



## Description

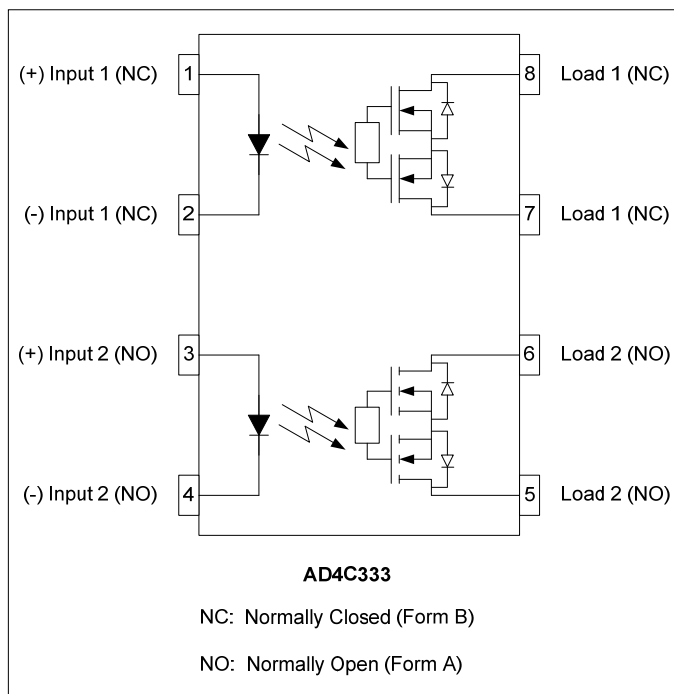
The AD4C333 is composed of two isolated relays; one normally open and one normally closed. Each relay has a bi-directional, single-pole, single-throw contact. Completely independent of its counterpart, each consists of an LED that activates an integrated circuit, which in turn drives a pair of DMOS transistors. These transistors are protected with free-wheeling diodes that can handle up to 1.5A of inrush current, making the relay ideal for switching lamps and highly inductive loads.

The AD4C333 comes standard in a miniature 8 pin DIP package making it ideal for high-density board applications.

## Applications

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

## Schematic Diagram



## Features

- 1 Form A / 1 Form B Integrated in 1 Package
- Low Input Control Current (1.5mA TYP)
- 200mA Maximum Continuous Load Current
- Low On Resistance (10Ω MAX – Both Poles)
- High Isolation Voltage (2.5kV<sub>RMS</sub>, 3.75kV<sub>RMS</sub> -H Option)
- 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 .....	5V
Input Power Dissipation .....	40mW
Output Power Dissipation .....	800mW
Solder Temperature – Wave (10sec).....	260°C
Solder Temperature – IR Reflow (10sec).....	260°C

## Ordering Information

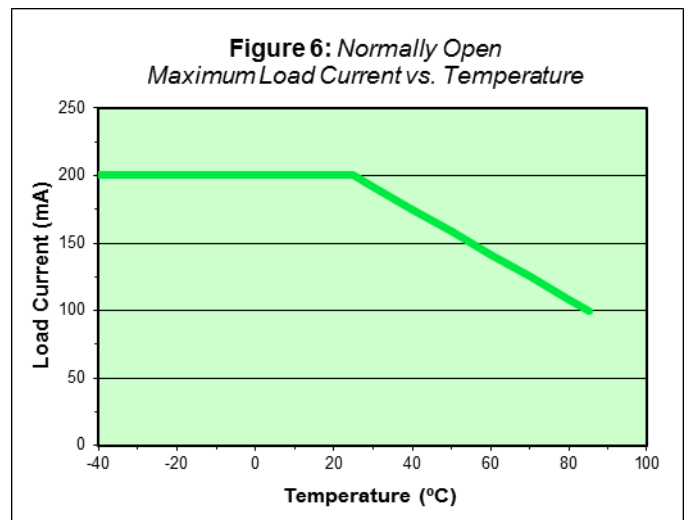
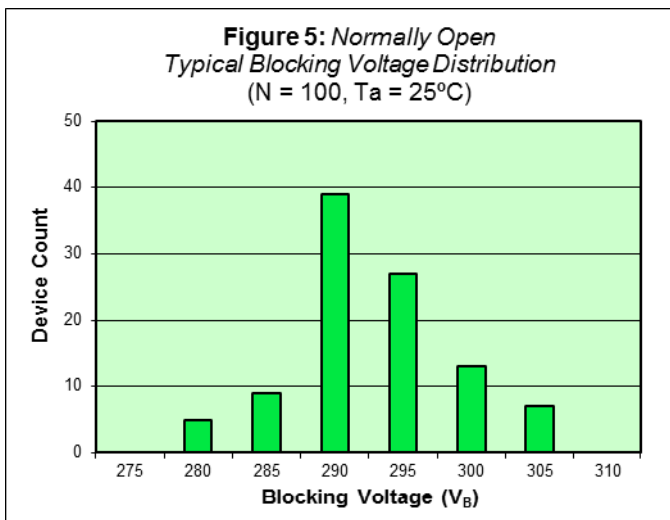
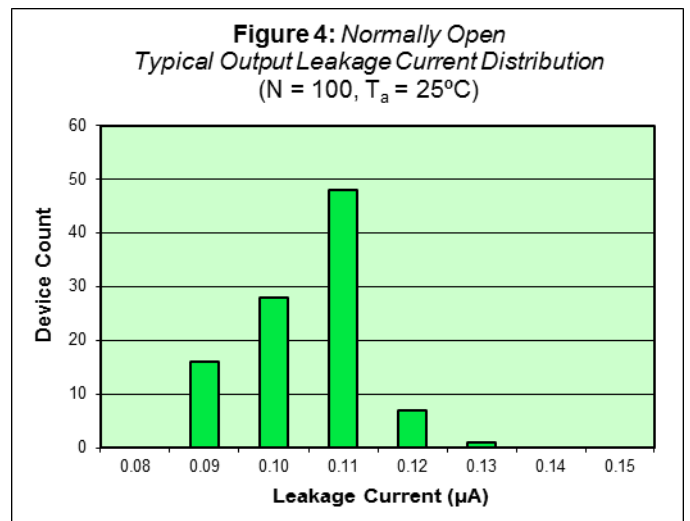
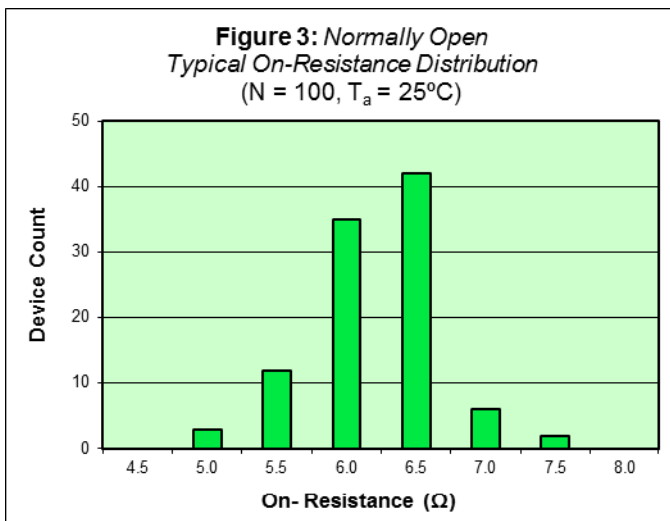
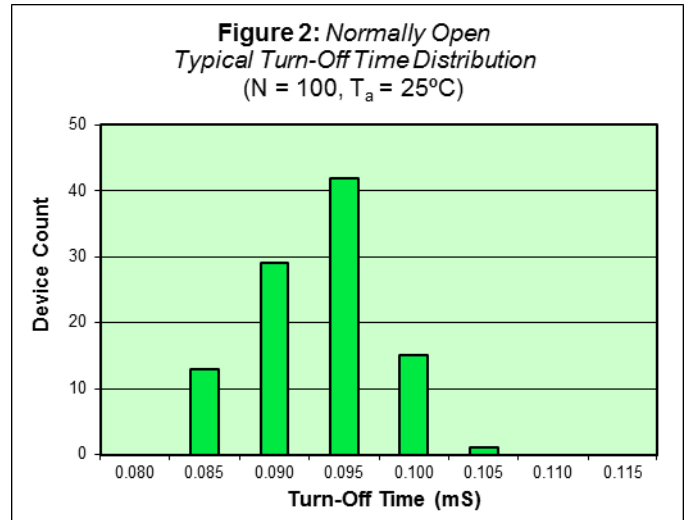
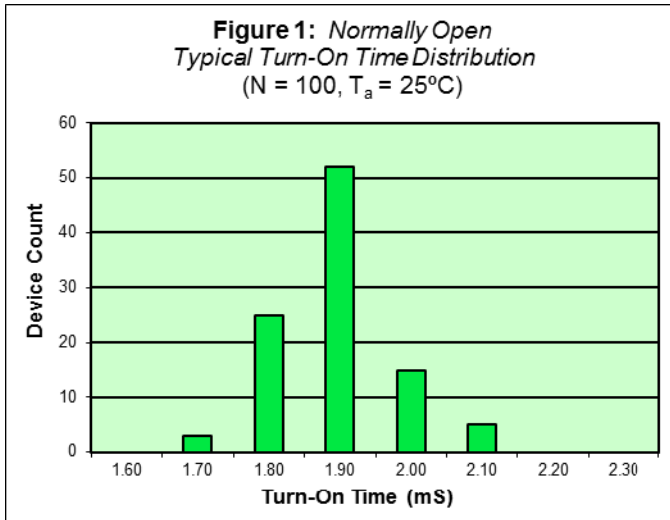
Part Number	Description
AD4C333	8 pin DIP, (50/Tube)
AD4C333-H	3.75kV <sub>RMS</sub> V <sub>ISO</sub> , 8 pin DIP, (50/Tube)
AD4C333-S	8 pin SMD, (50/Tube)
AD4C333-HS	3.75kV <sub>RMS</sub> , 8 pin SMD, (50/Tube)
AD4C333-STR	8 pin SMD, Tape and Reel (1000/Reel)
AD4C333-HSTR	3.75kV <sub>RMS</sub> , 8 pin SMD, Tape and Reel (1000/Reel)

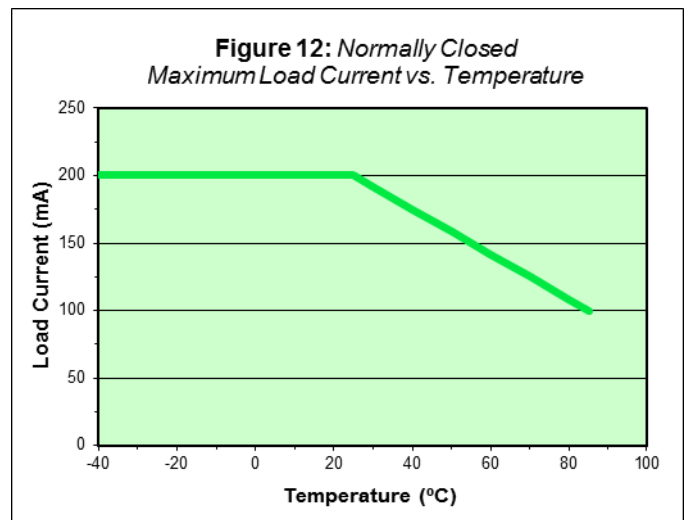
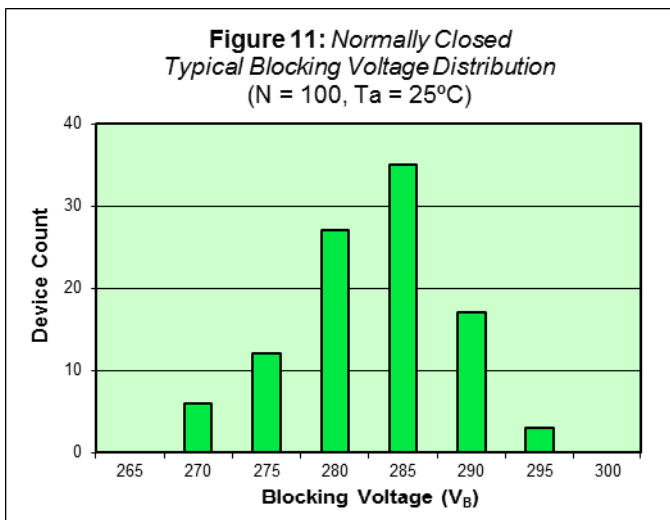
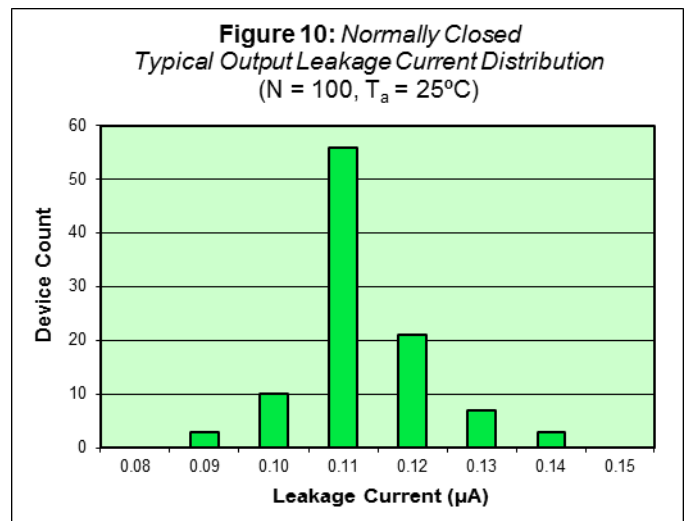
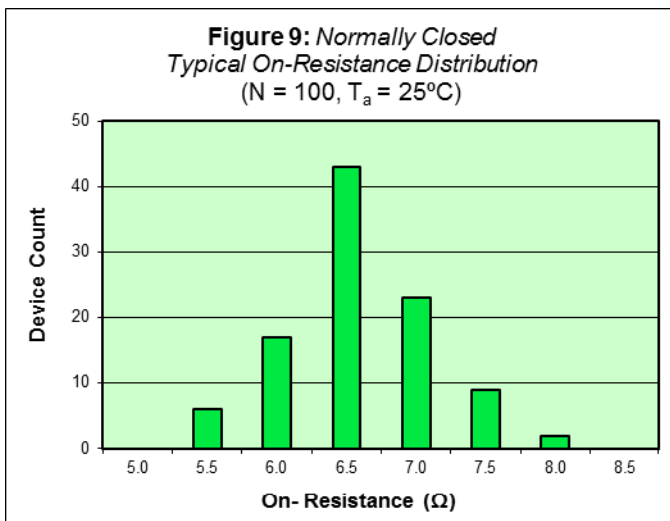
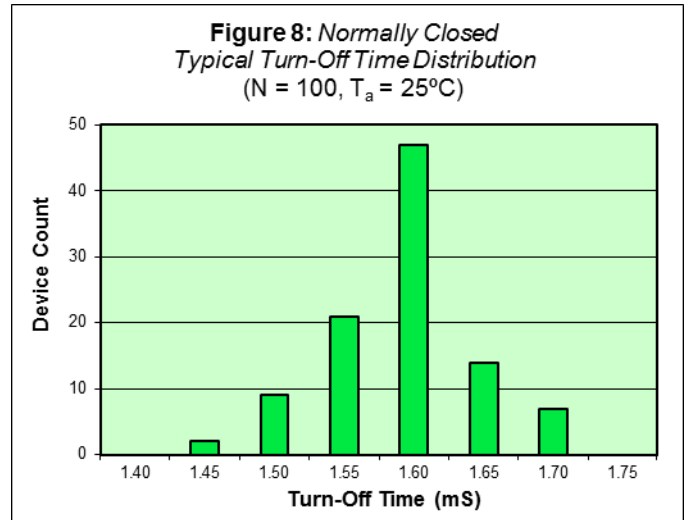
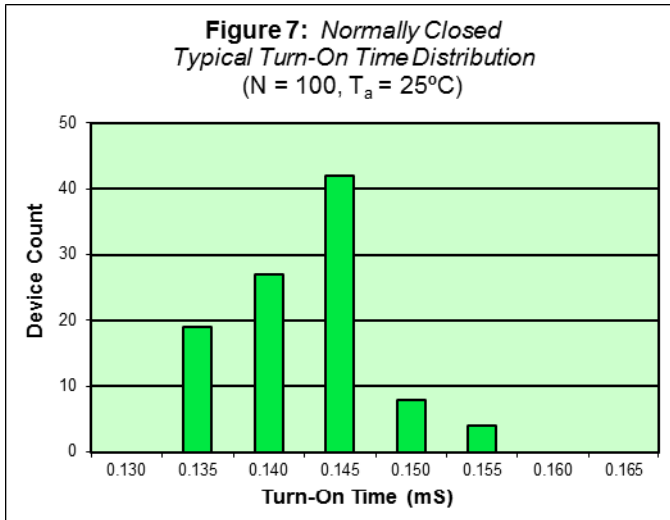
**NOTE: Suffixes listed above are not included in marking on device for part number identification**

**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	$BV_R$	5	-	-	V	$I_R = 10\mu\text{A}$
Turn-On Current (Form A – Normally Open)	$I_{F(NO)}$	-	2.5	5	mA	$I_O = 200\text{mA}$
Turn-On Current (Form B – Normally Closed)	$I_{F(NC)}$	-	0.5	-	mA	$I_O = 200\text{mA}$
Turn-Off Current (Form A – Normally Open)	$I_{OFF(NO)}$	-	0.5	-	mA	$I_O = 200\text{mA}$
Turn-Off Current (Form B – Normally Open)	$I_{OFF(NC)}$	-	2.5	5	mA	$I_O = 200\text{mA}$
<b>Output Specifications – Form A (Normally Open)</b>						
Blocking Voltage	$V_B$	250	-	-	V	$I_O = 1\mu\text{A}$
Continuous Load Current	$I_O$	-	-	200	mA	$I_F = 5\text{mA}$
On Resistance	$R_{ON}$	-	7	10	Ω	$I_F = 5\text{mA}, I_O = 200\text{mA}$
Leakage Current	$I_{Oleak}$	-	0.2	1	μA	$I_F = 0\text{mA}, V_O = 250\text{V}$
Output Capacitance	$C_{OUT}$	-	25	-	pF	$V_O = 25\text{V}, f = 1.0\text{MHz}$
Offset Voltage	$V_{OFFSET}$	-	-	0.2	mV	$I_F = 5\text{mA}$
Turn-On Time	$T_{ON}$	-	2	5	mS	$I_F = 5\text{mA}, I_O = 200\text{mA}$
Turn-Off Time	$T_{OFF}$	-	0.1	5	mS	$I_F = 0\text{mA}, I_O = 200\text{mA}$
<b>Output Specifications – Form B (Normally Closed)</b>						
Blocking Voltage	$V_B$	250	-	-	V	$I_F = 5\text{mA}, I_O = 1\mu\text{A}$
Continuous Load Current	$I_O$	-	-	200	mA	$I_F = 0\text{mA}$
On Resistance	$R_{ON}$	-	7	10	Ω	$I_F = 0\text{mA}, I_O = 200\text{mA}$
Leakage Current	$I_{Oleak}$	-	0.2	1	μA	$I_F = 5\text{mA}, V_O = 250\text{V}$
Output Capacitance	$C_{OUT}$	-	15	-	pF	$I_F = 5\text{mA}, V_O = 25\text{V}, f = 1.0\text{MHz}$
Offset Voltage	$V_{OFFSET}$	-	-	0.2	mV	$I_F = 0\text{mA}$
Turn-On Time	$T_{ON}$	-	0.2	5	mS	$I_F = 0\text{mA}, I_O = 200\text{mA}$
Turn-Off Time	$T_{OFF}$	-	2	5	mS	$I_F = 5\text{mA}, I_O = 200\text{mA}$
<b>Coupled Specifications</b>						
Coupled Capacitance	$C_{COUPLED}$	-	3	-	pF	
Contact Transient Ratio	-	2,000	7,000	0	V/μS	$dV = 50\text{V}$
<b>Isolation Specifications</b>						
Isolation Voltage	$V_{ISO}$	2,500	-	-	$V_{RMS}$	$RH \leq 50\%, t = 1\text{min}$
-H Option	$V_{ISO}$	3,750	-	-	$V_{RMS}$	$RH \leq 50\%, t = 1\text{min}$
Input-Output Resistance	$R_{I-O}$	-	$10^{12}$	-	Ω	$V_{I-O} = 500V_{DC}$

**AD4C333 Performance & Characteristics Plots,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**



**AD4C333 Performance & Characteristics Plots, Cont...**  $T_a = 25^\circ\text{C}$  (unless otherwise specified)


**AD4C333 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:

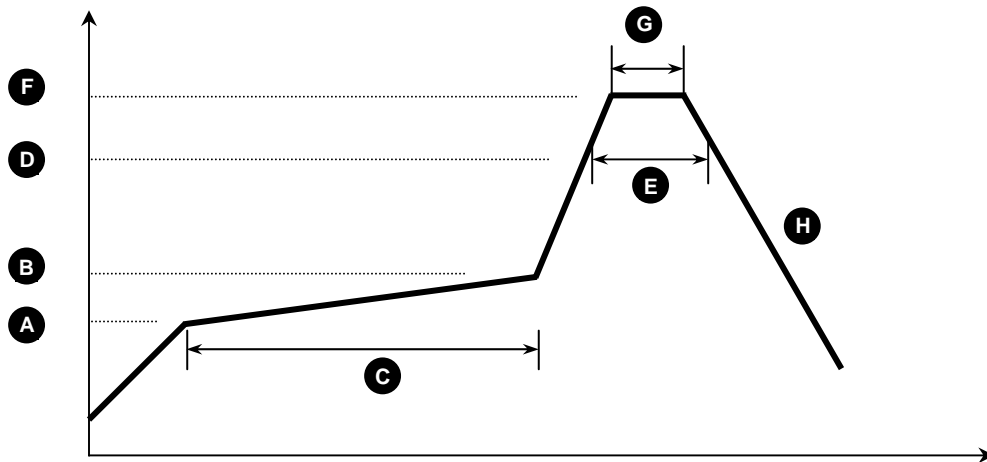


Figure 1

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

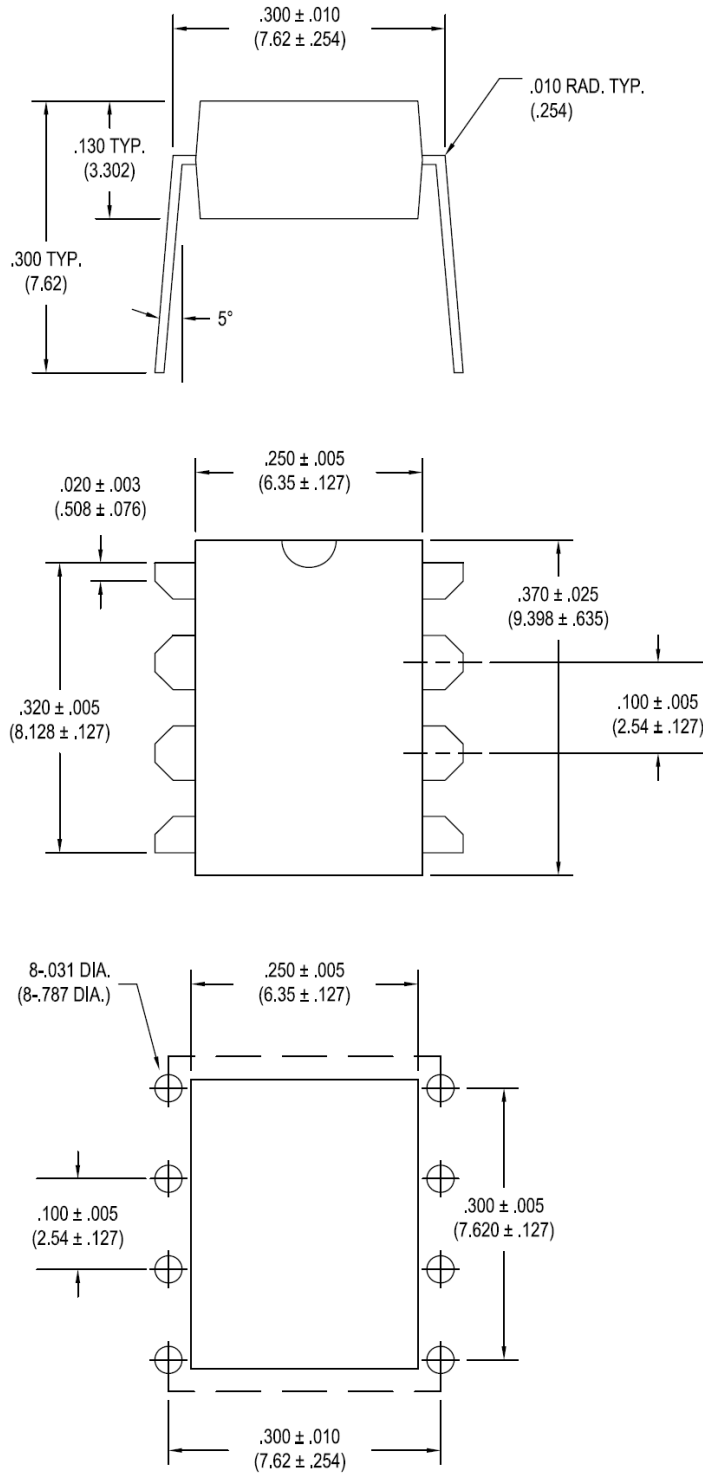
**(3) Hand Solder:**

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

**AD4C333 Package Dimensions**

8 PIN DIP Package

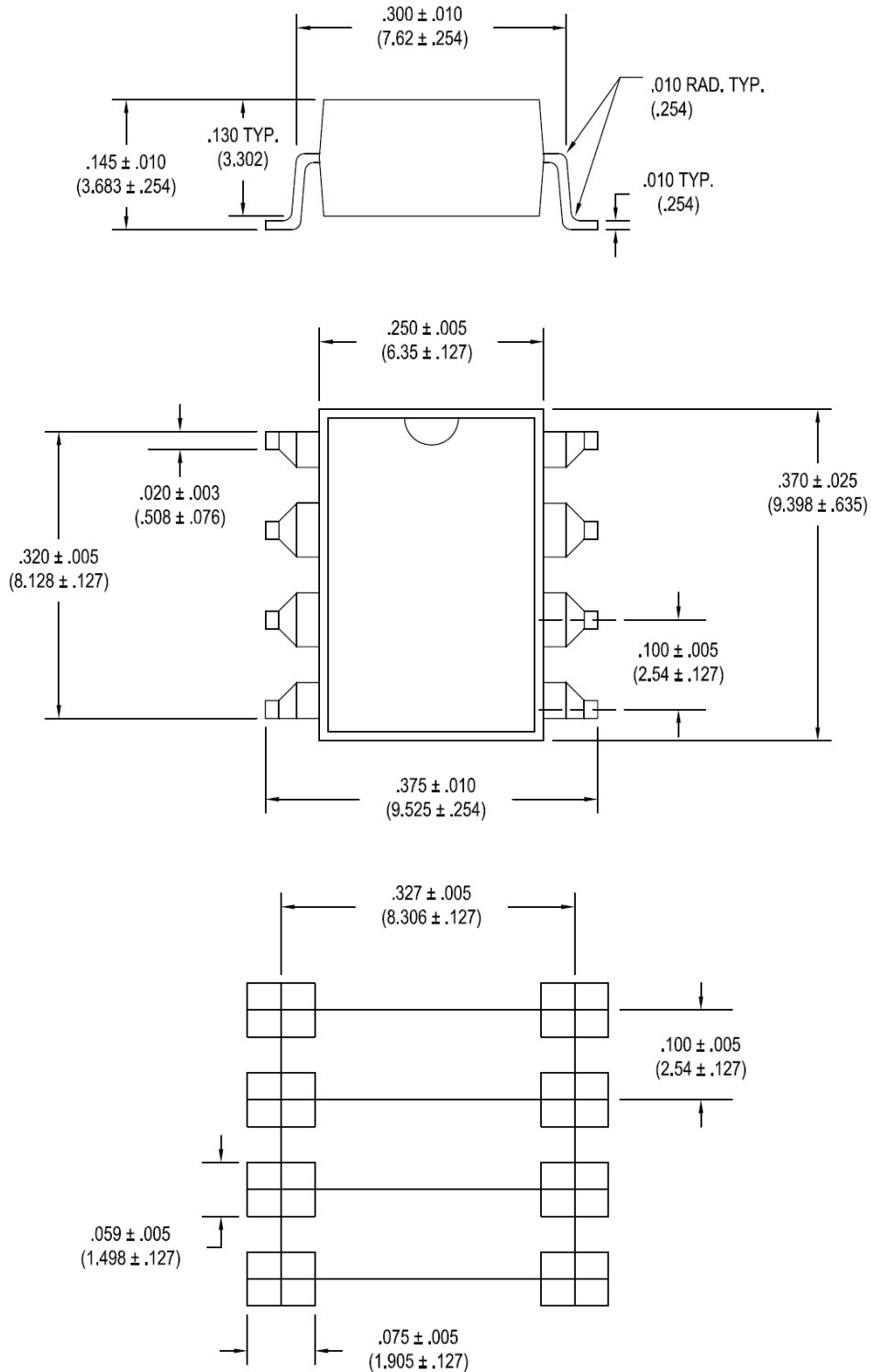
**Note:** All dimensions in inches [""] with millimeters in parenthesis ( )



**AD4C333 Package Dimensions**

8 PIN SMD Surface Mount Package (-S)

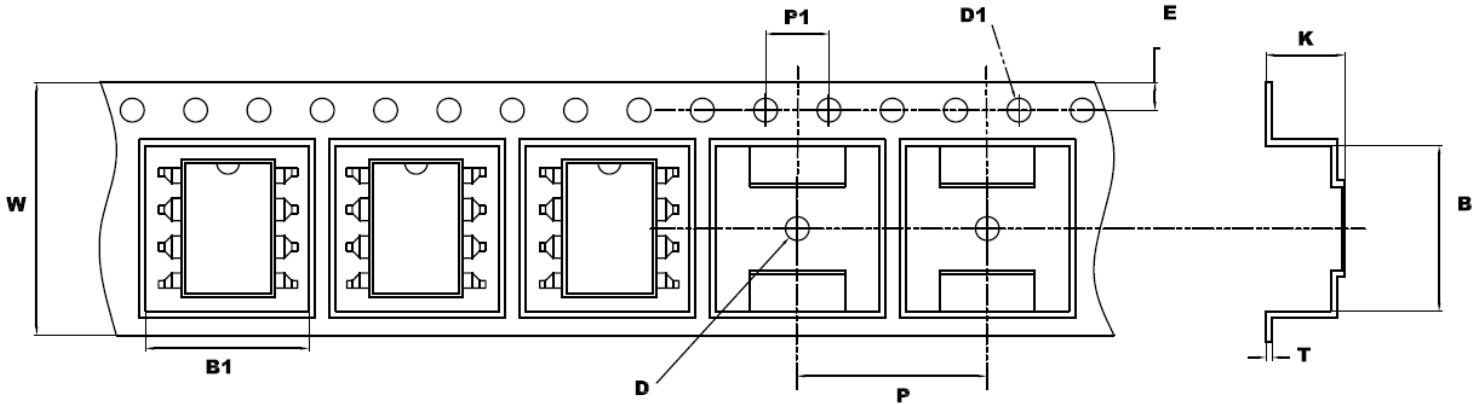
**Note:** All dimensions in inches ["] with millimeters in parenthesis ( )



**AD4C333 Package Dimensions**

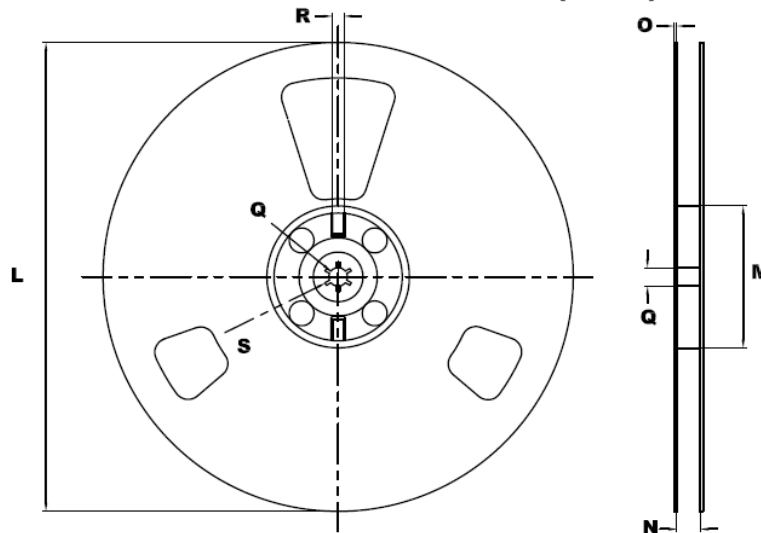
8 PIN SMD Tape &amp; Reel (-STR)

**Note:** All dimensions in millimeters

**Outline and Dimension (Tape)**


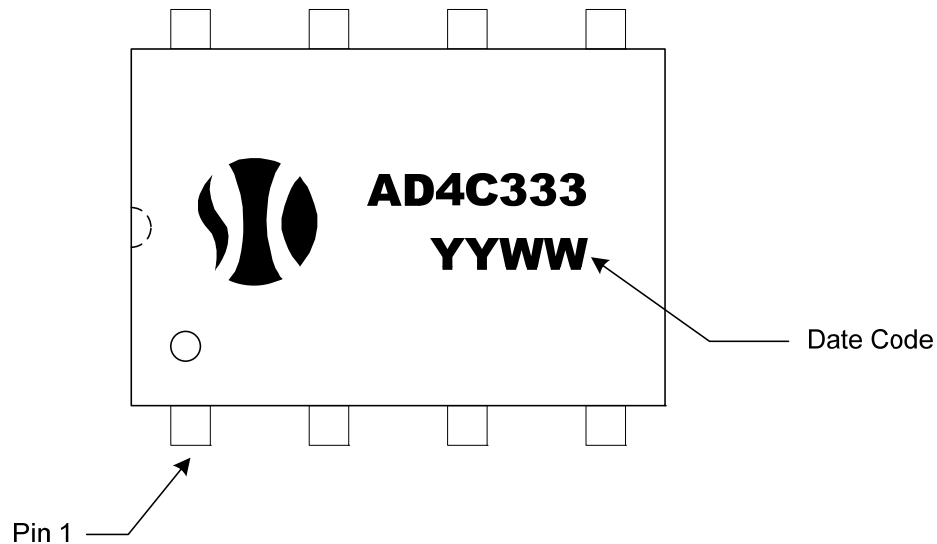
Direction of Feed →

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

**Outline and Dimensions (Reel)**

**Packaging: 1,000 pcs / reel**

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



**AD4C333 Package Marking**

**AD4C333 Package Weights**

Device	Single Unit	Full Tube (50pcs)	Full Pouch (10 tubes)	Full Reel (1000pcs)
AD4C333-(H)	0.54	48	490	-
AD4C333-(H)S	0.53	46	470	-
AD4C333-(H)STR	0.53	-	-	952

**Note:** All weights above are in GRAMS, and include packaging materials where applicable

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