

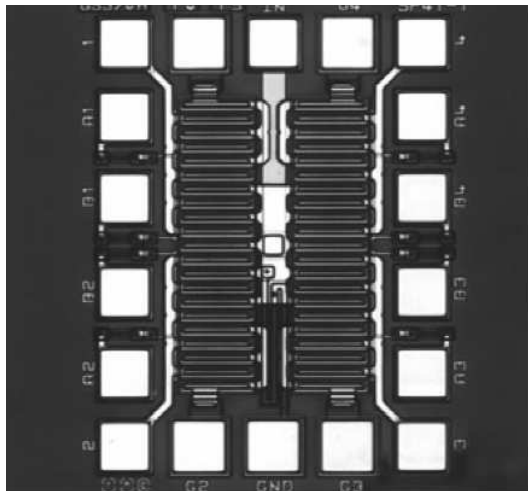
MMIC SP4T Reflective Switch, DC - 4GHz

The **P35-4252-000-200** is a high performance Gallium Arsenide single pole four throw RF switch MMIC. It is suitable for use in broadband communications and instrumentation applications. A $50\ \Omega$ termination is presented at the isolated outputs of the switch. The switch is controlled by the application of complimentary 0V/-5V or 0/-8V signals to the control lines in accordance with the truth table below.

This die is fabricated using Bookham Technology's $0.5\ \mu\text{m}$ gate length MESFET process (S20) and is fully protected using Silicon Nitride passivation for excellent performance and reliability.

Features

- Broadband performance
- Low insertion loss; 0.7dB typ at 2GHz
- Ultra low DC power consumption
- Fast switching speed; 3ns typical
- Small die size; $0.67\ \text{mm}^2$



Electrical Performance

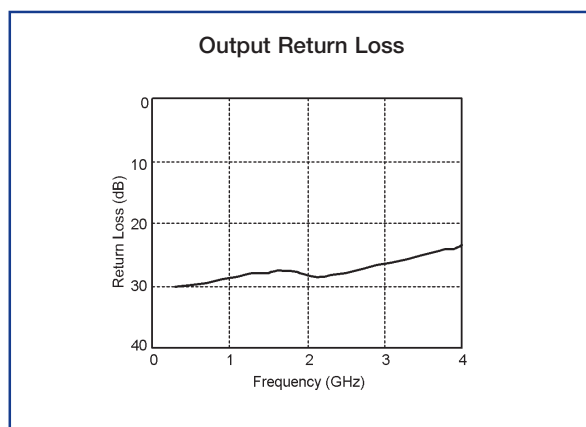
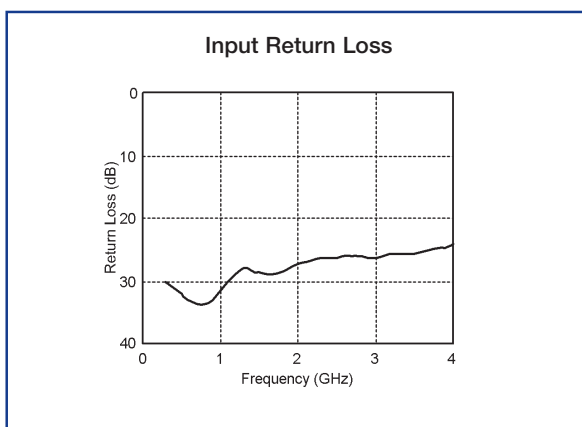
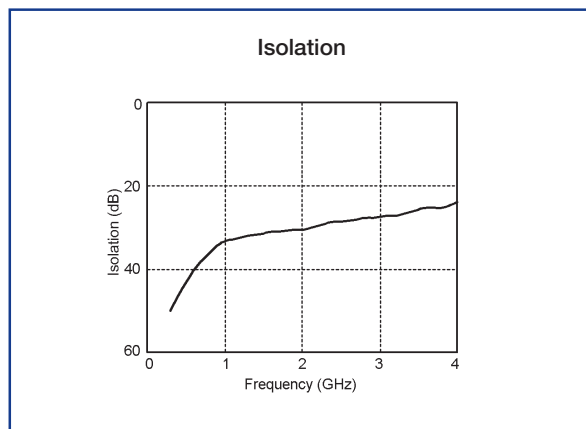
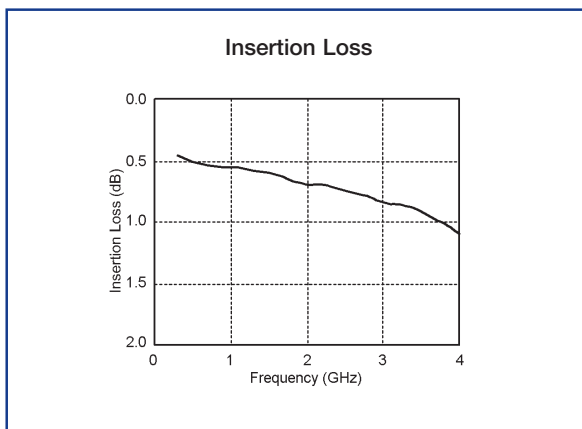
Ambient temperature = 22 ±3 °C, $Z_o = 50 \Omega$, Control voltages = 0V/-5V unless otherwise stated

Parameter	Conditions	Min	Typ	Max	Units
Insertion Loss ¹	DC - 2GHz	-	0.7	0.9	dB
	2 - 4GHz	-	1.1	1.3	dB
Isolation ¹	DC - 2GHz	25	30	-	dB
	2 - 4GHz	20	22	-	dB
Input Return Loss ²	DC - 2GHz	25	27	-	dB
	2 - 4GHz	23	24	-	dB
Output Return Loss ²	DC - 2GHz	25	27	-	dB
	2 - 4GHz	23	24	-	dB
1dB power compression point ³	0/-5V Control; 50MHz	-	19	-	dBm
	0/-5V Control; 2GHz	-	22.5	-	dBm
	0/-8V Control; 50MHz	-	21.5	-	dBm
	0/-8V Control; 2GHz	-	30	-	dBm
Switching Speed	50% Control to 10%90%RF	-	3	-	ns

Notes

1. Insertion Loss and Isolation measured between RF input and any output.
2. Return Loss measured in low loss switch state.
3. Input power at which insertion loss compresses by 1dB.

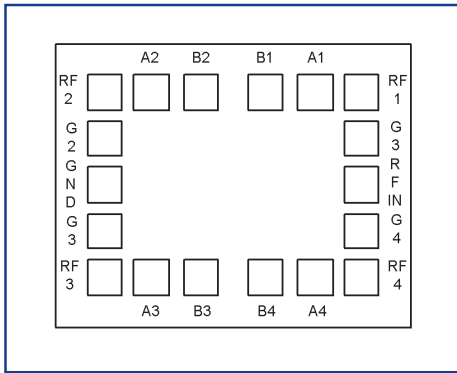
Typical Performance at 22° C



Absolute Maximum Ratings

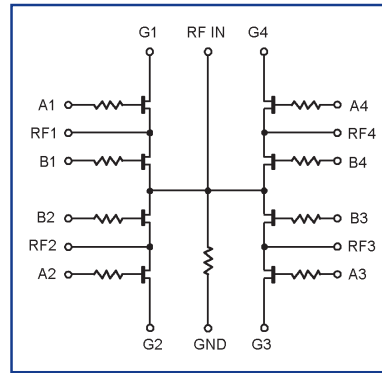
Max control voltage	-8V
Max I/P power	+30 dBm
Operating temperature	-60 °C to +125 °C
Storage temperature	-65 °C to +150 °C

Chip Outline



Die size: 0.91 x 0.74mm
 Bond pad size: 90 µm x 90 µm
 Die thickness: 200 µm

Electrical Schematic



MMICS

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Important Notice

Bookham Technology has a policy of continuous improvement. As a result certain parameters detailed on this flyer may be subject to change without notice. If you are interested in a particular product please request the product specification sheet, available from any RF sales representative.



Handling, Mounting and Bonding

The back of the die is gold metallized and can be die-attached manually onto gold, eutectically with Au- Sn (80:20) or with low temperature conductive epoxy. The maximum allowable die temperature is 310 °C for 2 minutes. Bonds should be made onto the exposed gold pads with 17 or 25 microns pure gold, half-hard gold wire. Bonding should be achieved with the die face at 225 °C to 275 °C with a heated thermosonic wedge (approx. 125 °C) and a maximum force of 60 grams. Ball bonds may be used but care must be taken to ensure the ball size is compatible with the bonding pads shown. The length of the bond wires should be minimised to reduce parasitic inductance, particularly those to the RF and ground pads.

Switching Truth Table

Control Pad Voltage (V)								Path From RF IN to			
A1	B1	A2	B2	A3	B3	A4	B4	RF1	RF2	RF3	RF4
-5	0	0	-5	0	-5	0	-5	Low Loss	Isolated	Isolated	Isolated
0	-5	-5	0	0	-5	0	-5	Isolated	Low Loss	Isolated	Isolated
0	-5	0	-5	-5	0	0	-5	Isolated	Isolated	Low Loss	Isolated
0	-5	0	-5	0	-5	-5	0	Isolated	Isolated	Isolated	Low Loss

Ordering Information

P35-4252-000-200