LCA210L
Dual Pole OptoMOS® Relays

	LCA210L	Units
Blocking Voltage	350	V
Load Current	100	mA
Max R_{ON}	35	Ω

Features
- Small 8 Pin DIP Package
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- 3750VRMS Input/Output Isolation
- No EMI/RFI Generation
- Machine Insertable, Wave Solderable
- Surface Mount and Tape & Reel Versions Available

Applications
- 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 LCA210L is a common input 1-Form 2A solid state relay which has two independent optically couple MOSFETS controlled by a common input signal. The efficient current limiting MOSFET switches and photovoltaic die use Clare's patented OptoMOS® architecture to provide 3750 V_{RMS} of input to output isolation. The optically coupled input is controlled by highly efficient GaAlAs infrared LEDs. Common input OptoMOS relays can replace standard dual pole relays in a variety of applications. The common input relay eliminates the need to make an external circuit connection when both poles are controlled by a common signal.

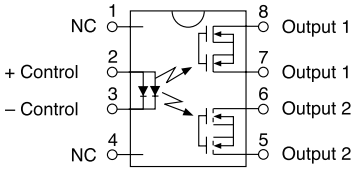
Approvals
- UL Recognized: File Number E76270
- CSA Certified: File Number LR 43639-10
- Certified to:
  - EN 60950
  - EN 41003
  - IEC 950
  - AS/NZS 3260

Ordering Information

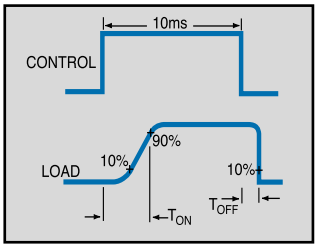
Part #	Description
LCA210L	8 Pin DIP (50/Tube)
LCA210LS	8 Pin Surface Mount (50/Tube)
LCA210LSTR	8 Pin Surface Mount (1000/Reel)

Pin Configuration

LCA210L Pinout



Switching Characteristics of Normally Open (Form A) Devices



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
Reverse Input Voltage	-	-	5	V
Relay Blocking Voltage	-	-	350	V
Total Power Dissipation	-	-	800[2]	mW
Isolation Voltage Input to Output	3750	-	-	V_{RMS}
Operational Temperature	-40	-	+85	°C
Storage Temperature	-40	-	+125	°C
Soldering Temperature DIP Package	-	-	+260	°C
Flatpack/Surface Mount Package (10 Seconds Max.)	-	-	+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 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.

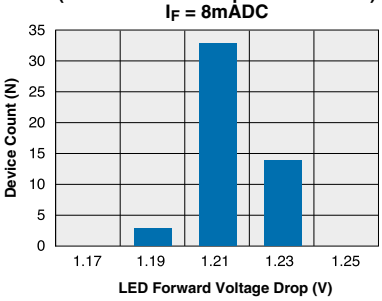
Electrical Characteristics

Parameter	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics @ 25°C						
Load Current (Continuous)	-	I_L	-	-	85	mA
Peak Load Current	10ms max	I_{LPK}	-	-	170	mA
On-Resistance	I_L=85mA	R_{ON}	-	-	35	Ω
Off-State Leakage Current	V_L=350V	I_{LEAK}	-	-	1	µA
Switching Speeds Turn-On	I_F=8mA, V_L=10V	T_{ON}	-	-	4	ms
Turn-Off	I_F=8mA, V_L=10V	T_{OFF}	-	-	4	ms
Output Capacitance	50V; f=1MHz	C_{OUT}	-	25	-	pF
Current Limit	I_F=8mA	I_{CL}	130	170	210	mA
***Input Characteristics @ 25°C**						
Input Control Current	I_L=120mA	I_F	8	-	100	mA
Input Dropout Current	-	-	0.8	1.4	-	mA
Input Voltage Drop	I_F=8mA	V_F	0.9	1.2	1.4	V
Reverse Input Voltage	-	V_R	-	-	5	V
Reverse Input Current	V_R=5V	I_R	-	-	20	µA
Input to Output Capacitance	-	$C_{I/O}$	-	3	-	pF
Input to Output Isolation	-	$V_{I/O}$	3750	-	-	V_{RMS}

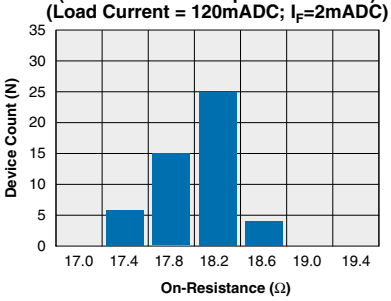
*Input characteristics represent requirements of two parallel connected LEDs.

PERFORMANCE DATA*

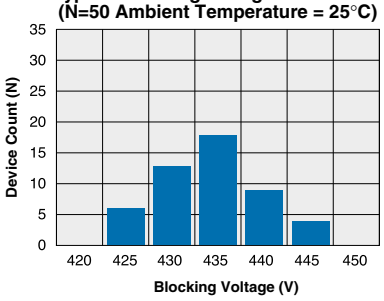
LCA210L
Typical LED Forward Voltage Drop
(N=50 Ambient Temperature = 25°C)
I_F = 8mADC



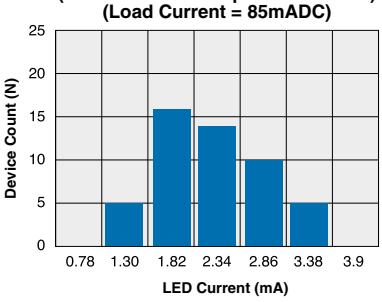
LCA210L
Typical On-Resistance Distribution
(N=50 Ambient Temperature = 25°C)
(Load Current = 120mADC; I_F=2mADC)



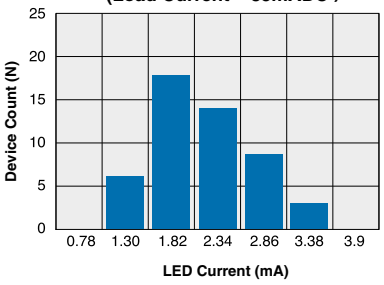
LCA210L
Typical Blocking Voltage Distribution
(N=50 Ambient Temperature = 25°C)



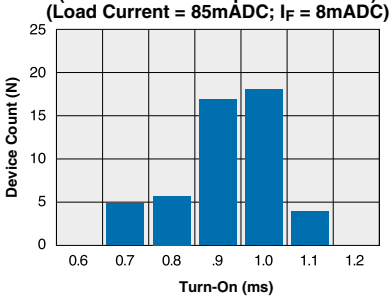
LCA210L
Typical I_F for Switch Operation
(N=50 Ambient Temperature = 25°C)
(Load Current = 85mADC)



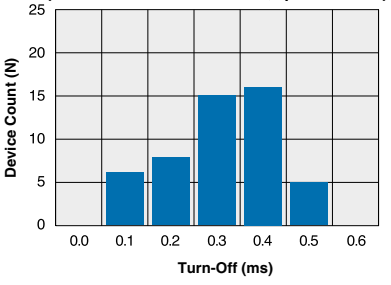
LCA210L
Typical I_F for Switch Dropout
(N=50 Ambient Temperature = 25°C)
(Load Current = 85mADC)



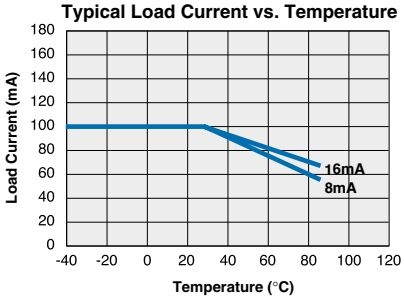
LCA210L
Typical Turn-On Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 85mADC; I_F = 8mADC)



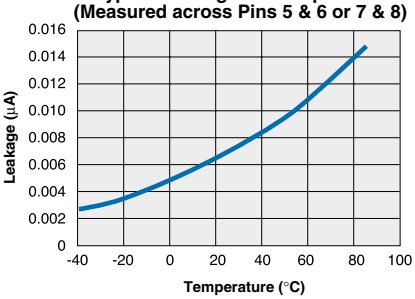
LCA210L
Typical Turn-Off Time
(N=50 Ambient Temperature = 25°C)
(Load Current = 85mADC; I_F = 8mADC)



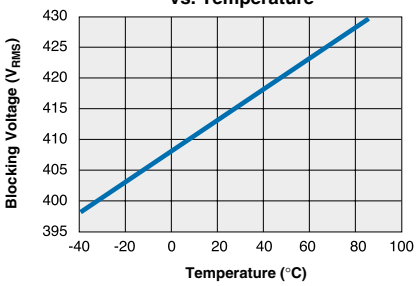
LCA210L
Typical Load Current vs. Temperature



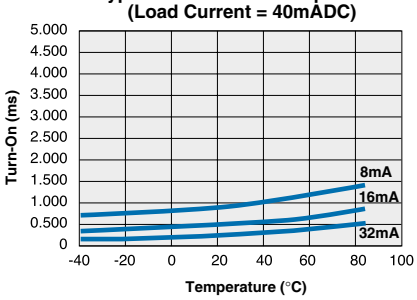
LCA210L
Typical Leakage vs. Temperature
(Measured across Pins 5 & 6 or 7 & 8)



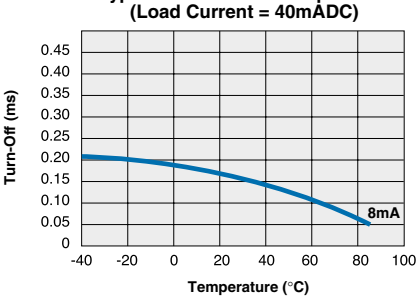
LCA210L
Typical Blocking Voltage
vs. Temperature



LCA210L
Typical Turn-On vs. Temperature
(Load Current = 40mADC)



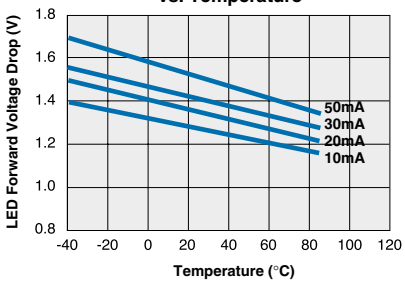
LCA210L
Typical Turn-Off vs. Temperature
(Load Current = 40mADC)



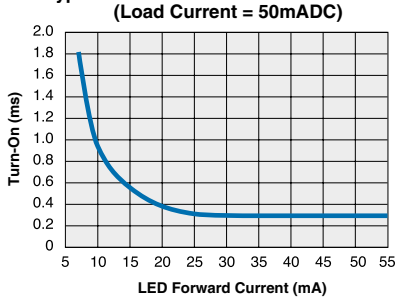
*The Performance data shown in the graphs above is typical of device performance. For guaranteed parameters not indicated in the written specifications, please contact our application department.

PERFORMANCE DATA*

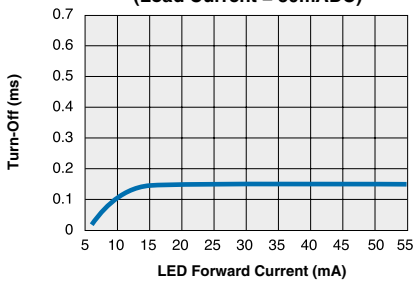
LCA210L
Typical LED Forward Voltage Drop vs. Temperature



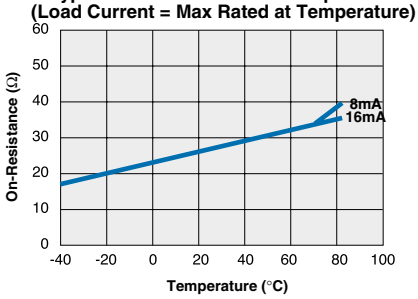
LCA210L
Typical Turn-On vs. LED Forward Current (Load Current = 50mADC)



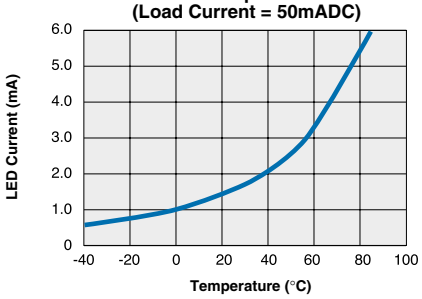
LCA210L
Typical Turn-Off vs. LED Forward Current (Load Current = 50mADC)



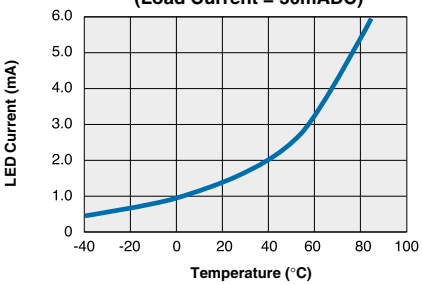
LCA210L
Typical On-Resistance vs. Temperature (Load Current = Max Rated at Temperature)



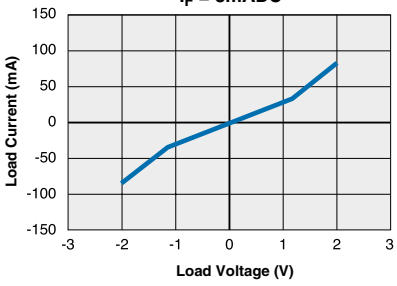
LCA210L
Typical I_F for Switch Operation vs. Temperature (Load Current = 50mADC)



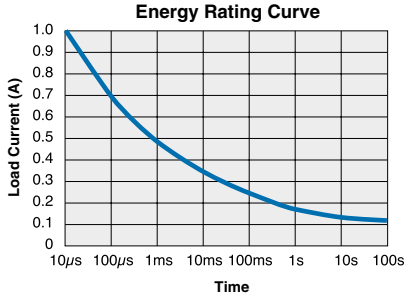
LCA210L
Typical I_F for Switch Dropout vs. Temperature (Load Current = 50mADC)



LCA210L
Typical Load Current vs. Load Voltage (Ambient Temperature = 25°C) I_F = 8mADC



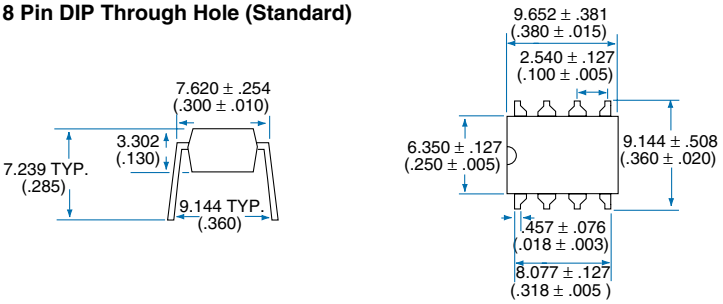
LCA210L
Energy Rating Curve



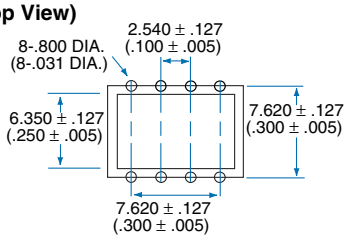
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MECHANICAL DIMENSIONS

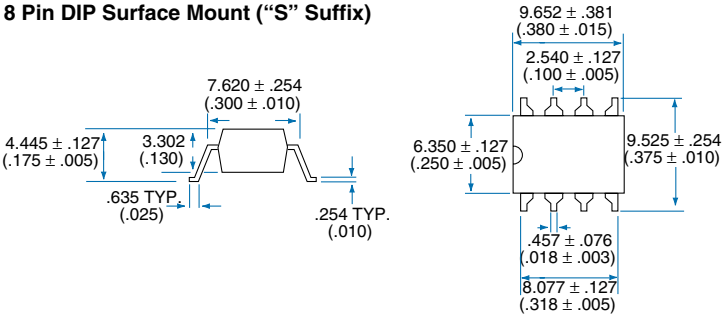
8 Pin DIP Through Hole (Standard)



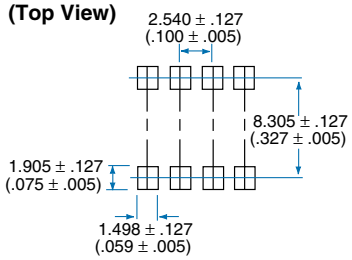
PC Board Pattern (Top View)



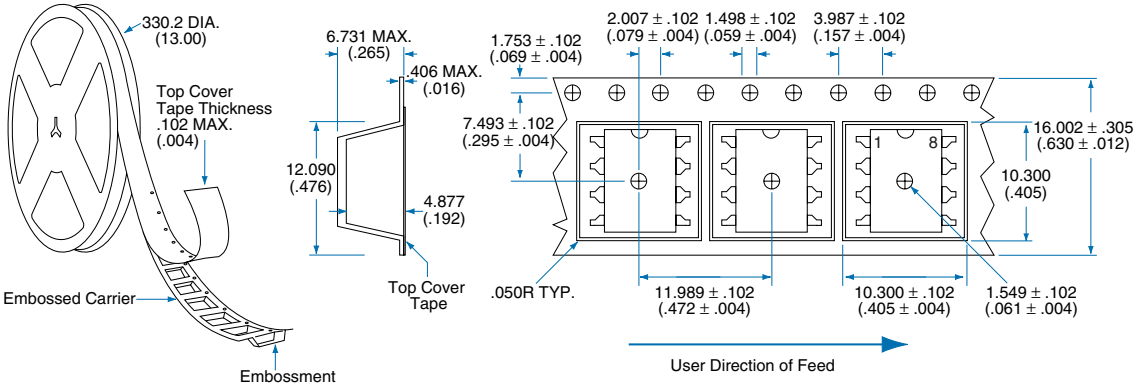
8 Pin DIP Surface Mount ("S" Suffix)



PC Board Pattern (Top View)



Tape and Reel Packaging for 8 Pin Surface Mount Package



Dimensions
mm
(inches)

CLARE

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6/21/02