PART NUMBER	DESCRIPTION
CCT-58S	Commercial Normally Open Multi-throw, DC-18 GHz

The CCT-58S/CT-58S is an internally terminated, broadband, multi-throw, electromechanical coaxial switch designed to switch a microwave signal from a common input to any of 7 or 8 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 1.54" dia. circle.
Each position has an individual actuator mechanism allowing random position selection. This also minimizes switching time.
The CCT-58S/CT-58S 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.
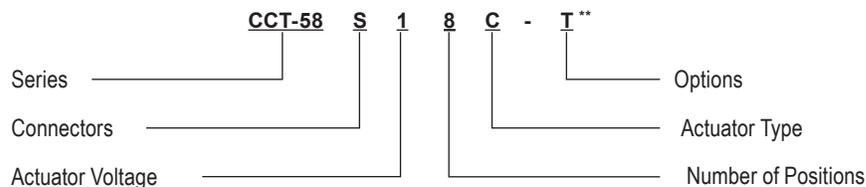
RoHS Compliant

ENVIRONMENTAL AND PHYSICAL CHARACTERISTICS

Operating Temperature	
Commercial Model, CCT-58S	–25°C to 65°C
Elite Model, CT-58S	–40°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	3,000,000 cycles
Actuator Life w/ Additional Features	1,000,000 cycles
Connector Type	SMA
Humidity (Moisture Seal)	Available
Weight	9 oz. (255.2G) (max.)

ELECTRICAL CHARACTERISTICS

Form Factor	Multi-Throw, break before make				
Frequency Range	DC–18 GHz				
Characteristic Impedance	50 Ohms				
Operate Time	20 ms (max.)				
Release Time	20 ms (max.)				
Actuation Voltage Available	12	15	24	28	V
Actuation Current, max. @ ambient	580	720	345	435	mA

RF PERFORMANCE SPECIFICATIONS

Frequency	DC–6 GHz	6–12 GHz	12–18 GHz
Insertion Loss, dB, max.	0.30	0.40	0.50
Isolation, dB, min.	70	60	60
VSWR , max.	1.25:1	1.40:1	1.60:1

PART NUMBERING SYSTEM

CCT-58 S 1 8 C - T**

Series
Connectors
Actuator Voltage
Number of Positions
Actuator Type
Options

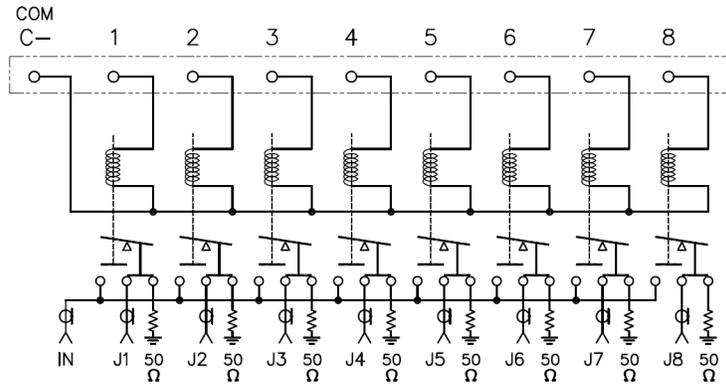| CONNECTOR	ACTUATOR VOLTAGE	NUMBER OF POSITIONS	ACTUATOR TYPE	OPTIONS
S: SMA FEMALE	1: 28 VDC NORMALLY OPEN	7: SP7T	0: NO INDICATOR CONTACTS	T: TTL DRIVERS WITH DIODES
	2: 15 VDC NORMALLY OPEN	8: SP8T	C: INDICATOR CONTACTS	D: COIL TRANSIENT SUPPRESSION DIODES
	3: 12 VDC NORMALLY OPEN			R: POSITIVE + COMMON
	4: 24 VDC NORMALLY OPEN			S: D-SUB CONNECTOR*
				TD: DECODERS AND TTL DRIVERS WITH DIODES
		**SEE PARTS LIST ON PAGE 10		M: MOISTURE SEAL

For additional options, please contact factory.

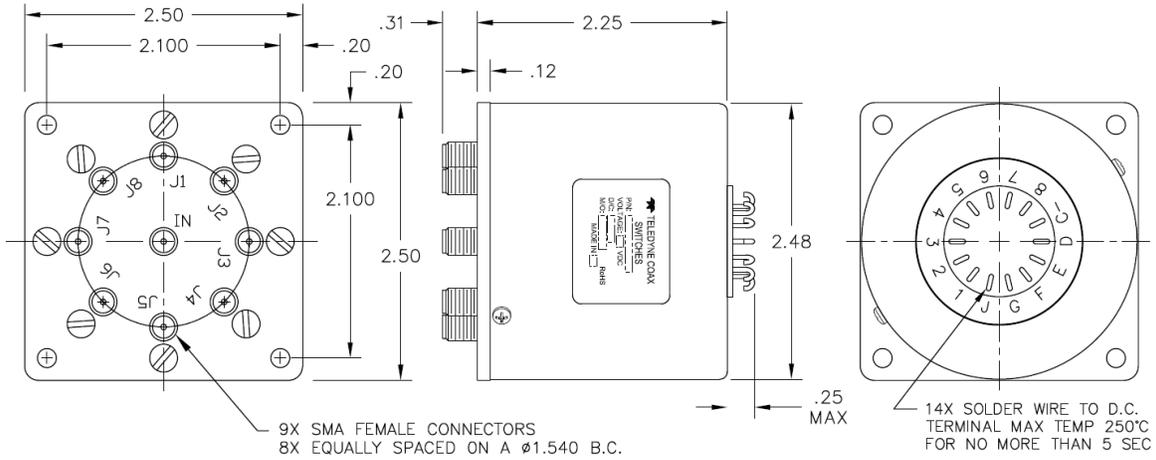* D-Sub Connector may be 15 or 25 pin depending on number of throws. (See Connector Pinout page)

Series CCT-58S
Multi-Throw DC–18 GHz, SP7T & SP8T
Normally Open Coaxial Switch

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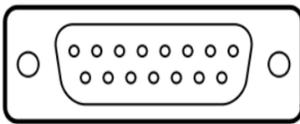Everywhere**you**look™

SCHEMATICS AND MECHANICAL OUTLINE

TERMINATIONS ON EACH UNUSED POSITION

9X SMA FEMALE CONNECTORS
8X EQUALLY SPACED ON A ø1.540 B.C.

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

"-S OPTION" 15-PIN OR 25-PIN D-SUB (EXAMPLE: CCT-58S180-S)

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CONNECTOR PINOUT FOR NORMALLY OPEN SP7T MULTI-THROW SWITCHES					
EXAMPLE	CR-58S170-S	CR-58S17C-S	CR-58S170-TS	CR-58S17C-TS	CR-58S170-TDS	CR-58S17C-TDS
PIN NO	15-PINS	25-PINS	15-PINS	25-PINS	15-PINS	25-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	PORT 7	PORT 7	TTL 7	TTL 7		
8						
9						
10						
11			Vsw	Vsw	Vsw	Vsw
12						
13	COMMON	COMMON	COMMON	COMMON	COMMON	COMMON
14						
15		D INDICATOR (COM)		D INDICATOR (COM)		D INDICATOR (COM)
16		E INDICATOR		E INDICATOR		E INDICATOR
17		F INDICATOR		F INDICATOR		F INDICATOR
18		G INDICATOR		G INDICATOR		G INDICATOR
19		H INDICATOR		H INDICATOR		H INDICATOR
20		K INDICATOR		K INDICATOR		K INDICATOR
21		L INDICATOR		L INDICATOR		L INDICATOR
22		M INDICATOR		M INDICATOR		M INDICATOR
23						
24						
25						

15-PIN D-SUB CONNECTOR
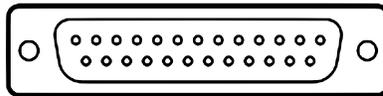
25-PIN D-SUB CONNECTOR

Series CCT-58S
Multi-Throw DC–18 GHz, SP7T & SP8T
Normally Open Coaxial Switch

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COAX SWITCHES
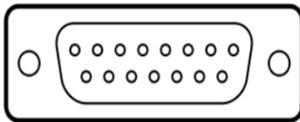Everywhere**you**look™

SP7T TRUTH TABLE Normally Open
CCT-58SX7C-T

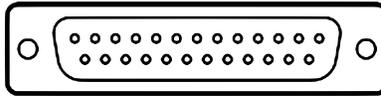| Logic Input							RF Path							Indicator Switches						
1	2	3	4	5	6	7	J1	J2	J3	J4	J5	J6	J7	E	F	G	H	K	L	M
1	0	0	0	0	0	0	On	Off	Off	Off	Off	Off	Off	C	0	0	0	0	0	0
0	1	0	0	0	0	0	Off	On	Off	Off	Off	Off	Off	0	C	0	0	0	0	0
0	0	1	0	0	0	0	Off	Off	On	Off	Off	Off	Off	0	0	C	0	0	0	0
0	0	0	1	0	0	0	Off	Off	Off	On	Off	Off	Off	0	0	0	C	0	0	0
0	0	0	0	1	0	0	Off	Off	Off	Off	On	Off	Off	0	0	0	0	C	0	0
0	0	0	0	0	1	0	Off	Off	Off	Off	Off	On	Off	0	0	0	0	0	C	0
0	0	0	0	0	0	1	Off	Off	Off	Off	Off	Off	On	0	0	0	0	0	0	C

TRUTH TABLE Normally Open
CCT-58SX7C-TD

Logic Input			RF Path							Indicator Switches						
1	2	3	J1	J2	J3	J4	J5	J6	J7	E	F	G	H	K	L	M
0	0	0	On	Off	Off	Off	Off	Off	Off	C	0	0	0	0	0	0
1	0	0	Off	On	Off	Off	Off	Off	Off	0	C	0	0	0	0	0
0	1	0	Off	Off	On	Off	Off	Off	Off	0	0	C	0	0	0	0
1	1	0	Off	Off	Off	On	Off	Off	Off	0	0	0	C	0	0	0
0	0	1	Off	Off	Off	Off	On	Off	Off	0	0	0	0	C	0	0
1	0	1	Off	Off	Off	Off	Off	On	Off	0	0	0	0	0	C	0
0	1	1	Off	Off	Off	Off	Off	Off	On	0	0	0	0	0	0	C
1	1	1	Off	Off	Off	Off	Off	Off	Off	0	0	0	0	0	0	0

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CONNECTOR PINOUT FOR NORMALLY OPEN SP8T MULTI-THROW SWITCHES					
EXAMPLE	CR-58S180-S	CR-58S18C-S	CR-58S180-TS	CR-58S18C-TS	CR-58S180-TDS	CR-58S18C-TDS
PIN NO	15-PINS	25-PINS	15-PINS	25-PINS	15-PINS	25-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	LOGIC 4	LOGIC 4
5	PORT 5	PORT 5	TTL 5	TTL 5		
6	PORT 6	PORT 6	TTL 6	TTL 6		
7	PORT 7	PORT 7	TTL 7	TTL 7		
8	PORT 8	PORT 8	TTL 8	TTL 8		
9						
10						
11			Vsw	Vsw	Vsw	Vsw
12						
13	COMMON	COMMON	COMMON	COMMON	COMMON	COMMON
14						
15		D INDICATOR (COM)		D INDICATOR (COM)		D INDICATOR (COM)
16		E INDICATOR		E INDICATOR		E INDICATOR
17		F INDICATOR		F INDICATOR		F INDICATOR
18		G INDICATOR		G INDICATOR		G INDICATOR
19		H INDICATOR		H INDICATOR		H INDICATOR
20		K INDICATOR		K INDICATOR		K INDICATOR
21		L INDICATOR		L INDICATOR		L INDICATOR
22		M INDICATOR		M INDICATOR		M INDICATOR
23		N INDICATOR		N INDICATOR		N INDICATOR
24						
25						

15-PIN D-SUB CONNECTOR

25-PIN D-SUB CONNECTOR

Series CCT-58S
Multi-Throw DC–18 GHz, SP7T & SP8T
Normally Open Coaxial Switch

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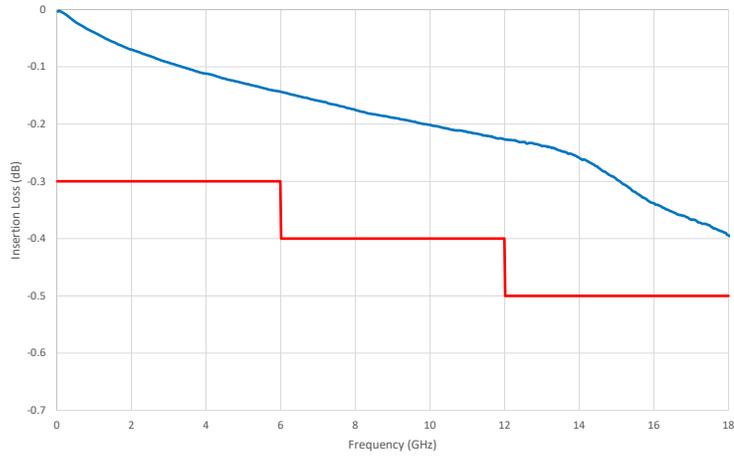## SP8T TRUTH TABLE Normally Open
CCT-58SX8C-T

Logic Input								RF Path								Indicator Switches							
1	2	3	4	5	6	7	8	J1	J2	J3	J4	J5	J6	J7	J8	E	F	G	H	K	L	M	N
1	0	0	0	0	0	0	0	On	Off	Off	Off	Off	Off	Off	Off	C	0	0	0	0	0	0	0
0	0	1	0	0	0	0	0	Off	Off	On	Off	Off	Off	Off	Off	0	0	C	0	0	0	0	0
0	0	0	1	0	0	0	0	Off	Off	Off	On	Off	Off	Off	Off	0	0	0	C	0	0	0	0
0	0	0	0	1	0	0	0	Off	Off	Off	Off	On	Off	Off	Off	0	0	0	0	C	0	0	0
0	0	0	0	0	1	0	0	Off	Off	Off	Off	Off	On	Off	Off	0	0	0	0	0	C	0	0
0	0	0	0	0	0	1	0	Off	Off	Off	Off	Off	Off	On	Off	0	0	0	0	0	0	C	0
0	0	0	0	0	0	0	1	Off	Off	Off	Off	Off	Off	Off	On	0	0	0	0	0	0	0	C

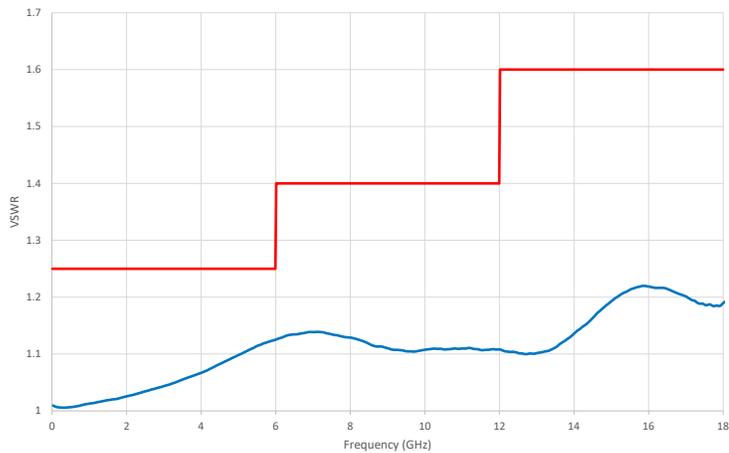## TRUTH TABLE Normally Open
CCT-58SX8C-TD

Logic Input				RF Path								Indicator Switches							
1	2	3	4	J1	J2	J3	J4	J5	J6	J7	J8	E	F	G	H	K	L	M	N
0	0	0	0	On	Off	Off	Off	Off	Off	Off	Off	C	0	0	0	0	0	0	0
1	0	0	0	Off	On	Off	Off	Off	Off	Off	Off	0	C	0	0	0	0	0	0
0	1	0	0	Off	Off	On	Off	Off	Off	Off	Off	0	0	C	0	0	0	0	0
1	1	0	0	Off	Off	Off	On	Off	Off	Off	Off	0	0	0	C	0	0	0	0
0	0	1	0	Off	Off	Off	Off	On	Off	Off	Off	0	0	0	0	C	0	0	0
1	0	1	0	Off	Off	Off	Off	Off	On	Off	Off	0	0	0	0	0	C	0	0
0	1	1	0	Off	Off	Off	Off	Off	Off	On	Off	0	0	0	0	0	0	C	0
1	1	1	0	Off	Off	Off	Off	Off	Off	Off	On	0	0	0	0	0	0	0	C
0	0	0	1	Off	Off	Off	Off	Off	Off	Off	Off	0	0	0	0	0	0	0	0

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Series CCT-58S
Multi-Throw DC–18 GHz, SP7T & SP8T
Normally Open Coaxial Switch

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TYPICAL RF PERFORMANCE CURVES

Insertion Loss (DC-18GHz)

VSWR (DC-18GHz)

Isolation (DC-18GHz)

— TYPICAL

— MAXIMUM TEST LIMIT

Series CCT-58S
Multi-Throw DC–18 GHz, SP7T & SP8T
Normally Open Coaxial Switch

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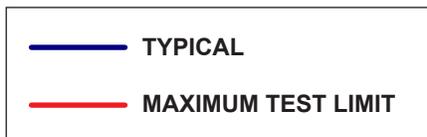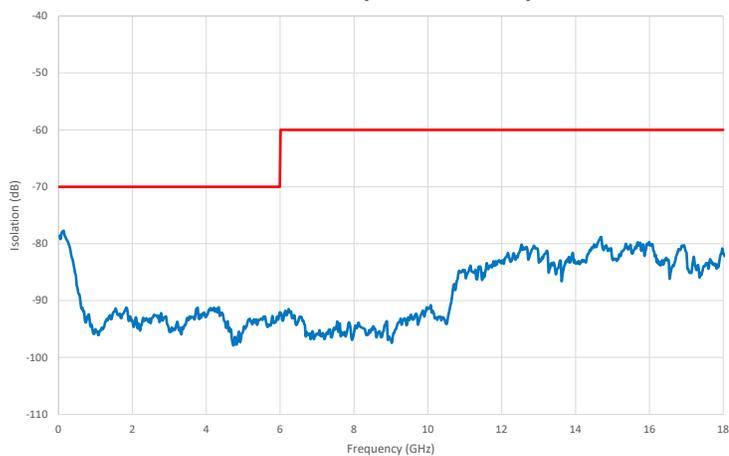
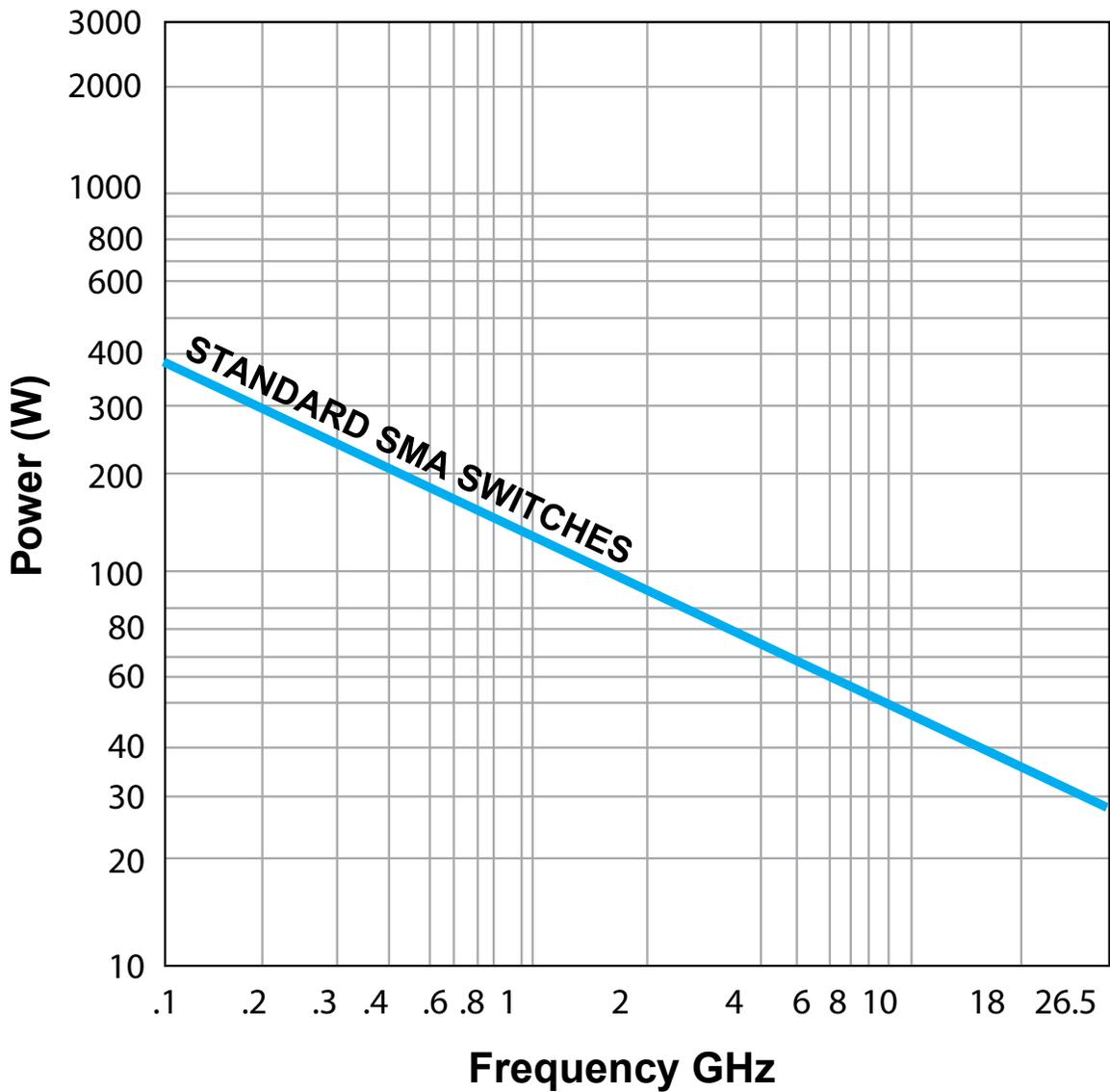**TYPICAL POWER PERFORMANCE CURVE**

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.

GLOSSARY

Actuator

An actuator is the electromechanical mechanism that transfers the RF contacts from one position to another upon DC command.

Arc Suppression Diode

A diode is connected in parallel with the coil. This diode limits the "reverse EMF spike" generated when the coil de-energizes to 0.7 volts. The diode cathode is connected to the positive side of the coil and the anode is connected to the negative side.

Date Code

All switches are marked with either a unique serial number or a date code. Date codes are in accordance with MIL-STD-1285 Paragraph 5.2.5 and consist of four digits. The first two digits define the year and the last two digits define the week of the year (YYWW). Thus, 1032 identifies switches that passed through final inspection during the 32nd week of 2010.

Indicator

Indicators tell the system which position the switch is in. Other names for indicators are telemetry contacts or tellback circuit. Indicators are usually a set of internally mounted DC contacts linked to the actuator. They can be wired to digital input lines, status lights, or interlocks. Unless otherwise specified, the maximum indicator contact rating is 30 Vdc, 50 mA, or 1.5 Watts into a resistive load.

Isolation

Isolation is the measure of the power level at the output connector of an unconnected RF channel as referenced to the power at the input connector. It is specified in dB below the input power level.

Multi-Throw Switch

A multi-throw switch is a switch with one input and three or more output ports. The CCT-58 can switch a microwave signal to any of 8 outputs from a single common input.

Switching Time

Switching time is the total interval beginning with the arrival of the leading edge of the command pulse at the switch DC input and ending with the completion of the switch transfer, including contact bounce. It consists of three parts: (1) inductive delay in the coil, (2) transfer time of the physical movement of the contacts, and (3) the bounce time of the RF contacts.

TTL Switch Driver Option

As a special option, switch drivers can be provided for both failsafe and latching switches, which are compatible with industry-standard low-power Schottky TTL circuits.

TD-Option

This option includes a decoder. The 3-bit parallel command is decoded to internally select the appropriate position. See the logic tables. The TD-Option increases the Vsw supply current demand by 50mA max at 28Vdc and +20°C.

Performance Parameters vs Frequency

Generally speaking, the RF performance of coaxial switches is frequency dependent. With increasing frequency, VSWR and insertion loss increase while isolation decreases. All data sheets specify these three parameters as "worst case" at the highest operating frequency. If the switch is to be used over a narrow frequency band, better performance can be achieved.

Actuator Current vs Temperature

The resistance of the actuator coil varies as a function of temperature. There is an inverse relationship between the operating temperature of the switch and the actuator drive current. For switches operating at 28 VDC, the approximate actuator drive current at temperature, T, can be calculated using the equation:

$$I_T = \frac{I_A}{[1 + .00385\,(T-20)]}$$

Where:

I_T = Actuator current at temperature, T

I_A = Room temperature actuator current – see data sheet

T = Temperature of interest in °C

Magnetic Sensitivity

An electro-mechanical switch can be sensitive to ferrous materials and external magnetic fields. Neighboring ferrous materials should be permitted no closer than 0.5 inches and adjacent external magnetic fields should be limited to a flux density of less than 5 Gauss.

Series CCT-58S
Multi-Throw DC–18 GHz, SP7T & SP8T
Normally Open Coaxial Switch

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NORMALLY OPEN CCT-58S PART NUMBER LIST

	Part No.		Part No.		Part No.
1	CCT-58SX7C	43	CCT-58SX70	85	CCT-58SX8C
2	CCT-58SX7C-D	44	CCT-58SX70-D	86	CCT-58SX8C-D
3	CCT-58SX7C-DM	45	CCT-58SX70-DM	87	CCT-58SX8C-DM
4	CCT-58SX7C-M	46	CCT-58SX70-M	88	CCT-58SX8C-M
5	CCT-58SX7C-MS	47	CCT-58SX70-MS	89	CCT-58SX8C-MS
6	CCT-58SX7C-S	48	CCT-58SX70-S	90	CCT-58SX8C-S
7	CCT-58SX7C-T	49	CCT-58SX70-T	91	CCT-58SX8C-T
8	CCT-58SX7C-TD	50	CCT-58SX70-TD	92	CCT-58SX8C-TD
9	CCT-58SX7C-TDM	51	CCT-58SX70-TDM	93	CCT-58SX8C-TDM
10	CCT-58SX7C-TDMS	52	CCT-58SX70-TDMS	94	CCT-58SX8C-TDMS
11	CCT-58SX7C-TDS	53	CCT-58SX70-TDS	95	CCT-58SX8C-TDS
12	CCT-58SX7C-TM	54	CCT-58SX70-TM	96	CCT-58SX8C-TM
13	CCT-58SX7C-TMS	55	CCT-58SX70-TMS	97	CCT-58SX8C-TMS
14	CCT-58SX7C-TS	56	CCT-58SX70-TS	98	CCT-58SX8C-TS
15	CCT-58SX70	57	CCT-58SX8C	99	CCT-58SX80
16	CCT-58SX70-D	58	CCT-58SX8C-D	100	CCT-58SX80-D
17	CCT-58SX70-DM	59	CCT-58SX8C-DM	101	CCT-58SX80-DM
18	CCT-58SX70-M	60	CCT-58SX8C-M	102	CCT-58SX80-M
19	CCT-58SX70-MS	61	CCT-58SX8C-MS	103	CCT-58SX80-MS
20	CCT-58SX70-S	62	CCT-58SX8C-S	104	CCT-58SX80-S
21	CCT-58SX70-T	63	CCT-58SX8C-T	105	CCT-58SX80-T
22	CCT-58SX70-TD	64	CCT-58SX8C-TD	106	CCT-58SX80-TD
23	CCT-58SX70-TDM	65	CCT-58SX8C-TDM	107	CCT-58SX80-TDM
24	CCT-58SX70-TDMS	66	CCT-58SX8C-TDMS	108	CCT-58SX80-TDMS
25	CCT-58SX70-TDS	67	CCT-58SX8C-TDS	109	CCT-58SX80-TDS
26	CCT-58SX70-TM	68	CCT-58SX8C-TM	110	CCT-58SX80-TM
27	CCT-58SX70-TMS	69	CCT-58SX8C-TMS	111	CCT-58SX80-TMS
28	CCT-58SX70-TS	70	CCT-58SX8C-TS	112	CCT-58SX80-TS
29	CCT-58SX7C	71	CCT-58SX80		
30	CCT-58SX7C-D	72	CCT-58SX80-D		
31	CCT-58SX7C-DM	73	CCT-58SX80-DM		
32	CCT-58SX7C-M	74	CCT-58SX80-M		
33	CCT-58SX7C-MS	75	CCT-58SX80-MS		
34	CCT-58SX7C-S	76	CCT-58SX80-S		
35	CCT-58SX7C-T	77	CCT-58SX80-T		
36	CCT-58SX7C-TD	78	CCT-58SX80-TD		
37	CCT-58SX7C-TDM	79	CCT-58SX80-TDM		
38	CCT-58SX7C-TDMS	80	CCT-58SX80-TDMS		
39	CCT-58SX7C-TDS	81	CCT-58SX80-TDS		
40	CCT-58SX7C-TM	82	CCT-58SX80-TM		
41	CCT-58SX7C-TMS	83	CCT-58SX80-TMS		
42	CCT-58SX7C-TS	84	CCT-58SX80-TS		

* X = 1 (28Vdc), 2 (15Vdc), 3 (12Vdc) and 4 (24Vdc)

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