



	LCB110	Units
Load Voltage	350	V
Load Current	120	mA
Max R <sub>ON</sub>	30	Ω

## Features

- Small 6 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750V<sub>RMS</sub> Input/Output Isolation
- FCC Compatible
- VDE Compatible
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available

## Applications

- Telecommunications
  - Telecom Switching
  - Tip/Ring Circuits
  - Modem Switching (Laptop, Notebook, Pocket Size)
  - Hookswitch
  - Dial Pulsing
  - Ground Start
  - Ringer Injection
- Instrumentation
  - Multiplexers
  - Data Acquisition
  - Electronic Switching
  - I/O Subsystems
  - Meters (Watt-Hour, Water, Gas)
- Medical Equipment-Patient/Equipment Isolation
- Security
- Aerospace
- Industrial Controls

## Description

The LCB110 is a 1-Form-B relay which uses optically coupled MOSFET technology to provide 3750V of input to output isolation. The efficient MOSFET switches and photovoltaic die use Clare's patented OptoMOS<sup>®</sup> architecture. A highly efficient GaAlAs infrared LED controls the optically coupled input. The LCB110 has low on resistance and is well suited for most applications requiring a normally closed relay. The device is available in small 6-pin dual in line package in standard through hole and surface mount lead bend.

## Approvals

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

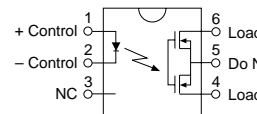
## Ordering Information

Part #	Description
LCB110	6 Pin DIP (50/Tube)
LCB110S	6 Pin Surface Mount (50/Tube)
LCB110STR	6 Pin Surface Mount (1000/Reel)

## Pin Configuration

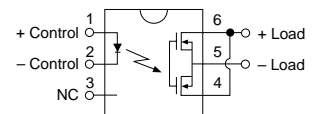
### LCB110 Pinout

AC/DC Configuration

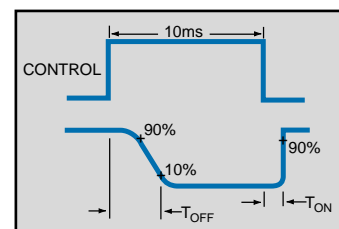


### LCB110 Pinout

DC Only Configuration



## Switching Characteristics of Normally Closed (Form B) Devices



**Absolute Maximum Ratings (@ 25° C)**

Parameter	Min	Typ	Max	Units
Input Power Dissipation	-	-	150 <sup>1</sup>	mW
Input Control Current	-	-	50	mA
Peak (10ms)	-	-	1	A
Reverse Input Voltage	-	-	5	V
Total Power Dissipation	-	-	800 <sup>2</sup>	mW
Isolation Voltage Input to Output	3750	-	-	V <sub>RMS</sub>
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature DIP Package	-	-	+260	°C
Surface Mount Package (10 Seconds Max.)	-	-	+220	°C

<sup>1</sup> Derate Linearly 1.33 mw/°C

<sup>2</sup> Derate Linearly 6.67 mw/°C

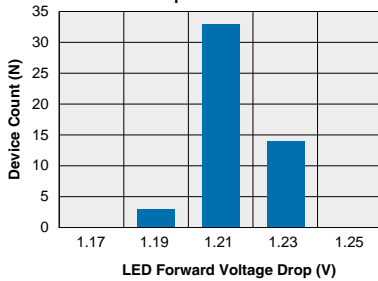
*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at these or any other conditions beyond those indicated in the operational sections of this data sheet is not implied. Exposure of the device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

**Electrical Characteristics**

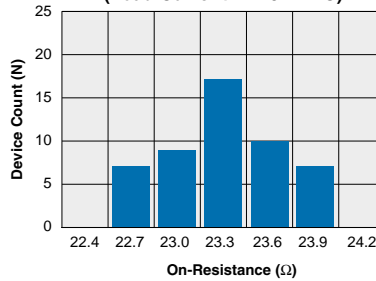
Parameter	Conditions	Symbol	Min	Typ	Max	Units
<b>Output Characteristics @ 25°C</b>						
Load Voltage (Peak)	-	V <sub>L</sub>	-	-	350	V
Load Current (Continuous) AC/DC Configuration	-	I <sub>L</sub>	-	-	120	mA
DC Configuration	-	I <sub>L</sub>	-	-	200	mA
Peak Load Current	10ms	I <sub>L</sub>	-	-	350	mA
On-Resistance AC/DC Configuration	I <sub>L</sub> =120mA	R <sub>ON</sub>	-	23	35	Ω
DC Configuration	I <sub>L</sub> =200mA	R <sub>ON</sub>	-	7	10	Ω
Off-State Leakage Current	V <sub>L</sub> =350V	I <sub>LEAK</sub>	-	-	1	μA
Switching Speeds Turn-On	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>ON</sub>	-	-	3	ms
Turn-Off	I <sub>F</sub> =5mA, V <sub>L</sub> =10V	T <sub>OFF</sub>	-	-	3	ms
Output Capacitance	50V; f=1MHz	C <sub>OUT</sub>	-	25	-	pF
<b>Input Characteristics @ 25°C</b>						
Input Control Current	I <sub>L</sub> =120mA	I <sub>F</sub>	5	-	50	mA
Input Dropout Current	-	I <sub>F</sub>	0.4	0.7	-	mA
Input Voltage Drop	I <sub>F</sub> =5mA	V <sub>F</sub>	0.9	1.2	1.4	V
Reverse Input Voltage	-	V <sub>R</sub>	-	-	5	V
Reverse Input Current	V <sub>R</sub> =5V	I <sub>R</sub>	-	-	10	μA
Input to Output Capacitance	-	C <sub>I/O</sub>	-	3	-	pF
Input to Output Isolation	-	V <sub>I/O</sub>	3750	-	-	V <sub>RMS</sub>

PERFORMANCE DATA\*

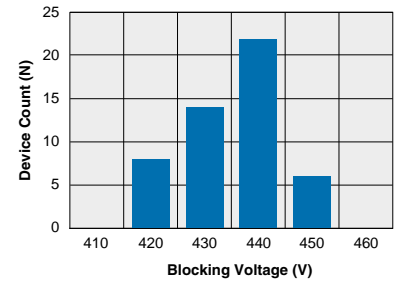
**LCB110**  
Typical LED Forward Voltage Drop  
(N=50 Ambient Temperature = 25°C)  
 $I_F = 5\text{mADC}$



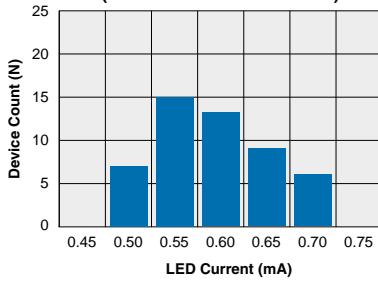
**LCB110**  
Typical On-Resistance Distribution  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



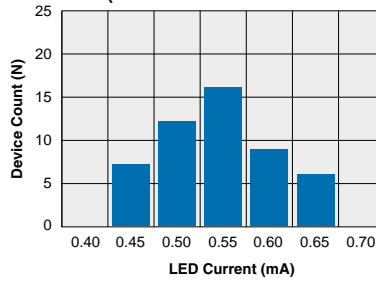
**LCB110**  
Typical Blocking Voltage Distribution  
(N=50 Ambient Temperature = 25°C)  
 $I_F = 5\text{mA}$



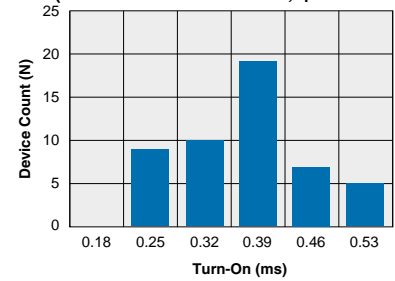
**LCB110**  
Typical  $I_F$  for Switch Operation  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



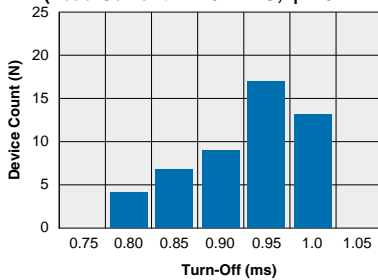
**LCB110**  
Typical  $I_F$  for Switch Dropout  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC)



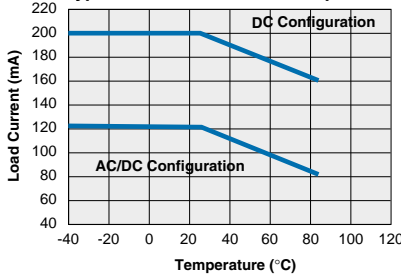
**LCB110**  
Typical Turn-On Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC;  $I_F = 5\text{mADC}$ )



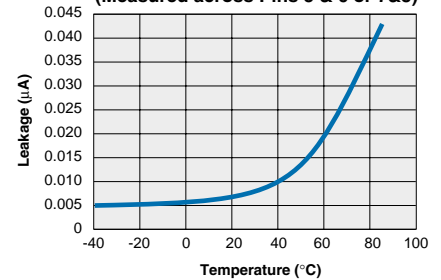
**LCB110**  
Typical Turn-Off Time  
(N=50 Ambient Temperature = 25°C)  
(Load Current = 120mADC;  $I_F = 5\text{mADC}$ )



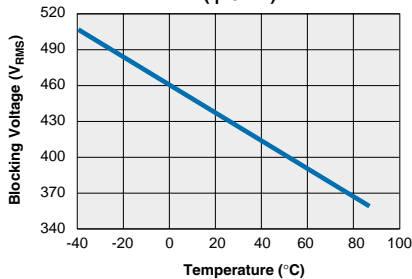
**LCB110**  
Typical Load Current vs. Temperature



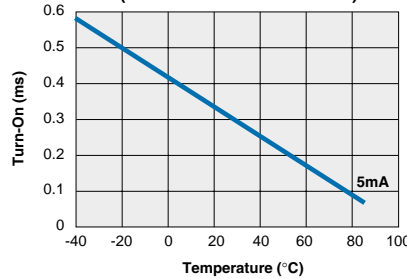
**LCB110**  
Typical Leakage vs. Temperature  
(Measured across Pins 5 & 6 or 7&8)



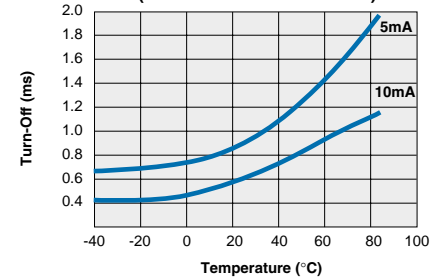
**LCB110**  
Typical Blocking Voltage vs. Temperature  
( $I_F = 5\text{mA}$ )



**LCB110**  
Typical Turn-On vs. Temperature  
(Load Current = 120mADC)

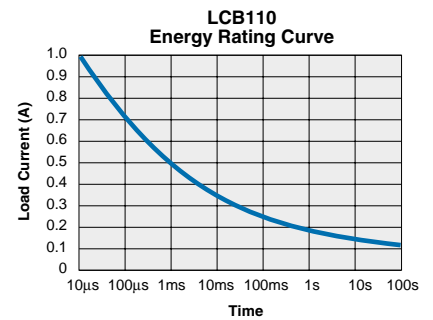
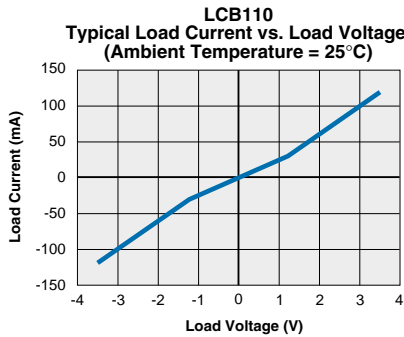
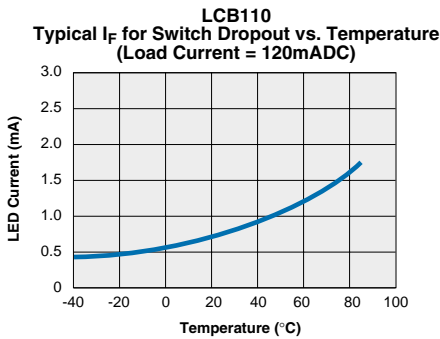
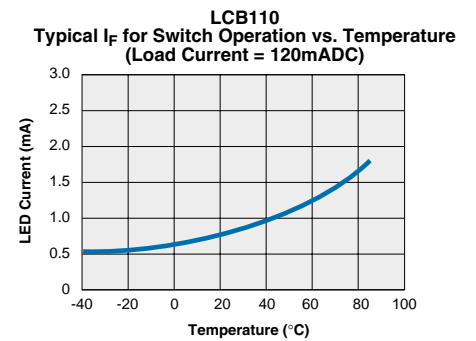
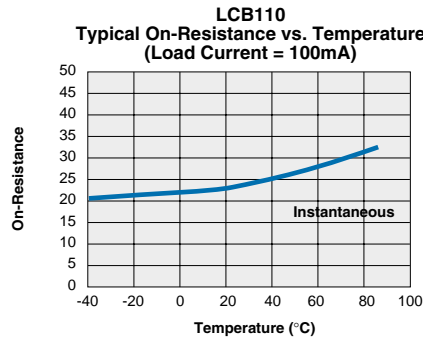
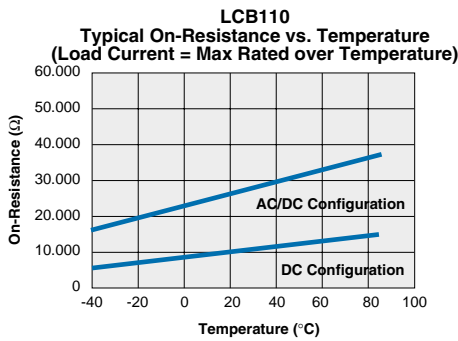
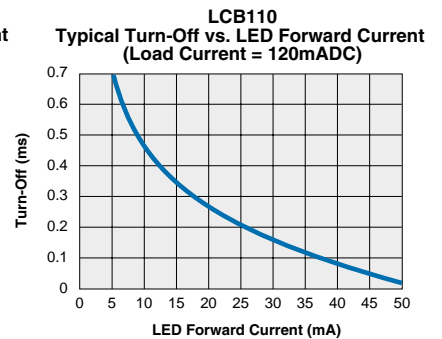
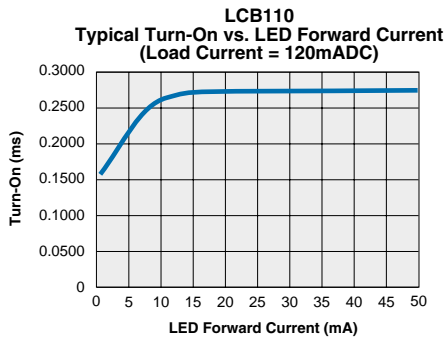
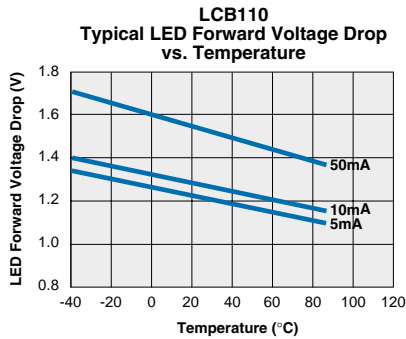


**LCB110**  
Typical Turn-Off vs. Temperature  
(Load Current = 120mADC)



\*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.

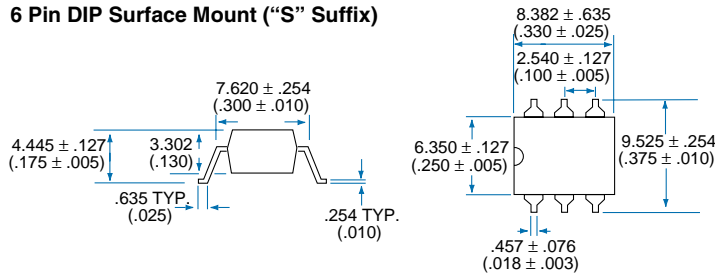
PERFORMANCE DATA\*



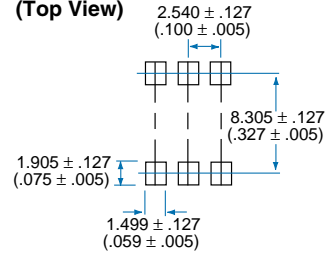
\*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

MECHANICAL DIMENSIONS

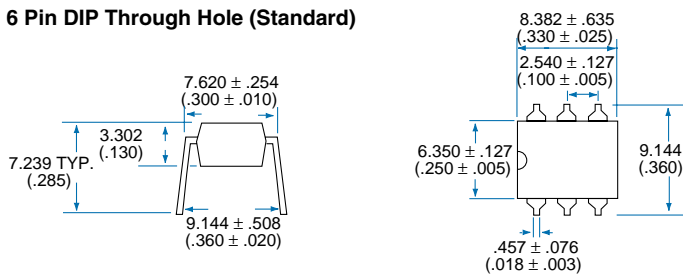
6 Pin DIP Surface Mount ("S" Suffix)



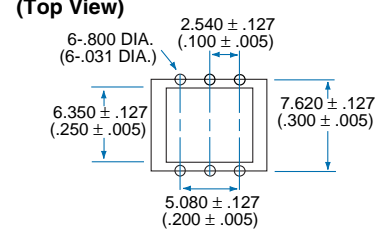
PC Board Pattern (Top View)



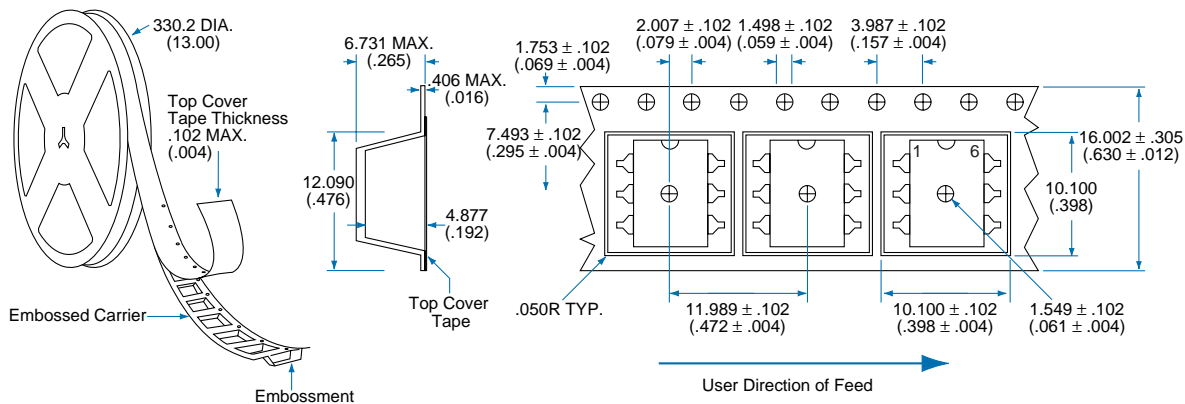
6 Pin DIP Through Hole (Standard)



PC Board Pattern (Top View)



Tape and Reel Packaging for 6 Pin Surface Mount Package



Dimensions  
 mm  
 (inches)



# CLARE

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