

SMA Reflective SP4T GaN High Power PIN Diode Switch from DC to 6 GHz Rated at 40 Watts < 100ns Speed with Heatsink

The FMSW1109 is a high power Reflective SP4T PIN Diode Switch that operates from DC to 6 GHz and incorporates an integrated heatsink to ensure optimum thermal dissipation for highly reliable operation. The module utilizes Gallium Nitride (GaN) and chip-and-wire technology in the manufacturing process that ensures state-of-the-art power performance with excellent power-to-volume ratio that's ideal for broadband high power applications. The 50 ohm reflective design has impressive RF input power handling capability for cold switching up to +46 dBm, and incorporates TTL compatible driver circuitry for accurate logic control. Typical performance includes 1.7 dB insertion loss, 40 dB isolation, 1.35:1 VSWR, and < 100 nsec switching speed. Operational temperature range is -45°C to +85°C and the bias voltage requirement is +5Vdc. The rugged and compact package supports SMA female connectors and is designed to meet a series of environmental conditions including Altitude, Vibration, Humidity, and Shock.

Electrical Specifications

TTL Control Logic

Off/Isolation: 0 to 0.8 V
On/Low Loss: 2.8 to 5 V

Description	Min	Typ	Max	Units
Frequency Range	DC		6	GHz
Impedance		50		Ohms
VSWR		1.35:1	1.5:1	
Insertion Loss		1.5	2	dB
IL Temp. Coefficient		0.003		dB/degC
Isolation	25	40		dB
Switching Time			100	ns
P0.1dB		50		dBm
Input IP3		50		dBm
Input Power (CW)			40	Watts
DC Power Dissipation		1		Watt
Positive Operating Voltage		5		Vdc
Current @ 5 Vdc		200		mA
Operating Temperature	-45		+85	deg C

Performance by Frequency

Description	F1	F2	F3	F4	F5	Units
Frequency Range	DC to 3	3 to 6				GHz
VSWR, Max	1.3:1	1.5:1				
VSWR, Typ	1.2:1	1.35:1				
Insertion Loss, Max	1.5	2				dB
Insertion Loss, Typ	1	1.7				dB
Isolation, Min	35	25				dB
Isolation, Typ	42	30				dB

Electrical Specification Notes:

Internal TTL Driver will become damaged if Negative Voltage is applied



Features:

- Reflective SPDT High Power PIN Diode Switch
- GaN Semiconductor Technology
- Reflective Design
- Frequency Range: 500 MHz to 18 GHz
- Insertion Loss: 1.7 dB typ
- Isolation: 40 dB typ
- VSWR: 1.35:1 typ
- Maximum RF Input Power: +46 dBm
- Input IP3: +50 dBm typ
- Switching Speed: < 100 nsec
- TTL Compatible Driver Circuitry
- 50 Ohm Design
- SMA Female Connectors
- Compact Package Design withstands up to 95% Relative Humidity
- -45°C to +85°C Operating Temperature

Applications:

- Aerospace & Defense
- Microwave Radio
- Military & Commercial Communication
- VSAT
- SATCOM
- Test & Measurement
- Wireless Infrastructure
- Fiber Optics

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*Cold Switching: Before changing any TTL signal(s), the RF input power must be blanked or the switch could become damaged

Absolute Maximum Rating

Parameter	Rating
Biasing	+12V±10%
TTL Control Voltage	0~0.8V/2.8~5V



ESD Sensitive Material,
Transport material in
Approved ESD bags.
Handle only in approved
ESD Workstation.

Mechanical Specifications

Length	1.97 in [50.04 mm]
Width	1.97 in [50.04 mm]
Height	0.37 in [9.4 mm]
Design	Reflective, SP4T
RF Connector	SMA Female

Environmental Specifications

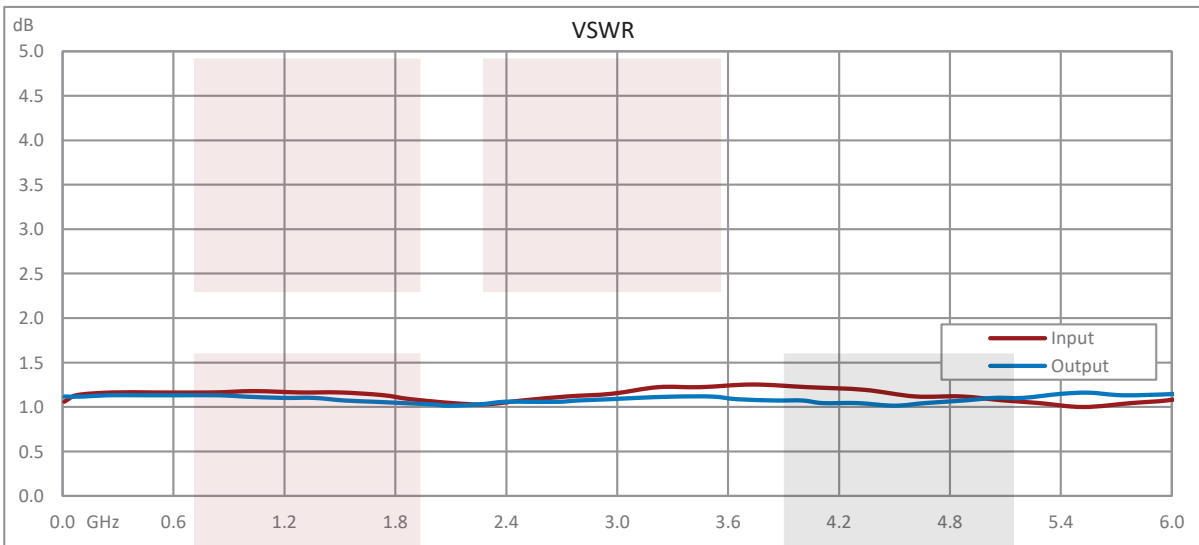
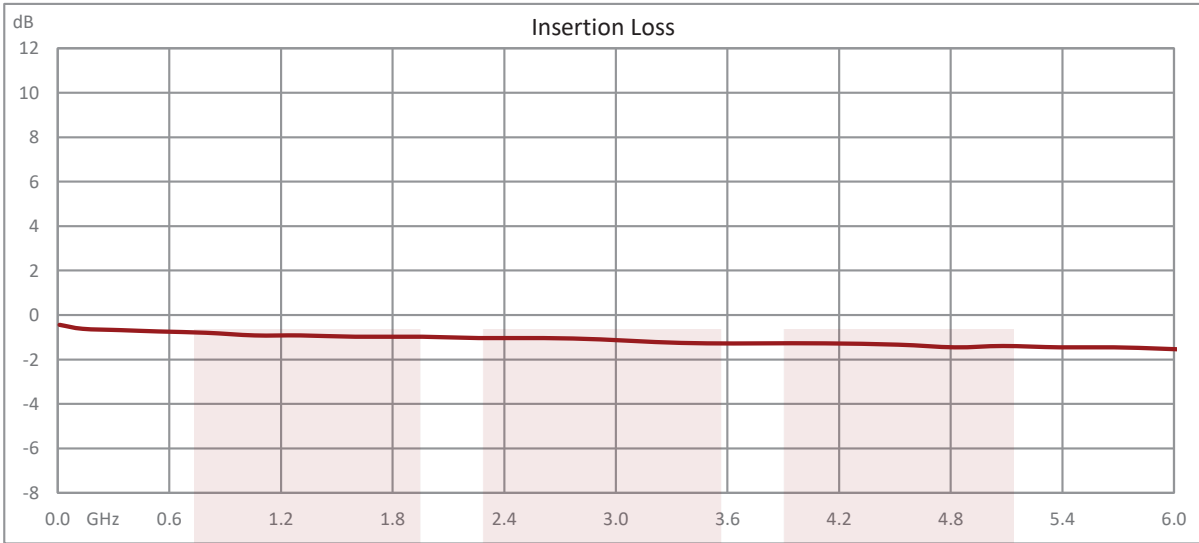
Temperature	
Operating Range	-45 to +85 deg C
Storage Range	-55 to +125 deg C
Humidity	100% RH @ 35°C, 95% RH @ 40°C
Shock	20G for 11ms Half Sinewave, 3 axis both directions
Vibration	25g RMS (15° 2KHz) endurance, 1 hr per axis
Altitude	30,000 ft. (Epoxy Sealed Controlled Environment)

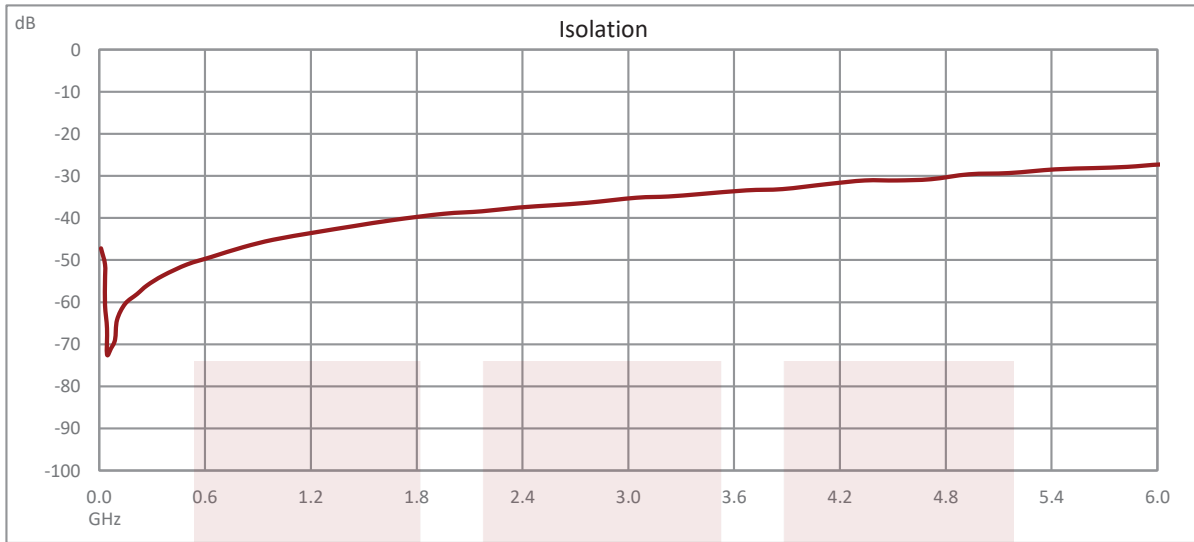
Compliance Certifications (see [product page](#) for current document)

Plotted and Other Data

Notes:

Typical Performance Data





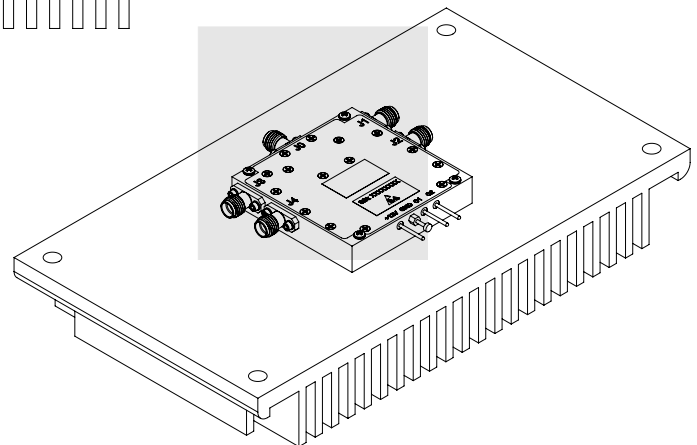
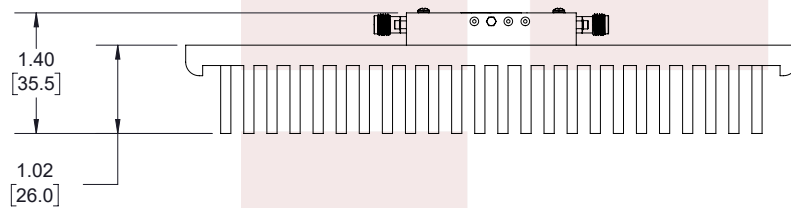
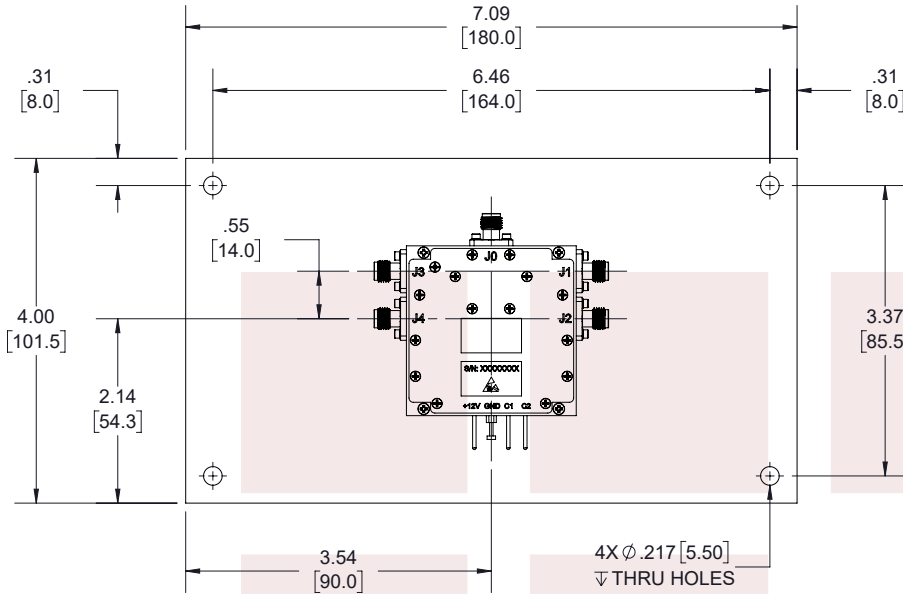
SMA Reflective SP4T GaN High Power PIN Diode Switch from DC to 6 GHz Rated at 40 Watts < 100ns Speed with Heatsink from Fairview Microwave is in-stock and available to ship same-day. All of our RF/microwave products are available off-the-shelf from our ISO 9001:2008 certified facilities in Lewisville, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: [SMA Reflective SP4T GaN High Power PIN Diode Switch from DC to 6 GHz Rated at 40 Watts < 100ns Speed with Heatsink FMSW1109](https://www.fairviewmicrowave.com/sma-sp4t-pin-diode-switch-6-ghz-40-watts-fmsw1109-p.aspx)

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REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
A	INITIAL RELEASE	7/16/2020	T.GALLA



LABEL



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TITLE
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UNLESS OTHERWISE SPECIFIED LEADING DIMENSIONS ARE INCHES
DIMENSIONS IN [] ARE MILLIMETERS

TOLERANCES: CABLE LENGTH (L) TOLERANCES:

.X = ±.2 [5.08]	FRACTIONS	L ≤ 12 [305] = +1 [25] / -0
.XX = ±.02 [.51]	± 1/32	12 [305] < L ≤ 60 [1524] = +2 [51] / -0
.XXX = ±.005 [.13]	ANGLES ± 1°	60 [1524] < L ≤ 120 [3048] = +4 [102] / -0
		120 [3048] < L ≤ 300 [7620] = +6 [152] / -0
		300 [7620] < L = +5%L / -0

THIRD-ANGLE PROJECTION



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SHEET 1 OF 2

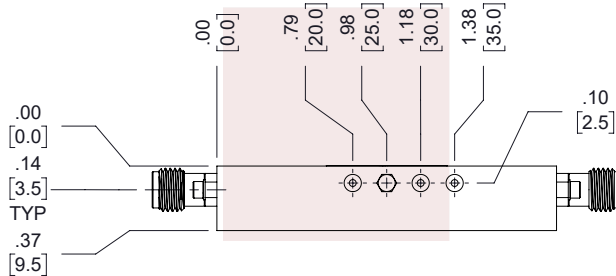
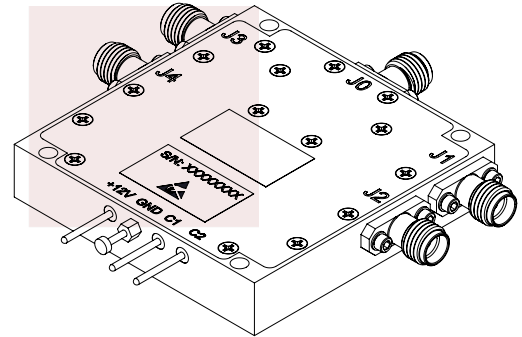
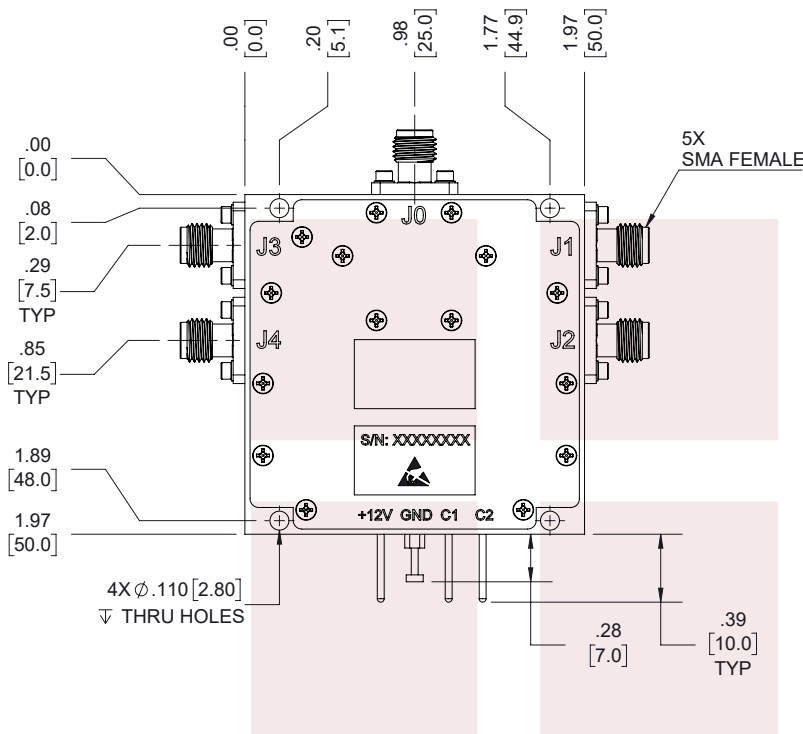
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SCALE N/A

SIZE A	CAGE CODE 3FKR5	DRAWN BY K.DANG	ITEM NO. FMSW1109	REV A
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T-Rev.D

SWITCH DETAIL



Truth Table		
Control Input TTL		Signal Path State
C1	C2	
0	0	J0 - J1
0	1	J0 - J2
1	0	J0 - J3
1	1	J0 - J4

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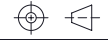
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T-Rev.D