


SJM PREWELL PSC13A

Single Ended 3-Way Active Splitter

Features

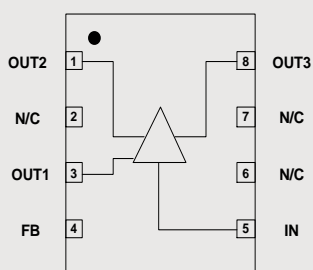
- 3-Way Active Splitter
- Single Ended Input and Outputs
- Gain 3.1dB @ 50MHz
- 15dBmV / Channel Input
- NF 3.4dB @ 400MHz
- Lead-free / Green / RoHS  compliant DFN Package

Applications

- Set-top Box
- Home Gateways
- CATV Distribution System
- Cable Splitter Modules

Functional Diagram

RF IN	5	RF OUT 1	3
Feedback / bias	4	RF OUT 2	1
		RF OUT 3	8



Exposed Pad – RF/DC GND

* The exposed pad centered on the package bottom must be connected to RF/DC ground.

ESD/MSL

- 1 ESD sensitive device. Observe handling precautions.
- 2 HBM: Class 1B, JESD22-A114
- 3 CDM: Class C3, JESD22-C101F
- 4 MSL 3, J-STD-020

Description

The PSC13A is a GaAs MMIC single ended 3-way active splitter which exhibits low noise figure and distortion in a lead-free 2mm 8-lead DFN plastic package. The device features 75Ω input and outputs. The PSC13A is fabricated in using p-HEMT process to realize low noise and low distortion. All devices are 100% RF and DC tested.

Specifications

Parameter	Units	Typ.	Condition
Gain	dB	3.1	IN to OUT1/OUT2/OUT3
Gain Flatness	dB	0.7	IN to OUT1/OUT2/OUT3
Input Return Loss	dB	19	IN
Output Return Loss	dB	9.6	OUT1/OUT2/OUT3
Reverse Isolation	dB	30	OUT1/OUT2/OUT3 to IN
Output to Output Isolation	dB	24	Isolation between all RF Outputs
Noise Figure	dB	3.4	IN to OUT1/OUT2/OUT3
Composite Triple Beat	dBc	-59	132ch, 15 dBmV/channel at the Input
Composite Second Order	dBc	-59	132ch, 15dBmV/channel at the Input
P1dB	dBm	8	IN to OUT1/OUT2/OUT3
OIP3	dBm	23	@ 500MHz, Note 1 ²⁾
I _{cc}	mA	130	
V _{DD}	V	5	
T _j	°C	22	@ T _c =85°C

1) Test Conditions : T=25°C, Supply Voltage=5V, 75ohm System,

2) Note 1. OIP3 measured with two tones at an output power of -15dBm/tone separated by 6MHz.

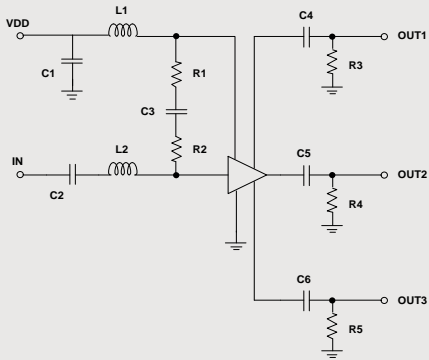
Absolute Maximum Ratings

Parameter	Rating	Unit
Device Voltage	10	V
RF Power Input	12	dBm
Storage Temperature	-55 to 150	°C
Ambient Operating Temperature	-40 to 85	°C
Junction Temperature	185	°C

1) Stresses above the maximum values listed have may cause permanent damage to the device.

2) MTTF is more than 100 years.

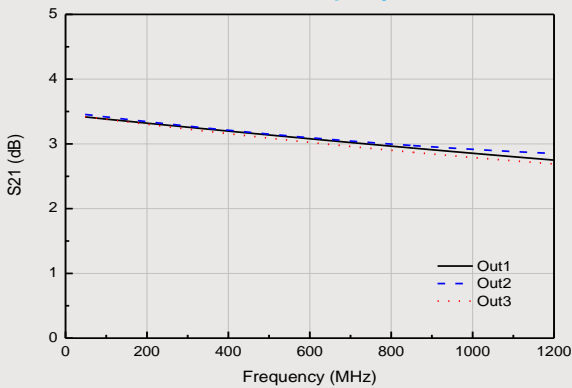
RF Application Circuit



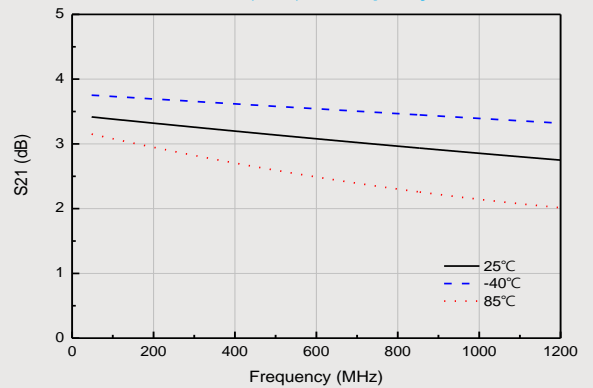
Component Values of Application Circuit

Component	Value	Remark
C1, C2, C3, C4, C5, C6	0.01uF	
L1	1uH	1210 package
L2	5.1nH	
R1, R2	180Ω	
R3, R4, R5	390Ω	

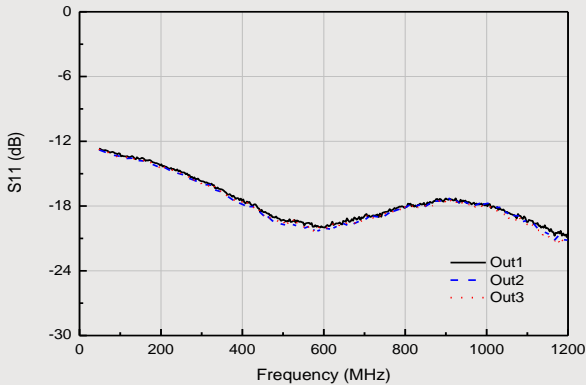
Gain vs. Frequency



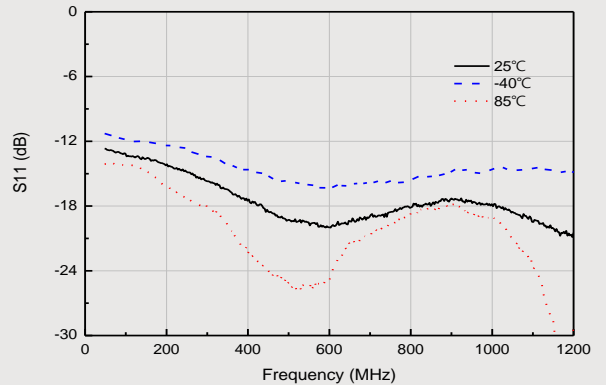
Gain (Out1) vs. Frequency



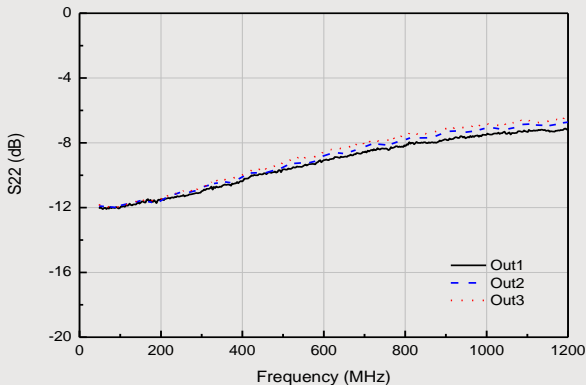
Input Return Loss



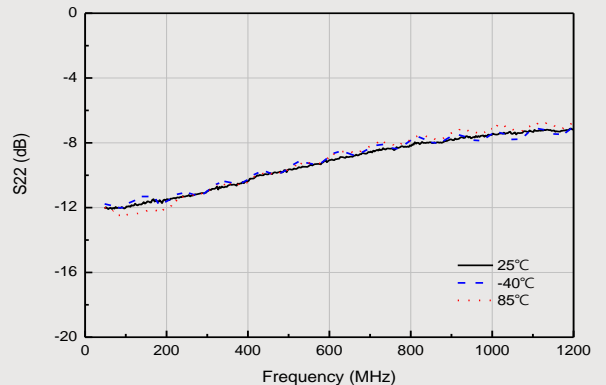
Input Return Loss (Out1)



Output Return Loss



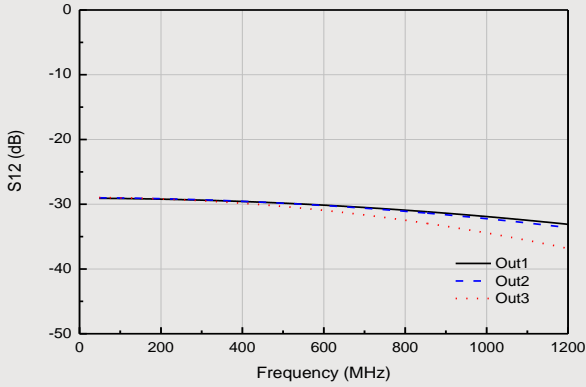
Output Return Loss (Out1)



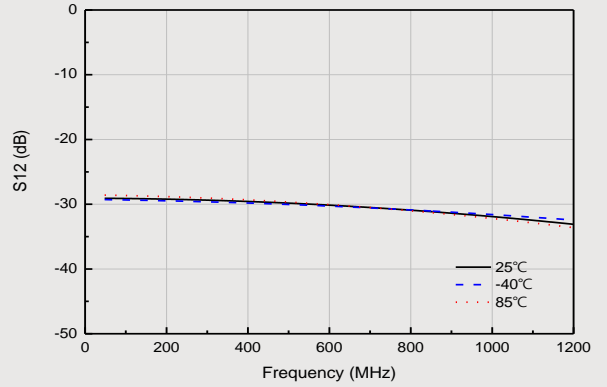
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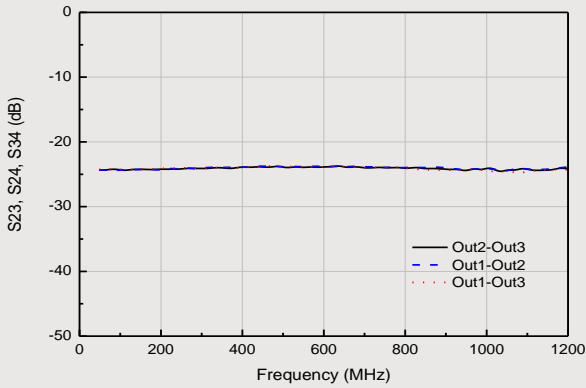
Reverse Isolation



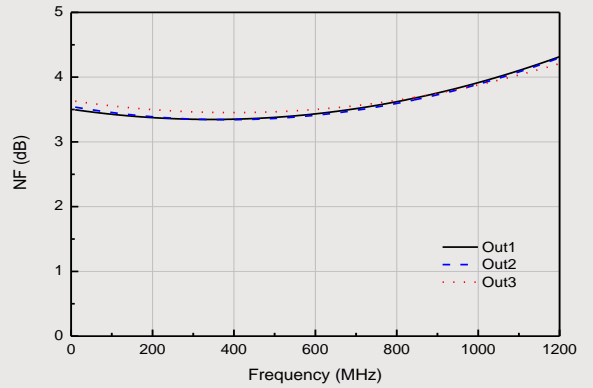
Reverse Isolation (Out1)



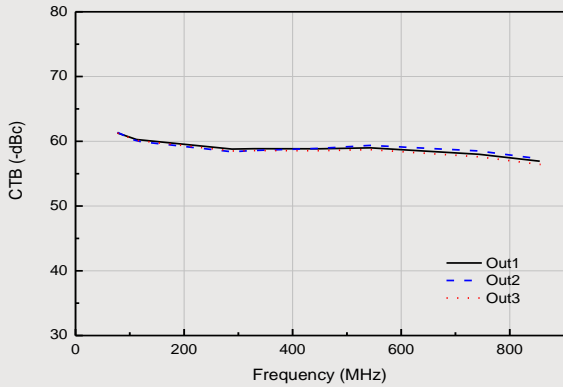
Output to Output Isolation



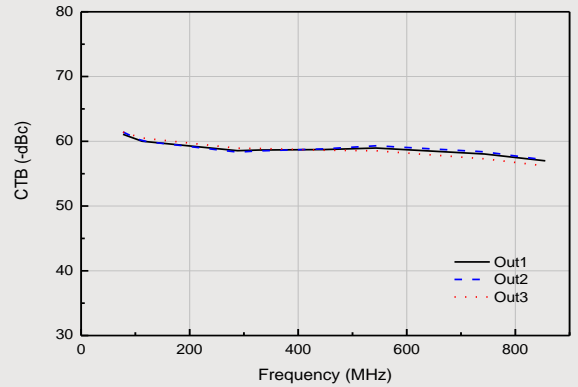
NF vs. Frequency



Composite Triple Beat



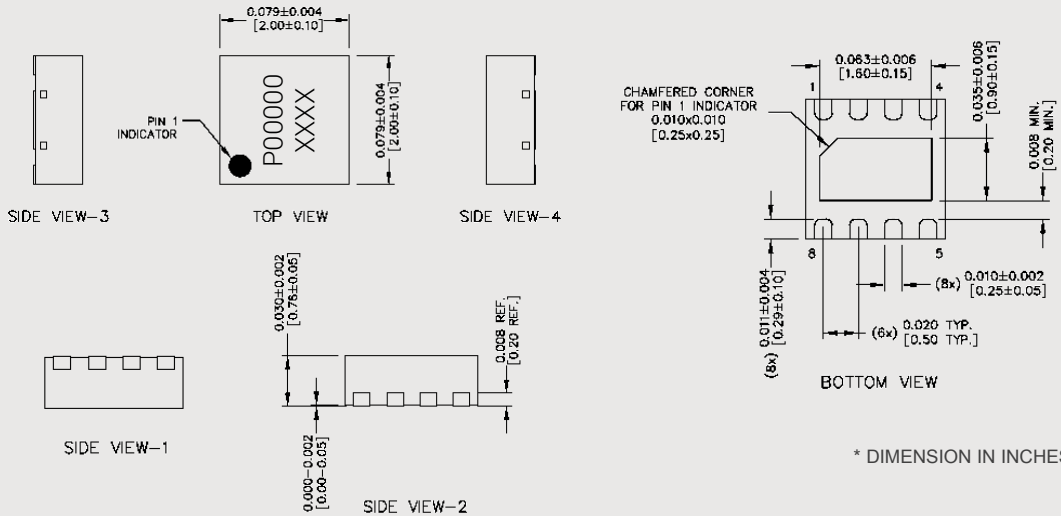
Composite Second Order



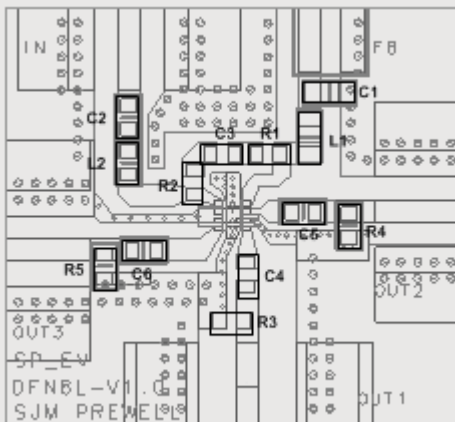
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Single Ended 3-Way Active Splitter

Lead-free /RoHS Compliant / Green 2x2 DFN 8L Package Outline



Evaluation Board Layout (27 x 25)



Mounting Instructions

- 1 Use a large ground pad area with many plated through-holes as shown.
- 2 We recommend 1 oz copper minimum.
- 3 Measurement for our data sheet was made on 1.6mm thick FR-4 Board.
- 4 RF trace width depends on the board material and construction.
- 5 Add as much copper as possible to inner and outer layers near the part to ensure optimal thermal performance.