OBSOLETE

IXYS
INTEGRATED CIRCUITS DIVISION

LDA101
Optocoupler, Unidirectional Input Single-Transistor Output

Parameter	Rating	Units
Breakdown Voltage BV_{CEO}	30	V_P
Current Transfer Ratio (Typical)	300	%
Saturation Voltage	0.5	V
Input Control Current	1	mA

Features

- 3750V_{rms} Input/Output Isolation
- Low Drive Power Requirements
- No Moving Parts
- High Reliability
- No EMI/RFI Generation
- Small 6-Pin Package
- Surface Mount Tape & Reel Version Available

Applications

- Telecom Switching
- Tip/Ring Circuits
- Modem Switching (Laptop, Notebook, Pocket Size)
- Loop Detect
- Ringing Detect
- Current Sensing

Description

The LDA101 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.

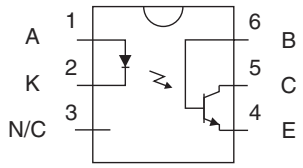
Approvals

- UL Recognized Component: File E76270
- CSA Certified Component: Certificate # 1175739
- TUV EN 62368-1: Certificate # B 082667 0008

Ordering Information

Part Number	Description
LDA101	6-Pin DIP (50/Tube)
LDA101S	6-Pin Surface Mount (50/Tube)
LDA101STR	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.

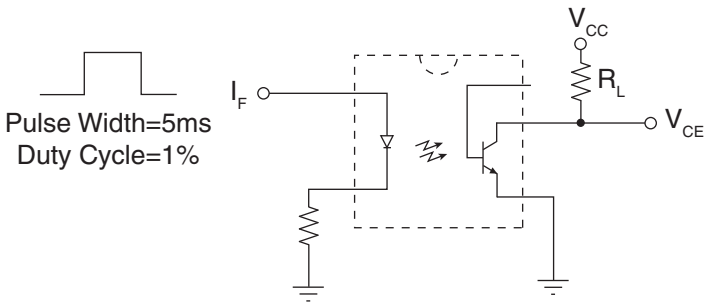
Electrical Characteristics @ 25°C (Unless Otherwise Noted)

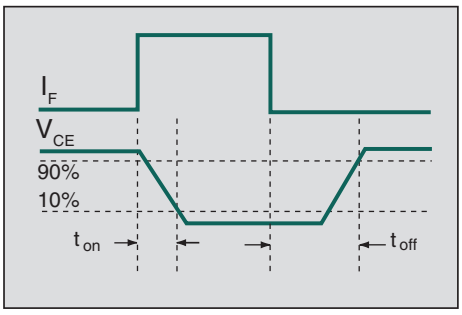
Parameters	Conditions	Symbol	Min	Typ	Max	Units
Output Characteristics						
Phototransistor Breakdown Voltage	I_C=10µA	BV_{CEO}	30	-	-	V
Phototransistor Dark Current	V_{CE}=5V, I_F=0mA	I_{CEO}	-	10	500	nA
Saturation Voltage	I_C=2mA, I_F=1mA	$V_{CE(sat)}$	-	-	0.5	V
Current Transfer Ratio	I_F=1mA, V_{CE}=0.5V	CTR	33	300	-	%
Output Capacitance	25V, f=1MHz	C_{OUT}	-	6	-	pF
Input Characteristics						
Input Control Current	I_C=0.33mA, 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	

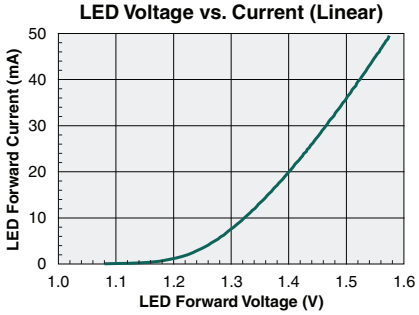
Switching Time Test Circuit



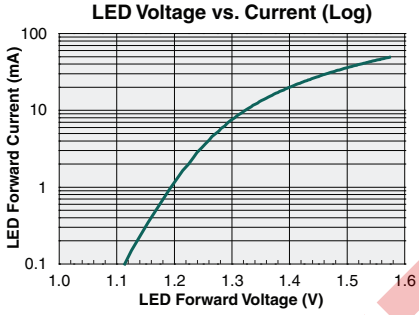


PERFORMANCE DATA*

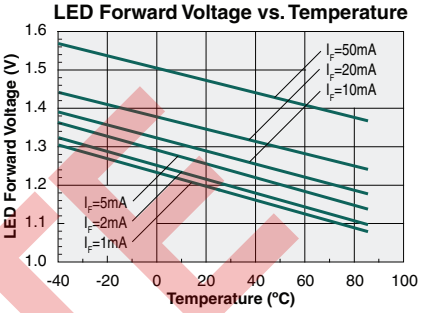
LED Voltage vs. Current (Linear)



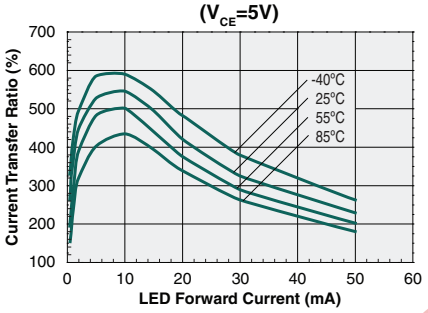
LED Voltage vs. Current (Log)



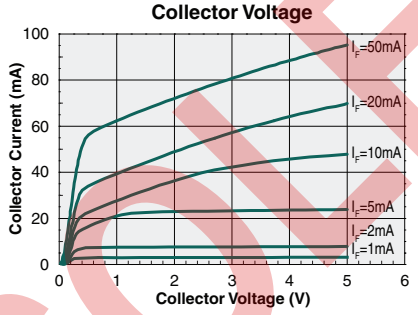
LED Forward Voltage vs. Temperature



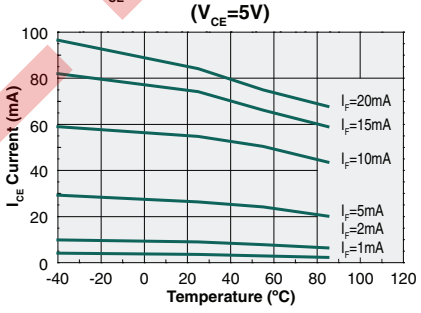
Typical CTR vs. LED Forward Current (V_{CE}=5V)



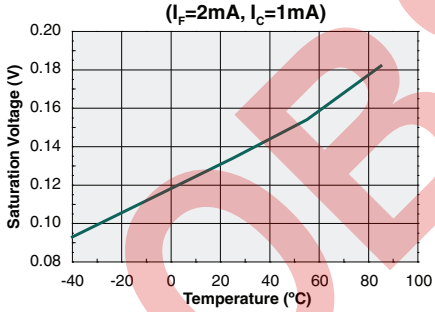
Typical Collector Current vs. Collector Voltage



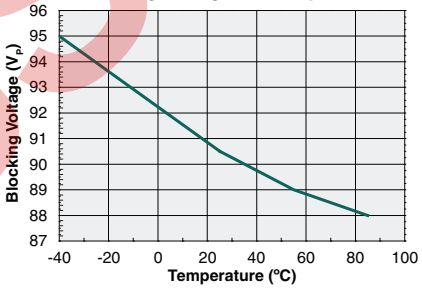
I_{CE} Current vs. Temperature (V_{CE}=5V)



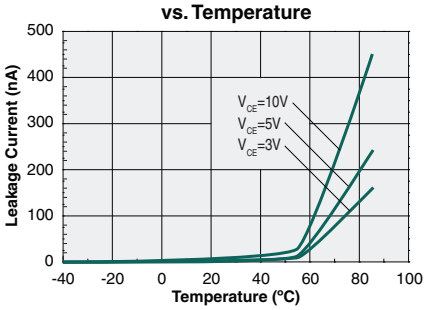
Saturation Voltage vs. Temperature (I_F=2mA, I_C=1mA)



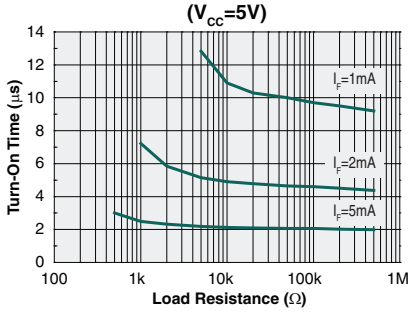
Blocking Voltage vs. Temperature



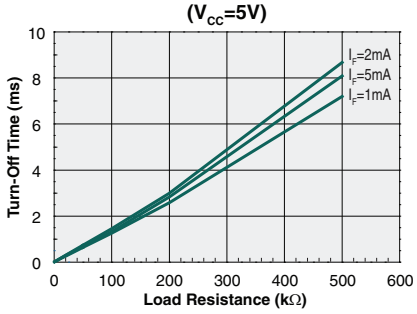
Collector Leakage Current vs. Temperature



Turn-On Time vs. Load Resistance (V_{CC}=5V)



Turn-Off Time vs. Load Resistance (V_{CC}=5V)



* Unless otherwise noted, data presented in these graphs is typical of device operation at 25°C.

Manufacturing Information

Moisture Sensitivity

All plastic encapsulated semiconductor packages are susceptible to moisture ingression. IXYS Integrated Circuits classifies 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)** classification 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) Classification
LDA101S	MSL 1

ESD Sensitivity

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

Soldering Profile

Provided in the table below is the **IPC/JEDEC J-STD-020** Classification Temperature (T_C) and the maximum total dwell time (t_P) in all reflow processes that the body temperature of these surface mount devices may be (T_C - 5)°C or greater. The device's body temperature must not exceed the Classification Temperature at any time during reflow soldering processes.

Device	Classification Temperature (T_c)	Dwell Time (t_P)	Max Reflow Cycles
LDA101S	250°C	30 seconds	3

For through-hole devices, the maximum pin temperature and maximum dwell time through all solder waves is provided in the table below. Dwell time is the interval beginning when the pins are initially immersed into the solder wave until they exit the solder wave. For multiple waves, the dwell time is from entering the first wave until exiting the last wave. During this time, pin temperatures must not exceed the maximum temperature given in the table below. Body temperature of the device must not exceed the limit shown in the table below at any time during the soldering process.

Device	Maximum Pin Temperature	Maximum Body Temperature	Maximum Dwell Time	Wave Cycles
LDA101	260°C	250°C	10 seconds*	1

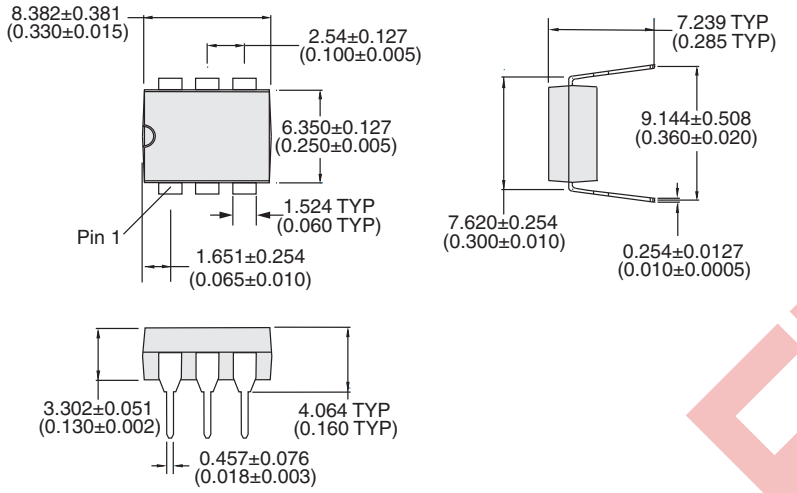
*Total cumulative duration of all waves.

Board Wash

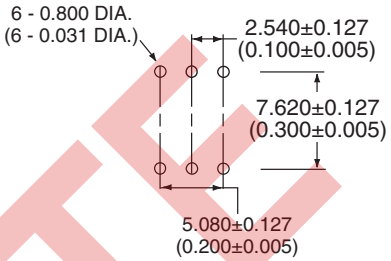
IXYS Integrated Circuits recommends the use of no-clean flux formulations. Board washing to reduce or remove flux residue following the solder reflow process is acceptable provided proper precautions are taken to prevent damage to the device. These precautions include but are not limited to: using a low pressure wash and providing a follow up bake cycle sufficient to remove any moisture trapped within the device due to the washing process. Due to the variability of the wash parameters used to clean the board, determination of the bake temperature and duration necessary to remove the moisture trapped within the package is the responsibility of the user (assembler). Cleaning or drying methods that employ ultrasonic energy may damage the device and should not be used. Additionally, the device must not be exposed to halide flux or solvents.

Mechanical Dimensions

LDA101



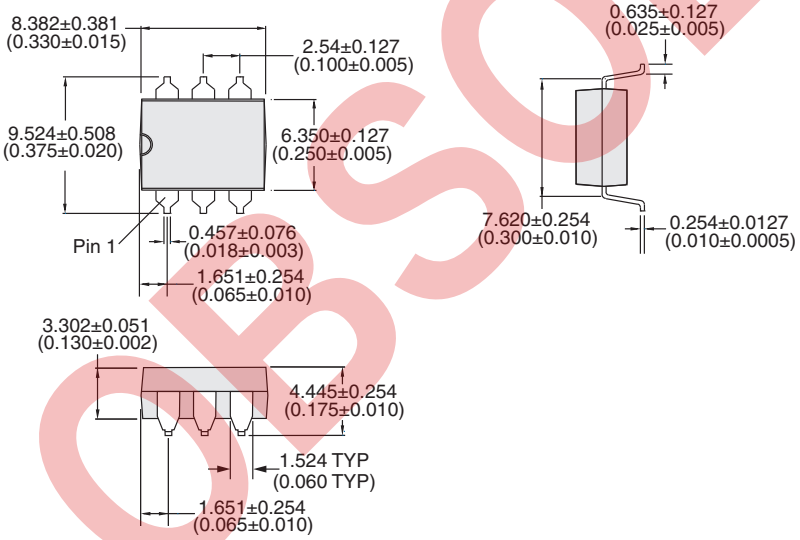
PCB Hole Pattern



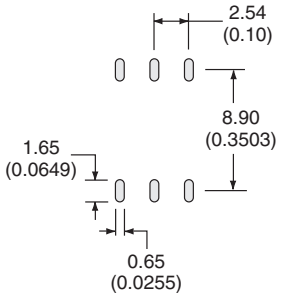
Controlling dimension: inches

Dimensions
mm
(inches)

LDA101S



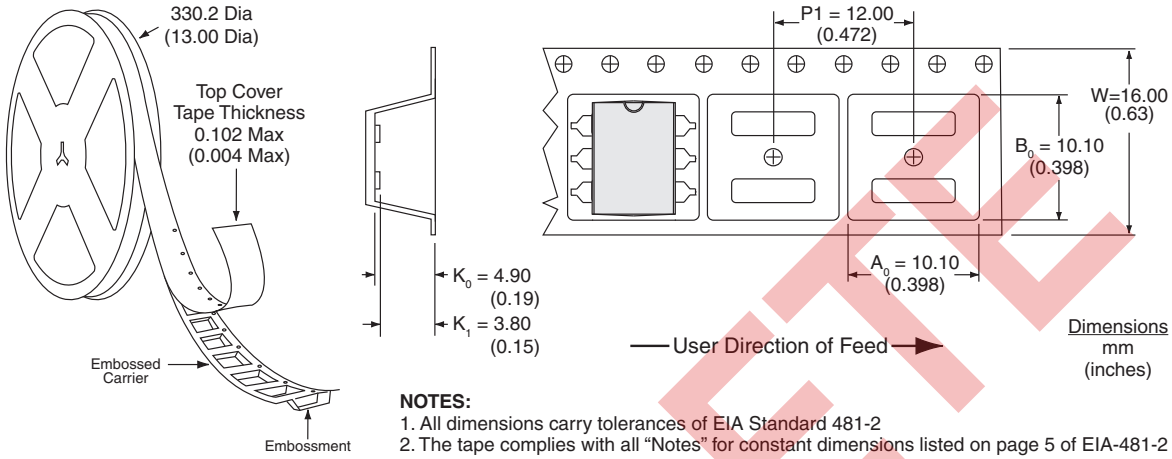
PCB Land Pattern



Controlling dimension: inches

Dimensions
mm
(inches)

LDA101STR Tape & Reel



NOTES:
1. All dimensions carry tolerances of EIA Standard 481-2
2. The tape complies with all "Notes" for constant dimensions listed on page 5 of EIA-481-2

For additional information please visit our website at: https://www.ixysic.com

IXYS
A Littelfuse Technology

Specification: DS-LDA101-ROBS

2/7/2023