



# Threshold Detector

## 10 to 2000 MHz

### Technical Data

#### UTD-2004

#### Features

- **Frequency Range: 10 to 2000 MHz**
- **Sensitive Threshold: -25 dBm**
- **Threshold Externally Programmable with One Resistor**
- **Wide Threshold Range: -25 to -10 dBm**
- **TTL Output**
- **Temperature Compensated Threshold**
- **2.5 mA (Typ) Power Consumption @ +5 VDC**

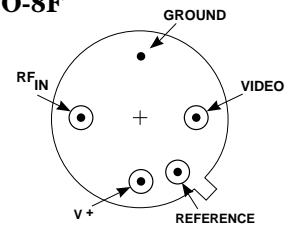
#### Applications

- **Specifically Designed for System Built-in Test**
- **Built for Retrofitting**
- **Channel RF Activity Monitoring**

#### Description

The UTD-2004 is a sensitive microwave threshold detector which provides efficient and accurate RF level measurement at critical system points. It contains a planar tunnel diode detector, 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 TO-8F



#### Maximum Ratings

Parameter	Maximum
DC Voltage	+20 V
Continuous RF Input Power	+10 dBm
“R” Series Burn-In Temperature	+100°C
Operating Case Temperature	-55°C to +100°C
Storage Temperature	-55°C to +100°C

**Weight:** (typical) 2.1 grams

## Electrical Specifications

(Measured in 50  $\Omega$  system @ +5 VDC)

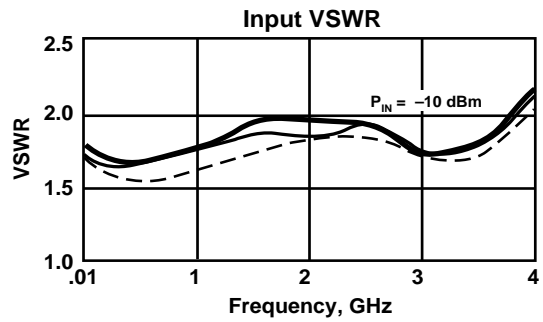
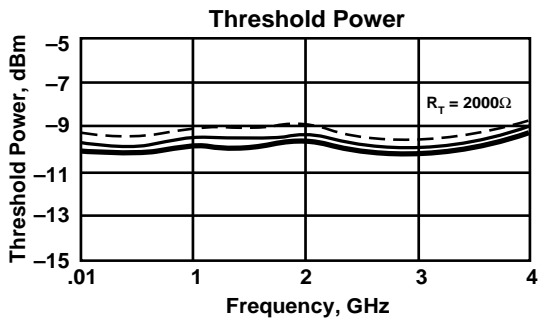
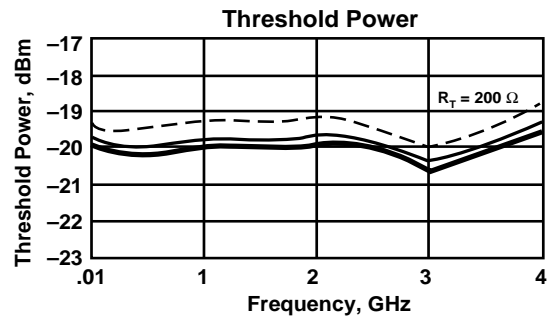
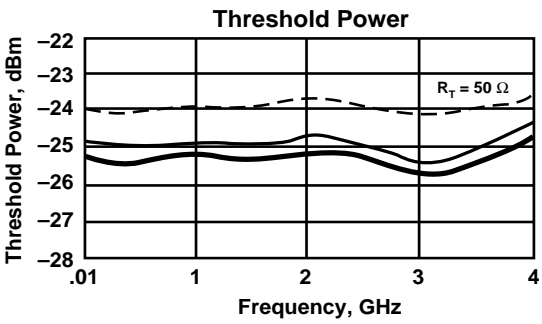
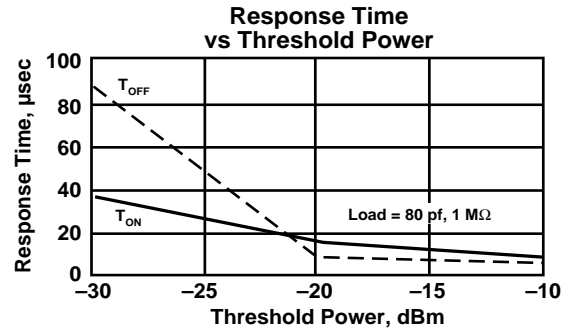
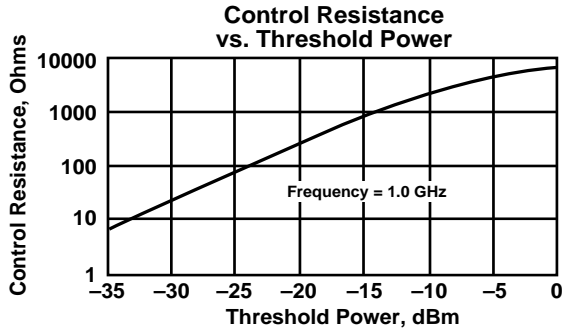
Symbol	Characteristic	Typical $T_c = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_c = 0$ to $50^\circ\text{C}$	$T_c = -55$ to $+85^\circ\text{C}$	
—	Frequency (Min.)	10-2000	10-2000	100-2000	MHz
—	Input Operating Range	-25 to -10	-25 to -10	-25 to -10	dBm
—	Input Flatness (Max.)	$\pm 0.5$	$\pm 1.0$	$\pm 1.0$	dB
—	Input VSWR (Max.)				
—	-25 < $P_{IN}$ < -20 dBm	1.5:1	2.0:1	2.0:1	—
—	-20 < $P_{IN}$ < -10 dBm	1.8:1	2.2:1	2.2:1	—
—	Threshold Temperature Stability (Max.)	—	—	$\pm 1.5$	dB
—	Threshold Hysteresis (Max.)	0.7	1.5	1.5	dB
—	Response Time (see Note 1) (Max.)				
—	$T_{ON}$ , 90% RF to TTL "1"	20	300	300	$\mu\text{s}$
—	$T_{OFF}$ , 10% RF to TTL "0"	30	300	300	$\mu\text{s}$
—	Control Resistance at Threshold Level:				
—	$P_{IN} = -25$ dBm	50	—	—	$\Omega$
—	$P_{IN} = -20$ dBm	200	—	—	$\Omega$
—	$P_{IN} = -10$ dBm	2000	—	—	$\Omega$
—	Output Compatibility (Standard TTL Loads) (Min.)	2	1	1	—
—	Output Voltage (see Note 2) (Min.)	3.6	2.7	2.7	V
—	Supply Voltage	5-20	5	5	V
—	Supply Current @ +5 VDC (Max.)	2.5	5.0	5.0	mA

Notes: 1. Response time for input change > 3 dB above CW threshold.  $R_{LOAD} = 1$  M  $\Omega$ ,  $C_{LOAD} = 80$  pF.

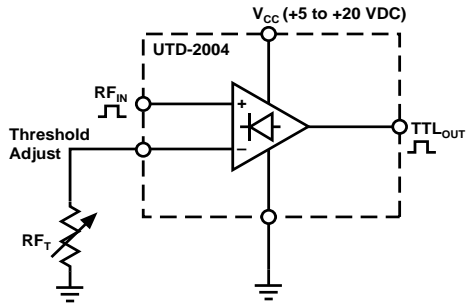
2. Output voltage for  $P_{IN} = >$  threshold,  $R_{LOAD} = 1$  M  $\Omega$ .

### Typical Performance Over Temperature (@ +5 VDC unless otherwise noted)

Key: +25°C ———  
 +85°C - - - -  
 -55°C ———



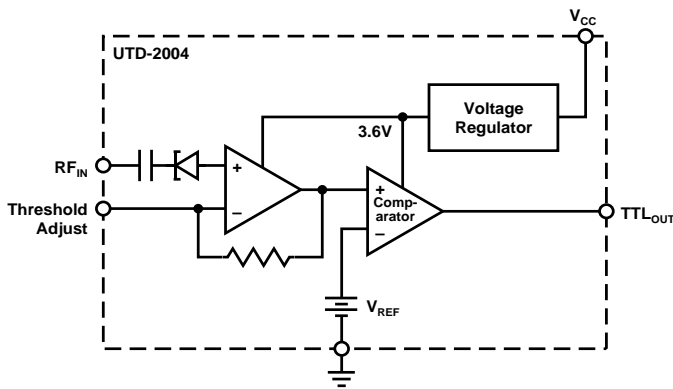
### Threshold Adjust



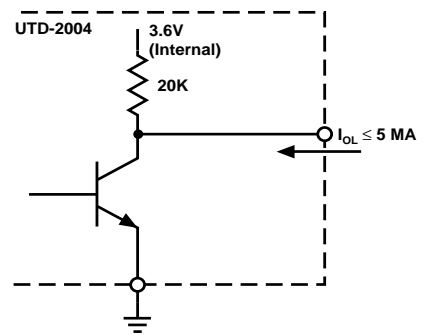
Threshold Adjust at +15 VDC Bias

R <sub>T</sub> , Ω	Sensitivity dBm, (typ)
50	-25
200	-20
2000	-10

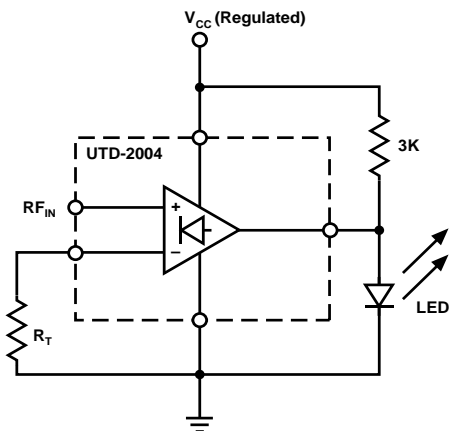
### Simplified Schematic



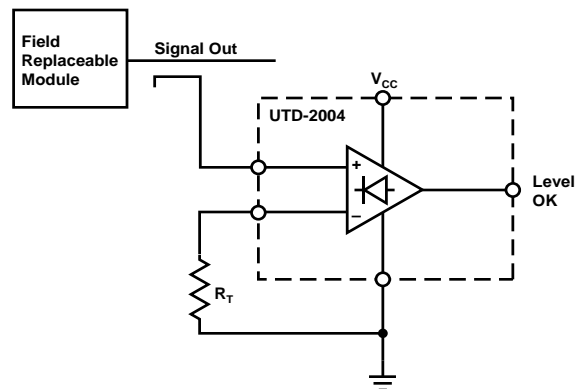
### Output Schematic



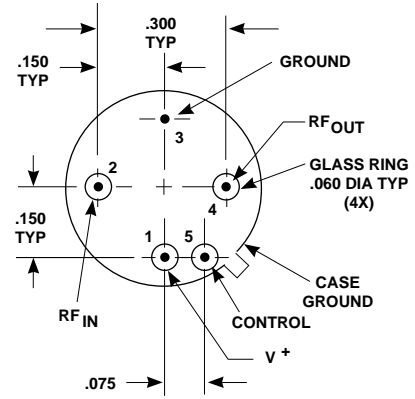
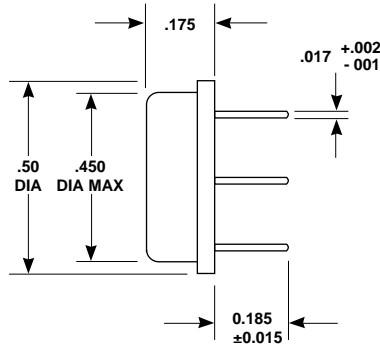
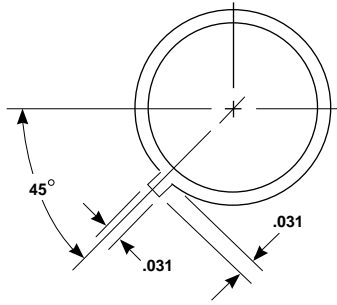
### Indicator Drive Circuit



### Built-In Test Detector



**Case Drawings  
TO-8F**



APPROXIMATE WEIGHT 2.1 GRAMS

- NOTES (UNLESS OTHERWISE SPECIFIED):**  
 1. DIMENSIONS ARE SPECIFIED IN INCHES  
 2. TOLERANCES:   xx ± .02  
                   xxx ± .010

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