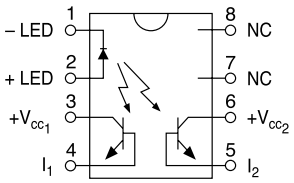
LOC112
Linear Optocouplers

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

Pin Configuration

LOC112 Pinout



Description
The LOC112 Single Linear Optocoupler features an infrared LED optically coupled with two phototransistors. One feedback (input) phototransistor is used to generate a control signal that provides a servomechanism to the LED drive current, thus compensating for the LEDs nonlinear time and temperature characteristics. The other (output) phototransistor provides an output signal that is linear with respect to the servo LED current. The product features wide bandwidth, high input to output isolation and excellent servo linearity.

Approvals
- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- BSI Certified:
  - BS EN 60950:1992 (BS7002:1992) Certificate #:7344
  - BS EN 41003:1993 Certificate #:7344

Ordering Information

Part #	Description
LOC112	8 Pin DIP (50/Tube)
LOC112P	8 Pin Flatpack (50/Tube)
LOC112PTR	8 Pin Flatpack (1000/Reel)
LOC112S	8 Pin Surface Mount (50/Tube)
LOC112STR	8 Pin Surface Mount (1000/Reel)

K3 Sorted Bins

Bin D	=	0.733-0.805
Bin E	=	0.806-0.886
Bin F	=	0.887-0.974
Bin G	=	0.733-1.072

- The LOC112 is shipped in anti-static tubes of 50 pieces. Each tube will contain one K3 sorted bin.
- Bin designation marked on each device (D - G).

Absolute Maximum Ratings (@ 25˚ C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150[1]	mW
Input Control Current	-	-	100	mA
Peak (10ms)	-	-	1	A
Total Package Dissipation	-	-	500[2]	mW
Isolation Voltage Input to Output SOIC Package	3750	-	-	V_{RMS}
Operational Temperature	-40		+85	˚C
Storage Temperature	-40	-	+125	˚C
Soldering Temperature (10 Seconds Max)	-	-	+260	˚C
Flatpack Package	-	-	+220	˚C

[1] Derate Linearly 1.33 mW/˚C
[2] Derate Linearly 6.67 mW/˚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.

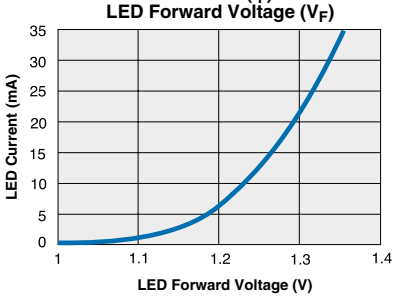
Electrical Characteristics

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
Reverse LED Voltage	-	V_R	-	-	5	V
Forward LED Current	-	I_F	-	-	100	mA
Coupler/Detector Characteristics @ 25°C						
Dark Current	I_F=0mA, V_{CC}=15V	I_D	-	1	25	nA
K1, Servo Gain (I_1/I_F)	I_F=2-10mA, V_{CC}=15V	K1	0.004	0.007	0.030	-
K2, Forward Gain (I_2/I_F)	I_F=2-10mA, V_{CC}=15V	K2	0.004	0.007	0.030	-
K3, Transfer Gain (K_2/K_1)[1]	I_F=2-10mA, V_{CC}=15V	K3	0.733	1.0	1.072	-
ΔK3, Transfer Gain Linearity[1] (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_{P-P}, R_L=2KΩ, F=100Hz	CMRR	-	130	-	dB
Total Harmonic Distortion	F_O=350Hz, 0dBm	THD	-96	-87	-80	dB
Frequency Response	Photoconductive Operation	BW (-3dB)	-	200	-	kHz
	Photovoltaic Operation	BW (-3dB)	-	40	-	kHz
Input/Output Capacitance	-	$C_{I/O}$	-	3	-	pF
Input/Output Isolation	-	$V_{I/O}$	3750	-	-	V_{RMS}

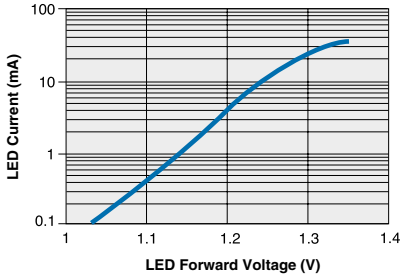
[1] LOC111 and LOC112 Bins D,E,F,G.

PERFORMANCE DATA*

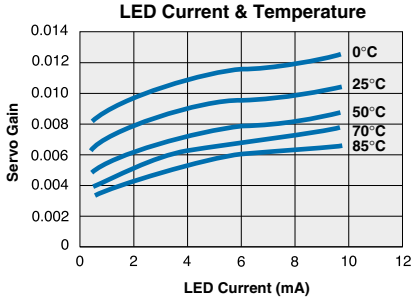
LOC112
LED Current (I_F) vs.
LED Forward Voltage (V_F)



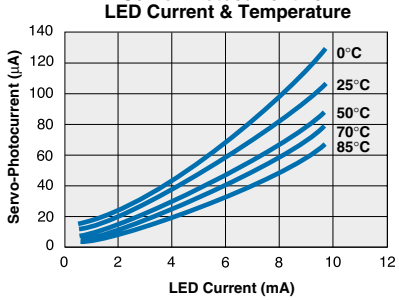
LOC112
LED Current (I_F) vs.
LED Forward Voltage (V_F)



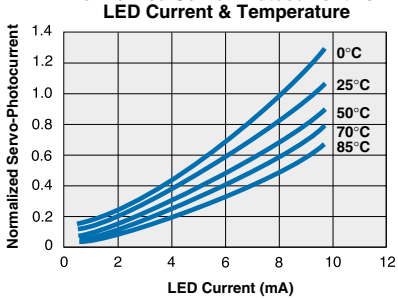
LOC112
Servo Gain vs.
LED Current & Temperature



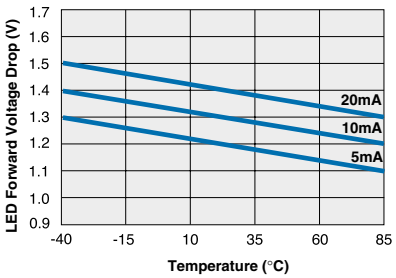
LOC112
Servo-Photocurrent vs.
LED Current & Temperature



LOC112
Normalized Servo-Photocurrent vs.
LED Current & Temperature



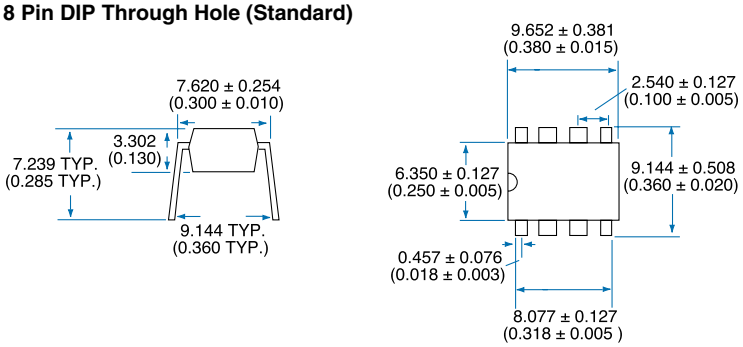
LOC112
Typical LED Forward Voltage Drop vs.
Temperature



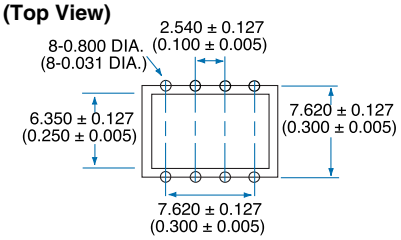
* The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

MECHANICAL DIMENSIONS

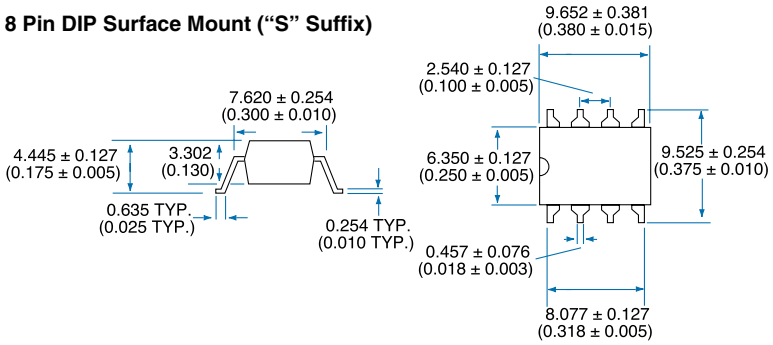
8 Pin DIP Through Hole (Standard)



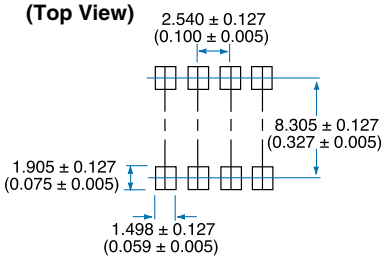
PC Board Pattern (Top View)



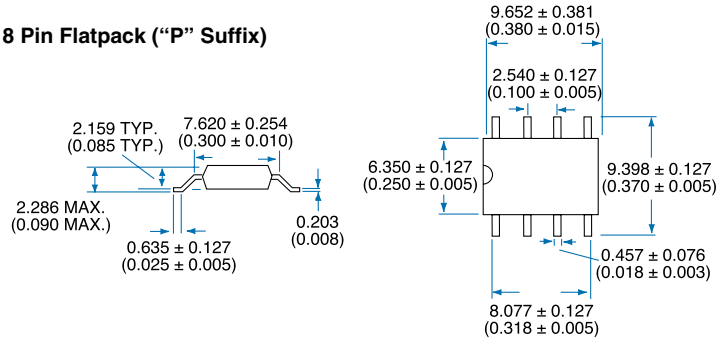
8 Pin DIP Surface Mount ("S" Suffix)



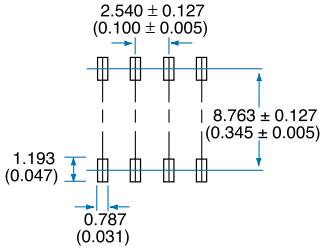
PC Board Pattern (Top View)



8 Pin Flatpack ("P" Suffix)



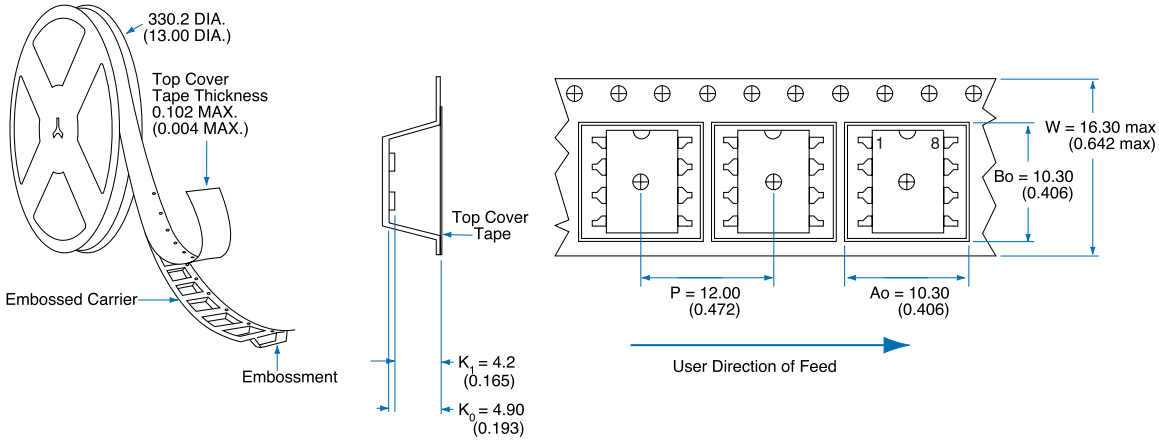
PC Board Pattern (Top View)



Dimensions
mm
(inches)

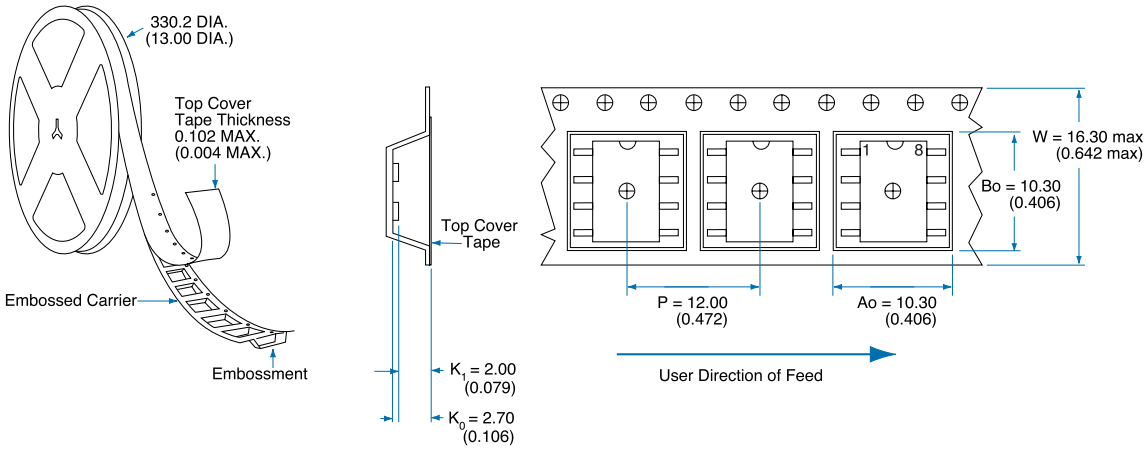
MECHANICAL DIMENSIONS

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-LOC112-R4.0

5/6/03