

# **TEST REPORT**

Product Name Model Numbe FCC ID	er	
Prepared for Address	:	SAFETY VISION, LLC 6100 W SAM HOUSTON PKWY N HOUSTON, TX 77041-5113, UNITED STATES OF AMERICA
Prepared by Address	:	EMTEK (SHENZHEN) CO., LTD. Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China
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Report Number		ES201014022W02

- Date(s) of Tests : Oct. 20, 2020 to Nov. 23, 2020
- Date of issue : Nov. 25, 2020



#### **TEST RESULT CERTIFICATION** 1

Applicant	: SAFETY VISION, LLC
Address	E 6100 W SAM HOUSTON PKWY N HOUSTON, TX 77041-5113, UNITED STATES OF AMERICA
Manufacturer	: SAFETY VISION, LLC
Address	. 6100 W SAM HOUSTON PKWY N HOUSTON, TX 77041-5113, UNITED STATES OF AMERICA
EUT	: Mobile Digital Video Recorder
Model Name	: 4112-HVR
Trademark	: SAFETY VISION

Measurement Procedure Used:

APPLICABLE STANDARDS				
STANDARD TEST RESULT				
FCC 47 CFR Part 15, Subpart E	PASS			

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Part 15.407

The test results of this report relate only to the tested sample identified in this report.

Date of Test :

Prepared by:

Reviewer:

Oct. 20, 2020 to Nov. 23, 2020

Seventrus

Sewen Guo /Editor

Xia

Joe Xia /Supervisor 🍰



Approve & Authorized Signer :

Lisa Wang/Manager



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Characteristics	Description				
Product	Mobile Digital Video Recorder				
Model Number	4112-HVR				
Sample number	1#				
Wifi Type	pe 🛛 UNII-1: 5150MHz-5250MHz Band UNII-3 with 5725MHz-5850MHz Band				
WLAN Supported	802.11n(40MHz channel b 802.11ac(20MHz channel 802.11ac(40MHz channel	<ul> <li>✓802.11a</li> <li>✓802.11n(20MHz channel bandwidth)</li> <li>✓802.11n(40MHz channel bandwidth)</li> <li>✓802.11ac(20MHz channel bandwidth)</li> <li>✓802.11ac(40MHz channel bandwidth)</li> <li>✓802.11ac(40MHz channel bandwidth)</li> <li>✓802.11ac(80MHz channel bandwidth)</li> </ul>			
Data Rate	802.11a:54/48/36/24/18/12/9/6Mbps 802.11n:up to 300 Mbps 802.11ac:up to 867Mbps				
Modulation		OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n;			
	UNII-1: 5150MHz-5250MHz Band				
Frequency Range	S180-5240MHz for 802.11a; S180-5240MHz for 802.11n(HT20); S180-5240MHz for 802.11ac(HT20);		<ul> <li>∑5190-5230MHz for 802.11n(HT40);</li> <li>∑5190-5230MHz for 802.11ac(HT40);</li> <li>∑5210MHz for 802.11ac(HT80);</li> </ul>		
Frequency Range	UNII-3 with 5725MHz-5850MHz Band				
	<ul> <li>⊠5745-5825MHz for 802.11a;</li> <li>⊠5745-5825MHz for 802.11n(HT20);</li> <li>⊠5745-5825MHz for 802.11ac(HT20);</li> </ul>		<ul> <li>□ 5755-5795MHz for 802.11n(HT40);</li> <li>□ 5755-5795MHz for 802.11ac(HT40);</li> <li>□ 5775MHz for 802.11ac(HT80);</li> </ul>		
TPC Function	Applicable		Not Applicable		
Antenna Type	External Antennna				
Antenna Gain 2 dBi					
Transmit Power	Output Power (Max.) for UNII-1	12.42dBm			
	Output Power (Max.) for UNII-3	11.74dBm			
Power supply	DC 8-36V				

# **2 EUT TECHNICAL DESCRIPTION**

*Note:* for more details, please refer to the User's manual of the EUT.

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Report No. ES201014022W02



# **3 SUMMARY OF TEST RESULT**

FCC Part Clause	Test Parameter	Verdict	Remark		
15.407 (a)	99% , 6dB and 26dB Bandwidth	PASS			
15.407 (e)		FASS			
15.407 (a)	Maximum Conducted Output Power	PASS			
15.407 (a)	Peak Power Spectral Density	PASS			
15.407 (b)	Radiated Spurious Emission	PASS			
15.407(g)	Frequency Stability	PASS			
15.407 (b)(6)	Power Line Conducted Emission	PASS			
15.207		FA33			
15.407(a)	Antenna Application	PASS			
15.203		FA35			
NOTE1: N/A (Not	Applicable)				
Remark: The test method refers to KDB 789033 and FCC 47 CFR Part 2, Subpart J					

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2ANKU-4112-HVR filing to comply with Section 15.407 of the FCC Part 15, Subpart E Rules.



# **4 TEST METHODOLOGY**

# 4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

According to its specifications, the EUT must comply with the requirements of the following standards:

FCC 47 CFR Part 15, Subpart E

### 4.2 MEASUREMENT EQUIPMENT USED

4.2.1 Conducted Emission Test Equipment

EQUIPMENT	MFR	MODEL	SERIAL	LASTCAL.	DUE CAL.
TYPE		NUMBER	NUMBER		
Test Receiver	Rohde & Schwarz	ESCS30	828985/018	05/16/2020	05/15/2021
L.I.S.N.	Schwarzbeck	NNLK8129	8129203	05/16/2020	05/15/2021
50Ω Coaxial Switch	Anritsu	MP59B	M20531	05/16/2020	05/15/2021
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100006	05/16/2020	05/15/2021
Voltage Probe	Rohde & Schwarz	TK9416	N/A	05/16/2020	05/15/2021
I.S.N	Rohde & Schwarz	ENY22	1109.9508.02	05/16/2020	05/15/2021

### 4.2.2 Radiated Emission Test Equipment

EQUIPMENT	MFR	MODEL	SERIAL	LAST CAL.	DUE CAL.
TYPE		NUMBER	NUMBER		
EMI Test Receiver	Rohde & Schwarz	ESU	1302.6005.26	05/16/2020	05/15/2021
Pre-Amplifier	HP	8447D	2944A07999	05/16/2020	05/15/2021
Bilog Antenna	Schwarzbeck	VULB9163	142	05/16/2020	05/15/2021
Loop Antenna	ARA	PLA-1030/B	1029	05/16/2020	05/15/2021
Horn Antenna	Schwarzbeck	BBHA 9170	BBHA9170399	05/16/2020	05/15/2021
Horn Antenna	Schwarzbeck	BBHA 9120	D143	05/16/2020	05/15/2021
Cable	Schwarzbeck	AK9513	ACRX1	05/16/2020	05/15/2021
Cable	Rosenberger	N/A	FP2RX2	05/16/2020	05/15/2021
Cable	Schwarzbeck	AK9513	CRPX1	05/16/2020	05/15/2021
Cable	Schwarzbeck	AK9513	CRRX2	05/16/2020	05/15/2021

### 4.2.3 Radio Frequency Test Equipment

EQUIPMENT	MFR	MODEL	SERIAL	LASTCAL.	DUE CAL.
TYPE		NUMBER	NUMBER		
Spectrum Analyzer	Agilent	E4407B	88156318	05/16/2020	05/15/2021
Signal Analyzer	Agilent	N9010A	My53470879	05/16/2020	05/15/2021
Power meter	Anritsu	ML2495A	0824006	05/16/2020	05/15/2021
Power sensor	Anritsu	MA2411B	0738172	05/16/2020	05/15/2021
Temperature & Humidity Chamber	YINHE	SDH0525F	2003003	05/16/2020	05/15/2021

Remark: Each piece of equipment is scheduled for calibration once a year.

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# 4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

Wifi 5G with U-NII - 1

Frequency and Channel list for 802.11a/n (HT20)/802.11ac (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

### Frequency and Channel list for 802.11n (HT40)/ 802.11ac (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190				
46	5230				

### Frequency and Channel list for 802.11ac Wave2 (HT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

Test Frequency and Channel for 802.11a/n (HT20)/802.11ac (HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

#### Test Frequency and channel for 802.11n (HT40)/ 802.11ac (HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

#### Test Frequency and channel for 802.11ac Wave2 (HT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	N/A	N/A	N/A	N/A



### 🛛 Wifi 5G with U-NII -3

Frequency and Channel list for 802.11a/n (HT20)/802.11ac (HT20):

Channel	Frequency	Channel	Frequency	Channel	Frequency	
	(MHz)	Channel	(MHz)	Channel	(MHz)	
149	5745	157	5785	165	5825	
153	5765	161	5805			

### Frequency and Channel list for 802.11n (HT40)/ 802.11ac (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755				
159	5795				

### Frequency and Channel list for 802.11ac (HT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

### Test Frequency and Channel for 802.11a/n (HT20)/802.11ac (HT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

### Test Frequency and channel for 802.11n (HT40)/ 802.11ac (HT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	N/A	N/A	159	5795

### Test Frequency and channel for 802.11ac (HT80):

Lowest Frequency		Middle F	Middle Frequency		st Frequency
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				, ,



# 5 FACILITIES AND ACCREDITATIONS

# 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at

Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR Publication 22.

### 5.2 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description		
EMC Lab.	:	Accredited by CNAS, 2018.11.30
		The certificate is valid until 2022.10.28
		The Laboratory has been assessed and proved to be in compliance with
		CNAS-CL01:2006 (identical to ISO/IEC 17025:2017)
		The Certificate Registration Number is L2291
		Accredited by FCC,
		Designation Number: CN1204
		Test Firm Registration Number: 882943
		Accredited by A2LA, August 25, 2020
		The Certificate Registration Number is 4321.01
		Accredited by Industry Canada, November 09, 2018
		The Conformity Assessment Body Identifier is CN0008
Name of Firm	:	EMTEK(SHENZHEN) CO., LTD.
Site Location	:	Building 69, Majialong Industry Zone,
		Nanshan District, Shenzhen, Guangdong, China



# 6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Radio Frequency	±1x10^-5
Maximum Peak Output Power Test	±1.0dB
Conducted Emissions Test	±2.0dB
Radiated Emission Test	±2.0dB
Power Density	±2.0dB
Occupied Bandwidth Test	±1.0dB
Band Edge Test	±3dB
All emission, radiated	±3dB
Antenna Port Emission	±3dB
Temperature	±0.5°C
Humidity	±3%

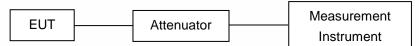
Measurement Uncertainty for a level of Confidence of 95%



# 7 SETUP OF EQUIPMENT UNDER TEST

### 7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



# 7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 and CAN/CSA-CEI/IEC CISPR 22.

### Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

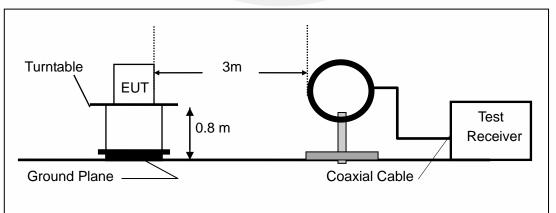
### Above 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

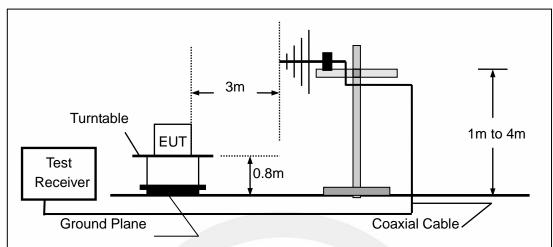
### Above 1GHz:

(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

(a) Radiated Emission Test Set-Up, Frequency Below 30MHz

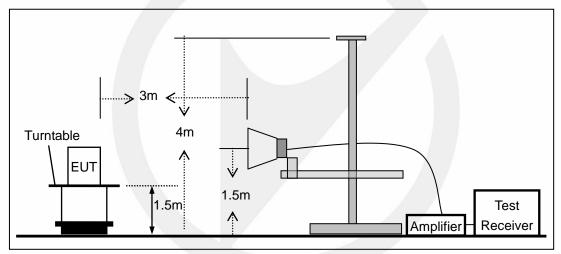






### (b) Radiated Emission Test Set-Up, Frequency Below 1000MHz

(c) Radiated Emission Test Set-Up, Frequency above 1000MHz



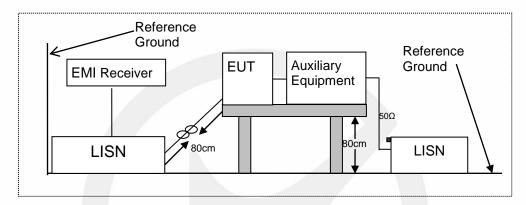


# 7.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

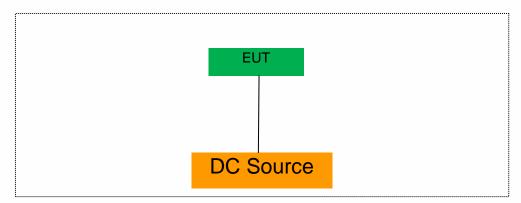
Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.





# 7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



# 7.5 SUPPORT EQUIPMENT

EUT Cable List and Details						
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite			
	1	1	/			

Auxiliary Cable List and Details										
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite							
/	/	1	/							

Auxiliary Equipment List and Details									
Description	Manufacturer	Model	Serial Number						
Notebook	acer	ZR1	LXTECOCO76643158 372500						

Notes:

1.All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.

2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



# 8 TEST REQUIREMENTS 8.1 BANDWIDTH MEASUREMENT

8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNII Band I According to FCC Part 15.407(a)(2) for UNII Band II-A and UNII Band II-C According to FCC Part 15.407(a)(3) for UNII Band III According to FCC Part 15.407(e) for UNII Band III According to 789033 D02 Section II(C) According to 789033 D02 Section II(D)

### 8.1.2 Conformance Limit

### (1) For the band 5.15-5.25 GHz.

(iv) For mobile and portable 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. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(2) 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 26 dB emission bandwidth in megahertz. In addition, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

(3) For the band 5.725-5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W. In addition, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band. If transmitting antennas of directional gain greater than 6 dBi are used, both the maximum conducted output power and the maximum power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi. However, fixed point-to-point U-NII devices operating in this band may employ transmitting antennas with directional gain greater than 6 dBi without any corresponding reduction in transmitter conducted power. Fixed, point-to-point operations exclude the use of point-to-multipoint systems, omnidirectional applications, and multiple collocated transmitters transmitting the same information. The operator of the U-NII device, or if the equipment is professionally installed, the installer, is responsible for ensuring that systems employing high gain directional antennas are used exclusively for fixed, point-to-point operations.

(e) Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

### 8.1.3 Test Configuration

Test according to clause 6.1 radio frequency test setup

#### 8.1.4 Test Procedure

According to 789033 D02 v02r01 section C&D, the following is the measurement procedure.

1. Emission Bandwidth (EBW)

- 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.

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Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

a) Set RBW = 100 kHz.

b) Set the video bandwidth (VBW)  $\geq$  3  $\times$  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.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

#### D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E. However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

1. Set center frequency to the nominal EUT channel center frequency.

2. Set span = 1.5 times to 5.0 times the OBW.

3. Set RBW = 1 % to 5 % of the OBW

4. Set VBW  $\geq$  3 • RBW

5. 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.

6. Use the 99 % power bandwidth function of the instrument (if available).

7. 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.

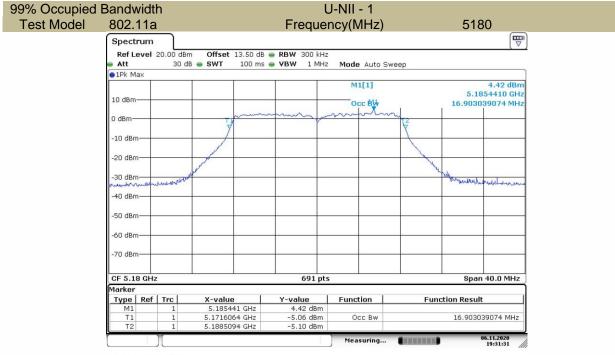


### 8.1.5 Test Results

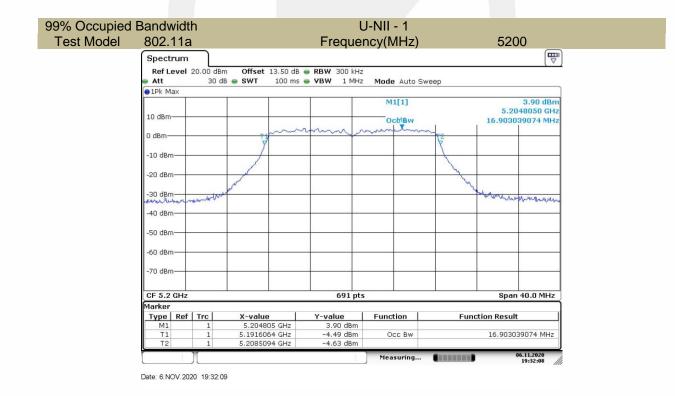
### 5150-5250MHz

Test Mode	Test Channel MHz		26 dB Bandwidth MHz	99% Bandwidth MHz	Verdict
	CH36	5180	21.245	16.903	Pass
802.11a	CH40	5200	21.360	16.903	Pass
	CH48	5240	21.708	16.845	Pass
802.11n-HT20	CH36	5180	22.171	17.829	Pass
	CH40	5200	22.402	17.945	Pass
	CH48	5240	22.113	17.887	Pass
	CH36	5180	21.650	17.887	Pass
802.11ac(HT20)	CH40	5200	21.708	17.829	Pass
	CH48	5240	21.823	17.829	Pass
802 11 × UT 10	CH38	5190	42.490	36.469	Pass
802.11n-HT40	CH46	5230	42.370	36.469	Pass
902 11aa(HT40)	CH38	5190	43.180	36.469	Pass
802.11ac(HT40)	CH46	5230	43.300	36.585	Pass
802.11ac(HT80)	CH42	5210	82.660	75.485	Pass

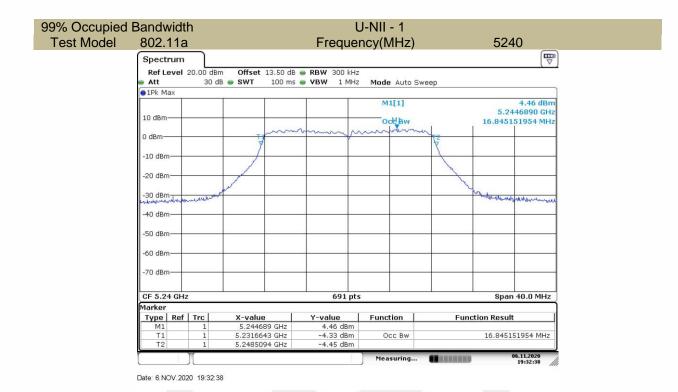




Date: 6.NOV.2020 19:31:31



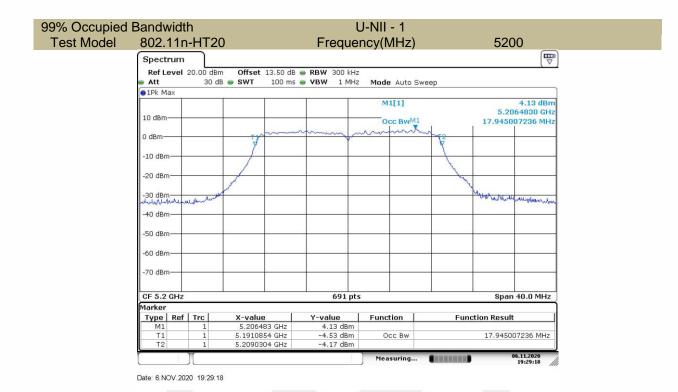




99% Occupied Bandwidth U-NII - 1 Test Model 802.11n-HT20 Frequency(MHz) 5180 Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 300 kHz Att 30 dB 🥌 SWT 100 ms 👄 VBW 🛛 1 MHz Mode Auto Sweep • 1Pk Max M1[1] 3.17 dBm 5.1860200 GHz 17.829232996 MHz Occ BW1 10 dB 0 dBr -10 dBm -20 dBm -30 dBm handrentanitation make with -40 dBm -50 dBm -60 dBm -70 dBm CF 5.18 GHz 691 pts Span 40.0 MHz Marker X-value 5.18602 GHz 5.1711433 GHz **Y-value** 3.17 dBm -4.78 dBm Type Ref Trc Function Function Result Occ Bw 17.829232996 MHz T1 T2 5.1889725 GHz -4.48 dBm Measuring... 06.11.2020 19:28:40 and some they have been been stated

Date: 6.NOV.2020 19:28:46

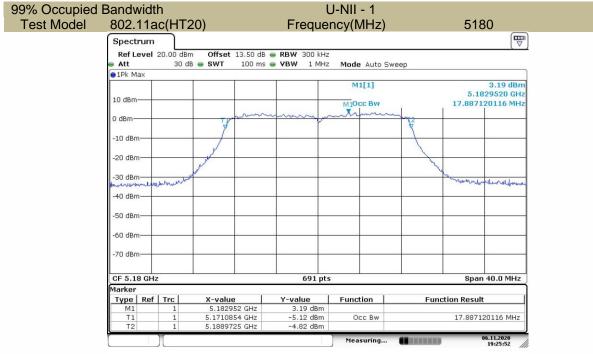




99% Occupied Bandwidth U-NII - 1 Test Model 802.11n-HT20 Frequency(MHz) 5240 Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 300 kHz Att 30 dB 🥌 SWT 100 ms 👄 VBW 🛛 1 MHz Mode Auto Sweep • 1Pk Max M1[1] 4.17 dBm 5.2454410 GHz 10 dB 17.887120116 MHz Occ BW 0 dBr -10 dBm -20 dBm -30 dBmthe mandal manufacture det. -40 dBm -50 dBm -60 dBm -70 dBm CF 5.24 GHz 691 pts Span 40.0 MHz Marker X-value 5.245441 GHz 5.2311433 GHz **Y-value** 4.17 dBm -3.43 dBm Type Ref Trc Function Function Result 17.887120116 MHz Occ Bw T1 T2 5.2490304 GHz -4.19 dBm Measuring... 06.11.2020 19:29:43 and some they have been been stated

Date: 6.NOV.2020 19:29:44



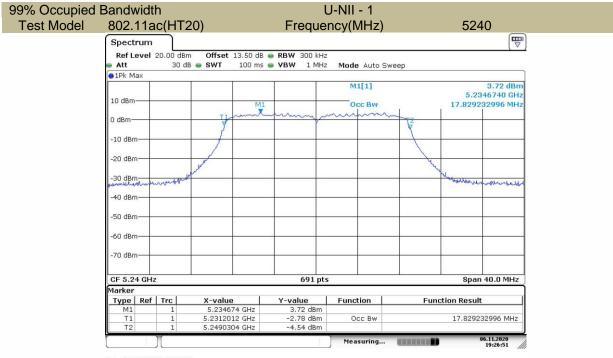


Date: 6.NOV.2020 19:25:53

802.11	<u> </u>	20)	Fieque	ncy(MHz)	5200	E
Spectrun	ר ו ר					
	20.00 dB		🖷 RBW 300 kHz			
Att 1Pk Max	30 (	dB 🕳 SWT 🛛 100 ms	VBW 1 MHz	Mode Auto Swe	ep	
TEK MIGA				M1[1]	3.95	dBm
10.10.					5.1971640	
10 dBm			M1	Occ Bw	17.829232996	5 MHz
0 dBm		Tron	mon	mmmm	-72	
		7			Y	
-10 dBm						
-20 dBm		A Contraction				
20 0011		and a start of the			N.	
-30 dBm	La Allerta	p <sup>entr</sup>			Muther whowever	instant i
-40 dBm-	philosophile a					
-40 uBili-						
-50 dBm			_			
-60 dBm						
-70 dBm						
CF 5.2 GH	z		691 pts		Span 40.0	MHz
Marker						
Type Re		X-value	Y-value	Function	Function Result	
M1 T1	1	5.197164 GHz 5.1911433 GHz	3.95 dBm -4.31 dBm	Occ Bw	17.829232996	MH2
T2	1	5.2089725 GHz	-3.70 dBm	000 DW	17.029232990	11112

Date: 6.NOV.2020 19:26:23



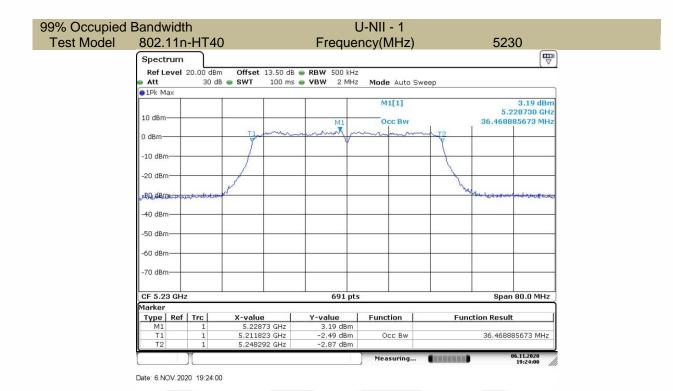


Date: 6.NOV.2020 19:26:52

	un du	با حادا	-						
ied Ba I 8			י -HT4	0			U-NII - 1 ncy(MHz)		5190
6	Spectr		<u> </u>	•					C.CC
198	03•203200-0404		20.00 dB	m Offcot	12 E0 d0	RBW 500 kHz	2		
	Att	svei 2		iB 👄 SWT		VBW 2 MHz		veep	
0	1Pk Ma	эх				-			
L L							M1[1]		2.55 dB
1	.0 dBm-	_		-			Occ Bw		5.186640 GI
						M1		1. T2	36.468885673 MI
0	) dBm—	+		TIA	mm	my	man	male	e
	10 dBm								
2	10 aBm							1	
-4	20 dBm	_						Y	
				N. C.				X	
تہ	30 dBm	mund	thattent.	H N					White the the war and the street
	40 dBm								
1	40 UDIII								
-3	50 dBm								
-6	60 dBm	-							
	70 dBm								
8	/o abiii	5							
G	CF 5.19	) GHz	6			691 pt	s		Span 80.0 MH
_	arker								
_	Type	Ref	Trc	X-value		Y-value	Function	Fund	tion Result
_	M1		1		64 GHz	2.55 dBm	0 0		06 460005670 ***
-	T1 T2		1	5.1718 5.2082		-3.29 dBm -2.20 dBm	Occ Bw		36.468885673 MH
5	1.6	-	1	0.2002		Erec abiii	Measuring	Concession 1	06.11.2020
L							measuring		19:23:22

Date: 6.NOV.2020 19:23:22

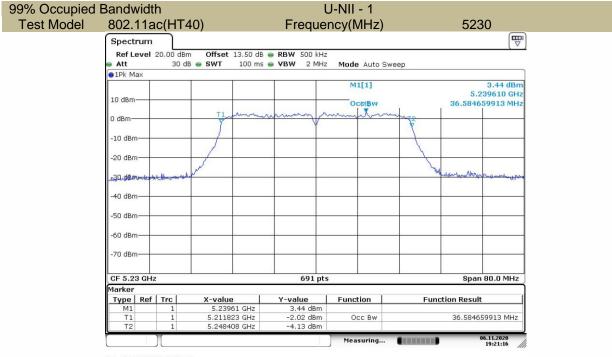




U-NII - 1 99% Occupied Bandwidth **Test Model** 802.11ac(HT40) Frequency(MHz) 5190 Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 500 kHz Att 30 dB 🥌 SWT 100 ms 👄 VBW 2 MHz Mode Auto Sweep 1Pk Max M1[1] 2.31 dBm 5.191510 GHz 10 dBr 36.468885673 MHz Occ Bw M1 0 dBn -10 dBm -20 dBm -30 d8m--40 dBm -50 dBm -60 dBm -70 dBm CF 5.19 GHz 691 pts Span 80.0 MHz /larker X-value 5.19151 GHz 5.171823 GHz 5.208292 GHz Y-value 2.31 dBm -3.80 dBm Type | Ref | Trc Function Function Result 36.468885673 MHz Occ Bw T1 T2 4.41 dBm 6.11.2020 19:20:37 Measuring...

Date: 6.NOV.2020 19:20:37



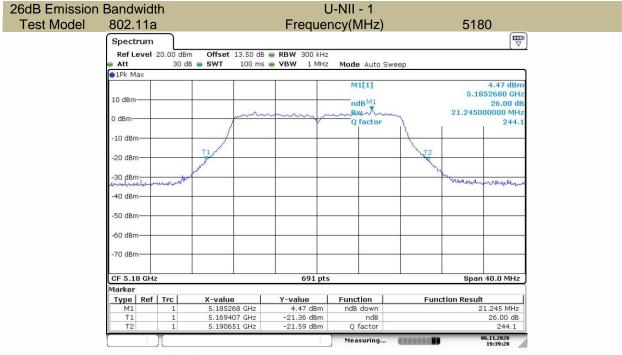


Date:	6.NOV.2020	19:21:17
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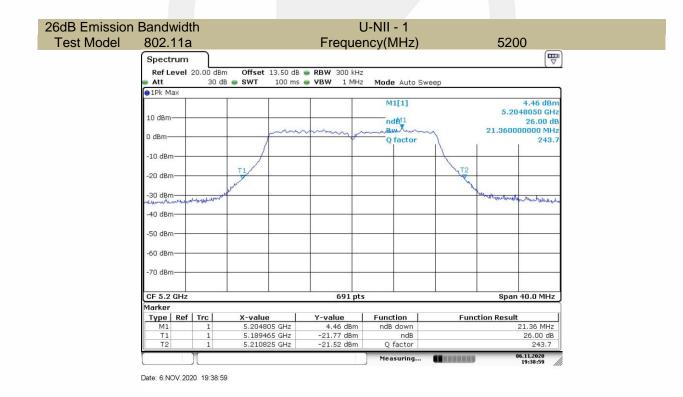
upied	Dondu										
	Danuv	vidtr	ר				U-NII - 1	1			
del	802.					Freque	ncy(M⊢	lz)		521	10
	Spect	rum									
	19809 D0520050		20.00 dBr	n Offset	13.50 dB	🖷 RBW 1 MHz					
	Att		30 d	B 👄 SWT	100 ms	VBW 3 MHz	Mode Aut	o Sweep			
	●1Pk M	ax		Q							
							M1[1	1		E /	4.77 dBm
	10 dBm	-		-			Occ E	awM1			235700 GHz 804631 MHz
				Tin	m	hann	nh	m	12		
	0 dBm-			1							
	-10 dBm	n									
									1		
	-20 dBn	n	and the state						the		martiner
	-30 dBn		monte	nun						- uuurora	and the second
		~									
	-40 dBn	n			<i></i>						
	-50 dBr										
	-60 dBm	n —									
	-70 dBn										
	-70 081										
	CF 5.2	1 GHz			6.	691 pt	s			Span	160.0 MHz
	Marker										
	Туре	Ref		X-value		Y-value	Function	n	Func	tion Resul	t
	M1 T1		1	5.23	57 GHz	4.77 dBm -1.15 dBm	Occ I	Bw		75 4949	04631 MHz
	T2		1		42 GHz	0.08 dBm	0001	5.44		75.4040	0-1031 MHZ
	<u>`</u>		1				Measur	ing			06.11.2020 18:51:45

Date: 6.NOV.2020 18:51:45





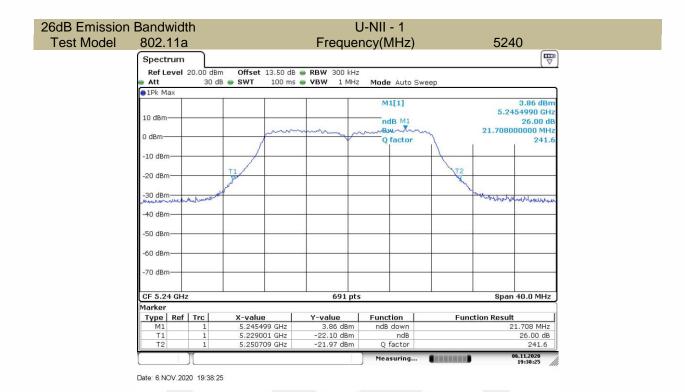
Date: 6.NOV.2020 19:39:28



深圳信测标准技术服务股份有限公司 地址:广东省深圳市南山区马家龙工业区69栋 网址:Http://www.emtek.com.cn 邮箱:cs.rep@emtek.com.cn

EMTEK (Shenzhen) Co., Ltd. Add: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Http://www.emtek.com.cn E-mail: cs.rep@emtek.com.cn

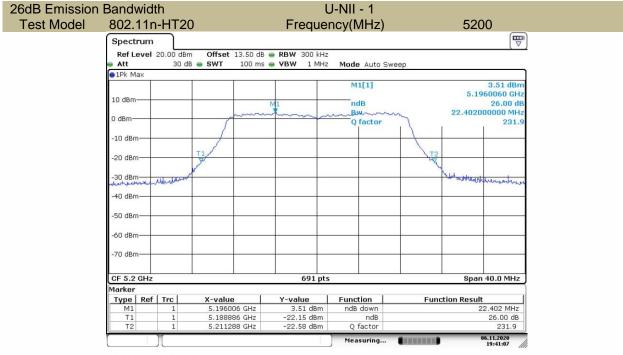




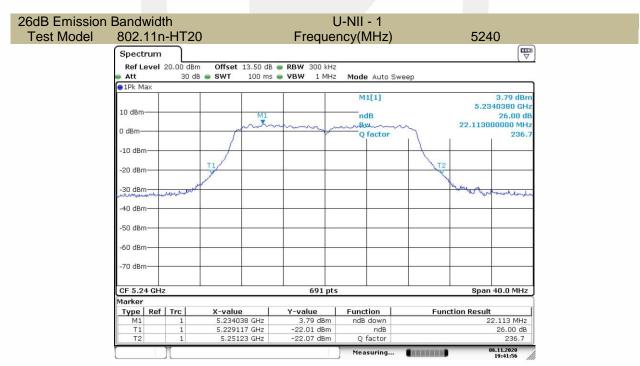
26dB Emission Bandwidth U-NII - 1 Test Model 802.11n-HT20 Frequency(MHz) 5180 ₽ Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 300 kHz Att 30 dB 🥌 SWT 100 ms 👄 VBW 🛛 1 MHz Mode Auto Sweep 1Pk Max M1[1] 3.09 dBm 5.1827210 GHz 26.00 dB 10 dBr MINDB 22 17100000 MHz 0 dBr 233. Q factor -10 dBm -20 dBm -30 dBm whiteham mound he be -40 dBm -50 dBm -60 dBm -70 dBm CF 5.18 GHz 691 pts Span 40.0 MHz Marker X-value 5.182721 GHz 5.169117 GHz Y-value 3.09 dBm -23.00 dBm Function Result 22.171 MHz Type Ref Trc Function ndB dow 26.00 dB 233.8 T1 T2 ndB Q factor 5.191288 GHz -23.11 dBm 06.11.2020 19:40:15 Measuring...

Date: 6.NOV.2020 19:40:15



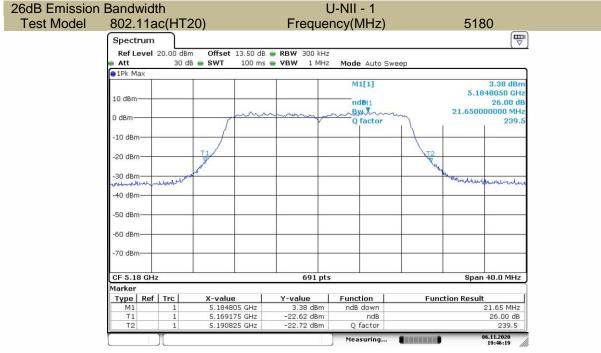


Date: 6.NOV.2020 19:41:07



Date: 6.NOV.2020 19:41:55



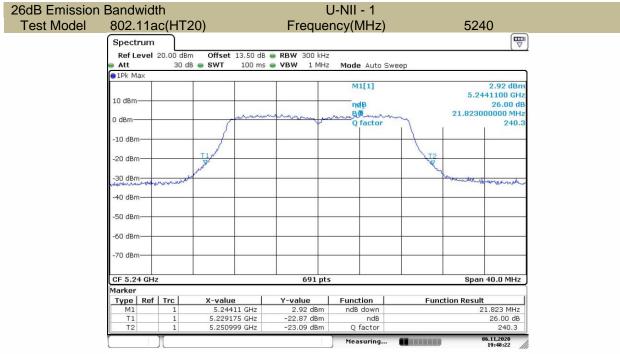


Date: 6.NOV.2020 19:46:19

802.11ac	:(HT20)		Frequer	ncy(MHz)		5200
Spectrum	$\overline{)}$					
19807 • 2012/0+2020-2010-2020-1						
Ref Level 2	30 dB 👄 SW		<ul> <li>RBW 300 kHz</li> <li>VBW 1 MHz</li> </ul>	Mode Auto Sw		
1Pk Max	50 ab 🖉 511	100 ms	<b>••••••</b> •••••••	HOUE AUTO SW	eep	
	1	1		M1[1]		3.32 dBm
		-				5.1977420 GHz
10 dBm			M1	ndB		26.00 dB
0 dBm		amment	milino	morBellin	~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~	1.70800000 MHz
		1	1	Q factor		239.4
-10 dBm		/				
	TI				LTO	
-20 dBm	T				Y	
-30 dBm	and and the second				W Jay	
-30 abm	manually					hallher ouder while we pre-
-40 dBm-						
-50 dBm						
-60 dBm						
-70 dBm						
CF 5.2 GHz			691 pts	-		Span 40.0 MHz
Marker						
Type   Ref			Y-value	Function	Function	
M1		97742 GHz	3.32 dBm	ndB down		21.708 MHz
T1 T2		39175 GHz 10883 GHz	-22.66 dBm -23.09 dBm	ndB O factor		26.00 dB 239.4

Date: 6.NOV.2020 19:47:28



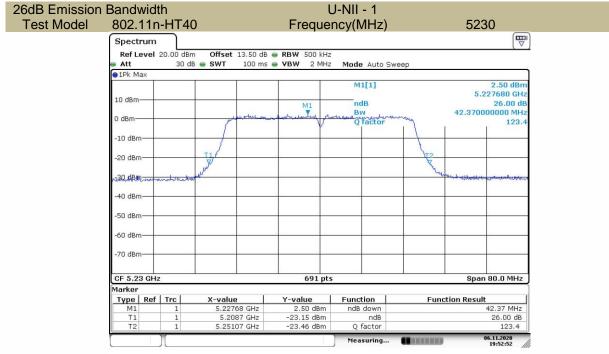


Date: 6.NOV.2020 19:48:22

ission	Bandw	vidth		ι	J-NII - 1		
del	802.1	1n-HT4	0	Freque	ncy(MHz)		5190
	Spectr	um					
	2502/ • • • (Parcener 202	vel 20.00 dB	m Offset 13.50 dB	RBW 500 kHz			(*)
	Att			. VBW 2 MHz		weep	
	😑 1 Pk Ma	X					61
					M1[1]		2.20 dBm
	10 dBm-	_			- dD		5.204700 GHz 26.00 dB
					ndB N	M1	42.49000000 MHz
	0 dBm		~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~		Q factor	Anny	122.5
				Y Y			
	-10 dBm-						
	-20 dBm-		TI			T2	
			7			X	
	-30 dBm-	anotherman	- Part			er la	manhorman una
	-40 dBm-						
	-50 dBm-						
	00 0011						
	-60 dBm-					_	
	-70 dBm-						
	05 5 40						
	CF 5.19 Marker	GHZ		691 pts			Span 80.0 MHz
		Ref   Trc	X-value	Y-value	Function	Fund	tion Result
	M1	1	5.2047 GHz	2.20 dBm	ndB down	T unc	42.49 MHz
	T1	1	5.16893 GHz	-23.88 dBm	ndB		26.00 dB
	T2	1	5.21142 GHz	-23.61 dBm	Q factor		122.5
					Measuring		06.11.2020 19:52:03

Date: 6.NOV.2020 19:52:03



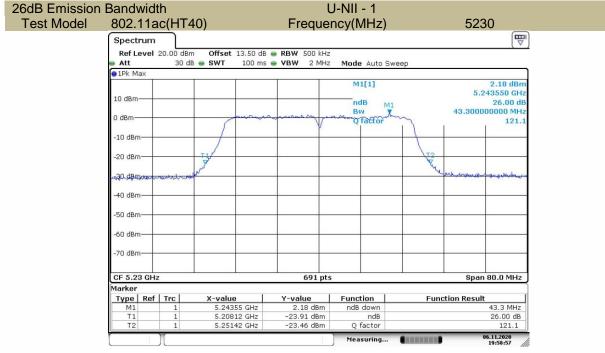


Date: 6.NOV.2020 19:52:52

Emission	Bandwidt	h			U-NII - 1	
			10)			5100
Model	802.11a		+0)	Freque	ncy(MHz)	5190
	Spectrum	)				
	Ref Level	20.00 dBr	n Offset 13.5	io dB 🖷 RBW 500 kHz	2	
	Att	30 d	B 😑 SWT 🛛 10	0 ms 💩 <b>VBW</b> 2 MHz	Mode Auto Sv	weep
	1Pk Max		20	1745° - 184	1112000	
					M1[1]	1.84 dBn
	10 dBm				10	5.203310 GH
					ndB M1	26.00 dt 43.180000000 MH
	0 dBm		- more	mont	QTactor	120.3
	2			Ý	-	
	-10 dBm					
	-20 dBm		TI			170
	-20 0011		3			N. C.
	BadBanta pro	consecutive at the	and the second s			no wanted pressed aborder way
	-40 dBm					
	-50 dBm					
	-60 dBm-					
	-00 0011					
	-70 dBm					
	CF 5.19 GHz			691 pt	s	Span 80.0 MHz
	Marker					
	Type   Ref	Trc	X-value	Y-value	Function	Function Result
	M1	1	5.20331 G		ndB down	43.18 MHz
	T1	1	5.16847 G		ndB	26.00 dB
	T2	1	5.21165 G	Hz -24.36 dBm	Q factor	120.5
		Π			Measuring	06.11.2020 19:57:56

Date: 6.NOV.2020 19:57:57





Date: 6.NOV.2020 19:58:57

802.11a	c 80		Frequer	ncy(MHz)	52	210
Spectrum						
Ref Level	20.00 dBm	n Offset 13.50 dB	🖷 RBW 1 MHz			(-
Att	30 dB	3 🥌 SWT 🛛 100 ms	🕳 VBW 3 MHz	Mode Auto Swee	p	
1Pk Max						
				M1[1]		3.10 dBm 5.235700 GHz
10 dBm				ndB M1		26.00 dB
				But	82.66	0000000 MHz
0 dBm		- por	- www.	Q factor	$\sim$	63.3
-10 dBm						
		1				
-20 dBm		<b>*</b>			E .	
-30 aBhrenne	-	war			homewalder	Inmohenteer
SO GDII						
-40 dBm						-
-50 dBm						
-50 0811						
-60 dBm						-
-70 dBm						
CF 5.21 GHz			691 pts		Sna	n 160.0 MHz
Marker	.e.		001 pt3	8	340	
Type   Ref	Trc	X-value	Y-value	Function	Function Res	ult
M1	1	5.2357 GHz	3.10 dBm	ndB down		82.66 MHz
T1 T2	1	5.16902 GHz 5.25168 GHz	-22.68 dBm -23.24 dBm	ndB Q factor		26.00 dB 63.3

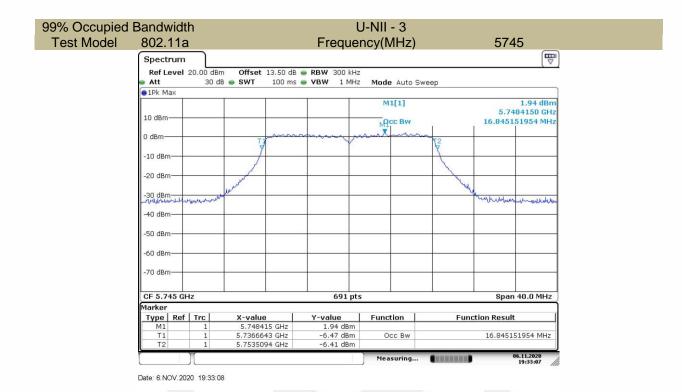
Date: 6.NOV.2020 20:02:15



### 5725-5850MHz

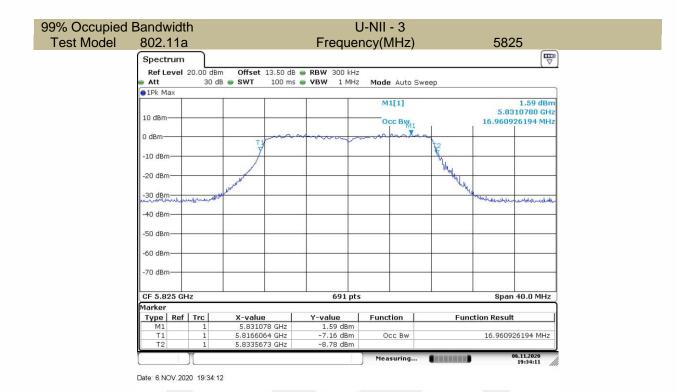
Test Mode	Test Channel MHz		6 dB Bandwidth MHz	99% Bandwidth MHz	Limit kHz
	CH149	5745	16.093	16.845	≥500
802.11a	CH157	5785	16.035	16.787	≥500
	CH165	5825	16.208	16.961	≥500
	CH149	5745	17.077	17.887	≥500
802.11n-HT20	CH157	5785	16.903	17.771	≥500
	CH165	5825	17.366	17.887	≥500
	CH149	5745	16.903	17.945	≥500
802.11ac(HT20)	CH157	5785	17.135	17.945	≥500
	CH165	5825	17.482	17.945	≥500
000 44 m LIT 40	CH151	5755	35.080	36.469	≥500
802.11n-HT40	CH159	5795	35.430	36.469	≥500
902 11 cc/UT 40)	CH151	5755	35.080	36.700	≥500
802.11ac(HT40)	CH159	5795	35.200	36.469	≥500
802.11ac(HT80)	CH155	5775	75.020	75.485	≥500





**U-NII - 3** 99% Occupied Bandwidth Test Model 802.11a Frequency(MHz) 5785 ₽ Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 300 kHz Att 30 dB 👄 SWT 100 ms 👄 VBW 1 MHz Mode Auto Sweep 1Pk Max M1[1] 2.19 dBm 5.7804270 GHz 10 dBr Occ Bw 16.787264834 MHz M 0 dBn -10 dBm -20 dBm -30 dBm-Mudoburghand -40 dBm -50 dBm -60 dBm -70 dBm-CF 5.785 GHz 691 pts Span 40.0 MHz Marker X-value 5.780427 GHz 5.7766064 GHz Type Ref Trc Y-value Function **Function Result** 2.19 dBm -6.81 dBm 16.787264834 MHz Occ Bw Τ1 T2 5.7933936 GHz -6.35 dBm Measuring... 06.11.2020 19:33:37 Date: 6.NOV.2020 19:33:37





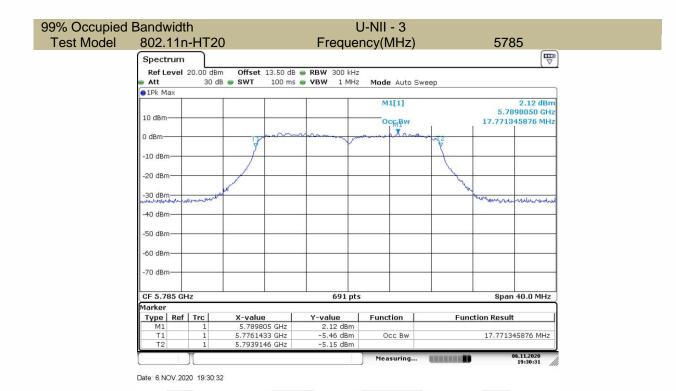
99% Occupied Bandwidth **U-NII - 3** Test Model 802.11n-HT20 Frequency(MHz) 5745 Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 300 kHz Att 30 dB 🥌 SWT 100 ms 👄 VBW 🛛 1 MHz Mode Auto Sweep • 1Pk Max M1[1] 2.22 dBm 5.7510780 GHz 10 dB Occ BW1 17.887120116 MHz 0 dBr -10 dBm -20 dBm -30 dBmmeder of indontion of -40 dBm -50 dBm -60 dBm -70 dBm CF 5.745 GHz 691 pts Span 40.0 MHz Marker X-value 5.751078 GHz 5.7361433 GHz 5.7540304 GHz Y-value 2.22 dBm -6.61 dBm Type Ref Trc Function Function Result 17.887120116 MHz Occ Bw T1 T2 -6.35 dBm Measuring... 06.11.2020 19:30:00

Date: 6.NOV.2020 19:30:06

深圳信测标准技术服务股份有限公司 地址:广东省深圳市南山区马家龙工业区69栋 网址:Http://www.emtek.com.cn 邮箱:cs.rep@emtek.com.cn

EMTEK (Shenzhen) Co., Ltd. Add: Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China Http://www.emtek.com.cn E-mail: cs.rep@emtek.com.cn





99% Occupied Bandwidth **U-NII - 3** Test Model 802.11n-HT20 Frequency(MHz) 5825 Spectrum Ref Level 20.00 dBm Offset 13.50 dB 🖷 RBW 300 kHz Att 30 dB 🥌 SWT 100 ms 👄 VBW 🛛 1 MHz Mode Auto Sweep • 1Pk Max M1[1] 1.22 dBm 5.8296890 GHz 10 dB 17.887120116 MHz OCC BW Y 0 dBr 1 -10 dBm -20 dBm -30 dBmnear -40 dBm -50 dBm -60 dBm -70 dBm CF 5.825 GHz 691 pts Span 40.0 MHz Marker X-value 5.829689 GHz 5.8161433 GHz **Y-value** 1.22 dBm -6.83 dBm Type Ref Trc Function Function Result 17.887120116 MHz Occ Bw T1 T2 5.8340304 GHz -7.32 dBm Measuring... 06.11.2020 19:31:02 and some they have been been stated

Date: 6.NOV.2020 19:31:01