

# Dow-Key Microwave

The Solutions Company

# **DowKey<sup>TM</sup>**

## **Microwave Switches**

## ***Company Profile***

Dow-Key Microwave, a subsidiary of Dover Corporation and a leader in the design and fabrication of switching products, has supplied the aerospace, military and communication industry with state-of-the-art products to direct RF energy since 1945. To date, thousands of designs have been created and manufactured at its facility located in Ventura, California, USA. Dow-Key offers switching products to four major markets – Commercial, Military, Avionics, and Hi-Rel/Space. These products include individual coaxial, waveguide, board mount, and MEMS switches along with custom integrated assemblies and switch matrices.

## ***Location***

Dow-Key Microwave is located in Ventura, California approximately one hour north of the Los Angeles International Airport with ready access to the 101 Ventura Highway.

## ***Capabilities and Facilities***

Dow-Key constantly maintains and updates in-house capability in design, machining, processing, assembly, and test of existing and new products. The company operates in a new 40,000 square foot building containing administrative, quality, engineering, and manufacturing groups. In support of manufacturing functions, Dow-Key has a class 100 and a 100K clean room, machine shop, environmental test lab, CAD design center, and production test areas. Its test labs use the most current RF test equipment and place an emphasis on developing test automation utilizing the latest industry tools.

## ***Engineering***

With many years of combined switch experience, Dow-Key's engineering team is considered by many to be the switch industry's best in both design and manufacturing support. Innovative engineering solutions achieved through active participation in customer design efforts along with direct technical support help to insure program success. Please feel free to contact Dow-Key's technical staff for all of your design support needs.

## ***Quality Management***

Dow-Key Microwave has developed and implemented a quality management system to satisfy the requirements of its customers. This also results in the ability to streamline internal and external company processes, improve product reliability and reduce cost. Its quality system has been registered though the ISO accreditation councils of the RvA and ANSI-RAB QMS, assuring that Dow-Key's Quality system is compliant to the ISO 9001 standard.

## ***General***

At Dow-Key you are not limited to the catalog products on the pages that follow. Requests for modification of standard items and their specifications in order to meet specific customer needs are always welcome. Inquiries regarding custom integrated components or switch assemblies are also always appreciated.

New product information is constantly being added in the form of industry publication press releases and through the corporate website at [www.dowkey.com](http://www.dowkey.com). Please visit this site for general company information and standard product descriptions and specifications. Dow-Key Microwave, "The Solutions Company", is waiting to assist you with all of your switch requirements.

This catalog is intended to be used as a guide in selecting the proper type of switch product or switching function for a given application and is subject to change without notification at any time. Please refer to our website for catalog updates and corrections along with new product information.

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**Ordering:**

The information found in this catalog or on our Website, [www.dowkey.com](http://www.dowkey.com), should be sufficient for you to select a particular Dow-Key product. In those cases where additional information is required, call Dow-Key directly or our local Dow-Key Sales Representative who will provide you with price and delivery information.

When placing your order, please include the part number, product name, quantity, and shipping instructions. In the case of a non-standard product, a full description of desired features must accompany your order to avoid any error.

**Send Orders to:**

Dow-Key Microwave  
4822 McGrath Street  
Ventura, CA 93003 U.S.A.

Or send them in care of our Sales Representative in your area. A complete listing of our Representatives can be found on our Website [www.dowkey.com](http://www.dowkey.com).

Orders will be accepted by way of U.S. mail, telephone, Fax, or Email. Confirmation of orders on your standard Purchase Order is required.

Telephone: (805) 650-0260  
Fax: (805) 650-1734  
Email: ASKDK@ DowKey.com

**Domestic Terms:**

Net 30 days, F.O.B. Dow-Key plant, Ventura, California, U.S.A. unless otherwise specified. Shipments made to firms are on a C.O.D. basis unless credit has been established or on receipt of advance payment. American Express, MasterCard and Visa are also accepted

**Export Terms:**

Unless other terms have been agreed upon in advance, export terms are either payment in advance of shipment or against a confirmed irrevocable letter of credit. All prices are F.O.B Ventura, California, U.S.A.

**Shipping:**

Orders within the United States and Canada will be shipped via United Parcel Service Ground unless other instructions are received. Shipment to all other countries will be by customer direction.

**Packaging:**

All products shipped from Dow-Key Microwave, Ventura, California are packaged in accordance with best commercial practices unless otherwise specified in the contract or purchase order.

**Delivery:**

Most standard products are available from stock or within our typical manufacturing lead-time of 4 to 8 weeks after receipt of order.

**Source Inspection:**

Should Customer Source Inspection of product be required, a charge of \$250.00 per occurrence will apply.

**Application and Technical Assistance:**

Dow-Key provides a knowledgeable and experienced engineering staff to work closely with customers in product design and application development as well as minor modifications to existing standard products. This service is also available for the design of individual specialized switching components or complex switching systems.

**Warranty:**

Dow-Key Microwave Corporation warrants all switch products to be free of defects in material and workmanship for a period of one year after the date of initial shipment. The limit of liability under this warranty is to repair, replace or refund purchase price on any product or part thereof that is returned by the purchaser and proves to be defective after examination by Dow-Key. This warranty does not extend to any products mishandled, misused or subjected to abuse or neglect in storage, transportation or use. Repairs or alterations made without consent or knowledge of Dow-Key Microwave Corporation will invalidate this warranty. This warranty supercedes all others, either expressed or implied.

**Return Material Authorization:**

Please call Dow-Key to receive a Return Material Authorization (RMA) number prior to returning any item for service. Items returned to Dow-Key without a RMA number are subject to return without evaluation or any work being done. Dow Key will not accept COD freight charges for returned items.

**Dow-Key Terms and Conditions:**

Dow-Key Microwave Corporation Terms and Conditions apply to all orders unless other provisions have been previously agreed upon. A copy of Dow-Key's Terms and Conditions can be found at [www.dowkey.com](http://www.dowkey.com).

**Certificate of Compliance:**

If requested at order placement, a certificate of compliance is available upon shipment.

**Minimum Order Amount:**

Dow-Key's minimum order amount is \$250.00

**Product Changes:**

Dow-Key Microwave Corporation continually improves products as new technologies, materials and processes become available. We, therefore, reserve the right to alter, amend, discontinue, or replace any product and or specifications in this catalog at our sole discretion without prior notice.

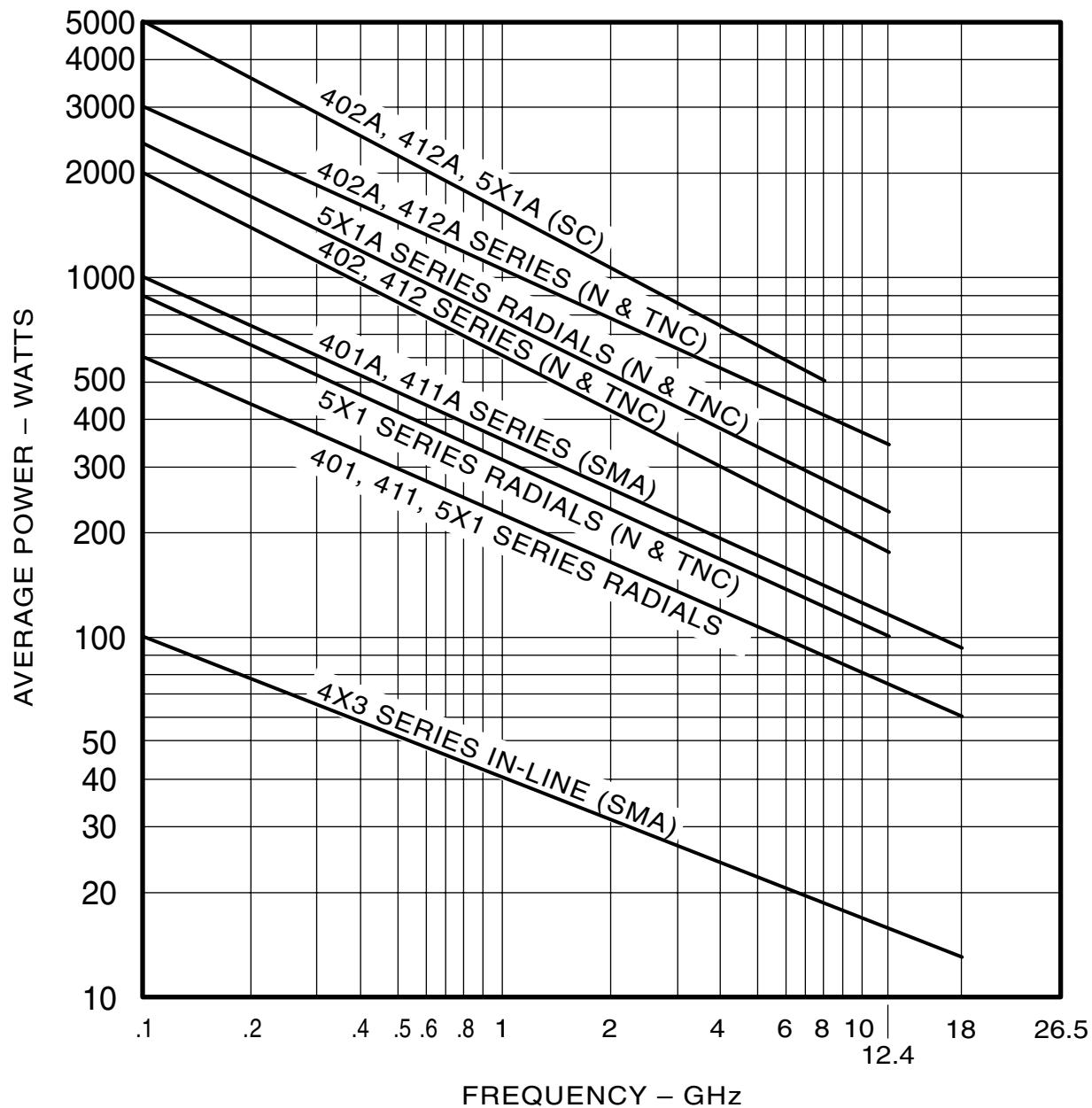
## Power Chart

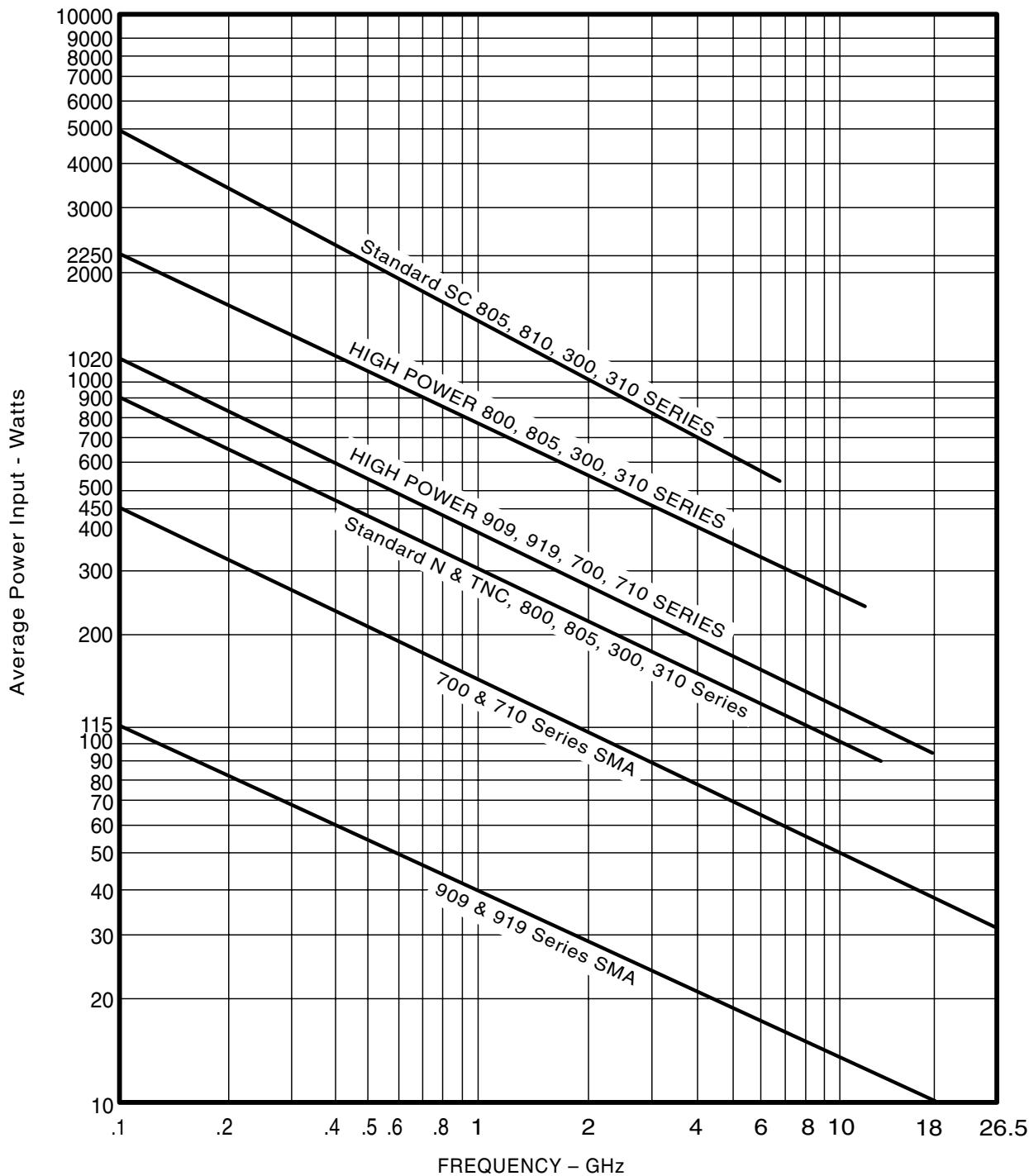
This chart is based on the following conditions:

Ambient Temperature= 40° C; Altitude= Sea Level; VSWR= 1.0:1; Non-switching

UHF connectors are not recommended for applications above 300MHz.

*Please consult factory for additional information.*





VSWR	Derating Factor	VSWR	Derating Factor
1.5:1	.96	3.5:1	.70
2.0:1	.88	4.0:1	.64
2.5:1	.84	4.5:1	.60
3.0:1	.75	5.0:1	.56

## Dow-Key Part Numbering System

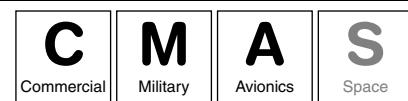
	X	A	B	C	-	D	E	FG	H	I	J
(X) RELAY FAMILY											(J) SPECIAL OPTIONS
4/5 50 Ohm System											
(A) CONFIGURATION											(I) TERMINATIONS
0 SPDT	A	SP10T									
1 Transfer	B	SP11T									
2 SPST	C	SP12T									
3 SP3T	E	SP14T									
4 SP4T	F	SP16T									
5 SP5T											
6 SP6T											
7 SP7T											
8 SP8T											
9 SP9T											
(B) SIZE											(H) AUXILIARY/INDICATOR CONTACTS
1 Std. Case, normally SMA connectors (Radial)											
2 Std. Case, normally N Connectors											
3 Small Case, normally SMA (Multithrow)											
4 Intermediate Cavity, SMA/TNC											
5 Miniature Radial											
6 Std. Case, normally N connectors (Radial)											
7 Microminiature Radial											
9 Microminiature Switch											
(C) SPECIAL OPTIONS											(F) CONNECTORS
A High Power	K	26.5 GHz									
B Bypass (2-4)	L	Flange Mount Cavity									
C Special Mounting	M	Fast Switching									
Bracket	N	Remove STD									
D Bypass (1-2)		Mounting Bracket									
E Bypass (3-4)	P	Power Connector									
F Bypass (1-3)	R	Reverse Polarity									
G Make Before Break											
H HI-REL	S	Seal, Enhanced Epoxy or									
		Gasket									
I Immersion Seal	T	-55°C to +85°C									
J "D" Type Connector	V	Laser Seal									
(D) ACTUATOR COIL TYPE											
1 Manual											
2 Failsafe, Position 1											
3 Pulse Latching											
4 Latching, Self Cutoff											
5 Normally Open											
6 Failsafe, Suppression Diodes											
7 Pulse Latching, Suppression Diodes											
8 Latching Reset, Suppression Diodes											
9 Normally Open, Suppression Diodes											
(E) ACTUATOR COIL VOLTAGE											
0 Manual											
1 6 Vdc											
2 12 Vdc											
3 28 Vdc											
4 48 Vdc											

\* GPO is a trademark of Gilbert Engineering

### (E) ACTUATOR COIL VOLTAGE

0	Manual	7	20 Vdc
1	6 Vdc	8	24 Vdc
2	12 Vdc	9	15 Vdc
3	28 Vdc		
4	48 Vdc		

# **SPDT SECTION**

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.10	85	0.10
1-4	1.15	80	0.15
4-8	1.20	70	0.20
8-12	1.30	65	0.30
12-18	1.35	60	0.35
*18-26.5	1.50	55	0.50

\* "K" option only. Ex: 401K-2208

Note: Typical performance dependent on selected options

**401 Series SPDT Failsafe, SMA****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 195 mA

28 Vdc 95 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

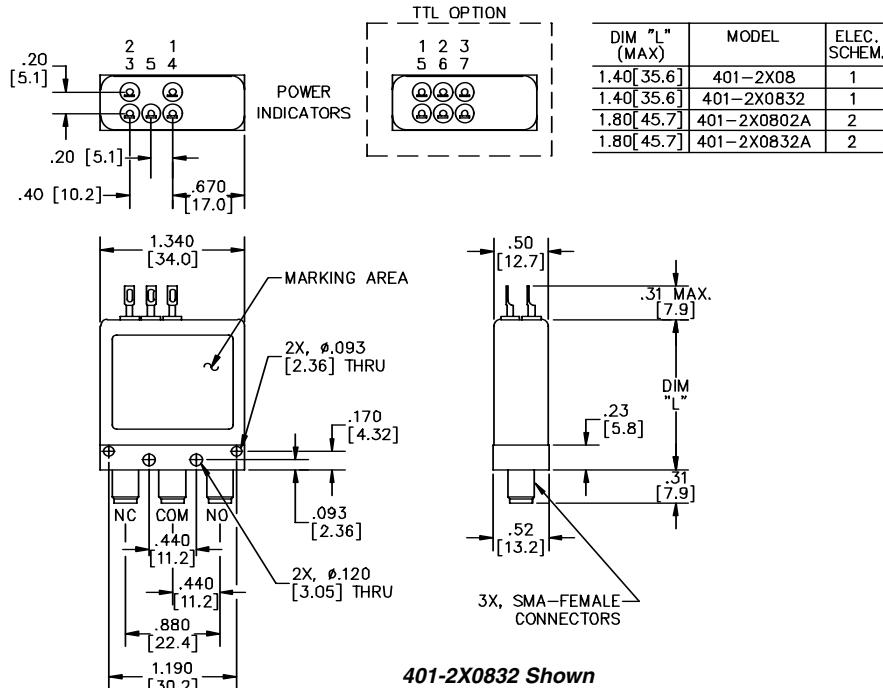
10G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11mS

**Nominal Weight:**

2.5 oz., (71g.)



401-2X0832 Shown

For Electrical Schematic  
see page # 1-5

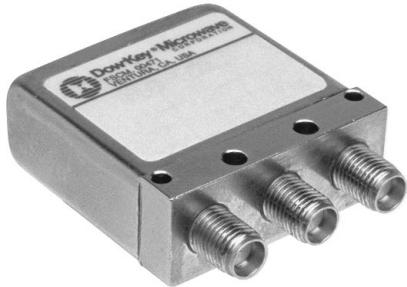
**Part Number Selection**

401 J - 2 2 08 02 A

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
<b>A</b> = High Power	<b>2</b> = Failsafe	<b>2</b> = 12Vdc	<b>08</b> = SMA Female	<b>02</b> = No Indicators	<b>A</b> = TTL High
<b>I</b> = Immersion Seal	<b>6</b> = Failsafe with Suppression Diode	<b>3</b> = 28Vdc	<b>19</b> = Pins, PC Board Mount	<b>32</b> = Indicators	<b>B</b> = JANTX TTL High
<b>J</b> = 'D' Connector		<b>7</b> = 20Vdc			<b>L</b> = TTL Low
<b>K</b> = 26.5 GHz		<b>8</b> = 24Vdc			
<b>M</b> = 5mS		<b>9</b> = 15Vdc			
<b>S</b> = Epoxy Seal					
<b>T</b> = -55°C to + 85°C					



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.10	85	0.10
1-4	1.15	80	0.15
4-8	1.20	70	0.20
8-12	1.30	65	0.30
12-18	1.35	60	0.35
*18-26.5	1.50	55	0.50

\* "K" option only. Ex: 401K-3208

Note: Typical performance dependent on selected options

**401 Series SPDT Latching, SMA****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 230 mA

28 Vdc 120 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

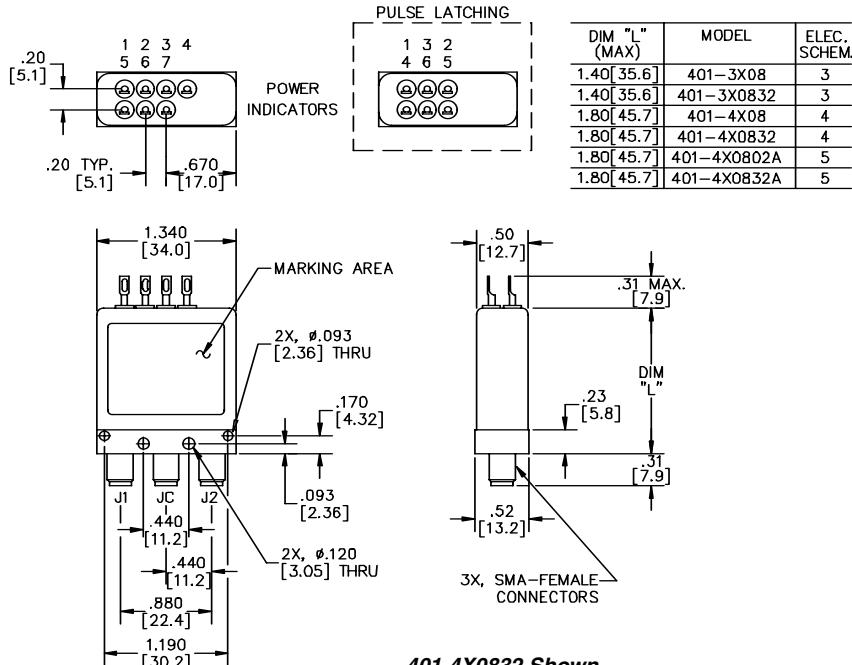
10G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11mS

**Nominal Weight:**

2.5 oz., (71g.)



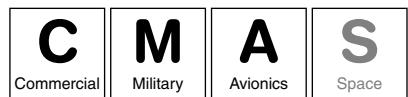
401-4X0832 Shown

For Electrical Schematic  
see page # 1-5

**Part Number Selection**

401 J - 4 2 08 02 A

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
A = High Power	3 = Pulse Latching	2 = 12Vdc	08 = SMA Female	02 = No Indicators	A = TTL High
I = Immersion Seal	4 = Latching Self Cutoff	3 = 28Vdc	19 = Pins, PC Board Mount	32 = Indicators	L = TTL Low
J = 'D' Connector	7 = Pulse Latching with Suppression Diodes	7 = 20Vdc			
K = 26.5 GHz		8 = 24Vdc			
M = 5mS		9 = 15Vdc			
R = (+) Com					
S = Epoxy Seal					
T = -55°C to + 85°C					



### RF Characteristics



Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.10	85	0.10
1-4	1.15	80	0.15
4-8	1.20	70	0.20
8-12	1.30	65	0.30
12-18	1.35	60	0.35
*18-26.5	1.50	55	0.50

\* "K" option only. Ex: 403K-2208

Note: Typical performance dependent on selected options

### Mechanical

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 195 mA

28 Vdc 95 mA

##### Switching Time:

15 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

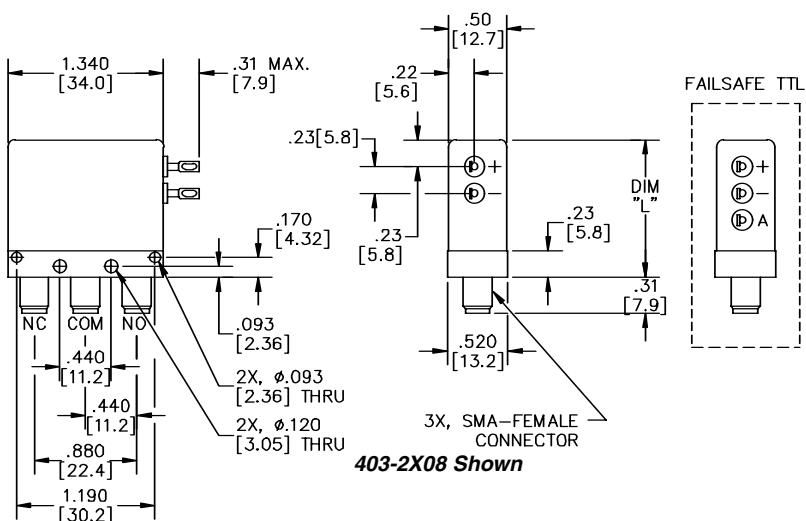
50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

1.5 oz., (42g.)



DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.18[30.0]	403-2X08	1
1.40[35.6]	403-2X0802A	2



For Electrical Schematic  
see page # 1-5

#### Part Number Selection

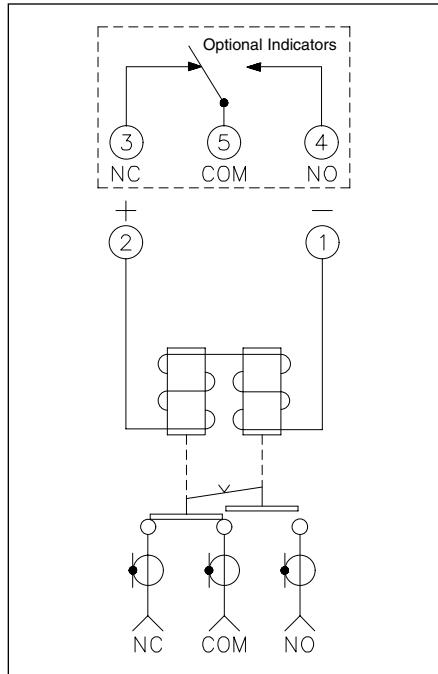
403    A - 2    2    08    02    A

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
A = High Power	2 = Failsafe	2 = 12Vdc	08 = SMA Female	02 = No Indicators	A = TTL High
I = Immersion Seal	6 = Failsafe with Suppression Diode	3 = 28Vdc	19 = Pins, PC Board Mount		
K = 26.5 GHz		7 = 20Vdc			
S = Epoxy Seal		8 = 24Vdc			
T = -55°C to + 85°C		9 = 15Vdc			

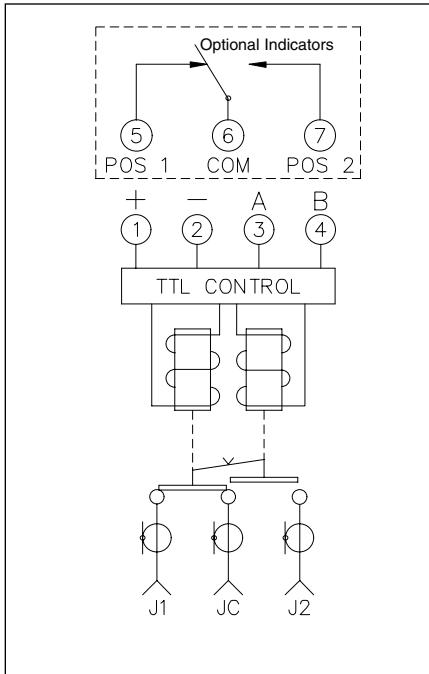


**DowKey® Microwave**  
CORPORATION

**1 401/403 Failsafe**



**2 401/403 Failsafe TTL**



**LOGIC TRUTH TABLE**

FAILSAFE TTL - SCH #2

LOGIC TRUTH TABLE		
RF PATH	INDICATOR PATH	LOGIC INPUT "A"
NC-COM	NC-COM	0
NO-COM	NO-COM	1

"0" = 0.0V-0.8V

"1" = 2.4V-5.5V

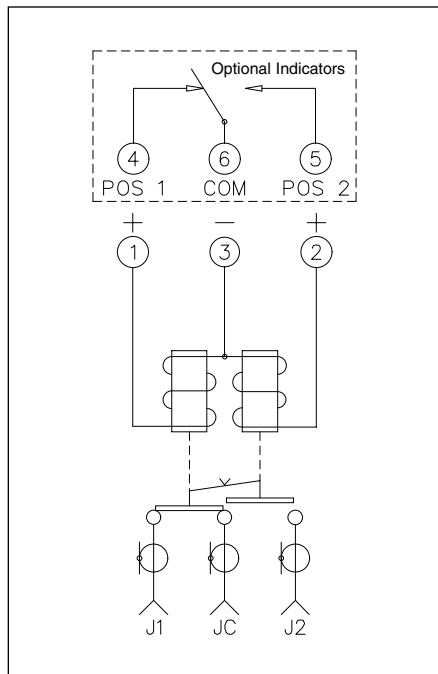
SELF CUTOFF TTL - SCH #5

LOGIC TRUTH TABLE			
RF PATH	INDICATOR PATH	LOGIC INPUT "A"	LOGIC INPUT "B"
JC-J1	COM-1	1	0
JC-J2	COM-2	0	1

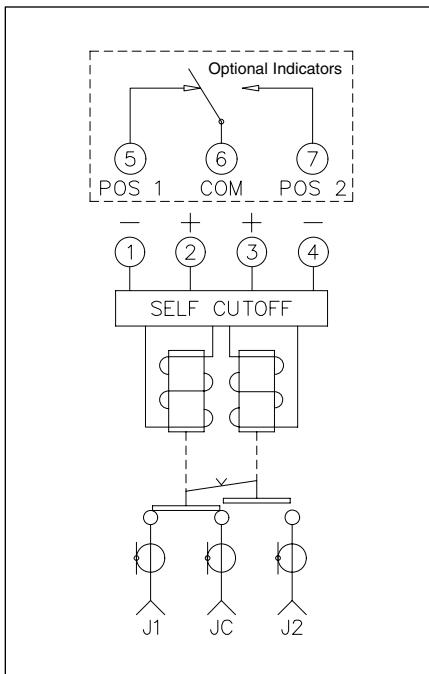
"0" = 0.0V-0.8V

"1" = 2.4V-5.5V

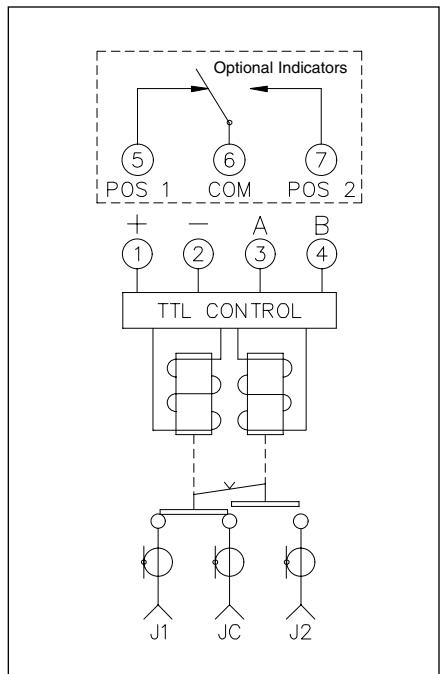
**3 401 Pulse Latch**



**4 401 Self Cutoff**



**5 401 Self Cutoff TTL**





<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	85	0.15
1-2	1.20	80	0.20
2-4	1.25	70	0.25
4-8	1.45	60	0.40
8-12.4	1.50	60	0.50

Note: RF characteristics for Type N & TNC female connectors, consult Dow-Key for other connector configurations

**402 Series SPDT Failsafe  
with TTL & Indicator Option, N**
**Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 275 mA

28 Vdc 115 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

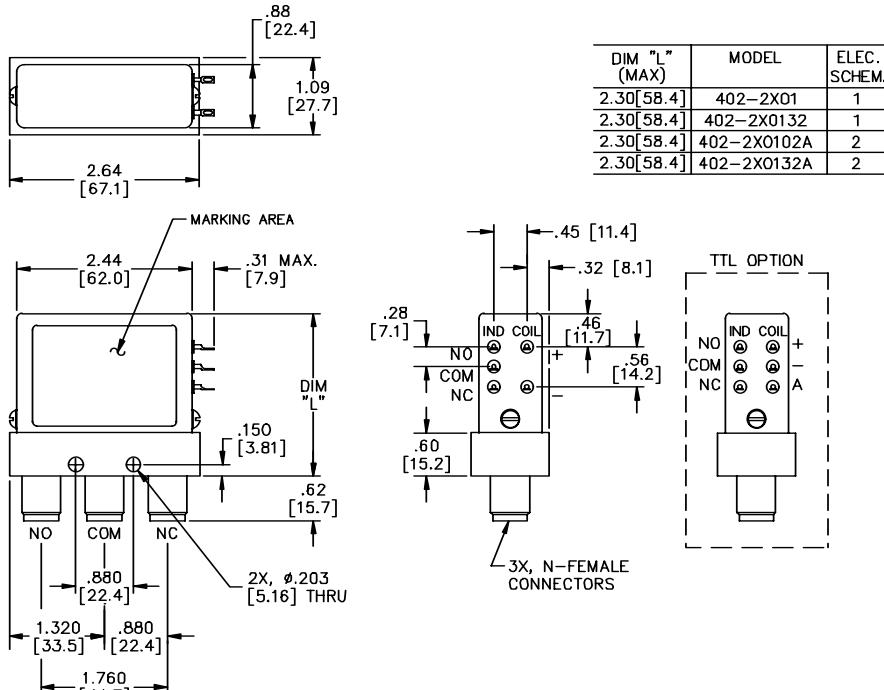
10G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11ms

**Nominal Weight:**

9.0 oz., (260g.)



402-2X0132 Shown

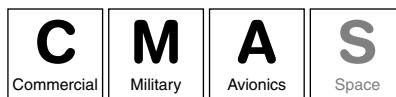
**Part Number Selection**

For Electrical Schematic  
see page # 1-8

402 J - 2 2 01 02 A

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
A = High Power	2 = Failsafe	2 = 12Vdc	01 = N Female	02 = No Indicators	A = TTL High
J = 'D' Connector	6 = Failsafe with Suppression Diode	3 = 28Vdc	02 = BNC Female	32 = Indicators	B = JANTX TTL High
P = Power Connector		4 = 48Vdc	03 = TNC Female		L = TTL Low
T = -55°C to + 85°C		7 = 20Vdc	53 = SC Female*		
		8 = 24Vdc			
		9 = 15Vdc			

\*1" connector spacing  
Consult Dow-Key for dimension

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	85	0.15
1-2	1.20	80	0.20
2-4	1.25	70	0.25
4-8	1.35	60	0.40
8-12.4	1.50	60	0.50

Note: RF characteristics are for Type N & TNC female connectors, consult Dow-Key for other connector configurations

**402 Series SPDT Latching  
with Indicator Option, N****Mechanical****Specifications**

**Operating Voltage:**  
(across temperature range)

12 Vdc (11-14 Vdc)  
28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 320 mA  
28 Vdc 135 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)  
-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

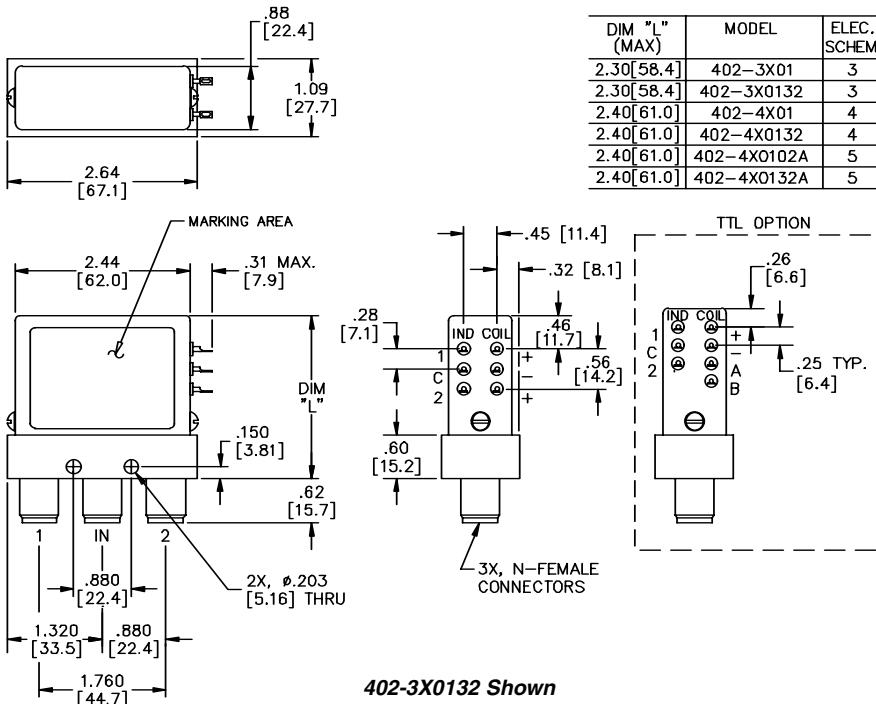
10G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

9.0 oz. (260g.)



402-3X0132 Shown

For Electrical Schematic  
see page # 1-8

**Part Number Selection**

402 J - 4 2 01 02 A

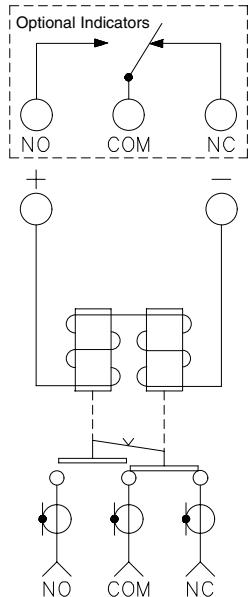
Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
A = High Power	3 = Pulse Latching	2 = 12Vdc	01 = N Female	02 = No Indicators	A = TTL High
J = 'D' Connector	4 = Latching Self Cutoff	3 = 28Vdc	02 = BNC Female	32 = Indicators	L = TTL Low
P = Power Connector	7 = Pulse Latching with Suppression Diodes	4 = 48Vdc	03 = TNC Female		
R = (+) Com		7 = 20Vdc	53 = SC Female*		
T = -55°C to + 85°C		8 = 24Vdc			
		9 = 15Vdc			

\*1" connector spacing  
Consult Dow-Key for dimensions

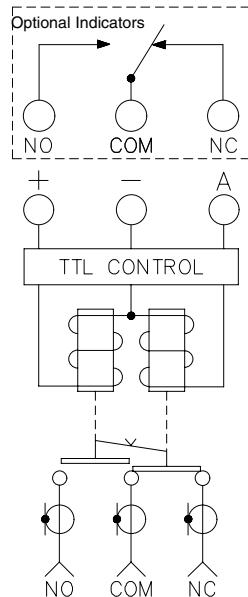
# 402 Series Electrical Schematics



## 1 402 Failsafe



## 2 402 Failsafe TTL



## LOGIC TRUTH TABLE

FAILSAFE TTL - SCH #2

LOGIC TRUTH TABLE		
RF PATH	INDICATOR PATH	LOGIC INPUT "A"
NC-COM	NC-COM	0
NO-COM	NO-COM	1

"0" = 0.0V-0.8V

"1" = 2.4V-5.5V

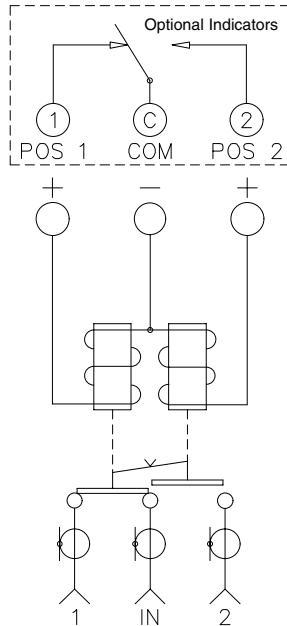
SELF CUTOFF TTL - SCH #5

LOGIC TRUTH TABLE			
RF PATH	INDICATOR PATH	LOGIC INPUT "A"	LOGIC INPUT "B"
IN-1	COM-1	1	0
IN-2	COM-2	0	1

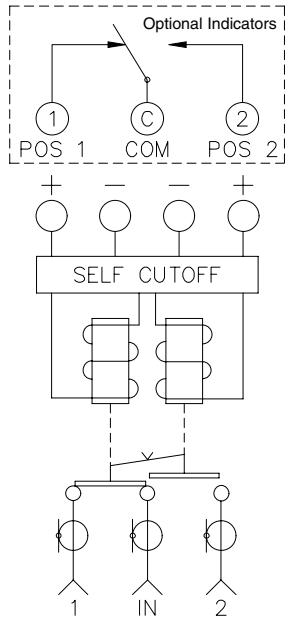
"0" = 0.0V-0.8V

"1" = 2.4V-5.5V

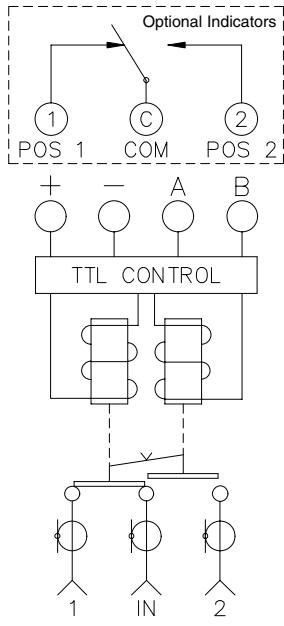
## 3 402 Pulse Latch



## 4 402 Self Cutoff



## 5 402 Self Cutoff TTL





<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



**521 Series SPDT  
Failsafe, SMA**

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12	1.40	60	0.40
12-18	1.50	60	0.50
*18-26.5	1.60	55	0.70

\* "K" option only

### Mechanical

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 690 mA

28 Vdc 295 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

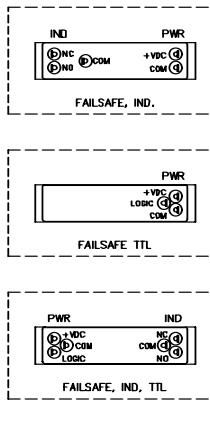
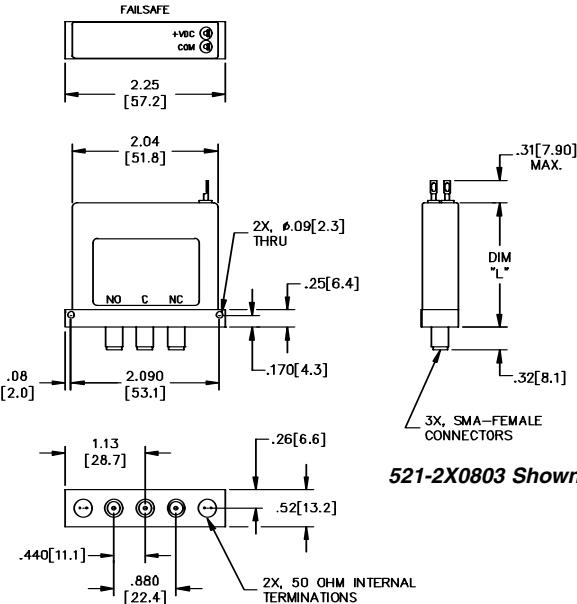
10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

3 oz., (85g.)



521-2X0803 Shown

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.28[35.5]	521-2X08	1
1.53[38.9]	521-2X0833	1
1.70[43.2]	521-2X0803A	2
1.70[43.2]	521-2X0833A	2

For Electrical Schematic  
see page # 1-11

### Part Number Selection

521 **J** - **2** **2** **08** **03** **A**

Special Options	Actuator	Coil Voltage	Connectors	Indicators/Terminations	Circuit Option
I = Immersion Seal	2 = Failsafe, Position 1	2 = 12 Vdc	08 = SMA Female	02 = No Indicators, Unterminated Ports	A = TTL High
J = 'D' Connector	6 = Failsafe, Position 1	3 = 28 Vdc		03 = No Indicators, 2W Terminations	L = TTL Low
K = 26.5 GHz	Suppression Diodes	8 = 24 Vdc		05 = No Indicators, 5W Terminations	
S = Epoxy Seal		9 = 15 Vdc		08 = No Indicators, 2W External Terminations	
T = -55°C to +85°C				32 = Indicators, Unterminated Ports	
				33 = Indicators, 2W Terminations	
				35 = Indicators, 5W Terminations	
				38 = Indicators, 2W External Terminations	

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12	1.40	60	0.40
12-18	1.50	60	0.50
*18-26.5	1.60	55	0.70

\* "K" option only

**521 Series SPDT  
Latching, SMA****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 450 mA

28 Vdc 190 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

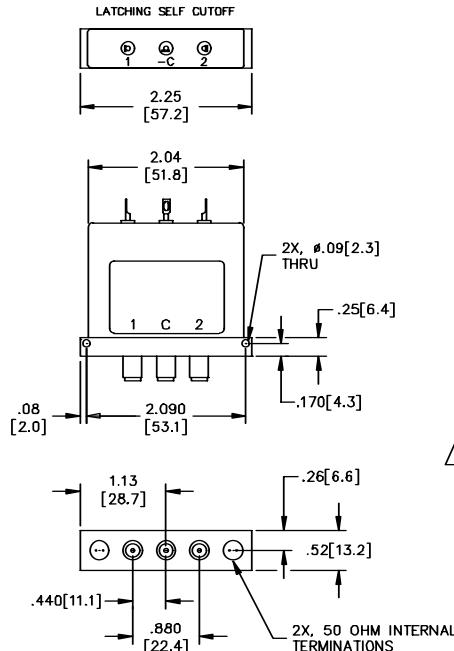
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

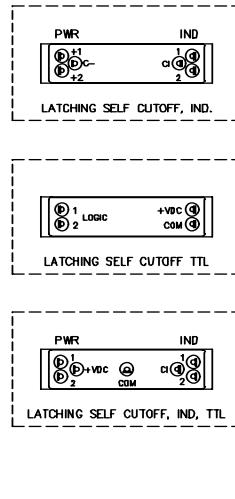
50 G, 1/2 Sine, 11 ms

**Nominal Weight:**

5 oz., (142g.)



521-4X0803 Shown



DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.68 [42.7]	521-4X08	3
1.78 [45.2]	521-4X083	3
1.78 [45.2]	521-4X0803A	4
1.78 [45.2]	521-4X0833A	4

For Electrical Schematic  
see page # 1-11

**Part Number Selection**

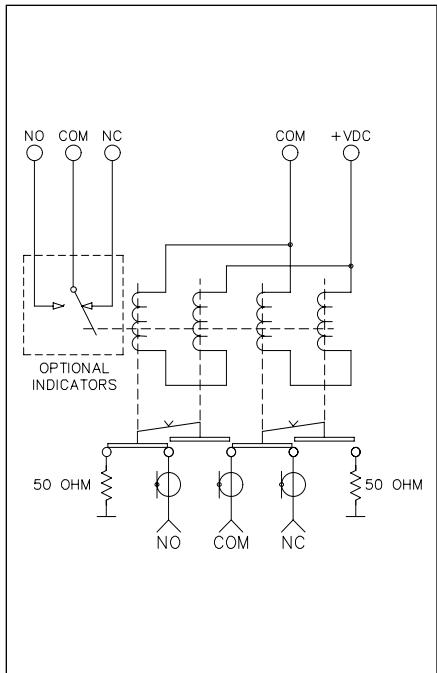
521 **J** - **4** **2** **08** **03** **A**

Special Options	Actuator	Coil Voltage	Connectors	Indicators/Terminations	Circuit Option
I = Immersion Seal	3 = Pulse Latching	2 = 12 Vdc	08 = SMA Female	02 = No Indicators, Unterminated Ports	A = TTL High
J = 'D' Connector	4 = Latching Self Cutoff	3 = 28 Vdc	03 = No Indicators, 2W Terminations	03 = No Indicators, 5W Terminations	L = TTL Low
K = 26.5 GHz		8 = 24 Vdc	05 = No Indicators, 5W Terminations	05 = No Indicators, 2W External Terminations	
R = Common Positive		9 = 15 Vdc	08 = No Indicators, 2W External Terminations	32 = Indicators, Unterminated Ports	
S = Epoxy Seal			32 = Indicators, 2W External Terminations	33 = Indicators, 2W Terminations	
T = -55°C to +85°C			35 = Indicators, 5W Terminations	35 = Indicators, 2W External Terminations	
			38 = Indicators, 2W External Terminations		

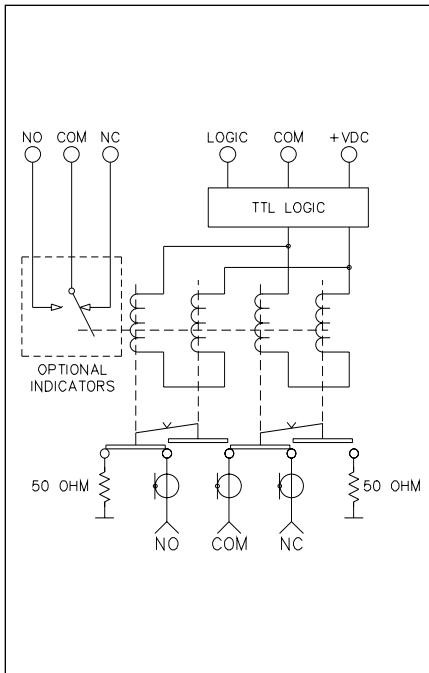


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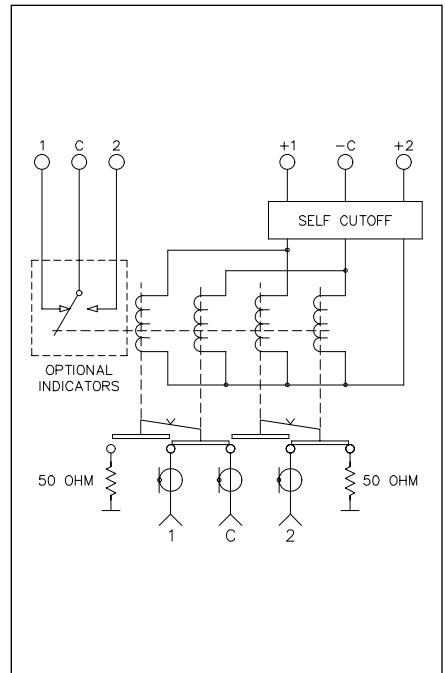
**1 521 Failsafe**



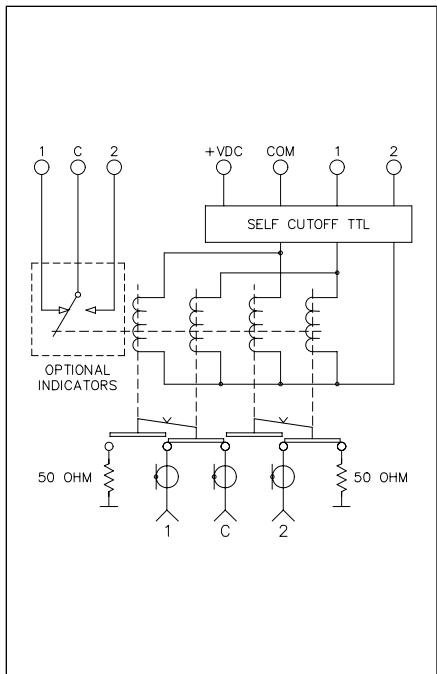
**2 521 Failsafe TTL**



**3 521 Self Cutoff**



**4 521 Self Cutoff TTL**



**LOGIC TRUTH TABLE**

FAILSAFE TTL - SCH #3

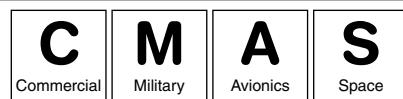
LOGIC TRUTH TABLE		
RF PATH	INDICATOR PATH	LOGIC INPUT
NC-COM	NC-COM	0
NO-COM	NO-COM	1

"0" = 0.0V-0.8V  
"1" = 2.4V-5.5V

SELF CUTOFF TTL - SCH #5

LOGIC TRUTH TABLE			
RF PATH	INDICATOR PATH	LOGIC INPUT "1"	LOGIC INPUT "2"
C-1	C-1	1	0
C-2	C-2	0	1

"0" = 0.0V-0.8V  
"1" = 2.4V-5.5V



### 909 Series SPDT Latching, SMA

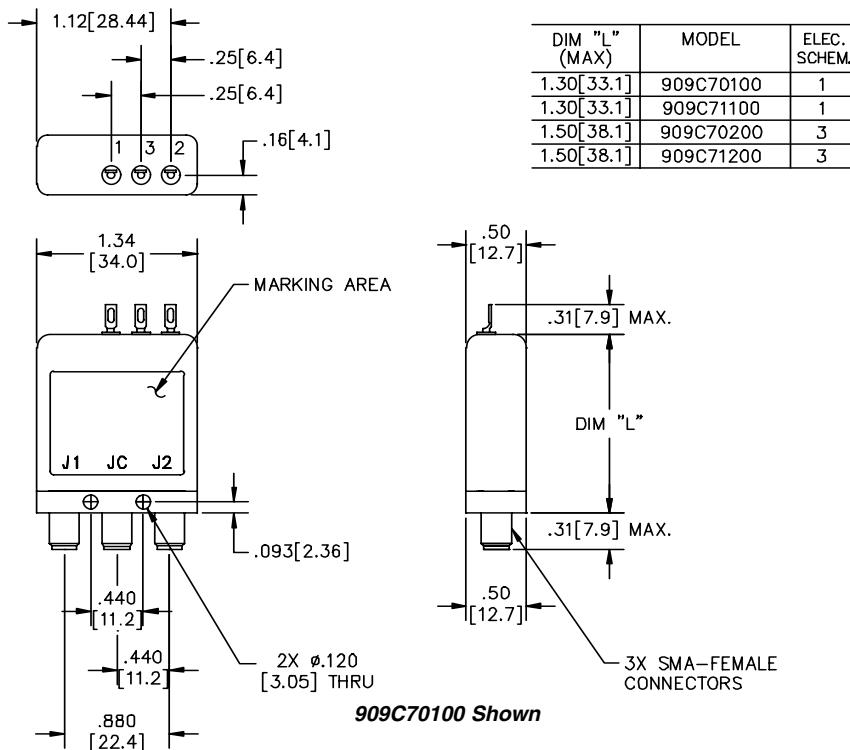
#### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	80	0.15
1-4	1.25	80	0.20
4-8	1.35	70	0.35
8-12.4	1.45	60	0.45
12.4-18	1.45	60	0.45

#### Specifications

**Operating Voltage:**  
(across temperature range)  
28 Vdc (20-30 Vdc)  
**Coil Current (max @ nom. Vdc & 20°C):**  
28 Vdc 95 mA  
**Switching Time:**  
20 mS maximum  
**Operating Temperature:**  
-55°C to +85°C  
**Mechanical Life, Cycles:**  
1,000,000 minimum  
**Vibration, Operating:**  
20g's sine/random  
**Mechanical Shock, Non-Operating:**  
50G, 1/2 Sine, 11mS  
**Nominal Weight:**  
2.0 oz., (57g.)

#### Mechanical



For Electrical Schematic  
see page # 1-14

#### Part Number Selection

909C 7 01 00 - XX

Family

909C = SPDT Latching

Connectors

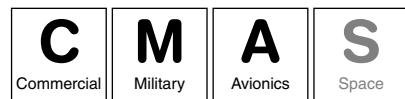
7 = SMA Female

Voltage/Actuator

01 = 28 Vdc  
02 = 28 Vdc with SPDT Indicators  
11 = 28 Vdc Pulse Latch  
12 = 28 Vdc Pulse Latch with  
with SPDT Indicators

Options

30 = TTL High  
50 = Common Positive  
60 = High Power

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	80	0.15
1-4	1.25	80	0.20
4-8	1.35	70	0.35
8-12.4	1.45	60	0.45
12.4-18	1.50	60	0.50

**919 Series SPDT Failsafe****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

28 Vdc (20-30 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

28 Vdc 120mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-55°C to +85°C

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

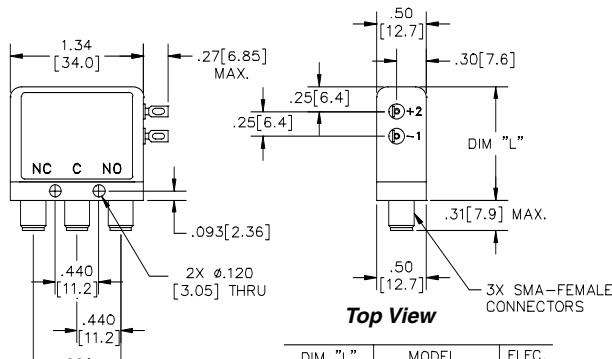
20g's sine/random

**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11mS

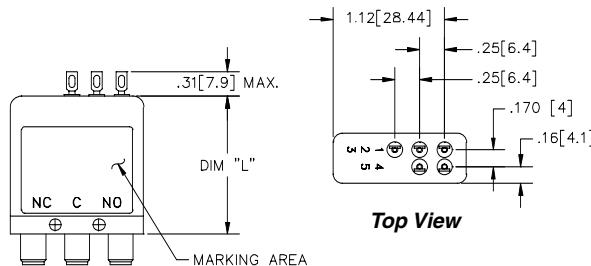
**Nominal Weight:**

2.0 oz., (57g.)



919C70100 Shown

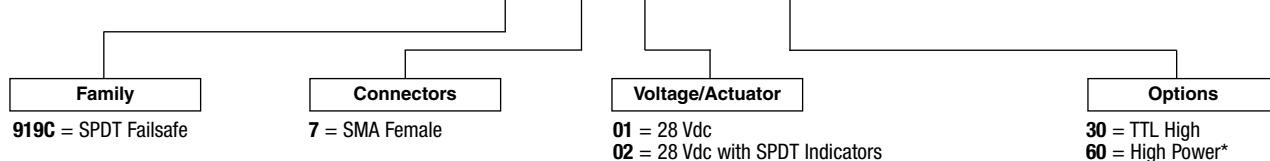
DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.15[29.21]	919C70100	5
1.40[35.6]	919C70200	5



919C70200 Shown

**Part Number Selection**For Electrical Schematic  
see page # 1-14

919C 7 01 00 - XX

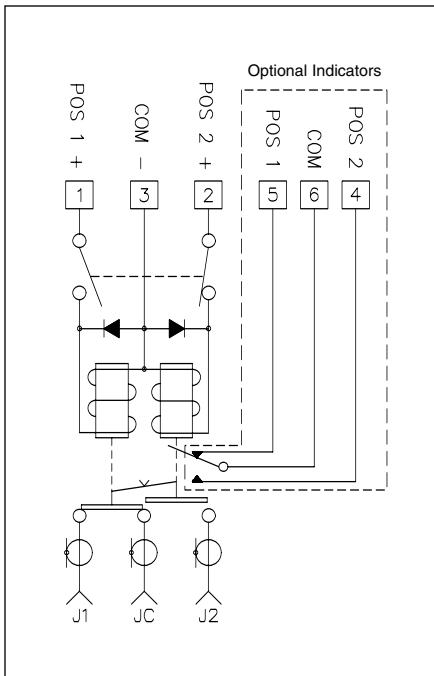


\*Consult Power Chart on page #

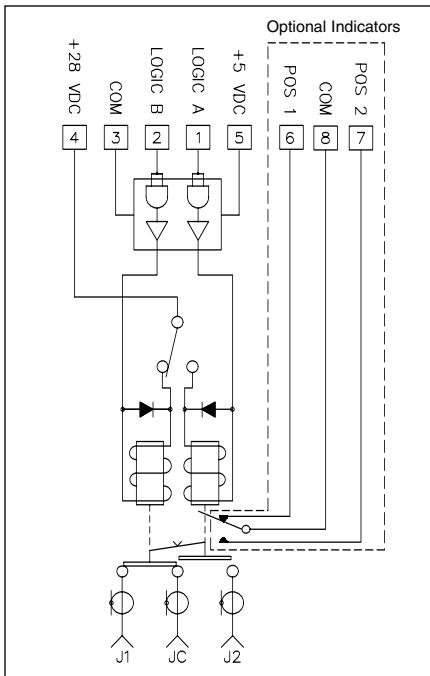


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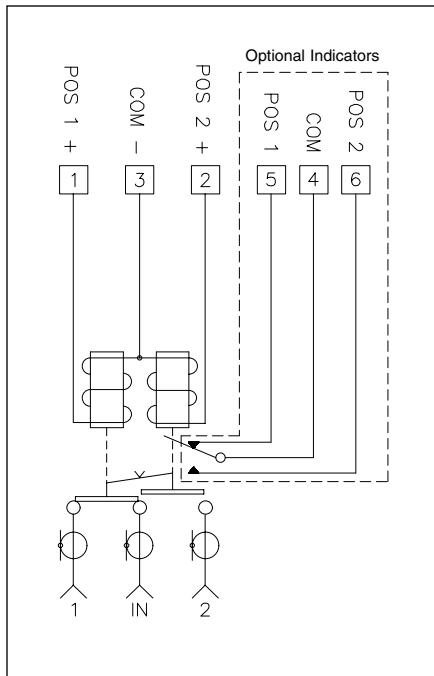
**1 909 Self Cutoff**



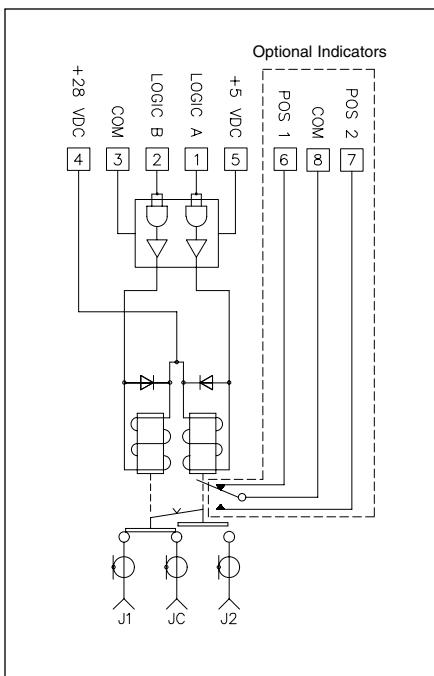
**2 909 Self Cutoff TTL**



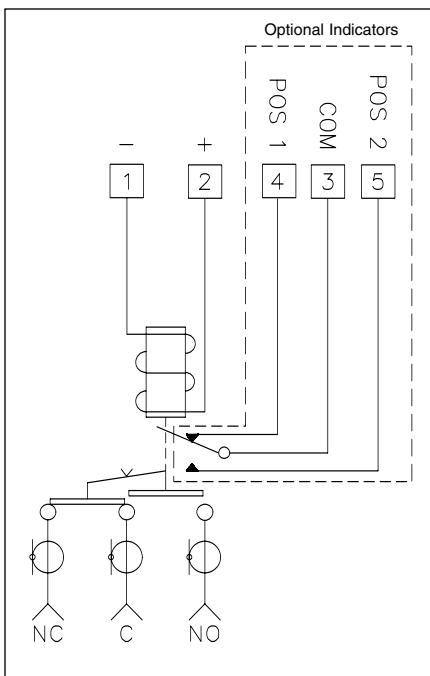
**3 909 Pulse Latch**



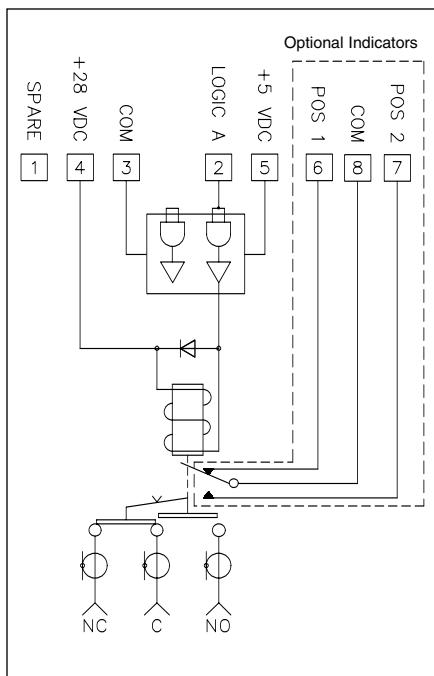
**4 909 Pulse Latch TTL**

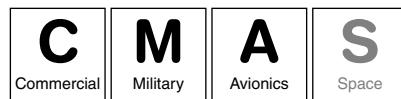


**5 919 Failsafe**



**6 919 Failsafe TTL**





### RF Characteristics



Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.20	75	0.20
1-4	1.30	60	0.30
4-8	1.40	60	0.40
8-12.4	1.50	60	0.50

Note: RF Characteristics are for type N & TNC Female connectors, consult Dow-Key for other connector configurations

### 805 Series SPDT Latching

### Mechanical

#### Specifications

##### Operating Voltage:

(across temperature range)

28 Vdc (20-30 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

28 Vdc 310mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-55°C to +85°C

##### Mechanical Life, Cycles:

100,000 minimum

##### Vibration, Operating:

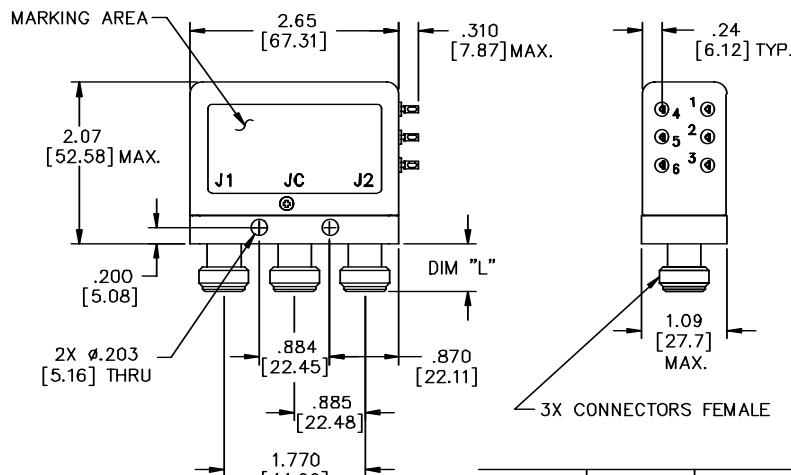
20g's sine/random

##### Mechanical Shock, Non-Operating:

50G, 1/2 Sine, 11ms

##### Nominal Weight:

8.5 oz., (241g.)



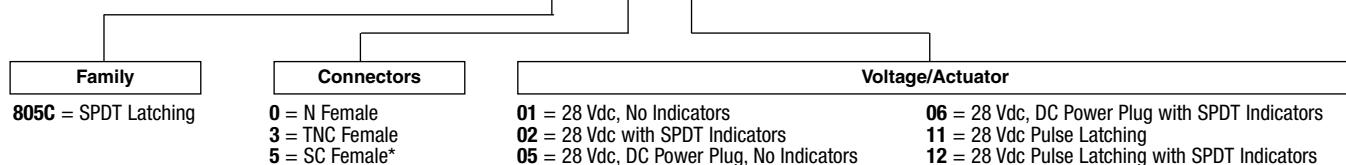
805C00200 Shown

CONN.	DIM "L" (MAX)	MODEL	ELEC. SCHEM.
N CONN.	.60[15.25]	805C00100	1
N CONN.	.60[15.25]	805C00200	1
N CONN.	.60[15.25]	805C01100	2
N CONN.	.60[15.25]	805C01200	2
TNC CONN.	.56[14.23]	805C30100	1
TNC CONN.	.56[14.23]	805C30200	1
TNC CONN.	.56[14.23]	805C31100	2
TNC CONN.	.56[14.23]	805C31200	2

### Part Number Selection

For Electrical Schematic  
see page # 1-17

805C 0 01 00



\*1" connector spacing  
Consult Dow-Key for Dimensions



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.20	75	0.20
1-4	1.30	60	0.30
4-8	1.40	60	0.40
8-12.4	1.50	60	0.50

Note: RF Characteristics are for type N & TNC Female connectors, consult Dow-Key for other connector configurations

### 810 Series SPDT Failsafe with indicators

### Mechanical

#### Specifications

##### Operating Voltage:

(across temperature range)  
28 Vdc (20-30 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

28 Vdc 160mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-55°C to +85°C

##### Mechanical Life, Cycles:

100,000 minimum

##### Vibration, Operating:

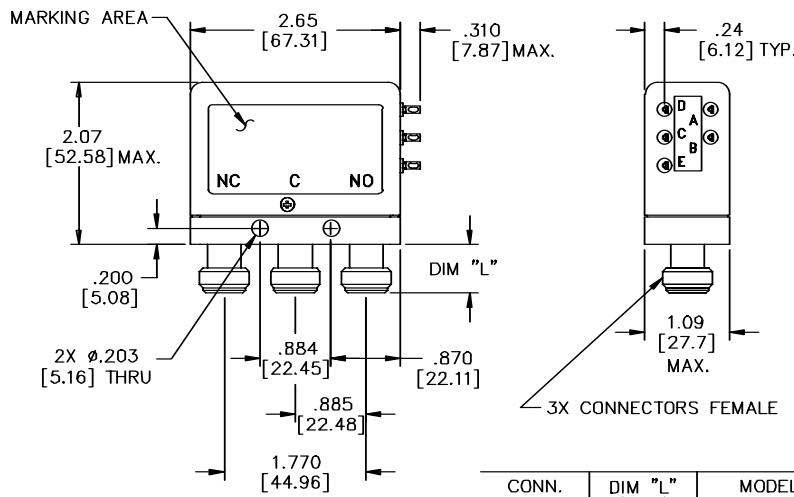
20g's sine/random

##### Mechanical Shock, Non-Operating:

50G, 1/2 Sine, 11mS

##### Nominal Weight:

8.5 oz., (241g.)



810C00200 Shown

CONN.	DIM "L" (MAX)	MODEL	ELEC. SCHEM.
N CONN.	.60[15.25]	810C00100	3
N CONN.	.60[15.25]	810C00200	3
TNC CONN.	.56[14.23]	810C30100	3
TNC CONN.	.56[14.23]	810C30200	3

For Electrical Schematic  
see page # 1-17

### Part Number Selection

810C 0 01 00 - XX

#### Family

810C = SPDT Failsafe

#### Connectors

0 = N Female  
3 = TNC Female  
5 = SC Female\*

#### Voltage/Actuator

01 = 28 Vdc, No Indicators  
02 = 28 Vdc with SPDT Indicators

#### Options

10 = Transient Diodes  
20 = DC Power Plug  
30 = TTL High  
60 = High Power\*\*

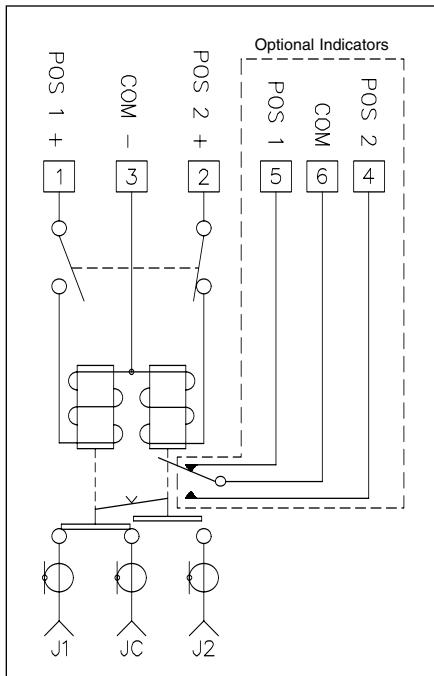
\*1" connector spacing  
Consult Dow-Key for Dimensions

\*\*Consult Power Chart on page #

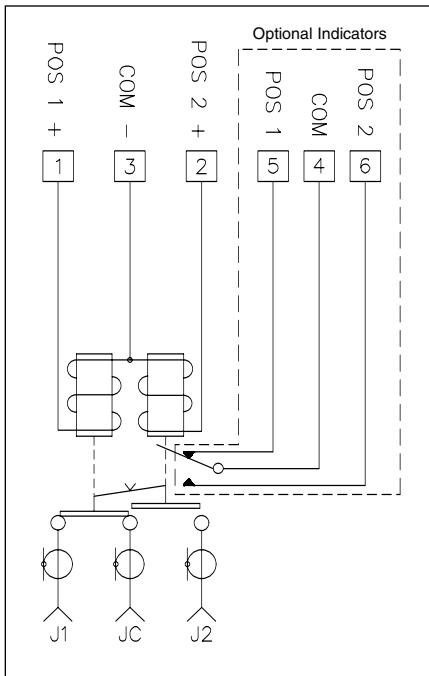


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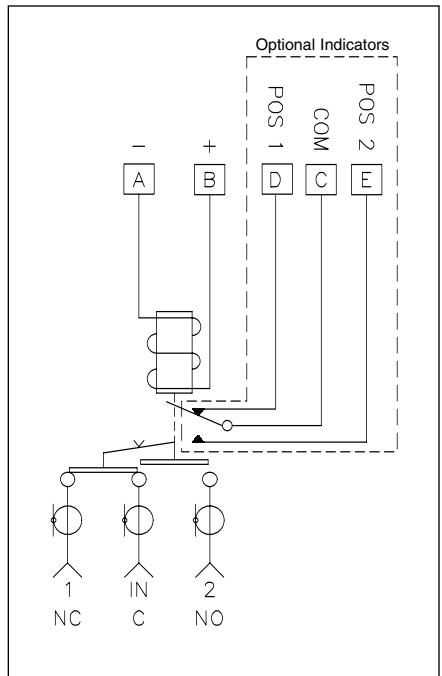
**1 805 Self Cutoff**



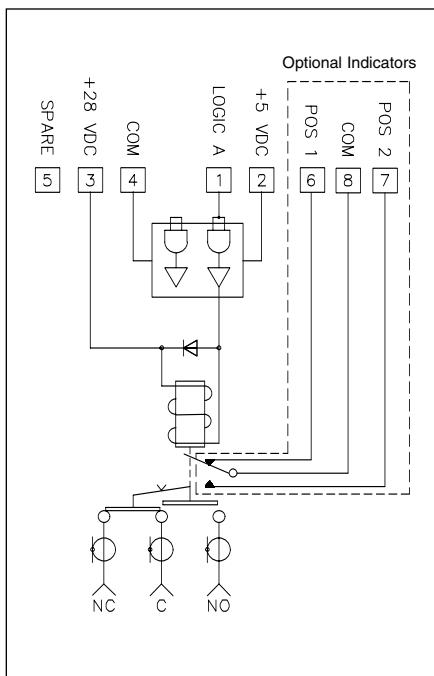
**2 805 Pulse Latch**



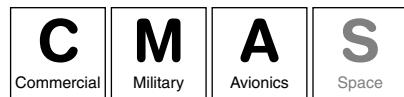
**3 810 Failsafe**



**4 810 Failsafe TTL**



# **TRANSFER SECTION**



## 411C Series Transfer Failsafe, SMA

### Specifications

#### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

#### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 360 mA

28 Vdc 145 mA

#### Switching Time:

20 mS maximum

#### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

#### Mechanical Life, Cycles:

1,000,000 minimum

#### Vibration, Operating:

10G RMS, 20-2000 Hz

#### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

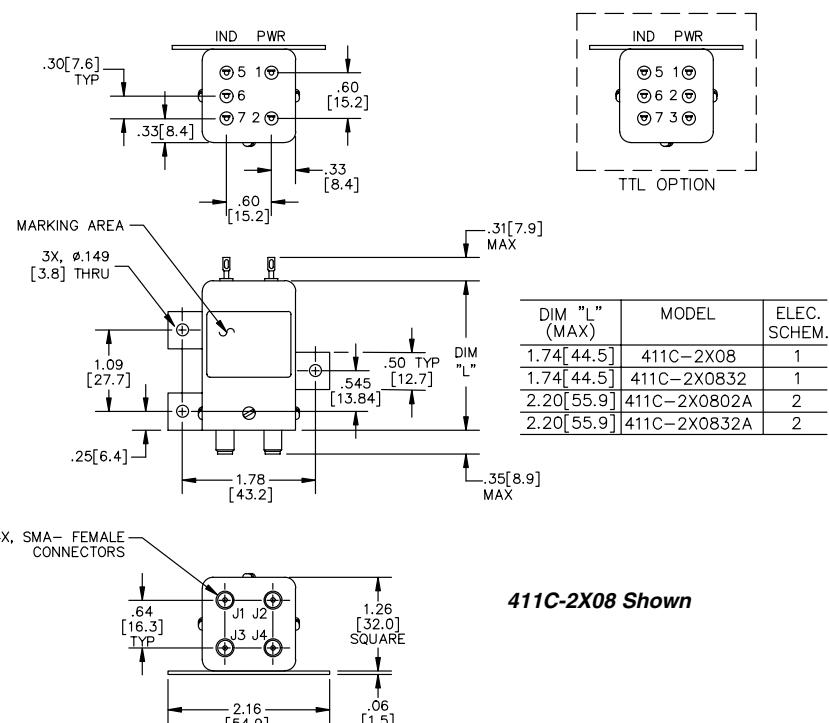
#### Nominal Weight:

4.0 oz., (115g.)

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.10	85	0.10
1-4	1.20	80	0.20
4-8	1.30	70	0.30
8-12	1.40	65	0.40
12-18	1.50	60	0.50

### Mechanical

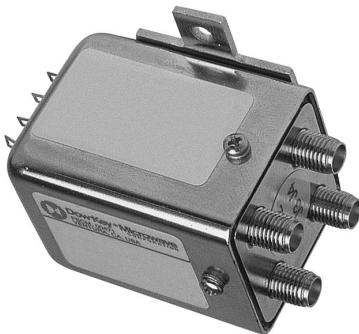
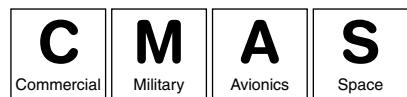


### Part Number Selection

For Electrical Schematic  
see page # 2.6

411C **J** - **2** **2** **01** **02** **A**

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
<b>A</b> = High Power	<b>2</b> = Failsafe	<b>2</b> = 12Vdc	<b>08</b> = SMA Female	<b>02</b> = No Indicators	<b>A</b> = TTL High
<b>B</b> = Bypass (J2-J4)	<b>6</b> = Failsafe with Suppression Diode	<b>3</b> = 28Vdc	<b>71</b> = SMB Female	<b>32</b> = Indicators	<b>B</b> = JANTX TTL High
<b>D</b> = Bypass (J1-J2)		<b>4</b> = 48Vdc			<b>L</b> = TTL Low
<b>E</b> = Bypass (J3-J4)		<b>7</b> = 20Vdc			
<b>F</b> = Bypass (J1-J3)		<b>8</b> = 24Vdc			
<b>I</b> = Immersion Seal		<b>9</b> = 15Vdc			
<b>J</b> = 'D' Connector					
<b>N</b> = No Mounting Bracket					
<b>S</b> = Epoxy Seal					
<b>T</b> = -55°C to + 85°C					



## 411C Series Transfer Latching, SMA

### Specifications

#### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

#### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 320 mA

28 Vdc 185 mA

#### Switching Time:

20 mS maximum

#### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

#### Mechanical Life, Cycles:

1,000,000 minimum

#### Vibration, Operating:

10G RMS, 20-2000 Hz

#### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

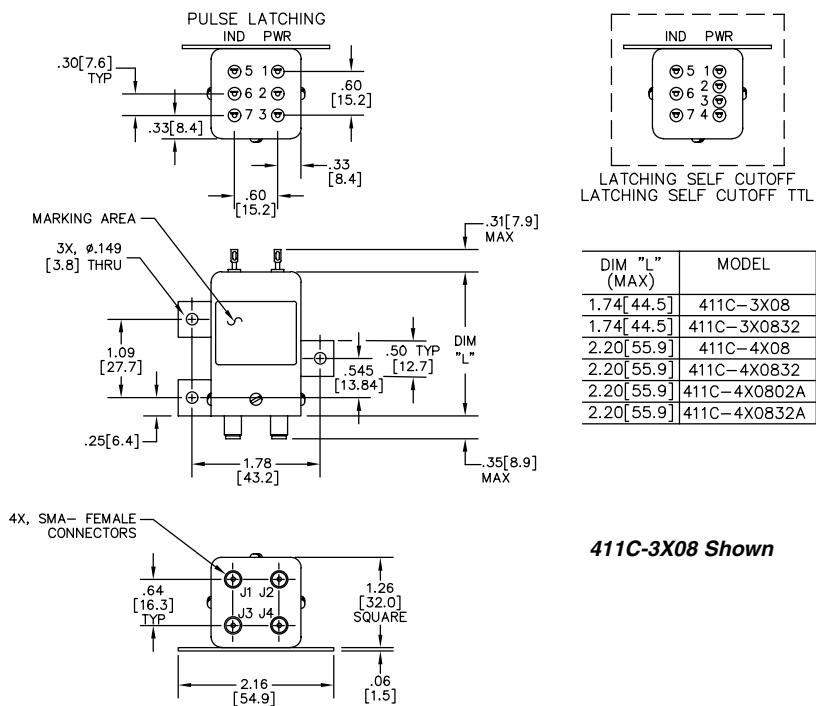
#### Nominal Weight:

4.0 oz., (115g.)

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.10	85	0.10
1-4	1.20	80	0.20
4-8	1.30	70	0.30
8-12	1.40	65	0.40
12-18	1.50	60	0.50

### Mechanical



411C-3X08 Shown

For Electrical Schematic  
see page # 2-6

### Part Number Selection

411C **J** - **4** **2** **08** **02** **A**

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
<b>A</b> = High Power	3 = Pulse Latching	2 = 12Vdc	08 = SMA Female	02 = No Indicators	<b>A</b> = TTL High
<b>B</b> = Bypass (J2-J4)	4 = Self Cutoff	3 = 28Vdc	71 = SMB Female	32 = Indicators	<b>L</b> = TTL Low
<b>D</b> = Bypass (J1-J2)	7 = Pulse Latching with Suppression Diode	4 = 48Vdc			<b>N</b> = CANBus
<b>E</b> = Bypass (J3-J4)		7 = 20Vdc			
<b>F</b> = Bypass (J1-J3)		8 = 24Vdc			
<b>I</b> = Immersion Seal		9 = 15Vdc			
<b>J</b> = 'D' Connector					
<b>N</b> = No Mounting Bracket					
<b>R</b> = (+) Com					
<b>S</b> = Epoxy Seal					
<b>T</b> = -55°C to + 85°C					



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	85	0.15
1-2	1.20	80	0.20
2-4	1.25	70	0.25
4-8	1.45	60	0.40
8-12.4	1.60	60	0.50

Note: RF characteristics for Type N & TNC female connectors, consult Dow-Key for other connector configurations

**412 Series Transfer Failsafe, N****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 320 mA

28 Vdc 185 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

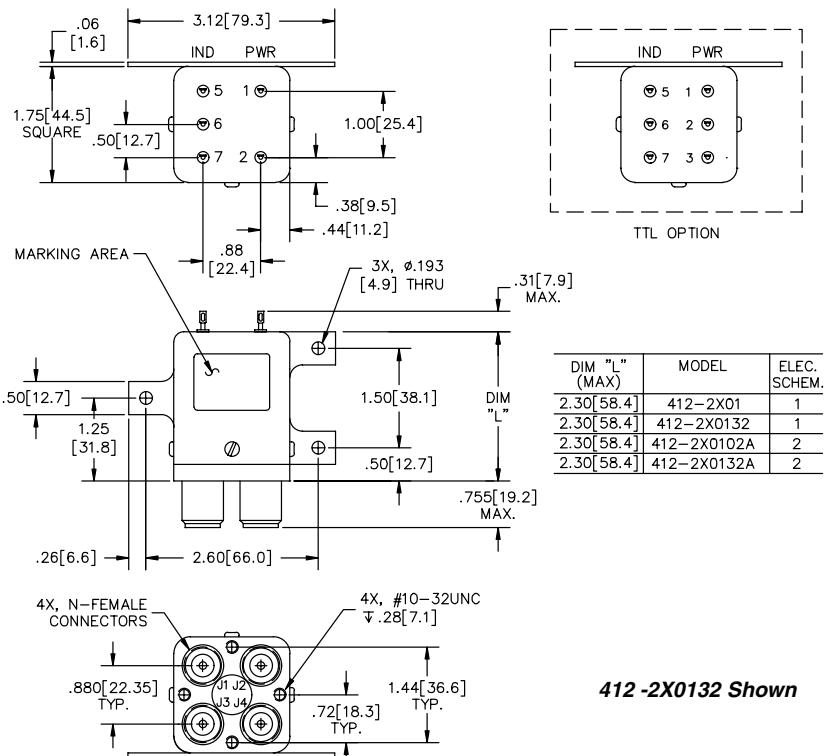
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

30 G, 1/2 Sine, 11 mS

**Nominal Weight:**

14 oz., (397g.)

**Mechanical**

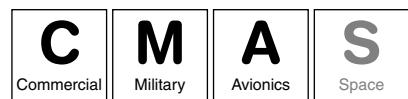
For Electrical Schematic  
see page # 2-6

**Part Number Selection**

412 J - 2 2 01 02 A

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
A = High Power	2 = Failsafe	2 = 12Vdc	01 = N Female	02 = No Indicators	A = TTL High
C = Special Mounting Bracket	6 = Failsafe with Suppression Diode	3 = 28Vdc	02 = BNC Female	32 = Indicators	
J = 'D' Connector		7 = 20Vdc	03 = TNC Female		
N = No Mounting Bracket		8 = 24Vdc	53 = SC Female*		
P = Power Plug		9 = 15Vdc			
S = Epoxy Seal					
T = -55°C to + 85°C					

\*1" connector spacing  
Consult Dow-Key for dimensions



### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	85	0.15
1-2	1.20	80	0.20
2-4	1.25	70	0.25
4-8	1.45	60	0.40
8-12.4	1.60	60	0.50

Note: RF characteristics for Type N & TNC female connectors, consult Dow-Key for other connector configurations

### 412 Series Latching

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 320 mA

28 Vdc 185 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

10 G RMS, 20-2000 Hz

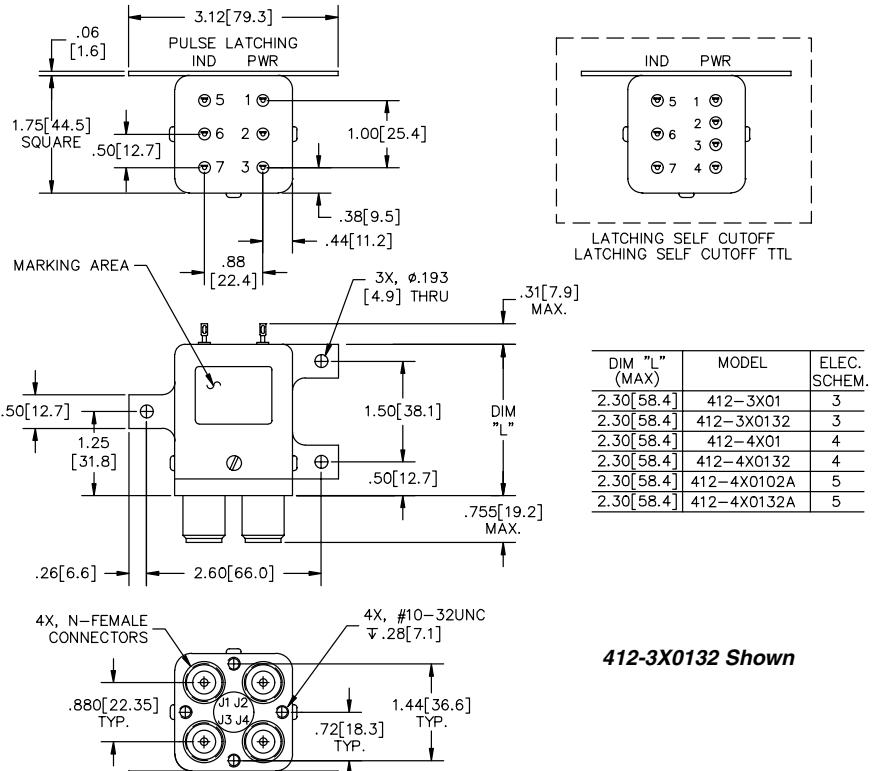
##### Mechanical Shock, Non-Operating:

30 G, 1/2 Sine, 11 mS

##### Nominal Weight:

14 oz., (397g.)

#### Mechanical



#### Part Number Selection

For Electrical Schematic  
see page # 2-6

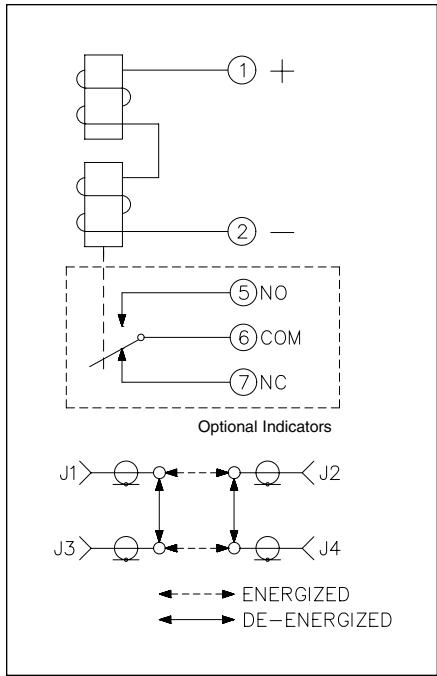
412 J - 4 2 01 02 A

Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
A = High Power	3 = Pulse Latching	2 = 12Vdc	01 = N Female	02 = No Indicators	A = TTL High
C = Special Mounting Bracket	4 = Self Cutoff	3 = 28Vdc	02 = BNC Female	32 = Indicators	
J = 'D' Connector	7 = Pulse Latching with Suppression Diodes	7 = 20Vdc	03 = TNC Female		
N = No Mounting Bracket		8 = 24Vdc	53 = SC Female*		
P = Power Plug		9 = 15Vdc			
R = (+) Com					
S = Epoxy Seal					
T = -55°C to + 85°C					

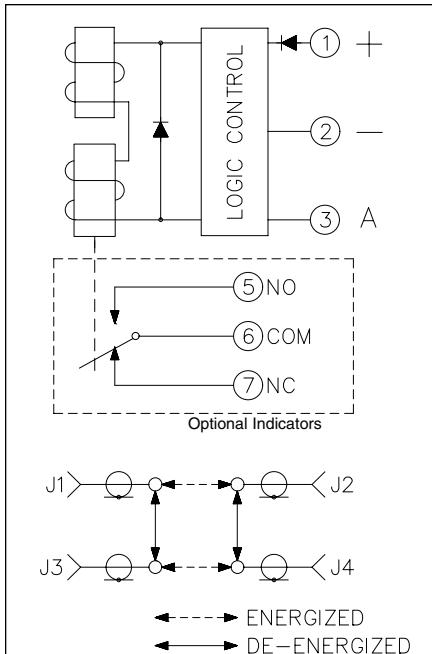
\*1" connector spacing  
Consult Dow-Key for dimensions



**1 411C/412 Failsafe**



**2 411C/412 Failsafe TTL**



**LOGIC TRUTH TABLE**

FAILSAFE TTL - SCH #2

LOGIC TRUTH TABLE		
RF PATH	INDICATOR PATH	LOGIC INPUT "A"
J1-J3/J2-J4	NC-COM	0
J1-J2/J3-J4	NO-COM	1

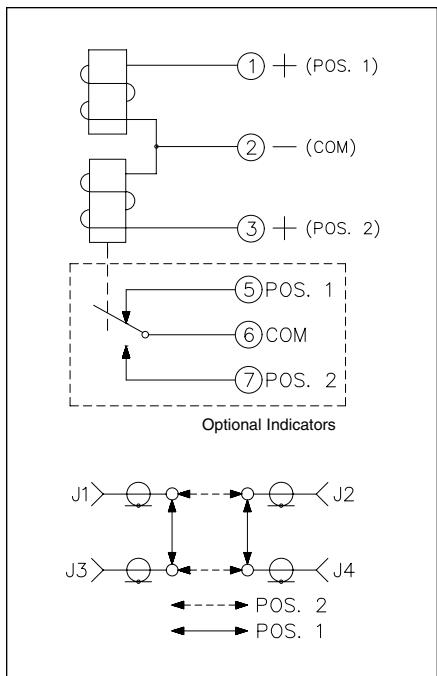
"0" = 0.0V-0.8V  
"1" = 2.4V-5.5V

SELF CUTOFF TTL - SCH #5

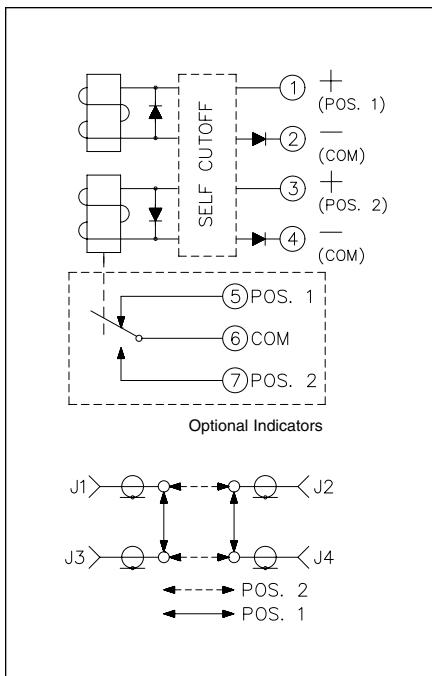
LOGIC TRUTH TABLE			
RF PATH	INDICATOR PATH	LOGIC INPUT "A"	LOGIC INPUT "B"
J1-J3/J2-J4	COM-1	1	0
J1-J2/J3-J4	COM-2	0	1

"0" = 0.0V-0.8V  
"1" = 2.4V-5.5V

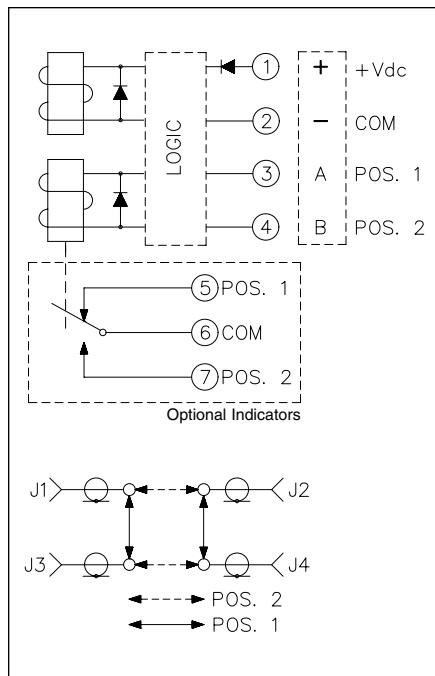
**3 411C/412 Pulse Latch**



**4 411C/412 Self Cutoff**



**5 411C/412 Self Cutoff TTL**





**300 Series  
Transfer Latching**

### Specifications

**Operating Voltage:**

(across temperature range)

28 Vdc (20-30 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

28 Vdc 650mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-55°C to +85°C

**Mechanical Life, Cycles:**

100,000 minimum

**Vibration, Operating:**

20g's sine/random

**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11mS

**Nominal Weight:**

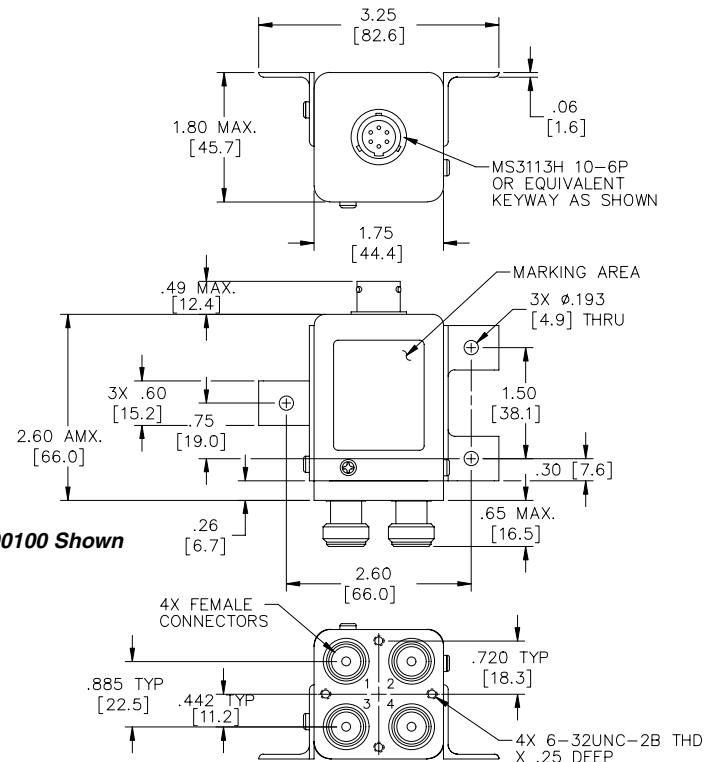
12 oz., (340g.)

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.20	60	0.15
1-4	1.35	60	0.25
4-8	1.45	60	0.35
8-12.4	1.50	60	0.50

Note: RF Characteristics are for type N & TNC Female connectors, consult Dow-Key for other connector configurations

### Mechanical



For Electrical Schematic  
see page # 2-11

### Part Number Selection

300C 0 01 00 - XX

**Family**

300C = Transfer Latching

**Connectors**

0 = N Female  
3 = TNC Female  
5 = SC Female\*

**Voltage**

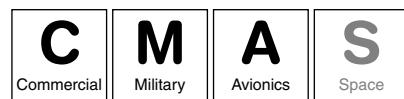
01 = 28 Vdc, No Indicators  
02 = 28 Vdc with SPDT Indicators  
11 = 28 Vdc Pulse Latch, No Indicators  
12 = 28 Vdc Pulse Latch with SPDT Indicators

**Options**

60 = High Power\*\*

\*1" connector spacing  
Consult Dow-Key for Dimensions

\*\*Consult Power Chart on page #



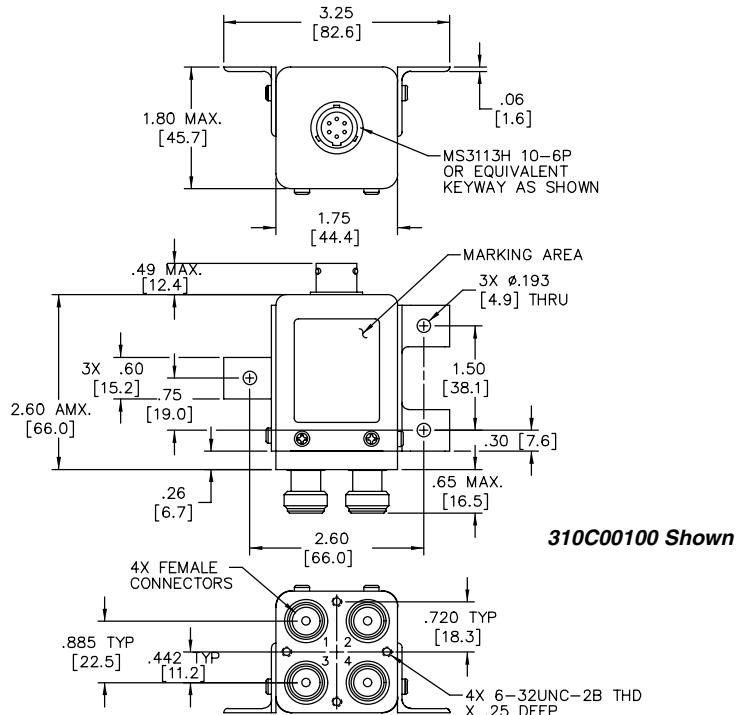
**310 Series  
Transfer Failsafe**

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.20	60	0.15
1-4	1.35	60	0.25
4-8	1.45	60	0.35
8-12.4	1.50	60	0.50

Note: RF Characteristics are for type N & TNC Female connectors, consult Dow-Key for other connector configurations

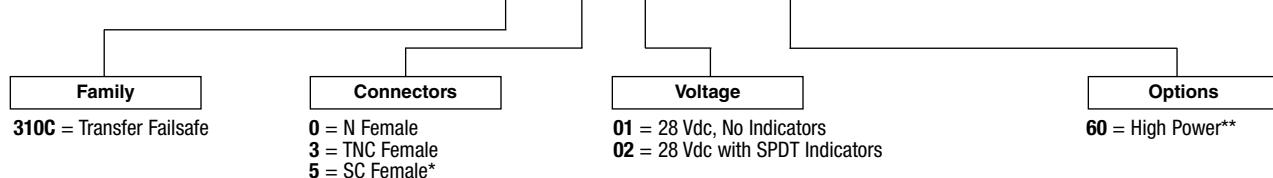
### Mechanical



### Part Number Selection

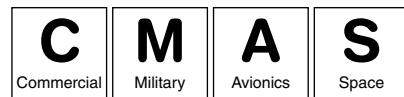
For Electrical Schematic  
see page # 2-11

310C 0 01 00 - XX



\*1" connector spacing  
Consult Dow-Key for Dimensions

\*\*Consult Power Chart on page #



## 700 Series Transfer Latching

### Specifications

#### Operating Voltage:

(across temperature range)

28 Vdc (20-30 Vdc)

#### Coil Current (max @ nom.Vdc & 20°C):

28 Vdc 65mA

#### Switching Time:

20 mS maximum

#### Operating Temperature:

-55°C to +85°C

#### Mechanical Life, Cycles:

100,000 minimum

#### Vibration, Operating:

20g's sine/random

#### Mechanical Shock, Non-Operating:

50G, 1/2 Sine, 11mS

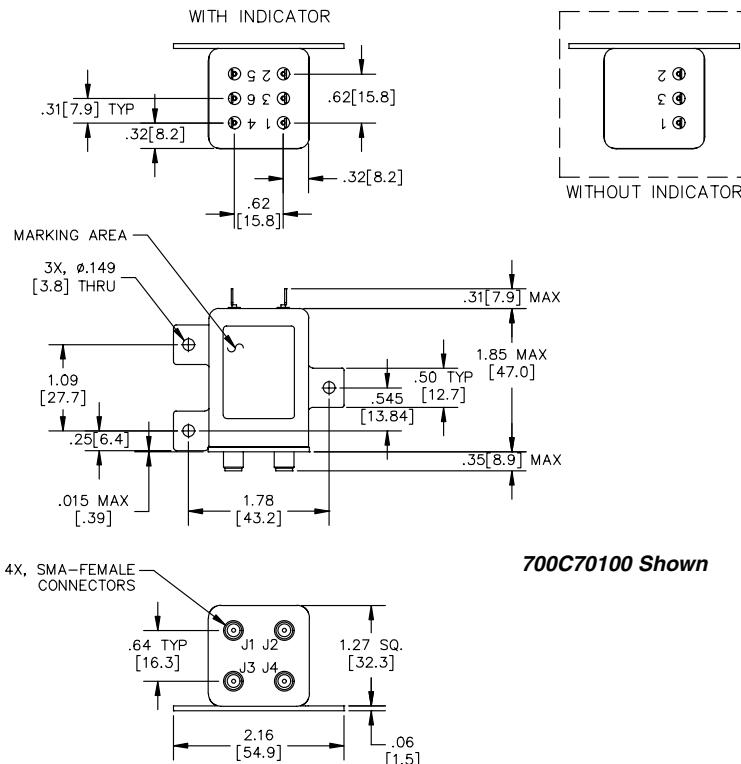
#### Nominal Weight:

3.5 oz., (100g.)

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	75	0.15
1-4	1.25	60	0.20
4-8	1.35	60	0.35
8-12.4	1.50	60	0.50
12.4-18	1.50	60	0.50

### Mechanical



### Part Number Selection

For Electrical Schematic  
see page # 2-11

700C 7 01 00 - XX

Family

700C = Transfer Latching

Connectors

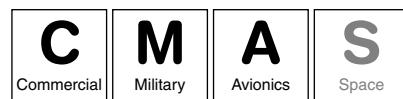
7 = SMA Female

Voltage

01 = 28 Vdc, No Indicators  
02 = 28 Vdc with SPDT Indicators  
11 = 28 Vdc, Pulse Latching, No Indicators  
12 = 28 Vdc Pulse Latching with SPDT Indicators

Options

20 = DC Power Plug  
30 = TTL High



**710 Series  
Transfer Failsafe**

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
0-1	1.15	75	0.15
1-4	1.25	60	0.20
4-8	1.35	60	0.35
8-12.4	1.50	60	0.50
12.4-18	1.50	60	0.50

### Specifications

**Operating Voltage:**

(across temperature range)

28 Vdc (20-30 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

28 Vdc 120mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-55°C to +85°C

**Mechanical Life, Cycles:**

100,000 minimum

**Vibration, Operating:**

20g's sine/random

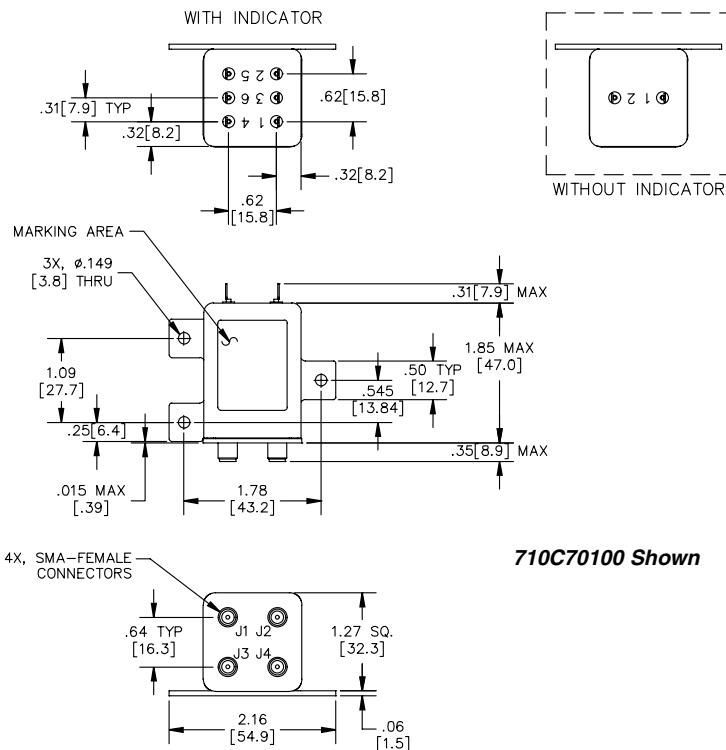
**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11mS

**Nominal Weight:**

3.5 oz., (100g.)

### Mechanical



710C70100 Shown

For Electrical Schematic  
see page # 2-11

### Part Number Selection

710C 7 01 00 - XX

Family

710C = Transfer Failsafe

Connectors

7 = SMA Female

Voltage

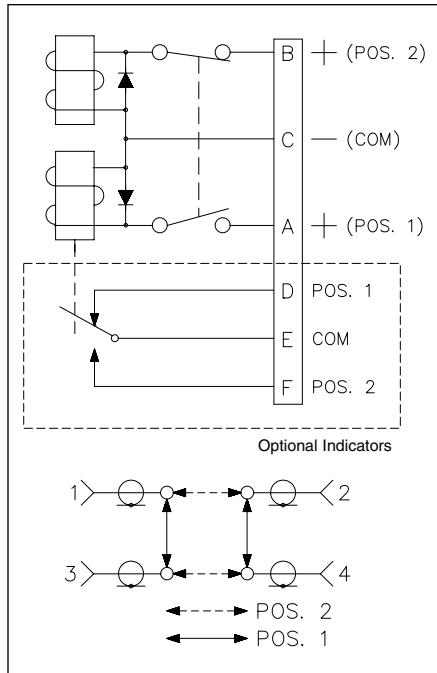
01 = 28 Vdc, No Indicators  
02 = 28 Vdc with SPDT Indicators

Options

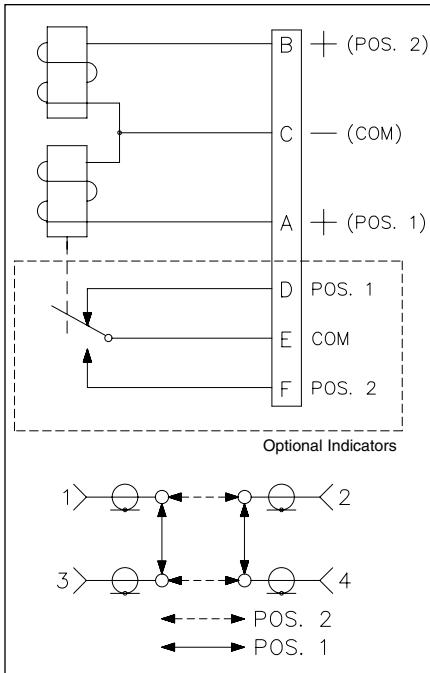
20 = DC Power Plug  
30 = TTL High



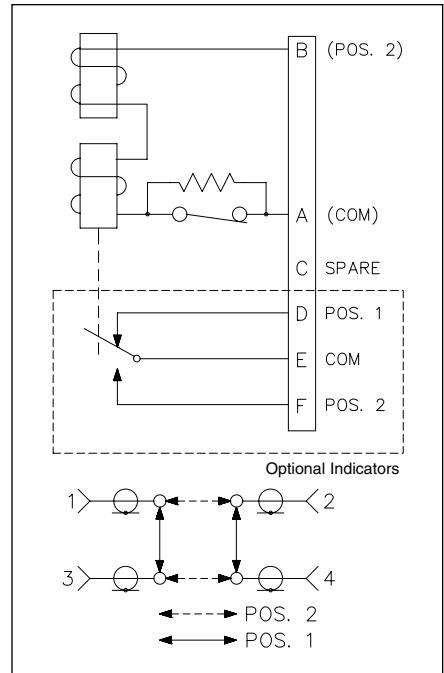
**1 300 Latching**



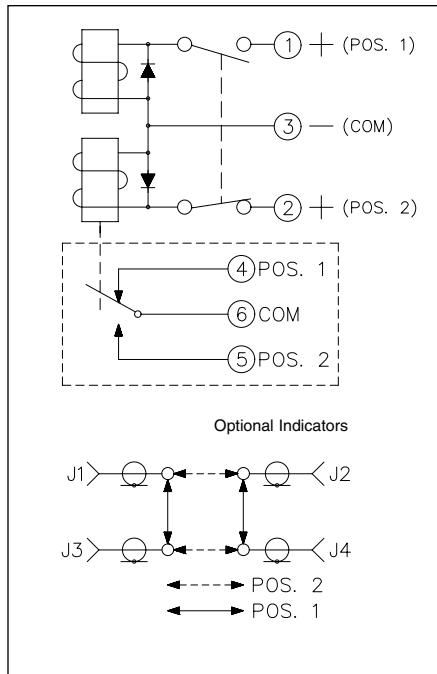
**2 300 Pulse Latch**



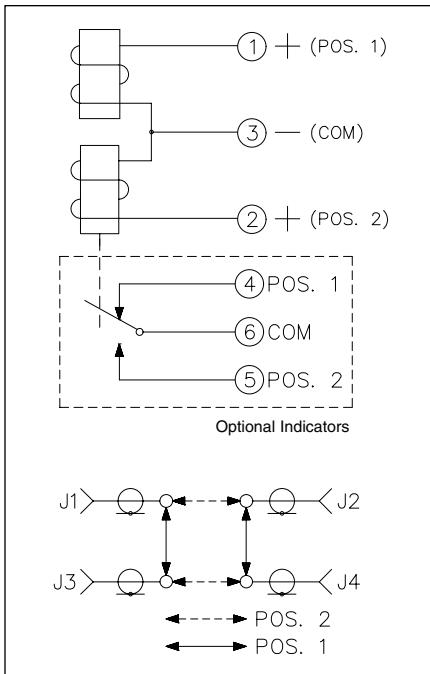
**3 310 Failsafe**



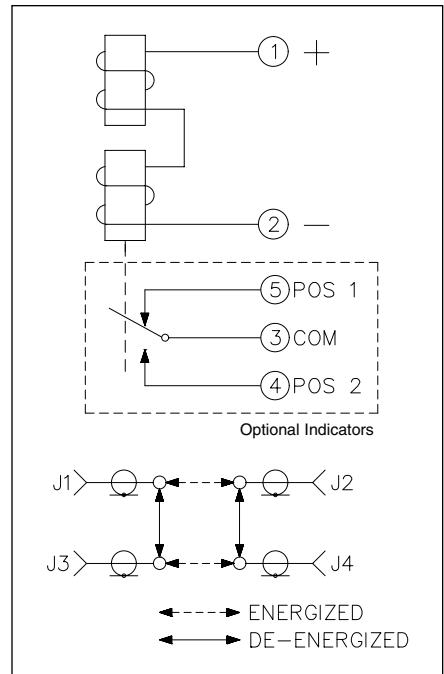
**4 700 Latching**



**5 700 Pulse Latch**



**6 710 Failsafe**



# MULTIPOSITION SECTION



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



### 535-565 Series Normally Open, SMA

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (Nominal):

12 Vdc 110 mA

28 Vdc 65 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

10G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50G, 1/2 Sine, 11ms

##### Nominal Weight:

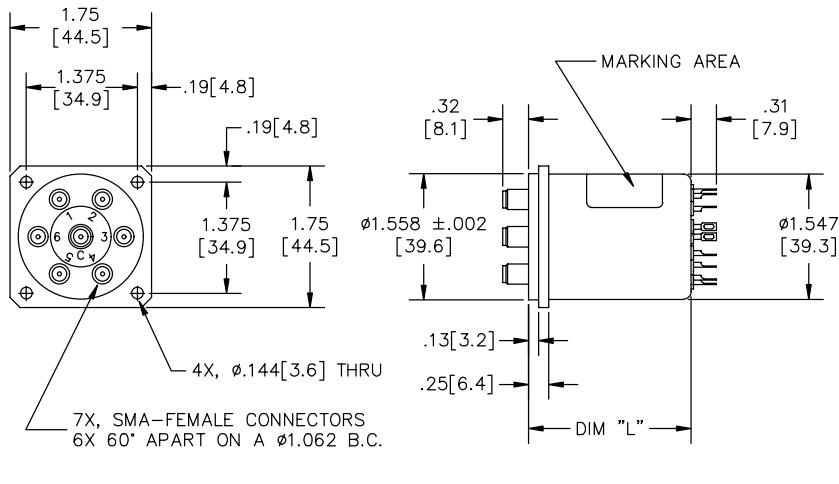
4.0 oz., (115g.)

#### RF Characteristics

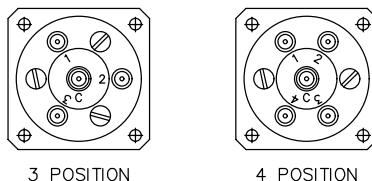
Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12.4	1.40	60	0.40
12.4-18	1.50	60	0.50
*18-22	1.60	50	0.60
*22-26.5	1.80	40	0.70

\* "K" option only.

#### Mechanical



565-530822 Shown



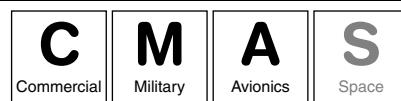
DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.41 [35.8]	5X5-5X08	1
1.90 [48.3]	5X5-5X0822	1
1.70 [43.2]	5X5-5X0802A	2
2.08 [52.8]	5X5-5X0822A	2

For Electrical Schematic  
see page # 3-9

#### Part Number Selection

535 J - 5 2 08 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
535 = SP3T 545 = SP4T 565 = SP6T	C = Mounting Bracket J = 9 or 15* Pin 'D' Connector K = 26.5 GHz P = Power Plug R = (-) Com T = -55° to +85° C	2 = Failsafe, Position 1 5 = Normally Open 6 = Failsafe, Position 1 Suppression Diodes (Com +) 9 = Normally Open Suppression Diodes (Com +)	2 = 12Vdc 3 = 28Vdc 8 = 24Vdc 9 = 15Vdc	07 = BMA Female 08 = SMA Female	02 = No Indicators 22 = SPST Indicators	A = TTL High E = BCD Decoding L = TTL low



### 461 Series Normally Open Terminated

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 400 mA

28 Vdc 160 mA

##### Switching Time:

15 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

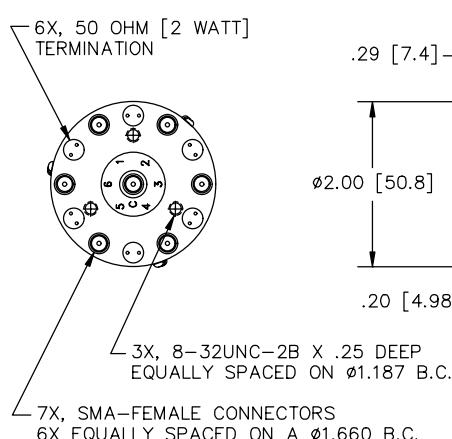
10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

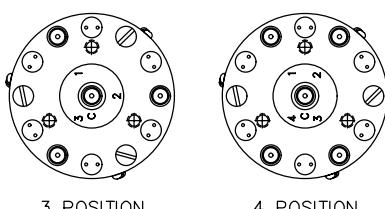
50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

10.0 oz., (275g.)



461-530823 Shown



DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.95[49.5]	4X1-5X0803	3
2.29[58.2]	4X1-5X0823	3
2.29[58.2]	4X1-5X0803A	4
2.58[65.5]	4X1-5X0823A	4

For Electrical Schematic  
see page # 3-9

#### Part Number Selection

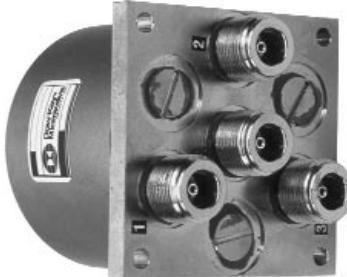
431 J - 5 2 08 03 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators / Terminations	Circuit Options
431 = SP3T	C = Mounting Bracket	L = Flange Mount	2 = 12Vdc	08 = SMA Female	03 = No Indicators	A = TTL High
441 = SP4T	J = 9 or 15 Pin 'D'	P = Power Plug	3 = 28Vdc		2W Terminations	L = TTL Low
461 = SPGT	K = 26.56 GHz	R = (-) Com (Used with Supp. Diodes Only)	8 = 24Vdc		08 = No Indicators	



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

## RF Characteristics



### 531-561 Series Normally Open, N

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (Nominal):

12 Vdc 110 mA

28 Vdc 65 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

10G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

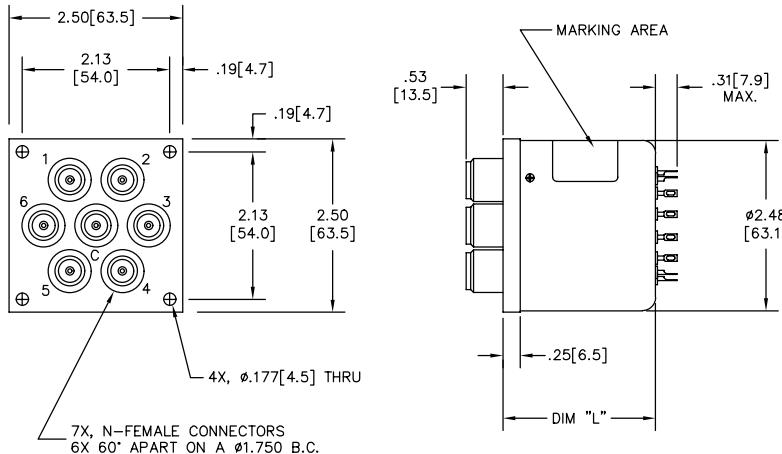
50G, 1/2 Sine, 11mS

##### Nominal Weight:

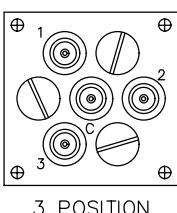
17.0 oz., (482g.)

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.25	70	0.30
4-8	1.35	60	0.40
8-12.4	1.70	55	0.70

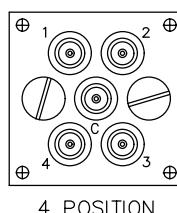
#### Mechanical



561-530122 Shown



3 POSITION



4 POSITION

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.20[55.9]	5X1-5X01	1
2.62[66.5]	5X1-5X0122	1
2.57[65.3]	5X1-5X0102A	2
2.90[73.7]	5X1-5X0122A	2

For Electrical Schematic  
see page # 3-9

#### Part Number Selection

561 J - 5 2 01 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
531 = SP3T	A = High Power	5 = Normally Open	2 = 12Vdc	01 = N Female	02 = No Indicators	A = TTL High
541 = SP4T	J = 9 or 15 Pin 'D' Connector	3 = 28Vdc	02 = BNC Female	22 = SPST Indicators		
561 = SP6T	T = -55° to +85° C	8 = 24Vdc	03 = TNC Female			
		9 = 15Vdc	53 = SC Female*			

\* 1" Connector Spacing Consult Dow-Key for dimensions



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



### 571-581 Series Normally Open, SMA

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12.4	1.40	60	0.40
12.4-18	1.50	60	0.50

### Specifications

**Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (Nominal):**

12 Vdc 286 mA

28 Vdc 122 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

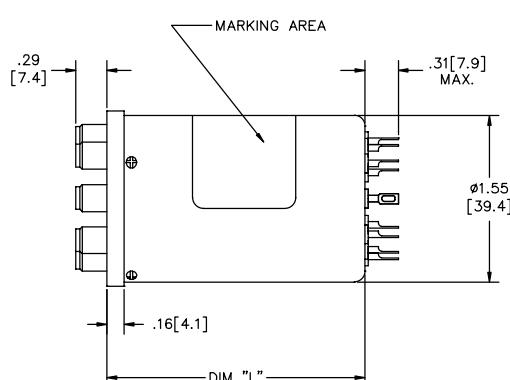
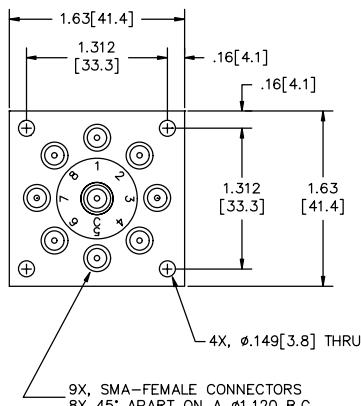
-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

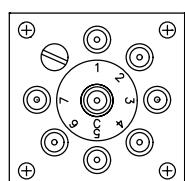
1,000,000 minimum

**Nominal Weight:**

5.0 oz., (142g.)



581-530822 Shown



DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.95[49.5]	5X1-5X08	1
2.29[58.2]	5X1-5X0822	1
2.29[58.2]	5X1-5X0802A	2
2.58[65.5]	5X1-5X0822A	2

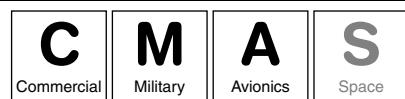
For Electrical Schematic  
see page # 3-9

### Part Number Selection

571 J - 5 2 08 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Option
571 = SP7T	C = Mounting Bracket	5 = Normally Open	2 = 12Vdc	08 = SMA Female	02 = No Indicators	A = TTL High
581 = SP8T	J = 9 OR 20* Pin "D" connector		3 = 28Vdc		22 = SPST Indicators	
	S = Epoxy Seal		8 = 24Vdc			
	T = -55° to +85° C		9 = 15Vdc			

\* 26-Pin 'O' Connector is 3 row high density

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	80	0.20
4-8	1.30	75	0.30
8-12.4	1.40	70	0.40
12.4-18	1.50	60	0.50
*18-22	1.60	60	0.60
*22-26	1.70	55	0.70

Note: RF Power for the terminated port is limited by the termination.

\* "K" option only

**581 Normally Open, SMA****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 550 mA

28 Vdc 240 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

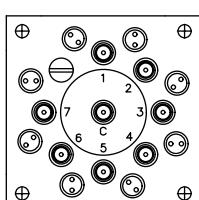
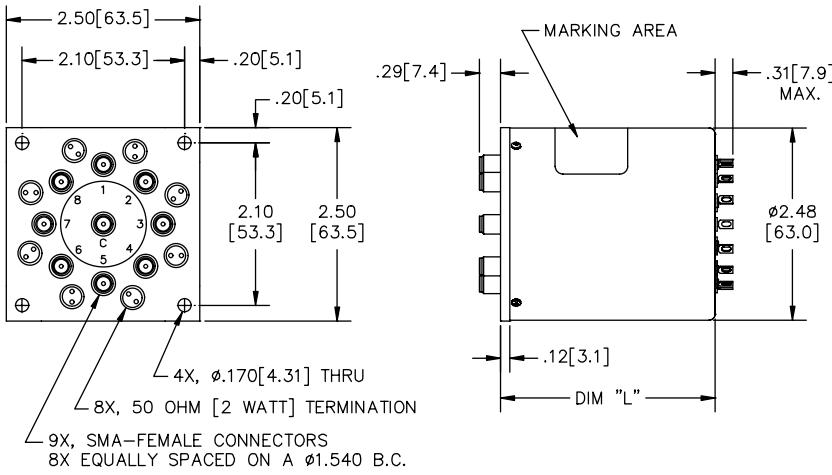
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

16.5 oz., (470g.)



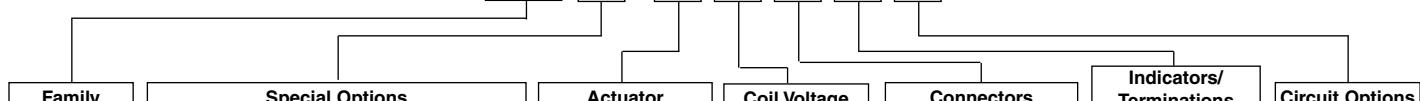
7 POSITION

581-530823 Shown

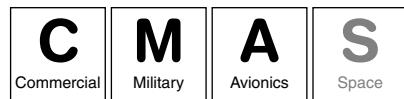
DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.93[49.0]	5X1-5X0803	3
2.25[57.2]	5X1-5X0823	3
2.25[57.2]	5X1-5X0803A	4
2.60[66.0]	5X1-5X0823A	4

For Electrical Schematic  
see page # 3-9**Part Number Selection**

571 J - 5 2 08 03 A

571 = SP7T  
581 = SP8TJ = 9 or 26\* Pin 'D' Connector  
P = Power Plug  
R = (-) Com  
S = Epoxy Seal  
T = -55° to +85° C2 = Failsafe, Position 1  
5 = Normally Open  
6 = Failsafe, Position 1  
Suppression Diodes  
(Com +)  
9 = Normally Open  
Suppression Diodes  
(Com +)2 = 12Vdc  
3 = 28Vdc  
8 = 24Vdc  
9 = 15Vdc06 = GPO Male  
08 = SMA Female03 = No Indicators  
2W Terminations  
08 = No Indicators  
SMA Female  
23 = SPST Indicators  
2W Terminations  
28 = SPST Indicators  
SMA FemaleA = TTL High  
N = CANBus  
T = Ethernet

\* 26-Pin 'D' Connector is 3 row high density



591 Normally Open, SMA

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12.4	1.40	60	0.40
12.4-18	1.60	55	0.60

**Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 550 mA

28 Vdc 240 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

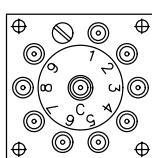
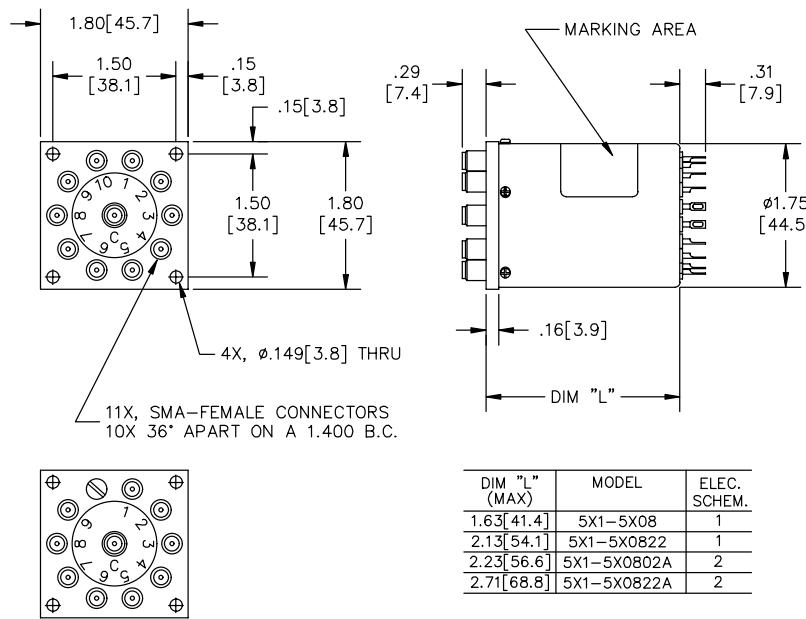
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

5.5 oz., (156g.)



9 POSITION

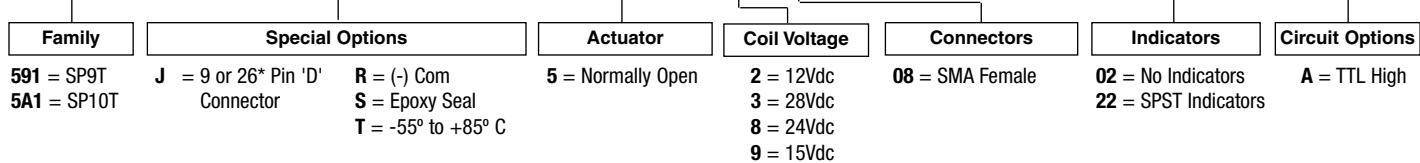
DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.63 [41.4]	5X1-5X08	1
2.13 [54.1]	5X1-5X0822	1
2.23 [56.6]	5X1-5X0802A	2
2.71 [68.8]	5X1-5X0822A	2

5A1-530822 Shown

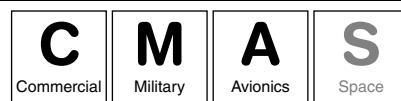
For Electrical Schematic  
see page # 3-9

**Part Number Selection**

591 J - 5 2 08 02 A



\* 26-Pin 'D' Connector is 3 row high density



**5A1 Normally Open Terminated, SMA**

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
*8-12.4	1.40	60	0.40
*12.4-18	1.60	55	0.60

Note: RF Power for the terminated port is limited by the termination.

\* "K" option only

### Mechanical

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 550 mA

28 Vdc 240 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

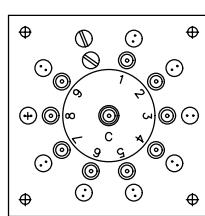
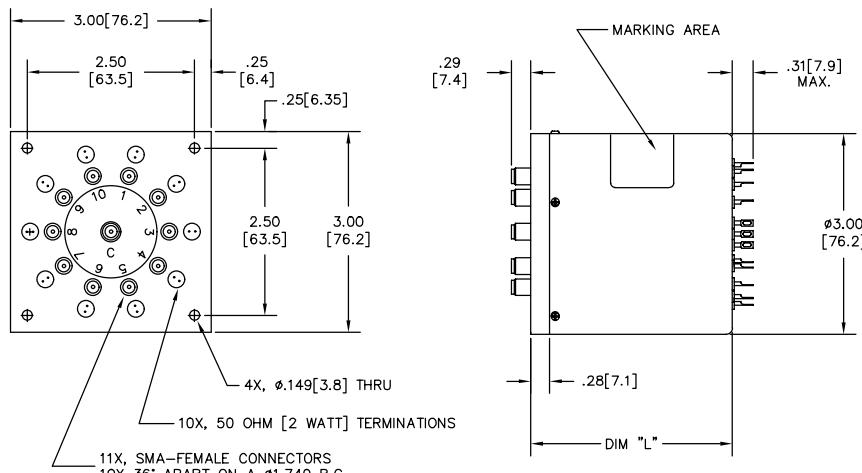
10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

17.5 oz., (496g.)



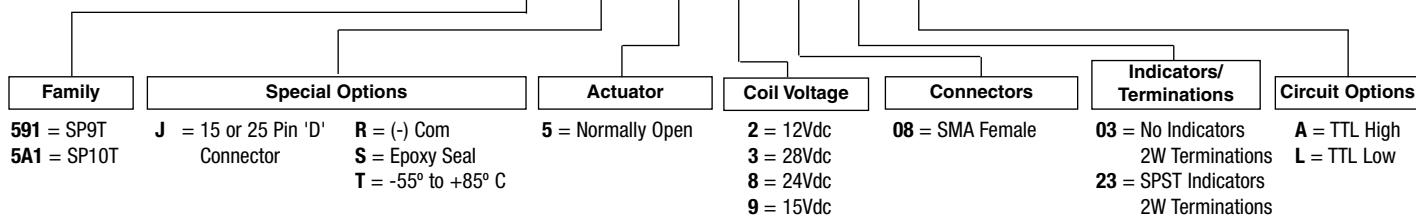
5A1-530823 Shown

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.93[49.0]	5X1-5X0803	3
2.27[57.6]	5X1-5X0823	3
2.27[57.6]	5X1-5X0803A	4
2.56[65.0]	5X1-5X0823A	4

For Electrical Schematic  
see page # 3-9

### Part Number Selection

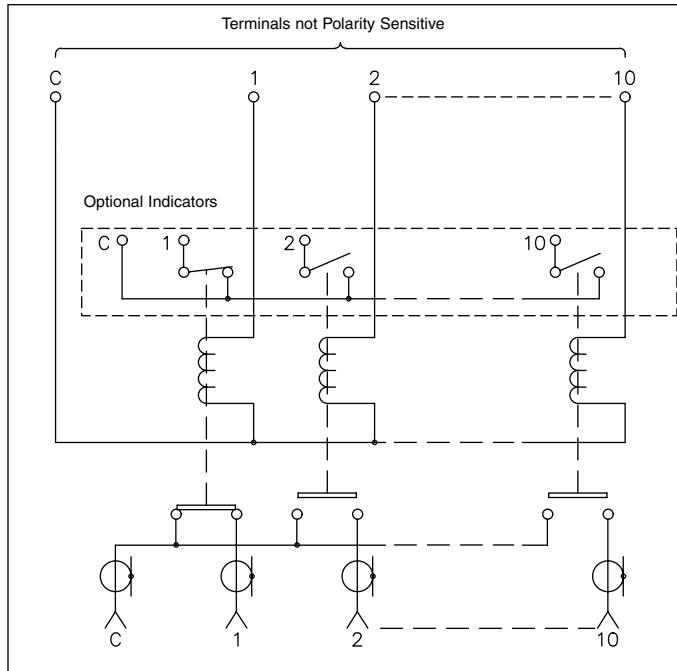
5A1 J - 5 2 08 03 A



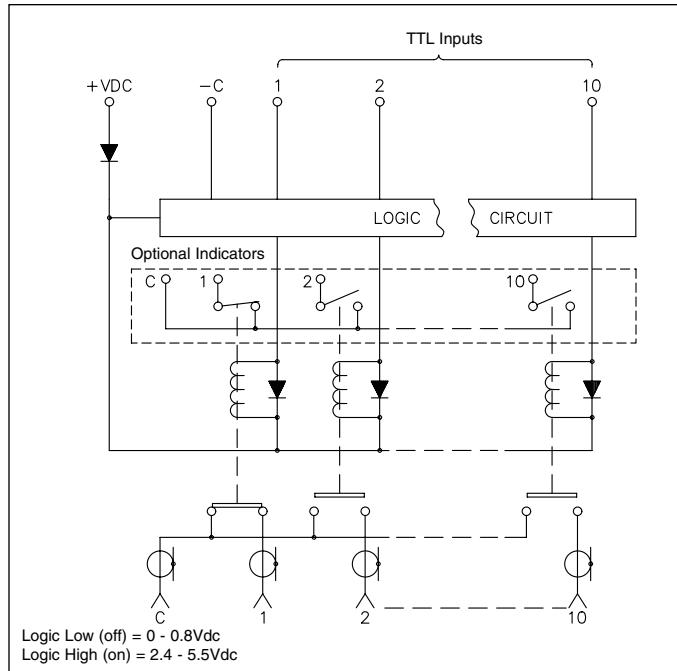
# MP Normally Open Series Electrical Schematics



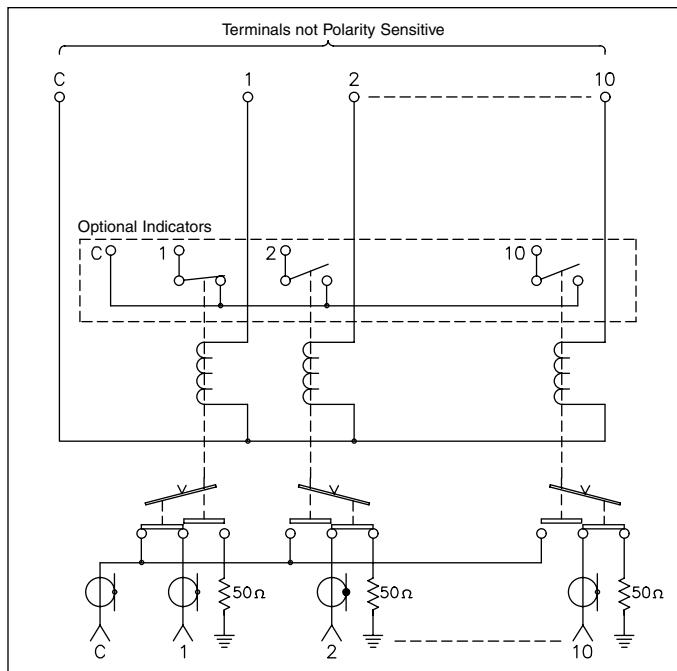
## 1 Normally Open



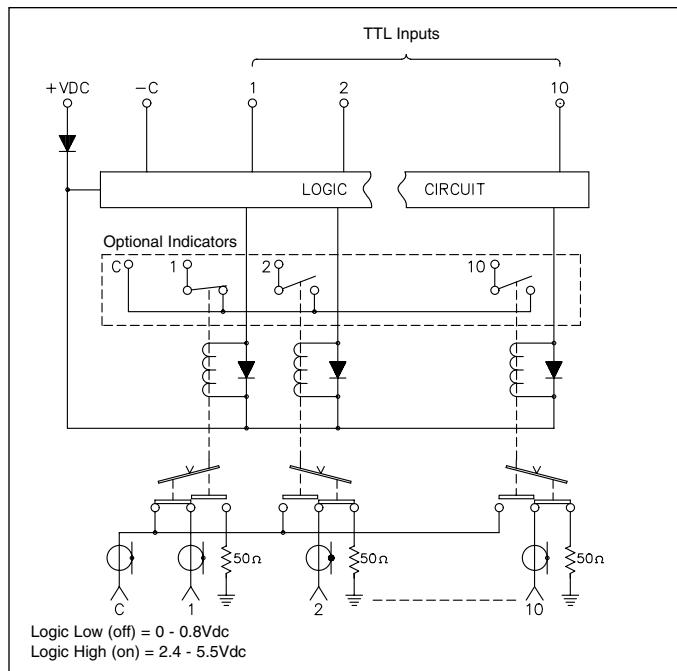
## 2 Normally Open TTL



## 3 N.O. Terminated



## 4 N.O. Terminated TTL



ALL SCHEMATICS SHOWN IN POSITION 1 ENERGIZED.



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	80	0.20
4-8	1.30	75	0.30
8-12.4	1.40	70	0.40
12.4-18	1.50	60	0.50
*18-22	1.60	60	0.60
*22-26	1.60	55	0.60

\* "K" option only

**461 Latching Series, SMA****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 375 mA

28 Vdc 200 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

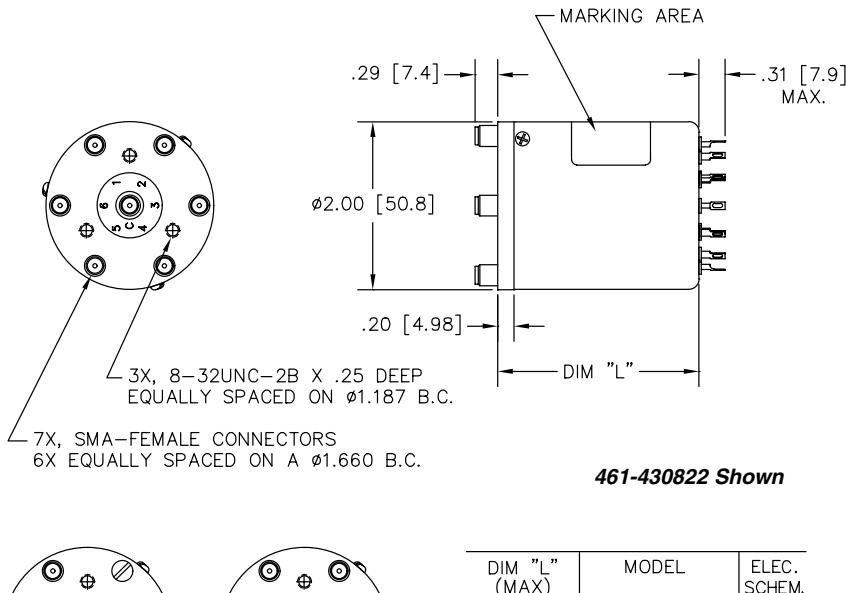
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

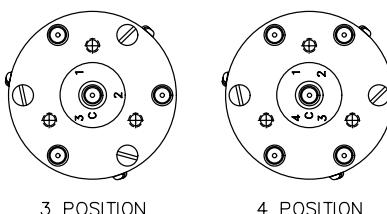
50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

11 oz., (312g.)



461-430822 Shown



DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.40[61.0]	4X1-4X08	1
2.70[68.6]	4X1-4X0822	1
2.70[68.6]	4X1-4X0802A	2
3.00[76.2]	4X1-4X0822A	2

For Electrical Schematic  
see page # 3-17

**Part Number Selection**

461 J - 4 2 08 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
431 = SP3T	C = Mounting Bracket	L = Flange Mount	2 = 12Vdc	08 = SMA Female	02 = No Indicators	A = TTL High
441 = SP4T	J = 9 or 15 Pin 'D' Connector	P = Power Plug	3 = 28Vdc	22 = SPST Indicators	N = CANBus	T = Ethernet
461 = SP6T	R = (-) Com	8 = 24Vdc	9 = 15Vdc			
	S = Epoxy Seal					
	T = -55° to +85° C					



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



### 461 Latching Terminated Series, SMA

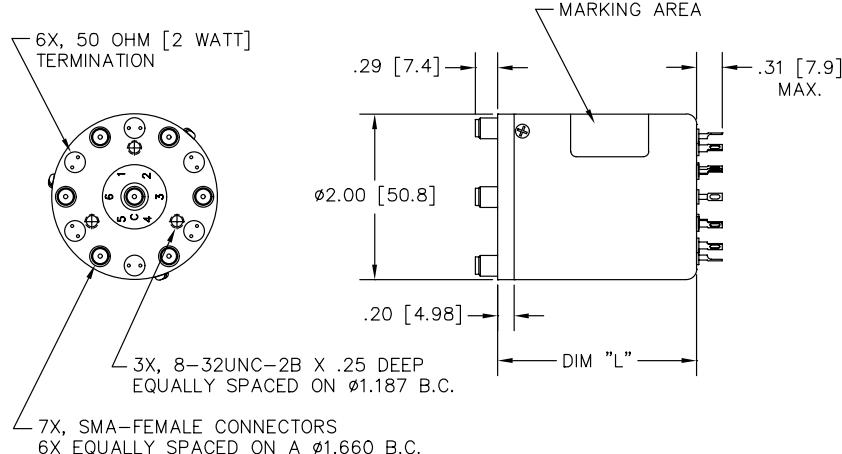
#### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	80	0.20
4-8	1.30	75	0.30
8-12.4	1.40	70	0.40
12.4-18	1.50	60	0.50
*18-22	1.60	60	0.60
*22-26	1.60	55	0.60

Note: RF Power for the terminated port is limited by the termination.

\* "K" option only

#### Mechanical



461-430823 Shown

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 375 mA

28 Vdc 200 mA

##### Switching Time:

15 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

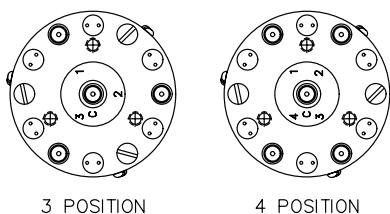
10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

11 oz., (312g.)

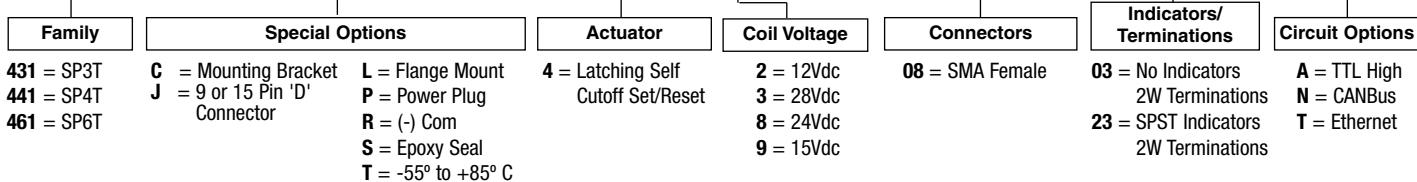


DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.40[61.0]	4X1-4X0803	3
2.70[68.6]	4X1-4X0823	3
2.70[68.6]	4X1-4X083A	4
3.00[76.2]	4X1-4X0823A	4

For Electrical Schematic  
see page # 3-17

#### Part Number Selection

461 J - 4 2 08 03 A





<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



### 561 Latching Series, N

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 550 mA

28 Vdc 240 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

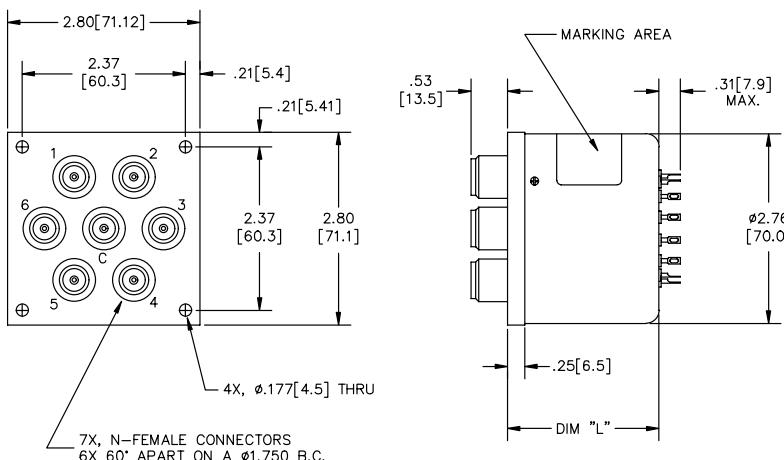
22.0 oz., (624g.)

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.25	70	0.30
4-8	1.35	65	0.40
8-12.4	1.40	55	0.70

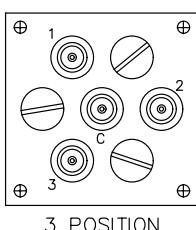
Note: RF Characteristics are for type N & TNC female connectors, consult Dow-Key for other connector configurations.

#### RF Characteristics

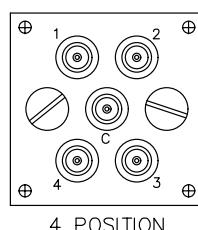
#### Mechanical



461-430122A Shown



3 POSITION



4 POSITION

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.20[55.9]	5X1-4X01	1
2.60[66.0]	5X1-4X0122	1
2.72[69.1]	5X1-4X0102A	2
2.91[73.9]	5X1-4X0122A	2

For Electrical Schematic  
see page # 3-17

#### Part Number Selection

561 J - 4 2 01 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
531 = SP3T	A = High Power	P = Power Plug	4 = Latching Self Cutoff Set/Reset	2 = 12Vdc 3 = 28Vdc 8 = 24Vdc 9 = 15Vdc	01 = N Female 02 = BNC Female 03 = TNC Female 53 = SC Female*	02 = No Indicators 22 = SPST Indicators
541 = SP4T	J = 9 or 15 Pin 'D' Connector	R = (-) Com S = Epoxy Seal T = -55° to +85° C				A = TTL High
561 = SP6T						

\* 1" Connector Spacing Consult Dow-Key for dimensions



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	80	0.20
4-8	1.30	75	0.30
8-12.4	1.40	70	0.40
12.4-18	1.50	60	0.50
*18-22	1.60	60	0.60
*22-26	1.70	55	0.70

\* "K" option only

**581 Latching Series, SMA****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 550 mA

28 Vdc 240 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

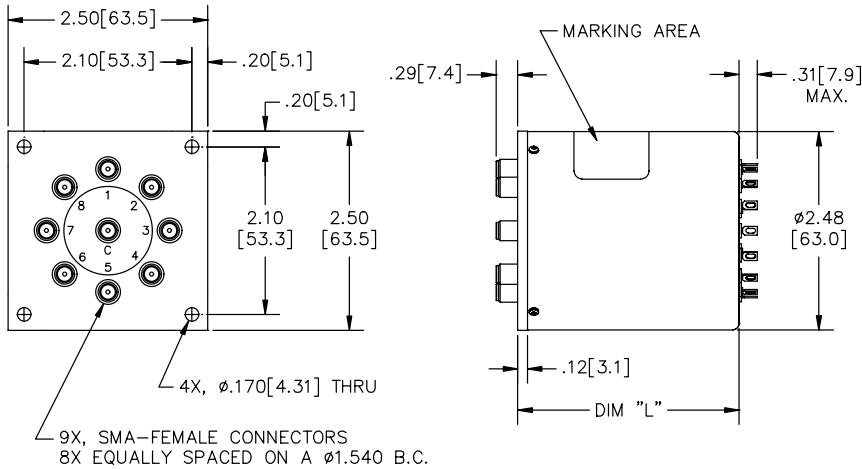
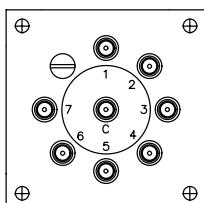
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

18 oz., (510g.)

**581-430822 Shown**

7 POSITION

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.40[61.0]	5X1-4X08	1
2.70[68.6]	5X1-4X0822	1
2.70[68.6]	5X1-4X0802A	2
3.00[76.2]	5X1-4X0822A	2

**For Electrical Schematic  
see page # 3-17****Part Number Selection**

571 J - 4 2 08 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
571 = SP7T 581 = SP8T	J = 9 or 26* Pin 'D' Connector P = Power Plug R = (-) Com S = Epoxy Seal T = -55° to +85° C	4 = Latching Self Cutoff Set/Reset	2 = 12Vdc 3 = 28Vdc 8 = 24Vdc 9 = 15Vdc	06 = GPO Male 08 = SMA Female	02 = No Indicators 22 = SPST Indicators	A = TTL High N = CANBus T = Ethernet

\* 26-Pin 'D' Connector is 3 row high density



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space



**581 Latching Terminated Series SMA**

### Specifications

#### Operating Voltage:

(across temperature range)  
12 Vdc (11-14 Vdc)  
28 Vdc (24-32 Vdc)

#### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 550 mA  
28 Vdc 240 mA

#### Switching Time:

15 mS maximum

#### Operating Temperature:

-25°C to +65°C (Standard)  
-55°C to +85°C (Extended "T" Option)

#### Mechanical Life, Cycles:

1,000,000 minimum

#### Vibration, Operating:

10 G RMS, 20-2000 Hz

#### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

#### Nominal Weight:

18 oz., (510g.)

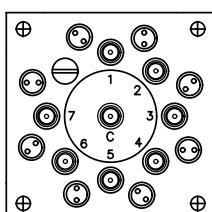
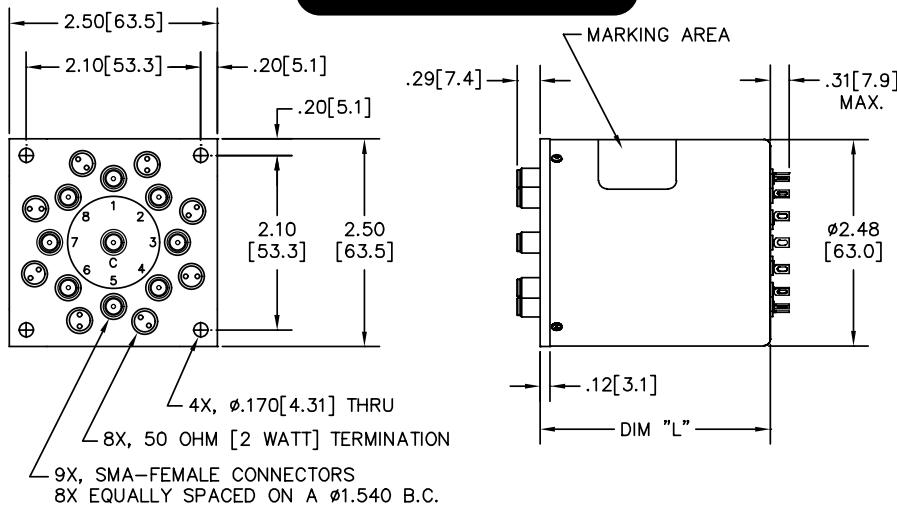
### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	80	0.20
4-8	1.30	75	0.30
8-12.4	1.40	70	0.40
12.4-18	1.50	60	0.50
*18-22	1.60	60	0.60
*22-26	1.70	55	0.70

Note: RF power for the terminated port is limited by the termination.

\* "K" option only

### Mechanical



581-430823 Shown

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.40[61.0]	5X1-4X0803	3
2.70[68.6]	5X1-4X0823	3
2.70[68.6]	5X1-4X0803A	4
3.00[76.2]	5X1-4X0823A	4

For Electrical Schematic  
see page # 3-17

### Part Number Selection

581 J - 4 2 08 03 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators/Terminations	Circuit Options
571 = SP7T	J = 9 or 26* Pin 'D' Connector	4 = Latching Self Cutoff Set/Reset	2 = 12Vdc	06 = GPO Male	03 = No Indicators 2W Terminations	A = TTL High
581 = SP8T	P = Power Plug		3 = 28Vdc	08 = SMA Female	08 = No Indicators SMA Female	N = CANBus
	R = (-) Com		8 = 24Vdc		23 = SPST Indicators 2W Terminations	T = Ethernet
	S = Epoxy Seal		9 = 15Vdc		28 = SPST Indicators SMA Female	
	T = -55° to +85° C					

\* 26-Pin 'D' Connector is 3 row high density

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12.4	1.40	60	0.40
12.4-18	1.60	55	0.60

**5A1 Latching Series, SMA****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 550 mA

28 Vdc 240 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

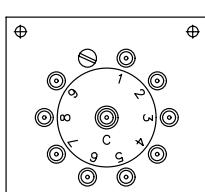
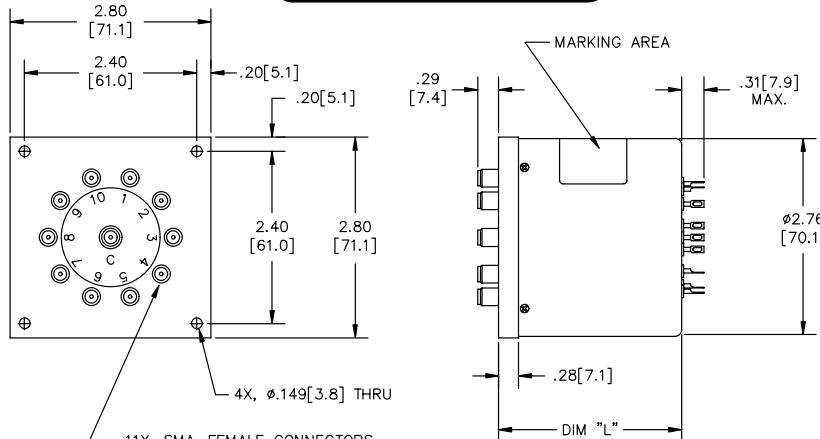
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

15 oz., (425g.)

**Mechanical**

5A1-430822 Shown

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
40 [61.0]	5X1-4X08	1
2.70 [68.6]	5X1-4X0822	1
2.70 [68.6]	5X1-4X0802A	2
3.00 [76.2]	5X1-4X0822A	2

For Electrical Schematic  
see page # 3-17

**Part Number Selection**

5A1 J - 4 2 08 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Options
591 = SP9T 5A1 = SP10T	J = 9 or 25 Pin 'D' Connector P = Power Plug R = (-) Com S = Epoxy Seal T = -55° to +85° C	4 = Latching Self Cutoff Set/Reset	2 = 12Vdc 3 = 28Vdc 8 = 24Vdc 9 = 15Vdc	08 = SMA Female 02 = No Indicators 22 = SPST Indicators		A = TTL High



<b>C</b>	<b>M</b>	<b>A</b>	<b>S</b>
Commercial	Military	Avionics	Space

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.30	65	0.30
8-12.4	1.40	60	0.40
12.4-18	1.60	55	0.60

Note: RF power for the terminated port is limited by the termination.

**5A1 Latching, Terminated Series, SMA****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 550 mA

28 Vdc 240 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

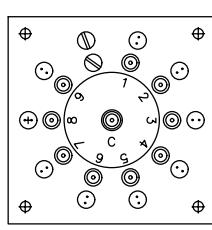
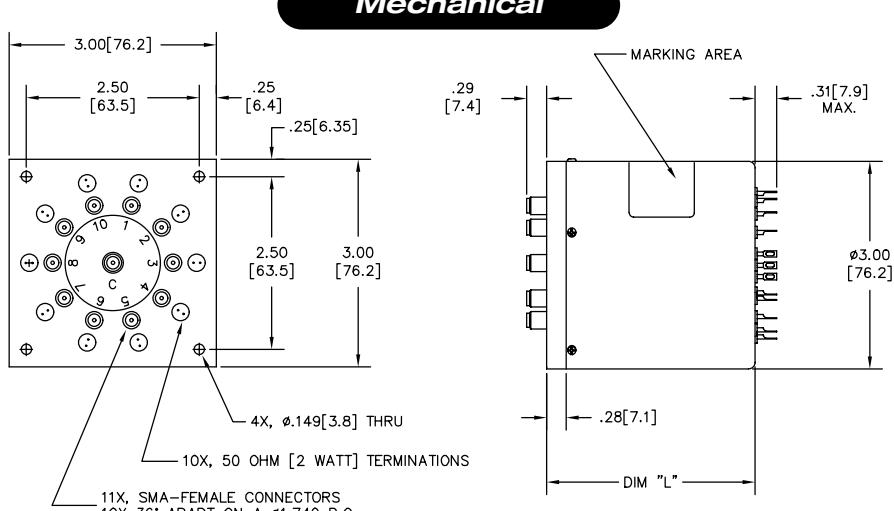
10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

15.3 oz., (434g.)



5A1-430823 Shown

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.40[61.0]	5X1-4X0803	3
2.70[68.6]	5X1-4X0823	3
2.70[68.6]	5X1-4X0803A	4
3.00[76.2]	5X1-4X0823A	4

For Electrical Schematic  
see page # 3-17

**Part Number Selection**

591 J - 4 2 08 03 A



591 = SP9T  
5A1 = SP10T

J = 9 or 25 Pin 'D' Connector  
P = Power Plug  
R = (-) Com  
S = Epoxy Seal  
T = -55° to +85° C

4 = Latching Self Cutoff Set/Reset

08 = SMA Female

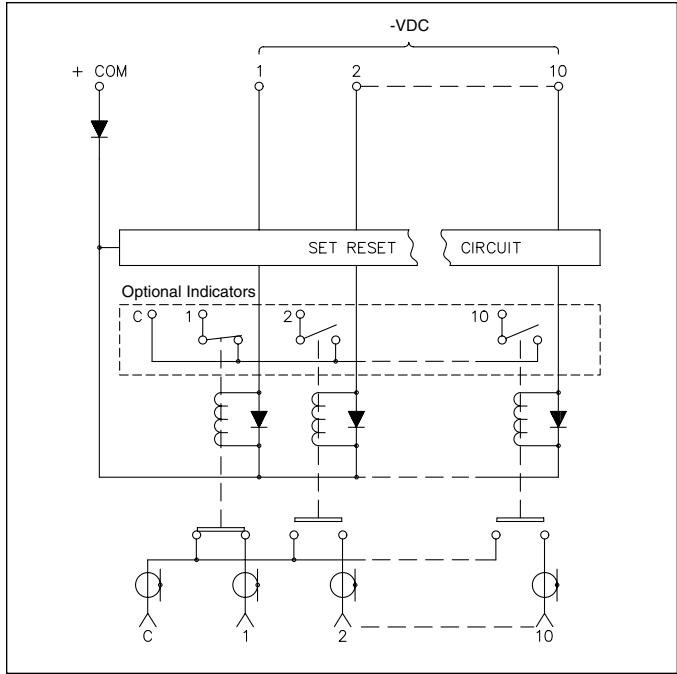
03 = No Indicators  
2W Terminations

03 = SPST Indicators  
2W Terminations

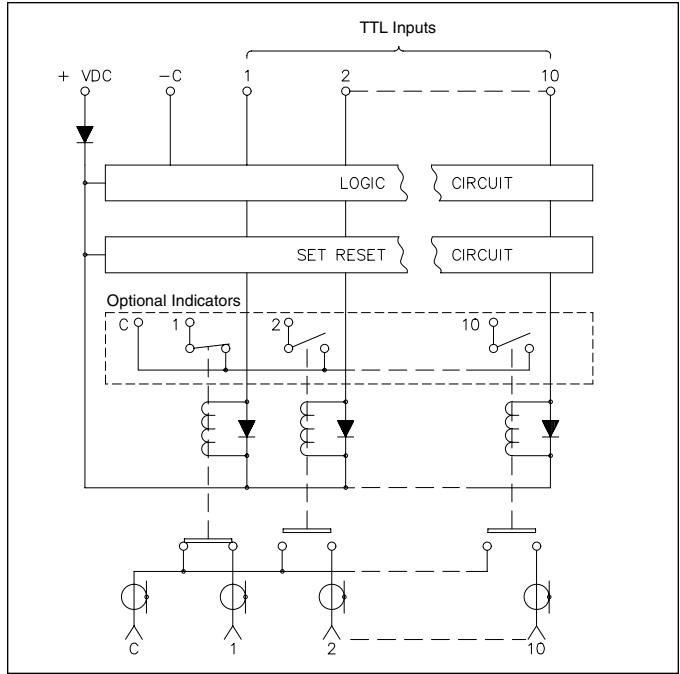
A = TTL High  
E = BCD Decoding



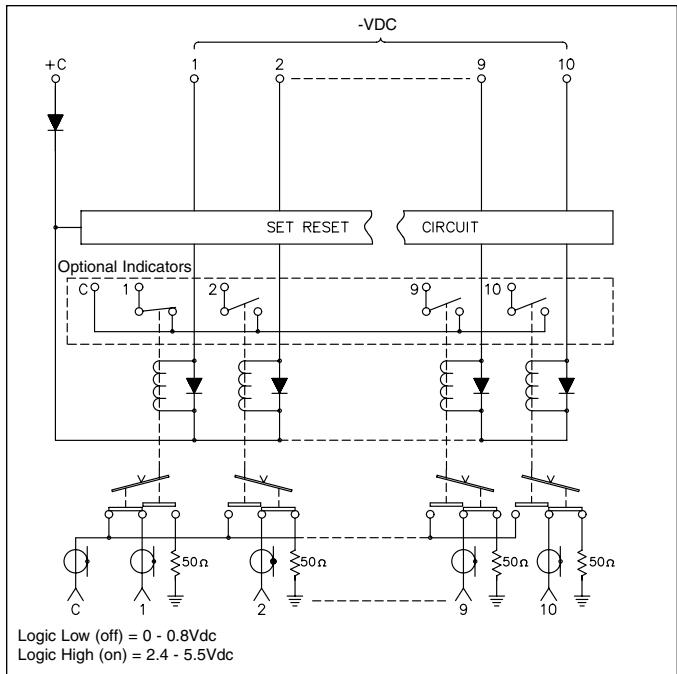
**1 Latching Self Cutoff**



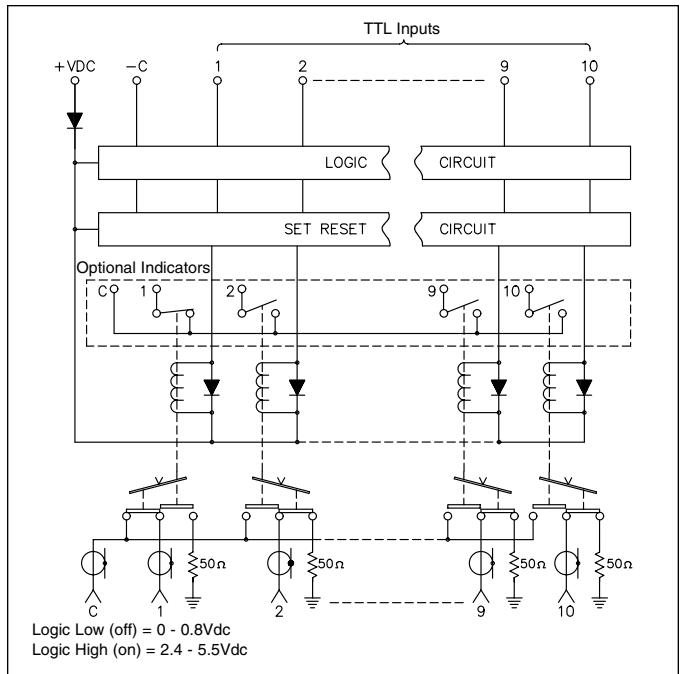
**2 Latching Self Cutoff TTL**

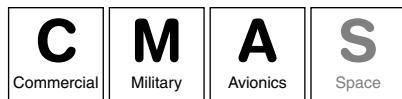


**3 Latching SCO Terminated**



**4 Latching SCO Terminated TTL**





### 5C1 Series Normally Open, SMA

#### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.20	70	0.20
4-8	1.40	65	0.40
8-12.4	1.50	60	0.60
12.4-18	1.80	60	0.80

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 310 mA

28 Vdc 130 mA

##### Switching Time:

15 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

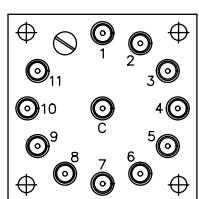
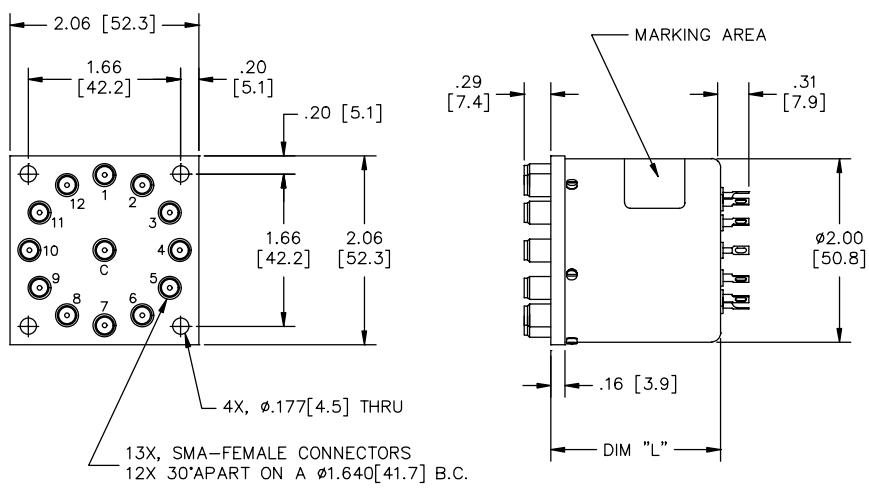
10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

##### Nominal Weight:

7.0 oz., (200g.)



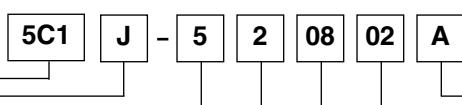
11 POSITION

5C1-5X0822 Shown

DIM "L" (MAX)	MODEL	ELEC. SCHEM.
1.90[48.2]	5C1-5X08	1
2.50[63.5]	5C1-5X082A	2

For Electrical Schematic  
see page # 3-21

#### Part Number Selection



Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators	Circuit Option
--------	-----------------	----------	--------------	------------	------------	----------------

5B1 = SP11T

J = 15 or 26\* Pin 'D' Connector 5 = Normally Open

5C1 = SP12T

S = Epoxy Seal

T = -55°C to +85°C

2 = 12 Vdc

3 = 28 Vdc

8 = 24 Vdc

9 = 15 Vdc

08 = SMA Female

02 = No Indicators

22 = SPST Indictors

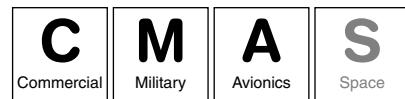
A = TTL High

E = BCD Decoding

N = CANBus

T = Ethernet

\*26-Pin 'D' Connector is 3 row high density

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)	RF Power Watts (CW)
DC-4	1.20	70	0.20	100
4-8	1.40	65	0.40	70
8-12.4	1.50	60	0.60	60
12.4-18	1.80	60	0.80	50

**5C1 Series Latching Self Cutoff, SMA with Optional SMA's****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 310 mA

28 Vdc 130 mA

**Switching Time:**

15 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

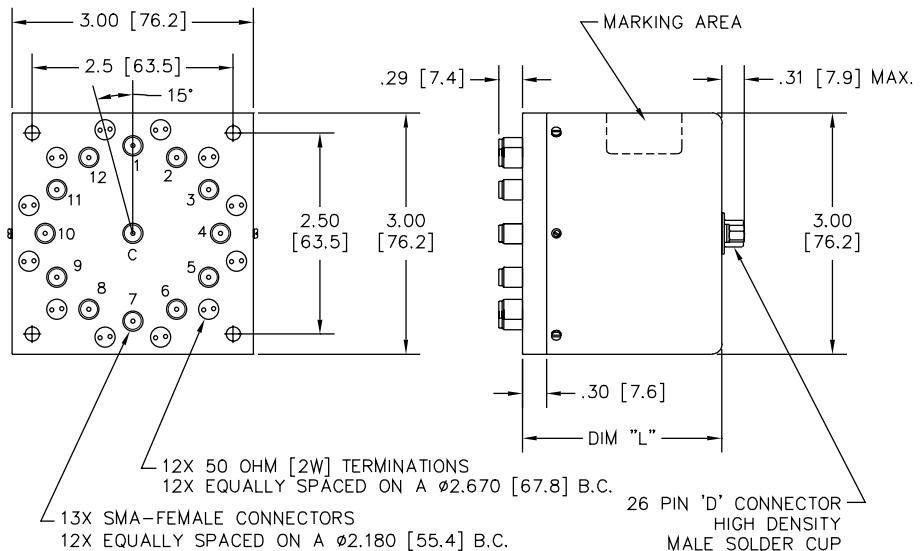
10G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50G, 1/2 Sine, 11 mS

**Nominal Weight:**

7.0 oz., (200g.)



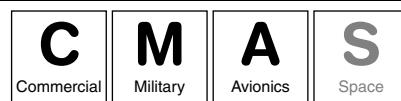
For Electrical Schematic  
see page # 3-21

**Part Number Selection**

5C1 J - 5 2 08 02 A

Family	Special Options	Actuator	Coil Voltage	Connectors	Indicators/Terminations	Circuit Option
5B1 = SP11T 5C1 = SP12T	J = 15 or 26* Pin 'D' Connector S = Epoxy Seal T = -55°C to +85°C	4 = Latching Self Cutoff	2 = 12 Vdc 3 = 28 Vdc 8 = 24 Vdc 9 = 15 Vdc	08 = SMA Female	02 = No Indicators 22 = SPST Indicators 08 = No Indicators, SMA Female 28 = Indicators, SMA Female	A = TTL High E = BCD Decoding N = CANBus T = Ethernet

\*26-Pin 'D' Connector is 3 row high density



### 5E1 Series Normally Open, SMA

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 310 mA

28 Vdc 130 mA

##### Switching Time:

20 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

10 G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50 G, 1/2 Sine, 11 mS

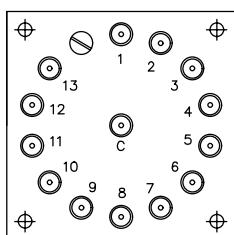
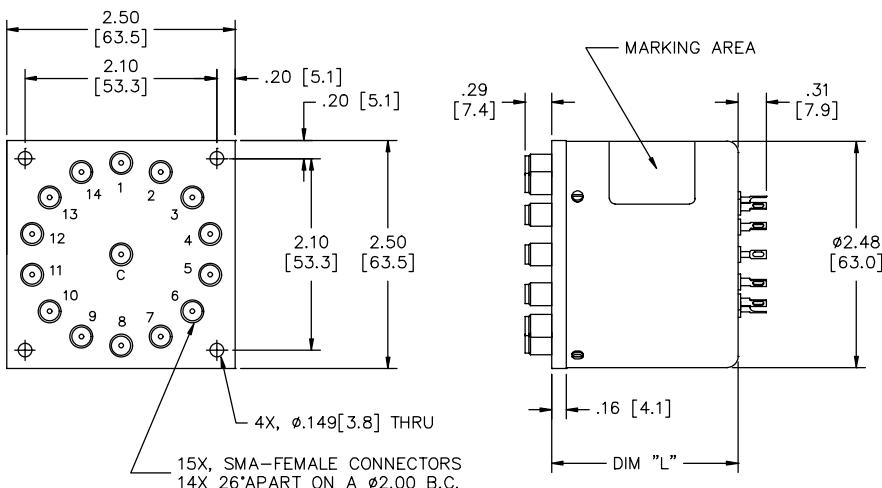
##### Nominal Weight:

9.0 oz., (250g.)

#### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-4	1.30	70	0.30
4-8	1.40	65	0.40
8-12	1.60	60	0.60
12-18	1.80	60	0.80

#### Mechanical

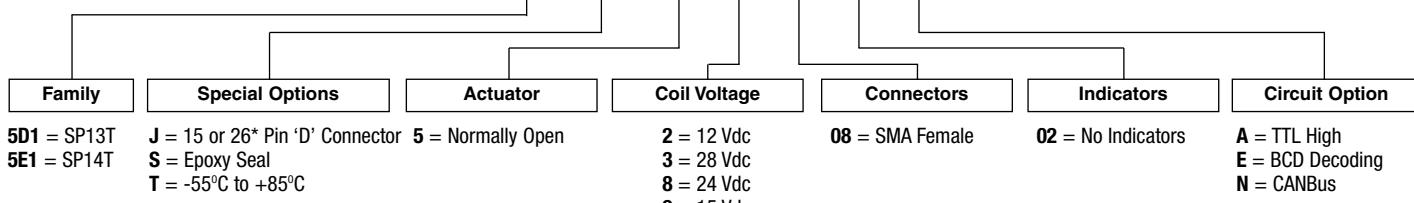


DIM "L" (MAX)	MODEL	ELEC. SCHEM.
2.04[52.0]	5E1-5X08	1
2.50[63.5]	5E1-5X0802A	2

For Electrical Schematic  
see page # 3-21

#### Part Number Selection

5E1 J - 5 2 08 02 A

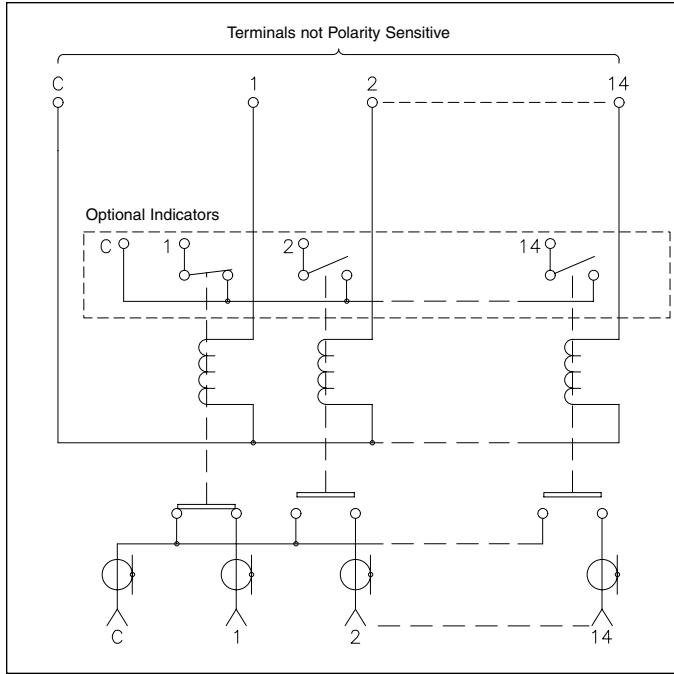


\*26-Pin 'D' Connector is 3 row high density

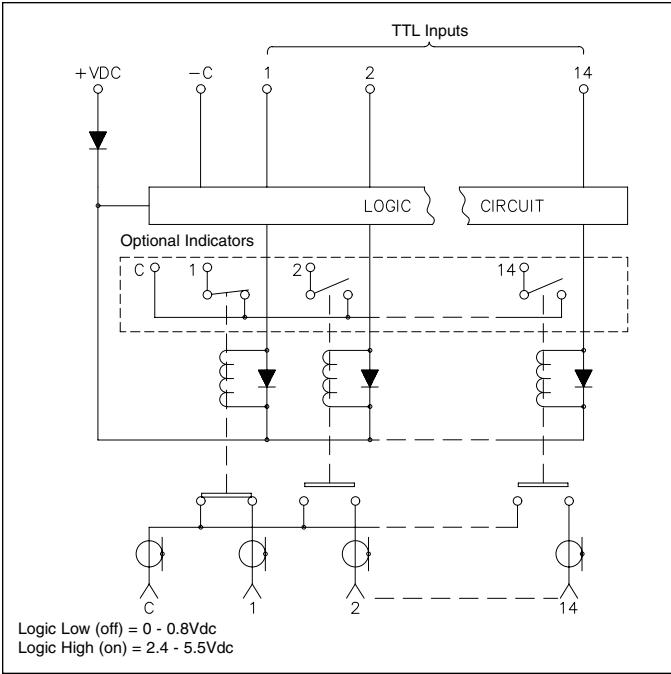


**DowKey® Microwave**  
CORPORATION

### 1 Normally Open

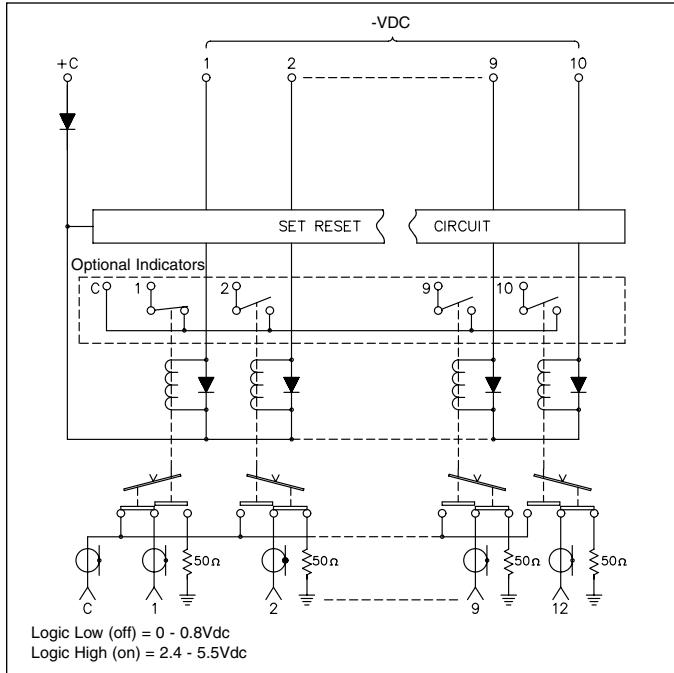


### 2 Normally Open TTL

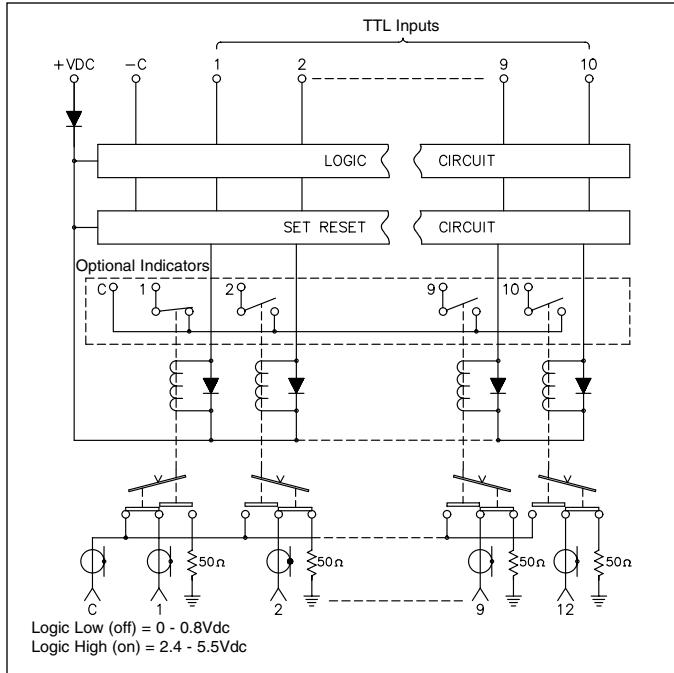


ALL SCHEMATICS SHOWN IN POSITION 1 ENERGIZED.

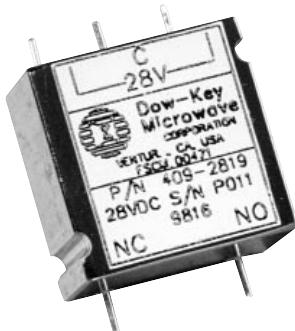
### 3 Latching SCO Terminated



### 4 Latching SCO Terminated TTL



# SPECIAL SECTION

**RF Characteristics**

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)	RF Power Watts (CW)
DC-1	1.10	80	0.10	80
1-2	1.15	75	0.15	75
2-3	1.20	70	0.30	70

Note: Higher frequency performance available, consult factory.

**409 Series SPDT Failsafe****Mechanical****Specifications****Operating Voltage:**

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

12 Vdc 130 mA

28 Vdc 55 mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-30°C to +70°C (Standard)

**Mechanical Life, Cycles:**

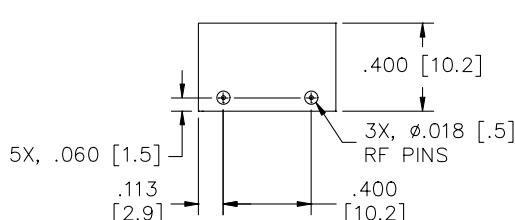
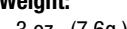
1,000,000 minimum

**Vibration, Operating:**

10 G RMS, 20-2000 Hz

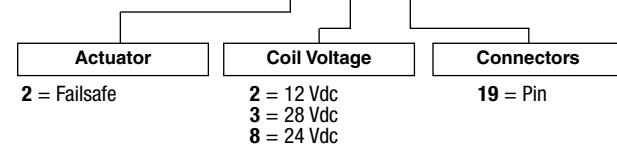
**Mechanical Shock, Non-Operating:**

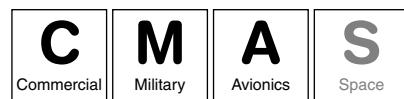
50 G, 1/2 Sine, 11 ms

**Nominal Weight:**

409-2X19 Shown

For Electrical Schematic  
see page # 4-7

**Part Number Selection**409 - **2** **2** **19**



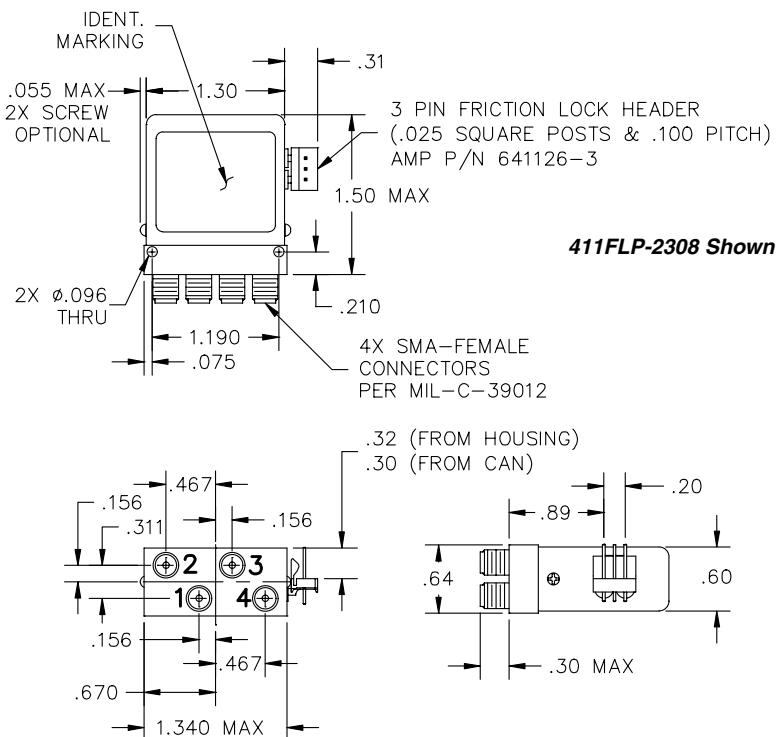
**411FL-2308 Failsafe Transfer Bypass, SMA**

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-1	1.10	80	0.10
1-2	1.15	80	0.15
2-3	1.20	80	0.20
3-4	1.25	80	0.25

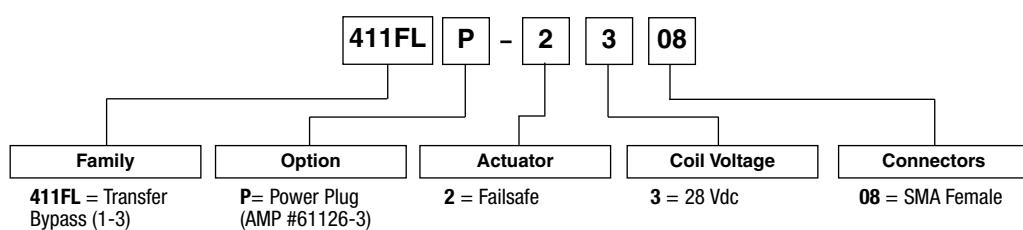
Note: Specify frequency range shown in "Special Options" under Part Number Selection

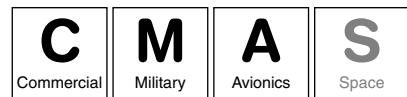
### Mechanical



For Electrical Schematic  
see page # 4-7

### Part Number Selection



**RF Characteristics****411JNT-330832 Pulse Latching Transfer, SMA****Specifications****Operating Voltage:**

(across temperature range)

28 Vdc (24-32 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

28 Vdc 200mA

**Switching Time:**

20 mS maximum

**Operating Temperature:**

-25°C to +65°C (Standard)

**Mechanical Life, Cycles:**

1,000,000 minimum

**Vibration, Operating:**

10 G RMS, 20-2000 Hz

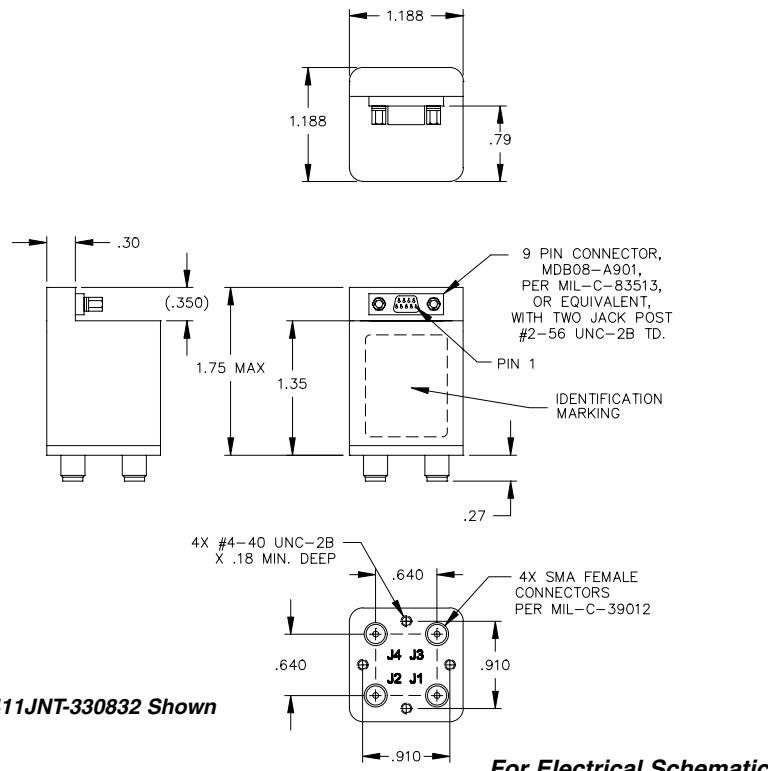
**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11mS

**Nominal Weight:**

4.0oz., (115g.)

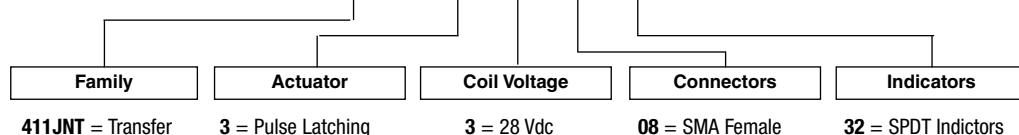
Frequency MHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-3	1.30	75	0.25

**Mechanical**

For Electrical Schematic  
see page # 4-7

**Part Number Selection**

411JNT - 3 3 08 32





**DowKey® Microwave**  
CORPORATION



**417LP Series Transfer  
Latching Self Cutoff**

### Specifications

**Operating Voltage:**

(across temperature range)

28 Vdc (25-31 Vdc)

**Coil Current (max @ nom.Vdc & 20°C):**

28 Vdc 3 Amps

**Switching Time:**

500 mS maximum

**Operating Temperature:**

-40°C to +70°C

**Mechanical Life, Cycles:**

100,000 minimum

**Vibration, Operating:**

10 G RMS, 20-2000 Hz

**Mechanical Shock, Non-Operating:**

50 G, 1/2 Sine, 11 mS

**Nominal Weight:**

5 lbs.

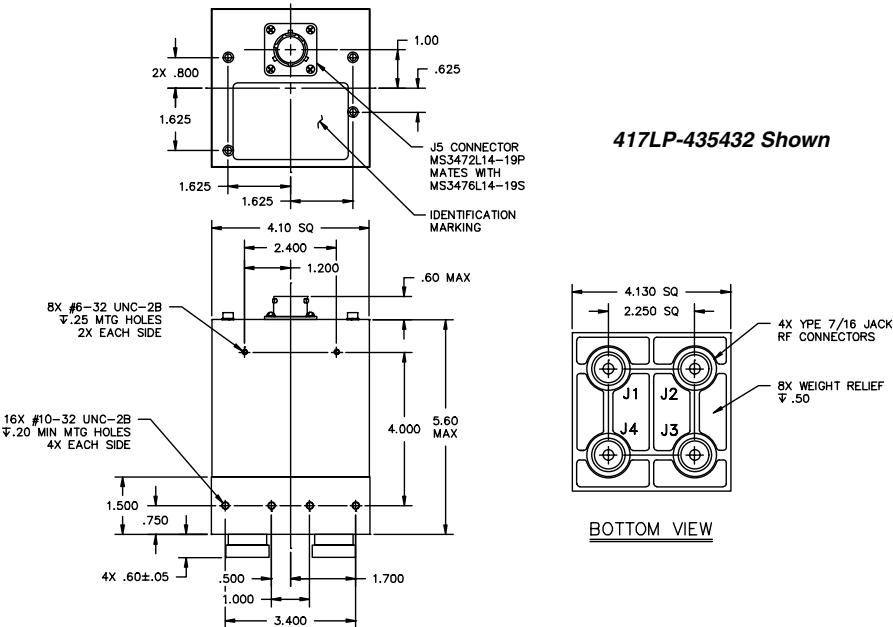
### RF Characteristics

Frequency MHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
20-2000	1.5:1	65	0.30

### RF Power Watts

20-100	4Kw Continuous
100-1200	3Kw Continuous
1200-2000	1Kw Continuous

### Mechanical



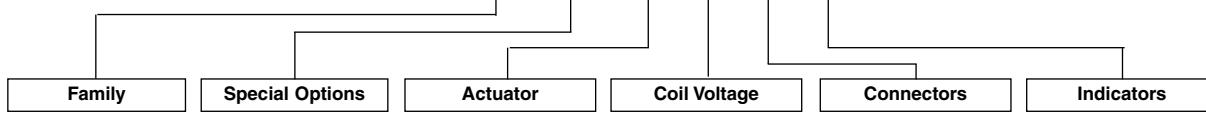
417LP-435432 Shown

BOTTOM VIEW

For Electrical Schematic  
see page # 4-7

### Part Number Selection

417 LP - 4 3 54 32



417 = DPDT Transfer

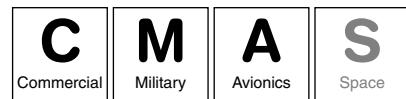
L = Flange Mount  
P = Power Connector

4 = Latching Self Cutoff

3 = 28 Vdc

54 = 7/16 Female

32 = SPDT Indicators



### 5X7 Series Normally Open, SMA

#### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
DC-1	1.10	85	0.10
1-4	1.20	80	0.20
4-8	1.30	70	0.30
8-12	1.40	65	0.40
12-18	1.50	60	0.50

#### Specifications

##### Operating Voltage:

(across temperature range)

12 Vdc (11-14 Vdc)

28 Vdc (24-32 Vdc)

##### Coil Current (max @ nom.Vdc & 20°C):

12 Vdc 310mA

28 Vdc 140mA

##### Switching Time:

15 mS maximum

##### Operating Temperature:

-25°C to +65°C (Standard)

-55°C to +85°C (Extended "T" Option)

##### Mechanical Life, Cycles:

1,000,000 minimum

##### Vibration, Operating:

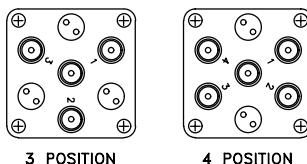
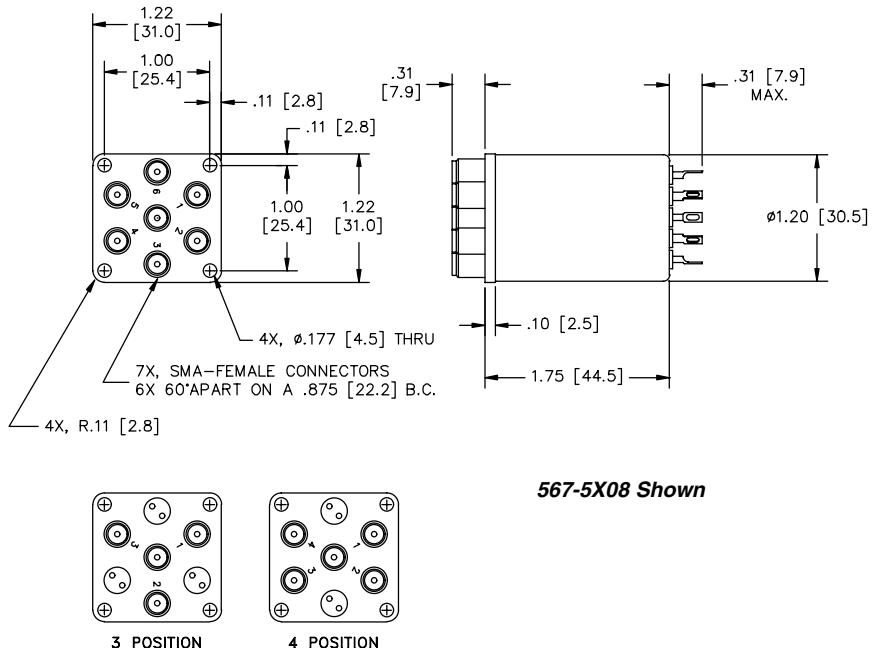
10G RMS, 20-2000 Hz

##### Mechanical Shock, Non-Operating:

50G, 1/2 Sine, 11mS

##### Nominal Weight:

3.0 oz., (85g.)



For Electrical Schematic  
see page # 4-7

#### Part Number Selection

5X7 J - 5 2 08

Family

Special Options

Actuator

Coil Voltage

Connectors

537 = SP3T

547 = SP4T

567 = SP6T

J = 9 Pin Micro 'D' Connector

S = Epoxy Seal

T = -55°C to +85°C

5 = Normally Open

2 = 12 Vdc

3 = 28 Vdc

8 = 24 Vdc

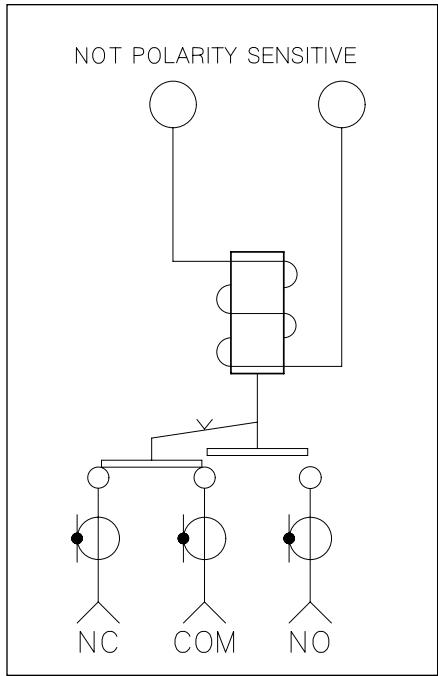
9 = 15 Vdc

08 = SMA Female

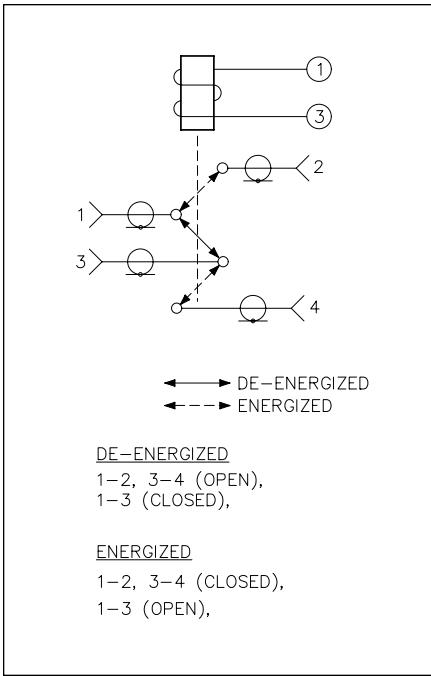


**DowKey® Microwave**  
CORPORATION

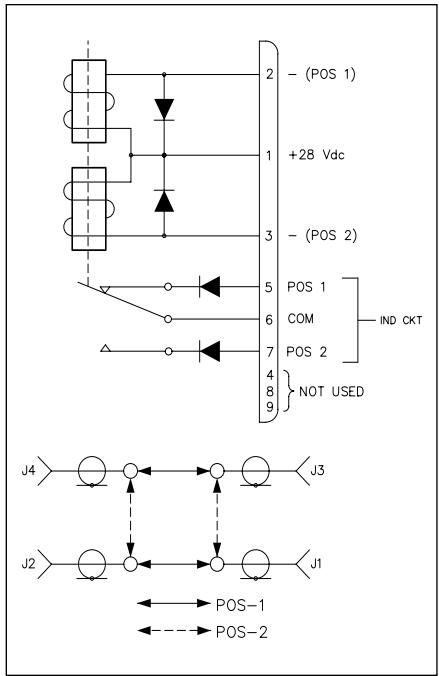
**1 409 Failsafe**



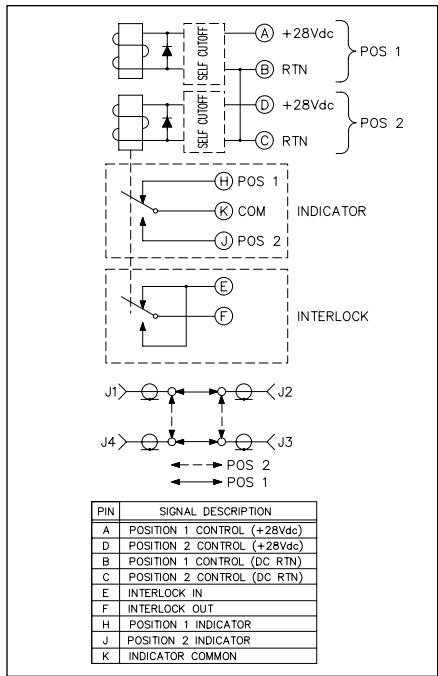
**2 411FL Failsafe**



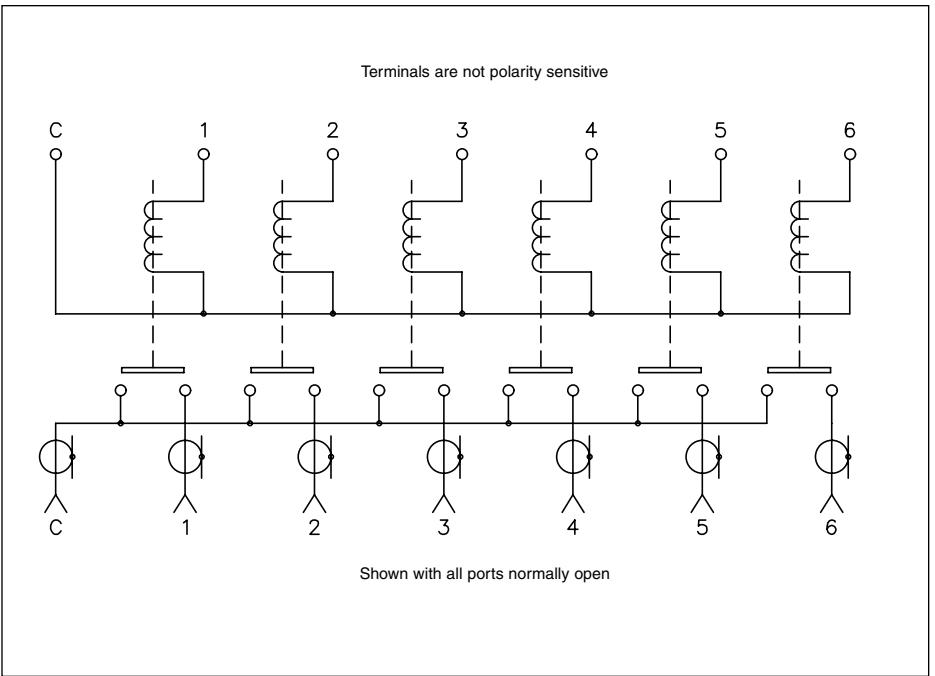
**3 411JNT Pulse Latching**



**4 417LP Latching**



**5 537-567 N.O.**



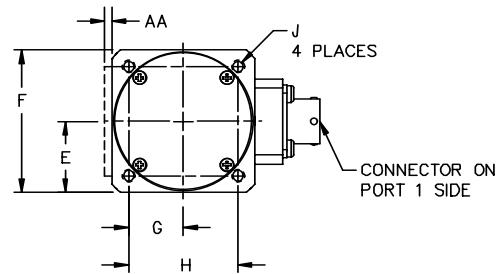
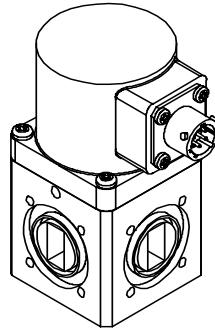
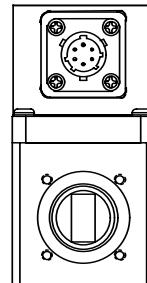
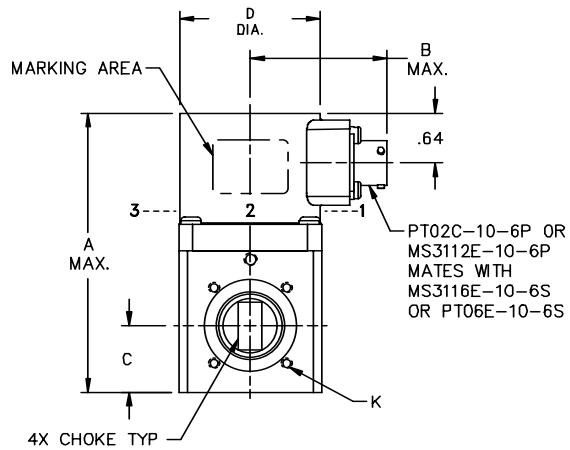
# **WAVEGUIDE SECTION**



<b>C</b> Commercial	<b>M</b> Military	<b>A</b> Avionics	<b>S</b> Space
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### Mechanical



For Electrical Schematic  
see page # 5-5

### Waveguide Latching Transfer

### Specifications

#### Operating Voltage:

(across temperature range)

28 Vdc (24-30 Vdc)

#### RF Characteristics:

Freq. Range: See Chart

VSWR: 1.0:1 Max

Isolation: 60dB Min.

Insertion Loss: See Chart

#### Operating Temperature:

-54°C to +84°C

#### Mechanical Life, Cycles:

200,000 minimum

#### Duty:

Continuous Operation

#### Pressurized:

20 psig

### Part Number Selection

Part No.	Wave-guide Size	Sch. Dia.	Switch Type	Frequency Range, GHz	Switching Time, Max. (mS)	Current, AMP Max (28Vdc, 20 C)	Insertion Loss, Max. (dB)	AA Max.	A	B	C	D	E	F	G	H	J	K	Weight, Max. (lbs)
33D00100	WR 62	2	Failsafe	12.4 - 18.0	100	0.5	0.10	-	3.80	1.87	0.877	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.3
33D00200	WR 62	1	Latching	12.4 - 18.0	100	1.0	0.10	-	4.00	1.87	0.877	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.3
33D00300	WR 62	4	Failsafe	12.4 - 18.0	100	0.5	0.10	0.10	3.80	1.87	0.877	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.3
33D00400	WR 62	3	Latching	12.4 - 18.0	100	1.0	0.10	0.10	4.00	1.87	0.877	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.3
33D09100	WR 75	2	Failsafe	10.0 - 15.0	100	0.5	0.10	-	3.95	1.87	0.941	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D09200	WR 75	1	Latching	10.0 - 15.0	100	1.0	0.10	-	4.15	1.87	0.941	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D09300	WR 75	4	Failsafe	10.0 - 15.0	100	0.5	0.10	0.10	3.95	1.87	0.941	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D09400	WR 45	3	Latching	10.0 - 15.0	100	1.0	0.10	0.10	4.15	1.87	0.941	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D01100	WR 90	2	Failsafe	8.20 - 12.40	100	0.5	0.10	-	4.05	1.87	1.016	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D01200	WR 90	1	Latching	8.20 - 12.40	100	1.0	0.10	-	4.30	1.87	1.016	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D01300	WR 90	4	Failsafe	8.20 - 12.40	100	0.5	0.10	0.13	4.05	1.87	1.016	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D01400	WR 90	3	Latching	8.20 - 12.40	100	1.0	0.10	0.13	4.30	1.87	1.016	1.85	0.9375	1.875	0.718	1.437	#8-32 x .25 Deep	#6-32 x .25 Deep	1.4
33D03200	WR 112	1	Latching	7.05 - 10.0	100	1.0	0.08	-	5.10	2.07	1.245	2.25	1.187	2.375	1.000	2.000	#10-32 x .31 Deep	#8-32 x .28 Deep	2.3
33D03400	WR 112	3	Latching	7.05 - 10.0	100	1.0	0.08	0.13	5.10	2.07	1.245	2.25	1.187	2.375	1.000	2.000	#10-32 x .31 Deep	#8-32 x .28 Deep	2.3
33D04200	WR 137	1	Latching	5.85 - 8.20	150	1.0	0.08	-	7.00	2.57	1.750	3.25	2.125	4.250	1.750	3.500	#1/4-20 x .40 Deep	#10-32 x .30 Deep	8.3
33D04400	WR 137	3	Latching	5.85 - 8.20	150	1.0	0.08	0.13	7.00	2.57	1.750	3.25	2.125	4.250	1.750	3.500	#1/4-20 x .40 Deep	#10-32 x .30 Deep	8.3
33D06200	WR 187	1	Latching	3.95 - 5.85	150	1.0	0.05	-	7.50	2.57	2.000	3.25	2.125	4.250	1.750	3.500	#1/4-20 x .40 Deep	#10-32 x .30 Deep	9.0
33D06400	WR 187	3	Latching	3.95 - 5.85	150	1.0	0.05	0.13	7.50	2.57	2.000	3.25	2.125	4.250	1.750	3.500	#1/4-20 x .40 Deep	#10-32 x .30 Deep	9.0
33D08200	WR 284	1	Latching	2.60 - 3.95	500	1.5	0.05	-	9.00	2.57	2.750	3.25	2.937	5.875	2.375	4.750	#1/4-20 x .50 Deep	#1/4-20 x .40 Deep	17.0
33D08400	WR284	3	Latching	2.60 - 3.95	500	1.5	0.05	0.15	9.00	2.57	2.750	3.25	2.937	5.875	2.375	4.750	#1/4-20 x .50 Deep	#1/4-20 x .40 Deep	17.0



<b>C</b> Commercial	<b>M</b> Military	<b>A</b> Avionics	<b>S</b> Space
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**30C01200 Waveguide  
Latching Transfer**

### Specifications

**Operating Voltage:**

(across temperature range)

28 Vdc (24-30 Vdc)

**Coil Current (max @ nom. Vdc & 20°C):**

28 Vdc (24-30 Vdc)

**Switching Time:**

100 mS maximum

**Operating Temperature:**

-54°C to +84°C

**Mechanical Life, Cycles:**

200,000 minimum

**Duty:**

Continuous Operation

**Pressurized:**

20 psig

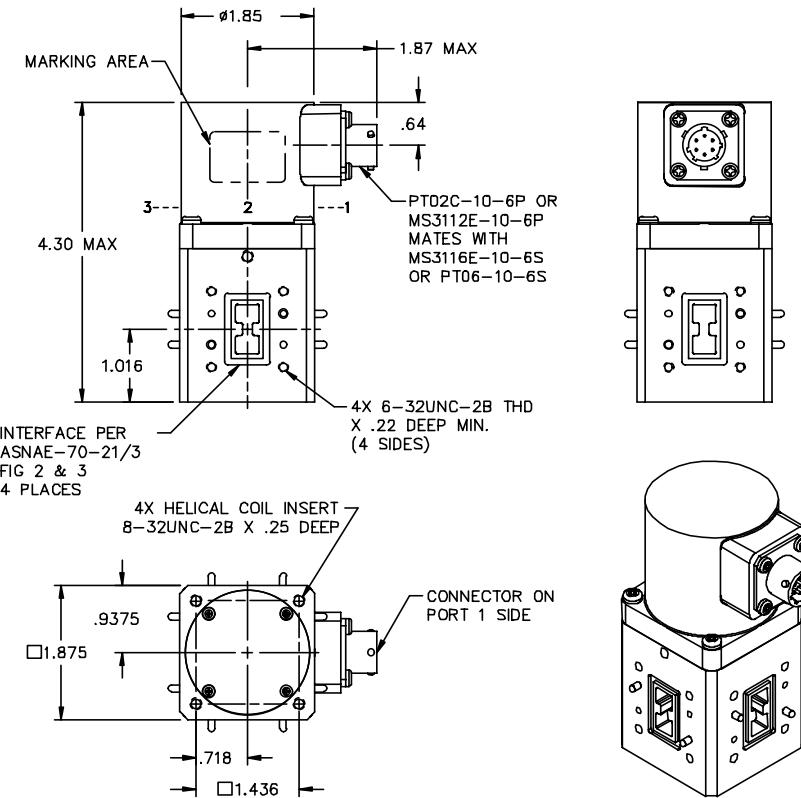
**Max. Weight:**

1.3 lbs

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
7.5 - 17.5	1.25	60	0.25

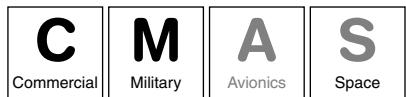
### Mechanical



For Electrical Schematic  
see page # 5-5

### Part Number Selection

Part Number	Part Description	Sch. Dia.
30C01200	Latching, Transfer, Ind. Ckt.	1
30C01300	Latching, SPDT, Ind. Ckt.	3
30C02000	Failsafe, Transfer, Ind. Ckt.	2
30C02100	Failsafe, SPDT, Ind. Ckt.	4



**30D01900 Waveguide  
Latching Transfer**

### Specifications

**Operating Voltage:**

(across temperature range)

28 Vdc (24-30 Vdc)

**Coil Current (max @ nom. Vdc & 20°C):**

28 Vdc (24-30 Vdc)

**Switching Time:**

150 mS maximum

**Operating Temperature:**

-54°C to +84°C

**Mechanical Life, Cycles:**

200,000 minimum

**Duty:**

Continuous Operation

**Pressurized:**

20 psig

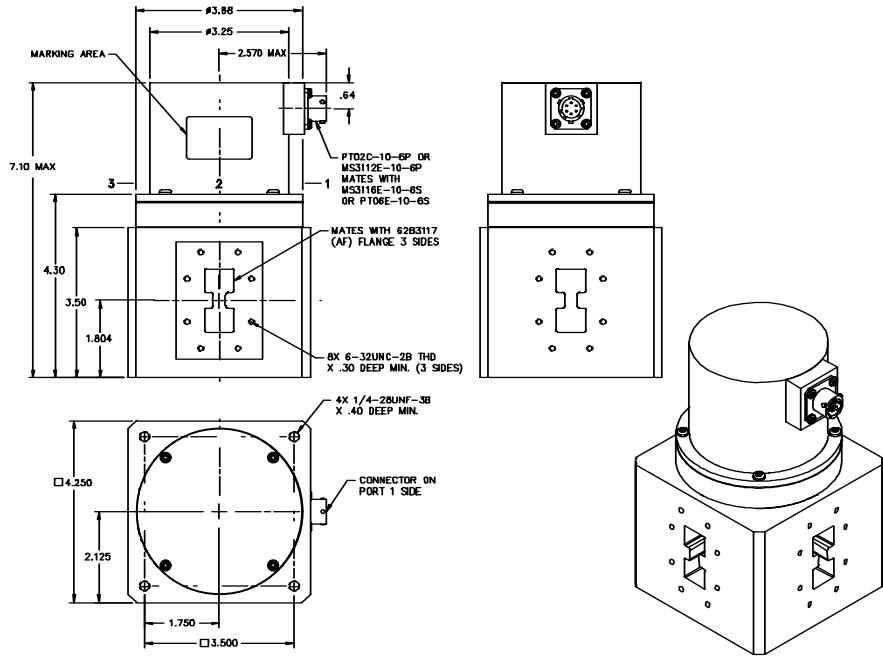
**Max. Weight:**

9 lbs

### RF Characteristics

Frequency GHz	VSWR (max)	Isolation dB (min)	Ins. Loss dB (max)
3.5 - 8.2	1.20	40	0.20

### Mechanical



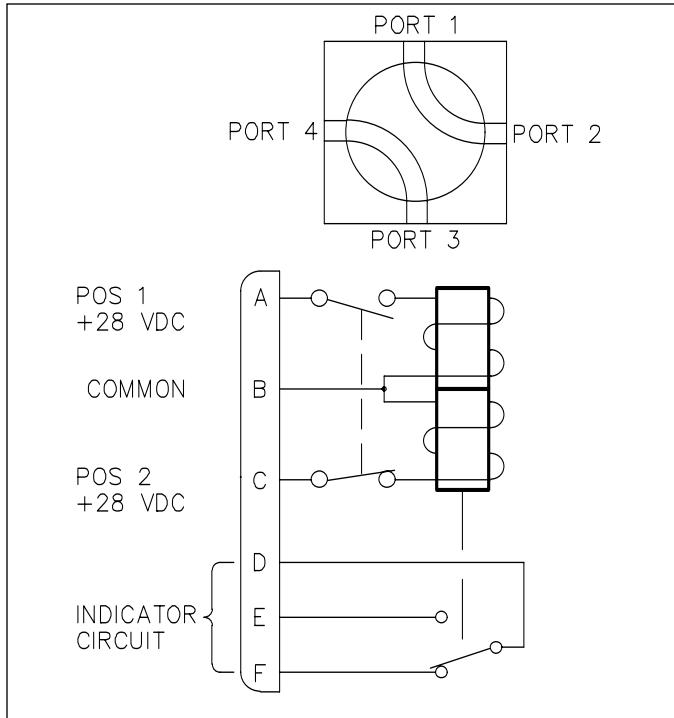
For Electrical Schematic  
see page # 5-5

### Part Number Selection

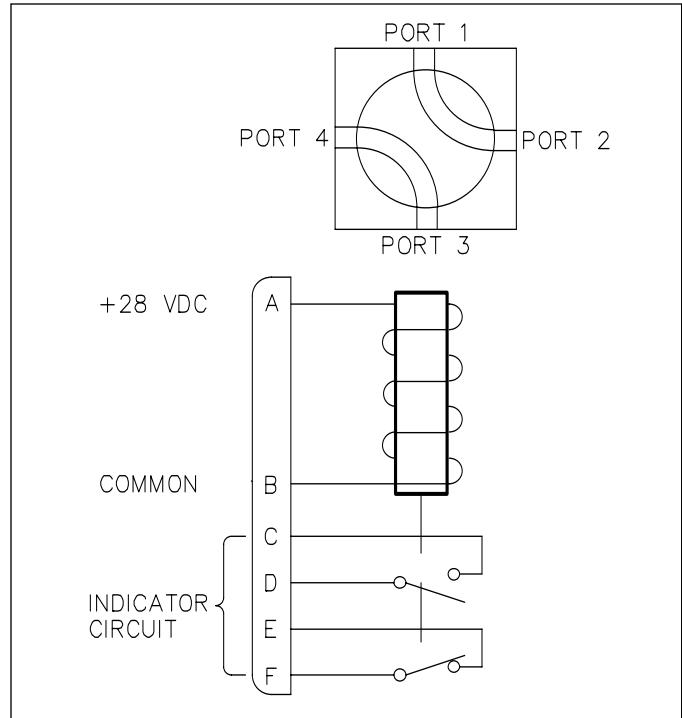
Part Number	Part Description	Sch. Dia.
30D01900	Latching, Transfer, Ind. Ckt.	1
30D01400	Latching, SPDT, Ind. Ckt.	3
30C00500	Failsafe, SPDT, Ind. Ckt.	4



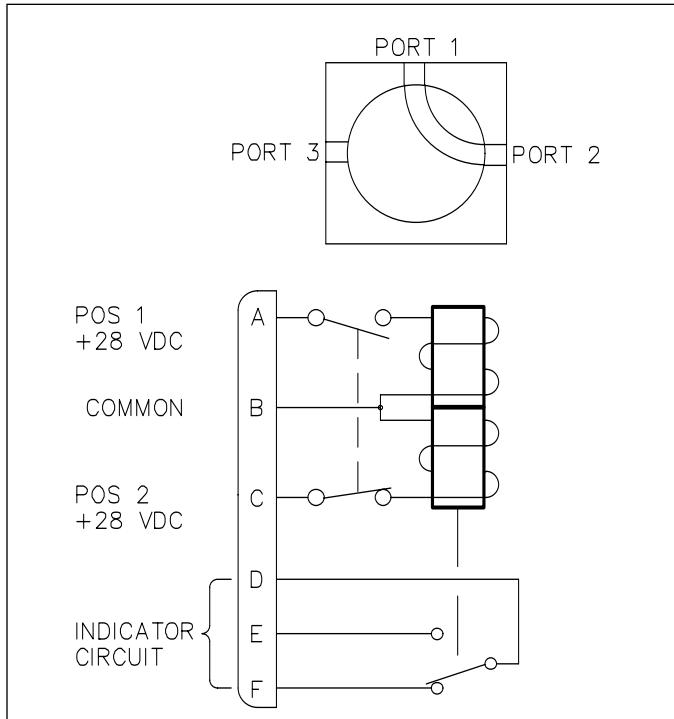
**1 Latching Transfer**



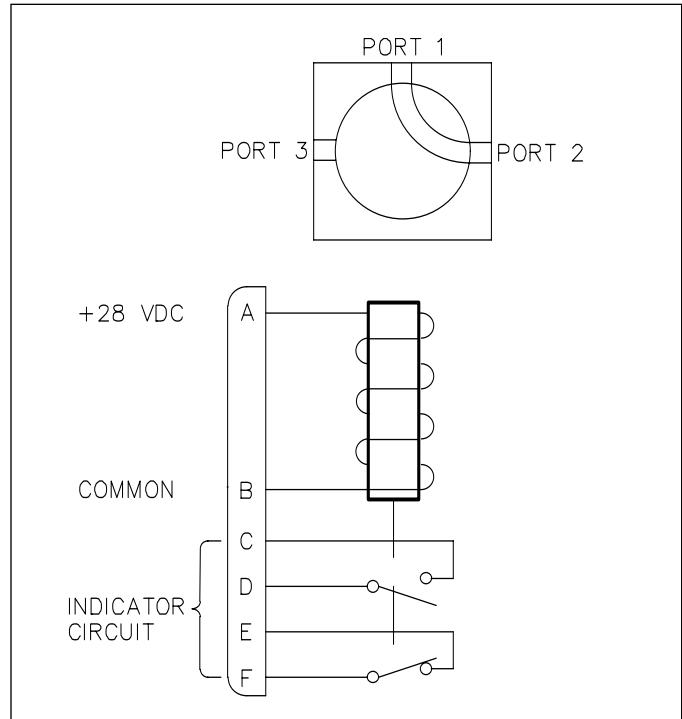
**2 Failsafe Transfer**

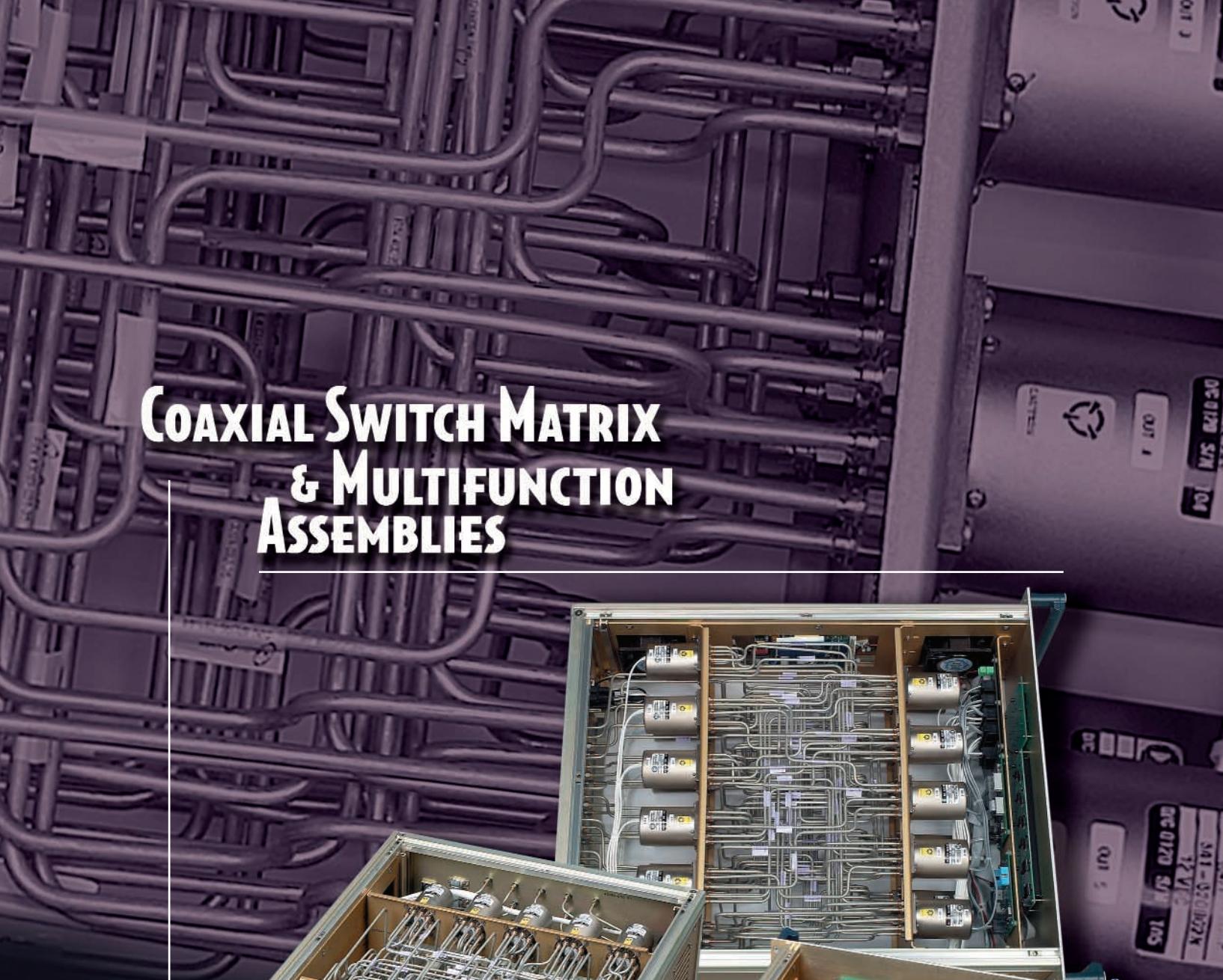


**3 Latching SPDT**



**4 Failsafe SPDT**





# COAXIAL SWITCH MATRIX & MULTIFUNCTION ASSEMBLIES



**DowKey® Microwave**  
CORPORATION

A  DOVER COMPANY

The RF/Microwave  
Switching Technology  
Solution Company



## NEW GENERATION OF SWITCH MATRICES BROADBAND DC-18 GHz SOLUTIONS

### Introduction

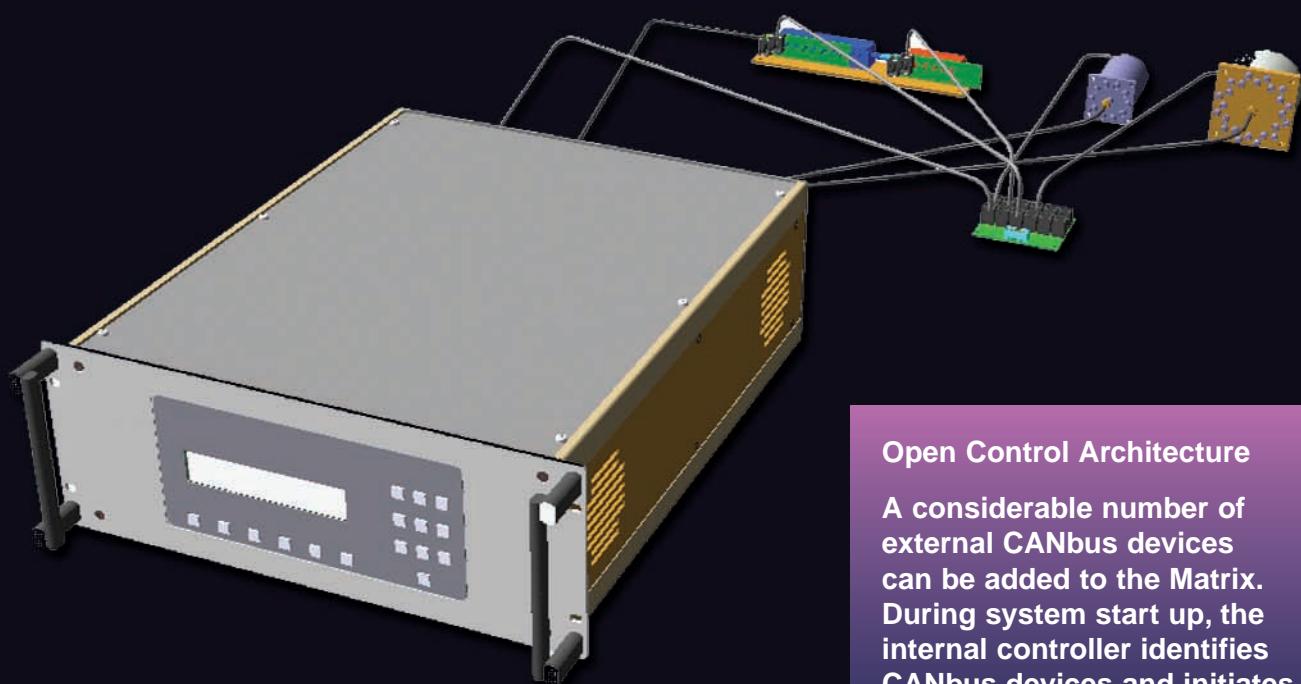
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Dow-Key Microwave, a leader in the design and manufacture of switching products, acquired its Matrix line in 1999. Since that time, the line has expanded to include both standard and custom matrices supporting the aerospace, military and communication industries for both signal routing and ATE applications. All Dow-Key matrices incorporate Control Area Network bus (CANbus) serial communication in their design. This technology allows for fast system integration and flexibility for today's complex system requirements. Although this brochure only showcases a few established designs, Dow-Key welcomes inquiries for all matrix applications.

Internal CANbus-based control technology includes the following features:

- Self-identification and configuration of all switchable devices
- Multiple control interfaces
- Field upgradeable operating software.
- Flexibility to add more than 200 switchable devices to the system.

As an option, the switch matrix can provide signal conditioning by incorporating amplifiers, filters, attenuators, couplers, and other components.



#### Open Control Architecture

A considerable number of external CANbus devices can be added to the Matrix. During system start up, the internal controller identifies CANbus devices and initiates control via communication interfaces.

# NEW GENERATION OF SWITCH MATRICES BROADBAND DC-18 GHz SOLUTIONS

## Overview of Standard Products

### 10X10 Coaxial Switch Matrix

#### Models:

4101-GPIB

4101-ENET

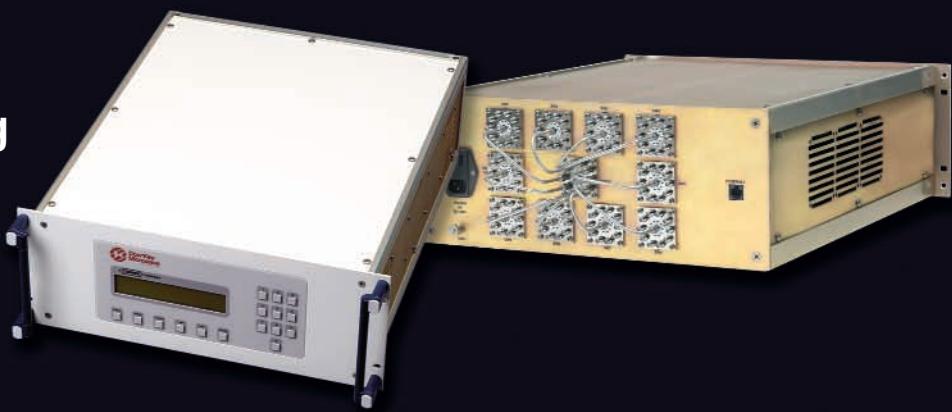
4101-EWEB



A compact and high performance solution, the model 4101 provides a Non-blocking Switch Matrix configured as a 5X5 up to a 10X10 in a small 4U (7 inch) high full rack enclosure . Available options include:

- Redundant power supplies
- N and BNC connectors.

### 1x100 Switching System



#### Models:

4201-GPIB

4201-ENET

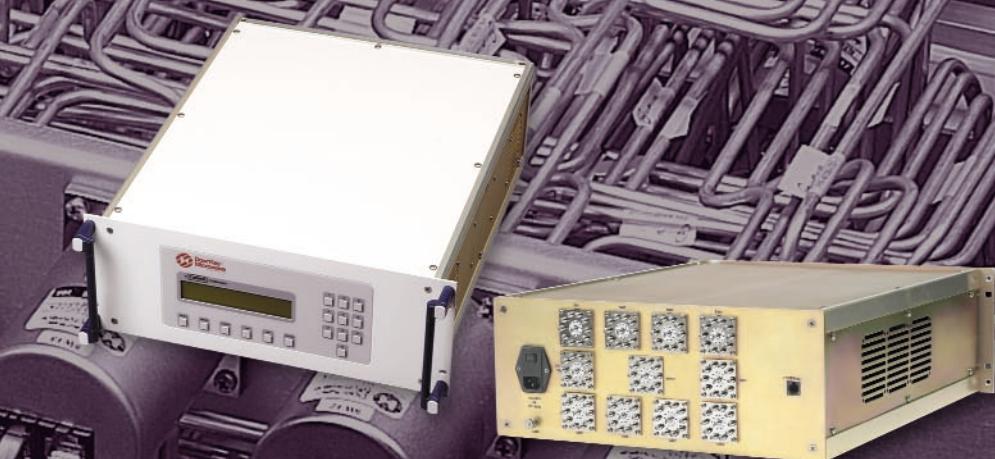
4201-EWEB

This unit houses up to 11 single pole ten throw (SP10T) switches configured (in its maximum capacity) as a 1X100 Multiplexer in a 4U (7 inch) high full rack enclosure. Back panel mounted switches reduce the number of internal RF/Microwave cables and eliminate output cables. The switching system is offered with a reduced number of switches starting from 1X10.

## **11SP10T Switch Unit**

### **Models:**

- 4301-GPIB**
- 4301-ENET**
- 4301-EWEB**



The model 4301 supports up to eleven individual SP10T switches in a 4U (7 inch) high full rack enclosure. Easy access to RF Input/Output connectors from the back panel permits easy maintenance and reconfiguration.

## **4SP10T Switch Unit**

### **Models:**

- 4104-GPIB**
- 4104-ENET**
- 4104-EWEB**



A compact switching solution, model 4104 supports up to four individual SP10T switches in a 1U (1.75 inch) high full rack enclosure. Trouble-free access to RF Input/Output connectors from the back panel permits easy maintenance and reconfiguration.

# NEW GENERATION OF SWITCH MATRICES BROADBAND DC-18 GHz SOLUTIONS

## Overview of Standard Products

### 2X8 Coaxial Switch Matrix

Models:

4401-GPIB

4401-ENET

4401-EWEB



The model 4401 is a Non-blocking Switch Matrix configured as a 2X4 to 2X8 unit in a 3U (5.25 inch) high full rack enclosure. Available options include N and BNC connectors.

### 2x8 Low Loss Coaxial Switch Matrix

Models:

4402-GPIB

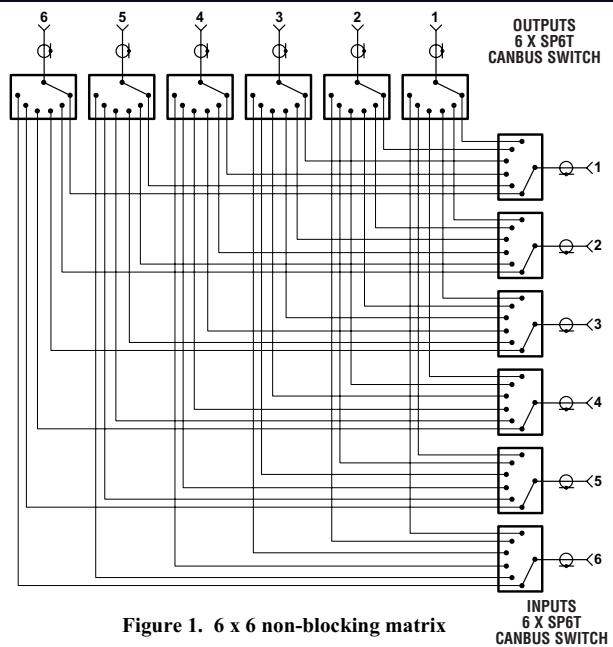
4402-ENET

4402-EWEB



The model 4402 is a Non-blocking Switch Matrix configured as a 2X4 to 2X8 system in a 3U (5.25 inch) high full rack enclosure. Back panel mounted switches minimize RF/Microwave cabling losses providing an Insertion Loss of less than 1 dB @ 18 GHz.

# Typical Switch Matrix Designs



## Non-blocking

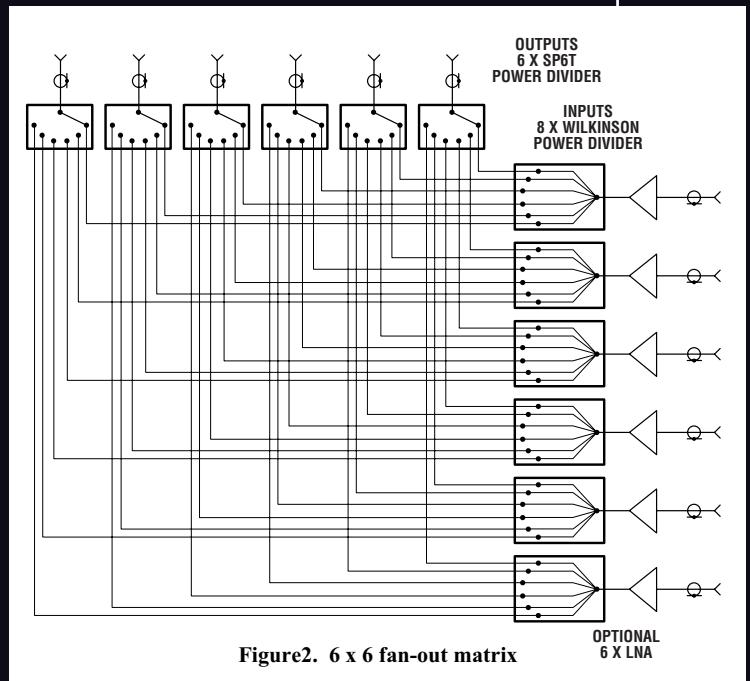
- Connects any input to any output
- Simultaneous active multiple channels

### Advantages:

- Wide Bandwidth
- Low Insertion Loss
- High Isolation
- Bi-Directional

### Disadvantages:

- Any input can be connected to only one output at a time



## Fan-out

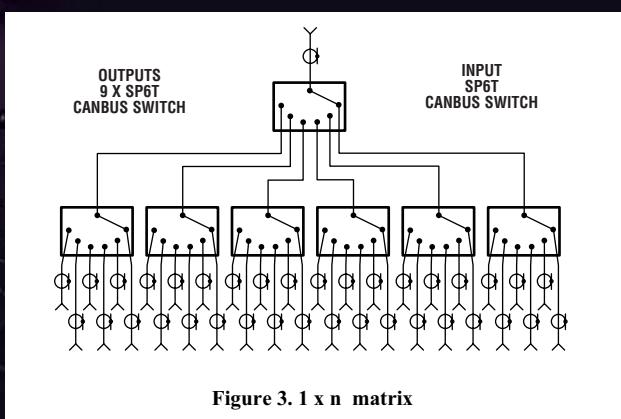
- Connects any input to any output simultaneously
- Multiple, simultaneous active channels
- Can connect any input to all outputs simultaneously

### Advantages:

- Interconnect flexibility
- High throughput

### Disadvantages:

- Bandwidth limited by power divider
- Higher insertion loss
- Low isolation between outputs connected to the same input



## 1xn

- Can connect one input to any output

### Advantages:

- Wide bandwidth
- High isolation
- Bi-directional

### Disadvantages:

- Can connect to only one output at a time

# RECONFIGURABLE SWITCH MATRIX (RMS)

## Models:

4700-GPIB

4700-ENET

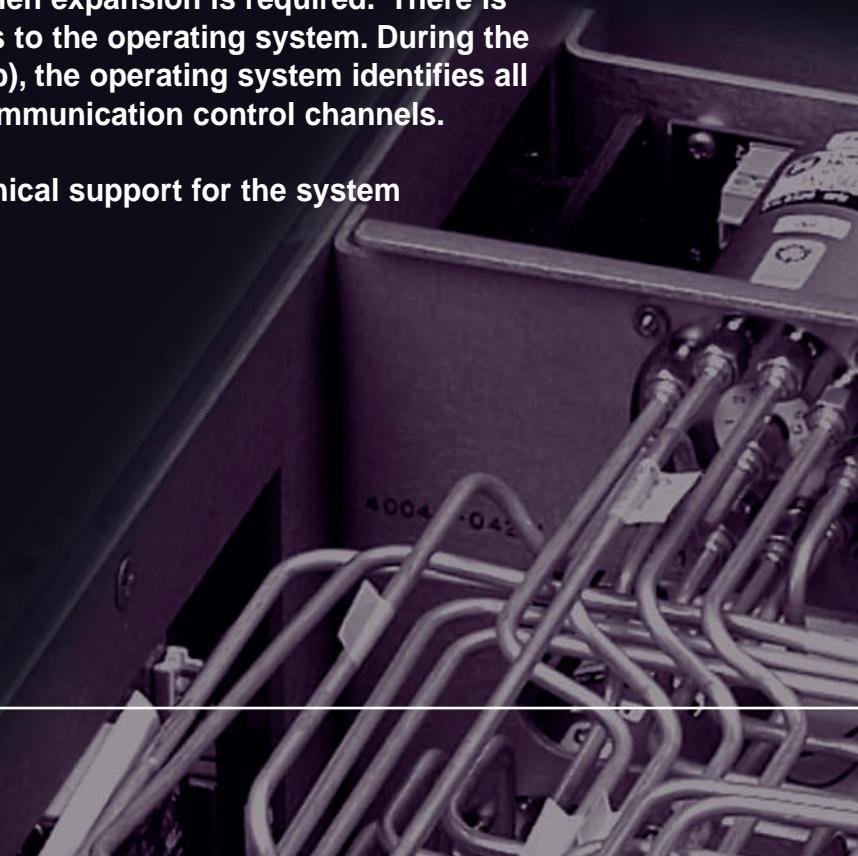
4700-EWEB

Dow-Key's Reconfigurable Matrix System (RMS) is offered as a solution for the new generation of reconfigurable and expandable state-of-the-art (ATE) test systems. It provides the user with the capability to configure the interconnection of all internal components and add additional components to a test system when needed, thereby extending its functionality.

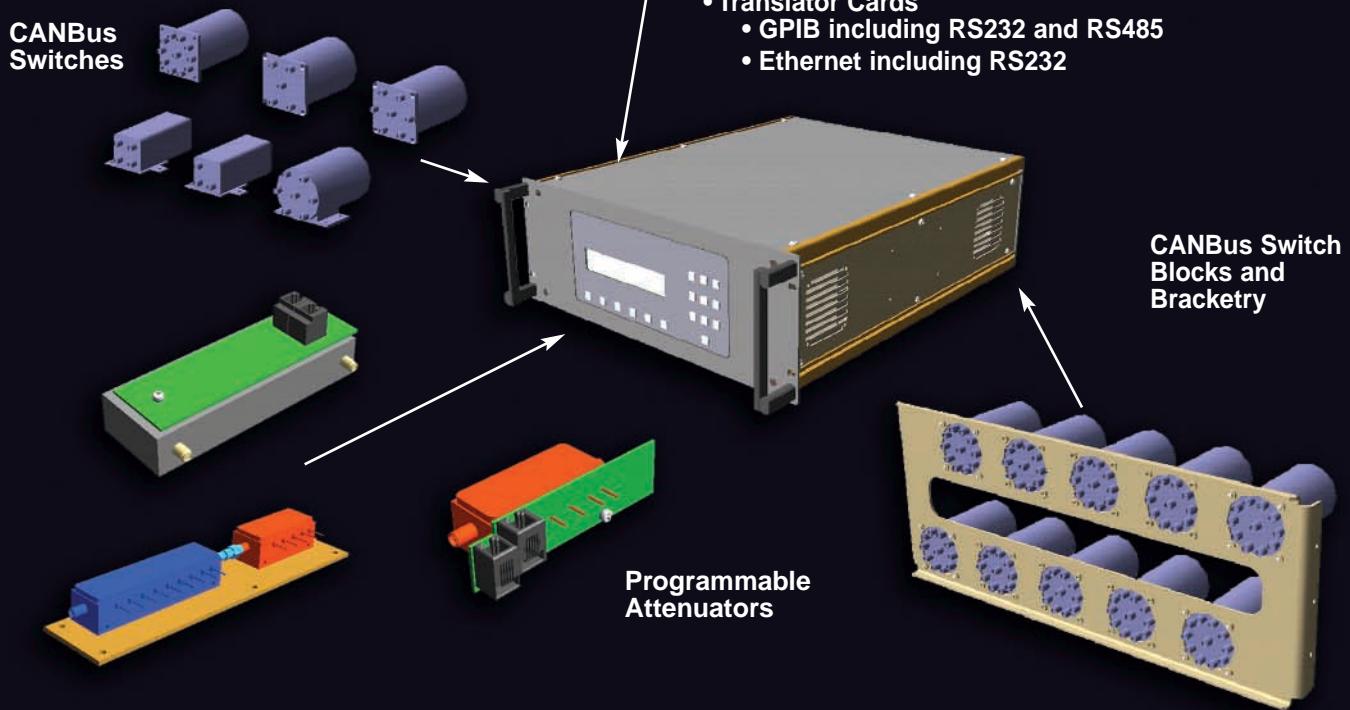
While the internal control interface is CANbus-based, the RMS software makes it transparent for users when a different control interface (e.g. GPIB, Ethernet, RS-232, and RS-485) is specified.

The internal operating system is specifically designed to universally accept any CANbus components when expansion is required. There is no need for any additional upgrades to the operating system. During the initiation process (when powered up), the operating system identifies all CANbus components and opens communication control channels.

Dow-Key Microwave offers full technical support for the system integration process.



## Hardware Configuration



The RMS consists of:

- Universal Matrix Cage
- Translator Card for various standard control interfaces
- Electro-mechanical Switches and other switchable components with CANbus Interface
- Standard mounting hardware to support the system mechanical integration.

Steps in RMS system selection and information:

- Provide a block diagram and specifications describing the functional requirements of the switching network
- Dow-Key selects required hardware and components and submits to customer for approval
- Customer chooses either Dow-Key providing the entire “turn-key” solution or procures a RMS kit.
- In addition to end item hardware, the “turn-key” solution also includes product design, design verification and manufacturing and test documentation.
- The RMS kit includes as a minimum; universal matrix cage, all CANbus controllable devices and associated hardware and software. The flexibility of the RMS system allows adding or removing CANbus components. The system can control over 100 components connected to one control bus.

# NEW GENERATION OF SWITCH MATRICES BROADBAND DC-18 GHz SOLUTIONS

## General Specifications

### RF Specifications

Dow-Key Model	Frequency Range dB	VSWR	Isolation dB	Insertion Loss dB	Power Handling W	Impedance OHMS	RF Connectors
4101 - Series	DC - 8	1.4 : 1	70	3	80	50	SMA Female
	8 - 12	1.6 : 1	60	4.5	60		
	12 - 18	1.8 : 1	50	6	40		
4201 - Series	DC - 8	1.4 : 1	70	3	80	50	SMA Female
	8 - 12	1.6 : 1	60	4.5	60		
	12 - 18	1.8 : 1	50	6	40		
4301 - Series	DC - 8	1.4 : 1	70	0.4	80	50	SMA Female
	8 - 12	1.6 : 1	60	0.5	60		
	12 - 18	1.8 : 1	50	0.8	40		
4104 - Series	DC - 8	1.4 : 1	70	0.4	80	50	SMA Female
	8 - 12	1.6 : 1	60	0.5	60		
	12 - 18	1.8 : 1	50	0.8	40		
4401 - Series	DC - 8	1.4 : 1	70	1	80	50	SMA Female
	8 - 12	1.5 : 1	60	2	60		
	12 - 18	1.7 : 1	50	3	40		
4402 - Series	DC - 8	1.4 : 1	70	0.6	80	50	SMA Female
	8 - 12	1.5 : 1	60	0.8	60		
	12 - 18	1.7 : 1	50	1	40		

### Translator Cards

Model\Translator Card	GPIB/RS-232-RS-485/CAN	Ethernet/RS-232/CAN
GPIB Version	Standard	Optional
ENET Version	Optional	Standard
EWEB Version	Optional	Standard

### Control Interfaces

IEEE-488 general purpose interface bus including SCPI Standard

IEEE-802.3 Ethernet communication bus including SCPI Standard

CANbus interface (version 2.0B passive)

RS-232 and RS-485 including SCPI Standard

### ENET Model Includes

TCP, IP, UDP, ARP, DHCP, ICMP, SMTP. Matrix is controlled over TCP/IP using the SCPI standard.

### EWEB Model Includes

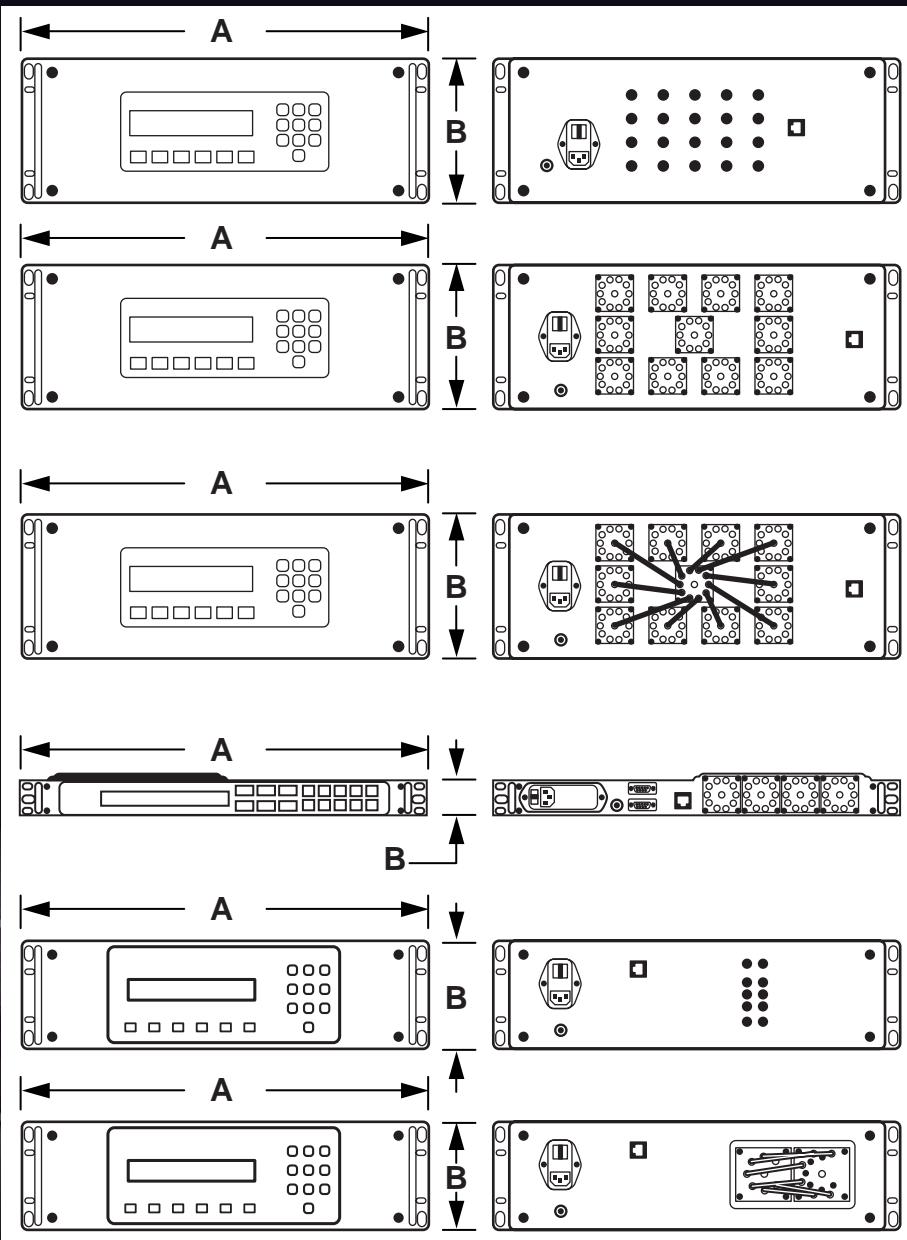
TCP, IP, UDP, ARP, DHCP, ICMP, SMTP, FTP, HTTP. Matrix is controlled over TCP/IP using the SCPI standard. For control by HTTP and any web browser, a web page is stored inside the matrix using FTP.

### Other Specifications

Model	4101	4201	4301	4104	4401	4402
Switch Type	Normally Open	Normally Open	Normally Open	Normally Open	Latching	Latching
Switching Speed	50 ms	50 ms	50 ms	50 ms	60 ms	60 ms
Operating Temperature	0 - 50 C	0 - 50 C	0 - 50 C	0 - 50 C	0 - 50 C	0 - 50 C
Power Supply	Input Voltage 85 - 232 VAC, 47 - 440 Hz (Optional Redundant Power Supply available)					

# General Specifications

## Outline Dimensions



DIM	4101	4301	4201	4104	4401	4402
A	19.02	19.02	19.02	19.02	19.02	19.02
B	7.00	7.00	7.00	1.75 (2.00)	5.25	5.25
DEPTH	21.81	21.81	21.81	21.81	5.00	5.00

# CUSTOM MATRICES & MULTIFUNCTION ASSEMBLIES

## Dow-Key PN 5010

Receiver Test Interface

Frequency Range:

0.7 - 2.3 GHz

Application:

ATE Wireless



## Dow-Key PN 5005

ATE Interface Network Box

Frequency Range:

0.8 – 4.0 GHz

Application:

ATE (3G Base)



## Dow-Key PN 5020

464 SRMU RF Output Module

Frequency Range:

0.5 – 18 GHz

Application:

Military Test System



## Dow-Key PN 5002

6 Sector Environmental and

Production Cross-Coupling Unit

Frequency Range:

1.5 – 2.7 GHz

(0.01 – 13.0 GHz)

Application:

ATE (3G Base Station Testing)



**DowKey® Microwave**  
CORPORATION  
A DOVER COMPANY

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# SPACE PRODUCTS



DowKey® **Microwave**  
CORPORATION

A  DOVER COMPANY

**Space Business Experts Always Like to Stress That the Three Most Important Factors in the Process of Supplier Selection Are:**



**1970**

33C12900 (WR-15)	TELECOM I
909C74900 (SPDT)	SPACE SHUTTLE

700C74900 (TRANSFER)	DCP
	METEOSAT

700C74900 (TRANSFER)	METEOSAT
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**1975**

33C21800 (WR-75)	TELESTAR
300C70500 (TRANSFER)	MAROTS
305C30500 (TRANSFER)	SPACE SHUTTLE
707C71700 (TRANSFER)	SPACE SHUTTLE
909C76100 (SPDT)	MAROTS
919C75600 (SPDT)	TIROS

818D30900-2 (SPDT)	SYMPHONIE
909C72200 (SPDT)	SYMPHONIE

**1980**

300C70500-1 (TRANSFER)	MAROTS
859C30500 (DP3T)	INSAT
909C72600-1 (SPDT)	ANIK D

**1985**

33D43600 (WR-75)	INTELSAT V
707C72200 (TRANSFER)	INTELSAT V
707C73000 (TRANSFER)	EXOSAT
707C76600 (TRANSFER)	INTELSAT V
707C76700 (TRANSFER)	INTELSAT V
707C90500 (TRANSFER)	INTELSAT V
800C33900-1 (SPDT)	INTELSAT V
909C76600 (SPDT)	INTELSAT V
959C70500 (DT3T)	INTELSAT V

33C92600 (WR-75)	TDRSS
707C90500 (TRANSFER)	TDRSS
707C73000-1 (TRANSFER)	SATCOM
800C35300 (SPDT)	INSAT
808C30800 (SPDT)	TDRSS
808C31000 (SPDT)	INSAT
909C72200 (SPDT)	RADARSAT
909C72800-1 (SPDT)	RADARSAT

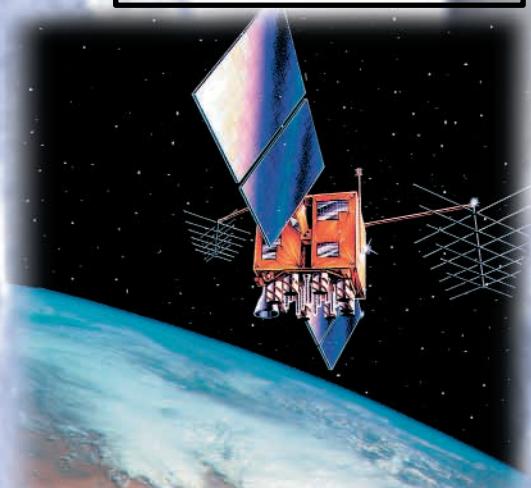
33C93500 (WR-75)	TELECOM I
305C30600 (TRANSFER)	SPACE SHUTTLE
700C77800-2 (TRANSFER)	TELECOM I
800C33900-1 (SPDT)	NAVSTAR GPS
808C30800-3 (SPDT)	NAVSTAR GPS
818C30800 (SPDT)	IUS
909C75100 (SPDT)	GPS
909C78300 (SPDT)	TELECOM I
959C71200 (DP3T)	TELECOM I

33C14700 (WR-42)	TV SAT
33C44300 (WR-112)	NATO III
33C93800 (WR-75)	ECS
406H-730332-2 (SPDT)	IUS
707C78200 (TRANSFER)	ECS
808C30800 (SPDT)	IUS
818C30800 (SPDT)	TV SAT
909C72600-2 (SPDT)	TV SAT

33C14700 (WR-42)	TV SAT
33C44300 (WR-112)	TV SAT
33C51200-1 (WR-90)	ISPM
402H-197 (SPDT)	GPS2F
707C71500-1 (TRANSFER)	GIOTTO
800C33900-1 (SPDT)	NAVSTAR GPS
909C72600-1 (SPDT)	TV SAT
909C72900 (SPDT)	TV SAT

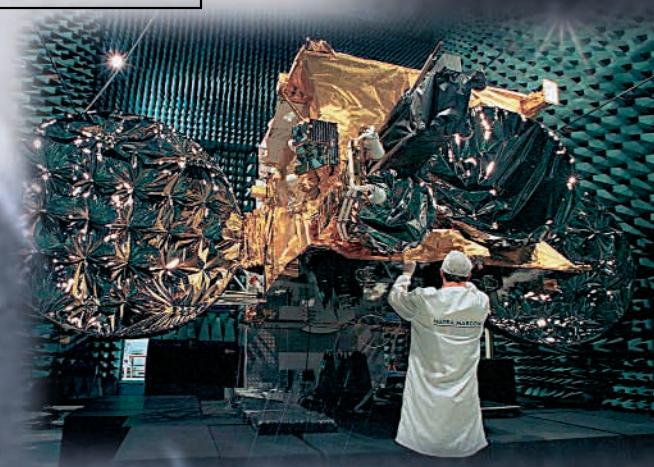
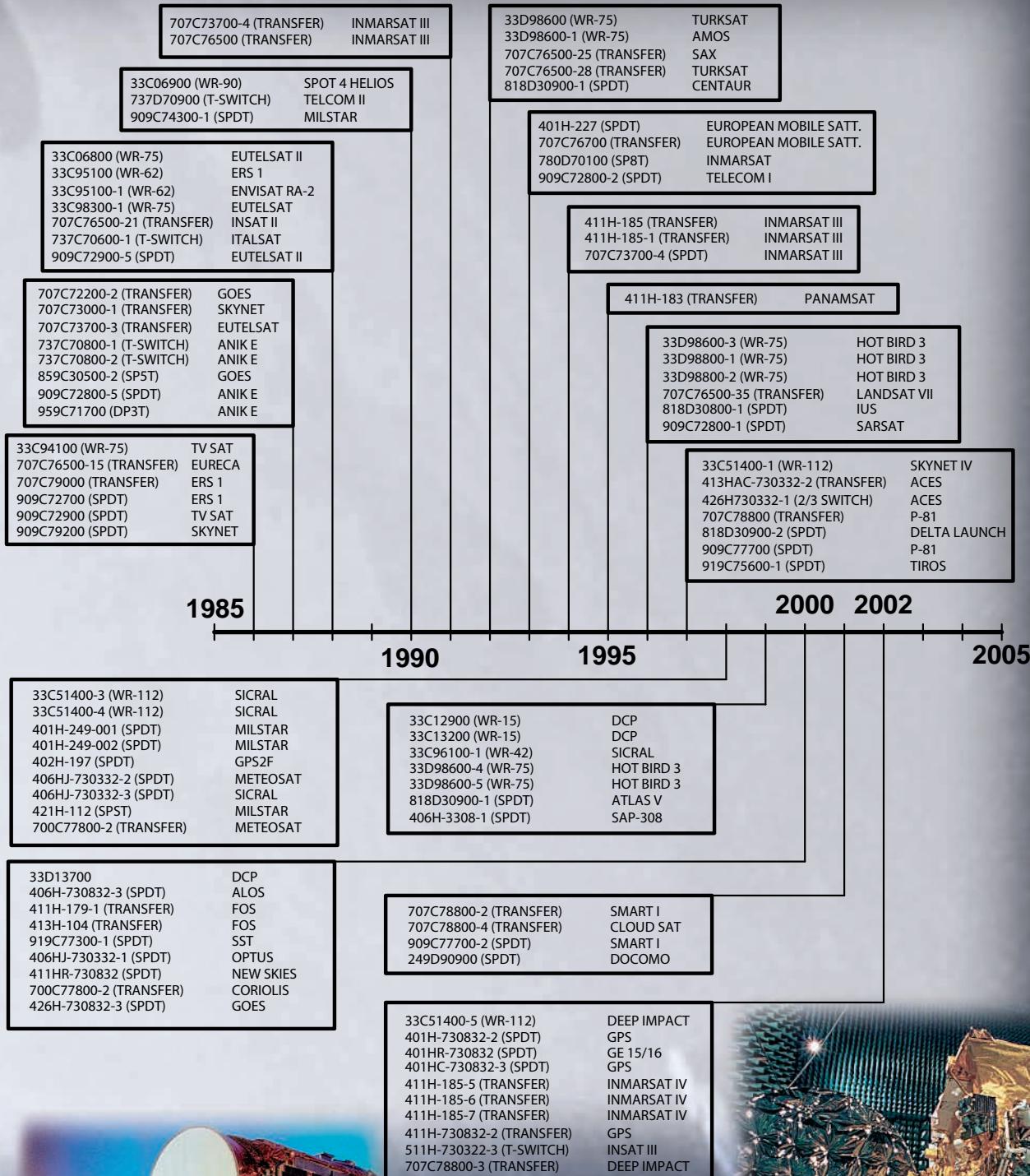
33C94100 (WR-75)	TV SAT
33D43600 (WR-75)	INTELSAT V
33D43600-1 (WR-75)	IBS
700C77500 (TRANSFER)	DSP 1
700C77700 (TRANSFER)	METEOSAT
805C31300 (SPDT)	SKYNET
808C30800-1 (SPDT)	IUS
808C30800-3 (SPDT)	IUS
818C30800-1 (SPDT)	IUS
909C72600-2 (SPDT)	METEOSAT
909C72600-3 (SPDT)	METEOSAT
909C72800-2 (SPDT)	LSAT
909C79200 (SPDT)	SKYNET
909C79800 (SPDT)	SKYNET
909C79800 (SPDT)	SKYNET IV

700C78100 (TRANSFER)	TOPEX
707C76500-12 (TRANSFER)	HIPPARCOS
707C76500-13 (TRANSFER)	HIPPARCOS
707C78200-1 (TRANSFER)	DFS
707C78200-3 (TRANSFER)	DFS
808C31000 (SPDT)	SHUTTLE/CENTAUR
909C72900-2 (SPDT)	DFS
909C72900-3 (SPDT)	DFS



# SPACE HERITAGE 1985-2003

## Heritage Heritage Heritage



# ADVANCED PRODUCTS - T - SWITCHES



FREQ (GHz)	I/L (dB)	VSWR	ISOL (dB)
1.0 - 4.2	0.15	1.07:1	65
5.5 - 6.6	0.20	1.20:1	65
6.6 - 7.7	0.21	1.25:1	65
7.7 - 8.8	0.24	1.33:1	65

VDC	CONN	DIMENSION (INCHES)	WEIGHT (OUNCES)
28	SMA	2.35 X 1.95 X 1.30	2.5

FREQ (GHz)	I/L (dB)	VSWR	ISOL (dB)
2.5 - 4.0	0.15	1.20:1	65
4.0 - 4.8	0.20	1.25:1	60

VDC	CONN	DIMENSION (INCHES)	WEIGHT (OUNCES)
42	TNC	3.42 X 2.275 DIA	6.7

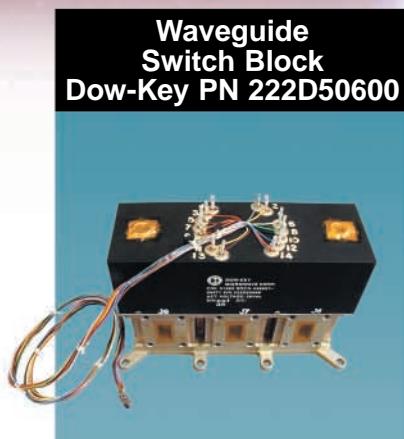
**High Power T-Switch  
511H - Series**



## STANDARD PRODUCTS

FIRST GENERATION OF SPACE QUALIFIED SPDT & TRANSFER SWITCHES						
PART DESCRIPTION	ACTUATOR TYPE	FREQUENCY (GHz)	VOLTAGE (VDC)	CONNECTOR	DIMENSION (INCHES)	WEIGHT (OZ)
909 SERIES SPDT	PULSE LATCHING PULSE LATCHING W/IND	0 - 18.0 0 - 18.0	20 - 30 20 - 30	SMA SMA	1.34 X 1.96 X .50 1.34 X 2.16 X .50	1.5 2.0
818 SERIES SPDT HI-PWR	FAILSAFE FAILSAFE W/IND	0 - 12.4 0 - 12.4	20 - 30 20 - 30	TNC TNC	2.97 X 2.63 X 1.09 2.97 X 2.63 X 1.09	8.0 8.0
800 SERIES SPDT HI-PWR	PULSE LATCHING PULSE LATCHING W/IND	0 - 12.4 0 - 12.4	20 - 30 20 - 30	TNC TNC	3.54 X 3.05 X 1.03 3.54 X 3.05 X 1.03	8.5 8.5
700 SERIES TRANSFER	PULSE LATCHING PULSE LATCHING W/IND	0 - 18.0 0 - 18.0	20 - 30 20 - 30	SMA SMA	2.16 X 2.50 X 1.37 2.16 X 2.50 X 1.37	3.5 3.5
707 SERIES TRANSFER	PULSE LATCHING PULSE LATCHING W/IND	0 - 18.0 0 - 18.0	20 - 30 20 - 30	SMA SMA	2.16 X 2.64 X 1.37 2.16 X 2.64 X 1.37	3.5 3.5

# ADVANCED PRODUCTS - SWITCH BLOCKS



FREQ (GHz)	I/L (dB)	VSWR	ISOL (dB)
18.25 - 18.85	.08 / PATH	1.10:1	50
19.65 - 20.25	.08 / PATH	1.10:1	52.5

VDC	CONN	DIMENSION (INCHES)	WEIGHT (OUNCES)
28	WR-51	4.73 X 3.27 X 2.13	16.9

**Coaxial Switch Block  
Dow-Key PN H9001**

FREQ (GHz)	INSERTION LOSS (dB)	VSWR	ISOL (dB)
1.525 - 1.559	.15 / SINGLE PATH	1.29:1	60
	.26 / THROUGH 2 PATHS	1.38:1	60

VDC	CONN	DIMENSION (INCHES)	WEIGHT (OUNCES)
28	SMA	12.5 X 3.05 X 4.00	23.9



## STANDARD PRODUCTS

SECOND GENERATION OF SPACE QUALIFIED SPDT, 2/3 AND TRANSFER SWITCHES						
PART DESCRIPTION	ACTUATOR TYPE	FREQUENCY (GHz)	VOLTAGE (VDC)	CONNECTOR	DIMENSION (INCHES)	WEIGHT (OZ)
401 SERIES SPDT LOW POWER	PULSE LATCHING PULSE LATCHING W/IND	0 - 18.0 0 - 18.0	11.0 - 32.0 11.0 - 32.0	SMA SMA	1.34 X 2.02 X .50 1.34 X 2.02 X .50	2.5 2.5
406 SERIES SPDT HIGH POWER	PULSE LATCHING PULSE LATCHING W/IND	0 - 18.0 0 - 18.0	24.0 - 30.0 24.0 - 30.0	SMA SMA	1.34 X 2.78 X .60 1.92 X 2.53 X .60	2.0 2.0
411 SERIES TRANSFER LOW POWER	FAILSAFE FAILSAFE W/IND PULSE LATCHING PULSE LATCHING W/IND	0 - 18.0 0 - 18.0 0 - 18.0 0 - 18.0	11.0 - 32.0 11.0 - 32.0 11.0 - 32.0 11.0 - 32.0	SMA SMA SMA SMA	2.16 X 2.40 X 1.32 2.16 X 2.40 X 1.32 2.16 X 2.40 X 1.32 2.16 X 2.40 X 1.32	4.0 4.0 4.0 4.0
421 SERIES 2/3 SWITCH LOW POWER	PULSE LATCHING W/IND	12.3 - 13.7	15.0 - 34.0	GPO	2.25 X 2.65 X .51	4.0
426 SERIES 2/3 SWITCH HIGH POWER	PULSE LATCHING W/IND	1.6 - 1.7	23.0 - 36.0	TNC	3.84 X 2.76 X .69	4.2

# ADVANCED PRODUCTS - SPECIAL REQUIREMENTS

**Isolator- Switch  
Dow-Key PN 249D90900**



FREQ (GHz)	I/L (dB)	VSWR	ISOL (dB)
2.660 - 2.690	0.30	1.25:1	70

VDC	CONN	DIMENSION (INCHES)	WEIGHT (OUNCES)
28	SMA PINS	1.60 X 2.26 X 1.90	4.0

**High Power SPDT  
406H-Series**



FREQ (GHz)	I/L (dB)	VSWR	ISOL (dB)
.045 - 1.720	0.20	1.15:1	65

VDC	CONN	DIMENSION (INCHES)	WEIGHT (OUNCES)
28	TNC	2.78 X 2.50 X .69	3.5



## STANDARD PRODUCTS

### SPACE QUALIFIED WAVEGUIDE SWITCHES

PART DESCRIPTION	ACTUATOR TYPE	FREQUENCY (GHz)	VOLTAGE (VDC)	WAVEGUIDE SIZE	DIMENSION (INCHES)	WEIGHT (LBS)
33C12900	LATCHING ( 4 PORTS )	56.0 - 64.0	28	WR 15	2.225 X 3.765 X 1.850	14.4 MAX
33C13200	LATCHING ( R TYPE )	56.0 - 64.0	28	WR 15	2.225 X 3.765 X 1.850	12.8 MAX
33C98100	LATCHING ( 4 PORTS )	27.5 - 30.0	28	WR 28	2.045 X 3.035 X 2.045	5.6 MAX
33C96600	LATCHING ( 4 PORTS )	22.0 - 32.0	28	WR 34	1.510 X 2.510 X 1.510	4.3 MAX
33D51500	LATCHING ( R TYPE )	17.7 - 20.2	28	WR 42	2.590 X 4.130 X 2.241	12.4 MAX
33C96100-1	LATCHING ( 4 PORTS )	20.2 - 21.2	28	WR 42	2.042 X 3.424 X 2.042	4.3 MAX
33C95100	LATCHING ( 4 PORTS )	13.6 - 14.0	28	WR 62	1.810 X 3.414 X 1.810	7.1 MAX
33C21800	LATCHING ( 3 PORTS )	11.7 - 12.2	28	WR 75	2.100 X 4.250 X 2.100	11.5 MAX
33C94100	LATCHING ( 4 PORTS )	10.0 - 15.0	28	WR 75	2.640 X 4.060 X 1.880	13.9 MAX
33C50900	LATCHING ( R TYPE )	11.7 - 14.5	28	WR 75	.937 X 3.970 X .937	10.4 MAX
33D43600-1	LATCHING ( 4 PORTS )	10.95 - 12.75	28	WR 75	1.840 X 4.030 X 1.840	18.1 MAX
33C51200	LATCHING ( 4 PORTS )	8.2 - 8.5	28	WR 90	2.637 X 3.900 X 1.875	16.2 MAX
33C51400-4	LATCHING ( 4 PORTS )	7.2 - 8.4	28	WR 112	2.173 X 4.400 X 2.173	14.3 MAX

# SUMMARY

We have been a leading supplier of space products for the last few decades, and have delivered space hardware ranging from a basic SPDT switch to fully integrated switch blocks.

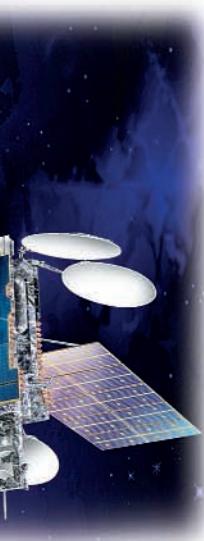
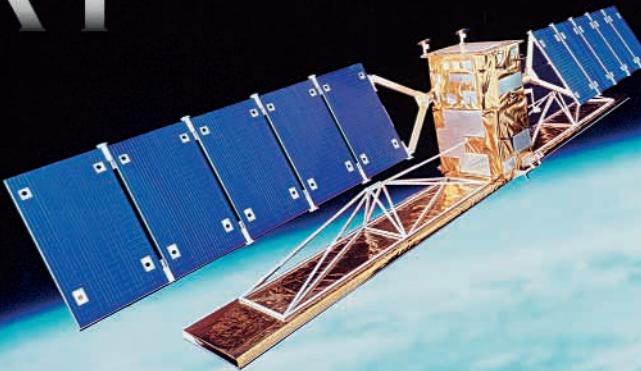
We have a dedicated staff of highly skilled and experienced engineers and technicians who, through their robust and mature knowledge, make possible our excellent reputation for performance.

We are completely facilitated with a modern in-place space infrastructure that can meet the most stringent requirements of our customers. With our extensive electromechanical switch production capability, we have the synergism to optimally blend our standard production capability into our space infrastructure to meet the rapid delivery and high quantity of products required for the satellite communications marketplace.

Our new and advanced capability includes an 800 sq. ft clean room facility, environmental facilities and thermal vacuum capability. Only a brief, and far from inclusive, sampling of the space products in which we have been active participants over the years, is presented in this short summary. If you do not see a product that specifically meets your requirements, don't hesitate to contact us and we will provide you with a prompt answer to your needs.

Through years of working with the space industry, Dow-Key has developed a product offering that extends from the simplest to the most complex electromechanical switch solutions that support space-level systems. At one end of this spectrum are the industry standard SPDT and Transfer Switches. At the other end are T-Switches, High Power Switches, Switch Blocks, and Integrated Assemblies. All of our Switches are designed, manufactured and screened in accordance with space level criteria and are supported by a unique team of program professionals inclusive of its own design engineering staff, data analysis, parts control program and dedicated manufacturing areas.

Dow-Key continues its strong commitment to the space market by implementing new products and services, as well as working closely with our customers as older designs are transitioned to include new technologies for higher levels of performance, reliability, mission success, and cost efficiencies.



# FACILITY

**400 sq. ft Class 100 area with controlled humidity and temperature is allocated for the most critical assembly processes.**



**400 sq. ft Class 100,000 area with controlled humidity and temperature is allocated for the final assembly processes and in-process testing.**

**Environmental Lab fully Equipped with four ThermoVac chambers, and the sophisticated Vibration Table fully equipped to perform random and sine vibration and limited level of mechanical shock**



**DowKey® Microwave**  
A DOVER COMPANY

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