

Dimensions (mm)

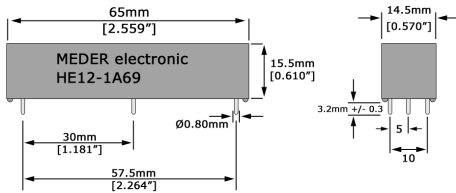


Figure 1. HE Relay Physical Layout

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. MEDER uses copper plated reed switches to minimize skin effect.

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

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.

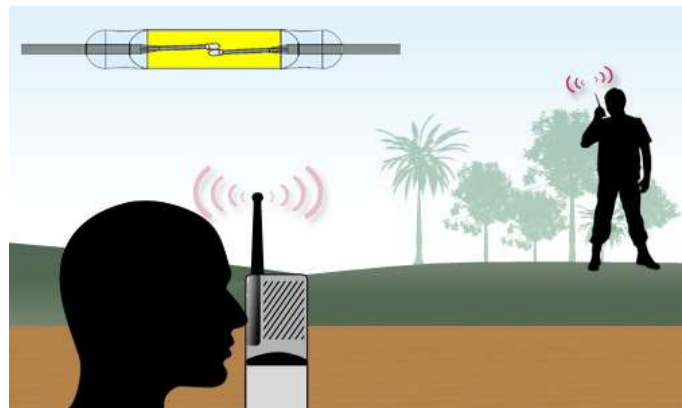
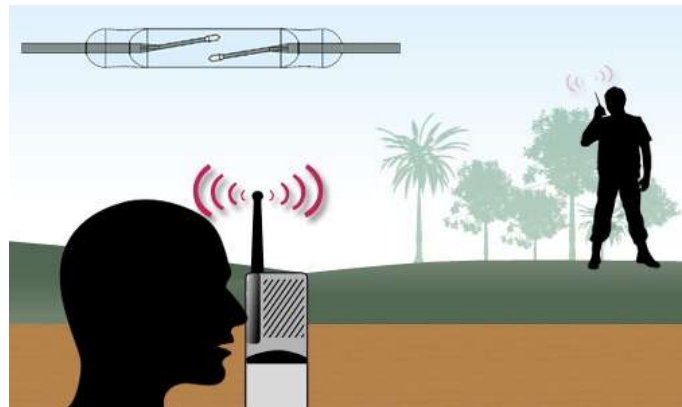


Figure 2. Reed Switch transmits RF signal in RF Receivers

Portable 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.

Specifications

HE Series	Min	Norm	Max	Units
Operate Specs (@20°C)				
Coil Characteristics*				
Coil Resistance	45	50	55	Ohms
Coil Voltage		5.0		Volts
Max Pull-in Voltage			3.5	Volts
Min. Drop-out	0.85			Volts
Reed Switch Characteristics				
Contact rating			50	Watts
Switching voltage	0		7500	Volts
Switching current	0		3.0	Amps
Carry current	0		6.0	Amps
Max Carry Current for 5 Ms			10.0	Amps
DC Static contact resistance			150	mΩ
Dynamic contact resistance			200	mΩ
Dielectric voltage across contacts	10K			Volts
Dielectric voltage from coil to contacts	10K			Volts
Operate time (w/ 40% overdrive min)			3.0	msec
Release time (no coil suppression)			1.5	msec
Operate Temperature	-20		70	°C
Storage Temperature	-30		100	°C




*Coil parameters will vary by 0.2% /°C

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, 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.

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.

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.

High Voltage Relay Series				
Series	Dimensions		Illustration	
	mm	inches		
HE	W	14.5	0.570	
	H	15.5	0.610	
	L	65	2.559	
HM	W	19	0.748	
	H	19.8	0.780	
	L	68	2.677	
HF	W	19	0.748	
	H	20	0.787	
	L	53.7	2.114	

**Consult the factory for more options not listed above.