

Main Features

- 0.25 μ m GaAs pHEMT Technology
- 25 – 38 GHz Frequency Range
- Insertion Loss \leq 3 dB
- Isolation (RFin to NC Outputs) \geq 40 dB
- Input Return Loss \leq -10 dB
- Output Return Loss \leq -10 dB
- Power Consumption \approx 0 W
- Reflective
- Control Bias Voltages: $V_c = -2 / 0.6$ V
- Chip Size: 2.40 x 3.40 x 0.10 mm³

Product Description

MECKASP4TR is a 0.25 μ m GaAs pHEMT Ka Band Reflective SP4T Switch designed and tested by MEC for 25 - 38 GHz Band applications.

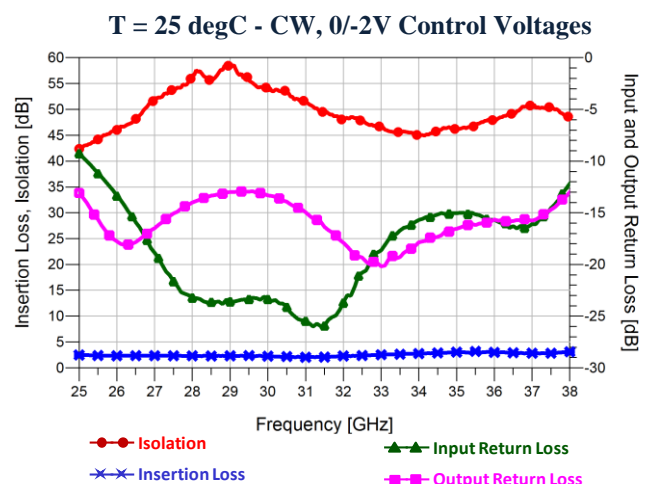
In the frequency range from 25 to 38 GHz MECKASP4TR provides less than 3 dB of small signal insertion loss and more than 45 dB of isolation, with negligible power consumption.

The Control Bias Voltages are from - 2 V to - 1.3 V (HIGH STATE) and from -0.2 V to 0.6V (LOW STATE).

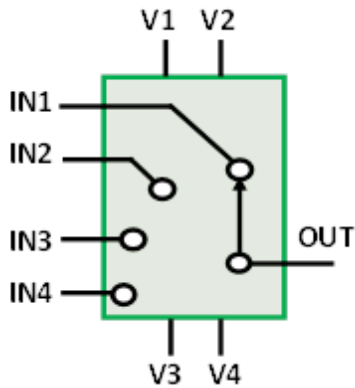
Typical Applications

- Telecom Infrastructure
- Microwave Radio & VSAT
- Military & Space Hybrids
- Test Instrumentation
- SATCOM & Sensors

Measured Data



Functional Diagram



Control Voltages

STATE	BIAS CONDITION
HIGH	-2 V to -1.3V
LOW	-0.2 V to 0.6V

True Table

Vc1	Vc2	Vc3	Vc4	STATE
HIGH	LOW	LOW	LOW	IN1 "ON" to OUT
LOW	HIGH	LOW	LOW	IN2 "ON" to OUT
LOW	LOW	HIGH	LOW	IN3 "ON" to OUT
LOW	LOW	LOW	HIGH	IN4 "ON" to OUT
LOW	LOW	LOW	LOW	N.C.

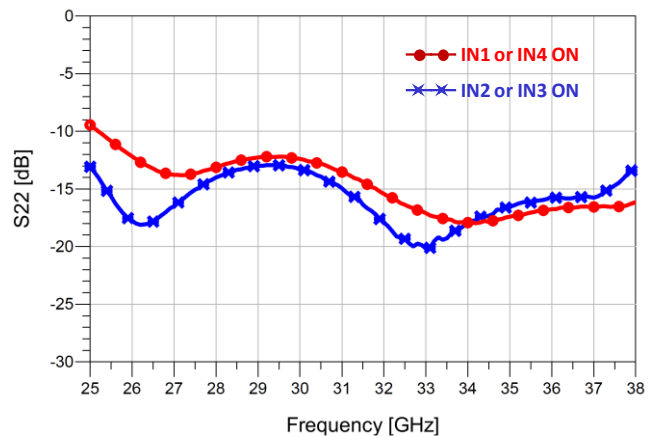
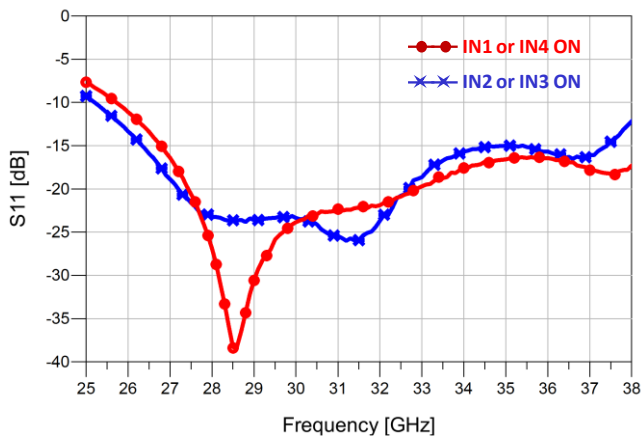
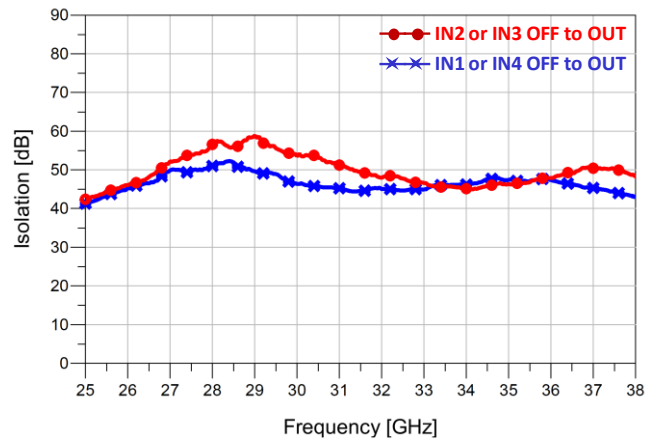
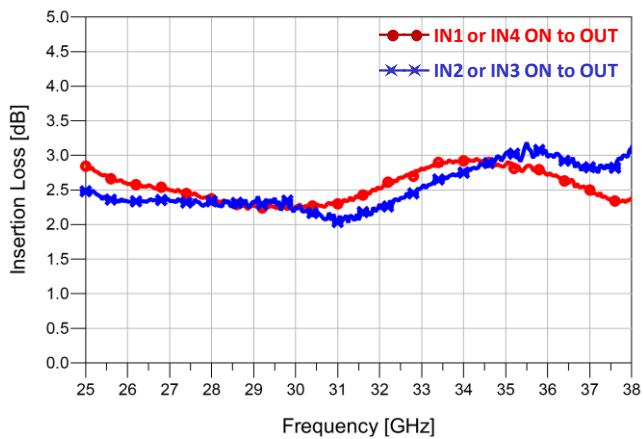
Main Characteristics

Test Conditions: $T_{\text{base_plate}} = 25^{\circ}\text{C}$ - CW, 0/-2V Control Voltages

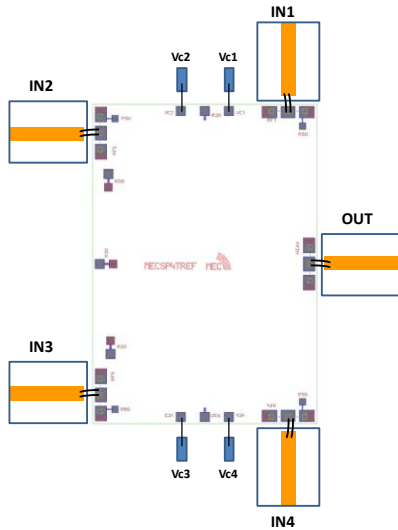
Parameter		Min	Typ	Max	Unit
Operating frequency		25	-	38	GHz
Insertion Loss (IN1 or IN4 "ON" to OUT)	25 – 31 GHz	2.2	-	2.9	dB
	31 – 38 GHz	2.3	-	3.0	dB
Insertion Loss (IN2 or IN3 "ON" to OUT)	25 – 31 GHz	2.0	-	2.5	dB
	31 – 38 GHz	2.0	-	3.1	dB
Isolation (IN1 or IN4 "OFF" to OUT)	25 – 31 GHz	40	-	-	dB
	31 – 38 GHz	45	-	-	dB
Isolation (IN2 or IN3 "OFF" to OUT)	25 – 31 GHz	40	-	-	dB
	31 – 38 GHz	45	-	-	dB
Input Return Loss (IN1 or IN4 "ON" to OUT)	25 - 31 GHz	-	-	-10	dB
Input Return Loss (IN2 or IN3 "ON" to OUT)	25 - 31 GHz	-	-	-10	dB
Output Return Loss (IN1 or IN4 "ON" to OUT)	25 - 31 GHz	-	-	-10	dB
Output Return Loss (IN2 or IN3 "ON" to OUT)	25 - 31 GHz	-	-	-13	dB
Control Current		-	≈ 0	-	mA

Insertion Loss, Isolation and Return Loss

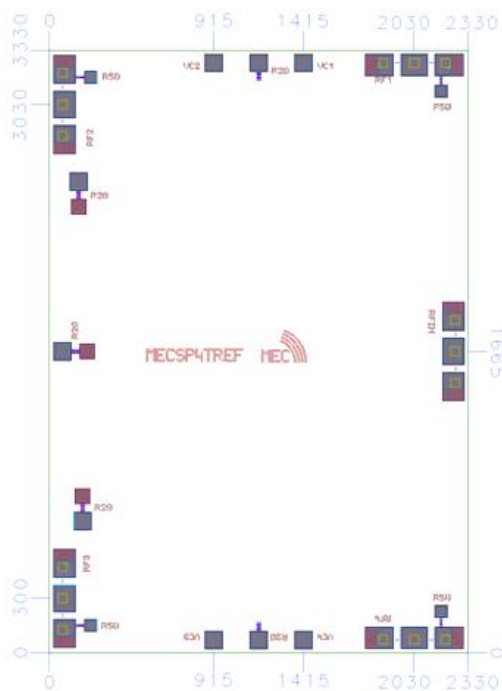
Test Conditions: Tbase_plate = 25°C - CW, 0/-2V Control Voltages



Bond Pad Configuration & Assembly Recommendations



Bond Pad #	Connection	External Components
IN1, IN2, IN3, IN4 and OUT	2 Bonding Wires $L_{\text{bond}} = 0.3\text{nH}$	
Vc1, Vc2, Vc3 and Vc4	$L_{\text{bond}} \leq 1\text{ nH}$	No external components required (Internal Series Resistance: $R_s=4\text{k}\Omega$)



All dimensions are in μm .

Eutectic Die bond using AuSn (80/20) solder is recommended.

The backside of the die is the Source (ground) contact.

Thermosonic ball or wedge bonding are the preferred connection methods.

Gold wire must be used for connections.

Bias Procedure

Bias-Up

1. Set Vc1, Vc2, Vc3 and Vc4 to Control Voltage.
2. Apply RF signal.

Bias-Down

1. Turn off RF signal.
2. Turn off Vc1, Vc2, Vc3 and Vc4.

MECKASP4TR

25 - 38 GHz Reflective SP4T



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Notice

The furnished information is believed to be reliable. However, performances and specifications contained herein are based on preliminary characterizations and then susceptible to possible variations. On the basis of customer requirements, the product can be tested and characterized in specific operating conditions and, if needed, tuned to meet custom specifications.

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