

10A IDEAL™ Bypass Device

Description

The LX2410A provides a bypass path for a string with voltage up to 33V. In the event of cell shading, when the string voltage becomes inverted, current is redirected through the LX2410A.

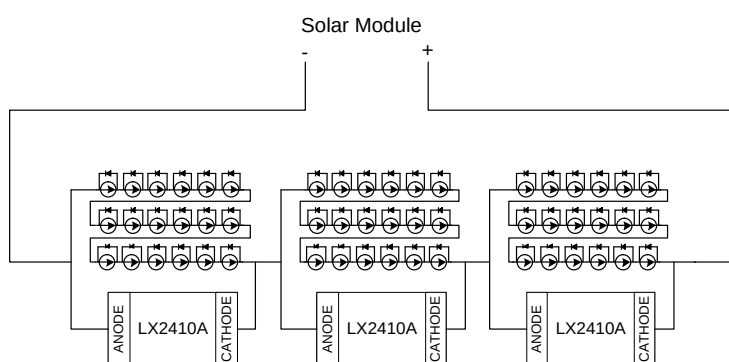
Unlike a diode, the LX2410A is an active device that has an extremely low voltage drop. The voltage drop across the conducting diode is typically 95mV at 10A and 110°C case temperature. The patented non-hiccup control eliminates EMI radiating from PV module strings.

The LX2410A is in a thin package with 0.7mm max thickness designed for mounting inside solar PV modules to shrink the junction box and minimize system expense. The pads of the package are 2.6mm apart to meet the IEC61730-1, IEC61730-2 creepage and clearance requirements.

When in reverse mode, the LX2410A has typically less than 12.5µA of leakage current up to 33V of reverse voltage.

The LX2410A provides the industry the only bi-directional surge protection for up to 500Amps of surge protection to maximize lifetime robustness and reliability.

Typical Application



Features

- Package Thickness of 0.7mm (max)
- Rated to a Forward Current of 12.5A for IEC testing
- Reverse Voltage up to 33V
- 0.95W Power Dissipation at 10A and 110°C Case Temperature
- Patented CoolRUN™ Non-Hiccup Control eliminates EMI radiated from PV Strings
- 12.5 µA of Reverse Leakage Current
- 500Amps of Bi-directional surge suppression per IEC61000-4-5, part 6.1
- 2.6mm of Package Creepage for IEC61730-1, IEC61730-2 Compliance
- Superior ESD Performance

Applications

- Solar Module

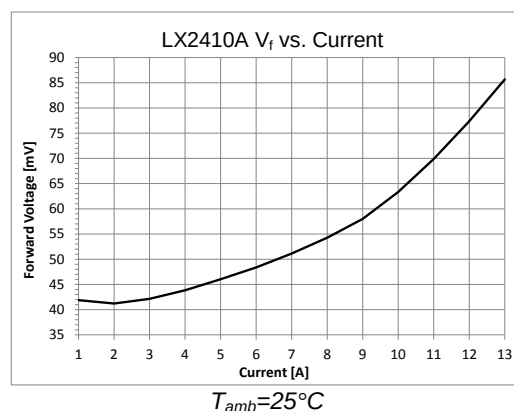


Figure 1 · Product Highlight / Typical VFWD Vs Current

Pin Configuration and Pinout

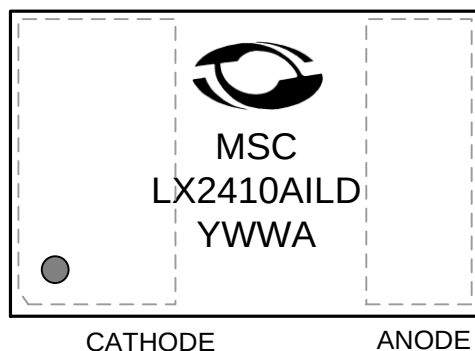


Figure 2 · Pinout DFN 6mmx8mm 2L Top View

Marking: Line 1 MSC
Line 2 LX2410AILD
Line 3 YWWA (Year/Work Week/Lot Code)

Surge Immunity Test	Bidirectional Peak Current (Both Forward And Reverse Current Directions)
IEC61000-4-5 Level 4	500A

Exceeding these ratings could cause damage to the device. These ratings are not intended to be used as guidance for normal continuous operation.

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Ordering Information

Ambient Temperature	Type	Package	Part Number	Packaging Type
-55°C to 90°C	RoHS Compliant	LD 6mmx8mm 2L	LX2410AILD-TR LX2410AILD	Tape and Reel TUBE

Pin Description

Pin Designator	Description
ANODE	Anode. Power Pin. Connect to negative terminal of solar cell string.
CATHODE	Cathode. Power Pin. Connect to positive terminal of solar cell string.

Block Diagram

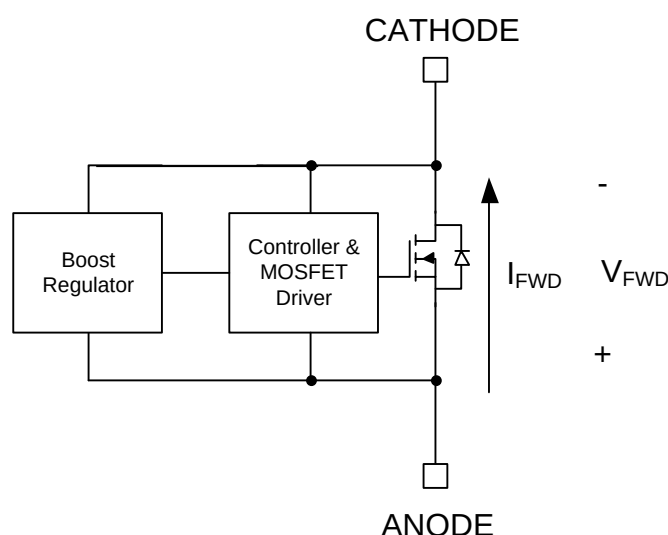


Figure 3 · Simplified Block Diagram of LX2410A

Absolute Maximum Ratings

Parameter	Min	Max	Units
Forward Current		17 ¹	A
Reverse Voltage (-55°C to +150°C Junction)		35	V
Operating Junction Temperature Range	-55	150	°C
RoHS/Pb Free peak package solder reflow temperature		260	
Storage Temperature	-65	150	°C
Mechanical Tensile Pull Strength		80	N

Note 1: $T_j = 150^{\circ}\text{C}$

Note: Performance is not necessarily guaranteed over this entire range. These are maximum stress ratings only. Exceeding these ratings, even momentarily, can cause immediate damage, or negatively impact long-term operating reliability

Thermal Properties

Thermal Resistance	Typ	Units
θ_{JA} (With glass-diode-glass construction)	27	°C/W
θ_{JA} (With glass-diode-backsheet construction)	36	
θ_{JC}	2.4	

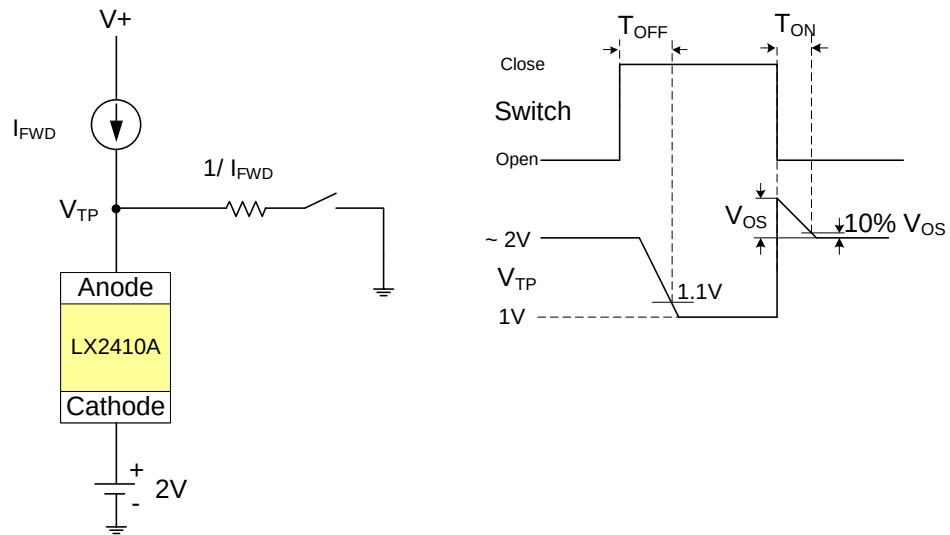
Note: The θ_{JA} numbers assume no forced airflow. Junction Temperature is calculated using $T_J = T_A + (PD \times \theta_{JA})$. θ_{JA} is for reference and will vary depending upon the customer implementation.

Electrical Characteristics

Note: The following specifications apply over the operating ambient temperature of $-55^{\circ}\text{C} \leq T_J \leq 125^{\circ}\text{C}$ except where otherwise noted. Typical parameter refers to $T_J = 25^{\circ}\text{C}$.

Symbol	Parameters	Test Conditions/Comments	Min	Typ	Max	Units
V_{FWD}	Diode Forward Voltage	$I_{FWD} = 8\text{A}$	$T_J = 25^{\circ}\text{C}$	67		mV
			$T_J = 125^{\circ}\text{C}$	94		
		$I_{FWD} = 10\text{A}$	$T_J = 25^{\circ}\text{C}$	78	90	
			$T_J = 125^{\circ}\text{C}$	109	133	
		$I_{FWD} = 17\text{A}$	$T_J = 25^{\circ}\text{C}$	116		
			$T_J = 125^{\circ}\text{C}$	161		
$I_{FWD-SUI}$	Start Up Current	FWD current needed to initiate bypass.	500			mA
T_{ON}	Off-to-On Transition Time	$I_{FWD} = 10\text{A}$			2	ms
T_{OFF}	On-to-Off Transition Time				2	
$I_{FLASH-LEVEL}$	Flash Testing Forced Shutoff Current	Current injected into Cathode and extracted from ANODE that will mandate a rapid de-energizing of bypass diode in less than $25\mu\text{s}$ during solar panel production flash testing.	1			A
$I_{FLASH-DELAY}$	Flash Testing Forced Shutoff Delay	Latency for forced shutoff when flash testing condition drives 1A current into CATHODE	3	6	25	μs
I_{REV}	Reverse Leakage Current	Cathode-to-Anode; $V_{REV} = 33\text{V}$		12.5	30	μA

PRODUCTION TEST CIRCUIT FOR ON / OFF TRANSITION TIME



Package Outline Dimensions

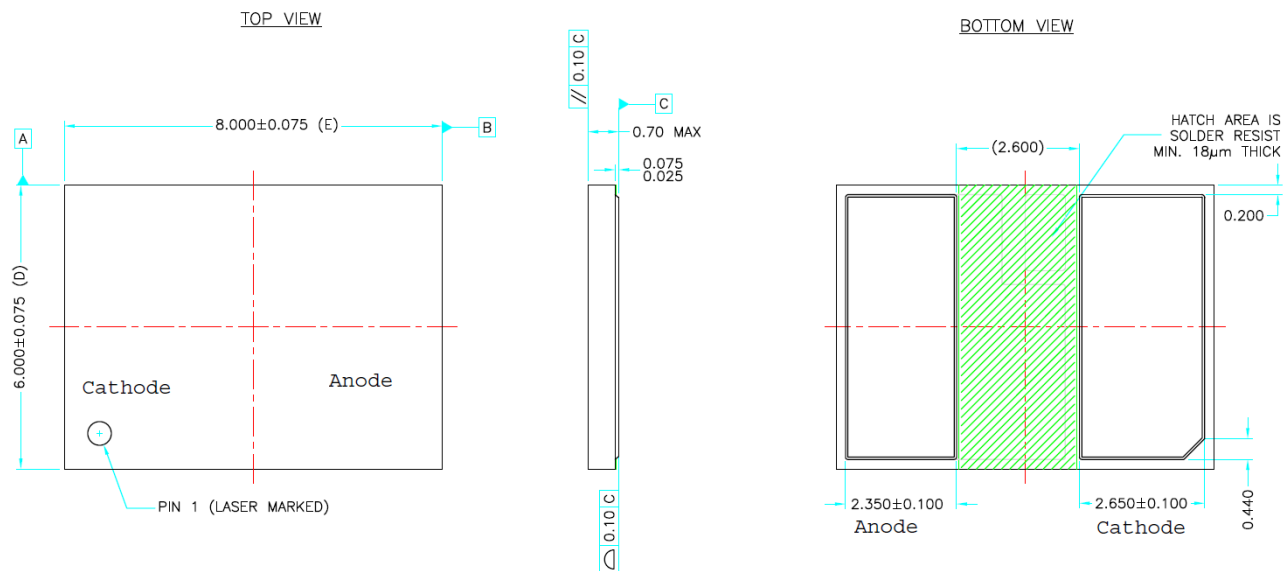


Figure 4 · DFN 2-Pin Package Dimensions

Note: 1. Dimensions and tolerancing per ASME Y14.5 - 1994

Note: 2. Dimensions are in mm.

Note: 3. TIN lead finished thickness: minimum of 1µm.



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