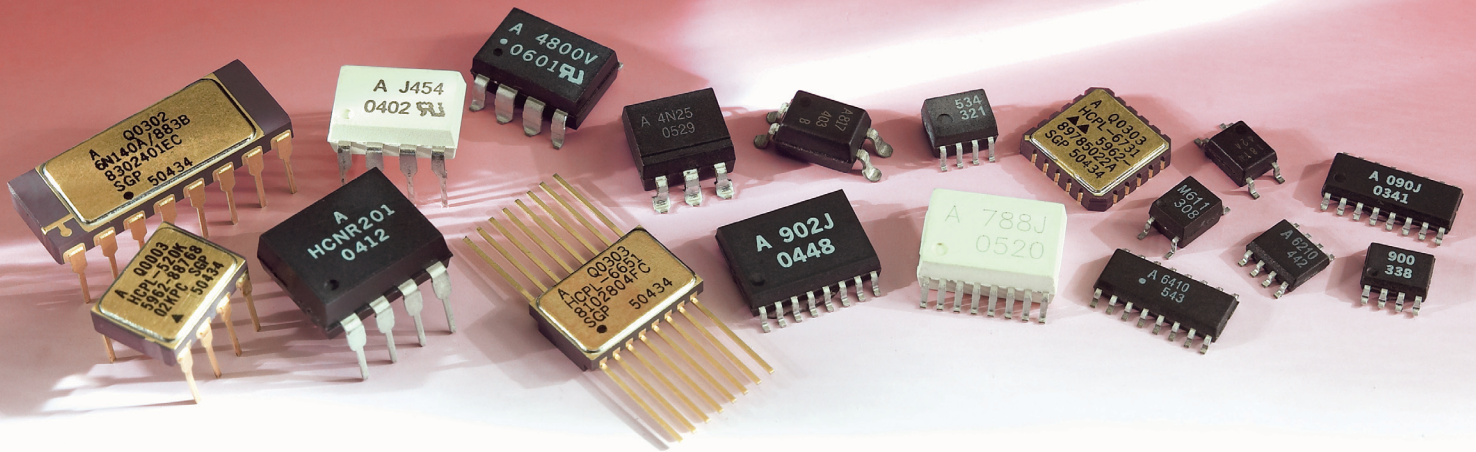


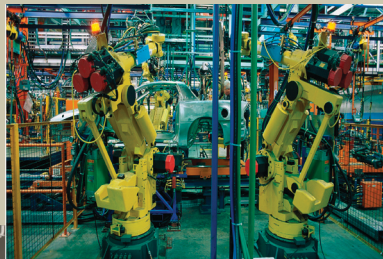
Optoisolation Products



Selection Catalog

Optoisolation Products

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- 6 High Speed Digital CMOS Logic Gate Optocoupler
- 7 20 MBd Logic Gate Optocoupler
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Avago Technologies offers the industry's best isolation technology along with the industry's leading CMR performance

Avago Technologies optocouplers can be used in an array of isolation applications ranging from power supply and motor control circuits to data communications and digital logic interface circuits.

The primary purpose of an optocoupler is to provide both electrical insulation and signal isolation. The popularity of Avago Technologies optocouplers is due to cost effective innovations in these areas.

Optocouplers eliminate the effects of electrical noise caused by crosstalk, power glitches and electrical interference. They provide high voltage isolation allowing safe interface between high and low voltages in electrical circuits. They are also used for shifting logic levels. Avago Technologies' key products include optocouplers with phototransistor output, digital and analog output, high speed and high gain performance, drivers for isolated gate transistors and intelligent power modules, smart current sensors, solid state relay (MOSFET) and other application specific devices.

Avago Technologies offers the industry's best isolation technology along with the industry's leading CMR performance of up to $40 \text{ kV}/\mu\text{s}$ in a broad line of packages. Products include the lowest power dissipation with input current as low as $40 \mu\text{A}$, high speed digital optocouplers operating at up to 50 MBd, propagation delays as low as 22 ns, 3.3 V JEDEC compatible optocouplers. Avago Technologies' optocouplers are manufactured with high quality and reliability and have worldwide safety approvals including the highest maximum insulation voltage (V_{IORM}) at 1414 V (per IEC/EN/DIN EN 60747-5-2).



Avago Technologies offers a broad range of isolation products that provide performance features and benefits that are unmatched in the industry for industrial, computing, consumer, communication, medical, military and aerospace markets.

Applications for Avago Technologies' Isolation Products

Industrial

The widest portfolio of optocouplers to meet the extensive requirements of applications in factory automation.

- Automated test equipment
- Fieldbus
- Industrial communications
- Industrial networking
- Motor control
- Panel switches
- PLC input/output isolation
- Power distribution systems
- Robotics
- Switching power supplies
- Test and measurement equipment

Medical

Avago Technologies offers optocouplers with high linearity and high resolution for severe isolation requirements to:

- Defibrillators
- ECG/EKG
- Endoscopes
- Magnetic resonance imaging
- Patient monitoring

Communications

Avago Technologies provides high speed optocouplers in both single and dual surface-mount packages which are used in:

- Automated metering reading
- Digital cross connect
- Distributed power architecture
- ISDN
- Modems
- PBX and central office
- Power line communication
- Power over ethernet
- Telephone switching equipment
- Telephone terminal equipment
- Wireless base station

Computers and Office Equipment

Avago Technologies' optocouplers with CMOS compatibility and high speed are used to provide interface isolation for:

- Isolated input/output module
- Isolated USB hub
- Printers and plotters

Consumer Electronics

Avago Technologies offers lower solution costs with highly integrated optocouplers for many consumer applications, such as:

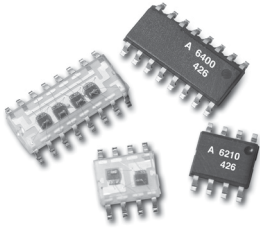
- Air conditioning
- Alarm systems
- Audio and video equipment
- Electronic gaming
- Fitness equipment
- Induction cookers
- Plasma displays
- Washing machines

Military and Aerospace

Avago Technologies' high reliability optocouplers are suitable for military and aerospace applications such as:

- Aircraft, satellite and space systems
- Communications
- Computers
- Test systems
- Defense systems

Optoisolation Products



Applications

- Full duplex communication
- Isolated line receiver
- Computer-peripheral interfaces
- Microprocessor system interfaces
- Digital isolation for A/D and D/A conversion
- Switching power supply
- Instrument input/output isolation
- Ground loop elimination
- Pulse transformer replacement

Multi-Channel Bi-Directional Digital Optocoupler

Description

The ACSL-6xx0 series are optoisolated, multi-channel and bidirectional, high-speed optocouplers. Integration of multiple optocouplers in monolithic form is achieved through patented process technology. These devices provide full duplex and bidirectional isolated data transfer and communication capability in compact surface mount packages. They are available in a 15Mbd speed option, wide supply voltage range and wide temperature range.

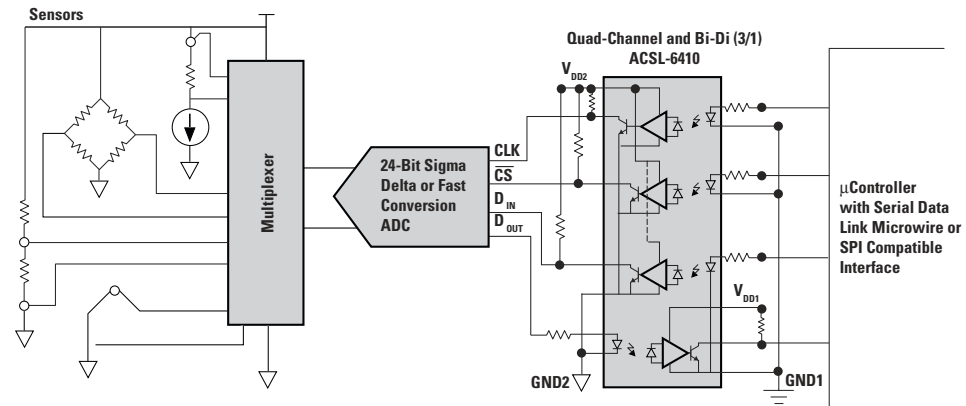
The isolated data acquisition system is ideal for digitizing the output of the sensors that operate in hostile environment. The ADC is a 24-bit sigma delta or fast conversion type, converts the analog voltage to a digital number. The digital number represents

the input voltage in discrete steps with finite resolution. The quad-channel and bi-directional, ACSL-6410, provides high CMR of 10kV/μs and electrical isolation of 2500Vrms between the host system and the data acquisition circuitry and sensors. The power supply is also isolated, usually via a transformer to isolate the AC line voltage from the DC voltages generated to power the data acquisition system.

Benefits

- Higher integration - multi-channel provides small and thin packages for space savings; bi-directional channel facilitates PCB routing
- Wide voltage supply and temperature - provides design flexibility

Typical Block Diagram

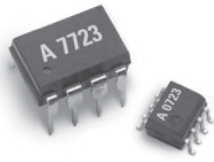


Multi-Channel Bi-Directional Digital Optocoupler Product Selection

Part No.	Package	Channel	Forward Direction	Reverse Direction	I _{F(on)} mA Typ.	t _{PLH} ns Max.	t _{PLH} ns Max.	PWD ns Max.	t _{PSK} ns Max.	V _{CC} V Min.	V _{CC} V Max.	CMR - V/μs@VCM		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
												CMR V/μs (Min.)	V _{CM} V		
ACSL-6210-00RE	S08	2	1	1	2.7	100	100	35	40	3	5.5	10000	1000	2500	560*
ACSL-6400-00TE	S016	4	4	0	2.7	100	100	35	40	3	5.5	10000	1000	2500	560*
ACSL-6410-00TE	S016	4	3	1	2.7	100	100	35	40	3	5.5	10000	1000	2500	560*
ACSL-6420-00TE	S016	4	2	2	2.7	100	100	35	40	3	5.5	10000	1000	2500	560*
ACSL-6310-00TE	S016	3	2	1	2.7	100	100	35	40	3	5.5	10000	1000	2500	560*
ACSL-6300-00TE	S016	3	3	0	2.7	100	100	35	40	3	5.5	10000	1000	2500	560*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060.



High Speed Digital CMOS Logic Gate Optocoupler

Description

These optocouplers use the latest CMOS IC technology to achieve outstanding performance with very low power consumption. Serial fieldbuses are used today primarily as the communication system for the exchange of information between automation system and distributed field devices. PROFIBUS is the leading open fieldbus system and it has

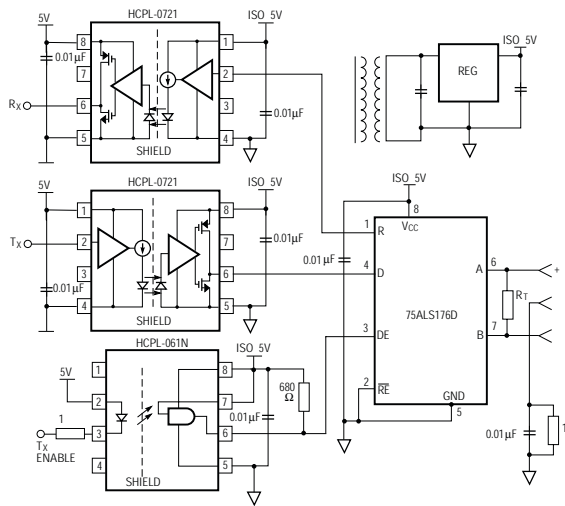
worldwide acceptance. PROFIBUS is essentially a twisted wire pair serial link that is very similar to RS 485. Profibus speed standard is either lower speed (1.5 MBd) or higher speed (12 MBd).

Applications

- AC plasma display panel level shifting
- CAN Bus
- CC_Link
- Microprocessor system interface
- Multiplexed data transmission
- Switching power supply

In this isolated multipoint transmission application circuit, two different optoisolators are utilized (HCPL-0721 and HCPL-061N). The benefits include low input drive current that maximizes LED lifetime/reliability and optimizes speed for Profibus and RS-485 applications.

Typical Profibus Block Diagram



Benefits

- High speed (up to 50 MBd)
- Wide temperature operation -40°C to 100°C (HCPL-x710)
- Low PWD (6 ns) & low Tp (40 ns) to meet DeviceNet and Profibus application
- Buffer input and CMOS output to eliminate any pull-up resistor
- 5 kV isolation voltage (HCPL-77xx)
- Dual channel device is available to save space (HCPL-0738)
- Certified with reinforced insulation under IEC/EN/DIN EN 60747-5-2

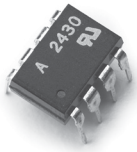
High Speed Digital CMOS Logic Gate Optocoupler Product Selection

Device	Part No.	Package	V _{DD} V	I _{F(om)} mA Min.	Max Data Rate MBd Min.	t _{PLH} ns Max.	t _{PHL} ns Max.	PWD ns Max.	t _{PSK} ns Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
										CMR V/μs (Min.)	V _{CM} V		
Single Channel CMOS Input 	HCPL-0710	S08	5	—	12.5	40	40	8	20	10000	1000	3750	560*
	HCPL-0720	S08	5	—	25	40	40	8	20	10000	1000	3750	560*
	HCPL-0721	S08	5	—	25	40	40	6	20	10000	1000	3750	560*
	HCPL-0723	S08	5	—	50	22	22	2	16	10000	1000	3750	560*
	HCPL-7710	300 mil DIP	5	—	12.5	40	40	8	20	10000	1000	3750/5000 [#]	630*
	HCPL-7721	300 mil DIP	5	—	25	40	40	6	20	10000	1000	3750/5000 [#]	630*
	HCPL-7720	300 mil DIP	5	—	25	40	40	8	20	10000	1000	3750/5000 [#]	630*
HCPL-7723	300 mil DIP	5	—	50	22	22	2	16	10000	1000	3750/5000 [#]	630*	
LED Input 	HCPL-0708	S08	5	10	15	60	60	30	40	10000	1000	3750	560*
Dual Channel LED Input 	HCPL-0738	S08	5	10	15	60	60	30	40	10000	1000	3750	560*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060. # - with UL5000V_{RMS}/1 minute Option 020

Optoisolation Products



20 Mbd Logic Gate Optocoupler

Description

These optocouplers have high data rate capability and low input current requirements. In analog-to-digital converters, designers should isolate the two portions of a circuit so that interference generated by digital switching and clock signals are not coupled to the analog section. The below figure demonstrates the ability of optocouplers to achieve isolation in a high speed parallel interface data communication application. Optocouplers reduce the channel distortion and thereby maximize the reliability of the circuit.

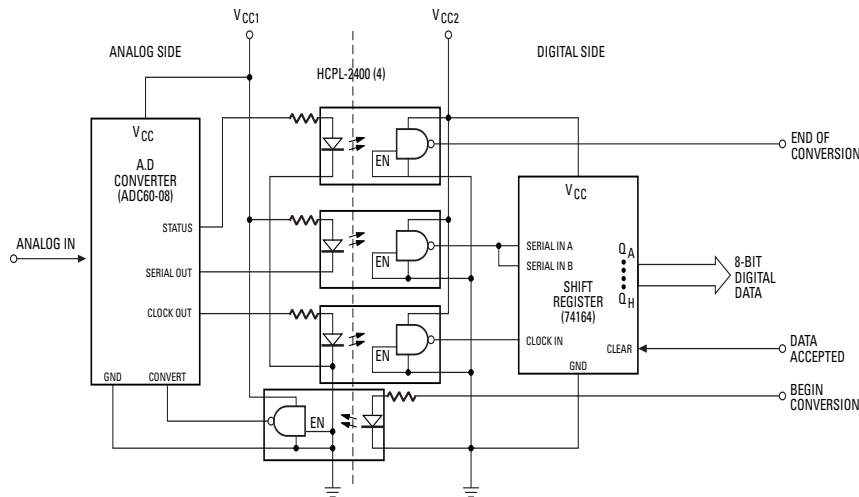
Benefits

- Totem pole & tri state output (with enable pin for HCPL-2400) to eliminate output pull-up resistors
- Certified with reinforced insulation under IEC/EN/DIN EN 60747-5-2, approved with $V_{iorm}=630V_{peak}$ (option 060)
- DIP-8 package (for min. 7mm creepage/clearance need) with $5kV V_{iso}$ protection (option 020)
- 2-channel for higher integration and space saving (HCPL-2430)

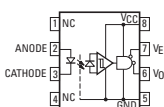
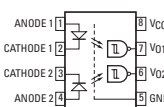
Applications

- Computer-peripheral interface
- High speed disk drive I/O
- Isolated bus driver (networking applications)
- Isolation of higher speed logic system
- Switching noise elimination

Typical Block Diagram



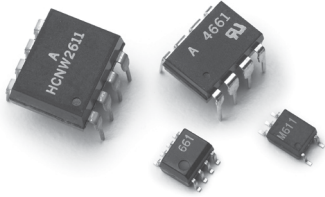
20 Mbd Logic Gate Optocoupler Product Selection

Device	Part No.	Package	$I_{F(on)}$ mA Min.	t_{PLH} ns Max.	t_{PLH} ns Max.	PWD ns Max.	t_{PSK} ns Max.	CMR - V/ $\mu s @ V_{CM}$		V_{ISO} V_{RMS} Min.	V_{IORM} V peak
								CMR V/ μs (Min.)	V_{CM} V		
Single Channel 	HCPL-2400	300 mil DIP	4	60	60	25	35	1000	300	3750	630*
Dual Channel 	HCPL-2430	300 mil DIP	4	60	60	25	35	1000	300	3750	630*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060

Optoisolation Products



10 MBd Logic Gate Optocoupler

Description

This isolated RS-422 circuit uses two high-speed optocouplers that can switch up to 10 MBd signals. An isolated power supply V_{CC2} is required to power the DS 75176A driver/receiver integrated circuit.

The main benefit is preventing common-mode transients from interfering with the signal.

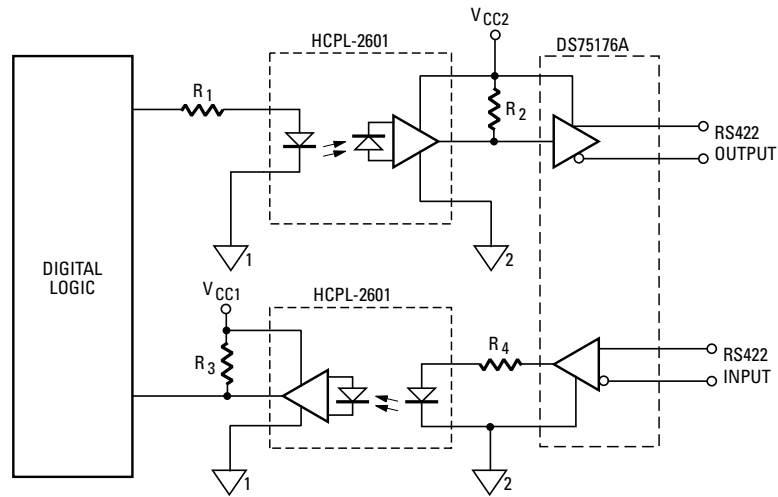
Benefits

- Provides high data rate transmission. It also offer high CMR for signal isolation from common mode transient noises

Applications

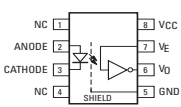
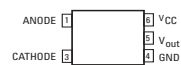
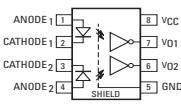
- Computer-peripheral interface
- Instrument input/output isolation
- Isolated line receiver
- Microprocessor system interface
- Switching power supply

Typical RS-422 Interface Block Diagram



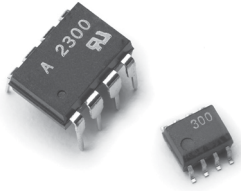
Optoisolation Products

10 Mbd Logic Gate Optocoupler Product Selection

Device	Part No.	Package	$I_{F(on)}$ mA Min.	t_{PLH} ns Max.	t_{PHL} ns Max.	PWD ns Max.	t_{PSK} ns Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
								CMR V/μs (Min.)	V _{CM} V		
Single Channel 	ACPL-P611-000E	Stretched SO6	5	100	100	35	40	10000	1000	3750/5000 [#]	630*
	ACPL-W611-000E	Stretched SO6	5	100	100	35	40	10000	1000	3750/5000 [#]	630*
	6N137	300 mil DIP	5	100	100	35	40	–	–	3750/5000 [#]	630*
	HCNW137	400 mil DIP	5	100	100	40	40	–	–	5000	1414
	HCNW2601	400 mil DIP	5	100	100	40	40	5000	50	5000	1414
	HCNW2611	400 mil DIP	5	100	100	40	40	10000	1000	5000	1414
	HCPL-061A	S08	3	100	100	45	60	1000	50	3750	560*
	HCPL-061N	S08	3	100	100	45	60	15000	1000	3750	560*
	HCPL-0600	S08	5	100	100	35	40	–	–	3750	560*
	HCPL-0601	S08	5	100	100	35	40	5000	50	3750	560*
	HCPL-0611	S08	5	100	100	35	40	10000	1000	3750	560*
	HCPL-2601	300 mil DIP	5	100	100	35	40	5000	50	3750/5000 [#]	630*
	HCPL-2611	300 mil DIP	5	100	100	35	40	10000	1000	3750/5000 [#]	630*
	HCPL-261A	300 mil DIP	3	100	100	45	60	1000	50	3750/5000 [#]	630*
	HCPL-261N	300 mil DIP	3	100	100	45	60	15000	1000	3750/5000 [#]	630*
	HCPL-M600	S05	5	100	100	35	40	–	–	3750	–
	HCPL-M601	S05	5	100	100	35	40	5000	50	3750	–
	HCPL-M611	S05	5	100	100	35	40	10000	1000	3750	–
Dual Channel 	HCPL-063A	S08	3	100	100	45	60	1000	50	3750	–
	HCPL-063N	S08	3	100	100	45	60	15000	1000	3750	–
	HCPL-0630	S08	5	100	100	35	40	–	–	3750	–
	HCPL-0631	S08	5	100	100	35	40	5000	50	3750	–
	HCPL-0661	S08	5	100	100	35	40	10000	1000	3750	–
	HCPL-263A	300 mil DIP	3	100	100	45	60	1000	50	3750/5000 [#]	–
	HCPL-263N	300 mil DIP	3	100	100	45	60	15000	1000	3750/5000 [#]	–
	HCPL-2630	300 mil DIP	5	100	100	35	40	–	–	3750/5000 [#]	–
	HCPL-2631	300 mil DIP	5	100	100	35	40	5000	50	3750/5000 [#]	–
	HCPL-4661	300 mil DIP	5	100	100	35	40	10000	1000	3750/5000 [#]	–

Notes: * - with IEC/EN/DIN EN 60747-5-2 Option 060, # - with UL 5000V_{RMS}/1 minute Option 020

Optoisolation Products



8 MBd Logic Gate Optocoupler

Description

The circuit shows a CMOS interface circuit for 8 MBd applications. Over the temperature range a CMOS CD4050 Hex Buffer can source about 0.7 mA (minimum), which is sufficient to drive the HCPL-2300 optocoupler. The 20 pF capacitor allows peaking currents to assist the LED in turning on and off quickly.

These optocouplers utilize a simple interface requiring low power consumption.

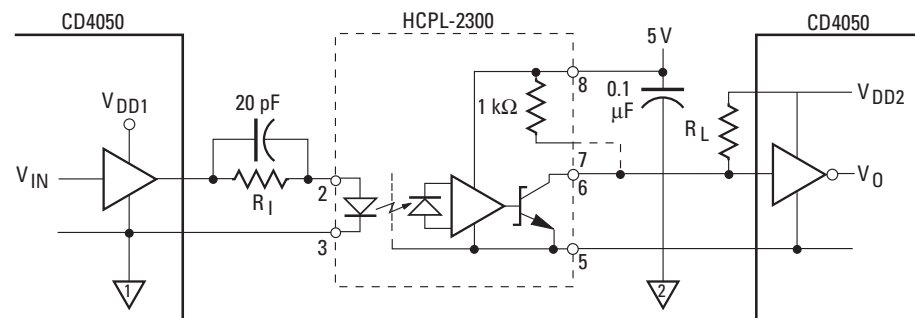
Benefits

- Offers low power consumption

Applications

- Computer-peripheral interface
- Digital isolation for A/D, D/A conversion
- High speed, long distance isolated line receiver
- Level shifting
- RS 232C interface

Typical CMOS Interface Block Diagram



V _{DD1} (V)	R ₁ (kΩ)	R _L (kΩ)	V _{DD2} (V)
5	5.11	1	5
10	13.3	2.37	10
15	19.6	3.16	15

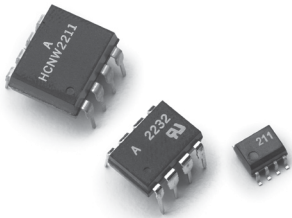
8 MBd Logic Gate Optocoupler Product Selection

Device	Part No.	Package	I _{F(on)} mA Min.	t _{PLH} μs Max.	t _{PHL} μs Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
						CMR V/μs (Min.)	V _{CM} V		
	HCPL-0300	S08	0.5	0.16	0.2	100	50	3750	—
	HCPL-2300	300 mil DIP	0.5	0.16	0.2	100	50	3750	630*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060

Optoisolation Products



5 Mbd Logic Gate Optocoupler

Description

The circuit shown in the typical TTL interface block diagram is an interface between two TTL gates using an active output (totem pole) optocoupler, the HCPL-2201. A series switching circuit drives the optocoupler LED. The active output HCPL-2201 can be directly connected to a TTL gate, and no pull-up resistor is required. The HCPL-2201 can sink enough current to handle up to 16 LSTTL or 4 TTL loads.

Typically, the 5 Mbd logic gate optocoupler is used in the Isolated High-Low Gate Drive interface block diagram as shown below.

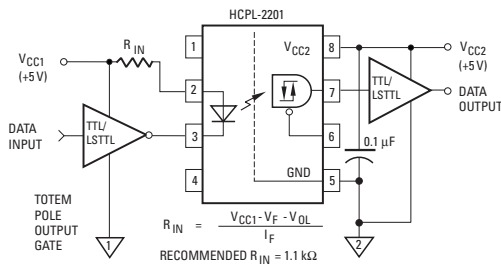
Benefits

- Pull up resistor not required at the optocoupler output
- Low power on the optocoupler input circuit
- Wide operating supply voltages up to 20V

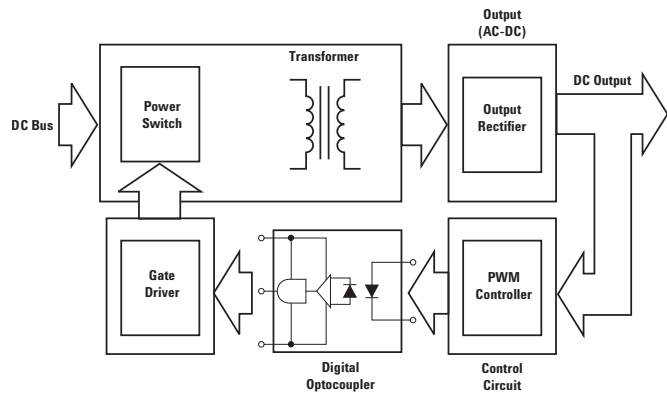
Applications

- Computer-peripheral interface
- Ground loop
- High speed line receiver
- Microprocessor system interface
- Pulse transformer replacement

Typical TTL Interface Block Diagram



Isolated High-Low Gate Drive Interface Block Diagram

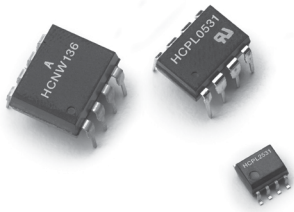


5 Mbd Logic Gate Optocoupler Product Selection

Device	Part No.	Package	I _{F(on)} mA Min.	t _{PLH} μs Max.	t _{PHL} μs Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
						CMR V/μs (Min.)	V _{CM} V		
	HCNW2201	400 mil DIP	1.6	0.3	0.3	1000	50	5000	1414
	HCNW2211	400 mil DIP	1.6	0.3	0.3	10000	1000	5000	1414
	HCPL-0201	S08	1.6	0.3	0.3	1000	50	3750	560*
	HCPL-0211	S08	1.6	0.3	0.3	10000	1000	3750	560*
	HCPL-2219	300 mil DIP	1.6	0.3	0.3	2500	400	3750	630*
	HCPL-2200	300 mil DIP	1.6	0.3	0.3	1000	50	3750	630*
	HCPL-2201	300 mil DIP	1.6	0.3	0.3	1000	50	3750	630*
HCPL-2211	300 mil DIP	1.6	0.3	0.3	10000	1000	3750	630*	
	HCPL-2202	300 mil DIP	1.6	0.3	0.3	1000	50	3750	630*
	HCPL-2212	300 mil DIP	1.6	0.3	0.3	10000	1000	3750	630*
	HCPL-2231	300 mil DIP	1.8	0.3	0.3	1000	50	3750	-
	HCPL-2232	300 mil DIP	1.8	0.3	0.3	10000	1000	3750	-

Notes: * - with IEC/EN/DIN EN 60747-5-2 Option 060

Optoisolation Products



1 Mbd Transistor Output Optocoupler

Description

The circuit in the level shifting/TTL interface block diagram shows how a 0 to 5 V logic signal can be level shifted to a -15 to 0 V signal. This circuit can safely be used for level shifting up to ± 800 V. The circuit uses an open collector output logic gate, the 74LS05, to drive the LED of the 6N135/6 optocoupler. The 6N135/6 also has an open collector output. The designer chooses R_{IN} to agree with the equation shown in the schematic. This equation sets the value of the optocoupler LED forward current. The output of the 6N135/6 requires a pull-up resistor, R_L . The current-transfer ratio (CTR) of the optocoupler determines the maximum amount of current the optocoupler output can sink while maintaining the output voltage (between pins 5 and 6) of 0.5 V or less.

The benefit of the application is that it reduces the transient immunity problem and it is a convenient way of replacing the pulse transformer for high-voltage level shifting.

Applications

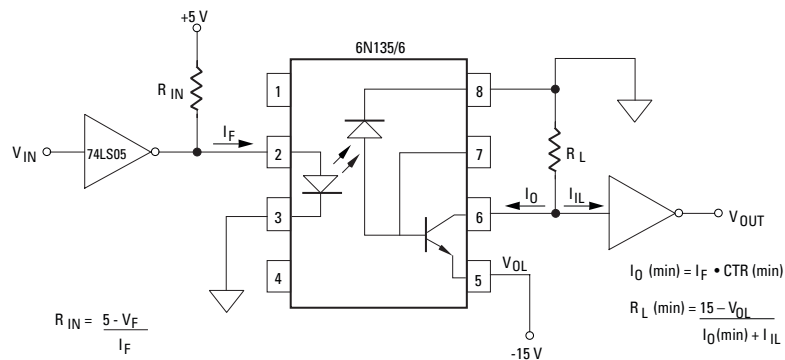
- Analog signal ground isolation
- High speed logic ground isolation
- Line receivers
- Replace pulse transformers
- Replace slow phototransistor isolators

The benefit of the application is that it reduces the transient immunity problem and it is a convenient way of replacing the pulse transformer for high-voltage level shifting.

Benefits

- Allow level shifting capability
- High current transfer ratio

Typical Level Shifting/TTL Interface Block Diagram



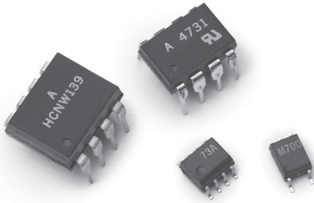
1 Mbd Transistor Output Optocoupler Product Selection

Device	Part No.	Package	$I_{F(on)}$ mA Min.	CTR			t_{PLH} μ s Max.	t_{PHL} μ s Max.	CMR - V/ μ s@ V_{CM}		V_{ISO} V_{RMS} Min.	V_{IORM} V peak
				% Min.	% Max.	I_F mA			CMR V/ μ s (Min.)	V_{CM} V		
	6N135	300 mil DIP	16	7	50	16	2.0	2.0	—	—	3750/5000 [#]	630*
	6N136	300 mil DIP	16	19	50	16	1.0	1.0	—	—	3750/5000 [#]	630*
	HCNW135	400 mil DIP	16	5	—	16	2.0	2.0	1000	10	5000	1414
	HCNW136	400 mil DIP	16	19	150	16	1.0	1.0	1000	10	5000	1414
	HCPL-0500	S08	16	7	50	16	2.0	2.0	1000	10	3750	560*
	HCPL-0501	S08	16	19	50	16	1.0	1.0	1000	10	3750	560*
	HCPL-0530	S08	16	7	50	16	2.0	2.0	1000	10	3750	—
	HCPL-0531	S08	16	19	50	16	1.0	1.0	1000	10	3750	—
	HCPL-2530	300 mil DIP	16	7	50	16	2.0	2.0	1000	10	3750/5000 [#]	—
	HCPL-2531	300 mil DIP	16	19	50	16	1.0	1.0	1000	10	3750/5000 [#]	—

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, [#] - with UL 5000V_{RMS}/1 minute Option 020

Optoisolation Products



100 kBd Darlington Transistor Output Optocoupler

Description

This differentially driven circuit can use up to eight 6N138 optocouplers at various receivers along the 90 m line. All stations are isolated. The first station would draw approximately 2.7 mA current, and the last station 1.8 mA of LED drive current. The output grounds of the optocoupler may be electrically separate.

The benefit of the application is its simple, low-cost, multidrop circuit for low signaling rates.

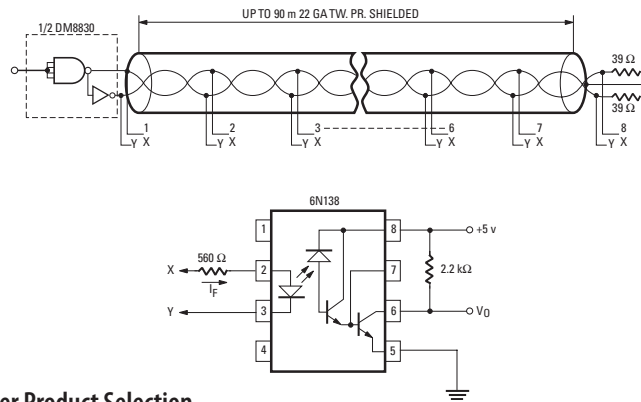
Benefits

- High CTR with low input current
- Low power consumption

Applications

- Digital logic ground isolation
- FIA RS-232C line receiver
- Low power systems and ground isolation
- Telephone ring detector

Typical Multidrop Line Receiver Block Diagram



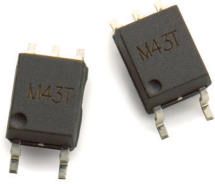
100 kBd Darlington Transistor Output Optocoupler Product Selection

Device	Part No.	Package	IF(on) mA Min.	CTR			CMR - V/μs@VCM		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
				% Min.	% Max.	I _F mA	CMR V/μs (Min.)	V _{CM} V		
Single Channel 	6N138	300 mil DIP	0.5	300	2600	1.6	—	—	3750/5000 [#]	—
	6N139	300 mil DIP	0.5	400	5000	0.5	—	—	3750/5000 [#]	630*
	HCNW138	400 mil DIP	0.5	300	—	1.6	1000	10	5000	1414
	HCNW139	400 mil DIP	0.5	400	—	0.5	1000	10	5000	1414
	HCPL-070A	S08	0.04	800	25000	0.04	1000	10	3750	560*
	HCPL-0700	S08	0.5	300	2600	1.6	1000	10	3750	560*
	HCPL-0701	S08	0.5	400	5000	0.5	1000	10	3750	560*
	HCPL-4701	300 mil DIP	0.04	800	25000	0.04	1000	10	3750/5000 [#]	630*
	HCPL-M700	S05	0.5	300	2600	1.6	1000	10	3750	—
	HCPL-M701	S05	0.5	400	3500	0.5	1000	10	3750	—
Dual Channel 	HCPL-073A	S08	0.04	800	25000	0.04	1000	10	3750	—
	HCPL-0730	S08	0.5	400	5000	0.5	1000	10	3750	—
	HCPL-0731	S08	0.5	400	5000	0.5	1000	10	3750	—
	HCPL-2730	300 mil DIP	0.5	400	5000	0.5	1000	10	3750/5000 [#]	—
	HCPL-2731	300 mil DIP	0.5	400	5000	0.5	1000	10	3750/5000 [#]	—
	HCPL-4731	300 mil DIP	0.04	800	25000	0.04	1000	10	3750/5000 [#]	—

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, # - with UL 5000V_{RMS}/1 minute Option 020

Optoisolation Products



Automotive Wide Temperature Digital Optocouplers

Description

Avago Technologies introduces a series of automotive optocouplers: ACPL-M43T and ACPL-M61T. These single channel, wide operating temperature, high CMR, high speed digital optocouplers in a five lead miniature footprint are specifically used in hybrid electric vehicle applications.

These digital optocouplers have an improved version of the light emitting diode for lower input driving current thus, providing longer LED operating lifetime, lower power consumption and higher efficiency over a -40°C to +125°C temperature range.

The typical circuit in the hybrid electric vehicle's motor inverter controller, DC-DC converter system, shows how the ACPL-M43T interfaces with the IPM module IGBT gate drive as well as fault detection isolation.

Most modern vehicles use communication media such as CANBus for data transmission and system control. In CANBus where transmission speed is up to 1Mbps, two 10MBd ACPL-M61T optocouplers in the CANBus interface are used for safe isolation such as in air-conditioner compressor controllers and battery management systems.

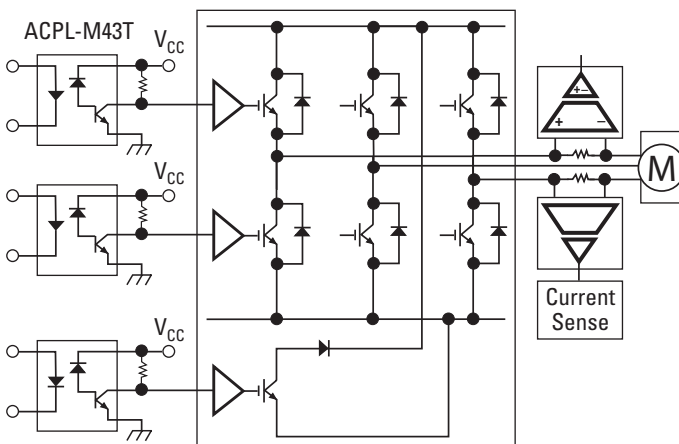
Benefits

- Wide operating temperature (-40°C to 125°C) meet AEC-Q100 guidelines
- High CMR (30 kV/μs at VCM=1kV)
- High reliability suitable for automotive applications
- Low input LED drive current

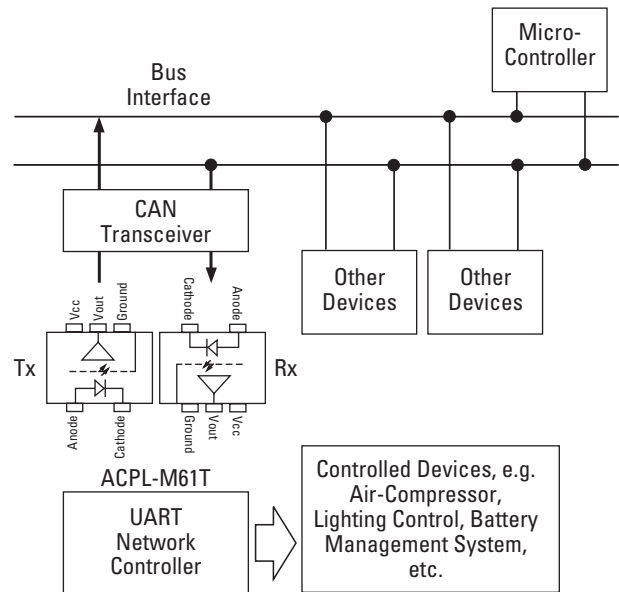
Applications

- Automotive IPM driver for DC-DC converters and motor inverters
- CANBus communications interface
- High temperature digital/analog signal isolation
- Power transistor isolation
- Automotive CANBus communications interface
- High temperature digital signal isolation
- Micro-controller interface
- Digital isolation for A/D, D/A conversion

Typical Intelligent Power Module Block Diagram

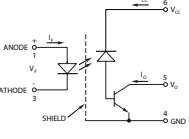


Automotive CANBus Block Diagram

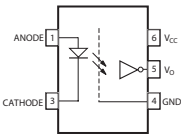


Optoisolation Products

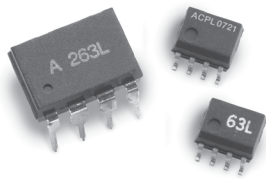
Automotive 1MBd Transistor Output Optocoupler Product Selection

Device	Part No.	Package	Operating Temperature °C	I _F mA	CTR		t _{PLH} μs Max.	t _{PHL} μs Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
					% Min.	% Max.			CMR V/μs (Min.)	V _{CM} V		
Single Channel 	ACPL-M43T-000E	S05	-40 to 125	10	32	80	1.0	1.0	15,000	1,000	3,750	–

Automotive 10MBd Logic Gate Optocoupler Product Selection

Device	Part No.	Package	Operating Temperature °C	I _{F(on)} mA Min.	t _{PLH} ns Max.	t _{PHL} ns Max.	PWD ns Max.	t _{PSK} ns Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
									CMR V/μs (Min.)	V _{CM} V		
Single Channel 	ACPL-M61T-000E	S05	-40 to 125	5	100	100	35	40	15,000	1,000	3,750	–

Optoisolation Products



3.3 V Digital Optocoupler Family

Description

Avago Technologies introduces a family of 3.3 V optocouplers that will ensure superior isolation performance for your low voltage designs.

Using Avago optocouplers for your design eliminates the need for using additional level shifting circuitry, and sacrificing board space and power consumption. All these factors contribute to a seamless integration of your design that is cost effective and in line with industry trends of moving away from the 5 V standard to lower voltage standards.

Avago's new range of 3.3 V optocouplers are the first commercially available optocouplers designed to meet the JEDEC specification for 3.3 V LVTTTL/LVCMOS logic, thereby simplifying the implementation of isolation in systems utilizing 3.3 V logic circuits.

These new optocouplers will provide not just a cost-effective solution, meeting all the requirements of isolation and insulation in 3.3 V systems, it will also provide the additional benefits of higher data rates and lower power supply requirements.

Avago Technologies' 3.3 V technology is available in the widest range of package platform offerings including dual channel and single channel versions in both standard DIP and SMT(SO8) packages.

The typical TIA/EIA-232-E interface block diagram illustrates an RS232-E driver/receiver interface that uses HCPL-260L. DS14C335 is an RS232-E driver/receiver that operates on 3.3 V. The low power requirements and high CMR capability of HCPL-260L make it an ideal choice in data transmission and microprocessor interface applications.

A typical Power over Ethernet power source equipment (PSE) block diagram uses two 15 Mbd 3.3 V optocouplers to isolate between the 13 W 48 V power supply and the inter-integrated chip (I²C) control bus.

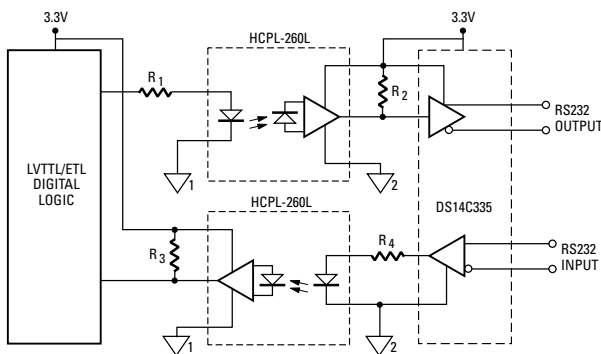
Applications

- Computer peripheral interface
- Digital isolation for A/D, D/A conversion
- Digital logic ground isolation
- Inter-integrated Chip (I²C) control bus
- Line receivers
- LVTTTL/LVCMOS interface
- Power over ethernet
- Pulse transformer replacement

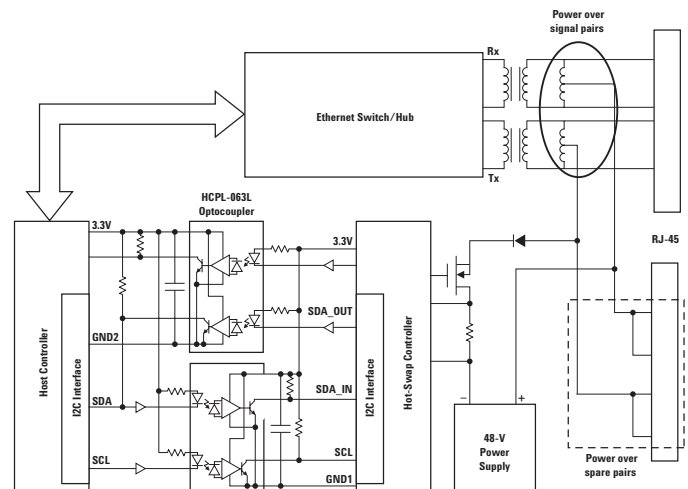
Benefits

- Provide high data rate and low power supply requirement
- Certified with reinforced insulation under IEC/EN/DIN EN 60747-5-2
- Dual supply voltages (3.3V/5V) for ACPL-x72L
- Wide temperature range (-40 °C to 105°C) for ACPL-x72L

Typical TIA/EIA-232-E Interface Block Diagram

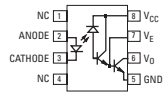
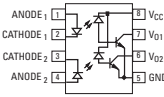


Typical Power over Ethernet Power Source Block Diagram



Optoisolation Products

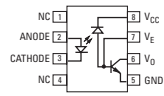
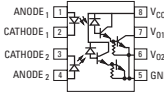
3.3V Family (100 kBd Darlington Transistor Output Optocoupler)

Device	Part No.	Package	$I_{F(on)}$ mA Min.	CTR			t_{PLH} μ s Max.	t_{PHL} μ s Max.	CMR - V/ μ s@ V_{CM}		V_{ISO} V_{RMS} Min.	V_{IORM} V peak
				% Min.	% Max.	IF mA			CMR V/ μ s (Min.)	V_{CM} V		
Single Channel 	HCPL-070L	S08	0.5	400	5000	0.5	90	30	1000	10	3750	560*
	HCPL-270L	300 mil DIP	0.5	400	5000	0.5	90	30	1000	10	3750/5000 [#]	630*
Dual Channel 	HCPL-073L	S08	0.5	400	5000	0.5	90	30	1000	10	3750	560*
	HCPL-273L	300 mil DIP	0.5	400	5000	0.5	90	30	1000	10	3750/5000 [#]	630*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, [#] - with UL 5000V_{RMS}/1 minute Option 020

3.3V Family (1 MBd Transistor Output Optocoupler)

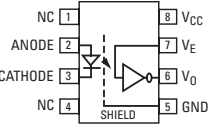
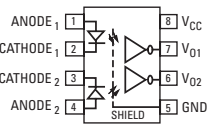
Device	Part No.	Package	$I_{F(on)}$ mA Min.	CTR			t_{PLH} μ s Max.	t_{PHL} μ s Max.	CMR - V/ μ s@ V_{CM}		V_{ISO} V_{RMS} Min.	V_{IORM} V peak
				% Min.	% Max.	IF mA			CMR V/ μ s (Typ.)	V_{CM} V		
Single Channel 	HCPL-050L	S08	16	15	50	16	1.0	1.0	1000	10	3750	560*
	HCPL-250L	300 mil DIP	16	15	50	16	1.0	1.0	1000	10	3750/5000 [#]	630*
Dual Channel 	HCPL-053L	S08	16	15	50	16	1.0	1.0	1000	10	3750	560*
	HCPL-253L	300 mil DIP	16	15	50	16	1.0	1.0	1000	10	3750/5000 [#]	630*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, [#] - with UL 5000V_{RMS}/1 minute Option 020

Optoisolation Products

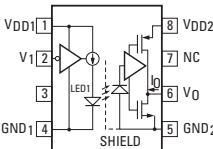
3.3V Family (15 Mbd Logic Gate Optocoupler)

Device	Part No.	Package	$I_{F(on)}$ mA Min.	t_{PLH} ns Max.	t_{PHL} ns Max.	PWD ns Max.	t_{PSK} ns Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
								CMR V/μs (Min.)	V _{CM} V		
Single Channel 	ACPL-M60L-000E	S05	5	90	75	25	40	15000	1000	3750	560*
	ACPL-W60L-000E	Stretched S06	5	90	75	25	40	10000	1000	3750	560*
	HCPL-060L	S08	5	90	75	25	40	15000	50	3750	560*
	HCPL-260L	300 mil DIP	5	90	75	25	40	15000	50	3750/5000 [#]	630*
Dual Channel 	ACPL-K63L-000E	Stretched S08	5	90	75	25	40	10000	1000	3750	560*
	HCPL-063L	S08	5	90	75	25	40	15000	50	3750	560*
	HCPL-263L	300 mil DIP	5	90	75	25	40	15000	50	3750/5000 [#]	630*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, [#] - with UL 5000V_{RMS}/1 minute Option 020

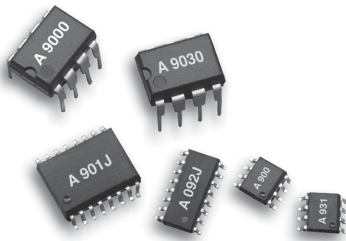
3.3V / 5V Family (25 Mbd High Speed Digital CMOS Logic Gate Optocoupler)

Device	Part No.	Package	V _{DD} V	$I_{F(on)}$ mA Min.	Max. Data Rate MBd Min.	t_{PLH} ns Max.	t_{PHL} ns Max.	PWD ns Max.	t_{PSK} ns Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
										CMR V/μs (Min.)	V _{CM} V		
Single Channel CMOS Input 	ACPL-072L-000E	S08	3.3/5	-	25	40	40	6	20	10000	1000	3750	560*
	ACPL-772L-000E	300 mil DIP	3.3/5	-	25	40	40	6	20	10000	1000	3750/5000 [#]	630*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, [#] - with UL 5000V_{RMS}/1 minute Option 020

Optoisolation Products



Digital Isolator

Description

The HCPL-90xx/-09xx series CMOS digital isolators integrated with giant magneto-resistive (GMR) technology enable high speed performance and excellent transient immunity specifications.

All devices operate at 3.3 V or 5 V supply voltages, boasting low power consumption. They are able to withstand high common mode voltages, 15kV/ μ s at $V_{cm}=1000V$, and meet UL 1577 and IEC 61010-1 safety ratings.

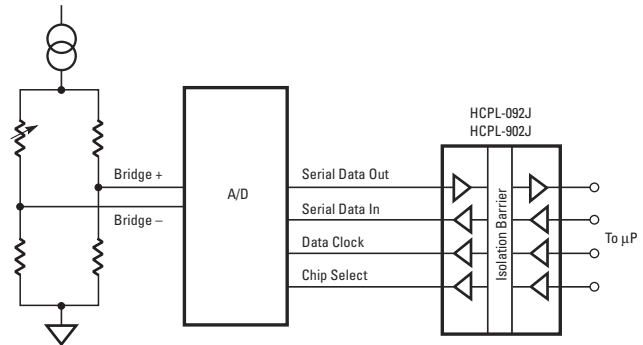
Benefits

- High speed (100MBd), low PWD (3ns) and low T_p (18ns)
- Wide temperature operation (-40°C to 100°C)
- Buffer input and CMOS output (eliminate input/output resistors)
- Multi-channel (1, 2 & 4-ch)
- Low power consumption

Applications

- Digital fieldbus isolation
- Multiplexed data transmission
- Computer peripheral interface
- High speed digital systems
- Isolated data interfaces
- Logic level shifting

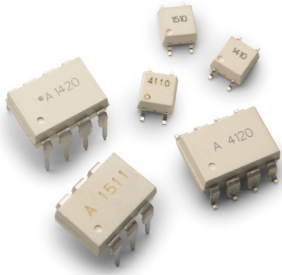
Typical Isolated A/D Conversion Block Diagram



Digital Isolator HCPL-09XX AND HCPL-90XX Product Selection

Device	Part No.	Channel	Package	Max. Data Rate MBd Min.	t_{PLH} & t_{PHL} ($V_{CC}=5.0V$) ns Max.	t_{PLH} & t_{PHL} ($V_{CC}=3.3V$) ns Max.	PWD ns Max.	t_{PSK} ns Max.	CMR - $V/\mu s @ V_{CM}$		V_{ISO} V_{RMS} Min.
									CMR $V/\mu s$ (Min.)	V_{CM} V	
	HCPL-0900	Single	S08	100	15	18	3	6	15000	1000	2500
	HCPL-9000	Single	300 mil DIP	100	15	18	3	6	15000	1000	2500
	HCPL-0930	Dual	S08	100	15	18	3	6	15000	1000	2500
	HCPL-9030	Dual	300 mil DIP	100	15	18	3	6	15000	1000	2500
	HCPL-0931	Dual, Bi-Dir	S08	100	15	18	3	6	15000	1000	2500
	HCPL-9031	Dual, Bi-Dir	300 mil DIP	100	15	18	3	6	15000	1000	2500
	HCPL-090J	Quad	S016 Narrow Body	100	15	18	3	6	15000	1000	2500
	HCPL-900J	Quad	S016 Wide Body	100	15	18	3	6	15000	1000	2500
	HCPL-091J	Quad, 2/2 Bi-dir	S016 Narrow Body	100	15	18	3	6	15000	1000	2500
	HCPL-901J	Quad, 2/2 Bi-dir	S016 Wide Body	100	15	18	3	6	15000	1000	2500
	HCPL-092J	Quad, 3/1 Bi-dir	S016 Narrow Body	100	15	18	3	6	15000	1000	2500
	HCPL-902J	Quad, 3/1 Bi-dir	S016 Wide Body	100	15	18	3	6	15000	1000	2500

Optoisolation Products



Applications

- Telecommunications switching
- Data communications
- Industrial control
- Medical system
- Security system
- Automatic test equipment
- Data acquisition system
- Measuring instruments
- EMR/reed relay replacement

Solid State Relay (MOSFET)

Description

Avago Technologies' new ASSR Series are high-speed optically isolated MOSFET-output solid-state relays that feature performance that has been qualified over a wide industrial temperature range of -40°C to +85°C. They are Form A (normally open) single-pole single-throw relays in industry-standard 6-pin and 8-pin dual-in-line (DIP) packages, and 4-pin small outline (SO) packages. Their output ratings range from 60V to 400V maximum load voltage and from 50mA to 1A continuous output current. Their transient immunity of more than 1kV/ μ s and excellent noise rejection between input-output as well as between open terminals on the output will eliminate undesirable transient effects. Reinforced insulation of 3.75kV with fast switching speed makes them suitable for a wide range of industrial, consumer and automotive applications.

Compared to electromechanical relays, the ASSR Series offer distinct advantages, including the elimination of contact bounce, and problems due to shock, vibration, or mounting position. They have no wear out mechanism limiting the number of operations, and require no minimum contact "wetting" current. They are also free from magnetic fields, do not generate electrical noise, and are not sensitive to electromagnetic interference.

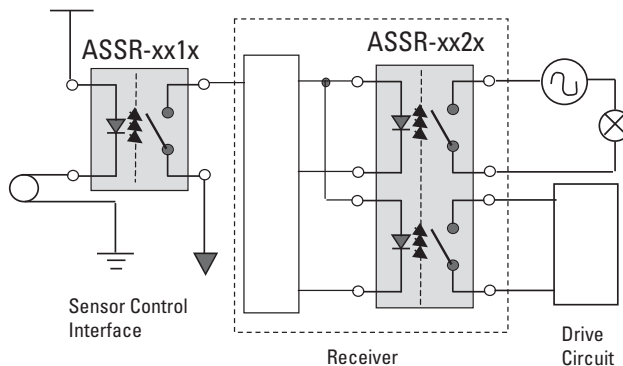
Benefits

- Superior to traditional electromechanical relays (EMR)
 - Lower power consumption
 - Faster switching speed with high transient immunity
 - Smaller size
 - Much better reliability
- High reinforced insulation in miniature SO-4 package
- Qualified performance over -40°C to +85°C
- Expanding portfolio to address diversified market
 - Low $R_{(ON)}$ for less insertion loss
 - Low $C_{(OFF)}$ for better isolation performance
 - High current capability with low $R_{(ON)}$

General Purpose

The ASSR-14xx, ASSR-32xx, and ASSR-41xx are designed for a wide variety of industrial and consumer electronics applications which includes telecommunications switching, data communications, automatic metering, medical system, security system, battery monitor, digital home appliances, set top boxes, etc.

Security Equipment Application Diagram



Optoisolation Products

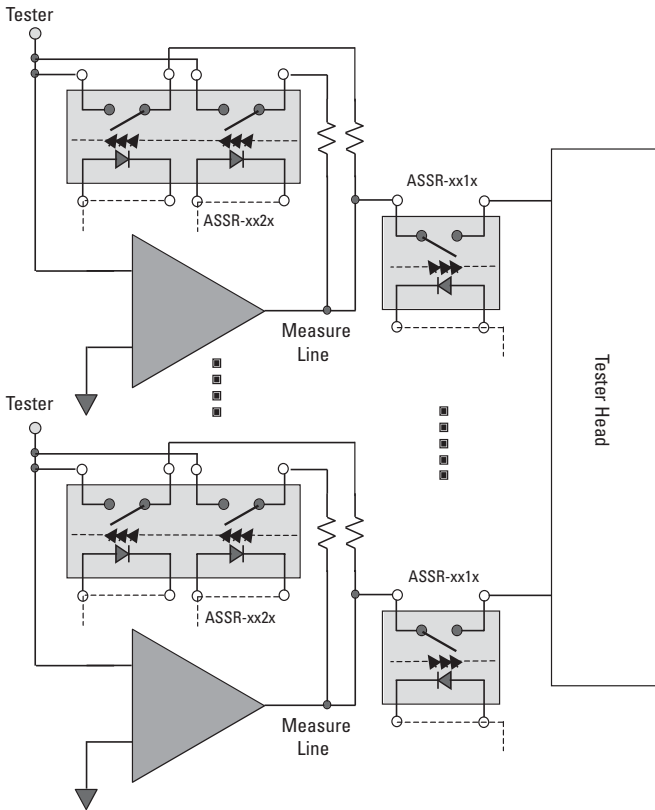
Low $C_{(OFF)} \times R_{(ON)}$

The ASSR-xxxC and ASSR-xxxR Series are specifically designed for fast switching applications, commonly found in automated test equipment (ATE) and other test equipment applications for pin electronics, data acquisition, multiplexers and matrix cards, and switching in the analog circuits of parametric measurement unit (PMUs). The low output capacitance, low on-resistance, and low output offstate leakage current of the ASSR Series provide higher system throughput and reduce system errors. In addition to their fast switching speeds, the ASSR Series provide reinforced insulation of 3.75kV, which is often required in industrial environments.

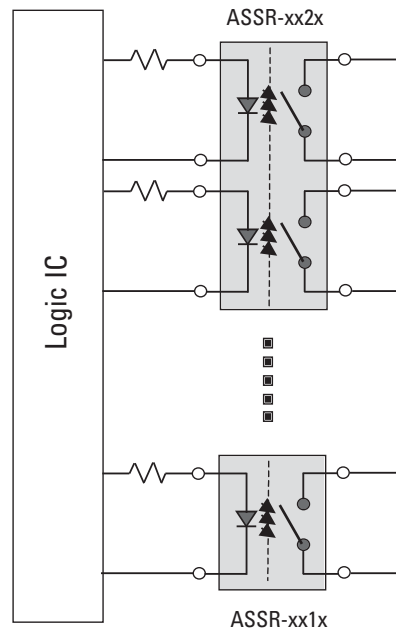
High Current

The ASSR-15x0 is specifically designed for high current applications, commonly found in the industrial applications. In programmable controllers, input and output modules allow microprocessors to sense and control various loads. An AC output module allows logic-level voltages to control a switch that turns AC loads on and off. For example, the output module of a process controller might be used to control the motor starters of adjustable frequency drives, position valves, or dampers. As the computing speed increases, noise problems arise at the input interface as well as at the output interface. The ASSR Series are resistant to inrush current (due to phase shift) and eliminate the need for snubber circuits as long as they are operated within the ratings. In addition, the use of small size relays result in more compact programmable controllers.

Automatic Test Equipment Application Diagram



Programmable Logic Control System Application Diagram



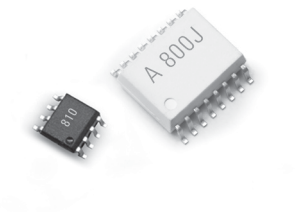
Unlike electromechanical relays, the ASSR Series do not have mechanical contacts, which could eventually deteriorate from arcing or dust particles.

Optoisolation Products

Device	Part No.	Function	Package	Channel & Output Type	V _{ISO} kV Min.	V _{O(OFF)} V Min.	I _O A Max.	I _{O(OFF)} μA Max.	C _{O(OFF)} pF Max.	R _{ION} Ω Max.	T _{ON} ms Max.	T _{OFF} ms Max.
	ASSR-1410-003E	GP	SO4	1 Form A	3.75	60	0.6	100	—	1	0.5	0.2
	ASSR-1510-003E	HC	SO4	1 Form A	3.75	60	1.0	100	—	0.5	1	0.2
	ASSR-301C-003E*	Low CxR	SO4	1 Form A	3.75	250	0.05	1	15	40	0.5	0.2
	ASSR-321R-003E*	Low CxR	SO4	1 Form A	3.75	250	0.2	1	60	8.5	0.5	0.2
	ASSR-3210-003E*	GP	SO4	1 Form A	3.75	250	0.2	100	—	10	1	0.2
	ASSR-401C-003E*	Low CxR	SO4	1 Form A	3.75	400	0.04	10	15	100	0.5	0.2
	ASSR-1411-001E*	GP	300mil DIP-6	1 Form A	3.75	60	0.6	100	—	1	0.5	0.2
	ASSR-1511-001E	HC	300mil DIP-6	1 Form A	3.75	60	1.0	100	—	0.5	1	0.2
	ASSR-3211-001E*	GP	300mil DIP-6	1 Form A	3.75	250	0.2	100	—	10	1	0.2
	ASSR-4111-001E*	GP	300mil DIP-6	1 Form A	3.75	400	0.12	100	—	25	0.5	0.2
	ASSR-1420-002E	GP	300mil DIP-8	2 Form A	3.75	60	0.6	100	—	1	0.5	0.2
	ASSR-1520-002E	HC	300mil DIP-8	2 Form A	3.75	60	1.0	100	—	0.5	1	0.2
	ASSR-302C-002E*	Low CxR	300mil DIP-8	2 Form A	3.75	250	0.05	1	15	40	0.5	0.2
	ASSR-322R-002E	Low CxR	300mil DIP-8	2 Form A	3.75	250	0.2	1	60	8.5	0.5	0.2
	ASSR-3220-002E	GP	300mil DIP-8	2 Form A	3.75	250	0.2	100	—	10	1	0.2
	ASSR-402C-002E*	Low CxR	300mil DIP-8	2 Form A	3.75	400	0.04	10	15	100	0.5	0.2
	ASSR-4120-002E	GP	300mil DIP-8	2 Form A	3.75	400	0.12	100	—	25	0.5	0.2

Note: * = Advanced Information, GP = General Purpose, Low CxR = Low C_{O(OFF)} x R_{ION}, HC = High Current

Optoisolation Products



Applications

- Automatic meter reading (AMR)
- Powerline modem
- Home automation/control
- Security and surveillance
- General purpose isolated transceiver
- Internet appliances

Powerline Communication Interface

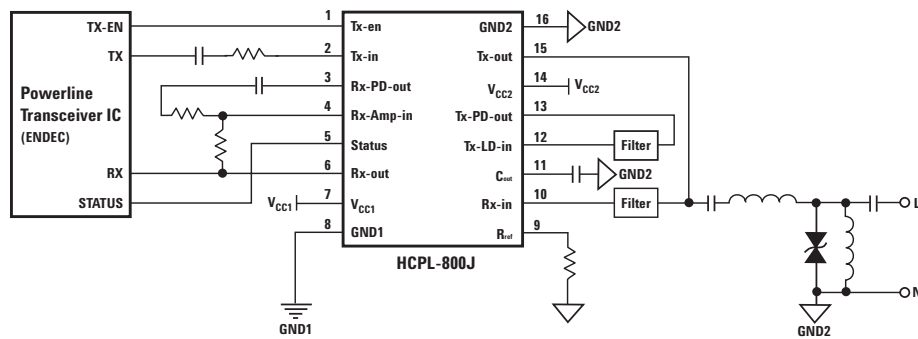
Description

The HCPL-8x0J, HCPL-0810 / 8100 and ACPL-0820 are designed for narrow band powerline communication (PLC) analog front end interfacing applications. Compact in size, suitable FCC Part 15 and EN50065-1 compliant design, this family can interface many common PLM transceivers to the powerline, thus simplifying the powerline modem (PLM) implementations.

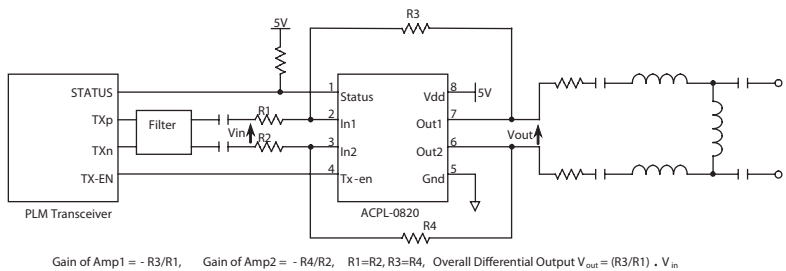
Benefits

- Compact integrated solution
- Low power consumption
- Integrated safety features such as over-temperature shutdown
- Suitable for FCC Part 15 and EN50065-1 compliant design

Typical Power Line Modem Using HCPL-800J



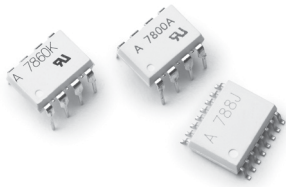
Typical Power Line Modem Using ACPL-0820



Power Line Communication Interface Product Selection

Part No.	Package	Signal Path	Bandwidth MHz Typ.	GBWP MHz Typ.	I_o A _{pp} Typ.	Harmonic Distortion dBc, Max.		Isolation	V _{CC} V Typ.	V _{ISO} V _{RMS} Min.	V _{I10RM} V peak
						HD2	HD3				
ACPL-0820-000E	S08	Tx only	—	3.0	1.0	-60	-65	No	5	—	—
HCPL-800J	S016	Tx/Rx	0.5	—	1.0	-60	-65	Yes	5	3750	891
HCPL-0810	S08	Tx only	—	3.5	1.0	-60	-65	No	5	—	—
HCPL-8100	300 mil Dip	Tx only	—	3.5	1.0	-60	-65	No	5	—	—

Optoisolation Products



Miniature Analog Isolation Amplifier

Description

The HCPL-788J can be used for isolating the motor current sensing element from the control circuit while at the same time transmitting precision analog signals overcurrent fault signals. This circuit requires a high precision-sensing resistor for monitoring the motor current. The single-ended output allows it to directly interface with the A/D port of the micro-controller. Other benefits include an in-built fault detection, high CMR and a package that is small in size compared to Hall effect devices.

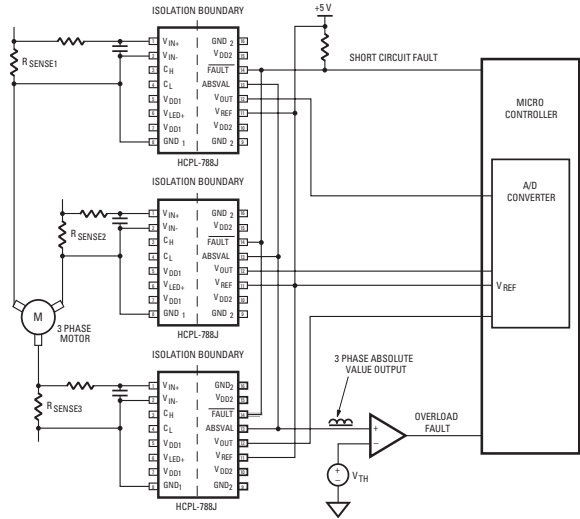
Benefits

- Compact package suitable for high volume production process
- Cost-effective solution
- Reinforced insulation

Applications

- Motor phase and rail current sensing
- Data acquisition systems
- Industrial process control
- Inverter current sensing
- General purpose current sensing and monitoring

Low Cost Three Phase Current Sensing with Short Circuit and Overload Detection Block Diagram



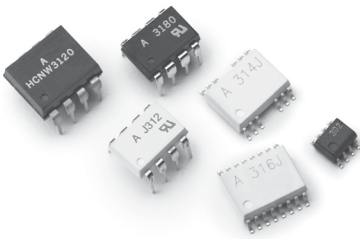
Miniature Analog Isolation Amplifier Product Selection

Device	Part No.	Package	Gain Tolerance % Max.	Non-Linearity % Max.	Prop Delay μ s Max.	CMR - V/μ s@ V_{CM}		Output Configuration	V_{ISO} V_{RMS} Min.	V_{IORM} V peak
						CMR V/μ s (Min.)	V_{CM} V			
	HCPL-7860	300 mil DIP	Isolated 12 bit A/D Converter with Isolated Modulator						3750	891
	HCPL-7560	300 mil DIP	Isolated 8 bit A/D Converter with Isolated Modulator						3750	891*
	HCPL-786J	S016	Isolated 12 bit A/D Converter with Isolated Modulator with better creepage and clearance						3750	891
	HCPL-0872	S016	Digital Interface IC for A/D Converter						-	-
	HCPL-7800A	300 mil DIP	1	0.2	9.9	10000	1000	Differential	3750	891
	HCPL-7800	300 mil DIP	3	0.2	9.9	10000	1000	Differential	3750	891
	HCPL-7840	300 mil DIP	5	0.2	9.9	10000	1000	Differential	3750	891*
	HCPL-788J	S016	5	0.4	20	10000	1000	Single-ended	3750	891
	<ul style="list-style-type: none"> • Smart Current Sensor with integrated fast short circuit detection (3μs) • Analog Output direct compatible with A/D converters • 1μV/$^{\circ}$C offset change vs temperature 								<ul style="list-style-type: none"> • 16 kHz bandwidth • Absolute value signal • Fault detection 	
	HCPL-7510	300 mil DIP	3	0.4	9.9	10000	1000	Single-ended	3750	891*
	HCPL-7520	300 mil DIP	5	0.4	9.9	10000	1000	Single-ended	3750	891*

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060

Optoisolation Products



Applications

- Isolated IGBT/MOSFET gate drive
- AC and brushless DC motor drives
- Industrial inverters
- Switching power supplies
- Uninterruptible power supplies (UPS)

Integrated Gate Drive Optocoupler

Description

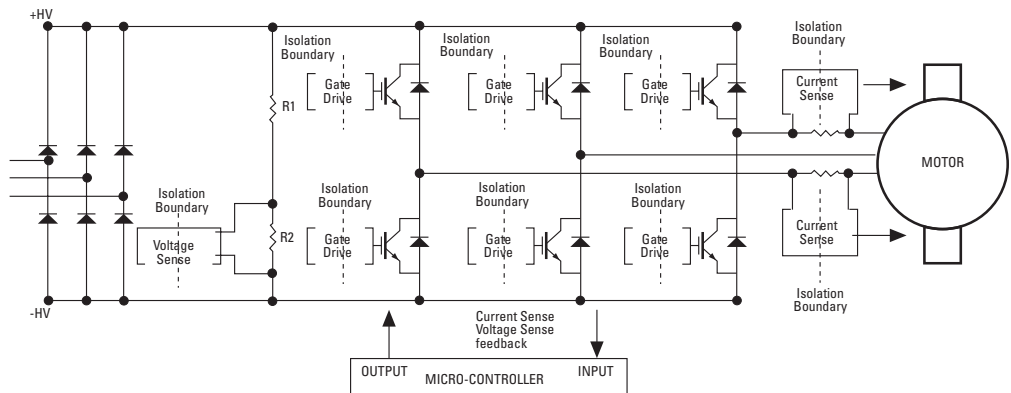
In typical motor drive and power control systems, there are several signals between the power devices and the micro-controller that need isolation and additional customized functions such as gate drive and current/voltage sensing. Avago Technologies' gate drive and isolation amplifier products provide low cost, high performance solutions for motor control applications.

High performance motor drives require precision timing for turning on and off the power devices on the inverter. The micro-controller that controls these functions needs to be isolated from the high voltage inverter side. Avago Technologies offers a variety of optoisolators that have built-in gate drive capability. For solutions that require lower output power capability, IPM interface optocouplers will meet the need.

Benefits

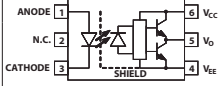
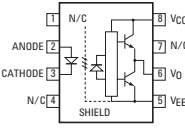
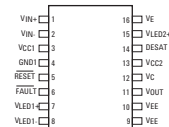
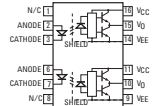
- Short propagation delay for faster switching
- Fast IGBT switching for improved efficiency
- High common mode transient rejection ensures reliable operation under noisy environment
- Direct drive of high power IGBTs
- Reduce component count and solution cost
- Reinforced insulation

Typical Motor Drive Block Diagram



Optoisolation Products

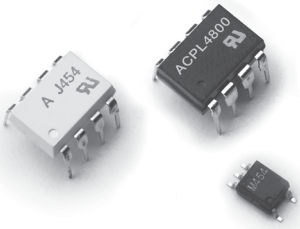
Integrated Gate Drive Optocoupler Product Selection

Device	Part No.	Package	$I_{F(on)}$ mA Min.	I_{OUT} A Min.	t_{PLH} μ s Max.	t_{PHL} μ s Max.	PDD μ s Max.	V_{CC} V Max.	CMR - V/ μ s@ V_{CM}		V_{ISO} V_{RMS} Min.	V_{IORM} V peak
									CMR V/ μ s (Min.)	V_{CM} V		
Single Channel 	ACPL-P314-000E	Stretched SO6	8	0.4	0.7	0.7	0.5	30	10000	1000	3750	630*
	ACPL-W302-000E	Stretched SO6	7	0.2	0.7	0.7	0.5	30	10000	1000	3750	630*
	ACPL-W314-000E	Stretched SO6	8	0.4	0.7	0.7	0.5	30	10000	1000	3750	630*
	ACNW3130-000E	400 mil DIP	10	2.0	0.5	0.5	0.3	30	40000	1500	5000	1414
	ACPL-3130-000E	300 mil DIP	7	2.0	0.5	0.5	0.35	30	40000	1500	3750	630*
	ACPL-J313-000E	300 mil DIP	7	2.0	0.5	0.5	0.35	30	40000	1500	3750	891
	HCNW3120	400 mil DIP	10	2.0	0.5	0.5	0.3	30	15000	1500	5000	1414
	HCPL-J312	300 mil DIP	7	2.0	0.5	0.5	0.35	30	15000	1500	3750	891
	HCPL-J314	300 mil DIP	8	0.4	0.7	0.7	0.5	30	10000	1500	3750	891
	HCPL-T250	300 mil DIP	7	0.5	0.5	0.5	–	30	5000	600	3750	630*
	HCPL-T251	300 mil DIP	8	0.1	1.0	1.0	–	30	10000	600	3750	–
	HCPL-0302	SO8	7	0.2	0.7	0.7	0.5	30	10000	1000	3750	566*
	HCPL-0314	SO8	8	0.4	0.7	0.7	0.5	30	10000	1000	3750	566*
	HCPL-3000	300 mil DIP	8	0.5	5	5	–	18	–	–	5000	–
	HCPL-3020	300 mil DIP	7	0.2	0.7	0.7	0.5	30	10000	1000	3750	630*
	HCPL-3100	300 mil DIP	12	0.1	2	2	–	24	–	–	5000	–
	HCPL-3101	300 mil DIP	8	0.1	0.5	0.5	–	24	–	–	5000	–
	HCPL-3120	300 mil DIP	7	2.0	0.5	0.5	0.35	30	15000	1500	3750	630*
	HCPL-3140	300 mil DIP	8	0.4	0.7	0.7	0.5	30	10000	1000	3750	630*
HCPL-3150	300 mil DIP	7	0.5	0.5	0.5	0.35	30	15000	1500	3750	630*	
HCPL-3180	300 mil DIP	10	2.0	0.2	0.2	0.09	20	10000	1500	3750	630*	
	HCPL-316J	SO16	–	2.0	0.5	0.5	0.3	30	15000	1500	3750	891
	– 2.0 A Highly Integrated Gate Drive Optocoupler with over-current Protection and Fault Feedback – CMOS compatible – Under Voltage Lock-Out Protection (UVLO) with Hysteresis											
Dual Channel 	HCPL-314J	SO16	8	0.4	0.7	0.7	0.5	30	10000	1500	3750	891
	HCPL-315J	SO16	7	0.5	0.5	0.5	0.35	30	15000	1500	3750	891

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060.

Optoisolation Products



Intelligent Power Module Interface Optocoupler

Description

The HCNW/HCPL-45xx and ACPL-48xx series optocouplers are designed for Intelligent Power Module (IPM) drive applications. Such as, in inverters and motor control systems. These high speed optocouplers have high CMR performance that help reject common mode noise in such high voltage systems. The output of HCNW/HCPL-45xx devices is conventional open-collector; the output of ACPL-48xx devices in the totem pole output stage eliminates the necessity of using the pull-up resistor and allows direct drive to the IPM.

Applications

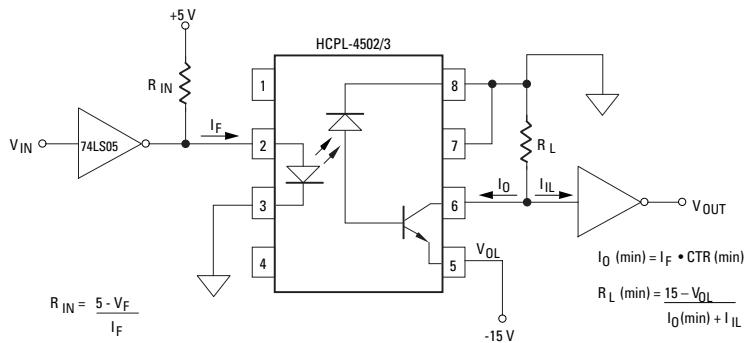
- Intelligent power module
- Inverter/Motor control
- Power switch design
- General purpose digital isolation

In addition to Intelligent Power Module drive, the HCNW/HCPL-45xx and ACPL-48xx series optocouplers can be used in general purpose isolation applications like high speed logic ground isolation, isolated line receivers, and microprocessor system interfaces.

Benefits

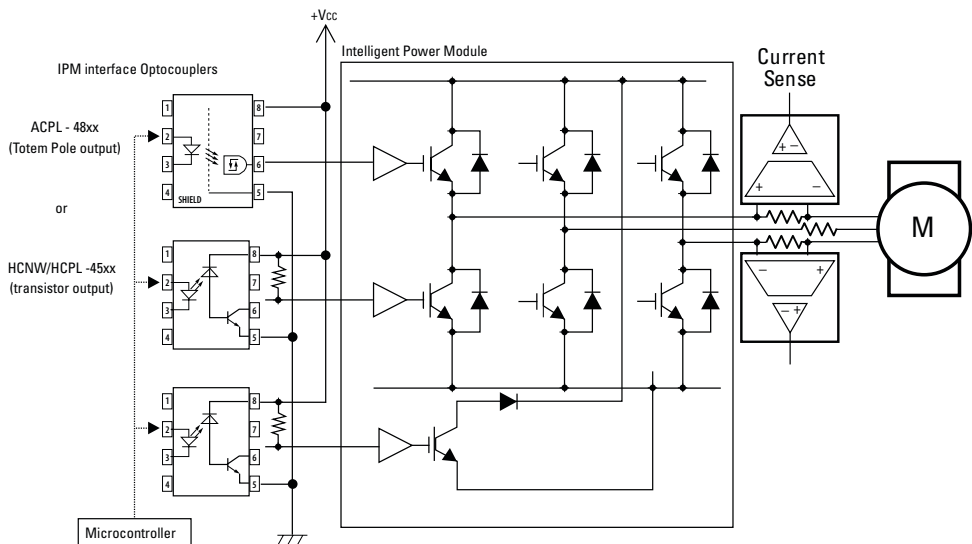
- Short propagation delay for faster switching
- Fast IGBT switching for improved efficiency
- High Common Mode Transient Rejection ensures reliable operation under noisy environment
- Wide operating temperature range
- Reinforced insulation

Typical Level Shifting/TTL Interface Block Diagram



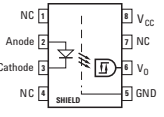
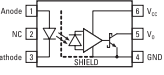
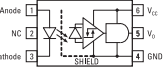
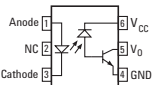
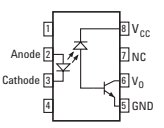
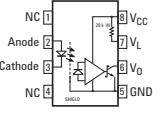
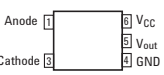
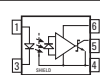
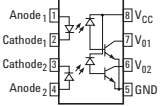
NOTE: FOR BEST CMR PERFORMANCE, CONNECT PIN 7 TO PIN 8.

Intelligent Power Module (IPM) Based Inverter Block Diagram



Optoisolation Products

Intelligent Power Module Interface Optocoupler Product Selection

Device	Part No.	Package	I _{F(on)} mA Min.	CTR			t _{PLH} μs Max.	t _{PHL} μs Max.	PDD μs Max.	CMR - V/μs@V _{CM}		V _{ISO} V _{RMS} Min.	V _{IORM} V peak
				% Min.	% Max.	I _F mA				CMR V/μs (Min.)	V _{CM} V		
	ACPL-4800-000E	300 mil DIP	6	–	–	–	0.35	0.35	0.25	30000	1000	3750	630*
	ACPL-P456-000E	Stretched SO6	10	44	>90	10	0.55	0.45	0.45	15000	1500	3750	630*
	ACPL-W456-000E	Stretched SO6	10	44	>90	10	0.55	0.45	0.45	15000	1500	3750	630*
	ACPL-P480-000E	Stretched SO6	6	–	–	–	0.35	0.35	0.25	30000	1000	3750	630*
	ACPL-K453-000E	Stretched SO8	16	19	50	16	1.00	1.00	1.00	15000	1500	3750/5000 [#]	630*
	ACPL-P454-000E	Stretched SO6	12	26	65	12	1.14	1.00	1.30	15000	1500	3750/5000 [#]	630*
	ACPL-W454-000E	Stretched SO6	12	26	65	12	1.14	1.00	1.30	15000	1500	3750/5000 [#]	630*
	HCNW4502†	400 mil DIP	16	19	50	16	1.0	1.0	–	1000	10	5000	1414
	HCNW4503†	400 mil DIP	16	19	50	16	1.0	1.0	–	15000	1500	5000	1414
	HCNW4504†	400 mil DIP	12	25	65	12	1.4	1.0	1.3	10000	1500	5000	1414
	HCPL-0452†	S08	16	19	50	16	1.0	1.0	–	1000	10	3750	560*
	HCPL-0453†	S08	16	19	50	16	1.0	1.0	1.0	15000	1500	3750	560*
	HCPL-0454†	S08	12	26	65	12	1.4	1.0	–	15000	1500	3750	560*
	HCPL-4502†	300 mil DIP	16	19	50	16	1.0	1.0	–	1000	10	3750/5000 [#]	630*
	HCPL-4503†	300 mil DIP	16	19	50	16	1.0	1.0	1.0	15000	1500	3750/5000 [#]	630*
	HCPL-4504†	300 mil DIP	12	26	65	12	1.4	1.0	1.3	15000	1500	3750/5000 [#]	630*
	HCPL-J454†	300 mil DIP	12	21	65	12	0.7	0.5	1.3	15000	1500	3750	891
	HCNW4506	400 mil DIP	10	44	>90	10	0.55	0.40	–	15000	1500	5000	1414
	HCPL-0466	S08	10	44	>90	10	0.55	0.48	0.45	15000	1500	3750	560*
	HCPL-4506	300 mil DIP	10	44	>90	10	0.55	0.40	0.45	15000	1500	3750/5000 [#]	630*
	HCPL-J456	300 mil DIP	10	44	>90	10	0.55	0.40	0.45	15000	1500	3750	891
	HCPL-M452	S05	16	20	50	16	1.0	1.0	–	1000	10	3750	–
	HCPL-M453	S05	16	20	50	16	1.0	1.0	1.0	15000	1500	3750	–
	HCPL-M454	S05	12	26	65	12	1.4	1.0	1.3	15000	1500	3750	–
	HCPL-M456	S05	10	44	>90	10	0.55	0.40	0.45	15000	1500	3750	–
	HCPL-0534	S08	16	19	50	16	1.0	1.0	–	15000	1500	3750	–
	HCPL-4534	300 mil DIP	16	19	50	16	1.0	1.0	–	15000	1500	3750/5000 [#]	–

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060, # - with UL 5000V_{RMS}/1 minute Option 020, † - pin 7 not connected

Optoisolation Products



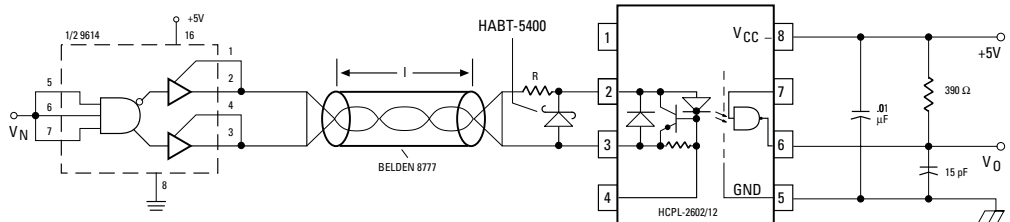
Isolated Line Receiver

Description

The HCPL-2602/12 have input current regulators and integrated high gain photo detectors. The input regulator serves as a line terminator for line receiver applications. The higher LED threshold voltage provides improved immunity to differential noise and the rejection internally shielded detector provides better common-mode rejection with no sacrifice in speed.

The diagram below illustrates an unbalanced line receiver using the integrated voltage-clamp input optocoupler, HCPL-2602. TTL data is converted to a differential signal via the differential line driver, and transmitted over twisted-pair wire. The Schottky diode helps to improve the turn-on and turn-off delays.

Typical Block Diagram



Benefits

- Line termination included – no extra circuitry required

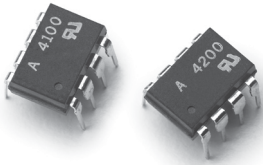
Applications

- Isolated line receiver
- Computer-peripheral interface
- Microprocessor system interface
- Digital isolation for A/D, D/A conversion
- Current sensing
- Instrument Input/Output isolation
- Ground loop elimination
- Pulse transformer replacement
- Power transistor isolation in motor drives

Line Receiver Product Selection

Device	Part No.	Package	Output Collector Output mA Max.	t_{PLH} μ s Max.	t_{PHL} μ s Max.	CMR - V/ μ s@VCM		V_{ISO} V_{RMS} Min.
						CMR V/ μ s (Min.)	V_{CM} V	
	HCPL-2602	300 mil DIP	50	100	100	1000	50	3750
	HCPL-2612	300 mil DIP	50	100	100	3500	300	3750
40 ns max propagation delay skew (part to part) Line termination circuitry included								

Optoisolation Products



Isolated 20 mA Current Loop Transmitter/Receiver

Description

Data transmission between electronic equipment which are physically separated by a distance of more than a few feet can be achieved by using the HCPL-4100 (transmitter) and the HCPL-4200 (receiver) optocouplers. These devices include specialized circuits for 20 mA digital current loop applications, and are designed to easily interface TTL and CMOS logic systems to current loop systems.

20 mA current loop systems conventionally signal a logic high state by transmitting 20 mA of loop current, and signal a logic low state by

allowing no more than few milli-amperes of loop current. Optical coupling loops break ground loops and provide very high immunity to common mode interference. These devices are simple to use in a data transmission system for industrial applications and maintain integrity.

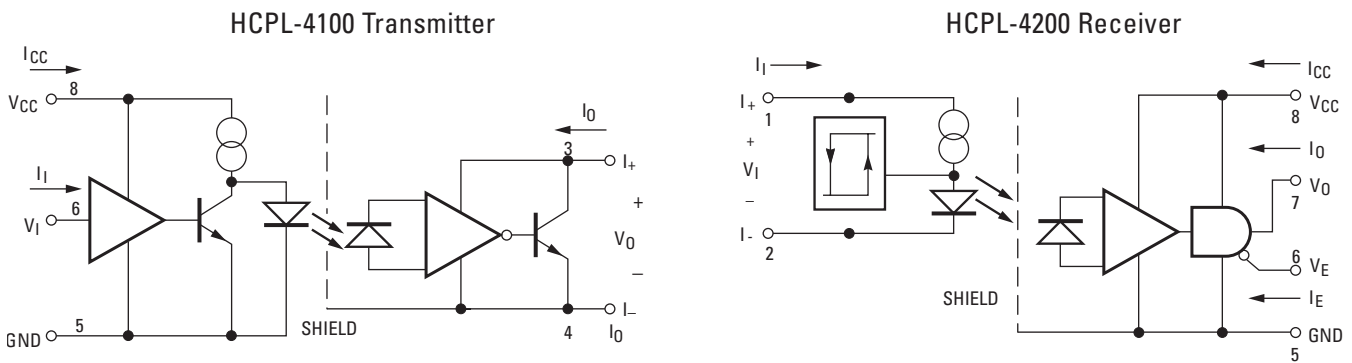
Benefits

- Direct control of the 20 mA current loop
- High noise immunity

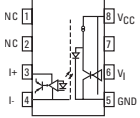
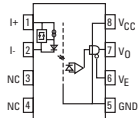
Applications

- Isolated 20 mA current loop transmitter in:
 - Industrial control equipment
 - Computer peripherals
 - Data communications equipment

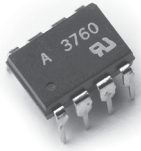
Typical Block Diagram



20 mA Current Loop Transmitter/Receiver Product Selection

Device	Part No.	Package	Data Rate kBd @ (meters)	t_{PLH} μs Max.	t_{PHL} μs Max.	CMR - V/ μs @VCM		V_{ISO} V_{RMS} Min.
						CMR V/ μs (Min.)	V_{CM} V	
Transmitter 	HCPL-4100	300 mil DIP	20 (400)	1.6	1.0	1000	50	3750
	CMOS compatible data input for HCPL-4100							
Receiver 	HCPL-4200	300 mil DIP	20 (1400)	1.6	1.0	1000	50	3750
	CMOS compatible data input for HCPL-4200							

Optoisolation Products



AC/DC to Logic Interface

Description

In the implementation of an interface from an electrically noisy environment into logic systems, it is often desirable to establish some current or voltage switching point or input switching threshold – the HCPL-3700 optocoupler provides such a solution. This device combines an AC or DC voltage and/or current detection function with high sensing input buffer ICs which permit control of threshold levels over a wide range like sensing industrial control systems, and ring detection in telephone system micro-processor interfacing.

The HCPL-0370/3700/3760 threshold-sensing optocoupler can be used for sensing the AC/DC power on/off condition. At the

optocoupler input, only a pair of series resistors $R_x/2$ are required to limit the current. The AC signal can be filtered with a capacitor at either the input or the output of the optocoupler. The value of R_x determines the threshold sensing voltage.

HCPL-0370/3700/3760's low threshold current reduces power dissipation and its built-in diode bridge and hysteresis circuit reduces the number of external components used.

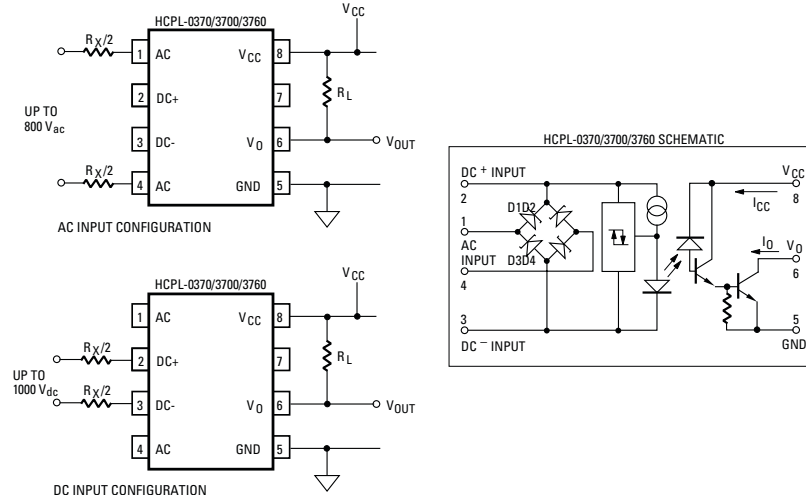
Benefits

- Low threshold current reduces power dissipation
- Hysteresis circuit reduces external components and PCB size

Applications

- Limit switch sensing
- Low voltage detector
- 5 V-240 V AC/DC voltage sensing
- Relay contact monitor
- Relay coil voltage monitor
- Current sensing
- Microprocessor interfacing

Typical Block Diagram



AC/DC to Logic Interface Product Selection

Device	Part No.	Package	Input Threshold Current		Hysteresis mA typ	t_{PLH} μs Max.	t_{PHL} μs Max.	CMR - $V/\mu s @ V_{CM}$		V_{ISO} V_{RMS} Min.
			mA					CMR $V/\mu s$ (Min.)	V_{CM} V	
			Min.	Max.						
	HCPL-0370	S08	1.96	3.11	1.2	40	15	600	140	3750
	HCPL-3700	300 mil DIP	1.96	3.11	1.2	40	15	600	140	3750
	HCPL-3760	300 mil DIP	0.87	1.56	0.6	40	15	600	140	3750
CMOS compatible output										

Optoisolation Products



High Linearity Analog Optocoupler

Description

Avago Technologies' Analog Isolation Applications with Linear Optocouplers HCNR200/1 constitute the basic optical coupling building blocks for high linearity isolation applications. The HCNR200/1 comprises of a high performance LED and two closely matched photodiodes. The output photodiode produces a photo current that is linearly related to the light output of the LED. These high speed, low cost isolation amplifiers are highly suitable for the use in the feedback path of switched mode power supplies, motor speed and position measurement. Very high linearity and excellent low transfer gain variation are the advantages of using HCNR200/1.

This circuit can be used in applications where high bandwidth, low-cost, and stable gain are required.

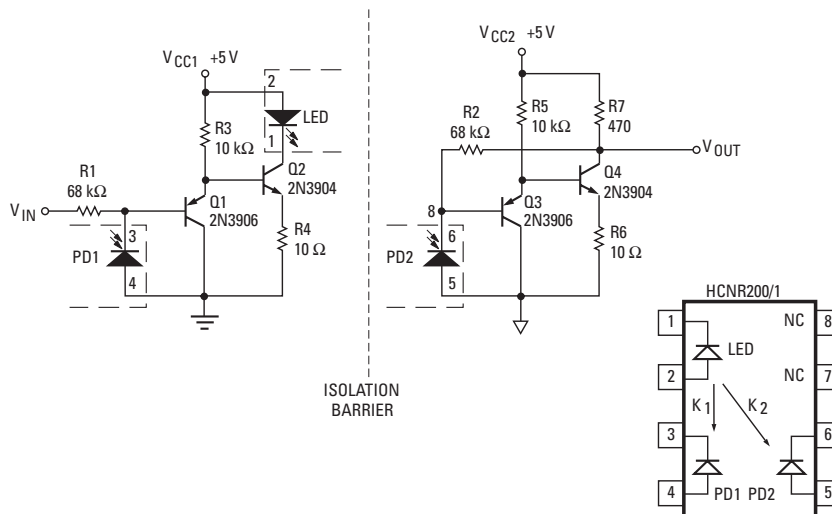
Benefits

- Simple and low cost
- Flexible design with the LED and both Photodiodes accessible to the designer
- Reinforced insulation

Applications

- Industrial process control:
 - Transducer isolator
 - Isolator for thermocouples
 - 4 mA to 20 mA loop isolation
- Low cost analog isolation
- Telecom: modem, PBX
- Switching power supply feedback loop and feedforward
- Monitor motor supply voltage
- Medical

Typical Block Diagram



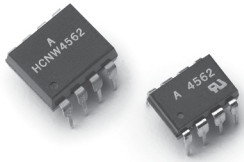
High Linearity Analog Optocoupler Product Selection

Device	Part No.	Package	Transfer Gain % Max.	DC Non-Linearity % Max.	CTR		V_{ISO} V_{RMS} Min.	V_{IORM} V peak
					% Min.	% Max.		
	HCNR200	400 mil DIP	+/-15	0.25	0.25	0.75	5000	1414*
	HCNR201	400 mil DIP	+/-5	0.05	0.36	0.72	5000	1414*
-65 ppm/°C gain temperature coefficient 1.5 MHz bandwidth								

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 050

Optoisolation Products



Wideband Analog/Video Optocoupler

Description

The HCPL-4562 and HCNW 4562 are recommended for very high bandwidth (up to 15 MHz) AC analog designs such as coupling audio or video signals.

This circuit, with the HCPL-4562 wideband analog/video optocoupler, is optimized for video signal coupling. The peaked response of the detector circuit helps extend the frequency range over which the gain is relatively constant. The number of gain stages, the overall circuit topology, and the DC bias point are all chosen to maximize the bandwidth.

HCPL-4562 provides simple and cost effective solutions for coupling audio and video signals.

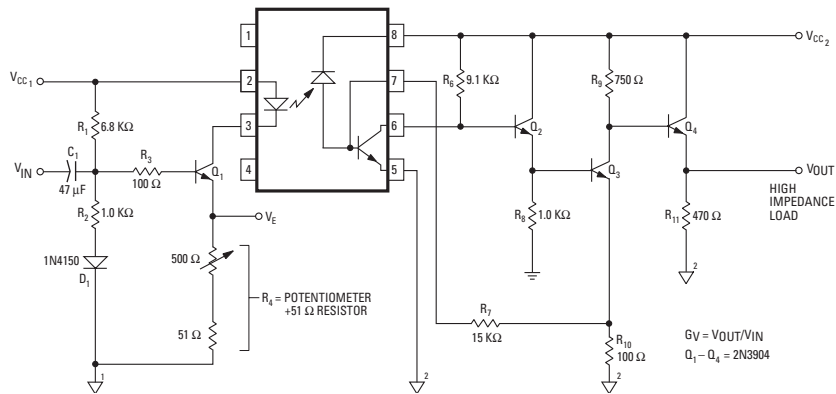
Benefits

- Optimized for video signal coupling
- Simple design for audio and video coupling
- Cost effective
- Reinforced insulation

Applications

- Video isolation for the following standards/formats:
NTSC, PAL, SECAM, S-VHS, ANALOG RGB
- Low drive current feedback
- Element in switching power supplies:
ISDN networks
- A/D converter signal isolation
- Analog signal ground isolation
- High voltage insulation

Typical Block Diagram



Wideband Analog/Video Optocoupler Product Selection

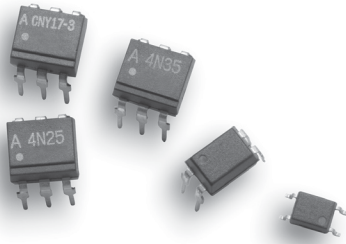
Device	Part No.	Package	Bandwidth MHz typ	DC Non-Linearity % Max.	CTR % typ	IMRR dB typ	V _{ISO} V _{RMS} Min.	V _{IORM} V peak
	HCNW4562	400 mil DIP	9	0.15	52	119	5000	1414
	HCPL-4562	300 mil DIP	17	0.25	45	122	3750/5000 [#]	630*
0.3% / °C gain temperature coefficient								

Notes:

* - with IEC/EN/DIN EN 60747-5-2 Option 060

- with UL 5000V_{RMS}/1 minute Option 020

Optoisolation Products



General Purpose Lead Free Phototransistor Optocoupler

Description

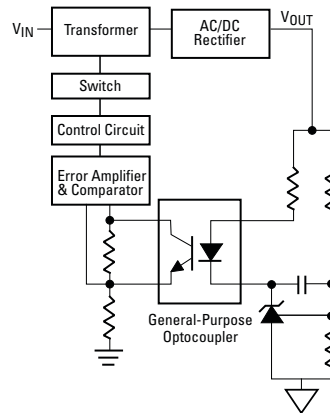
In switched-mode power supplies, Avago Technologies' optocouplers are the preferred choice for providing isolated feedback for the regulation loop. For this application, they do an excellent job of isolation, minimizing circuit complexity and reducing cost.

For applications which require multiple isolated paths such as interfaces between logic circuits, the 2-channels and 4-channels phototransistors can be used.

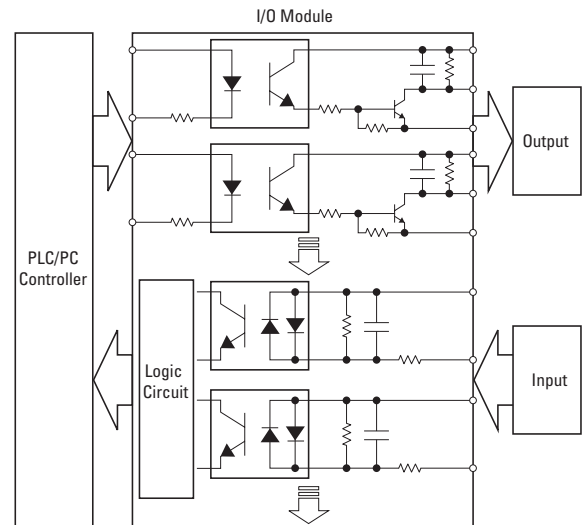
Applications

- Ground loop elimination
- Interface between logic circuits
- I/O or microprocessor interfacing
- Level shifting
- Regulation feedback circuits in smps

Typical Switched-mode Power Supply Block Diagram


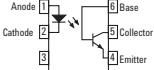
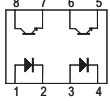
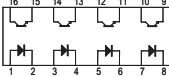


Programmable Logic Controller I/O Units



Optoisolation Products

General Purpose Phototransistor Optocoupler – DC Input Product Selection

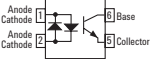
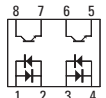
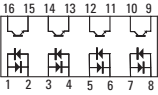
Device	Part No.	Package	Absolute Max. I _F mA	CTR				V _{CE(sat)}			t _r /t _f μs typ	BV _{CEO} V Min.	V _F		V _{ISO} V _{RMS} Min.	Note
				% Min.	% Max.	I _F mA	V _{CE} V	V Max.	I _F mA	I _C mA			V Max.	I _F mA		
Single Channel-4 pin 	HCPL-181-000E [#]	SO4	–	50	600	5	5	0.2	20	1	4/3	80	1.4	20	3750	1
	HCPL-817-000E [*]	300 mil DIP	–	50	600	5	5	0.2	20	1	4/3	35	1.4	20	5000	1/2
Single Channel-6 pin 	4N25-000E	300 mil DIP	–	20	–	10	10	0.5	50	2	3/3	30	1.5	10	2500	1/2
	4N35-000E	300 mil DIP	–	100	–	10	10	0.3	50	2	3/3	30	1.5	10	3550	1/2
	CNY17-1-000E	300 mil DIP	–	40	80	10	5	0.3	10	2.5	5/5	70	1.7	60	5000	1/2
	CNY17-2-000E	300 mil DIP	–	63	125	10	5	0.3	10	2.5	5/5	70	1.7	60	5000	1/2
	CNY17-3-000E	300 mil DIP	–	100	200	10	5	0.3	10	2.5	5/5	70	1.7	60	5000	1/2
	CNY17-4-000E	300 mil DIP	–	160	320	10	5	0.3	10	2.5	5/5	70	1.7	60	5000	1/2
Dual Channel-8 pin 	ACPL-827-000E [*]	300 mil DIP	50	50	600	5	5	0.2	20	1	4/3	70	1.4	20	5000	1/2
Quad Channel-16 pin 	ACPL-847-000E [#]	300 mil DIP	50	50	600	5	5	0.2	20	1	4/3	70	1.4	20	5000	1/2

Notes:

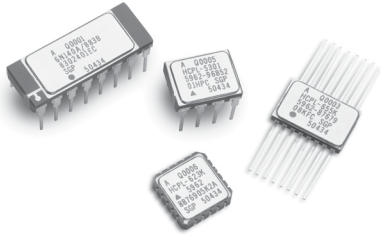
* - CTR rank with Option 00LE, 00AE, 00BE, 00CE and 00DE available,

- CTR rank with option 00AE, 00BE, 00CE and 00DE available

General Purpose Phototransistor Optocoupler – AC Input

Device	Part No.	Package	Absolute Max. I _F mA	CTR				V _{CE(sat)}			t _r /t _f μs typ	BV _{CEO} V Min.	V _F		V _{ISO} V _{RMS} Min.	Note
				% Min.	% Max.	I _F mA	V _{CE} V	V Max.	I _F mA	I _C mA			V Max.	I _F mA		
Single Channel-4 pin 	HCPL-354-000E	SO4	–	20	400	±1	5	0.2	±20	1	4/3	35	1.4	±20	3750	1
	HCPL-354-00AE	SO4	–	50	150	±1	5	0.2	±20	1	4/3	35	1.4	±20	3750	1
	HCPL-814-000E	300 mil DIP	–	20	300	±1	5	0.2	±20	1	4/3	35	1.4	±20	5000	1/2
	HCPL-814-00AE	300 mil DIP	–	50	150	±1	5	0.2	±20	1	4/3	35	1.4	±20	5000	1/2
Dual Channel-8 pin 	ACPL-824-000E	300 mil DIP	+/-50	20	300	±1	5	0.2	±20	1	4/3	70	1.4	±20	5000	1/2
Quad Channel-16 pin 	ACPL-844-000E	300 mil DIP	+/-50	20	300	±1	5	0.2	±20	1	4/3	70	1.4	±20	5000	1/2

Optoisolation Products



Benefits

- Long term commitment - zero obsolescence
- Recognized for high quality, reliability, and customer support
- Certified and qualified to classes H and K of MIL-PRF-38534
- -55°C to +125°C operating temperature range
- All products available on DSCC SMD's
- General purpose and application specific products available

Applications

- Military end-use equipment and systems
- Aerospace
- Train control
- Medical equipment

Hermetic High Performance Optocouplers

Isolating one portion of an electrical circuit from another is the primary function of an optocoupler. These devices isolate different voltage levels between the input and output source. Avago Technologies' optocouplers are ideally suited for isolating highly sensitive portions of a circuit from the effects of transmitted common mode signals; offering a variety of input and output characteristics that enable their use in high speed, high performance applications. Avago Technologies' hermetic optocouplers excel in designs for harsh environments that require an exceptionally strong, rugged enclosure.

For design ease, we offer most functions in 8- and 16-Pin DIPs, 20 terminal LCCC's and 16-Pin Flat Packs with various lead configurations for thru-hole or surface mount, with either single, dual or quad channels. These products are capable of operation and storage over the full military temperature range of -55°C to +125°C and can be purchased as either commercial product or with full MIL-PRF-38534 Class Level H or K testing. In line with regulations and our customers needs, we do not offer unleaded solder on our solder dipped devices. All devices are manufactured and tested on a MIL-PRF-38534 certified line and are included in the DSCC (Defense Supply Center, Columbus) Qualified Manufacturers List QML-38534 for Hybrid Microcircuits.

Avago Technologies has supplied high reliability hermetic optocoupler products since 1975 for use in state-of-the-art applications. To meet the requirements of high reliability, products must be designed with rugged capabilities. They must be able to withstand severe levels of environmental stress and exposure without failure over extended periods

of time. We have accomplished this objective in designing optocouplers that have proven their merits in numerous advanced space and defense programs in the international marketplace. Avago Technologies' continuity and support of the industry has remained stable, with zero product obsolescence. We are committed to continued process and performance upgrades, backed up with diligent notification to our customers of any changes made.

If use in radiation environments is a concern, the shallow depth and small junctions featured in Avago Technologies' IC process provides high radiation immunity. Although the devices are not manufactured as "Rad-Hard", they have proven tolerant to radiation effects, which is substantiated by available data.

Statistical Process Control and extensive reliability monitoring (life testing of hundreds of thousands of hours) are standard processes for hermetic optocouplers. Control charts are utilized at each critical step of the process and reviewed by product engineering to assure expected quality and reliability.

Avago Technologies is a champion of DSCC's QML and SMD (Standard Microcircuit Drawing) programs. We support standardization, which results in cost-effectiveness and a streamlined acquisition process. As such Avago Technologies offers all Class H and Class K products under SMD numbers. Each Hi-Rel device is dual marked with the DSCC SMD and Avago Technologies' part numbers.

Our Screening and Quality Conformance Inspection is outlined on the following page. Custom programs may include full Group A, B, C, and D inspection if required.

Optoisolation Products

Screening per MIL-PRF-38534

Procedure	Method	Conditions	Class H	Class K
Nondestruct bond pull	2023		N/A	100%
Internal visual	2017		100%	100%
Temperature cycle	1010	Condition C, -65°C to +125°C, 10 cycles	100%	100%
Constant acceleration	2001	3Kg's, Y1 and Y2	100%	100%
Visual inspection		Internal requirements	100%	100%
PIND*	2020	Condition A	N/A	N/A*
Serialization			N/A	100%
Pre-Burn-In Elec. Test		Group A, subgroup 1 (except I ₁₋₀) (DC @ +25°C)	100%	100%
Burn-In	1015	Condition B, +125°C, 160 hours Condition B, +125°C, 320 hours	100%	100%
Interim Elec. Test		Group A, subgroup 1 (except I ₁₋₀) (DC @ +25°C)	N/A	100%
Post Burn-In Elec. Test		Group A, subgroup 1, (DC @ +25°C), 10% PDA Group A, subgroup 1, (DC @ +25°C), 2% PDA	100%	100%
Final Elec. Test		Group A, subgroup 2 (DC @ +125°C) Group A, subgroup 3 (DC @ -55°C) Group A, subgroup 9 (AC @ +25°C) Group A, subgroup 10 (AC @ +125°C) Group A, subgroup 11 (AC @ -55°C)	100% 100% 100% 100% 100%	100% 100% 100% 100% 100%
Fine Leak	1014	Condition A	100%	100%
Gross Leak	1014	Condition A	100%	100%
Radiographics	2012		N/A	100%
External visual	2009		100%	100%

* PIND and RGA (Internal Water Vapor Content) testing (Group C) is no longer required on Avago Technologies optocouplers due to the construction of the devices. DSCC approved this test elimination in 2002.

Quality Conformance Inspection

Group A Testing

Group A testing is satisfied per the in-line verification testing requirements of MIL-PRF-38534 for Class H devices utilizing Option 1.

Group A testing is performed per end of line sample testing requirements of MIL-PRF-38534 for Class K devices utilizing Option 2.

Group B Testing

Group B testing is satisfied by performing in-line process monitors as required by MIL-PRF-38534 for Class H devices utilizing Option 1.

Group B testing is satisfied by performing end of line sampling as required by MIL-PRF-38534 for Class K devices utilizing Option 2.

Group C Testing

Group C testing is performed only on the first inspection lot and as required to evaluate or qualify changes per the requirements of MIL-PRF-38534.

Group D Testing

Group D testing is not performed. Note that Group D requirements are satisfied during incoming inspection element evaluation.

Please be advised that Class H and Class K devices have very similar Screening and Quality Conformance Inspection requirements as shown above. Class K devices, however, have substantially more stringent element evaluation and assembly criteria. The quality and reliability of a Class K device must be built in, not tested out.

Optoisolation Products

Hermetically Sealed High Speed Logic Gate Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	Package				No. of Channels	Typical Data Rate	Common Mode@ V _{CM} =50V	Input Current	Withstand Test Voltage
						8 pin DIP	16 pin DIP	16 pin FP	20 pad LCCC					
	HCPL-5200	HCPL-5201	5962-8876801	HCPL-520K	5962-8876802K	•				1	5MBd	1000V/μs	2-8 mA	1500 Vdc
	HCPL-5230	HCPL-5231	5962-8876901	HCPL-523K	5962-8876904K	•				2	5MBd	1000V/μs	2-8 mA	1500 Vdc
	HCPL-6230	HCPL-6231	5962-8876902	HCPL-623K	5962-8876905K				•	2	5MBd	1000V/μs	2-8 mA	1500 Vdc
	HCPL-6250	HCPL-6251	5962-8876903	HCPL-625K	5962-8876906K			•		4	5MBd	1000V/μs	2-8 mA	1500 Vdc
	HCPL-5400	HCPL-5401	5962-8957001	HCPL-540K	5962-8957002K	•				1	20MBd	500V/μs	6-10 mA	1500 Vdc
	HCPL-5430	HCPL-5431	5962-8957101	HCPL-543K	5962-8957103K	•				2	20MBd	500V/μs	6-10 mA	1500 Vdc
	HCPL-6430	HCPL-6431	5962-8957102	HCPL-643K	5962-8957104K			•		2	20MBd	500V/μs	6-10 mA	1500 Vdc
	6N134	6N134/883B	8102801	HCPL-268K	5962-9800101K		•			2	10MBd	1000V/vs	10 mA	1500 Vdc
	HCPL-5600	HCPL-5601	5962-9085501H	HCPL-560K	5962-9085501K	•				1	10MBd	1000V/μs	10 mA	1500 Vdc
	HCPL-5630	HCPL-5631	8102802	HCPL-563K	5962-9800102K	•				2	10MBd	1000V/μs	10 mA	1500 Vdc
	HCPL-5650	HCPL-5651	8102805			•				2	10MBd	1000V/μs	10 mA	2500 Vdc
	HCPL-6630	HCPL-6631	8102803	HCPL-663K	5962-9800103K			•		2	10MBd	1000V/μs	10 mA	1500 Vdc
	HCPL-6650	HCPL-6651	8102804	HCPL-665K	5962-9800104K			•		4	10MBd	1000V/μs	10 mA	1500 Vdc
	HCPL-1930	HCPL-1931	5962-8957201	HCPL-193K	5962-8957202K		•			2	10MBd	1000V/μs	10 mA	1500 Vdc

*DSCC SMD number does not include extensions for lead form and finish

Hermetically Sealed High Speed Transistor Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	Package				No. of Channels	Typical Data Rate	Current Transfer Ratio	Input Current	Withstand Test Voltage
						8 pin DIP	16 pin DIP	16 pin FP	20 pad LCCC					
	4N55	4N55/883B	5962-8767901	HCPL-257K	5962-8767905K		•			2	700 Kbd	9% Min.	16 mA	1500 Vdc
	HCPL-5500	HCPL-5501	5962-9085401H	HCPL-550K	5962-9085401K	•				1	700 Kbd	9% Min.	16 mA	1500 Vdc
	HCPL-5530	HCPL-5531	5962-8767902	HCPL-553K	5962-8767906K	•				2	700 Kbd	9% Min.	16 mA	1500 Vdc
	HCPL-6530	HCPL-6531	5962-8767903	HCPL-653K	5962-8767907K			•		2	700 Kbd	9% Min.	16 mA	1500 Vdc
	HCPL-6550	HCPL-6551	5962-8767904	HCPL-655K	5962-8767908K			•		4	700 Kbd	9% Min.	16 mA	1500 Vdc

*DSCC SMD number does not include extensions for lead form and finish

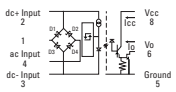
Hermetically Sealed High Gain Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	Package				No. of Channels	Typical Data Rate	Current Transfer Ratio	Input Current	Withstand Test Voltage
						8 pin DIP	16 pin DIP	16 pin FP	20 pad LCCC					
	6N140A	6N140A/883B	8302401	HCPL-177K	5962-9800201K		•			4	100 Kbd	300% Min.	0.5-5 mA	1500 Vdc
	HCPL-5700	HCPL-5701	5962-8981001	HCPL-570K	5962-8981002K	•				1	100 Kbd	300% Min.	0.5-5 mA	1500 Vdc
	HCPL-5730	HCPL-5731	5962-8978501	HCPL-573K	5962-8978503K	•				2	100 Kbd	300% Min.	0.5-5 mA	1500 Vdc
	HCPL-6730	HCPL-6731	5962-8978502	HCPL-673K	5962-8978504K			•		2	100 Kbd	300% Min.	0.5-5 mA	1500 Vdc
	HCPL-6750	HCPL-6751	8302401	HCPL-675K	5962-9800201K			•		4	100 Kbd	300% Min.	0.5-5 mA	1500 Vdc

*DSCC SMD number does not include extensions for lead form and finish

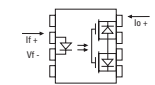
Optoisolation Products

Hermetically Sealed AC/DC to Logic Interface Optocouplers

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	8 pin DIP	No. of Channels	Typical Data Rate	Input Threshold Current	Output Current	Withstand Test Voltage
	HCPL-5760	HCPL-5761	5962-8947701	HCPL-576K	5962-8947702K	•	1	100 KHz	2.5 mA TH+ 1.3 mA TH-	2.6 mA	1500 Vdc

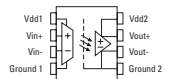
*DSCC SMD number does not include extensions for lead form and finish

Hermetically Sealed Power MOSFET

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class E	DSCC SMD Class E *	Package 8 pin DIP	No. of Channels	Output Withstand Voltage	Output On-Resistance	Maximum Load Current	Maximum Off-State Leakage	Input Current	Input/Output Insulation
	HSSR-7110	HSSR-7111	5962-9314001H	HSSR-711E	5962-9314001E	•	1	90 V	1.0 Ohm	0.8 A ac 1.6 A dc	250 mA	10-20mA	1500 Vdc
		HSSR-7112	5962-9314002H			•	1	90 V	1.0 Ohm	0.8 A ac 1.6 A dc	250 mA	5-20mA	1500 Vdc

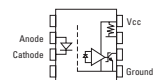
*DSCC SMD number does not include extensions for lead form and finish

Hermetically Sealed Analog Isolation Amplifier

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	Package 8 pin DIP	No. of Channels	Gain Tolerance (Max. %)	Non-Linearity (Max. %)	Prop Delay μ s (Max.)	CMR V/ μ s (Min.)	Bandwidth KHz (typ.)	Offset mV (typ.)
	HCPL-7850	HCPL-7851	5962-9755701H			•	1	5	0.1	11	5000	100	0.6

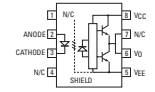
*DSCC SMD number does not include extensions for lead form and finish

Hermetically Sealed Intelligent Power Module and Gate Drive Interface

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	Package 8 pin DIP	No. of Channels	Typical Data Rate	Current Transfer Ratio	Input Current	Common Mode @ $V_{CM}=1000V$	Withstand Test Voltage
	HCPL-5300	HCPL-5301	5962-9685201H	HCPL-530K	5962-9685201K	•	1	2MBd	30 % Min.	10-20 mA	10kV/ μ s	1500 Vdc

*DSCC SMD number does not include extensions for lead form and finish

Hermetically Sealed Output Current IGBT Gate Drive

Single Channel Schematic	Commercial Part Number	Class H	DSCC SMD Class H *	Class K	DSCC SMD Class K *	Package 8 pin DIP	No. of Channels	Peak Output Current	UVLO+	UVLO-	Input Current	Common Mode @ $V_{CM}=1000V$	Withstand Test Voltage
	HCPL-5120	HCPL-5121	5962-0420401H			•	1	2.0 A	13.5V Max.	9.5V Min.	10-18 mA	10kV/ μ s	1500 Vdc
		HCPL-5150	HCPL-5151	5962-0420501H			•	1	0.5 A	13.5V Max.	9.5V Min.	10-18 mA	10kV/ μ s

*DSCC SMD number does not include extensions for lead form and finish

Optoisolation Products

Quick Guide to Direct Upgrades

Upgrade Part	Feature	Benefit
Improved Isolation/Insulation Ability to protect surrounding circuitry against physical damages resulting from differential voltages.	HCNW family offers highest available working voltage ratings with regulatory approval per IEC/EN/DIN EN 60747-5-2 of 1414 V peak.	Meets international safety regulations and standards. Provides better isolation and overall safety performance.
High CMR Common-mode transient rejection or signal isolation of data through suppression of noise transients.	Offers guaranteed CMR performance up to 40 kV/ μ s which is the highest available in the market.	Improves system performance, and reliability. More robust systems and better data integrity meet EMI and ESD requirements.
Drive Current, If Low Drive Current, LED drive current.	Offers the lowest If (up to 40 μ A) devices in the market and broadest HCMOS compatibility.	Eliminates additional LED drive circuitry. Improves system efficiency and reduces power consumption and LED degradation.
Propagation Delay, Tp It is a figure of merit to describe how quickly a logic signal can propagate through the system.	High speed digital optocouplers to meet wide range of applications with Tp as low as 22 ns.	Increase switching efficiency and better speed performance.
Surface Mount Device SMD permits more component density than DIP.	Smaller package to deliver the same functionality as standard DIP. True surface mount technology and standard footprint.	Lower assembly cost, easier and faster handling as well as better solderability.
Energy Saving The new 3.3V family of LV compatible optocouplers to meet the industry standard.	Low power consumption and high speed. Meets JEDEC low voltage requirements.	More than 50% power saving. Better Pulse Width Distortion and CMR performance.
Flexible Supply Voltages (3.3V/5V)	Support a combination of two different supply voltages at the input and output.	Built-in internal level shifter, eliminate the need of extra power supply. 3.3V helps to improve the overall power consumption.
Temperature The DC, speed performance and the reliability information is ensured at the specific temperature range.	Support from (-40°C to 105°C) temperature.	Allow extreme temperature operation.
Upgrade Pulse Width Distortion, PWD PWD is the difference between t_{PHL} and t_{PLH} and often determines the maximum data rate capability of a transmission system.	The lowest PWD offered by Avago Technologies' optocoupler is 2 ns.	To ensure signal data integrity over long bus line.
Multi-Channels with Bi-directional Features	Integrated dual, triple, quad with bi-directional channels offers in small SO8 and SO16 package. Provides wide supply voltage (3.3V/5V) and temperature range (-40°C to 100°C).	Provides designers with greater flexibility in operating voltages and temperature range. The integrated bi-directional channels help in space savings and ease of designs.
Clearance/Creepage 8mm Packages	House in a 50% smaller than 300mil (DIP8) package size that meets VDE/IEC/EN equipment standards. It offers high isolation voltage capabilities that satisfy industrial requirements.	Provides space savings with dual channels offerings. Allows high voltage surge protection. Meets many VDE/IEC/EN equipment standards that call for clearance and creepage of 8mm.

5V Part	Recommended 3.3V Part
5V DIP Single	3.3V DIP Single
6N135/6N136 6N137/HCPL-2601 6N138/6N139	HCPL-250L HCPL-260L ACPL-W60L HCPL-270L
5V S08 Single	3.3V S08 Single
HCPL-0500 HCPL-0501 HCPL-0600 HCPL-0601 HCPL-0700 HCPL-0701	HCPL-050L HCPL-060L ACPL-M60L ACSL-6210; ACSL-6300; ACSL-6310; ACSL-6400; ACSL-6410; ACSL-6420 HCPL-070L
5V DIP Dual	3.3V DIP Dual
HCPL-2530 HCPL-2531 HCPL-2630 HCPL-2631 HCPL-2730 HCPL-2731	HCPL-253L HCPL-263L ACPL-K63L HCPL-273L
5V S08 Duals	3.3V S08 Dual
HCPL-0530 HCPL-0531 HCPL-0630 HCPL-0631 HCPL-0730 HCPL-0731	HCPL-053L HCPL-063L ACSL-6210; ACSL-6300; ACSL-6310; ACSL-6400; ACSL-6410; ACSL-6420 HCPL-073L

Shaded Text—RECOMMENDED FOR NEW DESIGNS

Optoisolation Products

CMR	Recommended Part	Remark
6N135 6N136 HCPL-4502	HCPL-4503	Higher CMR
	HCPL-4504 HCPL-J454	Higher CMR + Higher Switching Speed
	HCPL-4506 HCPL-J456	Higher CMR + Higher Switching Speed + Lower <i>I</i> _f
HCPL-0500 HCPL-0501 HCPL-4502	HCPL-0453	Higher CMR
	HCPL-0454	Higher CMR + Higher Switching Speed
	HCPL-0466	Higher CMR + Higher Switching Speed + Lower <i>I</i> _f
HCNW135 HCNW136 HCNW4502	HCNW4503	Higher CMR
	HCNW4504	Higher CMR + Higher Switching Speed
	HCNW4506	Higher CMR + Higher Switching Speed + Lower <i>I</i> _f
HCPL-2530 HCPL-0530	HCPL-4534	Higher CMR + Higher CTR
	HCPL-053	
6N137 HCPL-2601	HCPL-2611	Higher CMR
	HCPL-261N	Higher CMR + Lower <i>I</i> _f
HCPL-0600 HCPL-0601	HCPL-0611	Higher CMR
	HCPL-061N	Higher CMR + Lower <i>I</i> _f
HCPL-2630 HCPL-2631	HCPL-4661	Higher CMR
	HCPL-263N	Higher CMR + Lower <i>I</i> _f
HCPL-0630 HCPL-0631	HCPL-0661	Higher CMR
	HCPL-063N	Higher CMR + Lower <i>I</i> _f
6N138	HCPL-4701	Higher CMR + Lower <i>I</i> _f
HCPL-0700	HCPL-070A	
HCPL-2730	HCPL-4731	
HCPL-0730	HCPL-073A	
HCPL-2200	HCPL-2219	
HCPL-2201 HCPL-2202	HCPL-2211	Higher CMR
	HCPL-2202	
HCPL-0201	HCPL-0211	
HCNW2201	HCNW2211	
HCPL-2231	HCPL-2232	
HCPL-3120	ACPL-3130	
HCPL-J312	ACPL-J313	
HCNW3120	ACNW3130	

<i>I</i> _f	Recommended Part	Remark		
6N135 6N136 HCPL-4502	HCPL-4506 HCPL-J456	Lower <i>I</i> _f + Higher CMR + Higher Switching Speed		
	HCPL-0500 HCPL-0501 HCPL-4502		HCPL-0466	
			HCNW135 HCNW136 HCNW4502	HCNW4506
6N137 HCPL-2601	HCPL-261A			Lower <i>I</i> _f
	HCPL-261N			Lower <i>I</i> _f + Higher CMR
HCPL-0600 HCPL-0601	HCPL-061A		Lower <i>I</i> _f	
	HCPL-061N		Lower <i>I</i> _f + Higher CMR	
HCPL-2630 HCPL-2631	HCPL-263A		Lower <i>I</i> _f	
	HCPL-263N		Lower <i>I</i> _f + Higher CMR	
HCPL-0630 HCPL-0631	HCPL-063A		Lower <i>I</i> _f	
	HCPL-063N	Lower <i>I</i> _f + Higher CMR		
6N138	HCNW4503	Lower <i>I</i> _f + Higher CMR		
HCPL-0700	HCNW4504			
HCPL-2730	HCNW4506			
HCPL-0730	HCPL-4534			

SMD	Recommended Part
6N135	HCPL-0500
6N136	HCPL-0501
6N137	HCPL-0600
6N138	HCPL-0700
6N139	HCPL-0701
ACPL-4800	ACPL-P480
HCPL-2201	HCPL-0201
HCPL-2211	HCPL-0211
HCPL-2530	HCPL-0530
HCPL-2531	HCPL-0531
HCPL-2601	HCPL-0601
HCPL-2611	HCPL-0611
HCPL-261A	HCPL-061A
HCPL-261N	HCPL-061N
HCPL-2631	HCPL-0631
HCPL-263A	HCPL-063A
HCPL-263N	HCPL-063N
HCPL-2730	HCPL-0730
HCPL-2731	HCPL-0731
HCPL-3020	ACPL-W302/HCPL-0302
HCPL-3140	ACPL-W314/HCPL-0314/ HCPL-314J
HCPL-3150	HCPL-315J
HCPL-3700	HCPL-0370
HCPL-4502	HCPL-0466/HCPL-M456
HCPL-4503	ACPL-K453/HCPL-0453/ HCPL-M453
HCPL-4504	ACPL-W454/ACPL-P454/ HCPL-0454/HCPL-M454
HCPL-4506	ACPL-W456/ACPL-P456/ HCPL-0466/HCPL-M456
HCPL-4534	HCPL-0534
HCPL-4661	HCPL-0661
HCPL-4701	HCPL-070A
HCPL-4731	HCPL-073A
HCPL-8100	ACPL-0810

NOTE: All SMD (S08) parts are prefix with "0".

Safety Regulatory	Recommended Part
6N135	HCNW135
6N136	HCNW136
6N137	HCNW137; ACPL-W611; ACPL-P611; ACPL-W60L; ACPL-K63L
6N138	HCNW138
6N139	HCNW139
ACPL-3130	ACNW3130
HCPL-2201	HCNW2201
HCPL-2211	HCNW2211
HCPL-2601	HCNW2601; ACPL-W611; ACPL-P611; ACPL-W60L; ACPL-K63L
HCPL-2611	HCNW2611
HCPL-3120	HCNW3120
HCPL-4502	HCNW4502
HCPL-4503	HCNW4503
HCPL-4504	HCNW4504
HCPL-4506	HCNW4506
HCPL-4562	HCNW4562

NOTE: All HCNW have better safety regulatory specification.
Shaded Text—RECOMMENDED FOR NEW DESIGNS

Optoisolation Products

5V Part	Recommended 3.3V/5V Part
5V DIP Single	3.3V/5V DIP Single
HCPL-7710 HCPL-7720 HCPL-7721	ACPL-772L
5V S08 Single	3.3V /5V S08 Single
HCPL-0710 HCPL-0720 HCPL-0721	ACPL-072L

Temperature	Recommended
-40°C to 85°C	-40°C to 105°C
HCPL-7720 HCPL-7721	ACPL-772L
HCPL-0720 HCPL-0721	ACPL-072L

PWD	Recommended
6 ns/8 ns	2 ns
HCPL-7710 HCPL-7720 HCPL-7721	HCPL-7723
HCPL-0710 HCPL-0720 HCPL-0721	HCPL-0723
30 ns	6 ns
HCPL-0708	HCPL-0721 ACPL-072L
25 ns	6 ns
HCPL-2400	HCPL-7721 ACPL-772L

t _p	Recommended
40 ns	22 ns
HCPL-7710 HCPL-7720 HCPL-7721	HCPL-7723
HCPL-0710 HCPL-0720 HCPL-0721	ACPL-072L
60 ns	40 ns
HCPL-0708	HCPL-0710 ACPL-072L
HCPL-2400	HCPL-7710 ACPL-772L

10MBd New Products Upgrade	Recommended Part	Remark
HCPL-0600 HCPL-0601 HCPL-0611 HCPL-0630 HCPL-0631 HCPL-0661 HCPL-M600 HCPL-M601 HCPL-M611	ACPL-M60L; ACSL-6210; ACSL-6300; ACSL-6310; ACSL-6400; ACSL-6410; ACSL-6420	New SMD products from Single to Quad channels (ACSL offers bi-dir. chs.) in S05, S08 and SO16 packages; Wide operating voltages and temperatures except ACPL-M60L

Clearance/Creepage 8 mm	Recommended Part	Remark
6N137 HCPL-2601 HCPL-2611 HCPL-260L HCPL-263L HCPL-4502 HCPL-4503 HCPL-4504 HCPL-4506 HCPL-4562	ACPL-W611; ACPL-P611; ACPL-W60L; ACPL-K63L ACPL-W454; ACPL-P454	50% package size smaller than 300 mil DIP8 package; Clearance/Creepage at 8 mm (7 mm clearance for 'P' option); DTI = 0.08 mm; defaulted Viso at 3750V (offers 5KV with options); IEC working insulation voltage at 630V

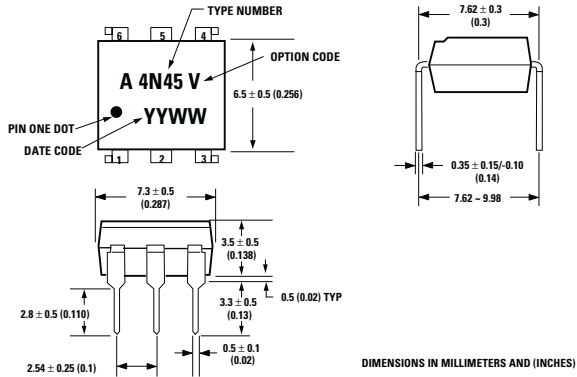
Safety Regulatory	Recommended Part	Remark
6N135 6N136 6N137 6N138 6N139 HCPL-2201 HCPL-2211 HCPL-2601 HCPL-2611 HCPL-4502 HCPL-4503 HCPL-4504 HCPL-4506 HCPL-4562	HCNW135 HCNW136 HCNW137 HCNW138 HCNW139 HCNW2201 HCNW2211 HCNW2601 HCNW2611 HCNW4502 HCNW4503 HCNW4504 HCNW4506 HCNW4562	Clearance/Creepage at 9.6mm/10mm; DTI = 0.4mm; defaulted at Viso = 5KV/us; IEC working insulation voltage at 1414V

Shaded Text – RECOMMENDED FOR NEW DESIGNS

Optoisolation Products

Optocoupler Package Dimensions

300 mil 6-pin DIP

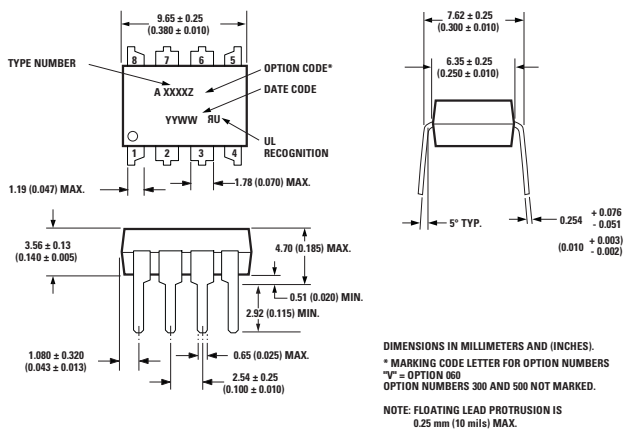


Options Available

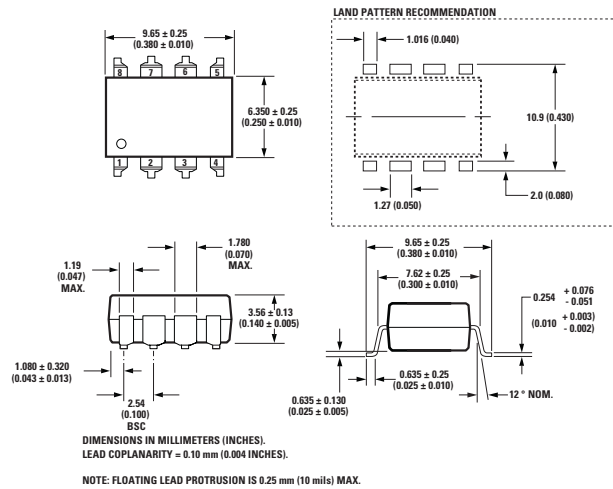
- 020 = UL 5000 V_{rms}/1 Minute Option
- 060 = IEC/EN/DIN EN 60747-5-2 Approved Part Option
- 300 = Gull Wing Surface Mount Option
- 500 = Tape & Reel Packaging Option
- xxxE = Lead Free Option

Remarks: The notation '#' is used for existing products, while (new) products launched since 15th July 01 will use '-'

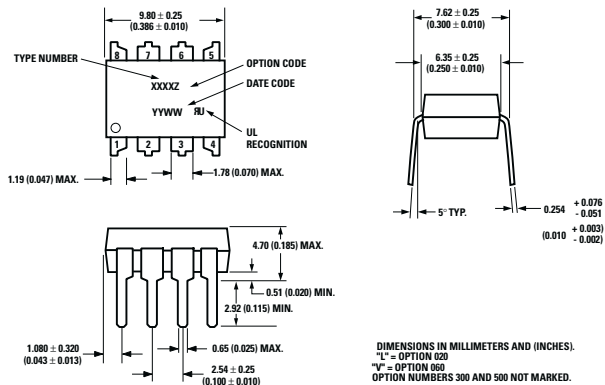
300 mil 8-pin DIP



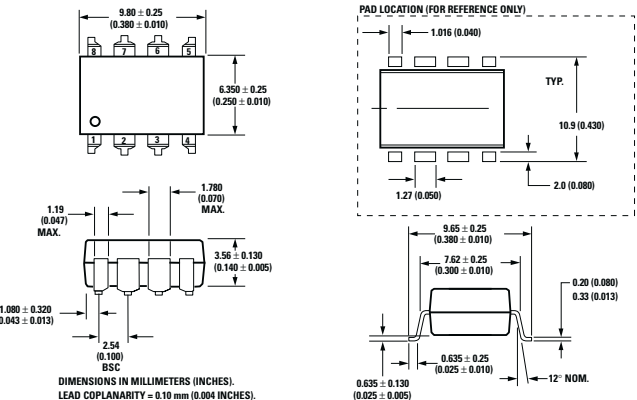
300 mil 8-pin DIP Gullwing Option 300 SMD



300 mil 8-pin DIP (white)



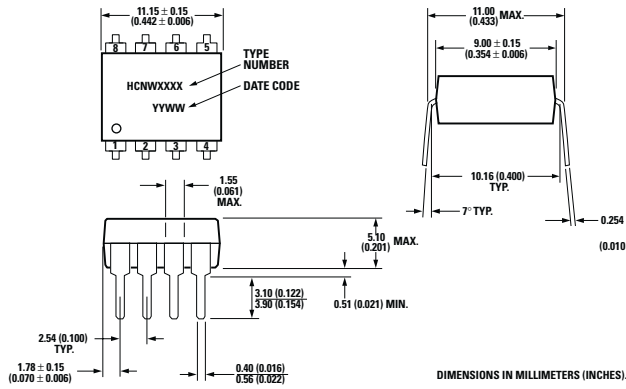
300 mil 8-pin DIP (white) Gullwing Option 300 SMD



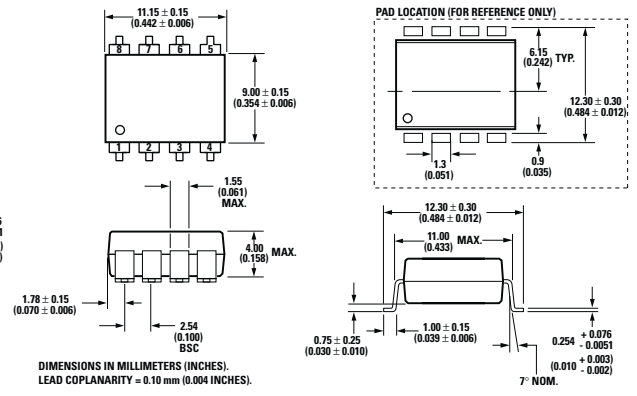
Optoisolation Products

Optocoupler Package Dimensions Continued

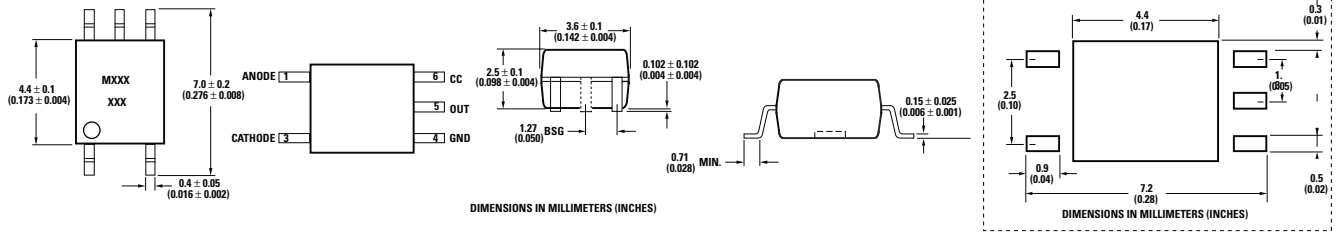
400 mil 8-pin DIP



400 mil 4-pin DIP Gull Wing Option 300 SMD

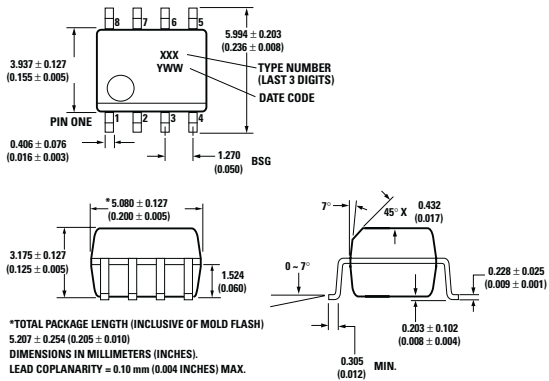


S0-5

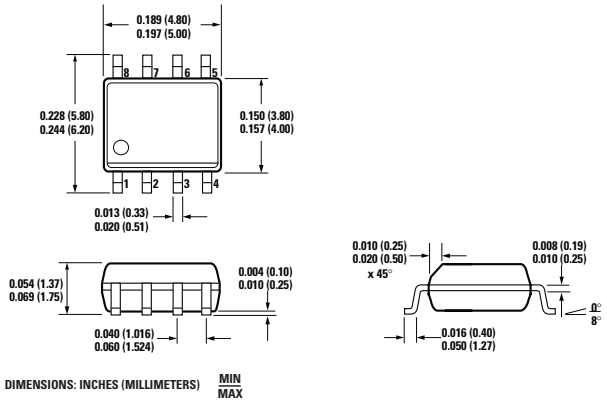


Optocoupler Package Dimensions Continued

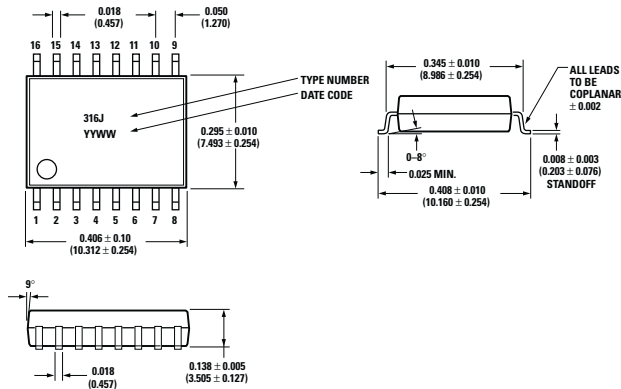
SO-8 SMD



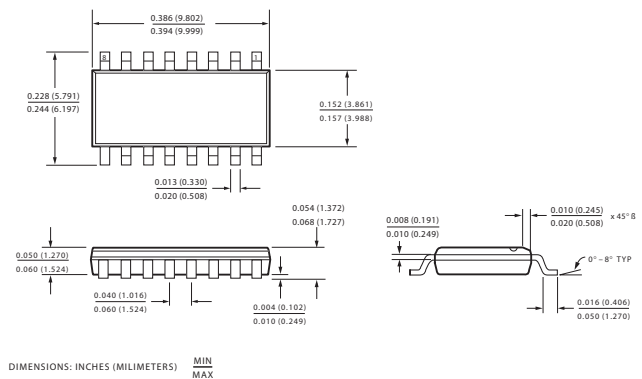
SO-8 SMD (ACSL-6210 & HCPL-0810)



SO-16 SMD



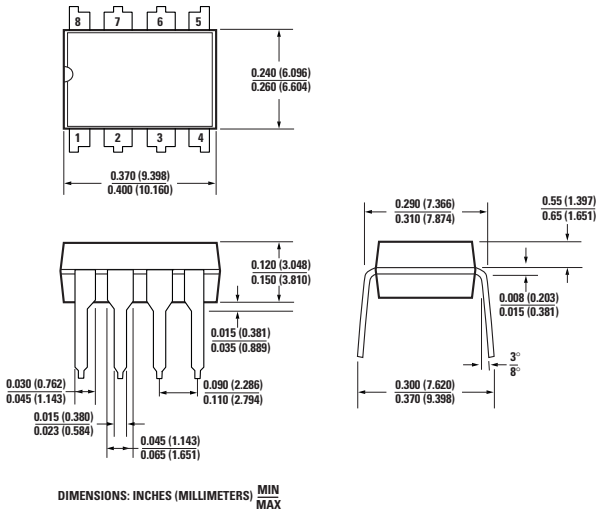
SO-16 SMD (ACSL-6300/6310/6410/6420)



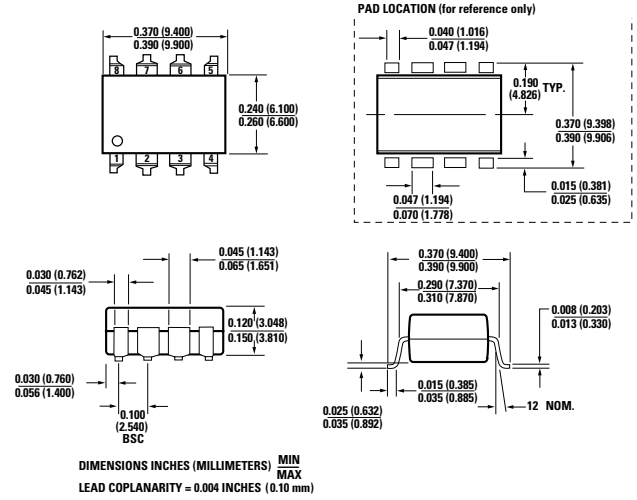
Optoisolation Products

Digital Isolator Package Dimensions

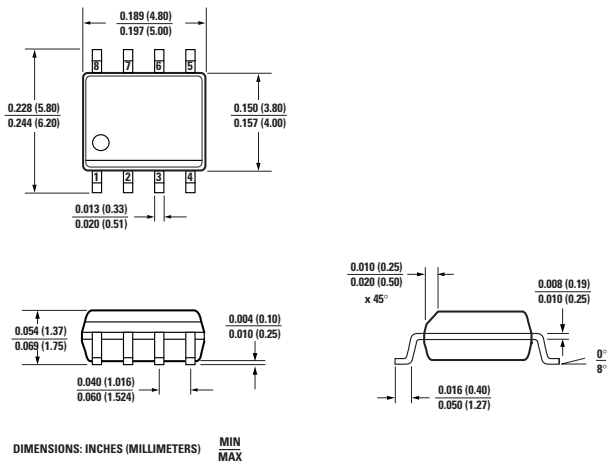
300 mil 8-pin DIP



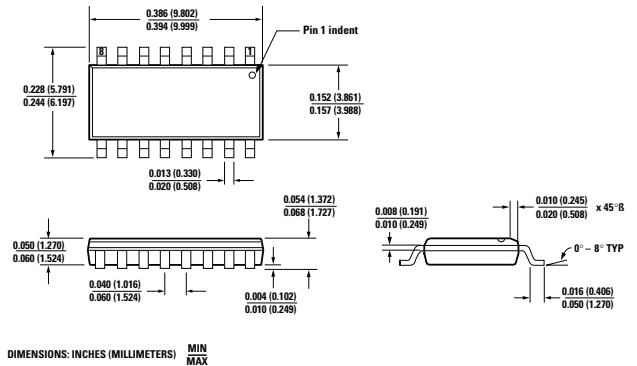
300 mil 8-pin Gull Wing Option 300 SMD



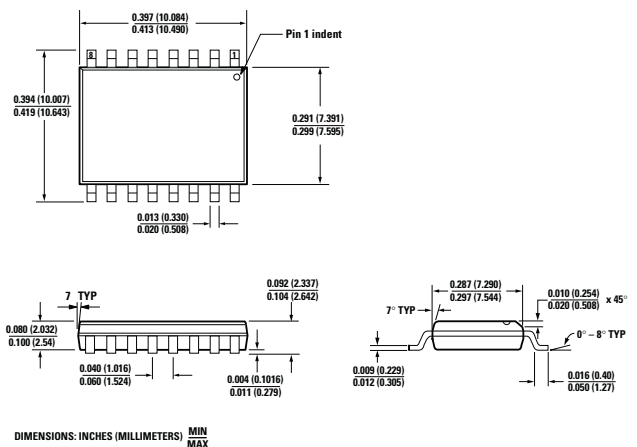
SO-8 SMD



Narrowbody SOIC-16 pin



Widebody SOIC-16 pin



Options Available

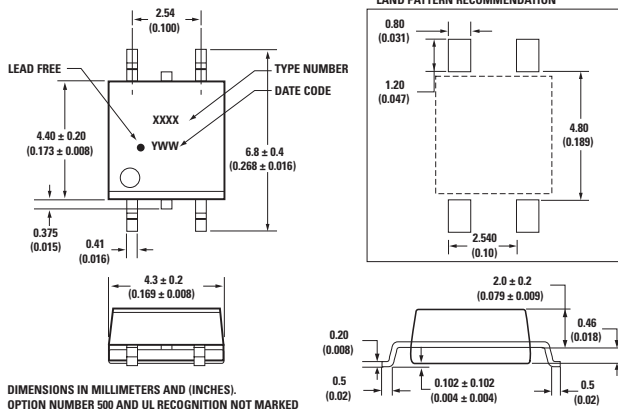
- 300 = Lead Bend SMD Option
- 500 = Tape and Reel Packaging Option
- xxxE = Lead Free Option

Remarks: The notation '#' is used for existing products, while (new) products launched since 15th July 01 will use '-'.

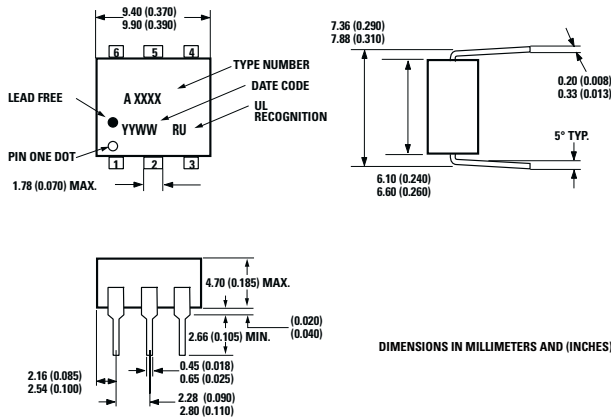
Optoisolation Products

Solid State Relay (MOSFET) Package Dimensions

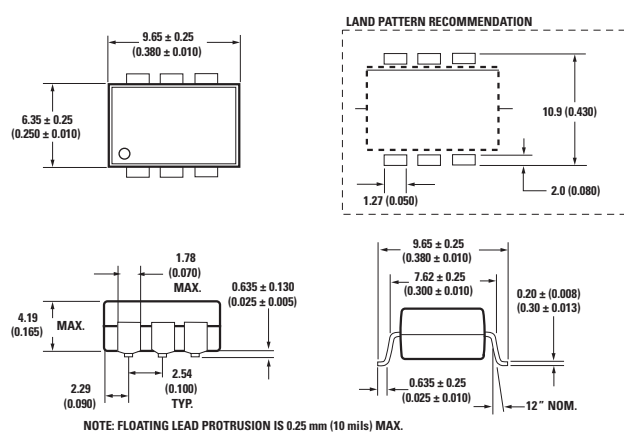
4-Pin Small Outline Package



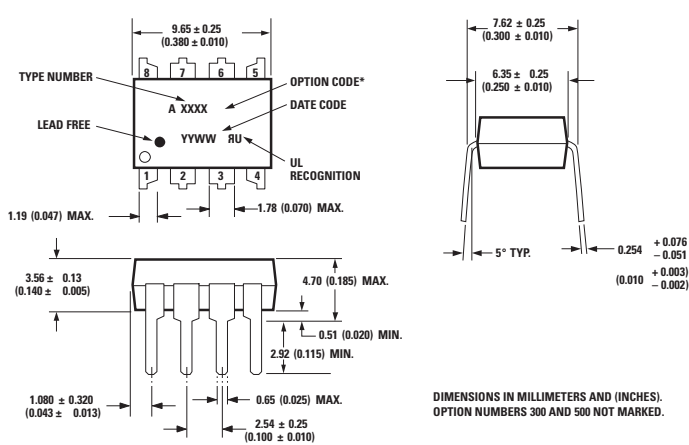
6-Pin DIP Package



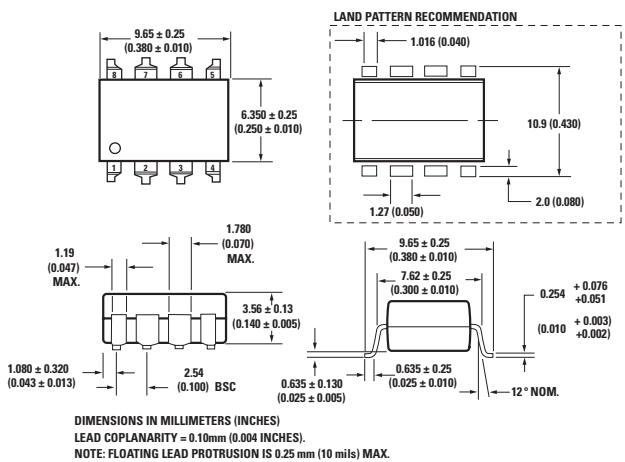
6-Pin DIP Package with Gull Wing Surface Mount Option 300



8-Pin DIP Package



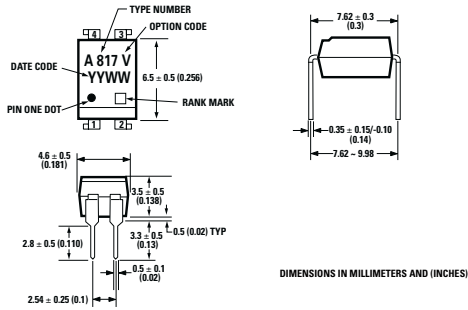
8-Pin DIP Package with Gull Wing Surface Mount Option 300



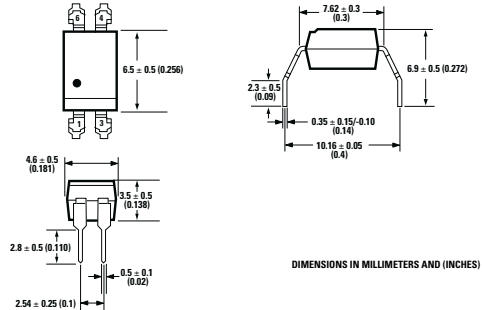
Optoisolation Products

Phototransistor Package Dimensions

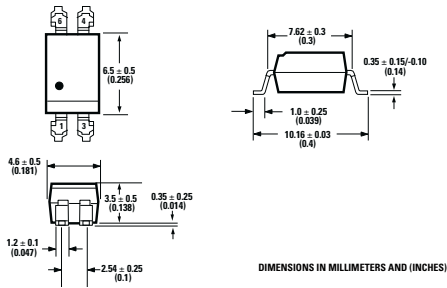
300 mil 4-pin DIP



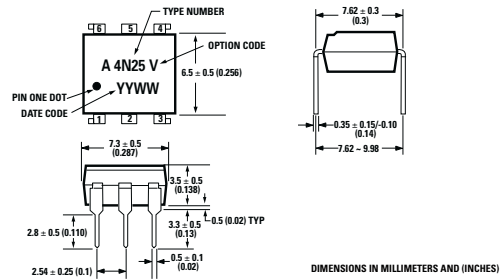
400 mil 4-pin 0.4" Lead Spacing



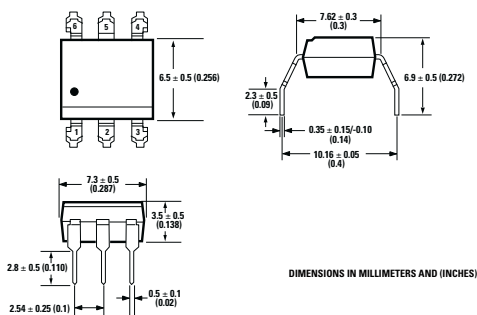
300 mil 4-pin Lead Bend Option 300 SMD



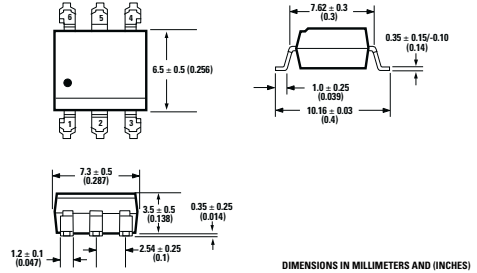
300 mil 6-pin DIP



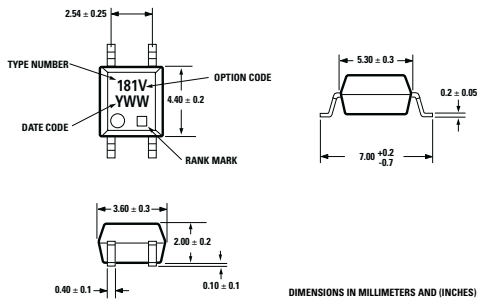
400 mil 6-pin 0.4 inch Lead Spacing Option



300 mil 6-pin Lead Bend Option 300 SMD



4-pin Miniflat SMD



Options Available

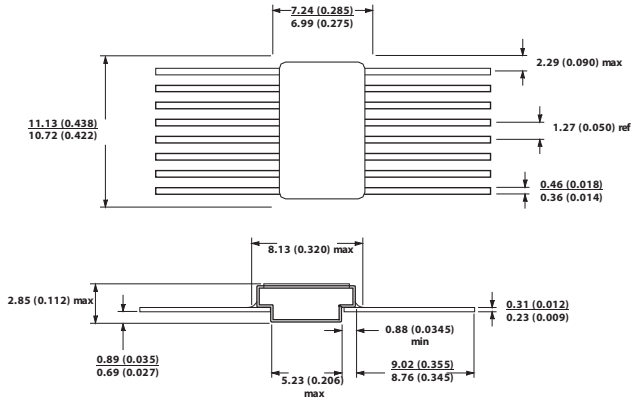
- 060E = IEC/EN/DIN EN 60747-5-2 Option
- W00E = 0.4" Lead Spacing Option
- 300E = Lead Bend SMD Option
- 500E = Tape and Reel Packaging Option
- 00LE = CTR: 50-100%
- 00AE = CTR: 80-160%
- 00BE = CTR: 130-260%
- 00CE = CTR: 200-400%
- 00DE = CTR: 300-600%

Remarks: The notation '#' is used for existing products, while (new) products launched since 15th July 01 will use 'L'.

Optoisolation Products

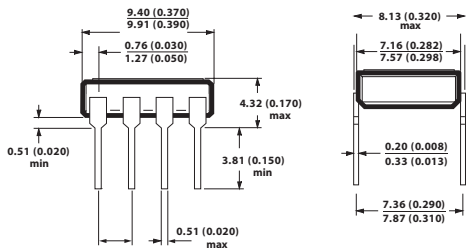
Hermetic Optocoupler Package Dimensions

16 Pin Flat Pack (4 Channel)



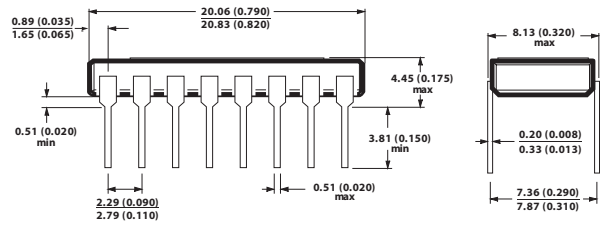
Note: Dimensions in millimeters (inches)

8 Pin DIP Through Hole (1 or 2 Channel)



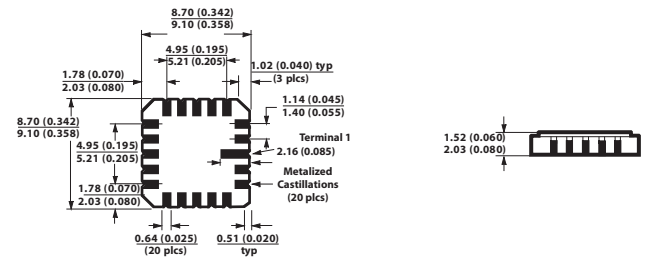
Note: Dimensions in millimeters (inches)

16 Pin DIP Through Hole (2 or 4 Channel)



Note: Dimensions in millimeters (inches)

20 Terminal LCCC Surface Mount (2 Channel)

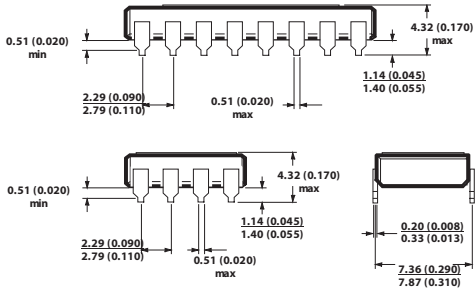


Note: Dimensions in millimeters (inches)
Solder thickness 0.127 (0.005) max.

Optoisolation Products

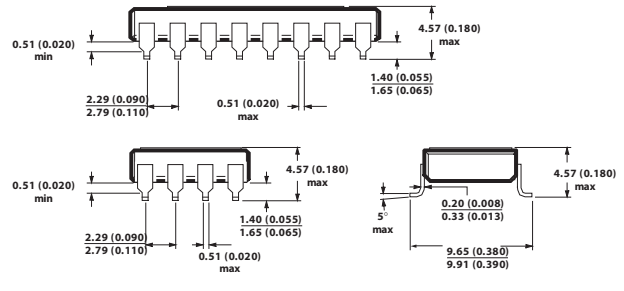
Hermetic Optocoupler Package Dimensions

Option 100, Surface Mount Butt Joint, available on 8 and 16 Pin DIP's



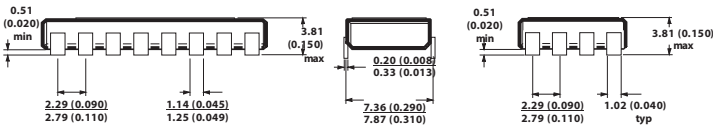
Note: Dimensions in millimeters (inches)

Option 300, Surface Mount Gull Wing, available on 8 and 16 Pin DIP's



Note: Dimensions in millimeters (inches)

Option 600, Surface Mount Short Butt Joint, available on 8 and 16 Pin DIP's



Note: Dimensions in millimeters (inches)

Optoisolation Products

Function vs Application Matrix – Digital Isolation

Function		Digital Isolation							Analog Isolation						
Market	Application	Power Device Drive		Data Communication			A-D Isolation		Voltage Monitor	Current Sensing	Voltage Sensing	Signal Amp	Signal Switching	Powerline Comm	Power Supply Feedback
		Inverter	IPM	Field Bus	RS422/485	Others	ADC/DAC	V-F Converter							
Industrial	Automated Test Equipment			8	1,6	3,4,5,11,17,(18)		2,6,(18)	13				21		
	Board CPU			8	1,6	3,4,5,11,17,(18)	6,(18)	2,6,(18)							
	Elevator	9	20			17			13	10	10,14,15		21		
	FFT/Data Logger					17		6,7,(18)							
	Industrial Induction Cooking	9	20			17				10	10,14,15				
	Industrial Networking			7,8,(18)	1,6,(18)	3,4,5,11,17,(18)									
	Instrument			8	1,6	3,4,5,11,17,(18)	6,(18)						21		17
	Motor Control	9	20	7,8	6	3,4,5,11,17,(18)	6,(18)	2,6,(18)	13	10	10,14,15		21		17
	NC/Robot	9	20	7,8	6	3,4,5,11,17,(18)	6,(18)		13	10	10,14,15		21		
	On-board Power Supply					17	6,(18)								17
	Panel Switches			8	1,6	3,4,5,11,17,(18)	6,(18)						21		
	PLC			7,8,(18)	1,6,(18)	3,4,5,12,17,(18)	6,(18)	2,6,(18)	13				21		
	Power Distribution System	9	20	8		3,4,5,12,17,(18)			13				21		17
	Process Meter			7,8,(18)	1,6,(18)	12,17,(18)	6,(18)	2,6,(18)	13		14,15		21		
	Remote Meter Reading												21	19	
	Servo Driver	9	20	7,8	6	3,4,5,11,17,(18)	6,(18)		13	10	10,14,15				17
	Sewing Machine	9	20			17			13	10	10,14,15				17
	Solar Generator	9	20	8		17			13	10	10,14,15				17
	Switching Power Supply	9	20			17				10	10,14,15				17
Test & Measurement Equipment			7,8,(18)	1,6,(18)	3,4,5,11,17,(18)	6,(18)		13				21			
Thermo Counter/Recorder			8	6	3,4,5,11,17,(18)	6,(18)	2,6,(18)								
Welding	9	20						13	10	10,14,15					
Medical	Defibrillator	9													
	Electrocardiograph (ECG/EKG)					6,7,(18)	6,7,(18)		10	10,14	10				
	Endoscopes					6,7,(18)	6,7,(18)					10			
	Esophagus Photothymography (PPG)					6,7,(18)	6,7,(18)					10			
	Magnetic Resonance Imaging (MRI)	9				6,7,(18)	6,7,(18)		10			10			
	Patient Monitoring			7,8		6,7,(18)	6,7,(18)					10			
	X-Ray	9				6,7,(18)	6,7,(18)			10					
Transportation	EV	9	20,22	6,7,8,22		6,22			10,13	10			21		
	Transportation System	9	20,22	6,7,8,22		6,22							21		
Computing and Office Automation	ECR, POS				2,4,5,6	6,7,8,17,(18)								17	
	Isolated I/O				2,4,5,6	6,7,8,17,(18)									
	Isolated USB				2,4,5,6	6,7,8,17,(18)									
	Network				2,4,5,6	6,7,8,17,(18)						21			
	UPS	9	20			8,17			13	10	10,14,15			17	
Consumer	Air Conditioning	9	20			17				10			21	17	
	Electronic Gaming				6	6,17,(18)								17	
	Fitness Equipment	9	20					13	10		10			17	
	Induction Heating Cookers	9	20												
	Musical (MIDI)					6,17,(18)									
	Plasma Displays					2,6,8,9,17									
	Refrigerator	9	20			17							21	17	
Washing Machines	9	20			17							21	17		
Communications	ISDN				1,2,3	7,8,17			13				21	17	
	PBX and Central Office				1,2,3	3,17			13				21	17	
	Power Line Communication											21	19		
	Power-Over-Ethernet (PoE)			7,8		1,6									
	Telephone Switching Equipment					6,7,8,17,(18)							21	17	
	Telephone Terminal Equipment					6,7,8,17,(18)							21	17	
Wireless Base Station					6,7,8,17,(18)							21	17		
Aerospace/Defense/ Government		16		16	16				16	16	16				

- 3.3V Digital Optocoupler Family
- 1 MBd Transistor Output Optocoupler
- 100 kBd Darlington Transistor Output Optocoupler
- 5 MBd Logic Gate Optocoupler
- 8 MBd Logic Gate Optocoupler
- 10 MBd Logic Gate Optocoupler
- 20 MBd Logic Gate Optocoupler
- High Speed Digital CMOS Logic Gate Optocoupler

- Integrated Gate Drive Optocoupler
- Miniature Analog Isolation Amplifier
- Isolated Line Receiver
- Isolated 20 mA Current Loop Transmitter/Receiver
- AC/DC to Logic Interface
- High Linearity Analog Optocoupler
- Wideband Analog/Video Optocoupler
- Hermetic High Performance Optocoupler

- General Purpose Phototransistor Optocoupler
- Digital Isolator
- Powerline Communication Interface
- Intelligent Power Module Interface Optocoupler
- Solid State Relay (MOSFET)
- Automotive Optocoupler

About Avago Technologies

Avago Technologies is a leading supplier of innovative semiconductor solutions for advanced communications, industrial and commercial applications. The company provides an extensive range of analog, mixed-signal and optoelectronic components and subsystems to more than 40,000 customers worldwide. Avago's products serve four end markets: industrial and automotive, wired infrastructure, wireless communications, and computer peripherals. It is recognized for providing high-quality products along with strong customer service and the industry's best on-time delivery. Avago's heritage of technical innovation dates back 40 years to its Agilent/Hewlett-Packard roots.

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