

# DTCP20231 0.7 TO 20.0 GHz ULTRA HI-SPEED THRESHOLD DETECTOR

Typical Values @ +25 °C	DTCP20231
Wide Frequency Range .....	0.7 to 20.0 GHz
Super-fast Pulse Response .....	5-10 ns
Temperature Stability .....	± 1.0 dB
Power Flatness .....	± 1.0 dB
High Frequency CougarPak® Package	
External Adjustable Threshold Level, Low Drift	

## SPECIFICATIONS\*

Parameter	Typical	Guaranteed	
		0 to 50 °C	-40 to +85 °C
Frequency (Min.)	0.7-20.0 GHz	0.7-20.0 GHz	0.7-20.0 GHz
Input Power Range (Min.)	-15 to -3 dBm*	-15 to -5 dBm*	-15 to -5 dBm*
VSWR (Max.)			
At P <sub>in</sub> = -15 dBm			
Freq: 0.7 to 8.0 GHz	2.5:1	3.0:1	3.0:1
Freq: 8.0 to 20.0 GHz	1.8:1	2.3:1	2.3:1
At P <sub>in</sub> = -4 dBm			
Freq: 0.7 to 8.0 GHz	3.0:1	3.8:1	3.8:1
Freq: 8.0 to 20.0 GHz	2.8:1	3.5:1	3.5:1
Power Flatness (Max.)			
At -10 dBm	±0.75 dB	±1.0 dB	±1.0 dB
At -3 dBm	±1.25 dB	±1.50 dB	±1.50 dB
Threshold Temp. Stability (Max.)	±0.25 dB	±0.5 dB	±0.5 dB
Threshold Hysteresis (Max.)	±0.2 dB	±1.0 dB	±1.5 dB
Pulse Response (Max.)			
At 50 Ω    8 pF load	8 <sup>^</sup> ns	13 <sup>^</sup> ns	15 <sup>^</sup> ns
Logic: P <sub>in</sub> > P <sub>th</sub>	1	1	1
Output Volt. Hi @ 5mA source (Min.)	4.4 Volts	3.5 Volts	3.5 Volts
Output Volt. Lo @ 5mA sink (Max.)	0.27 Volts	0.5 Volts	0.5 Volts
Supply Current (Max.)	7.0 mA	10.0 mA	12.0 mA

\* Measured in a 50 Ohm system at V<sub>s</sub>=+5.0 Vdc. R<sub>th</sub>=2 Ohm to 2 KOhm unless otherwise specified.  
<sup>^</sup> 50% RF to 10 or 90% Video Response time for input change 3 dB above P<sub>th</sub>.

## MAXIMUM RATINGS

DC Voltage .....	+6 V
Continuous RF Input Power .....	+14.0 dBm
Operating Case Temperature .....	-40 °C to +125 °C
Storage Temperature .....	-65 °C to +150 °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

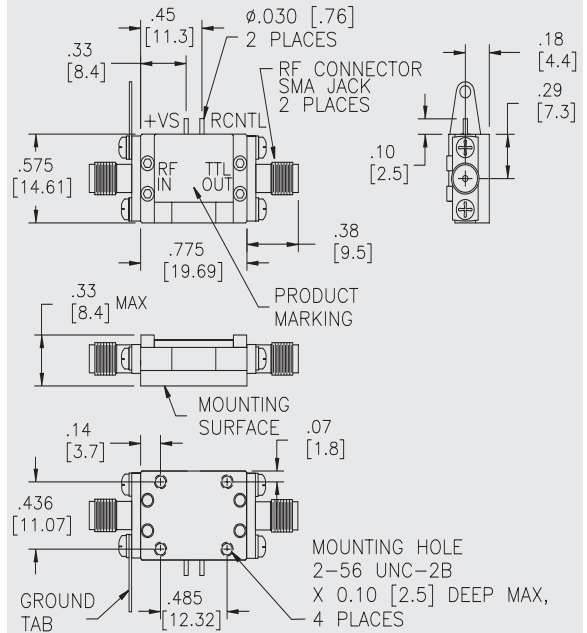
<sup>1</sup> Thermal resistance is based on RF input power. Ratings based on +25 °C.

## APPLICATION NOTES

- ✦ RF input is AC coupled (DC block).
- ✦ DTCP20231 contains a plastic packaged IC-Ultra Hi-speed comparator.
- ✦ DTCP20231 provides maximum performance with minimum output capacitance. A heavy capacitive load slows down the TTL output response.
- ✦ Connect external threshold resistor from Rcntl port to ground.

## DTCP20231

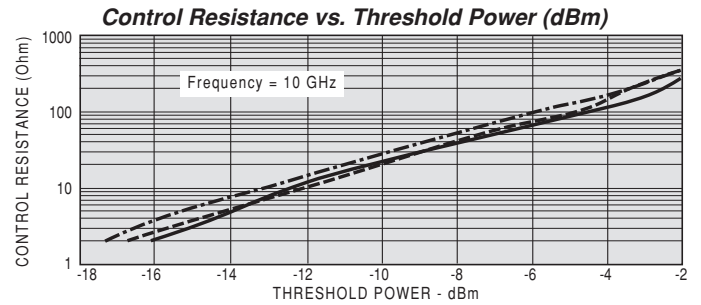
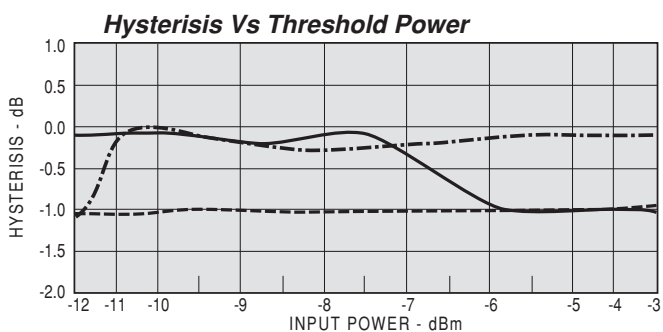
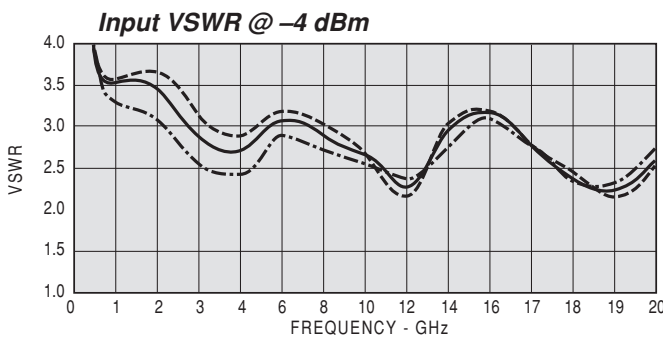
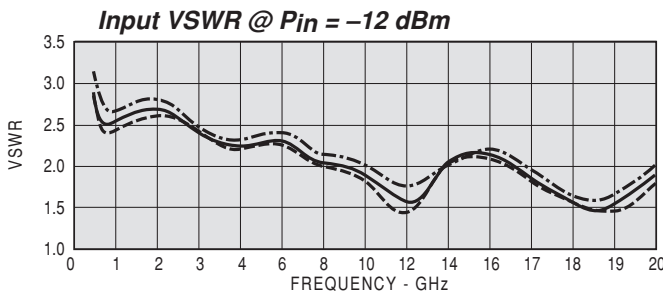
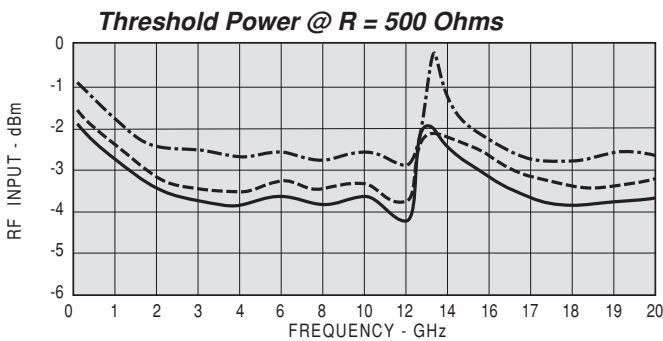
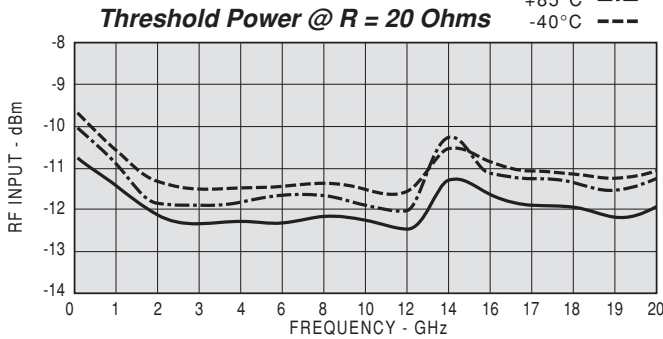
### High Frequency CougarPak® Package for Detectors



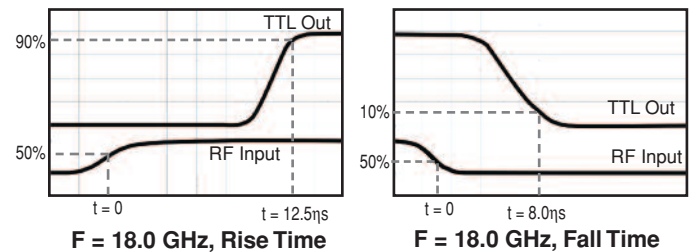
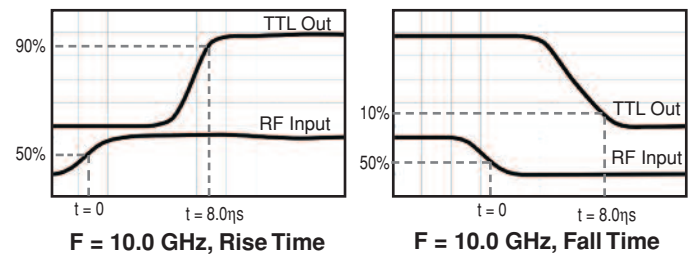
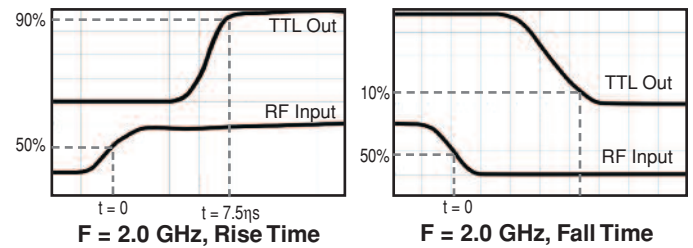
DIMENSIONS ARE IN INCHES [MILLIMETERS]

**TYPICAL PERFORMANCE**

KEY: +25°C —  
+85°C - - -  
-40°C - - -



**Pulse Response**



TTL Logic Out 800 mV/div  
RF Input 20 mV/div  
Time Base: 2.0 ns/div