



## Description

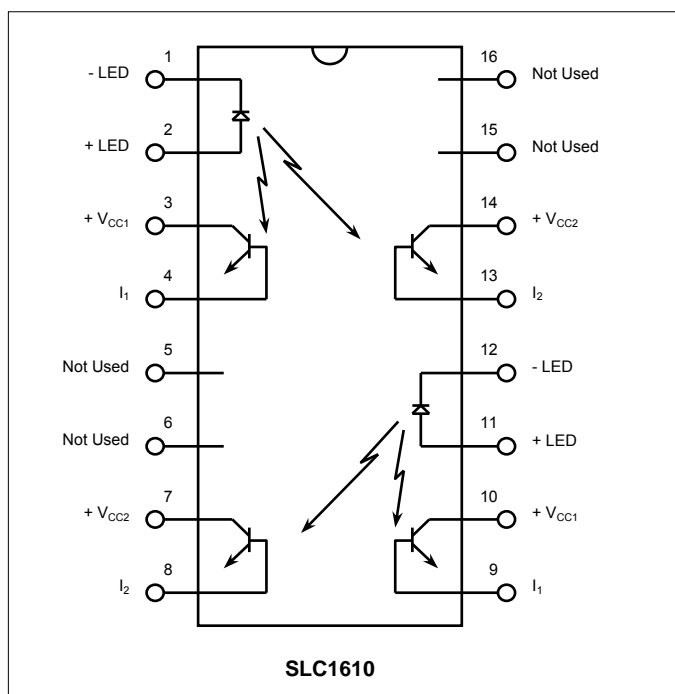
The SLC1610 is an advanced linear optocoupler device. The product takes advantage of highly matched transistors used for both a Servo Feedback Loop and a Forward Output Loop. The closely matched transistors provide a high degree of linearity across a wide range of input signal variation. These features make the SLC1610 an ideal product for transformer replacement in many medical, industrial and power supply isolation circuits. Its small size makes the SLC1610 quite attractive for telecom applications in which board space is limited.

The SLC1610 comes standard in a 16 SOIC package.

## Applications

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

## Schematic Diagram



## Features

- Two Linear Optocouplers in compact 16 SOIC package
- High servo linearity across temperature
- Low input power consumption
- High stability
- High Isolation Voltage (2500V<sub>RMS</sub>)
- 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 .....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

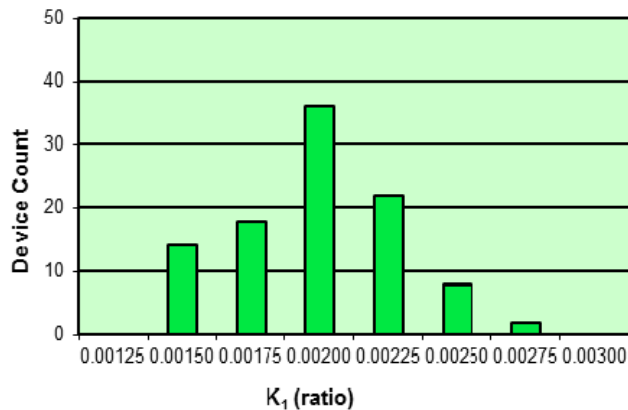
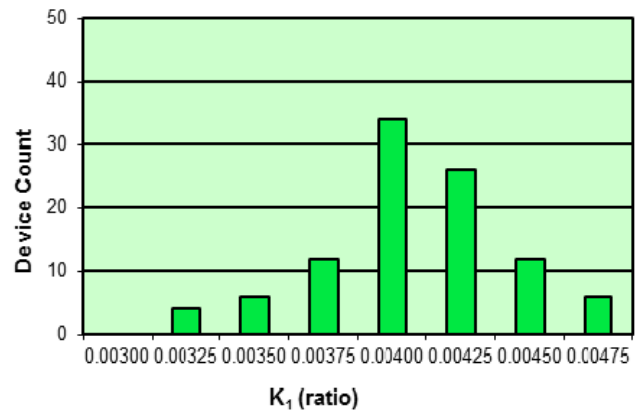
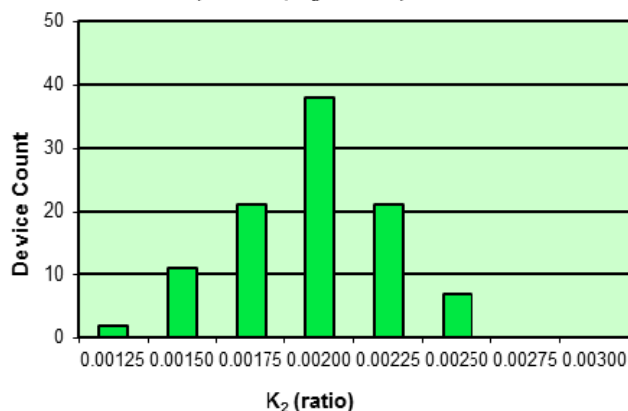
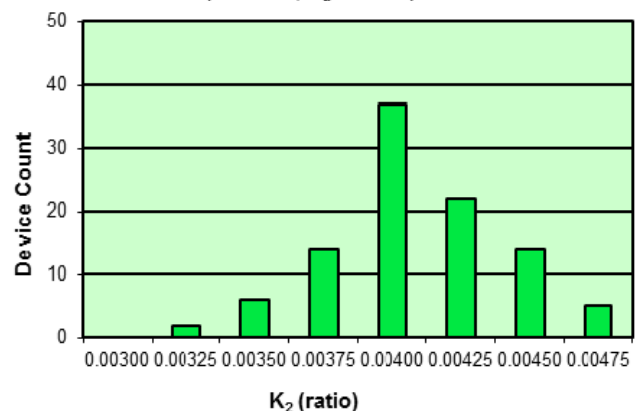
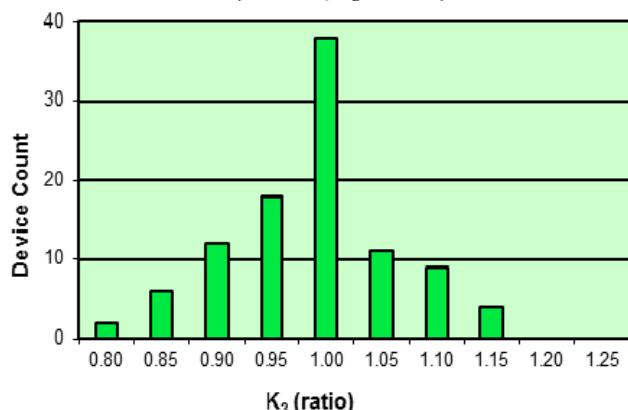
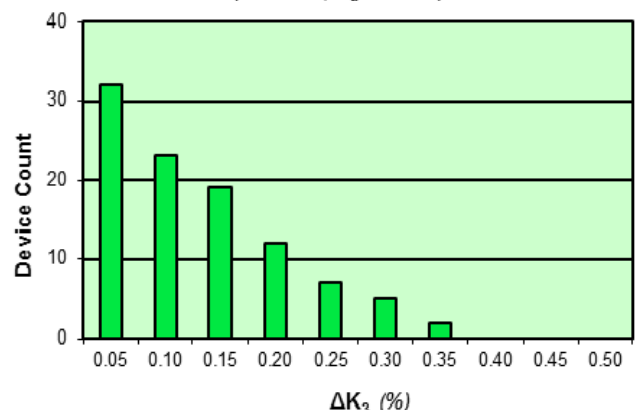
## Ordering Information

Part Number	Description
SLC1610	16 pin SOIC, (46/Tube)
SLC1610-TR	16 pin SOIC, 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)**

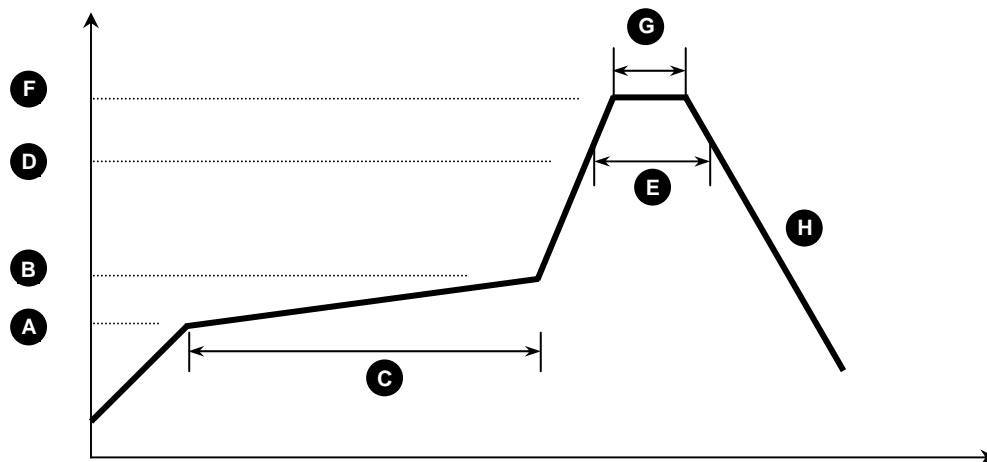
Parameter	Symbol	Min.	Typ.	Max.	Units	Test Conditions
<b>Input Specifications</b>						
LED Forward Voltage	$V_F$	-	1.2	1.4	V	$I_F = 10\text{mA}$
LED Reverse Voltage	$BV_R$	6	-	-	V	$I_R = 10\mu\text{A}$
Terminal Capacitance	$C_t$	-	30	250	pF	$V=0, f=1\text{KHz}$
Reverse Current	$I_R$	-	-	10	$\mu\text{A}$	$V_R=5\text{V}$
<b>Coupled Specifications</b>						
K1 Servo Gain ( $I_1/I_F$ )	K1	0.0015	0.005	0.01	n/a	$I_F=1-10\text{mA}, V_{CC}=15\text{V}$
K2 Forward Gain ( $I_2/I_F$ )	K2	0.0015	0.005	0.01	n/a	$I_F=1-10\text{mA}, V_{CC}=15\text{V}$
K3 Transfer Gain ( $K_2/K_1$ )	K3	0.83	1.00	1.17	n/a	$I_F=1-10\text{mA}, V_{CC}=15\text{V}$
Transfer Gain Linearity	$\Delta K3$	-	-	0.10	%	$I_F=1-10\text{mA}, V_{CC}=15\text{V}$
<b>Photo-Conductive Operation</b>						
Frequency Response (-3dB)	-	-	140	-	kHz	$I_F=10\text{mA}, \Delta V=2\text{V}$
Phase Response	-	-	-45	-	DEG	$f=140\text{kHz}$
<b>Isolation Specifications</b>						
Isolation Voltage	$V_{ISO}$	2500	-	-	$V_{RMS}$	$RH \leq 50\%, t=1\text{min}$
Input-Output Resistance	$R_{I-O}$	-	$10^{12}$	-	$\Omega$	$V_{I-O} = 500V_{DC}$

**SLC1610 Performance & Characteristics Plots,  $T_A = 25^\circ\text{C}$  (unless otherwise specified)**
**Figure 1: Typical  $K_1$  (5mA) Distribution**  
 (N = 100,  $T_A = 25^\circ\text{C}$ )

**Figure 2: Typical  $K_1$  (10mA) Distribution**  
 (N = 100,  $T_A = 25^\circ\text{C}$ )

**Figure 3: Typical  $K_2$  (5mA) Distribution**  
 (N = 100,  $T_A = 25^\circ\text{C}$ )

**Figure 4: Typical  $K_2$  (10mA) Distribution**  
 (N = 100,  $T_A = 25^\circ\text{C}$ )

**Figure 5: Typical  $K_3$  Transfer Gain Distribution**  
 (N = 100,  $T_A = 25^\circ\text{C}$ )

**Figure 6: Typical  $\Delta K_3$  Distribution**  
 (N = 100,  $T_A = 25^\circ\text{C}$ )


## SLC1610 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 250°C:



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:

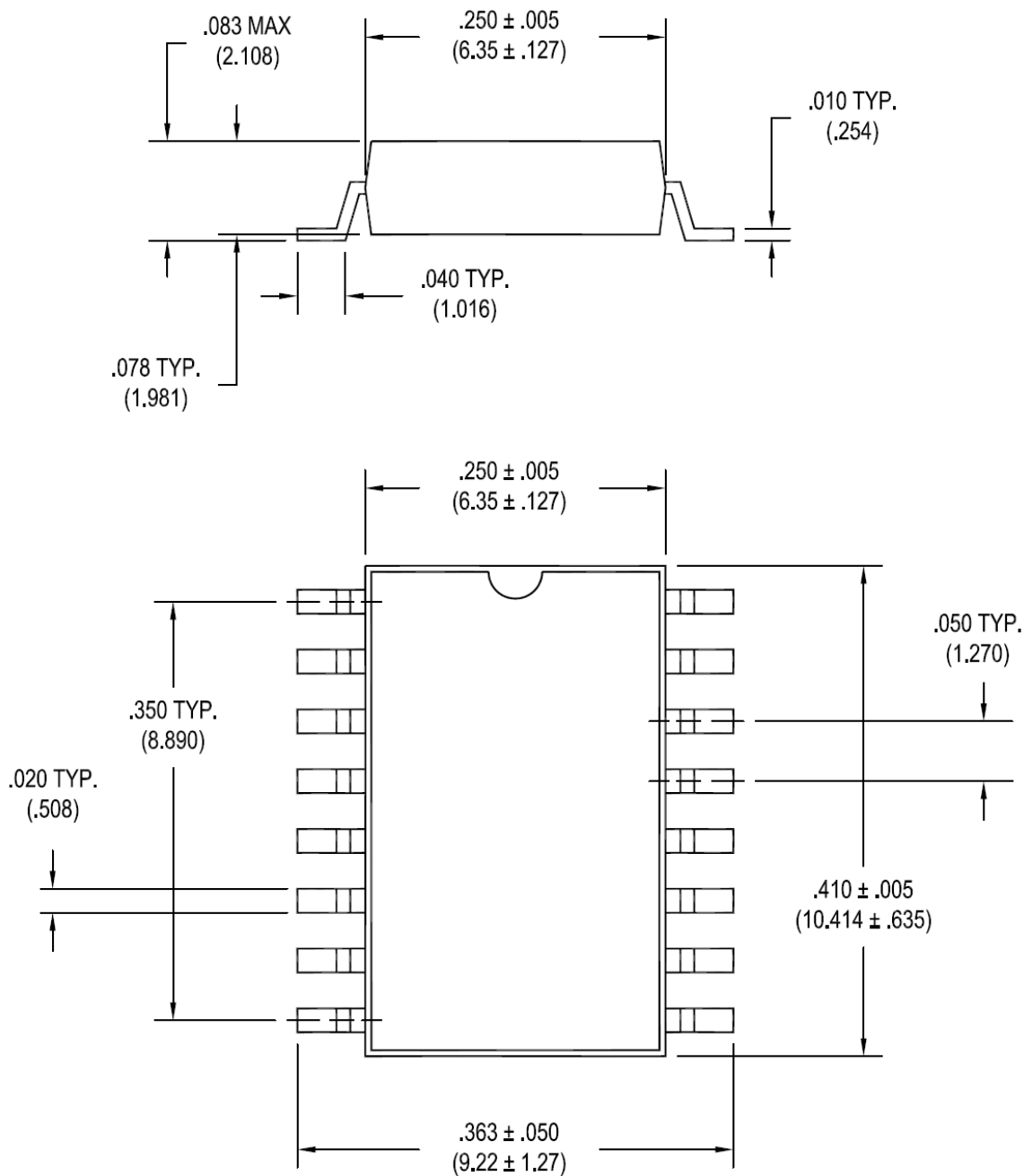
Maximum Temperature: 260°C (at terminal)  
 Maximum Time: 10s  
 Pre-heating: 100 - 150°C (30 - 90s)  
 Single Occurrence

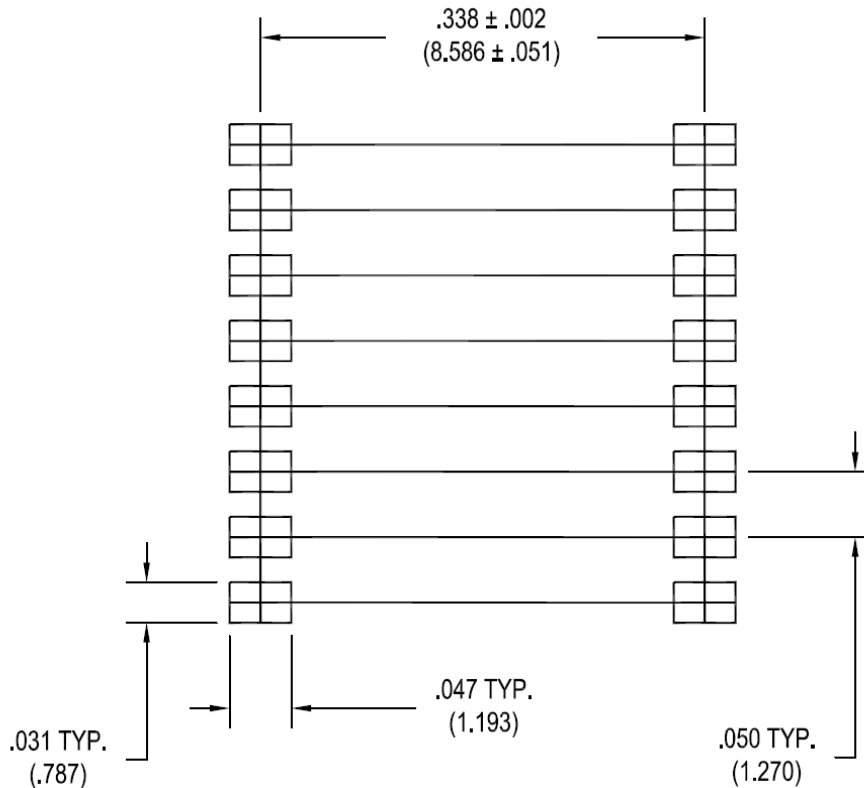
### (3) Hand Solder:

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

**SLC1610 Package Dimensions**

16 PIN SOIC Package

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


**SLC1610 Package Dimensions***16 PIN SOIC Footprint***Note:** All dimensions in inches ["] with millimeters in parenthesis (mm)

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