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July 20, 2011

Vipin Malik
Houston Radar, LLC
13814 Sherbun Manor Drive
Cypress, TX 77095

Dear Vipin:

Enclosed is the Wireless Test Report for the PD300 Radar by Houston Radar, LLC. This report can be used to demonstrate compliance with FCC requirements for wireless devices in the United States.

If you have any questions, please contact me.

Sincerely,

Jeffrey A. Lenk
President

Enclosure

Project 12538-10

**Houston Radar, LLC.
PD300**

Wireless Certification Report

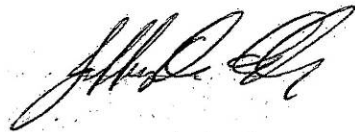
Prepared for:
Houston Radar, LLC.
13814 Sherbun Manor Drive
Cypress, TX 77095

By

Professional Testing (EMI), Inc.
1601 N. A.W. Grimes Blvd., Suite B
Round Rock, Texas 78665

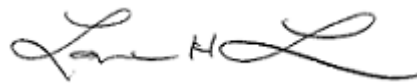
July 20, 2011

Reviewed by



Jeffrey A. Lenk
President

Written by



Layne Lueckemeyer
Product Development Engineer

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THIS REPORT SHALL NOT BE REPRODUCED EXCEPT IN FULL, WITHOUT THE WRITTEN APPROVAL OF PROFESSIONAL TESTING (EMI), INC.

NOTICE: (1) This Report must not be used to claim product endorsement, by NVLAP, NIST, the FCC or any other Agency. This report also does not warrant certification by NVLAP or NIST.

(2) This report shall not be reproduced except in full, without the written approval of Professional Testing (EMI), Inc.

(3) The significance of this report is dependent on the representative character of the test sample submitted for evaluation and the results apply only in reference to the sample tested. The manufacturer must continuously implement the changes shown herein to attain and maintain the required degree of compliance.



Applicant: Houston Radar, LLC.
 Applicant's Address: 13814 Sherbun Manor Drive
 Cypress, TX 77095
 FCC ID: TIAPD300
 Project Number: 12538-10
 Test Dates: June 27 - 28, 2011

The **Houston Radar PD300** was tested to and found to be in compliance with FCC 47 CFR Part 15.

The highest emissions generated by the above equipment are listed below:

Parameter	Frequency (MHz)	Level	Limit	Margin (dB)
Transmitter: Fundamental Field Strength at 1m	24026	119.3 dBuV/m @ 1 m	137.5 dBuV/m	-18.2
Transmitter: Radiated Spurious	96356	94.0 dB μ V/m @ .1 m	97.5 dB μ V/m	-3.5

NOTE: Transmitter limits above reflect Peak limits. The EUT met both Peak and Average limits.

99% Occupied Bandwidth	Emission Designator
215.000 MHz	215MF0N

I, Layne Lueckemeyer, for Professional Testing (EMI), Inc., being familiar with the FCC rules and test procedures have reviewed the test setup, measured data, and this report. I believe them to be true and accurate.

Layne Lueckemeyer
 Product Development Engineer

This report has been reviewed and accepted by Houston Radar, LLC. The undersigned is responsible for ensuring that this device will continue to comply with the FCC and IC rules.

Representative of Houston Radar, LLC.

1.0 Introduction

1.1 Scope

This report describes the extent of the equipment under test (EUT) conformance to the intentional radiator requirements of the United States and Canada.

Professional Testing (EMI), Inc. (PTI), follows the guidelines of NIST for all uncertainty calculations, estimates, and expressions thereof for EMC testing. The procedure of ANSI C63.4: 2009 were utilized for making all emissions measurements.

1.2 EUT Description

The PD300 Frequency Modulated Continuous-wave (FMCW) radar is nominally powered by a 12V DC supply but can operate from any 5.5V-18V DC source. The power input is protected from over-voltage, reverse voltage and over-current by a combination of a poly-fuse and a parallel uni-directional TVS diode. PD300 can monitor its own power consumption via a high side current sense circuit and input voltage through input divider that brings the voltage down to the level that can be safely measured by a microcontroller unit (MCU). Input voltage is further regulated down to 5V and 3.3V DC by two high-efficiency switching regulators operating at 250 KHz. The 5V DC rail is used to power a microwave sensor, audio frequency preamplifier and a varactor driver. The 3.3V DC regulator provides power to MCU and associated digital electronics such as RS232 transceiver and serial FLASH memory. The EUT continuously transmitted at maximum power. The system tested consisted of the following:

Manufacturer	Model	FCC ID Number
Houston Radar, LLC.	PD300	TIAPD300

The following rules apply to the operation of the EUT:

Guidelines	FCC Rules
	Part 15
Transmitter Characteristics	15.249
Spurious Radiated Power	15.209
Antenna Requirement	15.203

1.3 Modifications

No modifications were made to the EUT during the performance of the test program.

1.4 Test Site

Measurements were made at the PTI semi-anechoic facility designated Site 45 (FCC 459644, IC 3036B-1) in Austin, Texas. This site is registered with the FCC under Section 2.948 and Industry Canada per RS-212, and is subsequently confirmed by laboratory accreditation (NVLAP). The test site is located at 11400 Burnet Road, Austin, Texas, 78758, while the main office is located at 1601 N. A.W. Grimes Blvd., Suite B, Round Rock, Texas, 78665.

1.5 Applicable Documents

Document	Title	Release
ANSI C63.4	American National Standard for Methods of Measurement of Radio-Noise Emissions from Low Voltage Electrical and Electronic Equipment	2009
ANSI C63.10	American National Standard for Testing Unlicensed Wireless Devices	2009
47 CFR	Part 15 – Radio Frequency Devices Subpart C -Intentional Radiators	

2.0 Fundamental Field Strength Measurements

Fundamental field strength measurements were made on the selected fundamental transmit frequency of the EUT.

Tests of the fundamental field strength of the EUT also determined the worse case polarization of the device. The emissions of the device were measured with the EUT in three orthogonal axes.

2.1 Test Procedure

Radiated emission measurements were made of the fundamental field strength level for the EUT. The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a motorized turntable that enables 360-degree rotation. For measurements of the fundamental signal, a measurement antenna was positioned at a distance of 1 meters, as measured from the closest point of the EUT. The field strength emissions were maximized by rotating the EUT. A diagram showing the test setup is given as Figure 2.1.1.

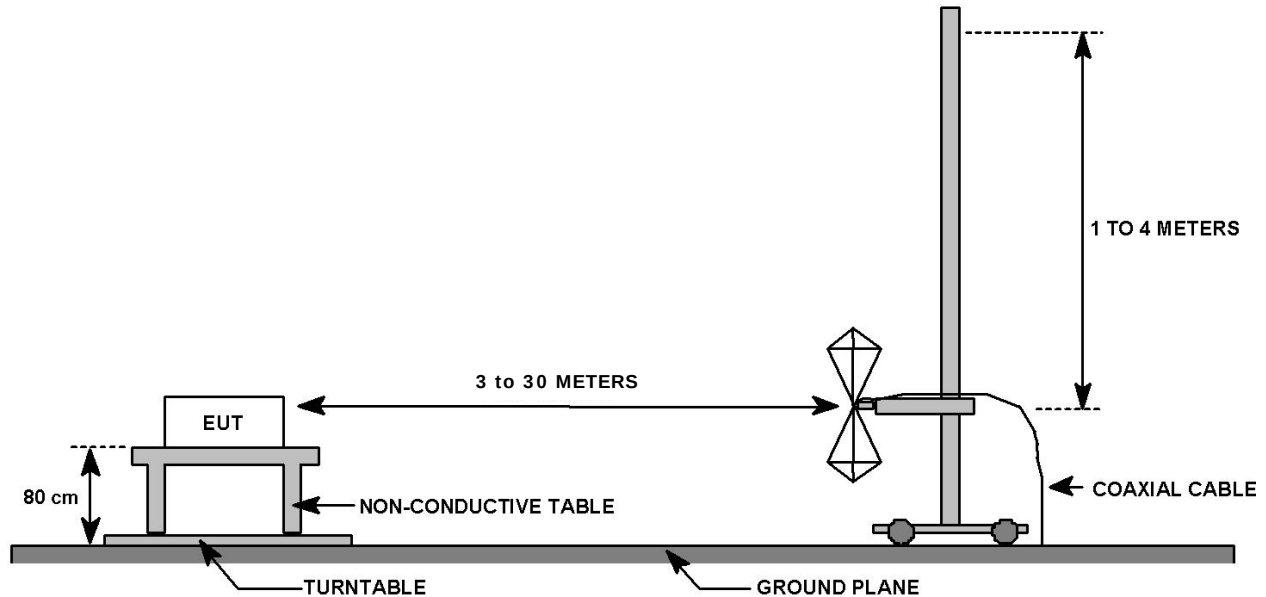


Figure 2.1.1: Radiated Emission Test Setup

2.2 Test Criteria

The maximum field strengths shall not exceed the following values:

Carrier (MHz)	Field Strength (mV/m)	Field Strength (dB μ V)	Harmonic (μ V/m)	Harmonic (dB μ V)
902-928	50	94	500	54
2400-2483.5	50	94	500	54
5725-5875	50	94	500	54
24000-24250	250	108	2500	68

(b) Field strength limits are specified at a distance of 3 meters.

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

(d) ...for frequencies above 1000 MHz, the above field strength limits 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.

Limits in the table below are at 1 meter. The limits are adjusted from the 3 meter limit by adding a factor of 9.5 dB from the formula:

$$20 \log(1/3) = -9.5 \text{ dB}$$

Peak limit is Avg. limit + 20 dB as described in 15.249(d).

Analyzer Settings:

Peak Readings: RBW = 1 MHz, VBW = 10 MHz, Peak detector

Average Readings: RBW = 1 MHz, VBW = 10 MHz, Average detector

The measurement was integrated over 215 MHz channel bandwidth to achieve the fundamental field strength.

2.3 Test Results

Radiated emission measurements of the fundamental field strength level for the EUT were taken on June 27, 2011, and the EUT was found to be in compliance with applicable requirements.

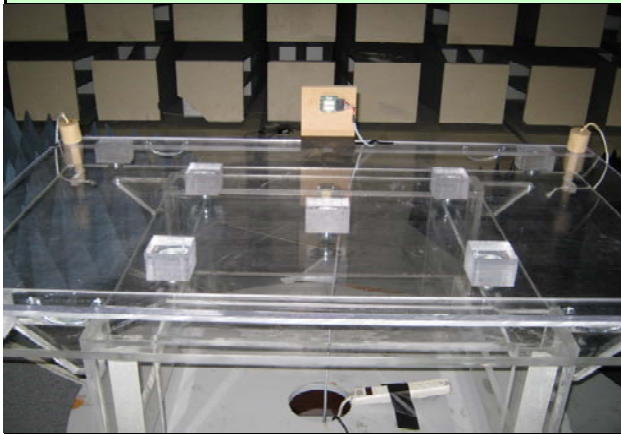
Table 2.3.1: Radiated Emissions of the Fundamental Strength Test Equipment

Professional Testing, EMI, Inc.					
Test Method:	ANSI C63.4–2003: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators,				
In accordance with:	Radiated Emissions Limits				
Section:	15.109				
Test Date(s):	6/27/2011	EUT Serial #:	1		
Customer:	Houston Radar	EUT Part #:	PD300		
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer		
Purchase Order #:	81126	Supervisor:	Jason Haley		
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov		
Radiated Emissions Test Equipment List					Page: 1 of 1
Tile! Software Version:		3.4.K.11, June 7, 2006, 07:49:00 PM			
Test Profile:		Radiated Emissions_updated_12-16-10.til			
Asset#	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
ALN-077	Rohde & Schwarz	FSP30	Spectrum Analyzer	100218	12/22/2012
1542	A.H. Systems	SAS-572	Antenna, Horn 18-26.5GHz, 20dB gain	225	NCR
C117	Times Microwave	SLU18-SMSM-05.00F	Cable, RF, SMA-SMA, 60", Brown	none	9/22/2011
1509B	Braden	N/A	TDK 10M Chamber, VSWR > 1 GHz	DAC-012915-005	4/7/2012

Table 2.3.2: Radiated Emissions of the Fundamental Strength Test Results

Professional Testing, EMI, Inc.									
Test Method:	ANSI C63.4–2009: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by								
In accordance with:	FCC Part 15.249 Code of Federal Regulations Part 47								
Section:	15.249								
Test Date(s):	6/27/2011				EUT Serial #:	1			
Customer:	Houston Radar				EUT Part #:	PD300			
Project Number:	12538-10				Test Technician:	Layne Lueckemeyer			
Purchase Order #:	81126				Supervisor:	Jason Haley			
Equip. Under Test:	FMCW Microwave Radar				Witness' Name:	Vipin Malik / Sergei Sharonov			
Fundamental Field Strength Test Results Data Sheet						Page: 1 of 1			
EUT Line Voltage:		12 VDC		EUT Line Frequency:		N/A		Hz	
EUT Mode of Operation:					Transmit Modulation On				
Frequency Measured (GHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBµV)	Corrected Level (dBµV/m)	Limit Level (dBµV/m)	Margin (dB)	Antenna Polarization
24.026	1	180	1	Peak	81.8	119.3	137.5	-18.2	Vertical
24.026	1	180	1	Peak	65.6	103.1	137.5	-34.4	Horizontal
24.026	1	180	1	Average	73.9	111.4	117.5	-6.1	Vertical
24.026	1	180	1	Average	55.8	93.3	117.5	-24.2	Horizontal

Table 2.3.3: Radiated Emissions of the Fundamental Strength Test Setup Photos

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators,		
In accordance with:	Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	6/27/2011	EUT Serial #:	1
Customer:	Houston Radar	EUT Part #:	PD300
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer
Purchase Order #:	81126	Supervisor:	Jason Haley
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov
Field Strength and Occupied Bandwidth Photographs		Page:	1 of 1
			
PD300 Front		PD300	

3.0 Occupied Bandwidth

Occupied bandwidth measurements were performed on the EUT to determine compliance with FCC 15.249 and RSS-210.

3.1 Test Procedure

The occupied bandwidth was measured with a spectrum analyzer connected to a double-ridged guide horn while the EUT was operating in continuous transmit mode at the appropriate center frequency. The analyzer center frequency was set to the EUT carrier frequency. The EUT was placed on a non-conductive table 0.8 meters above the floor. The table was rotated to an angle which presented the highest signal level. The occupied bandwidth was based on a 99% occupied bandwidth criteria. A drawing showing the test setup is given as Figure 1. A diagram showing the test setup is given as Figure 2.1.1.

3.2 Test Criteria

According to FCC Part 15.249, the emission must remain in the defined band.

3.3 Test Results

Occupied bandwidth measurements were taken on June 27, 2011, and the EUT was found to be in compliance with applicable requirements. Test equipment used to perform this test is given in Table 2.3.1.

Table 3.3.1: Occupied Bandwidth Test Results, Data Sheet 1

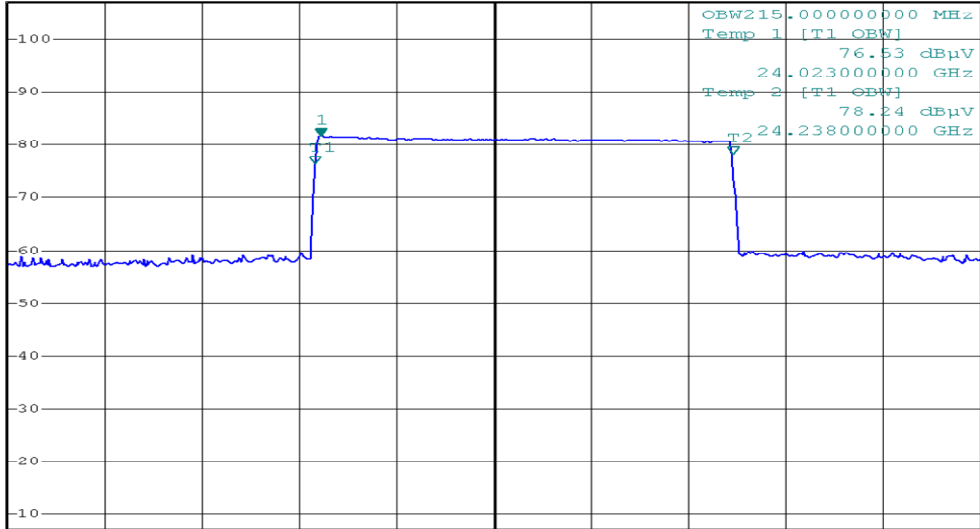
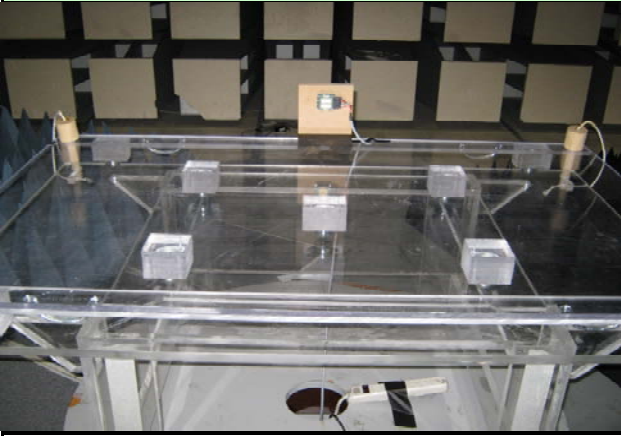
Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4-2009: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"		
In accordance with:	FCC Part 15.249 Code of Federal Regulations Part 47		
Section:	15.249		
Test Date(s):	6/27/2011	EUT Serial #:	1
Customer:	Houston Radar	EUT Part #:	PD300
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer
Purchase Order #:	81126	Supervisor:	Jason Haley
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov
Occupied Bandwidth Measurements			
		Page:	1 of 1
EUT Line Voltage:	12 VDC	99% Bandwidth	215 MHz
EUT Mode of Operation:		Transmit Modulation On	
Ref 107 dBμV * Att 10 dB REW 3 MHz * VBW 3 MHz SWT 20 ms Marker 1 [T1] 81.78 dBμV 24.026000000 GHz OBW215.000000000 MHz Temp 1 [T1_OBW] 76.53 dBμV 24.023000000 GHz Temp 2 [T1_OBW] 78.24 dBμV 24.238000000 GHz  The spectrum plot shows a blue trace on a grid. The y-axis is labeled from -10 to 100. The x-axis represents frequency. A sharp peak is visible at approximately 24.026 GHz, marked with a green '1'. The baseline noise level is around 55-60 dBμV. A second marker 'T2' is placed at a higher frequency, around 24.238 GHz.			
162.025 MHz Date: 27.JUN.2011 11:42:10			
Occupied Bandwidth 99%			

Table 3.3.2: Occupied Bandwidth Test Setup Photos

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators,		
In accordance with:	Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	6/27/2011	EUT Serial #:	1
Customer:	Houston Radar	EUT Part #:	PD300
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer
Purchase Order #:	81126	Supervisor:	Jason Haley
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov
Field Strength and Occupied Bandwidth Photographs		Page:	1 of 1
			
PD300 Front		PD300	

4.0 Out of Band Spurious Emissions

Out of band spurious/harmonic emissions measurements were performed on the EUT to determine compliance to FCC sections 15.249(c), 15.209 and RSS-210.

4.1 Test Procedure

The EUT was placed on a non-conductive table 0.8 meters above the ground plane. The table was centered on a rotating turntable at a distance of 10 meters from the measurement antenna.

For spurious emissions below 1 GHz, quasi-peak detection was used with a resolution bandwidth of 120 kHz. All measurements below 1 GHz were normalized to 3 meters using a 20 dB/decade distance extrapolation. The emissions were maximized by rotating the EUT and raising and lowering the measurement antenna from 1 to 4 meters.

Spurious/harmonic emissions above 1 GHz peak were measured with average and peak detection with a resolution bandwidth of 1 MHz and measured at a distance of 1 meter. Average detection was used to determine compliance of the EUT if the peak did not meet the average limit. Non-harmonic emissions must satisfy the average limit and the peak limit (20 dB above average). A diagram showing the test setup is given as Figure 2.1.1. Above 1 GHz, testing was completed at the transmit frequency to determine compliance.

From 24-100 GHz the measurement antenna was placed 0.1 meters from the EUT. The radiated emissions were maximized by rotating the EUT.

4.2 Test Criteria

The radiated limits of FCC 15.209 are shown below. The limits specified are at 3 meters. The limits are quasi-peak for emissions below 1 GHz and average for emissions above 1 GHz. Also above 1 GHz, the peak limit is 20 dB above the average limit.

Frequency MHz	Specification Distance (Meters)	Field Strength (dBuV/m)	Test Distance (Meters)	Field Strength (dBuV/m)
30 to 88	3	40.0	10	29.5
88 to 216	3	43.5	10	33.0
216 to 960	3	46.0	10	35.5
Above 960	3	54.0	3	54.0

4.3 Test Results

Out of band spurious emissions measurements were taken on June 27 and 28, 2011, and the EUT was found to be in compliance with applicable requirements. There were no emissions detected above the carrier. The spectrum was searched from 30 MHz to 100 GHz. All emissions detected within 20 dB of the specification limit are reported per 15.31(o). Test equipment used to perform this test is given in Table 4.3.1, and 4.3.2.

Table 4.3.1: Out of Band Spurious Emissions Test Equipment List

Professional Testing, EMI, Inc.					
Test Method:	CISPR 16-1-2:2003, Specification for radio disturbance and immunity measuring apparatus and methods – Part 1-2: Radio disturbance and immunity measuring apparatus – Ancillary				
In accordance with:	EN 55022:2006+A1:2007 Incorporating corrigendum no. 1 Information technology equipment —				
Section:	Radio disturbance characteristics — Limits and methods of measurement				
Section:	Section 10 - Method of measurement of radiated disturbance				
Test Date(s):	6/27/2011	EUT Serial #:	1		
Customer:	Houston Radar	EUT Part #:	PD300		
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer		
Purchase Order #:	81126	Supervisor:	Jason Haley		
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov		
Radiated Emissions Test Equipment List				Page:	1 of 1
Tile! Software Version:		3.4.K.11, June 7, 2006, 07:49:00 PM			
Test Profile:		Radiated Emissions_updated_12-16-10.til			
Asset#	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
1509A	Braden	N/A	TDK 10M Chamber, NSA < 1 GHz	DAC-012915-005	8/10/2011
85	HP	85650A	Quasi-Peak Adapter CISPR	3033A01458	7/28/2011
1526	HP	85662A	Spec Anal Dsply for AN 1525	2403A07220	N/A
1525	HP	8566B	Spectrum Analyzer 100Hz-22GHz	2532A02126	6/7/2012
238	HP	85685A	RF Preselector	2887A00841	7/27/2011
1497	EMCO	3108	Antenna, Bi Con, 30-300MHz	2121	8/4/2011
1278	HP	85650A	Quasi Peak Adapter	2811A01147	7/28/2011
1834	HP	85662A	Spec Anal Dsply	2349A06182	N/A
1145	HP	8568B	Spectrum Analyzer 100Hz-1.5GHz	2517A01821	7/28/2011
1035	HP	85685A	RF Preselector	2901A00891	4/13/2012
1486	EMCO	3147	Antenna, Log Periodic, .2-5GHz	9112-1052	8/4/2011
1497	EMCO	3108	Antenna, Bi Con, 30-300MHz	2121	8/4/2011
C026	N/A	RG214	Cable Coax, N-N, 25m	none	8/10/2011
C027	N/A	RG214	Cable Coax, N-N, 25m	none	8/10/2011
1414	HP	8447D	Preamp	1937A03403	7/15/2011
1509B	Braden	N/A	TDK 10M Chamber, VSWR > 1 GHz	DAC-012915-005	4/7/2012
1594	Miteq	AFS4-01001800	Amplifier, 1-26.5GHz, 42dB	none	1/28/2012
1529	Miteq	AFS4-01001800	Amplifier, 1-26.5GHz, 36dB	none	7/16/2011
C030	N/A	0	Cable Coax, N-N, 30m	none	3/21/2012
1780	ETS-Lindgren	3117	Antenna, DRG Horn, 1 - 18 GHz	1110313	1/14/2012

Table 4.3.2: Out of Band Spurious / Harmonic Emissions Test Equipment List

Professional Testing, EMI, Inc.					
Test Method:	ANSI C63.4–2003: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators,				
In accordance with:	Radiated Emissions Limits				
Section:	15.109				
Test Date(s):	6/27/2011	EUT Serial #:	1		
Customer:	Houston Radar	EUT Part #:	PD300		
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer		
Purchase Order #:	81126	Supervisor:	Jason Haley		
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov		
Harmonic Emissions Test Equipment List					
Asset#	Manufacturer	Model	Equipment Nomenclature	Serial Number	Calibration Due Date
ALN-077	Rohde & Schwarz	FSP30	Spectrum Analyzer	100218	12/22/2012
1542	A.H. Systems	SAS-572	Antenna, Horn 18-26.5GHz, 20dB gain	225	NCR
C117	Times Microwave	SLU18-SMSM-05.00F	Cable, RF, SMA-SMA, 60", Brown	none	9/22/2011
716	Tektronix	492AP	Spectrum Analyzer	B010153	6/30/2011
730	Millitech / Pacific Microwave	N/A	Horn, Mixer 40 - 60 GHz	none	NCR
730	Millitech / Pacific Microwave	N/A	Horn, Mixer 60 - 90 GHz	none	NCR
730	Millitech / Pacific Microwave	N/A	Horn, Mixer 90 - 110 GHz	none	NCR
716	Tektronix	N/A	Diplexer / Mixer	none	NCR

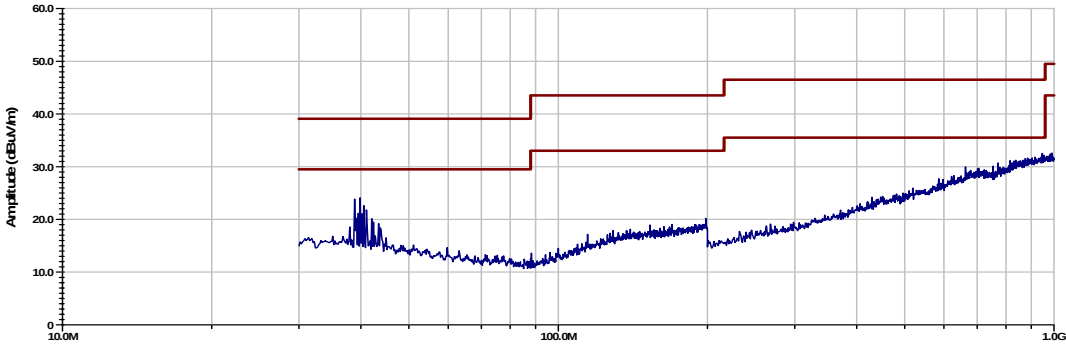
Table 4.3.3: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Horizontal Polarization

Professional Testing, EMI, Inc.									
Test Method:		ANSI C63.4-2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"							
In accordance with:		FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits							
Section:		15.109							
Test Date(s):		6/27/2011		EUT Serial #:		1			
Customer:		Houston Radar		EUT Part #:		PD300			
Project Number:		12538-10		Test Technician:		Layne Lueckemeyer			
Purchase Order #:		81126		Supervisor:		Jason Haley			
Equip. Under Test:		FMCW Microwave Radar		Witness' Name:		Vipin Malik / Sergei Sharonov			
Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity $\leq 1\text{GHz}$ Page: 1 of 1									
EUT Line Voltage:		12 VDC		EUT Line Frequency:		N/A Hz			
EUT Mode of Operation:					Transmit Normal Operation				
Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dB μ V)	Corrected Level (dB μ V/m)	Limit Level (dB μ V/m)	Margin (dB)	Test Results
34.86	10	1	1	Quasi-peak	22.5	10.1	29.5	-19.4	Pass
156.31	10	1	1	Quasi-peak	21.6	10.7	33.0	-22.3	Pass
199.83	10	1	1	Quasi-peak	21.4	12.1	33.0	-20.9	Pass
566.4	10	1	1	Quasi-peak	26.8	25.0	35.5	-10.5	Pass
841.6	10	1	1	Quasi-peak	26.1	30.1	35.5	-5.4	Pass
993.6	10	1	1	Quasi-peak	26.5	31.8	43.5	-11.7	Pass



Professional Testing
10 Meter Radiated Emissions
30-1000MHz Class B Horizontal Plot

Company - Houston Radar
Model # - PD300
Description - FMCW Microwave Radar
Project # - 12538-10
Voltage - 12 VDC



Frequency (Hz)

Operator: Layne Lueckemeyer
09:19:32 AM, Monday, June 27, 2011

— Horizontal Data
— FCC B 30M-1GHz
— FCC A 30M-1GHz

30MHz to 1GHz, Horizontal Polarity

Table 4.3.4: Out of Band Spurious Emissions Test Results, 30 MHz to 1 GHz, Vertical Polarization

Professional Testing, EMI, Inc.									
Test Method:		ANSI C63.4-2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"							
In accordance with:		FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits							
Section:		15.109							
Test Date(s):		6/27/2011			EUT Serial #:		1		
Customer:		Houston Radar			EUT Part #:		PD300		
Project Number:		12538-10			Test Technician:		Layne Lueckemeyer		
Purchase Order #:		81126			Supervisor:		Jason Haley		
Equip. Under Test:		FMCW Microwave Radar			Witness' Name:		Vipin Malik / Sergei Sharonov		
Radiated Emissions Test Results Data Sheet - Vertical Antenna Polarity ≤ 1GHz									
EUT Line Voltage:		12		VDC		EUT Line Frequency:		N/A Hz	
EUT Mode of Operation:					Transmit Normal Operation				
Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBμV)	Corrected Level (dBμV/m)	Limit Level (dBμV/m)	Margin (dB)	Test Results
43.1	10	1	1	Quasi-peak	22.8	9.4	29.5	-20.1	Pass
95.583	10	1	1	Quasi-peak	25.7	9.8	33.0	-23.2	Pass
199.83	10	1	1	Quasi-peak	21.4	12.1	33.0	-20.9	Pass
566.4	10	1	1	Quasi-peak	26.8	25.0	35.5	-10.5	Pass
841.6	10	1	1	Quasi-peak	26.1	30.1	35.5	-5.4	Pass
993.6	10	1	1	Quasi-peak	26.5	31.8	43.5	-11.7	Pass



Professional Testing

10 Meter Radiated Emissions

30-1000MHz Class B Vertical Plot

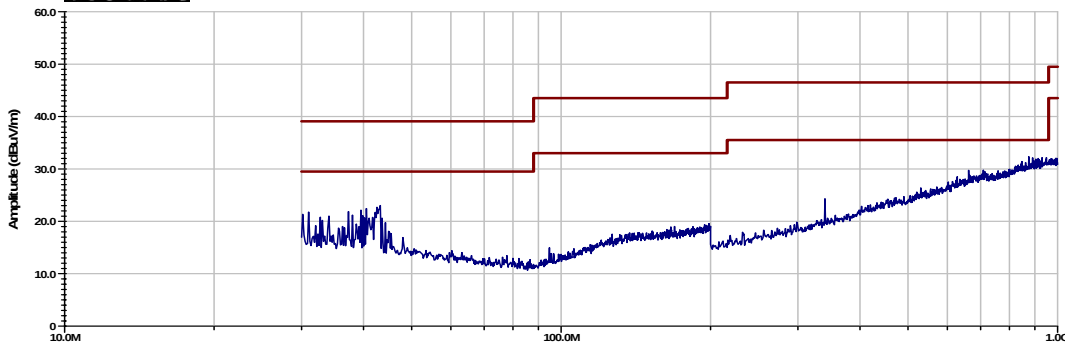
Company - Houston Radar

Model# - PD300

Description - FMCW Microwave Radar

Project # - 12538-10

Voltage - 12 VDC



Operator: Layne Lueckemeyer

09:24:43 AM, Monday, June 27, 2011

Transmit

Vertical Data

FCC B 30M-1GHz

FCC A 30M-1GHz

30MHz to 1GHz, Vertical Polarity

30MHz to 1GHz, Vertical Polarity

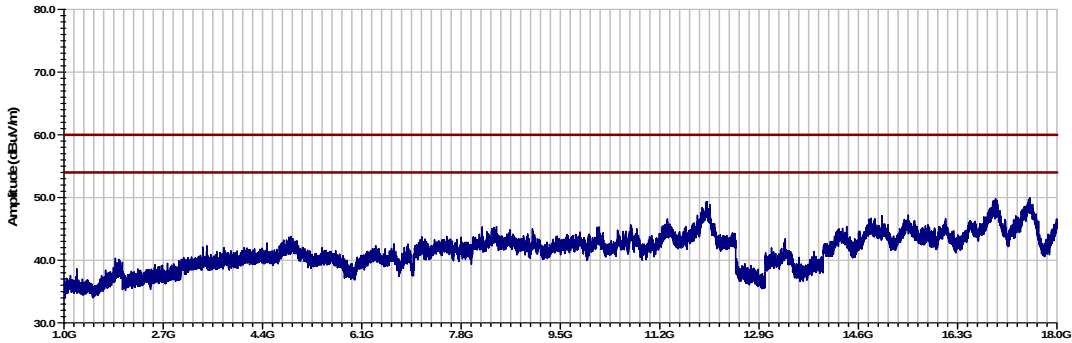
Table 4.3.5: Out of Band Spurious Emissions Test Results, 1 GHz to 18 GHz, Horizontal Polarization

Professional Testing, EMI, Inc.									
Test Method:		ANSI C63.4-2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"							
In accordance with:		FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits							
Section:		15.109							
Test Date(s):		6/27/2011		EUT Serial #:		1			
Customer:		Houston Radar		EUT Part #:		PD300			
Project Number:		12538-10		Test Technician:		Layne Lueckemeyer			
Purchase Order #:		81126		Supervisor:		Jason Haley			
Equip. Under Test:		FMCW Microwave Radar		Witness' Name:		Vipin Malik / Sergei Sharonov			
Radiated Emissions Test Results Data Sheet - Horizontal Antenna Polarity > 1GHz									
						Page: 1 of 1			
EUT Line Voltage:		12 VDC		EUT Line Frequency:		N/A Hz			
EUT Mode of Operation:					Transmit Normal Operation				
Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBμV)	Corrected Level (dBμV/m)	Limit Level (dBμV/m)	Margin (dB)	Test Results
3801	3	1	1	Average	42.7	13.8	54.0	-40.1	Pass
4861	3	1	1	Average	43.4	16.6	54.0	-37.4	Pass
5586	3	1	1	Average	42.6	15.4	54.0	-38.5	Pass
8367	3	1	1	Average	45.5	23.8	54.0	-30.2	Pass
12005	3	1	1	Average	49.7	38.2	54.0	-15.7	Pass
15474	3	1	1	Average	47	35.2	54.0	-18.8	Pass



Professional Testing
3 Meter Radiated Emissions
1-18GHz Class B Horizontal Plot

Company - Houston Radar
Model # - PD300
Description - FMCW Microwave Radar
Project # - 12538-10
Voltage - 12 VDC



Operator: Layne Lueckemeyer
11:30:14 AM, Monday, June 27, 2011

Transmit

— Horizontal Data

— FCC A 1-18GHz

— FCC B 1-18GHz

1GHz to 18GHz, Horizontal Polarity

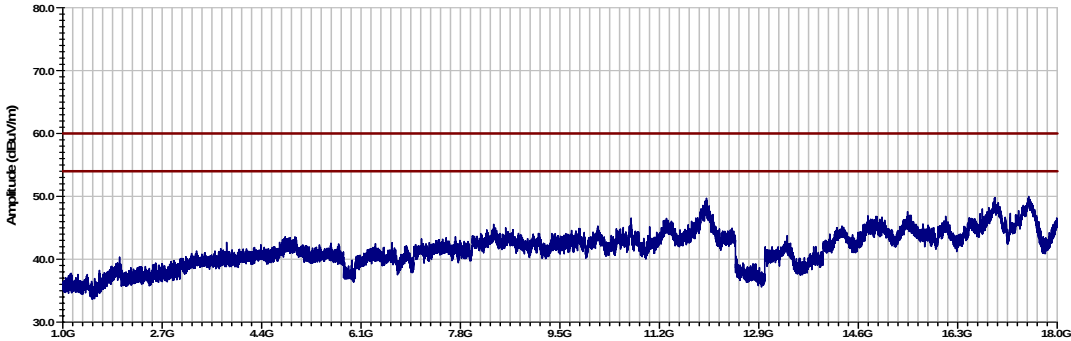
Table 4.3.6: Out of Band Spurious Emissions Test Results, 1 GHz to 18 GHz, Vertical Polarization

Professional Testing, EMI, Inc.									
Test Method:		ANSI C63.4-2003: "Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz"							
In accordance with:		FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators, Radiated Emissions Limits							
Section:		15.109							
Test Date(s):		6/27/2011		EUT Serial #:		1			
Customer:		Houston Radar		EUT Part #:		PD300			
Project Number:		12538-10		Test Technician:		Layne Lueckemeyer			
Purchase Order #:		81126		Supervisor:		Jason Haley			
Equip. Under Test:		FMCW Microwave Radar		Witness' Name:		Vipin Malik / Sergei Sharonov			
Radiated Emissions Test Results Data Sheet - Vertical Antenna Polarity > 1GHz									
						Page: 1 of 1			
EUT Line Voltage:		12 VDC		EUT Line Frequency:		N/A Hz			
EUT Mode of Operation:					Transmit Normal Operation				
Frequency Measured (MHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBμV)	Corrected Level (dBμV/m)	Limit Level (dBμV/m)	Margin (dB)	Test Results
3801	3	1	1	Average	42.7	13.8	54.0	-40.1	Pass
4861	3	1	1	Average	43.4	16.6	54.0	-37.4	Pass
5586	3	1	1	Average	42.6	15.4	54.0	-38.5	Pass
8367	3	1	1	Average	45.5	23.8	54.0	-30.2	Pass
12005	3	1	1	Average	49.7	38.2	54.0	-15.7	Pass
15474	3	1	1	Average	47	35.2	54.0	-18.8	Pass



Professional Testing
3 Meter Radiated Emissions
1-18GHz Class B Vertical Plot

Company - Houston Radar
Model# - PD300
Description - FMCW Microwave Radar
Project # - 12538-10
Voltage - 12 VDC



Operator: Layne Lueckemeyer
11:43:18 AM, Monday, June 27, 2011

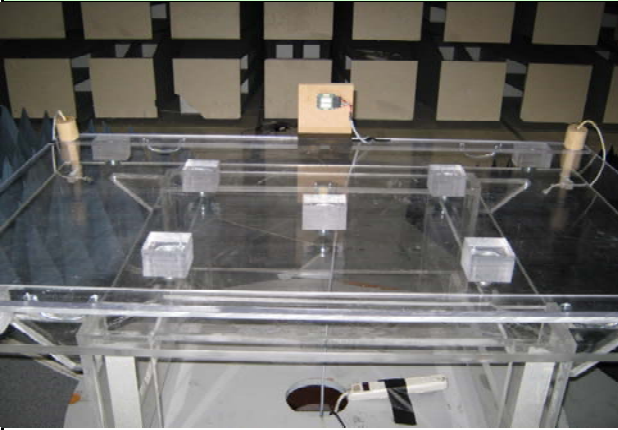
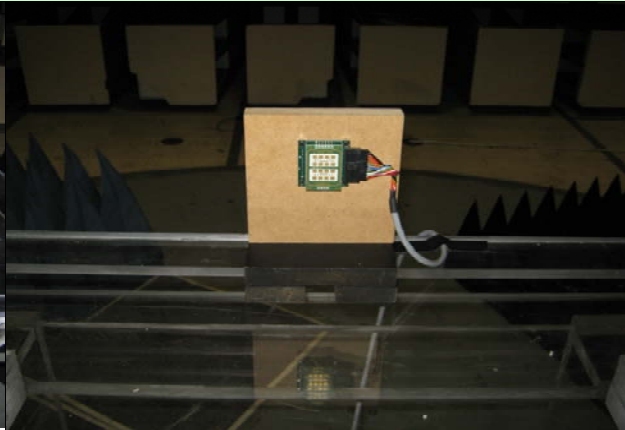
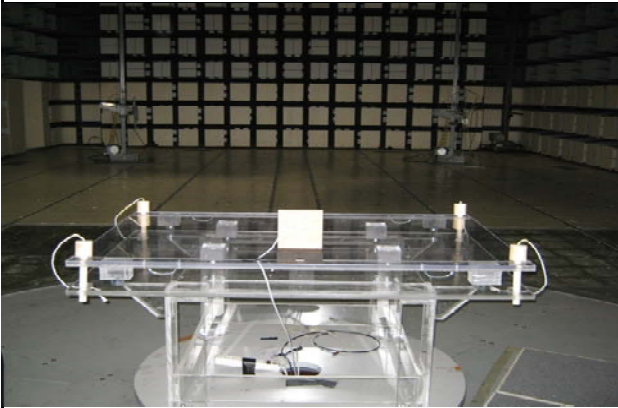
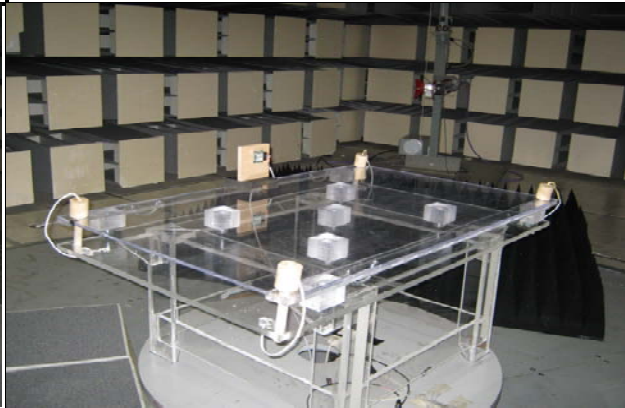
— Vertical Data
— FCC A 1-18GHz
— FCC B 1-18GHz

1GHz to 18GHz, Vertical Polarity

Table 4.3.7: Out of Band Spurious / Harmonic Emissions Test Results, 24 GHz to 100 GHz,

Professional Testing, EMI, Inc.									
Test Method:		ANSI C63.4-2009: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by							
In accordance with:		FCC Part 15.209 Code of Federal Regulations Part 47							
Section:		15.209							
Test Date(s):		6/27/2011			EUT Serial #:		1		
Customer:		Houston Radar			EUT Part #:		PD300		
Project Number:		12538-10			Test Technician:		Layne Lueckemeyer		
Purchase Order #:		81126			Supervisor:		Jason Haley		
Equip. Under Test:		FMCW Microwave Radar			Witness' Name:		Vipin Malik / Sergei Sharonov		
Fundamental Field Strength Test Results Data Sheet							Page: 1 of 1		
EUT Line Voltage:		12 VDC		EUT Line Frequency:		N/A		Hz	
EUT Mode of Operation:					Transmit Modulation On				
Frequency Measured (GHz)	Test Distance (Meters)	EUT Direction (Degrees)	Antenna Height (Meters)	Detector Function	Recorded Amplitude (dBμV)	Corrected Level (dBμV/m)	Limit Level (dBμV/m)	Margin (dB)	Antenna Polarization
48.178	0.1	180	1	Peak	53	92.9	97.5	-4.6	Vertical
72.267	0.1	180	1	Peak	47.4	90.8	97.5	-6.7	Vertical
96.356	0.1	180	1	Peak	48.1	94.0	97.5	-3.5	Vertical
48.178	0.1	180	1	Peak	42.9	82.8	97.5	-14.7	Horizontal
72.267	0.1	180	1	Peak	47.4	90.8	97.5	-6.7	Horizontal
96.356	0.1	180	1	Peak	48.1	94.0	97.5	-3.5	Horizontal

Table 4.3.8 Radiated Emissions Test Setup Photos

Professional Testing, EMI, Inc.			
Test Method:	ANSI C63.4–2003: “Methods of Measurement of Radio-Noise Emissions from Low-Voltage Electrical and Electronic Equipment in the Range of 9 kHz to 40 GHz” (incorporated by FCC Part 15.109 - Code of Federal Regulations Part 47, Subpart B - Unintentional Radiators,		
In accordance with:	Radiated Emissions Limits		
Section:	15.109		
Test Date(s):	6/27/2011	EUT Serial #:	1
Customer:	Houston Radar	EUT Part #:	PD300
Project Number:	12538-10	Test Technician:	Layne Lueckemeyer
Purchase Order #:	81126	Supervisor:	Jason Haley
Equip. Under Test:	FMCW Microwave Radar	Witness' Name:	Vipin Malik / Sergei Sharonov
Radiated Emissions Photographs		Page:	1 of 1
			
PD300 Front		PD300 Close View	
			
PD300 Rear		PD300 Side	

5.0 Antenna Requirements

An antenna evaluation was performed on the EUT to determine compliance with FCC sections 15.203, 15.249(b) and RSS-210.

5.1 Evaluation Procedure

The design of the EUT antenna was evaluated for conformance to engineering requirements for gain and to prevent substitution of unapproved antennae. Gain of the antenna was assessed by reviewing the antenna manufacturer's data sheet.

5.2 Evaluation Criteria

The antenna design must meet at least one of the following criteria:

- a) Antenna is permanently attached to the unit.
- b) Antenna must use a unique type of connector to attach to the EUT.
- c) Unit must be professionally installed. Installer shall be responsible for verifying that the correct antenna is employed with the unit.

5.3 Evaluation Results

The PD300 met the criteria of this rule by virtue of having an internal antenna inaccessible to the user. Therefore, the EUT is compliant.

End of Report

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