SOLID STATE OPTRONICS

SLC800

Single Channel
Linear Optocoupler

Description

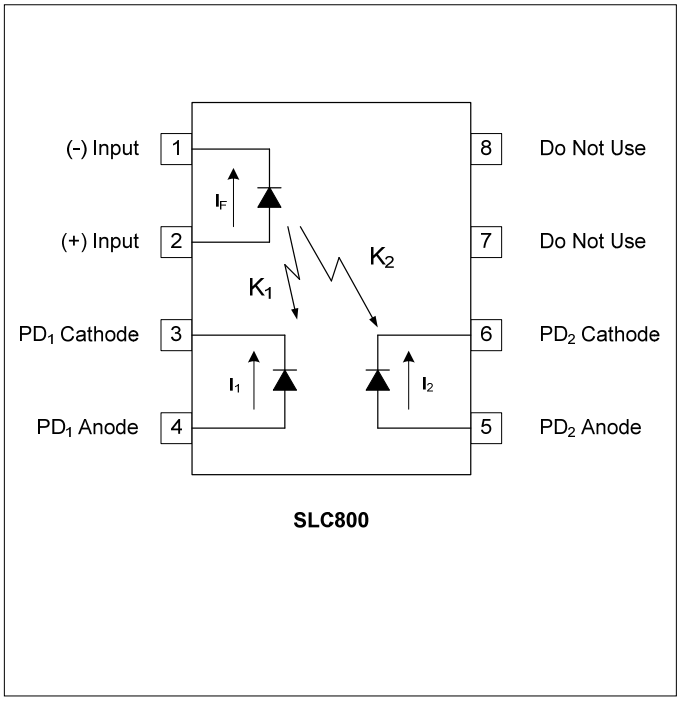
The SLC800 is a highly advanced linear optocoupler device. The product takes advantage of highly matched transistors used for both a Servo Feedback Loop and a Forward Output Loop. The closely matched transistors provide a high degree of linearity across a wide range of input signal variation. These features make the SLC800 an ideal product for transformer replacement in many medical, industrial and power supply isolation circuits. Its small size makes the SLC800 quite attractive for telecom applications in which board space is limited.

The SLC800 comes standard in a miniature 8 pin DIP package.

Applications

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

Schematic Diagram



SLC800

Features

- High Isolation Voltage (1500V_{RMS})
- Low Input Power Consumption
- High Servo Linearity Across Temperature
- 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.....40mA
Transient Input Current 400mA
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
SLC800	8 pin DIP, (50/Tube)
SLC800-S	8 pin SMD, (50/Tube)
SLC800-STR	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°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}

SLC800 Performance & Characteristics Plots, T_A = 25°C (unless otherwise specified)

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

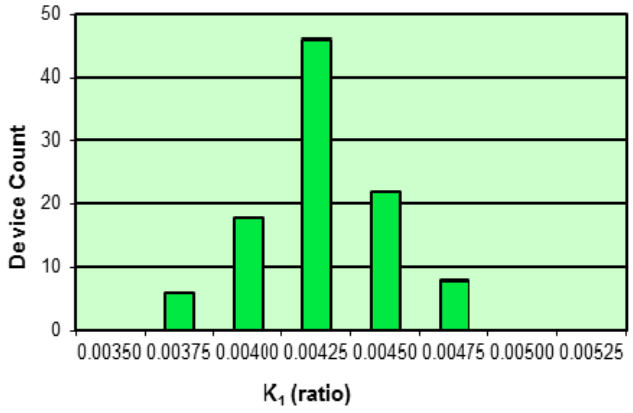


Figure 2: *Typical K_1 (10mA) Distribution*
(N = 100, T_a = 25ºC)

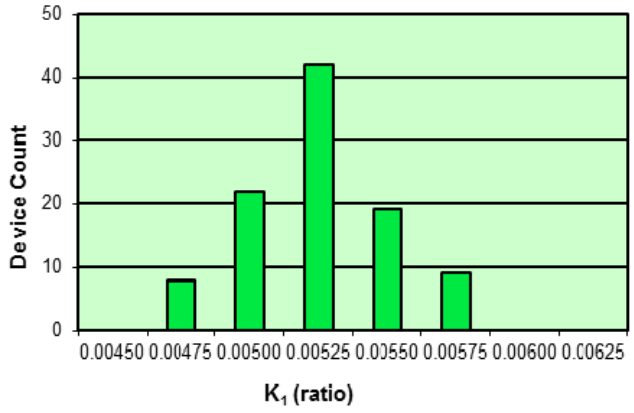


Figure 3: *Typical K_2 (5mA) Distribution*
(N = 100, T_a = 25ºC)

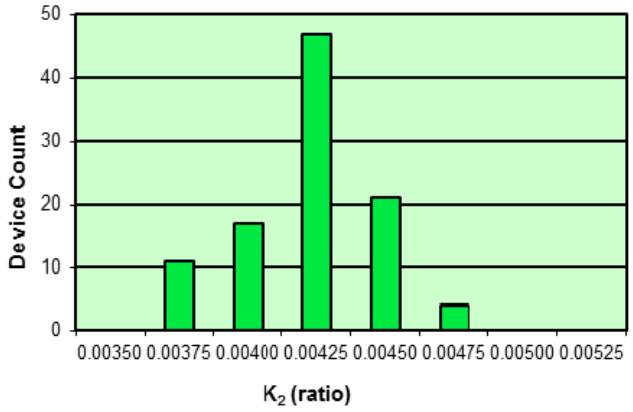


Figure 4: *Typical K_2 (10mA) Distribution*
(N = 100, T_a = 25ºC)

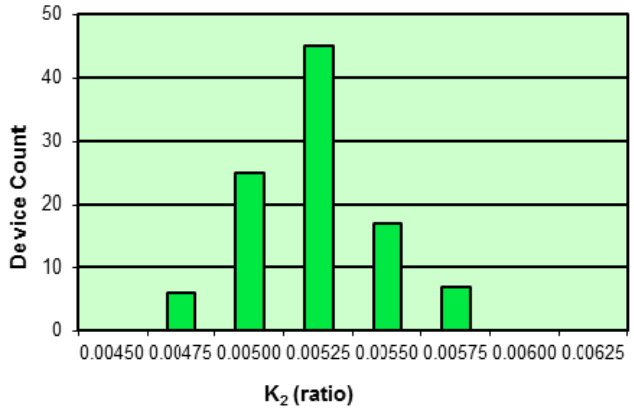


Figure 5: *Typical K_3 Transfer Gain Distribution*
(N = 100, T_a = 25ºC)

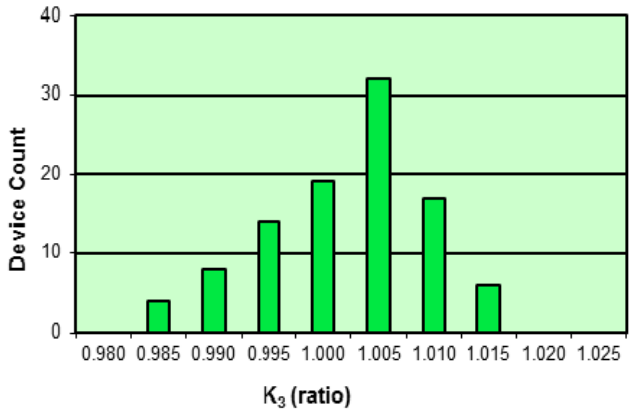
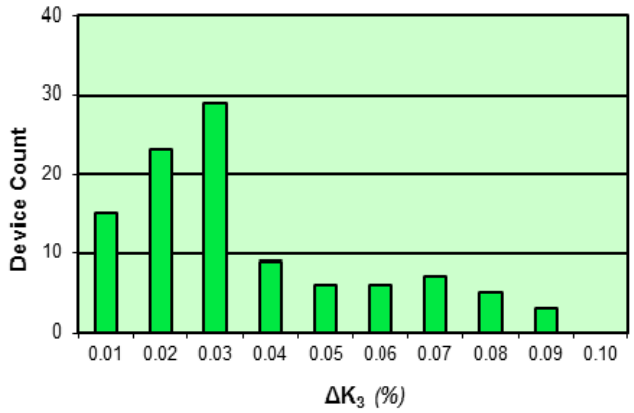


Figure 6: *Typical ΔK_3 Distribution*
(N = 100, T_a = 25ºC)



SLC800 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:

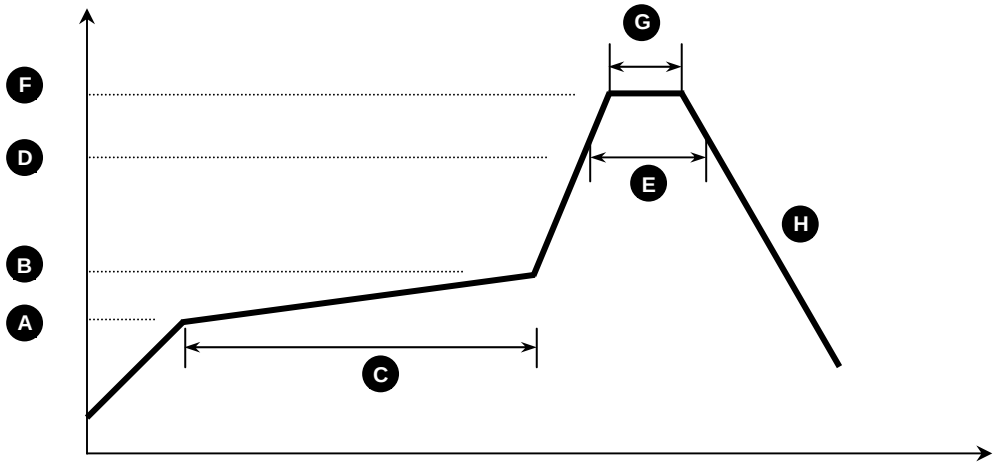


Figure 1

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	

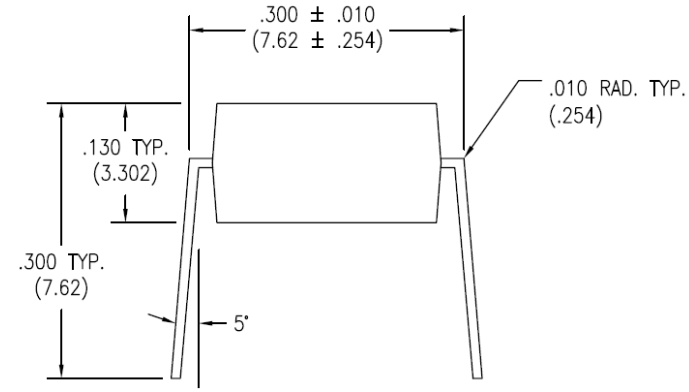
(3) *Hand Solder:*

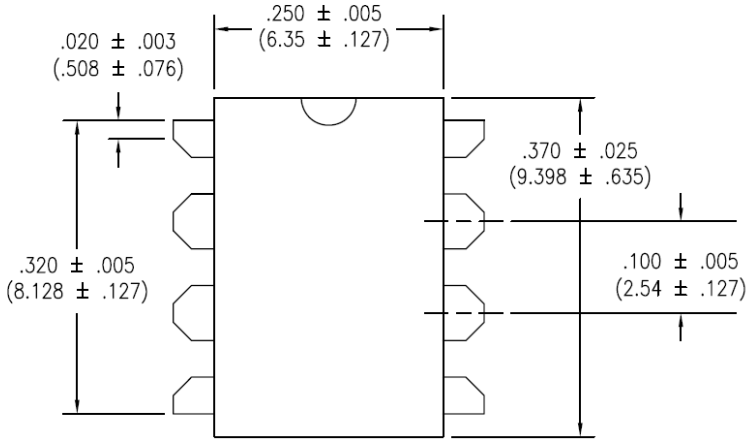
Maximum Temperature:	350ºC (at tip of soldering iron)
Maximum Time:	3s
Single Occurrence	

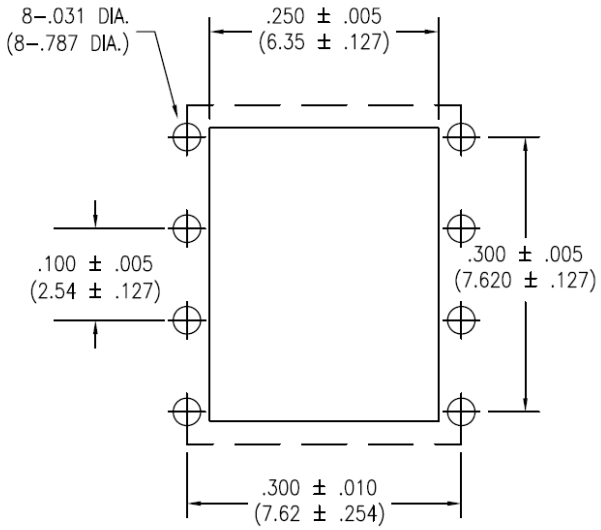
SLC800 Package Dimensions

8 PIN DIP Package

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





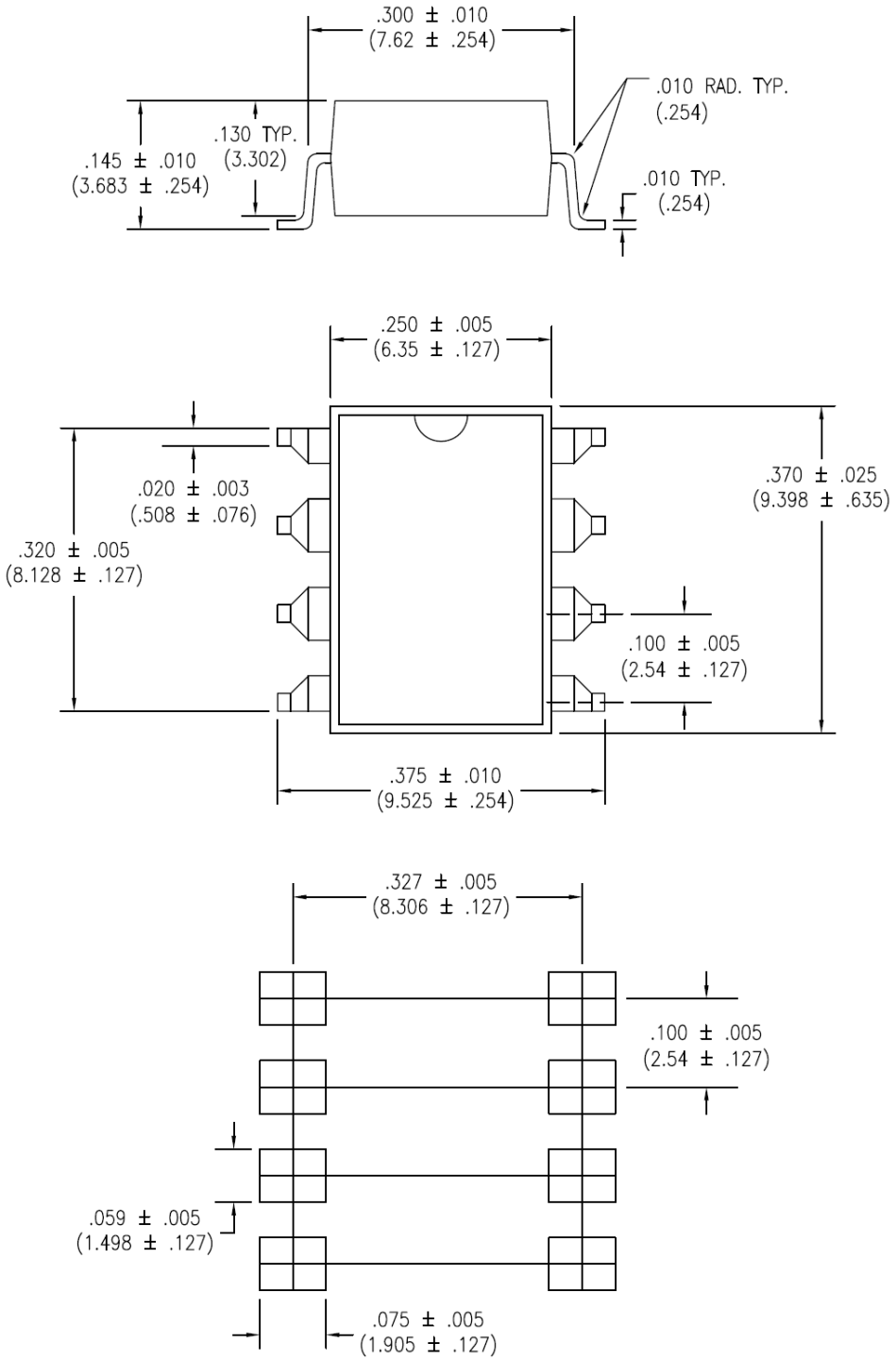


SLC800Package Dimensions

8 PIN SMD Surface Mount Package (-S)

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

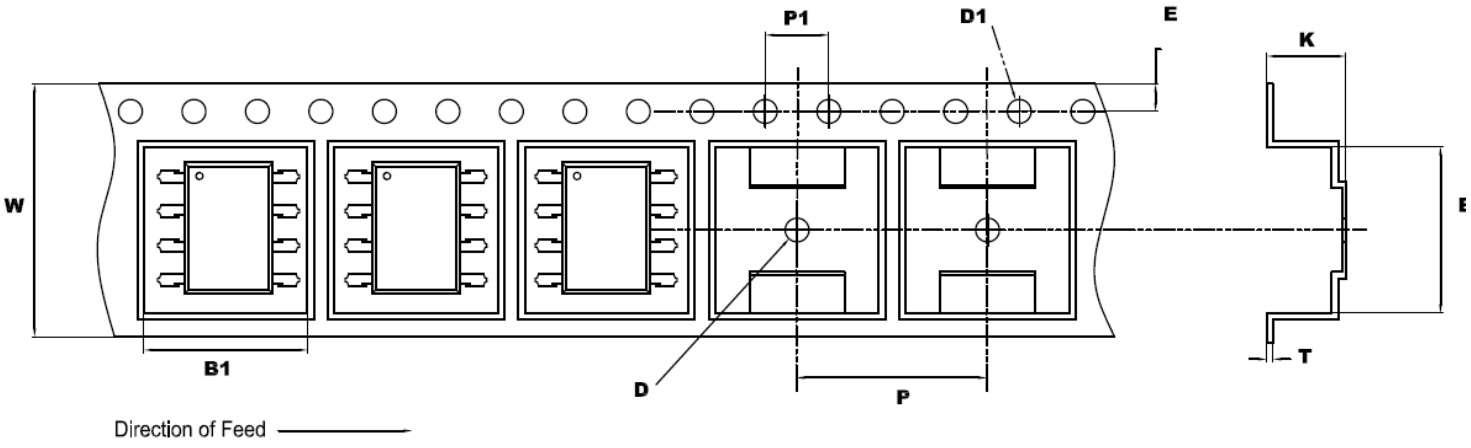
Device Weight: 0.45g



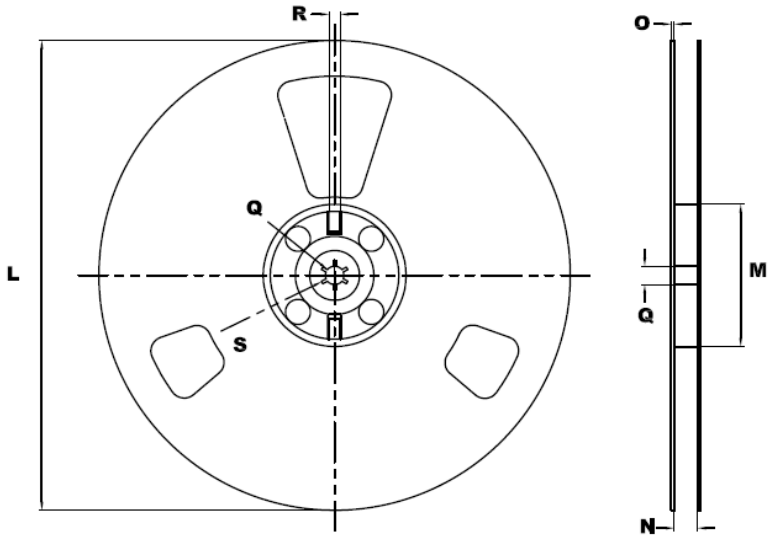
SLC800 Package Dimensions

8 PIN SMD Tape & Reel (-STR)

Note: *All dimensions in millimeters*

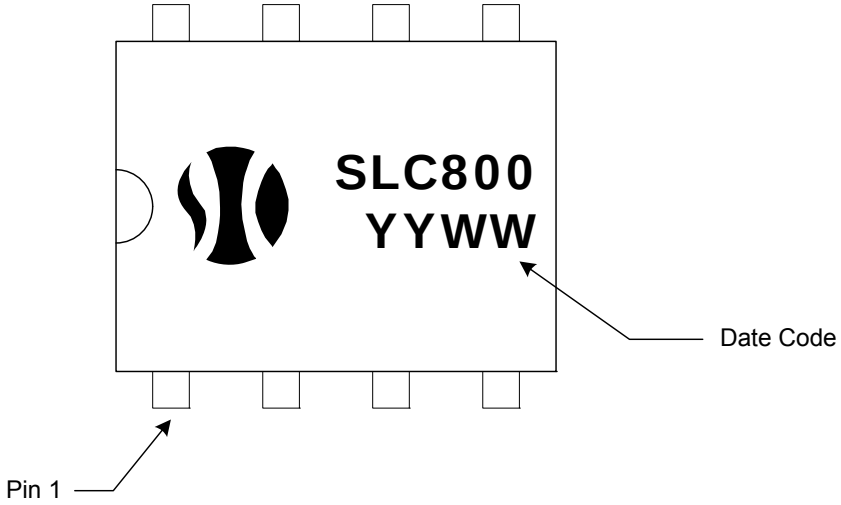


W	B	B1	P	P1	K	E	T	D	D1
16.00 ±0.1	10.50 ±0.1	10.30 ±0.1	12.00 ±0.1	4.00 ±0.1	5.00 ±0.1	1.75 ±0.1	0.40 ±0.1	1.50 ±0.1	1.50 ±0.1



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

SLC800 Package Marking



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