Avantek Products

Threshold Detector .1 to 6 GHz

Technical Data

PPD-6002

Features

- **Frequency Range: 0.1 to 6GHz**
- **Threshold Externally Programmable with One Resistor or Voltage**
- **Temperature Compensated Threshold**
- **TTL Output**
- **12 mA (typ) Power Consumption @ +15 VDC**
- **Surface Mount Package**

Applications

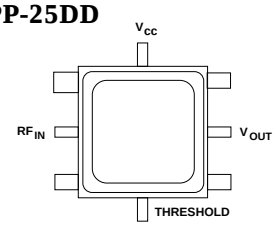
- **System Built-In Test (BIT)**
- **Channel RF Activity Monitoring**
- **Excessive VSWR Indicator**
- **Gain Switch Control**
- **Surface Mount Assembly**

Description

The PPD-6002 is a sensitive microwave threshold detector which provides efficient and accurate RF level measurement at critical system points. It contains a Schottky diode detector, a precision integrated circuit operational amp, comparator and a temperature compensated voltage reference assembly. The unit is built with chip and wire construction on a thin-film substrate for small size and ruggedness.

Pin Configuration

PP-25DD



Maximum Ratings

Parameter	Maximum
DC Voltage	±17 Volts
DC Voltage Reference	+2 Volts
Continuous RF Input Power	+15 dBm
Operating Case Temperature	–55 to +125°C
Storage Temperature	–62 to +150°C
“R” Series Burn-In Temperature	+125°C

Weight: (typical) 0.21 grams

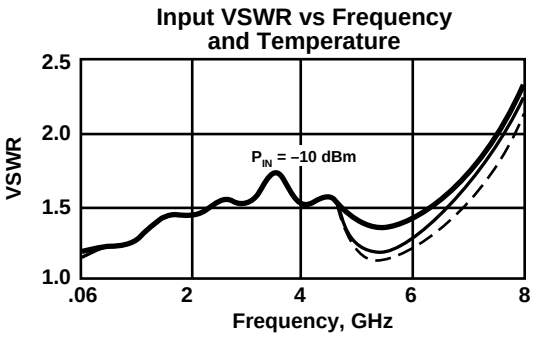
Electrical Specifications

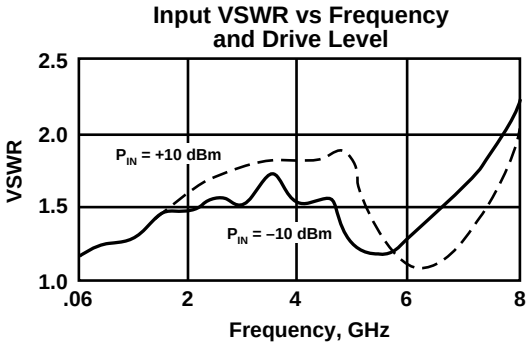
(Measured in 50 Ω system @ +15 VDC nominal unless otherwise noted)

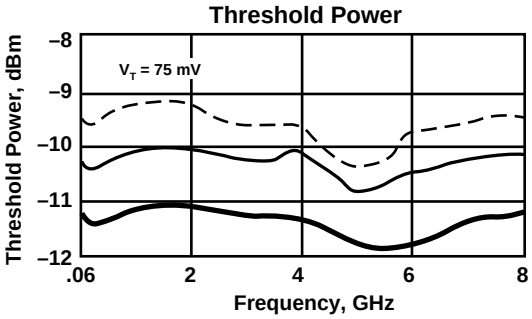
Symbol	Characteristic	Typical	Guaranteed Specifications		Unit
		T_C = 25°C	T_C = 0 to 50°C	T_C = –55 to +85°C	
—	Frequency (Min.)	.1-6	.1-6	.1-6	GHz
—	Input Flatness (Max.), P_{IN} = –10 to +10 dBm	±0.7	±1.0	±1.0	dB
—	Input Operating Range	–10 to +10	–10 to +10	–10 to +10	dBm
—	Input VSWR (Max.), P_{IN} = –10 dBm	1.5:1	2.0:1	2.0:1	—
—	Input Power (Max.)	+15	+15	+15	dBm
—	Threshold Temperature Stability (Max.)				
	@ –10 dBm Input Power	—	±1.0	±1.5	dB
	@ 0 dBm Input Power	—	±0.7	±1.0	dB
	@ +10 dBm Input Power	—	±0.5	±0.7	dB
—	Threshold Level Control				
	@ –10 dBm Input Power	75/220	—	—	mV/Ω
	@ 0 dBm Input Power	250/800	—	—	mV/Ω
	@ +10 dBm Input Power	900/3100	—	—	mV/Ω
—	Threshold Hysteresis				
	Resistance Control	0.5	—	—	dB
	Voltage Control	0.1	—	—	dB
—	Control Terminal Current	0.3	—	—	mA
—	Output Compatibility	TTL	TTL	TTL	—
—	Output at P_{IN} Threshold (Min.)	2.7	2.7	2.7	V
—	Output Short Circuit Current (Min.)	3.0	3.0	3.0	mA
—	Output Sink Current (Min.), V_0 = 0.7 V	2.0	2.0	2.0	mA
—	Output for Input Power Change > 3 dB above CW Threshold				
	Rise Time	30	—	—	ns
	Fall Time	80	—	—	ns
	Propagation Delay	1000	—	—	ns
—	Supply Voltage				
	As Specified	+15	—	—	VDC
	Operational	+11 to +16	—	—	VDC
—	Supply Current @ +15 Volts (Max.)	12	15	15	mA
—	Package	PP-25DD	—	—	—

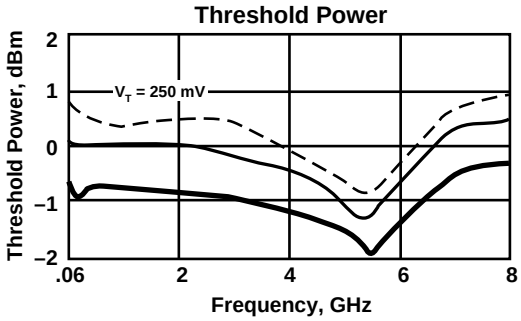
Typical Performance Over Temperature (@ +15 VDC unless otherwise noted)

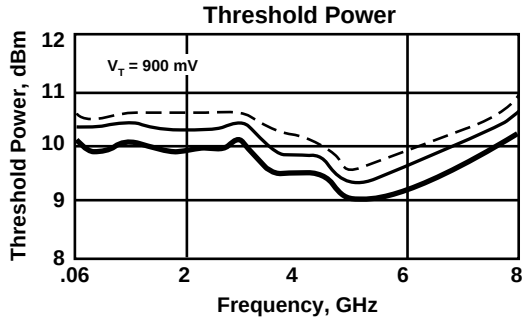
Key: +25°C
+85°C
-55°C

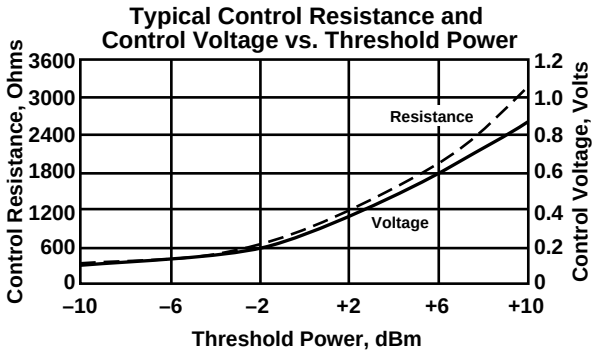




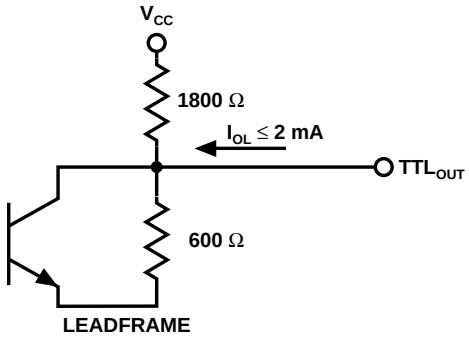




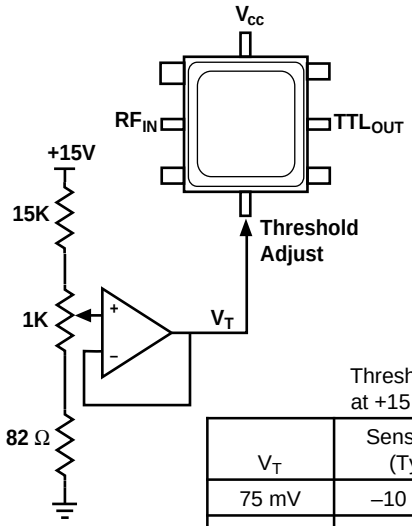




Output Schematic



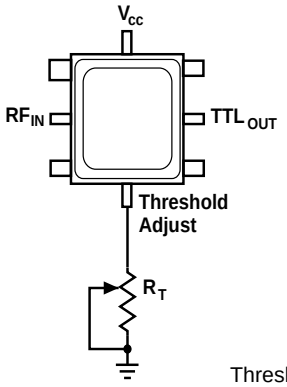
Voltage Control



Threshold Adjust at +15 VDC Bias

V_T	Sensitivity (Typ)	Hysteresis (Typ)
75 mV	–10 dBm	0.1 dB
250 mV	0 dBm	0.1 dB
900 mV	+10 dBm	0.1 dB

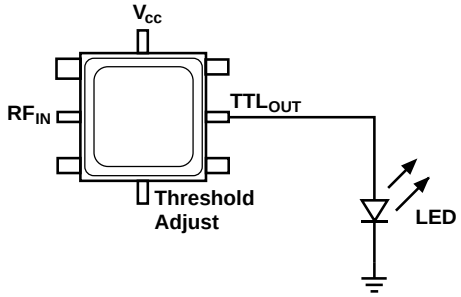
Resistive Control



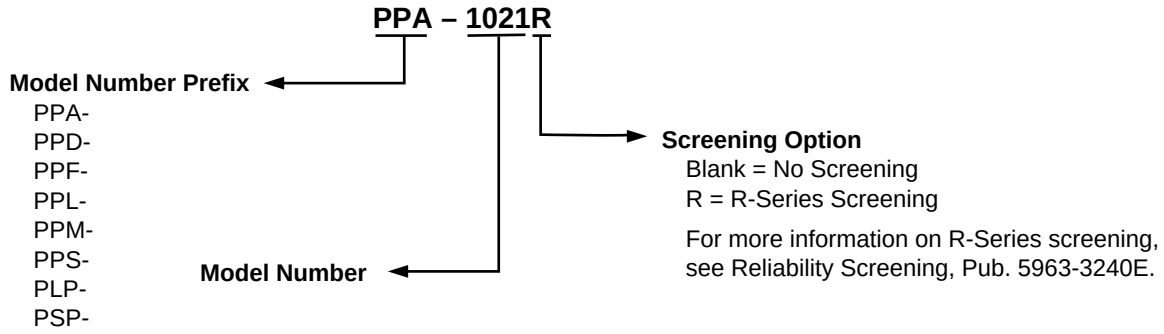
Threshold Adjust at +15 VDC Bias

R_T	Sensitivity (Typ)	Hysteresis (Typ)
220 Ω	–10 dBm	0.5 dB
800 Ω	0 dBm	0.5 dB
3100 Ω	+10 dBm	0.5 dB

Indicator Drive

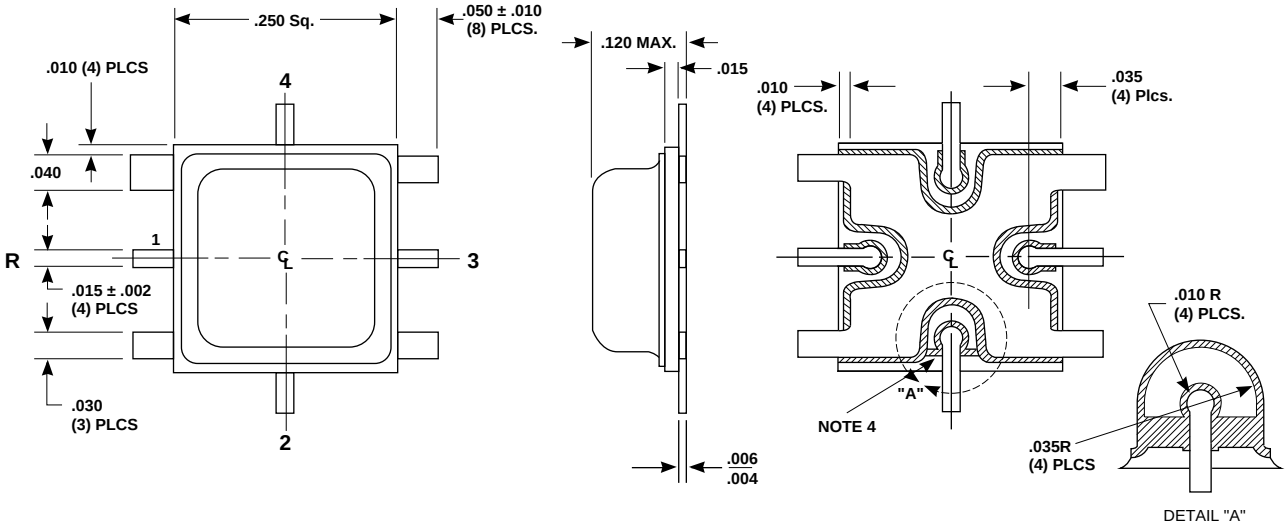


Product Options



Case Drawings
PP-25

.25 x .25 PLANARPAK SURFACE MOUNTED COMPONENTS



NOTE: Certain high frequency models have 0.010" lead widths

Typical Weight: 21 Grams

CASE	PIN DESIGNATION 1	2	3	4
PP-25	RF_{IN}	Ground	RF_{OUT}	V^+
PP-25A	RF_{IN}	$V_{CONTROL}$	RF_{OUT}	V^+
PP-25S	J_1	$V_{CONTROL}$	J_2	J_0
PP-25DA	RF_{IN}	V^-	V_{OUT}	V^+
PP-25DD	RF_{IN}	Threshold	V_{OUT}	V^+
PP-25M	RF	LO	IF	Open
PP-25SP	RF_{IN}	RF_{OUT}	GND	RF_{OUT}

NOTES (UNLESS OTHERWISE SPECIFIED):
1. **DIMENSIONS ARE SPECIFIED IN INCHES**
2. **TOLERANCES: xxx ± .005**
3. **LEADS ARE FOR TESTING ONLY AND MAY BE TRIMMED FLUSH AT TIME OF INSTALLATION.**
4. **PIN 2 IS AT GROUND POTENTIAL ONLY FOR PP-25. GROUNDING MAY BE AS SHOWN OR WITH THE WHOLE AREA METALIZED. FOR ALL OTHER PARTS PIN 2 LOOKS LIKE PINS 1, 3, AND 4.**

Recommended Assembly Procedure

1. Chemically clean the PC board and the unit to be mounted using a vapor degreaser or acetone followed by an isopropol alcohol wash. Do not use ultrasonic cleaning.
2. Mask the backside of the PC board to prevent solder from reflowing through the plated thru-holes causing a rough ground plane surface. A suggested masking material is 2 mil thick Kapton® film with silicone adhesive back (Permacel part #P-222).
3. Apply solder cream (suggest Multicore SN62PRMAB3 or equivalent) using screen printing techniques or careful hand application. A layer 4 to 6 mils thick is adequate.
4. Reflow of the unit to the board may be done in many ways. Using a hot plate is one of the most simple. During reflow, pressure (with a clamping arrangement) on the unit is recommended, but not absolutely necessary. Absolute maximum reflow temperature is 260°C for not more than 10 seconds.
5. Chemically reclean the unit using the procedures given in step one. Make sure that a flux remover is used which is appropriate for the type of solder cream used (Multicore PC81 is the recommended flux remover for the above mentioned cream).

It should be noted that there are many alternatives for component attachment. This procedure has been found to be simple and effective. For more detailed instructions on how to use PlanarPak Products, please see the application note "*PlanarPak* Users Information" Pub. 5963-3232E.

For more information:

United States*

Europe*

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*Call your local HP sales office listed in your telephone directory. Ask for a Components representative.

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