

# DTCP18001

## 0.01 TO 18.0 GHz ULTRA BROADBAND HIGH FREQUENCY THRESHOLD DETECTOR

Typical Values @ +25 °C	
Wide Frequency Range	0.01 to 20.0 GHz
Wide Power Range	-25.0 to -5.0 dBm
Temperature Stability	± 0.50 dB
Power Flatness	± 0.50 dB
<b>High Frequency CougarPak™ Package</b>	
External Adjustable Threshold Level, Fast Response Time, Low Drift, Insensitive Threshold Level to Applied Voltage	

### SPECIFICATIONS\*

Parameter	Typical	Guaranteed	
		0 to 50 °C	-55 to +85 °C
Frequency (Min.)	0.01 - 20.0 GHz	0.01 - 18.0 GHz	0.01 - 18.0 GHz
Input Power Range (Min.)	-30 to -5 dBm*	-25 to -5 dBm*	-20 to -5 dBm*
VSWR (Max.)	1.5:1†	2.0:1†	2.0:1†
Power Flatness (Max.)			
R <sub>TH</sub> =100kΩ	0.01 - 18.0 GHz	±0.5 dB	±0.75 dB
R <sub>TH</sub> =1kΩ	0.01 - 20.0 GHz	±0.75 dB	±1.0 dB
R <sub>TH</sub> =1kΩ	0.01 - 18.0 GHz	±0.5 dB	±0.75 dB
R <sub>TH</sub> =1kΩ	0.01 - 20.0 GHz	0.75 dB	±1.0 dB
R <sub>TH</sub> =20kΩ	0.01 - 18.0 GHz	±1.0 dB	±1.25 dB
R <sub>TH</sub> =20kΩ	0.01 - 20.0 GHz	±1.0 dB	±1.25 dB
Threshold Temp. Stability (Max.)	±0.25 dB	±0.5 dB	±0.5 dB
Threshold Hysteresis (Max.)	±0.2 dB	±0.5 dB	±0.5 dB
Pulse Response (Max.)	50 µsec‡	100 µsec‡	100 µsec‡
Logic: Pin > Pth	1	1	1
Output Voltage Hi @ 5mA source	4.4 Volts	3.5 Volts	3.5 Volts
Output Voltage Lo @ 5mA sink	0.1 Volts	0.25 Volts	0.25 Volts
Supply Current (Max.)	2.5 mA†	5.0 mA†	5.0 mA†

\*Measured in a 50 Ohm system at V<sub>S</sub>=+5.0 Vdc. R<sub>TH</sub>=100 Ohm to 100 kOhm unless otherwise specified.  
†Pin ≤ -15 dBm. ‡50% RF to 10 or 90% Video Response time for input change ≥ 3 dB above Pth.

### MAXIMUM RATINGS

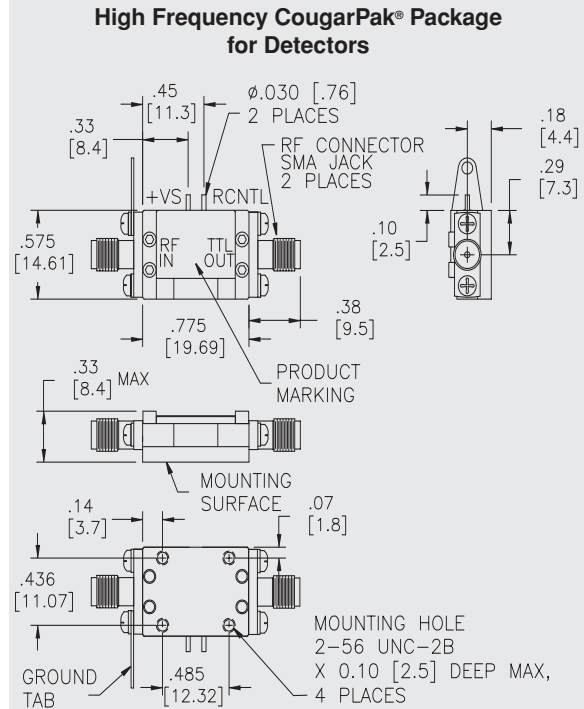
DC Voltage	+7 V
Continuous RF Input Power	+14.0 dBm
Operating Case Temperature	-55 °C to +125 °C
Storage Temperature	-65 °C to +125 °C
Burn-In Temperature	+125 °C
Detector Thermal Resistance <sup>1</sup> (θ <sub>jc</sub> )	+3500 °C/Watt
Temperature Rise @ 0 dBm	+3.5 °C

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

### APPLICATION NOTES

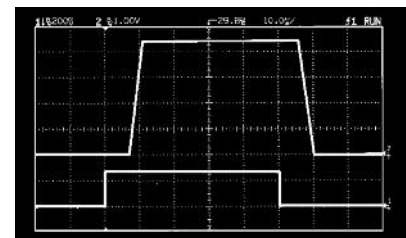
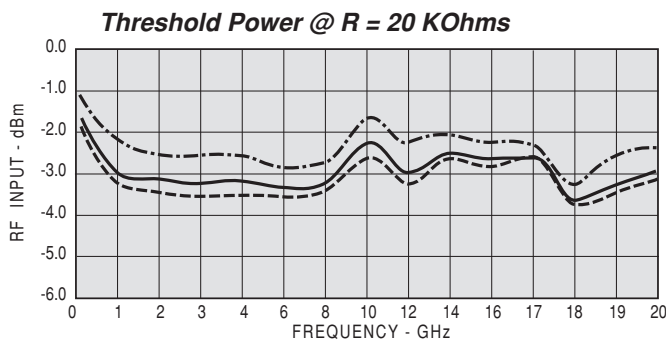
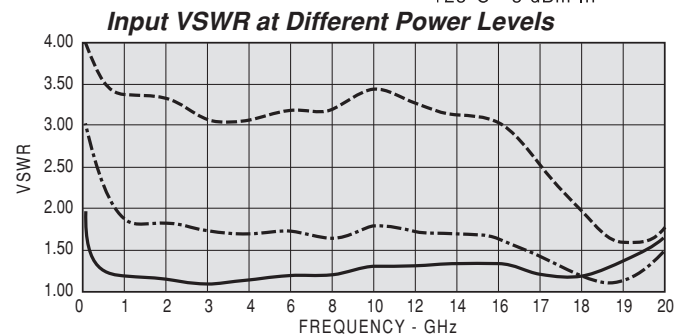
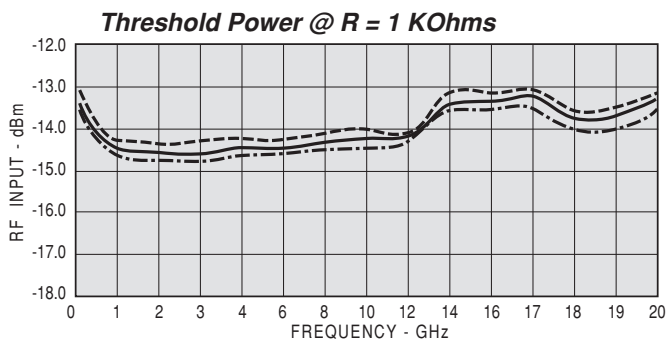
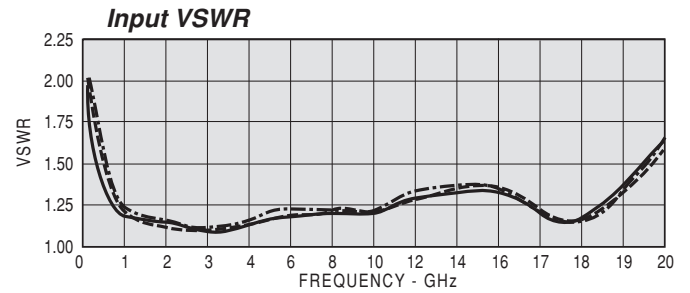
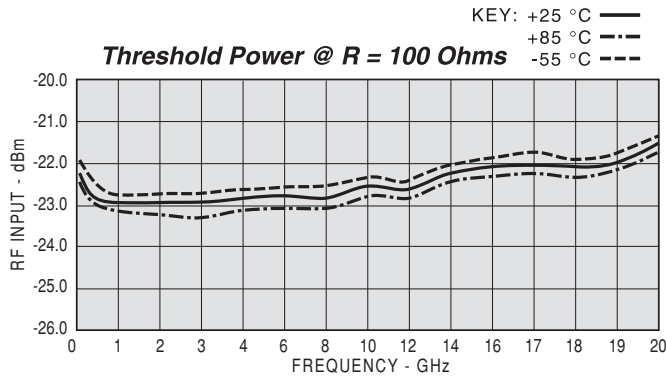
- ✦ This unit is DC coupled and employs a RF choke at the input (DC short).
- ✦ DO NOT bypass the Threshold Control pin. Capacitance greater than 50pF may cause instabilities. Keep the threshold programming resistor or circuit close to this pin.
- ✦ Average power detection is obtained at power levels below approximately -13 dBm.
- ✦ The output of this unit is derived from an op-amp, not a true logic device.
- ✦ Connect external threshold resistor from Rcntl port to ground.

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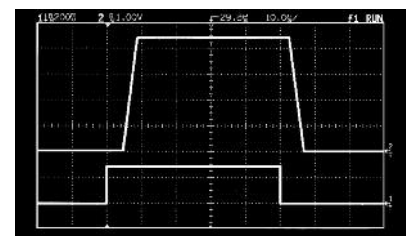


DIMENSIONS ARE IN INCHES [MILLIMETERS]

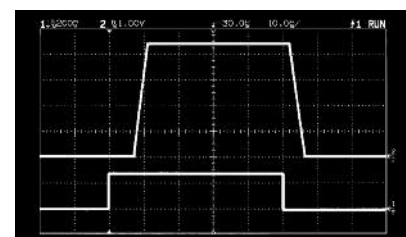
## TYPICAL PERFORMANCE



Pulse Response @  $R_{TH} = 100$  Ohms



Pulse Response @  $R_{TH} = 1$  KOhms



Pulse Response @  $R_{TH} = 20$  KOhms

Top Trace: TTL Logic Out  
Bottom Trace: RF Input  
Time Base: 10.0  $\mu$ s/div

