

150 Grid-space Relays Magnetic-latching

Type 3SBM (4PDT)

Features

- Low profile... only 0.32 inch high
- Internal diode for coil transient suppression available
- MIL-R-39016/31, 35, 36
- Suitable for pulse operation—2 ms at rated voltage

Description

The Type 3SBM relay adds magnetic-latching capability to the popular and growing family of 150-grid relays. This relay has memory in that the contact positions do not change when coil power is removed. Switching is accomplished by applying power to the applicable coil (dual coil) or with the applicable polarity (single coil). The low switching power requirements are further enhanced by its ability to operate from capacitor discharge or other pulses or through its own contacts from batteries or similarly limited supplies.

Other Specifications

Contact Arrangement:

4-pole double-throw (4C)

Operate Sensitivity:

Single-coil form, 100 mW, dual-coil form, 180 mW

Contact Ratings:

DC resistive—2 amps at 28 volts
DC inductive—0.5 amps at 28 volts, 200 mH

AC resistive—0.5 amps at 115 volts (enclosure isolated from ground, or enclosure and movable contact at same potential)

AC 0.125 amps at 115 volts (enclosure at line potential with respect to movable contact)

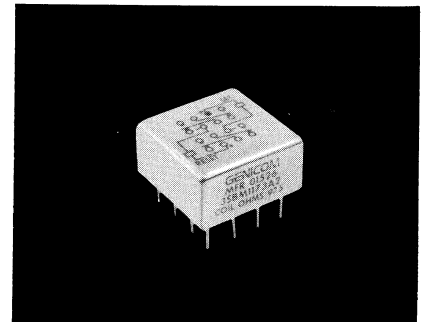
Low-level—50 μ A at 50 mV
Peak AC or DC

Contact Resistance:

0.050 ohms max.;
0.150 ohms after life tests

Life:

100,000 operations at rated loads listed;
1,000,000, operations at low-level loads



Operate Time:

4 ms max.

Reset Time:

4 ms max.

Bounce:

1.5 ms

Dielectric Strength:

500 volts rms at sea level;
350 volts rms at 70,000 feet and above

Insulation Resistance:

1,000 megohms minimum over temperature range

Vibration:

30G, 55-3000 Hz

Shock:

150G at 11 ms

Temperature:

— 65C to +125C

See page 22 for Mounting Forms, Terminals and Circuit Diagrams.

Coil Table (All Values DC)*

Coil Code Letter	SINGLE COIL, SENSITIVITY 1, (100 mW)			
	Coil Resistance @ 25C (Ohms) ± 10%	Maximum Set-Reset Values		Suggested Source Volts‡
		Calibration Code 5 Voltage (Volts)	Calibration Code 6 Current (mA)	
N	57	2.4	42	3.6– 8.5
R	256	5.1	20	7.6–18
T	830	9.1	11	14–32
V	1700	13.0	7.7	20–46
W	3250	18.0	5.5	28–63

Coil Code Letter	DUAL COIL, SENSITIVITY CODE 2, (180 mW)			
	Coil Resistance @ 25C (Ohms) ± 10%	Maximum Set-Reset Values		Suggested Source Volts‡
		Calibration Code 5 Voltage (Volts)	Calibration Code 6 Current (mA)	
H	10	1.4	135	2.0– 3.7
N	37	2.6	70	3.8– 7.2
R	145	5.2	35	7.6–14.5
T	450	9.0	20	14–25
V	975	13.5	13.5	20–35
W	2140	20.0	9.2	30–54

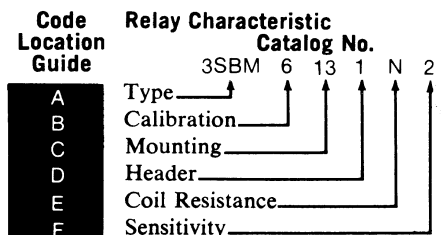
* Values are factory test and inspection values. User should allow for meter variations.

† Applicable over the operating temperature range in circulating air.

ORDERING INSTRUCTIONS

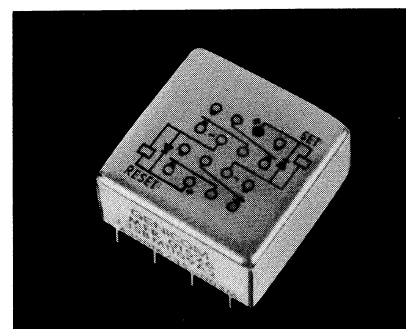
Type 3SBM relays can be ordered by specifying the correct catalog number. This number is derived by choosing the proper CODE for each of the six relay characteristics in the order in which the codes are listed. Use the code location guide (letters in vertical red columns) to find each CODE easily.

Example: The relay selected in this example is a dual-coil, current calibrated, four-hole end bracket mounting, solder hook header, 37 ohms coil resistance, and 180 mW sensitivity. By choosing the proper code for each of these relay characteristics, the catalog number is identified as 3SBM6131N2. The letter R following sensitivity code indicates relay received 5000 operations miss-test. Ex. 3SBM6131N2R.



150 Grid-space Relays Hybrid Magnetic-latching Single Diode, Dual Diode

Code
Location
Guide



Type 3SBM (4PDT)

Features

- Low profile... only 0.32 inch high
- Suitable for pulse operation
- MIL-R-39016/35
- MIL-R-39016/36

Description

The dual coil version of the 3SBM magnetic latching relay is now available with coil transient suppression with or without blocking diodes for reverse polarity protection. This hybrid magnetic latching relay is an addition to the growing family of 150 grid relays. The diode method is employed to limit the back EMF generated when the coil circuit is opened in order to protect other circuit components such as semiconductors. The contact load capabilities of the 3SBM as well as the memory feature of the latching function are both maintained.

Semiconductor

Characteristics at 25C:

Max. Negative Transient: 1 volt
Breakdown voltage: 100VDC Minimum
Max. Leakage Current: 1 microamp 50VDC

Other Specifications

Contact Arrangement:

4-pole double-throw (4C)

Operate Sensitivity:

Single-coil form, 100 mW, dual-coil form, 180 mW per coil

Contact Ratings:

DC resistive—2 amps at 28 volts
DC inductive—0.5 amps at 28 volts, 200 mH
AC resistive—0.5 amps at 115 volts (enclosure isolated from ground, or enclosure and movable contact at same potential)
AC 0.125 amps at 115 volts (enclosure at line potential with respect to movable contact)
Low-level—50 μ A at 50 mV
Peak AC or DC

Contact Resistance:

0.050 ohms max.;
0.150 ohms after life test

Life:

100,000 operations at rated loads listed;
1,000,000, operations at low-level loads

Operate Time:

4 ms max.

Reset Time:

4 ms max.

Bounce:

1.5 ms

Dielectric Strength: Note (1)

500 volts rms at sea level;
350 volts rms at 70,000 feet and above

Insulation Resistance: Note (1)

1,000 megohms minimum over temperature range

Vibration:

30G, 55-3000 Hz

Shock:

150G at 11 ms

Temperature:

— 65C to +125C

Note (1): Tests for dielectric withstanding voltage and insulation resistance should be made with "coil terminals" shorted together to avoid unnecessary electrical stress to semiconductor elements.

See page 22 for Mounting Forms, Terminals and Circuit Diagrams.

Coil Table Single Diode (All Values DC)*

Coil Code Letter	Dual Coil, Sensitivity Code 5 (180 mW)			
	Coil Resistance @ 25C (ohms) $\pm 10\%$	MAX. SET—RESET VALUES		Suggested Source Volts†
		Calibration Code 5 Voltage (Volts)	Calibration Code 6 Current (mA)	
H	10	1.4	135	2.0- 3.7
N	37	2.6	70	3.8- 7.2
R	145	5.2	35	7.6-14.5
T	450	9.0	20	14-25
V	975	13.5	3.5	20-35
W	2140	20.0	9.2	30-54

Coil Table Dual Diode (All Values DC)*

Coil Code Letter	Dual Coil, Sensitivity Code 6 (180 mW)			
	Coil Resistance @ 25C (ohms) $\pm 10\%^{**}$	MAX. SET—RESET VALUES		Suggested Source Volts†
		Calibration Code 5 Voltage (Volts)	Calibration Code 6 Current (mA)	
H	10	2.4	135	2.6- 4.1
N	37	3.6	70	3.8- 7.2
R	145	6.2	35	7.6-14.5
T	450	10.0	20	14.0-25.0
V	975	14.5	13.5	20.0-35.0
W	2140	21.0	9.2	30.0-45.0

* Values are factory test and inspection values. User should allow for meter variations.

† Applicable over the operating temperature range in circulating air.

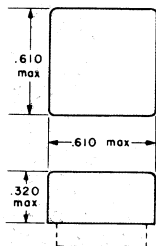
**Coil resistance cannot be measured by conventional bridge.

F
B

E

Mounting Forms (3SBM)

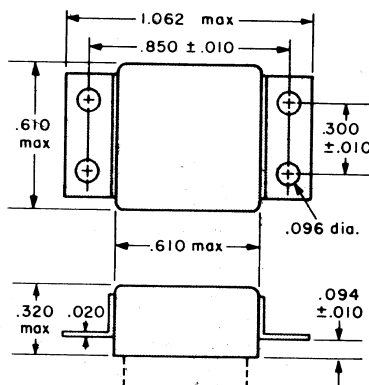
(Vibration note with each form is acceleration from 55 to 3000 Hz).



No Mount

Mounting Code	Vibration*
00	30g

*Assumes relay held securely by potting or other means.



End Bracket

Mounting Code	Vibration
13	30g

ALL DIMENSIONS IN INCHES

TOLERANCES
Unless otherwise specified:

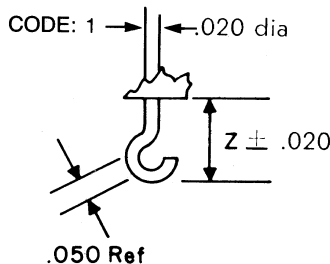
Hundredths	±0.020
Thousandths	±0.005

Header and Connection Diagrams

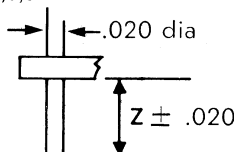
DUAL COIL

When the SET coil is pulsed with plus polarity on the blue bead, the movable contacts take the position shown in the connection diagram. The contacts are transferred when the RESET coil is pulsed with plus polarity on the reset terminal. A new pulse of the SET coil with plus polarity on the blue bead will transfer the contacts back.

The contacts can also be transferred by applying a pulse of opposite polarity to the coil previously pulsed. However, this method requires slightly more power than the more normal form of operation described in the previous paragraph.



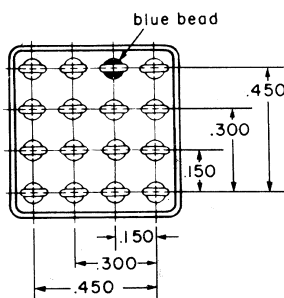
CODES: 4,5,8



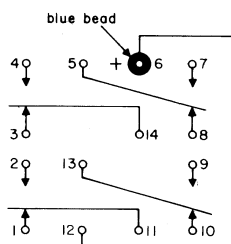
Header Types

Type	Z Dimension	Header Code
Solder Hook	0.13	1
Straight Pin	0.12	8
Straight Pin (socket or PCB type)	0.19	4
Straight Pin	0.25	5

Terminal numbers for reference only

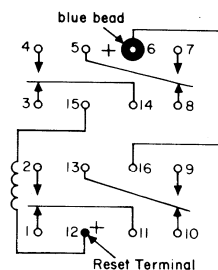


CODE 1

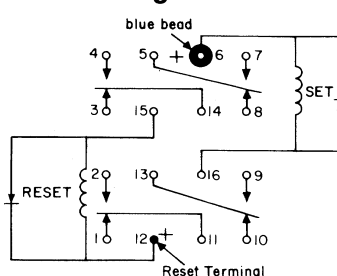


(Terminal numbers for reference only)

CODE 2



CODE 5
Single Diode



CODE 6
Dual Diode

