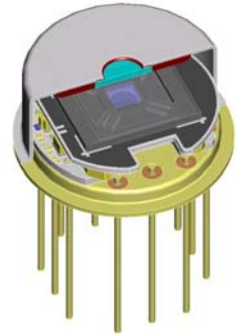


LFP-3950L-337

pyroelectric detector with tunable FPF

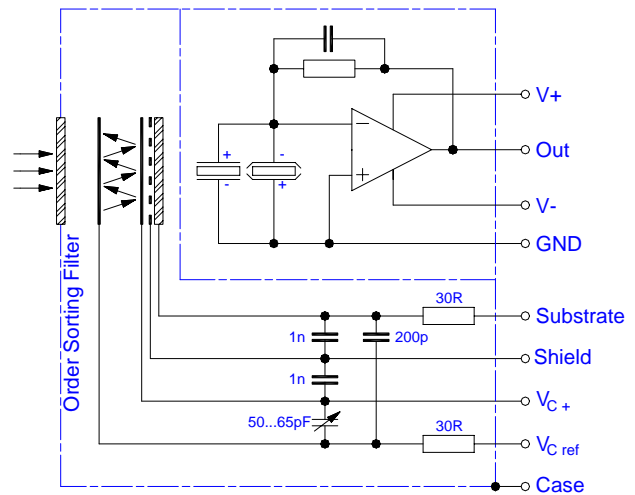
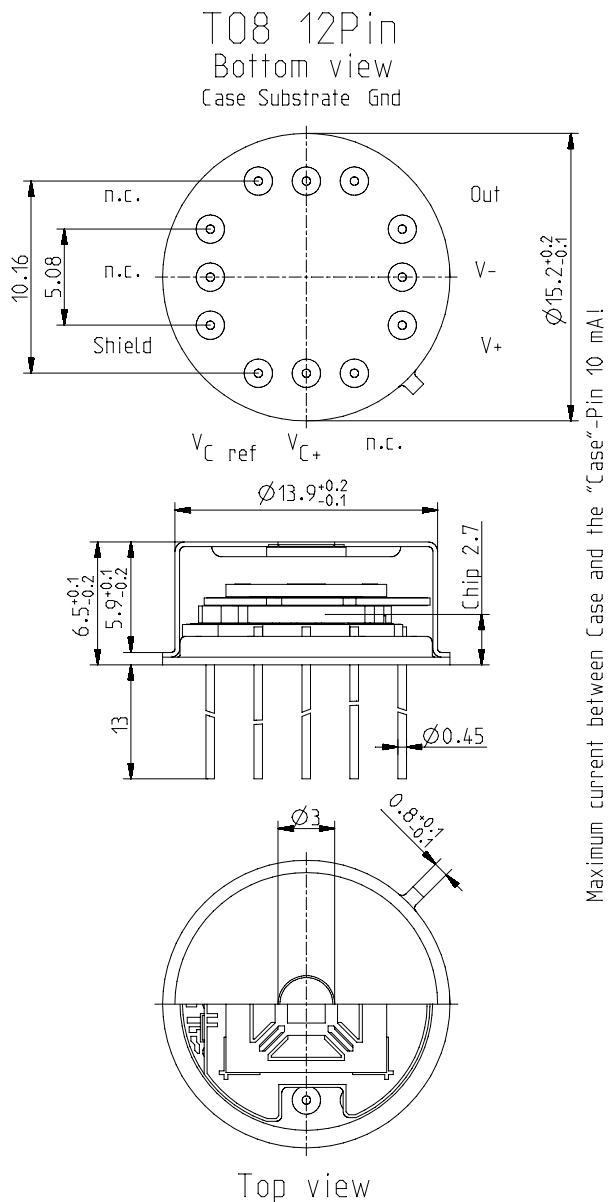
Description:

Pyroelectric IR detector with integrated $\varnothing 1.9\text{mm}$ micromachined tunable Fabry-Perot filter. Tuning range $3.9 \dots 4.8\mu\text{m}$, spectral bandwidth 100nm , low spring stiffness, pyroelectric element area $2.0 \times 2.0\text{mm}^2$
 thermal compensation, ultra low microphonic effect, current mode operation with advanced CMOS transimpedance amplifier (TIA) for 1Hz to 100Hz modulation frequency range
 feedback $R \ 100\text{G}\Omega \pm 20\% \ // \ C \ 50 \pm 10\text{fF}$ (very high gain)

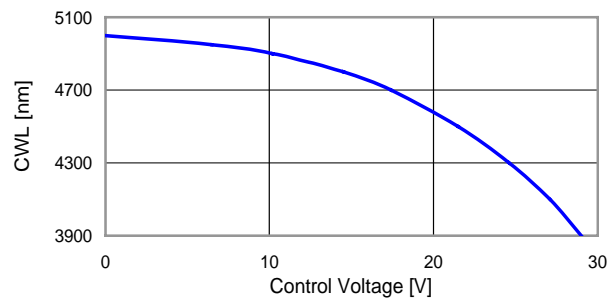
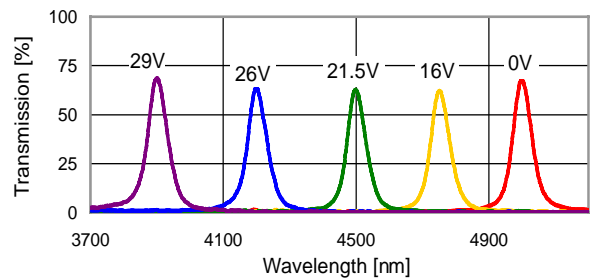


HOUSING:

PIN ASSIGNMENT:



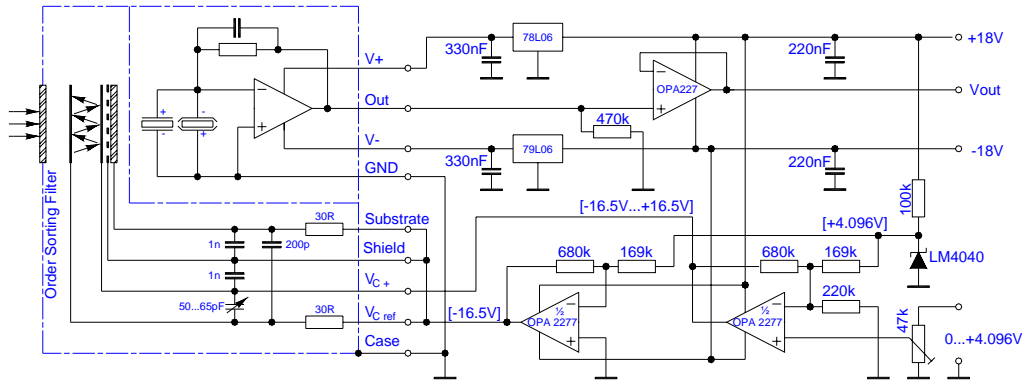
FPI WAVELENGTH RESPONSE:



LFP-3950L-337

pyroelectric detector with tunable FPF

TEST CIRCUIT:



PARAMETERS:

Fabry-Perot filter	nom	FPF 3.9 ... 4.8 μm low spring stiffness design
Filter aperture size		$\varnothing 1.9 \text{ mm}$
Mirror drive mechanism	nom	electrostatic, 1 nF load, <0.05 μA leakage current
Center wavelength CWL @ $V_c=0\text{V}$	nom	$5.0 \pm 0.2 \mu\text{m}$
Guaranteed tuning range	nom	3.9 ... 4.8 μm
Spectral bandwidth @ 50% of transmission peak	nom	$100 \pm 20 \text{ nm}$
Spectral bandwidth @ 10% of transmission peak	typ	200 nm
Control voltage $V_{c+} - V_{c \text{ ref}}$ @ 3.9 μm	typ	+29 V (max +32 V)
Allowable control voltage (limited by pull-in effect)	max	(control voltage @ 3.9 μm) + 0.5 V
Settling time (from 5.0 μm to 3.9 μm by control voltage step; $\pm 1 \text{ nm}$)	max	400 ms
CWL shift by gravity when turning upside down 5.0 μm / 3.9 μm	typ	$\pm 20 \text{ nm} / \pm 35 \text{ nm}$
Order sorting filter	nom	WBP
Out of band blocking UV to	min	25 μm
Pyroelectric detector	nom	LME-337 based type
Element size / type	nom	2.0x2.0 mm^2 lithium-tantalate with black layer
Thermal time constant	typ	150 ms
Feedback resistor	nom	100 G Ω $\pm 20\%$
Feedback capacitor	nom	$50 \pm 10 \text{ fF}$
Polarity	nom	negative signal by positive IR flux change
Voltage responsivity (rms) {400 $^\circ\text{C}$, 10 Hz, 25 $^\circ\text{C}$ } @ 0V, MgF2 long wavelength blocking	typ	1800 V/W
Noise density (rms) {10 Hz, BW 1 Hz, 25 $^\circ\text{C}$ }	max	65 $\mu\text{V}/(\text{sqrt}[\text{Hz}])$
Detectivity {400 $^\circ\text{C}$, 10 Hz, 1 Hz, 25 $^\circ\text{C}$ } @ 0V, MgF2 long wavelength blocking	typ	$6.5\text{E}+06 \text{ cm}(\text{sqrt}[\text{Hz}])/\text{W}$
CMOS operational amplifier	nom	OpAmp2 (for characteristics see application note)
Supply voltage $V_+ - V_-$	max	16 V
Operating supply voltage V_+ / V_-		+2.2 ... 8.0 V / -2.2 ... -8.0 V
Recommended supply voltage V_+ / V_-	nom	$V_+ = +5 \text{ V}; V_- = -5 \text{ V}$
Supply current {output load 1M Ω }	max	150 μA
Offset voltage {25 $^\circ\text{C}$; output load 1M Ω }		-5 mV ... +5 mV
Optimal output load	nom	330 k Ω m
Absolute output current	max	$\pm 0.4 \text{ mA}$
Operating / Storage temperature	nom	-25 ... +85 $^\circ\text{C}$
* Spectral measurement conditions		FTIR (resolution 8/cm; divergence angle $\pm 4^\circ$; AOI 0°)