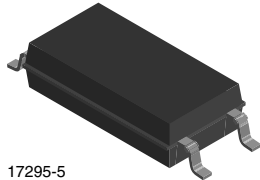
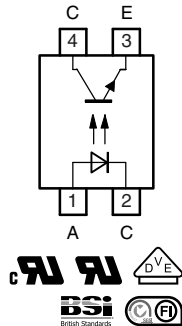


Optocoupler, Phototransistor Output, SOP-4L, Long Mini-Flat Package



17295-5



FEATURES

- SMD low profile 4 lead package
- High isolation 5000 V_{RMS}
- Special construction
- Extra low coupling capacitance
- DC input with transistor output
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96EC



Note

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

DESCRIPTION

The TCLT1003-3035 consists of a phototransistor optically coupled to a gallium arsenide infrared-emitting diode in a 4-lead SOP-4L package.

CUSTOMER REQUIREMENTS

This product meets lead (Pb)-free reflow requirement.

AGENCY APPROVALS

- UL1577, file no. E76222
- CSA (cUL) 1577 recognized file no. E76222 - double protection
- BSI: BS EN 41003, BS EN 60095 (BS 415), BS EN 60950 (BS 7002), certificate no. 7081 and 7402
- DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 (pending), available with option 1
- FIMKO (SETI): EN 60950, certificate no. 11027

Note

- See the Safety Standard Approval List "Agency Table" for more detailed information

ORDERING INFORMATION	
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <div style="border: 1px solid black; padding: 2px 5px;">T</div> <div style="border: 1px solid black; padding: 2px 5px;">C</div> <div style="border: 1px solid black; padding: 2px 5px;">L</div> <div style="border: 1px solid black; padding: 2px 5px;">T</div> <div style="border: 1px solid black; padding: 2px 5px;">1</div> <div style="border: 1px solid black; padding: 2px 5px;">0</div> <div style="border: 1px solid black; padding: 2px 5px;">0</div> <div style="border: 1px solid black; padding: 2px 5px;">3</div> <div style="border: 1px solid black; padding: 2px 5px;">-</div> <div style="border: 1px solid black; padding: 2px 5px;">3</div> <div style="border: 1px solid black; padding: 2px 5px;">0</div> <div style="border: 1px solid black; padding: 2px 5px;">3</div> <div style="border: 1px solid black; padding: 2px 5px;">5</div> </div> <div style="margin-left: 20px;"> </div> </div> <p style="text-align: center;">PART NUMBER</p>	
AGENCY CERTIFIED/PACKAGE	CTR (%)
UL, cUL, VDE, BSI, FIMKO	100 to 200
SOP-4L	TCLT1003-3035

Note

- Available only on tape and reel.



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, 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	$t_p \leq 10\text{ }\mu\text{s}$	I_{FSM}	1.5	A
Power dissipation		P_{diss}	100	mW
Junction temperature		T_j	125	$^{\circ}\text{C}$
OUTPUT				
Collector emitter voltage		V_{CEO}	70	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	50	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	$^{\circ}\text{C}$
COUPLER				
Isolation test voltage (RMS)		V_{ISO}	5000	V_{RMS}
Total power dissipation		P_{tot}	250	mW
Operating ambient temperature range		T_{amb}	- 55 to + 100	$^{\circ}\text{C}$
Storage temperature range		T_{stg}	- 55 to + 125	$^{\circ}\text{C}$
Soldering temperature ⁽¹⁾		T_{slid}	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⁾ 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	$I_C = 1\text{ mA}$	V_{CEO}	70			V
Emitter collector voltage	$I_E = 100\text{ }\mu\text{A}$	V_{ECO}	7			V
Collector emitter leakage current	$V_{CE} = 20\text{ V}, I_F = 0\text{ A}$	I_{CEO}		10	100	nA
COUPLER						
Collector emitter saturation voltage	$I_F = 10\text{ mA}, I_C = 1\text{ mA}$	V_{CEsat}			0.3	V
Cut-off frequency	$V_{CE} = 5\text{ V}, I_F = 10\text{ mA}, R_L = 100\text{ }\Omega$	f_c		110		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	$V_{CE} = 5\text{ V}, I_F = 10\text{ mA}$	TCLT1003-3035	CTR	100		200	%
	$V_{CE} = 5\text{ V}, I_F = 1\text{ mA}$	TCLT1003-3035	CTR	34	70		%
	$V_{CE} = 5\text{ V}, I_F = 1\text{ mA}, T_{amb} = 95\text{ }^{\circ}\text{C}$	TCLT1003-3035	CTR		40		%

SAFETY AND INSULATION RATED PARAMETERS						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Partial discharge test voltage - routine test	100 %, $t_{\text{test}} = 1 \text{ s}$	V_{pd}	1.6			kV
Partial discharge test voltage - lot test (sample test)	$t_{\text{Tr}} = 60 \text{ s}$, $t_{\text{test}} = 10 \text{ s}$, (see figure 2)	V_{IOTM}	8			kV
		V_{pd}	1.3			kV
Insulation resistance	$V_{\text{IO}} = 500 \text{ V}$	R_{IO}	10^{12}			Ω
	$V_{\text{IO}} = 500 \text{ V}$, $T_{\text{amb}} = 100 \text{ }^\circ\text{C}$	R_{IO}	10^{11}			Ω
	$V_{\text{IO}} = 500 \text{ V}$, $T_{\text{amb}} = 150 \text{ }^\circ\text{C}$ (construction test only)	R_{IO}	10^9			Ω
Forward current		I_{si}	130			mA
Power dissipation		P_{so}	265			mW
Rated impulse voltage		V_{IOTM}	8			kV
Safety temperature		T_{si}	150			$^\circ\text{C}$
Clearance distance			8.0			mm
Creepage distance			8.0			mm
Insulation distance (internal)			0.40			mm

Note

- According to DIN EN 60747-5-2 (VDE 0884) (see figure 2). This optocoupler is suitable for safe electrical isolation only within the safety ratings. Compliance with the safety ratings shall be ensured by means of suitable protective circuits.

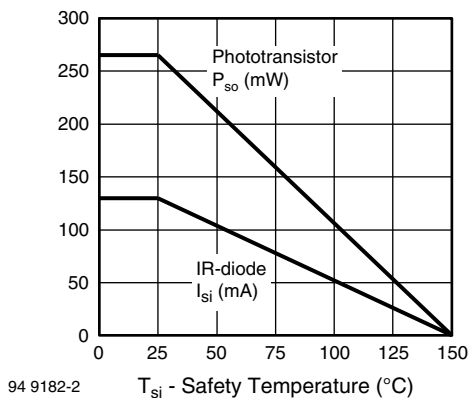


Fig. 1 - Derating Diagram

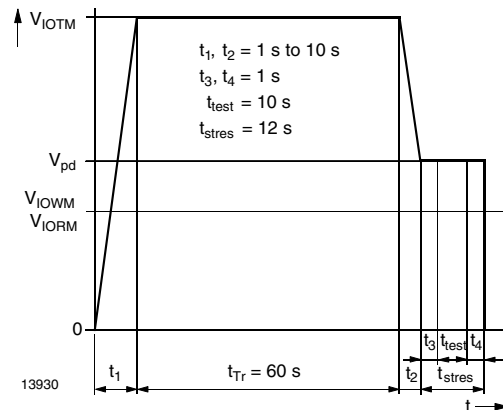


Fig. 2 - Test Pulse Diagram for Sample Test according to DIN EN 60747-5-2 (VDE 0884); IEC60747-5-5

SWITCHING CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Delay time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_d		3		μs
Rise time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_r		3		μs
Fall time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_f		4.7		μs
Storage time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_s		0.3		μs
Turn-on time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_{on}		6		μs
Turn-off time	$V_S = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$, (see figure 3)	t_{off}		5		μs
Turn-on time	$V_S = 5\text{ V}$, $I_C = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$, (see figure 4)	t_{on}		9		μs
Turn-off time	$V_S = 5\text{ V}$, $I_C = 10\text{ mA}$, $R_L = 1\text{ k}\Omega$, (see figure 4)	t_{off}		10		μs

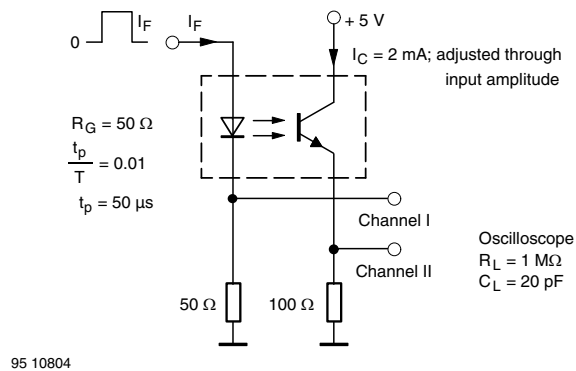


Fig. 3 - Test Circuit, Non-Saturated Operation

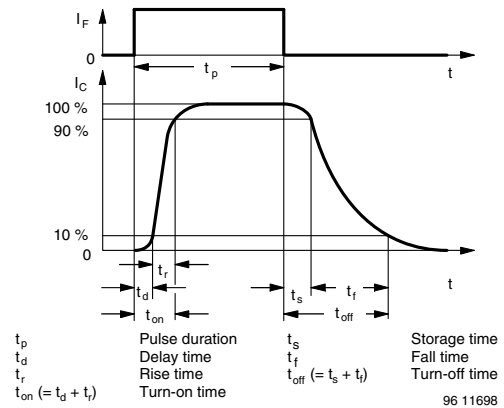


Fig. 5 - Switching Times

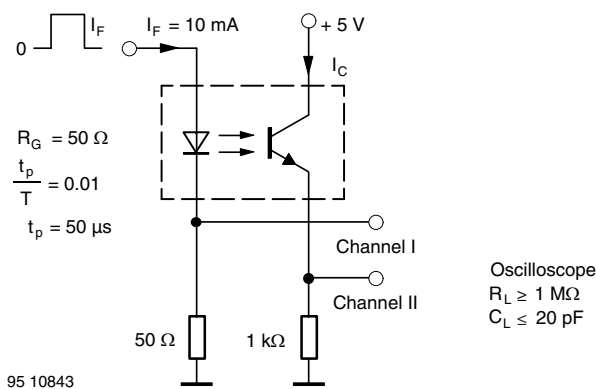
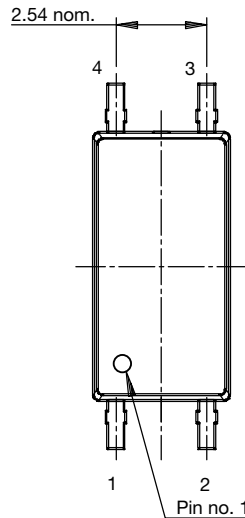
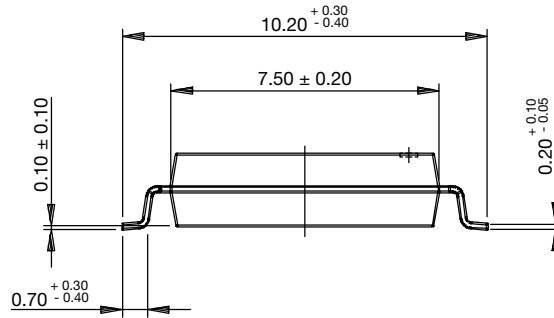
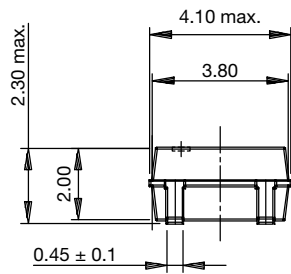


Fig. 4 - Test Circuit, Saturated Operation



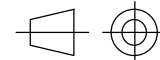
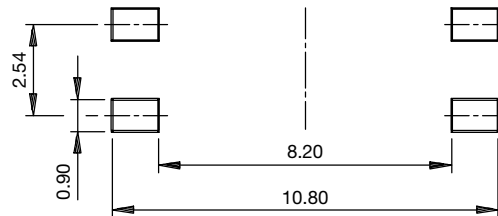
PACKAGE DIMENSIONS in millimeters



22533

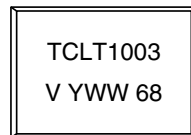
Pin no. 1 identification

Possible footprint



technical drawings according to DIN specifications

PACKAGE MARKING





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