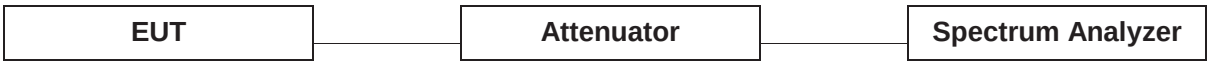
5. Power Spectral Density Measurement

5.1. Test Setup



5.2. Limit

§15.247(e) For digitally modulated system, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 ㏈ m in any 3 ㎑ band any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

5.3. Test Procedure

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.

The measurements are recorded using the AVGPSD measurement procedure in section 9.2 of KDB 558074.

1. Use this procedure when the maximum conducted output power in the fundamental emission is used to demonstrate compliance. The EUT must be configured to transmit continuously at full power over the measurement duration.
2. Set the analyzer span to at least 1.5 times the DTS channel bandwidth.
3. Set the RBW ≥ 3 ㎑
4. Set the VBW ≥ 3 x RBW
5. Detector = power average (RMS) or sample detector (when RMS not available).
6. Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW
7. Sweep time = auto couple.
8. Employ trace averaging (RMS) mode over a minimum of 100 traces.
9. Use the peak marker function to determine the maximum amplitude level.

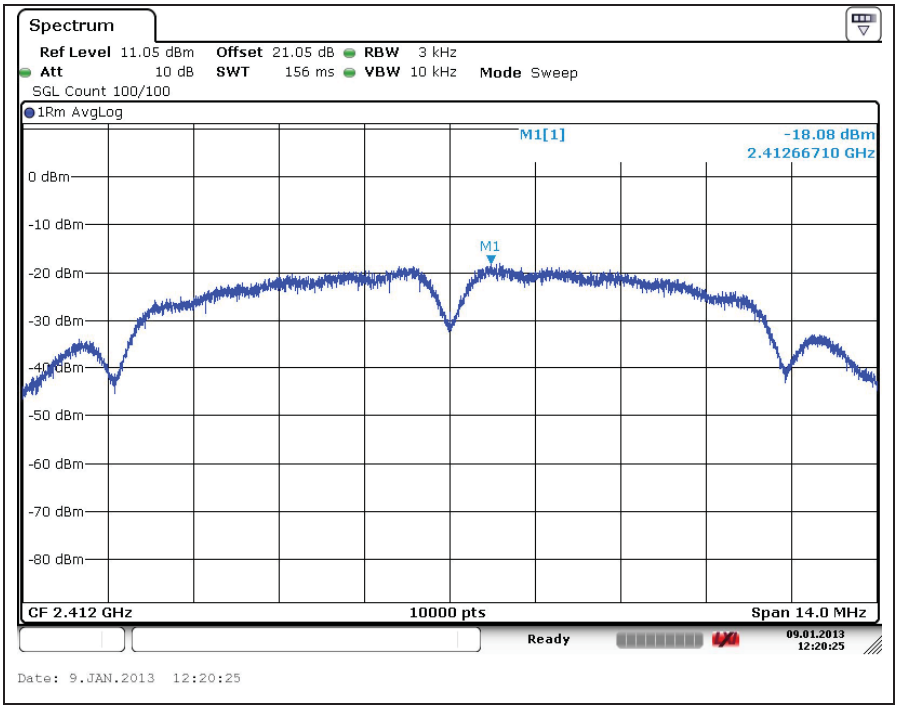
5.4. Test Results

Ambient temperature : (23 ± 2) ℃
Relative humidity : 47 % R.H.

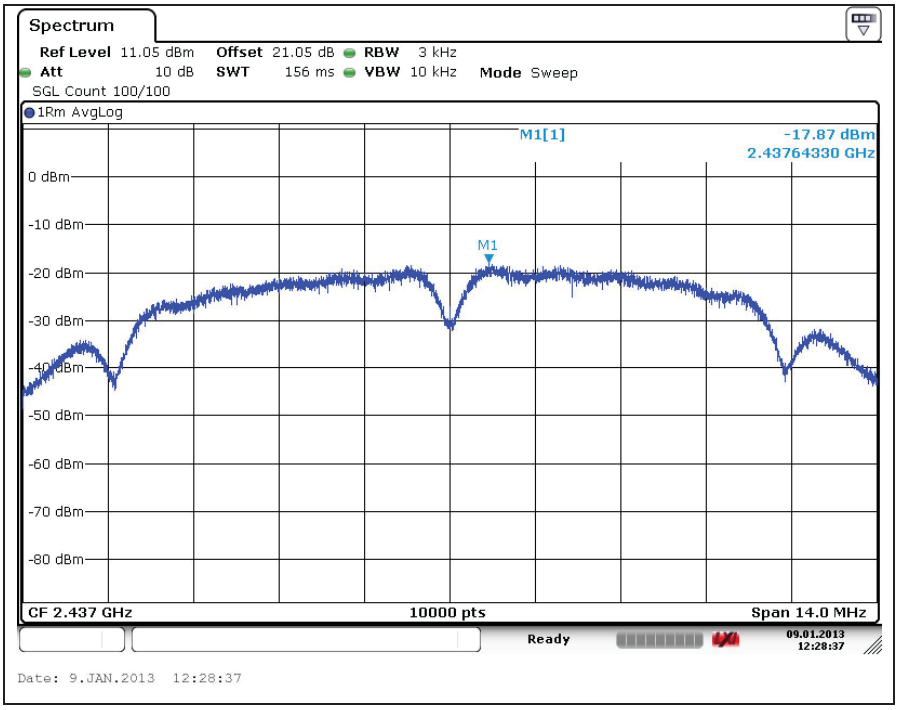
Operation Mode	Data Rate (Mbps)	Channel	Frequency	Measured PSD (dB m)	Maximum Limit (dB m)
DSSS (802.11b)	1	Low	2 412 ㎒	-18.08	8
		Middle	2 437 ㎒	-17.87	8
		High	2 462 ㎒	-18.17	8
OFDM (802.11g)	6	Low	2 412 ㎒	-25.04	8
		Middle	2 437 ㎒	-24.79	8
		High	2 462 ㎒	-23.73	8
OFDM (802.11n_HT20)	MCS0	Low	2 412 ㎒	-25.37	8
		Middle	2 437 ㎒	-25.72	8
		High	2 462 ㎒	-25.11	8
OFDM (802.11n_HT40)	MCS0	Low	2 422 ㎒	-26.12	8
		Middle	2 437 ㎒	-24.18	8
		High	2 452 ㎒	-25.94	8

DSSS : 802.11b

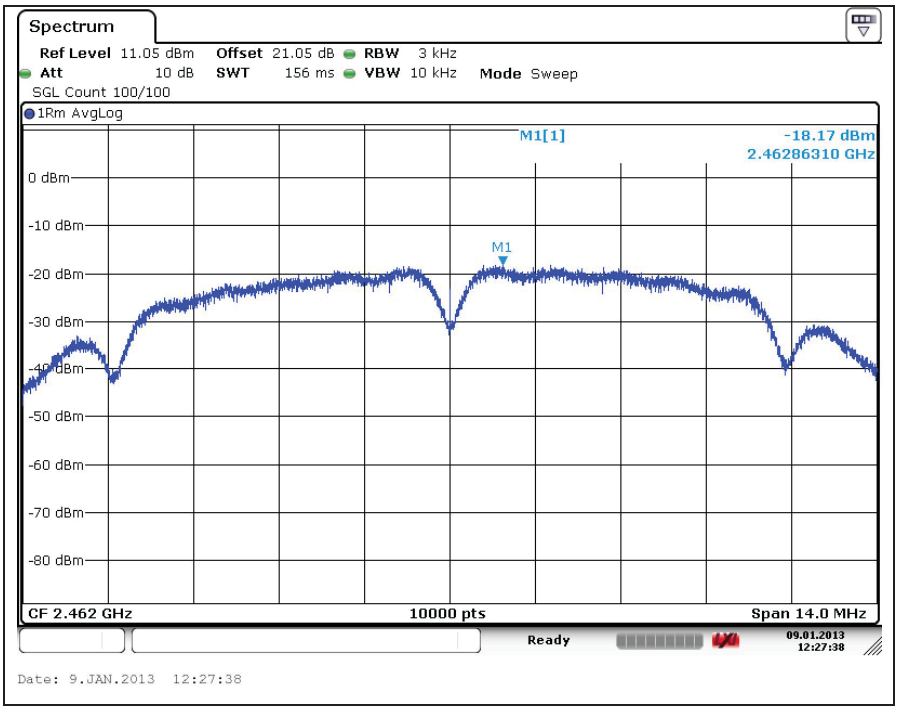
Low Channel



Middle Channel

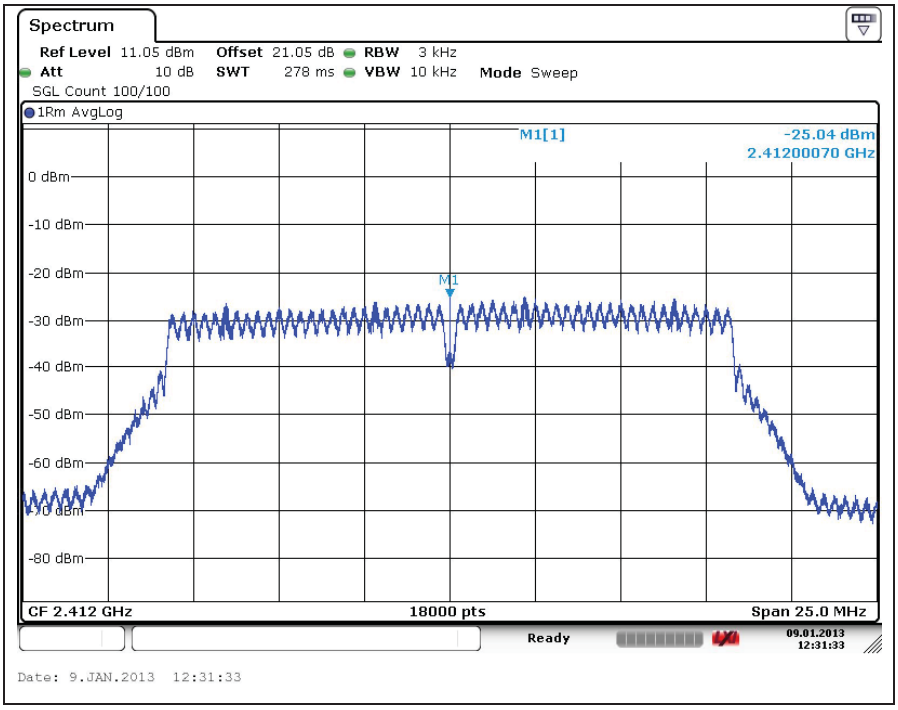


High Channel

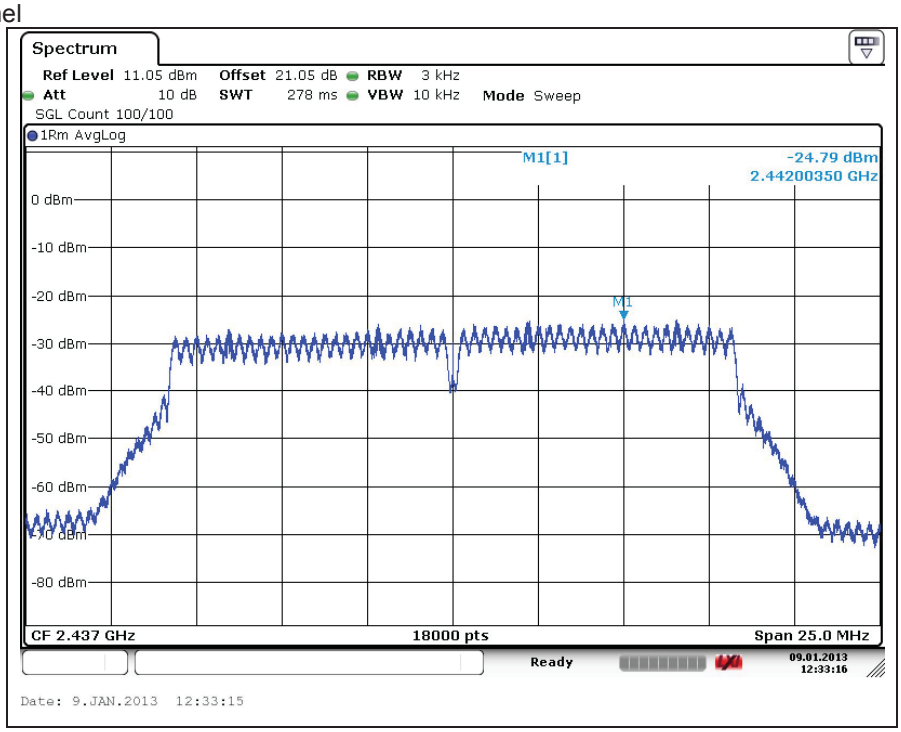


OFDM : 802.11g

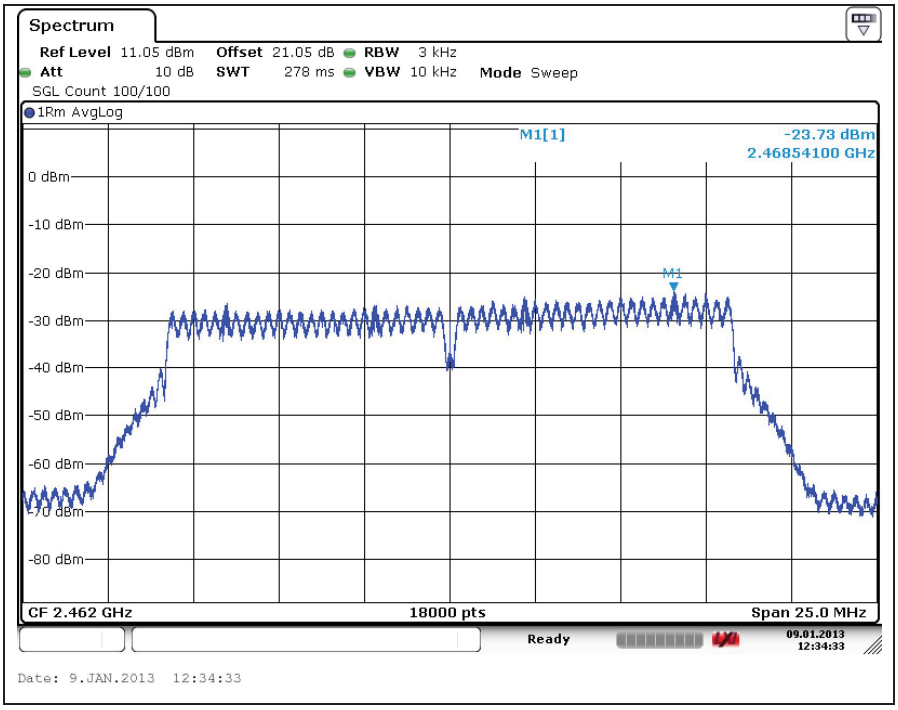
Low Channel



Middle Channel

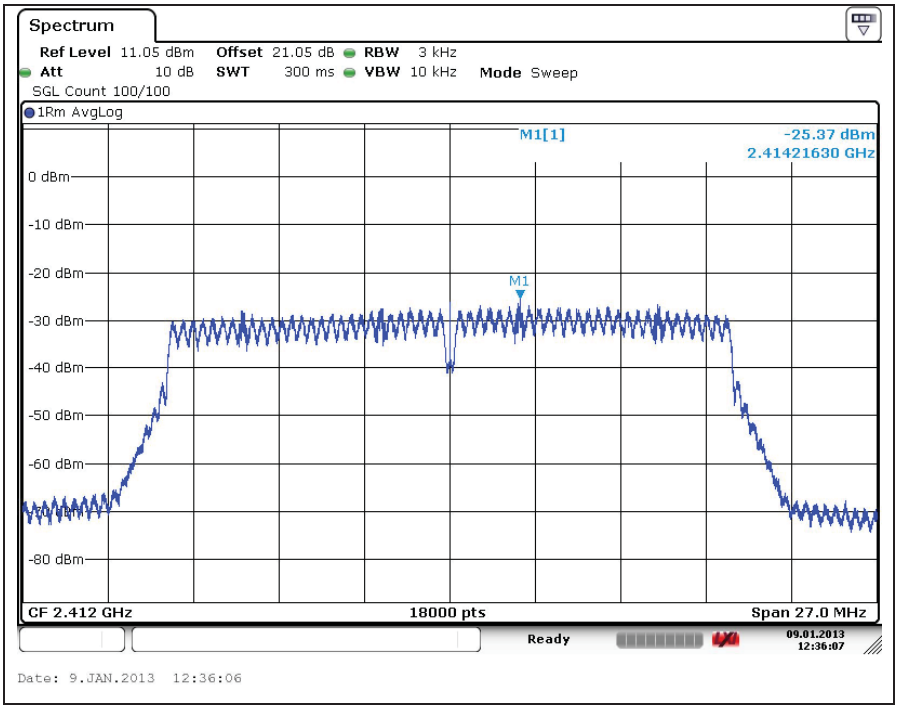


High Channel

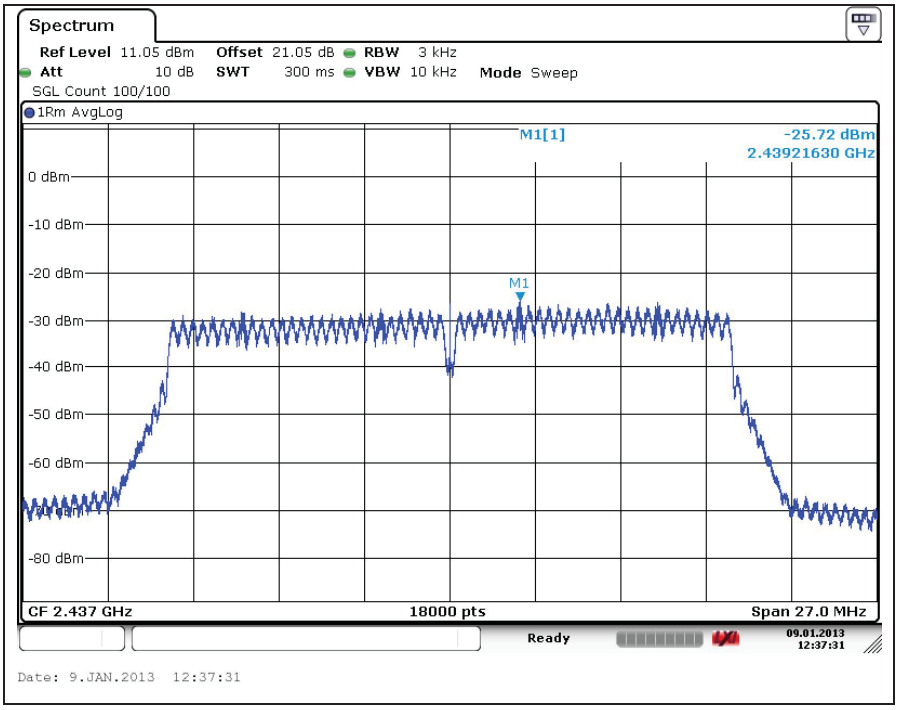


OFDM : 802.11n_HT20

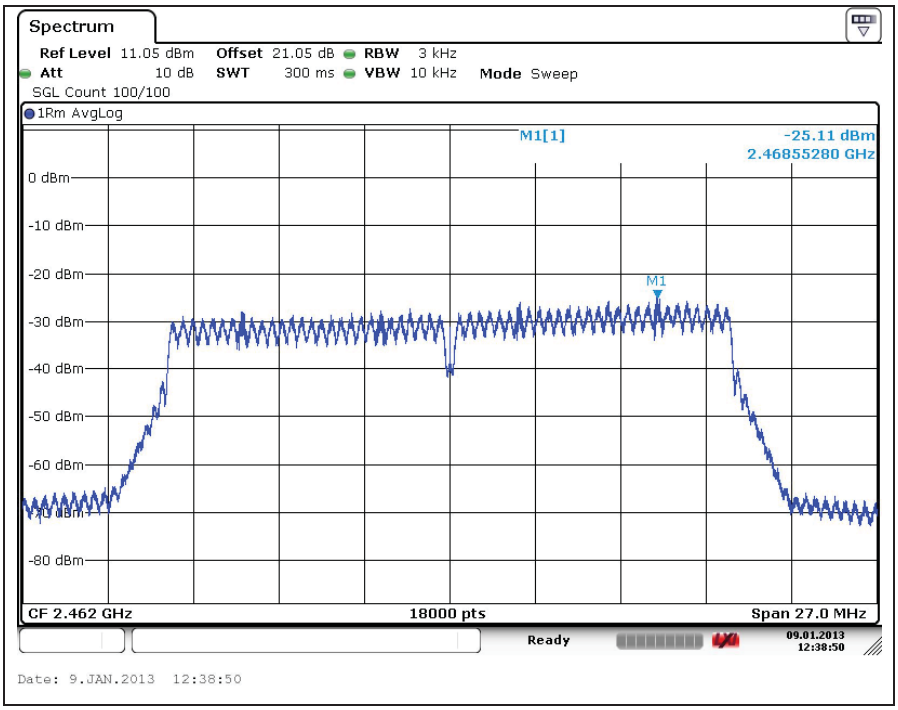
Low Channel



Middle Channel

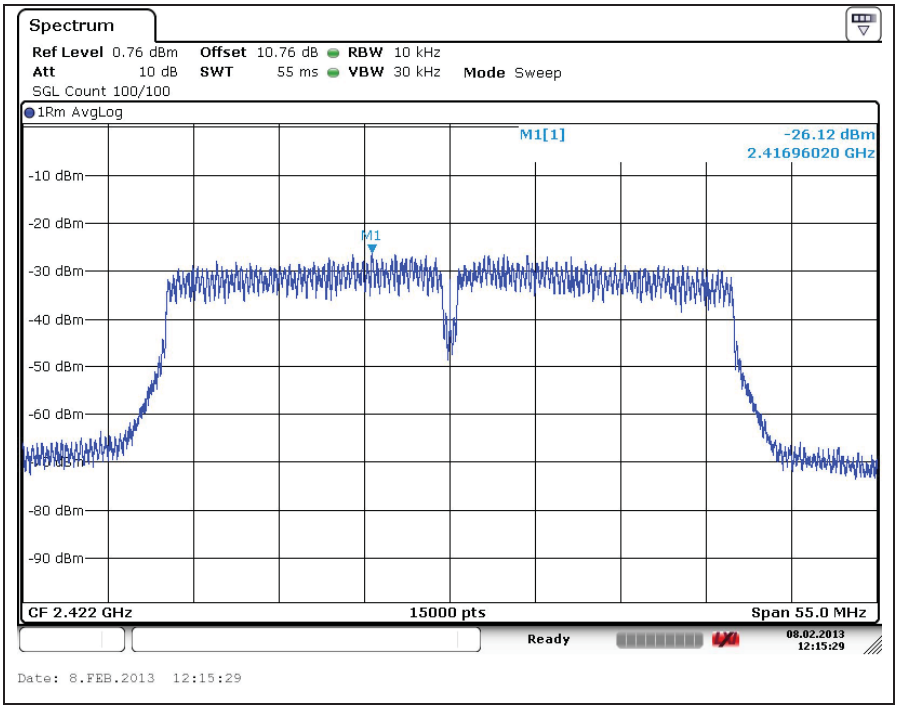


High Channel

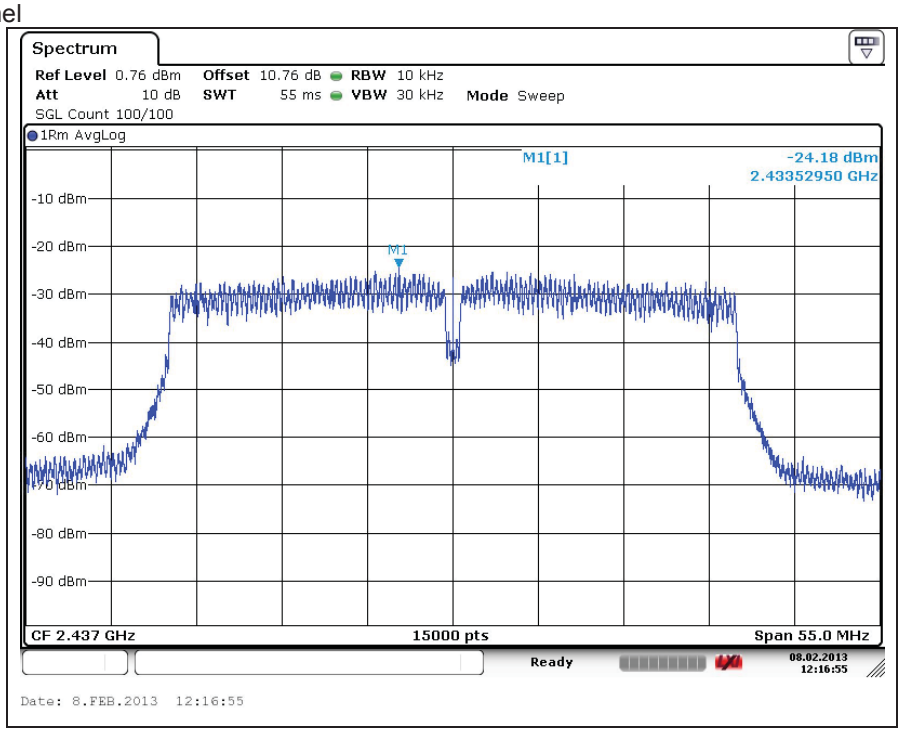


OFDM : 802.11n_HT40

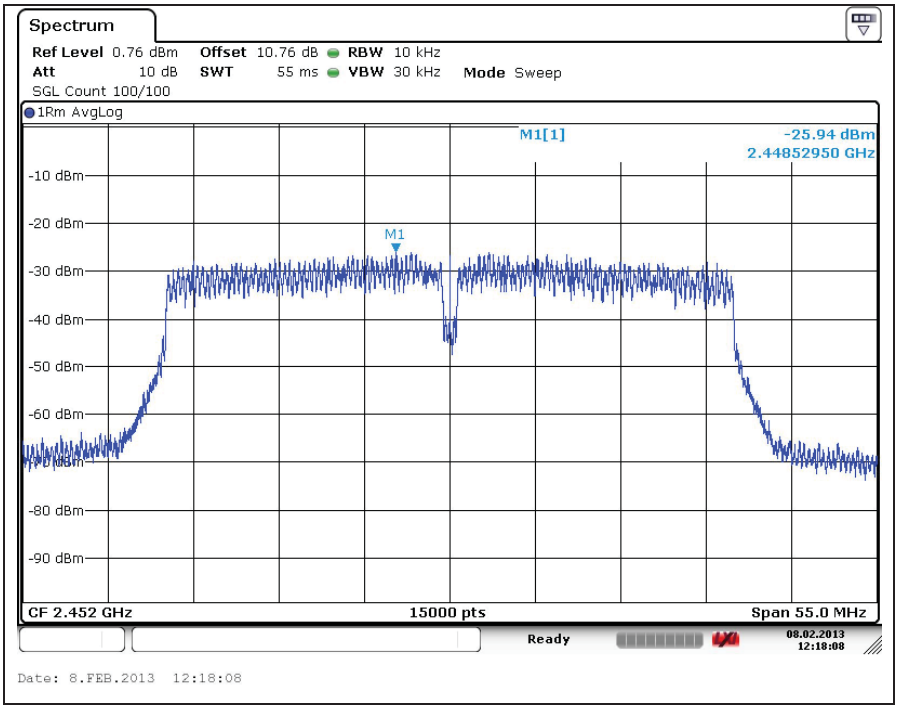
Low Channel



Middle Channel

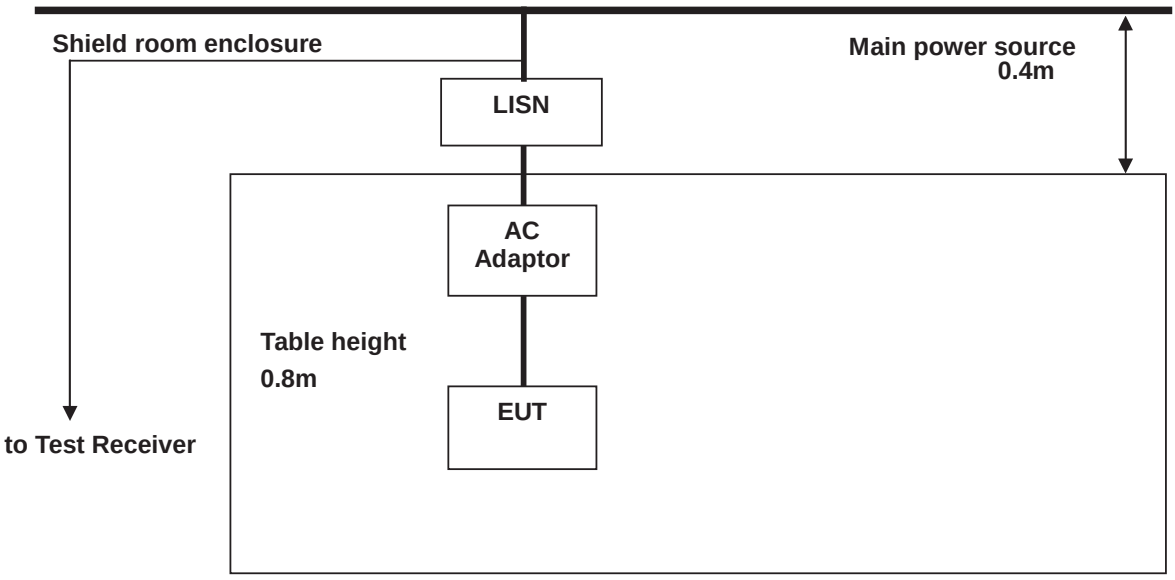


High Channel



6. Transmitter AC Power Line Conducted Emission

6.1. Test Setup



6.2. Limit

According to §15.207(a) for an intentional radiator that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies, within the band 150 ㎑ to 30 ㎒, shall not exceed the limits in the following table, as measured using a 50 uH/50 ohm line impedance stabilization network(LISN).
Compliance with the provision of this paragraph shall on the measurement of the radio frequency voltage between each power line and ground at the power terminal. The lower applies at the boundary between the frequency ranges.

Frequency of Emission (㎒)	Conducted limit (dB㎶)	
	Quasi-peak	Average
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.

6.3. Test Procedures

All data rates and modes were investigated for this test. The full data for the worst case data rate are reported in this section.
AC line conducted emissions from the EUT were measured according to the dictates of ANSI C63.4-2003

1. The test procedure is performed in a 6.5m × 3.6m× 3.6m (L × W × H) shielded room. The EUT along with its peripherals were placed on a 1.0 m(W)× 1.5 m(L) and 0.8 m in height wooden table and the EUT was adjusted to maintain a 0.4 meter space from a vertical reference plane.
2. The EUT was connected to power mains through a line impedance stabilization network (LISN) which provides 50 ohm coupling impedance for measuring instrument and the chassis ground was bounded to the horizontal ground plane of shielded room.
3. The excess power cable between the EUT and the LISN was bundled. All connecting cables of EUT were moved to find the maximum emission.

6.4. Test Results (Worst case configuration_11b mode, 1 Mbps, middle channel)

The following table shows the highest levels of conducted emissions on both phase of Hot and Neutral line.

Ambient temperature : (23 ± 2) ℃
Relative humidity : 47 % R.H.

Frequency range : 0.15 ㎒ – 30 ㎒
Measured Bandwidth : 9 ㎑

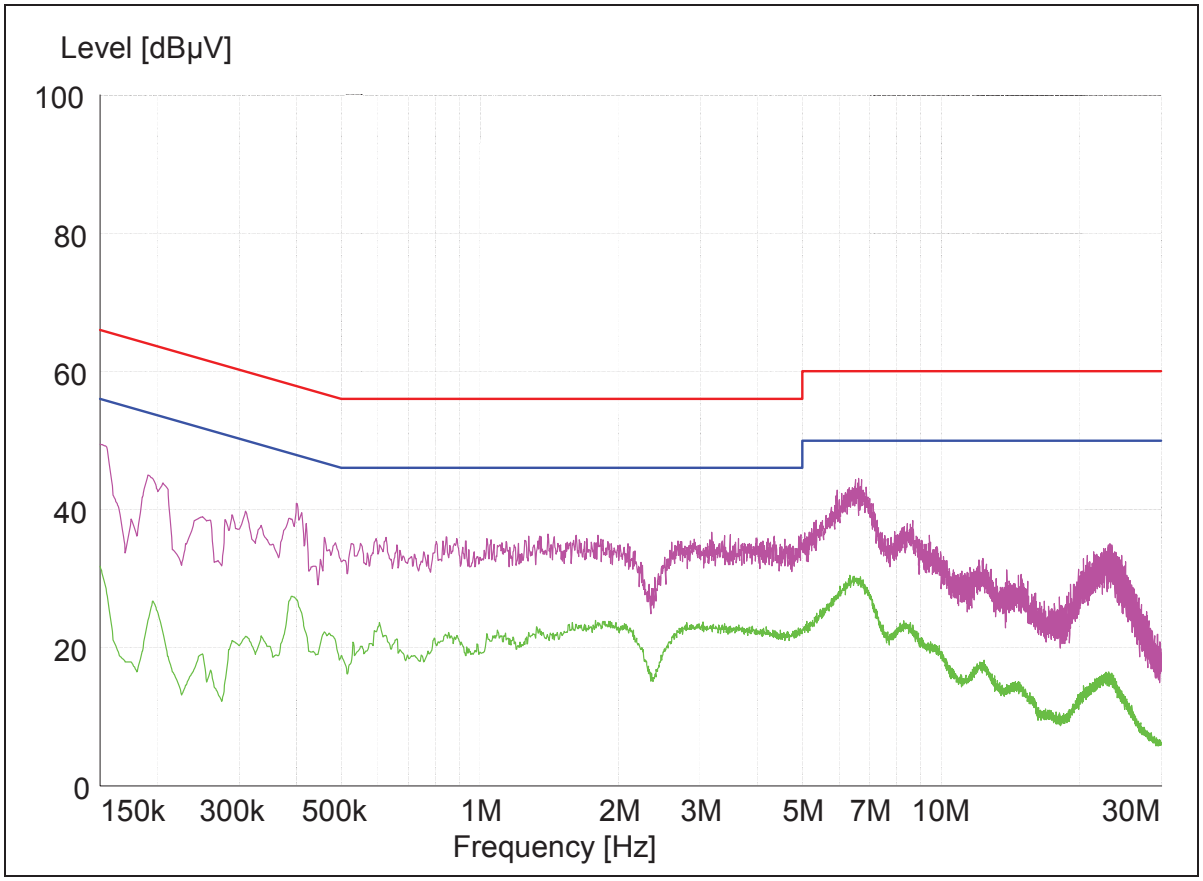
FREQ.	LEVEL(dBμV)		LINE	LIMIT(dBμV)		MARGIN(dB)	
(㎒)	Q-Peak	Average		Q-Peak	Average	Q-Peak	Average
0.15	17.56	10.16	N	66.00	56.00	48.44	45.84
0.19	16.06	9.96	N	64.04	54.04	47.98	44.08
0.40	33.37	26.97	N	57.85	47.85	24.48	20.88
6.62	31.35	23.55	N	60.00	50.00	28.65	26.45
8.68	28.00	20.20	N	60.00	50.00	32.00	29.80
23.27	26.80	16.30	N	60.00	50.00	33.20	33.70
0.18	34.18	20.58	H	64.72	54.72	30.54	34.14
0.23	38.58	28.98	H	62.45	52.45	23.87	23.47
0.41	40.09	29.79	H	57.65	47.65	17.56	17.86
1.76	31.84	20.94	H	56.00	46.00	24.16	25.06
5.88	35.67	26.77	H	60.00	50.00	24.33	23.23
25.06	24.76	22.26	H	60.00	50.00	35.24	27.74

Note ;

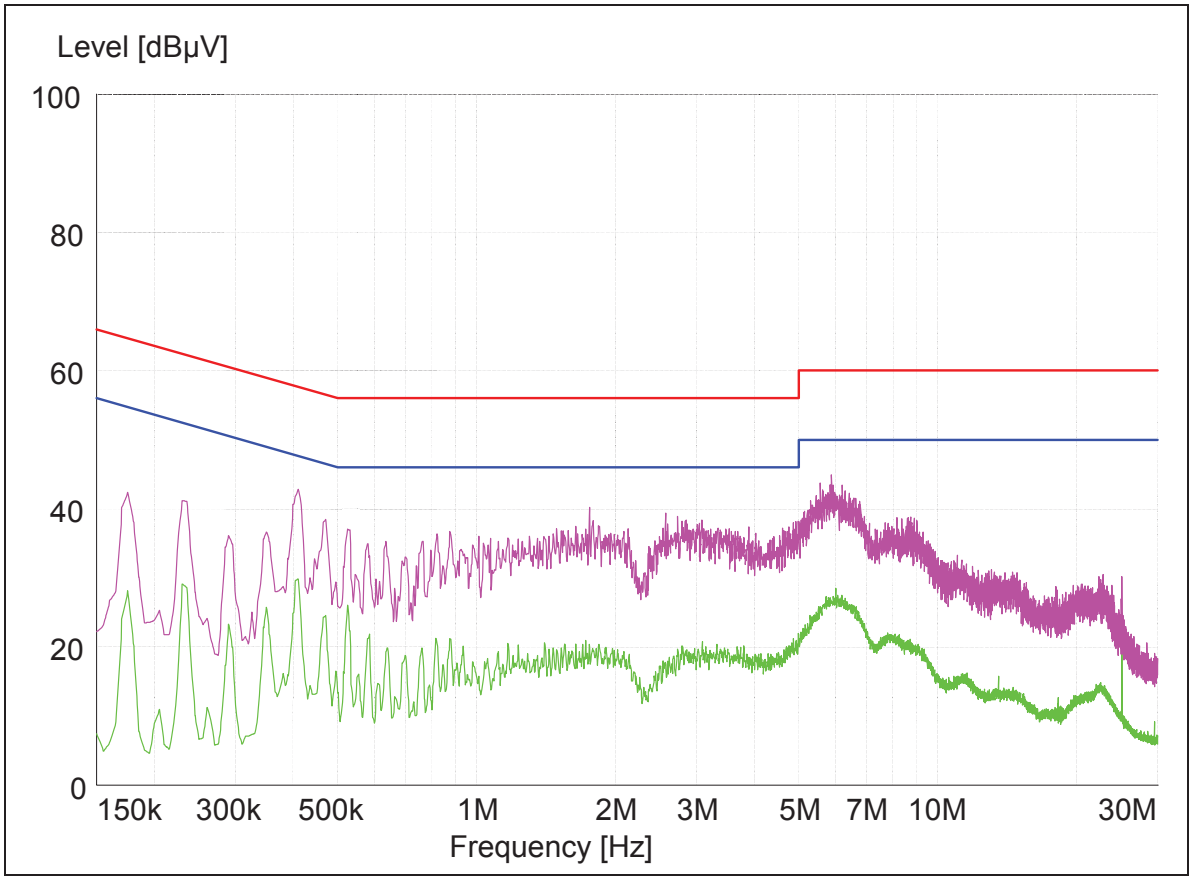
1. Line (H): Hot, Line (N): Neutral
2. All modes of operation were investigated and the worst-case emissions are reported using 11b_1Mbps
3. The limit for Class B device(s) from 150 ㎑ to 30 ㎒ are specified in Section of the Title 47 CFR.
4. Traces shown in plot mad using a peak detector and average detector
5. Deviations to the Specifications: None.

Plots of Conducted Power line

Test mode : (Neutral)



Test mode : (Hot)



7. Antenna Requirement

7.1. Standard Applicable

For intentional device, according to FCC 47 CFR Section §15.203, an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. And according to FCC 47 CFR Section §15.247 (b) if transmitting antennas of directional gain greater than 6 dBi are used, the power shall be reduced by the amount in dB that the gain of the antenna exceeds 6 dBi.

7.2. Antenna Connected Construction

Antenna used in this product is Internal type(PIFA) with gain of 0.3 dBi.