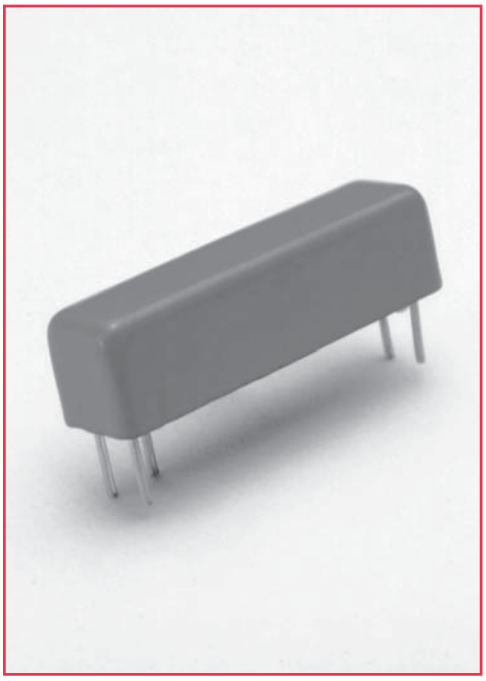
2200 Series Reed Relays



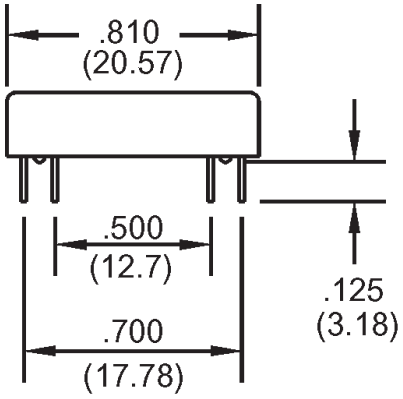
2200 Series Reed Relays

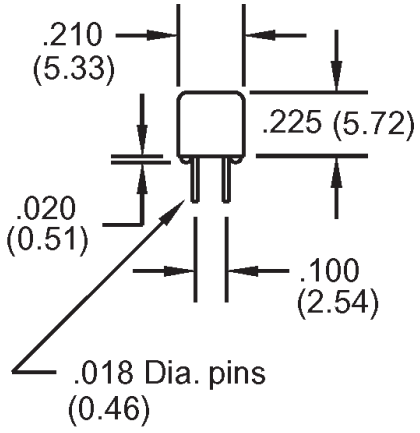
Ideally suited to the needs of Automated Test Equipment and RF requirements. The specification tables allow you to select the appropriate relay for your particular application. If your requirements differ, please consult your local representative or Coto's Factory.

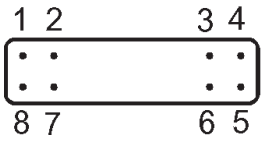
2200 Series Features

- Very small (0.17 in^2), high reliability reed relays
- High Insulation Resistance - 10^{12} Ω available with some models
- High speed switching compared to electromechanical relays
- Hermetically sealed contacts for long life
- Epoxy coated steel shell provides magnetic shielding
- Optional Electrostatic Shield for reducing capacitive coupling
- Optional Coaxial Shield for 50 Ω impedance and switching of fast rise time digital pulses offered on some models
- Relay models 2200-2301, 2200-2302, are ATE industry standards. Specifically engineered for OEM designs and maintenance of existing production fixtures

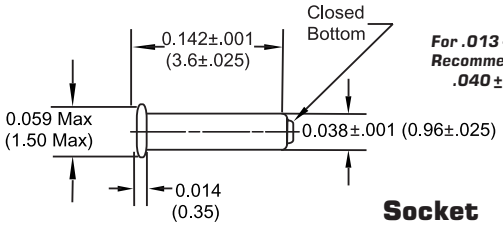
Dimensions in Inches (Millimeters)







Bottom View



For .013 - .020 (0.33 - 0.5) dia. pin Recommended mounting hole: .040 ± .002 (1.0 ± 0.05)

Socket

Ordering Information

Part Number XXXX-XX-XX1

Model Number
2204
2211

Coil Voltage
05 = 5 volts
12 = 12 volts

Coil Options
3 = use for Model #2204 (12 volt coil) and Model #2211 (5 & 12 volt coil)
4 = use for Model #2204 (5 volt coil)

Shielding Options[2]
0 = No Shielding
1 = Electrostatic Shield (N/A on Model #2211)
2 = Coaxial Shield (N/A on Model #2211)

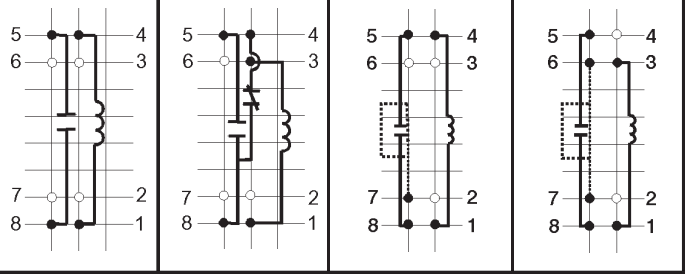
* If Required, Order Coto Socket #0116-0100-0000

Note:
Model #'s 2200-2301 & 2200-2302 represent complete part numbers.

2200 Series Reed Relays

Model Number			2204	2211	2200-2301	2200-2302
Parameters	**Test Conditions**	**Units**	**1 Form A**	**1 Form C**	**1 Form A Electrostatic Shield**	**1 Form A Coaxial Shield**
COIL SPECS.						
Nom. Coil Voltage		VDC	5 12	5 12	5	5
Coil Resistance	+/- 10%, 25° C	Ω	370 1500	230 1500	150	150
Operate Voltage	Must Operate by	VDC - Max.	3.8 9.0	3.8 9.0	3.6	3.6
Release Voltage	Must Release by	VDC - Min.	0.4 1.0	0.4 1.0	0.5	0.5
CONTACT RATINGS						
Switching Voltage	Max DC/Peak AC Resist.	Volts	200	100	150	150
Switching Current	Max DC/Peak AC Resist.	Amps	0.5	0.25	0.5	0.5
Carry Current	Max DC/Peak AC Resist.	Amps	1.0	0.5	1.0	1.0
Contact Rating	Max DC/Peak AC Resist.	Watts	10	3	10	10
Life Expectancy-Typical [1]	Signal Level 1.0V,10mA	x 10^6 Ops.	500	100	500	500
Rated Loads		x 10^6 Ops.	5	5	5	5
Static Contact Resistance (max. init.)	50mV, 10mA	Ω	0.100	0.150	0.150	0.150
Dynamic Contact Resistance (max. init.)	0.5V, 50mA at 100 Hz, 1.5 msec	Ω	0.200	0.200	0.200	0.200
RELAY SPECIFICATIONS						
Insulation Resistance (minimum)	Between all Isolated Pins .at 100V, 25°C, 40% RH	Ω	10^{12}	10^{11}	10^{11}	10^{11}
Capacitance - Typical	Shield Floating	pF	0.9	0.9	0.9	0.9
Across Open Contacts	Shield Guarding	pF	0.2	N/A	0.2	0.2
Dielectric Strength (minimum)	Between Contacts	VDC/peak AC	250	200	250	250
	Contacts to Shield	VDC/peak AC	250	N/A	250	250
	Contacts/Shield to Coil	VDC/peak AC	1500	1500	1500	1500
Operate Time - including bounce	At Nominal Coil Voltage, 30 Hz Square Wave	msec.	0.5 (typ.)	1.0 (typ.)	0.55 (max.)	0.55 (max.)
Release Time - Typical	Zener-Diode Suppression [3]	msec.	0.1	2.0	0.1	0.1

Top View:
Dot stamped on top of relay refers to pin #1 location
Grid = .1"x.1" (2.54mm x 2.54mm)



Notes:

[1]Consult factory for life expectancy at other switching loads.

[2]Model 2204, pin #7 is tied to optional electrostatic shield, pins #6 & #7 are tied to optional coaxial shield.

[3]Consists of 56V Zener diode and 1N4148 diode in series, connected in parallel with coil.

Environmental Ratings:

Storage Temp: -35°C to +100°C;
Operating Temp: -20°C to +85°C
Solder Temp: 270°C max; 10 sec. max
The operate and release voltage and the coil resistance are specified at 25°C. These values vary by approximately 0.4% / °C as the ambient temperature varies.
Vibration: 20 G's to 2000 Hz; Shock: 50 G's

COTO CORPORATION

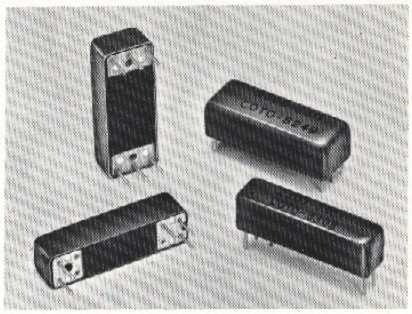
MICROMINIATURE REED RELAYS

SERIES 2200

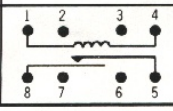
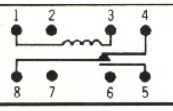
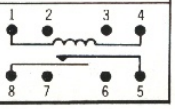
Coto's microminiature 2200 series relays are now available with greater than 10^{12} ohm insulation resistance.

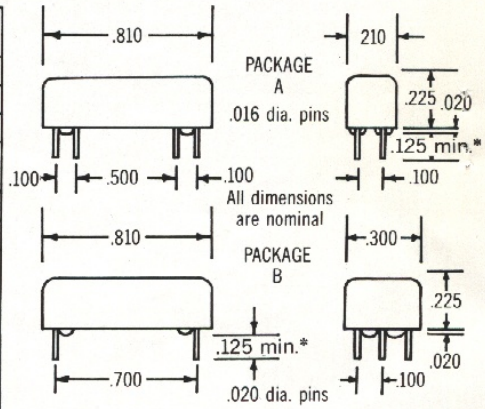
Utilizing a new low moisture absorbant bobbin material, Coto's special cleaning process and screening assures you of the most reliable high impedance relay available. This new microminiature design has been engineered to provide an improved system to lock in the terminal pins (up to 2 lbs. pull test prior to encapsulation).

The 2200 series reed relays, long recognized as the smallest high reliability relays in the industry, offer a wide variety of contact forms and coil resistances while occupying only .17 sq. in. of PC board space. Switching speeds of less than 500 micro seconds typical on most models and optional electrostatic or co-axial shielding contribute further to the versatility of the 2200 series.



RELAY SPECIFICATIONS

Model Number & Coil Voltage		2204-05, 12	2211-05, 12	2231†05, 12
Contact Form		1A	1C	1A
Package Size		A	A	A
Available Coil Options		2, 3, 4	2, 3	2, 3
Available Shield Options		Electrostatic or Co-Axial*	N/A	N/A
Parameter	Test Conditions	VALUES		
Max. Switch Voltage	DC/Peak AC	200	100	200
Max. Switch Current (Amps)	DC/Peak AC Resistive	0.5	0.25	0.5
Max. Carry Current (Amps)		1.0	0.5	1.0
Max. Contact Rating (Watts)	DC Resistive	10	3	10
Life Expectancy (Operations)	At Signal Level	500 x 10^6	100 x 10^6	500 x 10^6
	At Rated Level	5 x 10^6	5 x 10^6	5 x 10^6
Static Cont. (Ohms) Resistance (Initial)	0.050 Volt, 10 mA Contact Load	0.100 Max.	0.150 Max.	0.150 Max.
Dynamic Contact Resistance (Initial) (Ohms)	0.5 Volt, 50 mA Load 100 Hz, 1.5 msec. after coil energized	0.200 Max.	0.200 Max.	0.200 Max.
Insulation Resistance (Ohms)	Between all isolated pins @ 100V, 25 deg C, 40% relative humidity.	10^{10} Min. 10^{12} Optional	10^9 Min. 10^{11} Optional	10^{10} Min. 10^{12} Optional
Open Contact Capacitance (pf)	Shield Floating	.9	1.8	.9
	Shield Guarded	.2	N/A	N/A
Dielectric Strength (Min.) (Volts) Between Contacts / Contacts to Shield	DC/Peak AC Static Conditions	250	200	400
Dielectric Strength (Min.) (Volts) Contacts and Shield to Coil	AC VRMS	1,000	1,000	1,000
Oper. Time (msec) (Including Bounce)	At Nominal Voltage 30 Hz Sq. wave	0.5 Typical	1.0 Typical	0.5 Typical
Release Time (msec)	Zener-Diode Clamp Coil Suppression	0.1 Typical	2.0 Typical	0.1 Typical
Schematics (Bottom View) Not to scale				



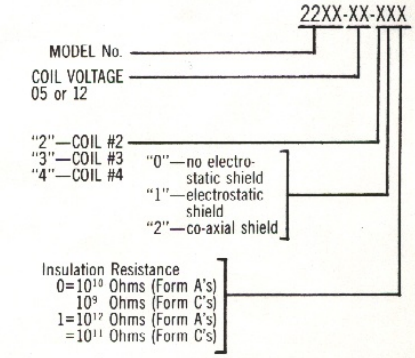
*.105 ±.015 for models #2200-2310 and #2200-2311

OPERATING PARAMETERS @ 25°C		
Nominal Volts	05	12
Must Operate Volts	3.75	9.0
Must Release Volts	0.4	1.0
Coil #2 Resistance Ohms*	150	900
Coil #3 Resistance Ohms*	230	1500
Coil #4 Resistance Ohms*	370	—

*Resistance figures are ± 10%

ORDERING INFORMATION

To order a Coto relay, assemble a part number from the data below to describe the desired parameters.



Unused pins are omitted.
Pin numbers for reference only.
Black dot on top of relay denotes pin #1.
*On model 2204 pin #7 is the optional electrostatic shield pin, pins #6 and #7 are the optional co-axial shield pins.
†Model 2231 offers a higher contact to contact breakdown voltage especially useful in European applications.

COTO CORPORATION

MICROMINIATURE REED RELAYS FOR ATE

SERIES 2200

Relay models 2200-2301, -2302, -2310, -2311 and -2314 are specifically designed to meet the rigorous specifications of the component Automatic Test Equipment industry.

Available from stock, these relays are ideal for use in new OEM designs or by the ATE user for new test fixturing as well as maintenance of existing production fixtures.

Coto's quality workmanship and designed-in reliability have become the standard in the ATE industry.

PACKAGING

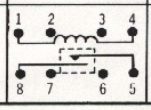
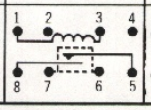
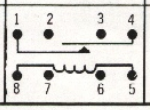
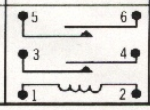
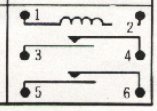
Series 2200 reed relays are fully encapsulated in a magnetically shielding steel shell coated with a bright red, chemically resistant and insulating epoxy finish. A new proprietary potting process provides stress-free encapsulation of both coil and reed switch.

TESTING AND RELIABILITY: Optimizing the 2200 Series Relays' operating parameters are coil windings carefully designed for power conservation.

All reed switch capsules are dry buzzed in a test coil for one million cycles and then tested for dynamic contact resistance. This process eliminates weak, contaminated or damaged reed switches which are subject to early failure. The switches utilize a contact plating which eliminates the low-level contact sticking failure mode.

- Dynamic contact resistance as described above, at the must-operate voltage and 100 Hz.
- Must operate time at 100 Hz.
- Insulation resistance at rated breakdown voltage between each isolated pin to all other pins tied together.
- Coil Resistance.
- See Engineering Bulletins #1 and #2 for further information on Coto testing procedures.

RELAY SPECIFICATIONS

Model Number			2200-2301	2200-2302	2200-2310	2200-2311	2200-2314-05 or -12
Available Coil Options			5 volt 150 ohms	5 volt 150 ohms	5 volt 550 ohms	5 volt 250 ohms	5 volt, 200 ohms — or — 12 volt, 800 ohms
Contact Form			1A	1A	1A	2A	2A
Package Size			A	A	A	B	B
Standard Shielding			Electrostatic 5 pin relay	Co-Axial 6 pin relay	N/A	N/A	N/A
Parameter		Test Conditions	VALUES				
Must Operate Volts		Volts DC	3.6	3.6	4.0	4.0	4.0 (5V) 9.0 (12V)
Must Release Volts		Volts DC	0.5	0.5	1.0	1.0	0.4 (5V) 1.0 (12V)
Max. Switch Voltage		DC/Peak AC	150	150	200	200	200
Max. Switch Current (Amps)		DC/Peak AC Resistive	0.5	0.5	0.5	0.5	0.5
Max. Carry Current (Amps)			1.0	1.0	1.0	1.0	1.0
Max. Contact Rating (Watts)		DC Resistive	10	10	10	10	10
Life Expectancy (Operations)		At Signal Level	500×10^6	500×10^6	500×10^6	500×10^6	500×10^6
		At Rated Level	5×10^6	5×10^6	5×10^6	5×10^6	5×10^5
Static Cont. (Ohms) Resistance (Initial)		0.050 Volt, 10 mA Contact Load	0.150 Max.	0.150 Max.	0.100 Max.	0.100 Max.	0.150 Max.
Dynamic Contact Resistance (Initial) (Ohms)		0.5 Volt, 50 mA Load 100 Hz, 1.5 msec. after coil energized	0.200 Max.	0.200 Max.	0.200 Max.	0.200 Max.	0.200 Max.
Insulation Resistance (Ohms)		Between all isolated pins @ 100V, 25 deg C, 40% relative humidity.	10^{11} Min.	10^{11} Min.	10^{10} Min.	10^{10} Min.	10^{10} Min.
Open Contact Capacitance (pf)		Shield Floating	.9	.9	.9	1.0	1.0
		Shield Guarded	.2	.2	N/A	N/A	N/A
Dielectric Strength (Min.) (Volts)	Between Contacts	DC/Peak AC Static Conditions	250	250	250	250	250
	Contacts to Shield						
	Contacts and Shield to Coil	AC VRMS	1,000	1,000	1,000	1,000	1,000
Oper. Time (msec) (Including Bounce)		At Nominal Voltage 30 Hz Sq. wave	0.55 Max.	0.55 Max.	0.650 Max.	0.650 Max.	1.0 Typical
Release Time (msec)		Zener-Diode Clamp Coil Suppression	0.1 Typical	0.1 Typical	0.020 Nominal	0.020 Nominal	0.10 Typical
Schematics (Bottom View) Not to scale							

Unused pins are omitted.
Pin numbers for reference only.
Black dot on top of relay denotes pin #1.

ENVIRONMENTAL RATINGS

Storage Temperature:
-50°C to +100°C
Operating Temperature:
-20°C to +70°C
Note: (The must-operate and must-release voltages and the coil resistance are specified at 25°C. These values vary by approximately 0.4%/°C as the ambient temperature varies.)
Vibration: 20 G's to 2000hz
Shock: 50 G's

ORDERING INFORMATION

2200-2301 through 2200-2311 are complete part numbers.

For 2200-2314 indicate coil voltage. Example, 2200-2314-05 or 2200-2314-12.

MOUNTING SOCKETS

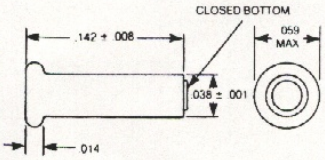
Miniature Spring Sockets suitable for use with 2301/2302 reed relays and the single pole versions of the 2200 series

MATERIAL

Spring: Tin plated Beryllium Copper
Eyelet: Tin Plated Copper

PART NUMBER

0116-0100



NOTE:
- FOR 014-017 DIA PIN
- RECOMMENDED MOUNTING HOLE .040 ± .002

COTO CORPORATION
55 DuPont Drive, Providence, R.I. 02907
(401) 943-2686 TWX 710-381-8016