

FCC Test Report

Report No.: AGC00210210705FE07

FCC ID : 2AVUHVA-SP003

APPLICATION PURPOSE : Original Equipment

PRODUCT DESIGNATION: VAVA Chroma 4K UST Triple Laser Projector

BRAND NAME : VAVA

MODEL NAME : VA-SP003

APPLICANT Shenzhen NearbyExpress Technology Development

Company Limited

DATE OF ISSUE : May 06, 2022

STANDARD(S) : FCC Part 15.407 **TEST PROCEDURE(S)** : KDB 905462 D02

REPORT VERSION : V1.0

Attestation of Global Compliance (Shenzhen) Co., Ltd





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Report Revise Record

Report Version	Revise Time	Issued Date	Valid Version	Notes
V1.0	/	May 06, 2022	Valid	Initial Release

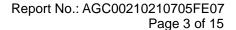
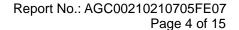




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1. VERIFICATION OF CONFORMITY

pplicant Shenzhen NearbyExpress Technology Development Company Limited	
Room 701, 702, 703, 705, 706, 708, 709, Building E, Galaxy World F Minle Community, Minzhi Street, Longhua District, Shenzhen, Guang China 518000	
Manufacturer	Shenzhen NearbyExpress Technology Development Company Limited
Address Room 701, 702, 703, 705, 706, 708, 709, Building E, Galaxy World F Minle Community, Minzhi Street, Longhua District, Shenzhen, Guang China 518000	
Factory	Appotronics Co., Ltd Bao'an Branch
Address	301, 1 Block &101 and 301, 3 Block, Yaochuan Industrial Park, Tangwei Community, Fuhai Subdistrict, Bao'an District, Shenzhen, Guangdong, P.R.China
Product Designation VAVA Chroma 4K UST Triple Laser Projector	
Brand Name	VAVA
Test Model	VA-SP003
Date of test	Jul. 19, 2021 to May 06, 2022
Deviation	No any deviation from the test method
Condition of Test Sample	Normal
Test Result	Pass
Report Template	AGCRT-US-BGN/RF

We hereby certify that:

The above equipment was tested by Attestation of Global Compliance (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 KDB 905462 D02.

Prepared By	Cool cheng	
	Cool Cheng (Project Engineer)	May 06, 2022
Reviewed By	Calin Lin	1
	Calvin Liu (Reviewer)	May 06, 2022
Approved By	Max Zhang	
	Max Zhang (Authorized Officer)	May 06, 2022



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2. GENERAL INFORMATION

The EUT is designed as "USB WiFi Adapter". It is designed by way of utilizing the OFDM technology to achieve the system operation.

Equipment Type	☐ Outdoor access points ☐ Indoor access points			
Equipment Type	☐ Fixed P2P access points ☐ Client devices			
Operation Frequency	☑ U-NII 1:5150MHz~5250MHz ☑ U-NII 2A: 5250MHz~5350MHz			
	☑ U-NII 2C:5470MHz~5725MHz ☑ U-NII 3: 5725MHz~5850MHz			
DFS Design Type	☐ Master ☐ Slave with radar detection ☐ Slave without radar detection			
TPC Function	☐ Yes			
	For 802.11a/n-HT20/ac-VHT20: 5180~5240MHz, 5260~5320MHz,			
	5500~5720MHz, 5745~5825MHz			
Test Frequency Range:	For 802.11n-HT40/ac-VHT40: 5190~5230MHz, 5270~5310MHz,			
	5510~5710MHz, 5755~5795MHz			
	For 802.11ac-VHT80: 5210MHz, 5290MHz, 5530~5610MHz,5775MHz			
	IEEE 802.11a:13.78dBm; IEEE 802.11n-HT20:13.43dBm;			
Output Power	IEEE 802.11n-HT40:13.54dBm; IEEE 802.11ac-VHT20:13.89dBm;			
	IEEE 802.11ac-VHT40:13.93dBm; IEEE 802.11ac-VHT80:13.97dBm			
	IEEE 802.11n-HT20:16.37dBm;IEEE 802.11n-HT40:16.37dBm;			
Output Power_MIMO	IEEE 802.11ac-VHT20:16.85dBm;IEEE 802.11ac-VHT40:16.74dBm;			
	IEEE 802.11ac-VHT80:16.66dBm			
Modulation	802.11a/n:(64-QAM, 16-QAM, QPSK, BPSK) OFDM			
Woddiation	802.11ac :(256-QAM, 64-QAM, 16-QAM, QPSK, BPSK) OFDM			
	802.11a: 6/9/12/18/24/36/48/54Mbps			
Data Rate	802.11n: up to 300Mbps			
	802.11ac: up to 400Mbps			
	7 channels of U-NII-1 Band			
Number of channels	7 channels of U-NII-2A Band			
Number of Charmers	21 channels of U-NII-2C Band			
	8 channels of U-NII-3 Band			
Hardware Version	VER:1.0			
Software Version	V1.0			
Antenna Designation	Dipole Balun Antenna (Comply with requirements of the FCC part 15.203)			
Number of transmit chain	2(802.a/11n/ac all used two antennas, but 802.11a support SISO and			
Number of transmit Chain	802.11n/ac support MIMO)			
Antonno Coin	Antenna 1: 3.33dBi			
Antenna Gain	Antenna 2: 3.16dBi			
Power Supply	AC 100-240V, 4A, 50/60Hz			
Test Voltage	AC 120V/60Hz			



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Note:

- 1. This device does not support radar monitoring.
- 2. The signal loading method between the client device and the Master device is TCP technology.
- 3. Distribution of start-up time of Master device and client device:

Equipment	Boot time(s)	
Passive device(client)	10s	
Active device(master)	40s	



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3. DESCRIPTION OF TEST MODES

The tests in this section are run sequentially and the UUT must pass all tests successfully.

If the UUT fails any one of the tests it will count as a failure of compliance.

To show compliance, all tests must be performed with waveforms randomly generated as specified with test results meeting the required percentage of successful detection criteria.

One frequency will be chosen from the operating Channels of the UUT within the 5250-5350 MHz or 5470-5725 MHz bands.

4. SUMMARY OF TEST RESULTS

FCC RULES	DESCRIPTION OF TEST	RESULT
§15.407(h)(2)	Dynamic Frequency Selection Channel Move Time and Channel Closing Transmission Time	Compliant

5. TEST FACILITY

Test Site	Attestation of Global Compliance (Shenzhen) Co., Ltd
Location 1-2/F, Building 19, Junfeng Industrial Park, Chongqing Road, Heping Com Fuhai Street, Bao'an District, Shenzhen, Guangdong, China	
Designation Number	CN1259
FCC Test Firm Registration Number	975832
A2LA Cert. No.	5054.02
Description	Attestation of Global Compliance(Shenzhen) Co., Ltd is accredited by A2LA

Description	Manufacturer	Model No.	S/N	Calibration Due.	Calibration Due.
MXG X-Series Vector Signal Generator	Agilent	N5182B	MY53050647	Aug. 18, 2021	Aug. 17, 2022
EXA Signal Analyzer	Agilent	N9020A	MY49100060	Aug. 18, 2021	Aug. 17, 2022
Attenuator	ZHINAN	E-002	N/A	Sep. 03, 2020	Sep. 02, 2022
Power spliter	Mini-Circuits	ZFRSC-183-s	3122	N/A	N/A
RF Cable	Harbour	SHWCB-3000-N	N/A	May 15, 2020	May 14, 2022
DFS waveform Generator software	Keysight	N7607C V2.0.0.0	N/A	N/A	N/A
DFS data Analyzer software	Tonscend	JS1120-2	N/A	N/A	N/A
AP(Master)	ZTE	ZXHN F670	N/A	N/A	N/A

FCC ID of AP(Master): Q78-ZXHNF670E



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6. DYNAMIC FREQUENCY SELECTION (DFS)

6.1. APPLICABILITY OF DFS REQUIREMENTS

Table 1: Applicability of DFS Requirements Prior to Use of a Channel

	Operational Mode			
Requirement	□Master	⊠Client Without Radar	☐Client With Radar	
		Detection	Detection	
Non-Occupancy Period	Yes	Not required	Yes	
DFS Detection Threshold	Yes	Not required	Yes	
Channel Availability Check Time	Yes	Not required	Not required	
U-NII Detection Bandwidth	Yes	Not required	Yes	

Table 2: Applicability of DFS requirements during normal operation

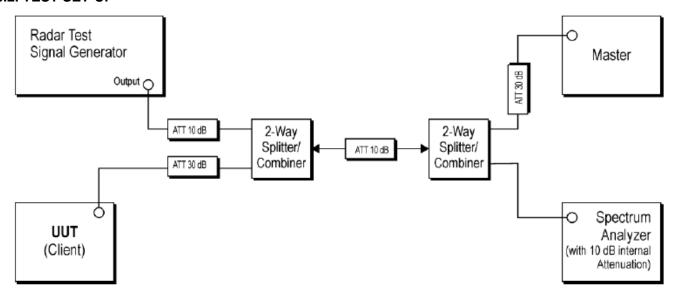
	Operational Mode		
Requirement	☐Master Device or Client with	⊠Client Without Radar	
	Radar Detection	Detection	
DFS Detection Threshold	Yes	Not required	
Channel Closing Transmission Time	Yes	Yes	
Channel Move Time	Yes	Yes	
U-NII Detection Bandwidth	Yes	Not required	

Additional requirements for devices	☐Master Device or Client with	⊠Client Without Radar	
with multiple bandwidth modes	Radar Detection	Detection	
U-NII Detection Bandwidth and	All BW modes must be tested	Not required	
Statistical Performance Check			
Channel Move Time and Channel	Test using widest BW mode	Test using the widest BW mode	
Closing Transmission Time	available	available for the link	
All other tests	Any single BW mode	Not required	

Note: Frequencies selected for statistical performance check (Section 7.8.4) should include several frequencies within the radar detection bandwidth and frequencies near the edge of the radar detection bandwidth. For 802.11 devices it is suggested to select frequencies in each of the bonded 20 MHz channels and the channel center frequency.



6.2. TEST SET-UP



6.3. LIMITS

Table 3: DFS Detection Thresholds for Master Devices and Client Devices with Radar Detection

Maximum Transmit Power	Value (See Notes 1, 2, and 3)	
EIRP ≥ 200 milliwatt	-64 dBm	
EIRP < 200 milliwatt and	CO JD	
power spectral density < 10 dBm/MHz	-62 dBm	
EIRP < 200 milliwatt that do not meet the power	0.4 dD	
spectral density requirement	-64 dBm	

Note 1: This is the level at the input of the receiver assuming a 0 dBi receive antenna.

Note 2: Throughout these test procedures an additional 1 dB has been added to the amplitude of the test transmission waveforms to account for variations in measurement equipment. This will ensure that the test signal is at or above the detection threshold level to trigger a DFS response.

Note3: EIRP is based on the highest antenna gain. For MIMO devices refer to KDB Publication 662911 D01.



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Table 4: DFS Response Requirement Values

Parameter	Value	
Non-occupancy period	Minimum 30 minutes	
Channel Availability Check Time	60 seconds	
Olas AM as Taxa	10 seconds	
Channel Move Time	See Note 1.	
	200 milliseconds + an	
	aggregate of 60	
Channel Closing Transmission Time	milliseconds over remaining	
	10 second period.	
	See Notes 1 and 2.	
	Minimum 100% of the U-	
U-NII Detection Bandwidth	NII 99% transmission power bandwidth.	
	See Note 3.	

Note 1: Channel Move Time and the Channel Closing Transmission Time should be performed with Radar Type 0. The measurement timing begins at the end of the Radar Type 0 burst.

Note 2: The Channel Closing Transmission Time is comprised of 200 milliseconds starting at the beginning of the Channel Move Time plus any additional intermittent control signals required to facilitate a Channel move (an aggregate of 60 milliseconds) during the remainder of the 10 second period. The aggregate duration of control signals will not count quiet periods in between transmissions.

Note 3: During the U-NII Detection Bandwidth detection test, radar type 0 should be used. For each frequency step the minimum percentage of detection is 90 percent. Measurements are performed with no data traffic.



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6.4. RADAR TEST WAVEFORMS

Radar	Pulse Width	PRI	Number of Pulses	Minimum	Minimum
Туре	(µsec)	(µsec)		Percentage of	Number of
				Successful	Trials
				Detection	
0	1	1428	18	See Note 1	See Note 1

6.5. TEST PROCEDURE

- 1. When a Client Device without Radar Detection is the UUT, the Master Device is the Radar Detection Device.
- 2. A spectrum analyzer is used to establish the test signal level for each radar type.
- 3. During this process, there are no transmissions by either the Master Device or Client Device.
- 4. The spectrum analyzer is switched to the zero span (time domain) mode at the frequency of the Radar Waveform generator. The peak detector function of the spectrum analyzer is utilized. The spectrum analyzer resolution bandwidth (RBW) and video bandwidth (VBW) are set to at least 3 MHz.
- 5. The measured channels are 5530MHz in 80MHz Bandwidth and 5290MHz in 80MHz Bandwidth. The Radar signal was the same as transmitted channels, and injected into the antenna port of AP(master) ,measured the DFS parameters. The master transmitted the test data to client, the transmitted duty cycle is 30.8%.

6.6. TEST RESULT

6.6.1 DFS DETECTION THRESHOLD

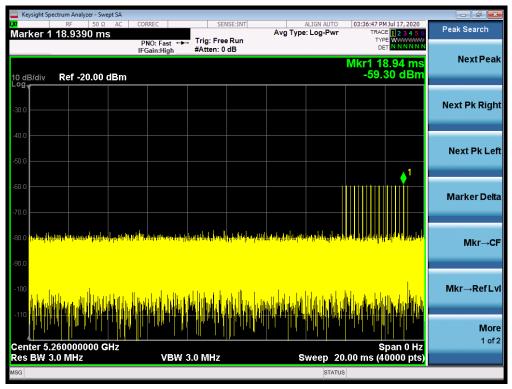
Calibration:

For a detection threshold level of -64dBm and the antenna gain is 5dBi, required detection threshold is -59 dBm (= -64+5).

Note: Maximum Transmit Power is greater than 200 milliwatt in this report, so detection threshold level is -64dBm.



Radar Type 0



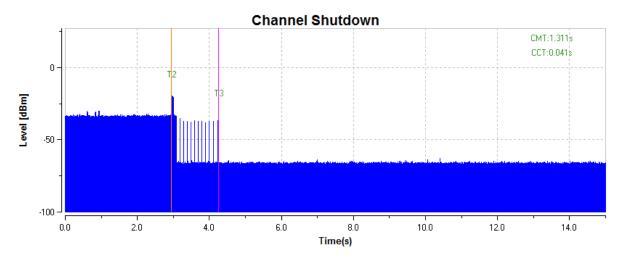
6.6.2TEST RESULT

Channel Move Time and Channel Closing Transmission Time

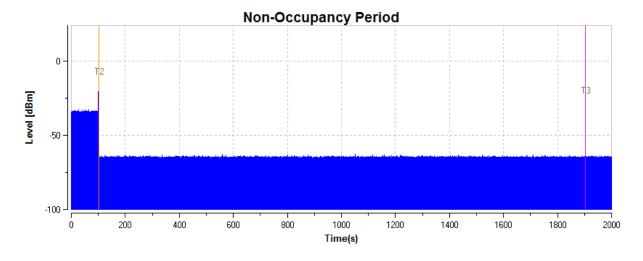
Test Frequency	Requirement	Measurement Level	Limit
EE20MU-	Channel Closing Transmission Time	1.311s	≤10s
5530MHz	Channel Move Time	0.041s	≤0.26s
E200MLI=	Channel Closing Transmission Time	1.069s	≤10s
5290MHz	Channel Move Time	0.009s	≤0.26s



Radar Type 0(20MHz/5530MHz)

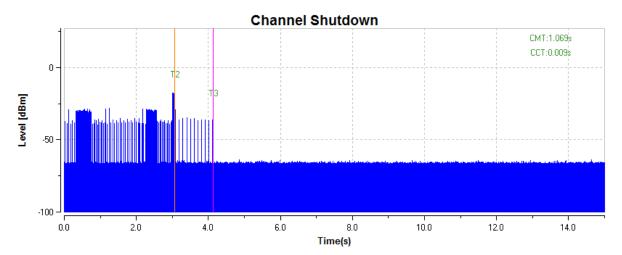


Non-occupancy Period-Elapse time 30minutes

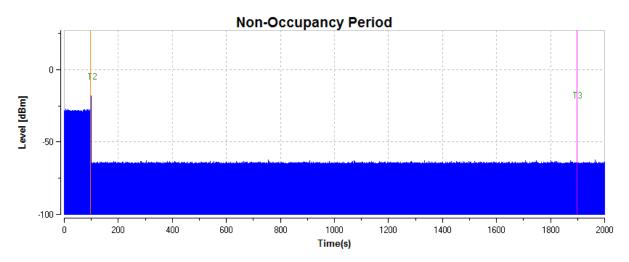




Radar Type 0(20MHz/5290MHz)



Non-occupancy Period-Elapse time 30minutes



RESULT: PASS



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APPENDIX A: PHOTOGRAPHS OF TEST SETUP

Refer to the Report No.: AGC00210210705AP02

APPENDIX B: PHOTOGRAPHS OF EUT

Refer to the Report No.: AGC00210210705AP04

----END OF REPORT----



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