



# FCC PART 15C

## TEST REPORT

For

### Pioneer Corporation

28-8, Honkomagome 2-chome, Bunkyo-ku, Tokyo 113-0021, Japan

**FCC ID: AJD-SC510**

<b>Report Type:</b> Original Report	<b>Product Type:</b> Wireless Smart Car Mount
<b>Report Number:</b> RSZ200807004-00B	
<b>Report Date:</b> 2021-01-25	
<b>Reviewed By:</b> RF Engineer	Jacob Kong
<b>Prepared By:</b> Bay Area Compliance Laboratories Corp. (Shenzhen) 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China Tel: +86-755-33320018 Fax: +86-755-33320008 <a href="http://www.baclcorp.com.cn">www.baclcorp.com.cn</a>	

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## GENERAL INFORMATION

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### Product Description for Equipment under Test (EUT)

Product	Wireless Smart Car Mount
Tested Model	SDA-SC510
Frequency Range	110-205kHz
Antenna Type	Coil
Voltage Range	DC 5/9/12V
Date of Test	2021-01-16 to 2021-01-23
Sample serial number	RSZ200807004-RF-S1(Assigned by BACL, Shenzhen)
Received date	2020-08-07
Sample/EUT Status	Good Condition
Adapter information	Model: SDA-SC510 Input: DC 12/24V Output: DC 5/9/12V, 3/2/1.5A

### Objective

This test report is in accordance with Part 2, Subpart J, and Part 15, Subparts A and C of the Federal Communications Commission's rules.

The objective is to determine the compliance of EUT with FCC rules, section 15.203, 15.205 and 15.209.

### Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

All emissions measurement was performed at Bay Area Compliance Laboratories Corp. (Shenzhen). The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

## Measurement Uncertainty

Item		Uncertainty
AC Power Line Conducted Emissions		±1.95 dB
Radiated emission	9 kHz~30MHz	±4.52 dB
	30MHz~1 GHz	±5.81 dB
Occupied Bandwidth		±0.5 kHz
Temperature		±3.0 °C
Humidity		±6 %

*Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor  $K$  with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.*

## Test Facility

The Test site used by Bay Area Compliance Laboratories Corp. (Shenzhen) to collect test data is located on the 6/F., West Wing, Third Phase of Wanli Industrial Building, Shihua Road, Futian Free Trade Zone, Shenzhen, Guangdong, China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 342867, the FCC Designation No.: CN1221.

The test site has been registered with ISED Canada under ISED Canada Registration Number 3062B.

## SYSTEM TEST CONFIGURATION

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### Justification

The system was configured for testing in a test mode

### EUT Exercise Software

No software used in test.

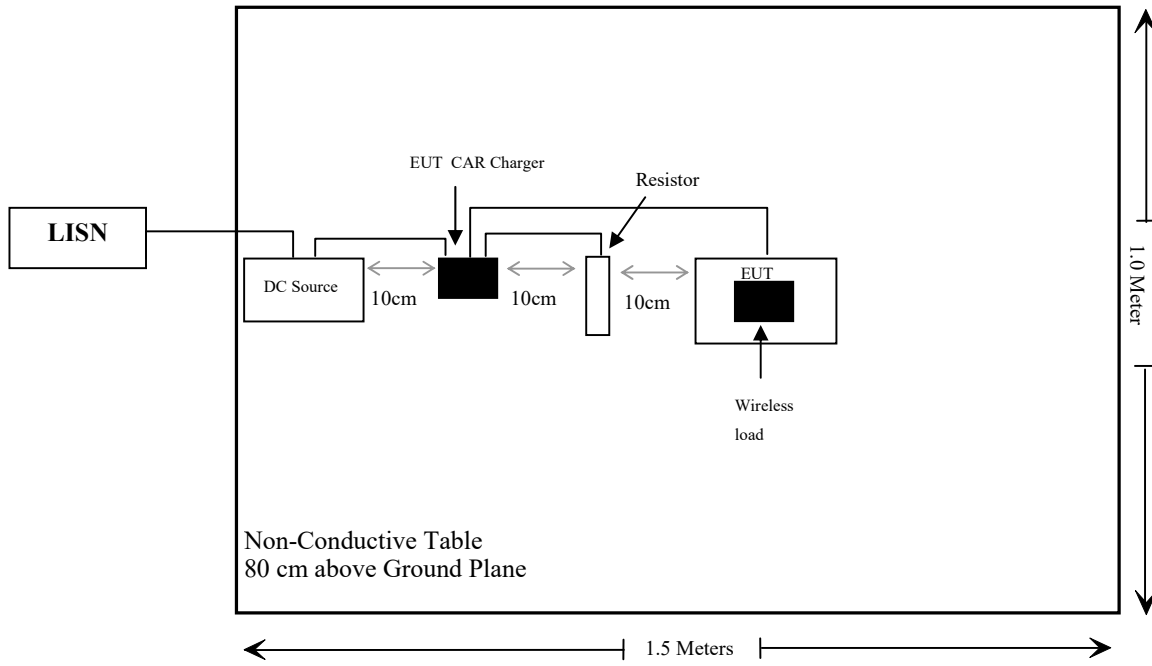
### Support Equipment List and Details

Manufacturer	Description	Model	Serial Number
Zhaoxin	DC Source	RXN-303A	RXN-303A
E-Charging	Wireless load	T20	E237212
Unknown	Resistor	Unknown	Unknown

### External I/O Cable

Cable Description	Length (m)	From Port	To
Unshielded Detachable AC Cable	1.2	LISN	DC Source
Unshielded Un-detachable DC Cable	0.3	DC Source	EUT CAR Charger
Unshielded detachable USB Cable	1.0	EUT CAR Charger	EUT
Unshielded Un-detachable DC Cable	0.3	EUT CAR Charger	Resistor

### Block Diagram of Test Setup



**SUMMARY OF TEST RESULTS**

<b>FCC Rules</b>	<b>Description of Test</b>	<b>Result</b>
FCC§1.1310 & §2.1091	Maximum Permissible Exposure(MPE)	Compliance
FCC§15.203	Antenna Requirement	Compliance
FCC§15.207	AC Line Conducted Emission	Not Applicable
§15.209 §15.205	Radiated Emission Test	Compliance

Note: EUT is intend for vehicle use and powered by vehicle battery.

**TEST EQUIPMENT LIST**

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
<b>MPE</b>					
Narda	Exposure Level Tester	ELT-400	N-0229	2019/11/19	2021/11/18
Narda	B Field Probe	ELT Probe 100cm <sup>2</sup>	M-0666	2019/11/19	2021/11/18
ETS-Lindgreen	Field Probe	HI-6005	6564158	2019/12/10	2022/12/09
<b>RF Radiated test</b>					
R&S	EMI Test Receiver	ESR3	102455	2020/08/04	2021/08/03
Sonoma instrument	Pre-amplifier	310 N	186238	2020/08/04	2021/08/03
Sunol Sciences	Broadband Antenna	JB1	A040904-1	2020/12/22	2023/12/21
ETS	Passive Loop Antenna	6512	29604	2018/07/14	2021/07/13
Unknown	Cable	Chamber Cable 4	EC-007	2020/11/29	2021/11/28
Rohde & Schwarz	Auto test software	EMC 32	V9.10	NCR	NCR

\* **Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Shenzhen) attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).



## **FCC §1.1310, §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)**

### **Applicable Standard**

According to subpart §1.1310, systems operating under the provisions of this section shall be operated in a manner that ensures that the public is not exposed to radio frequency energy level in excess of the Commission's guidelines.

Limits for Maximum Permissible Exposure (MPE) (§1.1310, §2.1091)

<b>(B) Limits for General Population/Uncontrolled Exposure</b>				
<b>Frequency Range (MHz)</b>	<b>Electric Field Strength (V/m)</b>	<b>Magnetic Field Strength (A/m)</b>	<b>Power Density (mW/cm<sup>2</sup>)</b>	<b>Averaging Time (minutes)</b>
0.3–1.34	614	1.63	*(100)	30
1.34–30	824/f	2.19/f	*(180/f <sup>2</sup> )	30
30–300	27.5	0.073	0.2	30
300–1500	/	/	f/1500	30
1500–100,000	/	/	1.0	30

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

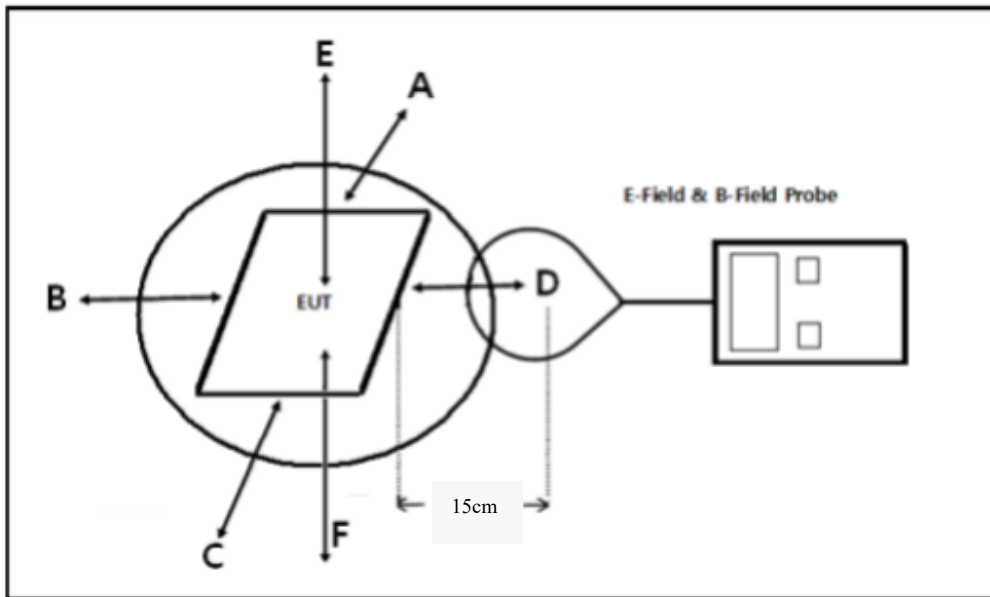
According with KDB 680106 D01 RF Exposure Wireless Charging Apps v03 clause 3 c)

- c) For devices designed for typical desktop applications, such as wireless charging pads, RF exposure evaluation should be conducted assuming a user separation distance of 15 cm. E and H field strength measurements or numerical modeling may be used to demonstrate compliance. Measurements should be made from all sides and the top of the primary/client pair, with the 15 cm measured from the center of the probe(s) to the edge of the device. Emissions between 100 kHz to 300 kHz should be assessed versus the limits at 300 kHz in Table 1 of Section 1.1310: 614 V/m and 1.63 A/m. A KDB inquiry is required to determine the applicable exposure limits below 100 kHz.

According to KDB 680106 D01 RF Exposure Wireless Charging App v03 clause 5 b)

- b) Inductive wireless power transfer applications with supporting field strength results and meeting all of the following requirements are not required to submit a KDB inquiry for devices approved using SDoC or a PAG for equipment approved using certification to address RF exposure compliance. However, the responsible party is required to keep a copy of the test report in accordance with KDB 865664 D02. A copy of the test report is to be submitted with the application if the device is approved using certification.
- (1) Power transfer frequency is less than 1 MHz.
  - (2) Output power from each primary coil is less than or equal to 15 watts.
  - (3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.
  - (4) Client device is placed directly in contact with the transmitter.
  - (5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).
  - (6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

**Block Diagram of Test Setup**



Note: 20 cm for Top test.

**Test Data**

**Environmental Conditions**

<b>Temperature:</b>	25°C
<b>Relative Humidity:</b>	65 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Andy Yu on 2021-01-23.*

*Test mode: wireless charging(full load)*

**H-Field Strength**

Frequency Range (kHz)	Position A (A/m)	Position B (A/m)	Position C (A/m)	Position D (A/m)	Position E (A/m)	50% Limit (A/m)	Limit Test (A/m)
110-205	0.139	0.141	0.127	0.133	0.119	0.815	1.63

**E-Field Strength**

Frequency Range (kHz)	Position A (V/m)	Position B (V/m)	Position C (V/m)	Position D (V/m)	Position E (V/m)	50% Limit (V/m)	Limit Test (V/m)
110-205	1.117	1.236	1.145	1.133	1.096	307	614

Note: Test with 15cm distance from the center of the probe(s) to the edge of the device, 20 cm for top test.

**Result: Pass**

**Considerations of compliance 680106 D01 RF Exposure Wireless Charging App v03 clause 5 b:**

(1) Power transfer frequency is less than 1 MHz.

Yes, the operation frequency is 110-205 kHz.

(2) Output power from each primary coil is less than or equal to 15 watts.

Yes, the maximum output power of primary coil is 15 Watts.

(3) The transfer system includes only single primary and secondary coils. This includes charging systems that may have multiple primary coils and clients that are able to detect and allow coupling only between individual pairs of coils.

The transfer system includes only single primary coils to detect and allow coupling only between individual pairs of coils.

(4) Client device is placed directly in contact with the transmitter.

Yes, client device is placed directly in contact with the transmitter

(5) Mobile exposure conditions only (portable exposure conditions are not covered by this exclusion).

Yes, mobile exposure conditions only

(6) The aggregate H-field strengths at 15 cm surrounding the device and 20 cm above the top surface from all simultaneous transmitting coils are demonstrated to be less than 50% of the MPE limit.

Yes, the test result for H and E-field strength less than 50% of the MPE limit.

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## **FCC§15.203 – ANTENNA REQUIREMENT**

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### **Applicable Standard**

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 shall be considered sufficient to comply with the provisions of this section.

### **Antenna Connected Construction**

The EUT has one coil antenna arrangement, which was permanently attached, fulfill the requirement of this section. Please refer to the EUT photos.

**Result: Pass**

## FCC §15.205 & §15.209 - RADIATED EMISSIONS TEST

### Applicable Standard

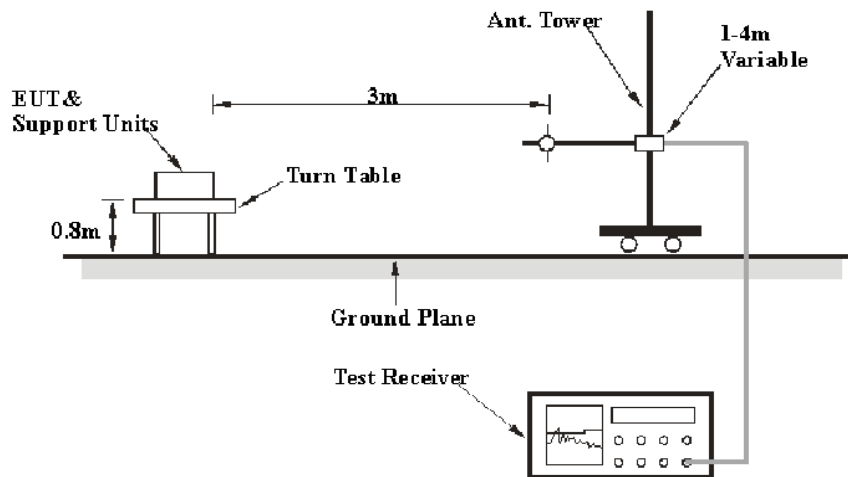
As per FCC Part 15.209

(a) Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100**	3
88-216	150**	3
216-960	200**	3
Above 960	500	3

\*\*Except as provided in paragraph (g), fundamental emissions from intentional radiators operating under this section shall not be located in the frequency bands 54-72 MHz, 76-88 MHz, 174-216 MHz or 470-806 MHz. However, operation within these frequency bands is permitted under other sections of this part, e.g., §§15.231 and 15.241.

### EUT Setup



The radiated emission tests were performed in the 3-meter chamber test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC Part Subpart C limits.

The spacing between the peripherals was 10 cm.

## EMI Test Receiver Setup

During the radiated emission test, the EMI test Receiver was set with the following configurations:

Frequency Range	RBW	Video B/W	Measurement
9 kHz – 150 kHz	300 Hz	1 kHz	PK
150 kHz – 30 MHz	10 kHz	30 kHz	PK
30 MHz – 1000 MHz	120 kHz	300 kHz	QP

The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector.

If the maximized peak measured value complies with the limit, then it is unnecessary to perform an QP/Average measurement

## Corrected Amplitude & Margin Calculation

The Corrected Amplitude is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain from the Amplitude reading. The basic equation is as follows:

$$\text{Corr. Ampl.} = \text{Meter Reading} + \text{Antenna Factor} + \text{Cable Loss} - \text{Amplifier Gain}$$

The “**Margin**” column of the following data tables indicates the degree of compliance with the applicable limit. For example, a margin of 7dB means the emission is 7dB below the limit. The equation for margin calculation is as follows:

$$\text{Margin} = \text{Limit} - \text{Corr. Ampl.}$$

## Test Data

### Environmental Conditions

<b>Temperature:</b>	22~24 °C
<b>Relative Humidity:</b>	51~52 %
<b>ATM Pressure:</b>	101.0 kPa

*The testing was performed by Holland Yang on 2021-01-16.*

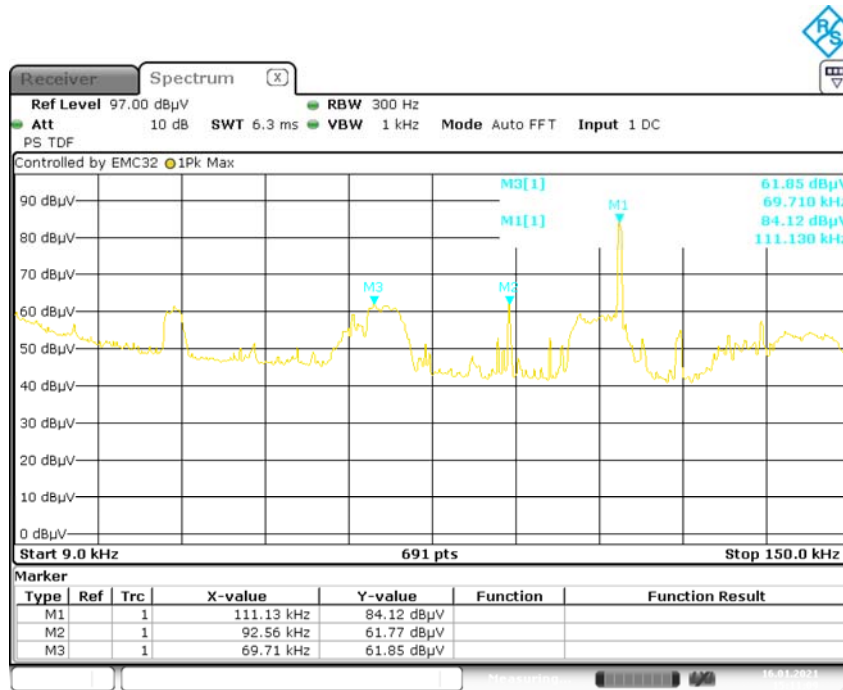
*Test mode: Wireless Charging (full load)*

9 kHz~30MHz:

Frequency (MHz)	Corrected Amplitude (dB $\mu$ V/m)	Detector (PK/QP/AV)	Turntable Degree	Rx Antenna Height (m)	FCC Part 15.205&15.209		Remark
					Limit (dB $\mu$ V/m)	Margin (dB)	
0.09256	61.77	PK	165	1.0	108.28	46.51	Spurious emission
0.06971	61.85	PK	165	1.0	100.74	38.89	
0.388	65.21	PK	165	1.0	95.83	30.62	
14.773	64.38	PK	165	1.0	69.54	5.16	
0.11113	84.12	PK	165	1.0	106.69	22.57	Fundamental

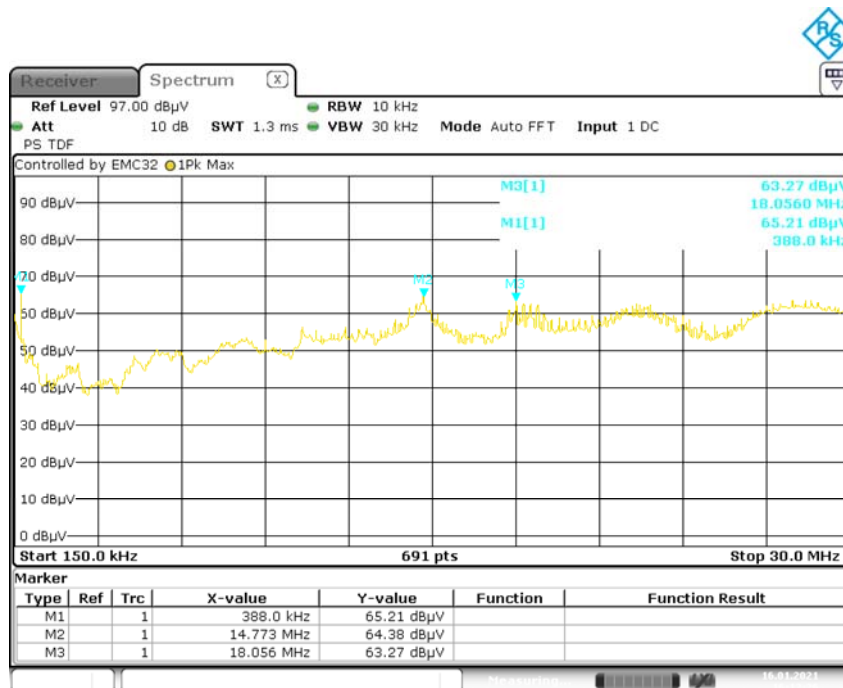
Note: PK detector data compliance with QP and average detector limit.

9 kHz-150 kHz



Date: 16.JAN.2021 15:11:09

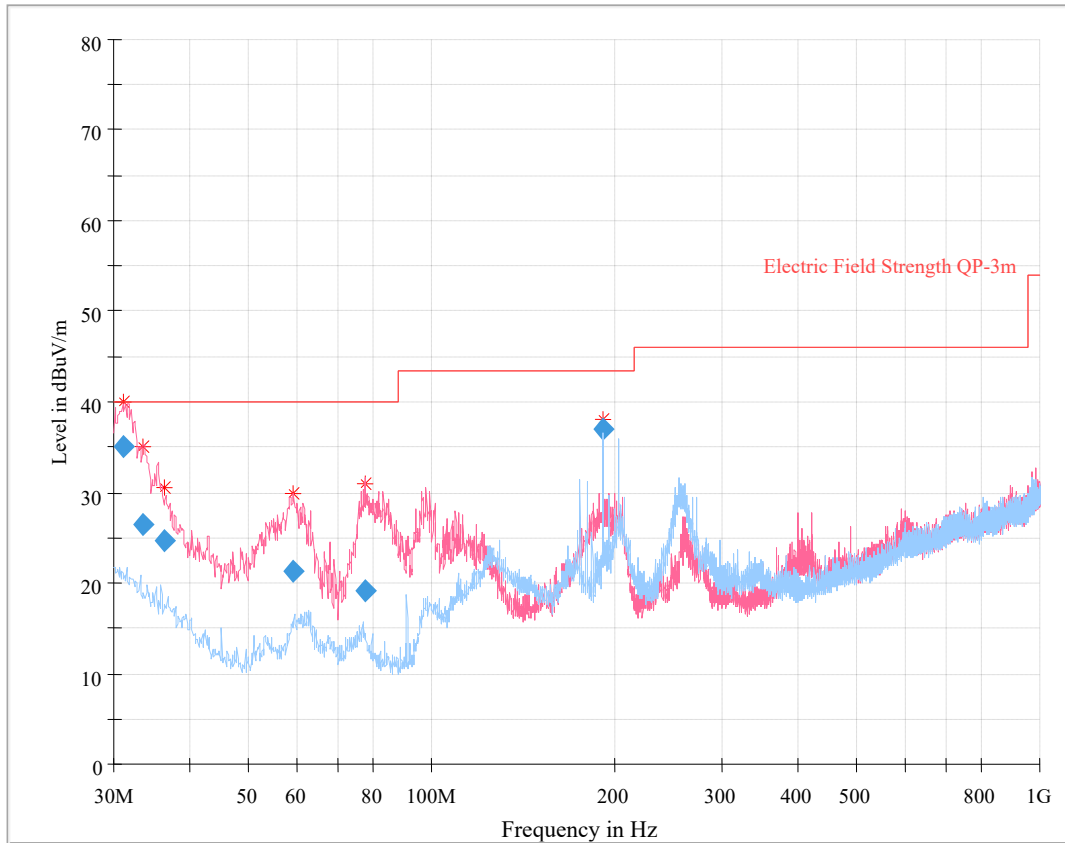
150 kHz-30 MHz



Date: 16.JAN.2021 16:12:26



30MHz-1GHz:



**Final Result**

Frequency (MHz)	QuasiPeak (dB $\mu$ V/m)	Limit (dB $\mu$ V/m)	Margin (dB)	Height (cm)	Pol	Azimuth (deg)	Corr. (dB)
31.113250	35.15	40.00	4.85	102.0	V	118.0	-5.1
33.554750	26.49	40.00	13.51	109.0	V	0.0	-6.6
36.296625	24.81	40.00	15.19	105.0	V	101.0	-8.2
59.374500	21.26	40.00	18.74	338.0	V	300.0	-17.1
77.588875	22.21	40.00	17.79	272.0	V	298.0	-17.0
191.710875	36.98	43.50	6.52	110.0	H	271.0	-11.8

\*\*\*\*\* END OF REPORT \*\*\*\*\*