

# Test Report

**Product:** 3-in-1 wireless charger

**Trade Mark:** /

**Model Number:** 966-M1116Q

**FCC ID:** 2A9Q9-966-M1116Q

**Prepared for**

ShenZhen Zhongyi Technology CO., Ltd.

Room 401, No.4 Road One, Shangxue Science and Technology City, Xinxue  
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**Prepared by**

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**TEST RESULT CERTIFICATION**


**Applicant's Name**..... : ShenZhen Zhongyi Technology CO., Ltd.  
Room 401, No.4 Road One, Shangxue Science and Technology  
**Address** ..... : City, Xinxue Community, Bantian Street, Longgang District,  
Shenzhen, China  
**Manufacturer's Name** ..... : ShenZhen Zhongyi Technology CO., Ltd.  
Room 401, No.4 Road One, Shangxue Science and Technology  
**Address** ..... : City, Xinxue Community, Bantian Street, Longgang District,  
Shenzhen, China


**Product description**

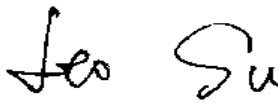
**Product name** ..... : 3-in-1 wireless charger  
**Model Number** ..... : 966-M1116Q  
**Standards**..... : FCC Part 15C  
**Test procedure**..... : ANSI C63.4: 2014

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

**Date of Test**..... :  
**Date (s) of performance of tests**..... : October 10, 2023~October 20, 2023  
**Test Result**..... : **Pass**

**Testing Engineer** :   
\_\_\_\_\_  
( Z o e S u )

**Technical Manager** :   
\_\_\_\_\_  
( G a r y L u )

**Authorized Signatory** :   
\_\_\_\_\_  
( L e o S u )

**Revision History**

<b>Revised No.</b>	<b>Date of Issue</b>	<b>Description</b>
01	October 20, 2023	Original

# 1 General Description

## 1.1 Description of EUT

Product name:	3-in-1 wireless charger
Model name:	966-M1116Q
Series Model:	/
Different of series model:	N/A
Operation frequency:	Wireless charging Output(Phone/Earphone):110kHz-205kHz, Wireless charging Output(Watch): 310kHz-340kHz
Operational mode:	Wireless charging
Modulation type:	ASK
Antenna type:	Coil Antenna
Hardware version:	V1.0
Software version:	V1.0
Power supply:	Type C Input: DC 5V/3A, 9V/3A, 12V/2.2A Wireless charging Output (Phone): 5W, 7.5W, 10W, 15W(MAX) Wireless charging Output (Earphone):5W Wireless charging Output (Watch):2.5W
Adapter information:	N/A

## 1.2 Test Mode

Pretest Test Mode	Description of Mode
TM1	Wireless charging 15W (Phone)
TM2	Wireless charging 3W (Earphone)
TM3	Wireless charging 2.5W (Watch)
TM4	Wireless charging 5W (Phone) + Wireless charging 5W (Earphone) + Wireless charging 2.5W (Watch)
TM5	Wireless charging 7.5W (Phone) + Wireless charging 5W (Earphone) + Wireless charging 2.5W (Watch)
TM6	Wireless charging 10W (Phone) + Wireless charging 5W (Earphone) + Wireless charging 2.5W (Watch)
TM7	Wireless charging 15W (Phone) + Wireless charging 5W (Earphone) + Wireless charging 2.5W (Watch)

Test Item	Final Test Mode
Conducted Emissions	TM7
Radiated Emissions	TM7
20dB bandwidth	TM7

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

### 1.3 Test Setup

See photographs of the test setup in the report for the actual setup and connections between EUT and support equipment.

### 1.4 Ancillary Equipment

Equipment	Model	S/N	Manufacturer
Adapter	TS-C137	/	PISEN
Dummy load	DL01	/	/
Earphone Charging case	I7MINI	/	YOUXUAN
Smart Watch	Series 3	/	Apple

Equipment	Length (cm)	Shielded/Unshielded	With/Without Ferrite
USB A to C Cable	100	Unshielded	Without Ferrite

## 2 Summary of Test Result

Test procedures according to the technical standards:

FCC Part 15C				
No.	Standard Section	Test Item	Result	Remark
1	FCC Part 15.203	Antenna Requirement	Pass	
2	FCC Part 15.207	Conducted Emission	Pass	
3	FCC Part 15.209	Radiated Emission	Pass	
4	FCC Part 15.215	20dB Bandwidth	Pass	

Note:  
1. "N/A" means the test case does not apply to the test object.

### 3 Test Facilities and Accreditations

#### 3.1 Test Laboratory

Test Site	Shenzhen HongBiao Certification& Testing Co., Ltd
Test Site Location	Room 102, 201, Building 2, Yuanwanggu RFID Industrial Park, Tongguan Road, Tianliao Community, Yutang Street, Guangming District, Shenzhen, China
Telephone:	(86-755) 2998 9321
Fax:	(86-755) 2998 5110
FCC Registration No.:	CN1341
A2LA Certificate No.:	6765.01

#### 3.2 Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15°C~35°C
Relative Humidity:	20%~75%
Air Pressure:	98kPa~101kPa

#### 3.3 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 %.

Measurement Frequency Range	U, (dB)	Note
RF frequency	$2 \times 10^{-5}$	
RF power, conducted	$\pm 0.57$ dB	
Conducted emission(150kHz~30MHz)	$\pm 2.5$ dB	
Radiated emission(30MHz~1GHz)	$\pm 4.2$ dB	
Radiated emission (above 1GHz)	$\pm 4.7$ dB	
Temperature	$\pm 1$ degree	
Humidity	$\pm 5$ %	

#### 3.4 Test Software

Software name	Manufacturer	Model	Version
EMI Measurement	Farad	EZ-EMC	V1.1.4.2
Conducted test system	MWRF-test	MTS 8310	V2.0.0



## 4 List of Test Equipment

Radiation emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E001	Horn Antenna	Schwarzbeck	BBHA 9120D	02592	2022-04-02	2024-04-01
2	HB-E002	Biconical log-periodic composite antenna	Schwarzbeck	VULB 9168	01340	2022-04-06	2024-04-05
3	HB-E003	SHF-EHF Horn	Schwarzbeck	BBHA 91270	01193	2022-04-02	2024-04-01
4	HB-E004	Preamplifier	Noyetec	LAN-0910	NYCM1420101	2023-05-11	2024-05-10
5	HB-E005	Preamplifier	Noyetec	LAN-0118	NYCM1420102	2023-05-12	2024-05-11
6	HB-E006	Preamplifier	Noyetec	LAN-1840	NYCM1420103	2023-06-11	2024-06-10
7	HB-E007	EMI TEST RECEIVER	R&S	ESR7	102520	2023-05-12	2024-05-11
8	HB-E009	POSITINAL COTROLLE R	Noyetec	N/A	N/A	/	/
9	HB-E013	RF switch	Noyetec	NY-RF4	NY0CM1420204	/	/
10	HB-E066	Illuminance Tester	TASI	TA8121	N/A	2023-05-11	2024-05-10
11	HB-E075	Active loop antenna	Schwarzbeck	FMZB 1519B	1519B-245	2022-07-24	2024-07-23
Conduction emission							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E014	4 Path V-LISN	Schwarzbeck	NNLK 8121	00770	2023-05-12	2024-05-11
2	HB-E015	Pulse Limiter	Schwarzbeck	VTSD 9561-F	00949	2023-05-12	2024-05-11
3	HB-E016	ZN23201	Noyetec	ZN23201	N/A	2023-05-11	2024-05-10
4	HB-E059	Attenuator	Xianghua	TS2-6-1	220215166	2023-05-12	2024-05-11
5	HB-E069	EMI TEST RECEIVER	R&S	ESCI	N/A	2023-05-12	2024-05-11
RF							
Item	Equipment No.	Equipment name	Manufacturer	Model	Serial No.	Calibration date	Due date
1	HB-E041	MXG Anaioq Signal Generator	Agilent	N5181A	MY47070421	2023-05-11	2024-05-10
2	HB-E042	WIDEBAND RADIO COMMUNICA	R&S	CMW500	132108	2023-05-11	2024-05-10

		TION TESTER					
3	HB-E043	MXG Anaioq Signal Generator	Agilent	N5182A	US46240335	2023-05-11	2024-05-10
4	HB-E044	Signal& spectrum Analyzer	R&S	FSV3044	101264	2023-05-11	2024-05-10
5	HB-E045	RF Control Box	Noyetec	NY100-R FCB	N/A	/	/
6	HB-E058	Thermometer Clock Humidity Monitor	N/A	HTC-1	N/A	/	/
7	HB-E077	PXA Signal Analyzer	Agilent	N9030A	N/A	2023-05-11	2024-05-10

Note: the calibration interval of the above test instruments is 12&24 months and the calibrations are traceable to international system unit (SI).

## **5 Test Item And Results**

### **5.1 Antenna Requirement**

#### **5.1.1 Standard 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

#### **5.1.2 Test Result**

The EUT antenna is Coil Antenna. It comply with the standard requirement. In case of replacement of broken antenna the same antenna type must be used.

## 5.2 Conducted Emission

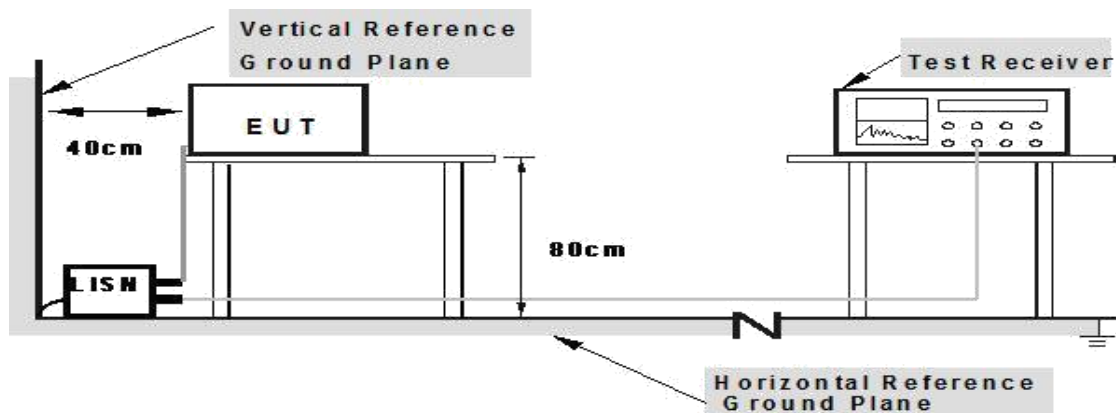
### 5.2.1 Limits

Limits – Class A		
Frequency (MHz)	Limit (dB $\mu$ V)	
	Quasi-Peak	Average
0.15 to 0.5	79	66
0.5 to 30	73	60
Limits – Class B		
Frequency (MHz)	Limit (dB $\mu$ V)	
	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 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.		

### 5.2.2 Test Procedures

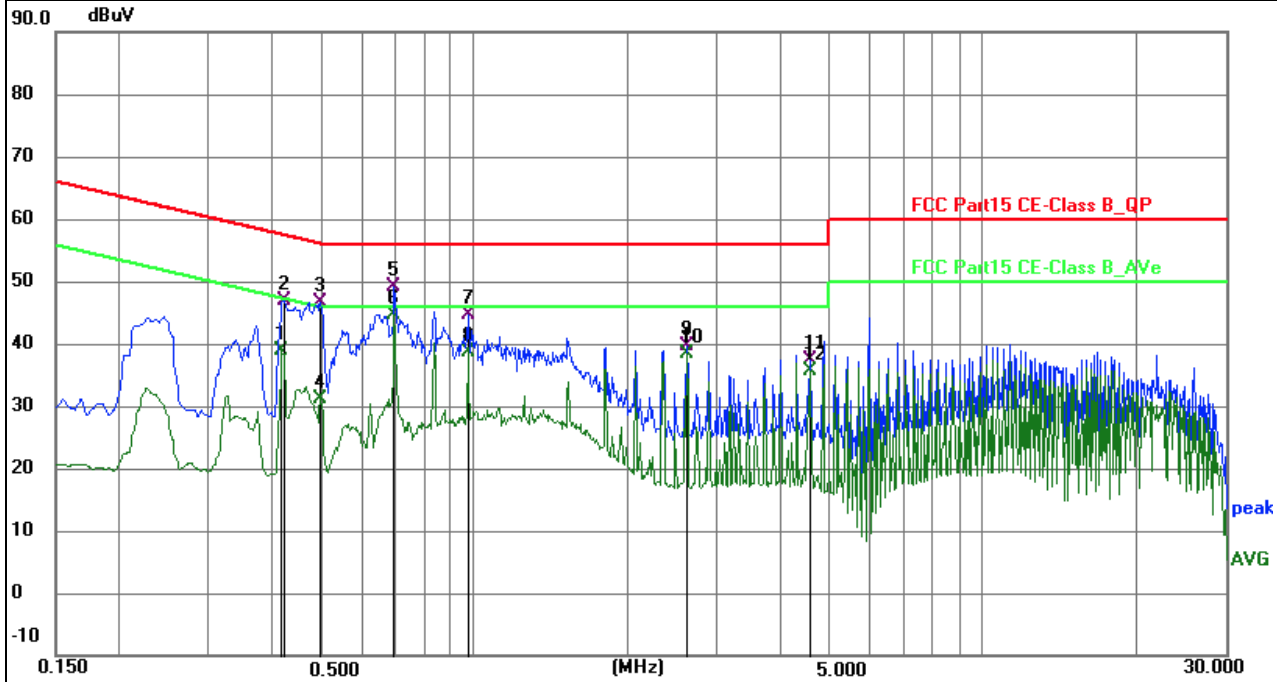
- a) The EUT was placed 0.8 meters from the horizontal ground plane with EUT being connected to the power mains through a line impedance stabilization network (LISN). All other support equipment powered from additional LISN(s). The LISN provide 50 Ohm/ 50uH of coupling impedance for the measuring instrument.
- b) 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.
- c) 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.
- d) LISN is at least 80 cm from nearest part of EUT chassis.
- e) For the actual test configuration, please refer to the related Item – photographs of the test setup.

### 5.2.3 Test setup



### 5.2.4 Test Result

EUT:	3-in-1 wireless charger	Model Name:	966-M1116Q
Test Mode:	TM7	Phase :	L
Test Voltage:	AC 120V/60Hz		

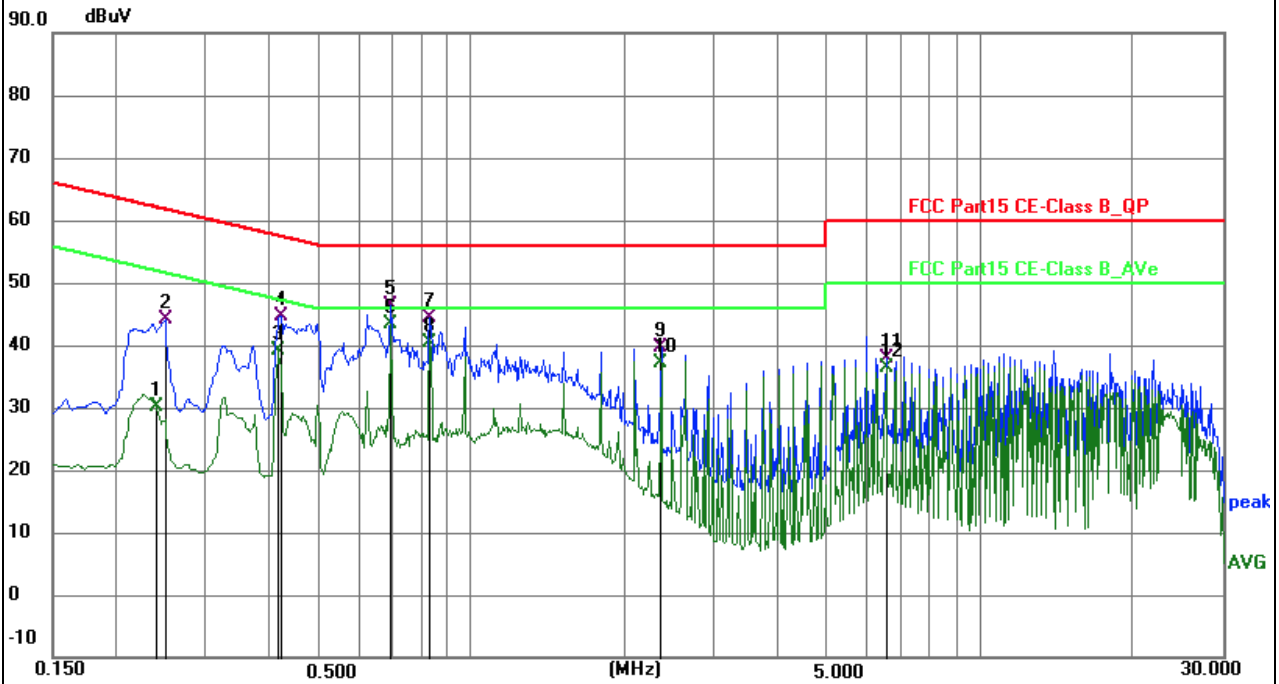


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.4155	28.90	9.94	38.84	47.54	-8.70	AVG	P	
2	0.4200	36.98	9.94	46.92	57.45	-10.53	QP	P	
3	0.4965	36.82	9.93	46.75	56.06	-9.31	QP	P	
4	0.4965	21.08	9.93	31.01	46.06	-15.05	AVG	P	
5	0.6945	39.36	9.84	49.20	56.00	-6.80	QP	P	
6 *	0.6945	34.74	9.84	44.58	46.00	-1.42	AVG	P	
7	0.9735	34.73	9.89	44.62	56.00	-11.38	QP	P	
8	0.9735	28.83	9.89	38.72	46.00	-7.28	AVG	P	
9	2.6204	29.58	10.08	39.66	56.00	-16.34	QP	P	
10	2.6204	28.31	10.08	38.39	46.00	-7.61	AVG	P	
11	4.5780	27.29	10.19	37.48	56.00	-18.52	QP	P	
12	4.5780	25.36	10.19	35.55	46.00	-10.45	AVG	P	

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. Measurement Level = Reading level + Correct Factor
4. All test modes were pre-tested, but we only recorded the worst case in this report.

EUT:	3-in-1 wireless charger	Model Name:	966-M1116Q
Test Mode:	TM7	Phase :	N
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB)	Level (dBuV)	Limit (dBuV)	Margin (dB)	Detector	P/F	Remark
1	0.2400	20.39	9.66	30.05	52.10	-22.05	AVG	P	
2	0.2490	34.38	9.68	44.06	61.79	-17.73	QP	P	
3	0.4155	29.11	9.94	39.05	47.54	-8.49	AVG	P	
4	0.4200	34.66	9.94	44.60	57.45	-12.85	QP	P	
5	0.6945	36.77	9.62	46.39	56.00	-9.61	QP	P	
6 *	0.6945	33.73	9.62	43.35	46.00	-2.65	AVG	P	
7	0.8295	34.68	9.63	44.31	56.00	-11.69	QP	P	
8	0.8295	30.65	9.63	40.28	46.00	-5.72	AVG	P	
9	2.3594	29.57	10.06	39.63	56.00	-16.37	QP	P	
10	2.3594	27.07	10.06	37.13	46.00	-8.87	AVG	P	
11	6.5265	27.60	10.24	37.84	60.00	-22.16	QP	P	
12	6.5265	26.10	10.24	36.34	50.00	-13.66	AVG	P	

**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.Measurement Level = Reading level + Correct Factor
- 4.All test modes were pre-tested, but we only recorded the worst case in this report.

## 5.3 Radiated Emission

### 5.3.1 Limits

Frequencies (MHz)	Field Strength (micovolts/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

Receiver Parameter	Setting
Attenuation	Auto
Start ~ Stop Frequency	9kHz~150kHz / RB 200Hz for QP
Start ~ Stop Frequency	150kHz~30MHz / RB 9kHz for QP
Start ~ Stop Frequency	30MHz~1000MHz / RB 120kHz for QP

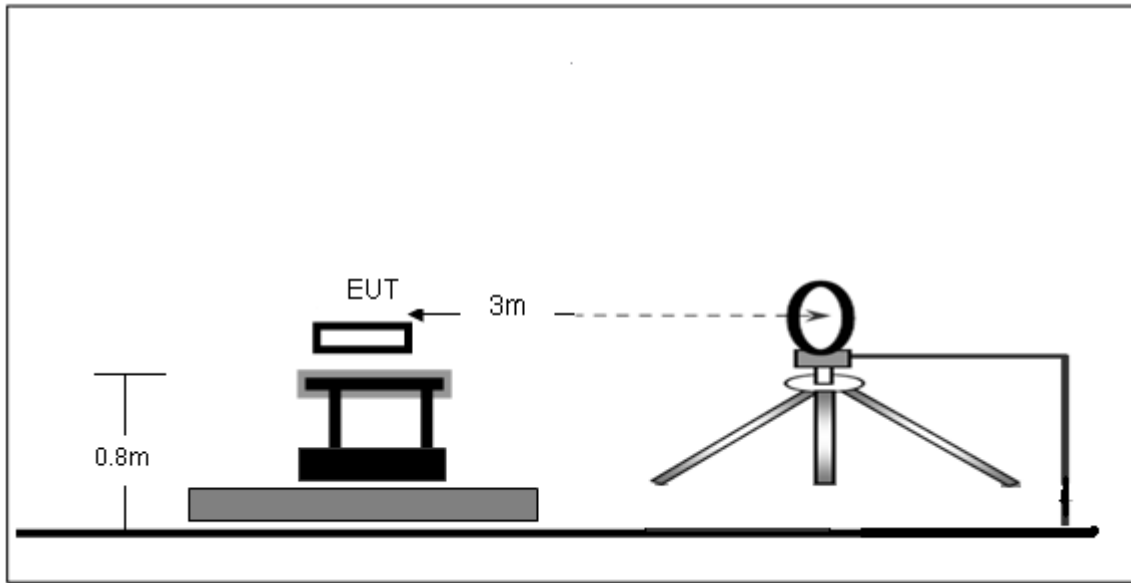
### 5.3.2 Test Procedures

- a) The radiated emission tests were performed in the 3 meters.
- b) The EUT was placed on the top of a rotating table 0.8 meters above the ground. The table was rotated 360 degrees to determine the position of the highest radiation.
- c) The height of the test antenna shall vary between 1m to 4m. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d) If the peak mode measured value compliance with and lower than quasi peak mode limit, the EUT shall be deemed to meet QP limits and then no additional QP mode measurement performed.
- e) If the peak mode measured value compliance with and lower than average mode limit, the EUT shall be deemed to meet average limits and then no additional average mode measurement performed.
- f) For the actual test configuration, please refer to the related item – EUT test photos.

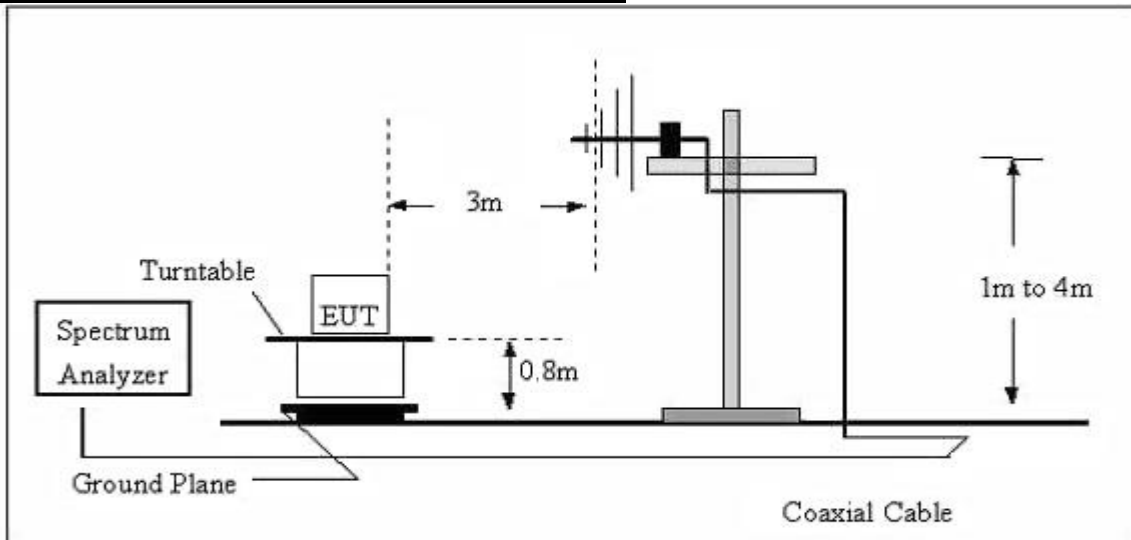
### 5.3.3 Test Setup



Radiated Emission Test-Up Frequency Below 30MHz



Radiated Emission Test-Up Frequency 30MHz~1GHz



**5.3.4 Test Result**

Frequency range (9kHz – 30MHz)

EUT:	3-in-1 wireless charger	Model Name:	966-M1116Q
Test Mode:	TM7	Phase :	Coplaner
Test Voltage:	AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
0.0432	49.08	114.89	-65.81	Pass
0.1259	62.90	105.60	-42.70	Pass
0.1461	79.62	104.31	-24.69	Pass
0.3285	63.08	97.27	-34.19	Pass
0.4374	66.90	94.79	-27.89	Pass
0.7235	58.93	70.42	-11.49	Pass

EUT:	3-in-1 wireless charger	Model Name:	966-M1116Q
Test Mode:	TM7	Phase :	coaxial
Test Voltage:	AC 120V/60Hz		

Freq. (MHz)	Reading (dBuV/m)	Limit (dBuV/m)	Margin (dB)	State P/F
0.0460	47.84	114.35	-66.51	Pass
0.1259	57.58	105.60	-48.02	Pass
0.1461	72.99	104.31	-31.32	Pass
0.3267	57.09	97.32	-40.23	Pass
0.4350	60.65	94.83	-34.18	Pass
0.7235	54.79	70.42	-15.63	Pass

Note:

Pre-scan in the all of mode, the worst case in of was recorded.

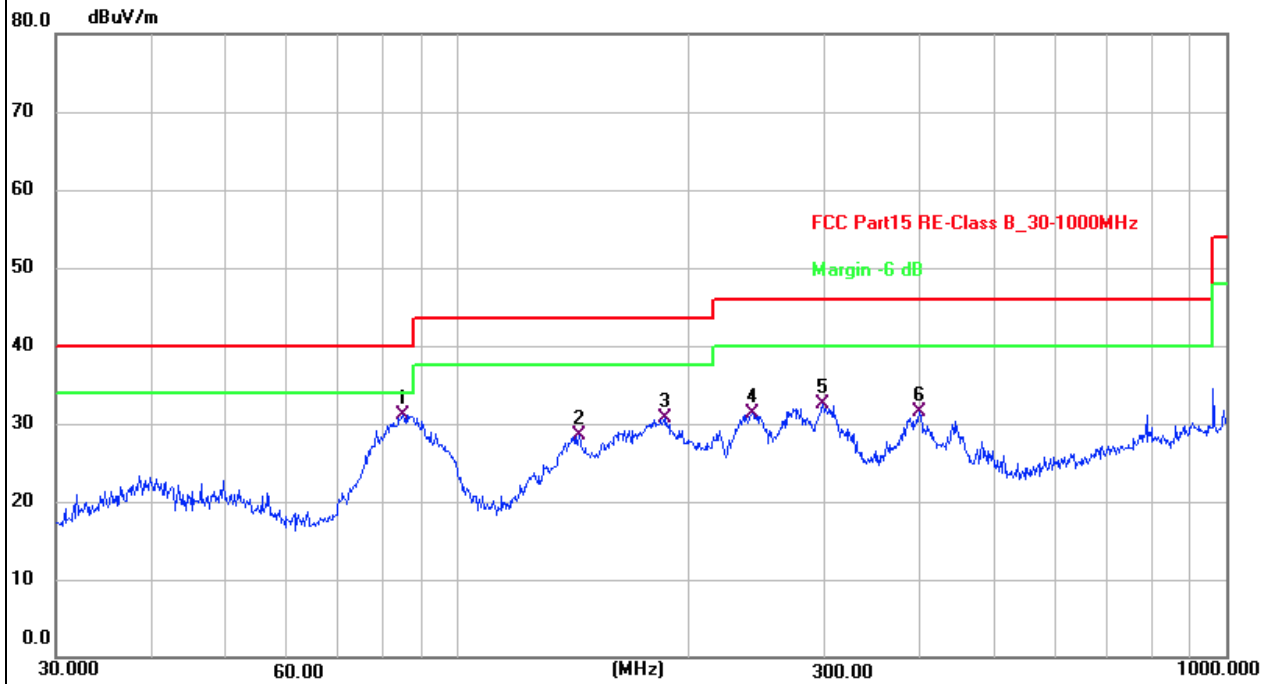
Limit dBuV/m @3m = Limit dBuV/m @300m+ 80

Limit dBuV/m @3m = Limit dBuV/m @30m + 40

Margin = Reading - Limit.

Frequency range (30MHz – 1GHz)

EUT:	3-in-1 wireless charger	Model Name:	966-M1116Q
Test Mode:	TM7	Phase :	Horizontal
Test Voltage:	AC 120V/60Hz		

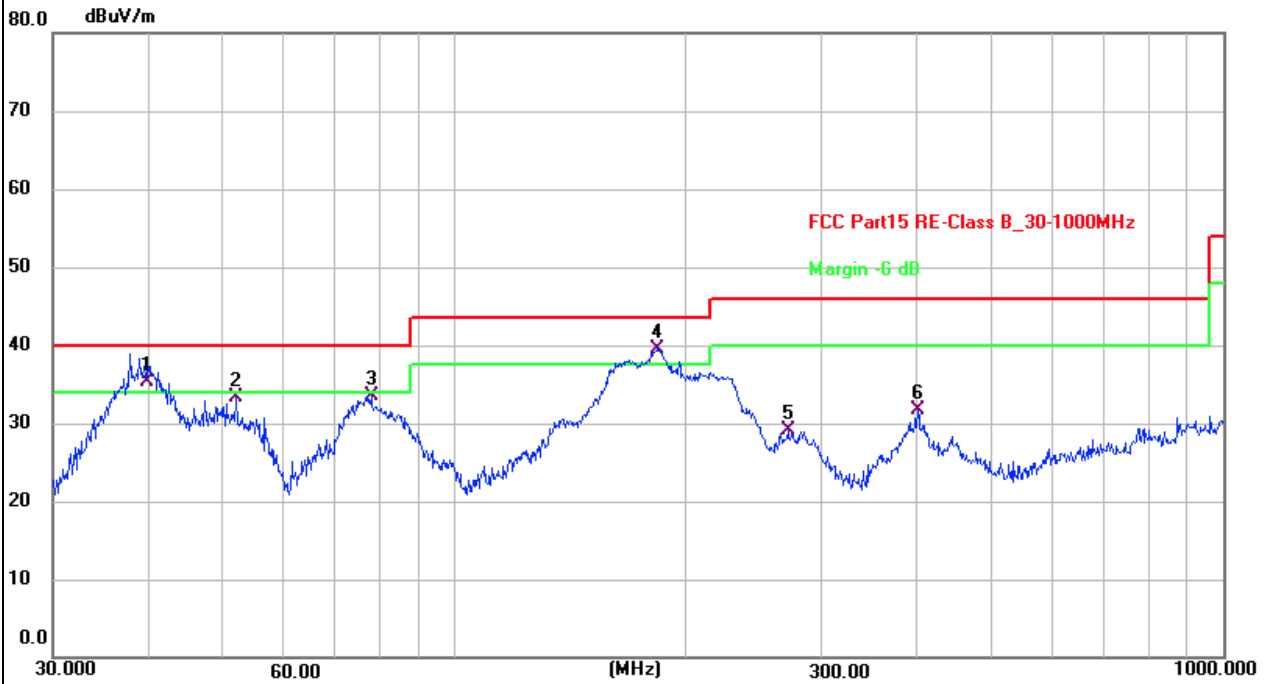


No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 *	84.9995	44.63	-13.43	31.20	40.00	-8.80	QP	200	11	P	
2	143.8295	37.67	-9.12	28.55	43.50	-14.95	QP	200	359	P	
3	186.4409	42.33	-11.72	30.61	43.50	-12.89	QP	200	82	P	
4	241.6763	41.21	-9.94	31.27	46.00	-14.73	QP	100	348	P	
5	298.2681	40.80	-8.37	32.43	46.00	-13.57	QP	100	348	P	
6	399.0302	37.44	-5.90	31.54	46.00	-14.46	QP	100	318	P	

Remarks:

1. Measurement Level = Reading level + Correct Factor, Margin = Measurement Level – Limit.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. All test modes were pre-tested, but we only recorded the worst case in this report.

EUT:	3-in-1 wireless charger	Model Name:	966-M1116Q
Test Mode:	TM7	Phase :	Vertical
Test Voltage:	AC 120V/60Hz		



No.	Frequency (MHz)	Reading (dBuV)	Factor (dB/m)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Detector	Height (cm)	Azimuth (deg.)	P/F	Remark
1 !	39.7971	43.43	-8.12	35.31	40.00	-4.69	QP	100	1	P	
2	52.0251	42.31	-8.97	33.34	40.00	-6.66	QP	100	0	P	
3	77.8654	46.42	-12.88	33.54	40.00	-6.46	QP	100	268	P	
4 *	183.2005	50.66	-11.23	39.43	43.50	-4.07	QP	100	156	P	
5	271.3246	38.29	-9.18	29.11	46.00	-16.89	QP	100	156	P	
6	400.4319	37.61	-5.86	31.75	46.00	-14.25	QP	200	11	P	

Remarks:

1. Measurement Level = Reading level + Correct Factor, Margin = Measurement Level – Limit.
2. The emission levels of other frequencies are very lower than the limit and not show in test report.
3. All test modes were pre-tested, but we only recorded the worst case in this report.

## 5.4 Occupied Bandwidth

### 5.4.1 Test method

Use the following spectrum analyzer settings:

Span = approximately 2 to 3 times the 20 dB bandwidth, centered on a hopping channel

RBW  $\geq$ 1% of the 20 dB bandwidth

VBW  $\geq$ RBW

Sweep = auto

Detector function = peak

Trace = max hold

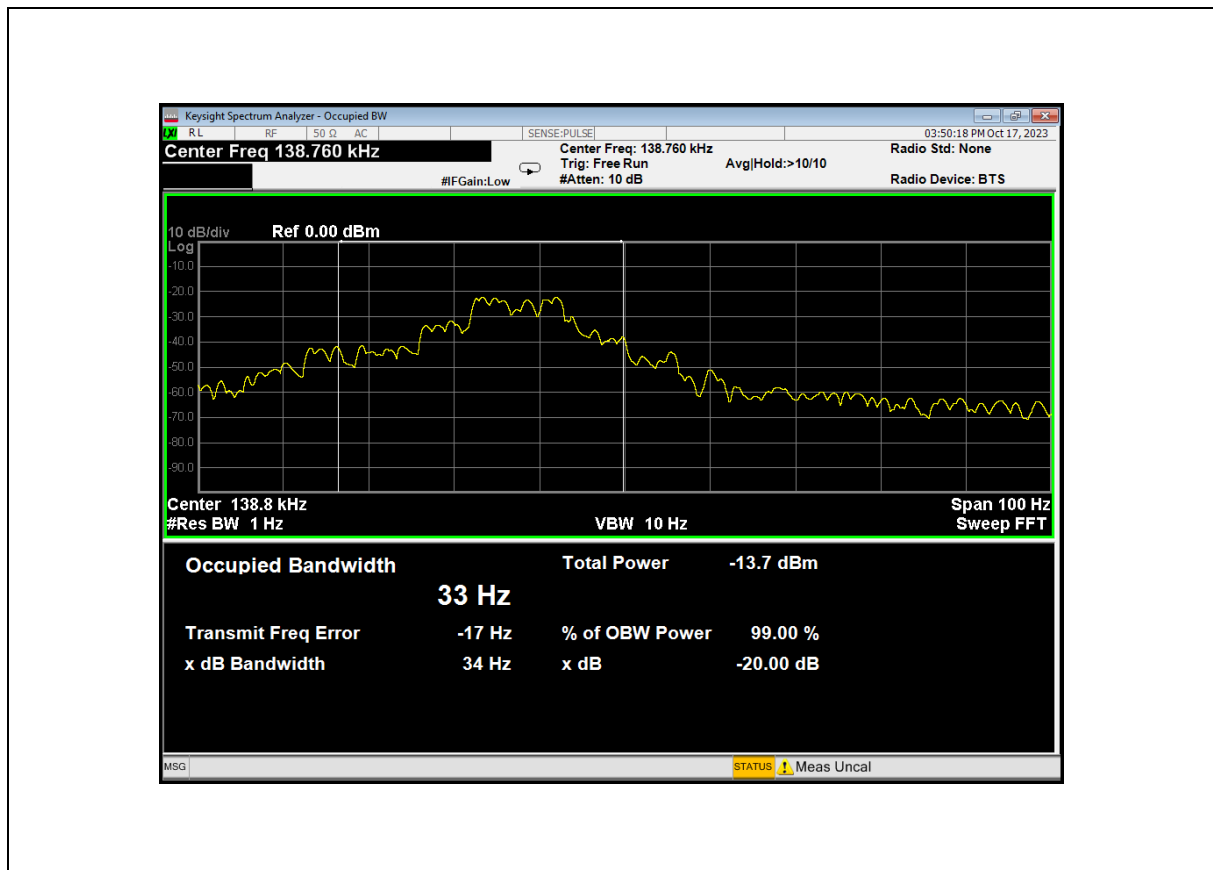
The EUT should be transmitting at its maximum data rate. Allow the trace to stabilize. Use the marker-to-peak function to set the marker to the peak of the emission. Use the marker-delta function to measure 20 dB down one side of the emission. Reset the marker-delta function, and move the marker to the other side of the emission, until it is (as close as possible to) even with the reference marker level. The marker-delta reading at this point is the 20 dB bandwidth and 99% occupied bandwidth of the emission.

### 5.4.2 Test result

Phone

Frequency (kHz)	20dB emission bandwidth (Hz)	99% occupied bandwidth (Hz)
138.8	34	33

Test plots as below:



Earphone

Frequency (kHz)	20dB emission bandwidth (Hz)	99% occupied bandwidth (Hz)
115.4	55	53

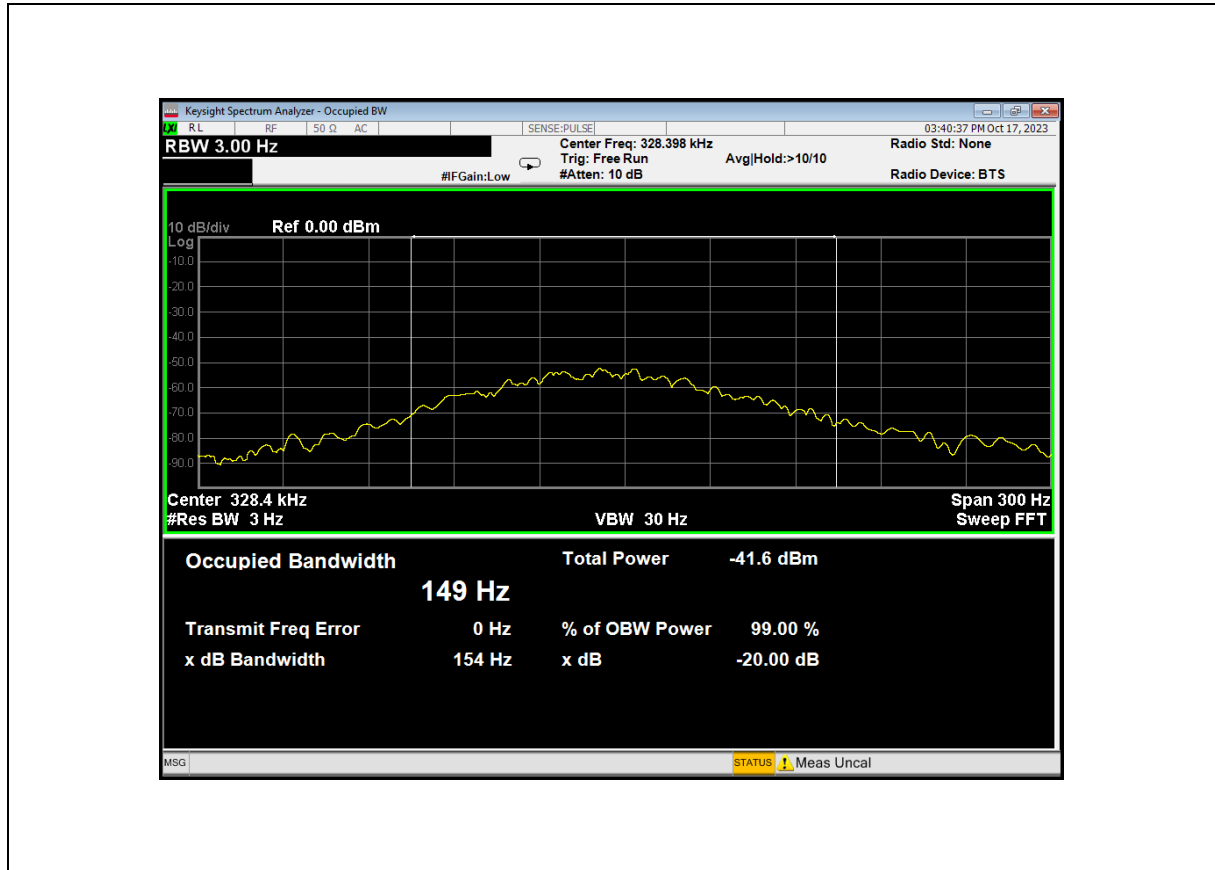
Test plots as below:



Watch

Frequency (kHz)	20dB emission bandwidth (Hz)	99% occupied bandwidth (Hz)
328.4	154	149

Test plots as below:



## **6 Photographs of the Test Setup**

Reference to the appendix Test Setup Photos for details.



## 7 Photographs of the EUT

Reference to the appendix External Photos and Internal Photos for details.

**\*\*\*\*\* END OF REPORT \*\*\*\*\***