain 1	1	2412	-12.25	0.06	8	-20.25
	6	2437	-12.8	0.05	8	-20.80
	11	2462	-12.67	0.05	8	-20.67

2TX Mode	Channel	Frequency (MHz)	PSD(dBm)		PSD		Limit (dBm)	Margin (dB)
			Chain0	Chain1	(mW)	(dBm)		
802.11n HT20	1	2412	-16.77	-16.71	0.04	-13.73	8	-21.73
	6	2437	-16.68	-16.25	0.05	-13.45	8	-21.45
	11	2462	-16.03	-16.96	0.05	-13.46	8	-21.46
802.11n HT40	3	2422	-19.58	-20.39	0.02	-16.96	8	-24.96
	6	2437	-19.1	-20.56	0.02	-16.76	8	-24.76
	9	2452	-19.28	-21.19	0.02	-17.12	8	-25.12

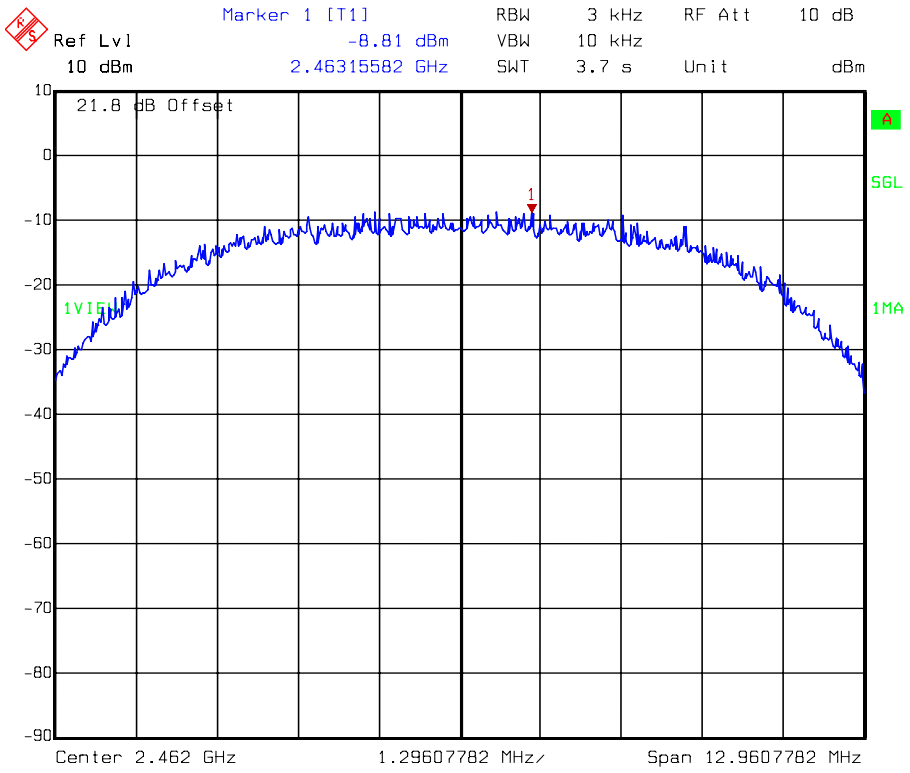
Chain 0: Power Spectral Density @ 802.11b mode Channel 1



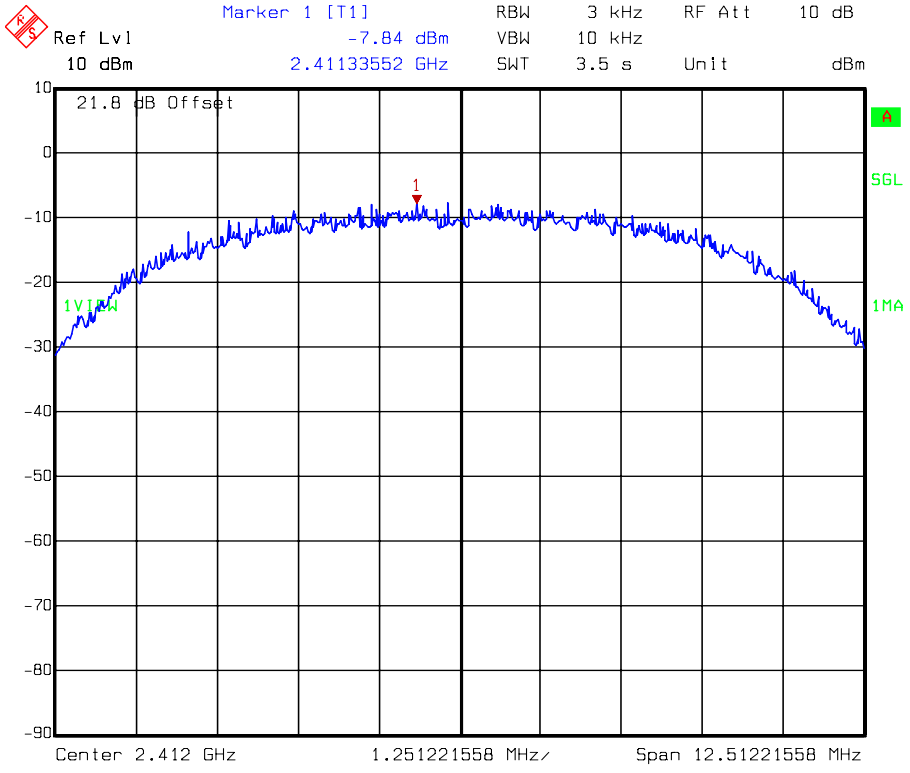
Chain 0: Power Spectral Density @ 802.11b mode Channel 6



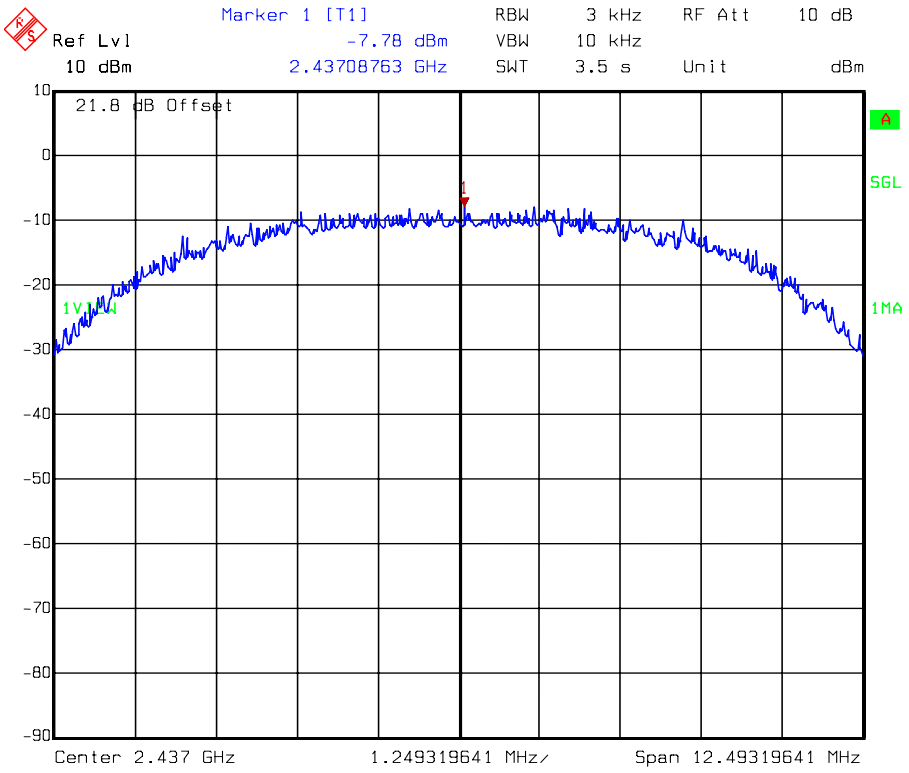
Chain 0: Power Spectral Density @ 802.11b mode Channel 11



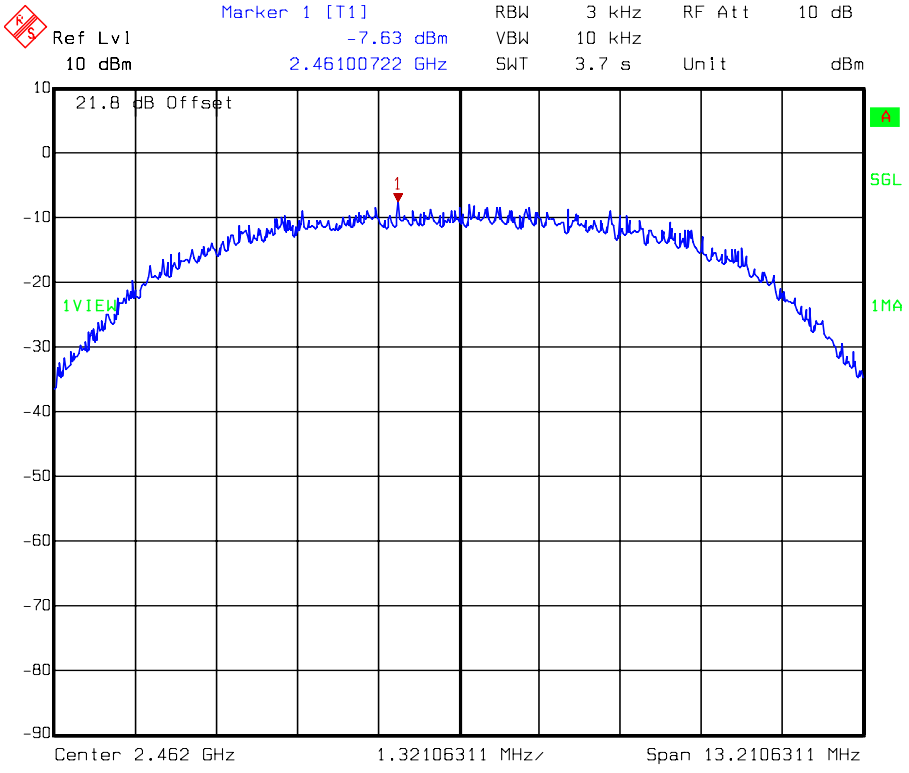
Chain 1: Power Spectral Density @ 802.11b mode Channel 1



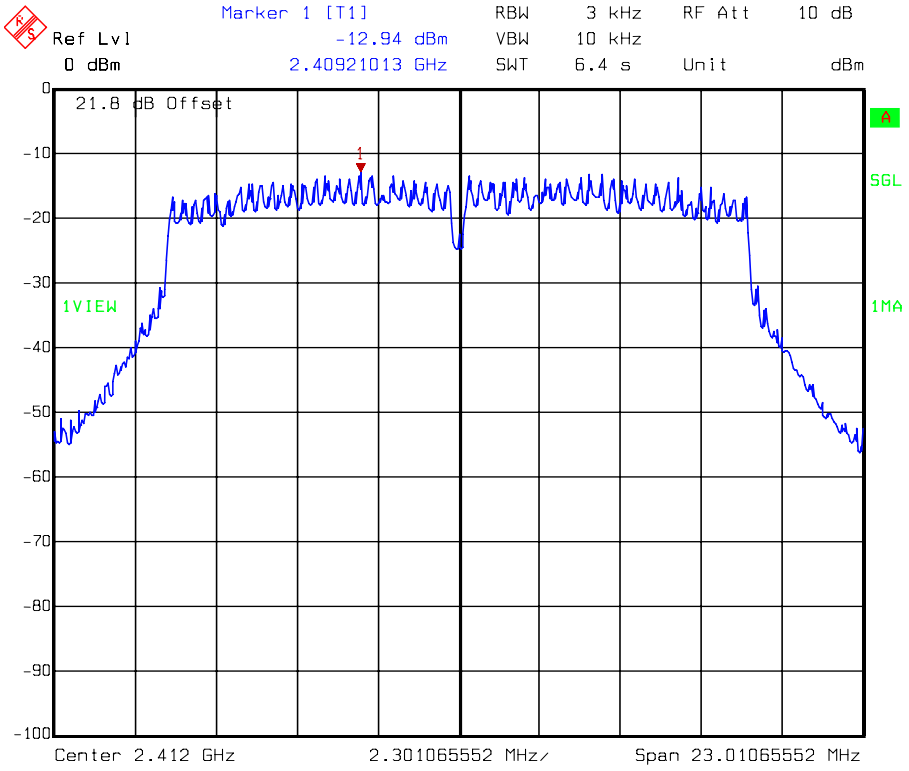
Chain 1: Power Spectral Density @ 802.11b mode Channel 6



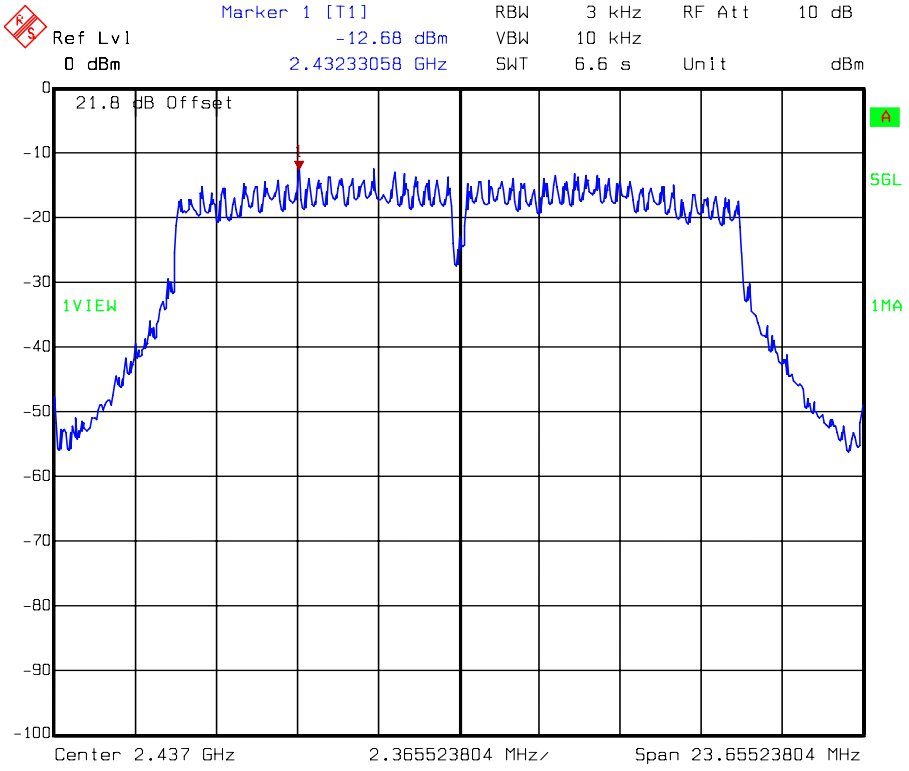
Chain 1: Power Spectral Density @ 802.11b mode Channel 11



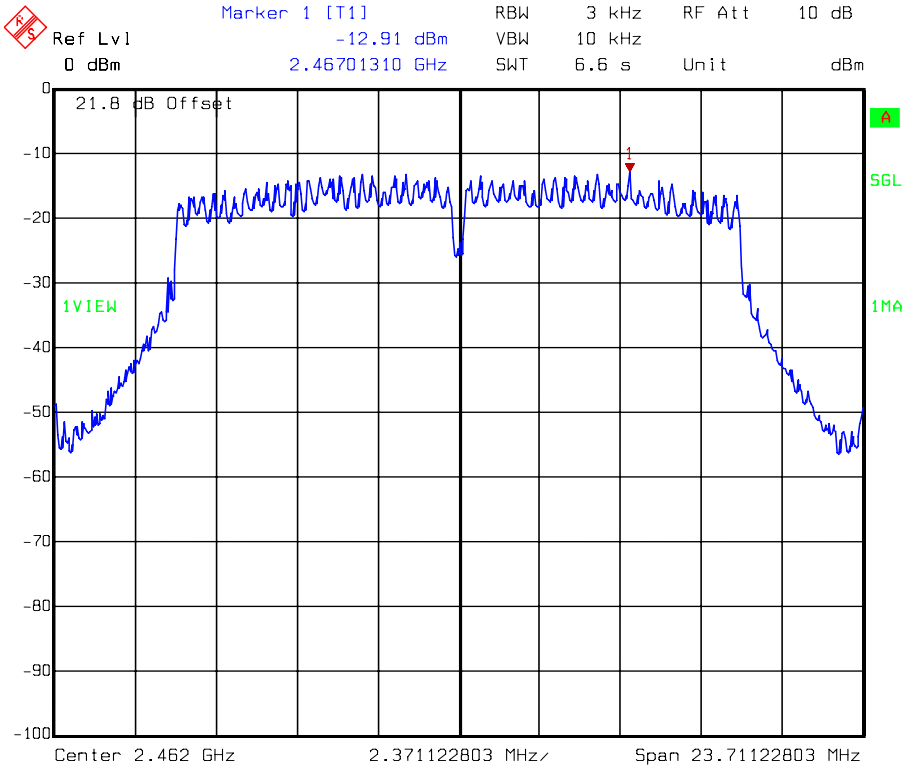
Chain 0: Power Spectral Density @ 802.11g mode Channel 1



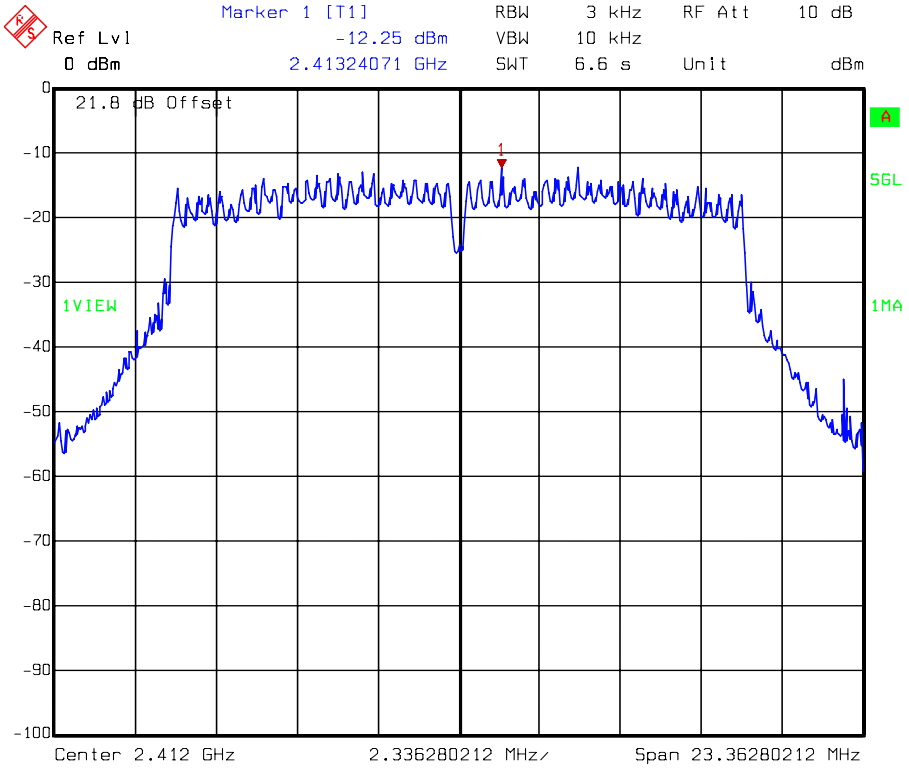
Chain 0: Power Spectral Density @ 802.11g mode Channel 6



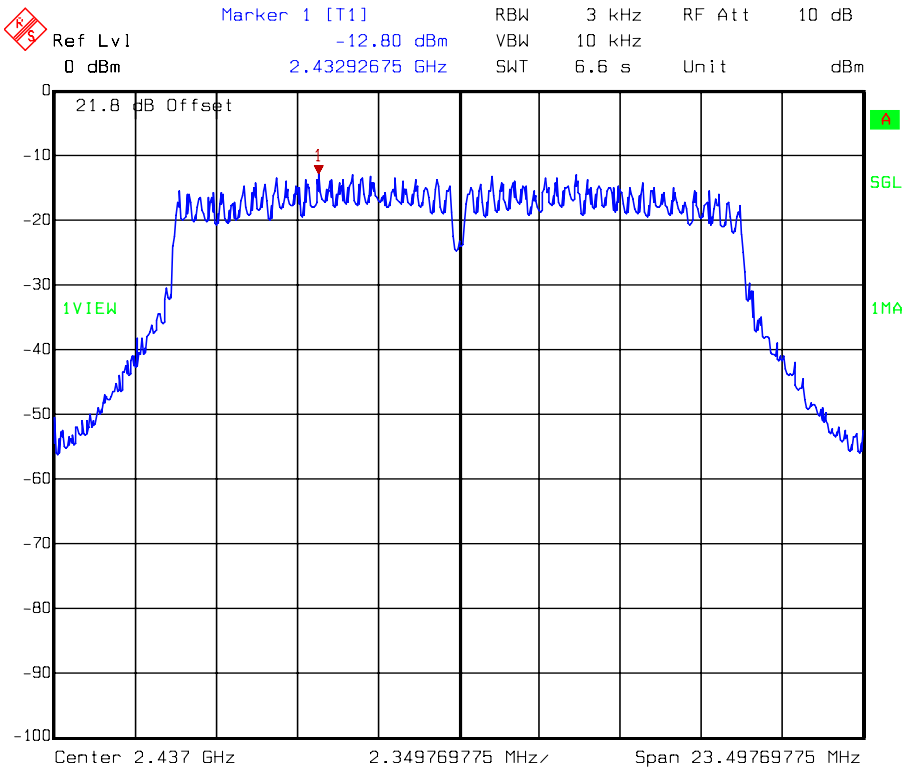
Chain 0: Power Spectral Density @ 802.11g mode Channel 11



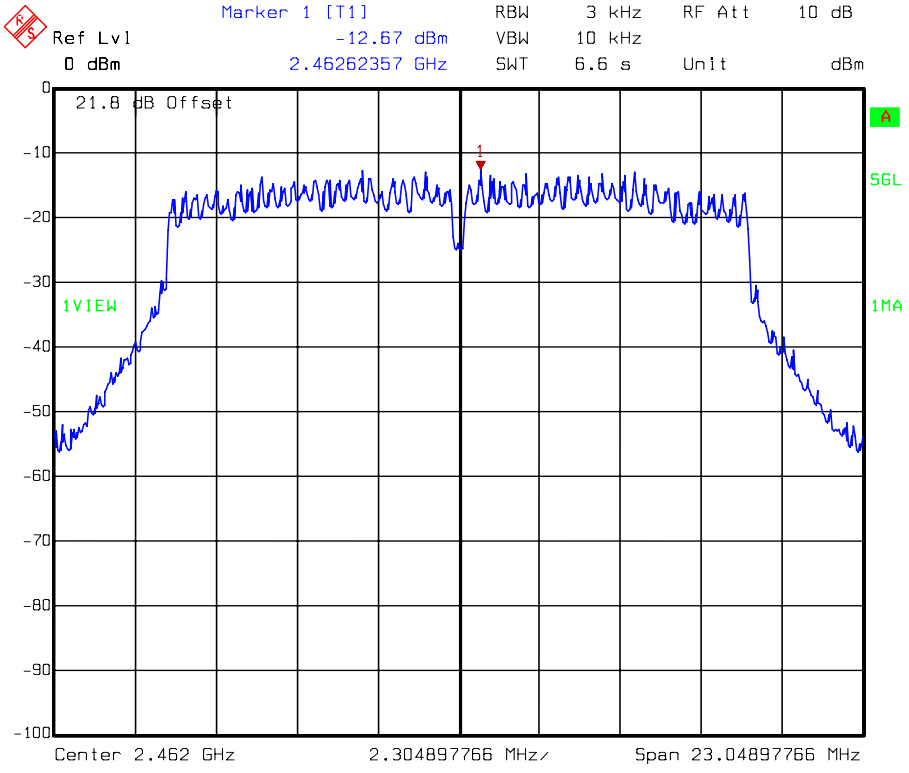
Chain 1: Power Spectral Density @ 802.11g mode Channel 1



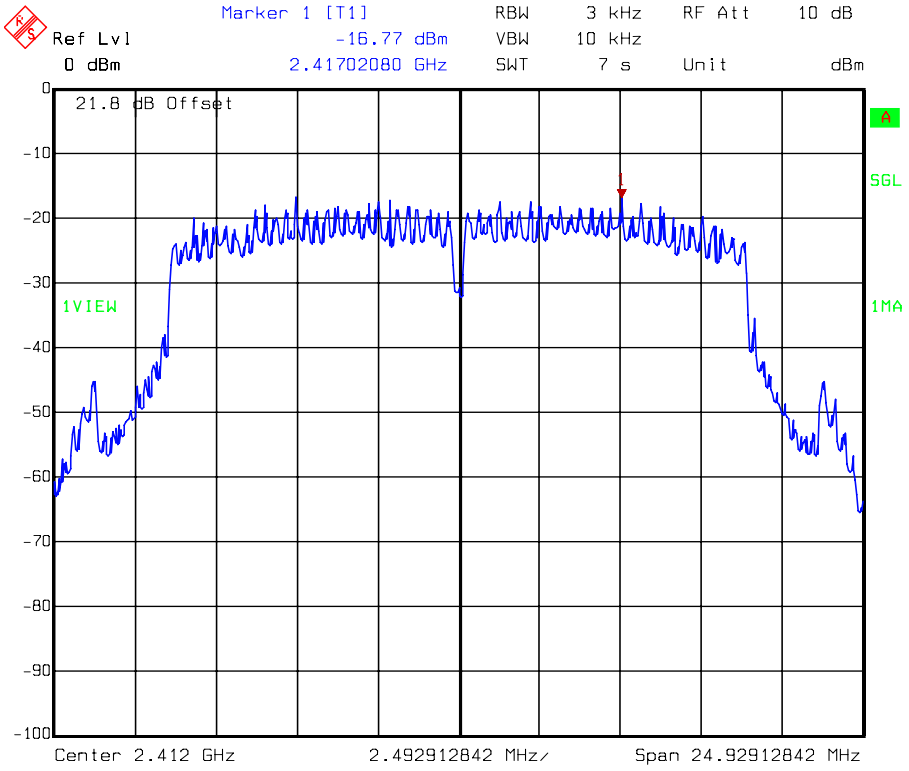
Chain 1: Power Spectral Density @ 802.11g mode Channel 6



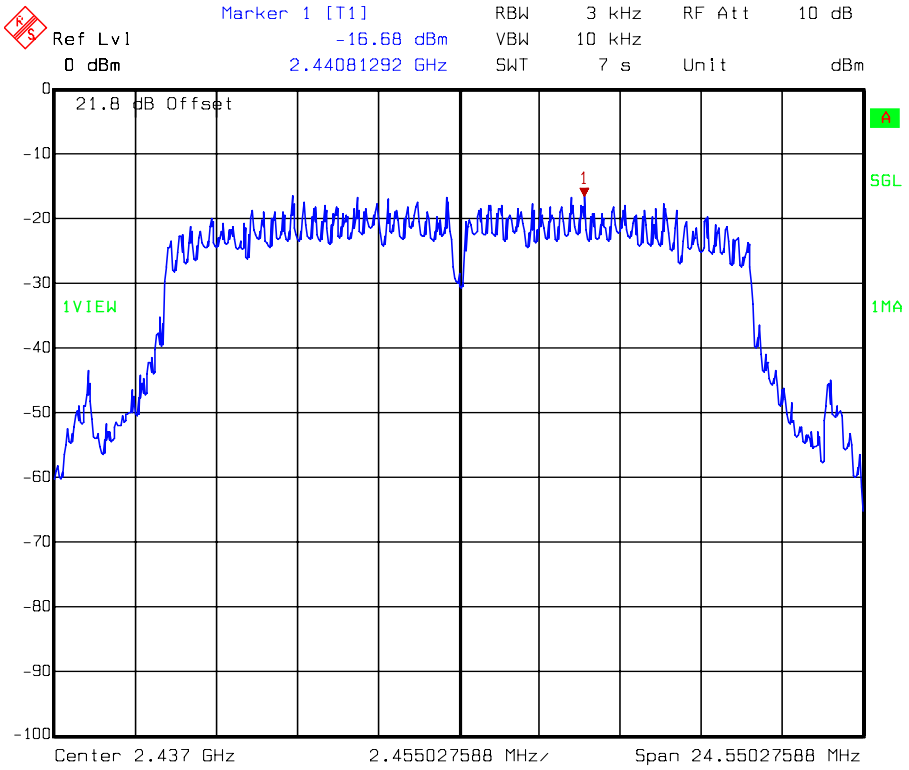
Chain 1: Power Spectral Density @ 802.11g mode Channel 11



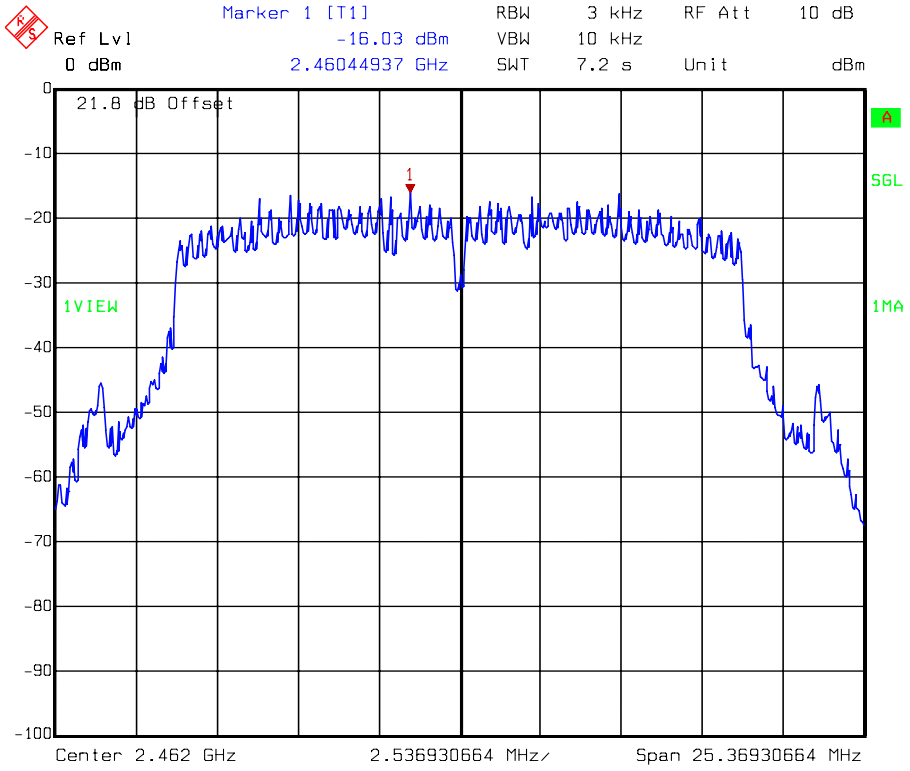
Chain 0: Power Spectral Density @ 802.11n HT20 mode Channel 1



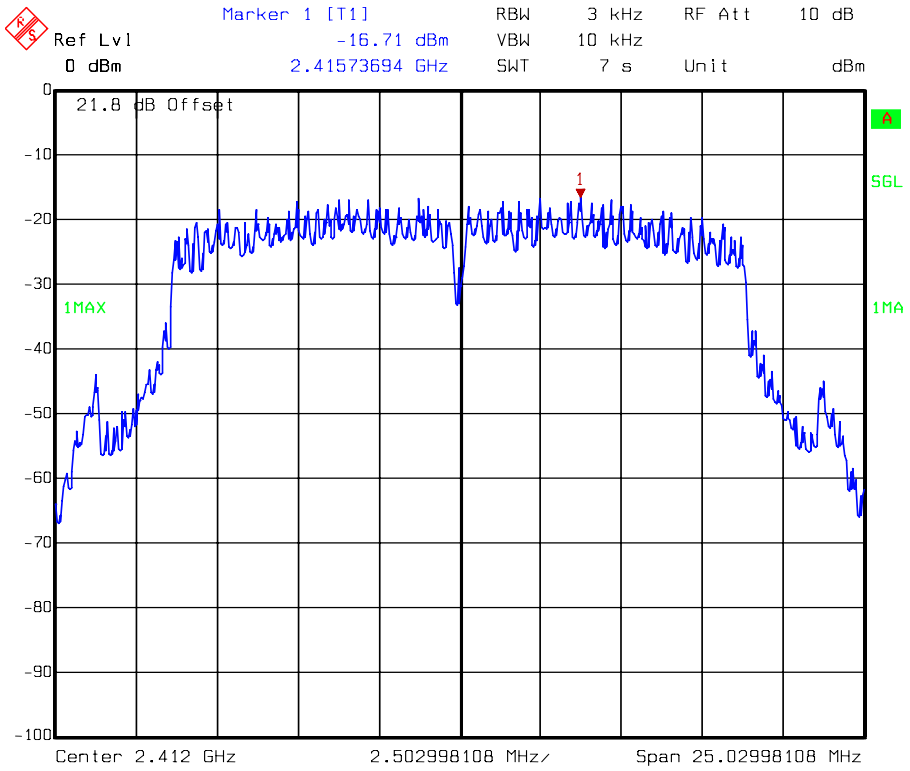
Chain 0: Power Spectral Density @ 802.11n HT20 mode Channel 6



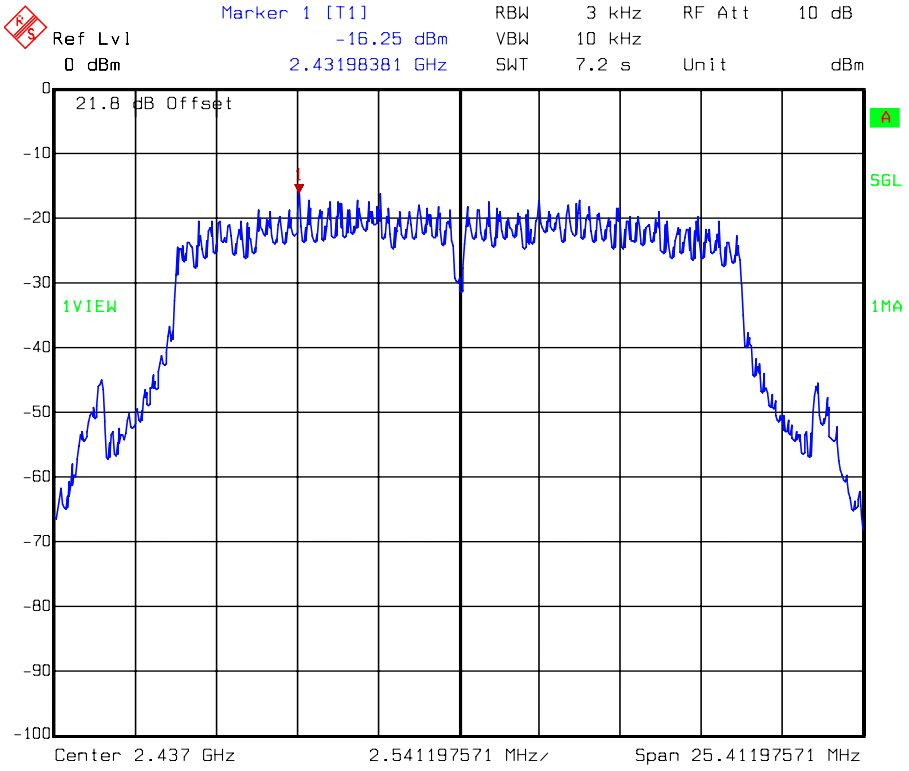
Chain 0: Power Spectral Density @ 802.11n HT20 mode Channel 11



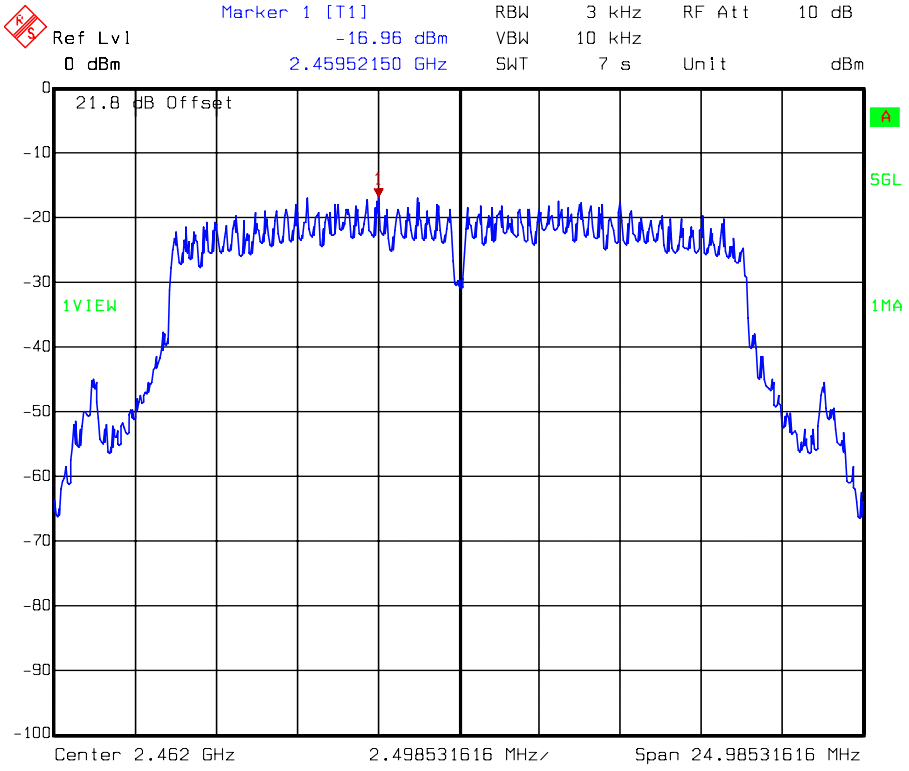
Chain 1: Power Spectral Density @ 802.11n HT20 mode Channel 1



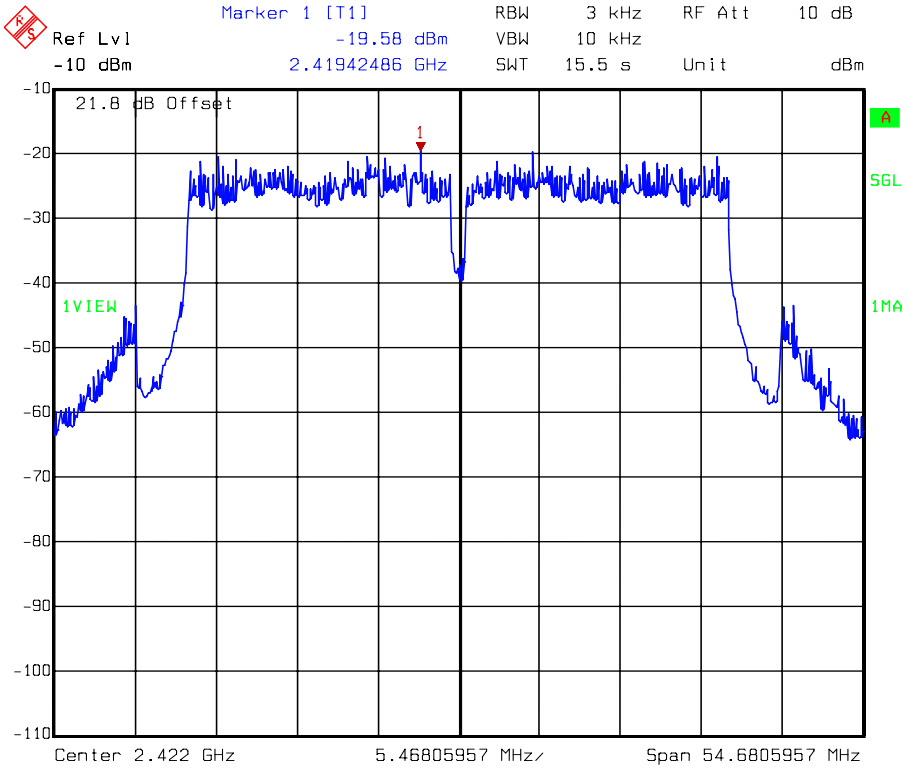
Chain 1: Power Spectral Density @ 802.11n HT20 mode Channel 6



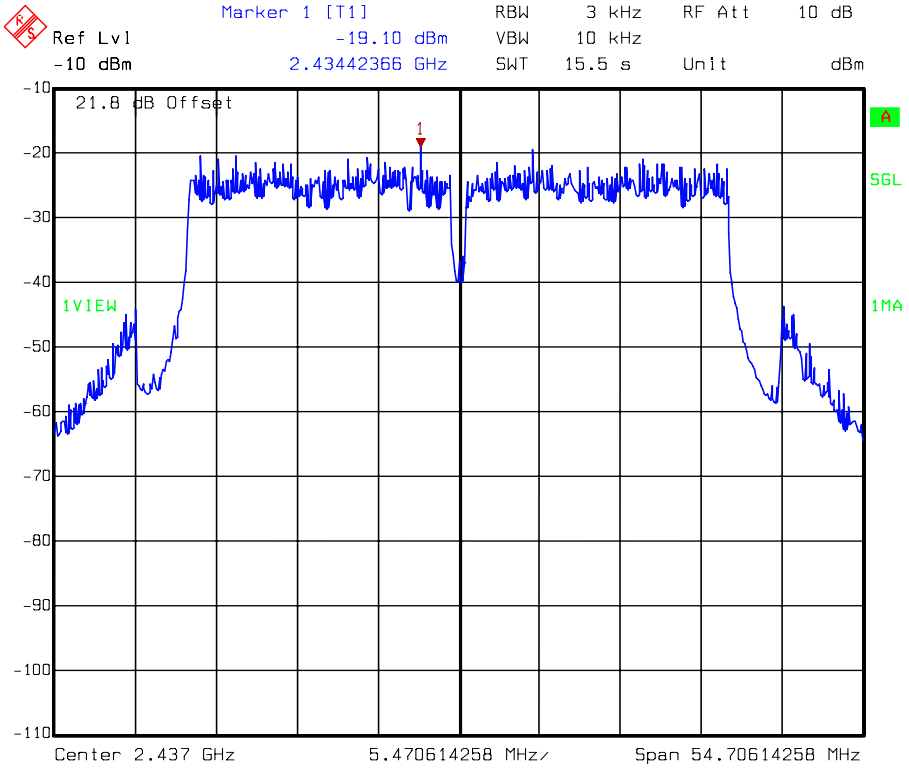
Chain 1: Power Spectral Density @ 802.11n HT20 mode Channel 11



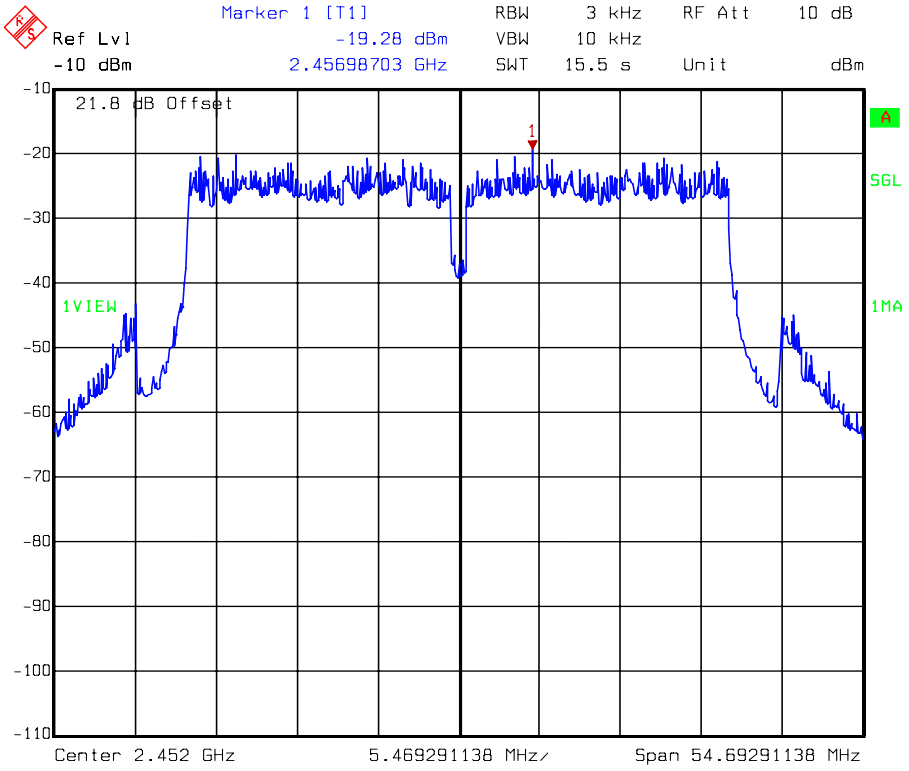
Chain 0: Power Spectral Density @ 802.11n HT40 mode Channel 3



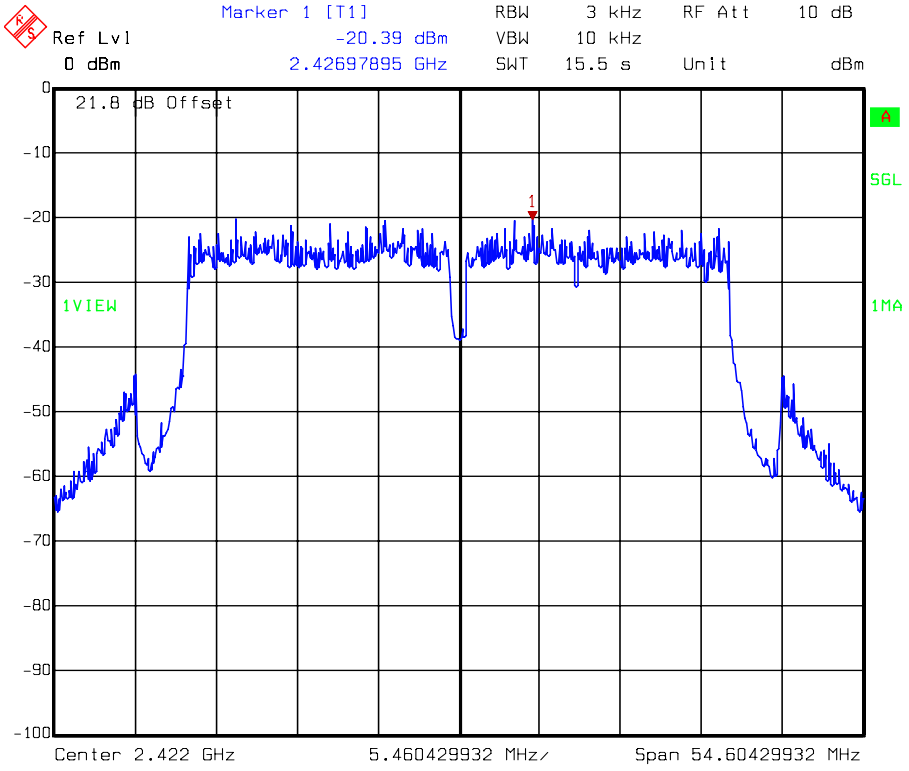
Chain 0: Power Spectral Density @ 802.11n HT40 mode Channel 6



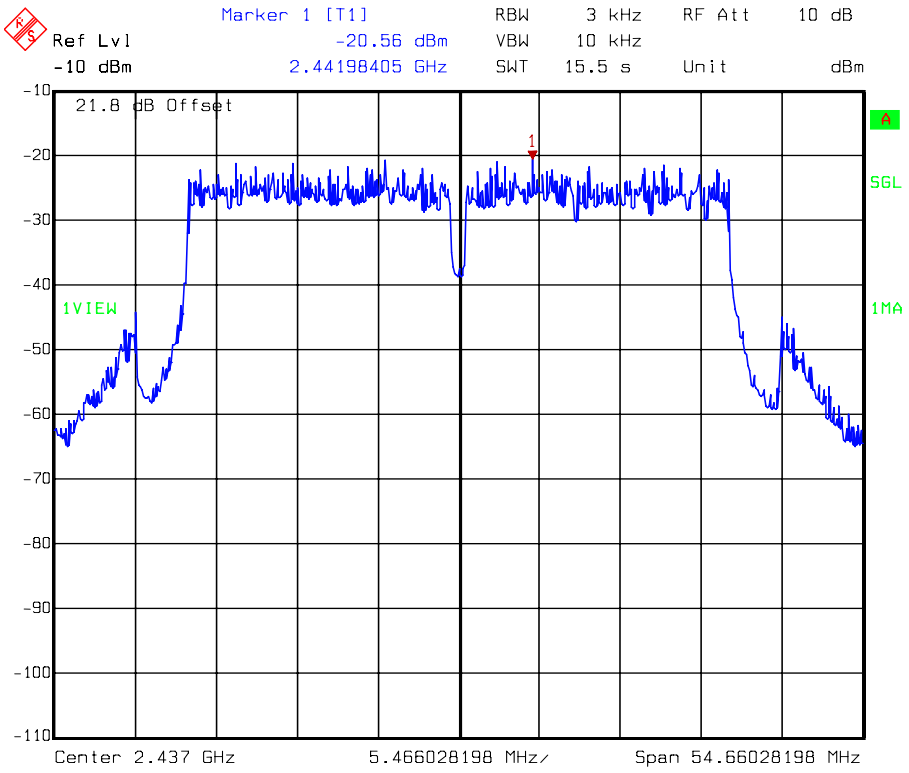
Chain 0: Power Spectral Density @ 802.11n HT40 mode Channel 9



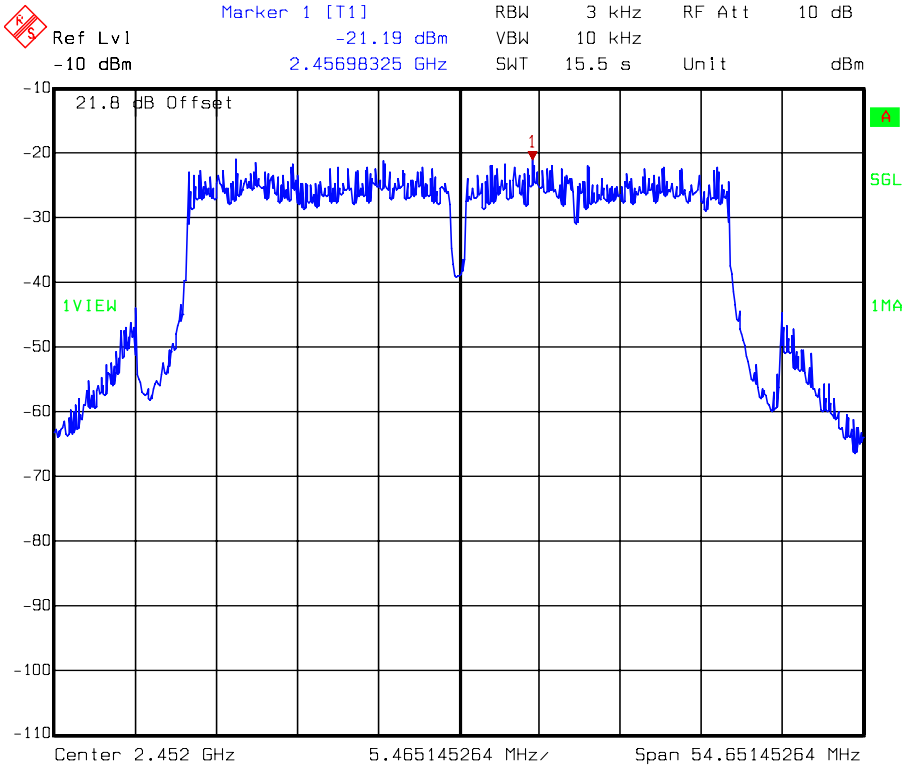
Chain 1: Power Spectral Density @ 802.11n HT40 mode Channel 3



Chain 1: Power Spectral Density @ 802.11n HT40 mode Channel 6



Chain 1: Power Spectral Density @ 802.11n HT40 mode Channel 9



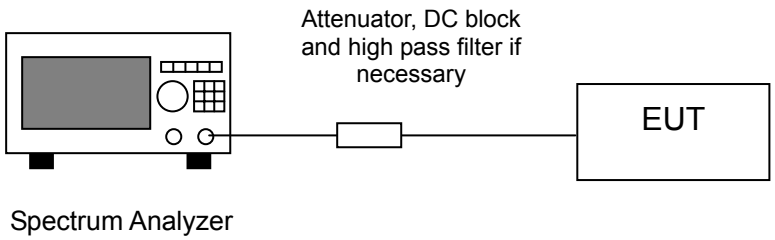
6. RF Antenna Conducted Spurious

Name of Test	RF Antenna Conducted Spurious
Base Standard	FCC 15.247(d)

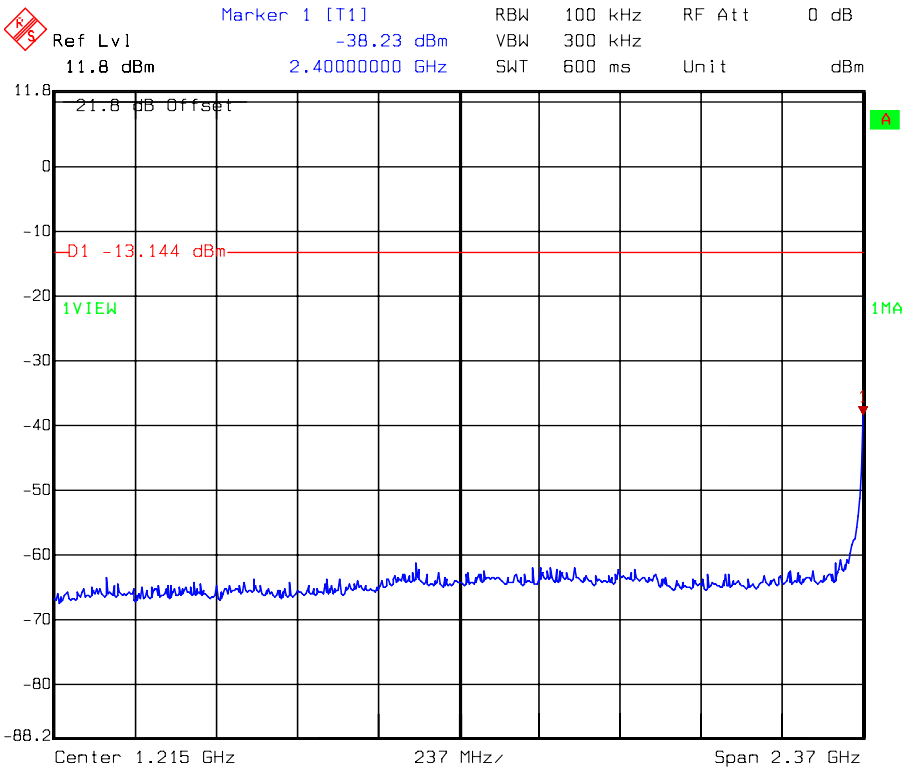
Test Result: Complies
Measurement Data: See plots below
Test Date: Jul. 01, 2013

Method of Measurement:
Reference FCC document: KDB558074 D01
The measurements were performed from 12 MHz to 25 GHz RF antenna conducted per FCC 15.247 (d) was measured from the EUT antenna port using a 50 ohm spectrum analyzer with the resolution bandwidth set at 100 kHz, and the video bandwidth set at 300 kHz. Harmonics and spurious noise must be at least 20 dB down from the highest emission level within the authorized band as measured with a 100 kHz RBW. The table below is the results from the highest emission for each channel within the authorized band. This table was used to determine the spurious limits for each channel. If maximum (average) conducted output power was used to demonstrate compliance to **15.247(b)(3)** requirements, then the peak power in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 30 dB relative to the maximum in-band peak PSD level in 100 kHz.

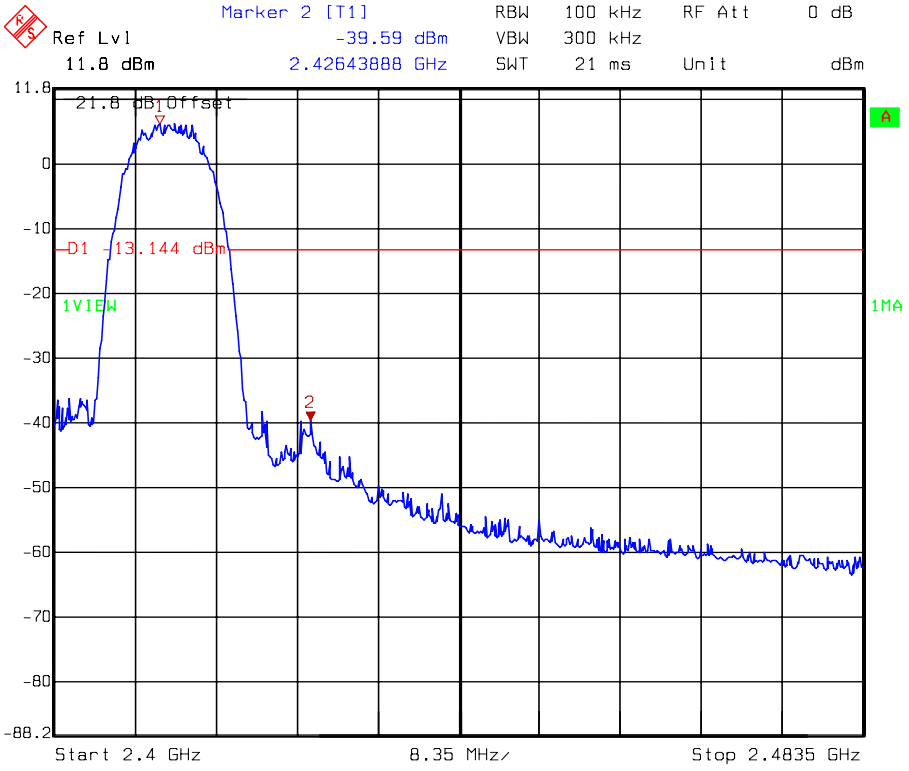
Test Diagram:



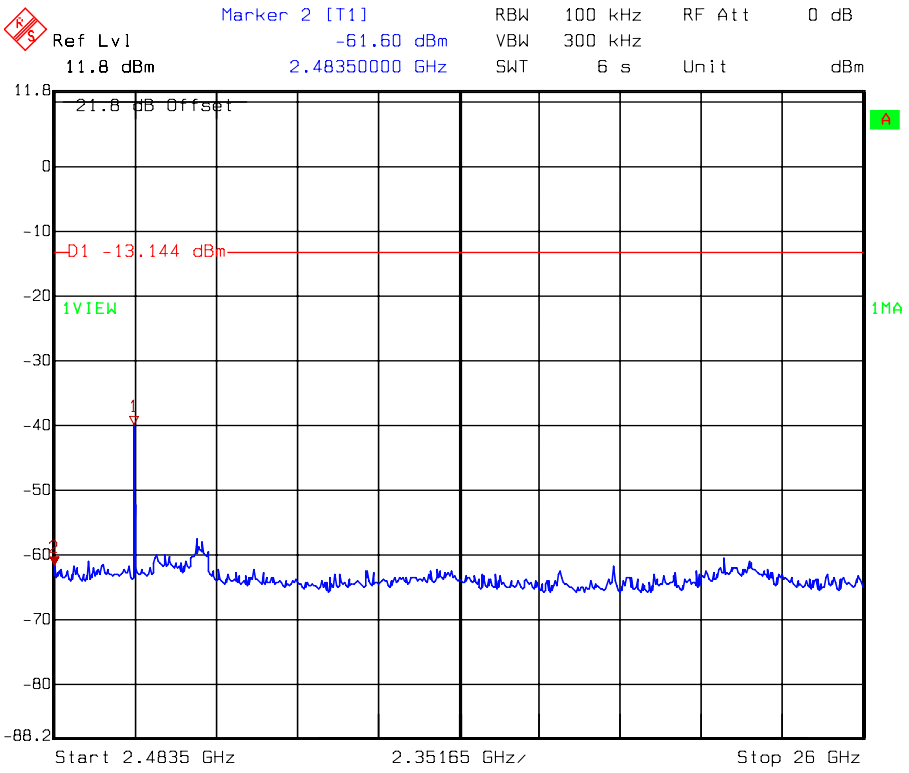
Chain 0: Conducted spurious @ 802.11b mode Channel 1 (1 of 3)



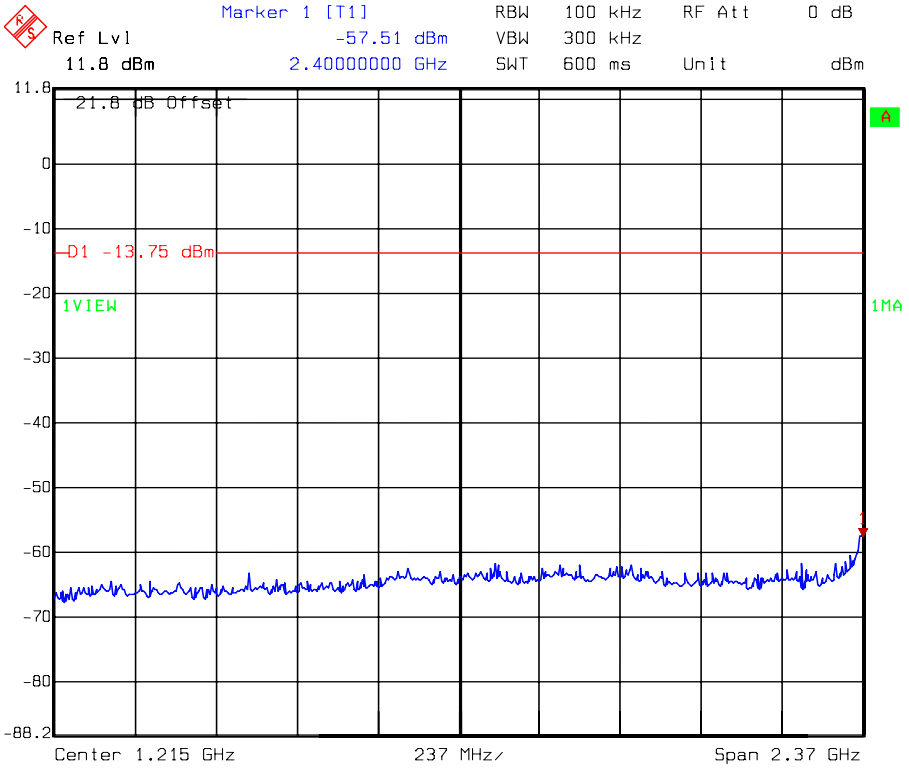
Chain 0: Conducted spurious @ 802.11b mode Channel 1 (2 of 3)



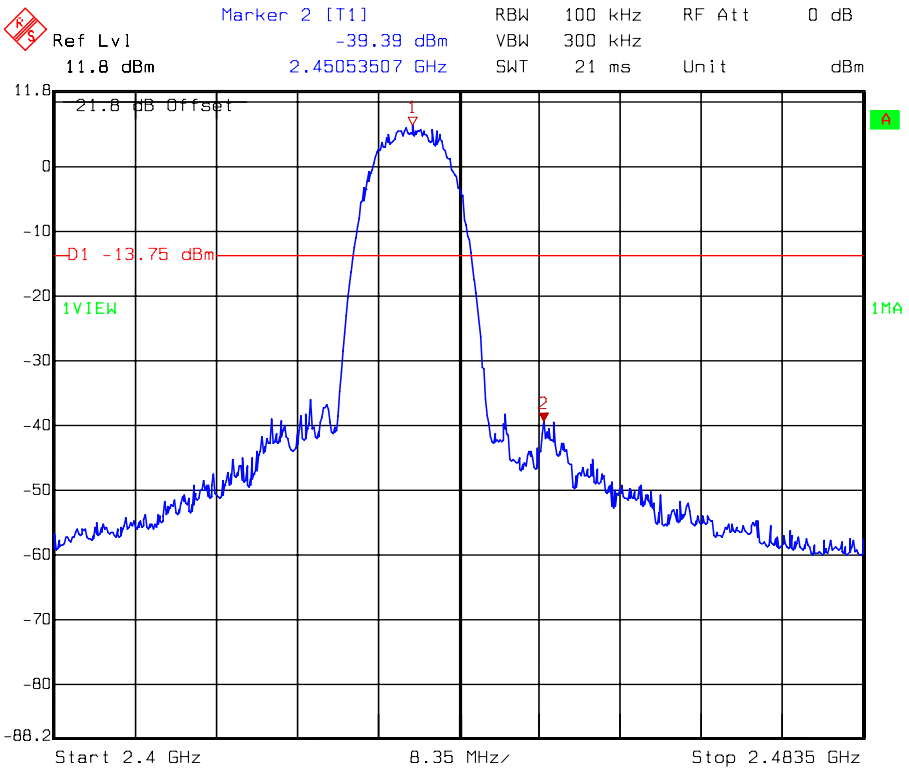
Chain 0: Conducted spurious @ 802.11b mode Channel 1 (3 of 3)



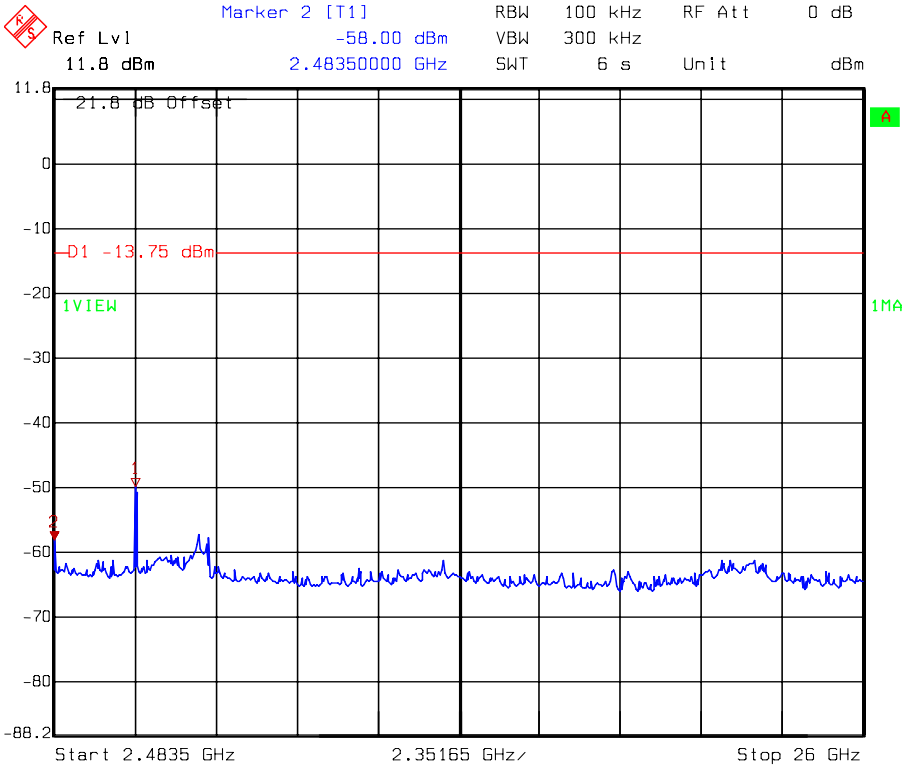
Chain 0: Conducted spurious @ 802.11b mode Channel 6 (1 of 3)



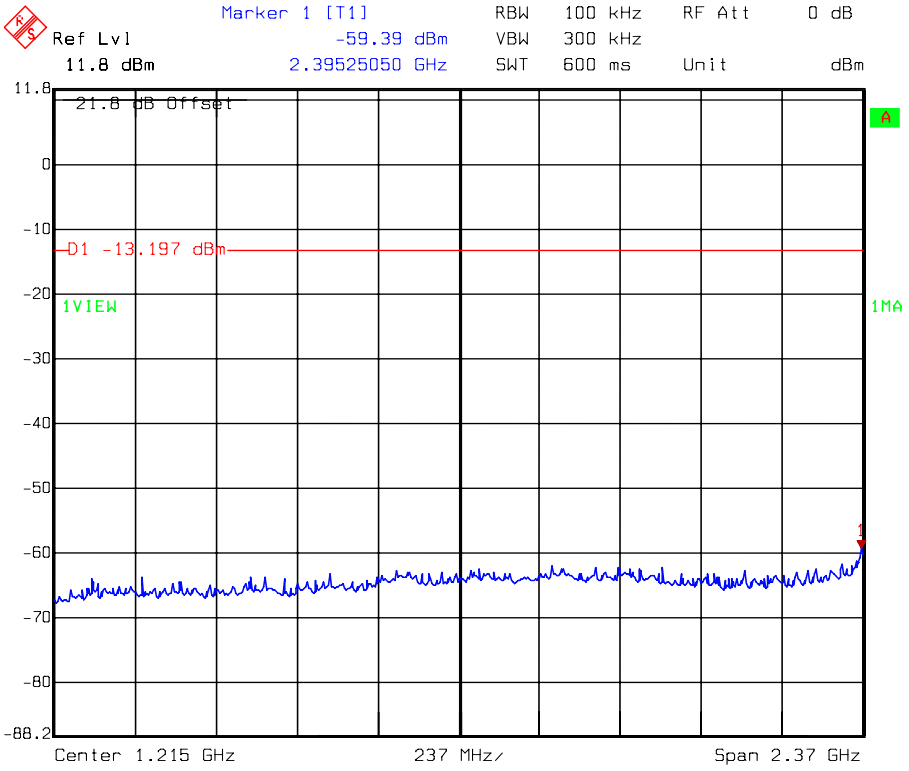
Chain 0: Conducted spurious @ 802.11b mode Channel 6 (2 of 3)



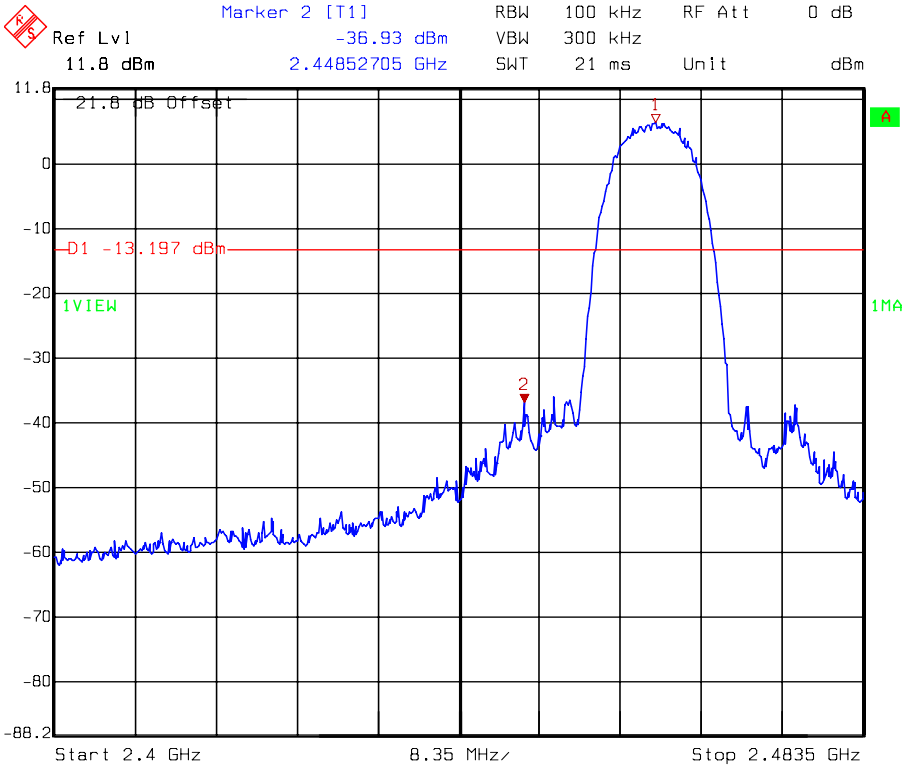
Chain 0: Conducted spurious @ 802.11b mode Channel 6 (3 of 3)



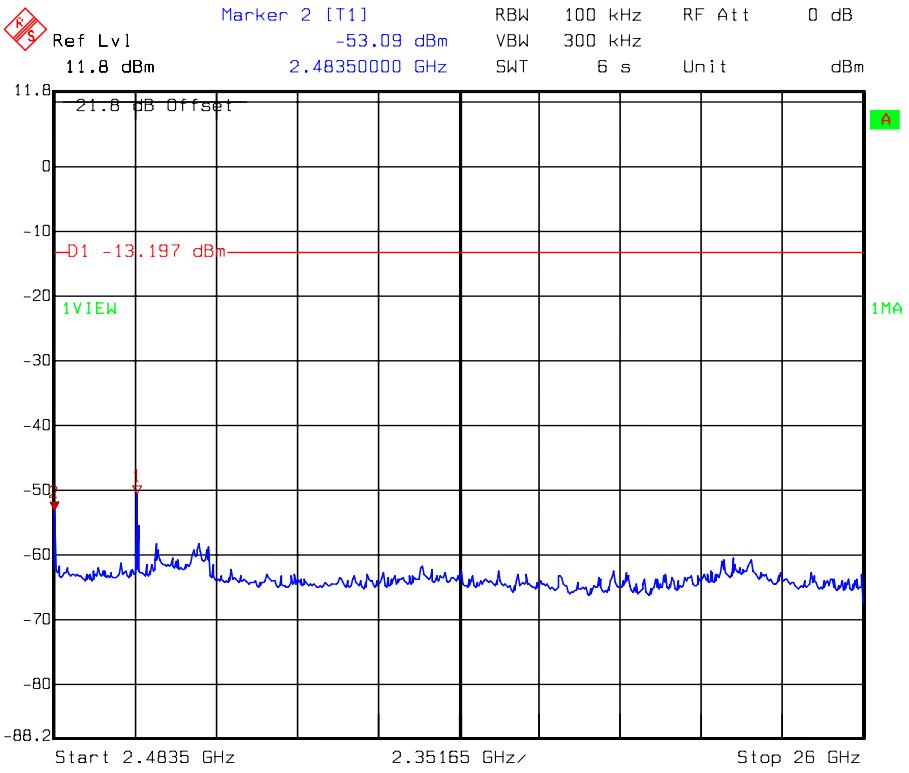
Chain 0: Conducted spurious @ 802.11b mode Channel 11 (1 of 3)



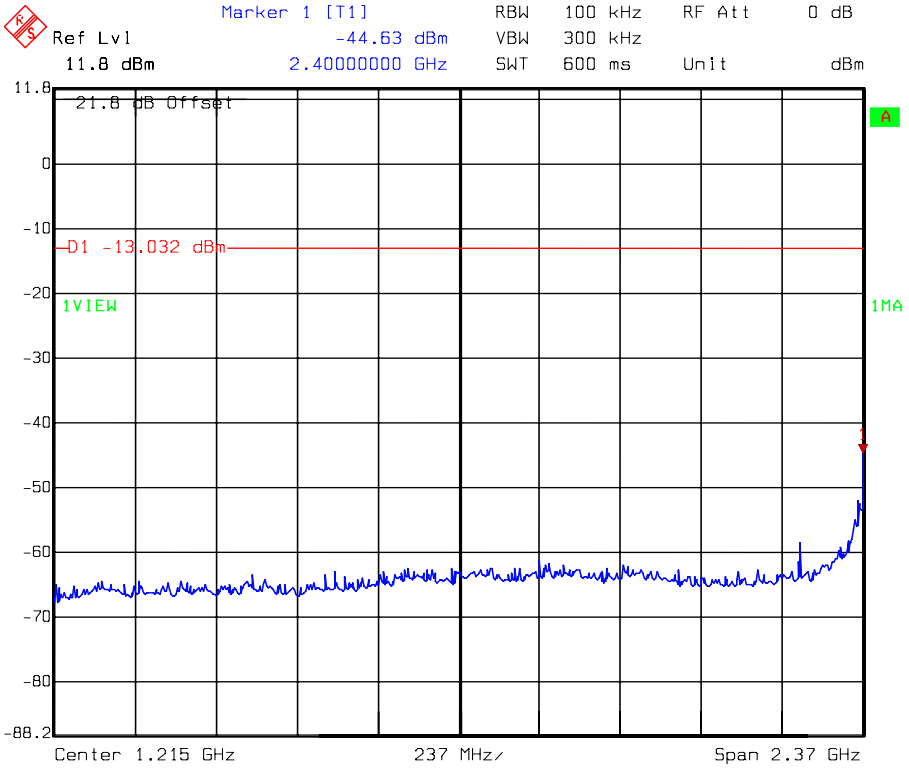
Chain 0: Conducted spurious @ 802.11b mode Channel 11 (2 of 3)



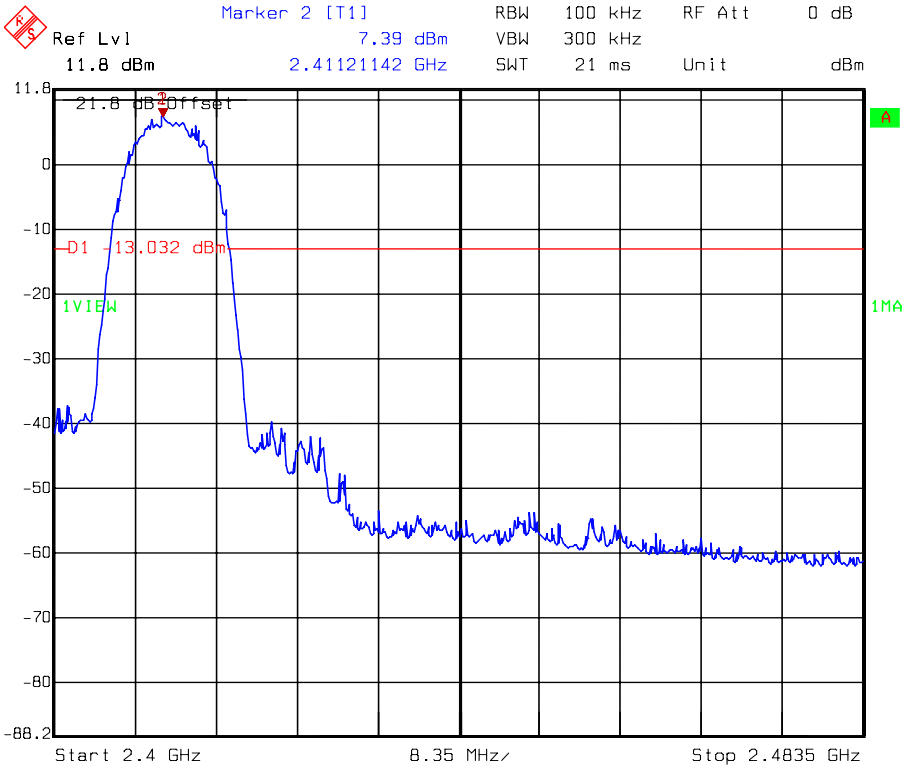
Chain 0: Conducted spurious @ 802.11b mode Channel 11 (3 of 3)



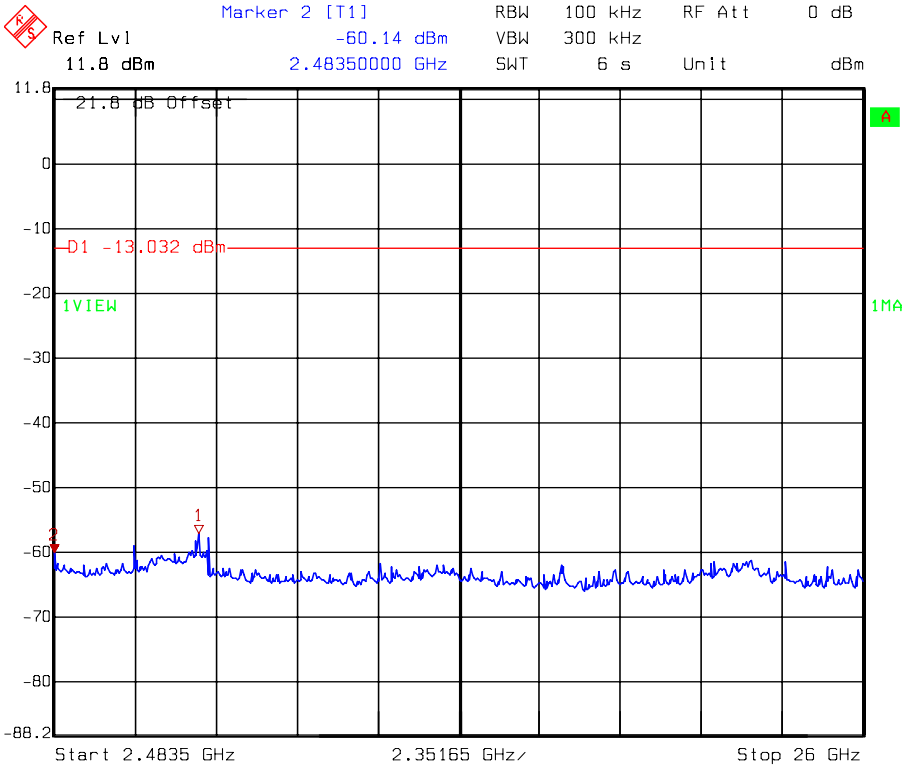
Chain 1: Conducted spurious @ 802.11b mode Channel 1 (1 of 3)



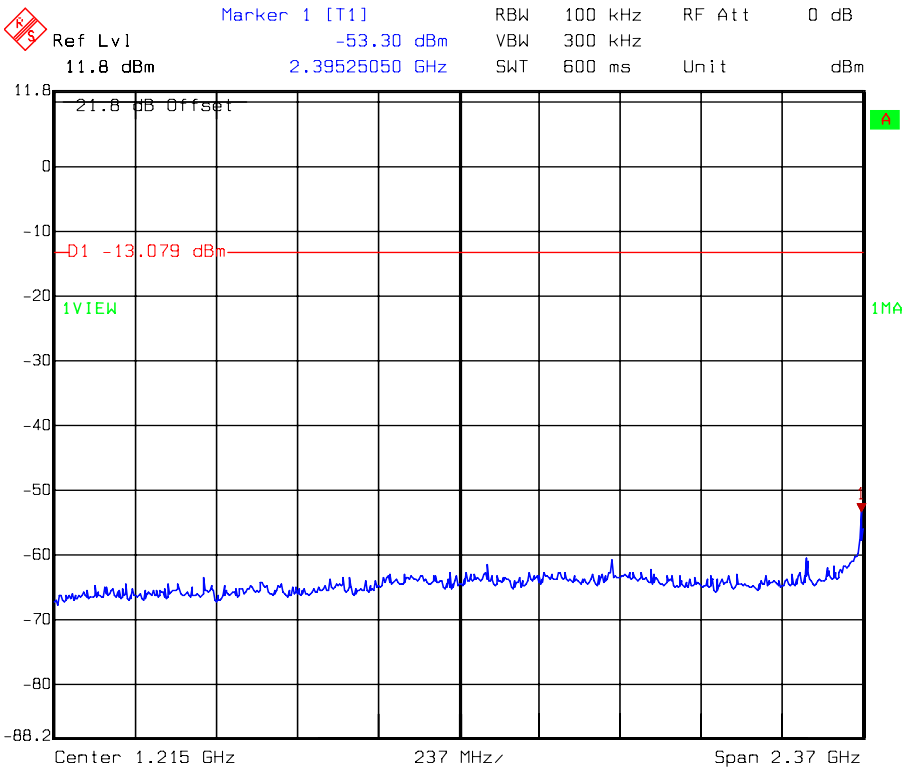
Chain 1: Conducted spurious @ 802.11b mode Channel 1 (2 of 3)



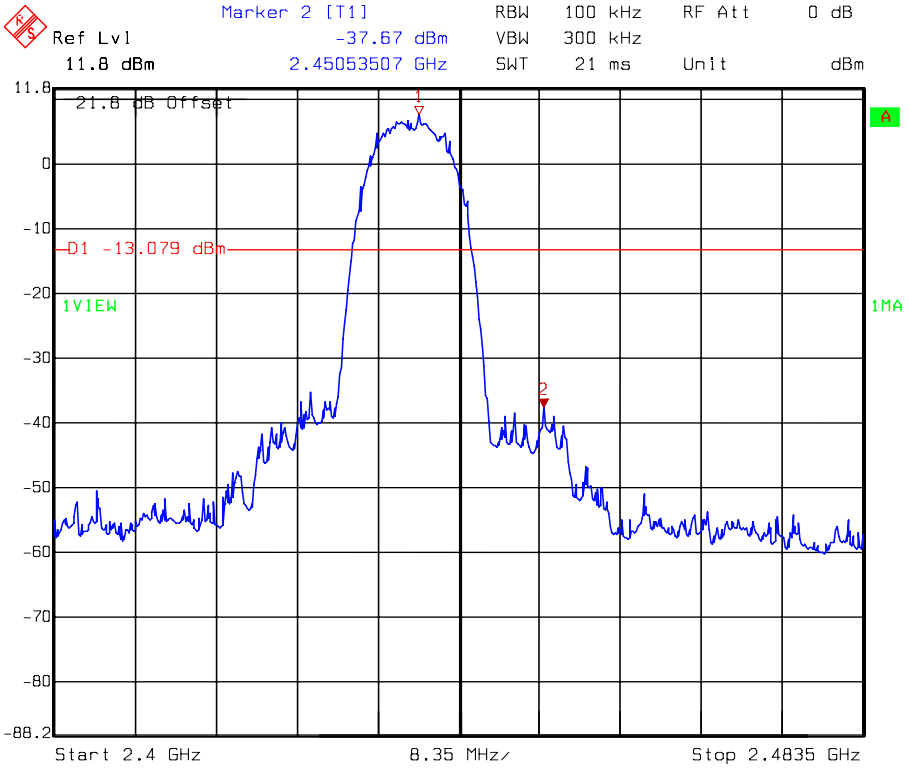
Chain 1: Conducted spurious @ 802.11b mode Channel 1 (3 of 3)



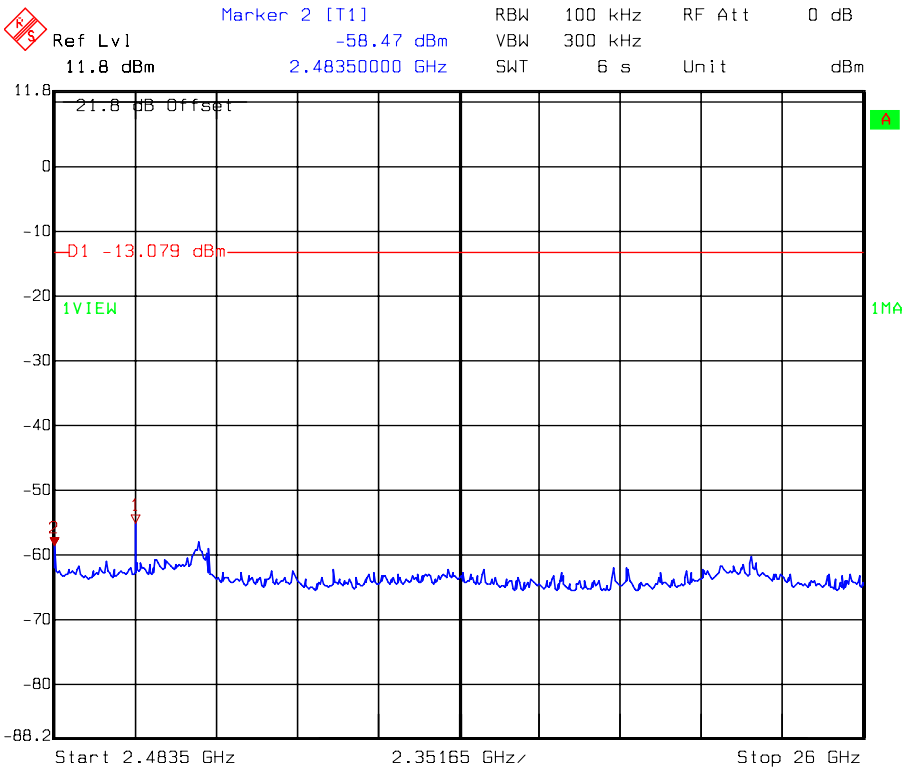
Chain 1: Conducted spurious @ 802.11b mode Channel 6 (1 of 3)



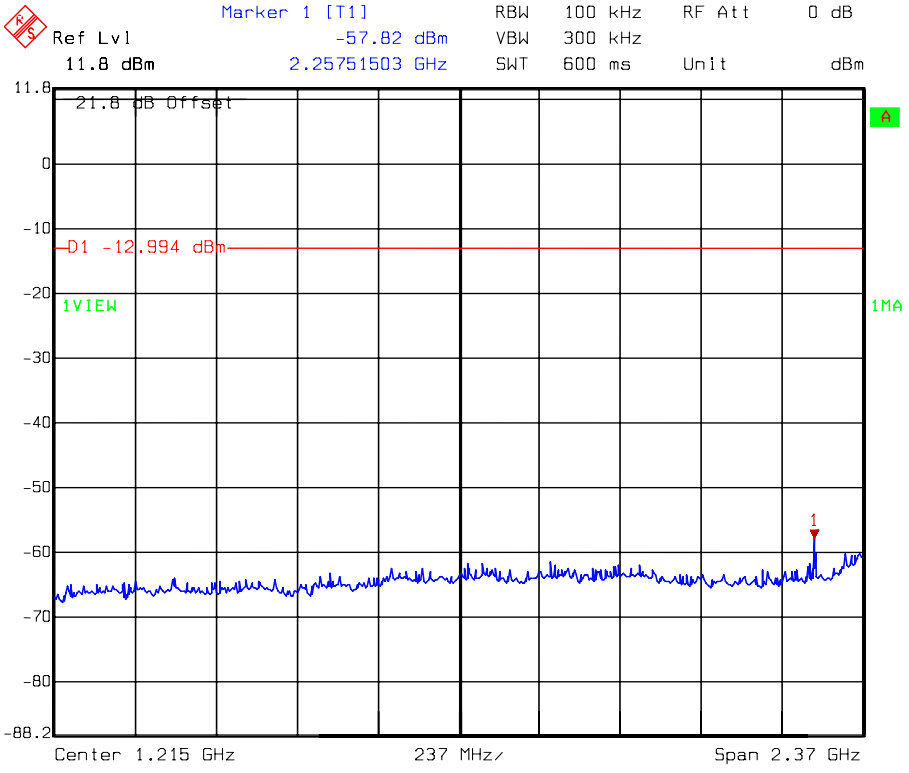
Chain 1: Conducted spurious @ 802.11b mode Channel 6 (2 of 3)



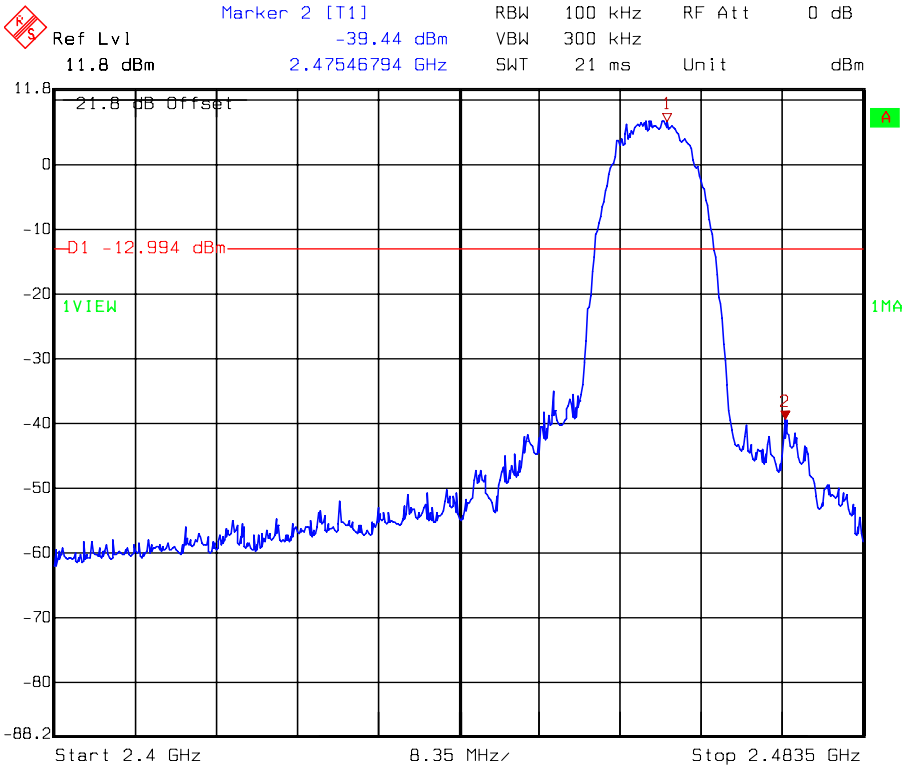
Chain 1: Conducted spurious @ 802.11b mode Channel 6 (3 of 3)



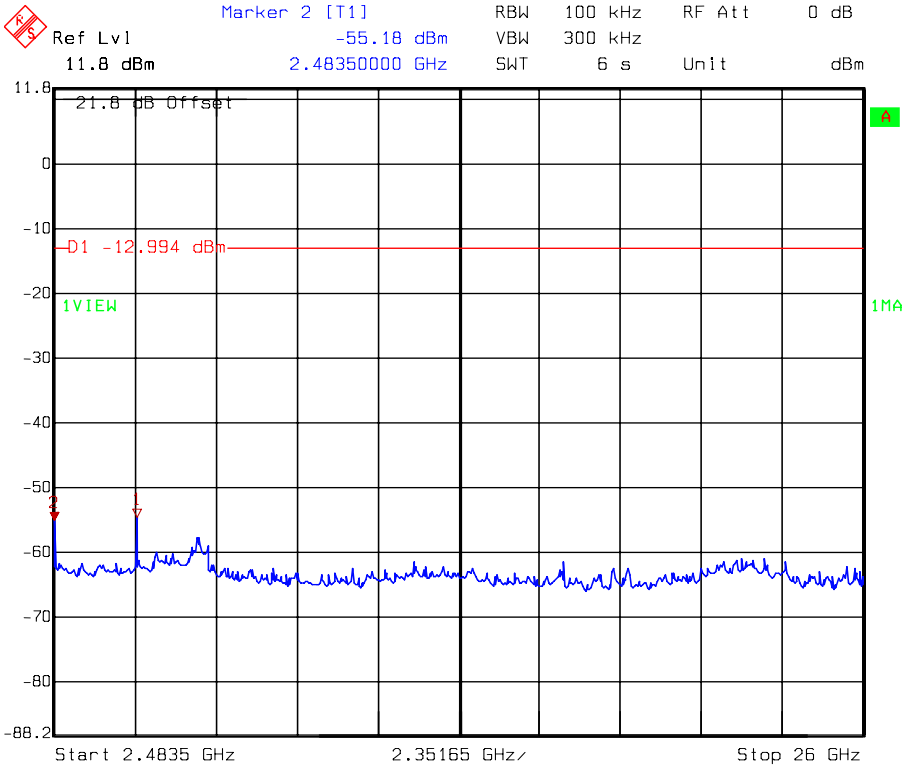
Chain 1: Conducted spurious @ 802.11b mode Channel 11 (1 of 3)



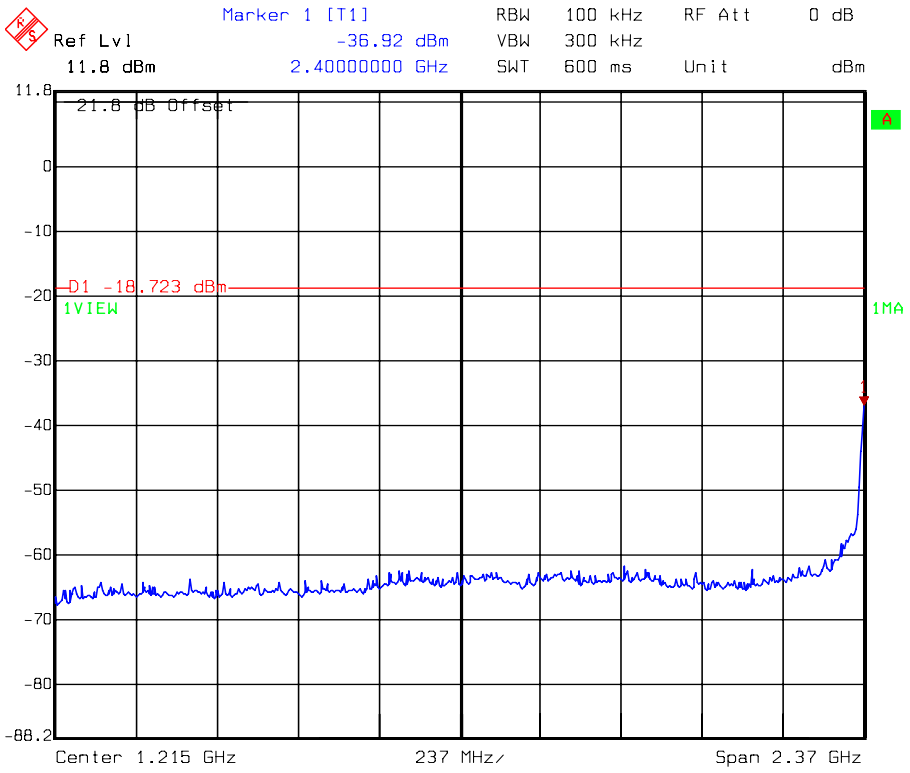
Chain 1: Conducted spurious @ 802.11b mode Channel 11 (2 of 3)



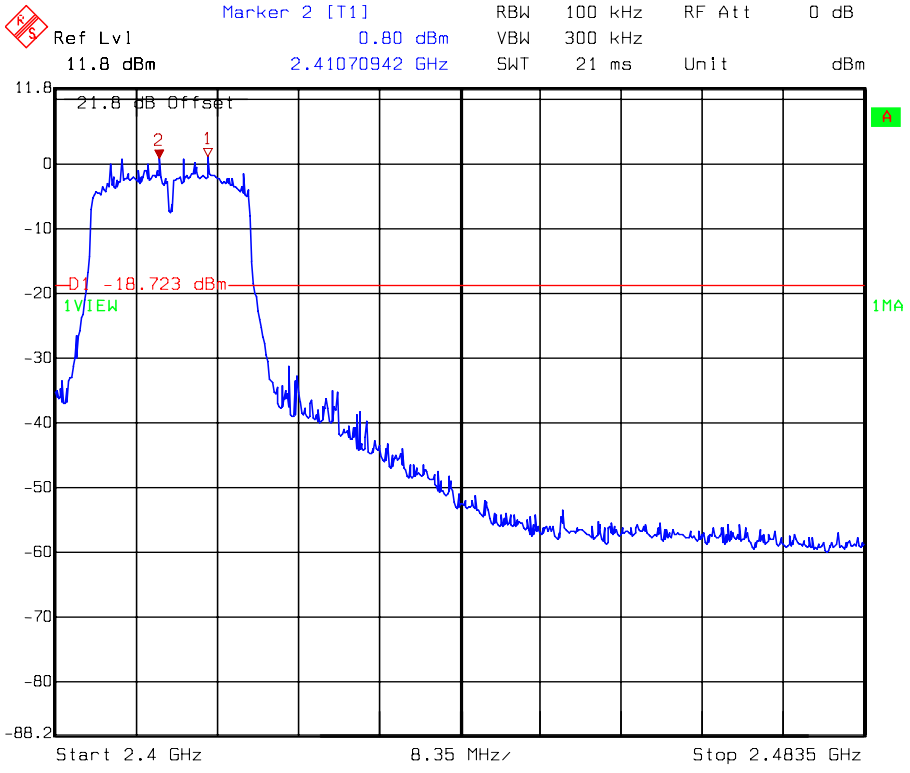
Chain 1: Conducted spurious @ 802.11b mode Channel 11 (3 of 3)



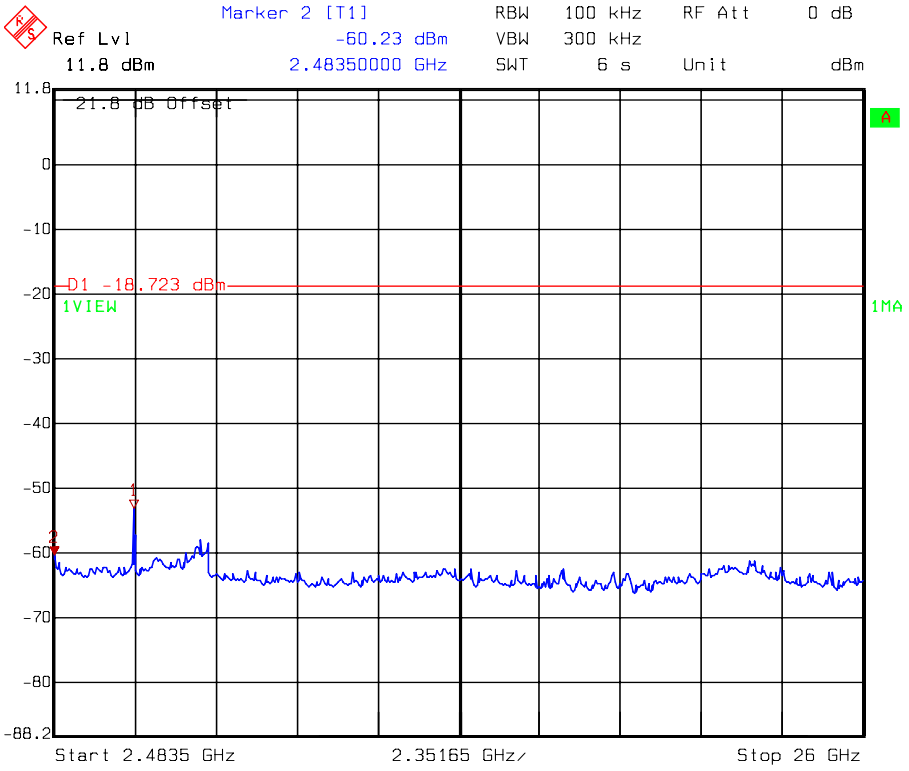
Chain 0: Conducted spurious @ 802.11g mode Channel 1 (1 of 3)



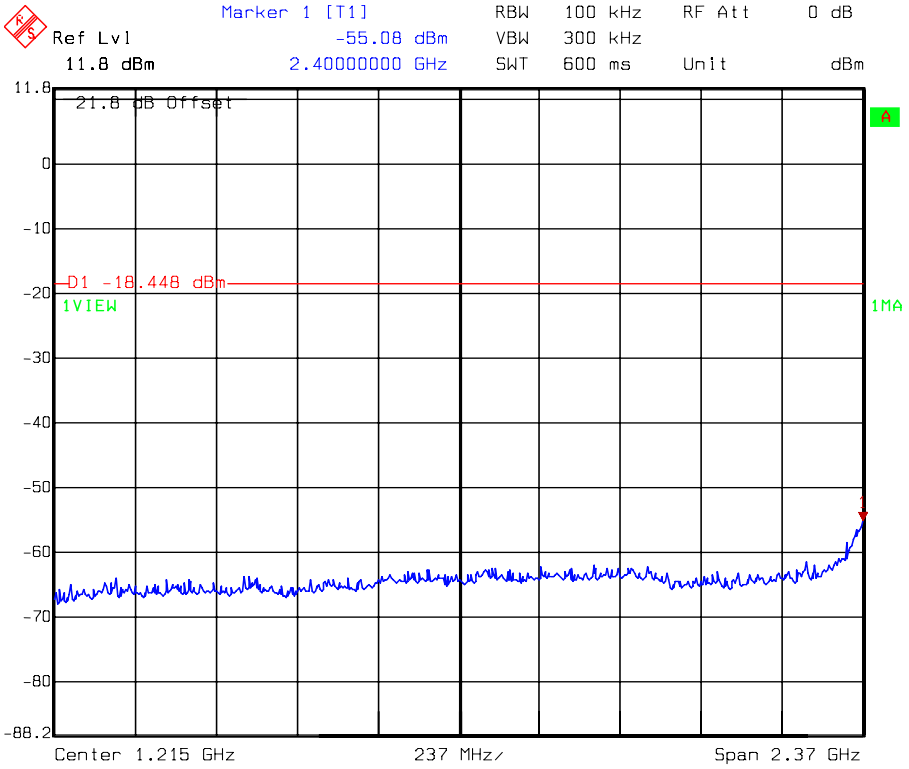
Chain 0: Conducted spurious @ 802.11g mode Channel 1 (2 of 3)



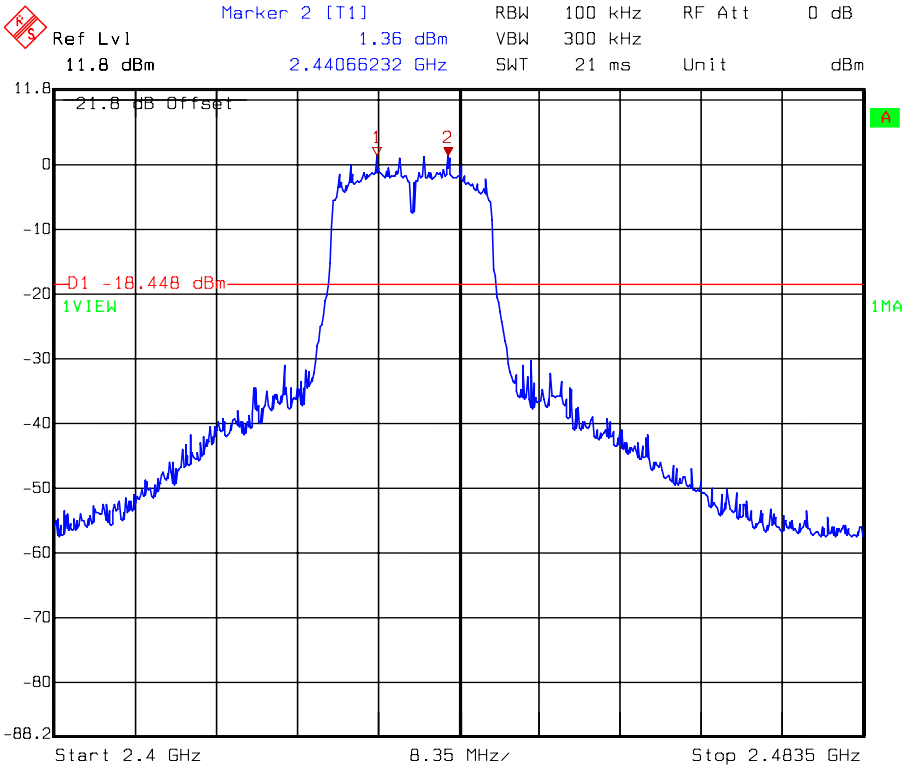
Chain 0: Conducted spurious @ 802.11g mode Channel 1 (3 of 3)



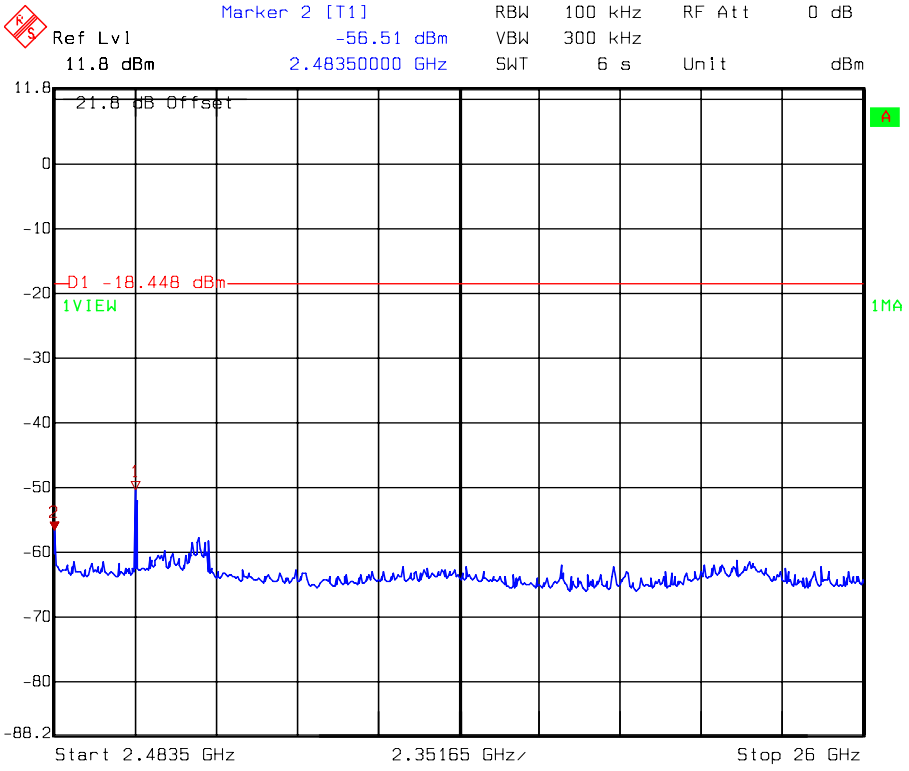
Chain 0: Conducted spurious @ 802.11g mode Channel 6 (1 of 3)



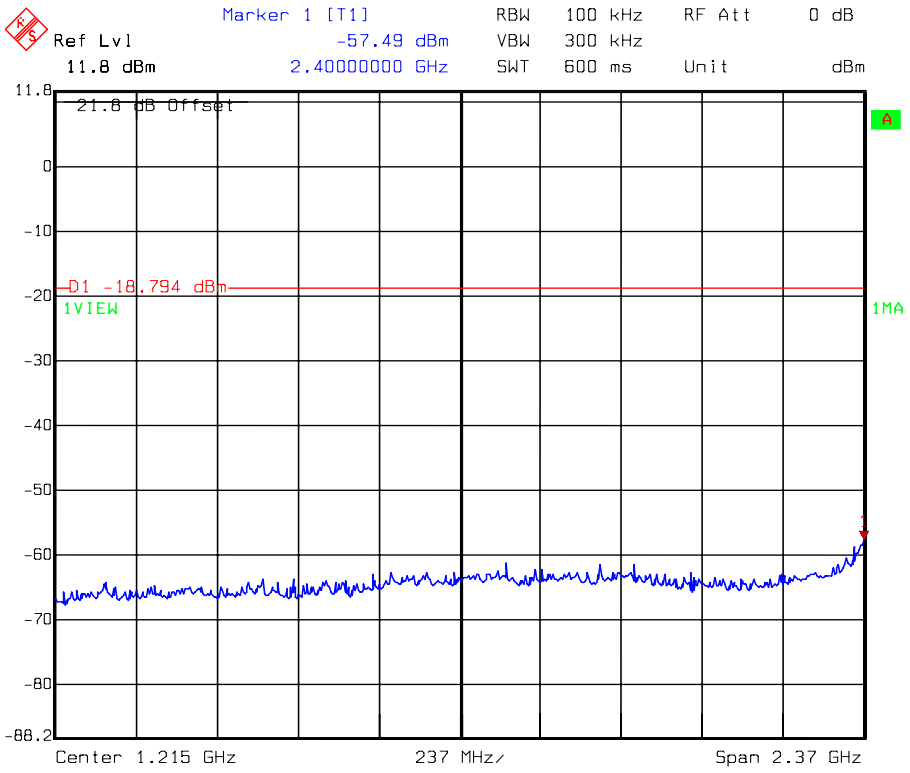
Chain 0: Conducted spurious @ 802.11g mode Channel 6 (2 of 3)



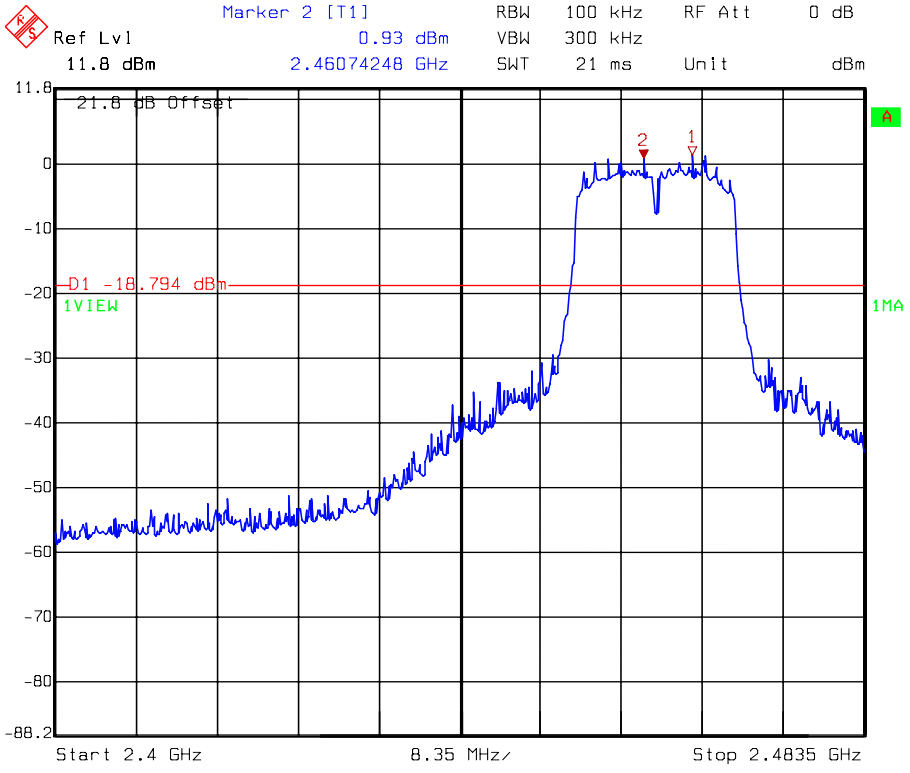
Chain 0: Conducted spurious @ 802.11g mode Channel 6 (3 of 3)



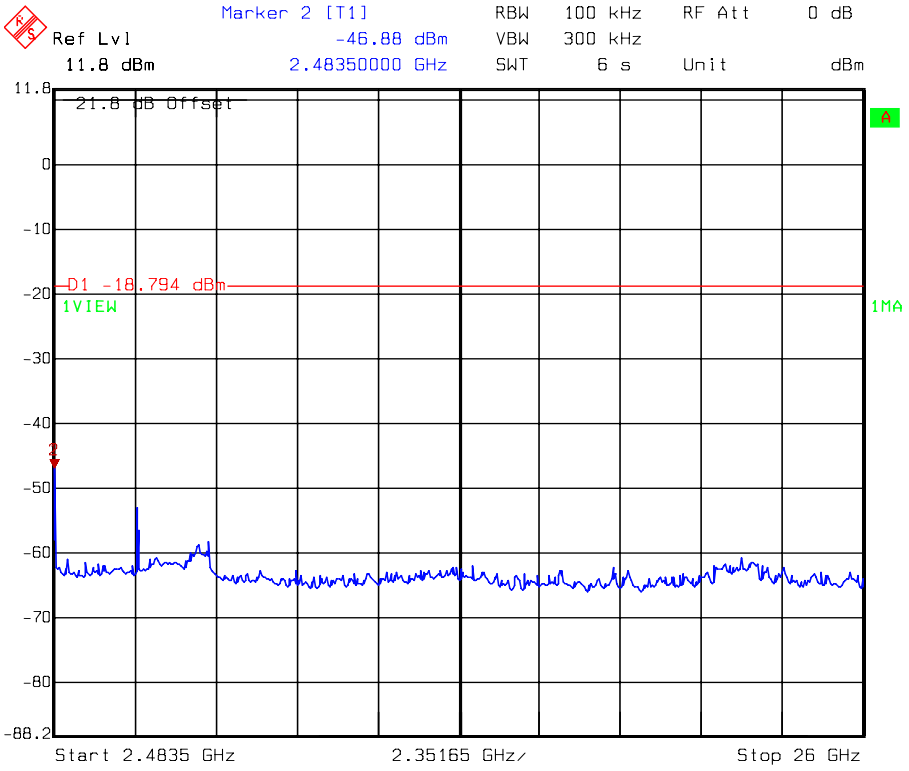
Chain 0: Conducted spurious @ 802.11g mode Channel 11 (1 of 3)



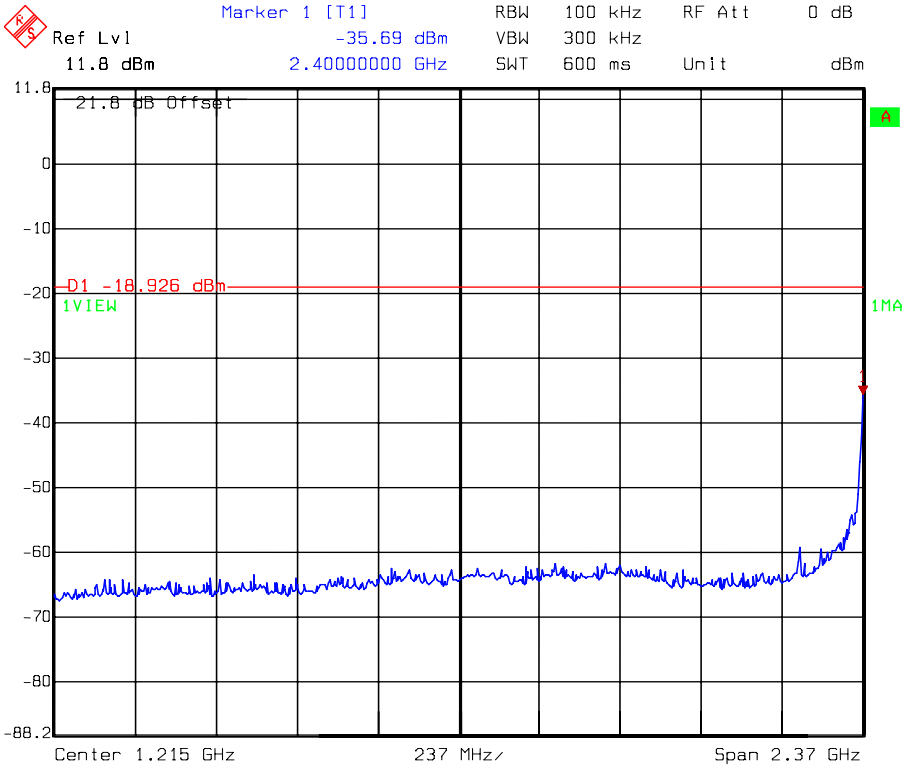
Chain 0: Conducted spurious @ 802.11g mode Channel 11 (2 of 3)



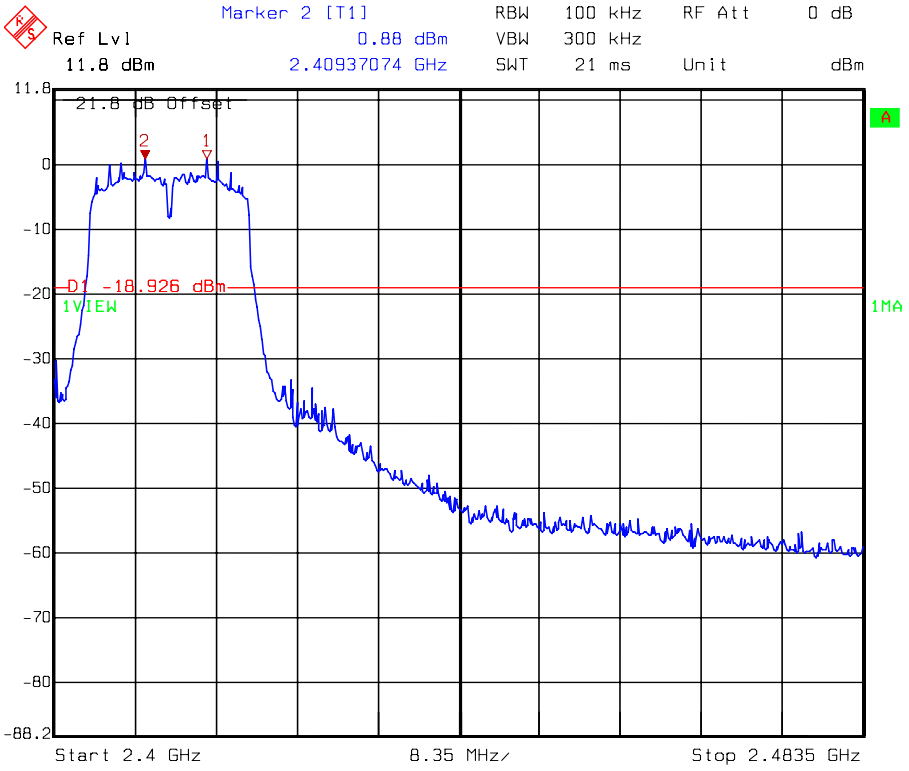
Chain 0: Conducted spurious @ 802.11g mode Channel 11 (3 of 3)



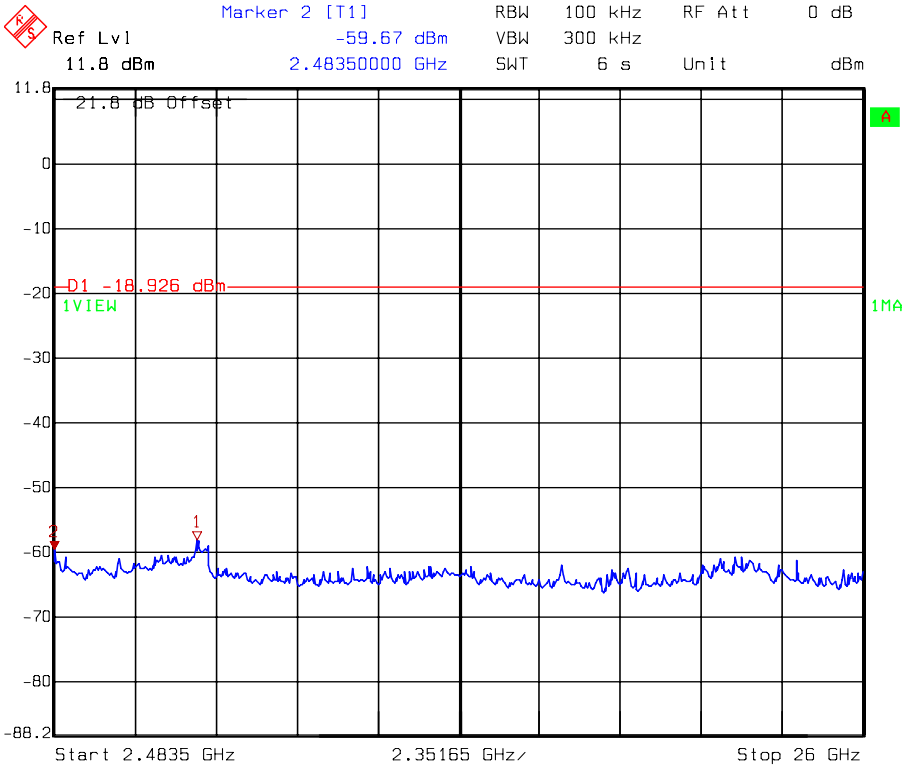
Chain 1: Conducted spurious @ 802.11g mode Channel 1 (1 of 3)



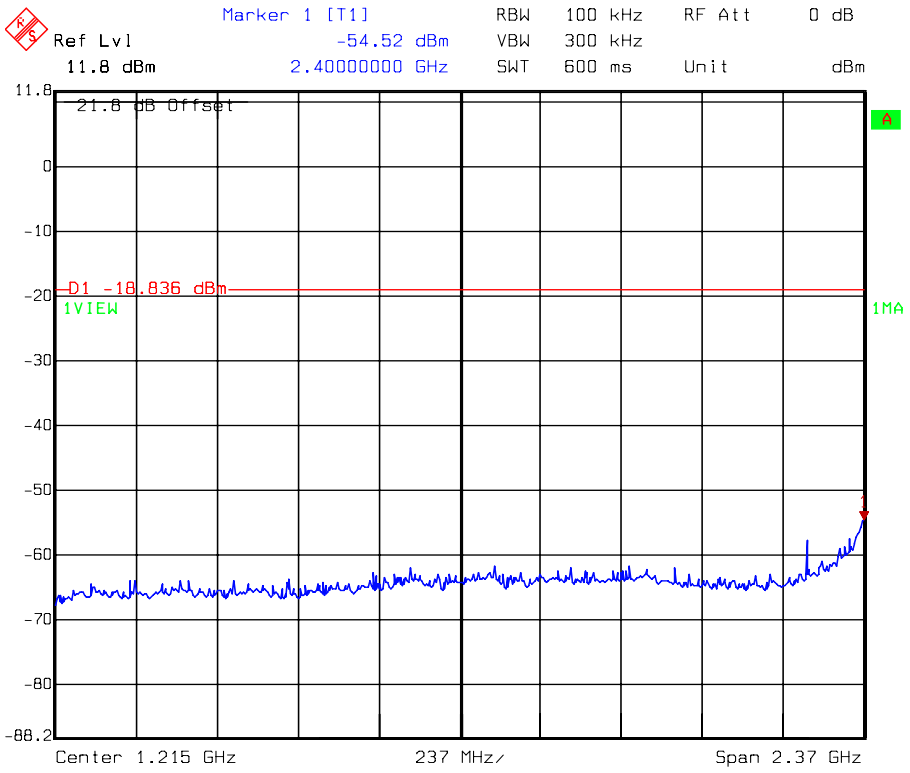
Chain 1: Conducted spurious @ 802.11g mode Channel 1 (2 of 3)



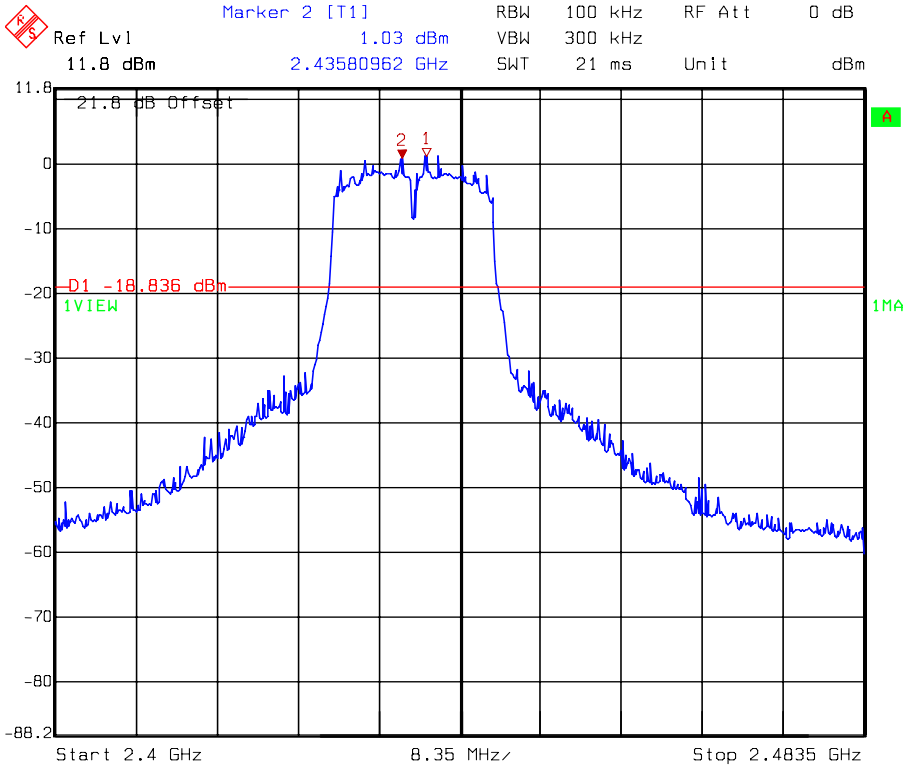
Chain 1: Conducted spurious @ 802.11g mode Channel 1 (3 of 3)



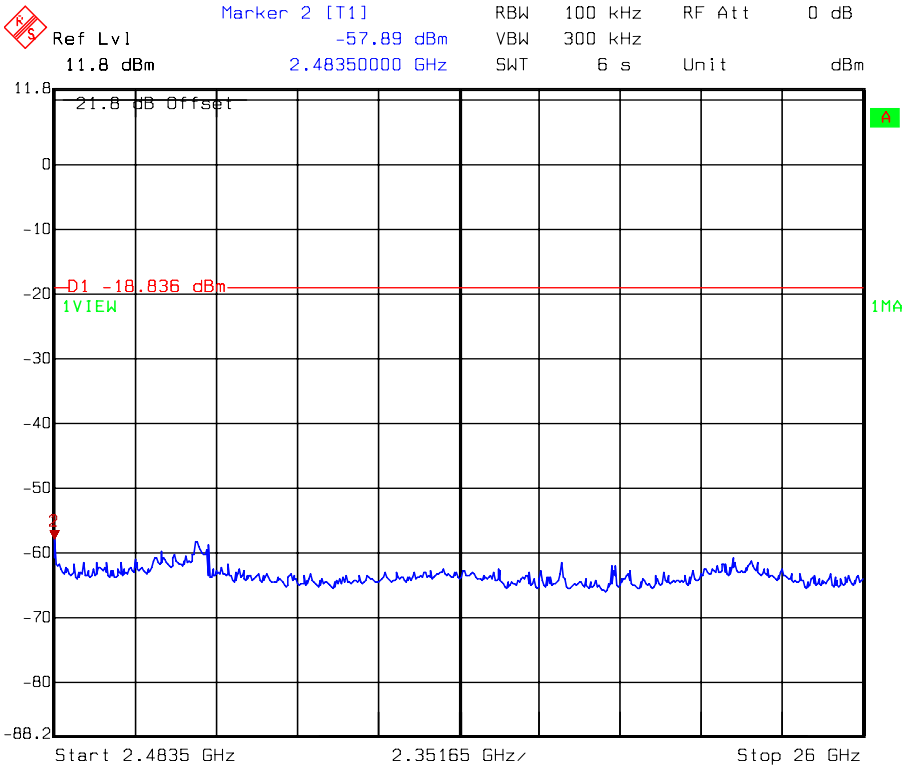
Chain 1: Conducted spurious @ 802.11g mode Channel 6 (1 of 3)



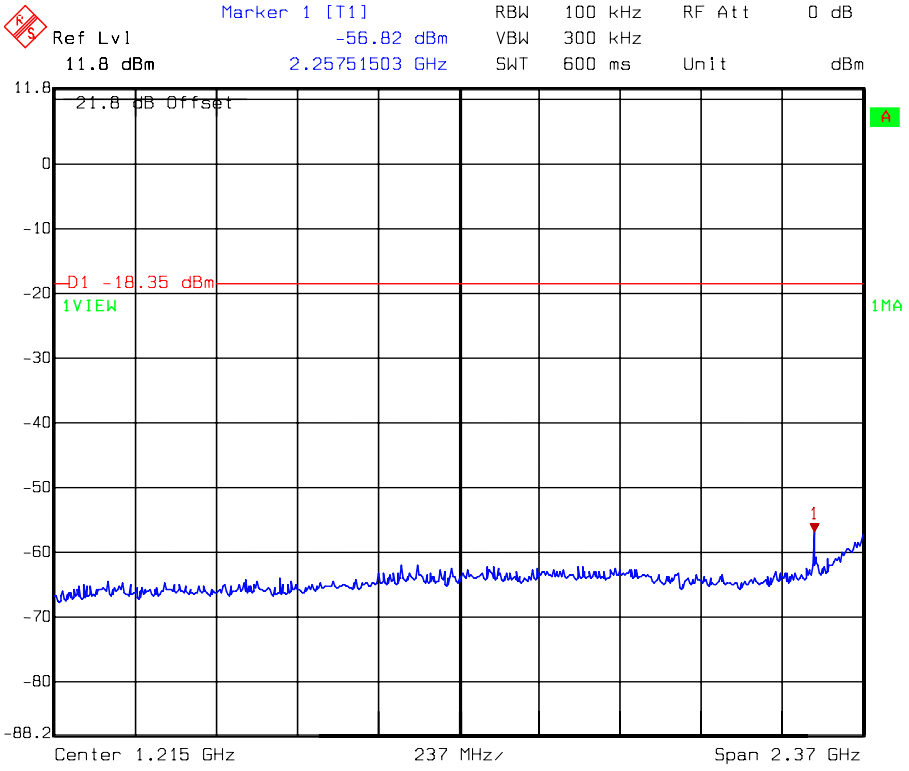
Chain 1: Conducted spurious @ 802.11g mode Channel 6 (2 of 3)



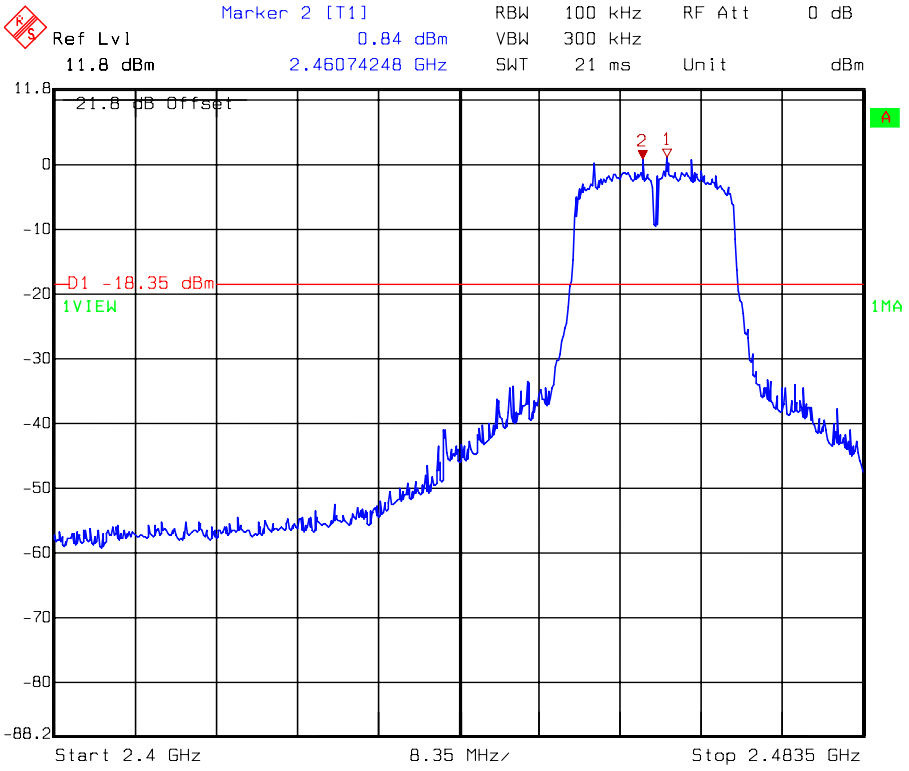
Chain 1: Conducted spurious @ 802.11g mode Channel 6 (3 of 3)



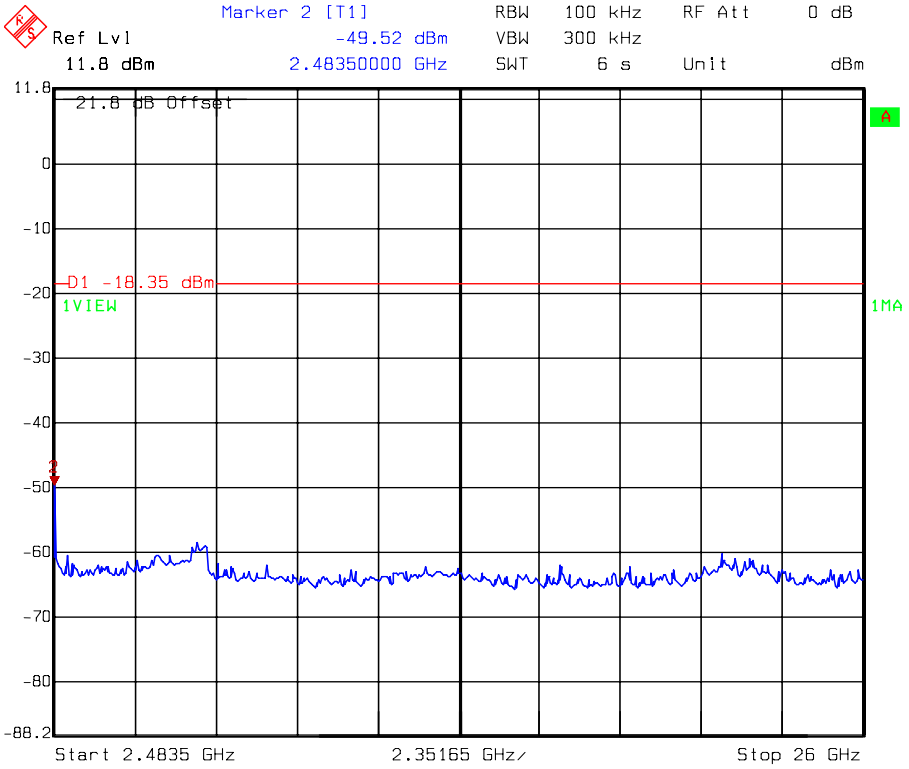
Chain 1: Conducted spurious @ 802.11g mode Channel 11 (1 of 3)



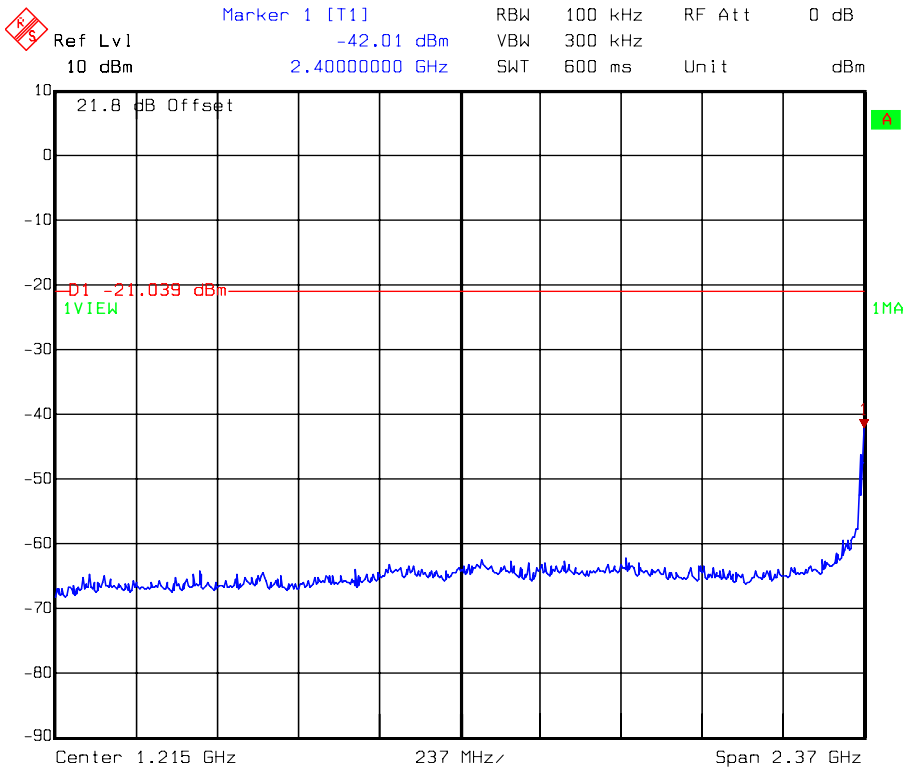
Chain 1: Conducted spurious @ 802.11g mode Channel 11 (2 of 3)



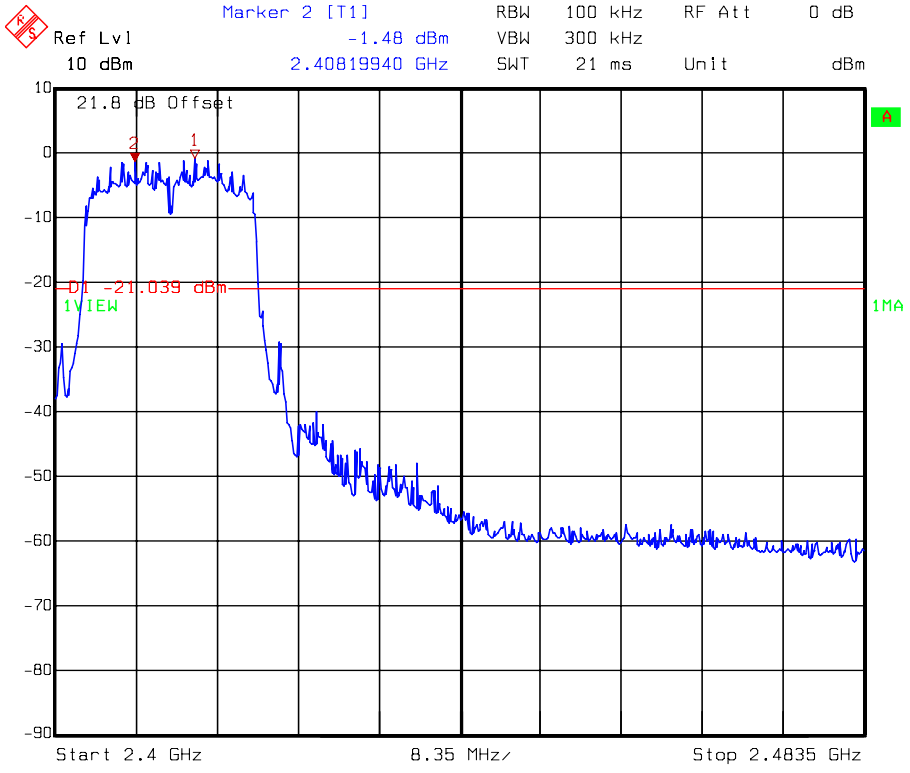
Chain 1: Conducted spurious @ 802.11g mode Channel 11 (3 of 3)



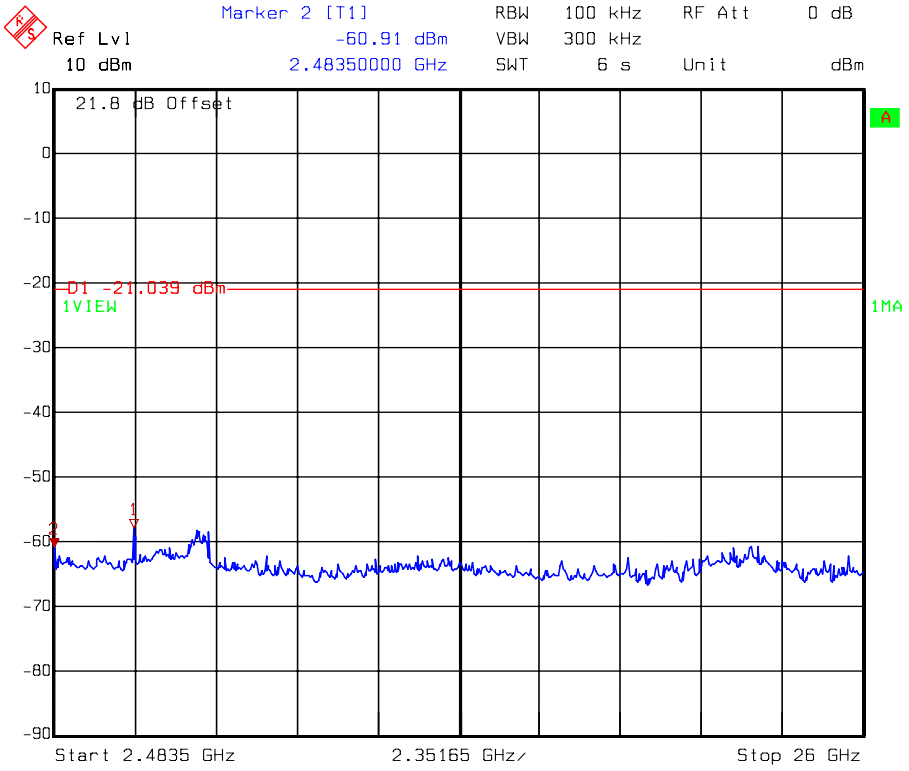
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 1 (1 of 3)



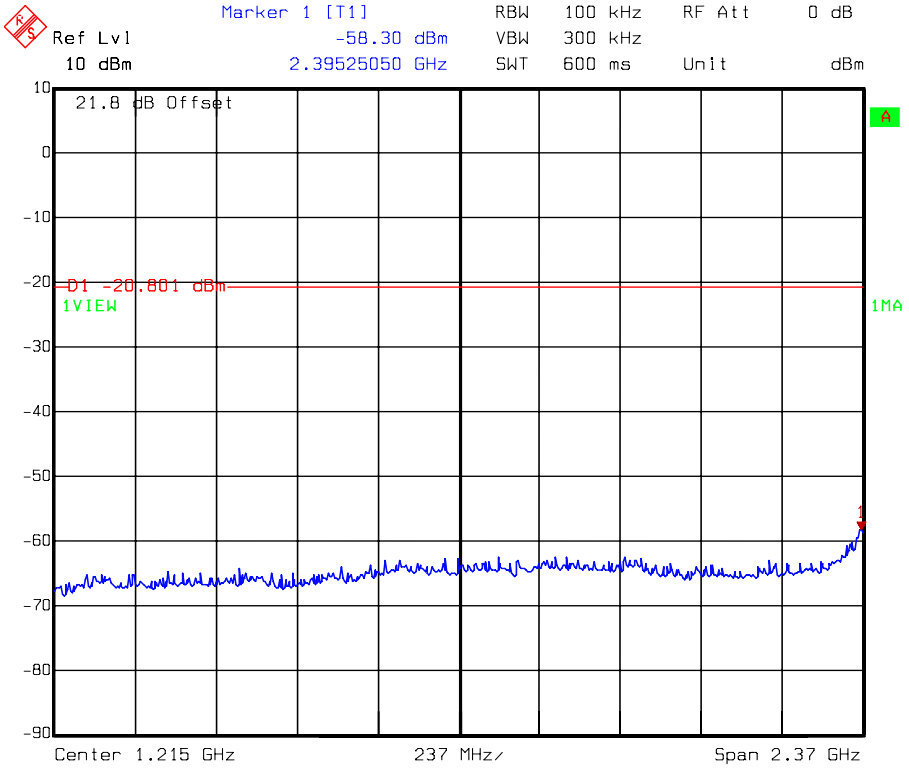
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 1 (2 of 3)



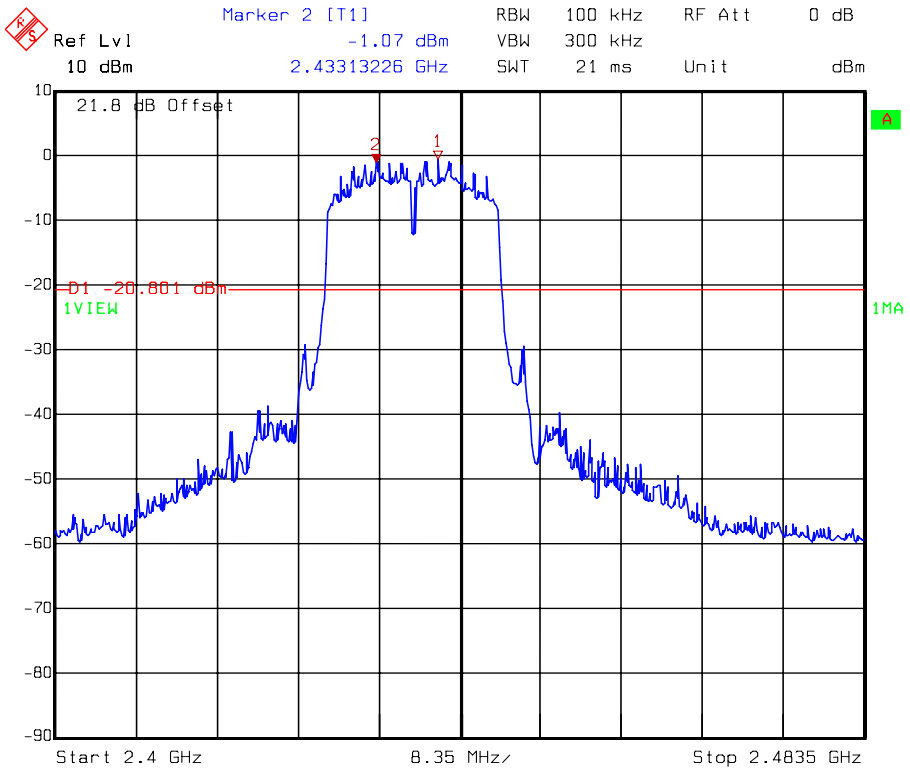
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 1 (3 of 3)



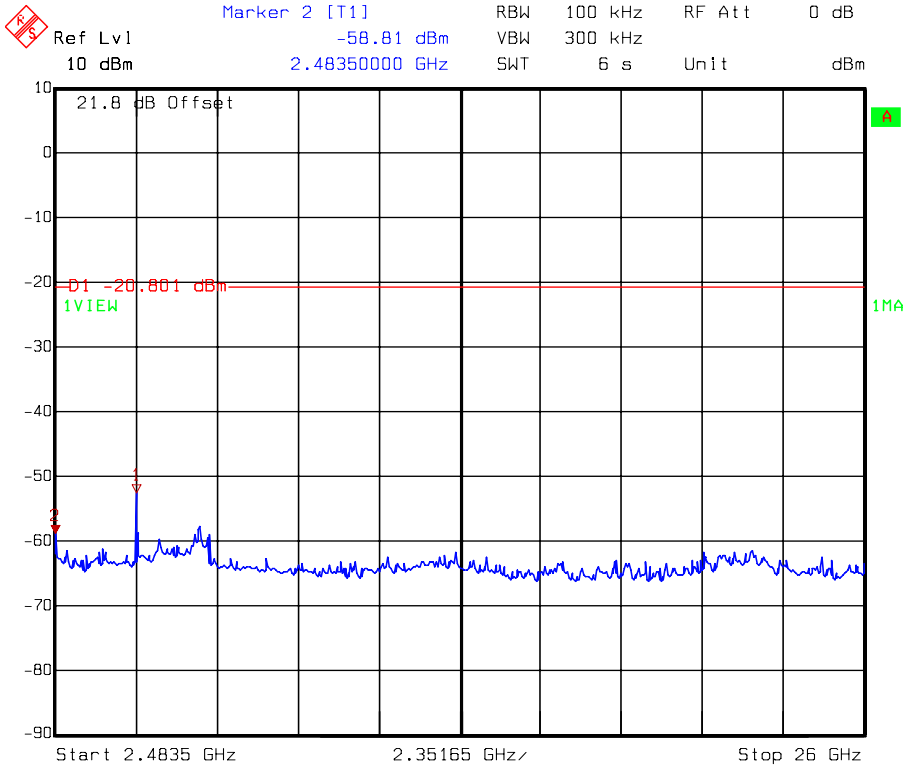
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 6 (1 of 3)



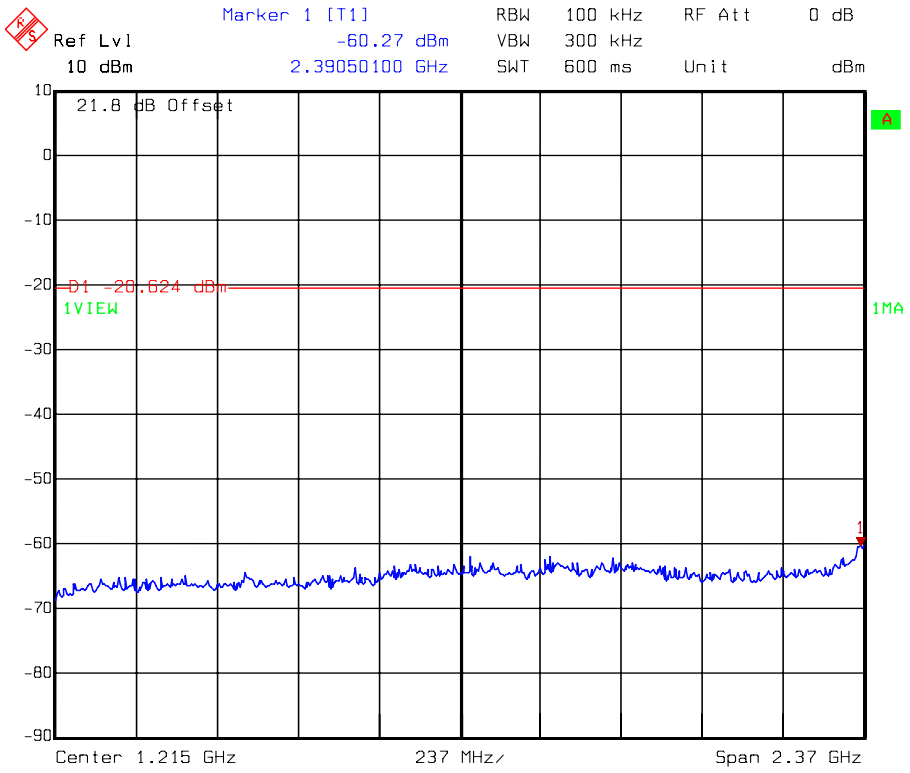
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 6 (2 of 3)



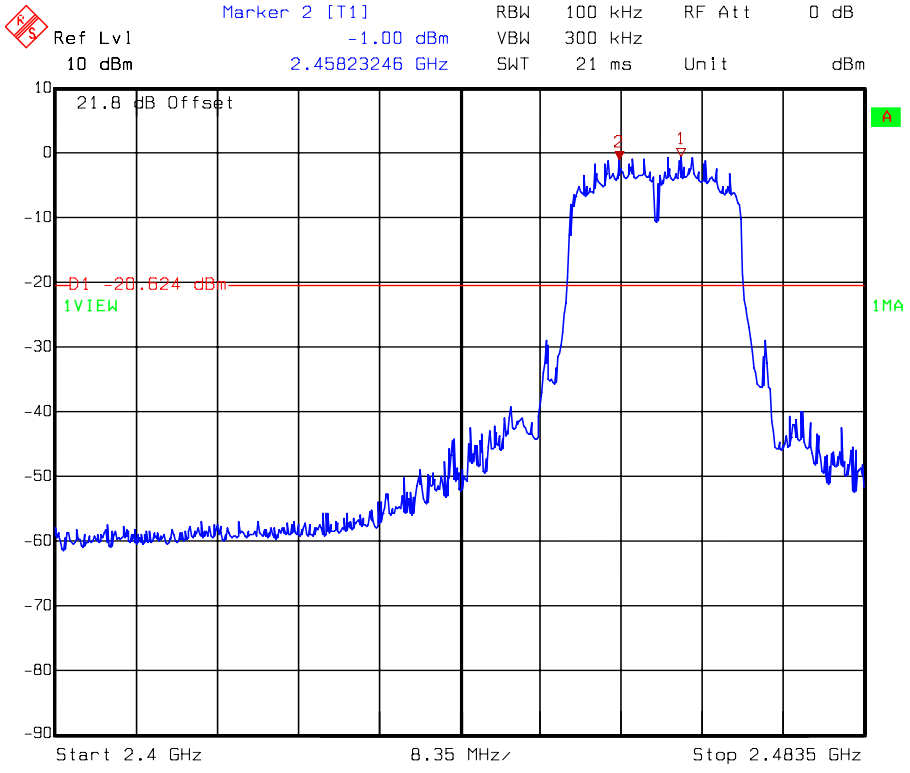
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 6 (3 of 3)



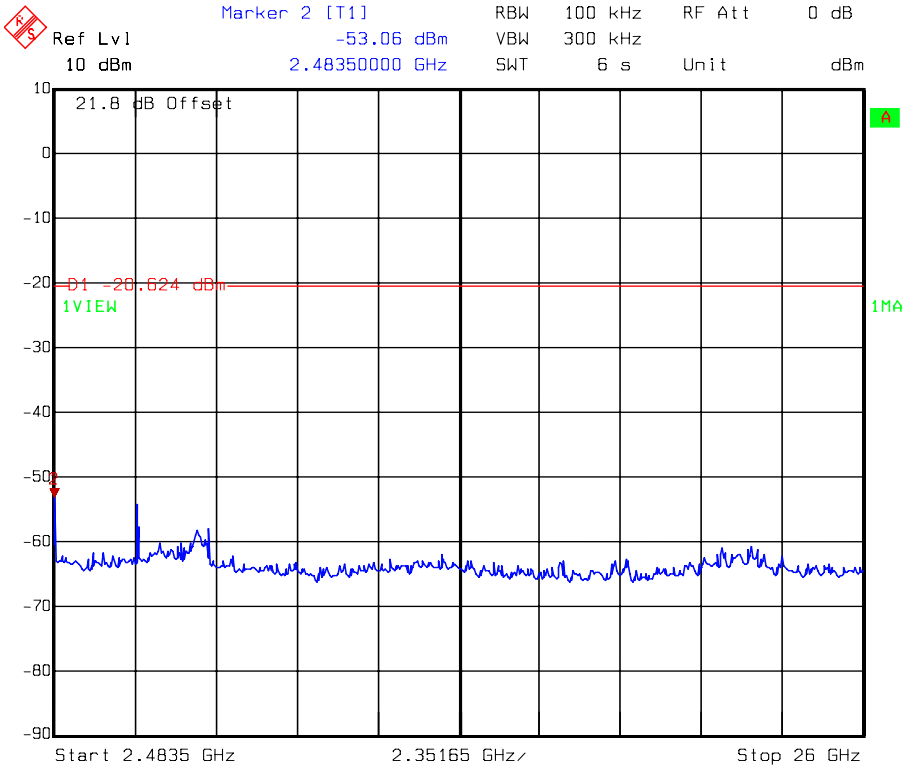
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 11 (1 of 3)



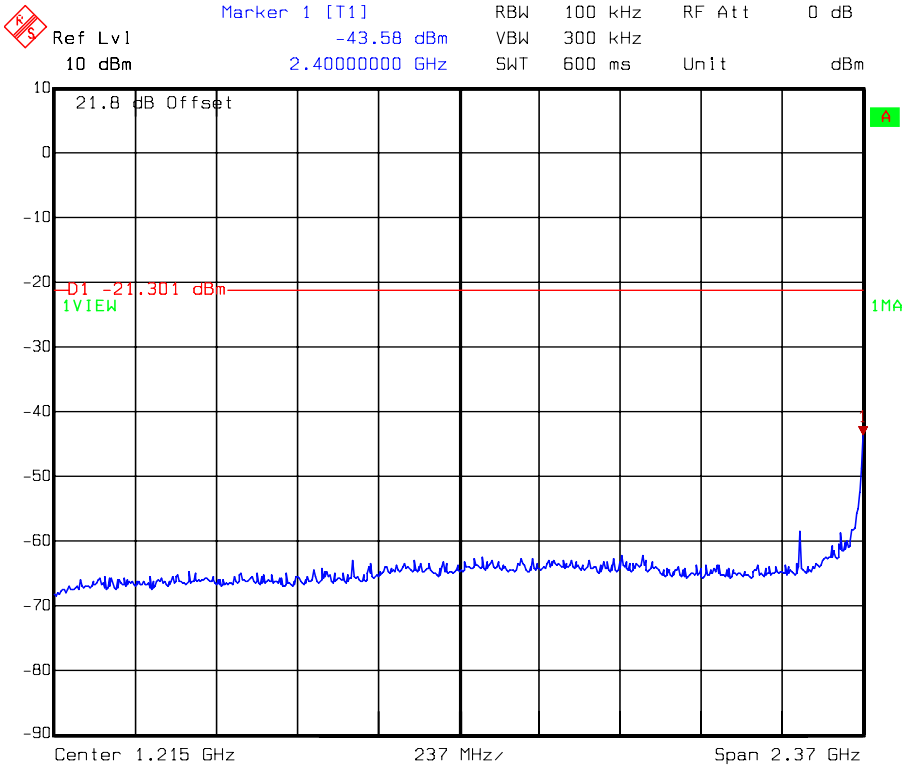
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 11 (2 of 3)



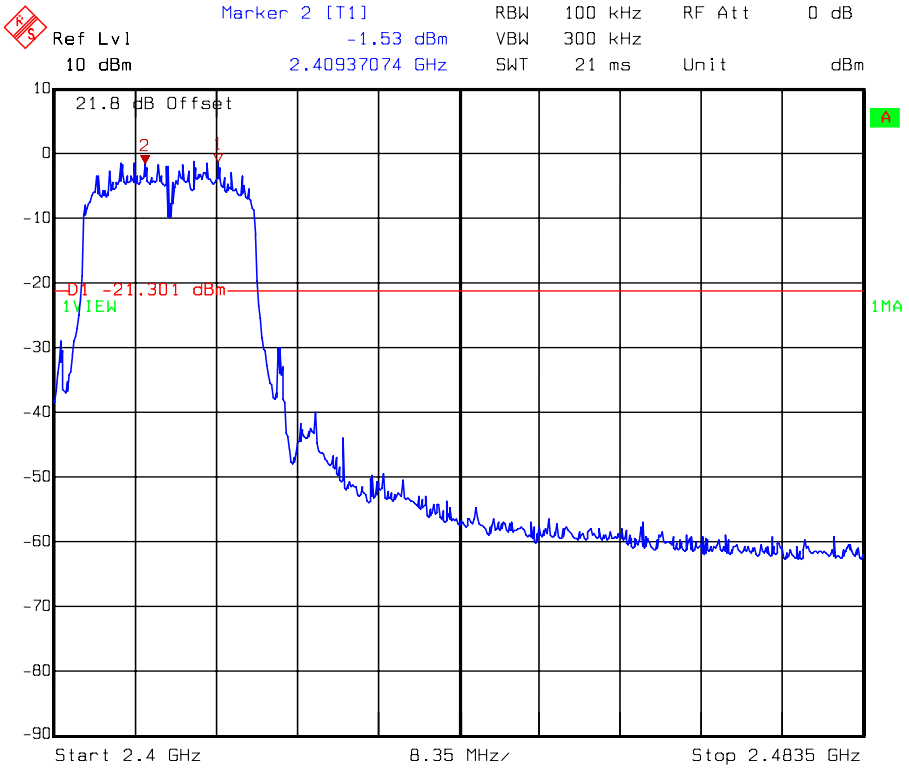
Chain 0: Conducted spurious @ 802.11n HT20 mode Channel 11 (3 of 3)



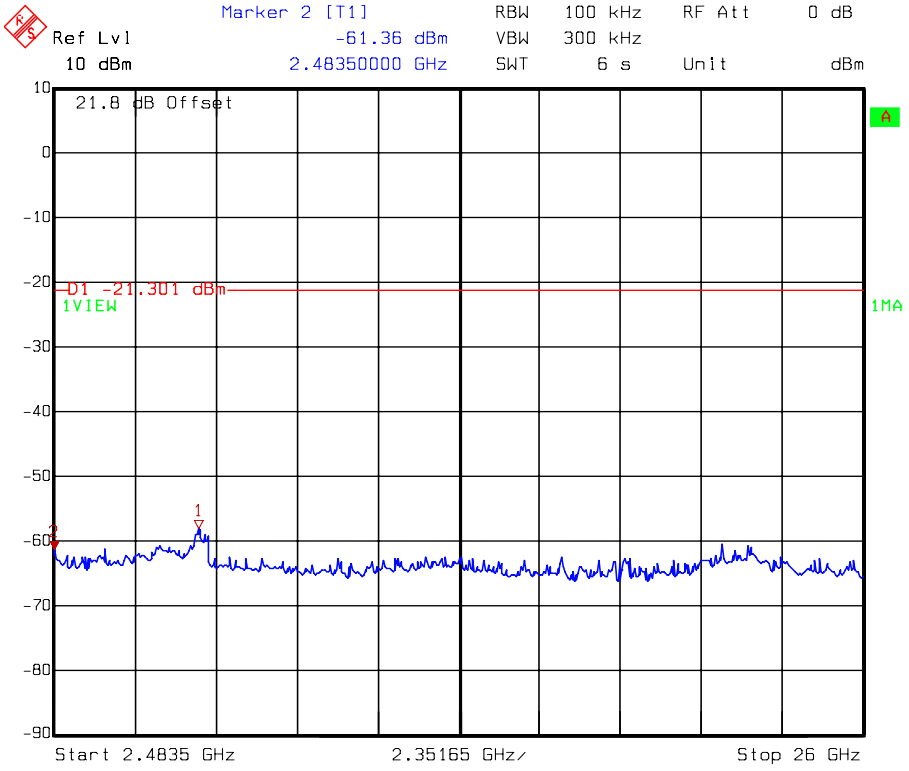
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 1 (1 of 3)



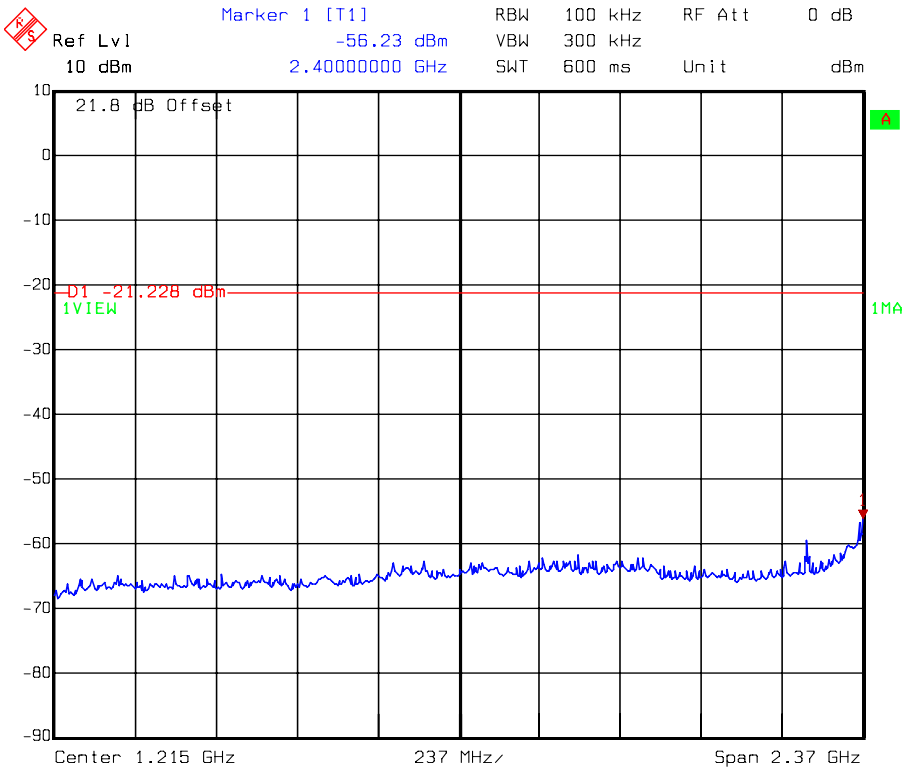
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 1 (2 of 3)



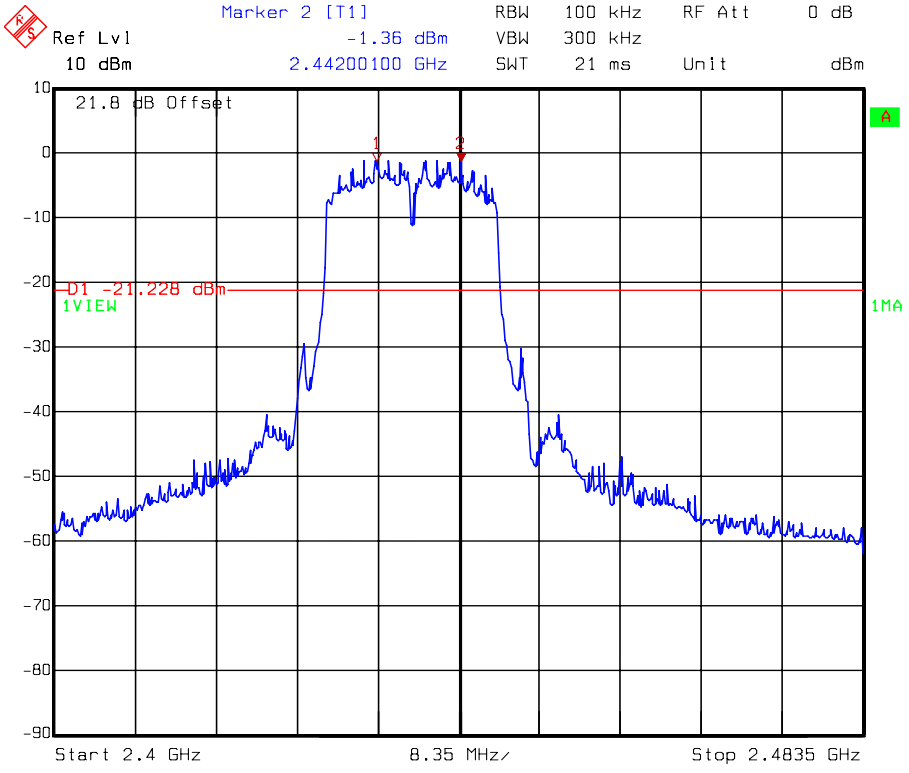
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 1 (3 of 3)



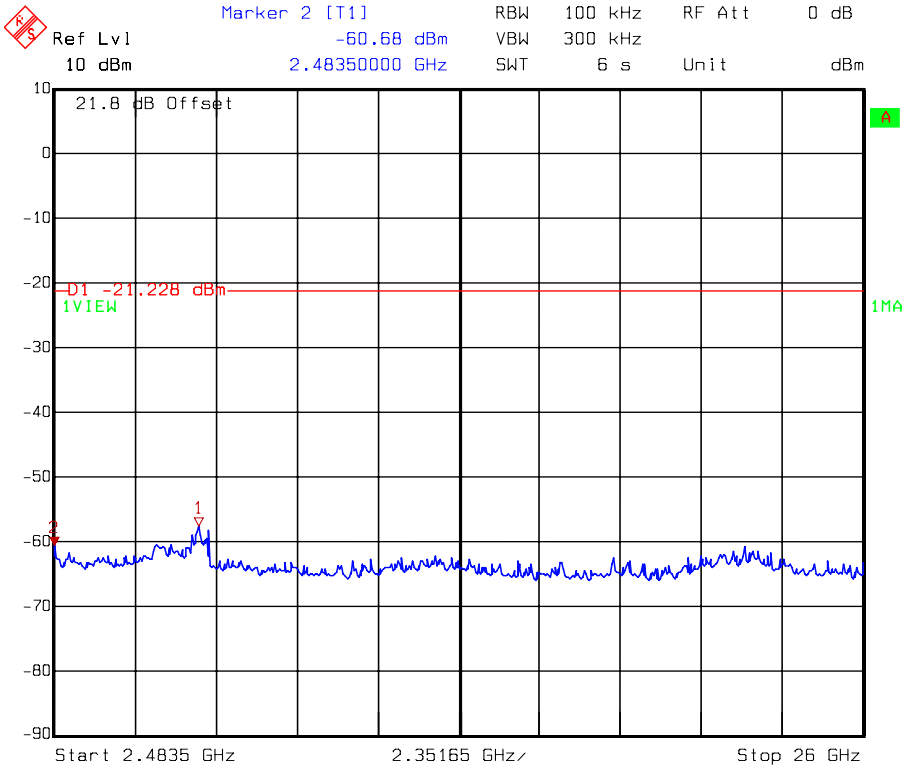
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 6 (1 of 3)



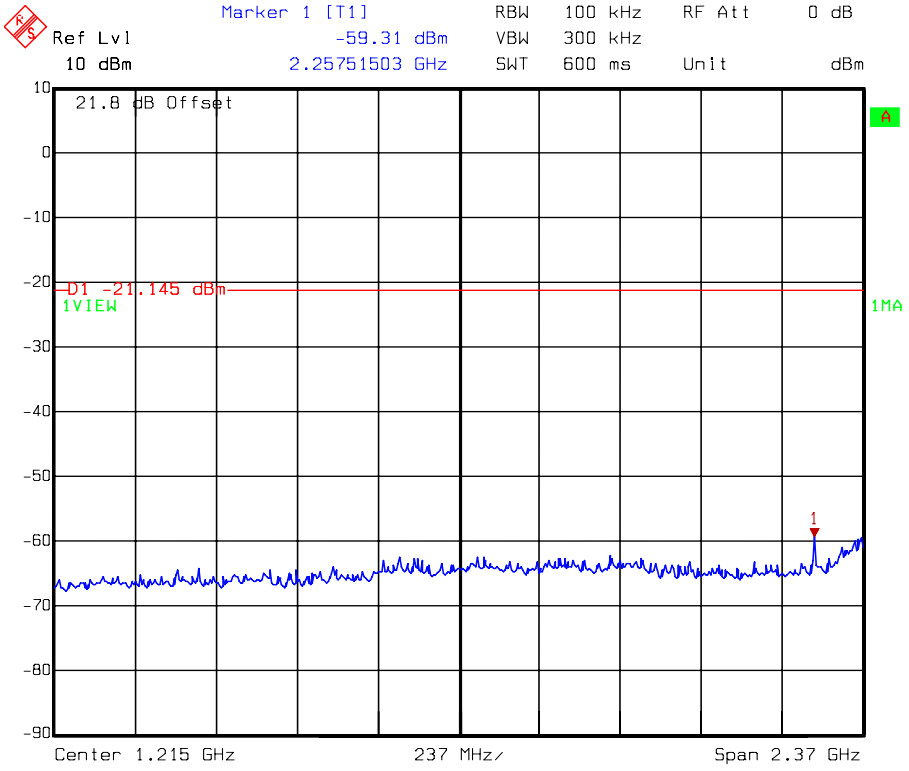
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 6 (2 of 3)



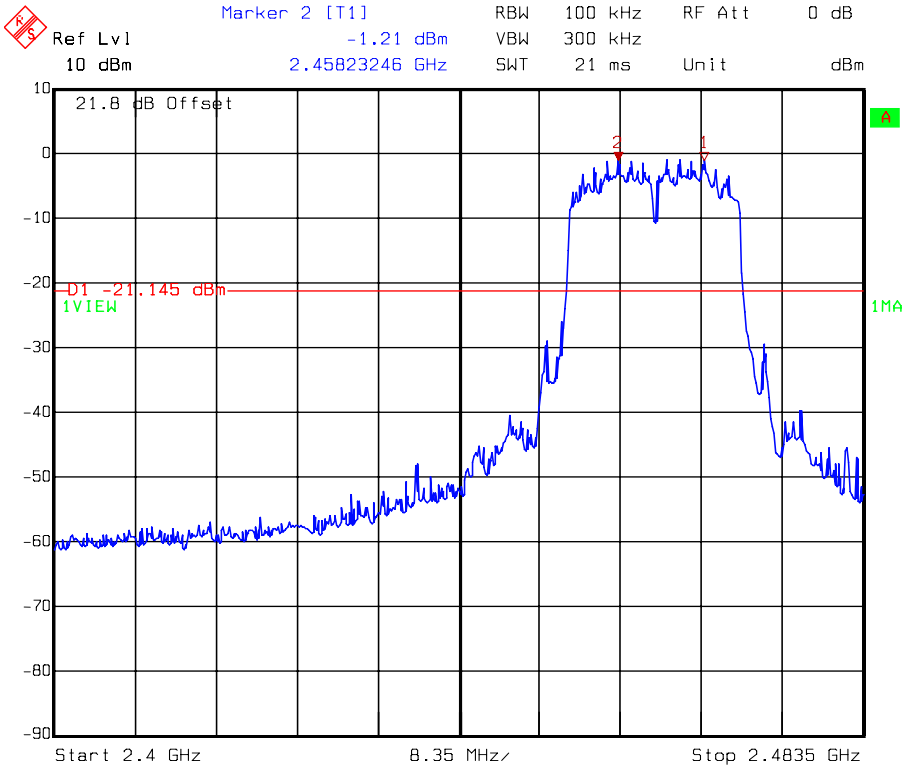
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 6 (3 of 3)



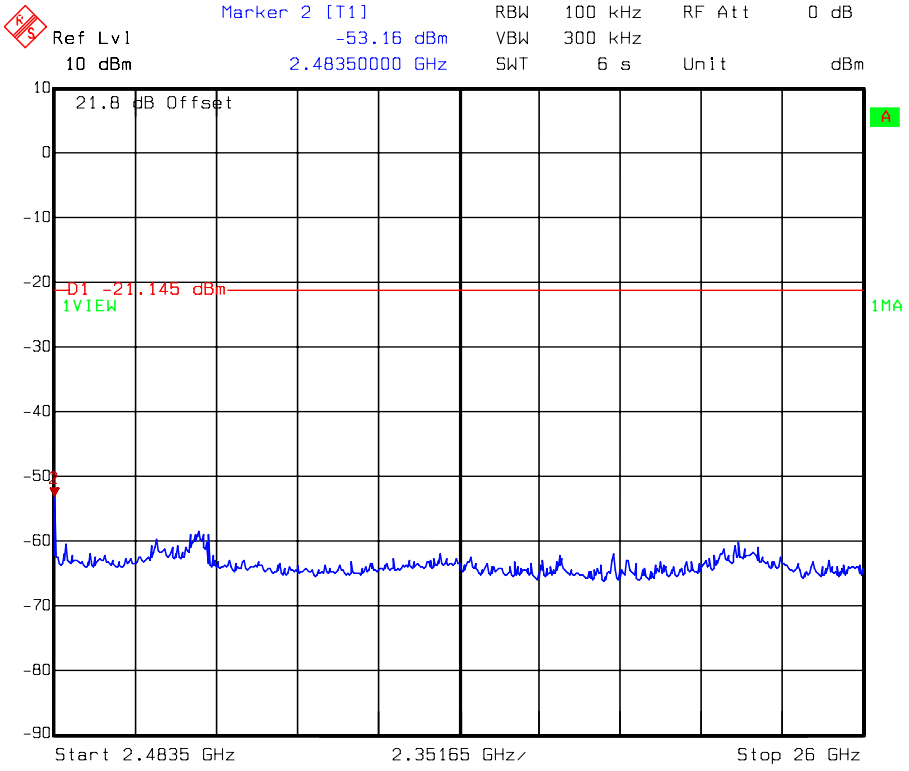
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 11 (1 of 3)



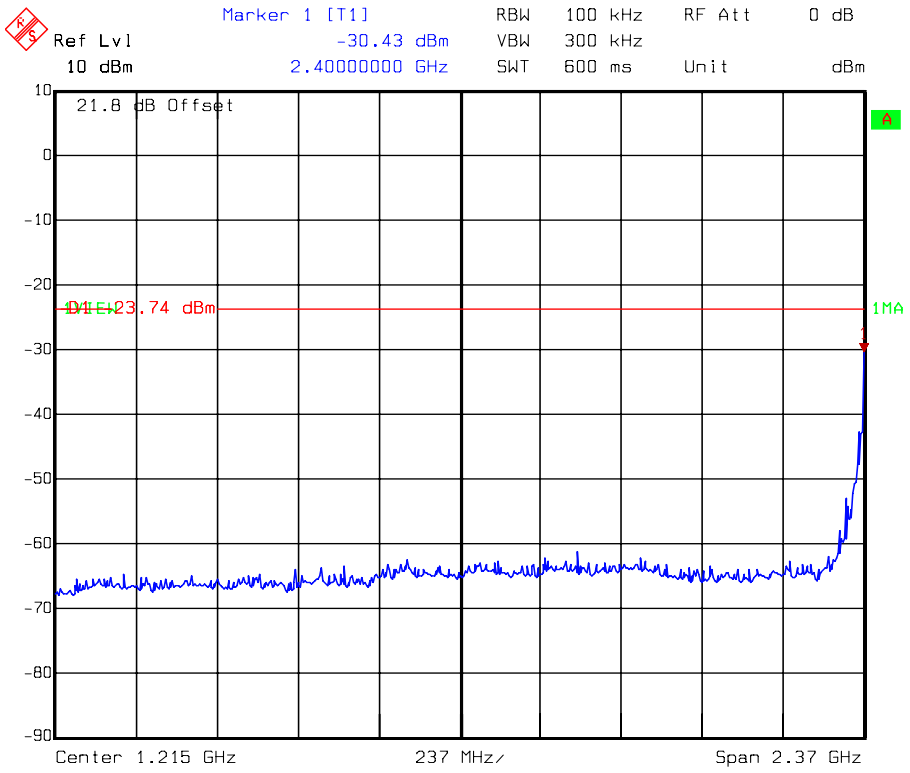
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 11 (2 of 3)



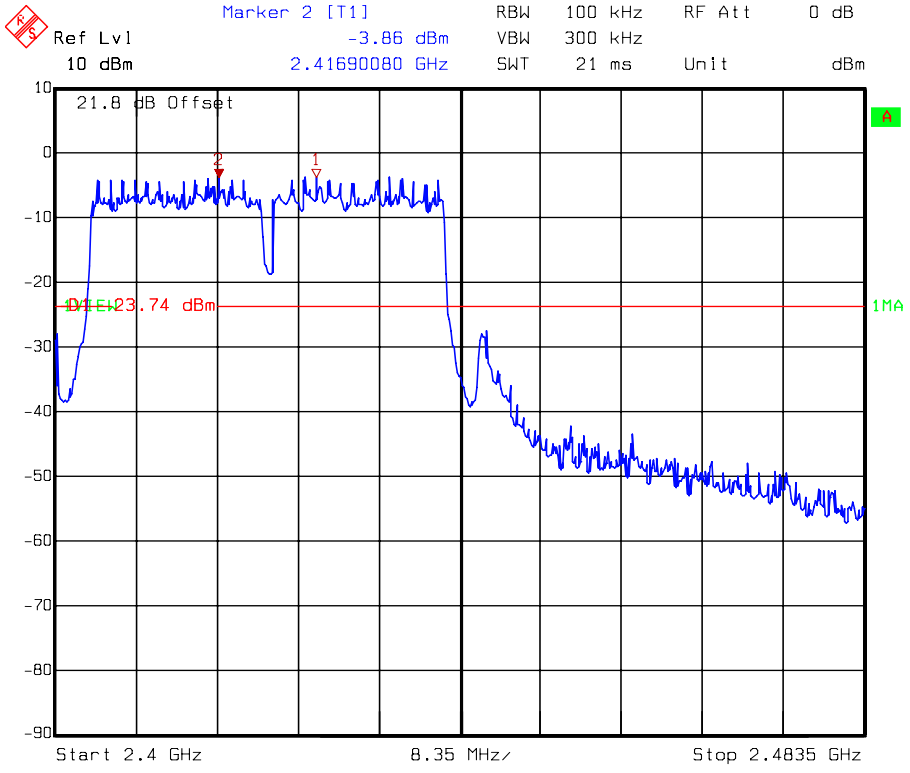
Chain 1: Conducted spurious @ 802.11n HT20 mode Channel 11 (3 of 3)



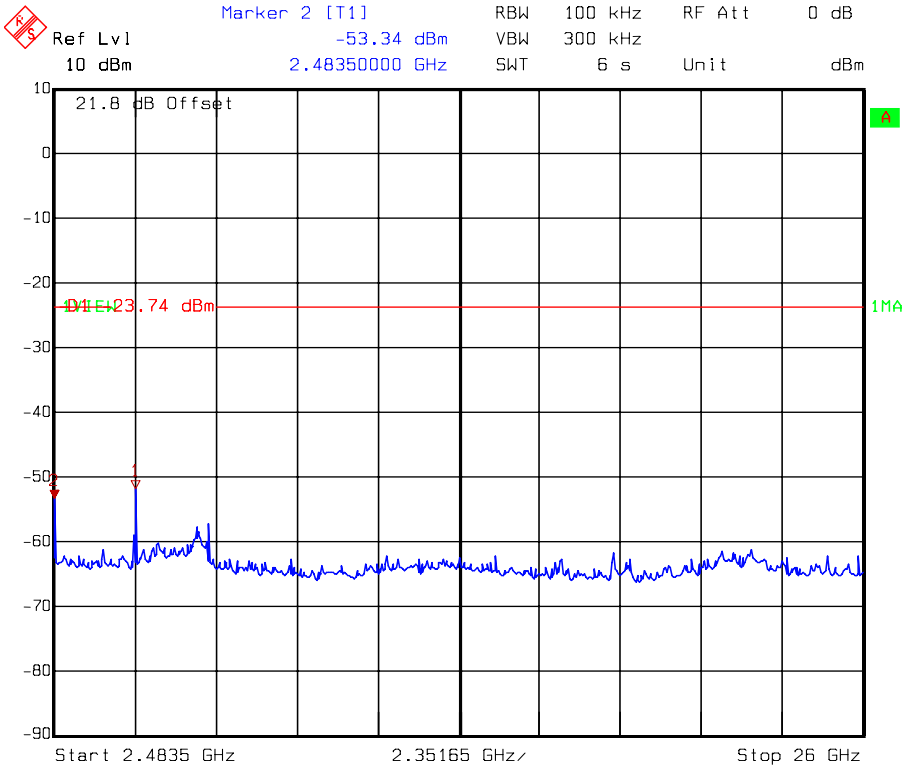
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 3 (1 of 3)



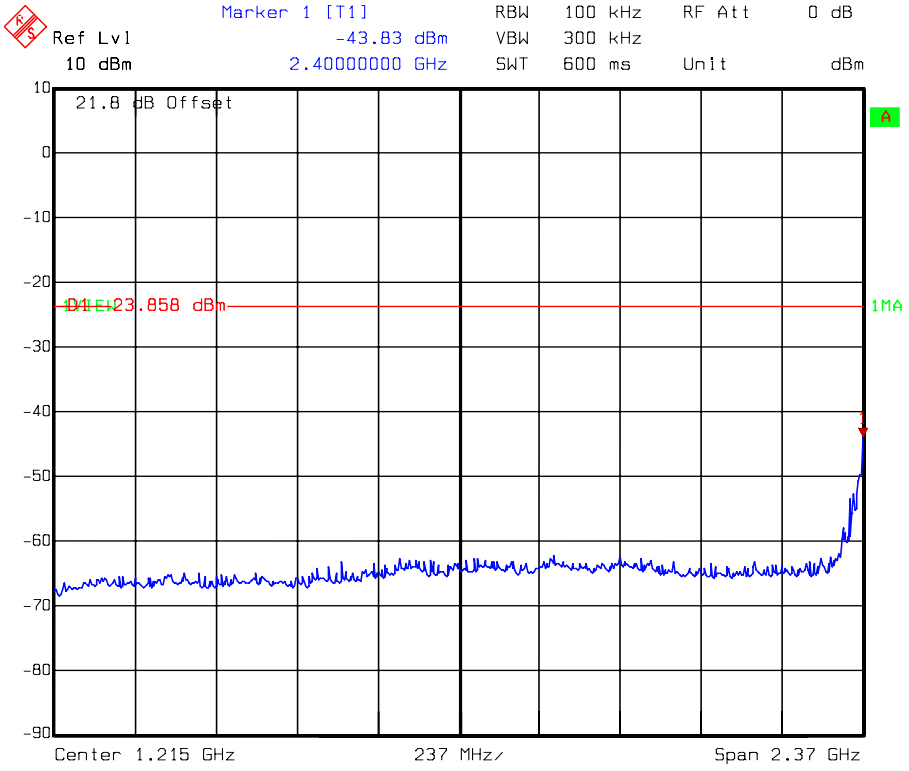
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 3 (2 of 3)



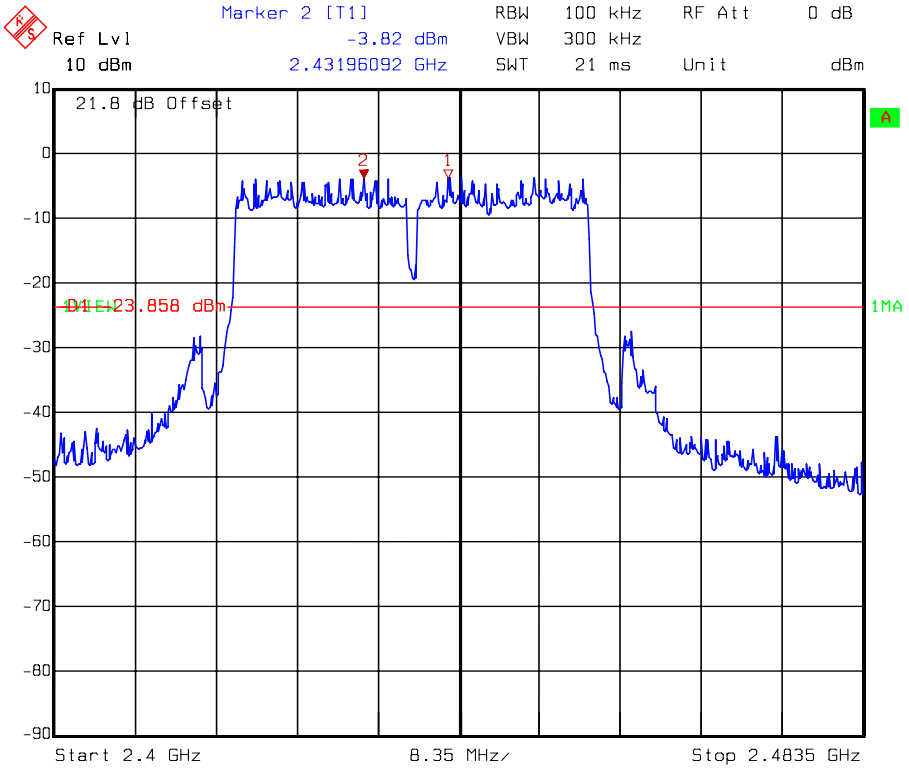
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 3 (3 of 3)



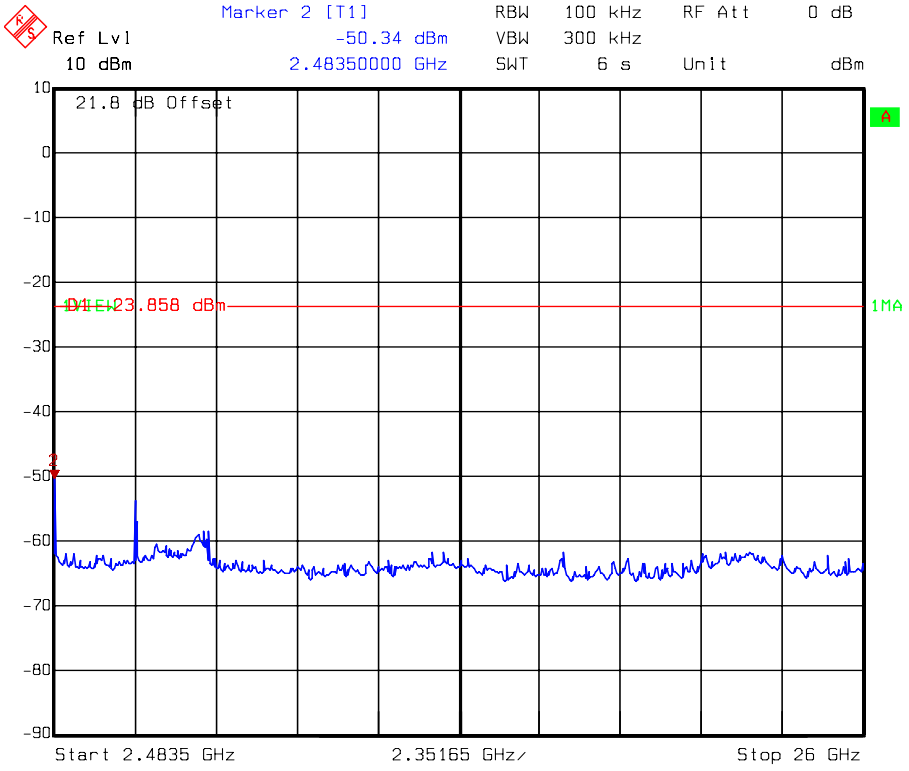
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 6 (1 of 3)



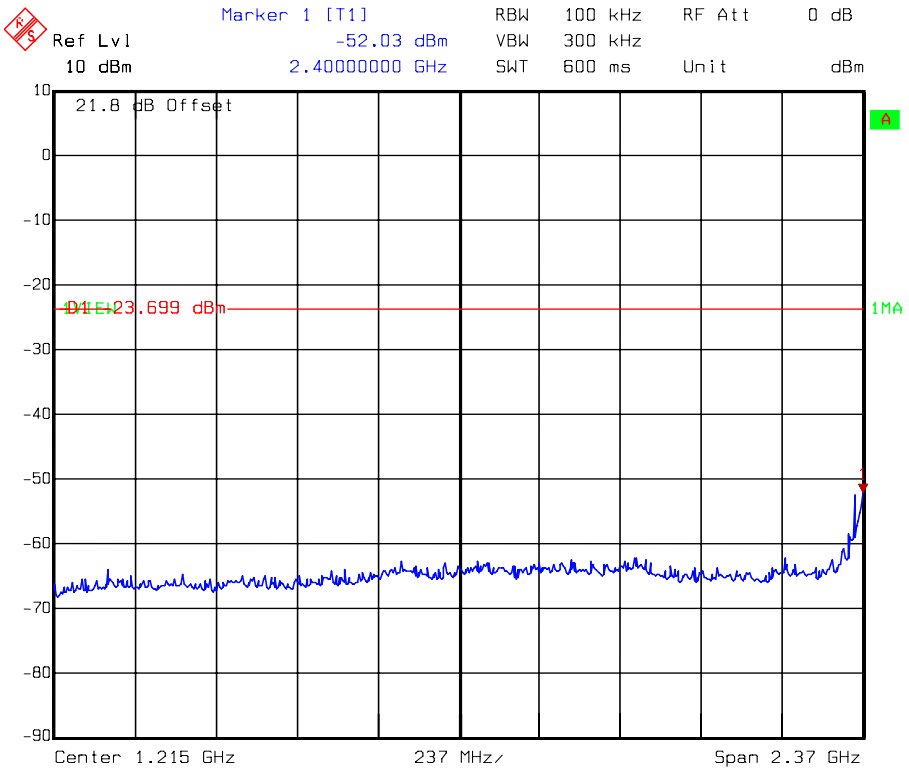
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 6 (2 of 3)



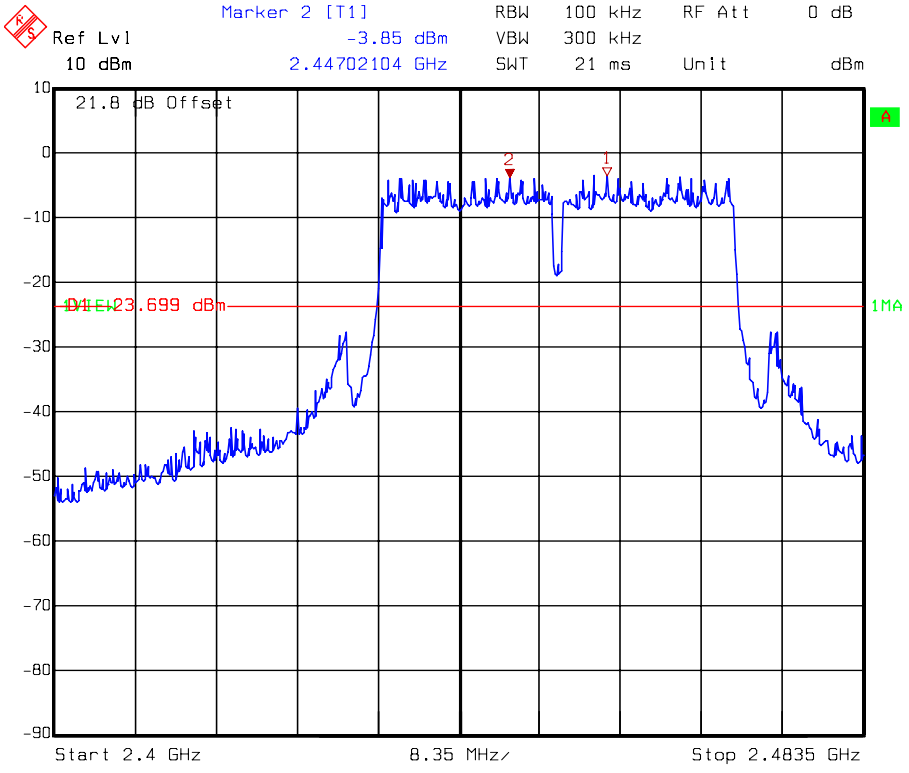
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 6 (3 of 3)



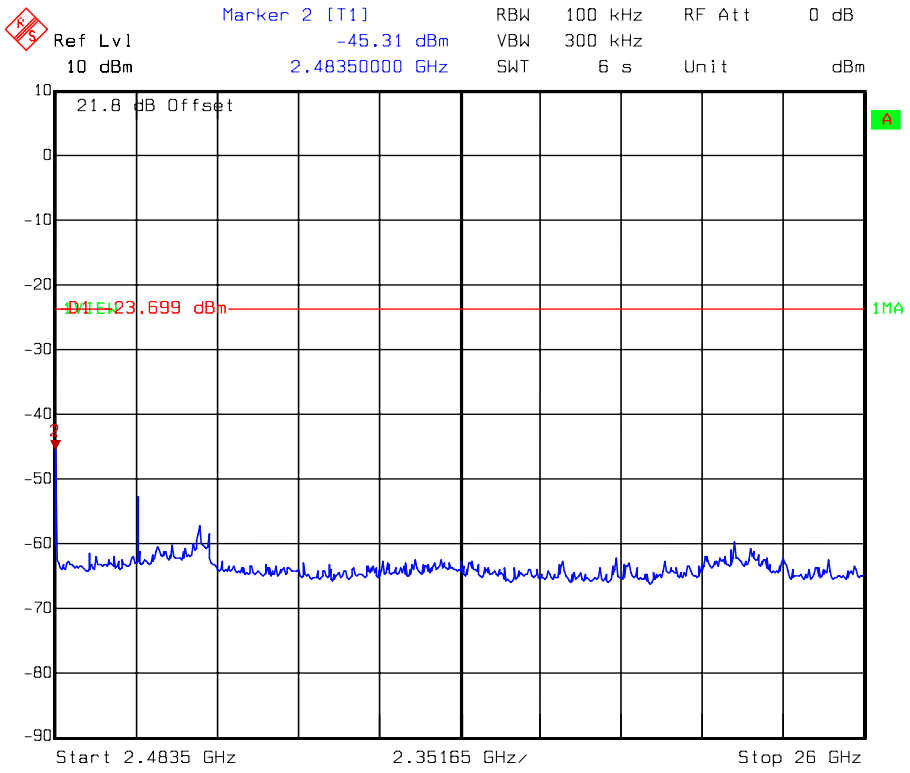
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 9 (1 of 3)



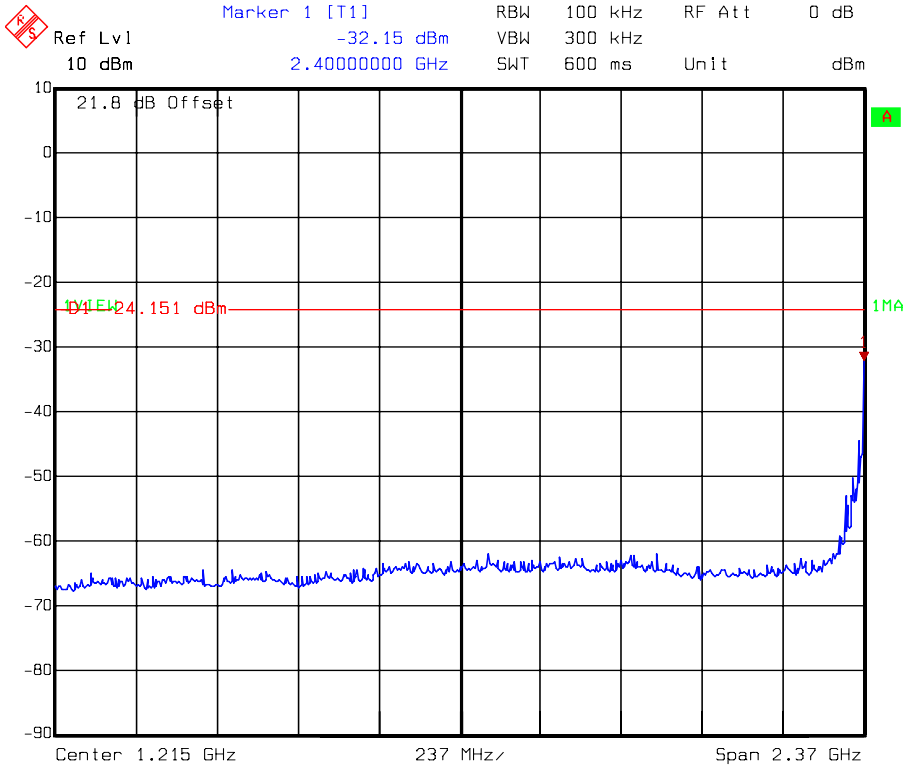
Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 9 (2 of 3)



Chain 0: Conducted spurious @ 802.11n HT40 mode Channel 9 (3 of 3)

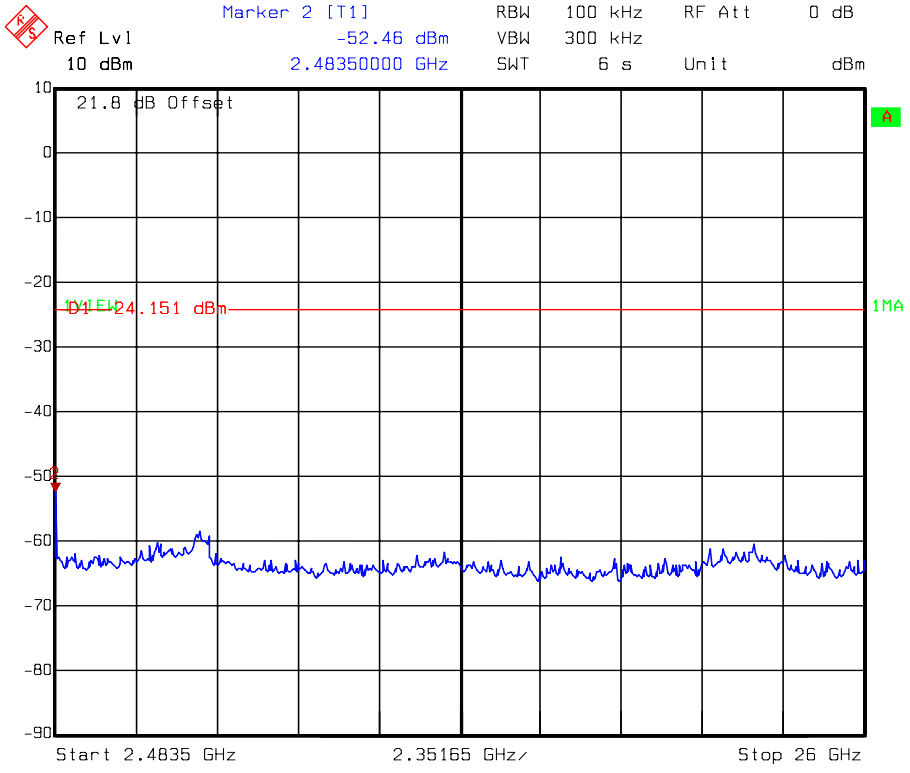


Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 3 (1 of 3)

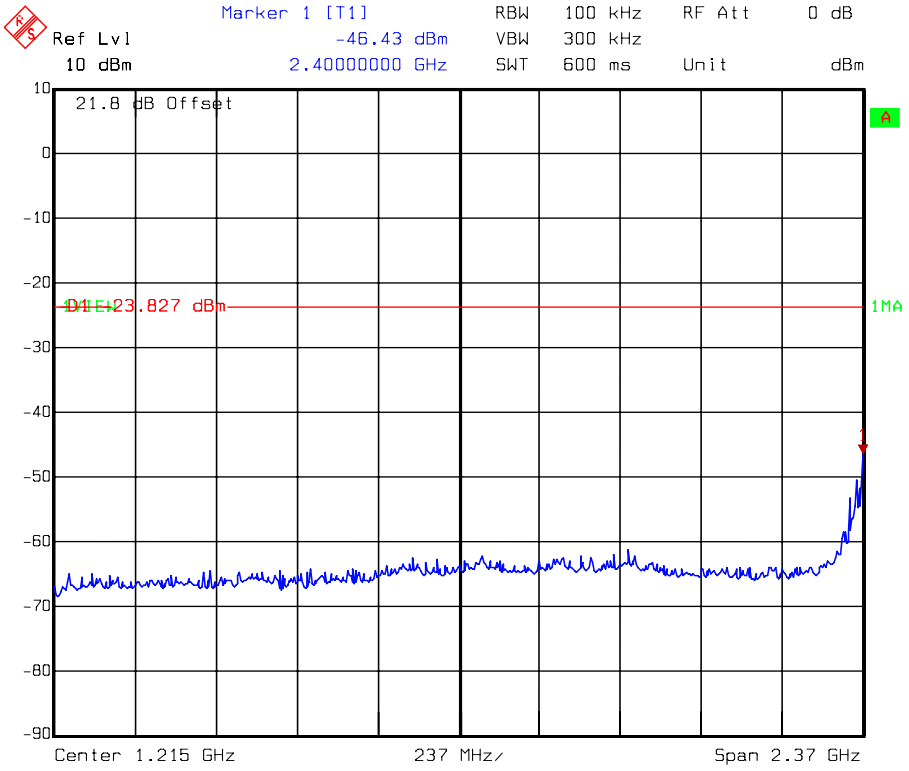


Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 3 (2 of 3)

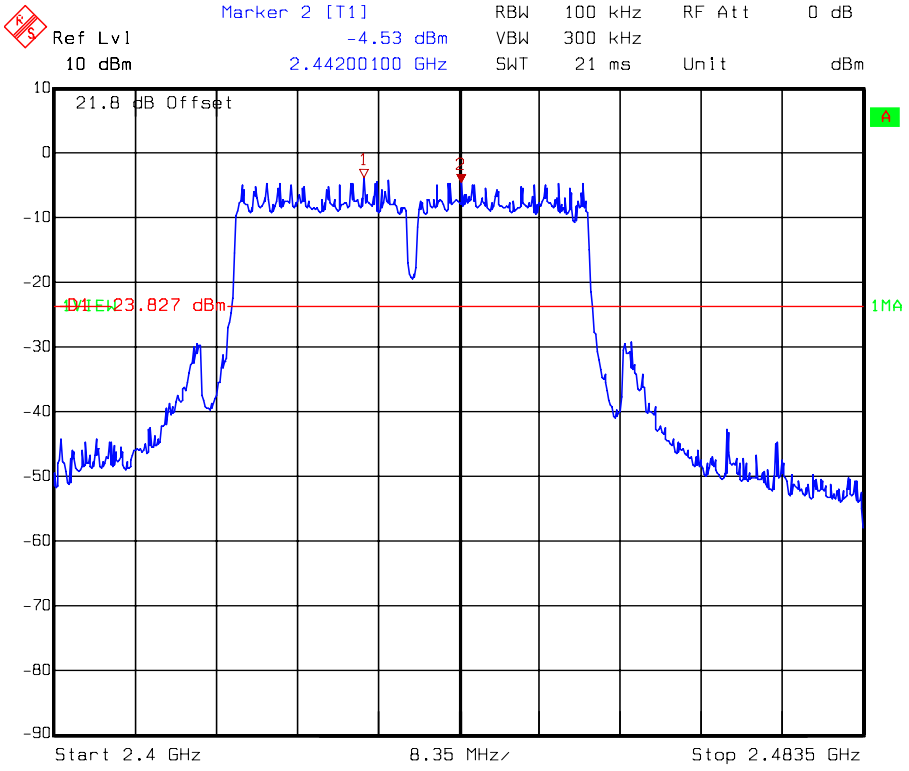
Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 3 (3 of 3)



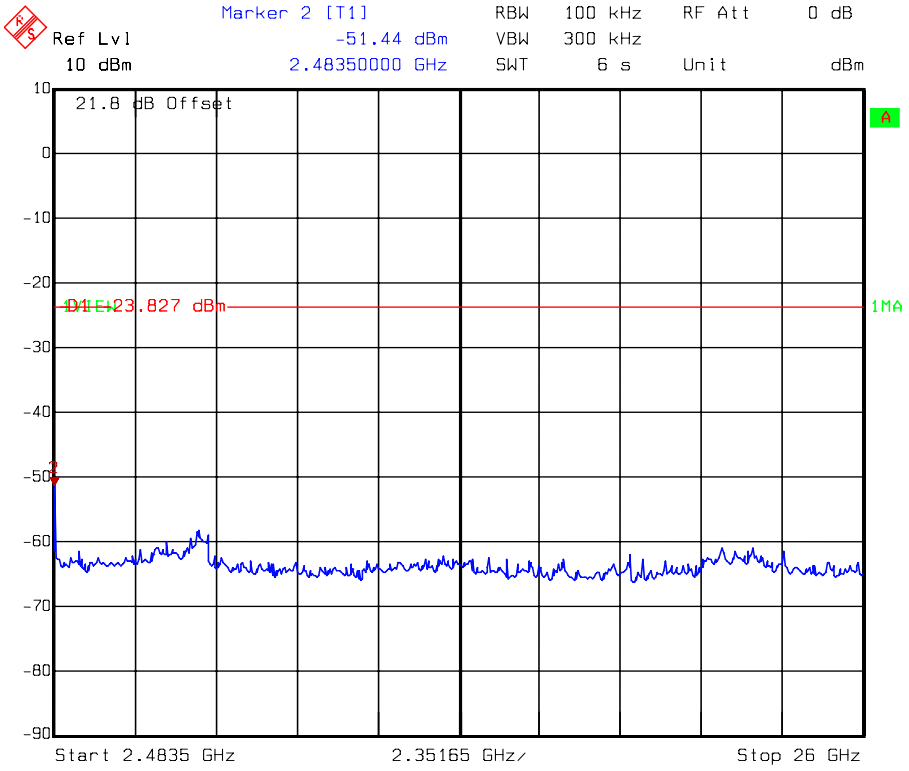
Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 6 (1 of 3)



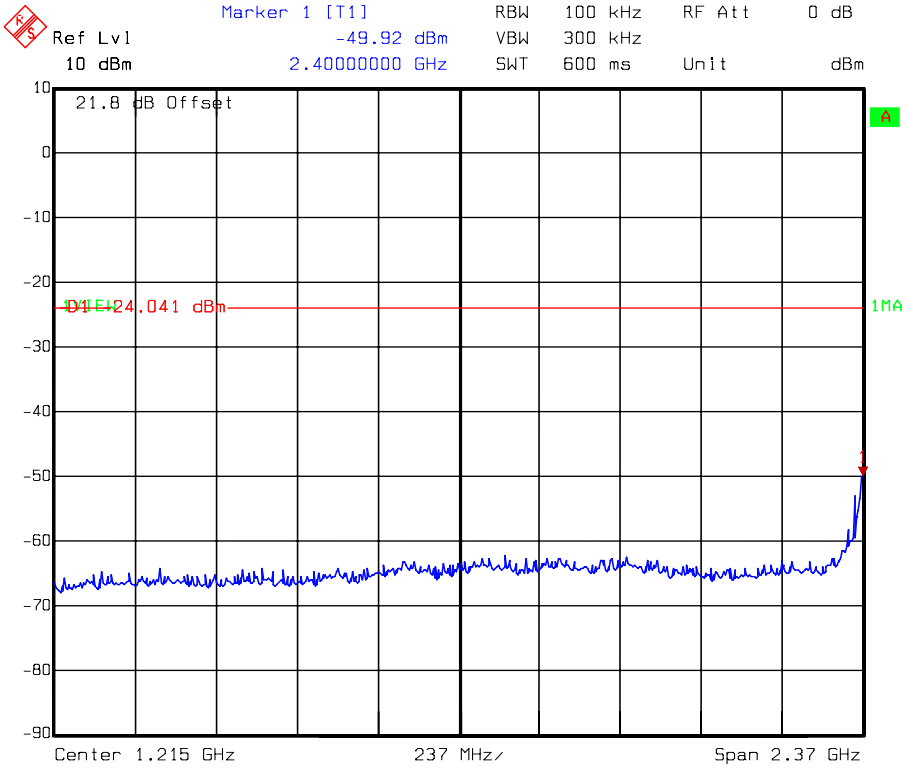
Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 6 (2 of 3)



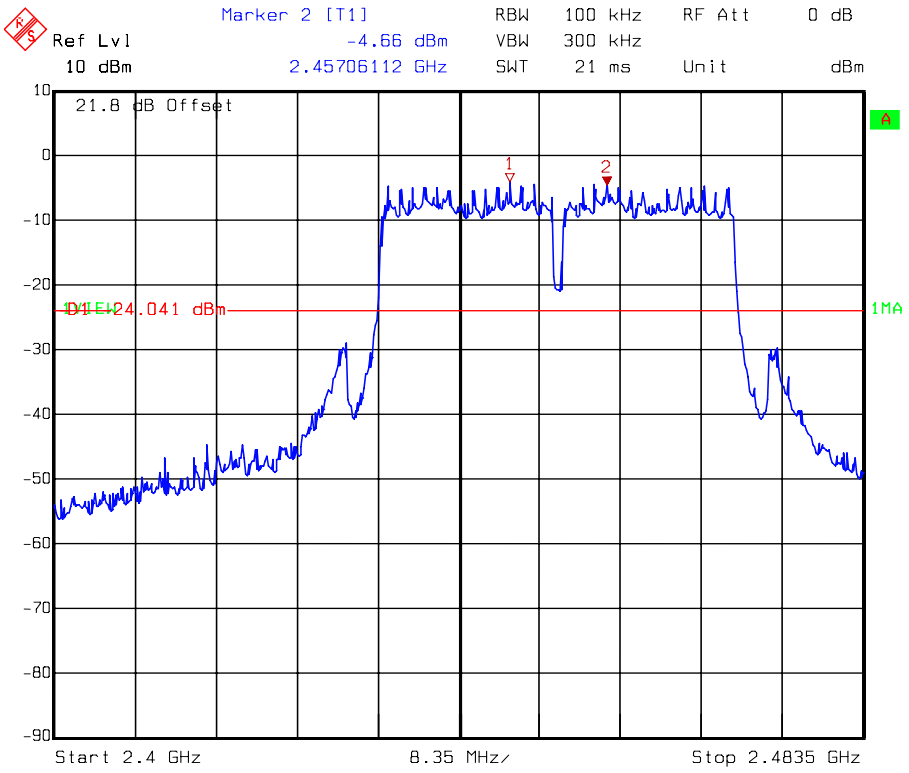
Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 6 (3 of 3)



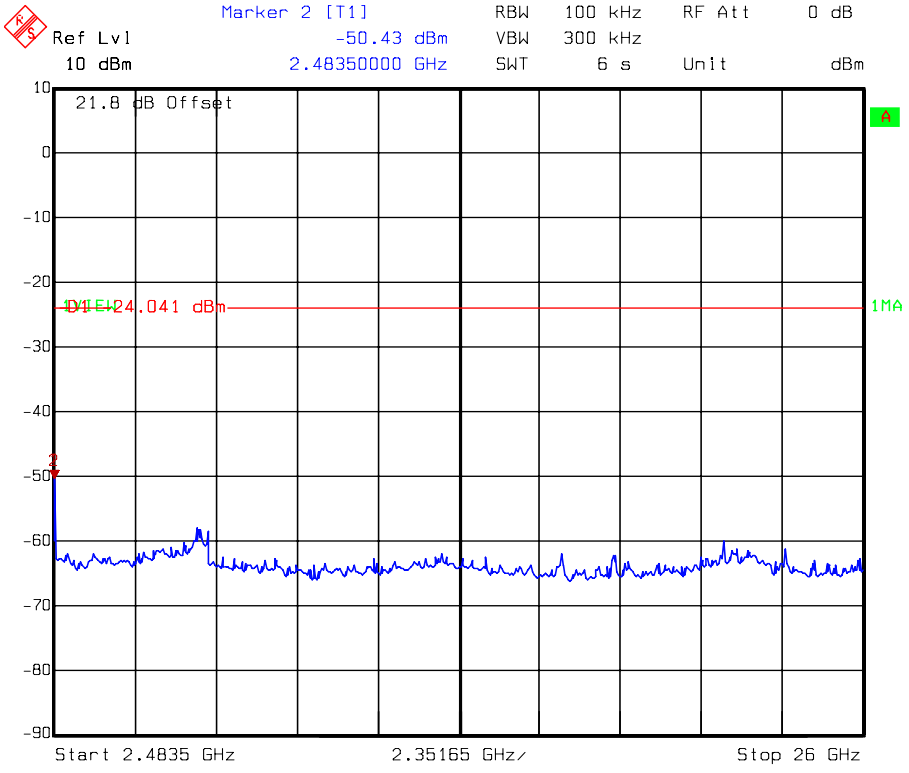
Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 9 (1 of 3)



Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 9 (2 of 3)



Chain 1: Conducted spurious @ 802.11n HT40 mode Channel 9 (3 of 3)



7. Radiated Spurious Emission

Name of Test	Radiated Spurious Emission
Base Standard	FCC 15.247(d), 15.209, 15.205, 15.33(a)

Test Result: Complies
Measurement Data: See Tables below
Test Date: Jun. 08, 2013~Jun. 09, 2013

Method of Measurement:
Reference FCC document: KDB558074 D01, ANSI C63.4

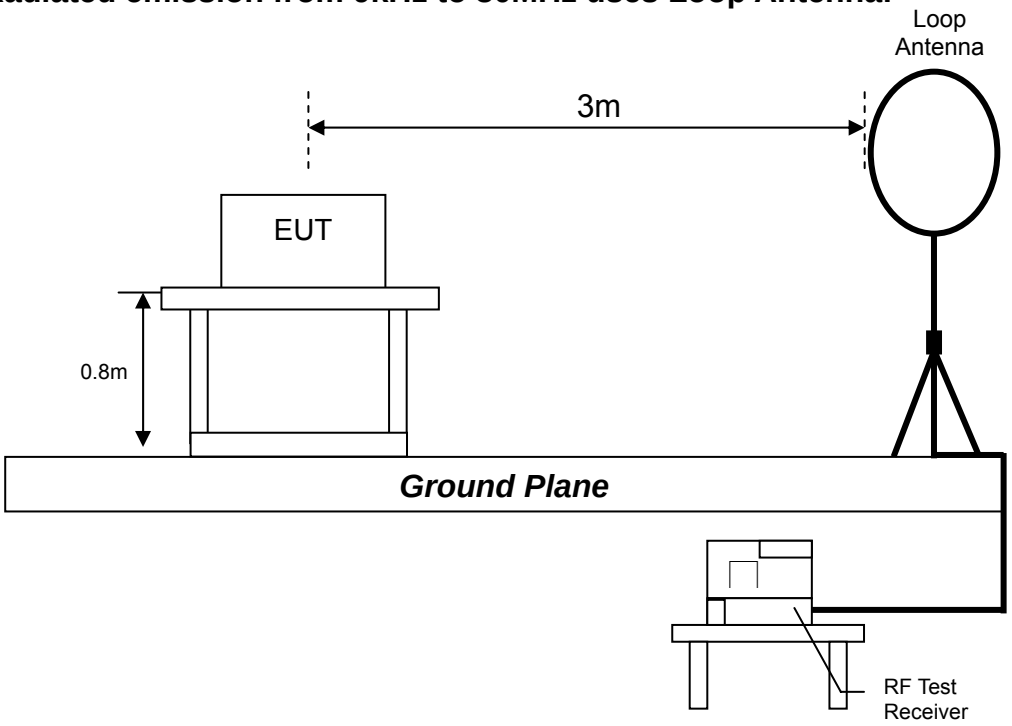
The signal is maximized through rotation and placement in the three orthogonal axes. According to §15.33(a), the spectrum shall be investigated from the lowest radio frequency signal generated in the device, to the tenth harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower. Spectrum Analyzer Resolution Bandwidth is 100kHz or greater for frequencies 30MHz to 1GHz, 1MHz – for frequencies above 1GHz.

The EUT for testing is arranged on a wooden turntable. If some peripherals apply to the EUT, the peripherals will be connected to EUT and the whole system. During the test, all cables were arranged to produce worst-case emissions. The signal is maximized through rotation. The height of antenna and polarization is changing constantly for exploring for maximum signal level. The height of antenna can be up to 4 meters and down to 1 meter. The measurement for radiated emission will be done at the distance of three meters unless the signal level is too low to measure at that distance. In the case of the reading under noise floor, a pre-amplifier is used and/or the test is conducted at a closer distance. And then all readings are extrapolated back to the equivalent 3 meters reading using inverse scaling with distance.

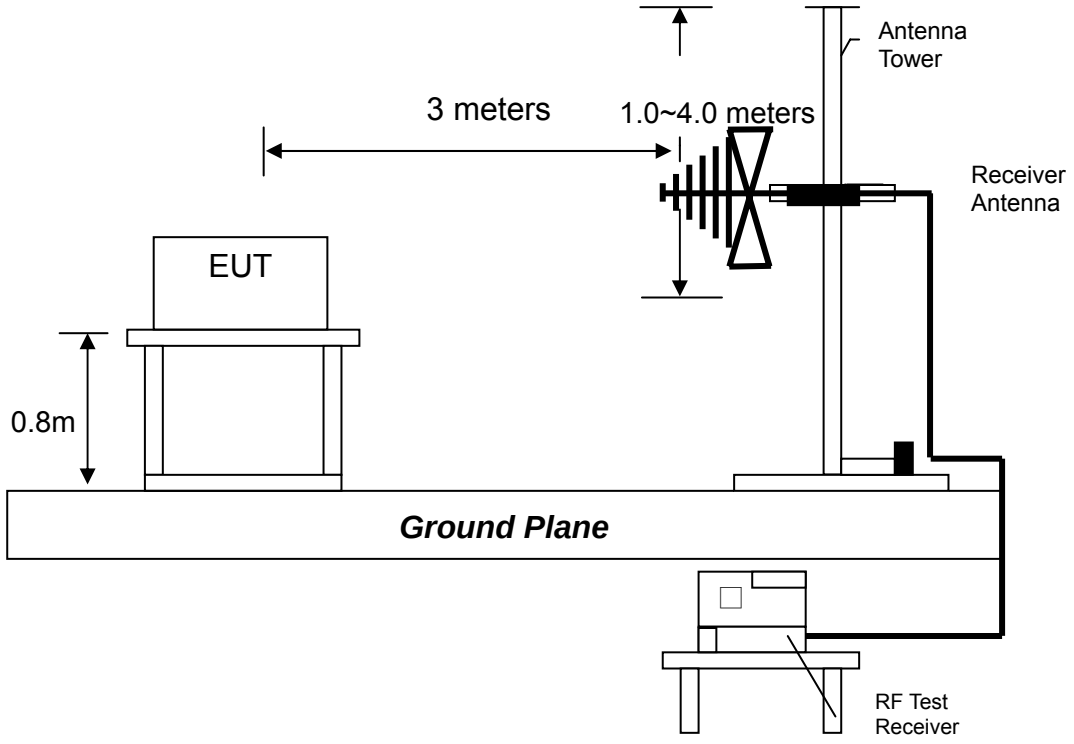
The EUT configuration refers to the “Spurious set-up photo.pdf”.

Test Diagram:

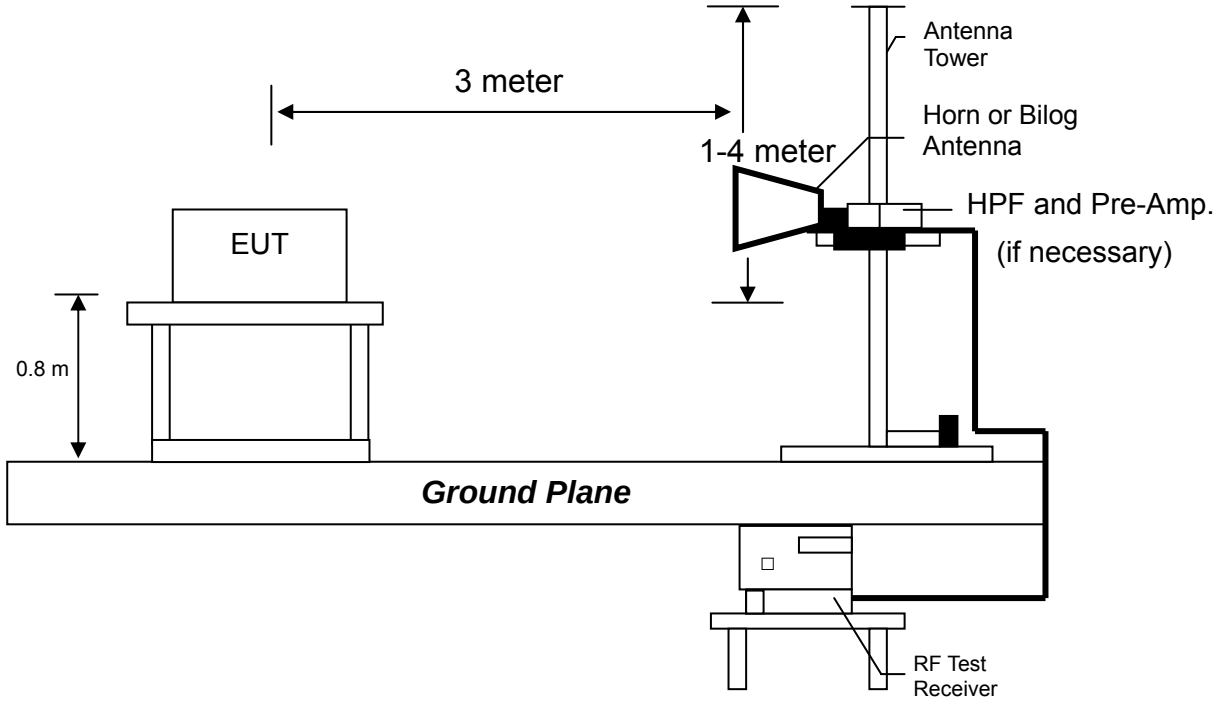
Radiated emission from 9kHz to 30MHz uses Loop Antenna:



Radiated emission from 30MHz to 1GHz uses Bilog Antenna:



Radiated emission above 1GHz uses Horn Antenna:



Emission Limit:

The spurious Emission shall test through the 10th harmonic. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a).

Frequency (MHz)	Field Strength (microvolts/meter)
0.009~0.490	2400/F(kHz)
0.490~1.705	2400/F(kHz)
1.705~30	30
30-88	100
88-216	150
216-960	200
Above 960	500

Remark:

1. In the above table, the tighter limit applies at the band edges.
2. Distance refers to the distance in meters between the measuring instrument antenna and the closed point of any part of the device or system

Note: (1) The EUT was tested while in a continuous transmit mode and the worst case data rates are 1 Mbps data rate for 802.11b mode, 6 Mbps data rate for 802.11g mode, 6.5 Mbps data rate for 802.11n HT20 mode and 13.5 Mbps data rate for 802.11n HT40 mode. The EUT was tuned to a low, middle and high channel.

(2) The EUT operating at 2.4 GHz ISM band. Frequency Range scanned from 37.4 MHz to 25 GHz.

Measurement results: frequency rage from 9kHz to 30MHz

Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
0.0327	QP	84.2	2.45	86.65	117.29	-30.64

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

Measurement results: frequency rage from 30MHz to 1GHz

The test was performed on EUT under 802.11b, 802.11g, 802.11n HT20 and 802.11n HT40 continuously transmitting mode. The worst case occurred at Chain 0 802.11b Tx Channel 1.

EUT : K110
Worst Case : Chain 0: 802.11b Tx at Channel 1

Antenna Polariz. (V/H)	Freq. (MHz)	Receiver Detector	Corr. Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
V	641.10	QP	21.53	16.13	37.66	46.00	-8.34
V	722.58	QP	22.29	17.19	39.47	46.00	-6.53
V	769.14	QP	22.81	18.10	40.91	46.00	-5.09
V	796.30	QP	23.19	17.43	40.62	46.00	-5.38
V	895.24	QP	24.35	17.70	42.04	46.00	-3.96
V	955.38	QP	25.34	17.31	42.64	46.00	-3.36
H	627.55	QP	21.55	16.90	38.44	46.00	-7.56
H	718.70	QP	22.44	17.09	39.53	46.00	-6.47
H	774.96	QP	23.02	18.70	41.72	46.00	-4.28
H	829.28	QP	24.04	17.08	41.11	46.00	-4.89
H	912.70	QP	24.59	17.74	42.32	46.00	-3.68
H	935.98	QP	25.33	17.60	42.93	46.00	-3.07

Remark: 1. Corr. Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Corr. Factor

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

Measurement results: frequency above 1GHz

EUT : K110
Test Condition : Chain 0: 802.11b Tx at Channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3360	PK	V	33.8	36.24	51.17	53.61	74	-20.39
3360	AV	V	33.8	36.24	24.96	27.4	54	-26.60
3750	PK	V	33.9	36.16	45.6	47.86	54	-6.14
4350	PK	V	34.5	37.48	45.29	48.27	54	-5.73
4530	PK	V	35.1	38.54	48.22	51.66	54	-2.34
4824	PK	V	35.1	38.54	59.41	62.85	74	-11.15
4824	AV	V	35.1	38.54	45.98	49.42	54	-4.58
6330	PK	V	34.6	41.49	42.3	49.19	54	-4.81
4824	PK	H	35.1	38.54	54.37	57.81	74	-16.19
4824	AV	H	35.1	38.54	40.81	44.25	54	-9.75

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0: 802.11b Tx at Channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	56.87	60.31	74	-13.69
4874	AV	V	35.1	38.54	43.66	47.1	54	-6.90
4874	PK	H	35.1	38.54	52.64	56.08	74	-17.92
4874	AV	H	35.1	38.54	39.22	42.66	54	-11.34

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0: 802.11b Tx at Channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	57.36	60.8	74	-13.20
4924	AV	V	35.1	38.54	20.8	24.24	54	-29.76
4924	PK	H	35.1	38.54	49.81	53.25	54	-0.75
4924	AV	H	35.1	38.54	36.89	40.33	54	-13.67

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 1: 802.11b Tx at Channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824	PK	V	35.1	38.54	52.82	56.26	74	-17.74
4824	AV	V	35.1	38.54	47.03	50.47	54	-3.53
4824	PK	H	35.1	38.54	44.41	47.85	54	-6.15

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 1: 802.11b Tx at Channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	52.62	56.06	74	-17.94
4874	AV	V	35.1	38.54	39.35	42.79	54	-11.21
4874	PK	H	35.1	38.54	48.99	52.43	74	-21.57
4874	AV	H	35.1	38.54	35.89	39.33	54	-14.67

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 1: 802.11b Tx at Channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	54.35	57.79	74	-16.21
4924	AV	V	35.1	38.54	41.55	44.99	54	-9.01
4924	PK	H	35.1	38.54	50.96	54.4	74	-19.60
4924	AV	H	35.1	38.54	37.6	41.04	54	-12.96

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1GHz to 25GHz.The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0: 802.11g Tx at Channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824	PK	V	35.1	38.54	53.44	56.88	74	-17.12
4824	AV	V	35.1	38.54	40.02	43.46	54	-10.54
6330	PK	V	34.6	41.49	40.77	47.66	54	-6.34
7236	PK	V	33	44.6	40.15	51.75	54	-2.25
4824	PK	H	35.1	38.54	46.66	50.1	54	-3.90

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0: 802.11g Tx at Channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	53.17	56.61	74	-17.39
4874	AV	V	35.1	38.54	40.44	43.88	54	-10.12
7311	PK	V	33	44.6	41.99	53.59	74	-20.41
7311	AV	V	33	44.6	28.57	40.17	54	-13.83
4874	PK	H	35.1	38.54	45.08	48.52	54	-5.48
7311	PK	H	33	44.6	37.88	49.48	54	-4.52

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0: 802.11g Tx at Channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	H	35.1	38.54	51.01	54.45	74	-19.55
4924	AV	H	35.1	38.54	38.96	42.4	54	-11.60
4924	PK	H	35.1	38.54	44.16	47.6	54	-6.40

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 1: 802.11g Tx at Channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4824	PK	V	35.1	38.54	44.35	47.79	54	-6.21
4824	PK	H	35.1	38.54	41.26	44.7	54	-9.30

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 1: 802.11g Tx at Channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	43.23	46.67	54	-7.33
4874	PK	H	35.1	38.54	43.85	47.29	54	-6.71

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 1: 802.11g Tx at Channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	44.6	48.04	54	-5.96
6330	PK	V	34.6	41.49	40.86	47.75	54	-6.25
4924	PK	H	35.1	38.54	44.86	48.3	54	-5.70

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0+1: 802.11n HT20 Tx at Channel 1

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3367	PK	V	33.8	36.24	60.15	62.59	74	-11.41
3367	AV	V	33.8	36.24	33.26	35.7	54	-18.30
4530	PK	V	35.1	38.54	46.87	50.31	54	-3.69
4824	PK	V	35.1	38.54	41.21	44.65	54	-9.35
4824	PK	H	35.1	38.54	41.04	44.48	54	-9.52

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0+1: 802.11n HT20 Tx at Channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
3364	PK	V	33.8	36.24	60.6	63.04	74	-10.96
3364	AV	V	33.8	36.24	33.21	35.65	54	-18.35
4157	PK	V	34.5	37.48	52.94	55.92	74	-18.08
4157	AV	V	34.5	37.48	29.84	32.82	54	-21.18
4874	PK	V	35.1	38.54	41.91	45.35	54	-8.65
3366	PK	H	33.8	36.24	54.16	56.6	74	-17.40
3366	AV	H	33.8	36.24	29.65	32.09	54	-21.91
4350	PK	H	34.5	37.48	45.23	48.21	54	-5.79
4874	PK	H	35.1	38.54	41.49	44.93	54	-9.07

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0+1: 802.11n HT20 Tx at Channel 11

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4924	PK	V	35.1	38.54	42.16	45.6	54	-8.40
4924	PK	H	35.1	38.54	41.94	45.38	54	-8.62

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0+1: 802.11n HT40 Tx at Channel 3

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4844	PK	V	35.1	38.54	45.08	48.52	54	-5.48
6330	PK	V	34.6	41.49	40.87	47.76	54	-6.24
3210	PK	H	33.8	36.24	42.48	44.92	54	-9.08

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0+1: 802.11n HT40 Tx at Channel 6

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4874	PK	V	35.1	38.54	45.17	48.61	54	-5.39
4874	PK	H	35.1	38.54	41.16	44.6	54	-9.40

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

EUT : K110
Test Condition : Chain 0+1: 802.11n HT40 Tx at Channel 9

Frequency (MHz)	Spectrum Analyzer Detector	Antenna Polariz. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
4904	PK	V	35.1	38.54	45.47	48.91	54	-5.09
6330	PK	V	34.6	41.49	40.8	47.69	54	-6.31
4904	PK	H	35.1	38.54	40.99	44.43	54	-9.57

Remark:

1. Correction Factor = Antenna Factor + Cable Loss
2. Corrected Level = Reading + Correction Factor – Preamp. Gain
3. The frequency measured ranges from 1 GHz to 25 GHz. The data value listed above which is higher than the system noise floor.

8. Emission on Band Edge

Name of Test	Emission Band Edge
Base Standard	FCC 15.247(d)

Test Result: Complies
Measurement Data: See Tables & plots below
Test Date: Jul. 08, 2013

Method of Measurement:
Reference FCC document: KDB558074 D01, ANSI C63.4
The frequency range from 30 MHz to 1000 MHz uses Bilog Antenna.
The frequency range over 1 GHz using Horn Antenna.

Radiated emissions were invested cover the frequency range from 30 MHz to 1000 MHz using a receiver RBW of 120 kHz record QP reading, and the frequency over 1 GHz using a spectrum analyzer RBW of 1 MHz and 10 Hz VBW record Average reading. (15.209 paragraph), the Peak reading (1 MHz RBW/VBW) recorded also on the report.

Mode	Restricted Band (MHz)	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
Chain 0: 802.11b	2310~2390	2388.00	PK	H	38.021	31.841	66.610	60.43	74	-13.57
		2388.00	AV	H	38.021	31.841	52.930	46.75	54	-7.25
	-	2412.00	PK	H	38.027	31.955	114.883	108.81	-	108.81
		2412.00	AV	H	38.027	31.955	103.833	97.76	-	97.76
	-	2462.00	PK	H	38.040	32.192	117.188	111.34	-	111.34
		2462.00	AV	H	38.040	32.192	105.728	99.88	-	99.88
	2483.5~2500	2486.08	PK	H	38.046	32.307	66.140	60.40	74	-13.60
		2486.08	AV	H	38.046	32.307	53.110	47.37	54	-6.63

Mode	Restricted Band (MHz)	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
Chain 1: 802.11b	2310 ~ 2390	2384.00	PK	H	38.020	31.822	63.448	57.25	74	-16.75
		2384.88	AV	H	38.020	31.826	51.714	45.52	54	-8.48
	-	2412.00	PK	H	38.027	31.955	114.943	108.87	-	108.87
		2412.00	AV	H	38.027	31.955	103.833	97.76	-	97.76
	-	2462.00	PK	H	38.040	32.192	113.628	107.78	-	107.78
		2462.00	AV	H	38.040	32.192	105.728	99.88	-	99.88
	2483.5 ~ 2500	2484.40	PK	H	38.046	32.299	60.667	54.92	74	-19.08
		2484.40	AV	H	38.046	32.299	51.227	45.48	54	-8.52
Chain 0: 802.11g	2310 ~ 2390	2389.82	PK	H	38.021	31.849	73.842	67.67	74	-6.33
		2389.82	AV	H	38.021	31.849	56.122	49.95	54	-4.05
	-	2412.00	PK	H	38.027	31.955	113.073	107.00	-	107.00
		2412.00	AV	H	38.027	31.955	100.223	94.15	-	94.15
	-	2462.00	PK	H	38.040	32.192	113.848	108.00	-	108.00
		2462.00	AV	H	38.040	32.192	101.248	95.40	-	95.40
	2483.5 ~ 2500	2483.44	PK	H	38.046	32.294	76.862	71.11	74	-2.89
		2483.44	AV	H	38.046	32.294	58.642	52.89	54	-1.11
Chain 1: 802.11g	2310 ~ 2390	2384.88	PK	H	38.020	31.826	63.444	67.51	74	-6.49
		2389.82	AV	H	38.021	31.849	56.312	50.14	54	-3.86
	-	2412.00	PK	H	38.027	31.955	111.823	105.75	-	105.75
		2412.00	AV	H	38.027	31.955	99.413	93.34	-	93.34
	-	2462.00	PK	H	38.040	32.192	109.228	103.38	-	103.38
		2462.00	AV	H	38.040	32.192	97.078	91.23	-	91.23
	2483.5 ~ 2500	2484.40	PK	H	38.046	32.299	69.207	63.46	74	-10.54
		2483.44	AV	H	38.046	32.294	53.432	47.68	54	-6.32
Chain 0 +Chain1: 802.11n HT20	2310 ~ 2390	2389.56	PK	H	38.021	31.848	65.313	59.14	74	-14.86
		2389.56	AV	H	38.021	31.848	51.893	45.72	54	-8.28
	-	2412.00	PK	H	38.027	31.955	108.353	102.28	-	102.28
		2412.00	AV	H	38.027	31.955	76.913	70.84	-	70.84
	-	2462.00	PK	H	38.040	32.192	113.368	107.52	-	107.52
		2462.00	AV	H	38.040	32.192	79.308	73.46	-	73.46
	2483.5 ~ 2500	2483.44	PK	H	38.046	32.294	68.452	62.70	74	-11.30
		2483.44	AV	H	38.046	32.294	52.952	47.20	54	-6.80

Mode	Restricted Band (MHz)	Freq. (MHz)	Spectrum Analyzer Detector	Ant. Pol. (H/V)	Preamp. Gain (dB)	Correction Factor (dB/m)	Reading (dBuV)	Corrected Level (dBuV/m)	Limit @ 3 m (dBuV/m)	Margin (dB)
Chain 0 +Chain1: 802.11n HT40	2310 ~ 2390	2388.40	PK	H	38.021	31.842	71.279	65.10	74	-8.90
		2388.40	AV	H	38.021	31.842	53.689	47.51	54	-6.49
	-	2422.00	PK	H	38.030	32.002	106.968	100.94	-	100.94
		2422.00	AV	H	38.030	32.002	70.698	64.67	-	64.67
	-	2452.00	PK	H	38.038	32.145	106.483	100.59	-	100.59
		2452.00	AV	H	38.038	32.145	70.463	64.57	-	64.57
	2483.5 ~ 2500	2483.60	PK	H	38.046	32.295	69.331	63.58	74	-10.42
		2483.60	AV	H	38.046	32.295	53.121	47.37	54	-6.63

9. AC power line conducted emission

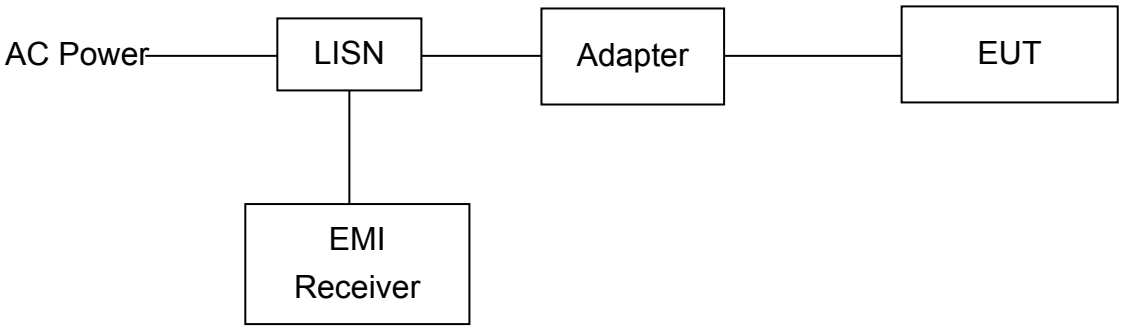
Name of Test	AC power line conducted emission
Base Standard	FCC 15.207

Test Result: Complies
Measurement Data: See Tables & plots below
Test Date: Jun. 11, 2013

Method of Measurement:
Reference FCC document: ANSI C63.4
The EUT are connected to the main power through a line impedance stabilization network (LISN). This provides a 50 ohm/50 uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN that provides a 50 ohm/ 50 uH coupling impedance with 50 ohm termination.
Both sides (Line and Neutral) of AC line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.4/2003 on conducted measurement.
The bandwidth of the field strength meter (R & S Test Receiver ESCS 30) is set at 9 kHz.

The EUT configuration refers to the “Conducted set-up photo.pdf”.

Test Diagram:



Emission Limit:

Freq. (MHz)	Conducted Limit (dBuV)	
	Q.P.	Ave.
0.15~0.50	66 – 56*	56 – 46*
0.50~5.00	56	46
5.00~30.0	60	50

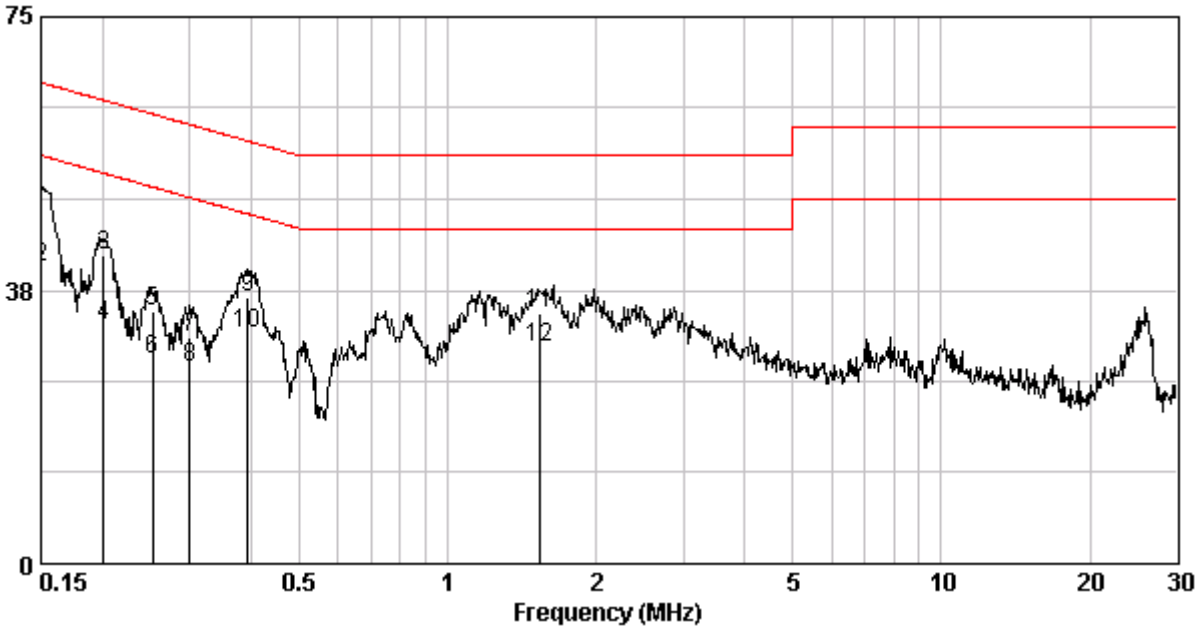
*Decreases with the logarithm of the frequency.

Note: The EUT was tested while in normal communication mode.

Phase : Line
EUT : K110
Test Condition : TX mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.150	0.13	49.48	66.00	40.70	56.00	-16.52	-15.30
0.201	0.14	42.20	63.58	32.59	53.58	-21.38	-20.99
0.252	0.14	34.66	61.69	27.94	51.69	-27.02	-23.74
0.300	0.15	31.17	60.24	27.03	50.24	-29.06	-23.20
0.393	0.16	36.53	57.99	31.53	47.99	-21.46	-16.46
1.544	0.24	34.32	56.00	29.64	46.00	-21.68	-16.36

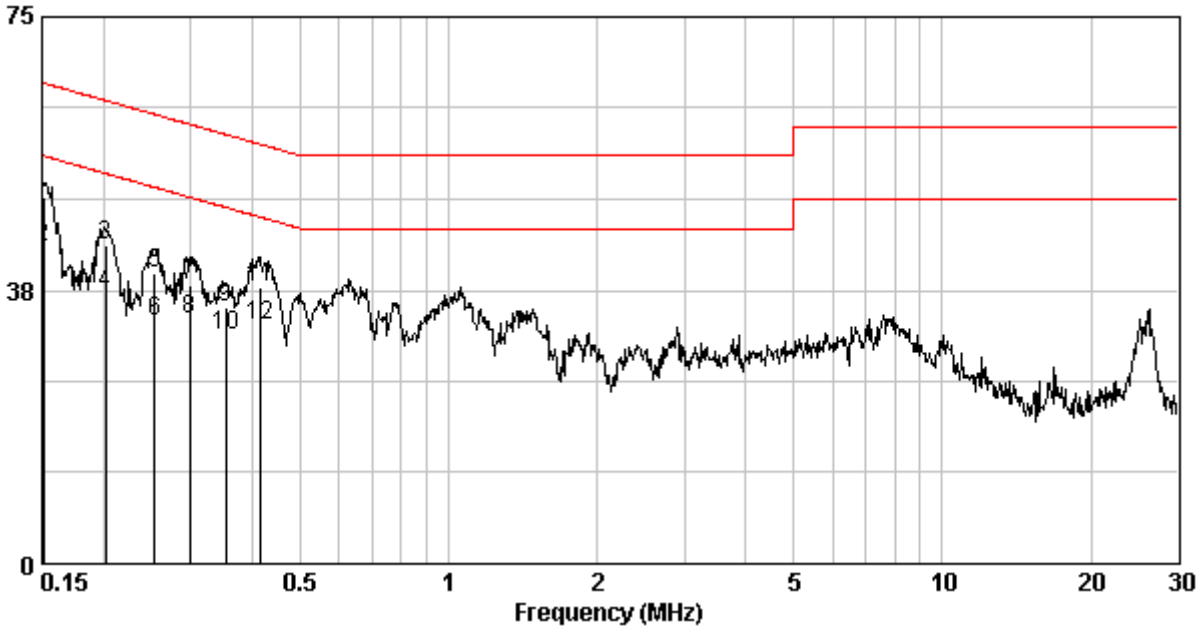
Remark:
1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Phase : Neutral
EUT : K110
Test Condition : TX mode

Frequency (MHz)	Corr. Factor (dB)	Level Qp (dBuV)	Limit Qp (dBuV)	Level Av (dBuV)	Limit Av (dBuV)	Margin (dB) Qp	Margin (dB) Av
0.151	0.10	50.41	65.96	43.47	55.96	-15.55	-12.49
0.202	0.11	43.73	63.54	37.09	53.54	-19.81	-16.45
0.253	0.11	39.81	61.64	33.36	51.64	-21.83	-18.28
0.299	0.11	38.11	60.28	33.62	50.28	-22.16	-16.65
0.354	0.12	35.29	58.87	31.33	48.87	-23.58	-17.54
0.417	0.12	37.88	57.51	32.71	47.51	-19.62	-14.79

Remark:
1. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Margin (dB) = Level (dBuV) – Limit (dBuV)



Appendix: Test Equipment List

Equipment	Brand	Model No.	Serial No.	Calibration Date	Next Calibration Date
EMI Test Receiver	Rohde & Schwarz	ESCI	100018	2012/11/30	2013/11/29
Spectrum Analyzer	Rohde&schwarz	FSP30	100137	2013/06/21	2014/06/21
Spectrum Analyzer	Rohde&schwarz	FSEK30	100186	2013/01/23	2014/01/23
Horn Antenna (1-18G)	Schwarzbeck	BBHA 9120 D	9120D-456	2012/09/03	2014/09/03
Horn Antenna (14-42G)	SHWARZBECK	BBHA 9170	BBHA9170159	2012/09/05	2014/09/05
Broadband Antenna	SCHWARZBECK	VULB 9168	9168-172	2011/07/26	2013/07/25
Loop Antenna	RolfHeine	LA-285	02/10033	2012/03/20	2014/03/20
Pre-Amplifier	MITEQ	AFS44-00102650--42-10P-44	1495287	2011/10/27	2013/10/26
Pre-Amplifier	MITEQ	JS4-26004000--27-8A	828825	2012/09/18	2014/09/18
Power Meter	Anritsu	ML2495A	0844001	2012/10/09	2013/10/09
Power Senor	Anritsu	MA2411B	0738452	2012/10/09	2013/10/09
Temperature & Humidity Test Chamber	TERCHY	MHU-225LRU (SA)	950838	2013/06/14	2014/06/14
Two-Line -V-Network	Rohde&schwarz	ESH3-Z5	825562/003	2012/10/29	2013/10/29

Measurement Uncertainty:
Measurement uncertainty was calculated in accordance with TR 100 028-1.

Parameter	Uncertainty		
Radiated Emission	Below 1 GHz	Vertical	3.90 dB
		Horizontal	3.86 dB
	Above 1 GHz	Vertical	5.74 dB
		Horizontal	5.55 dB
Conducted Emission	2.08 dB		

This uncertainty represents an expanded uncertainty expressed at approximately the 95 % confidence level using a coverage factor of k=2.