FCC TEST REPORT

Product Name : HIGHBAY FACTORY LAMP

Model Name : SBF6110-YQL200
SBF6110-YQL300

Prepared for:

Shanghai Senben Lighting Technology Incorporated Company
Zone B, Block 2, No. 4800, Baoqian Highway, Jiading District, Shanghai City, China
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Prepared by:

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Report Number	**:**	UL22020130913FCC117-1
Date of Report	**:**	2013-11-21
Date of Test	**:**	2013-10-26~2013-10-27

Notes：
The test results only relate to these samples which have been tested.
Partly using this report will not be admitted unless been allowed by Unilab.
Unilab is only responsible for the complete report with the reported stamp of Unilab.

Applicant:	Shanghai Senben Lighting Technology Incorporated Company . Zone B, Block 2, No. 4800, Baoqian Highway, Jiading District, Shanghai City, China.
Manufacturer:	Shanghai Senben Lighting Technology Incorporated Company. Zone B, Block 2, No. 4800, Baoqian Highway, Jiading District, Shanghai City, China
Product Name:	HIGHBAY FACTORY LAMP
Brand Name:	N/A
Model Name:	SBF6110-YQL200，SBF6110-YQL300
Operating frequency:	0.22MHz-0.28MHz
Model difference:	Power is the only difference for the two lamps,**SBF6110-YQL200** power is 200 watts and **SBF6110-YQL300** power is 300 watts.
FCC ID:	2AA556110TO300
EUT Voltage:	AC input: AC 120V/60Hz
Date of Receipt:	2013-10-26
Test Standard:	FCC CFR Tile 47 Part 18 Subpart C
Test Result:	Complied
Date of Test	2013-11-21

Prepared by : Flame Wang
(Technical Engineer: Flame Wang)

Reviewed by : Forest Cao
(Senior Engineer: Forest Cao)

Approved by : Eva wang
(Supervisor: Eva Wang)

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1. TECHNIACL SUMMARY

1.1 SUMMARY OF STANDARDS AND TEST RESULTS

The EUT have been tested according to the applicable standards as referenced below:

Test Item	FCC	Result
Conducted disturbance	FCC 18.307(c)	P
Radiated disturbance	FCC 18.305(c)	P
Magnetic Field Emission	FCC 18.305(b)	P

Note: P means pass, F means failure, N/A means not applicable

1.2 TEST UNCERTAINTY

Where relevant, the following test uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2. This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

Test item	Value (dB)
Conducted disturbance	3.4
Radiated disturbance	4.2

1.3 TEST EQUIPMENT LIST

Shielding Room No. 3 - Conducted disturbance Test				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
Receiver	Agilent	N9038A	MY51210142	2014/09/27
LISN	R&S	ENV216	100069	2014/06/23

3m Semi-anechoic Chamber - Radiated disturbance Test				
Equipment	**Manufacturer**	**Model**	**Serial No.**	**Due Date**
3m Chamber & Accessory Equipment	ETS-LINDGREN	FACT-3	CT-0000336	2013/11/27
Receiver	Agilent	N9038A	MY51210142	2014/09/27
Biconilog Antenna	SCHWARZBECK	VULB 9160	3316	2014/10/19
Loop Antenna	Schwarzbeck	FMZB1519	1519-020	2014/03/27

The measuring equipment utilized to perform the tests documented in this report has been calibrated once a year or in accordance with the manufacturer's recommendations, and has been calibrated by accredited calibration laboratories.

1.4 SUPPORT EQUIPMENT

Equipment	Manufacturer	Model	Serial No.	Due Date
N/A	N/A	N/A	N/A	N/A

1.5 TEST FACILITY

All test facilities used to collect the test data are located at No. 1350, Lianxi Rd. Pudong New District, Shanghai, China. The site and apparatus are constructed in conformance with the requirements of ANSI C63.4: 2009, CISPR 16-1-1 and other equivalent standards. The laboratory is compliance with the requirements of the ISO/IEC/EN17025. FCC Registration Number is 714465.

1.6 TEST SETUP CONFIGURATION

See test photographs attached in Appendix 1 for the actual connections between EUT and support equipment.

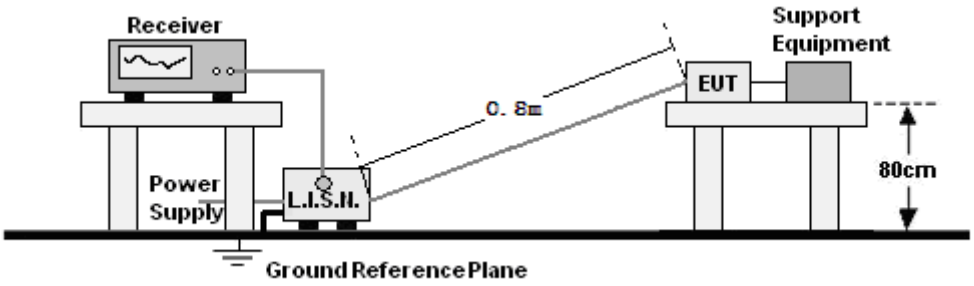
Notes:

1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.
3. All the tests were carried out with the EUT in normal operation. Which was shown in this test report is the worst test mode.

2. CONDUCTED DISTURBANCE

2.1 TEST SETUP

For mains port:



2.2 LIMITS

Limits for Class B digital devices

Frequency range (MHz)	Limits dB(μV)	
	Quasi-peak	Average
0,45 to 2.51	48	/
2.51 to 3	70	/
3 to 30	48	/

NOTE: The lower limit shall apply at the transition frequencies.

2.3 TEST PROCEDURE

For mains port:

a. The EUT and support equipment were placed on a nonconductive table 0.8m above the horizontal ground reference plane, and 0.4 m from the vertical ground reference plane. The EUT connected to the main through Line Impedance Stability Network (L.I.S.N) to provide a 50 Ω/50uH coupling impedance for the measuring equipment. The support equipment is also connected to the main power through a LISN that provides a 50 Ω/50uH coupling impedance with 50 Ω terminations. Both sides of AC line (Line & Neutral) were checked to find out the maximum conducted emission.

b. The RBW of the receiver was set at 9 kHz. The frequency range from 150 kHz to 30 MHz was checked. Run the receiver's pre-scan to record the maximum disturbance generated from EUT in all power lines in the full band.

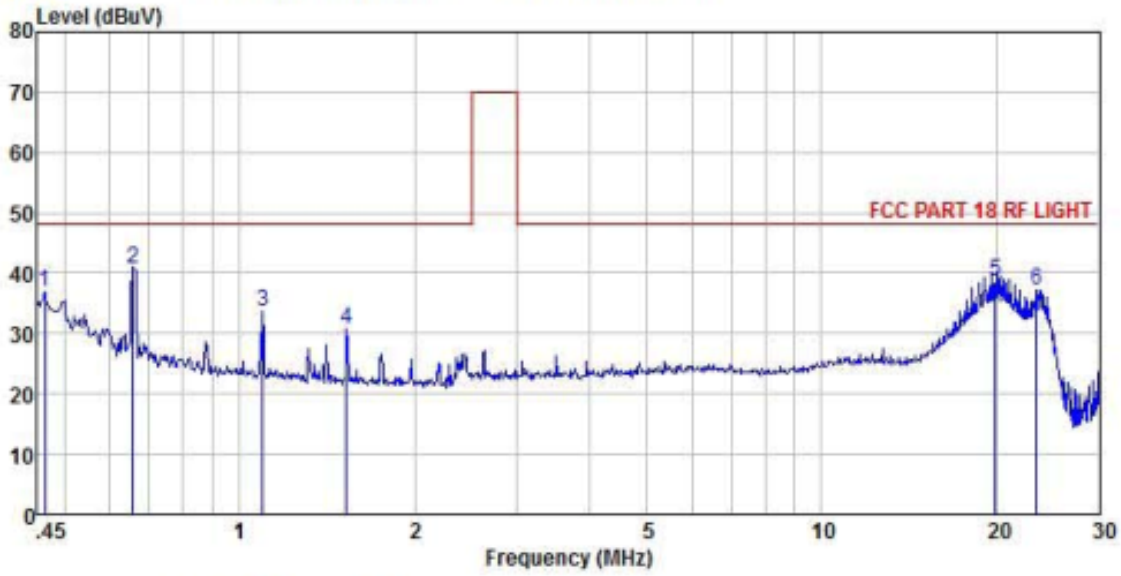
c. For each frequency whose maximum record was higher or close to limit, measure its QP and record.

2.4 TEST RESULT

For mains port:

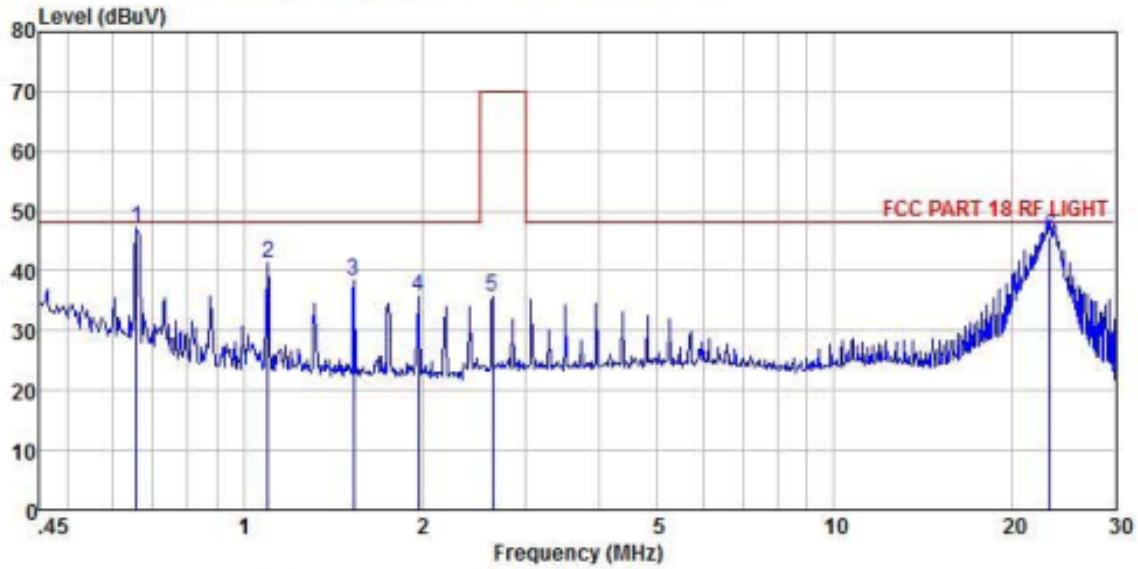
Model Name: SBF6110-YQL200

Test mode: Power on



Site : shielded room 3
Condition : FCC PART 18 RF LIGHT ENV216(L)-20120730 LINE
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL200
Temp/Humi : 22℃ / 54%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.46	26.19	10.56	0.11	0.00	36.86	48.00	-11.14	QP
2 pp	0.66	30.27	10.42	0.12	0.00	40.81	48.00	-7.19	QP
3	1.10	23.00	10.52	0.14	0.00	33.66	48.00	-14.34	QP
4	1.53	19.93	10.52	0.15	0.00	30.60	48.00	-17.40	QP
5	19.96	28.05	10.53	0.10	0.00	38.68	48.00	-9.32	QP
6	23.42	26.54	10.49	0.11	0.00	37.14	48.00	-10.86	QP

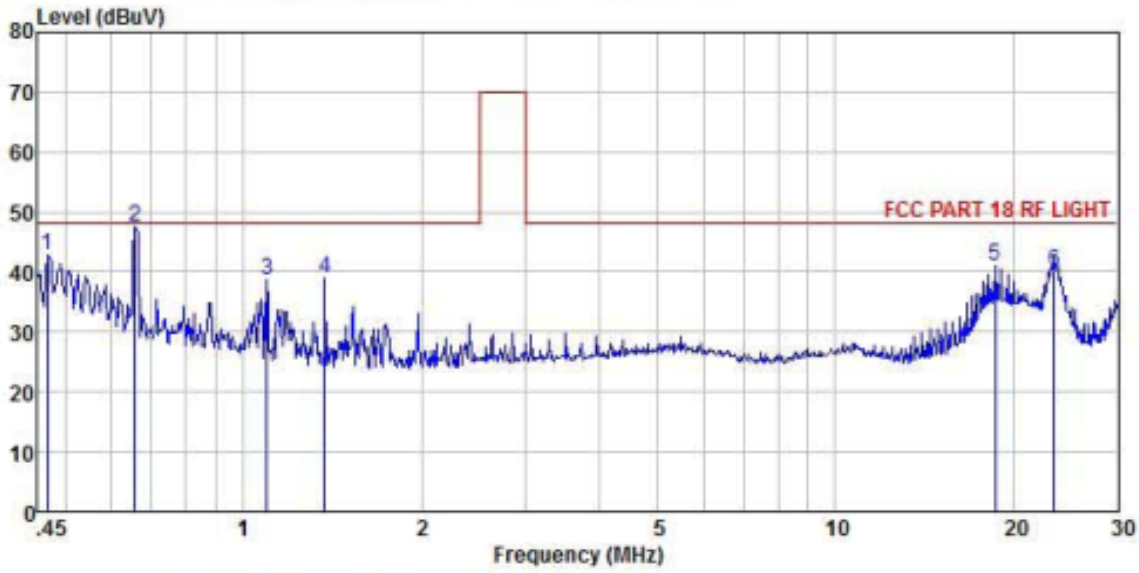


Site : shielded room 3
Condition : FCC PART 18 RF LIGHT ENV216(N)-20120730 NEUTRAL
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL200
Temp/Humi : 22℃ / 54%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1 pp	0.66	36.78	10.32	0.12	0.00	47.22	48.00	-0.78	QP
2	1.10	30.88	10.31	0.14	0.00	41.33	48.00	-6.67	QP
3	1.53	27.82	10.31	0.15	0.00	38.28	48.00	-9.72	QP
4	1.97	25.20	10.31	0.15	0.00	35.66	48.00	-12.34	QP
5	2.64	25.21	10.32	0.15	0.00	35.68	70.00	-34.32	QP
6	23.25	35.29	10.45	0.11	0.00	45.85	48.00	-2.15	QP

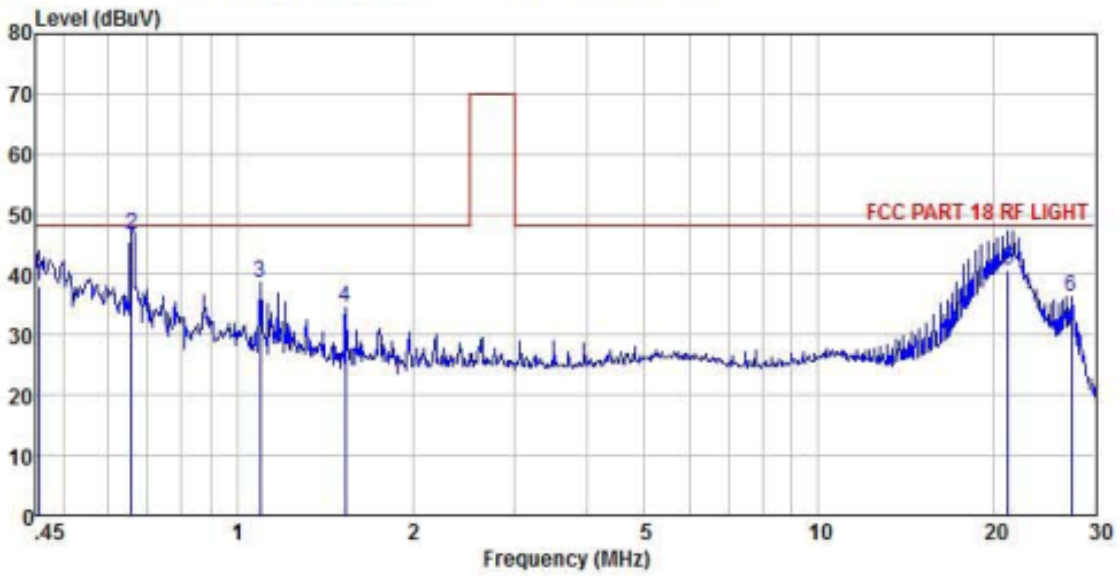
Model Name: SBF6110-YQL300

Test mode: Power on



Site : shielded room 3
Condition : FCC PART 18 RF LIGHT ENV216(L)-20120730 LINE
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL300
Temp/Humi : 24 ℃ / 56%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.47	32.19	10.56	0.11	0.00	42.86	48.00	-5.14	QP
2 pp	0.66	36.93	10.42	0.12	0.00	47.47	48.00	-0.53	QP
3	1.10	28.06	10.52	0.14	0.00	38.72	48.00	-9.28	QP
4	1.38	28.24	10.52	0.14	0.00	38.90	48.00	-9.10	QP
5	18.66	30.26	10.53	0.11	0.00	40.90	48.00	-7.10	QP
6	23.42	29.53	10.49	0.11	0.00	40.13	48.00	-7.87	QP



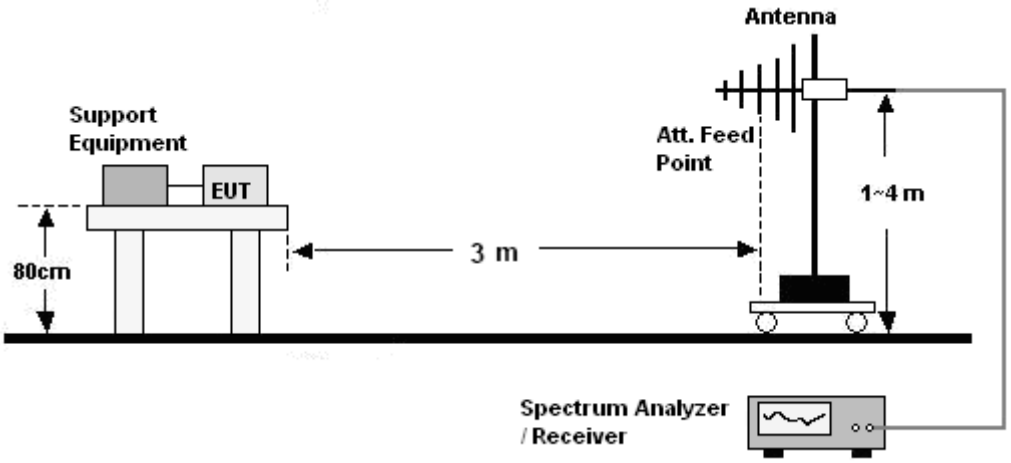
Site : shielded room 3
Condition : FCC PART 18 RF LIGHT ENV216(N)-20120730 NEUTRAL
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL300
Temp/Humi : 24 ℃ / 56%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	LISN Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB	dB	dB	dBuV	dBuV	dB	
1	0.45	27.49	10.42	0.11	0.00	38.02	48.00	-9.98	QP
2 pp	0.66	36.31	10.32	0.12	0.00	46.75	48.00	-1.25	QP
3	1.09	28.14	10.31	0.14	0.00	38.59	48.00	-9.41	QP
4	1.53	24.04	10.31	0.15	0.00	34.50	48.00	-13.50	QP
5	21.26	30.33	10.41	0.11	0.00	40.85	48.00	-7.15	QP
6	27.24	25.81	10.52	0.12	0.00	36.45	48.00	-11.55	QP

3. RADIATED DISTURBANCE

3.1 TEST SETUP

30MHz ~ 1GHz:



3.2 LIMITS

Limits for Class B digital devices

Frequency (MHz)	limits at 3m dB(μV/m)
30-88	40.0
88-216	43.5
216-960	46.0

NOTE: 1. The lower limit shall apply at the transition frequency.
2. The limits shown above are based on measuring equipment employing a CISPR quasi-peak detector function for frequencies below or equal to 1000MHz.
3. The limits shown above are based on measuring equipment employing an average detector function for frequencies above 1000MHz.

3.3 TEST PROCEDURE

30MHz ~ 1GHz:

a. The EUT and support equipment were placed on the non-conductive turntable 0.8m above the horizontal metal ground plane at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. Broadband antenna (Calibrated Bilog Antenna) was used as receiving antenna.

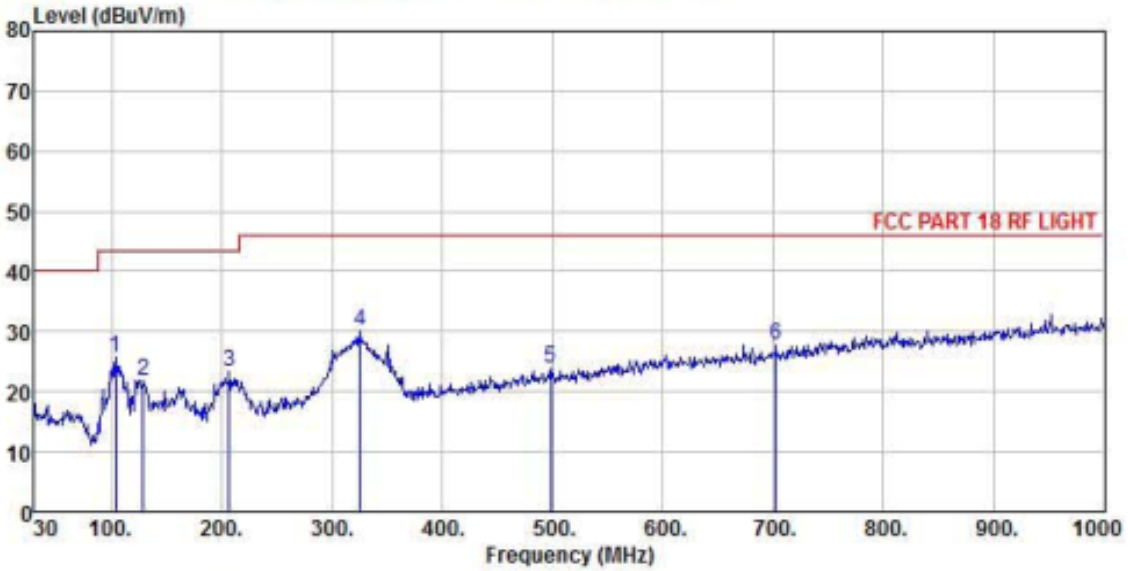
b. The frequency range from 30MHz to 1GHz was checked. The RBW of the receiver was set at 120kHz. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band when the antenna is varied between 1~4 m in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the height and degree where EUT radiated the maximum emission, then set the test frequency receiver to QP Detector and record the maximum value.

3.4 TEST RESULT

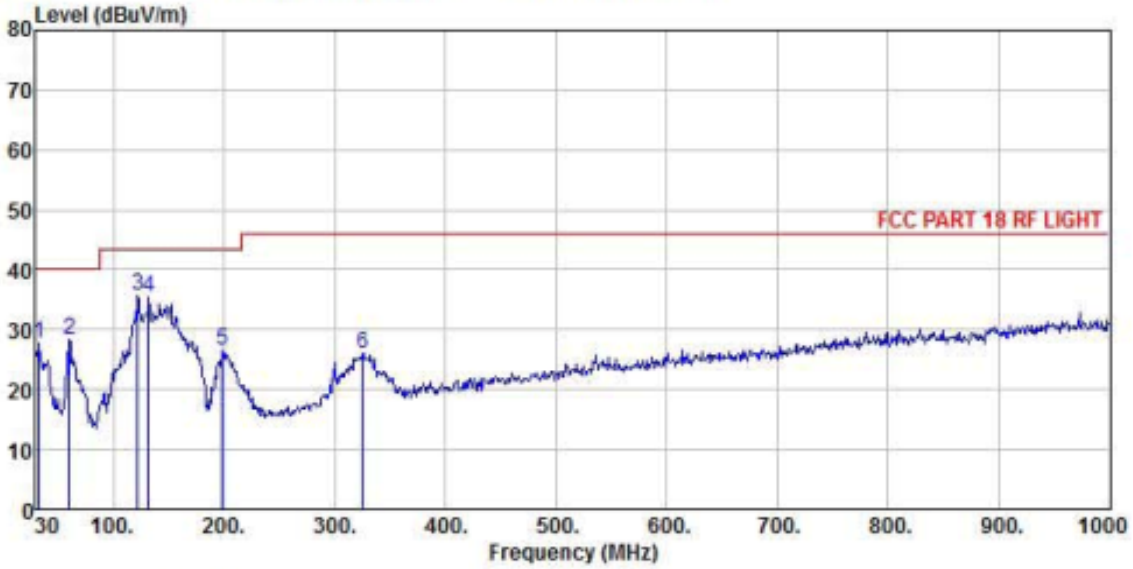
Model Name: SBF6110-YQL200

Test mode: Power on



Site : chamber
Condition : FCC PART 18 RF LIGHT 3m VULB9160 HORIZONTAL
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL200
Temp/Humi : 22℃ / 54%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	ReadAntenna Level	Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	103.72	13.87	10.57	1.35	0.00	25.79	43.50	-17.71	QP
2	128.94	7.67	12.63	1.60	0.00	21.90	43.50	-21.60	QP
3	206.54	10.92	10.49	1.92	0.00	23.33	43.50	-20.17	QP
4 pp	324.88	13.76	13.78	2.50	0.00	30.04	46.00	-15.96	QP
5	498.51	3.96	17.04	3.04	0.00	24.04	46.00	-21.96	QP
6	702.21	4.06	20.18	3.65	0.00	27.89	46.00	-18.11	QP

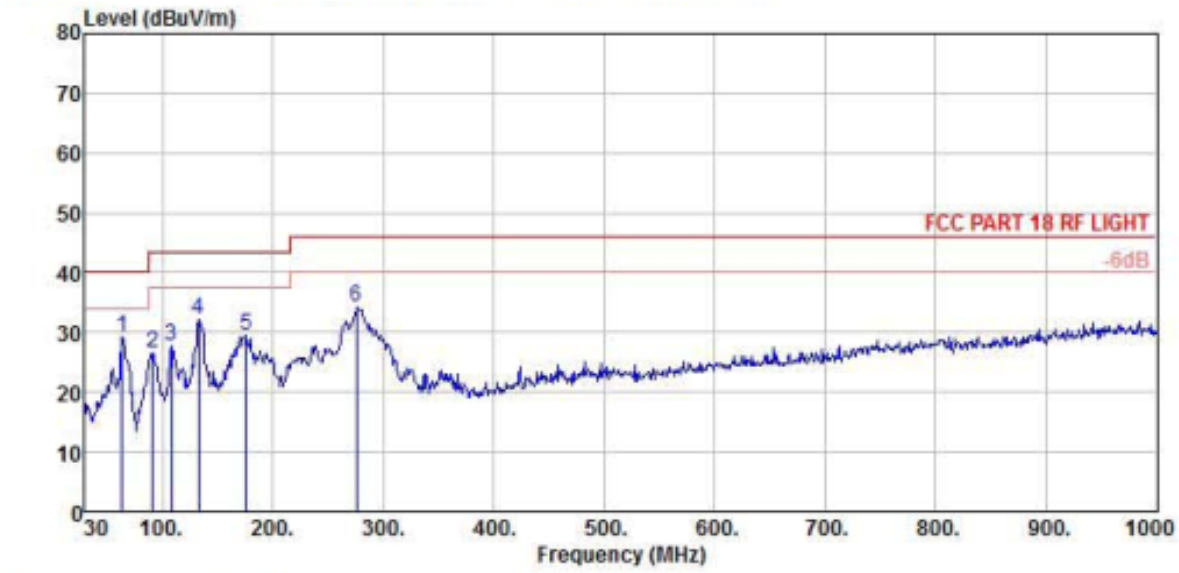


Site : chamber
Condition : FCC PART 18 RF LIGHT 3m VULB9160 VERTICAL
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL200
Temp/Humi : 22℃ / 54%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	32.91	14.78	12.22	0.71	0.00	27.71	40.00	-12.29	QP
2	60.07	14.75	12.67	1.05	0.00	28.47	40.00	-11.53	QP
3 pp	122.15	22.14	12.15	1.48	0.00	35.77	43.50	-7.73	QP
4	131.85	21.12	12.78	1.61	0.00	35.51	43.50	-7.99	QP
5	198.78	14.10	10.52	1.89	0.00	26.51	43.50	-16.99	QP
6	324.88	9.80	13.78	2.50	0.00	26.08	46.00	-19.92	QP

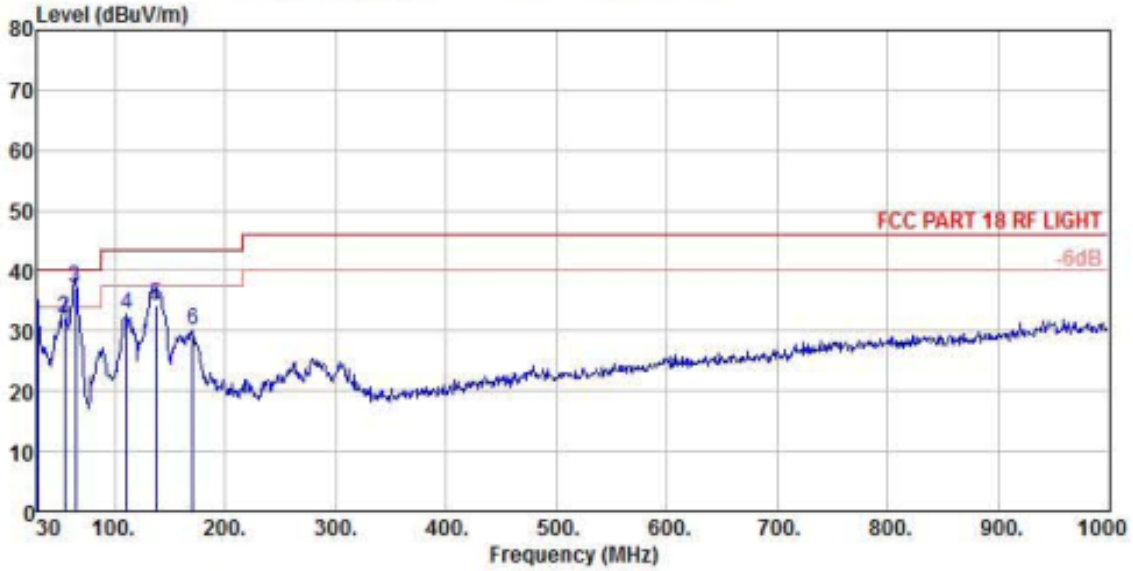
Model Name: SBF6110-YQL300

Test mode: Power on



Site : chamber
Condition : FCC PART 18 RF LIGHT 3m VULB9160 HORIZONTAL
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL300
Temp/Humi : 23 ℃ /54%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1 pp	63.95	15.87	12.34	1.07	0.00	29.28	40.00	-10.72	QP
2	91.11	16.19	9.30	1.11	0.00	26.60	43.50	-16.90	QP
3	108.57	15.36	10.90	1.40	0.00	27.66	43.50	-15.84	QP
4	132.82	17.61	12.92	1.61	0.00	32.14	43.50	-11.36	QP
5	175.50	14.96	12.80	1.87	0.00	29.63	43.50	-13.87	QP
6	275.41	19.26	12.67	2.21	0.00	34.14	46.00	-11.86	QP



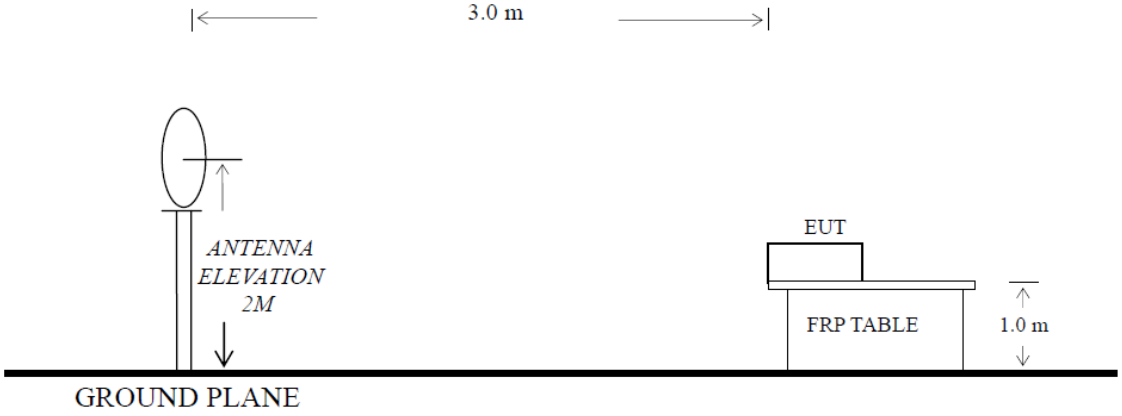
Site : chamber
Condition : FCC PART 18 RF LIGHT 3m VULB9160 VERTICAL
EUT : HIGHBAY FACTORY LAMP
Model Name : SBF6110-YQL300
Temp/Humi : 23 ℃ /54%
Power Rating: AC 120V/60Hz
Mode : power on
Memo :

	Freq	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Level	Limit Line	Over Limit	Remark
	MHz	dBuV	dB/m	dB	dB	dBuV/m	dBuV/m	dB	
1	30.00	18.72	12.24	0.67	0.00	31.63	40.00	-8.37	QP
2	54.25	18.75	12.40	0.99	0.00	32.14	40.00	-7.86	QP
3 pp	64.03	23.78	12.34	1.08	0.00	37.20	40.00	-2.80	QP
4	110.51	20.14	11.07	1.41	0.00	32.62	43.50	-10.88	QP
5	137.67	19.46	13.21	1.62	0.00	34.29	43.50	-9.21	QP
6	170.65	15.14	13.15	1.86	0.00	30.15	43.50	-13.35	QP

4. MAGNETIC FIELD EMISSION

4.1 TEST SETUP

30MHz ~ 1GHz:



4.2 LIMITS

Frequency (MHz)	limits at 3m dB(μV/m)
0.009-30	63.5

4.3 TEST PROCEDURE

a. The EUT and support equipment were placed on the non-conductive turntable 1m above the horizontal metal ground plane at a chamber. The EUT was set 3 meters away from the receiving antenna, which was mounted on an antenna tower. The antenna shall be set at height 2m above the floor.

b. The frequency range from 0.009MHz to 30MHz was checked. The bandwidth setting on the test receiver is 200Hz from 9kHz to 150kHz and 9kHz from 150kHz to 30MHz.. Set the receiver in Peak detector, Max Hold mode. Record the maximum field strength of all the pre-scan process in the full band in both horizontal and vertical, and the turntable is rotated from 0 to 360 degrees.

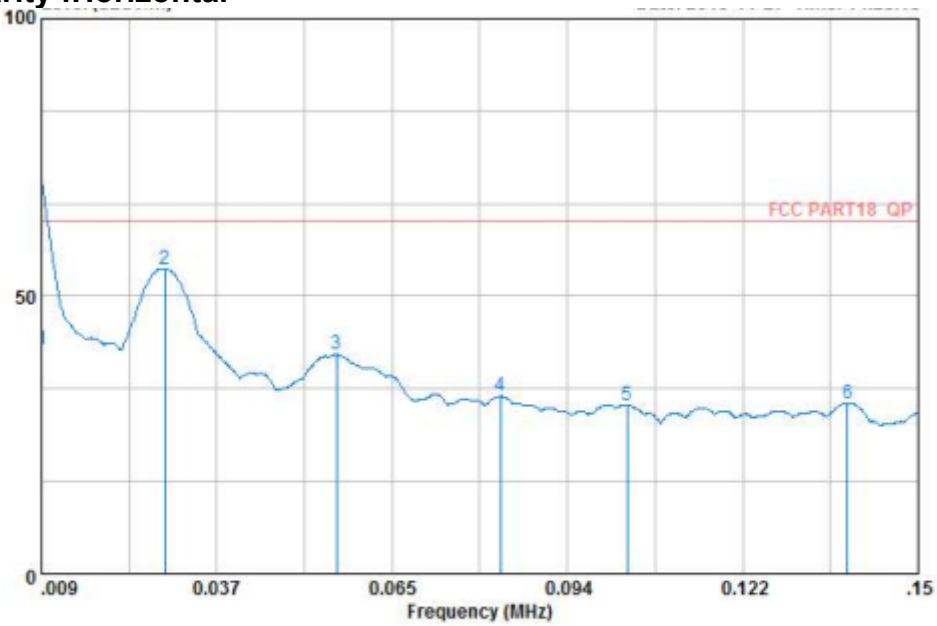
c. For each frequency whose maximum record was higher or close to limit, measure its QP value: vary the antenna's height and rotate the turntable from 0 to 360 degrees to find the degree where EUT radiated the maximum emission, then set the test frequency receiver to QP Detector and record the maximum value.

4.4 TEST RESULT

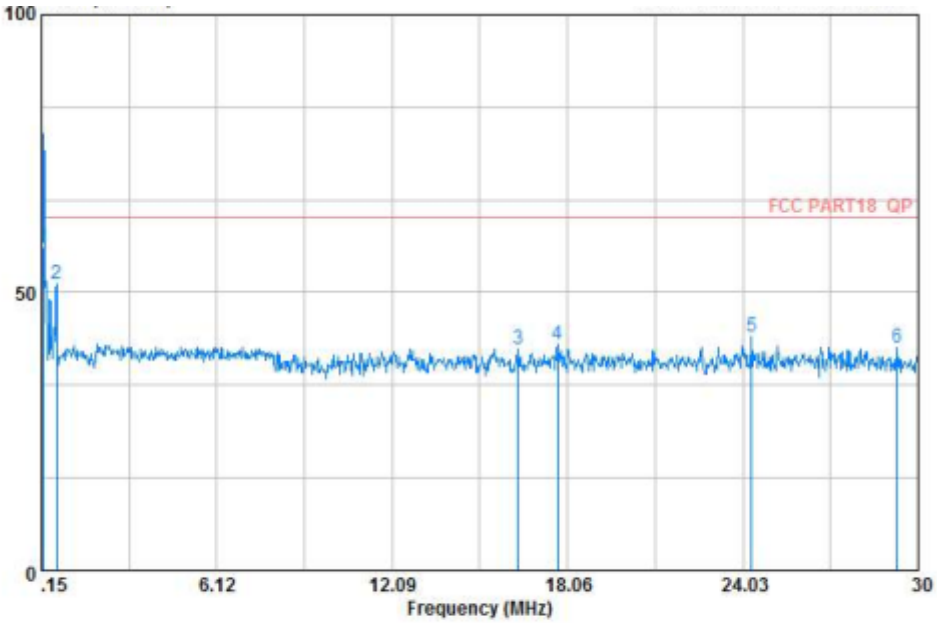
Model Name: SBF6110-YQL200

Test mode: Power on

Antenna polarity :Horizontal

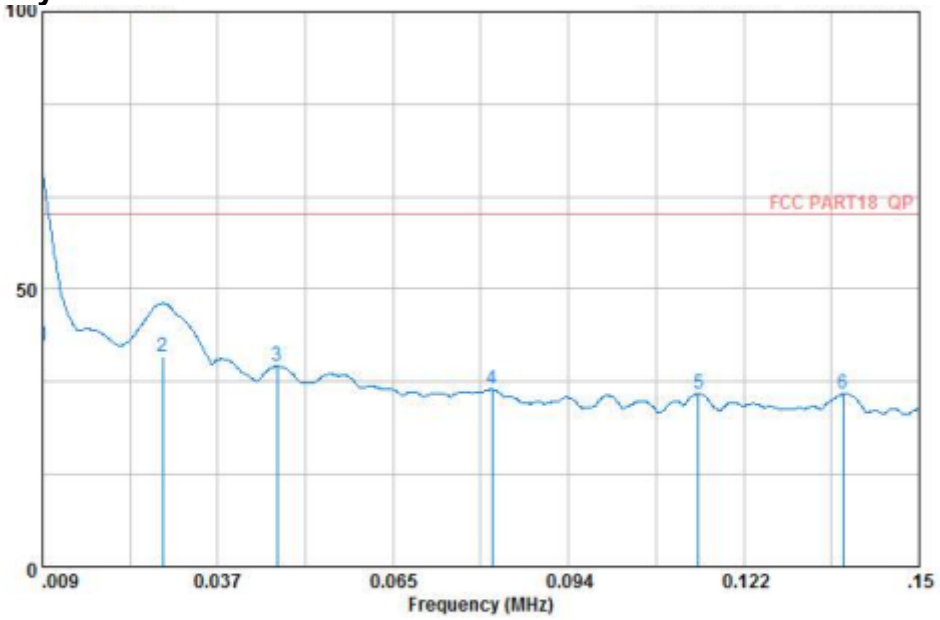


Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.00900	21.86	18.50	40.36	63.50	-23.14	QP	200	0
2	0.02888	20.48	34.48	54.96	63.50	-8.54	Peak	200	0
3	0.05638	20.12	19.34	39.46	63.50	-24.04	Peak	200	0
4	0.08274	20.06	11.88	31.94	63.50	-31.56	Peak	200	0
5	0.10319	20.06	10.40	30.46	63.50	-33.04	Peak	200	0
6	0.13858	20.02	10.76	30.78	63.50	-32.72	Peak	200	0

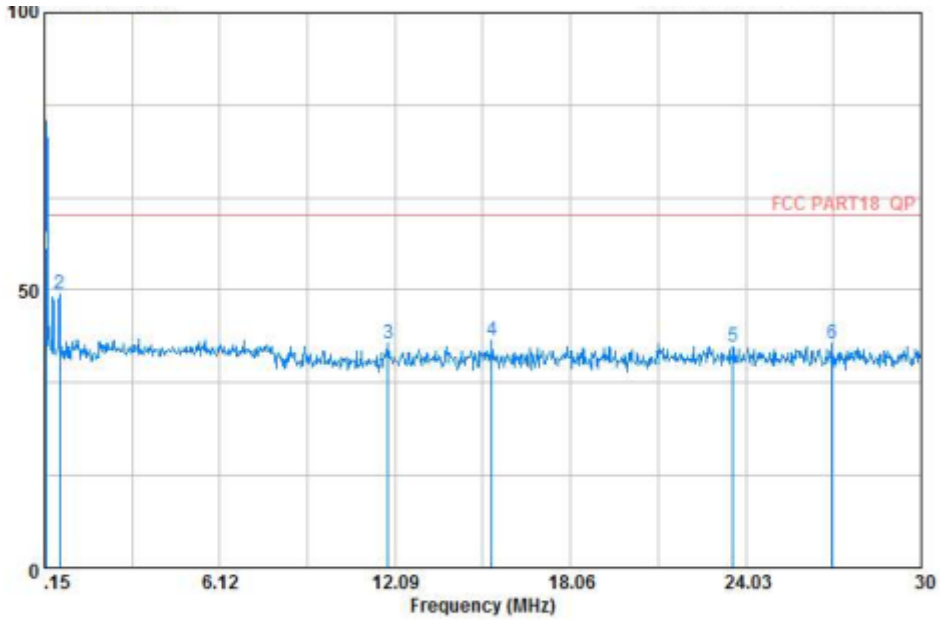


Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.20970	20.12	38.08	58.20	63.50	-5.30	QP	200	0
2	0.65745	20.07	31.52	51.59	63.50	-11.91	Peak	200	0
3	16.388	20.42	19.54	39.96	63.50	-23.54	Peak	200	0
4	17.732	20.55	20.15	40.70	63.50	-22.80	Peak	200	0
5	24.329	20.65	21.29	41.94	63.50	-21.56	Peak	200	0
6	29.284	20.70	19.53	40.23	63.50	-23.27	Peak	200	0

Antenna polarity :Vertical



Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.00900	21.86	17.90	39.76	63.50	-23.74	QP	200	0
2	0.02832	20.49	17.41	37.90	63.50	-25.60	QP	200	0
3	0.04679	20.33	15.80	36.13	63.50	-27.37	Peak	200	0
4	0.08133	20.06	11.85	31.91	63.50	-31.59	Peak	200	0
5	0.11447	20.04	11.11	31.15	63.50	-32.35	Peak	200	0
6	0.13773	20.03	11.12	31.15	63.50	-32.35	Peak	200	0

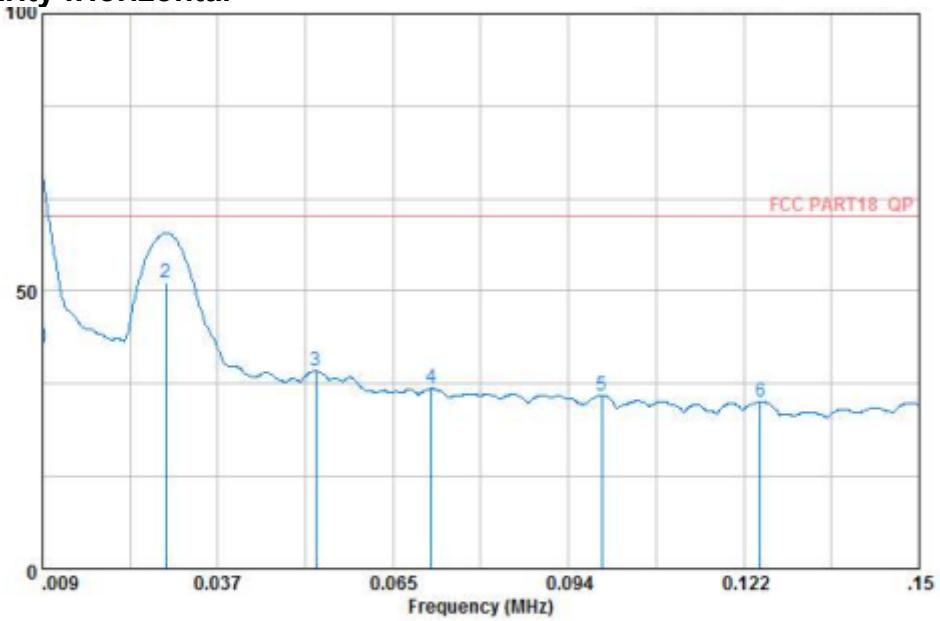


Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.20970	20.12	37.50	57.62	63.50	-5.88	QP	200	0
2	0.65745	20.07	29.12	49.19	63.50	-14.31	Peak	200	0
3	11.851	20.21	20.23	40.44	63.50	-23.06	Peak	200	0
4	15.374	20.39	20.57	40.96	63.50	-22.54	Peak	200	0
5	23.582	20.64	19.26	39.90	63.50	-23.60	Peak	200	0
6	26.955	20.65	19.73	40.38	63.50	-23.12	Peak	200	0

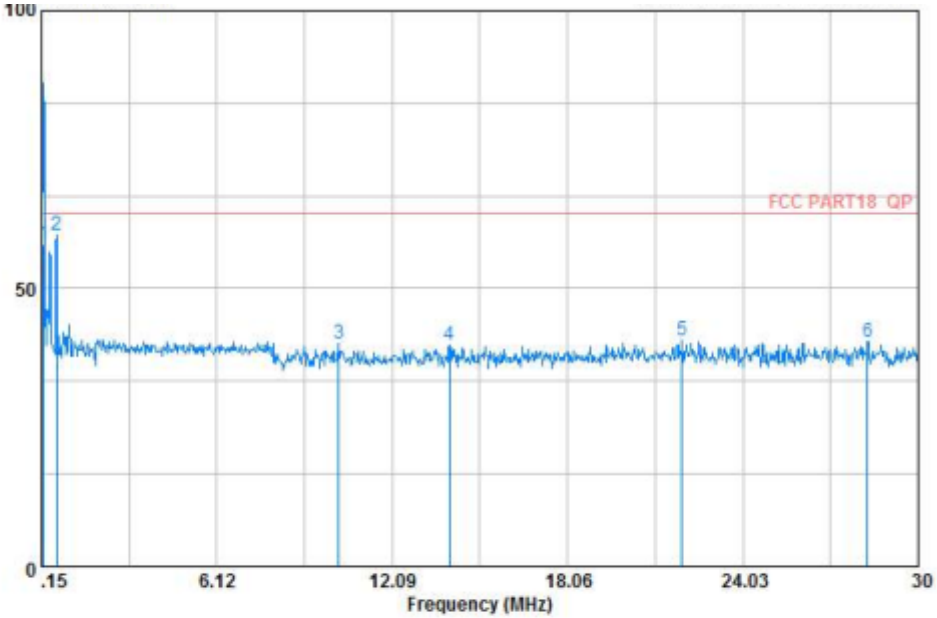
Model Name: SBF6110-YQL300

Test mode: Power on

Antenna polarity :Horizontal

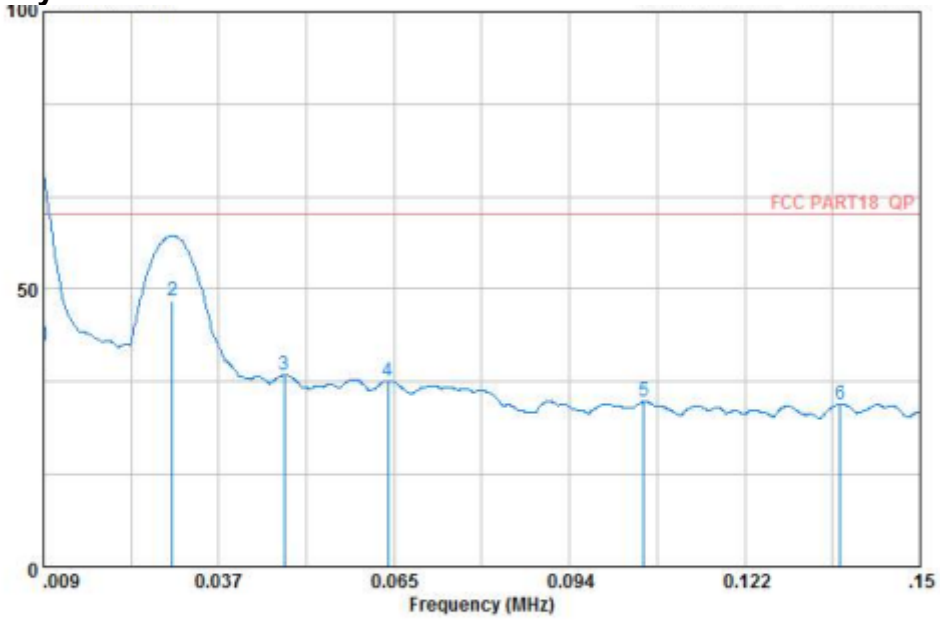


Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.00900	21.86	17.90	39.76	63.50	-23.74	QP	200	0
2	0.02888	20.48	31.10	51.58	63.50	-11.92	QP	200	0
3	0.05299	20.29	15.34	35.63	63.50	-27.87	Peak	200	0
4	0.07146	20.12	12.34	32.46	63.50	-31.04	Peak	200	0
5	0.09896	20.06	11.16	31.22	63.50	-32.28	Peak	200	0
6	0.12448	20.04	10.03	30.07	63.50	-33.43	Peak	200	0

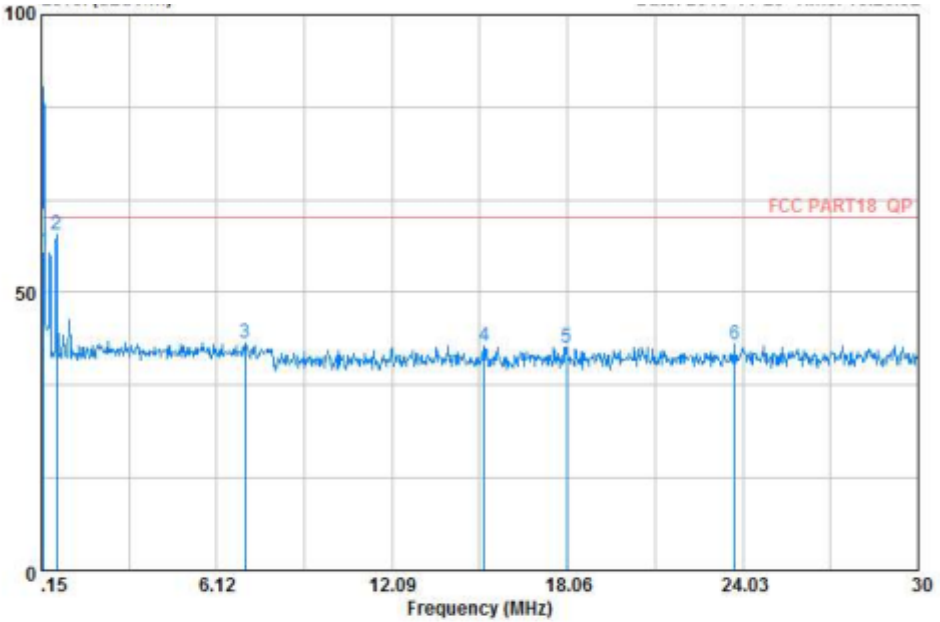


Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.20970	20.12	37.78	57.90	63.50	-5.60	QP	200	0
2	0.65745	20.07	39.53	59.60	63.50	-3.90	Peak	200	0
3	10.269	20.08	20.08	40.16	63.50	-23.34	Peak	200	0
4	14.030	20.36	19.35	39.71	63.50	-23.79	Peak	200	0
5	21.970	20.60	20.08	40.68	63.50	-22.82	Peak	200	0
6	28.269	20.70	19.80	40.50	63.50	-23.00	Peak	200	0

Antenna polarity :Vertical



Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.00900	21.86	17.90	39.76	63.50	-23.74	QP	200	0
2	0.02973	20.47	27.31	47.78	63.50	-15.72	Peak	200	0
3	0.04778	20.32	14.19	34.51	63.50	-28.99	Peak	200	0
4	0.06441	20.11	13.43	33.54	63.50	-29.96	Peak	200	0
5	0.10559	20.06	9.71	29.77	63.50	-33.73	Peak	200	0
6	0.13717	20.03	9.23	29.26	63.50	-34.24	Peak	200	0



Item	Freq	Factor	Read	Level	Limit	Over	Remark	Height	Angle
	(MHz)	(dB)	(dBuV/m)	(dBuV/m)	(dBuV/m)	(dB)		(cm)	(deg)
1	0.20970	20.12	37.28	57.40	63.50	-6.10	QP	200	0
2	0.65745	20.07	40.34	60.41	63.50	-3.09	Peak	200	0
3	7.075	19.94	21.13	41.07	63.50	-22.43	Peak	200	0
4	15.224	20.38	19.99	40.37	63.50	-23.13	Peak	200	0
5	18.030	20.57	19.62	40.19	63.50	-23.31	Peak	200	0
6	23.761	20.64	20.08	40.72	63.50	-22.78	Peak	200	0

APPENDIX 1 PHOTOGRAPHS OF TEST SETUP

Please refer to the file named “2AA556110TO300_Setup Photos”.

APPENDIX 2 PHOTOGRAPHS OF EUT

Please refer to the two files named “2AA556110TO300_External Photos” and “2AA556110TO300_Internal Photos”.

----End of the report----