



Parameter	Rating	Units
Breakdown Voltage	30	V _p
Current Transfer Ratio (Minimum)	50	%
Saturation Voltage	0.5	V
Input Control Current	1	mA

Features

- 3750V_{rms} Input/Output Isolation
- Low Drive Power Requirements (TTL/CMOS Compatible)
- No Moving Parts
- High Reliability
- Arc-Free With No Snubbing Circuits
- No EMI/RFI Generation
- Small 6-Pin Package, Thru-Hole or Surface Mount
- Machine Insertable, Wave Solderable
- Surface Mount Tape & Reel Version Available

Applications

- Sensor Circuitry
- Instrumentation
- Multiplexers
- Data Acquisition
- Electronic Switching
- I/O Subsystems
- Meters (Watt-Hour, Water, Gas)
- Medical Equipment: Patient/Equipment Isolation
- Aerospace
- Industrial Controls

Description

The LDA102 is a unidirectional-input optocoupler with a single-transistor output. Optically coupled technology provides a 3750V_{rms} isolation barrier between the input and the output.

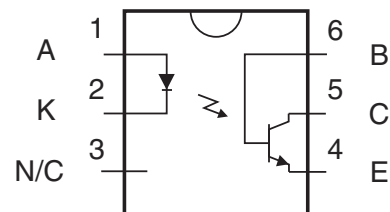
Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate 1175739
- EN/IEC 60950-1 Certified Component: TUV Certificate B 09 07 49410 006

Ordering Information

Part Number	Description
LDA102	6-Pin DIP (50/Tube)
LDA102S	6-Pin Surface Mount (50/Tube)
LDA102STR	6-Pin Surface Mount (1000/Reel)

Pin Configuration



Absolute Maximum Ratings @ 25°C

Parameter	Ratings	Units
Breakdown Voltage	30	V _P
Reverse Input Voltage	5	V
Input Control Current	50	mA
Peak (10ms)	1	A
Power Dissipation		
Input ¹	150	mW
Phototransistors ²	150	
Isolation Voltage, Input to Output	3750	V _{rms}
Operational Temperature	-40 to +85	°C
Storage Temperature	-40 to +125	°C

¹ Derate linearly 1.33mW / °C

² Derate linearly 2mW / °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.

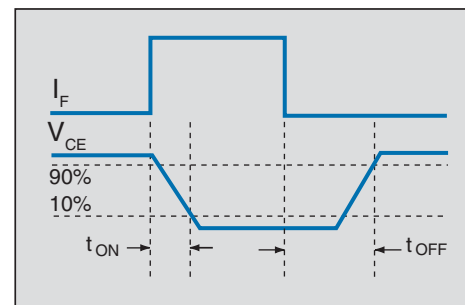
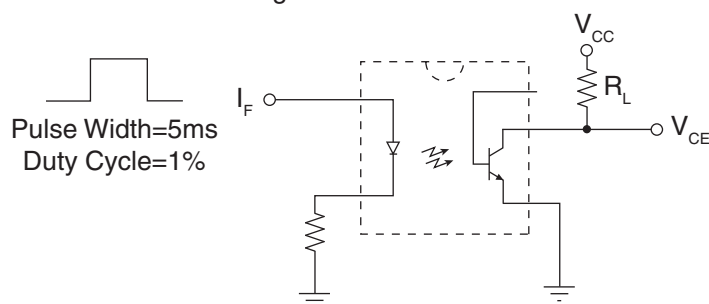
Electrical Characteristics @ 25°C (Unless Otherwise Noted)

Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Phototransistor Breakdown Voltage	I _C =10μA	BV _{CEO}	30	-	-	V
Phototransistor Dark Current	V _{CE} =5V, I _F =0mA	I _{CEO}	-	-	500	nA
Saturation Voltage	I _C =2mA, I _F =1mA	V _{CEsat}	-	-	0.5	V
Current Transfer Ratio	I _F =1mA, V _{CE} =0.5V	CTR	50	350	-	%
Output Capacitance	25V, f=1MHz	C _{OUT}	-	6	-	pF
Input Characteristics						
Input Control Current	I _C =2mA, V _{CE} =0.5V	I _F	-	-	1	mA
Input Voltage Drop	I _F =5mA	V _F	0.9	1.2	1.4	V
Common Characteristics						
Input to Output Capacitance	-	C _{I/O}	-	3	-	pF

Switching Characteristics @ 25°C

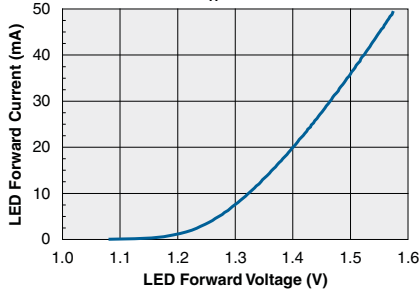
Characteristic	Symbol	Test Condition	Typ	Units
Turn-On Time	t _{on}	V _{CC} =5V, I _F =2mA, R _L =1KΩ	7	μs
Turn-Off Time	t _{off}		20	

Switching Time Test Circuit

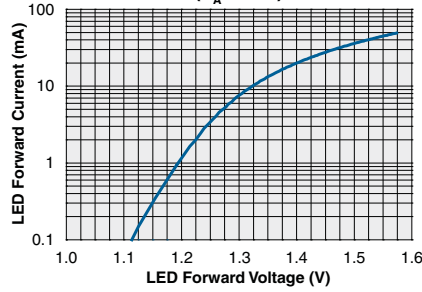


PERFORMANCE DATA *

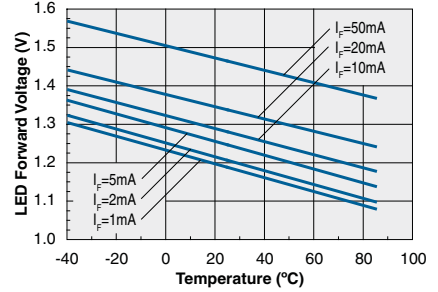
LED Voltage vs. Current (Linear)
($T_A=25^\circ\text{C}$)



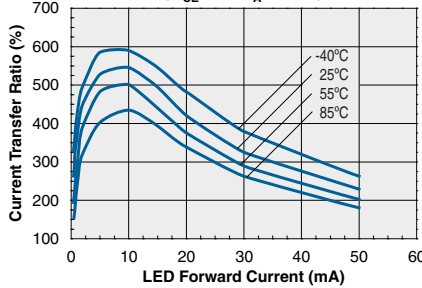
LED Voltage vs. Current (Log)
($T_A=25^\circ\text{C}$)



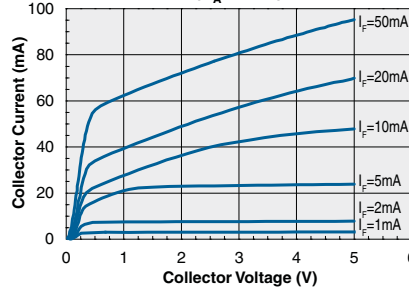
LED Forward Voltage vs. Temperature



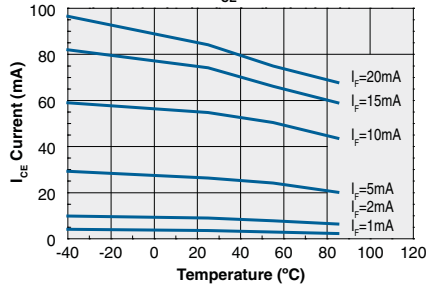
Typical CTR vs. LED Forward Current
($V_{CE}=5\text{V}, T_A=25^\circ\text{C}$)



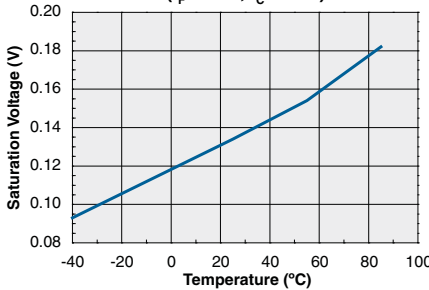
Typical Collector Current vs. Collector Voltage
($T_A=25^\circ\text{C}$)



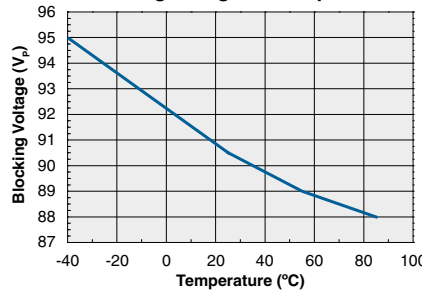
IC_{CE} Current vs. Temperature
($V_{CE}=5\text{V}$)



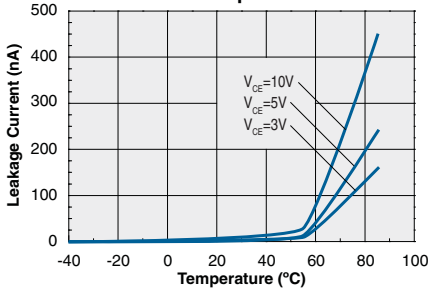
Saturation Voltage vs. Temperature
($I_F=2\text{mA}, I_C=1\text{mA}$)



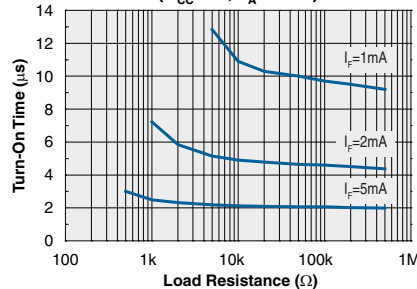
Blocking Voltage vs. Temperature



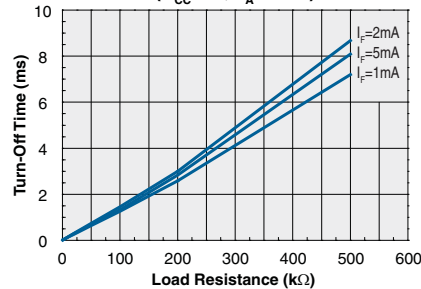
Collector Leakage Current vs. Temperature



Turn-On Time vs. Load Resistance
($V_{CC}=5\text{V}, T_A=25^\circ\text{C}$)



Turn-Off Time vs. Load Resistance
($V_{CC}=5\text{V}, T_A=25^\circ\text{C}$)



*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

Moisture Sensitivity



All plastic encapsulated semiconductor packages are susceptible to moisture ingress. Clare classified all of its plastic encapsulated devices for moisture sensitivity according to the latest version of the joint industry standard, **IPC/JEDEC J-STD-020**, in force at the time of product evaluation. We test all of our products to the maximum conditions set forth in the standard, and guarantee proper operation of our devices when handled according to the limitations and information in that standard as well as to any limitations set forth in the information or standards referenced below.

Failure to adhere to the warnings or limitations as established by the listed specifications could result in reduced product performance, reduction of operable life, and/or reduction of overall reliability.

This product carries a **Moisture Sensitivity Level (MSL) rating** as shown below, and should be handled according to the requirements of the latest version of the joint industry standard **IPC/JEDEC J-STD-033**.

Device	Moisture Sensitivity Level (MSL) Rating
LDA102 / LDA102S	MSL 1

ESD Sensitivity



This product is **ESD Sensitive**, and should be handled according to the industry standard **JESD-625**.

Reflow Profile

This product has a maximum body temperature and time rating as shown below. All other guidelines of **J-STD-020** must be observed.

Device	Maximum Temperature x Time
LDA102 / LDA102S	250°C for 30 seconds

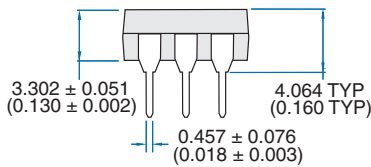
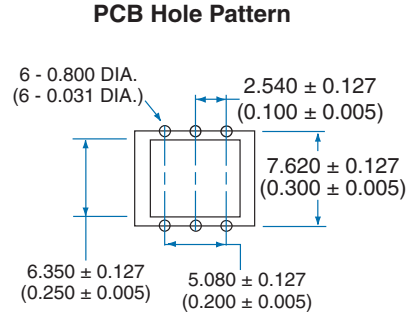
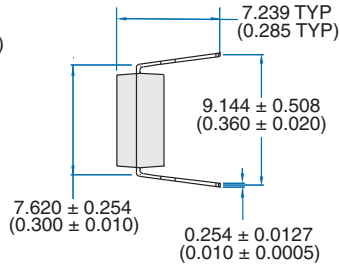
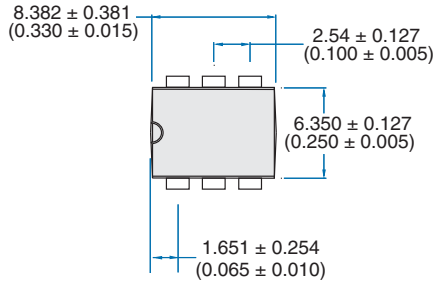
Board Wash

Clare recommends the use of no-clean flux formulations. However, board washing to remove flux residue is acceptable. Since Clare employs the use of silicone coating as an optical waveguide in many of its optically isolated products, the use of a short drying bake may be necessary if a wash is used after solder reflow processes. Chlorine-based or Fluorine-based solvents or fluxes should not be used. Cleaning methods that employ ultrasonic energy should not be used.



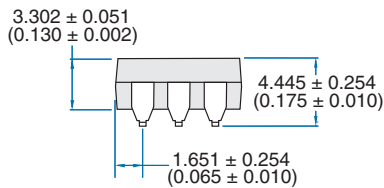
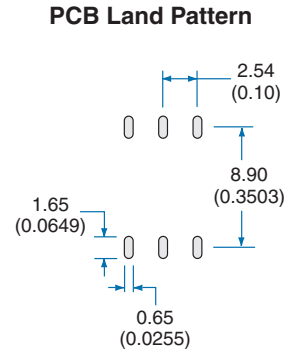
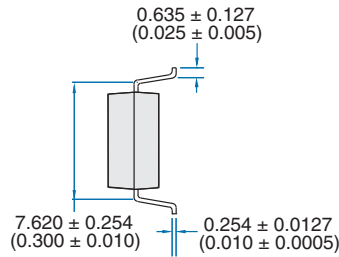
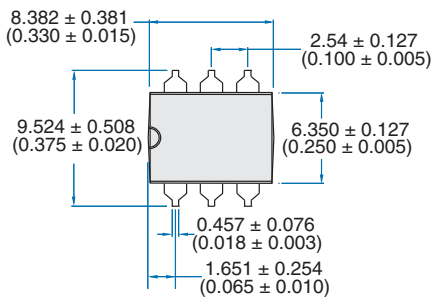
MECHANICAL DIMENSIONS

LDA102



Dimensions
mm
(inches)

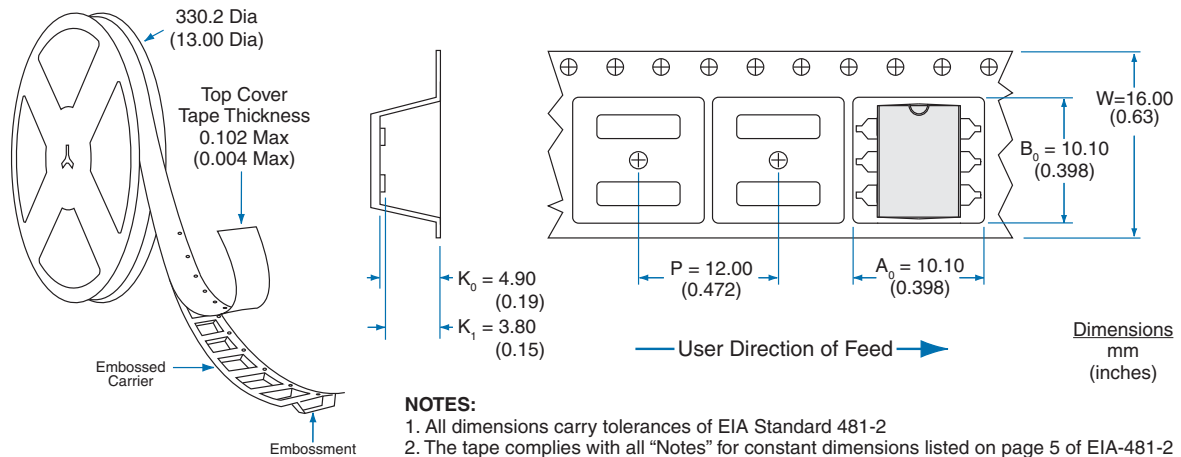
LDA102S



Dimensions
mm
(inches)

MECHANICAL DIMENSIONS (Cont.)

LDA102S Tape & Reel



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