

## Data Sheet

### Description

Optocouplers are frequently used to provide high voltage insulation. Because optocouplers perform this safety function, they are regulated by many country safety agencies, both at the component level and the equipment level.

Standard 8 Pin DIP optocouplers with Option 060, are tested according to IEC/EN/DIN EN60747-5-2 at VIORM = 630 Vpeak.

Surface Mount SO8 optocouplers with Option 060, are tested at VIORM = 560 Vpeak.

Avago Technologies also offers other various IEC/EN/DIN EN60747-5-2 approved products at different levels of VIORM such as VIORM = 1414 Vpeak

(HCNWxxxx series) and VIORM = 891 Vpeak (HCPL-Jxxx series).

Refer to the front of the optocoupler section of the Isolation and Control Component Designer's Catalog, under Product Safety Regulations section, for a detailed description of IEC/EN/DIN EN60747-5-2 and the partial discharge tests for production

Option 060 is available on the following products:

#### Standard 8 Pin DIP Product (VIORM = 630 Vpeak)

|           |           |
|-----------|-----------|
| HCPL-2211 | HCPL-2212 |
| HCPL-2219 | HCPL-2300 |
| HCPL-2400 | HCPL-2611 |
| HCPL-261A | HCPL-261N |
| HCPL-3120 | HCPL-3150 |
| HCPL-4503 | HCPL-4504 |
| HCPL-4506 | HCPL-4701 |
| HCPL-7840 |           |

#### Surface Mount SO8 Product (VIORM = 560 Vpeak)

|           |           |
|-----------|-----------|
| HCPL-0211 | HCPL-0454 |
| HCPL-0466 | HCPL-0611 |
| HCPL-061A | HCPL-061N |
| HCPL-070A |           |

Contact your local Avago Technologies Sales Representative concerning availability of this option for optocouplers not listed.

### Ordering Information

Specify Part Number followed by Option Number.

Example:

HCPL-3120#060

This option may also be combined with Option #300 (gullwing surface mount) or #500 (gullwing in tape and reel).

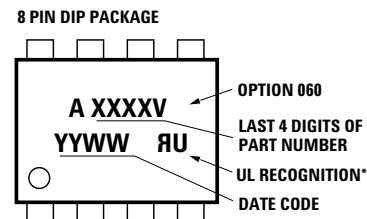
To obtain these combinations, order Option #360 or #560 respectively.

Examples:

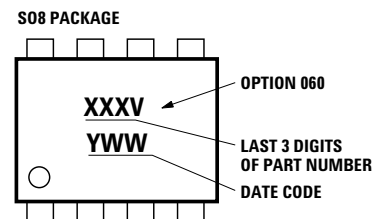
HCPL-3120#360 (gullwing surface mount and IEC/EN/DIN EN60747-5-2 approved)

HCPL-3120#560 (gullwing surface mount and IEC/EN/DIN EN60747-5-2 approved in tape and reel)

### Marking Information



\* NO UL MARKING ON HCPL-261A/261N/  
 3120/3150/4701/7840.



| Parameter   | Symbol  | Value |      | Units | Conditions   |
|---|---------|-------|------|-------|--|
|   |         | DIP   | S08  |       |  |
| Minimum External Air Gap<br>(External Clearance)    | L(101)  | 7.1   | 4.9  | mm    | Measured from input terminals to output terminals, shortest distance through air.  |
| Minimum External Tracking<br>(External Creepage)    | -L(102) | 7.4   | 4.8  | mm    | Measured from input terminals to output terminals, shortest distance path along body.  |
| Minimum Internal Plastic Gap                        |         | 0.08  | 0.08 | mm    | Through insulation distance, conductor to conductor, usually the direct distance between (Internal Clearance) the photoemitter and photo-detector inside the optocoupler cavity. |
| Tracking Resistance<br>(Comparative Tracking Index) | CTI     | 175   | 175  | V     | DIN IEC 112/VDE 0303 Part 1  |
| Isolation Group                                     |         | IIIa  | IIIa |       | Material Group (DIN VDE 0110, 1/89, Table 1)   |

All Avago Technologies' data sheets report the creepage and clearance inherent to the optocoupler component itself. These dimensions are needed as a starting point for the equipment designer when determining the circuit insulation requirements. However, once mounted on a printed circuit board, minimum creepage and clearance requirements must be met as specified for individual equipment standards. For creepage, the shortest distance path along the surface of a printed circuit board between the solder fillets of the input and output leads must be considered. There are recommended techniques such as grooves and ribs which may be used on a printed circuit board to achieve desired creepage and clearances. Creepage and clearance distances will also change depending on factors such as pollution degree and insulation level.

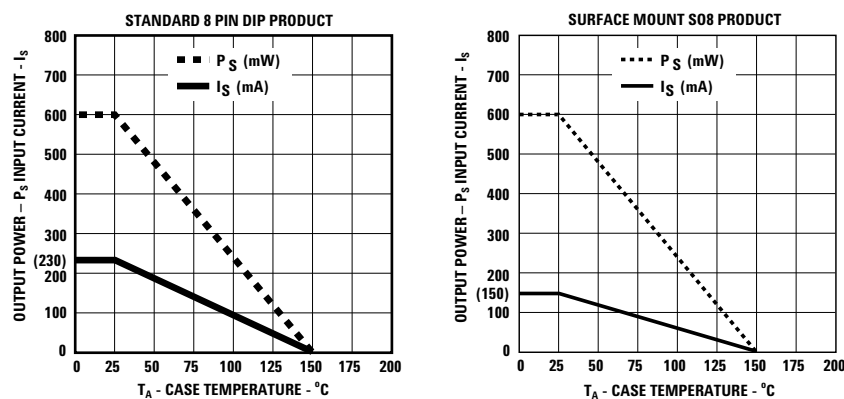


Figure 1. Thermal Derating Curve, Dependence of Safety Limiting Value with Case Temperature per VDE 0884.

## IEC/EN/DIN EN60747-5-2 Insulation Related Characteristics (Option 060)

### Standard 8 Pin DIP Package

\*85°C: HCPL-2211, HCPL-2212, HCPL-2219, HCPL-2300, HCPL-2400, HCPL-2611, HCPL-261A, HCPL-261N, HCPL-4701, HCPL-7840.

\*\*100°C: HCPL-3120, HCPL-3150, HCPL-4503, HCPL-4504, HCPL-4506.

### S08 Package

\*85°C: HCPL-0211, HCPL-0611, HCPL-061A, HCPL-061N, HCPL-070A.

\*\*100°C: HCPL-0454, HCPL-0466.

| Description  | Symbol         | Std. 8 Pin DIP | S08         | Units  |
|--|----------------|----------------|-------------|--------|
| Installation classification per DIN VDE 0110/1.89, Table 1   |                |                |             |        |
| for rated mains voltage £ 150 V rms  |                | I-IV           | I-IV        |        |
| for rated mains voltage £ 300 V rms  |                | I-IV           | I-III       |        |
| for rated mains voltage £ 450 V rms  |                | I-III          |             |        |
| Climatic Classification  |                | 55/85/21*      | 55/85/21*   |        |
|  |                | 55/100/21**    | 55/100/21** |        |
| Pollution Degree (DIN VDE 0110/1.89)   |                | 2              | 2           |        |
| Maximum Working Insulation Voltage   | $V_{IORM}$     | 630            | 560         | V peak |
| Input to Output Test Voltage, Method b†<br>$V_{IORM} \times 1.875 = V_{PR}$ , 100% Production<br>Test with $t_m = 1$ sec, Partial Discharge < 5 pC | $V_{PR}$       | 1181           | 1050        | V peak |
| Input to Output Test Voltage, Method a†<br>$V_{IORM} \times 1.5 = V_{PR}$ , Type and Sample Test,<br>$t_m = 60$ sec, Partial Discharge < 5 pC      | $V_{PR}$       | 945            | 840         | V peak |
| Highest Allowable Over voltage †<br>(Transient Overvoltage, $t_{ini} = 10$ sec)  | $V_{IOTM}$     | 6000           | 4000        | V peak |
| Safety Limiting Values<br>(Maximum values allowed in the event of a failure,<br>also see Thermal Derating curve, Figure 1.)                        |                |                |             |        |
| Case Temperature   | $T_S$          | 175            | 150         | °C     |
| Input Current  | $I_{S,INPUT}$  | 230            | 150         | mA     |
| Output Power   | $P_{S,OUTPUT}$ | 600            | 600         | mW     |
| Insulation Resistance at $T_S$ , $V_{10} = 500$ V  | $R_{IO}$       | $\geq 10^9$    | $\geq 10^9$ | W      |

†Refer to the front of the optocoupler section of the *Isolation and Control Component Designer's Catalog*, under Product Safety Regulations section (IEC/EN/DIN EN60747-5-2), for a detailed description.

Note: These optocouplers are suitable for "safe electrical isolation" only within the safety limit data. Maintenance of the safety data shall be ensured by means of protective circuits.

Note: The surface mount classification is Class A in accordance with CECC 00802.

For product information and a complete list of distributors, please go to our web site: [www.avagotech.com](http://www.avagotech.com)

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