Integrated Circuits - Reed Relays

Reed Relays Carry Out Switching Functions in Performance Boards Used in Integrated Circuits
Introduction

Chip makers use new performance boards for every new chip they develop. Since most integrated circuit/chip makers generally have large factories devoted to the testing of their chips. Hundreds of testers are typically used on a 24 hour/7 days a week basis. Each tester may be well over $1,000,000. So when a new chip is developed, which is often, having to go purchase hundreds of new testers can be a very costly option. Fortunately, most times all that is necessary is the need to change to new performance boards. These performance boards can be directly configured for the new chip and acts as the transition from the new chip to the existing testers. Most of the time, these performance boards have many reed relays carrying out the switching, allowing the integrated circuit signals from the tester to properly test the device under test.

The Performance Boards Used in Integrated Circuits Use Reed Relays as Well

Performance boards are used in conjunction with integrated circuits to directly connect the actual test functions from the test system to the integrated circuit under test. The millions of gates in these tiny chips all need to be properly tested. The performance boards play the critical interconnect role.

Features

- High reliability
- Ideal RF characteristics
- Ideal for carrying fast digital pulses with skew rates less than 20 picoseconds.
- Ability to carry RF signals from DC up to 20 GHz (SRF)
- 50 Ω characteristic impedance
- Switch to shield capacitance < 0.5 picofarads
- Dielectric strength across the contacts 200 volts
- Contacts dynamically tested
- Surface mounted
- Very low profile
- BGAs available
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- Rugged thermoset over-molded packaging
- Qual-shield arrangement

Applications

- Any factories where integrated circuit testing is being carried out for the following: Digital memory chips, VLSI, ASICS, microprocessors, analog chips, mixed signal (analog and digital), discrete ICs.

Integrated circuits are rapidly changing the world we live in. Every year new faster integrated circuit chips become available that are used in the marketplace to speed up computers, expand cell phone features, and present new products. These new chips present quite a challenge to automatic test equipment (ATE) makers that need to develop the testers to test them. Since the testers cost generally in the 1 to 5 million dollar range, depending on options and add-ons, scraping these testers with each new generation of new chips would represent prohibitive costs. Performance boards have extended the life of the IC testers for several years and defers those up front capital expenditures. With each new integrated circuit, new performance boards are generated that create the interconnects necessary to test the new IC. With new chips being introduced almost weekly, the need for new performance boards is an ongoing process. Generally the interconnect points are made using reed relays. These relays need to have very good RF characteristics to be capable of passing fast digital pulses and passing analog RF signals. With hundreds of testers in a typical chip maker factory, the number performance boards used is quite high, and correspondingly, the reed relay usage is even higher.

Standex-Meder’s line of RF relays are specially designed to switch and pass fast digital pulses in a 50 ohm impedance environment while offering excellent isolation. Standex-Meder’s SRF series using a quad-shield that has only 0.5 pf from the open switch to its shield and only 0.2 pf across the open contacts. This series can switch and carry pulses shorter than 50 pico-seconds with no discernible effect on the pulse’s leading and trailing edge.

### Specifications (@ 20°C) CRF Series

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Min</th>
<th>Typ</th>
<th>Max</th>
<th>Units</th>
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<tbody>
<tr>
<td>Coil characteristics</td>
<td></td>
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<tr>
<td>Coil resistance</td>
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<td>Coil voltage</td>
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<tr>
<td>Pull-In</td>
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<tr>
<td>Drop-Out</td>
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<td>Switch characteristics</td>
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<tr>
<td>Contact rating</td>
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<td>Watts</td>
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<td>Switching current</td>
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<tr>
<td>Carry current</td>
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<td>Amps</td>
<td>Amps</td>
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<tr>
<td>Static contact resistance</td>
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<td>mΩ</td>
<td>mΩ</td>
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</tr>
<tr>
<td>Dynamic contact resistance</td>
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<td>mΩ</td>
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<td>Dielectric from voltage coil to contacts</td>
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<td>Insertion Loss (@ the -3 dB down point)</td>
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<td>Storage temp</td>
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</tbody>
</table>

*Coil parameters will vary by 0.2% /°C

### Applications

- Any factories where integrated circuit testing is being carried out for the following: Digital memory chips, VLSI, ASICS, microprocessors, analog chips, mixed signal (analog and digital), discrete ICs.
Standex-Meder’s CRF series offers a flat insertion loss from DC up to 7 GHz, while the SRF series offers an insertion loss from DC to 20 GHz. Both series are ultra small with surface mount lead configurations. Standex-Meder’s LP series is available for through hole mounting and socketing.

Standex-Meder’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.

Find out more about our ability to propel your business with our products by visiting www.standexmeder.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-Meder Electronics

Standex-Meder Electronics is a worldwide market leader in the design, development and manufacture of standard and custom electro-magnetic components, including magnetics products and reed switch-based solutions. Our magnetic offerings include planar, Rogowski, current, and low- and high-frequency transformers and inductors. Our reed switch-based solutions include Meder, Standex and OKI 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 spectrum of product applications in the automotive, medical, test and measurement, military and aerospace, as well as appliance and general industrial markets.

Standex-Meder Electronics has a commitment to absolute customer satisfaction and customer-driven innovation, with a global organization that offers sales support, engineering capabilities, and technical resources worldwide.

Headquartered in Cincinnati, Ohio, USA, Standex-Meder Electronics has eight manufacturing facilities in six countries, located in the United States, Germany, China, Mexico, the United Kingdom, and Canada.

For more information on Standex-Meder Electronics, please visit us on the web at www.standexmeder.com.

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