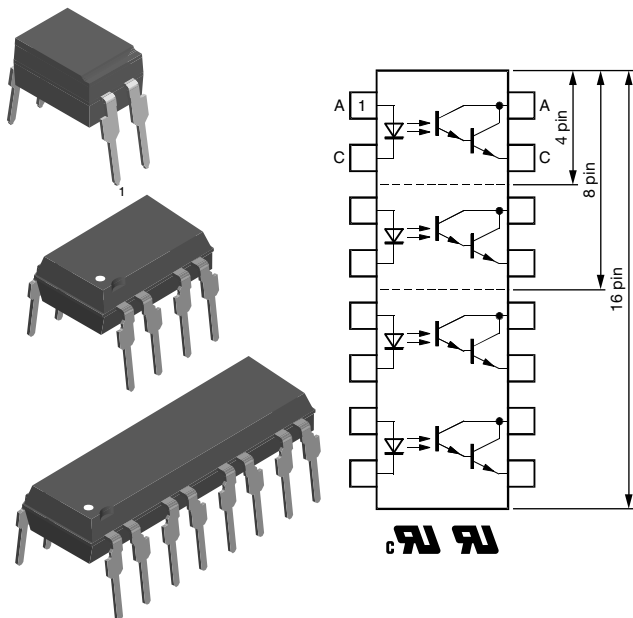


## Optocoupler, Photodarlington Output



### DESCRIPTION

In the K815P, K825P, K845P parts, each channel consist of a photodarlington optically coupled to a gallium arsenide infrared-emitting diode in an 4 pin, 8 pin, and 16 pin plastic dual inline package.

The elements are mounted on one leadframe providing a fixed distance between input and output for highest safety requirements.

### FEATURES

- Endstackable to 2.54 mm (0.1") spacing
- Isolation test voltage 5300 V<sub>RMS</sub>
- Low temperature coefficient of CTR
- Wide ambient temperature range
- Material categorization: For definitions of compliance please see [www.vishay.com/doc?999912](http://www.vishay.com/doc?999912)



**RoHS**  
COMPLIANT

### APPLICATIONS

- Programmable logic controllers
- Modems
- Answering machines
- General applications

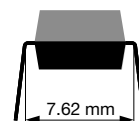
### AGENCY APPROVALS

- UL1577, file no. E76222 system code C, double protection
- CSA 22.2 bulletin 5A, double protection
- CQC: GB8898-2001 (K815P only)

### ORDERING INFORMATION



DIP-4/DIP-8/DIP-16



| AGENCY CERTIFIED/PACKAGE | CTR (%) |
|--------------------------|---------|
| UL, cUL                  | > 600   |
| DIP-4 (CQC)              | K815P   |
| DIP-8                    | K825P   |
| DIP-16                   | K845P   |

### ABSOLUTE MAXIMUM RATINGS (T<sub>amb</sub> = 25 °C, unless otherwise specified)

| PARAMETER             | TEST CONDITION         | SYMBOL            | VALUE | UNIT |
|-----------------------|------------------------|-------------------|-------|------|
| <b>INPUT</b>          |                        |                   |       |      |
| Reverse voltage       |                        | V <sub>R</sub>    | 6     | V    |
| Forward current       |                        | I <sub>F</sub>    | 60    | mA   |
| Forward surge current | t <sub>p</sub> ≤ 10 μs | I <sub>FSM</sub>  | 1.5   | A    |
| Power dissipation     |                        | P <sub>diss</sub> | 100   | mW   |
| Junction temperature  |                        | T <sub>j</sub>    | 125   | °C   |

**ABSOLUTE MAXIMUM RATINGS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                            | TEST CONDITION                       | SYMBOL     | VALUE         | UNIT               |
|--------------------------------------|--------------------------------------|------------|---------------|--------------------|
| <b>OUTPUT</b>                        |                                      |            |               |                    |
| Collector emitter voltage            |                                      | $V_{CEO}$  | 35            | V                  |
| Emitter collector voltage            |                                      | $V_{ECO}$  | 7             | V                  |
| Collector current                    |                                      | $I_C$      | 80            | mA                 |
| Collector peak current               | $t_p/T = 0.5, t_p \leq 10\text{ ms}$ | $I_{CM}$   | 100           | mA                 |
| Power dissipation                    |                                      | $P_{diss}$ | 150           | mW                 |
| Junction temperature                 |                                      | $T_j$      | 125           | $^{\circ}\text{C}$ |
| <b>COUPLER</b>                       |                                      |            |               |                    |
| AC isolation test voltage (RMS)      | $t = 1\text{ min}, f = 50\text{ Hz}$ | $V_{ISO}$  | 5             | kV                 |
| Total power dissipation              |                                      | $P_{tot}$  | 250           | mW                 |
| Operating ambient temperature        |                                      | $T_{amb}$  | - 40 to + 100 | $^{\circ}\text{C}$ |
| Storage temperature range            |                                      | $T_{stg}$  | - 55 to + 125 | $^{\circ}\text{C}$ |
| Soldering temperature <sup>(1)</sup> |                                      | $T_{sld}$  | 260           | $^{\circ}\text{C}$ |

**Notes**

- Stresses in excess of the absolute maximum ratings can cause permanent damage to the device. Functional operation of the device is not implied at these or any other conditions in excess of those given in the operational sections of this document. Exposure to absolute maximum ratings for extended periods of the time can adversely affect reliability.
- <sup>(1)</sup> Refer to wave profile for soldering conditions for through hole devices.

**ELECTRICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)

| PARAMETER                            | TEST CONDITION                                                     | SYMBOL      | MIN. | TYP. | MAX. | UNIT          |
|--------------------------------------|--------------------------------------------------------------------|-------------|------|------|------|---------------|
| <b>INPUT</b>                         |                                                                    |             |      |      |      |               |
| Forward voltage                      | $I_F = 20\text{ mA}$                                               | $V_F$       |      | 1.2  | 1.4  | V             |
| Reverse current                      | $V_R = 6\text{ V}$                                                 | $I_R$       |      |      | 10   | $\mu\text{A}$ |
| <b>OUTPUT</b>                        |                                                                    |             |      |      |      |               |
| Collector emitter voltage            | $I_C = 100\text{ }\mu\text{A}$                                     | $V_{CEO}$   | 35   |      |      | V             |
| Emitter collector voltage            | $I_E = 100\text{ }\mu\text{A}$                                     | $V_{CEO}$   | 7    |      |      | V             |
| Collector dark current               | $V_{CE} = 10\text{ V}, I_F = 0\text{ A}, E = 0$                    | $I_{CEO}$   |      |      | 100  | nA            |
| <b>COUPLER</b>                       |                                                                    |             |      |      |      |               |
| Collector emitter saturation voltage | $I_C = 5\text{ mA}, I_F = 20\text{ mA}$                            | $V_{CEsat}$ |      |      | 0.1  | V             |
| Cut-off frequency                    | $I_F = 10\text{ mA}, V_{CE} = 5\text{ V}, R_L = 100\text{ }\Omega$ | $f_c$       |      | 10   |      | kHz           |
| Coupling capacitance                 | $f = 1\text{ MHz}$                                                 | $C_k$       |      | 0.3  |      | pF            |

**Note**

- Minimum and maximum values are testing requirements. Typical values are characteristics of the device and are the result of engineering evaluation. Typical values are for information only and are not part of the testing requirements.

**CURRENT TRANSFER RATIO**

| PARAMETER | TEST CONDITION                           | SYMBOL | MIN. | TYP. | MAX. | UNIT |
|-----------|------------------------------------------|--------|------|------|------|------|
| $I_C/I_F$ | $I_F = 1\text{ mA}, V_{CE} = 2\text{ V}$ | CTR    | 600  | 800  |      | %    |

**SWITCHING CHARACTERISTICS**

| PARAMETER     | TEST CONDITION                                                                       | SYMBOL    | MIN. | TYP. | MAX. | UNIT          |
|---------------|--------------------------------------------------------------------------------------|-----------|------|------|------|---------------|
| Rise time     | $V_{CE} = 2\text{ V}, I_C = 10\text{ mA}, R_L = 100\text{ }\Omega$<br>(see figure 1) | $t_r$     |      | 300  |      | $\mu\text{s}$ |
| Turn-off time | $V_{CE} = 2\text{ V}, I_C = 10\text{ mA}, R_L = 100\text{ }\Omega$<br>(see figure 1) | $t_{off}$ |      | 250  |      | $\mu\text{s}$ |

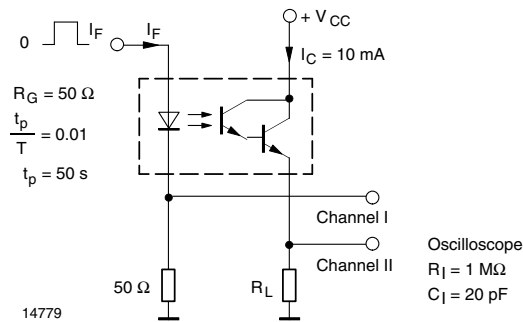


Fig. 1 - Test Circuit, Non-Saturated Operation

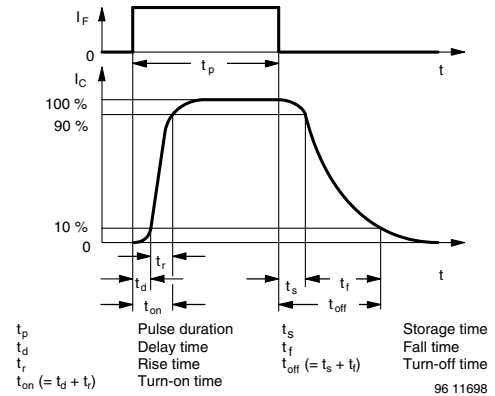


Fig. 2 - Switching Times

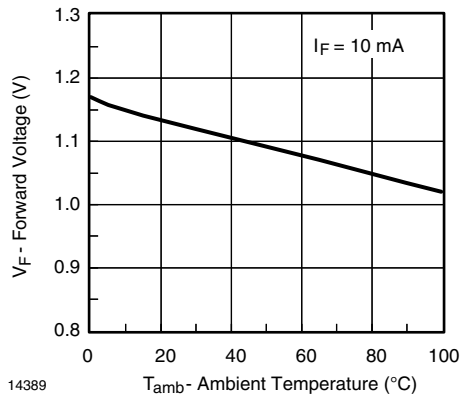
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25\text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Voltage vs. Ambient Temperature

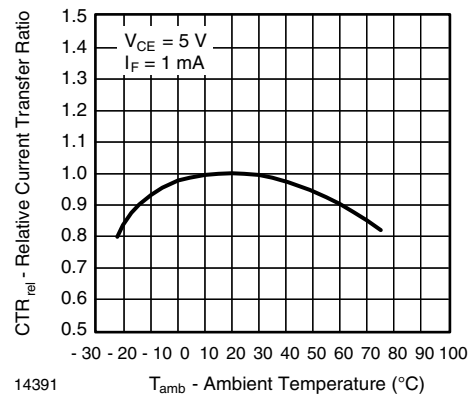


Fig. 5 - Relative Current Transfer Ratio vs. Ambient Temperature

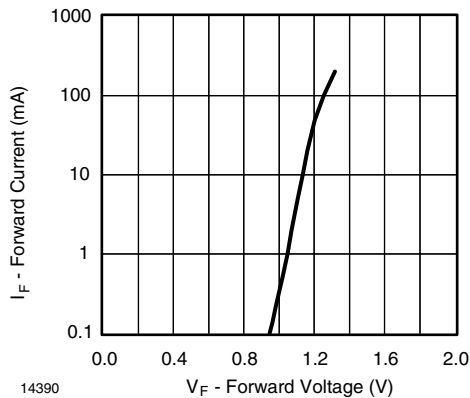


Fig. 4 - Forward Current vs. Forward Voltage

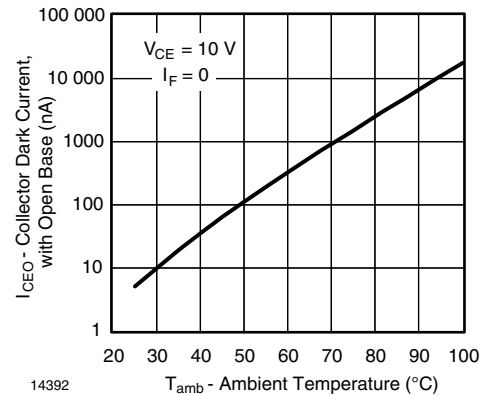


Fig. 6 - Collector Dark Current vs. Ambient Temperature

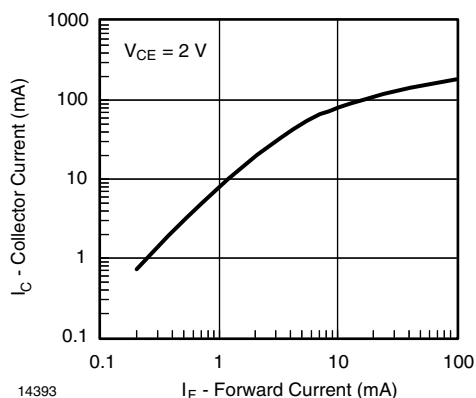


Fig. 7 - Collector Current vs. Forward Current

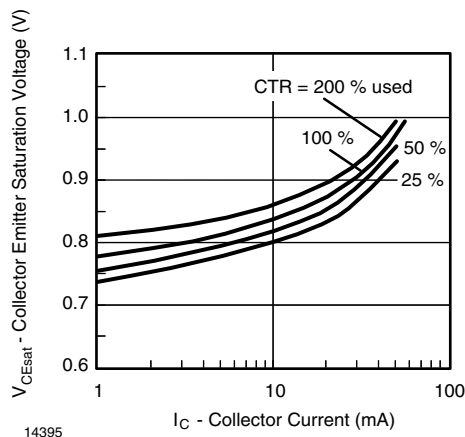


Fig. 9 - Collector Emitter Saturation Voltage vs. Collector Current

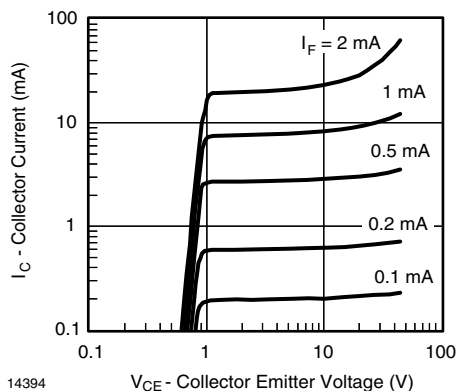


Fig. 8 - Collector Current vs. Collector Emitter Voltage

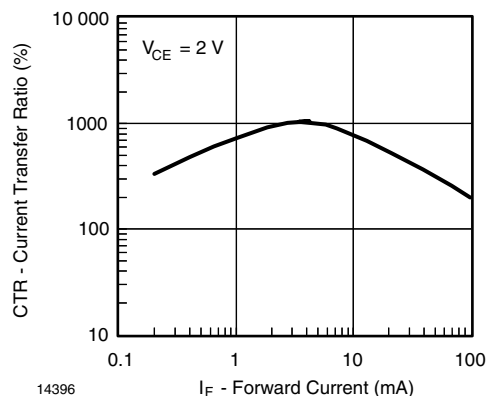
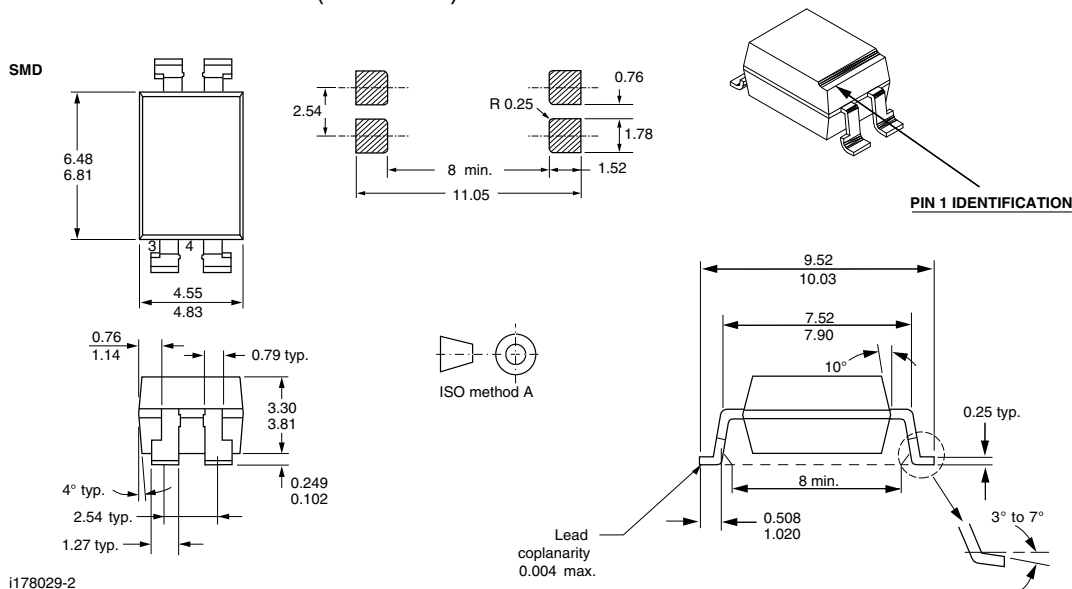
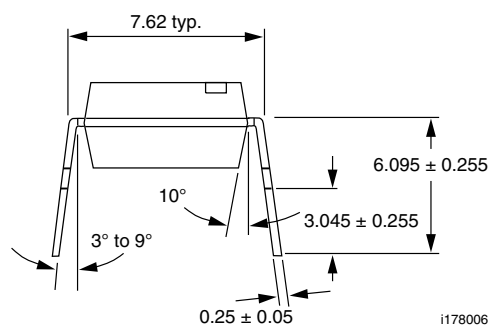
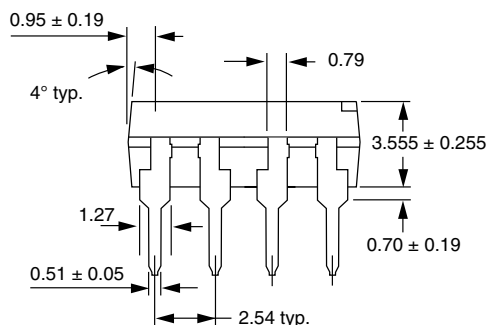
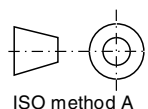
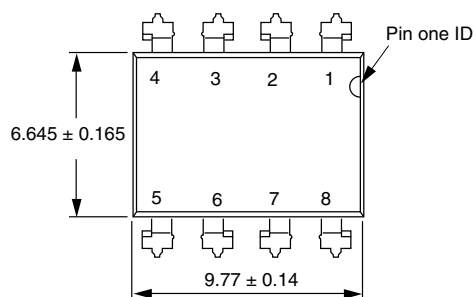


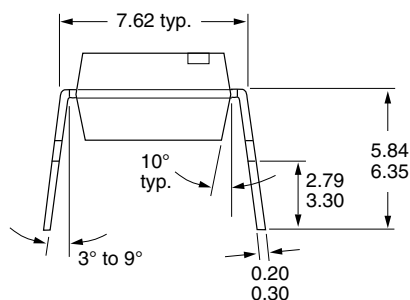
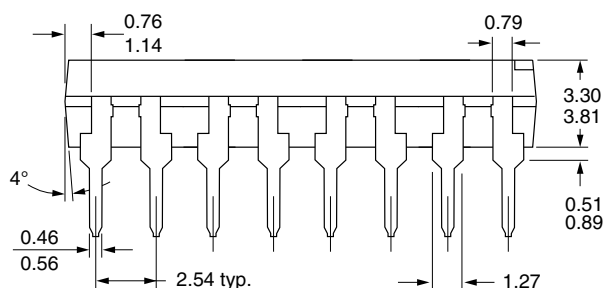
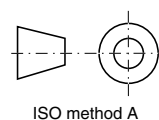
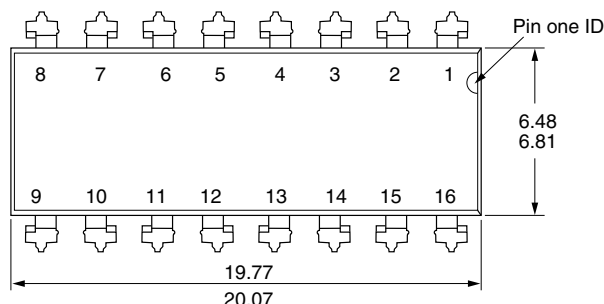
Fig. 10 - Current Transfer Ratio vs. Forward Current

## PACKAGE DIMENSIONS in inches (millimeters)



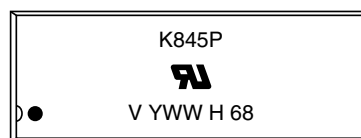
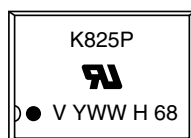
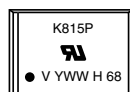


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### PACKAGE MARKING





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