

A photograph of an airplane cabin interior, showing rows of seats with passengers. Each seat has a small screen on the back of the headrest, which are all displaying a blue screen. The cabin is brightly lit, and the overhead luggage bins are visible.

Application Alley

Airline Video & Audio - Reed Relays

Airline Video and Audio Systems use Reed Relays for Signal Switching

Introduction

Airliners around the world are bringing more services to the expanding number of flights occurring daily. The airlines compete with each other to convince, we the consumer, to fly on their airline. A major focus area is the individual seat we are assigned when we board the aircraft. Whether it is a first class seat, a business class seat or economy seat, the number of features available at the seat for the flyer is growing. One of the more exciting features now available on many flights for all seats, is the expansion of audio/video. In fact, on the newer Boeing 777 aircrafts there are literally several hundred options for audio and/or video available at each seat. Now each passenger has their own video screen to view more than 200 movies at their own discretion. To keep track and switch the different RF video signals requires the careful selection of components capable of maintaining signal integrity. Many airline designers are choosing reed relays to handle these RF switching requirements.

and present new products. These new chips present quite a challenge to automatic test equipment (ATE) makers that need to develop the tester to test them. Since each of the millions of gates in each chip needs to be tested time becomes an important obstacle. The test equipment designers need to use switches in their testers that will allow them to switch the various test voltages and currents for each gate. The designer has three options: electromechanical relays, semiconductor switches (pin diodes, FETs, etc.), or reed relays. Generally, the semiconductor switches offer too much leakage with too much capacitance that will literally interact with the test being performed, and therefore, its isolation is not good enough. Electromechanical relays are larger, very slow acting, and very costly for carrying high frequency pulses. Standex'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.

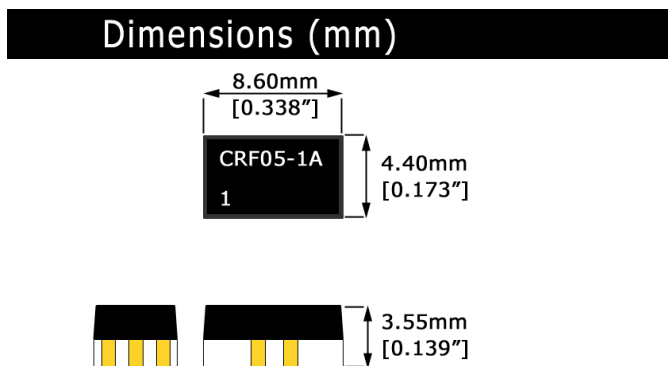


Figure 1. CRF physical layout

Reed Relays are used extensively in test equipment testing integrated circuits

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,



Figure 2. In-flight video monitor

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
- Contacts dynamically tested
- Low stable contact resistance
- Long life with up to a billion reliable operations

Applications

Ideal for use with systems that are switching video, which is in the lower RF range, but still one must respect its RF nature.

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

Reed Relays are a Key Component in switching video signals on aircraft



Today's ultra long flights are up to 15 hours long leaving passengers sitting in a cramped seat with very little to do over that period. Certainly lunches, dinners and snacks are served, but use up very little time when looked at in a 15 hour block of time. Naps can help, but many people have trouble sleeping for very long. Now the newer airplanes are equipped with individual movie screens capable of individual selection and having hundreds to choose from. Also, available are an assortment of music and video games to pass the time. Switching these RF signals can be a difficult undertaking while promoting distortion free reception. Reed relays have been chosen by airline designers to carry out the switching of these RF signals to the individual passengers. Standex's ultra small line of surface mount and through hole relays have been selected to carry out this complex job.

Surface Mount RF Reed Relay Series

Series	Dimensions		Illustration
	mm	inches	
SRF	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



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	

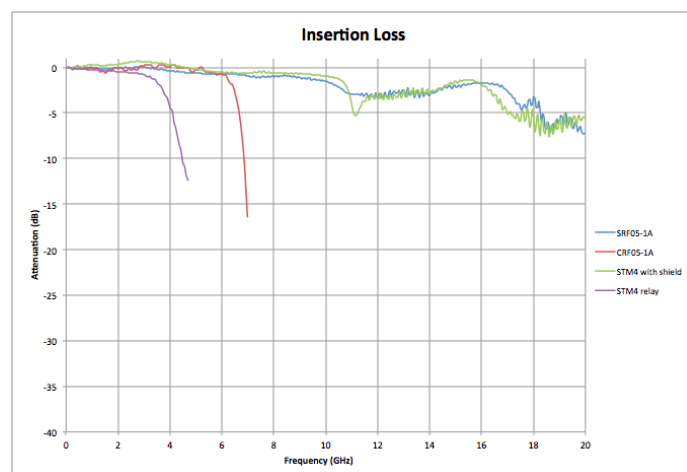
Complex matrices are required with banks of several hundred relays needed to carry out the switching to several hundred passengers. These long flights occur at least once a day, seven days a week for 20 to 30 years. So the quality and reliability is a critical requirement for selecting Standex's relays.

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

Standex'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.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.

Contact Information:

Standex Electronics

World Headquarters
4538 Camberwell Road
Cincinnati, OH 45209 USA

Standex Americas (OH)

+1.866.STANDEX (+1.866.782.6339)
info@standexelectronics.com

Standex Electronics Asia (Shanghai)

+86.21.37606000
salesasia@standexelectronics.com

Standex Electronics Europe (Germany)

+49.7731.8399.0
info@standexelectronics.com

Standex Electronics India (Chennai)

+91.98867.57533
kkasaragod@standexelectronics.com

Standex Electronics Japan (Kofu)

+81.42.698.0026
sej-sales@standex.co.jp

