SOLID STATE OPTRONICS

SLC1600

Dual Channel
Linear Optocoupler

Description

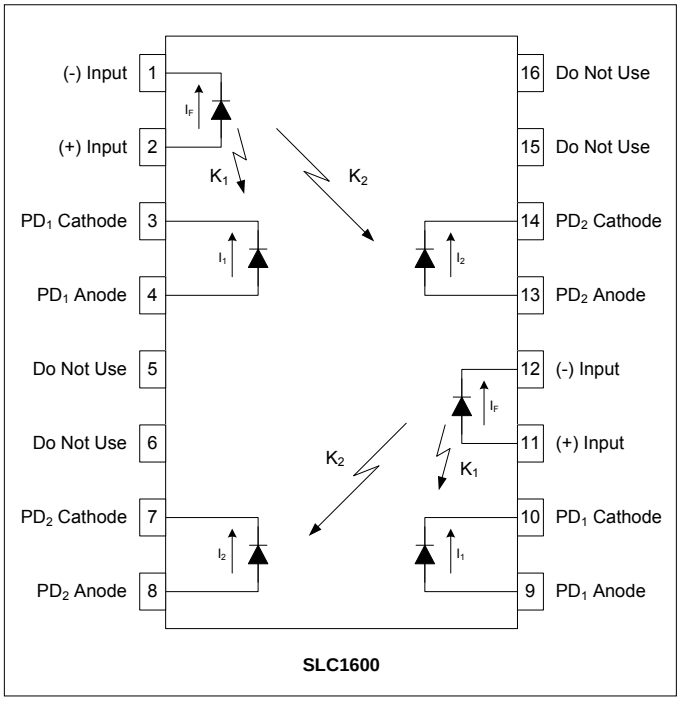
The SLC1600 combines two highly advanced linear optocouplers in one compact 16 pin SOIC package. This device takes advantage of highly matched transistors used for both a Servo Feedback Loop and a Forward Output Loop. The closely matched transistors provide a high degree of linearity across a wide range of input signal variation. These features make the SLC1600 an ideal product for transformer replacement in many medical, industrial and power supply isolation circuits. Its small size makes the SLC1600 quite attractive for telecom applications in which board space is limited.

The SLC1600 comes standard in a 16 SOIC package.

Applications

- Power Supply Feedback
- Transformer Replacement
- Audio Signal Interface
- Digital Telephone Isolation

Schematic Diagram



SLC1600

Features

- Two Linear Optocouplers in compact 16 SOIC package
- High servo linearity (K3) across temperature
- Low input power consumption
- High Isolation Voltage (1500V_{RMS})
- Long Life / High stability / 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	40mA
Transient Input Current	400mA
Reverse Input Control Voltage	6V
Input Power Dissipation	70mW
Total Power Dissipation	500mW
Solder Temperature – Wave (10sec)	260°C
Solder Temperature – IR Reflow (10sec)	260°C

Ordering Information

Part Number	Description
SLC1600	16 pin SOIC, (46/Tube)
SLC1600TR	16 pin SOIC, Tape and Reel (1000/Reel)

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

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SLC1600/TR
Rev 2.01 (09/17/2012)
001528

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	6	-	-	V	I_R = 10µA
Terminal Capacitance	C_t	-	30	250	pF	V=0, f=1KHz
Reverse Current	I_R	-	-	10	µA	V_R=6V
Coupled Specifications						
K1 Servo Gain (I_1/I_F)	K1	0.001	0.002	0.01	n/a	I_F=0.3-1.0mA
K1 Servo Gain (I_1/I_F)	K1	0.002	0.004	0.01	n/a	I_F=1-10mA
K2 Forward Gain (I_2/I_F)	K2	0.001	0.002	0.01	n/a	I_F=0.3-1.0mA
K2 Forward Gain (I_2/I_F)	K2	0.002	0.004	0.01	n/a	I_F=1-10mA
K3 Transfer Gain (K_2/K_1)	K3	0.98	1.00	1.02	n/a	I_F=0.3-10mA
Transfer Gain Linearity	ΔK3	-	0.07	0.1	%	I_F=0.3-10mA
Photo-Conductive Operation						
Frequency Response (-3dB)	-	-	140	-	kHz	I_F=10mA, ΔV=2V
Phase Response	-	-	-45	-	DEG	f=140kHz
Isolation Specifications						
Isolation Voltage	V_{ISO}	1500	-	-	V_{RMS}	RH ≤ 50%, t=1min
Input-Output Resistance	R_{I-O}	-	10^{12}	-	Ω	V_{I-O} = 500V_{DC}

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SLC1600 Performance & Characteristics Plots, T_A = 25°C (unless otherwise specified)

Figure 1: *Typical K_1 (5mA) Distribution*
(N = 100, T_a = 25ºC)

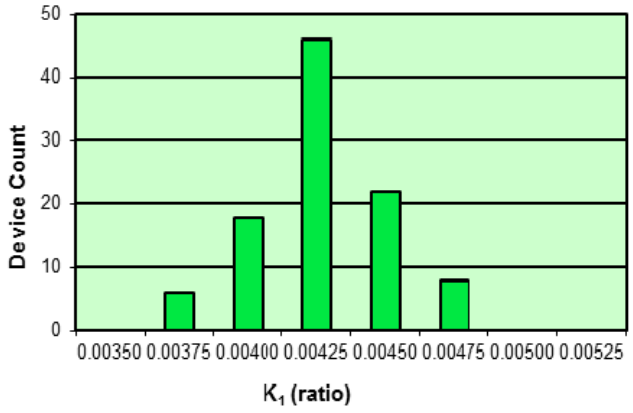


Figure 2: *Typical K_1 (10mA) Distribution*
(N = 100, T_a = 25ºC)

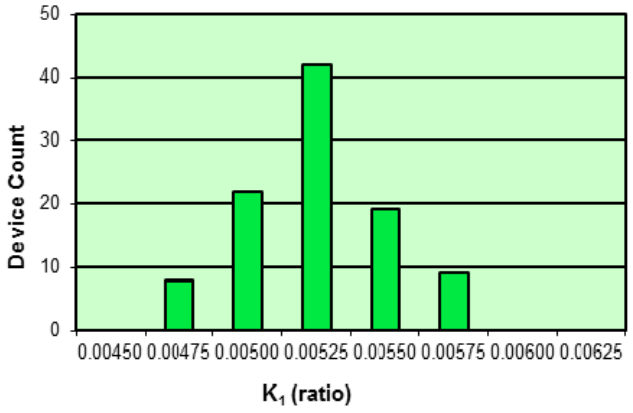


Figure 3: *Typical K_2 (5mA) Distribution*
(N = 100, T_a = 25ºC)

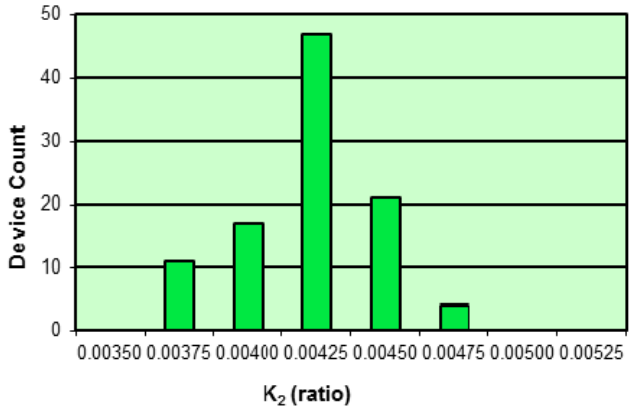


Figure 4: *Typical K_2 (10mA) Distribution*
(N = 100, T_a = 25ºC)

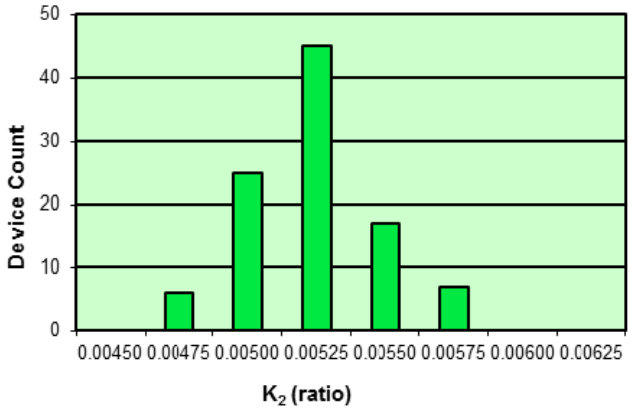


Figure 5: *Typical K_3 Transfer Gain Distribution*
(N = 100, T_a = 25ºC)

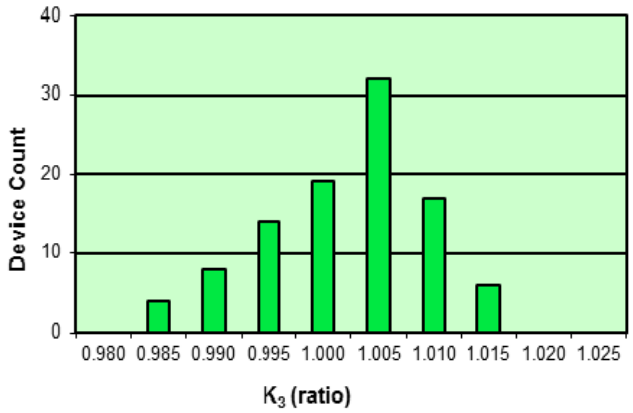
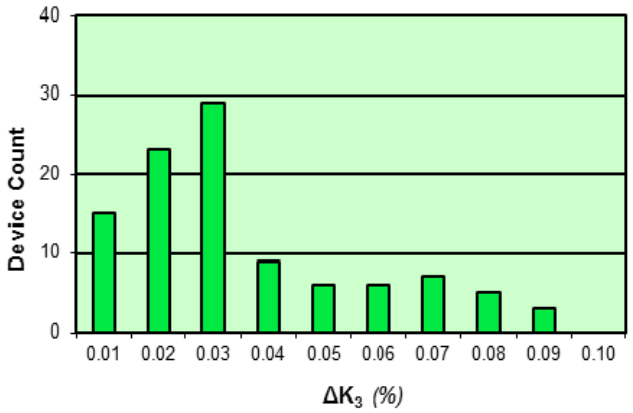


Figure 6: *Typical ΔK_3 Distribution*
(N = 100, T_a = 25ºC)

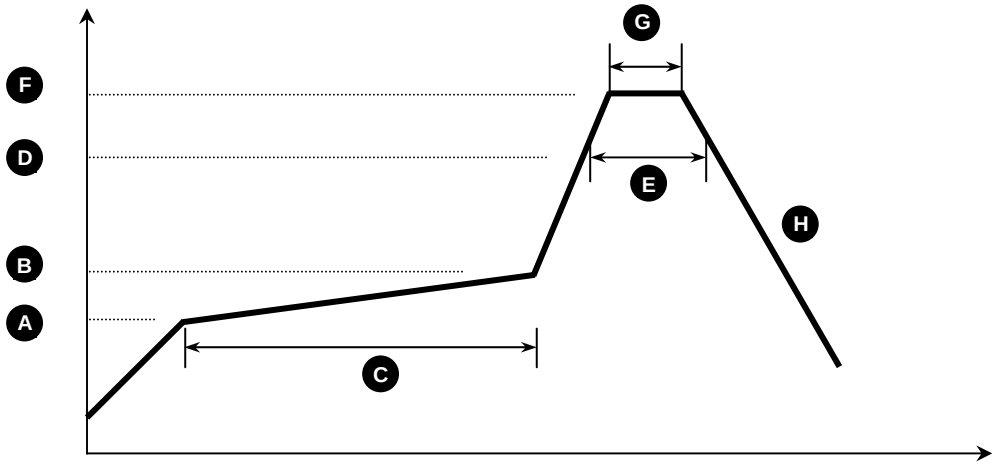


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SLC1600 Solder Reflow Temperature Profile Recommendations

(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:



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:*

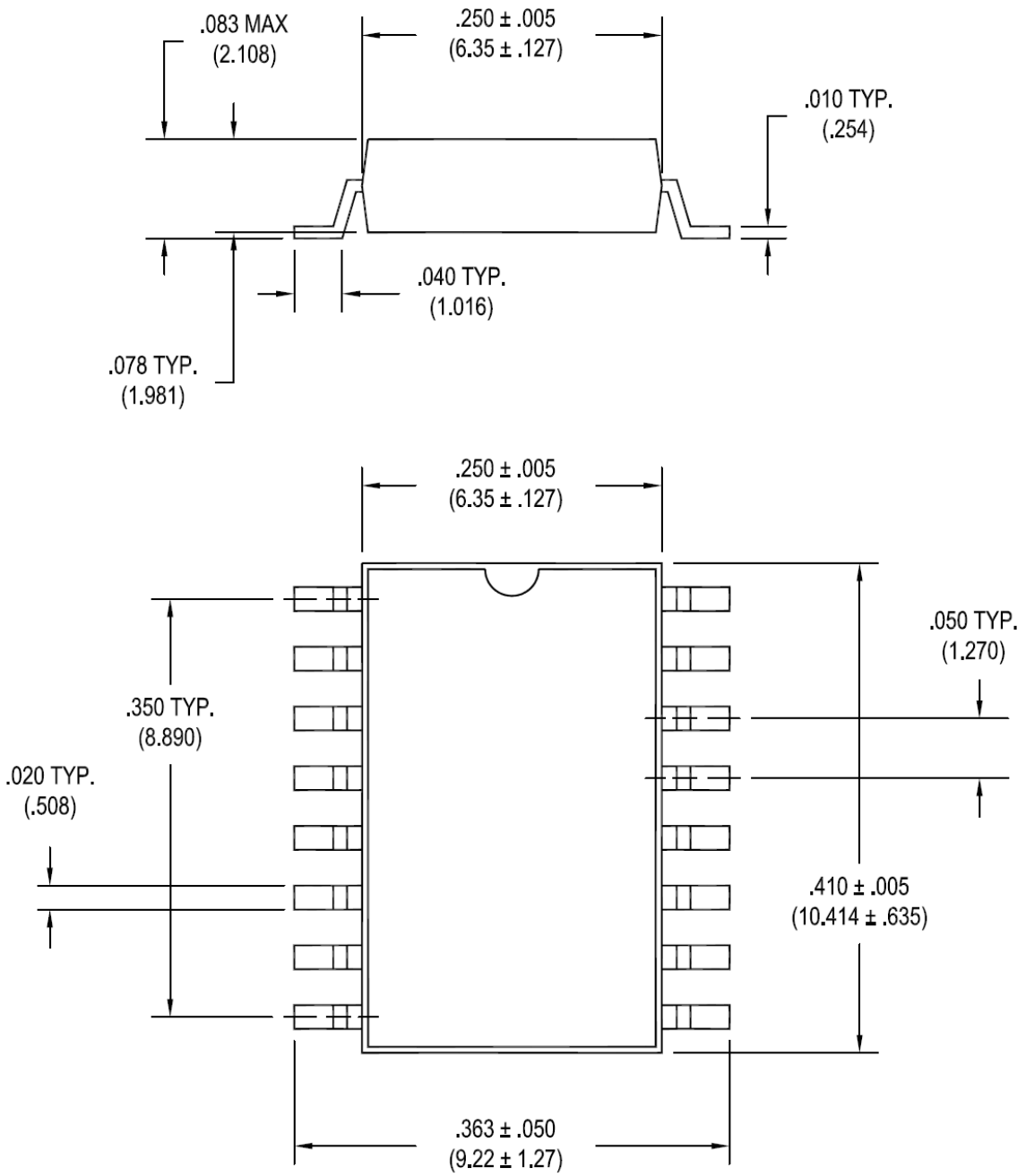
Maximum Temperature:	350ºC (at tip of soldering iron)
Maximum Time:	3s
Single Occurrence	

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SLC1600 Package Dimensions

16 PIN SOIC Package

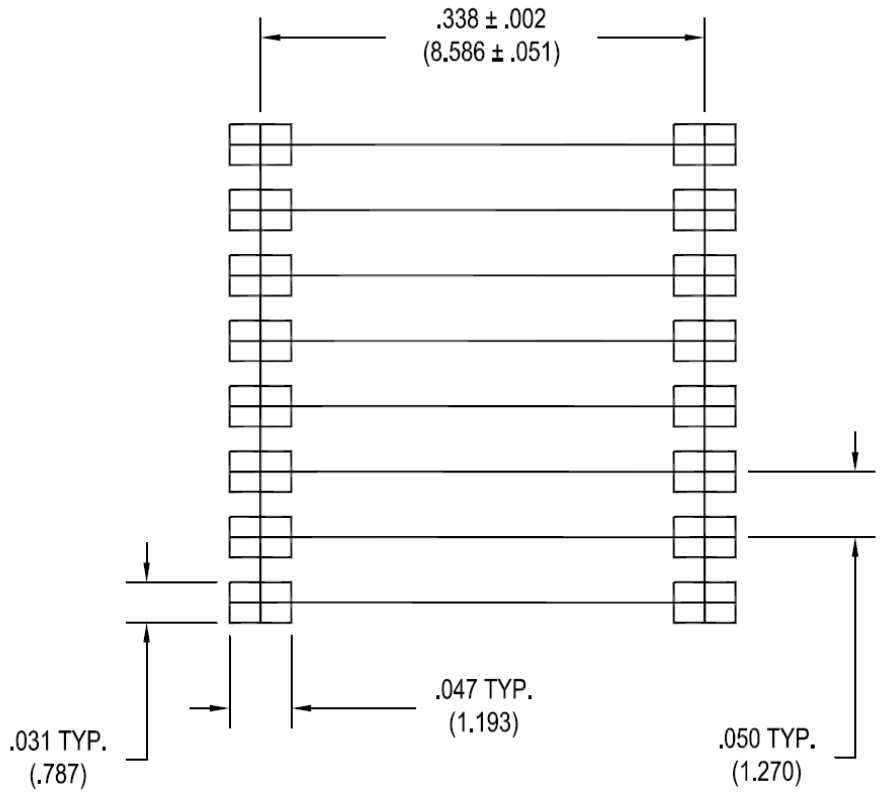
Note: *All dimensions in inches ["] with millimeters in parenthesis (mm)*



SLC1600 Package Dimensions

16 PIN SOIC Footprint

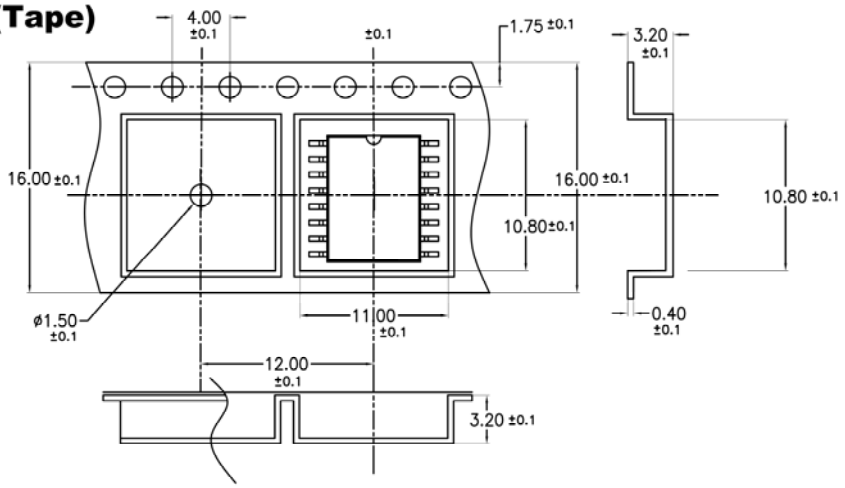
Note: *All dimensions in inches ["] with millimeters in parenthesis (mm)*



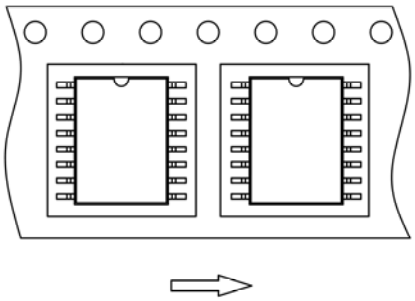
SLC1600 Package Dimensions

TAPING SPECIFICATIONS (in millimeters)

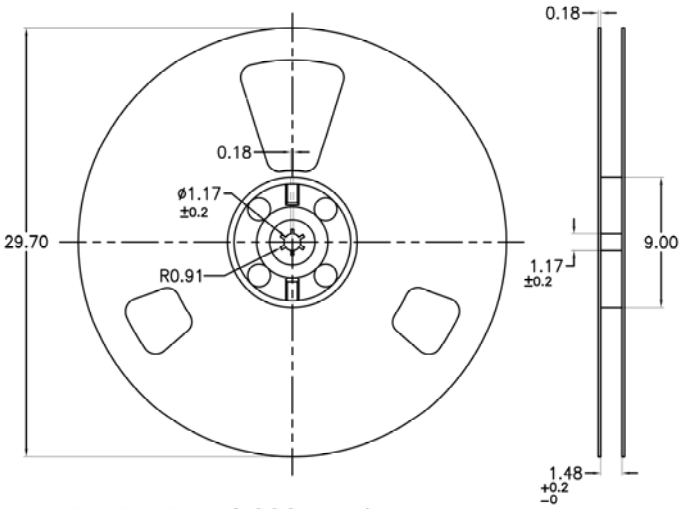
Outline and Dimension (Tape)



Parts Orientation and Tape Direction

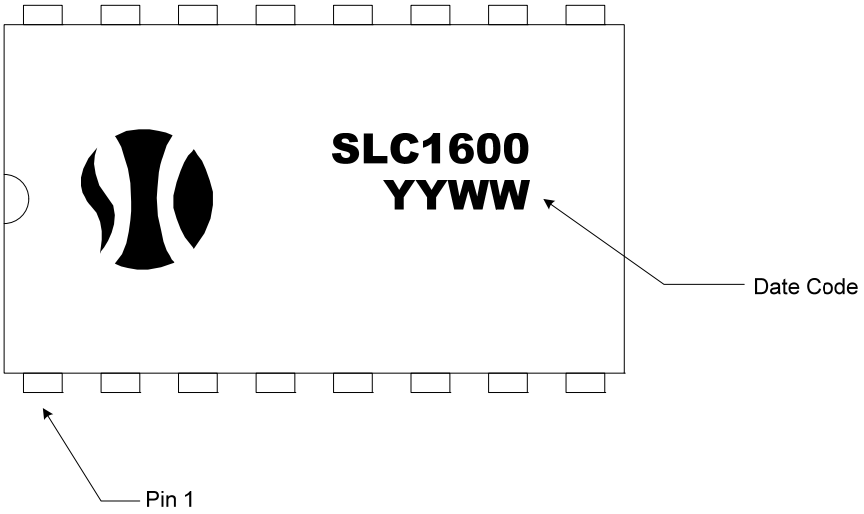


Outline and Dimensions (Reel)



Packaging: 1,000 pcs / reel

SLC1600 Package Marking



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