5. BANDWIDTH TEST

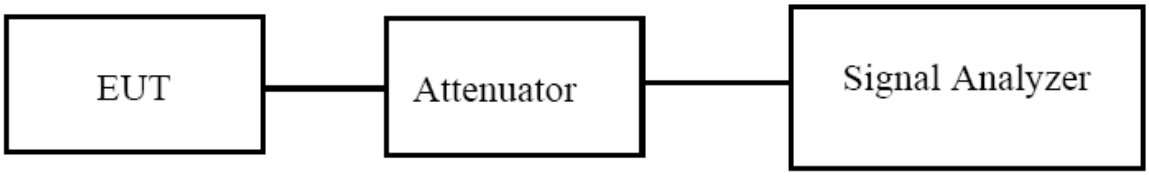
5.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(a)(2)	Bandwidth	>= 500KHz (6dB bandwidth)	2400-2483.5	PASS

5.1.1 TEST PROCEDURE

According to KDB 558074 D01 DTS Meas Guidance v03r03

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



5.1.2 EUT OPERATION CONDITIONS

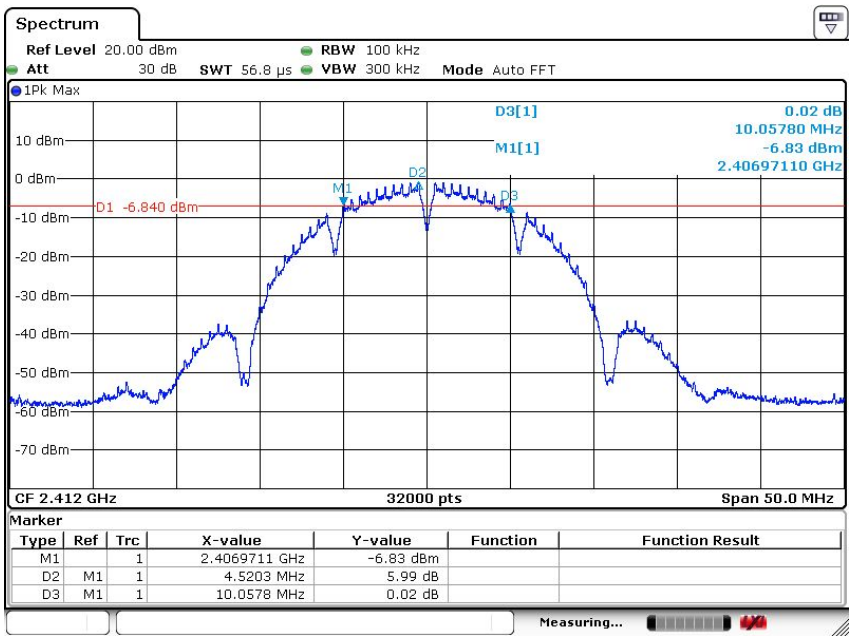
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

5.1.3 TEST RESULTS

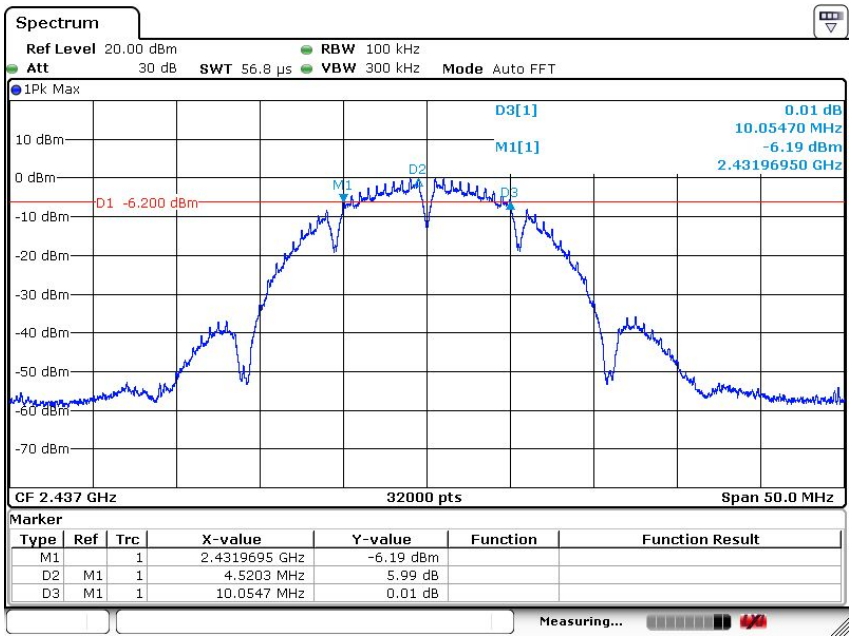
EUT：	Wireless Smart Gateway	Model Name ：	MT101
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz
Test Mode ：	TX b Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	10.0578	500	Pass
Middle	2437	10.0547	500	Pass
High	2462	10.0578	500	Pass

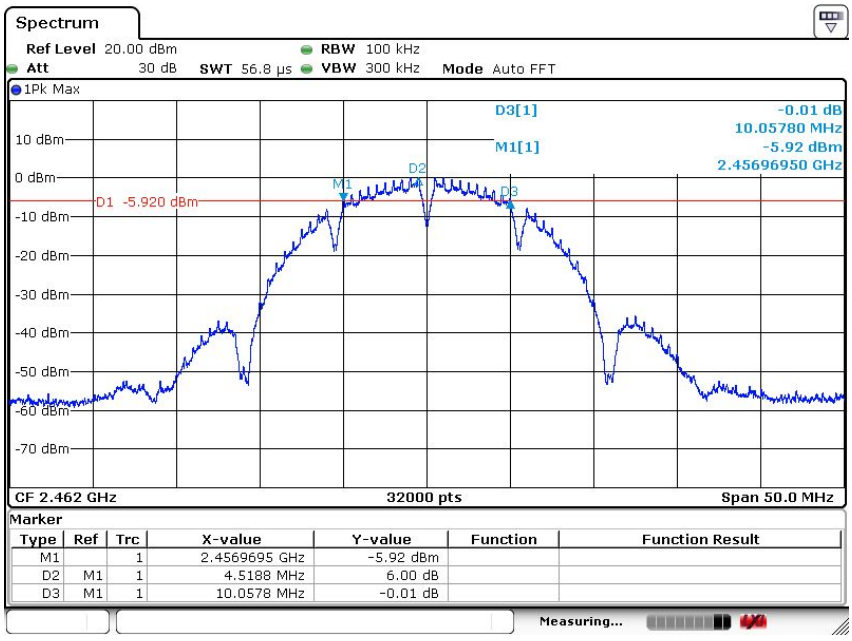
TX CH 01



TX CH 06



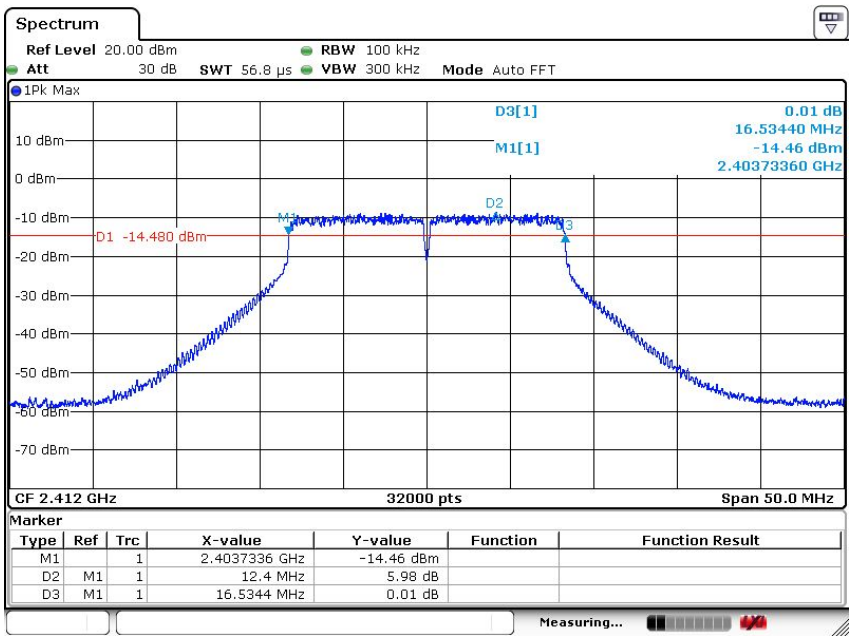
TX CH 11



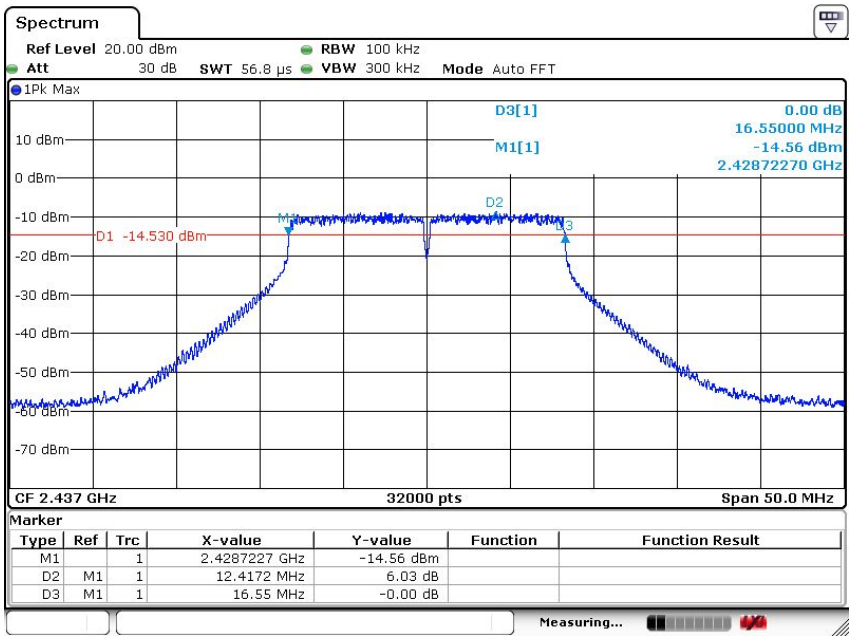
EUT：	Wireless Smart Gateway	Model Name ：	MT101
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz
Test Mode ：	TX g Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	16.5344	500	Pass
Middle	2437	16.5500	500	Pass
High	2462	16.5391	500	Pass

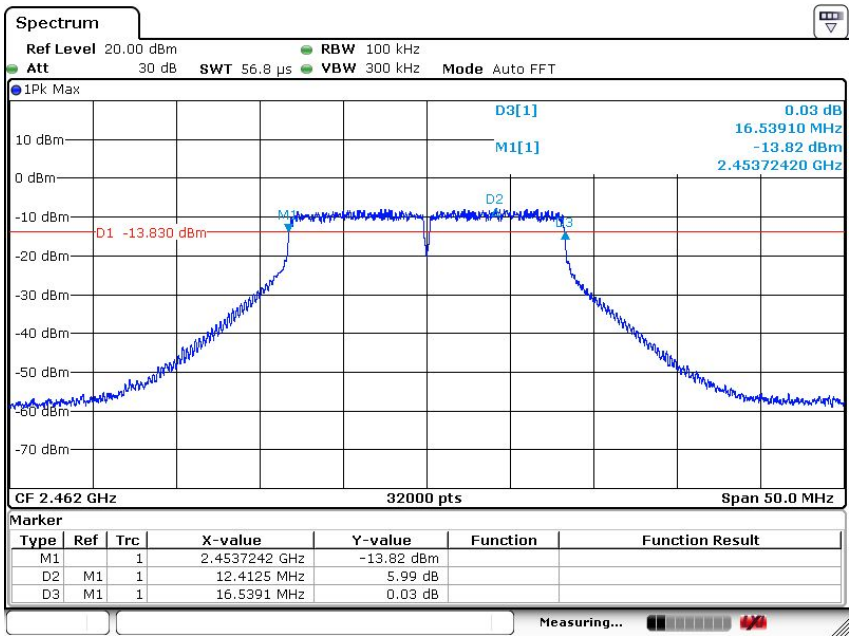
TX CH 01



TX CH 06



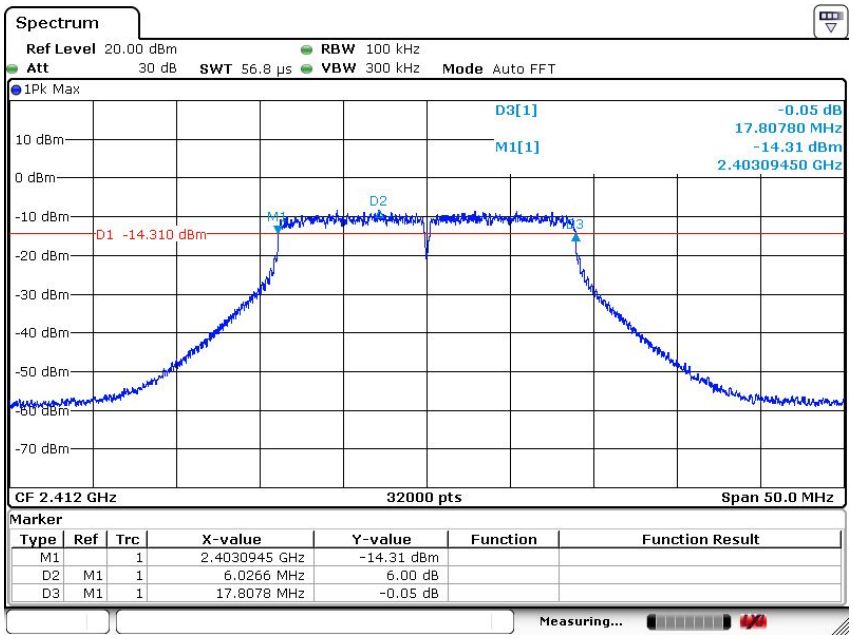
TX CH 11



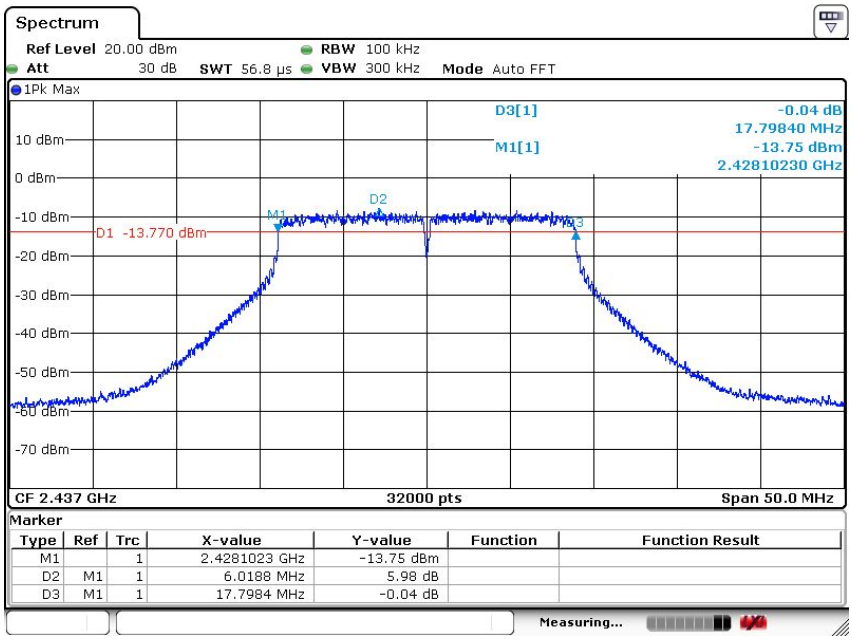
EUT：	Wireless Smart Gateway	Model Name ：	MT101
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz
Test Mode ：	TX n(HT20) Mode /CH01, CH06, CH11		

Channel	Frequency (MHz)	6dB bandwidth (MHz)	Limit (kHz)	Result
Low	2412	17.8078	500	Pass
Middle	2437	17.7984	500	Pass
High	2462	17.8094	500	Pass

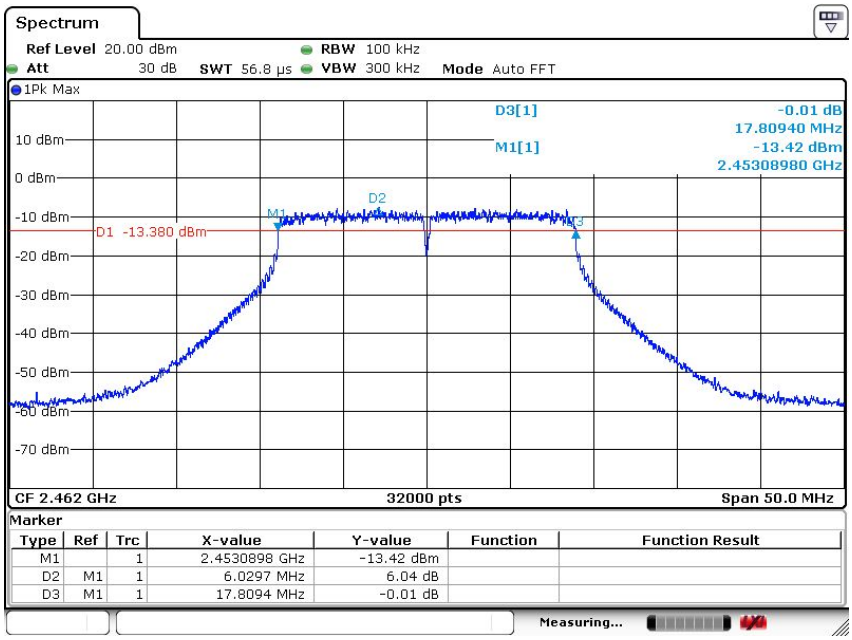
TX CH 01



TX CH 06



TX CH 11



6. PEAK OUTPUT POWER TEST

6.1 APPLIED PROCEDURES / LIMIT

FCC Part15 (15.247) , Subpart C				
Section	Test Item	Limit	Frequency Range (MHz)	Result
15.247(b)(3)	Peak Output Power	1 watt or 30dBm	2400-2483.5	PASS

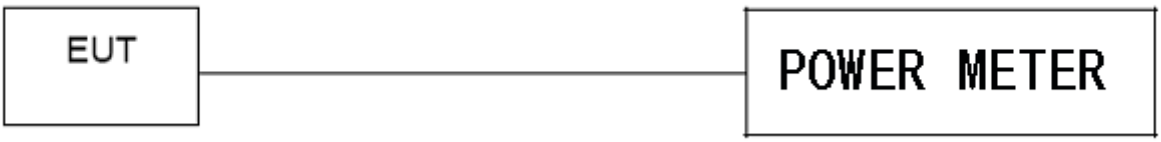
6.1.1 TEST PROCEDURE

a. The EUT was directly connected to the Power meter

6.1.2 DEVIATION FROM STANDARD

No deviation.

6.1.3 TEST SETUP



6.1.4 EUT OPERATION CONDITIONS

The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

6.1.5 TEST RESULTS

EUT：	Wireless Smart Gateway	Model Name ：	MT101
Temperature：	25 ℃	Relative Humidity：	60%
Pressure：	1012 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz
Test Mode ：	TX b/g/n Mode		

Test Channe	Frequency	Maximum Conducted Output Power(PK)	Max. Tune up Power	LIMIT
	(MHz)	(dBm)	(dBm)	(dBm)
802.11b				
CH01	2412	13.47	13.50	30
CH06	2437	13.29	13.50	30
CH11	2462	13.34	13.50	30
802.11g				
CH01	2412	13.08	13.50	30
CH06	2437	13.19	13.50	30
CH11	2462	13.26	13.50	30
802.11n(HT20)				
CH01	2412	12.79	13.00	30
CH06	2437	12.95	13.00	30
CH11	2462	12.65	13.00	30

Note： the highest powers for：

802.11b：1Mbps

802.11g：6Mbps

802.11n(HT20):11Mbps

7. 100 KHZ BANDWIDTH OF FREQUENCY BAND EDGE

APPLICABLE STANDARD

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) (see §15.205(c)).

TEST PROCEDURE

a) Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.

b) Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.

c) Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.

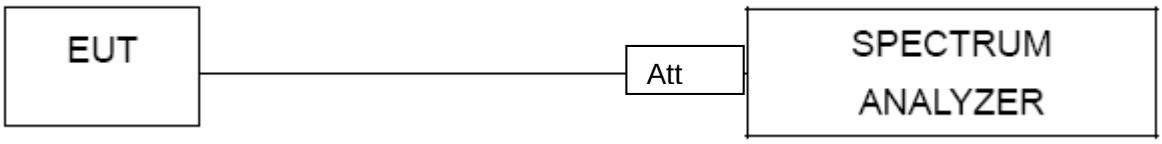
d) Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.

e) Repeat above procedures until all measured frequencies were complete.

7.1 DEVIATION FROM STANDARD

No deviation.

7.2 TEST SETUP



7.3 EUT OPERATION CONDITIONS

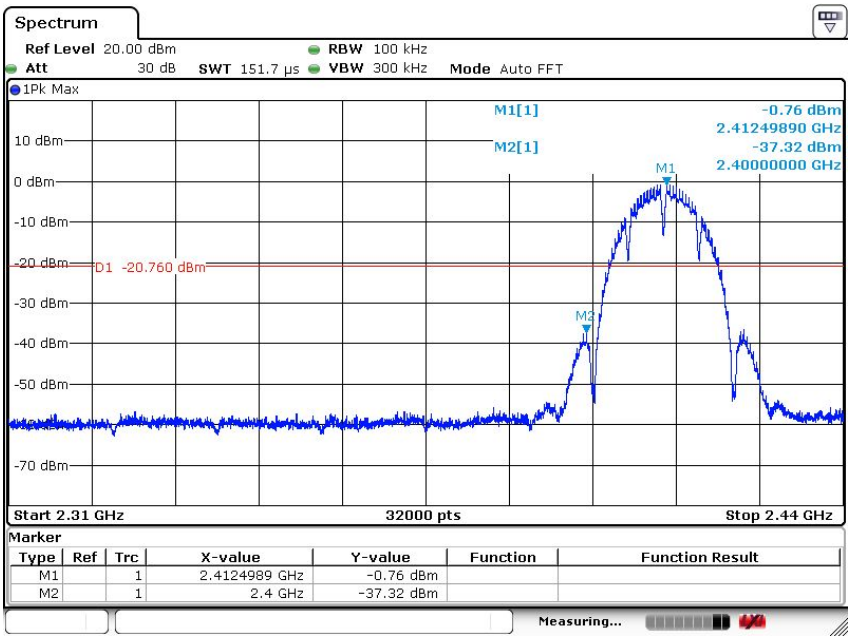
The EUT tested system was configured as the statements of 2.4 Unless otherwise a special operating condition is specified in the follows during the testing.

7.4 TEST RESULTS

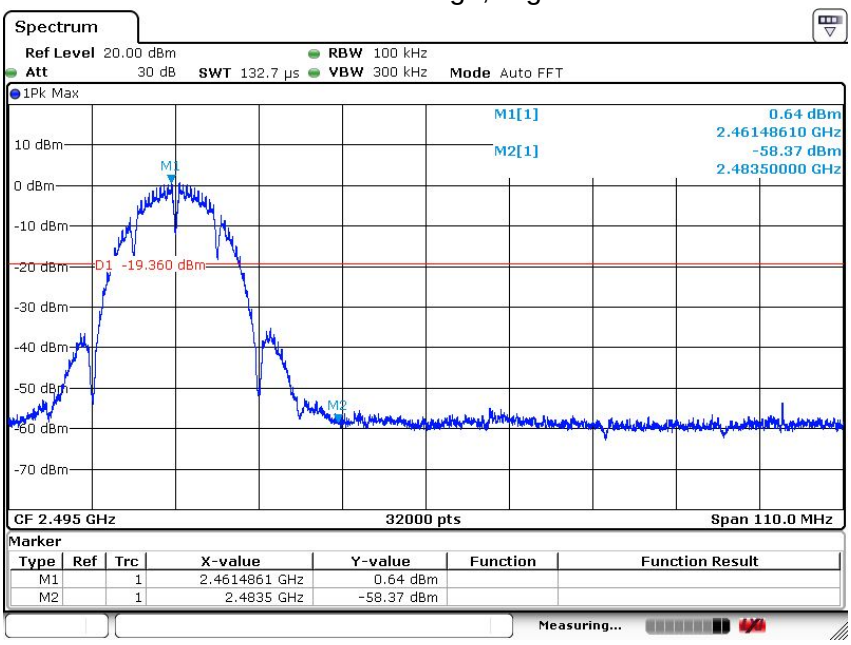
EUT：	Wireless Smart Gateway	Model Name ：	MT101
Temperature：	25 ℃	Relative Humidity：	56%
Pressure：	1012 hPa	Test Voltage ：	DC 5V from adapter AC 120V/60Hz

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type	Comment
802.11b							
2390	47.26	9.86	57.12	74	-16.88	Pk	Vertical
2390	36.95	9.86	46.81	54	-7.19	Av	Vertical
2483.5	45.58	10.14	55.72	74	-18.28	Pk	Vertical
2483.5	36.52	10.14	46.66	54	-7.34	Av	Vertical
802.11g							
2390	46.78	9.86	56.64	74	-17.36	Pk	Vertical
2390	35.91	9.86	45.77	54	-8.23	Av	Vertical
2483.5	44.25	10.14	54.39	74	-19.61	Pk	Vertical
2483.5	34.19	10.14	44.33	54	-9.67	Av	Vertical
802.11n(HT20)							
2390	44.78	9.86	54.64	74	-19.36	Pk	Vertical
2390	35.12	9.86	44.98	54	-9.02	Av	Vertical
2483.5	45.33	10.14	55.47	74	-18.53	Pk	Vertical
2483.5	34.19	10.14	44.33	54	-9.67	Av	Vertical

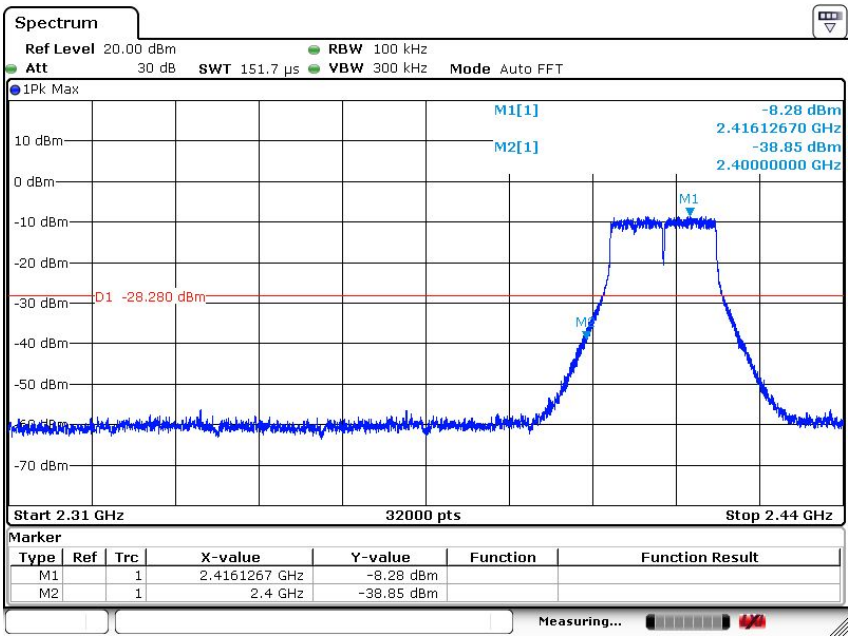
802.11b: Band Edge, Left Side



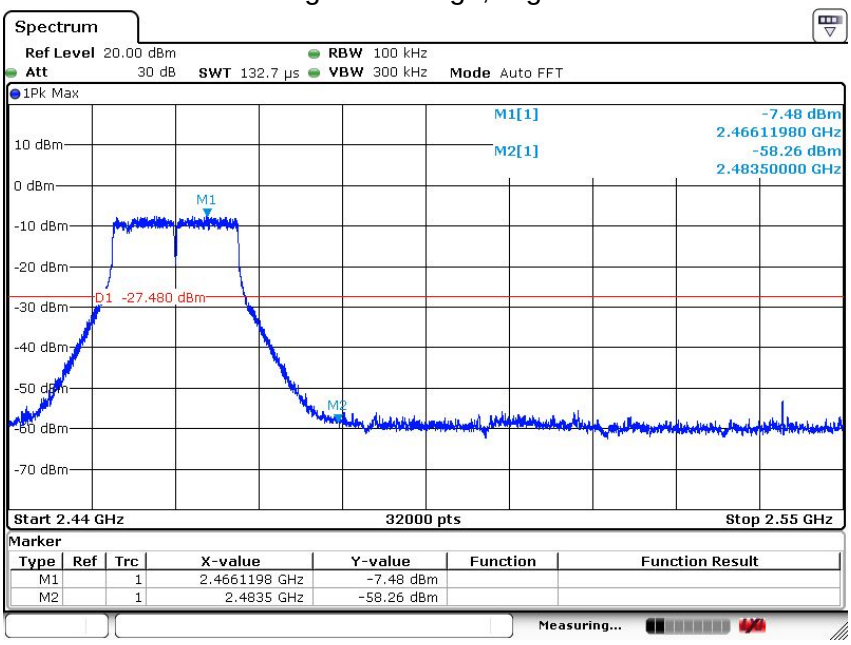
802.11b: Band Edge, Right Side



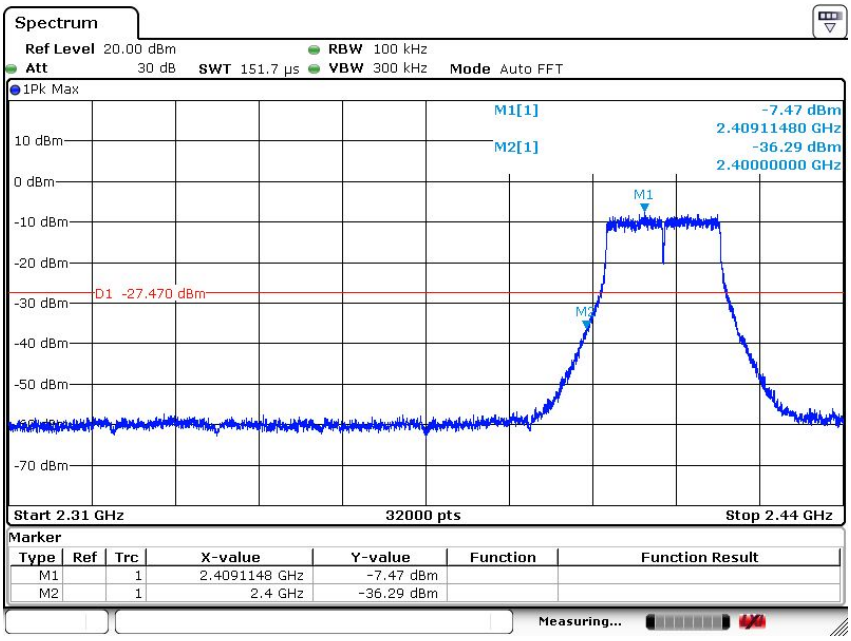
802.11g: Band Edge, Left Side



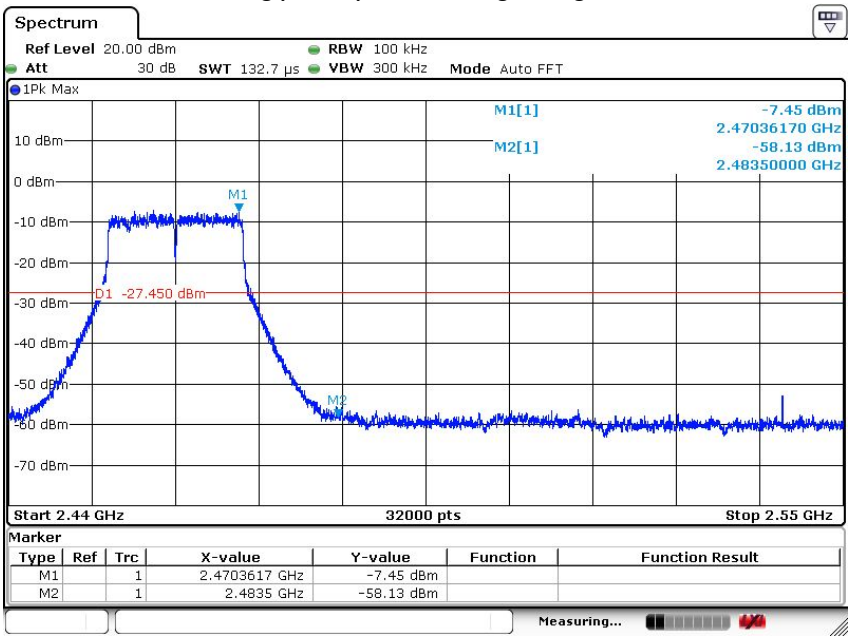
802.11g: Band Edge, Right Side



802.11n(HT20): Band Edge, Left Side



802.11g(HT20): Band Edge, Right Side



8. ANTENNA REQUIREMENT

8.1 STANDARD REQUIREMENT

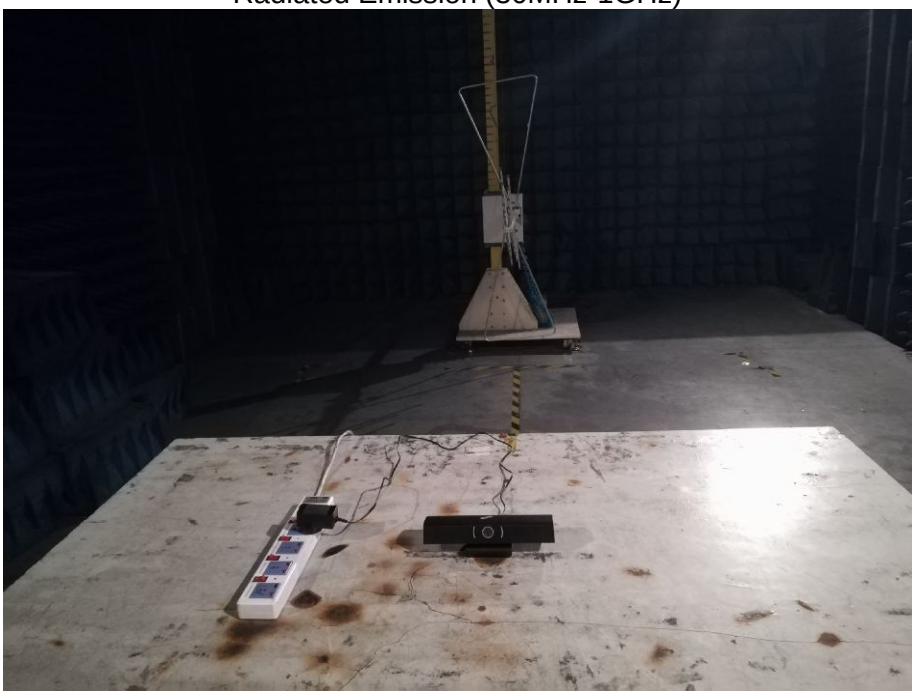
15.203 requirement: For intentional device, according to 15.203: an intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device.

8.2 EUT ANTENNA

The EUT antenna is PCB antenna. It comply with the standard requirement.

9. EUT TEST PHOTO

Radiated Emission (30MHz-1GHz)



Radiated Emission (above 1GHz)

Conducted Emission (AC Mains)