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Report Template Version: V05

# **Test Report**

Report No.: CQASZ20240601097E-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:** lce Cooling Car Charger

Model No.: S21, S22, S23, S24, S26, WQI200, CWC06, TZ-S21, AB-011

Test Model No.: S21

Brand Name: ITIAN

FCC ID: 2AUDO-S21S23

Standards: 47 CFR Part 15, Subpart C

**Date of Receipt:** 2024-6-18

**Date of Test:** 2024-6-18 to 2024-7-8

Date of Issue: 2024-7-18
Test Result: PASS\*

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

Tested By:

( 111 1 3

Reviewed By:

( Timo Lei )

Approved By:

( Alex Wang )







## 1 Version

## **Revision History Of Report**

Report No.	Version	Description	Issue Date
CQASZ20240601097E-01	Rev.01	Initial report	2024-7-18



Report No.: CQASZ20240601097E-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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### 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:	Ice Cooling Car Charger
Model No.:	S21, S22, S23, S24, S26, WQI200, CWC06, TZ-S21, AB-011
Test Model No.:	S21
Brand Name:	ITIAN
Software Version:	V1.0
Hardware Version:	V1.0
Power Supply:	DC 5V = 3A, 9V = 3A, 12V = 2.5A

## 4.3 Product Specification subjective to this standard

Equipment Category:	Non-ISM frequency
Operation Frequency range:	115kHz~205kHz,360KHz
Modulation Type:	Induction
Antenna Type:	Induction coil
Antenna Gain:	0dBi
Power:	Output: 15W(Max)

#### Note:

2.the circuit design, layout, components used and internal wiring are all the same, except for the color difference.

<sup>1.</sup> In section 15.31(m), regards to the operating frequency range less 1 MHz.



### 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:	53 % RH
Atmospheric Pressure:	1009 mbar
Radio conducted item t	est (RF Conducted test room):
Temperature:	22.8 °C
Humidity:	49 % RH
Atmospheric Pressure:	1009 mbar
Test Mode:	
Mode a:	Keep the EUT Wireless Out Put for Wireless charge load 5W
Mode b:	Keep the EUT Wireless Out Put for Wireless charge load 7.5W
Mode c:	Keep the EUT Wireless Out Put for Wireless charge load 10W
Mode d:	Keep the EUT Wireless Out Put for Wireless charge load 15W (Max)
Note: The above test modes all reflected in this report is the full	include full load,empty load,and half load, The worst-case state y loaded state

## 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	/	LPL-C010050200Z	/	CQA
Wireless charge load	1	1	1	CQA

### 2) Cable

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





### 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)

<sup>(1)</sup>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	2023/9/8	2024/9/7
Spectrum analyzer	R&S	FSU26	CQA-038	2023/9/8	2024/9/7
Preamplifier	MITEQ	AMF-6D-02001800-29- 20P	CQA-036	2023/9/8	2024/9/7
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	2023/9/8	2024/9/7
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2023/9/8	2024/9/7
Antenna Connector	CQA	RFC-01	CQA-080	2023/9/8	2024/9/7
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2023/9/8	2024/9/7
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2023/9/8	2024/9/7
EMI Test Receiver	R&S	ESR7	CQA-005	2023/9/8	2024/9/7
LISN	R&S	ENV216	CQA-003	2023/9/8	2024/9/7
Coaxial cable	CQA	N/A	CQA-C009	2023/9/8	2024/9/7
DC power	KEYSIGHT	E3631A	CQA-028	2023/9/8	2024/9/7





### 5 Test results and Measurement Data

### 5.1 Antenna Requirement

**Standard requirement:** 47 CFR Part 15C Section 15.203

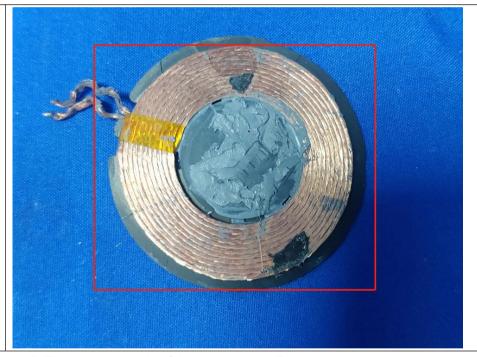
15.203 requirement:

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.



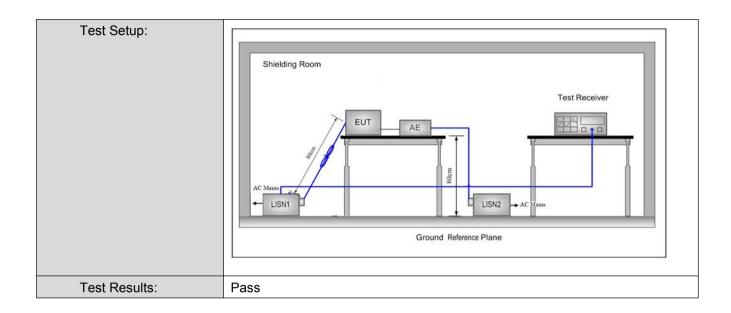
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## 5.2 Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.207				
Test Method:	ANSI C63.10: 2013				
Test Frequency Range:	150kHz to 30MHz				
Limit:	Frequency range (MHz)	Limit (c	lBuV)		
	Frequency range (IVII IZ)	Quasi-peak	Average		
	0.15-0.5	66 to 56*	56 to 46*		
	0.5-5	56	46		
	5-30	60	50		
	* Decreases with the logarithn	n of the frequency.		•	
Test Procedure:	The mains terminal disturt room.	bance voltage test was	s conducted in a shie	elded	
	2) The EUT was connected to	AC power source thro	ough a LISN 1 (Line		
	Impedance Stabilization N	etwork) which provides	s a 50Ω/50μH + 5Ω lin	near	
	impedance. The power cal	bles of all other units of	f the EUT were		
	connected to a second LIS	SN 2, which was bonde	d 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 Li exceeded.	ISN provided the rating	of the LISN was not	r	
	The tabletop EUT was place.	ced upon a non-metalli	c table 0.8m above th	he	
	ground reference plane. A	•			
	placed on the horizontal gr	ound reference plane,			
	4) The test was performed wi	th a vertical ground ref	erence plane. The re	ar	
	of the EUT shall be 0.4 m	from the vertical ground	d reference plane. Th	ne	
	vertical ground reference p		•		
	reference plane. The LISN	•	-	he	
	unit under test and bonded	<u> </u>	•		
	mounted on top of the grou	·			
	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				
		• •		۷.	
	5) In order to find the maximum		•	to	
	equipment and all of the interface cables must be changed according to ANSI C63.10: 2013 on conducted measurement.				
	, 1101 000.10. 2010 011 001	idabled incasurement.			



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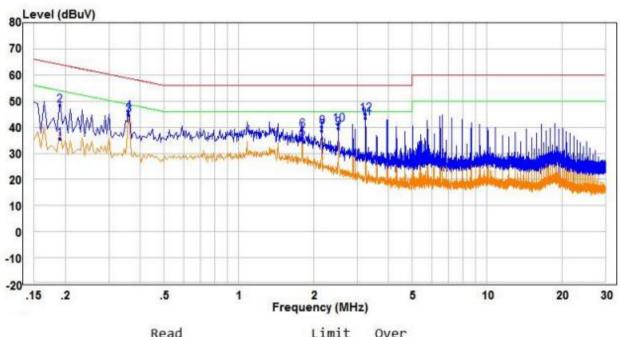


#### **Measurement Data**

The worst case:

Mode d:

Live line:



		Read			LIMIT	over		
	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
-	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.190	25.87	9.63	35.50	54.04	-18.54	Average	Line
2	0.190	38.72	9.63	48.35	64.04	-15.69	QP	Line
3	0.360	35.09	9.56	44.65	48.73	-4.08	Average	Line
4	0.360	36.41	9.56	45.97	58.73	-12.76	QP	Line
	1.800	24.24	11.35	35.59	46.00	-10.41	Average	Line
6	1.800	27.70	11.35	39.05	56.00	-16.95	QP	Line
7	2.160	27.14	11.49	38.63	46.00	-7.37	Average	Line
8	2.160	28.70	11.49	40.19	56.00	-15.81	QP	Line
9	2.520	28.38	11.16	39.54	46.00	-6.46	Average	Line
10	2.520	30.08	11.16	41.24	56.00	-14.76	QP	Line
11 PP	3.245	32.77	10.62	43.39	46.00	-2.61	Average	Line
12 QP	3.245	34.33	10.62	44.95	56.00	-11.05	QP	Line

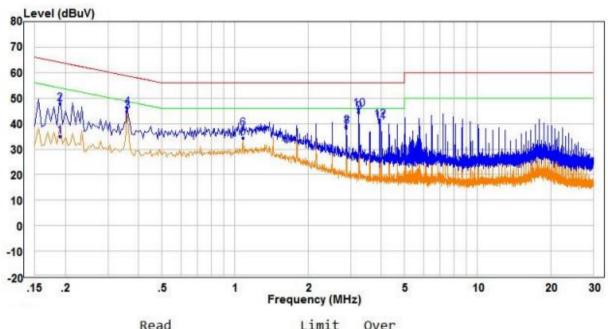
#### Remark:

- 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:



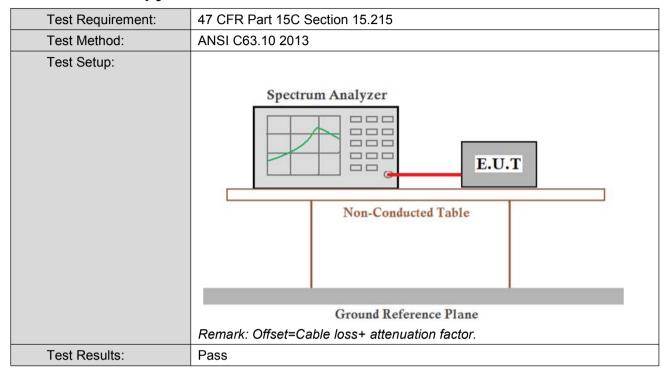
	Freq	Level	Factor	Level	Line	Limit	Remark	Pol/Phase
_	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.190	25.34	9.62	34.96	54.04	-19.08	Average	Neutral
2	0.190	38.19	9.62	47.81	64.04	-16.23	QP	Neutral
3	0.360	35.14	9.56	44.70	48.73	-4.03	Average	Neutral
4	0.360	36.60	9.56	46.16	58.73	-12.57	QP	Neutral
5	1.080	24.66	9.70	34.36	46.00	-11.64	Average	Neutral
6	1.080	28.43	9.70	38.13	56.00	-17.87	QP	Neutral
7	2.880	28.52	9.76	38.28	46.00	-7.72	Average	Neutral
8	2.880	29.30	9.76	39.06	56.00	-16.94	QP	Neutral
9 PP	3.240	34.72	9.77	44.49	46.00	-1.51	Average	Neutral
10 QP	3.240	35.98	9.77	45.75	56.00	-10.25	QP	Neutral
11	3.960	30.67	9.79	40.46	46.00	-5.54	Average	Neutral
12	3.960	31.51	9.79	41.30	56.00	-14.70	QP	Neutral

### Remark:

- 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

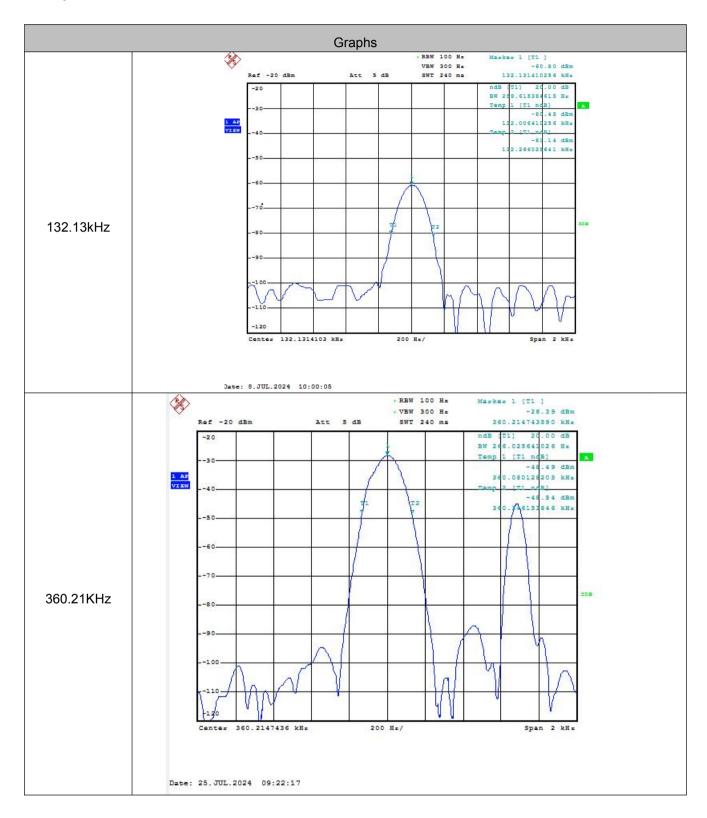


#### **Measurement Data**

Mode d						
Test Frequency (kHz)	20dB Occupy Bandwidth (Hz)	Result				
132.13	259.62	Pass				
360.21	266.02	Pass				



### Test plot as follows:





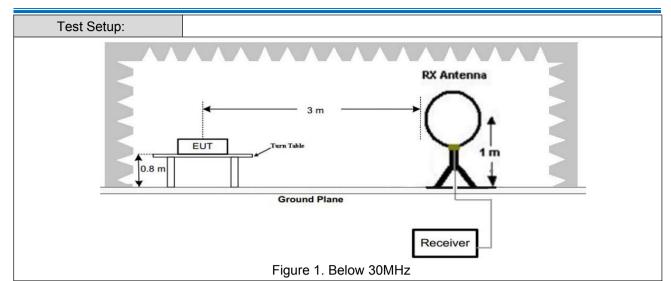


# 5.4 Radiated Spurious Emission & Restricted bands

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	<u>z</u>	30kHz	Peak	
	0.009MHz-0.090MH	z	Average	10kHz	z	30kHz	Average	
	0.090MHz-0.110MH	z	Quasi-peak	10kHz	<u>z</u>	30kHz	Quasi-peak	
	0.110MHz-0.490MH	z	Peak	10kHz	<u>z</u>	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 Above 1GHz		Quasi-peak	100 kH	lz 3	300kHz	Quasi-peak	
			Peak	1MHz	2	3MHz	Peak	
			Peak	1MHz	<u> </u>	10Hz	Average	
Limit:	Frequency		eld strength crovolt/meter)	Limit (dBuV/m)	R	temark	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	Quasi-peak		3	
	88MHz-216MHz		150	43.5	Quasi-peak		3	
	216MHz-960MHz		200	46.0	Quasi-peak		3	
	960MHz-1GHz		500	54.0	Qua	asi-peak	3	
	Above 1GHz	Above 1GHz		54.0	A۱	verage	3	
	Note: 15.35(b), Unless otherwise specified, the limit on p frequency emissions is 20dB above the maximum permitted average limit applicable to the equipment under test. This peak limit applies peak emission level radiated by the device.					erage emission		



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Antenna Tower

Artenna Antenna Tower

Ground Reference Plane

Test Receiver Angular Controller

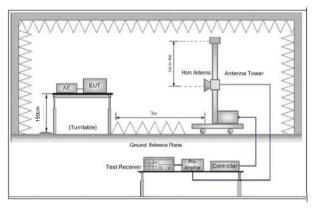


Figure 2. 30MHz to 1GHz

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

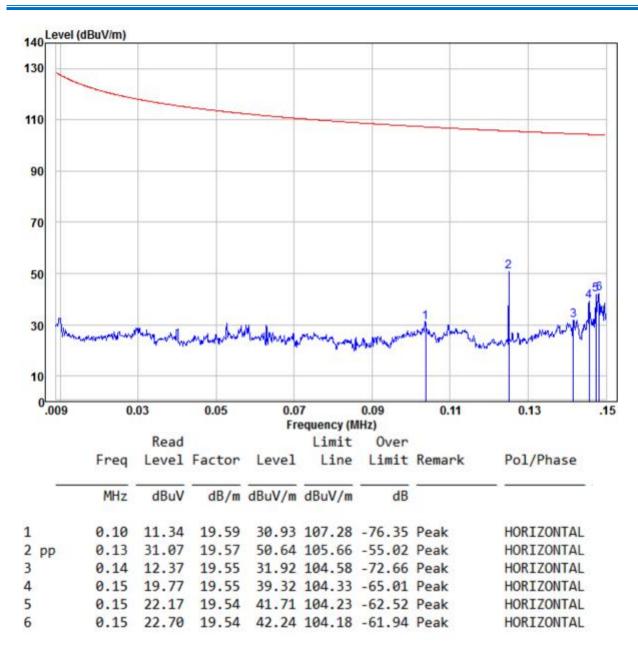


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		measurement.
		For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable 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:	Pas	ss

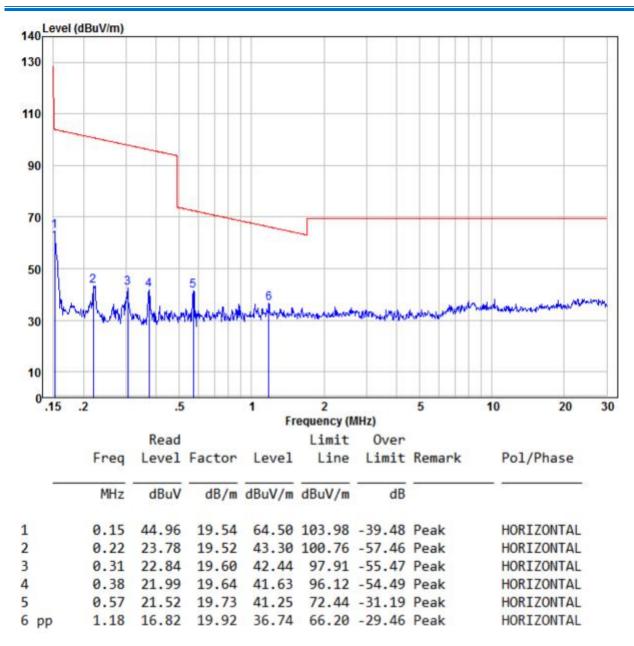
Radiated Emission below 9k~30MHz				
the worst case				
Test mode:	Mode d			







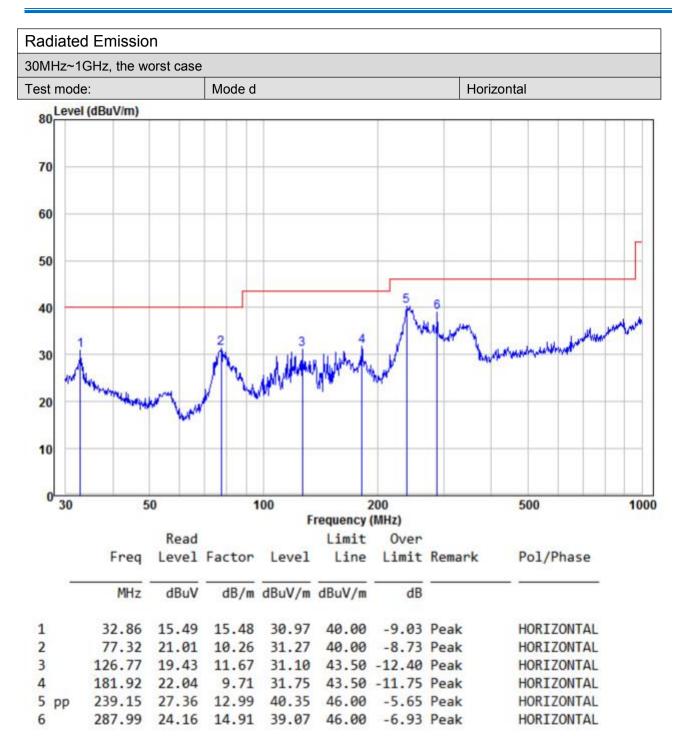




Note: No other emissions found between lowest internal used/generated frequencies to 30MHz. The peak level of the emission is less than the average limit, so the average level shall be less than 1 the limit without test.







#### Remark:

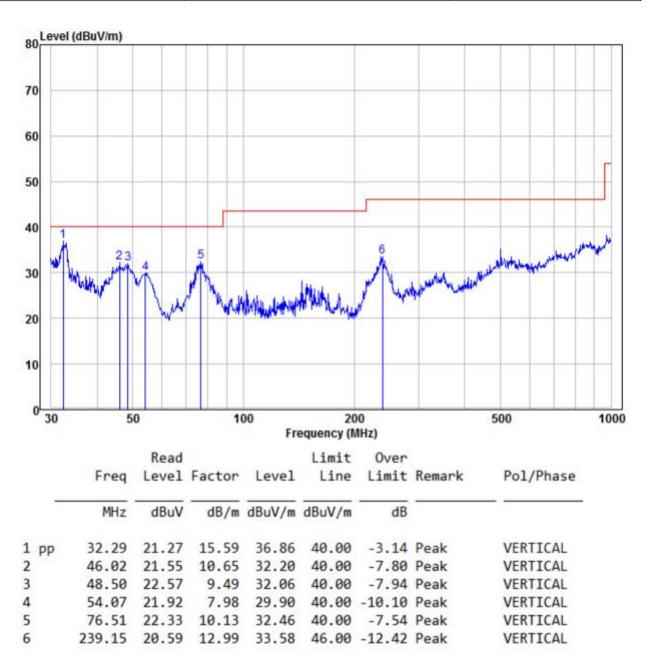
The field strength is calculated by adding the Antenna Factor, Cable Factor & Preamplifier. The basic equation with a sample calculation is as follows:

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor



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30MHz~1GHz, the worst case				
Test mode:	Mode d	Vertical		



#### Remark:

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

Final Test Level =Receiver Reading + Antenna Factor + Cable Factor

# 6 Photographs - EUT Test Setup

## 6.1 Radiated Emission









## **6.2 Conducted Emission**



# 7 Photographs - EUT Constructional Details

















