SOLID STATE OPTRONICS



SLC1610

Dual Channel
Linear Optocoupler

Description

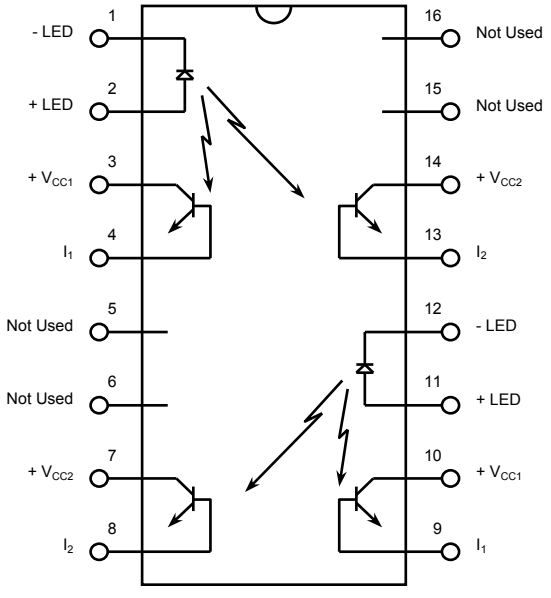
The SLC1610 is an advanced linear optocoupler device. The product takes advantage of highly matched transistors used for both a Servo Feedback Loop and a Forward Output Loop. The closely matched transistors provide a high degree of linearity across a wide range of input signal variation. These features 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



SLC1610

Features

- Two Linear Optocouplers in compact 16 SOIC package
- High servo linearity across temperature
- Low input power consumption
- High stability
- High Isolation Voltage (2500V_{RMS})
- 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

© 2012 Solid State Optronics • San José, CA
www.ssousa.com • +1.408.293.4600

SLC1610/TR
Rev 2.00 (03/23/2012)

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	1.4	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=5V
Coupled Specifications						
K1 Servo Gain (I_1/I_F)	K1	0.0015	0.005	0.01	n/a	I_F=1-10mA, V_{CC}=15V
K2 Forward Gain (I_2/I_F)	K2	0.0015	0.005	0.01	n/a	I_F=1-10mA, V_{CC}=15V
K3 Transfer Gain (K_2/K_1)	K3	0.83	1.00	1.17	n/a	I_F=1-10mA, V_{CC}=15V
Transfer Gain Linearity	ΔK3	-	-	0.10	%	I_F=1-10mA, V_{CC}=15V
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}	2500	-	-	V_{RMS}	RH ≤ 50%, t=1min
Input-Output Resistance	R_{I-O}	-	10^{12}	-	Ω	V_{I-O} = 500V_{DC}

© 2012 Solid State Optronics • San José, CA

SLC1610 Performance & Characteristics Plots, T_A = 25°C (unless otherwise specified)

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

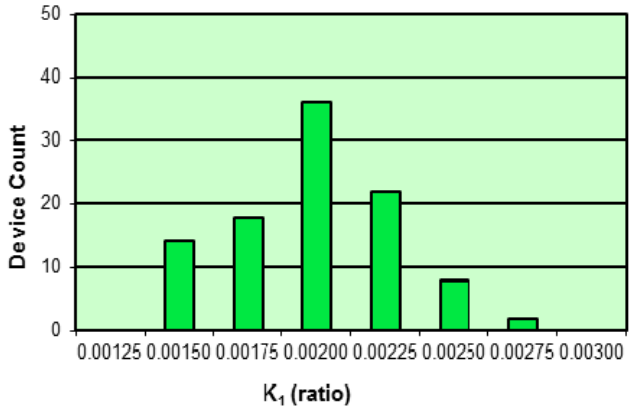


Figure 2: *Typical K_1 (10mA) Distribution*
(N = 100, T_a = 25ºC)

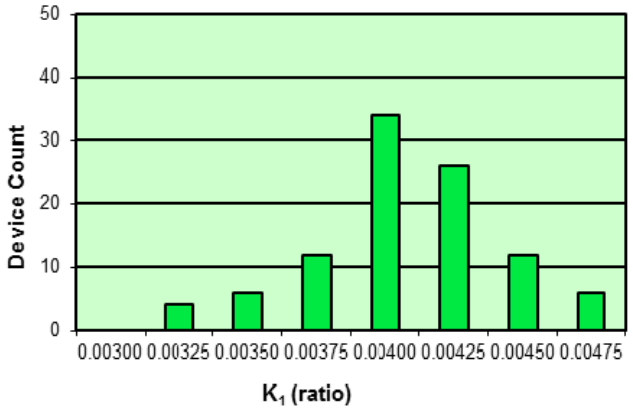


Figure 3: *Typical K_2 (5mA) Distribution*
(N = 100, T_a = 25ºC)

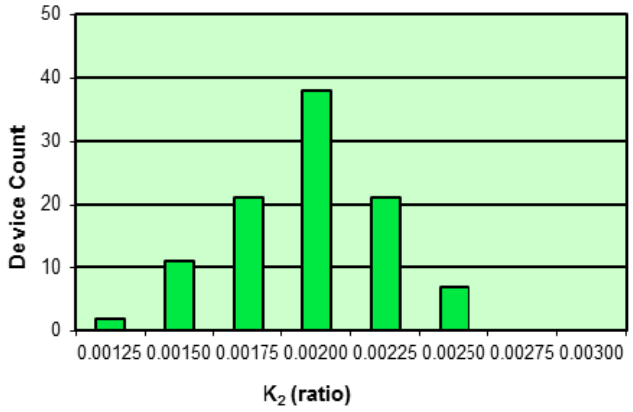


Figure 4: *Typical K_2 (10mA) Distribution*
(N = 100, T_a = 25ºC)

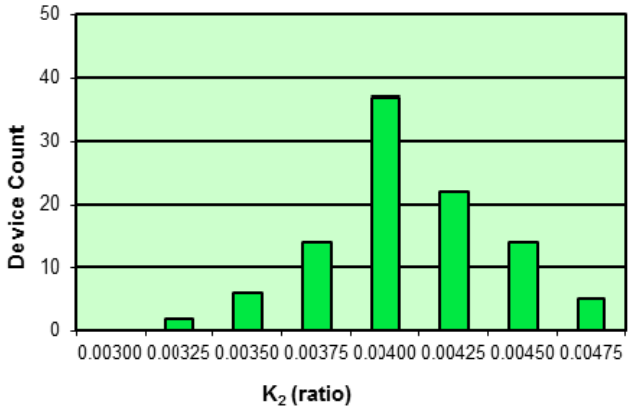


Figure 5: *Typical K_3 Transfer Gain Distribution*
(N = 100, T_a = 25ºC)

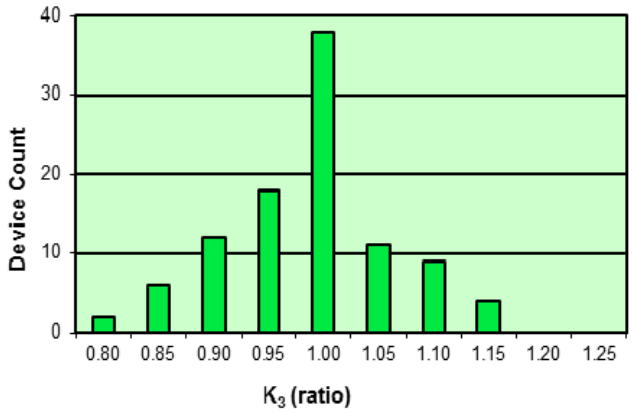
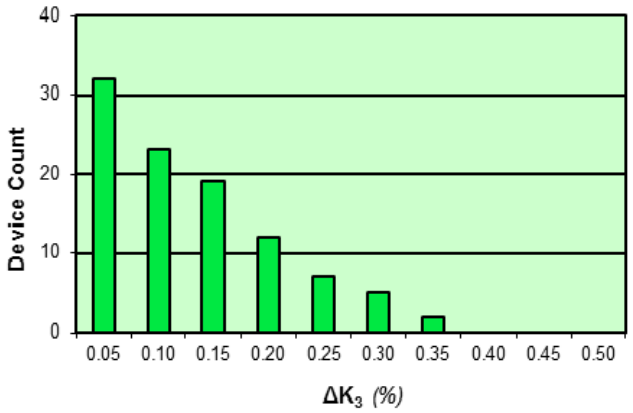


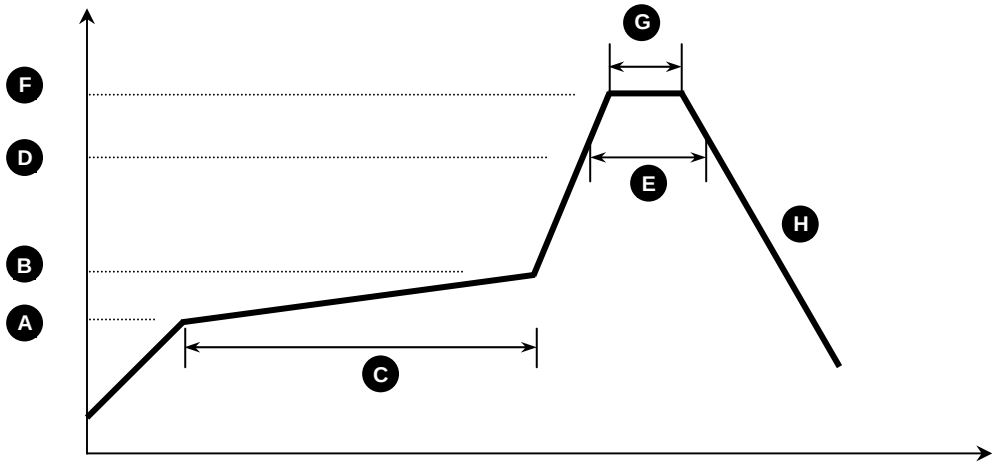
Figure 6: *Typical ΔK_3 Distribution*
(N = 100, T_a = 25ºC)



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 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:*

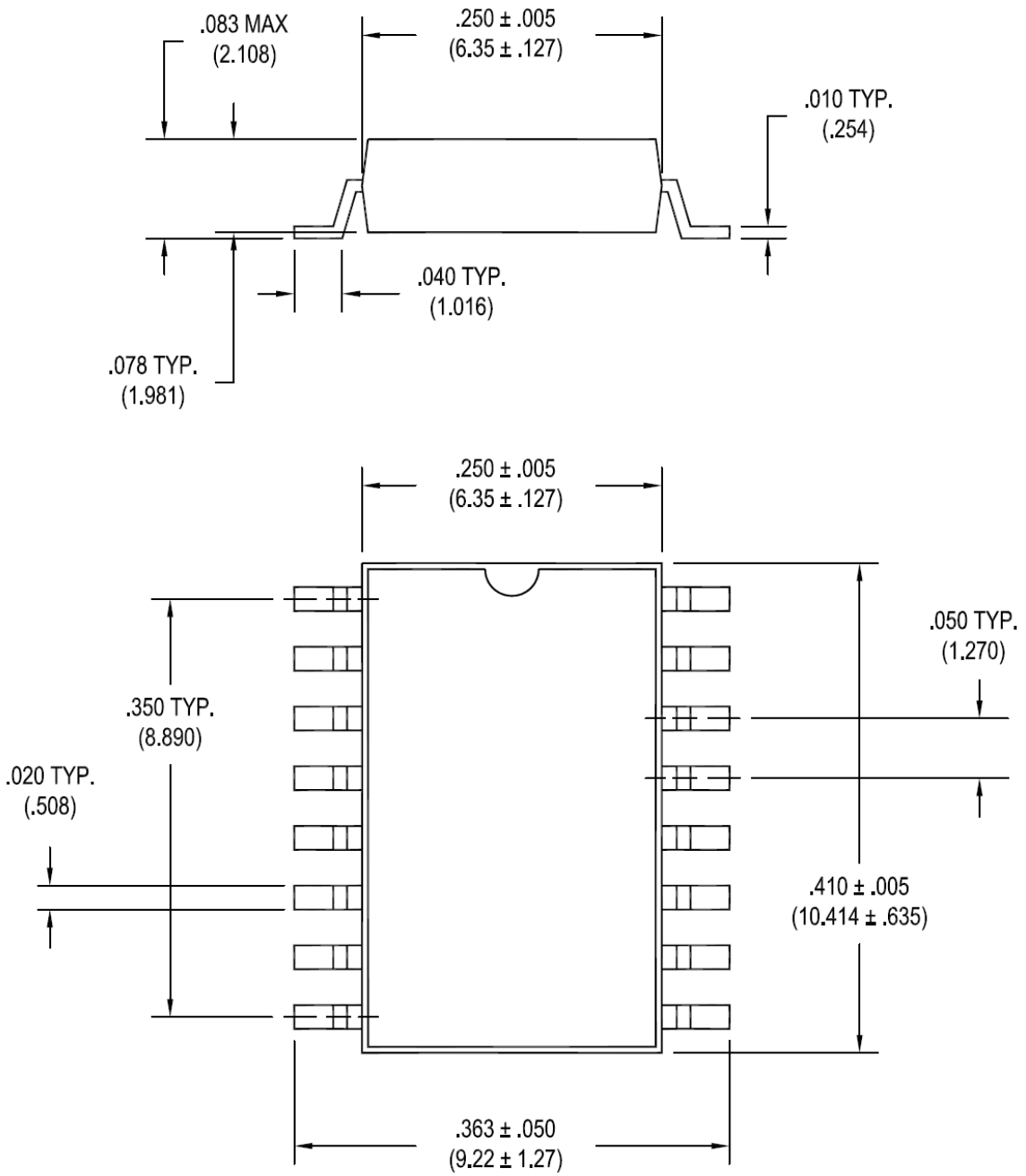
Maximum Temperature:	350ºC (at tip of soldering iron)
Maximum Time:	3s
Single Occurrence	

© 2012 Solid State Optronics • San José, CA

SLC1610 Package Dimensions

16 PIN SOIC Package

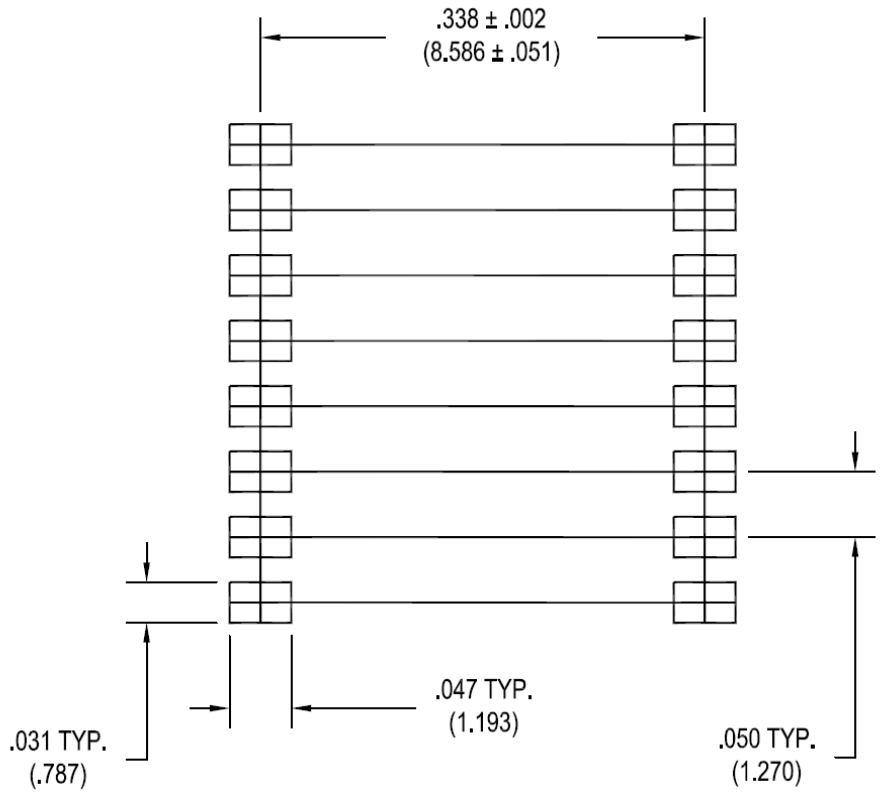
Note: *All dimensions in inches ["] with millimeters in parenthesis (mm)*



SLC1610 Package Dimensions

16 PIN SOIC Footprint

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



DISCLAIMER

Solid State Optronics (SSO) makes no warranties or representations with regards to the completeness and accuracy of this document. SSO reserves the right to make changes to product description, specifications at any time without further notices.
SSO shall not assume any liability arising out of the application or use of any product or circuit described herein. Neither circuit patent licenses nor indemnity are expressed or implied.
Except as specified in SSO's Standard Terms & Conditions, SSO disclaims liability for consequential or other damage, and we make no other warranty, expressed or implied, including merchantability and fitness for particular use.

LIFE SUPPORT POLICY

SSO does not authorize use of its devices in life support applications wherein failure or malfunction of a device may lead to personal injury or death. Users of SSO devices in life support applications assume all risks of such use and agree to indemnify SSO against any and all damages resulting from such use. Life support devices are defined as devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and (c) whose failure to perform when used properly in accordance with instructions for use can be reasonably expected to result in significant injury to the user, or (d) a critical component of a life support device or system whose failure can be reasonably expected to cause failure of the life support device or system, or to affect its safety or effectiveness.

© 2012 Solid State Optronics • San José, CA