

# **TEST REPORT**

# Product Name : SkyGuard Model Number : SG03500BK, SG02400WT FCC ID : 2ADXI-SBHD60

Prepared for Address		Skybell Technologies Inc 1 Jenner Ste 100, Irvine CA 92618, USA
Prepared by Address	:	EMTEK (SHENZHEN) CO., LTD. Building 69, Majialong Industry Zone, Nanshan District, Shenzhen, Guangdong, China
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Report Number	:	ENS2108180105W00303R
Date(s) of Tests	:	August 18, 2021 to January 18, 2022
Date of issue	:	January 18, 2022



# **1 TEST RESULT CERTIFICATION**

Applicant	:	Skybell Technologies Inc
Address	:	1 Jenner Ste 100, Irvine CA 92618, USA
Manufacturer	:	Skybell Technologies Inc
Address	:	1 Jenner Ste 100, Irvine CA 92618, USA
EUT	:	SkyGuard
Model Name	:	SG03500BK, SG02400WT
Trademark	:	SKYBELL

#### Measurement Procedure Used:

APPLICABLE STANDARDS				
STANDARD	TEST RESULT			
FCC 47 CFR Part 2, Subpart J 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 Rules Part 2 and Part 15.407

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

Date of Test :	: August 18, 2021 to January 18, 2022			
Prepared by :	Justiaolan			
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Report No. ENS2108180105W00303R



# **Modified History**

Version	Report No.	Revision Date	Summary
V1.0	ENS2108180105W00303R	/	Original Report





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# 2 EUT TECHNICAL DESCRIPTION

Frequency Range:       Construction; the difference are the appearance and model purpose, we prepared SG03500BK for test.)         Sample Number:       2#         Wifi 5G with 5150MHz-5250MHz Band         Wifi 5G with 520MHz-5350MHz Band         Wifi 5G with 5470MHz-5725MHz Band         Wifi 5G with 5725MHz-5350MHz Band         Wifi 5G with 5725MHz-5850MHz Band         Wufi 5G with 5725MHz-5850MHz Band         Wufi 5G with 5725MHz-5850MHz Band         Wufi 5G with 5725MHz-5850MHz Band         Wath Supported:         802.11a         202.11a         802.11a(20MHz channel bandwidth)         802.11ac(80MHz channel bandwidth)         802.11ac(90MHz channel bandwidth)         802.11ac(90MHz channel bandwidth)         802.11ac(90MHz channel bandwidth)         802.11ac(116(MZ)         802.11ac(90MHz channel bandwidth)         802.11ac(90MHz channel bandwidth) </th <th>haracteristics</th> <th>Description</th> <th></th>	haracteristics	Description				
Model Number:       (Note: All models are identical in circuitry and electrical, me construction; the difference are the appearance and model purpose, we prepared SG03500BK for test.)         Sample Number:       2#         Wifi Type:       Wifi 5G with 5150MHz-5250MHz Band Wifi 5G with 5250MHz-5350MHz Band Wifi 5G with 5725MHz-5850MHz Band Wifi 5G with 5725MHz channel bandwidth)         WLAN Supported:       \$802.11a         % 802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         >802.11a(20MHz channel bandwidth)       802.11a(40MHz channel bandwidth)         >802.11ac(20MHz channel bandwidth)       802.11a(80MHz channel bandwidth)         >802.11ac(80MHz channel bandwidth)       802.11a(80MHz channel bandwidth)         >802.11ac(90MHz channel bandwidth)       802.11a(80MHz channel bandwidth)         >802.11ac(80MHz channel bandwidth)       802.11a(80MHz channel bandwidth)         Wifi 5G with 550MHz band       \$802.11ac(180MHz channel bandwidth)         Modulation:       \$802.11ac(90MHz channel bandwidth)         Modulation:       \$60FDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n         Yull:1:1:5150MHz-5250MHz Band       \$5180-5240MHz for 802.11a;         \$5180-5240MHz for 802.11a;       \$5190-5230M         \$5260-5320MHz for 802.11a;	Product:	SkyGuard				
Wifi Type:       Wifi 5G with 5150MHz-5250MHz Band         Wifi 5G with 5250MHz-5350MHz Band       Wifi 5G with 5270MHz-5320MHz Band         Wifi 5G with 570MHz-5725MHz Band       Wifi 5G with 5725MHz-5850MHz Band         WLAN Supported:       802.11a         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(40MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(40MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(40MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(40MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(WID to 300 Mbps       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(WID to 807 Mbps       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11a(20MHz channel b	lodel Number:	(Note: All models are identical in circuitry and electrical, mechanical and physical construction; the difference are the appearance and model number for trading				
Wifi Type:       Wifi 5G with 5250MHz-5350MHz Band         Wifi 5G with 5470MHz-5725MHz Band       Wifi 5G with 5725MHz-5850MHz Band         WLAN Supported:       802.11a         802.11n(20MHz channel bandwidth)       802.11a(20MHz channel bandwidth)         802.11ac(40MHz channel bandwidth)       802.11ac(40MHz channel bandwidth)         802.11ac(40MHz channel bandwidth)       802.11ac(40MHz channel bandwidth)         802.11ac(80MHz channel bandwidth)       802.11ac(40MHz channel bandwidth)         802.11ac(40MHz channel bandwidth)       802.11ac(40MHz channel bandwidth)         802.11ac(80MHz channel bandwidth)       802.11a(00MHz channel bandwidth)         802.11ac(80MHz channel bandwidth)       \$5100-5230M         802.11	ample Number:	2#				
WLAN Supported:              802.11n(20MHz channel bandwidth) 802.11ac(20MHz channel bandwidth) 802.11ac(20MHz channel bandwidth) 802.11ac(40MHz channel bandwidth)            Data Rate :              802.11a:54/48/36/24/18/12/9/6Mbps 802.11a:cup to 300 Mbps           Modulation:              802.11a:cup to 300 Mbps            Modulation:              0 OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n 0 OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 8           Modulation:              0 OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 8            VINII-1: 5150MHz-5250MHz Band                5180-5240MHz for 802.11a; 5180-5240MHz for 802.11a; 5180-5240MHz for 802.11a; 5260-5320MHz for 802.11a; 5500-5700MHz for 802.11a; 5745-5825MHz for 802.11a; 5745-5825MHz for 802.11a; 5745-5825MHz for 802.11a; 5745-5825MHz for 802.11a; 5745-5825MHz for 802.11a; 5745-	Vifi Type:	⊠ Wifi 5G with 5250MHz-5350MHz Band ⊠ Wifi 5G with 5470MHz-5725MHz Band				
Data Rate :              \approx 802.11n:up to 300 Mbps \approx 802.11ac:up to 867 Mbps            Modulation:              \OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n \approx OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n \approx 0FDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11a/n \approx 5180-5240MHz for 802.11a; \approx 5180-5240MHz for 802.11a; \approx 5180-5240MHz for 802.11a; \approx 5260-5320MHz for 802.11a; \approx 5260-5320MHz for 802.11a; \approx 5260-5320MHz for 802.11a; \approx 52500-5700MHz for 802.11a; \approx 5500-5700MHz for 802.11a; \approx 5755-5795M \approx 5745-5825MHz for 802.11a; \approx 5755-5795M \approx 5755-5795M             \approx 5755-5795M            \		<ul> <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> </ul>				
Modulation:         OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 8           QUNII-1: 5150MHz-5250MHz Band         UNII-1: 5150MHz-5250MHz Band           5180-5240MHz for 802.11a;         5190-5230M           5180-5240MHz for 802.11a;         5190-5230M           5180-5240MHz for 802.11a;         5190-5230M           5180-5240MHz for 802.11a;         5190-5230M           5180-5240MHz for 802.11a;         5210MHz for           5180-5240MHz for 802.11a;         5270-5310M           5260-5320MHz for 802.11a;         5270-5310M           5260-5320MHz for 802.11a;         5270-5310M           5260-5320MHz for 802.11a;         5290MHz for           5260-5700MHz for 802.11a;         5510-5670M           5500-5700MHz for 802.11a;         5510-5670M           5500-5700MHz for 802.11a;         5510-5670M           5500-5700MHz for 802.11a;         5530MHz for           5500-5700MHz for 802.11a;         5530MHz for           UNII-3 with 5725MHz-5850MHz Band         5530MHz for           UNII-3 with 5725MHz-5850MHz Band         5755-5795M           5745-5825MHz for 802.11a;         5755-5795M           5745-5825MHz for 802.11a;         5755-5795M           5755-5795M         5755-5795M	Pata Rate :	⊠ 802.11n:up to 300 Mbps				
Frequency Range:       5180-5240MHz for 802.11a;	Iodulation:	<ul> <li>☑ OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n</li> <li>☑ OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac</li> </ul>				
S180-5240MHz for 802.11n(HT20); S5190-5230M S5180-5240MHz for 802.11ac(HT20); S5210MHz for S210MHz for S260-5320MHz for 802.11a; S5260-5320MHz for 802.11n(HT20); S5260-5320MHz for 802.11ac(HT20); S5260-5320MHz for 802.11ac(HT20); S5290MHz for S5200-5700MHz for 802.11a; S5500-5700MHz for 802.11a; S5500-5700MHz for 802.11a; S5500-5700MHz for 802.11ac(HT20); S5500-5700MHz for 802.11ac(HT20); S5500-5700MHz for 802.11ac(HT20); S5500-5700MHz for 802.11ac(HT20); S5500-5700MHz for 802.11ac(HT20); S5500-5705MHz for 802.11a; S745-5825MHz for 802.11a; S5745-5825MHz for 802.11a; S5755-5795M		⊠ UNII-1: 5150MHz-5250MHz Band				
Frequency Range:		S180-5240MHz for 802.11n(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:          \[             \begin{aligned}             5260-5320MHz for 802.11n(HT20); & \$5270-5310M & \$5260-5320MHz for 802.11ac(HT20); & \$5290MHz for 802.11ac(HT20); & \$5290MHz for 802.11a; & \$5500-5700MHz for 802.11a; & \$5510-5670M & \$5500-5700MHz for 802.11n(HT20); & \$5510-5670M & \$5500-5700MHz for 802.11ac(HT20); & \$5530MHz for 802.11ac(HT20); & \$5745-5825MHz for 802.11ac(HT20); & \$5755-5795M & \$5745-5825MHz for 802.11n(HT20); & \$5755-5795M & \$5755		⊠ UNII-2A: 5250MHz-5350MHz Band				
Image: Contract of the second state of the second stat		S260-5320MHz for 802.11n(HT20);	<ul> <li>S270-5310MHz for 802.11n(HT40);</li> <li>S270-5310MHz for 802.11ac(HT40);</li> <li>S290MHz for 802.11ac(HT80);</li> </ul>			
<ul> <li>☆ 5500-5700MHz for 802.11n(HT20);</li> <li>☆ 5510-5670M</li> <li>☆ 5500-5700MHz for 802.11ac(HT20);</li> <li>☆ 5530MHz for</li> <li>☆ UNII-3 with 5725MHz-5850MHz Band</li> <li>☆ 5745-5825MHz for 802.11a;</li> <li>☆ 5745-5825MHz for 802.11n(HT20);</li> <li>☆ 5755-5795M</li> <li>☆ 5755-5795M</li> </ul>	requency Range:	UNII-2C: 5470MHz-5725MHz Band				
<ul> <li>☑ 5745-5825MHz for 802.11a;</li> <li>☑ 5745-5825MHz for 802.11n;</li> <li>☑ 5745-5825MHz for 802.11n(HT20);</li> <li>☑ 5755-5795M</li> </ul>		S500-5700MHz for 802.11n(HT20);				
⊠ 5745-5825MHz for 802.11n(HT20); ⊠ 5755-5795M		UNII-3 with 5725MHz-5850MHz Band				
		S745-5825MHz for 802.11n(HT20);	<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	PC Function:		⊠ Not Applicable			

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Antenna Port:	Antenna port 1 Antenna port 2		
Antenna Type:	ternal Antenna		
Antenna Gain:	ANT 1: 1.09 dBi ANT 2: 1.75 dBi		
Transmit Power:	150MHz-5250MHz:18.82 dBm 250MHz-5350MHz:21.23 dBm 470MHz-5725MHz:21.27 dBm 725MHz-5850MHz:24.52 dBm		
Power supply:	DC 5V from USB port AC 120V, 60Hz		
Data of received:	August 18, 2021		
Temperature Range:	0°C ~ +45°C		

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



# **3 SUMMARY OF TEST RESULT**

FCC Part Clause	Test Parameter	Verdict	Remark	
15.407 (a) 15.407 (e)	99% , 6dB and 26dB Bandwidth	PASS		
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) 15.207	Power Line Conducted Emission	PASS		
15.407(a) 15.203	Antenna Application	PASS		
NOTE1: N/A (Not Applicable)				

NOTE2: According to FCC OET KDB 789033 D2 General UNII Test Procedures New Rules v02r01, In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.

#### RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for FCC ID: 2ADXI-SBHD60 filing to comply with Section 15.247 of the FCC Part 15, Subpart C 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 2, Subpart J

FCC 47 CFR Part 15, Subpart E

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

## 4.2 MEASUREMENT EQUIPMENT USED

#### Conducted Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Test Receiver	Rohde & Schwarz	ESCI	101384	May 15, 2021	1 Year
L.I.S.N.	Rohde & Schwarz	ENV216	5	May 15, 2021	1 Year
L.I.S.N.	Kyoritsu	KNW-407	8-1492-9	May 16, 2021	1 Year
Absorbing Clamp	Rohde & Schwarz	MDS-21	833711/025	June 15, 2021	1 Year
Loop antenna	Laplace	RF300	8006	May 15, 2021	1 Year
Van der Hoofden test-head	Schwarzbeck	VDHH 9502	9502-054	May 15, 2021	1 Year
Pulse Limiter	Rohde & Schwarz	ESH3-Z2	100107	May 15, 2021	1 Year

#### For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	May 15, 2021	1 Year
Pre-Amplifie	Lunar EM	LNA30M3G-25	J1010000070	May 15, 2021	1 Year
Bilog Antenna	Schwarzbeck	VULB9163	659	August 22, 2021	2 Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1177	July 4, 2020	2 Year
Pre-Amplifie	SKET	LNPA_0118G-45	SK2019051801	May 15, 2021	1 Year
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	June 12, 2021	2 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	May 15, 2021	1 Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1198	July 4, 2020	2 Year
Bilog Antenna	Schwarzbeck	VULB9163	660	June 12, 2021	2 Year
Cable	H+B	NmSm-05-C15052	N/A	May 15, 2021	1 Year
Cable	H+B	NmSm-2-C15201	N/A	May 15, 2021	1 Year
Cable	H+B	NmNm-7-C15702	N/A	May 15, 2021	1 Year
Cable	H+B	SAC-40G-1	414	May 15, 2021	1 Year
Cable	H+B	SUCOFLEX104	MY14871/4	May 15, 2021	
Cable	H+B	BLU18A-NmSm-650 0	D8501	May 15, 2021	1 Year
Band reject Filter(50dB)	WI/DE	WRCGV-2400(2400- 2485MHz)	2	May 15, 2021	1 Year

**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



Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
Vector Signal Generater	Agilent	N5182B	My53050553	May 15, 2021	1 Year
Analog Signal Generator	Agilent	N5171B	My53050878	May 15, 2021	1 Year
Signal Analyzer	Agilent	N9010A	My53470879	May 16, 2021	1 Year
Power Analyzer	Agilent	PS-X10-200	N/A	May 15, 2021	1 Year
Wideband Radio Communication Tester	R&S	CMW500	1201.0002K50- 140822zk	May 15, 2021	1 Year
Test Accessories	Agilent	PS-X10-100	N/A	May 15, 2021	1 Year
Temperature&Humidity test chamber	ESPEC	EL-02KA	12107166	July 3, 2021	1 Year
Blocking Box	Agilent	AD211	N/A	May 15, 2021	1 Year

#### For other test items:

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



## 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, 802.11n (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 (HT80):

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

Test Frequency and Channel for 802.11a, 802.11n (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 for802.11ac (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

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#### 🛛 Wifi 5G with U-NII -2A

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300		
56	5280	64	5320		

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270				
62	5310				

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

	-		/		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

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

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	56	5280	64	5320

#### 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)
54	5270	N/A	N/A	62	5310

#### 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)
58	5290				



#### ☑ Wifi 5G with U-NII -2C

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

	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)	
	100	5500	116	5580	132	5660	
	104	5520	120	5600	136	5680	
	108	5540	124	5620	140	5700	
	112	5560	128	5640			

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	118	5590	134	5670
110	5550	126	5630		

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

	Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
	106	5530	122	5610		
Ī						

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

Lowest Frequency		Middle F	requency	Highes	st Frequency
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	116	5580	140	5700

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

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510			134	5670

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

Lowest F	Lowest Frequency		Frequency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530				

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#### ⊠ Wifi 5G with U-NII -3

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

		,			
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (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, 802.11n (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 F	Middle Frequency		st 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 F	requency	Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

The 5G WIFI has two antennas and support Multiple Outputs for 802.11n/ac mode for this report; Antenna 1 Gain is 1.09dBi; Antenna 2 Gain is 1.75dBi; for this function is belong to Correlated Categorization equipment

According to KDB 662911, for Unequal antenna gains,

Directional gain =  $10 \log [(10^{1.09/20} + 10^{1.75/20})^2/2] dBi=4.44 dBi$ 



# 5 FACILITIES AND ACCREDITATIONS

## 5.1 FACILITIES

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

EMTEK (Shenzhen) Co., Ltd.

Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

## **5.2 EQUIPMENT**

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

## 5.3 LABORATORY ACCREDITATIONS AND LISTINGS

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

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Report No. ENS2108180105W00303R



# 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%

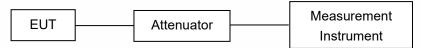
Measurement Uncertainty for a level of Confidence of 95%



# 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.

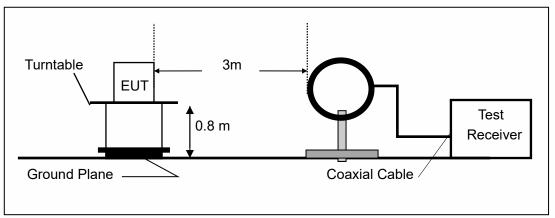
#### Above 30MHz:

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  $0^{\circ}$  to  $360^{\circ}$ , and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

#### Above 1GHz:

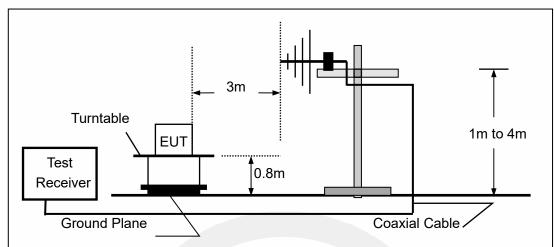
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable 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).





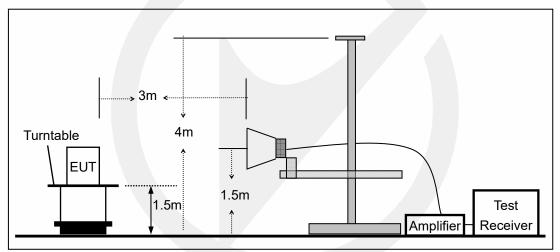
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(b) Radiated Emission Test Set-Up, Frequency Below 1000MHz

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



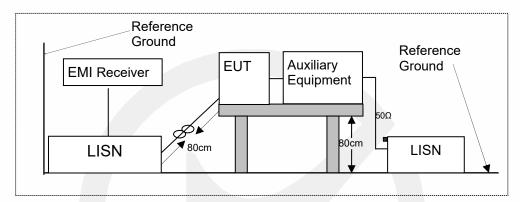


## 7.3 CONDUCTED EMISSION TEST SETUP

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.

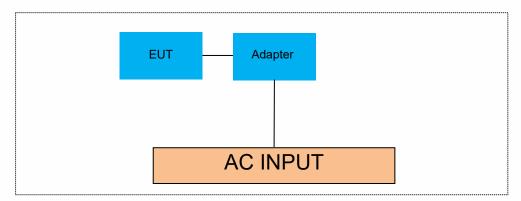
Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not 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	1	1	/						

Auxiliary Equipment List and Details									
Description	Manufacturer	Model	Serial Number						
1	1	1	1						

#### 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 7.1 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.

 $\dot{d}$  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.

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#### 8.1.5 Test Results

5150-5250MHz Antenna A

Test Mode		hannel Hz	26 dB Bandwidth MHz	99% Bandwidth MHz	Verdict
	CH36	5180	18.698	16.556	Pass
802.11a	CH40	5200	18.987	16.671	Pass
	CH48	5240	18.813	16.614	Pass
	CH36	5180	19.971	17.540	Pass
802.11n-HT20	CH40	5200	19.624	17.540	Pass
	CH48	5240	19.855	17.598	Pass
	CH36	5180	19.682	17.598	Pass
802.11ac(HT20)	CH40	5200	19.797	17.598	Pass
	CH48	5240	19.913	17.598	Pass
902 11p HT40	CH38	5190	40.20	36.491	Pass
802.11n-HT40	CH46	5230	40.00	36.425	Pass
802 11co(HT40)	CH38	5190	39.93	36.358	Pass
802.11ac(HT40)	CH46	5230	40.16	36.367	Pass
802.11ac(HT80)	CH42	5210	81.92	75.799	Pass

#### Antenna B

Test Mode		hannel Hz	26 dB Bandwidth MHz	99% Bandwidth MHz	Verdict
	CH36	5180	19.103	16.440	Pass
802.11a	CH40	5200	18.871	16.440	Pass
	CH48	5240	18.987	16.440	Pass
	CH36	5180	19.682	17.598	Pass
802.11n-HT20	CH40	5200	19.855	17.540	Pass
	CH48	5240	19.855	17.598	Pass
	CH36	5180	19.682	17.598	Pass
802.11ac(HT20)	CH40	5200	19.624	17.598	Pass
	CH48	5240	19.797	17.540	Pass
802 11p UT40	CH38	5190	40.750	36.122	Pass
802.11n-HT40	CH46	5230	40.520	36.122	Pass
902 11co(UT40)	CH38	5190	41.790	36.237	Pass
802.11ac(HT40)	CH46	5230	40.870	36.006	Pass
802.11ac(HT80)	CH42	5210	81.740	74.559	Pass

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mission 802.11a		/idth			J-NII - 1 ncy(MHz)		518	30
Spectrum								
Ref Level	26.00 dBm	Offcot 10	00 dB =	RBW 300 kHz				
Att	20.00 dBm 30 dB		1 ms 🖷		Mode Sweep			
• 1Pk Max								
oo doo					M1[1]		2 char	9.43 dBr
20 dBm					0.000			46310 GH 16353 MH
10 dBm			-	distances -	OddBw	- 1	10.5557	10353 MH
		1	~~~~			12		
0 dBm		1				X		
-10 dBm								
		~				m	mar man	12
-20 dBm	man			-				many
-30 dBm								
-30 ubm								
-40 dBm				+				
-50 dBm								
-60 dBm								
-70 dBm				+				
CF 5.18 GH	z			691 pt:	5		Span	40.0 MHz
Marker	1 - 1							
Type Ref M1	1 1	X-value 5.184631	CHA	Y-value 9.43 dBm	Function	Fur	nction Result	
T1	1	5.17178		2.76 dBm	Occ Bw		16.55571	16353 MHz
		5.17178 5.1883357	GHz		Occ Bw			14.10.2021 18:00:08
T1 T2		5.17178 5.1883357	GHz	2.76 dBm				14.10.2021
T1 T2 Date: 14.0CT.20 Spectrum Ref Level	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	) Measuring			14.10.2021 18:00:08
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att	1 1 021 18:00:0	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm				14.10.2021 18:00:08
T1 T2 Date: 14.0CT.20 Spectrum Ref Level	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Measuring			(4.10.2021 18:00:08
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	) Measuring		•	14.10.2021 18:00:08
T1 T2 Date: 14.0CT.2( Spectrum Ref Level Att 1Pk Max 20 dBm	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Measuring Mode Sweep 		5.18	14.10.2021 18:00:08 0.63 dBr 21420 GH 26.00 d
T1 T2 Date: 14.0CT.20 Spectrum Ref Level Att IPk Max	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18	(4.10.2021 18:00:08
T1 T2 Date: 14.0CT.2( Spectrum Ref Level Att 1Pk Max 20 dBm	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Measuring Mode Sweep 		5.18	14.10.2021 18:00:08 0.63 dBr 21420 GH 26.00 d
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att • 1Pk Max 20 dBm 10 dBm 0 dBm	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18	(4.10.2021 18:00:08
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 10 dBm	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 9 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW	~	5.18	(4.10.2021 18:00:08
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 10 dBm -10 dBm -10 dBm	1 1 021 18:00:0 26.00 dBm	5.17178 5.1883357 8 Offset 10.	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 0 dBm 10 dBm -10 dBm -20 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 10 dBm -10 dBm -10 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30.dBm -30.d	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 0 dBm 10 dBm -10 dBm -20 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 10 dBm -10 dBm -20 dBm -20 dBm -30.dBm -30.d	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att • 1Pk Max 20 dBm 10 dBm -10 dBm -20 dBm -30.dBm -50 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1           T2           Date: 14.0CT.20           Spectrum           Ref Level           Att           10 dBm           0 dBm           -10 dBm           -20 dBm           -30.dBm           -40 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att • 1Pk Max 20 dBm 10 dBm -10 dBm -20 dBm -30.dBm -50 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep M1[1] M1 BW		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1           T2           Date: 14.0CT.20           Spectrum           Ref Level           Att           10 dBm           10 dBm           -10 dBm           -20 dBm           -20 dBm           -30.dBm           -50 dBm           -60 dBm           -70 dBm	1 1 221 18:00:00 226:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm 9 <b>RBW</b> 300 kHz 9 <b>VBW</b> 1 MHz	Mode Sweep		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30.dBm -50 dBm -50 dBm -70 dBm -70 dBm	1 1 221 18:00:00 226:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm	Mode Sweep		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1           T2           Date: 14.0CT.20           Spectrum           Ref Level           Att           10 dBm           10 dBm           -10 dBm           -20 dBm           -20 dBm           -30.dBm           -50 dBm           -60 dBm           -70 dBm	1 1 221 18:00:00 26:00 dBm 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 00 dB	2.76 dBm 0.69 dBm 9 <b>RBW</b> 300 kHz 9 <b>VBW</b> 1 MHz	Mode Sweep		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.
T1 T2 Date: 14.OCT.20 Spectrum Ref Level Att 10 dBm 10 dBm 0 dBm -10 dBm -20 dBm -20 dBm -30.dBm -50 dBm -50 dBm -70 dBm -70 dBm CF 5.18 GH2 Marker Type Ref M1	1 1 1 1 221 18:00:0 226.00 dBm 30 dB 30 dB 2 2 2 2 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 1 ms GHz GHz	2.76 dBm 0.69 dBm 9 <b>RBW</b> 300 kHz 9 <b>VBW</b> 1 MHz 1 MHZ	Mode Sweep M1[1] M1 ndB M1 Bw M2 detate S Function ndB down		5.18 18.6980	4.10.2021 18:00:08 6.63 dBr 21:420 GH 22:1420 GH 22:00 MH 277. 40.00 MH 20:00 MH 20:
T1           T2           Date: 14.0CT.20           Spectrum           Ref Level           Att           10 dBm           0 dBm           -10 dBm           -20 dBm           -20 dBm           -30 dBm           -50 dBm           -60 dBm           -70 dBm           CF 5.18 GHZ           Marker           Type	1 1 1 1 1 1 26.00 dBm 30 dB 30 dB 26.00 dBm 30 dB 30 dB	5.17178 5.1883357 8 Offset 10. SWT	GHz GHz 1 ms GHz GHz GHz GHz	2.76 dBm 0.69 dBm 9 <b>RBW</b> 300 kHz 9 <b>VBW</b> 1 MHz 1 MHZ	Mode Sweep M1[1] M1_ndB M1_gw M0_foctors		5.18 18.6980	6.63 dBr 21420 GH 25.00 d 00000 MH 277.

Date: 14.OCT.2021 23:24:03

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Date: 14.OCT.2021 23:24:37



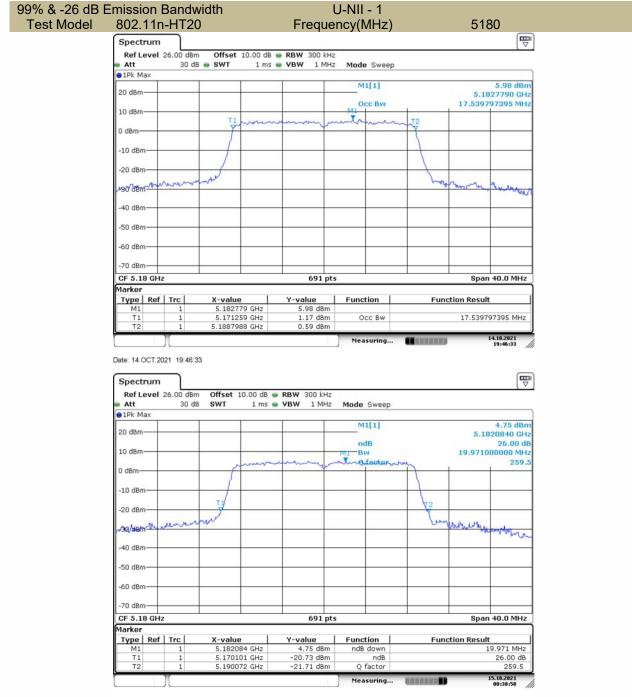


Date: 14.OCT.2021 23:25:02

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Report No. ENS2108180105W00303R





Date: 15.OCT.2021 00:38:58





Date: 15.OCT.2021 00:39:39

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Date: 15.OCT.2021 00:40:25

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Date: 15.OCT.2021 00:52:48

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Report No. ENS2108180105W00303R





Date: 15.OCT.2021 00:53:14

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Report No. ENS2108180105W00303R Pa



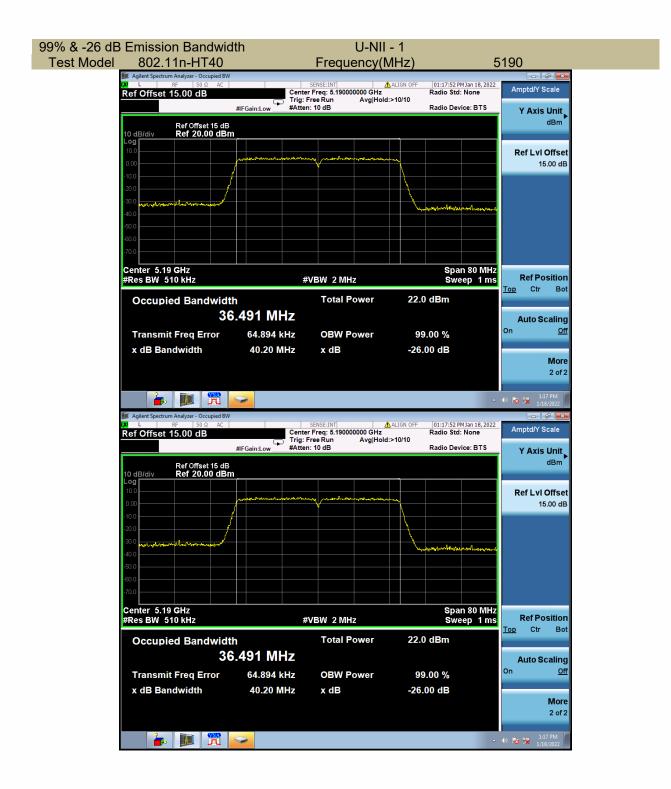


Date: 15.OCT.2021 00:53:47

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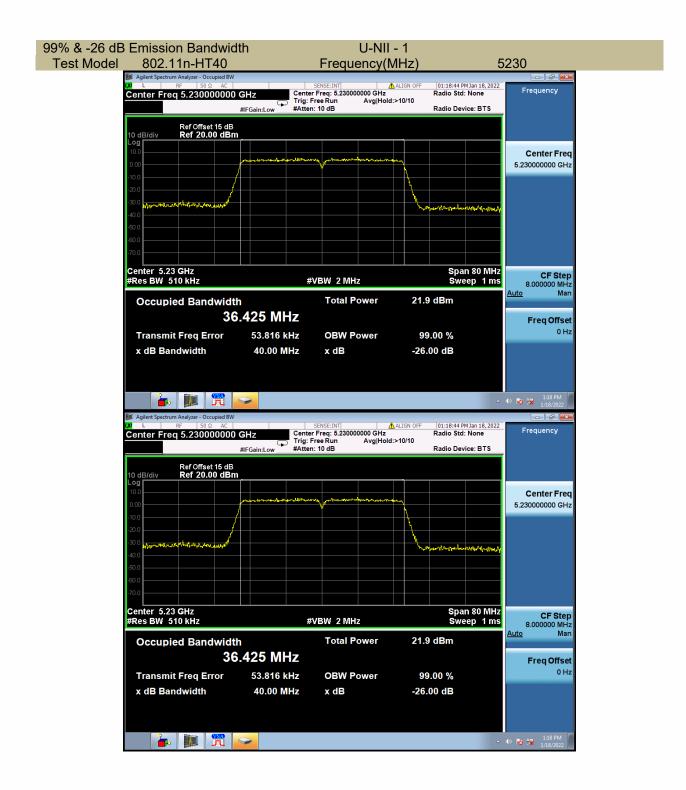
Report No. ENS2108180105W00303R





Report No. ENS2108180105W00303R

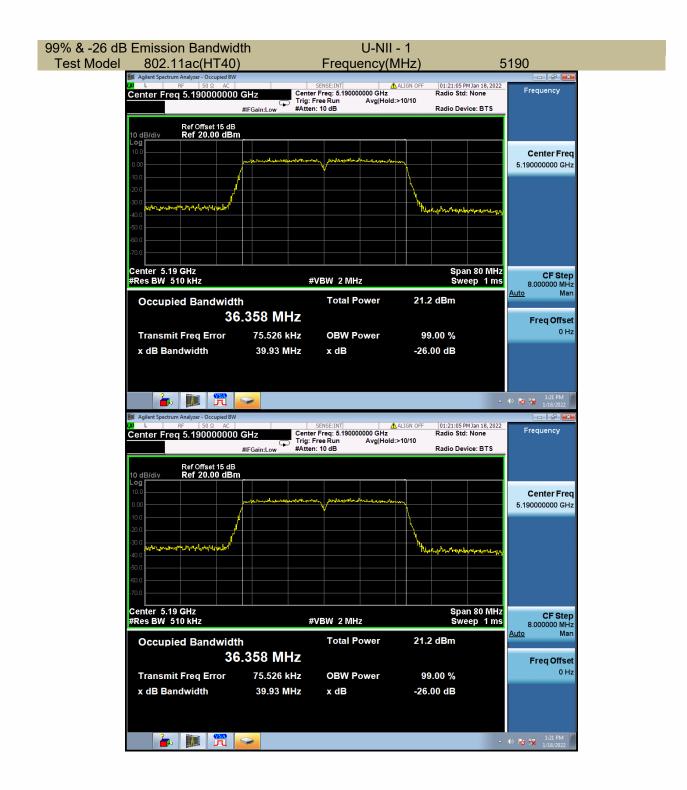




Report No. ENS2108180105W00303R

Ver. 1.0

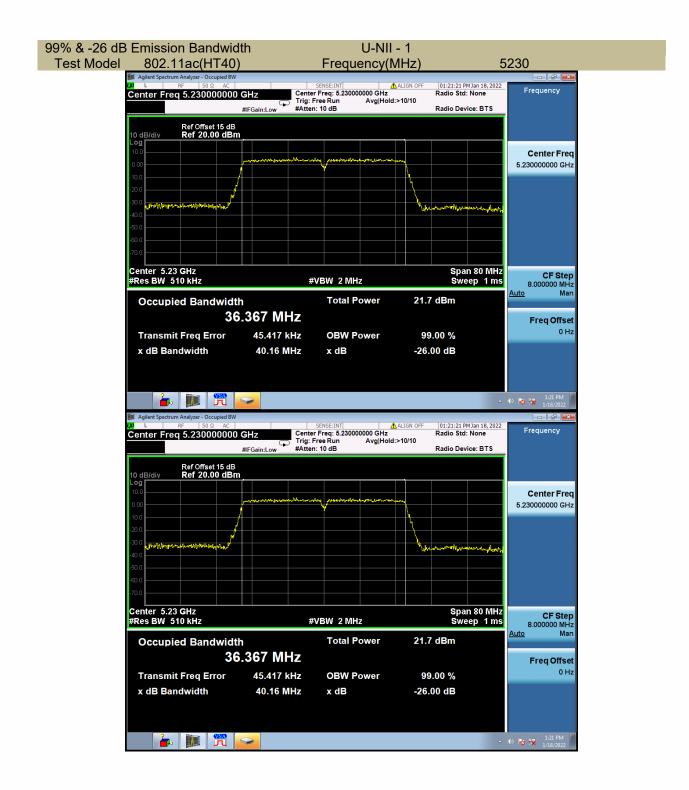




Report No. ENS2108180105W00303R

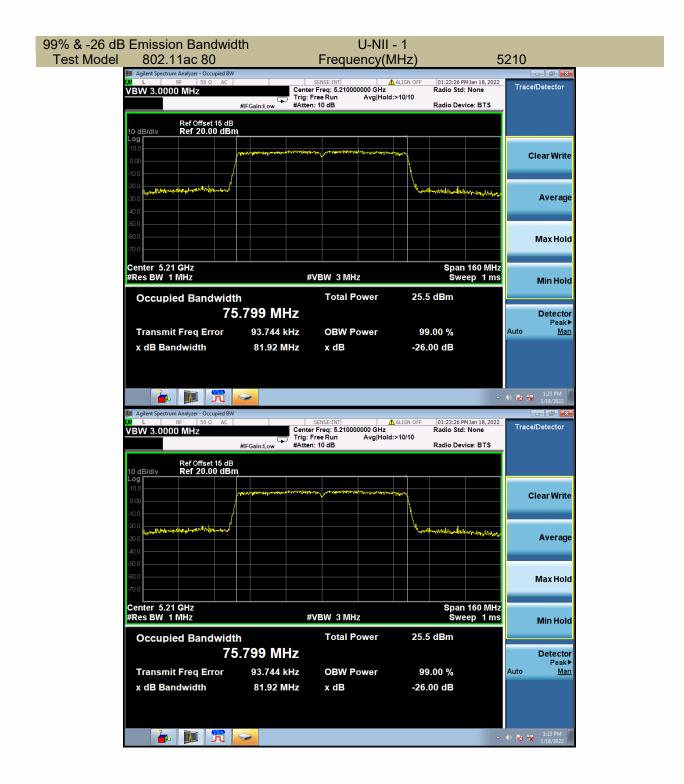
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Report No. ENS2108180105W00303R





Report No. ENS2108180105W00303R

Ver. 1.0





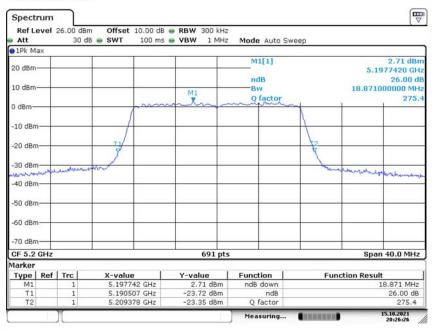
99% & -26 dB Er	mission Bandwidth	U-NII - 1		
Test Model	802.11a	Frequency(MHz)	5200	

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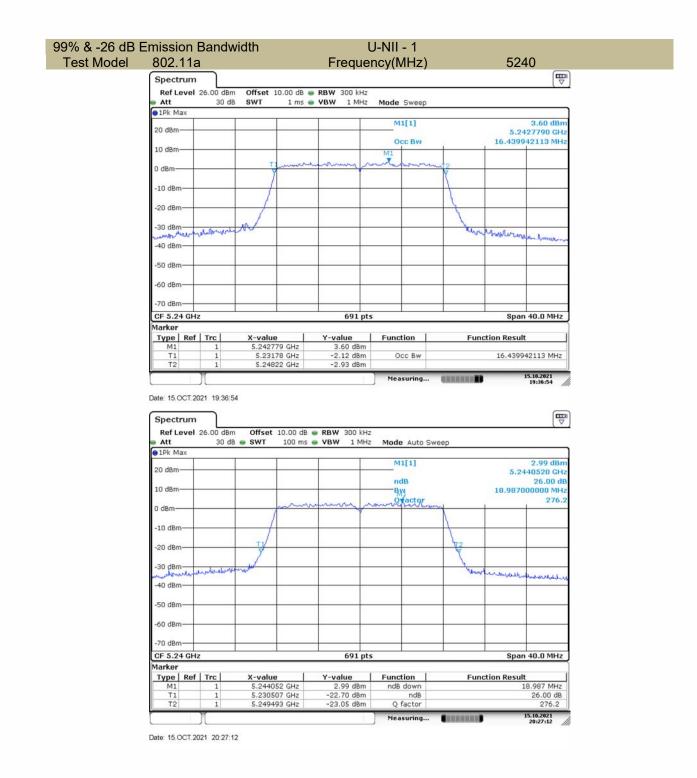
	evel 2	26.00 dBr 30 d		0.00 dB e 1 ms e	<b>RBW</b> 300 kH VBW 1 MH		Sweep			
Att	ах	30 U	5 911	1 1115	YOW INH	2 Mode	Sweep			
20 dBm							1[1] cc Bw			2.83 dBi 52100 GH
10 dBm						0	M1	1	10.4399	42113 MH
0 dBm-			T	- Ann	mannen	haven	when	WT2		-
-10 dBn										
-20 dBn							2			
-30 dBn			mered		_					
Leenn	versions	rmadu					2		shuman	membering
40 dBn								1		
40 dBn					-		-	-	-	
-40 dBn -50 dBn	n						2			
-40 dBn -50 dBn -60 dBn	)									
-40 dBn -50 dBn -60 dBn -70 dBn	)				691;	ots			Span	40.0 MH:
-40 dBn -50 dBn -60 dBn -70 dBn CF 5.2 larker	GHz	~ 1					· · · ·			
40 dBn 50 dBn 60 dBn 70 dBn CF 5.2 Iarker Type	GHz	Trc	X-value	1.642	Y-value	Func	tion	Fun	Span action Result	
-40 dBn -50 dBn -60 dBn -70 dBn CF 5.2 Marker Type M1 T1 T2	GHz	<b>Trc</b> 1 1	X-value 5.2052 5.1917 5.2082	8 GHz		Func n n O	tion CC Bw	Fun	iction Result	40.0 MH2

Date: 15.OCT.2021 19:36:22



Date: 15.OCT.2021 20:26:26





99% & -26 dB Emission Bandwidth Test Model 802.11n-HT20 U-NII - 1 Frequency(MHz)

5180

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Ref Le Att	vel 2	26.00 dBr 30 d		) dB 🖶 RBW 300 ms 🖷 VBW 1	) kHz MHz	Mode	Sweep			
1Pk Ma	ĸ									
20 dBm-							1[1]			2.57 dB 760060 GH
10 dBm-				MI	-	0	CC BW	1	17.5976	584515 MH
0 dBm—	_		Time	maniference	Sund	m	ann mar			
-10 dBm-	_				-		-			
-20 dBm-	-				_				-	
-30 dBm-	-				_					
-40 dBm-	abur	entry			_		2		Marian	handra
50 dBm-										
-60 dBm-					_			_	-	
-70 dBm-	_							_	_	
CF 5.18	GHz			6	91 pts			1	Spar	40.0 MHz
larker										
Type M1	Ref	Trc 1	X-value 5.176006 G	Hz 2.57		Func	tion	Fu	nction Resul	t
T1 T2		1 1	5.1712012 G 5.1887988 G	Hz -3.57	dBm	0	CC BW		17.5976	84515 MHz
12	-	1	0.2007900 0	0119	Gent	1	suring			15.10.2021

Date: 15.OCT.2021 19:50:02

Att	30	dB 😑 SWT 🛛 100 m	s 🖶 VBW 1 MHz	Mode Auto Sw	reep	
1Pk Max						
20 dBm				M1[1]		5.39 dBr 5.1841100 GH 26.00 d
10 dBm				Boy		26.00 a 19.682000000 MH 263.
0 dBm		- Ann			n	203.
-10 dBm						
-20 dBm		T¥	_		12 12	
30. dBn	a house the sea	ne			Un	down when when
-40 dBm						
-50 dBm						
-60 dBm						
-70 dBm						
CF 5.18 GHz	!		691 pts			Span 40.0 MHz
Marker						
	Trc	X-value	Y-value	Function	Fund	tion Result
M1	1	5.18411 GHz	5.39 dBm	ndB down		19.682 MHz
T1	1	5.170101 GHz	-20.33 dBm	ndB		26.00 dB
T2	1	5.189783 GHz	-20.23 dBm	Q factor		263.4

Date: 15.OCT.2021 20:37:51





99% & -26 dB Emission Bandwidth Test Model 802.11n-HT20

U-NII - 1 Frequency(MHz)

5240



Att	evel	26.00 dBr 30 d		iB 🖷 RBW 300 kHz ns 🖷 VBW 1 MHz	Mode Sweep		
D1Pk M	ах		10 - 10 - 11	1997 - St.			
20 dBm	_				M1[1]		1.70 dB 5.2389580 GF
10 dBm					Occ Bw	i i	17.597684515 MH
to abiii				M1			
0 dBm-			Theresen		ad Augano	- TP	
-10 dBn							
-20 dBn	-						
-30 dBn	1	unner	when			t.	N. L.
-40 dBn	- Inter					~~~~	hunderson
10 001							
-50 dBn						+	
-60 dBn					-		
00 001	e						
-70 dBn							
CF 5.2	4 GHz			691 pt	s		Span 40.0 MHz
larker							
Туре	Ref	Trc	X-value	Y-value	Function	Fun	ction Result
M1	_	1	5.238958 GH: 5.2312012 GH:		Occ Bw		17.597684515 MHz
T1							

Date: 15.OCT.2021 19:51:35

Ref Level Att			dB      RBW 300 kH ms      VBW 1 MH		reep		
1Pk Max							
20 dBm				M1[1]		6.69 dBr 5.2372210 GH 26.00 d	
10 dBm		m	magaling,	Bw 		19.855000000 MH 263.	
0 dBm				Q I GLICH	$\uparrow$		
-10 dBm		ти			+2		
-20 dBm	01/347				Real Provide P	L	
30-d8maar	undrel	a the astron			way	plus under torston	
-40 dBm							
-50 dBm							
-60 dBm							
-70 dBm							
CF 5.24 GH	z		691 pt	ts		Span 40.0 MHz	
Marker	1 - 1	March 1	1	L E L	· ·		
Type Ref M1			Y-value     6.69 dBm	Function ndB down	Function Result 19.855 MH		
T1	1	5.229986 GH		ndB		26.00 dB	
	T1 1 5.229986 GHz T2 1 5.249841 GHz		22102.0011	nao	26.00 d		

Date: 15.OCT.2021 20:38:29

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Report No. ENS2108180105W00303R





99% & -26 dB Emission BandwidthU-NII - 1Test Model802.11ac(HT20)Frequency(MHz)5200

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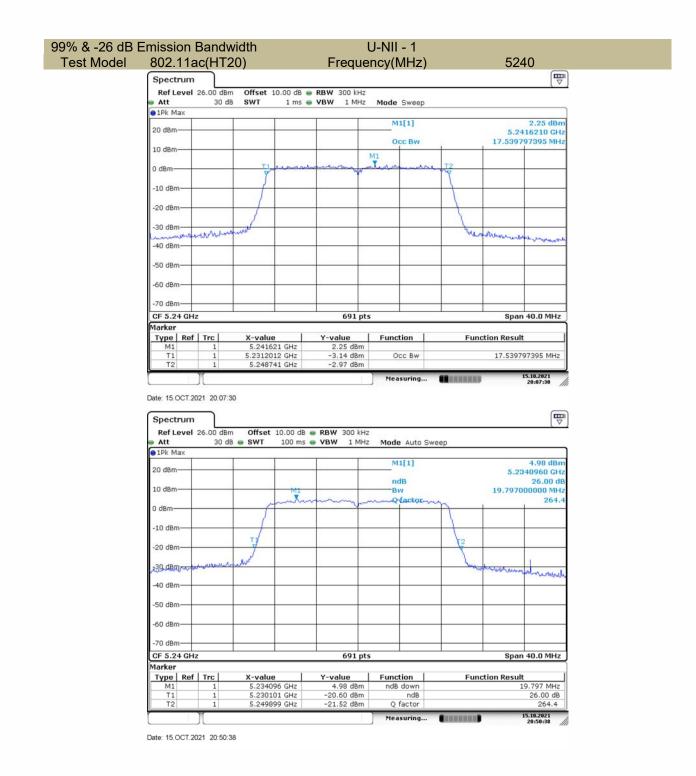
Att	el 26.00 dB 30 d		VBW 1 MHz	Mode	Sweep			
1Pk Max 20 dBm—					1[1]			2.19 dB 127790 GH
10 dBm—					C Bw	1	17.5976	84515 MH
) dBm		T1 montan	- Annon	M1	and and and			
-10 dBm—		Ĭ			-			
-20 dBm—							_	
-30 dBm—	anohom	mont			-	tw	monorm	mure
40 dBm-					-	-		
50 dBm—						-	+	
60 dBm—					-		-	
-70 dBm—						_	_	
CF 5.2 GH	Iz		691 pts				Span	40.0 MH
larker	ef   Trc	X-value	Y-value	Funct	11			
Type R M1	ef Trc	5.202779 GHz	2.19 dBm	Funct	ion	Fu	nction Result	
T1	1	5.1912012 GHz	-3.83 dBm	00	c Bw		17.5976	84515 MH
T2	1	5.2087988 GHz	-3.74 dBm					

Date: 15.OCT.2021 20:06:58

Att	30	dB 🗑 SWT 🛛 100 ms	VBW 1 MHz	Mode Auto Sw	еер	
1Pk Max						
20 dBm				M1[1]		4.72 dBr 5.2027210 GF
10 dBm				ndB MrBw		26.00 d 19.624000000 MH 265.
0 dBm			and the second		T	203.
-10 dBm						
-20 dBm					t2	
-30 dBm	and the states	where the second s			Your	Anton Margan herend
-40 dBm-						and a contraction
-50 dBm						
-60 dBm						
-70 dBm						
CF 5.2 GHz			691 pts			Span 40.0 MHz
larker						
Type   Ref	Trc	X-value	Y-value	Function	Fund	ction Result
M1	1	5.202721 GHz	4.72 dBm	ndB down		19.624 MHz
T1	1	5.190159 GHz	-21.20 dBm	ndB		26.00 dB
T2	1	5.209783 GHz	-21.13 dBm	Q factor		265.1

Date: 15.OCT.2021 20:50:15





99% & -26 dB Emission Bandwidth Test Model 802.11n-HT40 U-NII - 1 Frequency(MHz)

5190

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Ref Lev Att	el 26.0	00 dBm 30 dB			RBW 500 k		Mode Swee	р			
1Pk Ma>	S.,										
20 dBm-	-						M1[1]				4.66 dB
							Occ Bw				62952 MH
10 dBm—					-	-	MI		_	50.1210	02932 11
			Tim	m	umma		minum	min T2			
) dBm			pro			1º~		many	-		-
						1					
10 dBm-	-					+	-				-
00 40					0.0				()		
20 dBm-			1						1		
30 dBm-			In						Z		
30 dBm-	more	and a	W.						••	whenderwand	manun
40 dBm-						+					
50 dBm-						+					
60 dBm-						+					
-70 dBm-											
										0	
CF 5.19	GHZ				691	pts				Spar	n 80.0 MH
larker Type   I	Ref   Tr	- 1	X-value	1	Y-value	- 1	Function	1	Euro	tion Resul	
M1		1	5.19602	GHz	4.66 d	3m	Function		Func	cion Resul	ι
T1		1	5.171939		-0.52 di		Occ Bw			36.1215	62952 MH
T2		1	5.208061	GHz	0.09 di						

Date: 15.OCT.2021 20:01:38

Att	26.00 di 30		B 🖶 RBW 500 kHz s 🖶 VBW 2 MHz		reep	
1Pk Max						
20 dBm				M1[1]		7.87 dBr 5.194520 GH
10 dBm		- mm	manna .	M1 ndB Bw	Ln.	26.00 d 40.750000000 MH 127.
0 dBm			- Y	QIUCCUI	11	
-10 dBm		т			F2	
-20 dBm		7			1	
130 dBm	ing	ma			-	many vin
-40 dBm						
-50 dBm						
-60 dBm						
-70 dBm						
CF 5.19 GH	z		691 pts	5		Span 80.0 MHz
Marker						
	Trc	X-value	Y-value	Function	Funct	ion Result
M1 T1	1	5.19452 GHz	7.87 dBm	ndB down		40.75 MHz
		5.16974 GHz	-18.08 dBm	ndB		26.00 dB

Date: 15.OCT.2021 20:46:07