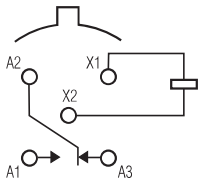
Single Pole, Electrically Held, 1 Amp and Less

1MA, 1MAD, 1MADD

1MA

Standard TO-5 High Performance Relay

Qualified to MIL-R-39016/7



Terminal View

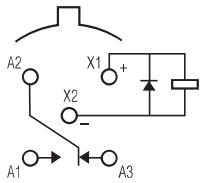
Product Facts

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

1MAD

Standard TO-5 Diode Suppressed High Performance Relay

Qualified to MIL-R-39016/23



Terminal View

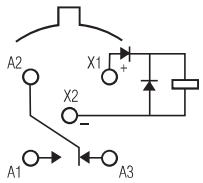
Product Facts

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

1MADD

Standard TO-5 Diode Suppressed/Protected High Performance Relay

Qualified to MIL-R-39016/24



Terminal View

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

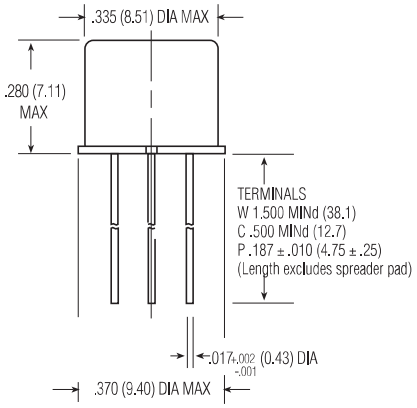
Pick-up Voltage — Approximately 50% of nominal coil voltage

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

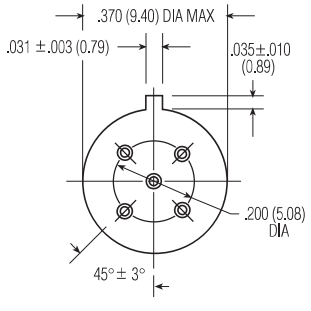
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

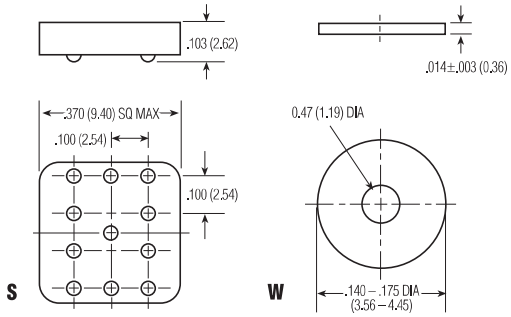
Vibration Resistance —
30 G's, 10 to 3,000 Hz

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.
1MA/1MAD												
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
1MADD												
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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

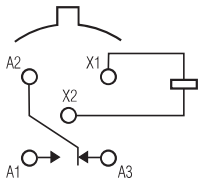
Single Pole, Electrically Held, 1 Amp and Less (Continued)

1MS, 1MSD, 1MSDD

1MS

Sensitive TO-5 High Performance Relay

Qualified to MIL-R-39016/10



Terminal View

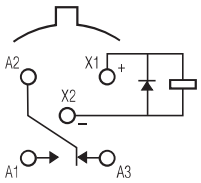
Product Facts

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

1MSD

Sensitive TO-5 Diode Suppressed High Performance Relay

Qualified to MIL-R-39016/25



Terminal View

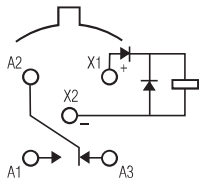
Product Facts

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

1MSDD

Sensitive TO-5 Diode Suppressed/Protected High Performance Relay

Qualified to MIL-R-39016/26



Terminal View

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

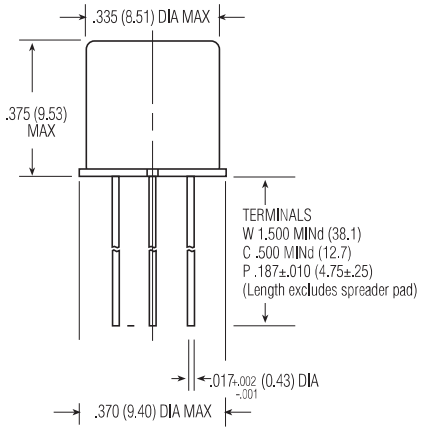
Pick-up Voltage — Approximately 50% of nominal coil voltage

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

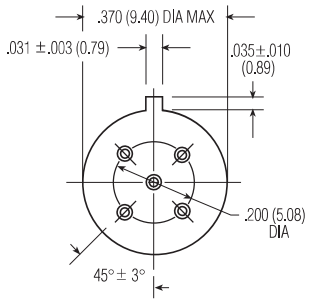
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

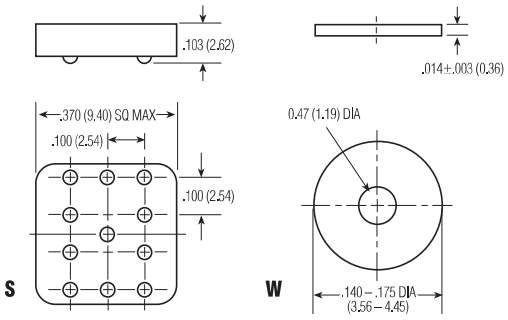
Vibration Resistance —
30 G's, 10 to 3,000 Hz

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.
1MS/1MSD												
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
1MSDD												
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.

Specifying a Part Number Example:	Type	Terminal	Diodes	Coils	Spreader/Mounting Pads
	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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

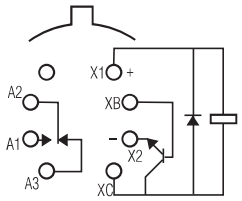
Single Pole, Electrically Held, 1 Amp and Less (Continued)

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

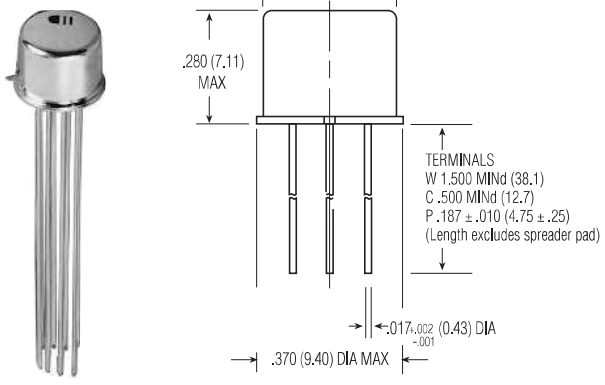
Duty Cycle — Continuous

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

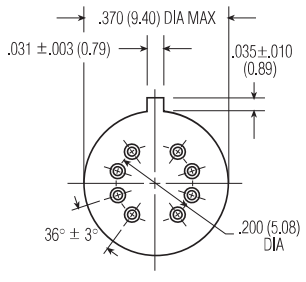
Pick-up Sensitivity — 100 mW max. @ 25°C

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

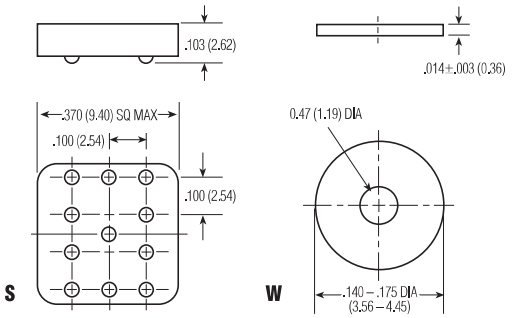
Shock Resistance —
75 G's, 6 ±1 ms max.

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_{EBO}) @ 25°C;
80.0 Vdc min. collector-base breakdown voltage (BV_{CBO}) @ 25°C & I_C=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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

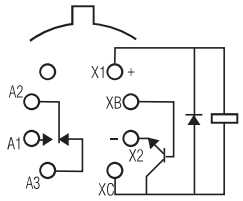
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

1MST

1MST

Sensitive TO-5
Diode Suppressed/
Transistor Driven
High Performance Relay
Qualified to MIL-R-28776/4



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 40 Vdc

Coil Power — 506 mW max. @ 25°C

Duty Cycle — Continuous

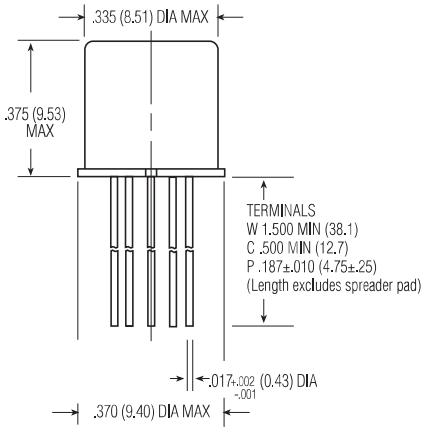
Pick-up Voltage — Approximately 50% of nominal coil voltage

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

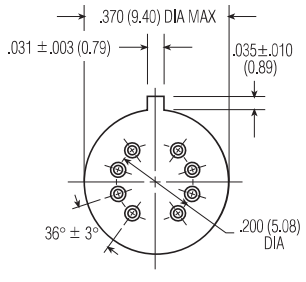
Contact Ratings

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





1MST Enclosure



1MST Header

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

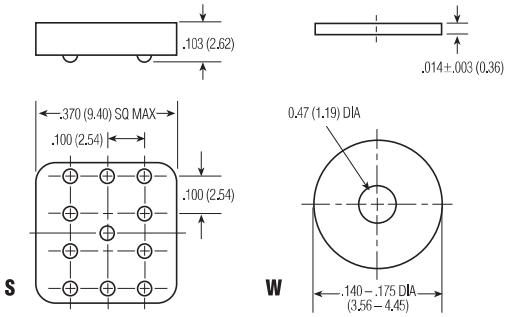
Shock Resistance —
75 G's, 6 ±1 ms max.

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_{EBO}) @ 25°C;
80.0 Vdc min. collector-base breakdown voltage (BV_{CBO}) @ 25°C & I_C=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 (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.

Specifying a Part Number Example:	Type	Terminal	Diodes	Coils	Spreader/Mounting Pads
	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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

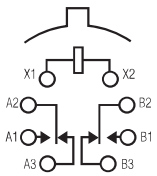
Double Pole, Electrically Held, 1 Amp and Less

MA, MAD, MADD

MA

Standard TO-5 High Performance Relay

Qualified to MIL-R-39016/9



Terminal View

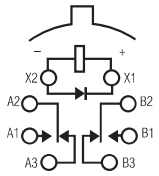
Product Facts

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

MAD

Standard TO-5 Diode Suppressed High Performance Relay

Qualified to MIL-R-39016/15



Terminal View

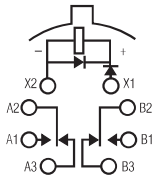
Product Facts

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

MADD

Standard TO-5 Diode Suppressed/Protected High Performance Relay

Qualified to MIL-R-39016/20



Terminal View

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 30 Vdc (MA/MAD) 5 to 26.5 Vdc (MADD)

Coil Power — 675 mW max. @ 25°C

Duty Cycle — Continuous

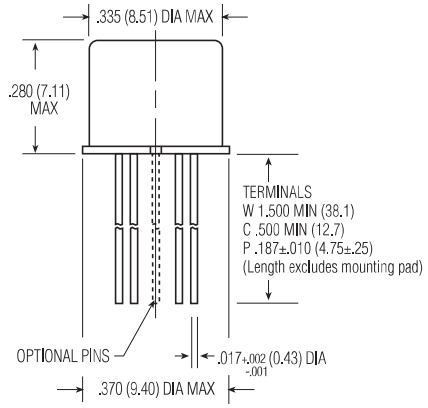
Pick-up Voltage — Approximately 50% of nominal coil voltage

Pick-up Sensitivity — 130 mW max. @ 25°C

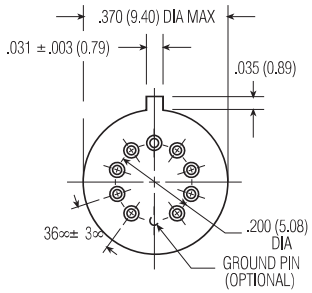
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MA, MAD, MADD (Continued)

Operating Characteristics

Timing —
Operate Time — 2.0 ms max.
Release Time —
MA — 1.5 ms max.
MAD/MADD — 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 min. @ 500 Vdc
1,000 megohms @ 500 Vdc
(coil to case @ +125°C)

Environmental Characteristics

Temperature Range —
-65°C to +125°C

Weight —
0.09 oz. (2.55 grms)
0.10 oz. (2.80 grms) with spreader pad attached

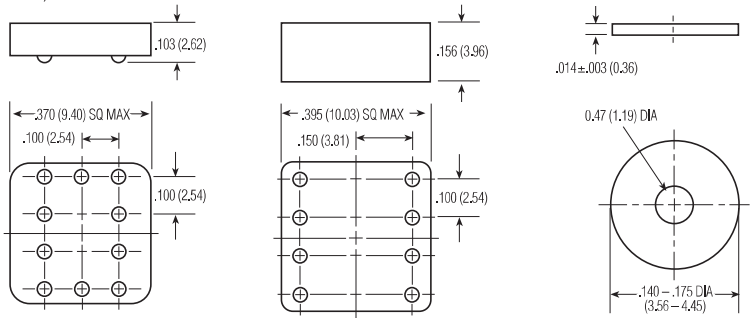
Vibration Resistance —
30 G's, 10 to 3,000 Hz

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

QPL Approval —
MIL-R-39016/9 (JMA)
MIL-R-39016/15 (JMAD)
MIL-R-39016/20 (JMADD)

Semiconductor Characteristics

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



S **S2** **W**

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.
MA/MAD												
5.0	50	n/a	n/a	2.7	n/a	3.5	n/a	0.22	0.14	500	5.8	5
6.0	98	n/a	n/a	3.5	n/a	4.5	n/a	0.28	0.18	367	8.0	6
9.0	220	n/a	n/a	5.3	n/a	6.8	n/a	0.54	0.35	368	12.0	9
12.0	390	n/a	n/a	7.0	n/a	9.0	n/a	0.63	0.41	369	16.0	12
18.0	880	n/a	n/a	10.5	n/a	13.5	n/a	0.91	0.59	368	24.0	18
26.5	1,560	n/a	n/a	14.2	n/a	18.0	n/a	1.37	0.89	450	32.0	26
30.0	2,500	n/a	n/a	17.7	n/a	22.0	n/a	1.50	1.00	360	36.0	30
MADD												
5.0	39	128.2	93.2	3.2	n/a	4.0	n/a	0.6	0.6	641	5.8	5
6.0	78	78.3	58.3	4.0	n/a	5.0	n/a	0.7	0.7	462	8.0	6
9.0	220	42.9	33.0	6.3	n/a	7.8	n/a	0.9	0.8	368	12.0	9
12.0	390	32.8	25.6	8.0	n/a	10.0	n/a	1.1	0.9	369	16.0	12
18.0	880	22.1	17.5	11.5	n/a	14.5	n/a	1.4	1.1	368	24.0	18
26.5	1,560	18.5	14.8	15.2	n/a	19.0	n/a	1.8	1.4	450	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	Ground Pins	Coils	Spreader/Mounting Pads
	MA	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.

Catalog 5-1773450-5
Revised 9-08
www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

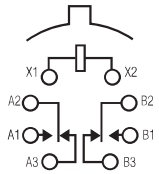
Double Pole, Electrically Held, 1 Amp and Less (Continued)

MS, MSD, MSDD

MS

Sensitive TO-5 High Performance Relay

Qualified to MIL-R-39016/11



Terminal View

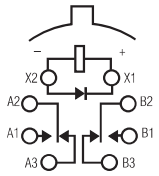
Product Facts

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

MSD

Sensitive TO-5 Diode Suppressed High Performance Relay

Qualified to MIL-R-39016/16



Terminal View

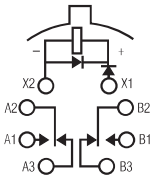
Product Facts

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

MSDD

Sensitive TO-5 Diode Suppressed/Protected High Performance Relay

Qualified to MIL-R-39016/21



Terminal View

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

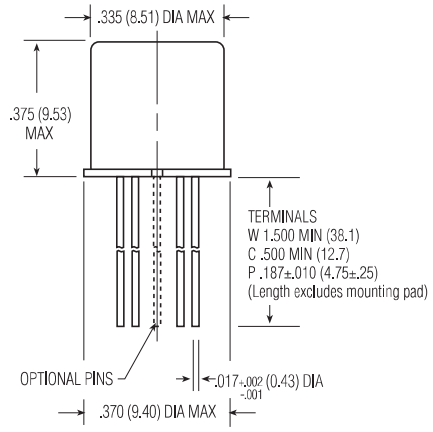
Pick-up Voltage — Approximately 50% of nominal coil voltage

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

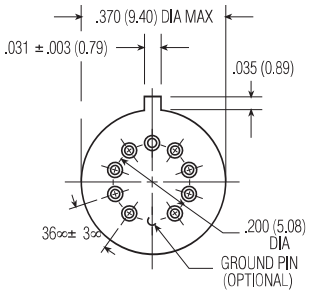
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

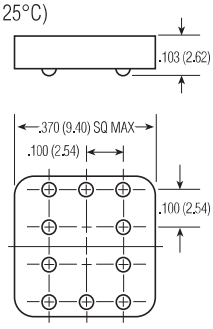
Vibration Resistance —
30 G's, 10 to 3,000 Hz

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

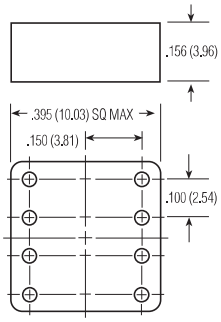
QPL Approval —
MIL-R-39016/11 (JMS)
MIL-R-39016/16 (JMSD)
MIL-R-39016/21 (JMSDD)

Semiconductor Characteristics

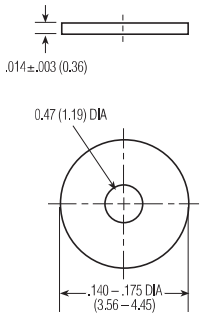
Diode —
100 Vdc peak inverse voltage (PIV)
1.0 Vdc max. transient voltage



S



S2



W

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.
MS/MSD												
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
MSDD												
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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

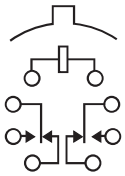
Double Pole, Electrically Held, 1 Amp and Less (Continued)

HM, HMD, HS, HSD



HM, HS

Standard / Sensitive TO-5 Commercial Relay



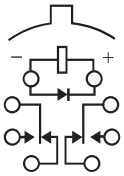
Terminal View

Product Facts

- Hermetically sealed
- Spreader Pads
- Excellent RF switching

HMD, HSD

Standard / Sensitive TO-5 Diode Suppressed Commercial Relay



Terminal View

Product Facts

- Suppression Diode
- Hermetically sealed
- 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

Electrical Characteristics

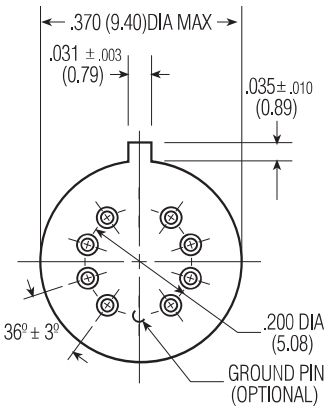
Coil Voltage — 5 to 30 Vdc (HM/HMD) 5 to 48 Vdc (HS/HSD)

Coil Power — HM/HMD — 675 mW max. @ 25°C HS/HSD — 565 mW max. @ 25°C

Duty Cycle — Continuous

Pick-up Voltage — Approximately 70% of nominal coil voltage

Pick-up Sensitivity — HM/HMD — 180 mW max. @ 25°C HS/HSD — 90 mW max. @ 25°C



Header

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

HM, HMD, HS, HSD
(Continued)

Operating Characteristics

Timing —
Operate Time —
HM/HMD — 4.0 ms max.
HS/HSD — 6.0 ms max.
Release Time —
HM — 3.0 ms max.
HS — 3.0 ms max.
HMD — 6.0 ms max.
(suppression diode)
HSD — 7.5 ms max.
(suppression diode)

Dielectric Withstanding Voltage —
Between Open Contacts —
350 Vrms 60 Hz
Between Adjacent Contacts —
350 Vrms 60 Hz
Between Contacts & Coil —
350 Vrms 60 Hz

Insulation Resistance —
1,000 megohms @ 500 Vdc

Environmental Characteristics

Temperature Range —
-55°C to +85°C

Weight —
HM/HMD —
0.09 oz. (2.55 gms)
0.099 oz. (2.80 gms) w/ spreader pad
HS/HSD —
0.12 oz. (3.40 gms)
0.129 oz. (3.45 gms) w/ spreader pad

Vibration Resistance —
10 G's, 10 to 500 Hz

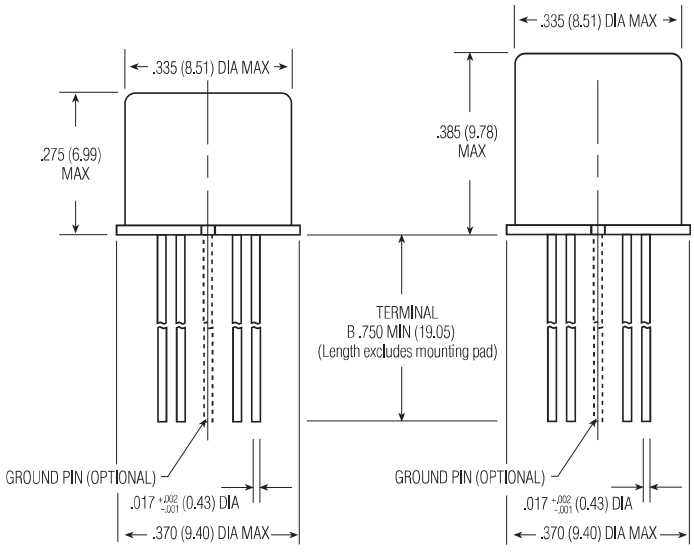
Shock Resistance —
30 G's, 6 ±1 ms

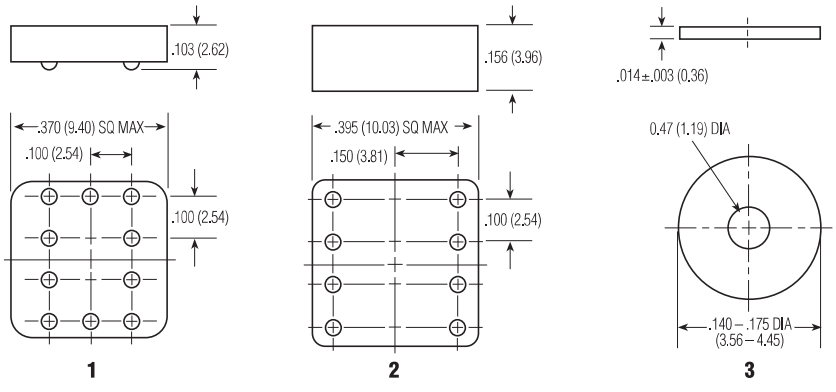
Semiconductor Characteristics

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

Standard Coil Data

	Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±20% @ 25°C	Pickup Voltage Vdc (max.) @ 25°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
HM/HMD	5.0	50	3.6	500	5.8	5
	6.0	98	4.2	367	8.0	6
	9.0	220	6.5	368	12.0	9
	12.0	390	8.4	369	16.0	12
	18.0	880	13.0	368	24.0	18
	26.5	1,560	17.0	450	32.0	26
	30.0	2,500	22.0	360	36.0	30
HS/HSD	5.0	100	3.5	250	7.5	5
	6.0	200	4.5	180	10.0	6
	9.0	400	6.8	203	15.0	9
	12.0	850	9.0	169	20.0	12
	18.0	1,600	13.5	203	30.0	18
	26.5	3,300	18.0	213	40.0	26
	36.0	6,500	24.0	199	57.0	36
	48.0	11,000	32.0	209	75.0	48





Spreader and Mounting Pads

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	Diodes	Ground Pin	Spreader/Mounting Pads	Coils	Terminals
	HM	D	X	3	-26	B

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

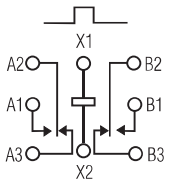
Double Pole, Electrically Held, 1 Amp and Less (Continued)

MGA, MGAD, MGADD

MGA

Standard .100 Grid High Performance Relay

Qualified to MIL-R-39016/17



Terminal View

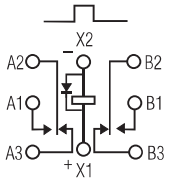
Product Facts

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

MGAD

Standard .100 Grid Diode Suppressed High Performance Relay

Qualified to MIL-R-39016/18



Terminal View

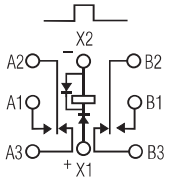
Product Facts

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

MGADD

Standard .100 Grid Diode Suppressed/Protected High Performance Relay

Qualified to MIL-R-39016/19



Terminal View

Product Facts

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

Electrical Characteristics

Contact Arrangement — 2 Form C (DPDT)

Contact Material — Stationary — Gold/platinum/palladium/silver (gold plated) Moveable — Gold/platinum/palladium/silver (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 — 660 mW max. @ 25°C

Duty Cycle — Continuous

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

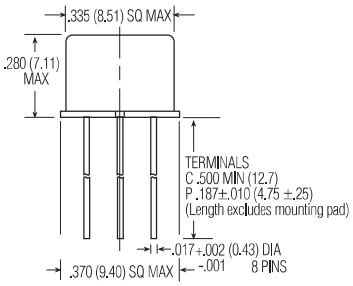
Pick-up Sensitivity — 130 mW max. @ 25°C

Contact Ratings

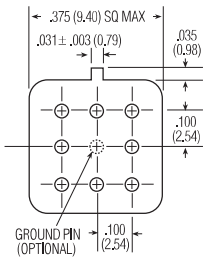
Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive (case not grounded)	100,000
100 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive	100,000
0.2 A @ 28 Vdc	Inductive (0.32 Henry)	100,000
0.1 A @ 28 Vdc	Lamp	100,000
30 µA @ 50 mVdc	Low Level	1,000,000
0.1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



MGA



MGA/MGAD/MGADD Enclosure



MGA/MGAD/MGADD Header

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MGA, MGAD, MGADD
(Continued)

Operating Characteristics

Timing —
Operate Time — 2.0 ms max.
Release Time —
MGA — 1.5 ms max.
MGAD/MGADD — 4.0 ms max.
(suppression diode, protection/ suppression 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 —
0.09 oz. (2.55 gms)
0.129 oz. (3.45 gms) w/ mounting pad attached

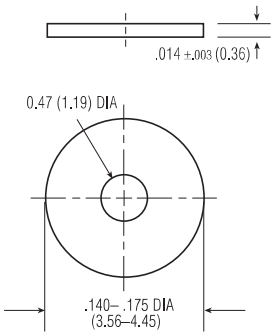
Vibration Resistance —
30 G's, 10 to 3,000 Hz

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

QPL Approval —
MIL-R-39016/17 (JMGA)
MIL-R-39016/18 (JMGAD)
MIL-R-39016/19 (JMGADD)

Semiconductor Characteristics

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



MGA/MGAD/MGADD Mounting Pad

Coil Data

Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±10% @ 25°C (Note)	Coil Circuit Current mA (Max.) (Note)	Coil Circuit Current mA (Min.) (Note)	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Max.) @ 125°C	Drop-Out Voltage Vdc (Min.) @ 25°C	Drop-Out Voltage Vdc (Min.) @ -65°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
MGA/MGAD										
5.0	50	n/a	n/a	2.7	3.5	0.22	0.14	500	5.8	5
6.0	98	n/a	n/a	3.5	4.5	0.28	0.18	367	8.0	6
9.0	220	n/a	n/a	5.3	6.8	0.54	0.35	368	12.0	9
12.0	390	n/a	n/a	7.0	9.0	0.63	0.41	369	16.0	12
18.0	880	n/a	n/a	10.5	13.5	0.91	0.59	368	24.0	18
26.5	1,560	n/a	n/a	14.2	18.0	1.37	0.89	450	32.0	26
MGADD										
5.0	39	128.2	93.2	3.2	4.0	0.6	0.6	641	5.8	5
6.0	78	78.3	58.3	4.0	5.0	0.7	0.7	462	8.0	6
9.0	220	42.9	33.0	6.3	7.8	0.9	0.8	368	12.0	9
12.0	390	32.8	25.6	8.0	10.0	1.1	0.9	369	16.0	12
18.0	880	22.1	17.5	11.5	14.5	1.4	1.1	368	24.0	18
26.5	1,560	18.5	14.8	15.2	19.0	1.8	1.4	450	32.0	26

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

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	Terminals	Diodes	Ground Pins	Coils	Mounting Pads
	MGA	C	D	G	-26	W

* 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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

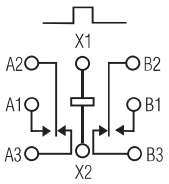
Double Pole, Electrically Held, 1 Amp and Less (Continued)

MGS, MGSD, MGSDD

MGS

Sensitive .100 Grid High Performance Relay

Qualified to MIL-R-39016/41



Terminal View

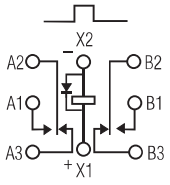
Product Facts

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

MGSD

Sensitive .100 Grid Diode Suppressed High Performance Relay

Qualified to MIL-R-39016/42



Terminal View

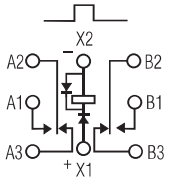
Product Facts

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

MGSDD

Sensitive .100 Grid Diode Suppressed/Protected High Performance Relay

Qualified to MIL-R-39016/43



Terminal View

Product Facts

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

Electrical Characteristics

Contact Arrangement — 2 Form C (DPDT)

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

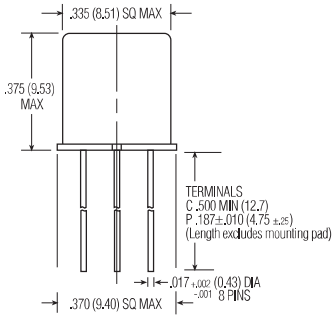
Pick-up Sensitivity — 60 mW max. @ 25°C

Contact Ratings

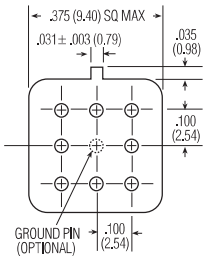
Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive (case not grounded)	100,000
100 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive	100,000
0.2 A @ 28 Vdc	Inductive (0.32 Henry)	100,000
0.1 A @ 28 Vdc	Lamp	100,000
30 µA @ 50 mVdc	Low Level	1,000,000
0.1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



MGS



MGS/MGSD/MGSDD Enclosure



MGS/MGSD/MGSDD Header

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MGS, MGSD, MGSDD
(Continued)

Operating Characteristics

Timing —
Operate Time — 4.0 ms max.
Release Time —
MGS — 2.0 ms max.
MGSD/MGSDD — 7.5 ms max.
(suppression diode, protection/ suppression 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 —
0.09 oz. (2.55 gms)
0.129 oz. (3.45 gms) w/ mounting pad attached

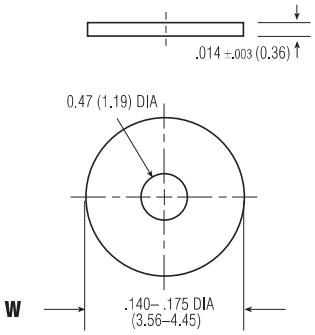
Vibration Resistance —
30 G's, 10 to 3,000 Hz

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

QPL Approval —
MIL-R-39016/41 (JMGS)
MIL-R-39016/42 (JMGSD)
MIL-R-39016/43 (JMGSDD)

Semiconductor Characteristics

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



MGS/MGSD/MGSDD
Mounting Pad

Coil Data

Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±10% @ 25°C (Note)	Coil Circuit Current mA (Max.) (Note)	Coil Circuit Current mA (Min.) (Note)	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Max.) @ 125°C	Drop-Out Voltage Vdc (Min.) @ 25°C	Drop-Out Voltage Vdc (Min.) @ -65°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
MGS/MGSD										
5.0	100	n/a	n/a	2.6	3.5	0.23	0.12	250	7.5	5
6.0	200	n/a	n/a	3.4	4.5	0.28	0.18	180	10.0	6
9.0	400	n/a	n/a	4.85	6.8	0.55	0.35	203	15.0	9
12.0	800	n/a	n/a	7.0	9.0	0.64	0.41	180	20.0	12
18.0	1,600	n/a	n/a	9.8	13.5	0.92	0.59	203	30.0	18
26.5	3,200	n/a	n/a	14.0	18.0	1.4	0.89	219	40.0	26
36.0	6,500	n/a	n/a	20.0	27.0	1.8	1.25	199	57.0	36
48.0	11,000	n/a	n/a	25.8	36.0	2.4	1.60	209	75.0	48
MGSDD										
5.0	64	78.1	56.8	2.9	3.7	0.8	0.7	391	7.5	5
6.0	125	48.9	36.3	4.0	4.8	0.9	0.8	288	10.0	6
9.0	400	23.6	18.1	6.1	8.0	1.1	0.9	203	15.0	9
12.0	800	16.0	12.5	7.8	11.0	1.3	1.0	180	20.0	12
18.0	1,600	12.2	9.6	11.3	14.5	1.5	1.1	203	30.0	18
26.5	3,200	9.0	7.2	15.2	19.0	1.7	1.3	219	40.0	26
36.0	6,500	6.1	4.9	21.7	27.2	2.3	1.7	199	57.0	36
48.0	11,000	4.8	3.9	27.8	34.8	2.8	2.0	209	75.0	48

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

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	Terminals	Diodes	Ground Pins	Coils	Mounting Pads
	MGS	C	D	G	-26	W

* 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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

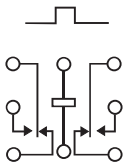
Double Pole, Electrically Held, 1 Amp and Less (Continued)

HC, HCD, HCS, HCSD



HC, HCS

Standard / Sensitive
.100 Grid Commercial Relay



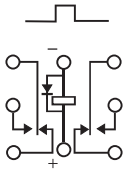
Terminal View

Product Facts

- Hermetically sealed
- Mounting pads
- Excellent RF switching

HCD, HCSD

Standard / Sensitive
.100 Grid Diode Suppressed
Commercial Relay



Terminal View

Product Facts

- Suppression diode
- Hermetically sealed
- Mounting 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

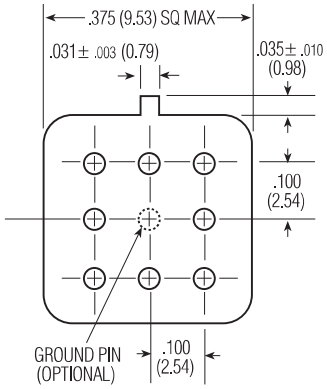
Coil Voltage —
5 to 26.5 Vdc (HC/HCD)
5 to 48 Vdc (HCS/HCSD)

Coil Power —
HC/HCD — 660 mW max. @ 25°C
HCS/HCSD — 565 mW max. @ 25°C

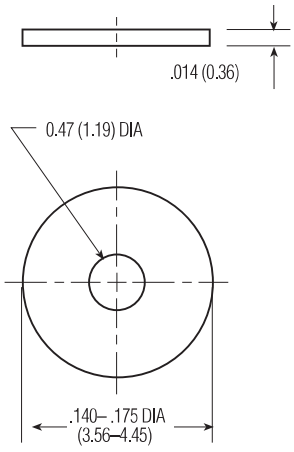
Duty Cycle — Continuous

Pick-up Voltage — Approximately 70% of nominal coil voltage

Pick-up Sensitivity —
HC/HCD — 180 mW max. @ 25°C
HCS/HCSD — 90 mW max. @ 25°C



Header



Mounting Pad

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

HC, HCD, HCS, HCSD
(Continued)

Operating Characteristics

Timing —
Operate Time —
HC/HCD — 4.0 ms max.
HCS/HCSD — 6.0 ms max.
Release Time —
HC — 3.0 ms max.
HCS — 3.0 ms max.
HCD — 6.0 ms max.
(suppression diode)
HCSD — 7.5 ms max.
(suppression diode)

Dielectric Withstanding Voltage —
Between Open Contacts —
350 Vrms 60 Hz
Between Adjacent Contacts —
350 Vrms 60 Hz
Between Contacts & Coil —
350 Vrms 60 Hz

Insulation Resistance —
1,000 megohms @ 500 Vdc

Environmental Characteristics

Temperature Range —
-55°C to +85°C

Weight —
HC/HCD —
0.09 oz. (2.55 gms)
HCS/HCSD —
0.15 oz. (4.30 gms)

Vibration Resistance —
10 G's, 10 to 500 Hz

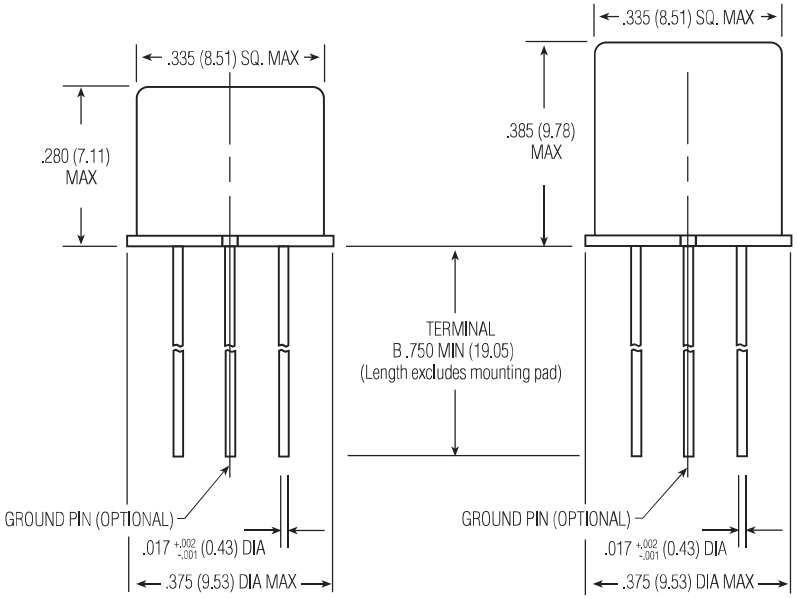
Shock Resistance —
30 G's, 6 ±1 ms

Semiconductor Characteristics

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

Standard Coil Data

	Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±20% @ 25°C	Pickup Voltage Vdc (Max.) @ 25°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
HC/HCD	5.0	64	3.8	391	5.8	5
	6.0	98	4.9	367	8.0	6
	9.0	220	7.0	368	12.0	9
	12.0	400	9.0	360	16.0	12
	18.0	880	14.0	368	24.0	18
	26.5	1,600	18.0	439	32.0	26
HCS/HCSD	5.0	100	3.5	250	7.5	5
	6.0	200	4.5	180	10.0	6
	9.0	400	6.8	203	15.0	9
	12.0	800	9.0	180	20.0	12
	18.0	1,600	13.5	203	30.0	18
	26.5	3,200	18.0	219	40.0	26
	36.0	6,500	24.0	199	57.0	36
	48.0	11,000	32.0	209	75.0	48



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	Diodes	Ground Pin	Mounting Pads	Coils	Terminals
	HC	D	X	3	-26	B

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

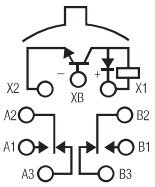
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MAT

MAT

Standard TO-5
Diode Suppressed/
Transistor Driven
High Performance Relay
Qualified to MIL-R-28776/1



Terminal View

Product Facts

- **Transistor driver & suppression diode**
- **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 26.5 Vdc

Coil Power — 675 mW max. @ 25°C

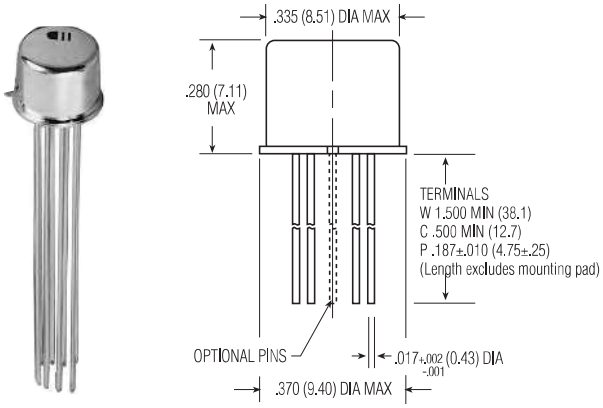
Duty Cycle — Continuous

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

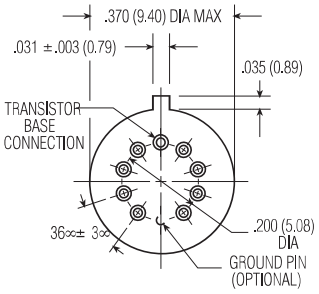
Pick-up Sensitivity — 130 mW max. @ 25°C

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MAT (Continued)

Operating Characteristics

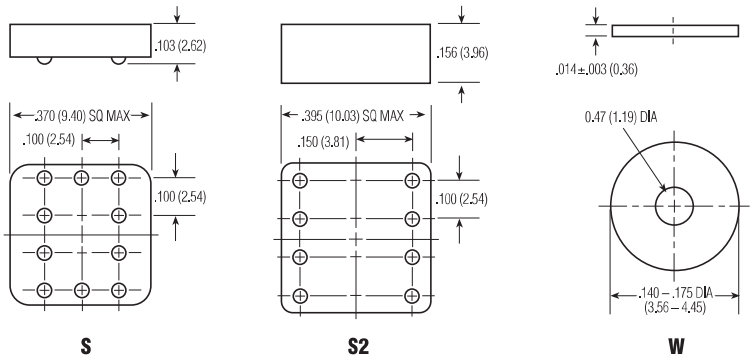
Timing —
Operate Time — 2.0 ms max.
Release Time — 7.5 ms max.
Contact Bounce — 1.5 ms max
Dielectric Withstanding Voltage —
Between Open Contacts —
500 Vrms 60 Hz
Between Adjacent Contacts —
500 Vrms 60 Hz
Between Contacts & Coil —
500 Vrms 60 Hz
Insulation Resistance —
10,000 megohms @ 500 Vdc
1,000 megohms @ 500 Vdc
(coil to case @ +125°C)

Environmental Characteristics

Temperature Range —
-65°C to +125°C
Weight —
0.09 oz. (2.55 grms)
0.10 oz. (2.80 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-28776/1 (JMAT)

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_{EBO}) @ 25°C;
80.0 Vdc min. collector-base breakdown voltage (BV_{CBO}) @ 25°C & I_C=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 (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.
MAT												
5.0	50	112.1	82.2	2.7	0.75	3.5	3.00	0.22	0.14	500	5.8	5
6.0	98	69.9	52.9	3.5	0.55	4.5	2.04	0.28	0.18	367	8.0	6
9.0	220	47.4	35.3	5.3	0.36	6.8	1.36	0.54	0.35	368	12.0	9
12.0	390	35.8	26.6	7.0	0.27	9.0	1.03	0.63	0.41	369	16.0	12
18.0	880	24.0	17.9	10.5	0.16	13.5	0.68	0.91	0.59	368	24.0	18
26.5	1,560	19.8	14.7	14.2	0.13	18.0	0.50	1.37	0.89	450	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	Ground Pins	Coils	Spreader/Mounting Pads
	MA	C	T	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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

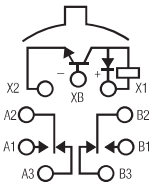
South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MST

MST

Sensitive TO-5
Diode Suppressed/
Transistor Driven
High Performance Relay
Qualified to MIL-R-28776/3



Terminal View

Product Facts

- **Transistor driver & suppression diode**
- **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

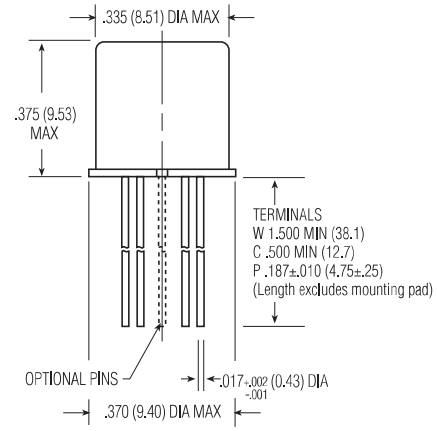
Pick-up Voltage — Approximately 50% of nominal coil voltage

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

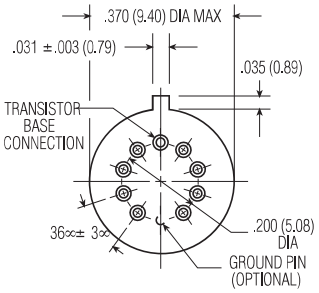
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MST (Continued)

Operating Characteristics

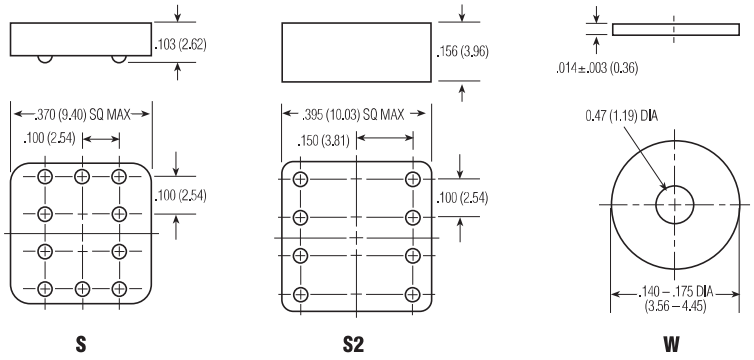
Timing —
Operate Time — 4.0 ms max.
Release Time — 7.5 ms max.
Contact Bounce — 1.5 ms max
Dielectric Withstanding Voltage —
Between Open Contacts —
500 Vrms 60 Hz
Between Adjacent Contacts —
500 Vrms 60 Hz
Between Contacts & Coil —
500 Vrms 60 Hz
Insulation Resistance —
10,000 megohms min. @ 500 Vdc
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-28776/3 (JMST)

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_{EBO}) @ 25°C;
80.0 Vdc min. collector-base breakdown voltage (BV_{CBO}) @ 25°C & I_C=100 µA



S **S2** **W**

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.
MST												
5.0	100	59.3	43.5	2.8	0.37	3.6	1.50	0.22	0.14	250	7.0	5
6.0	200	35.4	26.4	3.8	0.25	4.8	1.00	0.28	0.18	180	10.0	6
9.0	400	25.8	19.7	5.2	0.18	7.8	0.75	0.54	0.35	203	15.0	9
12.0	850	16.7	12.2	7.4	0.12	11.0	0.47	0.63	0.41	169	20.0	12
18.0	1,600	13.1	9.7	10.0	0.09	14.5	0.38	0.91	0.59	203	30.0	18
26.5	3,300	9.5	6.9	14.2	0.06	19.0	0.24	1.37	0.89	213	40.0	26
36.0	6,500	6.4	4.8	20.0	0.034	27.0	0.17	1.80	1.25	199	57.0	36
48.0	11,000	5.1	3.7	25.8	0.026	36.0	0.13	2.40	1.60	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	T	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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

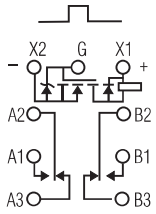
Double Pole, Electrically Held, 1 Amp and Less (Continued)

MGAT

MGAT

Standard .100 Grid Diode Suppressed/MOSFET Driven High Performance Relay

Qualified to MIL-R-28776/6



Terminal View

Product Facts

- **MOSFET driver, zener & suppression diodes**
- **Hermetically sealed**
- **High shock & vibration ratings**
- **Mounting pads**
- **Excellent RF switching**

Electrical Characteristics

Contact Arrangement — 2 Form C (DPDT)

Contact Material — Stationary — Gold/platinum/palladium/silver (gold plated) Moveable — Gold/platinum/palladium/silver (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 — 660 mW max. @ 25°C

Duty Cycle — Continuous

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

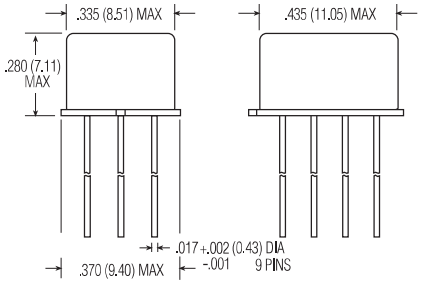
Pick-up Sensitivity — 130 mW max. @ 25°C

Contact Ratings

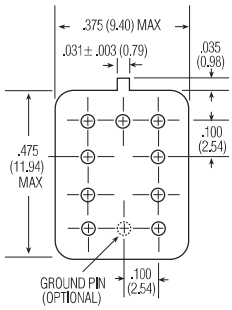
Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive (case not grounded)	100,000
100 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive	100,000
0.2 A @ 28 Vdc	Inductive (0.32 Henry)	100,000
0.1 A @ 28 Vdc	Lamp	100,000
30 µA @ 50 mVdc	Low Level	1,000,000
0.1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



MGAT



MGAT Enclosure



MGAT Header

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MGAT (Continued)

Operating Characteristics

Timing —
Operate Time — 2.0 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 min. @ 500 Vdc
1,000 megohms @ 500 Vdc
(coil to case @ +125°C)

Environmental Characteristics

Temperature Range —
-65°C to +125°C

Weight —
0.09 oz. (2.55 gms)
0.129 oz. (3.45 gms) w/ mounting pad attached

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

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

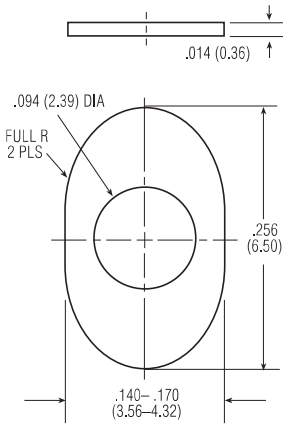
QPL Approval —
MIL-R-28776/6 (JMGAT)

Semiconductor Characteristics

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

Zener Diode —
20 Vdc ±3 Vdc over temperature range

MOSFET —
0.5 Vdc min. gate turn-off voltage
4.3 Vdc max. gate turn-on voltage



MGAT Mounting Pad

Coil Data

Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±10% @ 25°C (Note)	Coil Circuit Current mA (Max.) (Note)	Coil Circuit Current mA (Min.) (Note)	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Max.) @ 125°C	Drop-Out Voltage Vdc (Min.) @ 25°C	Drop-Out Voltage Vdc (Min.) @ -65°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
MGAT										
5.0	39	132.3	96.5	2.9	3.5	0.23	0.13	641	5.8	5
6.0	78	83.9	60.3	3.5	4.5	0.32	0.18	462	8.0	6
9.0	220	47.1	33.1	5.3	6.8	0.48	0.27	368	12.0	9
12.0	390	36.1	24.9	7.1	9.0	0.65	0.36	369	16.0	12
18.0	880	24.1	16.1	10.6	13.5	0.97	0.54	368	24.0	18
26.5	1,560	19.9	12.9	14.2	18.0	1.30	0.72	450	32.0	26

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

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	Terminals	Diodes	Ground Pins	Coils	Mounting Pads
	MGA	C	T	G	-26	W

* 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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

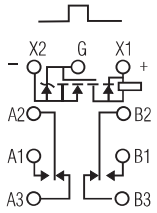
Double Pole, Electrically Held, 1 Amp and Less (Continued)

MGST

MGST

Sensitive .100 Grid Diode Suppressed/MOSFET Driven High Performance Relay

Qualified to MIL-R-28776/7



Terminal View

Product Facts

- **MOSFET driver, zener & suppression diodes**
- **Hermetically sealed**
- **High shock & vibration ratings**
- **Mounting pads**
- **Excellent RF switching**

Electrical Characteristics

Contact Arrangement — 2 Form C (DPDT)

Contact Material — Stationary — Gold/platinum/palladium/silver (gold plated) Moveable — Gold/platinum/palladium/silver (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 — 565 mW max. @ 25°C

Duty Cycle — Continuous

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

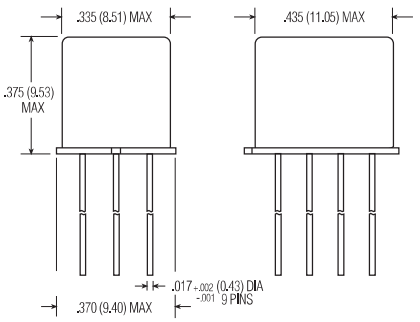
Pick-up Sensitivity — 60 mW max. @ 25°C

Contact Ratings

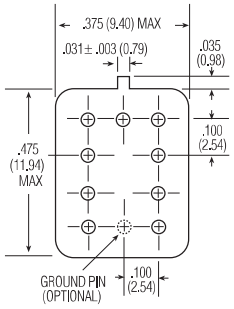
Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive (case not grounded)	100,000
100 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive	100,000
0.2 A @ 28 Vdc	Inductive (0.32 Henry)	100,000
0.1 A @ 28 Vdc	Lamp	100,000
30 µA @ 50 mVdc	Low Level	1,000,000
0.1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



MGST



MGST Enclosure



MGST Header

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

MGST (Continued)

Operating Characteristics

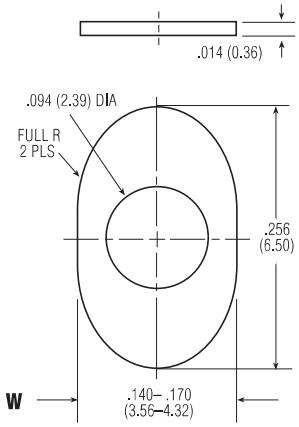
Timing —
Operate Time — 4.0 ms max.
Release Time — 7.5 ms max.
Contact Bounce — 1.5 ms max.
Dielectric Withstanding Voltage —
Between Open Contacts —
500 Vrms 60 Hz
Between Adjacent Contacts —
500 Vrms 60 Hz
Between Contacts & Coil —
500 Vrms 60 Hz
Insulation Resistance —
10,000 megohms min. @ 500 Vdc
1,000 megohms @ 500 Vdc
(coil to case @ +125°C)

Environmental Characteristics

Temperature Range —
-65°C to +125°C
Weight —
0.09 oz. (2.55 gms)
0.129 oz. (3.45 gms) w/ mounting 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-28776/7 (JMGST)

Semiconductor Characteristics

Diode —
100 Vdc peak inverse voltage (PIV)
1.0 Vdc max. transient voltage
Zener Diode —
20 Vdc ±3 Vdc over temperature range
MOSFET —
0.5 Vdc min. gate turn off voltage
4.3 Vdc max. gate turn on voltage



MGST Mounting Pad

Coil Data

Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±10% @ 25°C (Note)	Coil Circuit Current mA (Max.) (Note)	Coil Circuit Current mA (Min.) (Note)	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Max.) @ 125°C	Drop-Out Voltage Vdc (Min.) @ 25°C	Drop-Out Voltage Vdc (Min.) @ -65°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
MGST										
5.0	100	56.0	43.0	2.9	4.0	0.23	0.13	250	5.6	5
6.0	200	33.0	27.0	3.5	4.9	0.32	0.18	180	8.0	6
9.0	400	26.4	17.8	5.3	7.3	0.48	0.27	203	12.0	9
12.0	800	17.7	11.3	7.1	9.8	0.65	0.36	180	16.0	12
18.0	1,600	13.8	8.4	10.6	14.6	0.97	0.54	203	24.0	18
26.5	3,200	10.2	5.8	14.2	19.5	1.30	0.72	219	32.0	26

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

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	Terminals	Diodes	Ground Pins	Coils	Mounting Pads
	MGS	C	T	G	-26	W

* 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.

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

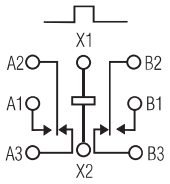
Double Pole, Electrically Held, 1 Amp and Less (Continued)

SMGA, SMGAD, SMGADD

SMGA

Standard .100 Grid Surface Mount High Performance Relay

Designed to MIL-R-39016/17



Terminal View

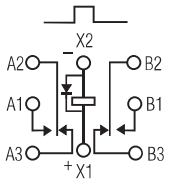
Product Facts

- Hermetically sealed
- High shock & vibration ratings
- Surface mount leads
- Excellent RF switching

SMGAD

Standard .100 Grid Diode Suppressed Surface Mount High Performance Relay

Designed to MIL-R-39016/18



Terminal View

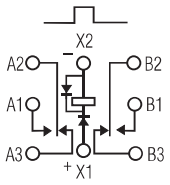
Product Facts

- Suppression diode
- Hermetically sealed
- High shock & vibration ratings
- Surface mount leads
- Excellent RF switching

SMGADD

Standard .100 Grid Diode Suppressed/Protected Surface Mount High Performance Relay

Designed to MIL-R-39016/19



Terminal View

Product Facts

- Suppression & protection diodes
- Hermetically sealed
- High shock & vibration ratings
- Surface mount leads
- Excellent RF switching

Electrical Characteristics

Contact Arrangement — 2 Form C (DPDT)

Contact Material — Stationary — Gold/platinum/palladium/silver (gold plated) Moveable — Gold/platinum/palladium/silver (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 — 660 mW max. @ 25°C

Duty Cycle — Continuous

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

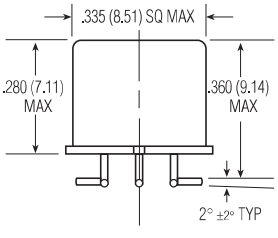
Pick-up Sensitivity — 130 mW max. @ 25°C

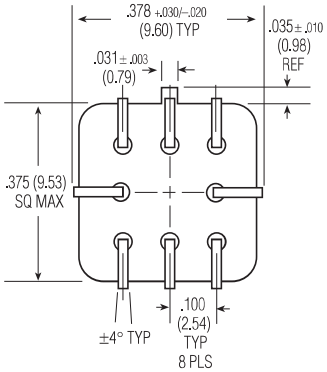
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

SMGA, SMGAD, SMGADD
(Continued)

Operating Characteristics

Timing —
Operate Time — 2.0 ms max.
Release Time —
SMGA — 1.5 ms max.
SMGAD/SMGADD — 4.0 ms max.
(suppression diode, protection/ suppression 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

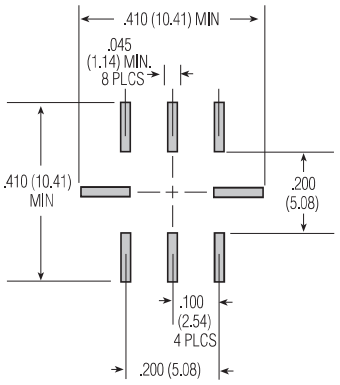
Weight —
0.09 oz. (2.55 gms)

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

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

Semiconductor Characteristics

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



Recommended Solder Pad Layout

Coil Data

Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±10% @ 25°C (Note)	Coil Circuit Current mA (Max.) (Note)	Coil Circuit Current mA (Min.) (Note)	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Max.) @ 125°C	Drop-Out Voltage Vdc (Min.) @ 25°C	Drop-Out Voltage Vdc (Min.) @ -65°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
SMGA/SMGAD										
5.0	50	n/a	n/a	2.7	3.5	0.22	0.14	500	5.8	5
6.0	98	n/a	n/a	3.5	4.5	0.28	0.18	367	8.0	6
9.0	220	n/a	n/a	5.3	6.8	0.54	0.35	368	12.0	9
12.0	390	n/a	n/a	7.0	9.0	0.63	0.41	369	16.0	12
18.0	880	n/a	n/a	10.5	13.5	0.91	0.59	368	24.0	18
26.5	1,560	n/a	n/a	14.2	18.0	1.37	0.89	450	32.0	26
SMGADD										
5.0	39	128.2	93.2	3.2	4.0	0.6	0.6	641	5.8	5
6.0	78	78.3	58.3	4.0	5.0	0.7	0.7	462	8.0	6
9.0	220	42.9	33.0	6.3	7.8	0.9	0.8	368	12.0	9
12.0	390	32.8	25.6	8.0	10.0	1.1	0.9	369	16.0	12
18.0	880	22.1	17.5	11.5	14.5	1.4	1.1	368	24.0	18
26.5	1,560	18.5	14.8	15.2	19.0	1.8	1.4	450	32.0	26

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

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**	**Diode**	**Coils**
	SMGA	D	-26

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

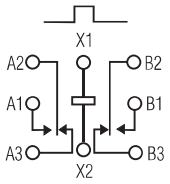
Double Pole, Electrically Held, 1 Amp and Less (Continued)

SMGS, SMGSD, SMGSDD

SMGS

Sensitive .100 Grid Surface Mount High Performance Relay

Designed to MIL-R-39016/41



Terminal View

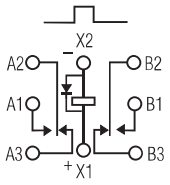
Product Facts

- Hermetically sealed
- High shock & vibration ratings
- Surface mount leads
- Excellent RF switching

SMGSD

Sensitive .100 Grid Diode Suppressed Surface Mount High Performance Relay

Designed to MIL-R-39016/42



Terminal View

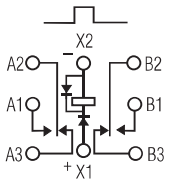
Product Facts

- Suppression diode
- Hermetically sealed
- High shock & vibration ratings
- Surface mount leads
- Excellent RF switching

SMGSDD

Sensitive .100 Grid Diode Suppressed/Protected Surface Mount High Performance Relay

Designed to MIL-R-39016/43



Terminal View

Product Facts

- Suppression & protection diodes
- Hermetically sealed
- High shock & vibration ratings
- Surface mount leads
- Excellent RF switching

Electrical Characteristics

Contact Arrangement — 2 Form C (DPDT)

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

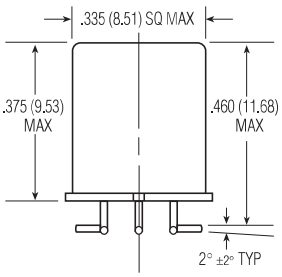
Pick-up Voltage — Approximately 50% of nominal coil voltage

Pick-up Sensitivity — 130 mW max. @ 25°C

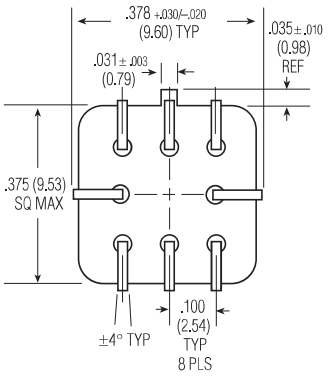
Contact Ratings

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

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208

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

SMGS, SMGSD, SMGSDD
(Continued)

Operating Characteristics

Timing —
Operate Time — 4.0 ms max.
Release Time —
SMGS — 2.0 ms max.
SMGSD/SMGSDD — 7.5 ms max.
(suppression diode, protection/ suppression 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

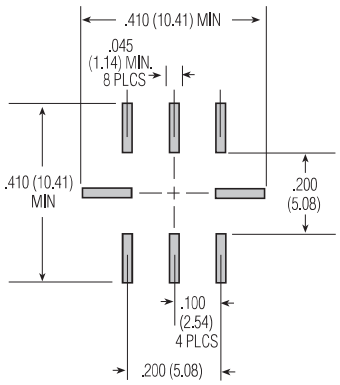
Weight —
0.09 oz. (2.55 gms)

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

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

Semiconductor Characteristics

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



Recommended Solder Pad Layout

Coil Data

Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ±10% @ 25°C (Note)	Coil Circuit Current mA (Max.) (Note)	Coil Circuit Current mA (Min.) (Note)	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Max.) @ 125°C	Drop-Out Voltage Vdc (Min.) @ 25°C	Drop-Out Voltage Vdc (Min.) @ -65°C	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
SMGS/SMGSD										
5.0	100	n/a	n/a	2.6	3.5	0.23	0.12	250	7.5	5
6.0	200	n/a	n/a	3.4	4.5	0.28	0.18	180	10.0	6
9.0	400	n/a	n/a	4.85	6.8	0.55	0.35	203	15.0	9
12.0	800	n/a	n/a	7.0	9.0	0.64	0.41	180	20.0	12
18.0	1,600	n/a	n/a	9.8	13.5	0.92	0.59	203	30.0	18
26.5	3,200	n/a	n/a	14.0	18.0	1.4	0.89	219	40.0	26
36.0	6,500	n/a	n/a	20.0	27.0	1.8	1.25	199	57.0	36
48.0	11,000	n/a	n/a	25.8	36.0	2.4	1.60	209	75.0	48
SMGSDD										
5.0	64	78.1	56.8	2.9	3.7	0.8	0.7	391	7.5	5
6.0	125	48.9	36.3	4.0	4.8	0.9	0.8	288	10.0	6
9.0	400	23.6	18.1	6.1	8.0	1.1	0.9	203	15.0	9
12.0	800	16.0	12.5	7.8	11.0	1.3	1.0	180	20.0	12
18.0	1,600	12.2	9.6	11.3	14.5	1.5	1.1	203	30.0	18
26.5	3,200	9.0	7.2	15.2	19.0	1.7	1.3	219	40.0	26
36.0	6,500	6.1	4.9	21.7	27.2	2.3	1.7	199	57.0	36
48.0	11,000	4.8	3.9	27.8	34.8	2.8	2.0	209	75.0	48

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

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**	**Diode**	**Coils**
	SMGS	D	-26

Catalog 5-1773450-5
Revised 9-08

www.tycoelectronics.com

Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

USA: 1-800-522-6752
Canada: 1-905-470-4425
Mexico: 01-800-733-8926
C. America: 52-55-1106-0803

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-8706-080-208