DGD International Limited

TEST REPORT

SCOPE OF WORK
EMC TESTING–2046010

REPORT NUMBER
190905013GZU-001

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TEST REPORT

Applicant Name & Address	:	DGD International Limited Unit B-D, 5/F, Kimley Commercial Building, 142-146 Queen's Road, Central, HONG KONG, CHINA
Manufacturing Site	:	Same as applicant
Intertek Report No:		190905013GZU-001
FCC ID:		2AMHH-2046010

Test standards

47 CFR Part 18 [2018 Edition]

Sample Description

Product	:	HY-VS-VSOP-XO KIT DE CHARGE PAD LUMINOUS
Model No.	:	2046010
Electrical Rating	:	For single charge pad input: 4.96Vdc, 0.3A (Powered by adaptor) For six charge pads input: 8.94W Wireless output: 3.7Vdc, 0.14A, 0.52W max.
Adaptor:		Model: AK 18WG-0500200DP Input: 100-240V, 50/60Hz 0.5A
Power cord:		1.8m x 2 wires unscreened DC cable
Serial No.		Not Labeled
Date Received	:	05 September 2019
Date Test Conducted	:	05 September 2019-05 December 2019

Prepared and Checked By

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Intertek Guangzhou

Approved By:

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TEST REPORT

CONTENT

TEST REPORT

1. TEST RESULTS SUMMARY

Test Item	Standard	Result
Conducted disturbance voltage at mains ports	**FCC Part 18**	**Pass**
Radiated Emission (9 kHz to 30 MHz)	**FCC Part 18**	**Pass**
Radiated Emission (30 MHz to 1 GHz)	**FCC Part 18**	**Pass**
Remark: Reference publication is used for methods of measurement: FCC OST/ MP-5:1986		

Remark:

1. The symbol “N/A” in above table means Not Applicable.
2. When determining the test results, measurement uncertainty of tests has been considered.

TEST REPORT

2. EMC RESULTS CONCLUSION

RE: EMC Testing Pursuant to FCC part 18 authorized under the Certification was performed on the HY-VS-VSOP-XO KIT DE CHARGE PAD LUMINOUS, Models: 2046010.

We tested the HY-VS-VSOP-XO KIT DE CHARGE PAD LUMINOUS, Model: 2046010, to determine if it was in compliance with the relevant standard as marked on the Test Results Summary. We found that the unit met the requirement of FCC part 18 standard when tested as received. The worst case's test data was presented in this test report.

The base can be charged individually or linked with other induction bases through specific connecting wire, up to 6 bases can be charged in the same time.

To investigate the maximum EMI emission characteristics generates from EUT, the test system was pre-scanning tested based 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 evaluated respectively.

Pre-test mode	Description
Charging Mode	Lighting pads is charging at 1% battery power, 50% and 99% battery power respectively, keep transmitting continuously.

All tests were carried out by 6 pic charged bases connected together.

For AC port Conducted Emission:

Pre-test all modes listed above, find the worst case as: wireless charging for Lighting pads at 1% battery power.

For Radiated Emission:

Pre-test all modes listed above, find the worst case as: wireless charging for Lighting pads at 1% battery power.

Remark: The induction base only charges the lighted pads, it cannot charge a mobile phone or other type of items

The production units are required to conform to the initial sample as received when the units are placed on the market.

TEST REPORT

3. LABORATORY MEASUREMENTS

Configuration Information

Support Equipment:

Description	Manufacturer	Model No.	Quantity	Supplied by
DC cable	--	0.5m	5	Client
Lighting pads	--	2045957	2	Client
	--	2045958	2	Client
	--	2045959	2	Client

Rated Voltage and frequency under test: 120Vac, 60Hz
Condition of Environment: Temperature: 22~28°C
Relative Humidity:35~60%
Atmosphere Pressure:86~106kPa

Notes:
1. The EMI measurements had been made in the operating mode produced the largest emission in the frequency band being investigated consistent with normal applications. An attempt had been made to maximize the emission by varying the configuration of the EUT.

2. Test Facility accreditation:
A2LA Certificate Number 0078.10
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch is accredited by A2LA and Listed in FCC website. FCC accredited test labs may perform both Certification testing under Parts 15 and 18 and Declaration of Conformity testing.

3. Test Location:
Intertek Testing Services Shenzhen Ltd. Guangzhou Branch
All tests were performed at:
Block E, No.7-2 Guang Dong Software Science Park, Caipin Road, Guangzhou Science City, GETDD Guangzhou, China
Except Radiated Emissions was performed at:
Room102/104, No 203, KeZhu Road, Science City, GETDD Guangzhou, China

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4. Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Conducted Emission (9 kHz-150 kHz)	2.66 dB
2	Conducted Emission (150 kHz-30 MHz)	2.44 dB
3	Disturbance Power (30 MHz-300 MHz)	3.02 dB
4	Radiated Emission (30 MHz-1 GHz)	4.72 dB
5	Radiated Emission (1 GHz-6 GHz)	4.96 dB
6	Radiated Emission (6 GHz-18 GHz)	4.93 dB

The measurement uncertainty describes the overall uncertainty of the given measured value during the operation of the EUT.
Measurement uncertainty is calculated in accordance with CISPR16-4-2:2011
The measurement uncertainty is given with a confidence of 95%, k=2.
Determination of the test conclusion is based on IEC Guide 115 in consideration of measurement uncertainty.

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4. EQUIPMENT USED DURING TEST

Conducted Disturbance-Mains Terminal (1)

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM080-05	EMI receiver	ESCI	R&S	1Y
EM006-05	LISN	ENV216	R&S	1Y
SA047-112	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y
EM004-04	EMC shield Room	8m×3m×3m	Zhongyu	1Y

Radiated Disturbance （9 kHz-30 MHz）

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM030-04	3m Semi-Anechoic Chamber	9×6×6 m3	ETS-LINDGREN	1Y
EM031-02	EMI Test Receiver (9 kHz~7 GHz)	R&S ESR7	R&S	1Y
EM011-04	Loop antenna (9 kHz-30 MHz)	HFH2-Z2	R&S	1Y
EM031-02-01	Coaxial cable	/	R&S	1Y
SA047-118	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y
EM045-01-01	EMC32 software (RE/RS)	V10.01.00	R&S	N/A

Radiated Disturbance （30 MHz-1 GHz）

Equipment No.	Equipment	Model	Manufacturer	Calibration Interval
EM030-04	3m Semi-Anechoic Chamber	9×6×6 m3	ETS-LINDGREN	1Y
EM031-02	EMI Test Receiver (9 kHz~7 GHz)	R&S ESR7	R&S	1Y
EM033-01	TRILOG Super Broadband test Antenna（30 MHz-3 GHz）	VULB 9163	SCHWARZBECK	1Y
EM031-02-01	Coaxial cable	/	R&S	1Y
EM036-01	Common-mode absorbing clamp	CMAD 20B	TESEQ	1Y
SA047-118	Digital Temperature-Humidity Recorder	RS210	YIJIE	1Y
EM045-01-01	EMC32 software (RE/RS)	V10.01.00	R&S	N/A

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Detail of the equipment calibration due date:

Equipment No.	Cal. Due date (DD-MM-YYYY)
Conducted Disturbance-Mains Terminal (1)	
EM080-05	17/07/2020
EM006-05	16/06/2020
SA047-112	08/11/2020
EM004-04	13/01/2020
Conducted Disturbance-Mains Terminal (2)	
EM080-04	10/11/2020
EM031-04	15/01/2020
EM006-06	08/09/2020
SA047-111	08/11/2020
EM004-03	03/01/2020
EM031-04-01	N/A
Conducted Disturbance-Load and Control Terminal (1)	
EM080-05	17/07/2020
EM080-05-01	08/09/2020
SA047-112	08/11/2020
EM004-04	13/01/2020
Conducted Disturbance-Load and Control Terminal (2)	
EM080-05	17/07/2020
EM005-06-01	09/09/2020
SA047-112	08/11/2020
EM004-04	13/01/2020
Conducted Disturbance-Telecom Terminal	
EM080-05	17/07/2020
EM011-05	07/04/2020
EM011-06	07/04/2020
EM006-06	08/09/2020
SA047-112	08/11/2020
EM004-04	13/01/2020
Conducted Disturbance-Antenna Terminal	
EM080-04	10/11/2020
EM031-04	15/01/2020
EM084-02	18/07/2020
EM041-01	07/01/2020
EM041-02	07/01/2020
SA047-111	08/11/2020
EM004-03	03/01/2020

Equipment No.	Cal. Due date (DD-MM-YYYY)
Radiated Disturbance (CDN Method)	
EM080-05	17/07/2020
EM003-02	10/11/2020
EM003-03	10/11/2020
EM003-01-05	08/09/2020
SA047-112	08/11/2020
EM004-04	13/01/2020
Radiated electromagnetic disturbances (9 kHz-30 MHz)	
EM080-04	10/11/2020
EM031-04	15/01/2020
EM061-04	28/02/2020
SA047-111	08/11/2020
EM004-03	03/01/2020
Radiated Disturbance (9 kHz-30 MHz)	
EM030-04	09/04/2020
EM031-02	22/10/2020
EM011-04	24/06/2020
EM031-02-01	09/04/2020
SA047-118	16/7/2020
EM045-01-01	N/A
Radiated Disturbance (30 MHz-1 GHz)	
EM030-04	9/04/2020
EM031-02	22/10/2020
EM033-01	19/09/2020
EM031-02-01	9/04/2020
EM036-01	21/07/2020
SA047-118	16/07/2020
EM045-01-01	N/A
Radiated Disturbance (1-18 GHz)	
EM030-04	09/04/2020
EM031-02	22/10/2020
EM031-03	08/09/2020
EM033-02	22/06/2020
EM033-02-02	09/04/2020
EM022-03	16/05/2020
SA047-118	16/07/2020
EM045-01-01	N/A

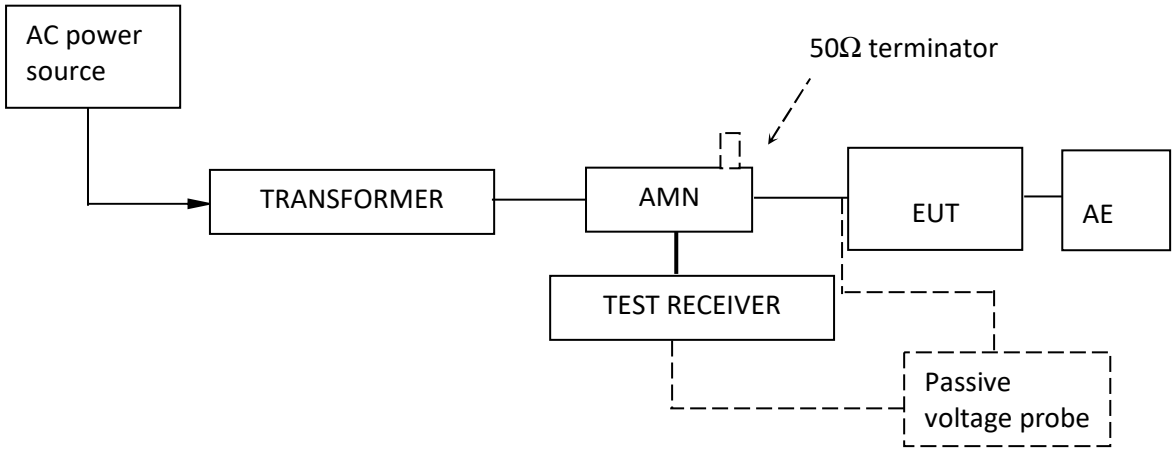
TEST REPORT

5. EMI TEST

5.1 FCC part 18 Continuous Conducted Disturbance Voltage Test

Test Result: Pass

5.1.1 Block Diagram of Test Setup



5.1.2 Test Setup and Procedure

The EUT was set to achieve the maximum emission level. The mains terminal disturbance voltage was measured with the EUT in a shielded room. The EUT was connected to AC power source through an Artificial Mains Network which provides a 50Ω linear impedance artificial hand is used if appropriate (for handheld apparatus).

The table-top EUT was placed on a 0.8m high non-metallic table above earthed ground plane (Ground Reference Plane).And for floor standing EUT, was placed on a 0.1m high non-metallic supported on GRP. The EUT keeps a distance of at least 0.4m from a vertical metallic surface. The Artificial Mains Network is situated at a distance of 0.8m from the EUT.

During the test, mains lead of EUT excess 0.8m was folded back and forth parallel to the lead so as to form a horizontal bundle with a length between 0.3m and 0.4m.

The bandwidth of test receiver was set at 200 Hz for measurements from 9 kHz to 150 kHz and 9 kHz for measurements from 150 kHz to 30 MHz.

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5.1.3 Limit

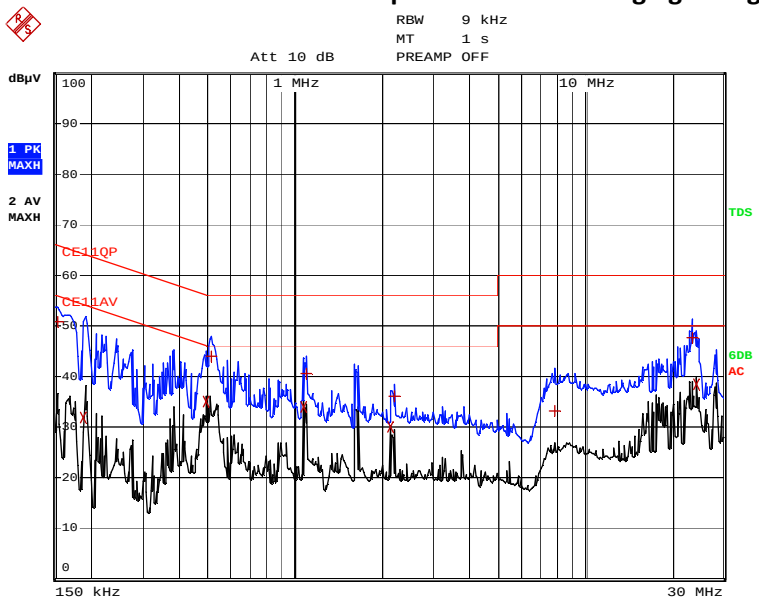
Frequency range MHz	**AC mains terminals** dB (uV)	
	Quasi-peak	Average
0.15 to 0.5	66 to 56*	56 to 46*
0.5 to 5	56	46
5 to 30	60	50
Note 1: The limit decreases linearly with the logarithm of the frequency in the range 0.15 MHz to 0.5 MHz. Note 2: The lower limit is applicable at the transition frequency.		

TEST REPORT

5.1.4 Test Data and curve

At mains terminal:

Tested Wire: Live **Operation Mode: charging for Lighting pads**



EDIT PEAK LIST (Final Measurement Results)

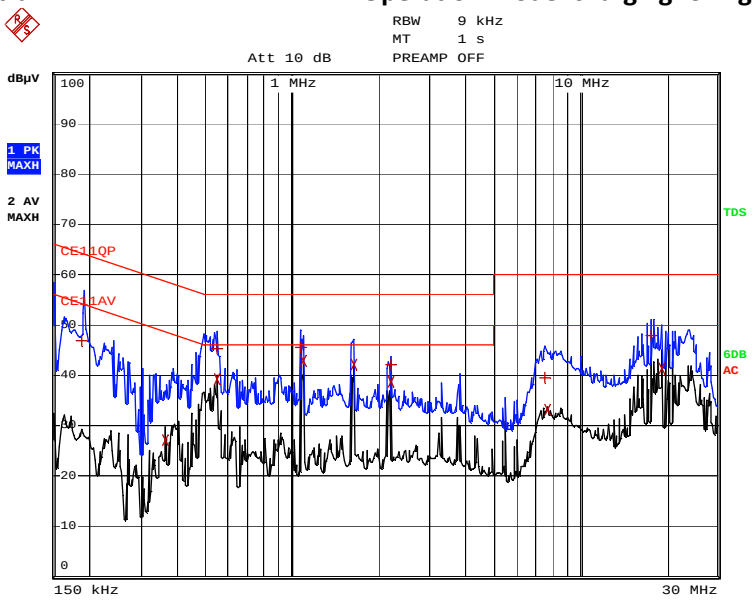
Trace1: CE11QP
Trace2: CE11AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	154 kHz	50.75	L1	-15.02
2	Average	190 kHz	32.01	L1	-22.02
2	Average	494 kHz	34.94	L1	-11.15
1	Quasi Peak	514 kHz	43.94	L1	-12.05
2	Average	1.078 MHz	33.99	L1	-12.00
1	Quasi Peak	1.098 MHz	40.52	L1	-15.47
2	Average	2.15 MHz	30.12	L1	-15.87
1	Quasi Peak	2.198 MHz	36.03	L1	-19.96
1	Quasi Peak	7.958 MHz	33.32	L1	-26.67
1	Quasi Peak	23.622 MHz	47.51	L1	-12.48
2	Average	24.378 MHz	38.48	L1	-11.51

Remark:
1. Corr. (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBµV) = Corr. (dB) + Read Level (dBµV)
3. Delta Limit (dB) = Level (dBµV)-Limit (dBµV)

TEST REPORT

Tested Wire: Neutral **Operation Mode: charging for Lighting pads**



EDIT PEAK LIST (Final Measurement Results)

Trace1: CE11QP
Trace2: CE11AV
Trace3: ---

TRACE		FREQUENCY	LEVEL dBµV		DELTA LIMIT dB
1	Quasi Peak	190 kHz	46.84	L1	-17.18
2	Average	362 kHz	27.29	L1	-21.39
1	Quasi Peak	550 kHz	45.27	L1	-10.72
2	Average	550 kHz	39.35	L1	-6.64
1	Quasi Peak	1.078 MHz	45.45	L1	-10.54
2	Average	1.098 MHz	43.02	L1	-2.97
2	Average	1.646 MHz	42.04	L1	-3.95
1	Quasi Peak	2.198 MHz	42.02	L1	-13.97
2	Average	2.198 MHz	38.80	L1	-7.19
1	Quasi Peak	7.598 MHz	39.58	L1	-20.41
2	Average	7.69 MHz	33.19	L1	-16.80
1	Quasi Peak	17.578 MHz	47.86	L1	-12.13
2	Average	19.226 MHz	41.32	L1	-8.67

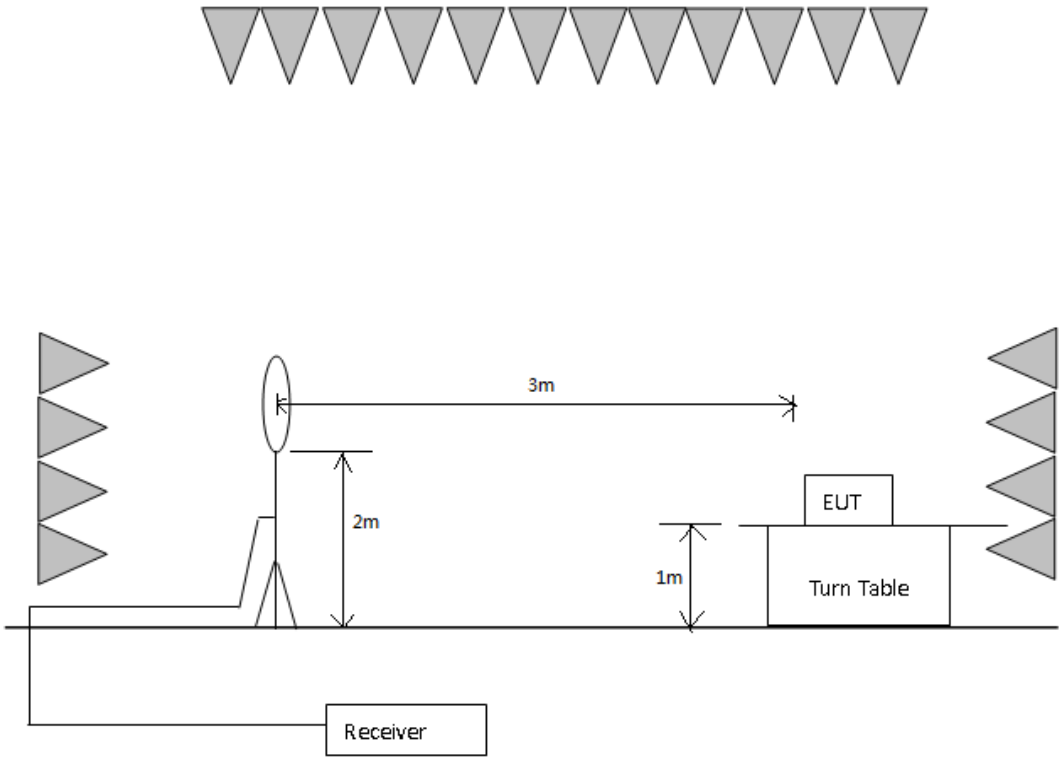
Remark:
1. Corr. (dB) = LISN Factor (dB) + Cable Loss (dB)
2. Level (dBµV) = Corr. (dB) + Read Level (dBµV)
3. Delta Limit (dB) = Level (dBµV)-Limit (dBµV)

TEST REPORT

5.2 FCC part 18 Radiated Emission 9 kHz to 30 MHz

Test Result: PASS

5.2.1 Block Diagram of Test Setup



5.2.2 Test Setup and Procedure

The measurement was applied in a semi-anechoic chamber. The EUT were placed on a 1 m high foam table above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna tripod.

Loop antenna was used as receiving antenna. The antenna was supported in the vertical plane and was rotatable about a vertical axis to obtain the maximum emission. The antenna height of was set at 2 m above ground level.

The bandwidth setting on Receiver was 9 kHz. The frequency range from 9 kHz to 30MHz was checked.

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5.2.3 Limit

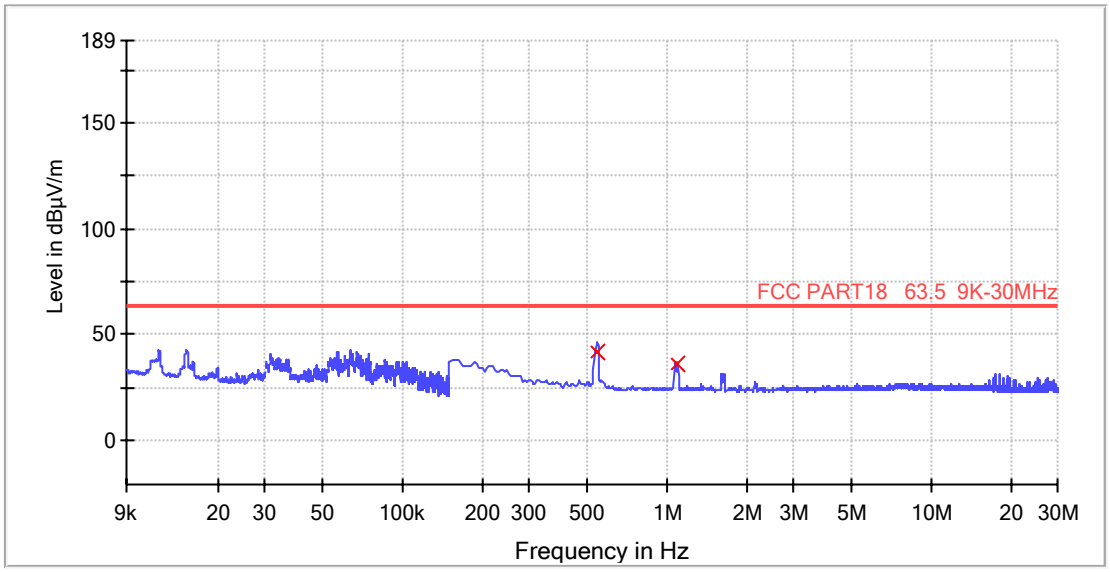
Frequency range (MHz)	Field strength at 300 meters (µV/m)	Field strength at 3 meters (dBµV/m)
0.009-30	15	63.5
Note: Test limit is calculated and base on equipment type and operating frequency. Detector: Peak for pre-scan, Average for the final result		

TEST REPORT

5.2.4 Test Data and Curve

Operation Mode: charging for Lighting pads

Horizontal

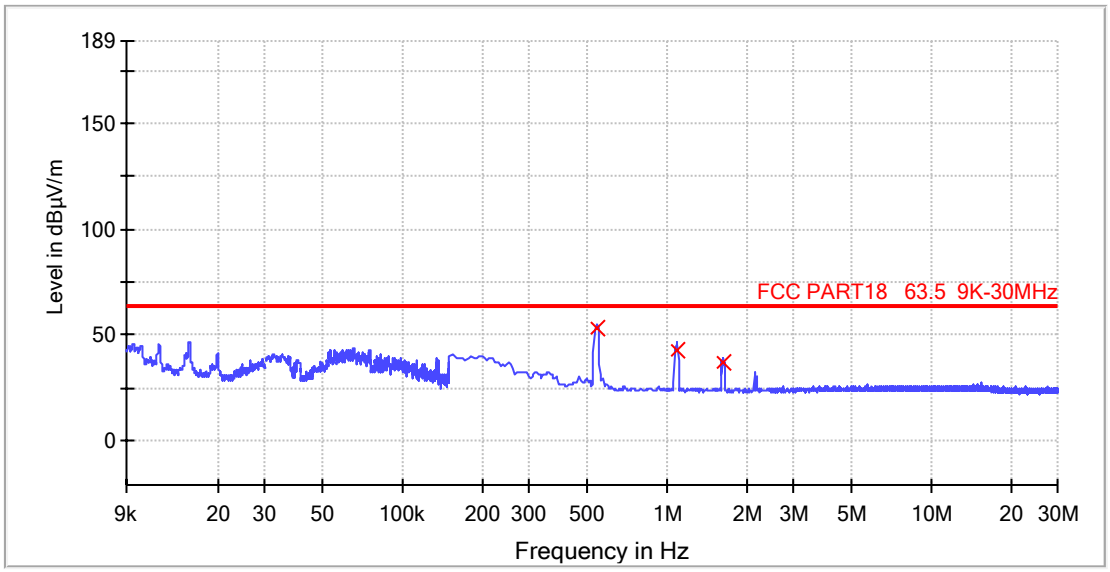


Frequency (MHz)	Read Level (dBµV)	Correction Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
0.542	20.8	20.6	41.4	63.5	22.1	AV
1.098	14.6	21.1	35.7	63.5	27.8	AV

Remark:
1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Average (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit AVG (dBµV/m) –Average (dBµV/m)

TEST REPORT

Vertical



Frequency (MHz)	Read Level (dBµV)	Correction Factor (dB)	Level (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Detector
0.542	32.1	20.6	52.7	63.5	10.8	AV
1.098	22.0	21.1	43.1	63.5	20.4	AV
1.626	15.6	21.1	36.7	63.5	26.8	AV

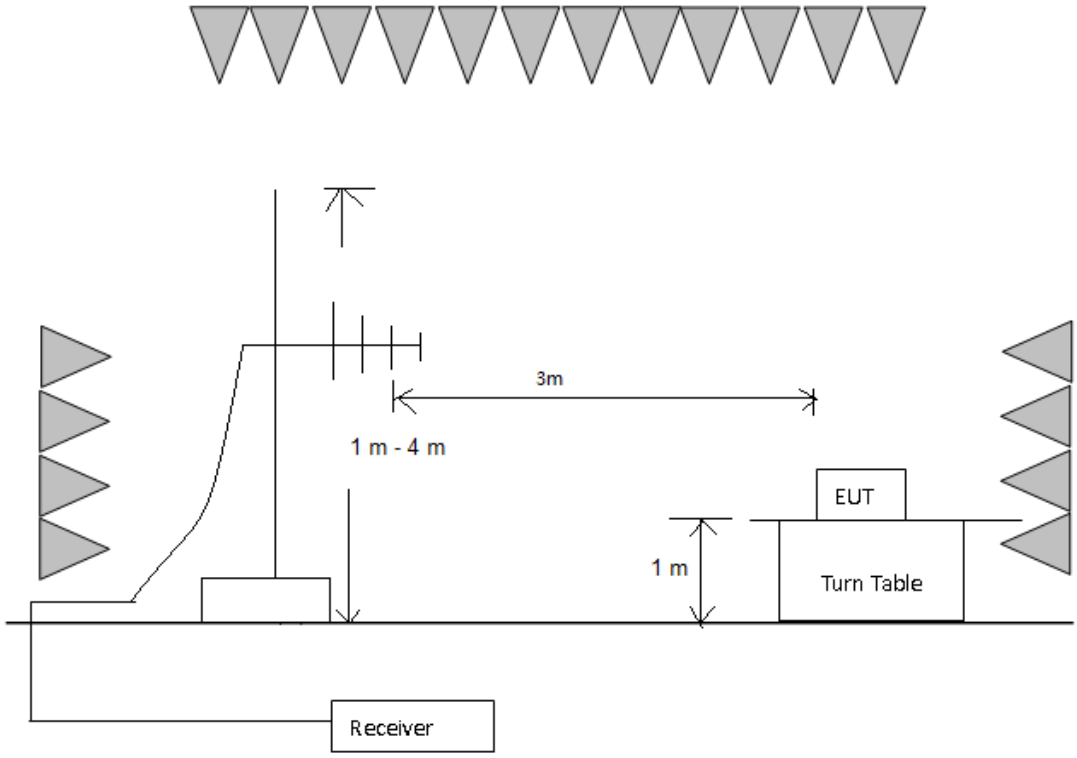
Remark:
1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Average (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit AVG (dBµV/m) –Average (dBµV/m)

TEST REPORT

5.3 FCC part 18 Radiated Emission 30 MHz -1000 MHz

Test Result: Pass

5.3.1 Block Diagram of Test Setup



5.3.2 Test Setup and Procedure

The measurement was applied in a semi-anechoic chamber. The EUT and simulators were placed on a 1 m high foam table above the horizontal metal ground plane. The turn table rotated 360 degrees to determine the position of the maximum emission level. The EUT was set 3 meters away from the receiving antenna which was mounted on an antenna mask. The antenna moved up and down between from 1 meter to 4 meters to find out the maximum emission level.

Broadband antenna was used as receiving antenna. Both horizontal and vertical polarization of the antenna was set on measurement. In order to find the maximum emission, all of the interface cables were manipulated according to FCC OST/MP-5 requirement during radiated test.
The bandwidth setting on R&S Test Receiver was 120 kHz.
The frequency range from 30 MHz to 1000 MHz was checked

TEST REPORT

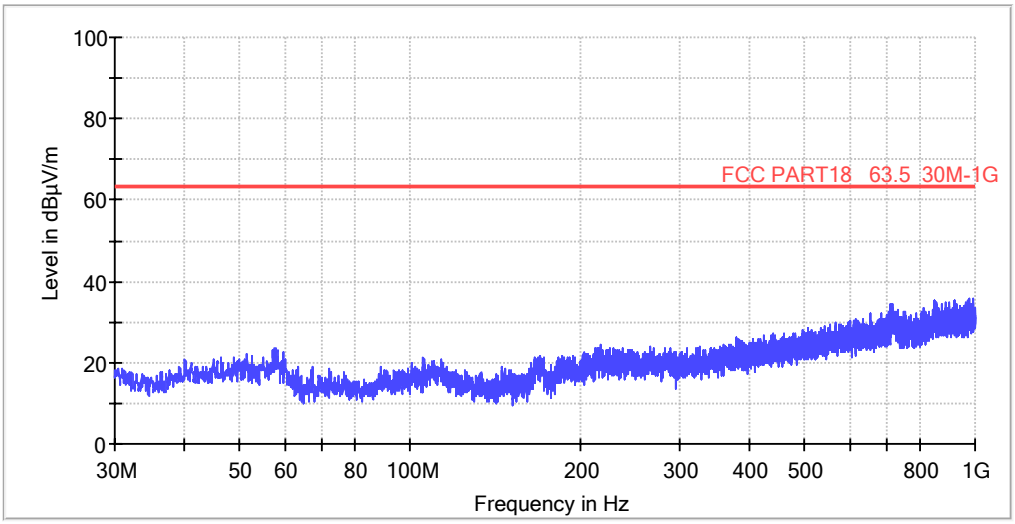
5.3.3 Limit

Frequency range (MHz)	Field strength at 300 meters (µV/m)	Field strength at 3 meters (dBµV/m)
30-1000	15	63.5
Note: Test limit is calculated and base on equipment type and operating frequency. Detector: Peak for pre-scan, Average for the final result		

TEST REPORT

5.3.4 Test Data and Curve

Operation Mode: charging for Lighting pads
Horizontal

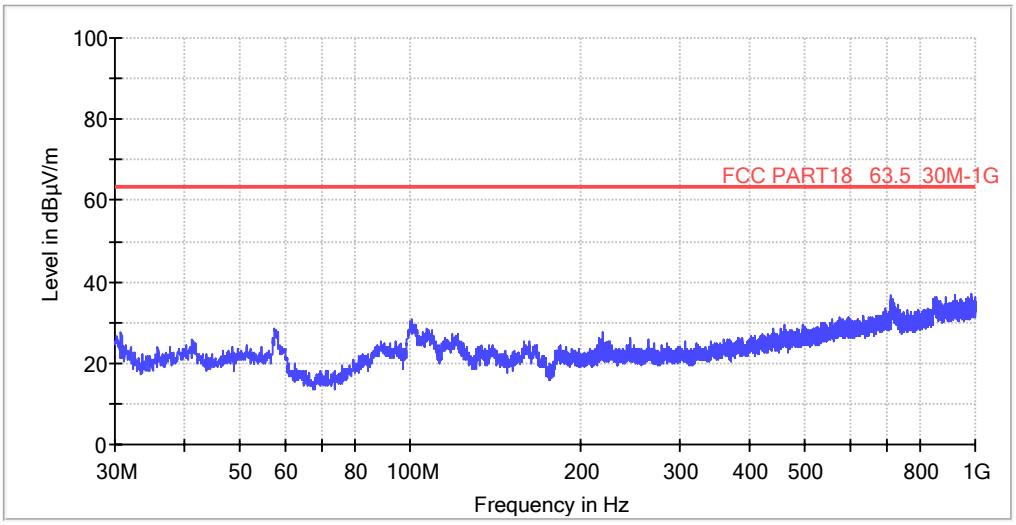


All emission levels are more than 20 dB below the limit.

Remark:
1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Average (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit AVG (dBµV/m) –Average (dBµV/m)

TEST REPORT

Vertical



All emission levels are more than 20 dB below the limit.
Remark:
1. Corr. (dB) = Antenna Factor (dB) + Cable Loss (dB)
2. Average (dBµV/m) = Corr. (dB) + Read Level (dBµV)
3. Margin (dB) = Limit AVG (dBµV/m) –Average (dBµV/m)

**********End of Report**********