



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

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

Telephone: +86 (0) 755 2601 2053
Fax: +86 (0) 755 2671 0594
Email: ee.shenzhen@sgs.com

Report No.: SZEM170400327703
Page: 1 of 28

TEST REPORT

Application No.: SZEM1704003277CR (GZEM1704002010CR)
Applicant: Mattel Asia Pacific Sourcing Limited
Address of Applicant: Room 1301, South Tower, World Finance Centre, Harbour City Tsim Sha Tsui
Kowloon Hong Kong
Manufacturer: Mattel Asia Pacific Sourcing Limited
Address of Manufacturer: Room 1301, South Tower, World Finance Centre, Harbour City Tsim Sha Tsui
Kowloon Hong Kong
Factory: Mattel Asia Pacific Sourcing Limited
Address of Factory: Room 1301, South Tower, World Finance Centre, Harbour City Tsim Sha Tsui
Kowloon Hong Kong
Equipment Under Test (EUT):
EUT Name: RC Skate Tricks Alvin
Model No.: FDP28-R
FCC ID: PIYFDP28-17A5R
Standards: 47 CFR Part 15, Subpart C 15.249
Date of Receipt: 2017-04-14
Date of Test: 2017-04-17 to 2017-04-28
Date of Issue: 2017-05-05

Test Result :	Pass*
----------------------	--------------

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



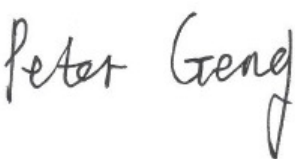

Jack Zhang
EMC Laboratory Manager

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

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-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 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.



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

Authorized for issue by:				
Tested By				
		Peter Geng /Project Engineer		Date
Checked By				
		Eric Fu /Reviewer		Date



2 Test Summary

Radio Spectrum Technical Requirement				
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



3 Contents

	Page
1 COVER PAGE	1
2 TEST SUMMARY	3
3 CONTENTS	4
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.....	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 Measurement Data.....	10
7.2 FIELD STRENGTH OF THE FUNDAMENTAL SIGNAL(15.249(A)).....	12
7.2.1 E.U.T. Operation	13
7.2.2 Measurement Data.....	13
7.3 RESTRICTED BAND AROUND FUNDAMENTAL FREQUENCY	16
7.3.1 E.U.T. Operation	17
7.3.2 Measurement Data.....	17
7.4 RADIATED EMISSIONS	22
7.4.1 E.U.T. Operation	22
7.4.2 Measurement Data.....	22
8 PHOTOGRAPHS.....	27
8.1 RADIATED EMISSIONS TEST SETUP	27
8.2 EUT CONSTRUCTIONAL DETAILS.....	28



4 General Information

4.1 Details of E.U.T.

Power supply:	Skateboard: DC 6V by 4*1.5V "AA" batteries
Operation Frequency:	2408MHz, 2436MHz, 2464MHz
Modulation type:	GFSK
Antenna type:	Integral antenna
Antenna gain:	0dBi

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	7.25×10^{-8}
2	Occupied Bandwidth	3%
3	Radiated Spurious emission test	4.5dB (30MHz-1GHz)
		4.8dB (1GHz-18GHz)
4	Temperature test	1 °C
5	Humidity test	3%
6	Time	3%



4.4 Test Location

All tests were performed at:

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

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

Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

- **CNAS (No. CNAS L2929)**

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

- **A2LA (Certificate No. 3816.01)**

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

- **VCCI**

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

- **FCC – Registration No.: 556682**

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.: 556682.

- **Industry Canada (IC)**

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

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



5 Equipment List

RE in Chamber					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2016-05-13	2017-05-13
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
Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2016-04-25	2017-04-25
Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
Loop Antenna	Beijing Daze	ZN30401	SEM003-09	2015-05-13	2018-05-13

RF connected test					
Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. Date (yyyy-mm-dd)	Cal. Due date (yyyy-mm-dd)
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
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09



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

Report No.: SZEM170400327703

Page: 8 of 28

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

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
Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

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

6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.249

6.1.2 Conclusion

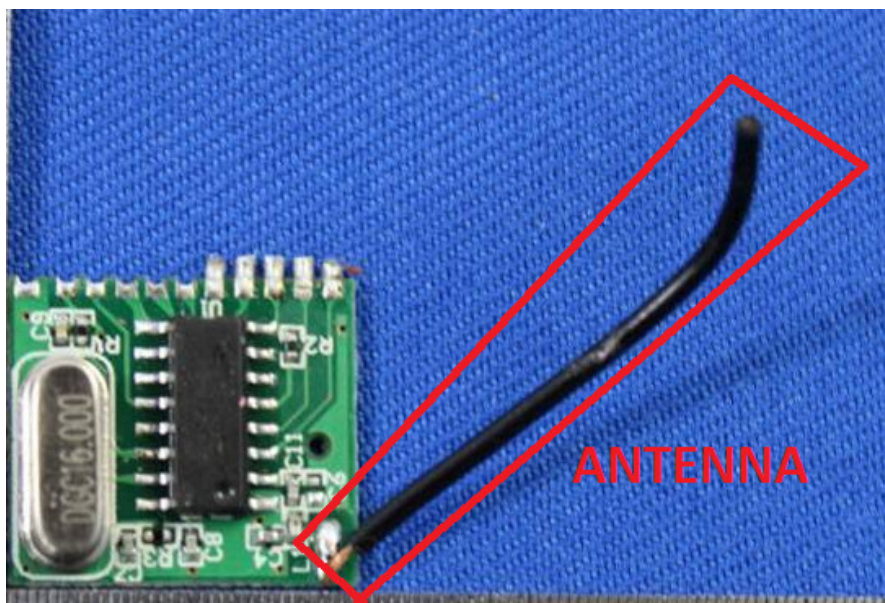
Standard Requirement:

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.





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:

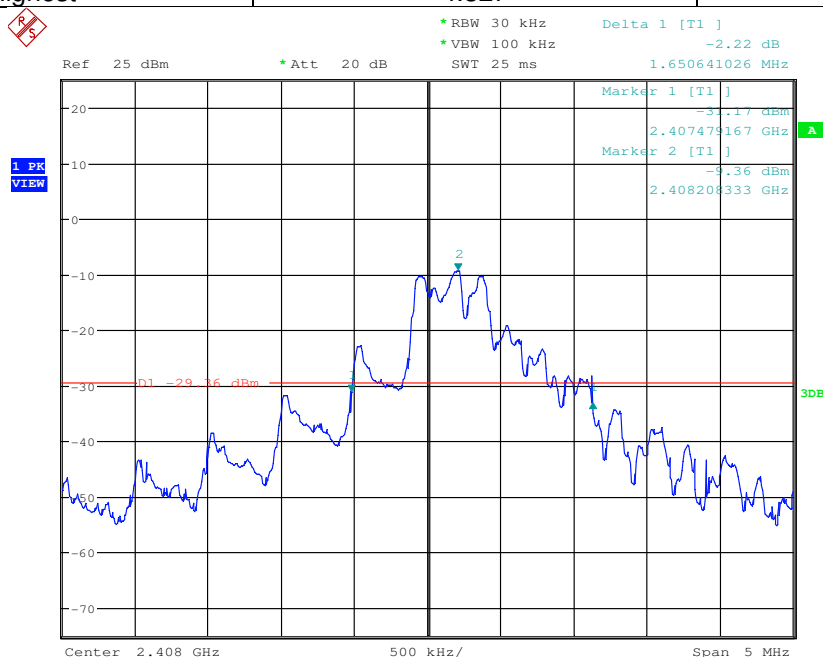
Temperature: 23 °C Humidity: 56 % RH Atmospheric Pressure: 1015 mbar

Pretest these mode to find the worst case: c: TX mode_Keep the EUT in transmitting mode(skateboard)

7.1.2 Measurement Data

Measurement Data

Test Channel	20dB bandwidth (MHz)	Results
Lowest	1.651	Pass
Middle	3.000	Pass
Highest	4.327	Pass

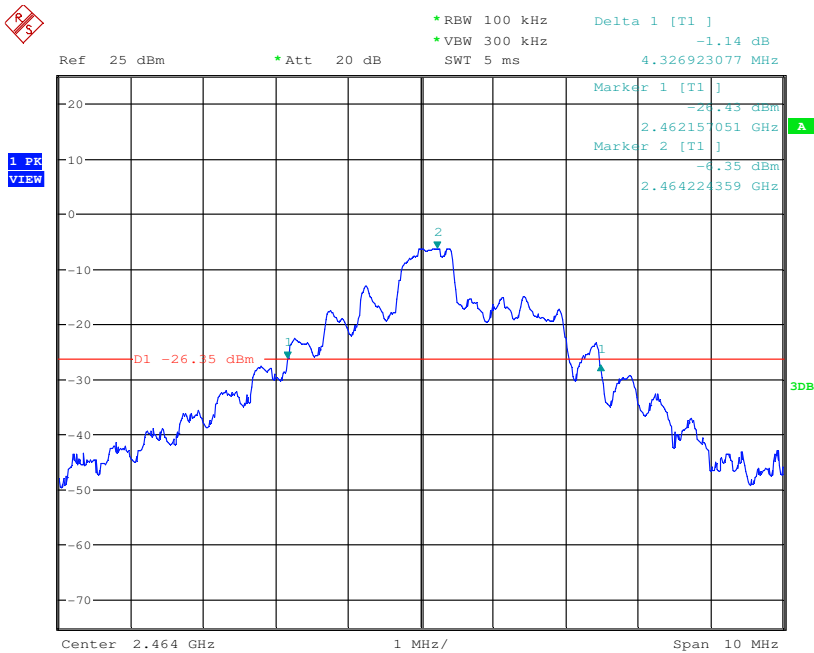
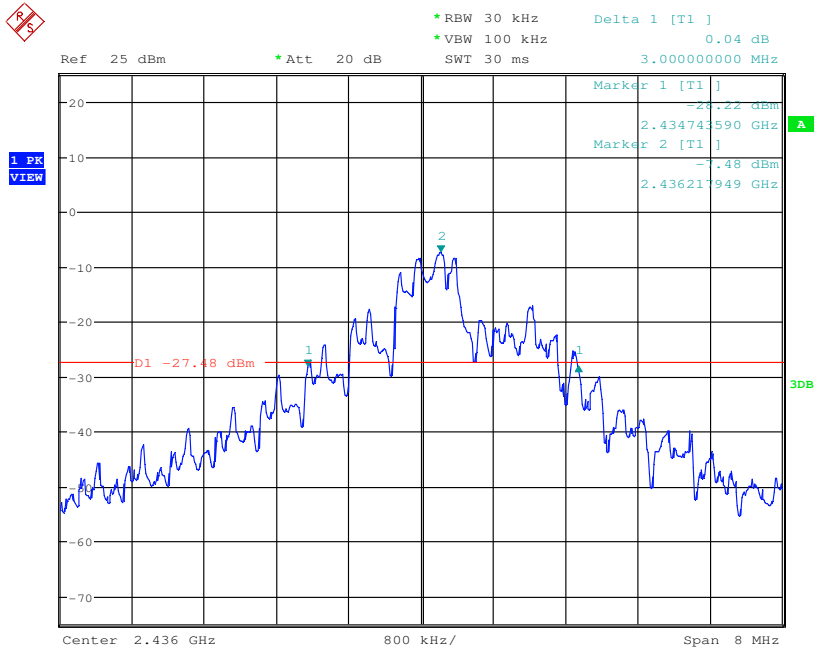




SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

Report No.: SZEM170400327703

Page: 11 of 28





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
2400MHz-2483.5MHz	94.0	Average Value
	114.0	Peak Value



7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 50 % RH Atmospheric Pressure: 1015 mbar

Pretest these

mode to find the worst case: c: TX mode_Keep the EUT in transmitting mode(skateboard)

The worst case for final test: c: TX mode_Keep the EUT in transmitting mode(skateboard)

7.2.2 Measurement Data

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

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

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

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

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

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

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

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

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

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



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

Report No.: SZEM170400327703

Page: 14 of 28

Mode:c; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:Low

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2408.208	29.13	5.35	37.96	97.12	93.64	114	-20.36

Mode:c; Polarization:Vertical; Modulation Type:GFSK; ; Channel:Low

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2409.329	29.14	5.35	37.96	94.05	90.58	114	-23.42

Mode:c; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:middle;

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2436.000	29.21	5.37	37.96	95.21	91.83	114	-22.17

Mode:c; Polarization:Vertical; Modulation Type:GFSK; ; Channel:middle

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2436.000	29.21	5.37	37.96	94.49	91.11	114	-22.89



Mode:c; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:High

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2464.247	29.30	5.39	37.95	97.08	93.82	114	-20.18

Mode:c; Polarization:Vertical; Modulation Type:GFSK; ; Channel:High

Frequency (MHz)	Antenna factors (dB/m)	Cable Loss (dB)	Preamp Gain (dB)	Reading Level (dBμV)	Level (dBμV/m)	Limit (dBμV/m)	Over limit (dB)
2464.396	29.30	5.39	37.95	93.79	90.53	114	-23.47



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.		



7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C Humidity: 54 % RH Atmospheric Pressure: 1015 mbar

Pretest these
mode to find the worst case: c: TX mode_Keep the EUT in transmitting mode(skateboard)

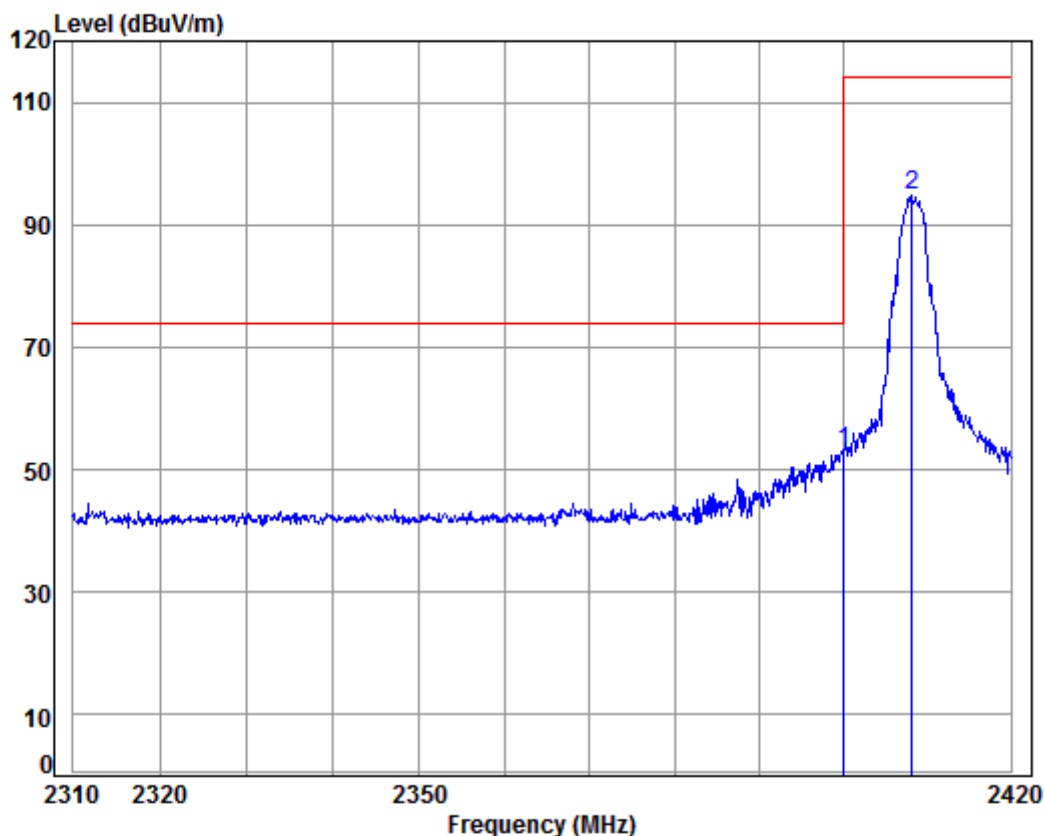
The worst case
for final test: c: TX mode_Keep the EUT in transmitting mode(skateboard)

7.3.2 Measurement Data

- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
- h. Test the EUT in the lowest channel,the middle channel,the Highest channel.
- i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- j. Repeat above procedures until all frequencies measured was complete.



Mode:c; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:Low

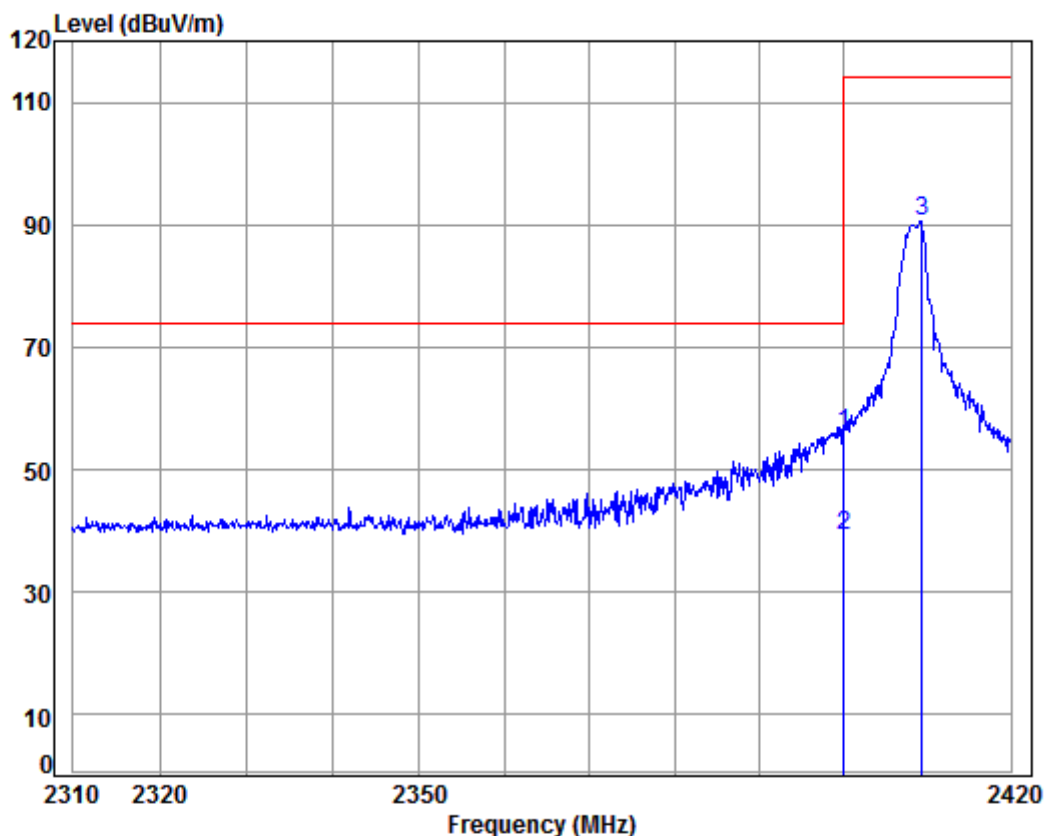


Condition: 3m Horizontal
Job No: : 03277CR
Mode: : 2408 Bandedge
: Skater

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2400.000	5.35	29.11	37.96	56.62	53.12	74.00	-20.88	Peak
2 pp	2408.208	5.35	29.13	37.96	98.28	94.80	114.00	-19.20	Peak



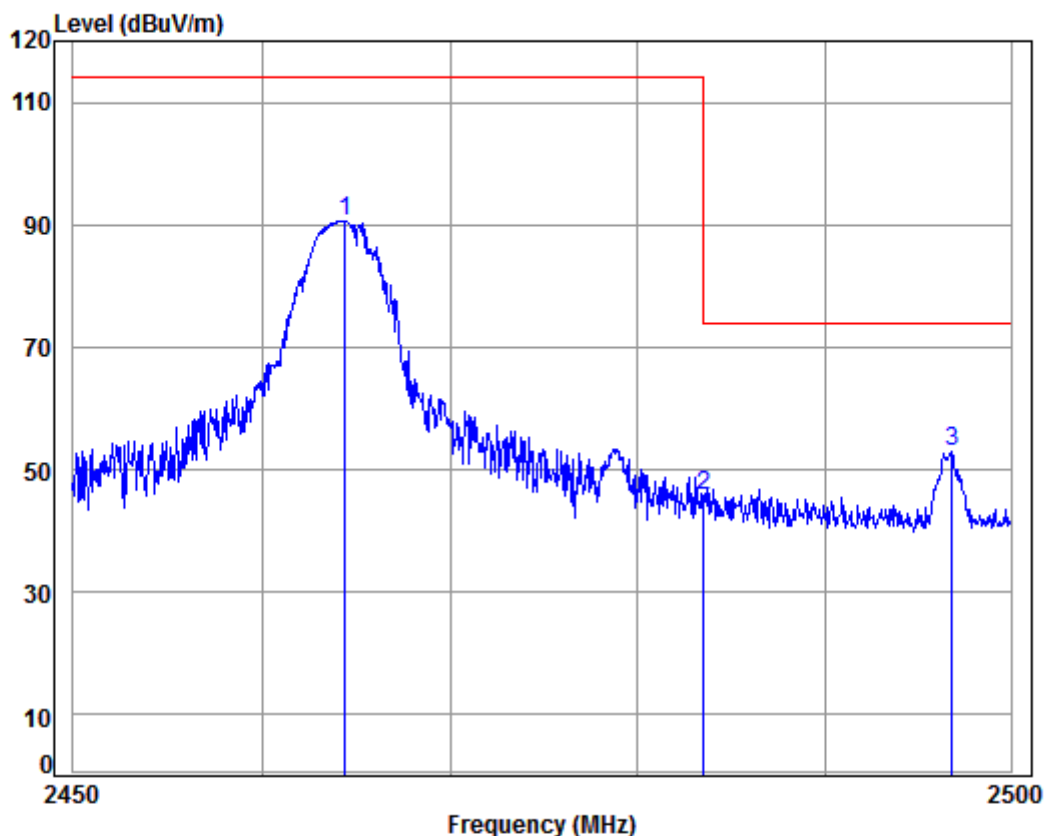
Mode:c; Polarization:Vertical; Modulation Type:GFSK; ; Channel:Low



Condition: 3m VERTICAL
Job No: : 03277CR
Mode: : 2408 Bandedge
: Skater

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2400.000	5.35	29.11	37.96	59.26	55.76	74.00	-18.24	Peak
2 pp	2400.000	5.35	29.11	37.96	42.66	39.16	54.00	-14.84	Peak
3	2409.329	5.35	29.14	37.96	94.05	90.58	114.00	-23.42	Peak

Mode:c; Polarization:Horizontal; Modulation Type:GFSK; ; Channel:High



Condition: 3m VERTICAL

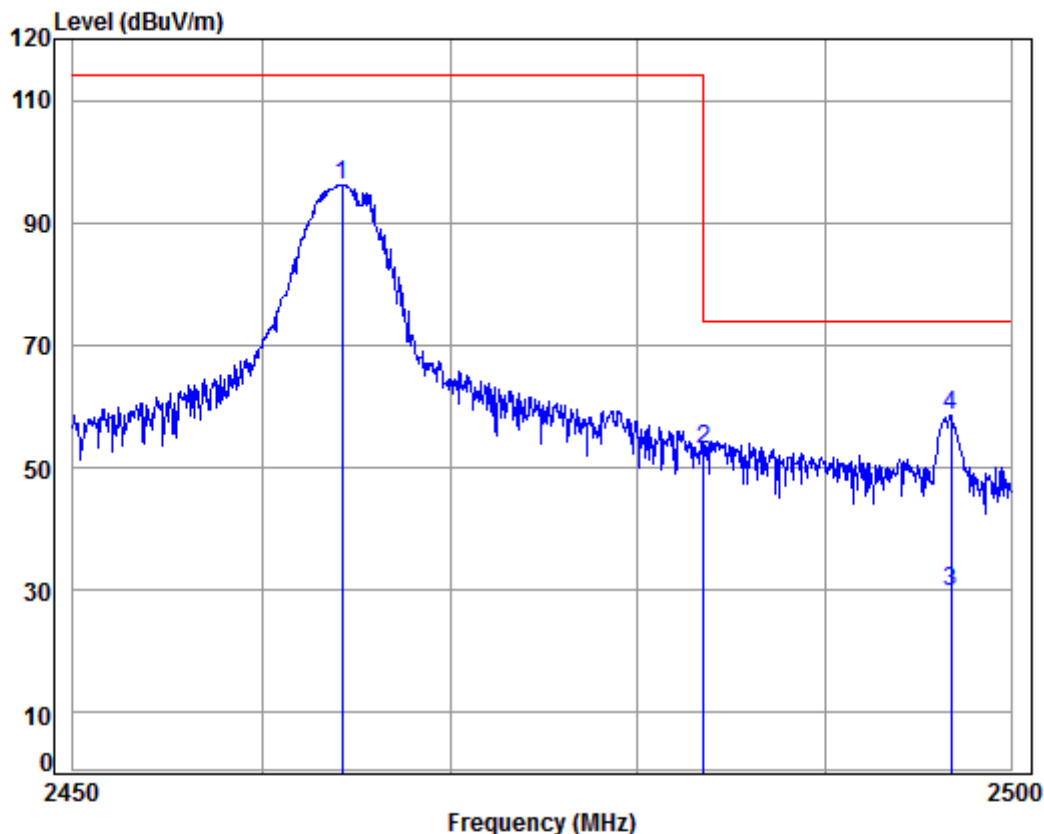
Job No: : 03277CR

Mode: : 2464 Bandedge

: Skater

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2464.396	5.39	29.30	37.95	93.79	90.53	114.00	-23.47	Peak
2	2483.500	5.41	29.35	37.95	48.83	45.64	74.00	-28.36	Peak
3 pp	2496.820	5.42	29.39	37.95	56.23	53.09	74.00	-20.91	Peak

Mode:c; Polarization:Vertical; Modulation Type:GFSK; ; Channel:High



Condition: 3m HORIZONTAL

Job No: : 03277CR

Mode: : 2464 Bandedge

: Skater

	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2464.247	5.39	29.30	37.95	99.28	96.02	114.00	-17.98	Peak
2	2483.500	5.41	29.35	37.95	56.14	52.95	74.00	-21.05	Peak
3 av	2496.770	5.42	29.39	37.95	32.92	29.78	54.00	-24.22	Average
4 pp	2496.770	5.42	29.39	37.95	61.66	58.52	74.00	-15.48	Peak



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

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25 °C Humidity: 50 % RH Atmospheric Pressure: 1015 mbar

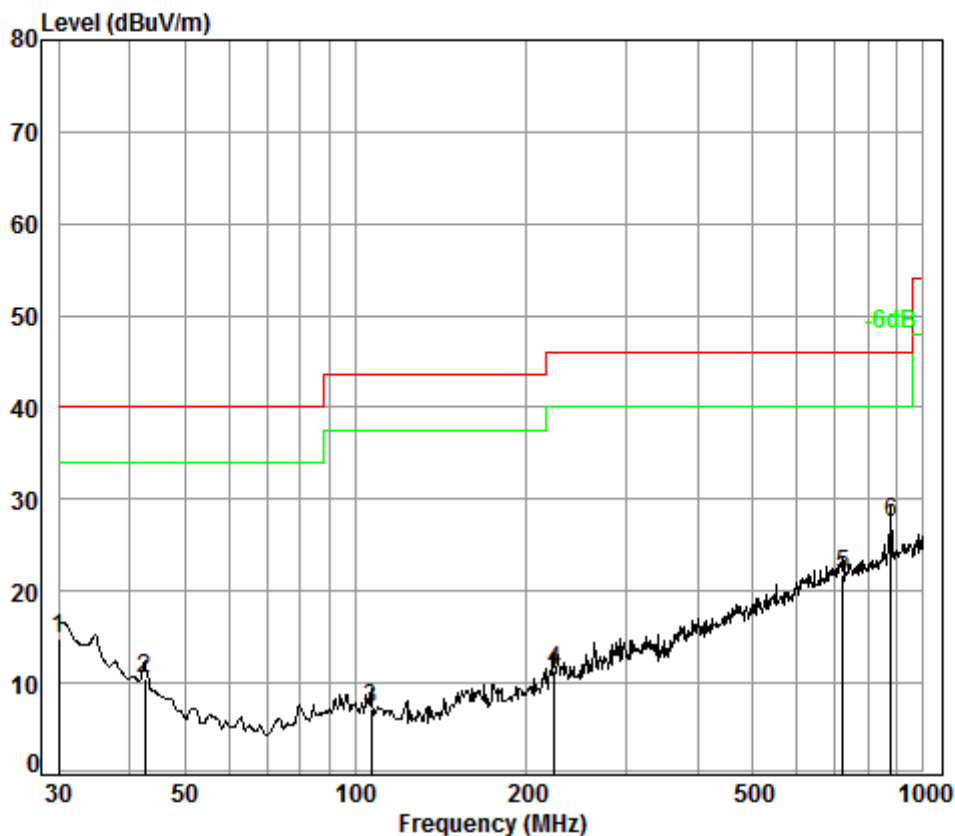
Pretest these
mode to find the worst case: c: TX mode_Keep the EUT in transmitting mode(skateboard)

The worst case
for final test: c: TX mode_Keep the EUT in transmitting mode(skateboard)

7.4.2 Measurement 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.

Below 1GHz



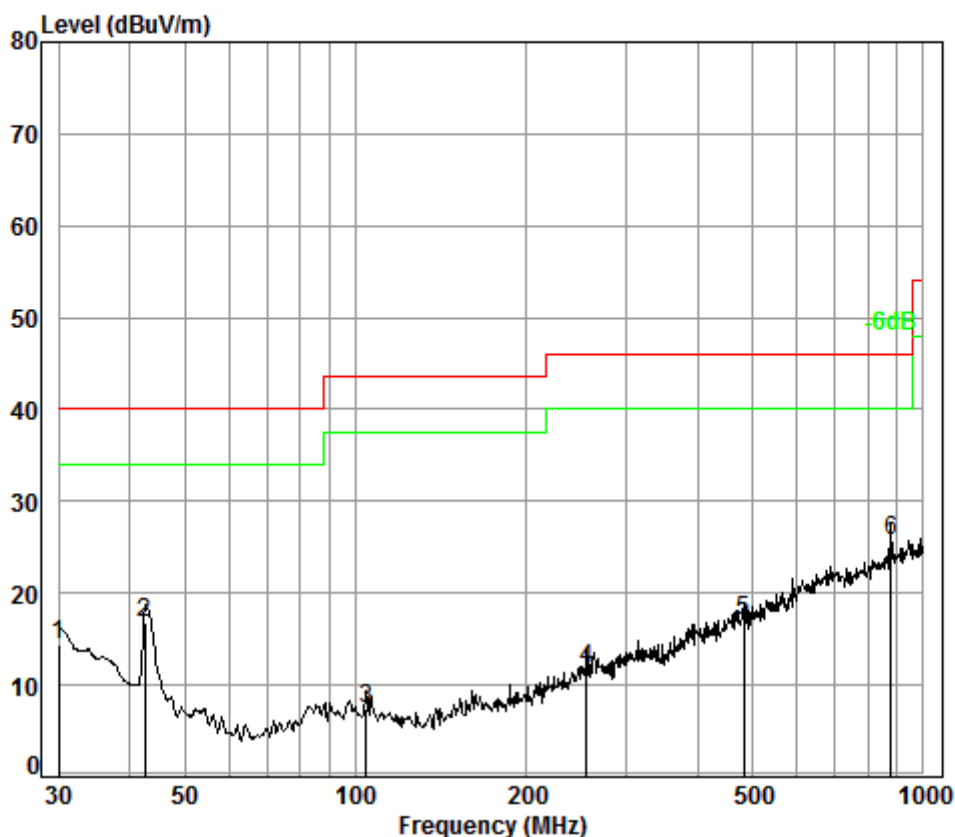
Condition: 3m HORIZONTAL

Job No. : 03277CR

Test Mode: TX

: Skateboard

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dB
1	30.00	0.60	18.70	27.36	22.78	14.72	40.00	-25.28
2	42.60	0.66	11.96	27.31	25.06	10.37	40.00	-29.63
3	106.76	1.22	8.76	27.15	24.47	7.30	43.50	-36.20
4	223.73	1.54	11.43	26.62	24.91	11.26	46.00	-34.74
5	721.73	2.97	21.60	27.39	24.53	21.71	46.00	-24.29
6 pp	878.32	3.52	23.03	26.89	27.73	27.39	46.00	-18.61



Condition: 3m VERTICAL

Job No. : 03277CR

Test Mode: TX

: Skateboard

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.00	0.60	18.70	27.36	22.49	14.43	40.00	-25.57
2	42.60	0.66	11.96	27.31	31.39	16.70	40.00	-23.30
3	104.54	1.21	8.87	27.17	24.41	7.32	43.50	-36.18
4	255.62	1.70	12.41	26.52	24.27	11.86	46.00	-34.14
5	482.22	2.54	17.80	27.62	24.28	17.00	46.00	-29.00
6 pp	878.32	3.52	23.03	26.89	26.03	25.69	46.00	-20.31



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

Report No.: SZEM170400327703

Page: 25 of 28

Polarization:Horizontal; Modulation Type:GFSK; Channel:Low

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
1565.191	26.10	4.55	38.04	42.65	35.75	74	-38.25
3505.809	32.22	6.30	37.95	43.86	44.96	74	-29.04
4816.000	34.18	7.75	38.41	45.46	49.37	74	-24.63
7224.000	36.41	9.66	37.10	42.73	51.95	74	-22.05
9632.000	37.53	11.09	35.08	38.97	52.96	74	-21.04
13135.540	38.75	13.57	38.14	39.24	53.84	74	-20.16

Polarization:Vertical; Modulation Type:GFSK; Channel:Low

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
1473.013	25.69	4.44	38.05	43.77	36.33	74	-37.67
3357.061	31.96	6.20	37.94	43.72	44.52	74	-29.48
4816.000	34.18	7.75	38.41	47.20	51.11	74	-22.89
7224.000	36.41	9.66	37.10	42.76	51.98	74	-22.02
9632.000	37.53	11.09	35.08	40.30	53.84	74	-20.16
14366.840	40.08	14.69	38.96	34.31	50.12	74	-23.88

Polarization:Horizontal; Modulation Type:GFSK; Channel:middle; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
1808.551	27.10	4.82	38.02	43.77	38.38	74	-35.62
3567.138	32.40	6.36	37.96	42.79	44.12	74	-29.88
4872.000	34.28	7.83	38.44	50.79	54.87	74	-19.13
7308.000	36.38	9.72	37.03	42.18	51.49	74	-22.51
9744.000	37.55	11.20	35.02	38.70	52.89	74	-21.11
13173.560	38.73	13.62	38.17	38.93	53.54	74	-20.46

Polarization:Horizontal; Modulation Type:GFSK; Channel:middle; Detector: Average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
4872.000	34.28	7.83	38.44	30.79	34.87	54	-19.13

Polarization:Vertical; Modulation Type:GFSK; Channel:middle

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamp_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
1921.727	27.52	4.94	38.01	44.43	39.88	74	-34.12
3714.443	32.82	6.48	37.97	45.00	46.84	74	-27.16
4872.000	34.28	7.83	38.44	46.68	50.76	74	-23.24
7308.000	36.38	9.72	37.03	41.31	50.62	74	-23.38
9744.000	37.55	11.20	35.02	37.90	52.09	74	-21.91
12219.850	38.73	12.73	36.13	37.15	53.18	74	-20.82



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

Report No.: SZEM170400327703

Page: 26 of 28

Polarization:Horizontal; Modulation Type:GFSK; Channel:High; Detector: Peak

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
1350.667	25.18	4.29	38.06	42.49	34.40	74	-39.60
3196.094	31.67	6.08	37.92	43.23	43.70	74	-30.30
4928.000	34.38	7.90	38.47	51.31	55.54	74	-18.46
7392.000	36.34	9.78	36.95	41.42	50.81	74	-23.19
9856.000	37.57	11.31	34.97	37.66	52.03	74	-21.97
13917.240	39.10	14.51	38.92	38.18	53.38	74	-20.62

Polarization:Horizontal; Modulation Type:GFSK; Channel:High; Detector: Average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
4928.000	34.38	7.9	38.47	31.33	35.56	54	-18.44

Polarization:Vertical; Modulation Type:GFSK; Channel:High; Detector: Peak

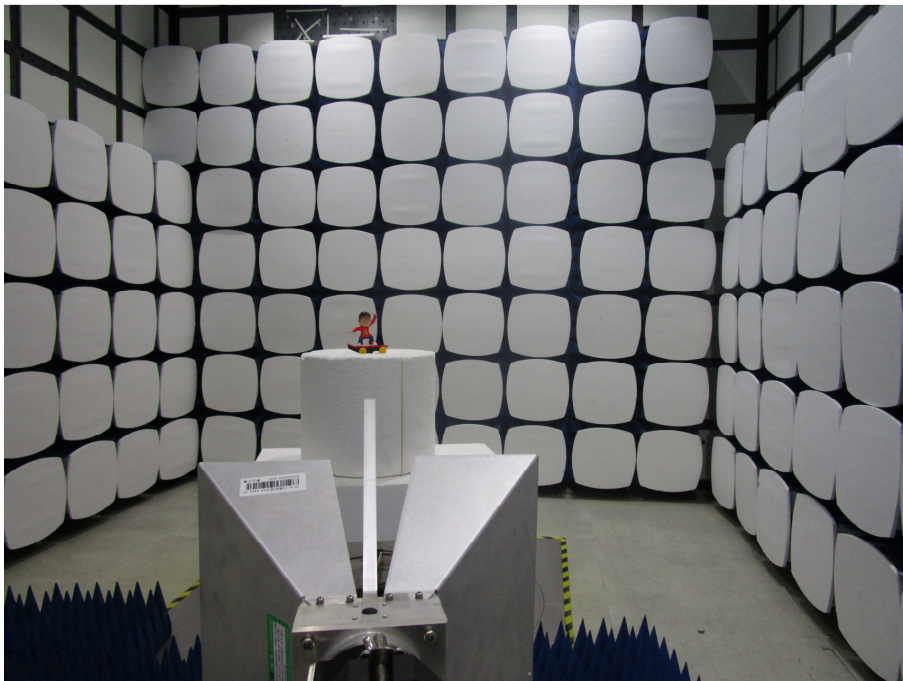
Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
1503.119	25.81	4.47	38.05	41.57	34.28	74	-39.72
3168.500	31.62	6.06	37.92	43.70	44.11	74	-29.89
4928.000	34.38	7.90	38.47	52.03	56.26	74	-17.74
7392.000	36.34	9.78	36.95	41.62	51.01	74	-22.99
9856.000	37.57	11.31	34.97	38.05	52.42	74	-21.58
13599.130	38.72	14.21	38.60	38.60	53.40	74	-20.60

Polarization:Vertical; Modulation Type:GFSK; Channel:High; Detector: Average

Freq (MHz)	Antenna_Factor (dB/m)	Cable_Loss (dB)	Preamplifier_Gain (dB)	Read_Level (dBuV)	Level (dBuV/m)	Limit_Line (dBuV/m)	Over_Limit (dB)
4928.000	34.38	7.90	38.47	32.05	36.28	54	-17.72

8 Photographs

8.1 Radiated Emissions Test Setup





8.2 EUT Constructional Details

Refer to Appendix B - Photographs of EUT Constructional Details for SZEM1704003277CR.