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Report Template Version: V05

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Website: www.cga-cert.com Report Template Revision Date: 2021-11-03

Test Report

Report No.: CQASZ20230600958E-01

Applicant: Shenzhen Itian Technology Co.,LTD

Address of Applicant: 6F, Building D, Phase 2nd, Anfeng Industrial Park, Dalang Street, Longhua

District, Shenzhen, China

Equipment Under Test (EUT):

Product: 3 in 1 MagSafe Charger

Model No.: V16,AB-005

Test Model No.: V16
Brand Name: ITIAN

FCC ID: 2AUDO-V16

Standards: 47 CFR Part 15, Subpart C

Date of Receipt: 2023-6-1

Date of Test: 2023-6-1 to 2023-6-8

Date of Issue: 2023-6-26
Test Result: PASS*

*In the configuration tested, the EUT complied with the standards specified above

Tested By:

(Joe Wang)

Reviewed By:

(Timo Lei)

Approved By: (Jack Ai)







1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20230600958E-01	Rev.01	Initial report	2023-6-26



Report No.: CQASZ20230600958E-01

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
20dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.215	ANSI C63.10 2013	PASS
Radiated Emission , Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.209	ANSI C63.10 2013	PASS



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Report No.: CQASZ20230600958E-01

4 General Information

4.1 Client Information

Applicant:	Shenzhen Itian Technology Co.,LTD
Address of Applicant:	6F, Building D, Phase 2nd, Anfeng Industrial Park, Dalang Street, Longhua
	District, Shenzhen, China
Manufacturer:	Shenzhen Itian Technology Co.,LTD
Address of Manufacturer:	6F, Building D, Phase 2nd, Anfeng Industrial Park, Dalang Street, Longhua
	District, Shenzhen, China
Factory:	Shenzhen Itian Technology Co.,LTD
Address of Factory:	6F, Building D, Phase 2nd, Anfeng Industrial Park, Dalang Street, Longhua
	District, Shenzhen, China

4.2 General Description of EUT

Product Name:	3 in 1 MagSafe Charger
Model No.:	V16,AB-005
Test Model No.:	V16
Brand Name:	ITIAN
Software Version:	V16-1024-V1
Hardware Version:	V16-1024-V12
Power Supply:	DC 5V-2A / 9V-2A

4.3 Product Specification subjective to this standard

Equipment Category:	Non-ISM frequency
Operation Frequency range:	110kHz~205kHz
Modulation Type:	ASK
Antenna Type:	Induction coil
Antenna Gain:	0dBi
Power:	Output: 15W(Max)

Note:

Only the model V16 was tested, since the circuit design, layout, components used and internal wiring are all the same, except for the color difference.

^{1.} In section 15.31(m), regards to the operating frequency range less 1 MHz.

^{2.}Model No.:V16,AB-005



4.4 Test Environment

Operating Environment	
Radiated Emissions:	
Temperature:	25.5 °C
Humidity:	53 % RH
Atmospheric Pressure:	1009 mbar
Conducted Emissions:	
Temperature:	25.5 °C
Humidity:	55 % RH
Atmospheric Pressure:	1009 mbar
Radio conducted item to	est (RF Conducted test room):
Temperature:	27.1 °C
Humidity:	56 % RH
Atmospheric Pressure:	1009 mbar
Test Mode:	
Mode a:	Wireless output Mode at 15W (Max)
Mode b:	Wireless output Mode at 5W (Max)
Mode c:	Wireless output Mode at 3W (Max)
Mode d:	Wireless total output Mode at 23W (Max)

4.5 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by
Adapter	1	LPL-C010050200Z	1	CQA
Wireless charge load	1	1	1	CQA
Apple Watch	Apple	1	1	CQA
Air Pods	Apple	1	1	CQA

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
1	1	1	1	1



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4.6 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 "Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements" and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	5.12dB	(1)
2	Radiated Emission (Above 1GHz)	4.60dB	(1)
3	Occupied Bandwidth	1.1%	(1)
4	Temperature test	0.8℃	(1)
5	Humidity test	2.0%	(1)

⁽¹⁾This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.

4.7 Test Location

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

4.8 Test Facility

A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.9 Deviation from Standards

None.

4.10 Other Information Requested by the Customer

None.





4.11 Equipment List

Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2022/9/9	2023/9/8
Spectrum analyzer	R&S	FSU26	CQA-038	2022/9/9	2023/9/8
Preamplifier	MITEQ	AMF-6D-02001800-29- 20P	CQA-036	2022/9/9	2023/9/8
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/9/16	2024/9/15
Bilog Antenna	R&S	HL562	CQA-011	2021/9/16	2024/9/15
Horn Antenna	R&S	HF906	CQA-012	2021/9/16	2024/9/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/9/16	2024/9/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2022/9/9	2023/9/8
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2022/9/9	2023/9/8
Antenna Connector	CQA	RFC-01	CQA-080	2022/9/9	2023/9/8
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2022/9/9	2023/9/8
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2022/9/9	2023/9/8
EMI Test Receiver	R&S	ESR7	CQA-005	2022/9/9	2023/9/8
LISN	R&S	ENV216	CQA-003	2022/9/9	2023/9/8
Coaxial cable	CQA	N/A	CQA-C009	2022/9/9	2023/9/8
DC power	KEYSIGHT	E3631A	CQA-028	2022/9/9	2023/9/8





5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement: 47 CFR Part 15C Section 15.203

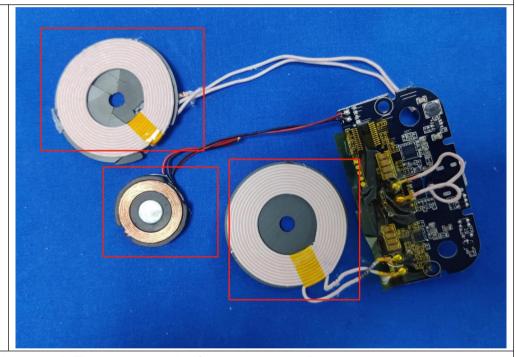
15.203 requirement:

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. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:



The antenna is Induction coil. The best case gain of the antenna is 0dBi.





5.2 Conducted Emissions

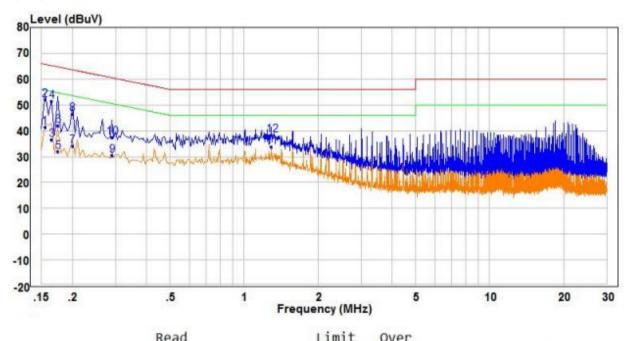
ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between	To at Daniel and and	47 OFD David 450 October 45 (207			
Test Frequency Range: Limit: Frequency range (MHz)	·		207			
Limit: Frequency range (MHz)						
Frequency range (MHz)						
Quasi-peak	Limit:	Frequency range (MHz)	Limit (c	dBuV)		
1 Decreases with the logarithm of the frequency. 1 Test Procedure: 1 Test Procedure: 1 The mains terminal disturbance voltage test was conducted in a shielded room. 2 The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3 The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.			Quasi-peak	Average		
Test Procedure: 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 500/30µH + 50 linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane test and bonded to a ground reference plane or LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		0.15-0.5	66 to 56*	56 to 46*		
*Decreases with the logarithm of the frequency. 1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		0.5-5	56	46		
1) The mains terminal disturbance voltage test was conducted in a shielded room. 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50μH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The ISN1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.		5-30	60	50		
 7 The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50Ω/50µH + 5Ω linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. 		* Decreases with the logarithn	n of the frequency.			
impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded. 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane to the horizontal ground reference plane to the object of the LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.	rest Procedure.	room. 2) The EUT was connected	to AC power source	through a LISN 1 (Line	
ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane. 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. Test Setup:		impedance. The power connected to a second LIS plane in the same way a multiple socket outlet strip	cables of all other SN 2, which was bonde as the LISN 1 for the was used to connect r	units of the EUT verted to the ground reference unit being measured multiple power cables	were ence d. A	
the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2. 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. Test Setup:		3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.				
and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement. Test Setup: Shielding Room Test Receiver		4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.				
ANSI C63.10: 2013 on conducted measurement. Test Setup: Shielding Room Test Receiver					nent	
Test Setup: Shielding Room Test Receiver LISN2 AC Mains			-	•		
Shielding Room Test Receiver LISN2 AC Mains	Test Setup:				1	
	. John Golden	AC Mains	USN2 → AC Ma			
Test Results: Pass	Test Results:	Pass				

Measurement Data

The worst case:

Mode a:

Live line:



		Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
	-	MHZ	dBuV	dB	dBuV	dBuV	dB		
1		0.155	31.78	9.49	41.27	55.73	-14.46	Average	Line
2	QP	0.155	42.58	9.49	52.07	65.73	-13.66	QP	Line
3		0.165	27.20	9.49	36.69	55.21	-18.52	Average	Line
4 5		0.165	41.99	9.49	51.48	65.21	-13.73	QP	Line
5		0.175	22.55	9.49	32.04	54.72	-22.68	Average	Line
6		0.175	32.58	9.49	42.07	64.72	-22.65	QP	Line
7		0.200	24.48	9.49	33.97	53.61	-19.64	Average	Line
8		0.200	37.16	9.49	46.65	63.61	-16.96	QP	Line
9		0.290	20.87	9.49	30.36	50.52	-20.16	Average	Line
10		0.290	28.10	9.49	37.59	60.52	-22.93	QP	Line
11	PP	1.295	24.44	9.52	33.96	46.00	-12.04	Average	Line
12		1.295	28.78	9.52	38.30	56.00	-17.70	QP	Line

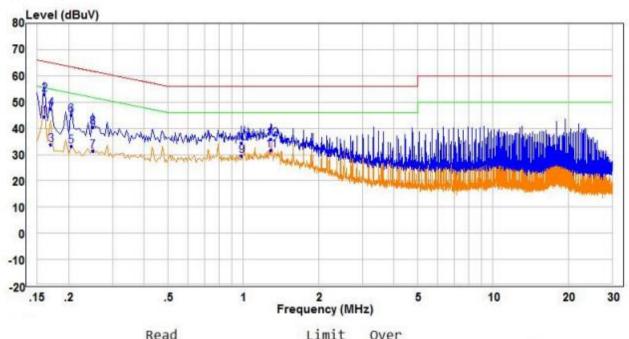
- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



The worst case:

Mode a:

Neutral line:



	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
_	MHz	dBuV	——dB	dBuV	dBuV	dB		
1 PP	0.160	34.79	9.68	44.47	55.46	-10.99	Average	Neutral
2 QP	0.160	43.36	9.68	53.04	65.46	-12.42	QP	Neutral
3	0.170	24.20	9.66	33.86	54.96	-21.10	Average	Neutral
4	0.170	37.77	9.66	47.43	64.96	-17.53	QP	Neutral
4 5 6	0.205	23.63	9.60	33.23	53.41	-20.18	Average	Neutral
6	0.205	35.47	9.60	45.07	63.41	-18.34	QP	Neutral
7	0.250	21.83	9.54	31.37	51.76	-20.39	Average	Neutral
8	0.250	30.93	9.54	40.47	61.76	-21.29	QP	Neutral
9	0.985	19.71	9.71	29.42	46.00	-16.58	Average	Neutral
10	0.985	24.73	9.71	34.44	56.00	-21.56	QP	Neutral
11	1.295	22.04	9.71	31.75	46.00	-14.25	Average	Neutral
12	1.295	26.28	9.71	35.99	56.00	-20.01	QP	Neutral

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.

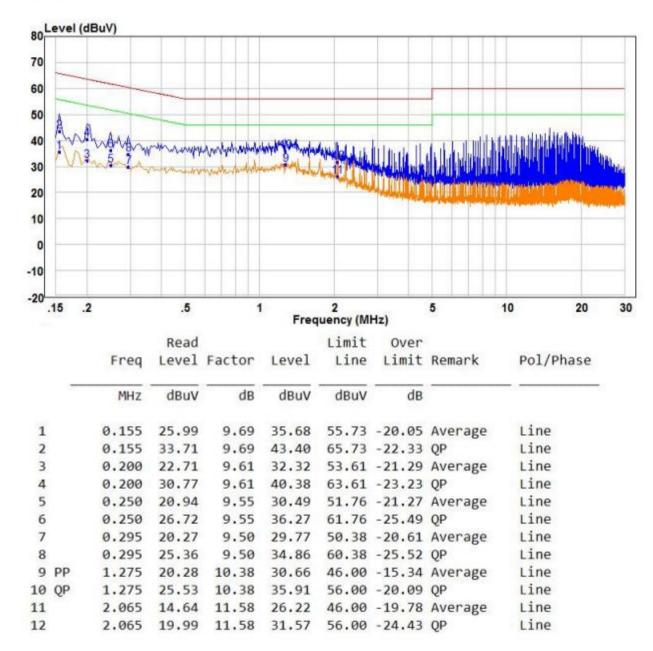




The worst case:

Mode d:

Live line:

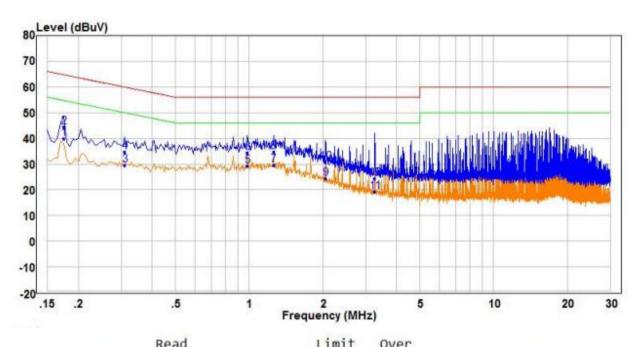


- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.

The worst case:

Mode d:

Neutral line:

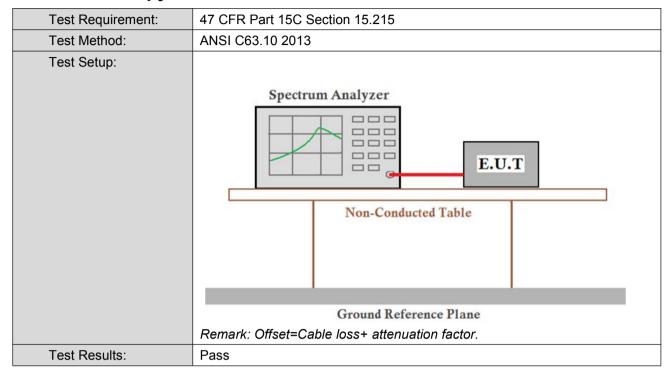


		Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
		MHz	dBuV	dB	dBuV	dBuV	dB		
1	PP	0.175	30.12	9.65	39.77	54.72	-14.95	Average	Neutral
2	QP	0.175	34.66	9.65	44.31	64.72	-20.41	QP	Neutral
3		0.310	20.09	9.49	29.58	49.97	-20.39	Average	Neutral
4		0.310	25.20	9.49	34.69	59.97	-25.28	QP	Neutral
5		0.985	19.57	9.71	29.28	46.00	-16.72	Average	Neutral
6		0.985	24.70	9.71	34.41	56.00	-21.59	QP	Neutral
7		1.260	19.90	9.71	29.61	46.00	-16.39	Average	Neutral
8		1.260	25.13	9.71	34.84	56.00	-21.16	QP	Neutral
9		2.055	14.58	9.75	24.33	46.00	-21.67	Average	Neutral
10		2.055	20.98	9.75	30.73	56.00	-25.27	QP	Neutral
11		3.265	9.47	9.77	19.24	46.00	-26.76	Average	Neutral
12		3.265	14.61	9.77	24.38	56.00	-31.62	QP	Neutral

- 1. The following Quasi-Peak and Average measurements were performed on the EUT:
- 2. Final Test Level =Receiver Reading + LISN Factor + Cable Loss.
- 3. If the Peak value under Average limit, the Average value is not recorded in the report.



5.3 20dB Occupy Bandwidth



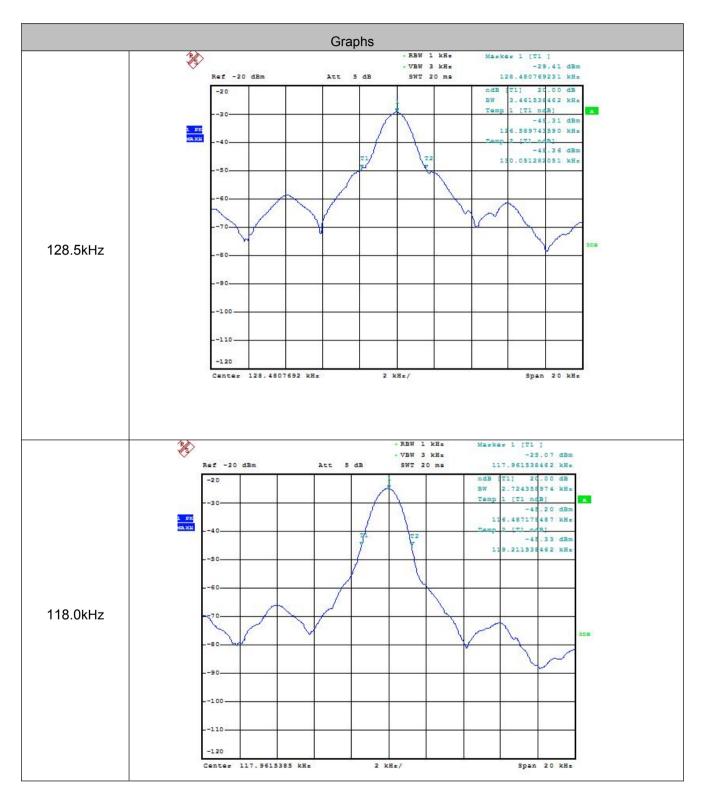
Measurement Data

	Mode a	
Test Frequency (kHz)	20dB Occupy Bandwidth (Hz)	Result
128.5	3462	Pass

Mode d					
Test Frequency (kHz)	20dB Occupy Bandwidth (Hz)	Result			
118.0	2724	Pass			



Test plot as follows:





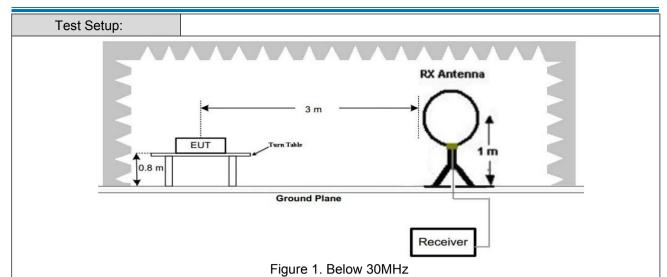


5.4 Radiated Spurious Emission & Restricted bands

5.4.1 Spurious Emissions									
Test Requirement:	47 CFR Part 15C Section 15.209 and 15.205								
Test Method:	ANSI C63.10 2013								
Test Site:	Measurement Distance: 3m (Semi-Anechoic Chamber)								
Receiver Setup:	Frequency		Detector	RBW		VBW	Remark		
	0.009MHz-0.090MH	z	Peak	10kHz	z	30kHz	Peak		
	0.009MHz-0.090MH	z	Average	10kHz	<u>z</u>	30kHz	Average		
	0.090MHz-0.110MH	z	Quasi-peak	10kHz	<u>z</u>	30kHz	Quasi-peak		
	0.110MHz-0.490MH	z	Peak	10kHz	2	30kHz	Peak		
	0.110MHz-0.490MH	z	Average	10kHz	<u>z</u>	30kHz	Average		
	0.490MHz -30MHz		Quasi-peak	10kHz	2	30kHz	Quasi-peak		
	30MHz-1GHz		Quasi-peak	100 kH	lz (300kHz	Quasi-peak		
	Above 1GHz		Peak	1MHz	<u>-</u>	3MHz	Peak		
			Peak	1MHz	<u>:</u>	10Hz	Average		
Limit:	Frequency		eld strength crovolt/meter)	Limit (dBuV/m)	R	Remark	Measuremer distance (m		
	0.009MHz-0.490MHz	2	400/F(kHz)	-		-	300		
	0.490MHz-1.705MHz	24	1000/F(kHz)	-		-	30		
	1.705MHz-30MHz		30	-		-	30		
	30MHz-88MHz		100	40.0	40.0 Quasi-pea		3		
	88MHz-216MHz		150	43.5	43.5 Quasi-p		3		
	216MHz-960MHz		200	46.0	Qua	asi-peak	3		
	960MHz-1GHz		500	54.0	Qua	asi-peak	3		
	Above 1GHz		500	54.0	A	verage	3		
	Note: 15.35(b), Unless otherwise specified, the limit on peak radio frequency emissions is 20dB above the maximum permitted average emission limit applicable to the equipment under test. This peak limit applies to the total peak emission level radiated by the device.								



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Antenna Tower

Antenna Tower

Ground Reference Plane

Ground Reference Plane

Controller

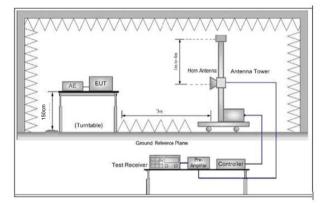


Figure 2. 30MHz to 1GHz

Figure 3. Above 1 GHz

Test Procedure:

- a. 1) Below 1G: The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.
 - 2) Above 1G: The EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter semi-anechoic camber. The table was rotated 360 degrees to determine the position of the highest radiation.

Note: For the radiated emission test above 1GHz:

Place the measurement antenna away from each area of the EUT determined to be a source of emissions at the specified measurement distance, while keeping the measurement antenna aimed at the source of emissions at each frequency of significant emissions, with polarization oriented for maximum response. The measurement antenna may have to be higher or lower than the EUT, depending on the radiation pattern of the emission and staying aimed at the emission source for receiving the maximum signal. The final measurement antenna elevation shall be that which maximizes the emissions. The measurement antenna elevation for maximum emissions shall be restricted to a range of heights of from 1 m to 4 m above the ground or reference ground plane.

- 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 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



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	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 (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
	e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
	f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.
	g. Repeat above procedures until all frequencies measured was complete.
Test Results:	Pass

Radiated Emission below 9k~30MHz			
the worst case			
Test mode:	Mode a		

Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) Peak	Limit dB(uV/m) Average	Margin dB	Pass/Fail
0.1285	Face	38.96	19.63	58.59	105.43	-46.84	Pass
0.1285	Side	40.56	19.63	60.19	105.43	-45.24	Pass

Radiated Emission below 9k~30MHz			
the worst case			
Test mode:	Mode d		

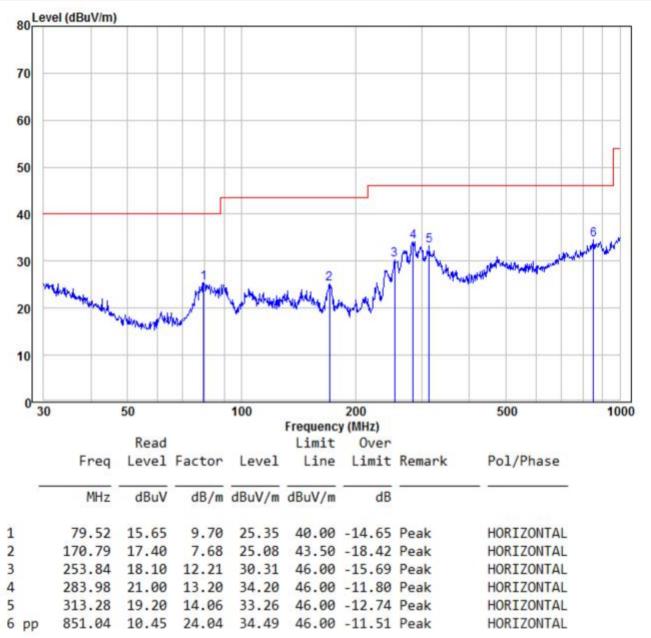
Frequency MHz	Polarization	Reading dB(uV)	Factor dB (1/m)	Level dB(uV/m) Peak	Limit dB(uV/m) Average	Margin dB	Pass/Fail
0.118	Face	40.12	19.63	59.75	106.17	-46.42	Pass
0.118	Side	41.94	19.63	61.57	106.17	-44.60	Pass

Note: No other emissions found between lowest internal used/generated frequencies to 30MHz. The peak level of the emission is less than the average limit, so the average level shall be less than 1 the limit without test.









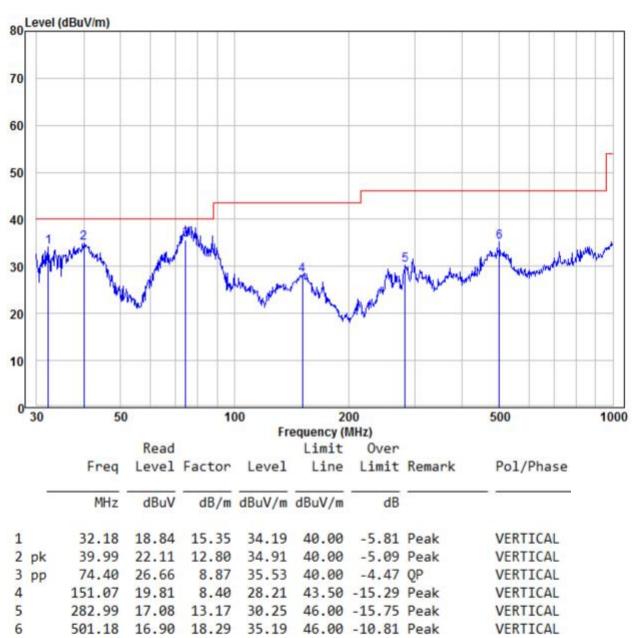
Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:



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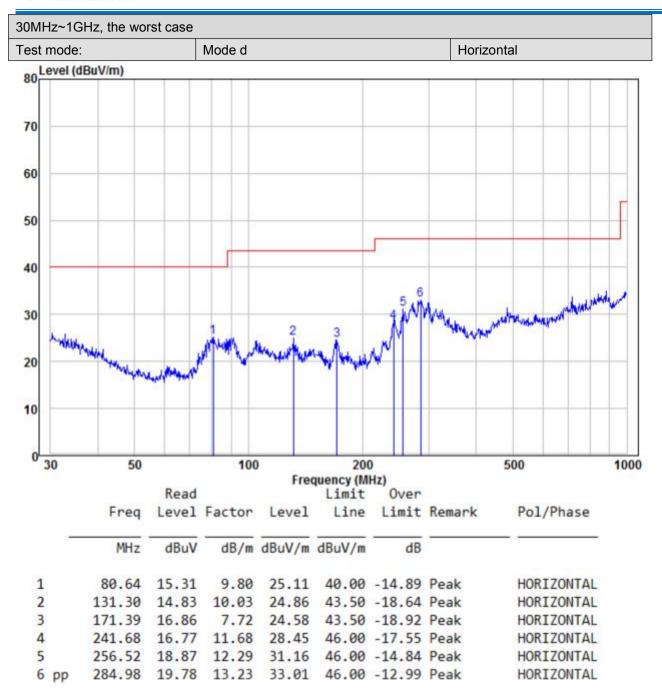


Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:



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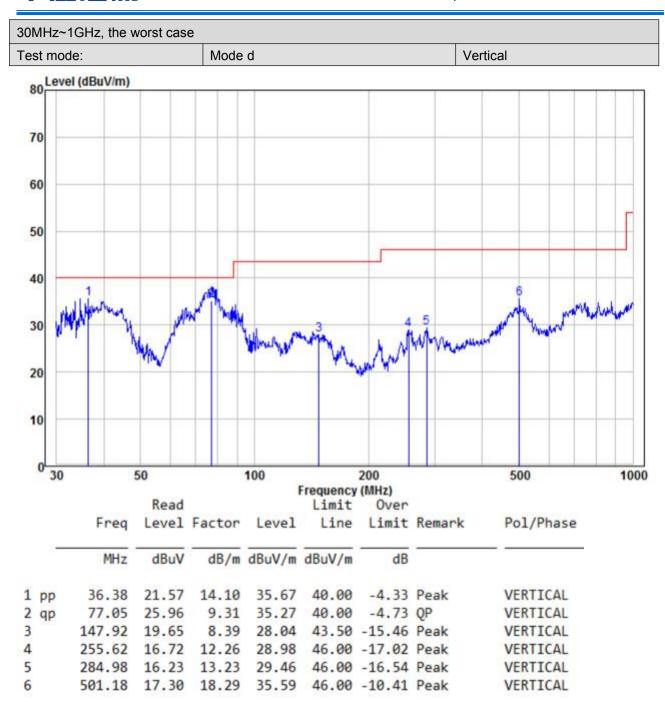


Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:



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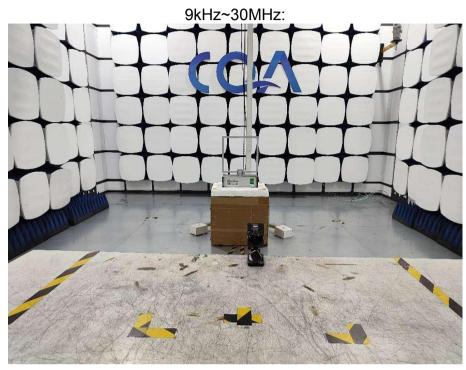


Remark:

The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

6 Photographs - EUT Test Setup

6.1 Radiated Emission









6.2 Conducted Emission



7 Photographs - EUT Constructional Details

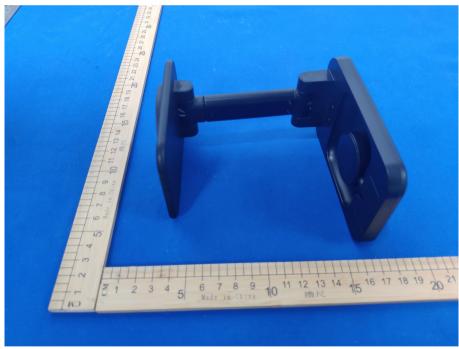














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