

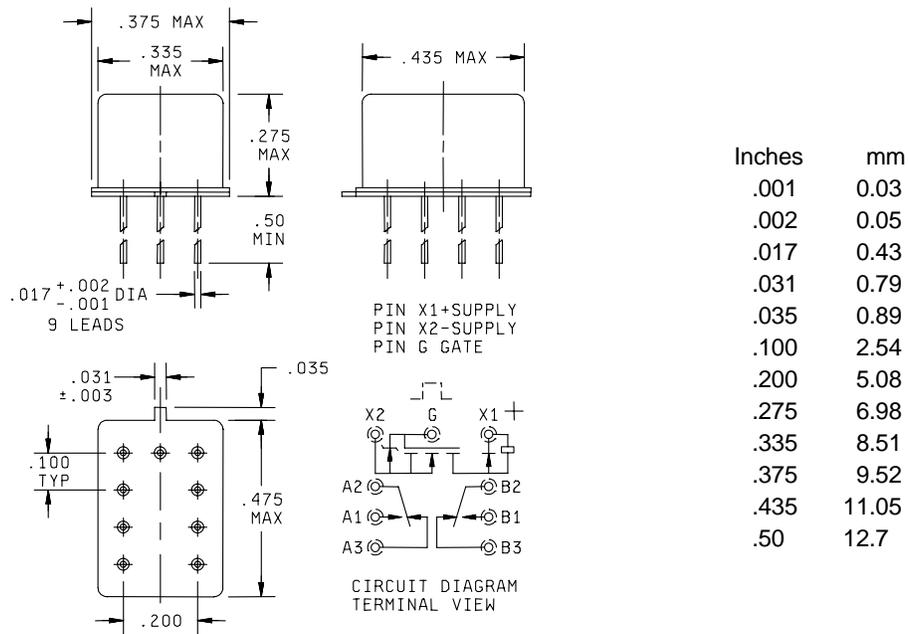
MIL-PRF-28776/6E  
 23 June 2003  
 SUPERSEDING  
 MIL-PRF-28776/6D  
 8 July 1996

PERFORMANCE SPECIFICATION SHEET

RELAYS, HYBRID, ESTABLISHED RELIABILITY, DPDT, LOW LEVEL TO 1.0 AMPERE  
 INTERNAL MOSFET DRIVE WITH ZENER DIODE GATE PROTECTION  
 (ELECTROMECHANICAL OUTPUT)  
 DIODE COIL SUPPRESSION AND TERMINALS WITH 0.100 GRID LEAD SPACING

This specification sheet is approved for use by all Departments  
 and Agencies of the Department of Defense.

The complete requirements for acquiring the product described herein shall  
 consist of this specification sheet and the latest issue of MIL-PRF-28776.

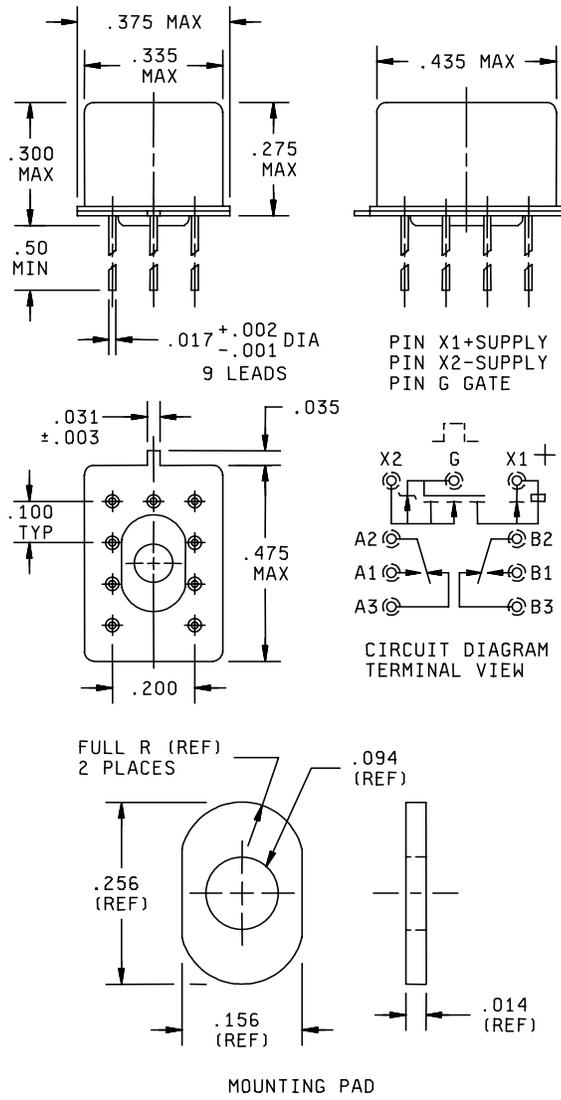


NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.010$  (0.25 mm).
4. Terminal numbers shown above are for reference only. Numbers do not appear on the relay.
5. Relays shall have a plus (+) sign placed on the circuit diagram as shown.
6. Coil symbol optional in accordance with MIL-STD-1285.
7. Circuit diagram shown on part is the terminal view.

FIGURE 1. Dimensions and configuration.

MIL-PRF-28776/6E



Inches	mm
.001	0.03
.002	0.05
.003	0.08
.005	0.13
.010	0.25
.017	0.43
.031	0.79
.035	0.89
.094	2.38
.100	2.54
.156	3.96
.170	4.32
.200	5.08
.256	6.50
.275	6.98
.294	7.47
.335	8.51
.370	9.40
.435	11.05
.470	11.94
.50	12.7

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.010$  (0.25 mm).
4. Spacer pad shall be a polyester film. Spacer pad shall be rigidly attached to the relay as shown.
5. Terminal numbers shown above are for reference only. Numbers do not appear on the relay.
6. Relays shall have a plus (+) sign placed on the circuit diagram as shown.
7. Coil symbol optional in accordance with MIL-STD-1285.
8. Circuit diagram shown on part is the terminal view.

FIGURE 2. Dimensions and configuration relay with mounting pad.

REQUIREMENTS:

CONTACT DATA:

Load ratings:

High level (relay case grounded):

Resistive:

1.0 ampere at 28 V dc.

250 milliamperes at 115 V ac 60 and 400 Hz case not grounded.

100 milliamperes at 115 V ac 60 and 400 Hz case grounded.

Inductive load: 0.2 ampere at 28 V dc with 0.32 henry inductance.

Lamp: 0.10 ampere at 28 V dc.

Low level: 10  $\mu$ A to 50  $\mu$ A at 10 mV to 50 mV dc or peak ac maximum.

Intermediate current: Applicable.

Contact resistance or voltage drop:

Initial: 100 m $\Omega$  maximum, 110 m $\Omega$  maximum with spacer pad, (tested at 10 mA maximum at 6 V dc maximum or peak ac).

High level:

During life: Not more than 5 percent of open circuit voltage.

After life: 200 m $\Omega$  maximum (210 m $\Omega$  maximum with spacer pad).

Low level:

During life: 100  $\Omega$  maximum.

After life: 150 m $\Omega$  maximum (160 m $\Omega$  maximum with spacer pad).

Intermediate current:

During life: 1  $\Omega$  maximum.

After life: 200 m $\Omega$  maximum (210 m $\Omega$  maximum with spacer pad).

Contact bounce: 1.5 milliseconds maximum.

Contact stabilization time: 2.0 milliseconds maximum.

Overload (high level only): Two times rated current. Not applicable to ac load ratings.

MIL-PRF-28776/6E

COIL DATA:

Supply voltage: See table I.

Turn-off time: 4.0 ms maximum.

Turn-on time: 2.5 ms maximum.

DIODE DATA:

Zener voltage: 20 ±3 V dc over the temperature range.

Coil transient suppression: 1.5 V maximum.

Diode peak inverse voltage: 100 V minimum.

TRANSISTOR DATA:

Specified gate turn-off voltage: 0.5 V dc maximum.

Specified gate turn-on voltage: 4.3 V dc minimum.

Maximum gate voltage: 15 V dc.

ELECTRICAL DATA:

Insulation resistance: 10,000 MΩ minimum at 500 V dc, except the resistance between coil and case at high temperature shall be 1,000 MΩ minimum.

Dielectric withstanding voltage:

	Sea level V rms (60 Hz)	Post intermediate current life test Sea level V rms (60 Hz)	Altitude V rms (60 Hz)
Between case, frame or enclosure, and all contacts in the energized and deenergized positions: -----	500	500	125 All terminals to case
Between case, frame or enclosure, and coil: -----	500	500	
Between all contacts and coil: -----	500	500	
Between open contacts in the energized and deenergized positions: -----	500	375	
Between contact poles in the energized and deenergized positions: -----	500	500	

ENVIRONMENTAL DATA:

Temperature range: -65°C to +125°C.

Shock (specified pulse): Applicable. Test condition B.

Magnetic interference: Applicable.

Salt atmosphere (corrosion): Applicable.

MIL-PRF-28776/6E

PHYSICAL DATA:

Terminal strength: Applicable.

Pull test: Test condition A, 1 pound pull.

Bend test: Test condition C, 0.5 pound pull.

Twist test: Applicable.

Dimensions and configuration: See figures 1 and 2.

Weight: 3.12 grams (0.11 ounce) maximum.

Seal: Hermetic.

Minimum marking: As specified in MIL-PRF-28776.

LIFE TEST REQUIREMENTS:

High level: 100,000 cycles.

Low level: 100,000 cycles.

Intermediate current: 50,000 cycles.

Mechanical life: 1,000,000 cycles.

Part or Identifying Number (PIN): M28776/6- (dash number from table I and suffix letter designating failure rate level).

TABLE I. Dash numbers and characteristics. 1/

Dash numbers 2/		Supply voltage (V dc) 4/		At +25°C						Over temperature range		
.500 min leads	Mounting pads 3/			Coil resistance (ref. only) ohms 5/	Coil circuit current (mA) 5/ 6/		Spec. pick-up volt. (V dc) 6/	Spec. hold volt. (V dc) 6/	Spec. dropout volt. (V dc) 6/	Spec. pickup volt. (V dc) 6/	Spec. hold volt. (V dc) 6/	Spec. dropout volt. (V dc) 6/
					Max	Min						
		Rated	Max									
001	007	5.0	5.6	39	132.3	96.5	2.9	1.4	0.23	4.0	2.3	0.13
002	008	6.0	8.0	78	83.9	60.3	3.5	2.0	0.32	4.9	3.2	0.18
003	009	9.0	12.0	220	47.1	33.1	5.3	3.0	0.48	7.3	4.9	0.27
004	010	12.0	16.0	390	36.1	24.9	7.1	4.0	0.65	9.8	6.5	0.36
005	011	18.0	24.0	880	24.1	16.1	10.6	6.0	0.97	14.6	9.8	0.54
006	012	26.5	32.0	1,560	19.9	12.9	14.2	8.0	1.30	19.5	13.0	0.72

- 1/ Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc maximum or peak ac open circuit are not recommended for subsequent use in low level applications.
- 2/ The suffix letter L, M, P, or R to designate the applicable failure rate level shall be added to the applicable listed dash number. Failure rate level (percent per 10,000 cycles): L, 3.0; M, 1.0; P, 0.1; R, 0.01. Example: 001L - - - - -006R.
- 3/ Relays supplied with spacer pads (-007 through -012) shall have the pad rigidly attached.
- 4/ CAUTION: The use of any supply voltage less than the rated supply voltage will compromise the operation of the relay.
- 5/ Coil resistance not directly measurable at relay terminals. When rated supply voltage is applied to the supply terminals, the coil circuit current must be within the limits shown. Measure at 25°C at rated supply voltage for 5 seconds, maximum.
- 6/ Set control signal voltage from 4.3 V dc to 15 V dc during electrical measurements.

6

MIL-PRF-2876/6E

MIL-PRF-28776/6E

QUALIFICATION INSPECTION:

Qualification inspection and sample size: See table II.

TABLE II. Qualification inspection and sample size. 1/

Single submission	Group submission	
37 units plus 1 unsealed unit for level L at C = 1 2/	M28776/6-006	37 units plus 1 unsealed unit for level L at C = 1 2/
63 units plus 1 unsealed unit for level M at C = 1 2/		63 units plus 1 unsealed unit for level M at C = 1 2/
Qualification inspection as applicable.		Qualification inspection as applicable.
	M28776/6-001	2 units each PIN
	M28776/6-002	Qualification inspection group I.
	M28776/6-003	
	M28776/6-004	
	M28776/6-005	

1/ For retention of qualification or extension of qualification to lower failure rate levels, all life test data accumulated on MIL-PRF-28776/7 may be used in addition to MIL-PRF-28776/6 data.

2/ The number of units required for qualification testing shall be increased as required in group Q5, of table II, MIL-PRF-28776, if the relay manufacturer elects to test the number of units permitting two or more failures. Prior to performance of qualification inspection testing, the relay manufacturer shall preselect the sampling plan.

Qualification inspection testing for relays supplied with spacer pads (-007 through -012), two (2) units of the 26.5 volt rated coil voltage (-012) shall be tested as follows:

Perform A1 tests of group A inspection. Attach spacer pad to relay. Perform A2, A3, and A4 tests of group A inspection.

Group A inspection testing for relays supplied with spacer pads (-007 through -012) shall be tested as follows:

Perform A1 tests of group A inspection. Attach spacer pad to relay. Perform A2, A3, and A4 tests of group A inspection.

Qualification inspection (reduced testing) and sample size: See table III. If the relays produced for MIL-PRF-28776/6 are similar in construction and design except for the coils to the relays produced for MIL-PRF-28776/7, then reduced testing for qualification of MIL-PRF-28776/6 relays may be performed concurrent with or subsequent to successful qualification of MIL-PRF-28776/7 relays.

TABLE III. Qualification inspection (reduced testing).

Examination or test
2 units each supply voltage: Group Q1 of qualification inspection table.
1 unsealed sample unit: Internal examination.

Custodians:  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC  
(Project 5945-1189-05)