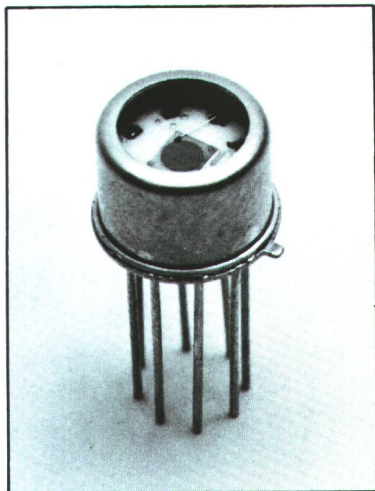


P1-10/P1-10H Pyroelectric Detectors



Features

- Rugged LiTaO_3 material
- 610°C Curie temperature
- $0.2\%/^\circ\text{C}$ temperature stability
- Non-hygroscopic
- Broad spectral range .001 to 1000 microns
- Sub-nanosecond response
- Low noise
- -55°C to $+85^\circ\text{C}$ operation
- Optional windows

Applications

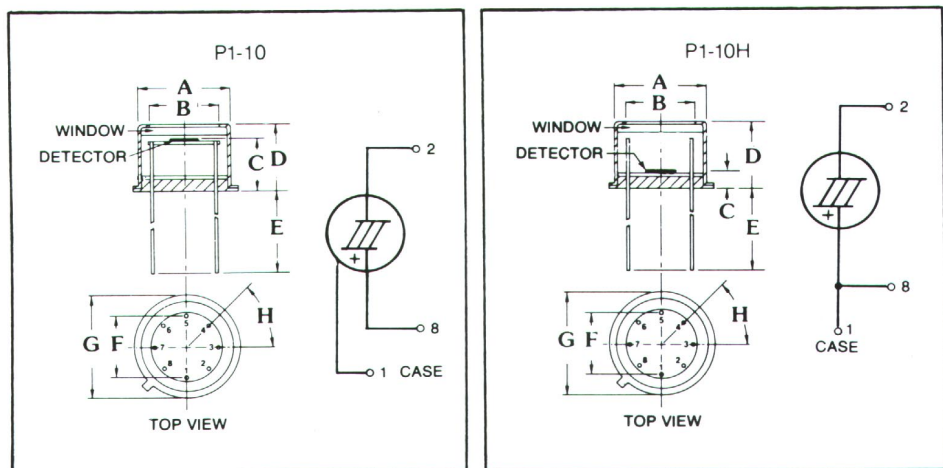
- Laser power and energy measurement
- Non-contact temperature measurement
- Security and surveillance systems
- Process control
- X-ray calorimetry
- Gas analyzer instrumentation
- Solar instrumentation

This series of devices offer a high quality, yet low cost solution to your detection problems. The P1-10/P1-10H series feature a rugged lithium tantalate (LiTaO_3) pyroelectric element (1, 2, 3, 5, and 9 mm dia) mounted in a miniature TO5 or TO8 transistor package.

P1-10 DETECTORS—designed for use with FET's and low noise operational amplifiers for high sensitivity applications.

P1-10H DETECTORS—Optimized for applications requiring high average power (to 1 watt).

Note that the maximum energy density threshold for short pulses ($< \mu\text{sec}$) is the same for both P1-10 and P1-10H.



	P1-11,12,13,15	P1-11H,12H,13H,15H	P1-19	P1-19H
A	.325	.325	.530	.530
B	.240	.240	.430	.430
C	.180	.100	.100	.090
D	.248	.248	.240	.240
E	.500	.500	.835	.835
F	.230	.230	.525	.525
G	.360	.360	.600	.600
H	45°	45°	45°	45°

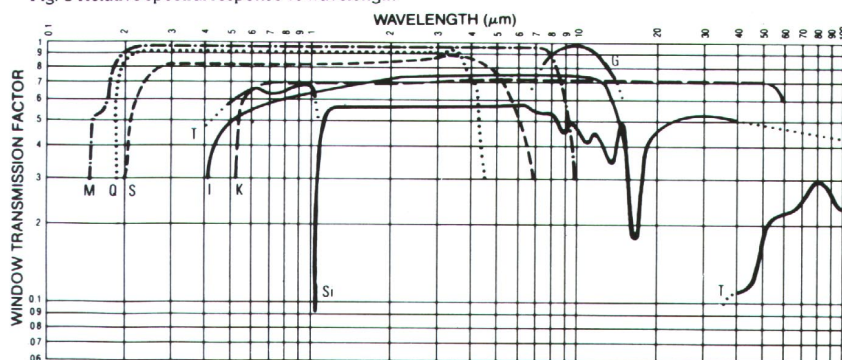
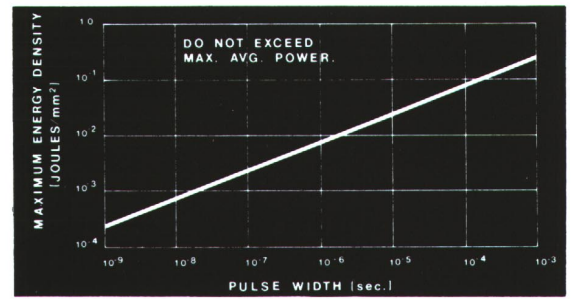
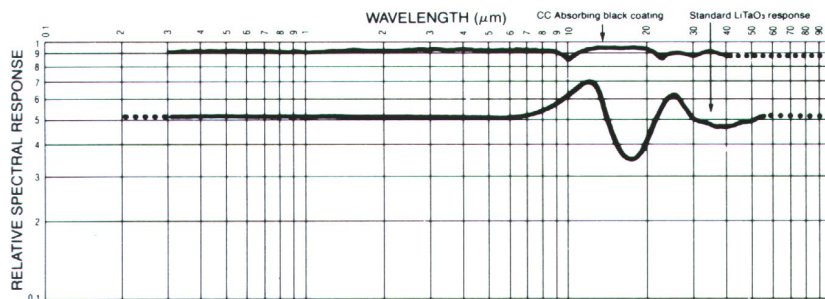
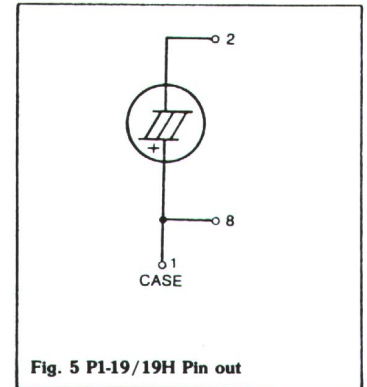
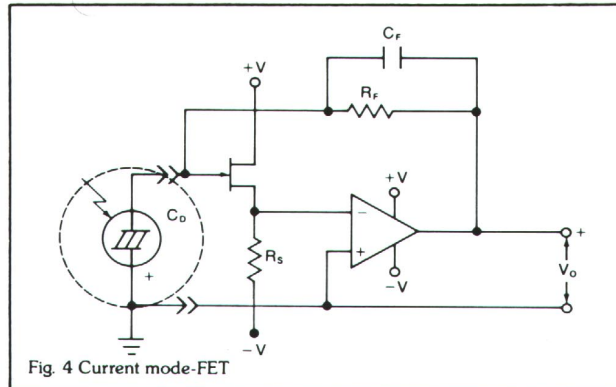
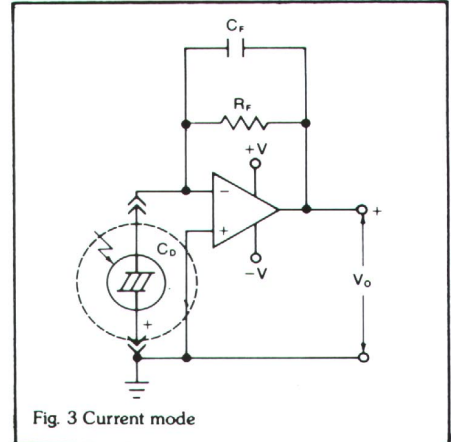
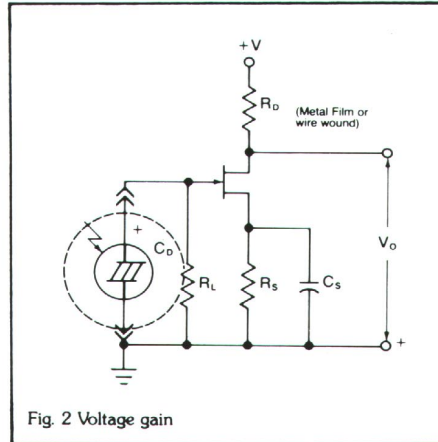
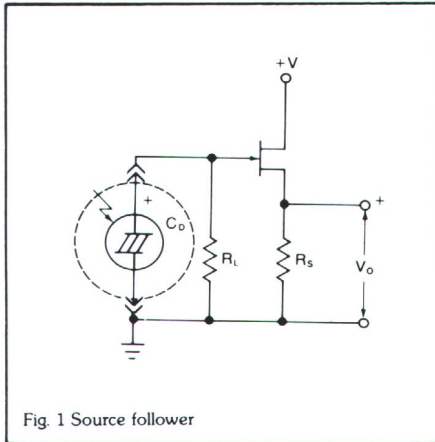
Performance Specifications P1-10

CHARACTERISTICS (25°C unless otherwise noted)		P1-11 Typ Max	P1-12 Typ Max	P1-13 Typ Max	P1-15 Typ Max	P1-19 Typ Max	UNIT	CONDITIONS
Dia	Active Diameter	1	2	3	5	9	mm	
R_i	Current Responsivity	1	.5	.5	25	25	$\mu\text{A/Watt}$	$\lambda = 632.8 \text{ nm}$, $f \geq 15 \text{ Hz}$
C_d	Element Capacitance	15	24	54	75	250	pF	$f = 1 \text{ kHz}$
D	Dissipation Factor	.4 2	.2 2	.2 2	.2 2	.2 2	$\times 10^{-3}$	$f = 1 \text{ kHz}$
f_t	Thermal 3db Frequency	3.5 6	1.6 3	.8 2	5 1	25 5	Hz	$P_{\text{Avg}} \leq 10 \text{ mW}$
$P_{\text{Max Avg}}$	Maximum Average Power	50	50	50	50	50	m Watts	
R_p	Element Resistance	10^{13}	10^{13}	10^{13}	10^{13}	10^{13}	Ohms	$T < 100^\circ\text{C}$

Performance Specifications P1-10H

		P1-11H Typ Max	P1-12H Typ Max	P1-13H Typ Max	P1-15H Typ Max	P1-19H Typ Max	UNIT	CONDITIONS
Dia	Active Diameter	1	2	3	5	9	mm	
R _i	Current Responsivity	25	25	25	25	.25	μA/Watt	λ = 632.8 nm, f ≥ 25 Hz
C _d	Element Capacitance	3	12	27	75	250	pF	f = 1kHz
D	Dissipation Factor	.4 2	.2 2	.2 2	.2 2	.2 2	×10 ⁻³	f = 1kHz
f _t	Thermal 3db Frequency	5 10	5 10	5 10	5 10	5 10	Hz	P _{Avg} ≤ 100 mWatts
P _{Max Avg}	Maximum Average Power	0.5	1	1	1	1	Watts	
R _p	Element Resistance	10 ¹³	10 ¹³	10 ¹³	10 ¹³	10 ¹³	Ohms	T <100°C

Typical Circuit Diagrams



Symbol	Description	Useful Wavelength Range (μm)
G	Germanium- AR Coated 10.6μm	1.8-23
I	Irtan-2	1 - 13
K	KRS-5	0.6-50
M	Magnesium Fluoride (MgF ₂)	<0.2 - 8
Q	Fused Quartz	0.23 - 3.5
S	Sapphire	0.3 - 5
Si	Silicon	1.2 - 9; 22-1000
T	TPX	(visible for alignment only) 50-1000

Fig. 7 Legend