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FCC PART 15.249
LOW POWER TRANSMITTER
TEST REPORT

Applicant	**KP ELECTRONIC SYSTEMS LTD.**
Address	**P.O. BOX 42** **TEFEN INDUSTRIAL PARK 24959** **ISRAEL**
Product Description	VHF AUTOMATIC METER READING TRANSCEIVER W/ 2.4 GHz MODULE
FCC ID:	H78KPMT2PIT
Product Model #	MT2PIT
Date Sample Received	1/4/2016
Final Test Date	2/25/2016
Tested By	Tim Royer
Approved By	Cory Leverett

Report Number	Version Number	Description	Issue Date
12CUT16TestReport_	Rev1	Initial Issue	2/26/2016

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GENERAL REMARKS

The attached report shall not be reproduced except in full without the written permission of Timco Engineering Inc.

Test Summary

The device under test does:

☒ Fulfill the general approval requirements as identified in this test report
☐ Not fulfill the general approval requirements as identified in this test report

Attestations

This equipment has been tested in accordance with the standards identified in this test report. To the best of my knowledge and belief, these tests were performed using the measurement procedures described in this report.

All instrumentation and accessories used to test products for compliance to the indicated standards are calibrated regularly in accordance with ISO 17025: 2005 requirements.

I attest that the necessary measurements were made at:

Timco Engineering Inc.
849 NW State Road 45
Newberry, FL 32669

Authorized Signatory Name:

Tim Royer
Project Manager:

Date: 2/26/2016

GENERAL INFORMATION

EUT Specification

EUT Description	VHF AUTOMATIC METER READING TRANSCEIVER W/ 2.4 GHz MODULE
FCC ID	H78KPMT2PIT
Model Number	MT2PIT
Operating Frequency Range	2432.999 – 2432.999
Test Frequency	2432.999MHz
EUT Power Source	☐ 110–120Vac/50– 60Hz
	☐ DC Power 12V
	☒ Battery Operated Exclusively
Test Item	☐ Prototype
	☒ Pre-Production
	☐ Production
Type of Equipment	☒ Fixed
	☐ Mobile
	☐ Portable
Test Conditions	Temperature: 24-26ºC Relative humidity: 50-65% Barometric Pressure: 768.9 mm
Modification to the EUT	None
Test Exercise	The EUT was operated in a normal mode.
Applicable Standards	FCC Part 15C – Intentional Radiators
Test Procedure	FCC Part 15.31, 15.33, 15.35 ANSI C63.10: 2013
Test Facility	**Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.**

TEST RESULTS SUMMARY

Specification – Rules Part No.	RESULTS – Pass/Fail/NA
FCC Rule 15.249 Fundamental	Pass
FCC Rule 15.249 Harmonics & Spurious	Pass
Occupied Bandwidth	Pass
Bandedge	Pass

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RADIATED EMISSIONS:

Rules Part No.: **Part 15.249 Operation within the band 2400 – 2483.5 MHz**

Requirements: **§ 15.249(a)(c)**, The field strength of emissions from intentional radiators operated within these frequency bands at 3 meters shall comply with the following table:

§ 15.249(d), Emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated to the general radiated emission limits in §15.209.

§ 15.249(e), As shown in §15.35(b), for frequencies above 1000 MHz, the field strength limits in of this section are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.

FCC Part 15.215 (c)
Intentional radiators operating under the alternative provisions to the general emission limits, as contained in §§15.217 through 15.257 and in subpart E of this part, must be designed to ensure that the 20 dB bandwidth of the emission, is contained within the frequency band designated in the rule section under which the equipment is operated.

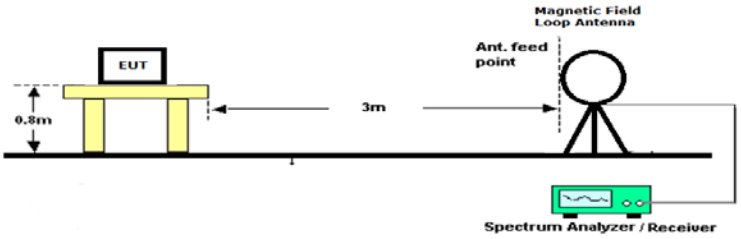
§ 15.209(a), Except as provided elsewhere in this subpart, the emissions from an intentional radiator shall not exceed the field strength levels specified in the following table:

Frequency	Limits
Part 15.209	
9 to 490 kHz	2400/F (kHz) µV/m @ 300 meters
490 to 1705 kHz	24000/F (kHz) µV/m @ 30 meters
1705 kHz to 30 MHz	29.54 dBµV/m @ 30 meters
30 – 88	40.0 dBµV/m @ 3 meters
80 – 216	43.5 dBµV/m @ 3 meters
216 – 960	46.0 dBµV/m @ 3 meters
Above 960	54.0 dBµV/m @ 3 meters
Part 15.249	
Fundamental 902 – 928 MHz	94.0 dBµV/m @ 3 meters
Fundamental 2.4 – 2.4835 GHz	94.0 dBµV/m @ 3 meters
Harmonics	54.0 dBµV/m @ 3 meters

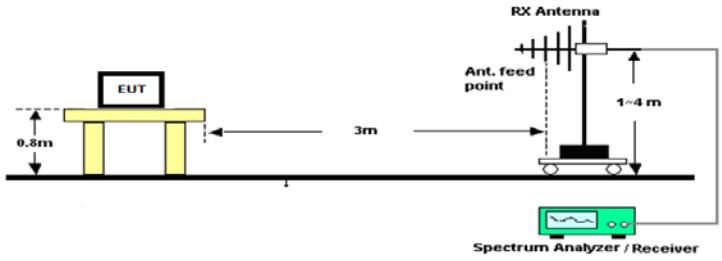
RADIATED EMISSIONS

Setup:

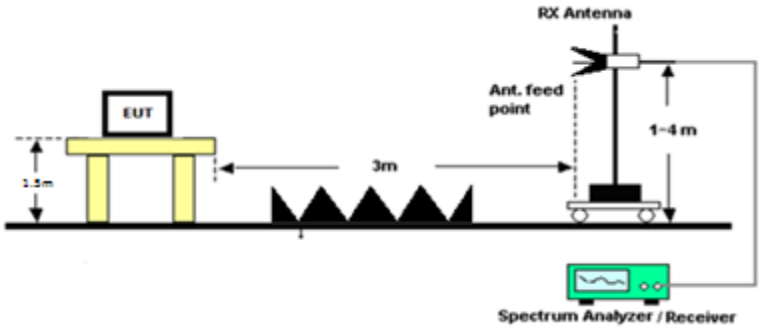
Emissions below 30 MHz



Emissions 30 – 1000 MHz



Emissions above 1 GHz



RADIATED EMISSIONS

Procedures: **FCC Rules § 15.31 -** Measurement Procedures
§ 15.33 - Frequency range of radiated measurements
§ 15.35 – Measurement detector functions and bandwidths

ANSI C63.10 § 6.3 - Radiated emissions, common requirements
§ 6.4 – Radiated emissions below 30 MHz
§ 6.5 – Radiated emissions 30 -1000 MHz
§ 6.6 – Radiated emissions above 1000 MHz
§ 6.10.5 - Restricted band-edge measurement
§ 6.9.2 Occupied bandwidth-relative measurement

Field Strength Calculation:

The field strength at 3m was established by adding the meter reading of the spectrum analyzer in dBuV to the antenna correction factor and the coax loss in from the receiver to the antenna in dB using the following formula:
Meter Reading+ ACF + CL = FS

Example:
20 dBuV + 10.36 dB+ 0.5 = 30.86 dBuV/m @ 3m

Test Data: **Field Strength of Radiated Emissions Table**

Tuned Freq MHz	Emission Frequency MHz	Detetcor	Meter Reading dBu V	Antenna Polarity	Coax Loss dB	Correction Factor dB	Field Strength dBu V/M	Margin
2432.99	2432.99	PK	47.89	H	5.73	32.50	86.12	27.88
2432.99	2432.99	AV	41.09	H	5.73	32.50	79.32	14.68
2432.99	2432.99	PK	45.89	V	5.73	32.50	84.12	29.88
2432.99	2432.99	AV	45.42	V	5.73	32.50	83.65	10.35
2432.99	4865.98	PK	8.60	H	8.12	33.93	50.65	23.35
2432.99	4865.98	AV	1.39	H	8.12	33.93	43.44	10.56
2432.99	4865.98	PK	8.49	V	8.12	33.93	50.54	23.46
2432.99	4865.98	AV	5.16	V	8.12	33.93	47.21	6.79

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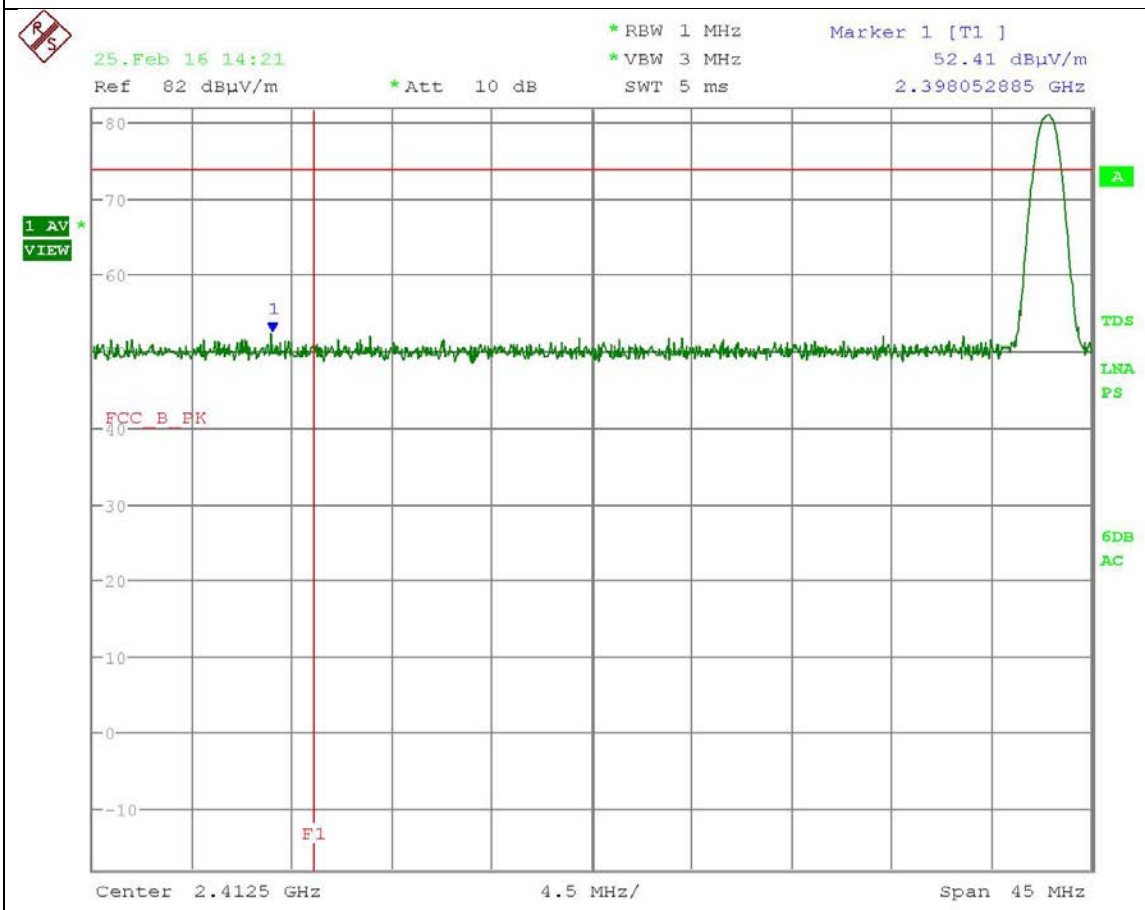
Results Meet Requirements

RADIATED EMISSIONS

Test data: Lower Bandedge 3 meter peak field strength Plot

3 Meter Peak Field Strength = 52.41 dBuV/m

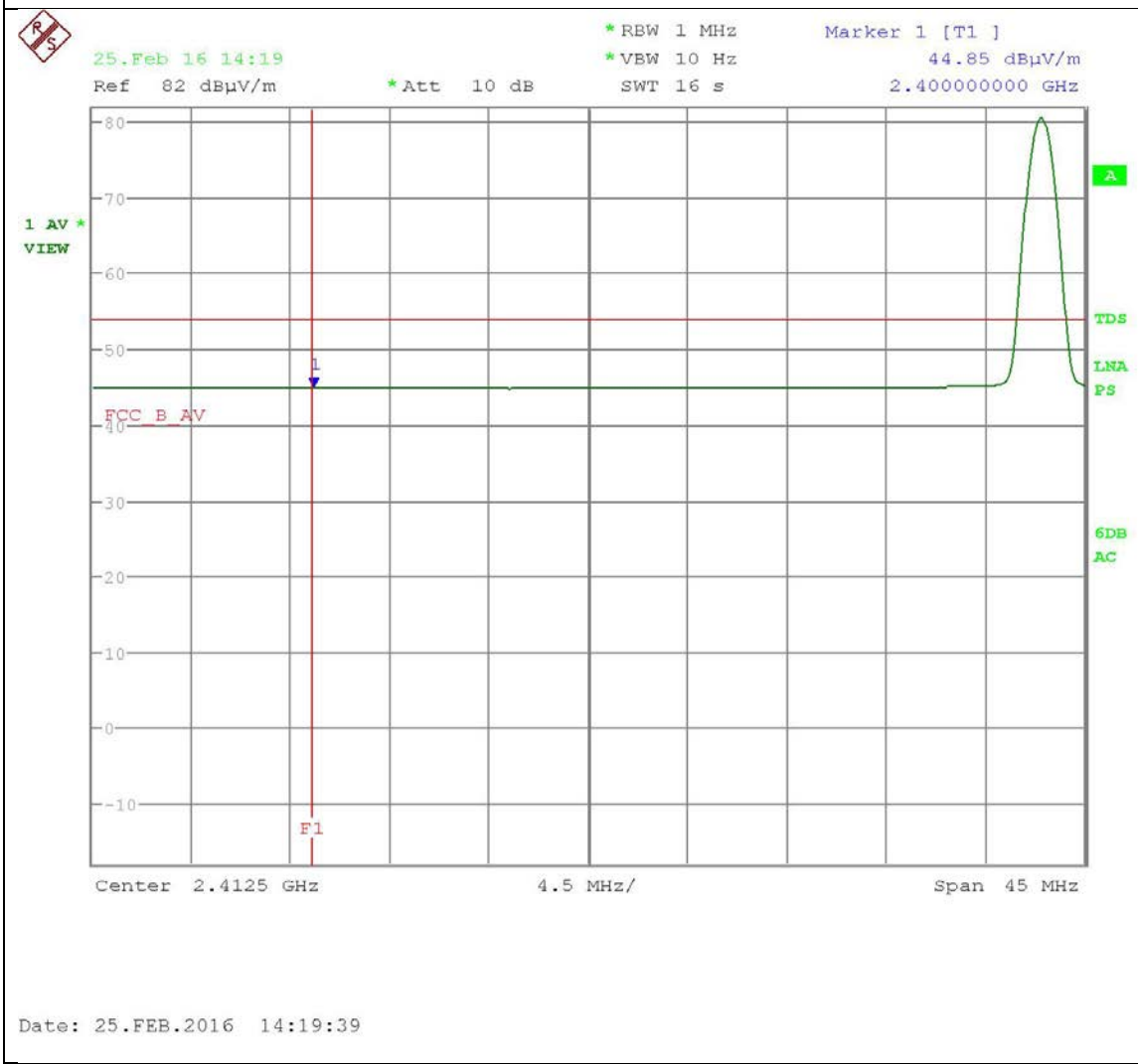


Result Meets The Requirement

RADIATED EMISSIONS

Test data: Lower Bandedge 3 meter average field strength Plot

3 Meter Average Field Strength = 44.85 dBuV/m

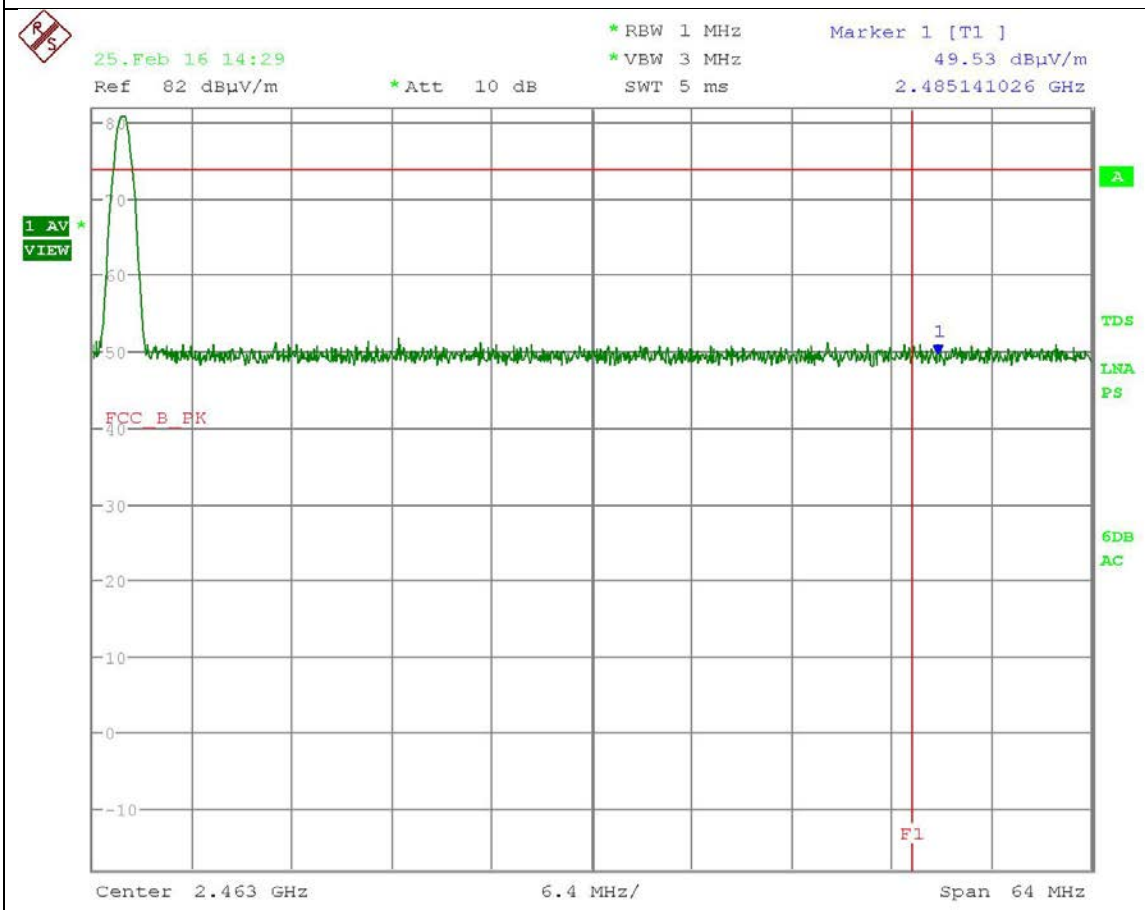


Result Meets The Requirement

RADIATED EMISSIONS

Test data: Upper Bandedge 3 meter peak field strength Plot

3 Meter Peak Field Strength = 49.53 dBuV/m

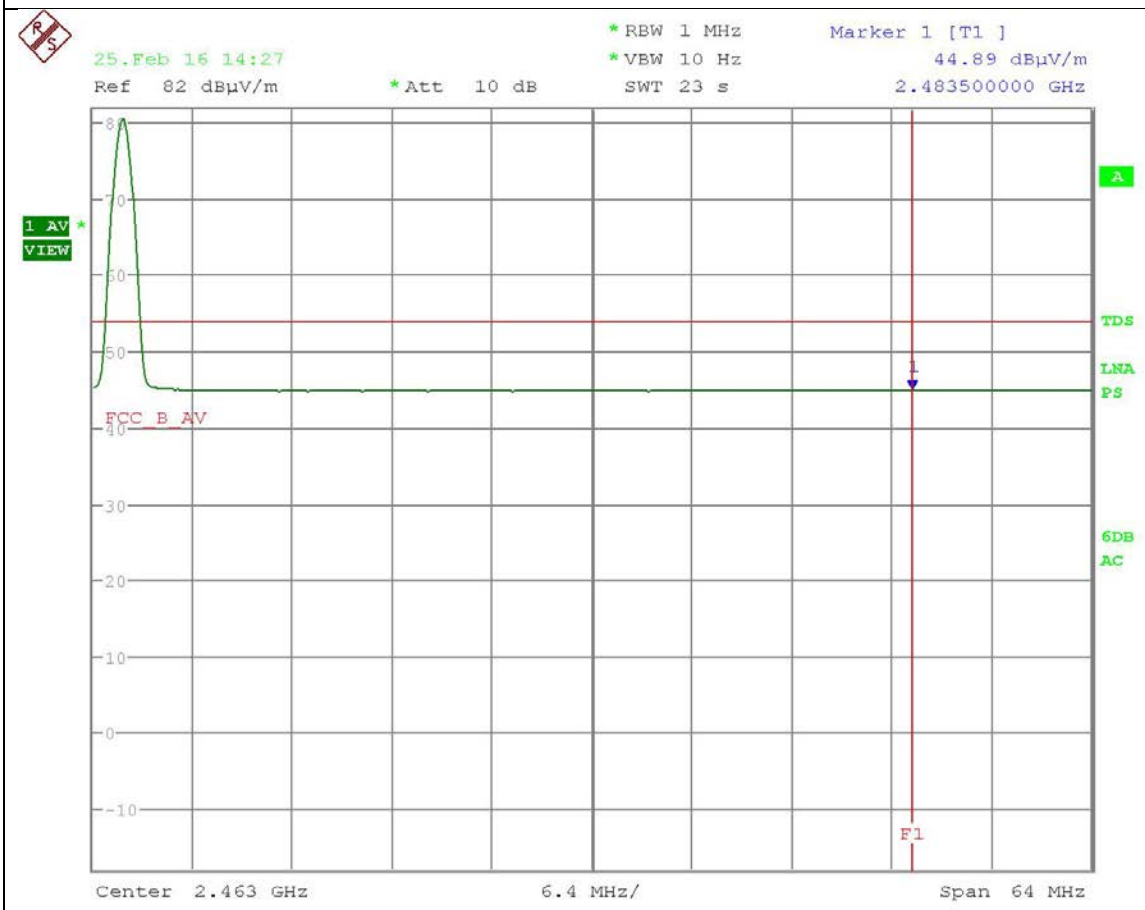


Result Meets The Requirement

RADIATED EMISSIONS

Test data: Upper Bandedge 3 meter average field strength Plot

3 Meter Peak Field Strength = 44.89 dBuV/m

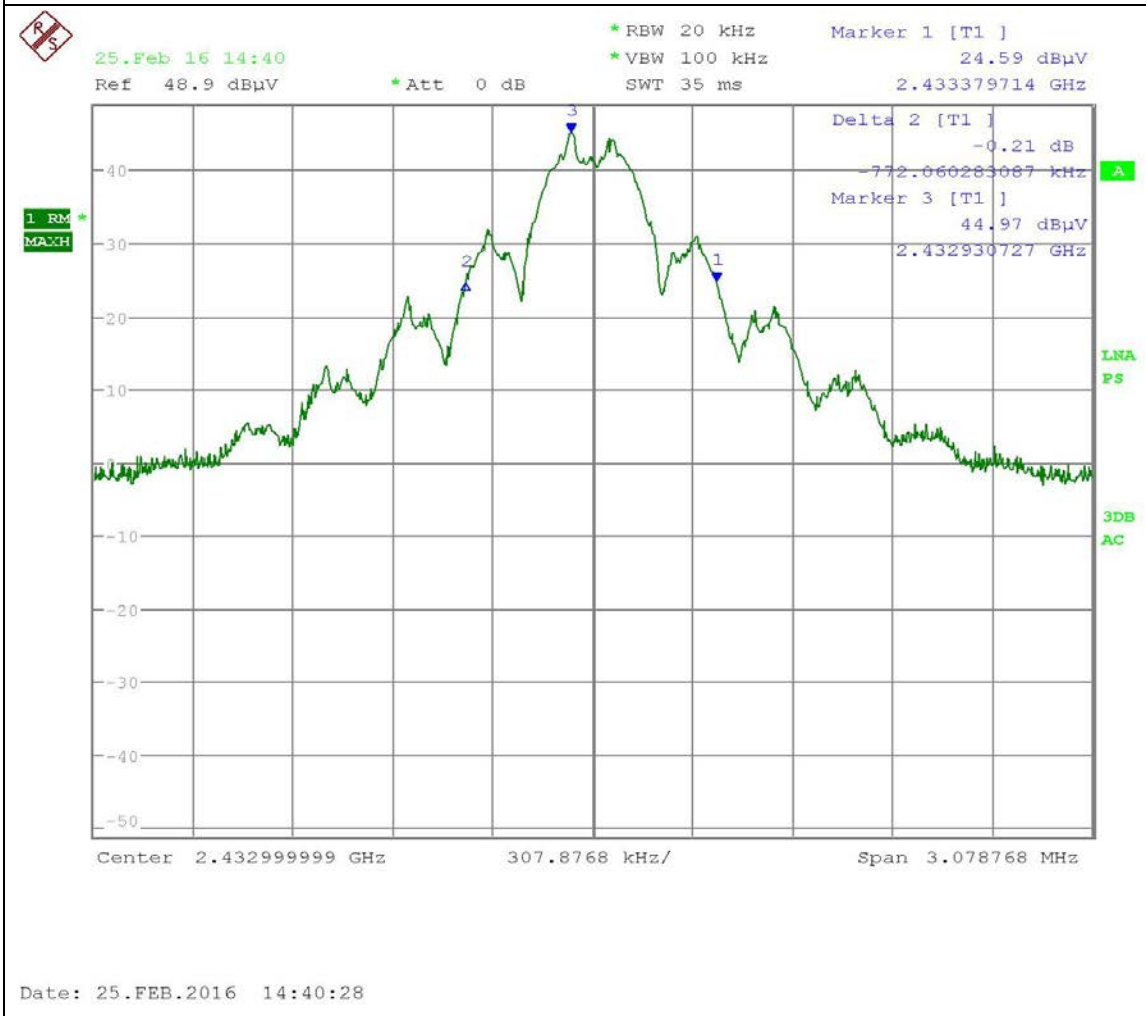


Result Meets The Requirement

RADIATED EMISSIONS

Test Data: 20 dB Occupied Bandwidth Plot

20 dB OCC BW = 772.06kHz



RESULTS MEET REQUIREMENTS

EMC EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconnical	Eaton	94455-1	1057	11/18/15	11/18/17
Antenna: Log-Periodic	Eaton	96005	1243		
Antenna: Passive Loop	EMC Test Systems	EMCO 6512	9706-1211	07/09/15	07/09/17
CHAMBER	Panashield	N/A	N/A	01/05/16	03/01/16
Antenna: Double-Ridged Horn/ETS Horn 1	ETS-Lindgren	3117	00035923	06/13/14	06/13/16
EMI Test Receiver R & S ESIB 40 Screen Room	Rohde & Schwarz	ESIB 40	100274	08/12/14	08/12/16
EMI Test Receiver R & S ESU 40 Chamber	Rohde & Schwarz	ESU 40	100320	03/11/14	03/11/16

*EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3