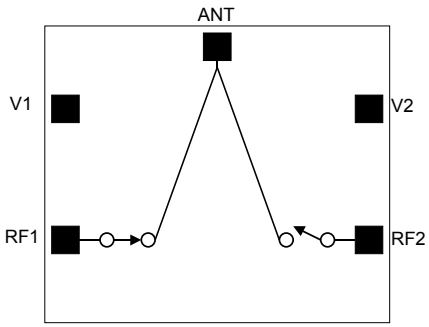
FMS2020QFN

GaAs Multi-Purpose Wide Band SPDT Switch

Features:

- 3x3x0.9mm Packaged pHEMT Switch
- Suitable for L, S, and C-band digital cellular, cordless telephony and WLAN applications
- High isolation, 25dB typ at 2.5GHz
- Low insertion loss, 0.5dB typ at 2.5GHz
- Low insertion loss, 1.0dB typ at 6GHz
- P0.1dB > 38dBm at 2GHz

Functional Schematic



Description and Applications:

The FMS2020QFN 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 FMS2020QFN is designed for use in L, S, and C band wireless applications and WLAN access points where high linearity switching is required.

Electrical Specifications: ($T_{AMBIENT}$ = 25°C, V_{ctrl} = 0V/2.5V, Z_{IN} = Z_{OUT} = 50Ω)

Parameter	Test Conditions	Min	Typ	Max	Units
Insertion Loss	0.5 – 1.0 GHz		0.4		dB
	1.0 – 2.0 GHz		0.45		dB
	2.0 – 3.0 GHz		0.55		dB
	3.0 – 4.0 GHz		0.65		dB
	4.0 – 5.0 GHz		0.75		dB
	5.0 –6.0 GHz		0.95		dB
Return Loss	0.5 – 2.5 GHz		23		dB
	2.5 – 5.0 GHz		18		dB
Isolation	0.5 – 1.0 GHz		30		dB
	1.0 – 2.5 GHz		25		dB
	2.5 – 6.0 GHz		18		dB
Input power at 0.1dB compression point	1.0 GHz		>38		dBm
	2.0 GHz		>38		dBm
	2.5 GHz		>37		dBm
	6.0 GHz		>33		dBm
2nd Harmonic Level	1 GHz, Pin = +35 dBm, 100% Duty Cycle		<-70		dBc
3rd Harmonic Level	1 GHz, Pin = +35 dBm, 100% Duty Cycle		<-70		dBc
Switching speed : T rise, T fall	10% to 90% RF and 90% to 10% RF		<0.3		μs
T on, T off	50% control to 90% RF and 50% control to 10% RF		<1.0		μs
Control Current	+35dBm RF input @1GHz		<10		μA

Note: External DC blocking capacitors are required on all RF ports (typ: 100pF)
All unused ports terminated in 50Ω.

Preliminary specifications subject to change without notice
Filtronic Compound Semiconductors Ltd
Contact Details (UK): Tel: +44 (0) 1325 301111 Fax: +44 (0) 1325 306177 Email: sales@filcs.com
Contact Details (USA): Tel: +1 (408) 850-5790 Fax: +1 (408) 850-5766 Email: sales@filcsi.com
Website: www.filtronic.co.uk/semis

Absolute Maximum Ratings:

Parameter	Symbol	Absolute Maximum
Max Input Power	Pin	+38dBm
Control Voltage	V ctrl	+5V
Operating Temperature	T oper	-40°C to +100°C
Storage Temperature	T stor	-55°C to +150°C

Note: Exceeding any one of these absolute maximum ratings may cause permanent damage to the device.

Truth Table:

Switch State	VC1	VC2	ANT– RF1	ANT– RF2
(A)	*HIGH*	LOW	*Insertion Loss*	Isolation
(B)	LOW	*HIGH*	Isolation	*Insertion Loss*

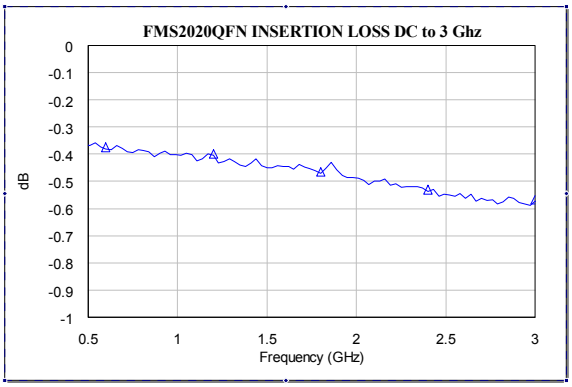
General Test Conditions:

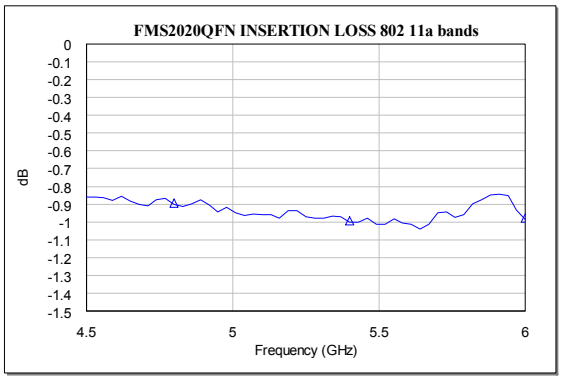
Bias Voltages	LOW = 0V to 0.2V HIGH +2.5V to +5V
Port Impedances	50Ω
Off arm termination	50Ω

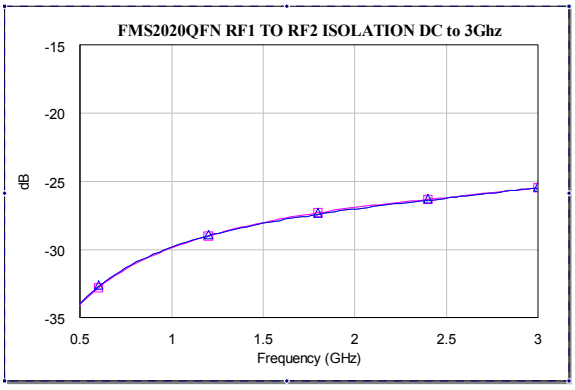
Preliminary specifications subject to change without notice
Filtronic Compound Semiconductors Ltd
Contact Details (UK): Tel: +44 (0) 1325 301111 Fax: +44 (0) 1325 306177 Email: sales@filcs.com
Contact Details (USA): Tel: +1 (408) 850-5790 Fax: +1 (408) 850-5766 Email: sales@filcsi.com
Website: www.filtronic.co.uk/semis

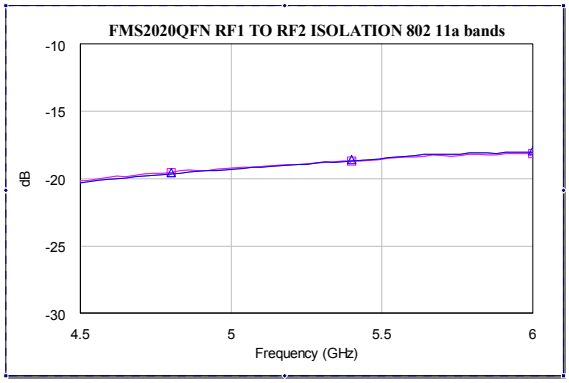
Typical Measured Performance on Evaluation Board (De-Embedded):

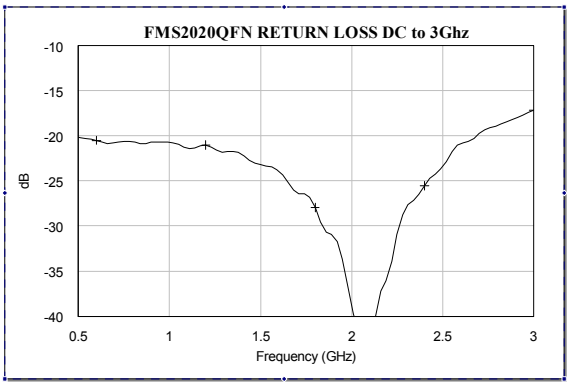
(Measurement Conditions V_{CTRL} = 2.5V (high) & 0V (low), $T_{AMBIENT}$ = 25°C unless otherwise stated)

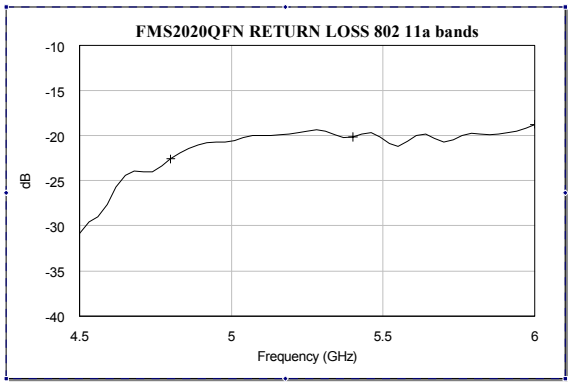






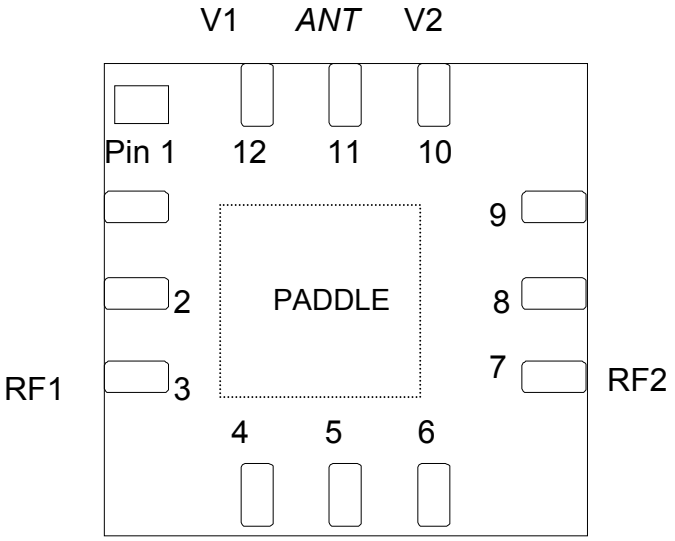






Preliminary specifications subject to change without notice
Filtronic Compound Semiconductors Ltd
Contact Details (UK): Tel: +44 (0) 1325 301111 Fax: +44 (0) 1325 306177 Email: sales@filcs.com
Contact Details (USA): Tel: +1 (408) 988 1845 Fax: +1 (408) 970 9950 Email: sales@filcsi.com
Website: : www.filtronic.co.uk/semis

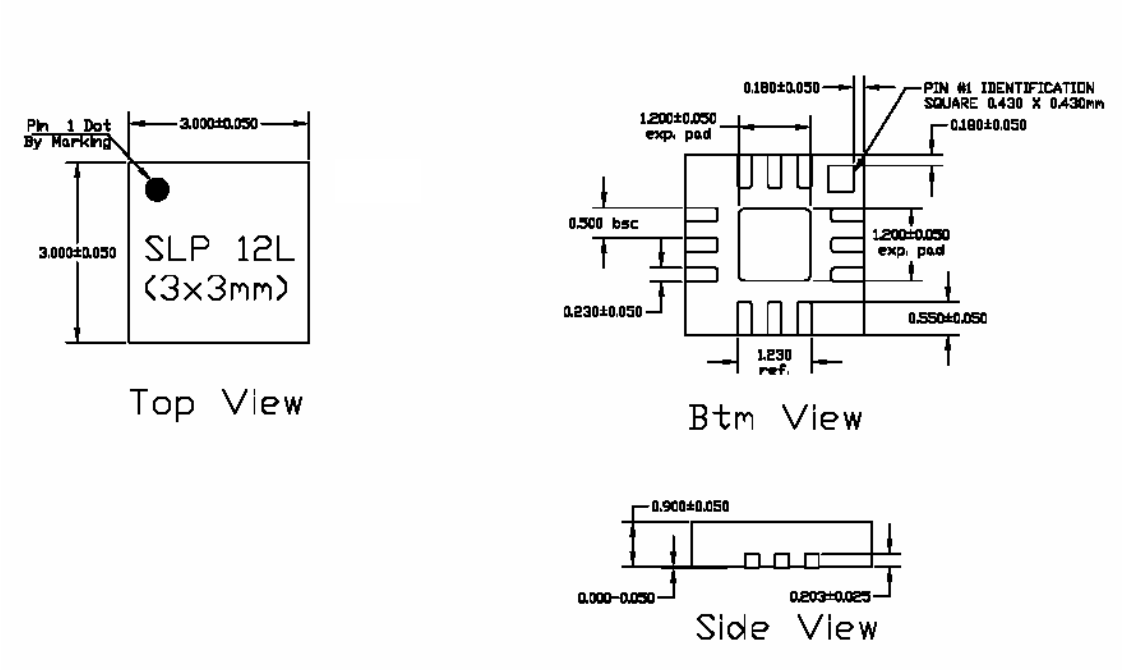
Pad Layout:



*View from the top of the package

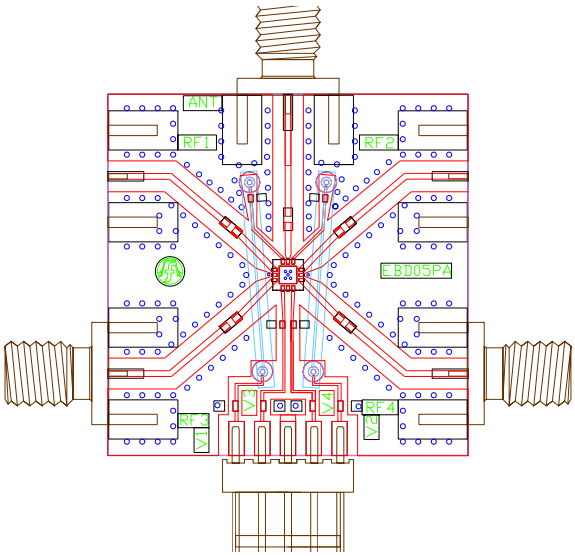
Pin Number	Description
1	N/C
2	N/C
3	RF1
4	N/C
5	N/C
6	N/C
7	RF2
8	N/C
9	N/C
10	V2
11	ANT RF
12	V1
PADDLE	GND

*QFN 12 Lead 3*3 Package Outline:*



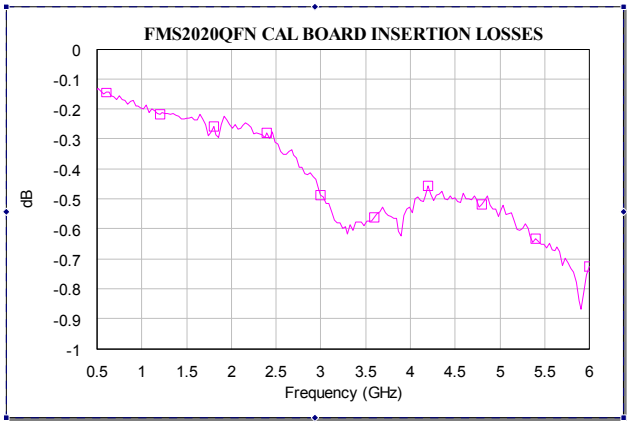
Preliminary specifications subject to change without notice
Filtronic Compound Semiconductors Ltd
Contact Details (UK): Tel: +44 (0) 1325 301111 Fax: +44 (0) 1325 306177 Email: sales@filcs.com
Contact Details (USA): Tel: +1 (408) 988 1845 Fax: +1 (408) 970 9950 Email: sales@filcsi.com
Website: : www.filtronic.co.uk/semis

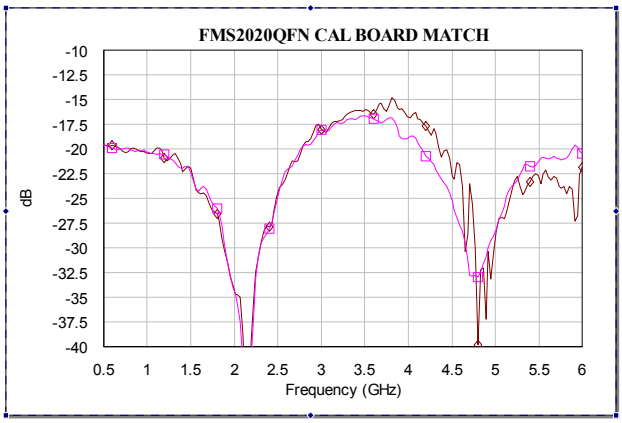
Evaluation Board:



BOM	
Label	**Component**
C3,C4	Capacitor, 470pF, 0603
C1,C2	Capacitor, 100pF, 0402
C5,C6	Capacitor, 47pF, 0402
BOARD	Preferred evaluation board material is 0.25 mm thick ROGERS RT4350. All RF tracks should be 50 ohm characteristic impedance.

Evaluation Board De-Embedding Data (Measured):





Preliminary specifications subject to change without notice
Filtronic Compound Semiconductors Ltd
Contact Details (UK): Tel: +44 (0) 1325 301111 Fax: +44 (0) 1325 306177 Email: sales@filcs.com
Contact Details (USA): Tel: +1 (408) 988 1845 Fax: +1 (408) 970 9950 Email: sales@filcsi.com
Website: : www.filtronic.co.uk/semis

Ordering Information:

Part Number	Description
FMS2020-001	Packaged Die
FMS2020-001-EB	Packaged die mounted on evaluation board

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 (0-500V). Further information on ESD control measures can be found in MIL-STD-1686 and MIL-HDBK-263.

Preferred Assembly Instructions:

Please refer to FCSL applications note: FAN 003 (handling and assembly of Filtronic QFN devices)

Disclaimers:

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

Preliminary specifications subject to change without notice
Filtronic Compound Semiconductors Ltd
Contact Details (UK): Tel: +44 (0) 1325 301111 Fax: +44 (0) 1325 306177 Email: sales@filcs.com
Contact Details (USA): Tel: +1 (408) 988 1845 Fax: +1 (408) 970 9950 Email: sales@filcsi.com
Website: : www.filtronic.co.uk/semis