FCC TEST REPORT

No. 180301555SHA-001

Applicant	:	Zhejiang Yankon Group Co.,Ltd. TONGJIANG MIDDLE ROAD SHANGYU ECONOMIC DEVELOPMENT ZONE ZHEJIANG PROVINCE
Manufacturer	:	Zhejiang Yankon Group Co.,Ltd. TONGJIANG MIDDLE ROAD SHANGYU ECONOMIC DEVELOPMENT ZONE ZHEJIANG PROVINCE
Product Name	:	LED Desk Light
Type/Model	:	MTSL1011XX (X can be A to Z, it represents the color of the enclosure. For example, YS means Silver as Y represents Yin and S represents Silver)
TEST RESULT	**:**	**PASS**

SUMMARY

The equipment complies with the requirements according to the following standard(s) or specification:

47CFR Part 15 (2017): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

Date of issue: May 02, 2018

Prepared by:

Erick Liu (*Project Engineer*)

Reviewed by:

Daniel Zhao (*Reviewer*)

Content

1 GENERAL INFORMATION

1.1 Description of Equipment Under Test (EUT)

Product Name	:	LED Desk Light
Type/Model	:	MTSL1011XX (X can be A to Z, it represents the color of the enclosure. For example, YS means Silver as Y represents Yin and S represents Silver).
Description of EUT	:	EUT is a LED Desk Light with wireless charging function. It has a series models, they have the same electrical construction except the color of the enclosure. The model of MTSL1011YS was chosen to perform the full tests as representative.
Rating	:	120V~, 60Hz, 5W
Category of EUT	:	Class B
EUT type	:	☒ Table top ☐ Floor standing
Operating frequency range	:	110kHz - 205kHz
Sample received date	:	March 26, 2018
Date of test	:	March 30, 2018
FCC ID	:	2AL76MTSL10111

1.2 Description of Client

Applicant	:	Zhejiang Yankon Group Co.,Ltd.
		TONGJIANG MIDDLE ROAD SHANGYU ECONOMIC DEVELOPMENT ZONE ZHEJIANG PROVINCE
Name of contact	:	Chris Sun
Tel	:	+86-0575 82423293
Fax	:	-
Email	:	sunjb@yankon.com
Manufacturer	:	Zhejiang Yankon Group Co.,Ltd.
		TONGJIANG MIDDLE ROAD SHANGYU ECONOMIC DEVELOPMENT ZONE ZHEJIANG PROVINCE

1.3 Description of Test Facility

☒ Name : Intertek Testing Services Shanghai

Address : Building 86, No. 1198 Qinzhou Road(North), Shanghai 200233, P.R. China

Telephone : 86 21 61278200

Telefax : 86 21 54262353

A2LA Certificate Number: 3309.02

Subcontractor:

☐ Name : Shanghai Institute of Measurement Technology

Address : 716 Yishan Road, Shanghai 200233, P.R. China

Telephone : 86 21 64700066

Telefax :

2 TEST SPECIFICATIONS

2.1 Standards or specification

47CFR Part 15 (2017): Radio Frequency Devices (Subpart C)

ANSI C63.10 (2013): American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices

2.2 Mode of operation during the test

Within this test report, EUT was tested with modulation and tested under its rating voltage and frequency.

2.3 Test software list

Test Items	Software	Manufacturer	Version
Conducted emission	ESxS-K1	R&S	V2.1.0
Radiated emission	ES-K1	R&S	V1.71

2.4 Test peripherals list

Item No.	Name	Manufacturer	Mode	Rating
1	Load1	Client	100% Power level	DC 5V/1A
2	Load2	Client	50% Power level	DC 5V/0.5A
3	Load3	Client	Stand by	DC 5V/0A

We tested the load at all three power level modes, and the 100% Power level mode is the worst case, we listed the results in this report.

2.5 Instrument list

Conducted Emission/Disturbance Power/Tri-loop Test/CDN method					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESCS 30	EC 2107	2018-09-12
☑	A.M.N.	R&S	ESH2-Z5	EC 3119	2018-12-01
☐	A.M.N.	R&S	ENV 216	EC 3393	2018-07-30
☐	A.M.N.	R&S	ENV4200	EC 3558	2018-06-20
☐	Absorbing clamp	R&S	MDS 21	EC 2108	2018-05-12
☐	CDN	Schaffner	CDN M216	EC 2113-2	2018-07-27
☐	CDN	Schaffner	CDN M316	EC 2113-1	2018-07-30
☐	Attenuator	Weinschel	68-6-44	EC 3043-9	2019-02-08
☐	Tri-loop	Schwarzbeck	HXYZ 9170	EC 3384	2018-07-12
☐	Voltage Probe	Schwarzbeck	TK9420	EC 4888	2018-09-11
☐	Current probe	R&S	EZ-17	EC 3221	2019-03-07
☐	I.S.N.	FCC	FCC-TLISN -T2-02	EC 3754	2019-02-08
☐	I.S.N.	FCC	FCC-TLISN -T4-02	EC 3755	2019-02-08
☐	I.S.N.	FCC	FCC-TLISN -T8-02	EC 3756	2019-02-08
Radiated Emission					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Test Receiver	R&S	ESIB 26	EC 3045	2018-09-12
☑	Bilog Antenna	TESEQ	CBL 6112D	EC 4206	2018-05-30
☑	Horn antenna	R&S	HF 906	EC 3049	2018-09-23
☐	Horn antenna	ETS	3117	EC 4792-1	2018-08-24
☐	Horn antenna	TOYO	HAP18-26W	EC 4792-3	2020-07-09
☑	Pre-amplifier	R&S	Pre-amp 18	EC5881	2018-06-19
☑	Active loop antenna	Schwarzbeck	FMZB1519	EC 5345	2019-01-25
		EM TEST	DPA 503N	EC 5383-1	2018-09-10
Tet Site					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☑	Shielded room	Zhongyu	-	EC 2838	2019-01-08
☐	Shielded room	Zhongyu	-	EC 2839	2019-01-08
☑	Semi-anechoic chamber	Albatross Project	-	EC 3048	2019-03-09
☐	Fully-anechoic chamber	Albatross project	-	EC 3047	2019-03-09
Additional instrument					
Used	Equipment	Manufacturer	Type	Internal no.	Due date
☐	Spectrum analyzer	Agilent	E7402A	EC 2254	2018-09-12

☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 2323	2018-06-14
☐	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3324	2018-04-09
☑	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3325	2019-03-23
☐	Therom-Hygrograph	ZJ1-2A	S.M.I.F.	EC 3326	2019-03-29
☐	Pressure meter	YM3	Shanghai Mengde	EC 3320	2018-06-28

2.6 Test Summary

This report applies to tested sample only. The test results have been compared directly with the limits, and the measurement uncertainty is recorded. This report shall not be reproduced in part without written approval of Intertek Testing Services Shanghai

TEST ITEM	FCC REFERANCE	RESULT
Conducted emission	15.207	Pass
Radiated emission	15.209	Pass

Notes: 1: NA =Not Applicable

2: This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.

3 Conducted emission

Test result: Pass

3.1 Limits

3.1.1 Limits for conducted emission of class A device

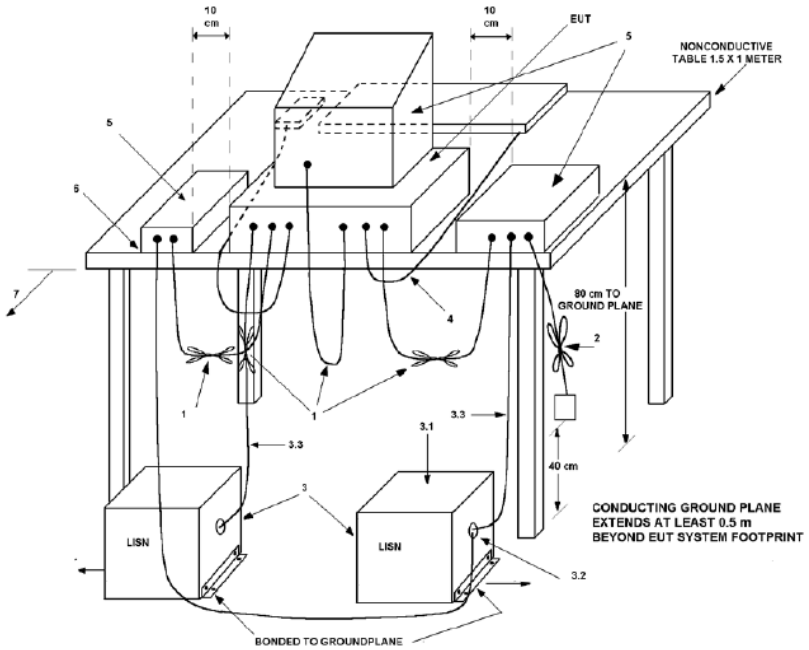
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	79	66
0.5 ~ 30	73	60
Note: If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.1.2 Limits for conducted emission of class B device

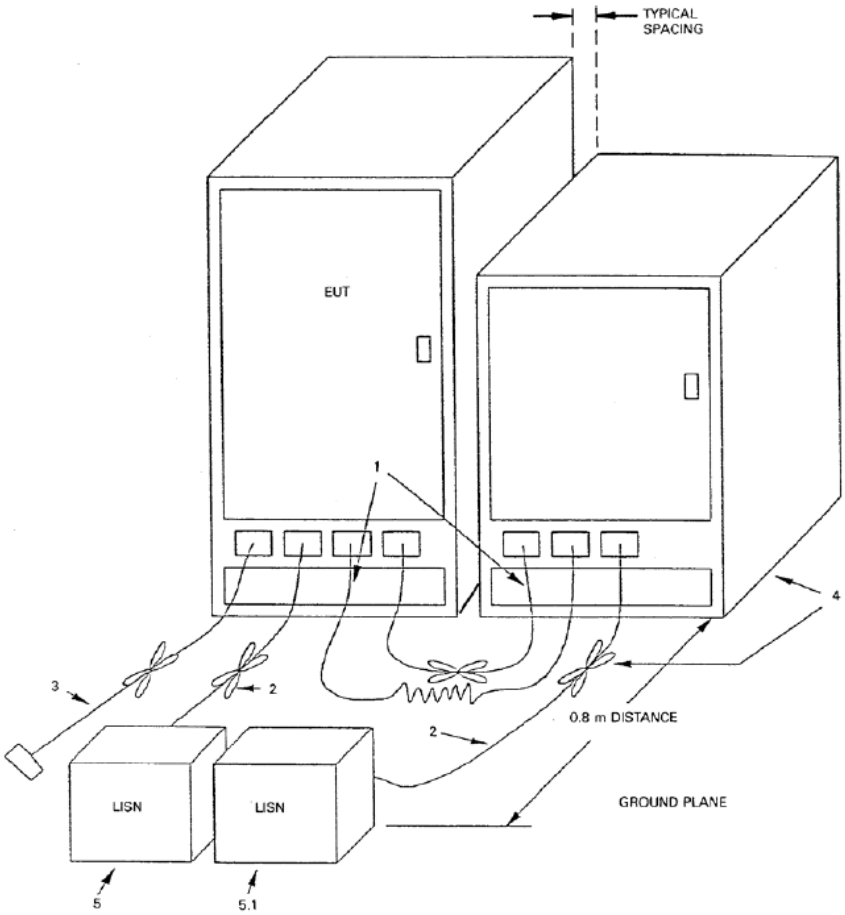
Frequency range (MHz)	Limits dB(μV) Quasi-peak	Average
0.15 ~ 0.5	66 ~ 56 *	56 ~ 46 *
0.5 ~ 5	56	46
5 ~ 30	60	50
Note: 1. * Means the limit decreasing linearly with the logarithm of the frequency in the range 0.15MHz to 0.5MHz 2. If the limit for the measurement with the average detector is met when using a receiver with a quasi-peak detector, the equipment under test shall be deemed to meet both limits and the measurement using the receiver with an average detector need not be carried out.		

3.2 Test setup

☒ For table top equipment



☐ For floor standing equipment



3.3 Test Setup and Test Procedure

Measured levels of ac power-line conducted emission shall be the emission voltages from the voltage probe, where permitted, or across the 50 Ω LISN port (to which the EUT is connected), where permitted, terminated into a 50 Ω measuring instrument. All emission voltage and current measurements shall be made on each current-carrying conductor at the plug end of the EUT power cord by the use of mating plugs and receptacles on the LISN, if used. Equipment shall be tested with power cords that are normally supplied or recommended by the manufacturer and that have electrical and shielding characteristics that are the same as those cords normally supplied or recommended by the manufacturer. For those measurements using a LISN, the 50 Ω measuring port is terminated by a measuring instrument having 50 Ω input impedance. All other ports are terminated in 50 Ω loads.

Tabletop devices shall be placed on a platform of nominal size 1 m by 1.5 m, raised 80 cm above the reference ground plane. The vertical conducting plane or wall of an RF-shielded (screened) room shall be located 40 cm to the rear of the EUT. Floor-standing devices shall be placed either directly on the reference ground-plane or on insulating material as described in ANSI C63.10. All other surfaces of tabletop or floor-standing EUTs shall be at least 80 cm from any other grounded conducting surface, including the case or cases of one or more LISNs.

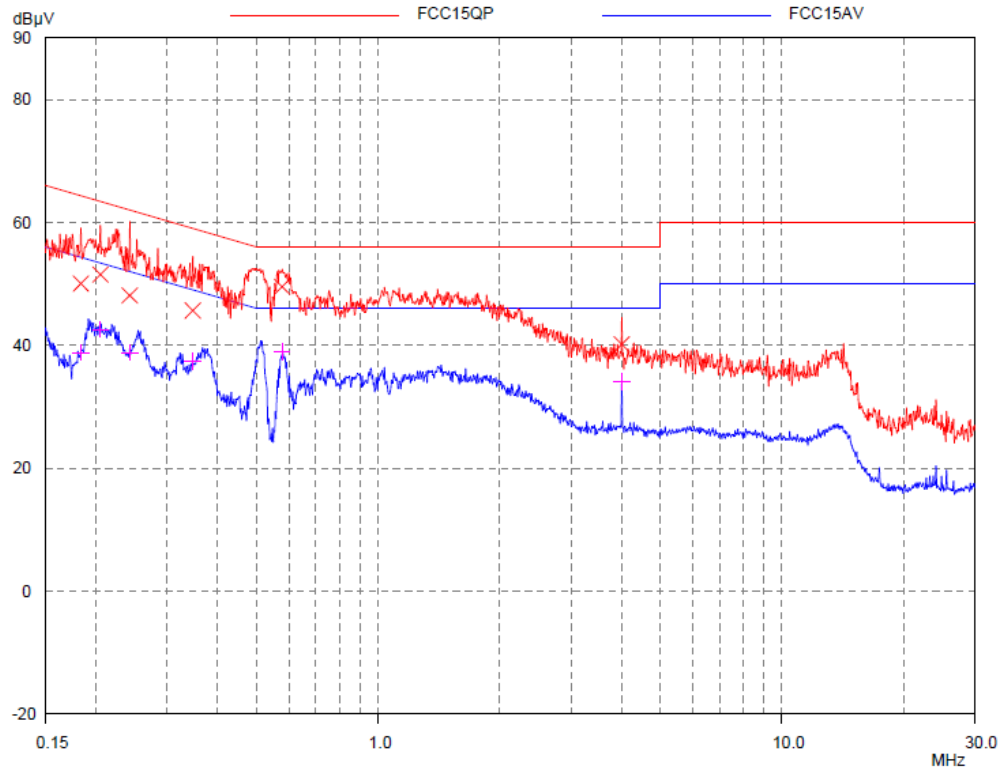
The bandwidth of the test receiver is set at 9 kHz.

3.4 Test Protocol

Temperature	:	22 °C
Relative Humidity	:	54 %

EUT was tested with empty load, half load and full load, the full load is the worst case and we listed the results in the report.

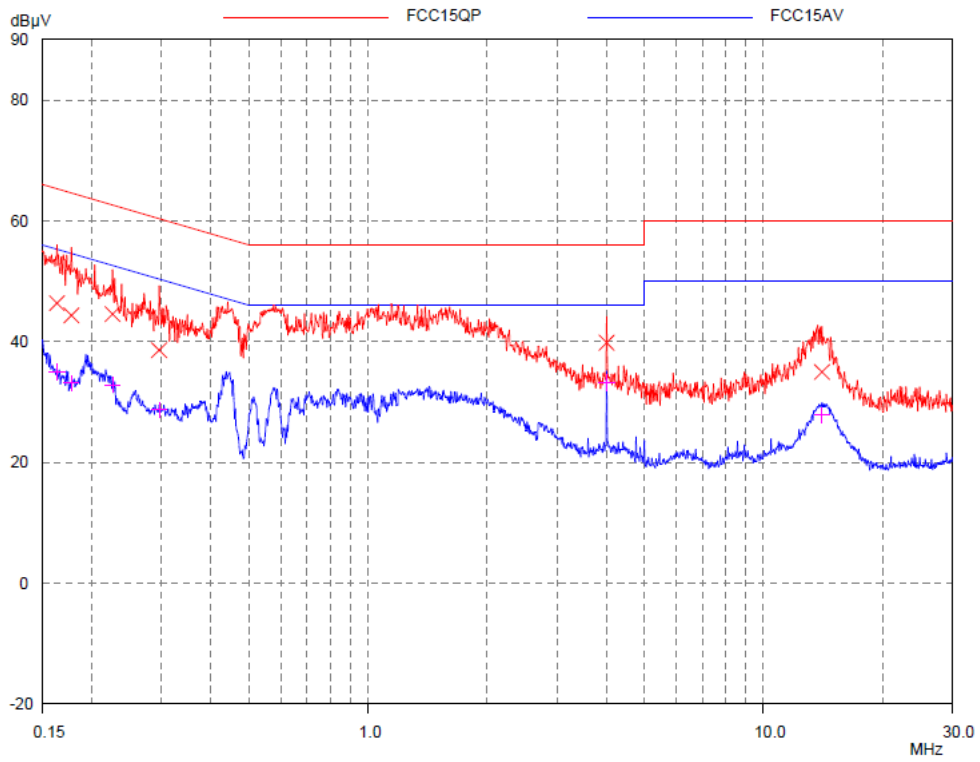
L line



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)
0.183	50.05	64.3	14.3	38.78	54.3	15.6
0.205	51.53	63.4	11.9	42.62	53.4	10.8
0.242	48.14	62.0	13.9	38.86	52.0	13.2
0.347	45.67	59.0	13.4	37.42	49.0	11.6
0.578	49.56	56.0	6.4	39.01	46.0	7.0
4.008	40.17	56.0	15.8	34.09	46.0	11.9

N line:



Test Data:

Frequency (MHz)	Quasi-peak			Average		
	level dB(µV)	Limit dB(µV)	Margin (dB)	level dB(µV)	limit dB(µV)	Margin (dB)
0.163	46.37	65.3	18.9	34.96	55.3	20.3
0.177	44.34	64.6	20.3	33.16	54.6	21.5
0.225	44.55	62.6	18.1	32.87	52.6	19.8
0.296	38.59	60.4	21.8	28.71	50.4	21.7
4.008	39.83	56.0	16.2	33.20	46.0	12.8
14.039	34.98	60.0	25.0	27.85	50.0	22.2

3.5 Measurement Uncertainty

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty at mains terminal: ± 3.52dB (9kHz-150kHz), ±3.19dB (150kHz-30MHz).
The measurement uncertainty is given with a confidence of 95%, k=2.

4 Radiated emission

Test result: **Pass**

4.1 Limit

The radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) showed as below:

Frequencies (MHz)	Field Strength (microvolts/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

4.2 Measurement Procedure

For Radiated emission below 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c) Both X and Y axes of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e) The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

NOTE:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz:

a) The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.

b) The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c) The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d) For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e) The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.

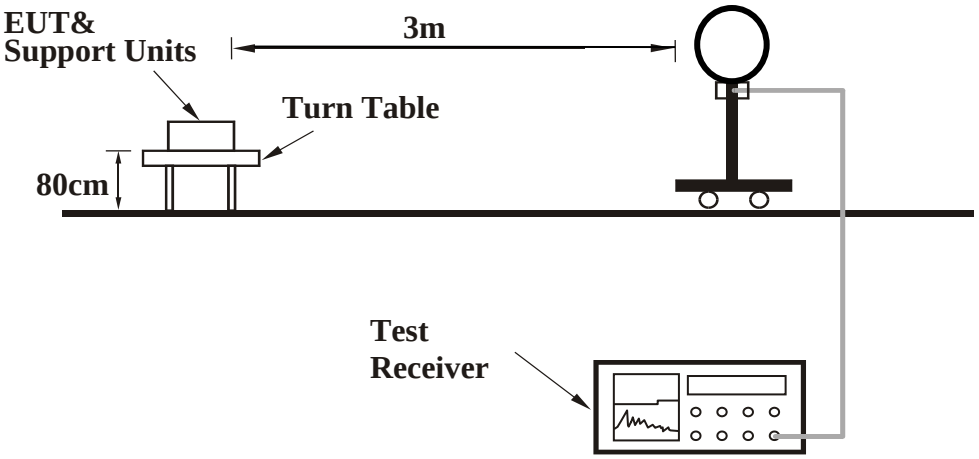
f) The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

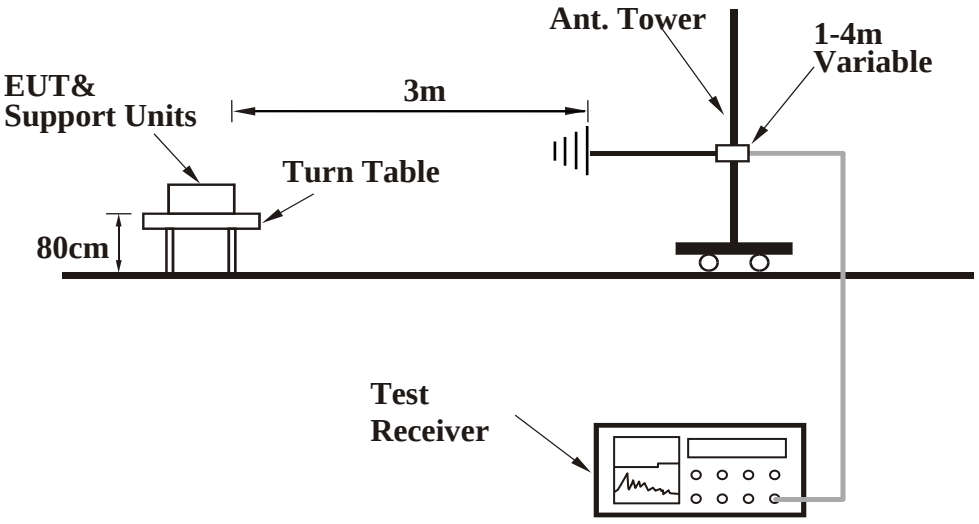
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 1/T (Duty cycle < 98%) or 3 x RBW (Duty cycle ≥ 98%) for Average detection (AV) at frequency above 1GHz.
4. All modes of operation were investigated and the worst-case emissions are reported

4.3 Test Configuration

For Radiated emission below 30MHz:



For Radiated emission 30MHz to 1GHz:



4.4 Test Results

Temperature : 23 °C Relative Humidity : 56 %

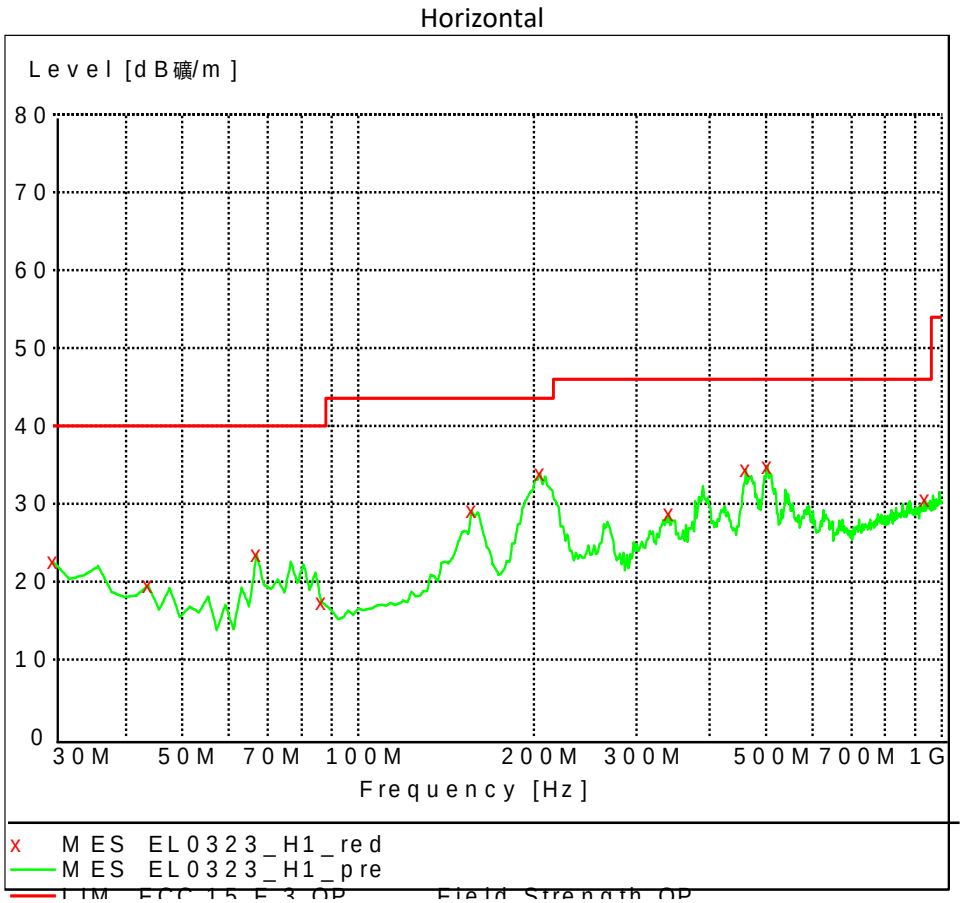
EUT was tested with empty load, half load and full load, the full load is the worst case and we listed the results in the report.

Test data below 30MHz

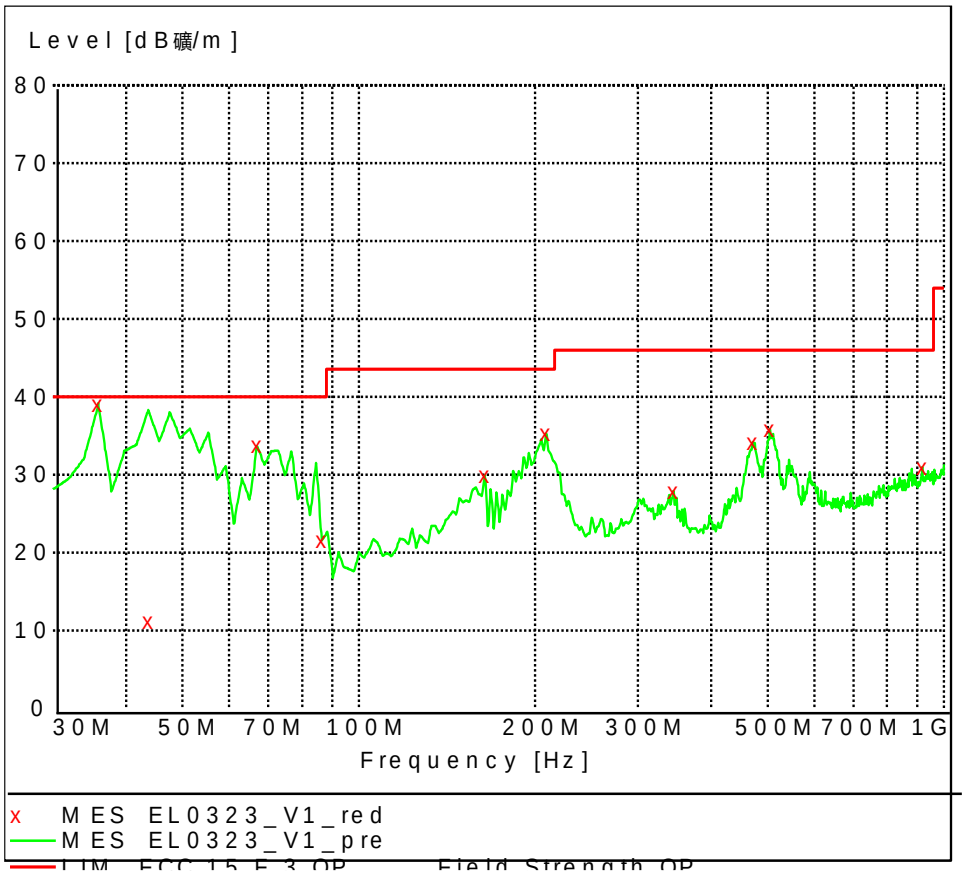
Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	0.110	62.90	133.55	70.65	PK
H	0.150	52.20	128.16	75.96	PK
H	0.389	54.50	111.61	57.11	PK
H	0.449	55.00	109.12	54.12	PK
H	0.509	53.00	106.94	53.94	PK
H	0.748	48.40	100.25	51.85	PK
V	0.090	51.80	137.04	85.24	PK
V	0.110	75.10	133.55	58.45	PK
V	0.449	55.40	109.12	53.72	PK
V	0.987	39.60	95.44	55.84	PK
V	1.227	35.10	91.65	56.55	PK
V	1.586	32.90	87.20	54.30	PK

Test data from 30MHz to 1GHz

The worst waveform from 30MHz to 1000MHz is listed as below:



Vertical



Antenna	Frequency (MHz)	Corrected Reading (dBuV/m)	Correct Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Detector
H	30.00	22.50	19.2	40.00	17.50	PK
H	156.35	29.1	11.3	43.50	14.40	PK
H	204.95	33.9	10.7	43.50	9.60	PK
H	461.54	34.4	18.5	46.00	11.60	PK
H	502.36	34.8	19.3	46.00	11.20	PK
H	935.85	30.5	23.3	46.00	15.50	PK
V	35.83	39.0	15.6	40.00	1.00	PK
V	66.93	33.7	7.2	40.00	6.30	PK
V	164.13	29.9	10.9	43.50	13.60	PK
V	208.84	35.3	10.7	43.50	8.20	PK
V	471.26	34.2	18.7	46.00	11.80	PK
V	504.31	35.8	19.3	46.00	10.20	PK

*****END of the report*****