

T0-5 High-Performance Relays

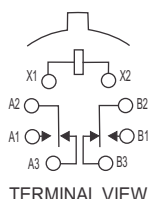
**CII Guardian
International Limited**
MIL GRADE RELAYS

MA-MAD-MADD

MA

Standard T0-5
High-Performance
Relay

Qualified to
MIL-PRF-39016/9



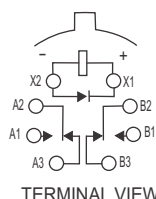
FEATURES

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

MAD

Standard T0-5
Diode Suppressed
High-Performance Relay

Qualified to
MIL-PRF-39016/15



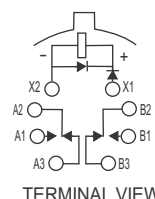
FEATURES

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

MADD

Standard T0-5 Diode
Suppressed/Protected
High-Performance Relay

Qualified to
MIL-PRF-39016/20



FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @
28 Vdc)

Mechanical Life Expectancy

1 million operations

Coil Voltage

5 to 30 Vdc

Coil Power

675 mW max. @ 25°C

Duty Cycle

Continuous

Pick-up Voltage

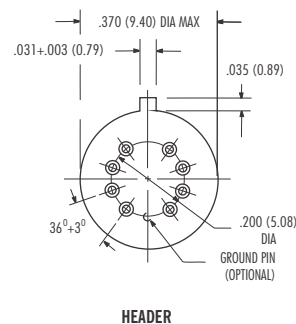
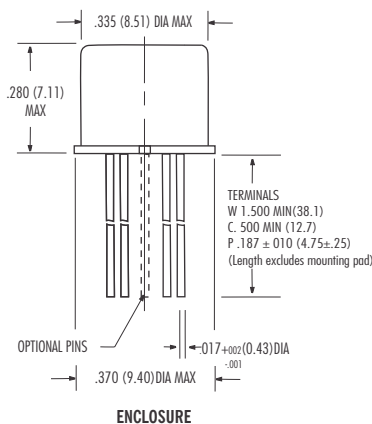
Approximately 50% of
nominal coil voltage

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 μ A @ 50 m Vdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



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 gms)

0.10 oz (2.80 gms) 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-PRF-39016/9 (JMA)

MIL-PRF-39016/15 (JMAD)

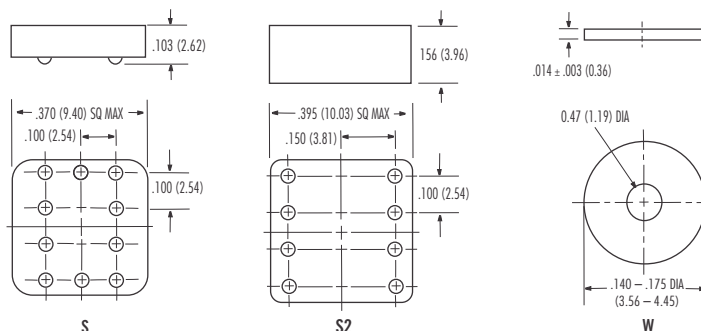
MIL-PRF-39016/20 (JMADD)

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.
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

Note 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.

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

Specifying a part number example:

Type	Terminals	Diodes	Ground Pins	Coils	Spreader/Mounting Pads
MA	C	D	G	26	S

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: cigmarketing@guardiangroup.in
Website: www.ciiguardian.net

T0-5 High-Performance Relays

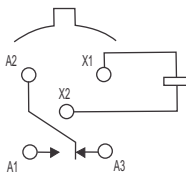
1MA-1MAD-1MADD

**CII Guardian
International Limited**
MIL GRADE RELAYS

1MA

Standard T0-5
High-Performance
Relay

Qualified to
MIL-PRF-39016/7



TERMINAL VIEW

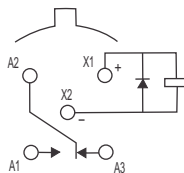
FEATURES

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

1MAD

Standard T0-5
Diode Suppressed
High-Performance Relay

Qualified to
MIL-PRF-39016/23



TERMINAL VIEW

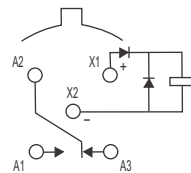
FEATURES

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

1MADD

Standard T0-5 Diode
Suppressed/Protected
High-Performance Relay

Qualified to
MIL-PRF-39016/24



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @ 28 Vdc)

Mechanical Life Expectancy

1 million operations

Coil Voltage

5 to 26 Vdc

Coil Power

512 mW max. @ 25°C

Duty Cycle

Continuous

Pick-up Voltage

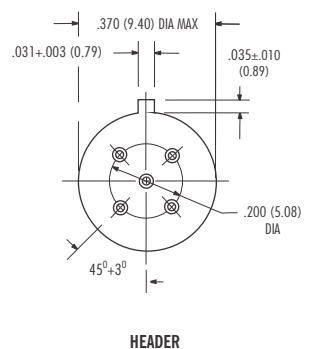
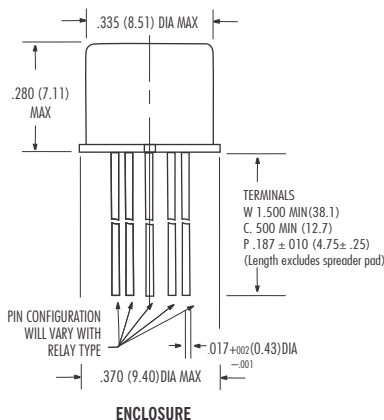
Approximately 50% of
nominal coil voltage

Pick-up Sensitivity

100 mW max. @ 25°C

CONTACT RATINGS

Contact Load	Type	Operations 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 mA @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



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 gms)

0.19 oz (2.52 gms) 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-PRF-39016/7 (J1MA)

MIL-PRF-39016/23 (J1MAD)

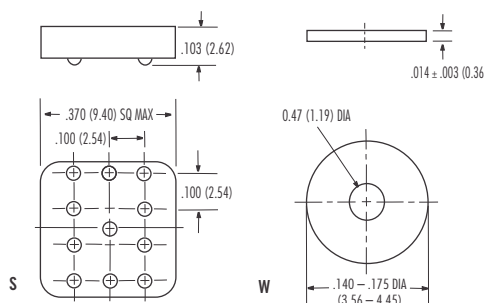
MIL-PRF-39016/24 (J1MADD)

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

Note 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.

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

Specifying a part number example:

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

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: cigmarketing@guardiangroup.in
Website: www.ciiguardian.net

T0-5 High-Performance Relays

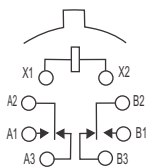
**CII Guardian
International Limited**
MIL GRADE RELAYS

MS-MSD-MSDD

MS

**Sensitive T0-5
High-Performance
Relay**

**Qualified to
MIL-PRF-39016/11**



TERMINAL VIEW

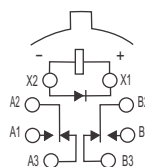
FEATURES

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

MSD

**Sensitive T0-5
Diode Suppressed
High-Performance Relay**

**Qualified to
MIL-PRF-39016/16**



TERMINAL VIEW

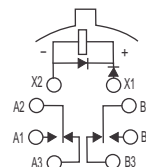
FEATURES

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

MSDD

**Sensitive T0-5 Diode
Suppressed/Protected
High-Performance Relay**

**Qualified to
MIL-PRF-39016/21**



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @ 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

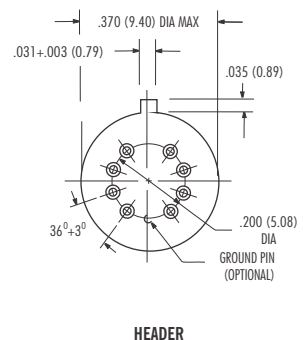
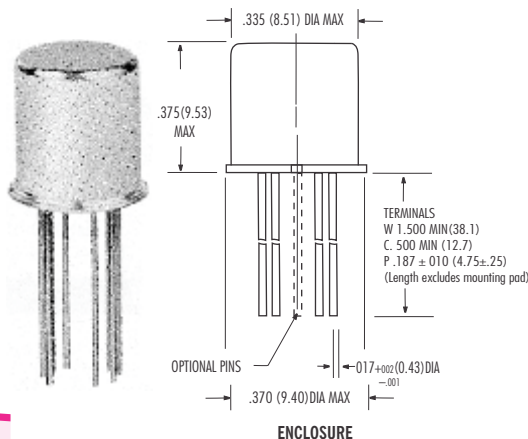
Approximately 50% of
nominal coil voltage

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 μ A @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



HEADER

ENCLOSURE

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 gms)

0.13 oz (3.45 gms) 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-PRF-39016/11 (JMS)

MIL-PRF-39016/16 (JMSD)

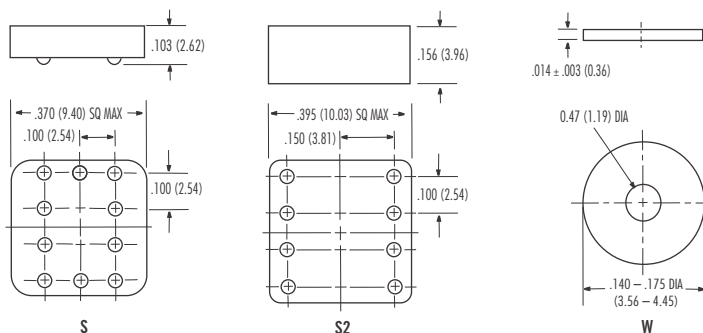
MIL-PRF-39016/21 (JMSDD)

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.
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

Note 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.

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

Specifying a part number example:

Type	Terminals	Diodes	Ground Pins	Coils	Spreader/Mounting Pads
MS	C	D	G	26	S

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: ciiguardian@guardiangroup.in
Website: www.ciiguardian.net

CAT/11-13/250-MS

T0-5 High-Performance Relays

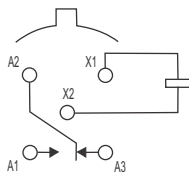
1MS-1MSD-1MSDD

**CII Guardian
International Limited**
MIL GRADE RELAYS

1MS

**Sensitive T0-5
High-Performance
Relay**

**Qualified to
MIL-PRF-39016/10**



TERMINAL VIEW

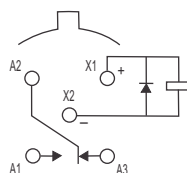
FEATURES

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

1MSD

**Sensitive T0-5
Diode Suppressed
High-Performance Relay**

**Qualified to
MIL-PRF-39016/25**



TERMINAL VIEW

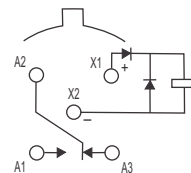
FEATURES

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

1MSDD

**Sensitive T0-5 Diode
Suppressed/Protected
High-Performance Relay**

**Qualified to
MIL-PRF-39016/26**



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @
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

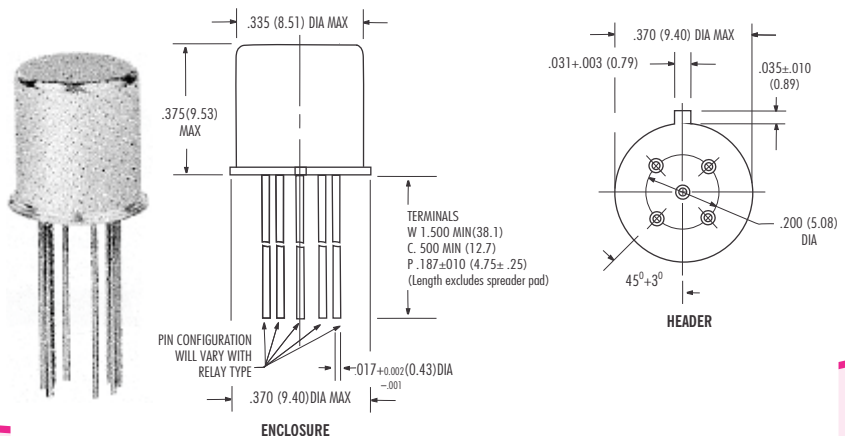
Approximately 50% of
nominal coil voltage

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 mA @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



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-PRF-39016/10 (J1MS)

MIL-PRF-39016/25 (J1MSD)

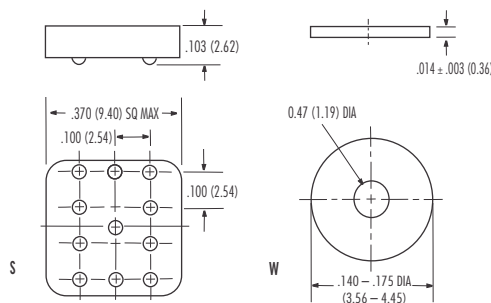
MIL-PRF-39016/26 (J1MSDD)

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 (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.
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

Note 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.

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

Specifying a part number example:

Type	Terminals	Diodes	Coils	Spreader/Mounting Pads
1MS	C	D	26	S

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: cigmarketing@guardiangroup.in
Website: www.ciiguardian.net

.100 Grid High-Performance Relays

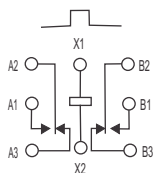
**CII Guardian
International Limited**
MIL GRADE RELAYS

MGA-MGAD-MGADD

MGA

Standard .100 Grid
High-Performance
Relay

Qualified to
MIL-PRF-39016/17



TERMINAL VIEW

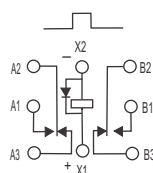
FEATURES

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

MGAD

Standard .100 Grid
Diode Suppressed
High-Performance Relay

Qualified to
MIL-PRF-39016/18



TERMINAL VIEW

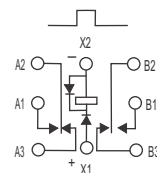
FEATURES

- 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-PRF-39016/19



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @
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

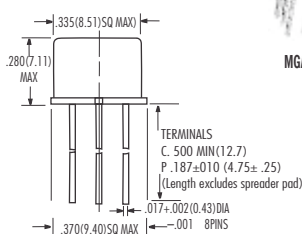
130 mW max. @ 25°C

CONTACT RATINGS

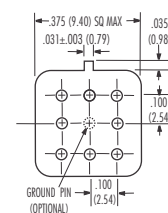
Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive (case not grounded)	100,000
100 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive	100,000
0.2 A @ 28 Vdc	Inductive (0.32 Henry)	100,000
0.1 A @ 28 Vdc	Lamp	100,000
30 μ A @ 50 mVdc	Low Level	1,000,000
0.1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



MGA



ENCLOSURE



HEADER

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-PRF-39016/17 (JMGA)

MIL-PRF-39016/18 (JMGAD)

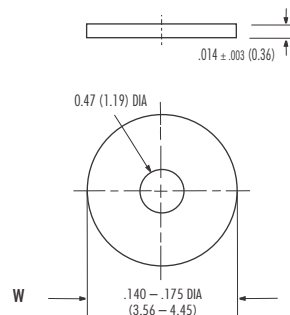
MIL-PRF-39016/19 (JMGADD)

SEMICONDUCTOR CHARACTERISTICS

Diode

100 Vdc peak inverse voltage (PIV)

1.0 Vdc max. transient voltage



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.

Specifying a part number example:

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

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: cigmarketing@guardiangroup.in
Website: www.ciiguardian.net

CAT/11-13/250-MGA

.100 Grid High-Performance Relays

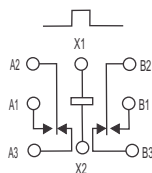
**CII Guardian
International Limited**
MIL GRADE RELAYS

MGS-MGSD-MGSDD

MGS

Sensitive .100 Grid
High-Performance
Relay

Qualified to
MIL-PRF-39016/41



TERMINAL VIEW

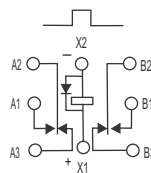
FEATURES

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

MGSD

Sensitive .100 Grid
Diode Suppressed
High-Performance Relay

Qualified to
MIL-PRF-39016/42



TERMINAL VIEW

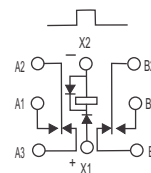
FEATURES

- 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-PRF-39016/43



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @
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

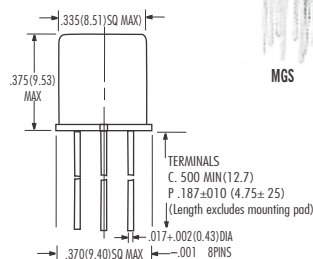
60 mW max. @ 25°C

CONTACT RATINGS

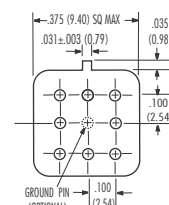
Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive (case not grounded)	100,000
100 mA @ 115 Vac, 60 Hz & 400 Hz	Resistive	100,000
0.2 A @ 28 Vdc	Inductive (0.32 Henry)	100,000
0.1 A @ 28 Vdc	Lamp	100,000
30 μ A @ 50 mVdc	Low Level	1,000,000
0.1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



MGS



ENCLOSURE



HEADER

OPERATING CHARACTERISTICS

Timing

Operate Time:

4.0 ms max.

Release Time:

MGS: 2.0 ms max.

MGSD/MGSD: 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-PRF-39016/41 (JMGS)

MIL-PRF-39016/42 (JMGSDD)

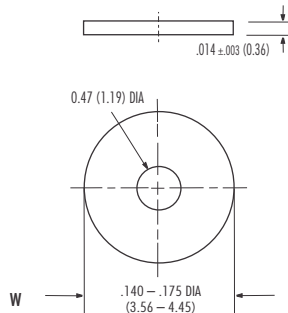
MIL-PRF-39016/43 (JMGSDD)

SEMICONDUCTOR CHARACTERISTICS

Diode

100 Vdc peak inverse voltage (PIV)

1.0 Vdc max. transient voltage



MGS/ MGSD/ MGSD
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
MGSD										
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.

Specifying a part number example:

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

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: cigmarketing@guardiangroup.in
Website: www.ciiguardian.net

.100 Grid Surface Mount High-Performance Relays

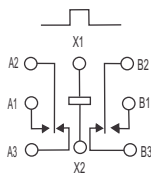
SMGA-SMGAD-SMGADD

CII Guardian International Limited
MIL GRADE RELAYS

SMGA

Standard .100 Grid Surface Mount High-Performance Relay

Designed to MIL-PRF-39016/17



TERMINAL VIEW

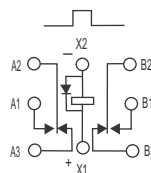
FEATURES

- 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-PRF-39016/18



TERMINAL VIEW

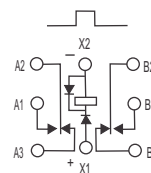
FEATURES

- 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-PRF-39016/19



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @ 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

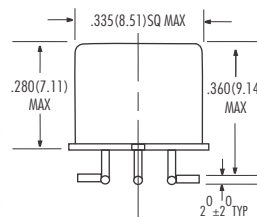
Approximately 50% of nominal coil voltage

Pick-up Sensitivity

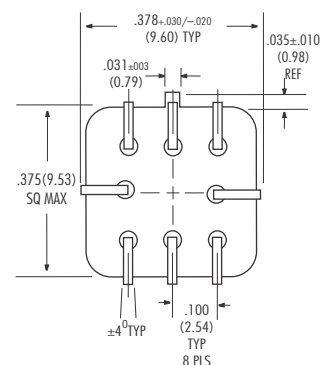
130 mW max. @ 25°C

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 μ A @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



ENCLOSURE



HEADER

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

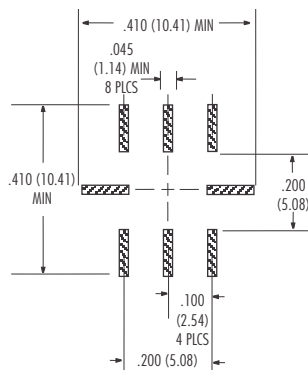
75 G's, 6 ± 1 ms max.

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.

Specifying a part number example:

Type	Coils
SMGA	26

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: ciigmarketing@guardiangroup.in
Website: www.ciiguardian.net

CAT/11-13/250-SMGA

.100 Grid Surface Mount High-Performance Relays

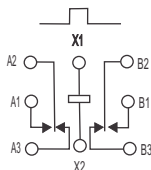
SMGS-SMGSD-SMGSD

CII Guardian International Limited
MIL GRADE RELAYS

SMGS

Sensitive .100 Grid Surface Mount High-Performance Relay

Designed to MIL-PRF-39016/41



TERMINAL VIEW

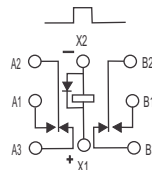
FEATURES

- 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-PRF-39016/42



TERMINAL VIEW

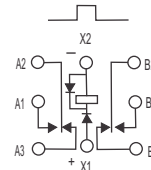
FEATURES

- 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-PRF-39016/43



TERMINAL VIEW

FEATURES

- 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 @ 10mA @ 6 Vdc)

After Life: 200 milliohms max. (measured @ 1A @ 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

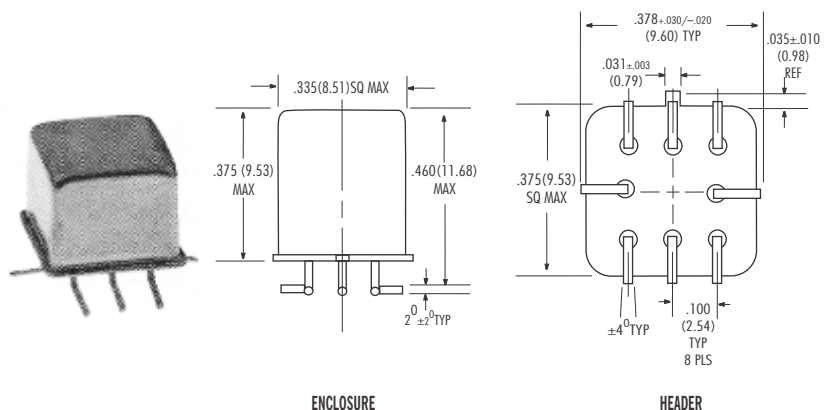
Approximately 50% of nominal coil voltage

Pick-up Sensitivity

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 μ A @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



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

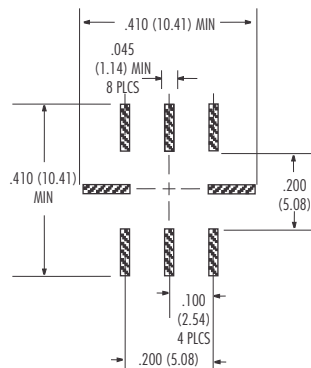
75 G's, 6 ± 1 ms max.

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.

Specifying a part number example:

Type	Coils
SMGS	26

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: cigmarketing@guardiangroup.in
Website: www.ciiguardian.net

CAT/11-13/250-SMGS

Half Size High-Performance Relays

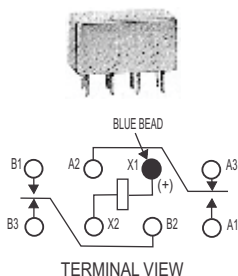
HFW-HFW4A-HFW5A-HMB-HMS

**CII Guardian
International Limited**
MIL GRADE RELAYS

HFW-HFW4A-HFW5A

Standard Half Size
High-Performance Relay

Qualified to
MIL-PRF-39016/6



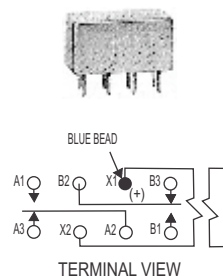
FEATURES

- Hermetically sealed
- Up to 5 amps switching
- High shock & vibration ratings
- Optional terminals & mounting styles
- Excellent RF switching

HMB

Bifilar Half Size
High-Performance Relay

Qualified to
MIL-PRF-39016/22



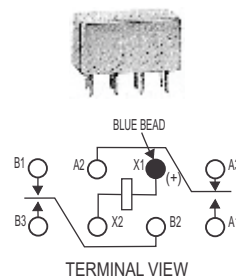
FEATURES

- Hermetically sealed
- Up to 2 amps switching
- High shock & vibration ratings
- Optional terminals & mounting styles
- Excellent RF switching

HMS

Sensitive Half Size
High-Performance Relay

Qualified to
MIL-PRF-39016/44



FEATURES

- Hermetically sealed
- Up to 2 amps switching
- High shock & vibration ratings
- Optional terminals & mounting styles
- Excellent RF switching

ELECTRICAL CHARACTERISTICS

Contact Arrangement

2 Form C (DPDT)

Contact Material

Stationary:

Hardened silver alloy

Moveable:

Gold plated hardened silver alloy.

Contact Resistance

Before Life: 50 milliohms max.

(measured @ 10mA @ 6 Vdc)

After Life: 100 milliohms max. (measured @ 2A @ 28 Vdc)

Mechanical Life Expectancy

50 million operations

Coil Voltage

5 to 48 Vdc

Coil Power

1.4watts max. @ 25°C

Duty Cycle

Continuous

Pick-up Voltage

Approximately 50% of nominal coil voltage

Pick-up Sensitivity @ 25°C

145 to 260 mW (HFW)

325 mW(HMB)

100 to 125 mW (HMS)

CONTACT RATINGS

Contact Load	Type	Operations Min.
HFW, HMB, HMS 2 A @ 28 Vdc	Resistive	100,000
HFW4A 4 A @ 28 Vdc	Resistive	100,000
HFW5A 5 A @ 28 Vdc	Resistive	100,000
0.75 A @ 28 Vdc	Inductive (200m H)	100,000
0.1 A @ 115Vac, 60Hz & 400Hz	Resistive	100,000
0.3 A @ 115Vac, 60Hz & 400Hz	Resistive	100,000
0.1 A @ 28 Vdc	Intermediate	50,000
0.160 A @ 28 Vdc	Lamp	100,000
30 μ A @ 50 m Vdc	Low Level	1,000,000

RF PERFORMANCE

Frequency (MHz)	RF Losses (dB)	VSWR	ISOLATION (dB)
100	0.1	1.17:1	40
500	0.3	1.19:1	28
1000	0.4	1.19:1	23

OPERATING CHARACTERISTICS

Timing

Operate Time:

4.0 ms max. (HFW)

5.0 ms max. (HMB)

6.0 ms max. (HMS)

Release Time:

4.0 ms max. (HFW)

5.0 ms max. (HMB/HMS)

Contact Bounce

2.0 ms max

Dielectric Withstanding Voltage

Between Open Contacts:

500 Vrms 60 Hz

Between Adjacent Contacts:

1000 Vrms 60 Hz

Between Contacts & Coil:

1000 Vrms 60 Hz

Insulation Resistance

10,000 megohms @ 500 Vdc

ENVIRONMENTAL CHARACTERISTICS

Temperature Range

-65°C to + 125°C

Weight

0.46 oz. (13 gms max.)

Vibration Resistance

HFW/HMB/HMS:

Standard: 20G's, 10 to 2,000Hz

HFW/HMB:

QPL: 30G's, 10 to 3,000Hz

HMS:

QPL: 20G's, 10 to 2,500Hz

Shock Resistance

100 G's, 6 ± 1 ms

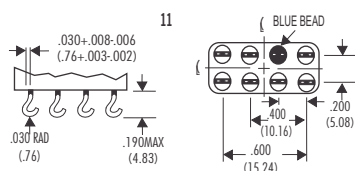
50 G's, 11 ± 1 ms (HMS)

QPL Approval

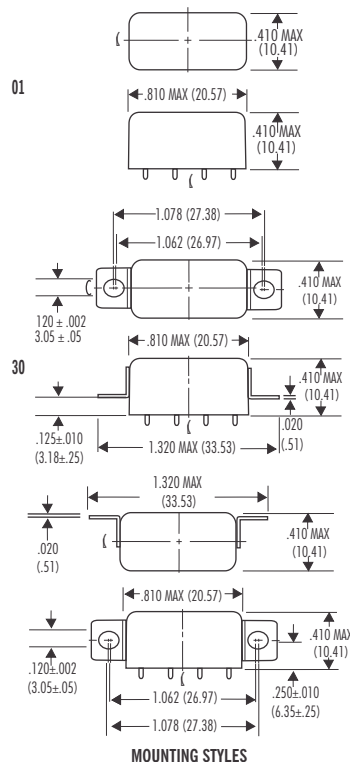
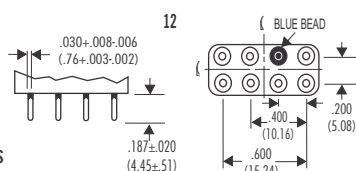
MIL-PRF-39016/6 (HFW)

MIL-PRF-39016/22 (HMB)

MIL-PRF-39016/44 (HMS)



TERMINALS



MOUNTING STYLES

STANDARD COIL DATA

	Nom. Coil Voltage (Vdc)	Coil Resistance in Ohms ± 10% @ 25°C	Pickup Voltage Vdc (Max.) @ 25°C	Pickup Voltage Vdc (Min.) @ 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.
HFW/HFW4A/HFW5A	5.0	27	2.7	3.8	0.29	0.21	926	6.0	L
	6.0	40	3.2	4.5	0.35	0.25	900	7.5	F
	12.0	160	6.4	9.0	0.7	0.5	900	15.0	G
	26.5	700	13.5	18.0	1.5	1.0	1003	32.0	K
HMB	6.0	40	3.6	4.8	0.35	0.25	900	7.5	F
	12.0	160	7.2	9.6	0.7	0.5	900	15.0	G
	26.5	700	15.0	20.0	1.5	1.0	1003	32.0	K
HMS	5.0	47	2.2	3.2	0.21	0.12	532	7.0	S001
	6.0	75	2.75	4.0	0.27	0.17	480	9.0	S002
	12.0	310	5.6	8.0	0.55	0.35	465	20.0	S003
	26.5	1,030	11.4	16.5	1.1	0.7	682	35.0	S004
	30.0	1,620	14.3	21.0	1.4	0.9	556	44.0	S005
	36.0	2,640	18.0	26.0	1.8	1.1	491	56.0	S006
OTHER	6-8	60	3.5	4.85	0.35	0.22	817	9.0	A
	(avail. for 12-15	320	6.8	9.42	0.68	0.44	570	21.0	B
	HFW/HFW4A	520	9.5	13.16	0.95	0.62	623	27.0	J
	relays only)	1,250	14.0	19.4	1.5	0.98	684	42.0	D
	40.0	2,700	21.3	29.5	2.1	1.37	593	61.0	H
	48.0	3,500	25.5	35.3	2.5	1.63	658	70.0	E

Specifying a part number example:

Type	Terminals	Mountings	Coils	Features
HFW	12	30	K	00(n/a HMS)

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682 020, Kerala, India
Ph: 0484-2316606, 2317031 Fax: 0484-2317032
E-mail: ciiguardian@guardiangroup.in
Website: www.ciiguardian.net

CAT/11-13/250-HFW

T0-5 High-Performance Relays

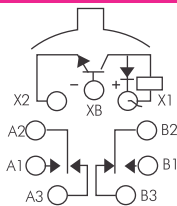
MAT-MST

CII Guardian
International Limited
MIL GRADE RELAYS

MAT

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

**Qualified to
MIL-R-28776/1**



Terminal View

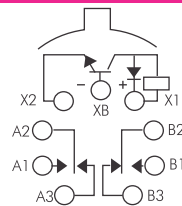
Product Facts

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

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 pad
- Excellent RF switching

ELECTRICAL CHARACTERISTICS

Contact Arrangement

2 Form C (DPDT)

Contact Material

Stationary-Gold /platinum/palladium/silver alloy(gold plated)

Movable:

Gold/platinum/palladium/silver alloy(gold plated)

Contact Resistance

Before Life: 100 milliohms max (measured@10mA@6Vdc)

After Life: 200 millions max (measured@1A@28Vdc)

Mechanical Life Expectancy

1 million operations

Coil Power

MAT: 675 mW max.@25°C

MST: 565 mW max.@25°C

Duty Cycle

Continuous

Pick up Voltage

Approximately 50% of nominal coil voltage

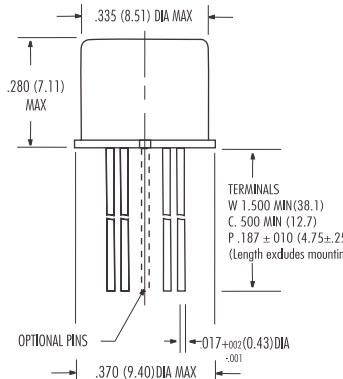
Pick up Sensitivity

MAT: 130 mW max.@25°C

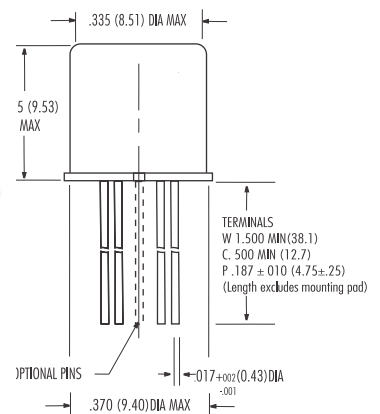
MST: 60 mW max.@25°C

CONTACT RATINGS

Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250mA @ 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 μ A @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



ENCLOSURE (MAT)



ENCLOSURE (MST)

OPERATING CHARACTERISTICS

Timing

Operate Time
MAT: 2.0 ms max
MST: 4.0 ms max

Release Time:
MAT & MST 7.5 ms max

Contact Bounce

1.5 ms max

Dielectric Withstanding Voltage

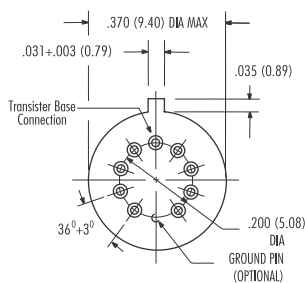
Between Open Contacts:
500 Vrms 60Hz

Between Adjacent Contacts:
500 Vrms 60Hz

Between Contacts & Coil:
500 Vrms 60Hz

Insulation Resistance

10,000 megohms@500 Vdc
1,000 megohms@500 Vdc
(coil to case @+125°C)



**HEADER
MAT & MST**

ENVIRONMENTAL CHARACTERISTICS

Temperature Range

-65°C to +125°C

Weight

MAT: 0.09 oz(2.55 grms)
MAT: 0.10 oz.(2.80 grms)
with spreader pad attached
MST: 0.12 oz(3.40 grms)
MST: 0.13 oz.(3.45 grms) with
spreader pad attached

Vibration Resistance

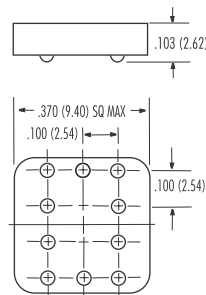
30 G's, 10 to 3000Hz

Shock Resistance

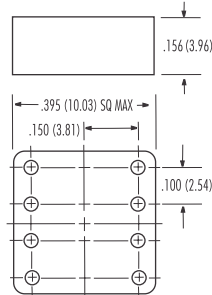
75 G's, 6± 1 ms max

QPL Approval

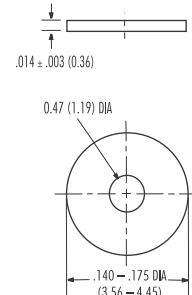
MIL-R-28776/1(JMAT)
MIL-R-28776/3(JMST)



S



S2



W

Spreader & Mounting Pads(MAT & MST)

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 d.) (Note 1 & 2)	Pick up Voltage Vdc (Max.) @ 25°C (Note 2)	Base Turn On Current mA (Max.) @ 25°C	Pick up Voltage Vdc (Max.) @ 125°C (Note 2)	Base Turn On Current mA (Max.) @ 125°C	Drop-Out Voltage Vdc (Min d.) @ 25°C (Note 2)	Drop-Out Voltage Vdc (Min d.) @ -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	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
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

Note 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.

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

Specifying a part number example: **Type** **Terminals** **Diodes** **Ground Pins** **Coils** **Spreader/Mounting Pads**
MA/MS C T G 26 S

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

**CII Guardian
International Limited**

149, Giri Nagar, Cochin - 682020, Kerala, India
Ph: 0484-2316606, 2317031, Fax: 0484-2317032
E-mail: ciiguardian@guardiangroup.in
Website: www.ciiguardian.net

T0-5 High-Performance Relays

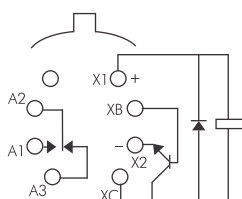
1 MAT-1 MST

**CII Guardian
International Limited**
MIL GRADE RELAYS

1 MAT

**Standard T0-5
Diode Suppressed/Transistor Driven
High Performance Relay**

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



Terminal View

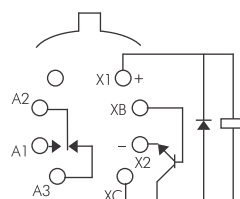
Product Facts

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

1 MST

**Sensitive T0-5
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)
Movable: Gold /platinum/palladium/silver alloy(gold plated)

Contact Resistance

Before Life: 100 milliohms max
(measured@10mA@6Vdc)

After Life: 200 milliohms max
(measured@1A@28Vdc)

Mechanical Life Expectancy

1 million operations

Coil Power

1 MAT: 512 mW max.@25°C
1 MST: 506 mW max.@25°C

Duty Cycle

Continuous

Pick up Voltage

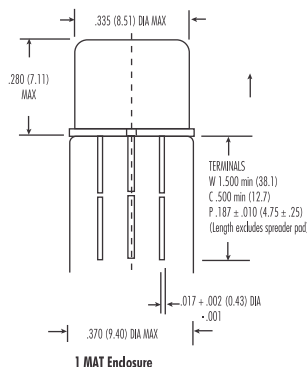
Approximately 50%
of nominal coil voltage

Pick up Sensitivity

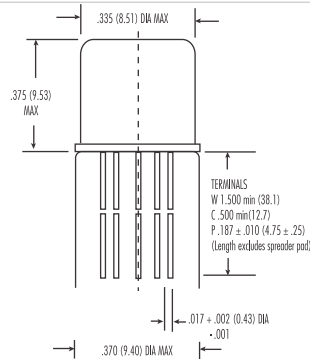
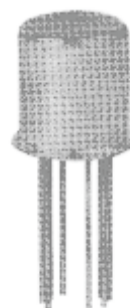
1MAT: 100 mW max.@25°C
1 MST: 40 mW max.@25°C

CONTACT RATINGS

Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250mA @ 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 μ A @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



1 MAT Enclosure



1 MST Enclosure

OPERATING CHARACTERISTICS

Timing

1 MAT: Operate Time
2.0 ms max
Release Time: 4.0 ms max
1 MST: Operating 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 60Hz

Between Adjacent Contacts:
500 Vrms 60Hz

Between Contacts & Coil:
500 Vrms 60Hz

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

1 MAT: 0.08 oz(2.27 grms)
1 MAT: 0.09 oz.(2.52 grms)
with spreader pad attached
1 MST: 0.10 oz(2.84 grms)
1 MST: 0.11 oz.(3.09 grms)
with spreader pad attached

Vibration Resistance

30 G's, 10 to 3000Hz

Shock Resistance

75 G's, 6± 1 ms max

QPL Approval

MIL-R-28776/5(J1MAT)
MIL-R-28776/4(J1MST)

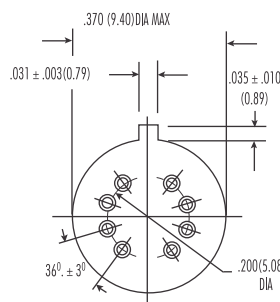
SEMICONDUCTOR CHARACTERISTICS

Diode

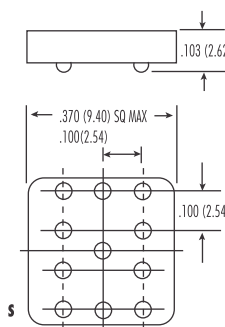
100 Vdc peak inverse voltage(PIV)
1.0 Vdc max transient voltage

Transistor

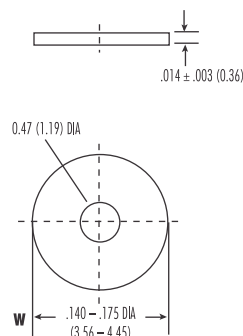
0.3 Vdc min. Base turn off voltage
6.0 Vdc min. Emitter-base breakdown voltage
(BV_{EBO})@25°C
80.0 Vdc min. Collector base breakdown voltage
(BV_{CBO})@25°C & I_C=100μA



Header
1 MAT & 1MST



Spreader & Mounting Pads (1 MAT & 1 MST)



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 d.) (Note 1 & 2)	Pick up Voltage Vdc (Max.) @ 25°C (Note 2)	Base Turn On Current mA (Max.) @ 25°C	Pick up Voltage Vdc (Max.) @ 125°C (Note 2)	Base Turn On Current mA (Max.) @ 125°C	Drop-Out Voltage Vdc (Min d.) @ 25°C (Note 2)	Drop-Out Voltage Vdc (Min d.) @ -65°C (Note 2)	Nom. Coil Power (mW) @ 25°C	Max. Coil Voltage	Coil Desig.
1 MAT												
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
1 MST												
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	4000	7.7	5.7	12.8	0.05	19.0	0.20	1.37	0.89	176	45.0	26
32	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

Note 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.

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

Specifying a part number example: **Type** **Terminals** **Diodes** **Coils** **Spreader/Mounting Pads**
1 MA/1 MS C T 26 S

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682020, Kerala, India
Ph: 0484-2316606, 2317031, Fax: 0484-2317032
E-mail: ciigmarketing@guardiangroup.in
Website: www.ciiguardian.net

A joint venture with **TE** USA
connectivity

CAT/11-13/250-1MAT/1MST

.100 Grid High Performance Relays

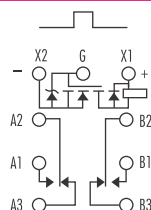
MGAT - MGST

**CII Guardian
International Limited**
MIL GRADE RELAYS

MGAT

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

Qualified to
MIL-R-28776/6



Terminal View

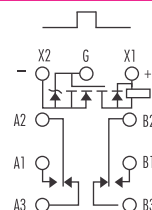
Product Facts

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

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 diode
- 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)
Movable: Gold /platinum/palladium/silver (gold plated)

Contact Resistance

Before Life: 100 milliohms max(measured@10mA@6Vdc)

After Life: 200 milliohms max (measured@1A@28Vdc)

Mechanical Life Expectancy

1 million operations

Coil Power

MGAT: 660 mW max.@25°C
MGST: 565 mW max.@25°C

Duty Cycle

Continuous

Pick up Voltage

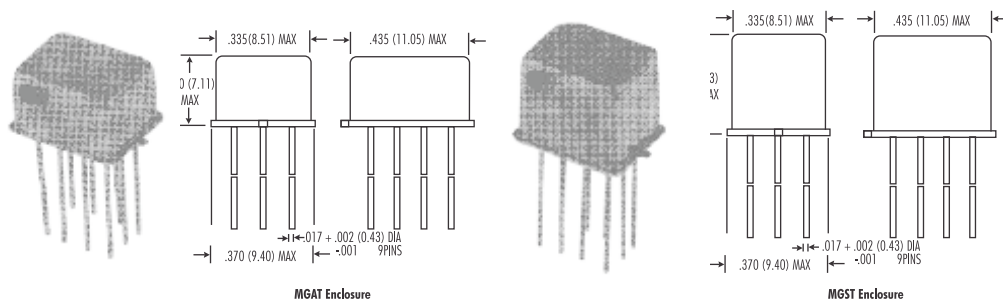
Approximately 50% of nominal coil voltage

Pick up Sensitivity

MGAT: 130 mW max.@25°C
MGST: 60 mW max.@25°C

CONTACT RATINGS

Contact Load	Type	Operations Min.
1.0 A @ 28 Vdc	Resistive	100,000
250mA @ 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 μ A @ 50 mVdc	Low Level	1,000,000
0.1 A @ 28 Vdc	Intermediate Current	50,000



OPERATING CHARACTERISTICS

Timing

Operate Time
MGAT: 2.0 ms max
MGST: 4.0 ms max
MGST Release Time:
7.5 ms max

Contact Bounce

1.5 ms max

Dielectric Withstanding Voltage

Between Open Contacts:
500 Vrms 60Hz
Between Adjacent Contacts:
500 Vrms 60Hz
Between Contacts & Coil:
500 Vrms 60Hz

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)
0.129 oz.(3.45 grms)
with mounting pad attached

Vibration Resistance

30 G's, 10 to 3000Hz

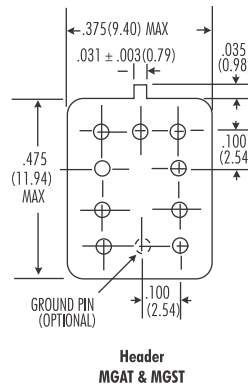
Shock Resistance

75 G's, 6± 1 ms max

QPL Approval

MIL-R-28776/6(JMGAT)

MIL-R-28776/7(JMGST)



SEMICONDUCTOR CHARACTERISTICS

Diode

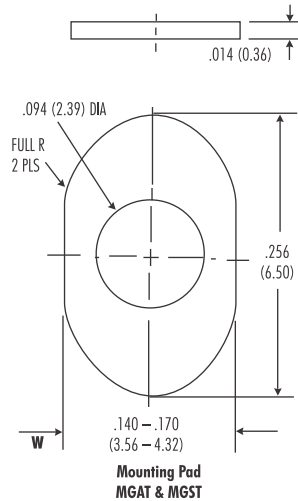
100 Vdc peak inverse voltage(PIV)
1.0 Vdc max transient voltage

Zener Diode

20 Vdc ±3 Vdc over temperature range

MOSFET

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



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)	Pick up Voltage Vdc (Max.) @ 25°C	Pick up Voltage Vdc (Min.) @ 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
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 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.

Specifying a part number example: **Type** **Terminals** **Diodes** **Ground Pins** **Coils** **Mounting Pads**
MGA/MGS C T G 26 W

The part number example shown above is for catalogue items.
For a specific QPL part number, please contact us.

CII Guardian International Limited

149, Giri Nagar, Cochin - 682020, Kerala, India
Ph: 0484-2316606, 2317031, Fax: 0484-2317032
E-mail: ciigmarketing@guardiangroup.in
Website: www.ciiguardian.net

A joint venture with **TE** USA
connectivity

CAT/11-13/250-MGAT/MGST