

SP4T USB Ethernet Controlled High Isolation Absorptive Switch 500 MHz to 50 GHz, 2.4mm



FMSW5023

Features

- Ultra-Wideband SP4T PIN Diode Switch
- 500 MHz to 50 GHz
- 50 Ohm Absorptive Design
- Insertion Loss: 5 dB typ
- Isolation: 55 dB typ
- Maximum RF input Power: +23 dBm
- Bias Voltage: +5Vdc
- USB 2.0 Interface and Ethernet (IPv4)
- Field Replaceable Female 2.4mm output
- Operational Temperature Range -40°C to +85°C
- Downloadable User Manual and Software
- USB and Ethernet cables included

Applications

- Test & Measurement
- 5G Communication
- Military Electronic Systems
- Wireless Infrastructure
- Fiber Optics
- Research & Development

Description

The FMSW5023 is a Single Pole Four Throw (SP4T) USB/Ethernet RF Switch Module designed to cover a wide frequency range from 500 MHz to 50 GHz with excellent 55 dB typical isolation and 5 dB typical low insertion loss. The switch requires a +5Vdc bias voltage through USB, and has maximum input power handling of up to +23 dBm. The module supports both USB 2.0 and LAN (Ethernet) interfaces, allowing seamless control from a host PC or networked system. The rugged and compact package supports field replaceable 2.4mm female RF connectors. The SP4T switch can be controlled through an intuitive GUI (downloadable user manual), as well as with system design software such as LabVIEW. The robust construction and wide frequency range make it well-suited for bench-top test and measurement environments, as well as integration into radar and communication systems.

The RF Switch Module includes a USB 2.0 A extension cable and IPv4 Ethernet cable for flexible connectivity. Its advanced internal switching architecture ensures low signal distortion and high isolation between channels, providing consistent and reliable performance across the entire operating frequency range.

Electrical Specifications

Description	Min	Typ	Max	Units
Frequency Range	0.5		50	GHz
Impedance		50		Ohms
VSWR		2.5:1	3:1	
Insertion Loss			7	dB
IL Temperature Coefficient		0.003		
Isolation	40			dB
0.1dB Compression Point		23		
Input IP3	35			dBm
Input Power (CW)			23	dBm
DC Power Dissipation		0.8		Watt
Positive Operating Voltage		5		Vdc
Current @ 5 Vdc		260		mA
Operating Temperature	-40		+85	deg C

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Performance by Frequency

Description	F1	F2	F3	F4	F5	Units
Frequency Range	0.5 to 18	18 to 43.5	43.5 to 50			GHz
Insertion Loss, Max	4	6	7			dB
Insertion Loss, Typ	3.3	5	6.5			dB
Isolation, Min	60	40	45			dB
Isolation, Typ	70	55	55			dB

Mechanical Specifications

Size

Length	3.02 in [76.71 mm]
Width	1.39 in [35.31 mm]
Height	0.98 in [24.89 mm]
Weight	0.05 lbs [22.68 g]
Body Material and Plating	Aluminum, Nickel

Configuration

Design	Absorptive, SP4T
RF Input/Output Connector	2.4mm Female
Control Connector	USB 2.0 Type B
Band Type	Ultra Wide Band

Environmental Specifications

Temperature

Operating Range	-40 to +85 deg C
Storage Range	-50 to +105 deg C
Shock	20G for 11msec half sine wave, 3 axis both directions?
Vibration	25g RMS (15 degrees 2KHz) endurance, 1 hour per axis?

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

Plotted and Other Data

Notes:

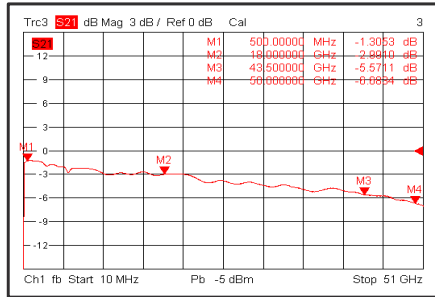
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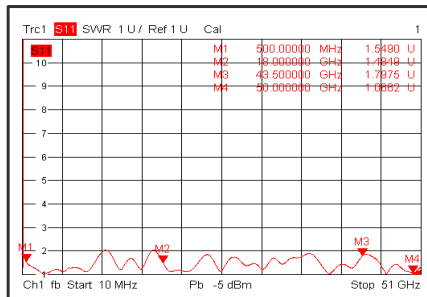
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Typical Performance Data

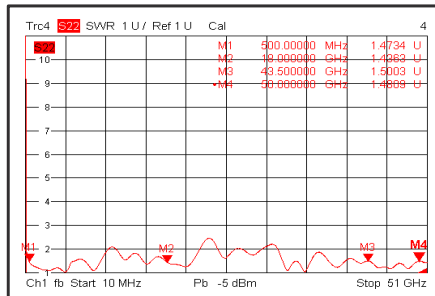
Insertion Loss @+25°C



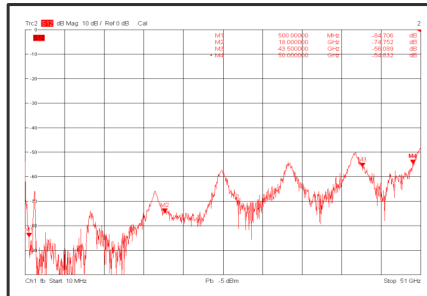
Input VSWR @+25°C



Output VSWR @+25°C



Isolation @+25°C

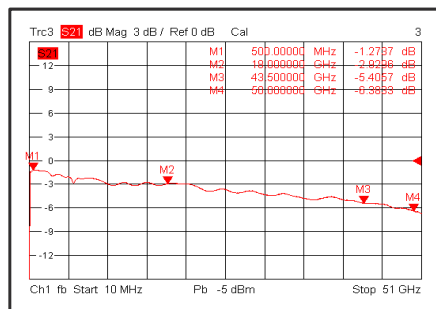


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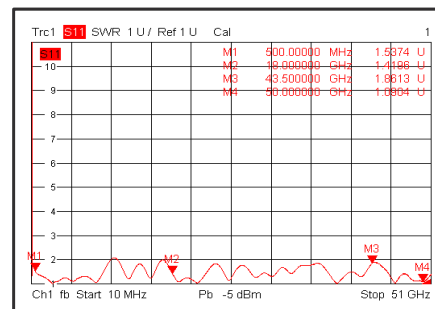


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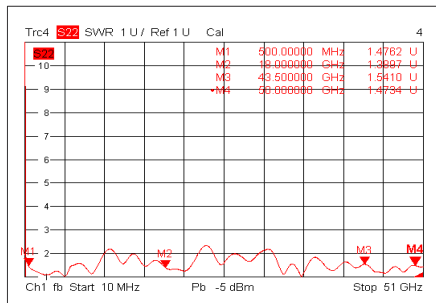
Insertion Loss @-40°C



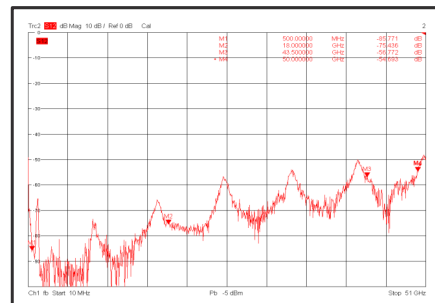
Input VSWR @-40°C



Output VSWR @-40°C



Isolation @-40°C

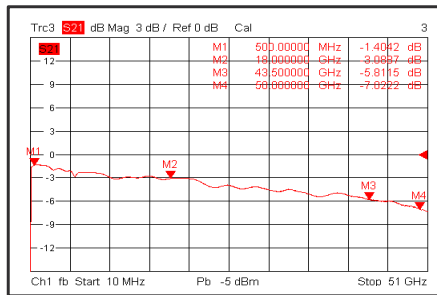


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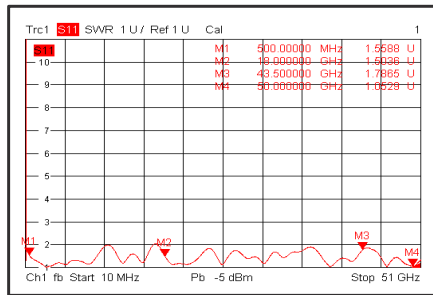


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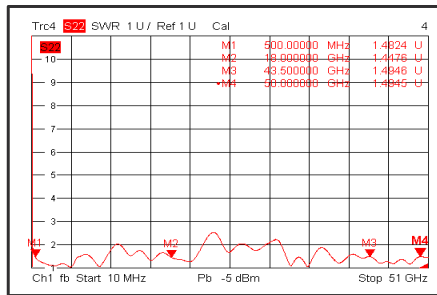
Insertion Loss @+85°C



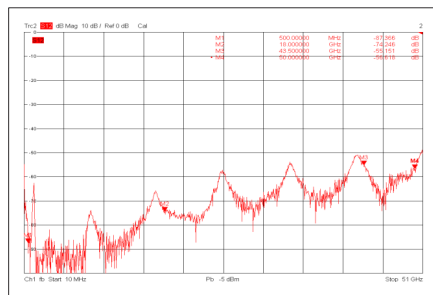
Input VSWR @+85°C



Output VSWR @+85°C



Isolation @+85°C

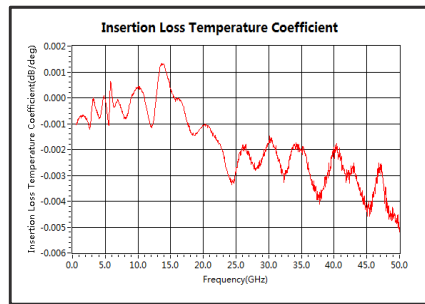


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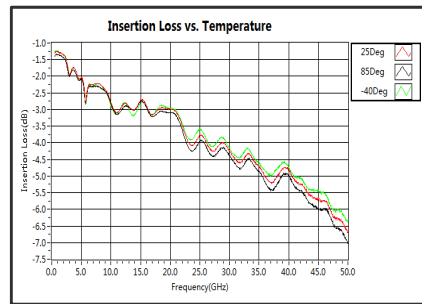


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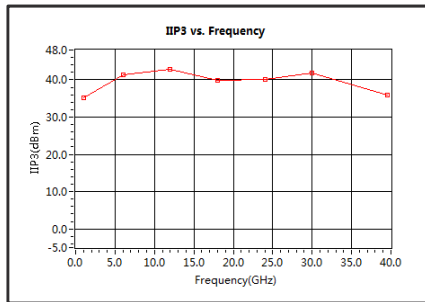
Insertion Loss Temperature Coefficient



Insertion Loss vs. Temperature



IIP3



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SP4T USB Ethernet Controlled High Isolation Absorptive Switch 500 MHz to 50 GHz, 2.4mm 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.

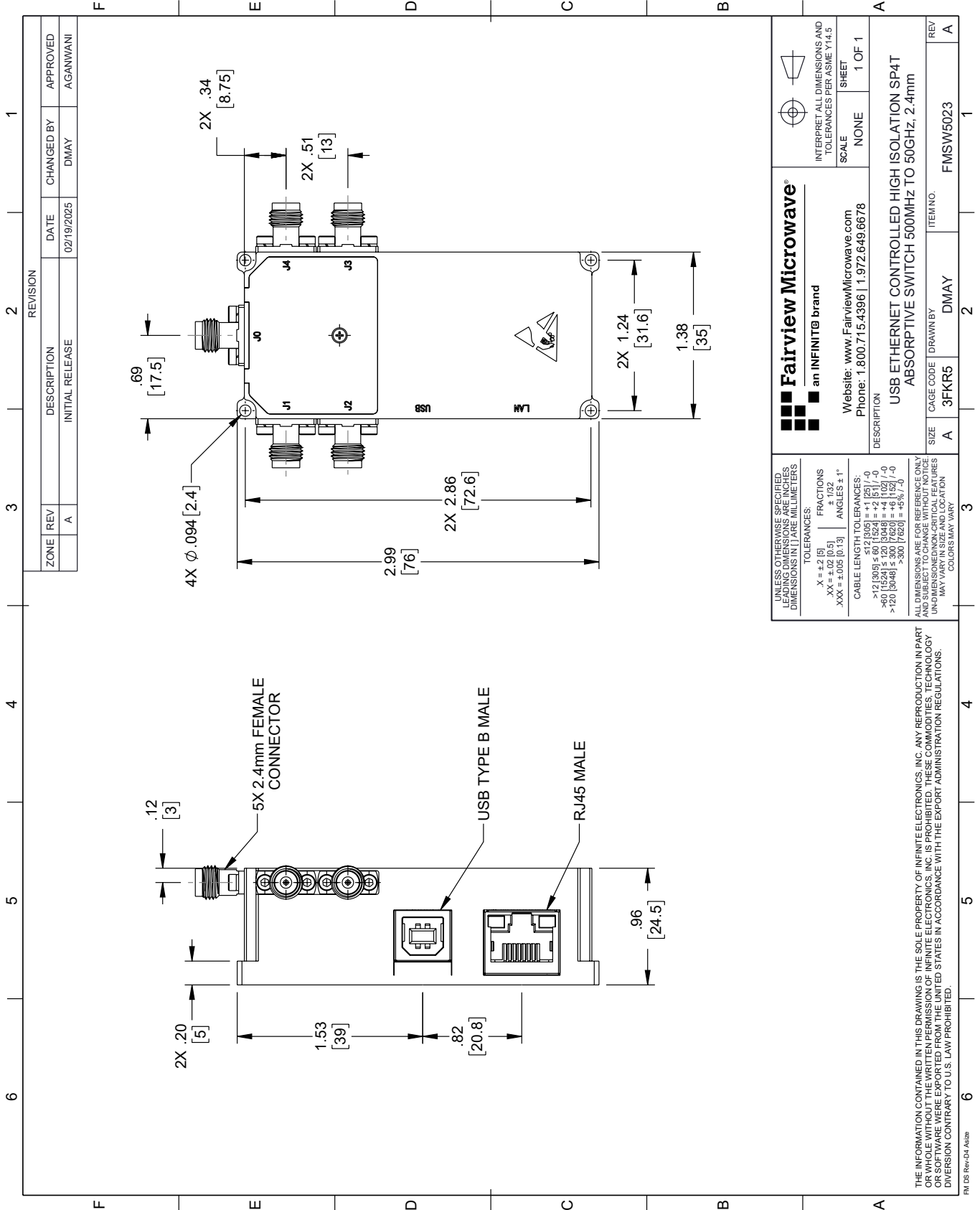
For additional information on this product, please click the following link: [SP4T USB Ethernet Controlled High Isolation Absorptive Switch 500 MHz to 50 GHz, 2.4mm FMSW5023](#)

URL: <https://www.fairviewmicrowave.com/2.4mm-sp4t-pin-diode-switch-absorptive-50-ghz-23-watts-fmsw5023-p.aspx>

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FMSW5023 CAD Drawing

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REVISION		DESCRIPTION		DATE		CHANGED BY		APPROVED	
ZONE	REV	INITIAL RELEASE		02/19/2025		DMAY		AGANWANI	
	A								

 Fairview Microwave® an INFINIT® brand Website: www.FairviewMicrowave.com Phone: 1.800.715.4396 1.972.649.6678		 INTERPRET ALL DIMENSIONS AND TOLERANCES PER ASME Y14.5 SCALE: NONE SHEET: 1 OF 1
DESCRIPTION USB ETHERNET CONTROLLED HIGH ISOLATION SP4T ABSORPTIVE SWITCH 500MHz TO 50GHz, 2.4mm		
SIZE A	CAGE CODE 3FKR5	ITEM NO. FMSW5023
DRAWN BY DMAY	REV A	SCALE NONE

UNLESS OTHERWISE SPECIFIED, LEADING DIMENSIONS ARE IN INCHES AND TRAILING DIMENSIONS ARE IN MILLIMETERS.

TOLERANCES:
 .X = ±.2 [5] FRACTIONS ± 1/32
 .XX = ±.02 [0.5] ANGLES ± 1°
 .XXX = ±.005 [0.13]

CABLE LENGTH TOLERANCES:
 ≤ 12 [305] ±.60 [15.24] = ±.2 [5] / -0
 > 12 [305] ≤ 60 [1524] = ±.1 [2.5] / -0
 > 60 [1524] ≤ 120 [3048] = ±.4 [10.2] / -0
 > 120 [3048] ≤ 300 [7620] = ±.6 [15.2] / -0
 > 300 [7620] = ±.8 [20.3] / -0

ALL DIMENSIONS ARE FOR REFERENCE ONLY. UNDIMENSIONS/NON-CRITICAL FEATURES MAY VARY IN SIZE AND LOCATION. COLORS MAY VARY.

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