

## NARROWBAND

# SPDT SWITCH

HIGH ISOLATION REFLECTIVE AND ABSORPTIVE 0.02-18 GHz

## SERIES XN/XN-HA

### GENERAL INFORMATION:

Series XN and XN-HA switches are medium power devices that operate over commonly used frequency ranges. Carefully selected diodes placed in either series, series-shunt, or shunt configurations produce excellent electrical performance from UHF through KU bands.

### GENERAL SPECIFICATIONS:

|                                 |                                                                                                                                                                                                                                                                                                                                                                  |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Frequency Coverage:</b>      | 0.02 to 18.0 GHz.                                                                                                                                                                                                                                                                                                                                                |
| <b>RF Impedance:</b>            | 50 OHMS.                                                                                                                                                                                                                                                                                                                                                         |
| <b>RF Power:</b>                | +20 dBm operational.<br>Consult factory for high power options.                                                                                                                                                                                                                                                                                                  |
| <b>DC Requirements:</b>         | Switches without drivers require +60 mA max per path for the "off" condition and -60 mA max per path for the "on" condition.<br>Switches with drivers require $\pm 5$ volt supplies at $\pm 70$ mA. Logic "1" turns J2 "on" and J3 "off". Logic "0" turns J3 "on" and J2 "off". Different supply voltages and logic available if specified when order is placed. |
| <b>Temperature Information:</b> | Operating temperature from $-55^{\circ}\text{C}$ to $+85^{\circ}\text{C}$ .                                                                                                                                                                                                                                                                                      |
| <b>Switching Speed:</b>         | 10% to 90% or 90% to 10% of RF. There is an additional 30 nanosec of driver delay.                                                                                                                                                                                                                                                                               |
| <b>Environment:</b>             | MIL-E-5400, MIL-STD-202, MIL-E-16400 MIL-STD-883 (Special request only).                                                                                                                                                                                                                                                                                         |
| <b>Connectors:</b>              | RF connectors are SMA. Other connectors available (when specified at time of order) include types N, TNC, and BNC.                                                                                                                                                                                                                                               |

### NOTES:

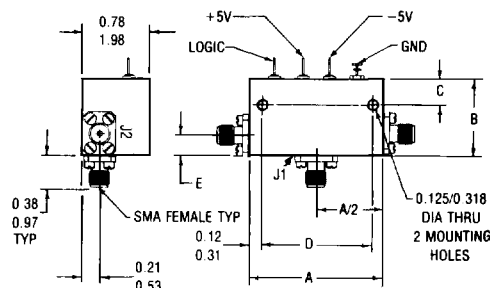
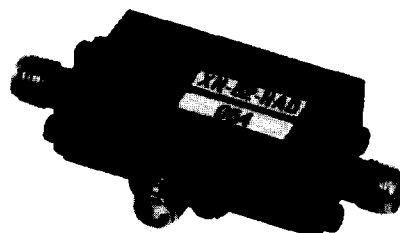
1. Drive connection is normally supplied as a solder feedthrough terminal. Separate inputs for each path are available on request. Other connectors available (when specified at time of order) include SMA and SMC.
2. If driver is required, add "D" to the model number when ordering, i.e. Model XN-11, with driver, becomes XN-11D.
3. When ordering, the complete model number should be given. The model number consists of the model number for a standard switch plus the dash number for any options, i.e. model XN-69D-1 is a SPDT switch with driver whose frequency range is 5.9 to 6.4 GHz and a switching speed of 100 nanosecs.
4. Any unit listed can be supplied with pins instead of RF connectors. (Consult factory.)
5. Switches are available with output connectors in line with input. Sizes may change and a special part number may be assigned. (Consult factory.)

### MECHANICAL OUTLINES

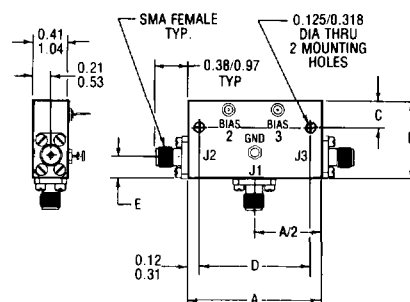
| Outline | A<br>Inches<br>cm. | B<br>Inches<br>cm. | C<br>Inches<br>cm. | D<br>Inches<br>cm. | E<br>Inches<br>cm. |
|---------|--------------------|--------------------|--------------------|--------------------|--------------------|
| 1       | 1.55<br>3.56       | 0.90<br>2.29       | 0.30<br>0.76       | 1.300<br>3.327     | 0.25<br>0.64       |
| 2       | 1.30<br>3.30       | 0.75<br>1.91       | 0.20<br>0.51       | 1.050<br>2.692     | 0.25<br>0.64       |
| 3       | 1.55<br>3.56       | 0.95<br>2.41       | 0.30<br>0.76       | 1.300<br>3.327     | 0.35<br>0.89       |
| 4       | 2.00<br>5.08       | 1.00<br>2.54       | 0.35<br>0.89       | 1.750<br>4.470     | 0.30<br>0.76       |
| 5       | 1.55<br>3.94       | 0.95<br>2.41       | 0.30<br>0.76       | 1.300<br>3.327     | 0.25<br>0.64       |
| 6       | 1.55<br>3.94       | 1.20<br>3.05       | 0.50<br>1.27       | 1.300<br>3.327     | 0.25<br>0.64       |
| 7       | 1.55<br>3.94       | 0.90<br>2.29       | 0.30<br>0.76       | 1.300<br>3.327     | 0.25<br>0.64       |

Inches/Centimeters

xx  $\pm 0.3$  xxx  $\pm .010$  / xx  $\pm .08$  xxx  $\pm .025$



OUTLINE WITH DRIVER J1-INPUT



OUTLINE WITHOUT DRIVER J1-INPUT

### TYPICAL MODEL NO.

XX  
 or  
 XX-HA  
 - D - X  
 Model Series    Freq Code    Driver Option    Speed Option  
 (Note 2) (Note 3)

Hermetic Seal  
 and MIL STD 883  
 Screening Available

**KDI/triangle  
ELECTRONICS**

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# NARROWBAND

# SPDT SWITCH

# SERIES XN/XN-HA

HIGH ISOLATION REFLECTIVE AND ABSORPTIVE 0.02-18 GHz

## ELECTRICAL PERFORMANCE

Power: 1 watt average, 10 watts peak, survival

| STANDARD SWITCH                                                 |                      |                     |                   |                                    |            |                     | HIGH SPEED OPTION |                                    |                |                                    |
|-----------------------------------------------------------------|----------------------|---------------------|-------------------|------------------------------------|------------|---------------------|-------------------|------------------------------------|----------------|------------------------------------|
| Isolation: 60 dB or 80 dB minimum<br>Speed: 2 microsec. maximum |                      |                     |                   |                                    |            |                     | MODEL-1           |                                    | MODEL-2        |                                    |
| Reflective Model No.                                            | Absorptive Model No. | Frequency Range GHz | Isolation Min. dB | Insertion Loss Max. dB Ref. / Abs. | VSWR† Max. | Outline Ref. / Abs. | Speed Nanosec.    | Insertion Loss Max. dB Ref. / Abs. | Speed Nanosec. | Insertion Loss Max. dB Ref. / Abs. |
| XN-11                                                           | XN-13-HA             | 0.02-0.07           | 60                | 0.35 / 0.45                        | 1.45       | 1 / 4               | 500               | 0.40 / 0.50                        | N/A            | N/A                                |
| XN-12                                                           | XN-14-HA             | 0.02-0.07           | 80                | 0.40 / 0.50                        | 1.45       | 1 / 4               | 500               | 0.45 / 0.55                        | N/A            | N/A                                |
| XN-14                                                           | XN-15-HA             | 0.2-0.25            | 60                | 0.45 / 0.55                        | 1.45       | 1 / 4               | 500               | 0.50 / 0.60                        | N/A            | N/A                                |
| XN-15                                                           | XN-17-HA             | 0.2-0.25            | 80                | 0.50 / 0.60                        | 1.45       | 1 / 4               | 500               | 0.55 / 0.65                        | N/A            | N/A                                |
| XN-17                                                           | XN-19-HA             | 0.4-0.45            | 60                | 0.45 / 0.55                        | 1.45       | 1 / 6               | 200               | 0.50 / 0.60                        | N/A            | N/A                                |
| XN-18                                                           | XN-20-HA             | 0.4-0.45            | 80                | 0.50 / 0.60                        | 1.45       | 1 / 5               | 200               | 0.55 / 0.65                        | N/A            | N/A                                |
| XN-21                                                           | XN-22-HA             | 0.7-0.8             | 60                | 0.55 / 0.65                        | 1.45       | 2 / 5               | 100               | 0.60 / 0.70                        | 20             | 0.65 / 0.75                        |
| XN-22                                                           | XN-24-HA             | 0.7-0.8             | 80                | 0.60 / 0.70                        | 1.45       | 2 / 5               | 100               | 0.65 / 0.75                        | 20             | 0.70 / 0.80                        |
| XN-24                                                           | XN-25-HA             | 0.95-1.22           | 60                | 0.65 / 0.75                        | 1.45       | 2 / 5               | 100               | 0.70 / 0.80                        | 20             | 0.75 / 0.85                        |
| XN-25                                                           | XN-26-HA             | 0.95-1.22           | 80                | 0.70 / 0.80                        | 1.45       | 2 / 5               | 100               | 0.75 / 0.85                        | 20             | 0.80 / 0.90                        |
| XN-27                                                           | XN-28-HA             | 1.02-1.10           | 60                | 0.65 / 0.75                        | 1.45       | 2 / 5               | 100               | 0.70 / 0.80                        | 20             | 0.75 / 0.85                        |
| XN-28                                                           | XN-30-HA             | 1.02-1.10           | 80                | 0.70 / 0.80                        | 1.45       | 2 / 5               | 100               | 0.75 / 0.85                        | 20             | 0.80 / 0.90                        |
| XN-31                                                           | XN-31-HA             | 1.2-1.4             | 60                | 0.65 / 0.75                        | 1.45       | 2 / 5               | 100               | 0.70 / 0.80                        | 20             | 0.75 / 0.85                        |
| XN-32                                                           | XN-33-HA             | 1.2-1.4             | 80                | 0.70 / 0.80                        | 1.45       | 2 / 5               | 100               | 0.75 / 0.85                        | 20             | 0.80 / 0.90                        |
| XN-34                                                           | XN-35-HA             | 1.5-1.6             | 60                | 0.70 / 0.80                        | 1.45       | 2 / 5               | 100               | 0.75 / 0.85                        | 20             | 0.80 / 0.90                        |
| XN-35                                                           | XN-37-HA             | 1.5-1.6             | 80                | 0.80 / 0.90                        | 1.45       | 2 / 5               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-37                                                           | XN-39-HA             | 1.7-2.4             | 60                | 0.80 / 0.90                        | 1.45       | 2 / 5               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-38                                                           | XN-40-HA             | 1.7-2.4             | 80                | 0.85 / 0.95                        | 1.45       | 2 / 5               | 100               | 0.90 / 1.00                        | 20             | 0.95 / 1.10                        |
| XN-41                                                           | XN-42-HA             | 2.2-2.3             | 60                | 0.80 / 0.90                        | 1.45       | 2 / 5               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-42                                                           | XN-44-HA             | 2.2-2.3             | 80                | 0.85 / 0.95                        | 1.45       | 2 / 5               | 100               | 0.90 / 1.00                        | 20             | 0.95 / 1.10                        |
| XN-44                                                           | XN-45-HA             | 2.9-3.1             | 60                | 0.80 / 0.90                        | 1.45       | 3 / 6               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-45                                                           | XN-46-HA             | 2.9-3.1             | 80                | 0.85 / 0.95                        | 1.45       | 3 / 6               | 100               | 0.90 / 1.00                        | 20             | 0.95 / 1.10                        |
| XN-47                                                           | XN-48-HA             | 3.1-3.5             | 60                | 0.80 / 0.90                        | 1.45       | 3 / 6               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-48                                                           | XN-50-HA             | 3.1-3.5             | 80                | 0.85 / 0.95                        | 1.45       | 3 / 6               | 100               | 0.90 / 1.00                        | 20             | 0.95 / 1.10                        |
| XN-51                                                           | XN-51-HA             | 3.3-3.7             | 60                | 0.80 / 0.90                        | 1.45       | 3 / 6               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-52                                                           | XN-53-HA             | 3.3-3.7             | 80                | 0.85 / 0.95                        | 1.45       | 3 / 6               | 100               | 0.90 / 1.00                        | 20             | 0.95 / 1.10                        |
| XN-54                                                           | XN-55-HA             | 3.7-4.2             | 60                | 0.80 / 0.90                        | 1.45       | 3 / 6               | 100               | 0.85 / 0.95                        | 20             | 0.90 / 1.00                        |
| XN-55                                                           | XN-57-HA             | 3.7-4.2             | 80                | 0.85 / 0.95                        | 1.45       | 3 / 6               | 100               | 0.90 / 1.00                        | 20             | 0.95 / 1.10                        |
| XN-57                                                           | XN-59-HA             | 4.2-4.4             | 60                | 0.90 / 1.00                        | 1.45       | 3 / 6               | 100               | 0.95 / 1.10                        | 20             | 1.00 / 1.20                        |
| XN-58                                                           | XN-60-HA             | 4.2-4.4             | 80                | 0.95 / 1.10                        | 1.45       | 3 / 6               | 100               | 1.00 / 1.20                        | 20             | 1.05 / 1.30                        |
| XN-62                                                           | XN-62-HA             | 4.4-5.0             | 60                | 1.00 / 1.10                        | 1.45       | 3 / 6               | 100               | 1.05 / 1.20                        | 20             | 1.10 / 1.30                        |
| XN-62                                                           | XN-64-HA             | 4.4-5.0             | 80                | 1.05 / 1.15                        | 1.45       | 3 / 6               | 100               | 1.10 / 1.25                        | 20             | 1.15 / 1.40                        |
| XN-64                                                           | XN-66-HA             | 5.0-5.25            | 60                | 1.05 / 1.15                        | 1.45       | 3 / 6               | 100               | 1.10 / 1.25                        | 20             | 1.15 / 1.40                        |
| XN-65                                                           | XN-67-HA             | 5.0-5.25            | 80                | 1.10 / 1.20                        | 1.45       | 3 / 6               | 100               | 1.15 / 1.30                        | 20             | 1.20 / 1.40                        |
| XN-67                                                           | XN-68-HA             | 5.4-5.9             | 60                | 1.10 / 1.20                        | 1.45       | 3 / 6               | 100               | 1.15 / 1.30                        | 20             | 1.20 / 1.40                        |
| XN-68                                                           | XN-70-HA             | 5.4-5.9             | 80                | 1.20 / 1.30                        | 1.45       | 3 / 6               | 100               | 1.25 / 1.40                        | 20             | 1.30 / 1.50                        |
| XN-69                                                           | XN-71-HA             | 5.9-6.4             | 60                | 1.20 / 1.30                        | 1.45       | 3 / 6               | 100               | 1.25 / 1.40                        | 20             | 1.30 / 1.50                        |
| XN-71                                                           | XN-73-HA             | 5.9-6.4             | 80                | 1.30 / 1.40                        | 1.45       | 3 / 6               | 100               | 1.35 / 1.50                        | 20             | 1.40 / 1.60                        |
| XN-72                                                           | XN-75-HA             | 6.7-7.4             | 60                | 1.25 / 1.35                        | 1.45       | 3 / 6               | 100               | 1.30 / 1.50                        | 20             | 1.35 / 1.60                        |
| XN-73                                                           | XN-77-HA             | 6.7-7.4             | 80                | 1.35 / 1.45                        | 1.45       | 3 / 6               | 100               | 1.40 / 1.60                        | 20             | 1.45 / 1.70                        |
| XN-75                                                           | XN-78-HA             | 7.1-7.7             | 60                | 1.30 / 1.40                        | 1.45       | 3 / 6               | 100               | 1.35 / 1.50                        | 20             | 1.40 / 1.60                        |
| XN-76                                                           | XN-79-HA             | 7.1-7.7             | 80                | 1.40 / 1.50                        | 1.45       | 3 / 6               | 100               | 1.45 / 1.60                        | 20             | 1.50 / 1.70                        |
| XN-77                                                           | XN-80-HA             | 8.5-9.6             | 60                | 1.40 / 1.50                        | 1.45       | 2 / 7               | 100               | 1.50 / 1.60                        | 20             | 1.60 / 1.70                        |
| XN-79                                                           | XN-81-HA             | 8.5-9.6             | 80                | 1.50 / 1.60                        | 1.45       | 2 / 6               | 100               | 1.60 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-81                                                           | XN-82-HA             | 9.0-9.2             | 60                | 1.40 / 1.50                        | 1.45       | 2 / 7               | 100               | 1.50 / 1.60                        | 20             | 1.60 / 1.70                        |
| XN-82                                                           | XN-83-HA             | 9.0-9.2             | 80                | 1.50 / 1.60                        | 1.45       | 2 / 6               | 100               | 1.60 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-83                                                           | XN-84-HA             | 9.3-9.7             | 60                | 1.40 / 1.50                        | 1.45       | 2 / 7               | 100               | 1.50 / 1.60                        | 20             | 1.60 / 1.70                        |
| XN-84                                                           | XN-85-HA             | 9.3-9.7             | 80                | 1.50 / 1.60                        | 1.45       | 2 / 6               | 100               | 1.60 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-86                                                           | XN-86-HA             | 9.8-10.4            | 60                | 1.40 / 1.50                        | 1.45       | 2 / 7               | 100               | 1.50 / 1.60                        | 20             | 1.60 / 1.70                        |
| XN-87                                                           | XN-87-HA             | 9.8-10.4            | 80                | 1.50 / 1.60                        | 1.45       | 2 / 6               | 100               | 1.60 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-88                                                           | XN-88-HA             | 10.0-10.5           | 60                | 1.45 / 1.55                        | 1.45       | 2 / 7               | 100               | 1.55 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-89                                                           | XN-89-HA             | 10.0-10.5           | 80                | 1.55 / 1.65                        | 1.45       | 2 / 6               | 100               | 1.65 / 1.80                        | 20             | 1.75 / 1.90                        |
| XN-90                                                           | XN-90-HA             | 12.0-12.4           | 60                | 1.50 / 1.60                        | 1.45       | 2 / 6               | 100               | 1.60 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-91                                                           | XN-91-HA             | 12.0-12.4           | 80                | 1.60 / 1.70                        | 1.45       | 2 / 6               | 100               | 1.70 / 1.80                        | 20             | 1.80 / 1.90                        |
| XN-92                                                           | XN-92-HA             | 13.1-13.5           | 60                | 1.60 / 1.70                        | 1.55       | 2 / 7               | 100               | 1.70 / 1.80                        | 20             | 1.80 / 1.90                        |
| XN-93                                                           | XN-93-HA             | 13.1-13.5           | 80                | 1.70 / 1.80                        | 1.55       | 2 / 7               | 100               | 1.80 / 1.90                        | 20             | 1.90 / 2.00                        |
| XN-94                                                           | XN-94-HA             | 14.5-15.5           | 60                | 1.60 / 1.70                        | 1.55       | 2 / 7               | 100               | 1.70 / 1.80                        | 20             | 1.80 / 1.90                        |
| XN-95                                                           | XN-95-HA             | 14.5-15.5           | 80                | 1.70 / 1.80                        | 1.55       | 2 / 7               | 100               | 1.80 / 1.90                        | 20             | 1.90 / 2.00                        |
| XN-96                                                           | XN-96-HA             | 15.0-17.0           | 60                | 1.50 / 1.60                        | 1.55       | 2 / 7               | 100               | 1.60 / 1.70                        | 20             | 1.70 / 1.80                        |
| XN-97                                                           | XN-97-HA             | 15.0-17.0           | 80                | 1.70 / 1.80                        | 1.55       | 2 / 7               | 100               | 1.80 / 1.90                        | 20             | 1.90 / 2.00                        |
| XN-98                                                           | XN-98-HA             | 16.0-18.0           | 60                | 1.70 / 1.80                        | 1.55       | 2 / 7               | 100               | 1.80 / 1.90                        | 20             | 2.00 / 2.00                        |
| XN-99                                                           | XN-99-HA             | 16.0-18.0           | 80                | 1.90 / 2.00                        | 1.55       | 2 / 7               | 100               | 2.00 / 2.10                        | 20             | 2.20 / 2.25                        |

If improvement of any of the electrical specifications listed above is required, consult factory.

† Reflective Switch: VSWR measured in the 'ON' input and 'ON' Output Position.

Absorptive Switch: VSWR measured in the 'ON' input and 'ON' Output and 'OFF' Output Position.

Insertion Loss measured with input power less than 100 mW.

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