

Prüfbericht-Nr.: Test report no.:	CN22YTAP 001	Auftrags-Nr.: Order no.:	168377337	Seite 1 von 23 Page 1 of 23
Kunden-Referenz-Nr.: Client reference no.:	N/A	Auftragsdatum: Order date:	2022-06-15	
Auftraggeber: Client:	Dongguan Aohai Technology Co.,Ltd. Block A & 3-5F of Block B, Zhenlong East Road No.6, Jiaoyitang, Tangxia Town, Dongguan, Guangdong, China			
Prüfgegenstand: Test item:	Magnetic Wireless Portable Charger			
Bezeichnung / Typ-Nr.: Identification / Type no.:	BE-MQ25KW23, NS-MQ25Kxxxxxxxx, BE-MQ25Kxxxxxxxx ("x"=0-9, A-Z, a-z, - or blank, for market purpose only)			
Auftrags-Inhalt: Order content:	Type test			
Prüfgrundlage: Test specification:	CFR47 FCC Part 15: Subpart C Section 15.207 CFR47 FCC Part 15: Subpart C Section 15.209 CFR47 FCC Part 15: Subpart C Section 15.215			
Wareneingangsdatum: Date of sample receipt:	2022-06-23	Refer to photos document		
Prüfmuster-Nr.: Test sample no.:	A003285801-004~005			
Prüfzeitraum: Testing period:	2022-07-06 – 2022-07-12			
Ort der Prüfung: Place of testing:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüflaboratorium: Testing laboratory:	TÜV Rheinland (Shenzhen) Co., Ltd.			
Prüfergebnis*: Test result*:	Pass			
geprüft von: tested by:			genehmigt von: authorized by:	
Datum: Date: 2022-07-22	Signed by: Alex Lan		Ausstellungsdatum: Issue date: 2022-07-25	Signed by: Lin Lin
Stellung / Position	Assistant Project Manager	Stellung / Position	Reviewer	
Sonstiges / Other:	FCC ID: 2AP4X-MQ25KW23			
Zustand des Prüfgegenstandes bei Anlieferung: Condition of the test item at delivery:	Prüfmuster vollständig und unbeschädigt Test item complete and undamaged:			
* Legende: 1 = sehr gut 2 = gut 3 = befriedigend 4 = ausreichend 5 = mangelhaft P(ass) = entspricht o.g. Prüfgrundlage(n) F(ail) = entspricht nicht o.g. Prüfgrundlage(n) N/A = nicht anwendbar N/T = nicht getestet Legend: 1 = very good 2 = good 3 = satisfactory 4 = sufficient 5 = poor P(ass) = passed a.m. test specifications(s) F(ail) = failed a.m. test specifications(s) N/A = not applicable N/T = not tested				
Dieser Prüfbericht bezieht sich nur auf das o.g. Prüfmuster und darf ohne Genehmigung der Prüfstelle nicht auszugsweise vervielfältigt werden. Dieser Bericht berechtigt nicht zur Verwendung eines Prüfzeichens. This test report only relates to the a. m. test sample. Without permission of the test center this test report is not permitted to be duplicated in extracts. This test report does not entitle to carry any test mark.				

V05

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Test Summary

5.1.1 ANTENNA REQUIREMENT

RESULT: Pass

5.1.2 99% BANDWIDTH

RESULT: Pass

5.1.3 20dB BANDWIDTH

RESULT: Pass

5.1.4 RADIATED SPURIOUS EMISSION

RESULT: Pass

5.1.5 CONDUCTED EMISSION ON AC MAINS

RESULT: Pass

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1 General Remarks

1.1 Complementary Materials

All attachments are integral parts of this test report. This applies especially to the following appendix:

Appendix A: Photographs of the Test Set-up

2 Test Sites

2.1 Test Facilities

TÜV Rheinland (Shenzhen) Co., Ltd.

No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China

FCC Registration No.: CN1260

IC Registration No.: 25069 and the CAB identifier is CN0078.

2.2 List of Test and Measurement Instruments

Table 1: List of Test and Measurement Equipment

Radio Spectrum Testing				
Description	Manufacturer	Model	Serial No.	Cal. Until
EXA Signal Analyzer, Multi-touch	Keysight	N9010B	MY60241175	2022-09-28
Power Control Unit	Tonscend	JS0806-4ADC	N/A	2022-09-28
Automation Control Unit	Tonscend	JS0806-2	21C8060396	2022-09-28
Test Software	Tonscend	JS1120-3	N/A	N/A
Control PC	Lenovo	TianYi510S-071MB	YLX23JMF	N/A
Unwanted Emission Testing				
Description	Manufacturer	Model	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR 7	102021	2022-08-10
Signal Analyzer	R&S	FSV 40	101439	2022-08-09
System Controller Interface	R&S	SCI-100	S10010038	N/A
Filterbank	R&S	Wlan	100759	2022-08-09
OSP	R&S	OSP 120	102040	N/A
Pre-amplifier	R&S	SCU08F1	08320031	2022-08-09
Amplifier	R&S	SCU-18F	180070	2022-08-09
Amplifier	R&S	SCU40A	100475	2022-08-09
Trilog Broadband Antenna (30 MHz - 7 GHz)	Schwarzbeck	VULB 9162	193	2022-08-08
Double-Ridged Antenna (1 -18 GHz)	ETS-LINDGREN	3117	00218717	2022-08-08
Wideband Ridged Horn Antenna (18-40 GHz)	Steatite	QMS-00880	19067	2022-08-08
Active Loop Antenna	Schwarzbeck	FMZB 1513	302	2022-09-13
Test software	R&S	EMC32 (V10.60.10)	N/A	N/A
Control PC	Dell	OptiPlex 7050	36NV9P2	N/A
3m Semi-Anechoic Chamber	Albatross	SAC-3m	APC17151-SAC	2024-06-22

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Conducted Emission				
Description	Manufacturer	Model	Serial No.	Cal. Until
EMI Test Receiver	R&S	ESR3	102680	2023-02-27
Artificial Mains Network	R&S	ENV216	101445	2023-02-27
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A

2.3 Traceability

All measurement equipment calibrations are traceable to NIM (National Institute of Metrology) or where calibration is performed in other countries, to equivalent nationally recognized standards organizations.

2.4 Calibration

Equipment requiring calibration is calibrated periodically by the manufacturer or according to manufacturer's specifications. Additionally all equipment is verified for proper performance on a regular basis using in house standards or comparisons.

2.5 Measurement Uncertainty

The estimated combined standard uncertainty for radiated emissions and conducted emissions measurements as below table

Parameter	Uncertainty
Radiated Emission, valid up to 26.5 GHz	±6 dB
Conducted Emission, (9kHz to 150kHz)/(150kHz to 30MHz)	±3.70 dB / ±3.30 dB

2.6 Location of Original Data

The original copies of all test data taken during actual testing were attached at Appendix A of this report and delivered to the applicant. A copy has been retained in the TÜV Rheinland (Shenzhen) Co., Ltd. file for certification follow-up purposes.

2.7 Status of Facility Used for Testing

The TÜV Rheinland (Shenzhen) Co., Ltd. Test facility located at No. 362 Huangguan Road Middle, Longhua District, Shenzhen 518110, China is listed on the US Federal Communications Commission list of facilities approved to perform measurements.

3 General Product Information

3.1 Product Function and Intended Use

The EUTs are a **Magnetic Wireless Portable Charger** which supports wireless charging function.

All models are identical except the model number or color for different market purpose.

For details refer to the User Manual, Technical Description and Circuit Diagram.

3.2 Ratings and System Details

Table 2: Technical Specification of EUT

General Information of EUT	Value
Kind of Equipment	Magnetic Wireless Portable Charger
Type Designation	BE-MQ25KW23, NS-MQ25Kxxxxxxx, BE-MQ25Kxxxxxxx ("x"=0-9, A-Z, a-z, - or blank, for market purpose only)
FCC ID	2AP4X-MQ25KW23
Operating Voltage	DC 5V, 3A via Type C port DC 3.7V via internal battery
Testing Voltage	AC 120V, 60Hz via AC/DC Adapter or Fully charged battery
Technical Specification of WPT	
Operating Frequency	111-205KHz
Modulation	FSK
Antenna Type	Induction Coil Antenna
Antenna Gain	0 dBi
Antenna number	1
Wireless Charger output power	7.5W

3.3 Independent Operation Modes

The basic operation modes are:

- A. On, Wireless discharging (WPT)
- B. On, Charging by AC/DC Adapter + Wireless discharging (WPT)
- C. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- | | |
|----------------------------------|-------------------------|
| - FCC/IC Label and Location Info | - Instruction Manual |
| - Application Form | - Operation Description |

4 Test Set-up and Operation Modes

4.1 Principle of Configuration Selection

Emission: The equipment under test (EUT) was configured to measure its highest possible radiation level. The test modes were adapted accordingly in reference to the instructions for use.

Radio Spectrum: The equipment under test (EUT) was configured at its highest power output in order to measure its highest possible radiation and conducted level. The test modes were adapted accordingly in reference to the instructions for use.

4.2 Test Operation and Test Software

Test operation refers to test setup in chapter 5&6. All testing were performed according to the procedures in ANSI C63.10: 2013.

According to clause 3.1, all test were applied on model **BE-MQ25KW23**.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Dummy Load	YBZ	N/A	N/A	N/A
Adapter	Xiaomi	MDY-12-EY	N/A	Output: DC 5V, 3A

4.4 Countermeasures to Achieve EMC Compliance

The test sample which has been tested contained the noise suppression parts as described in the Technical Construction File (TCF).

No additional measures were employed to achieve compliance.

4.5 Test Setup Diagram

Diagram of Measurement Configuration for Radiation Test (Below 30MHz)

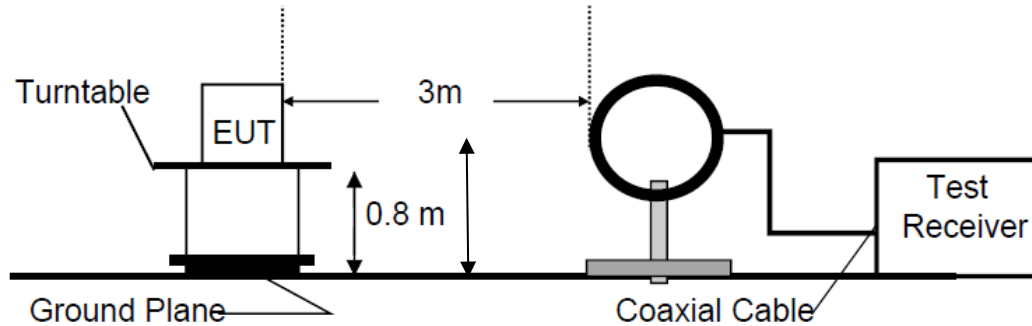


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

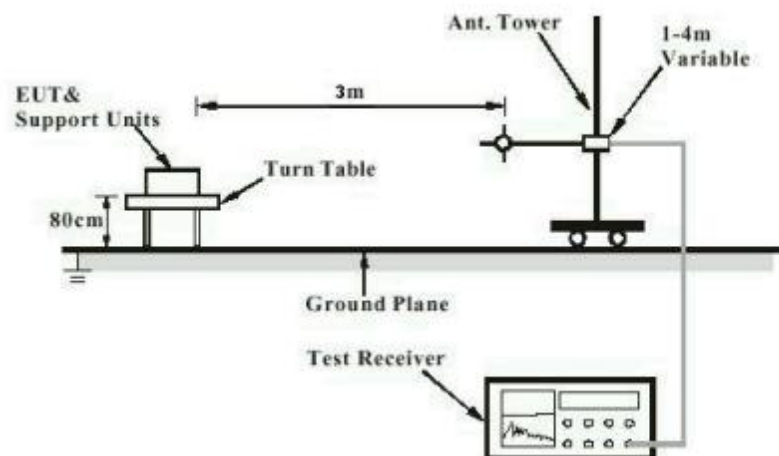
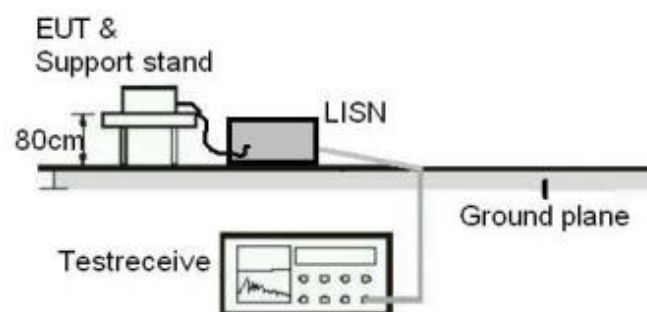


Diagram of Measurement Configuration for Mains Conduction Measurement



5 Test Results

5.1 Transmitter Requirement & Test Suites

5.1.1 Antenna Requirement

RESULT:

Pass

Test Specification

Test standard : Part 15.203

According to the manufacturer declared, the EUT has one internal antenna, and the antenna is permanent attachment and no consideration of replacement. Therefore the EUT is considered sufficient to comply with the provision.

Refer to EUT Photo for further details.

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5.1.2 99% Bandwidth

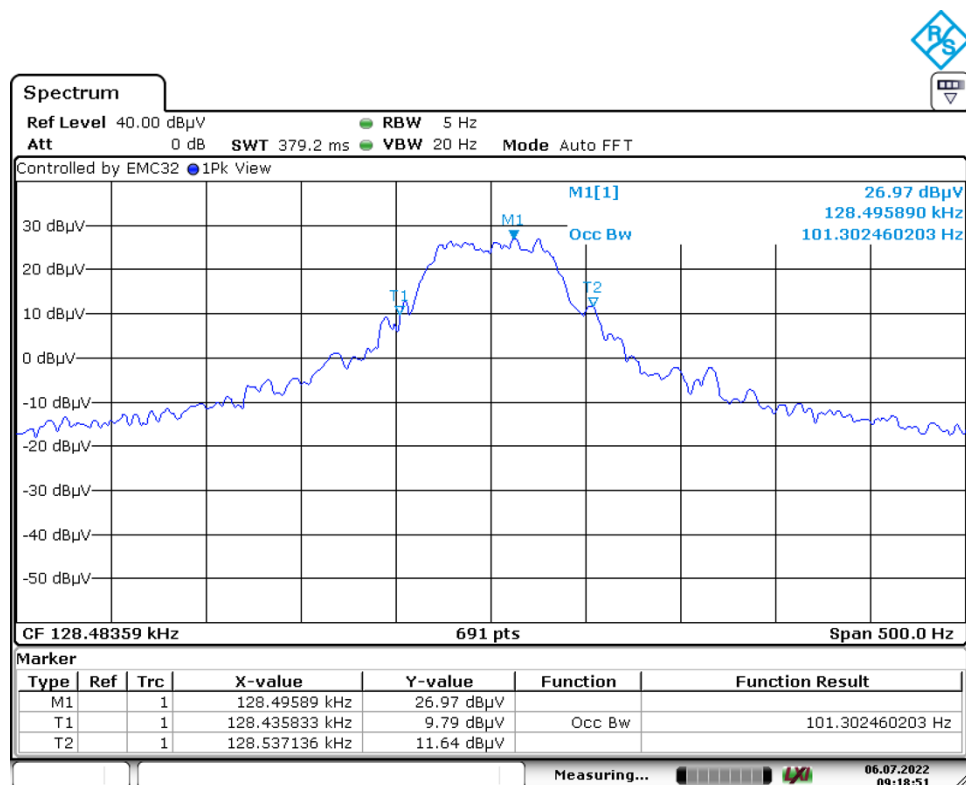
RESULT:
Pass
Test Specification

Basic standard : ANSI C63.10: 2013
Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-07-06
Input voltage : Fully charged battery
Operation mode : A
Ambient temperature : 24.1 °C
Relative humidity : 52 %
Atmospheric pressure : 101 kPa

For the measurement records, refer to the following test plots.



Date: 6.JUL.2022 09:18:51

5.1.3 20dB Bandwidth

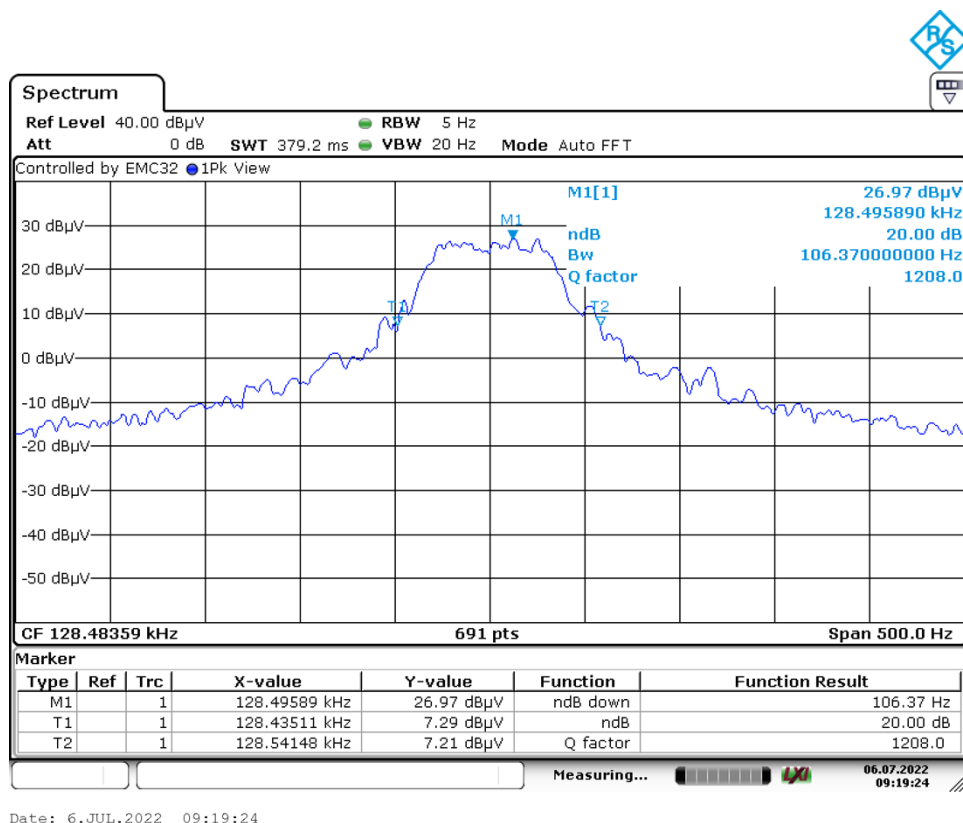
RESULT:
Pass
Test Specification

Test standard : FCC Part 15.215(c)
 Basic standard : ANSI C63.10: 2013
 Kind of test site : Shielded Room

Test Setup

Date of testing : 2022-07-06
 Input voltage : Fully charged battery
 Operation mode : A
 Ambient temperature : 24.1 °C
 Relative humidity : 52 %
 Atmospheric pressure : 101 kPa

For the measurement records, refer to the following test plots.



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5.1.4 Radiated Spurious Emission

RESULT:

Pass

Test Specification

Test standard : FCC Part 15.209 & 15.205
Basic standard : ANSI C63.10: 2013
Limits : Refer to 15.209(a)
Kind of test site : 3m Semi-anechoic Chamber

Test Setup

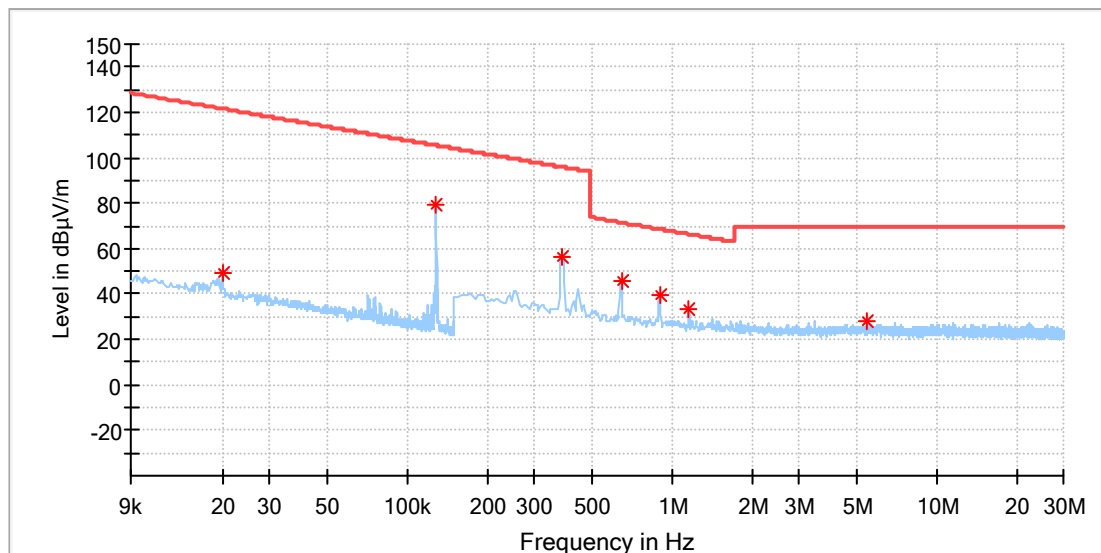
Date of testing : 2022-07-06
Input voltage : Fully charged battery
Operation mode : A
Ambient temperature : 23 °C
Relative humidity : 56 %
Atmospheric pressure : 101 kPa

Refer to following test plots for details of test result.

Note: This products are portable device, so radiated spurious emissions were performed on the EUT rotated in each of three orthogonal axis positions, only the worst case (EUT in horizontal X orthogonal orientation) recorded.

EUT Information

EUT Name: Magnetic Wireless Portable Charger
Model: BE-MQ25KW23
Test Mode: Wireless discharging (WPT)
Order No/Sample No: 168377337/A003285801-005
Test Voltage: Battery
Remark: Temp 23 Humi:56%
Test Standard: FCC Part 15C
Tested By: Kei Zhang
Reviewed By: Terry Yin



Critical Freqs

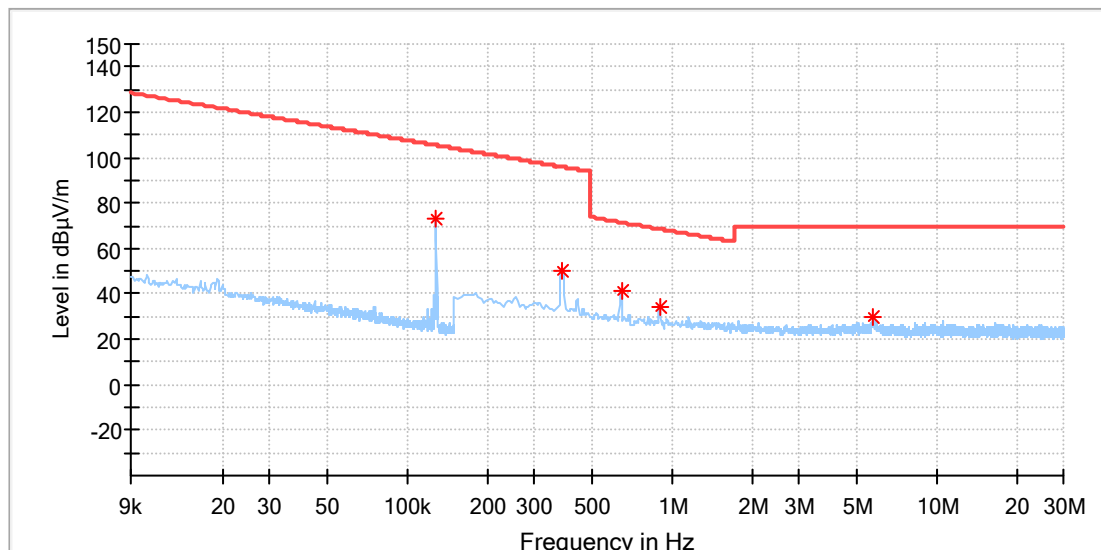
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.019978	48.90	121.58	72.68	100.0	X	271.0	20.1
0.128447	78.88	105.42	26.55	100.0	X	123.0	20.1
0.382655	56.43	95.95	39.52	100.0	X	122.0	20.1
0.641647	45.96	71.47	25.50	100.0	X	96.0	20.1
0.896250	39.39	68.57	29.18	100.0	X	127.0	20.1
1.155243	33.07	66.37	33.31	100.0	X	76.0	20.1
5.408868	28.13	69.50	41.37	100.0	X	164.0	20.3

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EUT Information

EUT Name: Magnetic Wireless Portable Charger
 Model: BE-MQ25KW23
 Test Mode: Wireless discharging (WPT)
 Order No/Sample No: 168377337/A003285801-005
 Test Voltage: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC Part 15C
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

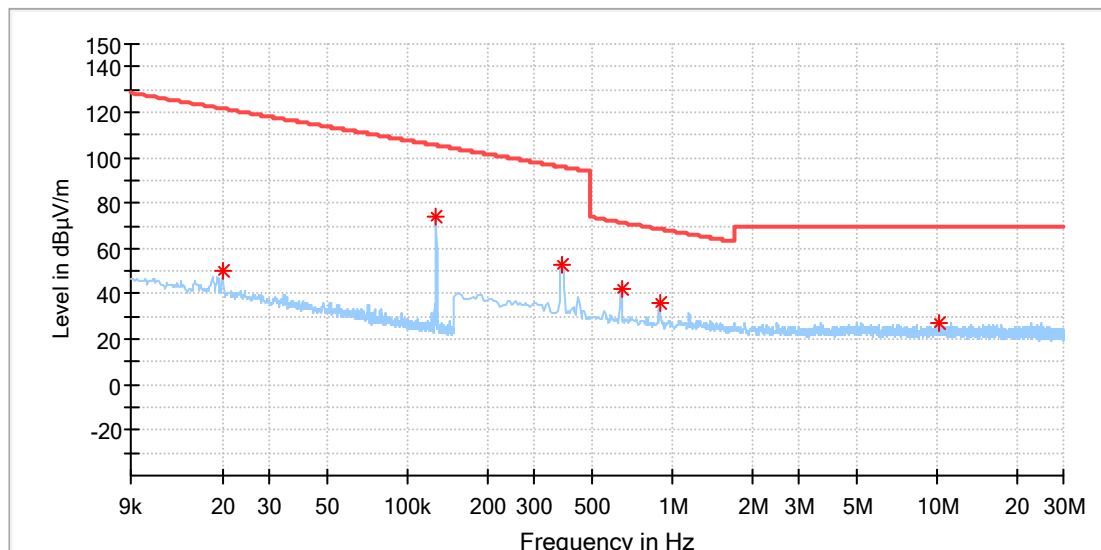
Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.128447	73.06	105.42	32.36	100.0	Y	207.0	20.1
0.382655	50.11	95.95	45.84	100.0	Y	213.0	20.1
0.641647	40.96	71.47	30.50	100.0	Y	209.0	20.1
0.896250	34.57	68.57	34.00	100.0	Y	191.0	20.1
5.742485	29.61	69.50	39.89	100.0	Y	108.0	20.3

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EUT Information

EUT Name:	Magnetic Wireless Portable Charger
Model:	BE-MQ25KW23
Test Mode:	Wireless discharging (WPT)
Order No/Sample No:	168377337/A003285801-005
Test Voltage:	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

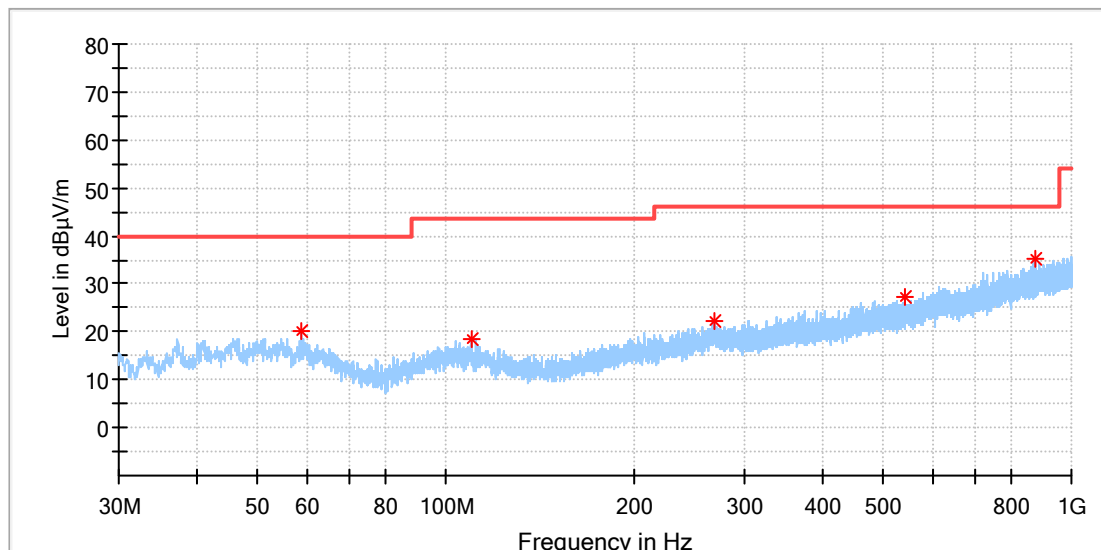


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.019978	49.98	121.58	71.60	100.0	Z	292.0	20.1
0.128447	74.13	105.42	31.30	100.0	Z	114.0	20.1
0.382655	52.52	95.95	43.43	100.0	Z	109.0	20.1
0.641647	42.42	71.47	29.05	100.0	Z	104.0	20.1
0.896250	35.85	68.57	32.72	100.0	Z	137.0	20.1
10.158530	26.78	69.50	42.72	100.0	Z	195.0	20.4

EUT Information

EUT Name:	Magnetic Wireless Portable Charger
Model:	BE-MQ25KW23
Test Mode:	Wireless discharging (WPT)
Order No/Sample No:	168377337/A003285801-005
Test Voltage:	Battery
Remark:	Temp 23 Humi:56%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

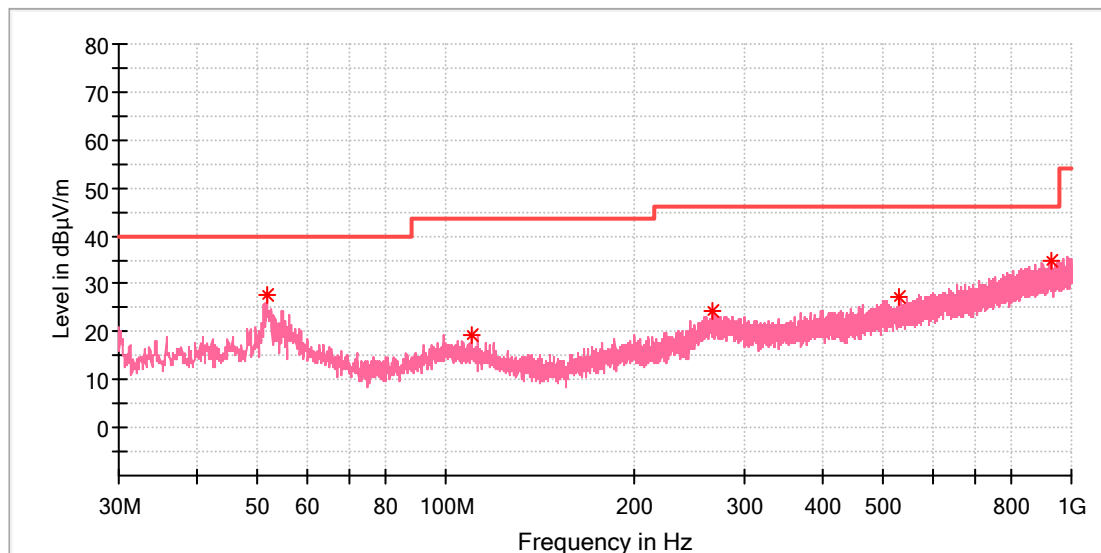


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
58.663500	20.33	40.00	19.67	100.0	H	36.0	-18.8
109.685500	18.27	43.50	25.23	100.0	H	248.0	-19.1
267.941000	22.10	46.00	23.90	100.0	H	340.0	-17.0
540.802000	27.39	46.00	18.61	100.0	H	229.0	-11.2
875.985500	35.07	46.00	10.93	100.0	H	318.0	-5.2

EUT Information

EUT Name: Magnetic Wireless Portable Charger
 Model: BE-MQ25KW23
 Test Mode: Wireless discharging (WPT)
 Order No/Sample No: 168377337/A003285801-005
 Test Voltage: Battery
 Remark: Temp 23 Humi:56%
 Test Standard: FCC Part 15C
 Tested By: Kei Zhang
 Reviewed By: Terry Yin



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
51.776500	27.68	40.00	12.32	100.0	V	313.0	-18.4
110.122000	19.43	43.50	24.07	100.0	V	313.0	-19.1
267.650000	24.29	46.00	21.71	100.0	V	220.0	-17.0
531.635500	27.12	46.00	18.88	100.0	V	64.0	-11.3
925.504000	34.60	46.00	11.40	100.0	V	99.0	-4.7

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5.1.5 Conducted Emission on AC Mains

RESULT:

Pass

Test Specification

Test standard	: FCC Part 15.207
Basic standard	: ANSI C63.10: 2013
Frequency range	: 150KHz - 30MHz
Limits	: FCC Part 15.207(a)
Kind of test site	: Shielded Room

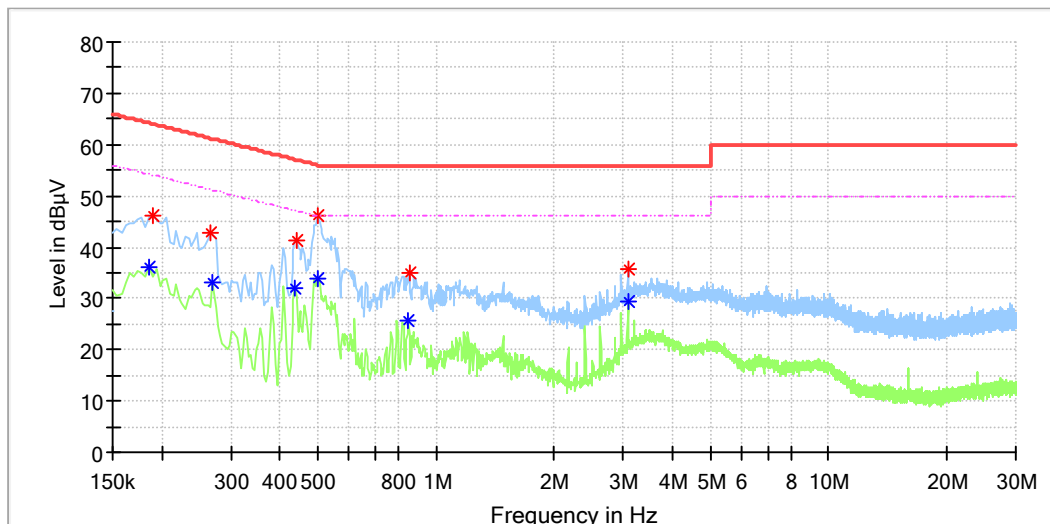
Test Setup

Date of testing	: 2022-07-12
Input voltage	: AC 120V, 60Hz
Operation mode	: B
Earthing	: Not connected
Ambient temperature	: 24.1 °C
Relative humidity	: 52.8 %
Atmospheric pressure	: 101 kPa

Refer to following test plots for details of test result.

EUT Information

EUT Name:	Magnetic Wireless Portable Charger
Order No:	168377337_P00723407
Model:	BE-MQ25KW23
Test mode:	Charging by AC/DC Adapter + Wireless discharging (WPT)
Test Voltage:	AC 120V/60Hz
Test By:/Review By:	Shower Dai/Gary Chen
Test Standard:	FCC Part 15C
Tem./Hum./Pressure:	24.1°C/52.8%/101kPa
Remark:	SR2

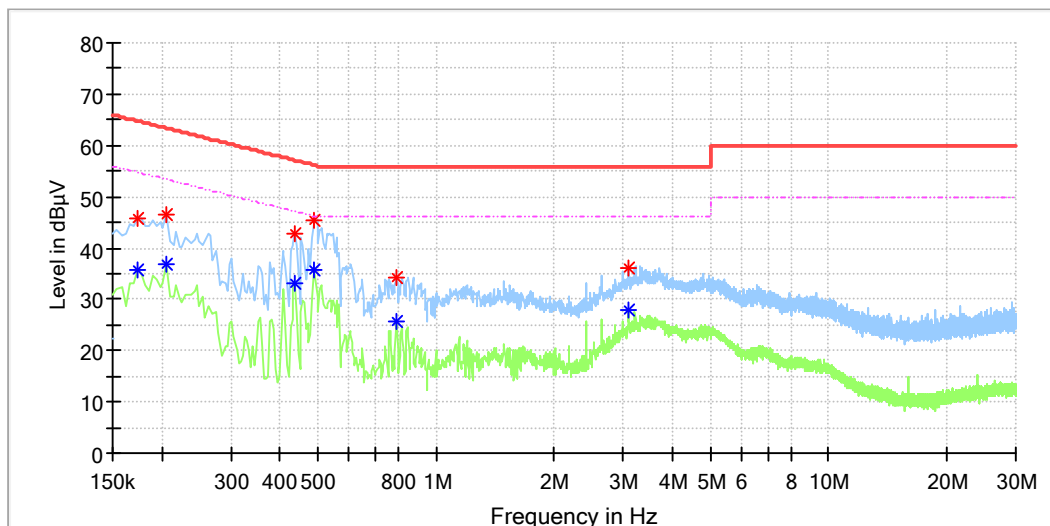


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.186000	---	36.24	54.21	17.97	L1	9.9
0.190000	46.29	---	64.04	17.75	L1	9.9
0.266000	42.75	---	61.24	18.49	L1	9.9
0.270000	---	33.02	51.12	18.10	L1	9.9
0.438000	---	31.92	47.10	15.18	L1	9.9
0.442000	41.46	---	57.02	15.56	L1	9.9
0.498000	---	33.92	46.03	12.11	L1	10.0
0.498000	46.17	---	56.03	9.86	L1	10.0
0.850000	---	25.62	46.00	20.38	L1	10.0
0.854000	35.03	---	56.00	20.97	L1	10.0
3.082000	---	29.38	46.00	16.62	L1	10.2
3.082000	35.83	---	56.00	20.17	L1	10.2

EUT Information

EUT Name:	Magnetic Wireless Portable Charger
Order No:	168377337_P00723407
Model:	BE-MQ25KW23
Test mode:	Charging by AC/DC Adapter + Wireless discharging (WPT)
Test Voltage:	AC 120V/60Hz
Test By:/Review By:	Shower Dai/Gary Chen
Test Standard:	FCC Part 15C
Tem./Hum./Pressure:	24.1°C/52.8%/101kPa
Remark:	SR2



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.174000	---	35.55	54.77	19.22	N	9.8
0.174000	45.91	---	64.77	18.86	N	9.8
0.206000	46.47	---	63.37	16.89	N	9.8
0.206000	---	36.99	53.37	16.37	N	9.8
0.438000	42.96	---	57.10	14.14	N	9.8
0.438000	---	33.18	47.10	13.92	N	9.8
0.486000	---	35.75	46.24	10.48	N	9.8
0.490000	45.46	---	56.17	10.71	N	9.8
0.794000	---	25.53	46.00	20.47	N	9.8
0.794000	34.26	---	56.00	21.74	N	9.8
3.102000	---	27.80	46.00	18.20	N	9.9
3.102000	36.20	---	56.00	19.80	N	9.9

6 Photographs of the Test Set-Up

Refer to test photo document.

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