FCC - TEST REPORT

Report Number	:	**68.930.20.0020.01**	Date of Issue:	**August 16, 2020**

Model	:	**GBF-1717-W**
Product Type	:	Body Fat Analyzer
Applicant	:	Zhongshan Transtek Electronics Co., Ltd
Address	:	No.23 Jin'an Road, Minzhong, 528441 Zhongshan, Guangdong, PEOPLE'S REPUBLIC OF CHINA
Manufacturer&Factory	:	Zhongshan Transtek Electronics Co., Ltd
Address	:	No.23 Jin'an Road, Minzhong, 528441 Zhongshan, Guangdong, PEOPLE'S REPUBLIC OF CHINA
Factory	:	Zhongshan Transtek Electronics Co., Ltd
Address	:	No.23 Jin'an Road, Minzhong, 528441 Zhongshan, Guangdong, PEOPLE'S REPUBLIC OF CHINA

Test Result	:	■ **Positive**	☐ **Negative**
Total pages including Appendices	:	**89**	

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2 Details about the Test Laboratory

Details about the Test Laboratory

Test Site 1

Company name:	TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch Building 12&13, Zhiheng Wisdomland Business Park, Nantou Checkpoint Road 2, Nanshan District, Shenzhen City, 518052, P. R. China
FCC Registration Number:	502708
Telephone:	86 755 8828 6998
Fax:	86 755 8828 5299

3 Description of the Equipment Under Test

Description of the Equipment Under Test

Product:	Body Fat Analyzer
Model no.:	GBF-1717-W
Brand Name:	N/A
FCC ID:	2AOJNGBF-1717-W
Rating:	DC 6V（4*1.5 AAA battery）
RF Transmission Frequency:	5.150GHz~5.250GHz; 5.250GHz~5.350GHz; 5.725GHz~5.850GHz
Modulation:	802.11n-HT20: BPSK, QPSK, 16QAM, 64QAM 802.11n-HT40: BPSK, QPSK, 16QAM, 64QAM
Antenna Type:	Integral Antenna
Antenna Gain:	1.5dBi
Description of the EUT:	The Equipment Under Test (EUT) is a Body Fat Analyzer which support 2.4G Wi-Fi, 5G Wi-Fi and BLE function. The 2.4G Wi-Fi, BLE operated at 2402MHz to 2480MHz, The 5G Wi-Fi operation 5150MHz to 5250MHz, 5250MHz to 5350MHz and 5725MHz to 5850MHz.

Only 5G Wi-Fi test data include in this report.

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4 Summary of Test Standards

Test Standards	
FCC Part 15 Subpart E 10-1-2019 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart E - Unlicensed National Information Infrastructure Devices
FCC Part 15 Subpart C 10-1-2019 Edition	PART 15 - RADIO FREQUENCY DEVICES Subpart C - Intentional Radiators

Test Method:
KDB 789033 D02 General UNII Test Procedures New Rules v02r01f
KDB 905462 D02 UNII DFS Compliance Procedures New Rules v02
ANSI C63.10-2013, American National Slave standard for Testing Unlicensed Wireless Devices

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5 Summary of Test Results

Technical Requirements			
FCC Part 15 Subpart E, FCC Part 15 Subpart C			
Test Condition	Test Result		
	Pass	Fail	N/A
15.207 Conducted Emission AC Power Port	☐	☐	☒
15.407(e) Emission bandwidth	☒	☐	☐
15.407(a)(i) Maximum Conducted Output Power	☒	☐	☐
15.407(a)(i) Maximum Power Spectral Density	☒	☐	☐
15.407(b)(1), 15.407(b)(2), 15.407(b)(3), 15.407(b)(5), 15.407(b)(4), 15.407(b)(6) 15.407(b)(7) 15.209 Unwanted Emissions	☒	☐	☐
15.407(g) Frequencies Slavebility	☒	☐	☐
15.407(h) Dynamic Frequency Selection (DFS).	☒	☐	☐
15.203 Antenna Requirement	☒ See note 2	☐	☐

Note 1: N/A=Not Applicable.
Note 2: The antenna is a PCB antenna with 1.5dB antenna gain. It is considered sufficiently to comply with the provisions of this section.

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6 General Remarks

Remarks
This submittal(s) (test report) is intended for FCC ID: 2AOJNGBF-1717-W, complies with Section FCC Part 15 Subpart C Rules, FCC Part 15 Subpart E Rules.

The Equipment Under Test (EUT) is a Body Fat Analyzer which support 2.4G Wi-Fi, 5G Wi-Fi and BLE function. The 2.4G Wi-Fi, BLE operated at 2400MHz to 2483.5MHz, The 5G Wi-Fi operation 5150MHz to 5250MHz, 5250MHz to 5350MHz and 5725MHz to 5850MHz.

This report is for the 5GHz Wi-Fi.

SUMMARY:

All tests according to the regulations cited on page 5 were

■ - Performed

☐ - **Not** Performed

The Equipment Under Test

■ - **Fulfills** the general approval requirements.

☐ - **Does not** fulfill the general approval requirements.

Sample Received Date:	June 30, 2020
Testing Start Date:	July 26, 2020
Testing End Date:	July 30, 2020

- TÜV SÜD Certification and Testing (China) Co., Ltd. Shenzhen Branch –

Reviewed by:	Prepared by:	Tested by:
Zhi John	Grace Gao	Louise Liu
EMC Section Manager	EMC Project Engineer	EMC Test Engineer

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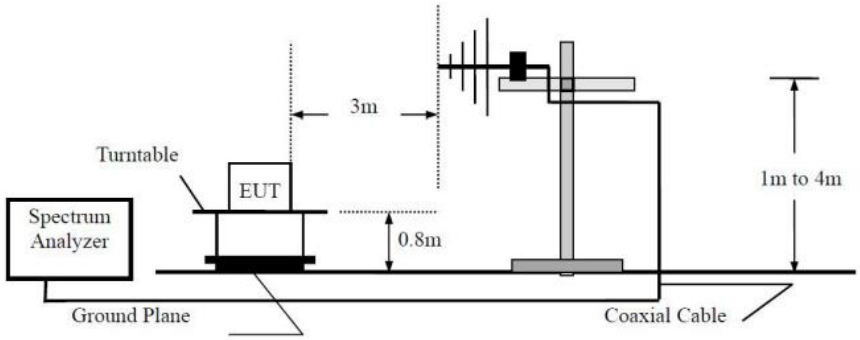
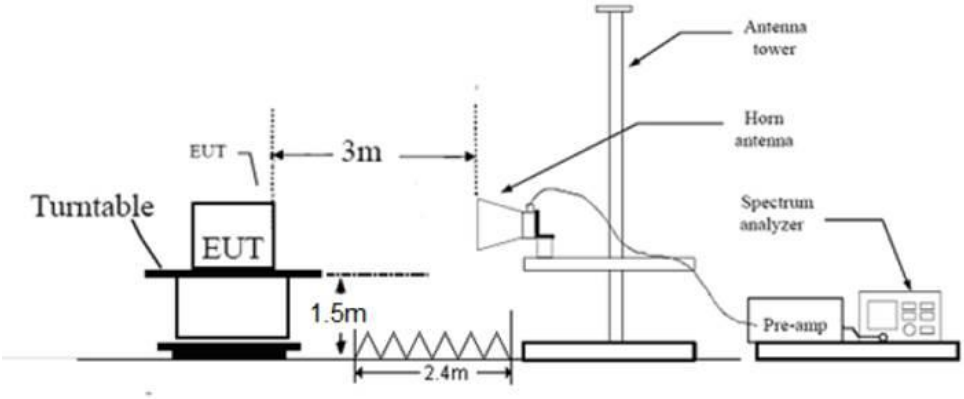
7 Test setups

7.1 Radiated test setups

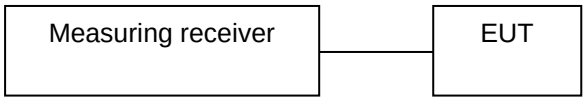
Below 1GHz:



Above 1GHz



7.2 Conducted RF test setups



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8. Systems test configuration

Auxiliary Equipment Used during Test:

DESCRIPTION	MANUFACTURER	MODEL NO.(SHIELD)	S/N(LENGTH)
Netobook	Lenovo	E470c	---

The system was configured to channel:

Test Mode	Channel (MHz)		
802.11n HT20	5G WIFI-Band 1		
	CH36 (5180MHz)	CH40 (5200MHz)	CH48 (5240MHz)
	5G WIFI-Band 2		
	CH52 (5260MHz)	CH56 (5280MHz)	CH64 (5320MHz)
	5G WIFI-Band 3		
	CH149 (5745MHz),	CH157(5785MHz)	CH165 (5825MHz)

Test Mode	Channel (MHz)	
802.11n HT40	5G WIFI-Band 1	
	CH38(5190MHz)	CH46 (5230MHz)
	5G WIFI-Band 2	
	CH54(5270MHz)	CH62(5310MHz)
	5G WIFI-Band 3	
	CH151(5755MHz)	CH159(5795MHz)

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9 Technical Requirement

9.1 Emission bandwidth

1、Test Method of 26dB Bandwidth
According to KDB789033 D02
a) Set RBW = approximately 1% of the emission bandwidth.
b) Set the VBW > RBW.
c) Detector = Peak.
d) Trace mode = max hold.
e) Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

Limit: No limit

2、Test Method of 6dB Bandwidth
According to KDB789033 D02
a) Set RBW = 100KHz
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.

Limit: ≥500KHz

3、Test Method of 99% Bandwidth
According to KDB789033 D02
a) Set center frequency to the nominal EUT channel center frequency
b) Set span = 1.5 times to 5.0 times the OBW.
c) Set RBW = 1 % to 5 % of the OBW
d) Set VBW ≥ 3 · RBW
e) Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
f) Use the 99 % power bandwidth function of the instrument (if available).
g) If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.
Limit: No limit

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Test result as below table:

IEEE 802.11n-HT20 modulation Test Result

Band	Channel	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Measured 26dB Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)
5.2G Band	Low	5180	18.062	20.120	N/A
	Mid	5200	18.222	20.400	N/A
	High	5240	18.142	20.720	N/A
5.3G Band	Low	5260	18.222	20.280	N/A
	Mid	5280	18.262	20.240	N/A
	High	5320	18.222	20.480	N/A
5.8G Band	Low	5745	18.142	20.560	17.120
	Mid	5785	18.182	20.160	17.640
	High	5825	18.142	20.680	17.640

IEEE 802.11n-HT40 modulation Test Result

Band	Channel	Channel Frequency (MHz)	Measured 99% Bandwidth (MHz)	Measured 26dB Bandwidth (MHz)	Measured 6dB Bandwidth (MHz)
5.2G Band	Low	5190	36.523	41.280	N/A
	High	5230	36.444	40.880	N/A
5.3G Band	Low	5270	36.523	42.640	N/A
	High	5310	36.444	40.800	N/A
5.8G Band	Low	5755	36.523	40.960	35.920
	High	5795	36.603	41.200	36.240

Remark: “N/A” means “Not Applicable”

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26dB Bandwidth Test graphs:

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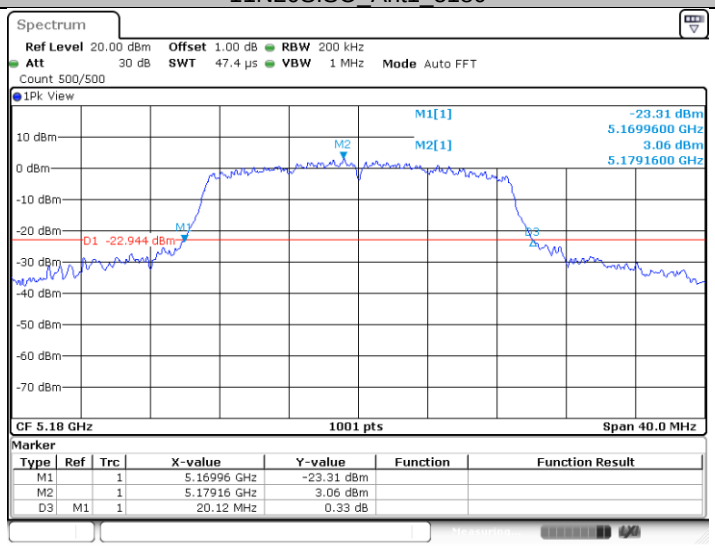

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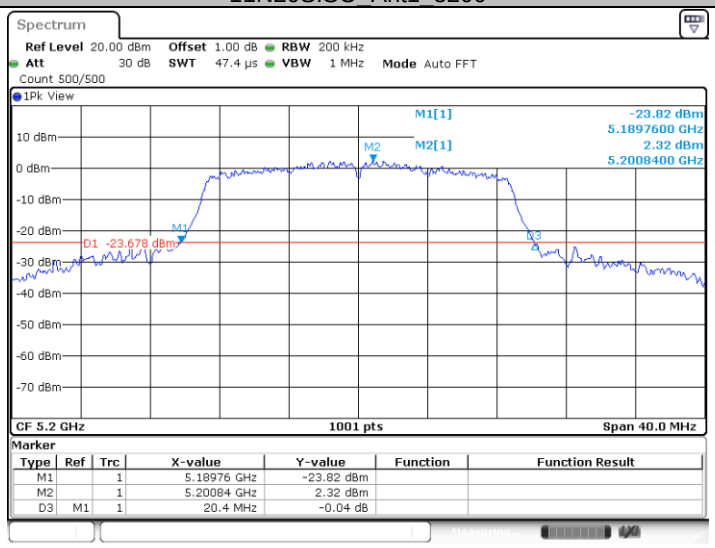

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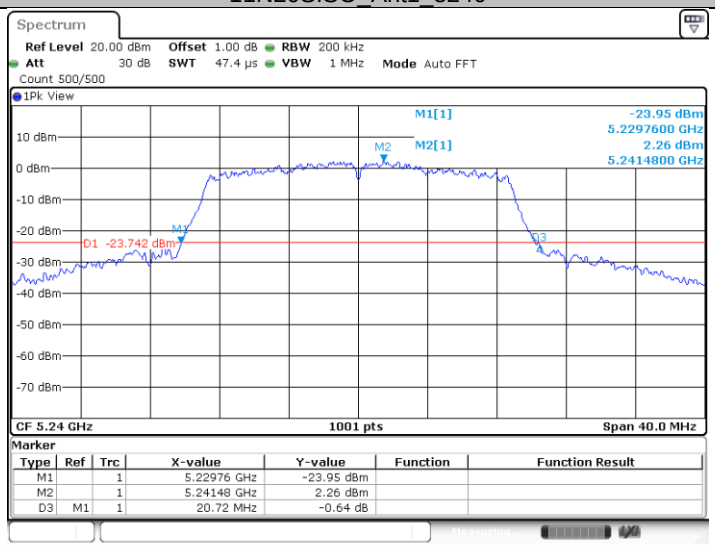

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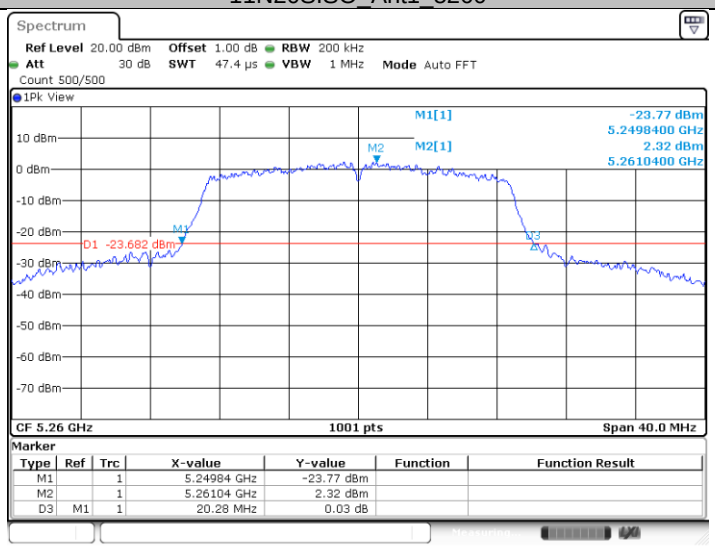

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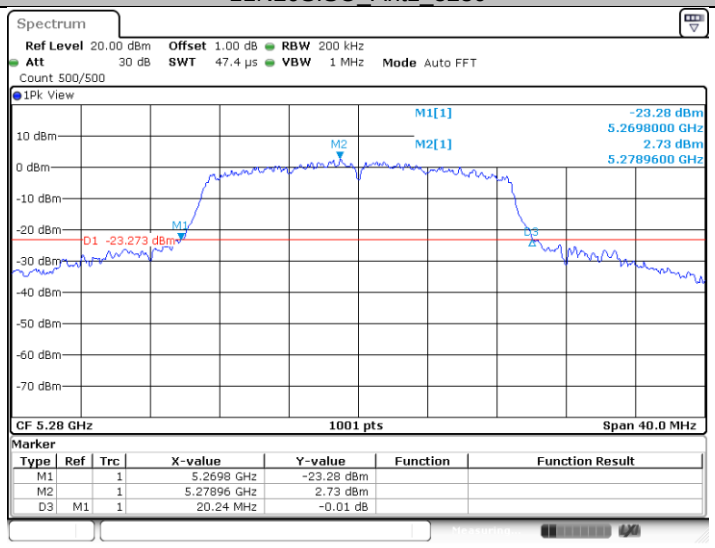

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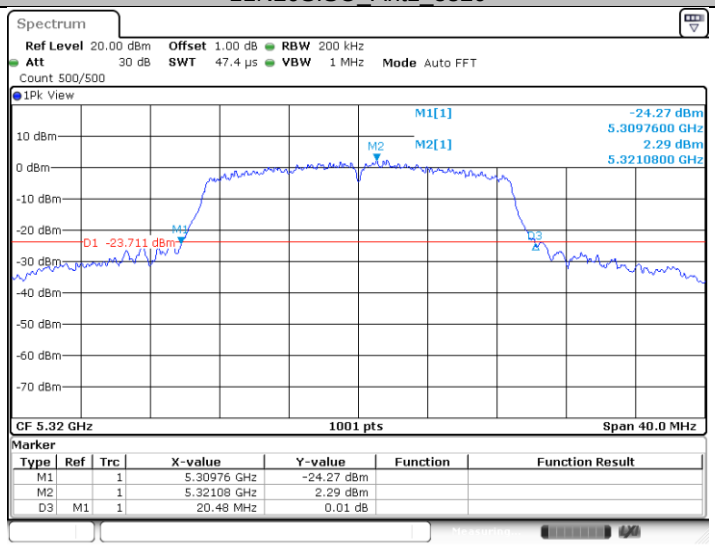

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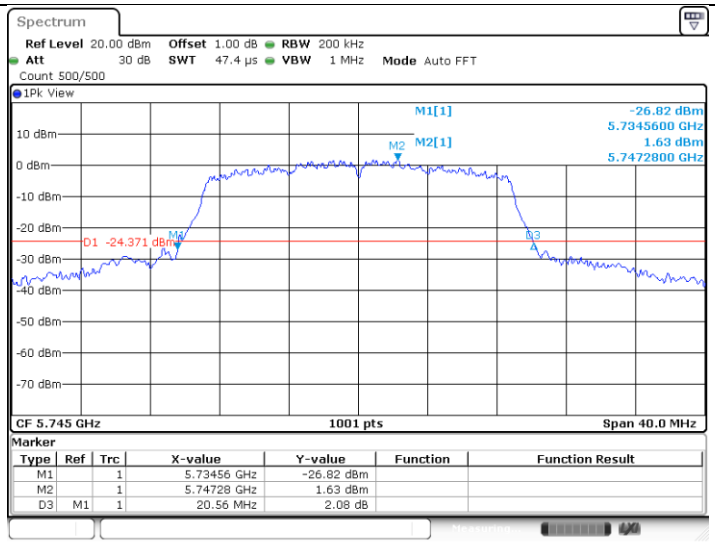

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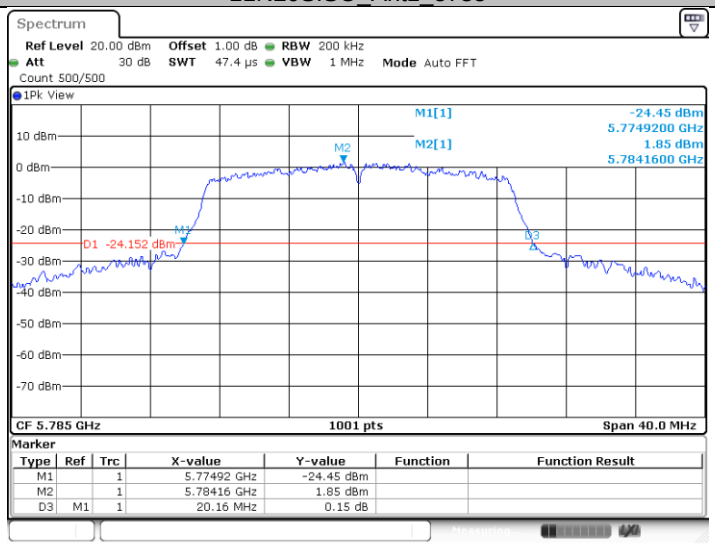

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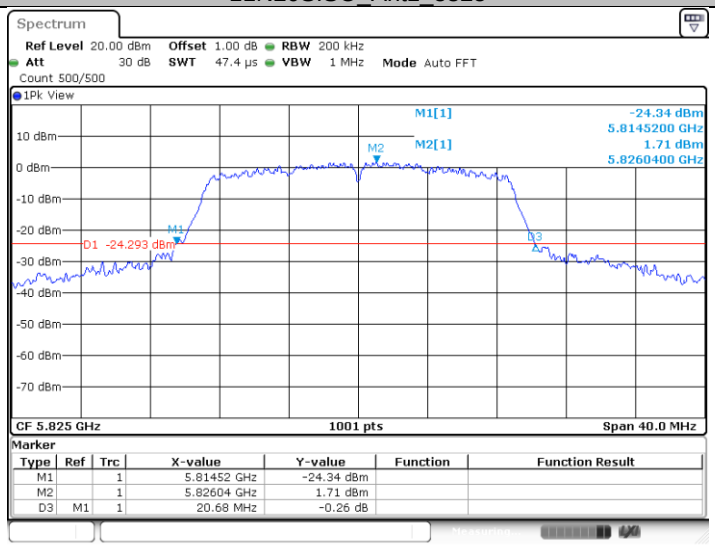

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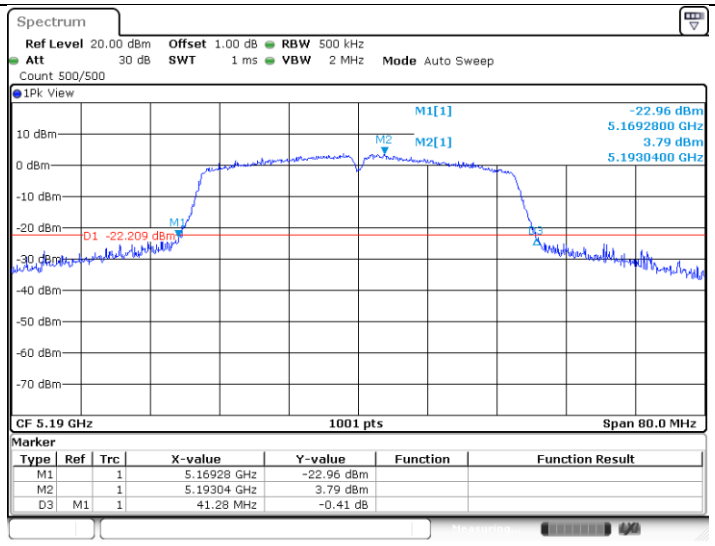

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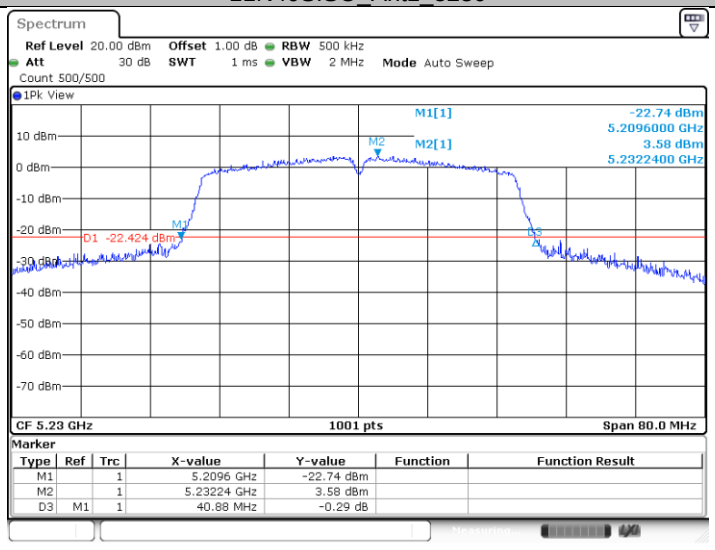

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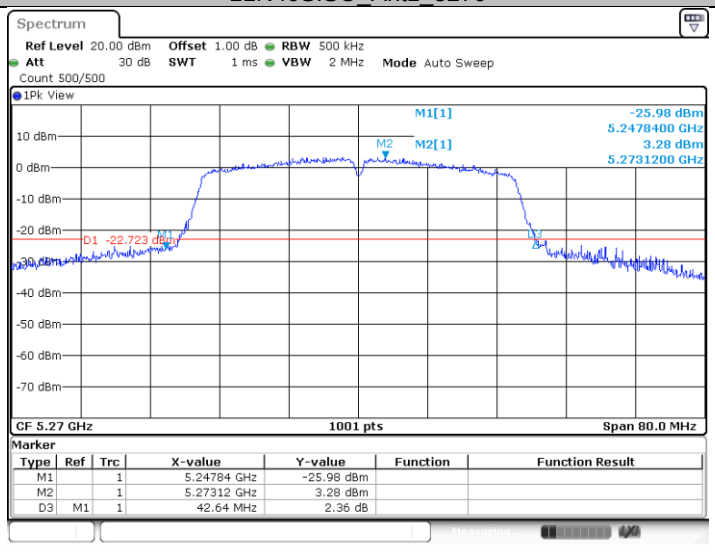

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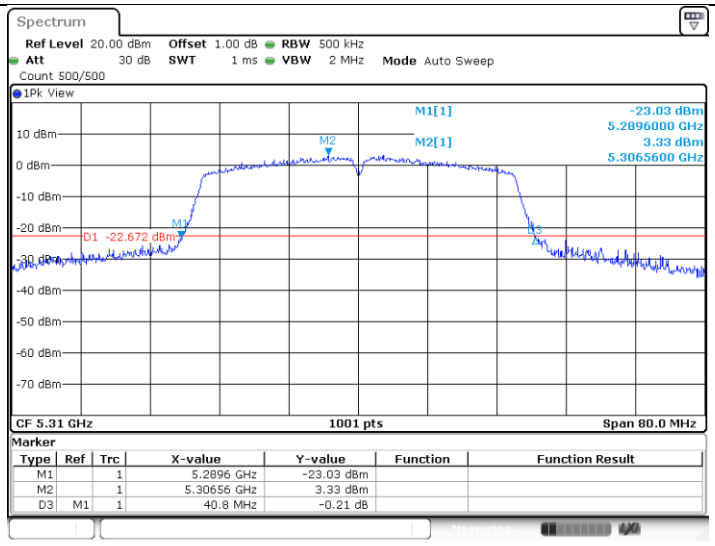

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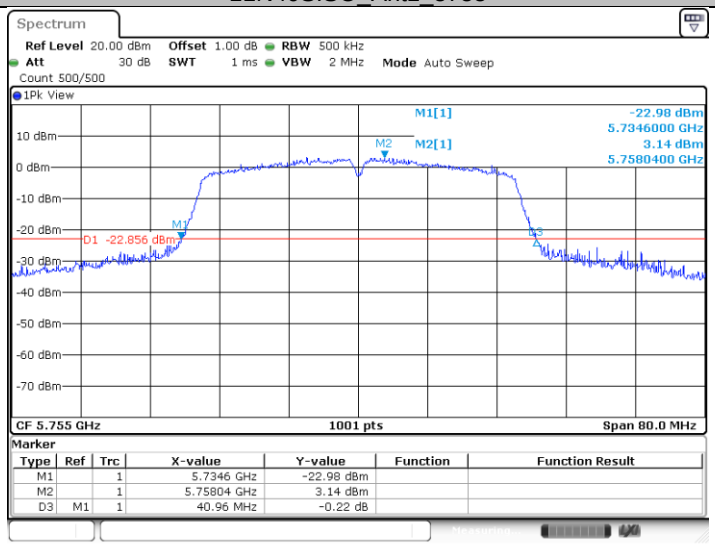

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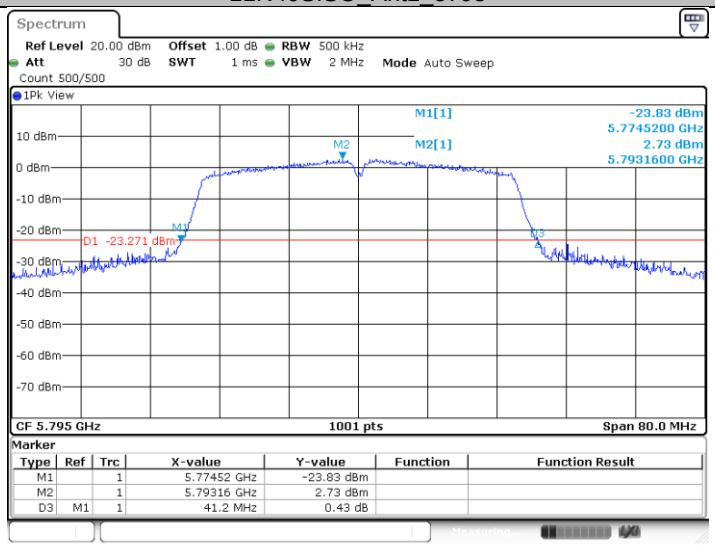

6dB Bandwidth Test graphs:

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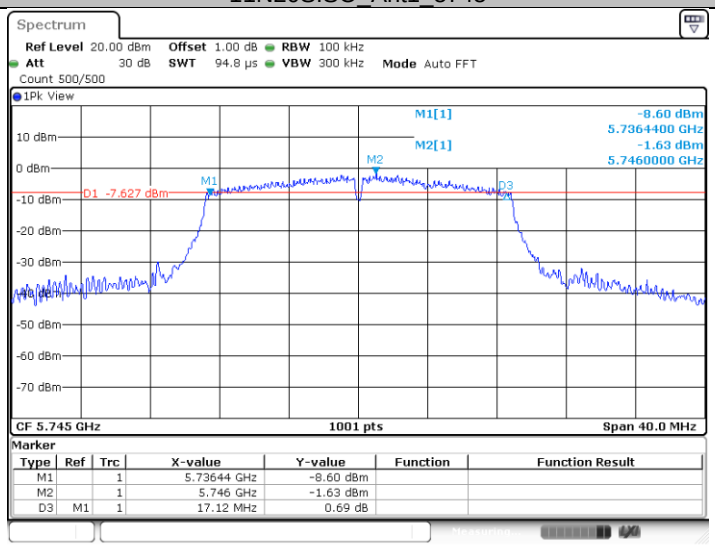

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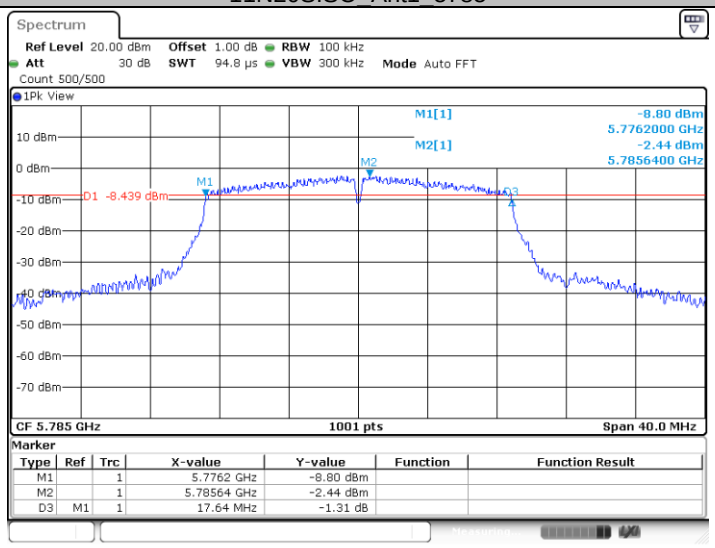

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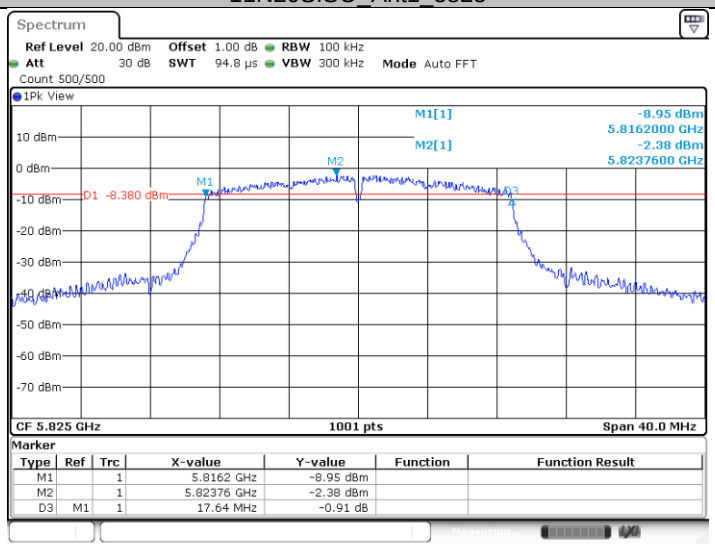

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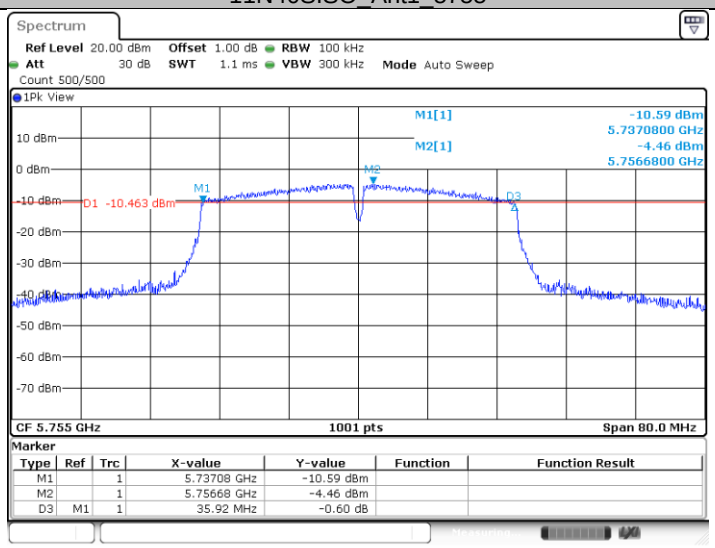

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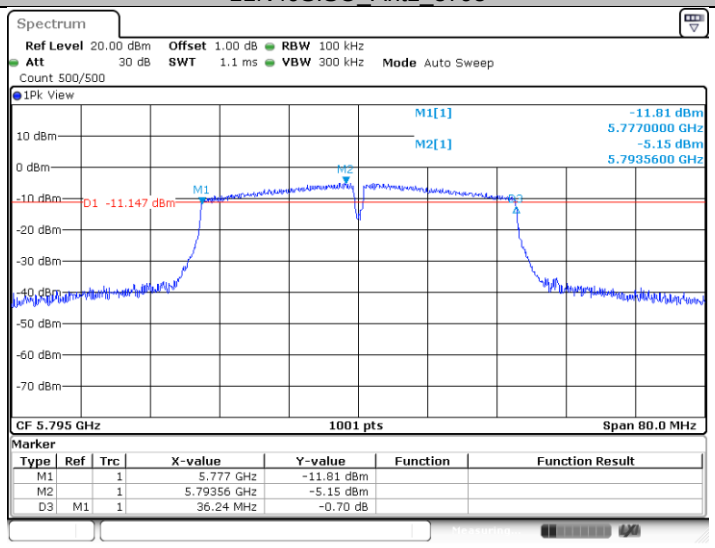

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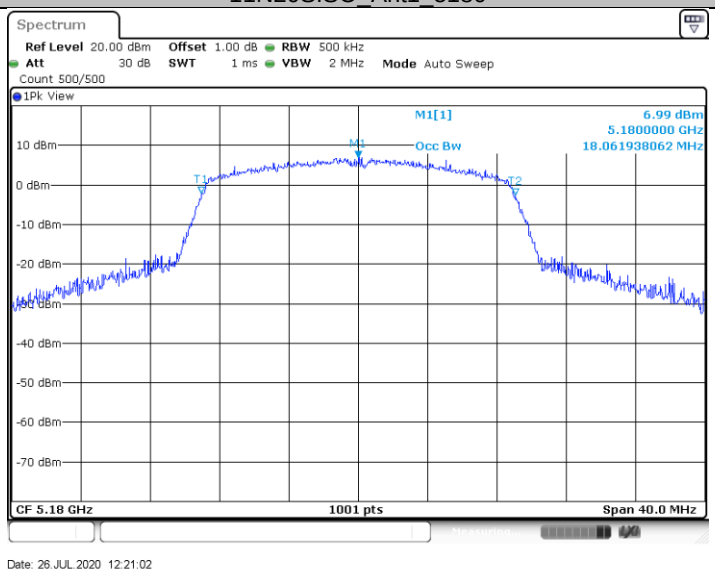
99% Bandwidth Test graphs:

11N20SISO_Ant1_5180



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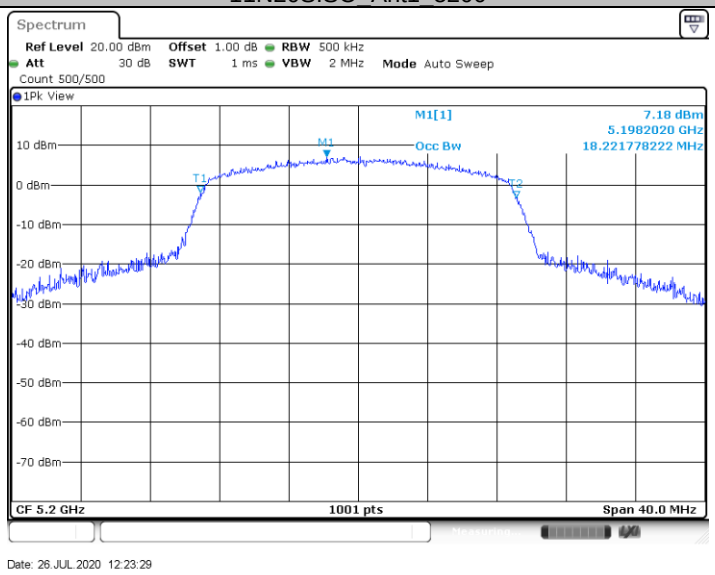

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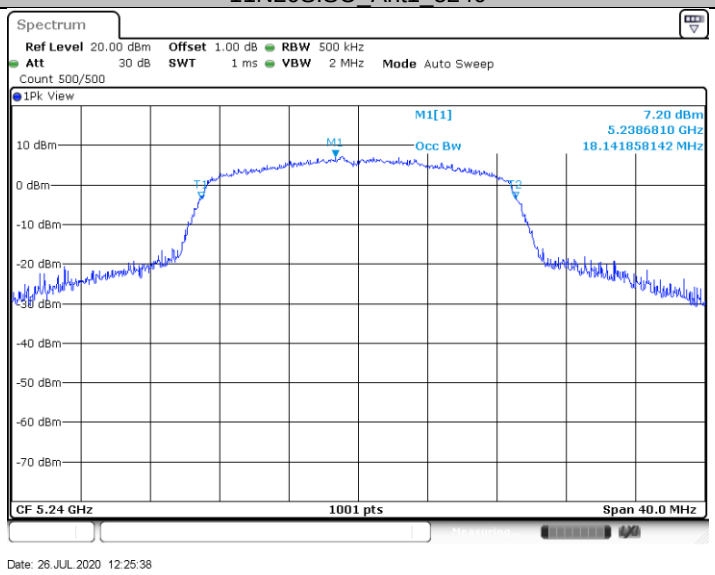

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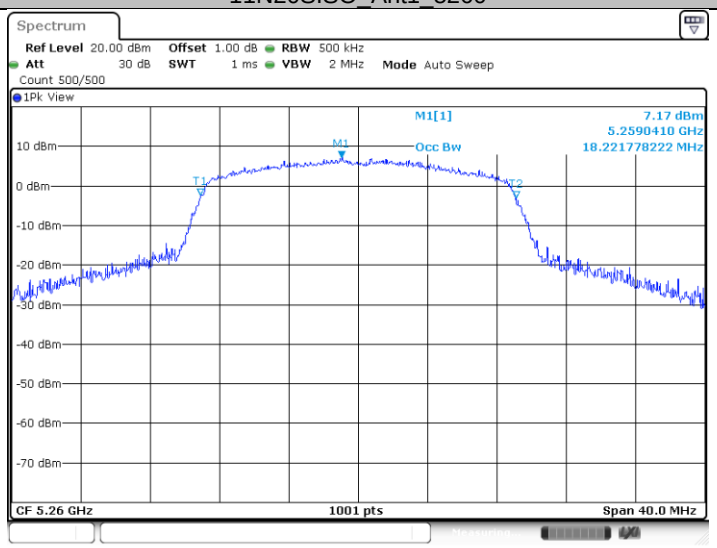
11N20SISO_Ant1_5260

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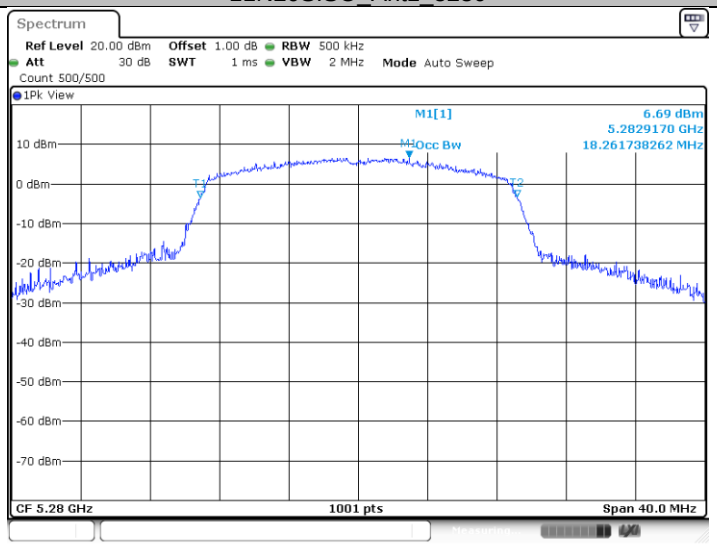
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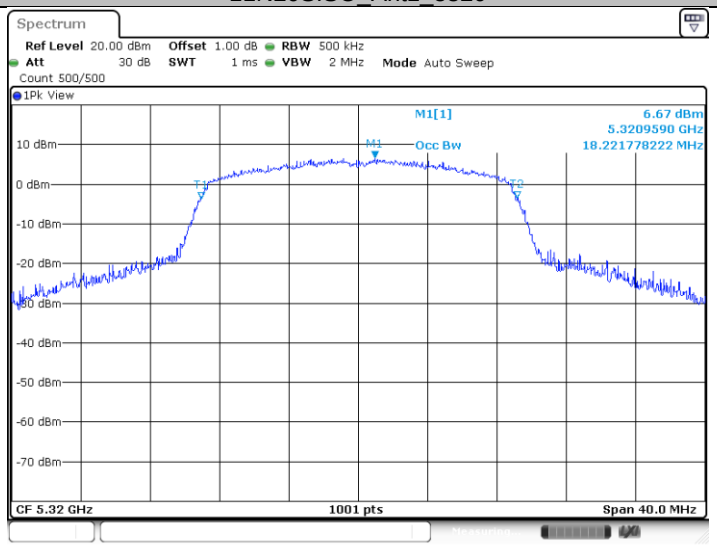
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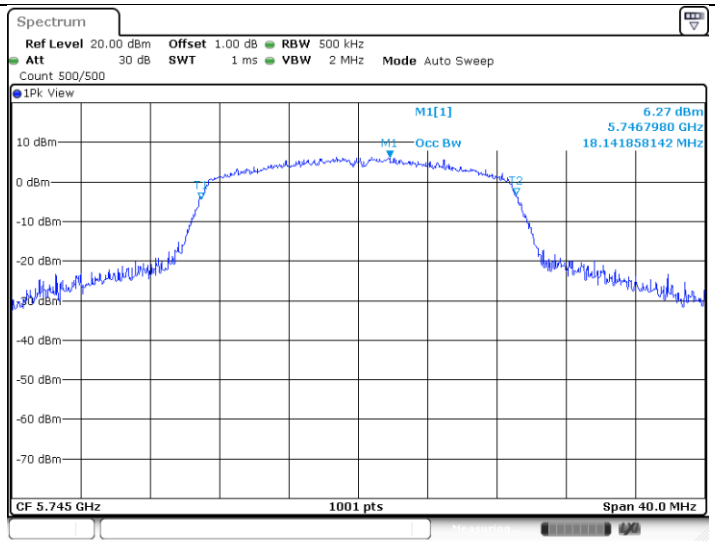

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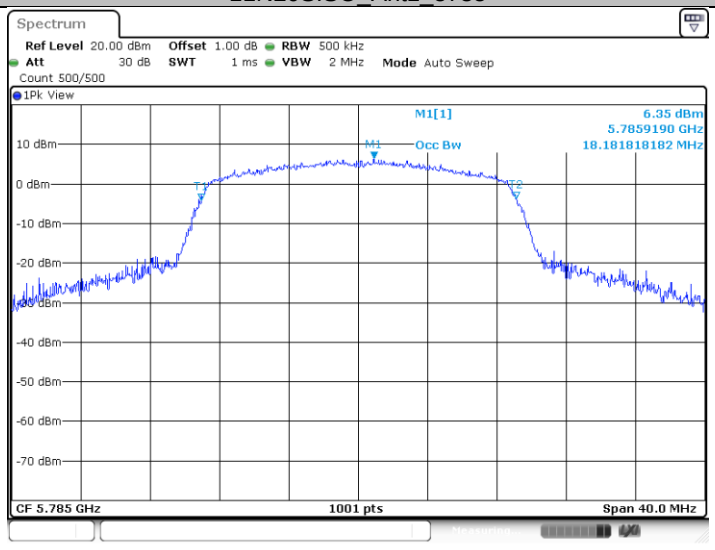

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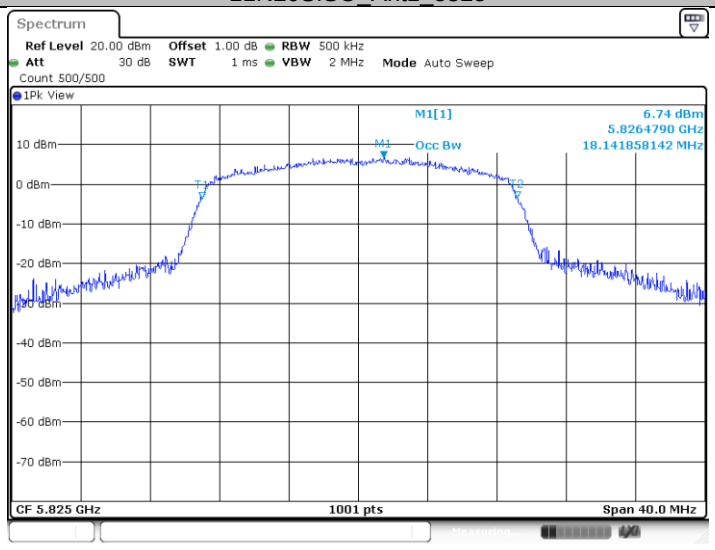

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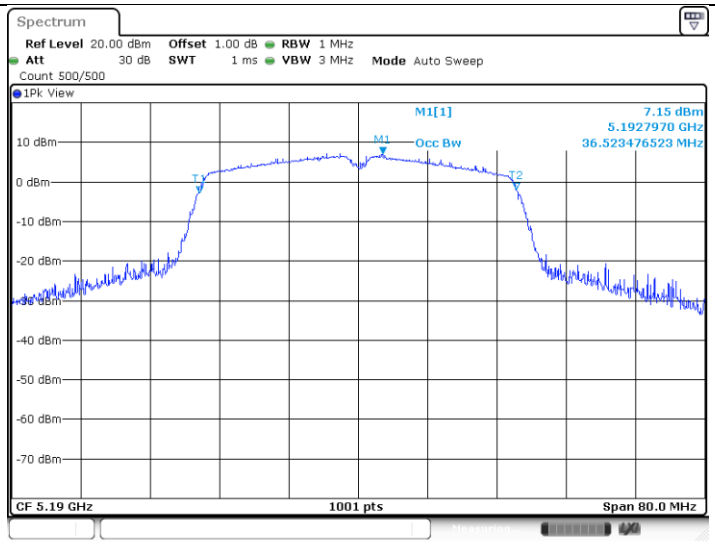

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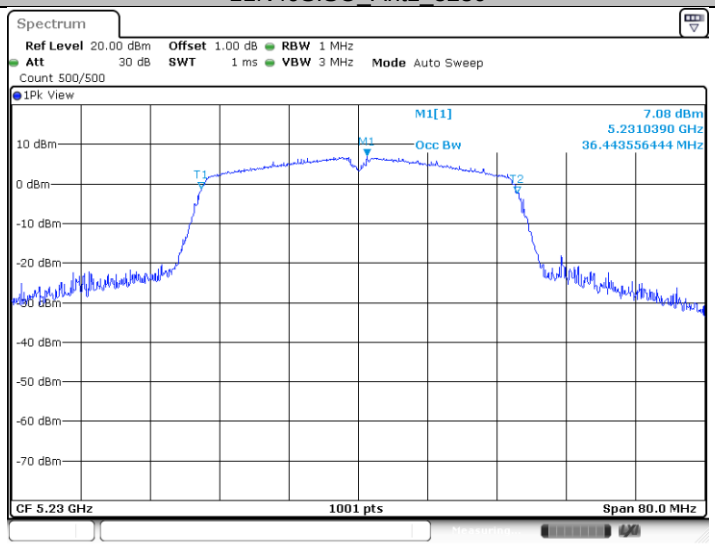

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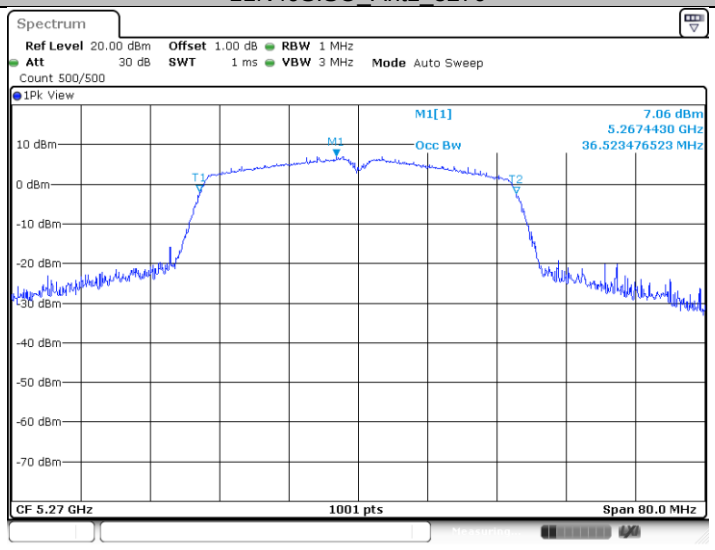

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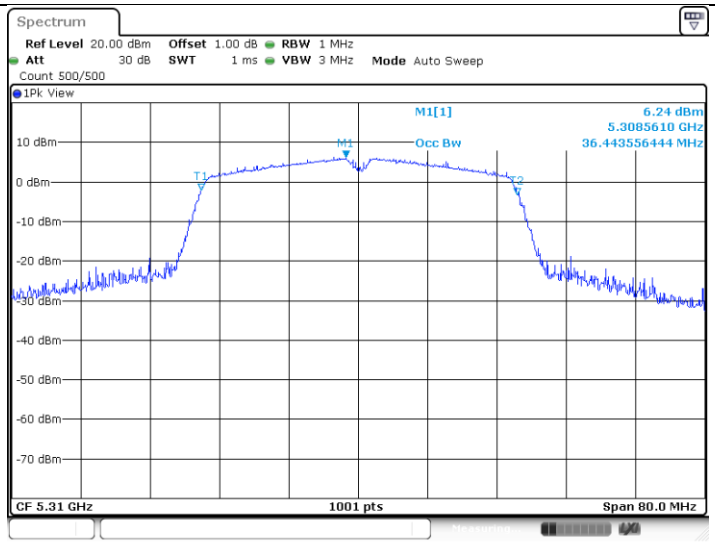

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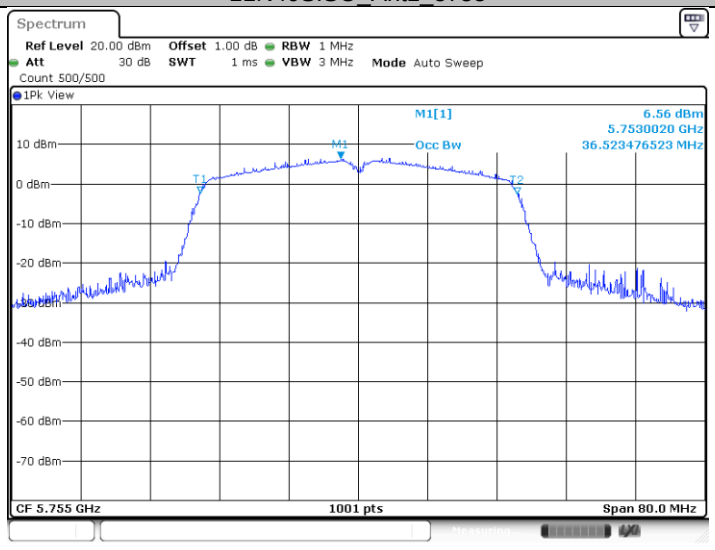

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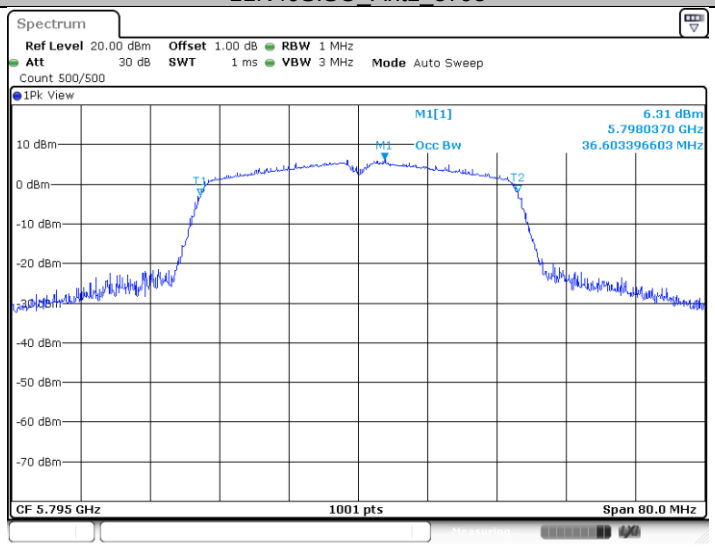

9.2 Maximum conducted output power

Test Method
According to KDB789033 D02

(1) Measurements may be performed using a wideband RF power meter with a thermocouple detector or equivalent if all of the following conditions are satisfied:
The EUT is configured to transmit continuously or to transmit with a conSlavent duty cycle.
At all times when the EUT is transmitting, it must be transmitting at its maximum power control level.
The integration period of the power meter exceeds the repetition period of the transmitted signal by at least a factor of five.
(2) If the transmitter does not transmit continuously, measure the duty cycle, x, of the transmitter output signal as described in II.B.
(3) Measure the average power of the transmitter. This measurement is an average over both the on and off periods of the transmitter.
(4) Adjust the measurement in dBm by adding 10 log (1/x) where x is the duty cycle (e.g., 10 log (1/0.25) if the duty cycle is 25%).

Limits:
For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi.
For the 5.25-5.35 GHz and 5.47-5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm + 10 log B, where B is the 26dB emission bandwidth in megahertz.
For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

Note:
Maximum Conducted Output Power=Conducted Output Power + Correction Factor

Test result as below table

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IEEE 802.11n-HT20 modulation Test Result

Band	Channel	Frequency (MHz)	Conducted power (dBm)	Power Limit (dBm)
5.2G Band	Low	5180	13.20	24.00
	Middle	5200	15.10	24.00
	High	5240	13.90	24.00
5.3G Band	Low	5260	13.80	24.00
	Middle	5280	15.50	24.00
	High	5320	13.60	24.00
5.8G Band	Low	5745	13.80	30.00
	Middle	5785	13.80	30.00
	High	5825	14.00	30.00

IEEE 802.11n-HT40 modulation Test Result

Band	Channel	Frequency (MHz)	Conducted power (dBm)	Power Limit (dBm)
5.2G Band	Low	5190	14.60	24.00
	High	5230	13.40	24.00
5.3G Band	Low	5270	14.10	24.00
	High	5310	13.30	24.00
5.8G Band	Low	5755	12.70	30.00
	High	5795	13.50	30.00

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9.3 Maximum power spectral density

Test Method
According to KDB789033 D02
For devices operating in the bands 5.15-5.25 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth
specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 KHz bandwidth, the following adjustments to the procedures apply:

a) Set RBW ≥ 1/T, where T is defined in section II.B.l.a).

b) Set VBW ≥ 3 RBW.

c) If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10log(500kHz/RBW) to the measured result, whereas RBW (< 500 KHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.

d) If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10log(1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.

e) Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.

Note: As a practical matter, it is recommended to use reduced RBW of 100 KHz for the sections 5.c) and 5.d) above, since RBW=100 KHZ is available on nearly all spectrum analyzers.

Limit: The maximum power spectral density shall not exceed 11dBm for the 5.15-5.25GHz, 5.25-5.35GHz, 5.47-5.725 GHz Band and 30dBm for the 5.8GHz Band in any 1 megahertz band.

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TestMode	Antenna	Channel(MHz)	Result(dBm/MHz)	Limit(dBm/MHz)	Verdict
11N20SISO	Ant1	5180	6.71	<=11	PASS
		5200	7.12	<=11	PASS
		5240	6.65	<=11	PASS
		5260	7.19	<=11	PASS
		5280	7.24	<=11	PASS
		5320	6.32	<=11	PASS
		5745	4.71	<=30	PASS
		5785	4.41	<=30	PASS
		5825	5.19	<=30	PASS
11N40SISO	Ant1	5190	3.43	<=11	PASS
		5230	3.39	<=11	PASS
		5270	3.26	<=11	PASS
		5310	3.04	<=11	PASS
		5755	1.69	<=30	PASS
		5795	1	<=30	PASS

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9.4 Conducted Spurious emissions

Test Method

1. Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious emissions (e.g., harmonics) from the lowest frequency generated in the EUT up through the 10th harmonic. Typically, several plots are required to cover this entire span.
   RBW = 100 kHz, VBW≥RBW, Sweep = auto, Detector function = peak, Trace = max hold
2. Allow the trace to stabilize. Set the marker on the peak of any spurious emission recorded.
3. The level displayed must comply with the limit specified in this Section. Submit these plots.
4. Repeat above procedures until all frequencies measured were complete.

Limits:

For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

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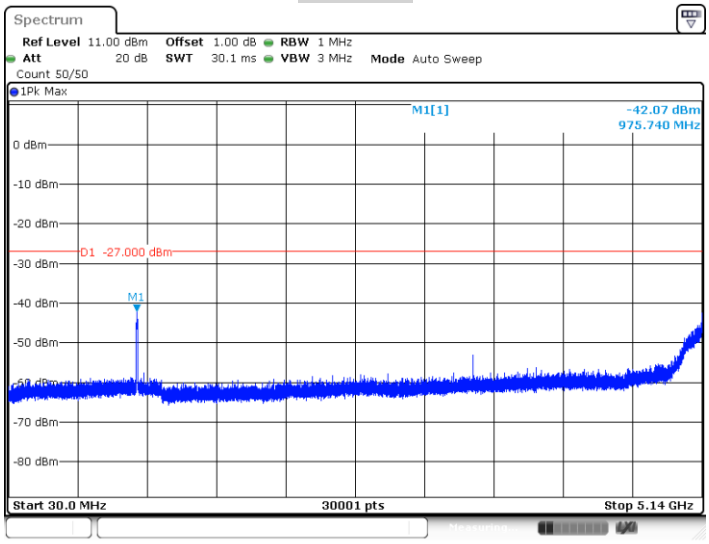
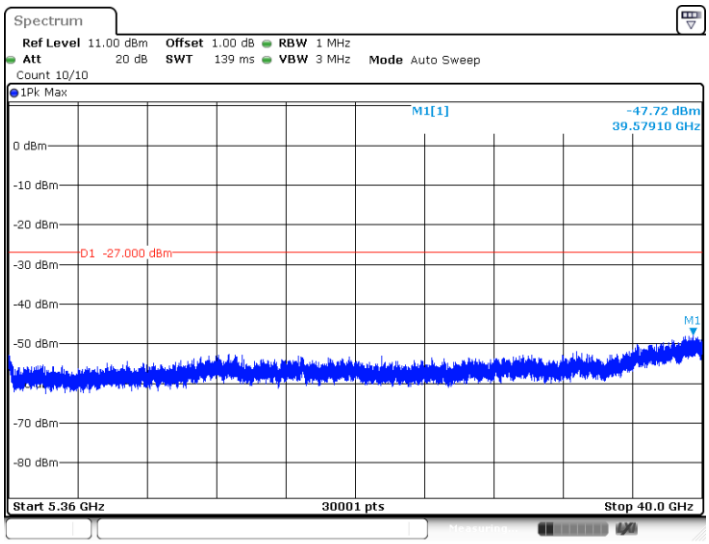
Transmitting spurious emission test result as below (Conducted Mode):

IEEE 802.11n-HT20 modulation Test Result

5180MHz





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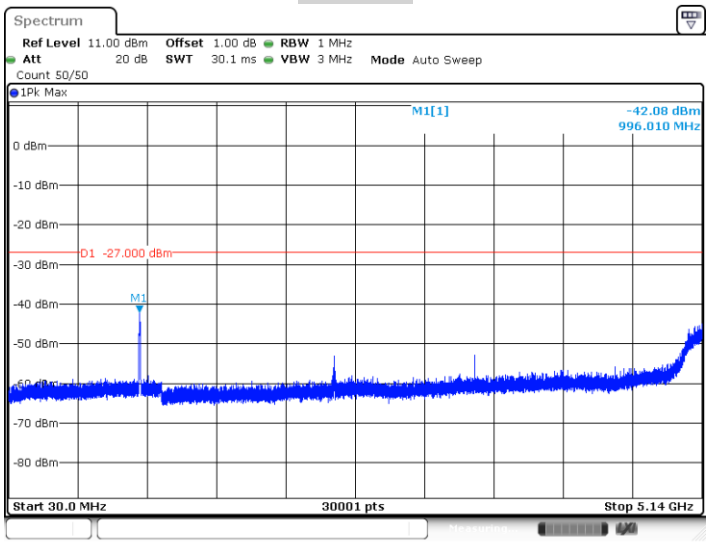
5200MHz



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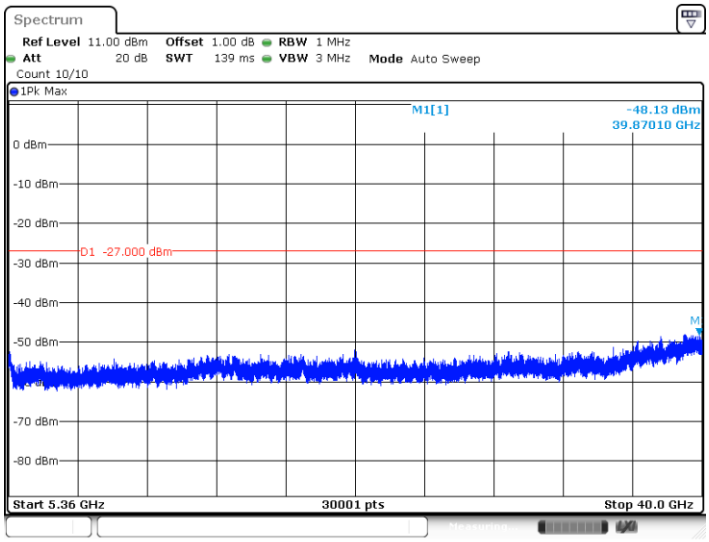

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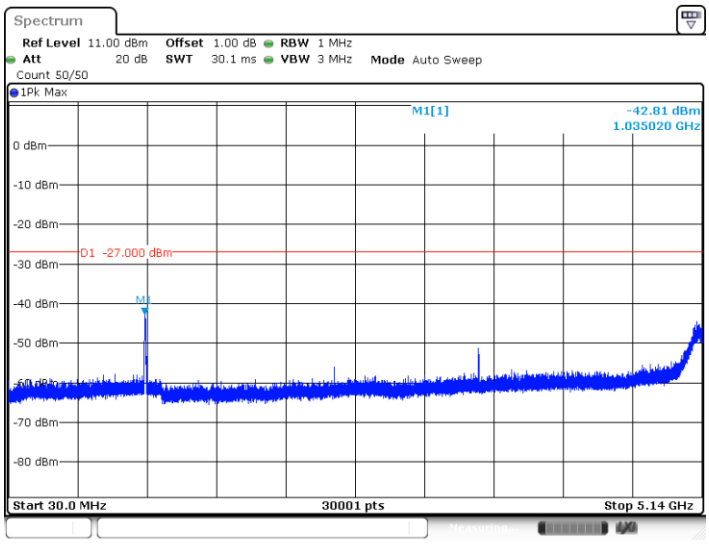
5240MHz



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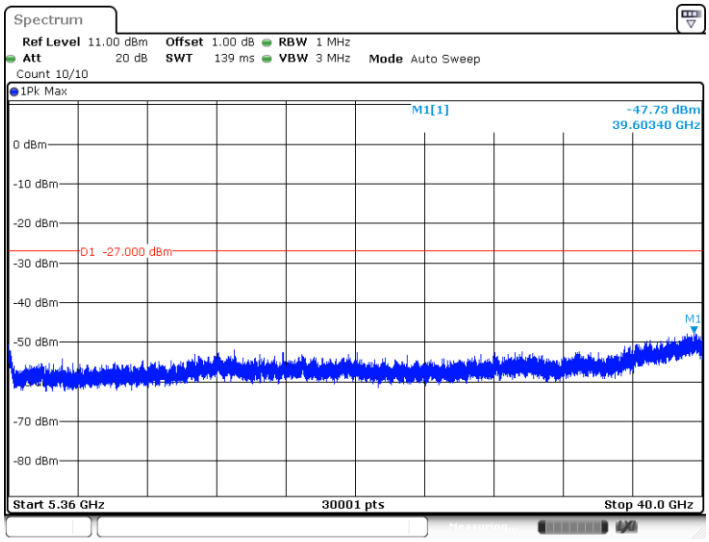

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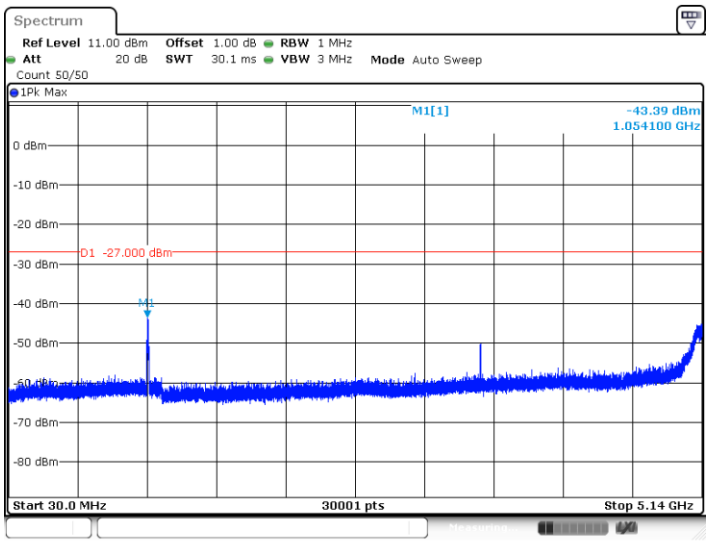
5260MHz



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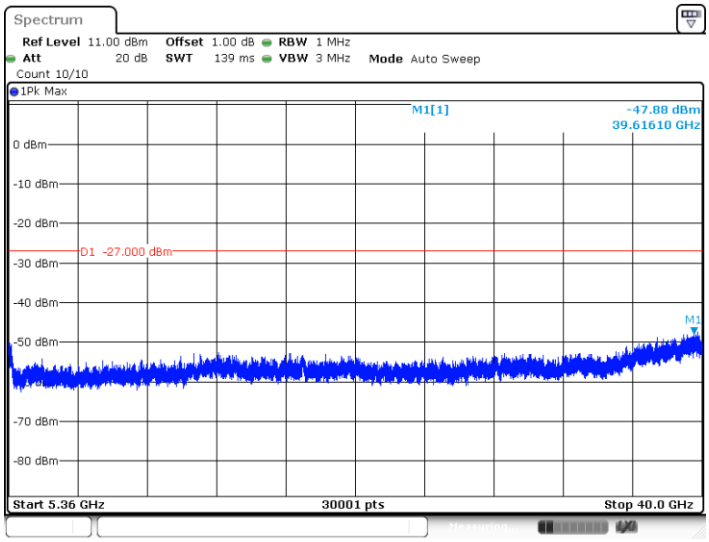

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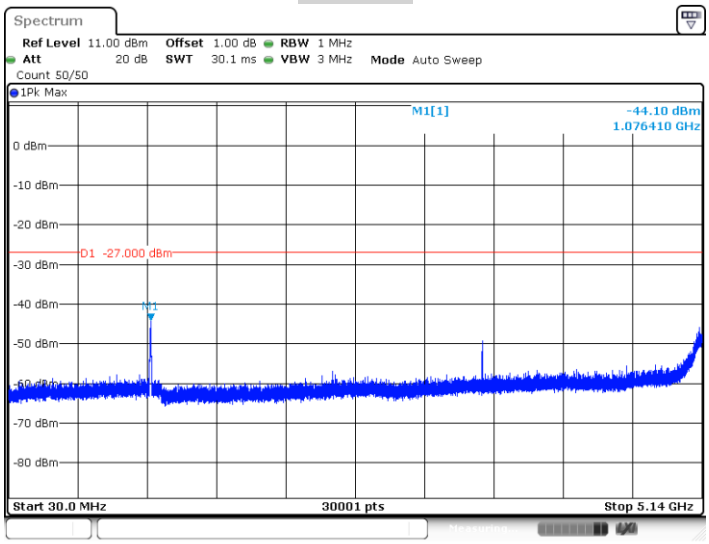
5280MHz



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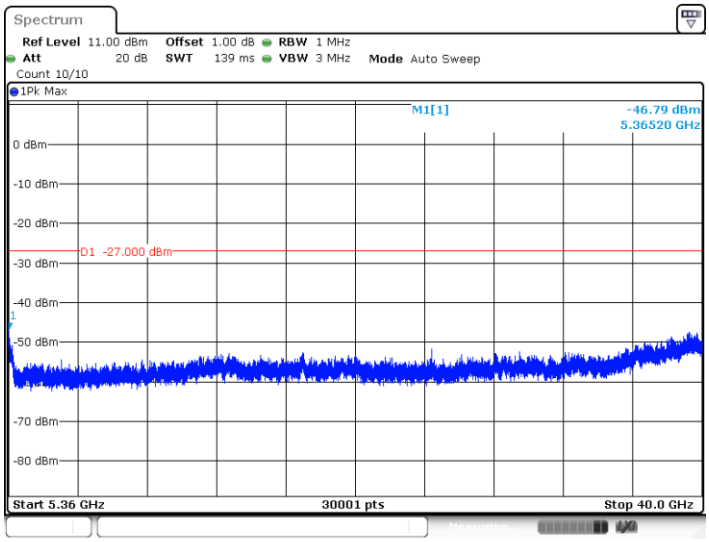

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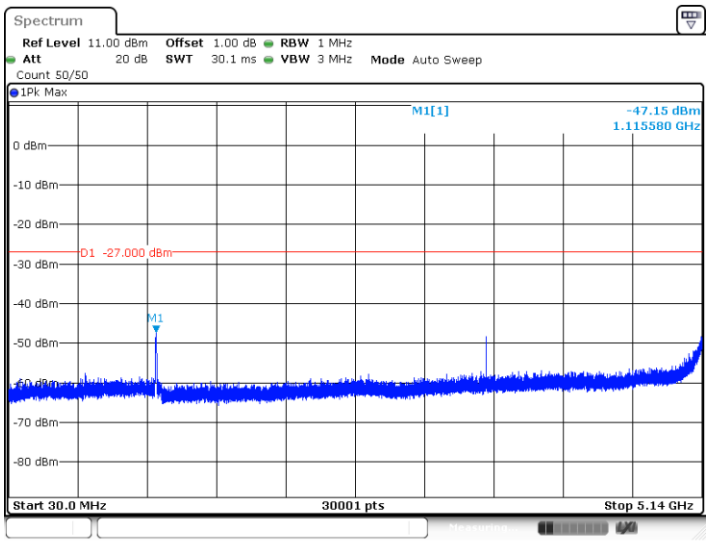
5320MHz



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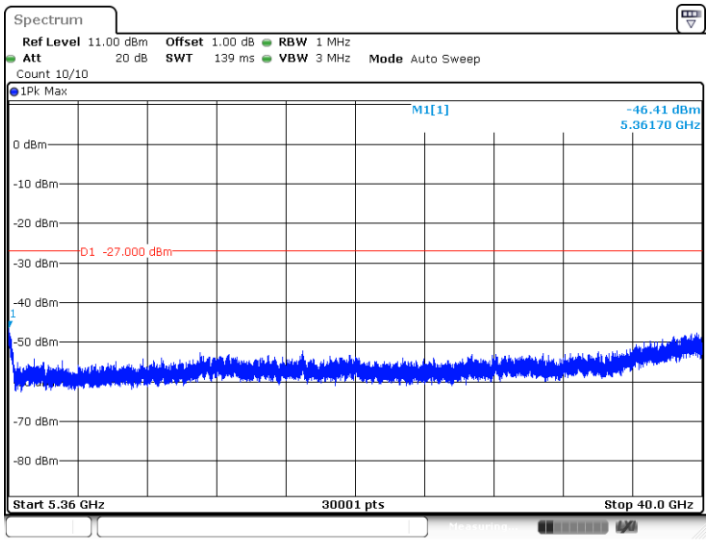

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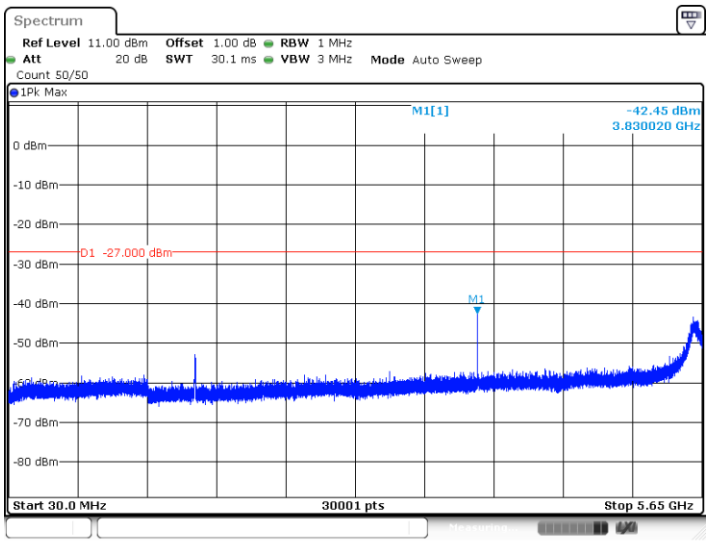
5745MHz



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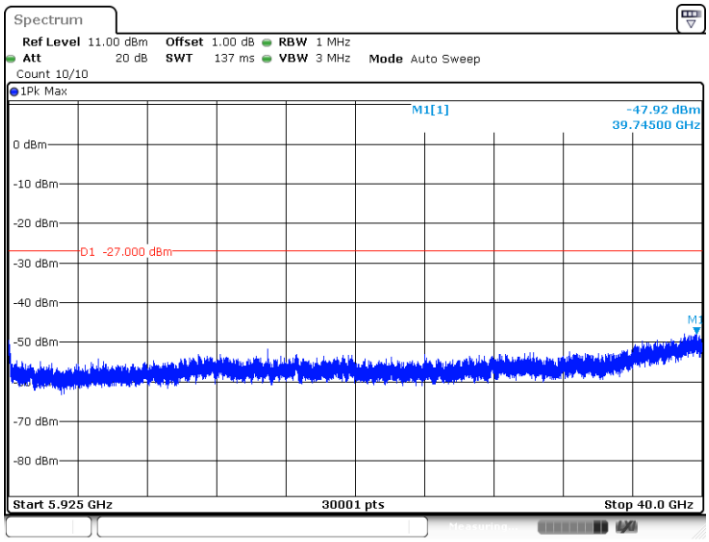

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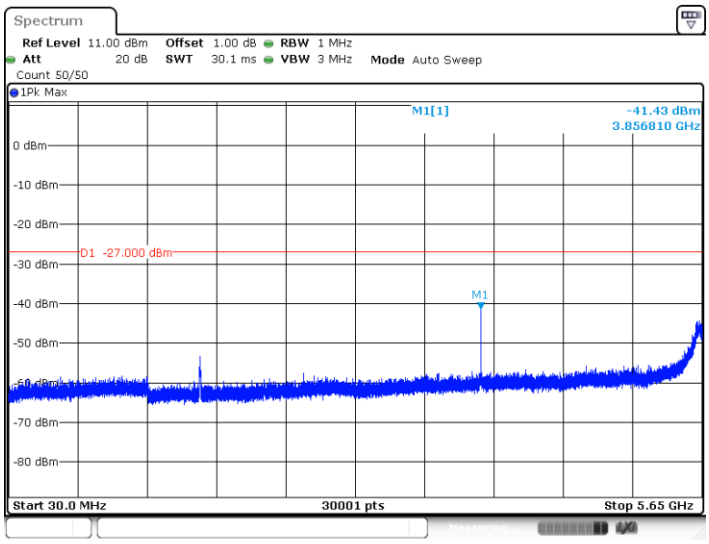
5785MHz



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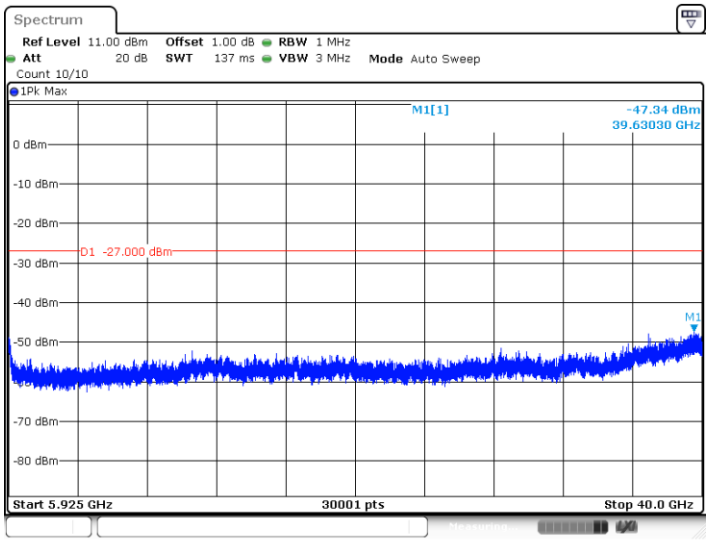

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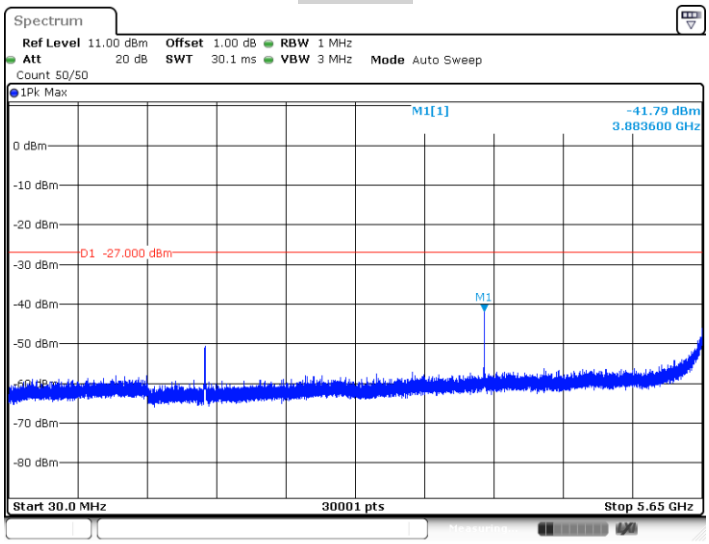
5825MHz



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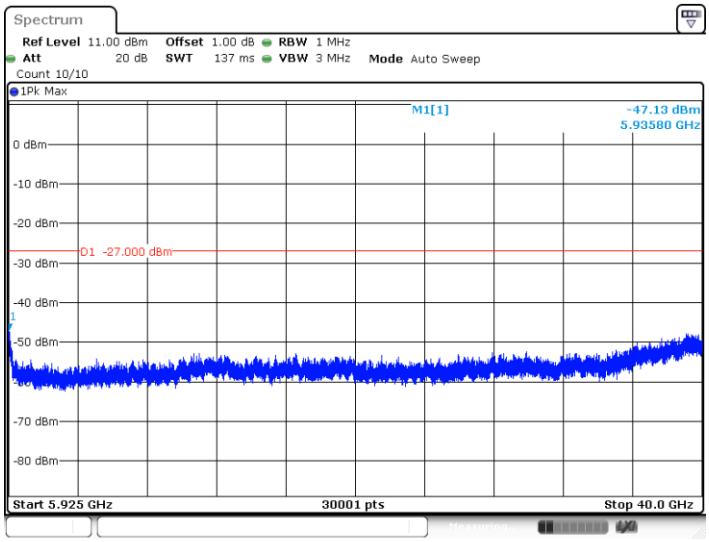

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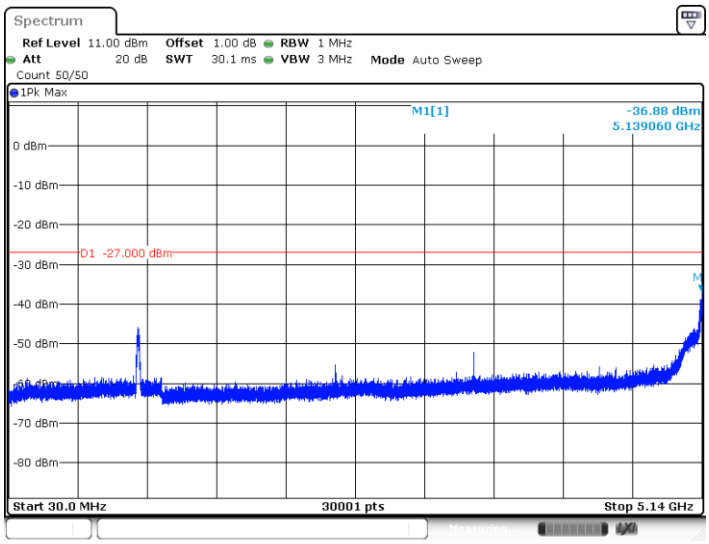
IEEE 802.11n-HT40 modulation Test Result

5190MHz



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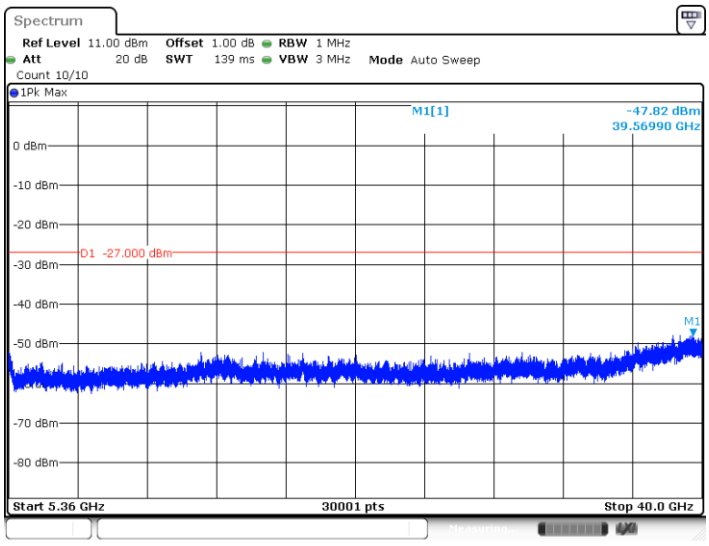

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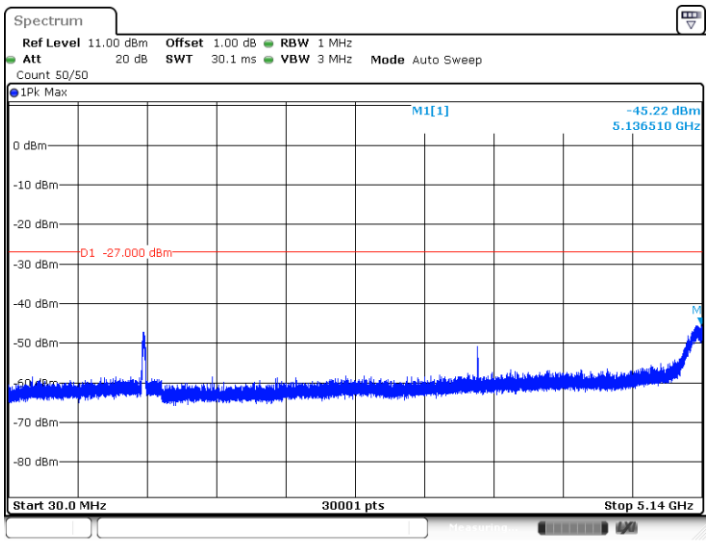
5230MHz



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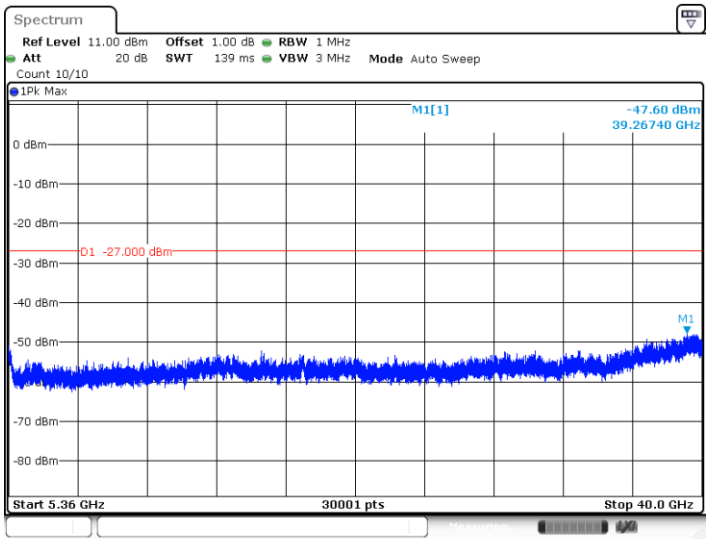

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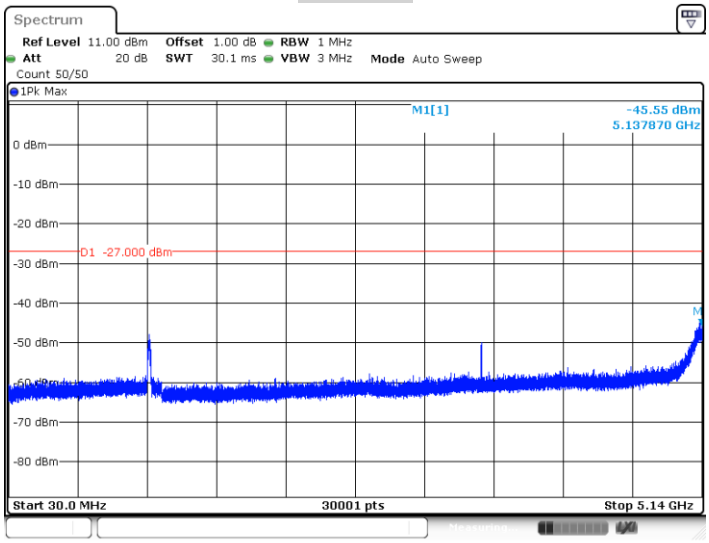
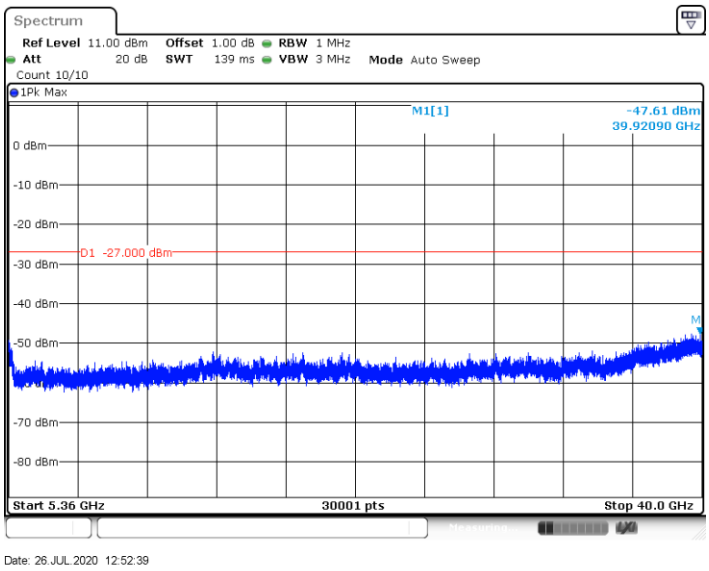
5270MHz





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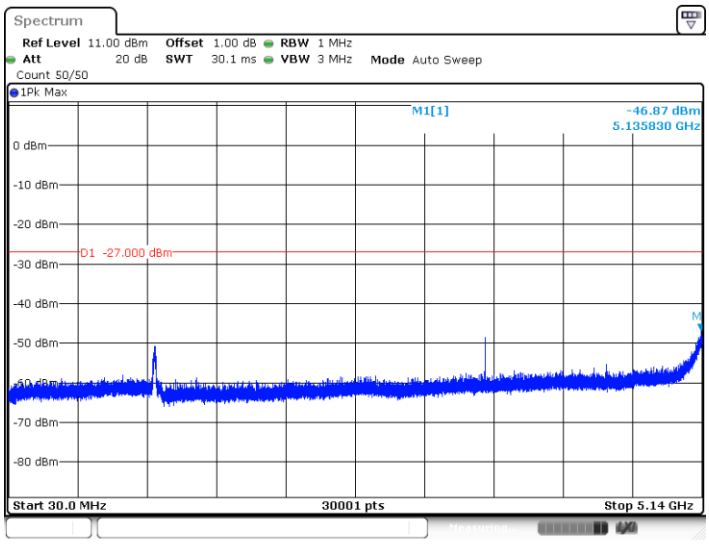
5310MHz



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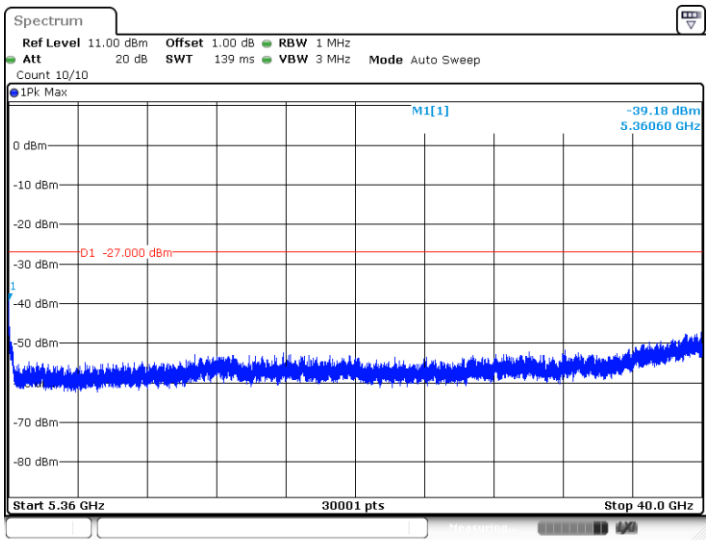

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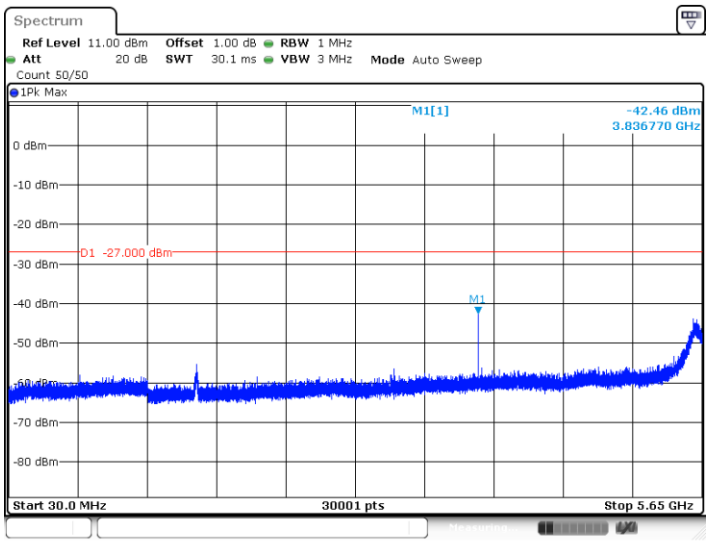
5755MHz



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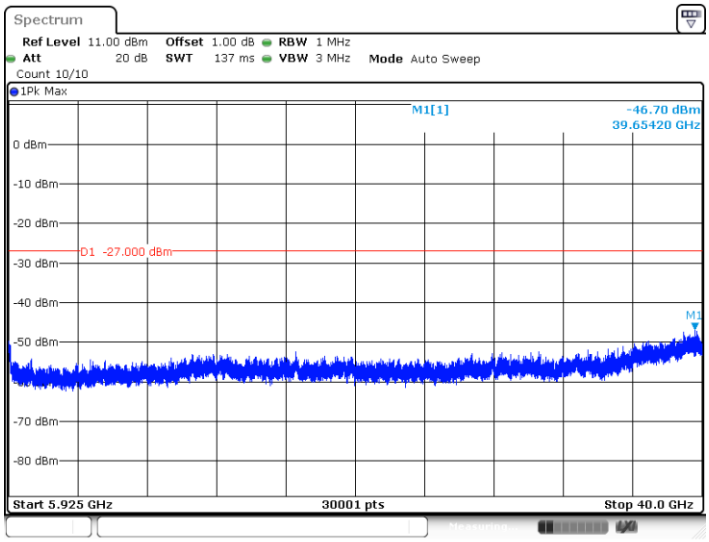

Date: 26.JUL.2020 13:04:54

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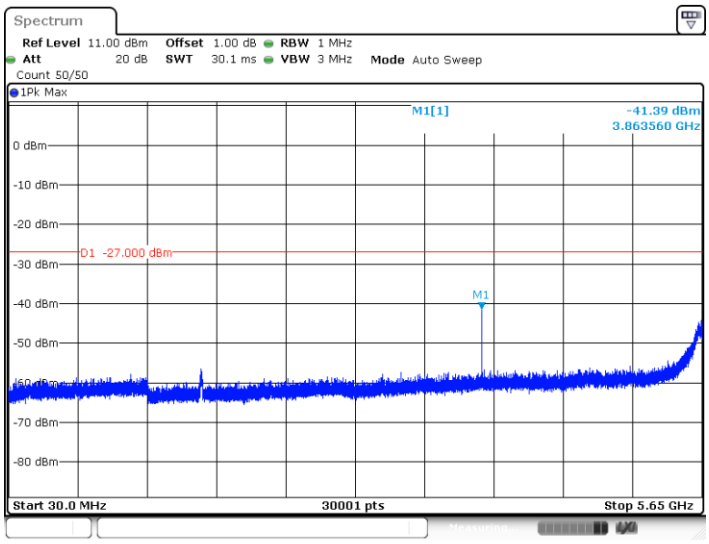
5795MHz



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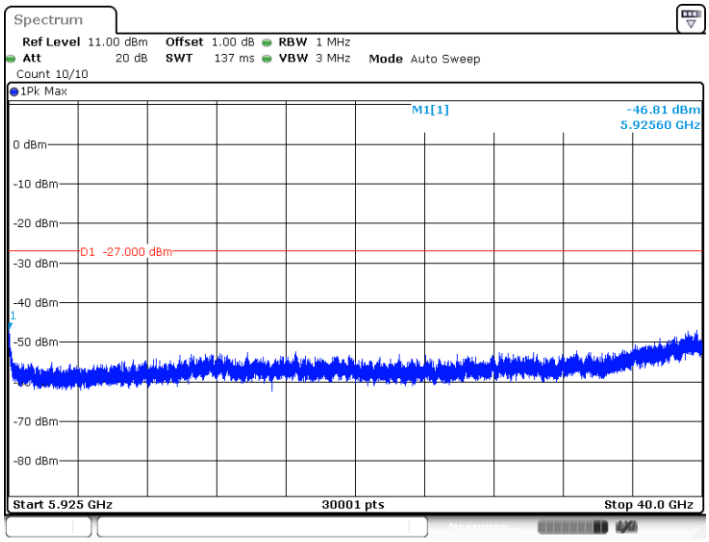

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9.5 Radiated Spurious emissions

Transmitting spurious emission test result as below (Radiated Mode):

Test Method

1. The EUT was place on a turn table which is 1.5m above ground plane for above 1GHz and 0.8m above ground for below 1GHz at 3meter chamber room for test. The table was
   rotated 360 degrees to determine the position of the highest radiation.
2. The EUT was set 3 meters away from the interference – receiving antenna, which was mounted on the top of a variable – height antenna tower.
3. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
4. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned
5. Use the following spectrum analyzer settings According to C63.10:
   For Above 1GHz
   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 1MHz, VBW≥RBW for peak measurement and VBW = 10Hz for average measurement, Sweep = auto, Detector function = peak, Trace = max hold.
   For Below 1GHz
   Use the following spectrum analyzer settings:
   Span = wide enough to capture the peak level of the in-band emission and all spurious
   RBW = 100 KHz, VBW≥RBW for peak measurement, Sweep = auto, Detector function = peak, Trace = max hold.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 KHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for RMS Average ((duty cycle < 98%) for Average detection (AV) at frequency above 1GHz, then the measurement results was added to a correction factor (20log(1/duty cycle)).
4. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 10Hz (duty cycle > 98%) for Average detection (AV) at frequency above 1GHz.

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Limit

According to part 15.407b , the radio emission outside the operating frequency band 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. Radiated emissions which fall in the restricted bands, as defined in section15.205, must comply with the radiated emission limits specified in section 15.209.

Frequency MHz	Field Strength uV/m	Field Strength dBµV/m	Detector
30-88	100	40	QP
88-216	150	43.5	QP
216-960	200	46	QP
960-1000	500	54	QP
Above 1000	500	54	AV
Above 1000	5000	74	PK

According to part 15.407b (1) (2) (3) (4)
For transmitters operating in the 5.15-5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.25-5.35 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.47-5.725 GHz band: All emissions outside of the 5.47-5.725 GHz band shall not exceed an e.i.r.p. of −27 dBm/MHz.
For transmitters operating in the 5.725-5.85 GHz band: All emissions within the frequency range from the band edge to 10 MHz above or below the band edge shall not exceed an e.i.r.p. of −17 dBm/MHz; for frequencies 10 MHz or greater above or below the band edge, emissions shall not exceed an e.i.r.p. of −27 dBm/MHz.

Note: According to KDB 789033 D02 (G): E[dBµV/m] = EIRP[dBm] + 95.2, for d = 3 meters.

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