

High-Repeatability Electromechanical Switch Series

High Reliability Across DC – 27 GHz



High-Repeatability Switches Enable Consistent Signal Routing

Special Features

- ▶ 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

Applications

- ▶ Automated Test Equipment (ATE)
- ▶ RF/Microwave Switch Matrices
- ▶ 5G/6G Wireless Communication Testing
- ▶ Aerospace & Defense RF Test (Radar, EW, SATCOM)
- ▶ Automotive Radar & Telematics Testing
- ▶ Quantum Computing RF Infrastructure

High-Repeatability Series

The High-Repeatability Series of electromechanical switches features compact, high performance models with high reliability and excellent repeatability across the DC to 27 GHz frequency range. These 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.

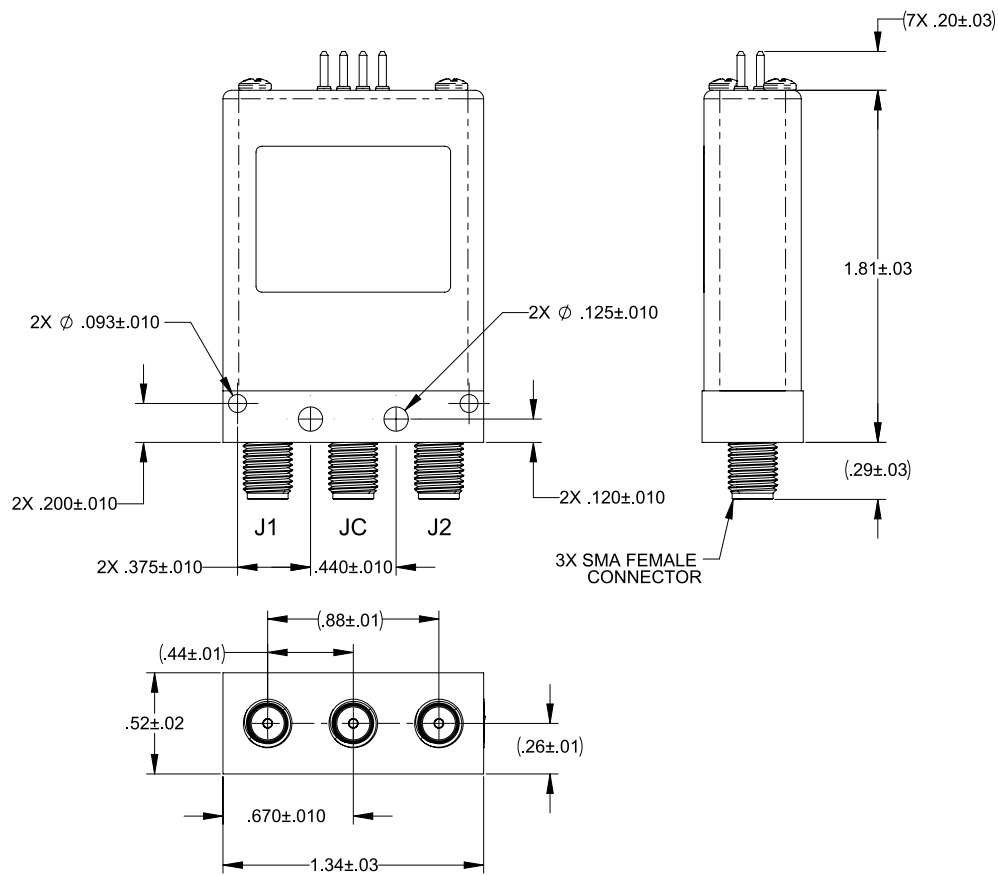
SPDT (A401) / SPDT-IT (A421) RF Specifications

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

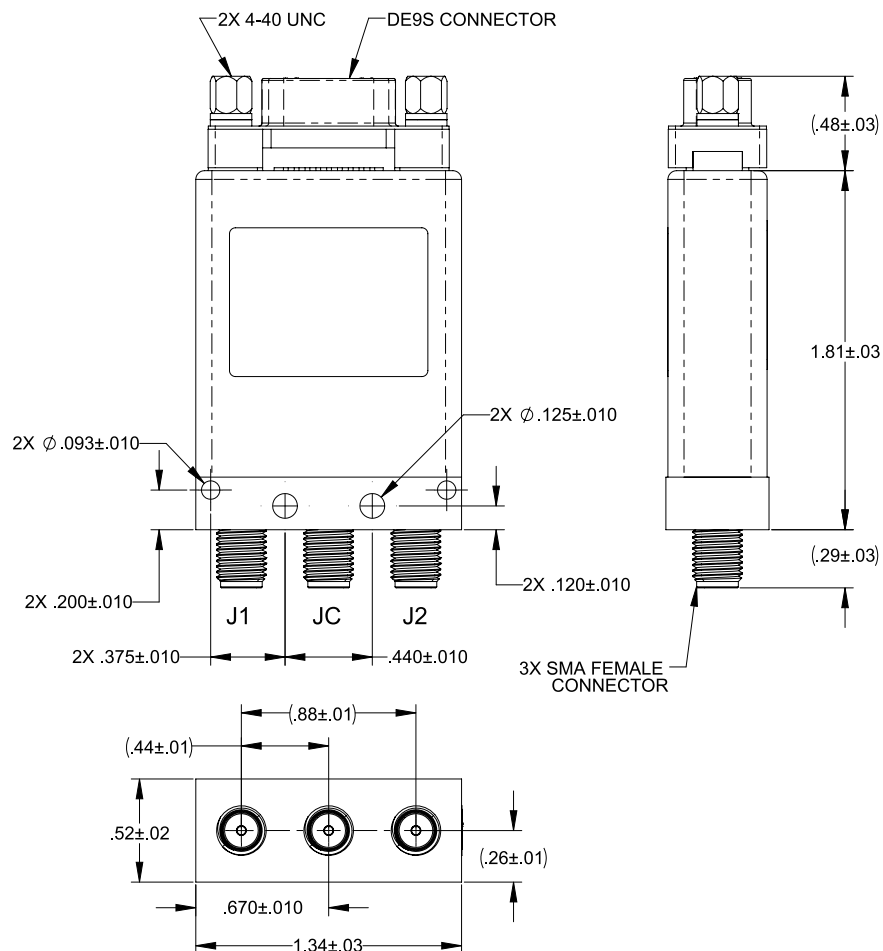
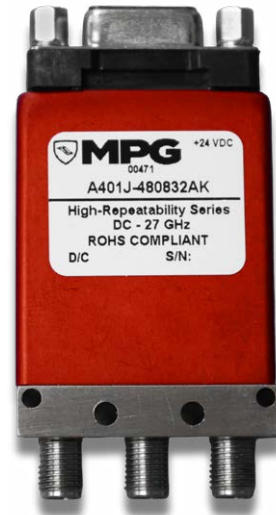
Parameter	Performance Specifications by Configuration	
	SPDT (A401)	SPDT-IT (A421)
Operating Voltage	24 VDC Nominal (20-28 VDC) 15 VDC Nominal (12-18 VDC)	
Operating Current, 24 VDC Nominal (Typ)	81 mA	162 mA
Operating Current, 15 VDC Nominal (Typ)	124 mA	248 mA
Max Quiescent Current	None (0 mA)	
50 Ohm Termination	No	Yes
Max Switching Time	15 ms	
Actuator Coil Types	Latching, Self Cut-Off	
Control Options	TTL-High Positive Common	
Suppression Diodes	Yes	
Indicators	Yes	
Weight (Typ)	1.3 oz (37 grams)	2.1 oz (60 grams)

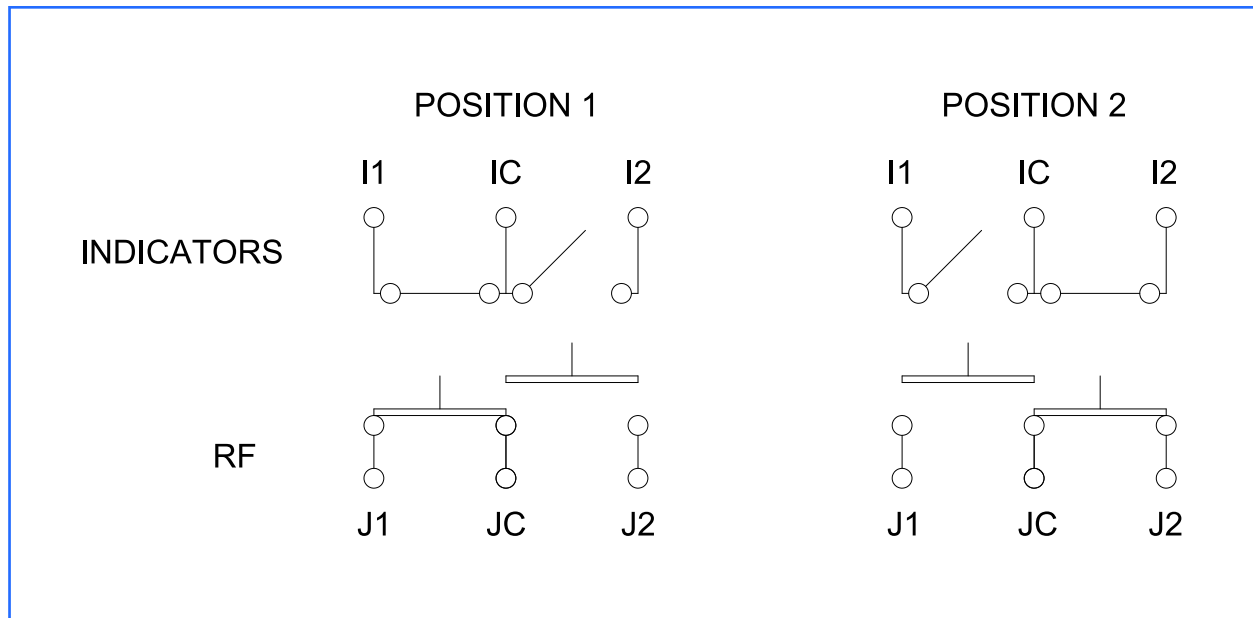
SPDT (A401) Electrical Schematic and Mechanical Outline Drawing



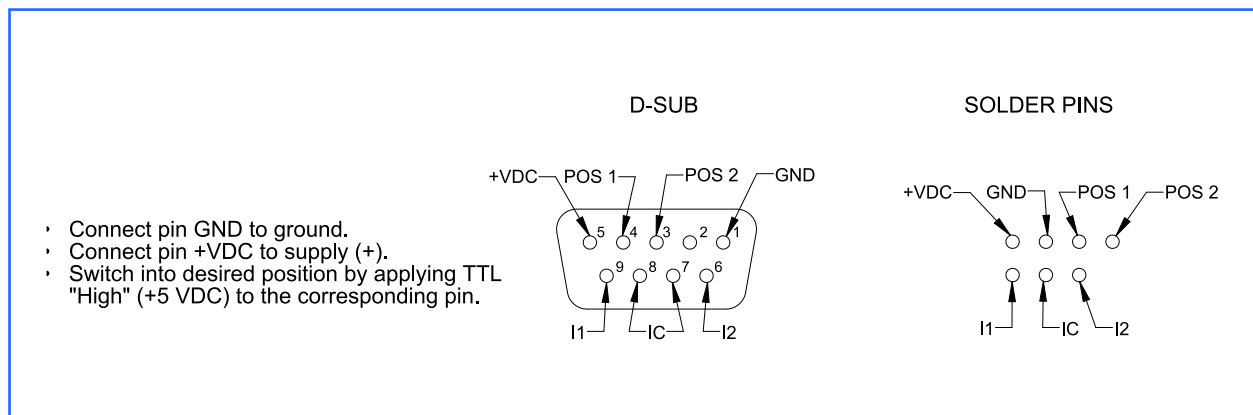
SPDT (A401) Specifications

SPDT (A401J) Electrical Schematic and Mechanical Outline Drawing

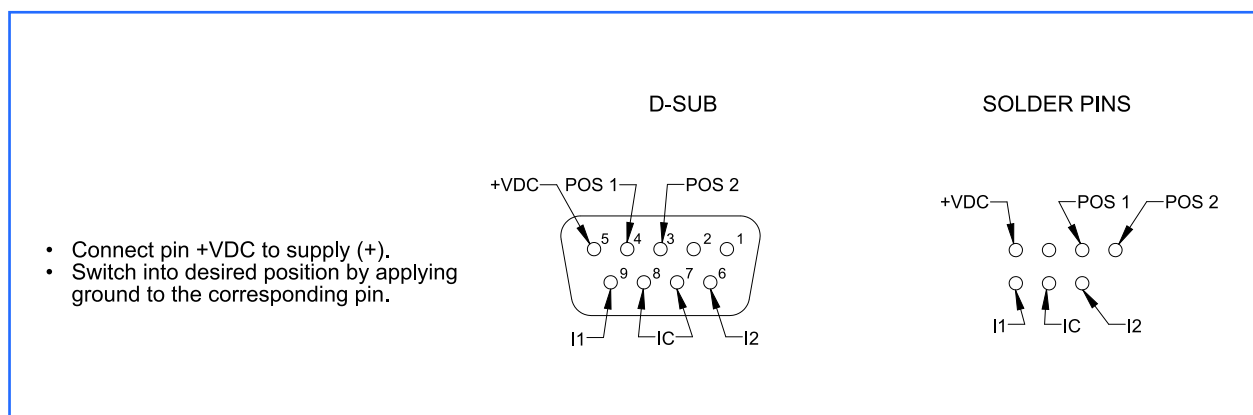




Control Option A

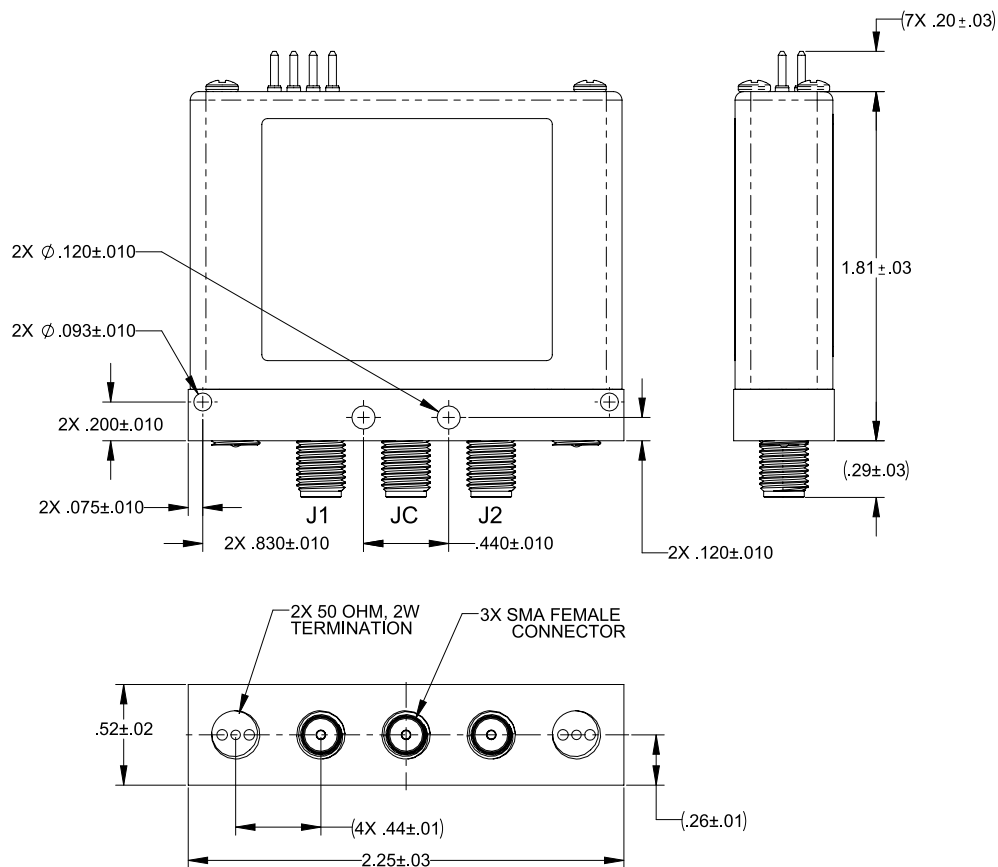


Control Option C

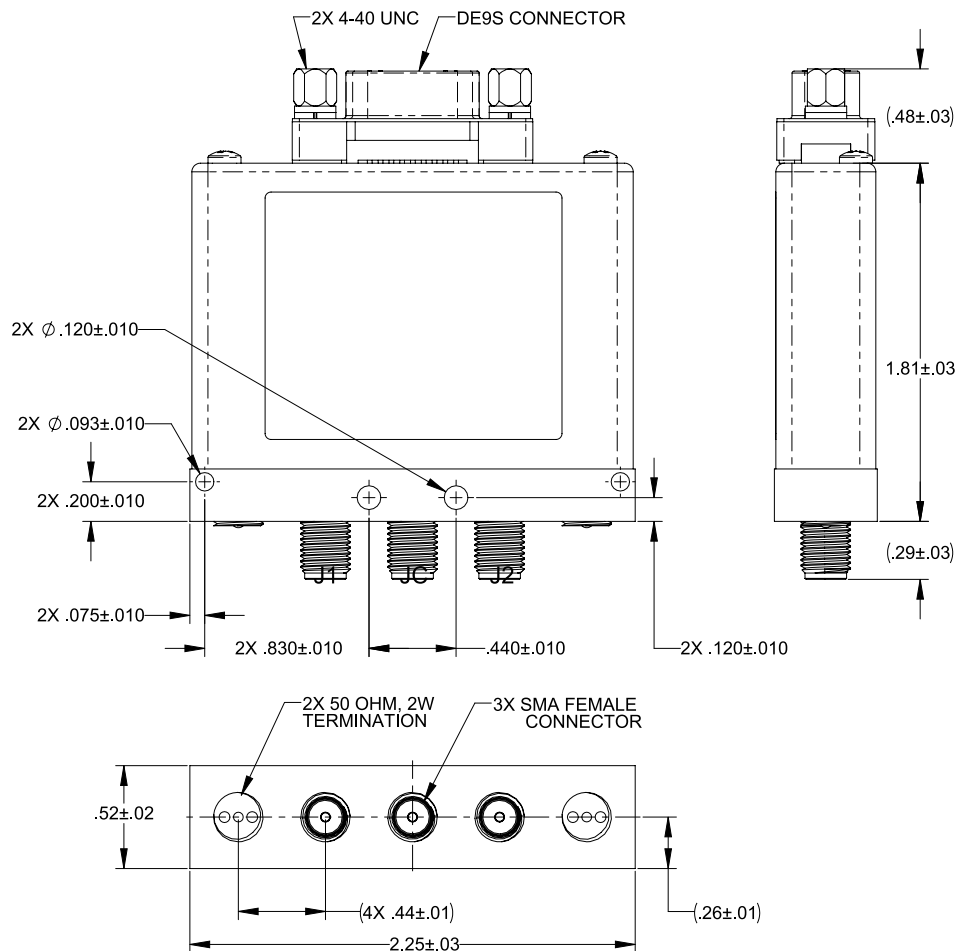


SPDT-IT (A421) Specifications

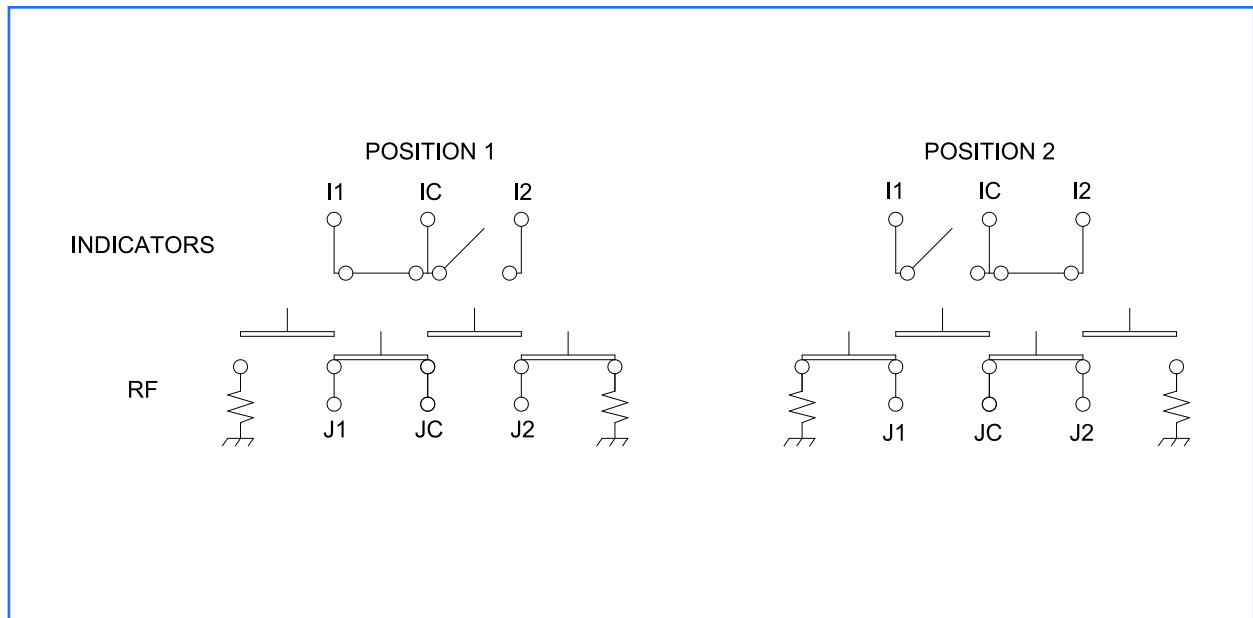
SPDT-IT (A421) Electrical Schematic and Mechanical Outline Drawing



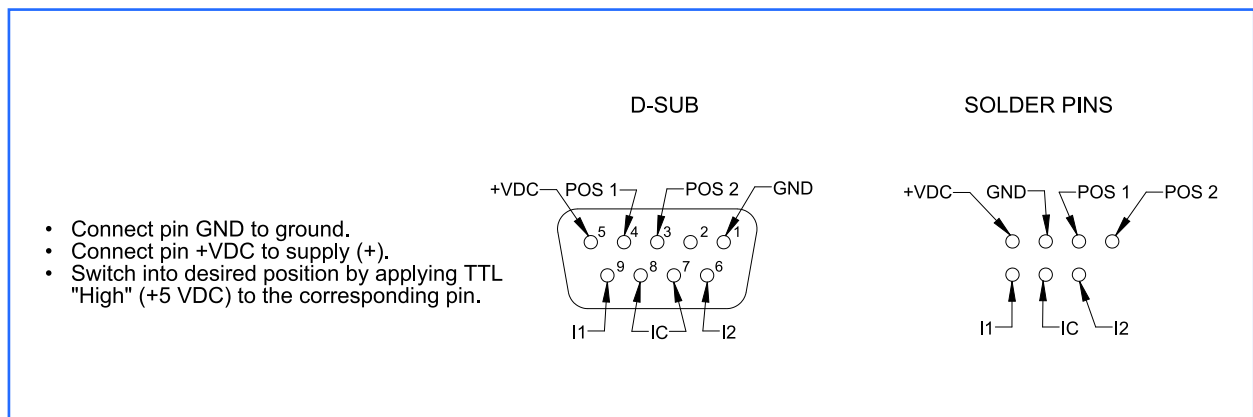
SPDT-IT (A421J) Electrical Schematic and Mechanical Outline Drawing



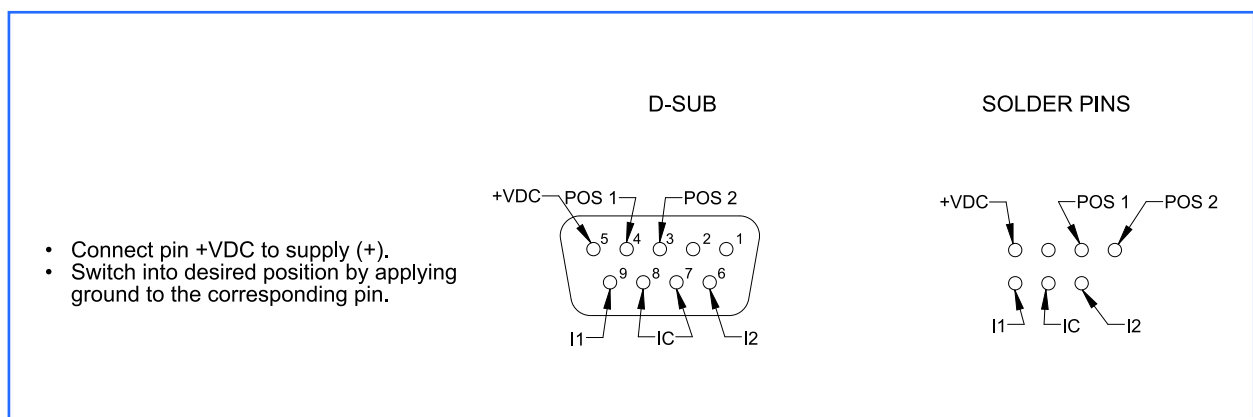
Specifications and Performance Plots



Control Option A

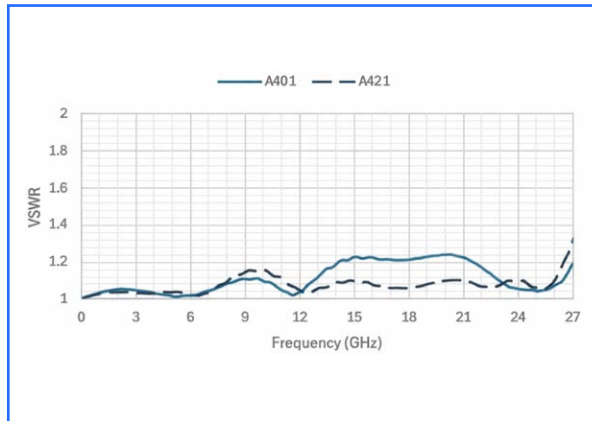


Control Option C

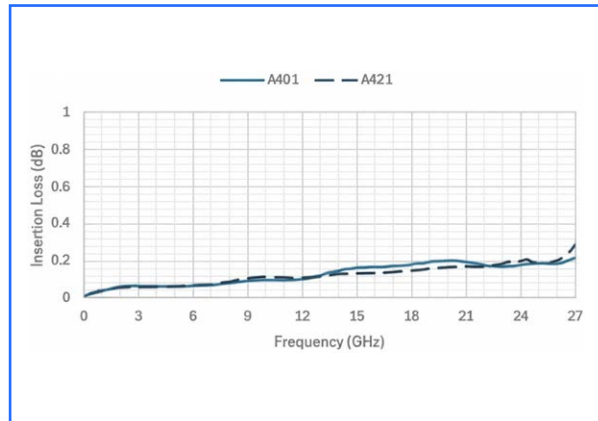


SPDT (A401) / SPDT-IT (A421) RF Performance Plots

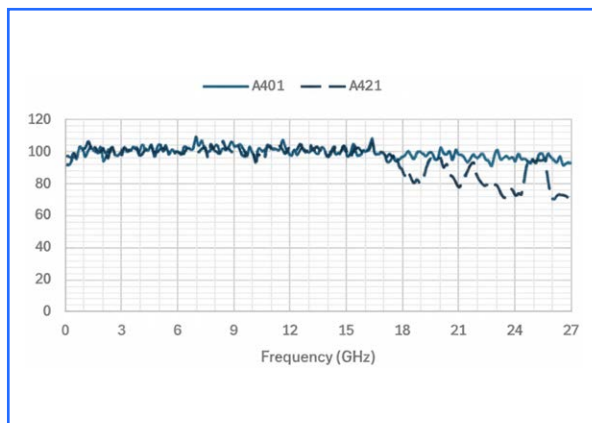
Typical VSWR



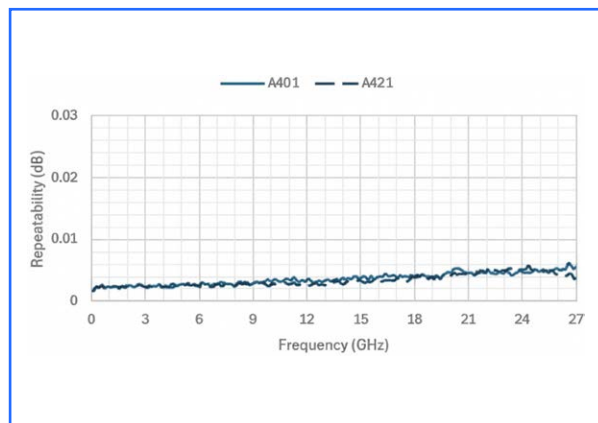
Typical Insertion Loss



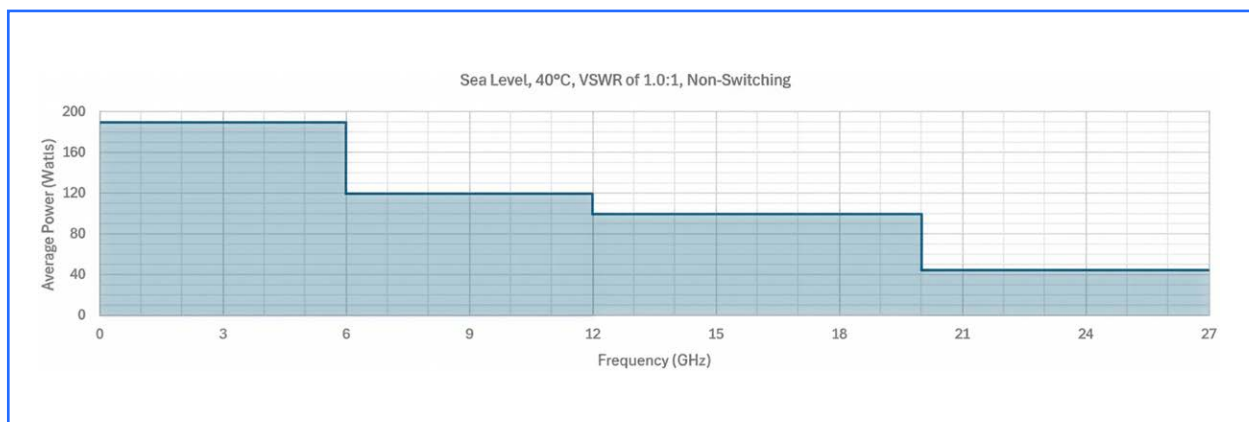
Typical Isolation



Typical Insertion Loss Repeatability



Power Handling (A401, A421)



Part Selection Guides

SPDT (A401) Part Selection Guide

		A401	-	4	08	3	2	J	K
(X) PRODUCT LINE/FAMILY	A4	ATE & High Reliability							
(A) CONFIGURATION	0	SPDT							
(B) SIZE	1	Std Case (Normally SMA Conn)							
(C) SPECIAL OPTIONS	J	D-Sub Connector							
(D) ACTUATOR COIL TYPE	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	2	OPEN							
(J) CONTROL OPTIONS	A	TTL-HI (2.4 - 5.5V)							
	C	Positive 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							

Note: Certain combinations may not be available for purchase. Contact us for assistance with specifying your 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 DPST							
(B) SIZE	1 Std Case (Normally SMA Conn)							
(C) SPECIAL OPTIONS	J D-Sub Connector							
(D) ACTUATOR COIL TYPE	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							
(K) FREQUENCY	H DC-6 I DC-12.4 J DC-20 K DC-27 V DC-50 W DC-67 Y DC-40							

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



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, 10 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, 10 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

About MPG – A Dover Company

MPG delivers spectrum-centric solutions at the speed of technology. We enable critical electronic warfare; intelligence, surveillance and reconnaissance; communications and space-based missions with ruggedized radio frequency components, subsystems and turnkey solutions. Our comprehensive portfolio encompasses the RF Spectrum (2 MHz to 40 GHz), the Solution Spectrum (low-noise amplifiers to complete signals intelligence systems), and the Domain Spectrum (land, sea, air and space). Government and commercial customers rely on our deep engineering expertise, seven manufacturing sites and Dover Corporation resources to deliver at spec, on time and within budget.

About Dover Corporation

Dover is a diversified global manufacturer and solutions provider with annual revenue of over \$7 billion. We deliver innovative equipment and components, consumable supplies, aftermarket parts, software and digital solutions, and support services through five operating segments: Engineered Products, Clean Energy & Fueling, Imaging & Identification, Pumps & Process Solutions and Climate & Sustainability Technologies. Dover trades on the New York Stock Exchange under "DOV."



**Connecting and protecting people
by delivering solutions
at the speed of technology.**

MPG Headquarters: 13033 Trautwein Road, Austin, TX 78737 USA | ph. 512-261-1016 | www.mpgdover.com | info@mpgdover.com

MPG Europe: Dover House, Units 10-11 Stirling Park, Bleriot Way, Clifton Moor, York YO30 4WU, England
ph. +44 (0) 1904 694250 | sales@bscfilters.com

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