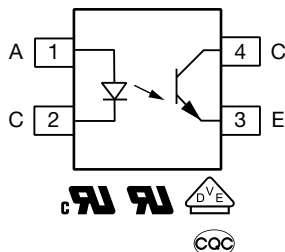
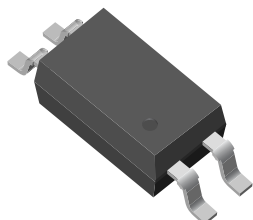


Optocoupler, Phototransistor Output, 4 Pin SSOP, Half Pitch, Low Profile Package



DESCRIPTION

The VOS619A series has an infrared emitting diode, which is optically coupled to a phototransistor detector, and is incorporated in a small 4-pin half pitch mini-flat package.

It features a high current transfer ratio at low input current with enhanced characteristic over temperature. The coupling devices are designed for signal transmission between two electrically separated circuits.

FEATURES

- High CTR at low forward current
- High collector emitter voltage, $V_{CEO} = 80\text{ V}$
- High isolation voltage, $V_{ISO} = 3750\text{ V}_{RMS}$
- Enhanced CTR linearity over forward current and ambient temperature
- Operating temperature up to $125\text{ }^{\circ}\text{C}$
- Material categorization: for definitions of compliance please see www.vishay.com/doc?99912



RoHS
COMPLIANT
HALOGEN
FREE
GREEN
(5-2008)

APPLICATIONS

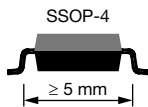
- DC/DC converters
- Programmable controllers
- Power supplies
- Signal transmission with galvanic and noise isolation

AGENCY APPROVALS

(All parts are certified under base model VOS619A)

- UL
- cUL
- DIN EN 60747-5-5 (VDE 0884-5)
- CQC

ORDERING INFORMATION

<div> <div>V O S 6 1 9 A - # X 0 0 1 T</div> <div> PART NUMBER CTR BIN PACKAGE OPTION TAPE AND REEL </div> </div>											
											
<div> <div>AGENCY CERTIFIED / PACKAGE</div> <div>CTR (%)</div> </div>											
<div> <div>UL, cUL, CQC, VDE</div> <div>100 to 250</div> <div>160 to 320</div> <div>200 to 400</div> </div>											
<div> <div>SSOP-4</div> <div>VOS619A-3X001T</div> <div>VOS619A-4X001T</div> <div>VOS619A-9X001T</div> </div>											

Note

- Additional options may be possible, please contact sales office.



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
Power dissipation		P_{diss}	50	mW
Forward current		I_F	30	mA
Surge forward current	$t_p \leq 1\text{ }\mu\text{s}$	I_{FSM}	1.0	A
Junction temperature		T_J	135	$^{\circ}\text{C}$
OUTPUT				
Collector emitter voltage		V_{CEO}	80	V
Emitter collector voltage		V_{ECO}	7	V
Collector current		I_C	30	mA
Power dissipation		P_{diss}	200	mW
Junction temperature		T_J	135	$^{\circ}\text{C}$
COUPLER				
Total power dissipation		P_{tot}	200	mW
Storage temperature range		T_{stg}	-55 to +125	$^{\circ}\text{C}$
Ambient temperature range		T_{amb}	-55 to +125	$^{\circ}\text{C}$
Soldering temperature ⁽¹⁾	$t = 10\text{ s}$	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.

RECOMMENDED OPERATING CONDITIONS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)				
PARAMETER	SYMBOL	MIN.	MAX.	UNIT
Forward current	I_F	0.5	10	mA

ELECTRICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)						
PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
INPUT						
Forward voltage	$I_F = 10\text{ mA}$	V_F	-	-	1.6	V
Reverse current	$V_R = 6\text{ V}$	I_R	-	-	10	μA
OUTPUT						
Collector emitter leakage current	$V_{CE} = 20\text{ V}$, $I_F = 0\text{ mA}$		-	-	200	nA
Collector emitter breakdown voltage	$I_C = 0.5\text{ mA}$	BV_{CEO}	80	-	-	
Emitter-Collector breakdown voltage	$I_E = 0.1\text{ mA}$	BV_{ECO}	7	-	-	
COUPLER						
Collector emitter saturation voltage	$I_C = 2.4\text{ mA}$, $I_F = 8\text{ mA}$	V_{CEsat}	-	-	0.3	V

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	$I_F = 0.5\text{ mA}$, $V_{CE} = 5\text{ V}$	VOS619A-3	CTR	100	-	250	%
		VOS619A-4	CTR	160	-	320	%
		VOS619A-9	CTR	200	-	400	%

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

PARAMETER	TEST CONDITION	SYMBOL	MIN.	TYP.	MAX.	UNIT
Rise time	$V_{CE} = 2\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$	t_r	-	6	18	μs
Fall time	$V_{CE} = 2\text{ V}$, $I_C = 2\text{ mA}$, $R_L = 100\text{ }\Omega$	t_f	-	8	18	μs

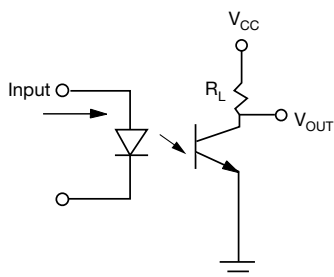


Fig. 1 - Test Circuit

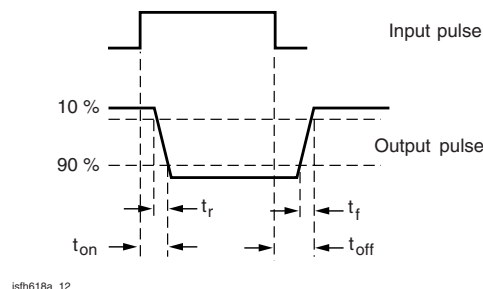


Fig. 2 - Test Circuit and Waveforms

SAFETY AND INSULATION RATINGS

PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
Climatic classification	According to IEC 68 part 1		55 / 125 / 21	
Pollution degree	According to DIN VDE 0109		2	
Comparative tracking index	Insulation group IIIa	CTI	175	
Maximum rated withstanding isolation voltage	According to UL1577, $t = 1\text{ min}$	V_{ISO}	3750	V_{RMS}
Maximum transient isolation voltage	According to DIN EN 60747-5-5	V_{IOTM}	4800	V_{peak}
Maximum repetitive peak isolation voltage	According to DIN EN 60747-5-5	V_{IORM}	707	V_{peak}
Isolation resistance	$T_{amb} = 25\text{ }^{\circ}\text{C}$, $V_{IO} = 500\text{ V}$	R_{IO}	$\geq 5 \times 10^{10}$	Ω
	$T_{amb} = T_S$, $V_{IO} = 500\text{ V}$	R_{IO}	$\geq 10^9$	Ω
Output safety power		P_{SO}	150	mW
Input safety current		I_{SI}	130	mA
Input safety temperature		T_S	150	$^{\circ}\text{C}$
Creepage distance			≥ 5	mm
Clearance distance			≥ 5	mm
Insulation thickness		DTI	≥ 0.4	mm

Note

- As per IEC 60747-5-5, this optocoupler is suitable for "safe electrical insulation" only within the safety ratings. Compliance with the safety ratings shall be ensured by means of protective circuits.

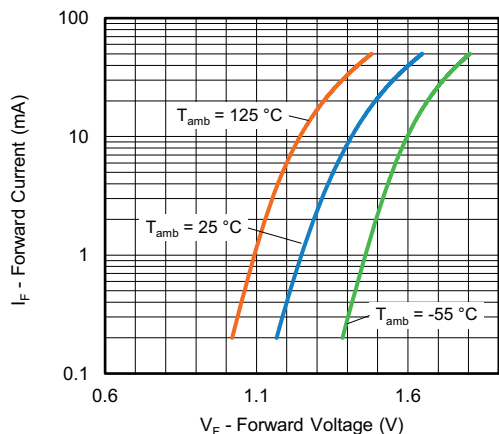
TYPICAL CHARACTERISTICS ($T_{amb} = 25\text{ }^{\circ}\text{C}$, unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

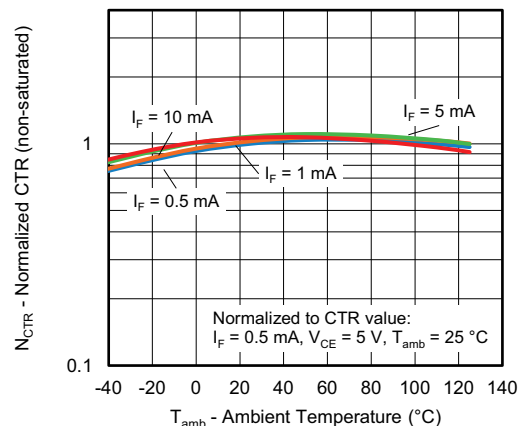


Fig. 6 - Normalized CTR vs. Ambient Temperature

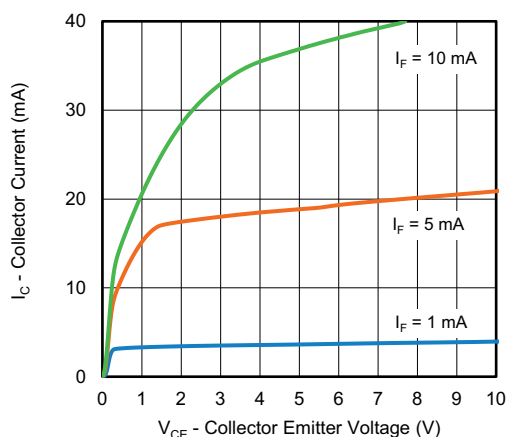


Fig. 4 - Collector Current vs. Collector Emitter Voltage (non-saturated)

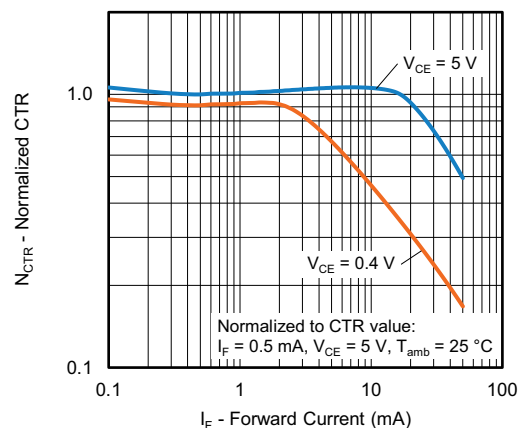


Fig. 7 - Normalized CTR vs. Forward Current

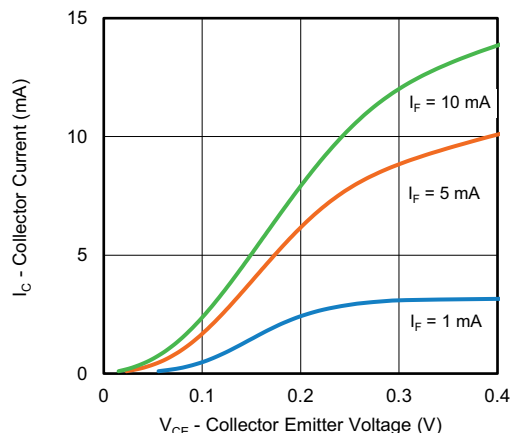


Fig. 5 - Collector Current vs. Collector Emitter Voltage (saturated)

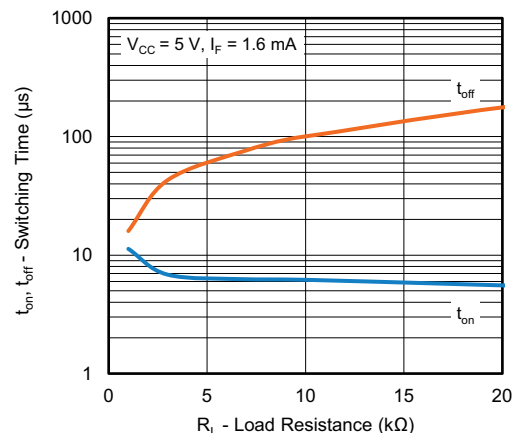


Fig. 8 - Switching Time vs. Load Resistance

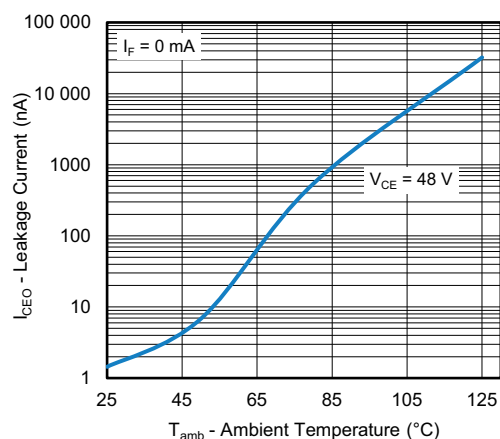
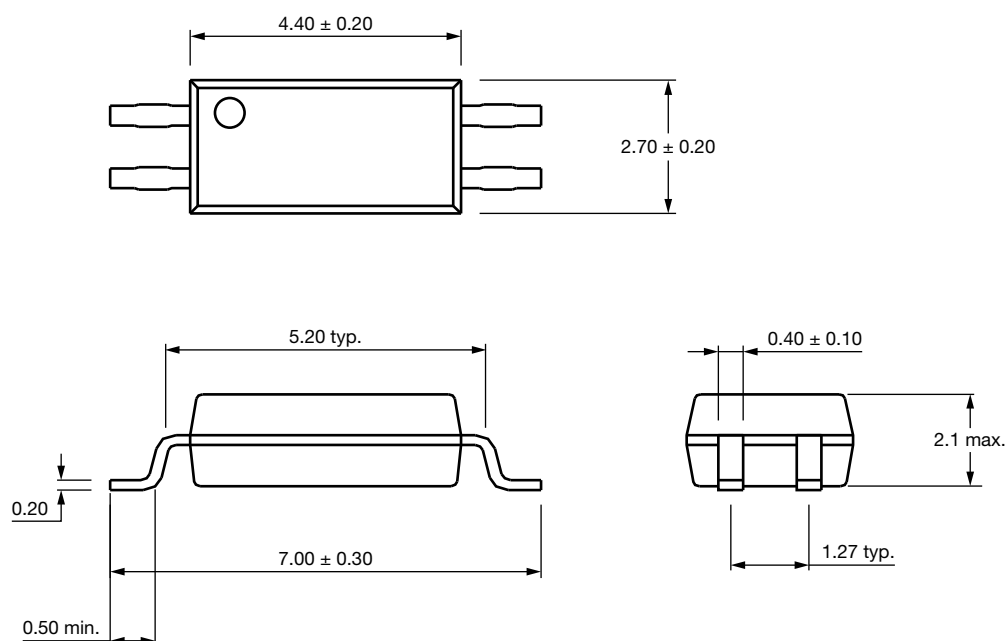
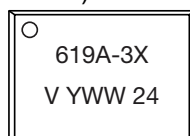


Fig. 9 - Leakage Current vs. Ambient Temperature

PACKAGE DIMENSIONS (in millimeters)



PACKAGE MARKING (example of VOS619A-3X001T)



Notes

- Tape and reel suffix (T) is not part of the package marking
- YWW = date code

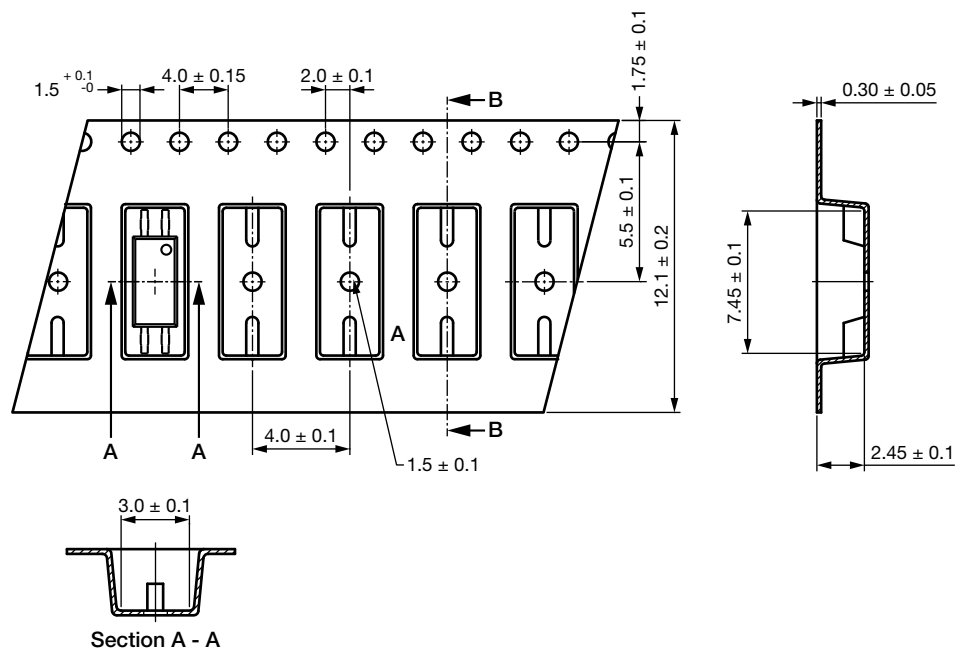
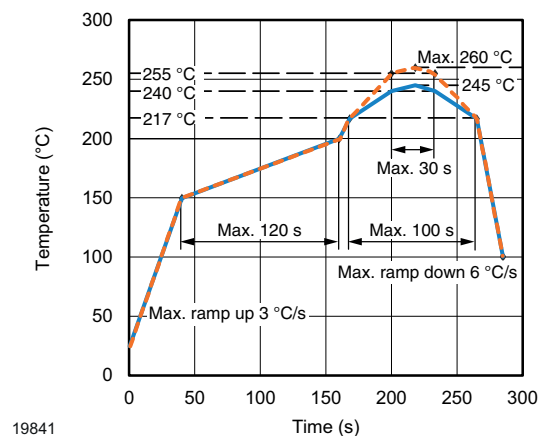
TAPE AND REEL DIMENSIONS (in millimeters)


Fig. 10 - Tape and Reel Packing

TAPE AND REEL PACKING	
TYPE	UNITS/REEL
SSOP-4	6000

SOLDER PROFILE

Fig. 11 - Lead (Pb)-free Reflow Solder Profile
According to J-STD-020

HANDLING AND STORAGE CONDITIONS

ESD level: HBM class 2

Floor life: unlimited

Conditions: $T_{amb} < 30\text{ °C}$, RH < 85 %

Moisture sensitivity level 1, according to J-STD-020



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