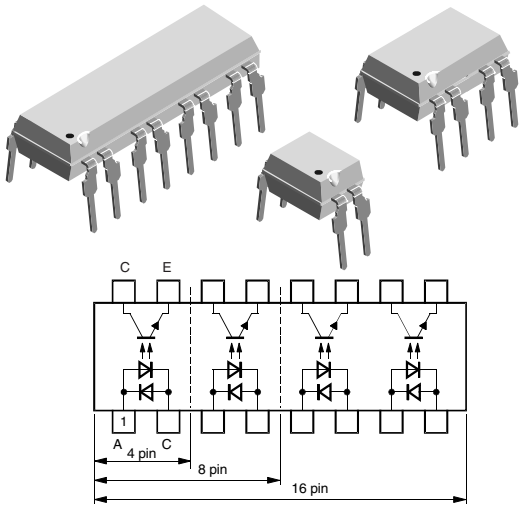
Optocoupler, Photodarlington Output



17220_2

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 (Pb)-free component
- Component in accordance to RoHS 2002/95/EC and WEEE 2002/96/EC

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

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.

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

ABSOLUTE MAXIMUM RATINGS (1)				
PARAMETER	**TEST CONDITION**	**SYMBOL**	**VALUE**	**UNIT**
INPUT				
Reverse voltage		V_R	6.0	V
Forward current		I_F	60	mA
Forward surge current	$t_P \leq 10$ µs	I_{FSM}	1.5	A
Power dissipation		P_{diss}	100	mW
Junction temperature		T_j	125	°C
OUTPUT				
Collector emitter voltage		V_{CEO}	35	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	80	mA
Collector peak current	$t_p/T = 0.5$, $t_p \leq 10$ ms	I_{CM}	100	mA
Power dissipation		P_{diss}	150	mW
Junction temperature		T_j	125	°C

ABSOLUTE MAXIMUM RATINGS (1)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
COUPLER				
AC isolation test voltage (RMS)	t = 1 min, f = 50 Hz	V_{ISO}	5	kV
Total power dissipation		P_{tot}	250	mW
Operating ambient temperature		T_{amb}	- 40 to +100	°C
Storage temperature range		T_{stg}	- 55 to + 125	°C
Soldering temperature (2)	2 mm from case, t ≤ 10 s	T_{sld}	260	°C

Notes

(1) 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 ratings for extended periods of the time can adversely affect reliability.

(2) Refer to wave profile for soldering conditions for through hole devices.

ELECTRICAL CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	I_F = 20 mA	V_F		1.2	1.4	V
Reverse current	V_R = 6 V	I_R			10	µA
OUTPUT						
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 V, I_F = 0, E = 0	I_{CEO}			100	nA
COUPLER						
Collector emitter saturation voltage	I_F = 20 mA, I_C = 5 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

Note

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.

CURRENT TRANSFER RATIO

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

SWITCHING CHARACTERISTICS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Rise time	V_{CE} = 2 V, I_C = 10 mA, R_L = 100 Ω (see figure 1)	t_r		300		µs
Turn-off time	V_{CE} = 2 V, I_C = 10 mA, R_L = 100 Ω (see figure 1)	t_{off}		250		µs

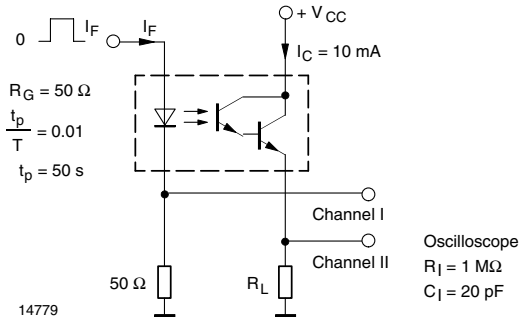


Fig. 1 - Test Circuit, Non-Saturated Operation

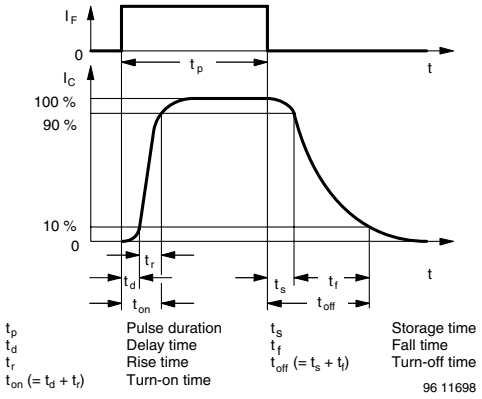


Fig. 2 - Switching Times

TYPICAL CHARACTERISTICS

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

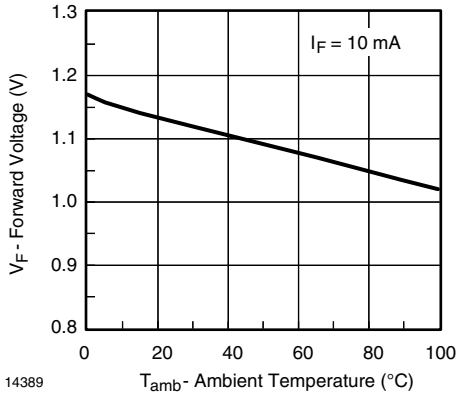


Fig. 3 - Forward Voltage vs. Ambient Temperature

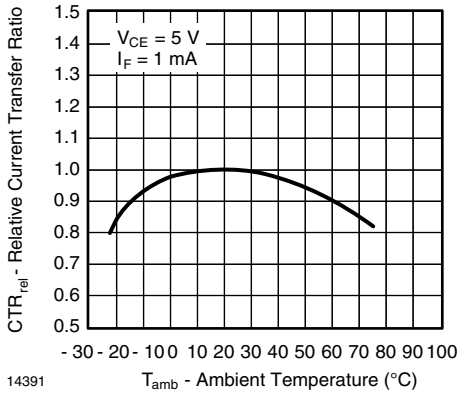


Fig. 5 - Relative Current Transfer Ratio vs. Ambient Temperature

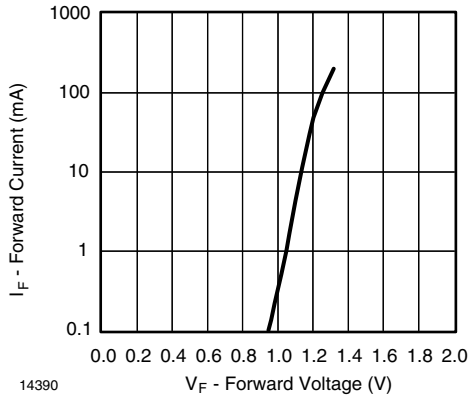


Fig. 4 - Forward Current vs. Forward Voltage

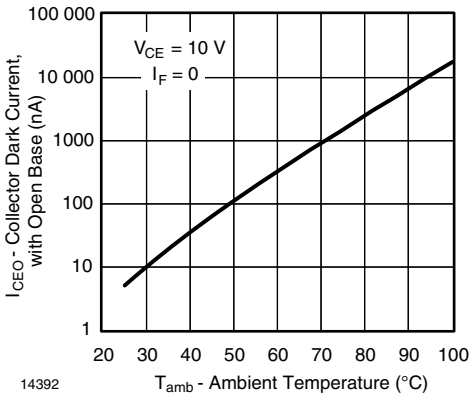


Fig. 6 - Collector Dark Current vs. Ambient Temperature

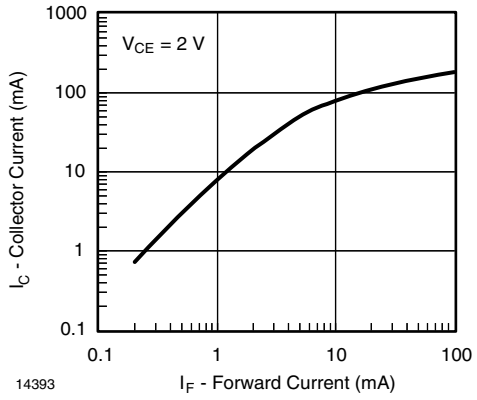


Fig. 7 - Collector Current vs. Forward Current

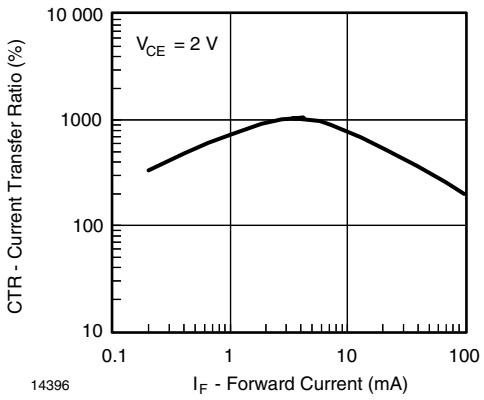


Fig. 10 - Current Transfer Ratio vs. Forward Current

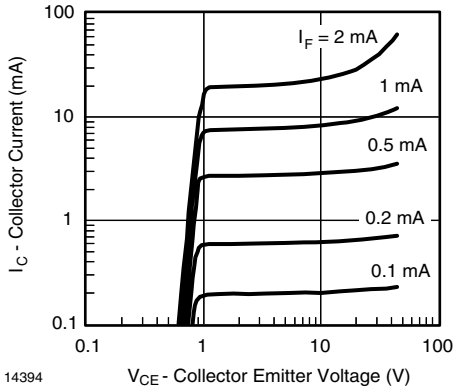


Fig. 8 - Collector Current vs. Collector Emitter Voltage

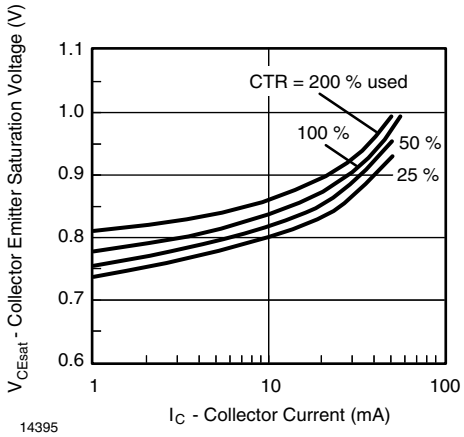
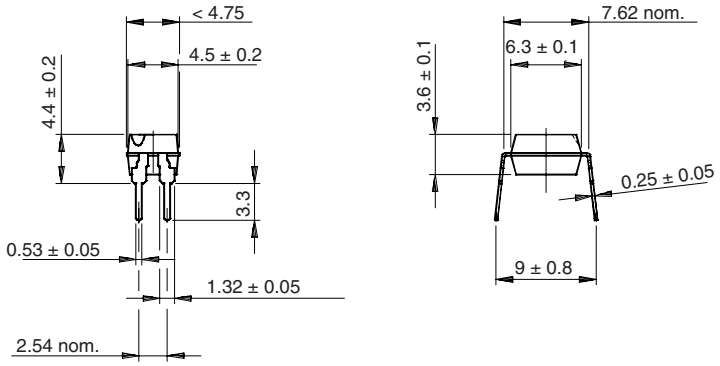


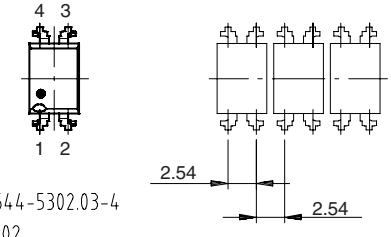
Fig. 9 - Collector Emitter Saturation Voltage vs. Collector Current

PACKAGE DIMENSIONS in millimeters



E. g.:
Special features: endstackable
to 2.54 mm (0.100") spacing

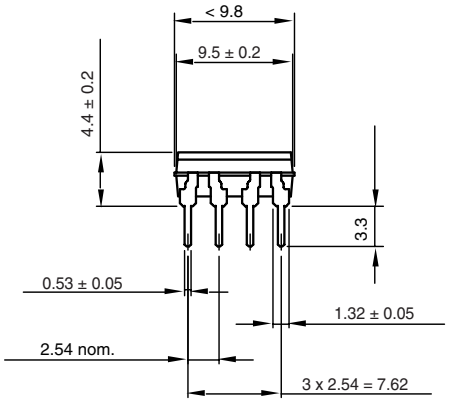
Weight: ca. 0.25 g
Creepage distance: > 6 mm
Air path: > 6 mm
after mounting on PC board

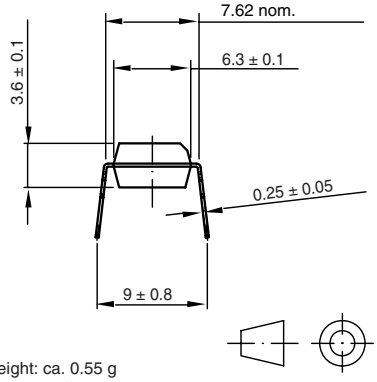


Drawing-No.: 6.544-5302.03-4
Issue: 5; 20.03.02

technical drawings
according to DIN
specifications

14789



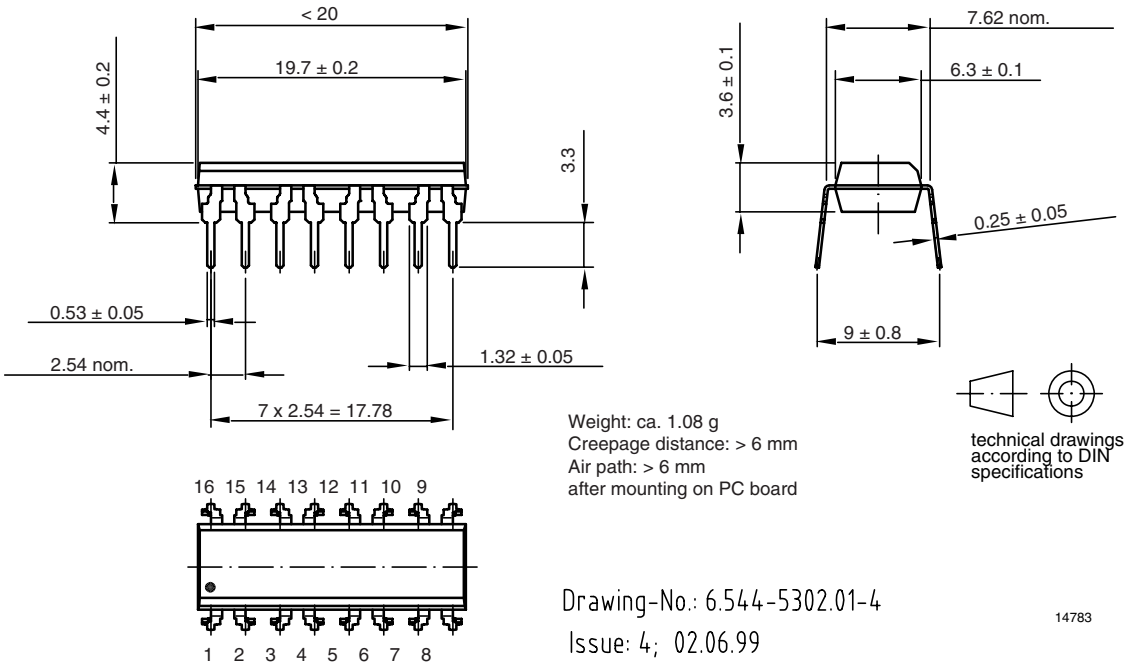


Weight: ca. 0.55 g
Creepage distance: > 6 mm
Air path: > 6 mm
after mounting on PC board

technical drawings
according to DIN
specifications

Drawing-No.: 6.544-5302.02-4
Issue: 4; 02.06.99

14784



Weight: ca. 1.08 g
Creepage distance: > 6 mm
Air path: > 6 mm
after mounting on PC board

Drawing-No.: 6.544-5302.01-4
Issue: 4; 02.06.99

14783

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 operating systems 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.

Vishay Semiconductor GmbH, P.O.B. 3535, D-74025 Heilbronn, Germany

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