

No. 1 Workshop, M-10, Middle section, Science & Technology Park,

Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Report No.: SZEM180700576001

Fax: +86 (0) 755 2671 0594 Page: 1 of 40

TEST REPORT

Application No.: SZEM1807005760CR

Applicant: XIN XUN TOYS CO., LTD.

Address of Applicant: BATOU XINGDA INDUSTRY ZONE Chenghai District Shantou City,

Guangdong China

Manufacturer/ Factory: XIN XUN TOYS CO., LTD.

Address of Manufacturer/ BATOU XINGDA INDUSTRY ZONE Chenghai District Shantou City,

Factory: Guangdong China

Equipment Under Test (EUT):

EUT Name: RC DRONE

Model No.: Please refer to section 2 ♣

FCC ID: KUMY182304

Please refer to section 2 of this report which indicates which model was

actually tested and which were electrically identical.

Standard(s): 47 CFR Part 15, Subpart C 15.249

Date of Receipt: 2018-07-02

Date of Test: 2018-07-04 to 2018-07-09

Date of Issue: 2018-07-10

Test Result: Pass*



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.

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sqs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sqs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document is advised that information contained hereon reflects the Company's intengray's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) are retained for 30 days only.

^{*} In the configuration tested, the EUT complied with the standards specified above.



Report No.: SZEM180700576001

Page: 2 of 40

	Revision Record						
Version	Version Chapter Date Modifier						
01		2018-07-10		Original			

Authorized for issue by:		
	Co. Ci	
	Leo Li /Project Engineer	
	EvicFu	
	Eric Fu /Reviewer	



Report No.: SZEM180700576001

Page: 3 of 40

2 Test Summary

Radio Spectrum Technical Requirement						
Item	Item Standard Method Requirement Result					
Antenna Requirement	47 CFR Part 15, Subpart C 15.249	N/A	47 CFR Part 15, Subpart C 15.203	Pass		

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	
20dB Bandwidth	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass	
Field Strength of the Fundamental Signal (15.249(a))	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.5&6.6	47 CFR Part 15, Subpart C 15.249(a)	Pass	
Restricted Band Around Fundamental Frequency	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209	Pass	
Radiated Emissions	47 CFR Part 15, Subpart C 15.249	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)	Pass	

Declaration of EUT Family Grouping:

Model No.: Y182304, INF0001, INF0002, INF0003, INF0004, INF0005, INF0006, INF0007, INF0008, INF0009, INF0010, INF0011, INF0012, INF0013, INF0014, INF0015, INF0016, INF0017, INF0018, INF0019, INF0020, X-5, X-8, X-9, X-14C, X-16, X-18, X-20A, X21, X22, X-30, X-33, X-35, X-39, X-40, X-42, X-43, X-48, X-49, X-53W, X-54, X-56, X-60, X-62, X-64, X-65, X-66, X-68, X-69, X-70, X-71, X-72, X-73, X-74, X-75, X-76, X-77, X-78, X-79, X-80, X-81, X-82, X-83, X-84, X-85, X-86, X-87, X-88, X89, X-90, X-91, X-92, X-93, X-94, X-95, X-96, X-97, X-98, X-99, X-100, X-101, X-102, X-103, X-104, X-105 X-106, X-107, X-108, X-109, X-110, X-111, X-112, X-113, X-114, X-115, X-116, X-117, X-118, X-119

Only the model Y182304 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for the above models, with only difference on model name.



Report No.: SZEM180700576001

Page: 4 of 40

3 Contents

		Page
1	COVER PAGE	1
2	TEST SUMMARY	2
_	TLST SUMMANT	3
3	CONTENTS	4
4	GENERAL INFORMATION	5
	4.1 DETAILS OF E.U.T	5
	4.2 DESCRIPTION OF SUPPORT UNITS	
	4.3 MEASUREMENT UNCERTAINTY	5
	4.4 TEST LOCATION	
	4.5 TEST FACILITY	
	4.6 DEVIATION FROM STANDARDS	
	4.7 ABNORMALITIES FROM STANDARD CONDITIONS	
5	EQUIPMENT LIST	7
6	RADIO SPECTRUM TECHNICAL REQUIREMENT	9
	6.1 Antenna Requirement	9
	6.1.1 Test Requirement:	
	6.1.2 Conclusion	9
7	RADIO SPECTRUM MATTER TEST RESULTS	10
	7.1 20DB BANDWIDTH	10
	7.1.1 E.U.T. Operation	
	7.1.2 Test Setup Diagram	
	7.1.3 Measurement Procedure and Data	
	7.2 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.249(A))	
	7.2.1 E.U.T. Operation7.2.2 Test Setup Diagram	
	7.2.3 Measurement Procedure and Data	
	7.3 RESTRICTED BAND AROUND FUNDAMENTAL FREQUENCY	
	7.3.1 E.U.T. Operation	
	7.3.2 Test Setup Diagram	
	7.3.3 Measurement Procedure and Data	
	7.4 RADIATED EMISSIONS	
	7.4.1 E.U.T. Operation	
	7.4.2 Test Setup Diagram	
_	7.4.3 Measurement Procedure and Data	
8		
	8.1 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.249(A)) TEST SETUP	39
	8.2 RADIATED EMISSIONS TEST SETUP	



Report No.: SZEM180700576001

Page: 5 of 40

4 General Information

4.1 Details of E.U.T.

Power supply:	6.0V DC (1.5Vx4"AA" Size Batteries)
Test voltage:	DC 6V
Antenna Gain	0dBi
Antenna Type	Wire
Modulation Type	GFSK
Number of Channels	3
Operation Frequency	2460MHz-2475MHz

Channel List:

Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2460MHz	2	2468MHz	3	2475MHz

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

Channel	Frequency
The lowest channel (CH1)	2460MHz
The middle channel (CH2)	2468MHz
The highest channel (CH3)	2475MHz

4.2 Description of Support Units

The EUT has been tested as an independent unit.

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	± 7.25 x 10 ⁻⁸
2	Duty cycle	± 0.37%
3	Occupied Bandwidth	± 3%
4	RF conducted power	± 0.75dB
5	RF power density	± 2.84dB
6	Conducted Spurious emissions	± 0.75dB
7	DE Dedicted recover	± 4.5dB (below 1GHz)
/	RF Radiated power	± 4.8dB (above 1GHz)
0	Dedicted Couriers emission test	± 4.5dB (Below 1GHz)
8	Radiated Spurious emission test	± 4.8dB (Above 1GHz)
9	Temperature test	± 1 ℃
10	Humidity test	± 3%
11	Supply voltages	± 1.5%
12	Time	± 3%

This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sqs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sqs.com/en/Terms-and-Conditions/Terms-e-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document information contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawful and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.



Report No.: SZEM180700576001

Page: 6 of 40

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 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

FCC –Designation Number: CN1178

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1178. Test Firm Registration Number: 406779.

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.: SZEM180700576001

Page: 7 of 40

5 Equipment List

20dB Bandwidth					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2017-07-13	2018-07-12
Attenuator	Weinschel Associates	WA41	SEM021-09	N/A	N/A
Signal Generator	KEYSIGHT	N5173B	SEM006-05	2017-09-27	2018-09-26
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2017-09-27	2018-09-26

Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118- 352810	SEM005-05	2017-09-27	2018-09-27
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2018-04-02	2019-04-01
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2018-04-02	2019-04-01
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21
Band filter	N/A	N/A	SEM023-01	N/A	N/A



Report No.: SZEM180700576001

Page: 8 of 40

Restricted Band Around Fundamental Frequency						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2018-03-13	2021-03-12	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM026-01	2017-07-13	2018-07-12	
Spectrum Analyzer	Rohde & Schwarz	FSU43	SEM004-08	2018-04-02	2019-04-01	
BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-01	2017-06-27	2020-06-26	
Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2018-04-13	2021-04-12	
Horn Antenna (15GHz-40GHz)	Schwarzbeck	BBHA 9170	SEM003-15	2017-10-17	2020-10-16	
Pre-amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2017-09-27	2018-09-26	
Low Noise Amplifier (100MHz-18GHz)	Black Diamond Series	BDLNA-0118- 352810	SEM005-05	2017-09-27	2018-09-27	
Pre-amplifier (18-26GHz)	Rohde & Schwarz	CH14-H052	SEM005-17	2018-04-02	2019-04-01	
Pre-amplifier (26GHz-40GHz)	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2018-04-02	2019-04-01	
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2017-09-27	2018-09-26	
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21	
Band filter	N/A	N/A	SEM023-01	N/A	N/A	

General used equipmen	t				
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-03	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Shanghai Meteorological Industry Factory	ZJ1-2B	SEM002-04	2017-09-29	2018-09-28
Humidity/ Temperature Indicator	Mingle	N/A	SEM002-08	2017-09-29	2018-09-28
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2018-04-08	2019-04-07



Report No.: SZEM180700576001

Page: 9 of 40

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

Limit:

15.203 requirement:

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.

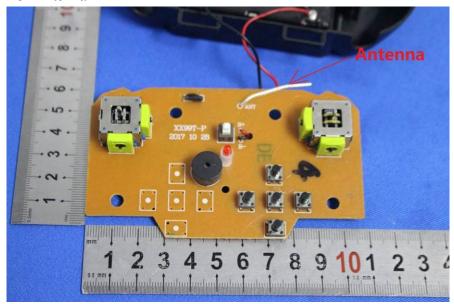
6.1.2 Conclusion

Standard Requirement:

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.

EUT Antenna:



The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.



Report No.: SZEM180700576001

Page: 10 of 40

7 Radio Spectrum Matter Test Results

7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.215 Test Method: ANSI C63.10 (2013) Section 6.9

Limit: N/A

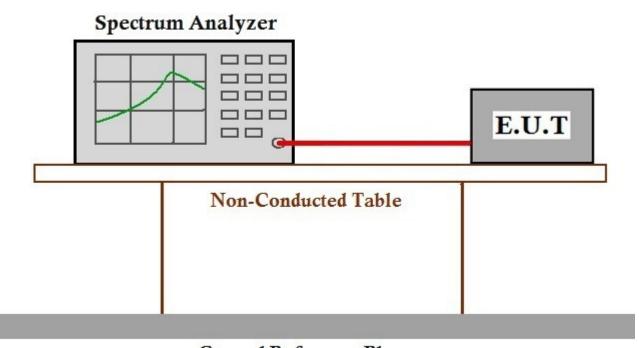
7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54.1 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

7.1.2 Test Setup Diagram



Ground Reference Plane

7.1.3 Measurement Procedure and Data

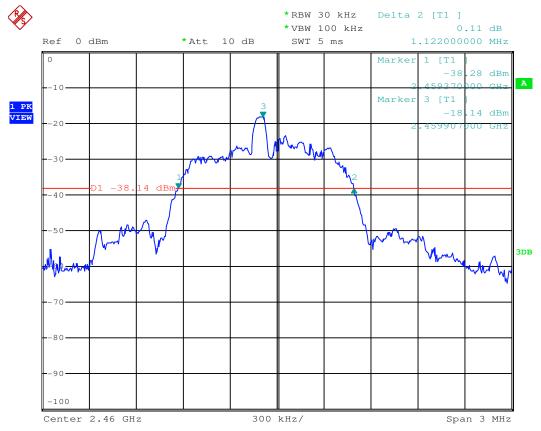
Test channel	20dB bandwidth (MHz)	Results
Lowest	1.122	Pass
Middle	1.116	Pass
Highest	1.226	Pass



Report No.: SZEM180700576001

Page: 11 of 40

Mode:a; Channel:Low

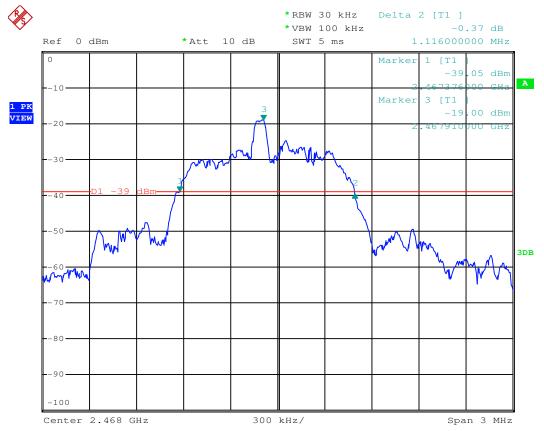




Report No.: SZEM180700576001

Page: 12 of 40

Mode:a; Channel:middle

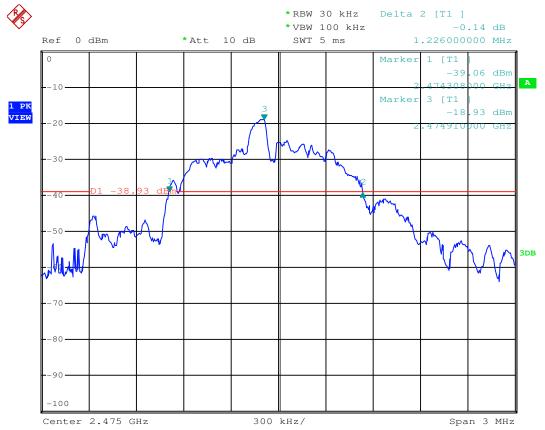




Report No.: SZEM180700576001

Page: 13 of 40

Mode:a; Channel:High





Report No.: SZEM180700576001

Page: 14 of 40

7.2 Field Strength of the Fundamental Signal (15.249(a))

Test Requirement 47 CFR Part 15, Subpart C 15.249(a)
Test Method: ANSI C63.10 (2013) Section 6.5&6.6

Measurement Distance: 3m

Limit:

Frequency	Limit (dBuV/m @3m)	Remark
0400MH= 0400 EMH=	94.0	Average Value
2400MHz-2483.5MHz	114.0	Peak Value

Average value:

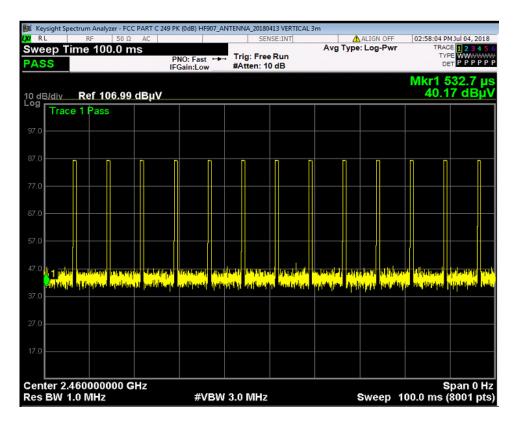
	Average value=Peak value + PDCF
Calculate Formula:	PDCF=20 log(Duty cycle)
	Duty cycle= T on time / T period
	Ton time =(0.7037*13)=9.1481ms
Test data:	T period =100ms
	PCDF value= -20.77dB

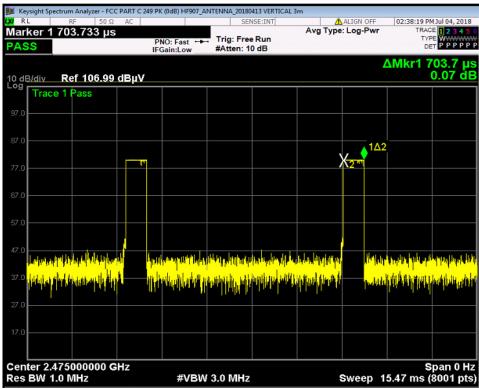


Report No.: SZEM180700576001

Page: 15 of 40

Duty cycle test plots:





This document is issued by the Company subject to its General Conditions of Service printed overleaf, available on request or accessible at http://www.sgs.com/en/Terms-and-Conditions.aspx and, for electronic format documents, subject to Terms and Conditions for Electronic Documents at http://www.sgs.com/en/Terms-en-Document.aspx. Attention is drawn to the limitation of liability, indemnification and jurisdiction issues defined therein. Any holder of this document contained hereon reflects the Company's findings at the time of its intervention only and within the limits of Client's instructions, if any. The Company's sole responsibility is to its Client and this document does not exonerate parties to a transaction from exercising all their rights and obligations under the transaction documents. This document cannot be reproduced except in full, without prior written approval of the Company. Any unauthorized alteration, forgery or falsification of the content or appearance of this document is unlawfull and offenders may be prosecuted to the fullest extent of the law. Unless otherwise stated the results shown in this test report refer only to the sample(s) are retained for 30 days only.



Report No.: SZEM180700576001

Page: 16 of 40

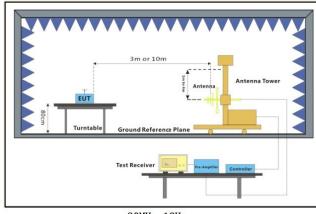
7.2.1 E.U.T. Operation

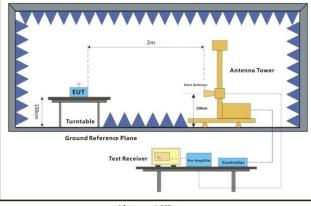
Operating Environment:

Temperature: 24.2 °C Humidity: 55.5 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode Keep the EUT in transmitting with modulation mode.

7.2.2 Test Setup Diagram





30MHz-1GHz

Above 1GHz

7.2.3 Measurement Procedure and 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.

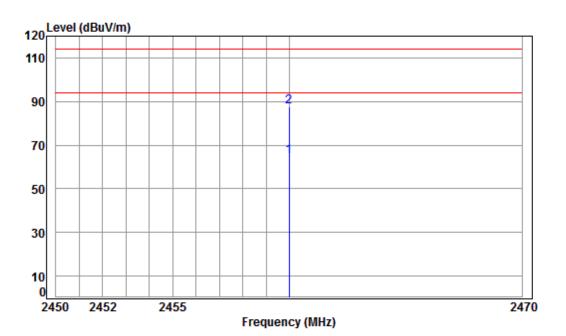
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



Report No.: SZEM180700576001

Page: 17 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2460 Field Strength

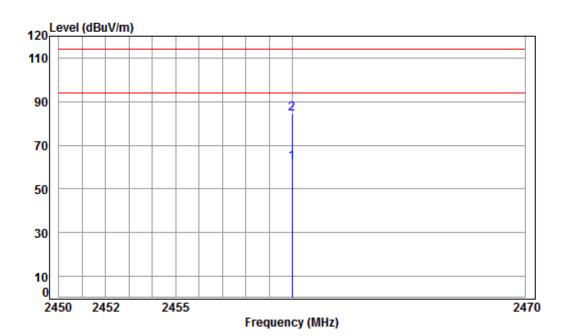
Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
v 2460.000 p 2460.000								_



Report No.: SZEM180700576001

Page: 18 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL

Job No : 05760CR

Mode : 2460 Field Strength

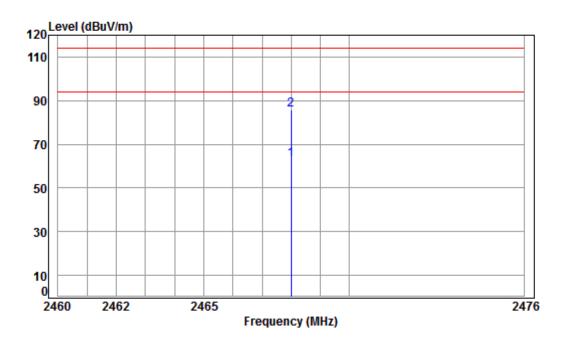
	_		_								
			Cable	Ant	Preamp	Read		Limit	0ver		
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	_										_
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	av	2460.000	5.57	28.64	41.90	69.52	61.83	94.00	-32.17	Average	
2	pp	2460.000	5.57	28.64	41.90	92.29	84.60	114.00	-29.40	peak	



Report No.: SZEM180700576001

Page: 19 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:middle



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2468 Field Strength

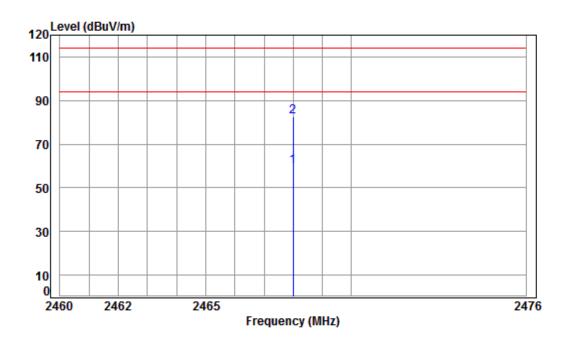
	_		_								
			Cable	Ant	Preamp	Read		Limit	0ver		
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	_										_
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	av	2468.000	5.58	28.65	41.90	70.69	63.02	94.00	-30.98	Average	
2	pp	2468.000	5.58	28.65	41.90	93.46	85.79	114.00	-28.21	Peak	



Report No.: SZEM180700576001

Page: 20 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:middle



Condition: 3m VERTICAL

Job No : 05760CR

Mode : 2468 Field Strength

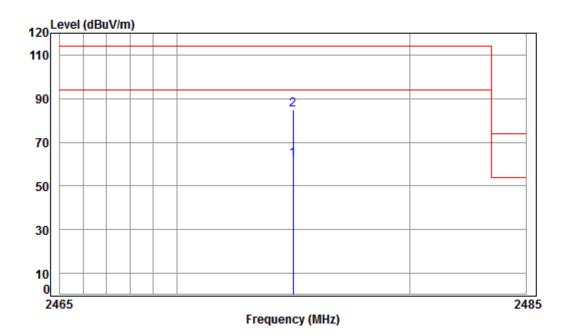
	Freq			Preamp Factor					
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
	2468.000 2468.000								_



Report No.: SZEM180700576001

Page: 21 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2475 Field Strength

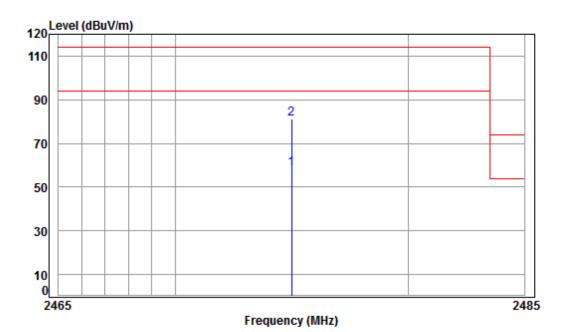
	_		_								
			Cable	Ant	Preamp	Read		Limit	0ver		
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	_										_
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	av	2475.000	5.59	28.66	41.91	69.93	62.27	94.00	-31.73	Average	
2	pp	2475.000	5.59	28.66	41.91	92.69	85.03	114.00	-28.97	peak	



Report No.: SZEM180700576001

Page: 22 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL

Job No : 05760CR

Mode : 2475 Field Strength

Freq			Preamp Factor					Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 av 2475.000 2 pp 2475.000								_



Report No.: SZEM180700576001

Page: 23 of 40

7.3 Restricted Band Around Fundamental Frequency

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.249(d) & 15.209

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Measurement Distance: 3m

Limit:

Frequency	Limit (dBuV/m @3m)	Remark		
30MHz-88MHz	40.0	Quasi-peak Value		
88MHz-216MHz	43.5	Quasi-peak Value		
216MHz-960MHz	46.0	Quasi-peak Value		
960MHz-1GHz	54.0	Quasi-peak Value		
Above 1GHz	54.0	Average Value		
Above 1GHz	74.0	Peak Value		

Emission radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or to the general radiated emission limits in Section 15.209, whichever is the lesser attenuation.



Report No.: SZEM180700576001

Page: 24 of 40

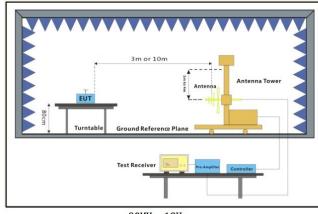
7.3.1 E.U.T. Operation

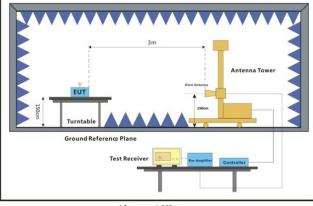
Operating Environment:

Temperature: 24.2 °C Humidity: 55.5 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode Keep the EUT in transmitting with modulation mode.

7.3.2 Test Setup Diagram





30MHz-1GHz

Above 1GHz

7.3.3 Measurement Procedure and 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.

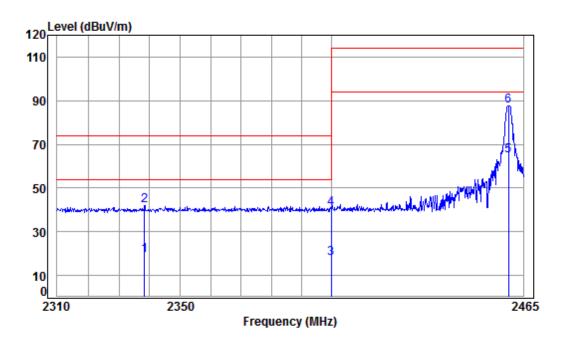
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



Report No.: SZEM180700576001

Page: 25 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2460 Band edge

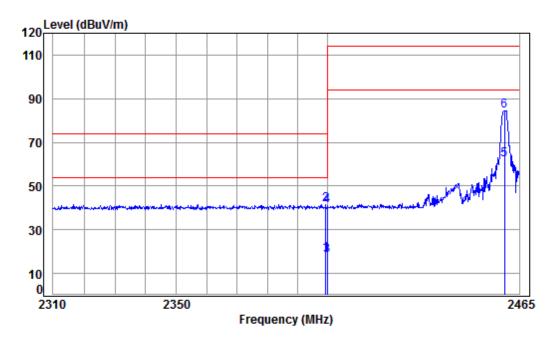
			Cable	Ant	Preamp	Read		Limit	0ver	
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2338.377	5.40	28.43	41.85	27.13	19.11	54.00	-34.89	Average
2		2338.377	5.40	28.43	41.85	49.91	41.89	74.00	-32.11	peak
3		2400.000	5.49	28.54	41.88	25.66	17.81	54.00	-36.19	Average
4		2400.000	5.49	28.54	41.88	48.43	40.58	74.00	-33.42	peak
5	av	2460.000	5.57	28.64	41.90	72.37	64.68	94.00	-29.32	Average
6	pp	2460.000	5.57	28.64	41.90	95.14	87.45	114.00	-26.55	peak



Report No.: SZEM180700576001

Page: 26 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL Job No : 05760CR

Mode : 2460 Band edge

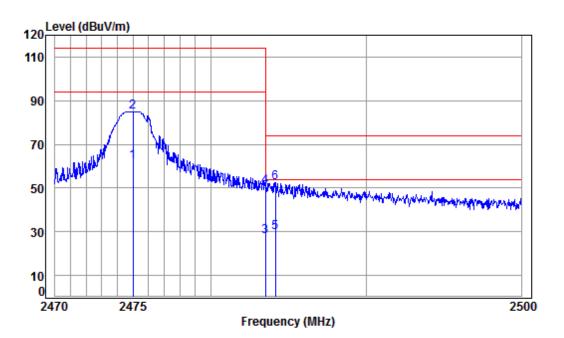
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2399.451	5.49	28.53	41.88	26.54	18.68	54.00	-35.32	Average
2	2399.451	5.49	28.53	41.88	49.30	41.44	74.00	-32.56	peak
3	2400.000	5.49	28.54	41.88	26.04	18.19	54.00	-35.81	Average
4	2400.000	5.49	28.54	41.88	48.81	40.96	74.00	-33.04	peak
5 a	av 2460.000	5.57	28.64	41.90	69.52	61.83	94.00	-32.17	Average
6 r	p 2460.000	5.57	28.64	41.90	92.29	84.60	114.00	-29.40	peak



Report No.: SZEM180700576001

Page: 27 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2475 Band edge

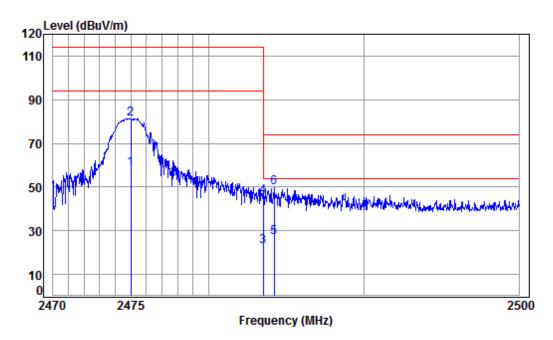
			Cable	Ant	Preamp	Read		Limit	0ver	
		Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
		MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1		2475.000	5.59	28.66	41.91	69.93	62.27	94.00	-31.73	Average
2		2475.000	5.59	28.66	41.91	92.69	85.03	114.00	-28.97	peak
3		2483.500	5.60	28.67	41.91	35.57	27.93	54.00	-26.07	Average
4		2483.500	5.60	28.67	41.91	58.34	50.70	74.00	-23.30	peak
5	av	2484.145	5.60	28.67	41.91	37.29	29.65	54.00	-24.35	Average
6	рp	2484.145	5.60	28.67	41.91	60.07	52.43	74.00	-21.57	peak



Report No.: SZEM180700576001

Page: 28 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL Job No : 05760CR

Mode : 2475 Band edge

	Freq	Cable Loss		Preamp Factor			Limit Line		Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2475.000	5.59	28.66	41.91	66.01	58.35	94.00	-35.65	Average
2	2475.000	5.59	28.66	41.91	88.78	81.12	114.00	-32.88	peak
3	2483.500	5.60	28.67	41.91	30.40	22.76	54.00	-31.24	Average
4	2483.500	5.60	28.67	41.91	53.17	45.53	74.00	-28.47	peak
5 av	2484.205	5.60	28.67	41.91	34.73	27.09	54.00	-26.91	Average
6 pr	2484.205	5.60	28.67	41.91	57.50	49.86	74.00	-24.14	peak



Report No.: SZEM180700576001

Page: 29 of 40

7.4 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.209 & 15.249 (a),(d)

Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength (microvolts/meter)	Limit (dBuV/m)	Detector	Measurement Distance (meters)
0.009-0.490	2400/F(kHz)	-	-	300
0.490-1.705	24000/F(kHz)	-	-	30
1.705-30	30	-	-	30
30-88	100	40.0	QP	3
88-216	150	43.5	QP	3
216-960	200	46.0	QP	3
960-1000	500	54.0	QP	3
Above 1000	500	54.0	AV	3



Report No.: SZEM180700576001

Page: 30 of 40

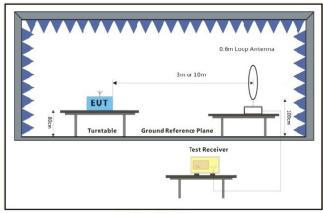
7.4.1 E.U.T. Operation

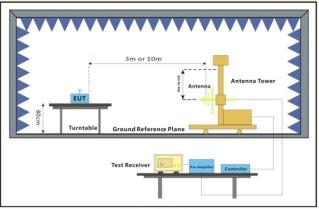
Operating Environment:

Temperature: 24.2 °C Humidity: 55.5 % RH Atmospheric Pressure: 1005 mbar

Test mode a:TX mode_Keep the EUT in transmitting with modulation mode.

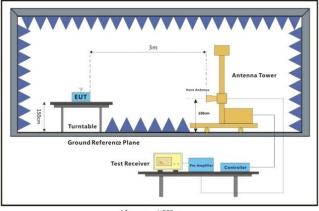
7.4.2 Test Setup Diagram





Below 30MHz

30MHz-1GHz



Above 1GHz

7.4.3 Measurement Procedure and Data

For testing performed with the loop antenna, the center of the loop was positioned 1 m above the ground and positioned with its plane vertical at the specified distance from the EUT. During testing the loop was rotated about its vertical axis for maximum response at each azimuth and also investigated with the loop positioned in the horizontal plane. Only the worst position of vertical was shown in the report.

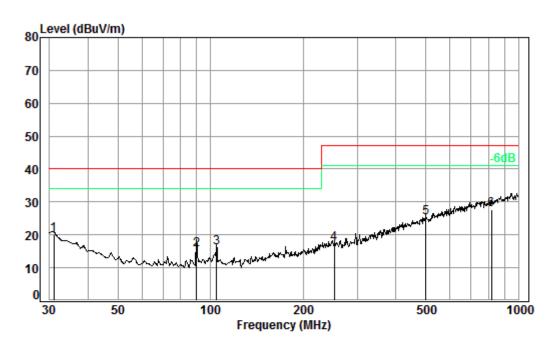


Report No.: SZEM180700576001

Page: 31 of 40

30MHz~1GHz

Mode: a; Polarization: Horizontal



Condition: 3m HORIZONTAL

Job No. : 05760CR

Test mode: a

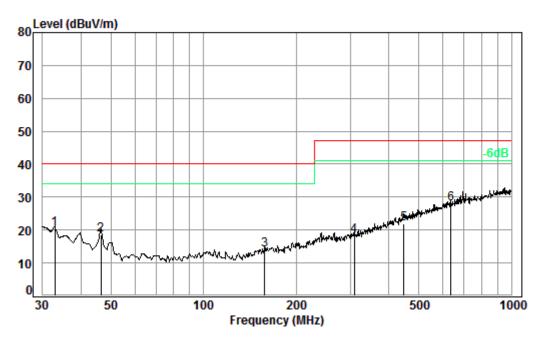
		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.96	0.60	21.95	27.67	25.07	19.95	40.00	-20.05
2	90.22	1.10	13.12	27.51	28.94	15.65	40.00	-24.35
3	104.54	1.21	13.78	27.51	28.68	16.16	40.00	-23.84
4	252.06	1.68	18.98	27.54	24.10	17.22	47.00	-29.78
5	501.18	2.60	24.63	27.88	25.87	25.22	47.00	-21.78
6 pp	818.83	3.28	28.76	27.35	23.11	27.80	47.00	-19.20



Report No.: SZEM180700576001

Page: 32 of 40

Mode: a; Polarization: Vertical



Condition: 3m VERTICAL Job No. : 05760CR

Test mode: a

		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	aB/m	dB	abuv	aBuv/m	aBuv/m	dB
1	32.86	0.60	20.92	27.66	26.49	20.35	40.00	-19.65
2	46.50	0.73	15.27	27.61	30.06	18.45	40.00	-21.55
3	158.11	1.33	15.34	27.52	24.98	14.13	40.00	-25.87
4	308.91	1.93	19.88	27.56	23.88	18.13	47.00	-28.87
5	447.98	2.40	23.52	27.81	23.82	21.93	47.00	-25.07
6 pp	636.13	2.78	27.09	27.64	25.65	27.88	47.00	-19.12

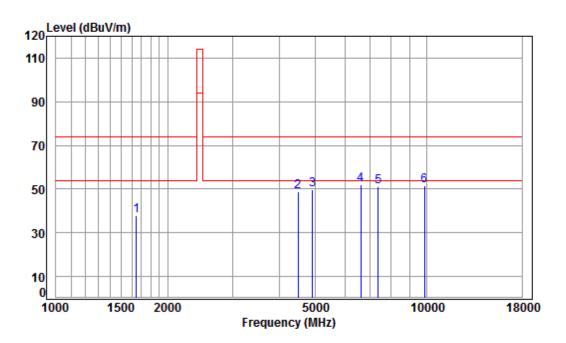


Report No.: SZEM180700576001

Page: 33 of 40

Above 1GHz

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:Low



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2460 TX RSE

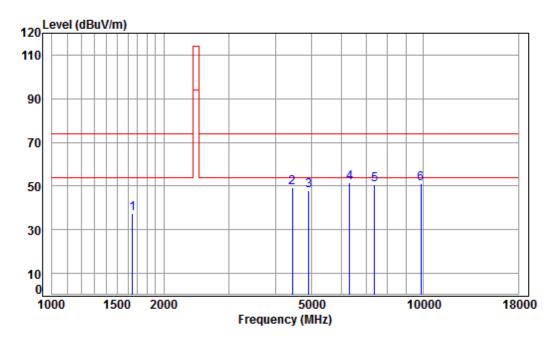
OCC	. 2.7	•								
		Cable	Ant	Preamp	Read		Limit	0ver		
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark	
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB		
1	1648.778	5.29	26.46	41.50	47.68	37.93	74.00	-36.07	peak	
2	4495.125	7.55	33.59	42.42	49.99	48.71	74.00	-25.29	peak	
3	4920.000	8.01	34.11	42.49	50.13	49.76	74.00	-24.24	peak	
4 p	p 6621.375	11.19	35.67	41.13	46.42	52.15	74.00	-21.85	peak	
5	7380.000	10.03	36.21	40.59	45.57	51.22	74.00	-22.78	peak	
6	9840 000	10 86	37 81	37 42	40 19	51 44	74 99	-22 56	neak	



Report No.: SZEM180700576001

Page: 34 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:Low



Condition: 3m VERTICAL

Job No : 05760CR

Mode : 2460 TX RSE

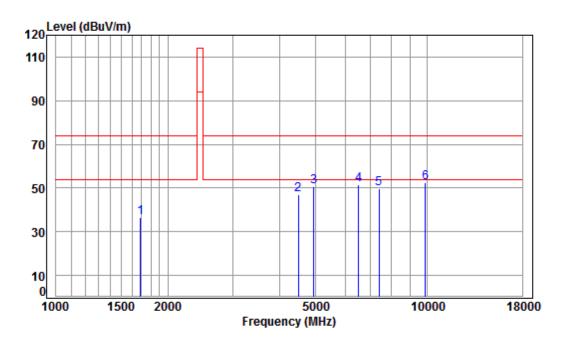
. 2.7	•							
	Cable	Ant	Preamp	Read		Limit	0ver	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1648.778	5.29	26.46	41.50	47.32	37.57	74.00	-36.43	peak
4430.628	7.48	33.48	42.41	50.89	49.44	74.00	-24.56	peak
4920.000	8.01	34.11	42.49	48.45	48.08	74.00	-25.92	peak
p 6322.136	11.20	35.43	41.35	46.47	51.75	74.00	-22.25	peak
7380.000	10.03	36.21	40.59	45.11	50.76	74.00	-23.24	peak
9840.000	10.86	37.81	37.42	39.65	50.90	74.00	-23.10	peak
	MHz 1648.778 4430.628 4920.000 p 6322.136 7380.000	Freq Loss MHz dB 1648.778 5.29 4430.628 7.48 4920.000 8.01 p 6322.136 11.20 7380.000 10.03	Freq Loss Factor MHz dB dB/m 1648.778 5.29 26.46 4430.628 7.48 33.48 4920.000 8.01 34.11 p 6322.136 11.20 35.43 7380.000 10.03 36.21	Freq Loss Factor Factor MHz dB dB/m dB 1648.778 5.29 26.46 41.50 4430.628 7.48 33.48 42.41 4920.000 8.01 34.11 42.49 p 6322.136 11.20 35.43 41.35 7380.000 10.03 36.21 40.59	Freq Loss Factor Factor Level MHz dB dB/m dB dBuV 1648.778 5.29 26.46 41.50 47.32 4430.628 7.48 33.48 42.41 50.89 4920.000 8.01 34.11 42.49 48.45 p 6322.136 11.20 35.43 41.35 46.47 7380.000 10.03 36.21 40.59 45.11	Freq Loss Factor Factor Level Level MHz dB dB/m dB dBuV dBuV/m 1648.778 5.29 26.46 41.50 47.32 37.57 4430.628 7.48 33.48 42.41 50.89 49.44 4920.000 8.01 34.11 42.49 48.45 48.08 p 6322.136 11.20 35.43 41.35 46.47 51.75 7380.000 10.03 36.21 40.59 45.11 50.76	Freq Loss Factor Factor Level Level Line MHz dB dB/m dB dBuV dBuV/m dBuV/m 1648.778 5.29 26.46 41.50 47.32 37.57 74.00 4430.628 7.48 33.48 42.41 50.89 49.44 74.00 4920.000 8.01 34.11 42.49 48.45 48.08 74.00 p 6322.136 11.20 35.43 41.35 46.47 51.75 74.00 7380.000 10.03 36.21 40.59 45.11 50.76 74.00	Cable Ant Preamp Read Limit Over Loss Factor Factor Level Level Line Limit MHz dB dB/m dB dBuV dBuV/m dBuV/m dBuV/m dB 1648.778 5.29 26.46 41.50 47.32 37.57 74.00 -36.43 4430.628 7.48 33.48 42.41 50.89 49.44 74.00 -24.56 4920.000 8.01 34.11 42.49 48.45 48.08 74.00 -25.92 6322.136 11.20 35.43 41.35 46.47 51.75 74.00 -22.25 7380.000 10.03 36.21 40.59 45.11 50.76 74.00 -23.24 9840.000 10.86 37.81 37.42 39.65 50.90 74.00 -23.10



Report No.: SZEM180700576001

Page: 35 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:middle



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2468 TX RSE

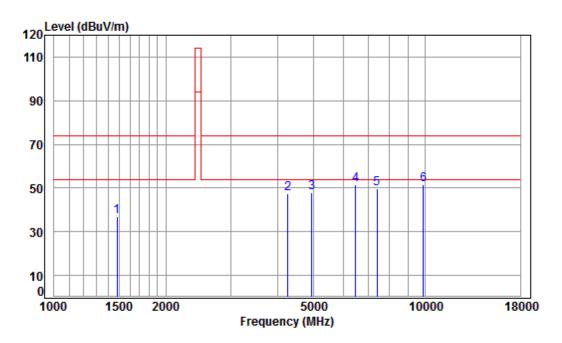
		_							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	5.24	26.62	41.52	46.13	36.47	74.00	-37.53	peak
2	4495.125	7.55	33.59	42.42	48.42	47.14	74.00	-26.86	peak
3	4936.000	8.03	34.13	42.49	51.01	50.68	74.00	-23.32	peak
4	6526.373	11.46	35.62	41.20	45.68	51.56	74.00	-22.44	peak
5	7404.000	10.02	36.23	40.58	44.22	49.89	74.00	-24.11	peak
6	pp 9872.000	10.88	37.82	37.37	41.02	52.35	74.00	-21.65	peak



Report No.: SZEM180700576001

Page: 36 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:middle



Condition: 3m VERTICAL

Job No : 05760CR

Mode : 2468 TX RSE

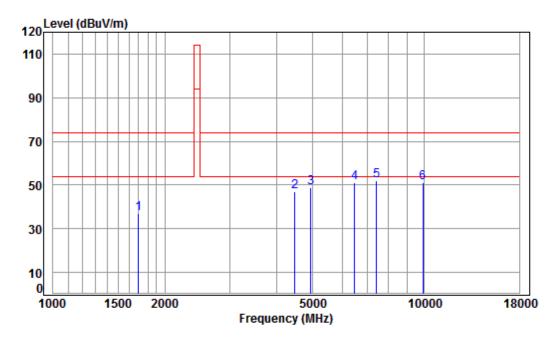
000	. 2.7	•							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1477.276	5.41	25.72	41.39	47.14	36.88	74.00	-37.12	peak
2	4267.237	7.30	33.19	42.38	49.13	47.24	74.00	-26.76	peak
3	4936.000	8.03	34.13	42.49	48.10	47.77	74.00	-26.23	peak
4 p	p 6488.754	11.52	35.59	41.22	45.54	51.43	74.00	-22.57	peak
5	7404.000	10.02	36.23	40.58	44.12	49.79	74.00	-24.21	peak
6	9872.000	10.88	37.82	37.37	40.08	51.41	74.00	-22.59	peak



Report No.: SZEM180700576001

Page: 37 of 40

Mode:a; Polarization:Horizontal; Modulation:GFSK; Channel:High



Condition: 3m HORIZONTAL

Job No : 05760CR

Mode : 2475 TX RSE

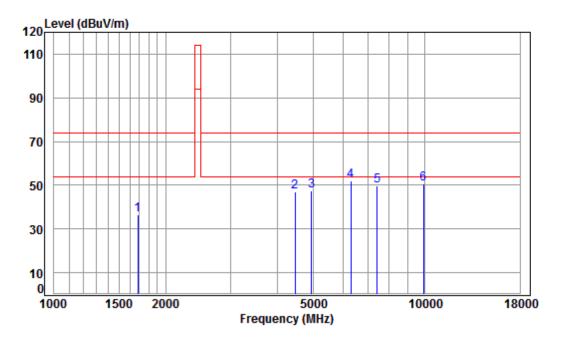
	_							
	Cable	Ant	Preamp	Read		Limit	0ver	
Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1697.129	5.23	26.66	41.53	46.66	37.02	74.00	-36.98	peak
4482.150	7.54	33.57	42.41	48.17	46.87	74.00	-27.13	peak
4950.000	8.04	34.14	42.49	49.28	48.97	74.00	-25.03	peak
6488.754	11.52	35.59	41.22	45.12	51.01	74.00	-22.99	peak
7425.000	10.02	36.24	40.57	46.13	51.82	74.00	-22.18	peak
9900.000	10.89	37.84	37.34	39.79	51.18	74.00	-22.82	peak
	MHz 1697.129 4482.150 4950.000 6488.754 7425.000	Freq Loss MHz dB 1697.129 5.23 4482.150 7.54 4950.000 8.04 6488.754 11.52 7425.000 10.02	Freq Loss Factor MHz dB dB/m 1697.129 5.23 26.66 4482.150 7.54 33.57 4950.000 8.04 34.14 6488.754 11.52 35.59 7425.000 10.02 36.24	Freq Loss Factor Factor MHz dB dB/m dB 1697.129 5.23 26.66 41.53 4482.150 7.54 33.57 42.41 4950.000 8.04 34.14 42.49 6488.754 11.52 35.59 41.22 7425.000 10.02 36.24 40.57	Freq Loss Factor Factor Level MHz dB dB/m dB dBuV 1697.129 5.23 26.66 41.53 46.66 4482.150 7.54 33.57 42.41 48.17 4950.000 8.04 34.14 42.49 49.28 6488.754 11.52 35.59 41.22 45.12 7425.000 10.02 36.24 40.57 46.13	Freq Loss Factor Factor Level Level MHz dB dB/m dB dBuV dBuV/m 1697.129 5.23 26.66 41.53 46.66 37.02 4482.150 7.54 33.57 42.41 48.17 46.87 4950.000 8.04 34.14 42.49 49.28 48.97 6488.754 11.52 35.59 41.22 45.12 51.01 7425.000 10.02 36.24 40.57 46.13 51.82	Freq Loss Factor Factor Level Level Line MHz	Cable Ant Preamp Read Limit Over Freq Loss Factor Factor Level Level Line Limit MHz dB dB/m dB dBuV dBuV/m dBuV/m dBuV/m dB 1697.129 5.23 26.66 41.53 46.66 37.02 74.00 -36.98 4482.150 7.54 33.57 42.41 48.17 46.87 74.00 -27.13 4950.000 8.04 34.14 42.49 49.28 48.97 74.00 -25.03 6488.754 11.52 35.59 41.22 45.12 51.01 74.00 -22.99 7425.000 10.02 36.24 40.57 46.13 51.82 74.00 -22.18 9900.000 10.89 37.84 37.34 39.79 51.18 74.00 -22.82



Report No.: SZEM180700576001

Page: 38 of 40

Mode:a; Polarization:Vertical; Modulation:GFSK; Channel:High



Condition: 3m VERTICAL Job No : 05760CR

Job No : 05760CR Mode : 2475 TX RSE

	. 2.7	•							
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1682.477	5.25	26.60	41.52	46.19	36.52	74.00	-37.48	peak
2	4469.214	7.53	33.55	42.41	48.36	47.03	74.00	-26.97	peak
3	4950.000	8.04	34.14	42.49	47.93	47.62	74.00	-26.38	peak
4 p	p 6303.890	11.17	35.41	41.37	46.67	51.88	74.00	-22.12	peak
5	7425.000	10.02	36.24	40.57	44.06	49.75	74.00	-24.25	peak
6	9900.000	10.89	37.84	37.34	39.24	50.63	74.00	-23.37	peak

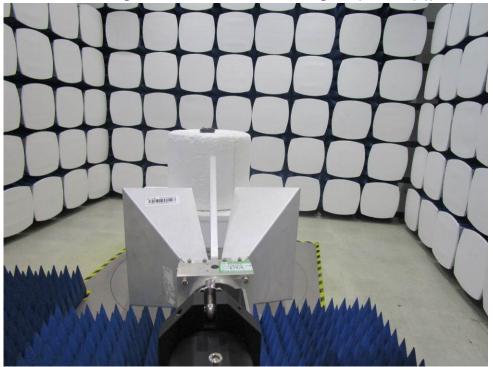


Report No.: SZEM180700576001

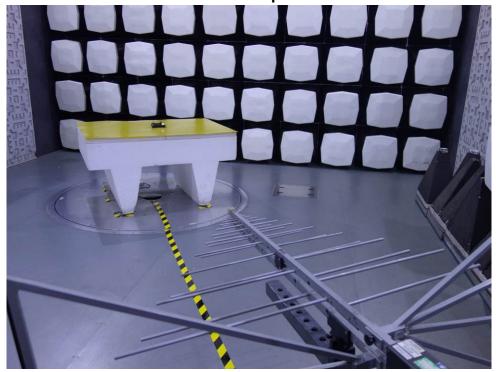
Page: 39 of 40

8 Photographs

8.1 Field Strength of the Fundamental Signal (15.249(a)) Test Setup



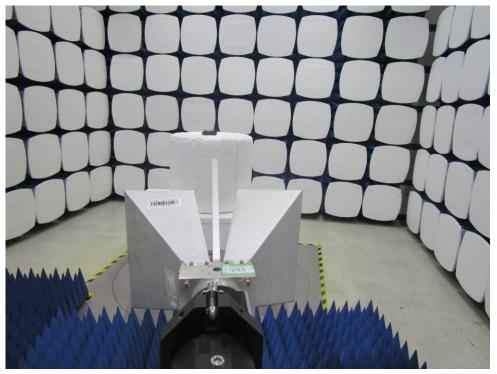
8.2 Radiated Emissions Test Setup





Report No.: SZEM180700576001

Page: 40 of 40



8.3 EUT Constructional Details (EUT Photos)

Refer to EUT external and internal photos.

- End of the Report -