LOC117
Linear Optocoupler

Parameter	Rating	Units
LED Operating Range	2-10	mA
K3, Transfer Gain	0.887-1.072	-
Isolation, Input to Output	3750	V_{rms}

Features
- Small 8-Pin Package
- Flatpack Package (PCMCIA Compatible)
- Couples Analog and Digital Signals
- Wide Bandwidth (>200kHz)
- High Gain Stability
- Low Input-to-Output Capacitance
- Low Power Consumption
- 0.01% Servo Linearity
- THD 87dB Typical
- Machine Insertable, Wave Solderable
- Surface Mount Tape and Reel Packaging Available
- VDE Compatible

Applications
- Modem Transformer Replacement With No Insertion Loss
- Digital Telephone Isolation
- Power Supply Feedback Voltage/Current
- Medical Sensor Isolation
- Audio Signal Interfacing
- Isolation of Process Control Transducers

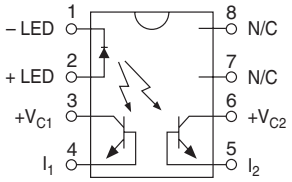
Description
The LOC117 Linear Optocoupler features an infrared LED optically coupled to a pair of phototransistors. An input phototransistor provides the servomechanism used to generate a feedback control signal for the input LED drive current thus compensating for the LED's nonlinear time and temperature characteristics. The output phototransistor provides an isolated signal that is linear with respect to the servo LED current. LOC117 features include wide bandwidth, high input-to-output isolation, and excellent servo linearity.

Approvals
- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- EN/IEC 60950-1:2001 Compliant

Ordering Information

Part #	Description
LOC117	8-Pin DIP (50/tube)
LOC117P	8-Pin Flatpack (50/tube)
LOC117PTR	8-Pin Flatpack (1000/Reel)
LOC117S	8-Pin Surface Mount (50/tube)
LOC117STR	8-Pin Surface Mount (1000/Reel)

Pin Configuration



Absolute Maximum Ratings

Parameter	Ratings	Units
Reverse Input Voltage	5	V
Input Control Current	100	mA
Peak (10ms)	1	A
Input Power Dissipation [1]	150	mW
Total Package Dissipation [2]	500	mW
Isolation Voltage Input to Output	3750	V_{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

[1] Derate Linearly 1.33 mW/°C

[2] Derate Linearly 6.67 mW/°C

Electrical absolute maximum ratings are at 25°C

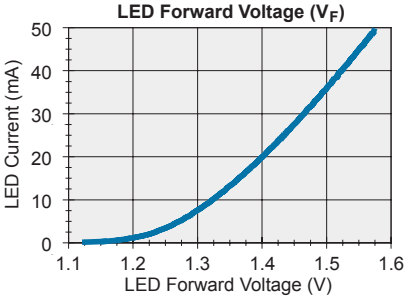
Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.

Electrical Characteristics

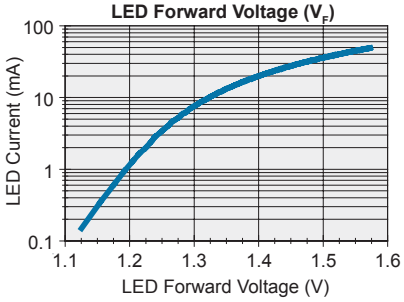
Parameter	Conditions	Symbol	Min	Typ	Max	Units
Input Characteristics @ 25°C						
LED Voltage Drop	I_F=2-10mA	V_F	0.9	1.2	1.4	V
Reverse LED Current	V_R=5V	I_R	-	-	10	µA
Coupler/Detector Characteristics @ 25°C						
Dark Current	I_F=0mA, V_{CB}=15V	I_{CBO}	-	1	25	nA
K1, Servo Gain (I_1/I_F)	I_F=2-10mA, V_{CB1}=15V	K1	0.008	-	0.030	-
K2, Forward Gain (I_2/I_F)	I_F=2-10mA, V_{CB2}=15V	K2	0.006	-	0.030	-
K3, Transfer Gain (K_2/K_1)	I_F=2-10mA, V_{CB1}=V_{CB2}=15V	K3	0.887	1.0	1.072	-
ΔK3, Transfer Gain Linearity (non-servoed)	I_F=2-10mA	ΔK3	-	-	1.0	%
K3 Temperature Coefficient	I_F=2-10mA, V_{det}=-5V	ΔK3/ΔT	-	0.005	-	%/°C
Common Mode Rejection Ratio	V=20V_{PP}, R_L=2KΩ, f=100Hz	CMRR	-	130	-	dB
Total Harmonic Distortion	f_0=350Hz, 0dBm	THD	-96	-87	-80	dB
Frequency Response	Photoconductive Operation	f_{-3dB}	-	200	-	kHz
	Photovoltaic Operation	f_{-3dB}	-	40	-	kHz
Common Characteristics @ 25°C						
Input/Output Capacitance	-	$C_{I/O}$	-	3	-	pF

PERFORMANCE DATA*

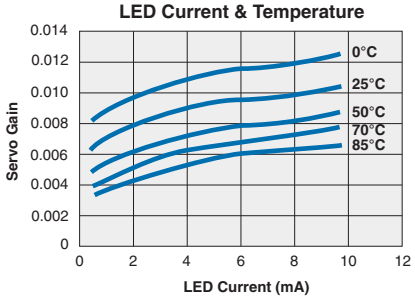
LOC117
LED Current (I_F) vs.
LED Forward Voltage (V_F)



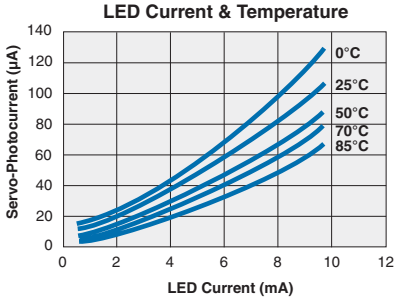
LOC117
LED Current (I_F) vs.
LED Forward Voltage (V_F)



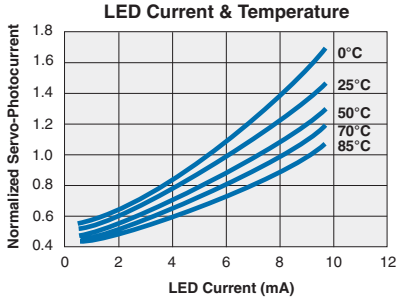
LOC117
Servo Gain vs.
LED Current & Temperature



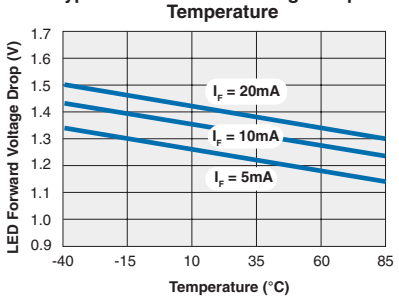
LOC117
Servo-Photocurrent vs.
LED Current & Temperature



LOC117
Normalized Servo-Photocurrent vs.
LED Current & Temperature



LOC117
Typical LED Forward Voltage Drop vs.
Temperature



*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

Manufacturing Information

Soldering

For proper assembly, the component must be processed in accordance with the current revision of IPC/JEDEC standard J-STD-020. Failure to follow the recommended guidelines may cause permanent damage to the device resulting in impaired performance and/or a reduced lifetime expectancy.

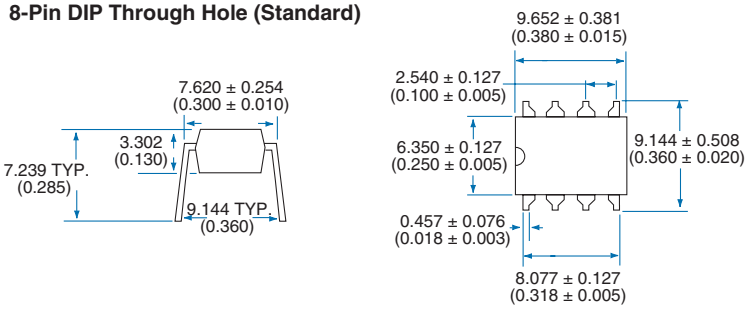
Recommended soldering processes are limited to 260ºC component body temperature for 10 seconds.

Washing

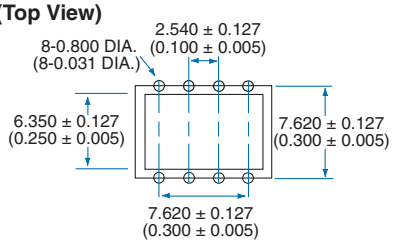
Clare does not recommend ultrasonic cleaning or the use of chlorinated solvents.

MECHANICAL DIMENSIONS

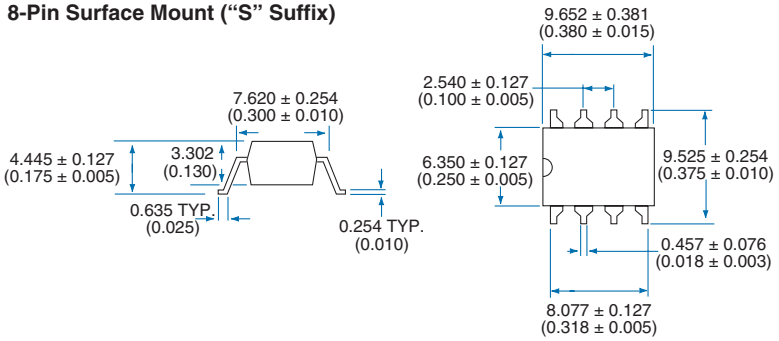
8-Pin DIP Through Hole (Standard)



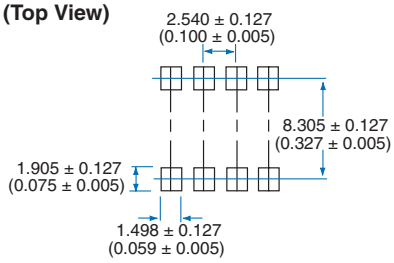
PC Board Pattern (Top View)



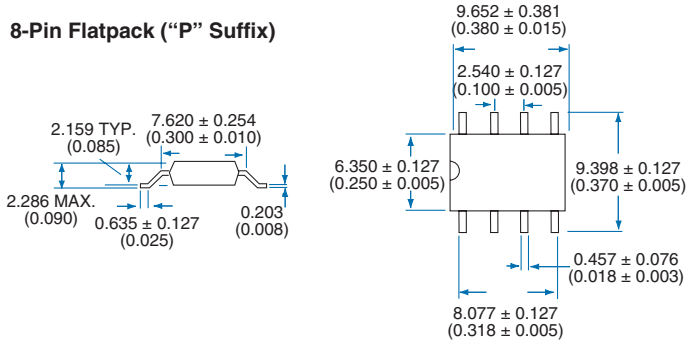
8-Pin Surface Mount ("S" Suffix)



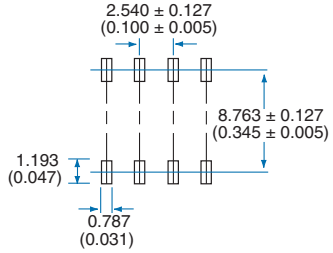
PC Board Pattern (Top View)



8-Pin Flatpack ("P" Suffix)



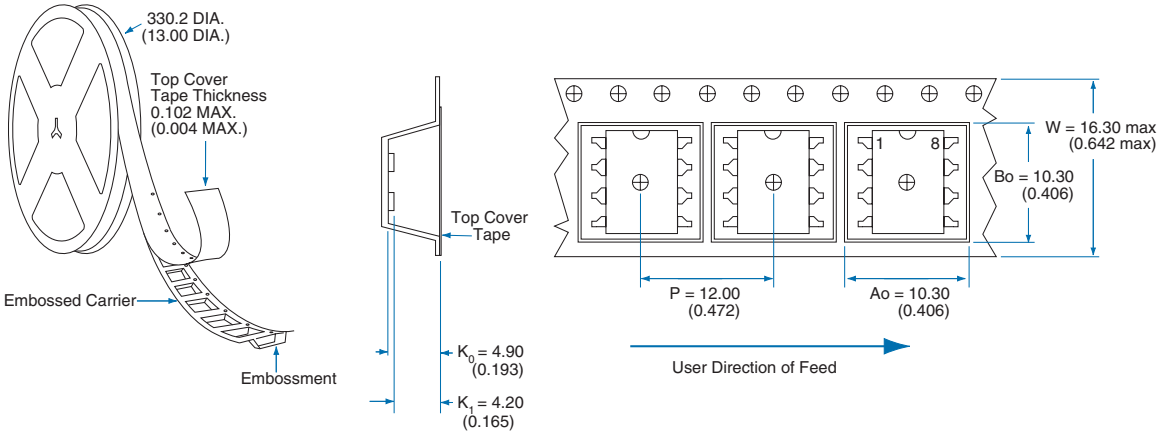
PC Board Pattern (Top View)



Dimensions:
mm
(inches)

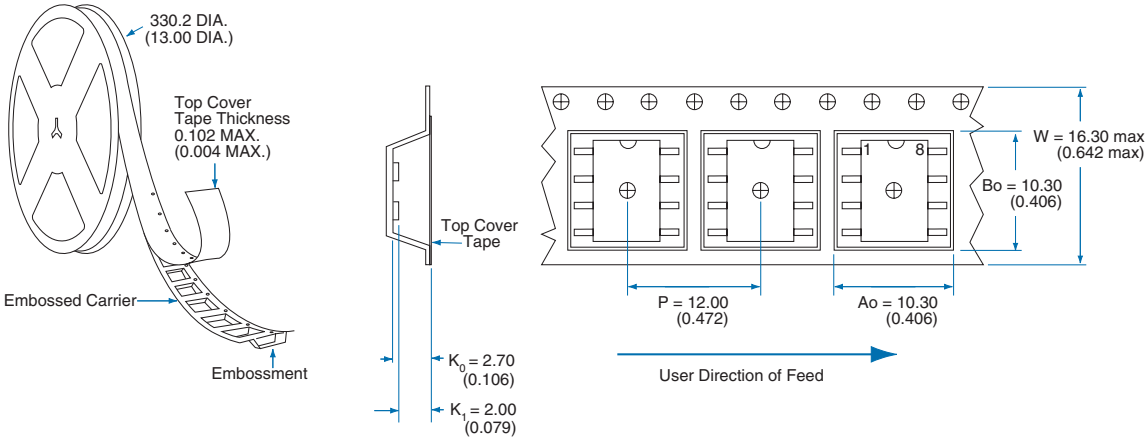
MECHANICAL DIMENSIONS

Tape and Reel Packaging for 8-Pin Surface Mount Package



NOTE: Tape dimensions not shown, comply with JEDEC Standard EIA-481-2

Tape and Reel Packaging for 8-Pin Flatpack Package



NOTE: Tape dimensions not shown, comply with JEDEC Standard EIA-481-2

Dimensions:
mm
(inches)

For additional information please visit our website at: www.clare.com

Specification: DS-LOC117-R01

10/26/06