

Optocoupler with Photo Schmitt-Trigger Output

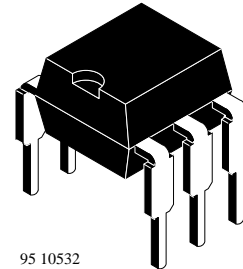
Description

The TCDS1001 consists of a Photo Schmitt-trigger optically coupled to a gallium arsenide infrared emitting diode in a 6 lead plastic dual inline packages.

The elements are mounted in opposite position (face to face) with a distance of > 0.4 mm.

Applications

Computer peripheral interface,
microprocessor system interface,
line receiver.

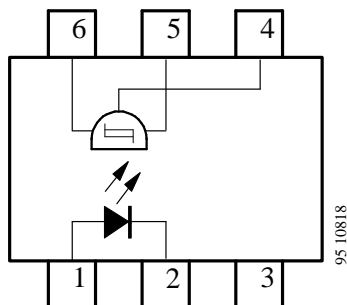


Features

- Isolation materials according to UL 94
- Input/output AC isolation test voltage (RMS)
 $V_{IO} = 3,75$ kV
- Climatic classification 55/100/21 (IEC 68 part 1)
- Supply voltage V_S 4.5 – 1.6 V
- Maximum LED threshold current $I_{FT} = 1.6$ mA
- Open collector output
- Low current consumption
- UL recognized; file No. E 76222



Pin Connection



- Truth table (positive logic)

Input	Output
H	L
L	H

Absolute Maximum Ratings

Input (Emitter)

Parameters	Test Conditions	Symbol	Value	Unit
Reserve voltage		V_R	6	V
Forward current		I_F	15	mA
Forward surge current	$t_p \leq 10 \mu s$	I_{FSM}	1.5	A
Power dissipation	$T_{amb} \leq 25^\circ C$	P_V	25	mW
Junction temperature		T_j	125	$^\circ C$

Output (Detector)

Parameters	Test Conditions	Symbol	Value	Unit
Supply voltage range		V_S	3 – 16	V
Output voltage		V_O	16	V
Output current		I_O	30	mA
Power dissipation	$T_{amb} \leq 25^\circ C$	P_{tot}	100	mW
Junction temperature		T_j	125	$^\circ C$

Coupler

Parameters	Test Conditions	Symbol	Value	Unit
AC isolation test voltage (RMS)		$V_{IO}^{1)}$	3.75	kV
Total power dissipation	$T_{amb} \leq 25^\circ C$	P_{tot}	125	mW
Ambient temperature range		T_{amb}	-40 to +85	$^\circ C$
Storage temperature range		T_{stg}	-55 to +125	$^\circ C$
Soldering temperature	2 mm from case, $t \leq 10 s$	T_{sd}	260	$^\circ C$

1) Related to standard climate 23/50 DIN 50014

Electrical Characteristics $T_{amb} = 25^\circ C$

Input (Emitter)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Forward voltage	$I_F = 50 mA$	V_F		1.15	1.5	V
Breakdown voltage	$I_R = 100 \mu A$	$V_{(BR)}$	6			V
Junction capacitance	$V_R = 0, f = 1 MHz$	C_j		50		pF

Output (Detector)

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
High level output current		V_{OH}			1	μA
Supply voltage		V_S	3		16	V
High level supply current	$V_S = 5 V, I_F = 0$	I_S		2.5	5	mA
Low level supply current	$V_S = 5 V, I_F = 5 mA$	I_S		2.5	5	mA

Coupler

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Low level output voltage	$V_S = 5 V, R_L = 270 \Omega, I_F = 5 mA$	V_{OL}		0.2	0.4	V
Input threshold current	$V_S = 5 V, R_L = 270 \Omega$	I_{FON}		0.8	1.6	mA
Hysteresis ratio	$V_S = 5 V, R_L = 270 \Omega$	$\frac{I_{F(off)}}{I_{F(on)}}$		80		%

Switching Characteristics

$V_S = 5\text{ V}$, $T_{\text{amb}} = 25^\circ\text{C}$, $I_F = 5\text{ mA}$, $R_L = 270\ \Omega$

Parameters	Test Conditions	Symbol	Min.	Typ.	Max.	Unit
Rise time		t_r		0.1		μs
Turn on time		t_{on}		0.5	2	μs
Fall time		t_f		0.05		μs
Turn off time		t_{off}		5	10	μs

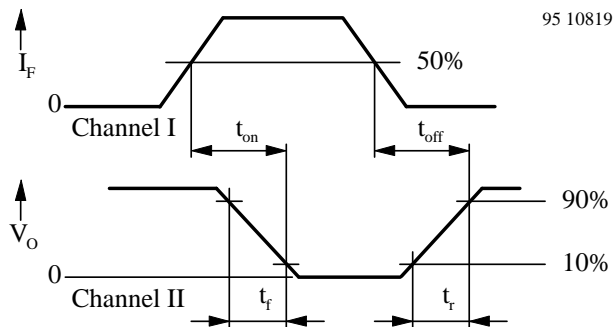


Figure 1.

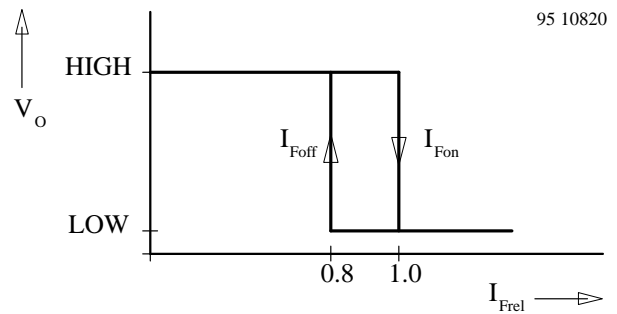


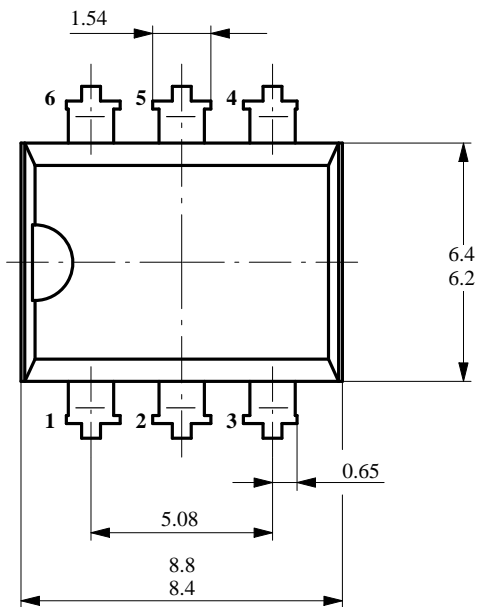
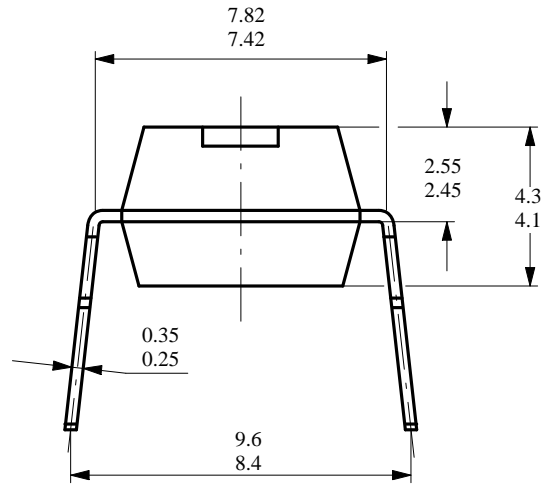
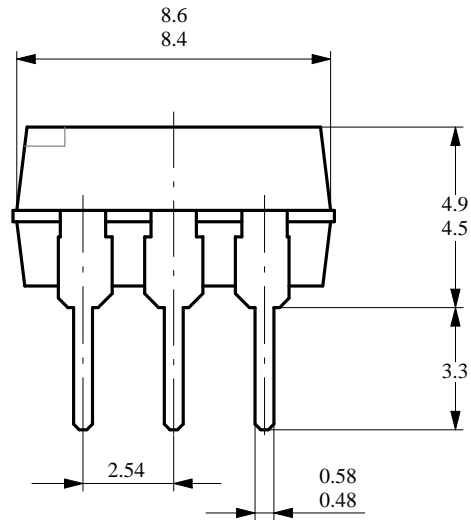
Figure 2.

TCDS1001

TEMIC

TELEFUNKEN Semiconductors

Dimensions in mm




technical drawings
according to DIN
specifications

95 10931

Ozone Depleting Substances Policy Statement

It is the policy of **TEMIC TELEFUNKEN microelectronic 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.

TEMIC TELEFUNKEN microelectronic GmbH semiconductor division 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.

TEMIC 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 TEMIC products for any unintended or unauthorized application, the buyer shall indemnify TEMIC 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.

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