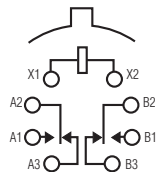


## Double Pole, Electrically Held, 1 Amp and Less (Continued)

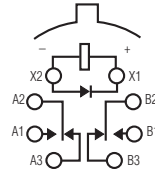
### MS, MSD, MSDD

**MS**  
**Sensitive TO-5**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/11**



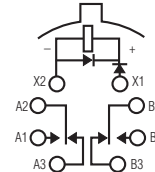
Terminal View

**MSD**  
**Sensitive TO-5**  
**Diode Suppressed**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/16**



Terminal View

**MSDD**  
**Sensitive TO-5 Diode**  
**Suppressed/Protected**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/21**



Terminal View

#### Product Facts

- Hermetically sealed
- High shock & vibration ratings
- Spreader pads
- Excellent RF switching

#### Product Facts

- Suppression diode
- Hermetically sealed
- High shock & vibration ratings
- Spreader pads
- Excellent RF switching

#### Product Facts

- Suppression & protection diodes
- Hermetically sealed
- High shock & vibration ratings
- Spreader pads
- Excellent RF switching

#### Electrical Characteristics

**Contact Arrangement** —  
2 Form C (DPDT)

**Contact Material** —  
Stationary —  
Gold/platinum/palladium/silver alloy  
(gold plated)  
Moveable —  
Gold/platinum/palladium/silver alloy  
(gold plated)

**Contact Resistance** —  
Before Life — 100 milliohms max.  
(measured @ 10 mA @ 6 Vdc)  
After Life — 200 milliohms max.  
(measured @ 1 A @ 28 Vdc)

**Mechanical Life Expectancy** —  
1 million operations

**Coil Voltage** — 5 to 48 Vdc

**Coil Power** — 565 mW max. @ 25°C

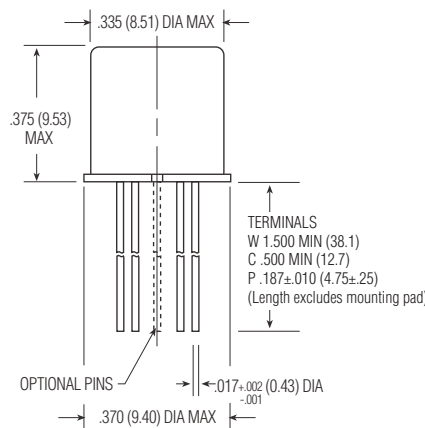
**Duty Cycle** — Continuous

**Pick-up Voltage** — Approximately  
50% of nominal coil voltage

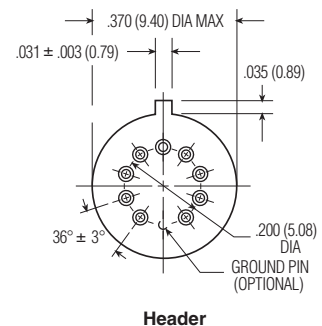
**Pick-up Sensitivity** —  
60 mW max. @ 25°C

#### Contact Ratings

| Contact Load                     | Type                          | Operations Min. |
|----------------------------------|-------------------------------|-----------------|
| 1.0 A @ 28 Vdc                   | Resistive                     | 100,000         |
| 250 mA @ 115 Vac, 60 Hz & 400 Hz | Resistive (case not grounded) | 100,000         |
| 100 mA @ 115 Vac, 60 Hz & 400 Hz | Resistive                     | 100,000         |
| 0.2 A @ 28 Vdc                   | Inductive (0.32 Henry)        | 100,000         |
| 0.1 A @ 28 Vdc                   | Lamp                          | 100,000         |
| 30 µA @ 50 mVdc                  | Low Level                     | 1,000,000       |
| 0.1 A @ 28 Vdc                   | Intermediate Current          | 50,000          |



Enclosure



Header

## Double Pole, Electrically Held, 1 Amp and Less (Continued)

### MS, MSD, MSDD (Continued)

#### Operating Characteristics

##### Timing —

Operate Time — 4.0 ms max.

Release Time —

MS — 2.0 ms max.

MSD/MSDD — 7.5 ms max.

(suppression diode, suppression/steering diodes)

**Contact Bounce** — 1.5 ms max

##### Dielectric Withstanding Voltage —

Between Open Contacts —

500 Vrms 60 Hz

Between Adjacent Contacts —

500 Vrms 60 Hz

Between Contacts & Coil —

500 Vrms 60 Hz

##### Insulation Resistance —

10,000 megohms min. @ 500 Vdc

1,000 megohms @ 500 Vdc

(coil to case @ +125°C)

#### Environmental Characteristics

##### Temperature Range —

-65°C to +125°C

##### Weight —

0.12 oz. (3.40 grms)

0.13 oz. (3.45 grms) with spreader pad attached

##### Vibration Resistance —

30 G's, 10 to 3,000 Hz

##### Shock Resistance —

75 G's, 6 ±1 ms max.

##### QPL Approval —

MIL-R-39016/11 (JMS)

MIL-R-39016/16 (JMSD)

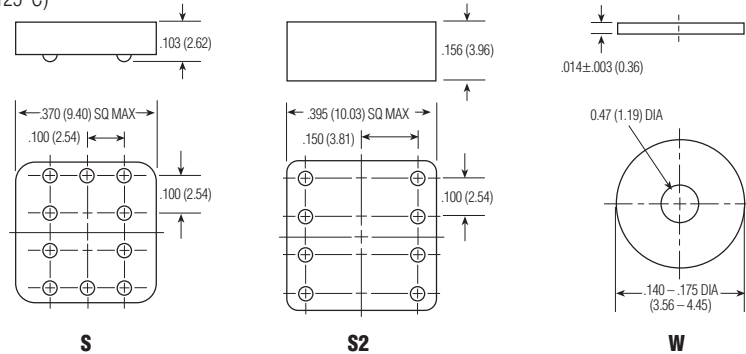
MIL-R-39016/21 (JMSDD)

#### Semiconductor Characteristics

##### Diode —

100 Vdc peak inverse voltage (PIV)

1.0 Vdc max. transient voltage



### Coil Data

### Spreader & Mounting Pads

| Nom. Coil Voltage (Vdc) | Coil Resistance in Ohms ±10% @ 25°C (Note 1) | Coil Circuit Current mA (Max.) (Note 1 & 2) | Coil Circuit Current mA (Min.) (Note 1 & 2) | Pickup Voltage Vdc (Max.) @ 25°C (Note 2) | Base Turn On Current mA (Max.) @ 25°C | Pickup Voltage Vdc (Max.) @ 125°C (Note 2) | Base Turn On Current mA (Max.) @ 125°C | Drop-Out Voltage Vdc (Min.) @ 25°C (Note 2) | Drop-Out Voltage Vdc (Min.) @ -65°C (Note 2) | Nom. Coil Power (mW) @ 25°C | Max. Coil Voltage | Coil Desig. |
|-------------------------|----------------------------------------------|---------------------------------------------|---------------------------------------------|-------------------------------------------|---------------------------------------|--------------------------------------------|----------------------------------------|---------------------------------------------|----------------------------------------------|-----------------------------|-------------------|-------------|
| <b>MS/MSD</b>           |                                              |                                             |                                             |                                           |                                       |                                            |                                        |                                             |                                              |                             |                   |             |
| 5.0                     | 100                                          | n/a                                         | n/a                                         | 2.6                                       | n/a                                   | 3.5                                        | n/a                                    | 0.23                                        | 0.12                                         | 250                         | 7.5               | 5           |
| 6.0                     | 200                                          | n/a                                         | n/a                                         | 3.4                                       | n/a                                   | 4.5                                        | n/a                                    | 0.28                                        | 0.18                                         | 180                         | 10.0              | 6           |
| 9.0                     | 400                                          | n/a                                         | n/a                                         | 4.85                                      | n/a                                   | 6.8                                        | n/a                                    | 0.55                                        | 0.35                                         | 203                         | 15.0              | 9           |
| 12.0                    | 850                                          | n/a                                         | n/a                                         | 7.0                                       | n/a                                   | 9.0                                        | n/a                                    | 0.64                                        | 0.41                                         | 169                         | 20.0              | 12          |
| 18.0                    | 1,600                                        | n/a                                         | n/a                                         | 9.8                                       | n/a                                   | 13.5                                       | n/a                                    | 0.92                                        | 0.59                                         | 203                         | 30.0              | 18          |
| 26.5                    | 3,300                                        | n/a                                         | n/a                                         | 14.0                                      | n/a                                   | 18.0                                       | n/a                                    | 1.4                                         | 0.89                                         | 213                         | 40.0              | 26          |
| 36.0                    | 6,500                                        | n/a                                         | n/a                                         | 20.0                                      | n/a                                   | 27.0                                       | n/a                                    | 1.8                                         | 1.25                                         | 199                         | 57.0              | 36          |
| 48.0                    | 11,000                                       | n/a                                         | n/a                                         | 25.8                                      | n/a                                   | 36.0                                       | n/a                                    | 2.4                                         | 1.60                                         | 209                         | 75.0              | 48          |
| <b>MSDD</b>             |                                              |                                             |                                             |                                           |                                       |                                            |                                        |                                             |                                              |                             |                   |             |
| 5.0                     | 64                                           | 78.1                                        | 56.8                                        | 2.9                                       | n/a                                   | 3.7                                        | n/a                                    | 0.8                                         | 0.7                                          | 391                         | 7.0               | 5           |
| 6.0                     | 125                                          | 48.9                                        | 36.3                                        | 4.0                                       | n/a                                   | 4.8                                        | n/a                                    | 0.9                                         | 0.8                                          | 288                         | 10.0              | 6           |
| 9.0                     | 400                                          | 23.6                                        | 18.1                                        | 6.1                                       | n/a                                   | 8.0                                        | n/a                                    | 1.1                                         | 0.9                                          | 203                         | 15.0              | 9           |
| 12.0                    | 850                                          | 15.0                                        | 11.7                                        | 7.8                                       | n/a                                   | 11.0                                       | n/a                                    | 1.3                                         | 1.0                                          | 169                         | 20.0              | 12          |
| 18.0                    | 1,600                                        | 12.2                                        | 9.6                                         | 11.3                                      | n/a                                   | 14.5                                       | n/a                                    | 1.5                                         | 1.1                                          | 203                         | 30.0              | 18          |
| 26.5                    | 3,300                                        | 8.8                                         | 7.0                                         | 15.2                                      | n/a                                   | 19.0                                       | n/a                                    | 1.7                                         | 1.3                                          | 213                         | 40.0              | 26          |
| 36.0                    | 6,500                                        | 6.1                                         | 4.9                                         | 21.7                                      | n/a                                   | 27.2                                       | n/a                                    | 2.3                                         | 1.7                                          | 199                         | 57.0              | 36          |
| 48.0                    | 11,000                                       | 4.8                                         | 3.9                                         | 27.8                                      | n/a                                   | 34.8                                       | n/a                                    | 2.8                                         | 2.0                                          | 209                         | 75.0              | 48          |

**Notes:** 1. Coil resistance not directly measurable. Coil current should be within limits shown when tested at nominal voltage at 25°C for 5 seconds max.

2. Set base current at 3 mA to 15 mA during measurements.

### Ordering Instructions

Catalog-selected Relays: The catalog number is derived by choosing the proper CODE for each of the relay characteristics in the order in which the codes are listed.

### Specifying a Part Number Example:

| Type | Terminal | Diodes | Ground Pins | Coils | Spreader/Mounting Pads |
|------|----------|--------|-------------|-------|------------------------|
| MS   | C        | D      | G           | -26   | S                      |

\* The part number example shown on this page is for catalog items. For a list of specific QPL part numbers, please see the index in Section 15.