

Shenzhen Toby Technology Co., Ltd.

Report No.: TB-FCC151604

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FCC Radio Test Report FCC ID: 2AK80-S100

Report No. : TB-FCC151604

Applicant: Shenzhen Qianyan Intelligent Technology Electric Vehicle Co., LTD.

Equipment Under Test (EUT)

EUT Name: Wireless Four Wheel Electric Scooter

Model No. : S100

Serial No. : Please see the page of 3

Brand Name : FS.FCM

Receipt Date : 2017-02-07

Test Date : 2017-02-08 to 2017-02-23

Issue Date : 2017-02-24

Standards : FCC Part 15, Subpart C (15.249: 2016)

Test Method : ANSI C63.10: 2013

Conclusions : PASS

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

The EUT technically complies with the FCC requirements

Test/Witness Engineer : WAN SV

Approved& Authorized :

This report details the results of the testing carried out on one sample. The results contained in this test report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in the report.

TB-RF-074-1.0



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1. General Information about EUT

1.1 Client Information

Applicant	:	Shenzhen Qianyan Intelligent Technology Electric Vehicle Co., LTD.
Address	 5F,8Building,Jinfanghua Electric Business Industrial Park,Zhongxing Road,Buji New District,Shenzhen City, China 	
Manufacturer		Shenzhen Qianyan Intelligent Technology Electric Vehicle Co., LTD.
Address	:	5F,8Building,Jinfanghua Electric Business Industrial Park,Zhongxing Road,Buji New District,Shenzhen City, China

1.2 General Description of EUT (Equipment Under Test)

EUT Name	:	Wireless Four Wheel Electric Scooter			
Models No.	:	S100, SL100, S200, SL200, S300, SL300, SL400, SL500, SP400, SP300, SP200, SP100, SY100, S400, S500			
Model Difference	:	All these models are identical in the same PCB, layout and electrica circuit, the only difference is model name for commercial.			
		Operation Frequency:240	02~2478 MHz		
OF THE PERSON NAMED IN		Number of Channels:	77 Channels		
Product Description	15	Out Power:	78.64 dBuV/m@3m Peak 74.65 dBuV/m@3m Avg		
		Antenna Gain:	0 dBi PCB Antenna		
		Modulation Type:	GFSK		
Power Supply	:	DC power by USB cable. DC power by Li-ion batte			
Power Rating	•	DC 5V by USB Cable. DC 3.7V by 400mAh Li-id			
Connecting I/O Port(S)	n.	Please refer to the User's Manual			

Note:

(1) For a more detailed features description, please refer to the manufacturer's specifications or the User's Manual.

(2) Channel List:

	Channel List						
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)		
00	2402	27	2429	54	2456		
01	2403	28	2430	55	2457		
02	2404	29	2431	56	2458		
03	2405	30	2432	57	2459		

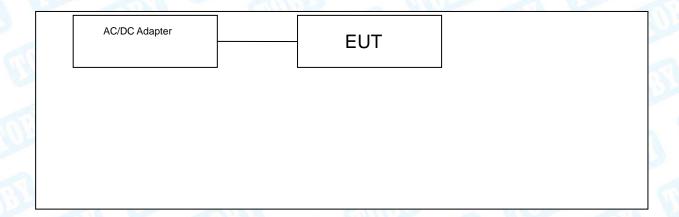


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04	2406	31	2433	58	2460
05	2407	32	2434	59	2461
06	2408	33	2435	60	2462
07	2409	34	2436	61	2463
08	2410	35	2437	62	2464
09	2411	36	2438	63	2465
10	2412	37	2439	64	2466
11	2413	38	2440	65	2467
12	2414	39	2441	66	2468
13	2415	40	2442	67	2469
14	2416	41	2443	68	2470
15	2417	42	2444	69	2471
16	2418	43	2445	70	2472
17	2419	44	2446	71	2473
18	2420	45	2447	72	2474
19	2421	46	2448	73	2475
20	2422	47	2449	74	2476
21	2423	48	2450	75	2477
22	2424	49	2451	76	2478
23	2425	50	2452	A COLUMN TO THE PARTY OF THE PA	1000
24	2426	51	2453		M. C.
25	2427	52	2454		0.00
26	2428	53	2455	MAC	

1.3 Block Diagram Showing the Configuration of System Tested

Mode 1: USB Charging+TX Mode





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Mode 2: TX Mode

	EUT			

1.4 Description of Support Units

	Eq	uipment Information	on	
Name	Model	FCC ID/VOC	Manufacturer	Used "√"
AC/DC Adapter	TEKA012	VOC	TEKA	√
AC/DC Adapter:	Input:100~240V, 50/60	OHz, 0.2A. Output: 5V	/, 1A	
		Cable Information		
Number	Shielded Type	Ferrite Core	Length	Note
Cable 1	YES	YES	0.6M	113





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1.5 Description of Test Mode

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested base on the consideration of following EUT operation mode or test configuration mode which possible have effect on EMI emission level. Each of these EUT operation mode(s) or test configuration mode(s) mentioned follow was evaluated respectively.

For Conducted Test			
Final Test Mode	Description		
Mode 1	USB Charging with TX Mode		

For Radiated Test				
Final Test Mode	Description			
Mode 2	TX Mode(CH00/CH40/CH76)			

Note:

For all test, we have verified the construction and function in typical operation. And all the test modes were carried out with the EUT in transmitting operation in maximum power with all kinds of data rate.

- (1)According to ANSI C63.10 standards, the measurements are performed at the highest, middle, lowest available channels.
- (2)During the testing procedure, the continuously transmitting with the maximum power mode was programmed by the customer.
- (3) The EUT is considered a portable unit; it was pre-tested on the positioned of each 3 axis, X-plane, Y-plane and Z-plane. The worst case was found positioned on X-plane. Therefore only the test data of this X-plane was used for radiated emission measurement test.

1.6 Description of Test Software Setting

During testing channel & Power controlling software provided by the customer was used to control the operating channel as well as the output power level. The RF output power selection is for the setting of RF output power expected by the customer and is going to be fixed on the firmware of the final end product power parameters of RF mode.

Product SW/HW Version :	N/A		
Radio SW/HW Version: N/A			
Test Software Version	N/A		The same of the sa
Frequency	2402 MHz	2442MHz	2478 MHz
GFSK	DEF	DEF	DEF



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1.7 Measurement Uncertainty

The reported uncertainty of measurement $y \pm U$, where expended uncertainty U is based on a standard uncertainty multiplied by a coverage factor of k=2, providing a level of confidence of approximately 95 %.

Test Item	Parameters	Expanded Uncertainty (U _{Lab})
	Level Accuracy:	
Conducted Emission	9kHz~150kHz	±3.42 dB
	150kHz to 30MHz	±3.42 dB
Dadiated Emission	Level Accuracy:	. 4 60 dD
Radiated Emission	9kHz to 30 MHz	±4.60 dB
Dadiated Emission	Level Accuracy:	. 4 40 dD
Radiated Emission	30MHz to 1000 MHz	±4.40 dB
Dadiated Emission	Level Accuracy:	. 4 20 dB
Radiated Emission	Above 1000MHz	±4.20 dB

1.8 Test Facility

The testing report were performed by the Shenzhen Toby Technology Co., Ltd., in their facilities located at 1A/F., Bldg.6, Yusheng Industrial Zone, The National Road No.107 Xixiang Section 467, Xixiang, Bao'an, Shenzhen, Guangdong, China. At the time of testing, the following bodies accredited the Laboratory:

CNAS (L5813)

The Laboratory has been accredited by CNAS to ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories for the competence in the field of testing. And the Registration No.: CNAS L5813.

FCC List No.: (811562)

The Laboratory is listed in the United States of American Federal Communications Commission (FCC), and the registration number is 811562.

IC Registration No.: (11950A-1)

The Laboratory has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing. The site registration: Site# 11950A-1.



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2. Test Summary

FCC Part 15 Subpart C(15.249)					
Standard Section	Test Item	Judgment	Remark		
15.203	Antenna Requirement	PASS	N/A		
15.205	Restricted Bands	PASS	N/A		
15.207	AC Power Conducted Emission	PASS	N/A		
15.249 &15.209	Radiated Spurious Emission	PASS	N/A		
15.215(C)	20dB Bandwidth	PASS	N/A		



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3. Test Equipment

AC Main C	onducted Emis	sion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
EMI Test Receiver	ROHDE& SCHWARZ	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017
RF Switching Unit	Compliance Direction Systems Inc	RSU-A4	34403	Jul. 22, 2016	Jul. 21, 2017
L.I.S.N	Rohde & Schwarz	ENV216	101131	Jul. 22, 2016	Jul. 21, 2017
L.I.S.N	SCHWARZBECK	NNBL 8226-2	8226-2/164	Jul. 22, 2016	Jul. 21, 2017
Radiation	Spurious Emiss	ion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
EMI Test Receiver	Rohde & Schwarz	ESPI	100010/007	Jul. 22, 2016	Jul. 21, 2017
Bilog Antenna	ETS-LINDGREN	3142E	00117537	Mar. 20, 2016	Mar. 19, 2017
Horn Antenna	ETS-LINDGREN	3117	00143207	Mar. 19, 2016	Mar. 18, 2017
Pre-amplifier	Sonoma	310N	185903	Mar. 20, 2016	Mar. 19, 2017
Pre-amplifier	HP	8447B	3008A00849	Mar. 26, 2016	Mar. 25, 2017
Loop Antenna	Laplace instrument	RF300	0701	Mar. 19, 2016	Mar. 18, 2017
Cable	HUBER+SUHNER	100	SUCOFLEX	Mar. 26, 2016	Mar. 25, 2017
Positioning Controller	ETS-LINDGREN	2090	N/A	N/A	N/A
Antenna C	onducted Emis	sion			
Description	Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due Date
Spectrum Analyzer	Agilent	E4407B	MY45106456	Jul. 22, 2016	Jul. 21, 2017
Spectrum Analyzer	Rohde & Schwarz	ESCI	100321	Jul. 22, 2016	Jul. 21, 2017



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4. Conducted Emission Test

4.1 Test Standard and Limit

4.1.1Test Standard FCC Part 15.207

4.1.2 Test Limit

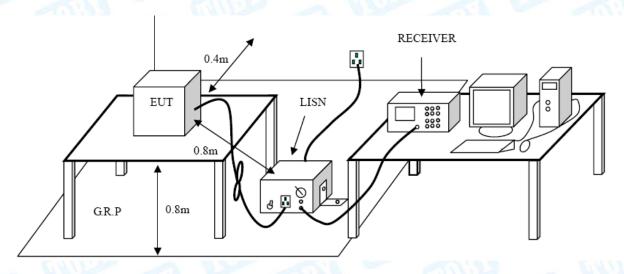
Conducted Emission Test Limit

	Maximum RF Line Voltage (dBμV)				
Frequency	Quasi-peak Level	Average Level			
150kHz~500kHz	66 ~ 56 *	56 ~ 46 *			
500kHz~5MHz	56	46			
5MHz~30MHz	60	50			

Notes:

- (1) *Decreasing linearly with logarithm of the frequency.
- (2) The lower limit shall apply at the transition frequencies.
- (3) The limit decrease in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

4.2 Test Setup



4.3 Test Procedure

The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/50uH of coupling impedance for the measuring instrument.

Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.



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I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.

LISN is at least 80 cm from nearest part of EUT chassis.

The bandwidth of EMI test receiver is set at 9kHz, and the test frequency band is from 0.15MHz to 30MHz.

4.4 EUT Operating Mode

Please refer to the description of test mode.

4.5 Test Data

Test data please refer the following pages.





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		Scoote		eel Electric	Model	Name :	S1	100
empera	ature:	25℃			Relativ	e Humidity:	55	5%
est Vol	tage:	AC 120	0V/60 Hz	Will.		I The		
ermina	l:	Line			CHILD !	3	A	Milia
est Mo	de:	Chargi	ng with TX	Mode 2402 M	Hz			
Remark	•	Only w	orse case is	s reported		A MARIE		
90.0 dBu	v							
40			Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y Y			My warmen and a second	avg:	peak
0.150		0.5	Reading		5 Measure-	limit 6		30.000
No. I		req.	Level	Factor	ment		Over	D
- 1		MHz	dBu∀	dB	dBuV	dBuV	dB	Detector
1 		1780 1780	34.11 22.49	9.98	44.09 32.47		0.48 2.10	QP AVG
			31.16	10.02	41.18	60.19 -19		
4		3020 3020	19.69	10.02	29.71	50.19 -19		QP AVG
5		3620	30.96	10.02	40.98	58.68 -17		QP
6		3620	20.44	10.02	30.46	48.68 -18		AVG
		5180	35.28	10.02	45.31	56.00 -10		QP
8		5180	22.88	10.03	32.91	46.00 -13		AVG
9		7340	30.80	10.03	40.91	56.00 -1		QP
10		7340	15.70	10.11	25.81	46.00 -20		AVG
		2180	26.78	10.06	36.84	56.00 -19		QP
11		/ 100						





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UT:	Scoo		heel Electric	Mod	el Name	:	S100
Temperature:	25℃			Rela	tive Hum	nidity:	55%
est Voltage:	AC 1	20V/60 Hz			61		
Terminal:	Neutr	ral	MAG				
Test Mode:	Char	ging with T	K Mode 2402 N	ИHz		0	BILL
Remark:	Only	worse case	is reported			33	
90.0 dBuV							
						QP: AVG:	
<i>Y</i> 1 <i>X</i> 1	X						
40	i Maria	AMMAN, WAYN	dali	White production will be the second	Wa.		
VAW. Va		k hat hillskir i	wally the section of	4,1	m, M		
	Y W VM M				\		
	1 1 19 7 15 4 1	orthologia a Mari	Marry John Miller	May your many with	MA MANAMAN	haddanaandan	ndy William Marie
		ייז אעעעעיין דע					
	$\bigvee\bigvee\bigvee$	1 MAAA	Harmy Am.	΄ γ	May and an a	L	
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10	\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \	N 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Mar " Vr '	γ .	And my hours	American Company of the Company of t	
0.150	0.5	W 1 W W V V	(MHz)	5	And a	Arrange and the contract of th	
	0.5	Reading		5 Measure-		***************************************	AVI
	o.s Freq.	Reading Level			Limit	Over	AVI
0.150		_	Correct N	/leasure-		Over dB	AVI
0.150 No. Mk.	Freq.	Level	Correct N Factor	/leasure- ment	Limit dBuV		30.000
0.150 No. Mk.	Freq.	Level dBuV	Correct N Factor dB 10.12	Measure- ment	dBuV 64.96	dB	30.000 Detector
0.150 No. Mk.	Freq. MHz	Level dBuV 32.64	Correct N Factor dB 10.12	Measure- ment dBuV 42.76	dBu√ 64.96 54.96	dB -22.20	30.000 Detector QP
0.150 No. Mk. 1 2 3	Freq. MHz 0.1700 0.1700	dBuV 32.64 16.03	Correct N Factor dB 10.12 10.12 10.09	Measure- ment dBuV 42.76 26.15	dBuV 64.96 54.96 60.30	dB -22.20 -28.81	30.000 Detector QP AVG
0.150 No. Mk. 1 2 3 4	Freq. MHz 0.1700 0.1700 0.2980	dBuV 32.64 16.03 33.98	Correct N Factor dB 10.12 10.12 10.09 10.09	Measure- ment dBuV 42.76 26.15 44.07	dBuV 64.96 54.96 60.30 50.30	dB -22.20 -28.81 -16.23	30.000 Detector QP AVG QP
0.150 No. Mk. 1 2 3 4 5 *	Freq. MHz 0.1700 0.1700 0.2980 0.2980	dBuV 32.64 16.03 33.98 20.72	Correct N Factor dB 10.12 10.12 10.09 10.09 10.07	Measure- ment dBuV 42.76 26.15 44.07 30.81	64.96 54.96 60.30 50.30 58.96	dB -22.20 -28.81 -16.23 -19.49	30.000 Detector QP AVG QP AVG
0.150 No. Mk. 1 2 3 4 5 *	Freq. MHz 0.1700 0.1700 0.2980 0.2980 0.3500	Level dBuV 32.64 16.03 33.98 20.72 33.57	Correct N Factor dB 10.12 10.12 10.09 10.09 10.07 10.07	Measure- ment dBuV 42.76 26.15 44.07 30.81 43.64	Limit dBuV 64.96 54.96 60.30 50.30 58.96 48.96	dB -22.20 -28.81 -16.23 -19.49 -15.32	Detector QP AVG QP AVG QP
0.150 No. Mk. 1 2 3 4 5 * 6 7	Freq. MHz 0.1700 0.1700 0.2980 0.2980 0.3500 0.3500	Level dBuV 32.64 16.03 33.98 20.72 33.57 20.32	Correct N Factor dB 10.12 10.09 10.09 10.07 10.07 10.02	Measure- ment dBuV 42.76 26.15 44.07 30.81 43.64 30.39	dBuV 64.96 54.96 60.30 50.30 58.96 48.96 56.24	dB -22.20 -28.81 -16.23 -19.49 -15.32 -18.57	Detector QP AVG QP AVG QP AVG
0.150 No. Mk. 1 2 3 4 5 7 8	Freq. MHz 0.1700 0.1700 0.2980 0.2980 0.3500 0.3500 0.4860	Level dBuV 32.64 16.03 33.98 20.72 33.57 20.32 30.38	Correct N Factor dB 10.12 10.09 10.09 10.07 10.07 10.02 10.02	Measure- ment dBuV 42.76 26.15 44.07 30.81 43.64 30.39 40.40	Limit dBuV 64.96 54.96 60.30 50.30 58.96 48.96 56.24 46.24	dB -22.20 -28.81 -16.23 -19.49 -15.32 -18.57 -15.84	30.000 Detector QP AVG QP AVG QP AVG
0.150 No. Mk. 1 2 3 4 5 * 6 7 8 9	Freq. MHz 0.1700 0.1700 0.2980 0.2980 0.3500 0.3500 0.4860 0.4860	Level dBuV 32.64 16.03 33.98 20.72 33.57 20.32 30.38 14.68 27.54	Correct Factor dB 10.12 10.12 10.09 10.07 10.07 10.02 10.02 10.03	Measure- ment dBuV 42.76 26.15 44.07 30.81 43.64 30.39 40.40 24.70 37.57	Limit dBuV 64.96 54.96 60.30 50.30 58.96 48.96 56.24 46.24 56.00	dB -22.20 -28.81 -16.23 -19.49 -15.32 -18.57 -15.84 -21.54	Detector QP AVG QP AVG QP AVG QP AVG
0.150 No. Mk. 1 2 3 4 5 * 6 7 8 9 10	Freq. MHz 0.1700 0.1700 0.2980 0.2980 0.3500 0.3500 0.4860 0.4860 0.7260	Level dBuV 32.64 16.03 33.98 20.72 33.57 20.32 30.38 14.68	Correct Factor dB 10.12 10.12 10.09 10.09 10.07 10.07 10.02 10.02 10.03 10.03	Measure- ment dBuV 42.76 26.15 44.07 30.81 43.64 30.39 40.40 24.70	Limit dBuV 64.96 54.96 60.30 50.30 58.96 48.96 56.24 46.24 56.00 46.00	dB -22.20 -28.81 -16.23 -19.49 -15.32 -18.57 -15.84 -21.54 -18.43	Detector QP AVG QP AVG QP AVG QP AVG QP AVG





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EUT.	Wireless Four Whee	el Electric	Madal Name	0.4	00
EUT:	Scooter		Model Name :	51	00
Temperature:	25 ℃		Relative Humic	dity: 55	%
Test Voltage:	AC 240V/60 Hz	Millian	- U		THE STATE OF
Terminal:	Line		WILLIAM STATE	a W	M. Carrie
Test Mode:	Charging with TX M	ode 2402 MHz	Z	339	The state of the s
Remark:	Only worse case is	reported	- 13º		ALL RE
90.0 dBuV					
-10 0.150	0.5	(MHz)	April Market Mar	QP: AVG:	peak AVG
No. Mk.	Reading Freq. Level		easure- ment Limit	Over	
	MHz dBuV	dB	dBuV dBuV	dB	Detector
1 0.	1740 34.61	9.97 4	4.58 64.76	-20.18	QP
2 0.	1740 22.51	9.97 3	32.48 54.76	-22.28	AVG
3 0.	3500 31.46	10.02 4	1.48 58.96	-17.48	QP
4 0.	3500 20.70	10.02	30.72 48.96	-18.24	AVG
5 0.	4820 36.69	10.02 4	6.71 56.30	-9.59	QP
6 0.	4820 24.07	10.02	46.30	-12.21	AVG
7 * 0.	5220 37.39	10.03 4	7.42 56.00	-8.58	QP
8 0.	5220 24.20	10.03	34.23 46.00	-11.77	AVG
9 0.	7420 31.96	10.11 4	2.07 56.00	-13.93	QP
10 0.	7420 16.09	10.11 2	26.20 46.00	-19.80	AVG
11 1.	1140 29.80	10.06	9.86 56.00	-16.14	QP
12 1.	1140 14.65	10.06 2	24.71 46.00	-21.29	AVG
Emission Level	= Read Level+ Corre	ct Factor			





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EUT:	Wireless F Scooter	our Wheel Elect	Mode	l Name :	9	S100
Temperature:	25℃	The same of	Relat	ive Humid	ity: 5	55%
Test Voltage:	AC 240V/6	0 Hz		a W		
Terminal:	Neutral	(3.)	The same	333	~ (HI L
Test Mode:	Charging v	vith TX Mode 24	02 MHz	-011	13	1
Remark:	Only worse	e case is reporte	d	ABOVE		THE PERSON
90.0 dBuV						
-10 0.150	0.5	W MAZ)	was a supple of the supple of		QP: AVG:	AVG
				_		
No. Mk. F	req. Le	ding Correct vel Factor			Over	
		vei racioi	r ment	Limit	OVCI	
N		uV dB	dBuV	dBu∀	dB	Detector
		uV dB				Detector
1 0.1	1Hz dB	uV dB	dBu∨	dBuV	dB	
1 0.1 2 0.1	1Hz dB 860 30. 860 16.	uV dB 38 9.99	dBu√ 40.37	dBuV 64.21 54.21	dB -23.84	QP
1 0.1 2 0.1 3 0.2	1Hz dB 860 30. 860 16. 460 31.	uV dB 38 9.99 99 9.99	dBuV 40.37 26.98	dBuV 64.21 54.21 61.89	dB -23.84 -27.23	QP AVG
1 0.1 2 0.1 3 0.2 4 0.2	1Hz dB 860 30. 860 16. 460 31.	uV dB 38 9.99 99 9.99 39 10.02 25 10.02	dBuV 40.37 26.98 41.41	dBuV 64.21 54.21 61.89 51.89	dB -23.84 -27.23 -20.48	QP AVG QP
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3	1Hz dB 860 30 860 16 460 31 460 19 700 22	uV dB 38 9.99 99 9.99 39 10.02 25 10.02	dBuV 40.37 26.98 41.41 29.27	dBuV 64.21 54.21 61.89 51.89 58.50	dB -23.84 -27.23 -20.48 -22.62	QP AVG QP AVG
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3 6 0.3	1Hz dB 860 30 860 16 460 31 460 19 700 22	uV dB 38 9.99 99 9.99 39 10.02 25 10.02 31 10.02	dBuV 40.37 26.98 41.41 29.27 32.33	dBuV 64.21 54.21 61.89 51.89 58.50 48.50	dB -23.84 -27.23 -20.48 -22.62 -26.17	QP AVG QP AVG QP
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3 6 0.3 7 0.4	1Hz dB 860 30 860 16 460 31 460 19 700 22 700 7	uV dB 38 9.99 99 9.99 39 10.02 25 10.02 31 10.02 65 10.02	dBuV 40.37 26.98 41.41 29.27 32.33 17.67	dBuV 64.21 54.21 61.89 51.89 58.50 48.50 57.25	dB -23.84 -27.23 -20.48 -22.62 -26.17 -30.83	QP AVG QP AVG AVG
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3 6 0.3 7 0.4 8 0.4	1Hz dB 860 30 860 16 460 31 460 19 700 22 700 7 300 30 300 17	uV dB 38 9.99 99 9.99 39 10.02 25 10.02 31 10.02 65 10.02 43 10.02	dBuV 40.37 26.98 41.41 29.27 32.33 17.67 40.45	dBuV 64.21 54.21 61.89 51.89 58.50 48.50 57.25	dB -23.84 -27.23 -20.48 -22.62 -26.17 -30.83 -16.80	QP AVG QP AVG QP AVG QP
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3 6 0.3 7 0.4 8 0.4 9 * 0.4	1Hz dB 860 30. 860 16. 460 31. 460 19. 700 22. 700 7. 300 30. 300 17. 740 41.	uV dB 38 9.99 99 9.99 39 10.02 25 10.02 31 10.02 65 10.02 43 10.02 24 10.02	dBuV 40.37 26.98 41.41 29.27 32.33 17.67 40.45 27.26	dBuV 64.21 54.21 61.89 51.89 58.50 48.50 57.25	dB -23.84 -27.23 -20.48 -22.62 -26.17 -30.83 -16.80 -19.99 -5.32	QP AVG QP AVG QP AVG AVG
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3 6 0.3 7 0.4 8 0.4 9 * 0.4 10 0.4	1Hz dB 860 30 860 16 460 31 460 19 700 22 700 7 300 30 300 17 740 41	uV dB 38 9.99 99 9.99 39 10.02 25 10.02 31 10.02 65 10.02 43 10.02 24 10.02 10 10.02	dBuV 40.37 26.98 41.41 29.27 32.33 17.67 40.45 27.26 51.12	dBuV 64.21 54.21 61.89 51.89 58.50 48.50 57.25 47.25 56.44 46.44	dB -23.84 -27.23 -20.48 -22.62 -26.17 -30.83 -16.80 -19.99 -5.32	QP AVG QP AVG QP AVG QP AVG QP
1 0.1 2 0.1 3 0.2 4 0.2 5 0.3 6 0.3 7 0.4 8 0.4 9 * 0.4 10 0.5	1Hz dB 860 30 860 16 460 31 460 19 700 22 700 7 300 30 300 17 740 41 740 28	dB 38 9.99 99 9.99 39 10.02 25 10.02 31 10.02 65 10.02 43 10.02 24 10.02 10 10.02 67 10.02	dBuV 40.37 26.98 41.41 29.27 32.33 17.67 40.45 27.26 51.12 38.69	dBuV 64.21 54.21 61.89 51.89 58.50 48.50 57.25 47.25 56.44 46.44 56.00	dB -23.84 -27.23 -20.48 -22.62 -26.17 -30.83 -16.80 -19.99 -5.32 -7.75	QP AVG QP AVG QP AVG QP AVG AVG



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5. Radiated Emission Test

5.1 Test Standard and Limit

5.1.1 Test Standard FCC Part 15.209

5.1.2 Test Limit

Radiated Emission Limit (9kHz~1000MHz)

Frequency (MHz	Field Strength (microvolt/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

Radiated Emission Limit (Above 1000MHz)

Frequency	Distance Meters (at 3m)			
(MHz)	Peak	Average		
Above 1000	74	54		

Note:

(1) The tighter limit applies at the band edges.

(2) Emission Level(dBuV/m)=20log Emission Level(Uv/m)

Limits of radiated emission measurement (15.249)

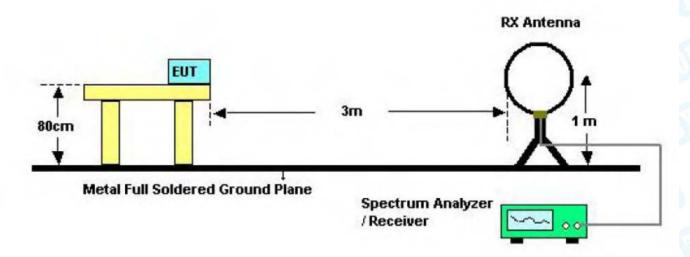
FCC Part 15 (15.249), Subpart C				
Limit	Frequency Range (MHz)			
Field strength of fundamental 50000 μV/m (94 dBμV/m) @ 3 m	2400~2483.5			
Field strength of fundamental 500 μV/m (94 dBμV/m) @ 3 m	Above 2483.5			

Restricted bands requirement for equipment operating in 2400MHz to 2483.5 MHz (15.249)

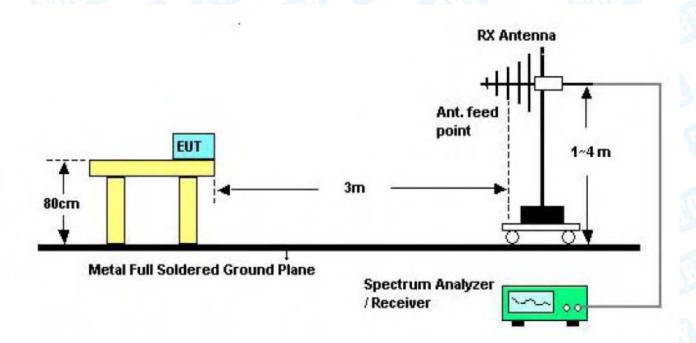
TOBY

Restricted Frequency Band (MHz)	(dBuV/m)(at 3 M)
2310~2390	Attenuated by at least 50 dB below the level of the fundamental or to the general radiated
2483.5~2500	emission limits in 15.209, whichever is the lesser attenuation

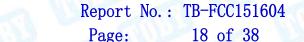
5.2 Test Setup



Bellow 30MHz Test Setup



Bellow 1000MHz Test Setup





Antenna tower

Horn antenna

Spectrum analyzer

Turntable 1.5m A 30cm

Pre-amp

Above 1GHz Test Setup

5.3 Test Procedure

- (1) The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1 GHz. The EUT was placed on a rotating 0.8m high above ground, the table was rotated 360 degrees to determine the position of the highest radiation.
- (2) Measurements at frequency above 1GHz. The EUT was placed on a rotating 1.5m high above the ground. RF absorbers covered the ground plane with a minimum area of 3.0m by 3.0m between the EUT and measurement receiver antenna. The RF absorber shall not exceed 30cm in high above the conducting floor. The table was rotated 360 degrees to determine the position of the highest radiation.
- (3) The Test antenna shall vary between 1m and 4m, Both Horizontal and Vertical antenna are set to make measurement.
- (4) The initial step in collecting conducted emission data is a spectrum analyzer peak detector mode pre-scanning the measurement frequency range. Significant peaks are then marked and then Quasi Peak detector mode re-measured.
- (5) If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit Bellow 1 GHz, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed. But the Peak Value and average value both need to comply with applicable limit above 1 GHz.
- (6) Testing frequency range below 1GHz the measuring instrument use VBW=120 kHz with Quasi-peak detection.
- (7) Testing frequency range above 1GHz the measuring instrument use RBW=1 MHz and VBW=3 MHz with Peak Detector for Peak Values, and use RBW=1 MHz and VBW=10 Hz with Peak Detector for Average Values.
- (8) For the actual test configuration, please see the test setup photo.



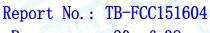
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5.4 EUT Operating Condition

The EUT was set to Continual Transmitting in maximum power, and new batteries are used during testing.

5.5 Test Data

Please see the next page.

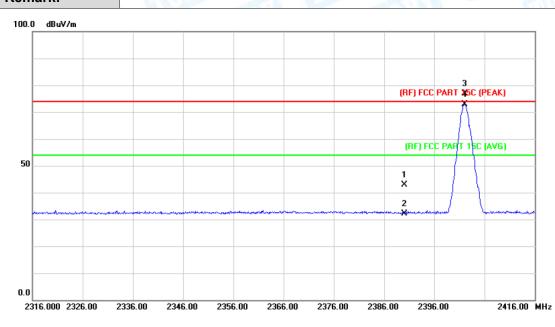




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5.6.1 Field Strength of the Fundamental

EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal	DAIL STATE	A V
Test Mode:	TX 2402MHz		
Remark:			3



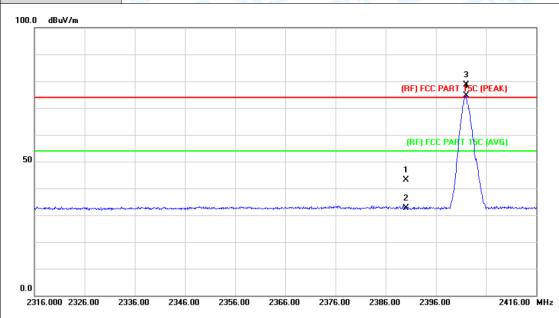
No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.10	0.77	42.87	74.00	-31.13	peak
2		2390.000	31.39	0.77	32.16	54.00	-21.84	AVG
3	Χ	2402.000	76.17	0.82	76.99	114.00	-37.01	peak
4	*	2402.000	72.02	0.82	72.84	94.00	-21.16	AVG





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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		MILL
Test Mode:	TX 2402MHz		
Remark:	33 - 61112	- William	A DE



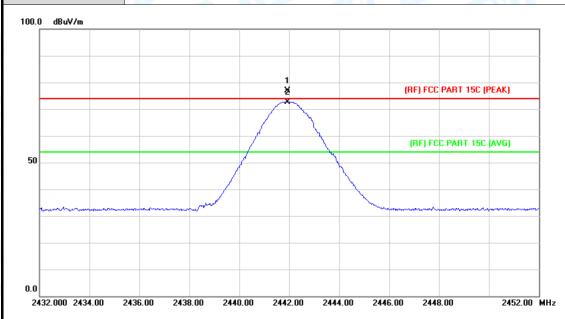
No.	Mk	Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		2390.000	42.34	0.77	43.11	74.00	-30.89	peak
2		2390.000	31.81	0.77	32.58	54.00	-21.42	AVG
3	Χ	2402.000	77.82	0.82	78.64	114.00	-35.36	peak
4	*	2402.000	73.83	0.82	74.65	94.00	-19.35	AVG





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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100
Temperature:	25 ℃	55%	
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		AMILE .
Test Mode:	TX 2442MHz		
Remark:	12 CIII	A VIII	



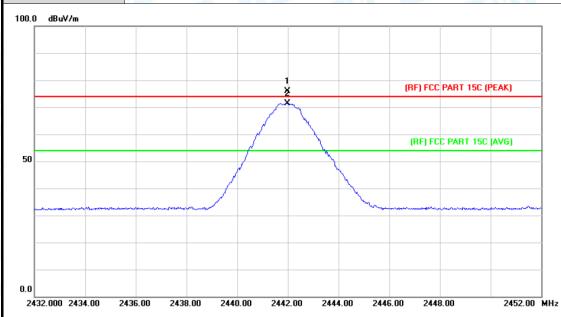
N	lo. MI	k. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2441.920	75.87	0.99	76.86	114.00	-37.14	peak
2	*	2441.920	71.76	0.99	72.75	94.00	-21.25	AVG



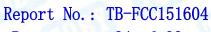


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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		MILL
Test Mode:	TX 2442MHz		
Remark:	33 - 611123	A VIII	



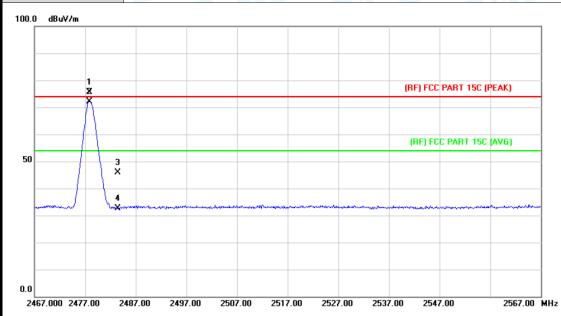
No	o. Mk	. Freq.	_	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2441.980	74.90	0.99	75.89	114.00	-38.11	peak
2	*	2441.980	70.39	0.99	71.38	94.00	-22.62	AVG





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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Horizontal		MIN.
Test Mode:	TX 2478MHz		
Remark:	33 - 611122		



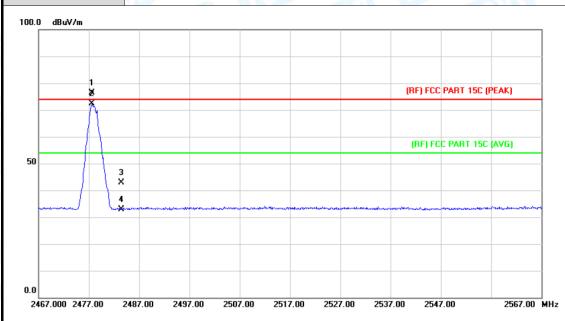
No	o. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	Χ	2477.800	74.55	1.14	75.69	114.00	-38.31	peak
2	*	2477.900	71.06	1.14	72.20	94.00	-21.80	AVG
3		2483.500	44.59	1.17	45.76	74.00	-28.24	peak
4		2483.500	31.55	1.17	32.72	54.00	-21.28	AVG



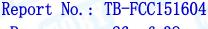


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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100
Temperature:	25 ℃	Relative Humidity:	55%
Test Voltage:	DC 3.7V		
Ant. Pol.	Vertical		MILL
Test Mode:	TX 2478MHz		
Remark:	33 - 61122	A WILL	1



No	. Mk	. Freq.	Reading Level	Correct Factor	Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	X	2477.600	75.24	1.14	76.38	114.00	-37.62	peak
2	*	2477.600	71.28	1.14	72.42	94.00	-21.58	AVG
3		2483.500	41.61	1.17	42.78	74.00	-31.22	peak
4		2483.500	31.72	1.17	32.89	54.00	-21.11	AVG





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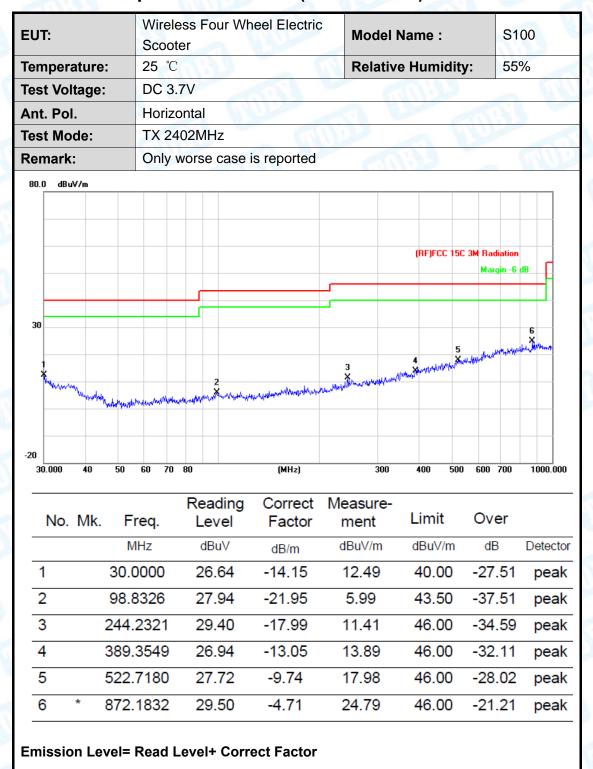
5.6.2 Radiated Spurious Emission (9 KHz~30 MHz)

From 9 KHz to 30 MHz: Conclusion: PASS

Note: The amplitude of spurious emissions which are attenuated by more than 20dB

below the permissible value has no need to be reported.

5.6.3 Radiated Spurious Emission (Below 1 GHz)







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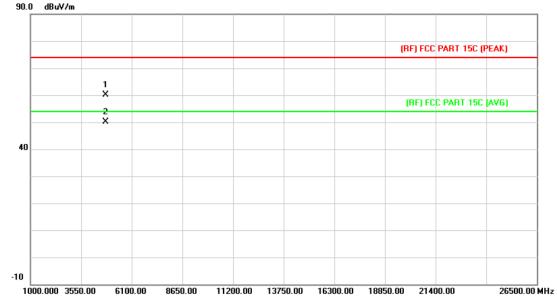
EUT	Wirele Scoote			Wheel Electri	С	odel Name :	5	\$100	
Tem	perature:		25 °C			R	elative Hum	idity: 5	55%
Test	t Voltage:		DC 3	.7V			a W		
Ant.	Pol.		Vertic	cal		The same		J 81	Market Land
Test Mode:			TX 2	402MHz		6200		3	
Remark: Only worse case is reported									
30	dBuV/m	They broken to the	sown of which	- 2 Maridan data da la caracteria da la	tolders, phospholist, pholistophistophistophistophis	3 X	(RFJFCC 15	Margin -6	
-20 30	.000 40	50 (60 70	80	(MHz)	3	00 400 50	0 600 700	1000.000
	No. Mk.	Fre	q.	Readin Level	•	Measure ment	- Limit	Over	
		MHz	Z	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detecto
1	3	35.62	40	26.48	-17.61	8.87	40.00	-31.13	peak
2	1	01.28	385	28.09	-21.85	6.24	43.50	-37.26	peak
3	2	19.07		29.23	-19.16	10.07	46.00	-35.93	peak
		19.07 59.18	753	29.23 27.86		10.07 13.76	46.00 46.00	-35.93 -32.24	
3	3		753 360		-14.10				peak



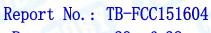
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5.6.4 Radiated Spurious Emission (Above 1 GHz)

EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100				
Temperature:	25 ℃	Relative Humidity:	55%				
Test Voltage:	DC 3.7V	OH!					
Ant. Pol.	Horizontal						
Test Mode:	TX 2402MHz						
Remark:	No report for the emission which prescribed limit.	h more than 10 dB below	the				
90.0 dBuV/m							
		(DE) FOO DADY 150					



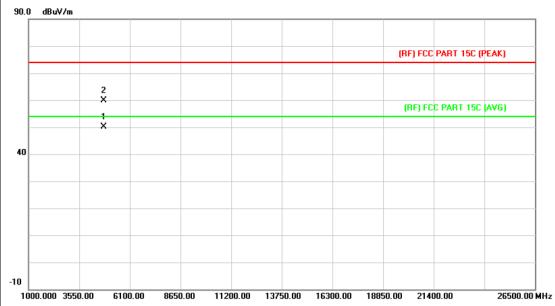
No	o. Mk	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4803.562	46.68	13.44	60.12	74.00	-13.88	peak
2	*	4805.470	36.58	13.45	50.03	54.00	-3.97	AVG



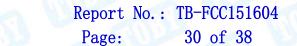


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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical		THUE			
Test Mode:	TX 2402MHz					
Remark:	No report for the emission which prescribed limit.	more than 10 dB below t	the			

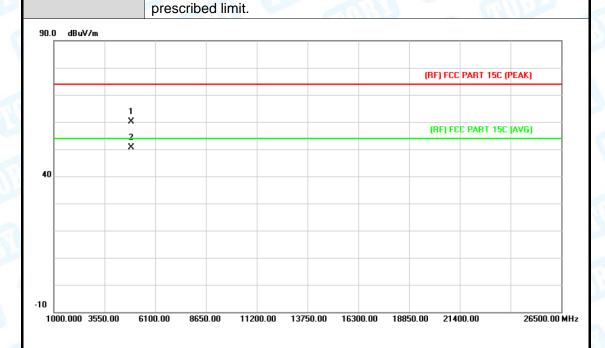


-	No.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4804.981	36.69	13.44	50.13	54.00	-3.87	AVG
2			4805.086	46.52	13.45	59.97	74.00	-14.03	peak

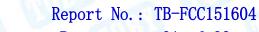




Wireless Four Wheel Electric EUT: **Model Name:** S100 Scooter Temperature: 25 ℃ **Relative Humidity:** 55% DC 3.7V **Test Voltage:** Ant. Pol. Horizontal **Test Mode:** TX 2442MHz Remark: No report for the emission which more than 10 dB below the



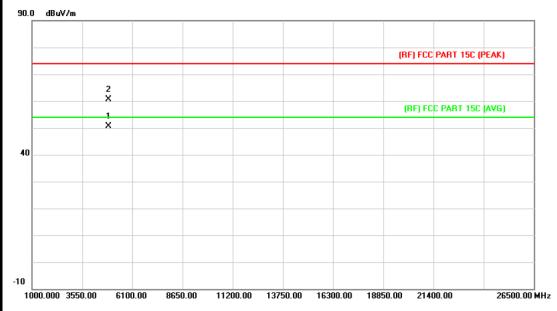
No	o. Mk.	. Freq.	Reading Level		Measure- ment	Limit	Over	
		MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1		4883.640	46.23	13.92	60.15	74.00	-13.85	peak
2	*	4883.868	36.71	13.92	50.63	54.00	-3.37	AVG



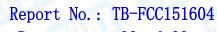


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EUT:	Wireless Four Wheel Electric Scooter	Model Name :	S100			
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX 2442MHz					
Remark:	No report for the emission which prescribed limit.	n more than 10 dB below	the			



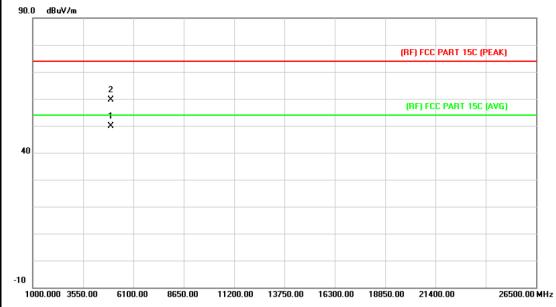
N	0.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∀	dB/m	dBuV/m	dBuV/m	dB	Detector
1	,	k	4883.823	36.83	13.92	50.75	54.00	-3.25	AVG
2			4883.889	46.82	13.92	60.74	74.00	-13.26	peak





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EUT:	Wireless Four Wheel Electric Scooter	Model Name :				
Temperature:	25 ℃	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Horizontal					
Test Mode:	TX 2478MHz					
Remark:	nore than 10 dB below th	ne				

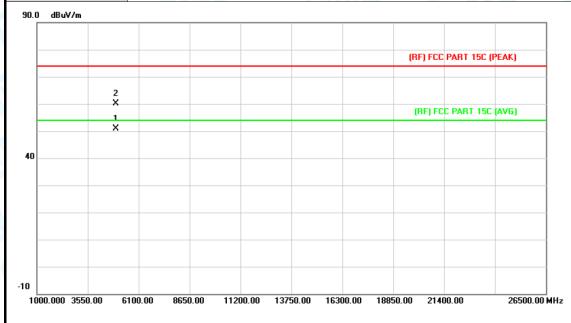


1	Vo.	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1		*	4955.853	35.59	14.34	49.93	54.00	-4.07	AVG
2			4956.216	45.20	14.34	59.54	74.00	-14.46	peak



33 of 38 Page:

EUT:	Wireless Four Wheel Electric Scooter	Model Name:				
Temperature:	25 °C	Relative Humidity:	55%			
Test Voltage:	DC 3.7V					
Ant. Pol.	Vertical					
Test Mode:	TX 2478MHz					
Remark:	No report for the emission which more than 10 dB below the					
prescribed limit.						



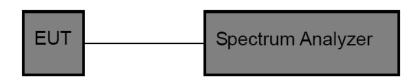
N	lo. I	Mk.	Freq.	Reading Level		Measure- ment	Limit	Over	
			MHz	dBu∨	dB/m	dBuV/m	dBuV/m	dB	Detector
1	*	r	4955.814	36.58	14.34	50.92	54.00	-3.08	AVG
2			4955.844	45.82	14.34	60.16	74.00	-13.84	peak



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6. Bandwidth Test

6.1 Test Setup



6.2 Test Procedure

- (1) The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram above.
- (2) Spectrum Setting:

Bandwidth: RBW=100 kHz, VBW=300kHz.

(3) The bandwidth is measured at an amplitude level reduced 20dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst –case (i.e the widest) bandwidth.

6.3 EUT Operating Condition

The EUT was set to continuously transmitting for the Bandwidth Test.

6.4 Test Data

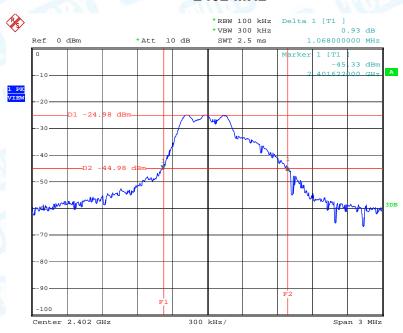




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Low Channel Frequency (MHz)	20dB Bandwidth (MHz)
2402	1.068

2402 MHz



Date: 23.FEB.2017 13:09:50

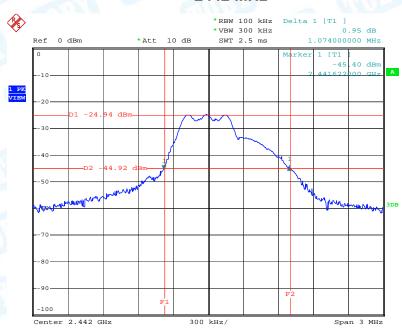




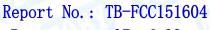
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MID Channel Frequency (MHz)	20dB Bandwidth (MHz)
2442	1.074

2442 MHz



Date: 23.FEB.2017 13:16:13

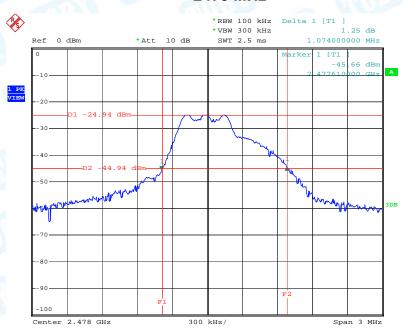




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HIGH Channel Frequency (MHz)	20dB Bandwidth (MHz)
2478	1.074

2478 MHz



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7. Antenna Requirement

7.1 Standard Requirement

7.1.1 Standard FCC Part 15.203

7.1.2 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 shall be considered sufficient to comply with the provisions of this Section. 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.

7.2 Antenna Connected Construction

The directional gains of the antenna used for transmitting is 0 dBi, and the antenna de-signed with permanent attachment and no consideration of replacement. Please see the EUT photo for details.

7.3 Result

The EUT antenna is a PCB Antenna. It complies with the standard requirement.

Antenna Type	
	▼ Permanent attached antenna
A VIII	□ Unique connector antenna
on Bi	□ Professional installation antenna

----END OF REPORT----