

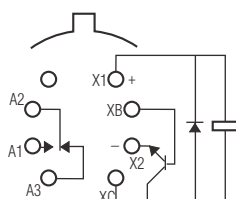
## Single Pole, Electrically Held, 1 Amp and Less (Continued)

### 1MAT

### 1MAT

**Standard TO-5  
Diode Suppressed/  
Transistor Driven  
High Performance Relay**

**Qualified to  
MIL-R-28776/5**



Terminal View

### Product Facts

- Transistor driver & suppression diode
- Hermetically sealed
- High shock & vibration ratings
- Spreader pad
- Excellent RF switching

### Electrical Characteristics

**Contact Arrangement** —  
1 Form C (SPDT)

**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 26.5 Vdc

**Coil Power** — 512 mW max. @ 25°C

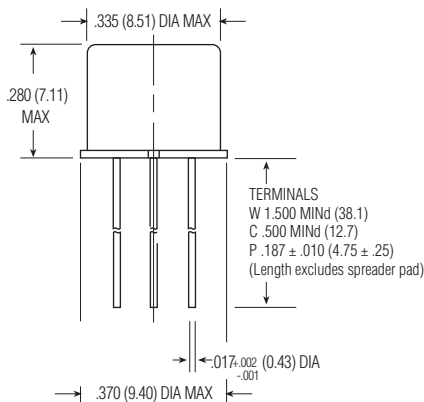
**Duty Cycle** — Continuous

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

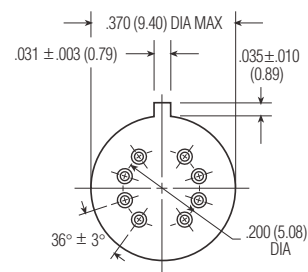
**Pick-up Sensitivity** —  
100 mW max. @ 25°C

### Contact Ratings

| Contact Load                     | Type                          | Operations MINd. |
|----------------------------------|-------------------------------|------------------|
| 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           |



1MAT Enclosure



1MAT Header

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

### 1MAT (Continued)

#### Operating Characteristics

##### Timing —

Operate Time — 2.0 ms max.

Release Time —

4.0 ms max.

**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 @ 500 Vdc

1,000 megohms @ 500 Vdc

(coil to case @ +125°C)

#### Environmental Characteristics

##### Temperature Range —

-65°C to +125°C

##### Weight —

0.08 oz. (2.27 grms)

0.09 oz. (2.52 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-28776/5 (J1MAT)

#### Semiconductor Characteristics

##### Diode —

100 Vdc peak inverse voltage (PIV)

1.0 Vdc max. transient voltage

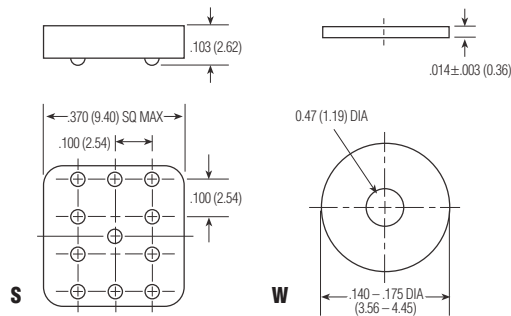
##### Transistor —

0.3 Vdc MINd. base turn off voltage;

6.0 Vdc min. emitter-base breakdown

voltage (BV<sub>EB0</sub>) @ 25°C;

80.0 Vdc min. collector-base breakdown voltage (BV<sub>CB0</sub>) @ 25°C & I<sub>C</sub>=100 µA



Spreader & Mounting Pads

### Coil Data

| 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 (MINd.) (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 (MINd.) @ 25°C (Note 2) | Drop-Out Voltage Vdc (MINd.) @ -65°C (Note 2) | Nom. Coil Power (mW) @ 25°C | Max. Coil Voltage | Coil Desig. |
|-------------------------|----------------------------------------------|---------------------------------------------|----------------------------------------------|-------------------------------------------|---------------------------------------|--------------------------------------------|----------------------------------------|----------------------------------------------|-----------------------------------------------|-----------------------------|-------------------|-------------|
| 1MAT                    |                                              |                                             |                                              |                                           |                                       |                                            |                                        |                                              |                                               |                             |                   |             |
| 5.0                     | 63                                           | 89.6                                        | 66.6                                         | 3.0                                       | 0.60                                  | 3.9                                        | 2.38                                   | 0.24                                         | 0.15                                          | 397                         | 5.8               | 5           |
| 6.0                     | 125                                          | 55.5                                        | 42.0                                         | 3.8                                       | 0.42                                  | 5.2                                        | 1.60                                   | 0.31                                         | 0.18                                          | 288                         | 8.0               | 6           |
| 9.0                     | 280                                          | 38.1                                        | 28.0                                         | 5.6                                       | 0.27                                  | 7.8                                        | 1.07                                   | 0.47                                         | 0.35                                          | 289                         | 12.0              | 9           |
| 12.0                    | 500                                          | 28.1                                        | 20.9                                         | 7.2                                       | 0.21                                  | 10.0                                       | 0.80                                   | 0.62                                         | 0.40                                          | 288                         | 16.0              | 12          |
| 18.0                    | 1,130                                        | 18.8                                        | 13.8                                         | 10.7                                      | 0.12                                  | 14.5                                       | 0.53                                   | 0.94                                         | 0.58                                          | 287                         | 24.0              | 18          |
| 26.5                    | 2,000                                        | 15.5                                        | 11.5                                         | 14.4                                      | 0.10                                  | 19.0                                       | 0.40                                   | 1.25                                         | 0.89                                          | 351                         | 32.0              | 26          |

**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 | Coils | Spreader/Mounting Pads |
|------|----------|--------|-------|------------------------|
| 1MA  | C        | T      | -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.