

| Part Number | Description                                                                                     |
|-------------|-------------------------------------------------------------------------------------------------|
| ZD24CC*     | 500mA, 80 Vdc short-circuit protected up to 60 Vdc, solid-state relay for through-hole mounting |
| SZD24CC*    | 500mA, 80 Vdc short-circuit protected up to 60 Vdc, solid-state relay for surface mount         |

\*No suffix: Room temperature electrical testing only  
W suffix: load conditioning, temperature cycling and 25°C parametric testing  
T suffix: load conditioning, temperature cycling, burn-in and 3-temperature parametric testing

**ELECTRICAL SPECIFICATIONS**  
(-55°C to +105°C ambient temperature unless otherwise specified)

**INPUT (CONTROL) SPECIFICATIONS**

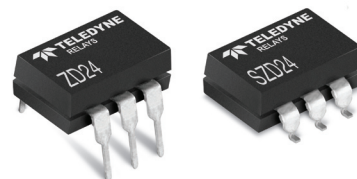
|                       | Min | Max | Units |
|-----------------------|-----|-----|-------|
| Input Current         | 8   | 20  | mA    |
| Input Voltage @ 10 mA | 2   | 3   | Vdc   |
| Must Turn-On Current  | 8   |     | mA    |
| Must Turn-Off Current |     | 100 | μA    |
| Must Turn-Off Voltage |     | 0.8 | Vdc   |
| Reverse Polarity      | -6  |     | Vdc   |

**OUTPUT (LOAD) SPECIFICATIONS**

|                                      | Min | Max | Units |
|--------------------------------------|-----|-----|-------|
| Load Voltage Range                   | 0   | 80  | Vdc   |
| Output Current Rating (See Figure 5) |     | 500 | mA    |
| Leakage Current at Rated Voltage     |     | 10  | μA    |
| Transient Blocking Voltage @25°C     |     | 100 | Vdc   |
| Output Capacitance @25Vdc (25°C)     |     | 600 | pF    |
| Output Voltage Drop @500mA           |     | 0.5 | Vdc   |
| On Resistance                        |     | 1.0 | Ohm   |
| Turn-On Time                         |     | 2.0 | ms    |
| Turn-Off Time                        |     | 1.0 | ms    |
| Trip Overload (See Figure 6)         |     |     | A     |
| Short-Circuit Protection             |     | 60  | Vdc   |

**STATUS SPECIFICATIONS**

|                                 | Min | Max | Units |
|---------------------------------|-----|-----|-------|
| Status Leakage Current @ 15 Vdc |     | 5   | μA    |
| Status Blocking Voltage         |     | 32  | Vdc   |
| Status "On" Voltage @ 10 mAdc   |     | 0.4 | Vdc   |
| Status "On" Current             |     | 10  | mA    |



**FEATURES/BENEFITS**

- Short-circuit protected
- Overload protected
- Trip status
- Low off-state leakage
- Optical isolation
- Compact 6-pin package

**DESCRIPTION**

ZD24CC Series Relays have optical isolation between relay input and output. Loads may be connected to either the positive or negative output terminals. ZD24CC Relays act as electronic circuit breakers that sense shorted loads or other overload events and then trip-off. Relay contacts open and no current flows through the relay and associated loads. These relays prevent overcurrent damage to the system. ZD24CC Series Relays have Trip Status to indicate a latched-off relay condition. Cycling the relay on-off removes the tripped or latched-off condition and returns the relay to the normal operating state.

**STATUS OUTPUT TRUTH TABLE**

| Output (Switch) State | Status Output Level   |
|-----------------------|-----------------------|
| Tripped               | Low ( $\leq 0.4$ Vdc) |
| Not Tripped           | High (open collector) |

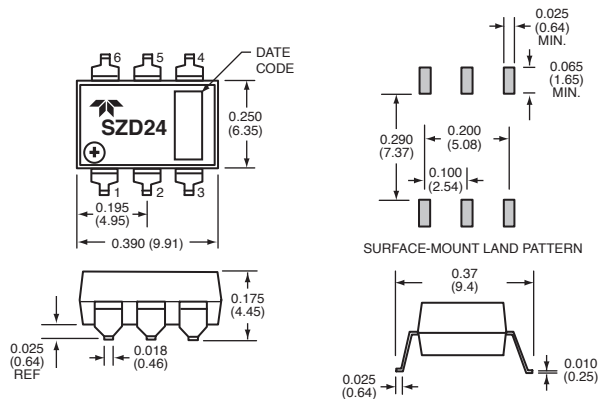
### GENERAL SPECIFICATIONS

(+25°C ambient temperature unless otherwise specified)

### ENVIRONMENTAL SPECIFICATIONS

|                                     | Min                                      | Max  | Units |
|-------------------------------------|------------------------------------------|------|-------|
| Operating Temperature               | -55                                      | +105 | °C    |
| Storage Temperature                 | -55                                      | +125 | °C    |
| Junction Temperature @0.5A          |                                          | +125 | °C    |
| Thermal Resistance $\theta_{JA}$    |                                          | 125  | °C/W  |
| Dielectric Strength                 | 1000                                     |      | Vac   |
| Insulation Resistance<br>(@500 Vdc) | $10^9$                                   |      | Ohm   |
| Input to Output Capacitance         |                                          | 5    | pF    |
| Shock                               | MIL STD 202, method 213, cond. F, 1500 g |      |       |
| Vibration                           | MIL STD 202, method 204, cond. F, 1500 g |      |       |
| Resistance to Soldering Heat        | MIL STD 202, method 210                  |      |       |
| Solderability                       | MIL STD 202, method 208                  |      |       |
| Thermal Shock                       | MIL STD 202, method 107                  |      |       |

### MECHANICAL SPECIFICATIONS



Weight: 0.035 oz. (1g) maximum  
Case: 6-pin, dual-in-line, filled epoxy

TOLERANCES: .XX =  $\pm 0.010$  ( $\pm 0.25$ ), .XXX =  $\pm 0.005$  ( $\pm 0.13$ )  
CONTROLLING DIMENSIONS ARE IN INCHES. METRIC DIMENSIONS ARE SUPPLIED FOR REFERENCE ONLY.

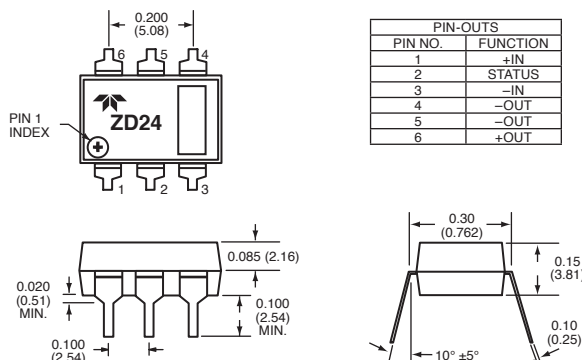
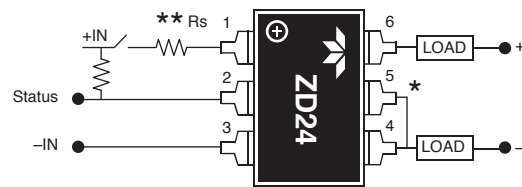


Figure 1

### TYPICAL WIRING DIAGRAM



\*Shorted internally

\*\*Series resistor required to limit input current to 20mA maximum

Figure 2

### CONTROL CURRENT VS. INPUT VOLTAGE

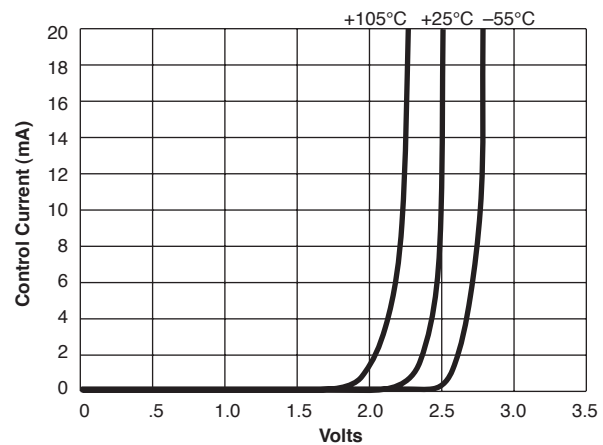


Figure 3

### TURN-ON TIME VS. INPUT CURRENT

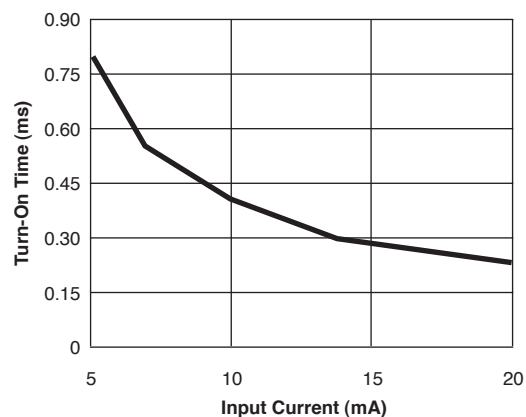


Figure 4

### LOAD CURRENT VS. AMBIENT TEMPERATURE

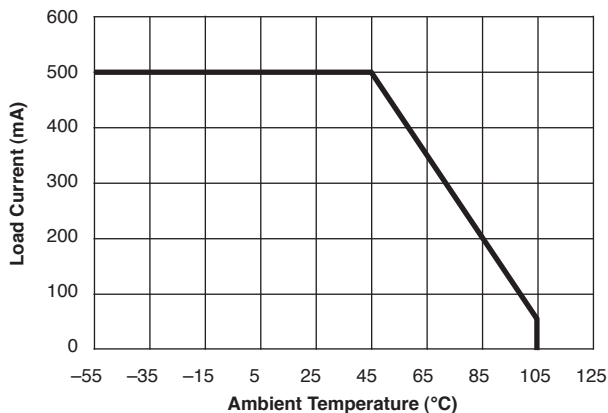


Figure 5

### TYPICAL OVERLOAD TRIP CURRENT VS. TIME

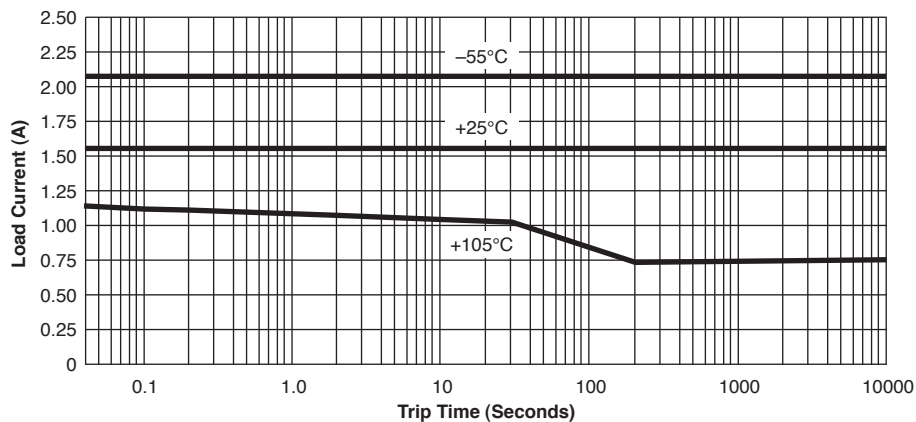


Figure 6

### FUNCTIONAL BLOCK DIAGRAM

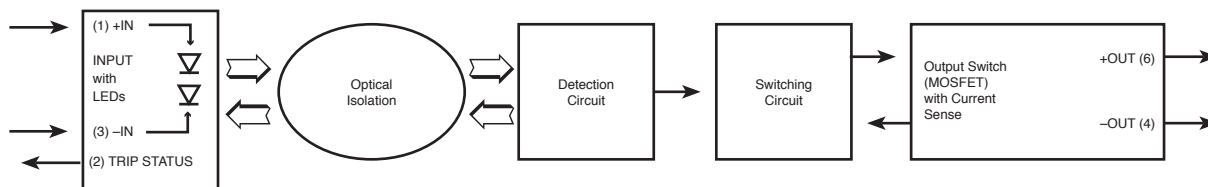


Figure 7

#### NOTES:

- The ZD24CC relay's input current should be limited to between 8 and 20mA. An external resistor whose value  $= (V_{IN} - 2.5 \text{ volts}) \div 0.012 \text{ Amps}$  is a good choice for limiting input current.
- Relay input transitions should be less than 1.0 millisecond.
- Loads may be attached to either the positive or negative output terminal.
- Maximum load current ratings are with the relay in free air and soldered to a printed circuit board.
- Timing is measured from the input current transition to the 10% or 90% points on the output voltage transition.
- Overload conditions (including shorted loads) are specified for load supply voltages to 60 Vdc maximum.
- For through-hole-PCB-solder-attaching ZD24CC Series Relays, the wave-solder or solder pot operations are limited to +260°C maximum for 10 seconds, maximum.
- For surface-mount-solder-attaching SZD24CC Series Relays, in IR heating or convection heating systems, the component temperature is limited to +235°C maximum for 10 seconds maximum.