

# DACP18001 0.1 TO 18.0 GHz ULTRA BROADBAND ANALOG DETECTOR

Typical Values @ +25 °C

Wide Frequency Range	0.1 to 18.0 GHz
Wide Power Range	-30.0 to +5.0 dBm
Temperature Stability	± 0.25 dB
Flatness	± 0.50 dB
High Frequency CougarPak® Package	

**DACP18001**

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High Frequency CougarPak® Package  
for Detectors

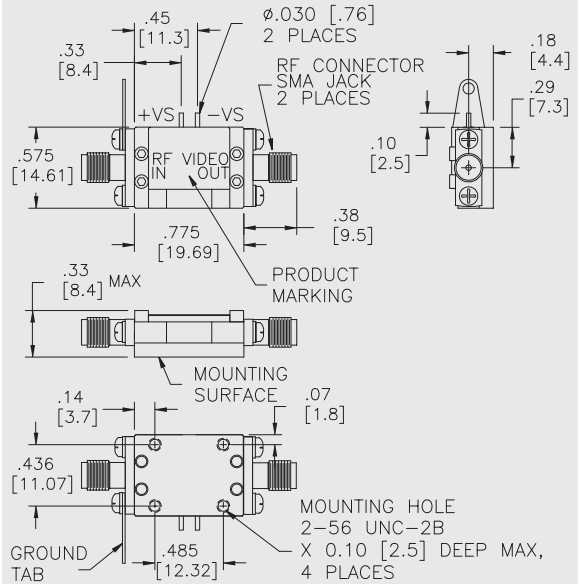
## SPECIFICATIONS\*

Parameter	Typical	Guaranteed	
		0 to 50 °C	-55 to +85 °C
Frequency (Min.)	0.1-18.0 GHz	0.1-18.0 GHz	0.1-18.0 GHz
Input Power Range (Min.)	-30 to +5 dBm	-25 to 0 dBm	-25 to 0 dBm
VSWR (Max.)	1.5:1**	2.0:1**	2.0:1**
Sensitivity, Vout (Min.)	140 mV†	100 mV†	100 mV†
Power Flatness (Max.)	±0.5 dB^	±1.0 dB^	±1.0 dB^
Temperature Stability (Max.)	±0.25 dB	±0.5 dB	±0.5 dB
Output Offset Voltage, no RF (Max.)	±0.3 mV	±1.5 mV	±2.0 mV
1 dB Square Law Departure	-10 dBm	—	—
Tangential Sensitivity	-45 dBm^^	—	—
Pulse Response, Pin = -15 dBm	0.3 µsec‡	0.5 µsec‡	0.7 µsec‡
Pulse Response, Pin = 0 dBm	0.5 µsec‡	0.7 µsec‡	1.0 µsec‡
Supply Current, no RF	+3 mA, -3 mA	+4 mA, -4 mA	+4 mA, -4 mA
Supply Current, Pin = +5 dBm	+10 mA, -4 mA	+11 mA, -5 mA	+11 mA, -5 mA

\* Measured in a 50 Ohm system at ±5.0 Vdc, 1 MΩ||8 pF unless otherwise specified.

† Pin = -15 dBm. ^ Vout = 100 mV. ^^ 3 dB NF, 1 MHz Bandwidth. ‡ 50% RF to 10 or 90% Video.

\*\* Pin < -15 dBm.



## MAXIMUM RATINGS

DC Voltage (no RF)	±22 V
Continuous RF Input Power	+14.0 dBm (±5 Vdc)
Operating Case Temperature	-55 °C to +100 °C
Storage Temperature	-65 °C to +150 °C
Burn-In Temperature	+100 °C
Detector Thermal Resistance <sup>1</sup> (θjc)	+3500 °C/Watt
Temperature Rise @ 0 dBm (Tjc)	+3.5 °C
Temperature Rise @ +5 dBm (Tjc)	+35 °C

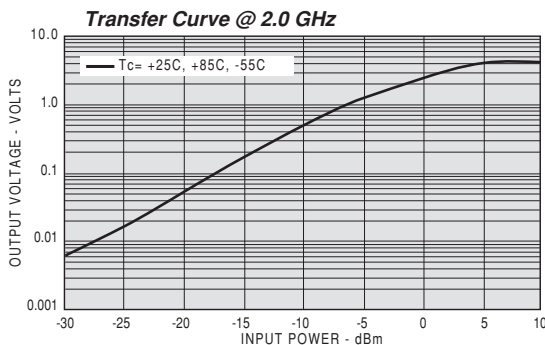
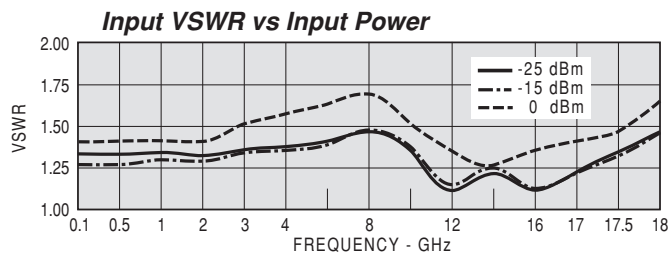
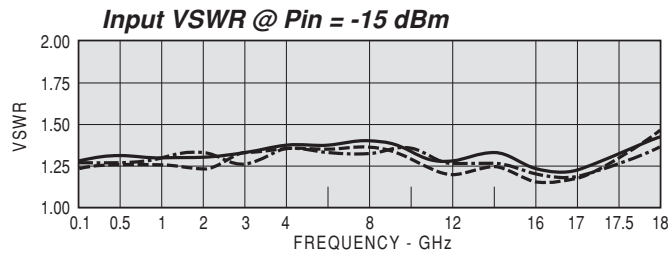
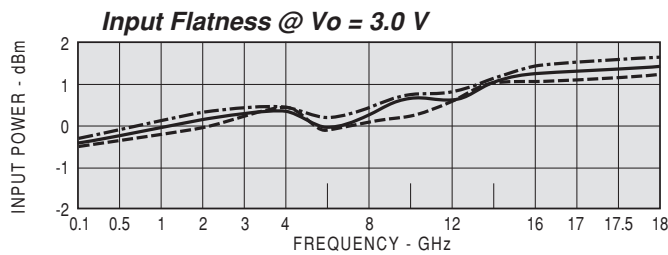
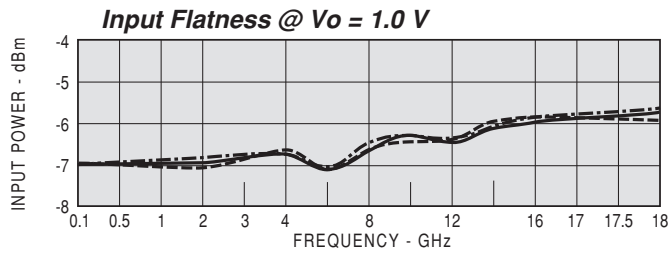
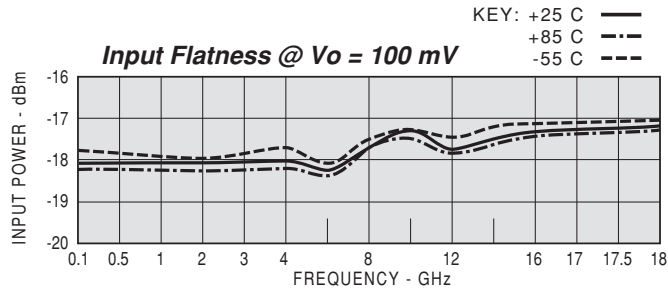
<sup>1</sup> Thermal resistance is based on RF input power. Ratings based on +25 °C.

## APPLICATION NOTES

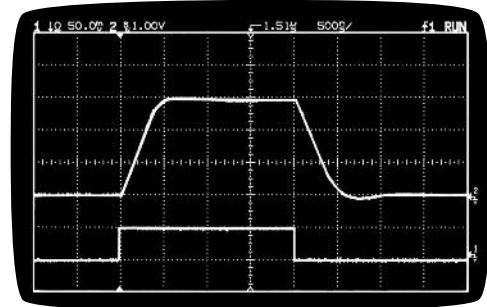
- ✦ This unit is DC coupled and employs a RF choke at the input (DC short). If the application calls for the input to sink current there will approximately be an additional 1 mV of output offset voltage for each 3 mA of current. Sink current should be limited to 250 mA max to avoid choke burnout.
- ✦ For higher supply voltages, up to ±22 volts, the positive supply pin must include a series current limiting resistor  $R_s = (V_s - 5)/0.01$ . (e.g.:  $V_s = 15v$ ,  $R_s = 1K$ )
- ✦ Average power detection is obtained at power levels below approximately -13 dBm.
- ✦ For best pulse response both supply pins should be bypassed with an additional 1.0 µF capacitor. The unit contains 0.01 µF internal capacitors.

DIMENSIONS ARE IN INCHES [MILLIMETERS]

## TYPICAL PERFORMANCE



Pulse Response @  $P_{IN} = 0$  dBm



Pulse Response @  $P_{IN} = -15$  dBm

Top Trace: Detector Response  
Bottom Trace: RF Input  
Time Base: 500 ns

