

FCC PART 15 SUBPART C MEASUREMENT AND TEST REPORT

For

Scosche Industries Inc.

1550 Pacific Avenue, Oxnard, CA 93033, United States

E.U.T.: TUNE FREE FM Transmitter

Model Name: FMTD1A, FMTD1R

Brand Name: SCOSCHE

FCC ID: IKQFMTD1A

Report Number: NTC1604258F

Test Date(s): April 22, 2016 to May 13, 2016

Report Date(s): May 13, 2016

Prepared by

Dongguan Nore Testing Center Co., Ltd.

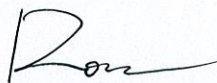
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Note: This test report is for the customer shown above and their specific product only. It may not be duplicated or used in part without prior written consent from Dongguan Nore Testing Center Co., Ltd. The test results referenced from this report are relevant only to the sample tested.



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Revision History of This Test Report

Report Number	Description	Issued Date
NTC1604258F	Initial Issue	2016-05-13

1. GENERAL INFORMATION

1.1 Product Description for Equipment under Test

This device is a FM Transmitter, it's powered by DC 12V. For more details features, please refer to User's Manual.

Manufacturer & Factory : Zhongshan K-mate General Electronics Co., Ltd.
Address : No.2, 5th Xinsheng Street, Gangkou Town,
Zhongshan City, Guangdong, China

Power Supply : DC 12

Adapter : None

Test voltage : DC 12V

Model name : FMTD1A, FMTD1R

All tests were carried on model FMTD1A.

Model difference : Both of models have the same circuitry, electrical mechanical, PCB layout and physical construction. Their differences in model name for trading purpose.

Hardware version : 1.0

Software version : 1.0

Serial number : N/A

For FM function

Frequency	88.1-107.9MHz
Modulation	FM
Number of Channel	199
Channel space	100KHz
Antenna Type	Internal antenna
Antenna Gain	0 dBi (declared by manufacturer)

Note: According to section 15.31(m), regards to the operating frequency range over 10MHz, the Lowest, middle, and the Highest frequency of channel were selected to perform the test. The selected frequency and test software see below:

Channel	Frequency MHz
1	88.1
100	98.0
199	107.9

1. All the requirements have been tested by modulating the transmitter with a 2.5KHz tone at a level 16dB higher than that required to produce a frequency deviation of 75KHz.
2. For Radiated emission, 3 axis were chosen for testing for each applicable mode.
3. Only the result of the worst case was recorded in the report, if no other cases.



1.2 Related Submittal(s) / Grant (s)

This submittal(s) (test report) is intended for FCC ID: IKQFMTD1A filing to comply with Section 15.239 of the FCC Part 15 (2016), Subpart C Rule.

1.3 Test Methodology

The radiated emission measurement was performed according to the procedures in ANSI C63.10 (2013). Radiated emission measurement was performed in semi-anechoic chamber. For radiated emission measurement, preliminary scans were performed in the semi-anechoic chamber only to determine the worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters.

1.4 Equipment Modifications

Not available for this EUT intended for grant.

1.5 Support Device

Audio Signal Generator	: Manufacturer: LONGWEIINSTRUMENTS (H.K) CO., LTD. M/N: TAG-101 S/N: N/A CE
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1.6 Test Facility and Location

Listed by FCC, July 03, 2014
The Certificate Registration Number is 665078.
Listed by Industry Canada, June 18, 2014
The Certificate Registration Number is 9743A.

Dongguan NTC Co., Ltd.
(Full Name: Dongguan Nore Testing Center Co., Ltd.)

Building D, Gaosheng Science and Technology Park, Hongtu Road,
Nancheng District, Dongguan City, Guangdong, China
(Full Name: Building D, Gaosheng Science & Technology Park,
Zhouxi Longxi Road, Nancheng District, Dongguan, Guangdong, China.

1.7 Summary of Test Results

FCC Rules	Description Of Test	Result
§15.239(a)/ §2.1049	Occupied Bandwidth	Compliant
§15.239(b)	Field strength of the fundamental signal	Compliant
§15.239(b)(c)/ §15.209/ §2.1053	Spurious emissions	Compliant
§ 15.203	Antenna requirements	Compliant

2. System Test Configuration

2.1 EUT Configuration

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

2.2 Special Accessories

Not available for this EUT intended for grant.

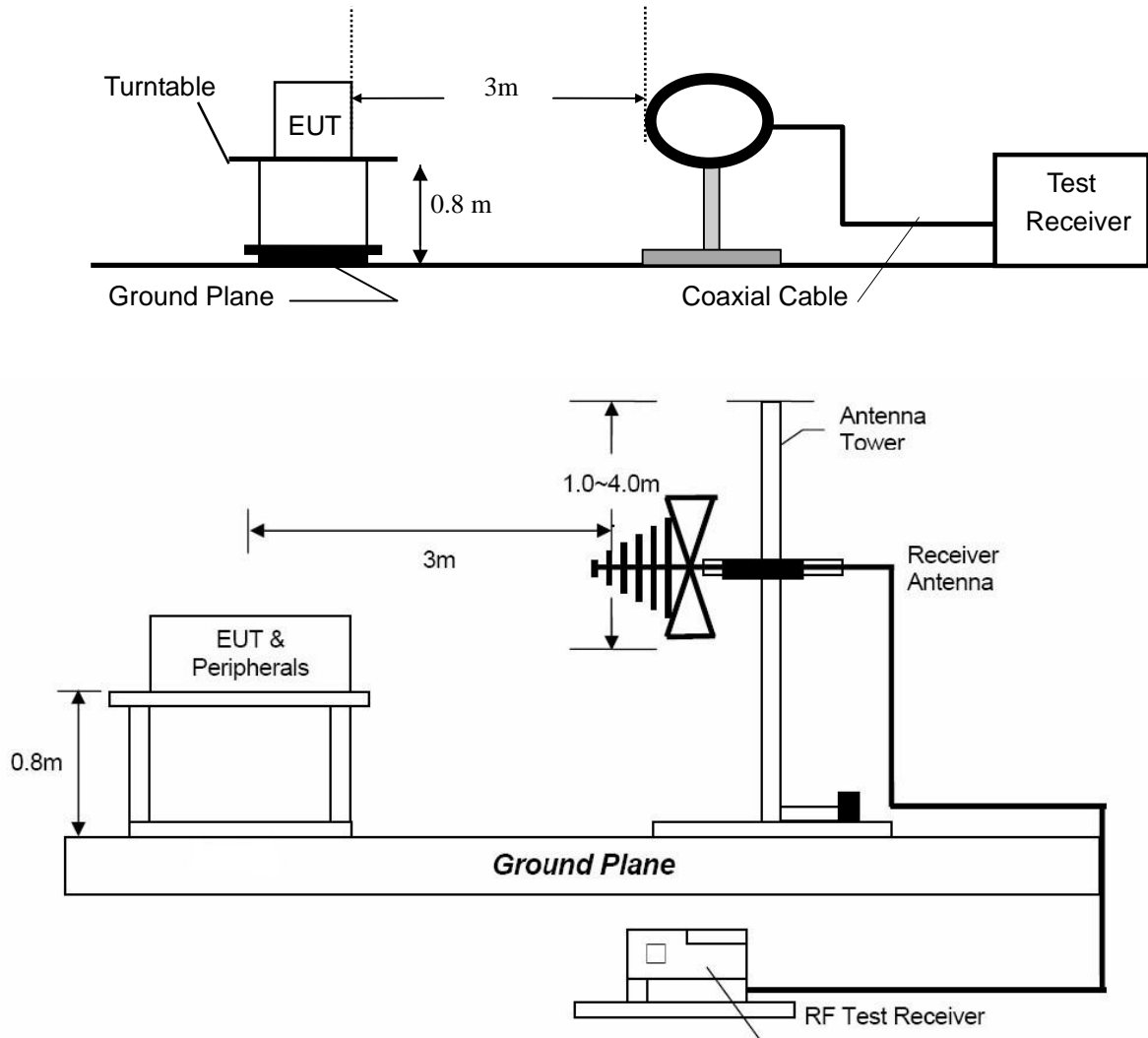
2.3 Description of test modes

The EUT has been tested under operating condition. The Lowest, middle and highest channel were chosen for testing.

3. Radiated Emission Test

3.1 Test SET-UP (Block Diagram of Configuration)

3.1.1 Radiated Emission Test Set-Up, Frequency Below 30MHz



3.2 Measurement Procedure

- a. Blow 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter semi- anechoic chamber room.
- 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 height of antenna 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 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 and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading. The test-receiver system was set to peak detect function and specified bandwidth with maximum hold mode.
- e. A Quasi-peak measurement was then made for that frequency point for below 1GHz test.

During the radiated emission test, the spectrum analyzer was set with the following configurations:

Frequency	Detector	Resolution Bandwidth	Video Bandwidth
9-150KHz	QP	200Hz	1KHz
150KHz-30MHz	QP	9KHz	30KHz
30MHz-1GHz	QP	120KHz	300KHz

3.3 Limit

(1) Limit for Field strength of the fundamental signal

Frequency	Limit	
	Average Value (dBuv/m @3m)	Peak Value (dBuv/m @3m)
88-108MHz	48	68

Note: FCC part 15.239(b) the field strength of any emissions with the permitted 200KHz band shall not exceed 250microvolts/meter at 3 meters. The emission limit in this paragraph is based on measurement instrumentation employing an average detector. The provision in section 15.35 for limiting peak emissions apply.

(2) Limit for Spurious emission

Frequency MHz	Limit
	Quasi-peak Value (dBuv/m @3m)
30-88	40.0
88-216	43.5
216-960	46.0
960-1000	54.0

(3) Limit for band edge

FCC 15.205(3)

Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50dB below the level of the fundamental or to the general radiated emission limits in section 15.209, whichever is the lesser attenuation.

3.4 Measurement Results

Please refer to following tables.



Spurious Emissions

Freq. (MHz)	Ant.Pol. (H/V)	Emission Level QP (dBuV)	Limit 3m (dBuV/m)	Margin (dB)
Lowest channel				
75.0199	H	16.58	40.00	-23.42
176.2000	H	13.45	43.50	-30.05

74.9790	V	13.50	40.00	-26.50
176.2000	V	13.33	43.50	-30.17

Middle channel				
175.6900	H	12.85	43.50	-30.65

198.000	V	13.69	43.50	-29.81

Highest channel				
107.5400	H	34.46	43.50	-9.04
215.8000	H	14.18	43.50	-29.32

107.5400	V	19.90	43.50	-23.60
215.8000	V	12.71	43.50	-30.79



Field Strength of Fundamental

Freq. (MHz)	Ant.Pol. (H/V)	Emission Level (dBuV)		Limit 3m (dBuV/m)		Margin (dB)	
		PK	AV	PK	AV	PK	AV
88.1	V	31.45	27.02	68.00	48.00	-36.55	-20.98
88.1	H	42.33	40.27	68.00	48.00	-25.67	-7.73

98.0	V	28.14	25.45	68.00	48.00	-39.86	-22.55
98.0	H	41.00	39.59	68.00	48.00	-27.00	-8.41

107.9	V	24.00	19.90	68.00	48.00	-44.00	-28.10
107.9	H	35.15	34.45	68.00	48.00	-32.85	-13.55

Band Edge Emission

Freq. (MHz)	Ant.Pol. (H/V)	Emission Level (dBuV) QP	Limit 3m (dBuV/m) QP	Margin (dB)
108.0	V	33.86	43.50	-9.64
108.0	H	19.25	43.50	-24.25

- Note: (1) Below 30MHz, the emissions are lower than 20dB below the allowable limit.
 (2) Data of measurement within this frequency range shown “ ---” in the table above means the reading of emissions are attenuated more than 10dB below the permissible limits.
 (3) Measurement uncertainty : ±3.7dB.

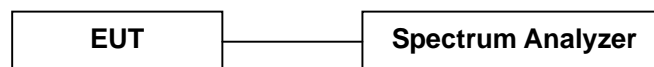
4. Occupied Bandwidth

4.1 Measurement Procedure

FCC Part 15C section 15.239(a) & §2.1049

1. Set the parameters of SPA as below:
Centre frequency = Operation frequency
RBW=10KHz
VBW=30KHz
Span: 500KHz
Sweep time: Auto
2. Set the EUT to continue transmitting mode. Allow the trace to stabilize. Use the “N dB down” function of SPA to define the bandwidth.
3. Record the plots and reported.

4.2 Test SET-UP (Block Diagram of Configuration)

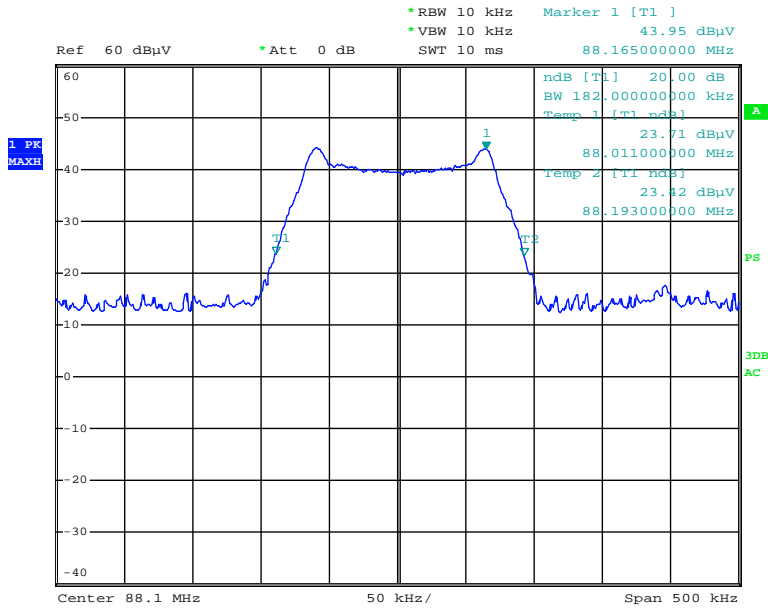


4.3 Measurement Results

Refer to attached data chart.

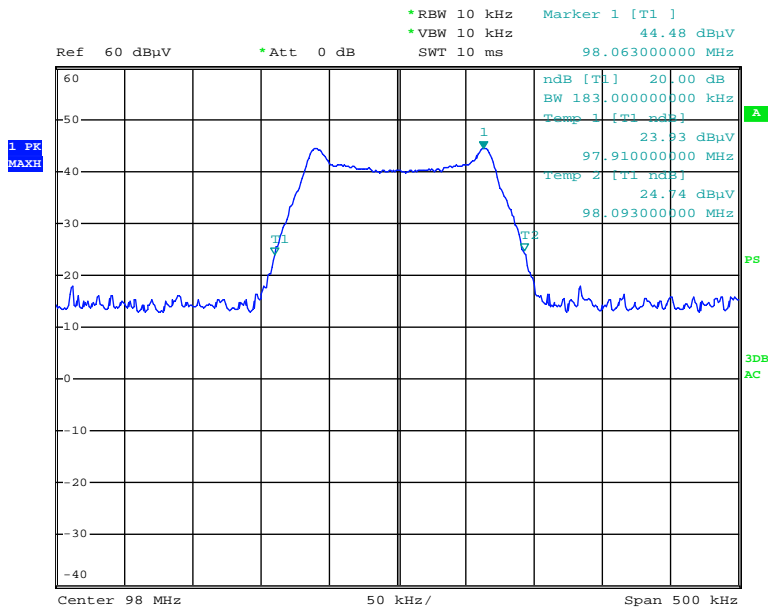
Channel Frequency(MHz)	20dB Bandwidth(kHz)	Limit (kHz)	Result
88.1	182	200	PASS
98.0	183	200	PASS
107.9	183	200	PASS

Lowest Channel



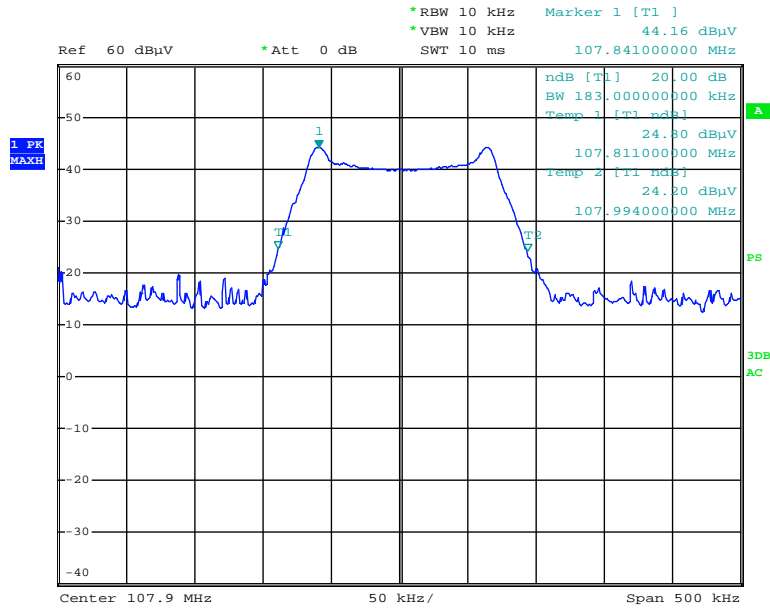
Date: 10.MAY.2016 01:21:26

Middle Channel



Date: 10.MAY.2016 01:18:22

Highest Channel



Date: 10.MAY.2016 01:19:45

5. Antenna Application

5.1 Antenna requirement

According to of FCC part 15C section 15.203 and 15.240:

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.

5.2 Measurement Results

The antenna is integrated on the main PCB and no consideration of replacement, and the best case gain of the antenna is 0dBi. So, the antenna is consider meet the requirement.

6. Test Equipment List

Description	Manufacturer	Model Number	Serial Number	Characteristics	Calibration Date	Calibration Due Date
Test Receiver	Rohde & Schwarz	ESCI7	100837	9KHz~7GHz	Nov. 23, 2015	Nov. 22, 2016
Antenna	Schwarzbeck	VULB9162	9162-010	30MHz~7GHz	Nov. 26, 2015	Nov. 25, 2016
Positioning Controller	UC	UC 3000	N/A	0~360°, 1-4m	N/A	N/A
Color Monitor	SUNSP0	SP-140A	N/A	N/A	N/A	N/A
Single Phase Power Line Filter	SAEMC	PF201A-32	110210	32A	N/A	N/A
3 Phase Power Line Filter	SAEMC	PF401A-200	110318	200A	N/A	N/A
DC Power Filter	SAEMC	PF301A-200	110245	200A	N/A	N/A
Cable	Huber+Suhner	CBL2-NN-1M	22390001	9KHz~7GHz	Nov. 07, 2015	Nov. 06, 2016
Cable	Huber+Suhner	CIL02	N/A	9KHz~7GHz	Nov. 07, 2015	Nov. 06, 2016
RF Cable	Huber+Suhner	SF-104	MY16559/4	9KHz~25GHz	Mar. 06, 2016	Mar. 05, 2017
Power Amplifier	HP	HP 8447D	1145A00203	100KHz~1.3GHz	Nov. 07, 2015	Nov. 06, 2016
Horn Antenna	Schwarzbeck	BBHA9170	9170-372	15GHz~26.5GHz	Oct.23, 2015	Oct.22, 2016
Horn Antenna	Com-Power	AH-118	071078	1GHz~18GHz	Nov. 05, 2015	Nov. 04, 2016
Loop antenna	Daze	ZA30900A	0708	9KHz~30MHz	Oct.10, 2015	Oct.09, 2016
Spectrum Analyzer	Rohde & Schwarz	FSU26	200409/026	20Hz~26.5GHz	Sep. 01, 2015	Aug. 31, 2016
Pre-Amplifier	Agilent	8449B	3008A02964	1GHz~26.5GHz	Nov. 03, 2015	Nov. 02, 2016
L.I.S.N.	Rohde & Schwarz	ENV 216	101317	9KHz~30MHz	Nov. 07, 2015	Nov. 06, 2016
Temporary antenna connector	TESCOM	SS402	N/A	9KHz-25GHz	N/A	N/A

Note: The temporary antenna connector is soldered on the PCB board in order to perform conducted tests and this temporary antenna connector is listed in the equipment list.

---End---