



Application Alley

PCB Testing - Reed Relays

Reed Relays Are a Key Component in Testing Functional PCBs

Introduction

Functional PCB testers test printed circuit boards as large as 600 mm by 600 mm (or 2 foot square). These boards are in some cases, up to 20 layers thick, requiring 1000s of test points for functional verification. Each one of these test points may require as many as 6 switches each to provide the various voltages and currents for proper measurement. Because of size restrictions, isolation, relatively fast acting and good RF characteristics, reed relays are often chosen as the testing switch. A fully loaded tester can therefore, house over 20,000 reed relays. If there is one relay failure, this is equivalent to a failure level of 50 part per million (PPM). So the quality and reliability must reign supreme. Standex Electronics's reed relays have stepped up to meet these requirements; and their relays have become an accepted standard in the Automatic Test Equipment (ATE) industry.

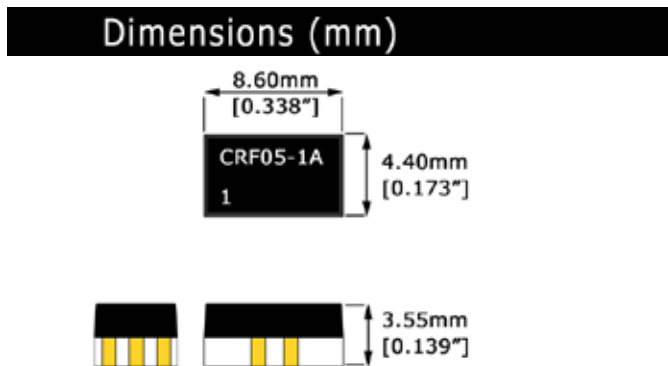


Figure 1. CRR/CRF physical layout

Reed Relays are a Key Component in ATE Testers Testing Functional PCBs

Almost every piece of electronic equipment today uses printed circuit boards (PCBs). These PCBs range from a few square mm (0.08 square inches) to as large as 600 mm by 600 mm (2 ft by 2 ft). These PCBs can have only a few components to as many as thousands of components. On the larger PCBs there may be 1000s of test points that need their

functionality determined. These usually work in conjunction with a bed of nails tester. This allows for the direct hook up to all the test points. Each one of these test points will need up to 6 switches to correctly switch in different voltages, currents and determine functionality. Semiconductor switches offer too much leakage, lack isolation and can interact with the actual test being undertaken. Electromechanical relays become unreliable after 1 million cycles. Reed relays make the best choice. Standex Electronics offers several reed relay series that represent a technically savvy low cost solution.

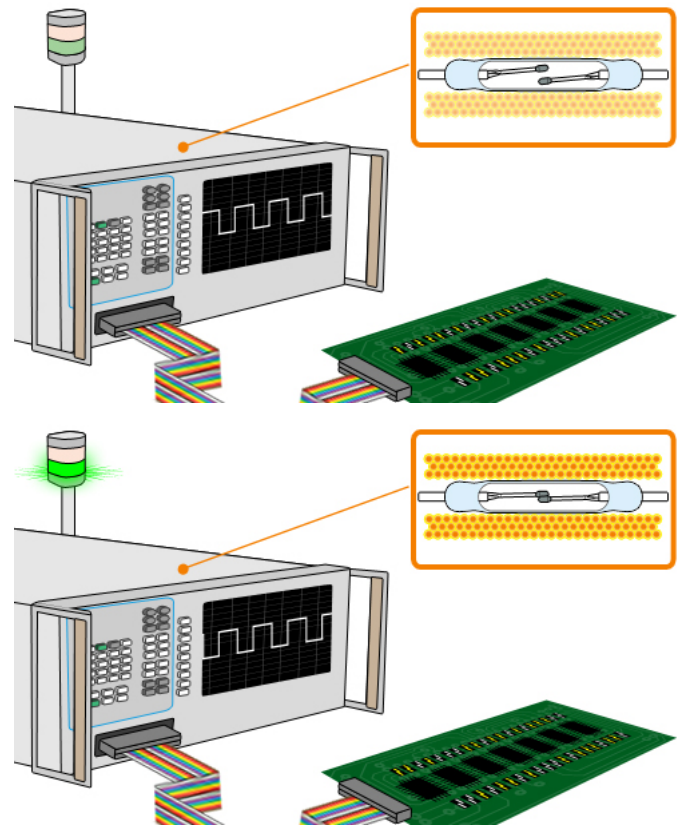


Figure 2. Reed relay signals pass/fail test results on functional PCB test.

Features

- High quality and reliability
- Very small size
- Ability to switch up to 1 amp

- Insulation resistance > 1012 Ohms
- Capable of switching and carrying up to 2 GHz
- Dielectric strength across the contacts 200 volts
- Low offset voltage < 1μV
- Contacts dynamically tested
- Low stable contact resistance
- Long life with up to a billion reliable operations
- Low stable contact resistance
- Long life with up to a billion reliable operations at relatively low levels

Specifications (@ 20°C) CRR Series

	Min	Typ	Max	Units
Coil characteristics				
Coil resistance	135	150	165	Ω
Coil voltage		5.0		V
Pull-In			3.75	V
Drop-Out	0.85			V
Switch characteristics				
Contact rating			10	Watts
Switching voltage			170	V
Switching current			0.5	Amps
Carry current			0.5	Amps
Static contact resistance			250	mΩ
Dynamic contact resistance			250	mΩ
Dielectric from voltage across the contacts	210			V
Dielectric from voltage coil to contacts	1000			V
Operate time			0.1	msec
Release time			20	μsec
Operate temp	-20		100	°C
Storage temp	-55		125	°C



*Coil parameters will vary by 0.2% /oC

Applications

- Ideal for use in testers and Automatic Test Equipment that test the functionality of all sizes of printed circuit boards.

Standex Electronics offers both standard through hole and surface mount in very small packages. All relays come with magnetic shielding allowing for very close packaging. Our surface mount CRR series can switch and carry DC to 2 GHz signals for use in high frequency requirements or fast digital pulses. Our standard SIL and MS in-line pin layouts are both considered standards in the industry and meet the

Surface Mount Reed Relay Series



Series	Dimensions			Illustration
		mm	inches	
SRR	W	4.0	0.157	
	H	3.2	0.126	
	L	7.5	0.295	
CRR	W	4.4	0.173	
	H	3.5	0.137	
	L	8.6	0.338	

stringent conditions for high quality and reliability. All series can carry up to 1 amp and hold off 200 Volts across the contacts.

Standex Electronics's reed relays use hermetically sealed reed switches that are further packaged in strong high strength thermoset molding compound, and can therefore be subject to various environments without any loss of reliability.

The reed relay is an excellent choice because it can operate reliably over a wide temperature range, and represents an economical way to carry out billions of switching operations.

Through Hole Reed Relay Series

Series	Dimensions			Illustration
		mm	inches	
MS	W	3.8	0.150	
	H	6.8	0.268	
	L	15.2	0.598	
SIL	W	5.08	0.200	
	H	7.8	0.307	
	L	19.08	0.780	

Find out more about our ability to propel your business with our products by visiting www.standexelectronics.com or by giving us a hello@standexelectronics.com today! One of our brilliant engineers or solution selling sales leaders will listen to you immediately.

About Standex Electronics

Standex Electronics is a worldwide market leader in the design, engineering, and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions.

Our magnetics offerings include planar, current sense, and conventional low- and high-frequency transformers and inductors. Reed switch-based solutions include Meder, Kent, and KOFU brand reed switches, as well as a complete portfolio of reed relays, and a comprehensive array of fluid level, proximity, motion, water flow, HVAC condensate, hydraulic pressure differential, capacitive, conductive and inductive sensors.

We offer engineered product solutions for a broad range of product applications in the transportation, automotive, medical, test and measurement, military and aerospace, aviation, HVAC, appliance, security and safety, and general power and industrial markets.

Standex Electronics has a commitment to absolute customer satisfaction through a partner, solve, and deliver approach. With a global organization that offers sales support, engineering capabilities, and technical resources worldwide – we implement customer driven innovation that puts the customer first.

For more information on Standex Electronics, visit us on the web at standexelectronics.com.

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