



Application Alley

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Telecomm - Reed Relays

Portable Radio Communication Equipment Use Reed Relays



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Tomorrow

Introduction

Portable military radios typically operate between 3 MHz and 30 MHz. These frequencies are relatively low by today's standards when compared to the telephone bands in the 1 GHz to 4 GHz range. However, even as low as 30 MHz the signals will 'ride' on the outside of their conductor (skin effect). When switching between transmit and receive, reed relays have become the design-in choice, because they are hermetically sealed and packaged in a rugged epoxy, making them a good choice for the outdoor environment. Standex-Meder uses copper plated reed switches to minimize skin effect.

Dimensions (mm)

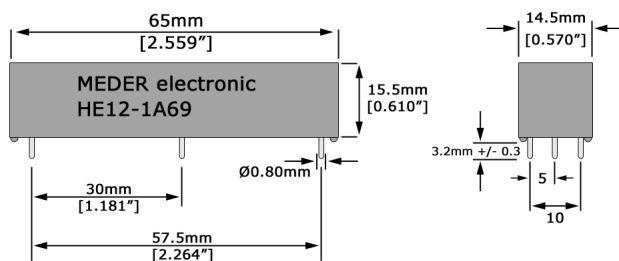


Figure 1. HE physical layout

AnyPortable Military Radios Use Reed Relays For Transmitting and Receiving

When it comes to portable radio communication equipment, all the components making up the radio, must be able to withstand the rigors of the outside environment. Whether this means dirty dusty, moist environments, or cold/hot rainy/snowy conditions under a wide temperature range. The reed relay being hermetically sealed and then encapsulated in a rugged over-molded epoxy, meets the above conditions in a reliable manner when transmitting or receiving radio frequencies between 3 MHz to 30 MHz.

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)
- Switch to shield capacitance < 0.5 picofarads
- Dielectric strength across the contacts 200 volts
- Dielectric strength switch to coil 1000 Volts min.
- Contacts dynamically tested

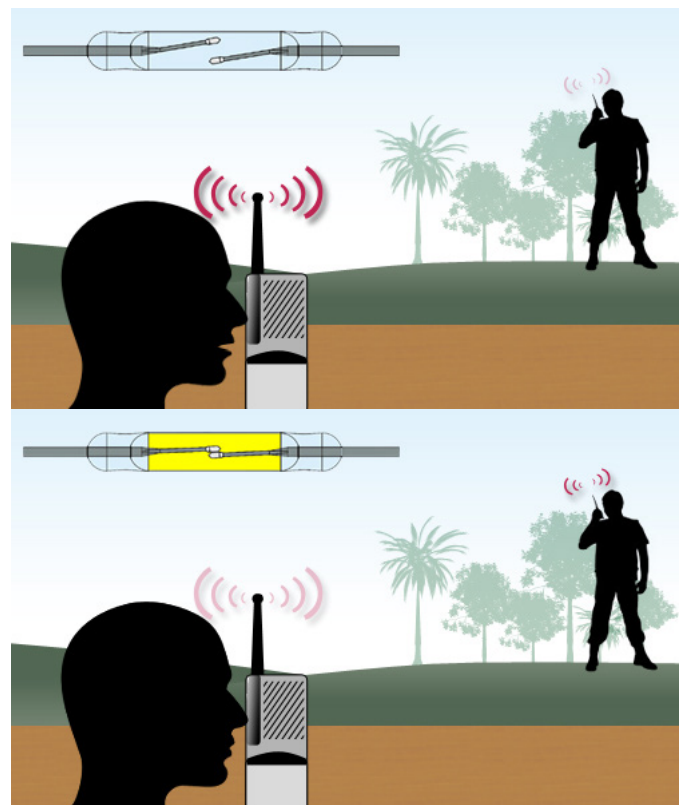


Figure 2. Reed Switch transmits RF signal in RF Receivers

Applications

- Ideal for switching high frequency matrices in medical applications
- Any applications where frequencies and/or fast digital pulses up to 20 GHz are involved.

Frequencies one MHz and above will travel on the outer wall of their conductor. Since the basic operation of reed switches requires the use of nickel/iron leads that have a high μ value, they will greatly impede the RF traveling on its outer surface. To get around this, Standex-Meder uses a copper plated reed switch. To meet the high current conditions of 6 amps or more when in the transmit mode, the highly conductive layer of copper solves the problem. Not only does it give a low stable contact resistance, but it prevents any internal heat build-up and allows for continuous transmission with a 100% duty cycle.

The HE along with its sister HM series together offer many options concerning packaging, pins outs, use of high insulation resistance wire, and multiple switches in the same package. Also, these series offer the relays in a normally closed contact configuration as well. The patented HF series uses an encapsulated electrostatic and magnetic shield making it an ideal choice for these RF applications.

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.

Specifications (@ 20°C) HE Series				
	Min	Typ	Max	Units
Coil characteristics				
Coil resistance	45	50	55	Ω
Coil voltage		5.0		V
Pull-In			3.5	V
Drop-Out	0.85			V
Switch characteristics				
Contact rating			100	Watts
Switching voltage			7500	V
Switching current			3.0	Amps
Carry current			6.0	Amps
Carry current max. for 5ms			10.0	Amps
Static contact resistance			150	m Ω
Dynamic contact resistance			200	m Ω
Dielectric from voltage across the contacts	10,000			V
Dielectric voltage between contacts and coil	10,000			V
Operate time			3.0	msec
Release time			1.5	msec
Operate temp	-20		70	°C
Storage temp	-30		100	°C

*Coil parameters will vary by 0.2% /oC

Standex-Meder's HE Series was designed for this very requirement. This series can carry these power requirements for years of satisfactory usage for the life time of the radio communication equipment. To meet the high voltage standoff of 10,000 volts the reed switch is hermetically sealed in a vacuum.

High Voltage / Current Reed Relay Series				Illustration
Series	Dimenstions	mm	inches	
		HE	W	14.5
L	15.5		0.610	
H	65.0		2.559	
HF	W	19.0	0.748	
	L	20.0	0.787	
	H	53.7	2.114	
HM	W	19.0	0.748	
	L	19.8	0.780	
	H	68.00	2.677	

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.