

DEM TR-1

Legal Limit RF Coaxial Relay

The DEM TR-1 is the first of a series of High Power RF relays designed by Down East Microwave Inc. The basis of this design is a standard type Vacuum relay that has been selected for its insertion loss and isolation characteristics through the UHF RF region. Because of this coupled with the high voltage and current breakdown specifications of standard Vacuum relays, and mil-spec type "N" connectors, the TR-1 may be utilized at legal limit RF power levels from DC to 450 MHz.



The TR-1 may be considered for use as a standard Transmit / Receive switch, antenna selection, polarity selection or bypassing any system component in a legal limit RF power environment. It will tolerate higher powers and switching mishaps that standard mechanical coax relays will not. It will also switch and release faster than any standard RF mechanical relay. The TR-1 is the ideal RF relay for any legal limit RF switching application and can be specified with either a 12 or 28VDC operating voltage. Switching time is 6ms each way.

Specifications

FREQUENCY	INSERTION LOSS	RETURN LOSS	ISOLATION
DC - 30 MHz	0.0 dB	>30 dB	>50 dB
50 – 54 MHz	0.0 dB	>30 dB	>48 dB
144 – 148 MHz	0.0 dB	>30 dB	>31 dB
222 – 225 MHz	0.0 dB	>30 dB	>27 dB
420 – 450 MHz	< 0.1 dB	>30 dB	>21 dB

Instructions and Cautions

1. All ports indicated are in the un-powered state.
2. The relay may be powered in a continuous service.
3. Use good quality RF cable for the desired frequency to maintain relay specifications.
4. Voltage is marked on 28 VDC units only.
5. The relay may be put into service at frequencies up to 600 MHz with reduced ratings. Expect higher Insertion loss, lower Return loss and poor isolation. Therefore the relay should be tested before use at higher than specified frequencies. **It is not recommended for use on the 33 and 23 cm bands because of poor isolation and insertion loss.**
6. Use of an additional "isolation" relay is recommended when using the relay to bypass an LNA at 144 MHz and higher frequencies. If the TX power leakage level, (the isolation specification) exceeds the input power limit of your LNA or receiver, damage may occur. In an example, at 222 MHz, there is 27 dB of isolation. With a level of 1kw output, 2 watts of energy will be present on the receive side port of the relay. NOTE: This should be used as a guide line only. Some LNA's with or without switching circuits may tolerate more TX power without damage. In the example above, an average LNA would require an additional 23 dB of isolation to operate safely.
7. Always consider Sequence switching when utilizing LNA's.
8. Mounting holes are tapped for 4-40 x 5/16" and are spaced 1.125" apart.
8. Lightning and high reflected power at high TX power levels is a KILLER!

