FCC PART 15.239

MEASUREMENT AND TEST REPORT

For

Philex Electronic (Ningbo) Co., Ltd.

Qi Fa Industrial Park, Qi Ming Road, Yinzhou District,

Ningbo, Zhejiang 315000, China

FCC ID: YSMFT28101
Model Number: FT28101

Report Type:	**Product Type:**
Original Report	FM Transmitter

Test Engineer:	Fisher / July
Report Number:	RSC100917001
Report Date:	2010-10-31
Reviewed By:	David Li
Prepared By:	Bay Area Compliance Laboratories Corp. (Chengdu) 5040, HuiLong Wan Plaza, No.1, ShaWan Road, JinNiu District, Chengdu, Sichuan, China www.baclcorp.com

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

The ***Philex Electronic (Ningbo) Co., Ltd's*** product, model number: *FT28101 (FCC ID: YSMFT28101)* or the "EUT" as referred to in this report is the ***FM Transmitter***, which measures approximately: 10 cm L x 5 cm W x 3 cm H, rated input voltage: DC 12V.

All measurement and test data in this report was gathered from production sample, serial number: 100906002(Assigned by BACL). The EUT was received on 2010-09-18.

Objective

This type approval report is prepared on behalf of ***Philex Electronic (Ningbo) Co., Ltd*** in accordance with Part 2, Subpart J, Part 15, Subparts A, B and C of the Federal Communication Commissions rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.209 and 15.239 rules.

Related Submittal(s)/Grant(s)

N/A.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.4-2003, American National Standard for Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the range of 9 kHz to 40 GHz.

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

Test Facility

The test site used by Bay Area Compliance Laboratories Corp. (Chnegdu) to collect test data is located in 5040, HuiLong Wan Plaza, No.1, ShaWan Road, JinNiu District, Chengdu, China

Test site at Bay Area Compliance Laboratories Corp. (Chnegdu) has been fully described in reports submitted to the Federal Communication Commission (FCC). The details of these reports have been found to be in compliance with the requirements of Section 2.948 of the FCC Rules on November 21, 2007. The facility also complies with the radiated and AC line conducted test site criteria set forth in ANSI C63.4-2003.

The Federal Communications Commission has the reports on file and is listed under FCC Registration No.: 560332. The test site has been approved by the FCC for public use and is listed in the FCC Public Access Link (PAL) database.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

The system was configured for testing in a typical fashion (as normally used by a typical user).

Equipment Modifications

No modification was made to the unit tested.

EUT Exercise Software

N/A

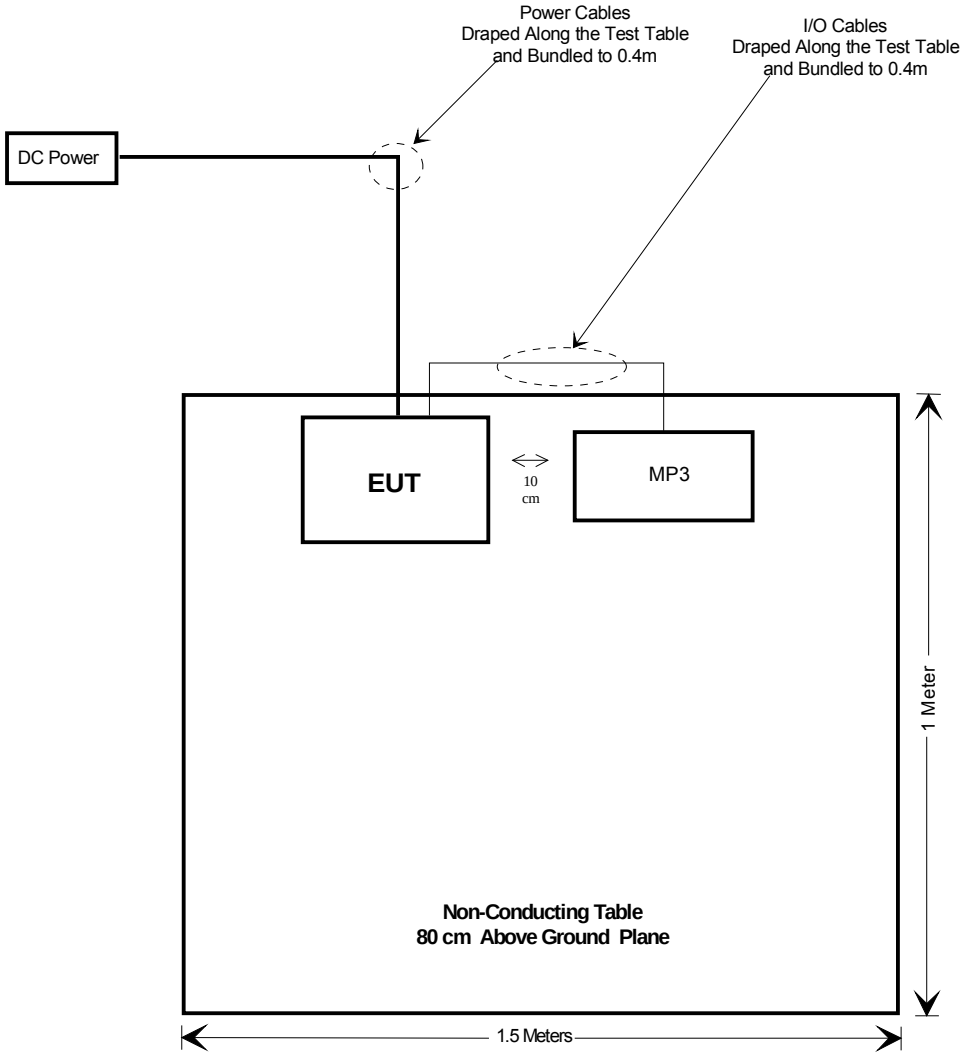
Local Support Equipment List and Details

Manufacturer	Description	Model	Serial Number	FCC ID
Ipod	MP3	Touch 4	NO	N/A

External I/O Cable

Cable Description	Length (m)	From/Port	To
DC Power Cable	1.2	DC Power Socket	EUT
Audio Cable	0.7	MP3	EUT

Block Diagram of Test Setup



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.203	Antenna Requirement	Compliant
§15.239(a)	Occupied Bandwidth	Compliant
§15.205, §15.209, §15.239(b),(c)	Radiated Emissions	Compliant

FCC §15.203 – ANTENNA REQUIREMENT

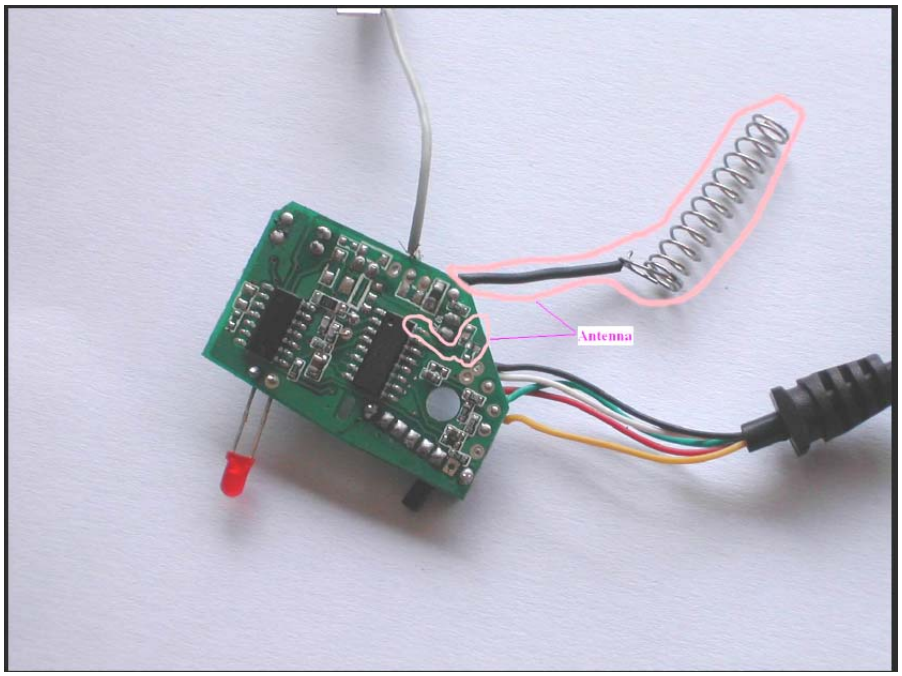
Standard Applicable

According to FCC §15.203, 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. 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.

Antenna Connector Construction

The EUT has one transmitter antennae which is permanently solderd on the PCB, no consideration of replacement.

Please refer to the antenna detail photo below:



Result: Compliant

FCC §15.239(a) – OCCUPIED BANDWIDTH

Applicable Standard

According to FCC §15.239(a), emissions from the intentional radiator shall be confined within a band 200 kHz wide centered on the operating frequency. Tha 200 kHz band shall lie wholly within the frequency range of 88-108 MHz.

Test Equipment List and Details

Manufacturer	Description	Model	Serial Number	Calibration Due Date
Rohde & Schwarz	EMI Test Receiver	ESCI	100224	2010-10-16

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chnegdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT as shown in figure and measrement theen turn on the EUT. Then set it to any one convenient frequency within its operating range.
3. Set both RBW and VBW of receiver to 30 kHz and 100 kHz respectively with a convenient frequcy span including 200 kHz bandwidth of the emission. And set a reference level on the measuring instrument equal to the highest peak value.
4. Measure the frequency difference of two frequencies that were attenuated 20 dB from the reference level. Record the frequency difference as the emission bandwidth.
5. Repeat above procedures until all frequencies measured were complete.

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

** The testing was performed by Fisher & July.*

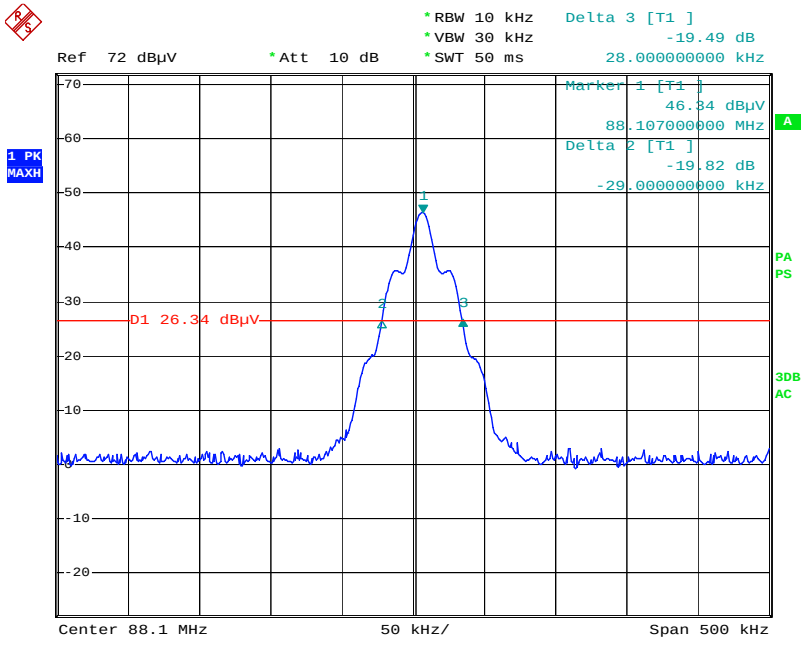
Test Result: Compliant, Please refer to following tables and plots.

Channel	Frequency (MHz)	20 dB Emission Bandwidth (kHz)	FCC Limit (kHz)	Result
1	88.1	57	200	Compliant
2	88.3	57	200	Compliant
3	88.5	57	200	Compliant
4	88.7	58	200	Compliant

Note 1: The device has been verified the tuning range, only 4 frequencies channels are avaiable for the device, namely 88.1 MHz, 88.3 MHz, 88.5 MHz and 88.7 MHz.

Note 2: The emission bandwidth was tested with the maximum audio input.

20 dB Bandwidth, Channel 1



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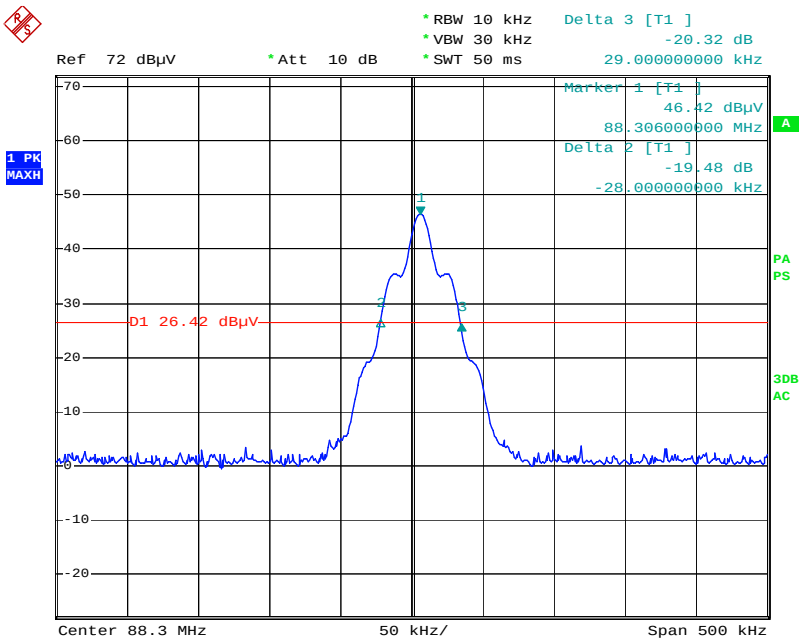
20 dB Bandwidth, Channel 2



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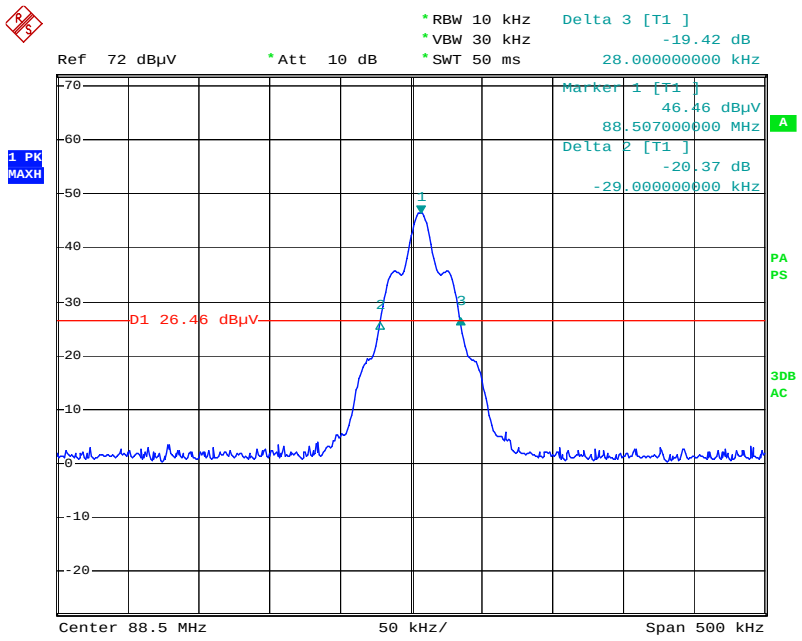
20 dB Bandwidth, Channel 3



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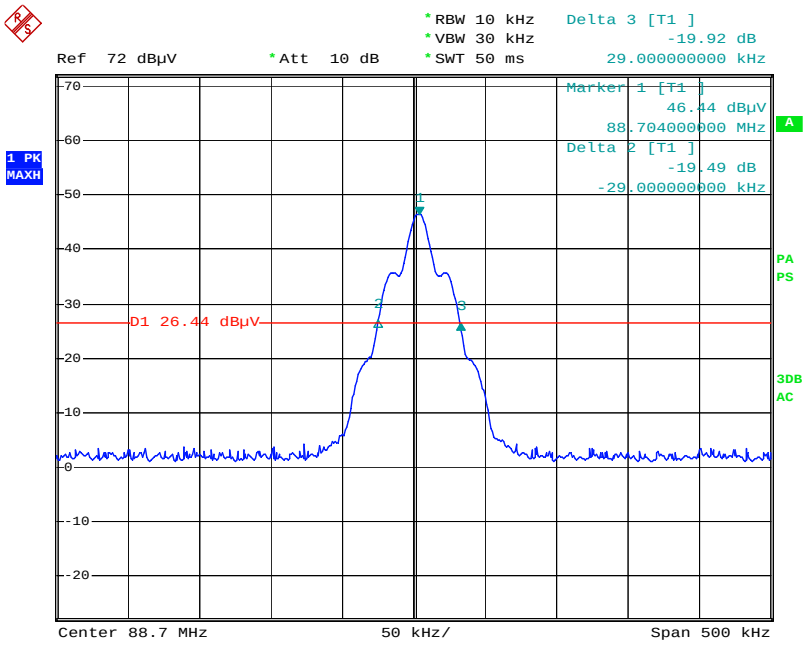
20 dB Bandwidth, Channel 4



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FCC §15.205, §15.209 & §15.239(b)(c) – RADIATED EMISSIONS

Applicable Standard

According to FCC §15.239(a), the field strength of any emissions within the permitted 200 kHz band shall not exceed 250 microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provisions in Section 15.35 for limiting peak emissions apply.

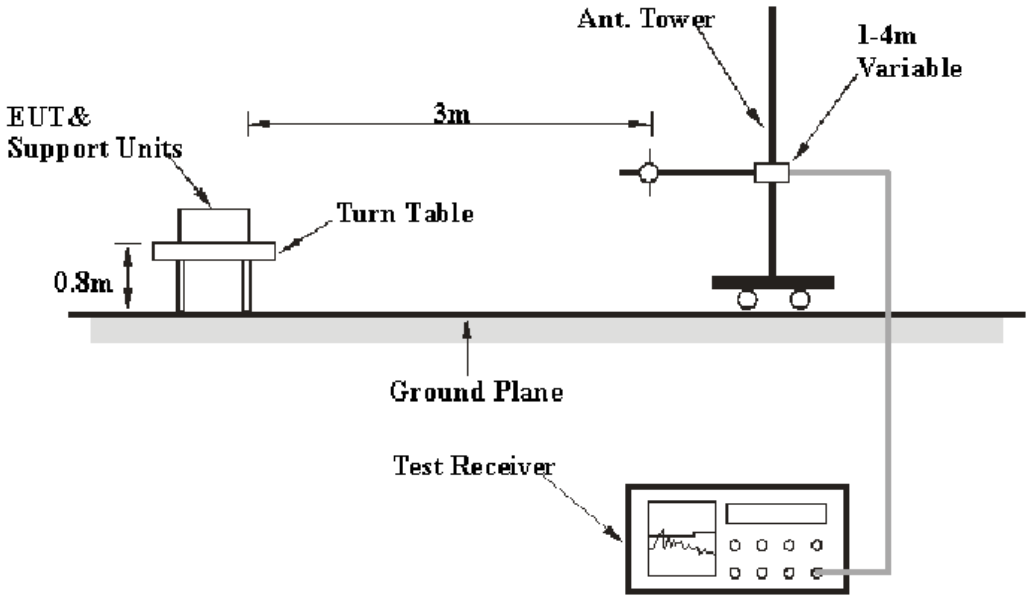
According to FCC §15.239(c), the field strength of any emissions radiated on any frequency outside of the specified 200 kHz band shall not exceed the general radiated emission limits in section 15.209.

Measurement Uncertainty

All measurements involve certain levels of uncertainties, especially in field of EMC. The factors contributing to uncertainties are spectrum analyzer, cable loss, antenna factor calibration, antenna directivity, antenna factor variation with height, antenna phase center variation, antenna factor frequency interpolation, measurement distance variation, site imperfections, mismatch (average), and system repeatability.

Based on NIS 81, The Treatment of Uncertainty in EMC Measurements, the best estimate of the uncertainty of a radiation emissions measurement at Bay Area Compliance Laboratories Corp. (Chengdu) is ±4.0 dB.

Test Setup



The radiated emission tests were performed in the 3 meters chamber B test site, using the setup accordance with the ANSI C63.4-2003. The specification used was the FCC §15.239(b),(c).

The power cables were draped along the test table and formed a bundle 30 to 40 cm long in the middle. A 12VDC power source was provided to the EUT.

EMI Test Receiver Setup

The centrel frequency of the receiver was set to the transmitting frequency of the EUT. And the span set to 1MHz.

During the radiated emission test, the EMI test receiver setup were set with the following configurations:

Fundamental:

RBW	***Video B/W***	***Detector***
100 kHz	300 kHz	AV & PK

Spuripus Emission:

Frequency Range	***RBW***	***Video B/W***	***Detector***
30 MHz – 1000 MHz	100 kHz	300 kHz	QP

Test Equipment List and Details

Manufacturer	Description	Model Number	Serial Number	Calibration Date	Calibration Due Date
HP	Amplifier	8447E	1937A01046	2009-11-15	2010-11-15
Rohde & Schwarz	EMI Test Receiver	ESCI	10028	2009-10-16	2010-10-16
Sunol Sciences	Broadband Antenna	JB3	A040904-2	2010-08-14	2011-08-14
Beijin microwave	Horn Antenna	OMCDH10180	10279001A	2010-08-14	2011-08-14
HP	Amplifier	8449B	3008A00277	2010-08-14	2011-08-14
HP	Spectrum Analyzer	8562A	3204A07083	2010-08-14	2011-08-14

*** Statement of Traceability:** Bay Area Compliance Laboratories Corp. (Chengdu) attests that all calibrations have been performed in accordance to NVLAP requirements, traceable to the NIST.

Test Procedure

For the radiated emissions test, the power cord of the EUT is connected to the outlet of the DC power.

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in PK, QP and Average.

Corrected Amplitude & Margin Calculation

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

Corrected Amplitude = Meter Reading + Antenna Factor + Cable Loss- Amplifier Gain

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

Margin = Limit - Corrected Amplitude

Test Results Summary

According to the recorded data in following table, the EUT complied with the FCC Title 47, Part 15, Subpart C, section 15.209(a) and 15.239(c), with the worst margin reading of:

For 88.1 MHz

11.5 dB at **30.14 MHz** in the **Horizontal** polarization

For 88.3 MHz

11.5 dB at **264.94 MHz** in the **Horizontal** polarization

For 88.5 MHz

9.8 dB at **177.01 MHz** in the **Horizontal** polarization

For 88.7 MHz

10.1 dB at **30.72 MHz** in the **Horizontal** polarization

Test Data

Environmental Conditions

Temperature:	25 °C
Relative Humidity:	52 %
ATM Pressure:	100.9 kPa

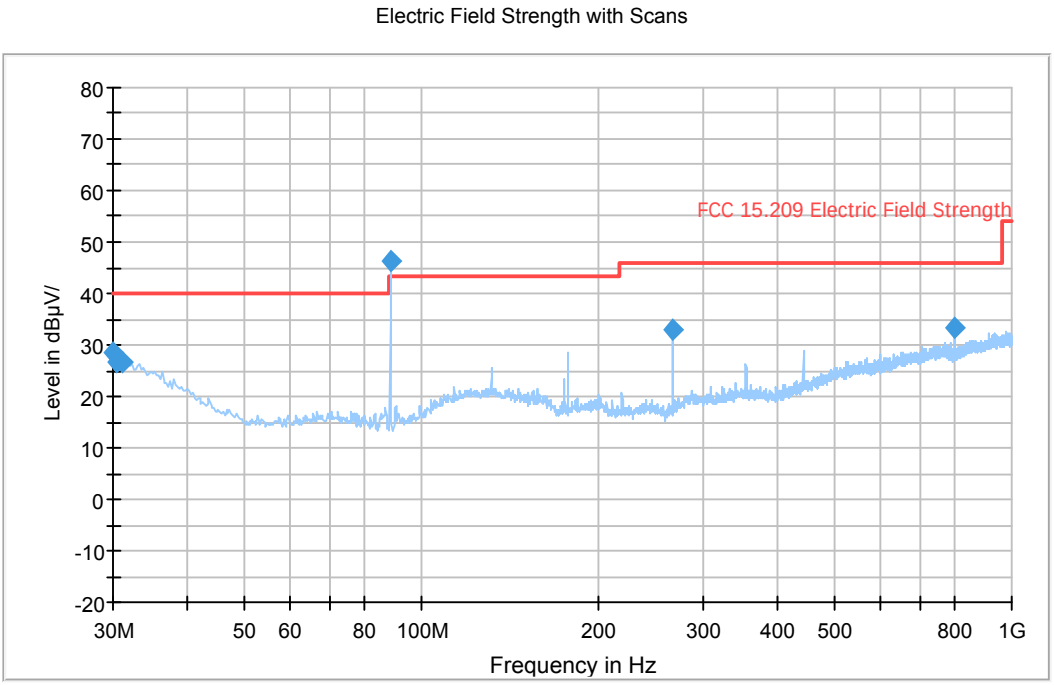
**The testing was performed by Fisher and July*

Test Result: Compliant, Please refer to the following tables and plots.

Fundamental:

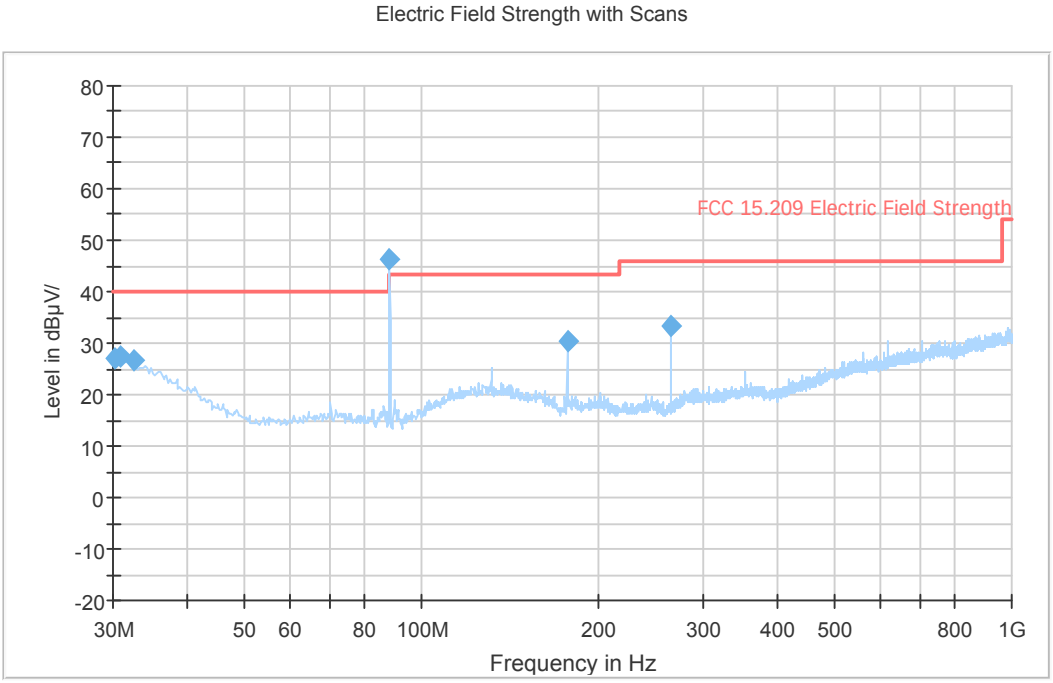
Freq. (MHz)	PK Reading (dBuV)	Ave Reading (dBuV)	Ant. Factor (dB/m)	Cable Loss (dB)	Pre-Amp. (dBi)	Cord. PK Amp. (dBuV/m)	Cord. Ave Amp. (dBuV/m)	FCC Limit		Result
								Peak (dBuV/m)	Ave (dBuV/m)	
88.1	37.54	37.06	7.9	0.8	0	46.24	45.76	68	48	Pass
88.3	37.41	37.06	7.9	0.8	0	46.11	45.76	68	48	Pass
88.5	37.62	37.33	7.9	0.8	0	46.32	46.03	68	48	Pass
88.7	37.45	37	7.9	0.8	0	46.15	45.7	68	48	Pass

F = 88.1 MHz



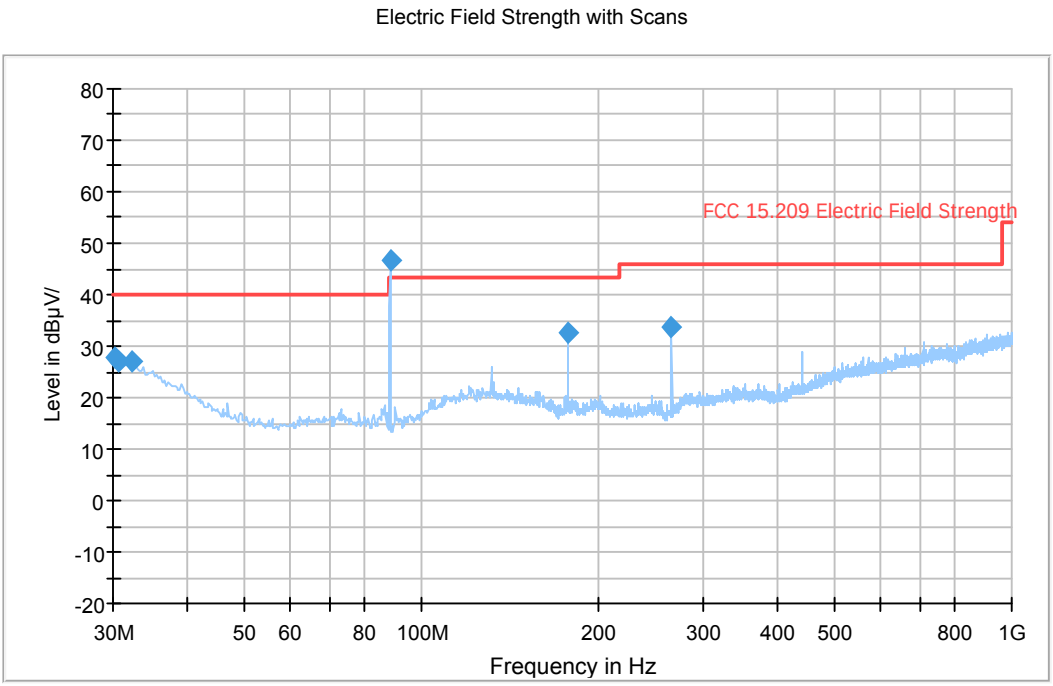
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Bandwidth (kHz)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.142310	28.5	120.0	325.0	H	75.0	0.3	11.5	40.0
264.297280	33.9	120.0	125.0	H	90.0	-6.5	12.1	46.0
31.392178	27.1	120.0	290.0	V	30.0	0.5	12.9	40.0
30.981452	26.2	120.0	3500	H	210.0	0.4	13.8	40.0
798.154281	29.1	120.0	220.0	H	300.0	4.1	16.9	46.0

F = 88.3 MHz



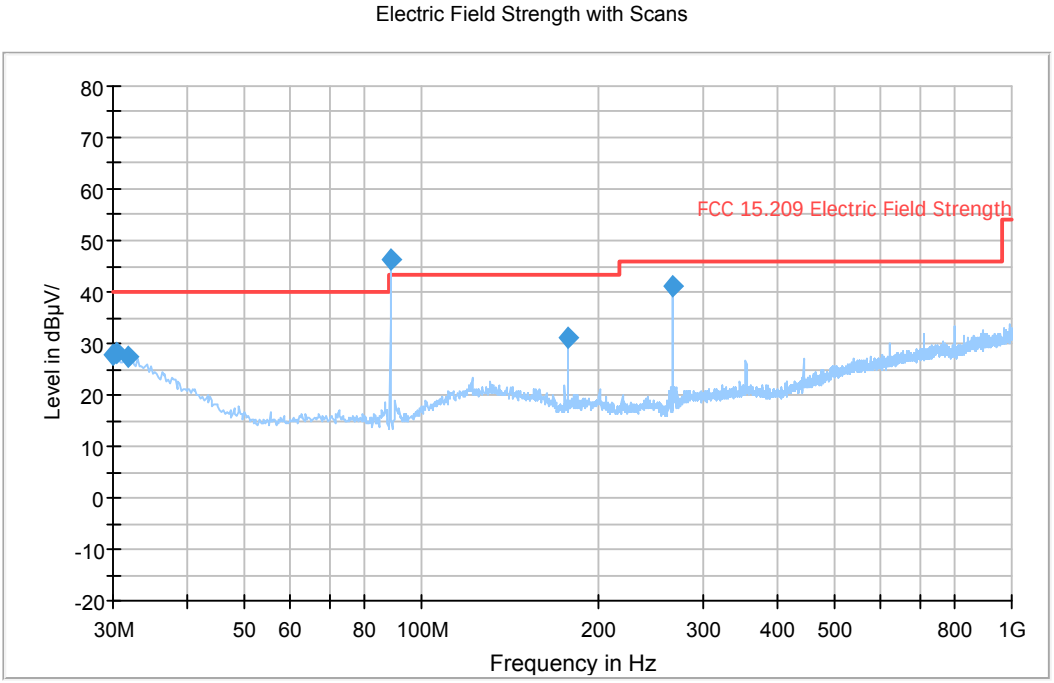
Frequency (MHz)	Corrected Amplitude (dBµV/m)	Bandwidth (kHz)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
264.935915	34.5	120.0	175.0	H	175.0	-6.4	11.5	46.0
32.014550	27.5	120.0	100.0	H	140.0	0.5	12.5	40.0
33.642151	26.9	120.0	100.0	V	90.0	0.6	13.1	40.0
176.587339	30.1	120.0	220.0	H	250.0	-7.2	13.4	43.5
30.244780	26.2	120.0	150.0	V	15.0	0.3	13.8	40.0

F = 88.5 MHz



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Bandwidth (kHz)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
177.005431	33.7	120.0	220.0	H	275.0	-7.2	9.8	43.5
30.242500	29.8	120.0	100.0	H	153.0	0.3	10.2	40.0
265.502008	34.8	120.0	170.0	H	195.0	-6.4	11.2	46.0
32.475520	28.7	120.0	100.0	H	330.0	0.4	11.3	40.0
30.772140	27.1	120.0	200.0	H	145.0	0.4	12.9	40.0

F = 88.7 MHz



Frequency (MHz)	Corrected Amplitude (dBµV/m)	Bandwidth (kHz)	Antenna Height (cm)	Antenna Polarity (H/V)	Turntable Position (deg)	Corr. (dB)	Margin (dB)	Limit (dBµV/m)
30.7227501	29.9	120.0	150.0	H	353.0	0.5	10.1	40.0
31.5472200	29.2	120.0	175.0	H	356.0	0.4	10.8	40.0
33.014527	28.7	120.0	275.0	H	255.0	0.3	11.3	40.0
798.874400	34.5	120.0	100.0	H	155.0	4.1	11.5	46.0
266.074820	34.1	120.0	125.0	H	87.0	-6.3	11.9	46.0

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