



Application Alley

Instrumentation Grade Reed Relays

Switching Technologies Offer Unparalleled Features

Introduction

Today's high tech electronic fields continue to prosper with innovative new products using finer and finer integrations that drive components smaller and smaller. Whether the electronic components are mounted on PCBs, at the wafer level or the finished component level, testing these components will require reed relays.

Features

- Ability to switch up to 1 Amp
- Carrying pulsed currents up to 5 Amps
- Input/output dielectric voltages up to 4k VDC
- Isolation greater than 1×10^{14} Ohms
- Long life with millions of reliable operations
- Low offset voltages < 1 microvolt
- Open state capacitance < 0.2 pF
- Switch signals from DC up to 7 GHz
- Switching voltages as high as 1k Volts
- Hermetically sealed switches with epoxy encapsulation
- Dynamically tested contacts

CR Series

The CR series is our smallest and most versatile instrument grade reed relay series. The CRF Series has a flat insertion loss curve from DC up to 7 GHz, attained by keeping the signal path as short as possible and using an internal coaxial shield with a consistent 50 Ohm impedance path. Not only is it excellent with RF signals, but is also great for digital signals where the skew rates or effects on the rise time of fast digital pulses is less than 40 picoseconds through the relay.



The epoxy over-molded ceramic package is very rugged and has very good low thermal offset voltage capability because of its excellent heat conducting alumina substrate. The ceramic substrate has leadless gold plated pads making it ideal for surface mounting with no worry of lead skewing or coplanarity issues. The CR series is only 3.4 mm high, making it ideal for very low profile environments.

Because there is an internal magnetic shield, the relays can be stacked very close together without having to deal with magnetic coupling effects between relays. This is the case whether you are designing a two dimensional or three dimensional relay matrix. A BGA option is offered for additional PCB attach methods.

SIL RF Series

The SIL RF Series is configured in a standard SIL through-hole package with UL certification. Its internal coaxial shield offers a consistent 50 Ohm impedance path for excellent RF characteristics at an economical cost.



The insertion loss is flat from DC to 1.5 GHz. The SIL RF Series is capable of switching up to 15 watts and voltages up to 200 Volts while providing over 1500 Volts isolation, switch to coil. The contacts can switch up to 1.0 amp while maintaining a consistent 100 milli-ohm on state resistance. Since it is in a standard SIL package, its foot print is compatible with other sources. Built-in diode suppression is another option.

SHV High Voltage/High Current Series

The SHV High Voltage/High Current Series was designed primarily for use in automatic test systems, testing high power MOS-FETs. These rugged semi conductors have very high initial peak current capability. Having a reed relay that can carry high current pulses for hundreds of millions of operations is a critical requirement.

This series can switch up to 1000 volts and carry up to 5 amps for up to 50 milli-second at a consistent repetition rate.



The relays can dielectrically hold off up to 4000 volts across the contacts as well as between contacts and coil. The relays have standard internal magnetic shields for close stacking matrices.

MS RF Series

The low cost MS series is a mini SIL principally designed for large, closely stacked matrices typically used in functional PCB test systems. These relays have a standard internal magnetic shield to support



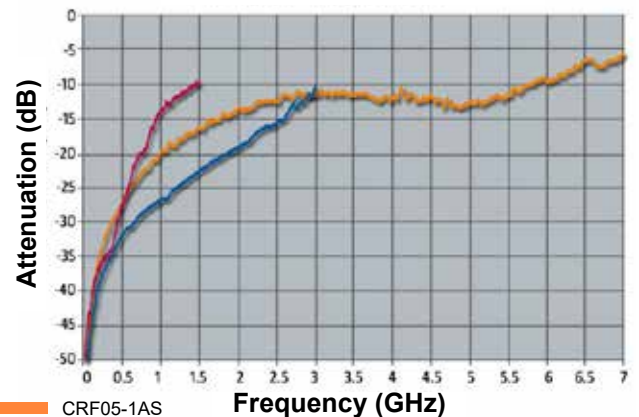
the close stacking and avoid any magnetic interference between relays.

Because of their relatively small size and short signal path, the relays are capable of carrying signals up to 1 Hz by grounding the start wire of the coil. MS relays are also capable of switching DC up to 10 Watts with voltages up to 200 volts. One amp of current can be switched with carry currents as high as 2 amps.

Industry Applications & Markets

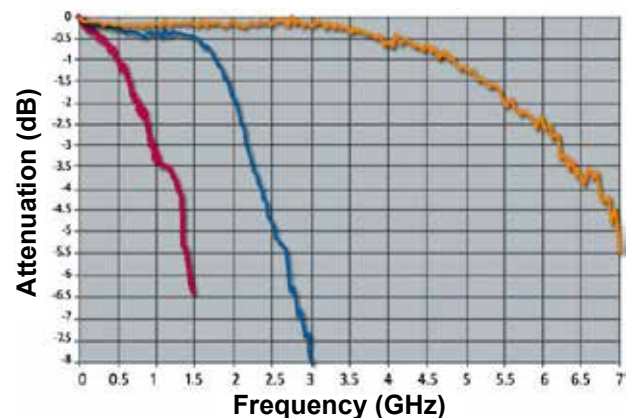
Analyzers, Automated test equipment, Battery powered, Cable testers, Functional PCB testers, High voltage testers, Industrial, Integrated circuit testers, Low voltage scanners, Medical equipment testers, Multimeters, RF transmitters, Telecommunications, Test & Measurement, Wafer testers

RF TEST - ISOLATION



CRF05-1AS
SIL RF Series
MS RF Series

RF TEST - INSERTION LOSS



The specification chart below summarizes the primary parameters.

RELAY SERIES COMPARISON						
	CRF	CRR	SIL RF	SHV	MS RF	Units
Dimensional Characteristics						
Height Profile	3.4	3.4	7.8	8.13	6.8	mm
	0.134	0.134	0.307	0.320	0.268	in
Overall Length	8.6	8.6	19.8	24.13	15.2	mm
	0.339	0.339	0.780	0.950	0.598	in
DC Parameters						
Rated Power (max.) Any DC combination of V & A not to exceed their individual max.'s	10	10	15	100	10	W
Switching Voltage (max.) DC or peak AC	170	170	200	1000	200	V
Switching Current (max.) DC or peak AC	0.5	0.5	1.0	1.0	1.0	Amps
Carry Current (max.) DC or peak AC	0.5	0.5	1.25	2.5	2.0	Amps
Pulsed Carry Current 5ms (max.) DC or peak AC	1.0	1.0	2.5	5.0	2.5	Amps
Insulation Resistance (typ.) RH 45%	10 ¹³	10 ¹³	10 ¹²	10 ¹²	10 ¹⁴	Ω
Breakdown Voltage (min.) Across contacts	210	210	250	4000	225	VDC
Breakdown Voltage (min.) Contacts to coil and/or shield	1500	1500	1500	4000	1500	VDC
Thermal Offset Voltage	1	1	15	20	15	μV
RF Characteristics						
Capacitance Across contacts	0.2	0.2	0.2	0.2	0.2	pF
Capacitance Contacts to coil and/or shield	0.6	0.6	1.5	1.8	1.4	pF
Insertion Loss* (see graphs) -3dB drop off point	7	2 Λ	1.5	n/a	1 Λ	GHz
Isolation* (see graphs) -3dB drop off point	10	15 Λ	14	n/a	18	GHz
VSWR -3dB drop off point	1.6	1.4 Λ	1.5	n/a	1.35	GHz

Λ Denotes start wire grounded

** The indicated electrical data are maximum values and can vary downwards when using a more sensitive switch. Consult factory if more detail is required.

Find out more about our ability to propel your business with our products by visiting www.standelectronic.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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