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FCC PART 15.109 RADAR DETECTOR REPORT

Applicant	B&M MERCHANDISE LLC
Address	744 STABLEWATCH DR INDEPENDENCE KY 41051 USA
Product Description	POLICE RADAR DETECTOR
FCC ID:	2AEE31SP
Date Sample Received	5/4/2015
Date Tested	5/6/2015
Tested By	Sid Sanders
Approved By	Cory Leverett
Test Results	☒ PASS ☐ FAIL

Report Number	Version Number	Description	Issue Date
837UT15TestReport.docx	Rev.1	Initial Issue	5/6/2015

**THE ATTACHED REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL
WITHOUT THE WRITTEN APPROVAL OF TIMCO ENGINEERING, INC.**

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GENERAL REMARKS

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

The test results relate only to the items tested.

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 requirements.

I attest that the necessary measurements were made, under my supervision, at:

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

Authorized Signatory Name:



Sid Sanders
Engineering Project Manager

Date: 5/6/2015

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GENERAL INFORMATION

EUT Specification

EUT Description	POLICE RADAR DETECTOR
FCC ID	2AEE31SP
Model Number	1SP
Operating Frequency	10.525GHz(X-Band), 24.150 GHz (K-Band), 33.4-36.0G Hz (Ka Band)
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: 24-26°C Relative humidity: 50-65% Barometric Pressure: 30.08 in.
Modification to the EUT	None
Test Exercise	The EUT was operated in a normal mode.
Applicable Standards	FCC Pt 15.109, Pt 15.107,
Test Procedure	ANSI C63.4: 2009
Test Facility	Timco Engineering Inc. at 849 NW State Road 45 Newberry, FL 32669 USA.

TEST RESULTS SUMMARY

The test results relate only to the items tested.	
FCC Rules Part No.	RESULTS Pass/Fail/NA
15.109 Radiated Emissions	PASS
15.109 Radiated Emissions in 11-12GHz	PASS
15.207 Power Line Emissions	NA

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RADIATED SPURIOUS EMISSIONS

Rules Part No.: 15.109

Requirements:

Frequency	Limits
30 – 88	40.0 dBμV/m measured @ 3 meters
80 – 216	43.5 dBμV/m measured @ 3 meters
216 – 960	46.0 dBμV/m measured @ 3 meters
Above 960	54.0 dBμV/m measured @ 3 meters
11.7 to 12.2GHz	54.0 dBμV/m measured @ 3 meters

Test Procedure: A search was made of the spectrum from 30 to 1000MHz and from 11.7 to 12.2GHz. Measurements in the 11.7 to 12.2GHz band were made with a Standard Gain Horn. The measurements in the 11.7 to 12.2GHz band represent the ambient noise levels. The attached plots were made with peak detector with the analyzer in a maximum hold for 2 minutes.

Testing was done in accordance with ANSI C63.4 & 15.35(b) specifies the use of an average detector in this band. In addition, the peak level of an emission shall not exceed the average limit by more than 20 dB using a minimum Resolution Bandwidth (RBW) of 1 MHz and minimum Video Bandwidth (VBW) OF 1 MHz. The following procedure is designed to determine if there are any spurious emissions from the local oscillator within the band of interest along with any additional spurious emissions caused by other circuitry within the device.

- 1) Determine the frequency of the peak emission:

Start Frequency 11.7 GHz

Stop Frequency 12.2 GHz

RBW equal to or greater than 1 MHz

VBW equal to or greater than 1 MHz

Detector Function Peak

Maximize the emissions with regards to device orientation, antenna polarization, and antenna height. Sweep the band using Max Hold for a minimum of 2 minutes. Record this frequency for measuring the peak emission. In addition record the frequency of other spurious emissions noted.

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RADIATED SPURIOUS EMISSIONS

Test Procedure (Cont.):

- 2) Determine the peak level of the emission:
Center Frequency Set to the frequency determined in Step 1
RBW Equal to or greater than 1 MHz
VBW Equal to or greater than 1 MHz
Detector Function Peak
Measure the value of the peak emission using Max Hold for a minimum of 2 minutes. This can be done at zero span or a frequency span where the analyzer does not show a "Measurement Uncalibrated" message. Record the peak value. If the peak measurement is compliant with the average limit an average measurement is not necessary. If the peak value exceeds the average limit by less than 20 dB proceed to Step 3.
- 3) Determine the average level of the emission:
Center Frequency Set to the frequency determined in Step 1
Span Zero
RBW Equal to or greater than 1 MHz
VBW Equal to or greater than 10 Hz
Detector Function Peak
This measurement uses video averaging and must be done in Linear mode. The analyzer Reference Level is adjusted so that a signal is clearly visible on the screen. Measure the value of the emission using Max Hold for a minimum of 2 minutes. Record this as the average value. Step 2 and Step 3 should be repeated for other spurious emissions.

Formula Of Conversion Factors: The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBuV) to the antenna correction factor supplied by the antenna manufacturer. The antenna correction factors are stated in terms of dB. The gain of the preselector was accounted for in the spectrum analyzer meter reading.

Example:

Freq (MHz)	Meter Reading	+ ACF	+CL	= FS
33	20 dBuV	+ 10.36 dB/m	+0.40 dB	=30.36
dBuV/m @ 3m				

ANSI STANDARD C63.4-2003 10.1.7 MEASUREMENT PROCEDURES: The unit under test was placed on a table 80 cm high and with dimensions of 1m by 1.5m. The table used for radiated measurements is capable of continuous rotation. When an emission was found, the table was rotated to produce the maximum signal strength. At this point, the antenna was raised and lowered from 1m to 4m. The antenna was placed in both the horizontal and vertical planes.

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RADIATED SPURIOUS EMISSIONS

Test Data:

Emission Frequency MHz	Meter Reading dBuV	Ant. Polarity	Coax Loss dB	Correction Factor dB / m	Field Strength dBuV / m	Margin dB
79.85	8.1	H	0.49	8.26	16.80	23.20
79.85	11.6	V	0.49	8.26	20.32	19.68
111.73	12.7	H	0.61	10.17	23.44	20.06
111.73	19.3	V	0.61	10.17	30.07	13.43
127.80	18.9	V	0.66	12.32	31.83	11.67
127.82	12.1	H	0.66	12.32	25.11	18.39
159.95	12.7	V	0.75	16.50	29.96	13.54
175.71	10.2	V	0.79	14.49	25.43	18.07
191.82	10.2	H	0.84	14.07	25.08	18.42
255.12	15.7	H	0.93	11.96	28.60	17.40
287.17	17.8	H	0.98	13.57	32.36	13.64
319.23	19.2	H	1.08	14.24	34.51	11.49
334.61	17.0	H	1.15	13.95	32.12	13.88
366.66	23.2	H	1.28	14.33	38.82	7.18
382.05	12.2	H	1.34	14.96	28.51	17.49
415.38	18.5	H	1.43	15.33	35.29	10.71
430.76	18.4	H	1.44	15.81	35.64	10.36

* The EUT is operating on the following bands; 10.525GHz(X-Band), 24.150 GHz (K-Band), 33.4-36.0G Hz (Ka Band)

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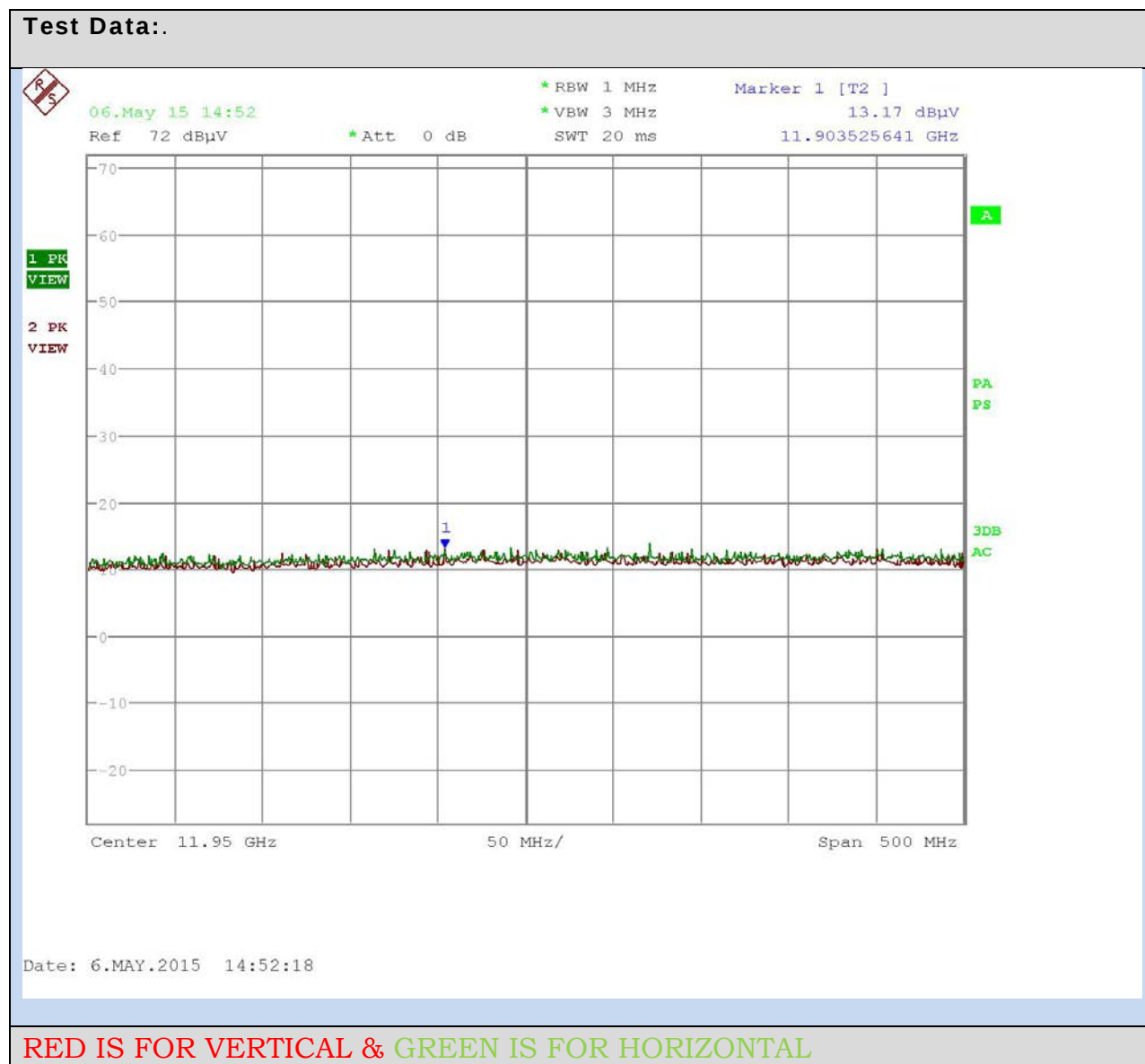
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RADIATED SPURIOUS EMISSIONS (Cont.)

HORIZONTAL PLOT



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TEST EQUIPMENT LIST

Device	Manufacturer	Model	Serial Number	Cal/Char Date	Due Date
Antenna: Biconnical Chamber	Eaton Chamber	94455-1	1057	06/14/13	06/14/15
Antenna: Log-Periodic Chamber	Eaton	96005	1243	05/31/13	05/31/15
LISN	Electro-Metrics	ANS-25/2	2604	01/07/14	01/07/16
LISN (Primary)	Electro-Metrics	EM-7820	2682	02/26/13	02/26/15
3-Meter Semi-Anechoic Chamber	Panashield	N/A	N/A	12/31/13	12/31/15
Antenna: Double-Ridged Horn/ETS Horn 2	ETS-Lindgren	3117	00041534	02/25/15	02/25/17
Software: Field Strength Program	Timco	N/A	Version 4.0	N/A	N/A
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

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