

# Test Report of FCC CFR 47 Part 15 Subpart C

## On Behalf of

## Graupner CO., Ltd

8th F,202 Dong,Chunui Techno-Park2,18, Bucheon-ro 198beon-gil,Wonmi-gu,, Bucheon-Shi, Kyungki-Do, South Korea

Draduat Nama	Quedrasenter
Product Name:	Quadrocopter
EUT Description:	5.8GHz Video module
Model/Type No.:	Alpha 110
Trade Name:	НоТТ
FCC ID:	SNL-19001200
Prepared By:	Shenzhen Hongcai Testing Technology Co., Ltd. 1st-3rd Floor, Building C, Shuanghuan Xin Yi Dai Hi-Tech Industrial Park, No.8 Baoqing Road, Baolong Industrial Zone, Longgang District, Shenzhen, Guangdong, China Tel: +86-755-86337020 Fax:+86-755-86337028
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## **1. GENERAL INFORMATION**

#### **1.1 Product Description for Equipment Under Test (EUT)**

**Client Information** 

Applicant:	Graupner CO.,Ltd	
Address of applicant:	8th F,202 Dong,Chunui Techno-Park2,18, Bucheon-ro 198beon-gil,	
	Wonmi-gu,,Bucheon-Shi, Kyungki-Do, South Korea	
Manufacturer :	SJ Technology(Shenzhen)Co.,Ltd	
Address of manufacturer:	F6, 1 Bldg, A Area, Yintianxifa Industrial Area, Xixiang Town, Baoan	
	District Shenzhen, Guangdong Province, China	

## General Description of E.U.T

Items	Description
EUT Description:	5.8GHz Video module
Model No.:	Alpha 110
Trade Name:	НоТТ
Frequency Band:	5740~5860MHz
Channel Spacing:	20MHz
Number of Channels:	7
Type of Modulation:	EMNGCAT TESTING
Antenna Gain	-6dBi
Antenna Type:	Integral Antenna
Rated Voltage:	Input: DC 4.5V~8.4V

Remark: \* The test data gathered are from the production sample provided by the manufacturer.

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#### 1.2 Related Submittal(s) / Grant (s) and Test Methodology

This submittal(s) is a test report based on the Electromagnetic Interference (EMI) tests performed on the EUT. The EMI measurements were performed according to the measurement procedure described in ANSI C63.4-2009.

The tests were performed in order to determine compliance with Section 15.107 and 15.109 under the FCC Rules Part 15 Subpart B and Section 15.207, 15.209, 15.249 under the FCC Rules Part 15 Subpart C.

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

#### **1.3 Test Facility**

All measurement required was performed at laboratory of Shenzhen CTL Testing Technology Co., Ltd. Floor 1-A, Baisha Technology Park, No. 3011, Shahexi Road, Nanshan, Shenzhen 518055 China There is one 3m semi-anechoic chamber and two line conducted labs for final test. The Test Sites meet the requirements in documents ANSI C63.4 and CISPR 22/EN 55022 requirements.

FCC – Registration No.: 970318

Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration 970318, December, 2013.

IC Registration No.: 9618B

The 3m alternate test site of Shenzhen CTL Testing Technology Co., Ltd. EMC Laboratory has been registered by Certification and Engineer Bureau of Industry Canada for the performance of with Registration No.: 9618B on November 13, 2013.



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## 2. SYSTEM TEST CONFIGURATION

#### 2.1 EUT Configuration

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

#### 2.2 EUT Exercise

The calibrated antennas used to sample the radiated field strength are mounted on a non-conductive, motorized antenna mast 3 or 10 meters from the leading edge of the turntable.

#### 2.3 General Test Procedures

Conducted Emissions: The EUT is placed on the table, which is 0.8 m above ground plane According to the requirements in ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30MHz using CISPR Quasi-Peak detector mode.

Radiated Emissions: The EUT is a placed on as turntable, which is 0.8 m above ground plane. The turntable shall rotate 360 degrees to determine the position of maximum emission level. EUT is set 3m away from the receiving antenna, which varied from 1m to 4m to find out the highest emission. And also, each emission was to be maximized by changing the polarization of receiving antenna both horizontal and vertical. In order to find out the maximum emissions, exploratory radiated emission measurements were made according to the requirements in ANSI C63.10-2013.

#### 2.4 Measurement Uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the Shenzhen CTL Testing Technology Co., Ltd. quality system acc. to DIN EN ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Parameter	Uncertainty
Transmitter power conducted	+/- 0.57 dB
Transmitter power Radiated	+/- 2.20 dB
Conducted spurious emission 9KHz-40 GHz	+/- 2.20 dB
Power Line Conducted Emission	+/- 3.20 dB
Radiated Emission	+/- 4.32 dB

Note: This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

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#### 2.5 Measure Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

The spectrum analyzer offset is derived from RF cable less and attenuator factor. Offset= RF cable less+ attenuator factor.

Note: Using a temporary antenna connector for the EUT when the conducted measurements are performed.

Equipment	Manufacturer	Model No.	Frequency range(GHz)	Attenuation values(dBm)
Line	Zhenjiang south electronic	RG316	1-12	0.08
Connector	Zhenjiang south electronic	SMA-K/N-J	1-12	0.01





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#### 2.6 List of Measuring Equipments Used No. Instrument no. Model No. S/N Equipment Manufacturer

No.	Instrument no.	Equipment	Manufacturer	Model No.	S/N	Last Calibration	Due Calibration
1	BCT-EMC001	EMI Test Receiver	R&S	ESCI	100687	2015-4-25	2016-4-24
2	BCT-EMC002	EMI Test Receiver	R&S	ES PI	100097	2015-11-1	2016-10-31
3	BCT-EMC003	Amplifier	HP	8447D	1937A02492	2015-4-25	2016-4-24
4	BCT-EMC018	TRILOGBroadband Test-Antenna	SCHWARZBECK	VULB9163	9163-324	2015-4-25	2016-4-24
5	BCT-EMC021	Triple-Loop Antenna	EVERFINE	LLA-2	711002	2015-11-1	2016-10-31
6	BCT-EMC026	RF POWER AMPLIFIER	FRANKONIA	FLL-75	1020A1109	2015-4-25	2016-4-24
7	BCT-EMC029	6DB Attenuator	FRANKONIA	N/A	1001698	2015-4-25	2016-4-24
8	BCT-EMC032	10dB attenuator	ELECTRO- METRICS	EM-7600	836	2015-4-25	2016-4-24
9	BCT-EMC036	Spectrum Analyzer	R&S	FSP	100397	2015-11-1	2016-10-31
10	BCT-EMC037	Broadband preamplifier	SCH WARZBECK	BBV9718	9718-182	2015-4-25	2016-4-24
11	BCT-EMC039	Horn Antenna	SCHWARZBECK	BBHA 9120D	0437	2015-4-25	2016-4-24
12	BCT-EMC038	Horn Antenna	SCHWARZBECK	BBHA9170	0483	2015-4-5	2016-4-4
13	BCT-EMC050	Pulse power sensor	Anritsu	MA2411B	110553	2015-11-1	2016-10-31
14	BCT-EMC050	Power Meter	Anritsu	ML2487B	100345	2015-11-1	2016-10-31

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## **3. SUMMARY OF TEST RESULTS**

EUT Fundamental Frequency	FCC Rules	Description of Test	Result
	15.207	Disturbance Voltage at The Mains Terminals	N/A
5740~5860	15.249	Band Edges Measurement	Pass
MHz	15.249	Spurious Emission	Pass
	15.203	Antenna Requirement	Pass



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## 4. TEST OF AC POWER LINE CONDUCTED EMISSION

#### 4.1 Applicable Standard

Refer to FCC §15.207.

For a Low-power Radio-frequency Device is designed to be connected to the AC power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed below limits table.

Frequency Bango (MHz)	Limits ( dBuV)		
Frequency Range (MHZ)	Quasi-Peak	Average	
0.150~0.500	66~56	56~46	
0.500~5.000	56	46	
5.000~30.00	60	50	

#### 4.2 Test Setup Diagram



Remark: The EUT was connected to a 120VAC/ 60Hz power source.

#### 4.3 Test Result

Not applicable.

The EUT is powered by battery without AC mains (with battery).

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## 5. BAND EDGES MEASUREMENT

#### Limit of Band Edges Measurement

1.In the above emission table, the tighter limit applies at the band edges.

2. As shown in Section 15.35(b), for frequencies above 1000 MHz, the above field strength limits in paragraphs (a) and (b) of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For point-to-point operation under paragraph (b) of this section, the peak field strength shall not exceed 2500 millivolts/meter at 3 meters along the antenna azimuth.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)	
30-88	100	40	
88-216	150	43.5	
216-960	200	46	
Above 960	500	54	

Note:

(1) The tighter limit shall apply at the edge between two frequency bands.

(2) The emission limits shown in the above table are based on measurement employing a CISPR guasi-peak detector and above 1000MHz are based on measurements employing an average detector.

#### 5.2 EUT Setup



Figure 2 : Frequencies measured above 1 GHz configuration

#### 5.3 Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

1). Configure the EUT according to ANSI C63.4:2009.

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- 2). The EUT was placed on the top of the turntable 0.8 meter above ground.
- 3). The receiving antenna was placed 3 meters far away from the turntable.
- 4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

#### 5.4 Test Result

Temperature ( $^{\circ}$ C ) : 22~23	EUT:5.8GHz Video module	
Humidity (%RH ): 50~54	M/N: Alpha 110	
Barometric Pressure (mbar): 950~1000	Operation Condition:continunious transmiting	



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#### Low Channel (5740MHz):



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## 6. SPURIOUS EMISSIONS

#### 6.1 Limit of Spurious Emissions

1. In the section 15.249(a): Except as provided in paragraph (b) of this section, the field strength of emissions from intentional radiators operated within these frequency bands shall comply with the following:

2. Except as provided elsewhere in this Subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Fundamental Frequency (MHz)	Field Strength of Fundamental Field Strength (mV/m)	Field Strength of Harmonics (µV/m)
902-928 MHz	50	500
2400 - 2483.5 MHz	50	500
5725 - 5875 MHz	50	500
24.0 - 24.25 GHz	250	2500

Frequency (MHz)	Field Strength (µV/m)	Measurement Distance (m)
30-88	100*	3
88-216	150*	3
216-960	200*	3
Above 960	IGCA 500 TESTIN	IG 3

Remark: Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this Section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this Part, e.g., Sections 15.231 and 15.241.

3. In the above emission table, the tighter limit applies at the band edges.

Frequency (MHz)	Field Strength (μV/m at 3-meter)	Field Strength (dBµV/m at 3-meter)
30-88	100	40
88-216	150	43.5
216-960	200	46
Above 960	500	54

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#### 6.2 EUT Setup



Figure 2 : Frequencies measured above 1 GHz configuration

#### 6.3 Test Procedure

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Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

- 1). Configure the EUT according to ANSI C63.4:2009.
- 2). The EUT was placed on the top of the turntable 0.8 meter above ground.
- 3). The receiving antenna was placed 3 meters far away from the turntable.
- 4). The turntable was rotated by 360 degrees to determine the position of the highest radiation.

5). The height of the broadband receiving antenna was varied between one meter and four meters above ground to find the maximum emission field strength of both horizontal and vertical polarization. For each suspected emission, the antenna tower was scanned (from 1 M to 4 M) and then the turntable was rotated (from 0 degree to 360 degrees) to find the maximum reading.

#### 6.4 Spurious Emissions Test Result

Temperature(℃): 22~23	EUT:5.8GHz Video module
Humidity (%RH ): 50~54	M/N: Alpha 110
Barometric Pressure (mbar): 950~1000	Operation Condition:continunious transmitting



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#### The worest Spurious Emission Data Below 1GHz:

EUT: Operating Conditi Test Site: Operator: Test Specification Comment:	on: ::	5.8GHz continui 3m CHA Chen DC 6V Polariza Tem:25	Video modu nious transm AMBER ation: Horizor ℃ Hum:50%	ile M iting ntal	И/N: Alpl	ha 110			
SWEEP TABLE: "test (30M-1G)" Short Description: Field Strength									
Start	Stop I	etector	Meas.	ÍF	Trans	sducer			
Frequency	Frequency		Time	Bandw.					
30.0 MHz	1.0 GHz N	laxPeak	Coupled	100 kHz	9163	NEW			



#### MEASUREMENT RESULT: "ASJ031402 red"

2016-3-14 08:	:53							
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
37.760000 86.260000 103.720000 196.840000 524.700000 920.460000	27.30 24.80 27.20 24.60 32.40 38.30	13.6 13.8 15.9 14.0 20.6 25.9	40.0 40.0 43.5 43.5 46.0 46.0	12.7 15.2 16.3 18.9 13.6 7.7	QP QP QP QP QP QP	100.0 100.0 100.0 100.0 100.0 100.0	0.00 0.00 0.00 0.00 0.00 0.00	HORIZONTAL HORIZONTAL HORIZONTAL HORIZONTAL HORIZONTAL HORIZONTAL

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#### The worest Spurious Emission Data Below 1GHz:

EUT:	5.8GHz Video module	M/N: Alpha 110
Operating Condition:	continunious transmiting	
Test Site:	3m CHAMBER	
Operator:	Chen	
Test Specification:	DC 6V	
Comment:	Polarization: Vertical	
	Tem:25℃ Hum:50%	

OME ED		11 + +	(2014 10) "	
SWEEP	TABLE:	"test	(30M-1G)"	

Short Desc	ription:	E	Field Strength					
Start	Stop	Detector	Meas.	IF	Transducer			
Frequency	Frequency		Time	Bandw.				
30.0 MHz	1.0 GHz	MaxPeak	Coupled	100 kHz	9163 NEW			



#### MEASUREMENT RESULT: "ASJ031401\_red"

2016-3-14 08:	51							
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarizatic
37.760000	27.80	13.6	40.0	12.2	QP	100.0	0.00	VERTICAL
61.040000	25.10	13.5	40.0	14.9	QP	100.0	0.00	VERTICAL
101.780000	26.90	16.1	43.5	16.6	QP	100.0	0.00	VERTICAL
210.420000	25.90	13.9	43.5	17.6	QP	100.0	0.00	VERTICAL
515.000000	32.80	20.5	46.0	13.2	QP	100.0	0.00	VERTICAL
858.380000	37.70	25.1	46.0	8.3	QP	100.0	0.00	VERTICAL

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#### The worest Spurious Emissions above 1GHz of horizontal

SWEEP TABL	E: "test	(1G-7G)"			
Short Desc	ription:	F	ield Stren	gth	
Start	Stop	Detector	Meas.	IF	Transducer
Frequency	Frequency		Time	Bandw.	
1.0 GHz	7.0 GHz	MaxPeak Average	Coupled	100 kHz	BBHA 9120A NEW



#### MEASUREMENT RESULT: "16BR050E14 red"

2016-3-22 10:	:58							
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1320.000000	2.70	-10.5	70.0	67.3	QP	100.0	0.00	HORIZONTAL
1740.000000	4.30	-8.4	70.0	65.7	QP	100.0	0.00	HORIZONTAL
2300.000000	9.20	-4.2	70.0	60.8	QP	100.0	0.00	HORIZONTAL
3000.000000	19.40	1.1	70.0	50.6	QP	100.0	0.00	HORIZONTAL
3430.000000	17.60	-0.8	74.0	56.4	QP	100.0	0.00	HORIZONTAL
5740.000000	53.00	6.6	74.0	21.0	QP	100.0	0.00	HORIZONTAL

#### MEASUREMENT RESULT: "16BR050E14 red2"

:58							
Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
-8.70	-11.0	50.0	58.7	QP	100.0	0.00	HORIZONTAL
-6.30	-8.4	50.0	56.3	QP	100.0	0.00	HORIZONTAL
-1.90	-4.1	50.0	51.9	Q₽	100.0	0.00	HORIZONTAL
6.10	1.1	50.0	43.9	QP	100.0	0.00	HORIZONTAL
6.80	0.6	54.0	47.2	QP	100.0	0.00	HORIZONTAL
25.10	6.6	54.0	28.9	QP	100.0	0.00	HORIZONTAL
	58 Level dBuV/m -8.70 -6.30 -1.90 6.10 6.80 25.10	Level Transd dBuV/m dB -8.70 -11.0 -6.30 -8.4 -1.90 -4.1 6.10 1.1 6.80 0.6 25.10 6.6	158           Level         Transd         Limit           dBuV/m         dB         dBuV/m           -8.70         -11.0         50.0           -6.30         -8.4         50.0           -1.90         -4.1         50.0           6.10         1.1         50.0           6.80         0.6         54.0           25.10         6.6         54.0	158         Level         Transd         Limit         Margin           dBuV/m         dB         dBuV/m         dB           -8.70         -11.0         50.0         58.7           -6.30         -8.4         50.0         56.3           -1.90         -4.1         50.0         51.9           6.10         1.1         50.0         43.9           6.80         0.6         54.0         47.2           25.10         6.6         54.0         28.9	158       Level Transd Limit Margin Det.         dBuV/m       dB       dBuV/m       dB         -8.70       -11.0       50.0       58.7       QP         -6.30       -8.4       50.0       56.3       QP         -1.90       -4.1       50.0       51.9       QP         6.10       1.1       50.0       43.9       QP         6.80       0.6       54.0       47.2       QP         25.10       6.6       54.0       28.9       QP	58         Level         Transd         Limit         Margin         Det.         Height           dBuV/m         dB         dBuV/m         dB         cm           -8.70         -11.0         50.0         58.7         QP         100.0           -6.30         -8.4         50.0         56.3         QP         100.0           -1.90         -4.1         50.0         51.9         QP         100.0           6.10         1.1         50.0         43.9         QP         100.0           6.80         0.6         54.0         47.2         QP         100.0           25.10         6.6         54.0         28.9         QP         100.0	158         Level         Transd         Limit         Margin         Det.         Height         Azimuth           dBuV/m         dB         dBuV/m         dB         cm         deg           -8.70         -11.0         50.0         58.7         QP         100.0         0.00           -6.30         -8.4         50.0         56.3         QP         100.0         0.00           -1.90         -4.1         50.0         51.9         QP         100.0         0.00           6.10         1.1         50.0         43.9         QP         100.0         0.00           6.80         0.6         54.0         47.2         QP         100.0         0.00           25.10         6.6         54.0         28.9         QP         100.0         0.00

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#### The worest Spurious Emissions above 1GHz of Vertical

SWEEP TABLE: "test (1G-7G)" Short Description: F Field Strength Start Stop Detector Meas. IF Transducer Frequency Frequency Time Bandw. 1.0 GHz 7.0 GHz MaxPeak Coupled 100 kHz BBHA 9120A NEW Average Level [dBuV/m] 80



#### MEASUREMENT RESULT: "16BR050E13 red"

2016-3-22 10:57 Level Transd Frequency Limit Margin Det. Height Azimuth Polarization dBuV/m dB dBuV/m MHz dB CM deg 1210.000000 -11.0 2.40 70.0 67.6 QP 100.0 0.00 VERTICAL 4.20 1760.000000 -8.4 70.0 65.8 QP 100.0 0.00 VERTICAL 
 70.0
 61.4
 QP

 70.0
 52.6
 QP

 74.0
 55.7
 QP
 2420.000000 8.60 -3.9 100.0 0.00 VERTICAL 100.0 0.00 VERTICAL 3000.000000 17.40 1.1 4320.000000 0.4 100.0 0.00 VERTICAL 18.30 5740.000000 59.40 6.6 74.0 14.6 QP 100.0 0.00 VERTICAL

MEASUREMENT RESULT: "16BR050E13 red2"

2016-3-22 10:	57							
Frequency MHz	Level dBuV/m	Transd dB	Limit dBuV/m	Margin dB	Det.	Height cm	Azimuth deg	Polarization
1330.000000 1780.000000 2410.000000 3000.000000 4260.000000 5750.000000	-8.60 -6.50 -2.00 5.90 6.80 28.80	-10.5 -8.4 -4.0 1.1 0.3 6.6	50.0 50.0 50.0 54.0 54.0	58.6 56.5 52.0 44.1 47.2 25.2	QP QP QP QP QP QP	100.0 100.0 100.0 100.0 100.0 100.0	0.00 0.00 0.00 0.00 0.00 0.00	VERTICAL VERTICAL VERTICAL VERTICAL VERTICAL VERTICAL

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#### The result of Field Strength of Fundamental Field Strength

#### Low Channel:

😹 ESPI	- 🗆 ×
Single Measurement Sweep Mode	
+++       110       ▽ 56.37 dB 0 (m)         +++       100       90         Chart       90       80         Chart       80       70         Marker Frequency       50       60         5740.900000       MHz       40         Trace       30       ~~~         • ClearWrite       20       ~~         ○ + MaxHolc       10       10         Save       10       10	r gannaderalen der
Sweeptable	1 5780
None> Detector MaxPeak	
Start Frequency 5725 000000 Build BE Attn. 0 dB	
Stop Frequency Res. Bw 200 Hz	
5875.000000 MHz Video Bw 3 MHz	I MHz I
Sweep Time 0.5000 s Ref. Level -40.0 Time Coupled	dBm Preselector Preamplifier
Sweep Listen Stop	<u>D</u> K <u>C</u> ancel

Remark: Field Strength of Fundamental Field Strength of the EUT is  $56.37 dB\mu V/m$ , is lower than  $50 mv/m(94~dB\mu V/m),~$  complies with limit of section 15.249(a),and the result is pass.

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#### High Channel:

🗃 ESPI	_ 🗆 ×						
Single Measurement Sweep Mode							
110       ▼49.92 dB 500         ●       100         ●       90         Chart       90         Barker Frequency       50         5860.100000       MHz         100       100         Trace       30         ClearWrite       20         + MaxHolc       10         Save       0	man market and the second second						
Sweeptable 5248. 57685	780 5800 58205840 _ 5860 58						
<none>  Detector MaxPeak</none>							
Start Frequency 5725.000000 MHz	RF A <u>t</u> tn. 0 dB						
Stop Freguency Res. Bw 1 MHz	IE Bw 1 MHz I						
5900.000000 MHz Video Bw 3 MHz V							
Sweep Time 0.5000 Ref. Level -40.0 dBm Time Coupled	Preselector						
Sweep Listen Stop DK Cancel							

Remark: Field Strength of Fundamental Field Strength of the EUT is  $49.92dB\mu V/m$ , is lower than  $50mv/m(94 \ dB\mu V/m)$ , complies with limit of section 15.249(a), and the result is pass.



## 7. ANTENNA REQUIREMENT

#### 7.1 Standard Applicable

Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator 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.

#### 7.2 Antenna Connected Construction

The antenna connector is designed with permanent attachment and no consideration of replacement.

The antenna connector is designed with permanent attachment and no consideration of replacement. The antenna used in this product is complied with Standard. The maximum Gain of the antenna lower than 6.0dBi and have the definite antenna Specification.



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#### The worest Radiated Spurious Emission Test Data Above 1GHz

#### Channel Low

Channel Low (5740MHz)								
Maximum Frequency		Limit	Margin	Mark				
(MHz)	(MHz) Polarity Height Readi (m) dBµ <sup>1</sup>		Reading dBµV	Transd Result dBµV/m		(dBµV/m)	(dBµV/m)	(P/Q/A)
5740		4	56.62	-3.15	53.47	N/A	N/A	Р
5740	П	I	45.81	-3.15	42.66	N/A	Margin         (dBµV/m)         N/A         N/A         N/A         N/A         -28.90         -18.75         -27.28         -18.75         -22.14         -11.56         -20.18         -11.49         -19.85         -8.58         -20.29         -11.48         -16.13         -4.41         -14.50         -4.24	А
5740	E740	4	55.43	-3.15	52.28	N/A	N/A	Р
5740	v	Ι	44.88	-3.15	41.73	N/A	N/A	А
11480	Ц	1	44.03	1.07	45.10	74	-28.90	Р
11400			34.18	1.07	35.25	54	-18.75	А
11480 V	М	1	45.65	1.07	46.72	74	-27.28	Р
	v		34.59	1.07	35.66	54	-18.34	А
22060	Ц	1	44.48	7.38	51.86	74	-22.14	Р
22900			35.06	7.38	42.44	54	-11.56	А
22060	М	1	46.44	7.38	53.82	74	-20.18	Р
22900	v		35.13	7.38	42.51	54	-11.49	А
45020	5020	1	43.86	10.29	54.15	74	-19.85	Р
45920	п		35.13	10.29	45.42	54	-8.58	А
45020	V	1	46.33	7.38	53.71	74	-20.29	Р
45920	v		35.14	7.38	42.52	54	-11.48	А
91840		IONG	43.86	14.01	57.87	74	-16.13	Р
	П		35.58	14.01	49.59	54	-4.41	А
04040	V	1	45.49	14.01	59.50	74	-14.50	Р
91040			35.75	14.01	49.76	54	-4.24	А
Remark: 1. Transd.=Antenna Factor+Cable Loss-Pre-amplifier								

Margin = Level-Limit

Mark: P means Peak Value, Q means Quasi Peak Value, A means Average Value

 Data of measurement within this frequency range shown "-" in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits or the field strength is too small to be measured.

3. Spectrum analyzer setting P(Peak): RBW=1MHz, VBW=3MHz, A(Average): RBW=1MHz, VBW=3MHz.

4. The test limit distance is 3m limit

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Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Emission Levels (dBuV/m)	Limit (dBµV/m)	Margin (dB)	Detector Mode
2.56	25.19	8.22	-1.01	32.4	67.0	-34.60	QP
16.38	24.09	8.17	-1.20	31.06	49.5	-18.44	QP
22.55	26.20	8.03	-1.05	33.18	49.5	-16.32	QP
26.41	27.25	7.48	-1.69	33.04	49.5	-16.46	QP

The worest Radiated Emission Below 30 MHz TX (CH Low)

Note:

- 1. The pre-test have done for the EUT in three axes and found the worst emission at position shown in test setup photos. The worst case data is recorded in the report.
- 2. Emission level (dBuV/m) =Raw Value (dBuV) + Correction Factor (dB/m)
- 3. Correction Factor (dB/m) = Antenna Factor (dB/m) + Cable Factor (dB)
- 4. The other emission levels were very low against the limit.
- 5. Margin value = Emission level.- Limit value



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#### **Channel High**



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