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TEST REPORT

Report No.: 15010947HKG-001

Scosche Industries, Inc.

Application
For
Certification
(Original Grant)
(FCC ID: IKQFMTD3PRO)
(IC: 6955A-FMTD3PRO)

FM Transmitter

Prepared and Checked by:

Signed On File
Wong Cheuk Ho, Herbert
Lead Engineer

Approved by:

Digitally signed by Kenneth Wong
Location: Intertek Testing Services Hong Kong Ltd.

Wong Kwok Yeung, Kenneth
Lead Engineer
Date: February 24, 2015

GENERAL INFORMATION

Grantee:	Scosche Industries, Inc.
Grantee Address:	1550 Pacific Avenue, Oxnard, California 93033, United States.
Contact Person:	Mark Larson
Tel:	(805) 486-4450-127
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Manufacturer:	PH Marketing Limited
Manufacturer Address:	Room 2A02, 2/F., Cheung Wah Industrial Building, 10-12 Shipyard Lane, Quarry Bay, Hong Kong.
Brand Name:	Scosche
Model:	FMTD3PRO
Type of EUT:	FM Transmitter
Description of EUT:	FM Transmitter with USB Charger
Serial Number:	N/A
FCC ID / IC:	IKQFMTD3PRO / 6955A-FMTD3PRO
Date of Sample Submitted:	January 27, 2015
Date of Test:	January 27, 2015 to February 12, 2015
Report No.:	15010947HKG-001
Report Date:	February 24, 2015
Environmental Conditions:	Temperature: +10 to 40°C Humidity: 10 to 90%

SUMMARY OF TEST RESULT

TEST SPECIFICATION	REFERENCE	RESULTS
Transmitter Field Strength and Bandwidth Requirement	15.239 / RSS-210 A2.8	Pass
Radiated Emission Radiated Emission on the Bandedge	15.209 / RSS-210 2.5	Pass

The equipment under test is found to be complying with the following standards:
FCC Part 15, October 1, 2013 Edition
RSS-210 Issue 8, December 2010
RSS-Gen Issue 4, December 2014

Note: 1. The EUT uses a permanently attached antenna which, in accordance to section 15.203, is considered sufficient to comply with the pervisions of this section.
2. Pursuant to FCC part 15 Section 15.215(c), the 20 dB bandwidth of the emission was contained within the frequency band designated (mentioned as above) which the EUT operated. The effects, if any, from frequency sweeping, frequency hopping, other modulation techniques and frequency stability over excepted variations in temperature and supply voltage were considered.

Table of Contents

1.0 General Description

1.1 Product Description

The EUT is an in-car FM transmitter which transmits audio signal from external electronic devices like iPhone or iPad to the car radio. The electronic devices are connected with the EUT by 3.5 AUX IN plug. The EUT also provides an USB port for charging with 5V power output that can charge most of the electronic devices with USB 5V DC in. The Unit comes with a big LCD display to show the frequency & channel being transmitted to the car radio. The Unit is powered by car cigarette 12V socket. It can be operated in 100 different channels in the frequency band 88.1MHz to 107.9MHz with 200kHz channel spacing (88.1, 88.3, 88.7, 88.9, … 107.9MHz).

Antenna Type: Internal, Integral

For electronic filing, the brief circuit description is saved with filename: descri.pdf.

1.2 Related Submittal(s) Grants

This is a single application for certification of a transmitter.

1.3 Test Methodology

Radiated emission measurements were performed according to the procedures in ANSI C63.4 (2009). All radiated measurements were performed in an 3m Chamber. Preliminary scans were performed in the 3m Chamber only to determine worst case modes. All radiated tests were performed at an antenna to EUT distance of 3 meters, unless stated otherwise in the **"Justification Section"** of this Application.

1.4 Test Facility

The 3m Chamber used to collect the radiated data is located at Workshop No. 3, G/F., World-Wide Industrial Centre, 43-47 Shan Mei Street, Fo Tan, Sha Tin, N.T., Hong Kong. This test facility and site measurement data have been placed on file with the FCC and IC.

2.0 System Test Configuration

2.1 Justification

The system was configured for testing in a typical fashion (as a customer would normally use it), and in the confines as outlined in ANSI C63.4 (2009).

The device was powered by 12VDC.

For maximizing emissions, the EUT was rotated through 360°, the antenna height was varied from 1 meter to 4 meters above the ground plane, and the antenna polarization was changed. This step by step procedure for maximizing emissions led to the data reported in Exhibit 3.0.

The rear of unit shall be flushed with the rear of the table.

The equipment under test (EUT) was configured for testing in a typical fashion (as a customer would normally use it). The EUT was mounted to a plastic stand if necessary and placed on the wooden turntable, which enabled the engineer to maximize emissions through its placement in the three orthogonal axes.

2.2 EUT Exercising Software

There was no special software to exercise the device. Once the unit is powered up, it transmits the RF signal continuously.

2.3 Special Accessories

There are no special accessories necessary for compliance of this product.

2.4 Measurement Uncertainty

When determining of the test conclusion, the Measurement Uncertainty of test has been considered.

2.5 Support Equipment List and Description

1. 2.5 ohm Resistive Load (Provided by Intertek)
2. iPhone (Provided by Intertek)
3. USB cable of 0.5m long (for charging only) (Provided by Intertek)

3.0 **Emission Results**

Data is included of the worst case configuration (the configuration which resulted in the highest emission levels). A sample calculation, configuration photographs and data tables of the emissions are included.

3.1 Field Strength Calculation

The field strength is calculated by adding the Antenna Factor and Cable Factor, and subtracting the Amplifier Gain (if any), Average Factor (optional) from the measured reading. The basic equation with a sample calculation is as follows:

FS = RA + AF + CF - AG - AV

where FS = Field Strength in dBµV/m
RA = Receiver Amplitude (including preamplifier) in dBµV
CF = Cable Attenuation Factor in dB
AF = Antenna Factor in dB
AG = Amplifier Gain in dB
AV = Average Factor in dB

In the following table(s), the reading shown on the data table reflects the preamplifier gain. An example for the calculations in the following table is as follows:

FS = RR + LF

where FS = Field Strength in dBµV/m
RR = RA - AG - AV in dBµV
LF = CF + AF in dB

Assume a receiver reading of 52.0 dBµV is obtained. The antenna factor of 7.4 dB and cable factor of 1.6 dB are added. The amplifier gain of 29 dB and average factor of 5 dB are subtracted, giving a field strength of 32 dBµV/m. This value in dBµV/m was converted to its corresponding level in µV/m.

RA = 52.0 dBµV/m
AF = 7.4 dB
CF = 1.6 dB
AG = 29.0 dB
AV = 5.0 dB
FS = RR + LF
FS = 18 + 9 = 27 dBµV/m

RR = 18.0 dBµV
LF = 9.0 dB

Level in µV/m = Common Antilogarithm [(27 dBµV/m)/20] = 22.4 µV/m

3.2 Radiated Emission Configuration Photograph

The worst case in radiated emission was found at 72.543 MHz

For electronic filing, the worst case radiated emission configuration photographs are saved with filename: radiated photos.pdf.

3.3 Radiated Emission Data

The data on the following page lists the significant emission frequencies, the limit and the margin of compliance. Numbers with a minus sign are below the limit.

Judgment: Passed by 5.4 dB

Applicant: Scosche Industries, Inc. Date of Test: February 12, 2015
Model: FMTD3PRO
Worst-Case Operating Mode: Transmitting (FM)

Table 1
Radiated Emissions
Pursuant to FCC Part 15 Section 15.239 / RSS-210 A2.8 Requirement

Lowest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	88.100	42.7	16	9.0	35.7	43.5	-7.8
V	176.200	27.9	16	19.0	30.9	43.5	-12.6
V	***264.300***	***26.2***	***16***	***21.0***	***31.2***	***46.0***	***-14.8***
V	352.400	24.2	16	24.0	32.2	46.0	-13.8
V	440.500	20.5	16	26.0	30.5	46.0	-15.5
V	528.600	20.2	16	27.0	31.2	46.0	-14.8

Middle Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	98.100	39.2	16	12.0	35.2	43.5	-8.3
V	196.200	30.6	16	16.0	30.6	43.5	-12.9
V	294.300	25.7	16	22.0	31.7	46.0	-14.3
V	392.400	23.4	16	25.0	32.4	46.0	-13.6
V	490.500	20.7	16	26.0	30.7	46.0	-15.3
V	588.600	18.8	16	29.0	31.8	46.0	-14.2

Highest Channel

Polari-zation	Frequency (MHz)	Reading (dBµV)	Pre-Amp Gain (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	107.900	37.5	16	14.0	35.5	43.5	-8.0
V	215.800	29.4	16	17.0	30.4	43.5	-13.1
V	***323.700***	***23.1***	***16***	***24.0***	***31.1***	***46.0***	***-14.9***
V	431.600	20.8	16	25.0	29.8	46.0	-16.2
V	539.500	15.6	16	28.0	27.6	46.0	-18.4
V	647.400	17.4	16	29.0	30.4	46.0	-15.6

NOTES:
1. Peak Detector Data unless otherwise stated.
2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.
3. Negative sign in the column shows value below limit.
4. Horn antenna is used for the emission over 1000MHz.
5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205 / RSS-210 Section 2.2.
6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

Applicant: Scosche Industries, Inc. Date of Test: February 12, 2015
Model: FMTD3PRO
Worst-Case Operating Mode: Transmitting (Other)

Table 2

Radiated Emissions
Pursuant to FCC Part 15 Section 15.209 / RSS-210 2.5 Requirement

Polarization	Frequency (MHz)	Reading (dBµV)	Pre-amp (dB)	Antenna Factor (dB)	Net at 3m (dBµV/m)	Limit at 3m (dBµV/m)	Margin (dB)
V	36.334	36.4	16	10.0	30.4	40.0	-9.6
V	48.545	38.5	16	11.0	33.5	40.0	-6.5
V	72.543	43.6	16	7.0	34.6	40.0	-5.4
V	***108.246***	***35.8***	***16***	***14.0***	***33.8***	***43.5***	***-9.7***
V	***136.669***	***36.9***	***16***	***14.0***	***34.9***	***43.5***	***-8.6***
V	192.778	32.0	16	16.0	32.0	43.5	-11.5

NOTES: 1. Peak Detector Data unless otherwise stated.

2. All measurements were made at 3 meters. Harmonic emissions not detected at the 3-meter distances were measured at 0.3-meter and an inverse proportional extrapolation was performed to compare the signal level to the 3-meter limit. No other harmonic emissions than those reported were detected at a test distance of 0.3-meter.

3. Negative sign in the column shows value below limit.

4. Horn antenna is used for the emission over 1000MHz.

5. Emission (the row indicated by ***bold italic***) within the restricted band meets the requirement of FCC Part 15 Section 15.205.

6. Measurement Uncertainty is ±5.3dB at a level of confidence of 95%.

4.0 Equipment Photographs

For electronic filing, the photographs are saved with filename: external photos.pdf and internal photos.pdf.

5.0 Product Labelling

For electronics filing, the FCC ID label artwork and the label location are saved with filename: label.pdf.

6.0 Technical Specifications

For electronic filing, the block diagram and schematic of the tested EUT are saved with filename: block.pdf and circuit.pdf respectively.

7.0 Instruction Manual

For electronic filing, a preliminary copy of the Instruction Manual is saved with filename: manual.pdf.

This manual will be provided to the end-user with each unit sold/leased in the United States and Canada.

8.0 Miscellaneous Information

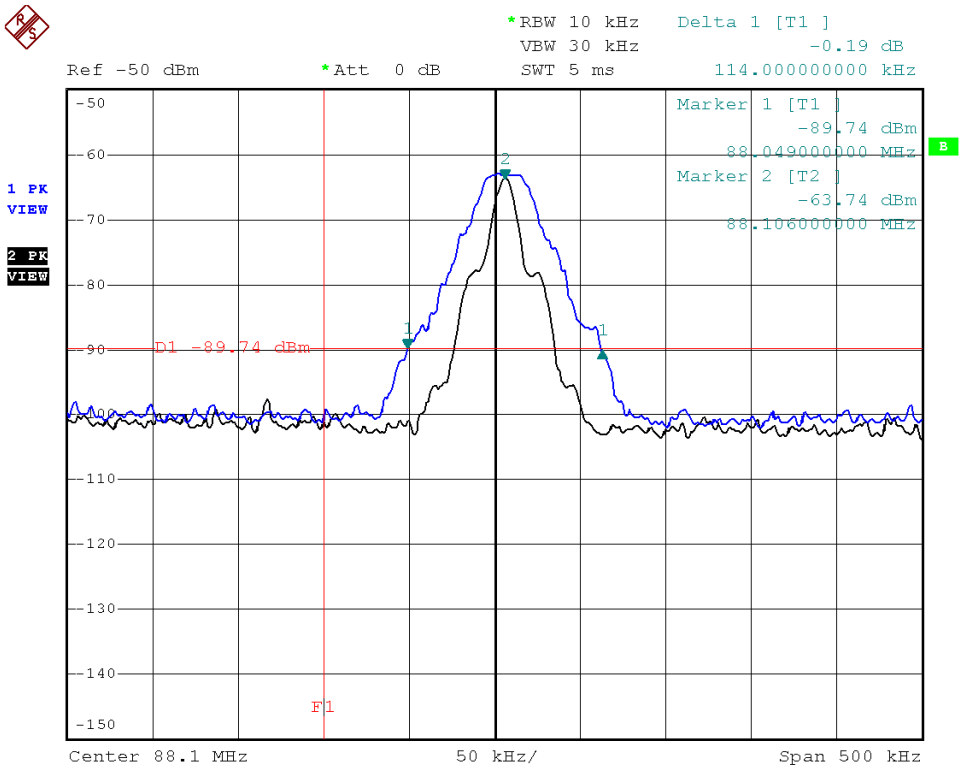
The miscellaneous information includes details of the test procedure and measured bandwidth / calculation of factor such as pulse desensitization and averaging factor.

8.1 Measured Bandwidth

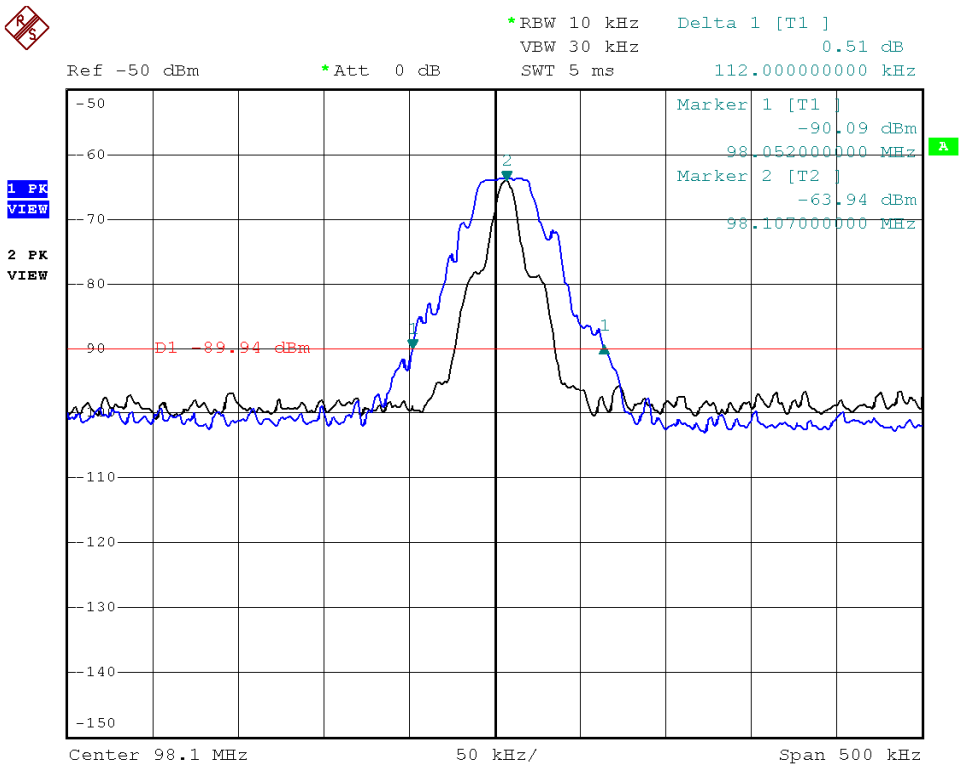
For FCC, the fundamental emission which is applied iPhone as audio input source in maximum volume. From the plots, it shows the emission is within 200kHz band.

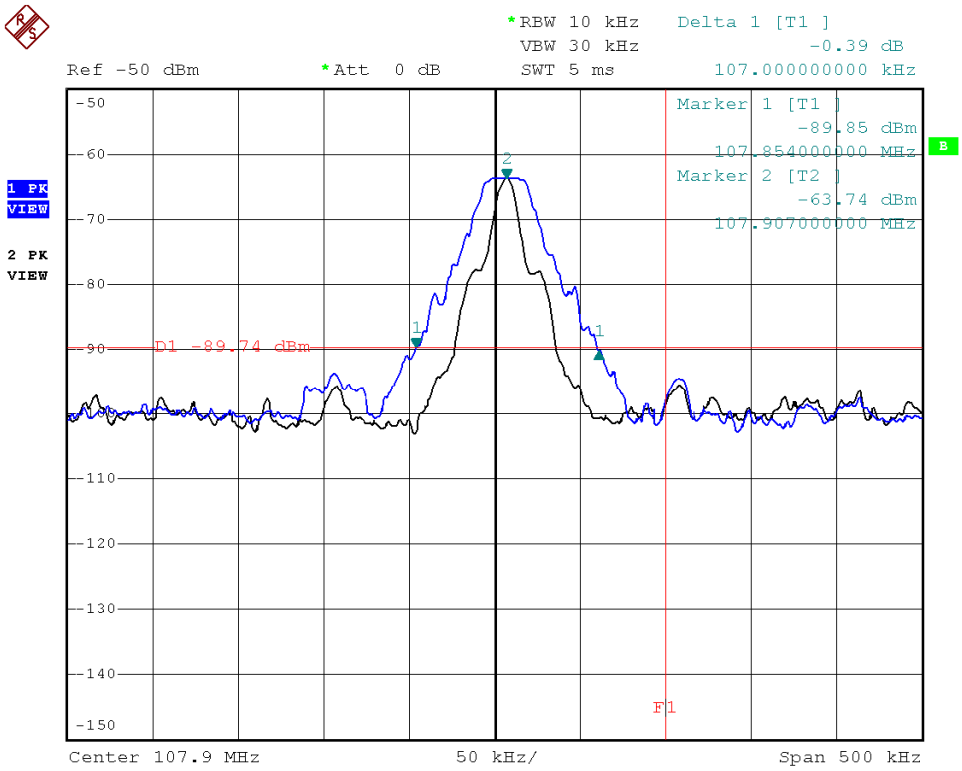
For FCC: Measured Bandwidth Results:

Bluetooth	Occupied Bandwidth (kHz)
Low Channel: 88.1MHz	114
Middle Channel: 98.1MHz	112
High Channel: 107.9MHz	107



Bandwidth Measurement





8.2 Discussion of Pulse Desensitization

Pulse desensitivity is not applicable for this device. Since the transmitter transmits the RF signal continuously.

8.3 Calculation of Average Factor

The average factor is not applicable for this device as the transmitted signal is a continuously signal.

8.4 Emissions Test Procedures

The following is a description of the test procedure used by Intertek Testing Services Hong Kong Ltd. in the measurements of transmitter operating under the Part 15, Subpart C rules.

The transmitting equipment under test (EUT) is placed on a wooden turntable which is four feet in diameter and approximately one meter in height above the ground plane. During the radiated emissions test, the turntable is rotated and any cables leaving the EUT are manipulated to find the configuration resulting in maximum emissions. The EUT is adjusted through all three orthogonal axis to obtain maximum emission levels. The antenna height and polarization are also varied during the testing to search for maximum signal levels. The height of the antenna is varied from one to four meters.

Detector function for radiated emissions is in peak mode. Average readings, when required, are taken by measuring the duty cycle of the equipment under test and subtracting the corresponding amount in dB from the measured peak readings. A detailed description for the calculation of the average factor can be found in Exhibit 8.3.

The frequency range scanned is from the lowest radio frequency signal generated in the device which is greater than 9 kHz to the tenth harmonic of the highest fundamental frequency or 40 GHz, whichever is lower.

8.4 Emissions Test Procedures (cont'd)

The EUT is warmed up for 15 minutes prior to the test.

AC power to the unit is varied from 85% to 115% nominal and variation in the fundamental emission field strength is recorded. If battery powered, a new, fully charged battery is used.

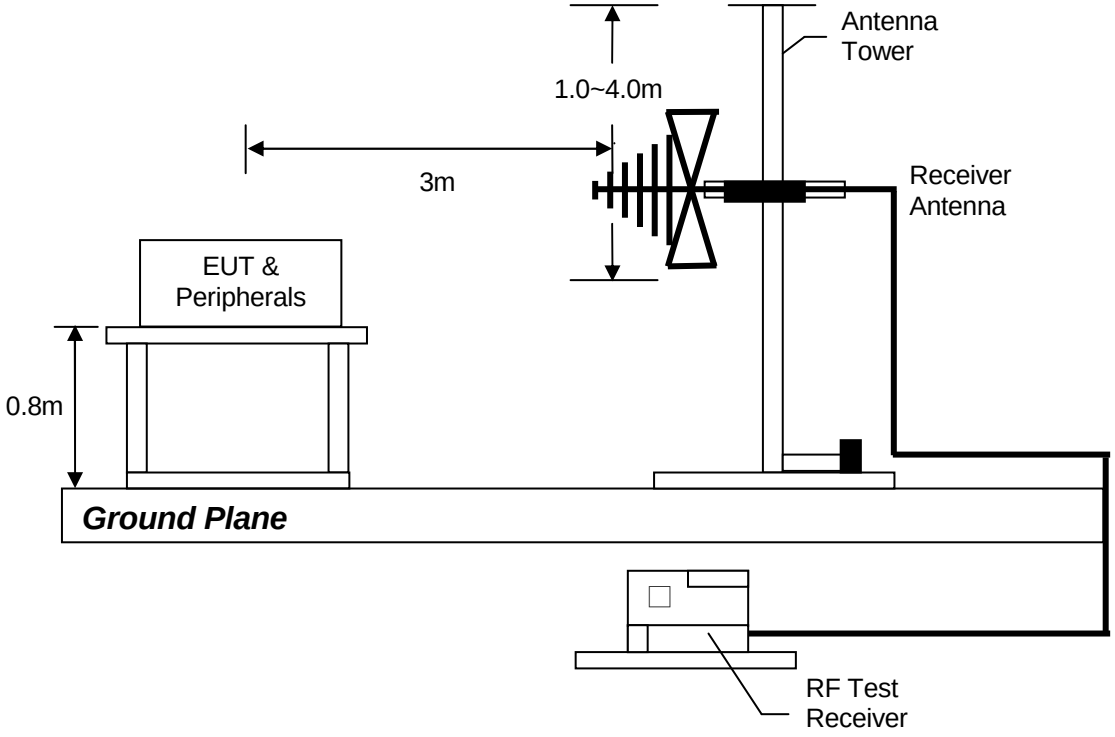
Conducted measurements were made as described in ANSI C63.4 (2009).

The IF bandwidth used for measurement of radiated signal strength was 100 kHz or greater when frequency is below 1000 MHz. Where pulsed transmissions of short enough pulse duration warrant, a greater bandwidth is selected according to the recommendations of Hewlett Packard Application Note 150-2. A discussion of whether pulse desensitivity is applicable to this unit is included in this report (See Exhibit 8.1). Above 1000 MHz, a resolution bandwidth of 1 MHz is used.

Transmitter measurements are normally conducted at a measurement distance of three meters. However, to assure low enough noise floor in the forbidden bands and above 1 GHz, signals are acquired at a distance of one meter or less. All measurements are extrapolated to three meters using inverse scaling, unless otherwise reported. Measurements taken at a closer distance are so marked.

8.4.1 Radiated Emission Test Setup

The figure below shows the test setup, which is utilized to make these measurements.

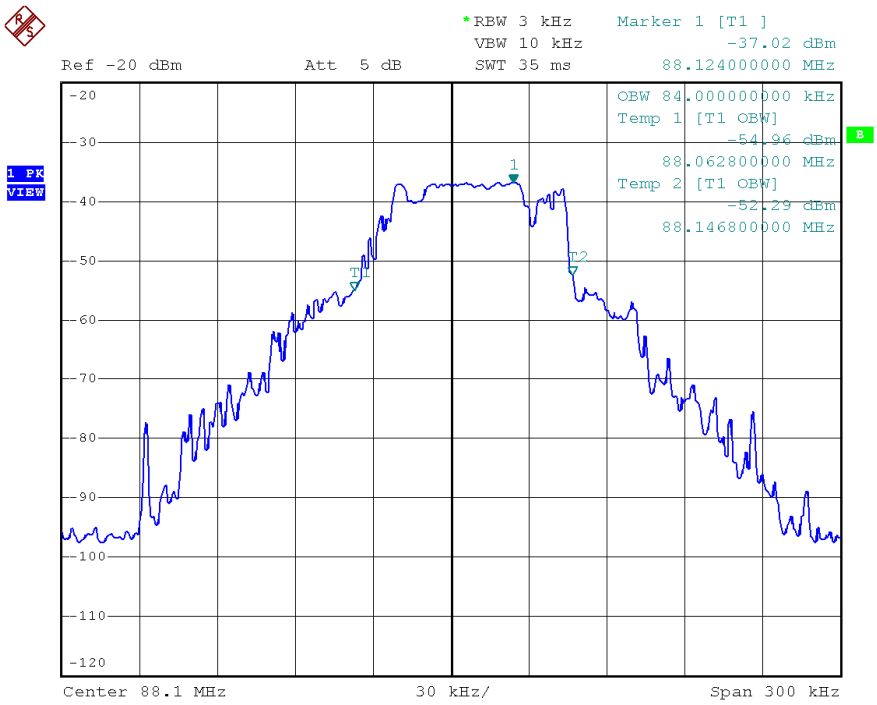


8.5 Occupied Bandwidth

For RSS-210: Occupied Bandwidth Results:

Bluetooth	Occupied Bandwidth (kHz)
Low Channel: 88.1	84
Middle Channel: 98.1	82
High Channel: 107.9	81

The worst case is shown as below:



9.0 **Confidentiality Request**

For electronic filing, a preliminary copy of the confidentiality request is saved with filename: request.pdf.

10.0 **Equipment List**

1) Radiated Emissions Test

Equipment	EMI Test Receiver	Biconical Antenna	Log Periodic Antenna
Registration No.	EW-2500	EW-0571	EW-0446
Manufacturer	R&S	EMCO	EMCO
Model No.	ESCI	3104C	3146
Calibration Date	Nov. 06, 2014	Nov. 01, 2013	Nov. 10, 2014
Calibration Due Date	Nov. 06, 2015	May 01, 2015	May 10, 2016

Equipment	Spectrum Analyzer	Double Ridged Guide Antenna
Registration No.	EW-2188	EW-1133
Manufacturer	AGILENTTECH	EMCO
Model No.	E4407B	3115
Calibration Date	Apr. 16, 2014	Apr. 30, 2014
Calibration Due Date	Apr. 16, 2015	Oct. 30, 2015

2) Bandedge/Bandwidth Measurement

Equipment	Spectrum Analyzer
Registration No.	EW-2249
Manufacturer	R&S
Model No.	FSP30
Calibration Date	Nov. 19, 2014
Calibration Due Date	Nov. 19, 2015

END OF TEST REPORT