



SGS-CSTC Standards Technical Services 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.: SZEM160900824102

Page: 1 of 36

FCC REPORT

Application No. : SZEM1609008241CR (SGS HK No.: T31620250022EM)
Applicant: Ideavillage Products Corporation
Manufacturer: Impact Products Ltd
Product Name: Pocket Racers
Model No.(EUT): PKRACER
FCC ID: 2AJKH- PKRACERC
Standards: 47 CFR Part 15, Subpart C (2015)
Date of Receipt: 2016-09-27
Date of Test: 2016-09-28 to 2016-10-24
Date of Issue: 2016-10-25

Test Result:	PASS *
---------------------	---------------

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

Authorized Signature:



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.

The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. All test results in this report can be traceable to National or International Standards.

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.



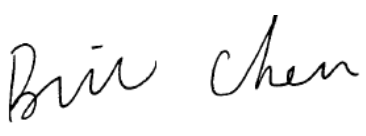
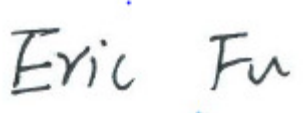
**SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch**

Report No.: SZEM160900824102

Page : 2 of 36

2 Version

Revision Record				
Version	Chapter	Date	Modifier	Remark
00		2016-10-25		Original

Authorized for issue by:				
Tested By		 		2016-10-24
				Date
Checked By		 		2016-10-25
				Date
		(Bill Chen) /Project Engineer		
		(Eric Fu) /Reviewer		



**SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch**

Report No.: SZEM160900824102

Page : 3 of 36

3 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 (2013)	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 (2013)	N/A
Field Strength of the Fundamental Signal	47 CFR Part 15, Subpart C Section 15.249 (a)	ANSI C63.10 (2013)	PASS
Spurious Emissions	47 CFR Part 15, Subpart C Section 15.249 (a)/15.209	ANSI C63.10 (2013)	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.249(a)/15.205	ANSI C63.10 (2013)	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215 (c)	ANSI C63.10 (2013)	PASS

Remark: N/A means Not Applicable



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 4 of 36

4 Contents

	Page
1 COVER PAGE	1
2 VERSION	2
3 TEST SUMMARY	3
4 CONTENTS	4
5 GENERAL INFORMATION	5
5.1 CLIENT INFORMATION	5
5.2 GENERAL DESCRIPTION OF EUT	5
5.3 TEST ENVIRONMENT AND MODE	8
5.4 DESCRIPTION OF SUPPORT UNITS	8
5.5 TEST LOCATION	8
5.6 TEST FACILITY	9
5.7 DEVIATION FROM STANDARDS	9
5.8 ABNORMALITIES FROM STANDARD CONDITIONS	9
5.9 OTHER INFORMATION REQUESTED BY THE CUSTOMER	9
5.10 EQUIPMENT LIST	10
6 TEST RESULTS AND MEASUREMENT DATA	12
6.1 ANTENNA REQUIREMENT	12
6.2 SPURIOUS EMISSIONS	13
6.2.1 Spurious Emissions	13
6.3 RESTRICTED BANDS AROUND FUNDAMENTAL FREQUENCY	21
6.4 20DB BANDWIDTH	27
7 PHOTOGRAPHS	30
7.1 RADIATED EMISSION TEST SETUP	30
7.2 RADIATED SPURIOUS EMISSIONS TEST SETUP	31
7.3 EUT CONSTRUCTIONAL DETAILS	32-36



**SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch**

Report No.: SZEM160900824102

Page : 5 of 36

5 General Information

5.1 Client Information

Applicant:	Ideavillage Products Corporation
Address of Applicant:	155 Route 46 West, Wayne, NJ 07470, United States, New Jersey
Manufacturer:	Impact Products Ltd
Address of Manufacturer:	1302 East Ocean Centre, 98 Granville Road, Hong Kong

5.2 General Description of EUT

Name:	Pocket Racers
Model No.:	PKRACER (for remote)
Frequency Range:	2405 MHz ~ 2475MHz
Modulation Type:	GFSK
Number of Channels:	71 (declared by the client)
Sample Type:	Portable production
Antenna Type:	Integral
Antenna Gain:	0dBi
Power Supply:	3.0V DC (1.5V x 2 " AAA " Size Batteries)



SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 6 of 36

Operation Frequency each of channel					
Channel	Frequency	Channel	Frequency	Channel	Frequency
1CH	2405 MHz	25CH	2429 MHz	49CH	2453 MHz
2CH	2406 MHz	26CH	2430 MHz	50CH	2454 MHz
3CH	2407 MHz	27CH	2431 MHz	51CH	2455 MHz
4CH	2408 MHz	28CH	2432 MHz	52CH	2456 MHz
5CH	2409 MHz	29CH	2433 MHz	53CH	2457 MHz
6CH	2410 MHz	30CH	2434 MHz	54CH	2458 MHz
7CH	2411 MHz	31CH	2435 MHz	55CH	2459 MHz
8CH	2412 MHz	32CH	2436 MHz	56CH	2460 MHz
9CH	2413 MHz	33CH	2437 MHz	57CH	2461 MHz
10CH	2414 MHz	34CH	2438 MHz	58CH	2462 MHz
11CH	2415 MHz	35CH	2439 MHz	59CH	2463 MHz
12CH	2416 MHz	36CH	2440 MHz	60CH	2464 MHz
13CH	2417 MHz	37CH	2441 MHz	61CH	2465 MHz
14CH	2418 MHz	38CH	2442 MHz	62CH	2466 MHz
15CH	2419 MHz	39CH	2443 MHz	63CH	2467 MHz
16CH	2420 MHz	40CH	2444 MHz	64CH	2468 MHz
17CH	2421 MHz	41CH	2445 MHz	65CH	2469 MHz
18CH	2422 MHz	42CH	2446 MHz	66CH	2470 MHz
19CH	2433 MHz	43CH	2447 MHz	67CH	2471 MHz
20CH	2424 MHz	44CH	2448 MHz	68CH	2472 MHz
21CH	2425 MHz	45CH	2449 MHz	69CH	2473 MHz
22CH	2426 MHz	46CH	2450 MHz	70CH	2474 MHz
23CH	2427 MHz	47CH	2451 MHz	71CH	2475 MHz
24CH	2428 MHz	48CH	2452 MHz		



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 7 of 36

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

Channel	Frequency
The Lowest channel(CH1)	2405MHz
The Middle channel(CH41)	2445MHz
The Highest channel(CH71)	2475MHz



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 8 of 36

5.3 Test Environment and Mode

Operating Environment:	
Temperature:	24.0 °C
Humidity:	52 % RH
Atmospheric Pressure:	1008 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with modulation.

5.4 Description of Support Units

The EUT has been tested independently.

5.5 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.



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 9 of 36

5.6 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.

5.7 Deviation from Standards

None.

5.8 Abnormalities from Standard Conditions

None.

5.9 Other Information Requested by the Customer

None.



**SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch**

Report No.: SZEM160900824102

Page : 10 of 36

5.10 Equipment List

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2016-05-13	2017-05-13
2	EMI Test Receiver	Agilent Technologies	N9038A	SEM004-05	2016-09-16	2017-09-16
3	BiConiLog Antenna (26-3000MHz)	ETS-LINDGREN	3142C	SEM003-01	2014-11-01	2017-11-01
4	Double-ridged horn (1-18GHz)	ETS-LINDGREN	3117	SEM003-11	2015-10-17	2018-10-17
5	Horn Antenna (18-26GHz)	ETS-LINDGREN	3160	SEM003-12	2014-11-24	2017-11-24
6	Pre-amplifier (0.1-1300MHz)	Agilent Technologies	8447D	SEM005-01	2016-04-25	2017-04-25
7	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A
8	DC Power Supply	Zhao Xin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
9	Loop Antenna	Beijing Daze	ZN30401	SEM003-09	2015-05-13	2018-05-13



SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

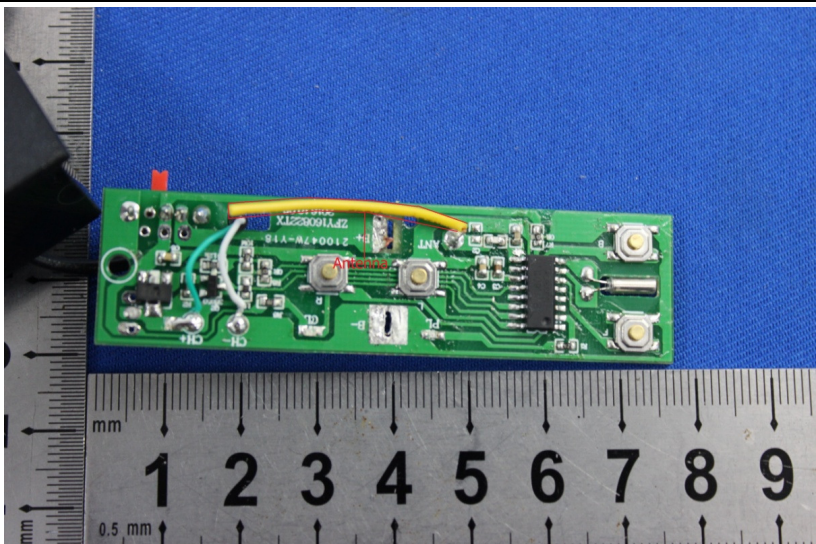
Page : 11 of 36

RE in Chamber						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	3m Semi-Anechoic Chamber	AUDIX	N/A	SEM001-02	2016-05-13	2017-05-13
2	EMI Test Receiver	Rohde & Schwarz	ESIB26	SEM004-04	2016-04-25	2017-04-25
3	BiConiLog Antenna (26-3000MHz)	ETS-Lindgren	3142C	SEM003-02	2014-11-15	2017-11-15
4	Amplifier (0.1-1300MHz)	HP	8447D	SEM005-02	2016-10-09	2017-10-09
5	Horn Antenna (1-18GHz)	Rohde & Schwarz	HF907	SEM003-07	2015-06-14	2018-06-14
6	Horn Antenna (18-26GHz)	ETS-Lindgren	3160	SEM003-12	2014-11-24	2017-11-24
7	Horn Antenna(26GHz-40GHz)	A.H.Systems, inc.	SAS-573	SEM003-13	2015-02-12	2018-02-12
8	Low Noise Amplifier	Black Diamond Series	BDLNA-0118-352810	SEM005-05	2016-10-09	2017-10-09
9	Band filter	Amindeon	Asi 3314	SEM023-01	N/A	N/A

RF connected test						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal. date (yyyy-mm-dd)	Cal.Due date (yyyy-mm-dd)
1	DC Power Supply	ZhaoXin	RXN-305D	SEM011-02	2016-10-09	2017-10-09
2	Spectrum Analyzer	Rohde & Schwarz	FSP	SEM004-06	2016-10-09	2017-10-09
3	Signal Generator	Rohde & Schwarz	SML03	SEM006-02	2016-04-25	2017-04-25
4	Power Meter	Rohde & Schwarz	NRVS	SEM014-02	2016-10-09	2017-10-09

6 Test results and Measurement Data

6.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0dBi.	



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

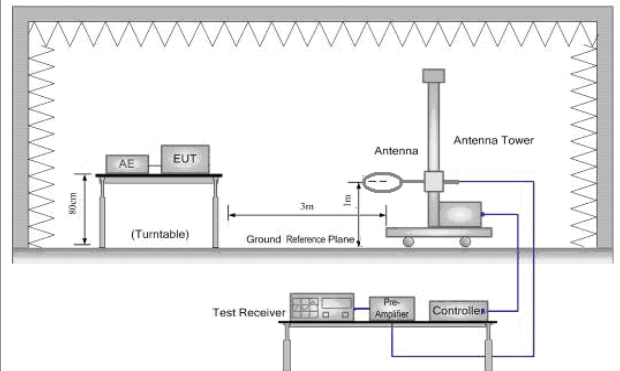
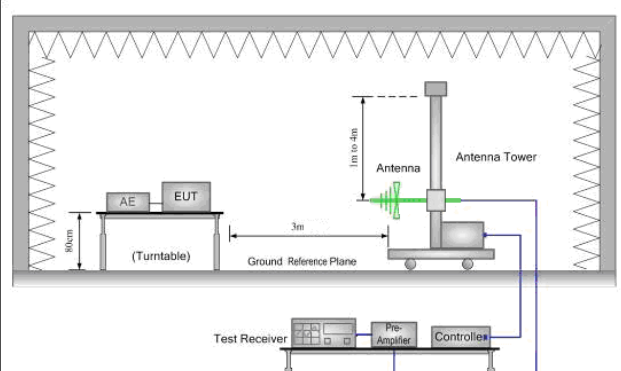
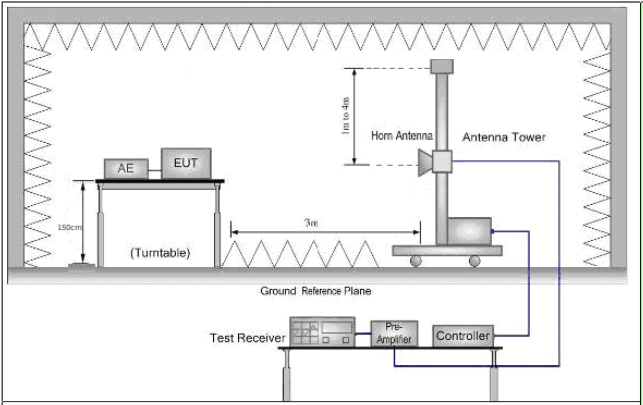
Report No.: SZEM160900824102

Page : 13 of 36

6.2 Spurious Emissions

6.2.1 Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.249 and 15.209				
Test Method:	ANSI C63.10: 2013				
Test Site:	Below 1GHz: Measurement Distance: 3m (Semi-Anechoic Chamber) Above 1GHz: Measurement Distance: 3m (Full-Anechoic Chamber)				
Receiver Setup:	Frequency	Detector	RBW	VBW	Remark
	0.009MHz-0.090MHz	Peak	10kHz	30KHz	Peak
	0.009MHz-0.090MHz	Average	10kHz	30KHz	Average
	0.090MHz-0.110MHz	Quasi-peak	10kHz	30KHz	Quasi-peak
	0.110MHz-0.490MHz	Peak	10kHz	30KHz	Peak
	0.110MHz-0.490MHz	Average	10kHz	30KHz	Average
	0.490MHz -30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak
	30MHz-1GHz	Quasi-peak	100 kHz	300KHz	Quasi-peak
	Above 1GHz	Peak	1MHz	3MHz	Peak
		Peak	1MHz	10Hz	Average
Limit: (Spurious Emissions)	Frequency	Field strength (microvolt/meter)	Limit (dBuV/m)	Remark	Measurement distance (m)
	0.009MHz-0.490MHz	2400/F (kHz)	-	-	300
	0.490MHz-1.705MHz	24000/F (kHz)	-	-	30
	1.705MHz-30MHz	30	-	-	30
	30MHz-88MHz	100	40.0	Quasi-peak	3
	88MHz-216MHz	150	43.5	Quasi-peak	3
	216MHz-960MHz	200	46.0	Quasi-peak	3
	960MHz-1GHz	500	54.0	Quasi-peak	3
	Above 1GHz	500	54.0	Average	3
Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.					
Limit: (Field strength of the fundamental signal)	Frequency	Limit (dBuV/m @3m)		Remark	
	2400MHz-2483.5MHz	94.0		Average Value	
		114.0		Peak Value	

Test Setup:	
	 
	
Test Procedure:	- 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. - For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation - The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. - 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. - 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. - The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. - 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.



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 15 of 36

	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 worse case. j. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting mode, Discharge + Transmitting mode
Final Test Mode:	Pretest the EUT at Transmitting mode and Discharge + Transmitting mode, found the Transmitting mode which it is worse case Only the worst case is recorded in the report.
Test Results:	Pass

Measurement Data

6.2.1.1 Field Strength Of The Fundamental Signal

Peak value:

Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
2405	29.12	5.35	38.15	94.96	91.28	114.00	-22.72	Horizontal
2405	29.12	5.35	38.15	93.70	90.02	114.00	-23.98	Vertical
2445	29.24	5.38	38.15	96.86	93.33	114.00	-20.67	Horizontal
2445	29.24	5.38	38.15	95.45	91.92	114.00	-22.08	Vertical
2475	29.33	5.40	38.15	97.35	93.93	114.00	-20.07	Horizontal
2475	29.33	5.40	38.15	96.36	92.94	114.00	-21.06	Vertical



SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

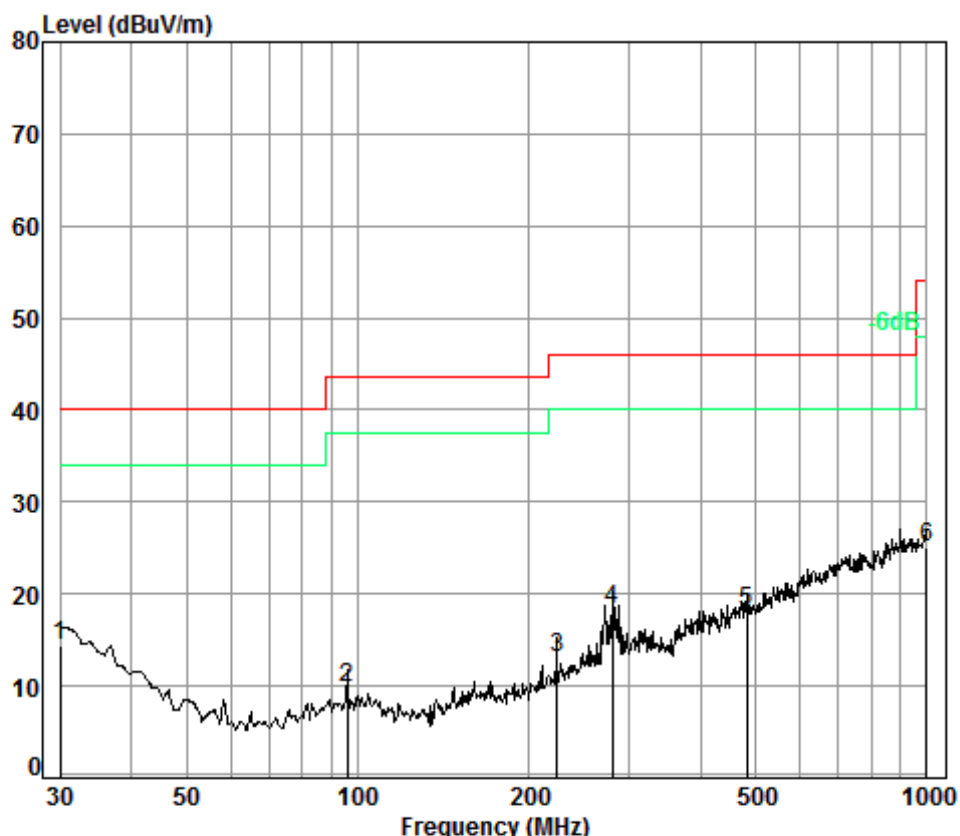
Report No.: SZEM160900824102

Page : 16 of 36

6.2.1.2 Spurious Emissions

30MHz~1GHz	
Test mode:	Transmitting

QP value:



Condition: 3m HORIZONTAL

Job No. : 8241CR

Test mode: TX mode

: Remote control

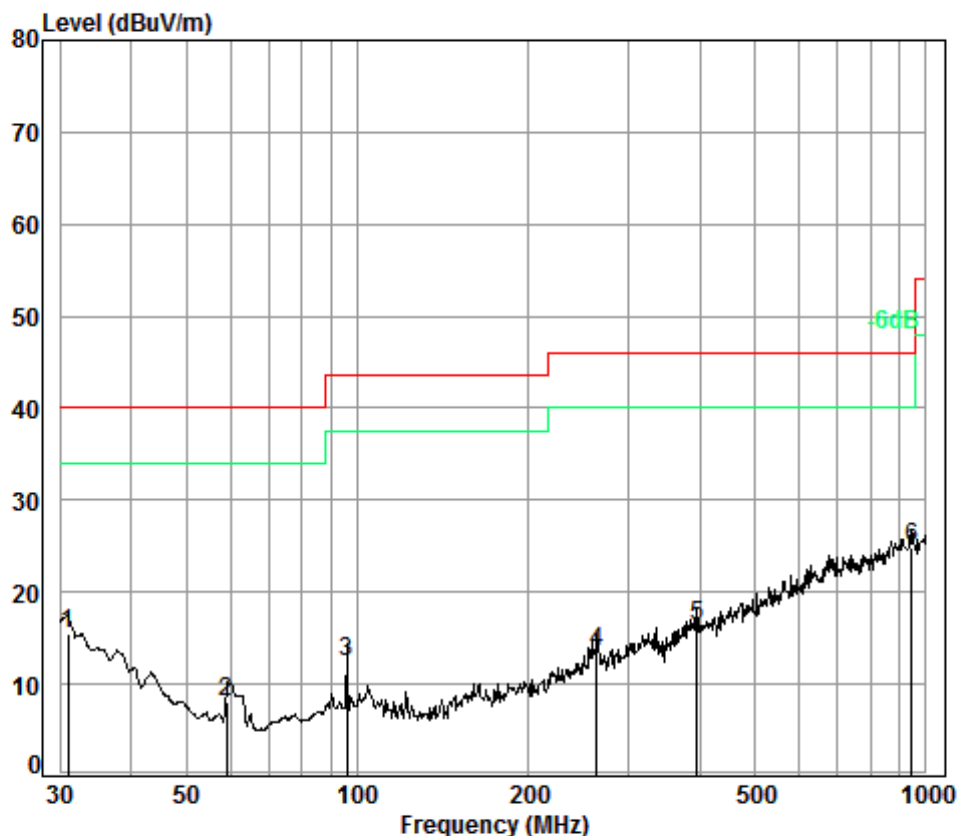
		Cable	Ant	Preamp	Read	Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB
1 pp	30.00	0.60	18.70	27.36	22.38	14.32	40.00 -25.68
2	96.10	1.16	8.94	27.21	26.92	9.81	43.50 -33.69
3	223.73	1.54	11.43	26.62	26.84	13.19	46.00 -32.81
4	280.02	1.81	13.02	26.45	29.86	18.24	46.00 -27.76
5	482.22	2.54	17.80	27.62	25.35	18.07	46.00 -27.93
6	1000.00	3.70	24.30	26.30	23.40	25.10	54.00 -28.90



SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 17 of 36



Condition: 3m VERTICAL

Job No. : 8241CR

Test mode: TX mode

: Remote control

		Cable	Ant	Preamp	Read		Limit	Over
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	30.96	0.60	18.16	27.35	24.16	15.57	40.00	-24.43
2	59.03	0.80	7.35	27.27	27.28	8.16	40.00	-31.84
3	96.10	1.16	8.94	27.21	29.50	12.39	43.50	-31.11
4	263.82	1.74	12.58	26.50	25.62	13.44	46.00	-32.56
5	396.24	2.19	16.25	27.11	24.96	16.29	46.00	-29.71
6 pp	945.44	3.65	23.30	26.58	24.39	24.76	46.00	-21.24



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 18 of 36

Above 1GHz								
Test mode:		Transmitting		Test channel:		Lowest		Remark:
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
3858.877	7.76	33.22	38.64	44.47	46.81	74.00	-27.19	Vertical
4810.000	8.88	34.17	39.03	53.51	57.53	74.00	-16.47	Vertical
5930.516	10.37	34.66	39.01	44.99	51.01	74.00	-22.99	Vertical
7215.000	10.68	36.41	38.17	55.64	64.56	74.00	-9.44	Vertical
9620.000	12.51	37.52	36.98	39.90	52.95	74.00	-21.05	Vertical
12173.120	14.42	38.71	38.48	38.65	53.30	74.00	-20.70	Vertical
3743.387	7.72	32.90	38.58	44.60	46.64	74.00	-27.36	Horizontal
4810.000	8.88	34.17	39.03	58.06	62.08	74.00	-11.92	Horizontal
6175.716	10.33	34.84	38.89	44.63	50.91	74.00	-23.09	Horizontal
7215.000	10.68	36.41	38.17	56.55	65.47	74.00	-8.53	Horizontal
9620.000	12.51	37.52	36.98	39.75	52.80	74.00	-21.20	Horizontal
12386.320	14.24	38.83	38.70	39.15	53.52	74.00	-20.48	Horizontal

Test mode:		Transmitting		Test channel:		Lowest		Remark:
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization
4810.000	8.88	34.17	39.03	37.83	41.85	54.00	-12.15	Vertical
7215.000	10.68	36.41	38.17	39.56	48.48	54.00	-5.52	Vertical
4810.000	8.88	34.17	39.03	42.71	46.73	54.00	-7.27	Horizontal
7215.000	10.68	36.41	38.17	40.90	49.82	54.00	-4.18	Horizontal



SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 19 of 36

Test mode:		Transmitting		Test channel:		Middle		Remark:		Peak	
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			
3853.298	7.76	33.21	38.64	45.45	47.78	74.00	-26.22	Vertical			
4890.000	8.99	34.31	39.06	52.84	57.08	74.00	-16.92	Vertical			
6175.716	10.33	34.84	38.89	44.46	50.74	74.00	-23.26	Vertical			
7335.000	10.73	36.36	38.05	55.40	64.44	74.00	-9.56	Vertical			
9780.000	12.59	37.56	36.91	39.81	53.05	74.00	-20.95	Vertical			
11946.280	14.50	38.55	38.25	38.32	53.12	74.00	-20.88	Vertical			
3966.435	7.80	33.51	38.69	44.40	47.02	74.00	-26.98	Horizontal			
4890.000	8.99	34.31	39.06	58.29	62.53	74.00	-11.47	Horizontal			
6051.874	10.49	34.74	38.97	44.74	51.00	74.00	-23.00	Horizontal			
7335.000	10.73	36.36	38.05	56.63	65.67	74.00	-8.33	Horizontal			
9780.000	12.59	37.56	36.91	38.98	52.22	74.00	-21.78	Horizontal			
12694.780	14.70	38.86	39.00	39.03	53.59	74.00	-20.41	Horizontal			

Test mode:		Transmitting		Test channel:		Middle		Remark:		Average	
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			
4890.000	8.99	34.31	39.06	37.50	41.74	54.00	-12.26	Vertical			
7335.000	10.73	36.36	38.05	39.63	48.67	54.00	-5.33	Vertical			
4890.000	8.99	34.31	39.06	42.60	46.84	54.00	-7.16	Horizontal			
7335.000	10.73	36.36	38.05	40.80	49.84	54.00	-4.16	Horizontal			



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 20 of 36

Test mode:		Transmitting		Test channel:		Highest		Remark:		Peak	
Frequency (MHz)	Cable Loss (dB)	Antenna Factor (dB/m)	Preamplifier Factor (dB)	Read Level (dBuV)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization			
3847.726	7.76	33.19	38.63	45.14	47.46	74.00	-26.54	Vertical			
4950.000	9.07	34.41	39.08	53.89	58.29	74.00	-15.71	Vertical			
6078.201	10.46	34.76	38.95	45.58	51.85	74.00	-22.15	Vertical			
7425.000	10.76	36.33	37.96	54.21	63.34	74.00	-10.66	Vertical			
9900.000	12.66	37.58	36.85	39.10	52.49	74.00	-21.51	Vertical			
12243.770	14.36	38.75	38.55	39.17	53.73	74.00	-20.27	Vertical			
3966.435	7.80	33.51	38.69	45.53	48.15	74.00	-25.85	Horizontal			
4950.000	9.07	34.41	39.08	59.85	64.25	74.00	-9.75	Horizontal			
6078.201	10.46	34.76	38.95	44.59	50.86	74.00	-23.14	Horizontal			
7425.000	10.76	36.33	37.96	56.43	65.56	74.00	-8.44	Horizontal			
9900.000	12.66	37.58	36.85	39.49	52.88	74.00	-21.12	Horizontal			
12279.260	14.33	38.77	38.59	39.00	53.51	74.00	-20.49	Horizontal			

Test mode:		Transmitting		Test channel:		Highest		Remark:		Average	
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			
4950.000	9.07	34.41	39.08	39.20	43.60	54.00	-10.40	Vertical			
7425.000	10.76	36.33	37.96	38.60	47.73	54.00	-6.27	Vertical			
4950.000	9.07	34.41	39.08	44.50	48.90	54.00	-5.10	Horizontal			
7425.000	10.76	36.33	37.96	40.90	50.03	54.00	-3.97	Horizontal			

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 13GHz 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 .

6.3 Restricted bands around fundamental frequency

Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205		
Test Method:	ANSI C63.10: 2013		
Test site:	Below 1GHz: Measurement Distance: 3m (Semi-Anechoic Chamber) Above 1GHz: Measurement Distance: 3m (Full-Anechoic Chamber)		
Limit(band edge):	Emissions 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.		
	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
		74.0	Peak Value
Test Setup:			

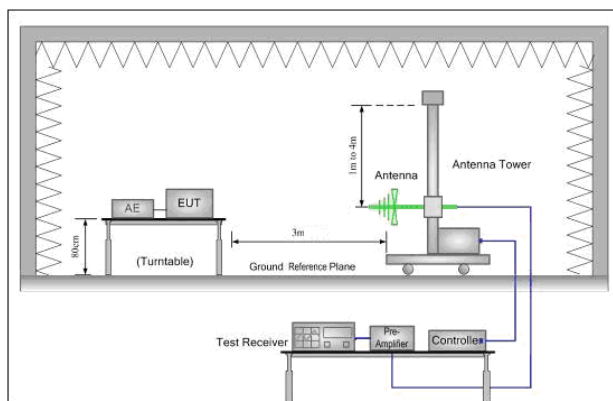


Figure 1. 30MHz to 1GHz

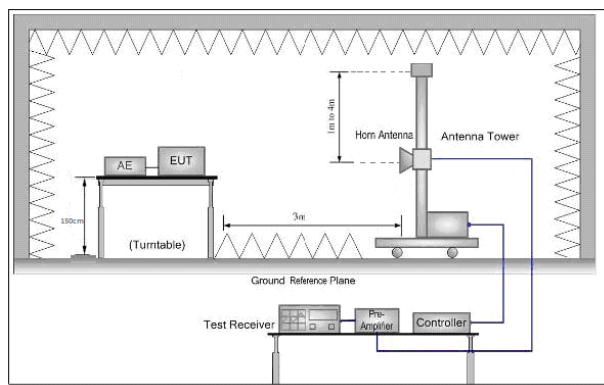


Figure 2. Above 1 GHz



SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 22 of 36

Test Procedure:	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 full-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. c. The EUT was set 3 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 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. Place a marker at the end of the restricted band closest to the transmit frequency to show compliance. Also measure any emissions in the restricted bands. Save the spectrum analyzer plot. Repeat for each power and modulation for lowest and highest channel h. Test the EUT in the lowest 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 worse case.. j. Repeat above procedures until all frequencies measured was complete.
Instruments Used:	Refer to section 5.10 for details
Exploratory Test Mode:	Transmitting mode, Discharge + Transmitting mode
Final Test Mode:	Pretest the EUT at Transmitting mode and Discharge + Transmitting mode, found the Transmitting mode which it is worse case Only the worst case is recorded in the report.
Test Results:	Pass

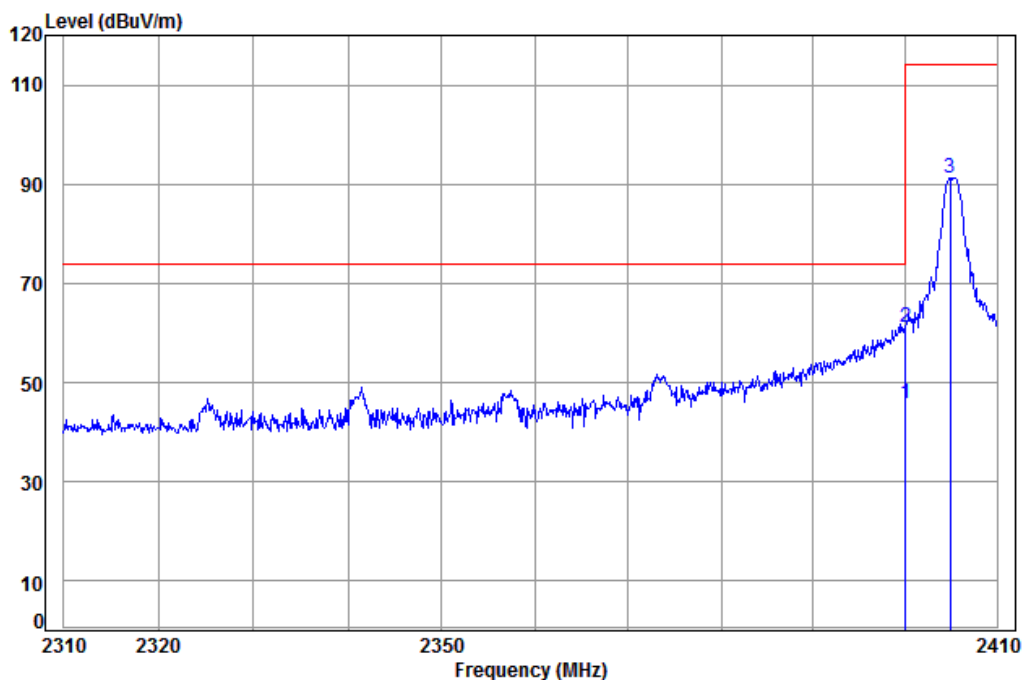


SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 23 of 36

Band edge (Radiated Emission)					
Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak



Condition: 3m Horizontal
Job No: : 8241CR
Mode: : 2405 Band edge
: Remote

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1 pp	2400.000	5.34	29.11	38.14	49.47	45.78	54.00	-8.22 Average
2 pk	2400.000	5.34	29.11	38.14	64.72	61.03	74.00	-12.97 Peak
3	2404.899	5.35	29.12	38.15	94.96	91.28	114.00	-22.72 Peak

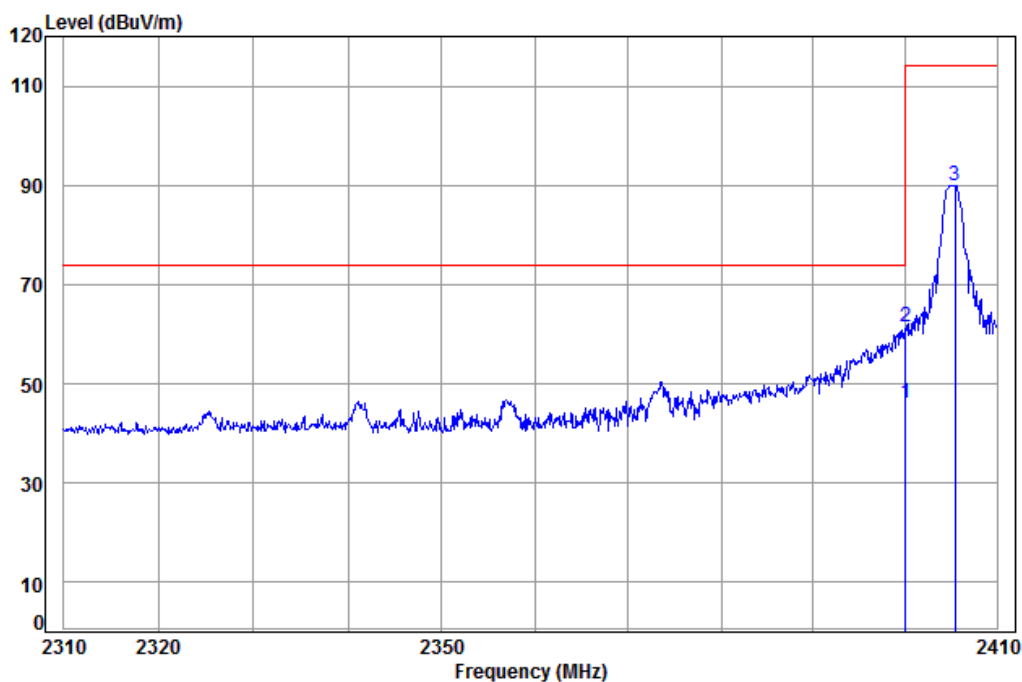


SGS-CSTC Standards Technical Services Ltd. Shenzhen Branch

Report No.: SZEM160900824102

Page : 24 of 36

Test mode:	Transmitting	Test channel:	Lowest	Remark:	Peak
------------	--------------	---------------	--------	---------	------



Condition: 3m Vertical

Job No: : 8241CR

Mode: : 2405 Band edge

: Remote

		Cable	Ant	Preamp	Read		Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1 pp	2400.000	5.34	29.11	38.14	49.64	45.95	54.00	-8.05	Average
2 pk	2400.000	5.34	29.11	38.14	65.10	61.41	74.00	-12.59	Peak
3	2405.408	5.35	29.12	38.15	93.70	90.02	114.00	-23.98	Peak

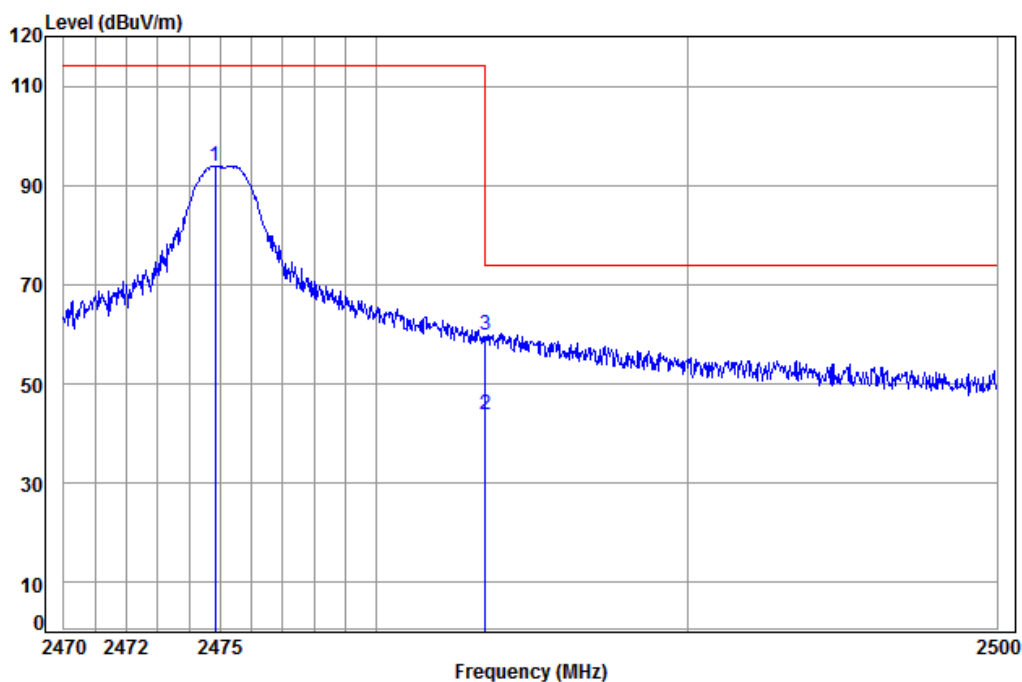


SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 25 of 36

Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
------------	--------------	---------------	---------	---------	------



Condition: 3m Horizontal

Job No: : 8241CR

Mode: : 2475 Band edge

: Remote

	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	2474.835	5.40	29.33	38.15	97.35	93.93	114.00	-20.07	Peak
2 pp	2483.500	5.41	29.35	38.15	47.35	43.96	54.00	-10.04	Average
3 pk	2483.500	5.41	29.35	38.15	63.27	59.88	74.00	-14.12	Peak

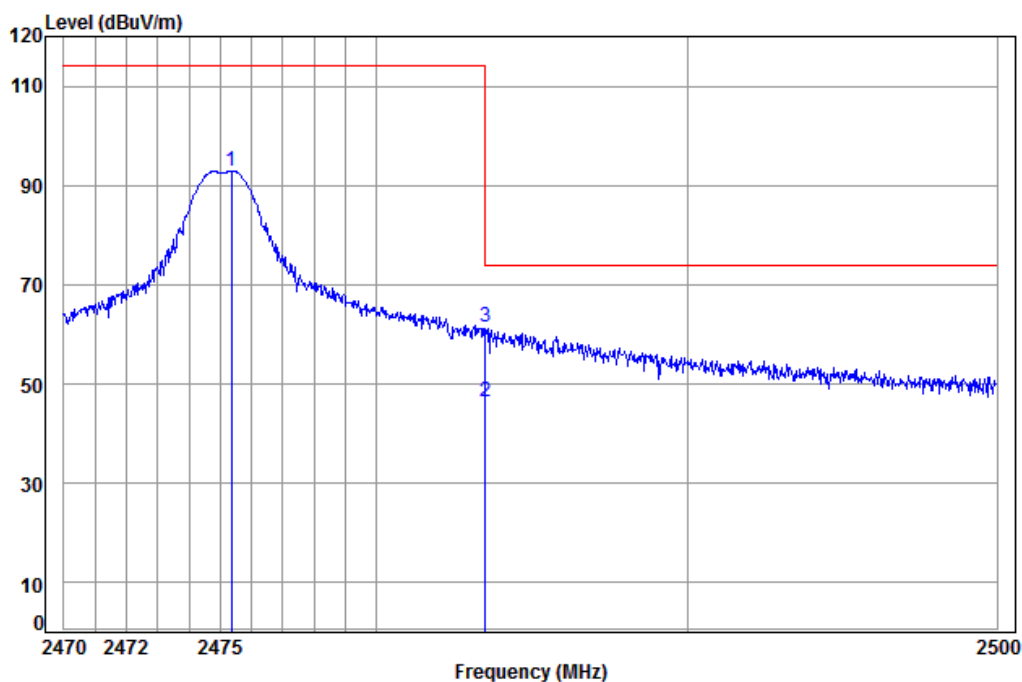


SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 26 of 36

Test mode:	Transmitting	Test channel:	Highest	Remark:	Peak
------------	--------------	---------------	---------	---------	------



Condition: 3m Vertical

Job No: : 8241CR

Mode: : 2475 Band edge

: Remote

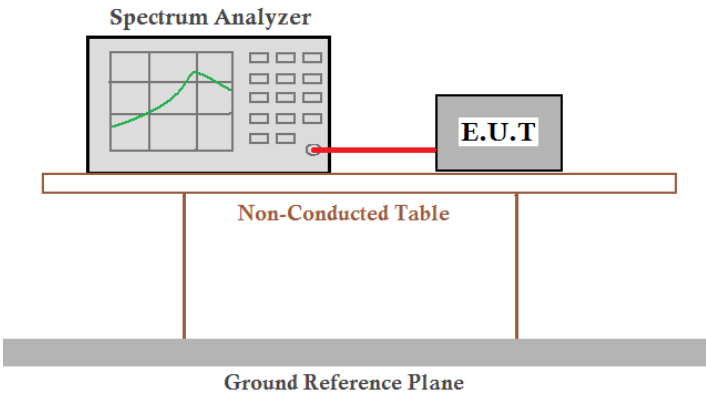
	Freq	Cable Loss	Ant Factor	Preamplifier Factor	Read Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2475.373	5.40	29.33	38.15	96.36	92.94	114.00	-21.06 Peak
2 pp	2483.500	5.41	29.35	38.15	49.69	46.30	54.00	-7.70 Average
3 pk	2483.500	5.41	29.35	38.15	64.96	61.57	74.00	-12.43 Peak

Note:

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

6.4 20dB Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.215
Test Method:	ANSI C63.10:2013
Test Setup:	
Instruments Used:	Refer to section 5.10 for details
Test mode:	Transmitting mode
Limit:	N/A
Test Results:	Pass

Measurement Data

Test channel	20dB bandwidth (MHz)	Results
Lowest	1.25	Pass
Middle	1.25	Pass
Highest	1.25	Pass



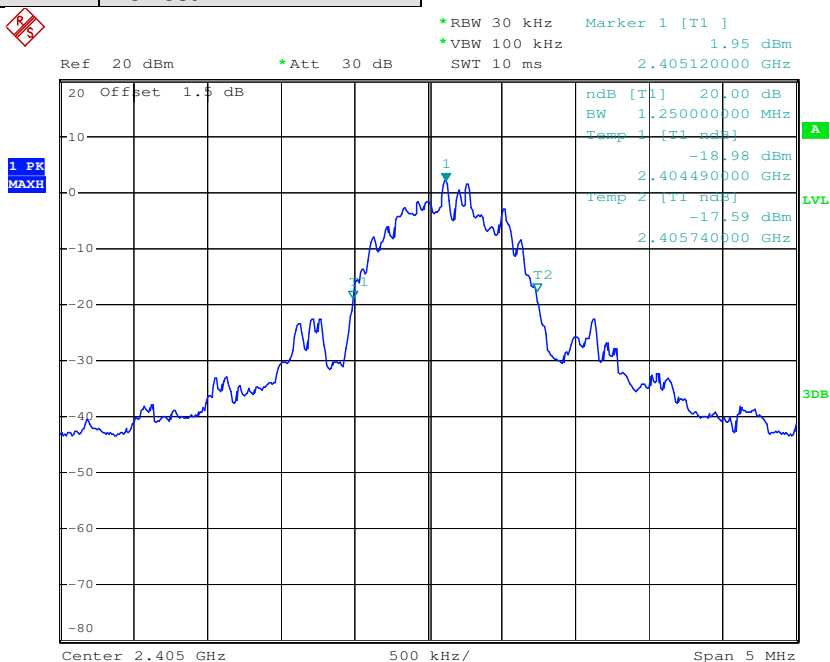
SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

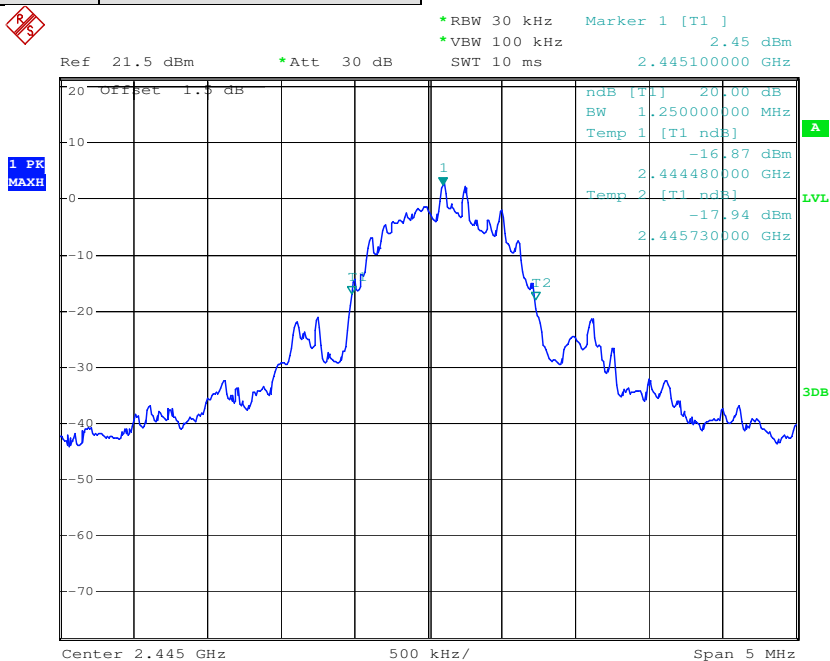
Page : 28 of 36

Test plot as follows:

Test channel: Lowest



Test channel: Middle



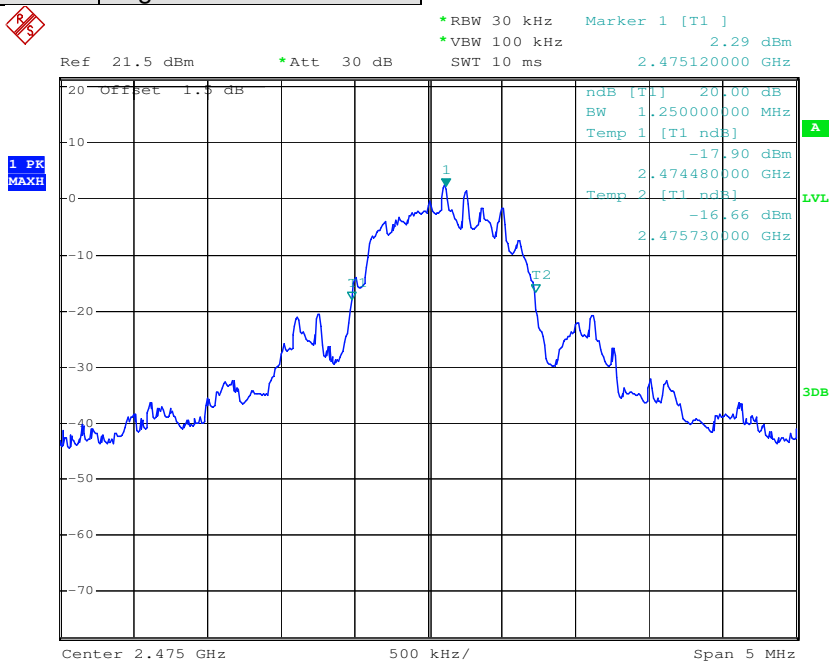


SGS-CSTC Standards Technical Services Ltd.
Shenzhen Branch

Report No.: SZEM160900824102

Page : 29 of 36

Test channel: Highest



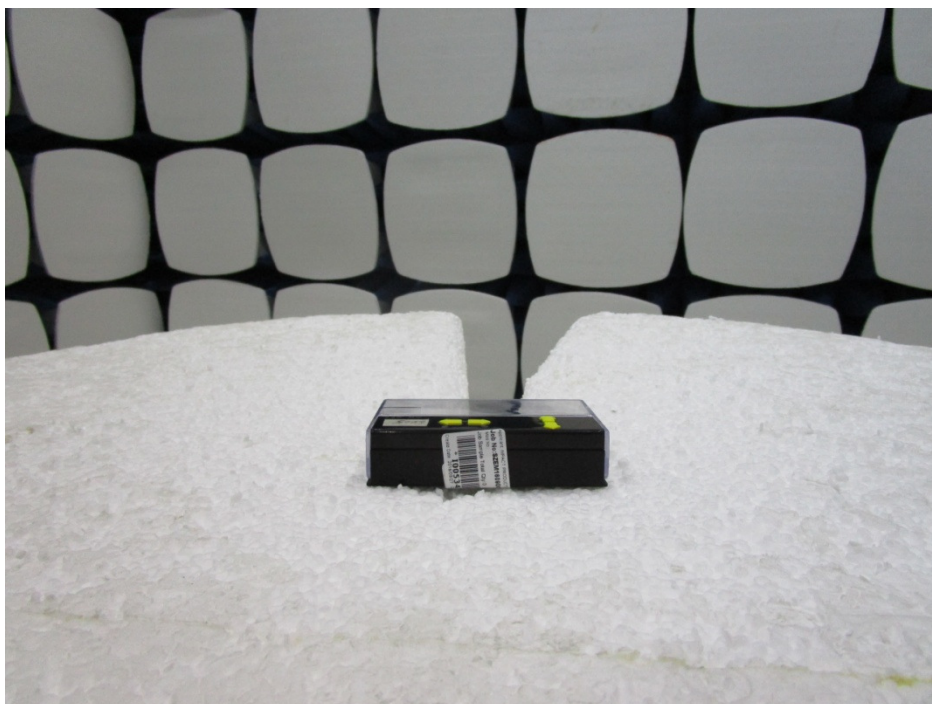
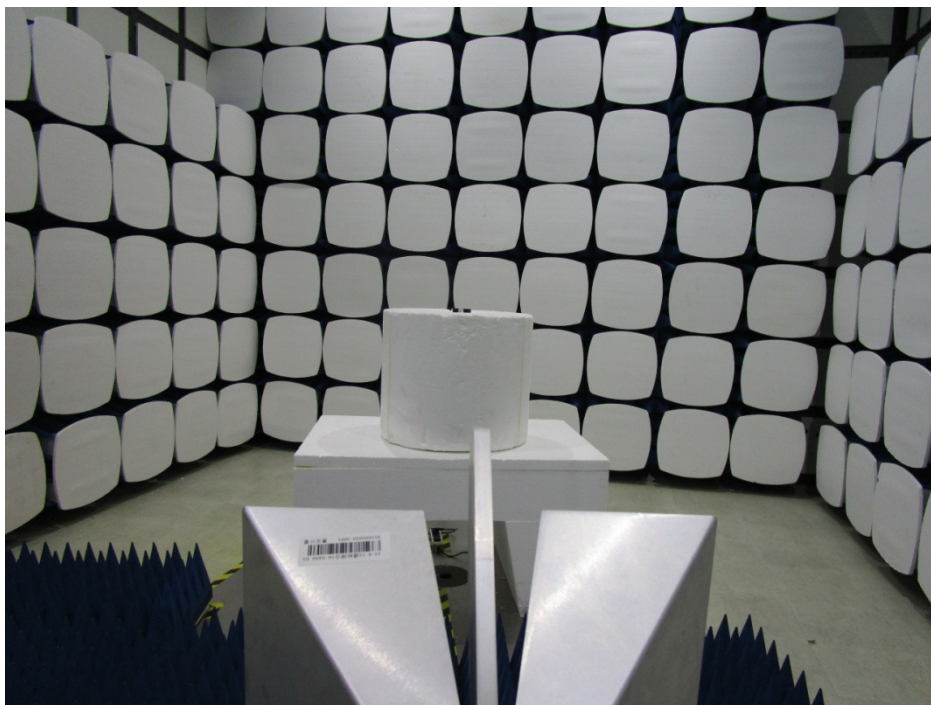
7 Photographs

Test model No.: PKRACER

7.1 Radiated Emission Test Setup



7.2 Radiated Spurious Emissions Test Setup



7.3 EUT Constructional Details

