Here's What's New...

New Product Releases

May 18, 2017

*** NEW RELEASES ***

1.0 PMI Model No. RSAAS-001

*Feasibility Study*

PMI Model No. RSAAS-001 is a Radar Sense and Avoid System that has been designed to provide obstacle detection for the 3DR SOLO drone. This system uses (four) Doppler shift sensors to detect obstacles from all sides of the drone allows obstacles from small size (such as a wire or a tree branch) to large (such as a wall) to be detected when in range mechanical mounting can be adapted to fit other UAV platforms. Low power requirements make this system ideal for UAV application. Each sensor has onboard adjustment for distance of detection communication with 3DR SOLO is accomplished over USB interface via 30-pin accessories port connector.

SPECIFICATIONS

- Operating Voltage: 5.0 ± 0.2 VDC
- Operating Current: 40 mA Typ
- Output Frequency Range:
10.525 GHz / 10.687 GHz
- Antenna Characteristic:
  - H-Plane Beamwidth: 120° Max
  - E-Plane Beamwidth: 90° Max
- Radar Range: 0.3 to 2 meters
- Output Power: 10 dBm Max per sensor
- Communication Protocol: USB 2.0
- Mechanical Size: 12.8" X 7.2" X 1.9"
- System Weight: 305 Grams
- Exterior Finish: Black Anodized Aluminum

ENVIRONMENTAL RATINGS

- Temperature: 30 °C to +55 °C (operating)
  -40 °C to +80 °C (storage)
- Humidity: 0 to 95% RH @ 35 °C

SYSTEM OVERVIEW

![System Diagram](image)

SYSTEM DIAGRAM

PMI Website Link,
http://www.pmi-rf.com/Products/Radar-Sense-&-Avoid/features.htm
**2.0 PMI Model No.: PD-16-0D5G18D0G-SFF**

PMI Model No. PD-16-0D5G18D0G-SFF is a 16-way, In-Phase Power Divider operating from 0.5 to 18.0 GHz. This model offers an insertion loss of 20 dB with over 14 dB of isolation. The phase balance is 9° maximum and the amplitude balance is 2.0 dB maximum. Features include SMA female connectors. Unit size is 19.00" x 10.06" x 1.73" (482.60 mm x 255.52 mm x 43.92 mm) with painted blue finish.

- Frequency: 0.5 to 18.0 GHz
- Insertion Loss: 16.0 dB Max - Measured 10.15 dB
- Isolation: 14 dB Max - Measured 15.95 dB
- VSWR: 2.0:1 Typ (Input / Output) - Measured 1.67:1
- Amplitude Balance: ±2.0 dB Max - Measured +1.25 dB / -0.85 dB
- Phase Balance: ±3° Goal, ±9° Max. - Measured +7° / -5°
- Power Handling:
  - Forward: 10 Watt Max
  - Reversed: 0.5 Watt Max
- Impedance: 50 Ω

PMI Website Link,
http://www.pmi-rf.com/products/power_divider/PD-16-0D5G18D0G-SFF.htm

**3.0 PMI Model No.: APD-16-0D5G18D0G-SFF**

PMI Model No. APD-16-0D5G18D0G-SFF is a 16-way, In-Phase Power Divider operating from 0.5 to 18.0 GHz. This model offers an insertion loss of 20 dB with over 14 dB of isolation. The phase balance is 9° maximum and the amplitude balance is 2.0 dB maximum. Features include SMA female connectors. Unit size is 19.00" x 10.06" x 1.73" (482.60 mm x 255.52 mm x 43.92 mm) with painted blue finish.

- Frequency Range: 0.5 to 18.0 GHz
- Insertion Loss: 16.0 dB Max - Measured 11.5 dB
- Isolation: 14 dB Max - Measured 15.95 dB
- VSWR: 2.0:1 Typ (Input / Output) - Measured 1.67:1
• Amplitude Balance: ±2.0 dB Max - Measured +1.25 dB / -0.85 dB
• Phase Balance: ±3° Goal, ±9° Max - Measured +7° / -5°
• Power Handling:
  Forward: 10 Watt Max
  Reversed: 0.5 Watt Max
• Impedance: 50 Ω

PMI Website Link,
http://www.pmi-rf.com/products/power_divider/APD-16-0D5G18D0G-SFF.htm

4.0 PMI Model No.: PLNA-35-100M18G-P1dB24-120VAC

PMI Model No. PLNA-35-100M18G-P1dB24-120VAC is a portable amplifier that operates over the 100 MHz to 18.0 GHz frequency range. This model provides 40 dB typical gain with a minimum OP1dB of +24 dBm. This amplifier features an illuminated push button On/Off switch in a small package (3.0" x 3.0" x 1.75") with Type N connectors. Gold plated finish.

• Frequency Range: 0.01 to 18.0 GHz
• Gain: 40 dB Typ - Measured 43.03 Max / 38.89 Min
• Gain Flatness: ±2.0 dB Typ - Measured ±2.03 dB
• Noise Figure: 3 dB Typ
  Measured:  5.35 dB @ < 0.5 GHz
  3.62 dB @ > 0.5 GHz
• OP1dB: +27 dBm Typ, +24 dBm Min - Measured 25.46 dB
• VSWR In/Out: 2.0:1 Typ. - Measured 1.95:1
• Maximum RF Input: +10 dBm CW
• AC Voltage Supply: 110 VAC
• AC Connector: 3 Pin IEC

PMI Website Link,

5.0 PMI Model No.: PDT-8G12G-40-515-SFF

PMI Model No. PDT-8G12G-40-515-SFF is an 8.0 to 12.0 GHz, 2 way high power switch that has an insertion loss of 2.0 dB maximum and a VSWR of 1.8:1 maximum. The operating power is +40 dBm CW average, +57 dBm 1 µs, 1% duty cycle with an isolation of 40 dB minimum. Features include SMA female connectors. Unit size is 1.15" x 1.25" x 0.30" with painted blue finish.

• Frequency Range:  8.0 to 12.0 GHz
• Insertion Loss: 2 dB Max - Measured 1.98 dB
• Isolation: 40 dB Min - Measured 44.89 dB
• Operating Power:  +40 dBm CW
  +57 dBm, 1 µs, 1% DC
• VSWR: 1.8:1 Max - Measured 1.43:1
• Switching Speed: 200 ns Max - Measured 100 ns
6.0 PMI Model No.: P3T-9G10G-45-R-SFF

PMI Model No. P3T-9G10G-45-R-SFF is a 9.0 to 10.0 GHz, single pole, three throw, reflective switch capable of switching within 100 ns maximum. This unit has a typical insertion loss of 2.7 dB and isolation of 45 dB with a VSWR of 1.8:1. Features include SMA female connectors. Unit size is 1.85" x 1.25" x 0.40" with painted blue finish.

- Frequency Range: 9.0 to 10.0 GHz
- Insertion Loss: 2.5 dB Typ, 2.7 dB Max - Measured 2.56 dB
- Isolation: 45 dB Min - Measured 51.07 dB
- VSWR: 1.8:1 - Measured 1.24:1
- Logic Control: TTL
- Switching Speed: 100 ns Max - Measured 98 ns
- Power Handling: 10 W CW Min, 57 dBm Peak 1% Duty Cycle
- Supply: +5 V @ 85 mA - Measured 80 mA
  -15 V @ 75 mA - Measured 0 mA

PMI Website Link,
http://www.pmi-rf.com/Products/Switches/P3T-9G10G-45-R-SFF.htm

7.0 PMI Model No.: EWDM-2G6G-65-70MV

PMI Model No. EWDM-2G6G-65-70MV is a CW immune EW detector module operating over the 2.0 to 6.0 GHz frequency range. This module features an internal switch used to switch between the "Bit In" and RF IN" with input blanking on both ports. In addition, two amplified RF outputs are provided a 7 dB gain channel and a 33 dB gain channel. The video output is designed to drive a 150 ft. cable, while maintaining high speed, and excellent accuracy.

- Input Frequency: 2.0 to 6.0 GHz
- Input VSWR: 2.3:1 Max, impedance = 50 Ohm
  - Measured:
    1.43 : 1 @ 50 Ω (BIT IN)
    1.30 : 1 @ 50 Ω (RF IN)
    1.24 : 1 @ 50 Ω (RF OUT)
    1.27 : 1 @ 50 Ω (SW)
- Noise Figure: 8 dB Max - Measured 4.55 dB
Input Power:
1 W CW Max
(2) 100 W Peak @ PW = 1 µs % duty Cycle = 1% Max

Control & DC Supply Connector: D-type Female 9 pin
RF Connectors & Video Output (5 Places): SMA (F)
TTL Control Logic Interface: See Logic Table

SP3T Switch Specifications:
- Switch Mode: See Logic Table (below)
- Isolation: 60 dB Min among all ports - Measured 76.58 dB
- Switching Speed: 100 ns Max Measured 53.4 ns

Output To 8-Way Power Combiner Specifications:
- Linear Gain: +33 dB Min - Measured 43.6 dB
- Frequency Flatness: ±2.5 dB Max - Measured ±1.36 dB
- 1 dB Compression Point: +3 dBm Min - Measured 4.6 dBm
- Saturated Power: +14 dBm Max - Measured 11.38 dBm
- Second Harmonics: -9 dBc Min - Measured -15.16 dBc
- Third Harmonics: -12 dBc Min - Measured -12.34 dBc
- I/O VSWR: 2.3:1 Max impedance = 50 Ohm

Output To Switch Matrix Specifications:
- Linear Gain: +7 dB Min - Measured 13.5 dB
- Frequency Flatness: ±1.5 dB Max - Measured ±0.85 dB
- 1 dB Compression Point: +3 dBm Min - Measured 3.1 dBm
- Saturated Power: +9min dBm Max - Measured 8.8 dBm
- Second Harmonic: -9 dBc Min - Measured -11.84 dBc
- Third Harmonic: -12 dBc Min - Measured -22.8 dBc
- I/O VSWR: 2.3:1 Max impedance = 50 Ohm

DC Power Specification:
- DC Supply Voltage: ±15 V ±15%
- Ripple From DC to 10MHz: 100 mV Max
- Current 1.0 A For +15 VDC Max - Measured 400 mA
- 0.5 A For -15 VDC Max - Measured 130 mA

Log Videos Output Specifications:
- TSS: -71dBm Max - Measured -71dBm Max
- Dynamic Range: -65 to 0 dBm
- Log Slope Fixed: 70 mV/dB Nominal - Measured 70.4 mV/dB
- Log Linearity (Deviation from 70 mV/dB Straight Line @ 10 GHz & 25 °C):
  ±1.0 dB Max - Measured ±0.45 dB
- Log Accuracy (Deviation from 70 mV/dB Straight Line @ 10 GHz &
  25°C & Frequency Range): ±1.25 dB Max - Measured ±1.08 dB
- Absolute Log Accuracy (Deviation from 70 mV/dB Straight Line over
  Frequency & Temperature Range): ±1.5 dB Max - Measured ±1.31 dB
- DC Offset: 0±70 mV (RF Input Terminated & DC Power On) - Measured -10 mV
- Rise Time (10% to 90%): 25ns typ, 28ns Max - Measured 21.4 ns
- Fall Time (90% to 10%): 300 ns Max - Measured 175.4 ns
- Setting Time: 50 ns within ±35 mV final value Max - Measured 40 ns
- Recovery Time: 1us max
- Measured from 1 dB below peak of the first 0 dBm, 330µs pulse where the second -60 dBm, 100 ns pulse is measured within ±1 dB error when the first 0 dBm pulse is not present - Measured 900 ns
- Video Frequency Flatness: ±0.75 dB max - Measured ±0.62 dB
  At any constant input power from -65 dBm to 0 dBm, as frequency is varied from 6-18 GHz (25°C)
- CW Immunity, Pulse frequency and CW Frequency. Difference of 500 MHz Min (Combined signals are inputted to DLVA):
  A. CW immune power TSS to -40 dBm baseline shift 140 mV Max- Measured 100 mV
  B. Pulse peak amplitude loss, 2 dB Max- Measured 0.8 dB
  C. At W > -40 dBm pulse on CW- Measured >-40 dBm
  D. CW immune time at CW = -40 dBm <3 ms- Measured 1.8 ms
  E. CW recovery time at CW = -40 dBm <100µs- Measured 50us
- Pulse response Input signal: 100 ns to CW - Measured 100 ns to CW
- Output Impedance: 75 ± 1 Ohms - Measured 75 Ohms
- Video Output @ -65 dBm within frequency range (middle point of window): 330 ± 123 mV - Measured 320 ±34 mV
- Output pulse peak variation versus duty cycle: ±70 mV (1dB) Max- Measured 40 mV
  Power changes from -60 dBm to 0 dBm pulse width changes from 100 ns to 330 µs for a duty cycle up to 60%, except when the minimum time between the first and second pulse is 1.5 µs.
- Signal Processing Capability: 100 ns to 330 µs pulse duty cycle up to 60%
  Coupled Mode: Pseudo AC coupled mode.
- Video Out - Noise Level (Vp-p):150 mV Max - Measured 138 mV
- Video Out - Drop of the Output Video Pulse, At lower Power 63 dBm for Pulse width 300 µs: 70 mV (1 dB) Max - Measured 40 mV
- Propagation Delay:80 ns (50% input RF to 10% output video) Max - Measured 16.06 ns

PMI Website Link,

8.0 PMI Model No.: EWDM-6G18G-65-70MV

PMI Model No. EWDM-6G18G-65-70MV is a CW immune EW detector module operating over the 6.0 to 18.0 GHz frequency range. This module features an internal switch used to switch between the "Bit In" and RF In" with input blanking on both ports. In addition, two amplified RF outputs are provided a 7 dB gain channel and a 33 dB gain channel. The video output is designed to drive a 150 ft. cable, while maintaining high speed, and excellent accuracy.

- Input Frequency: 6.0 to 18.0 GHz
- Input VSWR: 2.3:1 Max, impedance = 50 Ohm
  Measured:
  1.36 : 1 @ 50 Ω (BIT IN)
  1.46 :1 @ 50 Ω (RF IN)
  1.81 :1 @ 50 Ω (RF OUT)
  2.08 :1 @ 50 Ω (SW)
Noise Figure: 8 dB Max - Measured 4.1 dB
Input Power: (1) 1 W CW Max
(2) 100 W Peak @ PW = 1 µs % duty
Cycle = 1% Max
Control & DC Supply Connector: D-type Female 9 pin
RF Connectors & Video Output: SMA (F)
(5 Places)
TTL Control Logic Interface: See Logic Table (below)
Finish: Gray epoxy paint bottom surface free of paint

**SP3T Switch Specifications:**

- Switch Mode: See Logic Table (below)
  Isolation: 60 dB Min among all ports - Measured 85 dB
- Switching Speed: 100 ns Max - Measured 45 ns

**Output To 8-Way Power Combiner Specifications:**

- Linear Gain: +33 dB Min - Measured 40.7 dB
- Frequency Flatness: ±2.5 dB Max - Measured ±1.59 dB
- 1 dB Compression Point: +3 dBm Min - Measured 8.0 dBm
- Saturated Power: +14 dBm Max - Measured 11.2 dBm
- Second Harmonics: -9 dBc Min - Measured -13.97 dBc
- Third Harmonics: -12 dBc Min - Measured -26.84 dBc
- I/O VSWR: 2.3:1 Max impedance = 50 Ohm

**Output To Switch Matrix Specifications:**

- Linear Gain: +7 dB Min - Measured 14.3 dB
- Frequency Flatness: ±1.5 dB Max - Measured ±0.99 dB
- 1 dB Compression Point: +3 dBm Min - Measured 3.8 dBm
- Saturated Power: +9 dBm Min - Measured 8.5 dBm
- Second Harmonic: -9 dBc Min - Measured 14.04 dBc
- Third Harmonic: -12 dBc Min - Measured -16.30 dBc
- I/O VSWR: 2.3:1 Max impedance = 50 Ohm

**DC Power Specification:**

- DC Supply Voltage: ±15 V ±15%
- Ripple From DC to 10MHz: 100 mV Max
- Current: 1.0 A For +15 VDC Max - Measured 499 mA
  0.5 A For - 15 VDC Max - Measured 113 mA

**Log Videos Output Specifications:**

- TSS: -71 dBm Max
- Dynamic Range: -65 to 0 dBm
- Log Slope Fixed: 70 mV/dB nominal - Measured 70.4 mV/dB
- Log Linearity (Deviation from 70 mV/dB Straight Line @ 10 GHz & 25 °C): ±1.0 dB Max - Measured ±0.6 dB
- Log Accuracy (Deviation from 70 mV/dB Straight Line @ 10 GHz & 25 °C & Frequency Range): ±1.75 dB Max - Measured ±1.6 dB
- Absolute Log Accuracy (Deviation from 70 mV/dB Straight Line over Frequency & Temperature Range): ±2.0 dB Max - Measured ±1.6 dB
- DC Offset: 0 ± 70 mV (RF Input Terminated & DC Power On) - Measured -50 mV
**Rise Time (10% to 90%): 25 ns Typ, 28 ns Max - Measured 26.5 ns**

**Fall Time (90% to 10%): 300 ns Max - Measured 236 ns**

**Setting Time: 50 ns within ±35 mV final value Max - Measured 40 ns**

**Recovery Time: 1 µs Max - Measured 800 ns**

Measured from 1 dB below peak of the first 0 dBm, 330 µs pulse where the second -60 dBm, 100 ns pulse is measured within ±1 dB error when the first 0 dBm pulse is not present

**Video Frequency Flatness: ±1.75 dB Max @ any constant input power from -65 dBm to 0 dBm, as frequency is varied from 6-18 GHz (25 °C)**

**CW Immunity, Pulse frequency and CW Frequency, Difference of 500 MHz min (Combined signals are inputted to DLVA):**

A. CW immune power TSS to -40 dBm baseline shift
B. Pulse peak amplitude loss, 2 dB Max
C. At W > -40 dBm pulse on CW
D. CW immune time at CW = -40 dBm <3 ms
E. CW recovery time at CW = -40 dBm <100 ns

**Pulse response Input signal: 100 ns to CW**
**Output Impedance: 75 ± 1 Ohm**
**Video Output @ -65 dBm within frequency range (middle point of window): 330 ± 123 mV - Measured 56 mV**

**Output pulse peak variation versus duty cycle: ±70 mV (1dB) Max**

**Power changes from -60 dBm to 0 dBm pulse width changes from 100 ns to 330 µs for a duty cycle up to 60%, except when the minimum time between the first and second pulse is 1.5 µs**

**Signal Processing Capability: 100 ns to 330 µs pulse duty cycle up to 60%**
**Coupled Mode: Pseudo AC coupled mode**

**Drop of the Output Video Pulse at lower Power 63 dBm for Pulse width 300 µs: 70 mV (1 dB) Max**
**Propagation Delay: 80 ns (50% input RF to 10% output video) Max - Measured 30.8 ns**

PMI Website Link,
http://www.pmi-rf.com/Products/SDLVA/EWDM-6G18G-65-70MV.htm

**9.0 PMI Model No.: SDLVA-50M18G-70**

PMI Model No. SDLVA-50M18G-70 is an SDLVA (Successive Detection Logarithmic Video Amplifier) operating in the 50 MHz to 18 GHz frequency band. It features a built in voltage variable threshold detector circuit that is set up to match the video output voltage to within 5%. In addition, this model has a TSS of -70 dBm and a dynamic range of 70 dB, all in a package measuring only 2.3" x 2.2" x 0.4" with SMA female connectors and gold plated finish.

- **TSS: -70 dBm Typ - Measured -72 dBm**
- **VSWR: 2.0:1 Max - Measured 1.74:1**
- **Video Comparator Output (V0): 5 V Into 1 MΩ, 2.5 V Into 50 Ω Typ**
- **Video Comparator Threshold Level: Adjustable, -60 dBm to 0 dBm (Operating Range)**
- **Threshold Level = V1 ± 5% and ± 25 mV (Hysteresis)**
- **Log Range: -70 dBm to 0 dBm Min**
- **Log Slope: 25 mV/dB (±5%) @ 50 Ω Load - Measured 25.43 mV/dB**
**Log Linearity: ±1.75 dB (-65 to 0 dBm) Max - Measured -0.88 dB**
**Pulse Range: 100 ns to DC**
**Rise Time: 50 ns Max - Measured 47.5 ns**
**Recovery Time: 400 ns Max - Measured 296.5 ns**
**Power Supply:**
+12 To +15 VDC @ 400 mA - Measured 134 mA
-12 To -15 VDC @ 200 mA - Measured 111 mA

**PMI Website Link,**
http://www.pmi-rf.com/Products/SDLVA/SDLVA-50M18G-70.htm

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*** For more information on PMI's complete line of products, please visit ***
http://www.pmi-rf.com

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**DC to 50 GHz Components, Modules, and Sub-Systems**

PMI offers just about any RF/Microwave component, module, or sub-system for both industrial and military based requirements. Please click on the product types below to be directed to our web site catalog. Components and modules can be modified to meet your exact requirement.

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