FMSW5005 DATA SHEET

# SPDT High Isolation PIN Diode Switch DC to 18 GHz, 65 dB, 27 dBm, 3 dB Loss and SMA 

FMSW5005 is a Single Pole Double Throw (SPDT) Absorptive Switch that covers a wide frequency band from DC to 18 GHz . This general purpose design utilizes GaAs MESFET MMIC technology that has extremely fast switching speed levels of 12 nsec . Additional typical performance includes 65 dB Isolation up to 6 GHz , and 2 dB Insertion Loss at 10 GHz .

The design also incorporates CMOS driver circuitry that allows a single +5 V biased voltage at very low DC current levels. The drop-in package is hermetically sealed with field replaceable SMA connectors. Operating temperature range is $-55^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$. And for added confidence, this rugged package assembly is designed to meet MIL-STD-883 test conditions for Hermeticity and Temperature Cycle.

This High Isolation PI N Diode Switch is part of Fairview Microwave's expanding line of PI N Diode Switch offerings. These parts offer high isolation performance in a very wide Frequency Range coverage and outstanding electrical performance in the band.

Electrical Specifications

| Description | Min | Typ | Max | Units |
| :--- | :---: | :---: | :---: | :---: |
| Frequency Range | DC |  | 18 | GHz |
| Insertion Loss |  | 3 |  | dB |
| Isolation | 65 | dB |  |  |
| Switching Speed | 12 | ns |  |  |
| Control Input | TLL |  |  |  |
| Power Handling | +27 | dBm |  |  |



## Features:

- SPDT Absorptive Switch Design
- GaAs MESFET MMIC Technology
- Ultra Fast Switching Speed 12 nsec typical
- High Isolation 65 dB typical up to 6 GHz
- Low Insertion Loss 2 dB typical at 10 GHz
- CMOS Driver Circuit
- Hermetically Sealed Module
- Field Replaceable SMA Connectors
- $-55^{\circ} \mathrm{C}$ to $+85^{\circ} \mathrm{C}$ Operating Temperature
- Designed to meet MIL-STD-883 Conditions


## Applications:

- Electronic Warfare
- Electronic Countermeasures
- Microwave Radio
- VSAT
- Radar
- Fiber Optic
- Space Systems
- Test Instrumentation
- Telecom Infrastructure
- Base station Infrastructure

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Performance by Frequency

| Parameter | Frequency | Min. | Typ. | Max. | Units |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Insertion Loss | DC - 6 GHz |  | 1.6 | 2.4 | dB |
|  | DC - 10 GHz |  | 2.0 | 2.8 | dB |
|  | DC - 18 GHz |  | 3.0 | 5.5 | dB |
| Isolation | DC-6 GHz | 55 | 65 |  | dB |
|  | DC - 10 GHz | 50 | 60 |  | dB |
|  | DC - 18 GHz | 42 | 55 |  | dB |
| Return Loss "On State" | $\begin{gathered} \text { DC }-6 \mathrm{GHz} \\ \mathrm{DC}-18 \mathrm{GHz} \end{gathered}$ |  | $\begin{aligned} & 17 \\ & 12 \end{aligned}$ |  | dB |
| Return Loss RF1, RF2 "Off State" | $\begin{gathered} \mathrm{DC}-6 \mathrm{GHz} \\ \mathrm{DC}-18 \mathrm{GHz} \end{gathered}$ |  | $\begin{aligned} & 14 \\ & 17 \end{aligned}$ |  | dB |
| Input Power for 1 dB Compression | 0.5-18 GHz | 24 | 27 |  | dBm |
| Input Third Order Intercept <br> (Two-Tone Input Power $=+7 \mathrm{dBm}$ Each Tone) | 0.5-18 GHz |  | 46 |  | dBm |
| Switching Characteristics tRISE, tFALL (10/90\% RF) tON, tOFF (50\% CTL to 10/90\% RF) | DC - 18 GHz |  | $\begin{gathered} 3 \\ 12 \end{gathered}$ |  | ns |
| Switching Transients | DC-18 GHz |  | 12 |  | mVpp |

Functional Block Diagram


## Mechanical Specifications

## Size

Length
Width/Dia.
0.9 in [22.86 mm]
0.8 in [20.32 mm]
0.355 in [ 9.02 mm ]

Height
$0.1034 \mathrm{lbs}[46.9 \mathrm{~g}]$

## Environmental Specifications By Design

Temperature
Operating Range
Storage Range
-55 to +85 deg C -65 to +150 deg C

Temperature Cycling Hermetic Seal

ESD Sensitivity

MIL-STD-883, Method 101C, Cond B
Gross Leak MIL-STD-883 Method 1014C1/Fine Leak MIL-STD-883, Method 1014A2, $5 \times 10-8$ atm cc
ESD Sensitive Material, Transport material in Approved ESD bags. Handle only in ESD Workstation.

Compliance Certifications (visit www.FairviewMicrowave.com for current document) RoHS Compliant

## Plotted and Other Data

Notes:

- Values at $+25^{\circ} \mathrm{C}$, sea level


## Typical Performance Data

Insertion Loss
Return Loss RFC


Return Loss RF1, RF2 On



Return Loss RF1, RF2 Off


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Input P1dB Compression Point


Isolation Between Ports RF1 and RF2


Input Third Order Intercept Point


SPDT High Isolation PIN Diode Switch DC to $18 \mathrm{GHz}, 65 \mathrm{~dB}, 27 \mathrm{dBm}, 3 \mathrm{~dB}$ Loss and SMA from Fairview Microwave is instock 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 Allen, Texas. Fairview Microwave is RF on-demand.

For additional information on this product, please click the following link: SPDT High Isolation PIN Diode Switch DC to 18 GHz, $65 \mathrm{~dB}, 27 \mathrm{dBm}, 3 \mathrm{~dB}$ Loss and SMA FMSW5005

URL: https://www.fairviewmicrowave.com/high-isolation-pin-diode-switch-18-ghz-65db-3db-fmsw5005-p.aspx

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| TRUTH TABLE |  |  |
| :---: | :---: | :---: |
| CONTROL INPUT | SIGNAL PATH STATE |  |
| Vctl | RFC to RF1 | RFC to RF2 |
| HIGH | ON | OFF |
| LOW | OFF | ON |


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| :---: | :---: | :---: | :---: | :---: | :---: |
| TITLE <br> SPDT High Isolation PIN Diode Switch DC to 18 GHz , | FMSW5005 |  | CAGE | 3FKR5 |  |
|  | CAD FILE 071916 | SHEET | SCALE N/A | SIZE A | 2233 |


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