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Report No.: SZEM170300187602 Page: 1 of 65

### TEST REPORT

Application No.:	SZEM1703001876CR			
Applicant:	Flyability SA			
Address of Applicant:	Avenue de Sévelin 20, 1004 Lausanne			
Manufacturer:	Flyability SA			
Address of Manufacturer:	Avenue de Sévelin 20, 1004 Lausanne			
Factory:	Flyability SA			
Address of Factory:	Avenue de Sévelin 20, 1004 Lausanne			
Equipment Under Test (EUT):				
EUT Name:	Collision tolerant drone for industrial inspection			
Model No.:	Elios			
Trade mark:	Flyability			
FCC ID:	2AL7M-MAGICINTHEAIR			
Standards:	47 CFR Part 15, Subpart C 15.247			
Date of Receipt:	2017-03-15			
Date of Test:	2017-03-24 to 2017-05-02			
Date of Issue:	2017-05-04			
Test Result :	Pass*			

\* In the configuration tested, the EUT complied with the standards specified above.



#### Jack Zhang EMC Laboratory Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



Report No.: SZEM170300187602 Page: 2 of 65

Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2017-05-04		Original

Authorized for issue by:		
Tested By	Hank Yan (Project Engineer	2017-05-04
	Hallk fall/Project Eligilieer	Date
Checked By	Eric Fu Eric Fu /Reviewer	2017-05-04

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Report No.: SZEM170300187602 Page: 3 of 65

### 2 Test Summary

Radio Spectrum Matter Part					
ltem	Standard	Method	Requirement	Result	
Antenna Requirement	47 CFR Part 15, Subpart C 15.203	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(c)	Pass	
Conducted Disturbance at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	N/A	
Minimum 6dB Bandwidth	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass	
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.1.2	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass	
Power Spectrum Density	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass	
Conducted Band Edges Measurement	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass	
Conducted Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass	
Radiated Emissions which fall in the restricted bands	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass	
Radiated Spurious Emissions	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.10.4	47 CFR Part 15, Subpart C 15.209 & 15.247(d)	Pass	

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Report No.: SZEM170300187602 Page: 4 of 65

### 3 Contents

		Page
1	COVER PAGE	1
2	2 TEST SUMMARY	3
3	3 CONTENTS	4
4	GENERAL INFORMATION	6
	4.1 DETAILS OF E.U.T.	
	4.2 DESCRIPTION OF SUPPORT UNITS	
	4.3 MEASUREMENT UNCERTAINTY	7
	4.4 Test Location	
	4.5 TEST FACILITY	
	4.6 DEVIATION FROM STANDARDS	8
	4.7 ABNORMALITIES FROM STANDARD CONDITIONS	
5	5 EQUIPMENT LIST	9
6	S RADIO SPECTRUM TECHNICAL REQUIREMENT	
	6.1 ANTENNA REQUIREMENT	
	6.1.1 Test Requirement:	
	6.1.2 Conclusion	
7		13
1	RADIO SPECTRUM MATTER TEST RESULTS	12
	7.1 MINIMUM 6DB BANDWIDTH	
	7.1.1 E.U.T. Operation	
	7.1.2 Test Setup Diagram	
	7.1.3 Measurement Data	
	7.2 CONDUCTED PEAK OUTPUT POWER	
	7.2.1 E.U.T. Operation	
	7.2.2 Test Selup Diagram	
	7.2.5 MedSulement Data	
	7.3.1 FUT Operation	
	7.3.2 Test Setup Diagram	
	7.3.3 Measurement Data	
	7.4 CONDUCTED BAND EDGES MEASUREMENT	
	7.4.1 E.U.T. Operation	
	7.4.2 Test Setup Diagram	
	7.4.3 Measurement Data	
	7.5 CONDUCTED SPURIOUS EMISSIONS	16
	7.5.1 E.U.T. Operation	
	7.5.2 Test Setup Diagram	
	7.5.3 Measurement Data	
	7.6 KADIATED EMISSIONS WHICH FALL IN THE RESTRICTED BANDS	
	7.6.1 E.U.I. Uperation	
	7.0.∠ Test Setup Diagram	
	7.7 PADIATED SDIDIOUS EMISSIONS	18 דר
	7.1 FUT Operation	21 28
	772 Test Setup Diagram	
	7.7.3 Measurement Data	
<b></b>		

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Report No.: SZEM170300187602 Page: 5 of 65

8	Р	PHOTOGRAPHS	
	8.1 8.2	RADIATED SPURIOUS EMISSIONS TEST SETUP EUT CONSTRUCTIONAL DETAILS	
9	A	APPENDIX	
	9.1	Appendix 15.247	36-65

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Report No.: SZEM170300187602 Page: 6 of 65

### 4 General Information

#### 4.1 Details of E.U.T.

Frequency Range:	2406.5MHz to 2476.5MHz
Modulation Type:	OFDM
SampleType:	Mobile Device
Antenna type	PCB Antenna (2x2 MIMO)
Antenna gain	2 dBi
Power supply:	DC 11.1V Lithium-Polymer Battery

Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2406.5MHz	4	2436.5MHz	7	2466.5MHz
2	2416.5MHz	5	2446.5MHz	8	2476.5MHz
3	2426.5MHz	6	2456.5MHz		

Using test software was control EUT work in continuous transmitter and receiver mode. And select test channel as below:

Channel	Frequency
The Lowest channel	2406.5MHz
The Middle channel	2436.5MHz
The Highest channel	2476.5MHz

#### 4.2 Description of Support Units

The EUT has been tested with associated equipment below.

Description	Manufacturer	Model No.
Remote controller	DJI	GL858A, Lightbridge 2
Tablet PC	SAMSUNG	SM-T580



Report No.: SZEM170300187602 Page: 7 of 65

#### 4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	7.25 x 10-8
2	Timeout	2s
3	Duty cycle	0.37%
4	Occupied Bandwidth	3%
5	RF conducted power	0.75dB
6	RF power density	2.84dB
7	Conducted Spurious emissions	0.75dB
8	DE Dedicted newer	4.5dB (below 1GHz)
	RF Radialed power	4.8dB (above 1GHz)
0	Dedicted Courieus emission test	4.5dB (30MHz-1GHz)
9	Radiated Spundus emission test	4.8dB (1GHz-18GHz)
10	Temperature test	1℃
11	Humidity test	3%
12	Supply voltages	1.5%
13	Time	3%

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Report No.: SZEM170300187602 Page: 8 of 65

#### 4.4 Test Location

All tests were performed at:

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen Branch

No. 1 Workshop, M-10, Middle Section, Science & Technology Park, Shenzhen, Guangdong, China. 518057.

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594 No tests were sub-contracted.

#### 4.5 Test Facility

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

#### CNAS (No. CNAS L2929)

CNAS has accredited SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab to ISO/IEC 17025:2005 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

#### A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

#### • VCCI

The 10m Semi-anechoic chamber and Shielded Room of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-823, R-4188, T-1153 and C-2383 respectively.

#### FCC – Registration No.: 556682

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen 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 No.: 556682.

#### Industry Canada (IC)

Two 3m Semi-anechoic chambers and the 10m Semi-anechoic chamber of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch EMC Lab have been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing with Registration No.: 4620C-1, 4620C-2, 4620C-3.

#### 4.6 Deviation from Standards

None

#### 4.7 Abnormalities from Standard Conditions

None



Report No.: SZEM170300187602 Page: 9 of 65

### 5 Equipment List

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Peak Output Power					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Power Spectrum Density					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

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Report No.: SZEM170300187602 Page: 10 of 65

Radiated Spurious Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2017-05-10	2018-05-10
EXA Spectrum Analyzer	Agilent Technologies Inc	N9010A	SEM004-09	2016-07-19	2017-07-19
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
Horn Antenna(26GHz- 40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
Low Noise Amplifier	Black Diamond Series	BDLNA- 0118-352810	SEM005-05	2016-10-09	2017-10-09
Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

General used equipment					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2016-10-12	2017-10-12
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2016-10-12	2017-10-12
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2016-05-18	2017-05-18



Report No.: SZEM170300187602 Page: 11 of 65

### 6 Radio Spectrum Technical Requirement

#### 6.1 Antenna Requirement

#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(c)

#### 6.1.2 Conclusion

Standard Requirment:

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

#### 15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

#### EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 2dBi (2x2 MIMO).

The direction gain = 2dBi + 10\*log(2) = 5dBi





Report No.: SZEM170300187602 Page: 12 of 65

### 7 Radio Spectrum Matter Test Results

#### 7.1 Minimum 6dB Bandwidth

Test Requirement	47 CFR Part 15, Subpart C 15.247a(2)
Test Method:	ANSI C63.10 (2013) Section 11.8.1
Limit:	≥500 kHz

#### 7.1.1 E.U.T. Operation

**Operating Environment:** 

Temperature:23 °CHumidity:56 % RHAtmospheric Pressure:1015 mbarTest modea:TX mode\_Keep the EUT in transmitting mode.

#### 7.1.2 Test Setup Diagram



### **Ground Reference Plane**

#### 7.1.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170300187602 Page: 13 of 65

#### 7.2 Conducted Peak Output Power

Test Requirement	47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method:	ANSI C63.10 (2013) Section 11.9.1.2
Limit:	

Frequency range(MHz)	Output power of the intentional radiator(watt)
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation

#### 7.2.1 E.U.T. Operation

**Operating Environment:** 

Temperature:23 °CHumidity:56 % RHAtmospheric Pressure:1015 mbarTest modea:TX mode\_Keep the EUT in transmitting mode.

#### 7.2.2 Test Setup Diagram



### **Ground Reference Plane**

#### 7.2.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170300187602 Page: 14 of 65

#### 7.3 Power Spectrum Density

Test Requirement	47 CFR Part 15, Subpart C 15.247(e)
Test Method:	ANSI C63.10 (2013) Section 11.10.2
Limit:	≤8dBm in any 3 kHz band during any time interval of continuous transmission

#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature:23 °CHumidity:56 % RHAtmospheric Pressure:1015 mbarTest modea:TX mode\_Keep the EUT in transmitting mode.

#### 7.3.2 Test Setup Diagram



### **Ground Reference Plane**

#### 7.3.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170300187602 Page: 15 of 65

#### 7.4 Conducted Band Edges Measurement

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.13.3.2

#### 7.4.1 E.U.T. Operation

Operating Environment:

Temperature:23 °CHumidity:56 % RHAtmospheric Pressure:1015 mbarTest modea:TX mode\_Keep the EUT in transmitting mode.

#### 7.4.2 Test Setup Diagram



### **Ground Reference Plane**

#### 7.4.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170300187602 Page: 16 of 65

#### 7.5 Conducted Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 11.11
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement.

#### 7.5.1 E.U.T. Operation

Operating Environment:									
Temperature:	23	°C	Humidity:	56 % RH	Atmospheric Pressure:	1015	mbar		
Test mode	a:T)	X mode_Ke	ep the EUT	in transmitting mod	de.				

#### 7.5.2 Test Setup Diagram



### **Ground Reference Plane**

#### 7.5.3 Measurement Data

The detailed test data see: Appendix 15.247



Report No.: SZEM170300187602 Page: 17 of 65

#### 7.6 Radiated Emissions which fall in the restricted bands

Test Requirement	47 CFR Part 15, Subpart C 15.209 & 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 6.10.5
Measurement Distance:	3m

#### 7.6.1 E.U.T. Operation

Operating Environment:

Temperature:24 °CHumidity:58 % RHAtmospheric Pressure:1015 mbarTest modea:TX mode\_Keep the EUT in transmitting mode.

#### 7.6.2 Test Setup Diagram





Report No.: SZEM170300187602 Page: 18 of 65

#### 7.6.3 Measurement Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete



Report No.: SZEM170300187602 Page: 19 of 65

Test channel: L Channel Antenna polarization: Horizontal; Average value



		-	-	-	-	-	-	-
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	3.33	29.08	0.00	15.35	47.76	54.00	-6.24
2 pp	2404.514	3.34	29.12	0.00	60.63	93.09	54.00	39.09



Report No.: SZEM170300187602 Page: 20 of 65

Test channel: L channel Antenna polarization:Vertical; Average value



Condit	ion: 3m	Vertic	al					
Job Na	): : 018	76CR						
Mode:	: 240	6.5 Ba	nd edg	e				
		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
-								
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2390.000	3.33	29.08	0.00	15.44	47.85	54.00	-6.15
2 pp	2405.745	3.34	29.12	0.00	65.69	98.15	54.00	44.15



Report No.: SZEM170300187602 Page: 21 of 65

Test channel: L Channel Antenna polarization: Horizontal; Peak value





Report No.: SZEM170300187602 Page: 22 of 65

Test channel: L Channel Antenna polarization: Vertical; Peak value





Report No.: SZEM170300187602 Page: 23 of 65

Test channel: H Channel Antenna polarization: Horizontal; Average value



		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2478.214	3.40	29.34	0.00	58.12	90.86	54.00	36.86
2	2483.500	3.41	29.35	0.00	16.45	49.21	54.00	-4.79



Report No.: SZEM170300187602 Page: 24 of 65

Test channel: H Channel Antenna polarization: Vertical; Average value



ouc.		Cable	Ant	Preamp	Read		limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2478.034	3.40	29.34	0.00	63.72	96.46	54.00	42.46
2	2483.500	3.41	29.35	0.00	17.66	50.42	54.00	-3.58



Report No.: SZEM170300187602 Page: 25 of 65

Test channel: H Channel Antenna polarization: Horizontal; Peak value



Mode: : 2476.5 Band edge

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp 2	2477.197 2483.500	3.40 3.41	29.33 29.35	0.00 0.00	70.43 27.83	103.16 60.59	74.00 74.00	29.16 -13.41



Report No.: SZEM170300187602 Page: 26 of 65

Test channel: H Channel Antenna polarization: Vertical; Peak value



MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp 2479.621	3.40	29.34	0.00	75.82	108.56	74.00	34.56
2 2483.500	3.41	29.35	0.00	29.06	61.82	74.00	-12.18



Report No.: SZEM170300187602 Page: 27 of 65

#### 7.7 Radiated Spurious Emissions

Test Requirement	47 CFR Part 15, Subpart C 15.209 & 15.247(d)
Test Method:	ANSI C63.10 (2013) Section 6.10.4
Measurement Distance:	3m
Limit:	

Frequency(MHz)	Field	Measurement
	strength(microvolts/meter)	distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits	shown in the above table are based of	on measurements employing a

CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, 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.



Report No.: SZEM170300187602 Page: 28 of 65

#### 7.7.1 E.U.T. Operation

Operating Environment:

Temperature:24 °CHumidity:58 % RHAtmospheric Pressure:1015 mbarTest modea:TX mode\_Keep the EUT in transmitting mode.

#### 7.7.2 Test Setup Diagram





Above 1GHz



Report No.: SZEM170300187602 Page: 29 of 65

#### 7.7.3 Measurement Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.



Report No.: SZEM170300187602 Page: 30 of 65

Below 1GHz:

For emission below 1GHz, through pre-scan found the worst case is the lowest channel. Only the worst case is recorded in the report.

Mode:a; Polarization:Horizontal;



Condition: 3m HORIZONTAL Job No. : 01876CR Test mode: tx

		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	55.22	0.80	7.92	27.28	49.38	30.82	40.00	-9.18
2	63.98	0.80	7.08	27.26	46.13	26.75	40.00	-13.25
3	359.19	2.09	14.67	26.85	46.52	36.43	46.00	-9.57
4	444.85	2.39	16.80	27.42	47.63	39.40	46.00	-6.60
5 pp	472.18	2.50	17.70	27.56	49.45	42.09	46.00	-3.91
6	580.70	2.68	19.26	27.57	43.34	37.71	46.00	-8.29



Report No.: SZEM170300187602 Page: 31 of 65





Condition: 3m VERTICAL Job No. : 01876CR Test mode: tx

_	Cable	Ant	Preamp	Read		Limit	0ver
Freq	Loss	Factor	Factor	Level	Level	Line	Limit
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
56.20	0.80	7.77	27.27	50.30	31.60	40.00	-8.40
63.98	0.80	7.08	27.26	49.49	30.11	40.00	-9.89
310.00	1.93	14.26	26.48	50.33	40.04	46.00	-5.96
359.19	2.09	14.67	26.85	50.68	40.59	46.00	-5.41
408.95	2.24	16.34	27.19	49.85	41.24	46.00	-4.76
620.71	2.75	20.38	27.51	41.88	37.50	46.00	-8.50
	Freq MHz 56.20 63.98 310.00 359.19 408.95 620.71	Cable Freq Loss MHz dB 56.20 0.80 63.98 0.80 310.00 1.93 359.19 2.09 408.95 2.24 620.71 2.75	Cable Ant   Freq Loss Factor   MHz dB dB/m   56.20 0.80 7.77   63.98 0.80 7.08   310.00 1.93 14.26   359.19 2.09 14.67   408.95 2.24 16.34   620.71 2.75 20.38	Cable Ant Preamp   Freq Loss Factor Factor   MHz dB dB/m dB   56.20 0.80 7.77 27.27   63.98 0.80 7.08 27.26   310.00 1.93 14.26 26.48   359.19 2.09 14.67 26.85   408.95 2.24 16.34 27.19   620.71 2.75 20.38 27.51	Cable Ant Preamp Read   Freq Loss Factor Factor Level   MHz dB dB/m dB dB dBUV   56.20 0.80 7.77 27.27 50.30   63.98 0.80 7.08 27.26 49.49   310.00 1.93 14.26 26.48 50.33   359.19 2.09 14.67 26.85 50.68   408.95 2.24 16.34 27.19 49.85   620.71 2.75 20.38 27.51 41.88	Cable Ant Preamp Read   Freq Loss Factor Factor Level Level   MHz dB dB/m dB dBuV dBuV/m   56.20 0.80 7.77 27.27 50.30 31.60   63.98 0.80 7.08 27.26 49.49 30.11   310.00 1.93 14.26 26.48 50.33 40.04   359.19 2.09 14.67 26.85 50.68 40.59   408.95 2.24 16.34 27.19 49.85 41.24   620.71 2.75 20.38 27.51 41.88 37.50	Cable Ant Preamp Read Limit   Freq Loss Factor Factor Level Level Line   MHz dB dB/m dB dBuV dBuV/m dBuV/m   56.20 0.80 7.77 27.27 50.30 31.60 40.00   63.98 0.80 7.08 27.26 49.49 30.11 40.00   310.00 1.93 14.26 26.48 50.33 40.04 46.00   359.19 2.09 14.67 26.85 50.68 40.59 46.00   408.95 2.24 16.34 27.19 49.85 41.24 46.00   620.71 2.75 20.38 27.51 41.88 37.50 46.00



Report No.: SZEM170300187602 Page: 32 of 65

Above 1GHz:

Mode:a; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:10MHz; Channel:Low; Peak level

Freq (MHz)	Antenna_F actor (dB/m)	Cable_Los s (dB)	Preamp_G ain (dB)	Read_Leve I (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
3870.060	33.25	6.60	37.99	45.06	47.40	54	-6.60
4813.000	34.17	7.74	38.41	45.55	49.44	54	-4.56
6122.333	34.80	8.83	38.18	45.27	51.01	54	-2.99
7219.500	36.41	9.66	37.10	42.99	52.21	54	-1.79
9626.000	37.53	11.08	35.09	39.36	53.33	54	-0.67
12639.790	38.87	13.20	37.14	37.39	52.89	54	-1.11

Mode:a; Polarization:Vertical; Modulation Type:OFDM; bandwidth:10MHz; Channel:Low; Peak level

Freq (MHz)	Antenna_F actor (dB/m)	Cable_Los s (dB)	Preamp_G ain (dB)	Read_Leve I (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
3972.178	33.53	6.68	38.00	45.08	47.74	54	-6.26
4813.000	34.17	7.74	38.41	45.09	48.98	54	-5.02
6274.796	34.92	8.92	38.03	44.96	51.08	54	-2.92
7219.500	36.41	9.66	37.10	43.75	52.97	54	-1.03
9626.000	37.53	11.08	35.09	39.24	53.21	54	-0.79
12279.260	38.77	12.82	36.27	37.77	53.77	54	-0.23

Mode:a; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:10MHz; Channel:middle; Peak level

Freq (MHz)	Antenna_F actor (dB/m)	Cable_Los s (dB)	Preamp_G ain (dB)	Read_Leve I (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
3960.700	33.50	6.67	38.00	45.50	48.12	54	-5.88
4873.000	34.32	7.85	38.45	46.75	50.88	54	-3.12
5964.939	34.68	8.72	38.31	45.01	50.44	54	-3.56
7309.500	36.36	9.74	36.99	42.98	52.32	54	-1.68
9746.000	37.56	11.23	35.01	39.49	53.73	54	-0.27
12182.500	38.89	13.16	36.92	38.01	53.73	54	-0.27



Report No.: SZEM170300187602 Page: 33 of 65

Mode:a; Polarization:Vertical; Modulation Type:OFDM; bandwidth:10MHz; Channel:middle; Peak level

Freq (MHz)	Antenna_F actor (dB/m)	Cable_Los s (dB)	Preamp_G ain (dB)	Read_Leve I (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
3803.444	33.07	6.55	37.98	44.73	46.87	54	-7.13
4873.000	34.32	7.85	38.45	45.28	49.41	54	-4.59
6025.661	34.72	8.77	38.27	45.27	50.81	54	-3.19
7309.500	36.36	9.74	36.99	43.70	53.04	54	-0.96
9746.000	37.56	11.23	35.01	39.48	53.72	54	-0.28
12182.500	38.89	13.15	36.87	37.20	52.97	54	-1.03

Mode:a; Polarization:Horizontal; Modulation Type:OFDM; bandwidth:10MHz; Channel:High; Peak level

Freq (MHz)	Antenna_F actor (dB/m)	Cable_Los s (dB)	Preamp_G ain (dB)	Read_Leve I (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
3853.298	33.21	6.59	37.99	44.34	46.63	54	-7.37
4953.000	34.42	7.94	38.48	45.12	49.43	54	-4.57
5744.707	34.55	8.50	38.35	45.22	50.32	54	-3.68
7429.500	36.33	9.80	36.91	42.99	52.43	54	-1.57
9906.000	37.58	11.35	34.95	38.70	53.14	54	-0.86
12440.210	38.86	13.05	36.66	37.74	53.62	54	-0.38

Mode:a; Polarization:Vertical; Modulation Type:OFDM; bandwidth:10MHz; Channel:High; Peak level

Freq (MHz)	Antenna_F actor (dB/m)	Cable_Los s (dB)	Preamp_G ain (dB)	Read_Leve I (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
3847.726	33.19	6.58	37.98	44.68	46.96	54	-7.04
4953.000	34.42	7.94	38.48	45.57	49.88	54	-4.12
5556.674	34.44	8.31	38.39	45.69	50.51	54	-3.49
7429.500	36.33	9.80	36.91	43.89	53.33	54	-0.67
9906.000	37.58	11.35	34.95	38.76	53.20	54	-0.80
12548.680	38.89	13.16	36.92	37.10	52.82	54	-1.18

Remark:

1) The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level = Receiver Reading + Antenna Factor + Cable Factor - Preamplifier Factor

2) Scan from 9kHz to 25GHz, the disturbance above 18GHz and below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3) As shown in this section, for frequencies above 1GHz, the field strength limits 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 the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.



Report No.: SZEM170300187602 Page: 34 of 65

### 8 Photographs

8.1 Radiated Spurious Emissions Test Setup







Report No.: SZEM170300187602 Page: 35 of 65

#### 8.2 EUT Constructional Details

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM1703001876CR.



Report No.: SZEM170300187602 Page: 36 of 65

### 9 Appendix

#### 9.1 Appendix 15.247

#### 1. 6dB Bandwidth

#### Antenna 1

Test Mode	Test Channel	EBW[MHz]	Limit	Verdict
Low	2406.5	9.480	>=0.5	PASS
Middle	2436.5	9.480	>=0.5	PASS
High	2476.5	9.480	>=0.5	PASS





Report No.: SZEM170300187602 Page: 37 of 65





Report No.: SZEM170300187602 Page: 38 of 65





Report No.: SZEM170300187602 Page: 39 of 65

Antenna 2				
Test Mode	Test Channel	EBW[MHz]	Limit	Verdict
Low	2406.5	9.465	>=0.5	PASS
Middle	2436.5	9.465	>=0.5	PASS
High	2476.5	9.450	>=0.5	PASS





Report No.: SZEM170300187602 Page: 40 of 65





Report No.: SZEM170300187602 Page: 41 of 65





Report No.: SZEM170300187602 Page: 42 of 65

#### 2.Maximum peak conducted output power

Test channel	Peak	output Power (	Limit (dBm)	Pocult	
	Antenna 1	Antenna 2	Total		nesuit
Low	23.39	23.76	26.59	30.00	Pass
Middle	23.48	22.92	26.22	30.00	Pass
High	22.65	22.11	25.40	30.00	Pass

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Report No.: SZEM170300187602 Page: 43 of 65

#### 3.Maximum Peak power spectral density

Test channel	Power Spe	ectral Density (	dBm/3kHz)	Limit (dPm/2kHz)	Popult
	Antenna 1	Antenna 2	Total		nesuli
Low	-11.00	-11.90	0.58	≤8.00	Pass
Middle	-12.22	-12.81	0.46	≤8.00	Pass
High	-13.18	-13.68	0.38	≤8.00	Pass

#### Antenna 1

Test Mode	Test Channel	PSD[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
Low	2406.5	-11.00	<8.00	PASS
Middle	2436.5	-12.22	<8.00	PASS
High	2476.5	-13.18	<8.00	PASS





Report No.: SZEM170300187602 Page: 44 of 65





Report No.: SZEM170300187602 Page: 45 of 65





Antenna 2

# SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM170300187602 Page: 46 of 65

Test Mode	Test Channel	PSD[dBm/3kHz]	Limit[dBm/3kHz	Verdict
Low	2406.5	-11.90	<8.00	PASS
Middle	2436.5	-12.81	<8.00	PASS
High	2476.5	-13.68	<8.00	PASS





Report No.: SZEM170300187602 Page: 47 of 65





Report No.: SZEM170300187602 Page: 48 of 65





Report No.: SZEM170300187602 Page: 49 of 65

#### 4.Band-edge for RF Conducted Emissions

Antenna 1

Test Mode	Test Channel	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
Low	2406.5	4.000	-51.419	<-16	PASS
High	2476.5	3.580	-44.612	<-16.42	PASS





Report No.: SZEM170300187602 Page: 50 of 65





Report No.: SZEM170300187602 Page: 51 of 65

Antenna 2					
Test Mode	Test Channel	Carrier Power[dBm]	Max. Spurious Level [dBm]	Limit [dBm]	Verdict
Low	2406.5	3.870	-51.447	<-16.13	PASS
High	2476.5	2.110	-42.527	<-17.89	PASS





Report No.: SZEM170300187602 Page: 52 of 65





Report No.: SZEM170300187602 Page: 53 of 65

#### **5.RF Conducted Spurious Emissions**

Antenna 1

Test Mode	Test Channel	StartFr e [MHz]	StopFr e [MHz]	RBW [kHz]	VBW [kHz]	Pref[dBm ]	Max. Level [dBm]	Limit [dBm]	Verdict
Low	2406.5	30	10000	1000	3000	3.65	-33.740	<- 16.35	PASS
Low	2406.5	10000	25000	1000	3000	3.65	-55.350	<- 16.35	PASS
Middle	2436.5	30	10000	1000	3000	2.92	-32.140	<- 17.08	PASS
Middle	2436.5	10000	25000	1000	3000	2.92	-54.120	<- 17.08	PASS
High	2476.5	30	10000	1000	3000	2.59	-33.580	<- 17.41	PASS
High	2476.5	10000	25000	1000	3000	2.59	-54.440	<- 17.41	PASS



Report No.: SZEM170300187602 Page: 54 of 65





Report No.: SZEM170300187602 55 of 65 Page: × \*RBW 1 MHz Marker 2 [T1 ] \*VBW 3 MHz -33.74 dBm SWT 60 ms 93.143333333 MHz Ref 20 dBm \* Att 20 dB 20 Offset Ο. dB Mark 1 .64 dBm 567 GHz Α 1 PK MAXH LVL 02 -16 -20 30 CSE\_1 3DB 40 أفراراه 80 Stop 10 GHz Start 30 MHz 997 MHz/ × \* RBW 1 MHz Marker 1 [T1 ] \*VBW 3 MHz -55.35 dBm 23.38000000 GHz Ref 20 dBm \* Att 20 dB SWT 90 ms 20 Offset Ο. dB А SGL 1 PK MAXH LVL -10 5 dBm D2 -16. -20. CSE 2 3DB 40 -80 Start 10 GHz 1.5 GHz/ Stop 25 GHz



Report No.: SZEM170300187602 Page: 56 of 65





Report No.: SZEM170300187602 Page: 57 of 65





Report No.: SZEM170300187602 Page: 58 of 65





Report No.: SZEM170300187602 59 of 65 Page: × \*RBW 1 MHz Marker 2 [T1 ] \*VBW 3 MHz -33.58 dBm 20 dB SWT 60 ms 159.610000000 MHz Ref 20 dBm \* Att 20 Offset Ο. dB Marke 1 .28 dBm 000 GHz Α 1 PK MAXH LVL -30 CSE\_1 3DB 40 A MARINE AND al ha 80 Stop 10 GHz Start 30 MHz 997 MHz/ × \* RBW 1 MHz Marker 1 [T1 ] \*VBW 3 MHz -54.44 dBm 24.275000000 GHz Ref 20 dBm \* Att 20 dB SWT 90 ms 20 Offset Ο. dB А SGL 1 PK MAXH LVL -10 -17. dBm -20-CSE 2 3DB 40 الطأقاء -80 Start 10 GHz 1.5 GHz/ Stop 25 GHz



Report No.: SZEM170300187602 Page: 60 of 65

Test Mode	Test Channel	StartFre [MHz]	StopFre [MHz]	RBW [kHz]	VBW [kHz]	Pref[dBm]	Max. Level [dBm]	Limit [dBm]	Verdict
Low	2406.5	30	10000	1000	3000	4.06	-31.910	<-15.94	PASS
Low	2406.5	10000	25000	1000	3000	4.06	-55.290	<-15.94	PASS
Middle	2436.5	30	10000	1000	3000	3.77	-32.360	<-16.23	PASS
Middle	2436.5	10000	25000	1000	3000	3.77	-54.720	<-16.23	PASS
High	2476.5	30	10000	1000	3000	2.54	-34.510	<-17.46	PASS
High	2476.5	10000	25000	1000	3000	2.54	-55.090	<-17.46	PASS

#### TEST PLOT RF Conducted Spurious Emissions Low 2406.5 × \* RBW 100 kHz Marker 1 [T1 ] \*VBW 300 kHz 4.06 dBm Ref 20 dBm \* Att 20 dB SWT 10 ms 2.403700000 GHz 20 Offset Ο. dB A SGL 1 PK MAXH With many his LVL 10 4 dBm -15. Pref 3DB Wunnahall Maderichant under Hill Maran Allenson www. ihad Million and A 80 Start 2.4 GHz 10 MHz/ Stop 2.5 GHz

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#### Antenna 2



Report No.: SZEM170300187602 Page: 61 of 65





Report No.: SZEM170300187602 Page: 62 of 65





Report No.: SZEM170300187602 63 of 65 Page: × \*RBW 1 MHz Marker 2 [T1 ] \*VBW 3 MHz -32.36 dBm 20 dB SWT 60 ms 123.053333333 MHz Ref 20 dBm \* Att 20 Offset Ο. dB Mark .62 dBm 000 GHz Α 1 PK MAXH LVL 02 -16 -20 30 CSE\_1 3DB 40 **Jule** ALMANN . 80 Stop 10 GHz Start 30 MHz 997 MHz/ × \* RBW 1 MHz Marker 1 [T1 ] \*VBW 3 MHz -54.72 dBm 22.745000000 GHz Ref 20 dBm \* Att 20 dB SWT 90 ms 20 Offset Ο. dB А SGL 1 PK MAXH LVL -10 3 dBm D2 -16. -20. CSE 2 3DB المسأد الا -80 Start 10 GHz 1.5 GHz/ Stop 25 GHz



Report No.: SZEM170300187602 Page: 64 of 65





Report No.: SZEM170300187602 65 of 65 Page: R \*RBW 1 MHz Marker 2 [T1 ] \*VBW 3 MHz -34.51 dBm Ref 20 dBm \* Att 20 dB SWT 60 ms 162.933333333 MHz 20 Offset Ο. dB . 52 dBm 33 GH2 A 1 PK MAXH LVL -20 3DB CSE\_1 80 30 MHz 997 MHz/ Stop 10 GHz Start \*RBW 1 MHz Marker 1 [T1 ] \* VBW 3 MHz -55.09 dBm 22.45000000 GHz 20 dBm \* Att 20 dB SWT 90 ms Ref 20 Offset Ο. dB A GL 1 PK MAXH JVT. dBm -20 BDB CSE 2 40 Ť والأرد وال -80 Start 10 GHz Stop 25 GHz 1.5 GHz/