



| PART NUMBER | DESCRIPTION                                     |
|-------------|---|
| CCT-48K     | Commercial Normally Open Multi-throw, DC-40 GHz |
| CT-48K      | Elite Normally Open Multi-throw, DC-40GHz       |

The CCT-48K/CT-48K is an Internally Terminated 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. Internal terminations provide an impedance match for the unselected ports. 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 CCT-48K/CT-48K comes with a normally open actuator. For the normally open actuator, all ports are terminated in 50 Ohms, except the common input port which is open when the switch is de-energized.



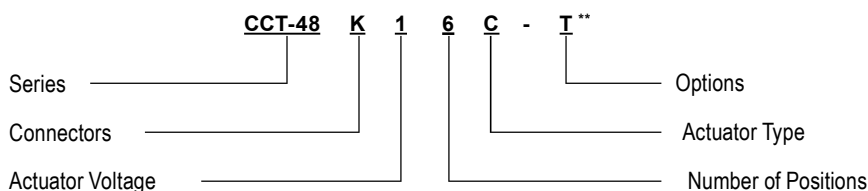
| ENVIRONMENTAL AND PHYSICAL CHARACTERISTICS                     |                       |
|--|-----------------------|
| Operating Temperature  |                       |
| Commercial Model, CCT-48K                                      | -25°C to 65°C         |
| Elite Model, CT-48K***   | -55°C to 85°C         |
| 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                   |                                 |
| CCT-48K                           | DC-40 GHz                       |
| CT-48K                            | DC-40 GHz                       |
| Characteristic Impedance          | 50 Ohms                         |
| Terminations                      | 50Ω, 2 Watts CW max.            |
| Operate Time                      | 15 ms (max.)                    |
| Release Time                      | 15 ms (max.)                    |
| Actuation Voltage Available       | 12 15 24 28 V                   |
| Actuation Current, max. @ ambient | 420 350 250 200 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**



| CONNECTOR        | ACTUATOR VOLTAGE       | NUMBER OF POSITIONS | ACTUATOR TYPE            | OPTIONS                                  |
|------------------|------------------------|---------------------|--------------------------|--|
| K: 2.92mm FEMALE | 1: 28VDC NORMALLY OPEN | 3: SP3T             | 0: NO INDICATOR CONTACTS | T: TTL DRIVERS WITH DIODES               |
|                  | 2: 15VDC NORMALLY OPEN | 4: SP4T             | C: INDICATOR CONTACTS*** | D: COIL TRANSIENT SUPPRESSION DIODES     |
|                  | 3: 12VDC NORMALLY OPEN | 5: SP5T             |                          | R: POSITIVE + COMMON                     |
|                  | 4: 24VDC NORMALLY OPEN | 6: SP6T             |                          | TD: DECODERS AND TTL DRIVERS WITH DIODES |

\*\*SEE PARTS LIST ON PAGE 12-14  
\*\*\*Indicator Contacts Operating Temperature -50°C to 85°C (Elite Model Only)

M: MOISTURE SEAL

S: D-SUB CONNECTOR\*

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

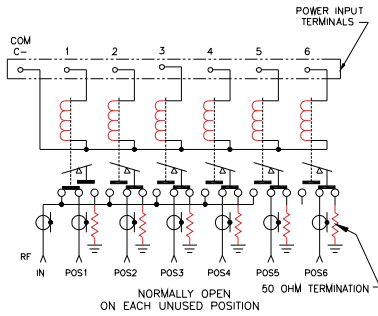
For additional options, please contact factory.

# Series CCT-48K/CT-48K

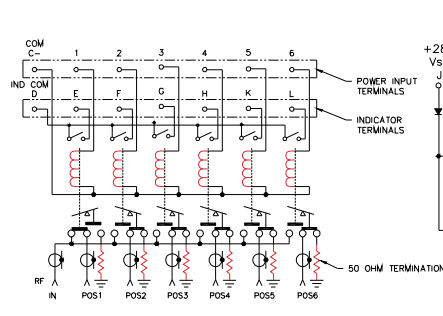
Internal 50Ω Termination DC-40 GHz  
Normally Open Multi-Throw Coaxial Switch



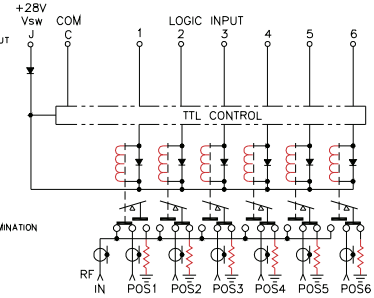
## SCHEMATICS AND MECHANICAL OUTLINE



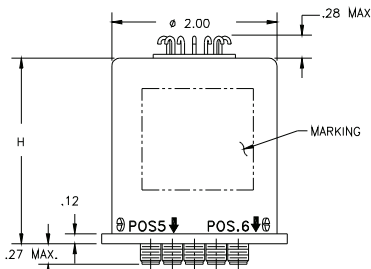
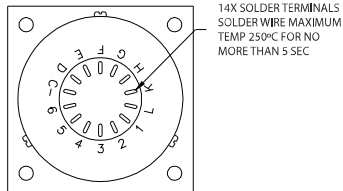
**Analog**



**Indicators**

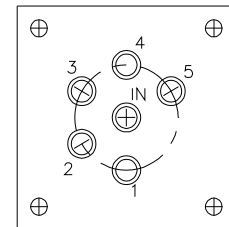
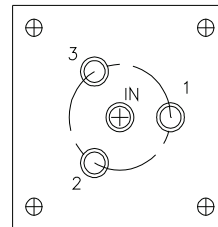


**TTL**



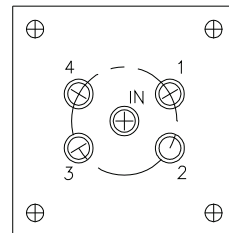
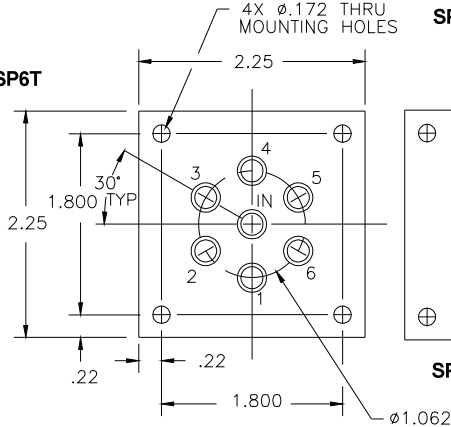
H = 1.85 STD, Indicator & D-Sub Models  
H = 2.50 All OTHER Models

**SP3T**

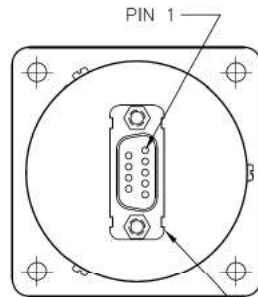
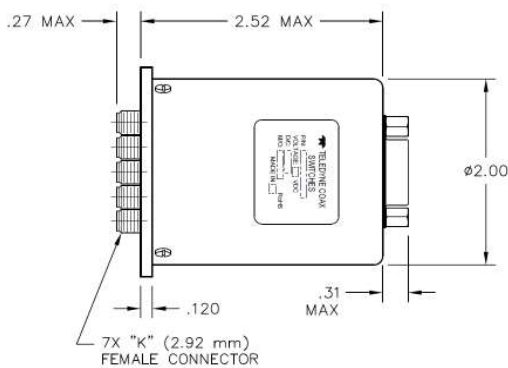


**SP5T**

**SP6T**



**SP4T**

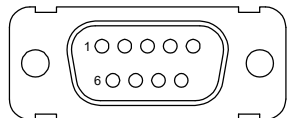


9-PIN D-SUB MINI CONNECTOR

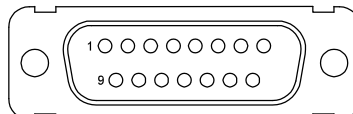
**“-SOPTION” 9-PIN, 15-PIN, 26-PIN D-SUB CONNECTOR (EXAMPLE: CCT-48Ks660-S)**

| CONNECTOR PINOUT FOR NORMALLY OPEN SP3T MULTI-THROW SWITCHES |             |                   |              |                   |               |                   |
|--|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE  | CT-48K130-S | CT-48K13C-S       | CT-48K130-TS | CT-48K13C-TS      | CT-48K130-TDS | CT-48K13C-TDS     |
| PIN NO   | 9-PINS      | 9-PINS            | 9-PINS       | 9-PINS            | 9-PINS        | 9-PINS            |
| INDICATOR  |             | YES               |              | YES               |               | YES               |
| TTL  |             |                   | YES          | YES               |               |                   |
| DECODERS & TTL   |             |                   |              |                   | YES           | YES               |
| 1  | PORT 1      | PORT 1            | TTL 1        | TTL 1             | LOGIC 1       | LOGIC 1           |
| 2  | PORT 2      | PORT 3            | TTL 2        | TTL 2             | LOGIC 2       | LOGIC 2           |
| 3  | PORT 3      | PORT 3            | TTL 3        | TTL 3             |               |                   |
| 4  |             | E INDICATOR       |              | E INDICATOR       |               | E INDICATOR       |
| 5  |             | F INDICATOR       |              | F INDICATOR       |               | F INDICATOR       |
| 6  |             | G INDICATOR       |              | G INDICATOR       |               | G INDICATOR       |
| 7  | COMMON      | COMMON            | COMMON       | COMMON            | COMMON        | COMMON            |
| 8  |             |                   | Vsw          | Vsw               | Vsw           | Vsw               |
| 9  |             | D INDICATOR (COM) |              | D INDICATOR (COM) |               | D INDICATOR (COM) |

| CONNECTOR PINOUT FOR NORMALLY OPEN SP4T MULTI-THROW SWITCHES |             |                   |              |                   |               |                   |
|--|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE  | CT-48K140-S | CT-48K14C-S       | CT-48K140-TS | CT-48K14C-TS      | CT-48K140-TDS | CT-48K14C-TDS     |
| PIN NO   | 9-PINS      | 15-PINS           | 9-PINS       | 15-PINS           | 9-PINS        | 15-PINS           |
| INDICATOR  |             | YES               |              | YES               |               | YES               |
| TTL  |             |                   | YES          | YES               |               |                   |
| DECODERS & TTL   |             |                   |              |                   | YES           | YES               |
| 1  | PORT 1      | PORT 1            | TTL 1        | TTL 1             | LOGIC 1       | LOGIC 1           |
| 2  | PORT 2      | PORT 3            | 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  |             |                   | Vsw          | Vsw               | Vsw           | Vsw               |
| 9  |             | D INDICATOR (COM) |              | D INDICATOR (COM) |               | D INDICATOR (COM) |
| 10   |             | E INDICATOR       |              | E INDICATOR       |               | E INDICATOR       |
| 11   |             | F INDICATOR       |              | F INDICATOR       |               | F INDICATOR       |
| 12   |             | G INDICATOR       |              | G INDICATOR       |               | G INDICATOR       |
| 13   |             | H INDICATOR       |              | H INDICATOR       |               | H INDICATOR       |
| 14   |             |                   |              |                   |               |                   |
| 15   |             |                   |              |                   |               |                   |



**9-PIN D-SUB CONNECTOR**



**15-PIN D-SUB CONNECTOR**

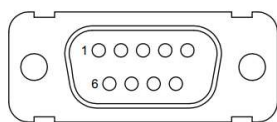
“-S option” 9-pin, 15-pin connector  
(example: [CCT-48KS660-S](#))

**Series CCT-48K/CT-48K**  
 Internal 50Ω Termination DC-40 GHz  
 Normally Open Multi-Throw Coaxial Switch

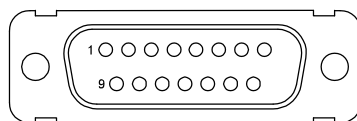


| CONNECTOR PINOUT FOR NORMALLY OPEN SP5T MULTI-THROW SWITCHES |             |                   |              |                   |               |                   |
|--|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE  | CT-48K150-S | CT-48K15C-S       | CT-48K150-TS | CT-48K15C-TS      | CT-48K150-TDS | CT-48K15C-TDS     |
| PIN NO   | 9-PINS      | 15-PINS           | 9-PINS       | 15-PINS           | 9-PINS        | 15-PINS           |
| INDICATOR  |             | YES               |              | YES               |               | YES               |
| TTL  |             |                   | YES          | YES               |               |                   |
| DECODERS & TTL   |             |                   |              |                   | YES           | YES               |
| 1  | PORT 1      | PORT 1            | TTL 1        | TTL 1             | LOGIC 1       | LOGIC 1           |
| 2  | PORT 2      | PORT 3            | 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  |             |                   | Vsw          | Vsw               | Vsw           | Vsw               |
| 9  |             | D INDICATOR (COM) |              | D INDICATOR (COM) |               | D INDICATOR (COM) |
| 10   |             | E INDICATOR       |              | E INDICATOR       |               | E INDICATOR       |
| 11   |             | F INDICATOR       |              | F INDICATOR       |               | F INDICATOR       |
| 12   |             | G INDICATOR       |              | G INDICATOR       |               | G INDICATOR       |
| 13   |             | H INDICATOR       |              | H INDICATOR       |               | H INDICATOR       |
| 14   |             | K INDICATOR       |              | K INDICATOR       |               | K INDICATOR       |
| 15   |             |                   |              |                   |               |                   |

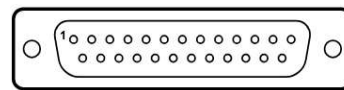
| CONNECTOR PINOUT FOR NORMALLY OPEN SP6T MULTI-THROW SWITCHES |             |                   |              |                   |               |                   |
|--|-------------|-------------------|--------------|-------------------|---------------|-------------------|
| EXAMPLE  | CT-48K160-S | CT-48K16C-S       | CT-48K160-TS | CT-48K16C-TS      | CT-48K160-TDS | CT-48K16C-TDS     |
| PIN NO   | 9-PINS      | 15-PINS           | 9-PINS       | 15-PINS           | 9-PINS        | 15-PINS           |
| INDICATOR  |             | YES               |              | YES               |               | YES               |
| TTL  |             |                   | YES          | YES               |               |                   |
| DECODERS & TTL   |             |                   |              |                   | YES           | YES               |
| 1  | PORT 1      | PORT 1            | TTL 1        | TTL 1             | LOGIC 1       | LOGIC 1           |
| 2  | PORT 2      | PORT 3            | 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  | PORT 6      | PORT 6            | TTL 6        | TTL 6             |               |                   |
| 7  | COMMON      | COMMON            | COMMON       | COMMON            | COMMON        | COMMON            |
| 8  |             |                   | Vsw          | Vsw               | Vsw           | Vsw               |
| 9  |             | D INDICATOR (COM) |              | D INDICATOR (COM) |               | D INDICATOR (COM) |
| 10   |             | E INDICATOR       |              | E INDICATOR       |               | E INDICATOR       |
| 11   |             | F INDICATOR       |              | F INDICATOR       |               | F INDICATOR       |
| 12   |             | G INDICATOR       |              | G INDICATOR       |               | G INDICATOR       |
| 13   |             | H INDICATOR       |              | H INDICATOR       |               | H INDICATOR       |
| 14   |             | K INDICATOR       |              | K INDICATOR       |               | K INDICATOR       |
| 15   |             | L INDICATOR       |              | L INDICATOR       |               | L INDICATOR       |



**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: [CCT-48KS660-S](#))

TRUTH TABLE Normally Open  
CCT-48KX3C-T

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

TRUTH TABLE Normally Open  
CCT-48KX3C-TD

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

TRUTH TABLE Normally Open  
CCT-48KX4C-T

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

TRUTH TABLE Normally Open  
CCT-48KX4C-TD

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

**Series CCT-48K/CT-48K**  
 Internal 50Ω Termination DC-40 GHz  
 Normally Open Multi-Throw Coaxial Switch



**TRUTH TABLE Normally Open  
 CCT-48KX5C-T**

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

**TRUTH TABLE Normally Open  
 CCT-48KX5C-TD**

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

**TRUTH TABLE Normally Open  
 CCT-48KX6C-T**

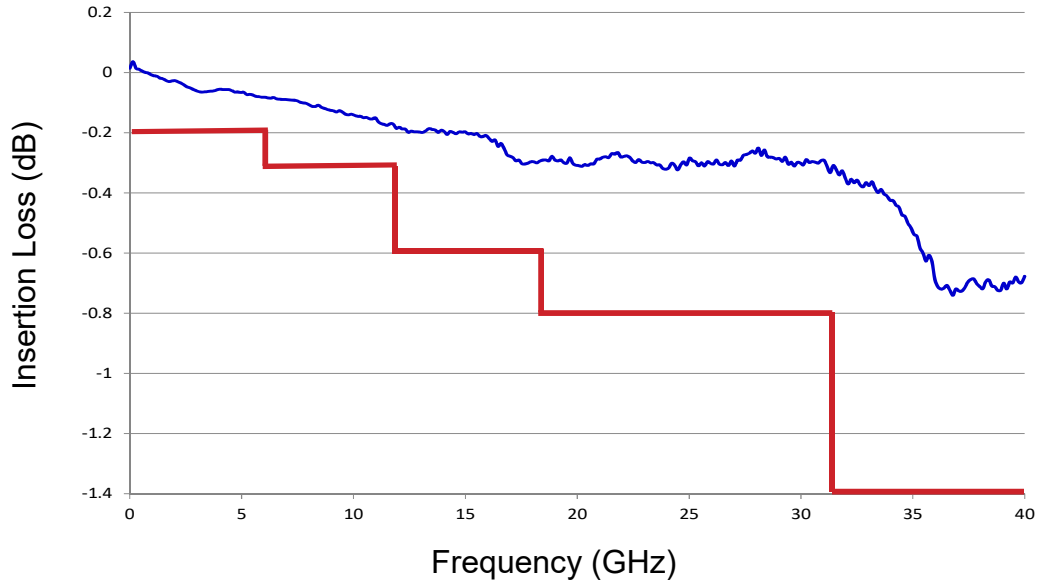
| Logic Input |   |   |   |   |   | RF Path |     |     |     |     |     | Indicator Switches |   |   |   |   |   |
|-------------|---|---|---|---|---|---------|-----|-----|-----|-----|-----|--------------------|---|---|---|---|---|
| 1           | 2 | 3 | 4 | 5 | 6 | J1      | J2  | J3  | J4  | J5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

**TRUTH TABLE Normally Open  
 CCT-48KX6C-TD**

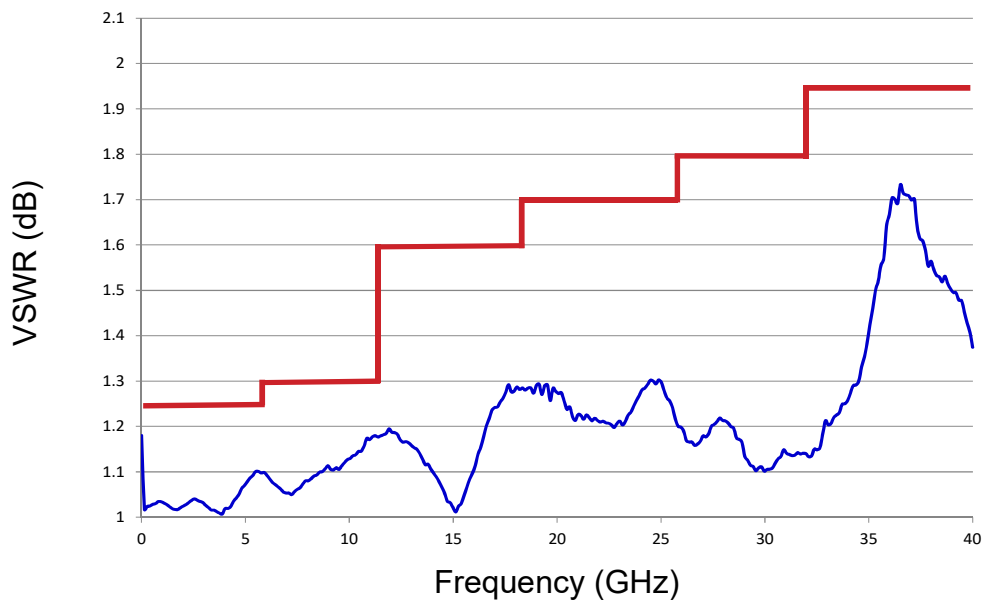
| Logic Input |   |   | RF Path |     |     |     |     |     | Indicator Switches |   |   |   |   |   |
|-------------|---|---|---------|-----|-----|-----|-----|-----|--------------------|---|---|---|---|---|
| 1           | 2 | 3 | J1      | J2  | J3  | J4  | J5  | J6  | E                  | F | G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

**TYPICAL RF PERFORMANCE CURVES**

**INSERTION LOSS**

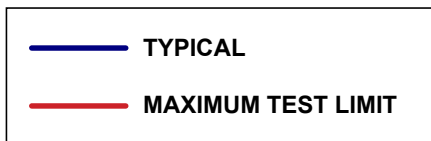
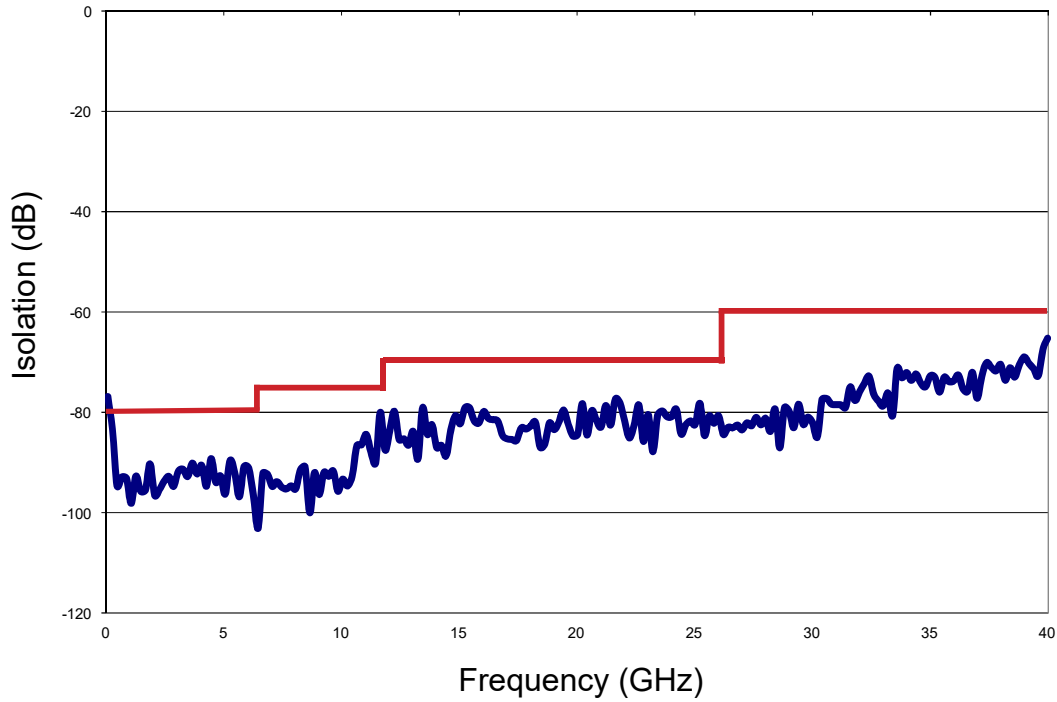


**VSWR**



**TYPICAL RF PERFORMANCE CURVES**

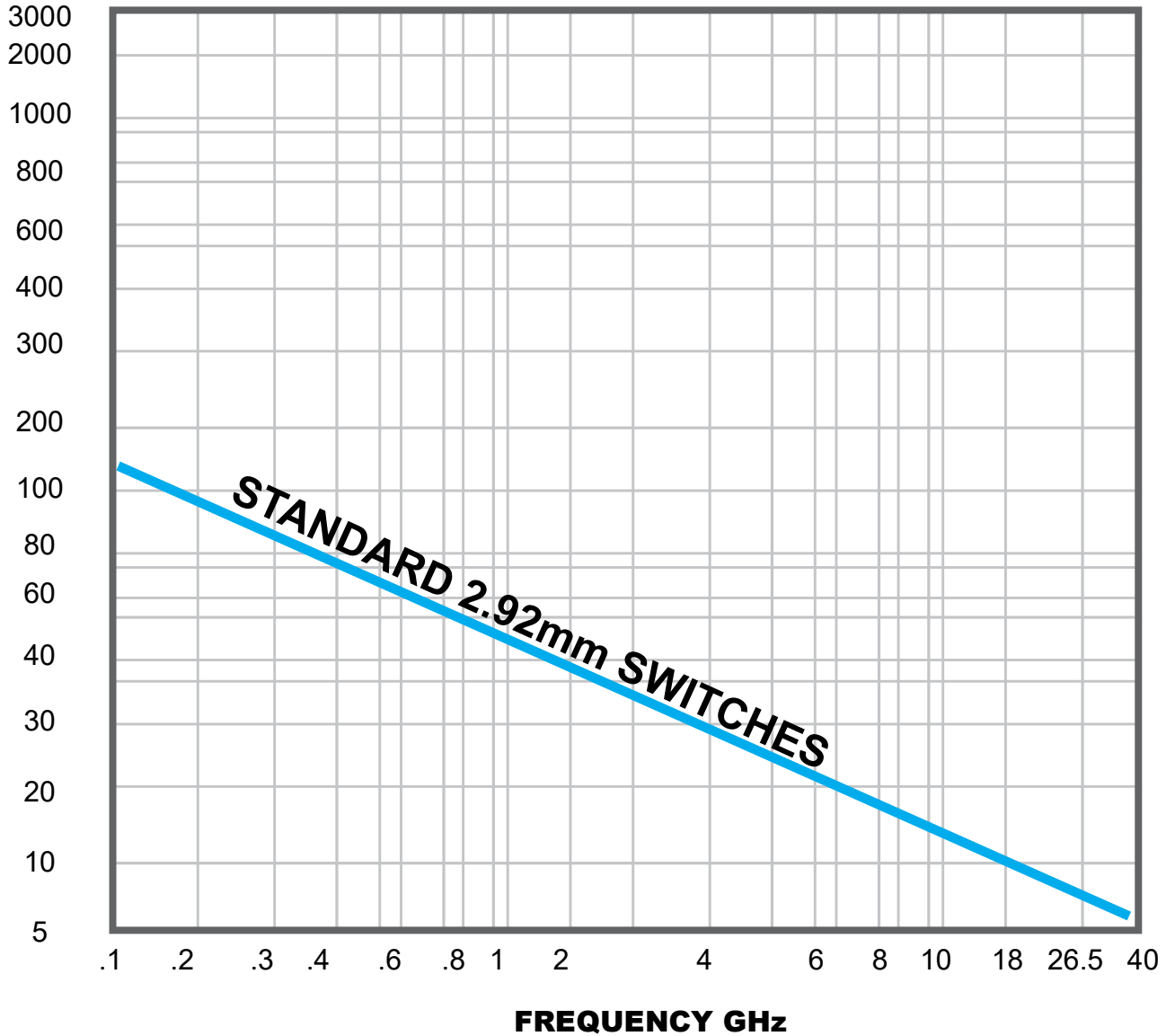
### ISOLATION





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.