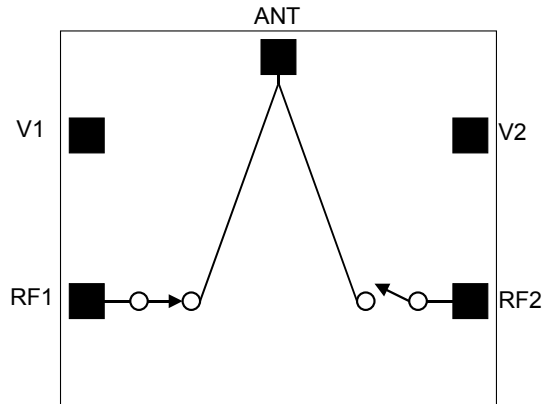


GaAs Multi-Purpose Wide Band SPDT Switch

Features:

- ◆ Available in die form
- ◆ Suitable for L and S-band digital cellular, cordless telephony and WLAN applications
- ◆ High isolation, 30dB typ at 2.5GHz
- ◆ Low insertion loss, 0.4dB typ at 2.5GHz
- ◆ P0.1dB > 35dBm

Functional Schematic



Description and Applications:

The FMS2020 is a low loss, high power and linear single pole dual throw Gallium Arsenide antenna switch. The die is fabricated using the Filtronic FL05 0.5μm switch process technology which offers leading edge performance optimised for switch applications. The FMS2020 is designed for use in L and S band wireless applications.

Electrical Specifications: ($T_{\text{AMBIENT}} = 25^{\circ}\text{C}$, $V_{\text{control}} = 0\text{V}/2.5\text{V}$, $Z_{\text{IN}} = Z_{\text{OUT}} = 50\Omega$)

Parameter	Test Conditions	Min	Typ	Max	Units
Insertion Loss	0.5 – 1.0 GHz		0.4		dB
	1.0 – 2.5 GHz		0.4		dB
Return Loss	0.5 – 2.5 GHz		25		dB
Isolation	0.5 – 1.0 GHz		33		dB
	1.0 – 2.5 GHz		30		dB
Input power at 0.1dB compression point	1GHz		36		
2nd Harmonic Level	1 GHz, Pin = +35 dBm, 100% Duty Cycle		-75		dBc
3rd Harmonic Level	1 GHz, Pin = +35 dBm, 100% Duty Cycle		-75		dBc
Switching speed : Trise, Tfall Ton, Toff	10% to 90% RF and 90% to 10% RF		<0.3		μs
	50% control to 90% RF and 50% control to 10% RF		<1.0		μs
Control Current			1		μA

Note: External DC blocking capacitors are required on all RF ports (typ: 100pF)

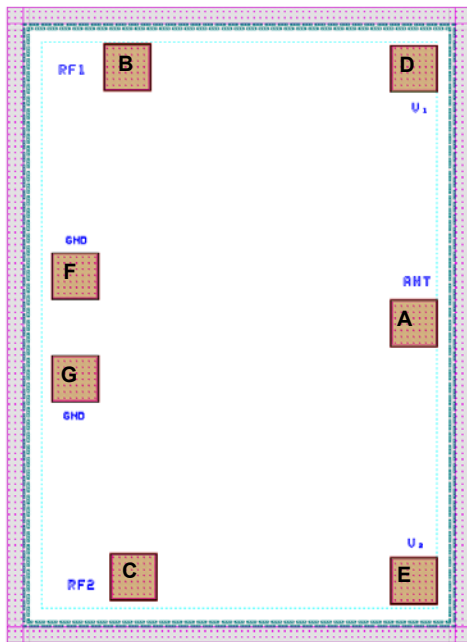
Truth Table:

V1	V2	PATH (ON)
High	Low	RF1-ANT
Low	High	RF2-ANT

Note:

‘High’ = +2.5V to +5V

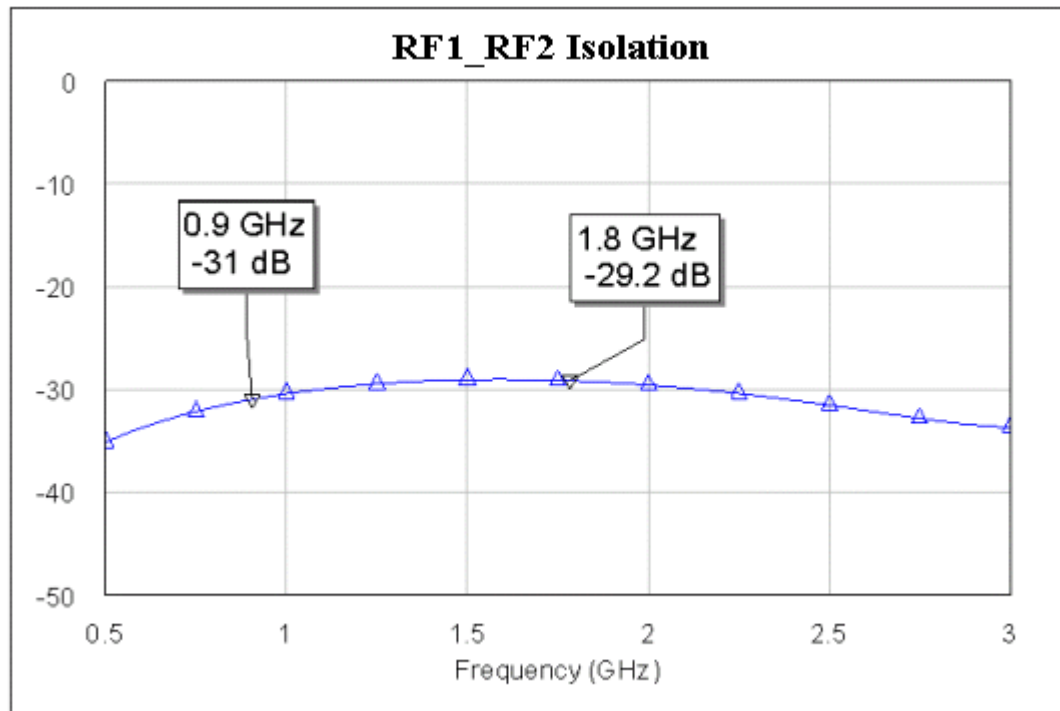
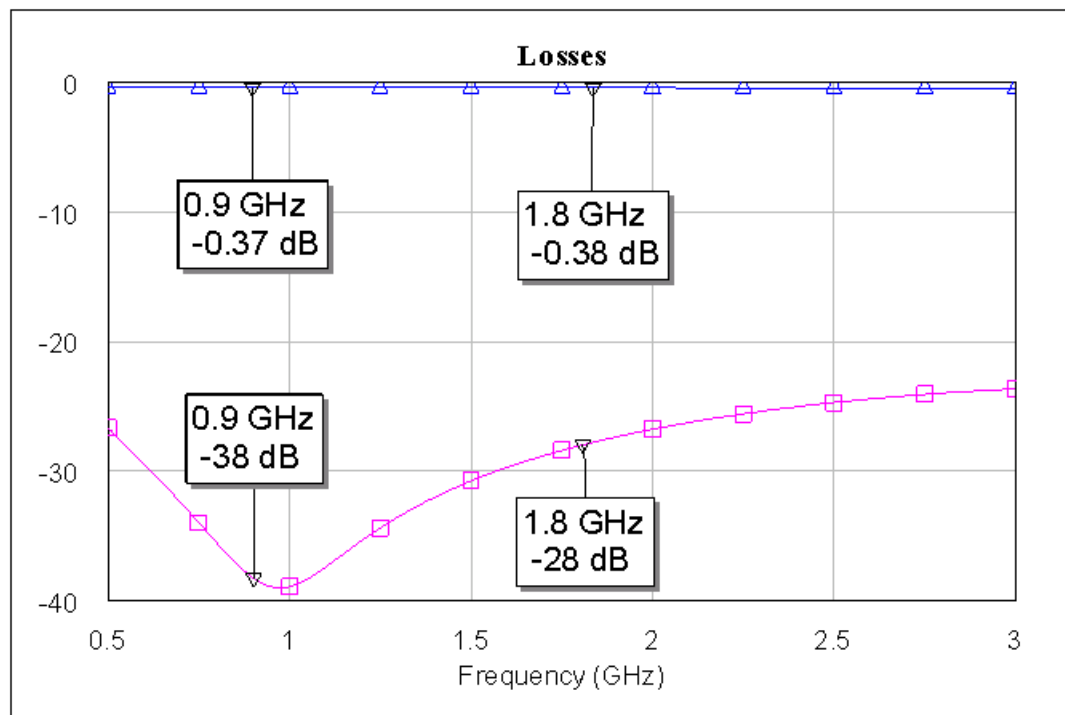
‘Low’ = 0V to 0.2V

Pad and Die Layout:

Pad	Pad Name	Description	Pin Coordinates (μm)
A	ANT	Antenna	732, 510
B	RF1	RF1 Output	270, 920
C	RF2	RF2 Output	280, 101
D	V1	RF1 Control Voltage	731, 918
E	V2	RF2 Control Voltage	734, 98
F	GND T1	Ground 1	186, 885
G	GND T2	Ground 2	186, 420

Note: Co-ordinates are referenced from the bottom left hand corner of the die to the centre of the bond pad opening

Die Size (μm)	Die Thickness (μm)	Min. Bond Pad Pitch(μm)	Min. Bond pad opening (μm)
930 x 1020(engineering mask)	100	166	70 x 70

Simulated Performance:

Preferred Assembly Instructions:

GaAs devices are fragile and should be handled with great care. Specially designed collets should be used where possible.

The back of the die is not metallised and the recommended mounting method is by the use of conductive epoxy. Epoxy should be applied to the attachment surface uniformly and sparingly to avoid encroachment of epoxy on to the top face of the die and ideally should not exceed half the chip height. For automated dispense Ablestick LMISR4 is recommended and for manual dispense Ablestick 84-1 LMI or 84-1 LMIT are recommended. These should be cured at a temperature of 150°C for 1 hour in an oven especially set aside for epoxy curing only. If possible the curing oven should be flushed with dry nitrogen.

This part has gold (Au) bond pads requiring the use of gold (99.99% pure) bondwire. It is recommended that 25.4µm diameter gold wire is used. Thermosonic ball bonding is preferred. A nominal stage temperature of 150°C and a bonding force of 40g has been shown to give effective results for 25µm wire. Ultrasonic energy shall be kept to a minimum. For this bonding technique, stage temperature should not be raised above 200°C and bond force should not be raised above 60g. Thermosonic wedge bonding and thermocompression wedge bonding can also be used to achieve good wire bonds.

Bonds should be made from the die first and then to the mounting substrate or package. The physical length of the bondwires should be minimised especially when making RF or ground connections.

Handling Precautions:

To avoid damage to the devices care should be exercised during handling. Proper Electrostatic Discharge (ESD) precautions should be observed at all stages of storage, handling, assembly, and testing. These devices should be treated as Class 1A (0-500 V) as defined in JEDEC Standard No. 22-A114-B. Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

Disclaimers:

This product is not designed for use in any space based or life sustaining/supporting equipment.