

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.

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 above 450 MHz with reduced power ratings. Expect higher Insertion loss, lower Return loss and poor isolation. Therefore the relay should be tested before use at higher than specified frequencies.
6. Use of an additional "isolation" relay is recommended when using the relay to bypass an LNA at 144 MHz and higher frequencies. If TX power levels, in dBm, exceed the Isolation value plus 10 dB, damage may occur to the LNA. Example: The 222 MHz TX power limit is 27 (the isolation) + 10dB or +37dBm which is 50 watts to prevent damage to an LNA the will tolerate 10 mw of energy on either the input or output ports. 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, the LNA would require an additional 16 dB of isolation to operate at legal limit power 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!

