



Application Alley

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Medical - Reed Relays

Operating Rooms Use Reed Relays to Eliminate Instruments Left Behind After Surgery



Custom
Engineered
Solutions for
Tomorrow

Introduction

Every year billions of dollars are paid out for malpractice suits against practicing medical doctors. Most of these suits involve medical procedures or operations where a problem occurs during surgery. Since blood is ever abundant during surgery it can obscure the area being worked on. Sponges are used to soak up blood pools to facilitate the surgery. These blood saturated sponges placed between tissue can be left behind after the operation is complete. Of course, many times this gives rise to post surgical complications and sometimes death. Medical electronic designers have come up with a clever way of detecting these sponges potentially left behind in conjunction with using Standex-Meder's CRF reed relays.

Dimensions (mm)

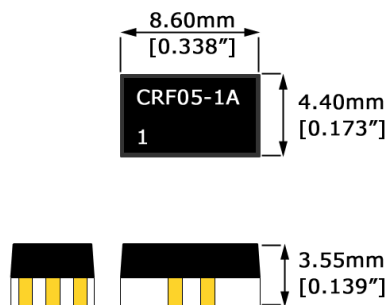


Figure 1. CRF physical layout

Reed Relays Solve a Large Area of Malpractice Litigation for Doctors

Malpractice suits against practicing medical doctors has become a multibillion dollar enterprise. One of the more obvious and easily proved litigations is when an instrument or some implement during an operation is left mistakenly inside the person being operated on. Many 1000s of medical procedures and operations occur every day, so that the percentages, however small, become a sizable amount. In any operation, blood pools are almost always the

biggest concern during an operation, because it can obscure the area being worked on making it more difficult to carry out the task at hand. Sponges and handy-wipes are used extensively and can quickly saturate with blood leaving them difficult to see when placed within the tissue. For this reason, they are one of the more prominent items left behind after surgery. Medical designers have come up with a clever way of keeping track of these sponges and handy-wipes by adding a microchip to each. After the operation, but just before closure of the wound, and electronic transmitter external to the body is turned on and using a matrix of relays, scans for these items. If any are left behind in the incision, they are quickly found and removed. The transmitters use an operating frequency of 900 MHz. Standex-Meder's CRF reed relay series are an ideal selection for switching and carrying these small RF signals.

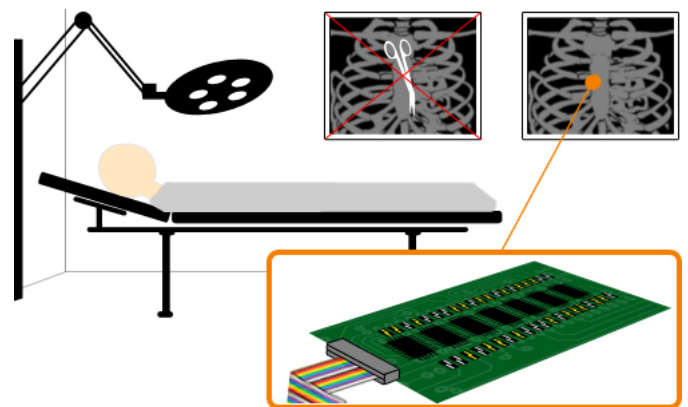


Figure 2. High frequency reed relay detects the presence of surgical instrument.

This RF ID tags system ideally uses our CRF relay taking advantage of its low profile and small size surface mountable package. Capable of handling up to 7 GHz in a 50 ohm impedance environment, it easily switches and carries the 900 MHz with no loss of signal power and no distortion. The relay carries out its job in a very reliable way eliminating many millions of dollars in malpractice litigation charges.

Features

- High reliability
- Ideal RF characteristics
- Ideal for carrying fast digital pulses with slew rates less than 200 picoseconds.
- Ability to carry RF signals from DC up to 7 GHz
- 50 Ω characteristic impedance
- Switch to shield capacitance 0.5 picofarads typ.
- Dielectric strength across the contacts 200 volts
- Contacts dynamically tested
- Surface mounted
- Very low profile
- BGAs available
- Rugged thermoset over-molded packaging
- Quad-shield arrangement

Applications

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	0.75			V
Switch characteristics				
Contact rating			10	Watts
Switching voltage			170	V
Switching current			0.5	Amps
Carry current			1.0	Amps
Static contact resistance			200	m Ω
Dynamic contact resistance			250	m Ω
Contact bulk resistance Through all plated material on substrate		260	440	m Ω
Breakdown voltage across the contacts	210			V
Dielectric strength coil/contact	1500			V
Insertion Loss (@ the -3 dB down point)			7	GHz
Operate time			0.6	msec
Release time			0.05	msec
Operate temp	-40		125	$^{\circ}$ C
Storage temp	-55		125	$^{\circ}$ C

The Pull-In, Drop-Out Voltage and Coil Resistance will change at rate of 0.4% per $^{\circ}$ C

- Ideal for switching high frequency matrices in medical applications

- Any applications where frequencies and/or fast digital pulses up to 7 GHz are involved.

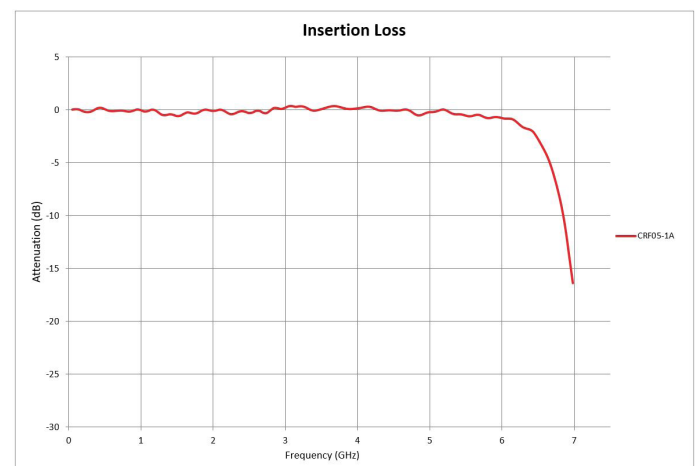
Surface Mount RF Reed Relay Series

Series	Dimensions	mm	inches	Illustration
CRF	W	4.4	0.173	
	H	3.5	0.137	
	L	8.6	0.338	

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.

Insertion Loss



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.