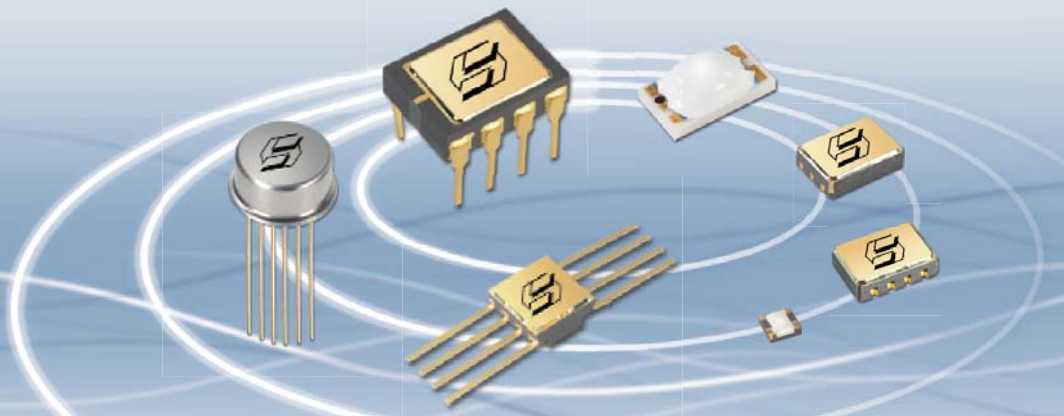
ISOLINK™



Optocoupler Selection Guide

Isolink, Inc.

Isolink (a subsidiary of Skyworks Solutions, Inc.) is the leading supplier of high performance and high quality optoelectronic radiation tolerant components worldwide. Founded by veterans in the optoelectronics industry, Isolink is headquartered in Milpitas, California.

Isolink's mission is to provide products and services to the high-reliability, military, aerospace, hybrid, industrial, medical, and telecommunications markets. Isolink specializes in the manufacture of high-performance miniature hybrids and hermetically sealed devices. The company pioneered the miniaturization of some of the most advanced optoelectronic components. Our expertise in optoelectronic components enables us to make products of high quality, achieving high isolation voltages. A hallmark of Isolink's products is high common mode rejection and radiation tolerance for high demand environments.

Isolink is committed to providing excellent products and services to its customers, and to serving as an extension of the customer's engineering and manufacturing resources. Isolink strives for a customer/vendor relationship aimed at optimizing product performance, quality, and cost. We meet and exceed customer expectations, and are committed to delivering excellence.

Isolink works with customers from program inception to the final implementation of the most demanding design and application challenges. We are proud to provide innovative products and custom solutions with uncompromising quality and on-time delivery.

New products are continually being introduced at Isolink. For the latest information, visit our Web site at **www.isolink.com**. For additional information, please contact your local sales office or email us at **sales@isolink.com**.

Custom Solutions

Isolink offers custom, application-specific, value-added components including:

- Optoswitches for miniature gyroscopes
- Emitter/detector arrays for medical, radiation, and therapy equipment
- Digital filters for secured data transmission
- Multi-wavelength emitter arrays
- Optical encoders for precision motor control
- High isolation voltage optical couplers

OPTOCOUPLERS

Photo-transistor Optocouplers

Photo-transistor optocouplers, shown in Tables 1 and 2, are primarily used for optical isolation, high current transfer ratio, and low saturation Vce. Each unit consists of a light emitting diode and a NPN silicon photo-transistor mounted and coupled in a miniature custom substrate for hybrid assembly or in hermetically sealed packages. See Figure 1 for an example of a photo-transistor optocoupler functional schematic.

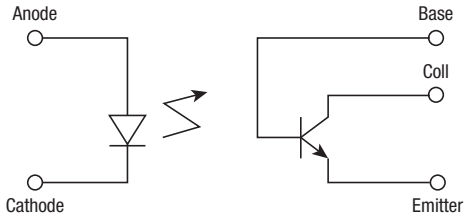


Figure 1. Photo-Transistor Optocoupler Functional Schematic

Table 1. Single Channel Photo-Transistor Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LI100	0.9	1.7	10	100	–	30	–	1500	6L 0.1 x 0.11 x 0.65
0LI249 [1]	1.4	1.8	1	200	1200	40	–	1500	6L 0.1 x 0.11 x 0.65
0LS010 [2] 0LS049 [2]	0.9	1.6	1	100	–	60	–	1000	4L 0.225 x 0.155 x 0.75
0LS100	0.9	1.9	1	100	–	60	–	1500	4L 0.225 x 0.155 x 0.75
0LS249 [1]	1.4	1.8	1	200	1200	40	–	1500	6L 0.245 x 0.17 x 0.08
0LS449 [1]	1.2	1.7	1	1500	4000	65	–	1500	6L 0.17 x 0.245 x 0.08
0LF100	0.9	1.7	10	100	–	30	–	1000	6L 0.18 x 0.18 x 0.10
0LF249 [1]	1.4	1.8	1	200	1200	40	–	1000	8L 0.18 x 0.18 x 0.10
0LH1047 0LH1048 0LH1049	1.4	1.8	1	200	1200	40	–	3000	8L 0.39 x 0.32 x 0.15
0LH249 [1]	0.8	1.5	1	50/100/200	–/500/1000	40	–	1000	8L 0.39 x 0.32 x 0.15
4N47 4N48 4N49	1.4	1.8	1	200	1200	40	–	1000	6L 0.2 x 0.302 x 0.745

Table 2. Dual Channel Photo-Transistor Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LH2047 [2] 0LH2048 [2] 0LH2049 [2]	0.8	1.5	1	50/100/200	–/500/1000	40	–	2500	8L 0.39 x 0.32 x 0.15
0LS2249	1.2	1.8	1	200	1200	65	–	1500	8L 0.245 x 0.170 x 0.08
0LS2440	1.2	1.7	1	1500	4000	65	–	1500	8L 0.245 x 0.170 x 0.08

1. Radiation tolerant.
2. No base connection.

OPTOCOUPLERS

High Speed Optocouplers

High speed optocouplers, shown in Tables 3–5, are suitable for interfacing TTL to LSTTL, TTL, or CMOS as well as wide bandwidth analog applications. Each unit has a light emitting diode and an integrated photo-diode transistor detector mounted and coupled in a miniature custom substrate for hybrid assembly, or in hermetically sealed packages. The integrated photo-diode transistor improves switching speed by orders of magnitude as compared to standard photo transistors, by reducing the base to collector capacitance. See Figure 2 for an example of a high speed optocoupler functional schematic.

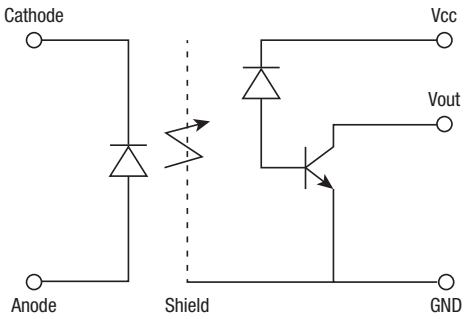


Figure 2. High Speed Optocoupler Functional Schematic

Table 3. Single Channel High Speed Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
OLI300 [1]	–	2.5	10	20	–	–	18	1500	6L 0.1 x 0.11 x 0.65
OLS300 [1]	–	2.5	10	20	–	–	18	1500	6L 0.245 x 0.17 x 0.08
OLH300 [1]	–	2.5	10	20	–	–	18	1000	6L 0.2 x 0.302 x 0.745
OLF300 [1]	–	2.5	16	9	–	–	18	1000	8L 0.18 x 0.18 x 0.1
OLH5500 [1] OLH5501 [1]	–	2.5	16	12	–	–	18	3000	8L 0.39 x 0.32 x 0.15

Table 4. Dual Channel High Speed Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
OLH5530 [1] OLH5531 [1]	–	2.5	16	12	–	–	18	3000	8L 0.39 x 0.32 x 0.15

Table 5. Wide Band Analog High Speed Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
OLI303	–	2.5	5	20	80	–	18	1500	6L 0.1 x 0.11 x 0.65
OLS303	–	2.5	5	20	80	–	18	1500	6L 0.245 x 0.17 x 0.08

1. Radiation tolerant.

OPTOCOUPLERS

Low Input Current Photodarlington Optocouplers

Low input current photodarlington optocouplers, shown in Tables 6 and 7, have high current transfer ratio at very low input currents making them ideal for applications such as MOS, CMOS, and low power logic interfacing or RS-232C data transmission systems. Each unit has a light emitting diode and an integrated photodiode-darlington detector IC mounted and coupled in a miniature custom substrate for hybrid assembly or in hermetically sealed packages. The darlington detector has an integrated base-emitter resistor for superior high temperature performance. The split darlington design permits lower output saturation voltage and higher switching speed operation than possible with conventional photodarlington design. See Figure 3 for an example of a low input current photodarlington optocoupler functional schematic.

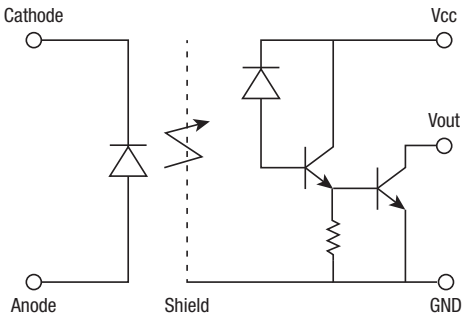


Figure 3. Low Input Current Photodarlington Optocoupler Functional Schematic

Table 6. Single Channel Low Input Current Photodarlington Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
OLI400 [1]	–	2	0.5 / 5	300/200	–	–	20	1500	6L 0.1 x 0.11 x 0.65
OLS400 [1]	–	2	0.5 / 5	300/200	–	–	20	1500	8L 0.225 x 0.155 x 0.75
OLF400 [1]	–	2	0.5 / 5	300/200	–	–	20	1000	8L 0.18 x 0.18 x 0.1
OLH400 [1]	–	2	0.5 / 5	300/200	–	–	20	1000	6L 0.2 x 0.302 x 0.745
OLH5700 [1] OLH5701 [1]	1	2	0.5 / 5	300/200	–	–	18	3000	8L 0.39 x 0.32 x 0.15

Table 7. Dual Channel Low Input Current Photodarlington Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		CTR @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
OLH5730 [1] OLS5731 [1]	1	2	0.5 / 5	300/200	–	–	18	3000	8L 0.39 x 0.32 x 0.15

1. Radiation tolerant.

OPTOCOUPLERS

Schmitt Trigger Optocouplers

Schmitt trigger optocouplers, shown in Table 8, have a light emitting diode and an integrated high-speed detector mounted and coupled in a miniature custom package. The light from the light emitting diode is collected by the photodiode in the integrated detector. The integrated detector incorporates a Schmitt trigger, which provides hysteresis for noise immunity and pulse shaping, and an open collector output. Typical propagation delay of this product is 170 ns. The common mode transient immunity is greater than 1000 V/ µs. See Figure 4 for an example of a Schmitt trigger optocoupler functional schematic.

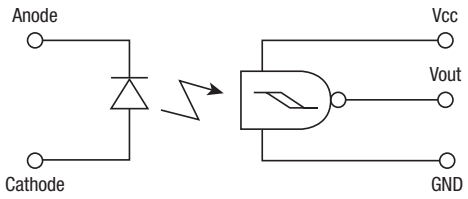


Figure 4. Schmitt Trigger Optocoupler Functional Schematic

Table 8. Single Channel Schmitt Trigger Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		Threshold Current I_F @ Vcc (V)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LI600	–	2.4	15	–	10	–	18	1500	6L 0.1 x 0.11 x 0.65
0LS600	–	2.4	15	–	10	–	18	1500	6L 0.245 x 0.17 x 0.08
0LH6000 0LH6001	–	2.4	15	–	10	–	18	1500	8L 0.39 x 0.32 x 0.15

High Speed Switching, High Common Mode Rejection (CMR), Logic Gate Optocouplers

High speed switching, high CMR, logic gate optocouplers, shown in Tables 9 and 10, are suitable for high-speed digital interfacing applications, elimination of ground loops and input/output buffering. Each unit has a light emitting diode and an integrated high-speed detector mounted and coupled in a miniature custom ceramic package providing 1500 Vdc electrical isolation between input and output. The light from the light emitting diode is collected by the photodiode in the integrated detector and amplified by a high gain linear amplifier that drive a Schottky clamped open collector output transistor. Typical propagation delay of this product is 60 ns. The internal shield improves common mode transient immunity to 1000 V/µs minimum. See Figure 5 for an example of a high speed switching optocoupler functional schematic.

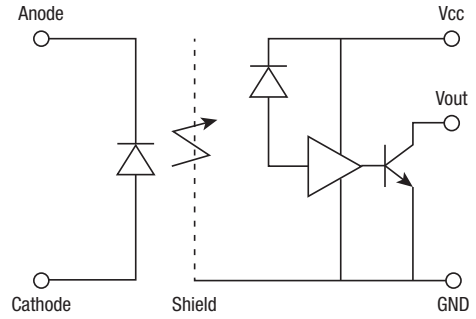


Figure 5. High Speed Switching, High CMR, Logic Gate Optocoupler Functional Schematic

Table 9. Single Channel High Speed Switching, High CMR, Logic Gate Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		VOL @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LI500	–	2.5	5	–	0.6 V	–	7	1500	6L 0.1 x 0.11 x 0.65
0LS500	–	2.5	5	–	0.6 V	–	7	1500	6L 0.245 x 0.17 x 0.08
0LF500	–	2.5	5	–	0.6 V	–	7	1000	8L 0.18 x 0.18 x 0.1
0LH500	–	2.5	5	–	0.6 V	–	7	1000	6L 0.39 x 0.32 x 0.15
0LH5600 0LH5601	–	2.5	5	–	0.6 V	–	7	3000	8L 0.39 x 0.32 x 0.15

OPTOCOUPLERS

High Speed Switching, High CMR, Logic Gate Optocouplers (Continued)

Table 10. Dual Channel High Speed Switching, High CMR, Logic Gate Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		VOL @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LH5630 0LH5631	–	2.5	10	–	0.6 V	–	7	3000	8L 0.39 x 0.32 x 0.15

Linear Optocouplers

Linear optocouplers, shown in Table 11, consist of one LED optically coupled to two matched photodiode detectors. Photodiode detectors are used for excellent linearity. The photodiode on the input side acts as a feedback device permitting an external feedback loop to ensure constant LED light output. A similar matching photodiode on the output side is used to drive an output circuit that is electrically isolated from the input. A fixed relationship is thus maintained between input and output. See Figure 6 for an example of a linear optocoupler functional schematic.

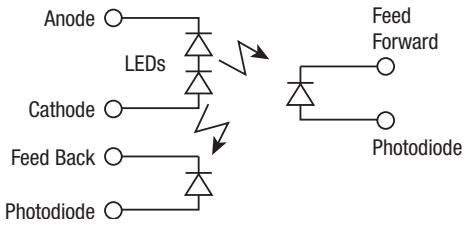


Figure 6. Linear Optocoupler Functional Schematic

Table 11. Single Channel

Part Number	V_F (V) @ I_F = 10 mA		Servo Current @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LS700	–	1.6	10	typ. 30 µA	–	30	–	1000	6L 0.245 x 0.17 x 0.08
0LH7000	–	3.3	10	typ. 50 µA	–	30	–	1000	8L 0.39 x 0.32 x 0.15

Photovoltaic Optocouplers

Photovoltaic optocouplers, shown in Table 12, consist of a pair of light emitting diodes optically coupled to a dielectrically isolated photovoltaic diode array. When the LED is energized, the infrared emission is detected by the photovoltaic array and a DC output voltage is generated. This electrically isolated voltage can be used to drive the gates of MOS devices. See Figure 7 for an example of a photovoltaic optocoupler functional schematic.

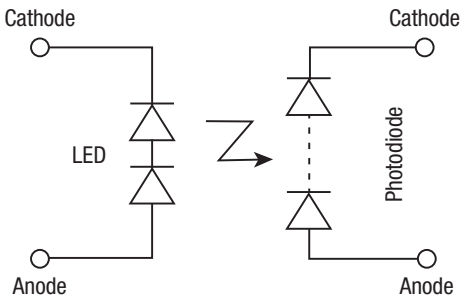


Figure 7. Photovoltaic Optocoupler Functional Schematic

Table 12. Single Channel Photovoltaic Optocouplers

Part Number	V_F (V) @ I_F = 10 mA		Isc @ I_F (mA)	Conditions		BVceo (V)	Vcc Max. (V)	Isolation @ V_{DC} 1 µs	Package Size (inch)
	Min.	Max.		Min.	Max.				
0LI910	–	3.2	10	-7 µA	–	200 Vr	–	1500	4L 0.17 x 0.095 x 0.085
0LS910	–	3.2	10	-7 µA	–	200 Vr	–	1500	6L 0.245 x 0.17 x 0.08
0LH910	–	3.2	10	-7 µA	–	200 Vr	–	1500	8L 0.39 x 0.32 x 0.15

PACKAGE SELECTION GUIDE

Isolink offers a variety of package types, shown in Table 13, followed by package outline drawings. Our package selection includes the OLI miniature series specially designed for hybrid applications, shown in Figures 8 and 9, the 8-pin flat pack, shown in Figure 10, the OLH hermetic series in TO-5, shown in Figure 11, the OLS miniature / leadless chip carrier (LCC) hermetic surface mount, shown in Figures 12–14, and the OLF hermetic surface mount and the sidebrazed DIP, shown in Figure 15.

Table 13. Package Selection Guide

Package Type	Actual Size	Package Dimension (inch)
6-Lead Ceramic Carrier Chp for Hybrid Assembly		0.1 x 0.11 x 0.65
4-Lead Ceramic Carrier Chp for Hybrid Assembly		0.170 x 0.095 x 0.085
8-Lead Hermetic Ceramic Flat		0.18 x 0.18 x 0.10
6-Lead Hermetic TO-5		0.200 x 0.302 x 0.745
4-Lead Ceramic LCC		0.225 x 0.155 x 0.075
6-Lead Hermetic Ceramic LCC		0.245 x 0.170 x 0.08
8-Lead Hermetic Ceramic LCC		0.245 x 0.170 x 0.08
8-Lead Hermetic Dip		0.39 x 0.32 x 0.15

OUTLINE DRAWINGS

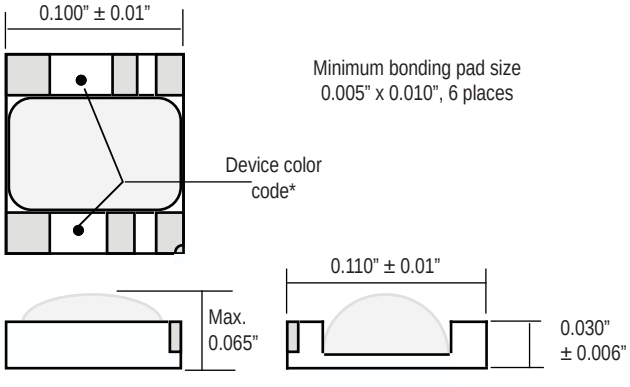


Figure 8. 6-Lead Ceramic Carrier Chip for Hybrid Assembly

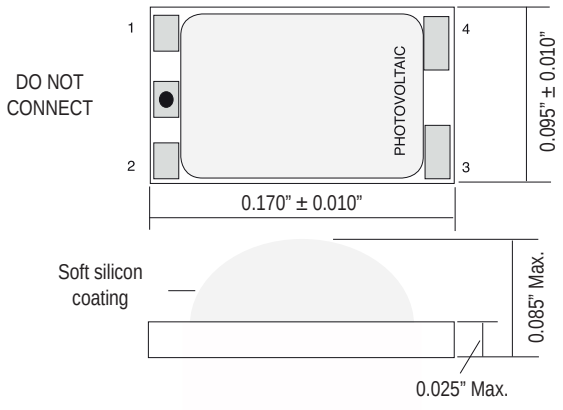


Figure 9. 4-Lead Ceramic Carrier Chip for Hybrid Assembly

OUTLINE DRAWINGS

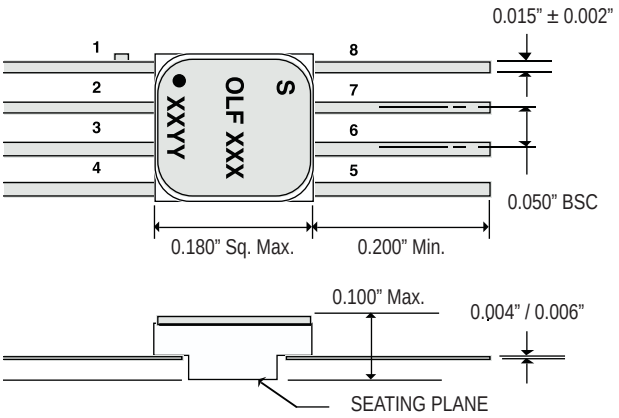


Figure 10. 8-Lead Hermetic Ceramic Flat

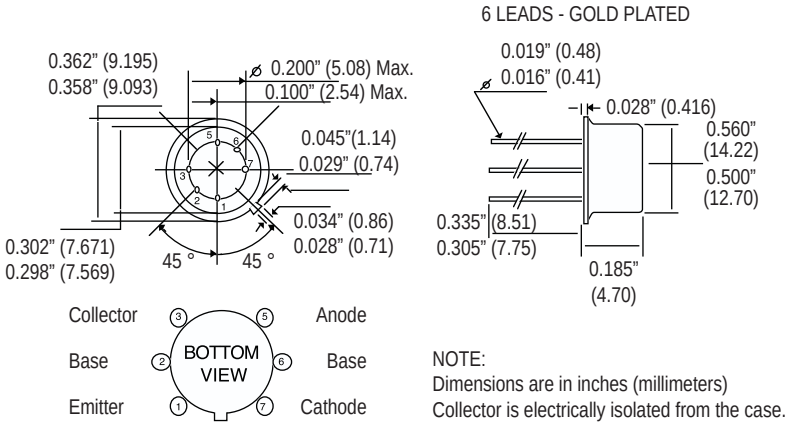


Figure 11. 6-Lead Hermetic TO-5

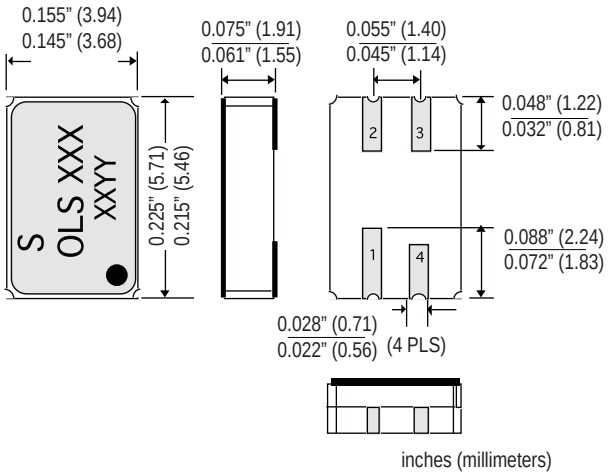


Figure 12. 4-Lead Ceramic LLC

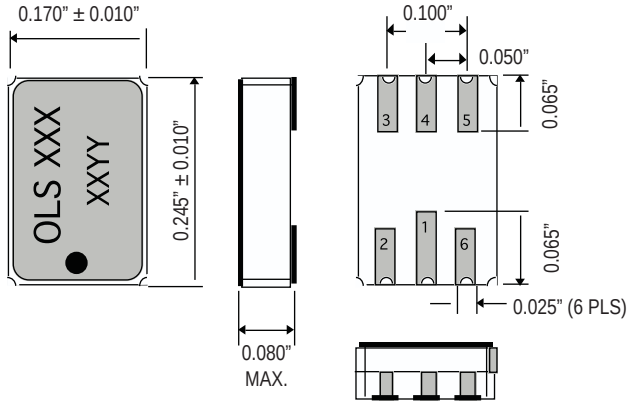


Figure 13. 6-Lead Hermetic Ceramic LLC

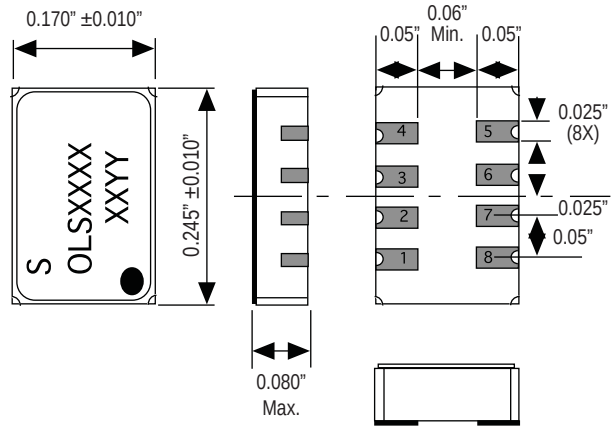


Figure 14. 8-Lead Hermetic Ceramic LLC

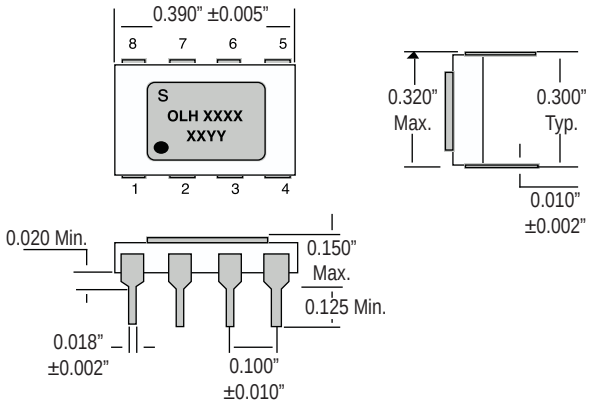


Figure 15. 8-Lead Hermetic Dip

HOW TO ORDER

Custom Products and Special Requirements

High-reliabilty screenings and multi-channel products are available upon request. For solder dip and tape and reel products, please see Table 15 below for ordering instructions.

Table 15. Ordering Instructions

Base Part Number	Solder Dip (Add "-1")	Tape and Reel (Add "-2")	Solder Dip and Tape and Reel (Add "-3")
0LH249	**0LH249-1**	**0LH249-2**	**0LH249-3**

APPLICATION NOTES

Please visit our Web site to access our application notes (shown in Table 16 below).

Table 16. Application Notes

Category	Description	Document Numbers
General	Optocouplers for the Hybrid industry	–
General	Radiation Immunity	AN1001
General	Optocouplers vs. Pulse Transformers	AN1002
General	Gamma Total Dose Radiation Performance	AN1003
General	Proton Radiation Graph	AN1004

PART NUMBER INDEX

ISOLINK SALES REPRESENTATIVES

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Fax: 1 (800) 398 3498
sales@superior-tek.com
Web site: www.superior-tek.com

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Fax: 1 (407) 896 6891
jeff@jwbolton.com
Web site: www.jwbolton.com

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sales@ue.com.hk
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