

# **FCC Test Report**

## **FCC ID: 2AF9Q-001**

**Product:** Wireless Charger

**Trade Name:** simplehuman

**Model Number:** C636

**Serial Model:** N/A

**Report No.:** S22050502909001

**Prepared for**

simplehuman

19850 Magellan Drive, Torrance, California 90502, United States

**Prepared by**

Shenzhen NTEK Testing Technology Co., Ltd.

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Website: <http://www.ntek.org.cn>

**TEST RESULT CERTIFICATION****Applicant's name** ..... : simplehuman

Address ..... : 19850 Magellan Drive, Torrance, California 90502, United States

**Manufacturer's Name** ..... : simplehuman

Address ..... : 19850 Magellan Drive, Torrance, California 90502, United States

**Product description**

Product name ..... : Wireless Charger

Model and/or type reference : C636

Family Model : N/A

FCC part 15C

**Standards** ..... : ANSI C63.10:2013

KDB 680106 D01 RF Exposure Wireless Charging App v03r01

This device described above has been tested by Shenzhen NTEK Testing Technology Co., Ltd., and the test results show that the equipment under test (EUT) is in compliance with the FCC requirements. And it is applicable only to the tested sample identified in the report.

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The test results of this report relate only to the tested sample identified in this report.

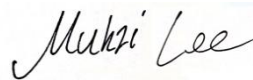
**Date of Test** ..... :**Test Sample Number** ..... : S220505029009

Date (s) of performance of tests ..... : May 05, 2022 ~ May 16, 2022

Date of Issue ..... : May 16, 2022

Test Result ..... : **Pass**

Testing Engineer : \_\_\_\_\_



(Mukzi Lee)

Authorized Signatory : \_\_\_\_\_



(Alex Li)

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## 1. TEST SUMMARY

Test procedures according to the technical standards:

EMC Emission					
Standard	Test Item	FCC Rules	Limit	Judgment	Remark
FCC part 15C:2018 ANSI C63.10:2013	Conducted Emission	§15.207	Class B	PASS	
	Radiated Emission	§15.209	Class B	PASS	
	ANTENNA APPLICATION	§15.203	/	PASS	

NOTE:

- (1) 'N/A' denotes test is not applicable in this Test Report
- (2) For client's request and manual description, the test will not be executed.

## 1.1 FACILITIES AND ACCREDITATIONS

All measurement facilities used to collect the measurement data are located at  
1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang Street, Bao'an District, Shenzhen 518126  
P.R. China.

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.10 and CISPR  
Publication 22.

## 1.2 LABORATORY ACCREDITATIONS AND LISTINGS

## Site Description

CNAS-Lab. : The Laboratory has been assessed and proved to be in compliance with  
CNAS-CL01:2006 (identical to ISO/IEC 17025:2005)

The Certificate Registration Number is L5516.

IC-Registration : The Certificate Registration Number is 9270A-1.

FCC- Accredited : Test Firm Registration Number: 463705.

Designation Number: CN1184

A2LA-Lab. : The Certificate Registration Number is 4298.01  
This laboratory is accredited in accordance with the recognized  
International Standard ISO/IEC 17025:2005 General requirements for  
the competence of testing and calibration laboratories.  
This accreditation demonstrates technical competence for a defined  
scope and the operation of a laboratory quality management system  
(refer to joint ISO-ILAC-IAF Communiqué dated 8 January 2009).

Name of Firm : Shenzhen NTEK Testing Technology Co., Ltd.

Site Location : 1/F, Building E, Fenda Science Park, Sanwei Community, Xixiang  
Street, Bao'an District, Shenzhen 518126 P.R. China.

## 1.3 MEASUREMENT UNCERTAINTY

The reported uncertainty of measurement  $y \pm U$ , where expanded uncertainty  $U$  is based on  
a standard uncertainty multiplied by a coverage factor of  $k=2$ , providing a level of confidence  
of approximately 95 %.

## A. Conducted Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKC01	ANSI	150 KHz ~ 30MHz	2.8	

## B. Radiated Measurement :

Test Site	Method	Measurement Frequency Range	U, (dB)	NOTE
NTEKA01	ANSI	30MHz ~ 1000MHz	2.64	
		1GHz ~6GHz	2.4	
		6GHz ~18GHz	2.52	

## Revision History

Report No.	Version	Description	Issued Date
S22050502909001	Rev.01	Initial issue of report	May 16, 2022

## 2. GENERAL INFORMATION

### 2.1 GENERAL DESCRIPTION OF EUT

Product Feature and Specification	
Equipment	Wireless Charger
Trade Name	simplehuman
FCC ID	2AF9Q-001
Model No.	C636
Family Model	N/A
Model Difference	N/A
Operating Frequency	115kHz~205kHz
Modulation Technique	ASK
Antenna Type	Induction coil
Power Rating	input:5V, 2A, output 5W
Adapter	N/A
Battery	N/A
HW Version	C636-110
FW version	VD3SJ
SW Version	N/A

## 2.1.1 DESCRIPTION OF TEST MODES

### EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

### EUT Exercise

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

The following summary table is showing all test modes to demonstrate in compliance with the standard.

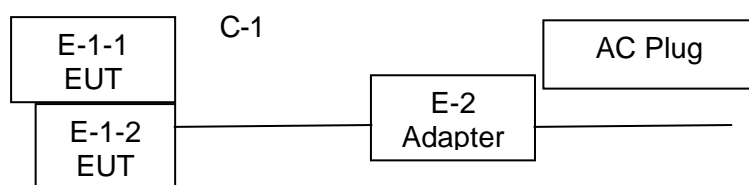
Test Cases	
Test Item	Data Rate/ Modulation
AC Conducted Emission	Mode 1: Max load*
Radiated Test Cases	Mode 1: Max load

(\*)EUT can only access the specified load, can not adjust the size of the load

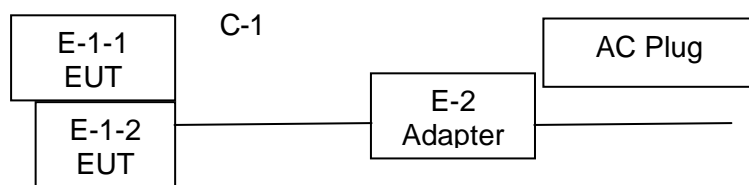


## 2.2 DESCRIPTION OF TEST SETUP

RE



CE



## 2.3 DESCRIPTION TEST PERIPHERAL AND EUT PERIPHERAL

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

Item	Equipment	Model/Type No.	Series No.	Note
E-1-1	Wireless Charger	C636	N/A	EUT
E-1-2	14oz liquid sensor pump	ST1069	N/A	Peripherals
E-2	Adapter	N/A	N/A	Peripherals

Item	Cable Type	Shielded Type	Ferrite Core	Length	Note
C-1	USB Cable	NO	NO	1.0m	

## Note:

- (1) The support equipment was authorized by Declaration of Confirmation.
- (2) For detachable type I/O cable should be specified the length in cm in 『Length』 column.
- (3) “YES” means “shielded” “with core”; “NO” means “unshielded” “without core”.

## 2.4 MEASUREMENT INSTRUMENTS LIST

### Radiation Test equipment

	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Spectrum Analyzer	Agilent	E4407B	MY45108040	2022.04.01	2023.03.31	1 year
2	Spectrum Analyzer	Agilent	N9020A	MY49100060	2022.04.01	2023.03.31	1 year
3	EMI Test Receiver	Agilent	N9038A	MY53227146	2022.04.06	2023.04.05	1 year
4	Test Receiver	R&S	ESPI	101318	2022.04.06	2023.04.05	1 year
5	Bilog Antenna	TESEQ	CBL6111D	31216	2022.03.30	2023.03.29	1 year
6	50Ω Coaxial Switch	Anritsu	MP59B	6200983705	2020.05.11	2023.05.10	3 year
7	Horn Antenna	EM	EM-AH-10180	2011071402	2022.03.31	2023.03.30	1 year
8	Horn Ant	Schwarzbeck	BBHA 9170	9170-181	2021.11.07	2022.11.06	1 year
9	Amplifier	EMC	EMC051835SE	980246	2022.04.01	2023.03.31	1 year
10	Amplifier	MITEQ	TTA1840-35-HG	177156	2022.04.01	2023.03.31	1 year
11	Loop Antenna	ARA	PLA-1030/B	1029	2022.03.31	2023.03.30	1 year
12	Power Meter	DARE	RPR3006W	15I00041SN084	2021.07.01	2022.06.30	1 year
13	Test Cable (9KHz-30MHz)	N/A	R-01	N/A	2019.08.07	2022.08.06	3 year
14	Test Cable (30MHz-1GHz)	N/A	R-02	N/A	2019.08.07	2022.08.06	3 year
15	High Test Cable(1G-40G Hz)	N/A	R-03	N/A	2019.08.07	2022.08.06	3 year
16	High Test Cable(1G-40G Hz)	N/A	R-04	N/A	2019.08.07	2022.08.06	3 year
17	Filter	TRILTHIC	2400MHz	29	2021.07.01	2022.06.30	1 year
18	temporary antenna connector (Note)	NTS	R001	N/A	N/A	N/A	N/A

## Conduction Test equipment

Item	Kind of Equipment	Manufacturer	Type No.	Serial No.	Last calibration	Calibrated until	Calibration period
1	Test Receiver	R&S	ESCI	101160	2022.04.06	2023.04.05	1 year
2	LISN	R&S	ENV216	101313	2022.04.06	2023.04.05	1 year
3	LISN	SCHWARZBECK	NNLK 8129	8129245	2022.04.06	2023.04.05	1 year
4	50Ω Coaxial Switch	ANRITSU CORP	MP59B	6200983704	2020.05.11	2023.05.10	3 year
5	Test Cable (9KHz-30MHz)	N/A	C01	N/A	2019.08.07	2022.08.06	3 year
6	Test Cable (9KHz-30MHz)	N/A	C02	N/A	2019.08.07	2022.08.06	3 year
7	Test Cable (9KHz-30MHz)	N/A	C03	N/A	2019.08.07	2022.08.06	3 year

### 3. EMC EMISSION TEST

#### 3.1 CONDUCTED EMISSION MEASUREMENT

##### 3.1.1 POWER LINE CONDUCTED EMISSION (Frequency Range 150KHz-30MHz)

FREQUENCY (MHz)	limit	
	Quasi-peak	Average
0.15 -0.5	66 - 56 *	56 - 46 *
0.50 -5.0	56.00	46.00
5.0 -30.0	60.00	50.00

Note:

- (1) The tighter limit applies at the band edges.
- (2) The limit of " \* " marked band means the limitation decreases linearly with the logarithm of the frequency in the range.

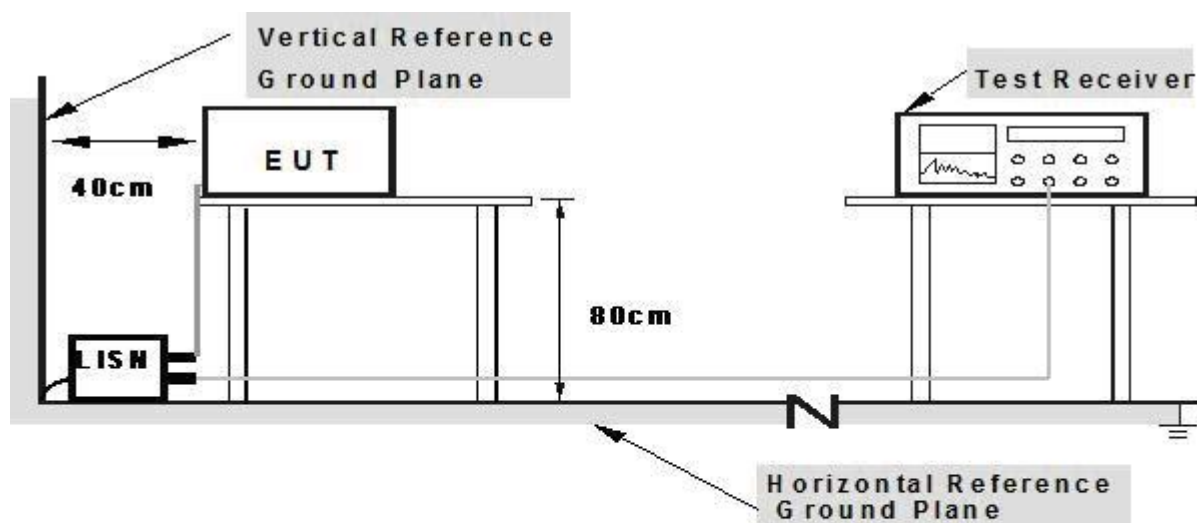
The following table is the setting of the receiver

Receiver Parameters	Setting
Attenuation	10 dB
Start Frequency	0.15 MHz
Stop Frequency	30 MHz
IF Bandwidth	9 kHz

### 3.1.2 TEST PROCEDURE

- The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipments powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- Interconnecting cables that hang closer than 40 cm to the ground plane shall be folded back and forth in the center forming a bundle 30 to 40 cm long.
- I/O cables that are not connected to a peripheral shall be bundled in the center. The end of the cable may be terminated, if required, using the correct terminating impedance. The overall length shall not exceed 1 m.
- LISN at least 80 cm from nearest part of EUT chassis.
- For the actual test configuration, please refer to the related Item –EUT Test Photos.

### 3.1.3 TEST SETUP



**Note: 1. Support units were connected to second LISN.**

**2. Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes**

### 3.1.4 EUT OPERATING CONDITIONS

The EUT tested system was configured as the statements of 2.3 Unless otherwise a special operating condition is specified in the follows during the testing.

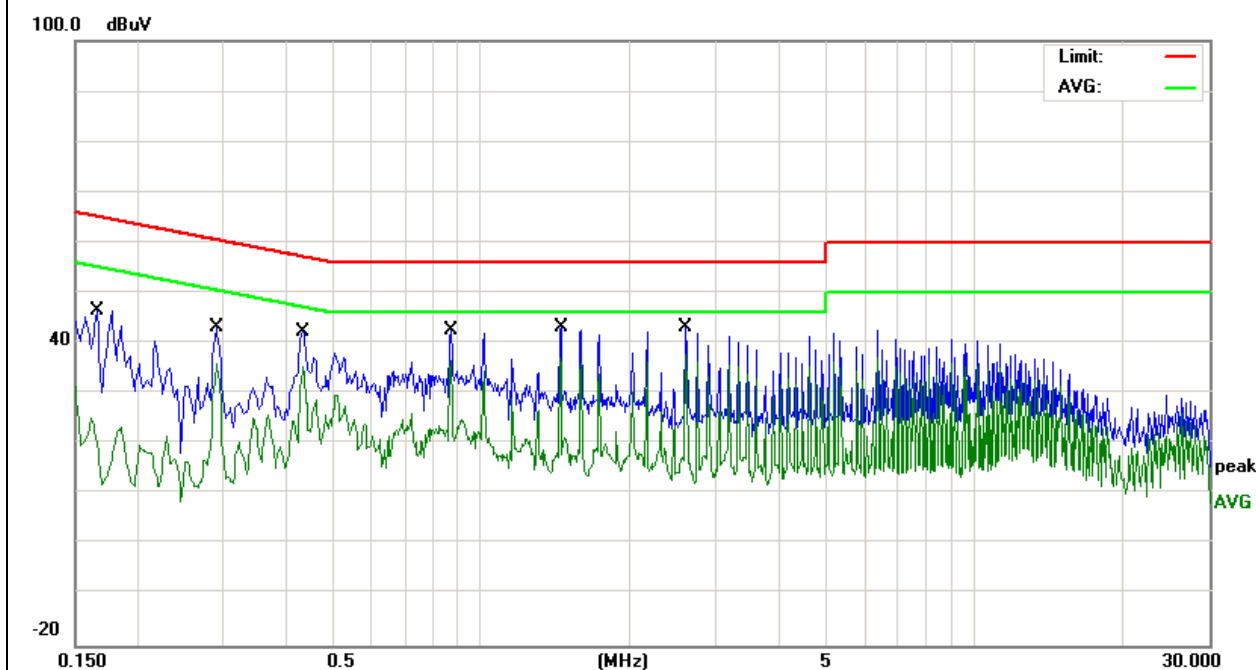
## 3.1.5 TEST RESULTS

EUT:	Wireless Charger	Model Name:	C636
Temperature:	23.8°C	Relative Humidity:	52%
Pressure:	1010hPa	Phase:	L
Test Voltage:	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency	Reading Level	Correct Factor	Measure-ment	Limits	Margin	Remark
(MHz)	(dBμV)	(dB)	(dBμV)	(dBμV)	(dB)	
0.1660	36.86	9.61	46.47	65.15	-18.68	QP
0.1660	10.59	9.61	20.20	55.15	-34.95	AVG
0.2900	33.62	9.63	43.25	60.52	-17.27	QP
0.2900	26.44	9.63	36.07	50.52	-14.45	AVG
0.4340	32.59	9.65	42.24	57.18	-14.94	QP
0.4340	25.65	9.65	35.30	47.18	-11.88	AVG
0.8700	33.04	9.66	42.70	56.00	-13.30	QP
0.8700	26.87	9.66	36.53	46.00	-9.47	AVG
1.4460	27.43	9.66	37.09	46.00	-8.91	AVG
1.4460	33.35	9.66	43.01	56.00	-12.99	QP
2.6060	33.48	9.71	43.19	56.00	-12.81	QP
2.6060	27.99	9.71	37.70	46.00	-8.30	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.

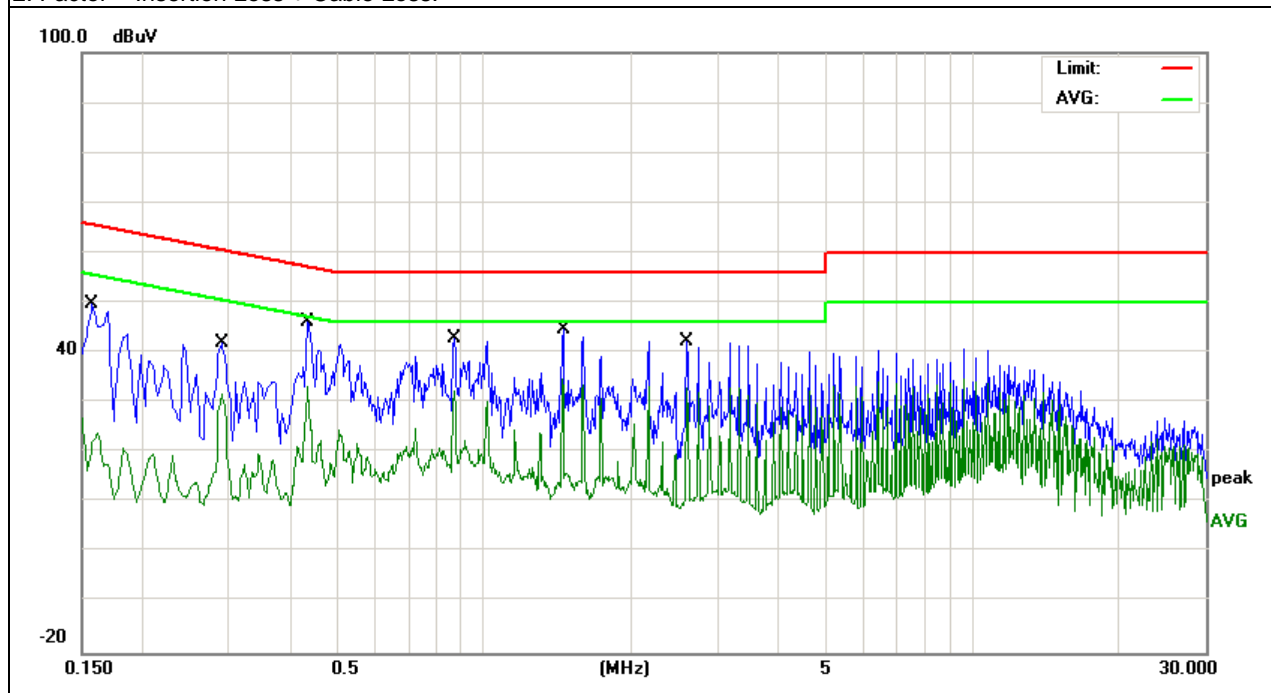


EUT:	Wireless Charger	Model Name:	C636
Temperature:	23.8℃	Relative Humidity:	52%
Pressure:	1010hPa	Phase:	N
Test Voltage:	DC 5V from Adapter AC 120V/60Hz	Test Mode:	Mode 1

Frequency (MHz)	Reading Level (dBμV)	Correct Factor (dB)	Measure-ment (dBμV)	Limits (dBμV)	Margin (dB)	Remark
0.1580	40.06	9.65	49.71	65.56	-15.85	QP
0.1580	14.32	9.65	23.97	55.56	-31.59	AVG
0.2900	32.17	9.63	41.80	60.52	-18.72	QP
0.2900	22.04	9.63	31.67	50.52	-18.85	AVG
0.4340	36.52	9.66	46.18	57.18	-11.00	QP
0.4340	23.60	9.66	33.26	47.18	-13.92	AVG
0.8700	33.15	9.67	42.82	56.00	-13.18	QP
0.8700	22.77	9.67	32.44	46.00	-13.56	AVG
1.4460	34.96	9.66	44.62	56.00	-11.38	QP
1.4460	24.96	9.66	34.62	46.00	-11.38	AVG
2.6060	32.47	9.68	42.15	56.00	-13.85	QP
2.6060	23.36	9.68	33.04	46.00	-12.96	AVG

Remark:

1. All readings are Quasi-Peak and Average values.
2. Factor = Insertion Loss + Cable Loss.





## 3.2 RADIATED EMISSION MEASUREMENT

### 3.2.1 LIMITS OF RADIATED EMISSION MEASUREMENT

The emissions from an intentional radiator shall not exceed the field strength levels specified in the following table 15.209(a):

Frequency (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

### 15.205 Restricted bands of operation

MHz	MHz	MHz	GHz
0.090-0.110	16.42-16.423	399.9-410	4.5-5.15
<sup>1</sup> 0.495-0.505	16.69475-16.69525	608-614	5.35-5.46
2.1735-2.1905	16.80425-16.80475	960-1240	7.25-7.75
4.125-4.128	25.5-25.67	1300-1427	8.025-8.5
4.17725-4.17775	37.5-38.25	1435-1626.5	9.0-9.2
4.20725-4.20775	73-74.6	1645.5-1646.5	9.3-9.5
6.215-6.218	74.8-75.2	1660-1710	10.6-12.7
6.26775-6.26825	108-121.94	1718.8-1722.2	13.25-13.4
6.31175-6.31225	123-138	2200-2300	14.47-14.5
8.291-8.294	149.9-150.05	2310-2390	15.35-16.2
8.362-8.366	156.52475-156.52525	2483.5-2500	17.7-21.4
8.37625-8.38675	156.7-156.9	2690-2900	22.01-23.12
8.41425-8.41475	162.0125-167.17	3260-3267	23.6-24.0
12.29-12.293	167.72-173.2	3332-3339	31.2-31.8
12.51975-12.52025	240-285	3345.8-3358	36.43-36.5
12.57675-12.57725	322-335.4	3600-4400	( <sup>2</sup> )
13.36-13.41			

#### Notes:

- (1) Measurement was performed at an antenna to the closed point of EUT distance of meters.
- (2) Emission level (dBuV/m)=20log Emission level (uV/m).
- (3) Only spurious frequency is permitted to locate within the Restricted Bands specified in provision of 15.205, and the emissions located in restricted bands also comply with 15.209 limit.
- (4) 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

### 3.2.2 TEST PROCEDURE

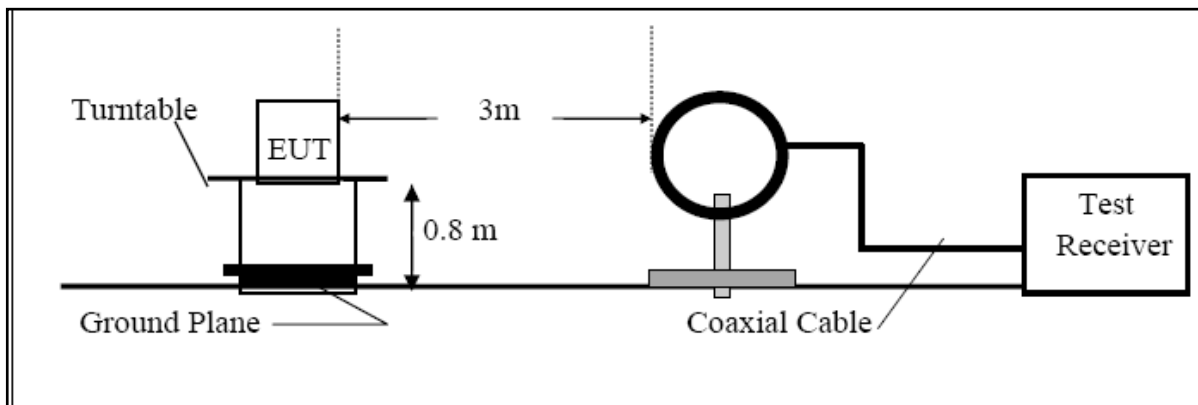
#### Test Arrangement for Radiated Emissions up to 1 GHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at an accredited test facility. 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 antenna is a broadband antenna (Blow 30M, use loop antenna), and its 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.
- 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.

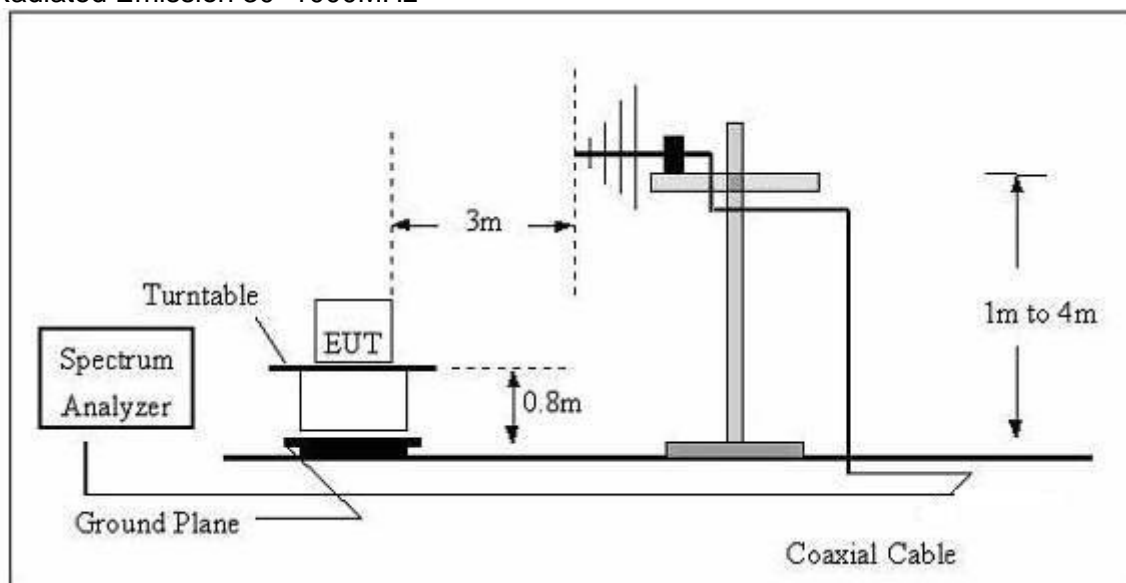
Note: The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for quasi-peak detection (QP) at frequency below 1GHz.

### 3.2.3 TEST SETUP

For Radiated Emission Test Set-Up, Frequency Below 30MHz



For Radiated Emission 30~1000MHz

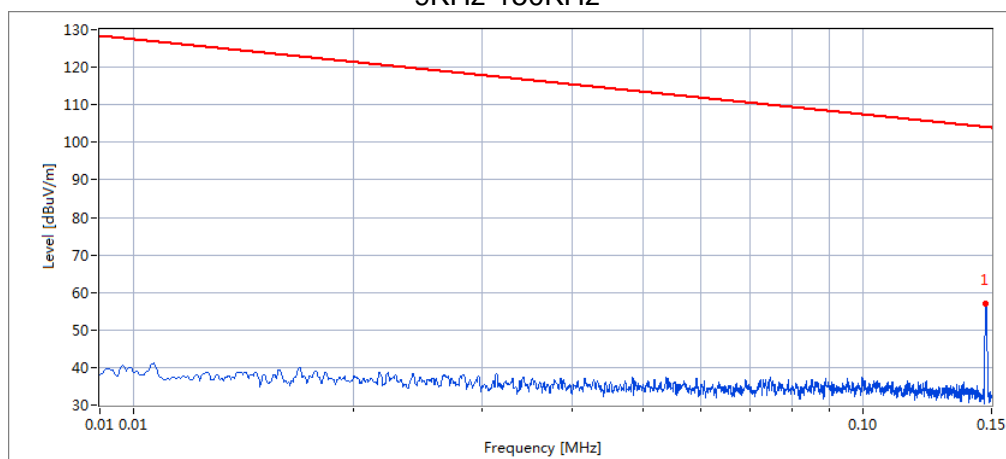


## 3.2.4 TEST RESULTS

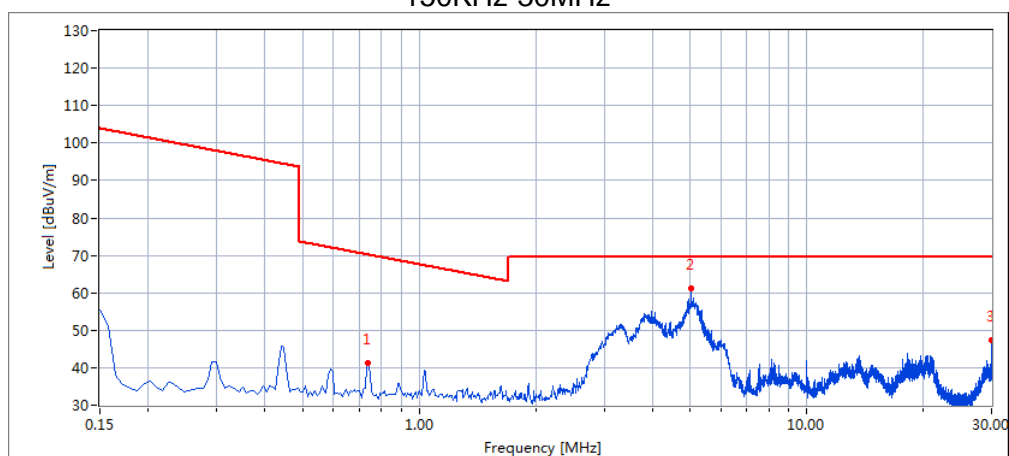
## TEST RESULTS (9KHz~30MHz)

EUT:	Wireless Charger	Model Name. :	C636
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization:	Horizontal
Test Power:	DC 5V	Test Mode :	Max Load

9KHz-150KHz



150KHz-30MHz



Frequency	Ant. Pol.	Emission Level	Limits	Margin	Remark
(MHz)		(dBuV/m)	(dBuV/m)	(dB)	
0.147	X	55.4	104.2	-48.8	Avg
0.738	X	40.8	70.2	-29.4	QP
5.105	X	55.2	69.5	-14.3	QP
30.000	X	45.8	69.5	-23.7	QP

## Note:

Below 30MHz, Pre-test the X, Y, Z axis to find X axis is worst case, so only record X axis test data.

X: Field strength which this device generates since the position of the charging coil and loop antenna differ by 0 degrees.

Y: Field strength which this device generates since the position of the charging coil and loop antenna differ by 90 degrees.

Z: Field strength which this device generates since the position of the charging coil and loop antenna differ by 180 degrees.

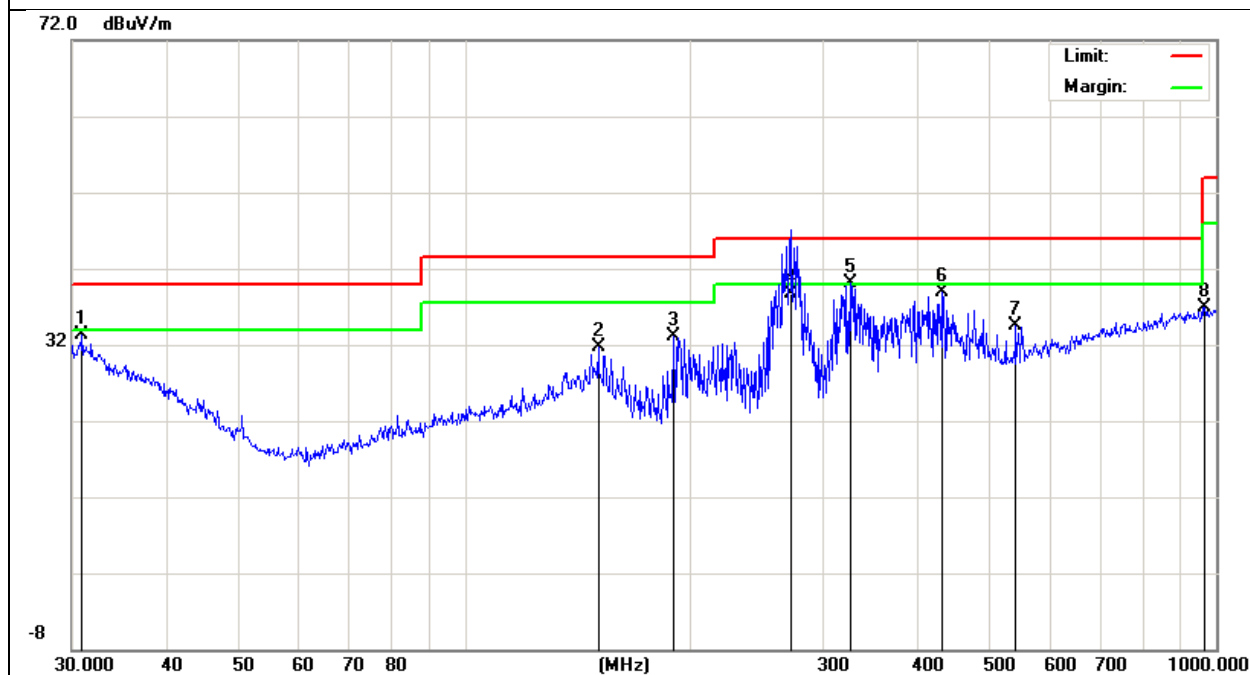
TEST RESULTS (30MHz ~1000MHz)

EUT:	Wireless Charger	Model Name. :	C636
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization:	Horizontal
Test Power :	DC 5V	Test Mode :	Max Load

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
H	30.9619	7.27	26.12	33.39	40.00	-6.61	QP
H	150.5378	13.14	18.64	31.78	43.50	-11.72	QP
H	189.7385	17.07	16.02	33.09	43.50	-10.41	QP
H	271.3246	19.72	19.08	38.80	46.00	-7.20	QP
H	325.5958	19.92	20.12	40.04	46.00	-5.96	QP
H	431.0316	15.41	23.43	38.84	46.00	-7.16	QP
H	541.3725	9.97	24.60	34.57	46.00	-11.43	peak
H	965.5421	6.84	30.02	36.86	54.00	-17.14	peak

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.

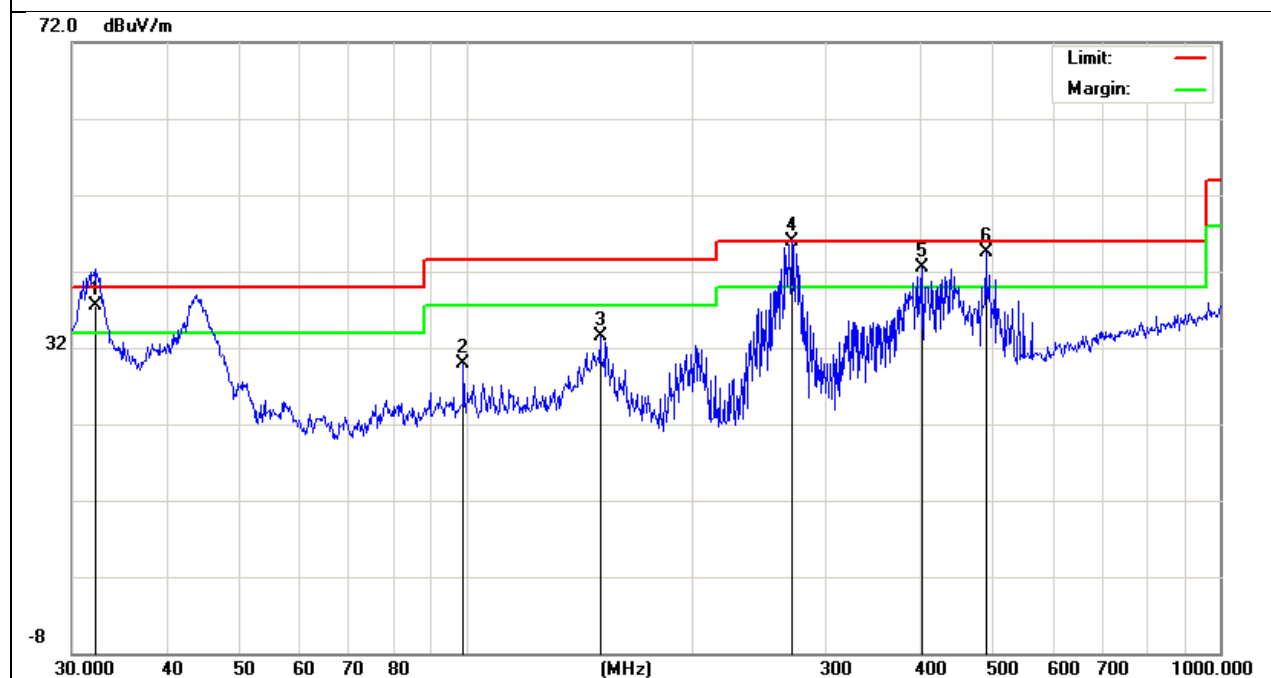


EUT:	Wireless Charger	Model Name. :	C636
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization:	Vertical
Test Power :	DC 5V	Test Mode :	Max Load

Polar (H/V)	Frequency	Meter Reading	Factor	Emission Level	Limits	Margin	Remark
	(MHz)	(dBuV)	(dB)	(dBuV/m)	(dBuV/m)	(dB)	
V	32.1795	12.60	24.90	37.50	40.00	-2.50	QP
V	99.1797	12.17	17.73	29.90	43.50	-13.60	QP
V	150.5378	14.85	18.64	33.49	43.50	-10.01	QP
V	270.3748	26.88	19.06	45.94	46.00	-0.06	QP
V	403.2500	19.72	22.81	42.53	46.00	-3.47	QP
V	489.0269	20.53	23.90	44.43	46.00	-1.57	QP

Remark:

Factor = Antenna Factor + Cable Loss - Amplifier.



#### 4. BANDWIDTH TEST

##### 4.1 TEST PROCEDURE

- 1). The transmitter output (antenna port) was connected to the spectrum analyzer in peak mode.
- 2). 20dB Bandwidth the resolution bandwidth of 300 Hz and the video bandwidth of 1 kHz were used.
- 3). Measured the spectrum width with power higher than 20dB below carrier.

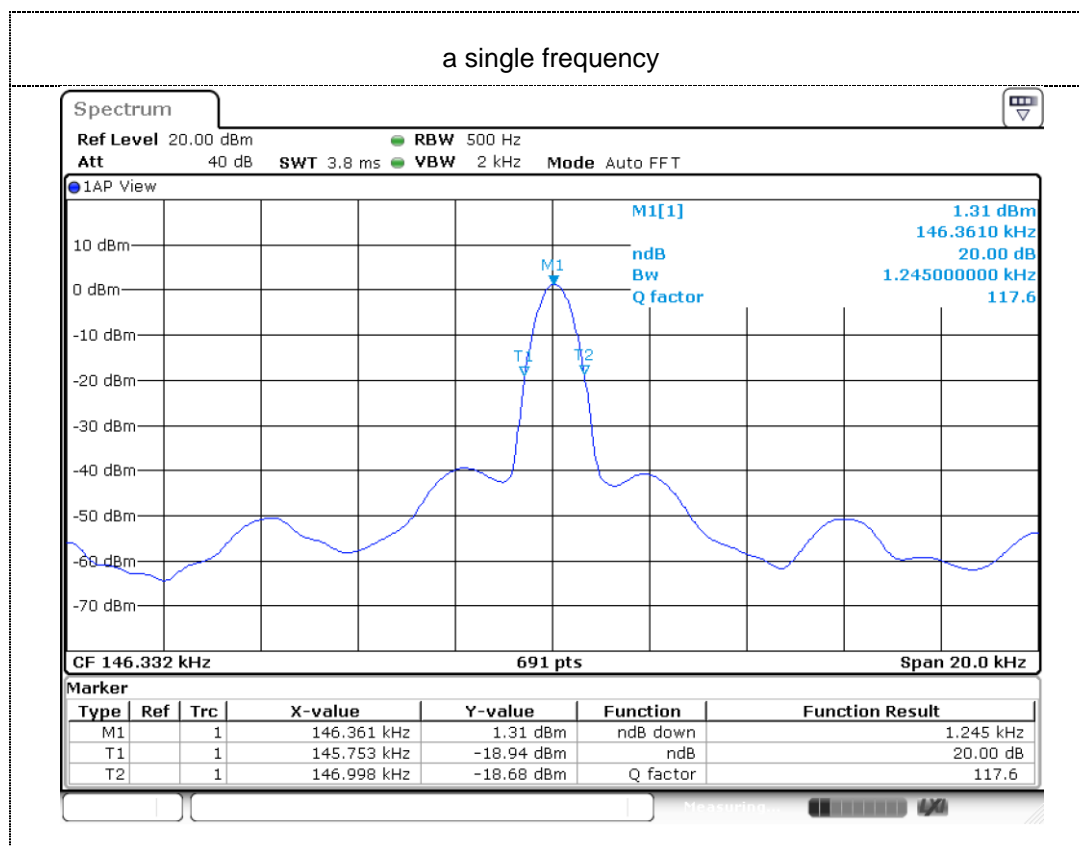
##### 4.2 TEST SETUP



## 4.3 TEST RESULT

EUT:	Wireless Charger	Model Name. :	C636
Temperature:	24 °C	Relative Humidity:	54%
Pressure:	1010 hPa	Polarization:	Vertical
Test Power :	DC 5V		

-20dB Bandwidth-a single frequency(kHz)	FL (kHz)	FH (kHz)
1.245	145.753	146.998





## 5. ANTENNA APPLICATION

### 5.1 Antenna Requirement

15.203 requirement: For intentional device, according to 15.203: 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.

### 5.2 Result

The EUT antenna is permanent attached antenna. It comply with the standard requirement

END REPORT