

SERIES PSP PIN SWITCHES (SPST)



FEATURES:

- High ON/OFF ratio
- Full waveguide bandwidth
- Fast switching speed
- Optional TTL driver
- Reflective

APPLICATIONS:

- Signal or load switching
- Pulse modulation
- Receiver protection

DESCRIPTION

Millitech series PSP single-pole, single-throw (SPST) PIN switches cover the frequency range from 18 to 110 GHz. Full waveguide bandwidth performance is available up to 75 GHz (WR-15) with broadband operation beyond 75 GHz. Two switching speeds are available for these PIN switches. The standard switching speed is typically 20 ns from low insertion loss state to isolation state, 150 ns from isolation state to low insertion loss state. Millitech also offers high speed switches (series PSH) with switching times as low as 2 ns.

Series PSP switches can be ordered either with or without a driver. The switching speed of the PIN switch is driver dependent. In addition to being used for pulse modulation and receiver protection applications, these units can also be used as voltage-controlled variable attenuators (see series VCA). Series PDT single-pole, double-throw (SPDT) switches and series PSN multi-throw are also offered.

ELECTRICAL SPECIFICATIONS

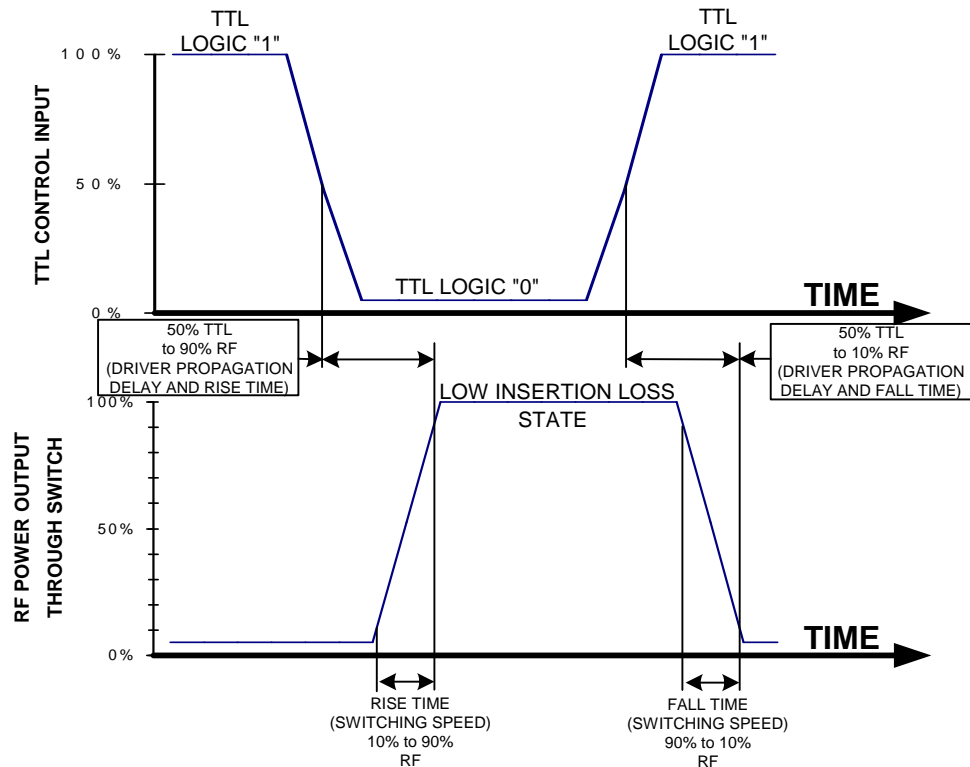
Model Number	PSP-42	PSP-28	PSP-22	PSP-19	PSP-15	PSP-12	PSP-10
Frequency band and range (GHz)	K 18-26.5	Ka 26.5-40	Q 33-50	U 40-60	V 50-75	E 60-90	W 75-110
Standard Isolation Version							
Bandwidth (GHz) (max)	Full	Full	Full	Full	Full	10	10
Insertion loss (dB) (max)	1.2	1.5	1.5	1.8	2.0	2.0	2.2
Isolation (dB) (min)	30	30	30	25	20	20	20
Switching speed (ns) (typ) ^{*1}	Rise time (90 to 10% RF)	20	20	20	20	20	20
	Fall time (10 to 90% RF)	150	150	150	150	150	150
Driver propagation delay (ns) (max)	10	10	10	10	10	10	10
VSWR (max) ^{*2}	2:1	2:1	2:1	2:1	2:1	2:1	2:1
Power handling (CW/peak, W) (max)	0.5/10	0.5/10	0.5/10	0.5/10	0.5/10	0.5/10	0.5/10
DC bias input (V/ma) ^{*3}	Positive supply	+5/20	+5/20	+5/20	+5/20	+5/20	+5/20
	Negative supply ^{*4}	-5/5	-5/5	-5/5	-5/5	-5/5	-5/5
High Isolation Version							
Bandwidth (GHz) (min)	Full	Full	Full	Full	Full	10	10
Insertion loss (dB) (max)	2.0	2.2	2.4	2.5	2.7	2.7	3.7
Isolation (dB) (min)	40	40	35	35	30	27	25
Switching speed (ns) (typ) ^{*1}	Rise time (90 to 10% RF)	20	20	20	20	20	20
	Fall time (10 to 90% RF)	150	150	150	150	150	150
Driver propagation delay (ns) (max)	10	10	10	10	10	10	10
VSWR (max) ^{*2} ("on" state)	2:1	2:1	2:1	2:1	2:1	2:1	2:1
Power handling (CW/peak, W) (max)	0.5/10	0.5/10	0.5/10	0.5/10	0.5/10	0.5/10	0.5/10
DC bias input (V/ma) ^{*3}	Positive supply	+5/40	+5/40	+5/40	+5/40	+5/40	+5/40
	Negative supply ^{*4}	-12/5	-12/5	-12/5	-12/5	-12/5	-12/5

^{*1} – Switching speed specifications apply to any switch/driver combination. Driver propagation delay (10 ns max) not included. Switching speed is driver dependant. See Figure 1 below for explanation of switching speeds.

^{*2} – Measured in PASS state only.

^{*3} – Forward current (positive supply) corresponds to isolation state, reverse current (negative supply) to low insertion loss state. Driver control input is TTL compatible with SMA connector.

^{*4} – DC bias input negative supply voltage can be operated from -5 Vdc to -12 Vdc.

Figure 1 - Switching Speed and Driver Propagation Delay Measurement


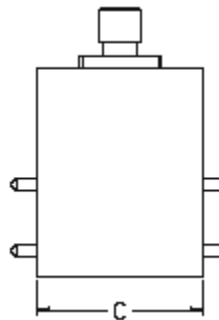
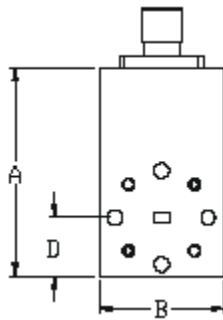
MECHANICAL SPECIFICATIONS

Model Number	PSP-42	PSP-28	PSP-22	PSP-19	PSP-15	PSP-12	PSP-10
A (in/mm)	1.40/35.56	1.39/35.31	1.70/43.18	1.70/43.18	1.25/31.75	1.25/31.75	1.25/31.75
B (in/mm)	0.88/22.4	0.75/19.1	1.13/28.7	1.13/28.7	0.75/19.1	0.75/19.1	0.75/19.1
C (in/mm)	1.90/48.26	1.38/35.05	1.21/30.73	1.20/30.48	1.00/25.4	1.00/25.4	0.75/19.1
D (in/mm)	0.58/14.6	0.44/11.1	0.56/14.3	0.56/14.3	0.38/9.05	0.38/9.05	0.38/9.05
Flange MIL-F-3922	/54-001*	/54-003*	/67B-006	/67B-007	/67B-008	/67B-009	/67B-010

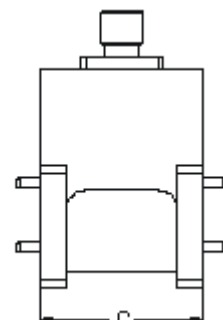
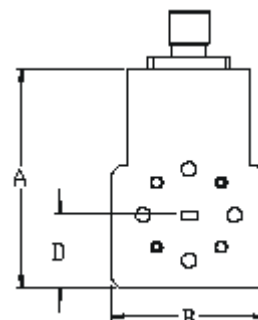
* With #4-40 threaded holes.

OUTLINE DRAWINGS*

PSP-42/28/15/12/10



PSP-22/19



*The outlines shown may not reflect the latest information. Please contact Millitech for current outline drawings.

HOW TO ORDER

Specify Model Number PSP-XX-ABCDØ
XX = Waveguide Band WR – number
A = Flange Type R – round (WR-22 through WR-10 only) S – square (WR-42 and WR-28 only)
B = Driver I – internal driver (standard) W – without driver
C = TTL A – TTL low corresponds to insertion loss B – TTL high corresponds to insertion loss
D = Isolation S – standard isolation version H – high isolation version
E = Bandwidth N – narrowband (other than fullband)* F – fullband (WR-42 through WR-15 only)
*Please specify frequency range when ordering narrowband units

EXAMPLE:

To Order: A 94 GHz PSP switch in WR-10 with a round flange and internal driver, where TTL low or “low” produces low insertion loss state.

Specify: PSP-1Ø-RIASN, frequency range 94 GHz, ±4 GHz.