

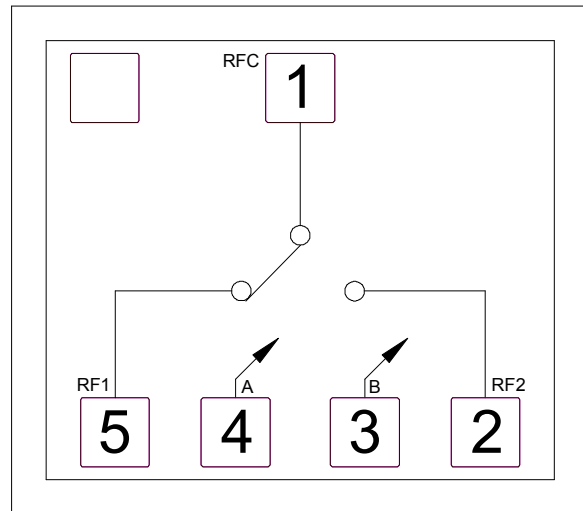
Features

- ▶ Low loss broadband performance
- ▶ High isolation
- ▶ Fast switching speed
- ▶ Reflective design
- ▶ Small die size

Description

The CMD230 is a general purpose broadband high isolation reflective MMIC SPDT switch in die form. Covering DC to 26 GHz, the CMD230 features a low insertion loss of 1.4 dB and high isolation of 40 dB at 13 GHz. The CMD230 operates using complementary control voltage logic lines of 0/-5 V and requires no bias supply.

Functional Block Diagram



Electrical Performance - $V_{ctl} = 0/-5\text{ V}$, $T_A = 25\text{ }^\circ\text{C}$, $F = 13\text{ GHz}$

Parameter	Min	Typ	Max	Units
Frequency Range	DC - 26			GHz
Insertion Loss		1.4		dB
Isolation		40		dB
Return Loss - RFC		16		dB
Return Loss RF1, RF2 - On State		27		dB
Input P0.1dB		21		dBm
Switching Speed		3.4		ns

Specifications

Absolute Maximum Ratings

Parameter	Rating
RF Input Power	+30 dBm
Control Voltage Range (A,B)	+0.5V to -7.5V
Channel Temperature, T _{ch}	150 °C
Operating Temperature	-55 to 85 °C
Storage Temperature	-55 to 150 °C

Operation of this device outside the maximum ratings may cause permanent damage.

Control Voltages

State	Bias Condition
Low	0 to -0.5V @ 0.01 uA Typ
High	-2V @ 0.1 uA Typ to -7V @ 20 uA Typ

Truth Table

Control Input		Signal Path State	
A	B	RFC to RF1	RFC to RF2
High	Low	On	Off
Low	High	Off	On

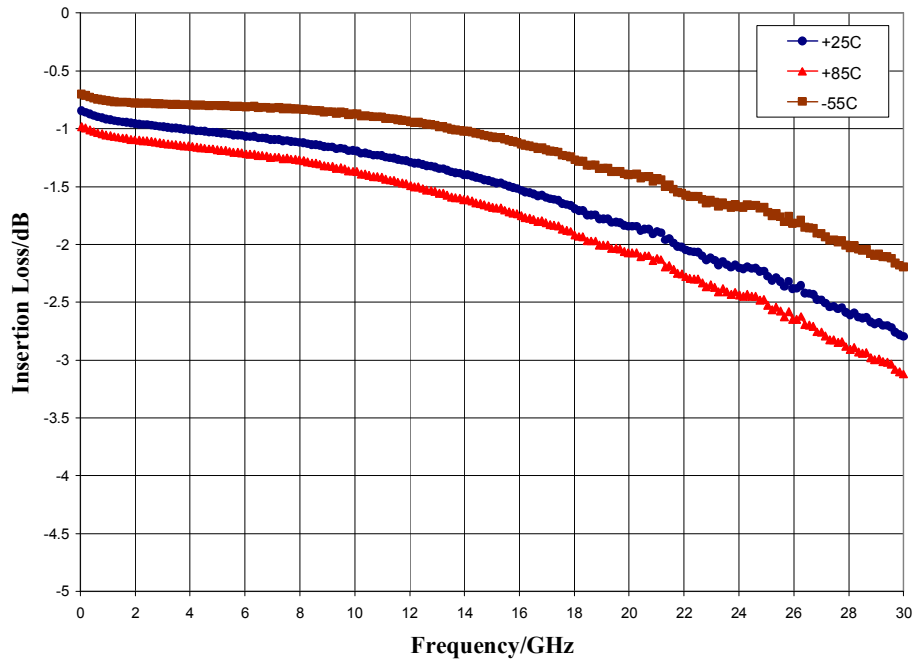
Electrical Specifications - V_{ctl} = 0/-5 V, T_A = 25 °C

Parameter	Min	Typ	Max	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range	DC - 8			DC - 18			DC - 26			GHz
Insertion Loss		1.1	1.5		1.7	2.1		2.4	2.8	dB
Isolation	39	44		32	37		27	32		dB
Return Loss - RFC		18			13			11		dB
Return Loss - RF1, 2 - On State		21			17			12		dB
Input P0.1dB		23			21			21		dBm
Input IP3		38			37			35		dBm
Switching Speed		3.4			3.4			3.4		ns

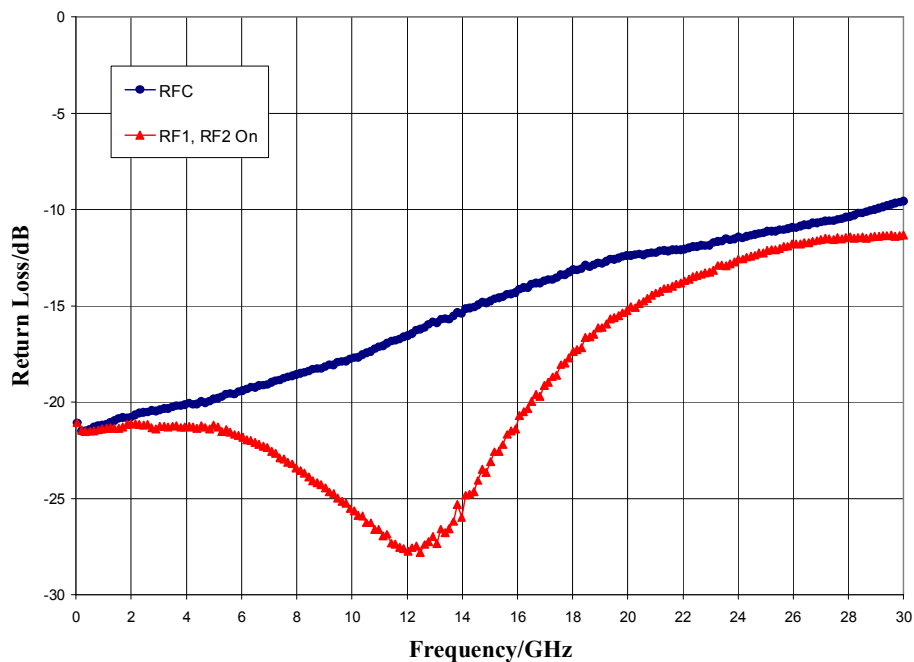
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Typical Performance

Insertion Loss vs. Temperature



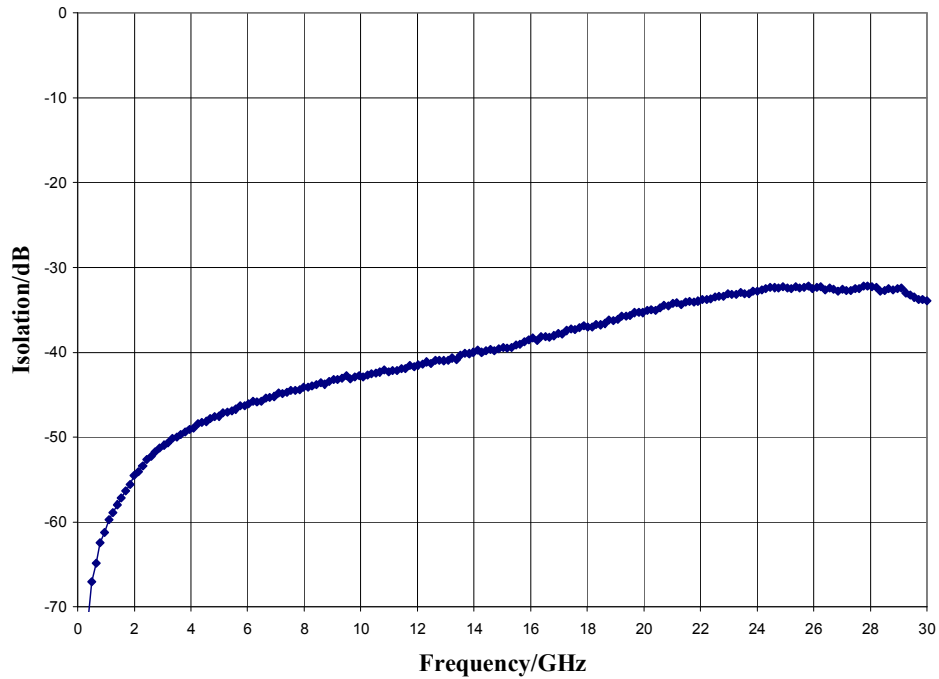
Return Loss



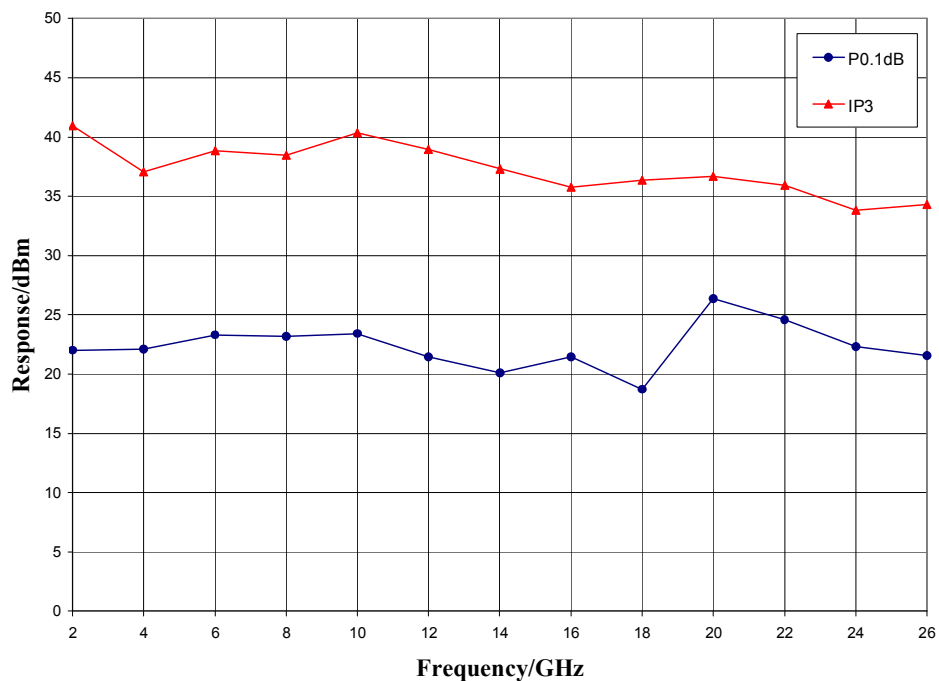
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Typical Performance

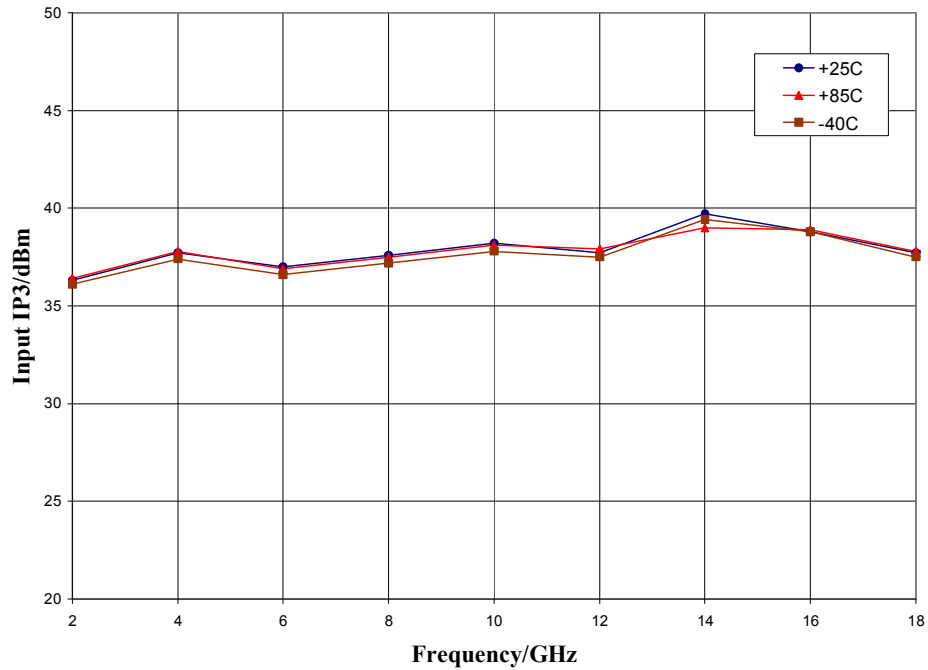
Isolation Between Ports RFC and RF1/RF2



Input P0.1dB Compression Point and Input Third Order Intercept Point

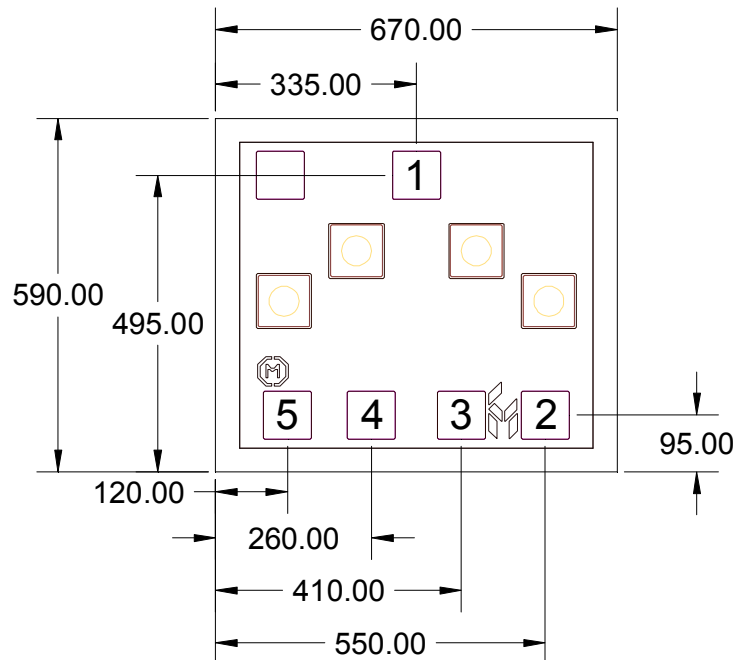


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*Typical Performance***Input Third Order Intercept Point**

Mechanical Information

Die Outline (all dimensions in microns)

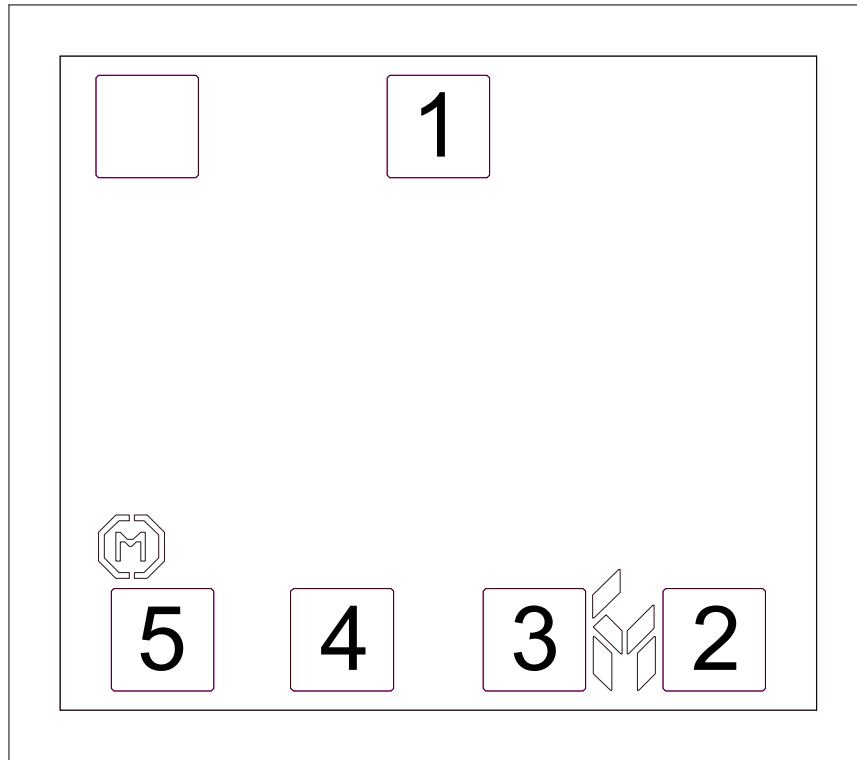


Notes:

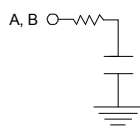

1. No connection required for unlabeled pads
2. Backside is RF and DC ground
3. Backside and bond pad metal: Gold
4. Die is 100 microns thick
5. DC bond pads are 100 microns square

Pad Description

Pad Diagram



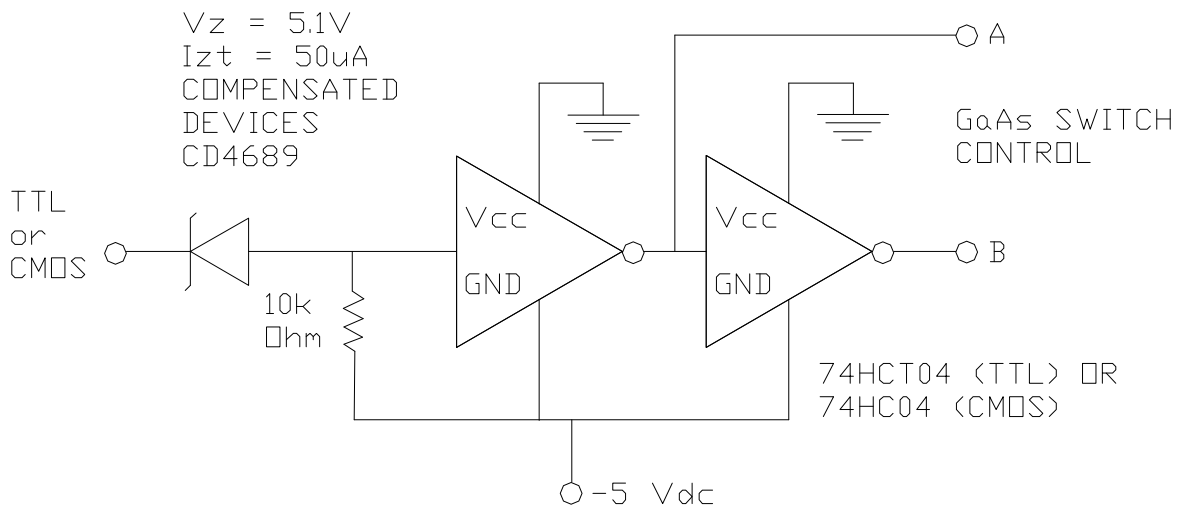
Functional Description

Pin	Function	Description	Schematic
1, 2, 5	RFC, RF2, RF1	These pins are DC coupled and matched to 50 Ohm. Blocking capacitors are required if RF line potential is not equal to 0V	
4	CTRLA	See truth table and control voltage table	
3	CTRLB	See truth table and control voltage table	
Backside	Ground	Connect to RF / DC ground	

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Applications Information

Suggested Driver Circuit



GaAs MMIC devices are susceptible to damage from Electrostatic Discharge. Proper precautions should be observed during handling, assembly and test.

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