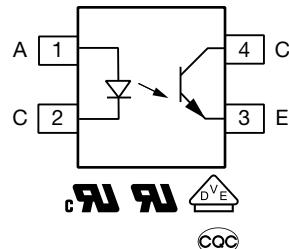
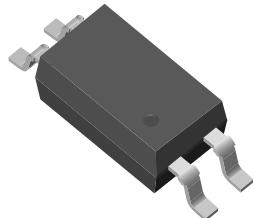


## Optocoupler, Phototransistor Output, 4 Pin SSOP, Half Pitch, Low Profile Package



### 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,  $V_{CEO} = 80$  V
- High isolation voltage,  $V_{ISO} = 3750$  V<sub>RMS</sub>
- Enhanced CTR linearity over forward current and ambient temperature
- Operating temperature up to 125 °C
- Material categorization:  
for definitions of compliance please see  
[www.vishay.com/doc?99912](http://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

V	O	S	6	1	9	A	-	#	X	0	0	1	T	SSOP-4		
PART NUMBER					CTR BIN			PACKAGE OPTION					TAPE AND REEL			
AGENCY CERTIFIED / PACKAGE					CTR (%)					0.5 mA						
UL, cUL, CQC, VDE			100 to 250			160 to 320			200 to 400							
SSOP-4			VOS619A-3X001T			VOS619A-4X001T			VOS619A-9X001T							

#### Note

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

<b>ABSOLUTE MAXIMUM RATINGS</b> ( $T_{amb} = 25^{\circ}C$ , unless otherwise specified)				
PARAMETER	TEST CONDITION	SYMBOL	VALUE	UNIT
<b>INPUT</b>				
Reverse voltage		$V_R$	6	V
Power dissipation		$P_{diss}$	50	mW
Forward current		$I_F$	30	mA
Surge forward current	$t_p \leq 1 \mu s$	$I_{FSM}$	1.0	A
Junction temperature		$T_J$	135	$^{\circ}C$
<b>OUTPUT</b>				
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	$^{\circ}C$
<b>COUPLER</b>				
Total power dissipation		$P_{tot}$	200	mW
Storage temperature range		$T_{stg}$	-55 to +125	$^{\circ}C$
Ambient temperature range		$T_{amb}$	-55 to +125	$^{\circ}C$
Soldering temperature <sup>(1)</sup>	$t = 10 \text{ s}$	$T_{sld}$	260	$^{\circ}C$

**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.

<sup>(1)</sup> Refer to reflow profile for soldering conditions for surface mounted devices.

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

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

<b>CURRENT TRANSFER RATIO</b> ( $T_{amb} = 25^{\circ}C$ , unless otherwise specified)						
PARAMETER	TEST CONDITION	PART	SYMBOL	MIN.	TYP.	MAX.
$I_C/I_F$	$I_F = 0.5 \text{ mA}$ , $V_{CE} = 5 \text{ V}$	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	$V_{CE} = 2 \text{ V}$ , $I_C = 2 \text{ mA}$ , $R_L = 100 \Omega$	$t_r$	-	6	18	$\mu\text{s}$
Fall time	$V_{CE} = 2 \text{ V}$ , $I_C = 2 \text{ mA}$ , $R_L = 100 \Omega$	$t_f$	-	8	18	$\mu\text{s}$

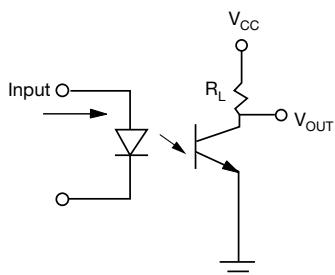


Fig. 1 - Test Circuit

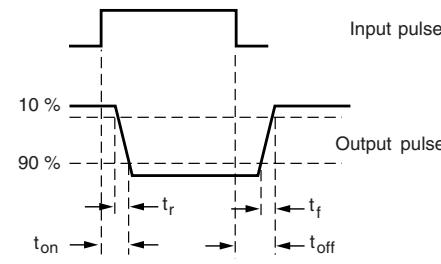


Fig. 2 - Test Circuit and Waveforms

**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	$T_{amb} = 25 \text{ }^{\circ}\text{C}$ , $V_{IO} = 500 \text{ V}$	$R_{IO}$	$\geq 5 \times 10^{10}$	$\Omega$
	$T_{amb} = T_S$ , $V_{IO} = 500 \text{ V}$	$R_{IO}$	$\geq 10^9$	$\Omega$
Output safety power		$P_{SO}$	150	$\text{mW}$
Input safety current		$I_{SI}$	130	$\text{mA}$
Input safety temperature		$T_S$	150	$^{\circ}\text{C}$
Creepage distance			$\geq 5$	$\text{mm}$
Clearance distance			$\geq 5$	$\text{mm}$
Insulation thickness		$DTI$	$\geq 0.4$	$\text{mm}$

**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.

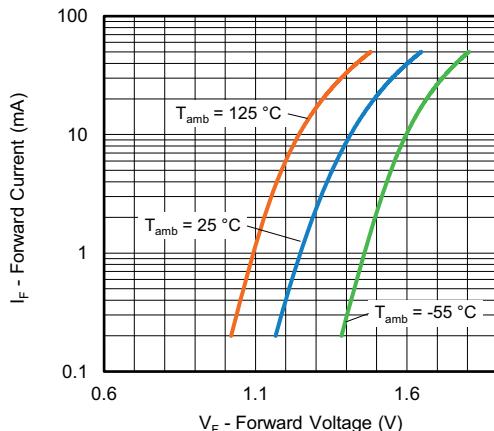
**TYPICAL CHARACTERISTICS** ( $T_{amb} = 25 \text{ }^{\circ}\text{C}$ , unless otherwise specified)


Fig. 3 - Forward Current vs. Forward Voltage

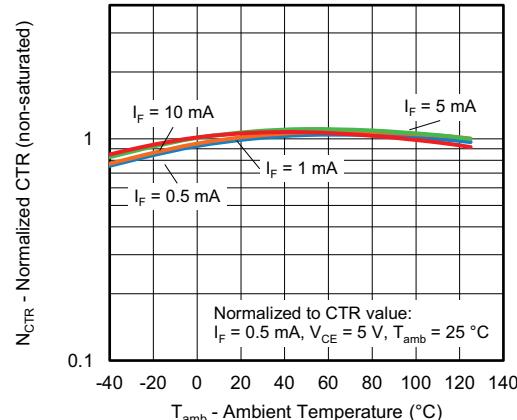


Fig. 6 - Normalized CTR vs. Ambient Temperature

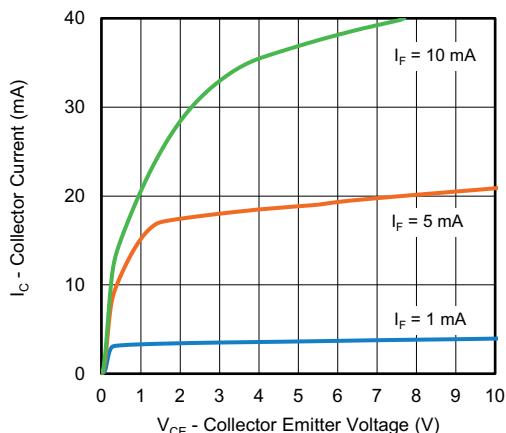


Fig. 4 - Collector Current vs. Collector Emitter Voltage (non-saturated)

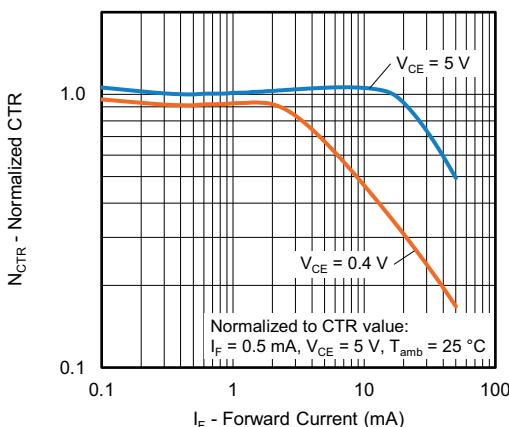


Fig. 7 - Normalized CTR vs. Forward Current

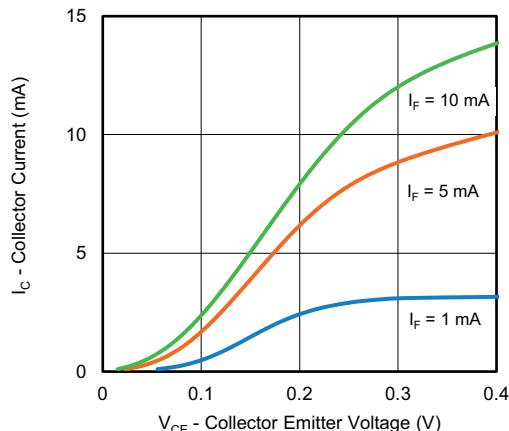


Fig. 5 - Collector Current vs. Collector Emitter Voltage (saturated)

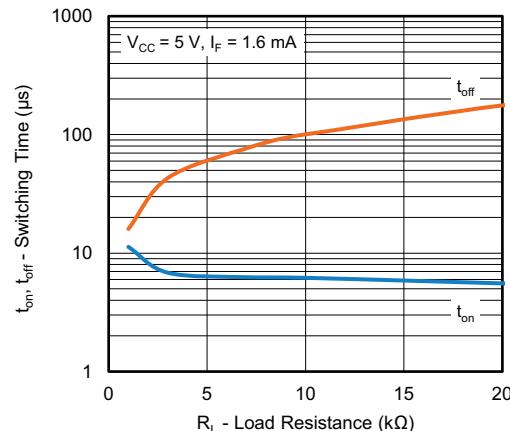


Fig. 8 - Switching Time vs. Load Resistance

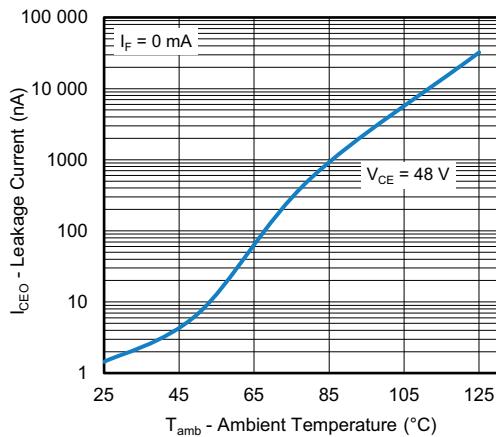
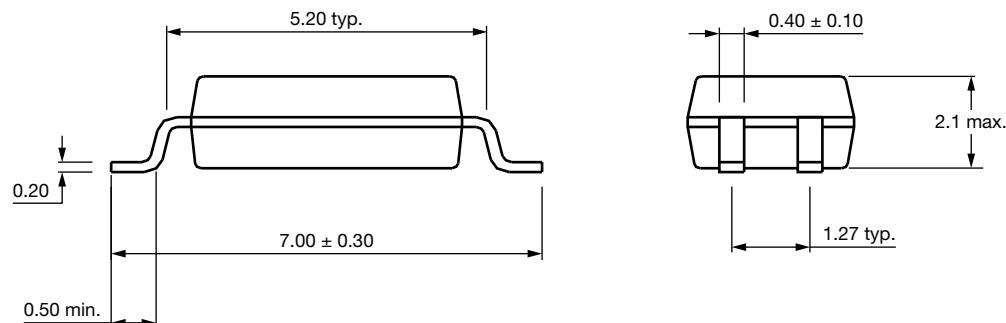
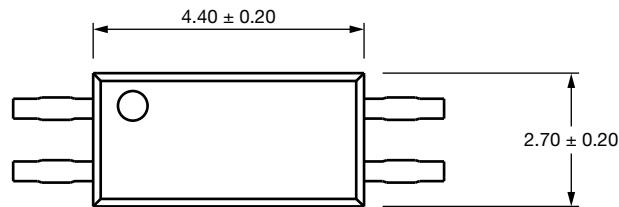
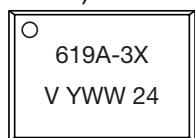


Fig. 9 - Leakage Current vs. Ambient Temperature

#### 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

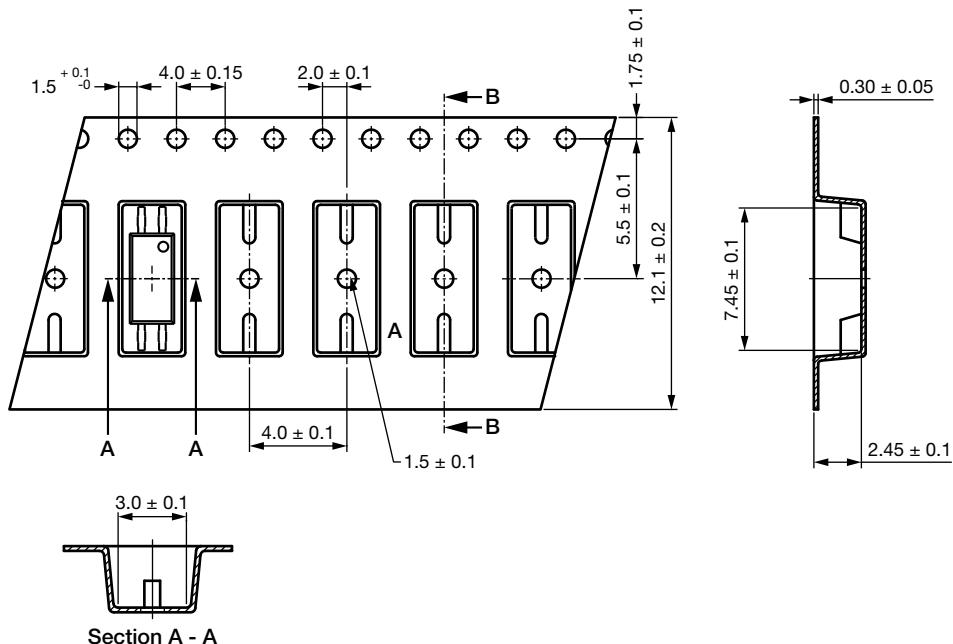
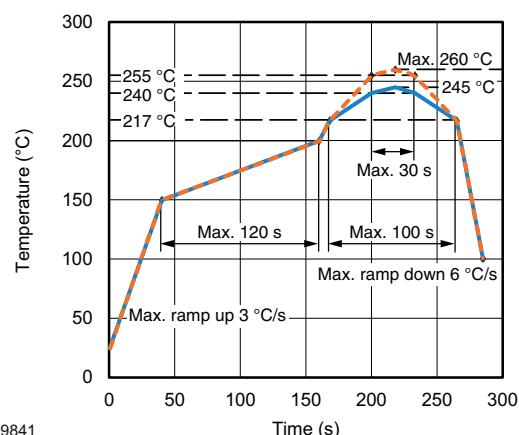
**TAPE AND REEL DIMENSIONS** (in millimeters)


Fig. 10 - Tape and Reel Packing

**TAPE AND REEL PACKING**

TYPE	UNITS/REEL
SSOP-4	6000

**SOLDER PROFILE**


19841

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:  $T_{amb} < 30^{\circ}\text{C}$ , RH < 85 %

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

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