LOC111
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

Description
LOC111 is a linear optocoupler for use in telecom, medical and power supply isolation circuits. They are available in 8 pin DIP, surface mount or flatpack packages.

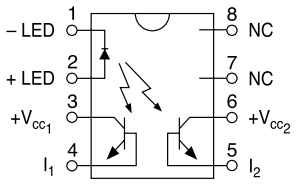
Approvals
- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- BSI Certified:
  - BS EN 60950:1992 (BS7002:1992) Certificate #:7344
  - BS EN 41003:1993 Certificate #:7344

Ordering Information

Part #	Description
LOC111	8 Pin DIP (50/Tube)
LOC111P	8 Pin Flatpack (50/Tube)
LOC111PTR	8 Pin Flatpack (1000/Reel)
LOC111S	8 Pin Surface Mount (50/Tube)
LOC111STR	8 Pin Surface Mount (1000/Reel)

Pin Configuration

LOC111 Pinout



Absolute Maximum Ratings (@ 25º C)

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150[1]	mW
Input Control Current	-	-	100	mA
Peak (10ms)	-	-	1	A
Total Package Dissipation	-	-	800[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) Flatpack Package	-	-	+220 +260	˚C ˚C

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

Absolute Maximum Ratings are stress ratings. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device to the absolute maximum ratings for an extended period may degrade the device and effect its reliability.

Electrical Characteristics

PARAMETER	CONDITIONS	SYMBOL	MIN	TYP	MAX	UNITS
Input Characteristics @ 25°C1						
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	0.008	-	0.030	-
K2, Forward Gain (I_2/I_F)	I_F=2-10mA, V_{CC}=15V	K2	0.006	-	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.

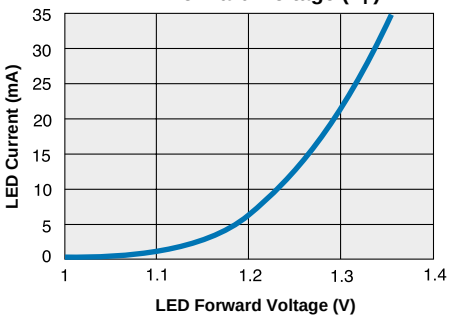
K3 Sorted Bins

Bin A = 0.550-0.605
Bin B = 0.606-0.667
Bin C = 0.668-0.732
Bin D = 0.733-0.805
Bin E = 0.806-0.886
Bin F = 0.887-0.974
Bin G = 0.975-1.072
Bin H = 1.073-1.179
Bin I = 1.180-1.297
Bin J = 1.298-1.426

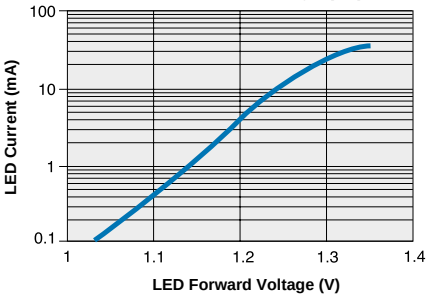
- The LOC110/LOC111/LOC112 are shipped in anti-static tubes of 50 pieces. Each tube will contain one K3 sorted bin.
- Bin designation marked on each device (A-J).
- Orders for the LOC110 product will be shipped using bins available at the date of the order. Any bin (A-J) can be shipped.
- For customers requiring selected bins D E F G we offer part numbers LOC111 or LOC112.

Performance Data

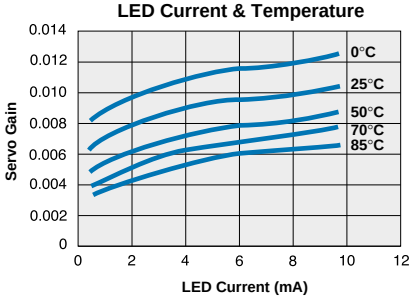
LOC111
LED Current (I_F) vs.
LED Forward Voltage (V_F)



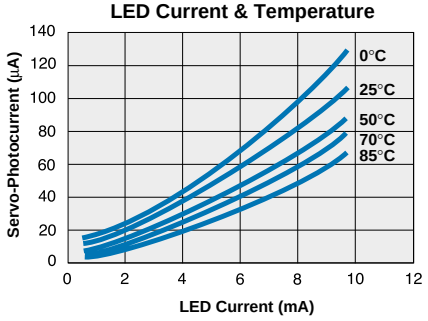
LOC111
LED Current (I_F) vs.
LED Forward Voltage (V_F)



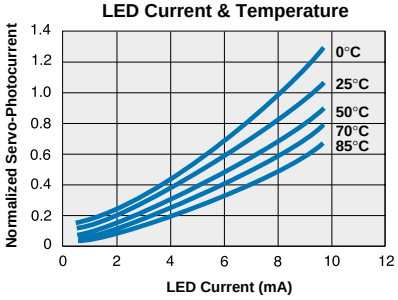
LOC111
Servo Gain vs.
LED Current & Temperature



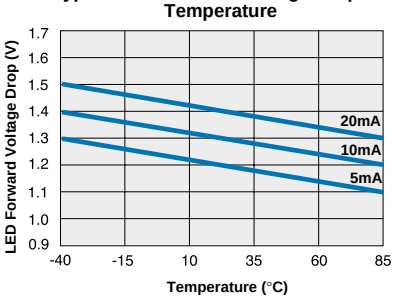
LOC111
Servo-Photocurrent vs.
LED Current & Temperature



LOC111
Normalized Servo-Photocurrent vs.
LED Current & Temperature



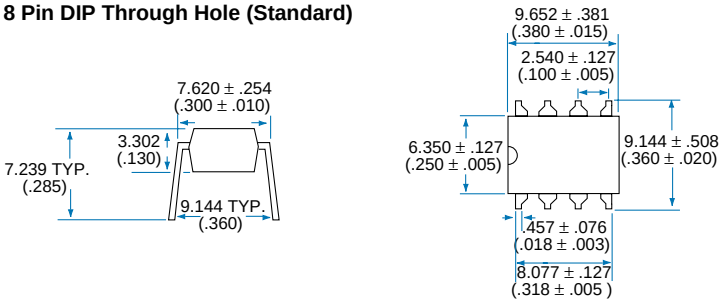
LOC111
Typical LED Forward Voltage Drop vs.
Temperature



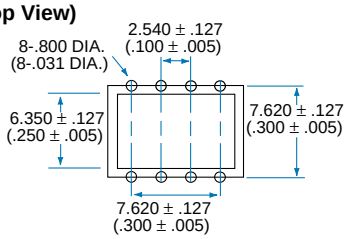
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

Mechanical Dimensions

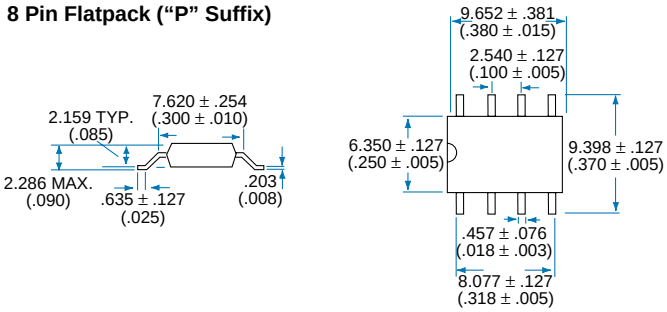
8 Pin DIP Through Hole (Standard)



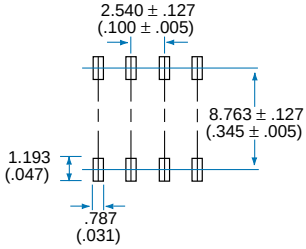
PC Board Pattern (Top View)



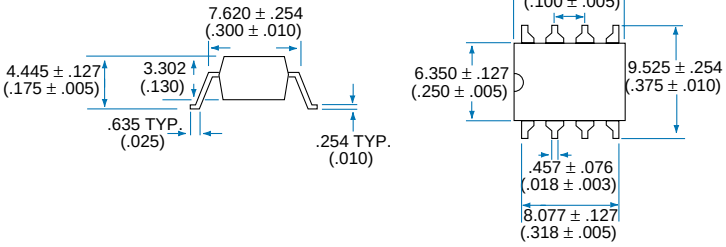
8 Pin Flatpack (“P” Suffix)



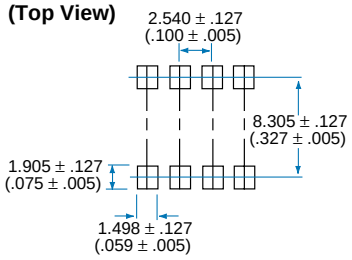
PC Board Pattern (Top View)



8 Pin DIP Surface Mount (“S” Suffix)



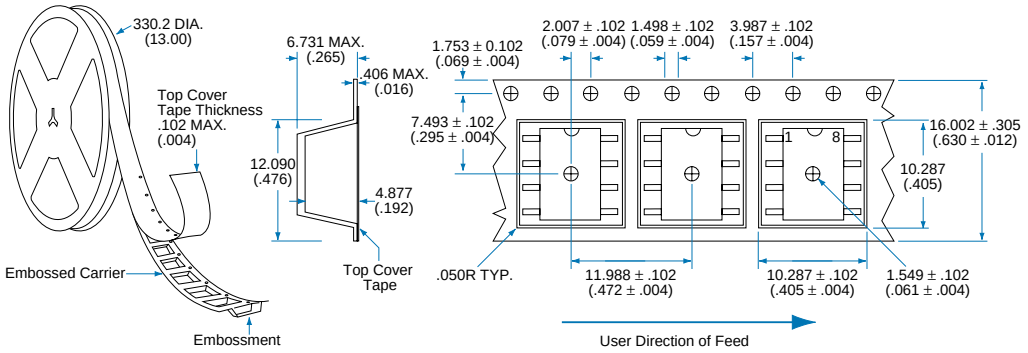
PC Board Pattern (Top View)



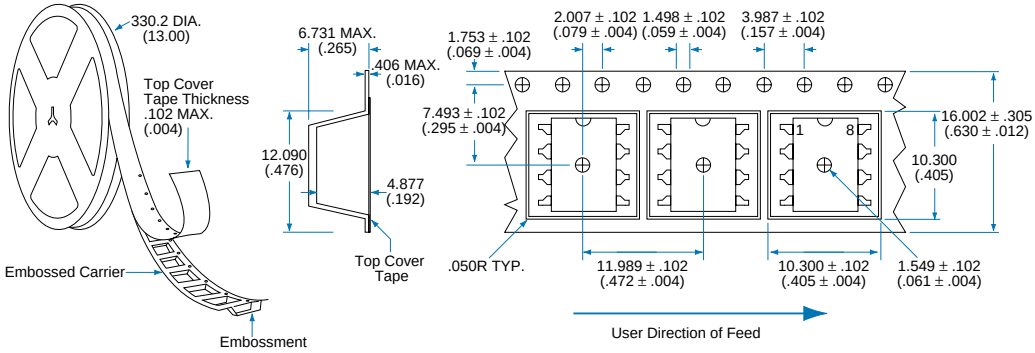
Dimensions
mm
(inches)

Mechanical Dimensions

Tape and Reel Packaging for 8 Pin Flatpack Package



Tape and Reel Packaging for 8 Pin Surface Mount Package



Dimensions
mm
(inches)

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