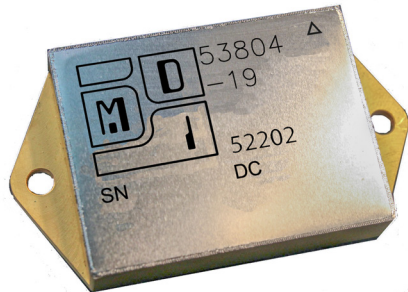


# HYBRID SOLID STATE RELAY

## Proton Rad Hard 100k+ 600V/10A Solid State Relay

### MODELS 53804/53805



Model 53804 is a form B (normally closed when de-energized) solid state relay rated at 10A and up to 600 VDC. The availability of normally closed function with these ratings unique to MDI.

Model 53805 is a form A (normally open when de-energized) solid state relay rated at 10A and up to 600 VDC.

Although the output section is rated at 600V, the low on resistances of the 53804 and the 53805 allow them to be practically used at much lower application voltages.

Control input to output isolation is magnetically coupled and the 5 VDC control section requires less than 250mW of bias power.

The relay has two user selectable modes, continuous or mag latch like. When pin 2 (latch/no latch) is connected to pin 1 (control ground), the relay energizes whenever a positive logic level is applied to pin 4 (command ON/Pulse to de-energize).

When pin 3 on case style 18, 19 or pin 9 on case style 20 (latch/no latch) is left open, a minimum 25 microsecond pulse on pin 5 on case style 18, 19 or pin 12 on case style 20 (command ON/Pulse to energize) sets the relay to the energized state as long as bias power is present. To de-energize, a minimum 25 microsecond plus on pin 4 on case style 18, 19 or pin 11 on case style 20 (pulse to de-energize) returns the relay to the de-energized state.

These SSR's are packaged in a hermetically sealed case able to withstand severe environments. The units are available with and without a mounting flange.

The SSR's are available in Industrial (I), Military/Aerospace (L & LE) and Space (S & SE) operating and screening grades.

#### Features:

- High Voltage/Low Resistance
- Single Pole, Single Throw available in Form A or Form B
- Wide Band Gap Semiconductors for low Resistance
- No SEE LET>82MeV\*cm<sup>2</sup>/mg
- 100K+ Rad Hard TID 100 kRads (S and SE Grades)
- TID 45 Krads (L and LE Grades)
- Magnetically Coupled Command for fast response
- No Optocoupler, no optocoupler issues
- Selectable Continuous or Mag Latch Function
- Logic Level Drive
- Rugged Hermetic Package

#### Specifications:

Bias Input Voltage 4.75 to 5.25 VDC  
 Bias input current 30 mA typical, 50 mA maximum  
 Command input 1 mA compatible with TTL logic levels  
 Input/output and all pins to case isolation 1kV  
 Power Dissipation 20 watts (538xx) or 30 watts (538xx) at maximum rated case temperature  
 Case temperature range:  
 Operating -55°C to +85°C (L or S grade)  
 Operating -55°C to +125°C (LE or SE grade)  
 Operating 0°C to +55°C (EU Grade)  
 Storage -65°C to +150°C

Weight 32 grams typical

For continuous operation, connect +5 VDC bias from pin 1 (Case Styles 18, 19) pins 4/5 (Case Style 20) to bias ground pin 2 (Case Style 18, 19) pins 6/7 (Case Style 20).

Ground pin 3 (Case Style 18,19) pin 9 (Case style 20) to energize the SSR.

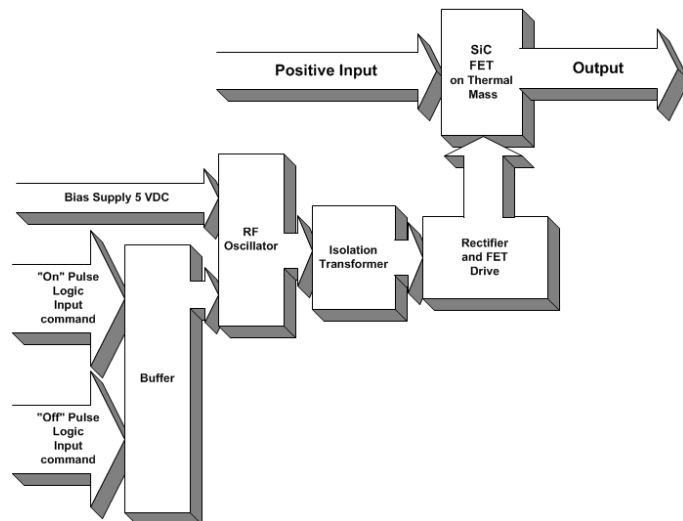
For latch operation leave pin 3 open, connect +5VDC bias from pin 1 (Case Styles 18, 19) pins 4/5 (Case Style 20) to bias ground pin 2 (Case Style 18, 19) pins 6/7 (Case Style 20).

To energize apply +5 VDC pulse, 25 microseconds minimum to pin 5 (Case Styles 18, 19) pin 12 (Case Style 20).

To de-energize apply +5 VDC pulse, 25 microseconds minimum to pin 4 (Case Style 18, 19) pin 11 (Case Style 20).

#### Power Dissipation:

Total steady state power dissipation of the model 53804 and 53805 is limited to 6 watts. The flanged package is rated at 8 watts.



600V/10A Solid State Relay				
Model 53804 Form B				
Model 53805 Form A				
PARAMETER	CONDITION	MIN	TYP	MAX
Contact Rating V	Max	—	—	1000V
Contact Rating I	Max	—	—	15A
Contact Rating V	Continuous	—	—	600V
Contact Rating I	Continuous	—	—	10A
Contact Resistance, 25°C	Energized	—	0.15Ω	0.2Ω
Contact Resistance, 125°C	Energized	—	0.3 Ω	0.4 Ω
Leakage Current, 1000V, 25°C	Off	—	—	30μA
Leakage Current, 1000V, 125°C	Off	—	—	60μA
Bias Voltage	—	4.75V	5.0V	5.25V
Bias Current	—	—	30mA	50mA
Command/Pulse Inputs On	—	3.0V	5.0V	6.0V
Command/Pulse Inputs Off	—	0V	0.5V	1V
Command Current	—	0.1mA	0.8mA	2mA
Delay Time, Energized	—	—	10μS	30μS
Delay Time, De-Energized	—	—	20μS	20μS
Energize Time, Dynamic	—	—	10μS	30μS
De-Energize Time, Dynamic	—	—	5μS	20μS
Latch/Unlatch Pulse Width	Min	25μS	—	—
Temperature, Operating	Case	-55°C	—	125°C LE & SE Grade
Temperature, Operating	Case	-55°C	—	85°C L & S Grades
Temperature, Operating	Case	-40°C	—	85°C Industrial Grade
Temperature, Storage	Case	-65°C	—	150°C
Weight	Case	—	—	50 grams



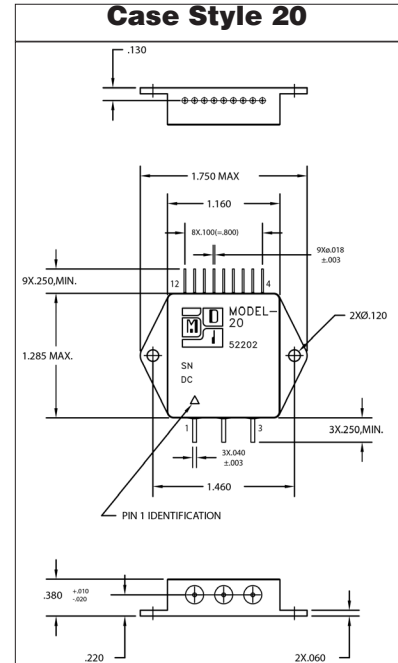
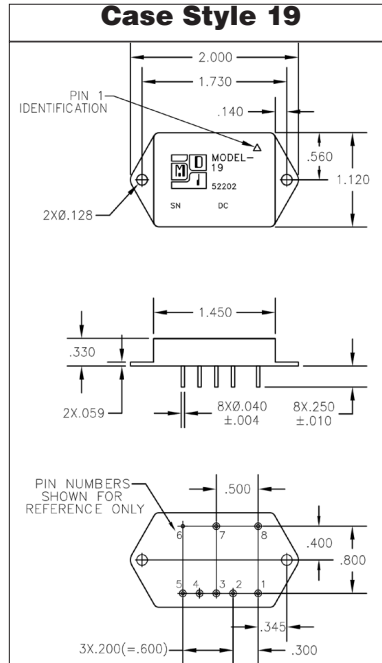
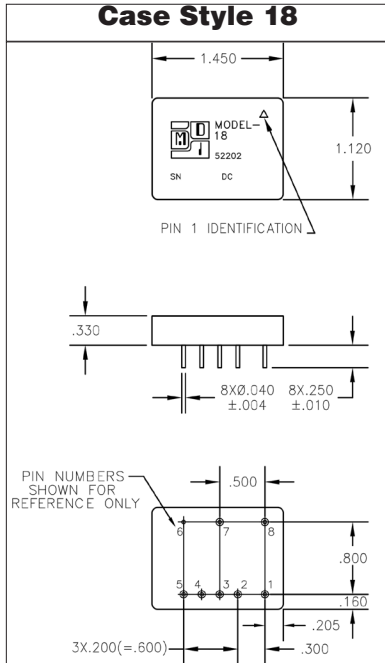
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 Power Conversion for Space and Military/Aerospace

For Heat Removal and Mounting Recommendations See MDI application notes on mounting considerations for DC-DC Converters.

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# 53804/53805

## Bi-Directional Solid State Relay



Pin Out Chart	
Pin 1	Bias +5 VDC
Pin 2	Bias Gnd
Pin 3	Latch/No Latch
Pin 4	Pulse Off
Pin 5	Pulse On
Pin 6	Case
Pin 7	Switch Positive
Pin 8	Switch Negative

Pin Out Chart	
Pin 1	Bias +5 VDC
Pin 2	Bias Gnd
Pin 3	Latch/No Latch
Pin 4	Pulse Off
Pin 5	Pulse On
Pin 6	Case
Pin 7	Switch Positive
Pin 8	Switch Negative

Pin Out Chart	
Pin 1	N/C
Pin 2	Switch Positive
Pin 3	Switch Negative
Pin 4	Bias +5 VDC
Pin 5	Bias +5 VDC
Pin 6	Bias Gnd
Pin 7	Bias Gnd
Pin 8	N/C
Pin 9	Latch/No Latch
Pin 10	N/C
Pin 11	Pulse Off
Pin 12	Pulse On

Model No.	Case Style	Pin Count	Mounting
53804/53805 -	18	8	Seam Weld Flangeless PCB Mount
53804/53805 -	19	8	Seam Weld PCB Mount with Flange
53804/53805 -	20	12	Seam Weld Chassis Mount with Flange

**GRADE LEVELS:**

Please specify grade level for your application. EU grade units will be shipped if no option is specified.

<b>EU</b>	Engineering Units	<b>S</b>	100K+™, -55°C to +85°C Space
<b>L</b>	45K, -55°C to +85°C Military	<b>SE</b>	100k+™, -55°C to +125°C Space
<b>LE</b>	45K, -55°C to +125°C Space		



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