RADIO TEST REPORT
FCC ID: 2APBB-S11

Product：	Electric skateboard
Trade Mark：	FREEMAN
Model Name：	S11
Serial Model：	S12, S13, S14, S15, S16, S17, S18, S19
Report No.：	SNR171130002001E

Prepared for

Freeman Intelligent Power Limited

2nd Bldg,Gangbei Industrial Park, Baohe Rd,Longcheng Street,
Longgang District Shenzhen, 518172 China

Prepared by

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TEST RESULT CERTIFICATION

Applicant's name	:	Freeman Intelligent Power Limited
Address	:	2nd Bldg,Gangbei Industrial Park, Baohe Rd,Longcheng Street,Longgang District Shenzhen, 518172 China
Manufacturer's Name	:	Freeman IT Limited
Address	:	2nd Bldg,Gangbei Industrial Park, Baohe Rd,Longcheng Street, Longgang District Shenzhen, 518172 China
Product description		
Product name	:	Electric skateboard
Model and/or type reference	:	S11
Serial Model：		S12, S13, S14, S15, S16, S17, S18, S19
Rating(s)	:	DC 3.7V from battery or DC 5V from USB Port
Standards	:	FCC Part15.249: 2018
Test procedure		ANSI C63.10-2013

This device described above has been tested by NTEK, and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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Date of Test	:	
Date (s) of performance of tests	:	06 Dec. 2017 ~18 May. 2018
Date of Issue	:	18 May. 2018
Test Result	:	**Pass**

Testing Engineer : Allen Liu

(Allen Liu)

Technical Manager : Jason Chen

(Jason Chen)

Authorized Signatory : Sam Chen

(Sam Chen)

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1. SUMMARY OF TEST RESULTS

Test procedures according to the technical standards:

FCC Part15, Subpart C (15.249)			
Standard Section	Test Item	Judgment	Remark
15.207	Conducted Emission	Pass	
15.203	Antenna Requirement	Pass	
15.249 15.209	Radiated Spurious Emission	Pass	
15.249(2)	Frequency Tolerance	Pass	
15.249(a)	Fundamental Measurement	Pass	
15.205	Band Edge Emission	Pass	
15.249	Occupied Bandwidth	Pass	

1.1 TEST FACILITY

Shenzhen NTEK Testing Technology Co., Ltd
Add. : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126 P.R. China.
FCC FRN Registration No.:463705; IC Registration No.:9270A-1
CNAS Registration No.:L5516

1.2 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement **y ± 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** %。

No.	Item	Uncertainty
1	Conducted Emission Test	±1.38dB
2	RF power,conducted	±0.16dB
3	Spurious emissions,conducted	±0.21dB
4	All emissions,radiated(<1G)	±4.68dB
5	All emissions,radiated(>1G)	±4.89dB
6	Temperature	±0.5°C
7	Humidity	±2%

2. GENERAL INFORMATION

2.1 GENERAL DESCRIPTION OF EUT

Equipment	Electric skateboard
Trade Mark	FREEMAN
Model Name	S11
Serial Model	S12, S13, S14, S15, S16, S17, S18, S19
Model Difference	All models are the same circuit and RF module, except the plate type.
Product Description	The EUT is a Electric skateboard Operation Frequency: 2420-2480MHz Modulation Type: GFSK Antenna Designation: PCB Antenna Antenna Gain(Peak) 1 dBi Based on the application, features, or specification exhibited in User's Manual. More details of EUT technical specification, please refer to the User's Manual.
Channel List	Please refer to the Note 2.
Adapter	N/A
Battery	DC 3.7V

Note:

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

2.

Channel	Frequency(MHz)
01	2420
02	2421
…	…
29	2429
30	2430
…	…
59	2479
60	2480

3.

Table for Filed Antenna

Ant.	Brand	Model Name	Antenna Type	Connector	Gain (dBi)	NOTE
1	N/A	N/A	PCB Antenna	N/A	1	Antenna

2.2 DESCRIPTION OF TEST MODES

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 above was evaluated respectively.

Pretest Mode	Description
Mode 1	CH01
Mode 2	CH30
Mode 3	CH60
Mode 4	Normal link

For Radiated Spurious Emission	
Pretest Mode	Description
Mode 1	CH01
Mode 2	CH30
Mode 3	CH60

For Conducted Emission	
Final Test Mode	Description
Mode 1	CH01
Mode 2	CH30
Mode 3	CH60
Mode 4	Normal link

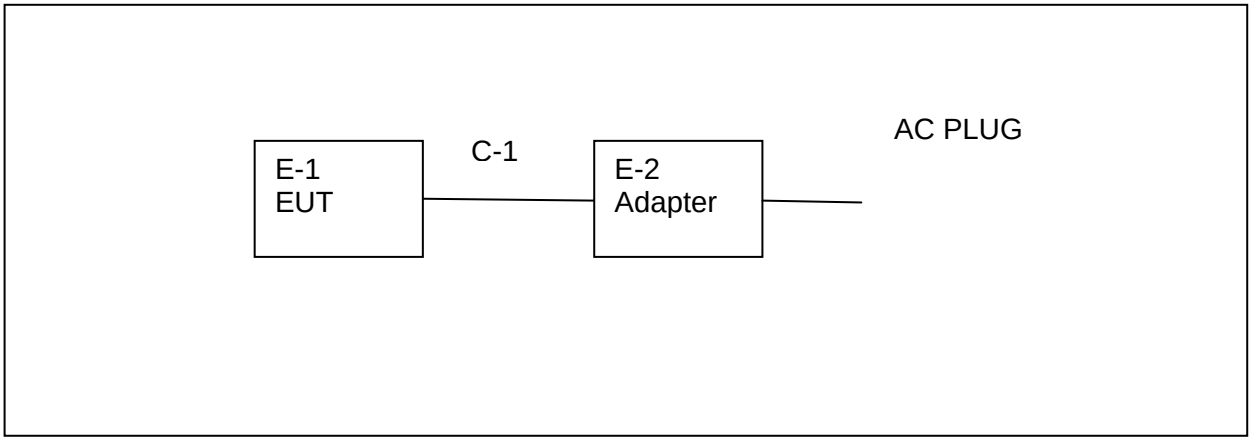
Note:

(1) The measurements are performed at the highest, middle, lowest available channels.

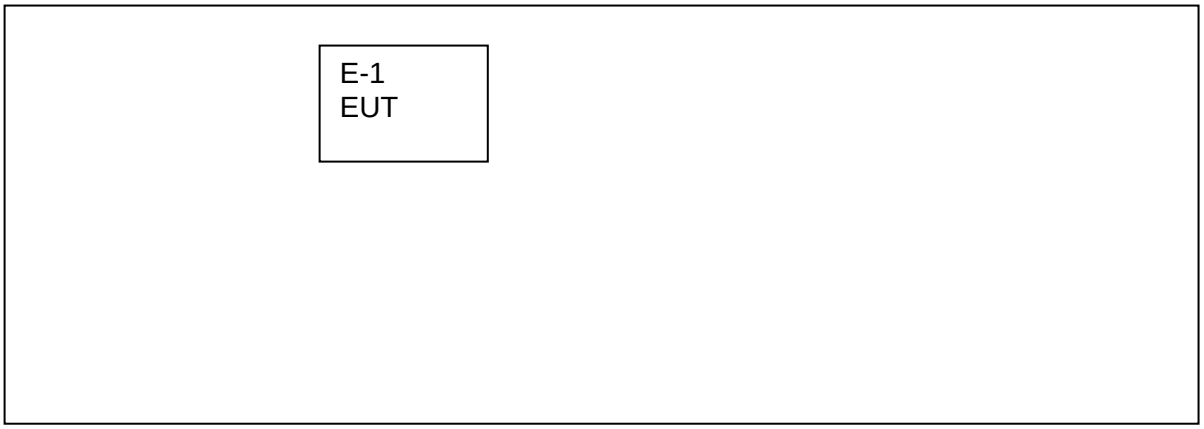
(2) EUT built-in battery-powered, the test battery is fully-charged.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

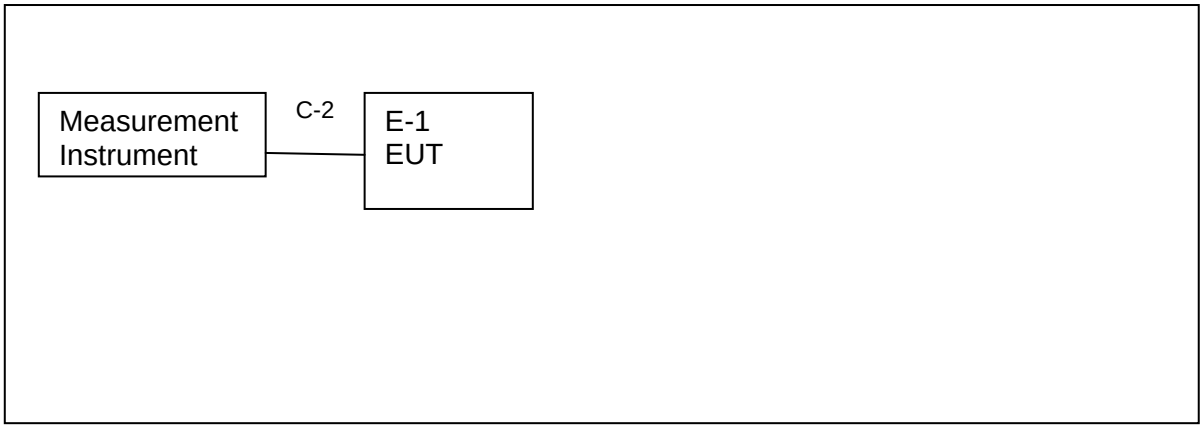
Conducted Emission Mode



Radiated Spurious Emission Test



For Conducted Test Cases



2.4 DESCRIPTION OF SUPPORT UNITS(CONDUCTED MODE)

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Mfr/Brand	Model/Type No.	Series No.	Note
E-1	Electric skateboard	FREEMAN	S11	N/A	EUT
E-2	Adapter	N/A	N/A	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable	NO	NO	1m	
C-2	RF Cable	NO	NO	0.5m	

Note:

(1) The support equipment was authorized by Declaration of Confirmation.
(2) For detachable type I/O cable should be specified the length in cm in『Length』column.

2.5 EQUIPMENTS LIST FOR ALL TEST ITEMS

Radiation Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Aglient	E4407B	MY45108040	2017.06.06	2018.06.05	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2017.11.10	2018.11.09	1 year
3	EMI Test Receiver	Agilent	N9038A	MY53227146	2017.06.06	2018.06.05	1 year
4	Test Receiver	R&S	ESPI	101318	2017.06.06	2018.06.05	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2018.04.09	2019.04.08	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2017.06.06	2018.06.05	1 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2018.04.09	2019.04.08	1 year
8	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2017.07.06	2018.07.05	1 year
9	Amplifier	EMC	EMC051835SE	980246	2017.08.09	2018.08.08	1 year
10	Amplifier	MITEQ	TTA1840-35-HG	177156	2017.06.06	2018.06.05	1 year
11	Loop Antenna	ARA	PLA-1030/B	1029	2017.06.06	2018.06.05	1 year
12	Power Meter	DARE	RPR3006W	15I00041SNO84	2017.08.07	2018.08.06	1 year
13	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2017.04.21	2020.04.20	3 year
14	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2017.04.21	2020.04.20	3 year
15	High Test Cable(1G-40 GHz)	N/A	R-03	N/A	2017.04.21	2020.04.20	3 year
16	High Test Cable(1G-40 GHz)	N/A	R-04	N/A	2017.04.21	2020.04.20	3 year
17	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

Note:
We will use the temporary antenna connector (soldered on the PCB board) When conducted test
And this temporary antenna connector is listed within the instrument list

Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2017.06.06	2018.06.05	1 year
2	LISN	R&S	ENV216	101313	2018.04.19	2019.04.18	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2017.06.06	2018.06.05	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2017.06.06	2018.06.05	1 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2017.04.21	2020.04.20	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2017.04.21	2020.04.20	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2017.04.21	2020.04.20	3 year

Note: Each piece of equipment is scheduled for calibration once a year except the Test Cable which is scheduled for calibration every 3 years.

3. ANTENNA REQUIREMENT

3.1 STANDARD REQUIREMENT

15.203 requirement: For intentional device, according to 15.203: 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.

3.2 EUT ANTENNA

The EUT antenna is permanent attached PCB antenna (Gain:1dBi). It comply with the standard requirement.

3.3 CONDUCTED EMISSION MEASUREMENT

3.3.1 POWER LINE CONDUCTED EMISSION Limits (Frequency Range 150KHz-30MHz)

According to FCC Part 15.207(a)

Frequency(MHz)	Conducted Emission Limit	
	Quasi-peak	Average
0.15-0.5	66-56*	56-46*
0.5-5.0	56	46
5.0-30.0	60	50

Note: 1. *Decreases with the logarithm of the frequency
2. The lower limit shall apply at the transition frequencies
3. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50MHz.

The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

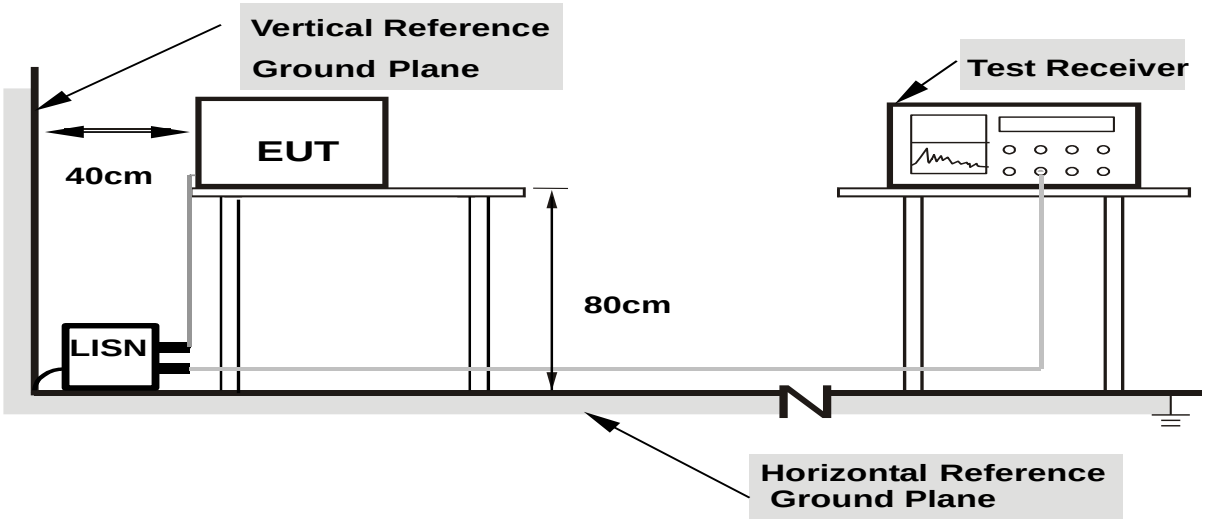
3.3.2 TEST PROCEDURE

a. The EUT was placed 0.4 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.
b. 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.
c. 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.
d. LISN at least 80 cm from nearest part of EUT chassis.
e. For the actual test configuration, please refer to the related Item –EUT Test Photos.

3.3.3 DEVIATION FROM TEST STANDARD

No deviation

3.3.4 TEST SETUP



Note: 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 from other units and other metal planes

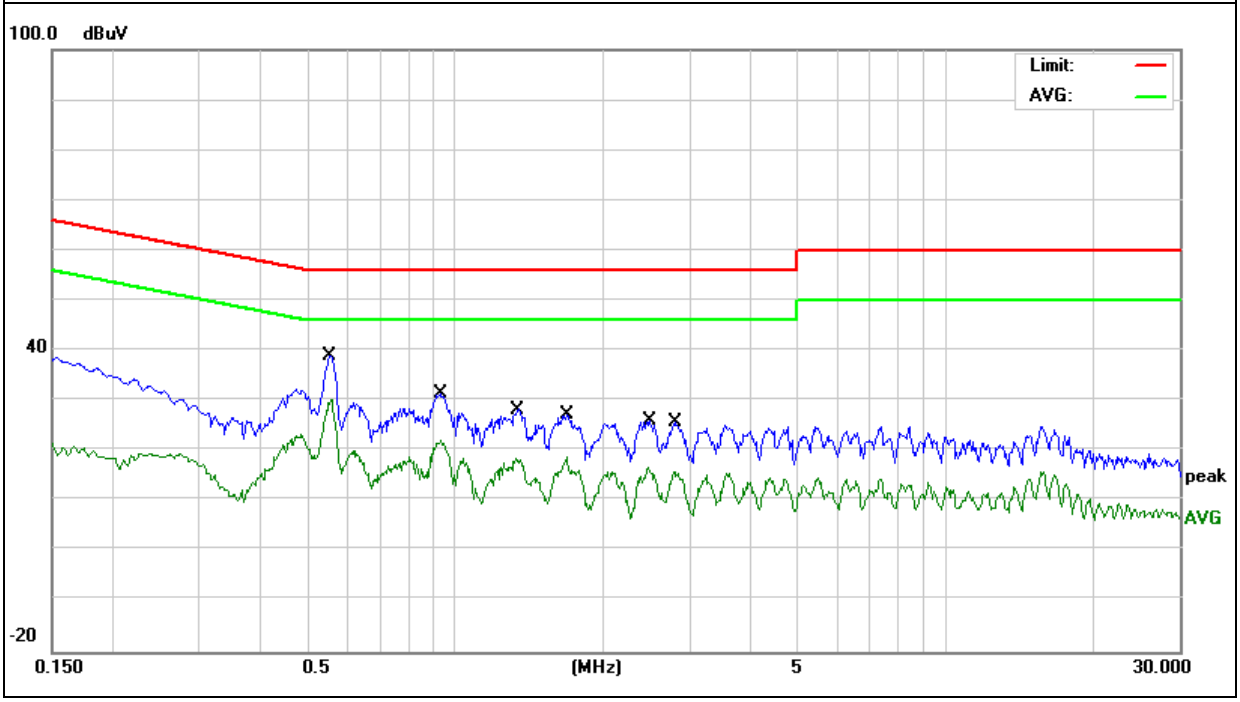
3.2.5 TEST RESULT

EUT：	Electric skateboard	Model Name. ：	S11
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from adapter AC 120V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.5540	29.02	9.83	38.85	56.00	-17.15	QP
0.5540	20.51	9.83	30.34	46.00	-15.66	AVG
0.9380	21.69	9.91	31.60	56.00	-24.40	QP
0.9380	12.11	9.91	22.02	46.00	-23.98	AVG
1.3260	18.53	9.90	28.43	56.00	-27.57	QP
1.3260	8.80	9.90	18.70	46.00	-27.30	AVG
1.6820	17.33	9.87	27.20	56.00	-28.80	QP
1.6820	8.83	9.87	18.70	46.00	-27.30	AVG
2.4700	16.07	9.93	26.00	56.00	-30.00	QP
2.4700	6.75	9.93	16.68	46.00	-29.32	AVG
2.7860	15.71	10.01	25.72	56.00	-30.28	QP
2.7860	5.96	10.01	15.97	46.00	-30.03	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

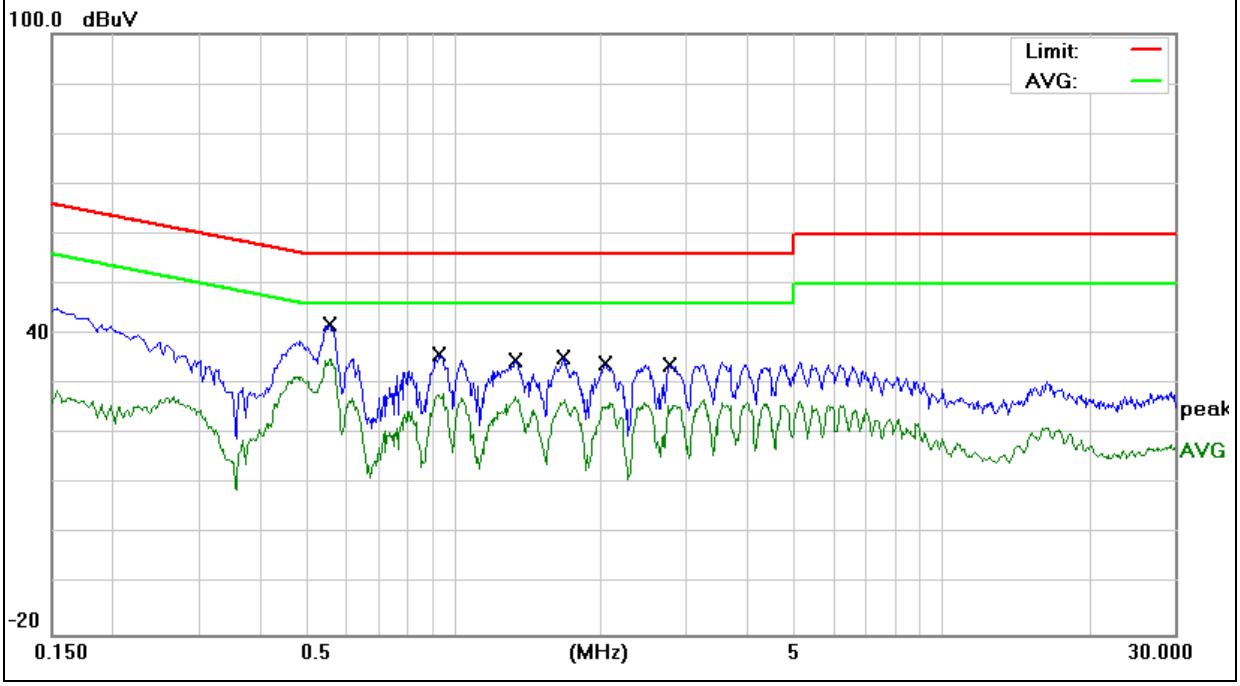


EUT：	Electric skateboard	Model Name. ：	S11
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from adapter AC 120V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.5552	31.91	9.89	41.80	56.00	-14.20	QP
0.5552	15.76	9.89	25.65	46.00	-20.35	AVG
0.9300	31.15	9.88	41.03	56.00	-14.97	QP
0.9300	23.03	9.88	32.91	46.00	-13.09	AVG
1.3340	27.79	9.91	37.70	56.00	-18.30	QP
1.3340	20.73	9.91	30.64	46.00	-15.36	AVG
1.6738	28.09	9.91	38.00	56.00	-18.00	QP
1.6738	19.64	9.91	29.55	46.00	-16.45	AVG
2.0499	26.80	9.92	36.72	56.00	-19.28	QP
2.0499	19.06	9.92	28.98	46.00	-17.02	AVG
2.7620	25.93	9.93	35.86	56.00	-20.14	QP
2.7620	17.94	9.93	27.87	46.00	-18.13	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

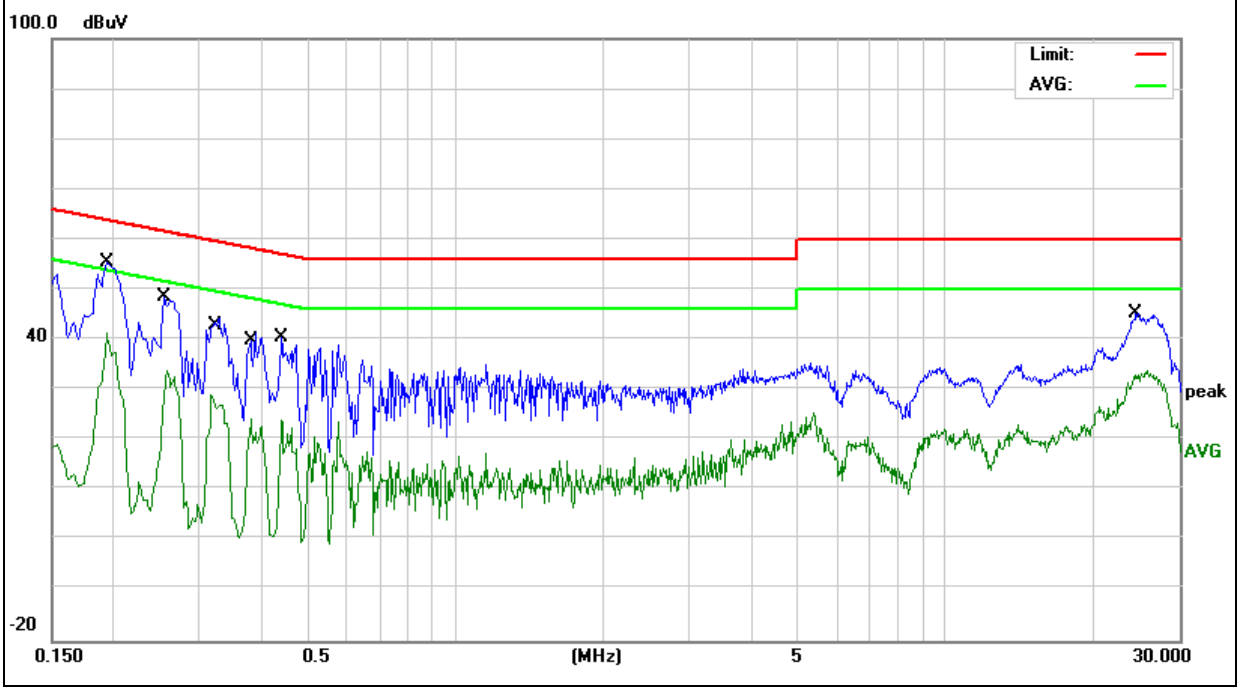


EUT：	Electric skateboard	Model Name. ：	S11
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from adapter AC 240V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1940	45.65	9.82	55.47	63.86	-8.39	QP
0.1940	31.46	9.82	41.28	53.86	-12.58	AVG
0.2540	38.60	9.82	48.42	61.62	-13.20	QP
0.2540	24.04	9.82	33.86	51.62	-17.76	AVG
0.3180	34.65	9.82	44.47	59.76	-15.29	QP
0.3180	19.16	9.82	28.98	49.76	-20.78	AVG
0.3820	31.54	9.83	41.37	58.23	-16.86	QP
0.3820	14.47	9.83	24.30	48.23	-23.93	AVG
0.4420	30.49	9.83	40.32	57.02	-16.70	QP
0.4420	14.08	9.83	23.91	47.02	-23.11	AVG
24.4060	35.05	10.31	45.36	60.00	-14.64	QP
24.4060	23.53	10.31	33.84	50.00	-16.16	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

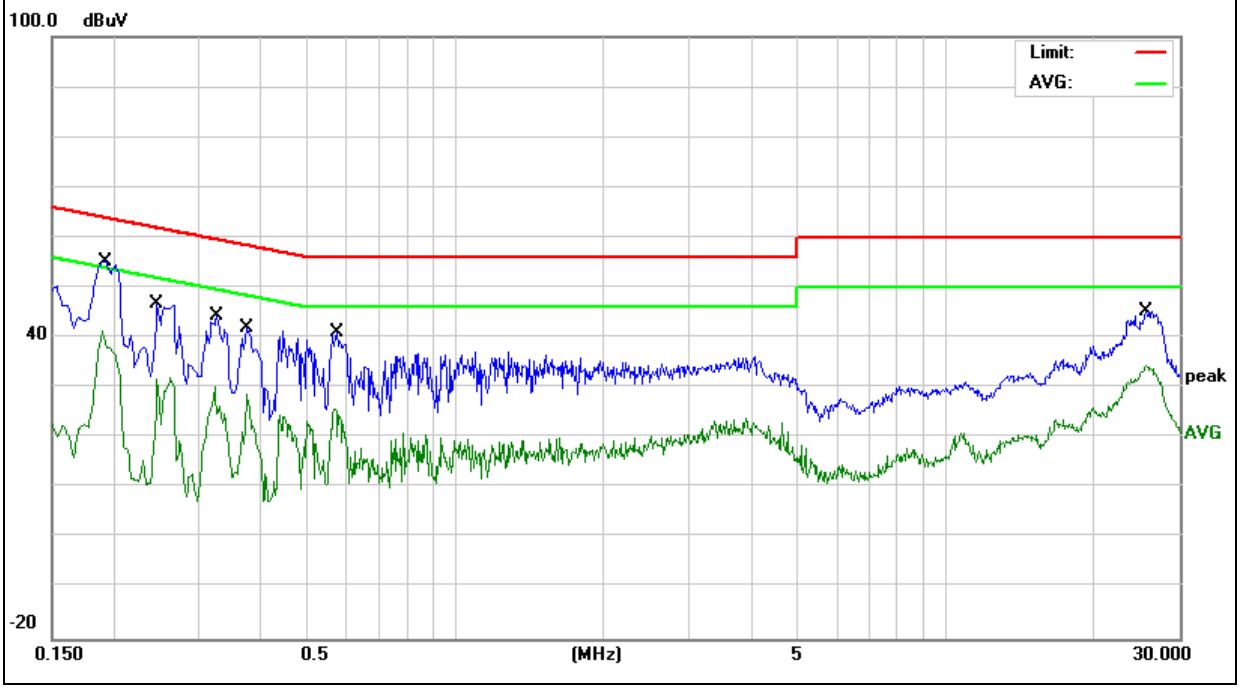


EUT：	Electric skateboard	Model Name. ：	S11
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from adapter AC 240V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1900	45.35	9.92	55.27	64.03	-8.76	QP
0.1900	31.46	9.92	41.38	54.03	-12.65	AVG
0.2460	36.89	9.92	46.81	61.89	-15.08	QP
0.2460	22.02	9.92	31.94	51.89	-19.95	AVG
0.3220	34.29	9.92	44.21	59.65	-15.44	QP
0.3220	20.45	9.92	30.37	49.65	-19.28	AVG
0.3740	32.03	9.93	41.96	58.41	-16.45	QP
0.3740	18.90	9.93	28.83	48.41	-19.58	AVG
0.5660	31.21	9.93	41.14	56.00	-14.86	QP
0.5660	15.82	9.93	25.75	46.00	-20.25	AVG
25.7180	34.99	10.39	45.38	60.00	-14.62	QP
25.7180	24.06	10.39	34.45	50.00	-15.55	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.



3.4 RADIATED EMISSION MEASUREMENT

3.4.1 Radiated Emission Limits (FCC 15.209)

Frequencies (MHz)	Field Strength (micorvolts/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
Frequency (MHz)	Limit (dBuV)	
30~88	40	3
88~216	43.5	3
216~960	46	3
960 -10000	54.00	3
*902 - 928	94.00	3

Note:

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

(2) Emission level (dBuV/m)=20log Emission level (uV/m).

(3) *Note: This is the limit for the fundamental frequency.

LIMITS OF RADIATED EMISSION MEASUREMENT (FCC 15.249)

Frequency of Emission (MHz)	Field Strength of fundamental ((millivolts /meter)	Field Strength of Harmonics (microvolts/meter)
2400-2483.5 MHz	50	500

Notes:

(1) 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.

Spectrum Parameter	Setting
Attenuation	Auto
Start Frequency	1000 MHz
Stop Frequency	10th carrier harmonic
RB / VB (emission in restricted band)	1MHz / 1MHz for Peak

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

3.4.2 TEST PROCEDURE

a. The measuring distance of at 3 m shall be used for measurements at frequency up to 1GHz. For frequencies above 1GHz, any suitable measuring distance may be used.
b. The EUT was placed on the top of a rotating table 0.8 m for below 1GHz and 1.5m for above 1GHz the ground at a 3 meter. The table was rotated 360 degrees to determine the position of the highest radiation.
c. The height of the equipment or of the substitution antenna shall be 0.8 m for below 1GHz and 1.5m for above 1GHz; the height of the test antenna shall vary between 1 m to 4 m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
d. 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.
e. If the Peak Mode measured value compliance with and lower than Quasi Peak Mode Limit, the EUT shall be deemed to meet QP Limits and then no additional QP Mode measurement performed.
f. For the actual test configuration, please refer to the related Item –EUT Test Photos.

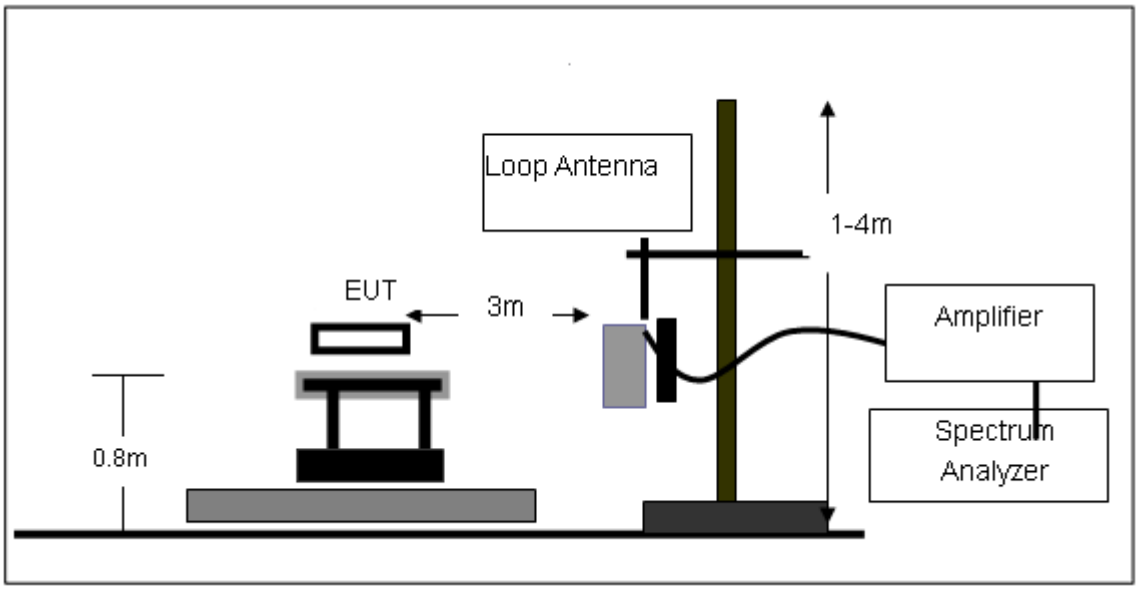
Note:

Both horizontal and vertical antenna polarities were tested
and performed pretest to three orthogonal axis. The worst case emissions were reported

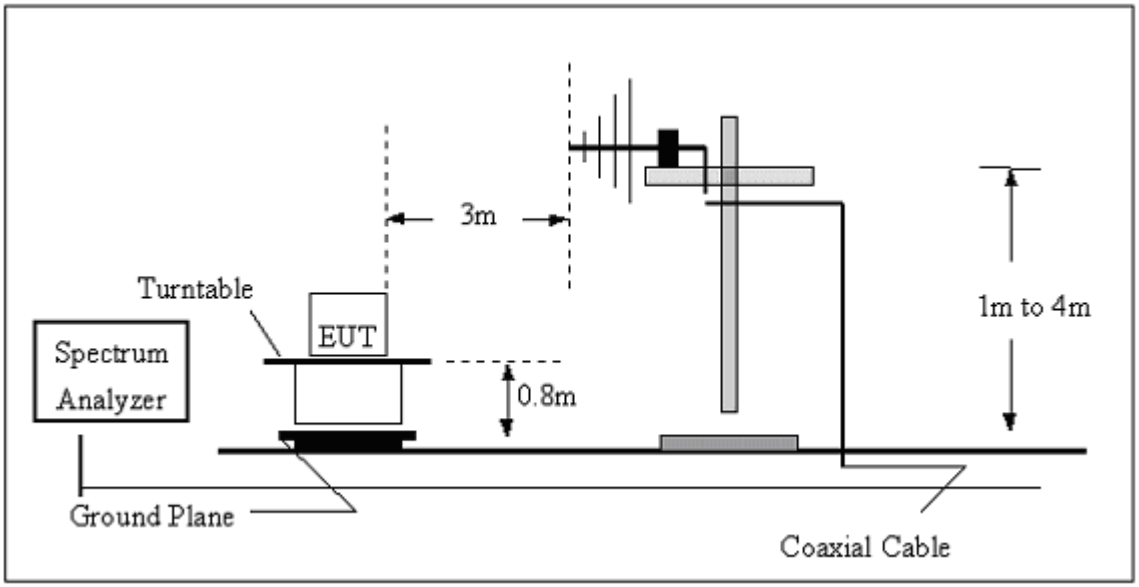
3.4.3 DEVIATION FROM TEST STANDARD

No deviation

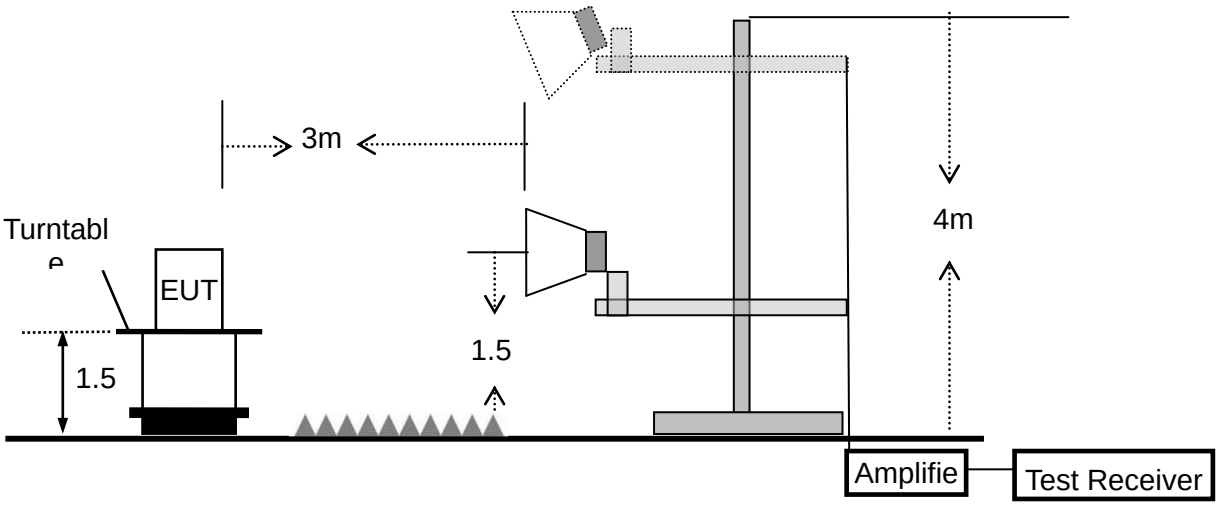
（A）Radiated Emission Test-Up Frequency Below 30MHz



（B）Radiated Emission Test-Up Frequency 30MHz~1GHz



（C）Radiated Emission Test-Up Frequency Above 1GHz



3.4.4 TEST RESULTS (BELOW 30MHz)

EUT：	Electric skateboard	Model Name. ：	S11
Temperature：	20 ℃	Relative Humidtity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	TX	Polarization :	--

Freq.	Reading	Limit	Margin	State
(MHz)	(dBuV/m)	(dBuV/m)	(dB)	P/F
--	--	--	--	PASS
--	--	--	--	PASS

NOTE:

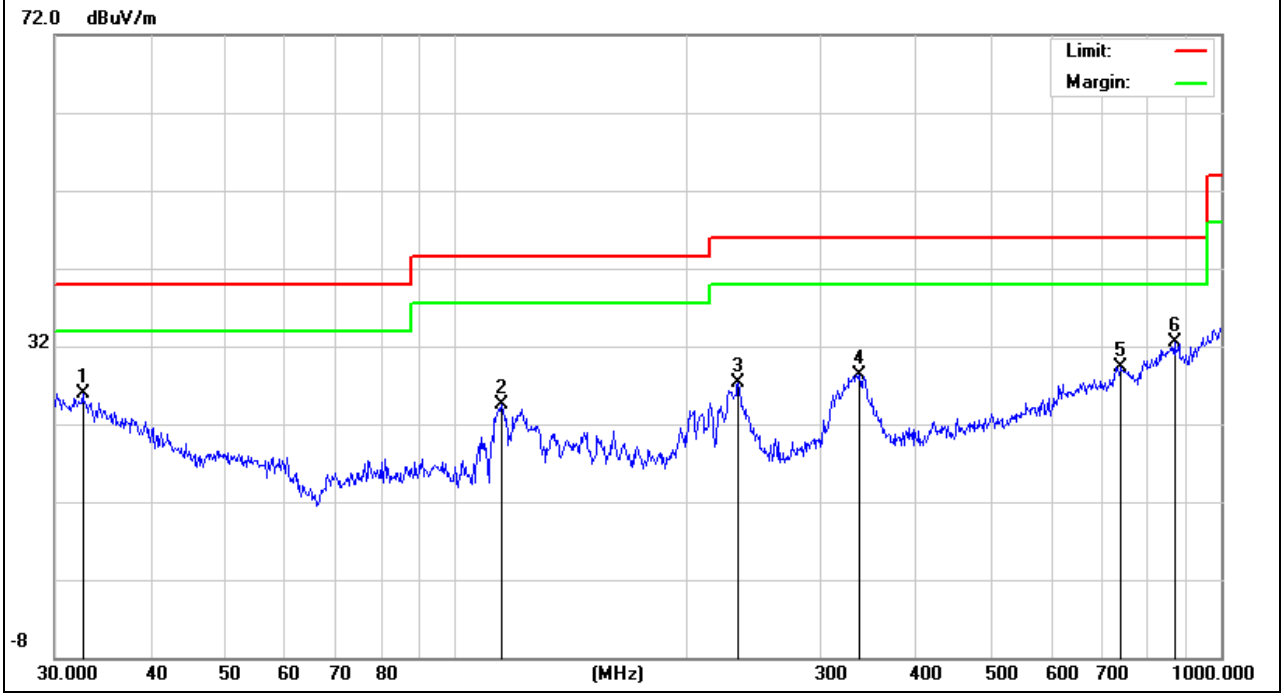
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =20 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.4.5 TEST RESULTS (BELOW 1000 MHz)

EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 1	Polarization :	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
32.6340	5.89	20.04	25.93	40.00	-14.07	QP
114.9169	14.45	10.05	24.50	43.50	-19.00	QP
234.1684	15.20	12.05	27.25	46.00	-18.75	QP
337.2155	14.18	14.15	28.33	46.00	-17.67	QP
739.6603	6.99	22.36	29.35	46.00	-16.65	QP
869.1300	6.49	25.93	32.42	46.00	-13.58	QP

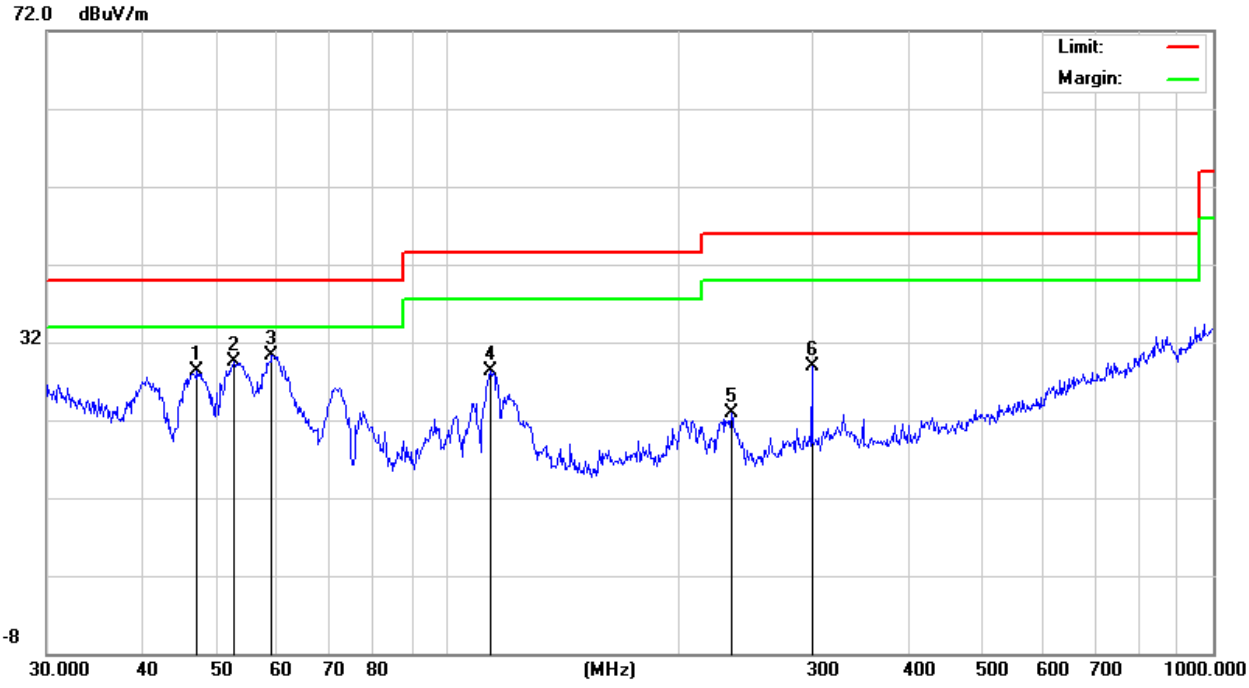
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 1	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
47.1599	15.14	13.23	28.37	40.00	-11.63	QP
52.7599	16.60	12.89	29.49	40.00	-10.51	QP
59.0251	18.74	11.58	30.32	40.00	-9.68	QP
113.7143	18.14	10.09	28.23	43.50	-15.27	QP
234.9909	10.90	12.05	22.95	46.00	-23.05	QP
299.3158	14.10	14.71	28.81	46.00	-17.19	QP

Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.

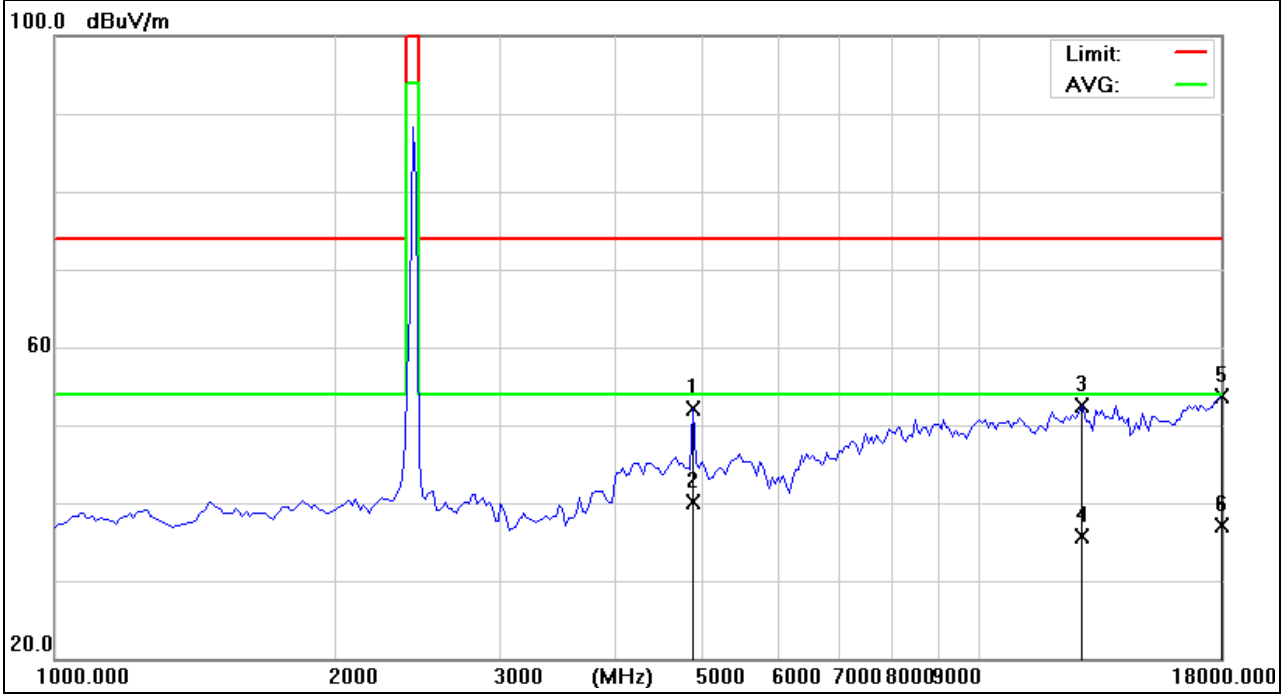


3.4.6 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 1	Polarization :	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4867.500	39.98	12.13	52.11	74.00	-21.89	peak
4867.500	27.89	12.13	40.02	54.00	-13.98	AVG
12772.500	-3.64	56.23	52.59	74.00	-21.41	peak
12772.500	-20.58	56.23	35.65	54.00	-18.35	AVG
18000.000	-13.23	66.94	53.71	74.00	-20.29	peak
18000.000	-29.84	66.94	37.10	54.00	-16.90	AVG

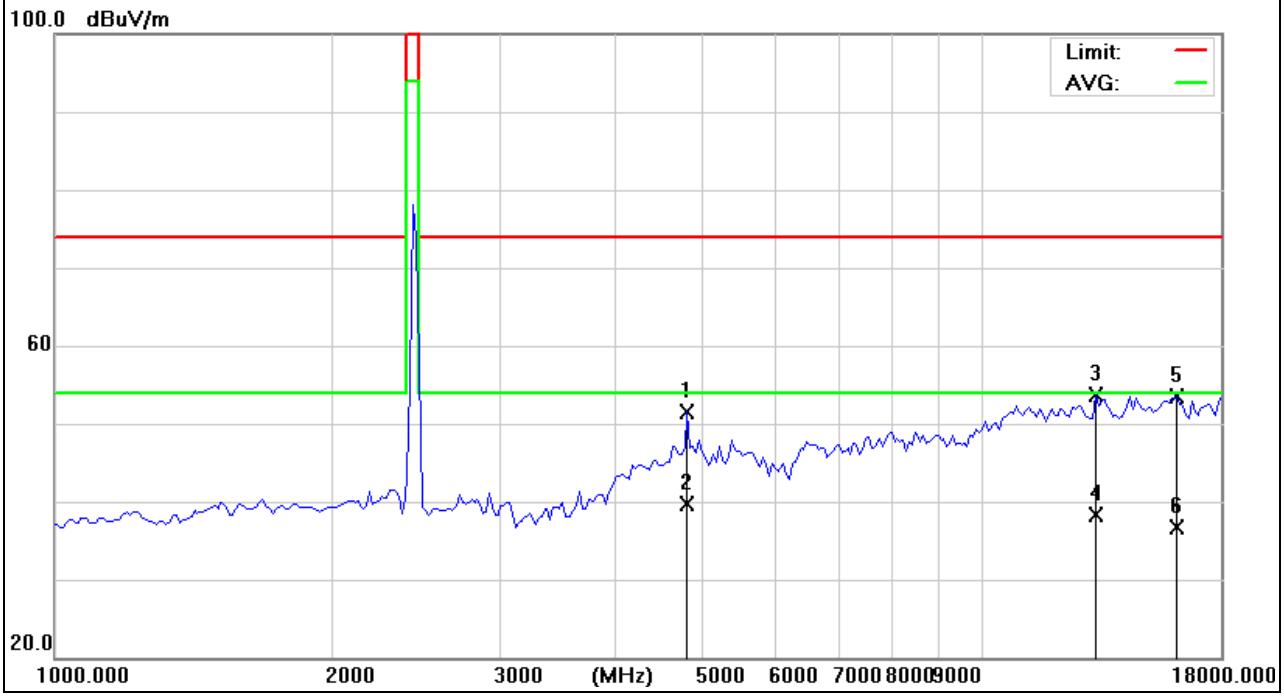
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 1	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4825.000	39.48	11.97	51.45	74.00	-22.55	peak
4825.000	27.69	11.97	39.66	54.00	-14.34	AVG
13197.500	-3.09	56.76	53.67	74.00	-20.33	peak
13197.500	-18.51	56.76	38.25	54.00	-15.75	peak
16257.500	-8.01	61.46	53.45	74.00	-20.55	peak
16257.500	-24.80	61.46	36.66	54.00	-17.34	peak

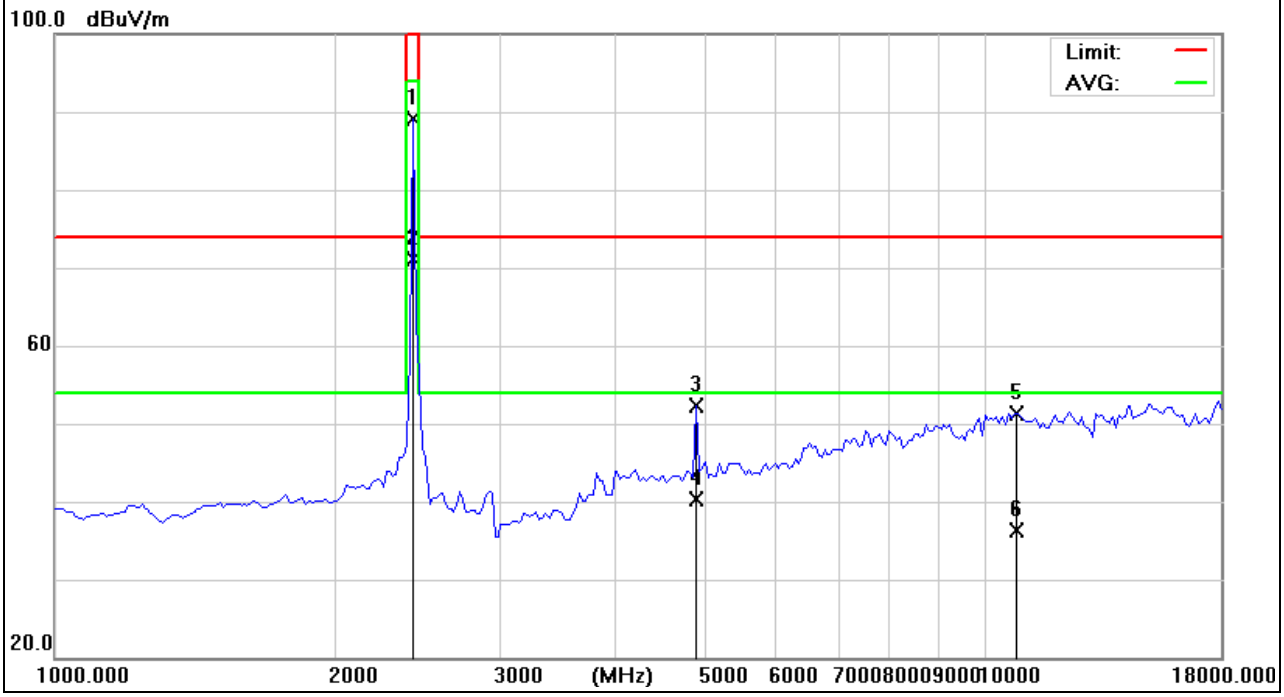
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 2	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2445.000	88.16	1.01	89.17	114.00	-24.83	peak
2445.000	70.01	1.01	71.02	94.00	-22.98	AVG
4910.000	40.17	12.21	52.38	74.00	-21.62	peak
4910.000	28.09	12.21	40.30	54.00	-13.70	AVG
10902.500	-2.73	54.11	51.38	74.00	-22.62	peak
10902.500	-17.81	54.11	36.30	54.00	-17.70	AVG

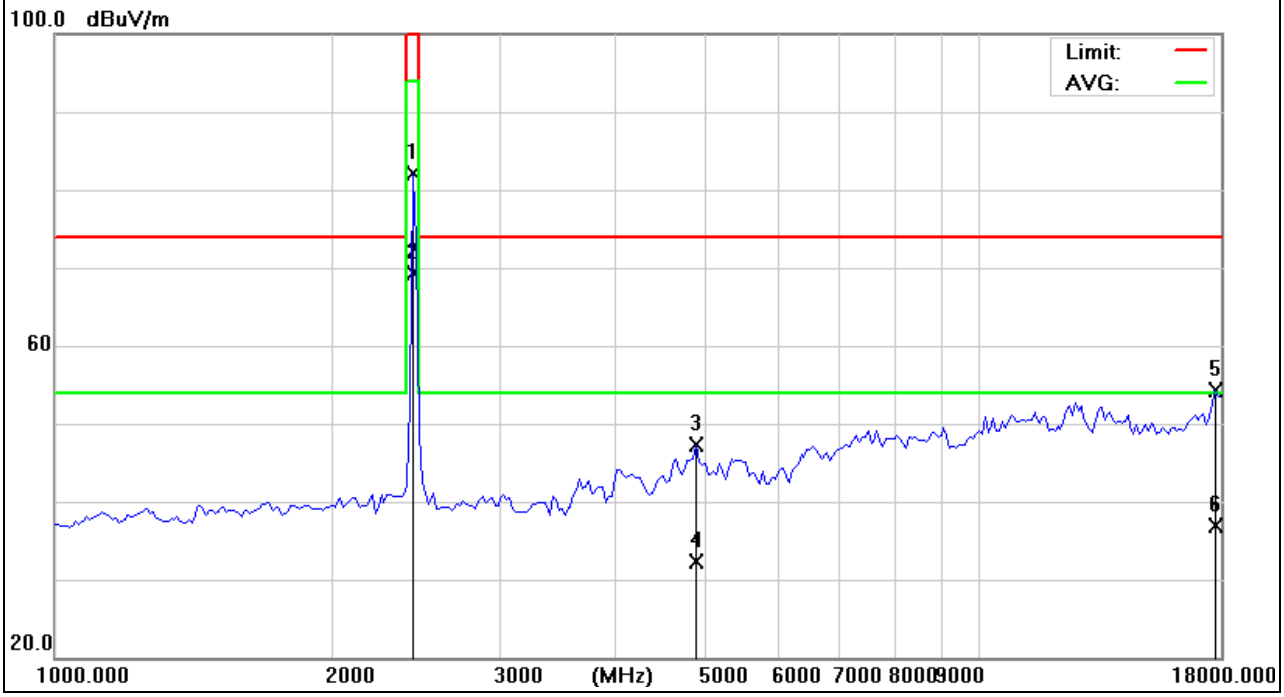
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 2	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2445.000	81.19	1.01	82.20	114.00	-31.80	peak
2445.000	68.29	1.01	69.30	94.00	-24.70	AVG
4910.000	35.01	12.21	47.22	74.00	-26.78	peak
4910.000	19.99	12.21	32.20	54.00	-21.80	AVG
17830.000	-11.71	66.04	54.33	74.00	-19.67	peak
17830.000	-29.14	66.04	36.90	54.00	-17.10	AVG

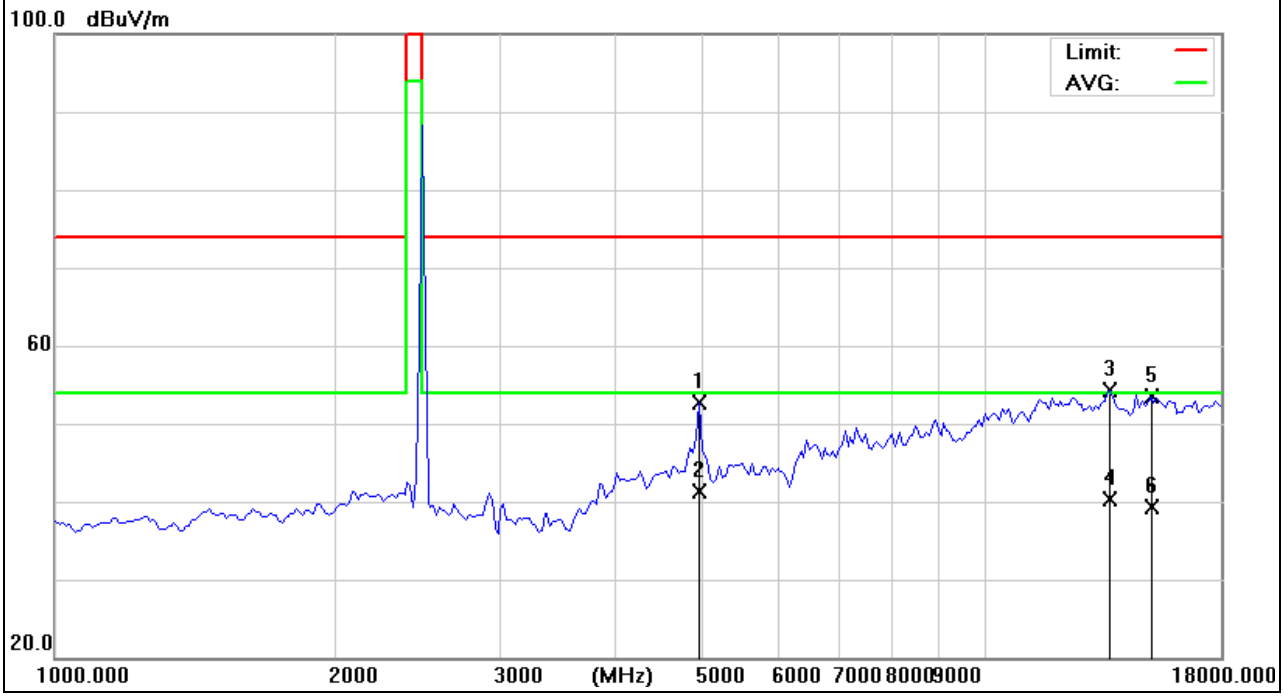
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 3	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4952.500	40.43	12.18	52.61	74.00	-21.39	peak
4952.500	29.07	12.18	41.25	54.00	-12.75	AVG
13707.500	-3.57	57.83	54.26	74.00	-19.74	peak
13707.500	-17.53	57.83	40.30	54.00	-13.70	AVG
15237.500	-5.93	59.41	53.48	74.00	-20.52	peak
15237.500	-20.11	59.41	39.30	54.00	-14.70	AVG

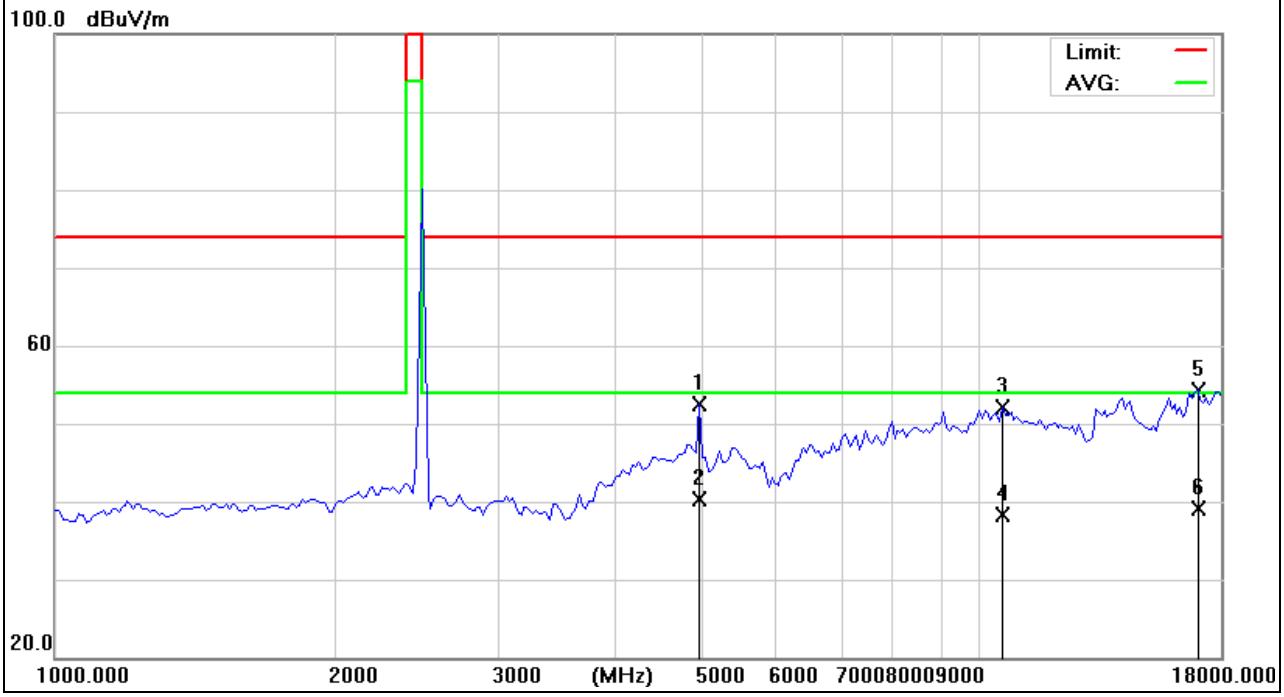
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 3	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4952.500	40.30	12.18	52.48	74.00	-21.52	peak
4952.500	28.04	12.18	40.22	54.00	-13.78	AVG
10477.500	-1.07	53.11	52.04	74.00	-21.96	peak
10477.500	-14.78	53.11	38.33	54.00	-15.67	AVG
17022.500	-9.52	63.77	54.25	74.00	-19.75	peak
17022.500	-24.75	63.77	39.02	54.00	-14.98	AVG

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



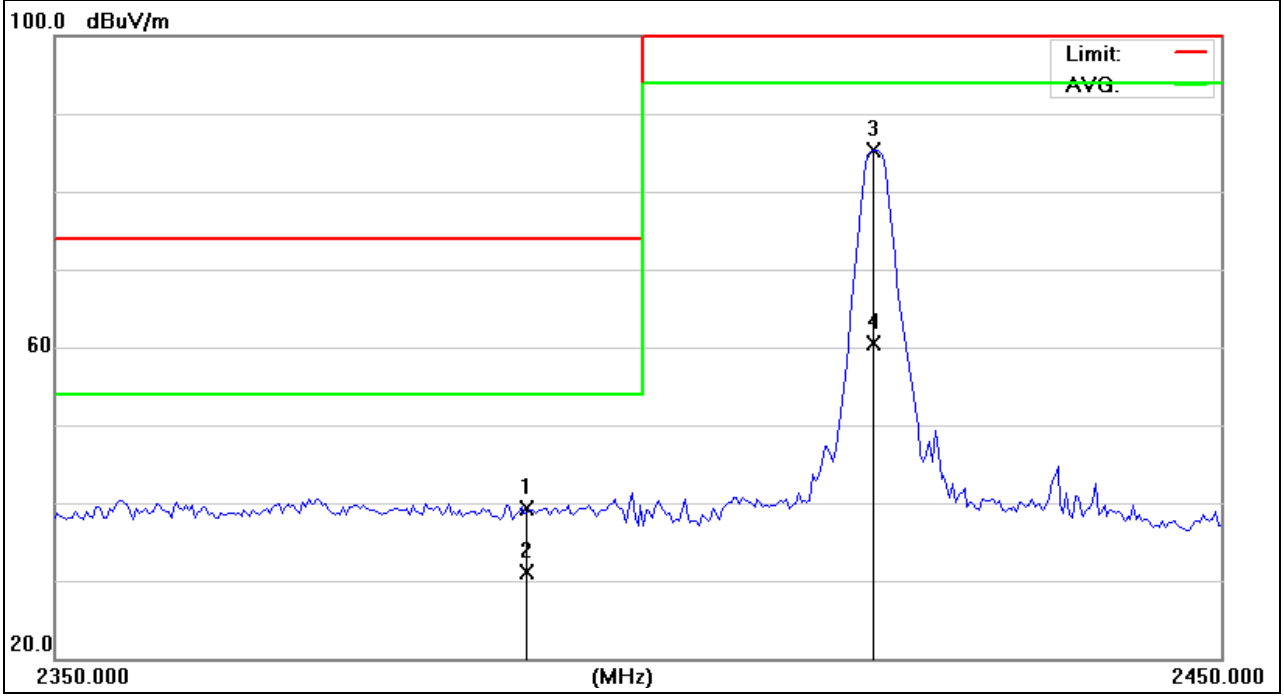
Note: EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report(X orientation).

3.4.7 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	TX-2420MHz	Polarization :	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
2390.000	37.24	1.97	39.21	74.00	-34.79	peak
2390.000	29.05	1.97	31.02	54.00	-22.98	AVG
2420.000	83.73	1.60	85.33	114.00	-28.67	peak
2420.000	58.95	1.60	60.55	94.00	-33.45	AVG

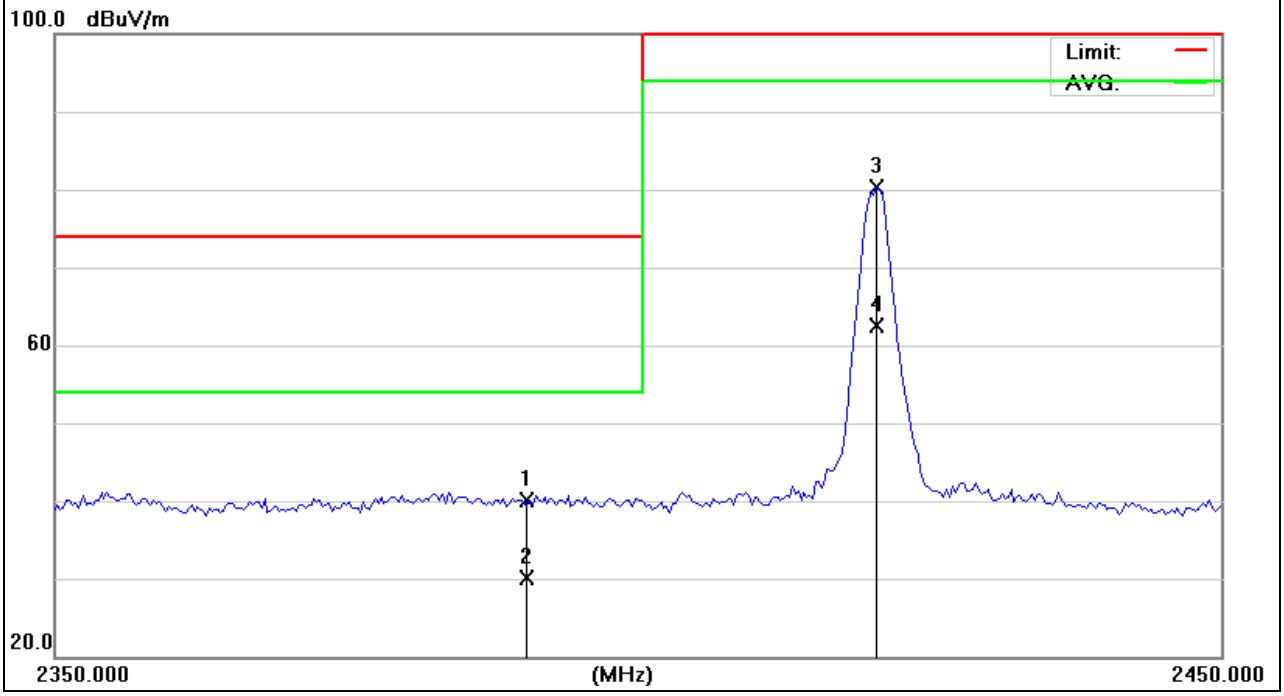
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	TX-2420MHz	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2390.000	38.13	1.97	40.10	74.00	-33.90	peak
2390.000	28.05	1.97	30.02	54.00	-23.98	AVG
2420.250	78.64	1.60	80.24	114.00	-33.76	peak
2420.250	60.99	1.60	62.59	94.00	-31.41	AVG

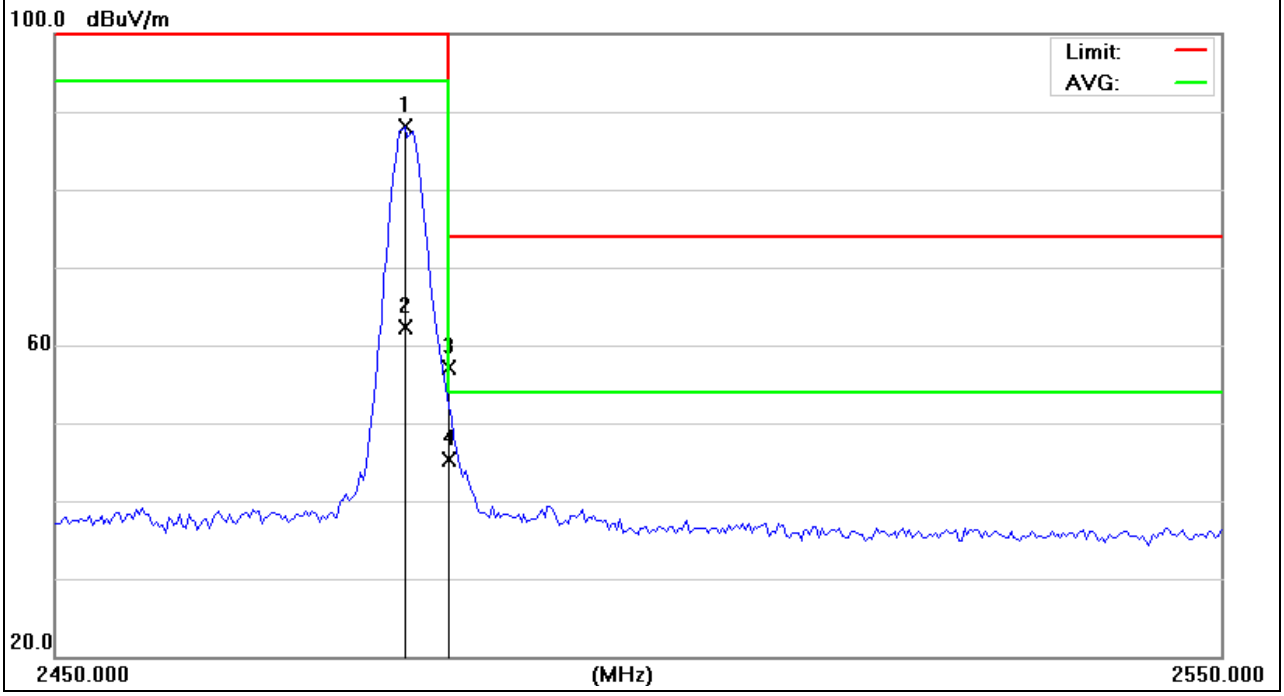
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	TX-2480MHz	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2479.750	88.31	-0.21	88.10	114.00	-25.90	peak
2479.750	62.57	-0.21	62.36	94.00	-31.64	AVG
2483.500	57.41	-0.34	57.07	74.00	-16.93	peak
2483.500	45.70	-0.34	45.36	54.00	-8.64	AVG

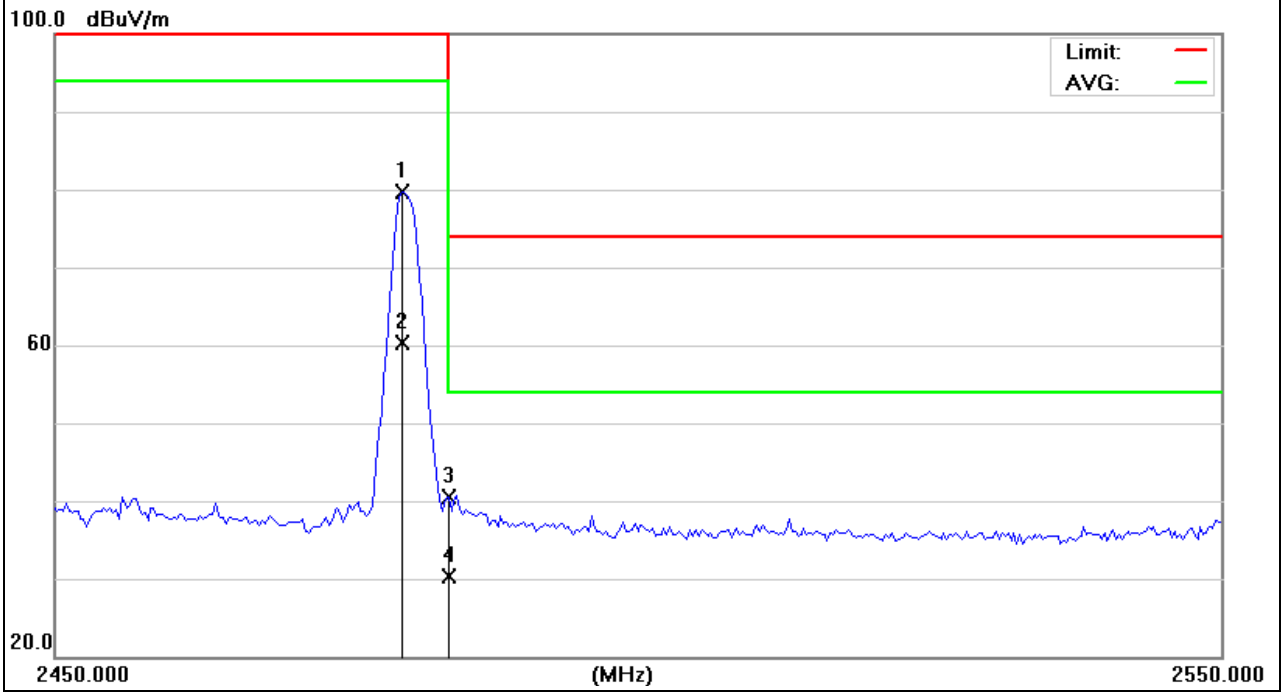
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S11
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	TX-2480MHz	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
2479.500	79.90	-0.20	79.70	114.00	-34.30	peak
2479.500	60.45	-0.20	60.25	94.00	-33.75	AVG
2483.500	40.83	-0.34	40.49	74.00	-33.51	peak
2483.500	30.70	-0.34	30.36	54.00	-23.64	AVG

Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



4. FREQUENCY TOLERANCE

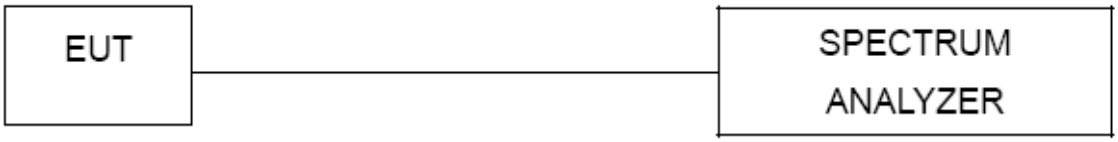
4.1 FREQUENCY TOLERANCE LIMITS

The frequency tolerance of the carrier signal shall be maintained within ±0.001% of the operating frequency over a temperature variation of −20 degrees to +50 degrees C at normal supply voltage, and for a variation in the primary supply voltage from 85% to 115% of the rated supply voltage at a temperature of 20 degrees C.

4.2TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 10KHz, VBW≧RBW, Sweep time = Auto.

4.3 TEST SETUP



4.4 TEST RESULTS

EUT：	Electric skateboard	Model Name ：	S11
Temperature：	26 ℃	Relative Humidity：	53%
Pressure：	1020 hPa	Test Power ：	DC 3.7V from battery
Test Mode ：	Mode 1/2/3		

2420MHz

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2420	2420.003	0.000124%	±0.001%
3.7	2420	2420.005	0.000207%	±0.001%
4.255	2420	2420.004	0.000165%	±0.001%

Temperature (℃)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2420	2420.004	0.000165%	±0.001%
-10	2420	2420.006	0.000248%	±0.001%
0	2420	2420.002	0.000083%	±0.001%
10	2420	2420.004	0.000165%	±0.001%
20	2420	2420.003	0.000124%	±0.001%
30	2420	2420.006	0.000248%	±0.001%
40	2420	2420.008	0.000331%	±0.001%
50	2420	2420.003	0.000124%	±0.001%

2450MHz

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2450	2450.004	0.000163%	±0.001%
3.7	2450	2450.001	0.000041%	±0.001%
4.255	2450	2450.002	0.000082%	±0.001%

Temperature (℃)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2450	2450.004	0.000163%	±0.001%
-10	2450	2450.003	0.000122%	±0.001%
0	2450	2450.002	0.000082%	±0.001%
10	2450	2450.007	0.000286%	±0.001%
20	2450	2450.006	0.000245%	±0.001%
30	2450	2450.002	0.000082%	±0.001%
40	2450	2450.006	0.000245%	±0.001%
50	2450	2450.002	0.000082%	±0.001%

2480MHz

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2480	2480.006	0.000242%	±0.001%
3.7	2480	2480.004	0.000161%	±0.001%
4.255	2480	2480.002	0.000081%	±0.001%

Temperature (℃)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2480	2480.002	0.000081%	±0.001%
-10	2480	2480.007	0.000282%	±0.001%
0	2480	2480.004	0.000161%	±0.001%
10	2480	2480.009	0.000363%	±0.001%
20	2480	2480.003	0.000121%	±0.001%
30	2480	2480.005	0.000202%	±0.001%
40	2480	2480.004	0.000161%	±0.001%
50	2480	2480.005	0.000202%	±0.001%

5. BANDWIDTH TEST

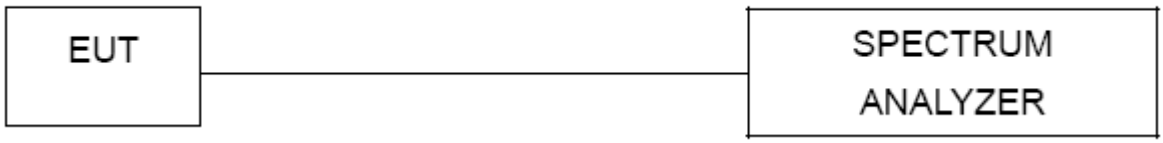
5.1 TEST PROCEDURE

a. The EUT was directly connected to the spectrum analyzer and antenna output port as show in the block diagram below,
b. Spectrum Setting : RBW= 100KHz, VBW≧RBW, Sweep time = Auto.

5.1 DEVIATION FROM STANDARD

No deviation.

5.1 TEST SETUP

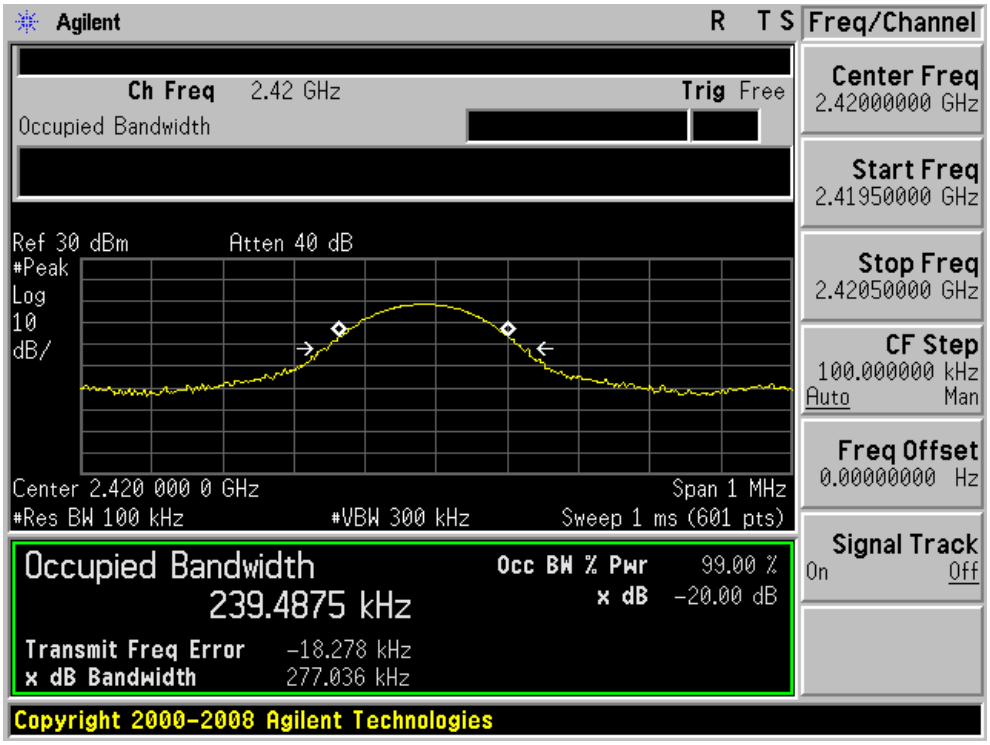


6. TEST RESULTS

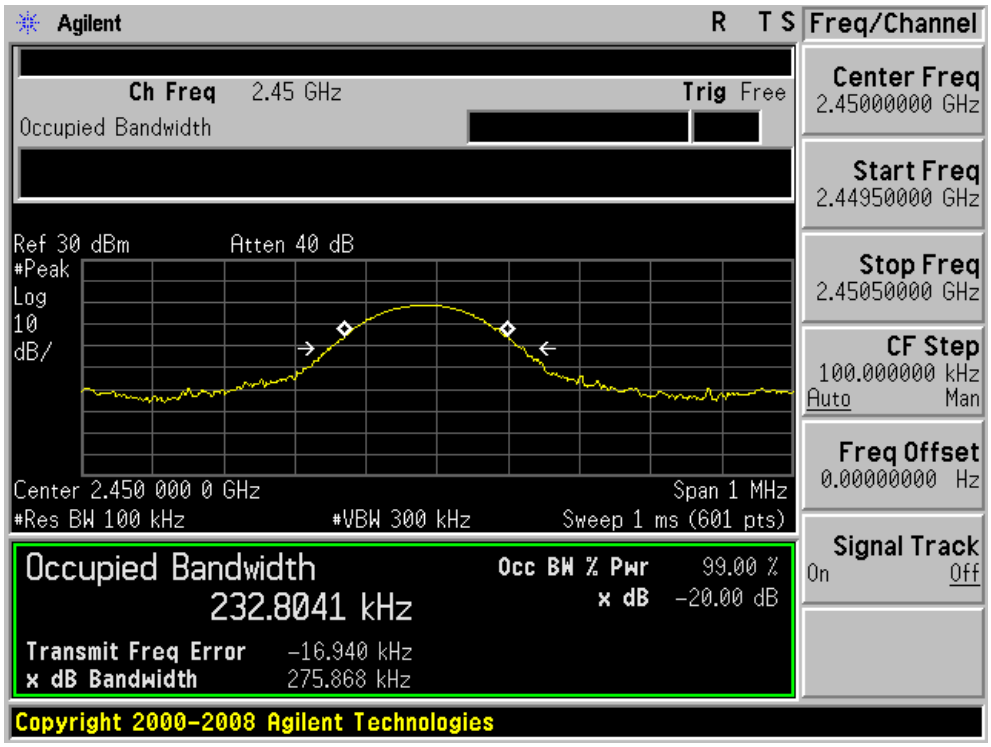
EUT：	Electric skateboard	Model Name ：	S11
Temperature：	26 ℃	Relative Humidity：	53%
Pressure：	1020 hPa	Test Power ：	DC 3.7V from battery
Test Mode ：	Mode 1/2/3		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)
CH01	2420	0.277
CH30	2450	0.276
CH60	2480	0.277

2420 MHz



2450 MHz



2480 MHz