



65 dB High Isolation SPDT PIN Diode Switch DC to 18 GHz, 3 dB Insertion Loss with SMA

TECHNICAL DATA SHEET

PE71S5005

The PE71S5005 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 +5V 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°C to +85°C. And for added confidence, this rugged package assembly is designed to meet MIL-STD-883 test conditions for Hermeticity and Temperature Cycle.

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°C to +85°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

Electrical Specifications

Description	Minimum	Typical	Maximum	Units
Frequency Range	DC		18	GHz
Insertion Loss		3		dB
Isolation		65		dB
Switching Speed		12		ns
Control Input		TTL		
Power Handling		+27		dBm

Click the following link (or enter part number in "SEARCH" on website) to obtain additional part information including price, inventory and certifications: [65 dB High Isolation SPDT PIN Diode Switch DC to 18 GHz, 3 dB Insertion Loss with SMA PE71S5005](#)



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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"		DC - 6 GHz	17	dB
			DC - 18 GHz	12	
Return Loss RF1, RF2	"Off State"		DC - 6 GHz	14	dB
			DC - 18 GHz	17	
Input Power for 1 dB Compression	0.5 - 18 GHz	24	27		dBm
Input Third Order Intercept (Two-Tone Input Power = +7 dBm Each Tone)	0.5 - 18 GHz		46		dBm
Switching Characteristics	tRISE, tFALL (10/90% RF)	DC - 18 GHz	3		ns
	tON, tOFF (50% CTL to 10/90% RF)		12		
	Switching Transients	DC - 18 GHz		12	

TTL Logic Table

Absolute Maximum Rating

RF Input Power	+30 dBm
Supply Voltage (Vdc)	+7 V
Control Voltage Range (Vctl)	-0.5V to Vdc +0.5V
Hot Switch Power Level	+27 dBm
Storage Temperature	-65 to +150 °C
Operating Temperature	-55 to +85 °C

Control Voltages

State	Bias Condition
High	+3.5 to Vdc @ 1 mA Typ.
Low	0 to +1.5V @ 20 µA Typ.

Bias Voltage & Current

Vdc Range = +5 Vdc ± 10%	
Vdc (V)	Idc (Typ.) (mA)
+5.0	1.4

(Bias current increases with switching rate to 15 - 20 mA.)

Truth Table

Control Input	Signal Path State	
	RFC to RF1	RFC to RF2
Vctl		
High	On	Off
Low	Off	On

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Mechanical Specifications

Size

Length	0.9 in [22.86 mm]
Width/Dia.	0.8 in [20.32 mm]
Height	0.355 in [9.02 mm]
Weight	0.104 lbs [47.17 g]

Environmental Specifications By Design

Temperature

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

Temperature Cycling
Hermetic Seal

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

ESD Sensitivity



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

Plotted and Other Data

Notes:

- Values at +25 °C, sea level

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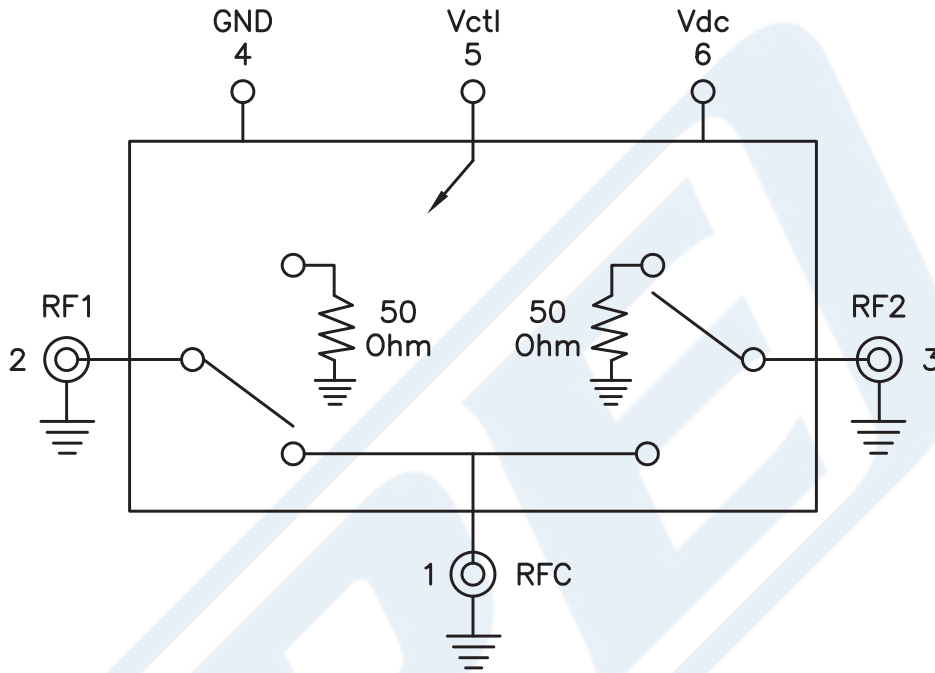


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Functional Block Diagram



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Pin Descriptions

Pin Number	Function	Description	Interface Schematic
1, 2, 3	RFC, RF1, RF2	RF connector, SMA female, field replaceable. These pins are DC coupled and matched to 50 Ohms. DC blocking capacitors are required if external RF line potential is not equal to 0V.	
4	GND	Power supply ground.	
5	Vctl	CMOS interface, control voltages per table. Requires active pullup to +5V (V _{dc}).	
6	Vdc	Supply voltage	

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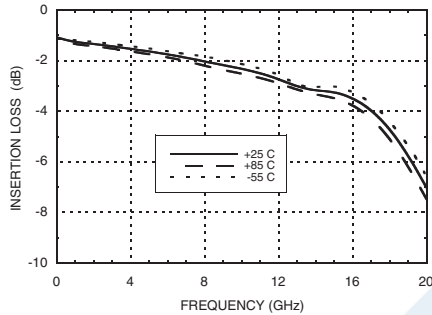


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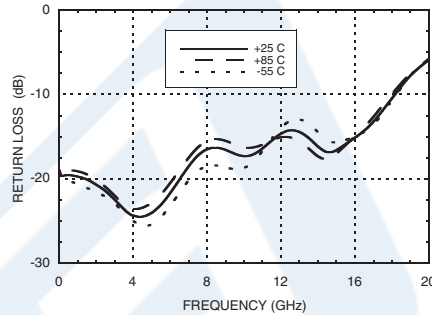
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Typical Performance Data

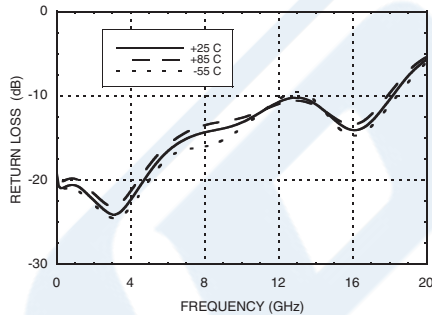
Insertion Loss



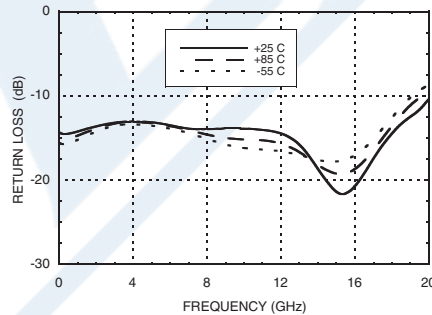
Return Loss RFC



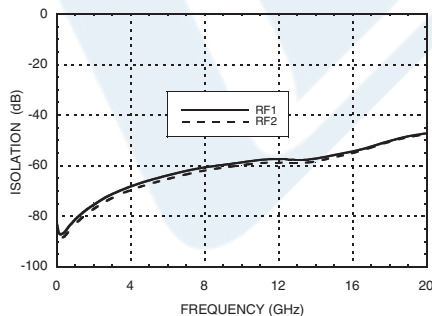
Return Loss RF1, RF2 On



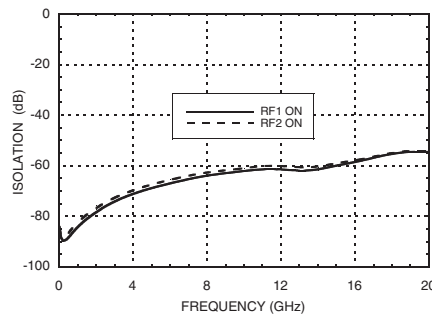
Return Loss RF1, RF2 Off



Isolations



Isolation Between Ports RF1 and RF2



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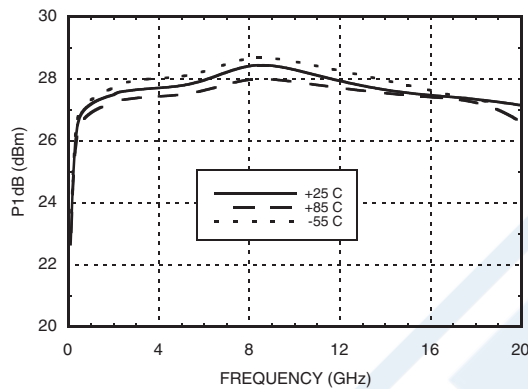


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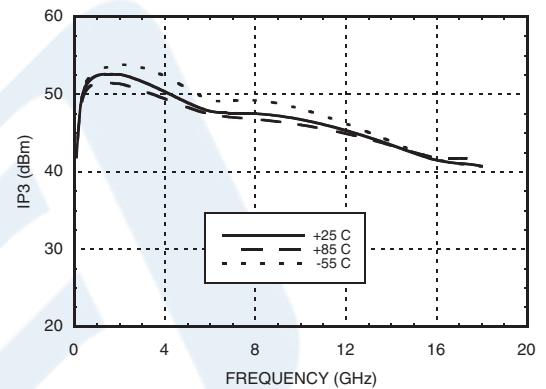
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Input P1dB Compression Point



Input Third Order Intercept Point



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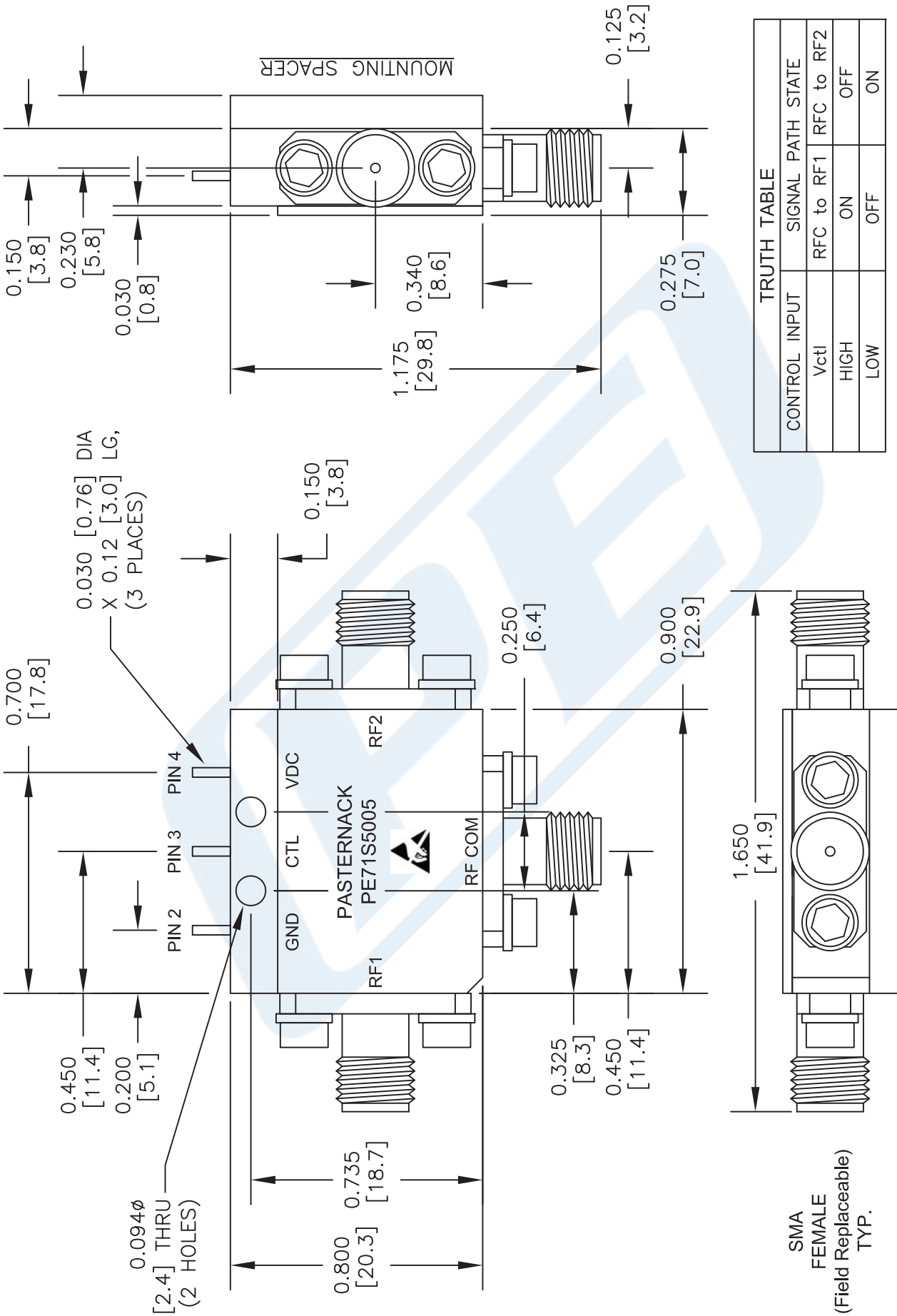
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PE71S5005 CAD Drawing

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NOTES:
1. UNLESS OTHERWISE SPECIFIED ALL DIMENSIONS ARE NOMINAL.
2. ALL SPECIFICATIONS ARE SUBJECT TO CHANGE WITHOUT NOTICE AT ANY TIME.
3. DIMENSIONS ARE IN INCHES [mm].

DWG TITLE
PE71S5005

FSCM NO. 53919

CAD FILE 071916 SCALE N/A SIZE A 2233

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