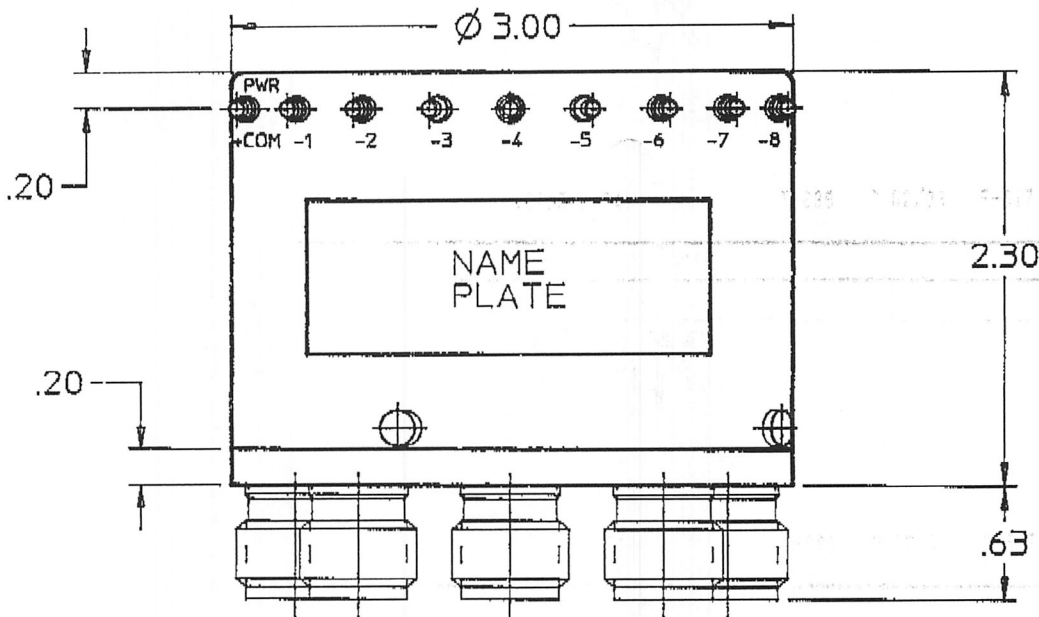


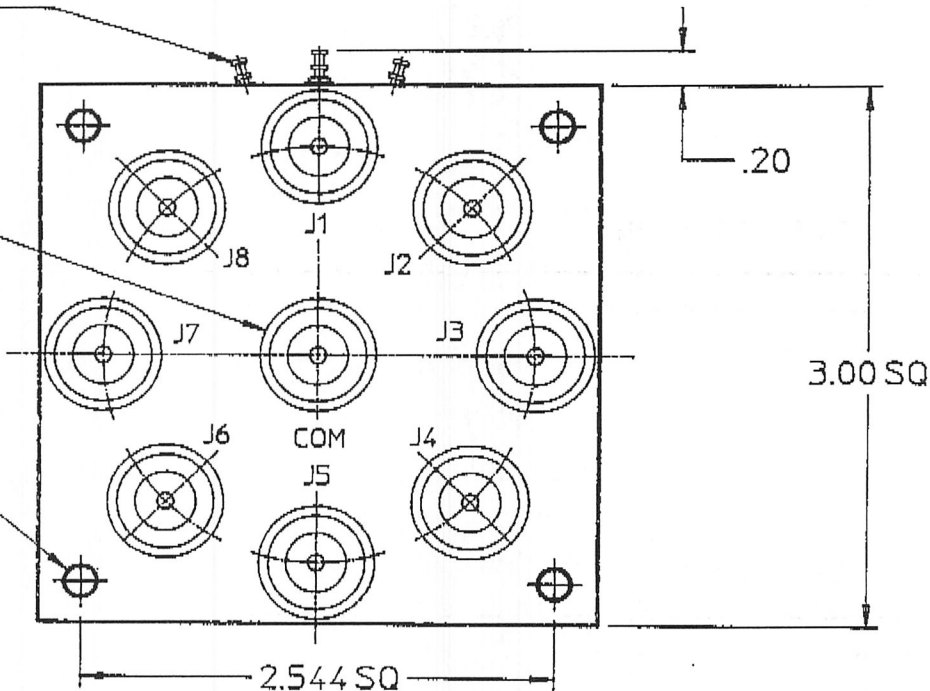
REVISIONS			
REV	DESCRIPTION	DATE	APPROVED




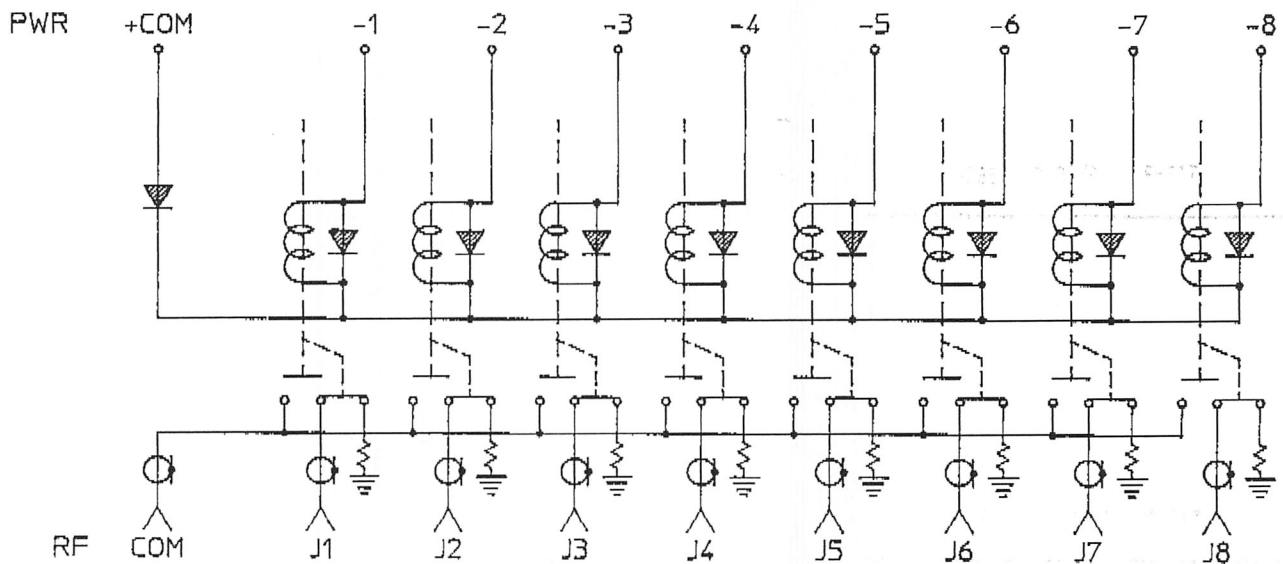
SOLDER TERMINALS
9 PLACES

N CONN FEM
PER MIL-C-39012
9 PL, 8 EQ SPCD
ON Ø 2.320 B.C.

4X Ø.177 THRU
MTG HOLES



UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCE ON DEC. XX ±.03 XXX ±.010 FRACTIONS ±1/64 ANGLES ±1/2°	CONTRACT No.		 DMT DIVISION OF JAY-EL PRODUCTS, INC. A SUBSIDIARY OF DUCOMMUN INCORPORATED 23301 SO. WILMINGTON AVE. • CARSON, CA 90745 • U.S.A.		
	APPROVALS	DATE	TITLE		
EXCEPT AS OTHERWISE PROVIDED BY CONTRACTOR, THIS DRAWING OR SPEC IS PROPERTY OF DMT. IT IS ISSUED IN STRICT CONFIDENCE AND SHALL NOT BE REPRODUCED OR COPIED OR USED AS THE BASIS FOR MANUFACTURE OR SALE OF APPARATUS WITHOUT DMT PERMISSION. ALL DRAWINGS OR SPECS MUST BE RETURNED TO DMT WHEN JOB IS COMPLETE.	DRAWN	L. SANCHEZ	6/27/95	1P 8T RF COAXIAL SWITCH	
	CHECKED	<i>Carroll M</i>	6/30/95	SIZE	FSCM No.
	ENGR	<i>R. [unclear]</i>	6/28/95	A	50667
DO NOT SCALE DRAWING	SCALE	1 : 1	WT.	DWG No.	L8-113J28FT
				REV.	SHEET 1 OF 2



SCHEMATIC SHOWN IN DE-ENERGIZED POSITION

SPECIFICATIONS:

- | | | | | |
|---------------------------|---|--|--------|--------|
| 1. Operating frequency | : | DC-3GHz | 3-8GHz | 8-9GHz |
| 2. V.S.W.R. (maximum) | : | 1.2:1 | 1.35:1 | 1.5:1 |
| 3. Insertion loss (max.) | : | 0.2dB | 0.35dB | 0.5dB |
| 4. Isolation (minimum) | : | 80dB | 70dB | 60dB |
| 5. Actuating voltage | : | 24-30 VDC (28 VDC nominal) | | |
| 6. Actuating current | : | 160 mA maximum at 28 VDC and 72°F | | |
| 7. Impedance | : | 50 ohms | | |
| 8. Switching time | : | 15 ms maximum | | |
| 9. R.F. Power | : | Average 250 watts, 5 watts terminated | | |
| 10. Operating mode | : | Normally open with suppression diodes and 50 ohm termination of each de-energized position | | |
| 11. Operating temperature | : | -35°C to +85°C | | |
| 12. Operating life | : | 1,000,000 cycles | | |
| 13. Environmental | : | Designed to meet MIL-E-5400 and MIL-S-3928 | | |
| 14. Finish | : | Switch body and Connector shell: aluminum, electroless nickel plated per MIL-C-26074; Connector contact: beryllium copper, gold plated per MIL-G-45204; Cover: aluminum, black | | |



DMT DIVISION OF
JAY-EL PRODUCTS, INC.
 A SUBSIDIARY OF DUCOMMUN INCORPORATED
 23301 SO. WILMINGTON AVE. * CARSON, CA 90745 * U.S.A.

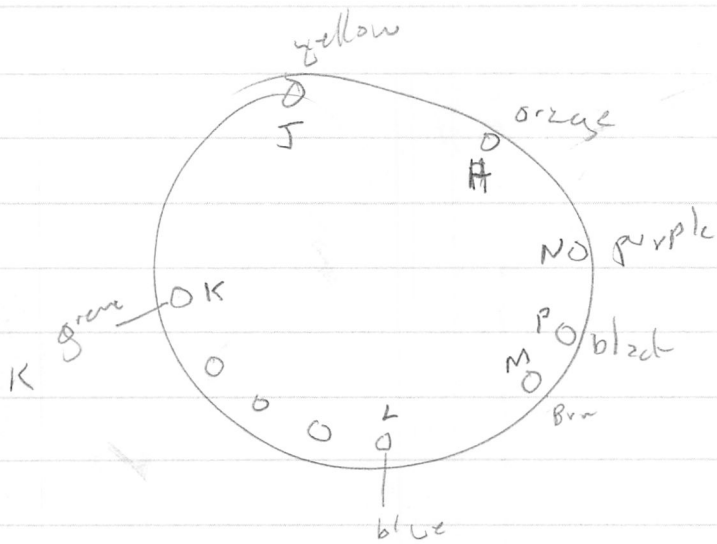
DWG No.

L8-113J28FT

SHEET

2 OF 2

REV.



Not used
A, T, U, R, S

orange is # connected
to act
orange & black are shaded

- | | | |
|--------------|----------|---|
| A | J | Yellow |
| B 53 | X | Green |
| C 53 | L | Blue |
| D 53 | M | Brown |
| E 53 | N | purple |
| F 53 | P | orange Black - common
ob ring |
| G 53 | R | |
| Orange | S | |
| | T | |
| | <u>U</u> | |

~~also~~ selected one shorts {H... M} to P

And #1 is active (connected to com)

DUCOMMUN TECHNOLOGIES inc.

ABOUT US

PRODUCTS

NEWS

EMPLOYMENT

CONTACT US

LINKS

ISO 9001

[DMT](#)

[AEI](#)

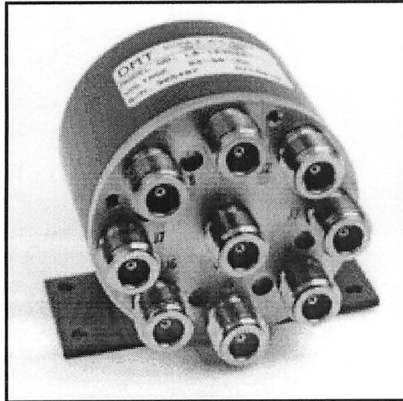
[Jay-EL](#)

[DB Camera](#)

DMT Products

[DMT RF and Microwave Products >> Multi-Position Switches](#)

(Type L: SP7T, SP8T to 9 GHz)



TYPICAL OUTLINE

SCHEMATICS

STANDARD CONNECTORS:
N, TNC



TYPICAL SPECIFICATIONS

Operating Frequency	DC-5GHz	5-9GHz
V.S.W.R. (max)	1.2:1	1.5:1
Insertion loss (max)	0.2dB	0.5dB
Isolation (min)	80dB	60dB
Actuating voltage	24-30 Vdc (28 Vdc nominal)	
Actuating current	160 milliamps maximum at 28 Vdc and 72°F	
Impedance	50 ohms	
Switching time	35 milliseconds maximum	
RF Power	See power chart page vi	
Operating mode	Normally Open	
Operating temp.	-35°C to + 85°C	
Operating life	1,000,000 cycles minimum	
Environmental	Designed to meet MIL-E-5400 and MIL-S-3928	
Finish	Switch body &	Aluminum, electroless nickel
	connector shell	plated per MIL-C-26074
	Connector Contact	Beryllium copper, gold plated per MIL-G-45204
	Cover	Aluminum, Black

AVAILABLE OPTIONS

- Special Options:
- BRACKET
 - FLANGE
 - HIGH POWER (Does not change DIM "A")
 - TTL (Low or High) (See below)

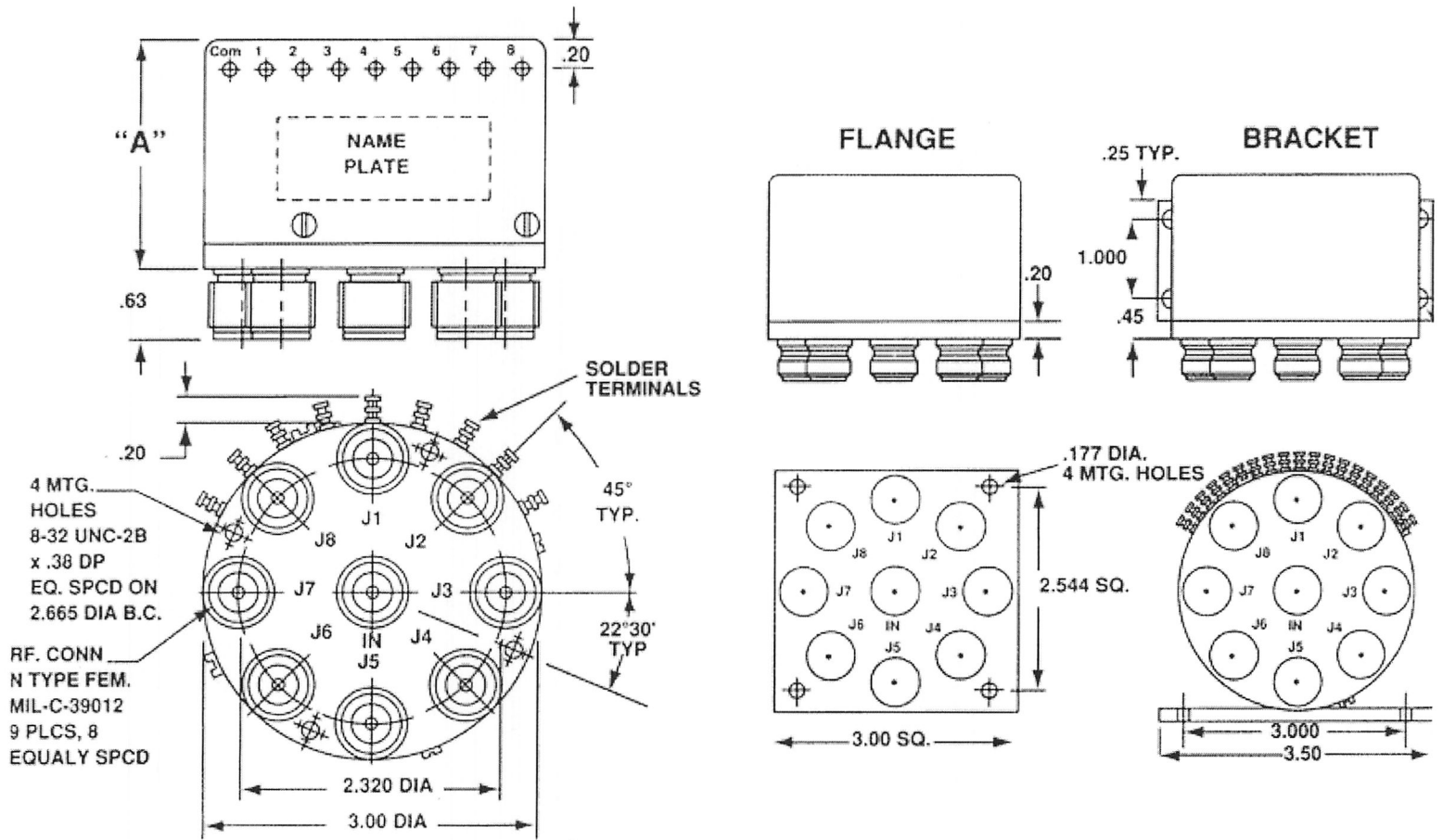
[Circuit Options](#)

[Outline Dim "A"](#)

	Circuit Options	Outline Dim. A
	G, H, J, K, N, R	2.30
TTL (Low, High or No Logic)	with C, G, H, J, K, N, R, S	2.47
TTL (Low, High or No Logic)	with D, E, F	2.71
TTL (Low, High or No Logic)	WITH G, H, J, K, N, R, S	2.71
TTL (Low or High)	with C, D, E, F	3.08
POWER CONNECTORS: Standard Circular MS3112E14-19P, mates with MS3116F14-195 Consult factory for "A". Standard D Subminiature DBM25P with D53018 sliding lock post, mates with DBM255.		

Application Notes

TYPICAL OUTLINE DRAWING



SP7T: ELIMINATE POSITION J8

AVAILABLE OPTIONS

Special Options:		
<ul style="list-style-type: none"> • BRACKET • FLANGE • HIGH POWER (Does not change DIM "A") • TTL (Low or High) (See below) 		
	Circuit Options	Outline Dim "A"
	G, H, J, K, N, R	2.30
TTL (Low, High or No Logic)	with C, G, H, J, K, N, R, S	2.47
TTL (Low, High or No Logic)	with D, E, F	2.71
TTL (Low, High or No Logic)	WITH G, H, J, K, N, R, S	2.71
TTL (Low or High)	with C, D, E, F	3.08
POWER CONNECTORS:		
Standard Circular MS3112E14-19P, mates with MS3116F14-19S Consult factory for "A".		
Standard D Subminiature DBM25P with D53018 sliding lock post, mates with DBM255.		



DMT Product Catalog Application Notes

APPLICATION NOTES

Failsafe: This switch configuration positively insures RF patch connection to a pre-selected port with no applied actuating voltage. For other RF path connection, a continuous actuating voltage must be applied. This option is utilized in SPDT and Transfer switches (Option A, B, M, and Q).

Latching: A switch that when energized to a selected RF port will maintain RF connection. This is accomplished whether the actuating voltage is removed or interrupted through the action of the internal permanent magnet field and mechanical mechanism. The switch will return to its original state only upon applying an activating voltage to select a new RF path.

The following application options are available:

Pulse Latching: (Option C and F): This is the simplest and least expensive type of Latching. A 35 to 100-millisecond pulse drive to the coil is required at the activating voltage level to select an RF Port. This option is typically utilized in SPDT and transfer switch, but not recommended for multi-position switches. Available with indicator circuit for Option F.

Latching with Self De-energizing Circuit: (Option D and E): This option is most commonly used in SPDT, Transfer and Multi-Position types. Through the action of the self de-energizing circuit, drive voltage to the activating coil is cut off once the Selected RF Port is made; therefore no current is drawn once switching has occurred. Available with indicator for Option E.

For multi-position switches, a set-reset control circuit is added in such a manner that upon command to select an RF Port, the previous selected port will be automatically reset.

Latching Reset: This option may be utilized in multi-position latching switches in place of the set-reset circuit. With the switch in a selected position a signal drive must be commanded to the reset coil of the selected position before a new RF position is selected. In this method of operation a position reset drive signal command is required after each position select command. In this option the current is halved in comparison to a set-reset circuit option. Note: If by accident, two set commands are given, two RF path closures will be made and this will affect the RF performance.

Transfer: A switch with four ports that provides two independent RF paths that switch simultaneous when actuated.

Self-De-energizing Circuit: Also referred to as Power Breaker or Cut-Off Circuit. This option is only available in Latching type switches. It provides means to disconnect the actuator drive to set coils once the RF path connection is completed and at the same time closes the path to the reset coil. This circuit is required in all multi-position switches and connected in such a manner that only one Set Coil and Reset Coil is connected at any one-position selection when used in conjunction with the set-reset circuit.

Set-Reset Circuit: This control circuit is utilized in all multi-position latching switches. It is a diode matrix that interconnects the set and reset coils of each position. Used in conjunction with the self de-energizing circuitry, it allows the switch to reset from the previous closed RF path upon selection of a new RF path. The current with this option is the total current of one set and one reset coil. Without self de-energizing circuitry, all reset coils are connected at all times so the total current can be excessive.

Multi-Position Switch: A switch with one common or input port and more than two outputs. DMT switches are available with up to 10 output ports. Except for manual switches, these ports are randomly selected (not sequential)

Normally Open: In this operating mode, the output ports of the switch are disconnected from the input/common port until actuating voltage is applied to select a port. This operation mode is available in all types of DMT models.

Normally Open: Failsafe to Position 1: position 1 RF port is always connected to the input port until actuating voltage is applied to select another switch position. Upon removal of actuating voltage, the switch will automatically connect Position 1 to input port. This mode of operation is available only in multi-position switches.

Manual Override Option: This option is applicable to normally open multi-position switches. Each RF port can be manually selected and when the manual selector is SET AT A NEUTRAL position, the switch RF ports can be electrically selected. Indicator circuitry option cannot be included when this option is selected. Consult factory before ordering this option.

Indicator Circuitry: Isolated internal SPDT to SPIOT contacts that are mechanically linked to each switch actuator on each RF path. These contacts are used for external monitoring of switch RF status.

Operating Voltage: Applied voltage range required to assure selected RF port connection through the operating temperature range.

Actuating Current: Current required to maintain actuator drive to the selected RF Port. Current is usually given at nominal voltage and at room temperature of 72°F. Current noted on specifications for all switch series are for Failsafe or Normally Open operating mode. Consult factory for actuating current for other operating temperatures, voltages or latching operating modes.

Suppression Diodes: Diodes are connected in parallel with each coil to suppress transient voltages generated when the actuating voltages are removed or interrupted. Diodes are mandatory on all switches with T2L Drivers and/or self de-energizing circuitry. All DMT switches with suppression diodes also incorporate a reverse polarity protection diode to prevent any damage to the suppression diodes in the event the actuating voltage to the switch is

erroneously reversed.

Termination Switches: Most DMT switch types are available with 50 ohms internal terminations. External terminations are available only on the SPDT. All available types are listed on the Product Specification Index, page i. Unselected ports are automatically terminated into 50 ohms resistive loads. This feature is often invaluable to the system designer in circuit which must not remain open; i.e. situations of frequency drift, high reflection, etc. Consult factory for termination of other resistive value application.

Polarity: Either common plus (+) or common minus (-) polarity is required when specifying switches with the following circuit options.

(a) All latching types.

(b) (b) All normally open including failsafe to position 1 types, with or without termination that incorporate Suppression Diodes.

Polarity is not applicable for following types that may have suppression diodes.

(a) SPDT and transfer types

(b) All types with solid state driver i.e., T2L, BCD, MOSFET, etc.

(c) Switch operating of AC voltage.

T2L Driver Options: Transistors - Transistor Logic circuitry that offers compatibility in driving the switch standard high or low logic inputs.

Typical input logic level

Voltage: High Level 2.4 to 5 Vdc Low Level 0 to 0.8 Vdc

Current: High level 1.3 ma at 3.5 Vdc Low level 1 ma at 0 Vdc

1. High Input. Logic driver that enables the RF path closure in the high level state. Application requires logic input for each switch position, i.e. SP6T requires 6 input lines except for Failsafe to Position 1 type switches.

2. Low Input. Similar to High Input option except the status of the switch is controlled at the low level state.

3. BCD Decoder Input. The RF path closures are enabled by the binary logic high level inputs. This option is very useful in multi-position switches to minimize the number of logic input lines to the switch. Consult factory for availability and part number assignments.

4. MOSFET driver Input. MOSFET circuit is switched with voltage up to 15 Vdc and requires minimal current to activate switch position. This option can be supplied on all switch types. Consult factory for availability and part number assignments.

5. Line Driver/Line receiver Input. This option can be supplied on most switch types. Consult factory for availability and part number assignments.

Manual Option: Switch operation that is manually selected either by toggle (SPDT) or rotary (multi-position) mechanical actuator in the local mode only.

Power Handling Capability (Watts CW): Several factors determine the power handling capability of each design. In general, DMT switches exceed the average power rating for the RF connector used.

For other applications consult factory with the following information:

(1) Operating temperature range

(2) Operating altitude and duration subjected to this condition.

(3) Load VSWR to switches.

(4) For peak power operation, state pulse duration and duty cycle.

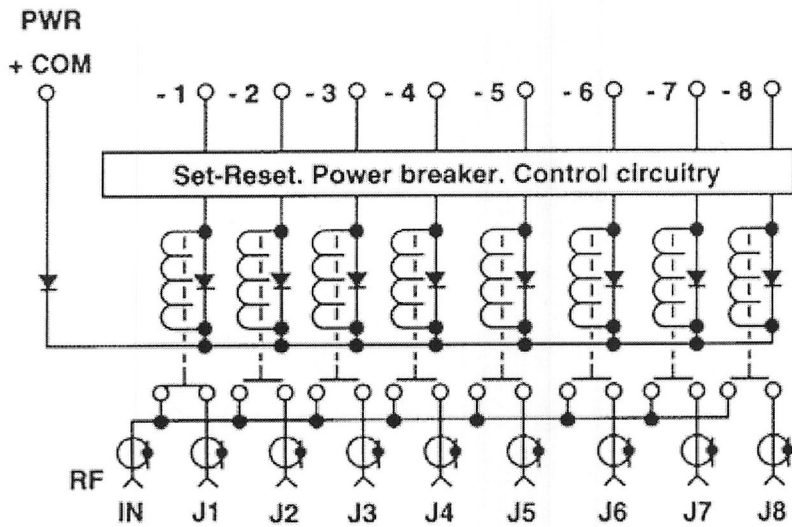
DC Power Connector. Standard power connectors are offered with all types of DMT switches and are specified on individual data sheets for each switch type. Mating connector types are also specified. All switch types can also be supplied with other connectors per customer requirements. Consult factory for part number assignments.

Voltage Standing Wave Ration (VSWR): VSWR measurement compares the amount of microwave signal transmitted to the switch with the amount reflected from the switch. VSWR is an indication of the switch's impedance.

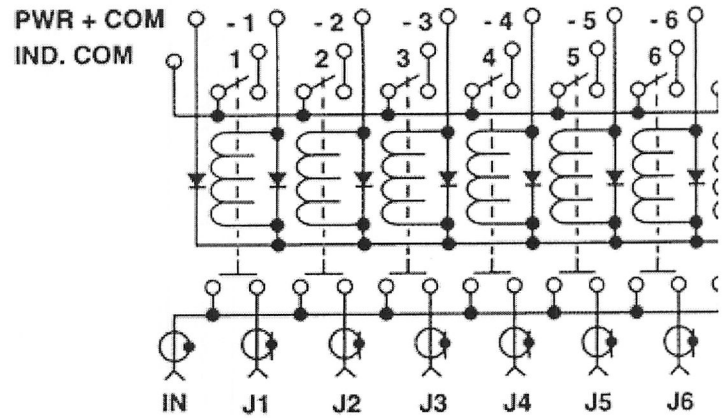
Insertion Loss: Insertion loss measurement compares the power level of microwave signal which enters a signal path with the power level output of the signal path. Insertion loss is an indication of the switch's electrical efficiency.

Isolation: Isolation measurement compares the power level of microwave signal that enters a signal path with the power level of signal which appears on adjacent output port(s).

(LATCHING



) (NORMALLY OPEN



Normally open with indicator circuitry and suppression diodes (Common Plus).

Latching, set-reset, self de-energizing circuitry, and suppression diodes (Common Plus). Shown in Position 1.