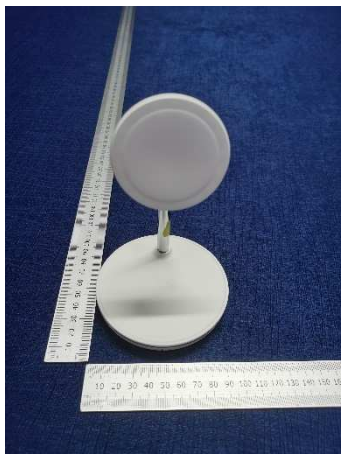
Prüfbericht - Produkte
Test Report - Products

TÜVRheinland®

Prüfbericht-Nr.: *Test report no.:*	**CN21R1IM 001**	**Auftrags-Nr.:** *Order no.:*	168342311	Seite 1 von 34 *Page 1 of 34*
Kunden-Referenz-Nr.: *Client reference no.:*	N/A	**Auftragsdatum:** *Order date:*	2021-11-04	
Auftraggeber: *Client:*	**SHENZHEN DNS INDUSTRIES CO., LTD.** 23/F Building A, Shenzhen International Innovation Center, No. 1006 Shennan Road, Futian, Shenzhen, 518026, China			
Prüfgegenstand: *Test item:*	Magnetic Wireless Charger			
Bezeichnung / Typ-Nr.: *Identification / Type no.:*	WD-286B (Trademark: DNS, omars, mbest, NOVOO, KEYMOX)			
Auftrags-Inhalt: *Order content:*	Test report			
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 B Section 15.107 CFR47 FCC Part 15: Subpart B Section 15.109 CFR47 FCC Part 2: Subpart J Section 1.1310			

Wareneingangsdatum: *Date of sample receipt:*	2021-11-07
Prüfmuster-Nr.: *Test sample no.:*	A003158018-002, 003
Prüfzeitraum: *Testing period:*	2021-11-15 – 2021-11-19
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:*	X Tim.zhang Signed by: Tim Zhang	**genehmigt von:** *authorized by:*	X Lin Lin Signed by: Lin Lin
Datum: *Date:* 2021-11-22		**Ausstellungsdatum:** *Issue date:* 2021-11-22	
Stellung / Position	Project Manager	**Stellung** / Position	Reviewer

Sonstiges / *Other:* FCC ID: ZBCWD-286B

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 = mangelhalt
	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*

TÜV Rheinland (Shenzhen) Co., Ltd. 1601 R&D Room, 1602-1604, 17-18F, Building 7 Site C, Vanke Cloud City Phase I, Xingke First Street, Xili Street, Xili Community, Nanshan District, Shenzhen 518052, P.R. China
Mail: service@de.tuv.com · Web: www.tuv.com

Test Summary

5.1.1 ANTENNA REQUIREMENT
RESULT: Pass

5.1.2 20DB BANDWIDTH
RESULT: Pass

5.1.3 RADIATED SPURIOUS EMISSION
RESULT: Pass

5.1.4 CONDUCTED EMISSIONS
RESULT: Pass

5.1.5 RADIATED EMISSION
RESULT: Pass

6.1.1 ELECTROMAGNETIC FIELDS
RESULT: Pass

Contents

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

TÜV Rheinland (Shenzhen) Co., Ltd.

Radio Spectrum Testing				
Description	**Manufacturer**	**Model**	**Serial No.**	**Cal. Until**
Signal Analyzer	Rohde & Schwarz	FSV 40	101441	2022-08-09
OSP	Rohde & Schwarz	OSP 150	101017	2021-12-20
Control PC	DELL	OptiPlex 7050	FTJZ9P2	N/A
Test Software	Rohde & Schwarz	WMS32 (V10.40.10)	N/A	N/A
Shielding Room 8#	Albatross	SR8	APC17151-SR8	2024-06-22
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
EMI Test Receiver	R&S	ESR 7	102021	2022-08-10
Conducted Emission				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
EMI Test Receiver	R&S	ESR3	102428	2022-08-10
Artificial Mains Network	R&S	ENV216	102333	2022-08-10
EMC32 test software	R&S	EMC32(Ver.10.50.00)	N/A	N/A
Radiated Emission				
Equipment	**Manufacturer**	**Model No.**	**Serial No.**	**Cal. Until**
3m SAC	ETS-Lindgren	SAC3	CT001632-Q1362	2024-04-26
EMI Test Receiver	R&S	ESR7	102111	2021-12-16
Horn Antenna	R&S	HF907	102706	2022-08-07
Preamplifier (1-18GHz)	FIT	SCU-18F	180077	2022-08-13
Active magnetic loop antenna	SCHWARZBECK	FMZB1519B	00080	2021-08-30
Trilog-Broadband antenna	SCHWARZBECK	VULB9168	0945	2022-12-12
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 basics 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

Test	Parameters	Expanded uncertainty (U_{lab})	Expanded uncertainty (U_{cispr})
Conducted Emission	Level accuracy (9kHz to 150kHz) (150kHz to 30MHz)	± 3.70 dB ± 3.30 dB	± 3.8 dB ± 3.4 dB
Radiated Emission (3m SAC)	Level accuracy (30MHz to 1000MHz)	± 4.52 dB	± 6.3 dB
	Level accuracy (above 1000MHz)	± 4.37 dB	N/A

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 device is a Magnetic Wireless Charger.

According to the declaration of the applicant, the electrical circuit design, PCB layout and components used are identical for all models, only the parameters are different.

This product has two differnet parameters:

1. Type C input: DC9V 3 A , DC12V 2.5A, DC15V 2A; Output: 15W(Apple Magsafe) + 5W(Wireless charger).
2. Type C input: DC9V 3 A , DC12V 2.5A, DC15V 2A; Output: 15W(Apple Magsafe) + 2.5W(Wireless charger).

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 Charger
Type Designation	WD-286B
Trademark	DNS, omars, mbest, NOVOO, KEYMOX
FCC ID	ZBCWD-286D
Operating Voltage	DC 9V/3A, DC12V/2.5A, DC15V/2A via Type-C port Output: 15W+2.5W or 15W+5W
Test Voltage	AC 120V, 60Hz
Technical Specification of Apple Magsafe	
Operating Frequency	360kHz
Modulation	FSK
Antenna Type	Coil Antenna
Antenna Gain	0 dBi
Antenna number	1
Wireless Charger output power	15W maximum
Technical Specification of WPT	
Operating Frequency	110.5-205kHz
Modulation	FSK
Antenna Type	Coil Antenna
Antenna Gain	0 dBi
Antenna number	1
Wireless Charger output power	2.5W or 5W(maximum)

3.3 Independent Operation Modes

The basic operation modes are:
A. On, Wireless charging(**Apple Magsafe+Wireless Charger)**
B. On, Wireless charging(**Apple Magsafe)**
C. On, Wireless charging(**Wireless Charger)**
D. Standby
E. Off

3.4 Noise Generating and Noise Suppressing Parts

Refer to Circuit Diagram for further details.

3.5 Submitted Documents

- ID Label and Location Info

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 tests of Radio Spectrum were applied on model WD-286B with two different parameters.

4.3 Special Accessories and Auxiliary Equipment

Table 3: List of Accessories and Auxiliary Equipment

Description	Manufacturer	Model	S/N	Rating
Mobile Phone	Apple	iphone 12 Pro max	n/a	n/a
Adapter	TUVR	VCB3HDEH	J121382ZB1000031	Input: 100-240Vac, 50/60Hz 1.2A max Output: DC 9V/3A, DC12V/2.5A, DC15V/2A
CTO C cable	/	/	/	Unshielded and length 1m
USB cable	TUVR	/	/	Unshielded and length 1m
Wireless charge Load	YBZ	---	---	---

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)

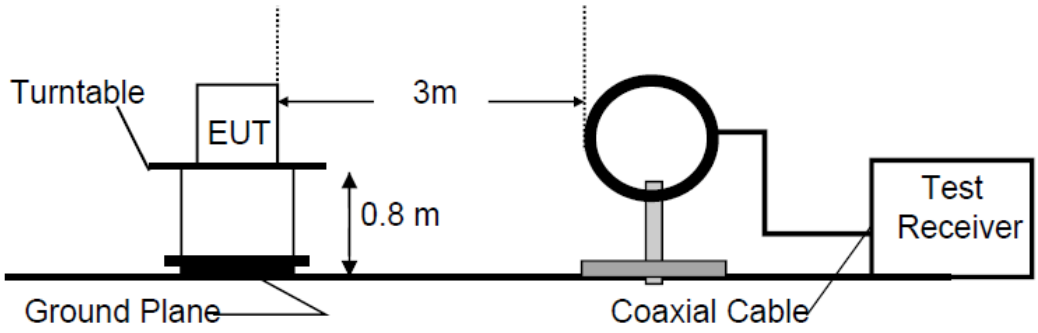


Diagram of Measurement Configuration for Radiation Test (Below 1GHz)

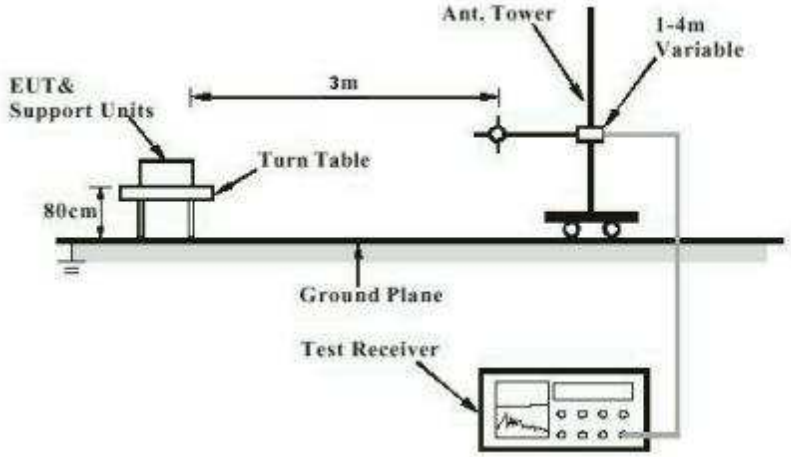
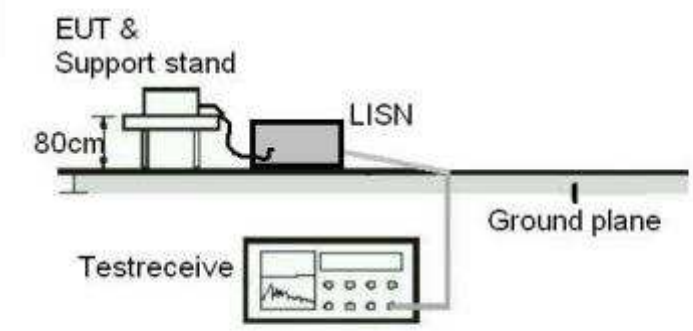


Diagram of Measurement Equipment Configuration for Mains Conduction Measurement



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 an 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.

5.1.2 20dB Bandwidth

RESULT: **Pass**

Test Specification

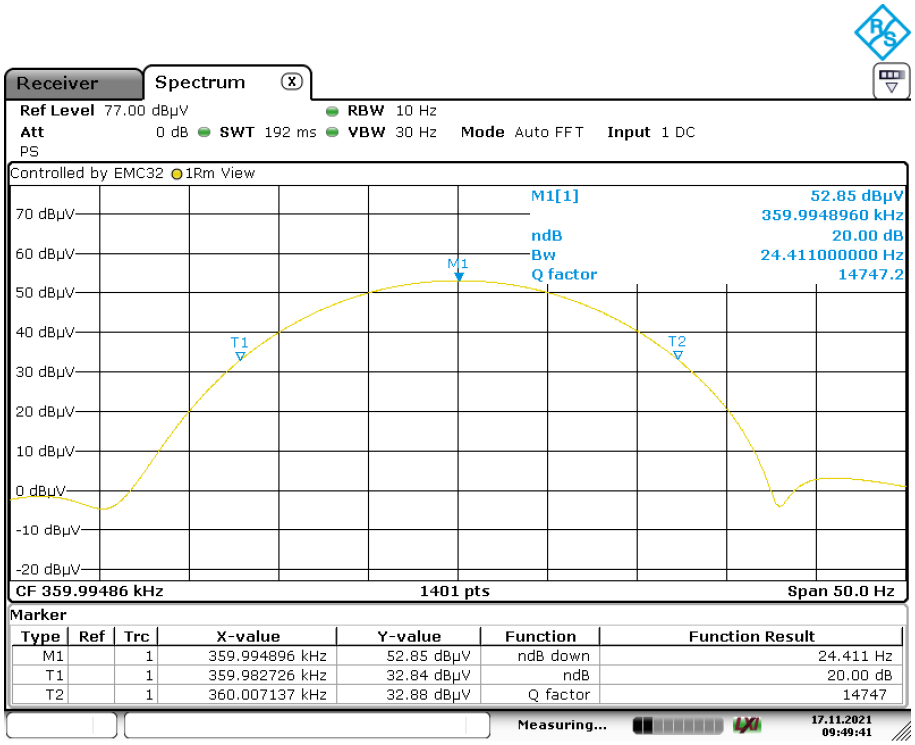
Test standard	:	FCC Part 15.215(c)
Basic standard	:	ANSI C63.10: 2013
Kind of test site	:	Shielded Room

Test Setup

Date of testing	:	2021-11-17
Input voltage	:	120Vac, 60Hz
Operation mode	:	A
Ambient temperature	:	23 ℃
Relative humidity	:	45 %
Atmospheric pressure	:	101 kPa

For details refer to following test result.

For Apple Magsafe:



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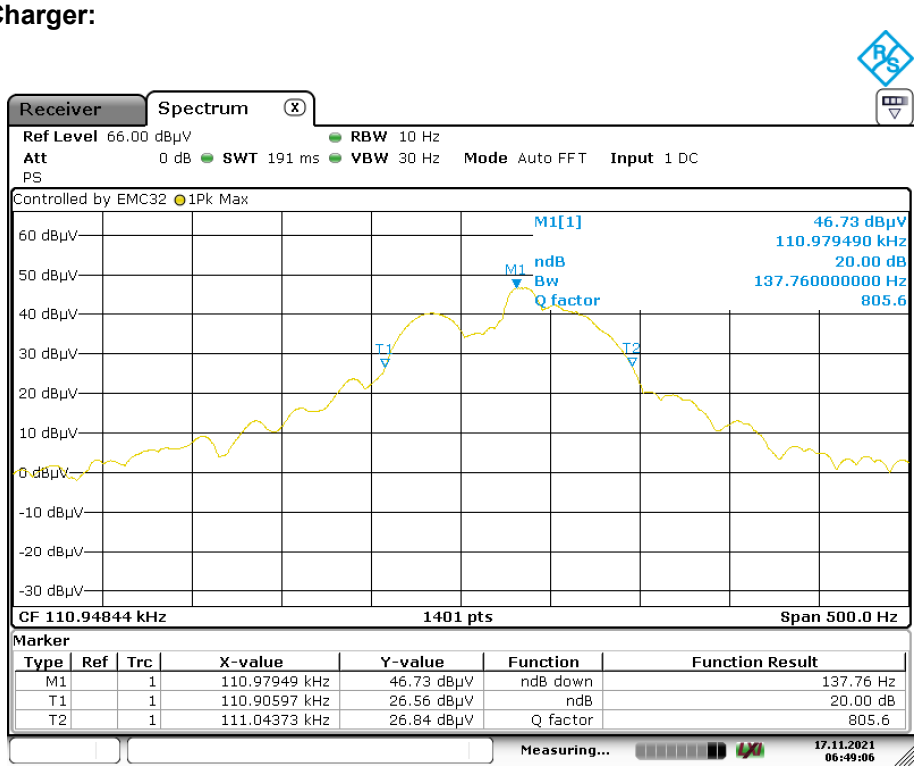
For Wireless Charger:



Date: 17.NOV.2021 06:49:06

5.1.3 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

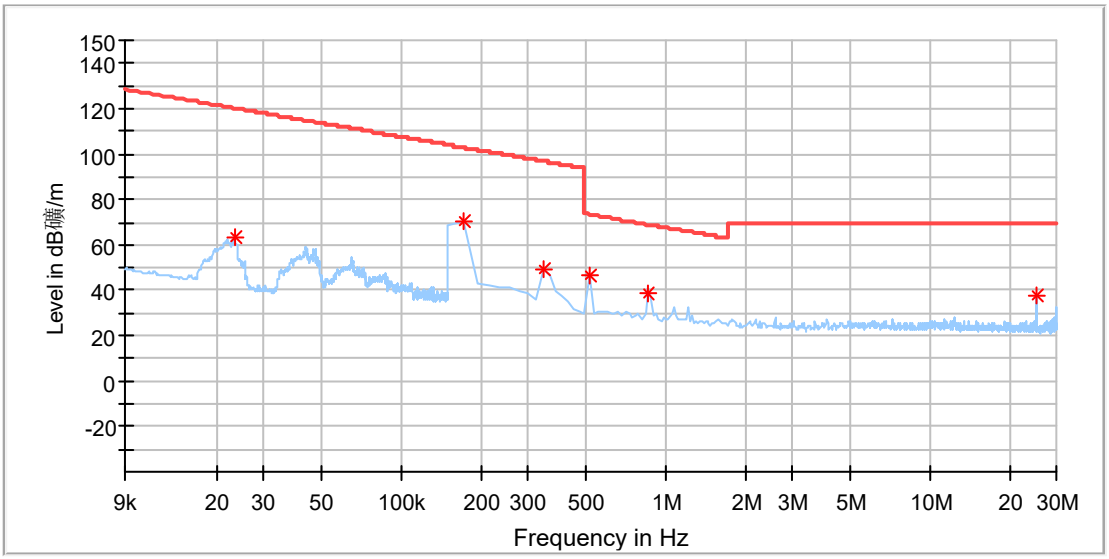
Date of testing	:	2021-11-17
Input voltage	:	120Vac, 60Hz
Operation mode	:	A
Ambient temperature	:	24 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Refer to following test plots for details of test result.

For Apple Magsafe:

EUT Information

EUT Name:	Magsafe Wireless Charger
Model:	WD-286B
Test Mode:	Wireless charging(Apple Magsafe)
Order No/Sample No:	168342311/A003158018-003
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
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)
0.023402	63.70	120.20	56.50	100.0	X	214.0	20.1
0.171322	70.77	102.92	32.15	100.0	X	31.0	20.1
0.341893	49.32	96.92	47.60	100.0	X	312.0	20.1
0.512464	46.78	73.41	26.63	100.0	X	31.0	20.1
0.853607	38.35	68.99	30.65	100.0	X	31.0	20.1
25.010786	37.33	69.50	32.17	100.0	X	146.0	20.7

EUT Information

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Test Mode:	Wireless charging(Apple Magsafe)
Order No/Sample No:	168342311/A003158018-003
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Remark:	Temp 24 Humi:50%
Test Standard:	FCC Part 15C
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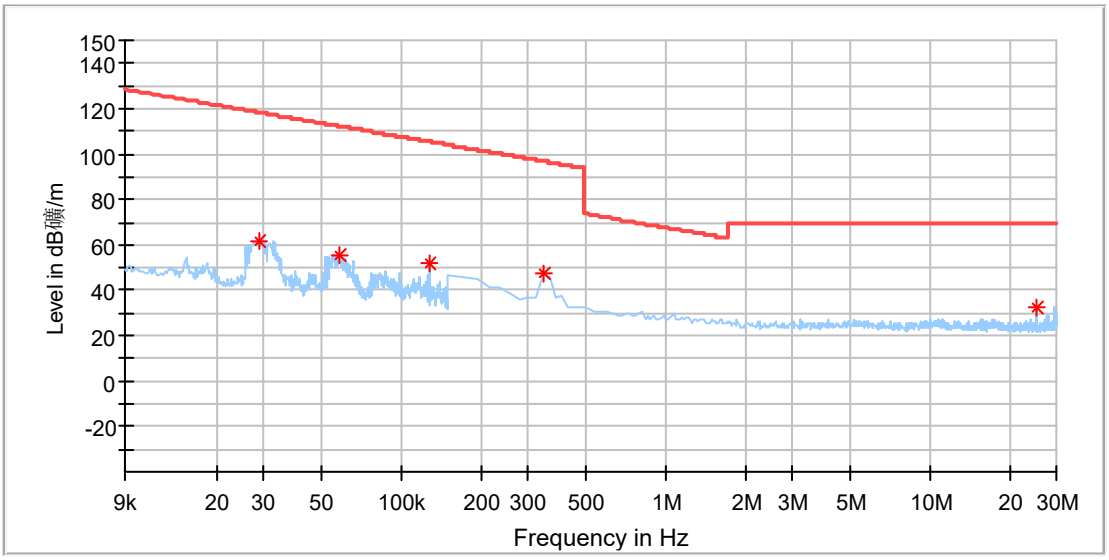

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.029143	61.49	118.30	56.81	100.0	Y	0.0	20.1
0.058249	55.52	112.29	56.77	100.0	Y	0.0	20.1
0.127843	51.56	105.46	53.90	100.0	Y	4.0	20.1
0.341893	47.57	96.92	49.35	100.0	Y	221.0	20.1
25.010786	32.54	69.50	36.96	100.0	Y	174.0	20.7

EUT Information

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Test Mode:	Wireless charging(Apple Magsafe)
Order No/Sample No:	168342311/A003158018-003
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
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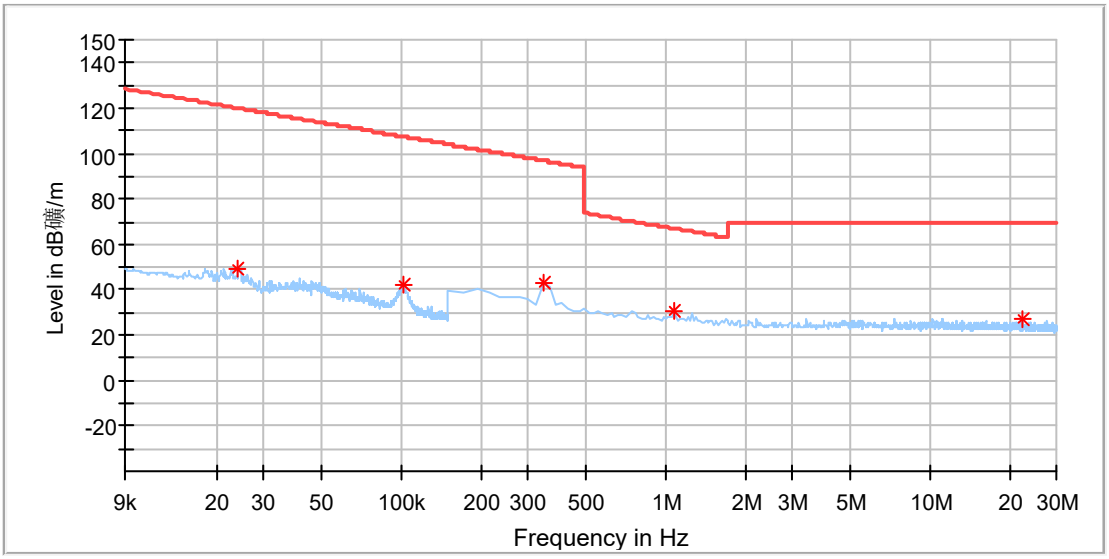

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.024107	49.11	119.95	70.84	100.0	Z	215.0	20.1
0.101154	42.48	107.50	65.02	100.0	Z	95.0	20.1
0.341893	43.51	96.92	53.42	100.0	Z	336.0	20.1
1.066822	30.37	67.06	36.69	100.0	Z	50.0	20.1
22.196357	26.98	69.50	42.52	100.0	Z	74.0	20.6

EUT Information

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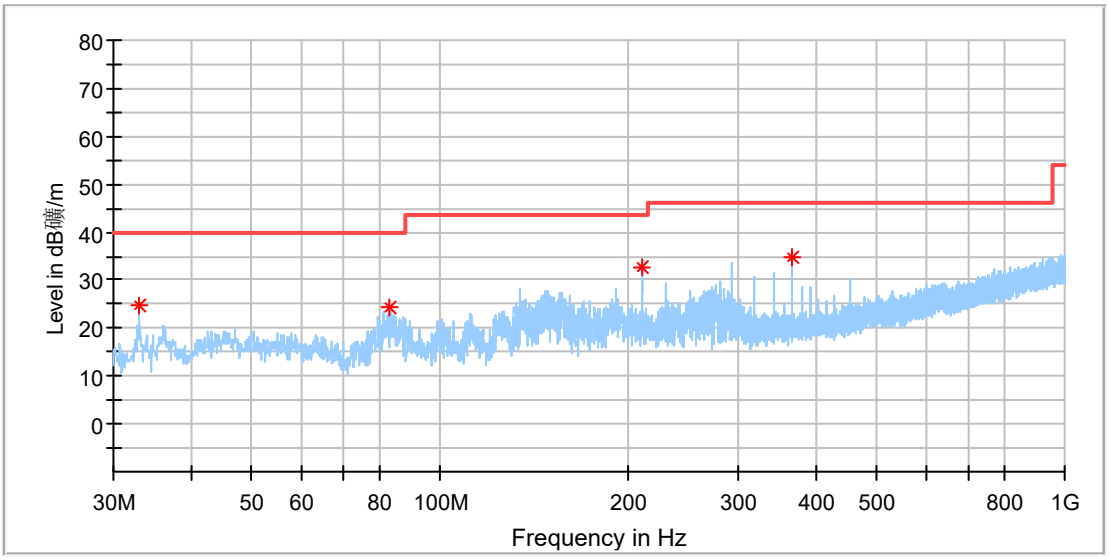

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.007000	24.55	40.00	15.45	100.0	H	190.0	-22.5
82.865000	24.25	40.00	15.75	100.0	H	209.0	-22.8
211.002000	32.82	43.50	10.68	100.0	H	73.0	-18.9
367.463000	34.70	46.00	11.30	100.0	H	24.0	-14.5

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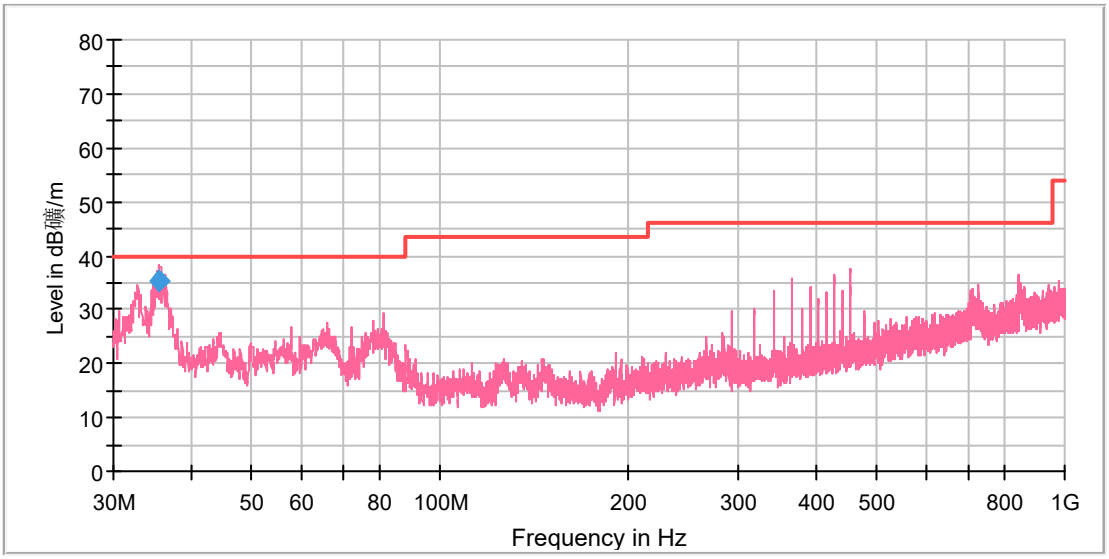

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
81.148846	29.41	40.00	10.59	100.0	V	276.0	-23.5
367.522692	35.64	46.00	10.36	100.0	V	256.0	-14.8
453.255769	37.57	46.00	8.43	100.0	V	202.0	-13.2
845.583462	36.58	46.00	9.42	100.0	V	327.0	-6.0

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
35.508369	35.41	40.00	4.59	100.0	V	313.0	-22.0

For Wireless Charger:

EUT Information

EUT Name:	Magsafe Wireless Charger
Model:	WD-286B
Test Mode:	Wireless charging(Wireless Charger)
Order No/Sample No:	168342311/A003158018-003
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC Part 15C
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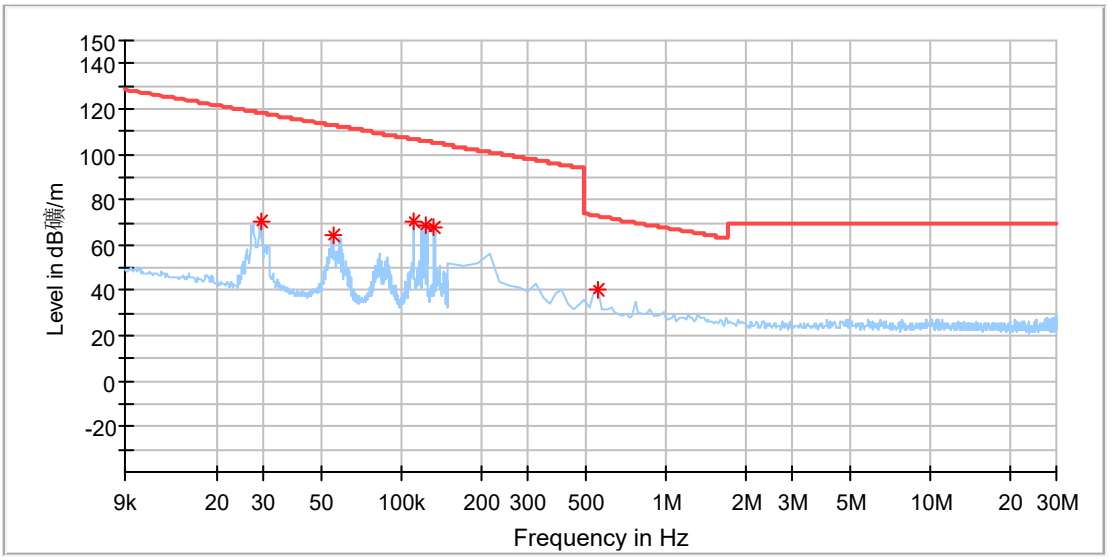

Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.029244	70.66	118.27	47.61	100.0	X	285.0	20.1
0.054825	64.59	112.81	48.22	100.0	X	285.0	20.1
0.111024	70.29	106.69	36.40	100.0	X	334.0	20.1
0.122304	68.84	105.85	37.01	100.0	X	0.0	20.1
0.133181	67.88	105.11	37.23	100.0	X	0.0	20.1
0.555107	39.98	72.72	32.74	100.0	X	5.0	20.1

EUT Information

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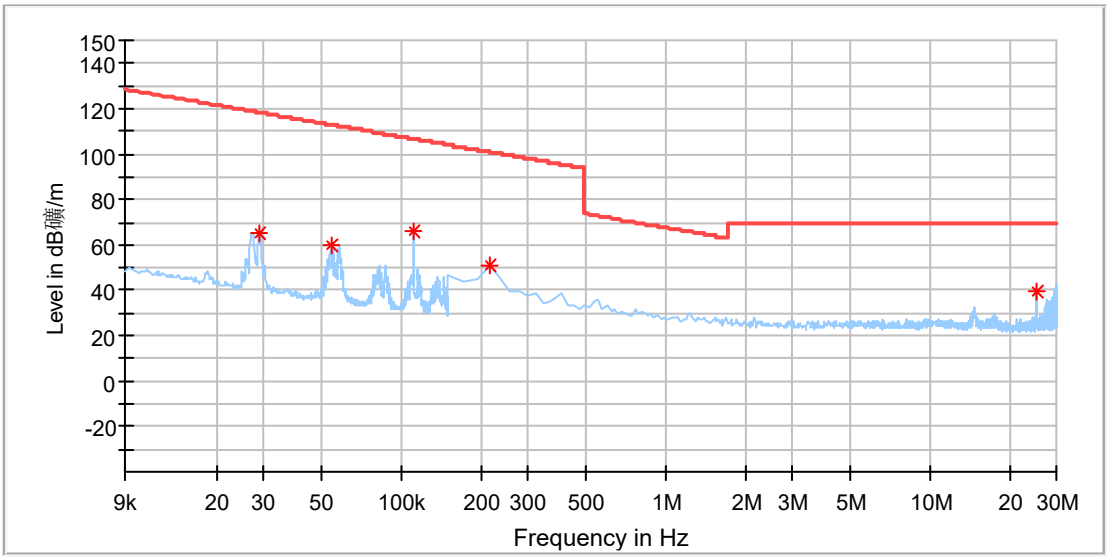
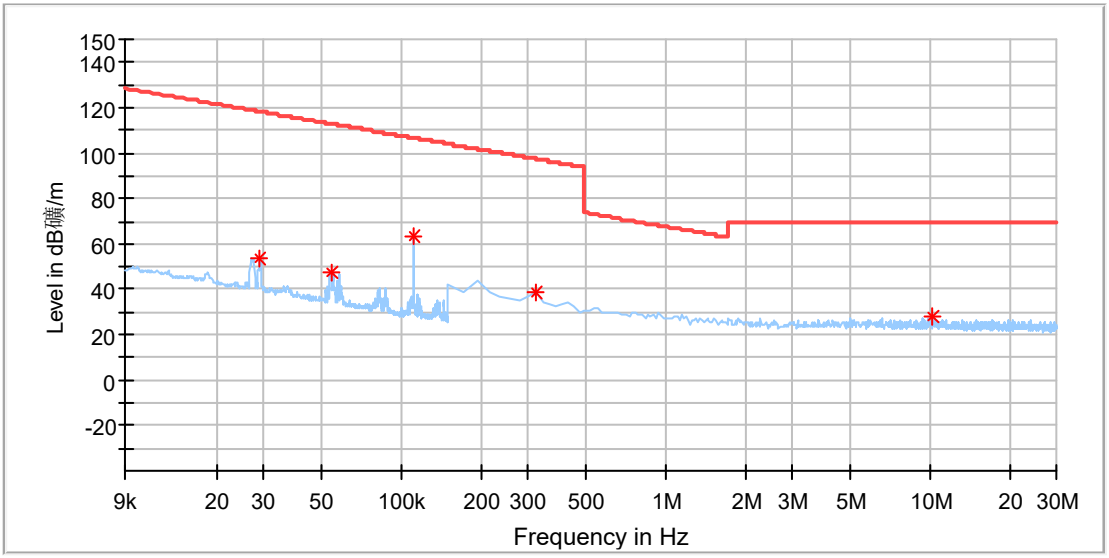


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.029042	65.36	118.33	52.97	100.0	Y	310.0	20.1
0.054523	59.48	112.86	53.39	100.0	Y	310.0	20.1
0.111124	65.79	106.68	40.89	100.0	Y	48.0	20.1
0.213964	50.90	100.99	50.09	100.0	Y	57.0	20.1
25.010786	39.81	69.50	29.69	100.0	Y	34.0	20.7

EUT Information

EUT Name:	Magsafe Wireless Charger
Model:	WD-286B
Test Mode:	Wireless charging(Wireless Charger)
Order No/Sample No:	168342311/A003158018-003
Test Voltage::	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

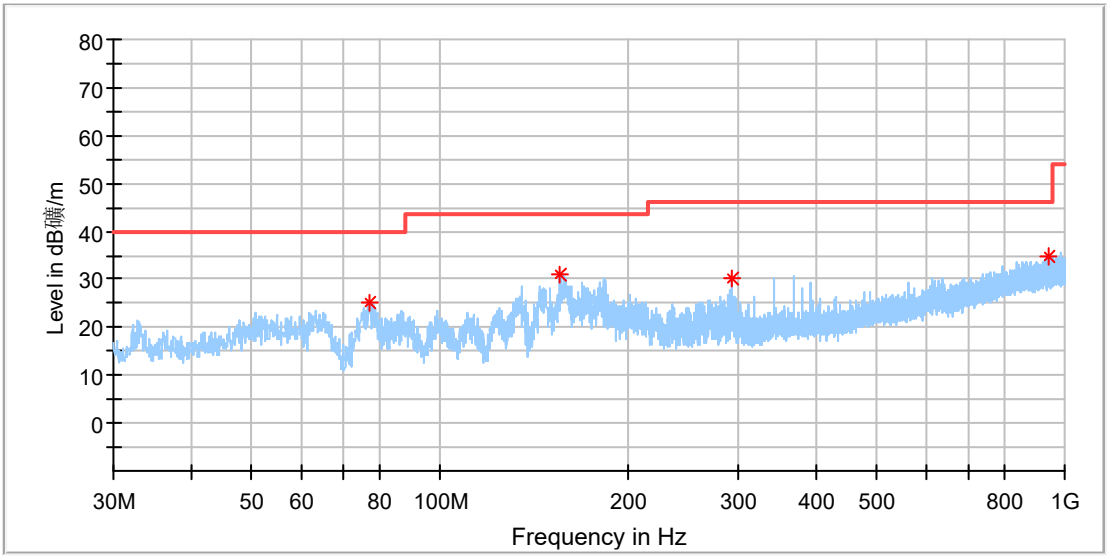


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
0.029042	53.28	118.33	65.05	100.0	Z	287.0	20.1
0.054523	47.56	112.86	65.30	100.0	Z	287.0	20.1
0.111024	63.05	106.69	43.64	100.0	Z	356.0	20.1
0.320572	39.01	97.48	58.47	100.0	Z	188.0	20.1
10.192393	28.40	69.50	41.10	100.0	Z	71.0	20.4

EUT Information

EUT Name:	Magsafe Wireless Charger
Model:	WD-286B
Test Mode:	Wireless charging(Wireless Charger)
Order No/Sample No:	168342311/A003158018-003
Test Voltage:	120V/60Hz
Remark:	Temp 24 Humi:50%
Test Standard:	FCC Part 15C
Tested By:	Kei Zhang
Reviewed By:	Terry Yin

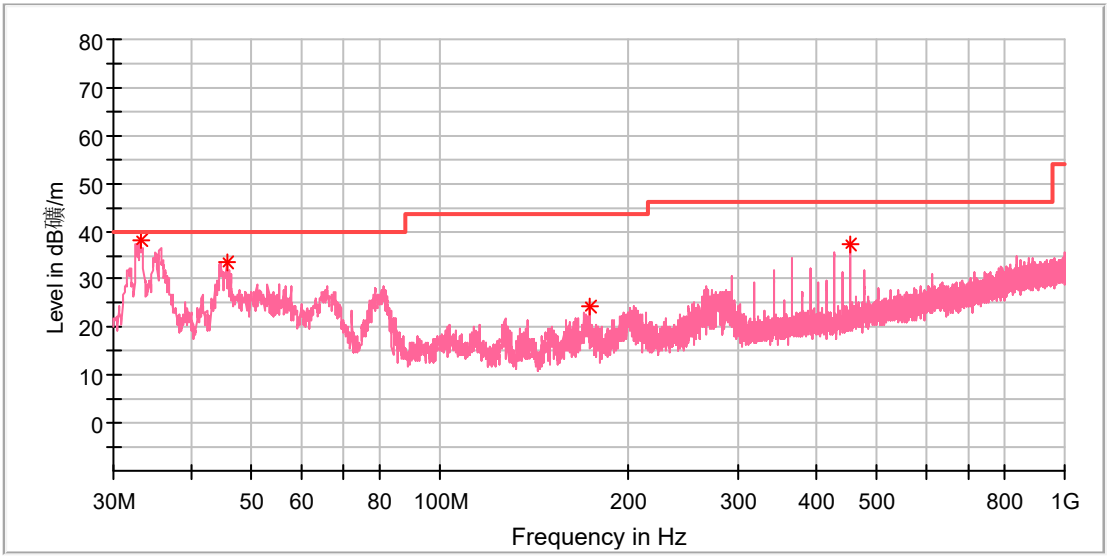


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
77.142000	25.37	40.00	14.63	100.0	H	197.0	-23.4
155.760500	31.05	43.50	12.45	100.0	H	291.0	-22.0
294.373500	30.25	46.00	15.75	100.0	H	357.0	-16.4
942.673000	34.89	46.00	11.11	100.0	H	134.0	-4.5

EUT Information

EUT Name:	Magsafe Wireless Charger
Model:	WD-286B
Test Mode:	Wireless charging(Wireless Charger)
Order No/Sample No:	168342311/A003158018-003
Test Voltage:	120V/60Hz
Remark:	Temp 24 Humi:50%
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)
33.152500	37.96	40.00	2.04	100.0	V	0.0	-22.5
45.617000	33.52	40.00	6.48	100.0	V	254.0	-18.7
174.239000	24.20	43.50	19.30	100.0	V	130.0	-20.9
453.356500	37.47	46.00	8.53	100.0	V	304.0	-12.8

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
33.152500	35.96	40.00	4.04	100.0	V	0.0	-22.0

5.1.4 Conducted emissions

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.207
Basic standard	:	ANSI C63.10: 2013
Frequency range	:	150kHz - 30MHz
Classification	:	Class B
Limit		FCC Part 15.207 (a)
Kind of test site	:	Shielded Room

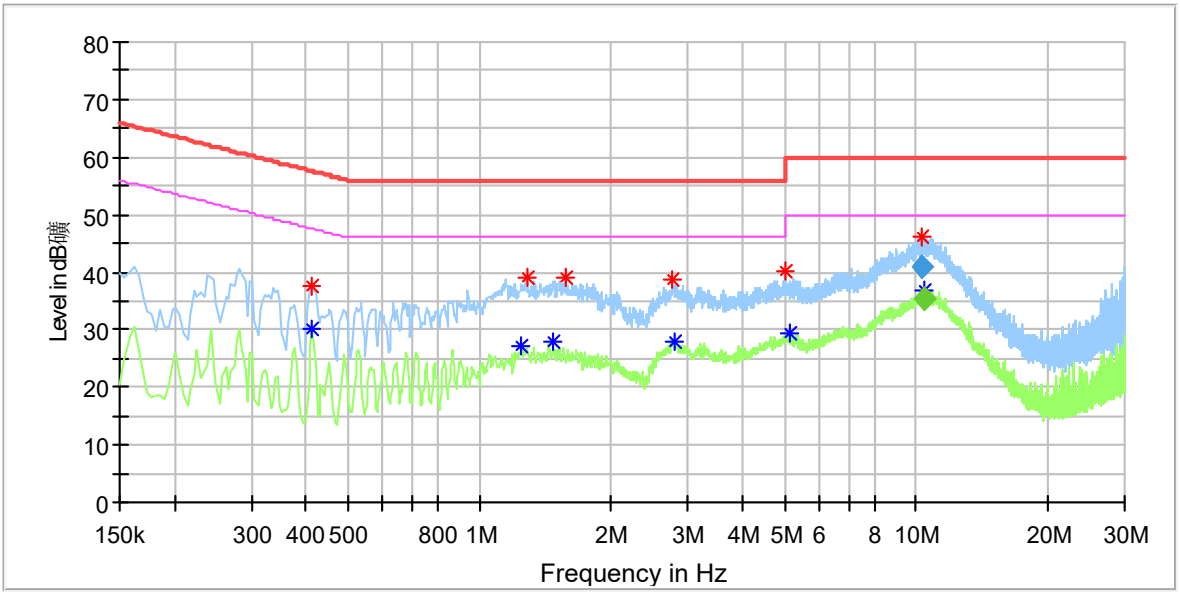
Test Setup

Date of testing	:	2021-11-16
Input voltage	:	120Vac, 60Hz
Operation mode	:	A
Ambient temperature	:	23 ℃
Relative humidity	:	48 %
Atmospheric pressure	:	101 kPa

Refer to following test plots for details of test result.

EUT Information

EUT Name:	Magsafe Wireless Charger
Order No:	168342311(P00486236)
Model:	WD-286B
Test Mode:	ON, Wireless charging(15W+5W max)
Test Voltage:	AC 120V/60HZ
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	SR1



Critical_Freqs

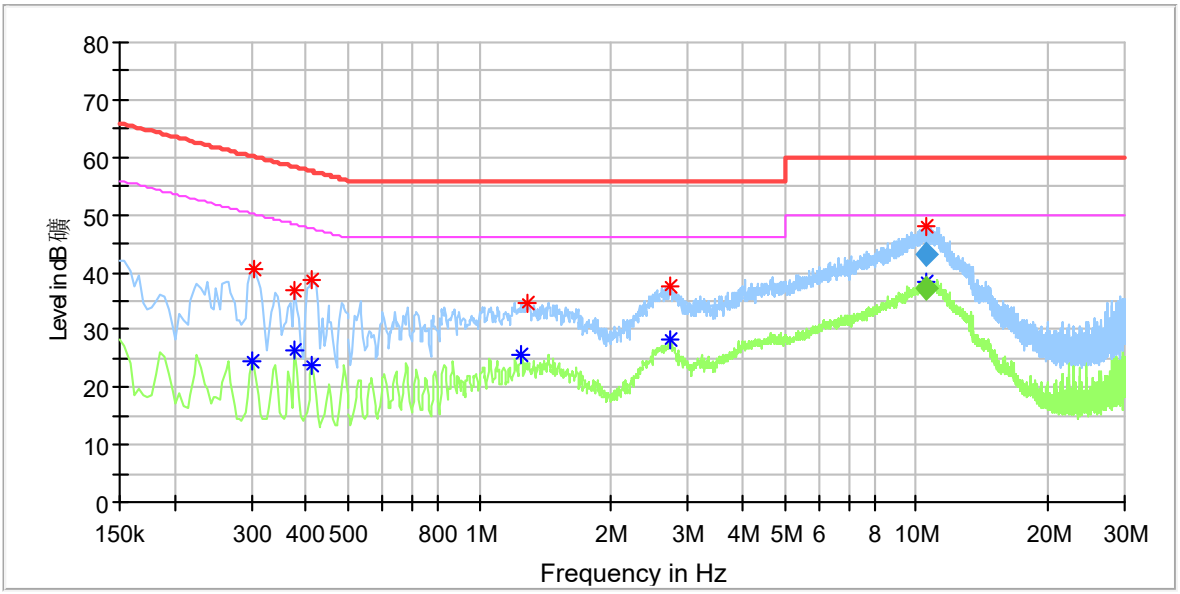
Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.414000	---	30.02	47.57	17.55	N	9.7
0.414000	37.71	---	57.57	19.86	N	9.7
1.248000	---	27.10	46.00	18.90	N	9.7
1.280000	39.17	---	56.00	16.83	N	9.7
1.472000	---	27.73	46.00	18.27	N	9.7
1.568000	39.21	---	56.00	16.79	N	9.7
2.756000	38.88	---	56.00	17.12	N	9.9
2.788000	---	28.07	46.00	17.93	N	9.9
5.016000	40.16	---	60.00	19.84	N	10.0
5.156000	---	29.21	50.00	20.79	N	10.0
10.270500	46.12	---	60.00	13.88	N	10.0
10.426500	---	36.72	50.00	13.28	N	10.0

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
10.270500	40.93	---	60.00	19.07	1000.0	9.000	N	10.0
10.426500	---	35.46	50.00	14.54	1000.0	9.000	N	10.0

EUT Information

EUT Name:	Magsafe Wireless Charger
Order No:	168342311(P00486236)
Model:	WD-286B
Test Mode:	ON, Wireless charging(15W+5W max)
Test Voltage:	AC 120V/60HZ
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	SR1



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Line	Corr. (dB)
0.302000	---	24.58	50.19	25.61	L1	9.6
0.306000	40.46	---	60.08	19.62	L1	9.6
0.378000	---	26.32	48.32	22.00	L1	9.7
0.378000	36.76	---	58.32	21.57	L1	9.7
0.414000	---	23.76	47.57	23.81	L1	9.7
0.414000	38.57	---	57.57	19.00	L1	9.7
1.248000	---	25.55	46.00	20.45	L1	9.7
1.280000	34.61	---	56.00	21.39	L1	9.7
2.736000	---	28.37	46.00	17.63	L1	9.9
2.740000	37.76	---	56.00	18.24	L1	9.9
10.522500	---	38.29	50.00	11.71	L1	10.0
10.593500	48.11	---	60.00	11.89	L1	10.0

Final_Result

Frequency (MHz)	QuasiPeak (dBµV)	Average (dBµV)	Limit (dBµV)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Line	Corr. (dB)
10.522500	---	37.31	50.00	12.69	1000.0	9.000	L1	10.0
10.593500	43.07	---	60.00	16.93	1000.0	9.000	L1	10.0

5.1.5 Radiated Emission

RESULT: **Pass**

Test Specification

Test standard	:	FCC Part 15.209
Basic standard	:	ANSI C63.4: 2014
Frequency range	:	30 - 1000MHz *
Limits	:	Refer to 15.209(a)
Kind of test site	:	3m Semi-anechoic Chamber

Test Setup

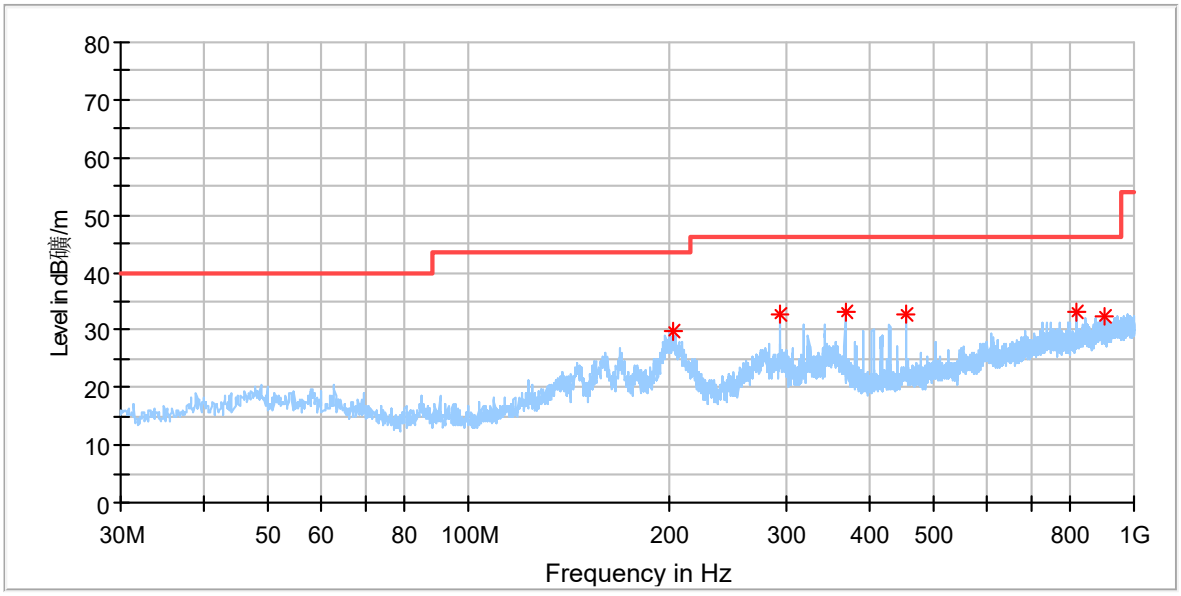
Date of testing	:	2021-11-16
Input voltage	:	DC 15V/2A via Type C port(Worse case)
Operation mode	:	A
Ambient temperature	:	24 ℃
Relative humidity	:	50 %
Atmospheric pressure	:	101 kPa

Refer to following test plots for details of test result.

Remark:*- The highest frequency of internal sources of EUT is less than 108MHz, the measurement shall only be made up to 1GHz.

EUT Information

EUT Name:	Magsafe Wireless Charger
Order No:	168342311(P00486236)
Model:	WD-286B
Test Mode:	ON, Wireless charging(15W+5W max)
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	3m Chamber

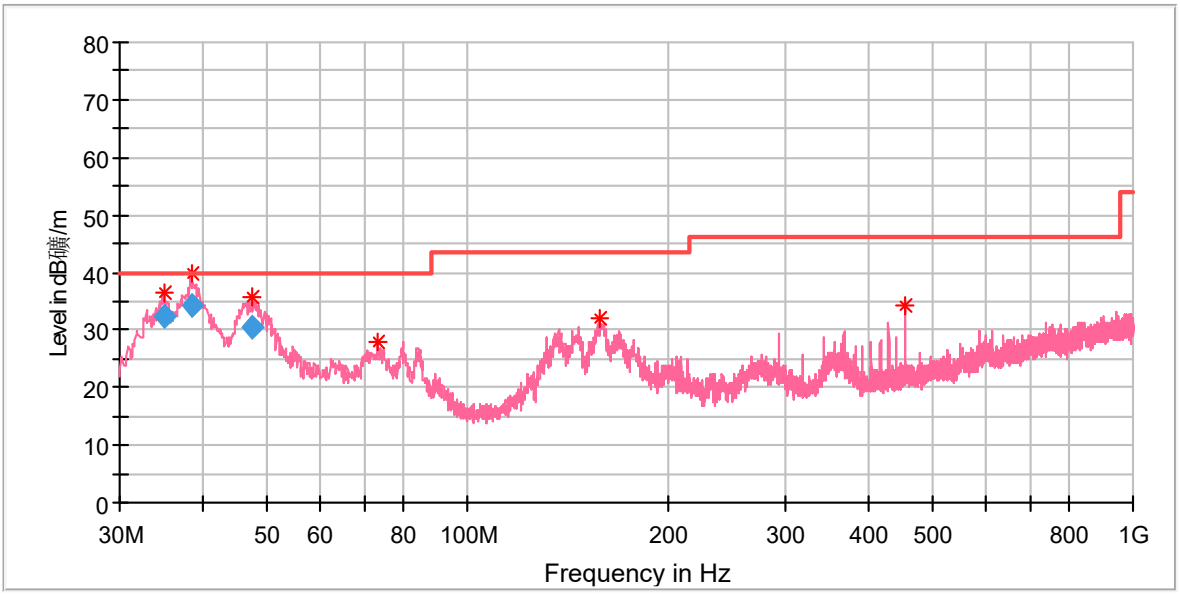


Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
368.045000	33.25	46.00	12.75	100.0	H	4.0	22.9
453.890000	32.60	46.00	13.40	100.0	H	54.0	24.7
294.422000	32.85	46.00	13.15	100.0	H	239.0	20.1
822.005000	33.04	46.00	12.96	100.0	H	338.0	30.6
202.660000	29.68	43.50	13.82	200.0	H	94.0	17.2
901.254000	32.35	46.00	13.65	200.0	H	158.0	31.4

EUT Information

EUT Name:	Magsafe Wireless Charger
Order No:	168342311(P00486236)
Model:	WD-286B
Test Mode:	ON, Wireless charging(15W+5W max)
Test Voltage:	AC 120V/60Hz
Test By:	Jianhua Lu
Review By:	Gary Chen
Remark:	3m Chamber



Critical_Freqs

Frequency (MHz)	MaxPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
34.910000	36.64	40.00	3.36	100.0	V	34.0	18.5
38.499000	39.69	40.00	0.31	100.0	V	71.0	19.2
47.440000	35.66	40.00	4.34	100.0	V	71.0	21.3
73.262000	27.83	40.00	12.17	100.0	V	82.0	17.3
157.652000	32.07	43.50	11.43	100.0	V	195.0	21.6
453.793000	34.08	46.00	11.92	100.0	V	126.0	24.7

Final_Result

Frequency (MHz)	QuasiPeak (dBµV/m)	Limit (dBµV/m)	Margin (dB)	Meas. Time (ms)	Bandwidth (kHz)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB/m)
34.910000	32.24	40.00	7.76	1000.0	120.000	100.0	V	34.0	18.5
38.499000	34.40	40.00	5.60	1000.0	120.000	100.0	V	71.0	19.2
47.440000	30.45	40.00	9.55	1000.0	120.000	100.0	V	71.0	21.3

6 Safety Human Exposure

6.1 Radio Frequency Exposure Compliance

6.1.1 Electromagnetic Fields

RESULT: **Pass**

Test Specification

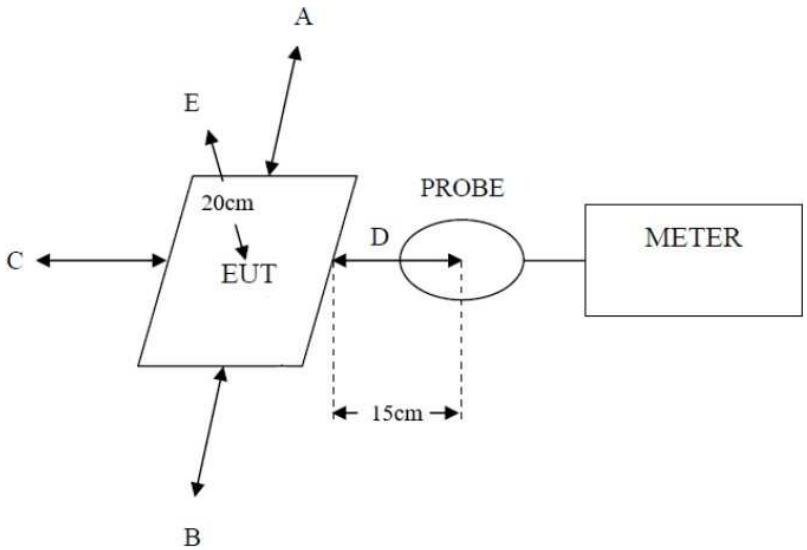
Test standard : CFR47 FCC Part 2: Subpart J Section 1.1310
FCC CFR 47 Part 1(1.1310) KDB 680106 D01 v03

According to the table 1 of FCC Part 2.1310, the reference limit as below:

Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm^2)	Averaging time (minutes)
(A) Limits for Occupational/Controlled Exposure				
0.3-3.0	614	1.63	*100	6
3.0-30	1842/f	4.89/f	$*900/f^2$	6
30-300	61.4	0.163	1.0	6
300-1,500			f/300	6
1,500-100,000			5	6
(B) Limits for General Population/Uncontrolled Exposure				
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	$*180/f^2$	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

f = frequency in MHz * = Plane-wave equivalent power density

Test Setup:



Test Result:

For base(110.5kHz-205kHz)

Table: H-Field Strength at 15 cm from the edges surrounding the EUT and 20cm from the top surface of the EUT

EUT Test Mode	Measured H-Field Strength Values (A/m)					50% Limit (A/m)	Limit (A/m)	Result
	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E			
Device working at the maximum power	0.1672	0.1731	0.1528	0.1650	0.1485	0.815	1.63	Pass

For apple iphone charger(360kHz)

Table: H-Field Strength at 15 cm from the edges surrounding the EUT and 20cm from the top surface of the EUT

EUT Test Mode	Measured H-Field Strength Values (A/m)					50% Limit (A/m)	Limit (A/m)	Result
	Test Position A	Test Position B	Test Position C	Test Position D	Test Position E			
Device working at the maximum power	0.2896	0.2696	0.2488	0.2632	0.2608	0.815	1.63	Pass

For an exposure waveform consisting of multiple frequencies, a test for compliance of exposure waveform shall satisfy the following criterion

EX:
base + apple iphone charger Max H-field
(base Max H-field (A/m) + apple watch charger Max H-field(A/m)) / Limit (A/m) = Max H-field
-> (0.1731 + 0.2896) / 1.63 = 0.2839 ≤ 1

RF Exposure				
Description	**Manufacturer**	**Model**	**Serial No.**	**Cal. Until**
H-Field Probe 100 cm2 SENSOR	narda	D-0010	BN 2300/90.10	2022-05-19
MAGNETIC FIELD HiTESTER ELT-400	narda	D-0009	BN 2304/03	2022-05-19

7 Photographs of the Test Set-Up

Refer to test photo document.

8 List of Tables