

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

Shenzhen, Guangdong, China 518057

Telephone: +86 (0) 755 2601 2053 Report No.: SZEM180500374901 Fax: +86 (0) 755 2671 0594 Report No.: SZEM180500374901

Fax: +86 (0) 755 2671 0594 Page: 1 of 21 Email: ee.shenzhen@sgs.com

## TEST REPORT

**Application No.:** SZEM1805003749CR **Applicant:** GOODLY TOYS LTD

Address of Applicant: ROOM 502A, HARBOUR CRYSTAL CENTRE, 100 GRANVILLE ROAD,

TST, KOWLOON, HK

Manufacturer / Factory: MEKBAO PLASTIC ELECTRONIC INDUSTRIAL CO., LTD

Address of Manufacturer / JIAOXI INDUSTRY AREAS LIANXIA CHENGHAI SHANTOU CITY, GD

Factory: CHINA

**Equipment Under Test (EUT):** 

**EUT Name:** Remote Control Car Series

Model No.: 110, 114, 116, 118, 120, 2013, 110-1, 110-2, 110-3, 110-4, 110-5, 110-6,

110-7, 110-8, 114-1, 114-2, 114-3, 114-4, 114-5, 114-6, 114-7, 114-8, 118-1, 118-2, 118-3, 118-4, 118-5, 118-6, 118-7, 118-8, 120-1, 120-2, 120-3, 120-4, 120-5, 120-6, 120-7, 120-8, 124-1, 124-2, 124-3, 124-4, 124-5, 124-6, 124-7, 124-8, 2011-18, 2011-28, 2011-38, 2011-48, 2011-58, 2011-68, 2011-78, 2011-88, 2015-18, 2015-28, 2015-38, 2015-48, 2015-58, 2013-98, 5588-601, 5588-602, 5588-603, 5588-604, 5588-604, 5588-604, 5588-702, 5588-608, 5588-609, 5588-610, 5588-612, 5588-613, 5588-614, 5588-702, 5588-

703, 5588-705, 5588-706, 5588-709, 5588-710, 5588-711

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

actually tested and which were electrically identical.

**FCC ID:** 2APSK-11049

Standard(s): 47 CFR Part 15, Subpart C 15.235

 Date of Receipt:
 2018-05-08

 Date of Test:
 2018-05-14

 Date of Issue:
 2018-05-22

Test Result: Pass\*

<sup>\*</sup> In the configuration tested, the EUT complied with the standards specified above.



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.

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Report No.: SZEM180500374901

Page: 2 of 21

	Revision Record					
Version Chapter Date Modifier				Remark		
01		2018-05-22		Original		

Authorized for issue by:		
	Bim Chen	
	Bill Chen /Project Engineer	
	EvicFu	
	Eric Fu /Reviewer	



Report No.: SZEM180500374901

Page: 3 of 21

## 2 Test Summary

Radio Spectrum Technical Requirement						
Item	Standard	Method	Requirement	Result		
Antenna Requirement	47 CFR Part 15, Subpart C 15.235	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 15.235	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.215	Pass		
Field Strength of the Fundamental Signal (15.235(a))	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.4	47 CFR Part 15, Subpart C 15.235	Pass		
Radiated Emissions(9kHz- 30MHz)	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.4 & 6.5	47 CFR Part 15, Subpart C 15.235 & 15.209	Pass		
Radiated Emissions(30MHz- 1GHz)	47 CFR Part 15, Subpart C 15.235	ANSI C63.10 (2013) Section 6.4 & 6.5	47 CFR Part 15, Subpart C 15.235 & 15.209	Pass		

#### Remark:

Model No.: 110, 114, 116, 118, 120, 2013, 110-1, 110-2, 110-3, 110-4, 110-5, 110-6, 110-7, 110-8, 114-1, 114-2, 114-3, 114-4, 114-5, 114-6, 114-7, 114-8, 118-1, 118-2, 118-3, 118-4, 118-5, 118-6, 118-7, 118-8, 120-1, 120-2, 120-3, 120-4, 120-5, 120-6, 120-7, 120-8, 124-1, 124-2, 124-3, 124-4, 124-5, 124-6, 124-7, 124-8, 2011-1B, 2011-2B, 2011-3B, 2011-4B, 2011-5B, 2011-6B, 2011-7B, 2011-8B, 2015-1B, 2015-2B, 2015-3B, 2015-4B, 2015-5B, 2013-9B, 5588-601, 5588-602, 5588-603, 5588-604, 5588-605, 5588-606, 5588-608, 5588-609, 5588-610, 5588-612, 5588-613, 5588-614, 5588-702, 5588-703, 5588-705, 5588-706, 5588-709, 5588-710, 5588-711

Only the model 110 was tested, since the electrical circuit design, layout, components used, internal wiring and functions were identical for all the above models, with only difference on colour, appearance, package.



Report No.: SZEM180500374901

Page: 4 of 21

## 3 Contents

		Page
1	COVER PAGE	1
2	TEST SUMMARY	3
3	CONTENTS	4
4		
•		
	4.1 DETAILS OF E.U.T.	
	4.2 DESCRIPTION OF SUPPORT UNITS	
	4.3 MEASUREMENT UNCERTAINTY	
	4.5 Test Facility	
	4.6 DEVIATION FROM STANDARDS	
	4.7 ABNORMALITIES FROM STANDARD CONDITIONS	
_		
5	EQUIPMENT LIST	/
6	RADIO SPECTRUM TECHNICAL REQUIREMENT	c
Ŭ		
	6.1 ANTENNA REQUIREMENT	
	6.1.1 Test Requirement:	
7	RADIO SPECTRUM MATTER TEST RESULTS	10
	7.1 20DB BANDWIDTH	10
	7.1.1 E.U.T. Operation	10
	7.1.2 Test Setup Diagram	
	7.1.3 Measurement Procedure and Data	10
	7.2 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.235(A))	
	7.2.1 E.U.T. Operation	
	7.2.2 Test Setup Diagram	
	7.2.3 Measurement Procedure and Data	
	7.3 HADIATED EMISSIONS	
	7.3.2 Test Setup Diagram	
	7.3.3 Measurement Procedure and Data	
8	PHOTOGRAPHS	21
	8.1 RADIATED EMISSIONS (30MHz-1GHz) TEST SETUP	21
	8.2 FUT CONSTRUCTIONAL DETAILS (FUT PHOTOS)	



Report No.: SZEM180500374901

Page: 5 of 21

## 4 General Information

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

Power supply:	Tx:DC 3.0V by 1.5V x 2"AA" batteries
Modulation Type:	ASK
Antenna Type	Integral
Antenna Gain:	0dBi
Operation Frequency	49.86MHz

#### 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 <sup>-8</sup>
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 Dadiated news	4.5dB (below 1GHz)
/	RF Radiated power	4.8dB (above 1GHz)
8	Dadiated Churique emission test	4.5dB (Below 1GHz)
0	Radiated Spurious emission test	4.8dB (Above 1GHz)
9	Temperature test	1℃
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



Report No.: SZEM180500374901

Page: 6 of 21

#### 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.: SZEM180500374901

Page: 7 of 21

## 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
EXA Signal Analyzer (10Hz-26.5GHz)	Agilent Technologies Inc	N9010A	SEM004-09	2018-04-13	2019-04-12
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

Field Strength of the Fundamental Signal (15.235(a))							
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date		
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04		
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A		
Coaxial Cable	SGS	N/A	SEM025-01	2017-07-13	2018-07-12		
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2017-09-27	2018-09-26		
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26		
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2018-04-02	2019-04-01		

Radiated Emissions(9kHz-30MHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2018-03-31	2021-03-30	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM029-01	2017-07-13	2018-07-12	
EMI Test Receiver (9kHz-3GHz)	Rohde & Schwarz	ESR	SEM004-03	2018-04-02	2019-04-01	
Trilog-Broadband Antenna (30MHz-1GHz)	Schwarzbeck	VULB9168	SEM003-18	2016-01-26	2019-01-25	
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-04	2018-04-13	2019-04-12	
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2017-08-22	2020-08-21	



Report No.: SZEM180500374901

Page: 8 of 21

Radiated Emissions(30MHz-1GHz)						
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date	
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2017-08-05	2020-08-04	
Measurement Software	AUDIX	e3 V8.2014-6- 27	N/A	N/A	N/A	
Coaxial Cable	SGS	N/A	SEM025-01	2017-07-13	2018-07-12	
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2017-09-27	2018-09-26	
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2017-06-27	2020-06-26	
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2018-04-02	2019-04-01	

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.: SZEM180500374901

Page: 9 of 21

## 6 Radio Spectrum Technical Requirement

#### 6.1 Antenna Requirement

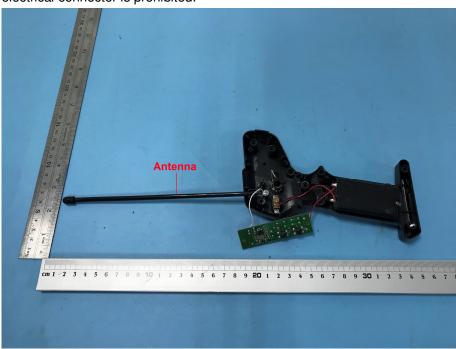
#### 6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203

#### 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 antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit permanently attached antenna or of an 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.: SZEM180500374901

Page: 10 of 21

## 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

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

Operating Environment:

Temperature: 24 °C Humidity: 52 % RH Atmospheric Pressure: 1015 mbar

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

#### 7.1.2 Test Setup Diagram

# Spectrum Analyzer E.U.T Non-Conducted Table

## Ground Reference Plane

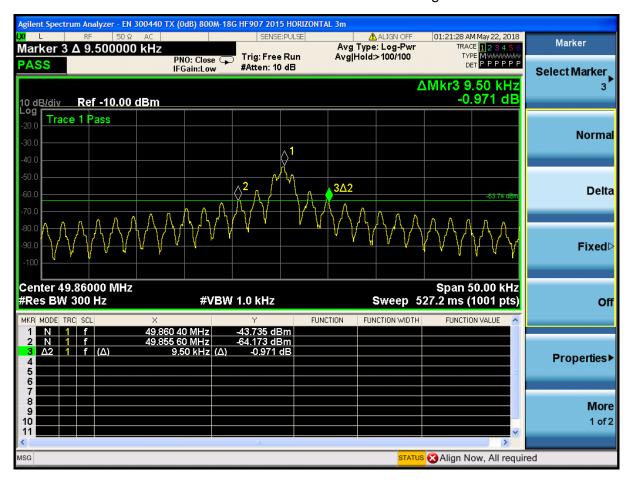
#### 7.1.3 Measurement Procedure and Data

Mode	Frequency (MHz)	-20dB Bandwidth(KHz)	Limit	Conclusion
Tx	49.86	9.5	N/A	Pass



Report No.: SZEM180500374901

Page: 11 of 21





Report No.: SZEM180500374901

Page: 12 of 21

#### 7.2 Field Strength of the Fundamental Signal (15.235(a))

Test Requirement 47 CFR Part 15, Subpart C 15.235 Test Method: ANSI C63.10 (2013) Section 6.4

Measurement Distance: 3m

Limit: \$ 10000 microvolts/meter at 3 meters, the emission limit is based on

measurement instrumentation employing an average Detector:. The

provisions in § 15.35 for limiting peak emissions apply.



Report No.: SZEM180500374901

Page: 13 of 21

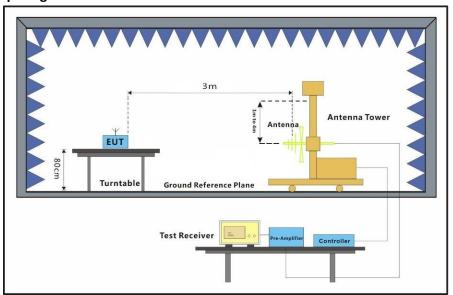
#### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C Humidity: 53 % RH Atmospheric Pressure: 1015 mbar

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

#### 7.2.2 Test Setup Diagram



#### 7.2.3 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1Ghz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

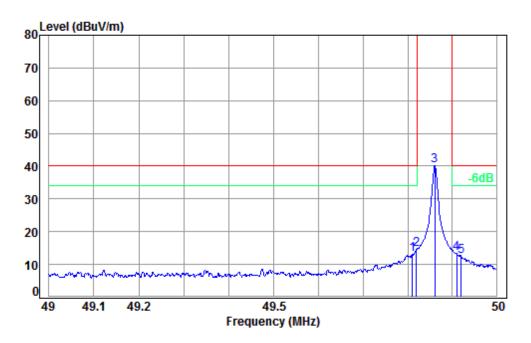
Remark: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor



Report No.: SZEM180500374901

Page: 14 of 21

Mode:a; Polarization:Horizontal



Condition: 3m HORIZONTAL

Job No. : 03749CR

Test mode: TX

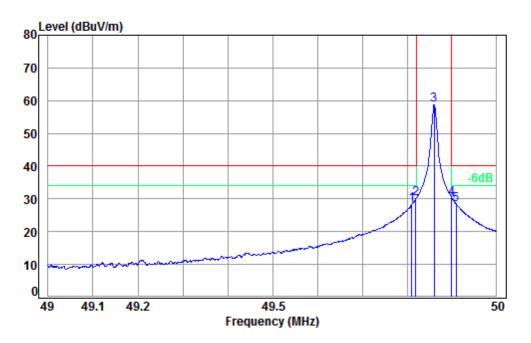
	Freq			Preamp Factor				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 2 pp	49.81 49.82			27.60 27.60				
3	49.86			27.60				
4	49.91			27.60				
5	49.92	0.80	14.22	27.60	25.00	12.42	40.00	-27.58



Report No.: SZEM180500374901

Page: 15 of 21

Mode:a; Polarization:Vertical



Condition: 3m Vertical Job No. : 03749CR

Test mode: TX

	Freq			Preamp Factor				
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	49.81	0.80	14.26	27.60	40.92	28.38	40.00	-11.62
2	49.82	0.80	14.25	27.60	42.67	30.12	40.00	-9.88
3	49.86	0.80	14.24	27.60	71.21	58.65	100.00	-41.35
4 pp	49.90	0.80	14.23	27.60	42.83	30.26	40.00	-9.74
5	49.91	0.80	14.23	27.60	40.90	28.33	40.00	-11.67

#### 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



Report No.: SZEM180500374901

Page: 16 of 21

#### 7.3 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.235 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4 & 6.5

Measurement Distance: 3m

Limit:

Frequency(MHz) <i>₄</i>	Field strength(microvolts/meter)₽	Measurement distance(meters)ಳ
0.009-0.490₽	2400/F(kHz)₽	300₽
0.490-1.705₽	24000/F(kHz)₽	30₽
1.705-30.0₽	30₽	30₽

Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz and 110-490kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

Frequency(MHz)₽	Field strength(microvolts/meter)₽	Measurement distance(meters)√
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 on measurements employing a CISPR quasi-peak detector except for above 1000MHz. Radiated emission limits above 1000MHz is based on measurements employing an average detector.

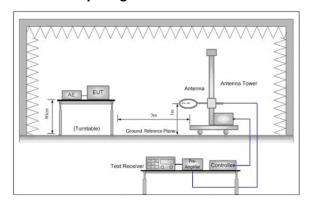
#### 7.3.1 E.U.T. Operation

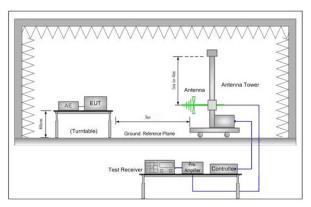
Operating Environment:

Temperature: 25.2 °C Humidity: 53 % RH Atmospheric Pressure: 1015 mbar

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

#### 7.3.2 Test Setup Diagram







Report No.: SZEM180500374901

Page: 17 of 21

#### 7.3.3 Measurement Procedure and Data

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground for below 1Ghz at a 3 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. 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.
- d. 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.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. 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.
- g. The radiation measurements are performed in X, Y, Z axis positioning. And found the X axis positioning which it is worse case, only the test worst case mode is recorded in the report.

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



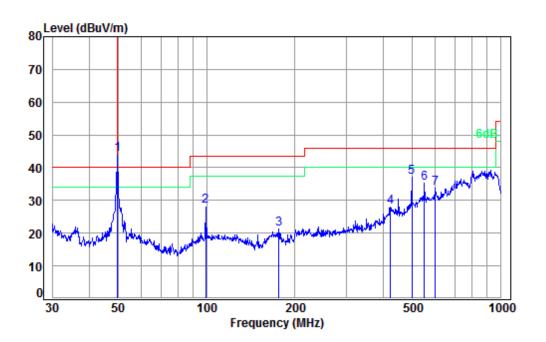
Report No.: SZEM180500374901

Page: 18 of 21

30MHz~1GHz

QP value:

Mode:a; Polarization:Horizontal



Condition: 3m HORIZONTAL

Job No. : 03749CR

Test mode: TX

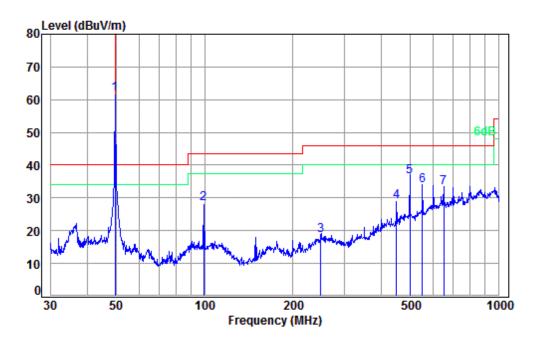
		Cable	Ant	Preamp	Read		Limit	0ver
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	49.88	0.80	14.24	27.60	56.61	44.05	100.00	-55.95
2	99.53	1.19	13.96	27.51	40.59	28.23	43.50	-15.27
3	176.27	1.36	15.83	27.53	31.50	21.16	43.50	-22.34
4	422.06	2.29	22.93	27.77	30.50	27.95	46.00	-18.05
5 pp	499.42	2.59	24.59	27.88	37.75	37.05	46.00	-8.95
6	549.02	2.65	25.63	27.79	34.82	35.31	46.00	-10.69
7	599.32	2.70	26.59	27.70	32.25	33.84	46.00	-12.16



Report No.: SZEM180500374901

Page: 19 of 21

Mode:a; Polarization:Vertical



Condition: 3m VERTICAL Job No. : 03749CR

Test mode: TX

est mode. IX								
		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	49.88	0.80	14.29	27.60	74.13	61.62	100.00	38.32
2	99.53	1.19	13.96	27.51	40.58	28.22	43.50	-15.28
3	248.55	1.67	18.93	27.53	25.41	18.48	46.00	-27.52
4	449.56	2.41	23.55	27.81	30.63	28.78	46.00	-17.22
5	499.42	2.59	24.59	27.88	37.32	36.62	46.00	-9.38
6	549.02	2.65	25.63	27.79	33.35	33.84	46.00	-12.16
7	649.66	2.81	27.27	27.62	30.79	33.25	46.00	-12.75



Report No.: SZEM180500374901

Page: 20 of 21

#### 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, and the above harmonics were the highest point could be found when testing, so only the above harmonics 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. So, only the peak measurements were shown in the report.

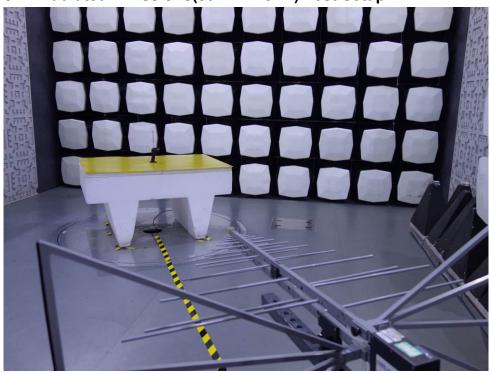


Report No.: SZEM180500374901

Page: 21 of 21

## 8 Photographs

## 8.1 Radiated Emissions(30MHz-1GHz) Test Setup



#### 8.2 EUT Constructional Details (EUT Photos)

Refer to Appendix A - Photographs of EUT Constructional Details for SZEM18050037497CR.

- End of the Report -