

TEST REPORT

Applicant: Shenzhen lanbo Technology Co., Ltd

Address of Applicant: Room 416, 4th floor, fuminda technology innovation center, 16 Baoji Road, xiangjiaotang community, Bantian street, Longgang District, Shenzhen

Manufacturer/Factory: Dongguan Huayue Plastic Hardware Products Co., Ltd.

Address of Manufacturer/Factory: 1 / F and 2 / F, building B, no.6, Hongji Wulian Industrial Park, No.9 Wulian Industrial Road 1, Wulian village, Fenggang town, Dongguan City

Equipment Under Test (EUT)

Product Name: Magnetic Wireless Charger

Model No.: CK60, CK50

Trade Mark: N/A

FCC ID: 2AZBF-CK60

Applicable standards: FCC CFR Title 47 Part 15 Subpart C

Date of sample receipt: Mar. 09, 2021

Date of Test: Mar. 09, 2021- Mar. 19, 2021

Date of report issued: Mar. 19, 2021

Test Result : PASS *

* In the configuration tested, the EUT complied with the standards specified above.

Authorized Signature:

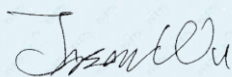
Robinson Lo
Laboratory Manager

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2 Version

Version No.	Date	Description
00	Mar. 19, 2021	Original

Tested/Prepared By:

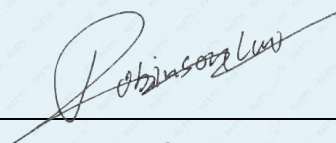


Date:

Mar. 19, 2021

Project Engineer

Check By:



Date:

Mar. 19, 2021

Reviewer

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4 Test Summary

Test Item	Section in CFR 47	Result
Antenna requirement	15.203	Pass
AC Power Line Conducted Emission	15.207	Pass
Radiated Emission	15.209(a)(f)	Pass
20dB Bandwidth	15.215	Pass

Pass: The EUT complies with the essential requirements in the standard.

4.1 Measurement Uncertainty

Test Item	Frequency Range	Measurement Uncertainty	Notes
Radiated Emission	30MHz-200MHz	3.8039dB	(1)
Radiated Emission	200MHz-1GHz	3.9679dB	(1)
Radiated Emission	1GHz-18GHz	4.29dB	(1)
Radiated Emission	18GHz-40GHz	3.30dB	(1)
AC Power Line Conducted Emission	0.15MHz ~ 30MHz	3.44dB	(1)

Note (1): The measurement uncertainty is for coverage factor of k=2 and a level of confidence of 95%.

5 General Information

5.1 General Description of EUT

Product Name:	Magnetic Wireless Charger
Model/Type reference:	CK60, CK50
Serial No.:	N/A
Test sample(s) ID:	GTSL202103000119-1
Power supply:	Type-C Input: 5V $\leq$ 2A, 9V $\leq$ 1.67A, 12V $\leq$ 1.5A USB Output: 5V $\leq$ 2.1A; Wireless charger Output: 10W Battery Capacity: 3.7V, 5000mAh, 18.5Wh
Operation frequency:	110KHz - 205KHz
Modulation type:	ASK
Antenna type:	Loop coil antenna

5.2 Test mode

Equipment under test was operated during the measurement under the following conditions:

☒ Charging and communication mode

Test Modes:

Mode 1	AC/DC Adapter (12V/1.5A) + EUT + Load (Full load)	Record
Mode 2	AC/DC Adapter (12V/1.5A) + EUT + Load (Half load)	Pre-tested
Mode 3	AC/DC Adapter (12V/1.5A) + EUT + Load (Empty load)	Pre-tested
Mode 4	AC/DC Adapter (9V/1.67A) + EUT + Load (Full load)	Pre-tested
Mode 5	AC/DC Adapter (9V/1.67A) + EUT + Load (Half load)	Pre-tested
Mode 6	AC/DC Adapter (9V/1.67A) + EUT + Load (Empty load)	Pre-tested
Mode 7	AC/DC Adapter (5V/2A) + EUT + Load (Full load)	Pre-tested
Mode 8	AC/DC Adapter (5V/2A) + EUT + Load (Half load)	Pre-tested
Mode 9	AC/DC Adapter (5V/2A) + EUT + Load (Empty load)	Pre-tested
Mode 10	EUT + Wireless charger tester (Battery Status: <1%)	Pre-tested
Mode 11	EUT + Wireless charger tester (Battery Status: <50%)	Pre-tested
Mode 12	EUT + Wireless charger tester (Battery Status: <100%)	Pre-tested

Note: All test modes were pre-tested, but we only recorded the worst case in this report.

5.3 Description of Support Units

Follow auxiliary equipment(s) test with EUT that provided by the manufacturer or laboratory is listed as follow:

Description	Manufacturer	Model	Technical Parameters	Certificate	Provided by
Adapter	CHENYANG ELECTRONICS	CD107	Input: 100-240V~, 50/60Hz, 0.5A Output: 5V---2A / 9V---1.67A /12V---1.5A	FCC	laboratory

5.4 Deviation from Standards

None.

5.5 Abnormalities from Standard Conditions

None.

5.6 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **FCC —Registration No.: 381383**

Designation Number:CN5029

Global United Technology Services Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in files.

- **IC —Registration No.: 9079A**

CAB identifier: CN0091

The 3m Semi-anechoic chamber of Global United Technology Services Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for radio equipment testing.

- **NVLAP (LAB CODE:600179-0)**

Global United Technology Services Co., Ltd., is accredited by the National Voluntary Laboratory Accreditation Program (NVLAP).

5.7 Test Location

All tests were performed at:

Global United Technology Services Co., Ltd.

No. 123-128, Tower A, Jinyuan Business Building, No.2, Laodong Industrial Zone, Xixiang Road, Baoan District, Shenzhen, Guangdong, China 518102

Tel: 0755-27798480

Fax: 0755-27798960

5.8 Other Information Requested by the Customer

None.

6 Test Instruments list

Radiated Emission:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	3m Semi- Anechoic Chamber	ZhongYu Electron	9.2(L)*6.2(W)* 6.4(H)	GTS250	July. 02 2020	July. 01 2025
2	Control Room	ZhongYu Electron	6.2(L)*2.5(W)* 2.4(H)	GTS251	N/A	N/A
3	EMI Test Receiver	Rohde & Schwarz	ESU26	GTS203	June. 25 2020	June. 24 2021
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9163	GTS214	June. 25 2020	June. 24 2021
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	June. 25 2020	June. 24 2021
6	Horn Antenna	ETS-LINDGREN	3160	GTS217	June. 25 2020	June. 24 2021
7	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
8	Coaxial Cable	GTS	N/A	GTS213	June. 25 2020	June. 24 2021
9	Coaxial Cable	GTS	N/A	GTS211	June. 25 2020	June. 24 2021
10	Coaxial cable	GTS	N/A	GTS210	June. 25 2020	June. 24 2021
11	Coaxial Cable	GTS	N/A	GTS212	June. 25 2020	June. 24 2021
12	Amplifier(100kHz-3GHz)	HP	8347A	GTS204	June. 25 2020	June. 24 2021
13	Amplifier(2GHz-20GHz)	HP	84722A	GTS206	June. 25 2020	June. 24 2021
14	Amplifier (18-26GHz)	Rohde & Schwarz	AFS33-18002 650-30-8P-44	GTS218	June. 25 2020	June. 24 2021
15	Band filter	Amindeon	82346	GTS219	June. 25 2020	June. 24 2021
16	Power Meter	Anritsu	ML2495A	GTS540	June. 25 2020	June. 24 2021
17	Power Sensor	Anritsu	MA2411B	GTS541	June. 25 2020	June. 24 2021
18	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	June. 25 2020	June. 24 2021
19	Splitter	Agilent	11636B	GTS237	June. 25 2020	June. 24 2021
20	Loop Antenna	ZHINAN	ZN30900A	GTS534	June. 25 2020	June. 24 2021
21	Breitband hornantenne	SCHWARZBECK	BBHA 9170	GTS579	Oct. 18 2020	Oct. 17 2021
22	Amplifier	TDK	PA-02-02	GTS574	Oct. 18 2020	Oct. 17 2021
23	Amplifier	TDK	PA-02-03	GTS576	Oct. 18 2020	Oct. 17 2021
24	PSA Series Spectrum Analyzer	Rohde & Schwarz	FSP	GTS578	June. 25 2020	June. 24 2021

Conducted Emission						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Shielding Room	ZhongYu Electron	7.3(L)x3.1(W)x2.9(H)	GTS252	May.15 2019	May.14 2022
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Coaxial Switch	ANRITSU CORP	MP59B	GTS225	June. 25 2020	June. 24 2021
4	ENV216 2-L-V-NETZNACHB.DE	ROHDE&SCHWARZ	ENV216	GTS226	June. 25 2020	June. 24 2021
5	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
6	EMI Test Software	AUDIX	E3	N/A	N/A	N/A
7	Thermo meter	KTJ	TA328	GTS233	June. 25 2020	June. 24 2021
8	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	June. 25 2020	June. 24 2021
9	ISN	SCHWARZBECK	NTFM 8158	GTD565	June. 25 2020	June. 24 2021

RF Conducted Test:						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	MXA Signal Analyzer	Agilent	N9020A	GTS566	June. 25 2020	June. 24 2021
2	EMI Test Receiver	R&S	ESCI 7	GTS552	June. 25 2020	June. 24 2021
3	Spectrum Analyzer	Agilent	E4440A	GTS533	June. 25 2020	June. 24 2021
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	June. 25 2020	June. 24 2021
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	June. 25 2020	June. 24 2021
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	June. 25 2020	June. 24 2021
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	June. 25 2020	June. 24 2021
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	June. 25 2020	June. 24 2021

General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Humidity/ Temperature Indicator	KTJ	TA328	GTS243	June. 25 2020	June. 24 2021
2	Barometer	ChangChun	DYM3	GTS255	June. 25 2020	June. 24 2021

7 Test results and Measurement Data

7.1 Antenna requirement:

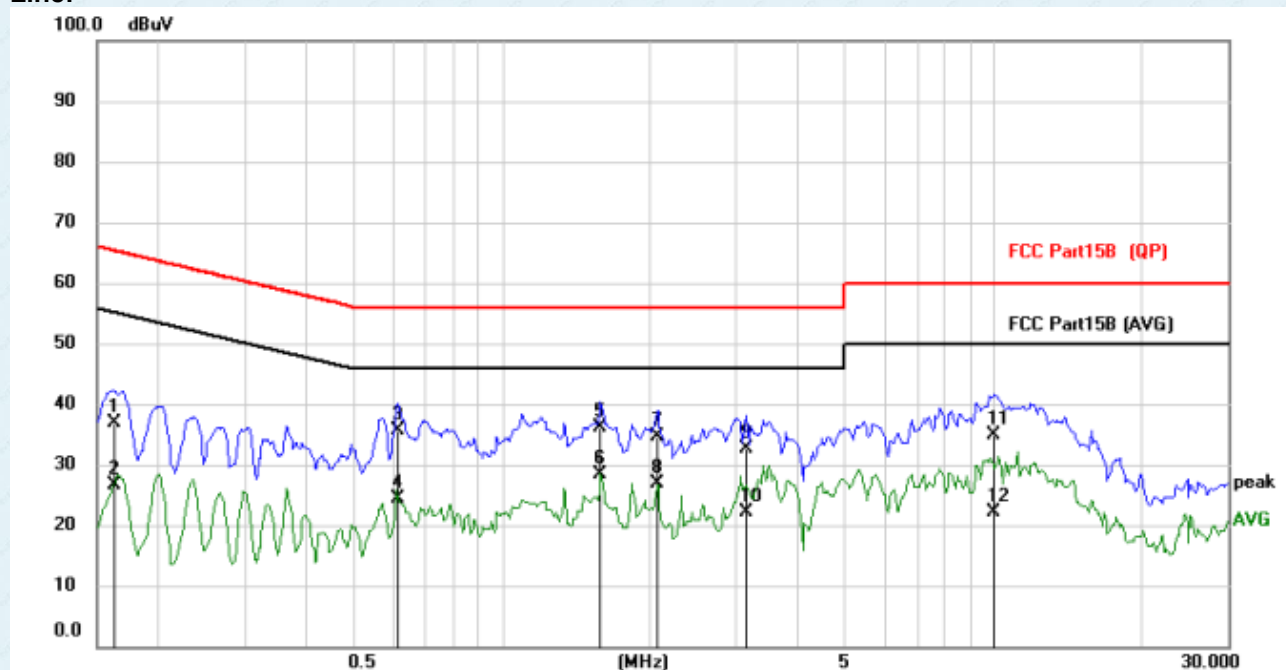
Standard requirement:	FCC Part15 C Section 15.203
15.203 requirement: An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.	
EUT Antenna:	
The antenna is Inductive loop coil Antenna, the best case gain of the antenna is 0dBi, reference to the appendix II for details.	

7.2 Conducted Emissions

Test Requirement:	FCC Part15 C Section 15.207					
Test Method:	ANSI C63.10:2013					
Test Frequency Range:	150KHz to 30MHz					
Class / Severity:	Class B					
Receiver setup:	RBW=9KHz, VBW=30KHz, Sweep time=auto					
Limit:	Frequency range (MHz)		Limit (dBuV)			
			Quasi-peak		Average	
	0.15-0.5		66 to 56*		56 to 46*	
	0.5-5		56		46	
	5-30		60		50	
* Decreases with the logarithm of the frequency.						
Test setup:	Reference Plane LISN 40cm AUX Equipment E.U.T Test table/Insulation plane LISN 80cm EMI Receiver Filter AC power Remark: E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m					
Test procedure:	1. The E.U.T and simulators are connected to the main power through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm/50uH coupling impedance for the measuring equipment. 2. The peripheral devices are also connected to the main power through a LISN that provides a 50ohm/50uH coupling impedance with 50ohm termination. (Please refer to the block diagram of the test setup and photographs). 3. Both sides of A.C. line are checked for maximum conducted interference. In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

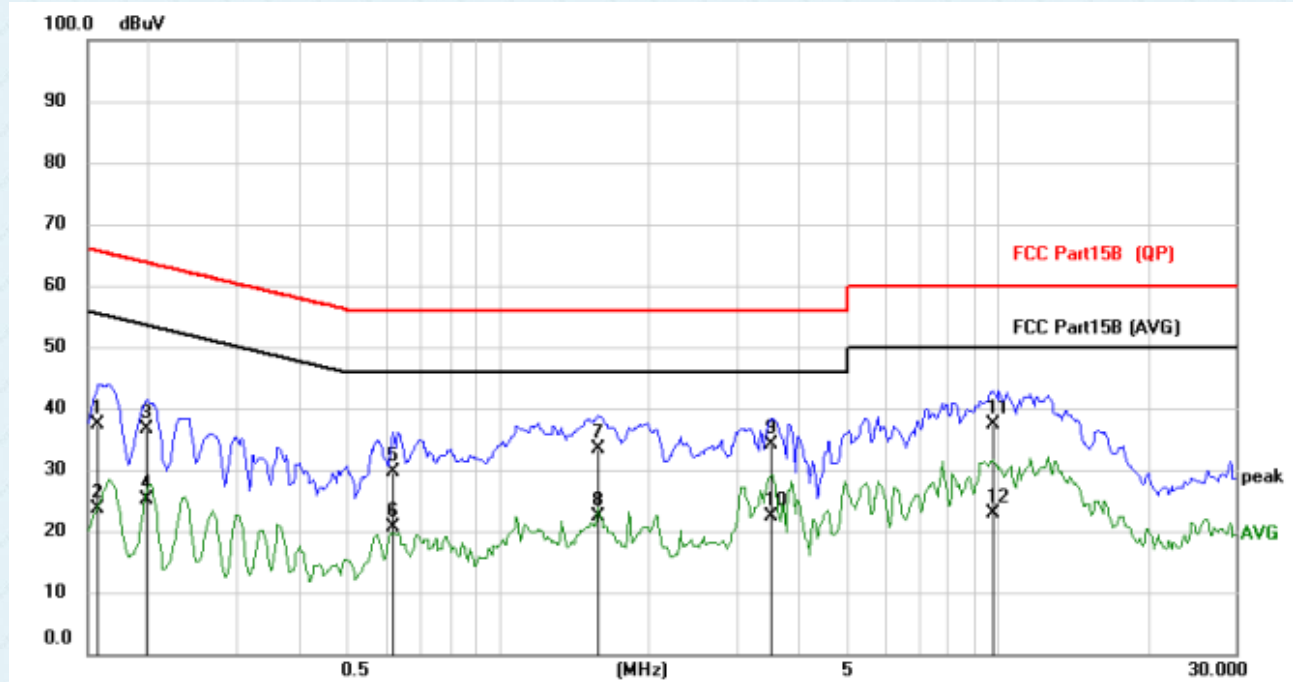
Measurement data:

Line:



No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1624	26.03	10.92	36.95	65.34	-28.39	QP	
2		0.1624	15.62	10.92	26.54	55.34	-28.80	AVG	
3		0.6141	24.76	10.92	35.68	56.00	-20.32	QP	
4		0.6141	13.41	10.92	24.33	46.00	-21.67	AVG	
5		1.5890	25.26	10.94	36.20	56.00	-19.80	QP	
6	*	1.5890	17.35	10.94	28.29	46.00	-17.71	AVG	
7		2.0765	23.72	10.96	34.68	56.00	-21.32	QP	
8		2.0765	16.02	10.96	26.98	46.00	-19.02	AVG	
9		3.1404	21.62	11.02	32.64	56.00	-23.36	QP	
10		3.1404	11.12	11.02	22.14	46.00	-23.86	AVG	
11		10.0395	23.47	11.36	34.83	60.00	-25.17	QP	
12		10.0395	10.89	11.36	22.25	50.00	-27.75	AVG	

Neutral:



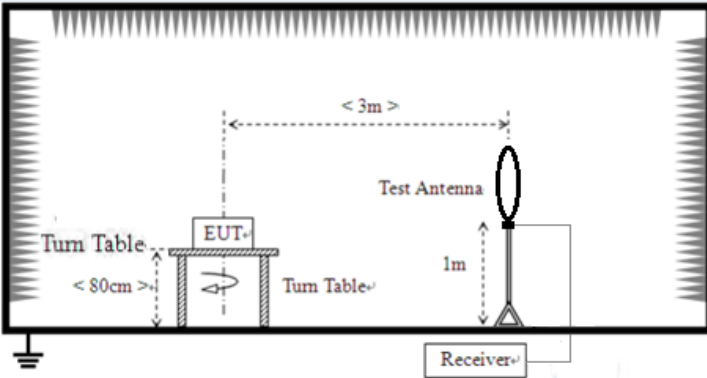
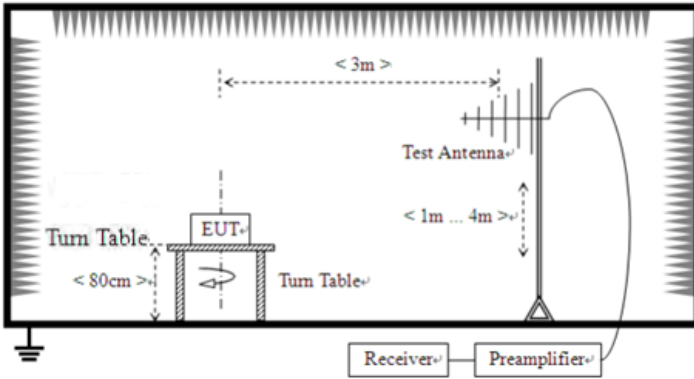
No.	Mk.	Freq. MHz	Reading Level dBuV	Correct Factor dB	Measure- ment dBuV	Limit dBuV	Over dB	Detector	Comment
1		0.1578	26.47	10.93	37.40	65.58	-28.18	QP	
2		0.1578	12.80	10.93	23.73	55.58	-31.85	AVG	
3		0.1968	25.80	10.92	36.72	63.74	-27.02	QP	
4		0.1968	14.31	10.92	25.23	53.74	-28.51	AVG	
5		0.6141	18.71	10.92	29.63	56.00	-26.37	QP	
6		0.6141	9.65	10.92	20.57	46.00	-25.43	AVG	
7		1.5852	22.39	10.94	33.33	56.00	-22.67	QP	
8		1.5852	11.42	10.94	22.36	46.00	-23.64	AVG	
9	*	3.5187	23.03	11.04	34.07	56.00	-21.93	QP	
10		3.5187	11.38	11.04	22.42	46.00	-23.58	AVG	
11		9.7899	26.04	11.35	37.39	60.00	-22.61	QP	
12		9.7899	11.41	11.35	22.76	50.00	-27.24	AVG	

Notes:

1. An initial pre-scan was performed on the line and neutral lines with peak detector.
2. Quasi-Peak and Average measurement were performed at the frequencies with maximized peak emission.
3. Final Level = Receiver Read level + LISN Factor + Cable Loss

7.3 Radiated Emission

Test Requirement:	FCC Part15 C Section 15.209				
Test Method:	ANSI C63.10:2013				
Test Frequency Range:	9kHz to 1GHz				
Test site:	Measurement Distance: 3m				
Receiver setup:	Frequency	Detector	RBW	VBW	Remark
	9kHz- 30MHz	Quasi-peak	10kHz	30kHz	Quasi-peak Value
	30MHz-1GHz	Quasi-peak	120kHz	300kHz	Quasi-peak Value
	Above 1GHz	Peak	1MHz	3MHz	Peak Value
		AV	1MHz	10Hz	Average Value
Remark: For the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission test in these three bands are based on measurements employing an average detector.					
Limit: (Spurious Emissions)	Limits for frequency below 30MHz				
	Frequency	Limit (uV/m)	Measurement Distance(m)	Remark	
	0.009-0.490	2400/F(kHz)	300	Quasi-peak Value	
	0.490-1.705	24000/F(kHz)	30	Quasi-peak Value	
	1.705-30	30	30	Quasi-peak Value	
	Limits for frequency Above 30MHz				
	Frequency	Limit (dBuV/m @3m)	Remark		
	30MHz-88MHz	40.00	Quasi-peak Value		
	88MHz-216MHz	43.50	Quasi-peak Value		
	216MHz-960MHz	46.00	Quasi-peak Value		
960MHz-1GHz	54.00	Quasi-peak Value			
Above 1GHz	54.00	Average Value			
	74.00	Peak Value			
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.					
Test Procedure:	1. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter camber. The table was rotated 360 degrees to determine the position of the highest radiation. 2. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower. 3. The antenna height 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. 4. 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 rota table was turned from 0 degrees to 360 degrees to find the maximum reading. 5. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode. 6. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the				

	EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet. 7. The radiation measurements are performed in X, Y, Z axis positioning. And found the Y axis positioning which it is worse case, only the test worst case mode is recorded in the report.					
Test setup:	Below 30MHz  30MHz ~ 1000MHz 					
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	24 °C	Humid.:	51%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Measurement data:

Measurement data:

For 9 KHz-30MHz

WORST-CASE RADIATED EMISSION BELOW 30 MHz

Frequency	Reading	Polar	Antenna Factor	Cable Loss	Emission Levels	Limits at 3m	Margin	Detector Mode
(MHz)	(dBμV/m)	Loop	(dB/m)	(dB)	(dBμV/m)	(dBμV/m)	(dB)	
0.145(F)	67.34	Loop	23.63	0.01	90.98	103.91	12.93	PK
0.145(F)	51.15	Loop	23.11	0.01	74.27	83.91	9.64	AV
0.110	41.98	Loop	23.59	0.01	65.58	106.78	41.20	PK
0.110	35.28	Loop	23.08	0.01	58.37	86.78	28.41	AV
0.685	25.27	Loop	25.34	-0.17	50.44	70.89	20.45	QP
1.735	19.51	Loop	27.95	-0.25	47.21	62.82	15.61	QP
6.525	28.53	Loop	23.03	-0.24	51.32	69.54	18.22	QP
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Remark:

1. Data of measurement within this frequency range shown "-- in the table above means the reading of emissions are attenuated more than 20dB below the permissible limits and not recorded.
2. The test limit distance is 3m limit.
3. PK means Peak Value, QP means Quasi Peak Value, AV means Average Value.
4. F means Fundamental Frequency.
5. Emission level (dBuV/m) =Reading + Antenna Factor + Cable Loss.
6. Margin value = Limit value- Emission level.

30MHz~1GHz

Horizontal



No.	Mk.	Freq.	Reading	Correct	Measure-	Limit	Over	Antenna	Table	
		MHz	Level	Factor	ment			Height	Degree	
			dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1		33.3279	35.36	-18.39	16.97	40.00	-23.03	QP		
2		43.2017	30.78	-17.92	12.86	40.00	-27.14	QP		
3	*	66.4989	37.58	-19.52	18.06	40.00	-21.94	QP		
4		152.6641	35.57	-17.33	18.24	43.50	-25.26	QP		
5		206.3976	36.70	-19.93	16.77	43.50	-26.73	QP		
6		340.7817	36.89	-17.94	18.95	46.00	-27.05	QP		

Final Level =Receiver Read level + Correct Factor

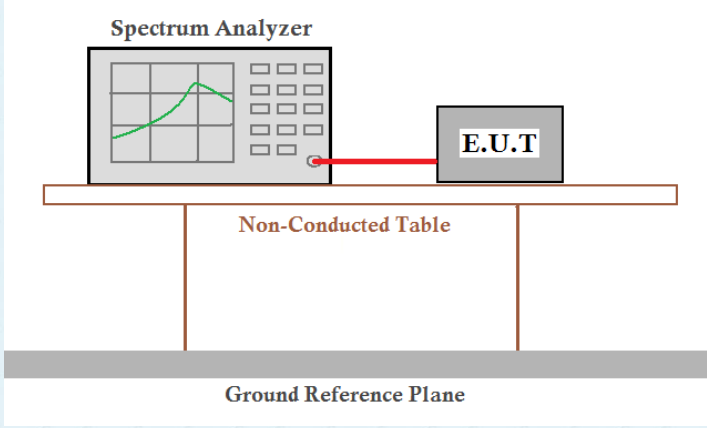
Vertical



No.	Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Over	Antenna Height	Table Degree	
		MHz	dBuV	dB	dBuV/m	dB/m	dB	cm	degree	Comment
1	*	30.0000	39.61	-18.59	21.02	40.00	-18.98	QP		
2		37.8121	36.67	-18.11	18.56	40.00	-21.44	QP		
3		55.4147	37.56	-18.62	18.94	40.00	-21.06	QP		
4		103.8054	37.99	-20.40	17.59	43.50	-25.91	QP		
5		148.9625	35.42	-17.69	17.73	43.50	-25.77	QP		
6		226.8935	32.53	-19.32	13.21	46.00	-32.79	QP		

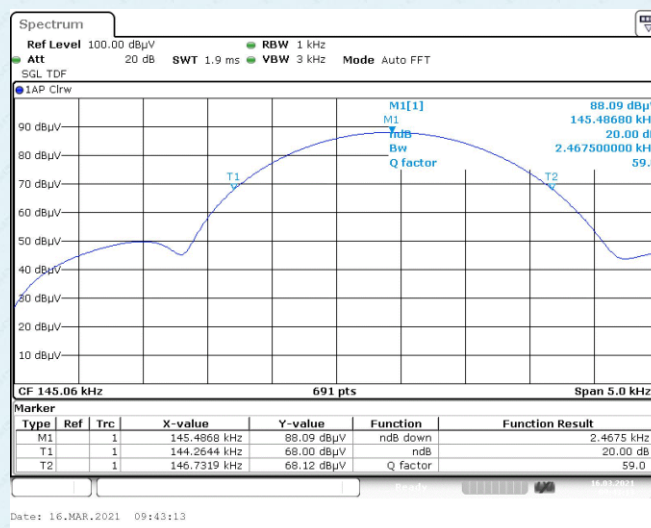
Final Level =Receiver Read level + Correct Factor

7.4 20dB Occupy Bandwidth

Test Requirement:	FCC Part15 C Section 15.215					
Test Method:	ANSI C63.10:2013					
Test setup:						
Test Instruments:	Refer to section 6.0 for details					
Test mode:	Refer to section 5.2 for details					
Test environment:	Temp.:	23 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

Measurement Data

Mode	Freq (KHz)	20dB Bandwidth (KHz)	Conclusion
Tx Mode	145.4868	2.4675	PASS



8 Test Setup Photo

Reference to the **appendix I** for details.

9 EUT Constructional Details

Reference to the **appendix II** for details.

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