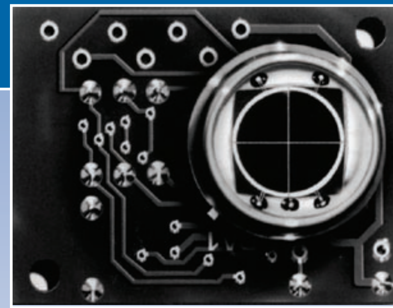
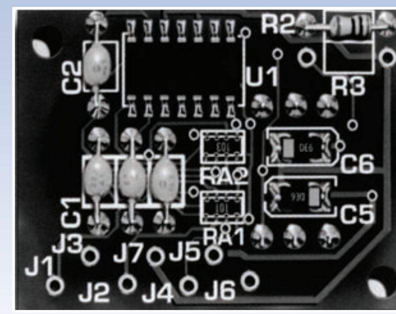
Sum and Difference Amplifier Modules

Position Sensing Modules

QD7-0-SD or QD50-0-SD are quadrant photodiode arrays with associated circuitry to provide two difference signals and a sum signal. The two difference signals are voltage analogs of the relative intensity difference of the light sensed by opposing pairs of the photodiode quadrant elements. In addition the amplified sum of all 4 quadrant elements is provided as the sum signal. This makes the QD7-0-SD or QD50-0-SD ideal for both light beam nulling and position applications. Very precise light beam alignments are possible, and the circuit can also be used for target acquisition and alignment.





APPLICATIONS

- Position Measuring
- Beam Centering
- Targeting
- Guidance Systems

FEATURES

- A 10µm gap is available for the QD50-SD Module.
- Other QD7-XX or QD50-XX are available upon request

Model Number	Active Area Per Element		Element Gap (mm)	Responsivity (A/W)		Capacitance (pF)	Dark Current (nA)		NEP (W/√Hz)	Reverse Voltage (V)	Rise Time (ns)	Temp Range (°C)		Package Style ¶
	Area (mm^2)	Dimensions (mm)		900 nm		0 V	900nm		0 V 900 nm		-30 V 900 nm 50 Ω	Operating	Storage	
				min.	typ.	typ.	typ.	max.	typ.	max.	typ.			
'O' Series														
QD7-0	7	3.0 ϕ	0.2	0.47	0.54	20	4.0	15.0	9.0 e-14	30	10	-40 ~ +100	-55 ~ +125	41 / TO-5
QD50-0	50	8.0 ϕ				125	15.0	30.0	1.3 e-13					73 / TO-8

INPUT

Power supply voltage Vcc = ±4.5V min; ±15V typical; ±18V max

Photodiode bias voltage = (.91) x (V_{PDBIAS})

V_{PDBIAS} = 0 TO +Vcc; Absolute maximum V_{PDBIAS} is +Vcc

NOTE: Negative voltages applied to PDBIAS will render the QD7-0-SD or QD50-0-SD inoperative.

ENVIRONMENTAL

Operating temperature	0 to 70° C
Theoretical noise	15 $nV/Hz^{1/2}$
Frequency response	(-3dB): 120kHz @ V_{PDBIAS}=0V;880nm 250kHz @ V_{PDBIAS}=15V;880nm
Max slew rate	10V/µs
Output current limit	25 ma

OUTPUT

Where i_x is the current from quadrant x

$V_{T-B} = -\{(i_1 + i_2) - (i_3 + i_4)\} \times (10^4)$

$V_{L-R} = -\{(i_1 + i_2) - (i_3 + i_4)\} \times (10^4)$

$V_{SUM} = -\{(i_1 + i_2 + i_3 + i_4)\} \times (10^4)$

MAXIMUM OUTPUT VOLTAGE

Positive: (+Vcc - 3V)

Negative: (- Vcc + 3V)