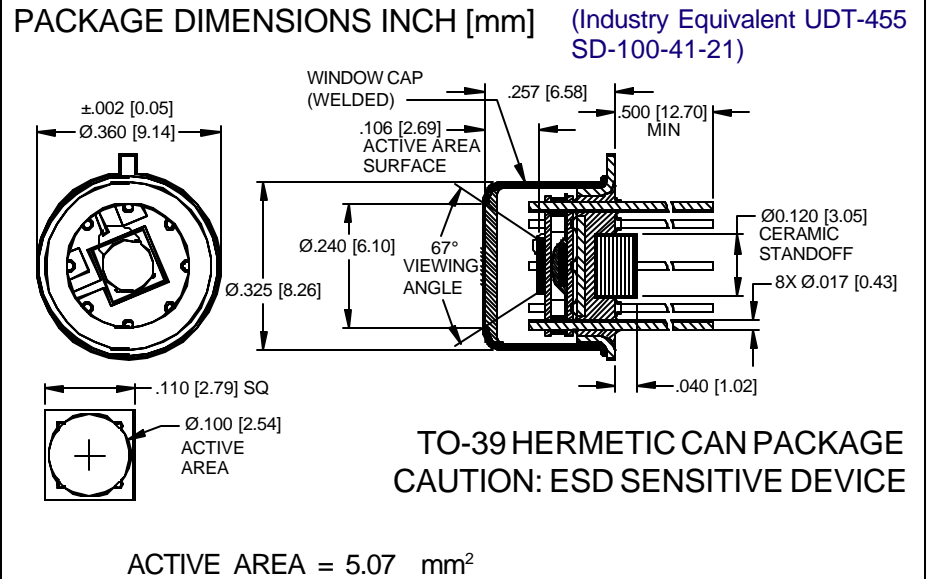


PHOTONIC DETECTORS INC.

Detector Amplifier Hybrid, Blue Enhanced (ref PDB-C705) Type PDB-705



FEATURES

- Low input bias current
- Low offset voltage
- 1 MHz bandwidth

DESCRIPTION

The **PDB-705** is a low noise, medium speed, blue enhanced silicon photodiode integrated with a low noise JFET monolithic trans-impedance op-amp. The feedback capacitor & resistor circuit are externally connected.

APPLICATIONS

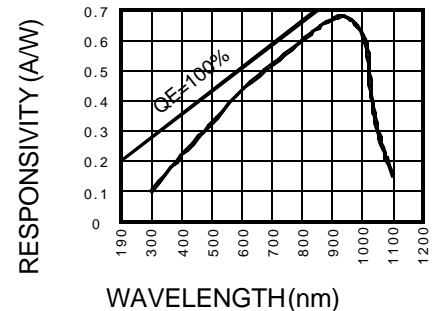
- Medical diagnostic
- Low signal level applications
- Spectroscopy

ABSOLUTE MAXIMUM RATING (TA=25°C unless otherwise noted)

| SYMBOL | PARAMETER | MIN | MAX | UNITS |
|------------------|-----------------------------|-----|------|-------|
| V _{BR} | Reverse Voltage | | 15 | V |
| T _{STG} | Storage Temperature | -55 | +125 | °C |
| T _O | Operating Temperature Range | 0 | +70 | °C |
| T _S | Soldering Temperature* | | +240 | °C |
| I _L | Light Current | | 500 | mA |

*1/16 inch from case for 3 secs max

SPECTRAL RESPONSE



PHOTODIODE ELECTRO-OPTICAL CHARACTERISTICS (TA=25°C unless otherwise noted)

| SYMBOL | CHARACTERISTIC | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|--------------------|----------------------------|---|-----|-----------------------|------|--------|
| I _{SC} | Short Circuit Current | H = 100 fc, 2850 K | 45 | 65 | | μA |
| I _D | Dark Current | H = 0, V _R = 10 V | | 1.0 | 5.0 | nA |
| R _{SH} | Shunt Resistance | H = 0, V _R = 10 mV | .5 | 2 | | GΩ |
| TC R _{SH} | RSH Temp. Coefficient | H = 0, V _R = 10 mV | | -8 | | % / °C |
| C _J | Junction Capacitance | H = 0, V _R = 10 V** | | 15 | | pF |
| λ _{range} | Spectral Application Range | Spot Scan | 350 | | 1100 | nm |
| λ _p | Spectral Response - Peak | Spot Scan | | 950 | | nm |
| V _{BR} | Breakdown Voltage | I = 10 μA | 100 | 125 | | V |
| NEP | Noise Equivalent Power | V _R = 10 V @ Peak | | 2.5x10 ⁻¹⁴ | | W/√Hz |
| tr | Response Time | R _L = 1 KΩ V _R = 10 V | | 15 | | nS |

Information in this technical data sheet is believed to be correct and reliable. However, no responsibility is assumed for possible inaccuracies or omission. Specifications are subject to change without notice. **f = 1 MHz

AMPLIFIER SPECIFICATION $T_A=25^\circ\text{C}$ and $V_S \pm 15\text{Vdc}$ UNLESS OTHERWISE NOTED

| CHARACTERISTIC | TEST CONDITIONS | MIN | TYP | MAX | UNITS |
|---|---|-----------|----------|----------|------------------------------|
| INPUT OFFSET VOLTAGE (V_{OS}) | INITIAL OFFSET | | 0.75 | 2.0 | mV |
| | LONG TERM OFFSET STABILITY | | 15 | | $\mu\text{V}/\text{MONTH}$ |
| AVERAGE INPUT OFFSET DRIFT (TCV_{OS}) | $R_L = 100\text{K}\Omega$ | | | 20 | $\mu\text{V}/^\circ\text{C}$ |
| INPUT BIAS CURRENT (I_b) | OFFSET CURRENT, $V_{CM}=0$ | | 5 | 10 | pA |
| INPUT OFFSET CURRENT (I_{OS}) | | | 5 | | pA |
| INPUT VOLTAGE RANGE (I_{VR}) | COMMON MODE REJECTION $V_{CM} \pm 10\text{V}$ | ± 11 | ± 12 | | V |
| INPUT VOLTAGE NOISE | VOLTAGE 0, $f=100\text{Hz}$ | | 40 | | $\text{nV}/\sqrt{\text{Hz}}$ |
| | VOLTAGE 0, $f=1\text{KHz}$ | | 30 | | $\text{nV}/\sqrt{\text{Hz}}$ |
| INPUT CURRENT NOISE (i_n) | TYP $f=100\text{Hz}$ | | 1.8 | | $\text{fA}/\sqrt{\text{Hz}}$ |
| FREQUENCY RESPONSE | UNITY GAIN, SMALL SIGNAL | 0.8 | 1.0 | | MHz |
| | SLEW RATE, UNITY GAIN | 1.0 | 1.8 | | $\text{V}/\mu\text{S}$ |
| CLOSED LOOP GAIN (CLBW) | $AV_{CL} = +5\text{V}$ | | 9 | | Mhz |
| SUPPLY CURRENT (I_{SV}) | | | | | mP |
| SHORT CIRCUIT CURRENT | | | 15 | | mA |
| POWER SUPPLY | OPERATING VOLTAGE | ± 4.5 | | ± 18 | V |

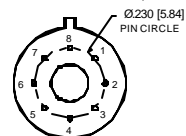
AMPLIFIER ABSOLUTE MAXIMUM RATING ($T_A=25^\circ\text{C}$ UNLESS OTHERWISE NOTED)

| PARAMETER | MIN | MAX | UNITS |
|----------------------------|-----|----------|------------------|
| SUPPLY VOLTAGE | | 18 | V |
| DIFFERENTIAL INPUT VOLTAGE | | ± 20 | V |
| STORAGE TEMPERATURE | -55 | +125 | $^\circ\text{C}$ |
| OPERATING TEMPERATURE | 0 | +70 | $^\circ\text{C}$ |

PIN CONNECTIONS

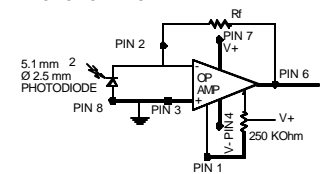
- 1- OFFSET ADJUSTMENT
- 2- INVERTING INPUT/ CATHODE OF PHOTODIODE
- 3- NON-INVERTING INPUT/ CASE GROUND
- 4- NEGATIVE SUPPLY VOLTAGE
- 5- OFFSET ADJUSTMENT
- 6- OUTPUT
- 7- POSITIVE SUPPLY VOLTAGE
- 8- ANODE OF PHOTODIODE

POWER SUPPLY RATED @ $\pm 15\text{V}$
RANGE $\pm 4.3\text{V} - \pm 18\text{V}$
QUIESCENT CURRENT $200\ \mu\text{A}$ MAX



BOTTOM VIEW

PHOTOVOLTAIC



PHOTOCONDUCTIVE

