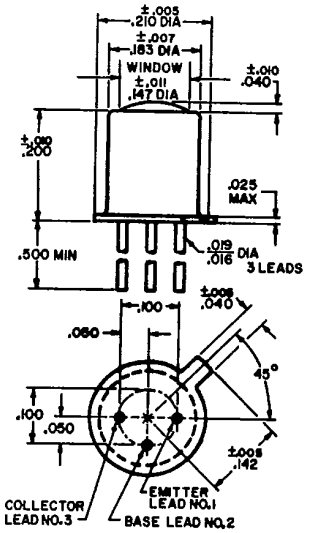
T-41-61

# CLT2130
# CLT2140
# CLT2150
# CLT2160

## Silicon Planar Epitaxial Phototransistors

**GENERAL DESCRIPTION** — The Clairex CLT2130, CLT2140, CLT2150, and CLT2160 are silicon NPN planar epitaxial phototransistors in a hermetically sealed TO-18 case with lens. The base lead is provided to enable more flexible circuit design. The units offer a full range of high current sensitivity for low illumination levels.




PHYSICAL DIMENSIONS — in accordance with JEDEC (T018) outline except for window on top of can.

All dimensions in inches. Collector electrically connected to case. Leads gold plated Kovar.

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**ABSOLUTE MAXIMUM RATINGS**

Maximum Temperatures
- Storage Temperature −65°C to +200°C
- Operating Junction Temperature +150°C

Maximum Power Dissipation
- Total Dissipation
- at 25°C Ambient Temperature $P_T$=250mW
- derate 2mW/°C
- at 100°C Ambient Temperature $P_T$=100mW

| Maximum Voltages | CLT2130 | CLT2140 | CLT2150 | CLT2160 |
|---|---|---|---|---|
| $V_{CBO}$ Collector to Base Voltage | 60 volts | 60 volts | 60 volts | 60 volts |
| $V_{CEO}$ Collector to Emitter Voltage | 50 volts | 40 volts | 40 volts | 30 volts |
| $V_{ECO}$ Emitter to Collector Voltage | 5 volts | 5 volts | 5 volts | 5 volts |

Maximum Current
$I_C$ Collector Current 200ma Pulsed conditions :300μ sec., 2% duty cycle.

**ELECTRICAL CHARACTERISTICS** (25°C Free Air unless otherwise designated.)

| Symbol | Characteristics | Test Conditions | CLT2130 Min. | CLT2130 Max. | CLT2140 Min. | CLT2140 Max. | CLT2150 Min. | CLT2150 Max. | CLT2160 Min. | CLT2160 Max. | Unit |
|---|---|---|---|---|---|---|---|---|---|---|---|
| $I_L$ ($I_{CEO}$) | Light Current | $V_{CE}$=5v, H=5mW/cm², Note 1 | 0.6 | 1.8 | 1.2 | 3.6 | 2.4 | 7.2 | 4.0 | 12.0 | ma |
| $I_D$ ($I_{CEO}$) | Dark Current | $V_{CE}$=10 volts, H=0 | | 25 | | 25 | | 25 | | 25 | na |
| $I_D$ ($I_{CEO}$) | Dark Current | $V_{CE}$=10 volts, H=0, T=+100°C | | 25 | | 25 | | 25 | | 25 | μa |
| $BV_{CEO}$ | Collector to Emitter Breakdown Voltage | $I_C$=.1ma | 50 | | 40 | | 40 | | 30 | | volts |
| $BV_{CBO}$ | Collector to Base Breakdown Voltage | $I_C$=.1ma | 60 | | 60 | | 60 | | 60 | | volts |
| $BV_{ECO}$ | Emitter to Collector Breakdown Voltage | $I_{EC}$=.1ma | 5 | | 5 | | 5 | | 5 | | volts |
| $t_r$ | Light Current Rise Time (unsaturated) | $R_1$=100Ω, $V_{CC}$=+5.0 volts, Note 2 | 3 Typical | | 3 Typical | | 3 Typical | | 3 Typical | | μsec |
| $t_f$ | Light Current Fall Time (unsaturated) | | 3 Typical | | 3 Typical | | 3 Typical | | 3 Typical | | μsec |
| $V_{CE\ (SAT)}$ | Collector to Emitter Saturation Voltage | $I_C$=10ma. $I_B$=0.5ma H=0 | | 0.35 | | 0.30 | | 0.30 | | 0.30 | volts |

**Note 1:** The light source is a frosted tungsten incandescent lamp at 2854°K.
**Note 2:** The light source is a gallium arsenide LED pulsed with a rise and fall time of < 0.3 μsec.

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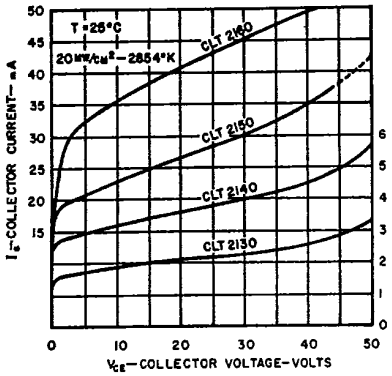
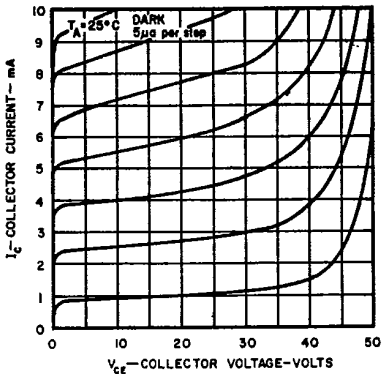
# Typical Electrical Characteristics

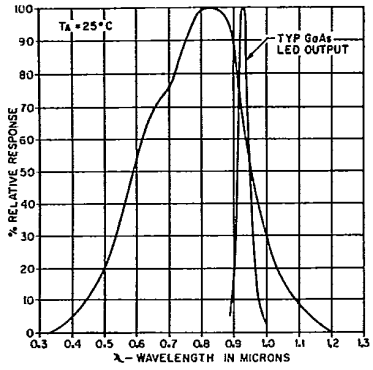
COLLECTOR CURRENT vs. COLLECTOR VOLTAGE



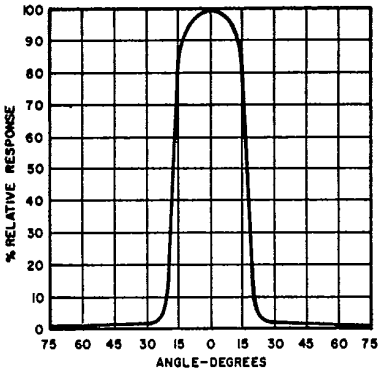

COLLECTOR CHARACTERISTICS CLT 2150




SPECTRAL RESPONSE




ANGULAR RESPONSE




LIGHT CURRENT vs. IRRADIATION