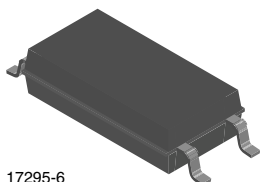
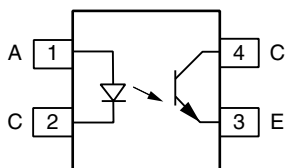


Optocoupler, Phototransistor Output, Low Input Current, SOP-4L, Long Mini-Flat Package



17295-6



DESCRIPTION

The VOL618A has a GaAs infrared emitting diode emitter, which is optically coupled to a silicon planar phototransistor detector, and is incorporated in a SOP-4 pin wide body package.

It features a high current transfer ratio, low coupling capacitance, and high isolation voltage.

The coupling device is designed for signal transmission between two electrically separated circuits.

FEATURES

- Low profile package
- High collector emitter voltage, $V_{CEO} = 80\text{ V}$
- Isolation test voltage, 5000 V_{RMS}
- Isolation voltage $V_{IROM} = 1050\text{ V}_{peak}$
- Low coupling capacitance
- High common mode transient immunity
- Compliant to RoHS Directive 2002/95/EC and in accordance to WEEE 2002/96/EC



RoHS
COMPLIANT
GREEN
(5-2008)**

Note

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

APPLICATIONS

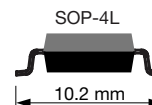
- Telecom
- Industrial controls
- Battery powered equipment
- Office machines
- Programmable controllers

AGENCY APPROVALS

- UL1577, file no. E76222
- cUL CSA 22.2 bulletin 5A, double protection
- DIN EN 60747-5-2 (VDE 0884)/DIN EN 60747-5-5 (pending), available with option 1
- BSI: EN 60065:2002, EN 60950-1:2006
- FIMKO

ORDERING INFORMATION

V	O	L	6	1	8	A	-	#	X	0	0	1	T
PART NUMBER								CTR BIN	PACKAGE OPTION			TAPE AND REEL	



AGENCY CERTIFIED/PACKAGE	CTR (%)		
	1 mA		
UL, cUL, BSI, FIMKO	63 to 125	100 to 200	160 to 320
SOP-4L, mini-flat, long	VOL618A-2T	VOL618A-3T	VOL618A-4T
VDE, UL, cUL, BSI, FIMKO	63 to 125	100 to 200	160 to 320
SOP-4L, mini-flat, long	VOL618A-2X001T	VOL618A-3X001T	VOL618A-4X001T



ABSOLUTE MAXIMUM RATINGS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
INPUT				
Power dissipation		P_{diss}	100	mW
Forward current		I_F	60	mA
OUTPUT				
Collector emitter voltage		V_{CEO}	80	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	50	mA
	$t_p/T = 0.5$, $t_p < 10\text{ ms}$	I_C	100	mA
Power dissipation		P_{diss}	150	mW
COUPLER				
Isolation test voltage between emitter and detector		V_{ISO}	5000	V_{RMS}
Isolation resistance	$V_{IO} = 500\text{ V}$, $T_{amb} = 25\text{ }^{\circ}\text{C}$	R_{IO}	$\geq 10^{12}$	Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = 100\text{ }^{\circ}\text{C}$	R_{IO}	$\geq 10^{11}$	Ω
Storage temperature range		T_{stg}	- 55 to + 125	$^{\circ}\text{C}$
Ambient temperature range		T_{amb}	- 55 to + 100	$^{\circ}\text{C}$
Soldering temperature ⁽¹⁾	max. 10 s, dip soldering distance to seating plane $\geq 1.5\text{ mm}$	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⁾ Refer to reflow profile for soldering conditions for surface mounted devices.

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)							
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT							
Forward voltage	$I_F = 5\text{ mA}$		V_F		1.16	1.5	V
Capacitance	$V_R = 0\text{ V}$, $f = 1\text{ MHz}$		C_O		45		pF
OUTPUT							
Collector emitter leakage current	$V_{CE} = 10\text{ V}$, $I_F = 0\text{ A}$		I_{CEO}		10	200	nA
Collector emitter capacitance	$V_{CE} = 5\text{ V}$, $f = 1\text{ MHz}$		C_{CE}		7		pF
COUPLER							
Collector emitter saturation voltage	$I_C = 0.32\text{ mA}$, $I_F = 1\text{ mA}$	VOL618A-2	V_{CEsat}		0.25	0.4	V
	$I_C = 0.5\text{ mA}$, $I_F = 1\text{ mA}$	VOL618A-3	V_{CEsat}		0.25	0.4	V
	$I_C = 0.8\text{ mA}$, $I_F = 1\text{ mA}$	VOL618A-4	V_{CEsat}		0.25	0.4	V
Coupling capacitance	$f = 1\text{ MHz}$		C_C		0.25		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	$I_F = 1\text{ mA}$, $V_{CE} = 5\text{ V}$	VOL618A-2	CTR	63		125	%
		VOL618A-3	CTR	100		200	%
		VOL618A-4	CTR	160		320	%

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Turn on time	$V_{CC} = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$	t_{on}		6		μs
Rise time	$V_{CC} = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$	t_r		3.5		μs
Turn off time	$V_{CC} = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$	t_{off}		5.5		μs
Fall time	$V_{CC} = 5\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$	t_f		5		μs

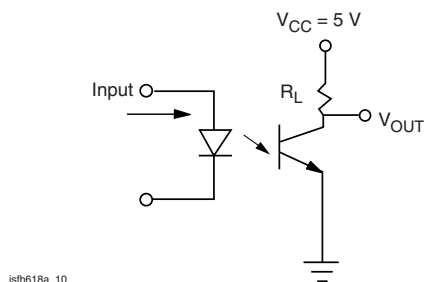


Fig. 1 - Test Circuit

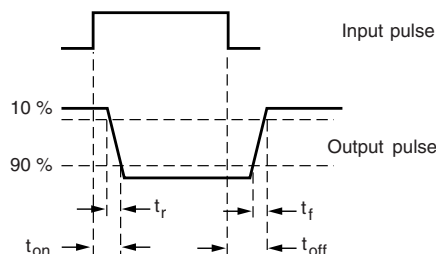


Fig. 2 - Test Circuit and Waveforms

SAFETY AND INSULATION RATED PARAMETERS

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Partial discharge test voltage - routine test	100 %, $t_{test} = 1\text{ s}$	V_{pd}	2			kV
Partial discharge test voltage - lot test (sample test)	$t_{Tr} = 60\text{ s}$, $t_{test} = 10\text{ s}$, (see figure 4)	V_{IOTM}	8			kV
		V_{pd}	1.68			kV
Insulation voltage	For lifetime	V_{IROM}			1050	V_{peak}
Insulation resistance	$V_{IO} = 500\text{ V}$	R_{IO}	10^{12}			Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = 100\text{ }^{\circ}\text{C}$	R_{IO}	10^{11}			Ω
	$V_{IO} = 500\text{ V}$, $T_{amb} = 150\text{ }^{\circ}\text{C}$ (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			8.00			mm
Creepage distance			8.00			mm
Insulation distance (internal)			0.40			mm

Note

- According to DIN EN 60747-5-2 (VDE 0884) (see figure 4). 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.

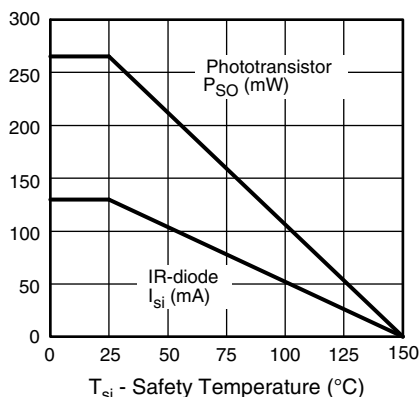


Fig. 3 - Derating Diagram

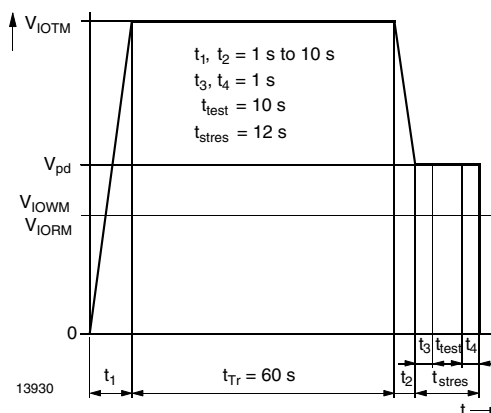
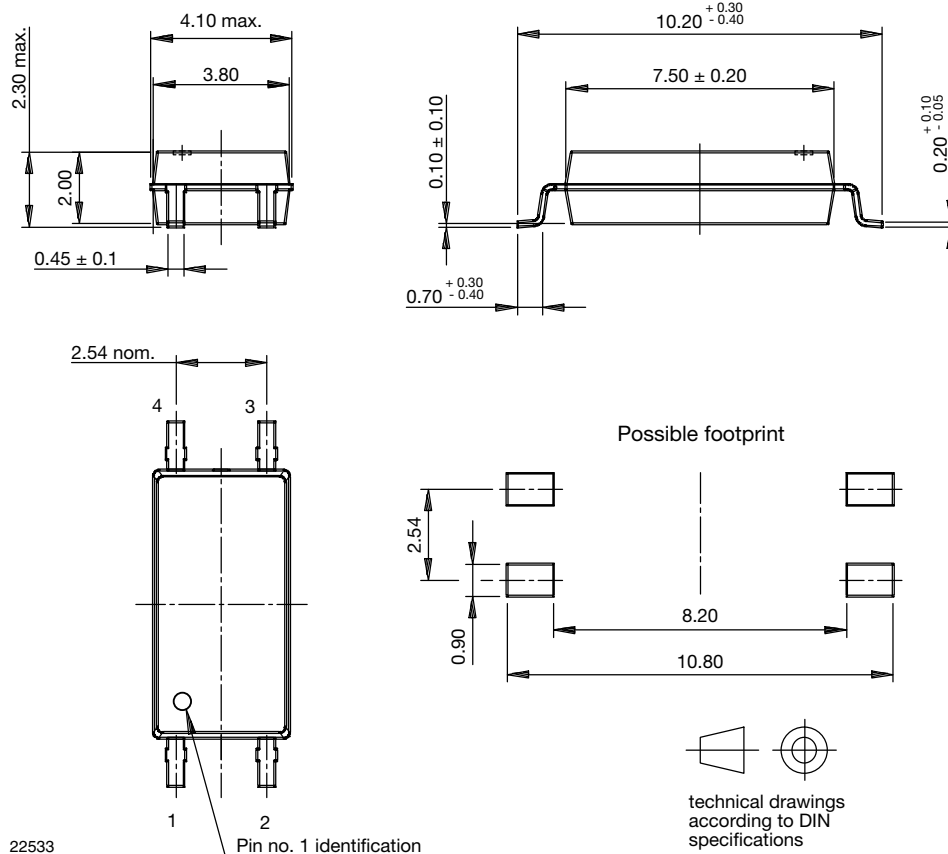
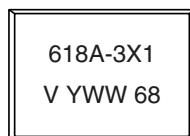


Fig. 4 - Test Pulse Diagram for Sample Test according to DIN EN 60747-5-2; IEC60747-5-5

PACKAGE DIMENSIONS in millimeters

PACKAGE MARKING (example)

Notes

- Only option 1 is reflected in the package marking with the characters "X1".
- Tape and reel suffix (T) is not part of the package marking.



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