

Optocoupler, Photodarlington Output

Features

- Endstackable to 2.54 mm (0.1") spacing
- Isolation test voltage 5000 V_{RMS}
- · Low coupling capacitance of typical 0.3 pF
- · Low temperature coefficient of CTR
- · Wide ambient temperature range
- · Lead-free component
- · Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

Agency Approvals

- UL1577, File No. E76222 System Code U, Double Protection
- CSA 22.2 bulletin 5A, Double Protection

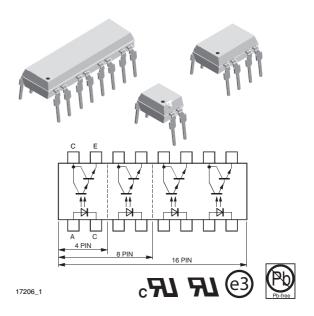
Applications

Programmable logic controllers

Modems Answering machines General applications

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, 8pin 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.

Order Information

Part	Remarks
K815P	CTR > 600 %, Single Channel, DIP-4
K825P	CTR > 600 %, Dual Channel, DIP-8
K845P	CTR > 600 %, Quad Channel, DIP-16

For additional information on the available options refer to Option Information.

Absolute Maximum Ratings

T_{amb} = 25 °C, unless otherwise specified

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 Rating for extended periods of the time can adversely affect reliability.

Input

Parameter	Test condition	Symbol	Value	Unit
Reverse voltage		V _R	6	V
Forward current		I _F	60	mA
Forward surge current	$t_p \le 10 \ \mu s$	I _{FSM}	1.5	Α
Power dissipation		P _{diss}	100	mW
Junction temperature		T _j	125	°C

www.vishay.com

Rev. 1.7, 26-Oct-04

K815P/ K825P/ K845P

Vishay Semiconductors



Output

Parameter	Test condition	Symbol	Value	Unit
Collector emitter voltage		V _{CEO}	35	V
Emitter collector voltage		V _{ECO}	7	V
Collector current		I _C	80	mA
Collector peak current	$t_p/T = 0.5, t_p \le 10 \text{ ms}$	I _{CM}	100	mA
Power dissipation		P _{diss}	150	mW
Junction temperature		Tj	125	°C

Coupler

Parameter	Test condition	Symbol	Value	Unit
AC Isolation test voltage (RMS)	t = 1 min, f = 50 Hz	V _{ISO} 1)	5	kV
Total power dissipation		P _{tot}	250	mW
Operating ambient temperature range		T _{amb}	- 40 to + 100	°C
Storage temperature range		T _{stg}	- 55 to + 125	°C
Soldering temperature	2 mm from case, t ≤ 10 s	T _{sld}	260	°C

¹⁾ Related to standard climate 23/50 DIN 50014

Electrical Characteristics

 T_{amb} = 25 °C, unless otherwise specified

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.

Input

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Forward voltage	I _F = 20 mA	V_{F}		1.2	1.4	V
Reverse current	V _R = 6 V	I _R			10	μА

Output

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Collector emitter voltage	I _C = 100 μA	V_{CEO}	35			V
Emitter collector voltage	I _E = 100 μA	V _{ECO}	7			V
Collector dark current	$V_{CE} = 10 \text{ V}, I_F = 0, E = 0$	I _{CEO}			100	nA

Coupler

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Collector emitter saturation voltage	$I_F = 20 \text{ mA}, I_C = 5 \text{ mA}$	V _{CEsat}			0.1	V
Cut-off frequency	I_F = 10 mA, V_{CE} = 5 V, R_L = 100 Ω	f _c		10		kHz
Coupling capacitance	f = 1 MHz	C _k		0.3		pF

Document Number 83524 www.vishay.com

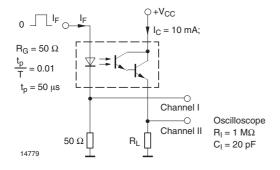


Current Transfer Ratio

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
I_{C}/I_{F}	$V_{CE} = 2 \text{ V}, I_F = 1 \text{ mA}$	CTR	600	800		%

Switching Characteristics

Parameter	Test condition	Symbol	Min	Тур.	Max	Unit
Rise time	$V_{CE} = 2 \text{ V}, I_{C} = 10 \text{ mA},$ $R_{L} = 100 \Omega \text{ (see figure 1)}$	t _r		300		μS
Turn-off time	$V_{CE} = 2 \text{ V}, I_{C} = 10 \text{ mA},$ $R_{L} = 100 \Omega \text{ (see figure 1)}$	t _{off}		250		μS



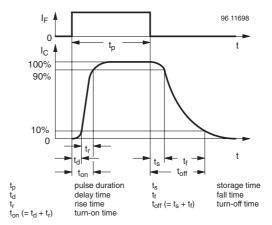


Figure 1. Test circuit, non-saturated operation

Figure 2. Switching Times

Typical Characteristics (Tamb = 25 °C unless otherwise specified)

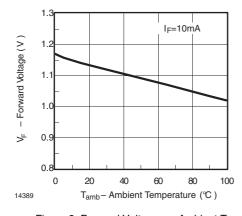


Figure 3. Forward Voltage vs. Ambient Temperature

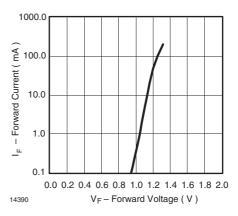


Figure 4. Forward Current vs. Forward Voltage

Document Number 83524 www.vishay.com



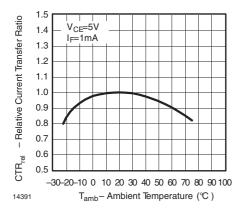


Figure 5. Relative Current Transfer Ratio vs. Ambient Temperature

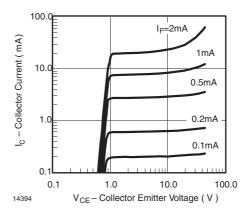


Figure 8. Collector Current vs. Collector Emitter Voltage

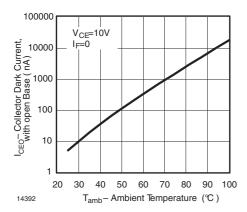


Figure 6. Collector Dark Current vs. Ambient Temperature

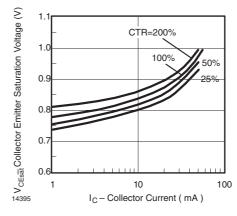


Figure 9. Collector Emitter Saturation Voltage vs. Collector Current

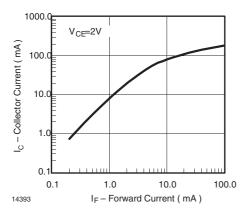


Figure 7. Collector Current vs. Forward Current

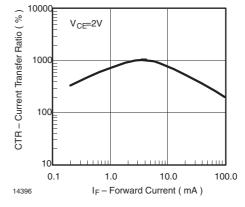
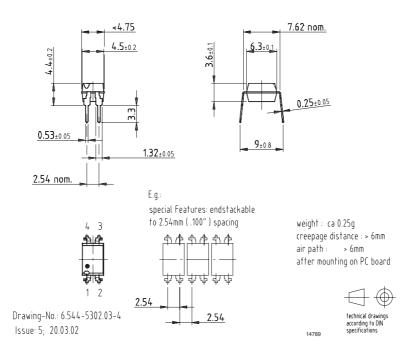
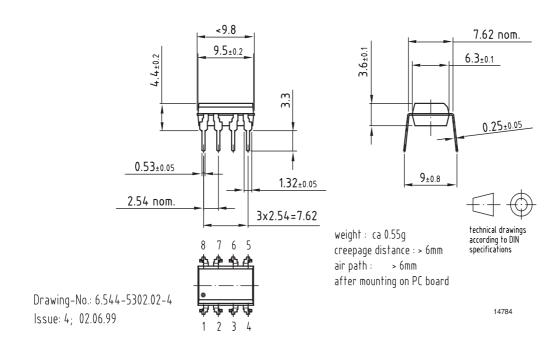


Figure 10. Current Transfer Ratio vs. Forward Current

Package Dimensions in mm



Package Dimensions in mm



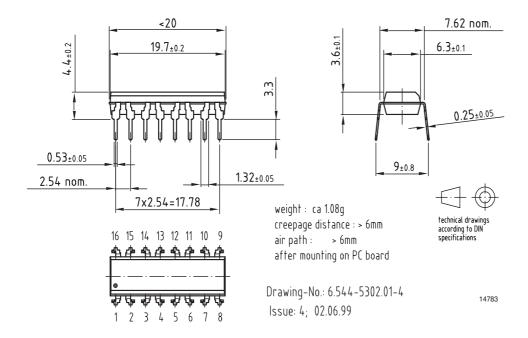
Document Number 83524 www.vishay.com

K815P/ K825P/ K845P

Vishay Semiconductors

Package Dimensions in mm





www.vishay.com
Document Number 83524
Rev. 1.7, 26-Oct-04

K815P/ K825P/ K845P



Vishay Semiconductors

Ozone Depleting Substances Policy Statement

It is the policy of Vishay Semiconductor GmbH to

- 1. Meet all present and future national and international statutory requirements.
- 2. Regularly and continuously improve the performance of our products, processes, distribution and operatingsystems with respect to their impact on the health and safety of our employees and the public, as well as their impact on the environment.

It is particular concern to control or eliminate releases of those substances into the atmosphere which are known as ozone depleting substances (ODSs).

The Montreal Protocol (1987) and its London Amendments (1990) intend to severely restrict the use of ODSs and forbid their use within the next ten years. Various national and international initiatives are pressing for an earlier ban on these substances.

Vishay Semiconductor GmbH has been able to use its policy of continuous improvements to eliminate the use of ODSs listed in the following documents.

- 1. Annex A, B and list of transitional substances of the Montreal Protocol and the London Amendments respectively
- 2. Class I and II ozone depleting substances in the Clean Air Act Amendments of 1990 by the Environmental Protection Agency (EPA) in the USA
- 3. Council Decision 88/540/EEC and 91/690/EEC Annex A, B and C (transitional substances) respectively.

Vishay Semiconductor GmbH can certify that our semiconductors are not manufactured with ozone depleting substances and do not contain such substances.

> We reserve the right to make changes to improve technical design and may do so without further notice.

Parameters can vary in different applications. All operating parameters must be validated for each customer application by the customer. Should the buyer use Vishay Semiconductors products for any unintended or unauthorized application, the buyer shall indemnify Vishay Semiconductors against all claims, costs, damages, and expenses, arising out of, directly or indirectly, any claim of personal damage, injury or death associated with such unintended or unauthorized use.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany Telephone: 49 (0)7131 67 2831, Fax number: 49 (0)7131 67 2423

Document Number 83524 www.vishay.com

Rev. 1.7, 26-Oct-04

Legal Disclaimer Notice



Vishay

Notice

Specifications of the products displayed herein are subject to change without notice. Vishay Intertechnology, Inc., or anyone on its behalf, assumes no responsibility or liability for any errors or inaccuracies.

Information contained herein is intended to provide a product description only. No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted by this document. Except as provided in Vishay's terms and conditions of sale for such products, Vishay assumes no liability whatsoever, and disclaims any express or implied warranty, relating to sale and/or use of Vishay products including liability or warranties relating to fitness for a particular purpose, merchantability, or infringement of any patent, copyright, or other intellectual property right.

The products shown herein are not designed for use in medical, life-saving, or life-sustaining applications. Customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Vishay for any damages resulting from such improper use or sale.

Document Number: 91000 www.vishay.com