SOLID STATE OPTRONICS

AD6C011

1 Form A
800V / 35Ω
MOSFET Output Solid State Relay

Description

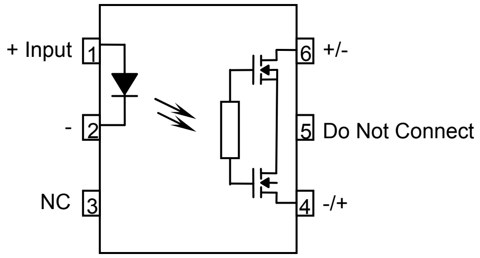
The AD6C011 is a bi-directional, single-pole, single-throw, normally open multipurpose solid-state relay. The relay consists of an IR LED optically coupled to a Photo Diode Array, which in turn drives two open MOSFETs. The AD6C011 provides high load voltage (800V) and high input-to-output isolation (2.5kV).

The AD6C011 comes standard in a miniature 6 pin DIP package, making it ideal for high-density board applications.

Applications

- Multiplexers
- Meter Reading Systems
- Data Acquisition
- Medical Equipment
- Battery Monitoring
- Home Security Systems
- Safety Systems

Schematic Diagram



AD6C011

Features

- High Blocking Voltage (800V)
- 100mA Maximum Continuous Load Current
- Small 6 pin DIP/SMD Package
- High Isolation Voltage (2500V_{RMS})
- Long Life / High Reliability
- RoHS / Pb-Free / REACH Compliant

Agency Approvals

UL:	File # E201932
C-UL:	File # E201932

Absolute Maximum Ratings

The values indicated are absolute stress ratings. Functional operation of the device is not implied at these or any conditions in excess of those defined in electrical characteristics section of this document. Exposure to absolute Maximum Ratings may cause permanent damage to the device and may adversely affect reliability.

Storage Temperature	-55 to +125°C
Operating Temperature	-40 to +85°C
Continuous Input Current	50mA
Transient Input Current	500mA
Reverse Input Control Voltage	5V
Input Power Dissipation	40mW
Output Power Dissipation	800mW
Solder Temperature – Wave (10sec)	260°C
Solder Temperature – IR Reflow (10sec)	260°C

Ordering Information

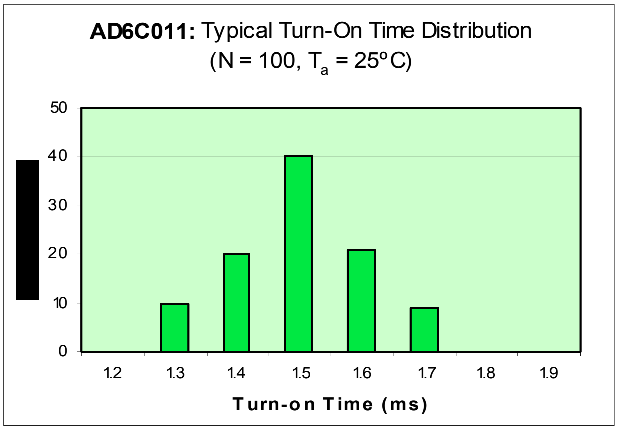
Part Number	Description
AD6C011	6 pin DIP, (50/Tube)
AD6C011-S	6 pin SMD, (50/Tube)
AD6C011-STR	6 pin SMD, Tape and Reel (1000/Reel)

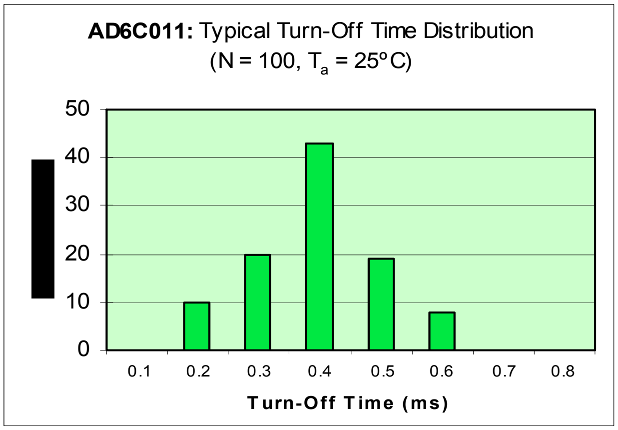
NOTE: Suffixes listed above are not included in marking on device for part number identification

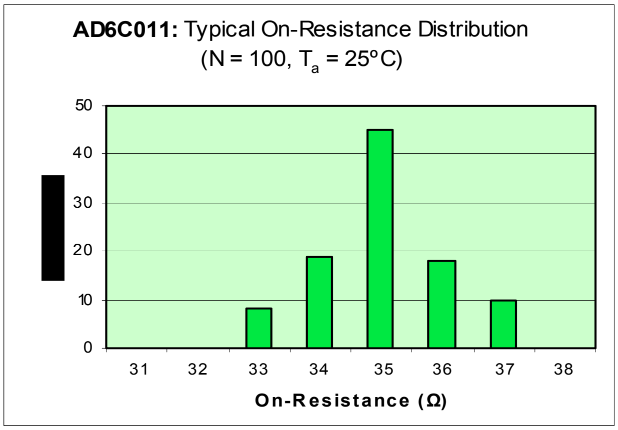
Electrical Characteristics, T_A = 25°C (unless otherwise specified)

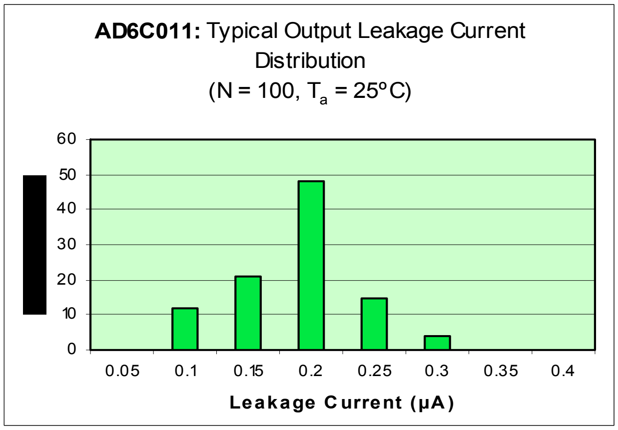
Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
Input Specifications						
LED Forward Voltage	V_F	-	1.2	1.5	V	I_F = 10mA
LED Reverse Voltage	BV_R	5	-	-	V	I_R = 10µA
Turn-On Current	I_F	-	3.2	5.0	mA	I_O = 100mA
Turn-Off Current	I_{FOFF}	0.2	-	-	mA	-
Output Specifications						
Blocking Voltage	V_B	800	-	-	V	I_O=1µA
Continuous Load Current	I_O	-	-	100	mA	I_F=5mA
On Resistance	R_{ON}	-	35	60	Ω	I_F=5mA, I_O=100mA
On Resistance	R_{ON}	-	50	100	Ω	I_F=5mA, I_O=10mA
Leakage Current	I_{Oleak}	-	0.2	1	µA	I_F=0mA, V_O=800V
Output Capacitance	C_{OUT}	-	25	50	pF	I_F=0mA, f=1.0MHz
Offset Voltage	V_{OFFSET}	-	-	0.2	mV	I_F=5mA
Coupled Specifications						
Turn-On Time	T_{ON}	-	1.5	5.0	mS	I_F=5mA, I_O=100mA
Turn-Off Time	T_{OFF}	-	.4	1	mS	I_F=0mA, I_O=100mA
Coupled Capacitance	$C_{COUPLED}$	-	3	-	pF	
Contact Transient Ratio	-	2,000	7,000	0	V/µS	dV = 50V
Isolation Specifications						
Isolation Voltage	V_{ISO}	2,500	-	-	V_{RMS}	RH ≤ 50%, t=1min
Input-Output Resistance	R_{I-O}	-	10^{12}	-	Ω	V_{I-O} = 500V_{DC}

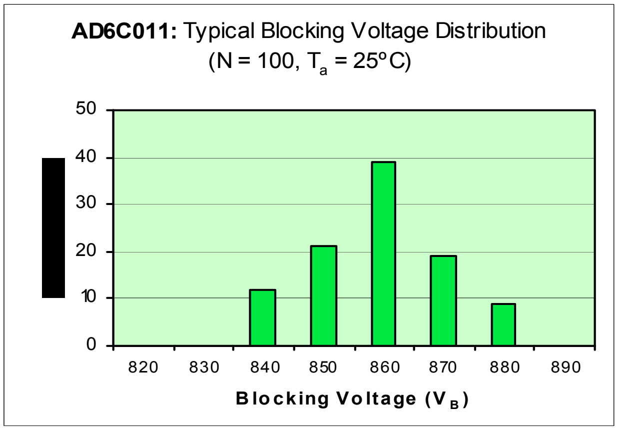
AD6C011 Performance & Characteristics Plots, T_A = 25°C (unless otherwise specified)

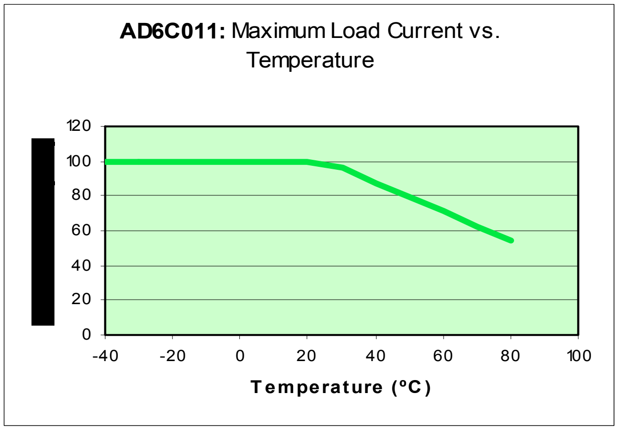

AD6C011: Typical Turn-On Time Distribution
(N = 100, T_a = 25°C)


AD6C011: Typical Turn-Off Time Distribution
(N = 100, T_a = 25°C)


AD6C011: Typical On-Resistance Distribution
(N = 100, T_a = 25°C)


AD6C011: Typical Output Leakage Current Distribution
(N = 100, T_a = 25°C)


AD6C011: Typical Blocking Voltage Distribution
(N = 100, T_a = 25°C)


AD6C011: Maximum Load Current vs. Temperature

AD6C011 Solder Temperature Profile Recommendations

(1) *Infrared Reflow*:

Refer to the following figure as an example of an optimal temperature profile for single occurrence infrared reflow. Soldering process should not exceed temperature or time limits expressed herein. Surface temperature of device package should not exceed 250ºC:

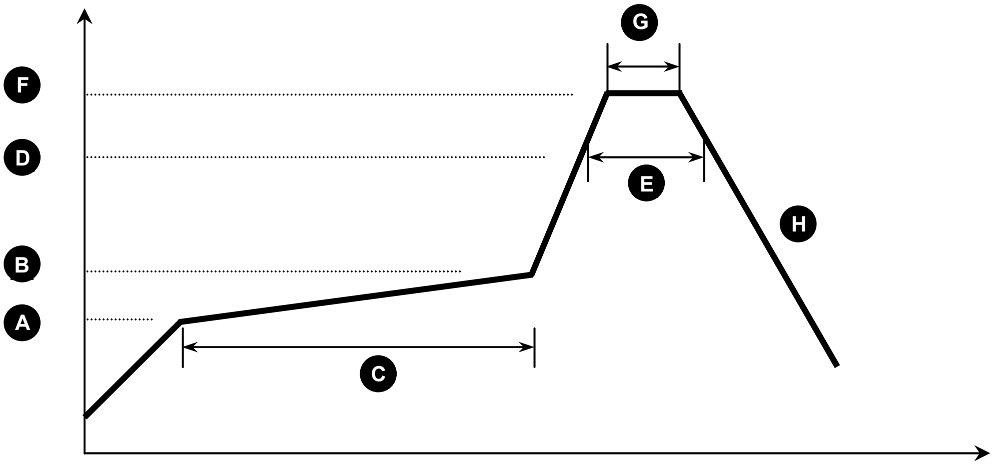


Figure 1

Process Step	Description	Parameter
A	Preheat Start Temperature (ºC)	150ºC
B	Preheat Finish Temperature (ºC)	180ºC
C	Preheat Time (s)	90 - 120s
D	Melting Temperature (ºC)	230ºC
E	Time above Melting Temperature (s)	30s
F	Peak Temperature, at Terminal (ºC)	260ºC
G	Dwell Time at Peak Temperature (s)	10s
H	Cool-down (ºC/s)	<6ºC/s

(2) *Wave Solder*:

Maximum Temperature:	260ºC (at terminal)
Maximum Time:	10s
Pre-heating:	100 - 150ºC (30 - 90s)

Single Occurrence

(3) *Hand Solder*:

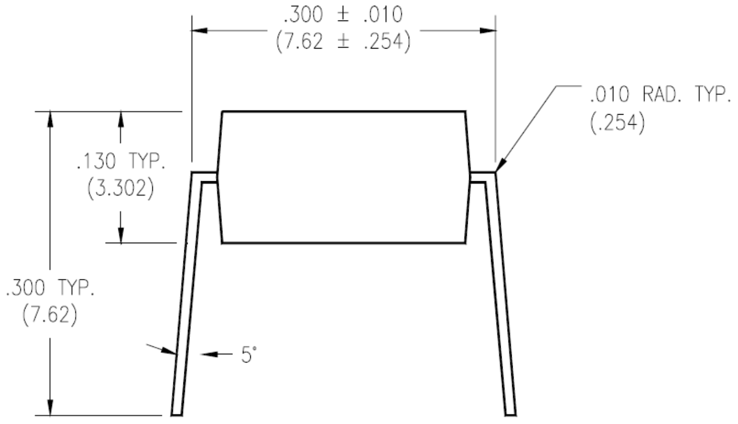
Maximum Temperature:	350ºC (at tip of soldering iron)
Maximum Time:	3s

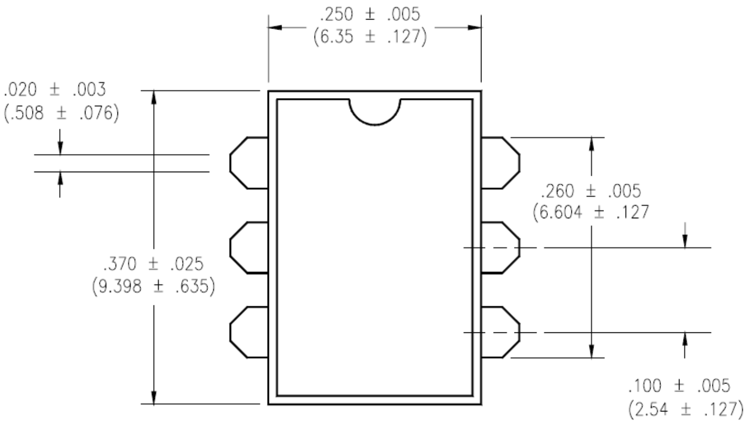
Single Occurrence

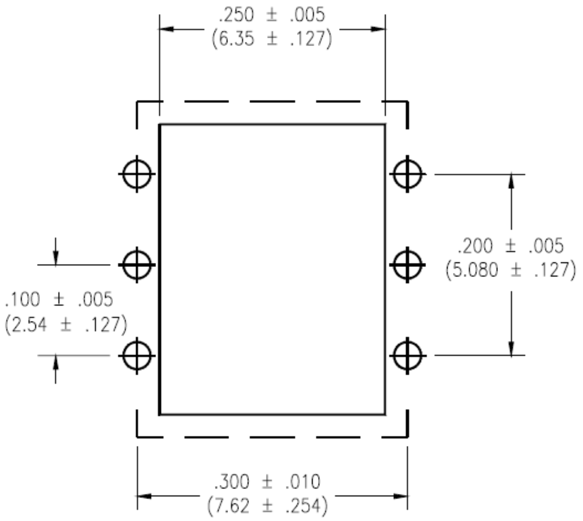
AD6C011 Package Dimensions

6 PIN DIP Package

Note: *All dimensions in inches [“] with millimeters in parenthesis ()*
Device Weight: **0.45g**



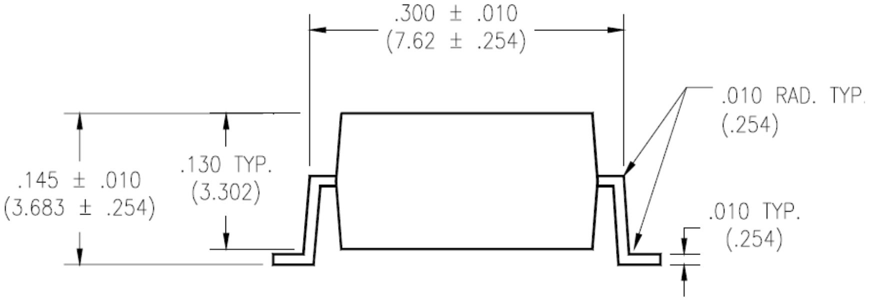


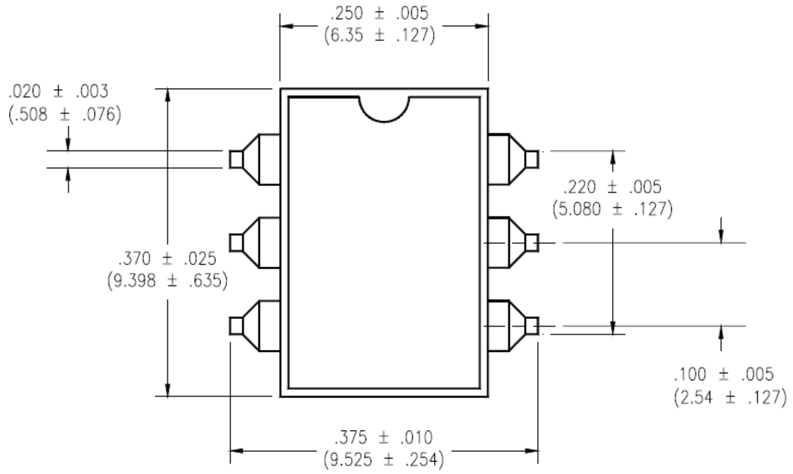


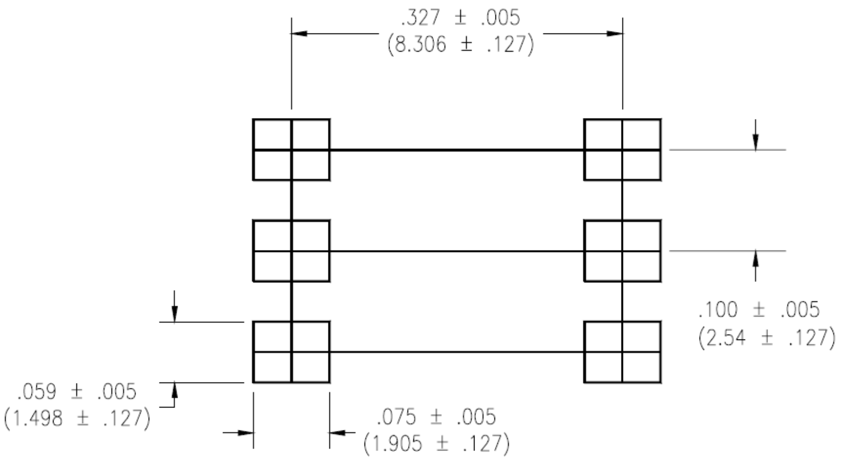
AD6C011 Package Dimensions

6 PIN SMD Surface Mount Package (-S)

Note: *All dimensions in inches [“] with millimeters in parenthesis ()*
Device Weight: **0.45g**







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