

Hercules™ Electromechanical Switch Series

High Reliability Across DC – 27 GHz

The Hercules™ Series of electromechanical switches features compact, high-performance models with high reliability and excellent repeatability across the DC to 27 GHz frequency range. Hercules switches last a minimum of 10 million cycles – and up to 15 million cycles – making them ideal for Automated Test Equipment (ATE) and applications where reliability and repeatability are paramount.



Single Pole Double
Throw (SPDT)
Model A401

SPECIAL FEATURES:

- Available in DC to 6 GHz, DC to 20 GHz, and DC to 27 GHz models
- Up to 15 million cycles lifetime (10 million minimum)
- 0.03 dB insertion loss repeatability
- RoHS compliant
- Evaluation units available to qualified customers
- Designed and manufactured in Ventura, California, USA



Single Pole Double Throw --
Internally Terminated (SPDT-IT)
Model A421

ENVIRONMENTAL SPECS:

- Operating Temperature: -25 °C to +75 °C
- Storage Temperature: -55 °C to +85 °C
- Thermal Shock: -55 °C to +85 °C, 10 Cycles per MIL-STD-202F, Method 107D, Condition A (modified)
- Operating Vibration:
 - Sine Vibration: 7 g, 5 to 2000 Hz, at 0.25 in p-p
 - Random Vibration: 2.41 G_{RMS} per MIL-STD-202 Method 214 (Modified), 10 min/axis
- Survival Vibration: 20 g, 5 to 2000 Hz, at 0.06 in p-p
- Operating Altitude: 15,000 Feet
- Survival Altitude: 50,000 Feet
- Mechanical Shock: MIL-STD-202, Method 213B, Cond C, 50 g at 11 ms, ½ sine, 6 directions
- Moisture Resistance: 15% to 95% Relative Humidity (Non-Condensing)
- Shielding Effectiveness: 65 dBi
- Magnetic Field: 5 Gauss, 1/4 in. from surface

SPDT (A401) / SPDT-IT (A421) RF SPECIFICATIONS:

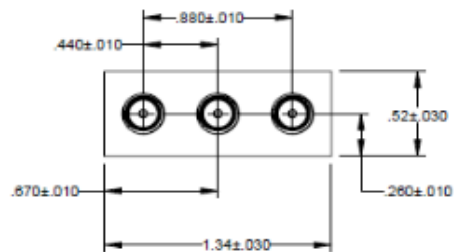
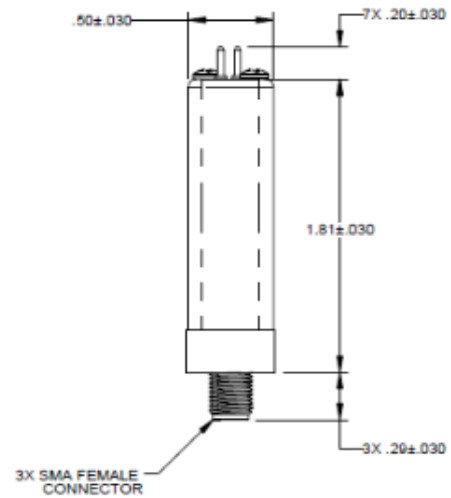
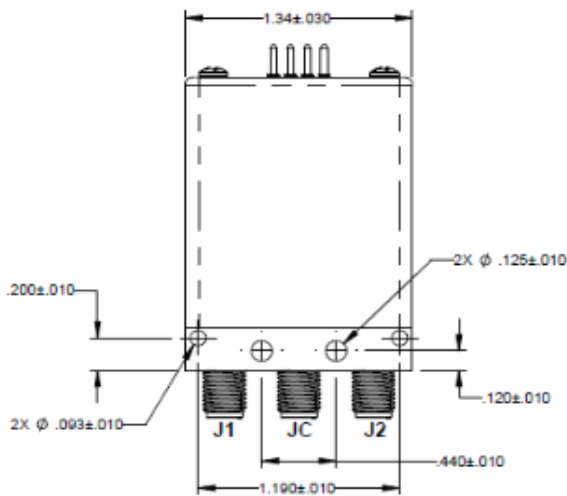
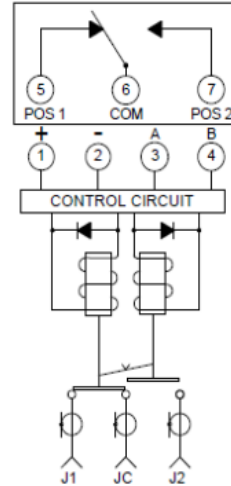
Parameter		Performance Specifications by Frequency Band SPDT (Model A401) & SPDT-IT (Model A421)
VSWR	DC - 6 GHz	1.15:1
	6 - 12 GHz	1.25:1
	12 - 20 GHz	1.4:1
	20 - 27 GHz	1.5:1
Insertion Loss	DC - 6 GHz (dB Max)	0.15
	6 - 12 GHz (dB Max)	0.25
	12 - 20 GHz (dB Max)	0.4
	20 - 27 GHz (dB Max)	0.5
Isolation	DC - 6 GHz (dB Min)	85
	6 - 12 GHz (dB Min)	75
	12 - 20 GHz (dB Min)	65
	20 - 27 GHz (dB Min)	60
Insertion Loss Repeatability (dB Max)		0.03

SPDT (A401) / SPDT-IT (A421) ACTUATOR SPECIFICATIONS:

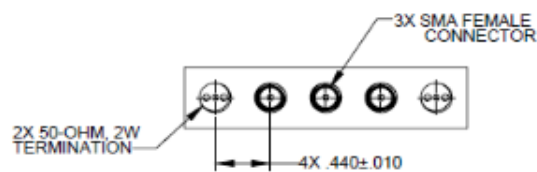
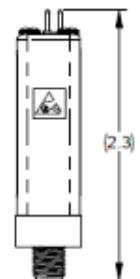
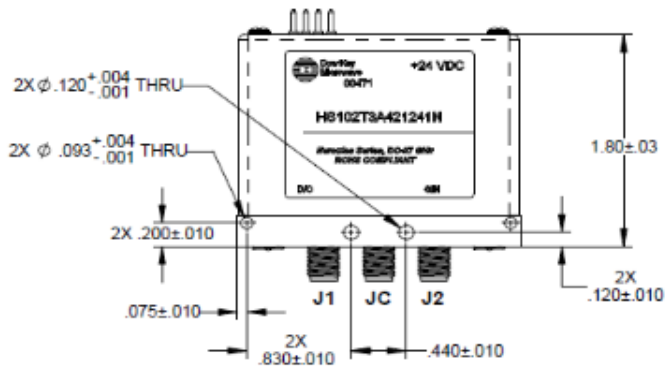
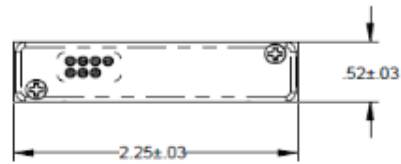
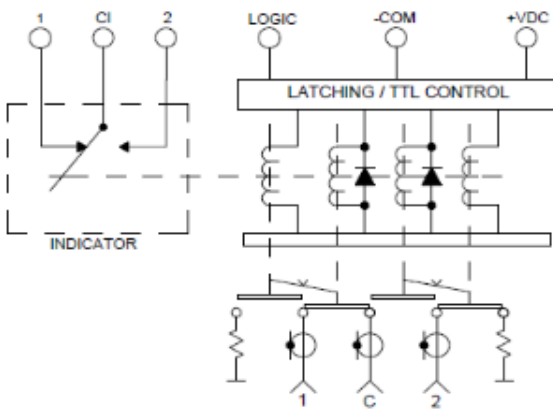
Parameter	Performance Specifications by Configuration	
	SPDT (A401)	SPDT-IT (A421)
Operating Voltage	24 VDC Nominal (20-28 VDC)	
Operating Current (Typ)	81 mA	162 mA
Max Quiescent Current	N/A	
Latching Self-Cutoff	Yes	
Max Switching Time	15 ms	
Actuator Coil Types	Latching, Self Cut-Off Failsafe* Pulse Latching* Normally Open* Failsafe Suppression Diodes* Pulse Latching*	
Control Options	TTL-High TTL-Low Positive Common Negative Common Not Polarity Sensitive CAN Bus RS-422* USB*	
Suppression Diodes	Yes	
Indicators	Yes	
Weight (Typ)	1.3 oz (37 grams)	2.1 oz (60 grams)

*Indicates potential future option

SPDT (A401) ELECTRICAL SCHEMATIC and MECHANICAL OUTLINE DRAWING:

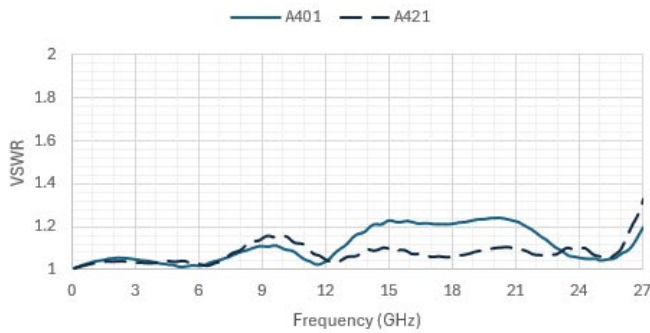


SPDT-IT (A421) ELECTRICAL SCHEMATIC and MECHANICAL OUTLINE DRAWING:

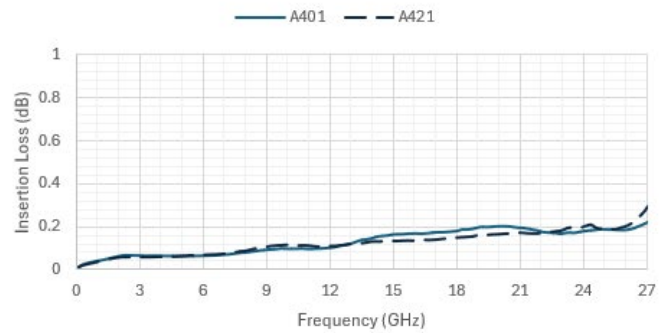


SPDT (A401) / SPDT-IT (A421) RF PERFORMANCE PLOTS:

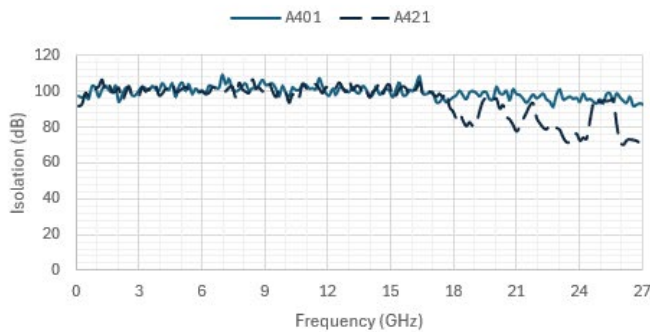
Typical VSWR



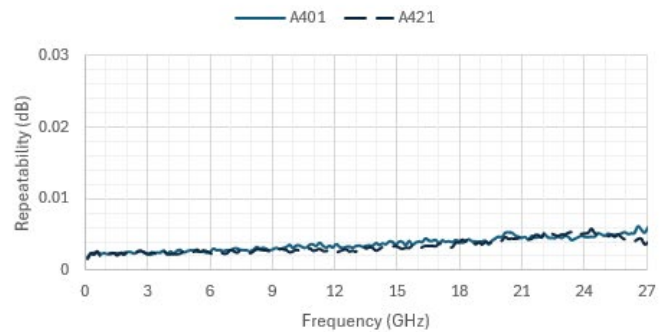
Typical Insertion Loss



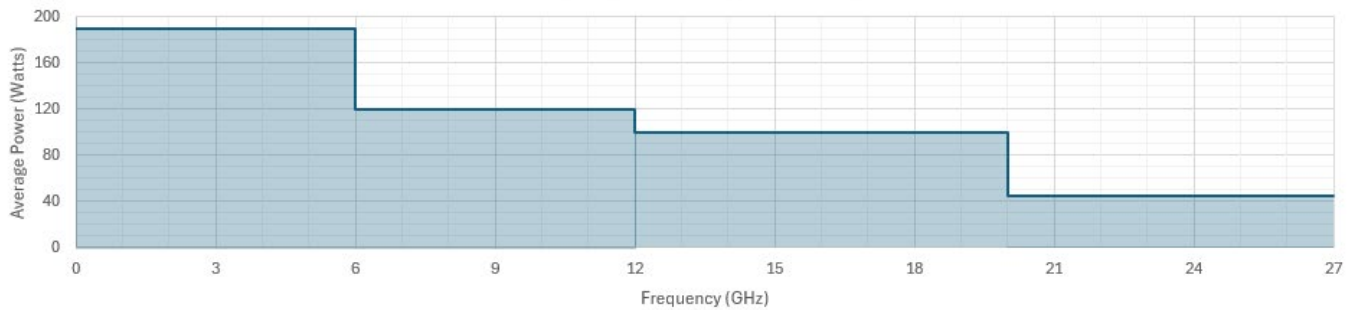
Typical Isolation



Typical Insertion Loss Repeatability



Power Handling (A401, A421)
Sea Level, 40°C, VSWR of 1.0:1, Non-Switching



SPDT (A401) PART SELECTION GUIDE:

	A401	-	4	08	3	2	J	K
(X) PRODUCT LINE/FAMILY	A4							
A4 ATE & High Reliability								
(A) CONFIGURATION	0							
0 SPDT								
(B) SIZE	1							
1 Std Case (Normally SMA Conn)								
(C) SPECIAL OPTIONS	J							
J D-Sub Connector								
(D) ACTUATOR COIL TYPE	2	4						
2 Failsafe		4						
4 Latching, Self Cut-off								
(E) ACTUATOR COIL VOLTAGE	8	9						
8 24 Vdc		9						
9 15 Vdc								
(FG) RF CONNECTORS	04	05	08	11				
04 2.4mm		05	08	11				
05 1.85mm			08	11				
08 SMA				11				
11 SMA 2.9								
(H) INDICATORS	3							
3 Mechanical								
(I) TERMINATIONS	2							
2 OPEN								
(J) CONTROL OPTIONS	A	C	D					
A TTL-HI (2.4 - 5.5V)		C	D					
C Positive Common			D					
D Negative Common								
(K) FREQUENCY	H	I	J	K	V	W	Y	
H DC-6		I	J	K	V	W	Y	
I DC-12.4			J	K	V	W	Y	
J DC-20				K	V	W	Y	
K DC-27					V	W	Y	
V DC-50						W	Y	
W DC-67							Y	
Y DC-40								

Note: Certain combinations may not be available for purchase. Contact us for assistance with specifying your Hercules™ Switches!



SPDT-IT (A421) PART SELECTION GUIDE:

	A421	-	4	08	3	J	K
(X) PRODUCT LINE/FAMILY	---						
A4 ATE & High Reliability							
(A) CONFIGURATION	-----						
2 SPDT-IT or DP3T							
(B) SIZE	-----						
1 Std Case (Normally SMA Conn)							
(C) SPECIAL OPTIONS	-----						
J D-Sub Connector							
(D) ACTUATOR COIL TYPE	-----						
2 Failsafe							
4 Latching, Self Cut-off							
(E) ACTUATOR COIL VOLTAGE	-----						
8 24 Vdc							
9 15 Vdc							
(FG) RF CONNECTORS	-----						
04 2.4mm							
05 1.85mm							
08 SMA							
11 SMA 2.9							
(H) INDICATORS	-----						
3 Mechanical							
(I) TERMINATIONS	-----						
3 50 Ohm, 2W, Internal							
4 50 Ohm, 1W, External							
8 50 Ohm, SMA							
(J) CONTROL OPTIONS	-----						
A TTL-HI (2.4 - 5.5V)							
C Positive Common							
D Negative Common							
(K) FREQUENCY	-----						
H DC-6							
I DC-12.4							
J DC-20							
K DC-27							
V DC-50							
W DC-67							
Y DC-40							
Y DC-40							

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