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FCC PART 15.109
RADAR DETECTOR REPORT

| | |
|---------------------------------|---|
| Applicant | COBRA ELECTRONICS CORPORATION |
| Address | 6500 WEST CORTLAND STREET CHICAGO IL 60707 |
| Product Model Number | RAD 450 |
| Product Description | RADAR DETECTOR |
| FCC ID: | BBO2016C |
| Date Sample Received | 4/06/2016 |
| Date Tested | 4/21/2016 |
| Tested By | Cory Leverett |
| Approved By | Tim Royer |

| Report Number | Version Number | Description | Issue Date |
|------------------|-------------------|---------------|------------|
| 61UT16TestReport | Rev1 | Initial Issue | 4/22/2016 |

**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 at:

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

A handwritten signature in blue ink is written over a circular purple stamp. The stamp contains the text 'TIMCO ENGINEERING' around the perimeter and 'APR 21 2016' in the center.

Authorized Signatory Name:

Engineering Project Manager

Date: 4/ 21/ 2016

GENERAL INFORMATION

| | |
|--|---|
| EUT Description | RADAR DETECTOR |
| FCC ID | BB02016C |
| Model Number | RAD 450 |
| Receive Range | 10.425 – 10.575 GHz (X-Band), 24.000 - 24.250 GHz (K-Band), 33.400 - 36.000 GHz (Ka Band) |
| Receiver Circuit | Radar Detector |
| EUT Power Source | <input type="checkbox"/> 110–120Vac/50– 60Hz |
| | <input checked="" type="checkbox"/> DC Power 12VDC Nominal |
| | <input type="checkbox"/> Battery Operated Exclusively |
| Test Item | <input type="checkbox"/> Prototype |
| | <input checked="" type="checkbox"/> Pre-Production |
| | <input type="checkbox"/> Production |
| Type of Equipment | <input type="checkbox"/> Fixed |
| | <input checked="" type="checkbox"/> Mobile |
| | <input type="checkbox"/> Portable |
| Modification required for testing | None |

REPORT SUMMARY

| | |
|--|---|
| Regulatory Standard | CFR Title 47 FCC Rule part 15B § 15.109 |
| Test Procedures | FCC 02-211 Interim Test Procedure for Radar Detector Compliance FCC Part 15.31, 15.33, 15.35 ANSI C63.4 – 2014 |
| Operational Modes | Radar Detector was powered on and operating as intended. |
| Test Frequencies | Receiver circuit sweeping through all supported radar bands |
| Setup | Powered through supplied 12V automotive cigarette lighter plug, using 12 VDC lab power supply adjusted for 13.6 VDC output. See test setup photo. |
| Environmental Condition in the laboratory | Temperature: 24-26°C Relative humidity: 50-65% Barometric Pressure: 30.03 in |
| Deviation from the standard/ procedure | No deviation |

RESULTS SUMMARY

| Requirement | Test Result | Limit | Pass/ Fail |
|--|--|-----------|------------|
| 15.109 Radiated Emissions in VSAT band 11.7 – 12.2 GHz | 24.18 dBuV/m @ 11.79 GHz (peak noise floor) | 54 dBuV/m | Pass |

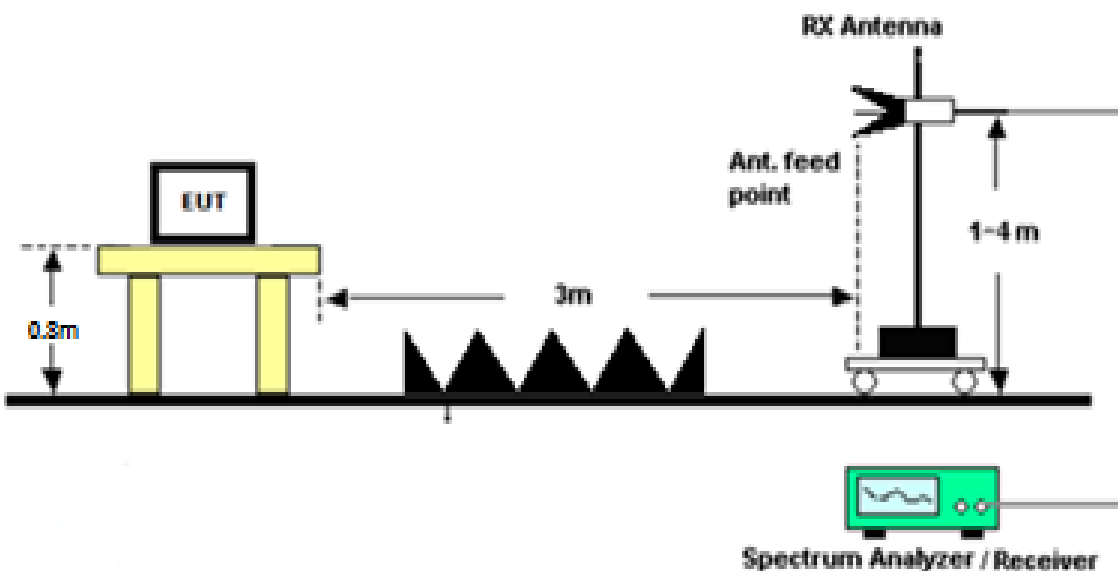
RADIATED EMISSIONS

Rules Part No.: 15.109

Requirements:

| Frequency | Limits |
|-----------------|---------------------------------------|
| 11.7 to 12.2GHz | 54.0 dB μ V/m measured @ 3 meters |

Setup:



Procedure: FCC Part 15.35(a) Measurement detector functions and bandwidths

ANSI C63.4 Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment 9 kHz to 40 GHz

§ 6.2 Operating conditions

§ 6.3 Arrangement of EUT

§ 8.3.1 Exploratory radiated emissions measurements

§ 8.3.2 Final radiated emission measurements

Configuration: Placed on edge of turntable, 13.6 VDC power was supplied through a lab power supply and all functions of the radar detector operating normally.

Field Strength Formula:

The field strength at 3m was established by adding the meter reading of the spectrum analyzer (which is set to read in units of dBμV) to the antenna correction factor supplied by the antenna manufacturer plus the coax loss. 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 Level (dBμV) | Pre-Amp Gain (dB) | Ant Cor Factor (dB) | Coax Loss (dB) | Field Strength (dBμV/m) |
|------------|--------------------|-------------------|---------------------|----------------|-------------------------|
| 33 | 25.6 | 15.2 | 12.4 | 2.2 | 25 |

Procedure: Interim Test Procedure for Determining Radar Detector Compliance
With the Rules Adopted in Report and Order FCC 02-211 July 19, 2002

Many radar detectors sweep the local oscillator across a wide band. Typically the local oscillator is the primary spurious emission from radar detectors. 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.

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 - 2 - 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:

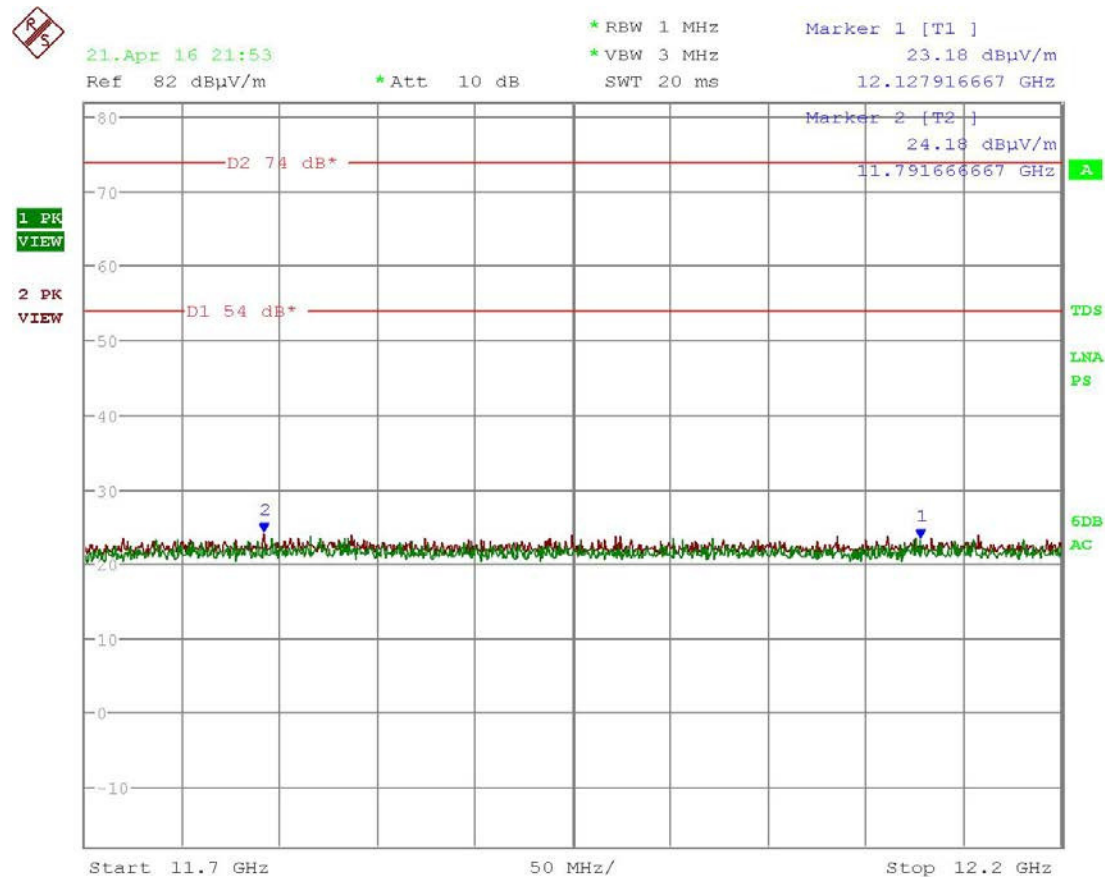
| | |
|-------------------|---|
| Center Frequency | Set to the frequency determined in Step 1 |
| Span | Zero |
| RBW | Equal to or greater than 1 MHz |
| VBW | Equal to or greater than 10 Hz |
| Detector Function | Peak |

This measurement uses video averaging and must be done in Linear mode. The analyzer Reference Level will have to be 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.

Note: Step 2 and Step 3 should be repeated for other spurious emissions within the band.

RADIATED SPURIOUS EMISSIONS

TEST DATA: 11.7 – 12.2 GHZ PEAK 3 METER FIELD STRENGTH



Date: 21.APR.2016 21:53:09

Ant Polarity: T1 (Green) = Vertical, T2 (Red) = Horizontal

Notes:

No emissions were found in excess of the reported noise floor figures in the peak plot above

Results - Meets Requirements

TEST EQUIPMENT LIST

| Device | Manufacturer | Model | Serial Number | Cal/ Char Date | Due Date |
|---|--------------------|-------------|---------------|----------------|----------|
| CHAMBER | Panashield | 3M | N/A | 02/18/16 | 08/18/18 |
| Antenna: Double- Ridged Horn/ETS Horn 2 | EMCO | 3116 | 9011-2145 | 11/18/15 | 11/18/17 |
| 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 | 12/15/14 | 12/15/17 |
| Pre-Amp | RF-Lambda | RLNA00M45GA | NA | 01/04/16 | 01/04/18 |

* EMI RECEIVER SOFTWARE VERSION

The receiver firmware used was version 4.43 Service Pack 3