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TEST REPORT

Application No.: SZEM1708008812CR

Applicant: Shenzhen Yiroka Electronic Co., LTD

Address of Applicant: (2nd Floor, 15th) the 6th-19th Building, Xinxing Industrial Park, Citianpu,

Gongming, Guangming, Shenzhen, Guangdong, China.

Manufacturer: Shenzhen Yiroka Electronic Co., LTD

Address of Manufacturer: Building 6 to 19(15block, 2floor), Xinxing industrial park, Shutianpu community,

Gongming, Guangming new district, Shenzhen, China

Factory: Shenzhen Yiroka Electronic Co., LTD

Address of Factory: Building 6 to 19(15block, 2floor), Xinxing industrial park, Shutianpu community,

Gongming, Guangming new district, Shenzhen, China

**Equipment Under Test (EUT):** 

**EUT Name:** wireless doorbell

Model No.: Please refer to section 2 ♣

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

tested and which were electrically identical.

Trade mark: YIROKA MUSTBY YOULIFE

FCC ID: XQKYIROKA2017

Standards: 47 CFR Part 15, Subpart C 15.231

**Date of Receipt:** 2017-08-22

**Date of Test:** 2017-08-25 to 2017-08-30

**Date of Issue:** 2017-09-05

Test Result : Pass\*



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.

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



Report No.: SZEM170800881201

Page: 2 of 22

	Revision Record					
Version	Chapter	Date	Modifier	Remark		
01		2017-09-05		Original		

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



Report No.: SZEM170800881201

Page: 3 of 22

# 2 Test Summary

Radio Spectrum Technical Requirement					
Item	Standard	Method	Requirement	Result	
Antenna Requirement	47 CFR Part 15, Subpart C 15.231	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 15.231	ANSI C63.10 (2013) Section 6.9	47 CFR Part 15, Subpart C 15.231(c)	Pass	
Dwell Time (15.231(a))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 7.8.4	47 CFR Part 15, Subpart C 15.231(a)	Pass	
Field Strength of the Fundamental Signal (15.231(b))	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.5	47 CFR Part 15, Subpart C 15.231(b)	Pass	
Radiated Emissions	47 CFR Part 15, Subpart C 15.231	ANSI C63.10 (2013) Section 6.4&6.5&6.6	47 CFR Part 15, Subpart C 15.231(b)	Pass	

#### Remark:

Model No.:a-101, a-102, a-103, a-104, a-105, a-106, a-107, a-108, a-109, a-110, a-126, a-128, a-129, a-136, a-138, a-139, a-288, a-289, a-291, a-298, a-299, a-518, a-528, a-538, a-558, a-608, a-618, a-628, a-638, a-658, a-668, a-688, a-708, a-718, a-728, a-738, a-758, a-768, a-778, a-788, a-798, a-289D, a-290D, a-291D, a-518D, a-528D, a-608D, a-638D, a-658D, a-668D, a-688D, a-708D, a-718D, a-728D, a-738D, a-758D, a-768D, a-778D, a-788D, a-798D ("a" = "A, B, C, D, E, F, G, H, I, J, K, L, M, N, Q, DQ, S, T, W, Z, YZ01, YZ02, YZ03, YZ04, YZ05, YZ06, YZ07, YZ08, YZ09, YZ10, YX01, YX02, YX03, YX04, YX05, YX06, YX07, YX08, YX09, YX10, 001A, 002A, 003A, 004A, 005A, 006A, 007A, 008A, 009A, WF01, WF02, WF03, WF04, WF05, WF06, WF07, WF08, WF09, WF10")
Only the model W-638D 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 model No..



Report No.: SZEM170800881201

Page: 4 of 22

## 3 Contents

1 COVER PAGE			Page
3 CONTENTS	1	1 COVER PAGE	1
4 GENERAL INFORMATION.       5         4.1 DETAILS OF E.U.T.       5         4.2 DESCRIPTION OF SUPPORT UNITS.       5         4.3 MEASUREMENT UNCERTAINTY       5         4.4 TEST LOCATION       6         4.5 TEST FACILITY       6         4.6 DEVIATION FROM STANDARDS.       6         4.7 ABNORMALITIES FROM STANDARD CONDITIONS       6         5 EQUIPMENT LIST.       7         6 RADIO SPECTRUM TECHNICAL REQUIREMENT       5         6.1.1 ANTENNA REQUIREMENT       9         6.1.2 Conclusion       9         7 RADIO SPECTRUM MATTER TEST RESULTS       10         7.1 20DB BANDWIDTH       10         7.1.1 E.U.T. Operation       11         7.1.2 Test Setup Diagram       10         7.1.3 Measurement Procedure and Data       11         7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3.1 E.U.T. Operation       12         7.3.2 Test Setup Diagram       12         7.3.3 Measurement Procedure and Data       14         7.3.3 Measurement Procedure and Data       15         7.4 RADIATED EMISSIONS       15         7.4 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       16	2	2 TEST SUMMARY	3
4.1       DETAILS OF E.U.T.       5         4.2       DESCRIPTION OF SUPPORT UNITS       5         4.3       MEASUREMENT UNCERTAINTY       5         4.4       TEST LOCATION       6         4.5       TEST FACILITY       6         4.6       DEVIATION FROM STANDARDS       6         4.7       ABNORMALITIES FROM STANDARD CONDITIONS       6         5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         7       RADIO SPECTRUM MATTER TEST RESULTS       10         7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       11         7.1.2       Test Setup Diagram       11         7.1.3       Measurement Procedure and Data       11         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.3.1       E.U.T. Operation       12         7.3.2       Test Setup Diagram       14         7.3.3       Measurement Procedure and Data       15         7.3.1       E.U.T. Operation       15 <th>3</th> <th>3 CONTENTS</th> <th>4</th>	3	3 CONTENTS	4
4.2       DESCRIPTION OF SUPPORT UNITS       5         4.3       MEASUREMENT UNCERTAINTY       5         4.4       TEST LOCATION       6         4.5       TEST FACILITY       6         4.6       DEVIATION FROM STANDARDS       6         4.7       ABNORMALITIES FROM STANDARD CONDITIONS       6         5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         7       RADIO SPECTRUM MATTER TEST RESULTS       10         7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       11         7.1.2       Test Setup Diagram       10         7.1.3       Measurement Procedure and Data       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.3.1       E.U.T. Operation       14         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.3.1       E.U.T. Operation       16         7.3.2       Test Setup Diagram       1	4	4 GENERAL INFORMATION	5
4.2       DESCRIPTION OF SUPPORT UNITS       5         4.3       MEASUREMENT UNCERTAINTY       5         4.4       TEST LOCATION       6         4.5       TEST FACILITY       6         4.6       DEVIATION FROM STANDARDS       6         4.7       ABNORMALITIES FROM STANDARD CONDITIONS       6         5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         7       RADIO SPECTRUM MATTER TEST RESULTS       10         7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       11         7.1.2       Test Setup Diagram       10         7.1.3       Measurement Procedure and Data       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.3.1       E.U.T. Operation       14         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.3.1       E.U.T. Operation       16         7.3.2       Test Setup Diagram       1		4.1 DETAILS OF ELLT	5
4.3       MEASUREMENT UNCERTAINTY       5         4.4       TEST LOCATION       6         4.5       TEST FACILITY       6         4.6       DEVIATION FROM STANDARDS       6         4.7       ABNORMALITIES FROM STANDARD CONDITIONS       6         5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1       ANTENNA REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         7       RADIO SPECTRUM MATTER TEST RESULTS       10         7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       11         7.1.2       Test Setup Diagram       10         7.1.3       Measurement Procedure and Data       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       12         7.3.3       Test Setup Diagram       12         7.3.1       E.U.T. Operation       15			
4.4       TEST LOCATION       6         4.5       TEST FACILITY       6         4.6       DEVIATION FROM STANDARDS       6         4.7       ABNORMALITIES FROM STANDARD CONDITIONS       6         5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1       ANTENNA REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         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       10         7.1.3       Measurement Procedure and Data       10         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.3.1       E.U.T. Operation       12         7.3.2       Test Setup Diagram       12         7.3.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       14         7.3.2       Test Setup Diagram       12         7.3.3       Measurement Procedure and Data			
4.5       TEST FACILITY       6         4.6       DEVIATION FROM STANDARDS       6         4.7       ABNORMALITIES FROM STANDARD CONDITIONS       6         5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         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       11         7.1.3       Measurement Procedure and Data       11         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       12         7.3.2       Test Setup Diagram       14         7.3.3       Measurement Procedure and Data       15         7.3.3       Measurement Procedure and Data       15         7.3.1       E.U.T. Operation       16         7.3.2       Test Setup Diagram       16         7.4.1       E.U.T. Opera			
4.6       DEVIATION FROM STANDARDS			
4.7 ABNORMALITIES FROM STANDARD CONDITIONS 6  5 EQUIPMENT LIST 7  6 RADIO SPECTRUM TECHNICAL REQUIREMENT 9  6.1 ANTENNA REQUIREMENT 9  6.1.1 Test Requirement 9  6.1.2 Conclusion 9  7 RADIO SPECTRUM MATTER TEST RESULTS 10  7.1 20DB BANDWIDTH 11  7.1.1 E.U.T. Operation 11  7.1.2 Test Setup Diagram 10  7.1.3 Measurement Procedure and Data 11  7.2 DWELL TIME (15.231(A)) 12  7.2.1 E.U.T. Operation 12  7.2.2 Test Setup Diagram 12  7.2.3 Measurement Procedure and Data 12  7.3 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B)) 14  7.3.1 E.U.T. Operation 15  7.3.3 Measurement Procedure and Data 16  7.3.4 RADIATED EMISSIONS 17  7.4.1 E.U.T. Operation 16  7.4.2 Test Setup Diagram 17  7.4.1 E.U.T. Operation 16  7.4.1 E.U.T. Operation 17  7.4.1 E.U.T. Operation 16  7.4.2 Test Setup Diagram 16			
5       EQUIPMENT LIST       7         6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1       ANTENNA REQUIREMENT       9         6.1.1       Test Requirement       9         6.1.2       Conclusion       9         7       RADIO SPECTRUM MATTER TEST RESULTS       10         7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       11         7.1.2       Test Setup Diagram       10         7.1.3       Measurement Procedure and Data       10         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       14         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.3.3       Measurement Procedure and Data       15         7.3.1       E.U.T. Operation       15         7.3.3       Measurement Procedure and Data       15         7.3.3       Measurement Procedure and Data       15         7.4.1       E.U.T. Operation       15         7.4.1       E.U.			
6       RADIO SPECTRUM TECHNICAL REQUIREMENT       9         6.1       ANTENNA REQUIREMENT       9         6.1.1       Test Requirement:       9         6.1.2       Conclusion       9         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       10         7.1.3       Measurement Procedure and Data       11         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       12         7.3.2       Test Setup Diagram       12         7.3.3       Measurement Procedure and Data       15         7.4.1       E.U.T. Operation       15         7.4.2       Test Setup Diagram       16         7.4.1       E.U.T. Operation       16         7.4.2	_		
6.1 ANTENNA REQUIREMENT       9         6.1.1 Test Requirement:       9         6.1.2 Conclusion       9         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       10         7.1.3 Measurement Procedure and Data       10         7.2 DWELL TIME (15.231(A))       12         7.2.1 E.U.T. Operation       12         7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3.1 E.U.T. Operation       12         7.3.2 Test Setup Diagram       12         7.3.3 Measurement Procedure and Data       15         7.4.1 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18	J	5 EQUIPMENT LIST	
6.1 ANTENNA REQUIREMENT       9         6.1.1 Test Requirement:       9         6.1.2 Conclusion       9         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       10         7.1.3 Measurement Procedure and Data       10         7.2 DWELL TIME (15.231(A))       12         7.2.1 E.U.T. Operation       12         7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3.1 E.U.T. Operation       12         7.3.2 Test Setup Diagram       12         7.3.3 Measurement Procedure and Data       15         7.4.1 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18	6	6 RADIO SPECTRUM TECHNICAL REQUIREMENT	9
6.1.1 Test Requirement:       5         6.1.2 Conclusion       5         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       10         7.1.3 Measurement Procedure and Data       10         7.2 DWELL TIME (15.231(A))       12         7.2.1 E.U.T. Operation       12         7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3.1 E.U.T. Operation       14         7.3.2 Test Setup Diagram       15         7.3.3 Measurement Procedure and Data       15         7.3.3 Measurement Procedure and Data       15         7.4 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18	Ī		
6.1.2 Conclusion       5         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       10         7.1.3 Measurement Procedure and Data       10         7.2 DWELL TIME (15.231(A))       12         7.2.1 E.U.T. Operation       12         7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1 E.U.T. Operation       15         7.3.2 Test Setup Diagram       15         7.3.3 Measurement Procedure and Data       15         7.4 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18			
7       RADIO SPECTRUM MATTER TEST RESULTS       10         7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       16         7.1.2       Test Setup Diagram       16         7.1.3       Measurement Procedure and Data       16         7.2       DWELL TIME (15.231(A))       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18         7.4.2       Test Setup Diagram       18			
7.1       20DB BANDWIDTH       10         7.1.1       E.U.T. Operation       10         7.1.2       Test Setup Diagram       10         7.1.3       Measurement Procedure and Data       11         7.2       DWELL TIME (15.231(A))       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18         7.4.2       Test Setup Diagram       18			
7.1.1 E.U.T. Operation	7	7 RADIO SPECTRUM MATTER TEST RESULTS	10
7.1.1 E.U.T. Operation		7.1 20pB Bandwidth	10
7.1.2 Test Setup Diagram       10         7.1.3 Measurement Procedure and Data       10         7.2 DWELL TIME (15.231(A))       12         7.2.1 E.U.T. Operation       12         7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1 E.U.T. Operation       15         7.3.2 Test Setup Diagram       15         7.3.3 Measurement Procedure and Data       15         7.4 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18         7.4.2 Test Setup Diagram       18			
7.2       DWELL TIME (15.231(A))       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3       FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18		•	
7.2       DWELL TIME (15.231(A))       12         7.2.1       E.U.T. Operation       12         7.2.2       Test Setup Diagram       12         7.2.3       Measurement Procedure and Data       12         7.3       FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18		7.1.3 Measurement Procedure and Data	10
7.2.2 Test Setup Diagram       12         7.2.3 Measurement Procedure and Data       12         7.3 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1 E.U.T. Operation       15         7.3.2 Test Setup Diagram       15         7.3.3 Measurement Procedure and Data       15         7.4 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18			
7.2.3 Measurement Procedure and Data       12         7.3 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1 E.U.T. Operation       15         7.3.2 Test Setup Diagram       15         7.3.3 Measurement Procedure and Data       15         7.4 RADIATED EMISSIONS       17         7.4.1 E.U.T. Operation       18         7.4.2 Test Setup Diagram       18		,	
7.3       FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL (15.231(B))       14         7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18			
7.3.1       E.U.T. Operation       15         7.3.2       Test Setup Diagram       15         7.3.3       Measurement Procedure and Data       15         7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18			
7.3.2 Test Setup Diagram			
7.3.3 Measurement Procedure and Data			
7.4       RADIATED EMISSIONS       17         7.4.1       E.U.T. Operation       18         7.4.2       Test Setup Diagram       18			
7.4.1 E.U.T. Operation			
7.4.2 Test Setup Diagram18			
		•	
/ 4.3 Measurement Procedure and Data		7.4.2 Test Setup Diagram	



Report No.: SZEM170800881201

Page: 5 of 22

## 4 General Information

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

Power supply: DC 3.0V(1x3.0 "CR2023" LITHIUM BATTERY)

Nominal Frequency: 433.92MHz

Modulation Technique: FSK Number of Channels: 1

Antenna Type: Integral
Antenna gain: 5dBi

## 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 a second	4.5dB (below 1GHz)
/	RF Radiated power	4.8dB (above 1GHz)
	Dedicted Courieus emission test	4.5dB (30MHz-1GHz)
8	Radiated Spurious emission test	4.8dB (1GHz-18GHz)
9	Temperature test	1℃
10	Humidity test	3%
11	Supply voltages	1.5%
12	Time	3%



Report No.: SZEM170800881201

Page: 6 of 22

#### 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 –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.: SZEM170800881201

Page: 7 of 22

# 5 Equipment List

20dB 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
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09
Cable	SGS	Conducted		2016-10-09	2017-10-09

Dwell Time (15.231(a))					
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
Measurement Software	JS Tonscend	JS1120-2 BT/WIFI V2.	N/A	N/A	N/A
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2017-04-14	2018-04-13
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09
Cable	SGS	Conducted		2016-10-09	2017-10-09

Field Strength of the Fundamental Signal (15.231(b))					
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
EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2016-10-09	2017-10-09
BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2014-11-01	2017-11-01
Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEM003-11	2015-10-17	2018-10-17
Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEM003-12	2014-11-24	2017-11-24
Cable	SGS	CE		2016-10-09	2017-10-09



Report No.: SZEM170800881201

Page: 8 of 22

Radiated Emissions					
Equipment	Manufacturer	Model No	Inventory No	Cal Date	Cal Due Date
10m Semi-Anechoic Chamber	SAEMC	FSAC1018	SEM001-03	2017-05-10	2018-05-10
Measurement Software	AUDIX	e3 V8.2014- 6-27	N/A	N/A	N/A
EMI Test Receiver (9kHz-3GHz)	Rohde & Schwarz	ESCI	SEM004-01	2017-04-14	2018-04-13
Trilog-Broadband Antenna(30MHz-1GHz)	Schwarzbeck	VULB9168	SEM003-17	2016-01-26	2019-01-26
Pre-amplifier	Sonoma Instrument Co	310N	SEM005-03	2017-06-05	2018-06-04
Active Loop Antenna	ETS-Lindgren	6502	SEM003-08	2015-08-14	2018-08-14
Cable	SGS	CE		2016-10-09	2017-10-09

General used equipmer	it				
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	2017-04-18	2018-04-18



Report No.: SZEM170800881201

Page: 9 of 22

## 6 Radio Spectrum Technical Requirement

### 6.1 Antenna Requirement

### 6.1.1 Test Requirement:

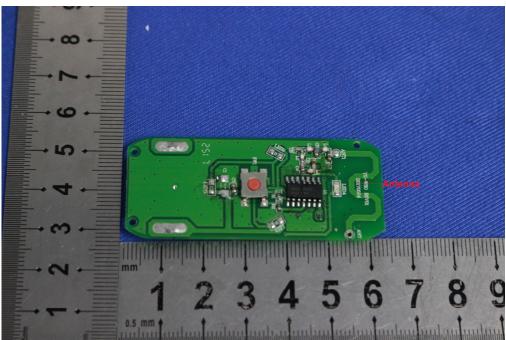
47 CFR Part 15, Subpart C 15.203

#### 6.1.2 Conclusion

#### Standard 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 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 5dBi.



Report No.: SZEM170800881201

Page: 10 of 22

## 7 Radio Spectrum Matter Test Results

### 7.1 20dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.231(c)
Test Method: ANSI C63.10 (2013) Section 6.9

Limit:

Frequency range(MHz)	Limit		
70-900	No wider than 0.25% of the center frequency		
Above 900	No wider than 0.5% of the center frequency		

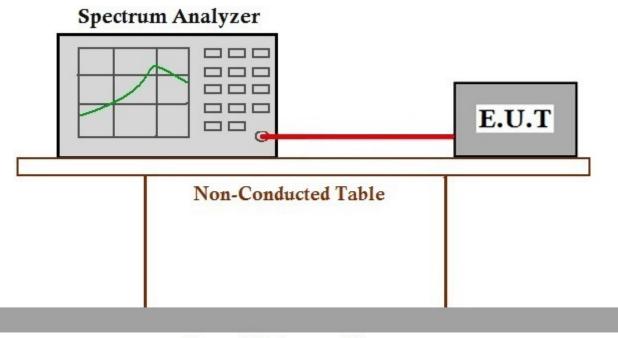
### 7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % 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



Report No.: SZEM170800881201

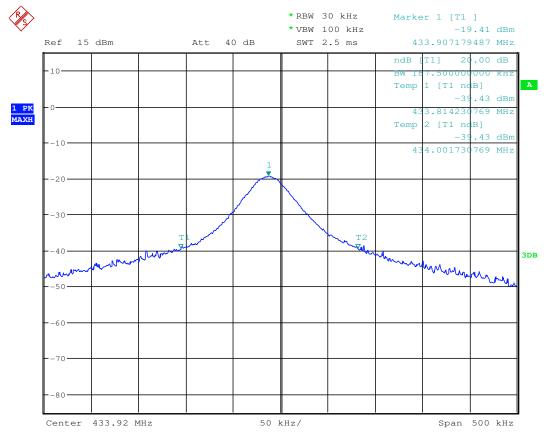
Page: 11 of 22

#### Transmitter mode

Test channel	20dB Bandwidth (KHz)	Limit (KHz)	Results
433.92MHz	187.50	1084.8	Pass

### Test plot as follows:

Mode:a





Report No.: SZEM170800881201

Page: 12 of 22

### 7.2 Dwell Time (15.231(a))

Test Requirement 47 CFR Part 15, Subpart C 15.231(a)
Test Method: ANSI C63.10 (2013) Section 7.8.4

Limit:

Device type	Limit			
Manually operated transmitter	The switch automatically deactivate the transmitter within not more than 5 seconds of being released			
Automatically actived transmitter	Cease transmission within 5 seconds after activation			
Periodic transmissions to determine system integrity of transmitters used in security or safety applications	The total transmission time does not exceed 2 seconds per hour			

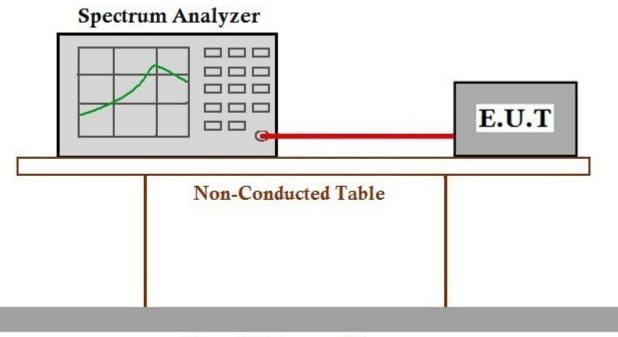
### 7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 55 % RH Atmospheric Pressure: 1005 mbar

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

### 7.2.2 Test Setup Diagram



## Ground Reference Plane

#### 7.2.3 Measurement Procedure and Data

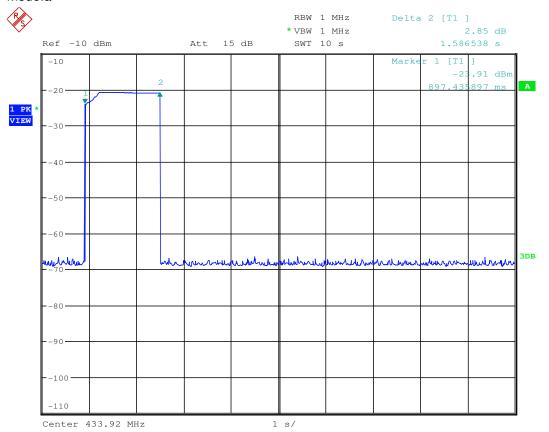


Report No.: SZEM170800881201

Page: 13 of 22

Test item	Limit (MHz)	Results		
Transmitting time	≤5S	Pass		

### Mode:a





Report No.: SZEM170800881201

Page: 14 of 22

## 7.3 Field Strength of the Fundamental Signal (15.231(b))

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)
Test Method: ANSI C63.10 (2013) Section 6.5

Measurement Distance: 3m

Limit:

Fundamental frequency(MHz)	Field strength of fundamental(microvolts/meter)	Field strength of spurious emissions(microvolts/meter)
40.66-40.70	2250	225
70-130	1250	125
130-174	1250 to 3750	125 to 375
174-260	3750	375
260-470	3750 to 12500	375 to 1250
Above 470	12500	1250

Remark: the emission limit is based on measurement instrumentation employing an average detector at a distance of 3 meters. The frequencies above 1000MHz 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.



Report No.: SZEM170800881201

Page: 15 of 22

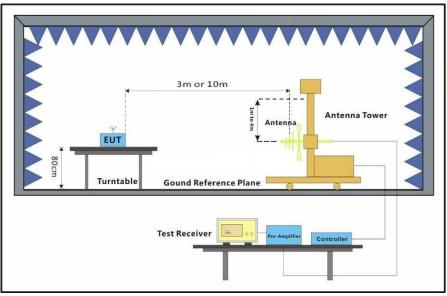
#### 7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

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

#### 7.3.2 Test Setup Diagram



### 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 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. 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.: SZEM170800881201

Page: 16 of 22

#### Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamp Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	polarization
433.92	2.35	16.58	27.33	83.86	75.46	100.81	-25.35	Horizontal
433.92	2.35	16.58	27.33	87.37	78.97	100.81	-21.84	Vertical

#### 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)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.: SZEM170800881201

Page: 17 of 22

### 7.4 Radiated Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.231(b)
Test Method: ANSI C63.10 (2013) Section 6.4&6.5&6.6

Measurement Distance: 10m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement 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 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.



Report No.: SZEM170800881201

Page: 18 of 22

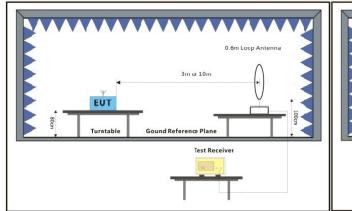
### 7.4.1 E.U.T. Operation

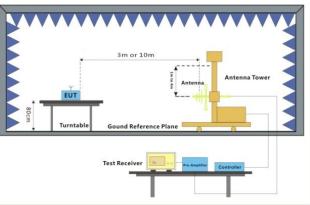
Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1005 mbar

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

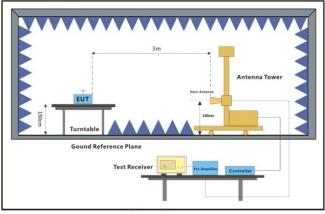
### 7.4.2 Test Setup Diagram





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.

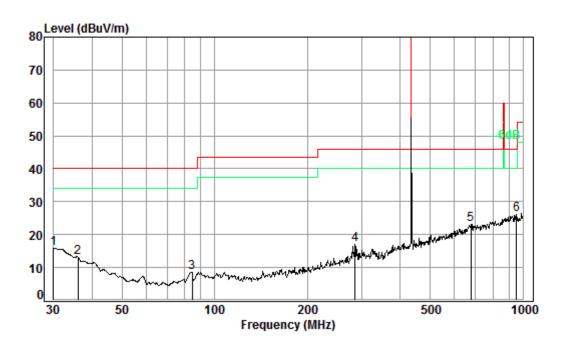


Report No.: SZEM170800881201

Page: 19 of 22

Below 1G Detection:QP

Mode:a; Polarization:Horizontal



Condition: 3m HORIZONTAL

Job No. : 08812CR

Test mode: a

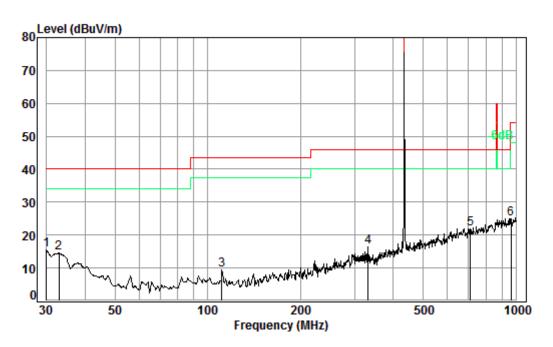
			Cable Ant Pream Freq Loss Factor Factor						
-	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	30.00	0.60	18.70	27.36	23.83	15.77	40.00	-24.23	
2	36.00	0.60	15.34	27.33	24.50	13.11	40.00	-26.89	
3	84.41	1.10	8.14	27.22	26.59	8.61	40.00	-31.39	
4	285.98	1.84	13.28	26.44	28.23	16.91	46.00	-29.09	
5	677.58	2.86	21.42	27.44	26.38	23.22	46.00	-22.78	
6 nn	952.09	3.65	23.30	26.54	25.70	26.11	46.00	-19.89	



Report No.: SZEM170800881201

Page: 20 of 22

Mode:a; Polarization:Vertical



Condition: 3m VERTICAL Job No. : 08812CR

Test mode: a

	Freq			Preamp Factor				Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.00	0.60	18.70	27.36	23.56	15.50	40.00	-24.50
2	32.86	0.60	17.10	27.35	24.13	14.48	40.00	-25.52
3	111.35	1.23	8.51	27.13	26.89	9.50	43.50	-34.00
4	331.35	2.00	14.57	26.64	26.53	16.46	46.00	-29.54
5 pp	711.67	2.94	21.60	27.40	24.88	22.02	46.00	-23.98
6	965.54	3.67	23.30	26.47	24.43	24.93	54.00	-29.07

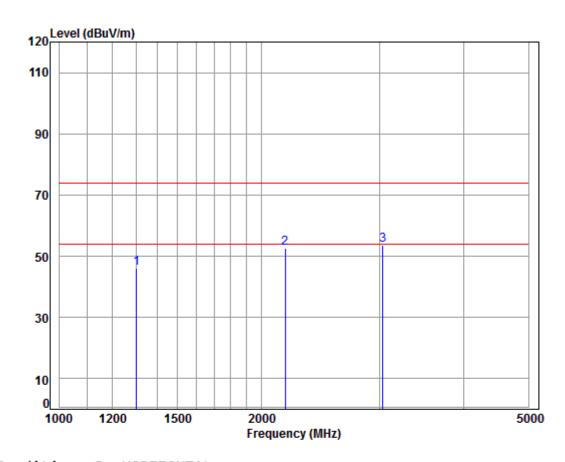


Report No.: SZEM170800881201

Page: 21 of 22

Above 1GHz

Mode:a; Polarization:Horizontal



Condition: 3m HORIZONTAL

Job No : 08812CR

Mode : 433.92 TX SE

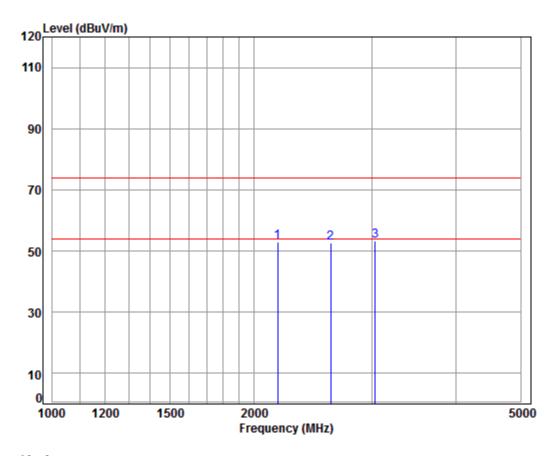
		Cable	Ant	Preamp	Read		Limit	0ver	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1302.060	4.81	24.96	38.06	54.35	46.06	74.00	-27.94	Peak
2	2168.725	5.16	28.38	37.98	57.04	52.60	74.00	-21.40	Peak
3 pp	3035.913	6.02	31.37	37.90	54.19	53.68	74.00	-20.32	Peak



Report No.: SZEM170800881201

Page: 22 of 22

Mode:a; Polarization:Vertical



Condition: 3m VERTICAL Job No : 08812CR

Mode : 433.92 TX SE

	Freq			Preamp Factor					Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
2	2168.725 2605.477 3035.913	5.70	29.83	37.93	54.98	52.58	74.00	-21.42	Peak

#### 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) 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.

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