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## 1. TEST SUMMARY

### 1.1. Test Standards

The tests were performed according to following standards:

**FCC Part 15, Subpart E(15.407)** - for 802.11a/n/ac, the test procedure follows the FCC KDB 789033 D02 General UNII Test Procedures New Rules V02r01.

**ANSI C63.10-2013:** American National Standard for Testing Unlicensed Wireless Devices.

### 1.2. Report version

Revised No.	Date of issue	Description
01	Aug.19, 2020	Original

### 1.3. Test Description

FCC Part 15 Subpart E(15.407)			
Test Item	Test require	Result	Test Engineer
Antenna Requirement	15.203	Pass	Rory Huang
Conducted Emission	15.207	Pass	Rory Huang
Band Edge Emissions	15.407(b)	Pass	Rory Huang
26dB Bandwidth & 99% Bandwidth	15.407(a)	Pass	Rory Huang
6dB Bandwidth (only for UNII-3)	15.407(e)	Pass	Rory Huang
Maximum Conducted Output Power	15.407(a)	Pass	Rory Huang
Maximum Power Spectral Density	15.407(a)	Pass	Rory Huang
Transmitter Radiated Spurious Emission	15.407(b)	Pass	Rory Huang
Peak Excursion	15.407(a)	Pass	Rory Huang
Frequency Stability	15.407(g)	Pass	Rory Huang
Transmitter Power Control	15.407(h)(1)	N/A	N/A

Note:

- 1.The measurement uncertainty is not included in the test result.
2. Transmit Power Control was not tested as the maximum EIRP is less than 500mW (27dBm) in U-NII Bands 2&3.
3. "N/A" is an abbreviation for "Not Applicable".

## 1.4. Test Facility

### Address of the report laboratory

**KSIGN(Guangdong) Testing Co., Ltd.**

West Side of 1/F., Building C, Zone A, Fuyuan New Factory, Jiujiu Industrial Park, Minzhu, Shatou, Shajing, Bao'an District, Shenzhen, Guangdong, People's Republic of China

### Laboratory accreditation

The test facility is recognized, certified, or accredited by the following organizations:

#### **CNAS-Lab Code: L13261**

KSIGN(Guangdong) Testing Co., Ltd. has been assessed and proved to be in Compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2017 General Requirements) for the Competence of Testing and Calibration Laboratories.

#### **A2LA-Lab Cert. No.: 5457.01**

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

#### **IC Registration No.: CN0096**

The 3m alternate test site of KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration NO.: CN0096

#### **FCC-Registration No.: CN1272**

KSIGN(Guangdong) Testing Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files.

## 1.5. Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM);Uncertainties in the measurement of mobile radio equipment characteristics; Part 2 " and is documented in the KSIGN(Guangdong) Testing Co., Ltd. system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device. Below is the best measurement capability for KSIGN(Guangdong) Testing Co., Ltd.

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.42 dB	(1)
Transmitter power Radiated	2.14 dB	(1)
Conducted spurious emissions 9kHz~40GHz	1.60 dB	(1)
Radiated spurious emissions 9kHz~40GHz	2.20 dB	(1)
Conducted Emissions 9kHz~30MHz	3.20 dB	(1)
Radiated Emissions 30~1000MHz	4.70 dB	(1)
Radiated Emissions 1~18GHz	5.00 dB	(1)
Radiated Emissions 18~40GHz	5.54 dB	(1)
Occupied Bandwidth	2.80 dB	(1)

**Note (1):** This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of  $k=1.96$ .

## 1.6. Environmental conditions

<b>Normal Condition</b>	Temperature	15 °C to +35 °C
	Relative humidity	20 % to 75 %.
	Voltage	The equipment shall be the nominal voltage for which the equipment was designed.
<b>Extreme Condition</b>	Temperature	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer
	Voltage	Measurements shall be made over the extremes of the operating temperature range as declared by the manufacturer

<b>Normal Condition</b>	$T_N$ =Normal Temperature	25 °C
<b>Extreme Condition</b>	$T_L$ =Lower Temperature	-20 °C
	$T_H$ =Higher Temperature	50 °C

## 2. GENERAL INFORMATION

### 2.1. General Description of EUT

Product Name:	360Anywhere
Trademark:	/
Model/Type reference:	PF1360
Listed Model(s):	PF1363
Model Different:	The difference between product models only depends on the model naming is different for the marketing requirement. Other power supply methods, interior structure, electrical circuits and key components are the same, which do not affect the safety and electromagnetic compatibility performance.
Power Supply:	MODEL: FY1264000 INPUT: 100-240V~ 50/60Hz 1.1A 110VA OUTPUT: 12.6V---4A
Power Supply (Li-ion Battery Pack):	Model: 186502P2S 50.32Wh Capacity: 6.8Ah 200402 Nominal Voltage: 7.4V Charging Voltage: 8.4V
Hardware version:	V120
Software version:	0.12.7

Technical index for 5GHz WIFI					
Operation Band:	<input type="checkbox"/> U-NII-1		<input type="checkbox"/> U-NII-2A		<input type="checkbox"/> U-NII-2C
Operation Frequency Range:	U-NII-1:		5150MHz~5250MHz		
	U-NII-2A:		5250MHz~5350MHz		
	U-NII-2C:		5470MHz~5725MHz		
	U-NII-3:		5725MHz~5850MHz		
Support bandwidth:	802.11a	<input checked="" type="checkbox"/> 20MHz			
	802.11n	<input checked="" type="checkbox"/> 20MHz	<input checked="" type="checkbox"/> 40MHz		
	802.11ac	<input type="checkbox"/> 20MHz	<input type="checkbox"/> 40MHz	<input type="checkbox"/> 80MHz	<input type="checkbox"/> 160MHz
Modulation:	802.11a: OFDM (QPSK, BPSK, 16QAM, 64QAM) 802.11n: OFDM (QPSK, BPSK, 16QAM, 64QAM)				
Bit Rate of Transmitter:	802.11a: 6/9/12/18/24/36/48/54 Mbps 802.11n: up to 150Mbps				
Max Peak Output Power:	802.11a: 8.00dBm 802.11n (HT20): -0.26dBm 802.11n (HT40): -4.65dBm				
Antenna type:	Internal Antenna				
Antenna gain:	1.5dBi				

## 2.2. Operation state

### ➤ Frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

Band	Test Channel	20MHz		40MHz	
		Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	CH <sub>L</sub>	149	5745	151	5755
	CH <sub>M</sub>	157	5785	-	-
	CH <sub>H</sub>	165	5825	159	5795

### ➤ Data Rated

Preliminary tests were performed in different data rate, and found which the below bit rate is worst case mode, so only show data which it is a worst case mode.

Mode	Data rate (worst mode)
802.11a	6Mbps
802.11n(HT20)	MCS0
802.11n(HT40)	MCS0

### ➤ Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For Radiated spurious emissions test item:
The engineering test program was provided and enabled to make EUT continuous transmit(duty cycle>98%). The EUT in each of three orthogonal axis emissions had been tested, but only the worst case (X axis) data Recorded in the report.

## 2.3. Measurement Instruments List

Tonscend JS0806-2 Test system					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	Spectrum Analyzer	R&S	FSV40-N	101798	04/07/2021
2	Vector Signal Generator	Agilent	N5182A	MY50142520	04/07/2021
3	Analog Signal Generator	HP	83752A	3344A00337	04/07/2021
4	Power Sensor	Agilent	E9304A	MY50390009	04/07/2021
5	Power Sensor	Agilent	E9300A	MY41498315	04/07/2021
6	Wideband Radio Communication Tester	R&S	CMW500	157282	04/07/2021
7	Climate Chamber	Angul	AGNH80L	1903042120	04/07/2021
8	Dual Output DC Power Supply	Agilent	E3646A	MY40009992	04/07/2021
9	RF Control Unit	Tonscend	JS0806-2	/	04/07/2021

Transmitter spurious emissions & Receiver spurious emissions					
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	EMI Test Receiver	R&S	ESR	102525	04/07/2021
2	High Pass Filter	Chengdu E-Microwave	OHF-3-18-S	0E01901038	03/27/2021
3	High Pass Filter	Chengdu E-Microwave	OHF-6.5-18-S	0E01901039	03/27/2021
4	Spectrum Analyzer	HP	8593E	3831U02087	04/07/2021
5	Ultra-Broadband logarithmic period Antenna	Schwarzbeck	VULB 9163	01230	03/29/2023
6	Loop Antenna	Beijin ZHINAN	ZN30900C	18050	03/25/2021
7	Spectrum Analyzer	R&S	FSV40-N	101798	04/07/2021
8	Horn Antenna	Schwarzbeck	BBHA 9120 D	2023	03/29/2023
9	Pre-Amplifier	Schwarzbeck	BBV 9745	9745#129	04/07/2021
10	Pre-Amplifier	EMCI	EMC051835SE	980662	04/07/2021

Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal. Until
1	LISN	R&S	ENV432	1326.6105.02	03/27/2021
2	EMI Test Receiver	R&S	ESR	102524	04/07/2021
3	Manual RF Switch	JS TOYO	/	MSW-01/002	04/07/2021

Note:

- 1)The Cal. Interval was one year.
- 2)The cable loss has calculated in test result which connection between each test instruments.

## 2.4. Test Software

Software name	Model	Version
Conducted emission Measurement Software	EZ-EMC	EMC-Con 3A1.1
Radiated emission Measurement Software	EZ-EMC	FA-03A.2.RE
Bluetooth and WIFI Test System	JS1120-3	2.577.0418

### 3. TEST ITEM AND RESULTS

#### 3.1. Antenna Requirement

##### Standard Requirement

###### **FCC CFR Title 47 Part 15 Subpart C Section 15.203:**

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

##### Test Result

The directional gain of the antenna less than 6dBi, please refer to the EUT internal photographs antenna photo.

Note: This antenna can be removed from the EUT

## 3.2. Conducted Emission

### Limit

#### FCC CFR Title 47 Part 15 Subpart C Section 15.207:

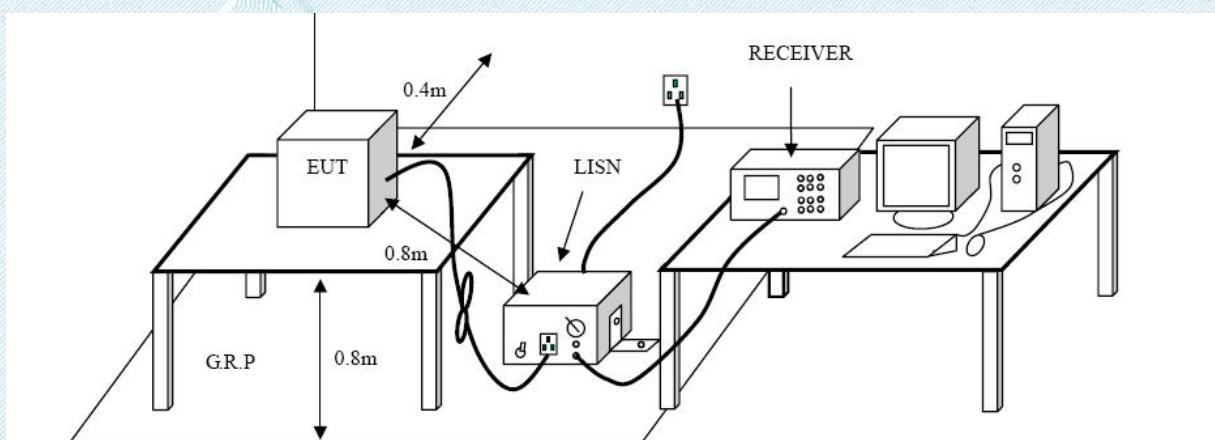
##### Conducted Emission Test Limit

Frequency	Maximum RF Line Voltage (dB $\mu$ V)	
	Quasi-peak Level	Average Level
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *
500kHz~5MHz	56	46
5MHz~30MHz	60	50

Notes:

- (1) \*Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

### Test Configuration



### Test Procedure

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
4. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
5. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
6. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
7. During the above scans, the emissions were maximized by cable manipulation.

### Test Mode

Please refer to the clause 2.2.

### Test Results

Pre-scan 802.11a/n(HT20/HT40)modulation, and found the 802.11a modulation 5745MHz which it is worse case, so only show the test data for worse case.

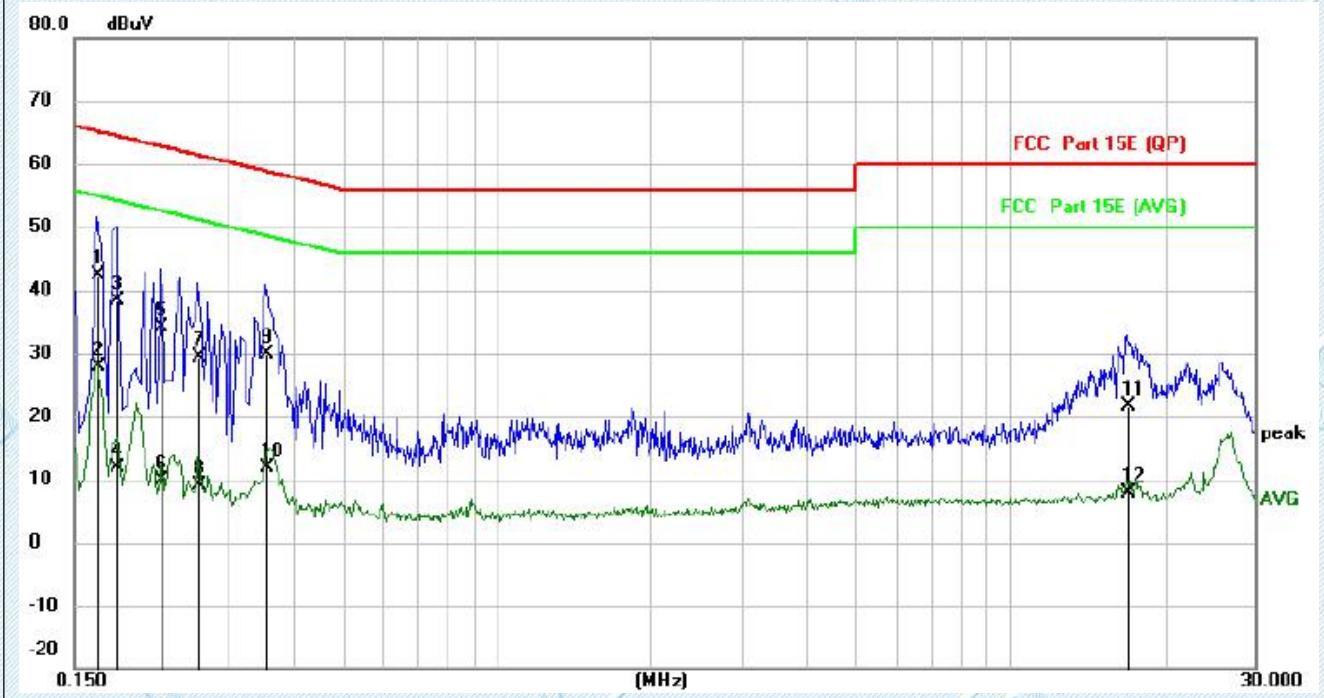
<b>Test Voltage:</b>	AC 120V/60 Hz						
<b>Terminal:</b>	Line						
<b>Test Mode:</b>	Charging+WIFI						
<b>80.0</b>	<b>dBuV</b>						
70							
60							
50							
40							
30							
20							
10							
-10							
-20							
0.150	<b>(MHz)</b>						
30.000							
<b>No.</b>	<b>Mk.</b>	<b>Freq.</b>	<b>Reading Level</b>	<b>Correct Factor</b>	<b>Measure-ment</b>	<b>Limit</b>	<b>Over</b>
		MHz	dBuV	dB	dBuV	dBuV	dB
1	*	0.1660	30.89	10.84	41.73	65.16	-23.43
2		0.1660	17.06	10.84	27.90	55.16	-27.26
3		0.1780	29.52	10.86	40.38	64.58	-24.20
4		0.1780	2.37	10.86	13.23	54.58	-41.35
5		0.1940	26.84	10.87	37.71	63.86	-26.15
6		0.1940	7.49	10.87	18.36	53.86	-35.50
7		0.2140	24.73	10.88	35.61	63.05	-27.44
8		0.2140	0.50	10.88	11.38	53.05	-41.67
9		0.2540	19.24	10.88	30.12	61.63	-31.51
10		0.2540	-2.58	10.88	8.30	51.63	-43.33
11		0.3620	21.13	10.89	32.02	58.68	-26.66
12		0.3620	4.23	10.89	15.12	48.68	-33.56

Remarks:

1. Measurement = Reading Level + Correct Factor

2. Over = Measurement - Limit

<b>Test Voltage:</b>	AC 120V/60 Hz
<b>Terminal:</b>	Neutral
<b>Test Mode:</b>	Charging+WIFI



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Detector
			Level	Factor	ment			
		MHz	dBuV	dB	dBuV	dBuV	dB	
1	*	0.1660	31.47	10.84	42.31	65.16	-22.85	QP
2		0.1660	16.96	10.84	27.80	55.16	-27.36	AVG
3		0.1819	27.62	10.87	38.49	64.40	-25.91	QP
4		0.1819	1.09	10.87	11.96	54.40	-42.44	AVG
5		0.2220	23.14	10.87	34.01	62.74	-28.73	QP
6		0.2220	-1.09	10.87	9.78	52.74	-42.96	AVG
7		0.2620	18.40	10.86	29.26	61.37	-32.11	QP
8		0.2620	-1.68	10.86	9.18	51.37	-42.19	AVG
9		0.3540	19.03	10.86	29.89	58.87	-28.98	QP
10		0.3540	1.11	10.86	11.97	48.87	-36.90	AVG
11		16.8700	10.61	11.01	21.62	60.00	-38.38	QP
12		16.8700	-3.09	11.01	7.92	50.00	-42.08	AVG

## Remarks:

1. Measurement = Reading Level+ Correct Factor
2. Over = Measurement -Limit

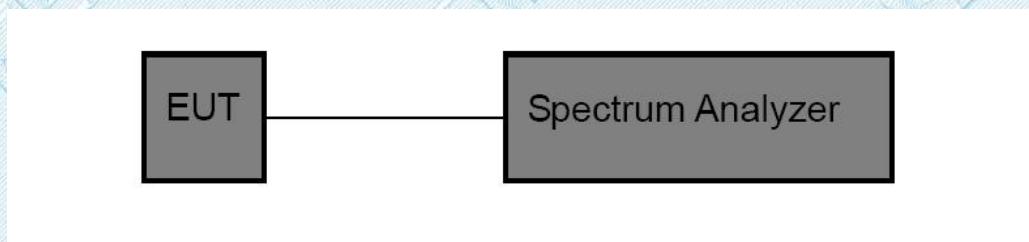
### 3.3. 26dB Bandwidth and 99% Occupied Bandwidth Test

#### Limit

The bandwidth at 26dB down from the highest in-band spectral density is measured with a spectrum analyzer connected to the antenna terminal while the EUT is operating at its maximum duty cycle, at its maximum power control level, as defined in KDB 789033 D02, and at the appropriate frequencies. The spectrum analyzer's bandwidth measurement function is configured to measure the 26dB bandwidth.

FCC Part 15 Subpart C(15.407)		
Test Item	Limit	Frequency Range (MHz)
26 dB Bandwidth	N/A	5150~5250
		5250~5350
		5470~5725
6 dB Bandwidth	>500kHz	5725~5850

#### Test Configuration



#### Test Procedure

1. According KDB 789033 D02 – Section C
2. Connect the antenna port(s) to the spectrum analyzer input.
3. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).  
Center Frequency = Channel center frequency  
Span=2 x emission bandwidth  
RBW = 1% to 5% of the emission bandwidth  
VBW>3 x RBW  
Sweep time= auto couple  
Detector = Peak  
Trace mode = max hold
4. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
5. Measure the maximum width of the emission that is 26 dB down from the maximum of the emission, and use the 99 % power bandwidth function of the instrument

**The setting of the spectrum analyser as below:**

<b>6dB Bandwidth Test</b>	
<b>Spectrum Parameters</b>	<b>Setting</b>
Attenuation	Auto
Span	>6 dB Bandwidth
RBW	100 kHz
VBW	VBW>=3*RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
<b>26dB Bandwidth Test</b>	
<b>Spectrum Parameters</b>	<b>Setting</b>
Attenuation	Auto
Span	>26 dB Bandwidth
RBW	Approximately 1% of the emission bandwidth
VBW	VBW>RBW
Detector	Peak
Trace	Max Hold
Sweep Time	Auto
<b>99% Occupied Bandwidth Test</b>	
<b>Spectrum Parameters</b>	<b>Setting</b>
Attenuation	Auto
RBW	1% to 5% of the OBW
VBW	≥ 3RBW
Detector	Peak
Trace	Max Hold

NOTE: The EUT was set to continuously transmitting in each mode and low, Middle and high channel for the test.

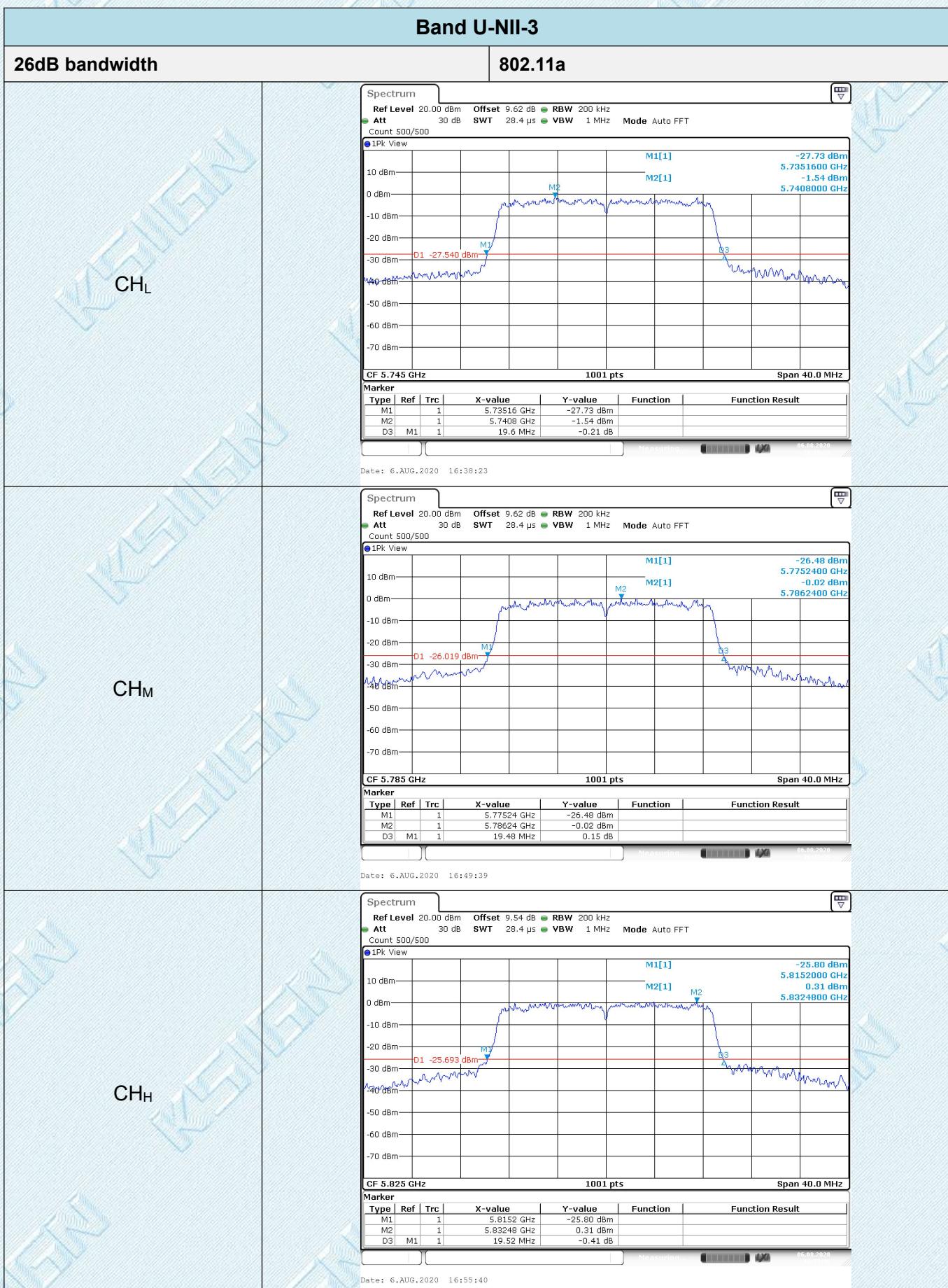
#### **Test Mode**

Please refer to the clause 2.2.

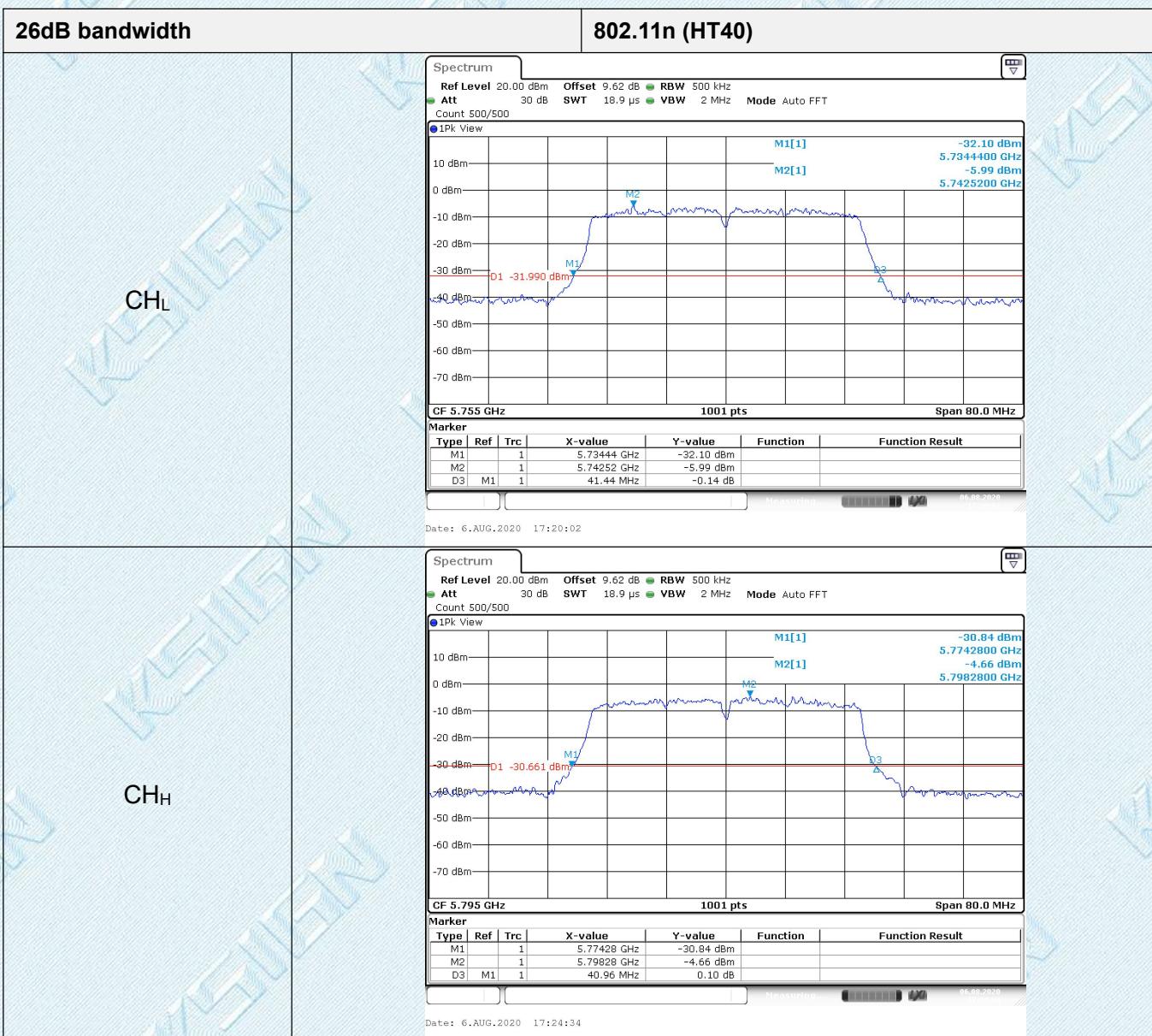
#### **Test Results**

Band	Test Mode	Channel	26dB Bandwidth [MHz]	99% Occupied bandwidth (MHz)	Result
U-NII-3	802.11a	CH <sub>L</sub>	19.600	17.662	Pass
		CH <sub>M</sub>	19.480	17.702	Pass
		CH <sub>H</sub>	19.520	17.662	Pass
	802.11n(HT20)	CH <sub>L</sub>	19.480	17.782	Pass
		CH <sub>M</sub>	19.520	17.822	Pass
		CH <sub>H</sub>	19.440	17.742	Pass
	802.11n(HT40)	CH <sub>L</sub>	41.440	36.124	Pass
		CH <sub>H</sub>	40.960	36.523	Pass

Band	Test Mode	Channel	6dB Bandwidth [MHz]	Result
U-NII-3	802.11a	CH <sub>L</sub>	17.640	Pass
		CH <sub>M</sub>	17.400	Pass
		CH <sub>H</sub>	17.400	Pass
	802.11n(HT20)	CH <sub>L</sub>	17.640	Pass
		CH <sub>M</sub>	17.640	Pass
		CH <sub>H</sub>	17.400	Pass
	802.11n(HT40)	CH <sub>L</sub>	35.360	Pass
		CH <sub>H</sub>	35.360	Pass





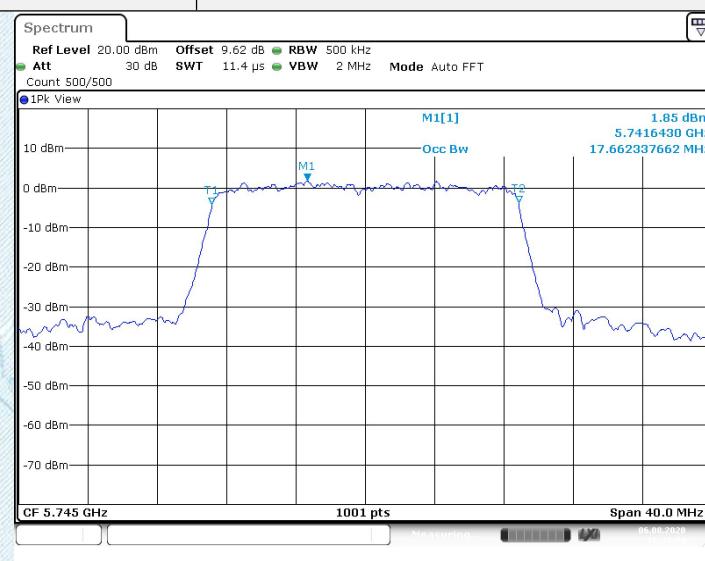


## Band U-NII-3

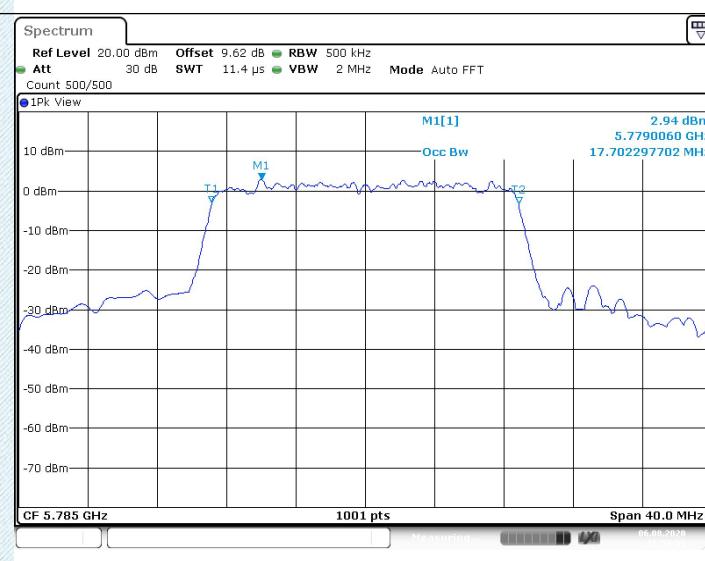
99% Occupied bandwidth

802.11a

CHL



CHM



CHH

