FCC Part 15C
Measurement and Test Report

For

TOPICON HK LIMITED

Room 2113-2114, Tower C, Huangdu Plaza, Yitian Road, Futian District,

Shenzhen, China

FCC ID: 2AHAF-MDT

FCC Rule(s):	FCC Part 15C
Product Description:	GPS
Tested Model:	MDT750
Report No.:	STR18048256I-2
Sample Receipt Date:	2018-04-25
Tested Date:	2018-04-26 to 2018-07-31
Issued Date:	2018-07-01
Tested By:	Jason Su / Engineer
Reviewed By:	Silin Chen / EMC Manager
Approved & Authorized By:	Jandy So / PSQ Manager

Prepared By:

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1. GENERAL INFORMATION

1.1 Product Description for Equipment Under Test (EUT)

Client Information

Applicant:	TOPICON HK LIMITED
Address of applicant:	Room 2113-2114, Tower C, Huangdu Plaza, Yitian Road, Futian District, Shenzhen, China
Manufacturer:	TOPICON HK LIMITED
Address of manufacturer:	Room 2113-2114, Tower C, Huangdu Plaza, Yitian Road, Futian District, Shenzhen, China

General Description of EUT	
Product Name:	GPS
Trade Name:	/
Model No.:	MDT750
Adding Model(s):	MDT740, MDT730, MDT720, MDT721, MDT701, MDT702, MDT703, MDT713D, M700, M700A, M700AG, M700AB, M700B, M700AKB, M700C, OBC720, MDT840, MDT850
Rated Voltage:	DC 3.7V by Battery
Battery:	4300 mAh
Power Adapter Model:	/
Software Version (MDT750):	mdt750_gms_lite_1.3.4.98a7a18
Hardware Version (MDT750):	MDT750-V30
Software Version (MDT850):	mdt750_1.3.2-1g5e16090-dirty.5e16090-dirty
Hardware Version (MDT850):	MDT750-V30
The EUT Main board support GSM850/PCS1900, WCDMA Band 2/5 function. It is intended for Multimedia Message Service (MMS) transmission. It is equipped with GPRS/EDGE class 12 for GSM850/PCS1900, GPS, NFC, Bluetooth and Wi-Fi functions. For more information see the following datasheet.	
Note: The test data is gathered from a production sample provided by the manufacturer. The screen size of others models listed in the report is different from main-test model MDT750, but the circuit and the electronic construction do not change, declared by the manufacturer.	

Technical Characteristics of EUT	
Support Standards:	802.11b, 802.11g, 802.11n-HT20
Frequency Range:	2412-2462MHz
RF Output Power:	15.18dBm (Conducted)
Type of Modulation:	CCK, OFDM, QPSK, BPSK, 16QAM, 64QAM
Data Rate:	1-11Mbps, 6-54Mbps, up to 72.2Mbps
Quantity of Channels:	11
Channel Separation:	5MHz
Type of Antenna:	Integral Antenna
Antenna Gain:	3.0dBi
Lowest Internal Frequency of EUT:	32.768kHz

1.2 Test Standards

The tests were performed according to following standards:

FCC Rules Part 15.247: Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.
558074 D01 DTS Meas Guidance v04: GUIDANCE FOR PERFORMING COMPLIANCE MEASUREMENTS ON DIGITAL TRANSMISSION SYSTEMS (DTS) OPERATING UNDER SECTION 15.247
ANSI C63.10-2013: American National Standard for Testing Unlicensed Wireless Devices.

Maintenance of compliance is the responsibility of the manufacturer. Any modification of the product, which result in lowering the emission, should be checked to ensure compliance has been maintained.

1.3 Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, KDB 558074 D01 DTS Meas Guidance v04
The equipment under test (EUT) was configured to measure its highest possible emission level. The test modes were adapted accordingly in reference to the Operating Instructions.

1.4 Test Facility

FCC – Registration No.: 125990
Shenzhen SEM Test Technology Co., Ltd. Laboratory has been recognized to perform compliance testing on equipment subject to the Commissions Declaration Of Conformity (DOC). The Designation Number is CN5010, and Test Firm Registration Number is 125990.

Industry Canada (IC) Registration No.: 11464A
The 3m Semi-anechoic chamber of Shenzhen SEM.Test Technology Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 11464A.

1.5 EUT Setup and Test Mode

The EUT was operated in the engineering mode to fix the Tx frequency that was for the purpose of the measurements. All testing shall be performed under maximum output power condition, with a duty cycle equal to 100%, and to measure its highest possible emissions level, more detailed description as follows:

Test Mode List		
Test Mode	Description	Remark
TM1	802.11b	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM2	802.11g	Low:2412MHz, Middle:2437MHz,High:2462MHz
TM3	802.11n-HT20	Low:2412MHz, Middle:2437MHz,High:2462MHz
Note: All test modes (different data rate and different modulation) are performed, but only the worst case is recorded in this report.		

Test Conditions	
Temperature:	22~25 °C
Relative humidity	50~55 %.
ATM Pressure:	1019 mbar

EUT Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
/	/	/	/

Special Cable List and Details			
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite
USB Cable	1.0	Shielded	Without Core
Camera Cable	0.4	Unshielded	Without Core
Power supply cable	1.1	Unshielded	Without Core

Auxiliary Equipment List and Details			
Description	Manufacturer	Model	Serial Number
/	/	/	/

1.6 Measurement Uncertainty

Measurement uncertainty		
Parameter	Conditions	Uncertainty
RF Output Power	Conducted	±0.42dB
Occupied Bandwidth	Conducted	±1.5%
Power Spectral Density	Conducted	±1.8dB
Conducted Spurious Emission	Conducted	±2.17dB
Conducted Emissions	Conducted	9-150kHz ±3.74dB
		0.15-30MHz ±3.34dB
Transmitter Spurious Emissions	Radiated	30-200MHz ±4.52dB
		0.2-1GHz ±5.56dB
		1-6GHz ±3.84dB
		6-18GHz ±3.92dB

1.7 Test Equipment List and Details

No.	Description	Manufacturer	Model	Serial No.	Cal Date	Due Date
SEMT-1072	Spectrum Analyzer	Agilent	E4407B	MY41440400	2018-05-22	2019-05-21
SEMT-1031	Spectrum Analyzer	Rohde & Schwarz	FSP30	836079/035	2018-05-22	2019-05-21
SEMT-1007	EMI Test Receiver	Rohde & Schwarz	ESVB	825471/005	2018-05-22	2019-05-21
SEMT-1008	Amplifier	Agilent	8447F	3113A06717	2018-05-22	2019-05-21
SEMT-1043	Amplifier	C&D	PAP-1G18	2002	2018-05-22	2019-05-21
SEMT-1011	Broadband Antenna	Schwarz beck	VULB9163	9163-333	2017-06-08	2020-06-07
SEMT-1042	Horn Antenna	ETS	3117	00086197	2017-06-08	2020-06-07
SEMT-1121	Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170582	2017-06-08	2020-06-07
SEMT-1069	Loop Antenna	Schwarz beck	FMZB 1516	9773	2017-06-08	2020-06-07
SEMT-1001	EMI Test Receiver	Rohde & Schwarz	ESPI	101611	2018-05-22	2019-05-21
SEMT-1003	L.I.S.N	Schwarz beck	NSLK8126	8126-224	2018-05-22	2019-05-21
SEMT-1002	Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100911	2018-05-22	2019-05-21
SEMT-1168	Pre-amplifier	Direction Systems Inc.	PAP-0126	14141-12838	2018-05-22	2019-05-21
SEMT-1169	Pre-amplifier	Direction Systems Inc.	PAP-2640	14145-14153	2018-05-22	2019-05-21
SEMT-1163	Spectrum Analyzer	Rohde & Schwarz	FSP40	100612	2018-05-22	2019-05-21
SEMT-1170	DRG Horn Antenna	A.H. SYSTEMS	SAS-574	571	2018-03-19	2021-03-18
SEMT-1166	Power Limiter	Agilent	N9356B	MY45450376	2018-05-22	2019-05-21
SEMT-1048	RF Limiter	ATTEN	AT-BSF-2400~2500	/	2018-05-22	2019-05-21
SEMT-1076	RF Switcher	Top Precision	RCS03-A2	/	2018-05-22	2019-05-21
SEMT-C001	Cable	Zheng DI	LL142-07-07-10M(A)	/	2018-03-19	2019-03-18
SEMT-C002	Cable	Zheng DI	ZT40-2.92J-2.92J-6M	/	2018-03-19	2019-03-18
SEMT-C003	Cable	Zheng DI	ZT40-2.92J-2.92J-2.5M	/	2018-03-19	2019-03-18
SEMT-C004	Cable	Zheng DI	2M0RFC	/	2018-03-19	2019-03-18
SEMT-C005	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18
SEMT-C006	Cable	Zheng DI	1M0RFC	/	2018-03-19	2019-03-18

2. SUMMARY OF TEST RESULTS

FCC Rules	Description of Test Item	Result
§2.1093	RF Exposure	Compliant
§ 15.203; § 15.247(b)(4)(i)	Antenna Requirement	Compliant
§15.205	Restricted Band of Operation	Compliant
§ 15.207(a)	Conducted Emission	N/A*
§ 15.247(e)	Power Spectral Density	Compliant
§ 15.247(a)(2)	6 dB Bandwidth	Compliant
§ 15.247(b)(3)	RF Output Power	Compliant
§ 15.209(a)	Radiated Emission	Compliant
§ 15.247(d)	Band Edge (Out of Band Emissions)	Compliant

N/A: not applicable

Remark: The AC Line Conducted Emissions testing is exempted because the device is intended to be used vehicle and powered by on-board battery. Thus, the AC Line Conducted Emissions testing is not applicable.

3. RF Exposure

3.1 Standard Applicable

According to § 1.1307 and § 2.1093, the portable transmitter must comply the RF exposure requirements.

3.2 Test Result

This product complied with the requirement of the RF exposure, please see the SAR Report.

4. Antenna Requirement

4.1 Standard Applicable

According to FCC Part 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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section.

4.2 Evaluation Information

This product has an integral antenna, fulfill the requirement of this section.

5. Power Spectral Density

5.1 Standard Applicable

According to 15.247(a)(1)(iii), For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

5.2 Test Procedure

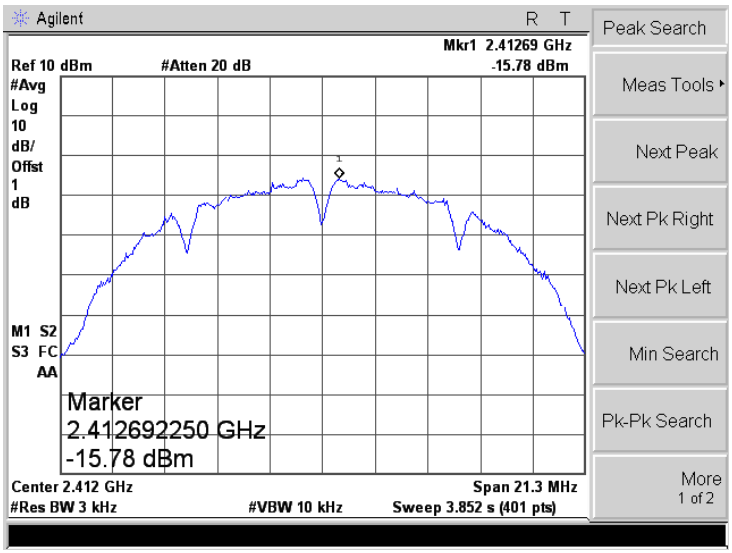
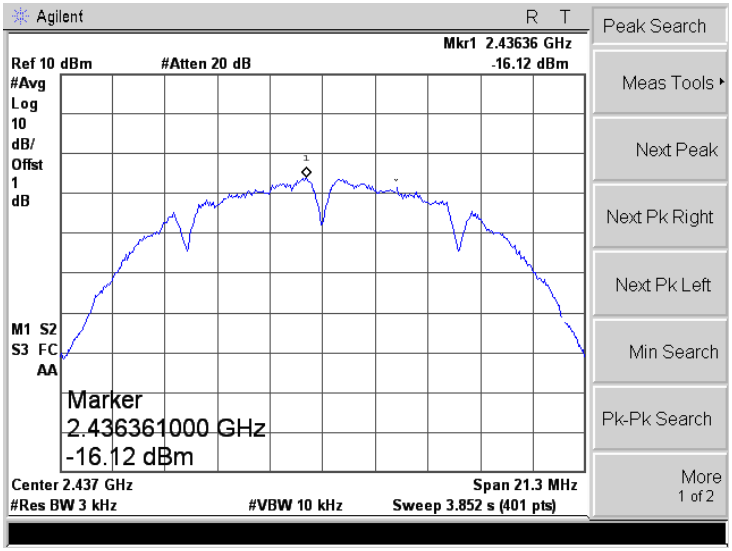
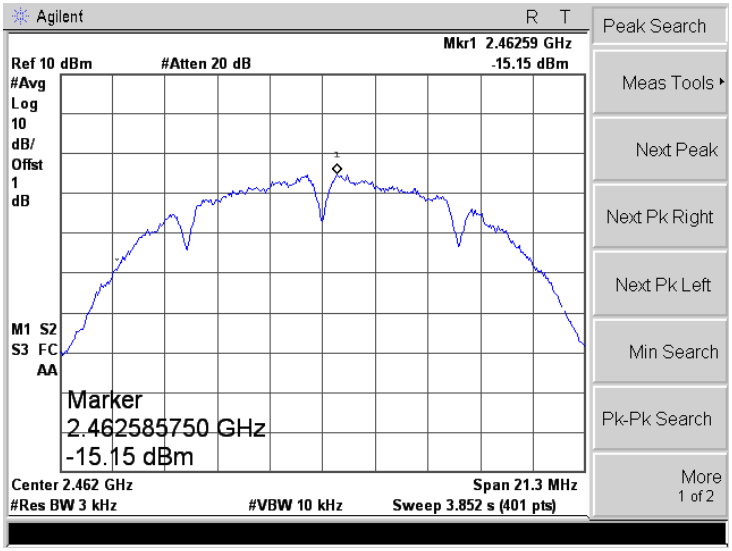
According to the KDB 558074 D01 v04, such specifications require that the same method as used to determine the conducted output power shall also be used to determine the power spectral density. The test method of power spectral density as below:

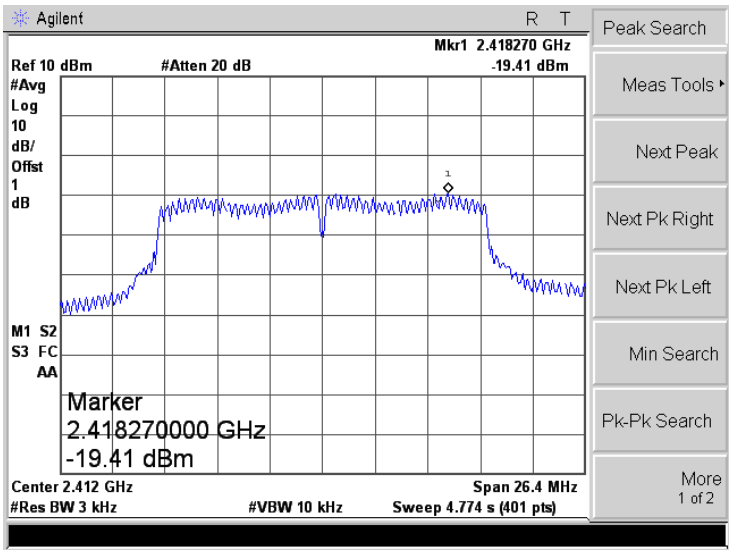
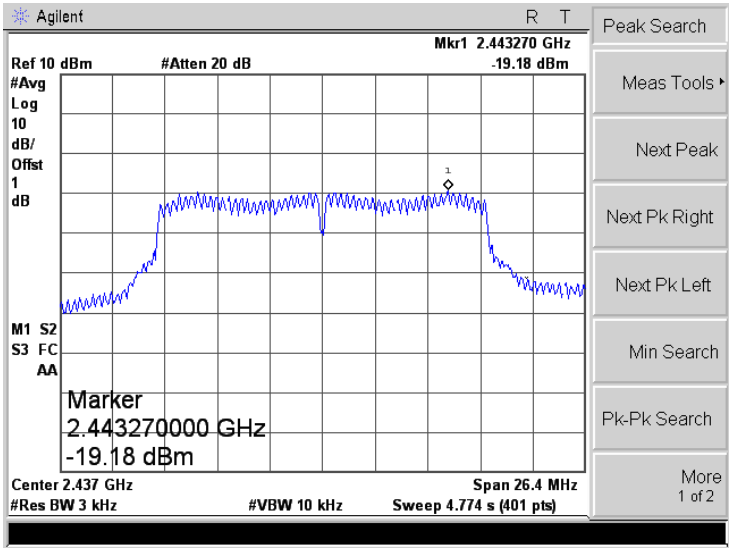
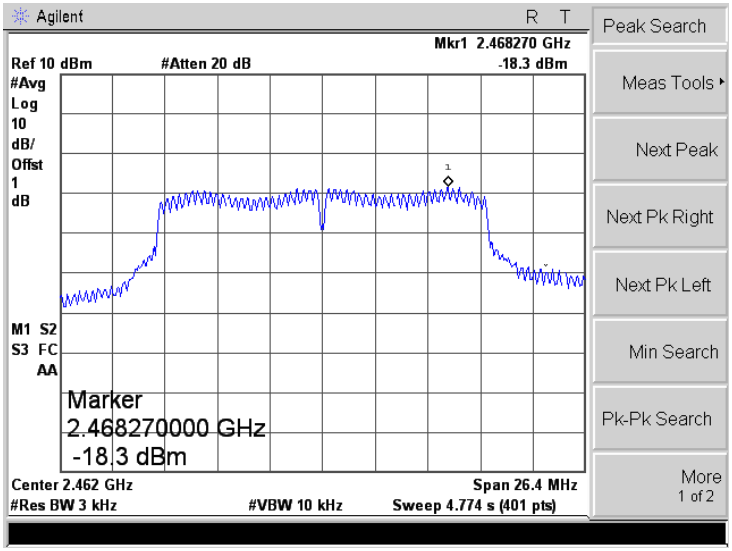
a) Set instrument center frequency to DTS channel center frequency.
b) Set span to at least 1.5 times the OBW.
c) Set RBW to: 3 kHz ≤ RBW ≤ 100 kHz. .
d) Set VBW ≥3 x RBW.
e) Detector = power averaging (RMS) or sample detector (when RMS not available).
f) Ensure that the number of measurement points in the sweep ≥ 2 x span/RBW.
g) Sweep time = auto couple.
h) Employ trace averaging (RMS) mode over a minimum of 100 traces.
i) Use the peak marker function to determine the maximum amplitude level.
j) If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat (note that this may require zooming in on the emission of interest and reducing the span in order to meet the minimum measurement point requirement as the RBW is reduced).

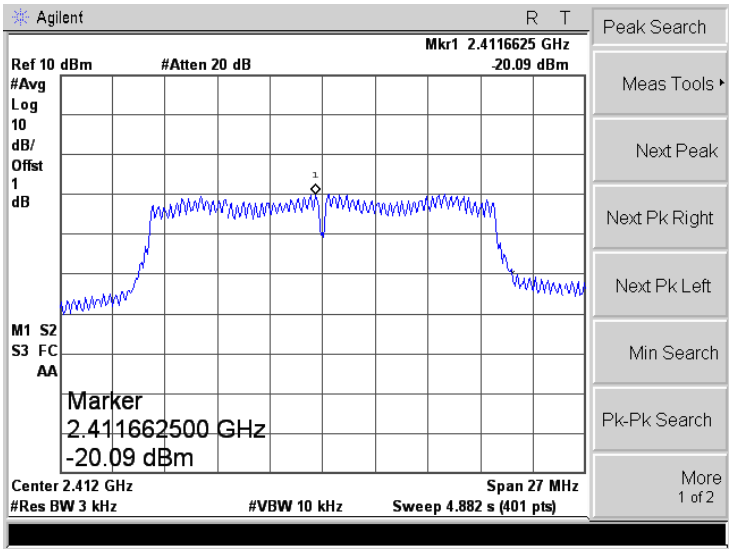
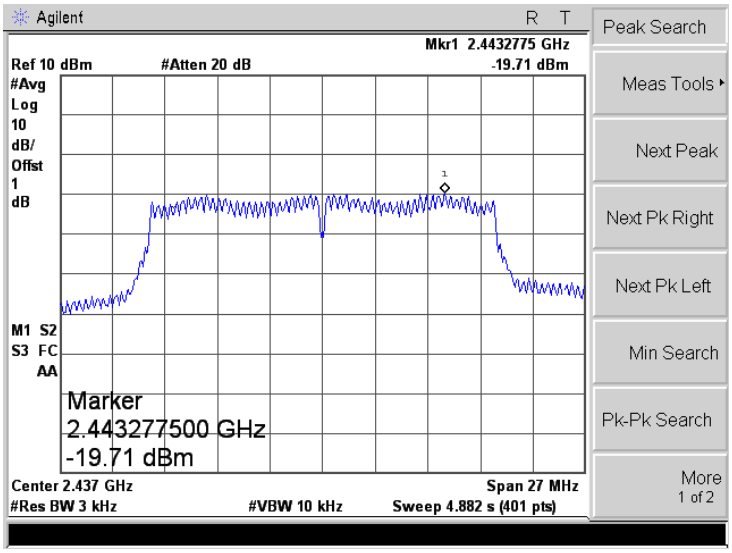
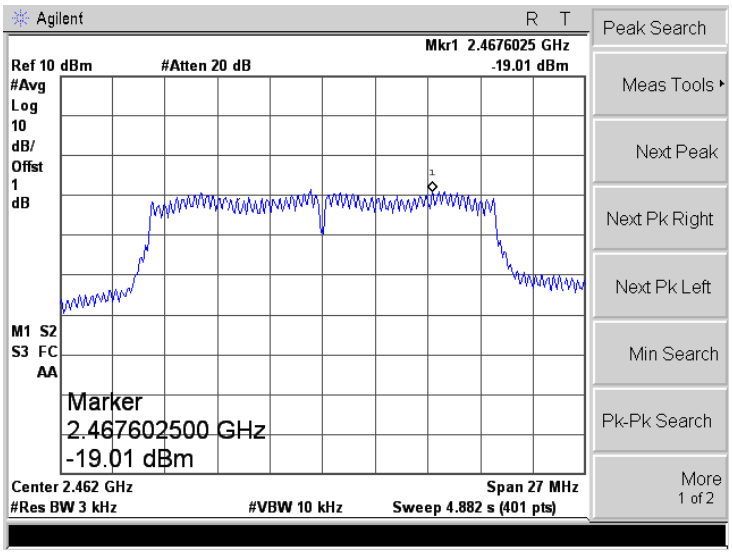
5.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	Power Spectral Density dBm/3kHz	Limit dBm/3kHz
802.11b	2412	-15.78	8
	2437	-16.12	8
	2462	-15.15	8
802.11g	2412	-19.41	8
	2437	-19.18	8
	2462	-18.30	8
802.11n-HT20	2412	-20.09	8
	2437	-19.71	8
	2462	-19.01	8

Please refer to the following test plots:

802.11b-Low	
802.11b-Middle	
802.11b-High	

802.11g-Low	
802.11g-Middle	
802.11g-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

6. 6dB Bandwidth

6.1 Standard Applicable

According to 15.247(a)(2). Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

6.2 Test Procedure

a) Set RBW = 100 kHz.
b) Set the video bandwidth (VBW) ≥ 3 × RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Sweep = auto couple.
f) Allow the trace to stabilize.
g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

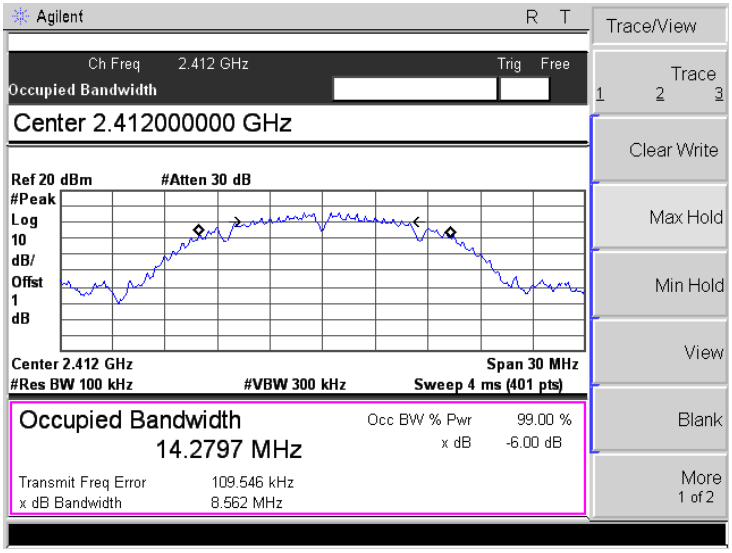
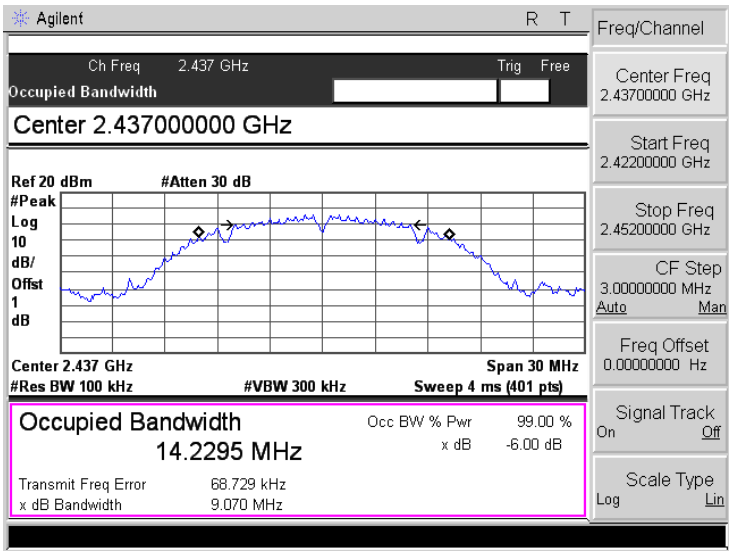
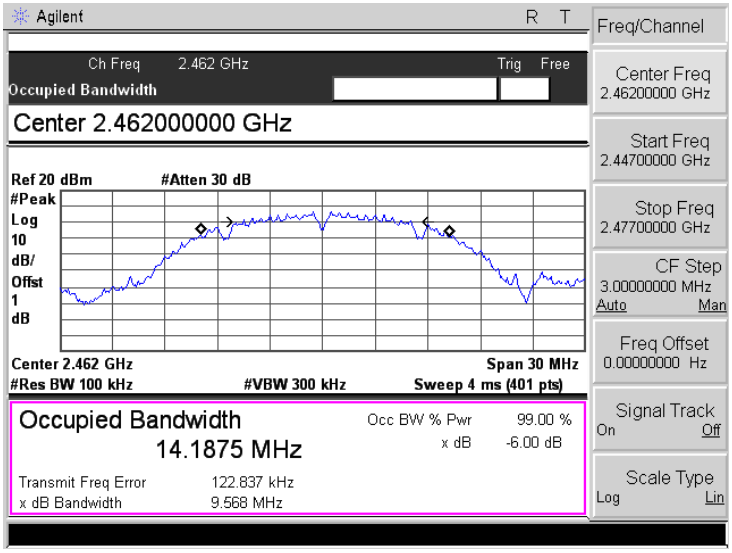
6.3 Environmental Conditions

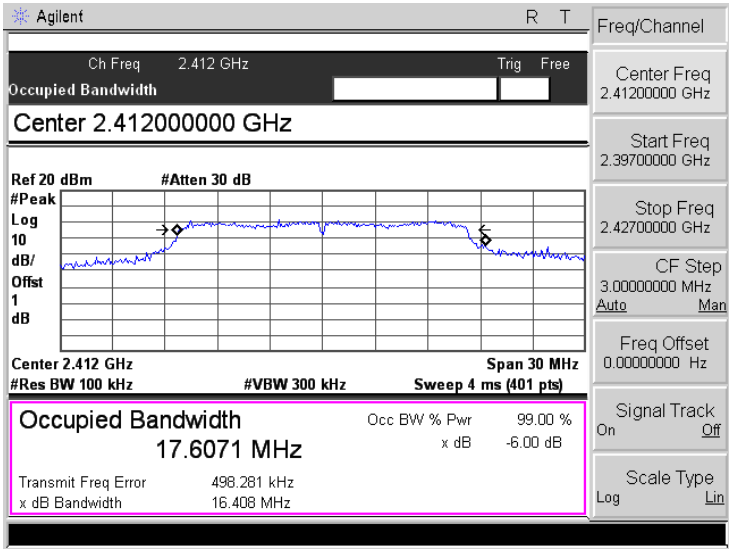
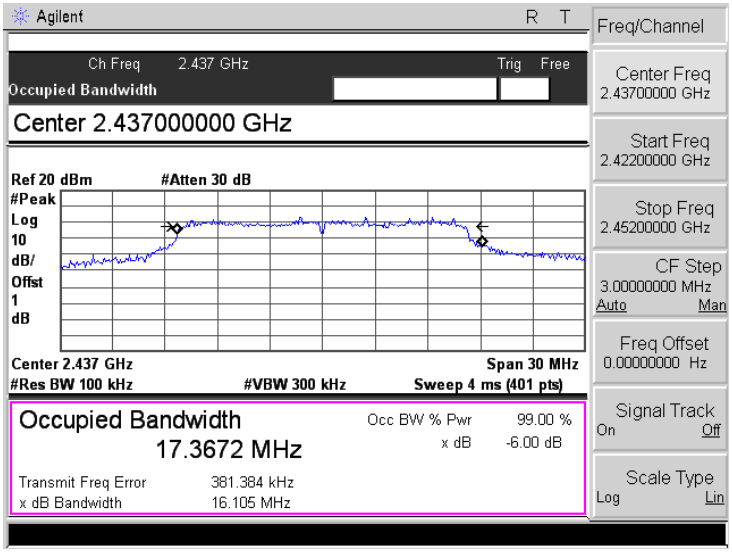
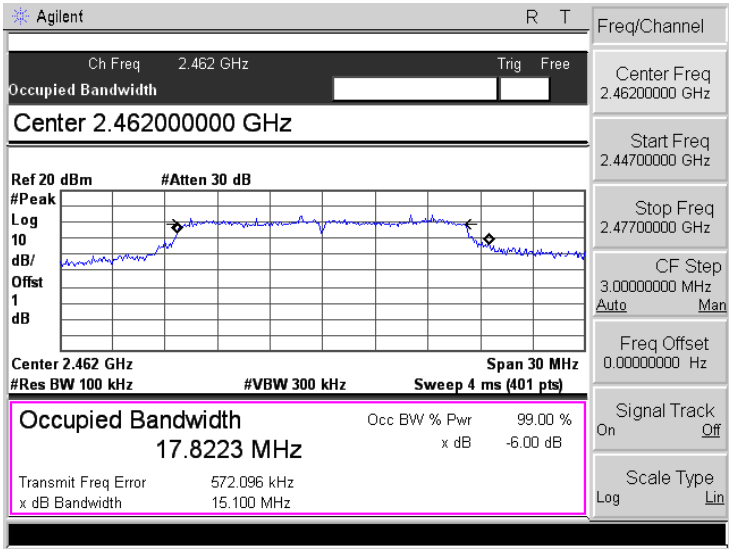
Temperature:	25° C
Relative Humidity:	53%
ATM Pressure:	1018 mbar

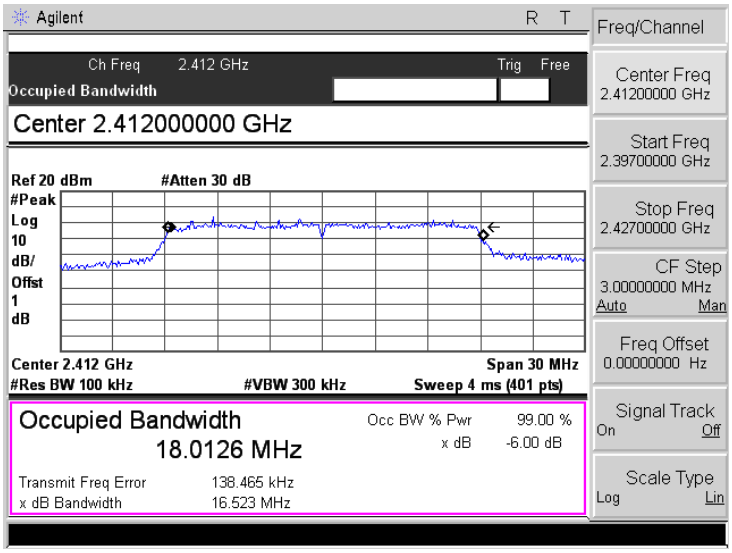
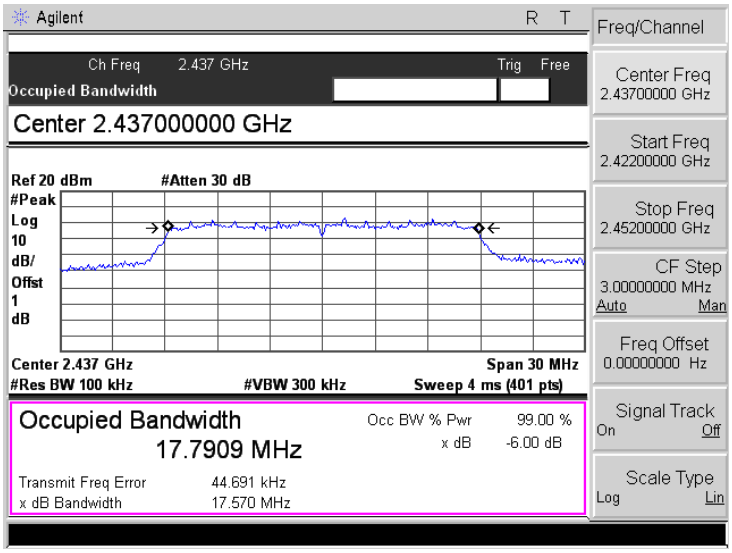
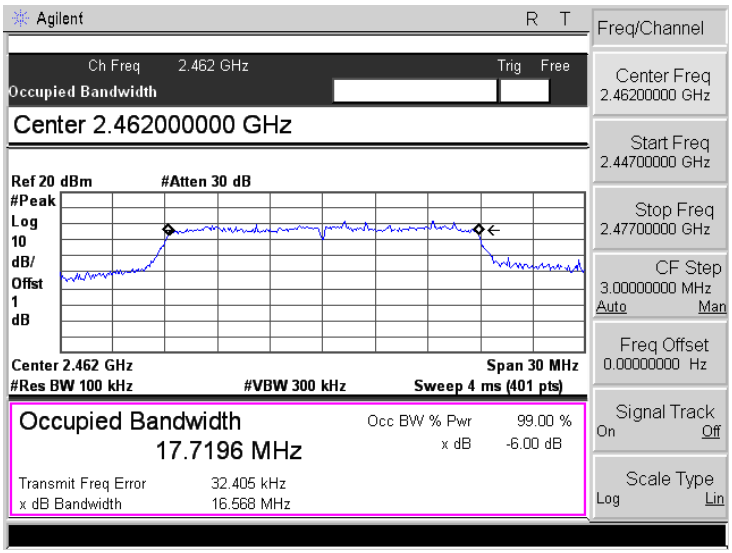
6.4 Summary of Test Results/Plots

Test Mode	Test Channel MHz	6 dB Bandwidth MHz	Limit kHz
802.11b	2412	8.562	≥500
	2437	9.070	≥500
	2462	9.568	≥500
802.11g	2412	16.408	≥500
	2437	16.105	≥500
	2462	15.100	≥500
802.11n-HT20	2412	16.523	≥500
	2437	17.570	≥500
	2462	16.568	≥500

Please refer to the following test plots:

802.11b-Low	
802.11b-Middle	
802.11b-High	

802.11g-Low	
802.11g-Middle	
802.11g-High	

802.11n-HT20-Low	
802.11n-HT20-Middle	
802.11n-HT20-High	

7. RF Output Power

7.1 Standard Applicable

According to 15.247(b)(3). For systems using digital modulation in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands: 1 Watt.

7.2 Test Procedure

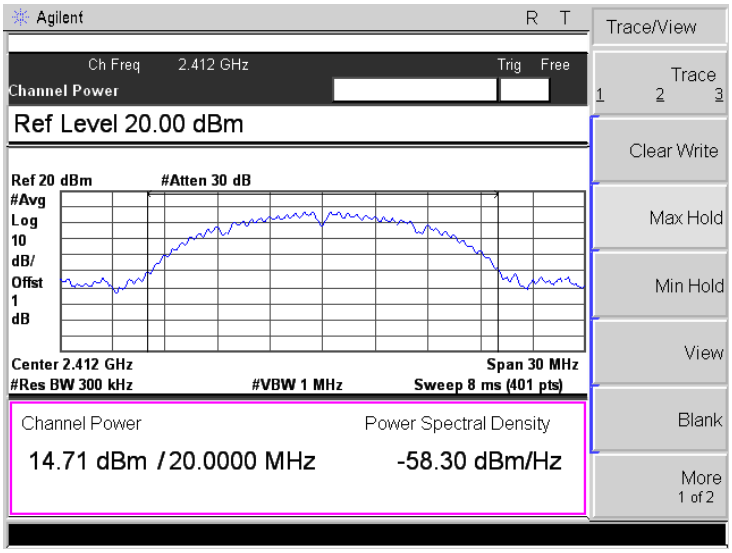
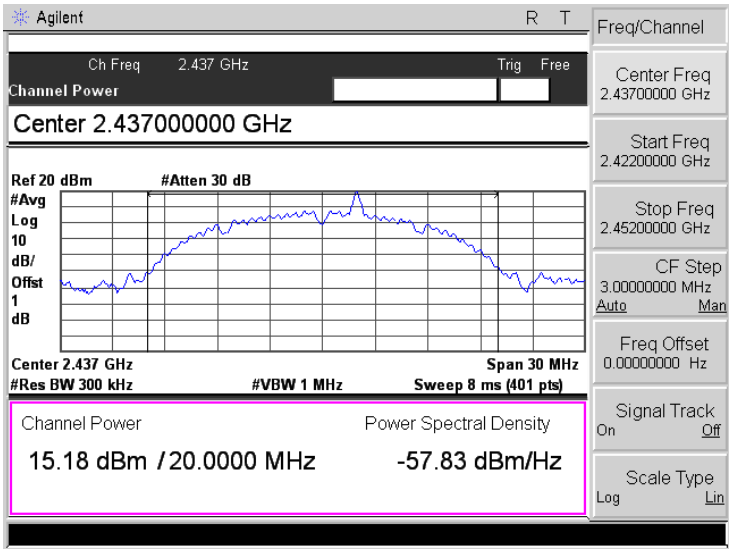
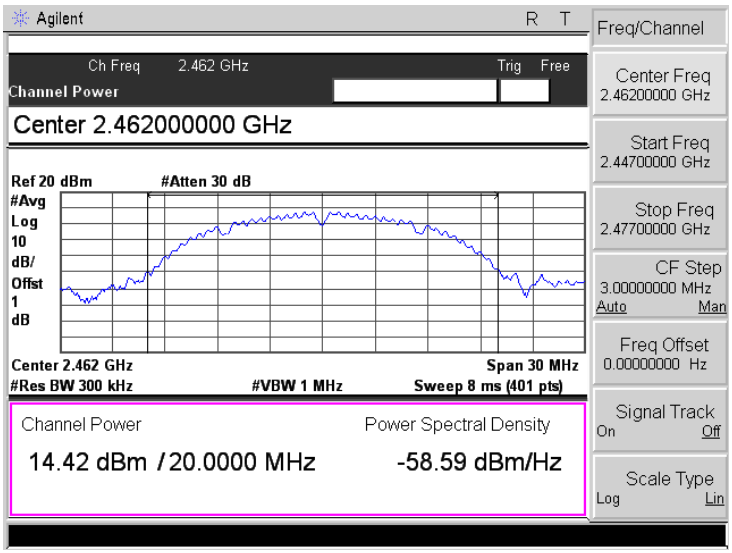
According to the KDB-558074 D01 v04, 9.2.2.2, when this option is exercised, the measured power is to be referenced to the OBW rather than the DTS bandwidth

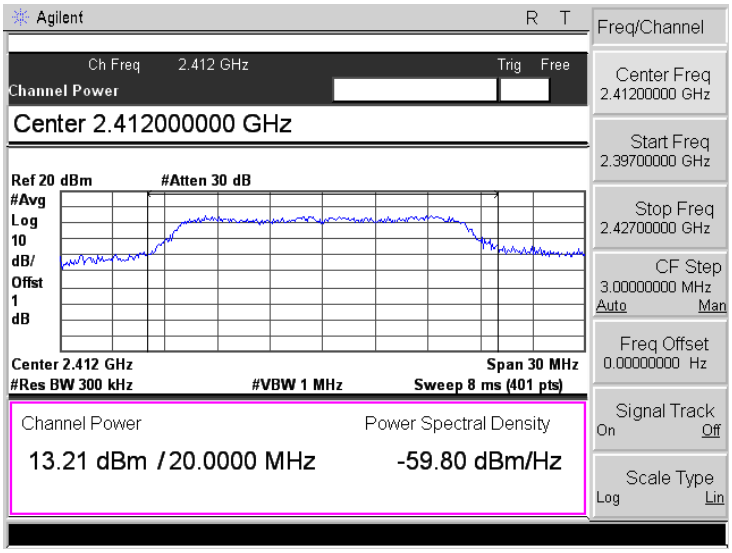
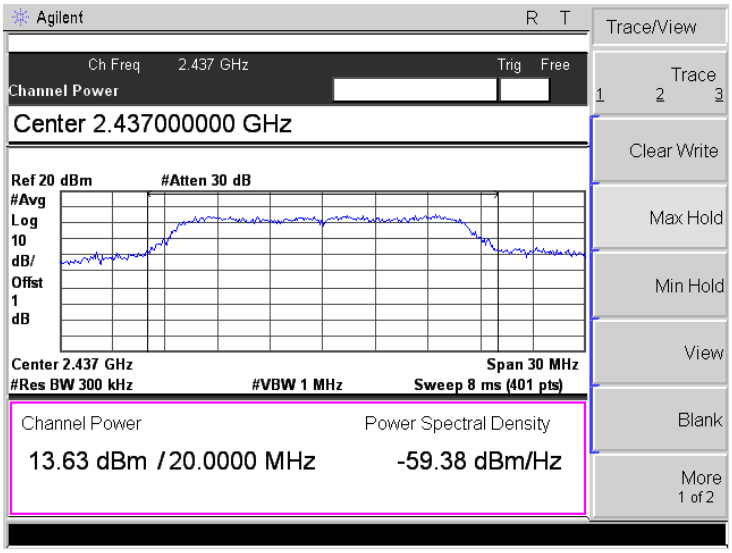
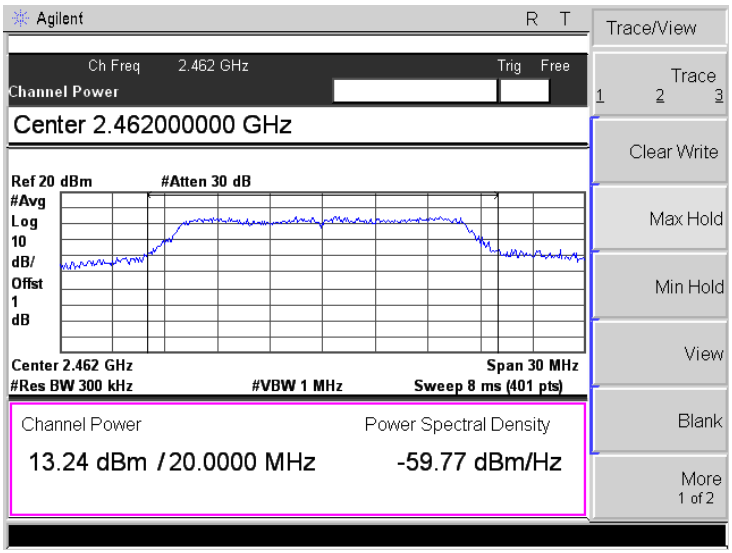
a) Set span to at least 1.5 times the OBW.
b) Set RBW = 1-5% of the OBW, not to exceed 1 MHz.
c) Set VBW ≥ 3 x RBW.
d) Number of points in sweep ≥ 2 × span / RBW. (This gives bin-to-bin spacing ≤ RBW/2, so that narrowband signals are not lost between frequency bins.)
e) Sweep time = auto.
f) Detector = RMS (i.e., power averaging), if available. Otherwise, use sample detector mode.
g) If transmit duty cycle < 98 %, use a sweep trigger with the level set to enable triggering only on full power pulses. The transmitter shall operate at maximum power control level for the entire duration of every sweep. If the EUT transmits continuously (i.e., with no off intervals) or at duty cycle ≥ 98 %, and if each transmission is entirely at the maximum power control level, then the trigger shall be set to "free run".
h) Trace average at least 100 traces in power averaging (i.e., RMS) mode.
i) Compute power by integrating the spectrum across the OBW of the signal using the instrument's band power measurement function, with band limits set equal to the OBW band edges. If the instrument does not have a band power function, sum the spectrum levels (in power units) at intervals equal to the RBW extending across the entire OBW of the spectrum.

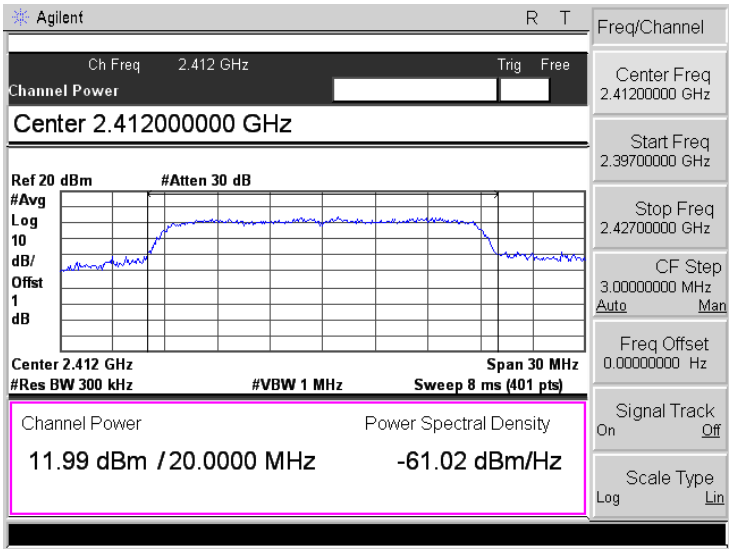
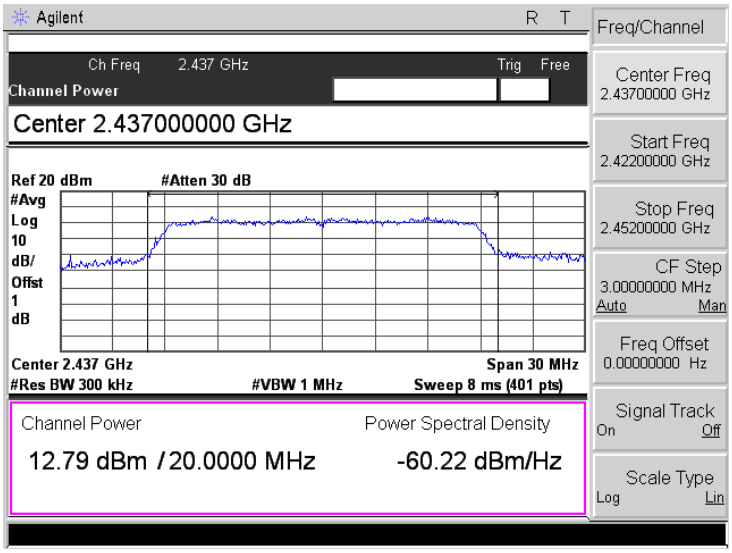
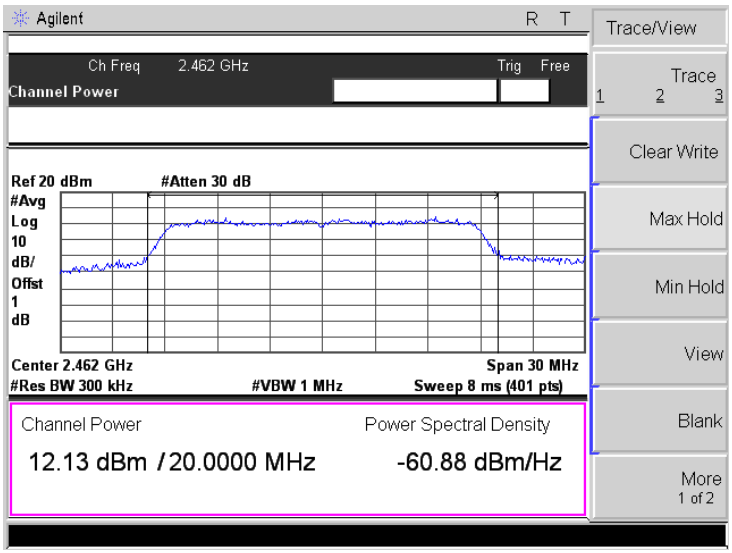
7.3 Summary of Test Results/Plots

Test Mode	Frequency MHz	Reading dBm	Output Power mW	Limit mW
802.11b _ 11Mbps	2412	14.71	29.580	1000
	2437	15.18	32.961	1000
	2462	14.42	27.669	1000
802.11g_54Mbps	2412	13.21	20.941	1000
	2437	13.63	23.067	1000
	2462	13.24	21.086	1000
802.11n HT20_MCS7	2412	11.99	15.812	1000
	2437	12.79	19.011	1000
	2462	12.13	16.331	1000

Please refer to the following test plots:

802.11b-Low 11Mbps	
802.11b-Middle 11Mbps	
802.11b-High 11Mbps	

802.11g-Low 54Mbps	
802.11g-Middle 54Mbps	
802.11g-High 54Mbps	

802.11n-HT20-Low MCS7	
802.11n-HT20-Middle MCS7	
802.11n-HT20-High MCS7	

8. Field Strength of Spurious Emissions

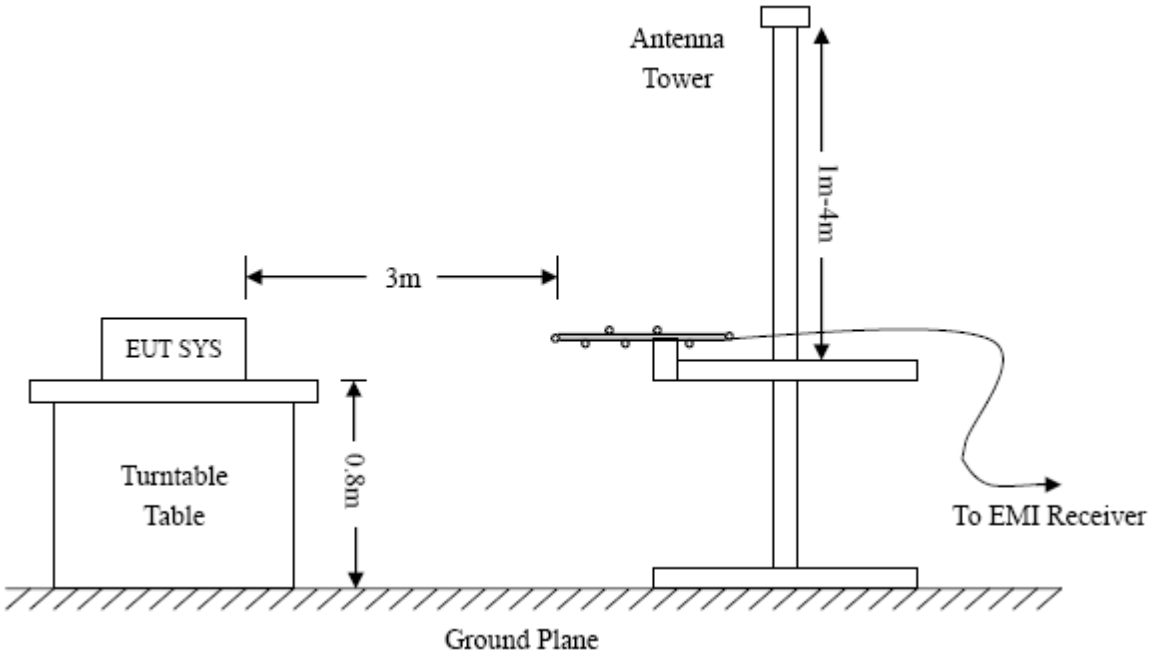
8.1 Standard Applicable

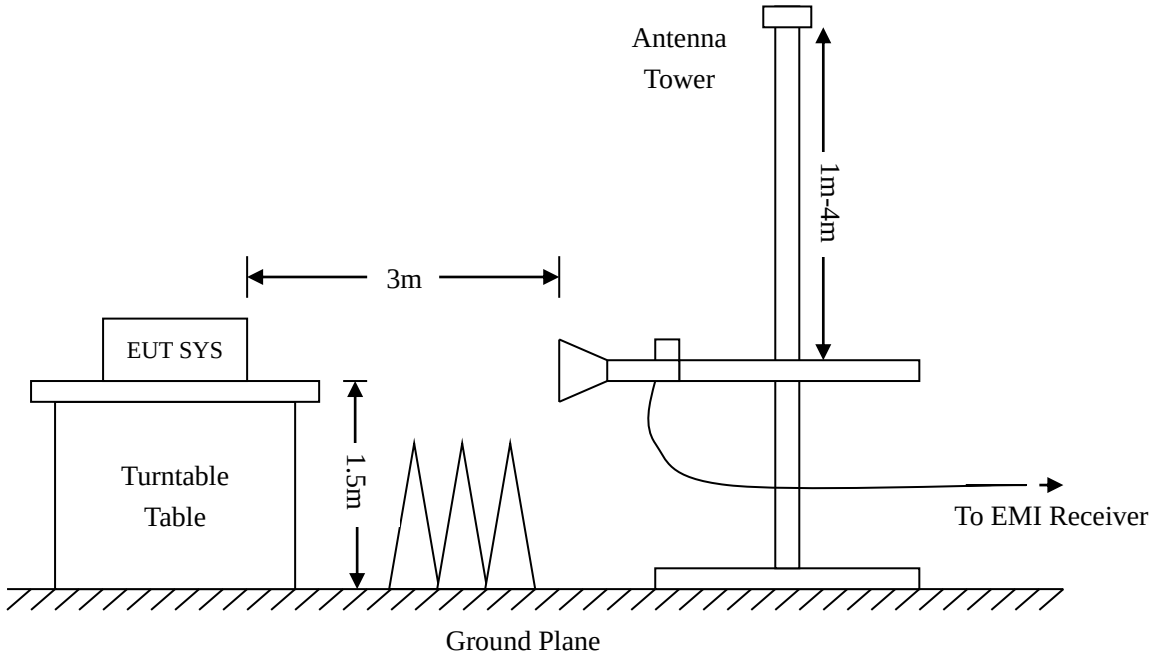
According to §15.247(d), in any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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).

The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in §15.35 for limiting peak emissions apply. Spurious Radiated Emissions measurements starting below or at the lowest crystal frequency.

8.2 Test Procedure

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.205 15.247(a) and FCC Part 15.209 Limit.
The external I/O cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle.
The spacing between the peripherals was 10 cm.





Frequency :9kHz-30MHz	Frequency :30MHz-1GHz	Frequency :Above 1GHz
RBW=10KHz,	RBW=120KHz,	RBW=1MHz,
VBW =30KHz	VBW=360KHz	VBW=3MHz(Peak), 10Hz(AV)
Sweep time= Auto	Sweep time= Auto	Sweep time= Auto
Trace = max hold	Trace = max hold	Trace = max hold
Detector function = peak	Detector function = peak, QP	Detector function = peak, AV

8.3 Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and the Cable Factor, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

Corr. Ampl. = Indicated Reading + Ant. Factor + Cable Loss – Ampl. Gain

The "**Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -6dBμV means the emission is 6dBμV below the maximum limit. The equation for margin calculation is as follows:

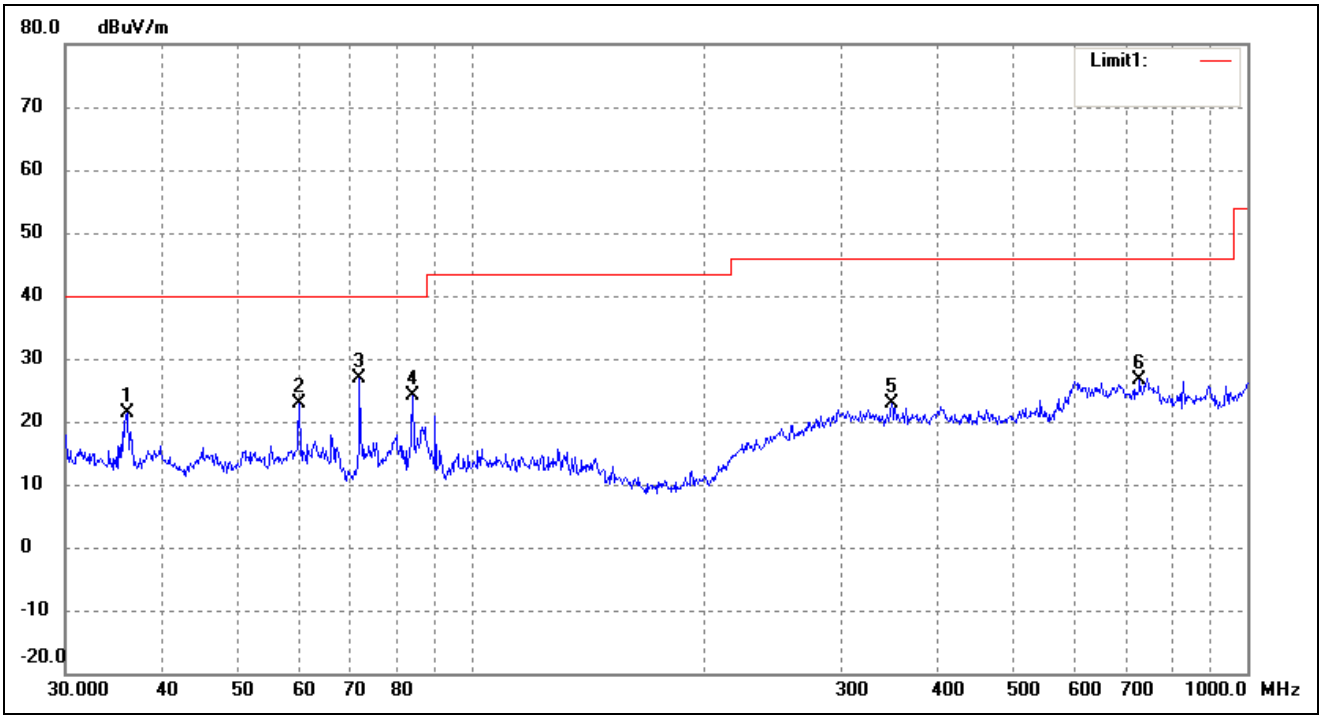
Margin = Corr. Ampl. – FCC Part 15 Limit

8.5 Summary of Test Results/Plots

Note: this EUT was tested in 3 orthogonal positions and the worst case position data was reported.

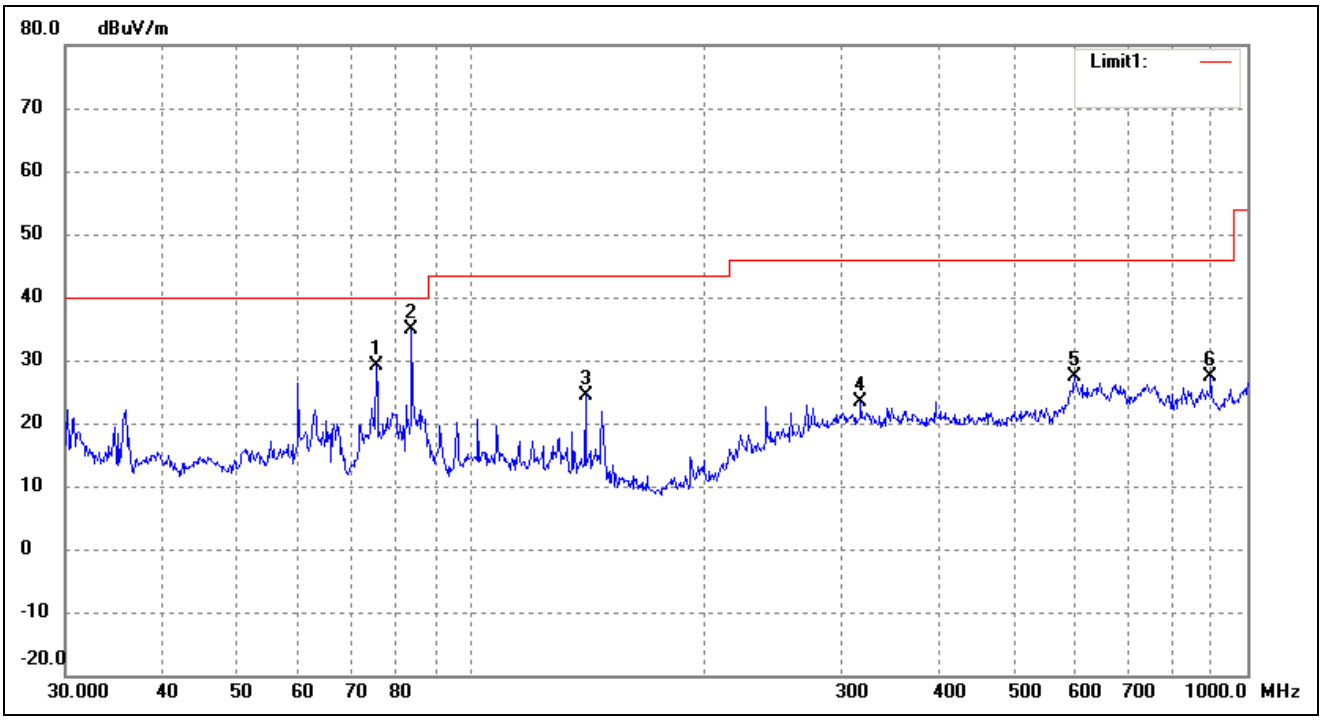
- Spurious Emissions Below 1GHz
- Model: MDT750

802.11b			
Test Channel	Low	Polarity:	Horizontal



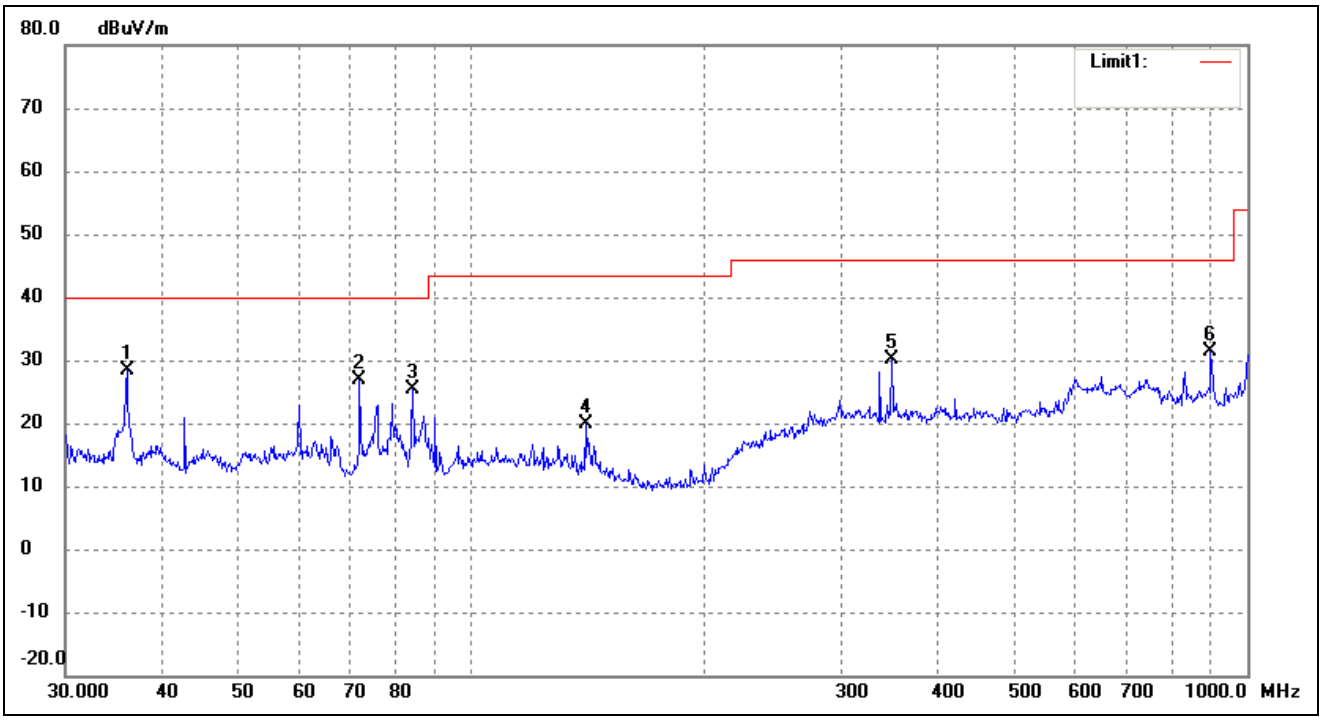
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	36.0007	40.48	-19.17	21.31	40.00	-18.69	261	100	peak
2	60.0691	41.16	-18.23	22.93	40.00	-17.07	90	100	peak
3	71.8320	47.51	-20.66	26.85	40.00	-13.15	346	100	peak
4	84.1100	44.94	-20.87	24.07	40.00	-15.93	112	100	peak
5	348.0274	31.29	-8.49	22.80	46.00	-23.20	272	100	peak
6	726.8052	29.77	-3.15	26.62	46.00	-19.38	157	100	peak

802.11b			
Test Channel	Low	Polarity:	Vertical



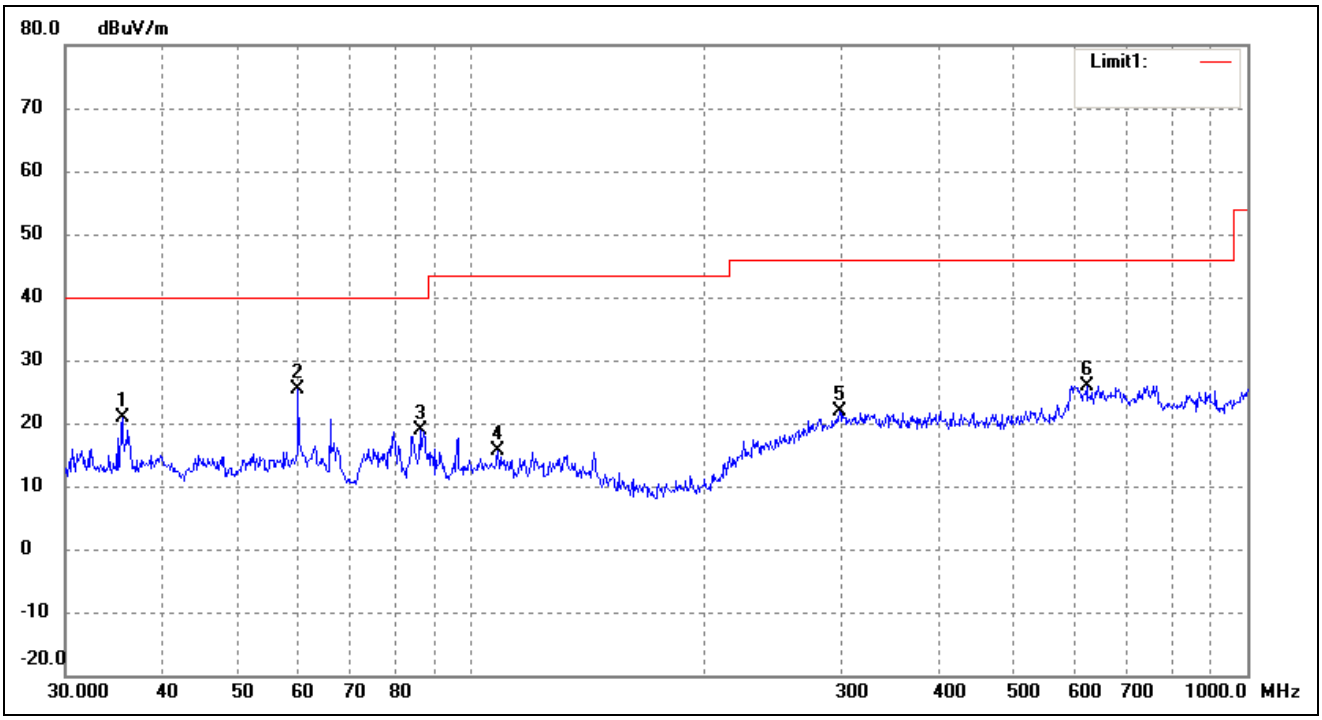
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	75.4464	50.34	-21.10	29.24	40.00	-10.76	311	100	peak
2	83.8156	55.91	-20.92	34.99	40.00	-5.01	92	100	peak
3	140.3421	43.65	-19.15	24.50	43.50	-19.00	224	100	peak
4	317.7011	31.19	-7.92	23.27	46.00	-22.73	107	100	peak
5	599.3212	30.00	-2.68	27.32	46.00	-18.68	200	100	peak
6	896.9965	31.26	-3.83	27.43	46.00	-18.57	169	100	peak

802.11b			
Test Channel	Middle	Polarity:	Horizontal



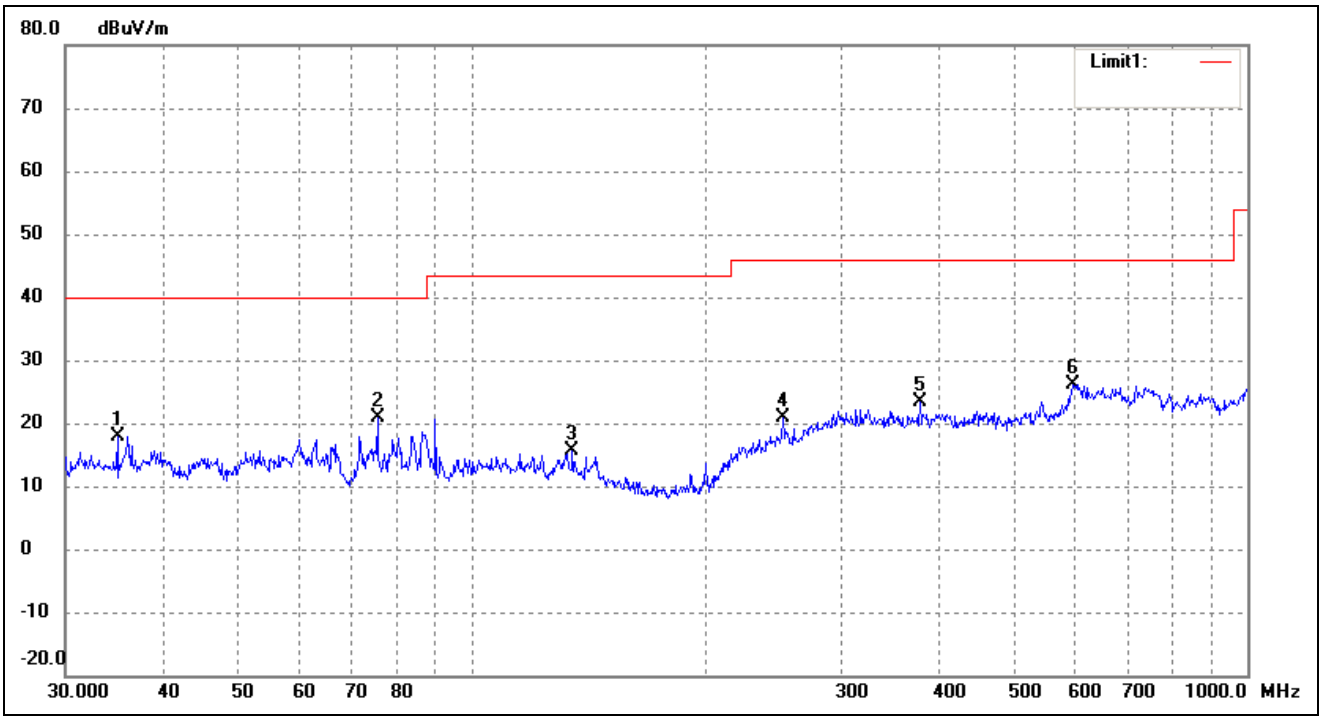
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	36.0007	47.60	-19.17	28.43	40.00	-11.57	223	100	peak
2	71.8320	47.51	-20.66	26.85	40.00	-13.15	217	100	peak
3	84.1100	46.19	-20.87	25.32	40.00	-14.68	96	100	peak
4	140.3421	38.93	-19.15	19.78	43.50	-23.72	283	100	peak
5	348.0274	38.54	-8.49	30.05	46.00	-15.95	112	100	peak
6	896.9965	35.31	-3.83	31.48	46.00	-14.52	328	100	peak

802.11b			
Test Channel	Middle	Polarity:	Vertical



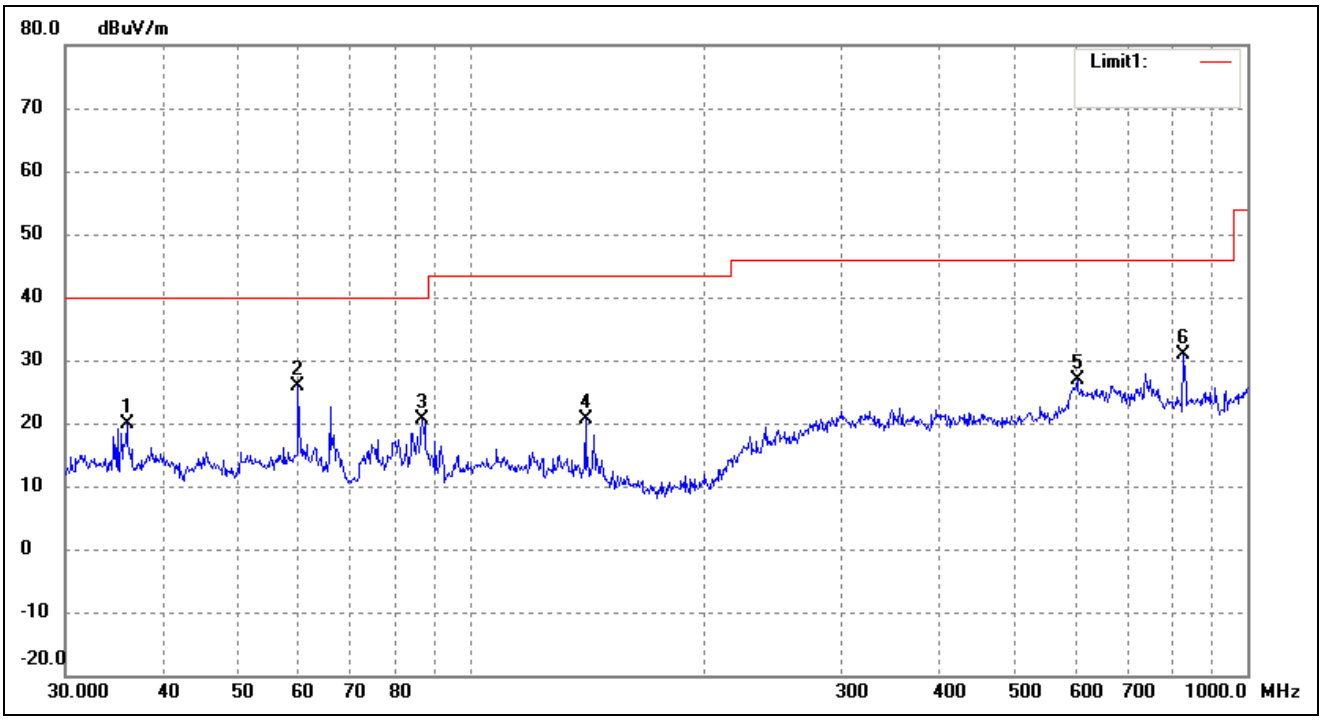
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	35.4993	40.09	-19.27	20.82	40.00	-19.18	145	100	peak
2	59.8588	43.70	-18.21	25.49	40.00	-14.51	291	100	peak
3	85.8984	39.34	-20.54	18.80	40.00	-21.20	52	100	peak
4	108.2667	33.57	-18.00	15.57	43.50	-27.93	224	100	peak
5	298.2681	29.77	-8.01	21.76	46.00	-24.24	268	100	peak
6	620.7096	29.88	-3.93	25.95	46.00	-20.05	126	100	peak

802.11b			
Test Channel	High	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	35.0048	37.26	-19.34	17.92	40.00	-22.08	32	100	peak
2	75.7114	42.10	-21.13	20.97	40.00	-19.03	128	100	peak
3	135.0319	34.42	-18.82	15.60	43.50	-27.90	117	100	peak
4	252.0627	31.93	-11.17	20.76	46.00	-25.24	148	100	peak
5	378.5843	31.73	-8.46	23.27	46.00	-22.73	325	100	peak
6	597.2234	29.26	-3.06	26.20	46.00	-19.80	348	100	peak

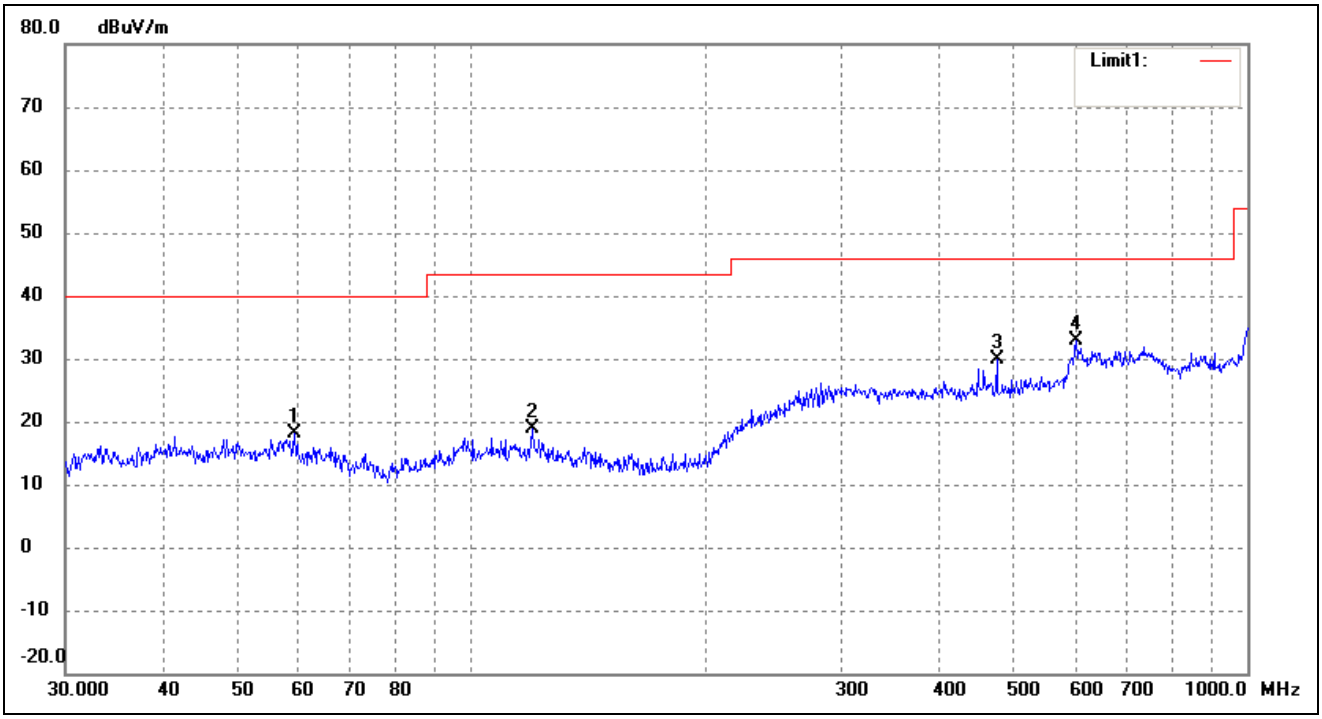
802.11b			
Test Channel	High	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	36.0007	39.00	-19.17	19.83	40.00	-20.17	91	100	peak
2	59.8588	44.19	-18.21	25.98	40.00	-14.02	161	100	peak
3	86.5029	41.02	-20.41	20.61	40.00	-19.39	124	100	peak
4	140.3421	39.78	-19.15	20.63	43.50	-22.87	113	100	peak
5	603.5392	29.68	-2.80	26.88	46.00	-19.12	234	100	peak
6	827.4934	35.27	-4.50	30.77	46.00	-15.23	341	100	peak

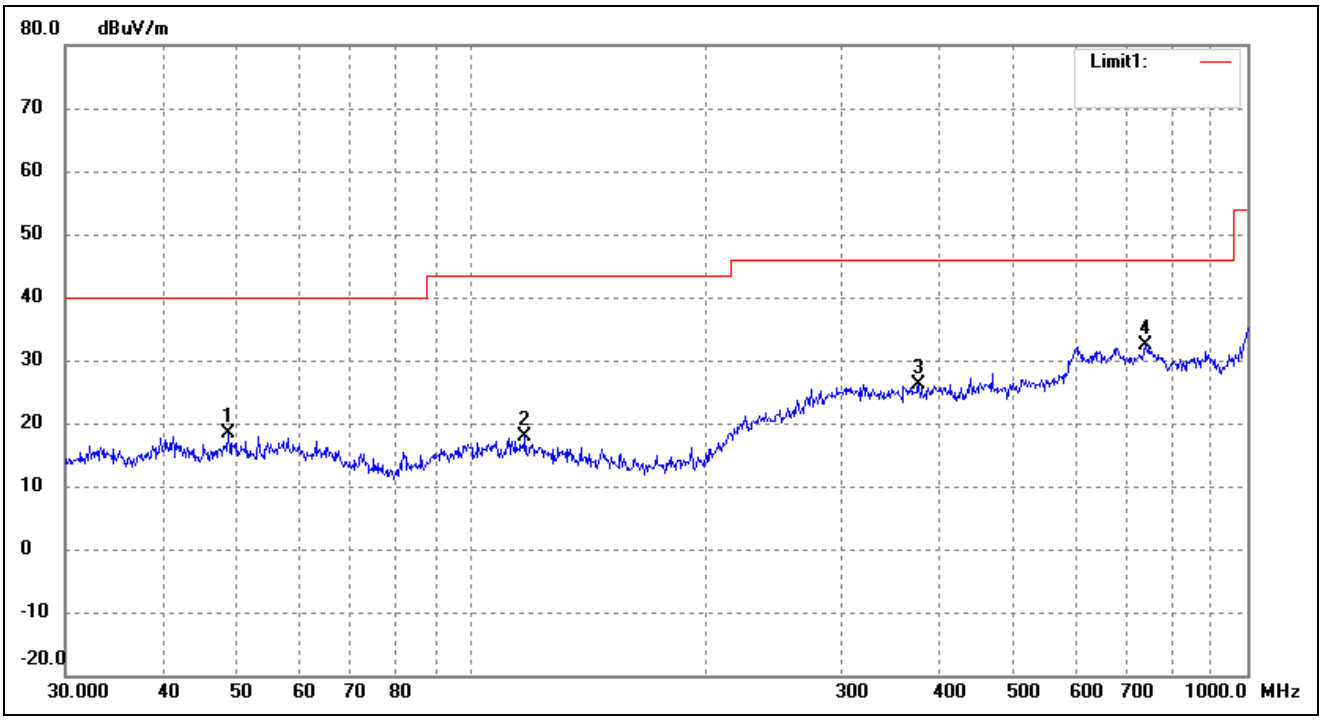
➢ Model: MDT850

802.11b			
Test Channel	Low	Polarity:	Horizontal



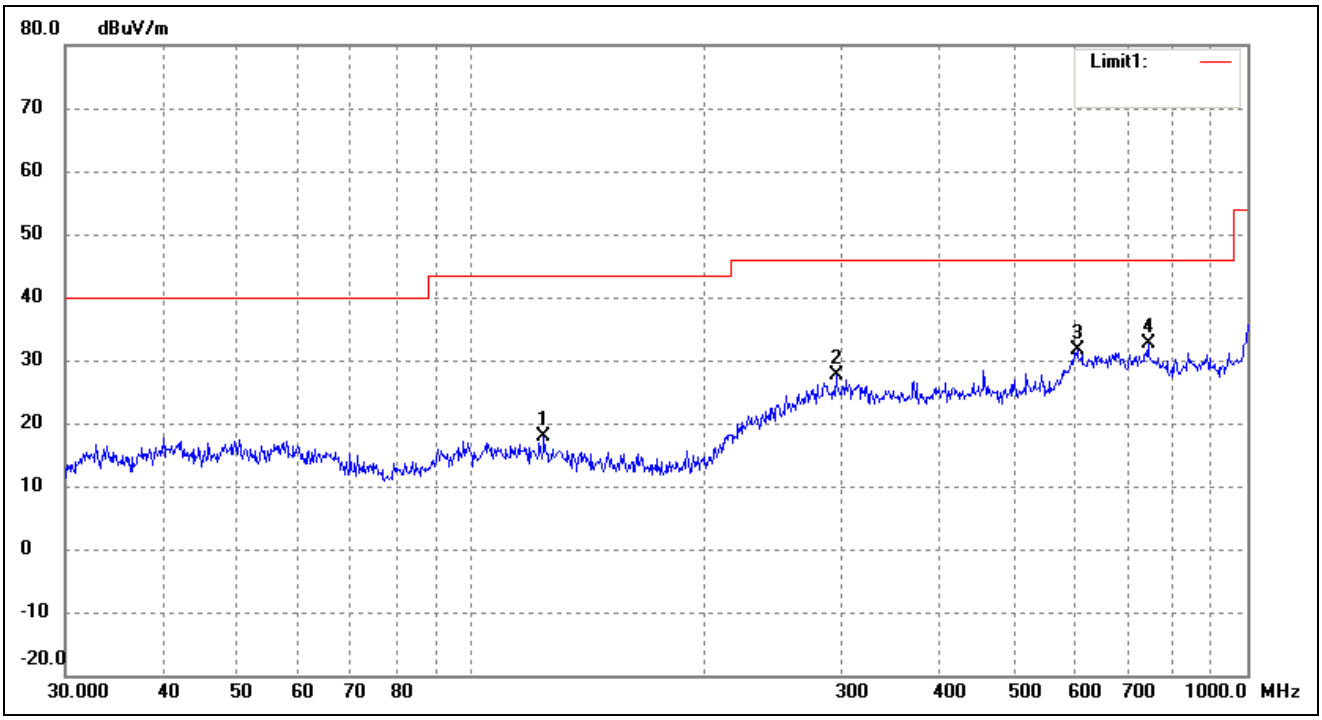
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	59.2325	33.53	-15.52	18.01	40.00	-21.99	351	100	peak
2	119.8556	33.53	-14.76	18.77	43.50	-24.73	96	100	peak
3	475.4991	34.00	-4.12	29.88	46.00	-16.12	62	100	peak
4	601.4265	31.00	1.81	32.81	46.00	-13.19	96	100	peak

802.11b			
Test Channel	Low	Polarity:	Vertical



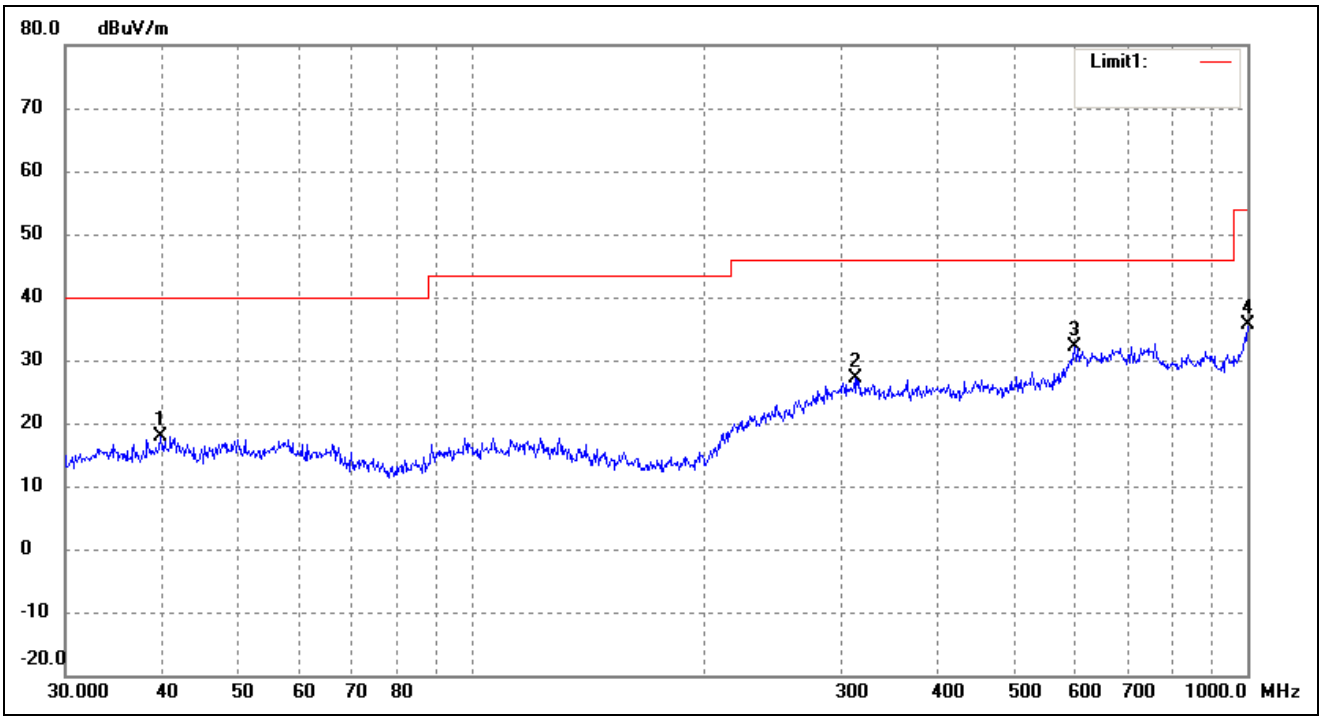
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	48.6719	37.07	-18.59	18.48	40.00	-21.52	281	100	peak
2	117.3603	35.79	-17.89	17.90	43.50	-25.60	91	100	peak
3	377.2591	34.58	-8.43	26.15	46.00	-19.85	214	100	peak
4	739.6605	34.83	-2.39	32.44	46.00	-13.56	104	100	peak

802.11b			
Test Channel	Middle	Polarity:	Horizontal



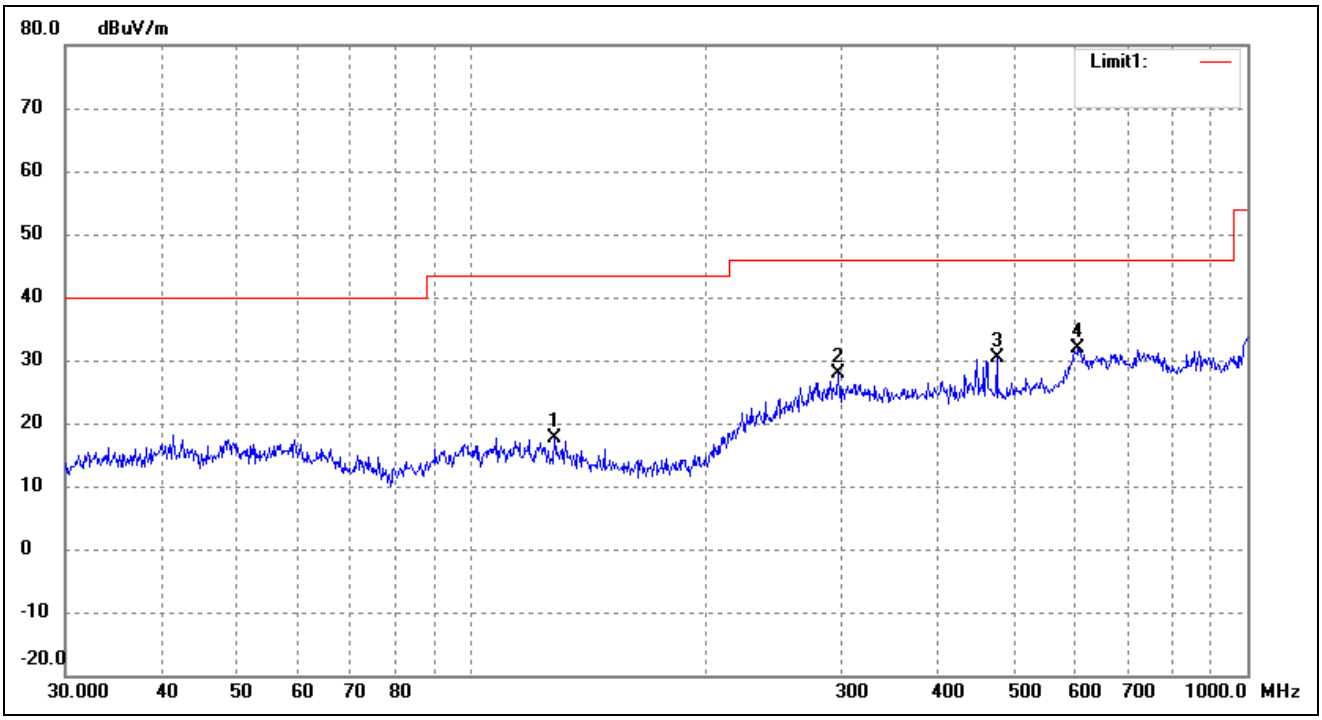
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	124.1330	32.92	-15.03	17.89	43.50	-25.61	269	100	peak
2	295.1469	32.28	-4.58	27.70	46.00	-18.30	98	100	peak
3	603.5392	30.04	1.66	31.70	46.00	-14.30	158	100	peak
4	744.8661	30.35	2.24	32.59	46.00	-13.41	120	100	peak

802.11b			
Test Channel	Middle	Polarity:	Vertical



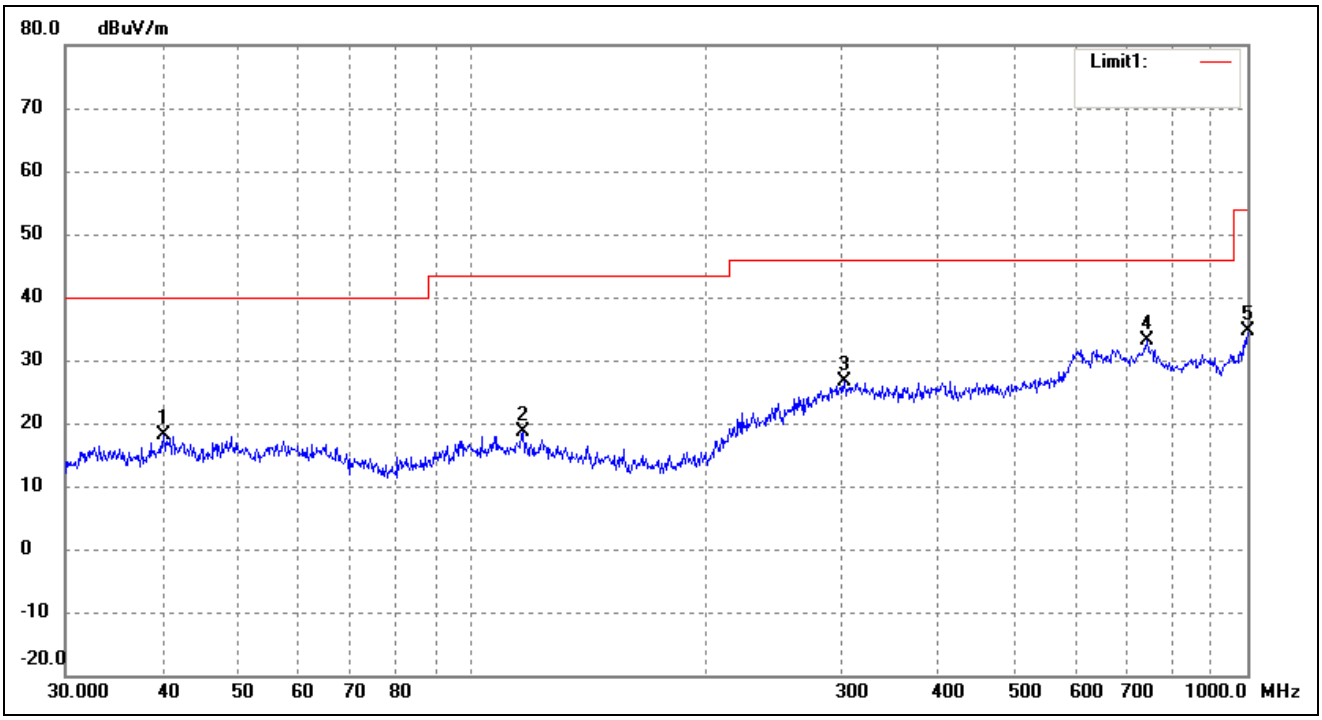
No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	39.7147	36.42	-18.57	17.85	40.00	-22.15	99	100	peak
2	312.1794	34.95	-7.92	27.03	46.00	-18.97	321	100	peak
3	599.3213	34.75	-2.68	32.07	46.00	-13.93	69	100	peak
4	1000.0000	36.51	-0.89	35.62	54.00	-18.38	271	100	peak

802.11b			
Test Channel	High	Polarity:	Horizontal



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	128.1130	32.82	-15.29	17.53	43.50	-25.97	269	100	peak
2	297.2241	32.40	-4.43	27.97	46.00	-18.03	215	100	peak
3	475.4991	34.57	-4.12	30.45	46.00	-15.55	54	100	peak
4	605.6592	30.39	1.51	31.90	46.00	-14.10	93	100	peak

802.11b			
Test Channel	High	Polarity:	Vertical



No.	Frequency	Reading	Correct	Result	Limit	Margin	Degree	Height	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	( )	(cm)	
1	40.1347	36.61	-18.52	18.09	40.00	-21.91	90	100	peak
2	116.5401	36.54	-17.91	18.63	43.50	-24.87	100	100	peak
3	302.4812	34.55	-7.91	26.64	46.00	-19.36	55	100	peak
4	742.2587	35.52	-2.47	33.05	46.00	-12.95	103	100	peak
5	1000.0000	35.61	-0.89	34.72	54.00	-19.28	339	100	peak

- Spurious Emissions Below 1GHz
- Model: MDT750
- *Test Mode: 802.11b (worst case)*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	61.04	-3.86	57.18	74	-16.82	H	PK
4824.000	41.88	-3.86	38.02	54	-15.98	H	AV
7236.000	60.23	1.1	61.33	74	-12.67	H	PK
7236.000	39.51	1.1	40.61	54	-13.39	H	AV
4824.000	60.22	-3.86	56.36	74	-17.64	V	PK
4824.000	39.2	-3.86	35.34	54	-18.66	V	AV
7236.000	58.09	1.1	59.19	74	-14.81	V	PK
7236.000	38.83	1.1	39.93	54	-14.07	V	AV
Middle Channel-2437MHz							
4874.000	60.7	-3.74	56.96	74	-17.04	H	PK
4874.000	39.6	-3.74	35.86	54	-18.14	H	AV
7311.000	59.99	1.47	61.46	74	-12.54	H	PK
7311.000	40.79	1.47	42.26	54	-11.74	H	AV
4874.000	60.24	-3.74	56.5	74	-17.5	V	PK
4874.000	41.59	-3.74	37.85	54	-16.15	V	AV
7311.000	61.42	1.47	62.89	74	-11.11	V	PK
7311.000	40.27	1.47	41.74	54	-12.26	V	AV
High Channel-2462MHz							
4924.000	61.28	-3.63	57.65	74	-16.35	H	PK
4924.000	38.25	-3.63	34.62	54	-19.38	H	AV
7386.000	60.45	1.62	62.07	74	-11.93	H	PK
7386.000	41.99	1.62	43.61	54	-10.39	H	AV
4924.000	58.24	-3.63	54.61	74	-19.39	V	PK
4924.000	40.62	-3.63	36.99	54	-17.01	V	AV
7386.000	60.43	1.62	62.05	74	-11.95	V	PK
7386.000	39.82	1.62	41.44	54	-12.56	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

- Model: MDT850
- *Test Mode: 802.11b (worst case)*

Frequency	Reading	Correct	Result	Limit	Margin	Polar	Detector
(MHz)	(dBuV/m)	dB	(dBuV/m)	(dBuV/m)	(dB)	H/V	
Low Channel-2412MHz							
4824.000	58.53	-3.86	54.67	74	-19.33	H	PK
4824.000	39.27	-3.86	35.41	54	-18.59	H	AV
7236.000	58.62	1.1	59.72	74	-14.28	H	PK
7236.000	39.69	1.1	40.79	54	-13.21	H	AV
4824.000	58.91	-3.86	55.05	74	-18.95	V	PK
4824.000	39.2	-3.86	35.34	54	-18.66	V	AV
7236.000	59.02	1.1	60.12	74	-13.88	V	PK
7236.000	40.35	1.1	41.45	54	-12.55	V	AV
Middle Channel-2437MHz							
4874.000	59.58	-3.74	55.84	74	-18.16	H	PK
4874.000	39.68	-3.74	35.94	54	-18.06	H	AV
7311.000	58.67	1.47	60.14	74	-13.86	H	PK
7311.000	41.27	1.47	42.74	54	-11.26	H	AV
4874.000	58.84	-3.74	55.1	74	-18.9	V	PK
4874.000	38.14	-3.74	34.4	54	-19.6	V	AV
7311.000	59.36	1.47	60.83	74	-13.17	V	PK
7311.000	39.34	1.47	40.81	54	-13.19	V	AV
High Channel-2462MHz							
4924.000	60.62	-3.63	56.99	74	-17.01	H	PK
4924.000	40.8	-3.63	37.17	54	-16.83	H	AV
7386.000	58.1	1.62	59.72	74	-14.28	H	PK
7386.000	40.21	1.62	41.83	54	-12.17	H	AV
4924.000	58.47	-3.63	54.84	74	-19.16	V	PK
4924.000	41.54	-3.63	37.91	54	-16.09	V	AV
7386.000	61.02	1.62	62.64	74	-11.36	V	PK
7386.000	38.55	1.62	40.17	54	-13.83	V	AV

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, other than listed in the table above are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

9. Out of Band Emissions

9.1 Standard Applicable

According to §15.247 (d) In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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).

9.2 Test Procedure

According to the KDB 558074D01 v04, the band-edge radiated test method as follows:

Set span = wide enough to capture the peak level of the emission operating on the channel closest to the bandedge, as well as any modulation products which fall outside of the authorized band of operation (2310MHz to 2420MHz for low bandedge, 2460MHz to 2500MHz for the high bandedge)
RBW = 1MHz, VBW = 1MHz for peak value measured
RBW = 1MHz, VBW = 10Hz for average value measured
Sweep = auto; Detector function = peak/average; Trace = max hold
All the trace to stabilize, set the marker on the emission at the bandedge, or on the highest modulation product outside of the band, if this level is greater than that at the bandedge. Enable the marker-delta function, then use the marker-to-peak function to move the marker to the peak of the in-band emission. Those emission must comply with the 15.209 limit for fall in the restricted bands listed in section 15.205. Note that the method of measurement KDB publication number: 913591 may be used for the radiated bandedge measurements.

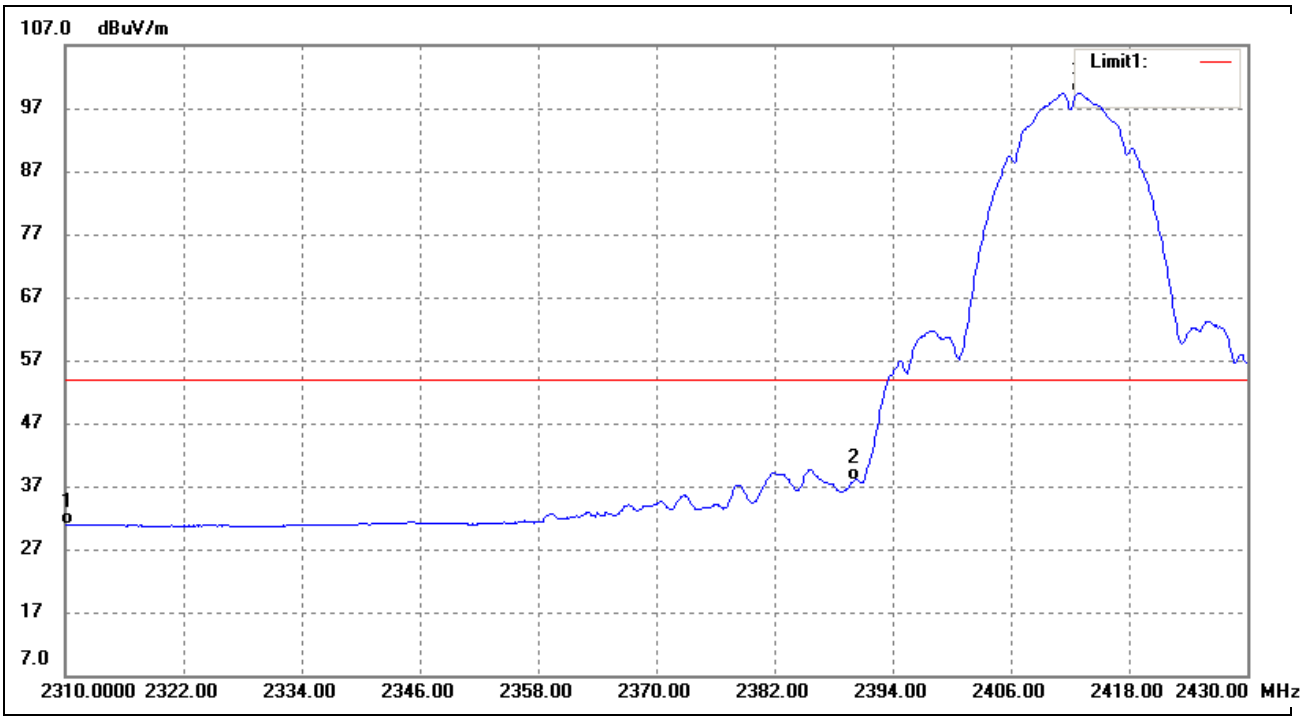
According to the KDB 558074 D01 v04, the conducted spurious emissions test method as follows:
1. Set start frequency to DTS channel edge frequency.
2. Set stop frequency so as to encompass the spectrum to be examined.
3. Set RBW = 100 kHz.
4. Set VBW ≥ 300 kHz.
5. Detector = peak.
6. Trace Mode = max hold.
7. Sweep = auto couple.
8. Allow the trace to stabilize (this may take some time, depending on the extent of the span).
9. Use peak marker function to determine maximum amplitude of all unwanted emissions within any 100 kHz bandwidth.

Ensure that the amplitude of all unwanted emissions outside of the authorized frequency band (excluding restricted frequency bands) are attenuated by at least the minimum requirements specified in section 8.1. Report the three highest emissions relative to the limit.

9.3 Summary of Test Results/Plots

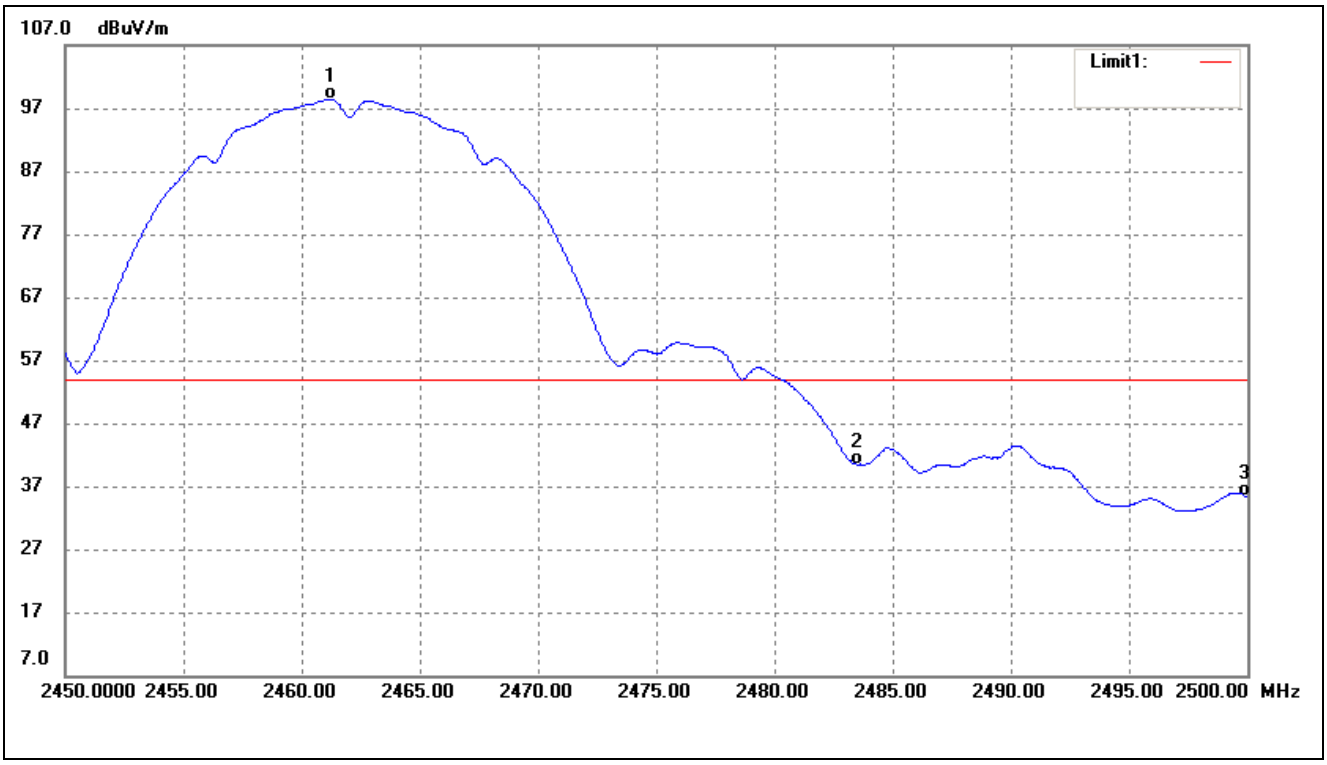
- Radiated test
- Model: MDT750

802.11b			
Test Channel	Low	Polarity:	Vertical(worst case)



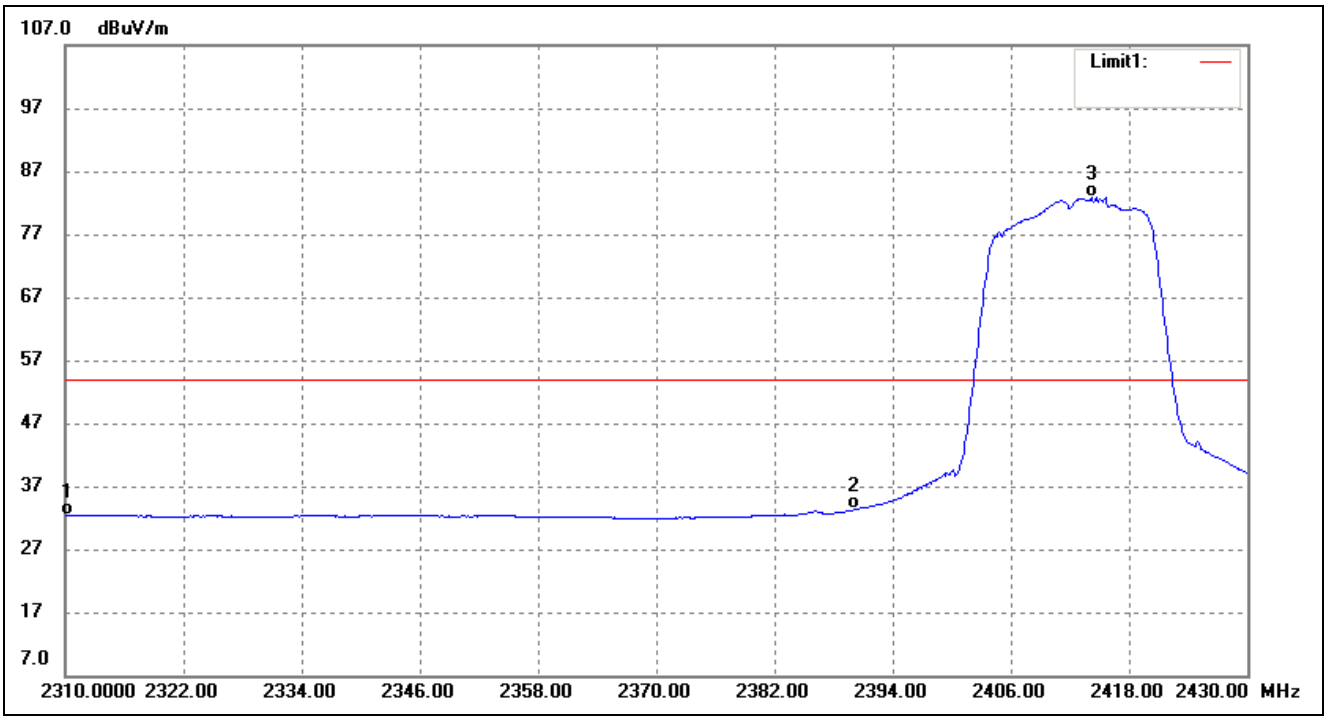
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	36.16	-5.28	30.88	54.00	-23.12	Average Detector
	2310.000	49.13	-5.28	43.85	74.00	-30.15	Peak Detector
2	2390.000	44.07	-6.12	37.95	54.00	-16.05	Average Detector
	2390.000	54.75	-6.12	48.63	74.00	-25.37	Peak Detector
3	2412.840	105.71	-6.25	99.46	/	/	Average Detector
	2413.080	110.10	-6.25	103.85	/	/	Peak Detector

802.11b			
Test Channel	High	Polarity:	Vertical(worst case)



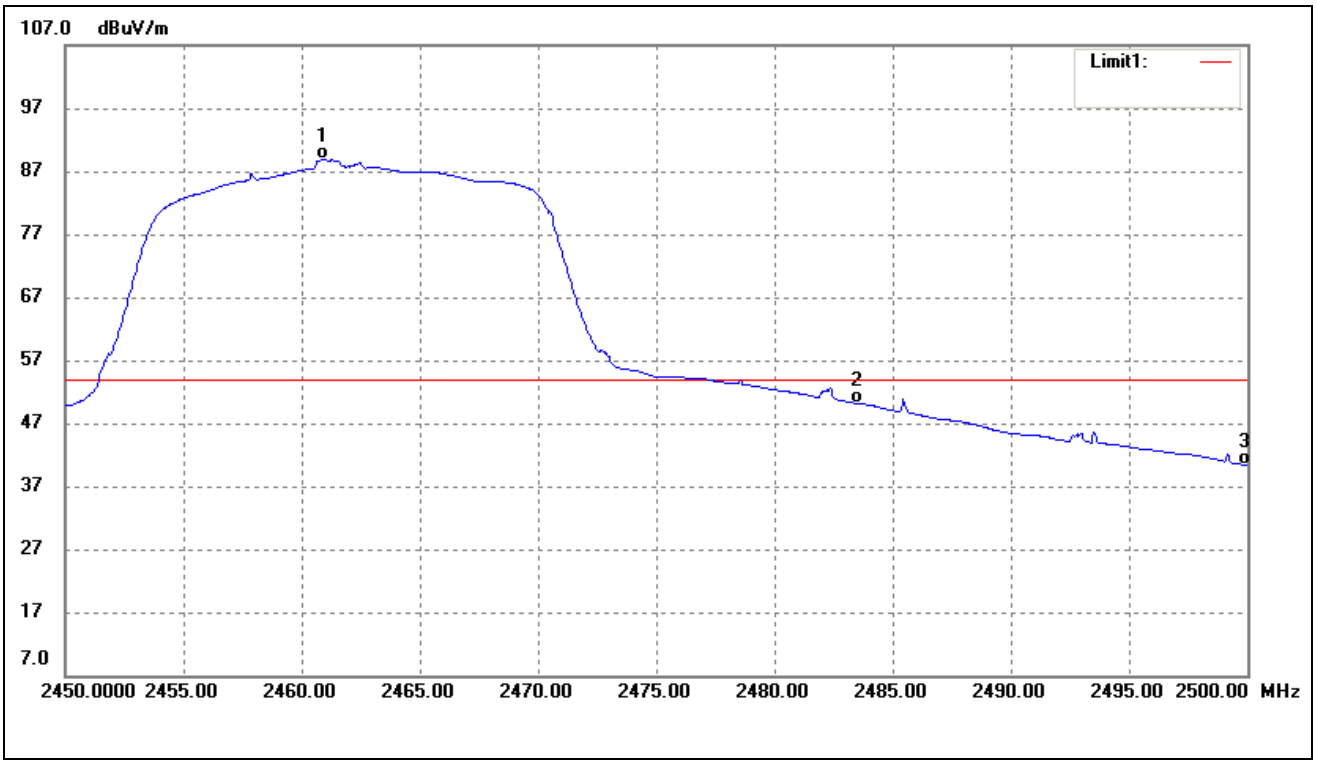
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2461.200	104.61	-6.13	98.48	/	/	Average Detector
	2460.900	108.98	-6.13	102.85	/	/	Peak Detector
2	2483.500	46.58	-6.08	40.50	54.00	-13.50	Average Detector
	2483.500	56.34	-6.08	50.26	74.00	-23.74	Peak Detector
3	2500.000	41.39	-6.04	35.35	54.00	-18.65	Average Detector
	2500.000	52.07	-6.04	46.03	74.00	-27.97	Peak Detector

802.11g			
Test Channel	Low	Polarity:	Vertical(worst case)



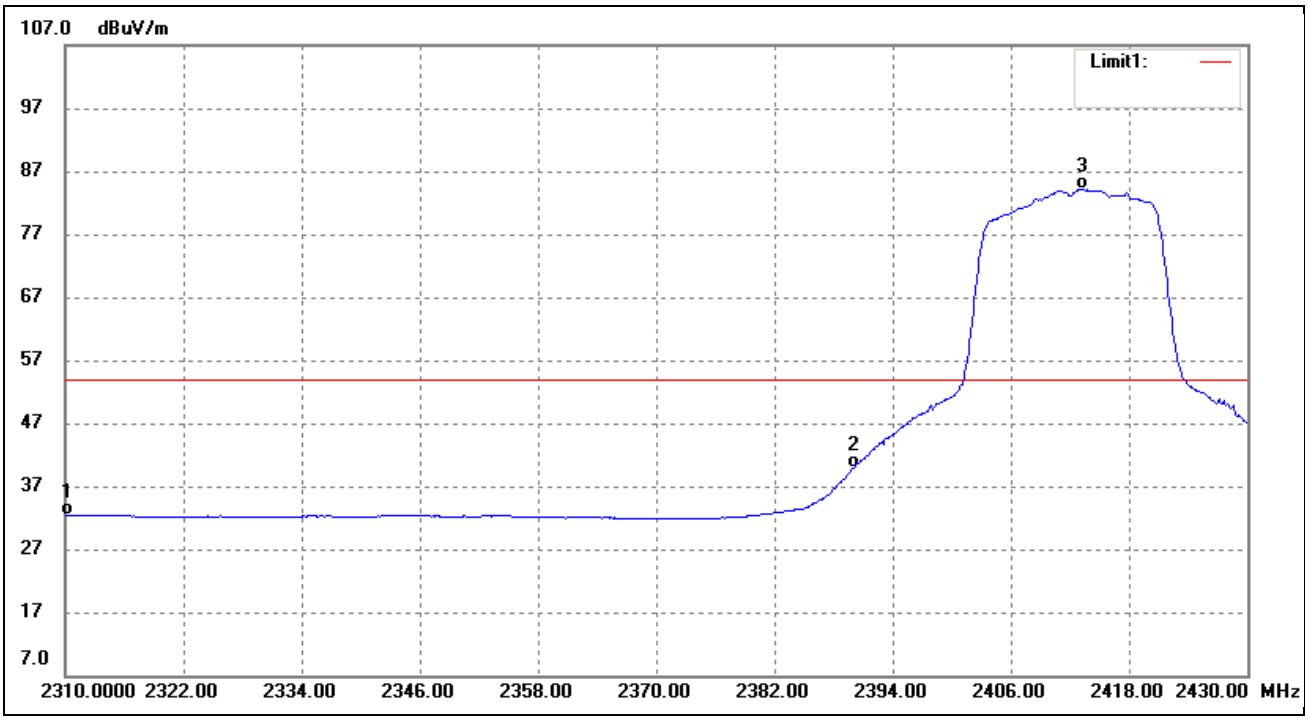
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	37.70	-5.28	32.42	54.00	-21.58	Average Detector
	2310.000	49.41	-5.28	44.13	74.00	-29.87	Peak Detector
2	2390.000	39.42	-6.12	33.30	54.00	-20.70	Average Detector
	2390.000	52.72	-6.12	46.60	74.00	-27.40	Peak Detector
3	2414.160	89.09	-6.25	82.84	/	/	Average Detector
	2413.920	100.81	-6.25	94.56	/	/	Peak Detector

802.11g			
Test Channel	High	Polarity:	Vertical(worst case)



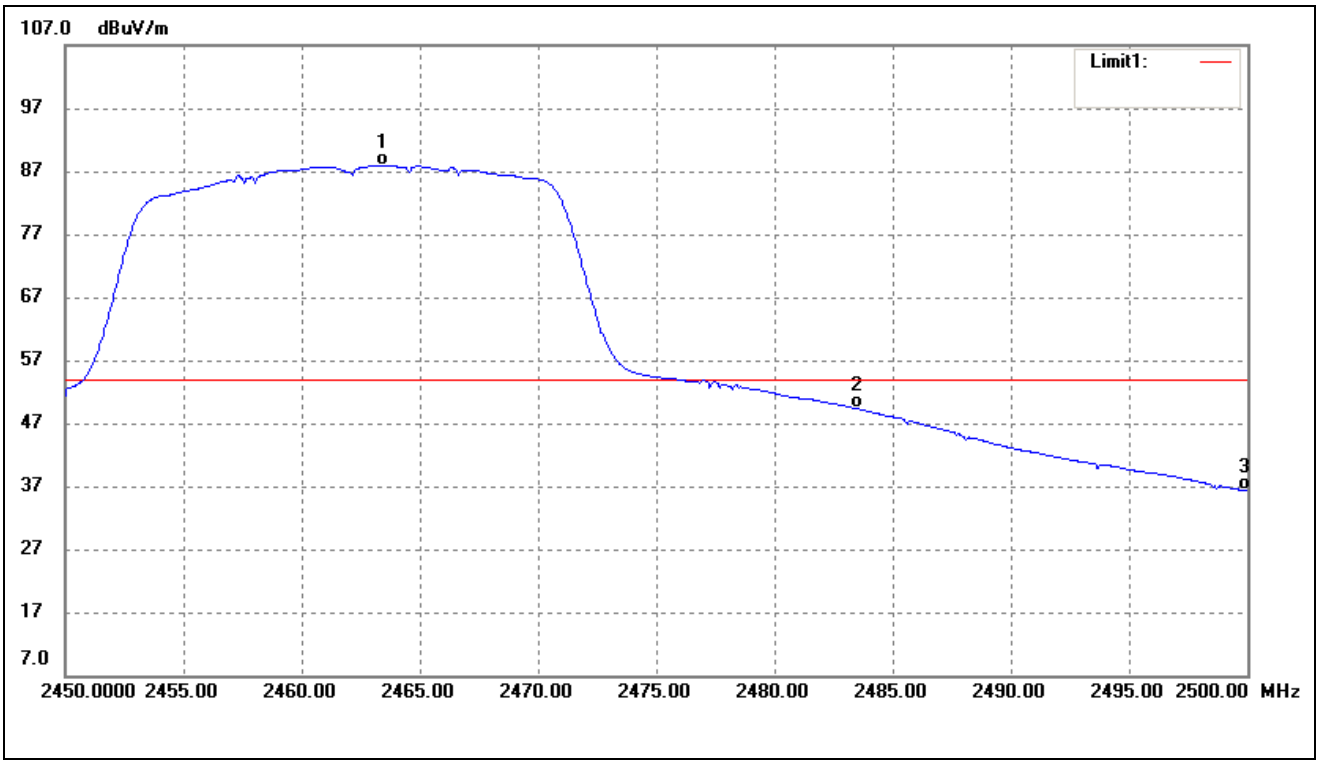
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2460.900	95.03	-6.13	88.90	/	/	Average Detector
	2463.700	105.71	-6.13	99.58	/	/	Peak Detector
2	2483.500	56.23	-6.08	50.15	54.00	-3.85	Average Detector
	2483.500	75.07	-6.08	68.99	74.00	-5.01	Peak Detector
3	2500.000	46.47	-6.04	40.43	54.00	-13.57	Average Detector
	2500.000	62.99	-6.04	56.95	74.00	-17.05	Peak Detector

802.11n-HT20			
Test Channel	Low	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	37.69	-5.28	32.41	54.00	-21.59	Average Detector
	2310.000	49.77	-5.28	44.49	74.00	-29.51	Peak Detector
2	2390.000	46.09	-6.12	39.97	54.00	-14.03	Average Detector
	2390.000	64.94	-6.12	58.82	74.00	-15.18	Peak Detector
3	2413.320	90.44	-6.25	84.19	/	/	Average Detector
	2415.240	100.98	-6.24	94.74	/	/	Peak Detector

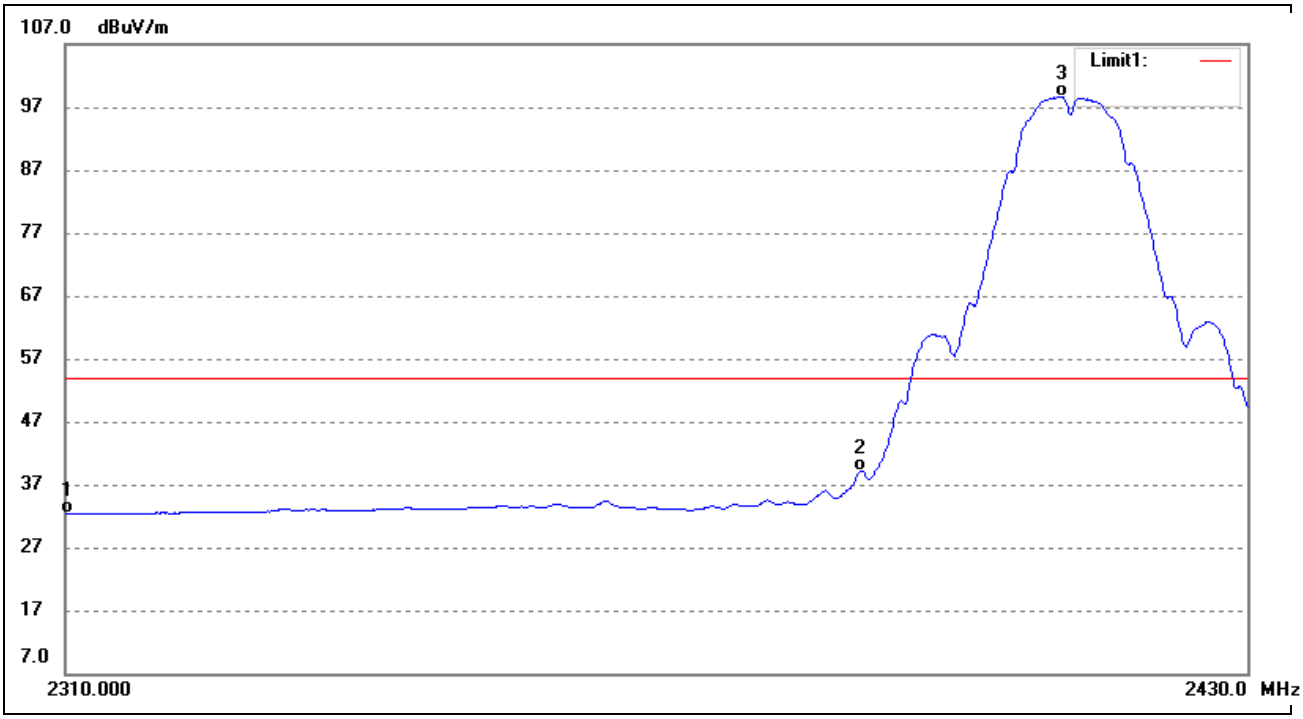
802.11n-HT20			
Test Channel	High	Polarity:	Vertical(worst case)



No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2463.400	94.12	-6.13	87.99	/	/	Average Detector
	2461.050	105.94	-6.13	99.81	/	/	Peak Detector
2	2483.500	55.40	-6.08	49.32	54.00	-4.68	Average Detector
	2483.500	75.21	-6.08	69.13	74.00	-4.87	Peak Detector
3	2500.000	42.38	-6.04	36.34	54.00	-17.66	Average Detector
	2500.000	62.45	-6.04	56.41	74.00	-17.59	Peak Detector

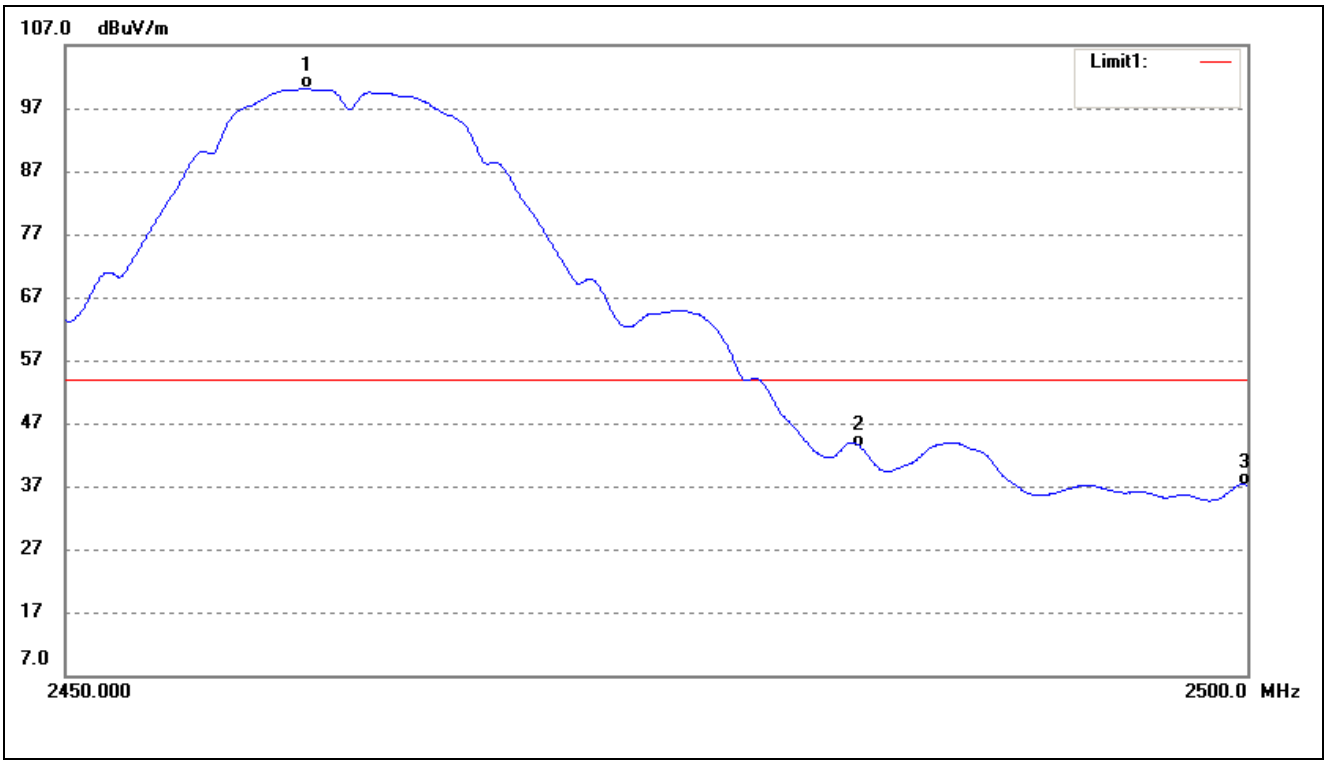
➢ Model: MDT850

802.11b			
Test Channel	Low	Polarity:	Vertical(worst case)



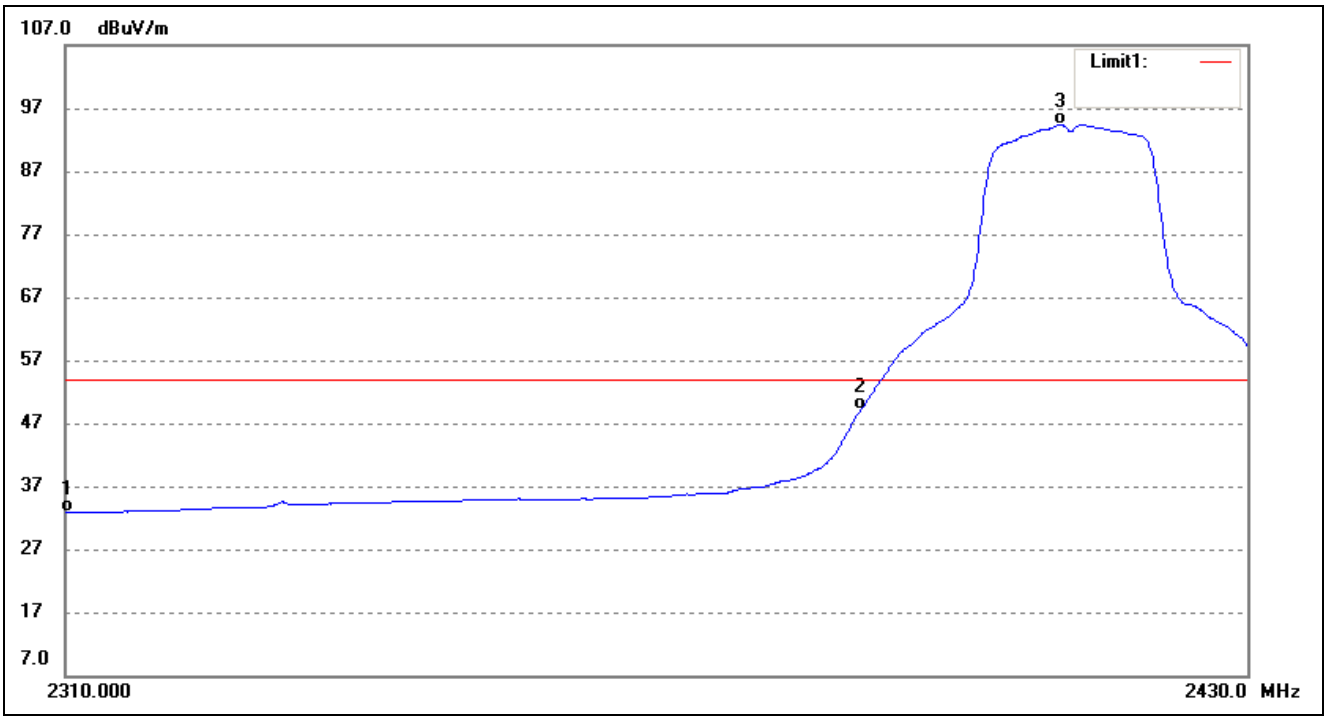
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	40.15	-7.78	32.37	54.00	-21.63	Average Detector
	2310.000	52.57	-7.78	44.79	74.00	-29.21	Peak Detector
2	2390.000	46.53	-7.32	39.21	54.00	-14.79	Average Detector
	2390.000	55.29	-7.32	47.97	74.00	-26.03	Peak Detector
3	2410.756	105.85	-7.19	98.66	/	/	Average Detector
	2410.145	110.33	-7.19	103.14	/	/	Peak Detector

802.11b			
Test Channel	High	Polarity:	Vertical(worst case)



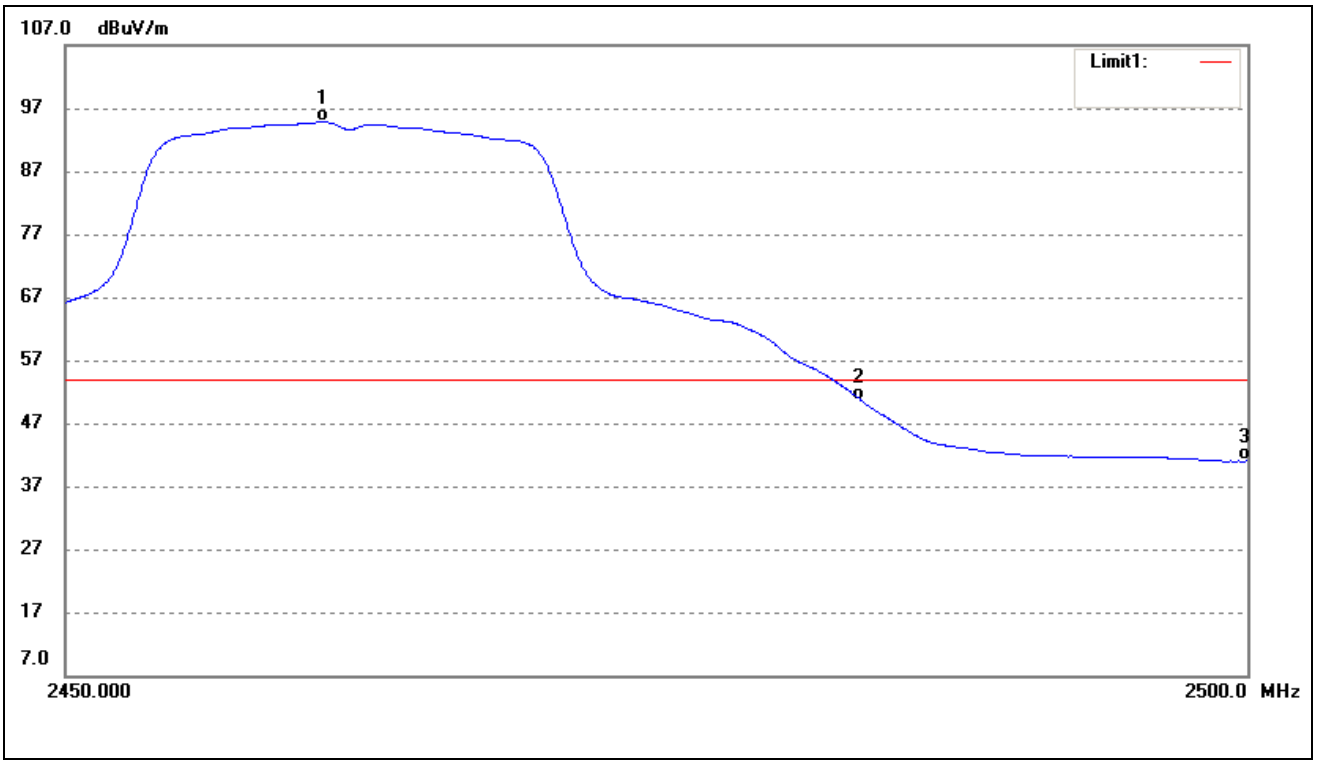
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	Factor(dB)	(dBuV/m)	(dBuV/m)	(dB)	
1	2460.118	107.01	-6.90	100.11	/	/	Average Detector
	2460.267	111.02	-6.90	104.12	/	/	Peak Detector
2	2483.500	49.97	-6.77	43.20	54.00	-10.80	Average Detector
	2483.500	59.46	-6.77	52.69	74.00	-21.31	Peak Detector
3	2500.000	43.83	-6.67	37.16	54.00	-16.84	Average Detector
	2500.000	53.80	-6.67	47.13	74.00	-26.87	Peak Detector

802.11g			
Test Channel	Low	Polarity:	Vertical(worst case)



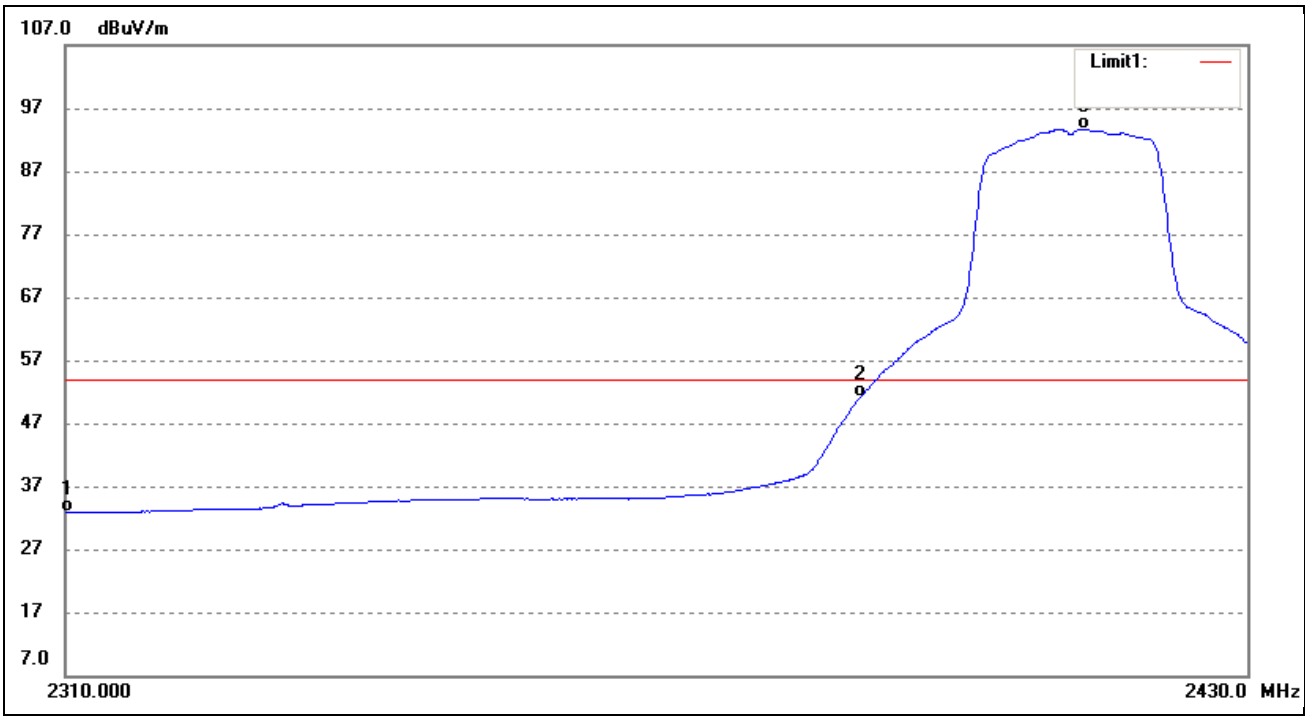
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	40.61	-7.78	32.83	54.00	-21.17	Average Detector
	2310.000	51.69	-7.78	43.91	74.00	-30.09	Peak Detector
2	2390.000	56.39	-7.32	49.07	54.00	-4.93	Average Detector
	2390.000	73.65	-7.32	66.33	74.00	-7.67	Peak Detector
3	2410.633	101.56	-7.19	94.37	/	/	Average Detector
	2412.832	110.76	-7.18	103.58	/	/	Peak Detector

802.11g			
Test Channel	High	Polarity:	Vertical(worst case)



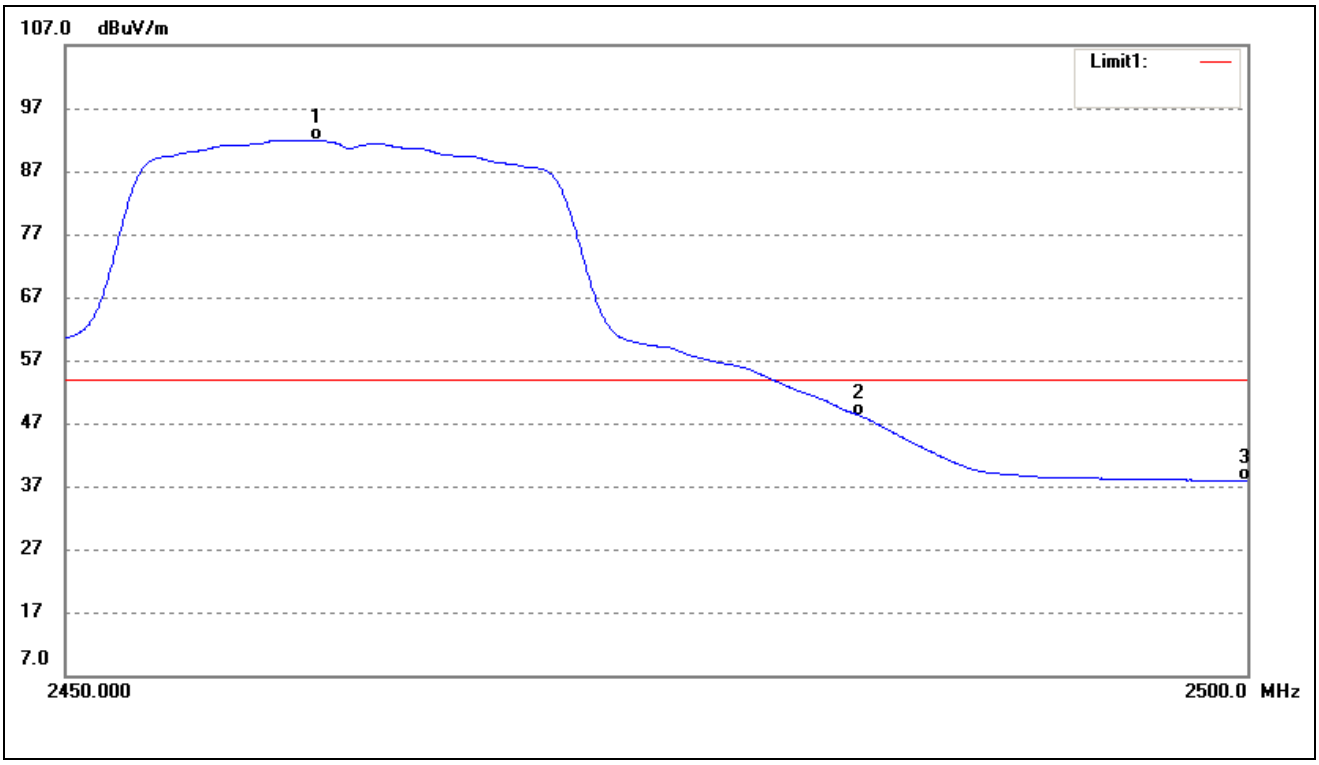
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2460.814	101.72	-6.90	94.82	/	/	Average Detector
	2460.566	110.92	-6.90	104.02	/	/	Peak Detector
2	2483.500	57.46	-6.77	50.69	54.00	-3.31	Average Detector
	2483.500	75.77	-6.77	69.00	74.00	-5.00	Peak Detector
3	2500.000	47.69	-6.67	41.02	54.00	-12.98	Average Detector
	2500.000	58.92	-6.67	52.25	74.00	-21.75	Peak Detector

802.11n-HT20			
Test Channel	Low	Polarity:	Vertical(worst case)



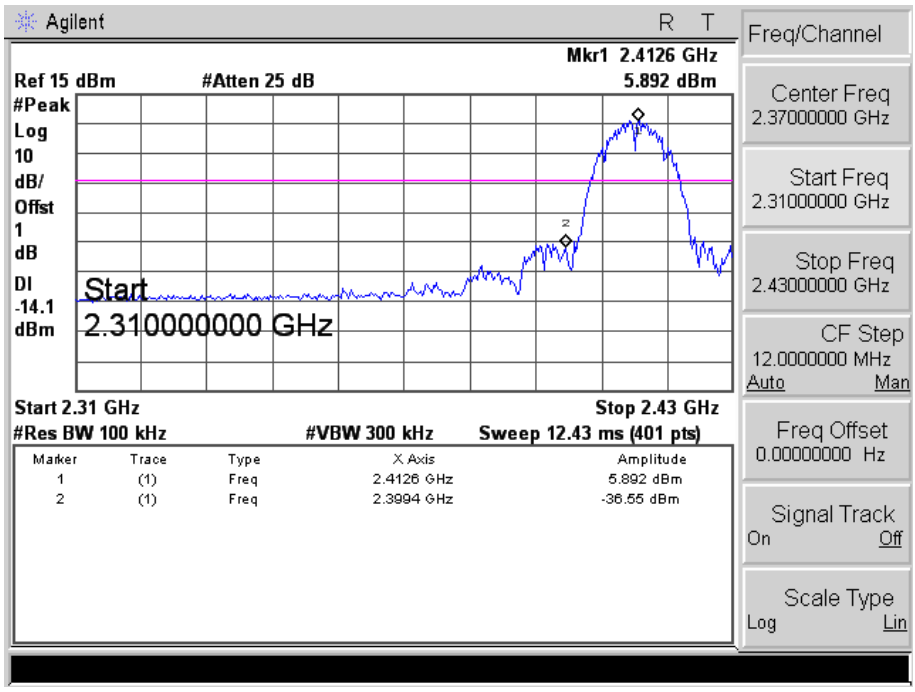
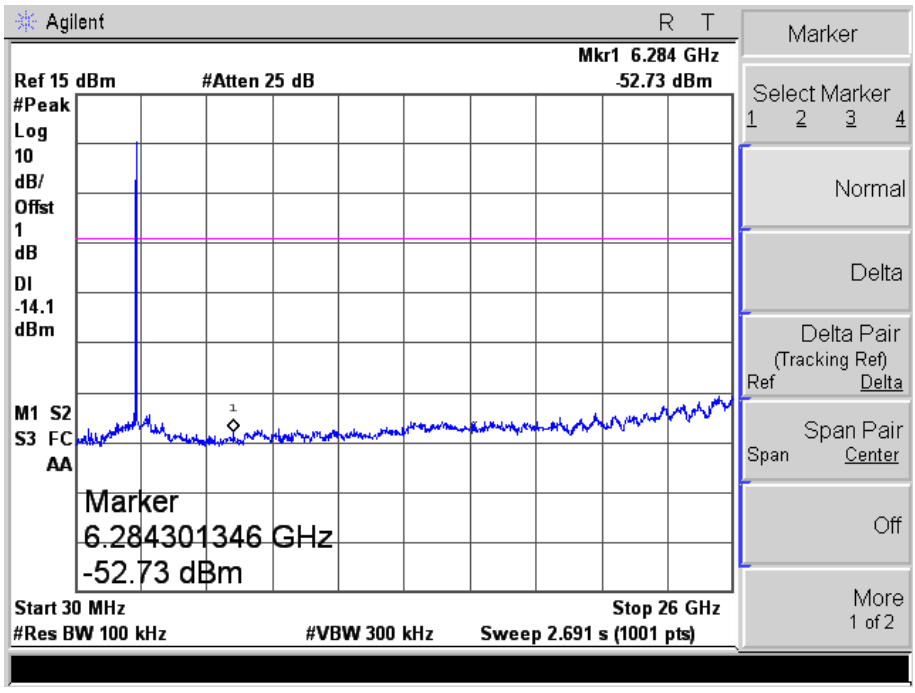
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2310.000	40.58	-7.78	32.80	54.00	-21.20	Average Detector
	2310.000	52.88	-7.78	45.10	74.00	-28.90	Peak Detector
2	2390.000	58.56	-7.32	51.24	54.00	-2.76	Average Detector
	2390.000	78.56	-7.32	71.24	74.00	-2.76	Peak Detector
3	2413.076	100.92	-7.18	93.74	/	/	Average Detector
	2410.511	110.43	-7.19	103.24	/	/	Peak Detector

802.11n-HT20			
Test Channel	High	Polarity:	Vertical(worst case)



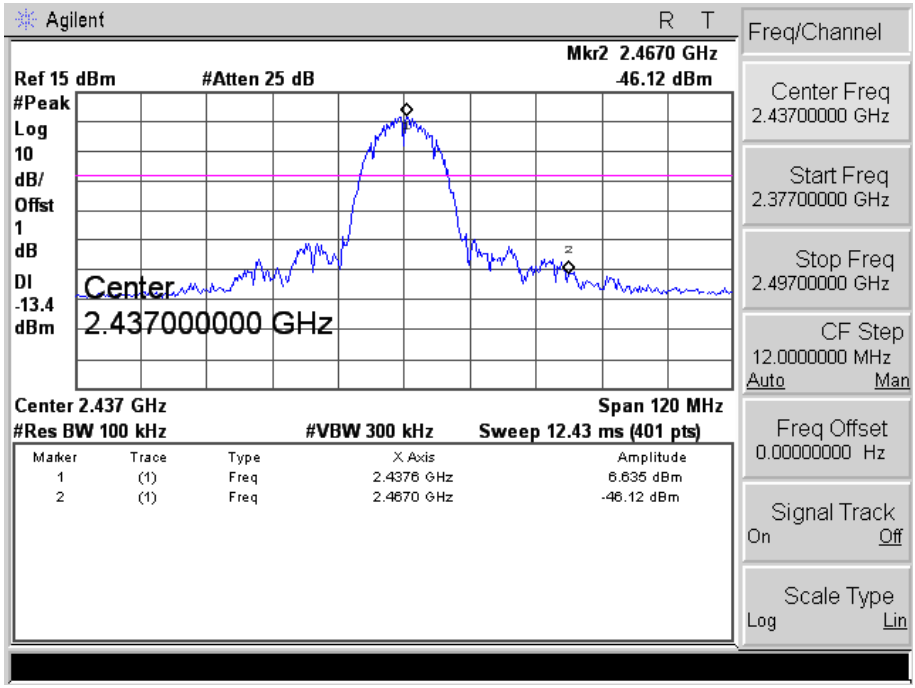
No.	Frequency	Reading	Correct	Result	Limit	Margin	Remark
	(MHz)	(dBuV/m)	dB/m	(dBuV/m)	(dBuV/m)	(dB)	
1	2460.516	98.88	-6.90	91.98	/	/	Average Detector
	2460.516	102.79	-6.90	95.89	/	/	Peak Detector
2	2483.500	54.93	-6.77	48.16	54.00	-5.84	Average Detector
	2483.500	62.29	-6.77	55.52	74.00	-18.48	Peak Detector
3	2500.000	44.63	-6.67	37.96	54.00	-16.04	Average Detector
	2500.000	47.48	-6.67	40.81	74.00	-33.19	Peak Detector

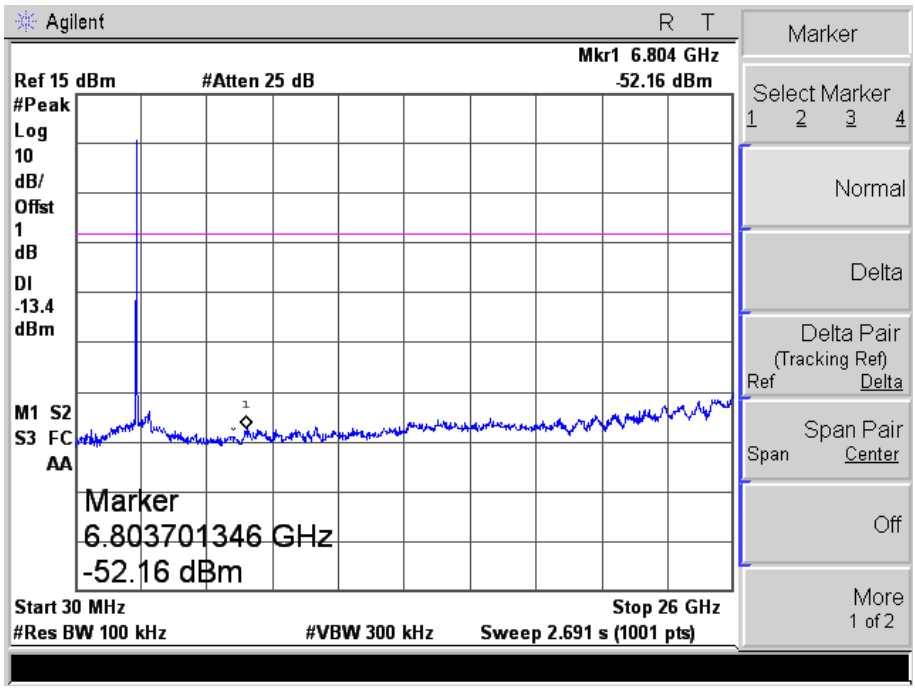
➢ Conducted test

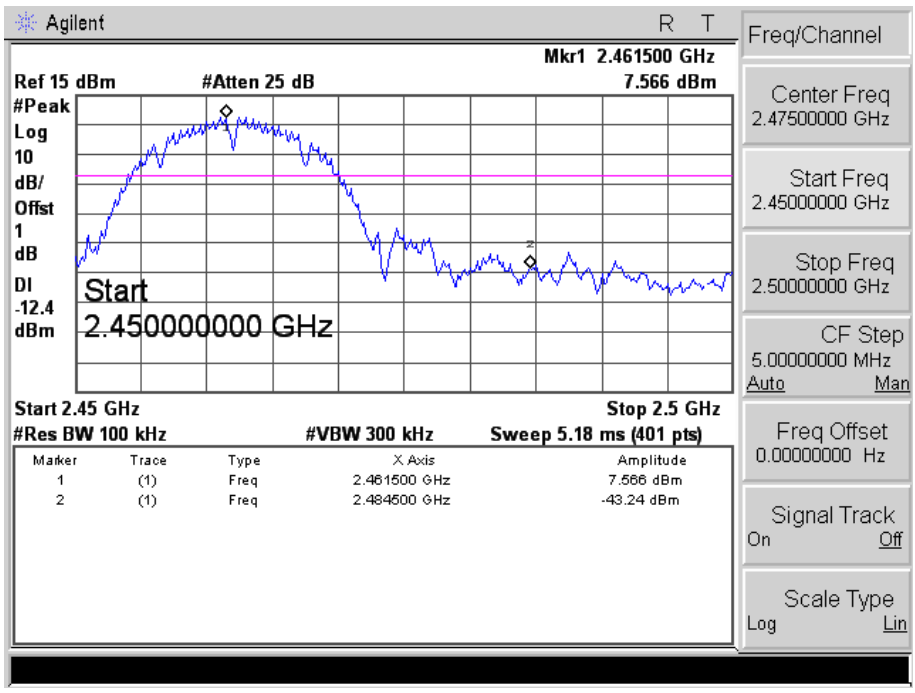
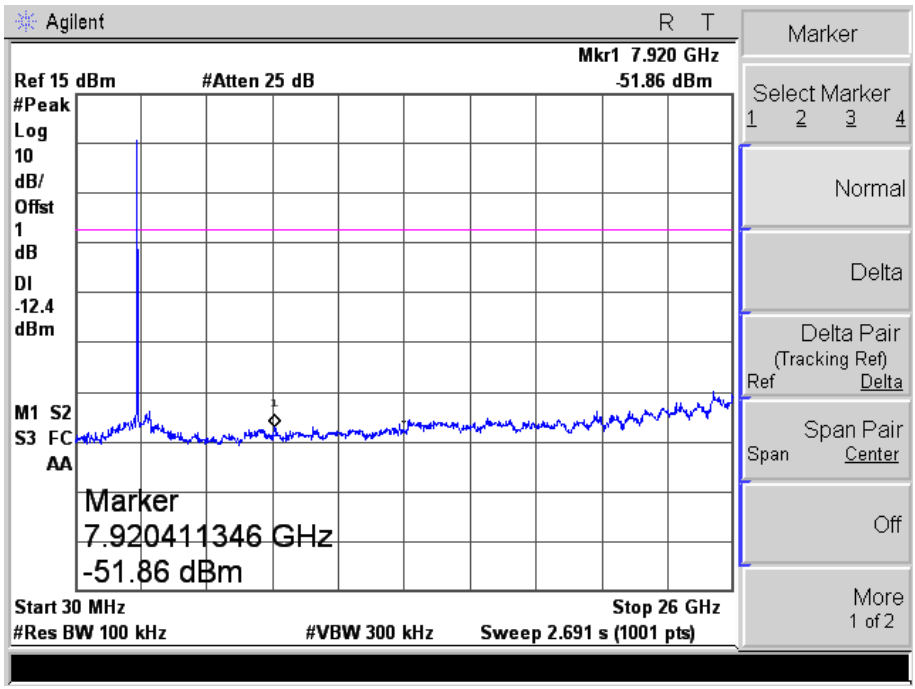
802.11b	
Low	 

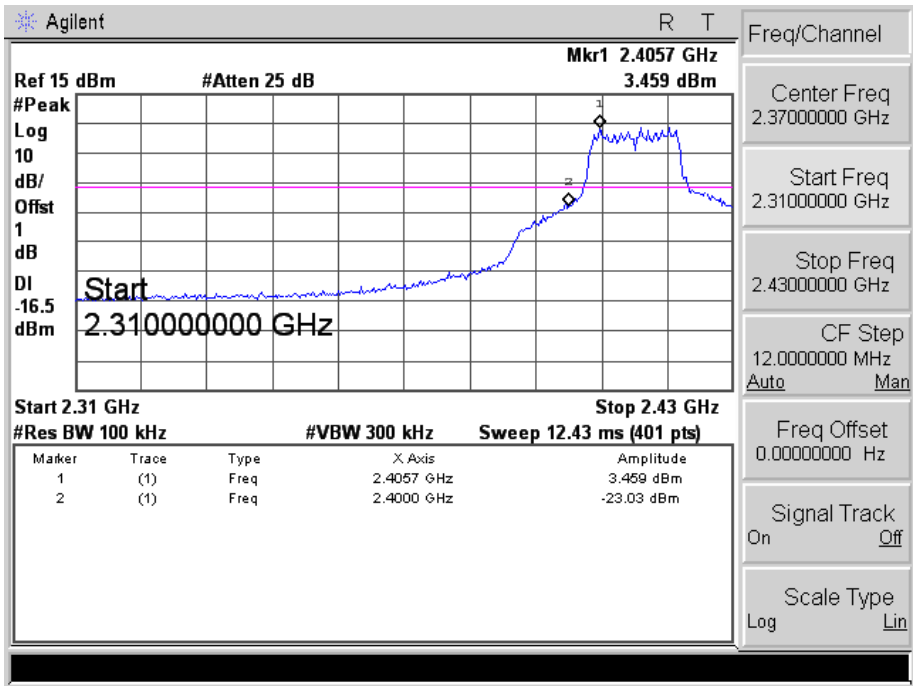
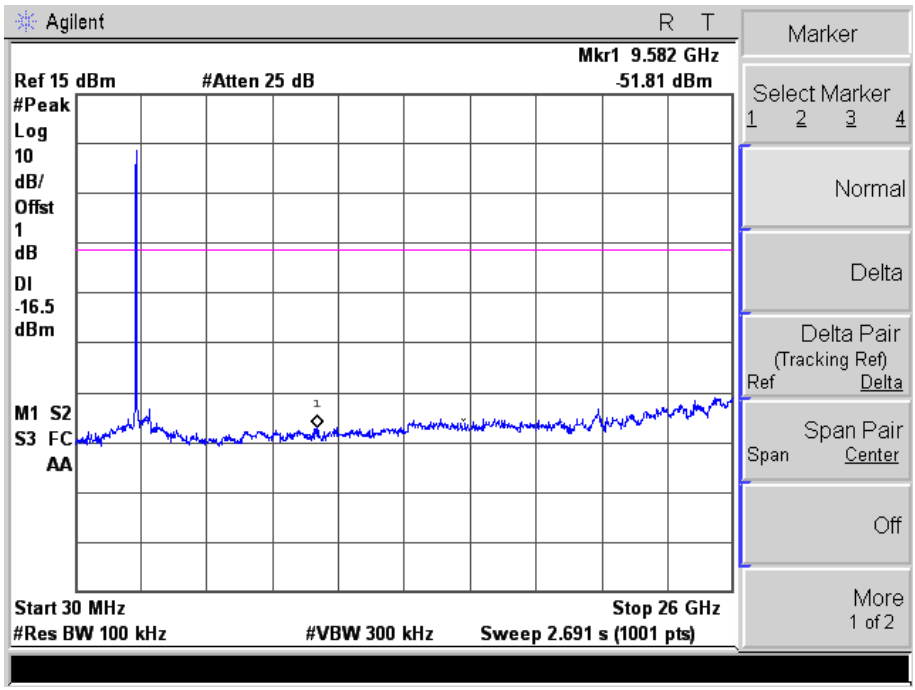
802.11b

Middle



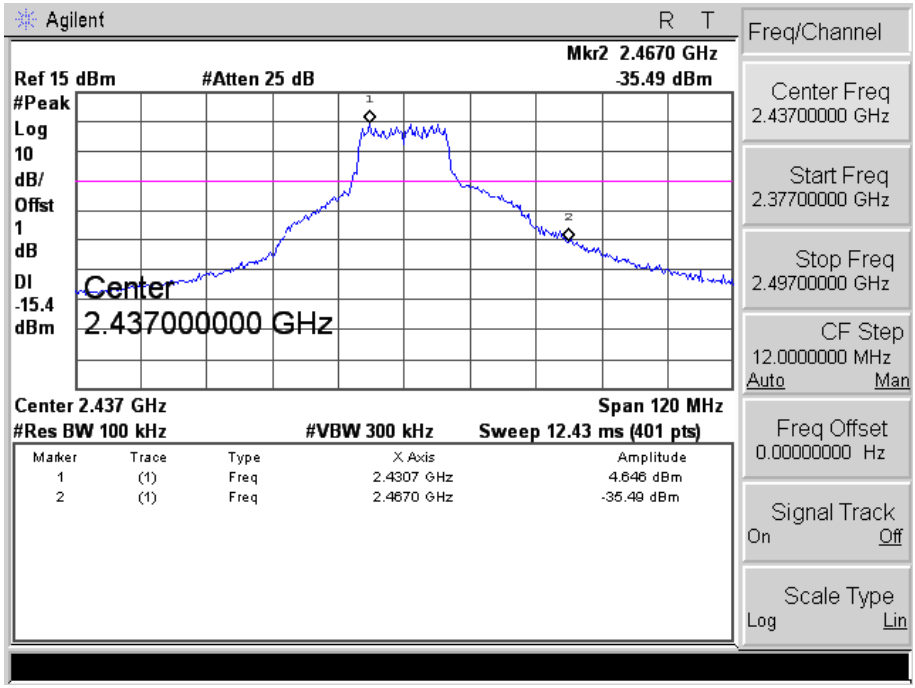


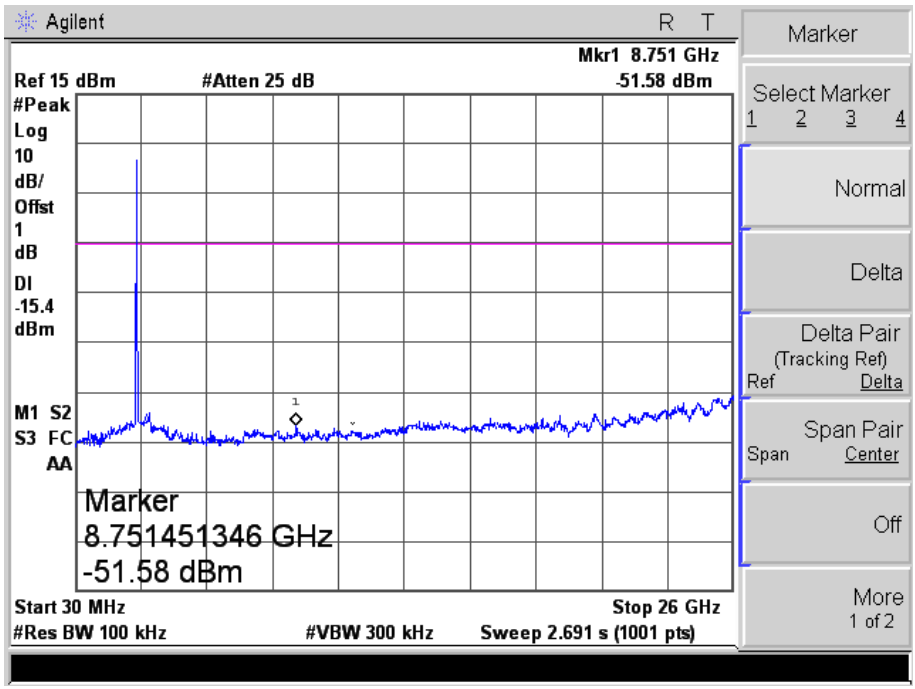
802.11b	
High	 

802.11g	
Low	 

802.11g

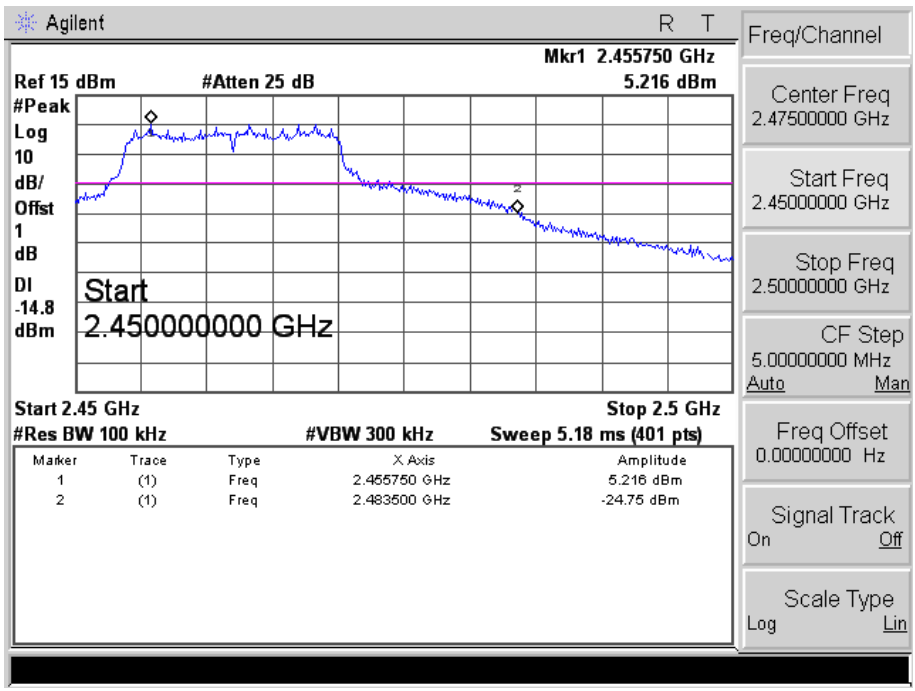
Middle

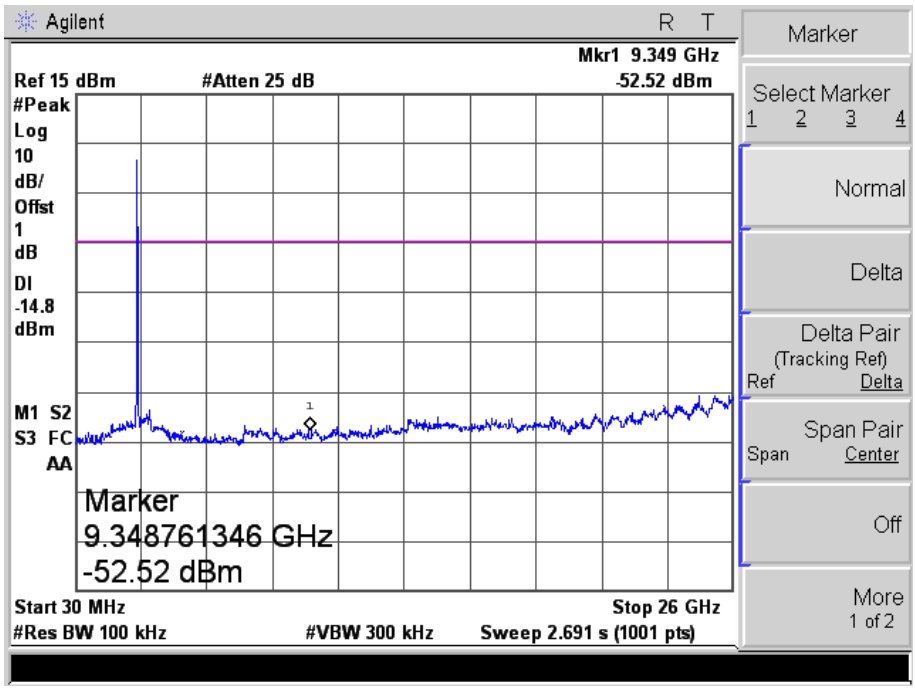


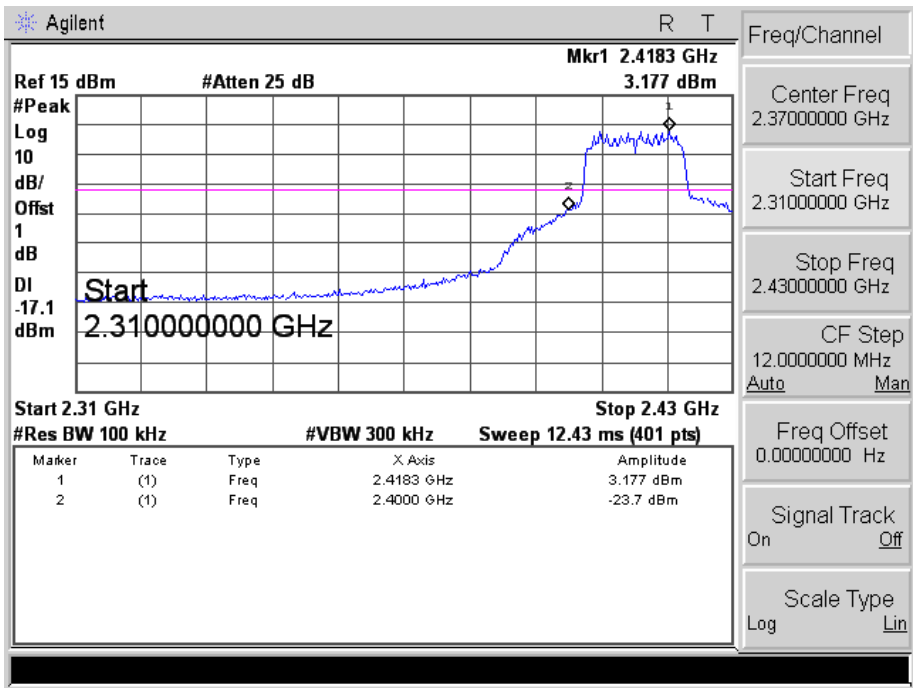
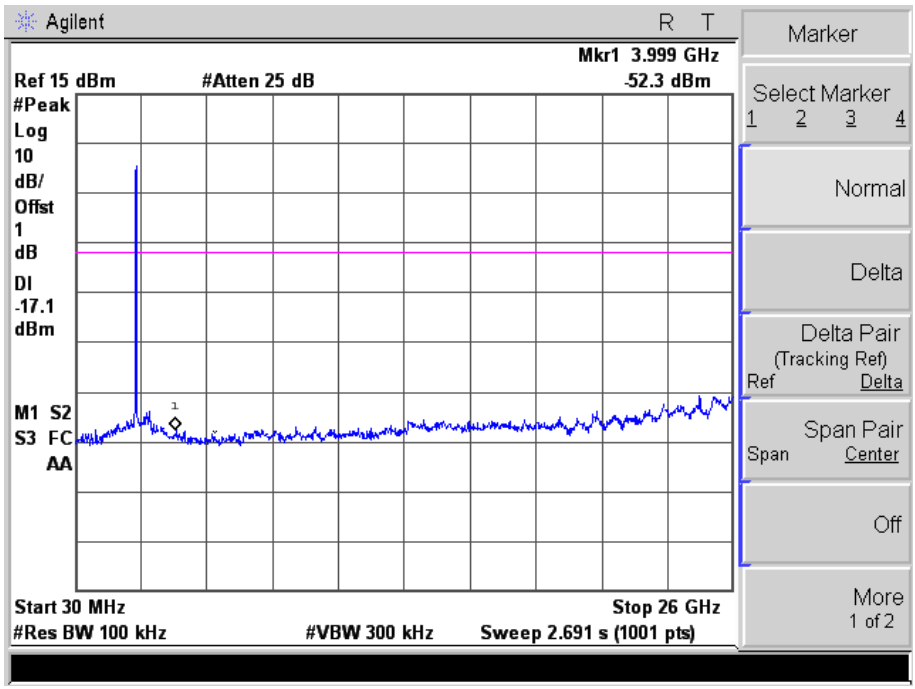


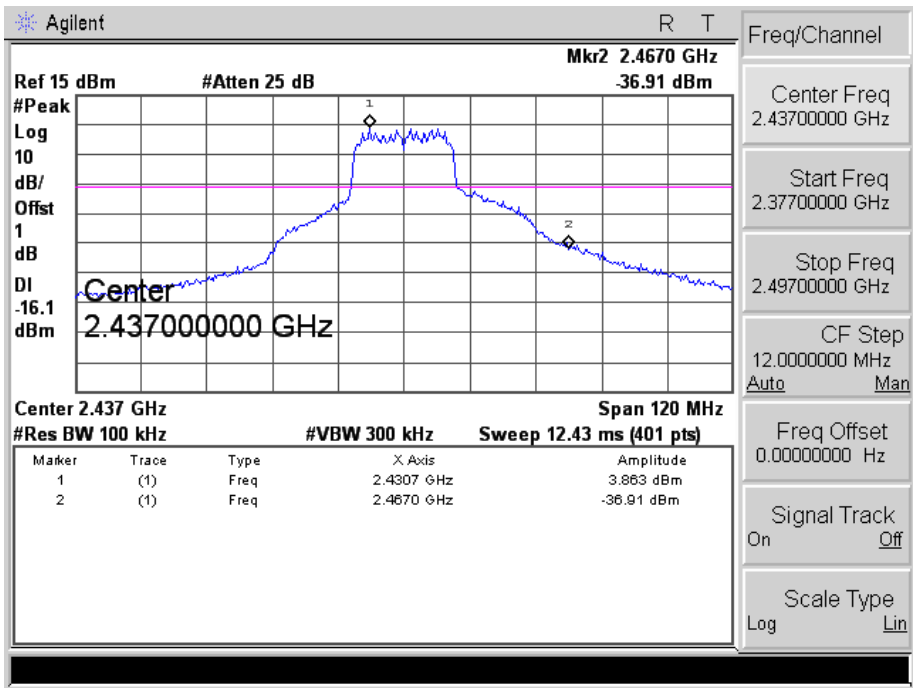
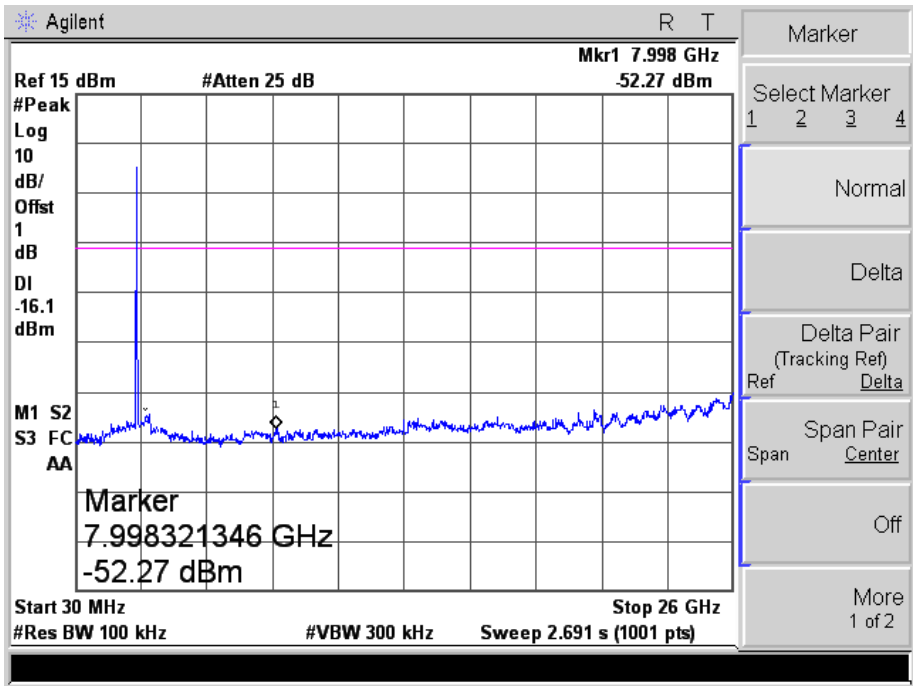
802.11g

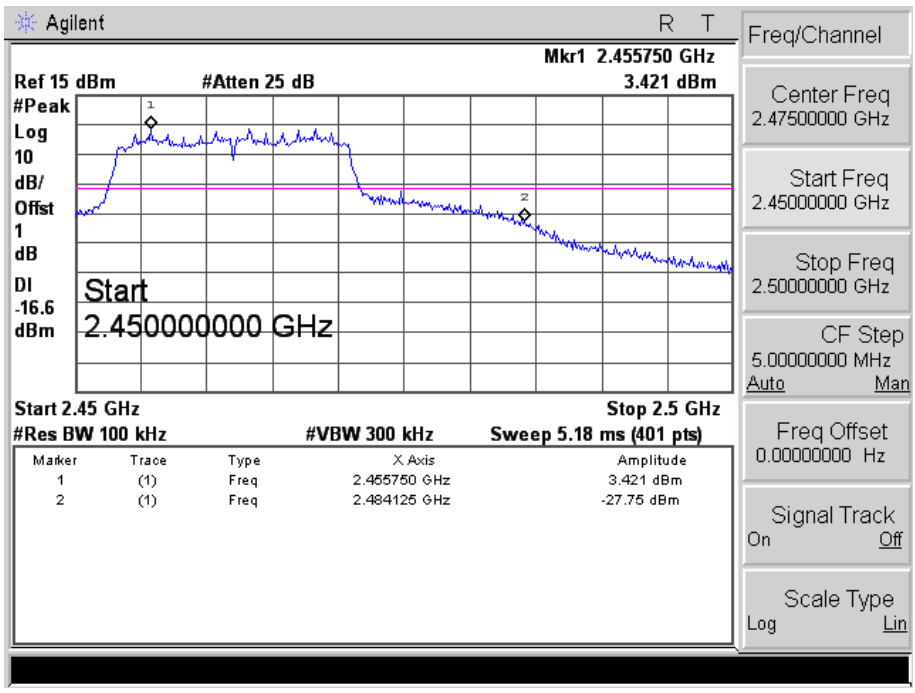
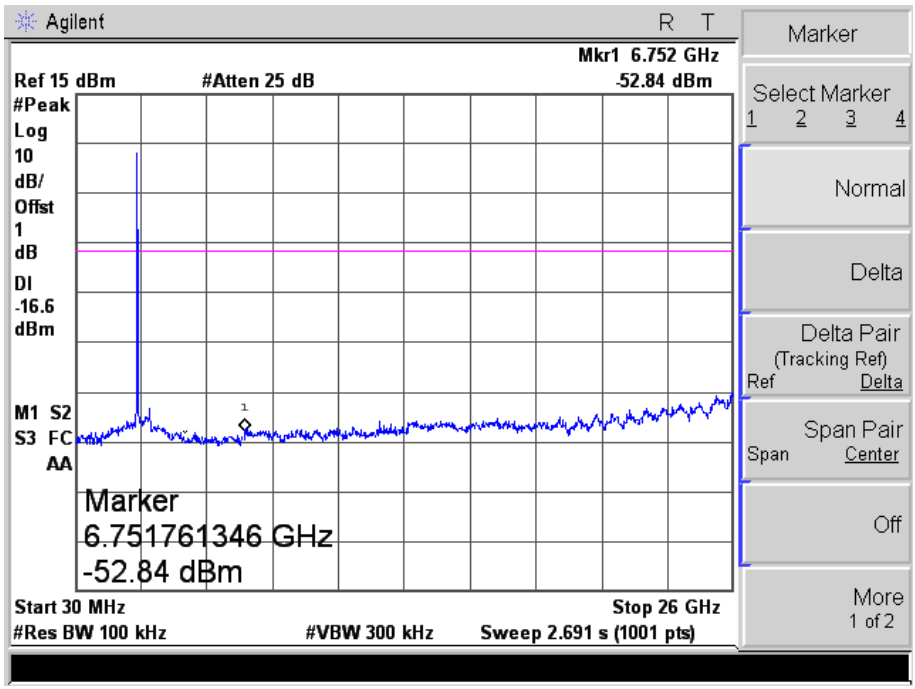
High


Agilent
R T
Mkr1 2.455750 GHz
Ref 15 dBm
#Atten 25 dB
5.216 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-14.8
dBm
Start
2.450000000 GHz
Start 2.45 GHz
Stop 2.5 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 5.18 ms (401 pts)
Marker Trace Type X Axis Amplitude
1 (1) Freq 2.455750 GHz 5.216 dBm
2 (1) Freq 2.483500 GHz -24.75 dBm
Freq/Channel
Center Freq
2.47500000 GHz
Start Freq
2.45000000 GHz
Stop Freq
2.50000000 GHz
CF Step
5.00000000 MHz
Auto Man
Freq Offset
0.00000000 Hz
Signal Track
On Off
Scale Type
Log Lin


Agilent
R T
Mkr1 9.349 GHz
Ref 15 dBm
#Atten 25 dB
-52.52 dBm
#Peak
Log
10
dB/
Offst
1
dB
Dl
-14.8
dBm
M1 S2
S3 FC
AA
Marker
9.348761346 GHz
-52.52 dBm
Start 30 MHz
Stop 26 GHz
#Res BW 100 kHz
#VBW 300 kHz
Sweep 2.691 s (1001 pts)
Marker
Select Marker
1 2 3 4
Normal
Delta
Delta Pair
(Tracking Ref)
Ref Delta
Span Pair
Span Center
Off
More
1 of 2

802.11n-HT20	
Low	 

802.11n-HT20	
Middle	 

802.11n-HT20	
High	 

******* END OF REPORT *******