

PART NUMBER	DESCRIPTION
CCS-37K	Commercial Latching TRANSFER, DC-36GHz
CS-37K	Elite Latching TRANSFER, DC-36GHz

The CCS-37K/CS-37K is a long-life high performance transfer switch designed for use in 50 Ohms coaxial transmission lines operating over frequencies ranging from DC to 36 GHz. The switch is designed for minimum size compatible with K connector spacing.

This switch is provided with a magnetic latching actuator which is particularly desirable in applications where actuator power consumption must be kept to an absolute minimum. The latching type actuator requires less switching current than the failsafe type. This makes this type of actuator especially suitable for portable battery operated systems.



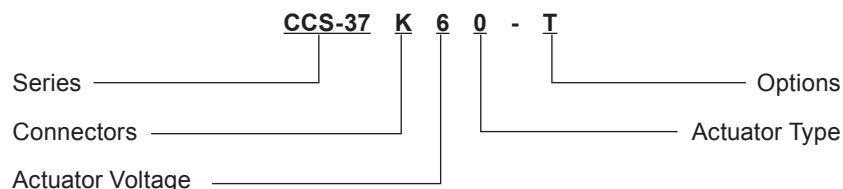
ENVIRONMENTAL AND PHYSICAL CHARACTERISTICS	
Operating Temperature	
Commercial Model, CCS-37K	–40°C to 65°C
Elite Model, CS-37K	–55°C to 85°C
Vibration (MIL-STD-202 Method 214, Condition D, non-operating)	10 g's RMS
Shock (MIL-STD-202 Method 213, Condition D, non-operating)	500 g's
Standard Actuator Life	5,000,000 cycles
Connector Type	2.92 mm / K
Weight	2.5 oz. (70.87g) (max.)

ELECTRICAL CHARACTERISTICS	
Form Factor	TRANSFER, break before make
Frequency Range	
CCS-37K	DC–36 GHz
CS-37K	DC–36 GHz
Characteristic Impedance	50 Ohms
Operate Time	20 ms (max.)
Actuation Voltage Available	12 15 24 28 V
Actuation Current, max. @ ambient	160 130 75 65 mA

TYPICAL PERFORMANCE CHARACTERISTICS						
Frequency	DC–6 GHz	6–12 GHz	12–18 GHz	18–30GHz	30–33GHz	33–36 GHz
Insertion Loss, dB, typical.	0.15	0.25	0.35	0.55	1.00	1.35
Isolation, dB, typical.	70	70	65	60	50	50
VSWR , typical.	1.15:1	1.20:1	1.25:1	1.50:1	2.00:1	2.50:1

For maximum limits, please see charts on page 3-4

PART NUMBERING SYSTEM



Connector
K: 2.92 mm Female

Actuator Voltage
 6: 28 Vdc Latching
 7: 15 Vdc Latching
 8: 12 Vdc Latching
 9: 24 Vdc Latching

Actuator Type
0: Standard Contacts

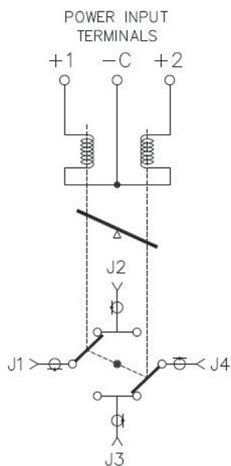
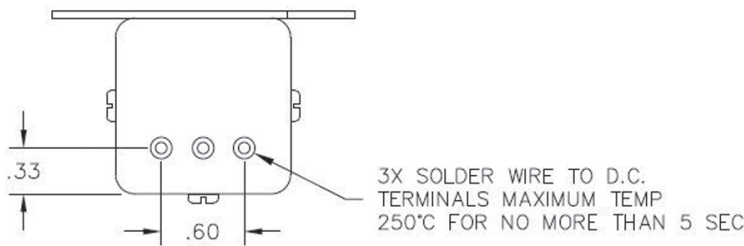
Options
 T: TTL Drivers with Diodes
 D: Transient Suppression Diodes
 R: Positive + Common
 M: Moisture Seal
 S: 9 Pin D-Sub Connector

For other options, contact factory.

Series CCS-37K/CS-37K
 Miniature DC–36 GHz
 Latching TRANSFER Coaxial Switch

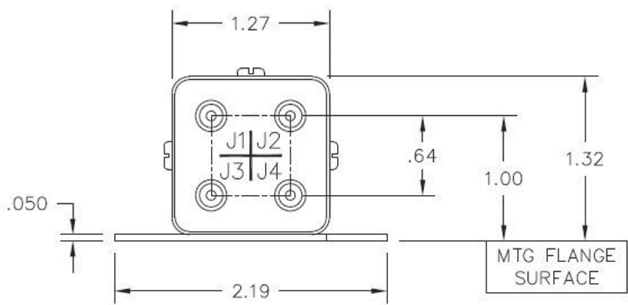
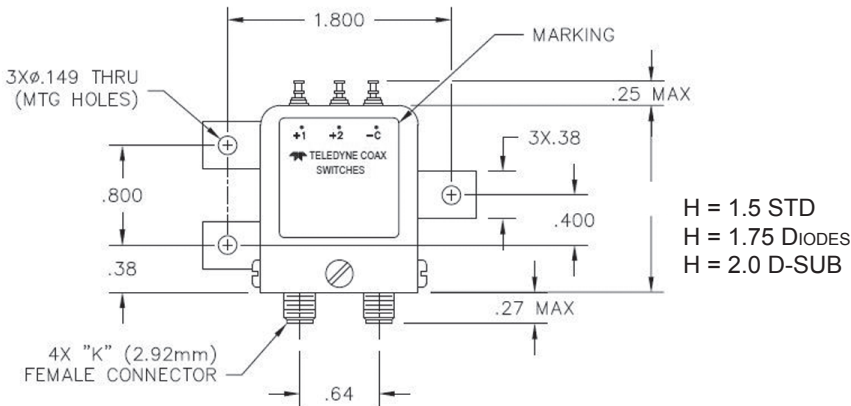


SCHEMATICS AND MECHANICAL OUTLINE



SCHEMATIC
 (SHOWN IN POSITION 2)

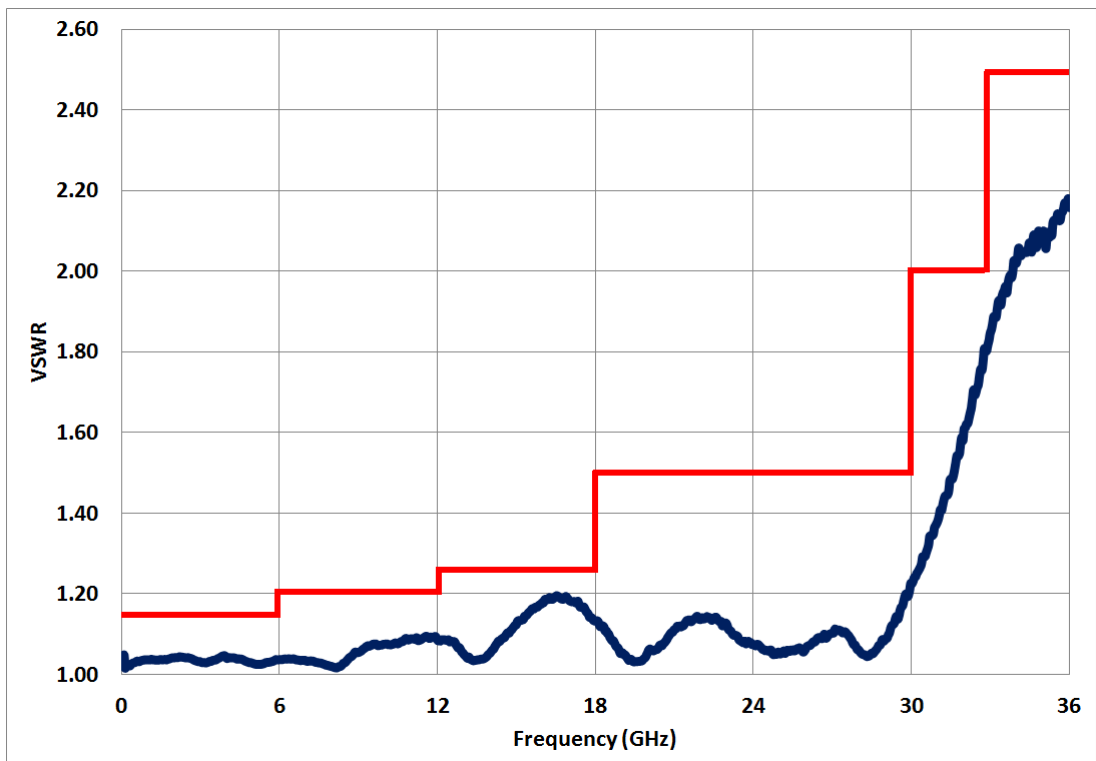
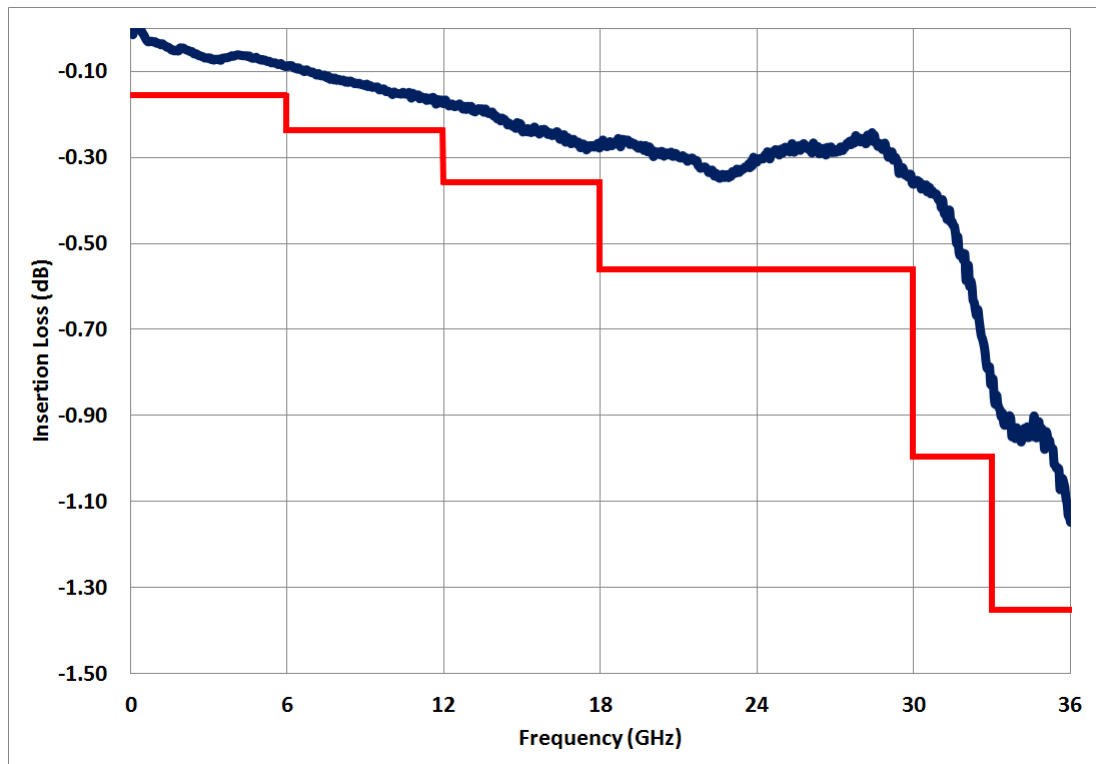
POSITION	RF CONTINUITY
POSITION 2	J1–J2 & J4–J3
POSITION 1	J1–J3 & J4–J2



9 PIN D-SUB PINOUT FOR LATCHING TRANSFER		
OPTIONS		
Pin No.	Basic	TTL
1	1	
2	2	
3	C	Common
4		1
5		2
6		Vsw
7		
8		
9		

TRUTH TABLE (with TTL option)						
Logic Input		RF Path				
1	2	1-2	1-3	2-4	3-4	
0	0	No Change				
1	0	Off	On	On	Off	
0	1	On	Off	Off	On	
1	1	Forbidden				

TYPICAL RF PERFORMANCE CURVES



Series CCS-37K/CS-37K

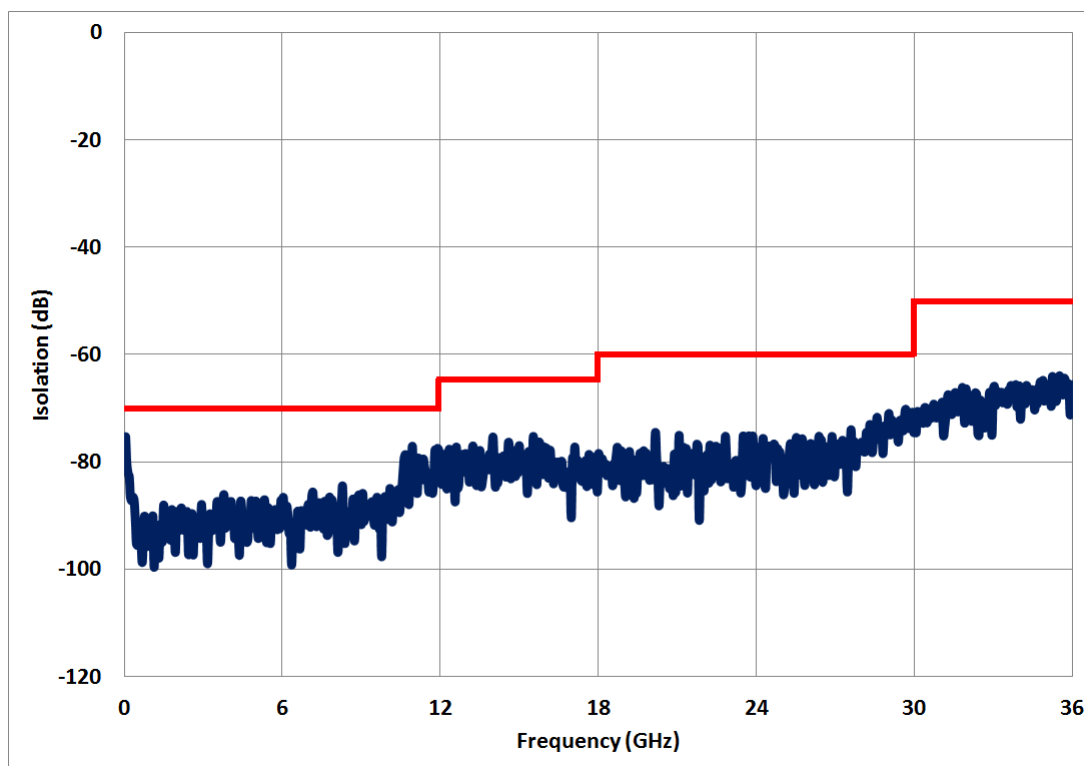
Miniature DC–36 GHz

Latching TRANSFER Coaxial Switch



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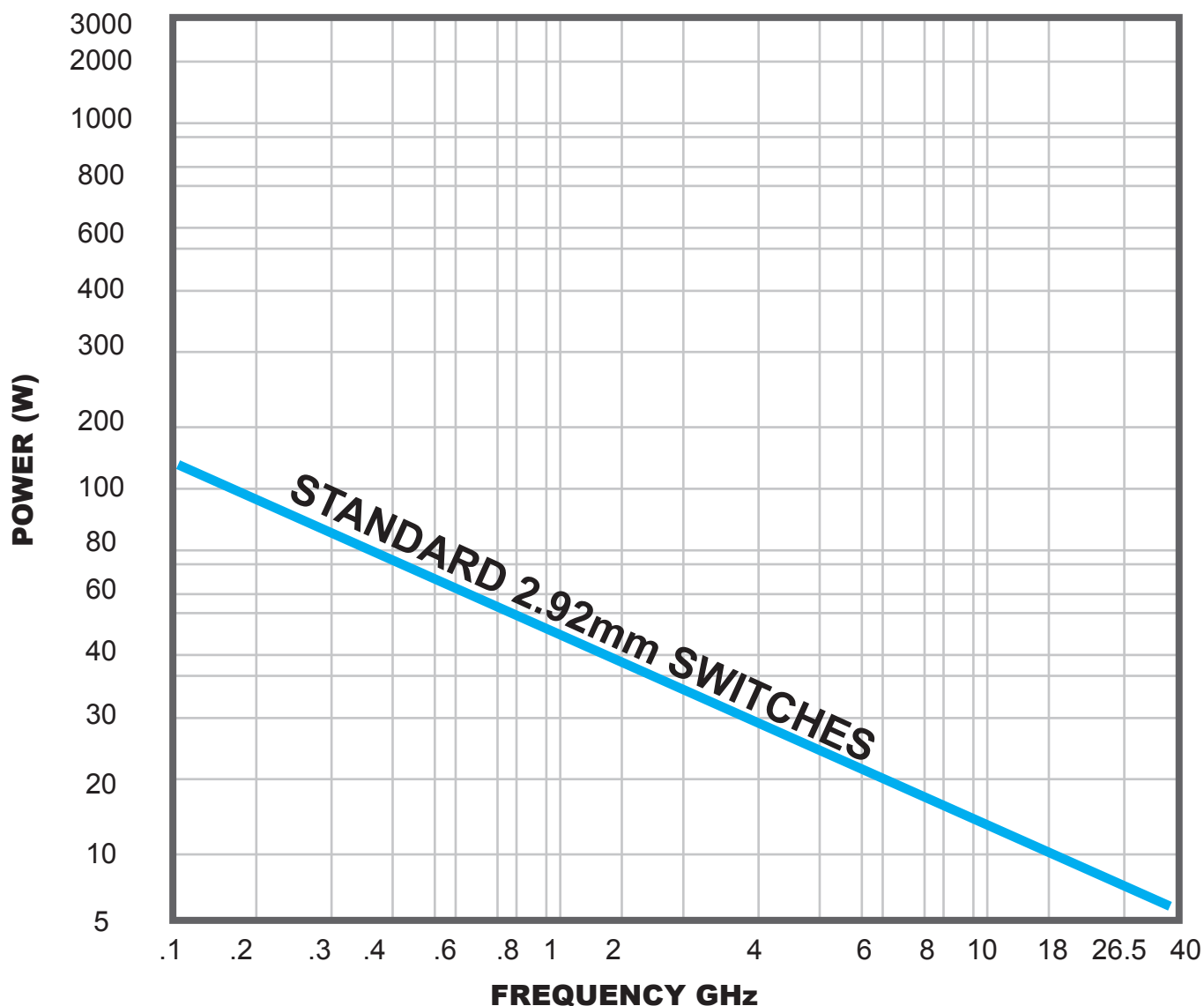
TYPICAL RF PERFORMANCE CURVES



— TYPICAL
— MAXIMUM TEST LIMIT

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.

Series CCS-37K/CS-37K

Miniature DC–36 GHz

Latching TRANSFER Coaxial Switch



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GLOSSARY

Actuator

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

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.

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.

Latching

A latching switch remains in the selected position whether or not voltage is maintained. This can be accomplished with either a magnetic or mechanical latching mechanism.

TRANSFER Switch

A four-port switch consisting of two independent pairs of RF paths. These pairs are actuated simultaneously. This actuation is similar to that of a double-pole double-throw switch.

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.

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:

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.

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

Where:

I_T = Actuator current at temperature, T

I_A = Room temperature actuator current –
see data sheet

T = Temperature of interest in °C