



## Description

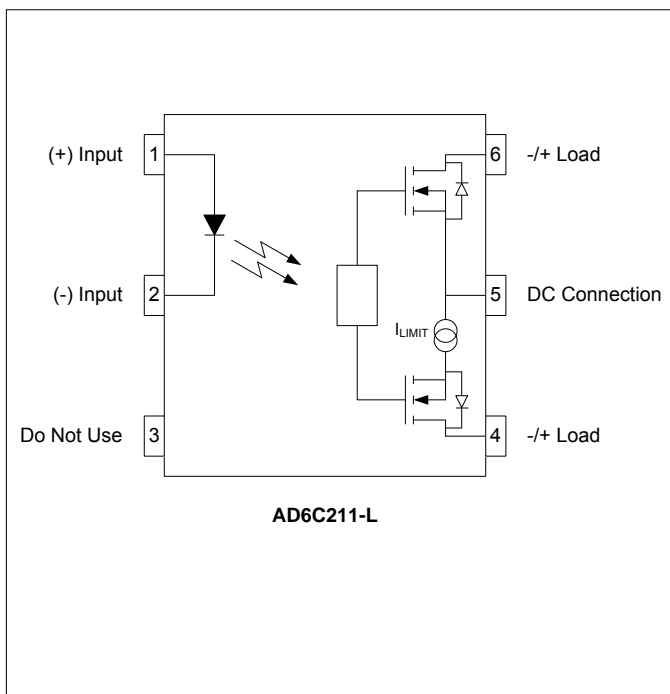
The AD6C211-L is a bi-directional, single-pole, single-throw, normally open solid-state relay. It provides a load current of 150mA, a high blocking voltage of 400V, and current limiting circuitry in a compact 6 pin DIP package. Current limiting circuitry provides a level of protection against increased load currents or transient current spikes by active current reduction across the device, thereby protecting itself and downstream components.

The AD6C211-L comes standard in a miniature 6 pin DIP package making it ideal for high-density board applications.

## Applications

- Reed Relay Replacement
- Multiplexers
- Meter Reading Systems
- Medical Equipment
- Battery Monitoring

## Schematic Diagram



## Features

- High Isolation Voltage (3750V<sub>RMS</sub>)
- Low Input Control Current (3mA TYP)
- 150mA Maximum Continuous Load Current
- 25 $\Omega$  Maximum On-Resistance
- Active Current Limiting Protection
- Long Life / High Reliability
- RoHS / Pb-Free / REACH Compliant

## Agency Approvals

UL / C-UL: File # E201932  
 VDE: File # 40035191 (EN 60747-5-2)

## 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 .....	6V
Input Power Dissipation .....	40mW
Output Power Dissipation .....	800mW
Solder Temperature – Wave (10sec).....	260°C
Solder Temperature – IR Reflow (10sec).....	260°C

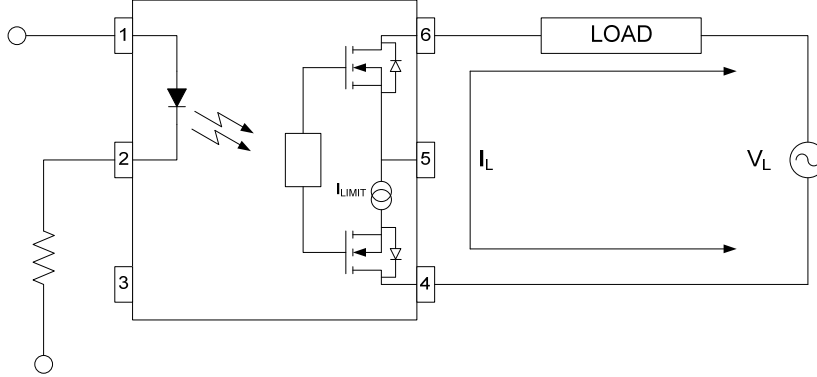
## Ordering Information

Part Number	Description
AD6C211-L	6 pin DIP, (50/Tube)
AD6C211-LS	6 pin SMD, (50/Tube)
AD6C211-LSTR	6 pin SMD, Tape and Reel (1000/Reel)

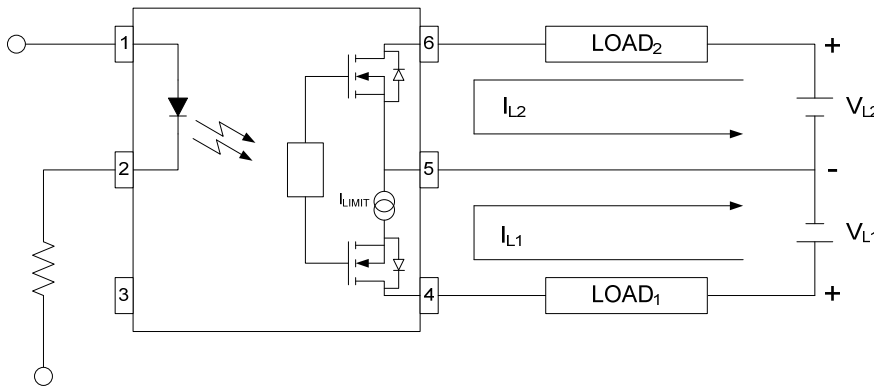
**NOTE: Suffixes listed above are not included in marking on device for part number identification**

**Electrical Characteristics,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**

Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Specifications</b>						
LED Forward Voltage	$V_F$	-	1.2	1.5	V	$I_F = 10\text{mA}$
LED Reverse Voltage	$BV_R$	6	-	-	V	$I_R = 10\mu\text{A}$
Turn-On Current	$I_F$	-	3	5	mA	$I_O = 150\text{mA}$
Turn-Off Current	$I_{\text{FOFF}}$	-	0.5	-	mA	-
<b>Output Specifications</b>						
Blocking Voltage	$V_B$	400	-	-	V	$I_O = 1\mu\text{A}$
Continuous Load Current	$I_O$	-	-	150	mA	$I_F = 5\text{mA}$
Current Limit (AC or DC connection)	$I_{\text{LIMIT}}$	180	300	-	mA	$I_F = 5\text{mA}$
On Resistance	$R_{\text{ON}}$	-	18	25	Ω	$I_F = 5\text{mA}, I_O = 150\text{mA}$
Leakage Current	$I_{\text{oleak}}$	-	0.2	1	μA	$I_F = 0\text{mA}, V_O = 400\text{V}$
Output Capacitance	$C_{\text{OUT}}$	-	25	50	pF	$I_F = 0\text{mA}, f = 1.0\text{MHz}$
Offset Voltage	$V_{\text{OFFSET}}$	-	-	0.2	mV	$I_F = 5\text{mA}$
<b>Coupled Specifications</b>						
Turn-On Time	$T_{\text{ON}}$	-	1.5	5.0	mS	$I_F = 5\text{mA}, I_O = 150\text{mA}$
Turn-Off Time	$T_{\text{OFF}}$	-	0.5	1.0	mS	$I_F = 0\text{mA}, I_O = 150\text{mA}$
Coupled Capacitance	$C_{\text{COUPLED}}$	-	3	-	pF	
Contact Transient Ratio	-	2,000	7,000	0	V/μS	$dV = 50\text{V}$
<b>Isolation Specifications</b>						
Isolation Voltage	$V_{\text{ISO}}$	3,750	-	-	$V_{\text{RMS}}$	$\text{RH} \leq 50\%, t = 1\text{min}$
Input-Output Resistance	$R_{\text{I-O}}$	-	$10^{12}$	-	Ω	$V_{\text{I-O}} = 500V_{\text{DC}}$

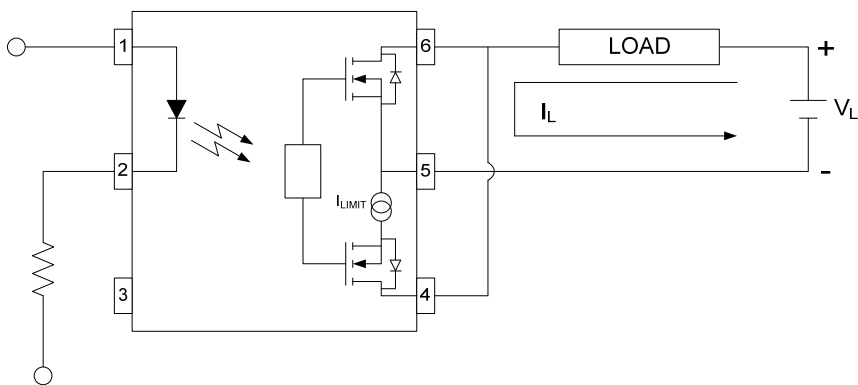
**AD6C211-L Current Limiting Connection Diagrams,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**
**Connection Diagrams**
**Comments**
**Option A: Normal AC Load Configuration**


On Resistance:  $R_{TYP}$   
Current Limit:  $I_{LIMIT}$

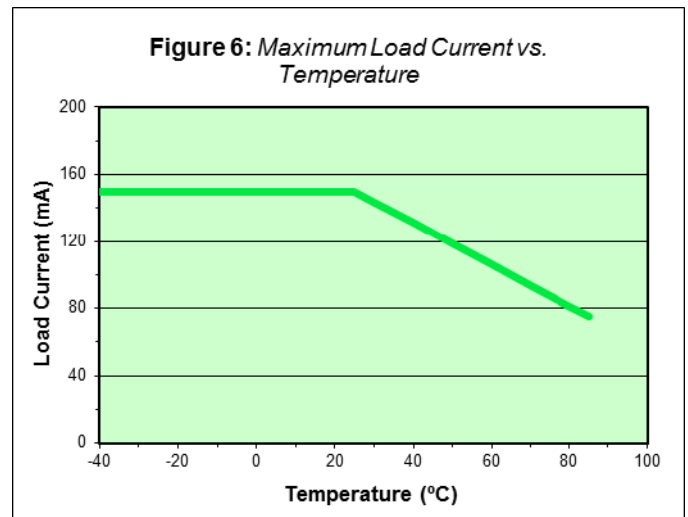
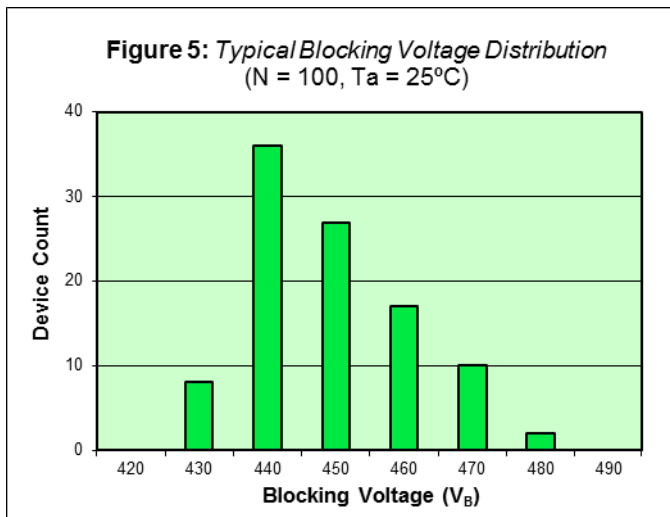
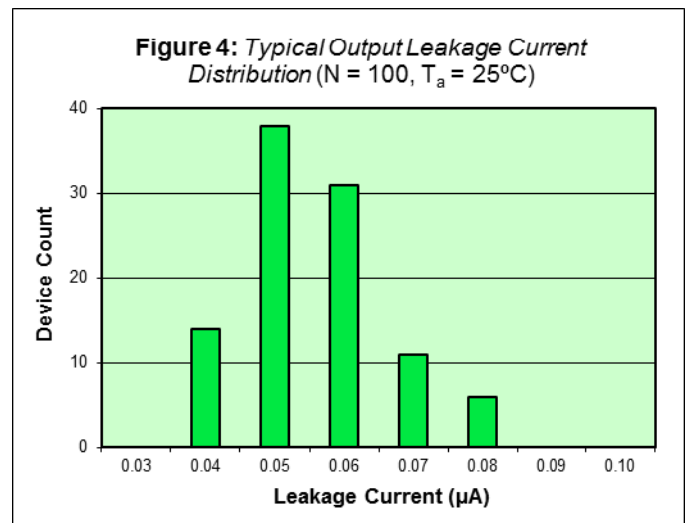
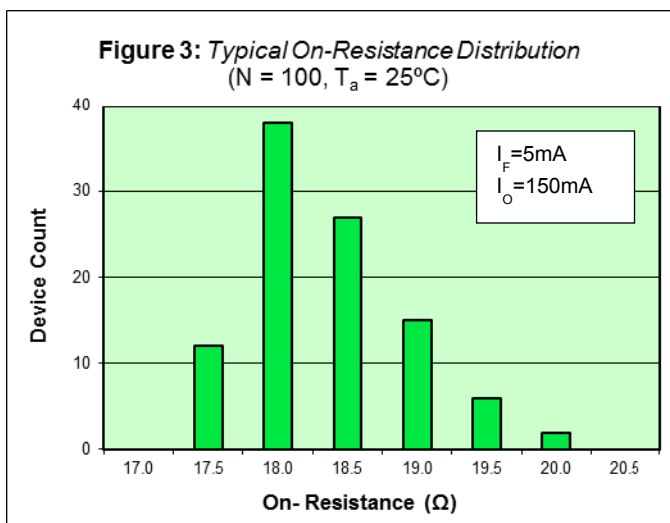
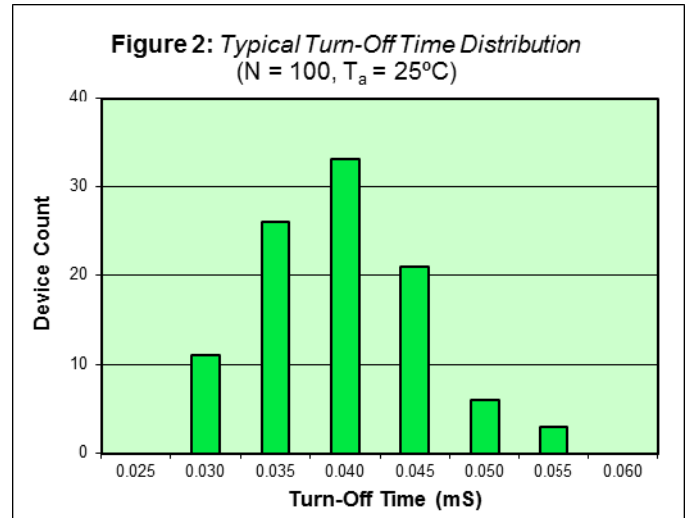
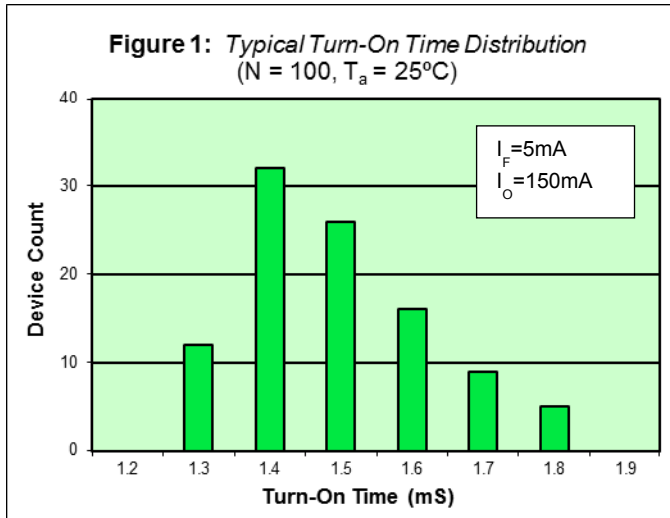
**Option B: Separate Loads & Load Voltages**


On Resistance:  
Load<sub>1</sub>  $\sim (R_{TYP} / 2) + 3\Omega$   
Load<sub>2</sub>  $R_{TYP} / 2$   
Current Limit:  
Load<sub>1</sub>  $I_{LIMIT}$   
Load<sub>2</sub> N/A

- Sum power of loads not to exceed maximum package power dissipation

**Option C: DC Load with Minimal Resistance and No Current Limit**


On Resistance:  $R_{TYP} / 4$   
Current Limit: None

**AD6C211-L Performance & Characteristics Plots,  $T_a = 25^\circ\text{C}$  (unless otherwise specified)**


**AD6C211-L 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 250°C:

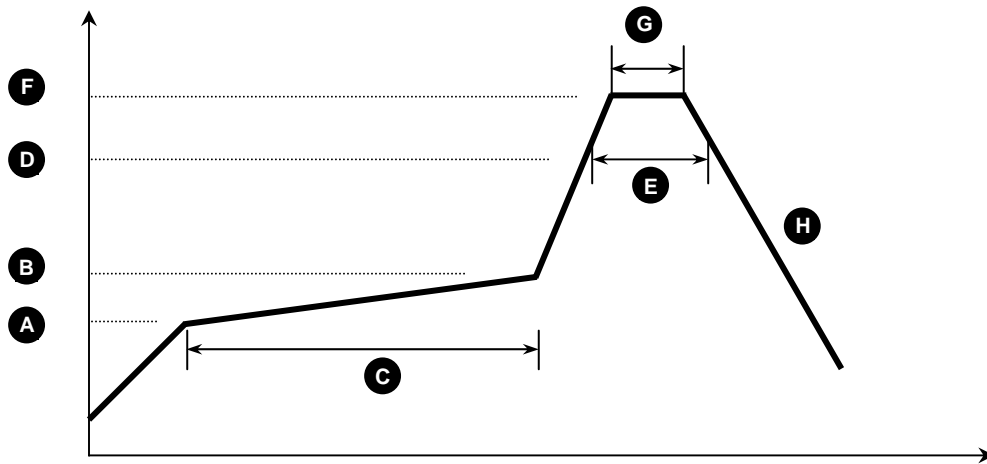


Figure 1

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

**(2) Wave Solder:**

Maximum Temperature: 260°C (at terminal)  
 Maximum Time: 10s  
 Pre-heating: 100 - 150°C (30 - 90s)  
 Single Occurrence

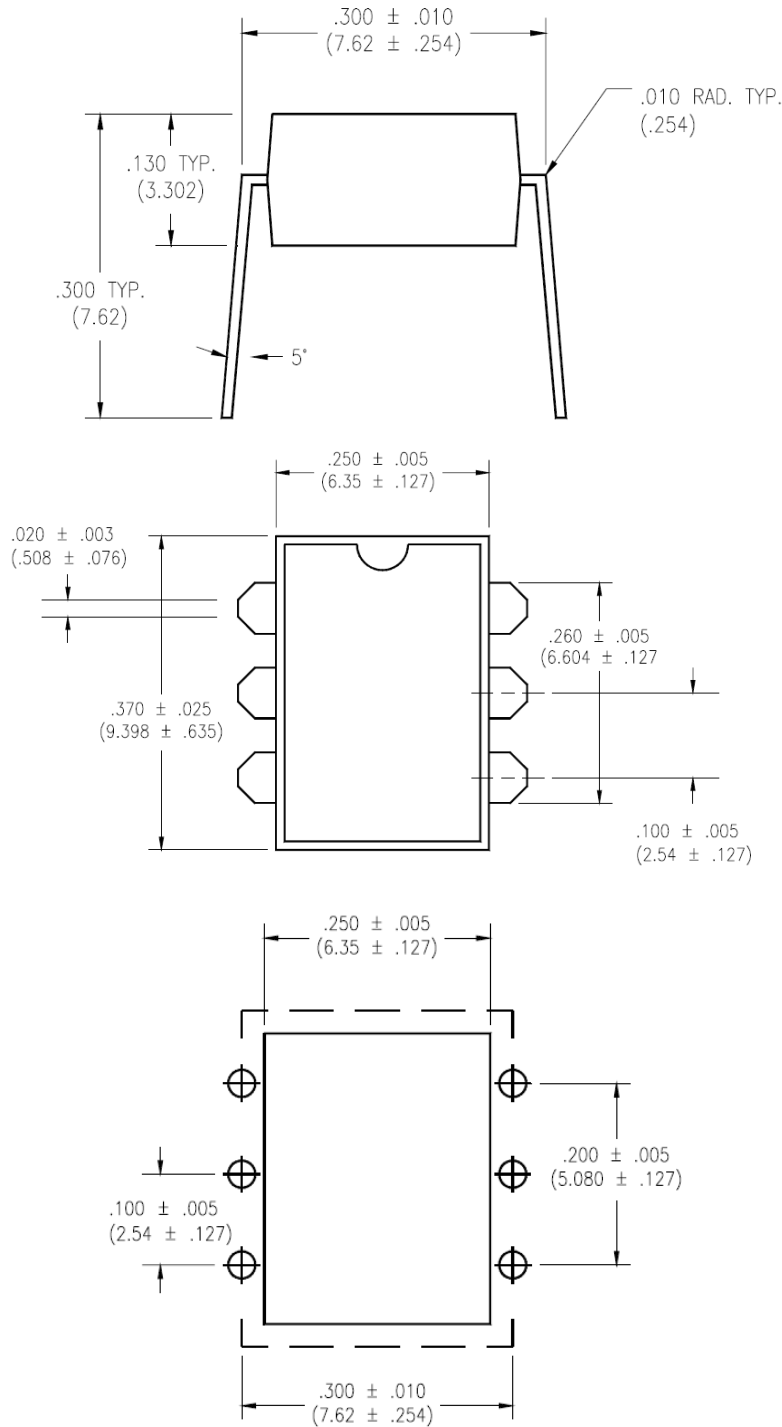
**(3) Hand Solder:**

Maximum Temperature: 350°C (at tip of soldering iron)  
 Maximum Time: 3s  
 Single Occurrence

**AD6C211-L Package Dimensions**

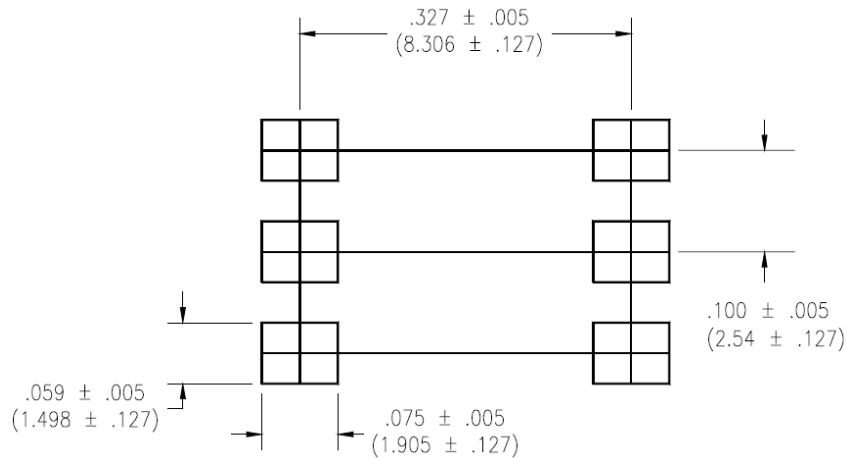
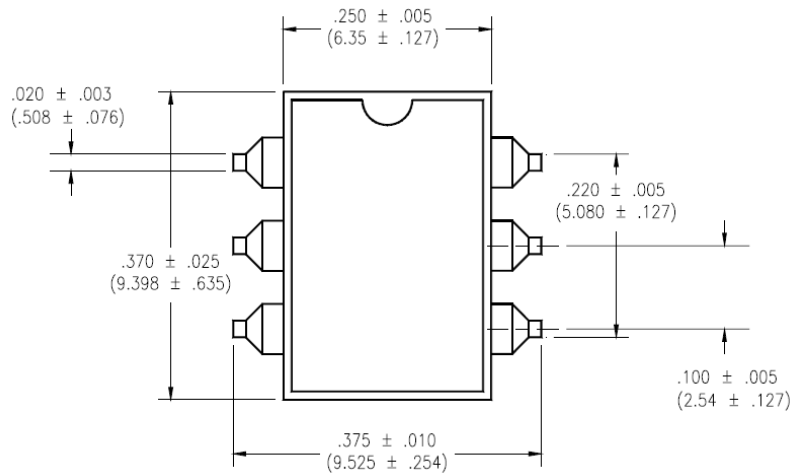
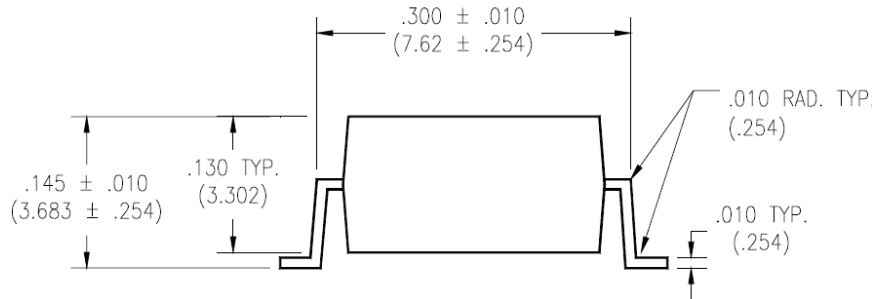
6 PIN DIP Package

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



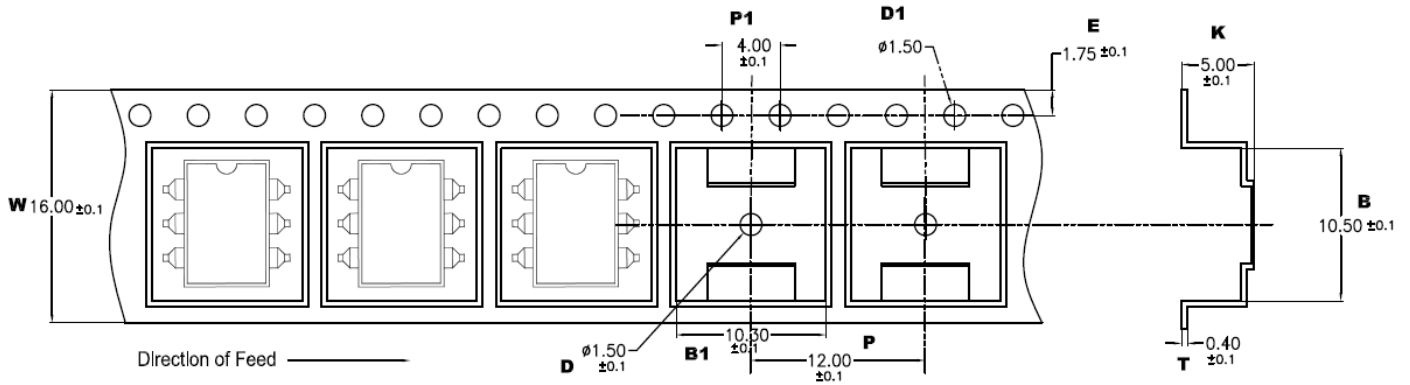
**AD6C211-L Package Dimensions**

6 PIN SMD Surface Mount Package (-S)

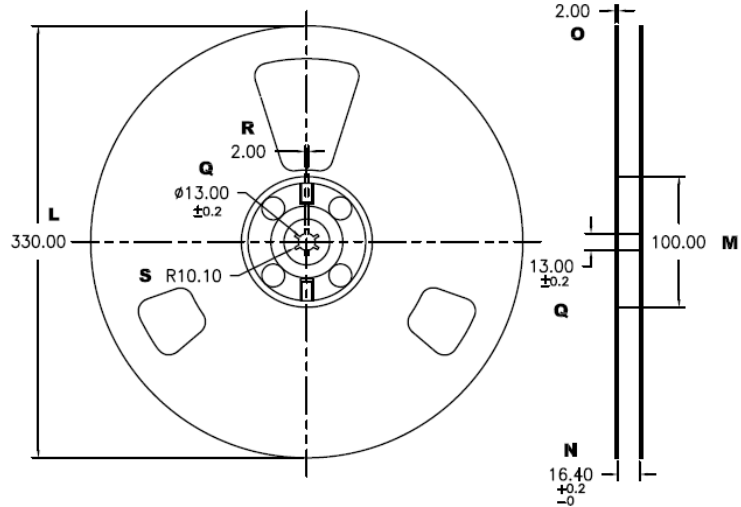
**Note:** All dimensions in inches ["] with millimeters in parenthesis ( )  
**Device Weight:** 0.45g


**AD6C211-L Package Dimensions**

6 PIN SMD Tape &amp; Reel (-STR)

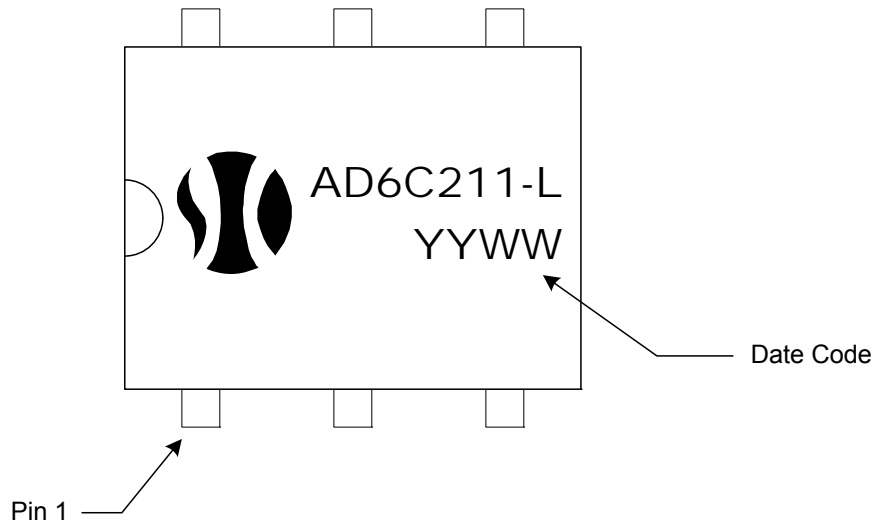
**Note:** All dimensions in millimeters


W	B	B1	P	P1	K	E	T	D	D1
16.00 ±0.1	10.50 ±0.1	10.30 ±0.1	12.00 ±0.1	4.00 ±0.1	5.00 ±0.1	1.75 ±0.1	0.40 ±0.1	1.50 ±0.1	1.50 ±0.1



L	M	N	O	Q	R	S
330.00	100.00	16.40 ±0.2	2.00 ±0.1	13.00 ±0.2	2.00	10.00



**AD6C211-L Package Marking****DISCLAIMER**

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