

**Table of Contents**

Single Pole, Electrically Held, 1 Amp and Less . . . . .1-2 – 1-9

    1MA, 1MAD, 1MADD . . . . .1-2, 1-3

    1MS, 1MSD, 1MSDD . . . . .1-4, 1-5

    1MAT . . . . .1-6, 1-7

    1MST . . . . .1-8, 1-9

Double Pole, Electrically Held, 1 Amp and Less . . . . .1-10 – 1-35

    MA, MAD, MADD . . . . .1-10, 1-11

    MS, MSD, MSDD . . . . .1-12, 1-13

    HM, HMD, HS, HSD . . . . .1-14, 1-15

    MGA, MGAD, MGADD . . . . .1-16, 1-17

    MGS, MGSD, MGSDD . . . . .1-18, 1-19

    HC, HCD, HCS, HCSD . . . . .1-20, 1-21

    MAT . . . . .1-22, 1-23

    MST . . . . .1-24, 1-25

    MGAT . . . . .1-26, 1-27

    MGST . . . . .1-28, 1-29

    SMGA, SMGAD, SMGADD . . . . .1-30, 1-31

    SMGS, SMGSD, SMGSDD . . . . .1-32, 1-33

    SHC, SHCD, SHCS, SHCSD . . . . .1-34, 1-35

Double Pole, Electrically Held, 2 Amps and Less . . . . .1-36 – 1-46

    HFW, HMB, HMS . . . . .1-36, 1-37

    3SCV . . . . .1-38, 1-39

    HFC . . . . .1-40

    3SBC . . . . .1-41, 1-42

    3SCC . . . . .1-43, 1-44

    3SAC, 3SAE . . . . .1-45, 1-46

Double Pole, Magnetic Latching, 2 Amps and Less . . . . .1-47 – 1-52

    LS . . . . .1-47, 1-48

    3SDM . . . . .1-49, 1-50

    3SAM . . . . .1-51, 1-52

Four Pole, Electrically Held, 2 Amps and Less . . . . .1-53 – 1-59

    SR . . . . .1-53, 1-54

    3SBH . . . . .1-55 – 1-57

    3SDH . . . . .1-58, 1-59

Four Pole, Magnetic Latching, 2 Amps and Less . . . . .1-60 – 1-62

    3SBM . . . . .1-60 – 1-62

Six Pole, Electrically Held, 2 Amps and Less . . . . .1-63, 1-64

    SS . . . . .1-63, 1-64

Double Pole, Electrically Held, 5 Amps and Less . . . . .1-65 – 1-69

    HFW4A, HFW5A . . . . .1-65, 1-66

    HFC4A, HFC5A . . . . .1-67

    FW, FW5A, SF, SF5A . . . . .1-68, 1-69

Single Pole, Electrically Held, 10 Amps and Less . . . . .1-70

    C . . . . .1-70

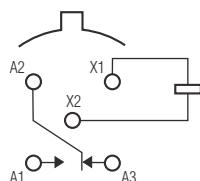
Double Pole, Electrically Held, 10 Amps and Less . . . . .1-71, 1-72

    07 . . . . .1-71, 1-72

## Single Pole, Electrically Held, 1 Amp and Less

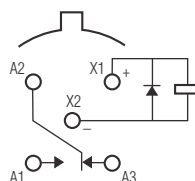
### 1MA, 1MAD, 1MADD

**1MA**  
**Standard TO-5**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/7**



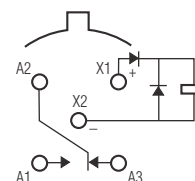
Terminal View

**1MAD**  
**Standard TO-5**  
**Diode Suppressed**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/23**



Terminal View

**1MADD**  
**Standard TO-5 Diode**  
**Suppressed/Protected**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/24**



Terminal View

#### Product Facts

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

#### Product Facts

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

#### Product Facts

- Suppression & protection diodes
- 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

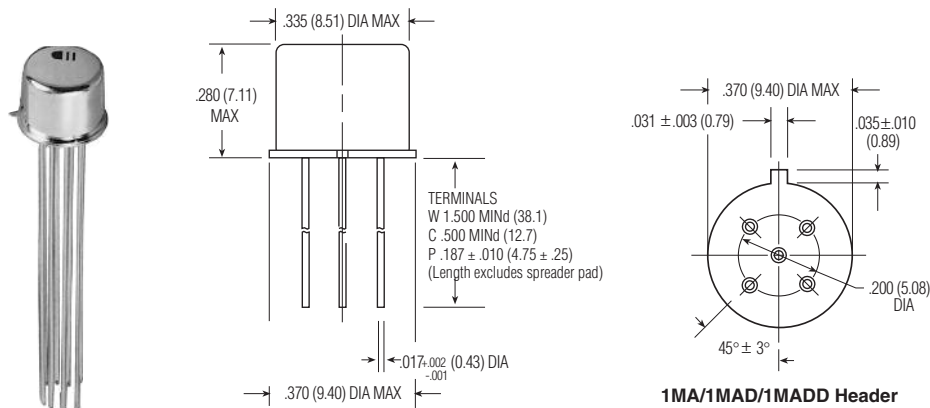
**Duty Cycle** — Continuous

**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



1MA/1MAD/1MADD Enclosure

1MA/1MAD/1MADD Header

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

**1MA, 1MAD, 1MADD**  
(Continued)

**Operating Characteristics**

**Timing** —  
Operate Time — 2.0 ms max.  
Release Time —  
1MA — 2.0 ms max.  
1MAD/1MADD — 4.0 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 @ 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

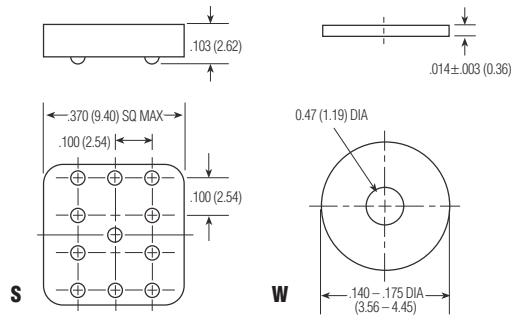
**Vibration Resistance** —  
30 G's, 10 to 3,000 Hz

**Shock Resistance** —  
75 G's, 6 ±1 ms max.

**QPL Approval** —  
MIL-R-39016/7 (J1MA)  
MIL-R-39016/23 (J1MAD)  
MIL-R-39016/24 (J1MADD)

**Semiconductor Characteristics**

**Diode** —  
100 Vdc peak inverse voltage (PIV)  
1.0 Vdc max. transient voltage



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 (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>1MA/1MAD</b>												
5.0	63	n/a	n/a	2.8	n/a	3.7	n/a	0.23	0.15	397	6.0	5
6.0	125	n/a	n/a	3.5	n/a	4.5	n/a	0.28	0.18	288	8.0	6
9.0	280	n/a	n/a	5.3	n/a	6.8	n/a	0.54	0.35	289	12.0	9
12.0	500	n/a	n/a	7.0	n/a	9.0	n/a	0.63	0.40	288	16.0	12
18.0	1,130	n/a	n/a	10.5	n/a	13.5	n/a	0.91	0.58	287	24.0	18
26.5	2,000	n/a	n/a	14.2	n/a	18.0	n/a	1.37	0.89	351	32.0	26
<b>1MADD</b>												
5.0	50	100.0	72.7	3.5	n/a	4.5	n/a	0.23	0.15	500	6.0	5
6.0	98	62.4	46.3	4.1	n/a	5.5	n/a	0.28	0.18	367	8.0	6
9.0	280	33.7	25.9	6.3	n/a	7.8	n/a	0.54	0.35	289	12.0	9
12.0	500	25.6	20.0	8.0	n/a	10.0	n/a	0.63	0.40	288	16.0	12
18.0	1,130	17.2	13.6	11.6	n/a	14.5	n/a	0.91	0.58	287	24.0	18
26.5	2,000	14.4	11.5	15.4	n/a	19.0	n/a	1.37	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\*:**

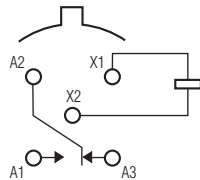
Type	Terminal	Diodes	Coils	Spreader/Mounting Pads
1MA	C	D	-26	S

\* 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.

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

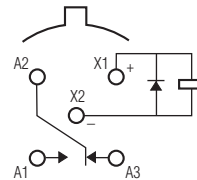
**1MS, 1MSD, 1MSDD**

**1MS**  
**Sensitive TO-5**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/10**



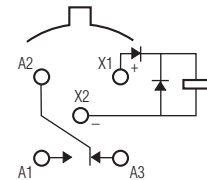
Terminal View

**1MSD**  
**Sensitive TO-5**  
**Diode Suppressed**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/25**



Terminal View

**1MSDD**  
**Sensitive TO-5 Diode**  
**Suppressed/Protected**  
**High Performance Relay**  
**Qualified to**  
**MIL-R-39016/26**



Terminal View

**Product Facts**

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

**Product Facts**

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

**Product Facts**

- Suppression & protection diodes
- 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

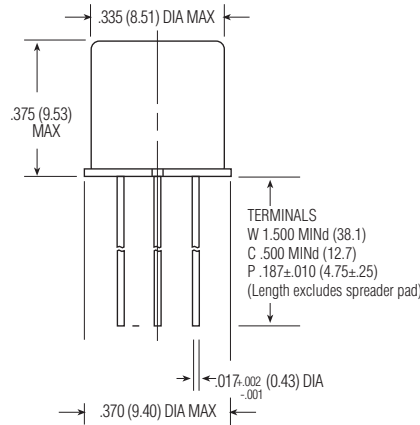
**Coil Voltage** — 5 to 40 Vdc  
**Coil Power** — 506 mW max. @ 25°C  
**Duty Cycle** — Continuous

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

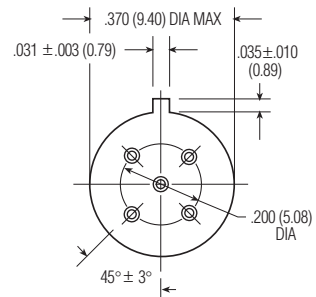
**Pick-up Sensitivity** —  
 40 mW max. @ 25°C

**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



1MS/1MSD/1MSDD Enclosure



1MS/1MSD/1MSDD Header

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

**1MS, 1MSD, 1MSDD**  
(Continued)

**Operating Characteristics**

**Timing** —  
Operate Time — 4.0 ms max.  
Release Time —  
1MS — 2.5 ms max.  
1MSD/1MSDD — 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 @ 500 Vdc  
1,000 megohms @ 500 Vdc  
(coil to case @ +125°C)

**Environmental Characteristics**

**Temperature Range** —  
-65°C to +125°C

**Weight** —  
0.10 oz. (2.84 grms)  
0.11 oz. (3.09 grms) with spreader pad  
attached

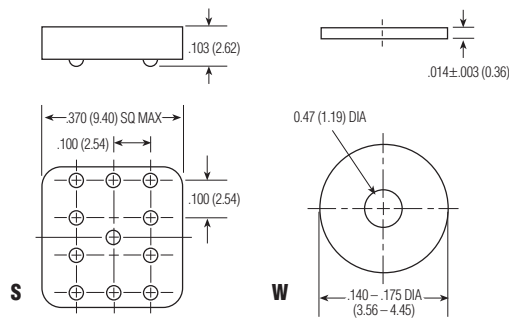
**Vibration Resistance** —  
30 G's, 10 to 3,000 Hz

**Shock Resistance** —  
75 G's, 6 ±1 ms max.

**QPL Approval** —  
MIL-R-39016/10 (J1MS)  
MIL-R-39016/25 (J1MSD)  
MIL-R-39016/26 (J1MSDD)

**Semiconductor Characteristics**

**Diode** —  
100 Vdc peak inverse voltage (PIV)  
1.0 Vdc max. transient voltage



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.
<b>1MS/1MSD</b>												
5.0	125	n/a	n/a	2.8	n/a	3.7	n/a	0.23	0.15	200	8.0	5
6.0	255	n/a	n/a	3.5	n/a	4.5	n/a	0.28	0.18	141	11.0	6
9.0	630	n/a	n/a	5.3	n/a	6.8	n/a	0.54	0.35	129	12.0	9
12.0	1,025	n/a	n/a	7.0	n/a	9.0	n/a	0.63	0.40	140	22.0	12
18.0	2,300	n/a	n/a	10.5	n/a	13.5	n/a	0.91	0.59	141	24.0	18
26.5	4,000	n/a	n/a	14.2	n/a	18.0	n/a	1.37	0.89	176	45.0	26
32.0	6,500	n/a	n/a	18.7	n/a	24.0	n/a	1.59	1.0	158	57.0	32
40.0	11,000	n/a	n/a	23.3	n/a	30.0	n/a	2.0	1.3	145	75.0	40
<b>1MSDD</b>												
5.0	100	50.0	36.3	3.5	n/a	4.5	n/a	0.23	0.15	250	8.0	5
6.0	200	30.6	22.7	4.1	n/a	5.5	n/a	0.28	0.18	180	11.0	6
9.0	630	15.0	11.5	6.3	n/a	7.8	n/a	0.54	0.35	129	16.0	9
12.0	1,025	12.5	9.7	8.0	n/a	10.0	n/a	0.63	0.40	140	22.0	12
18.0	2,300	8.5	6.7	11.6	n/a	14.5	n/a	0.91	0.58	141	33.0	18
26.5	4,000	7.2	5.7	15.4	n/a	19.0	n/a	1.37	0.89	176	45.0	26
32.0	6,500	5.4	4.3	17.0	n/a	21.0	n/a	1.5	0.95	158	57.0	32
40.0	11,000	4.0	3.2	22.0	n/a	27.0	n/a	2.0	1.28	145	75.0	40

**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.

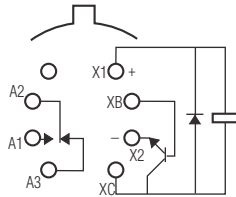
<b>Specifying a Part Number Example:</b>	<b>Type</b>	<b>Terminal</b>	<b>Diodes</b>	<b>Coils</b>	<b>Spreader/Mounting Pads</b>
	1MS	C	D	-26	S

\* 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.

**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

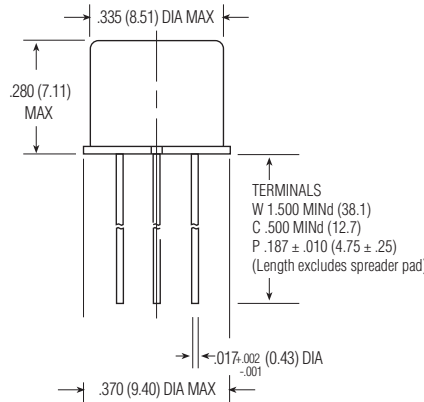
**Duty Cycle** — Continuous

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

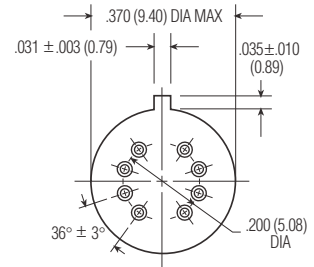
**Pick-up Sensitivity** —  
 100 mW max. @ 25°C

**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

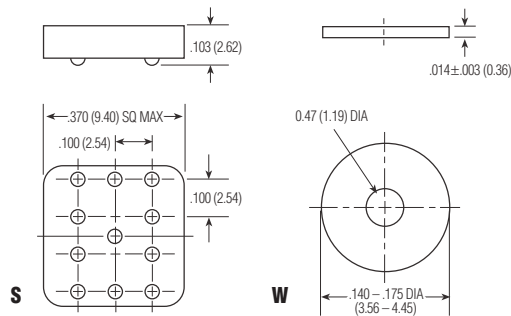
**Shock Resistance** —  
75 G's, 6 ±1 ms max.

**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:**

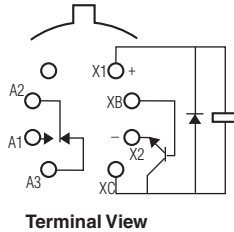
<u>Type</u>	<u>Terminal</u>	<u>Diodes</u>	<u>Coils</u>	<u>Spreader/Mounting Pads</u>
1MA	C	T	-26	S

\* 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.

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

1MST

**1MST**  
**Sensitive T0-5**  
**Diode Suppressed/**  
**Transistor Driven**  
**High Performance Relay**  
**Qualified to MIL-R-28776/4**



**Product Facts**

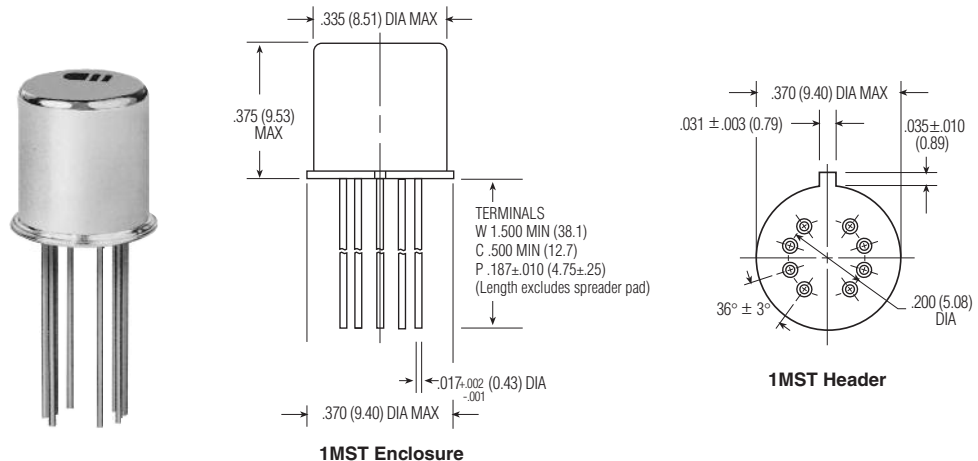
- Transistor driver & suppression diode
- Hermetically sealed
- High shock & vibration ratings
- Spreader pad
- Excellent RF switching

**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 40 Vdc  
**Coil Power** — 506 mW max. @ 25°C  
**Duty Cycle** — Continuous  
**Pick-up Voltage** — Approximately 50% of nominal coil voltage  
**Pick-up Sensitivity** — 40 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





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

**1MST** (Continued)

**Operating Characteristics**

**Timing** —  
 Operate Time — 3.5 ms max.  
 Release Time — 7.5 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)

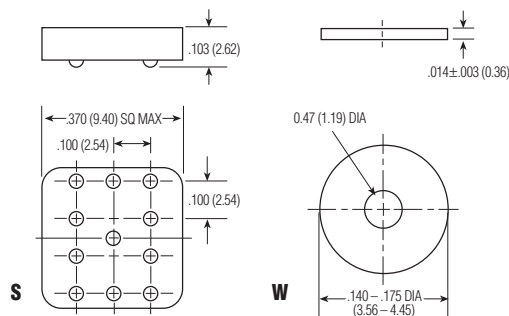
**Environmental Characteristics**

**Temperature Range** — -65°C to +125°C  
**Weight** —  
 0.10 oz. (2.84 grms)  
 0.11 oz. (3.09 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-28776/4 (J1MST)

**Semiconductor Characteristics**

**Diode** —  
 100 Vdc peak inverse voltage (PIV)  
 1.0 Vdc max. transient voltage  
**Transistor** —  
 0.3 Vdc min. 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

1  
CII Low Signal Relays



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 (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.
1MST												
5.0	125	47.8	34.7	2.6	0.28	3.6	1.20	0.22	0.15	200	8.0	5
6.0	255	27.7	21.2	3.5	0.20	4.8	0.78	0.28	0.18	141	11.0	6
9.0	630	16.8	11.8	5.4	0.13	7.8	0.48	0.54	0.35	129	16.0	9
12.0	1,025	13.6	10.1	6.6	0.10	10.0	0.39	0.63	0.41	140	22.0	12
18.0	2,300	9.1	6.7	9.8	0.07	14.5	0.26	0.91	0.58	141	33.0	18
26.5	4,000	7.7	5.7	12.8	0.05	19.0	0.20	1.37	0.89	176	45.0	26
32.0	6,500	5.8	4.2	18.7	0.04	24.0	0.16	1.60	1.00	158	57.0	32
40.0	11,000	4.3	3.1	23.3	0.03	30.0	0.13	2.10	1.30	145	75.0	40

**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.

<b>Specifying a Part Number Example:</b>	<b>Type</b>	<b>Terminal</b>	<b>Diodes</b>	<b>Coils</b>	<b>Spreader/Mounting Pads</b>
	1MS	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.