

TEST REPORT

Applicant: LI KUM TRADING CO.,LIMITED

Address of Applicant: SHOP 185 G/F HANG WAI IND CTR NO 6 KIN TAI ST TUEN MUN NT, HK, China

Manufacturer: LI KUM TRADING CO.,LIMITED

Address of Manufacturer: SHOP 185 G/F HANG WAI IND CTR NO 6 KIN TAI ST TUEN MUN NT, HK, China

Factory: PHUC VINH ELECTRONICS COMPANY LIMITED

Address of Factory: Than Canh Phuc Street, Hung Lam 1 Residential Area, Hong Thai Ward, Viet Yen Town, Bac Giang Province, Vietnam.

Equipment Under Test (EUT)

Product Name: 3-IN-1 MAGNETIC WIRELESS CHARGER

Model No.: MWC-36/24, 663216

FCC ID: 2BNL5-663216

Applicable standards: FCC CFR Title 47 Part 15 Subpart C

Date of sample receipt: February 05, 2025

Date of Test: February 06-20, 2025

Date of report issued: February 20, 2025

Test Result : PASS *

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

Authorized Signature:

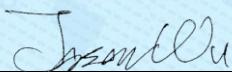
Robinson Luo
Laboratory Manager

This results shown in this test report refer only to the sample(s) tested, this test report cannot be reproduced, except in full, without prior written permission of the company. The report would be invalid without specific stamp of test institute and the signatures of compiler and approver.

2 Version

Version No.	Date	Description
00	February 20, 2025	Original

Prepared By:



Date:

February 20, 2025

Project Engineer

Check By:



Date:

February 20, 2025

Reviewer

3 Contents

	Page
1 COVER PAGE.....	1
2 VERSION	2
3 CONTENTS	3
4 TEST SUMMARY	4
4.1 MEASUREMENT UNCERTAINTY	4
5 GENERAL INFORMATION.....	5
5.1 GENERAL DESCRIPTION OF EUT	5
5.2 TEST MODE	6
5.3 DESCRIPTION OF SUPPORT UNITS	6
5.4 DEVIATION FROM STANDARDS	6
5.5 ABNORMALITIES FROM STANDARD CONDITIONS	6
5.6 TEST FACILITY.....	7
5.7 TEST LOCATION	7
5.8 OTHER INFORMATION REQUESTED BY THE CUSTOMER	7
6 TEST INSTRUMENTS LIST	8
7 TEST RESULTS AND MEASUREMENT DATA.....	10
7.1 ANTENNA REQUIREMENT:.....	10
7.2 CONDUCTED EMISSIONS	11
7.3 RADIATED EMISSION METHOD	14
7.4 20dB OCCUPY BANDWIDTH	19
8 TEST SETUP PHOTO	21
9 EUT CONSTRUCTIONAL DETAILS	21

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	Pass
20dB Bandwidth	15.215	Pass

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

4.1 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	RF conducted power	$\pm 0.75\text{dB}$
5	RF power density	$\pm 3\text{dB}$
6	Conducted Spurious emissions	$\pm 2.58\text{dB}$
7	AC Power Line Conducted Emission	$\pm 3.44\text{dB}$ (0.15MHz ~ 30MHz) $\pm 3.1\text{dB}$ (9kHz-30MHz) $\pm 3.8039\text{dB}$ (30MHz-200MHz) $\pm 3.9679\text{dB}$ (200MHz-1GHz) $\pm 4.29\text{dB}$ (1GHz-18GHz) $\pm 3.30\text{dB}$ (18GHz-40GHz)
8	Radiated Spurious emission test	
9	Temperature test	$\pm 1^\circ\text{C}$
10	Humidity test	$\pm 3\%$
11	Time	$\pm 3\%$

5 General Information

5.1 General Description of EUT

Product Name:	3-IN-1 MAGNETIC WIRELESS CHARGER
Model No.:	MWC-36/24, 663216
Test Model No.:	MWC-36/24
Remark: All above models are identical in the same PCB layout, interior structure and electrical circuits. The differences are appearance color and model name for commercial purpose.	
Serial No.:	AA010896A
Test sample(s) ID:	GTS2025010365-1
Sample(s) Status	Engineer sample
Operation Frequency:	111.5kHz~205kHz and 320kHz
Modulation type:	MSK
Antenna Type:	Inductance Coil Antenna
Antenna gain:	ANT 1: 0dBi ANT 2: 0dBi ANT 3: 0dBi
Power supply:	Input: DC 9V/3A Phone Output: 5W, 7.5W, 10W, 15W Max Earbuds Output: 3W Max Watch Output: 2.5W Max

Remark:

1. Antenna gain information provided by the customer
2. The relevant information of the sample is provided by the entrusting company, and the laboratory is not responsible for its authenticity.

5.2 Test mode

Mode	Description	Remark
1	EUT+ Wireless load	99% load
2	EUT+ Wireless load	50% load
3	EUT+ Wireless load	1% load
4	EUT+ Watch	99% load
5	EUT+ Watch	50% load
6	EUT+ Watch	1% load
7	EUT+ Headset	99% load
8	EUT+ Headset	50% load
9	EUT+ Headset	1% load
10	EUT+ Wireless load+ Watch	99% load
11	EUT+ Wireless load+ Watch	50% load
12	EUT+ Wireless load+ Watch	1% load
13	EUT+ Wireless load+ Headset	99% load
14	EUT+ Wireless load+ Headset	50% load
15	EUT+ Wireless load+ Headset	1% load
16	EUT+ Watch+ Headset	99% load
17	EUT+ Watch+ Headset	50% load
18	EUT+ Watch+ Headset	1% load
19	EUT+ Wireless load+ Watch+ Headset	99% load
20	EUT+ Wireless load+ Watch+ Headset	50% load
21	EUT+ Wireless load+ Watch+ Headset	1% load

Keep the EUT in wireless charging status. Mode 1 is worse case and reported.

5.3 Description of Support Units

Manufacturer	Description	Model	S/N
YBZ	Wireless charging test load	001	N/A
XIAOMI	USB Charger	MDY-10-EH	N/A
Apple	Watch	Ultra 2	N/A
Apple	AirPods	4	N/A

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.

- **ISED—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 ISED 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	Jun. 22, 2024	Jun. 21, 2027
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	Apr. 11, 2024	Apr. 10, 2025
4	BiConiLog Antenna	SCHWARZBECK MESS-ELEKTRONIK	VULB9168	GTS640	Mar. 19, 2023	Mar. 18, 2025
5	Double -ridged waveguide horn	SCHWARZBECK MESS-ELEKTRONIK	BBHA 9120 D	GTS208	Apr. 17, 2023	Apr. 16, 2025
6	Wideband Radio Communication Tester	Rohde & Schwarz	CMW500	GTS575	Apr. 11, 2024	Apr. 10, 2025
7	Loop Antenna	ZHINAN	ZN30900A	GTS534	Nov.12, 2024	Nov.11, 2025
8	Broadband Preamplifier	SCHWARZBECK	BBV9718	GTS535	Apr. 11, 2024	Apr. 10, 2025
9	Amplifier(1GHz-26.5GHz)	HP	8449B	GTS601	Apr. 11, 2024	Apr. 10, 2025
10	Horn Antenna (15GHz-40GHz)	SCHWARZBECK	01296	GTS691	Mar. 07, 2024	Mar. 06, 2025
11	FSV-Signal Analyzer (10Hz-40GHz)	Keysight	FSV-40-N	GTS666	Mar. 12, 2024	Mar. 11, 2025
12	Amplifier	/	LNA-1000-30S	GTS650	Apr. 11, 2024	Apr. 10, 2025
13	CDNE M2+M3-16A	HCT	30MHz-300MHz	GTS692	Nov. 07, 2024	Nov. 06, 2025
14	Wideband Amplifier	/	WDA-01004000-15P35	GTS602	Apr. 11, 2024	Apr. 10, 2025
15	Thermo meter	JINCHUANG	GSP-8A	GTS643	Apr. 18, 2024	Apr. 17, 2025
16	RE cable 1	GTS	N/A	GTS675	Jul. 02, 2024	Jul. 01, 2025
17	RE cable 2	GTS	N/A	GTS676	Jul. 02, 2024	Jul. 01, 2025
18	RE cable 3	GTS	N/A	GTS677	Jul. 02, 2024	Jul. 01, 2025
19	RE cable 4	GTS	N/A	GTS678	Jul. 02, 2024	Jul. 01, 2025
20	RE cable 5	GTS	N/A	GTS679	Jul. 02, 2024	Jul. 01, 2025
21	RE cable 6	GTS	N/A	GTS680	Jul. 02, 2024	Jul. 01, 2025
22	RE cable 7	GTS	N/A	GTS681	Jul. 05, 2024	Jul. 04, 2025
23	RE cable 8	GTS	N/A	GTS682	Jul. 05, 2024	Jul. 04, 2025
24	EMI Test Software	AUDIX	E3-6.100614a	GTS725	N/A	N/A

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	Jul. 12, 2022	Jul. 11, 2027
2	EMI Test Receiver	R&S	ESCI 7	GTS552	Apr. 11, 2024	Apr. 10, 2025
3	LISN	ROHDE & SCHWARZ	ENV216	GTS226	Apr. 11, 2024	Apr. 10, 2025
4	Coaxial Cable	GTS	N/A	GTS227	N/A	N/A
5	Thermo meter	JINCHUANG	GSP-8A	GTS642	Apr. 18, 2024	Apr. 17, 2025
6	Absorbing clamp	Elektronik-Feinmechanik	MDS21	GTS229	Apr. 11, 2024	Apr. 10, 2025
7	ISN	SCHWARZBECK	NTFM 8158	GTS565	Apr. 11, 2024	Apr. 10, 2025
8	High voltage probe	SCHWARZBECK	TK9420	GTS537	Apr. 11, 2024	Apr. 10, 2025
9	Antenna end assembly	Weinschel	1870A	GTS560	Apr. 11, 2024	Apr. 10, 2025
10	EMI Test Software	AUDIX	E3-6.100622	GTS726	N/A	N/A

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	Apr. 13, 2024	Apr. 12, 2025
2	EMI Test Receiver	R&S	ESCI 7	GTS552	Apr. 13, 2024	Apr. 12, 2025
3	PSA Series Spectrum Analyzer	Agilent	E4440A	GTS536	Apr. 13, 2024	Apr. 12, 2025
4	MXG vector Signal Generator	Agilent	N5182A	GTS567	Apr. 13, 2024	Apr. 12, 2025
5	ESG Analog Signal Generator	Agilent	E4428C	GTS568	Apr. 13, 2024	Apr. 12, 2025
6	USB RF Power Sensor	DARE	RPR3006W	GTS569	Apr. 13, 2024	Apr. 12, 2025
7	RF Switch Box	Shongyi	RFSW3003328	GTS571	Apr. 13, 2024	Apr. 12, 2025
8	Programmable Constant Temp & Humi Test Chamber	WEWON	WHTH-150L-40-880	GTS572	Apr. 13, 2024	Apr. 12, 2025
9	Thermo meter	JINCHUANG	GSP-8A	GTS641	Apr. 18, 2024	Apr. 17, 2025
10	EXA Signal Analyzer	Keysight	N9010B	MY60241168	Nov. 02, 2024	Nov. 01, 2025

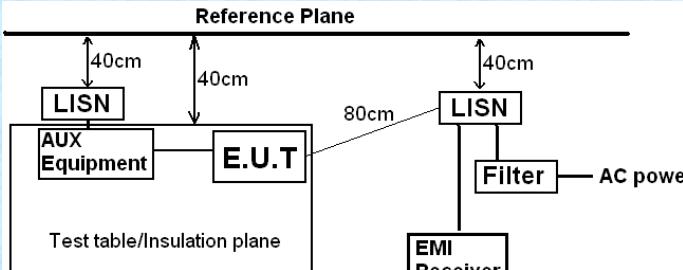
General used equipment:						
Item	Test Equipment	Manufacturer	Model No.	Inventory No.	Cal.Date (mm-dd-yy)	Cal.Due date (mm-dd-yy)
1	Barometer	KUMAO	SF132	GTS647	Apr. 18, 2024	Apr. 17, 2025

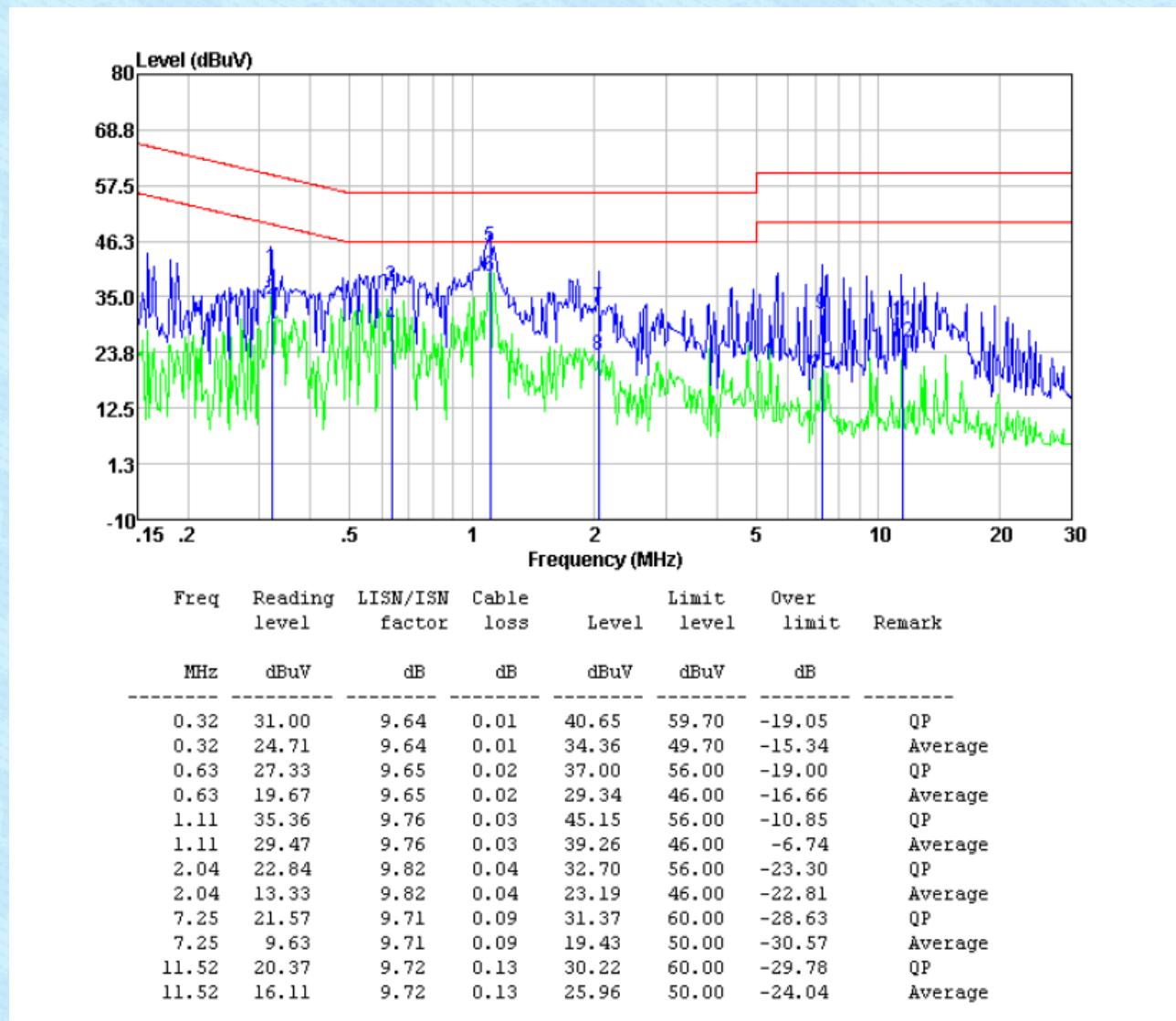
7 Test results and Measurement Data

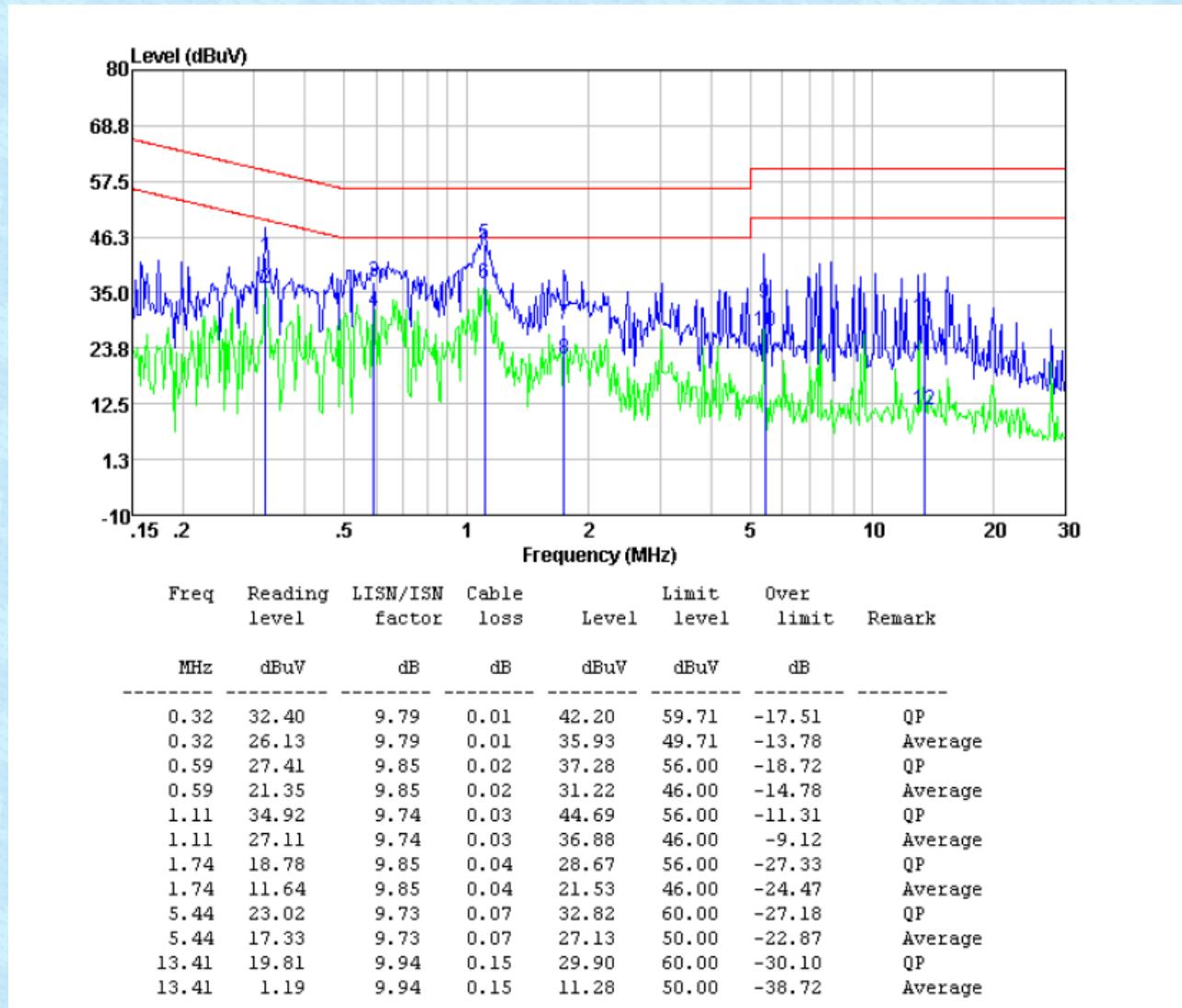
7.1 Antenna requirement:

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 ant is inductance coil antenna, 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					
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:	 <p>Remark E.U.T: Equipment Under Test LISN: Line Impedance Stabilization Network Test table height=0.8m</p>					
Test procedure:	<ol style="list-style-type: none"> 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. Only show the worst case (Mode19).					
Test environment:	Temp.:	25 °C	Humid.:	52%	Press.:	1012mbar
Test voltage:	AC 120V, 60Hz					
Test results:	Pass					

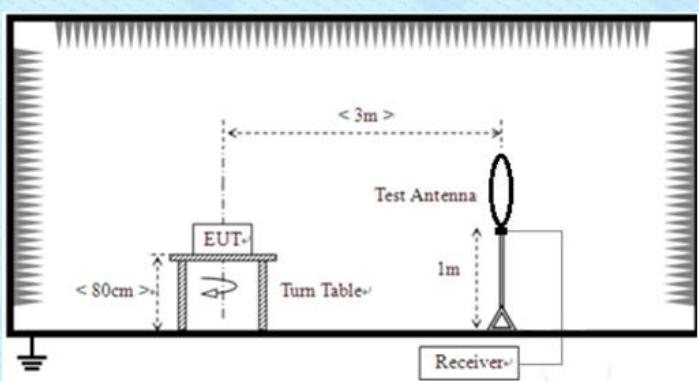
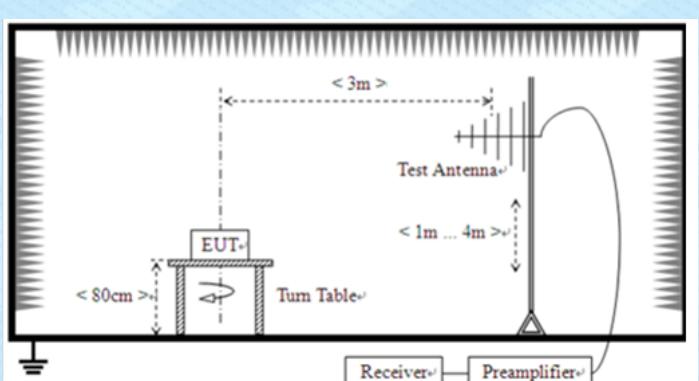
Measurement data:
Line:


Neutral:

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
4. If the average limit is met when using a quasi-peak detector receiver, the EUT shall be deemed to meet both limits and measurement with the average detector receiver is unnecessary.

7.3 Radiated Emission Method

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					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							
Test Procedure:	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.									
	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								

	<p>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.</p> <p>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.</p>
Test setup:	<p>Below 30MHz</p>  <p>30MHz ~ 1000MHz</p> 
Test Instruments:	Refer to section 6.0 for details
Test mode:	Refer to section 5.2 for details. Only show the worst cas (Mode 19).
Test environment:	Temp.: 25 °C Humid.: 52% Press.: 1012mbar
Test voltage:	AC 120V, 60Hz
Test results:	Pass

Measurement data:

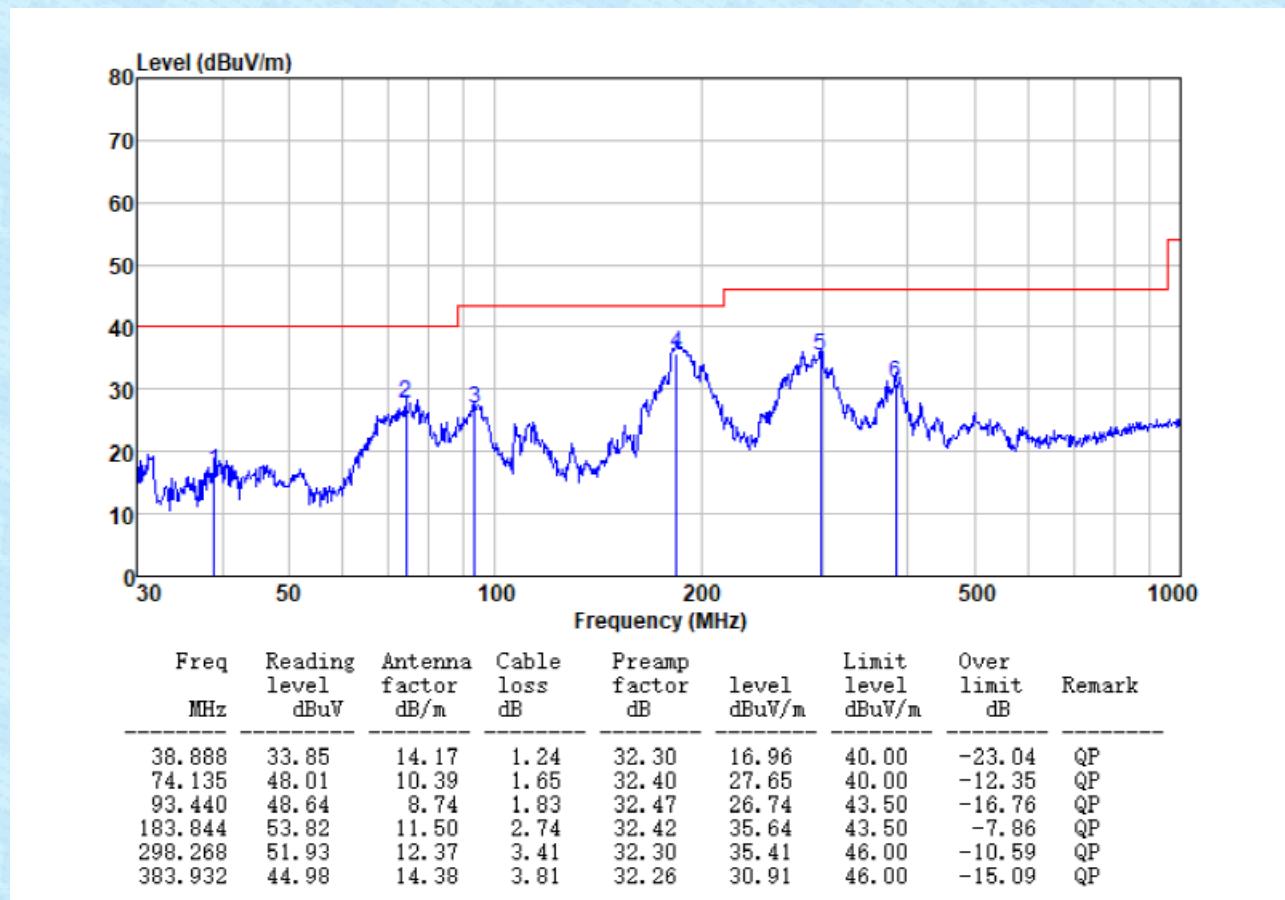
Below 30MHz

Only the worst case

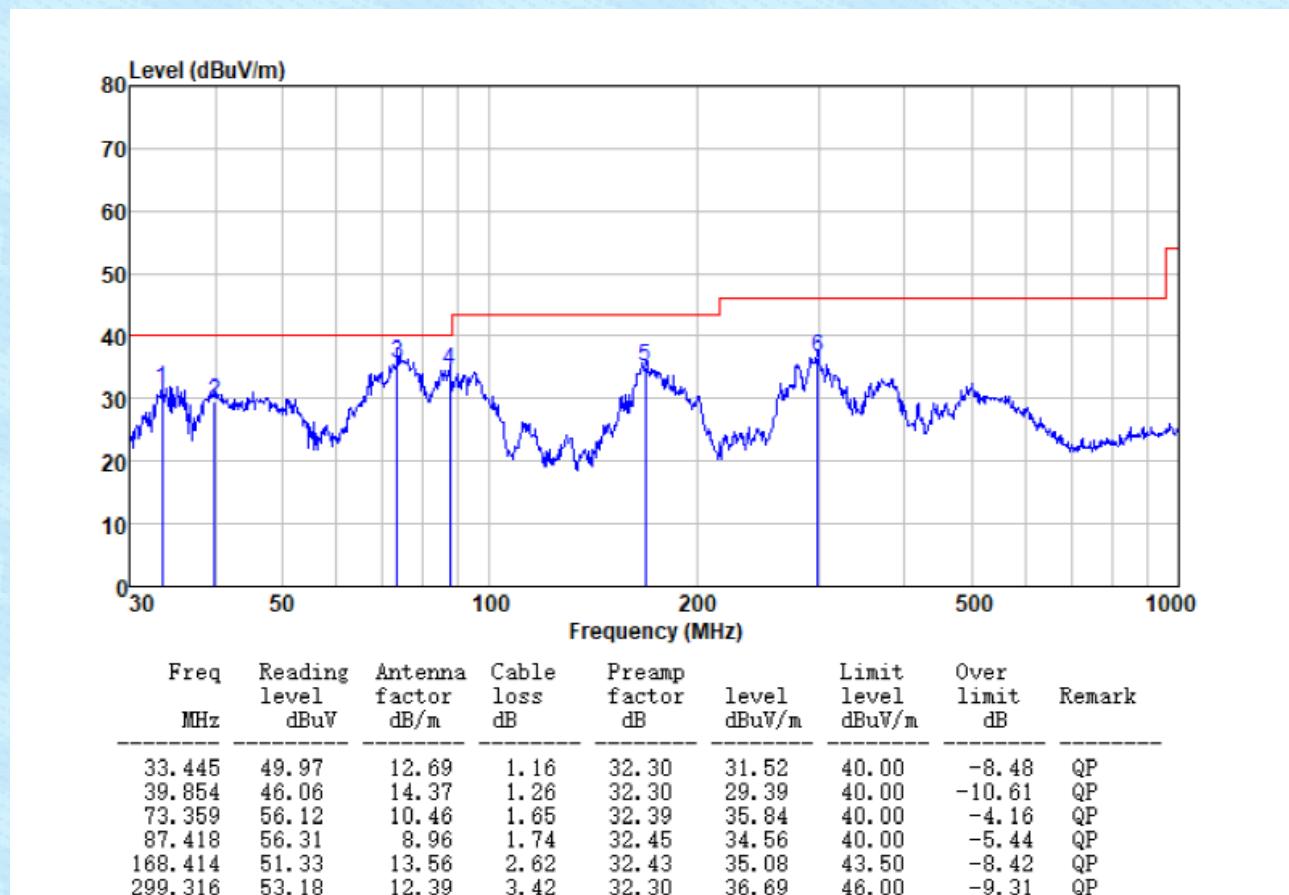
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Remark
0.11285	38.18	20.04	0.25	58.47	106.55	-48.08	Average
0.11285	43.65	20.04	0.25	63.94	106.55	-42.61	Peak
0.12000	41.14	19.90	0.25	61.29	106.02	-44.73	Average
0.12000	45.13	19.90	0.25	65.28	106.02	-40.74	Peak
0.32000	33.21	19.95	0.26	53.42	97.49	-44.07	Average
0.32000	37.35	19.95	0.26	57.56	97.49	-39.93	Peak
0.63643	-3.55	20.18	0.30	16.93	71.53	-54.6	QP
0.99429	2.06	20.4	0.34	22.80	67.66	-44.86	QP
2.131	-0.89	20.46	0.37	19.94	69.54	-49.60	QP
4.955	-2.01	20.89	0.43	19.31	69.54	-50.23	QP
9.253	-3.62	20.70	0.59	17.67	69.54	-51.87	QP
21.512	-4.22	20.58	0.89	17.25	69.54	-52.29	QP

30MHz ~ 1GHz

Horizontal



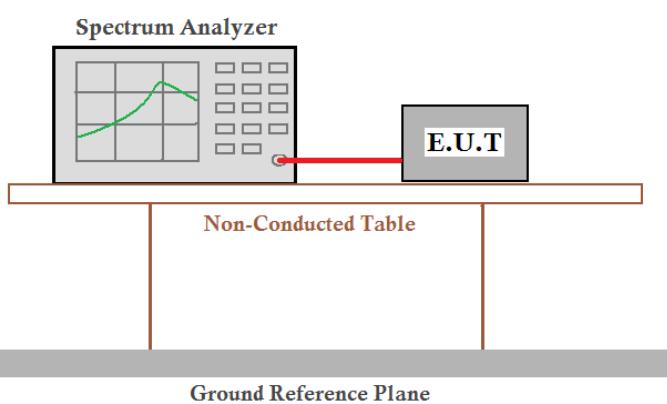
Vertical



Remark:

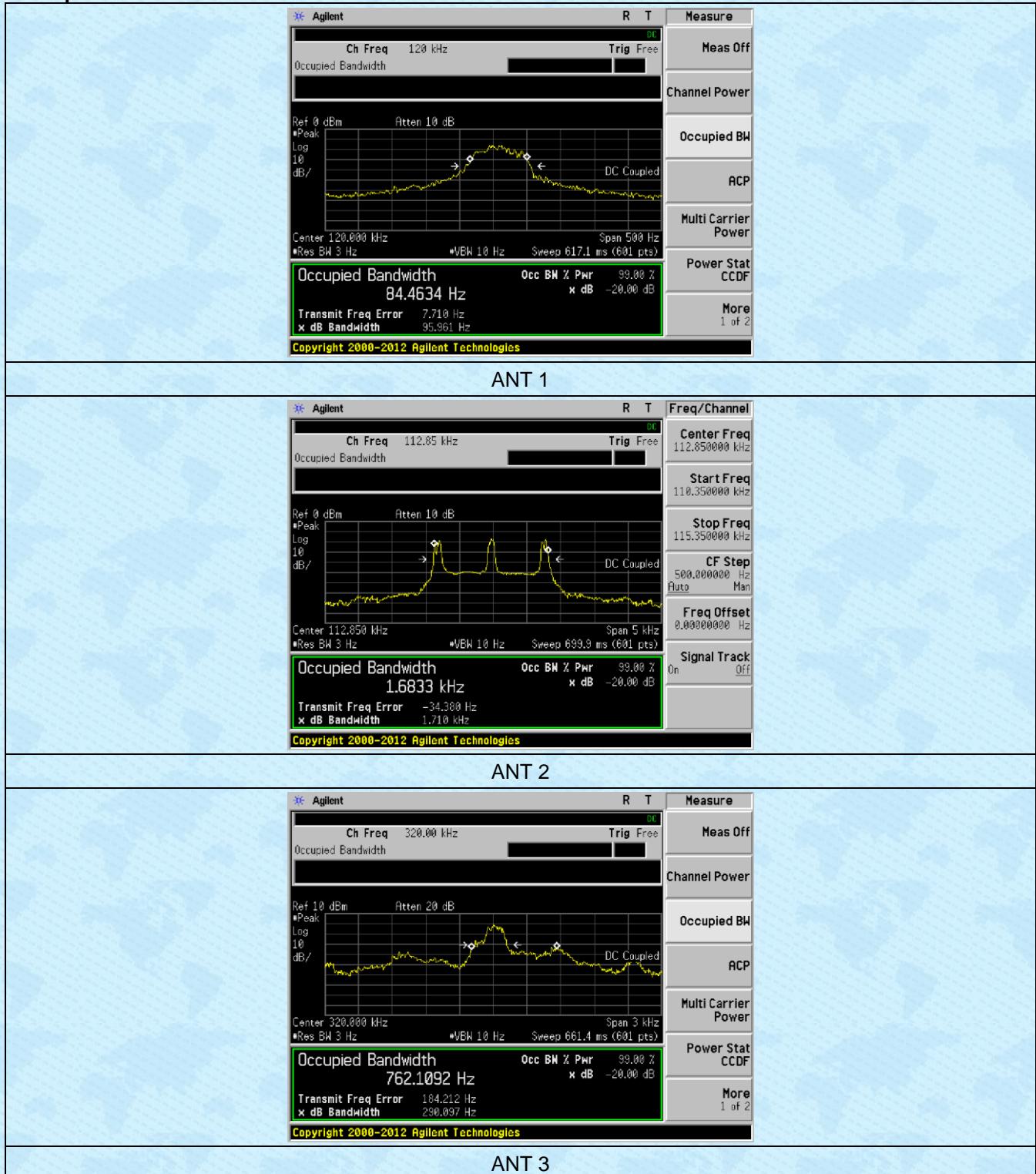
Final Level = Receiver Read level + Antenna Factor + Cable Loss – Preamplifier Factor

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 results:	Pass

Measurement Data

ANT	Test frequency(kHz)	20dB bandwidth(KHz)	Result
1	120.00	0.096	Pass
2	112.85	1.710	Pass
3	320.00	0.290	Pass

Test plot as follows:


8 Test Setup Photo

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

9 EUT Constructional Details

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

-----End-----