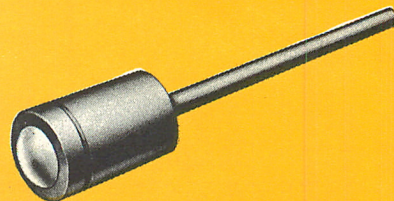


## Product Data

CLT4160  
CLT4170Silicon NPN Planar  
Epitaxial Phototransistors

**GENERAL DESCRIPTION** — The Clairex CLT 4160 and CLT 4170 are silicon planar epitaxial phototransistors in a lensed-window, miniature, coaxial, hermetic package. The 0.060" outside diameter enables high device density with modest mounting tolerances. The series is characterized by a narrow acceptance angle, fast switching and narrow tolerance ranges of sensitivity. The lensed window unit reduces optical cross-talk from stray light present in many applications.

**ABSOLUTE MAXIMUM RATINGS**

## Maximum Temperatures

Storage Temperature  $-65^{\circ}\text{C}$  to  $+180^{\circ}\text{C}$ Operating Junction Temperature  $+150^{\circ}\text{C}$ 

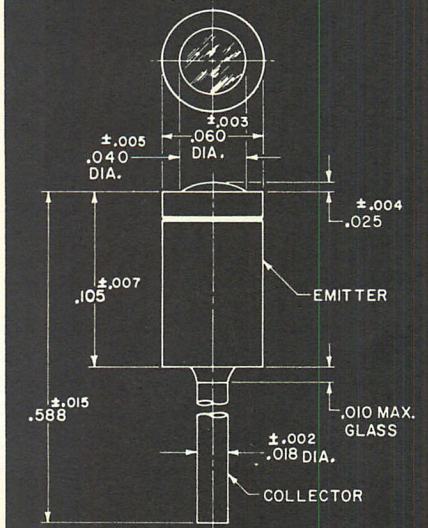
## Maximum Power Dissipation

## Total Dissipation

at  $25^{\circ}\text{C}$  Ambient Temperature  $P_T = 50\text{mW}$  derate  $0.5\text{mW}/^{\circ}\text{C}$ at  $100^{\circ}\text{C}$  Ambient Temperature  $P_T = 12.5\text{mW}$ 

Maximum Voltages	CLT4160	CLT4170
$V_{CEO}$ Collector to Emitter Voltage	50 volts	40 volts
$V_{ECO}$ Emitter to Collector Voltage	5 volts	5 volts

## Maximum Current: Note 3

 $I_C$  Collector Current 200ma

All dimensions in inches.  
Lead gold plated Kovar.

**ELECTRICAL CHARACTERISTICS** ( $25^{\circ}\text{C}$  Free Air unless otherwise designated.)

Symbol	Characteristics	Test Conditions	CLT4160		CLT4170		Unit
			Min.	Max.	Min.	Max.	
$I_L (I_{CEO})$	Light Current	$V_{CE} = 5\text{v}$ , $H = 5\text{mW}/\text{cm}^2$ , Note 1	0.5		2.0		ma
$I_L (I_{CEO})$	Light Current	$V_{CE} = 5\text{v}$ , $H = 20\text{mW}/\text{cm}^2$ , Note 1	2.0	7.0	7.0		ma
$I_D (I_{CEO})$	Dark Current	$V_{CE} = 10\text{ volts}$ , $H = 0$		10		10	na
$BV_{CEO}$	Collector to Emitter Breakdown Voltage	$I_C = 0.1\text{ma}$	50		40		volts
$BV_{ECO}$	Emitter to Collector Breakdown Voltage	$I_{EC} = 0.1\text{ma}$	5.0		5.0		volts
$t_r$	Light Current Rise Time (unsaturated)	$R_L = 1000\Omega$ , $I_C = 0.5\text{ma}$	1.5 Typical		1.5 Typical		$\mu\text{sec}$
$t_f$	Light Current Fall Time (unsaturated)	$V_{CC} = 5.0\text{ volts}$ Note 2	1.5 Typical		1.5 Typical		$\mu\text{sec}$
$V_{CE (SAT)}$	Collector to Emitter Saturation Voltage	$I_C = 0.4\text{ma}$ , $H = 20\text{mW}/\text{cm}^2$	0.3 Typical		0.3 Typical		volts

**Note 1:** The light source is a frosted tungsten incandescent lamp at  $2854^{\circ}\text{K}$ .

**Note 2:** The light source is a gallium/arsenide LED pulsed with a rise and fall time of  $< 0.3 \mu\text{sec}$ .

**Note 3:** Pulsed conditions:  $300 \mu\text{ sec.}$ , 2% duty cycle.



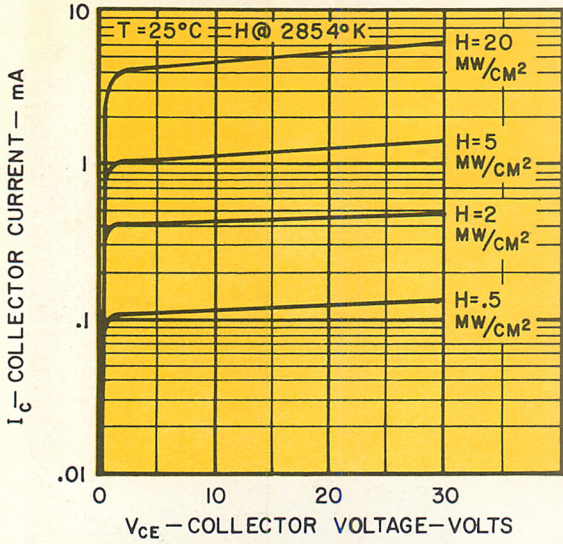
# CLAIREX ELECTRONICS

A DIVISION OF CLAIREX® CORPORATION

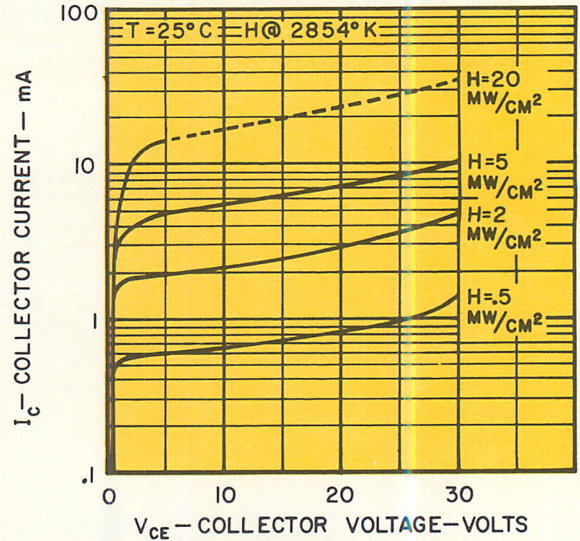
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# Typical Electrical Characteristics

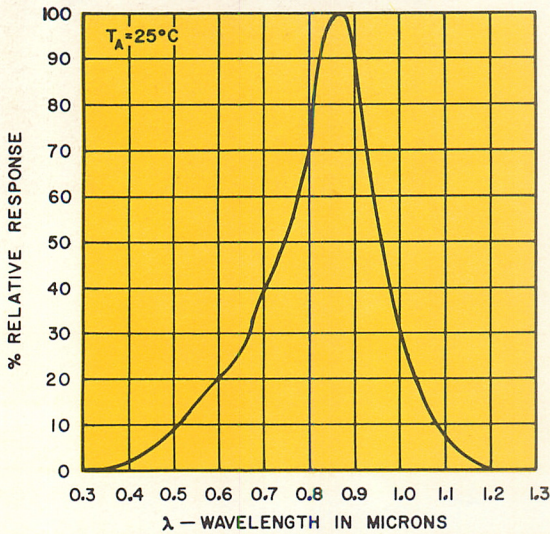
COLLECTOR CHARACTERISTICS CLT 4160



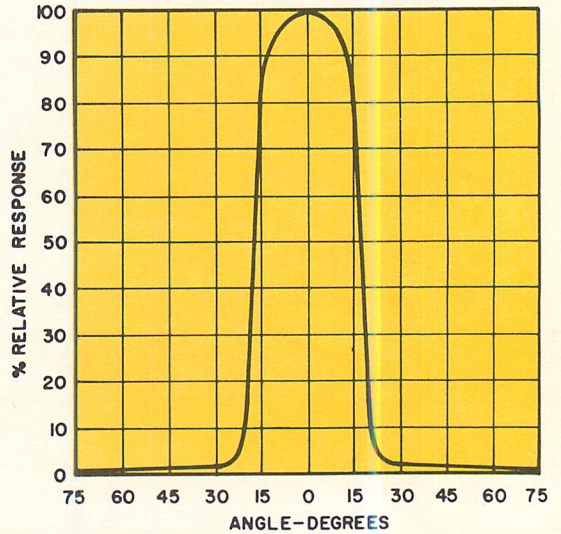
COLLECTOR CHARACTERISTICS CLT 4170



SPECTRAL RESPONSE



ANGULAR RESPONSE



LIGHT CURRENT vs. IRRADIATION

