



Part Number* Relay Description

M33-2N Solid State Relay With High Surge Current Capability

* The Y suffix denotes parameters tested to MIL-PRF-28750 specifications.
The W suffix denotes parameters tested to Teledyne specifications.

ELECTRICAL SPECIFICATIONS

(-55°C TO +125°C CASE UNLESS OTHERWISE SPECIFIED)

INPUT (CONTROL) SPECIFICATION

| | Min | Typ | Max | Units |
|-------------------------------------|-----|-----|-----|-------|
| Control Current @ 5 Vdc (Note 5) | | | 80 | μA |
| Control Voltage Range | | | 6.5 | Vdc |
| Bias Supply Range V_{DD} (Note 7) | 4.5 | | 5.5 | Vdc |
| Bias Current | | | 16 | mA |
| Turn-Off (Guaranteed Off) | | | 0.4 | Vdc |
| Turn-On (Guaranteed On) | 2.0 | | | Vdc |

OUTPUT (LOAD) SPECIFICATIONS

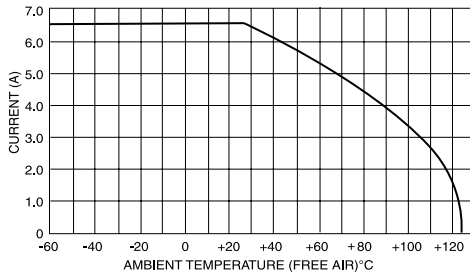
| | Min | Typ | Max | Units |
|---------------------------------------------------------------------|-----------------|-----|------|-------|
| Continuous Output Current (See Figure 1) | @25 °C (case) | | 7.0 | A |
| | @120 °C (case) | | 3.0 | A |
| Pulse/Surge Current (See Notes 1, 2, 3, Fig. 4) | @100 μs | | 100 | A |
| | @100 ms | | 23.5 | A |
| Operating Output Voltage | | | 60 | Vdc |
| Continuous Blocking Voltage | | | 80 | Vdc |
| On-State Resistance R_{ds} (on) (Note 4) | | | 0.09 | Ohm |
| Turn-On Time (Figure 2) | | | 60 | μs |
| Turn-Off Time (Figure 2) | | | 3.0 | ms |
| Off-State Leakage at 60 Vdc @25°C | | | 10 | μA |
| | @125°C | | 100 | μA |
| Off-State Leakage at 80 Vdc @25°C | | | 1.0 | mA |
| Capacitance Across Output @ $V_{DS} = 25$ Vdc $F = 1.0$ MHz | | | 1700 | pF |
| Insulation Resistance @ 500 Vdc | 10 ⁹ | | | Ohm |
| Capacitance (Input to Output at 1 KHz) | | | 15 | pF |
| Dielectric Strength, Input to Case, Input to Output, Output to Case | | | 1000 | Vrms |
| Thermal Resistance Junction To Ambient (θ_{JA}) | | | 35 | °C/W |
| Thermal Resistance Junction To Case (θ_{JC}) | | | 7 | °C/W |

FEATURES

- Up to 100 Amp pulse load capability
- Fast switching speed
- Low ON resistance
- Power FET output
- Transformer Isolated
- TTL or CMOS logic compatible input control
- Low-profile metal DIP, hermetically sealed
- Meets 80V surge and ±600V spike requirements
- Built and tested to requirements of MIL-PRF-28750

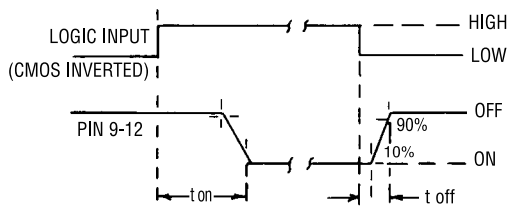
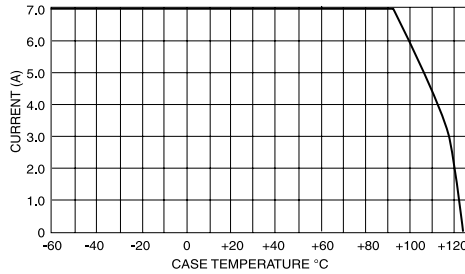
DESCRIPTION

The M33-2N is a military-style DC solid-state relay designed specifically for high-current pulse load applications. This device is constructed utilizing state-of-the-art solid-state techniques and features the latest power FET output technology to minimize ON resistance. This feature provides minimum output voltage drop and allows the M33-2N to switch high pulse currents up to 100 amps at higher temperatures than those allowable with bipolar devices. The input and output are magnetically isolated to protect delicate input logic circuits from output voltage transients. The M33-2N is designed to switch loads on MIL-STD-704 28 Vdc power systems, and meets 80V surge and ±600V spike requirements. The M33-2N is packaged in a low-profile hermetically sealed 22-pin DIP.



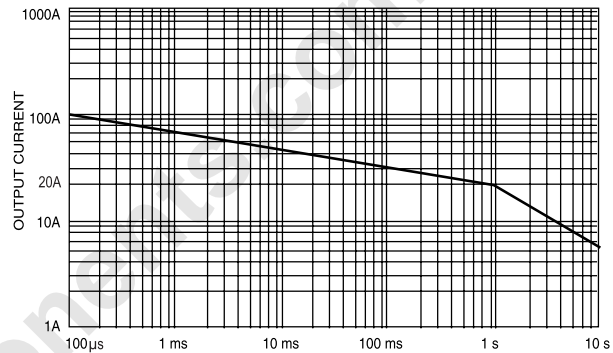
LOAD CURRENT DERATING CURVE

FIGURE 1



TIMING DIAGRAM

FIGURE 2



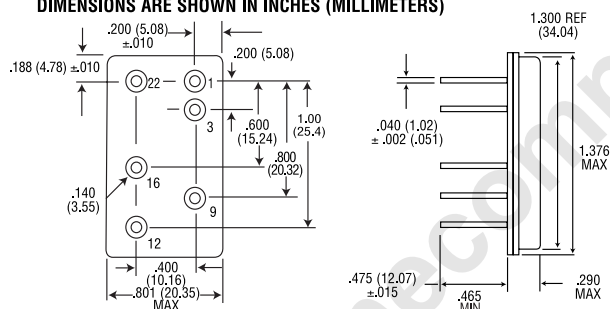
MAX OUTPUT CURRENT VS TIME

-55°C TO +100°C CASE

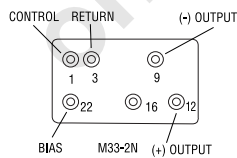
FIGURE 3

MECHANICAL SPECIFICATIONS

DIMENSIONS ARE SHOWN IN INCHES (MILLIMETERS)



- Enclosure: 22 Pin DIP, Hermetically Sealed
- Leak Rate: 1×10^{-8} CC/Sec Maximum
- Material: Header: Cold Rolled Steel Nickel Plated
Pins: Copper Core, Alloy #52 Clad Gold Plated
- Weight: 20 grams maximum



**HEADER PINOUTS
(BOTTOM VIEW)**

ENVIRONMENTAL SPECIFICATIONS

| | Min | Max | Units |
|-----------------------|------------------|------|---------|
| Temperature Range | Operating (case) | -55 | +125 °C |
| | Storage | -55 | +125 °C |
| Vibration, 100 g | 10 | 3000 | Hz |
| Constant Acceleration | | 5000 | g |
| Shock, 0.5 ms pulse | | 1500 | g |

NOTES:

1. 100 Amp max for 100 µsec pulse, non-repetitive.
2. 23.5 Amps, 100 msec pulse, 47 Vdc, 2 Ω load, 30 times at 2% duty cycle, 5 seconds between pulses.
3. 17.5 Amp, 100 msec pulse, 35 Vdc, 2 Ω load, 120 times at 1 second intervals, 10% duty cycle.
4. On-state resistance measured at 22A, 300 µsec pulse, 10 Hz repetition rate; for test purposes only, not a continuous operating condition.
5. Input transitions are to be less than 1.0 msec duration.
6. Inductive loads should be diode suppressed.
7. For test purposes, input bias voltage shall be 5.0 Vdc.
8. The maximum recommended solder temperature is 220°C for 4 seconds.