

Avantek Products

Threshold Detector 0.1 to 18 GHz

Technical Data

ATD-18021

Features

- **Frequency Range: 0.1 to 18 GHz**
- **Sensitive Input: -25 to -10 dBm**
- **Threshold Externally Programmable with One Resistor**
- **Temperature Compensated Threshold**
- **TTL Output**
- **2.5 mA (Typ) Power Consumption @ +5 VDC**
- **Wide Supply Voltage: 5 to 20 V**

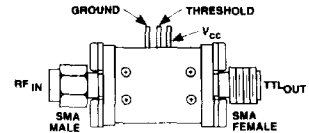
Applications

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

Description

The ATD-18021 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, voltage regulator, 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 AT-1



(See Section 5 for detailed case drawings.)

Maximum Ratings

Parameter	Maximum
DC Voltage	+20 Volts
Continuous RF Input Power	+10 dBm
Operating Case Temperature	-55 to +100°C
Storage Temperature	-55 to +100°C
"R" Series Burn-In Temperature (T _b)	+100°C

Weight: (typical) 7.1 grams (without connectors)

Electrical Specifications

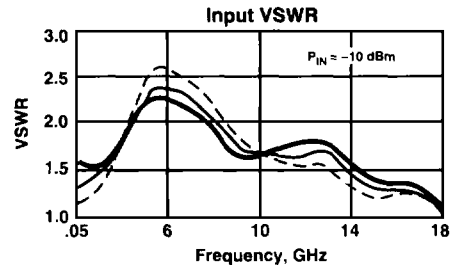
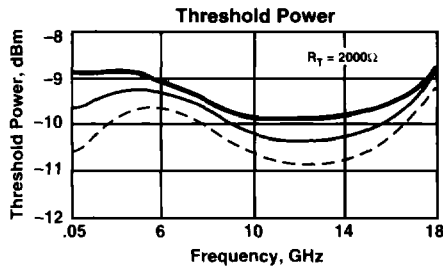
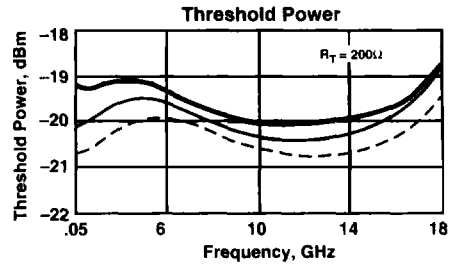
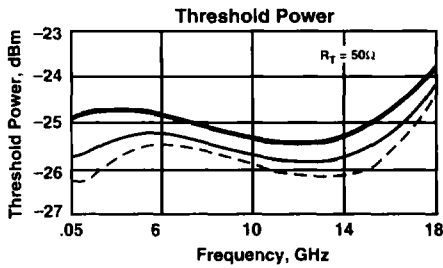
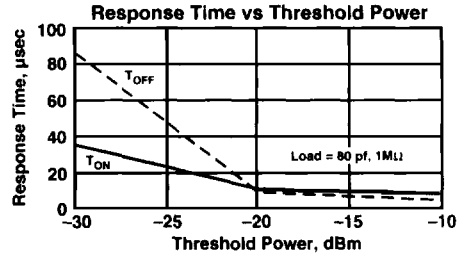
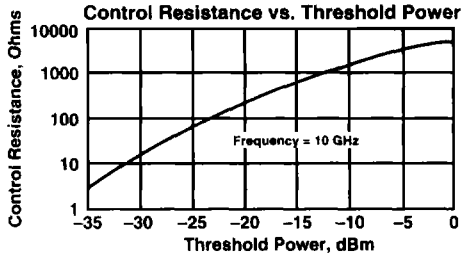
(Measured in 50 Ω system @ +5 VDC nominal unless otherwise noted)

Symbol	Characteristic	Typical $T_c = 25^\circ\text{C}$	Guaranteed Specifications		Unit
			$T_c = 0 \text{ to } 50^\circ\text{C}$	$T_c = -55 \text{ to } +85^\circ\text{C}$	
—	Frequency (Min.)	0.1-18	0.1-18	0.1-18	GHz
—	Input Operating Range	-25 to -10	-25 to -10	-25 to -10	dBm
—	Input Flatness (Max.)	± 0.6	± 1.5	± 1.5	dB
—	Input VSWR (Max.) -25 < P_{IN} < -10 dBm	2.2:1	3.0:1	3.0:1	—
—	Threshold Temperature Stability (Max.)	—	—	± 1.5	dB
—	Threshold Hysteresis (Max.)	.7	1.5	1.5	dB
—	Response Time (see Note 1) (Max.)				
	T_{ON} , 90% RF to TTL "1"	20	300	300	μs
	T_{OFF} , 10% RF to TTL "0"	30	300	300	μs
—	Control Resistance at Threshold Level:				
	$P_{IN} = -25$ dBm	50	—	—	Ω
	$P_{IN} = -20$ dBm	200	—	—	Ω
	$P_{IN} = -10$ dBm	2000	—	—	Ω
—	Output Compatibility Standard TTL Loads (Min.)	2	1	1	—
—	Output Voltage (see Note 2)	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

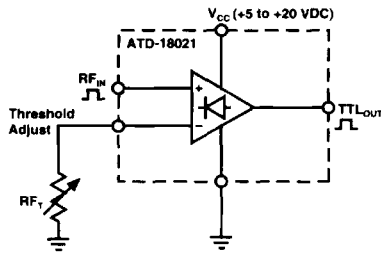
Notes: 1. Response time for input change > 3 dB above CW threshold. $R_{LOAD} = 1 \text{ M}\Omega$, $C_{LOAD} = 80 \text{ pF}$.
2. Output voltage for $P_{IN} = >$ threshold, $R_L = 1 \text{ M}\Omega$.

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

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



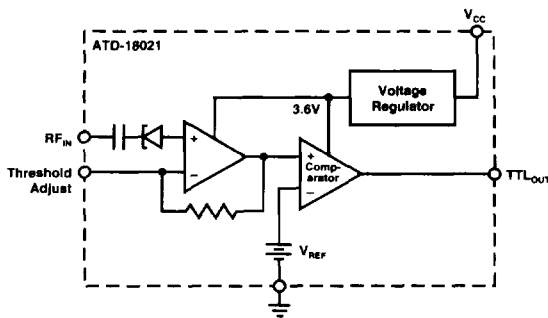
Threshold Adjust



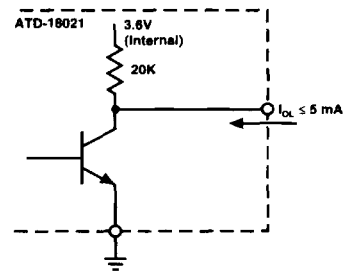
Threshold Adjust

R_T, Ω	Sensitivity dBm, (typ)
20	-25
200	-20
2000	-10

Simplified Schematic

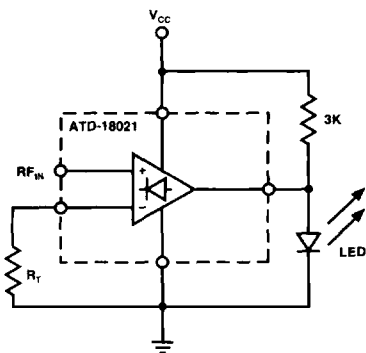


Output Schematic



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Indicator Drive Circuit



Built-In Test Detector

