



TEST REPORT

Application No.: SHEM2104003314CR
FCC ID: 2A2EZVW30ACAP
Applicant: Delta Electronics, Inc.
Address of Applicant: No. 256, Yangguang Street, Neihu District, Taipei 114067, Taiwan
Manufacturer: Delta Electronics, Inc.
Address of Manufacturer: No. 256, Yangguang Street, Neihu District, Taipei 114067, Taiwan
Factory: Delta Electronics, Inc.
Address of Factory: 252, Shangying Road, Guishan District, Taoyuan City 333425, Taiwan
Equipment Under Test (EUT):
EUT Name: Wireless Charger Module
Model No.: PT00062426-B
Standard(s) : 47 CFR Part 18
Date of Receipt: 2021-04-23
Date of Test: 2021-04-26 to 2021-05-28
Date of Issue: 2021-08-10

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

Parlan Zhan

Parlan Zhan
E&E Section Manager

The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report. If the product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any mention of SGS International Electrical Approvals or testing done by SGS International Electrical Approvals in connection with, distribution or use of the product described in this report must be approved by SGS International Electrical Approvals in writing.



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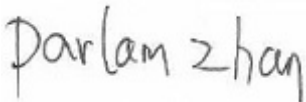
SGS-CSTC Standards Technical Services (Shanghai) Co., Ltd.
Testing Center EMC Lab (201612)

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Revision Record			
Version	Description	Date	Remark
00	Original	2021-06-30	/
01	Update	2021-08-10	Revise test mode.

Authorized for issue by:			
			
		Micheal Niu / Project Engineer	
			
		Parlam Zhan / Reviewer	



2 Test Summary

Emission Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 18	FCC OST/MP-5:1986	Class B	Pass
Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)	47 CFR Part 18	FCC OST/MP-5:1986	Class B	Pass



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4 General Information

4.1 Details of E.U.T.

Power supply: Input: DC 13.5V,2.4A by DC power supply
Output: DC 5V,6A
Wireless charging (Single):15W
Wireless charging (Dual):15W*2

Test voltage: AC 120V/60Hz

Operation frequency: 126.7KHz-128.7KHz

Antenna type: Inductive Loop Coil Antenna

4.2 Description of Support Units

Description	Manufacturer	Model No.
DC power supply	Agilent	E3632A
Load	/	/
Mobilephone	Apple	Iphone 12
Mobilephone	Huawei	P40

4.3 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.1dB (Below 1GHz)
		4.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%

Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.4 Test Location

All tests were performed at:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

No tests were sub-contracted.

4.5 Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

- **CNAS (No. CNAS L4354)**

CNAS has accredited Compliance Certification Services (Kunshan) Inc. to ISO/IEC 17025:2017 General Requirements for the Competence of Testing and Calibration Laboratories (CNAS-CL01 Accreditation Criteria for the Competence of Testing and Calibration Laboratories) for the competence in the field of testing.

- **A2LA (Certificate No. 2541.01)**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

- **FCC (Designation Number: CN1172)**

Compliance Certification Services Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

- **ISED (CAB identifier: CN0072)**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

CAB Identifier: CN0072.

- **VCCI (Member No.: 1938)**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-1600, C-1707, T-1499, G-10216 respectively.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

5 Equipment List

Conducted Emission at Mains Terminals (150kHz-30MHz)

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
1	Test Software	Farad	EZ-EMC	CCS-03A1	N.C.R	N.C.R
2	EMI Test Receive	R&S	ESCI	100781	02/01/2021	01/31/2022
3	LISN	R&S	ENV216	101604	10/19/2020	10/18/2021
4	LISN	Schwarzbeck	NNLK 8129	8129-143	10/19/2020	10/18/2021
5	Pulse Limiter	R&S	ESH3-Z2	100609	02/01/2021	01/31/2022
6	CE test Cable	Thermax		14	10/17/2020	10/16/2021

RF Conducted Test

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
1	Test Software	BST	TST PASS	V 1.1.0	N.C.R	N.C.R
2	Spectrum Analyzer	Agilent	E4446A	MY44020154	04/22/2021	04/21/2022
3	Spectrum Analyzer	Keysight	N9020A	MY53420174	09/25/2020	09/24/2021
4	Spectrum Analyzer	Keysight	N9020A	MY55370209	10/19/2020	10/18/2021
5	Signal Generator	Agilent	E8257C	MY43321570	10/18/2020	10/18/2021
6	MXG Vector Signal Generator	Agilent	N5182A	MY50142015	09/25/2020	09/24/2021
7	Universal Radio Communication Tester	R&S	CMU200	109525	10/19/2020	10/18/2021
8	Universal Radio Communication Tester	R&S	CMW500	159275	10/19/2020	10/18/2021
9	Power Meter	Anritsu	ML2495A	1445010	04/21/2021	04/20/2022
10	Switcher	CCSRF	FY562	KS301219	10/19/2020	10/18/2021
11	AC Power Source	EXTECH	6605	1570106	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	MY50340053	N.C.R	N.C.R
13	6dB Attenuator	Mini-Circuits	NAT-6-2W	15542-1	N.C.R	N.C.R
14	Power Divider	AISI	IOWOPE2068	PE2068	N.C.R	N.C.R
15	Filter	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
16	Conducted test cable	/	RF01-RF04	/	04/21/2020	04/22/2021
17	Temp. / Humidity Chamber	TERCHY	MHK-120AK	X30109	04/21/2020	04/20/2021

RF Radiated Test

Item	Equipment	Manufacturer	Model	Serial Number	Cal Date	Cal. Due Date
1	Test Software	Farad	EZ-EMC	CCS-03A1	N/A	N/A
2	Spectrum Analyzer	R&S	FSV40	101493	10/19/2020	10/18/2021
3	Signal Generator	Agilent	E8257C	MY43321570	10/10/2020	10/18/2021
4	Loop Antenna	COM-POWER	AL-130R	10160008	04/29/2019	04/28/2021
5	Loop Antenna	COM-POWER	AL-130R	10160008	04/29/2021	04/28/2023
6	Bilog Antenna	TESEQ	CBL 6112D	35403	06/22/2019	06/21/2021
7	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/29/2019	04/28/2021
8	Bilog Antenna	SCHWARZBECK	VULB9160	9160-3342	04/29/2021	04/28/2023
9	Horn-antenna(1-18GHz)	Schwarzbeck	BBHA9120D	267	10/26/2020	10/25/2022
10	Horn-antenna(1-18GHz)	ETS-LINDGREN	3117	00143290	02/22/2021	02/21/2023
11	Horn Antenna(18-40GHz)	Schwarzbeck	BBHA9170	BBHA9170171	02/22/2021	02/21/2024
12	Pre-Amplifier(30MHz~18GHz)	CCSRF	AMP1277	1	10/19/2020	10/18/2021
13	Pre-Amplifier(0.1~26.5GHz)	EMCI	EMC012645	980060	04/21/2020	04/20/2021
14	Pre-Amplifier(0.1~26.5GHz)	EMCI	EMC012645	980060	04/21/2021	04/20/2022



15	Low Pass Filter	MICRO-TRONICS	VLFX-950	RV142900829	N.C.R	N.C.R
16	High Pass Filter	Mini-Circuits	VHF-1200	15542	N.C.R	N.C.R
17	Filter (5450MHz~5770 MHz)	MICRO-TRONICS	BRC50704-01	2	N.C.R	N.C.R
18	Filter (5690 MHz~5930 MHz)	MICRO-TRONICS	BRC50705-01	4	N.C.R	N.C.R
19	Filter (5150 MHz~5350 MHz)	MICRO-TRONICS	BRC50703-01	2	N.C.R	N.C.R
20	Filter (885 MHz~915 MHz)	MICRO-TRONICS	BRM14698	1	N.C.R	N.C.R
21	Filter (815 MHz~860 MHz)	MICRO-TRONICS	BRM14697	1	N.C.R	N.C.R
22	Filter (1745 MHz~1910 MHz)	MICRO-TRONICS	BRM14700	1	N.C.R	N.C.R
23	Filter (1922 MHz~1977 MHz)	MICRO-TRONICS	BRM50715	1	N.C.R	N.C.R
24	Filter (2550 MHz)	MICRO-TRONICS	HPM13362	5	N.C.R	N.C.R
25	Filter (1532 MHz~1845 MHz)	MICRO-TRONICS	BRM50713	1	N.C.R	N.C.R
26	Filter (2.4GHz)	MICRO-TRONICS	BRM50701	5	N.C.R	N.C.R
27	RE test cable	/	RE01-RE04	/	04/21/2020	04/22/2021
28	RE test cable	/	RE01-RE04	/	04/21/2021	04/22/2022
29	Software	Fard technology co.,ltd	EZ-EMC	1.1.1.2	N/A	N/A

6 Emission Test Results

6.1 Conducted Emissions at Mains Terminals (150kHz-30MHz)

Test Requirement:	47 CFR Part 18
Test Method:	FCC OST/MP-5:1986
Frequency Range:	150kHz to 30MHz
Limit:	
0.15M-0.5MHz	66dB(μV)-56dB(μV) quasi-peak, 56dB(μV)-46dB(μV) average
0.5M-5MHz	56dB(μV) quasi-peak, 46dB(μV) average
5M-30MHz	60dB(μV) quasi-peak, 50dB(μV) average
Detector:	Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

6.1.1 E.U.T. Operation

Operating Environment:

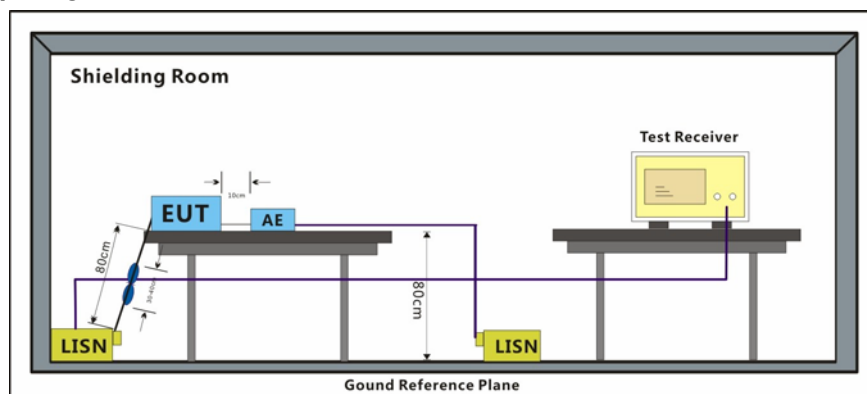
Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

Pre-test these modes to find the worst case:

- a: Left Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.
- b: Right Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.
- c: Dual Transfer Zones Charging_The load of each side shall be set at full/half/empty load (15W*2/7.5W*2/0W) respectively and simultaneous charging at same time.

The worst case for final test: c: Dual Transfer Zones Charging_The load of each side shall be set at full load (15W*2) respectively and simultaneous charging at same time.

6.1.2 Test Setup Diagram

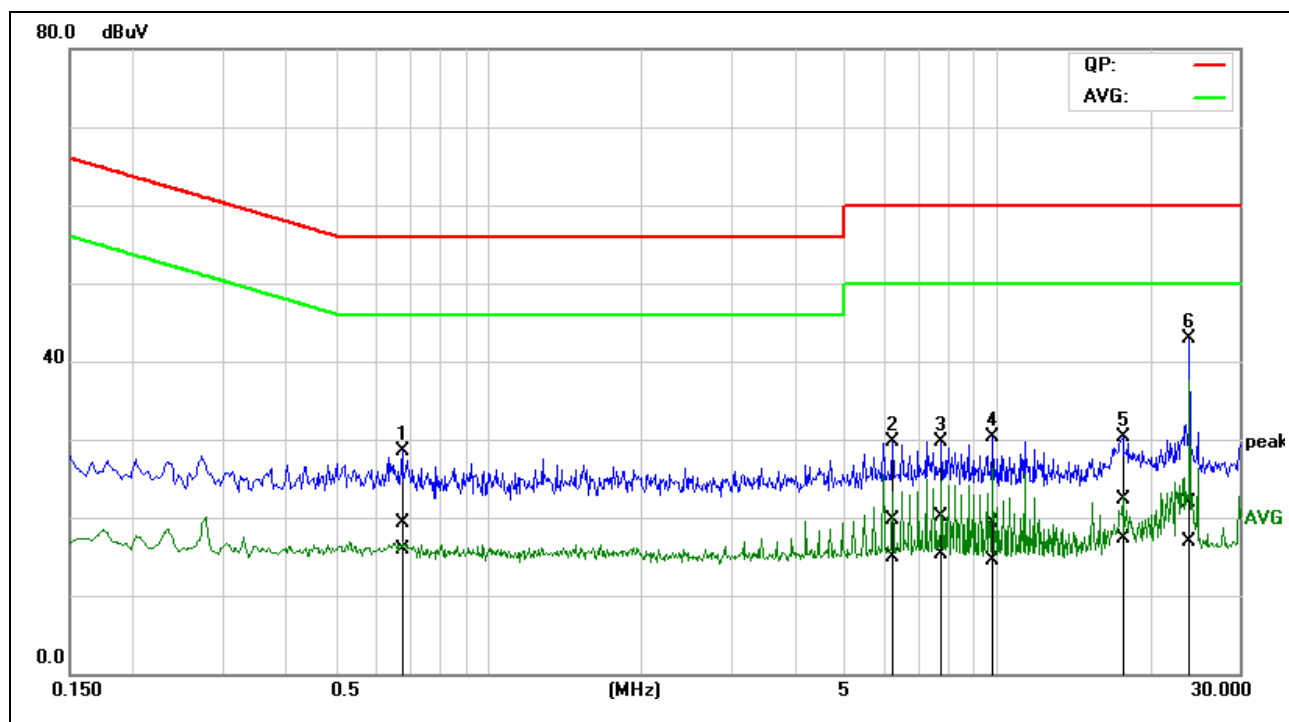


6.1.3 Measurement Data

An initial pre-scan was performed with peak detector. Quasi-Peak or Average measurement were performed at the frequencies with maximized peak emission were detected.

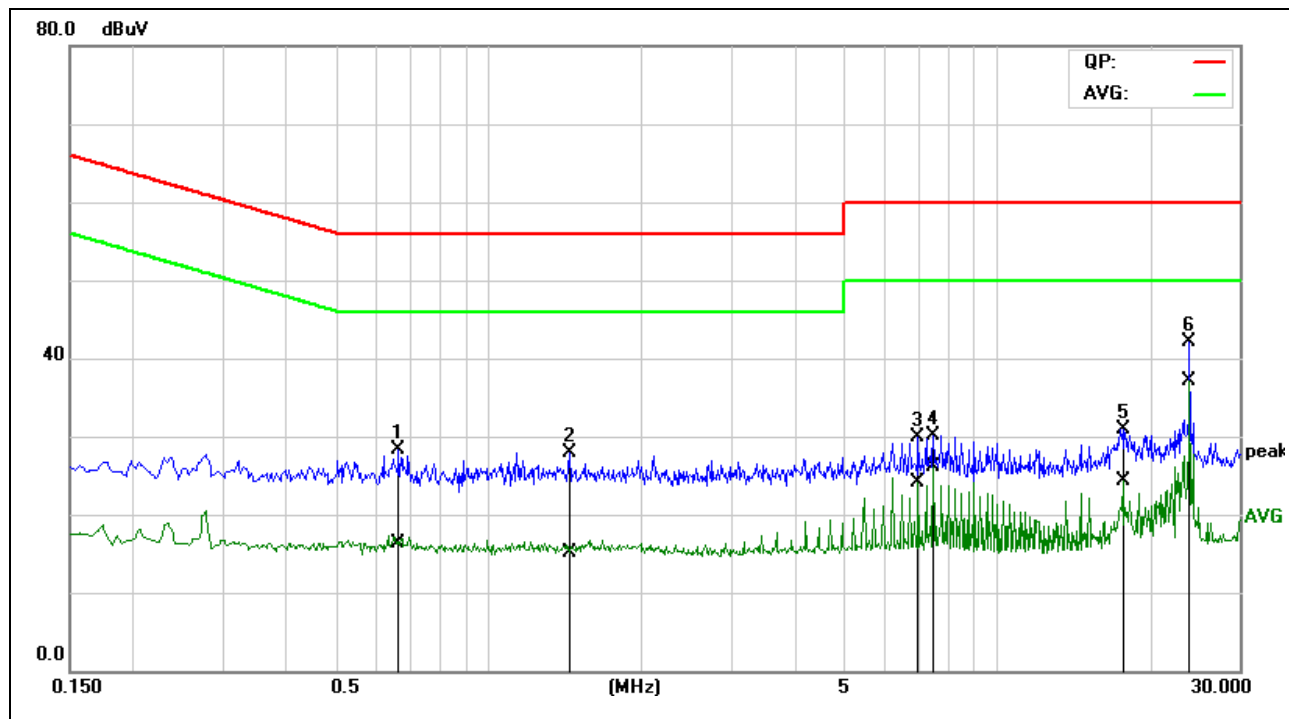
1. Result (dBuV) = Reading (dBuV) + Correction Factor (dB)
2. Correction Factor (dB) = LISN Factor (dB) + Cable Loss (dB)

Mode:c; Line:Live Line



No.	Frequency	QuasiPeak reading	Average reading	Corre ction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1*	0.6820	-0.27	-3.61	19.53	19.26	15.92	56.00	46.00	-36.74	-30.08
2	6.2668	-0.17	-4.85	19.82	19.65	14.97	60.00	50.00	-40.35	-35.03
3	7.7948	0.21	-4.53	19.89	20.10	15.36	60.00	50.00	-39.90	-34.64
4	9.8348	-0.76	-5.42	19.97	19.21	14.55	60.00	50.00	-40.79	-35.45
5	17.7184	2.17	-2.94	20.19	22.36	17.25	60.00	50.00	-37.64	-32.75
6	24.0266	1.50	-3.35	20.34	21.84	16.99	60.00	50.00	-38.16	-33.01

Mode:c; Line:Neutral Line



No.	Frequency	QuasiPeak reading	Average reading	Corre ction factor	QuasiPeak result	Average result	QuasiPeak limit	Average limit	QuasiPeak margin	Average margin
	(MHz)	(dBuV)	(dBuV)	(dB)	(dBuV)	(dBuV)	(dBuV)	(dBuV)	(dB)	(dB)
1	0.6708	-0.66	-3.59	19.52	18.86	15.93	56.00	46.00	-37.14	-30.07
2	1.4668	-1.49	-4.34	19.55	18.06	15.21	56.00	46.00	-37.94	-30.79
3	7.0308	-0.22	-4.85	19.84	19.62	14.99	60.00	50.00	-40.38	-35.01
4	7.5426	0.16	-4.59	19.86	20.02	15.27	60.00	50.00	-39.98	-34.73
5	17.7184	2.48	-2.60	20.18	22.66	17.58	60.00	50.00	-37.34	-32.42
6	24.0268	1.59	-3.35	20.34	21.93	16.99	60.00	50.00	-38.07	-33.01

6.2 Radiated Emissions (Magnetic field Strength) (9kHz-30MHz)

Test Requirement: 47 CFR Part 18

Test Method: FCC OST/MP-5:1986

Frequency Range: 9kHz to 30MHz

Measurement Distance: 3m

Limit:

Equipment	Operating frequency	RF Power generated by equipment (watts)	Field strength limit (μV/m)	Distance (meters)
Any type unless otherwise specified (miscellaneous)	Any frequency non-ISM	Below 500 500 or more	15 $15 \times \sqrt{\text{power}/500}$	300 300

¹Field strength may not exceed 10 μV/m at 1600 meters. Consumer equipment operating below 1000 MHz is not permitted the increase in field strength otherwise permitted here for power over 500 watts.

Frequency band in which device operates (MHz)	Range of frequency measurements	
	Lowest frequency	Highest frequency
Below 1.705	Lowest frequency generated in the device, but not lower than 9 kHz	30 MHz.
1.705 to 30	Lowest frequency generated in the device, but not lower than 9 kHz	400 MHz.
30 to 500	Lowest frequency generated in the device or 25 MHz, whichever is lower	Tenth harmonic or 1,000 MHz, whichever is higher.
500 to 1,000	Lowest frequency generated in the device or 100 MHz, whichever is lower	Tenth harmonic.

6.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24 °C Humidity: 48 % RH Atmospheric Pressure: 1010 mbar

Pre-test these modes to find the worst case:

a: Left Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.

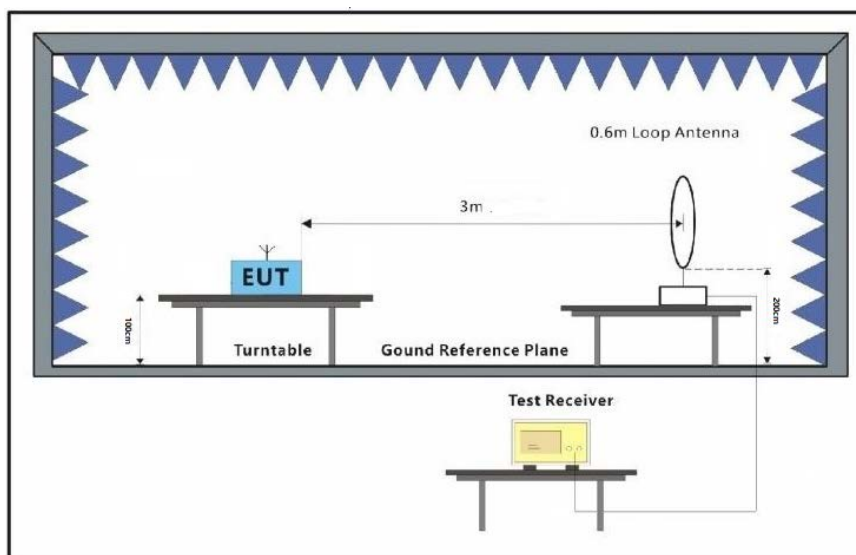
b: Right Transfer Zone Charging_The load shall be set at full/half/empty load (15W/7.5W/0W) respectively.

c: Dual Transfer Zones Charging_The load of each side shall be set at full/half/empty load (15W*2/7.5W*2/0W) respectively and simultaneous charging at same time.

The worst case for final test:

c: Dual Transfer Zones Charging_The load of each side shall be set at full load (15W*2) respectively and simultaneous charging at same time.

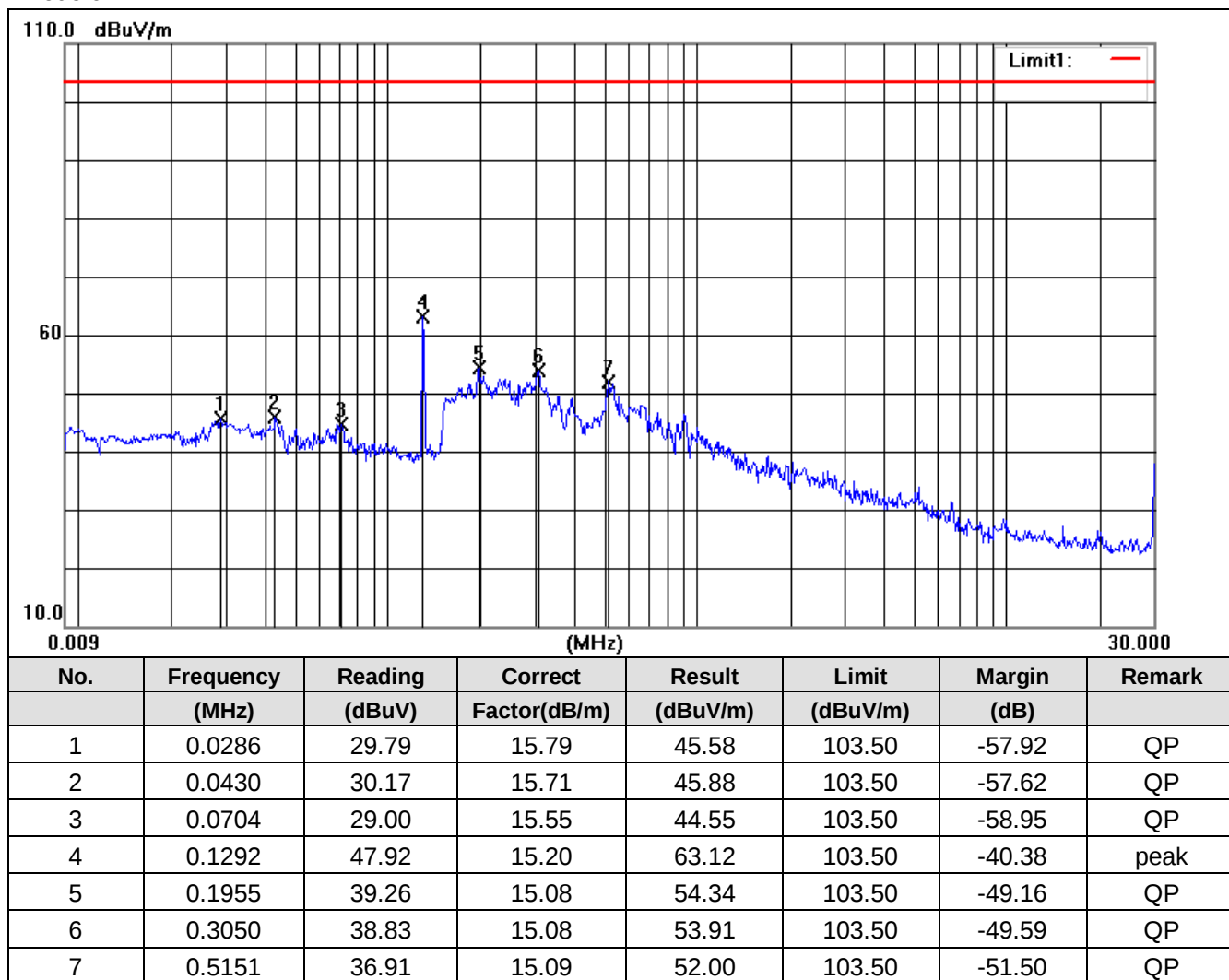
6.2.2 Test Setup Diagram



6.2.3 Measurement Data

An initial pre-scan was performed in the chamber using the spectrum analyser in peak detection mode. Quasi-peak measurements were conducted based on the peak sweep graph. The EUT was measured by BiConiLog antenna with 2 orthogonal polarities.

Mode c





7 Test Setup Photographs

Refer to the < Test Setup photos-FCC>.

8 EUT Constructional Details

Refer to the < External Photos > & < Internal Photos >.

- End of the Report -