

| PART NUMBER | DESCRIPTION |
|-------------|--------------------------------------------|
| CCR-49K | Commercial Latching Multi-throw, DC-40 GHz |
| CR-49K | Elite Latching Multi-throw, DC-40GHz |

The CCR-49K/CR-49K is a broadband, multi-throw, electromechanical coaxial switch designed to switch a microwave signal from a common input to any of 3, 4, 5, or 6 outputs. The characteristic impedance is 50 Ohms. The switches are small using the popular connector spacing on a 1.062" dia. circle. Each position has an individual actuator mechanism allowing random position selection. This also minimizes switching time.

The CCR-49K/CR-49K comes with a latching actuator. The latching switch remains in the last position selected when the switch is de-energized. STD dual command requires a reset pulse before a new selected position. A separate reset circuit allows all positions to be set to an open position. User must provide both reset (clear) and set (select new position) commands.



Available with USB & Ethernet Control!



| ENVIRONMENTAL AND PHYSICAL CHARACTERISTICS | |
|----------------------------------------------------------------|-----------------------|
| Operating Temperature | |
| Commercial Model, CCR-49K | -25°C to 65°C |
| Elite Model, CR-49K*** | -55°C to 85°C |
| Vibration (MIL-STD-202 Method 214, Condition D, non-operating) | 10 g's RMS |
| Shock (MIL-STD-202 Method 213, Condition D, non-operating) | 500 g's |
| Standard Actuator Life | 5,000,000 cycles |
| Actuator Life w/ Additional Features | 1,000,000 cycles |
| Connector Type | 2.92mm (K) |
| Humidity (Moisture Seal) | Available |
| Weight | 6 oz. (170.1g) (max.) |

| ELECTRICAL CHARACTERISTICS | |
|--------------------------------|--------------------------------|
| Form Factor | Multi-Throw, break before make |
| Frequency Range | |
| CCR-49K | DC-40 GHz |
| CR-49K | DC-40 GHz |
| Characteristic Impedance | 50 Ohms |
| Operate Time | 20 ms (max.) |
| Actuation Voltage Available | 12 15 24 28 V |
| Actuation Current | 255 205 130 90 mA |
| Reset Current (# of Positions) | 3 765 615 390 270 mA |
| | 4 1020 820 520 360 mA |
| | 5 1275 1025 650 450 mA |
| | 6 1530 1230 780 540 mA |

| PERFORMANCE CHARACTERISTICS | | | | | | |
|-----------------------------|----------|----------|-----------|-------------|-------------|-----------|
| Frequency | DC-6 GHz | 6-12 GHz | 12-18 GHz | 18-26.5 GHz | 26.5-32 GHz | 32-40 GHz |
| Insertion Loss, dB, max. | 0.20 | 0.30 | 0.60 | 0.80 | .80 | 1.40 |
| Isolation, dB, min. | 80 | 75 | 70 | 70 | 60 | 60 |
| VSWR, max. | 1.25:1 | 1.30:1 | 1.60:1 | 1.70:1 | 1.80:1 | 1.95:1 |

For maximum limits, please see charts on pages 7-8

PART NUMBERING SYSTEM

CCR-49 K 6 6 C - I**

Series

Connectors

Actuator Voltage

Options

Actuator Type

Number of Positions

| CONNECTOR | ACTUATOR VOLTAGE | NUMBER OF POSITIONS | ACTUATOR TYPE | OPTIONS |
|------------------|--------------------|---------------------|--------------------------|------------------------------------------|
| K: 2.92mm FEMALE | 6: 28 VDC LATCHING | 3: SP3T | 0: NO INDICATOR CONTACTS | T: TTL DRIVERS WITH DIODES |
| | 7: 15 VDC LATCHING | 4: SP4T | C: INDICATOR CONTACTS*** | D: COIL TRANSIENT SUPPRESSION DIODES |
| | 8: 12 VDC LATCHING | 5: SP5T | D: SELF CUTOFF ONLY | R: POSITIVE + COMMON |
| | 9: 24 VDC LATCHING | 6: SP6T | | TD: DECODERS AND TTL DRIVERS WITH DIODES |
| | | | | M: MOISTURE SEAL |
| | | | | S: D-SUB CONNECTOR* |

**SEE PARTS LIST ON PAGE 11-13
***Indicator Contacts Operating Temperature -50°C to 85°C (Elite Model Only)

For additional options, please contact factory.

* D-Sub Connector may be 9, 15, or 25 pin depending on number of throws. (See Connector Pinout page)

Series CCR-49K/CR-49K

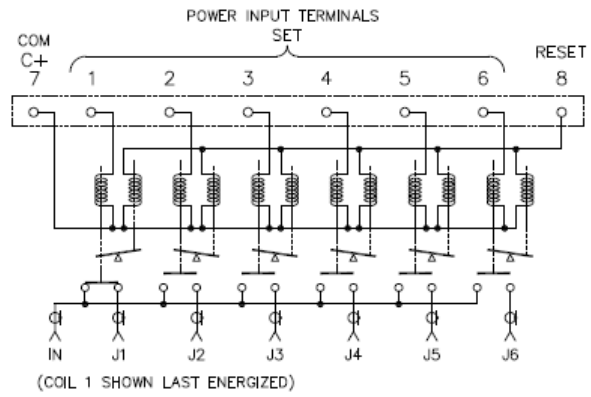
Multi-Throw DC-40 GHz, SP3T-SP6T
Latching Coaxial Switch



SCHEMATICS AND MECHANICAL OUTLINE



Basic



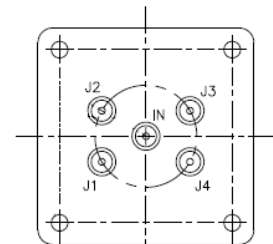
Positive Common



Indicators & TTL



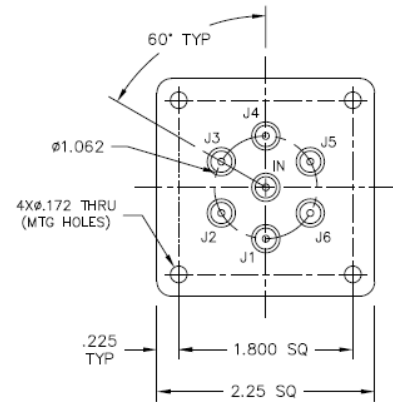
SP3T



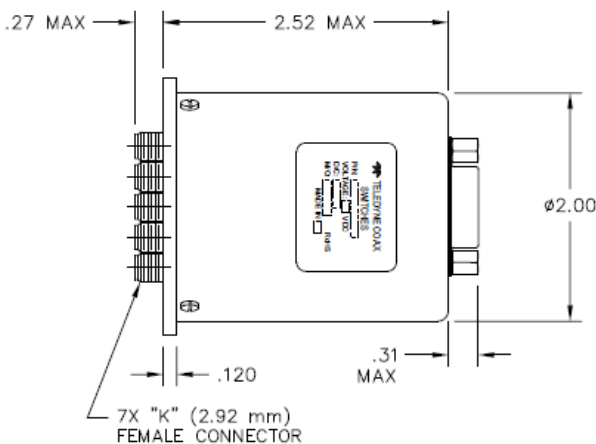
SP4T



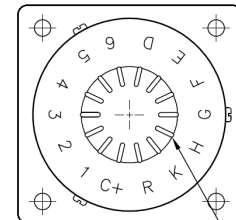
SP5T



SP6T



D-Sub



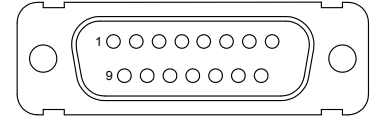
Basic

14X SOLDER WIRE TO D.C. TERMINALS MAX TEMP 250°C FOR NO MORE THAN 5 SECONDS

| CONNECTOR PINOUT FOR LATCHING SP3T MULTI-THROW SWITCHES | | | | | | |
|---------------------------------------------------------|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE | CR-49K630-S | CR-49K63C-S | CR-49K630-TS | CR-49K63C-TS | CR-49K630-TDS | CR-49K63C-TDS |
| INDICATOR | | Yes | | Yes | | Yes |
| TTL | | | Yes | Yes | | |
| DECODERS & TTL | | | | | Yes | Yes |
| PIN NO. | 9-PIN | 15-PIN | 9-PIN | 15-PIN | 9-PIN | 15-PIN |
| 1 | PORT 1 | PORT 1 | TTL 1 | TTL 1 | LOGIC 1 | LOGIC 1 |
| 2 | PORT 2 | PORT 2 | TTL 2 | TTL 2 | LOGIC 2 | LOGIC 2 |
| 3 | PORT 3 | PORT 3 | TTL 3 | TTL 3 | LOGIC 3 | LOGIC 3 |
| 4 | | | | | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | COMMON | COMMON | COMMON | COMMON | COMMON | COMMON |
| 8 | RESET | RESET | RESET | RESET | | |
| 9 | | | VSW | VSW | VSW | VSW |
| 10 | | D INDICATOR (COM) | | D INDICATOR (COM) | | D INDICATOR (COM) |
| 11 | | E INDICATOR | | E INDICATOR | | E INDICATOR |
| 12 | | F INDICATOR | | F INDICATOR | | F INDICATOR |
| 13 | | G INDICATOR | | G INDICATOR | | G INDICATOR |
| 14 | | | | | | |
| 15 | | | | | | |



9-PIN D-SUB CONNECTOR



15-PIN D-SUB CONNECTOR

“-S option” 9-pin, 15-pin connector
(example: [CCR-49KS660-S](#))

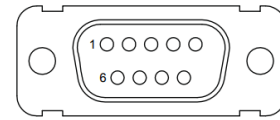
| CONNECTOR PINOUT FOR LATCHING SP4T MULTI-THROW SWITCHES | | | | | | |
|---------------------------------------------------------|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE | CR-49K640-S | CR-49K64C-S | CR-49K640-TS | CR-49K64C-TS | CR-49K640-TDS | CR-49K64C-TDS |
| INDICATOR | | Yes | | Yes | | Yes |
| TTL | | | Yes | Yes | | |
| DECODERS & TTL | | | | | Yes | Yes |
| PIN NO. | 9-PIN | 15-PIN | 9-PIN | 15-PIN | 9-PIN | 15-PIN |
| 1 | PORT 1 | PORT 1 | TTL 1 | TTL 1 | LOGIC 1 | LOGIC 1 |
| 2 | PORT 2 | PORT 2 | TTL 2 | TTL 2 | LOGIC 2 | LOGIC 2 |
| 3 | PORT 3 | PORT 3 | TTL 3 | TTL 3 | LOGIC 3 | LOGIC 3 |
| 4 | PORT 4 | PORT 4 | TTL 4 | TTL 4 | | |
| 5 | | | | | | |
| 6 | | | | | | |
| 7 | COMMON | COMMON | COMMON | COMMON | COMMON | COMMON |
| 8 | RESET | RESET | RESET | RESET | | |
| 9 | | | VSW | VSW | VSW | VSW |
| 10 | | D INDICATOR (COM) | | D INDICATOR (COM) | | D INDICATOR (COM) |
| 11 | | E INDICATOR | | E INDICATOR | | E INDICATOR |
| 12 | | F INDICATOR | | F INDICATOR | | F INDICATOR |
| 13 | | G INDICATOR | | G INDICATOR | | G INDICATOR |
| 14 | | H INDICATOR | | H INDICATOR | | H INDICATOR |
| 15 | | | | | | |

| CONNECTOR PINOUT FOR LATCHING SP5T MULTI-THROW SWITCHES | | | | | | |
|---------------------------------------------------------|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE | CR-49K650-S | CR-49K65C-S | CR-49K650-TS | CR-49K65C-TS | CR-49K650-TDS | CR-49K65C-TDS |
| INDICATOR | | Yes | | Yes | | Yes |
| TTL | | | Yes | Yes | | |
| DECODERS & TTL | | | | | Yes | Yes |
| PIN NO. | 9-PIN | 15-PIN | 9-PIN | 15-PIN | 9-PIN | 15-PIN |
| 1 | PORT 1 | PORT 1 | TTL 1 | TTL 1 | LOGIC 1 | LOGIC 1 |
| 2 | PORT 2 | PORT 2 | TTL 2 | TTL 2 | LOGIC 2 | LOGIC 2 |
| 3 | PORT 3 | PORT 3 | TTL 3 | TTL 3 | LOGIC 3 | LOGIC 3 |
| 4 | PORT 4 | PORT 4 | TTL 4 | TTL 4 | | |
| 5 | PORT 5 | PORT 5 | TTL 5 | TTL 5 | | |
| 6 | | | | | | |
| 7 | COMMON | COMMON | COMMON | COMMON | COMMON | COMMON |
| 8 | RESET | RESET | RESET | RESET | | |
| 9 | | | VSW | VSW | VSW | VSW |
| 10 | | D INDICATOR (COM) | | D INDICATOR (COM) | | D INDICATOR (COM) |
| 11 | | E INDICATOR | | E INDICATOR | | E INDICATOR |
| 12 | | F INDICATOR | | F INDICATOR | | F INDICATOR |
| 13 | | G INDICATOR | | G INDICATOR | | G INDICATOR |
| 14 | | H INDICATOR | | H INDICATOR | | H INDICATOR |
| 15 | | K INDICATOR | | K INDICATOR | | K INDICATOR |

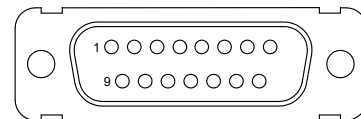
Series CCR-49K/CR-49K
Multi-Throw DC-40 GHz, SP3T-SP6T
Latching Coaxial Switch



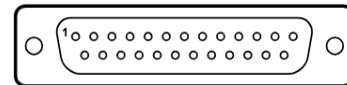
| CONNECTOR PINOUT FOR LATCHING SP6T MULTI-THROW SWITCHES | | | | | | |
|---------------------------------------------------------|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE | CR-49K660-S | CR-49K66C-S | CR-49K660-TS | CR-49K66C-TS | CR-49K660-TDS | CR-49K66C-TDS |
| INDICATOR | | YES | | YES | | YES |
| TTL | | | YES | YES | | YES |
| DECODERS & TTL | | | | | YES | YES |
| PIN NO. | 9-PIN | 15-PIN | 9-PIN | 15-PIN | 9-PIN | 15-PIN |
| 1 | PORT 1 | PORT 1 | TTL 1 | TTL 1 | LOGIC 1 | LOGIC 1 |
| 2 | PORT 2 | PORT 2 | TTL 2 | TTL 2 | LOGIC 2 | LOGIC 2 |
| 3 | PORT 3 | PORT 3 | TTL 3 | TTL 3 | LOGIC 3 | LOGIC 3 |
| 4 | PORT 4 | PORT 4 | TTL 4 | TTL 4 | | |
| 5 | PORT 5 | PORT 5 | TTL 5 | TTL 5 | | VSW |
| 6 | PORT 6 | PORT 6 | TTL 6 | TTL 6 | | |
| 7 | COMMON | COMMON | COMMON | COMMON | COMMON | COMMON |
| 8 | RESET | RESET | RESET | RESET | | |
| 9 | | D INDICATOR (COM) | VSW | VSW | VSW | D INDICATOR (COM) |
| 10 | | E INDICATOR | | | | E INDICATOR |
| 11 | | F INDICATOR | | | | F INDICATOR |
| 12 | | G INDICATOR | | | | G INDICATOR |
| 13 | | H INDICATOR | | | | H INDICATOR |
| 14 | | K INDICATOR | | | | K INDICATOR |
| 15 | | L INDICATOR | | | | L INDICATOR |
| 16 | | | | D INDICATOR (COM) | | |
| 17 | | | | E INDICATOR | | |
| 18 | | | | F INDICATOR | | |
| 19 | | | | G INDICATOR | | |
| 20 | | | | H INDICATOR | | |
| 21 | | | | K INDICATOR | | |
| 22 | | | | L INDICATOR | | |
| 23 | | | | | | |
| 24 | | | | | | |
| 25 | | | | | | |



9-PIN D-SUB CONNECTOR



15-PIN D-SUB CONNECTOR



25-PIN D-SUB CONNECTOR

“-S option” 9-pin, 15-pin, 25-pin connector
 (example: **CCR-49KS660-S**)

TRUTH TABLE Latching
CCR-49KX3C-T

| Logic Input | | | | RF Path | | | | Indicator Switches | | |
|-------------|---|---|---|---------|-----|-----|-------|--------------------|---|---|
| 1 | 2 | 3 | R | J1 | J2 | J3 | Reset | E | F | G |
| 1 | 0 | 0 | 0 | On | Off | Off | Off | C | 0 | 0 |
| 0 | 1 | 0 | 0 | Off | On | Off | Off | 0 | C | 0 |
| 0 | 0 | 1 | 0 | Off | Off | On | Off | 0 | 0 | C |

TRUTH TABLE Latching
CCR-49KX3C-TD

| Logic Input | | | RF Path | | | | Indicator Switches | | |
|-------------|---|---|----------|-----|-----|-------|--------------------|---|---|
| 1 | 2 | 3 | J1 | J2 | J3 | Reset | E | F | G |
| 0 | 0 | 0 | On | Off | Off | Off | C | 0 | 0 |
| 1 | 0 | 0 | Off | On | Off | Off | 0 | C | 0 |
| 0 | 1 | 0 | Off | Off | On | Off | 0 | 0 | C |
| 0 | 1 | 1 | Off | Off | Off | Reset | 0 | 0 | 0 |
| 1 | 1 | 1 | COIL OFF | | | | 0 | 0 | 0 |

TRUTH TABLE Latching
CCR-49KX4C-T

| Logic Input | | | | | RF Path | | | | | Indicator Switches | | | |
|-------------|---|---|---|---|---------|-----|-----|-----|-------|--------------------|---|---|---|
| 1 | 2 | 3 | 4 | R | J1 | J2 | J3 | J4 | Reset | E | F | G | H |
| 1 | 0 | 0 | 0 | 0 | On | Off | Off | Off | Off | C | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | Off | On | Off | Off | Off | 0 | C | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | Off | Off | On | Off | Off | 0 | 0 | C | 0 |
| 0 | 0 | 0 | 1 | 0 | Off | Off | Off | On | Off | 0 | 0 | 0 | C |

TRUTH TABLE Latching
CCR-49KX4C-TD

| Logic Input | | | RF Path | | | | | Indicator Switches | | | |
|-------------|---|---|----------|-----|-----|-----|-------|--------------------|---|---|---|
| 1 | 2 | 3 | J1 | J2 | J3 | J4 | Reset | E | F | G | H |
| 0 | 0 | 0 | On | Off | Off | Off | Off | C | 0 | 0 | 0 |
| 1 | 0 | 0 | Off | On | Off | Off | Off | 0 | C | 0 | 0 |
| 0 | 1 | 0 | Off | Off | On | Off | Off | 0 | 0 | C | 0 |
| 1 | 1 | 0 | Off | Off | Off | On | Off | 0 | 0 | 0 | C |
| 0 | 1 | 1 | Off | Off | Off | Off | Reset | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | COIL OFF | | | | | 0 | 0 | 0 | 0 |

Series CCR-49K/CR-49K

Multi-Throw DC-40 GHz, SP3T-SP6T
Latching Coaxial Switch



TRUTH TABLE Latching CCR-49KX5C-T

| Logic Input | | | | | | RF Path | | | | | | Indicator Switches | | | | |
|-------------|---|---|---|---|---|---------|-----|-----|-----|-----|-------|--------------------|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | R | J1 | J2 | J3 | J4 | J5 | Reset | E | F | G | H | K |
| 1 | 0 | 0 | 0 | 0 | 0 | On | Off | Off | Off | Off | Off | C | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | Off | On | Off | Off | Off | Off | 0 | C | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | Off | Off | On | Off | Off | Off | 0 | 0 | C | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | Off | Off | Off | On | Off | Off | 0 | 0 | 0 | C | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | Off | Off | Off | Off | On | Off | 0 | 0 | 0 | 0 | C |

TRUTH TABLE Latching CCR-49KX5C-TD

| Logic Input | | | RF Path | | | | | Indicator Switches | | | | | |
|-------------|---|---|----------|-----|-----|-----|-----|--------------------|---|---|---|---|---|
| 1 | 2 | 3 | J1 | J2 | J3 | J4 | J5 | Reset | E | F | G | H | K |
| 0 | 0 | 0 | On | Off | Off | Off | Off | Off | C | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | Off | On | Off | Off | Off | Off | 0 | C | 0 | 0 | 0 |
| 0 | 1 | 0 | Off | Off | On | Off | Off | Off | 0 | 0 | C | 0 | 0 |
| 1 | 1 | 0 | Off | Off | Off | On | Off | Off | 0 | 0 | 0 | C | 0 |
| 0 | 0 | 1 | Off | Off | Off | Off | On | Off | 0 | 0 | 0 | 0 | C |
| 0 | 1 | 1 | Off | Off | Off | Off | Off | Reset | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | COIL OFF | | | | | 0 | 0 | 0 | 0 | 0 | |

TRUTH TABLE Latching CCR-49KX6C-T

| Logic Input | | | | | | | RF Path | | | | | | Indicator Switches | | | | | | |
|-------------|---|---|---|---|---|---|---------|-----|-----|-----|-----|-----|--------------------|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | R | J1 | J2 | J3 | J4 | J5 | J6 | Reset | E | F | G | H | K | L |
| 1 | 0 | 0 | 0 | 0 | 0 | 0 | On | Off | Off | Off | Off | Off | Off | C | 0 | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | 0 | 0 | 0 | 0 | Off | On | Off | Off | Off | Off | Off | 0 | C | 0 | 0 | 0 | 0 |
| 0 | 0 | 1 | 0 | 0 | 0 | 0 | Off | Off | On | Off | Off | Off | Off | 0 | 0 | C | 0 | 0 | 0 |
| 0 | 0 | 0 | 1 | 0 | 0 | 0 | Off | Off | Off | On | Off | Off | Off | 0 | 0 | 0 | C | 0 | 0 |
| 0 | 0 | 0 | 0 | 1 | 0 | 0 | Off | Off | Off | Off | On | Off | Off | 0 | 0 | 0 | 0 | C | 0 |
| 0 | 0 | 0 | 0 | 0 | 1 | 0 | Off | Off | Off | Off | Off | On | Off | 0 | 0 | 0 | 0 | 0 | C |

TRUTH TABLE Latching CCR-49KX6C-TD

| Logic Input | | | RF Path | | | | | | Indicator Switches | | | | | | |
|-------------|---|---|----------|-----|-----|-----|-----|-----|--------------------|---|---|---|---|---|---|
| 1 | 2 | 3 | J1 | J2 | J3 | J4 | J5 | J6 | Reset | E | F | G | H | K | L |
| 0 | 0 | 0 | On | Off | Off | Off | Off | Off | Off | C | 0 | 0 | 0 | 0 | 0 |
| 1 | 0 | 0 | Off | On | Off | Off | Off | Off | Off | 0 | C | 0 | 0 | 0 | 0 |
| 0 | 1 | 0 | Off | Off | On | Off | Off | Off | Off | 0 | 0 | C | 0 | 0 | 0 |
| 1 | 1 | 0 | Off | Off | Off | On | Off | Off | Off | 0 | 0 | 0 | C | 0 | 0 |
| 0 | 0 | 1 | Off | Off | Off | Off | On | Off | Off | 0 | 0 | 0 | 0 | C | 0 |
| 1 | 0 | 1 | Off | Off | Off | Off | Off | On | Off | 0 | 0 | 0 | 0 | 0 | C |
| 0 | 1 | 1 | Off | Off | Off | Off | Off | Off | Reset | 0 | 0 | 0 | 0 | 0 | 0 |
| 1 | 1 | 1 | COIL OFF | | | | | | 0 | 0 | 0 | 0 | 0 | 0 | |

TYPICAL RF PERFORMANCE CURVES

INSERTION LOSS



VSWR



TYPICAL RF PERFORMANCE CURVES

ISOLATION



TYPICAL POWER PERFORMANCE CURVE

Power Handling vs. Frequency



Estimates based on the following reference conditions:

- Ambient temperature of 40°C or less
- Sea level operation
- Load VSWR of 1.20:1 maximum
- No high-power (hot) switching

Please contact Teledyne Coax Switches for derating factors when applications do not meet the foregoing reference conditions.