

# APPLICATION CERTIFICATION FCC Part 15C On Behalf of Hunan GM Innovation Technology Co., Ltd

Vaxis wireless video system Model No.: Vaxis Storm3000, Vaxis Storm3000 DV, Vaxis Storm3000 DG, Vaxis Storm5000, Vaxis Storm2000, Vaxis Storm2000+, Vaxis Storm1000+

### FCC ID: 2AJOF-3000

Address : No	unan GM Innovation Technology Co., Ltd. o 46, Jiefang East Road, Furong District, Changsha City, unan Province, China
Address : 1/. & P.	nenzhen Accurate Technology Co., Ltd. F., Building A, Changyuan New Material Port, Science Industry Park, Nanshan District, Shenzhen, Guangdong, R. China el: (0755) 26503290 ax: (0755) 26503396

Report No.	:	ATE20190671
Date of Test	:	May 15-May 16, 2019
Date of Report	:	May 17, 2019



# TABLE OF CONTENTS

Description

Т	est R	eport Certification	
1.	GE	ENERAL INFORMATION	5
	1.1.	Description of Device (EUT)	5
	1.2.	Special Accessory and Auxiliary Equipment	
	1.3.	Description of Test Facility	
	1.4.	Measurement Uncertainty	6
2.	M	EASURING DEVICE AND TEST EQUIPMENT	6
3.	OF	PERATION OF EUT DURING TESTING	8
	3.1.	Operating Mode	
	3.2.	Configuration and peripherals	
4.	TE	CST PROCEDURES AND RESULTS	
5.	26	DB OCCUPIED BANDWIDTH TEST	
	5.1.	Block Diagram of Test Setup	
	5.2.	The Requirement For Section 15.407(a)(5)	
	5.3.	EUT Configuration on Measurement	
	5.4.	Operating Condition of EUT	
	5.5.	Test Procedure	
	5.6.	Test Result	
6.	6D	B OCCUPIED BANDWIDTH TEST	14
	6.1.	Block Diagram of Test Setup	
	6.2.	The Requirement For Section 15.407(e)	
	6.3.	EUT Configuration on Measurement	14
	6.4.	Operating Condition of EUT	
	6.5.	Test Procedure	
	6.6.	Test Result	15
7.	99	% OCCUPIED BANDWIDTH	
	7.1.	Block Diagram of Test Setup	
	7.2.	The Requirement For Section KDB 789033 §D	19
	7.3.	EUT Configuration on Measurement	
	7.4.	Operating Condition of EUT	
	7.5.	Test Procedure	
	7.6.	Test Result	
8.	DU	JTY CYCLE MEASUREMENT	
	8.1.	Block Diagram of Test Setup	
	8.2.	EUT Configuration on Measurement	
	8.3.	Operating Condition of EUT	
	8.4.	Test Procedure	
	8.5.	Test Result	
9.		OWER SPECTRAL DENSITY TEST	
	9.1.	Block Diagram of Test Setup	
	9.2.	The Requirement For Section 15.407	
	9.3.	EUT Configuration on Measurement	
	9.4.	Operating Condition of EUT	
	9.5.	Test Procedure	

Page



9.6.	Test Result	
<b>10. M</b> A	AXIMUM CONDUCTED (AVERAGE) OUTPUT POWER	
10.1.	Block Diagram of Test Setup	41
10.2.	The Requirement For Section 15.407	
10.3.	EUT Configuration on Measurement	41
10.4.	Operating Condition of EUT	
10.5.	Test Procedure	
10.6.	Test Result	
11. RA	DIATED SPURIOUS EMISSION TEST	
11.1.	Block Diagram of Test Setup	
11.2.	The Requirement For Section 15.407(b)	
11.3.	Restricted bands of operation	
11.4.	Configuration of EUT on Measurement	
11.5.	Operating Condition of EUT	
11.6.	Test Procedure	
11.7.	Data Sample	
11.8.	Test Result	
12. BA	ND EDGE COMPLIANCE TEST	73
12.1.	Block Diagram of Test Setup	
12.2.	The Requirement For Section 15.407(b)	
12.3.	EUT Configuration on Measurement	
12.4.	Operating Condition of EUT	
12.5.	Test Procedure	
12.6.	Test Result	
13. IN	BAND EMISSION TEST	
13.1.	Block Diagram of Test Setup	
13.2.	The Requirement For Section 15.407(b)	
13.3.	EUT Configuration on Measurement	
13.4.	Operating Condition of EUT	
13.5.	Test Procedure	
13.6.	Test Result	
14. FR	EQUENCIES STABILITY	
14.1.	Block Diagram of Test Setup	
14.2.	EUT Configuration on Measurement	
14.3.	Operating Condition of EUT	
14.4.	Test Result	
15. AN	TENNA REQUIREMENT	
15.1.	The Requirement	
15.2.	Antenna Construction	96



# Test Report Certification

Applicant	<ul> <li>Hunan GM Innovation Technology Co., Ltd</li> <li>No 46, Jiefang East Road, Furong District, Changsha City, Hunan Province,</li></ul>
Address	China
Manufacturer	<ul> <li>Hunan GM Innovation Technology Co., Ltd</li> <li>No 46, Jiefang East Road, Furong District, Changsha City, Hunan Province,</li></ul>
Address	China
Product Name	: Vaxis wireless video system
Model No.	: Vaxis Storm3000, Vaxis Storm3000 DV, Vaxis Storm3000 DG, Vaxis Storm5000, Vaxis Storm2000, Vaxis Storm2000+, Vaxis Storm1000+

Measurement Procedure Used:

#### FCC Rules and Regulations Part 15 Subpart E Section 15.407 ANSI C63.10: 2013 KDB 789033 D02 General UNII Test Procedures New Rules v02r01 KDB 662911 D01 Multiple Transmitter Output v02r01

The device described above is tested by Shenzhen Accurate Technology Co., Ltd to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart E Section 15.407 limits. The measurement results are contained in this test report and Shenzhen Accurate Technology Co., Ltd is assumed full responsibility for the accuracy and completeness of these measurements. Also, this report shows that the Equipment Under Test (EUT) is to be technically compliant with the FCC requirements.

This report applies to above tested sample only. This report shall not be reproduced in part without written approval of Shenzhen Accurate Technology Co., Ltd.

Date of Test :	May 15-May 16, 2019
Date of Report :	May 17, 2019
Prepared by :	(Sterrender)
Approved & Authorized Signer :	Tenne

(Sean Liu, Manager)



# **1. GENERAL INFORMATION**

# 1.1.Description of Device (EUT)

EUT	:	Vaxis wireless video system	
Model Number	:	Vaxis Storm3000, Vaxis Storm3000 DV, Vaxis Storm3000 DG, Vaxis Storm5000, Vaxis Storm2000, Vaxis Storm2000+, Vaxis Storm1000+ (Note: We hereby state that these models are identical in interior structure, electrical circuits and components, Just model name is different. Therefore only model Vaxis Storm3000 is for tests.)	
Frequency Range	:	5190MHz, 5230MHz, 5745MHz, 5785MHz, 5825MHz	
Number of Channels	:	5	
G <sub>ANT</sub> Max	:	4.5dBi (two antennas have the same gain)	
Directional gain (G <sub>TX</sub> )	:	7.51	
Antenna type	:	Stick Antenna	
Modulation mode	:	OFDM 16QAM	
Power Supply	:	DC 6-36V	

1.2.Special Accessory and Auxiliary Equipment N/A



1.3.Description	of Test Facility
-----------------	------------------

EMC Lab	:	Recognition of accreditation by Federal Communications Commission (FCC) The Designation Number is CN1189 The Registration Number is 708358
		Listed by Innovation, Science and Economic Development Canada (ISEDC) The Registration Number is 5077A-2
		Accredited by China National Accreditation Service for Conformity Assessment (CNAS) The Registration Number is CNAS L3193
		Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 4297.01
Subcontracted Items	:	Radiated spurious Emission Test (26.5GHz to 40GHz)
Subcontractor Site Location	:	Shenzhen Academy of Metrology and Quality Inspection Bldg. of Metrology & Quality Inspection, Longzhu Road Nanshan District, Shenzhen, Guangdong, China
Name of Firm Site Location	:	Shenzhen Accurate Technology Co., Ltd 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China

# 1.4. Measurement Uncertainty

: U=2.66dB, k=2
: U=4.28dB, k=2
: U=4.98dB, k=2
: U=5.06dB, k=2
: U=2.72dB, k=2



# 2. MEASURING DEVICE AND TEST EQUIPMENT

Kind of equipment	Manufacturer	Туре	S/N	Calibrated dates	Cal. Interval	
EMI Test Receiver	Rohde&Schwarz	ESCS30	100307	Jan. 05, 2019	One Year	
EMI Test Receiver	Rohde&Schwarz	ESR	101817	Jan. 05, 2019	One Year	
Spectrum Analyzer	Rohde&Schwarz	FSV-40	101495	Jan. 05, 2019	One Year	
Pre-Amplifier (Radiated Emission)	Compliance Direction	RSU-M2	38322	Jan. 05, 2019	One Year	
Pre-Amplifier (Radiated Emission)	Agilent	8447D	294A10619	Jan. 05, 2019	One Year	
Loop Antenna	Schwarzbeck	FMZB1516	1516131	Jan. 05, 2019	One Year	
Bilog Antenna	Schwarzbeck	VULB9163	9163-323	Jan. 05, 2019	One Year	
Horn Antenna	Schwarzbeck	BBHA9120D	9120D-655	Jan. 05, 2019	One Year	
Horn Antenna	Schwarzbeck	BBHA9170	9170-359	Jan. 05, 2019	One Year	
LISN	Schwarzbeck	NSLK8126	8126431	Jan. 05, 2019	One Year	
Highpass Filter	Wainwright Instruments	WHKX3.6/18 G-10SS	N/A	Jan. 05, 2019	One Year	
Band Reject Filter	Wainwright Instruments	WRCG2400/2 485-2375/2510 -60/11SS	N/A	Jan. 05, 2019	One Year	
RF Coaxial Cable (Conducted Emission)	SUHNER	N-2m	No.2	Jan. 05, 2019	One Year	
RF Coaxial Cable (Radiated Emission)	SUHNER	N-5m	NO.3	Jan. 05, 2019	One Year	
RF Coaxial Cable (Radiated Emission)	SUHNER	N-5m	NO.4	Jan. 05, 2019	One Year	
RF Coaxial Cable (Radiated Emission)	SUHNER	N-1m	NO.5	Jan. 05, 2019	One Year	
RF Coaxial Cable (Radiated Emission)	SUHNER	N-1m	NO.6	Jan. 05, 2019	One Year	
Programmable Temperature & Humidity chamber	REALE	RHP-800BT	R201703183 10	Jan. 02, 2019	One Year	
Conducted Emission Measurement Software: ES-K1 V1.71						
Radiated Emission Mea	asurement Software:	EZ_EMC V1.1.4	.2			

### Table 1: List of Test and Measurement Equipment



# **3. OPERATION OF EUT DURING TESTING**

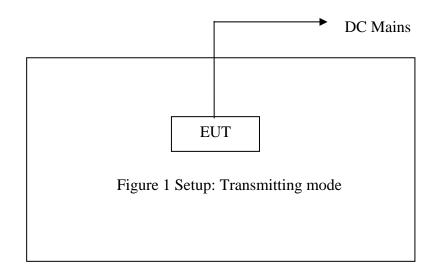
#### 3.1.Operating Mode

For the band 5.15–5.25 GHz: **Transmitting mode** Low Channel: 5190MHz High Channel: 5230MHz

For the band 5.725–5.825 GHz: **Transmitting mode** Low Channel: 5745MHz Middle Channel: 5785MHz High Channel: 5825MHz

Note: The EUT has been tested under continuous transmission mode.

## 3.2. Configuration and peripherals



Note: The EUT have two antenna(1 and 2), They can only transmit simultaneously.



# 4. TEST PROCEDURES AND RESULTS

FCC Rules	Description of Test	Result
Section 15.207	AC Power Line Conducted Emission	N/A
KDB 789033 §C Section 15.403(i) Section 15.407(a)(5) Band: 5.15-5.25 GHz 5.25-5.35 GHz 5.47-5.725 GHz	26dB Occupied Bandwidth	Compliant
KDB 789033 §C Section 15.403(i) Section 15.407(e) Band: 5.725-5.85 GHz	6dB Occupied Bandwidth	Compliant
KDB 789033 §D	99% occupied Bandwidth	Compliant
	Duty cycle	Compliant
Section 15.407(a)(1)(iv) Section 15.407(a)(3) KDB 789033 §F	Power Spectral Density	Compliant
Section 15.407(a)(1)(iv) Section 15.407(a)(3) KDB 789033 §E	Maximum conducted (average) output power	Compliant
Section 15.407(b)(1) Section 15.407(b)(4) Section 15.407(b)(6) Section 15.407(b)(7) Section 15.205 Section 15.209 KDB 789033 §G	Unwanted Emission	Compliant
Section 15.407(b) KDB 789033 §G	Band Edge Compliance	Compliant
Section 15.407(b)(4)(i)	IN Band Emission	Compliant
Section 15.407(g)	Frequency Stability	Compliant
Section 15.203, Section 15.204(b) Section 15.204(c)	Antenna Requirement	Compliant

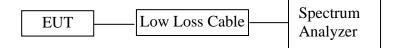
Remark: "N/A" means "Not applicable".

Note: The power supply mode of the EUT is DC 6-36V, According to the FCC standard requirements, conducted emission is not applicable.



# 5. 26DB OCCUPIED BANDWIDTH TEST

#### 5.1.Block Diagram of Test Setup



#### 5.2. The Requirement For Section 15.407(a)(5)

The maximum power spectral density is measured as a conducted emission by direct connection of a calibrated test instrument to the equipment under test. If the device cannot

be connected directly, alternative techniques acceptable to the Commission may be used. Measurements in the 5.725–5.85 GHz band are made over a reference bandwidth of 500 kHz or the 26 dB emission bandwidth of the device, whichever is less. Measurements in the 5.15–5.25 GHz, 5.25–5.35 GHz, and the 5.47–5.725 GHz bands are made over a bandwidth of 1 MHz or the 26 dB emission bandwidth of the device, whichever is less. A narrower resolution bandwidth can be used, provided that the measured power is integrated over the full reference bandwidth

#### 5.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 5.4. Operating Condition of EUT

5.4.1.Setup the EUT and simulator as shown as Section 5.1.

- 5.4.2.Turn on the power of all equipment.
- 5.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz and 5230MHz.



#### 5.5.Test Procedure

- 5.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 5.5.2.Set RBW = approximately 1% of the emission bandwidth.
- 5.5.3.Set the VBW > RBW.
- 5.5.4.Detector = Peak.
- 5.5.5.Trace mode = max hold.
- 5.5.6.Measure the maximum width of the emission that is 26 dB down from the maximum of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.

#### 5.6.Test Result

Frequency (MHz)	26dB Bandwidth ANT 1 (MHz)	26dB Bandwidth ANT 2(MHz)
5190	39.595	39.363
5230	39.711	39.363

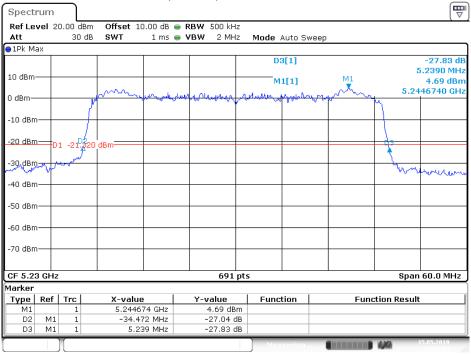
The spectrum analyzer plots are attached as below.



#### (ANT 1) 5190MHz **T** Spectrum Ref Level 20.00 dBm Offset 10.00 dB 👄 RBW 500 kHz Att 30 dB SWT 1 ms 👄 **VBW** 2 MHz Mode Auto Sweep ⊖1Pk Max D2[1] 27.63 dB -34.4720 MHz м1 10 dBm M1[1] 5.12 dBm 5.2046744 GHz m 0 dBm--10 dBm -20 dBm D1 -20.88 dBm -30 dBm-40 dBm -50 dBm -60 dBm -70 dBm Span 60.0 MHz CF 5.19 GHz 691 pts Marker Type Ref Trc X-value Y-value Function Function Result 5.2046744 GHz 5.12 dBm -27.63 dB M1 1 D2 Μ1 -34.472 MHz D3 M1 1 5.123 MHz -26.47 dB

Date: 15.MAY.2019 14:35:53

(ANT 1) 5230MHz



Date: 15.MAY.2019 14:38:09

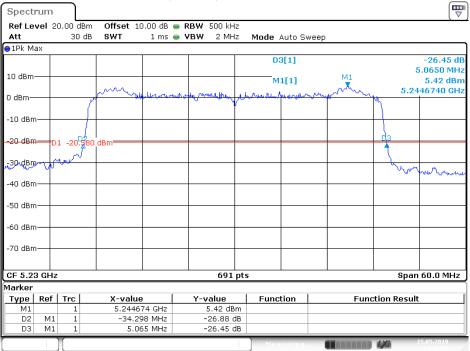


#### ₩ Spectrum Ref Level 20.00 dBm Offset 10.00 dB 👄 RBW 500 kHz Att 30 dB SWT 1 ms 👄 **VBW** 2 MHz Mode Auto Sweep ⊖1Pk Max D3[1] 26.05 dB 5.0360 MHz 10 dBm M1 M1[1] 5.30 dBm 5.2046740 GHz . Tur m d round war 0 dBm--10 dBm -20<mark>7</mark>200 20 dBm D1 dBn -30 dBm-4 - uhr one مريه 40 dBm -50 dBm -60 dBm -70 dBm Span 60.0 MHz CF 5.19 GHz 691 pts Marker Type Ref Trc X-value Y-value Function Function Result 5.204674 GHz 5.30 dBm -26.33 dB M1 1 D2 Μ1 -34.327 MHz D3 Μ1 1 5.036 MHz -26.05 dB **.....** 470

(ANT 2) 5190MHz

Date: 15.MAY.2019 14:42:36

(ANT 2) 5230MHz

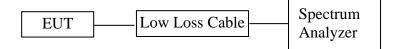


Date: 15.MAY.2019 14:40:50



# 6. 6DB OCCUPIED BANDWIDTH TEST

#### 6.1.Block Diagram of Test Setup



#### 6.2. The Requirement For Section 15.407(e)

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

#### 6.3.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 6.4. Operating Condition of EUT

6.4.1.Setup the EUT and simulator as shown as Section 6.1.

- 6.4.2.Turn on the power of all equipment.
- 6.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5745MHz, 5785MHz and 5825MHz.

#### 6.5.Test Procedure

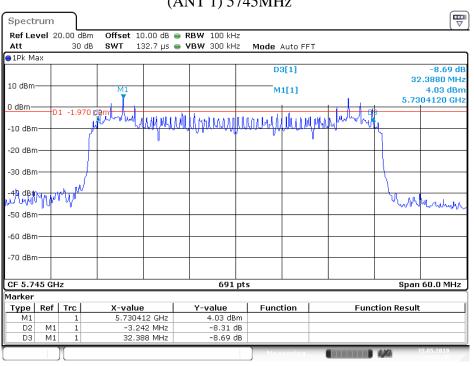
- 6.5.1.Set RBW = 100 kHz. Set the video bandwidth (VBW)  $\ge 3 \times RBW$ .
- 6.5.2.Detector = Peak.
- 6.5.3.Trace mode = max hold.
- 6.5.4.Sweep = auto couple.
- 6.5.5.Allow the trace to stabilize.
- 6.5.6.Measure the maximum width of the emission that is constrained by the frequencies associated 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.



#### 6.6.Test Result

Test mode: MIMO										
Frequency (MHz)	6dB Bandwidth ANT 1 (MHz)	6dB Bandwidth ANT 2(MHz)	Limit (MHz)							
5745	35.630	35.601	> 0.5MHz							
5785	35.601	35.630	> 0.5MHz							
5825	35.601	35.601	> 0.5MHz							

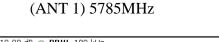
The spectrum analyzer plots are attached as below.

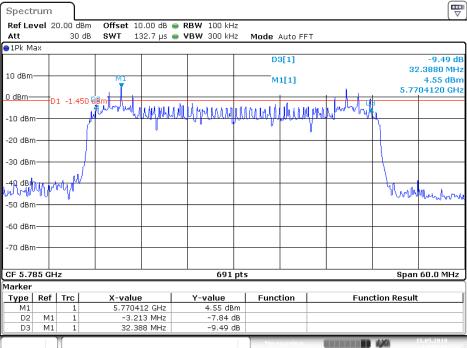


(ANT 1) 5745MHz

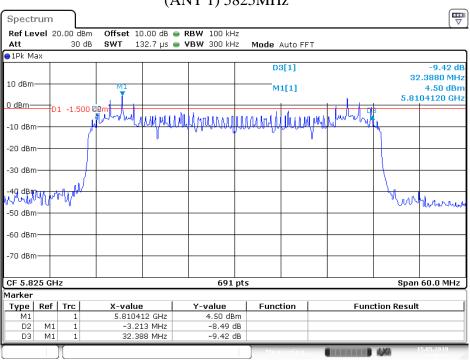
Date: 15.MAY.2019 14:59:40







Date: 15.MAY.2019 14:57:40

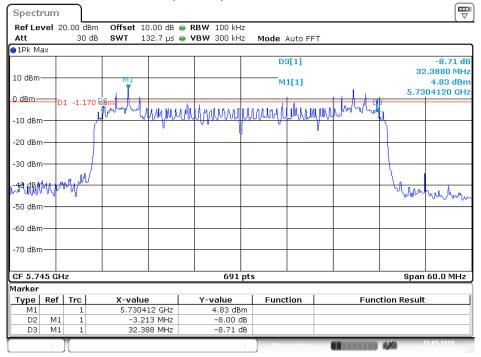


(ANT 1) 5825MHz

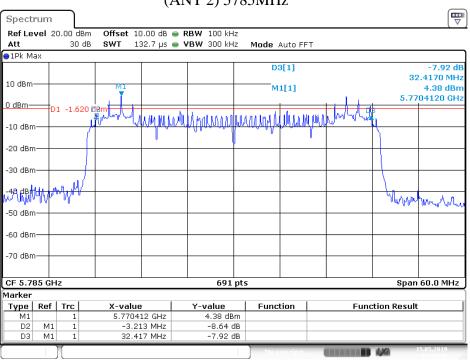
Date: 15.MAY.2019 14:56:13



#### (ANT 2) 5745MHz



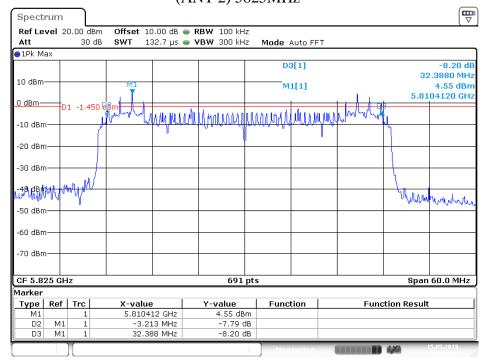
Date: 15.MAY.2019 14:47:50



(ANT 2) 5785MHz

Date: 15.MAY.2019 14:50:46





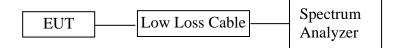
(ANT 2) 5825MHz

Date: 15.MAY.2019 14:54:07



# 7. 99% OCCUPIED BANDWIDTH

#### 7.1.Block Diagram of Test Setup



#### 7.2. The Requirement For Section KDB 789033 §D

The 99% 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% 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% occupied bandwidth may also optionally be used in lieu of the EBW to 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).

#### 7.3.EUT Configuration on Measurement

The equipment is installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 7.4. Operating Condition of EUT

- 7.4.1.Setup the EUT and simulator as shown as Section 7.1.
- 7.4.2.Turn on the power of all equipment.
- 7.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz, 5230MHz, 5745MHz, 5785MHz and 5825MHz.



#### 7.5.Test Procedure

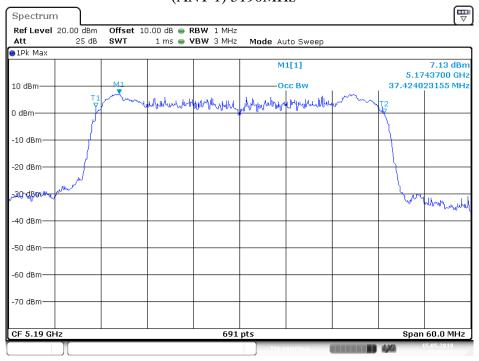
- 7.5.1.Set center frequency to the nominal EUT channel center frequency.
- 7.5.2.Set span = 1.5 times to 5.0 times the OBW.
- 7.5.3.Set RBW = 1% to 5% of the OBW
- 7.5.4.Set VBW  $\geq$  3  $\times$  RBW
- 7.5.5.Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- 7.5.6.Use the 99% power bandwidth function of the instrument (if available).
- 7.5.7.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.

Test mode: MIMO	-	
Frequency (MHz)	99% Occupied Bandwidth ANT1 (MHz)	99% Occupied Bandwidth ANT2 (MHz)
5190	37.424	37.424
5230	37.511	37.424
5745	37.424	37.424
5785	37.424	37.424
5825	37.424	37.424

#### 7.6.Test Result

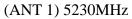
The spectrum analyzer plots are attached as below.

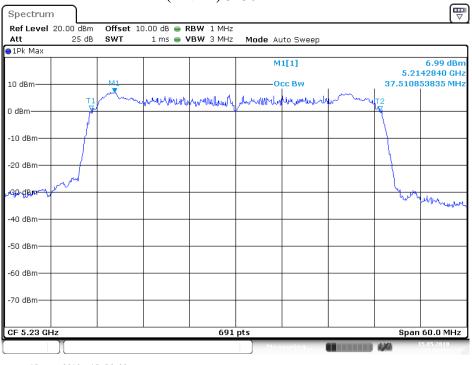




(ANT 1) 5190MHz

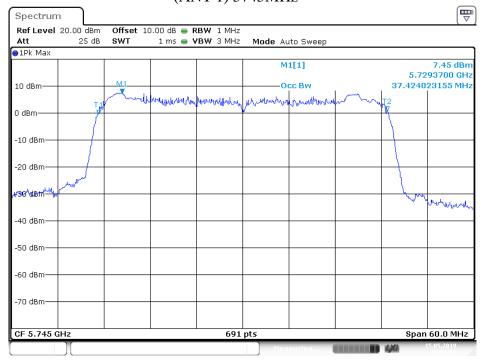
Date: 15.MAY.2019 15:55:21





Date: 15.MAY.2019 15:56:33

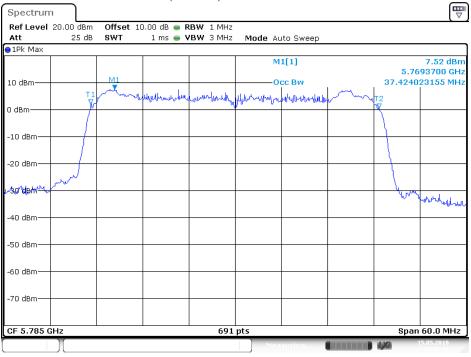




(ANT 1) 5745MHz

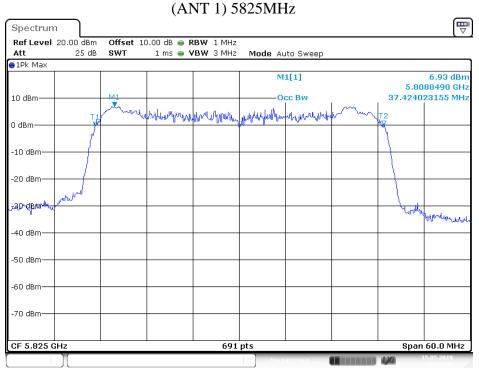
Date: 15.MAY.2019 15:01:28

(ANT 1) 5785MHz



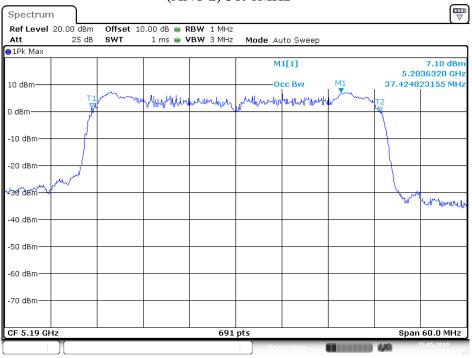
Date: 15.MAY.2019 15:57:46





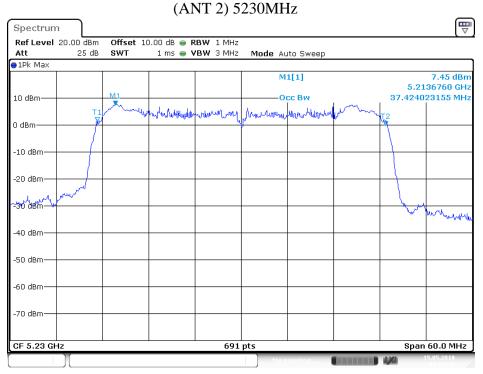
Date: 15.MAY.2019 15:58:36

(ANT 2) 5190MHz



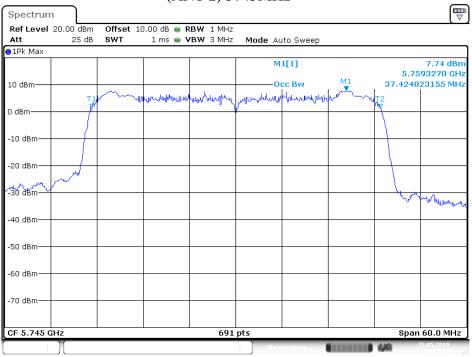
Date: 15.MAY.2019 16:01:51





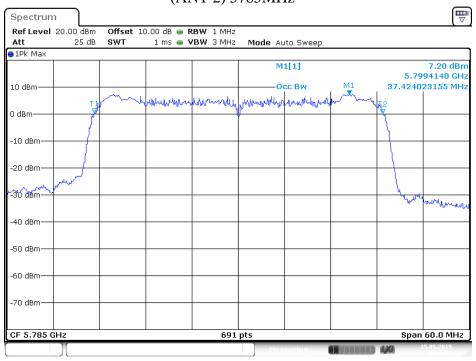
Date: 15.MAY.2019 16:00:43

(ANT 2) 5745MHz



Date: 15.MAY.2019 16:02:56

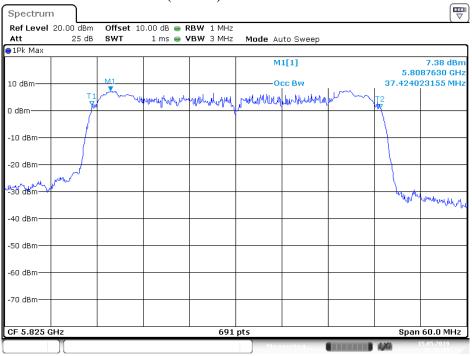




(ANT 2) 5785MHz

Date: 15.MAY.2019 16:03:53

(ANT 2) 5825MHz

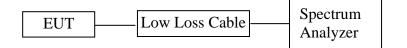


Date: 15.MAY.2019 15:59:48



# 8. DUTY CYCLE MEASUREMENT

#### 8.1.Block Diagram of Test Setup



#### 8.2.EUT Configuration on Measurement

The equipment are installed on the emission measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 8.3. Operating Condition of EUT

8.3.1.Setup the EUT and simulator as shown as Section 8.1.

- 8.3.2.Turn on the power of all equipment.
- 8.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz, 5230MHz, 5745MHz, 5825MHz and 5785MHz.

#### 8.4. Test Procedure

Measurements of duty cycle and transmission duration shall be performed using one of the following techniques:

1. A diode detector and an oscilloscope that together have sufficiently short response time to permit accurate measurements of the on- and off-times of the transmitted signal.

2. The zero-span mode on a spectrum analyzer or EMI receiver if the response time and spacing between bins on the sweep are sufficient to permit accurate measurements of the on- and off-times of the transmitted signal

a. Set the center frequency of the instrument to the centre frequency of the transmission b. Set RBW  $\geq$  OBW if possible; otherwise, set RBW to the largest

#### available value(10MHz).

c. Set detector = Peak or average.

d. The zero-span measurement method shall not be used unless both RBW and VBW are > 50/T and the number of sweep points across duration T exceeds 100.

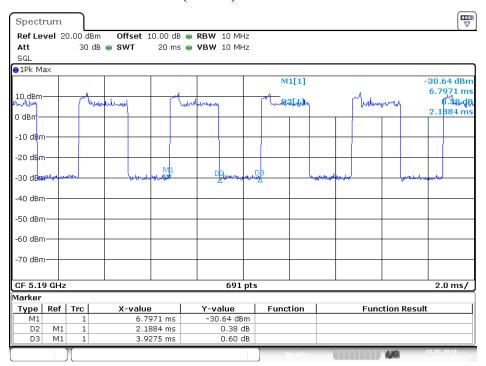
(For example, if VBW and/or RBW are limited to 3MHz, then the zero-span method of measuring duty cycle shall not be used if T $\leq$ 16.7 microseconds.)



#### 8.5.Test Result

Test mode: MIMO									
Frequency (MHz)	duty cycle(x) ANT 1	10log(1/x) ANT 1	duty cycle(x) ANT 2	10log(1/x) ANT 2					
5190	55.71%	2.54	56.04%	2.52					
5230	55.64%	2.55	55.72%	2.54					
5745	56.36%	2.49	55.64%	2.55					
5785	55.31%	2.57	54.98%	2.60					
5825	55.64%	2.55	55.31%	2.57					

The spectrum analyzer plots are attached as below.

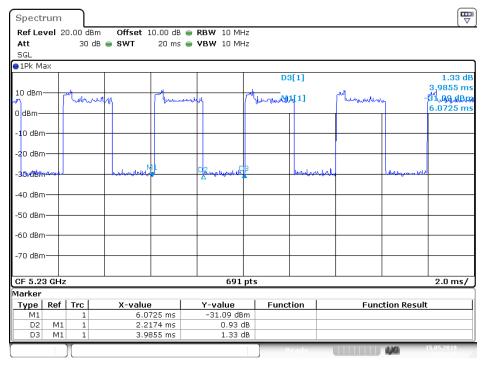


#### (ANT 1) 5190MHz

Date: 15.MAY.2019 16:20:45

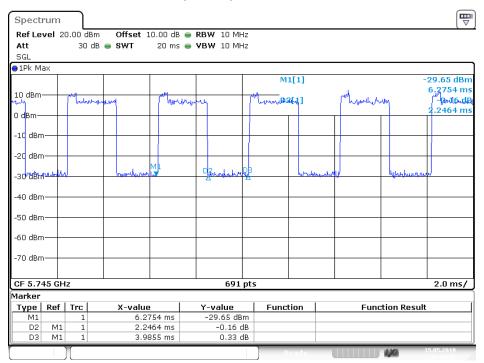


#### (ANT 1) 5230MHz



Date: 15.MAY.2019 16:20:15

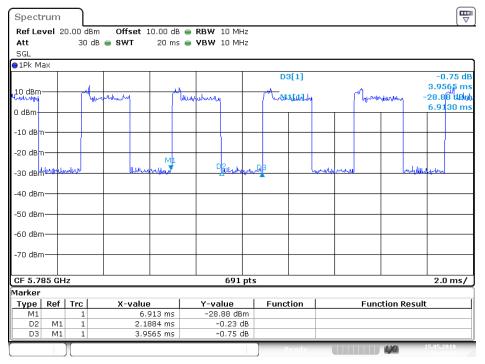
#### (ANT 1) 5745MHz



Date: 15.MAY.2019 16:14:57



#### (ANT 1) 5785MHz



Date: 15.MAY.2019 16:19:09

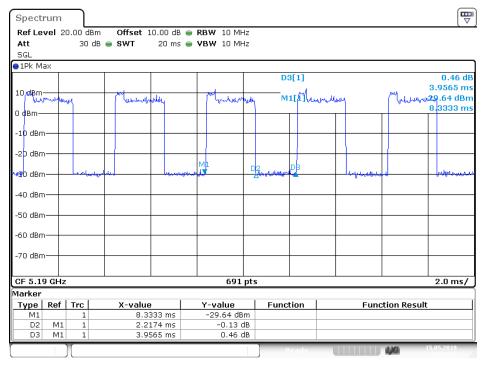
#### (ANT 1) 5825MHz

Spect	rum														▽
Ref Le	vel 2	0.00 dE	Sm Offset	10.00 dB	😑 F	RBW 10 M	IHz								
Att		30	dB 👄 SWT	20 ms	• \	<b>/BW</b> 10 M	1Hz								
SGL															
⊖1Pk Ma	эх														
								M	11[1]					30.13 di	
10 dBm-											л		- avh	5.5797	
	_ []]⊌	when whe	~~] [	haddenst	may		w	versel	2[1]	- [	Trafuncian			Auril or all	
0 dBm—									-					2.2174	ms
-10 dBm	ı———				_										+
-20 dBm	++-						-								+
ulana u			MI		D2	amound			Managa			mathematic			
1230 abit			UNUMPER ST		- 20	and a straight of the		ч.	mana a	1908 -		MMEANANNAME	4		
-40 dBm															
-50 dBm															
-30 UBI															
-60 dBm															
00 001	·														
-70 dBm															
CF 5.82	25 GF	Iz				69:	1 pts	5						2.0 m	5/
Marker															_
Type	Ref	Trc	X-valu	e		Y-value	1	Fund	tion	1	Fu	nction Re:	sult		
M1		1		797 ms		-30.13 d	Bm								
D2	M1	1	2.2	174 ms		1.28	dB								
D3	M1	1	3.9	855 ms		0.78	dB								
									Ready	-		120	1	5.05.2019	

Date: 15.MAY.2019 16:19:41



#### (ANT 2) 5190MHz



Date: 15.MAY.2019 16:13:22

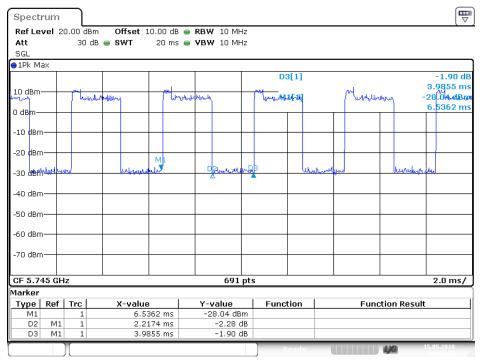
#### (ANT 2) 5230MHz

Spect	rum																
Ref Le	<b>vel</b> 21																
Att SGL		30	dB 😑 SWT	20 ms	-	<b>VBW</b> 10	I MHZ										
og∟ o1Pk Ma																	
UTK IN									MI	[1]					-	28.93	dBm
10 40																7.260	
10 dBm-	4		howwelling		My	hound		ſ	709	[Am			Muh	Mundung			р <sup>а</sup> Ър
0 dBm—																2.188	4 ms
-10 dBm	ı <del>     </del>								_								
													]				J
-20 dBm				м	1												
-30 dBm	L.	harris	dit di	All rations of	ŕ.	D	ی اید میں	n Ba			LIN	alsanstar					
-30 ubm												• • •					
-40 dBm							_										
-50 dBm															_		
co in																	
-60 dBm																	
-70 dBm																	
CF 5.23	3 GHz					۱ ۴	i91 pt:	5								2.0 r	ns/
Marker																	
Type	Ref	Trc	X-value			Y-valu	e	Fu	inct	ion			Func	tion Re	sult		
M1		1	7.2	609 ms		-28.93	3 dBm										
D2	M1	1		884 ms			23 dB										
D3	M1	1	3.9:	275 ms		-0	56 dB										
									2	eadv				1)(1)	1	5.05.201	9

Date: 15.MAY.2019 16:12:20

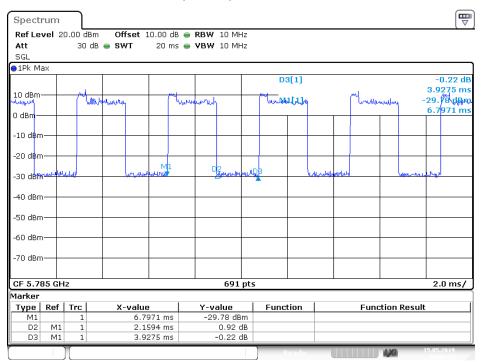


#### (ANT 2) 5745MHz



Date: 15.MAY.2019 16:14:06

#### (ANT 2) 5785MHz



Date: 15.MAY.2019 16:06:25



#### (ANT 2) 5825MHz

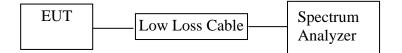
Spectrum					
Ref Level 20.00 dB		👄 RBW 10 MHz			
	iB 🛑 SWT 20 ms	VBW 10 MHz			
SGL 91Pk Max					
TEK MAX			M1[1]		-28.42 dBm
			milil		-20.42 ubin 5.9275 ms
10 dBm	vila hours	when the	genter B2[1]	Jud wohenwahilly	Man Jue Donald
0 dBm	····		A		2.1884 ms
U aBm					
-10 dBm					
20 dBm					
	ML	Enswerand			
-30'00H	had attas as Tak	TEALAND	M Market	sel here	the shall be
-40 dBm					
-50 dBm					
-50 ubin					
-60 dBm					
-70 dBm					
CF 5.825 GHz		691 pt:	<u> </u>	<u> </u>	2.0 ms/
Marker		•			
Type   Ref   Trc	X-value	Y-value	Function	Functio	on Result
M1 1	5.9275 ms	-28.42 dBm			
D2 M1 1	2.1884 ms	-1.09 dB			
D3 M1 1	3.9565 ms	0.46 dB			]
			Ready		15.05.2019

Date: 15.MAY.2019 16:10:53



# 9. POWER SPECTRAL DENSITY TEST

#### 9.1.Block Diagram of Test Setup



#### 9.2. The Requirement For Section 15.407

Section 15.407(a)(1)(iv): For the band 5.15–5.25GHz

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.

Section 15.407(a)(3): For the band 5.725–5.825GHz

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 output power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### 9.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 9.4. Operating Condition of EUT

9.4.1.Setup the EUT and simulator as shown as Section 9.1.

- 9.4.2.Turn on the power of all equipment.
- 9.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz, 5230MHz, 5745MHz, 5785MHz and 5825MHz.



#### 9.5.Test Procedure

- 9.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 9.5.2.Measurement Procedure PKPSD:

For devices operating in the bands 5.15-5.25 GHz, 5.25-5.35 GHz, and 5.47-5.725 GHz, the above procedures make use of 1 MHz RBW to satisfy directly the 1 MHz reference bandwidth specified in § 15.407(a)(5). For devices operating in the band 5.725-5.85 GHz, the rules specify a measurement bandwidth of 500 kHz. Many spectrum analyzers do not have 500 kHz RBW, thus a narrower RBW may need to be used. The rules permit the use of a RBWs less than 1 MHz, or 500 kHz, "provided that the measured power is integrated over the full reference bandwidth" to show the total power over the specified measurement bandwidth (i.e., 1 MHz, or 500 kHz). If measurements are performed using a reduced resolution bandwidth (< 1 MHz, or < 500 kHz) and integrated over 1 MHz, or 500 kHz bandwidth, the following adjustments to the procedures apply:

- 1. Set RBW  $\geq$  1/T, where T is defined in section II.B.l.a). Set VBW  $\geq$  3 RBW.
- 2. If measurement bandwidth of Maximum PSD is specified in 500 kHz, add 10 log (500 kHz/RBW) to the measured result, whereas RBW (< 500 kHz) is the reduced resolution bandwidth of the spectrum analyzer set during measurement.
- 3. If measurement bandwidth of Maximum PSD is specified in 1 MHz, add 10 log (1MHz/RBW) to the measured result, whereas RBW (< 1 MHz) is the reduced resolution bandwidth of spectrum analyzer set during measurement.
- 4. Care must be taken to ensure that the measurements are performed during a period of continuous transmission or are corrected upward for duty cycle.
- 5. Detector = RMS.
- 6. Sweep time = auto couple.
- 7. Trace mode = max hold.
- 8. Allow trace to fully stabilize.
- 9. Use the peak marker function to determine the maximum amplitude level.
- 9.5.3.Measurement the maximum power spectral density.

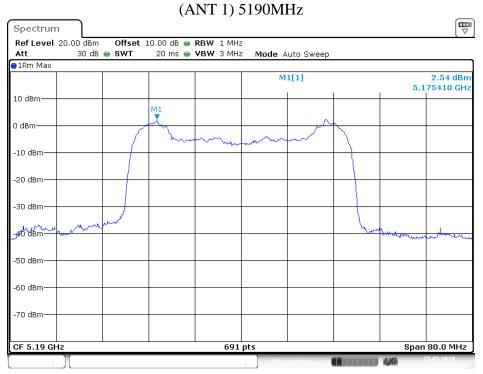


### 9.6.Test Result

Test mode: MIMO										
Frequency (MHz)	Power Spectral Density ANT 1 (dBm)	Power Spectral Density ANT 2 (dBm)	10log(1/x) ANT 1	10log(1/x) ANT 2	ANT 1	Final Power Spectral Density ANT 2 (dBm)	Limits (dBm)			
5190	(dBm) 2.54	(dBm) 2.76	2.54	2.52	(dBm) 5.08	(dBm) 5.28	9.49			
5230	2.63	2.68	2.55	2.54	5.18	5.22	9.49			
5745	2.16	2.41	2.49	2.55	4.65	4.96	28.49			
5785	1.46	2.15	2.57	2.60	4.03	4.75	28.49			
5825	0.93	1.84	2.55	2.57	3.48	4.41	28.49			

### Directional gain>6dBi

The spectrum analyzer plots are attached as below.



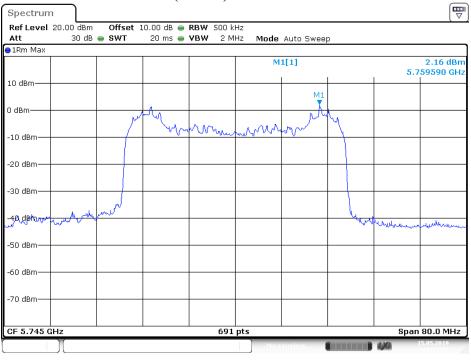
Date: 15.MAY.2019 16:22:11



#### (ANT 1) 5230MHz ₽ Spectrum Ref Level 20.00 dBm Offset 10.00 dB 👄 RBW 1 MHz 20 ms 👄 **VBW** 3 MHz Att 30 dB 👄 SWT Mode Auto Sweep ●1Rm Max M1[1] 2.63 dBm 5.244590 GHz 10 dBm м1 0 dBm· -10 dBm--20 dBm--30 dBm $\Delta$ -50 dBm--60 dBm--70 dBm-CF 5.23 GHz 691 pts Span 80.0 MHz

Date: 15.MAY.2019 16:23:41

(ANT 1) 5745MHz



Date: 15.MAY.2019 16:25:57



#### (ANT 1) 5785MHz ₽ Spectrum Ref Level 20.00 dBm Offset 10.00 dB 👄 RBW 500 kHz Att 30 dB 👄 SWT 20 ms 👄 **VBW** 2 MHz Mode Auto Sweep ●1Rm Max M1[1] 1.46 dBm 5.799700 GHz 10 dBm м1 0 dBm· n۳ ww In MM -10 dBm--20 dBm -30 dBm -40 վթիրդ an. Area -50 dBm -60 dBm -70 dBm-CF 5.785 GHz 691 pts Span 80.0 MHz

Date: 15.MAY.2019 16:26:51

(ANT 1) 5825MHz



Date: 15.MAY.2019 16:27:34

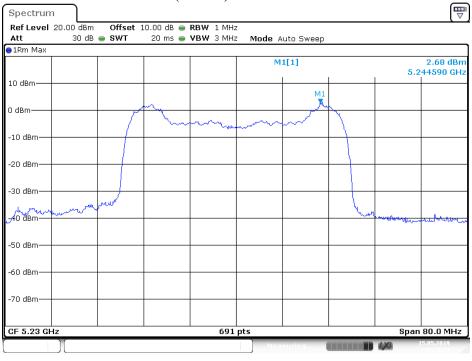




(ANT 2) 5190MHz

Date: 15.MAY.2019 16:30:40

(ANT 2) 5230MHz



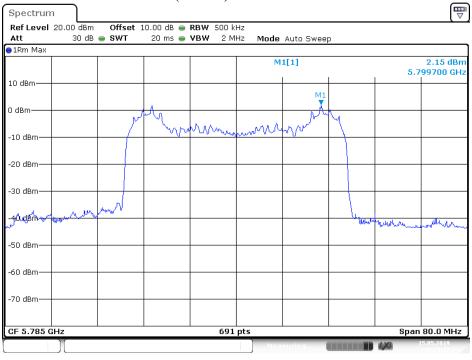
Date: 15.MAY.2019 16:31:24



#### (ANT 2) 5745MHz ₽ Spectrum Ref Level 20.00 dBm Offset 10.00 dB 👄 RBW 500 kHz Att 30 dB 👄 SWT 20 ms 👄 **VBW** 2 MHz Mode Auto Sweep ●1Rm Max 2.41 dBm 5.759700 GHz M1[1] 10 dBm м1 0 dBm· mm www M ٩N -10 dBm--20 dBm -30 dBm A 40 dBm willin Nontro -50 dBm -60 dBm -70 dBm CF 5.745 GHz 691 pts Span 80.0 MHz

Date: 15.MAY.2019 16:30:00

(ANT 2) 5785MHz



Date: 15.MAY.2019 16:29:17



# Ref Level 20.00 dBm Offset 10.00 dB RBW 500 kHz Att 30 dB SWT 20 ms VBW 2 MHz Mode Auto Sweep M1[1] 1.84 dBm

							1	5.8	39590 GHz
10 dBm						M1			
0 dBm		M	M			- M	4		
-10 dBm			ww	rpm	man	ww			
-20 dBm									
-30 dBm									
-40vdBhrtv4	AN JAY	min							
~40,08m <del>ntv~1</del> w	www.w						Wayner	hurbertun	enothere
-50 dBm									
-60 dBm									
-70 dBm									
CF 5.825 G	Hz			691	pts	-		Span	80.0 MHz

LX.

#### (ANT 2) 5825MHz

Date: 15.MAY.2019 16:28:31

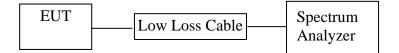
Spectrum

⊖1Rm Max



# **10.MAXIMUM CONDUCTED (AVERAGE) OUTPUT POWER**

#### 10.1.Block Diagram of Test Setup



#### 10.2. The Requirement For Section 15.407

Section 15.407(a)(1)(iv): For client devices in the 5.15-5.25 GHz band, the maximum conducted output power over the frequency band of operation shall not exceed 250 mW provided the maximum antenna gain does not exceed 6 dBi. 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.

Section 15.407(a)(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. 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

#### 10.3.EUT Configuration on Measurement

The equipment is installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

#### 10.4.Operating Condition of EUT

- 10.4.1.Setup the EUT and simulator as shown as Section 10.1.
- 10.4.2.Turn on the power of all equipment.
- 10.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz, 5230MHz, 5745MHz, 5785MHz and 5825MHz.



#### 10.5.Test Procedure

- 10.5.1.The transmitter output was connected to the spectrum analyzer through a low loss cable.
- 10.5.2.Set RBW = 1 MHz, VBW  $\geq$  3 x RBW, Sweep time = auto, Set span to at least 1.5 times the OBW, Detector = RMS.

10.5.3.Measurement the Maximum conducted (average) output power.

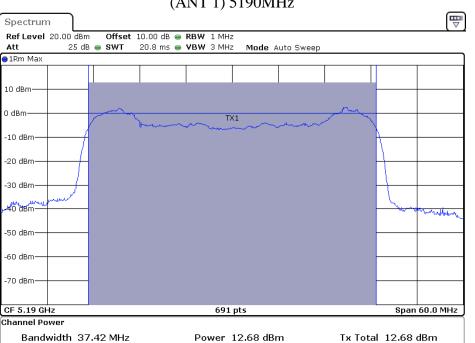
#### 10.6.Test Result

Final power= Ave output power+10log(1/ duty cycle)  $P_{out}=P_{Limit}$ -(G<sub>TX</sub>-6) Directional gain>6dBi

Test mode:	MIMO							
Frequency (MHz)	Ave output power ANT1 (dBm)	Ave output power ANT 2 (dBm)	10log(1/ duty cycle) ANT 1	10log(1/ duty cycle) ANT 2	ANT 1	1	output power (dBm)	Conducted output power limits (dBm)
5190	12.68	12.94	2.54	2.52	15.22	15.46	18.35	22.49
5230	12.49	12.97	2.55	2.54	15.04	15.51	18.29	22.49
5745	12.90	13.43	2.49	2.55	15.39	15.98	18.71	28.49
5785	12.92	13.13	2.57	2.60	15.49	15.73	18.62	28.49
5825	12.57	13.32	2.55	2.57	15.12	15.89	18.53	28.49

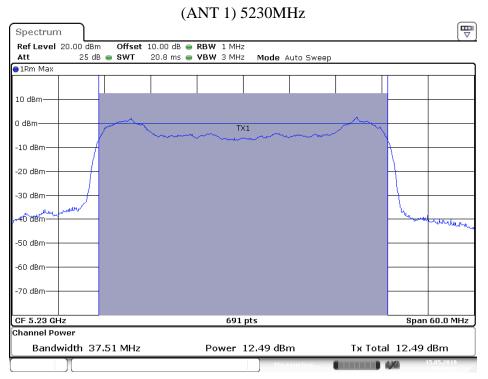
The spectrum analyzer plots are attached as below.





#### (ANT 1) 5190MHz

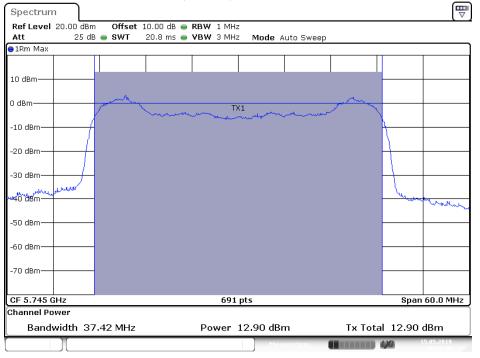
Date: 15.MAY.2019 16:40:32



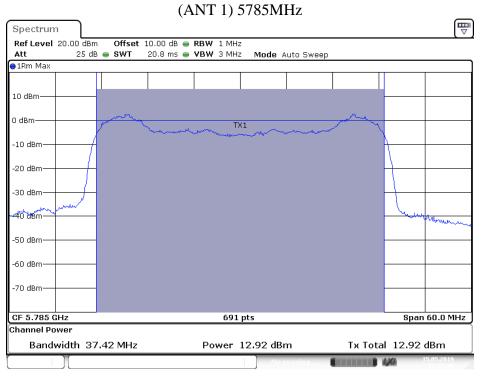
Date: 15.MAY.2019 16:41:37



#### (ANT 1) 5745MHz



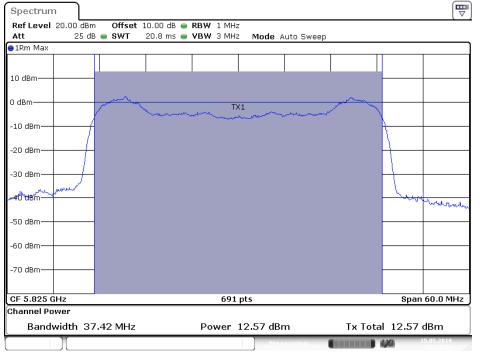
Date: 15.MAY.2019 16:39:30



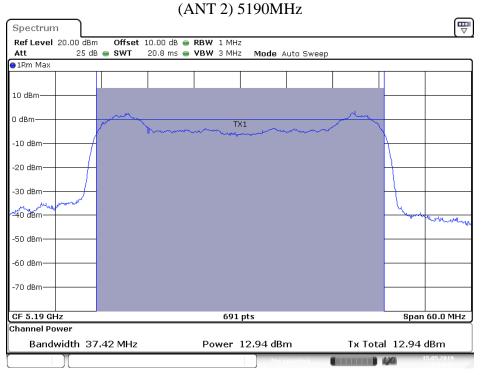
Date: 15.MAY.2019 16:38:48



#### (ANT 1) 5825MHz



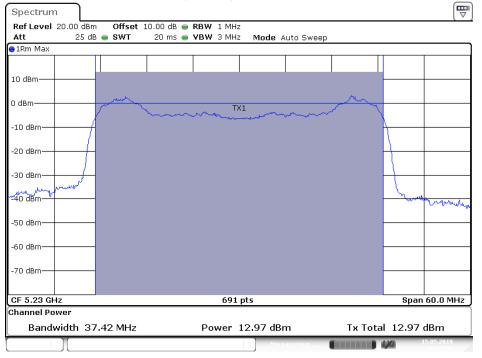
Date: 15.MAY.2019 16:38:01



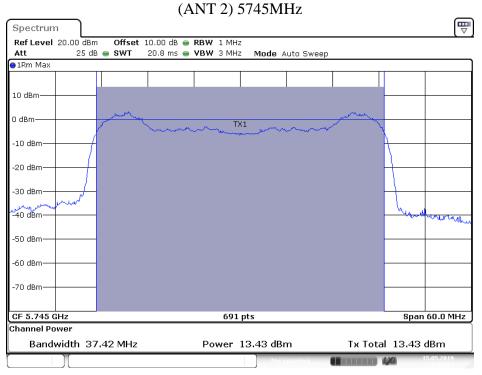
Date: 15.MAY.2019 16:34:17



#### (ANT 2) 5230MHz



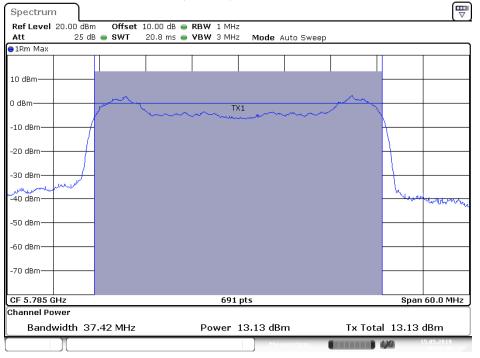
Date: 15.MAY.2019 16:32:58



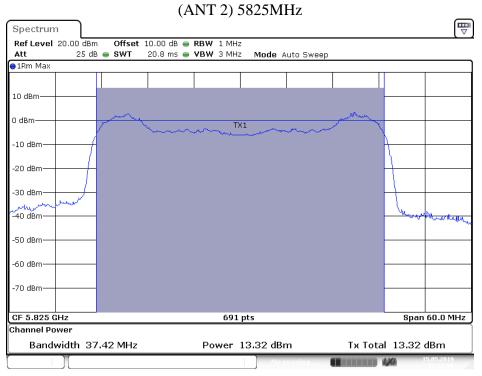
Date: 15.MAY.2019 16:35:04



#### (ANT 2) 5785MHz



Date: 15.MAY.2019 16:36:00



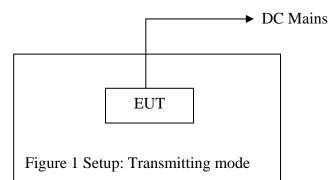
Date: 15.MAY.2019 16:36:56



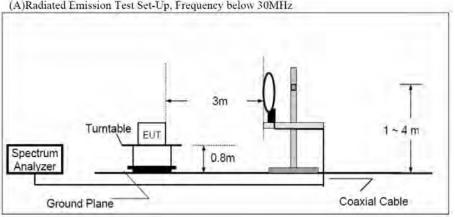
# **11. RADIATED SPURIOUS EMISSION TEST**

#### 11.1.Block Diagram of Test Setup

11.1.1.Block diagram of connection between the EUT and peripherals

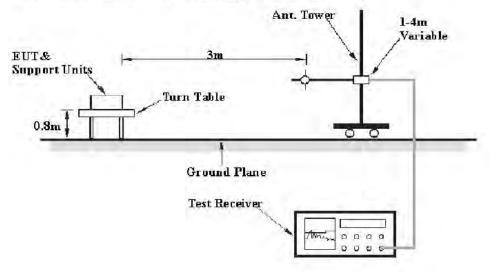


#### 11.1.2.Semi-Anechoic Chamber Test Setup Diagram



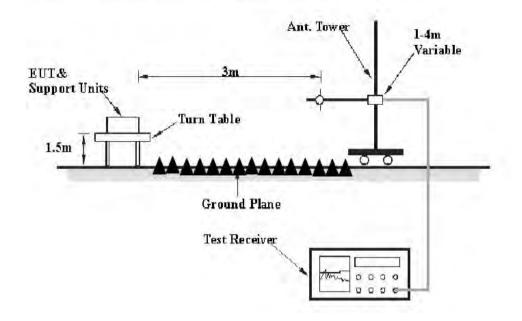
(A)Radiated Emission Test Set-Up, Frequency below 30MHz

(B)Radiated Emission Test Set-Up, Frequency 30MHz-1GHz





(C) Radiated Emission Test Set-Up. Frequency above 1GHz



#### 11.2. The Requirement For Section 15.407(b)

(1) For transmitters operating in the 5.15-5.25 GHz band:

All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725–5.825 GHz band:

All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge, and from 5 MHz above or below the band edge.

Unwanted emissions below 1 GHz must comply with the general field strength limits set forth in § 15.209.



#### 11.3.Restricted bands of operation

#### 11.3.1.FCC Part 15.205 Restricted bands of operation

(a) Except as shown in paragraph (d) of this section, Only spurious emissions are permitted in any of the frequency bands listed below:

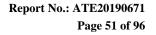
perm	incled in any of the freque	incy bands listed below.	
MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
$^{1}0.495-0.505$	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	$(^{2})$
13.36-13.41			

<sup>1</sup>Until February 1, 1999, this restricted band shall be 0.490-0.510 <sup>2</sup>Above 38.6

(b) Except as provided in paragraphs (d) and (e), the field strength of emission appearing within these frequency bands shall not exceed the limits shown in Section 15.209. At frequencies equal to or less than 1000MHz, Compliance with the limits in Section 15.209 shall be demonstrated using measurement instrumentation employing a CISPR quasi-peak detector. Above 1000MHz, compliance with the emission limits in Section15.209 shall be demonstrated based on the average value of the measured emissions. The provisions in Section 15.35 apply to these measurements.

#### 11.4.Configuration of EUT on Measurement

The equipment are installed on Radiated Emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.





#### 11.5.Operating Condition of EUT

- 11.5.1.Setup the EUT and simulator as shown as Section 11.1.
- 11.5.2.Turn on the power of all equipment.
- 11.5.3.Let the EUT work in TX modes measure it. The transmit frequency are 5745MHz, 5785MHz and 5825MHz.

#### 11.6.Test Procedure

The EUT and its simulators are placed on a turntable, which is 0.8 meter high above ground(Below 1GHz). The EUT and its simulators are placed on a turntable, which is 1.5 meter high above ground(Above 1GHz). The turntable can rotate 360 degrees to determine the position of the maximum emission level. EUT is set 3.0 meters away from the receiving antenna, which is mounted on an antenna tower. The antenna can be moved up and down between 1.0 meter and 4 meters to find out the maximum emission level. Broadband antenna (calibrated bi-log antenna) is used as receiving antenna. Both horizontal and vertical polarizations of the antenna are set on measurement. In order to find the maximum emission levels, all of the EUT location must be manipulated according to ANSI C63.10:2013 on radiated emission measurement. This EUT was tested in 3 orthogonal positions and the worst case position data was reported.

The frequency range from 9KHz to 40GHz is checked.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

- 1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak at frequency below 1GHz.
- 2. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 3MHz for peak measurement with peak detector at frequency above 1GHz.
- 3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and video bandwidth is 10Hz for Average measurement with peak detection at frequency above 1GHz.
- 4. All modes of operation were investigated and the worst-case emissions are reported.



#### 11.7.Data Sample

Frequency	Reading	Factor	Result	Limit	Margin	Remark
(MHz)	(dBµv)	(dB/m)	(dBµv/m)	(dBµv/m)	(dB)	
X.XX	48.69	-13.35	35.34	46	-10.66	QP

Frequency(MHz) = Emission frequency in MHz

Reading(dB $\mu$ v) = Uncorrected Analyzer/Receiver reading Factor (dB/m) = Antenna factor + Cable Loss – Amplifier gain Result(dB $\mu$ v/m) = Reading(dB $\mu$ v) + Factor(dB/m) Limit (dB $\mu$ v/m) = Limit stated in standard Margin (dB) = Result(dB $\mu$ v/m) - Limit (dB $\mu$ v/m) QP = Quasi-peak Reading

Calculation Formula: Margin(dB) = Result ( $dB\mu V/m$ )–Limit( $dB\mu V/m$ ) Result( $dB\mu V/m$ )= Reading( $dB\mu V$ )+ Factor(dB/m)

The "Margin" column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of -7dB means the emission is 7dB below the limit.

#### 11.8.Test Result

#### Pass.

Note: Testing is carried out with frequency rang 9kHz to the tenth harmonics, which above 3th Harmonics are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

The measurements greater than 20dB below the limit from 9kHz to 30MHz and 18 to 40GHz.

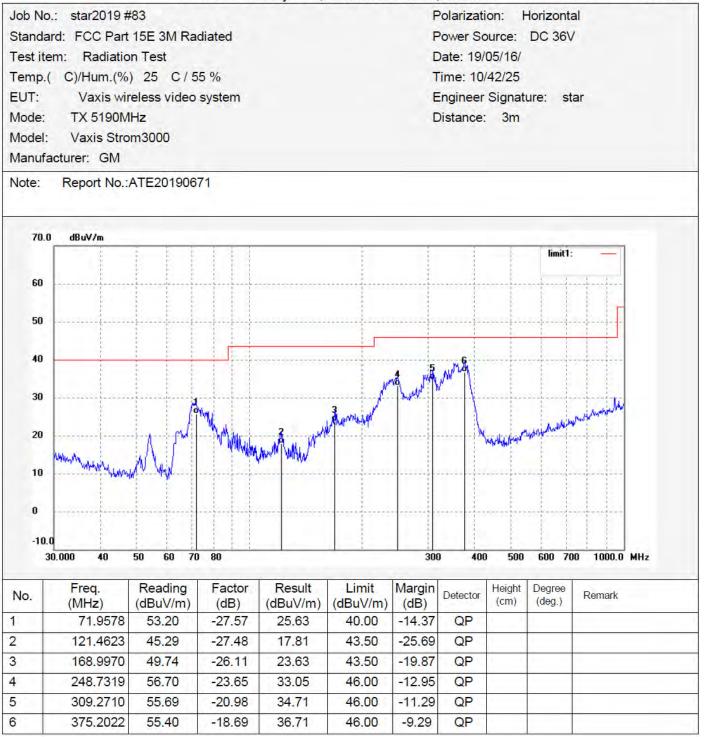
The spectrum analyzer plots are attached as below.



#### Below 1G



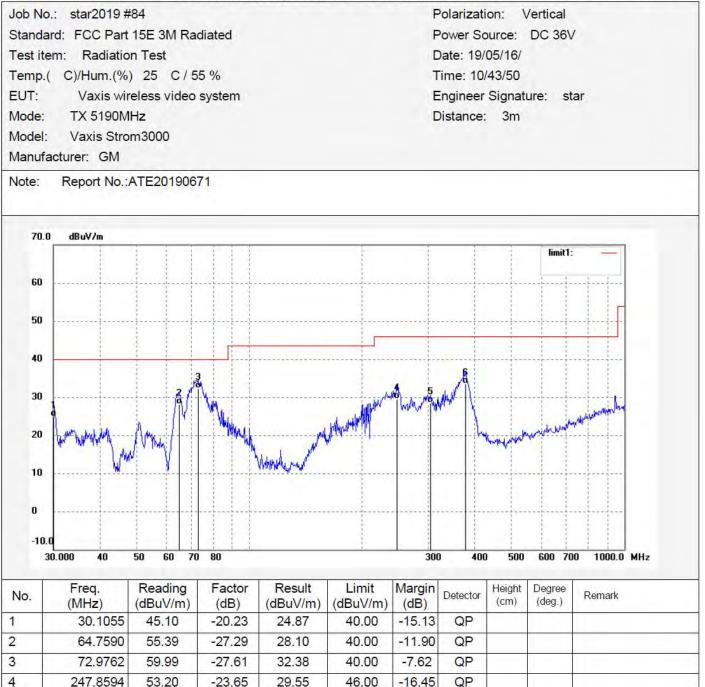
F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China







F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



5

6

303.8851

377.8480

49.57

52.10

-21.11

-18.66

28.46

33.44

46.00

46.00

-17.54

-12.56

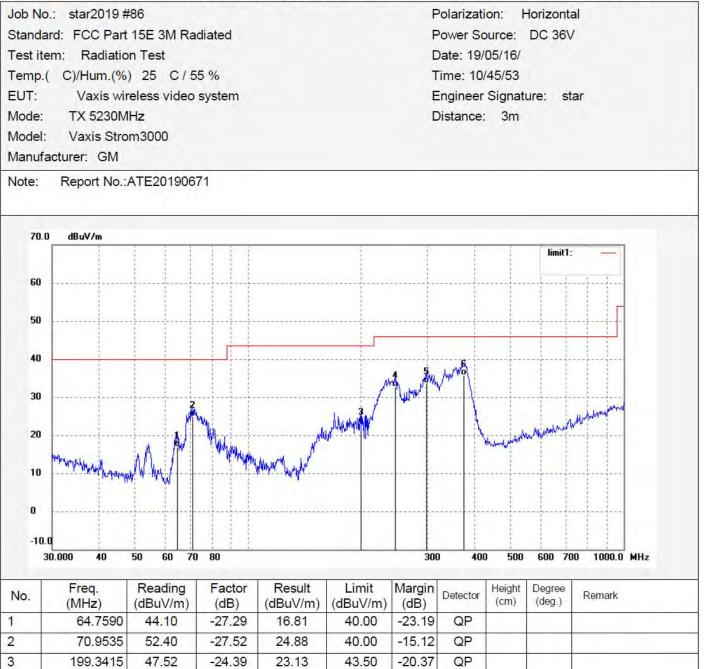
QP

QP





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



-23.66

-21.28

-18.69

32.67

33.76

35.70

46.00

46.00

46.00

-13.33

-12.24

-10.30

QP

QP

QP

246.9901

298.5932

375.2022

56.33

55.04

54.39

4

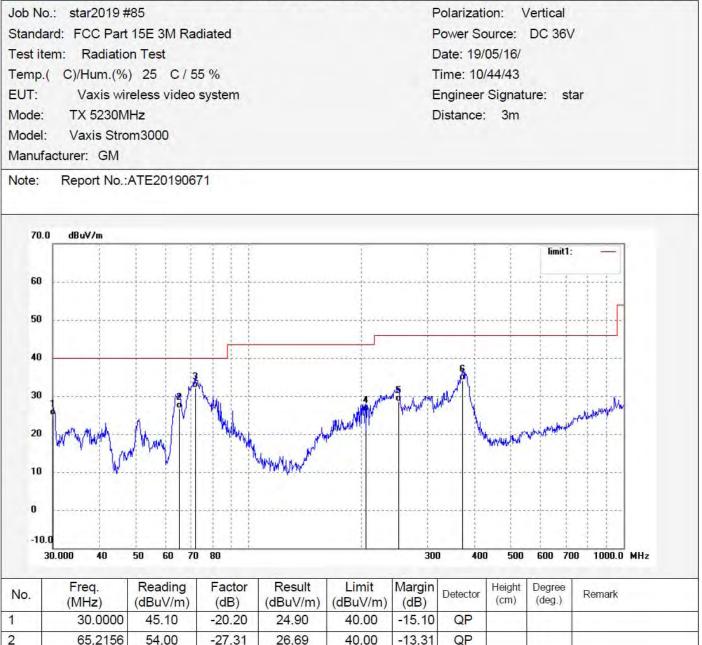
5

6





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



71.9578

205.0243

251.3676

372.5747

59.70

50.10

52.11

52.75

-27.57

-24.16

-23.55

-18.74

32.13

25.94

28.56

34.01

40.00

43.50

46.00

46.00

-7.87

-17.56

-17.44

-11.99

QP

QP

QP

QP

3

4

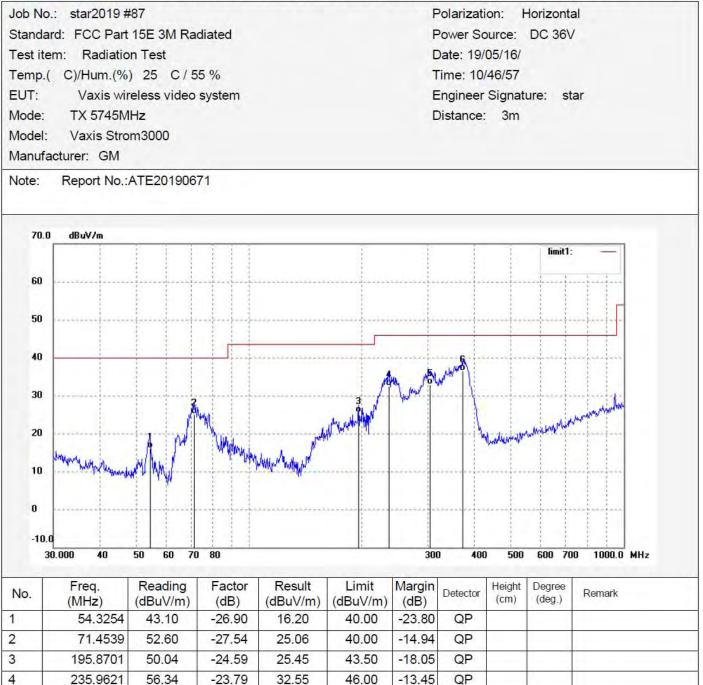
5

6





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



5

6

54.00

55.21

303.8851

371.2679

32.89

36,46

-21.11

-18.75

46.00

46.00

QP

QP

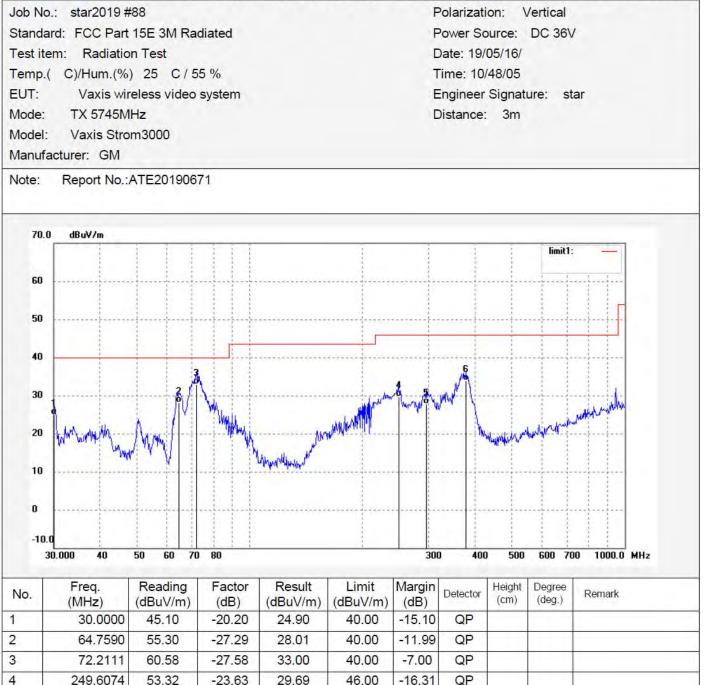
-13.11

-9.54





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



5

6

295,4623

377.8480

49.04

52.60

-21.39

-18.66

27.65

33.94

46.00

46.00

-18.35

-12.06

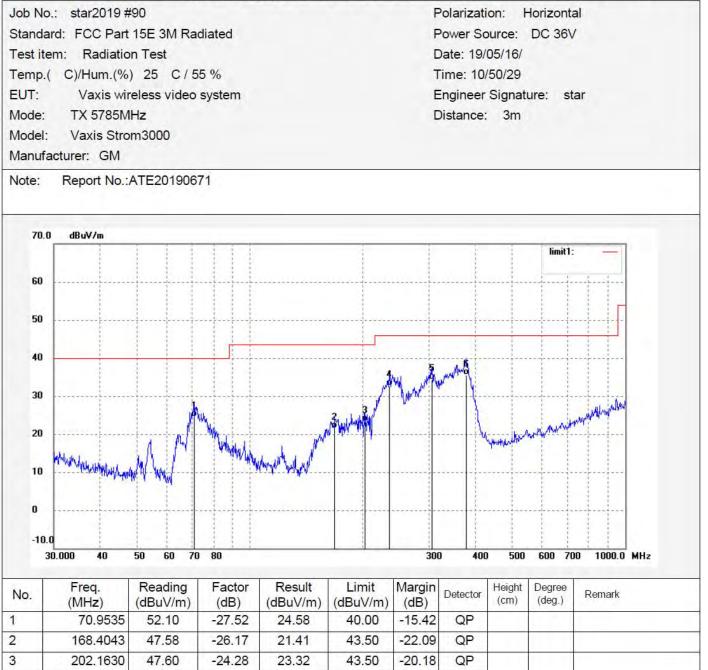
QP

QP





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



4

5

6

235.1346

306.0282

376.5227

56.55

55.34

54.20

-23.79

-21.04

-18.67

32.76

34.30

35.53

46.00

46.00

46.00

-13.24

-11.70

-10.47

QP

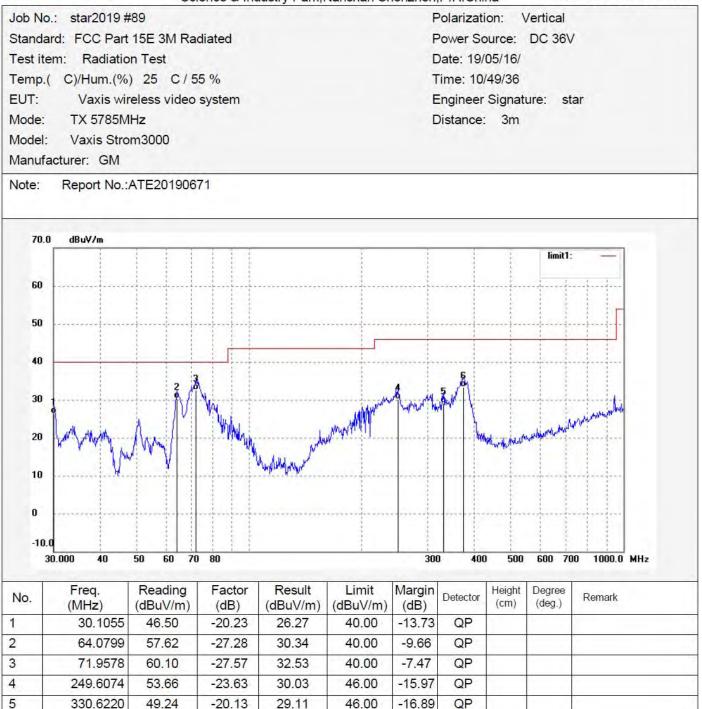
QP

QP





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



6

51.92

373.8861

33.21

46.00

-18.71

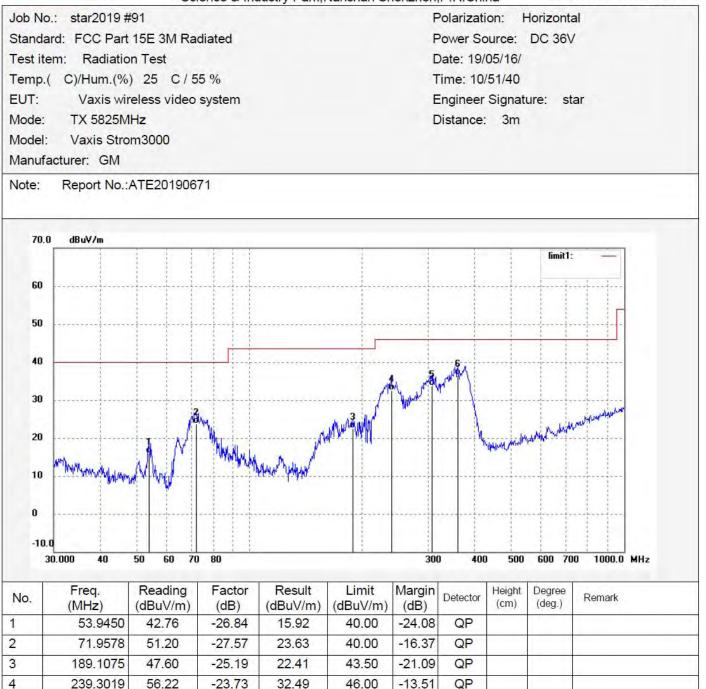
QP

-12.79





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



5

6

307.1051

359.7114

54.78

55.36

-21.02

-18.92

33.76

36.44

46.00

46.00

-12.24

-9.56

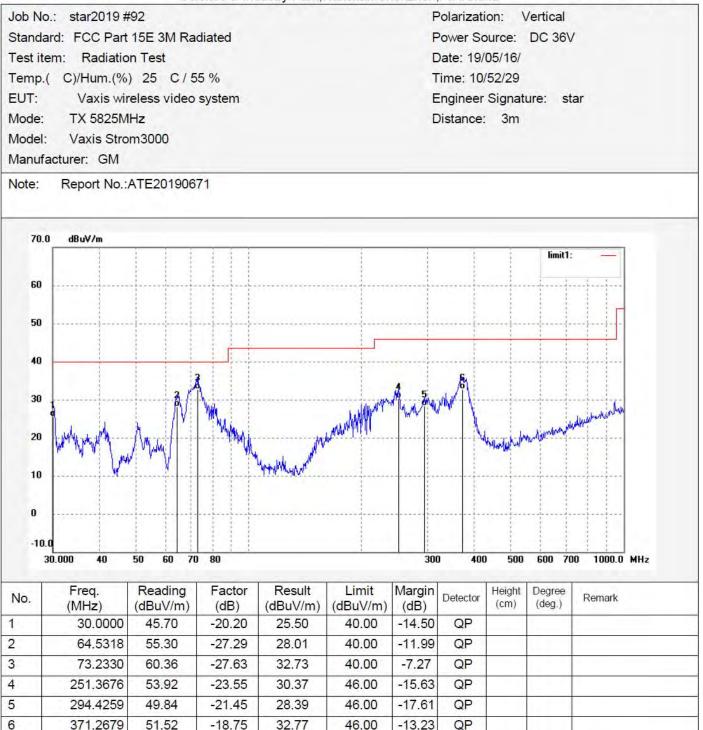
QP

QP





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China





Δ

B

#### Above 1G

## ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Job No.	: star2019 #	<sup>‡94</sup>				F	olarizati	ion: H	lorizonta	al			
Standar	rd: FCC Par	t 15E 3M Ra	adiated			F	ower So	ource:	DC 36V	1			
Test ite	m: Radiatio	n Test				E	)ate: 19/	05/16/					
Temp.(	C)/Hum.(%	) 25 C/5	5 %			Time: 10/57/52							
EUT:	Vaxis wir	reless video	system			E	Ingineer	Signat	ure: st	ar			
Mode:	TX 5190M	IHz				D	)istance:	3m					
Model:	Vaxis Stro	m3000											
Manufa	cturer: GM												
Note:	Report No.:	ATE201906	71										
-													
110.0	0 dBu∀/m												
		6 1 1							limit1: limit2:				
100				1	¥	1			annuz.				
90	*****		********						******				
80								ļ	فتقتيه فتقتره				
70													
70				1									
60		·····		····					*********	******			
50								X		3			
40					marked by	wanter have	Manhana	menilyn	and a start of the	monthemat			
	mandreaman	water water and the second	numbershim	and many many and	your a								
30													
20									********	****			
10					ļ								
0.0													
10	000.000	20	00	3000	5000	6000 7	7000 8000 9	9000		18000.0 MHz			
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark			
1	5190.089	94.35	2.09	96.44	/	/	peak						
2	10380.007	41.65	8.55	50.20	74.00	-23.80	peak						
3	15570.099	31.59	17.42	49.01	74.00	-24.99	peak						





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

ob No.	: star2019 #	93				F	Polarizati	ion: \	/ertical	
Standar	d: FCC Par	t 15E 3M Ra	adiated			F	ower So	ource:	DC 36V	1
est iter	m: Radiatio	n Test				0	Date: 19/	05/16/		
emp.(	C)/Hum.(%)	) 25 C/5	5 %			1	ime: 10	/56/06		
UT:	Vaxis wir	eless video	system			E	Engineer	Signat	ure: st	ar
lode:	TX 5190M	Hz				C	Distance	3m		
lodel:	Vaxis Stro	m3000								
lanufa	cturer: GM									
lote:	Report No.:	ATE201906	71							
	11.0									
110.0	) dBuV/m									
				1	1			1	limit1:	
100		·····							limit2:	<u> </u>
90			للمصادر							
80										
00										
70										*****
60										
50				1				2		3
					1					millimetro
40	htter bearting and a stand have a	1		winnown	Survey man	Wellingham	natural and a second	www.	Roward a count	
30	Wether Way to provide the Way of the	and the second								
20										
10	*************					0.100.0			*********	
0.0	00.000		00	2000	Enco	0000	000 0000	0000		10000 01411-
n	000.000	20	00	3000	5000	6000 4	000 8000	9000		18000.0 MHz
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
	5 <mark>1</mark> 90.089	101.96	2.09	104.05	1	1	peak			
2	10380.062	43.37	8.54	51.91	74.00	-22.09	peak			
	15570.013	32.23	17.43	49.66	74.00	-24.34	peak		1	





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China

Job No.:	star2019 #	95				F	Polarizati	on: H	Horizonta	al
Standard	: FCC Par	t 15E 3M Ra	adiated			F	Power So	ource:	DC 36V	1
Test iten	n: Radiatio	n Test				[	Date: 19/	05/16/		
Temp.(	C)/Hum.(%	) 25 C/5	5 %			-	Time: 11	/00/27		
	Vaxis wir					E	Engineer	Signat	ure: st	ar
Mode:	TX 5230M						Distance			
Model:	Vaxis Stro	m3000								
Manufac	turer: GM									
Note:	Report No.:	ATE201906	71							
110.0	dBu∀/m									
				1					limit1:	
100					*				limit2:	
90							ļļ			
80					L					
00				1		1				
70							1		********	******
60										
50				1				2		
					/m			Î		n Muner
40	granastasis britisatad		Independentitions	ANTIMAN MANY	SUMPORTUGA	war war	Annaparable	som ner ves	April 10 Marian	
30	y hyperaphyphy Allellandorud I	Montenan managere					ļ			
20										
						-				
10	amaman		*******			- Year	i de la company			****
0.0	10.000	20	100	3000	5000	6000	7000 8000			18000.0 MHz
TU	0.000	20	100	3000	5000	6000	7000 8000	3000		10000.0 MHZ
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	5230.014	94.61	2.13	96.74	1	1	peak			
2	10460.038	40.83	8.57	49.40	74.00	-24.60	peak			
3	15690.037	30.73	17.41	48.14	74.00	-25.86	peak			





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.	: star2019 #			austry rank,			Polarizati		/ertical		
	rd: FCC Par		adiated			F	Power So			1	
	m: Radiatio		and a starting				Date: 19/				
	C)/Hum.(%		5 %				Time: 11				
EUT:		eless video					Ingineer		ure: st	ar	
Node:	TX 5230M						Distance				
/lodel:	Vaxis Stro										
	cturer: GM										
Note:	Report No.:	ATE201906	71					_			
110.	0 dBu∀/m	1		Ĩ	1				limit1:	-1	
100		·····							limit2:	-	
90											
00				1							
80											
70				a function of						and the second	
60											
50								8			
					in the	hutrinder a			whether have	Mulanna	
40	hunderhand	manhamment	- Martine Andrews	persistent and a second and the	Annana	- WAW	anninan	and a second	WARDE CAUCH	adal and a	
30	A COTTAC OF THE CASE OF THE CA	Innin									
20			hannan								
10											
0.0											
	D00.000	20	00	3000	5000	6000	7000 8000	9000		18000.0 MH:	z
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark	
	5230.014	102.60	2.13	104.73		(ub)	peak	()	19.7		
	10460.038	43.45	8.57	52.02	74.00	-21.98	peak		1		
	45000.007	00.00		52.01	74.00		1	-			

3

15690.037

33.20

17.41

50.61

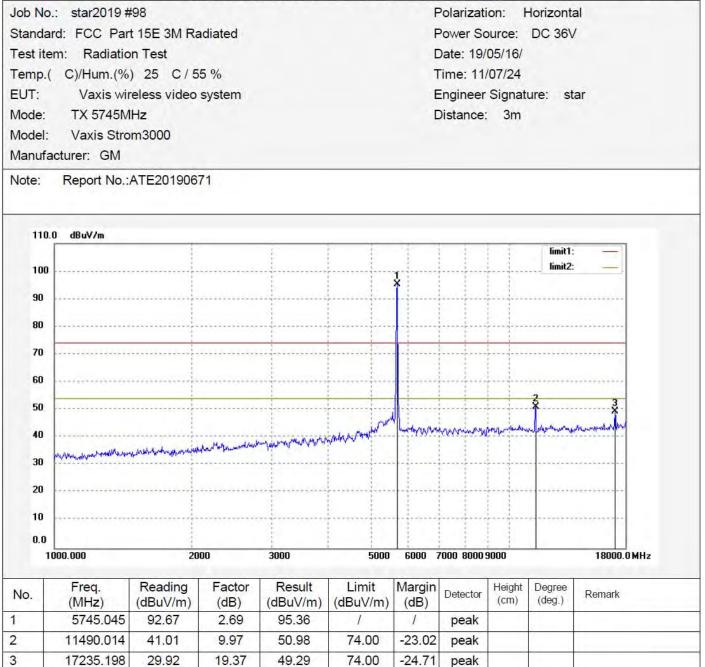
74.00

-23.39





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China







F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

Job No.	: star2019 #	ŧ97				F	Polarizati	on: \	/ertical	
Standar	d: FCC Par	t 15E 3M Ra	adiated			F	Power Sc	ource:	DC 36\	1
Test ite	m: Radiatio	n Test				0	Date: 19/	05/16/		
Temp.(	C)/Hum.(%	) 25 C/5	5 %			1	Time: 11/	05/58		
EUT:	Vaxis wir	eless video	system			E	Engineer	Signat	ure: st	ar
Mode:	TX 5745M						Distance:			
Model:	Vaxis Stro	m3000								
Manufa	cturer: GM									
Note:	Report No.:	ATE201906	71							
110.0	0 dBuV/m									
						1			limit1:	
100						×			limit2:	
90										
80										
80				1						
70										
60					ļ	1				
50				1					<u>k</u>	3
50					which				1	l.
40			A Marke water and	minum	SHUL PHUMP	- ANTHANANA	"Conversionse	www.w	n hay na anna	
30	monthematical	when the manual and	Assume Alexander	munan						
20										
20										
10					·					
0.0		1			t					
10	000.000	20	00	3000	5000	6000 7	7000 8000 9	9000		18000.0 MHz
No.	Freq.	Reading	Factor	Result	Limit	Margin	Detector	Height	Degree	Remark
1	(MHz) 5745.050	(dBuV/m) 98.73	(dB) 2.65	(dBuV/m) 101.38	(dBuV/m)	(dB)	peak	(cm)	(deg.)	and the second
2	11490.091	42.28	9.93	52.21	74.00	-21.79	peak			1
3	17235.089	30.75	9.93	52.21	74.00	-23.61	peak			
·	17235.069	50.75	19.04	50.59	14.00	-23.01	peak			





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

	o.: star2019 #						Polarizati		lorizonta	
	ard: FCC Par		adiated				Power Sc		DC 36V	
	em: Radiatio						Date: 19/			
	( C)/Hum.(%						Time: 11/			
EUT:	Vaxis wir	eless video	system			E	Engineer	Signat	ure: st	ar
Node:	TX 5785M	Hz				C	Distance:	3m		
Nodel:	Vaxis Stro	m3000								
Manufa	acturer: GM									
Note:	Report No.:	ATE201906	71							
-										
110	.0 dBuV/m									
100		ł		(					limit1: limit2:	
100						X	1			
90		·····								******
80										
		1		1. 1. 1. 1.		<u></u>				
70		<u>†</u> -				-			*******	******
60	متنهنيوننو								anain	
50				1					2 X	3
50					Mark	mannen	mumm		- Autor	Muserhaller
40		in the second	- we when have a start	minunder	MUN MAN		Mr. Mariana.	Munine	A halo a trans	
30	Vergendrumphics and sharted	- Anthe A		inimitet			[]			
20				ĺ.						
20										
10	متنفيتهم	minup								and the second sec
0.0				ł		1				
1	000.000	20	00	3000	5000	6000	7000 8000 9	9000		18000.0 MHz
No.	Freq.	Reading	Factor	Result	Limit	Margin	Detector	Height	Degree	Remark
	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg.)	Koman
	5785.45	93.91	2.69	96.60	/	1	peak			
2	11570.052	41.46	10.05	51.51	74.00	-22.49				
3	17355.008	29.05	20.17	49.22	74.00	-24.78	peak			





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No.	.: star2019 #	99				F	Polarizati	ion: \	/ertical				
Standa	rd: FCC Par	t 15E 3M R	adiated			F	Power So	ource:	DC 36\	/			
Test ite	m: Radiatio	n Test				E	Date: 19/	05/16/					
Temp.(	C)/Hum.(%	) 25 C/5	55 %			Time: 11/10/41							
EUT:	Vaxis wir	eless video	system			E	Engineer Signature: star						
Mode:	TX 5785M	Hz				C	Distance:	3m					
Model:	Vaxis Stro	m3000											
Manufa	cturer: GM												
Note:	Report No.:	ATE201906	71										
110.	0 dBu¥/m												
100						*			limit1: limit2:				
90													
80	*****												
70 60						-							
50									2	3			
50					Abrate		manunum		when me	mountering			
40 30	lumungandaruha	ne net the test of the section of the	konneerekkeleiteereene	havy make a proposition of the	W Dagning and and	Arvillan	. Duringer						
20													
10 0.0						-			******	*******			
	000.000	20	000	3000	5000	6000	7000 8000	9000	_	18000.0 MHz			
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark			
1	5785.033	101.22	2.75	103.97	1	/	peak						
2	11570.034	42.42	10.00	52.42	74.00	-21.58	peak						

3

17355.036

29.38

20.44

49.82

74.00

-24.18





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No	.: star2019 #	±101				F	Polarizati	ion: H	lorizonta	al	
Standa	rd: FCC Par	t 15E 3M R	adiated			F	Power So	ource:	DC 36V	1	
Test ite	m: Radiatio	n Test				C	Date: 19/	05/16/			
Temp.(	C)/Hum.(%	) 25 C/5	55 %			1	Time: 11	/22/20			
EUT:	Vaxis wir	eless video	system			E	Engineer	Signat	ure: st	ar	
Mode:	TX 5825M	Hz				E	Distance	3m			
Model:	Vaxis Stro	m3000									
Manufa	acturer: GM										
Note:	Report No.:	ATE201906	71								
110.	0 dBuV/m	-		-	1	-		1	limit1:		
100									limit2:		
90						¥					
30											
80											
70											
60											
									2		
50					Am		1	t tr	×	×	
40				in an altrant	tran paper	Winderson	tashinoge	how have the mo	WWWWWWW	wanter	
30	ord dotan become days	multilimitant	Handrey Manufacture 1	which a st							
-											
20				1		1	1				
	and the second second										
10					1 3	3		1.1			
0.0		1			1 1	1	1 1	1	-		
0.0	000.000	20	000	3000	5000	6000	7000 8000	9000	-	18000.0	MHz
0.0	000.000 Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	3000 Result (dBuV/m)	5000 Limit (dBuV/m)	6000 Margin (dB)		9000 Height (cm)	Degree (deg.)	18000.0 Remark	)MHz
0.0	Freq.	Reading	Factor	Result	Limit	Margin		Height			)MHz

3

17475.011

27.90

20.72

48.62

74.00

-25.38





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No	.: star2019 #	±102				F	Polarizati	ion: \	/ertical												
Standa	andard: FCC Part 15E 3M Radiated							Power Source: DC 36V													
Test item: Radiation Test Temp.( C)/Hum.(%) 25 C / 55 % EUT: Vaxis wireless video system Mode: TX 5825MHz							Date: 19/05/16/ Time: 11/25/02 Engineer Signature: star Distance: 3m														
											Model:	Vaxis Stro	m3000								
											Manufa	acturer: GM									
											Note:	Report No.:	ATE201906	71							
110.	0 dBuV/m	i		1		1	1	1	limit1:	_											
100						×			limit2:	-											
90																					
80																					
70	******								*******	******											
60																					
50									×	3											
40					minimum	* Linnay	mount	phonemante	rehammen	and the second											
30	M. Anyan Marton Math	any forward have been	union where the second s	an and a second	Mur																
20																					
10																					
0.0	1.1																				
1	000.000	20	000	3000	5000	6000	7000 8000 9	9000		18000.0 MHz											
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark											
NO.					1		1														
1	5825.033	99.61	2.75	102.36	1	1	peak		1												

3

17475.011

20.72

28.87

49.59

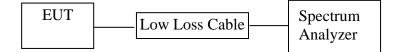
74.00

-24.41



# **12.BAND EDGE COMPLIANCE TEST**

#### 12.1.Block Diagram of Test Setup



### 12.2. The Requirement For Section 15.407(b)

(1) For transmitters operating in the 5.15–5.25 GHz band: All emissions outside of the 5.15-5.35 GHz band shall not exceed an e.i.r.p. of -27 dBm/MHz.

(4) For transmitters operating in the 5.725–5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge, and from 5 MHz above or below the band edge.

#### 12.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 12.4.Operating Condition of EUT

12.4.1.Setup the EUT and simulator as shown as Section 12.1.

12.4.2.Turn on the power of all equipment.

12.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz, 5230MHz, 5745MHz and 5825MHz.



#### 12.5.Test Procedure

#### Conducted Band Edge:

- 12.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 12.5.2.Set RBW of spectrum analyzer to 100kHz and VBW to 300kHz.

Radiate Band Edge:

- 12.5.3.The EUT is placed on a turntable, which is 1.5m above the ground plane and worked at highest radiated power.
- 12.5.4.The turntable was rotated for 360 degrees to determine the position of maximum emission level.
- 12.5.5.EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.
- 12.5.6.Set the spectrum analyzer in the following setting in order to capture the lower and upper band-edges of the emission:
- 12.5.7.RBW=1MHz, VBW=1MHz
- 12.5.8. The band edges was measured and recorded.
- 12.5.9. The field strength is calculated by adding the antenna factor, high pass filter loss(if used) and cable loss, and subtracting the amplifier gain(if any)from the measured reading. The basic equation calculation is as follows:

Result = Reading + Corrected Factor

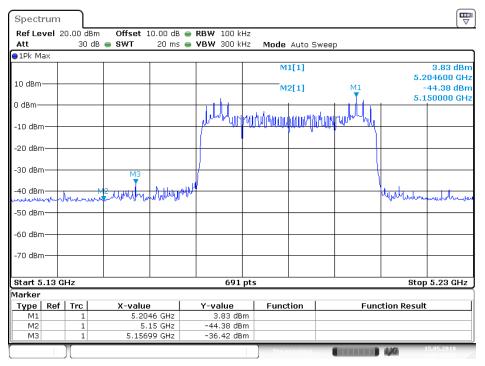
#### 12.6.Test Result

Pass

The spectrum analyzer plots are attached as below.

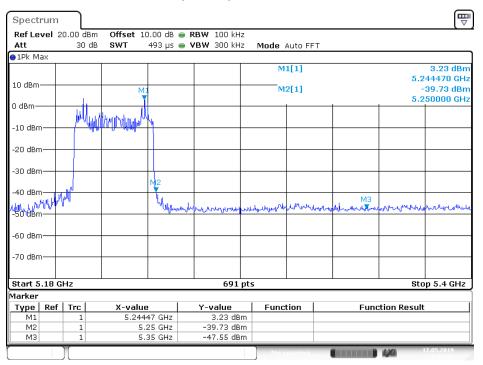


#### (ANT 1) 5190MHz



Date: 15.MAY.2019 16:59:50

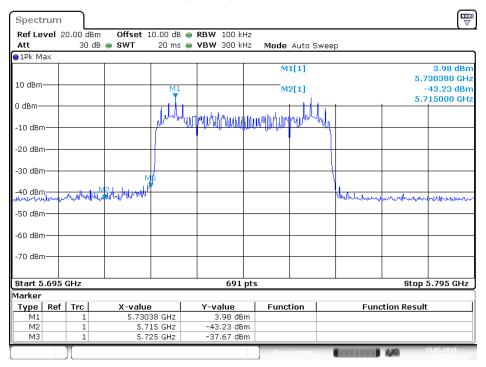
#### (ANT 1) 5230MHz



Date: 17.MAY.2019 16:37:25

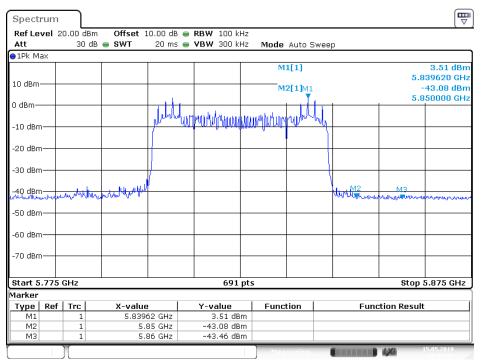


#### (ANT 1) 5745MHz

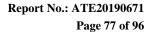


Date: 15.MAY.2019 16:51:44

#### (ANT 1) 5825MHz

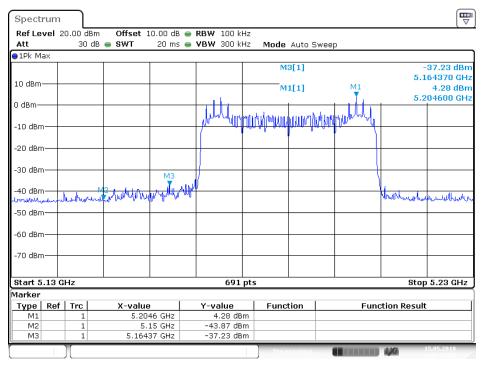


Date: 15.MAY.2019 17:01:18



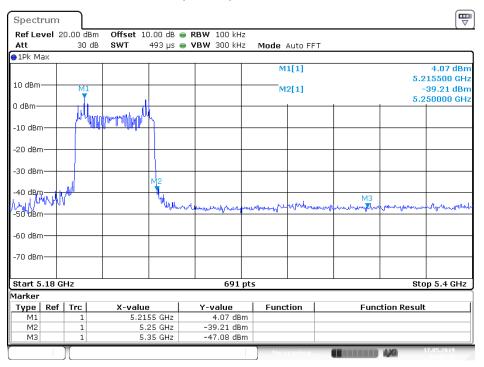


#### (ANT 2) 5190MHz



Date: 15.MAY.2019 16:57:03

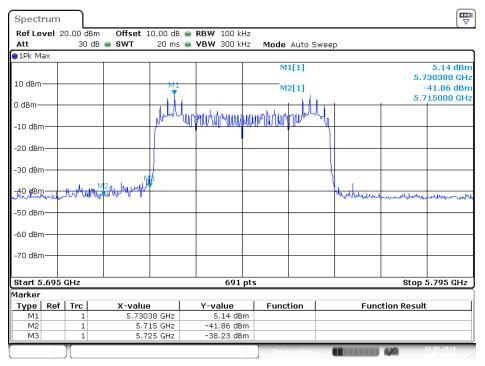
#### (ANT 2) 5230MHz



Date: 17.MAY.2019 16:40:40

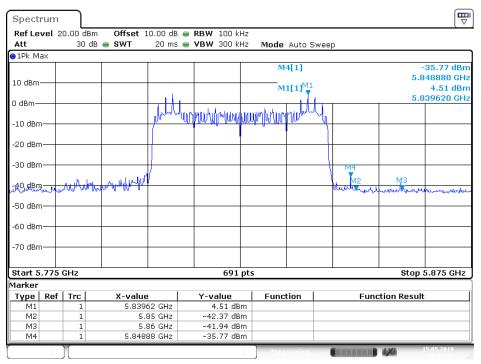


#### (ANT 2) 5745MHz



Date: 15.MAY.2019 16:55:40

#### (ANT 2) 5825MHz



Date: 15.MAY.2019 16:54:41

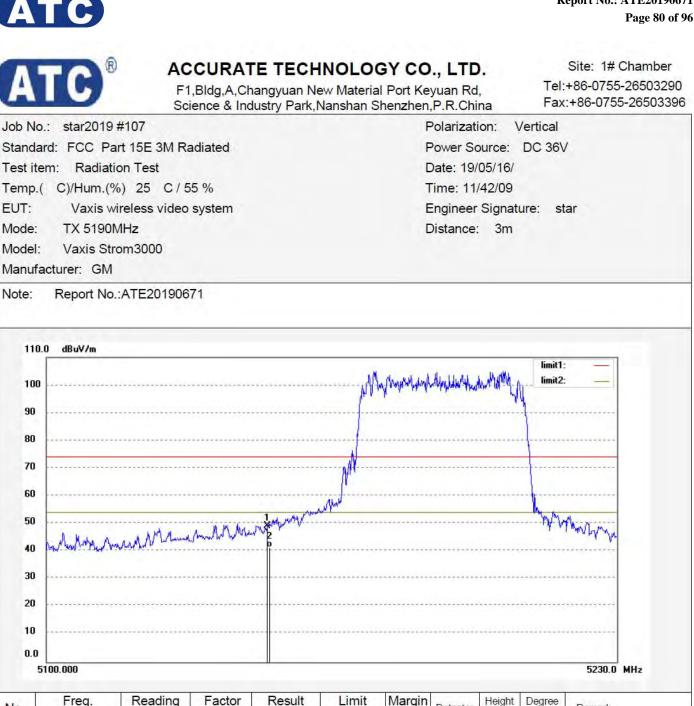




#### Radiated Band Edge Result ACCURATE TECHNOLOGY CO., LTD.

F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

		30	ence à m	uusuy Faik,	Nalisian S	nenznen	,F.IX.Off	IIa				
lob No.	: star2019 #	¢108				F	Polarizat	ion: I	Horizont	al		
tandar	d: FCC Par	t 15E 3M Ra	adiated			F	Power So	ource:	DC 36	/		
est iter	m: Radiatio	on Test				E	Date: 19/	05/16/				
emp.(	C)/Hum.(%	) 25 C/5	5 %			1	Time: 11	e: 11/44/08				
EUT:	Vaxis wir	reless video	system			E	Engineer	Signat	ure: st	tar		
Node:	TX 5190M	IHz				[	Distance	: 3m				
Nodel:	Vaxis Stro	m3000										
Manufa	cturer: GM											
Note:	Report No .:	ATE201906	71									
10 - 10 - 10 												
110.0	) dBuV/m											
									limit1:			
100									limit2:	:		
90		******			····· //	(market burket)	VIII-AMARAMA	N/2/44/huna	<b>\</b>			
80												
70				*****	·····				<i>f</i>			
60			••••		·····							
50				but	MAS				ma	Arrenter		
	historial tetration we	IL I HA MANYAM	Variation	Warmun					1.44	mann		
40	Propring Approximation Marc	Mar and	**********	2			********		*******	********		
30	******	*****	******									
20												
10							masa	1000000000				
0.0												
1.1	00.000									5230.0 MHz		
		1		1 2	T	1	1	-		The second second		
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark		
	5150.000	41.20	2.04	43.24	74.00	-30.76	peak		1.1.2	1		
1	5150.000	32.42	2.04	34.46	54.00	-19.54	AVG		12.2			



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)		Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark
1	5150.000	47.05	2.04	49.09	74.00	-24.91	peak			
2	5150.000	39.27	2.04	41.31	54.00	-12.69	AVG	1		

Report No.: ATE20190671





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

ob No .: STAR20	19 #109				F	Polarizati	on: H	Horizonta	al		
Standard: FCC P	art 15E 3M Ra	diated			Power Source: DC 36V						
est item: Radia	ion Test				Date: 19/05/16/						
emp.( C)/Hum.(	%) 25 C/55	5 %			Time: 11/47/23						
UT: Vaxis v							Signat	ure: st	ar		
/lode: TX 5230	MHz				0	Distance:	3m				
Nodel: Vaxis St	rom3000										
Anufacturer: GN											
Note: Report No	.:ATE2019067	71									
110.0 dBuV/m								E-341		1	
100								limit1: limit2:			
	. N. A. A.										
	www.yh										
	www.h										
90 Autor	ww.y.										
90	www.h										
90											
90				3							
90		mun	Annennaherraher	w	- Anglanda	ur, mpy halle	nontroduct	n producto de diver	burnadary		
90		mun	Annening	www.waya	- Additional	w.mpubulk	Ang Ang kan	regreederchickbeer	butenst		
90 80 70 60 50 40 30		umun	h.a.y.m.hymbu	who managed with the state of the	- Addibridge	wy.mpupulik		ng providence da de forma	dagterations		
90		munn	hang was by other	yn meger farlwer y	- Asselentes	www.mpup.halite	mmunun	ngpredentlighteer	duyprovedires		
90 80 70 60 50 40 30		mm	h.h., m.h. hy Miden	Warner Wittenburger	- Addibrithe	ury mpaghalith	Anghaghagh	ng procher de glacement	and the second		
90 80 70 60 50 40 30 20 10 0.0		mmm	A. Mary Mark Mark	yn men fer start wen y	- Assterits	wy. wpw.halle		n producto de la como			
90		mmm	h.h.y.m.h.ym.h.		- Addibridha	44.7mphubulik	Anghaghagh	ng procher de globorer	фууртунфоту 5480.0		
90		Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Aw Muluu Height (cm)	Degree (deg.)			
90	Reading (dBuV/m)	Factor	Result	Limit	Margin		Height	Degree	5480.0		

3

4

5350.000

5350.000

43.25

33.40

2.28

2.28

45.53

35.68

74.00

54.00

-28.47

-18.32

peak

AVG





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park, Nanshan Shenzhen, P.R. China

Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

Job No	.: STAR2019	9 #110				F	olarizati	on: \	/ertical			
Standa	rd: FCC Par	t 15E 3M Ra	diated			F	ower So	ource:	DC 36V	1		
est ite	em: Radiatio	n Test				Date: 19/05/16/						
Temp.(	C)/Hum.(%	) 25 C/5	5 %			Time: 11/49/01						
UT:	Vaxis wir	eless video	system			E	Ingineer	Signat	ure: st	ar		
/lode:	TX 5230M	Hz				C	Distance:	3m				
lodel:	Vaxis Stro											
Manufa	acturer: GM											
Note:	Report No.:	ATE2019067	71									
110.	.0 dBu∀/m											
110.		Constant Constant							limit1:	-		
100	MUMMM	Alterna							limit2:	-		
90		}										
50												
80		*****						*******	•••••	*****		
70					*******			*******				
60		X		100100000000000000000000000000000000000	0.00000000000							
	1	2										
50	f	"hours	WMALL MAY	As the Lore is	numphy and	unter a de la				to any effect		
40			-V-VV-	Ari Landon Jana Marian Marina	Catholin department	a, i nda belvindaladı	MP4. MP4. MP4. MP4. MP4. MP4. MP4. MP4.	has a start and the	uni AndaAnin N	MANTAN ALMENE NY A		
30												
20			******	******	******							
10					*****							
0.0		1										
5	200.000									5480.0 MHz		
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark		
2 = 1	5250.000	58.82	2.16	60.98	74.00	-13.02	peak	1				
	5250.000	49.30	2.16	51.46	54.00	-2.54	AVG					
2.11	5350.000	44.47	2.28	46.75	74.00	-27.25	peak					
	5350.000	35.69	2.28	37.97	54.00	-16.03	AVG					





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

ob No.:	star2019 #	105				F	Polarizati	ion: H	Horizonta	al	
Standar	d: FCC Par	t 15E 3M Ra	diated			F	Power So	ource:	DC 36\	/	
est iter	n: Radiatio	n Test				0	Date: 19/	05/16/			
emp.(	C)/Hum.(%	) 25 C/5	5 %			J	Fime: 11/	/36/06			
UT:	Vaxis wir	eless video	system			E	Engineer	Signat	ure: st	ar	
/lode:	TX 5745M	Hz				0	Distance:	3m			
/lodel:	Vaxis Stro	m3000									
lanufac	cturer: GM										
lote:	Report No .:.	ATE2019067	71								
110.0	dBuV/m										
[									limit1:	-	
100									limit2:	·	
90						M	Array Marine	Waterwall	1		
							0 million and		1		
80								*********			
70				•••••	•••••			*******			
60					,						
50						X			ha		
30	y beine when a period when the period of the	a . A statistics have	ul . to unteres	a where where have been	Mar Multimand	AMAN			wh	Malanda.	
40	In survey and a survey of the start of	on Warden and Anna and Anna an	an in the first first for the first of the f	Man di ina di		2					
30											
20											
10	************						0110010		********	******	
0.0	05 000									5705.0	
55	95.000									5795.0	MHZ
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB)	Result (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Degree (deg.)	Remark	
	()	(abav/iii)	(uD)	(abav/m)	(abav/iii)	(uD)					

2

3

4

5715.000

5725.000

5725.000

33.40

52.94

43.90

2.74

2.75

2.75

36.14

55.69

46.65

54.00

74.00

54.00

-17.86

-18.31

-7.35

AVG

peak

AVG





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

ob No.	: star2019 #	<i>‡</i> 106	-			F	Polarizati	ion: \	/ertical			
Standar	d: FCC Par	t 15E 3M Ra	adiated			F	Power Sc	ource:	DC 36V	1		
est iter	m: Radiatio	on Test				C	Date: 19/	05/16/				
emp.(	C)/Hum.(%	) 25 C/5	5 %			Time: 11/37/52						
UT:	Vaxis wi	reless video	system			E	Engineer	Signat	ure: st	ar		
/lode:	TX 5745M	IHz				C	Distance:	3m				
/lodel:	Vaxis Stro	m3000										
lanufa	cturer: GM											
lote:	Report No.:	ATE201906	71									
110.0	) dBuV/m								F-34			
100							Frunday	unulus A	limit1:			
90	human					1		414	1			
80								********				
70	******				******		******	*******				
60									1			
50						1			Aum			
50	Manharanthaniyaaaan			whentywerkywere	ANNAN WANNA	2				Munu		
40	an niveren an heard	N-ANARA BAYEV						******				
30												
20												
10	******						*********			*********		
0.0	OF 000									E70E 0		
55	95.000									5795.0	MHZ	
	Freq.	Reading	Factor	Result	Limit	Margin	Detector	Height	Degree	Remark		
No.	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Delector	(cm)	(deg.)	Kentark		

2

3

4

5715.000

5725.000

5725.000

38.25

55.24

46.73

2.74

2.75

2.75

40.99

57.99

49.48

54.00

74.00

54.00

-13.01

-16.01

-4.52

AVG

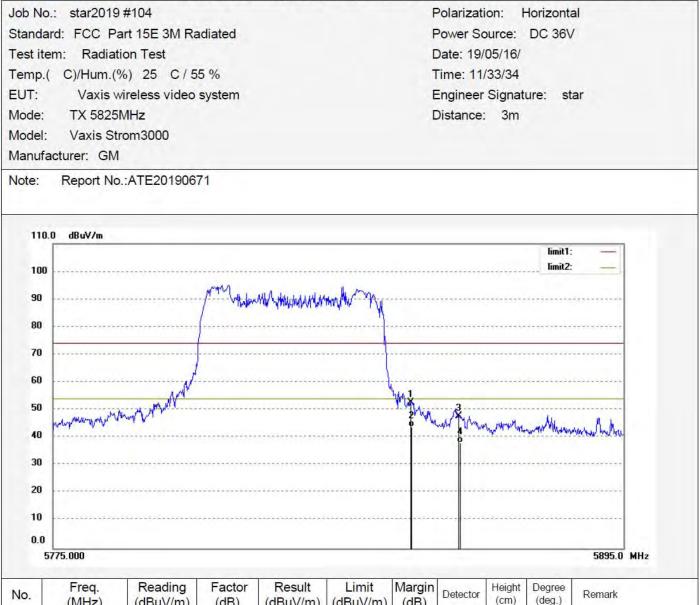
peak

AVG





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396

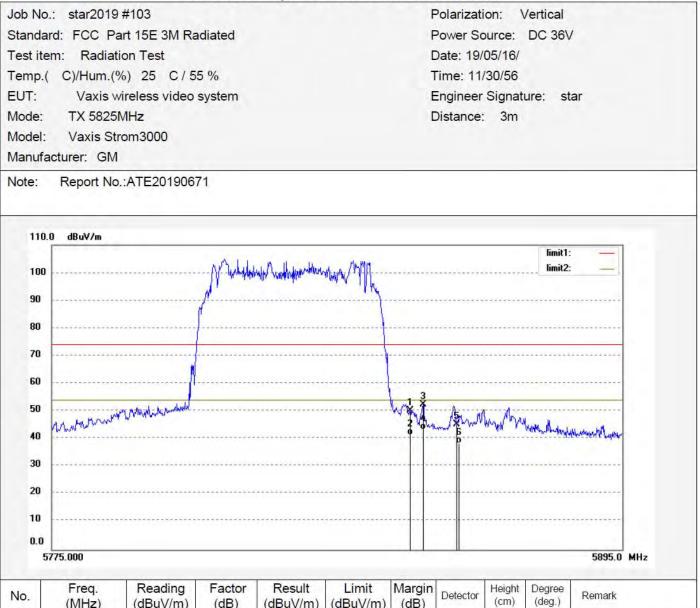


No.	(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Detector	(cm)	(deg.)	Remark
1	5850.000	49.78	2.93	52.71	74.00	-21.29	peak			
2	5850.000	40.90	2.93	43.83	54.00	-10.17	AVG	[]		
3	5860.000	44.65	2.95	47.60	74.00	-26.40	peak			
4	5860.000	35.14	2.95	38.09	54.00	-15.91	AVG			





F1,Bldg,A,Changyuan New Material Port Keyuan Rd, Science & Industry Park,Nanshan Shenzhen,P.R.China Site: 1# Chamber Tel:+86-0755-26503290 Fax:+86-0755-26503396



(MHz)	(dBuV/m)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	Detector	(cm)	(deg.)	Remark
5850.000	47.15	2.93	50.08	74.00	-23.92	peak			
5850.000	38.52	2.93	41.45	54.00	-12.55	AVG			
5852.876	49.56	2.93	52.49	74.00	-21.51	peak			
5852.876	40.44	2.93	43.37	54.00	-10.63	AVG			
5860.000	42.27	2.95	45.22	74.00	-28.78	peak			
5860.000	35.28	2.95	38.23	54.00	-15.77	AVG			1
	(MHz) 5850.000 5850.000 5852.876 5852.876 5852.876 5860.000	(MHz)         (dBuV/m)           5850.000         47.15           5850.000         38.52           5852.876         49.56           5852.876         40.44           5860.000         42.27	(MHz)         (dBuV/m)         (dB)           5850.000         47.15         2.93           5850.000         38.52         2.93           5852.876         49.56         2.93           5852.876         40.44         2.93           5860.000         42.27         2.95	(MHz)(dBuV/m)(dB)(dBuV/m)5850.00047.152.9350.085850.00038.522.9341.455852.87649.562.9352.495852.87640.442.9343.375860.00042.272.9545.22	(MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)           5850.000         47.15         2.93         50.08         74.00           5850.000         38.52         2.93         41.45         54.00           5852.876         49.56         2.93         52.49         74.00           5852.876         40.44         2.93         43.37         54.00           5860.000         42.27         2.95         45.22         74.00	(MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)         (dB)           5850.000         47.15         2.93         50.08         74.00         -23.92           5850.000         38.52         2.93         41.45         54.00         -12.55           5852.876         49.56         2.93         52.49         74.00         -21.51           5852.876         40.44         2.93         43.37         54.00         -10.63           5860.000         42.27         2.95         45.22         74.00         -28.78	(MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)         (dB)         Detector           5850.000         47.15         2.93         50.08         74.00         -23.92         peak           5850.000         38.52         2.93         41.45         54.00         -12.55         AVG           5852.876         49.56         2.93         52.49         74.00         -21.51         peak           5852.876         40.44         2.93         43.37         54.00         -10.63         AVG           5860.000         42.27         2.95         45.22         74.00         -28.78         peak	(MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)         (dB)         Detector         (cm)           5850.000         47.15         2.93         50.08         74.00         -23.92         peak           5850.000         38.52         2.93         41.45         54.00         -12.55         AVG           5852.876         49.56         2.93         52.49         74.00         -21.51         peak           5852.876         40.44         2.93         43.37         54.00         -10.63         AVG           5860.000         42.27         2.95         45.22         74.00         -28.78         peak	(MHz)         (dBuV/m)         (dB)         (dBuV/m)         (dBuV/m)         (dB)         Detector         (cm)         (deg.)           5850.000         47.15         2.93         50.08         74.00         -23.92         peak            5850.000         38.52         2.93         41.45         54.00         -12.55         AVG            5852.876         49.56         2.93         52.49         74.00         -21.51         peak            5852.876         40.44         2.93         43.37         54.00         -10.63         AVG            5860.000         42.27         2.95         45.22         74.00         -28.78         peak



# **13.IN BAND EMISSION TEST**

### 13.1.Block Diagram of Test Setup



### 13.2. The Requirement For Section 15.407(b)

(4) For transmitters operating in the 5.725–5.85 GHz band:

(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge, and from 5 MHz above or below the band edge.

### 13.3.EUT Configuration on Measurement

The equipment are installed on the emission Measurement to meet the commission requirements and operating regulations in a manner which tends to maximize its emission characteristics in normal application.

### 13.4.Operating Condition of EUT

- 13.4.1.Setup the EUT and simulator as shown as Section 13.1.
- 13.4.2.Turn on the power of all equipment.
- 13.4.3.Let the EUT work in TX modes measure it. The transmit frequency are 5745MHz and 5825MHz.

#### 13.5.Test Procedure

- 13.5.1.The transmitter output was connected to the spectrum analyzer via a low loss cable.
- 13.5.2.Set RBW of spectrum analyzer to 1MHz and VBW to 3MHz.

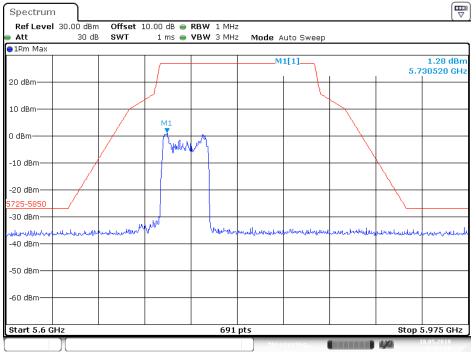
### 13.6.Test Result

#### Pass

The spectrum analyzer plots are attached as below.

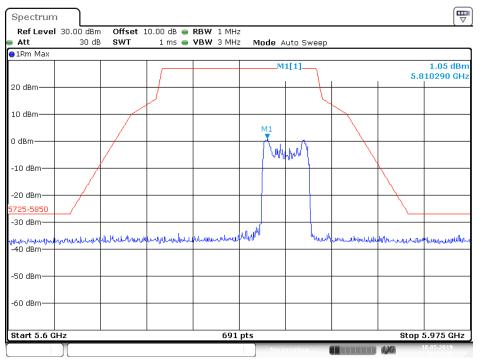


#### (ANT 1) 5745MHz



Date: 18.MAY.2019 16:24:16

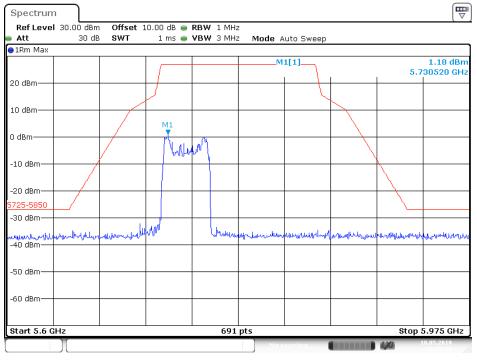
#### (ANT 1) 5825MHz



Date: 18.MAY.2019 16:31:33

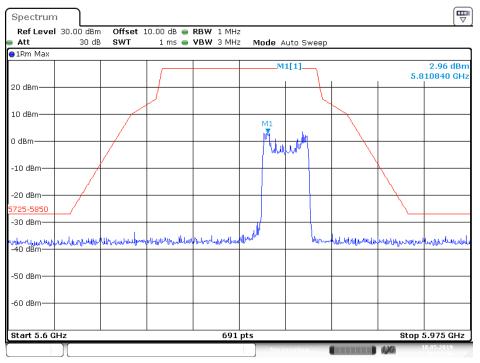


#### (ANT 2) 5745MHz



Date: 18.MAY.2019 16:33:33

#### (ANT 2) 5825MHz

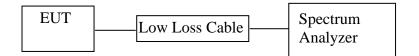


Date: 18.MAY.2019 16:29:56



# **14.FREQUENCIES STABILITY**

#### 14.1.Block Diagram of Test Setup



### 14.2.EUT Configuration on Measurement

Manufacturers of U-NII devices are responsible for ensuring frequency stability such that an emission is maintained within the band of operation under all conditions of normal operation as specified in the user manual.

### 14.3.Operating Condition of EUT

14.3.1.Setup the EUT and simulator as shown as Section 14.1.

- 14.3.2.Turn on the power of all equipment.
- 14.3.3.Let the EUT work in TX modes measure it. The transmit frequency are 5190MHz, 5230MHz, 5745MHz, 5785MHz and 5825MHz.

#### 14.4.Test Result

Pass.

The spectrum analyzer plots are attached as below.



### Frequencies Stability test result: 5190MHz

Test Conditions	Measured Frequency(MHz) 5190
V nor(V)	5190.0017
V max(V)	5190.0024
V min(V)	5190.0030
Max. Deviation Frequency	0.0030
Max. Frequency Error (ppm)	0.6

Test Conditions (°C)	Measured Frequency(MHz) 5190
-5	5190.0014
5	5190.0022
15	5190.0038
25	5190.0042
35	5190.0028
45	5190.0051
50	5190.0068
Max. Deviation Frequency	0.0068
Max. Frequency Error (ppm)	1.31



### Frequencies Stability test result: 5230MHz

Test Conditions	Measured Frequency(MHz) 5230
V nor(V)	5230.0058
V max(V)	5230.0047
V min(V)	5230.0069
Max. Deviation Frequency	0.0069
Max. Frequency Error (ppm)	1.32

Test Conditions (°C)	Measured Frequency(MHz) 5230
-5	5230.0047
5	5230.0039
15	5230.0011
25	5230.0070
35	5230.0034
45	5230.0014
50	5230.0092
Max. Deviation Frequency	0.0092
Max. Frequency Error (ppm)	1.76



### Frequencies Stability test result: 5745MHz

Test Conditions	Measured Frequency(MHz) 5745
V nor(V)	5745.0047
V max(V)	5745.0055
V min(V)	5745.0064
Max. Deviation Frequency	0.0064
Max. Frequency Error (ppm)	1.11

Test Conditions (°C)	Measured Frequency(MHz) 5745
-5	5745.0099
5	5745.0092
15	5745.0054
25	5745.0043
35	5745.0090
45	5745.0072
50	5745.0066
Max. Deviation Frequency	0.0099
Max. Frequency Error (ppm)	1.72



### Frequencies Stability test result: 5785MHz

Test Conditions	Measured Frequency(MHz) 5785
V nor(V)	5785.0037
V max(V)	5785.0061
V min(V)	5785.0054
Max. Deviation Frequency	0.0061
Max. Frequency Error (ppm)	1.05

Test Conditions (°C)	Measured Frequency(MHz) 5785
-5	5785.0040
5	5785.0037
15	5785.0021
25	5785.0033
35	5785.0045
45	5785.0030
50	5785.0088
Max. Deviation Frequency	0.0088
Max. Frequency Error (ppm)	1.52



### Frequencies Stability test result: 5825MHz

Test Conditions	Measured Frequency(MHz) 5825
V nor(V)	5825.0071
V max(V)	5825.0054
V min(V)	5825.0024
Max. Deviation Frequency	0.0071
Max. Frequency Error (ppm)	1.22

Test Conditions (°C)	Measured Frequency(MHz) 5825
-5	5825.0014
5	5825.0033
15	5825.0082
25	5825.0014
35	5825.0067
45	5825.0051
50	5825.0029
Max. Deviation Frequency	0.0082
Max. Frequency Error (ppm)	1.41



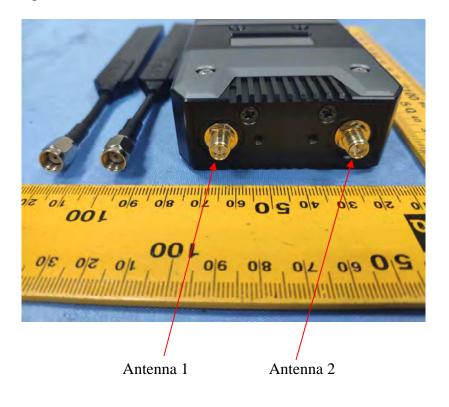
# **15.ANTENNA REQUIREMENT**

#### 15.1.The Requirement

According to Section 15.203 and 15.204, 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.

#### 15.2.Antenna Construction

The antenna use a unique coupling to the intentional radiator shall be considered sufficient to comply with the provisions of this section. 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. The antenna jack of EUT correspond to the standard. The Antenna gain of EUT is 4.5dBi. Therefore, the equipment complies with the antenna requirement of Section 15.203 and 15.204.



#### \*\*\*\*\* End of Test Report \*\*\*\*\*