

Solid State PIN Control Products

0.5-18 GHz and 2-18 GHz

High Performance PIN Switches



- Reflective and Absorptive
- SPST thru SP6T and Transfer (Standard)
- High Speed – 15 ns
- High Isolation – up to 80 dB
- Low Insertion Loss
- Small Package Size
- Integral TTL Drivers
- Hermetically Sealed

Description

The performance series of 0.5 to 18 GHz and 2 to 18 GHz hermetically sealed switches offers fast switching speed and low insertion loss in compact packages. These switches use the identical circuits employed in Narda's top-of-the-line Super Slim Series. They are ideal for connectorized applications where the absolutely thinnest profile is not required.

All models include integral drivers with reverse voltage protection. The drivers are TTL compatible and are tailored to each RF circuit to give optimum switching performance.

The small size, high speed, broad bandwidth and low insertion loss make these switches ideal for EW systems, automatic test equipment, and simulators.

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Specifications

Reflective Switches, SMA (F), 0.5 to 18 GHz

MODEL	TYPE	SWITCHING TIME MODULATION (ns)	BAND SEGMENTS (GHz)	INSERTION LOSS (dB max.)	VSWR (max.)	ISOLATION (dB min.)	POWER HANDLING (mW)	POWER SUPPLY REQUIREMENTS	
								mA @+5 V	mA @-12 V
SP212DHS	SPST	15	0.5-2	1.2	1.6	70	200	50	50
			2-12	2.1	1.9	70			
			12-18	2.6	2.0	70			
SP212DHS-80	SPST	15	0.5-2	1.2	1.6	80	200	50	50
			2-12	2.2	1.9	80			
			12-18	2.7	2.0	80			
SP122DHS	SP2T	20	0.5-2	1.5	1.8	70	200	90	60
			2-12	2.4	2.0	65			
			12-18	2.9	2.0	60			
SP132DHS	SP3T	20	0.5-2	1.5	1.8	70	200	90	60
			2-12	2.5	2.0	65			
			12-18	3.0	2.0	60			
SP142DHS	SP4T	20	0.5-2	1.6	1.8	70	200	110	70
			2-12	2.6	2.0	65			
			12-18	3.2	2.0	60			
SP152DHS	SP5T	20	0.5-2	2.0	1.8	70	200	220	90
			2-12	3.0	2.0	65			
			12-18	3.6	2.0	60			
SP162DHS	SP6T	20	0.5-2	2.0	1.8	70	200	220	100
			2-12	3.0	2.0	65			
			12-18	3.6	2.0	60			

Absorptive Switches, SMA (F), 0.5 to 18 GHz

MODEL	TYPE	SWITCHING TIME MODULATION (ns)	BAND SEGMENTS (GHz)	INSERTION LOSS (dB max.)	VSWR (max.)	ISOLATION (dB min.)	POWER HANDLING (mW)	POWER SUPPLY REQUIREMENTS	
								mA @+5 V	mA @-12 V to -15 V
SP212DHTS	SPST	30	0.5-12	2.4	1.9	55	200	50	60
			12-18	2.8	2.0	50			
SP122DHTS	SP2T	30	0.5-12	2.7	1.9	60	200	60	60
			12-18	3.1	2.0	55			
SP132DHTS	SP3T	30	0.5-12	2.9	1.9	60	200	105	75
			12-18	3.4	2.0	45			
SP142DHTS	SP4T	30	0.5-12	2.9	1.9	60	200	110	80
			12-18	3.4	2.0	45			
SP152DHTS	SP5T	30	0.5-12	3.3	2.0	60	200	220	90
			12-18	4.0	2.0	50			
SP162DHTS	SP6T	30	0.5-12	3.3	2.0	60	200	250	100
			12-18	4.0	2.0	50			

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Reflective Switches, SMA (F), 2 to 18 GHz

MODEL	TYPE	SWITCHING TIME MODULATION (ns)	BAND SEGMENTS (GHz)	INSERTION LOSS (dB max.)	VSWR (max.)	ISOLATION (dB min.)	POWER HANDLING (mW)	POWER SUPPLY REQUIREMENTS	
								mA @+5 V	mA @-12 V
SP213DHS	SPST	15	2-12 12-18	1.9 2.4	1.9 2.0	50 60	500	50	60
SP213DHS-80	SPST	15	2-12 12-18	1.9 2.5	1.9 2.0	70 80	500	50	50
SP123DHS	SP2T	15	2-12 12-18	2.4 2.9	1.9 2.0	65 60	200	90	60
SP123DHS-80	SP2T	15	2-12 12-18	2.2 2.9	2.0 2.0	80 80	200	90	60
SP133DHS	SP3T	15	2-12 12-18	2.6 3.0	1.9 2.0	65 60	200	110	70
SP143DHS	SP4T	15	2-12 12-18	2.6 3.0	1.9 2.0	65 60	200	110	70
SP153DHS	SP5T	20	2-12 12-18	3.0 3.6	2.0 2.0	65 60	200	220	90
SP163DHS	SP6T	20	2-12 12-18	3.0 3.6	2.0 2.0	65 60	200	250	100

Transfer Switches, SMA (F), 2 to 18 GHz

MODEL	TYPE	SWITCHING TIME (ns)	BAND SEGMENTS (GHz)	INSERTION LOSS (dB max.)	VSWR (max.)	ISOLATION (dB min.)	POWER HANDLING (mW)	POWER SUPPLY REQUIREMENTS	
								mA @+5 V	mA @-12 V
XSP323DHS	XFER	50	2-12 12-18	2.8 3.4	2.0 2.0	60 65	200	90	80

Absorptive Switches, SMA (F), 2 to 18 GHz

MODEL	TYPE	SWITCHING TIME MODULATION (ns)	BAND SEGMENTS (GHz)	INSERTION LOSS (dB max.)	VSWR (max.)	ISOLATION (dB min.)	POWER HANDLING (mW)	POWER SUPPLY REQUIREMENTS	
								mA @+5 V	mA @-12 V
SP213DHTS	SPST	25	2-12 12-18	2.1 2.5	1.9 2.0	55 50	200	40	60
SP213DHTS-80	SPST	25	2-12 12-18	2.1 2.6	1.9 2.0	70 80	200	50	60
SP123DHTS	SP2T	25	2-12 12-18	2.5 2.9	1.9 2.0	60 55	200	60	60
SP133DHTS	SP3T	25	2-12 12-18	2.7 3.2	1.9 2.0	60 45	200	105	75
SP143DHTS	SP4T	25	2-12 12-18	2.7 3.2	1.9 2.0	60 45	200	105	75
SP153DHTS	SP5T	25	2-12 12-18	3.2 3.8	2.0 2.0	60 50	200	220	90
SP163DHTS	SP6T	25	2-12 12-18	3.2 3.8	2.0 2.0	60 50	200	250	100

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Electrical Specifications

TTL CONTROL LOGIC

Logic 0 (0-0.8 V, 1.6 mA max. sink @ 0.4 V) = Insertion Loss
Logic 1 (2.0-5.5 V, 40 μ A max. source @ 2.4 V) = Isolation

FOR TRANSFER SWITCH (XSP323DHS)

Logic 0: J1-J4 and J2-J3 at Insertion Loss
Logic 1: J2-J2 and J4-J3 at Insertion Loss

SWITCHING TIME

T on = 50% TTL to 90% of RF voltage
T off = 50% TTL to 10% of RF voltage

SWITCHING RATE

Reflective Models 5 MHz max. PRF @50% duty cycle
Absorptive Models 2 MHz max. PRF @50% duty cycle

DRIVER

Reverse voltage protected

SURVIVAL POWER at 25°C (Cold Switching)

Models SP213DHS
and SP213DHS-80 1.5 W CW, 20 W Peak
(1 μ s max. pulse width, 7½% duty cycle)
All other 2 to 18 GHz models 1.0 W CW, 20 W Peak
(1 μ s max. pulse width, 5% duty cycle)
All 0.5 to 18 GHz models.....500 mW CW, 10 W Peak
(1 μ s max. pulse width, 5% duty cycle)
Derate linearly to 50% at +95°C

Environmental Specifications

TEMPERATURE

Operating -54°C to +95°C
Storage -65°C to +125°C

HUMIDITY

Per MIL-STD-202F, method 103B, condition B
(96 hours at 95% R.H.)

SHOCK

Per MIL-STD-202F, method 213B, condition B
(75 G, 6 ms)

ALTITUDE

Per MIL-STD-202F, method 105C, condition B
(50,000 feet)

VIBRATION

Per MIL-STD-202F, method 204D, condition B
(.06" double amplitude or 15 G, whichever is less)

THERMAL SHOCK

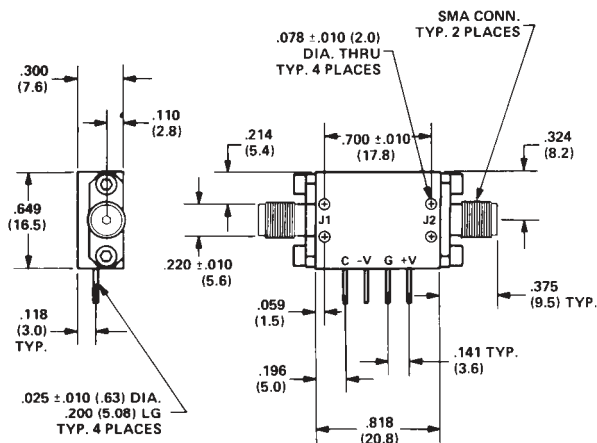
Per MIL-STD-202F, method 107D, condition A (5 cycles)

Options

- Very Low Loss Video Leakage
- Inverted TTL Logic Control
- BCD Decoder Driver
- Package Configuration
- Over Voltage Protection

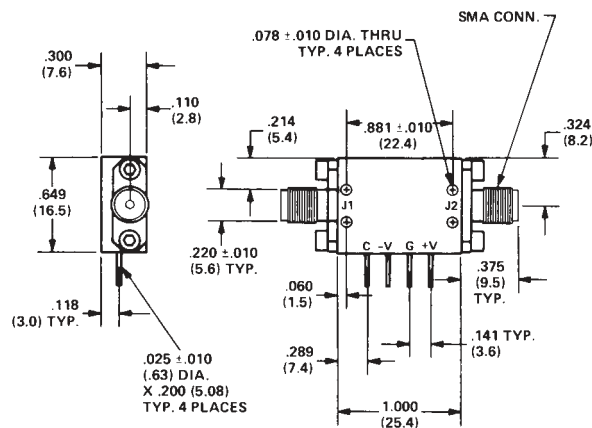
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Outline Drawings



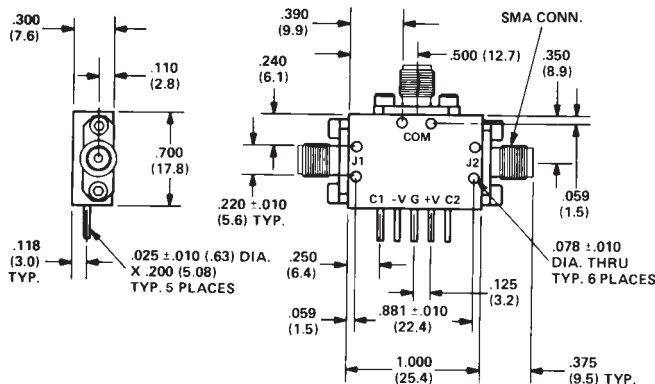
TOL: XX = ± .02 (.50)
XXX = ± .005 (.12)

SP213DHS, SP213DHTS, SP212DHTS, SP212DHS



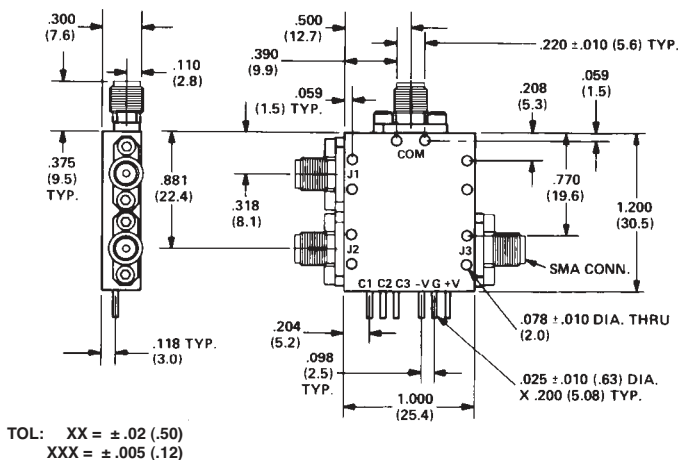
TOL: XX = ± .02 (.50)
XXX = ± .005 (.12)

SP213DHS-80, SP213DHTS-80, SP212DHS-80



TOL: XX = ± .02 (.50)
XXX = ± .005 (.12)

SP123DHS, SP123DHTS, SP122DHTS, SP122DHS



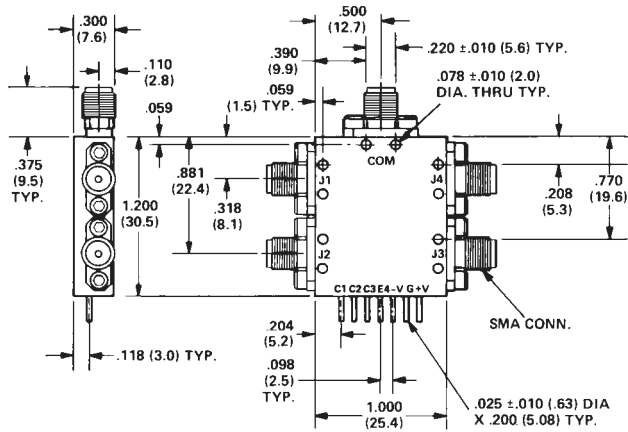
TOL: XX = ± .02 (.50)
XXX = ± .005 (.12)

SP133DHS, SP133DHTS, SP132DHTS, SP132DHS

Dimensions in inches (mm in parentheses), unless otherwise specified.

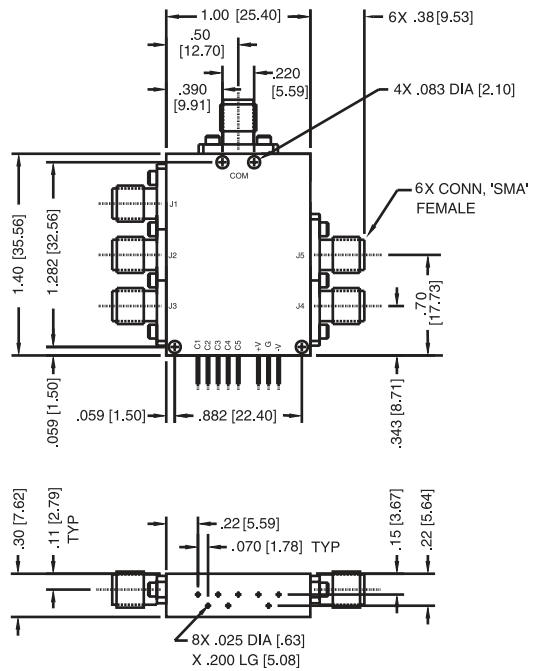
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Outline Drawings



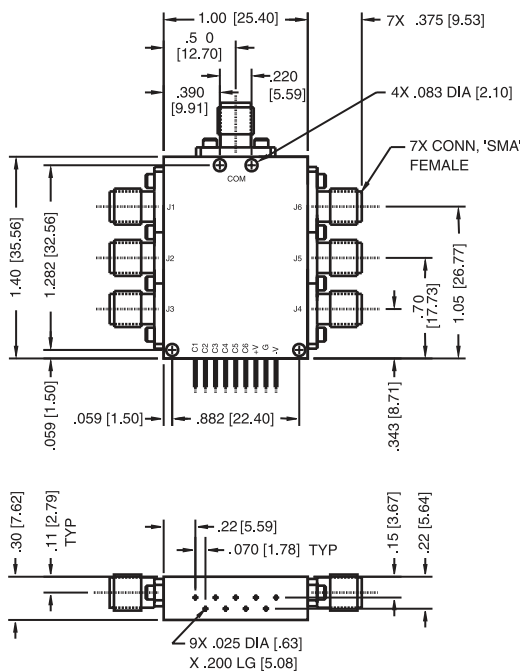
TOL: XX = ±.02 (.50)
XXX = ±.005 (.12)

SP143DHS, SP143DHTS, SP142DHTS, SP142DHS



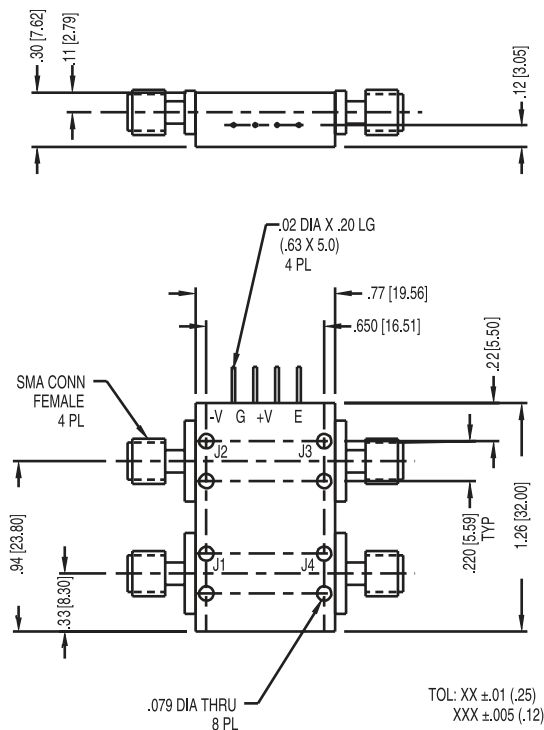
TOL: XX ±.02 [.51]
XXX ±.005 [.12]

SP153DHS, SP153DHTS, SP152DHTS, SP152DHS



TOL: XX ±.02 [.51]
XXX ±.005 [.12]

SP163DHS, SP163DHTS, SP162DHTS, SP162DHS



TOL: XX ±.01 (.25)
XXX ±.005 (.12)

XSP323DHS

Dimensions in inches (mm in parentheses), unless otherwise specified.