



Application Alley

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RF Attenuators - Reed Relays

RF Attenuators Use Reed Relays For Attenuating RF Signals



Custom
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Introduction

Test equipment capable of use in RF evaluations will generally require attenuation circuits to help them evaluate various aspects of RF components and RF circuitry. These attenuators need a switching device to switch the various dB levels that adjust the RF signals. Since attenuators are typically used to calibrate RF signal strength, the switching devices must be very good at handling RF so they don't end up attenuating the signal strength themselves. Also, the switching devices can be used on a regular basis which add up to a switching life concern. Electromechanical relays have been used in this application but the mechanical life is typically limited to less than one million operations. They can also be very expensive. New high frequency reed relays from Standex-Meder have become the design-in choice with their greatly improved RF characteristics and long life.

Dimensions (mm)

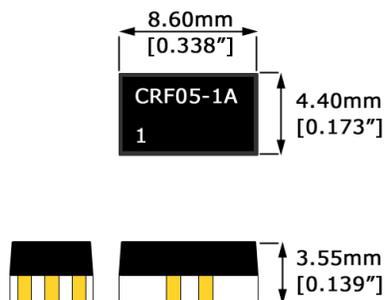


Figure 1. CRF physical layout

Reed Relays Are Used in RF Circuits Where Attenuators Are Used

Attenuators are used throughout the RF world particularly in the test equipment area. Most RF circuits need to be calibrated. Attenuator circuits allow the RF designer and user to calibrate their components and RF circuits. Attenuators can be switched in and out on a production

basis when testing RF components and RF sub-assemblies and thereby require switches that can last 10s of millions of operations. Electromechanical relays typically begin to run into reliability problems once their mechanical life exceeds 1 million operations. Reed relays on the other hand, can switch into the billions of operations without any mechanical wear under low signal conditions. Recent new RF reed relays have flat insertion loss out to 7 GHz making its long life and excellent RF characteristics an ideal solution in RF attenuators.

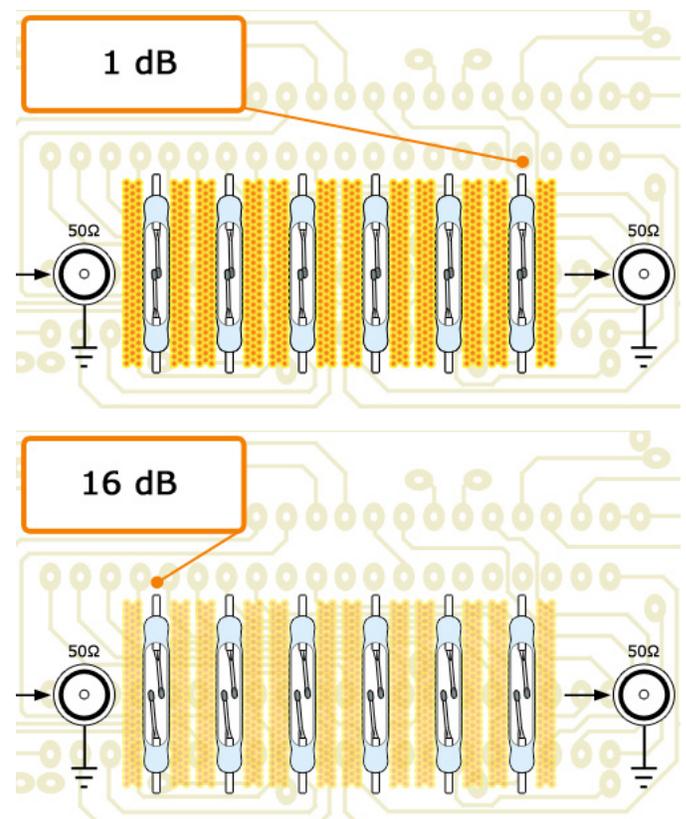


Figure 2. Reed Relays switch low signals in electromechanicals.

Features

- High reliability
- Ideal RF characteristics
- Ideal for carrying fast digital pulses with skew rates less than 160 picoseconds.
- Ability to carry RF signals from DC up to 7 GHz (CRF)

- 50 Ω characteristic impedance
- Switch to shield capacitance 0.7 picofarads typ. and 0.6 pf typ. across the open contacts.
- Dielectric strength across the contacts 210 volts
- Contacts dynamically tested
- Surface mounted
- Very low profile
- BGAs available
- Rugged thermoset over-molded packaging
- Quad-shield arrangement

Applications

- Ideal for use with systems that are switching an assortment of signals from DC to 7 GHz

Specifications (@ 20°C) CRF 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	m Ω
Dynamic contact resistance			250	m Ω
Dielectric from voltage across the contacts	210			V
Dielectric from voltage coil to contacts	1500			V
Insertion Loss (@ the -3 dB down point)			7	GHz
Operate time			0.1	msec
Release time			20	μ sec
Operate temp	-10		100	$^{\circ}$ C
Storage temp	-55		125	$^{\circ}$ C

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.

Surface Mount RF Reed Relay Series				
Series	Dimensions	mm		Illustration
		mm	inches	
CRF	W	4.4	0.173	
	H	3.5	0.137	
	L	8.6	0.338	