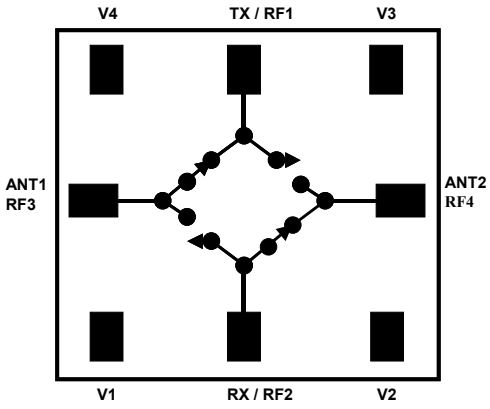
DC-6GHz DPDT Diversity Switch

Features:

- 3x3x0.9mm Packaged pHEMT Switch
- Very High Tx-Rx isolation
- Suitable for WLAN 802.11a and 802.11b/g Applications
- Filtronic Advanced GaAs pHEMT Technology
- Low Insertion Loss
- Excellent low control voltage performance

Functional Schematic



Description and Applications:

The FMS2007QFN is a low loss linear Double-Pole Double-Throw dual band diversity switch designed for use in WLAN applications. The die is fabricated using the Filtronic FL05 0.5μm switch process technology, which offers leading edge performance optimised for switch applications. Typical applications are for UNII, Hiperlan, 802.11a and 802.11b/g systems that employ two antennas for transmit and receive diversity.

Electrical Specifications: ($T_{AMBIENT}$ = 25°C, V_{cntrl} = 0V/(2.4,3.3V), Z_{IN} = Z_{OUT} = 50Ω)

Parameter	Simulated Conditions	Min	Typ	Max	Units
Insertion Loss	2.4GHz		0.9		dB
Insertion Loss	6GHz		1.15		dB
Return Loss	2.4GHz		18		dB
Return Loss	6GHz		15		dB
Tx-Rx Isolation	2.4GHz		-37		dB
Tx-Rx Isolation	6GHz		-25		dB
2nd Harmonic Level	2.4, 6 GHz, Pin = 20dBm, Vctrl = 2.4V		-70		dBc
3rd Harmonic Level	2.4, 6 GHz, Pin = 20dBm, Vctrl =2.4V		-70		dBc
Switching speed	Vctrl=2.4V, Pin=20dBm		30		nS

Note: External DC blocking capacitors are required on all RF ports (typ: 47pF)

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Absolute Maximum Ratings:

Parameter	Symbol	Absolute Maximum
Max Input Power	Pin	+36dBm
Control Voltage	Vctrl	+5V
Operating Temperature	Toper	-40°C to +100°C
Storage Temperature	Tstor	-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	V1	V2	V3	V4	RX ANT1	RX ANT2	TX ANT2	TX ANT1
1	High	Low	Low	Low	*Insertion Loss*	Isolation	Isolation	Isolation
2	Low	High	Low	Low	Isolation	*Insertion Loss*	Isolation	Isolation
3	Low	Low	High	Low	Isolation	Isolation	*Insertion Loss*	Isolation
4	Low	Low	Low	High	Isolation	Isolation	Isolation	*Insertion Loss*
5	Low	High	Low	High	Isolation	*Insertion Loss*	Isolation	*Insertion Loss*
6	High	Low	High	Low	*Insertion Loss*	Isolation	*Insertion Loss*	Isolation

General Test Conditions:

Bias Voltages	LOW = 0V to +0.2V HIGH +2.5V to +5.0V
Port Impedances	50Ω
Off arm termination	50Ω

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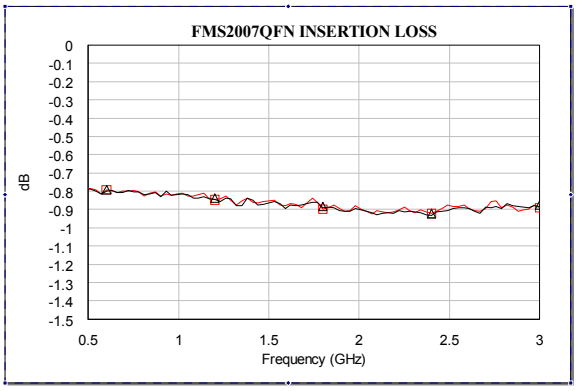
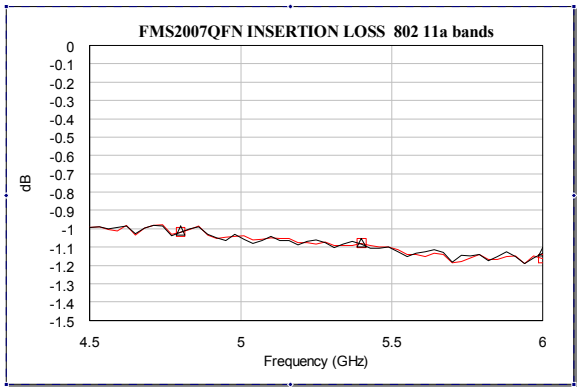
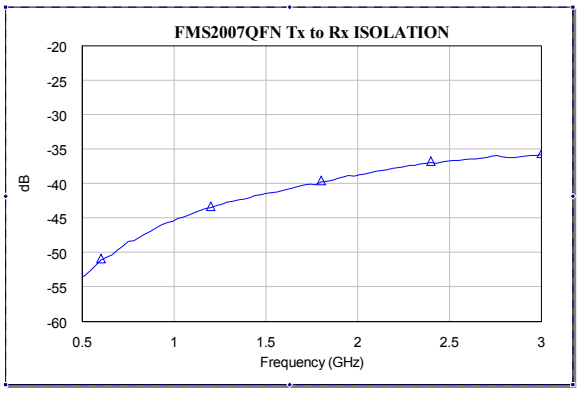
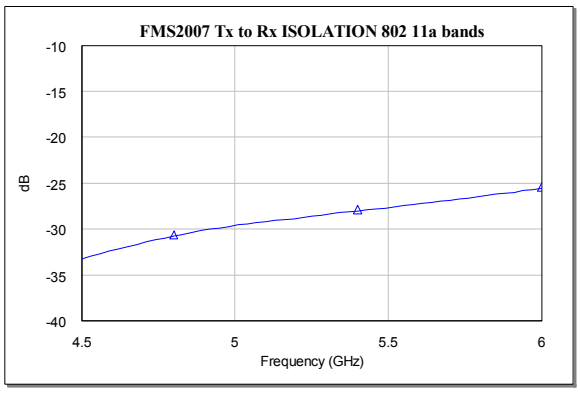
Typical Measured Performance on Evaluation Board (De-Embedded):

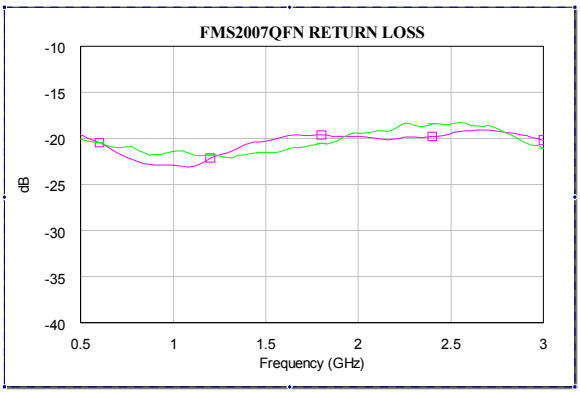
(Measurement Conditions V_{CTRL}=3V, $T_{AMBIENT}$ = 25°C unless otherwise stated)

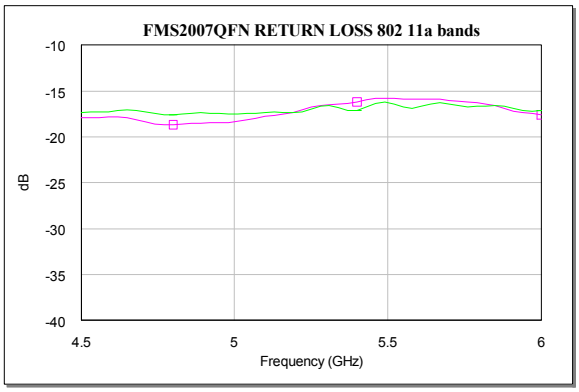












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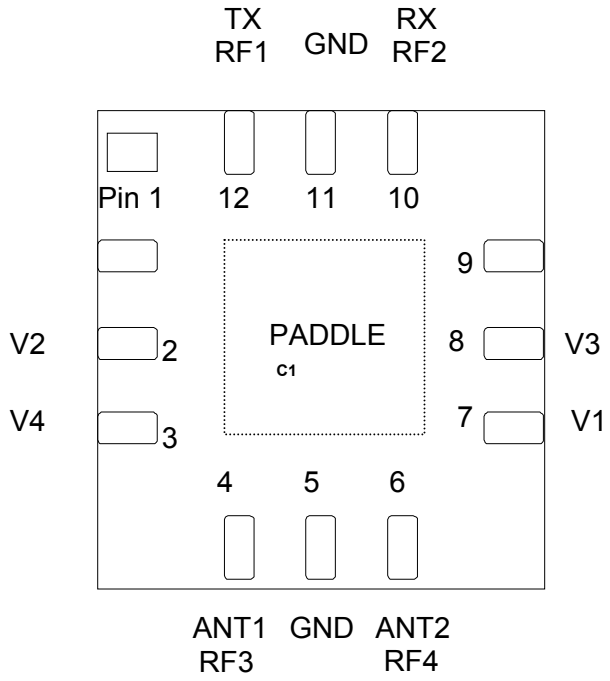
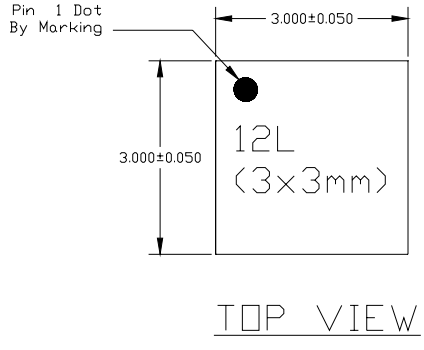
Pad Layout:

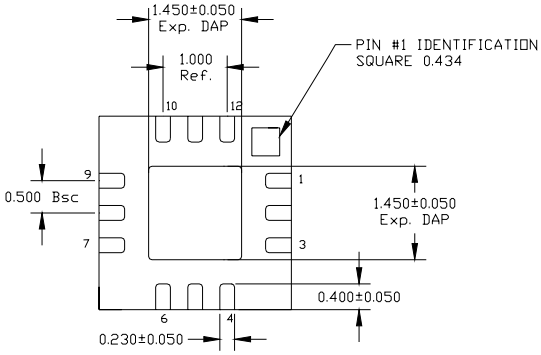


Pin Number	Description
1	N/C
2	V2
3	V4
4	ANT1 / RF3
5	GND
6	ANT2 / RF4
7	V1
8	V3
9	N/C
10	RX / RF2
11	GND
12	Tx / RF1
PADDLE	GND

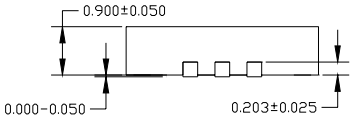
QFN 12 Lead 3*3 Package Outline:



TOP VIEW



BOTTOM VIEW



SIDE VIEW

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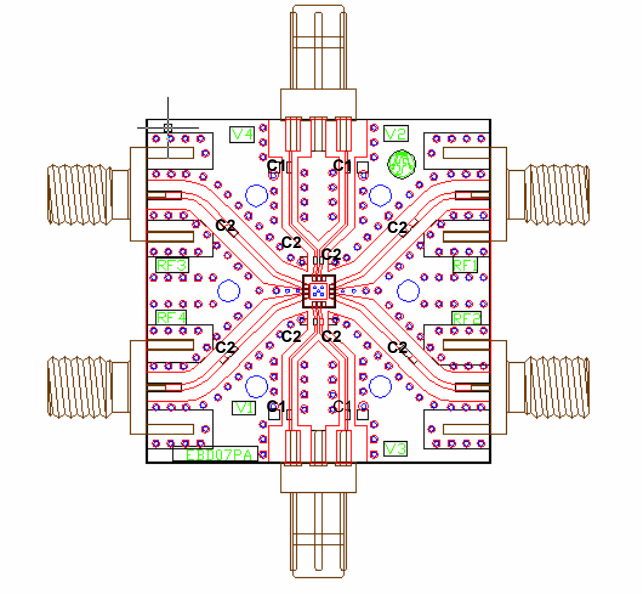
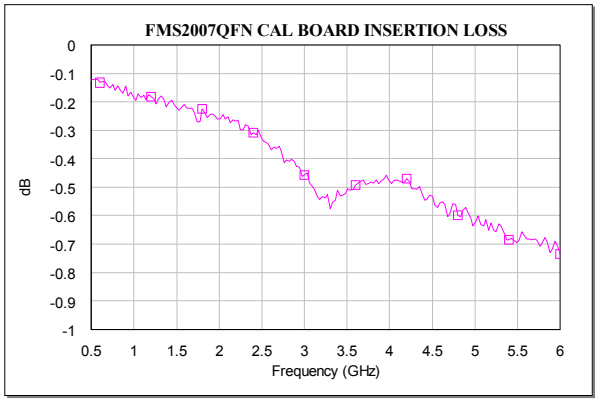
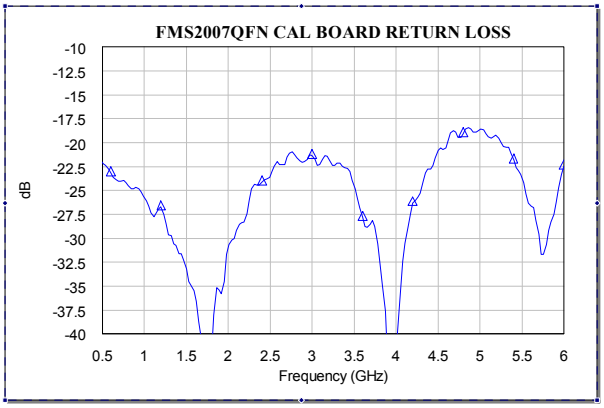
Evaluation Board:



BOM	
Label	**Component**
C1	Capacitor, 100pF, 0603
C2	Capacitor, 47pF, 0402
BOARD	Preferred evaluation board material is 0.25 mm thick ROGERS RT4350. All RF tracks should be 50 ohm characteristic impedance. Absolute placement of surface mount de-coupling capacitors is not critical.

Evaluation Board De-Embedding Data (Measured):





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Ordering Information:

Part Number	Description
FMS2007-001	Packaged Die
FMS2007-001-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.