

Part Number	Description
TS24D2G	2A, 275 Vac Solid-State Relay

Part Number Explanation

TS	24	D	2	G
Series	Line Voltage ¹	Switch Type ²	Output Current - Amps	Control Range ³

NOTES

- 1) Line Voltage (nominal): 24 = 240 Vac;
3 = 30 Vdc (3–30 Vdc/Vac for TS3R1G)
- 2) Switch Type: D = Zero-cross turn-on; R = Random turn-on
- 3) Control Range: G = 12–30 Vdc/Vac (TS24D2G, TS3R1G)
G = 12–30 Vdc (TS3R2G)

MECHANICAL SPECIFICATION

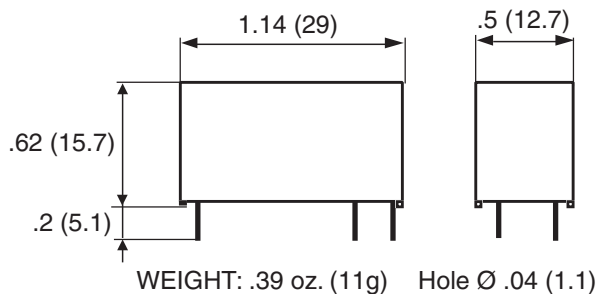


Figure 1 — TS relays; dimensions in inches (mm)

ELECTRICAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

INPUT (CONTROL) SPECIFICATIONS

	Min	Max	Units
Control Range			
TS242G, TS3R1G	12	30	Vac/Vdc
TS3R2G	12	30	Vdc
Input Current Range (See Figure 2)	4.1	13	mA
Must Turn-Off Voltage		2.5	V
Input Resistance (Typical)		2100	Ω



FEATURES/BENEFITS

- Pin-to-pin compatible with electromechanical relays
- AC and DC control
- AC and DC output
- Random and zero-cross turn-on
- Compact size
- High inrush capabilities
- Integrated clamping voltage

DESCRIPTION

The Series TS relays provide AC/DC switching in a compact size. The TS relays also provide an AC/DC control. These relays can withstand high surge currents. The TS relays are pin-to-pin compatible with electromechanical relays and may be used as replacements.

APPLICATIONS

- Interface applications
- Vending machines
- Light/lamp control
- Contactor driver
- Fan speed control

APPROVALS

All models are UL recognized.
UL File Number E128555.

CONTROL CHARACTERISTIC

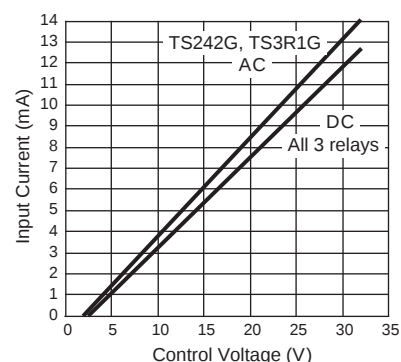


Figure 2

BLOCK DIAGRAM

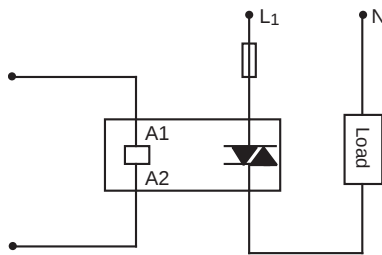


Figure 3a — TS24D2G

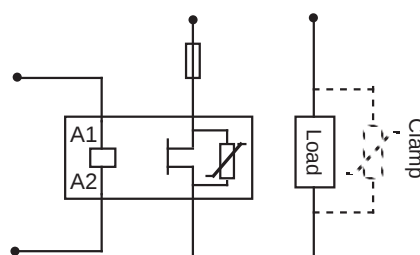


Figure 3b — TS3R1G

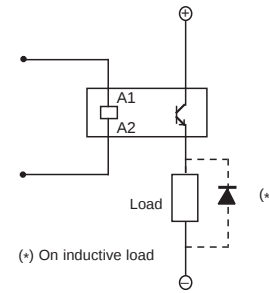


Figure 3c — TS3R2G

GRID DIAGRAM

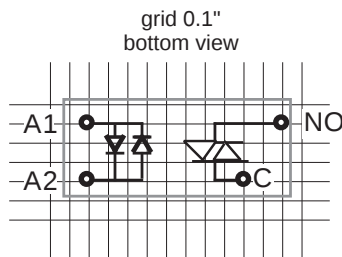


Figure 4a — TS24D2G

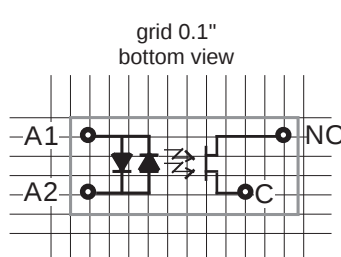


Figure 4b — TS3R1G

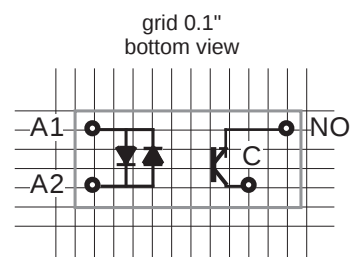


Figure 4c — TS3R2G

ELECTRICAL SPECIFICATIONS (+25°C ambient temperature unless otherwise specified)

OUTPUT (LOAD) SPECIFICATIONS

	Min	Max	Units
Operating Range			
TS24D2G	12	275	Vrms
TS3R2G	0	30	Vdc
TS3R1G	0	30	Vac/Vdc

Peak Voltage

TS24D2G	600	V
TS3R2G	60	V
TS3R1G	60	V

Load Current Range

TS24D2G	.05	2	Arms
TS3R2G	.001	2.5	Arms
TS3R1G	.001	1	Arms

Maximum Surge Current Rating (Non-Repetitive)

TS24D2G	100	A
TS3R2G	12	A
TS3R1G	2.4	A

OUTPUT (LOAD) SPECIFICATIONS (Continued)

	Min	Max	Units
On-State Voltage Drop			
TS24D2G		1.0	V
TS3R2G		0.5	V
TS3R1G		0.9	V

Zero-Cross Window (Typical)

TS24D2G	±10	V
TS3R2G	NA	
TS3R1G	NA	

Off-State Leakage Current (60Hz)

All Relays	1	mA
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Operating Frequency Range

TS24D2G	1	440	Hz
TS3R1G	0	50	KHz

Turn-On Time (60Hz)

TS24D2G	10	ms
TS3R2G	50	µs
TS3R1G	5	ms

OUTPUT (LOAD) SPECIFICATIONS (Continued)

	Min	Max	Units
Turn-Off Time (60Hz)			
TS24D2G		17	ms
TS3R2G		600	μs
TS3R1G		10	ms

Off-State dv/dt

TS24D2G	500	V/μs
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Switching Frequency

TS3R2G	100	Hz
TS3R1G	10	ms

I²t for Match Fusing (<8.3ms)

TS24D2G	50	A ² s
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ENVIRONMENTAL SPECIFICATIONS

	Min	Max	Units
Junction Temperature		125	°C

Operating Temperature

TS24D2G	-40	100	°C
TS3R2G	-40	100	°C
TS3R1G	-40	90	°C

Input-Output Isolation

TS24D2G	4000	V
TS3R2G	2500	V
TS3R1G	4000	V

Junction-Case Thermal Resistance

TS24D2G	12	°C/W
TS3R2G	12	°C/W
TS3R1G	44	°C/W

Junction-Ambient Thermal Resistance

TS24D2G	44	°C/W
TS3R2G	44	°C/W
TS3R1G	88	°C/W

Maximum Soldering Heat (1mm case)	260	°C
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THERMAL CURVE

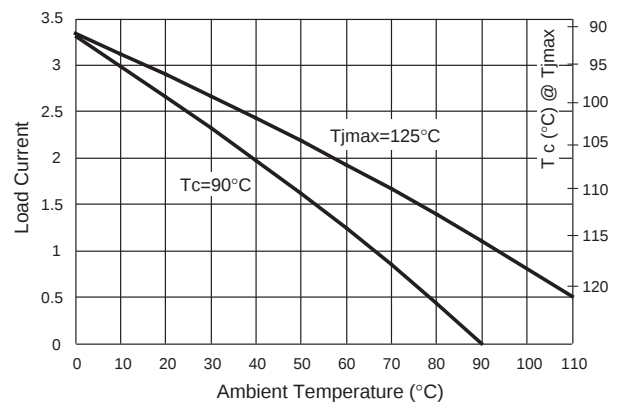


Figure 5a — TS24D2G

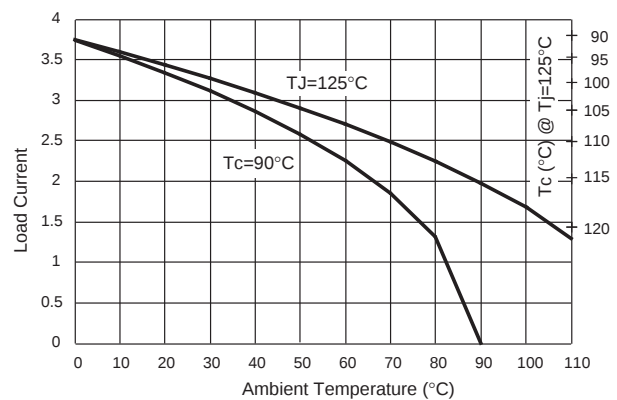


Figure 5b — TS3R2G

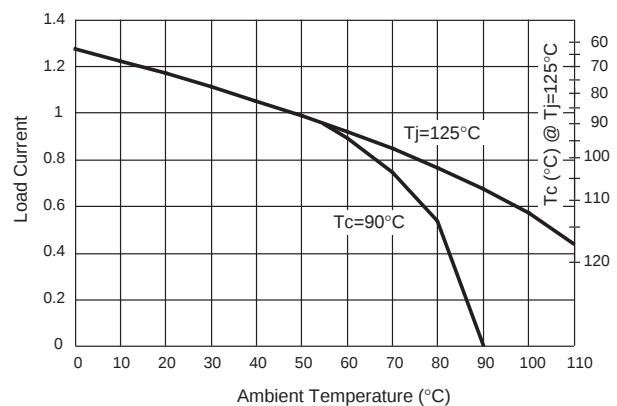


Figure 5c — TS3R1G

NON-REPETITIVE SURGE CURRENT

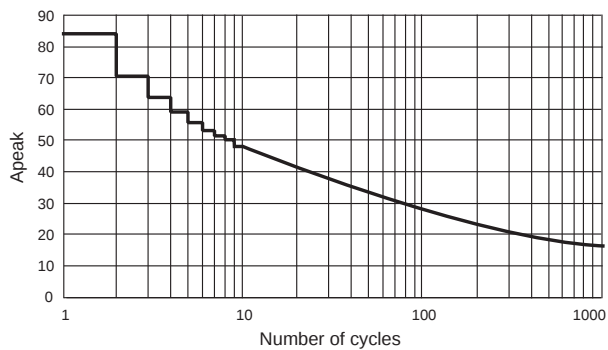


Figure 6a — TS24D2G

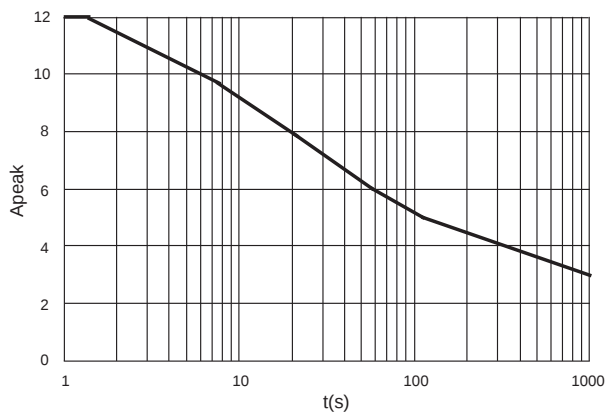


Figure 6b — TS3R2G

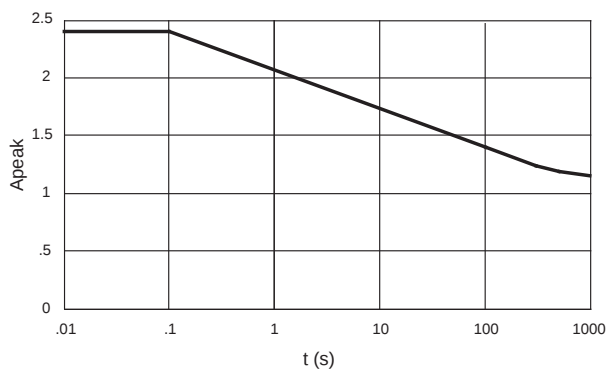


Figure 6c — TS3R1G

NOTES:

1. On inductive loads, a free-wheeling diode (or clamp) is recommended.
2. Electrical specifications at 25°C unless otherwise specified.
3. TS3R2G no polarity on the control pins.
4. For additional/custom options, contact factory.

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