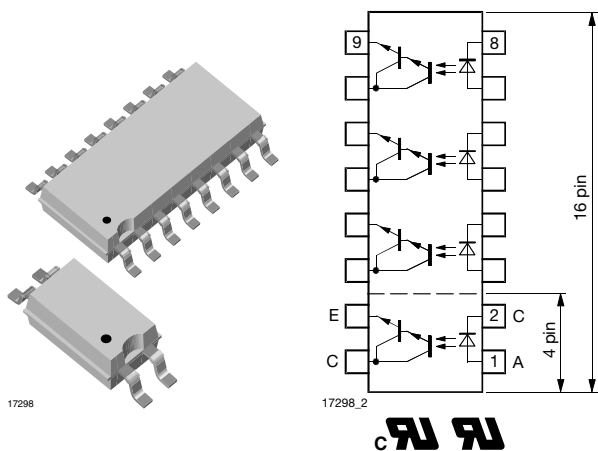


Optocoupler, Photodarlington Output, High Gain, Single/Quad Channel, Half Pitch Mini-Flat Package



DESCRIPTION

The TCMD1000, TCMD4000 consist of a photodarlington optically coupled to a gallium arsenide infrared-emitting diodes in either a 4 pin or 16 pin miniflat package.

The elements provide a fixed distance between input and output for highest safety requirements.

FEATURES

- Low profile package (half pitch)
- AC isolation test voltage 3750 V_{RMS}
- Low coupling capacitance of typical 0.3 pF
- Low temperature coefficient of CTR
- Wide ambient temperature range
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC

Note

** Please see document "Vishay Material Category Policy":
www.vishay.com/doc?99902



RoHS
COMPLIANT
GREEN
(5-2008)**

APPLICATIONS

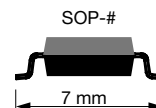
- Programmable logic
- Modems
- Answering machines
- General applications

AGENCY APPROVALS

- UL1577, file no. E76222 system code M, double protection
- CSA 22.2 bulletin 5A, double protection

ORDERING INFORMATION

T	C	M	D	#	0	0	0
PART NUMBER							



AGENCY CERTIFIED/PACKAGE	CTR (%)
UL, cUL	> 600
SOP-4	TCMD1000
SOP-16, quad channel	TCMD4000

ABSOLUTE MAXIMUM RATINGS (T_{amb} = 25 °C, unless otherwise specified)

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Reverse voltage		V _R	6	V
Forward current		I _F	60	mA
Forward surge current	t _p ≤ 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 ≤ 10 ms	I _{CM}	100	mA
Power dissipation		P _{diss}	150	mW
Junction temperature		T _j	125	°C



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
COUPLER				
AC isolation test voltage (RMS)		$V_{ISO}^{(1)}$	3750	V_{RMS}
Total power dissipation		P_{tot}	250	mW
Operating ambient temperature range		T_{amb}	- 40 to + 100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 40 to + 125	$^{\circ}\text{C}$
Soldering temperature ⁽²⁾		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.

(1) Related to standard climate 23/50 DIN 50014.

(2) Wave soldering three cycles are allowed. Also refer to "Assembly Instruction" (www.vishay.com/doc?80054).

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	$I_F = 50\text{ mA}$	V_F		1.25	1.6	V
Junction capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$	C_j		50		pF
OUTPUT						
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_{ECO}	7			V
Collector dark current	$V_{CE} = 10\text{ V}$, $I_F = 0$, $E = 0$	I_{CEO}			100	nA
COUPLER						
Collector emitter saturation voltage	$I_F = 20\text{ mA}$, $I_C = 5\text{ mA}$	V_{CEsat}			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 ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
I_C/I_F	$V_{CE} = 2\text{ V}$, $I_F = 1\text{ mA}$	TCMD1000	CTR	600	800		%
		TCMD4000	CTR	600	800		%

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Rise time	$V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$, $R_L = 100\text{ }\Omega$ (see figure 1)	t_r		300		μs
Turn-off time	$V_{CE} = 2\text{ V}$, $I_C = 10\text{ mA}$, $R_L = 100\text{ }\Omega$ (see figure 1)	t_{off}		250		μs

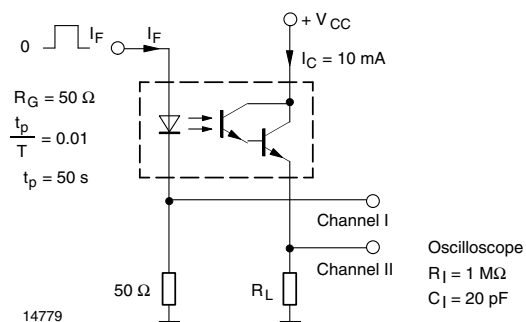


Fig. 1 - Test Circuit, Non-Saturated Operation

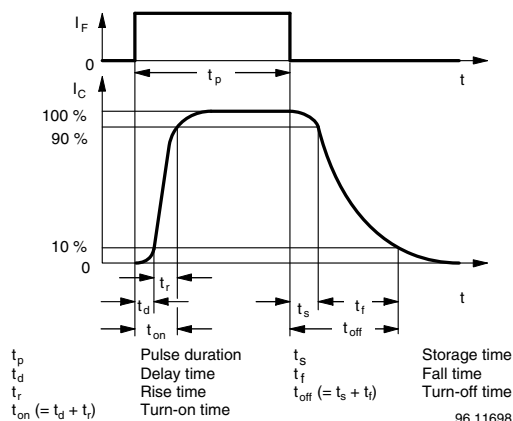


Fig. 2 - Switching Times

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

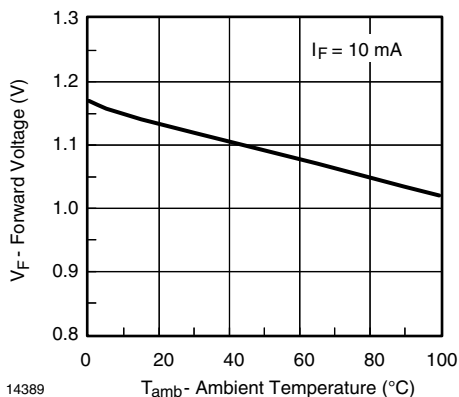


Fig. 3 - Forward Voltage vs. Ambient Temperature

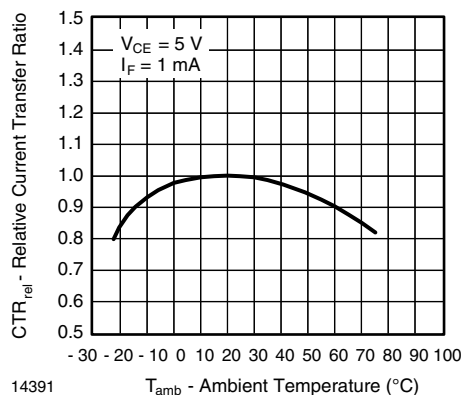


Fig. 5 - Relative Current Transfer Ratio vs. Ambient Temperature

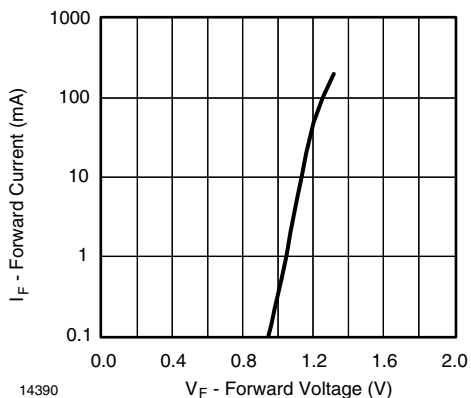


Fig. 4 - Forward Current vs. Forward Voltage

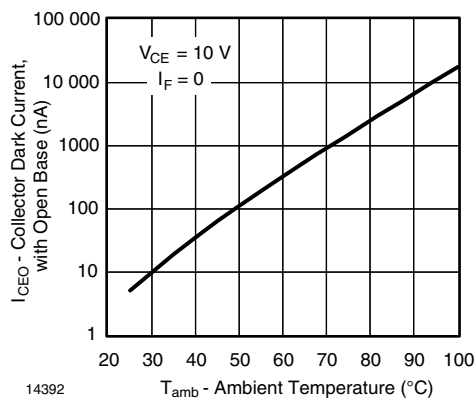


Fig. 6 - Collector Dark Current vs. Ambient Temperature

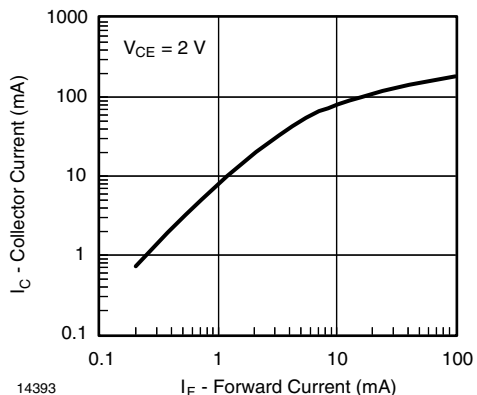


Fig. 7 - Collector Current vs. Forward Current

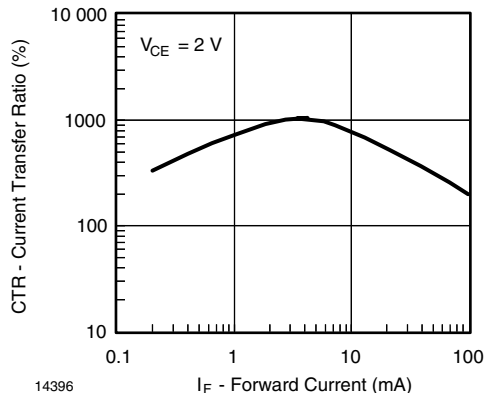


Fig. 10 - Current Transfer Ratio vs. Forward Current

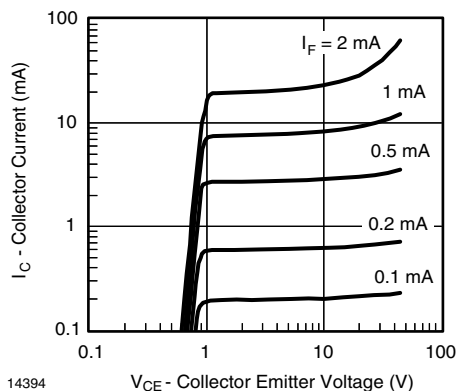


Fig. 8 - Collector Current vs. Collector Emitter Voltage

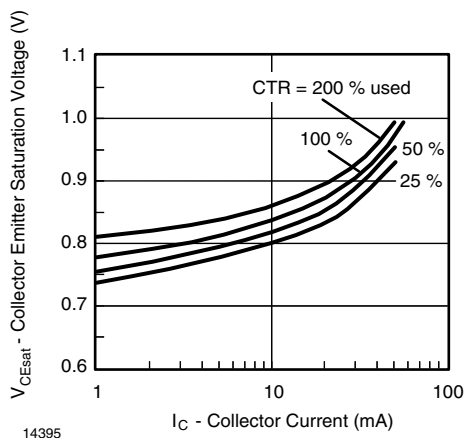
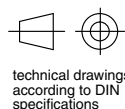
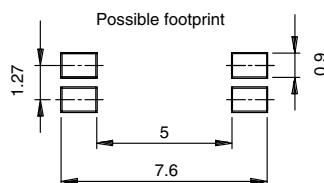
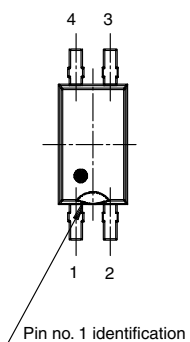
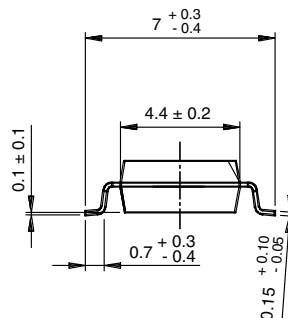
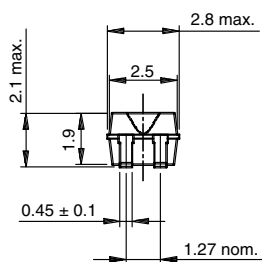


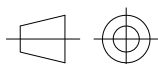
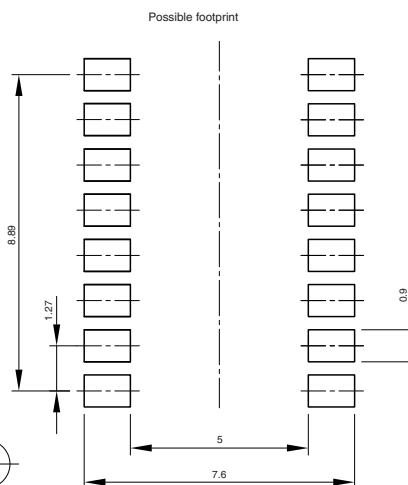
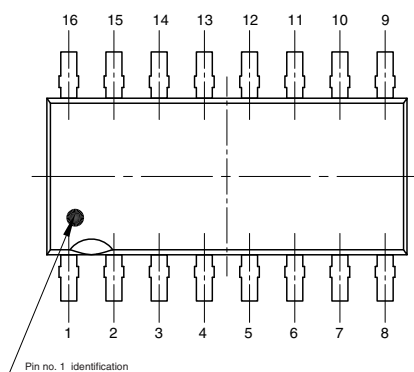
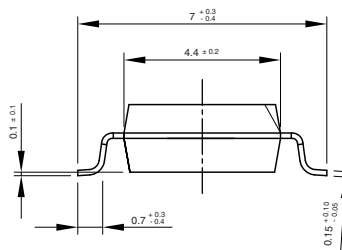
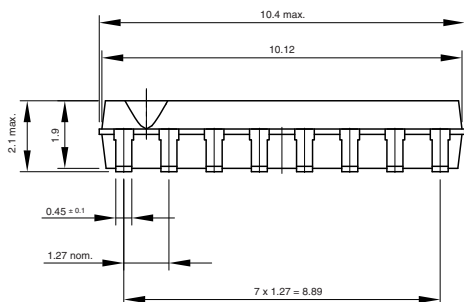
Fig. 9 - Collector Emitter Saturation Voltage vs. Collector Current



PACKAGE DIMENSIONS in millimeters



16283

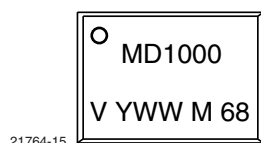


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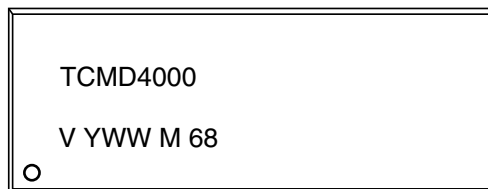
technical drawings
according to DIN
specifications



PACKAGE MARKING



21764-15



21764-16



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