RADIO TEST REPORT
FCC ID: 2APBB-S22

Product： Electric skateboard

Trade Mark： FREEMAN

Model Name： S22

Serial Model： S21, S23, S24, S25, S26, S27, S28, S29

Report No.： SNR171130004001E

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	:	S22
Serial Model：		S21, S23, S24, S25, S26, S27, S28, S29
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	:	05 Dec. 2017 ~18 May. 2018
Date of Issue	:	18 May. 2018
Test Result	:	**Pass**

Testing Engineer	**:**	(Allen Liu)
Technical Manager	**:**	(Jason Chen)
Authorized Signatory	**:**	(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	S22
Serial Model	S21, S23, S24, S25, S26, S27, S28, S29
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

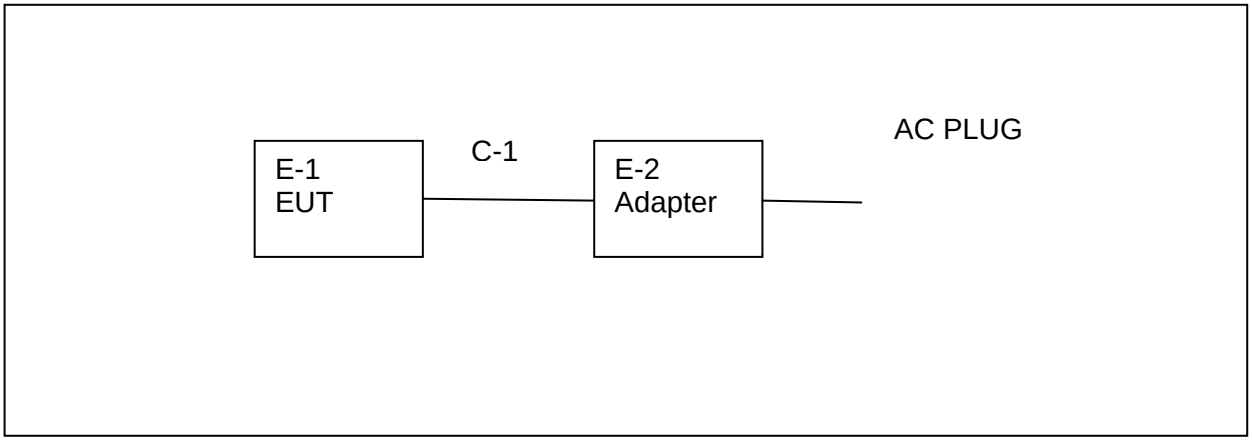
Note:

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

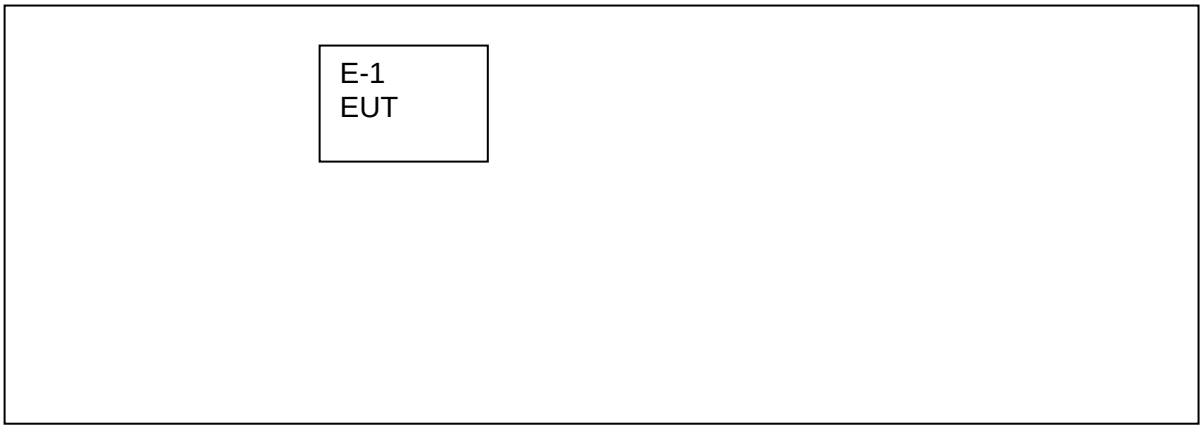
(2) EUT built-in battery-powered, the test battery is fully-charged.

2.3 BLOCK DIGRAM SHOWING THE CONFIGURATION OF SYSTEM TESTED

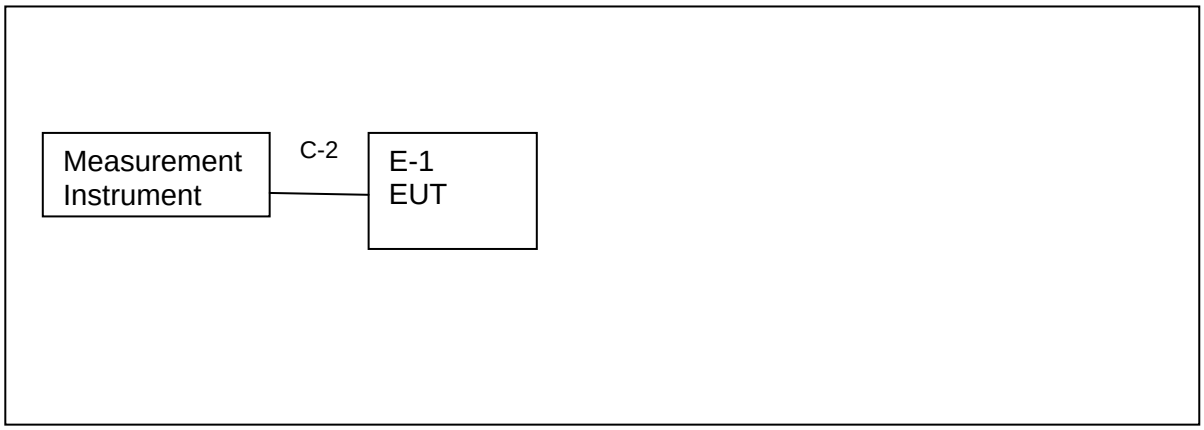
AC Conducted Emission Mode



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	S22	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

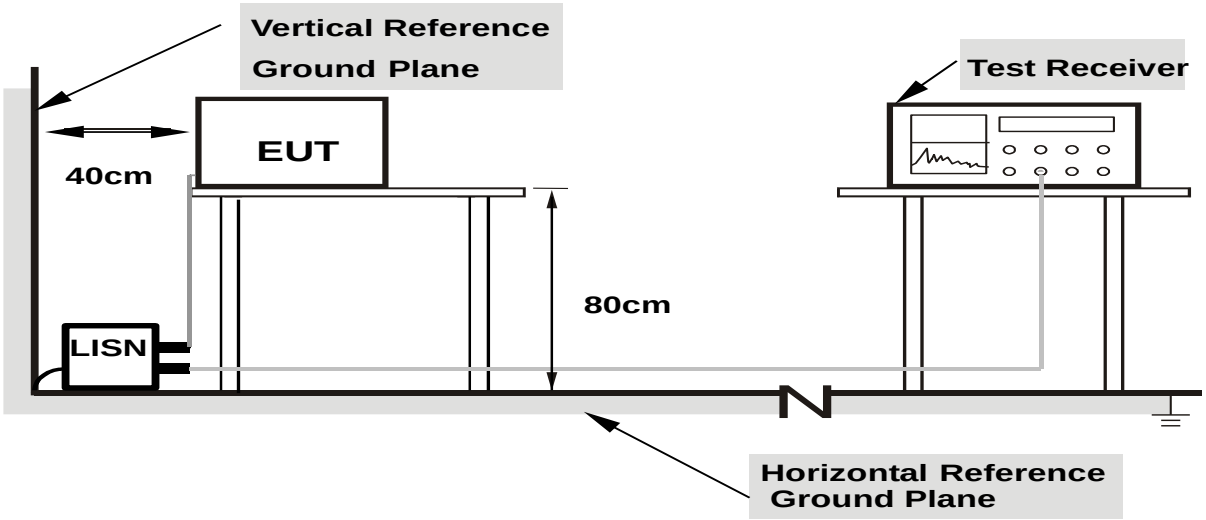
3.3.2 TEST PROCEDURE

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

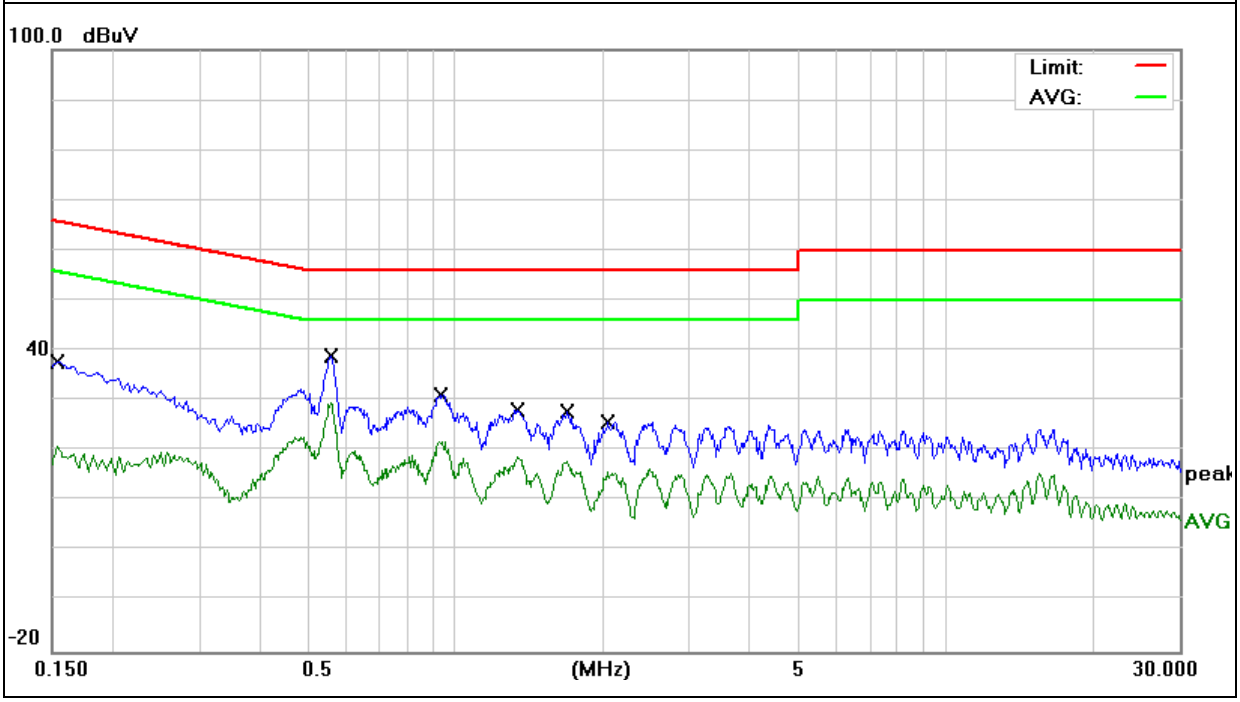
3.2.5 TEST RESULT

EUT：	Electric skateboard	Model Name. ：	S22
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)	
0.1539	27.99	9.82	37.81	65.78	-27.97	QP
0.1539	11.25	9.82	21.07	55.78	-34.71	AVG
0.5580	29.01	9.83	38.84	56.00	-17.16	QP
0.5580	19.70	9.83	29.53	46.00	-16.47	AVG
0.9340	21.30	9.91	31.21	56.00	-24.79	QP
0.9340	12.06	9.91	21.97	46.00	-24.03	AVG
1.3340	18.39	9.90	28.29	56.00	-27.71	QP
1.3340	8.90	9.90	18.80	46.00	-27.20	AVG
1.6820	17.98	9.87	27.85	56.00	-28.15	QP
1.6820	7.95	9.87	17.82	46.00	-28.18	AVG
2.0340	15.93	9.85	25.78	56.00	-30.22	QP
2.0340	6.07	9.85	15.92	46.00	-30.08	AVG

Remark:

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

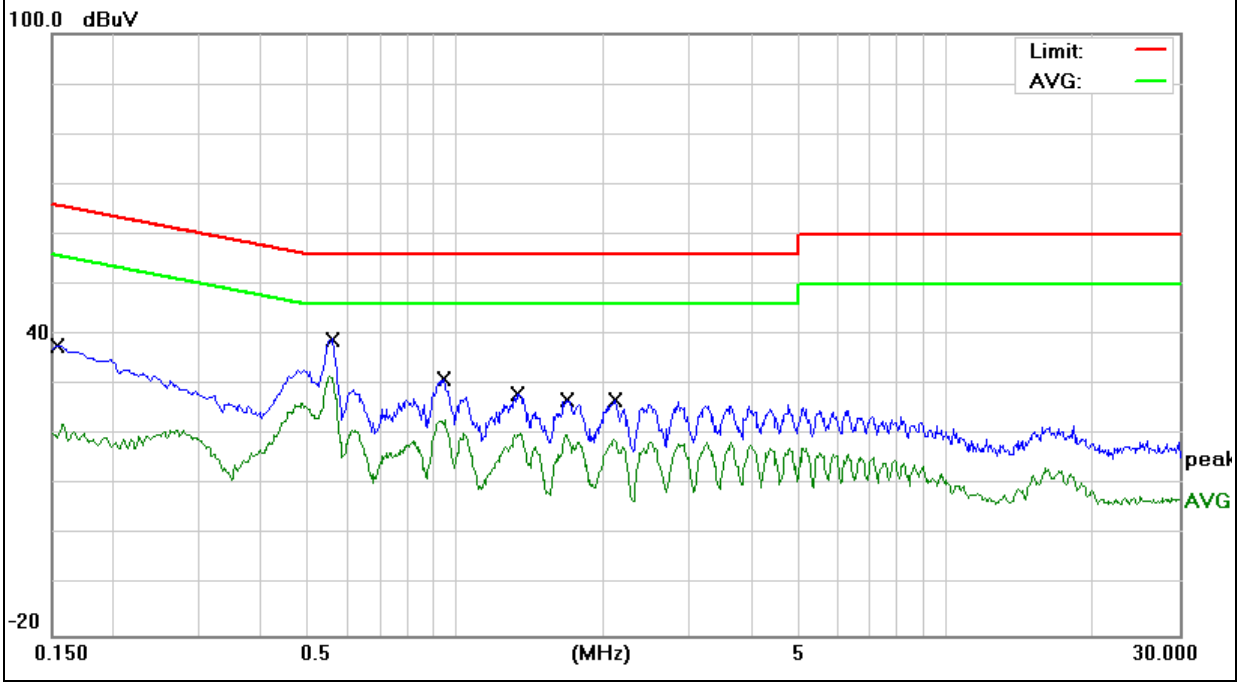


EUT：	Electric skateboard	Model Name. ：	S22
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from adapter AC 120V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1539	27.93	9.92	37.85	65.78	-27.93	QP
0.1539	12.26	9.92	22.18	55.78	-33.60	AVG
0.5540	29.29	9.93	39.22	56.00	-16.78	QP
0.5540	21.70	9.93	31.63	46.00	-14.37	AVG
0.9459	21.36	9.93	31.29	56.00	-24.71	QP
0.9459	13.12	9.93	23.05	46.00	-22.95	AVG
1.3340	18.33	9.93	28.26	56.00	-27.74	QP
1.3340	10.52	9.93	20.45	46.00	-25.55	AVG
1.6779	17.10	9.94	27.04	56.00	-28.96	QP
1.6779	10.17	9.94	20.11	46.00	-25.89	AVG
2.1018	17.08	9.94	27.02	56.00	-28.98	QP
2.1018	9.34	9.94	19.28	46.00	-26.72	AVG

Remark:

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

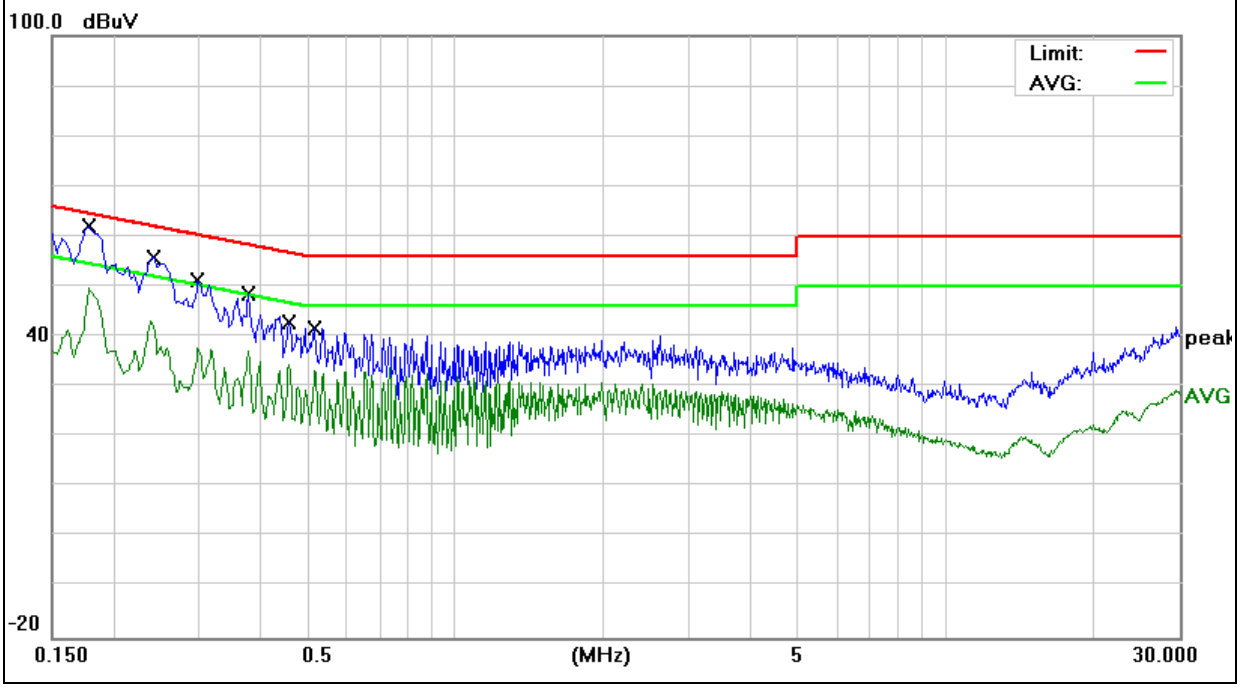


EUT：	Electric skateboard	Model Name. ：	S22
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	L
Test Voltage ：	DC 5V from adapter AC 240V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1780	47.68	9.92	57.60	64.57	-6.97	QP
0.1780	39.77	9.92	49.69	54.57	-4.88	AVG
0.2379	46.10	9.92	56.02	62.17	-6.15	QP
0.2379	33.20	9.92	43.12	52.17	-9.05	AVG
0.2979	41.36	9.92	51.28	60.30	-9.02	QP
0.2979	27.97	9.92	37.89	50.30	-12.41	AVG
0.3780	38.71	9.93	48.64	58.32	-9.68	QP
0.3780	27.14	9.93	37.07	48.32	-11.25	AVG
0.4580	32.84	9.93	42.77	56.73	-13.96	QP
0.4580	24.52	9.93	34.45	46.73	-12.28	AVG
0.5180	31.72	9.93	41.65	56.00	-14.35	QP
0.5180	23.34	9.93	33.27	46.00	-12.73	AVG

Remark:

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

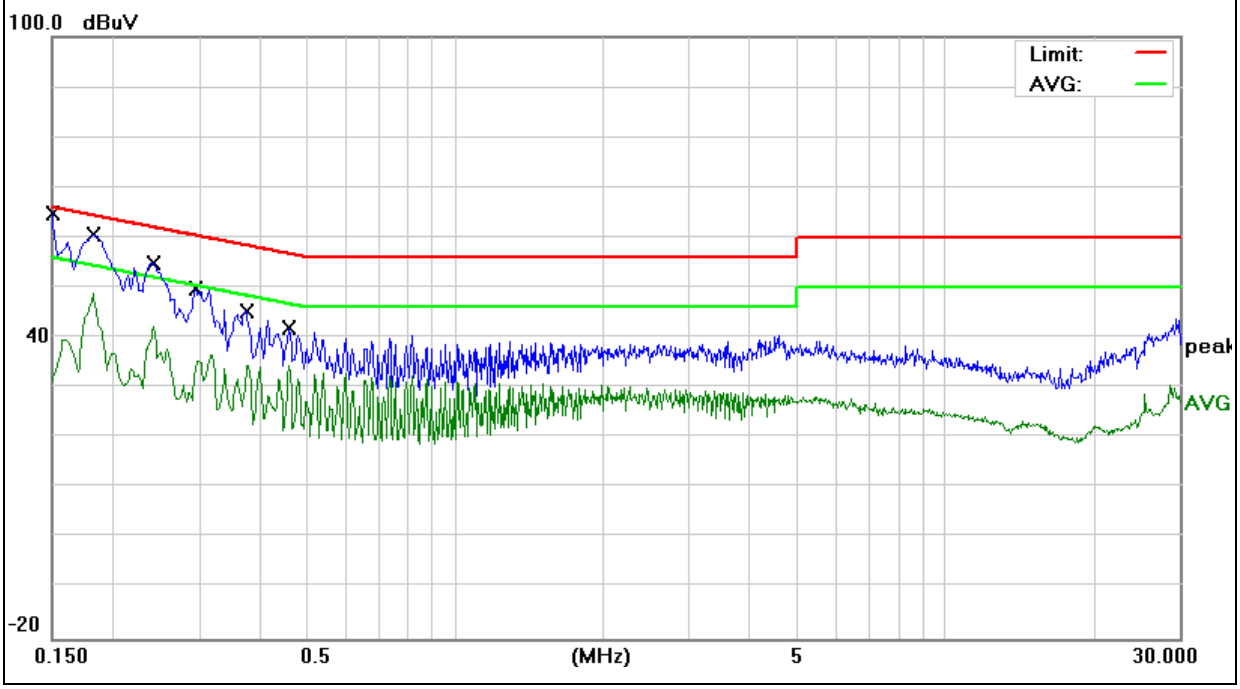


EUT：	Electric skateboard	Model Name. ：	S22
Temperature：	25 ℃	Relative Humidity：	55%
Pressure：	1010hPa	Phase：	N
Test Voltage ：	DC 5V from adapter AC 240V/60Hz	Test Mode：	Mode 4

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1500	39.98	9.92	49.90	65.99	-16.09	QP
0.1500	23.37	9.92	33.29	55.99	-22.70	AVG
0.1819	50.69	9.92	60.61	64.39	-3.78	QP
0.1819	38.82	9.92	48.74	54.39	-5.65	AVG
0.2420	44.97	9.92	54.89	62.02	-7.13	QP
0.2420	32.25	9.92	42.17	52.02	-9.85	AVG
0.2940	39.88	9.92	49.80	60.41	-10.61	QP
0.2940	25.43	9.92	35.35	50.41	-15.06	AVG
0.3740	35.24	9.93	45.17	58.41	-13.24	QP
0.3740	24.48	9.93	34.41	48.41	-14.00	AVG
0.4580	32.02	9.93	41.95	56.73	-14.78	QP
0.4580	24.42	9.93	34.35	46.73	-12.38	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.

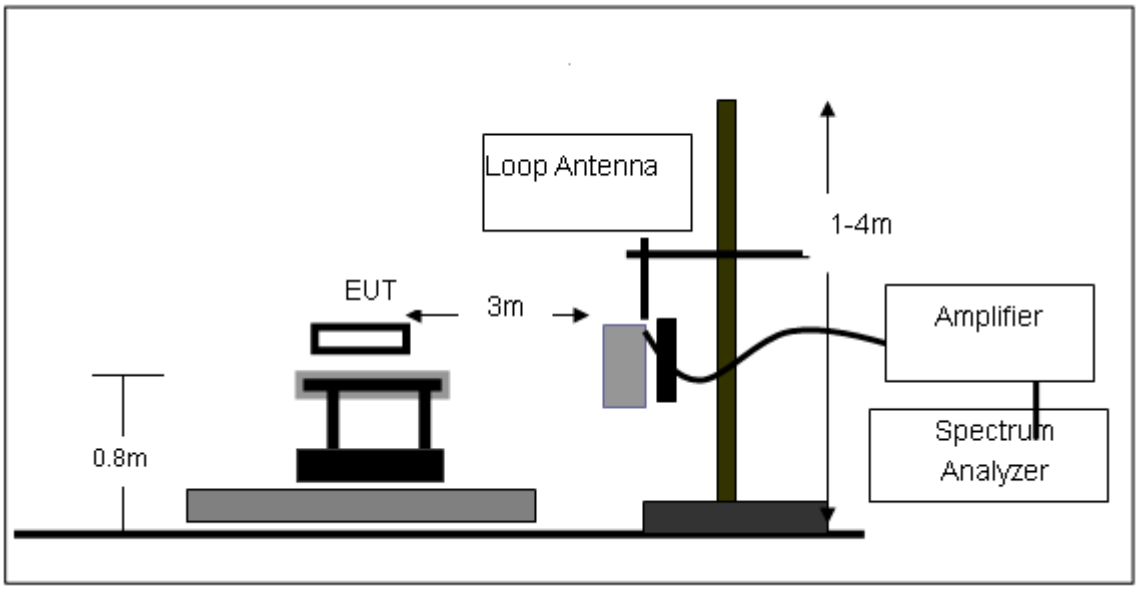
Note:

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

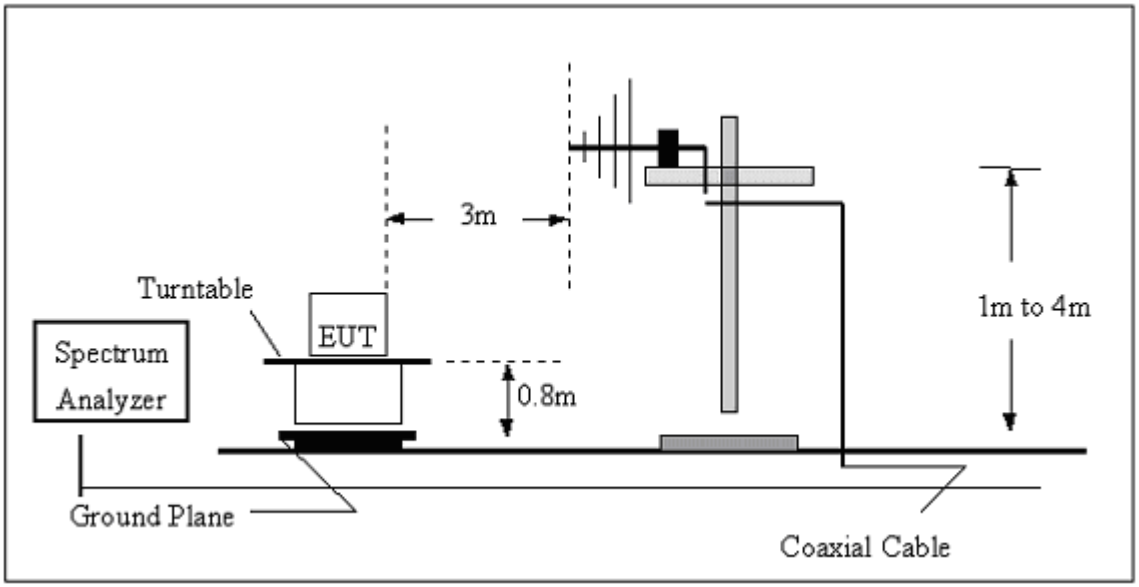
3.4.3 DEVIATION FROM TEST STANDARD

No deviation

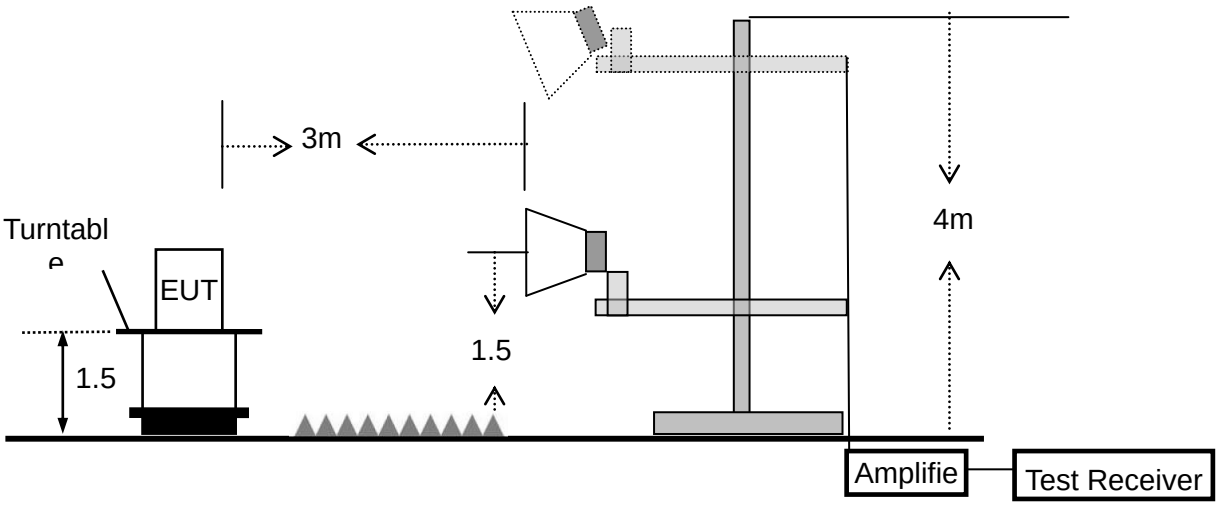
（A）Radiated Emission Test-Up Frequency Below 30MHz



（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. ：	S22
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:

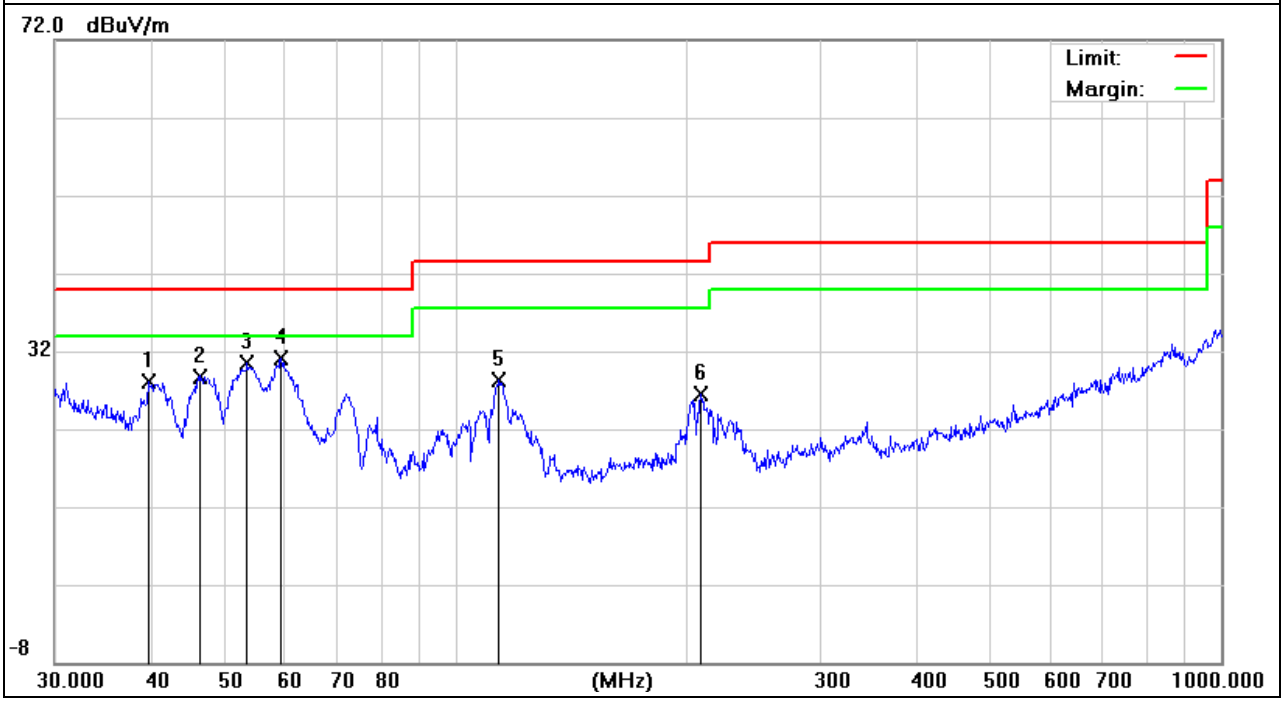
The amplitude of spurious emissions which are attenuated by more than 20dB below the permissible value has no need to be reported.
Distance extrapolation factor =20 log (specific distance/test distance)(dB);
Limit line = specific limits(dBuv) + distance extrapolation factor.

3.4.5 TEST RESULTS (BELOW 1000 MHz)

EUT：	Electric skateboard	Model Name ：	S22
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
39.7146	11.68	16.44	28.12	40.00	-11.88	QP
46.5030	15.68	13.12	28.80	40.00	-11.20	QP
53.5052	17.92	12.53	30.45	40.00	-9.55	QP
59.2325	19.46	11.57	31.03	40.00	-8.97	QP
114.1138	18.21	10.09	28.30	43.50	-15.20	QP
209.3129	13.21	13.36	26.57	43.50	-16.93	QP

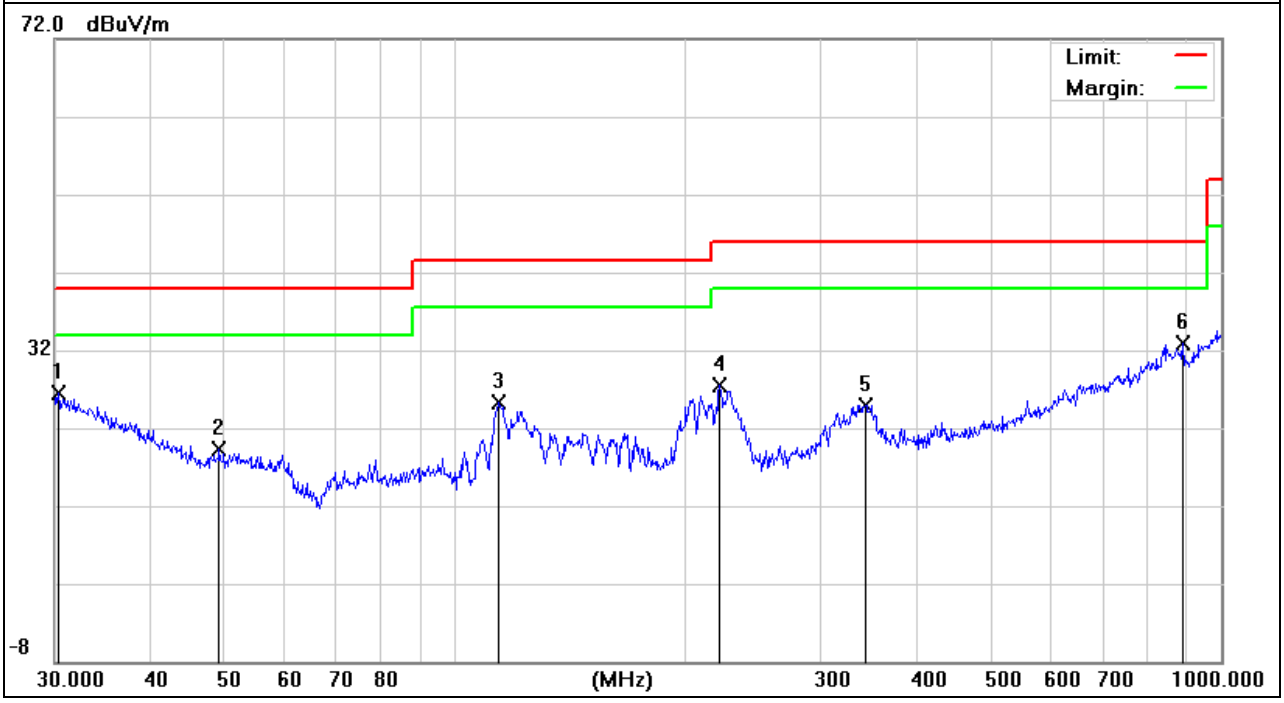
Remark:
1. Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S22
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)	
30.3172	5.37	21.06	26.43	40.00	-13.57	QP
49.1865	5.90	13.35	19.25	40.00	-20.75	QP
114.1138	15.13	10.09	25.22	43.50	-18.28	QP
221.3921	15.24	12.21	27.45	46.00	-18.55	QP
343.1800	10.66	14.28	24.94	46.00	-21.06	QP
890.7278	8.39	24.52	32.91	46.00	-13.09	QP

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

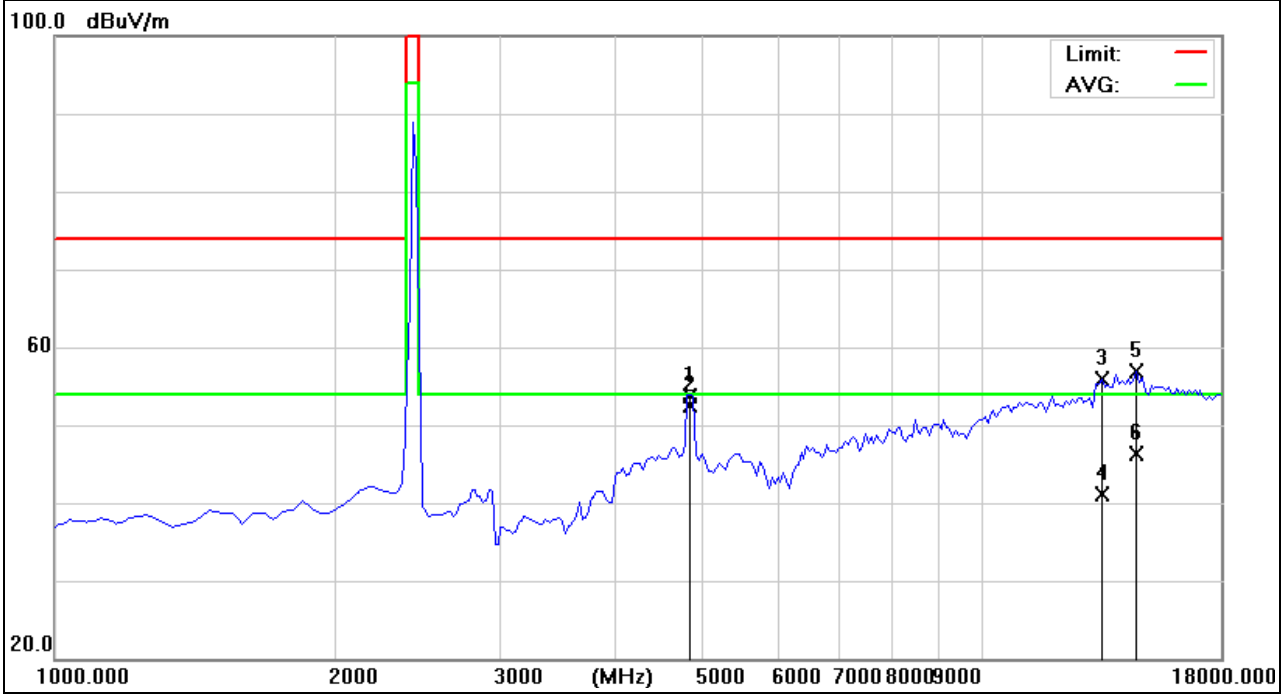


3.4.6 TEST RESULTS (ABOVE 1000 MHZ)

EUT：	Electric skateboard	Model Name ：	S22
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 1	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4840.000	41.57	12.04	53.61	74.00	-20.39	peak
4840.000	40.42	12.04	52.46	54.00	-1.54	AVG
13452.500	-1.35	57.29	55.94	74.00	-18.06	peak
13452.500	-16.27	57.29	41.02	54.00	-12.98	AVG
14642.500	-1.79	58.67	56.88	74.00	-17.12	peak
14642.500	-12.34	58.67	46.33	54.00	-7.67	AVG

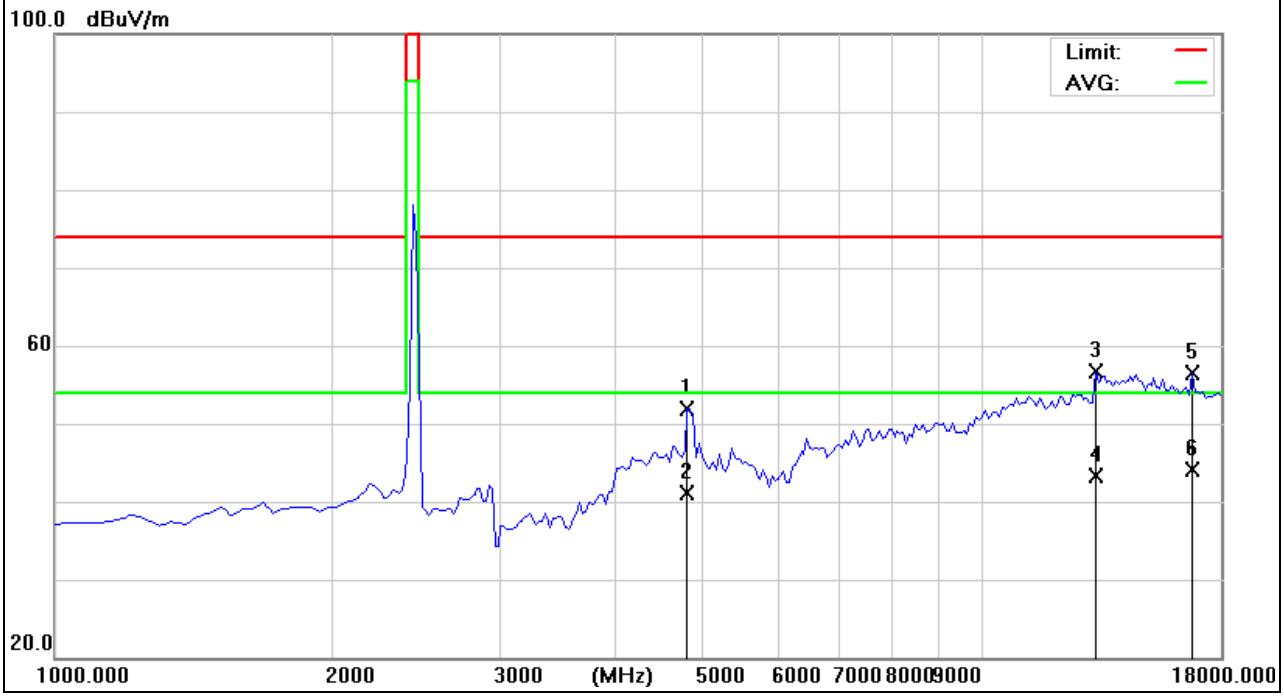
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S22
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 1	Polarization：	Vertical

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4825.000	39.98	11.97	51.95	74.00	-22.05	peak
4825.000	29.05	11.97	41.02	54.00	-12.98	AVG
13197.500	-0.09	56.76	56.67	74.00	-17.33	peak
13197.500	-13.40	56.76	43.36	74.00	-30.64	peak
16810.000	-6.98	63.43	56.45	74.00	-17.55	peak
16810.000	-19.28	63.43	44.15	74.00	-29.85	peak

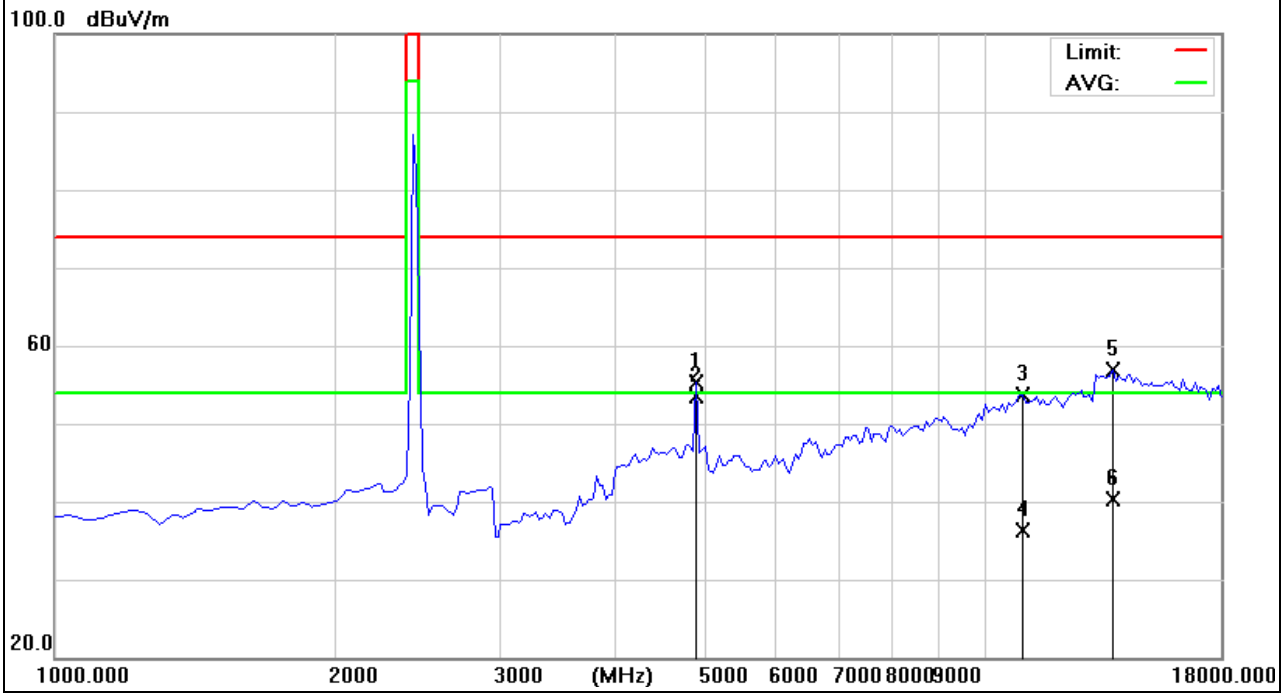
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S22
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 2	Polarization：	Horizontal

Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Detector Type
(MHz)	(dBμV)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
4910.000	43.17	12.21	55.38	74.00	-18.62	peak
4910.000	41.38	12.21	53.59	54.00	-0.41	AVG
11072.500	-0.58	54.36	53.78	74.00	-20.22	peak
11072.500	-18.03	54.36	36.33	54.00	-17.67	AVG
13835.000	-0.90	57.81	56.91	74.00	-17.09	peak
13835.000	-17.56	57.81	40.25	54.00	-13.75	AVG

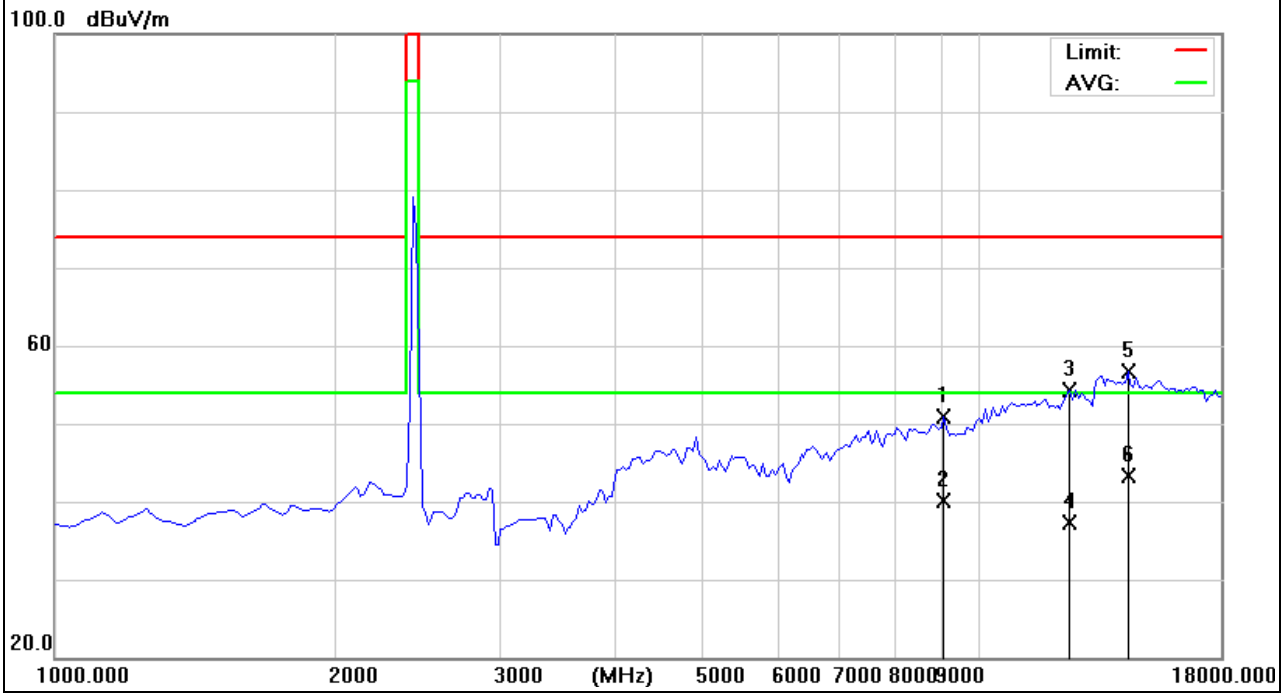
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S22
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
9117.500	0.03	50.92	50.95	74.00	-23.05	peak
9117.500	-10.90	50.92	40.02	54.00	-13.98	AVG
12390.000	-1.53	55.86	54.33	74.00	-19.67	peak
12390.000	-18.61	55.86	37.25	54.00	-16.75	AVG
14302.500	-1.38	58.07	56.69	74.00	-17.31	peak
14302.500	-14.74	58.07	43.33	54.00	-10.67	AVG

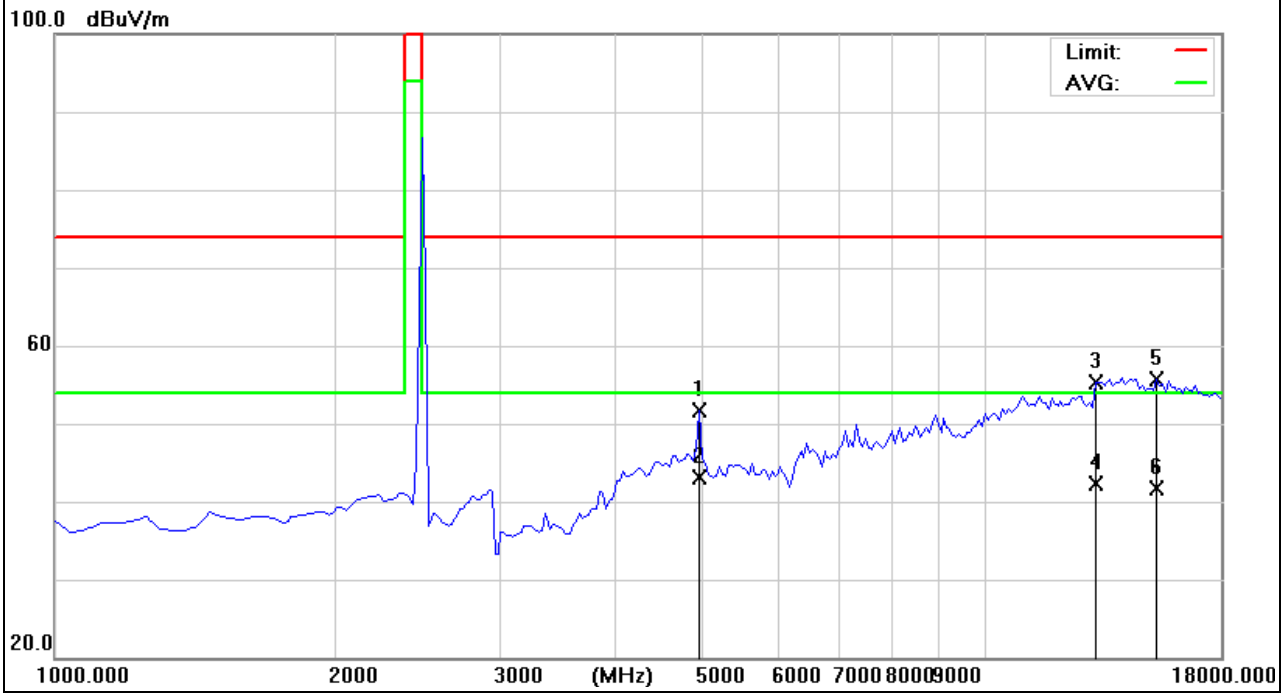
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S22
Temperature：	20 ℃	Relative Humidity：	48%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 3	Polarization：	Horizontal

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4952.500	39.43	12.18	51.61	74.00	-22.39	peak
4952.500	30.93	12.18	43.11	54.00	-10.89	AVG
13282.500	-1.55	56.91	55.36	74.00	-18.64	peak
13282.500	-14.66	56.91	42.25	54.00	-11.75	AVG
15365.000	-3.20	58.99	55.79	74.00	-18.21	peak
15365.000	-17.34	58.99	41.65	54.00	-12.35	AVG

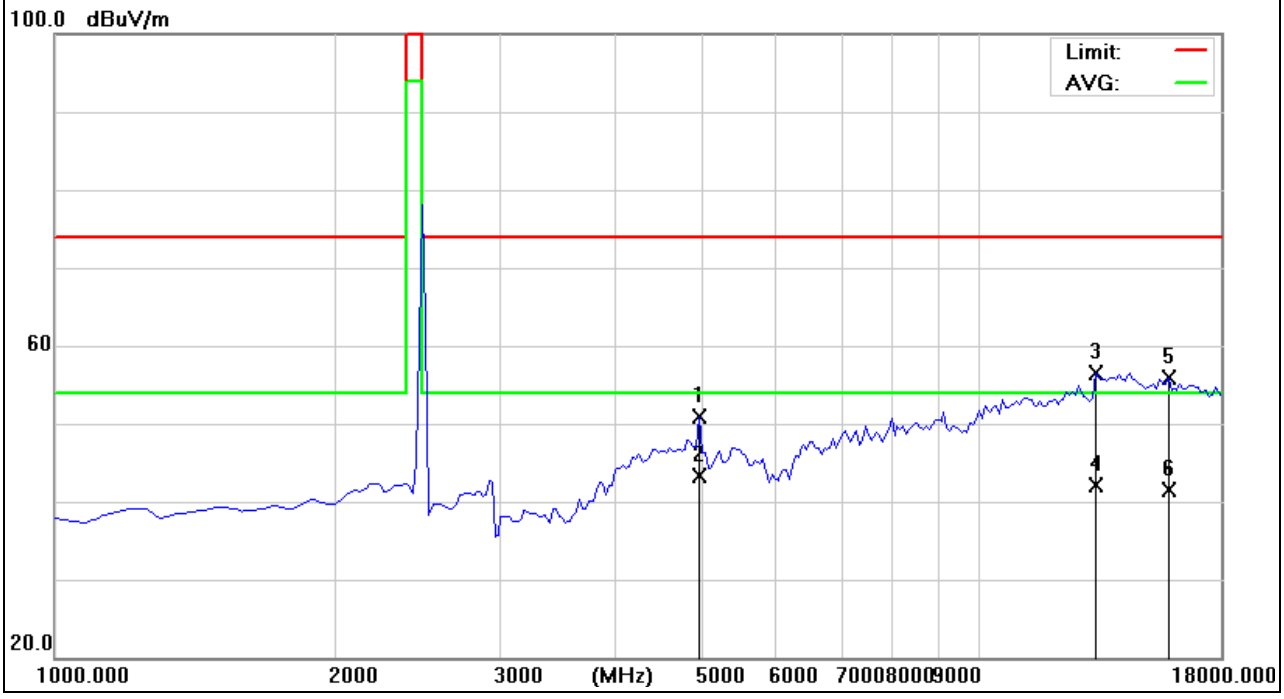
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.
No emission above 18GHz.



EUT：	Electric skateboard	Model Name ：	S22
Temperature：	25 ℃	Relative Humidity：	51%
Pressure：	1010 hPa	Test Voltage ：	DC 3.7V from battery
Test Mode ：	Mode 3	Polarization：	Vertical

Frequency (MHz)	Meter Reading (dBμV)	Factor (dB)	Emission Level (dBμV/m)	Limits (dBμV/m)	Margin (dB)	Detector Type
4952.500	38.80	12.18	50.98	74.00	-23.02	peak
4952.500	31.18	12.18	43.36	54.00	-10.64	AVG
13197.500	-0.34	56.76	56.42	74.00	-17.58	peak
13197.500	-14.74	56.76	42.02	54.00	-11.98	AVG
15875.000	-4.76	60.60	55.84	74.00	-18.16	peak
15875.000	-19.08	60.60	41.52	54.00	-12.48	AVG

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



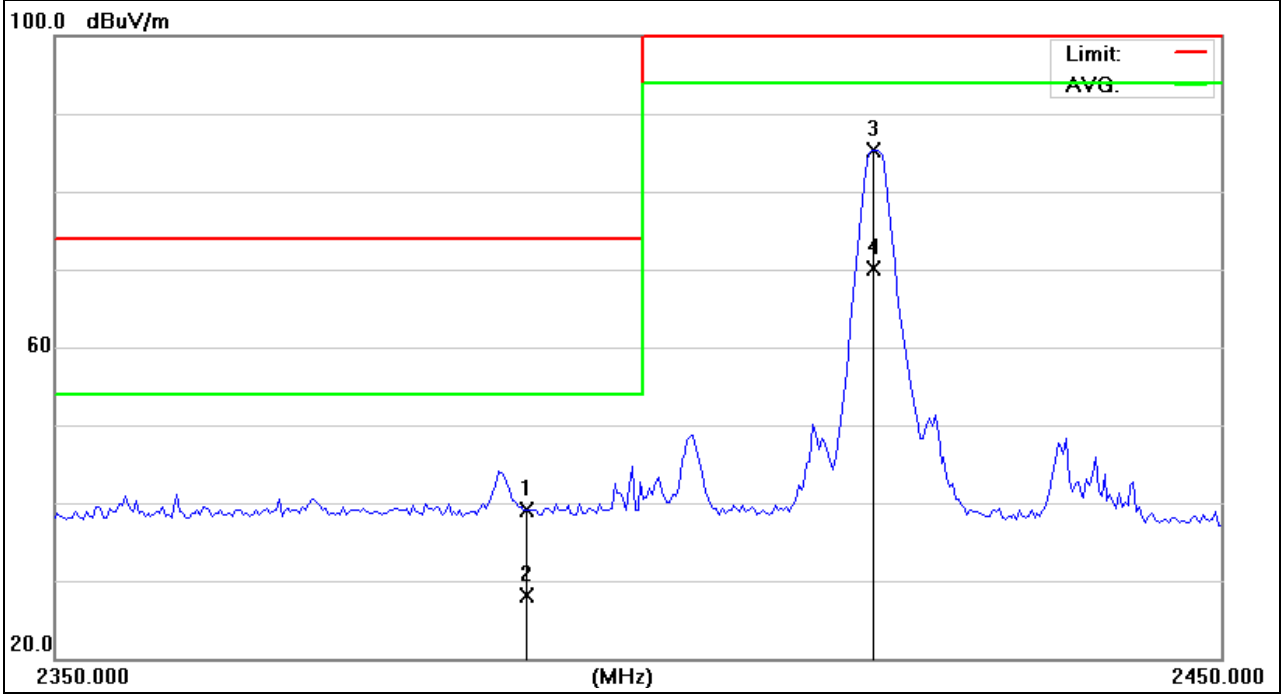
Note: EUT Pre-scan X/Y/Z orientation, only worst case is presented in the report(X orientation).

3.4.7 TEST RESULTS (RESTRICTED BANDS REQUIREMENTS)

EUT：	Electric skateboard	Model Name ：	S22
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	37.15	1.97	39.12	74.00	-34.88	peak
2390.000	26.05	1.97	28.02	54.00	-25.98	AVG
2420.000	83.73	1.60	85.33	114.00	-28.67	peak
2420.000	68.55	1.60	70.15	94.00	-23.85	AVG

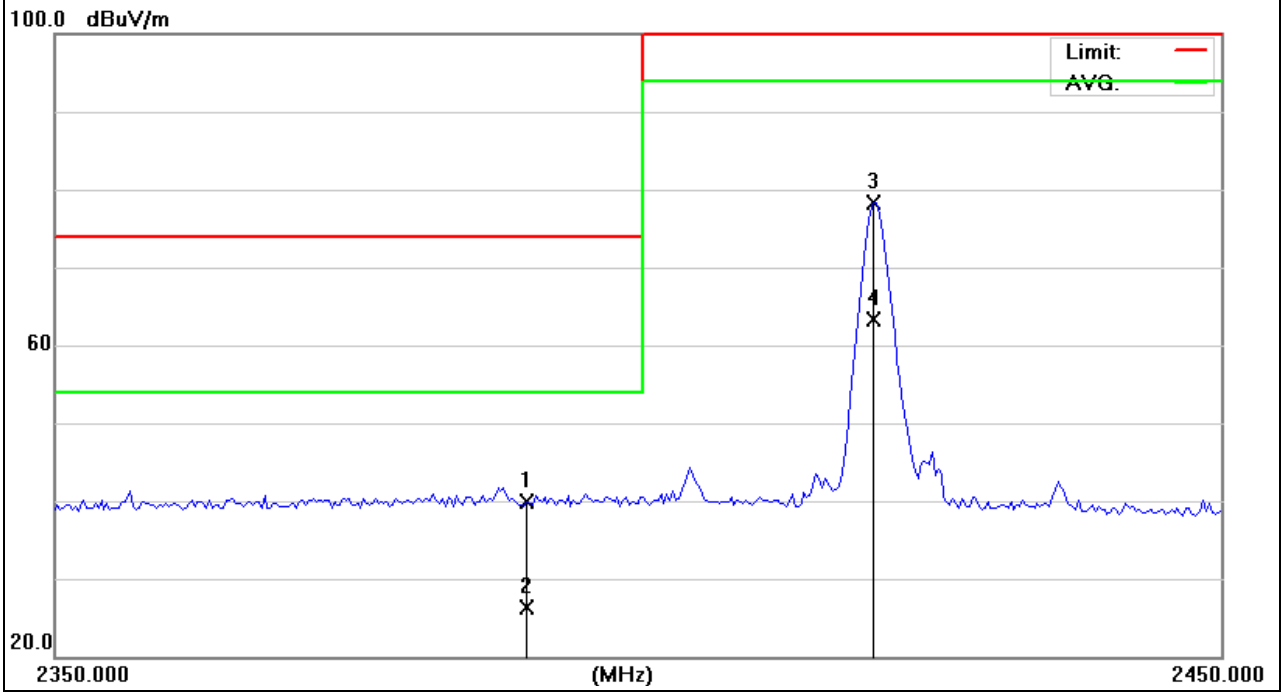
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S22
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	37.90	1.97	39.87	74.00	-34.13	peak
2390.000	24.39	1.97	26.36	54.00	-27.64	AVG
2420.000	76.75	1.60	78.35	114.00	-35.65	peak
2420.000	61.70	1.60	63.30	94.00	-30.70	AVG

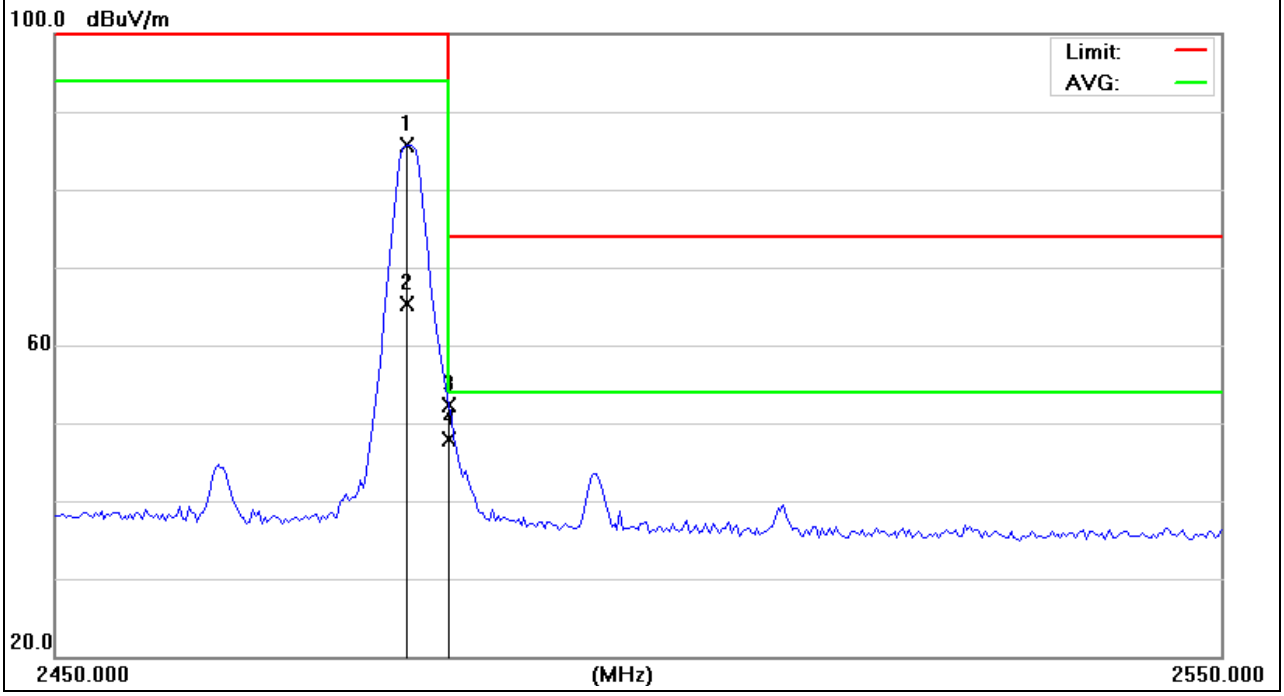
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S22
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)	
2480.000	85.91	-0.21	85.70	114.00	-28.30	peak
2480.000	65.54	-0.21	65.33	94.00	-28.67	AVG
2483.500	52.66	-0.34	52.32	74.00	-21.68	peak
2483.500	48.34	-0.34	48.00	54.00	-6.00	AVG

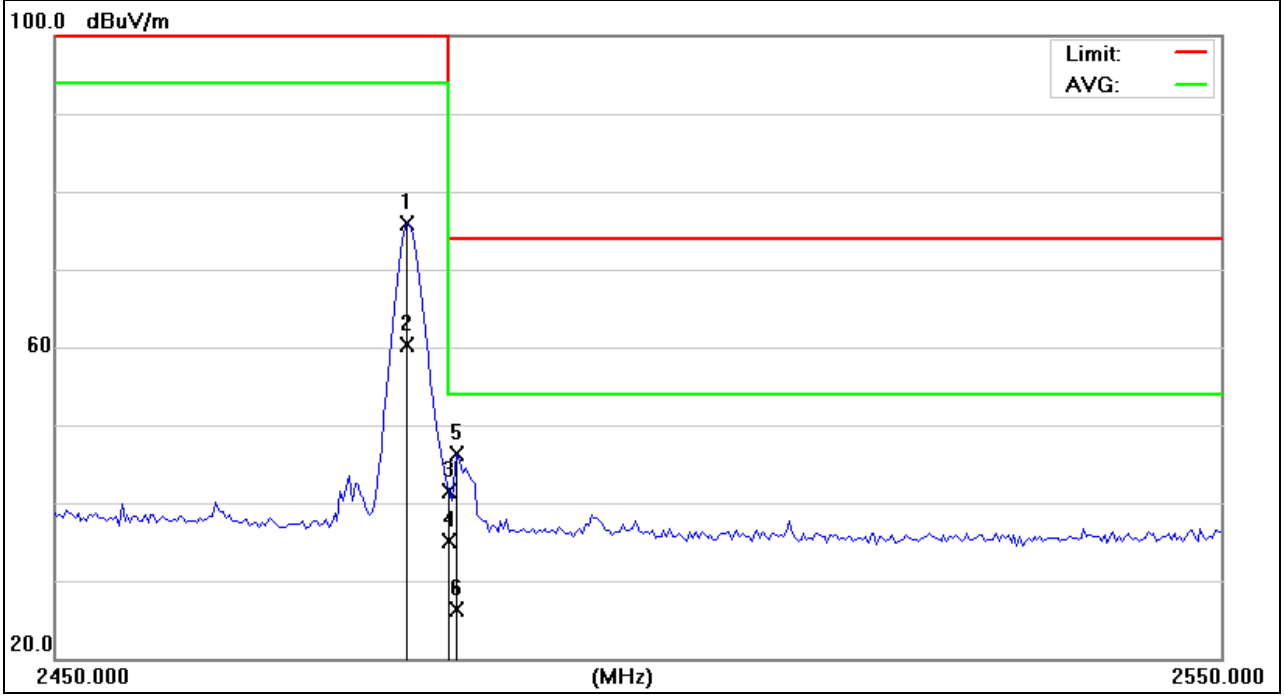
Remark:
Factor = Antenna Factor + Cable Loss – Pre-amplifier.



EUT：	Electric skateboard	Model Name ：	S22
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)	
2480.000	76.05	-0.21	75.84	114.00	-38.16	peak
2480.000	60.43	-0.21	60.22	94.00	-33.78	AVG
2483.500	41.83	-0.34	41.49	74.00	-32.51	peak
2483.500	35.44	-0.34	35.10	54.00	-18.90	AVG
2484.250	46.59	-0.37	46.22	74.00	-27.78	peak
2484.250	26.73	-0.37	26.36	54.00	-27.64	AVG

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



4. FREQUENCY TOLERANCE

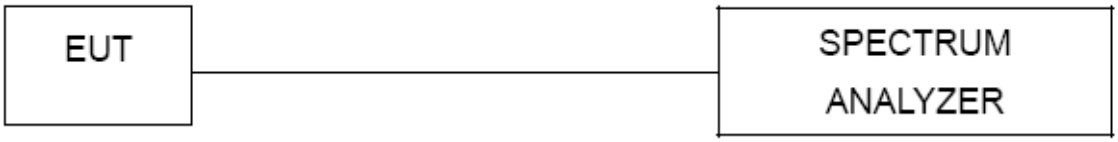
4.1 FREQUENCY TOLERANCE LIMITS

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 ：	S22
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	2420.004	0.000165%	±0.001%
3.7	2420	2420.006	0.000248%	±0.001%
4.255	2420	2420.005	0.000207%	±0.001%

Temperature (℃)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2420	2420.003	0.000124%	±0.001%
-10	2420	2420.005	0.000207%	±0.001%
0	2420	2420.001	0.000041%	±0.001%
10	2420	2420.003	0.000124%	±0.001%
20	2420	2420.002	0.000083%	±0.001%
30	2420	2420.005	0.000207%	±0.001%
40	2420	2420.007	0.000289%	±0.001%
50	2420	2420.002	0.000083%	±0.001%

2450MHz

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2450	2450.005	0.000204%	±0.001%
3.7	2450	2450.002	0.000082%	±0.001%
4.255	2450	2450.003	0.000122%	±0.001%

Temperature (℃)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2450	2450.003	0.000122%	±0.001%
-10	2450	2450.002	0.000082%	±0.001%
0	2450	2450.001	0.000041%	±0.001%
10	2450	2450.006	0.000245%	±0.001%
20	2450	2450.005	0.000204%	±0.001%
30	2450	2450.001	0.000041%	±0.001%
40	2450	2450.005	0.000204%	±0.001%
50	2450	2450.001	0.000041%	±0.001%

2480MHz

Voltage (V)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
3.145	2480	2480.005	0.000202%	±0.001%
3.7	2480	2480.003	0.000121%	±0.001%
4.255	2480	2480.001	0.000040%	±0.001%

Temperature (℃)	Frequency(MHz)	Reading(MHz)	Frequency Tolerance	LIMIT
-20	2480	2480.001	0.000040%	±0.001%
-10	2480	2480.006	0.000242%	±0.001%
0	2480	2480.003	0.000121%	±0.001%
10	2480	2480.008	0.000323%	±0.001%
20	2480	2480.002	0.000081%	±0.001%
30	2480	2480.004	0.000161%	±0.001%
40	2480	2480.003	0.000121%	±0.001%
50	2480	2480.004	0.000161%	±0.001%

5. BANDWIDTH TEST

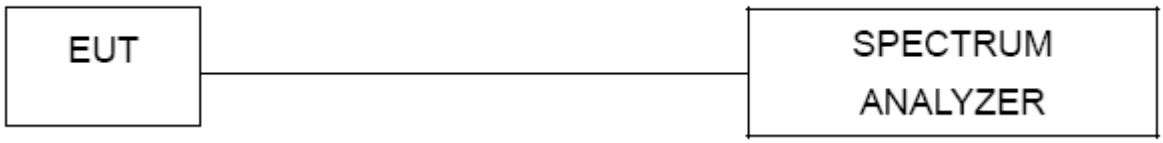
5.1 TEST PROCEDURE

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

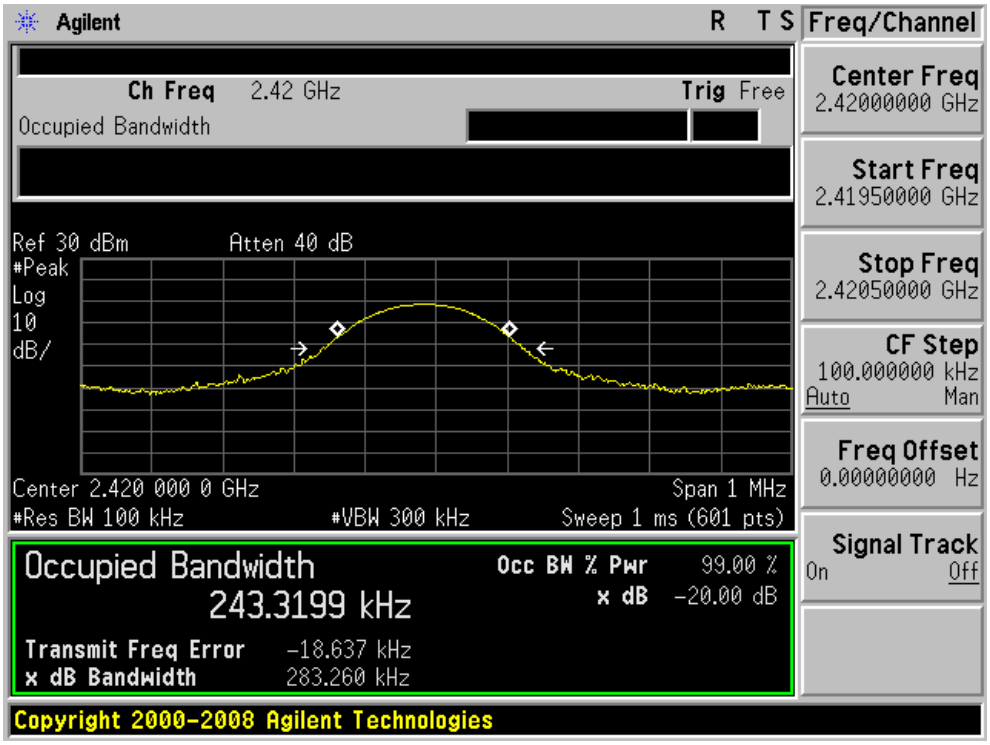


6. TEST RESULTS

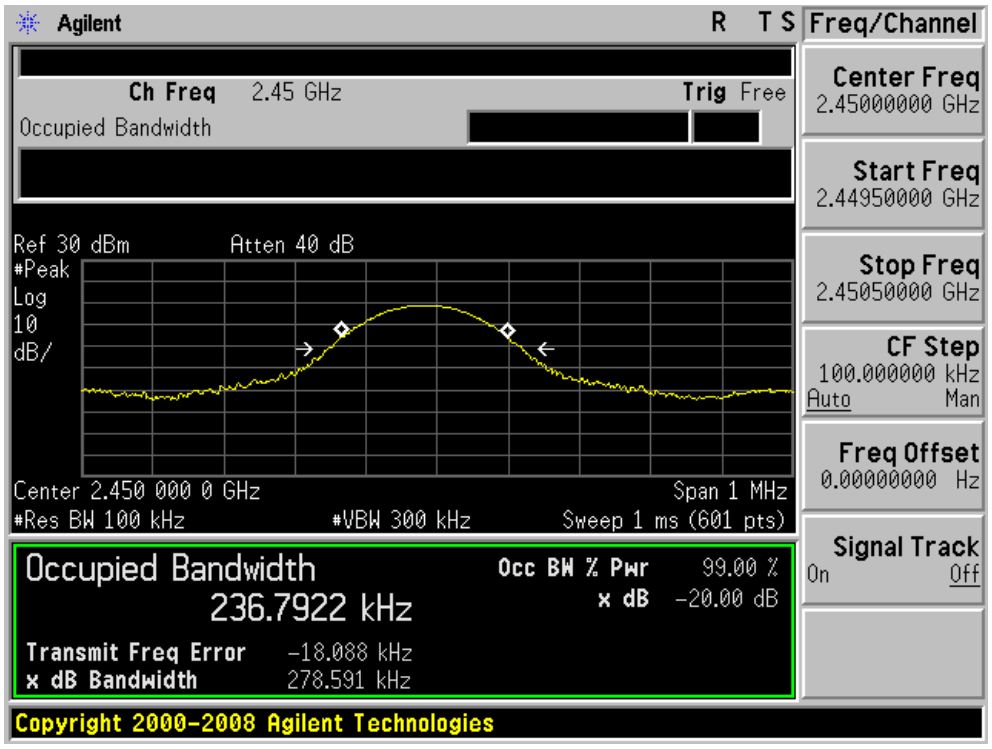
EUT：	Electric skateboard	Model Name ：	S22
Temperature：	26 ℃	Relative Humidity：	53%
Pressure：	1020 hPa	Test Power ：	DC 3.7V from battery
Test Mode ：	Mode 1/2/3		

Test Channel	Frequency (MHz)	20 dBc Bandwidth (MHz)
CH01	2420	0.283
CH30	2450	0.279
CH60	2480	0.276

2420 MHz



2450 MHz



2480 MHz