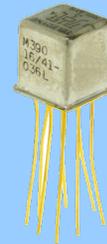




## CENTIGRID® MAGNETIC-LATCHING COMMERCIAL RELAYS DPDT CMOS COMPATIBLE



SERIES	RELAY TYPE
122C	DPDT general-purpose magnetic-latching relay with internal power MOSFET driver and diode coil transient suppression

### DESCRIPTION

The 122C Centigrad® magnetic-latching relay is an ultraminiature, hermetically sealed, armature relay capable of being directly driven by most IC logic families. Its low profile height and .100" grid spaced terminals, which precludes the need for spreader pads, make it ideal for applications where extreme packaging density and/or close PC board spacing are required.

The basic operating function and internal structure are similar to Teledyne's TO-5, 422 relay series. The 122C is capable of meeting Teledyne Relays' T2R® requirements. The following unique construction features and manufacturing techniques provide overall high reliability and excellent resistance to environmental extremes

#### The 122C feature:

- All welded construction.
- Unique uni-frame design providing high magnetic efficiency and mechanical rigidity.
- High force/mass ratios to withstand shock and vibration.
- Advanced cleaning techniques provide maximum assurance of internal cleanliness.
- Precious metal alloy contact material with gold plating assures excellent high current and dry circuit switching capabilities.

The Series 122C relay has internal silicon diodes for coil suppression, Zener diodes to protect the MOSFET gate inputs, and N-channel enhancement-mode MOSFET chips, which enable direct relay interfacing with most microprocessor and IC logic families (CMOS, TTL and MOS).

The 122C magnetic-latching relay is ideally suited for applications where coil operating power must be minimized. The relays can be operated with a short-duration pulse. After the contacts have transferred, no external coil power is required.

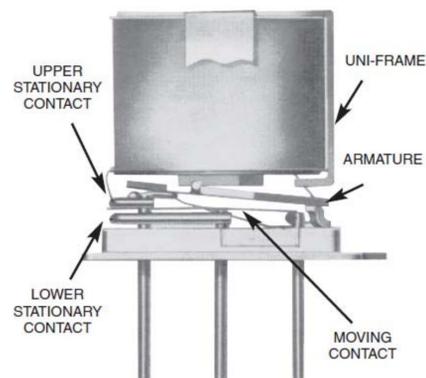
The magnetic-latching feature of the Series 122C relay provides a "memory" capability, since the relays will not reset upon removal of coil power.

By virtue of its inherently low intercontact capacitance and contact circuit losses, the 122C relay has proven to be an excellent ultraminiature RF switch for frequency ranges well into the UHF spectrum. A typical RF application for this Centigrad® relay is in handheld radio transceivers, wherein the combined features of good RF performance, small size, low coil power dissipation and high reliability make it a preferred method of transmit-receive switching.

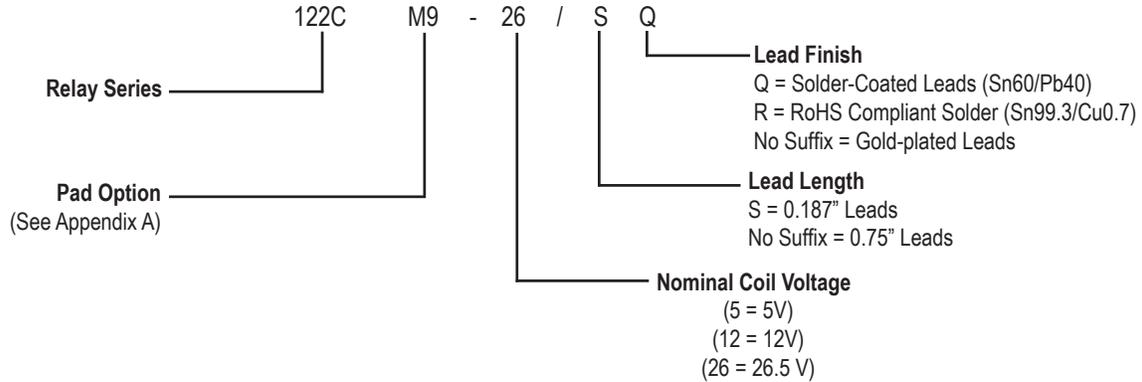
### ENVIRONMENTAL AND PHYSICAL SPECIFICATIONS

<b>Temperature</b> (Ambient)	-65°C to +125°C
<b>Vibration</b> (Note 1)	30 g's to 3000 Hz
<b>Shock</b> (Note 1)	50 g's, 6 ms, half sine
<b>Acceleration</b>	50 g's
<b>Enclosure</b>	Hermetically sealed
<b>Weight</b>	0.10 oz. (2.75g) max.
<b>Reflow Temperature</b>	260°C max. temp. 1 min. max

### INTERNAL CONSTRUCTION



**Part Numbering System (Notes 5 & 6)**



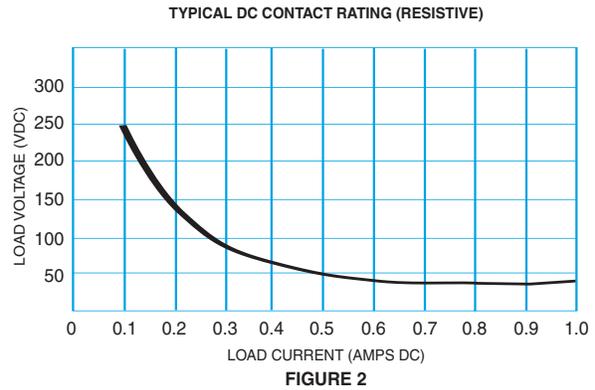
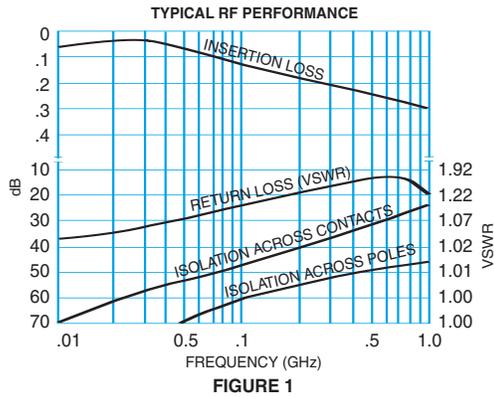
**GENERAL ELECTRICAL SPECIFICATIONS (-65 °C to 125 °C unless otherwise noted. See notes 2 & 3.)**

<b>Contact Arrangement</b>	2 Form C (DPDT)	
<b>Rated Duty</b>	Continuous	
<b>Contact Resistance</b>	0.125 Ω max. before life; 0.225 max. after life at 1A / 28 V <sub>dc</sub> (measured 1/8" from header)	
<b>Contact Load Rating (DC)</b>	Resistive: 1 A / 28 V <sub>dc</sub> Inductive: 200 mA / 28 V <sub>dc</sub> (320mH) Lamp: 100 mA / 28 V <sub>dc</sub> (320mH) Low level: 10 to 50 μA @ 10 to 50 mV	
<b>Contact Load Rating (AC)</b>	Resistive: 250 mA / 115Vac, 60 and 400 Hz (Case not grounded) 100 mA / 115 Vac, 60 and 400 Hz (Case grounded)	
<b>Contact Life Ratings</b>	10,000,000 cycles (typical) at low level 1,000,000 cycles (typical) at 0.5 A / 28 Vdc resistive 100,000 cycles min. at all other loads specified above	
<b>Contact Overload Rating</b>	2 A / 28 Vdc Resistive (100 cycles min.)	
<b>Contact Carry Rating</b>	Contact Factory	
<b>Operate Time</b>	1.5 ms max. @ nominal rated coil voltage	
<b>Contact Bounce</b>	1.5 ms max.	
<b>Min. Operate Pulse</b>	4.5 ms width @ rated voltage	
<b>Intercontact Capacitance</b>	0.4 pf typical	
<b>Insulation Resistance</b>	10,000 MΩ min. between mutually isolated terminals	
<b>Dielectric Strength</b>	500 V <sub>rms</sub> (60 Hz) @ atmospheric pressure	70,000 ft: 125 Vrms / 60Hz
<b>Negative Coil Transient (Vdc)</b>	1.0 V <sub>dc</sub> Max.	
<b>Min. Diode P.I.V. (Vdc)</b>	100	
<b>Zener Voltage (Vdc)</b>	17 min to 23 max	
<b>Zener Leakage Current @ 15.2 Vdc (μA)</b>	2.5 max.	
<b>Power FET Characteristics -65°C to +125°C</b>	<b>Gate Volt. to Turn Off (Vdc)</b>	0.5 max
	<b>Gate Volt. to Turn On (Vdc)</b>	3.8 min (Note 8)
	<b>Drain-Source (V<sub>ds</sub>) (Vdc)</b>	55 max.

**DETAILED ELECTRICAL SPECIFICATIONS (-65 °C to 125 °C unless otherwise noted. See note 3.)**

BASE PART NUMBERS (122C)		122C-5	122C-12	122C-26
Coil Voltage (Vdc)	Nom.	5.0	12.0	26.5
	Max.	5.6	16.0	32.0
Coil Current (mAdc@25°C)	Min.	82.2	20.5	7.2
	Max.	114.9	27.8	15.2
Coil Operating Power @25°C (mW)	Nom.	505	287	351
Latch and Reset Voltage (Vdc)	Max.	3.5	9.0	18.0

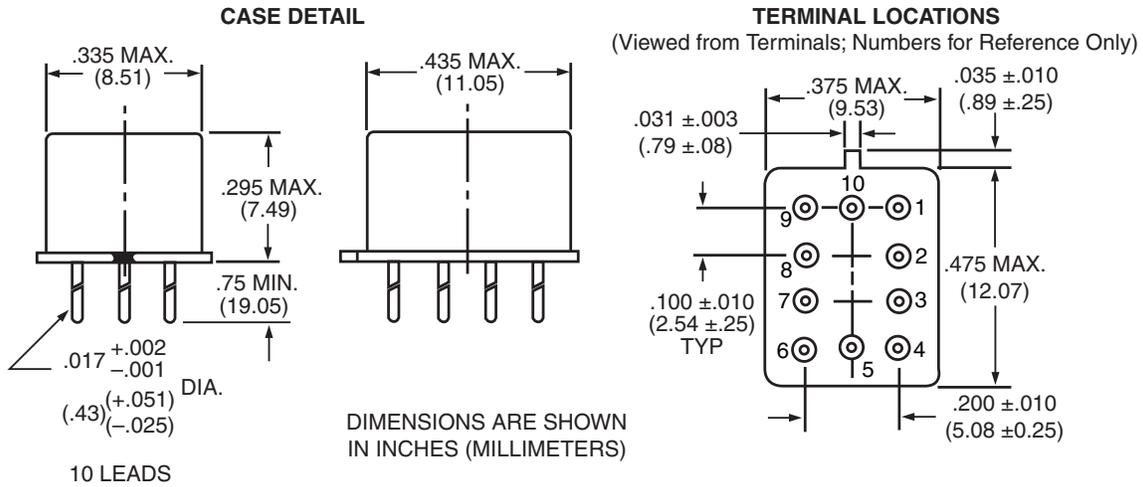
**PERFORMANCE CURVES (Note 2)**



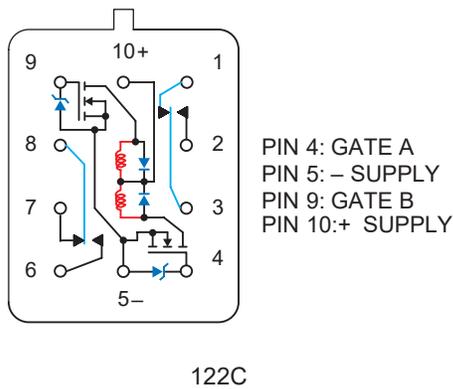
**NOTES**

- Relay contacts will exhibit no chatter in excess of 10  $\mu$ s or transfer in excess of 1  $\mu$ s.
- "Typical" characteristics are estimates based on available data. No on-going verification tests are performed.
- Unless otherwise specified, parameters are initial values.
- Pins, 4, 5, 9 must be shorted when tested for insulation Resistance and Dielectric withstanding Voltage
- Unless otherwise specified, relays will be supplied with gold-plated leads.
- The slash and characters appearing after the slash are not marked on the relay.
- Maximum rated gate voltage = 15 Vdc
- Measured for 5 s max. Includes allowance for "on" resistance of MOSFET

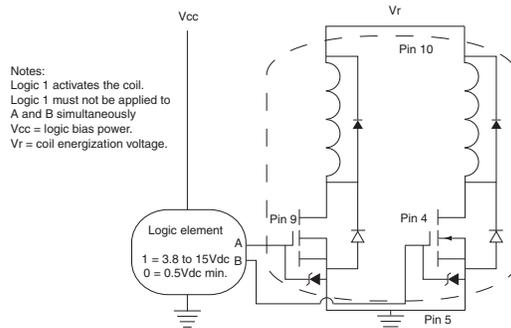
**OUTLINE DIMENSIONS**



**SCHEMATIC DIAGRAMS**



**TYPICAL CMOS INTERFACE CIRCUIT**



**NOTES:**

1. DIMENSIONS ARE IN INCHES, METRIC EQUIVALENTS SHOWN IN [ ].
2. POSITIONS 5 AND 10 ARE FOR UNINSULATED CASE GROUND OPTIONS.
3. NO PROTRUSION BELOW BOTTOM OF HEADER WHEN GROUND PINS ARE INSTALLED
4. TO ORDER THE CASE GROUND OPTION, AFTER THE SERIES DESIGNATOR, ADD "YZ" TO THE PART NUMBER.
5. UNLESS OTHERWISE SPECIFIED, TOLERANCES ON DIMENSIONS ARE ± .010 INCH (0.025 MM)

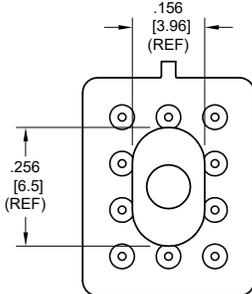
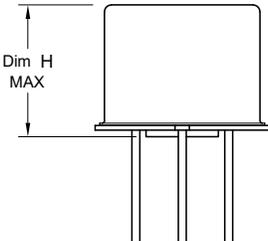
## APPENDIX A : Spacer Pads

### Pad designation and bottom view dimensions

### Height

### For use with the following:

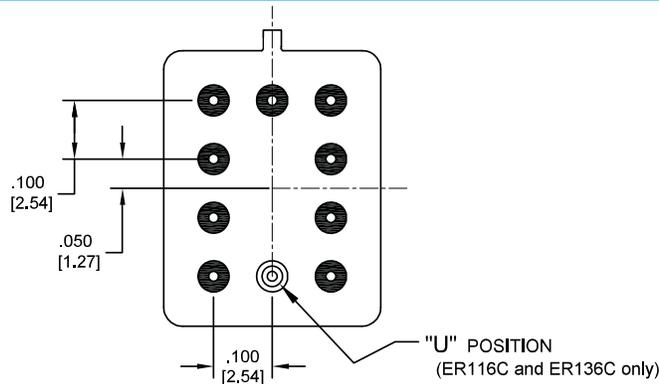
### Dim. H Max.

 <p>“M9” Pad for Centigrad®</p>		<p>122C, A152</p>	<p>.320 (8.13)</p>
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#### Notes:

1. Spacer pad material: Polyester film.
2. To specify an “M9” spacer pad, refer to the mounting variants portion of the part numbering example in the applicable datasheet.
3. Dimensions are in inches (mm).
4. Unless otherwise specified, tolerance is  $\pm .010$  (.25 mm).
5. Add 10 m $\Omega$  to the contact resistance shown in the datasheet.
6. Add 0.01 oz. (0.25 g) to the weight of the relay assembly shown in the datasheet.

## APPENDIX A : Ground Pin Positions



#### Centigrad® Relays: RF180, ER116C, 122C, ER136C

- Indicates ground pin position
- Indicates glass insulated lead position
- ⊙ Indicates ground pin or lead position depending on relay type

#### NOTES

1. Terminal views shown
2. Dimensions are in inches (mm)
3. Tolerances:  $\pm .010$  ( $\pm .25$ ) unless otherwise specified
4. Ground pin positions are within .015 (0.38) dia. of true position
5. Ground pin head dia., 0.035 (0.89) ref: height 0.010 (0.25) ref.
6. Lead dia. 0.017 (0.43) nom.