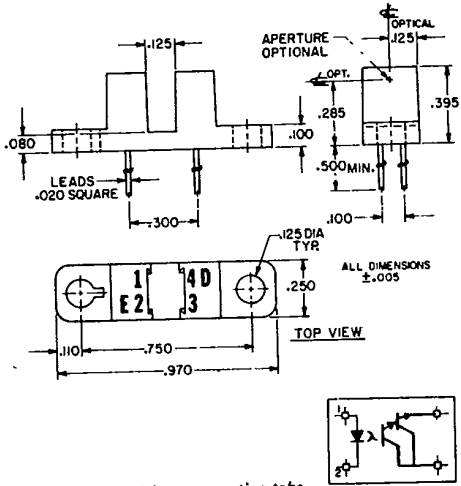
CLI840
CLI850
CLI860
CLI870

Optical Switches



Available without mounting tabs.

GENERAL DESCRIPTIONS — This optical switch series couples a gallium arsenide infrared emitting diode and a silicon darlington phototransistor, for high sensor currents. Maximum sensor voltage of 30 volts allows high sensitivity with lower cost than high voltage designs. The CLI870 has a .010" aperture over the sensor for precise position detection applications. The wide gap of .125" between emitter and sensor easily allows signal interruption by a moving target.

ABSOLUTE MAXIMUM RATINGS

Maximum Temperature:
Storage — 55°C to +150°C
Operating Jct. Temperature +100°C

EMITTER (GaAs Diode)

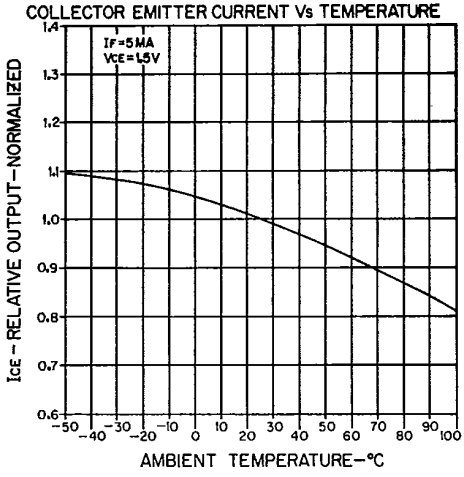
Power Dissipation:
At 25°C Amb., Pd=100mw, derate 1.33mw/°C
Maximum Voltage:
V_R Reverse Voltage=4.0 volts
Maximum Current:
I_F D.C. Forward Current=60ma cont.

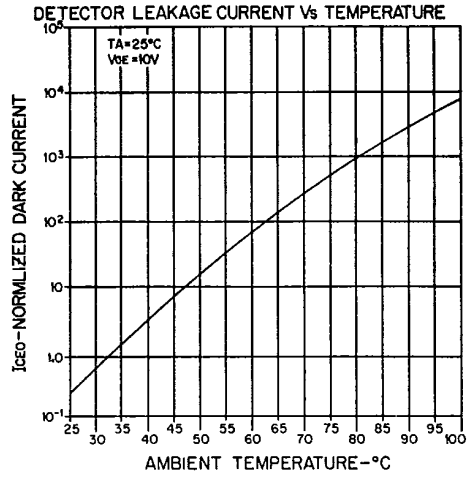
DETECTOR

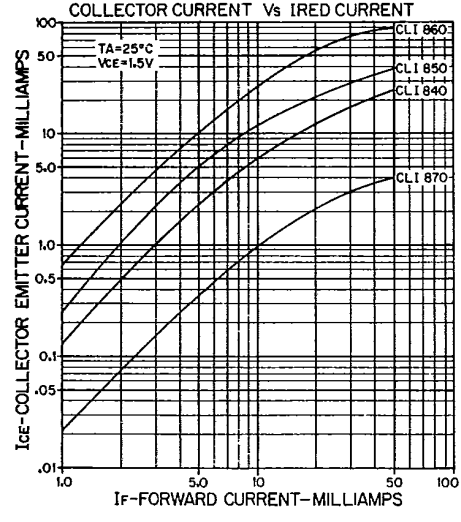
Power Dissipation:
At 25°C amb., Pd=150mw, derate 2.0mw/°C
Maximum Voltages:
V_{CEO}=30V, V_{ECO}=5V
Maximum Current:
I_C, Collector Current 100ma pulsed

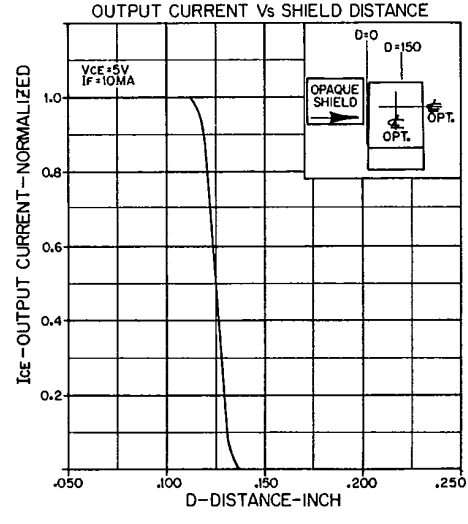
ELECTRICAL CHARACTERISTICS 25°C Free Air

Symbol	Characteristics	Test Conditions	CLI840 Min.	CLI840 Max.	CLI850 Min.	CLI850 Max.	CLI860 Min.	CLI860 Max.	CLI870 Min.	CLI870 Max.	Units
EMITTER											
V_R	Reverse Voltage	I_R=10μa	4.0		4.0		4.0		4.0		volts
V_F	Forward Voltage	I_F=16ma		1.5		1.5		1.5		1.5	volts
SENSOR											
BV_{CEO}	Collector to Emitter Breakdown Voltage	I_C=100μa	30		30		30		30		volts
I_D	Leakage Current	V_{CE}=10V,		250		250		250		250	na
C_{CE}	Capacitance	V_{CE}=5V, f=1MHZ		8		8		8		8	pf
COUPLED											
I_{CE}	Sensor Current	I_F=5ma, V_{CE}=1.5V	2.5		5.0		10.0				ma
		I_F=10ma, V_{CE}=1.5V		10 Typ.		17 Typ.		30 Typ.	1.0		ma
$V_{CE(SAT)}$	Collector to Emitter Saturation Voltage	I_F=10ma, I_C=1.5ma		1.2		1.2		1.2			volts
		I_F=20ma, I_C=1.5ma								1.2	volts
T_R, T_F	Rise, Fall Time	I_C=2ma, V_{CC}=5V R_L=100 ohms		150 Typ.		150 Typ.		150 Typ.		150 Typ.	μsec


COLLECTOR EMITTER CURRENT Vs TEMPERATURE
IF=5MA
VCE=1.5V
ICE - RELATIVE OUTPUT-NORMALIZED
1.4
1.3
1.2
1.1
1.0
0.9
0.8
0.7
0.6
-50 -40 -30 -20 -10 0 10 20 30 40 50 60 70 80 90 100
AMBIENT TEMPERATURE-°C


DETECTOR LEAKAGE CURRENT Vs TEMPERATURE
TA=25°C
VCE=10V
ICEO-NORMLIZED DARK CURRENT
10^5
10^4
10^3
10^2
10
1.0
10^-1
25 30 35 40 45 50 55 60 65 70 75 80 85 90 95 100
AMBIENT TEMPERATURE-°C


COLLECTOR CURRENT Vs IRED CURRENT
TA=25°C
VCE=1.5V
CLI 860
CLI 850
CLI 840
CLI 870
ICE-COLLECTOR EMITTER CURRENT-MILLIAMPS
100
50
10
5.0
1.0
0.5
0.1
.05
.01
1.0 5.0 10 50 100
IF-FORWARD CURRENT-MILLIAMPS


OUTPUT CURRENT Vs SHIELD DISTANCE
VCE=5V
IF=10MA
D=0
D=150
OPAQUE SHIELD
OPT.
OPT.
ICE-OUTPUT CURRENT-NORMALIZED
1.0
0.8
0.6
0.4
0.2
.050 .100 .150 .200 .250
D-DISTANCE-INCH