

Part Number	Description
AS24D4E	4A, 275 Vac
AS24R4E	4A, 275 Vac
AS46D4E	4A, 460 Vac
AS46R4E	4A, 460 Vac
AS46R4F-02	4A, 460 Vac
AS60D4E	4A, 600 Vac

**Part Number Explanation**

AS	46	D	4	E	-XX
Series	Switch Type <sup>2</sup>	Control Range <sup>3</sup>			
Line Voltage <sup>1</sup>	Output Current - Amps	Options <sup>4</sup>			

**NOTES**

- 1) Line Voltage (nominal): 24 = 240 Vac; 46 = 460 Vac; 60 = 600 Vac
- 2) Switch Type: D = Zero-cross turn-on; R = Random turn-on
- 3) Control Range: E = 4–30 Vdc (5–30 Vdc for AS60D4E); F = 7–30 Vdc
- 4) Options: 02 = Control LED (on AS46R4F-02 only)

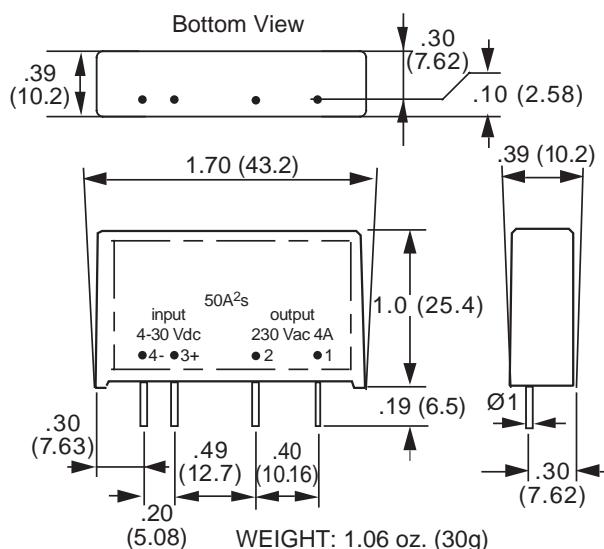
**MECHANICAL SPECIFICATION**

Figure 1 — AS relays; dimensions in inches (mm)  
(See Figure 7 for DIN-rail)

**ENVIRONMENTAL SPECIFICATION**

	Min	Max	Unit
Operating Temperature	-40	80	°C
Storage Temperature	-40	120	°C
Input-Output Isolation	4000		Vrms
Input-Output Capacitance		3	pF

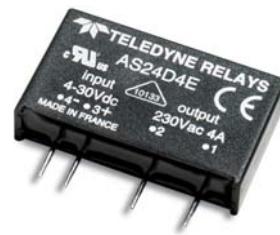


Figure 2a — All AS relays except AS60D4E

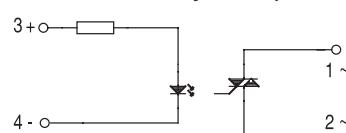


Figure 2b — AS60D4E relay

**FEATURES/BENEFITS**

- Industry standard package
- Control LED (AS46R4F-02 only)
- Tight zero-cross window for low EMI
- Low input current draw
- High dv/dt capability
- Integral transient voltage protection
- High immunity to surges

**DESCRIPTION**

The AS 4-amp solid-state single inline (SIP) four-pin relays are designed for mounting on a printed circuit board. The relays offer built-in voltage protection and can withstand very high current overloads. The Series AS4 relays have a low zero-cross window. The compact size and triac output make the AS relay the perfect retrofit for electromechanical relays.

**APPLICATIONS**

- Interface applications
- Vending machines
- Light/Lamp control
- Contactor driver
- Fan speed control
- HVAC controls

**APPROVALS**

All models except AS60D4E are UL recognized.  
UL File Number: E128555.

**BLOCK DIAGRAM**

(Control LED available on AS46R4F-02 only.)

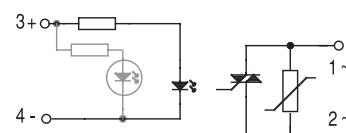


Figure 2a — All AS relays except AS60D4E

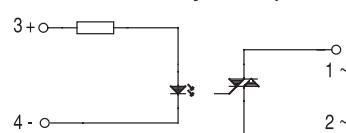


Figure 2b — AS60D4E relay

**INPUT (CONTROL) SPECIFICATION**

	Min	Max	Units
<b>Control Range</b>			
AS24D4E	4	30	Vdc
AS24R4E	4	30	Vdc
AS46D4E	4	30	Vdc
AS46R4E	4	30	Vdc
AS46R4F-02	7	30	Vdc
AS60D4E	5	30	Vdc

**Input Current Range**

AS24D4E	3	30	mA
AS24R4E	2	30	mA
AS46D4E	3	30	mA
AS46R4E	2	30	mA
AS46R4F-02	6	40	mA
AS60D4E	3	30	mA

**Must Turn-Off Voltage**

AS24D4E	0.8	Vdc
AS24R4E	0.8	Vdc
AS46D4E	0.8	Vdc
AS46R4E	0.8	Vdc
AS46R4F-02	0.8	Vdc
AS60D4E	1	Vdc

**Input Resistance (Typical)**

AS24D4E	1000	Ohms
AS24R4E	1000	Ohms
AS46D4E	1000	Ohms
AS46R4E	1000	Ohms
AS46R4F-02	750	Ohms
AS60D4E	1000	Ohms

**OUTPUT (LOAD) SPECIFICATION**

	Min	Max	Unit
<b>Operating Range</b>			
AS24D4E	12	275	Vrms
AS24R4E	12	275	Vrms
AS46D4E	12	460	Vrms
AS46R4E	12	460	Vrms
AS46R4F-02	12	460	Vrms
AS60D4E	24	600	Vrms

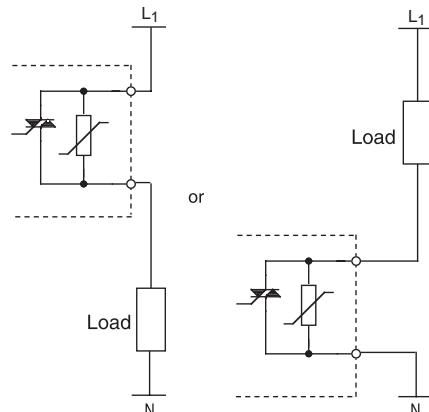
**TYPICAL APPLICATIONS**


Figure 3a — All AS relays except AS60D4E

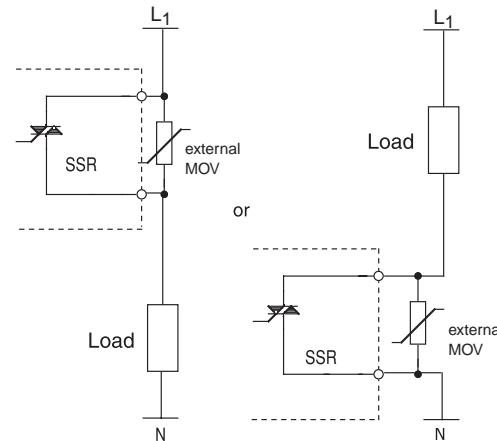


Figure 3b — AS60D4E relay

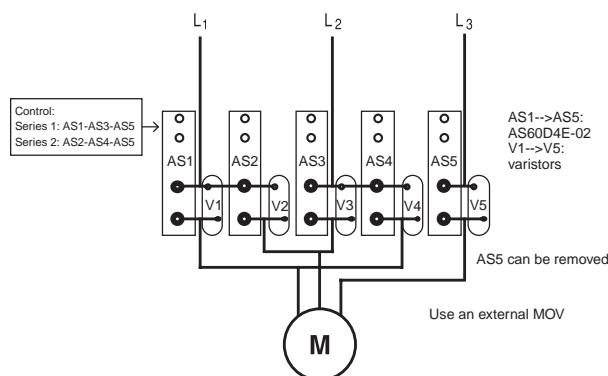


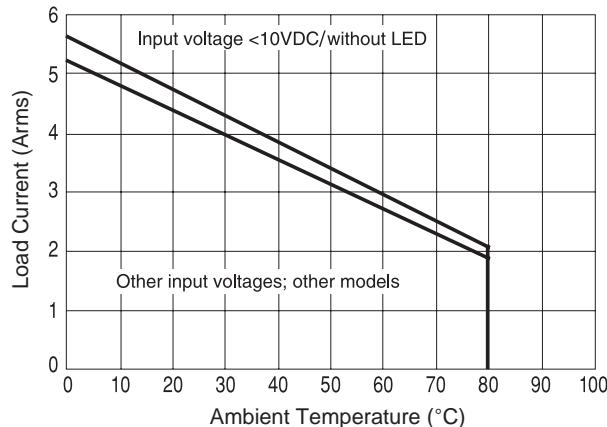
Figure 3c — AS60D4E in reverser for small motor

**OUTPUT (LOAD) SPECIFICATION (continued)**

	Min	Max	Unit
<b>Peak Voltage (Clamping Voltage)</b>			
AS24D4E	600 (450)	Vpeak	
AS24R4E	600 (450)	Vpeak	
AS46D4E	900 (720)	Vpeak	
AS46R4E	900 (720)	Vpeak	
AS46R4F-02	900 (720)	Vpeak	
AS60D4E	1200	Vpeak	
<b>Load Current Range</b>			
All relays	.005	4	Arms
<b>Maximum Surge Current Rating (Non-Repetitive)</b>			
(See Figure 5a and Figure 5b)			
AS24D4E	100	Apeak	
AS24R4E	100	Apeak	
AS46D4E	100	Apeak	
AS46R4E	100	Apeak	
AS46R4F-02	100	Apeak	
AS60D4E	120	Apeak	
<b>On-State Voltage Drop</b>			
All relays	1.6	V	
<b>Zero-Cross Window (Typical)</b>			
AS24D4E	±12	V	
AS24R4E	NA		
AS46D4E	±12	V	
AS46R4E	NA		
AS46R4F-02	NA		
AS60D4E	±12	V	
<b>Off-State Leakage Current (60Hz)</b>			
AS24D4E	0.3	mArms	
AS24R4E	0.3	mArms	
AS46D4E	0.3	mArms	
AS46R4E	0.3	mArms	
AS46R4F-02	0.3	mArms	
AS60D4E	1	mArms	

**OUTPUT (LOAD) SPECIFICATION (continued)**

	Min	Max	Unit
<b>Turn-On Time (60Hz)</b>			
AS24D4E	8.3	ms	
AS24R4E	0.1	ms	
AS46D4E	8.3	ms	
AS46R4E	0.1	ms	
AS46R4F-02	0.1	ms	
AS60D4E	8.3	ms	
<b>Turn-Off Time (60Hz)</b>			
All relays	8.3	ms	
<b>Off-State dv/dt</b>			
All relays	500	V/μs	
<b>Operating Frequency</b>			
All relays	10	440	Hz
<b>I<sup>2</sup>t for Match Fusing (&lt;8.3ms)</b>			
AS24D4E	50	A <sup>2</sup> S	
AS24R4E	50	A <sup>2</sup> S	
AS46D4E	50	A <sup>2</sup> S	
AS46R4E	50	A <sup>2</sup> S	
AS46R4F-02	50	A <sup>2</sup> S	
AS60D4E	72	A <sup>2</sup> S	

**LOAD CURRENT DERATING CURVE**

*Figure 4 — Thermal curves*

### SURGE CURRENT RATING

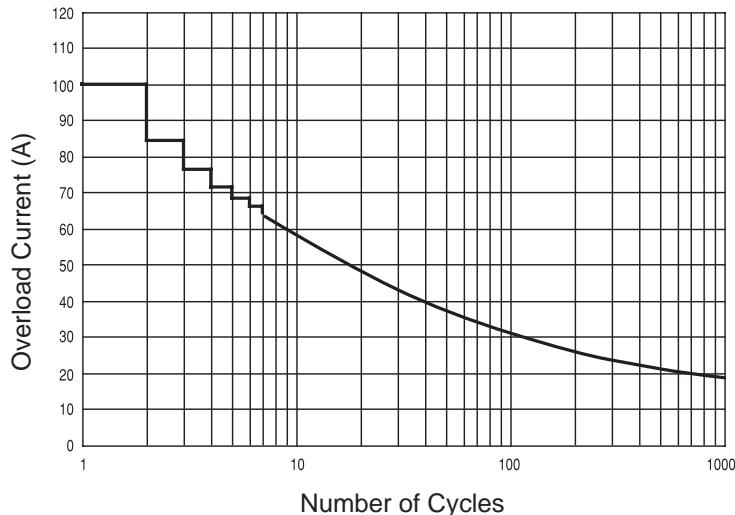


Figure 5a — Non-repetitive surge current

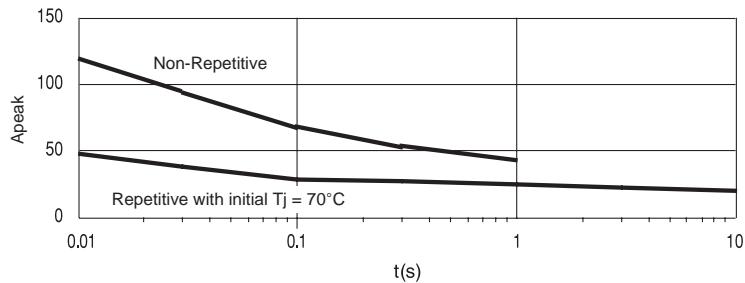


Figure 5b — AS60D4E non-repetitive surge peak on-state current

NOTES:

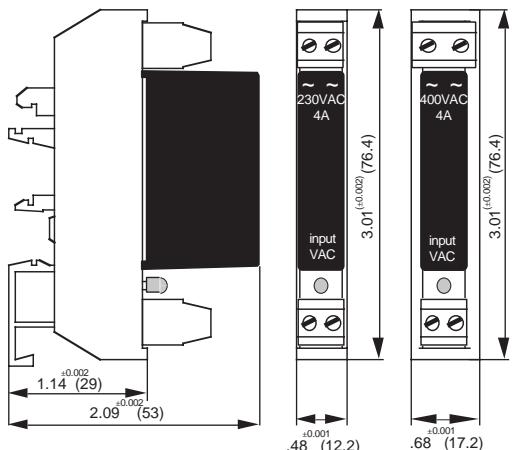
1. Electrical specifications at 25°C unless otherwise specified.
2. For 800Hz applications, contact factory.
3. For additional/custom options, contact factory.

# X1 DIN-Rail Clip

# Series AS4



Figure 6 — AS4 relays with X1 DIN-rail clip



WEIGHT: 1.06 oz (30g)

Figure 7 — AS4 relays with X1 DIN-rail clip,  
dimensions in inches (mm)

## SURGE CURRENT RATING

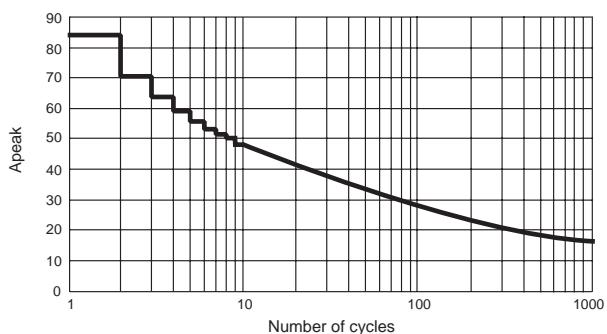


Figure 8 — AS4 relays with X1 DIN-rail clip

## X1 DESCRIPTION

The X1 allows the AS4 relays to be mounted onto a DIN-rail clip. The X1 option offers the clip and a control LED for visual diagnostics.

## INPUT (CONTROL) SPECIFICATION

	Min	Max	Unit
Control Range			
AS24D4E-X1	6	30	Vdc
AS46D4E-X1	15	30	Vdc/Vac
Input Current Range			
AS24D4E-X1	3	30	mAdc
AS46D4E-X1	6.5	14	mAdc
Must Turn-Off Voltage			
AS24D4E-X1	0.8		Vdc
AS46D4E-X1	2		Vdc
Input Resistance (Typical)			
AS24D4E-X1	1000		Ohms
AS46D4E-X1	1800		Ohms

## THERMAL CURVES

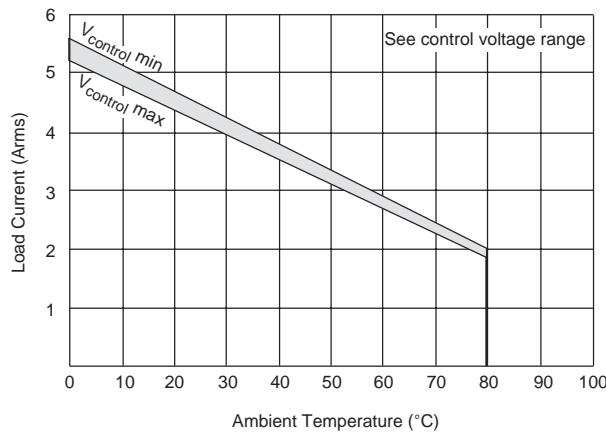


Figure 9 — AS4 relays with X1 DIN-rail clip

## NOTES:

1. Electrical specifications at 25°C unless otherwise specified.
2. Note control voltage change on X1 option.
3. For additional/custom options, contact factory.