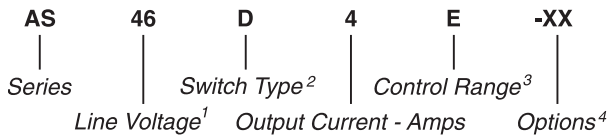


Part Number	Description
AS24D4E	4A, 275 Vac
AS24R4E	4A, 275 Vac
AS46D4E	4A, 460 Vac
AS46R4E	4A, 460 Vac
AS46R4F-02	4A, 460 Vac
AS60D4E	4A, 600 Vac

Part Number Explanation



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

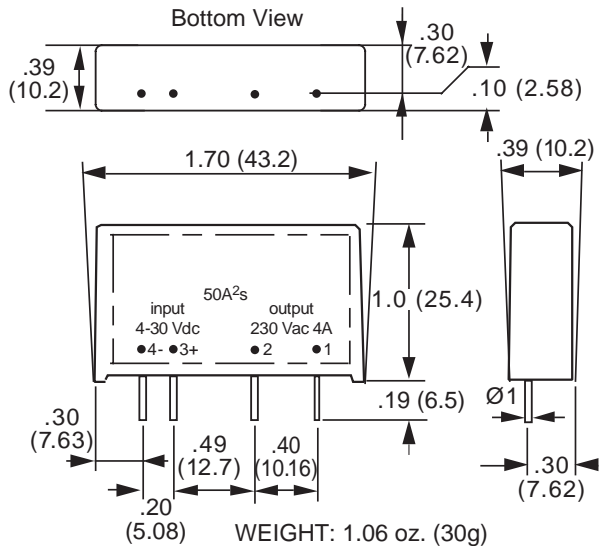
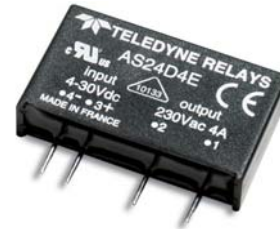


Figure 1 — AS relays; dimensions in inches (mm)
(See Figure 7 for DIN-rail)

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



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.)

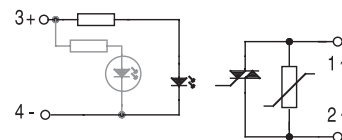


Figure 2a — All AS relays except AS60D4E

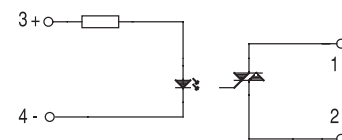


Figure 2b — AS60D4E relay

INPUT (CONTROL) SPECIFICATION

	Min	Max	Units
Control Range			
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
Operating Range			
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

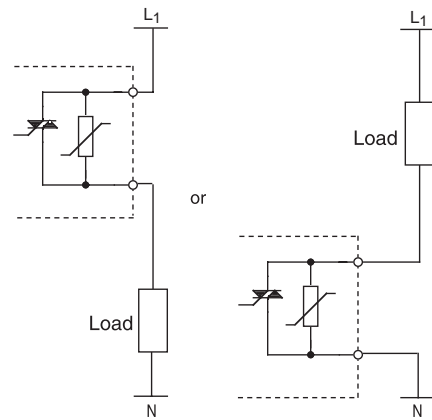


Figure 3a — All AS relays except AS60D4E

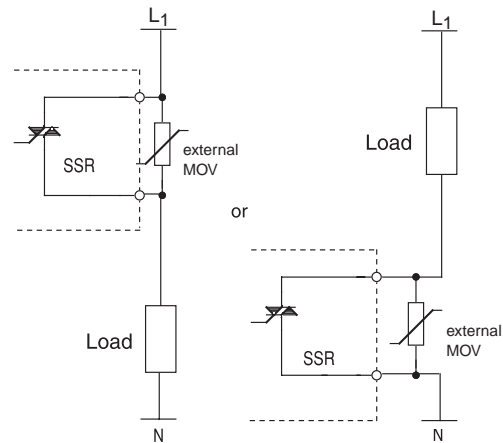


Figure 3b — AS60D4E relay

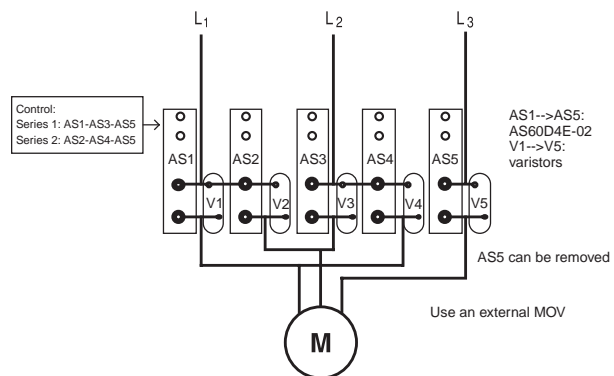


Figure 3c — AS60D4E in reverser for small motor

OUTPUT (LOAD) SPECIFICATION (continued)

	Min	Max	Unit
Peak Voltage (Clamping Voltage)			
AS24D4E		600 (450)	Vpeak
AS24R4E		600 (450)	Vpeak
AS46D4E		900 (720)	Vpeak
AS46R4E		900 (720)	Vpeak
AS46R4F-02		900 (720)	Vpeak
AS60D4E		1200	Vpeak

Load Current Range

All relays	.005	4	Arms
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Maximum Surge Current Rating (Non-Repetitive)

(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

On-State Voltage Drop

All relays		1.6	V
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Zero-Cross Window (Typical)

AS24D4E		±12	V
AS24R4E		NA	
AS46D4E		±12	V
AS46R4E		NA	
AS46R4F-02		NA	
AS60D4E		±12	V

Off-State Leakage Current (60Hz)

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
Turn-On Time (60Hz)			
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

Turn-Off Time (60Hz)

All relays		8.3	ms
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Off-State dv/dt

All relays		500	V/μs
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Operating Frequency

All relays	10	440	Hz
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I²t for Match Fusing (<8.3ms)

AS24D4E		50	A ² S
AS24R4E		50	A ² S
AS46D4E		50	A ² S
AS46R4E		50	A ² S
AS46R4F-02		50	A ² S
AS60D4E		72	A ² S

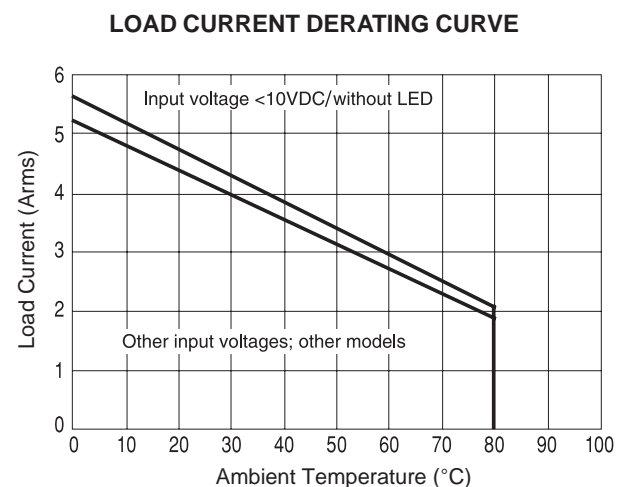


Figure 4 — Thermal curves

SURGE CURRENT RATING

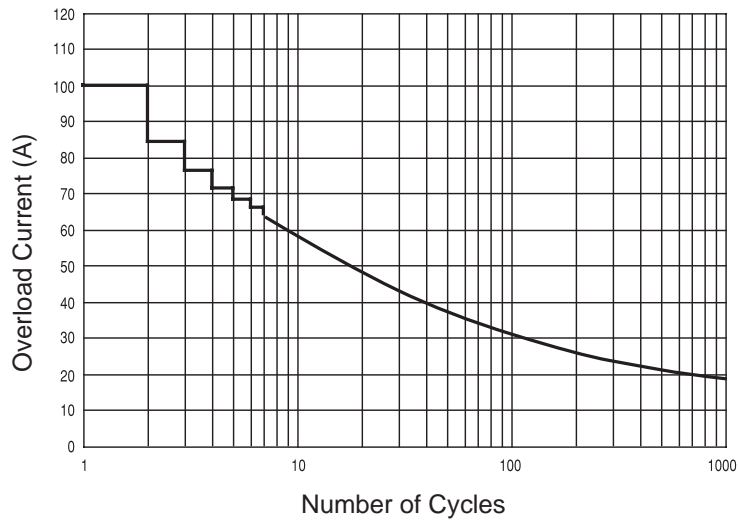


Figure 5a — Non-repetitive surge current

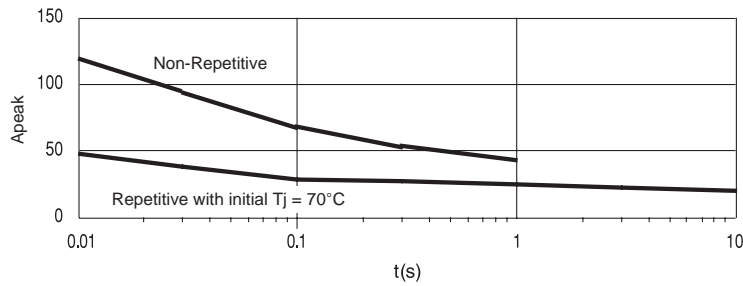


Figure 5b — AS60D4E non-repetitive surge peak on-state current

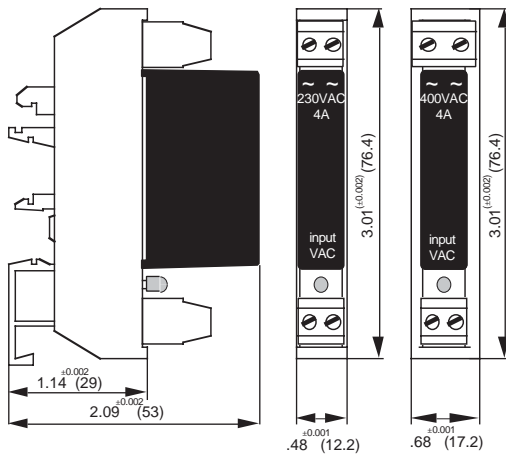
NOTES:

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

AS4 WITH X1 DIN-RAIL CLIP



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)

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

SURGE CURRENT RATING

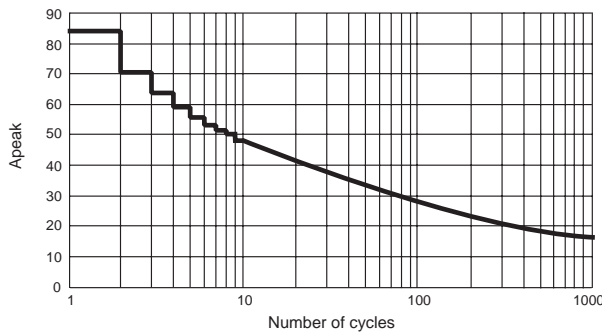


Figure 8 — AS4 relays with X1 DIN-rail clip

THERMAL CURVES

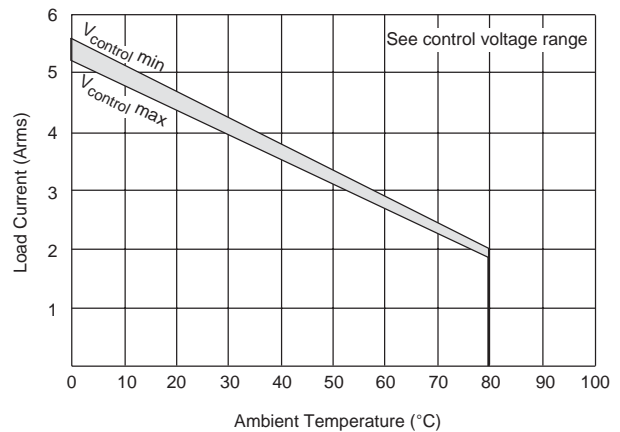


Figure 9 — AS4 relays with X1 DIN-rail clip

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.