CMD226

Passive Frequency Doubler, 7-11 GHz Input

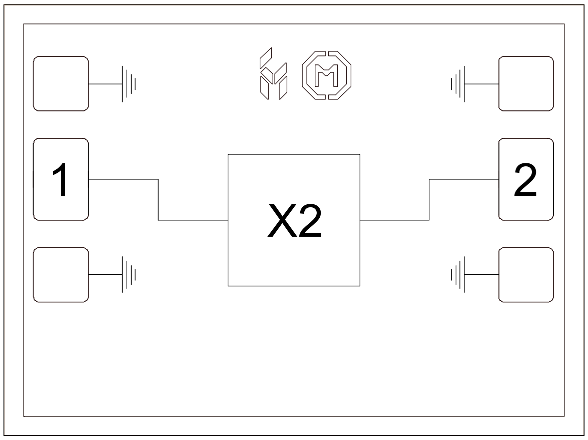
Features

- ► Low conversion loss
- ► Excellent Fo isolation
- ► Broadband performance
- ► No bias required
- ► Small die size

Description

The CMD226 die is a broadband MMIC GaAs x2 passive frequency multiplier. When driven by a +15 dBm signal, the multiplier provides 10.5 dB conversion loss at an output frequency of 18 GHz. The Fo and 3Fo isolations are 44 dBc and 46 dBc respectively. The CMD226 is a 50 ohm matched design eliminating the need for RF port matching.

Functional Block Diagram



Electrical Performance - T_A = 25 °C, Pin = +15 dBm, Fin = 9 GHz

Parameter	Min	Typ	Max	Units
Frequency Range, Input		7 - 11		GHz
Frequency Range, Output		14 - 22		GHz
Conversion Loss		10.5		dB
Fo Isolation (with respect to input level)		44		dB
3Fo Isolation (with respect to input level)		46		dB
4Fo Isolation (with respect to input level)		50		dB

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Specifications

Absolute Maximum Ratings

Parameter	**Rating**
RF Input Power	+27 dBm
Operating Temperature	-55 to 85 °C
Storage Temperature	-55 to 150 °C

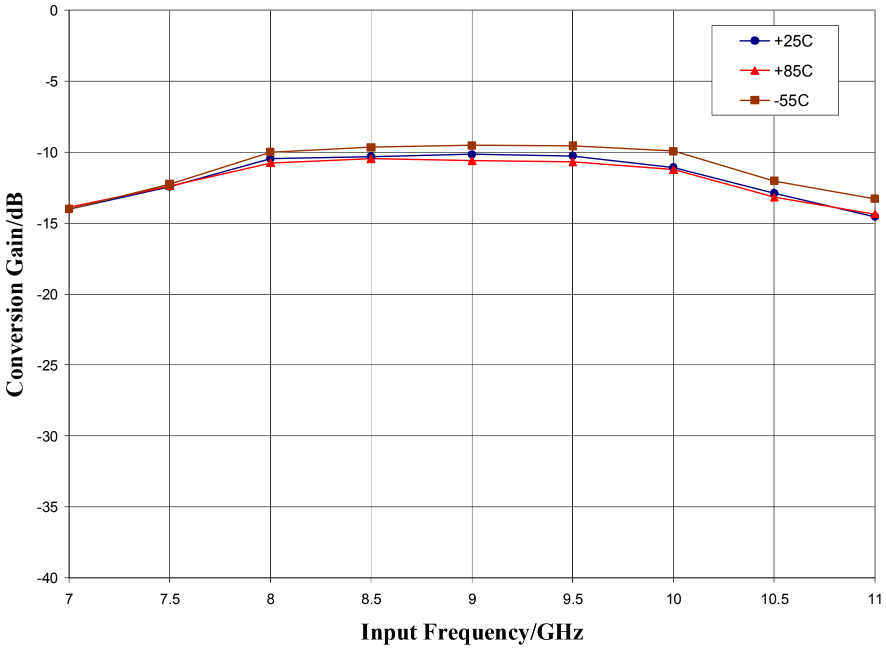
Operation of this device outside the maximum ratings may cause permanent damage.

Electrical Specifications - T_A = 25 ^oC, Pin = +15 dBm

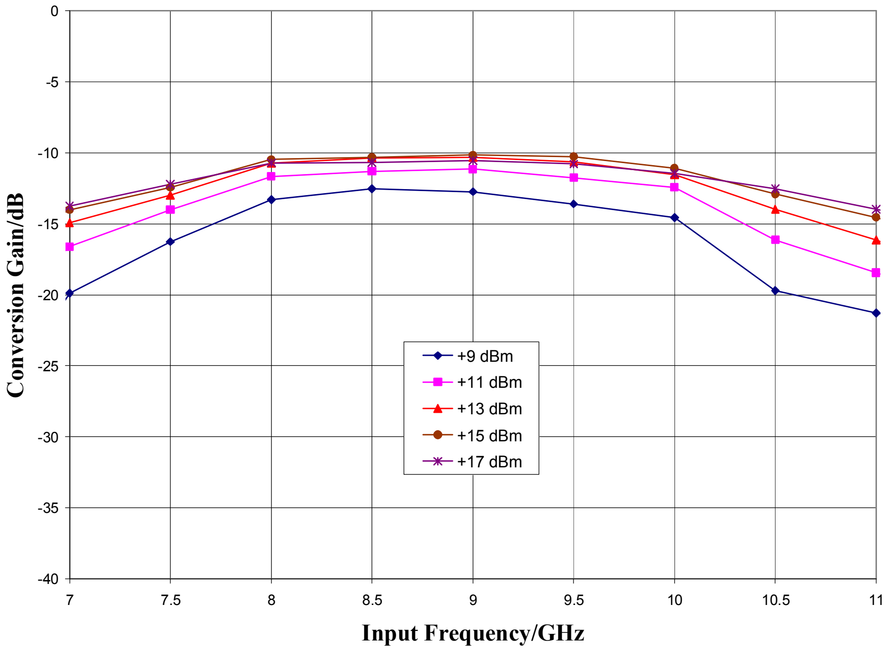
Parameter	Min	Typ	Max	Min	Typ	Max	Units
Frequency Range, Input	7 - 11			8 - 10			GHz
Frequency Range, Output	14 - 22			16 - 20			GHz
Conversion Loss		11	16		10.5	13	dB
Fo Isolation (with respect to input level)	33	44		33	44		dB
3Fo Isolation (with respect to input level)	37	48		40	48		dB
4Fo Isolation (with respect to input level)	25	45		33	45		dB

Typical Performance

Conversion Gain vs. Temperature @ +15 dBm Drive Level



Conversion Gain vs. Drive Level, T_A = 25 ^{o}C



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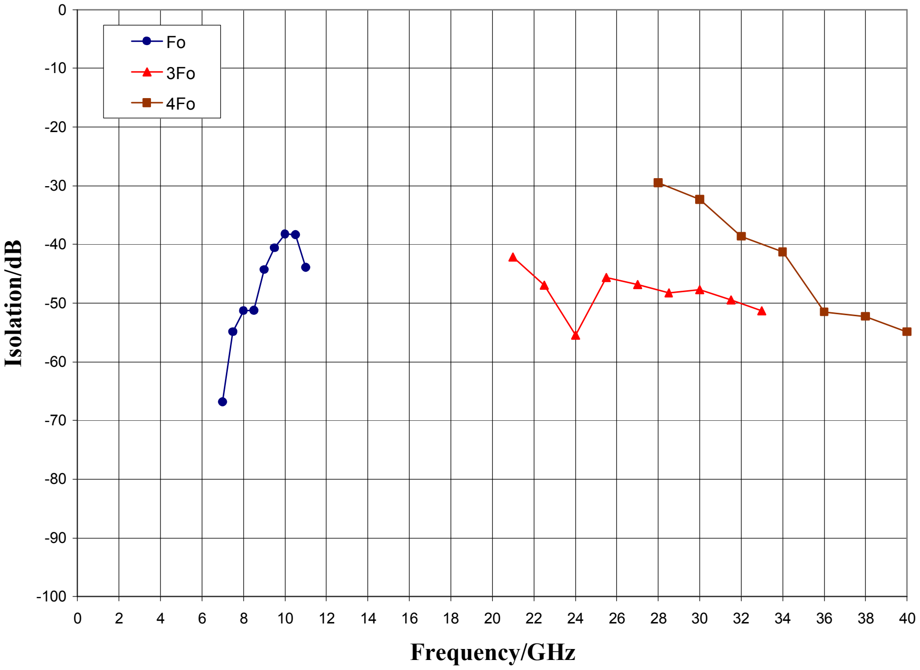
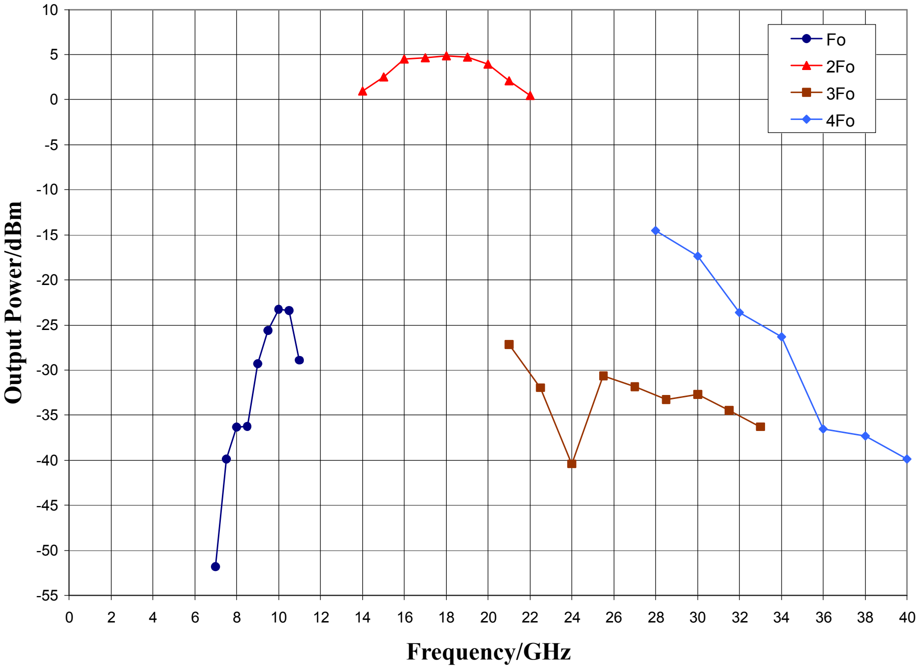
Typical Performance

Isolation (with respect to input level) @ +15 dBm Drive Level, T_A = 25 °C



Output Spectrum @ +15 dBm Drive Level, T_A = 25 °C



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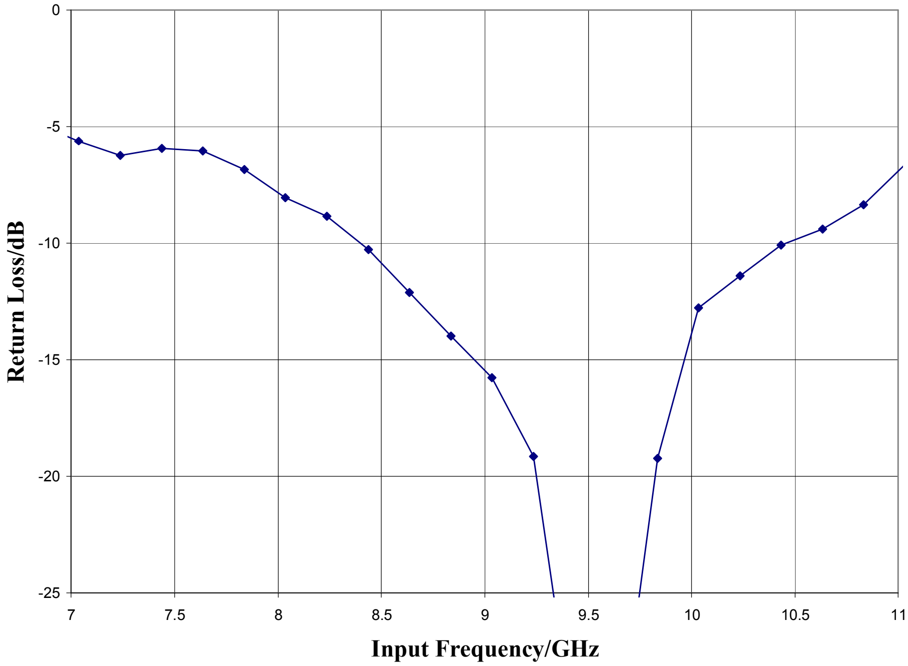
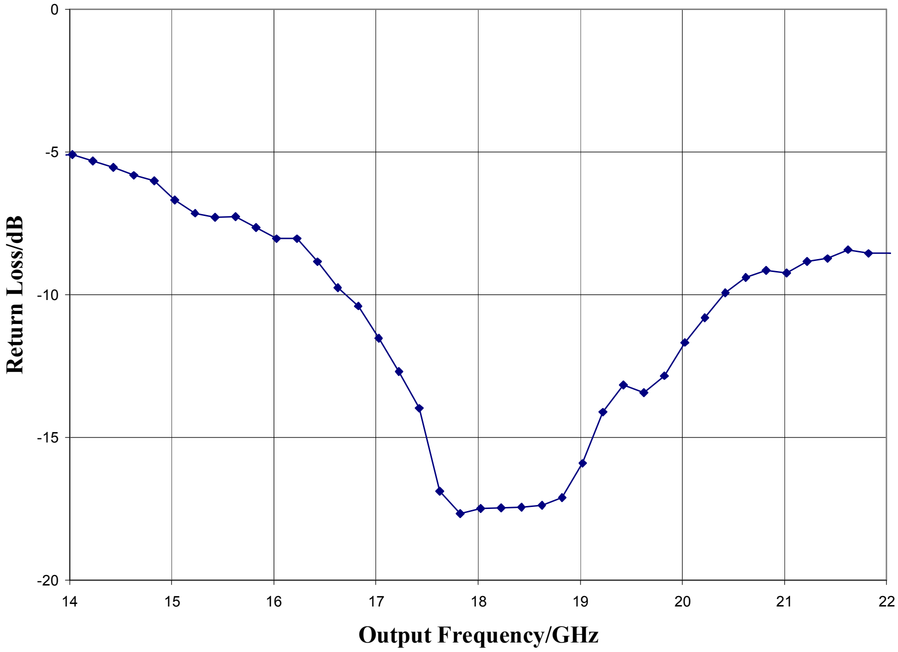
Typical Performance

Input Return Loss @ +15 dBm Drive Level, T_A = 25 °C



Output Return Loss @ +15 dBm Drive Level, F = 9 GHz Input, T_A = 25 °C



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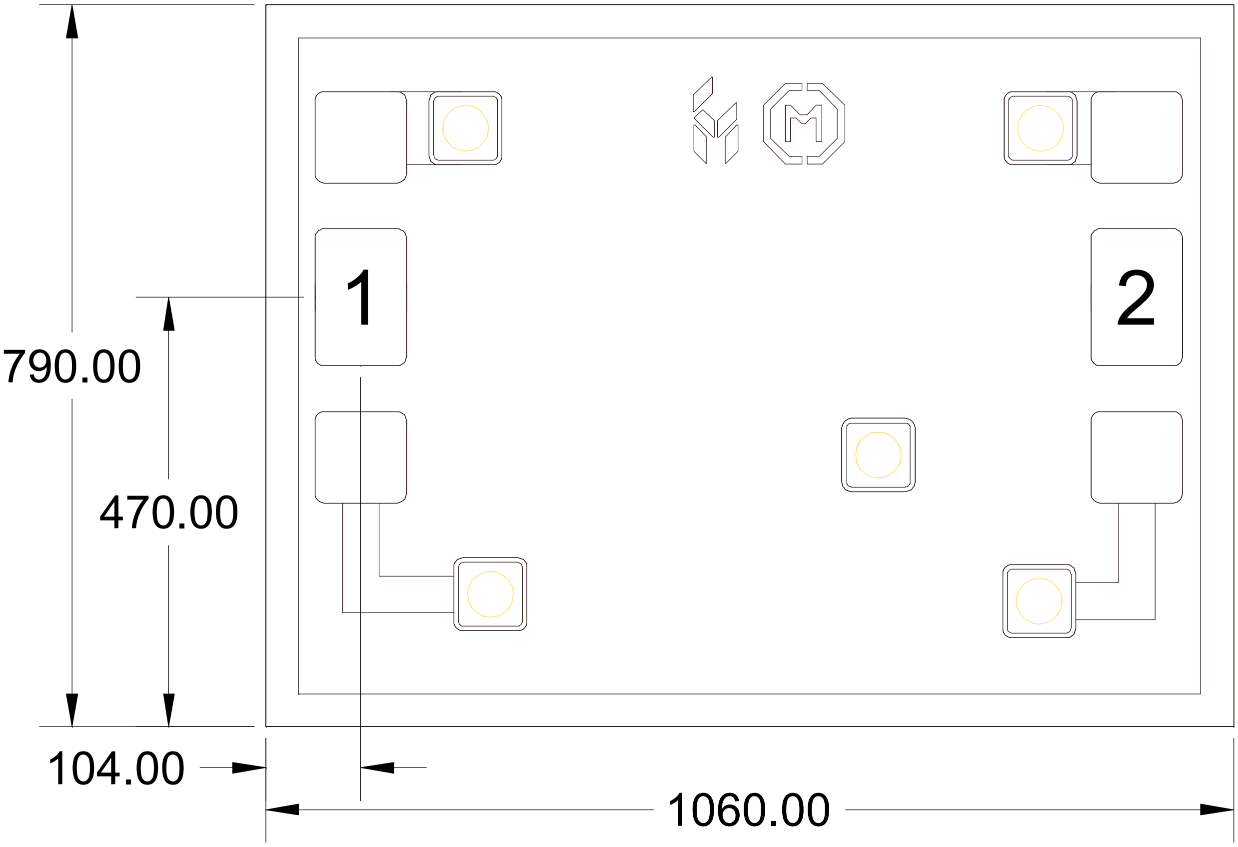
Mechanical Information

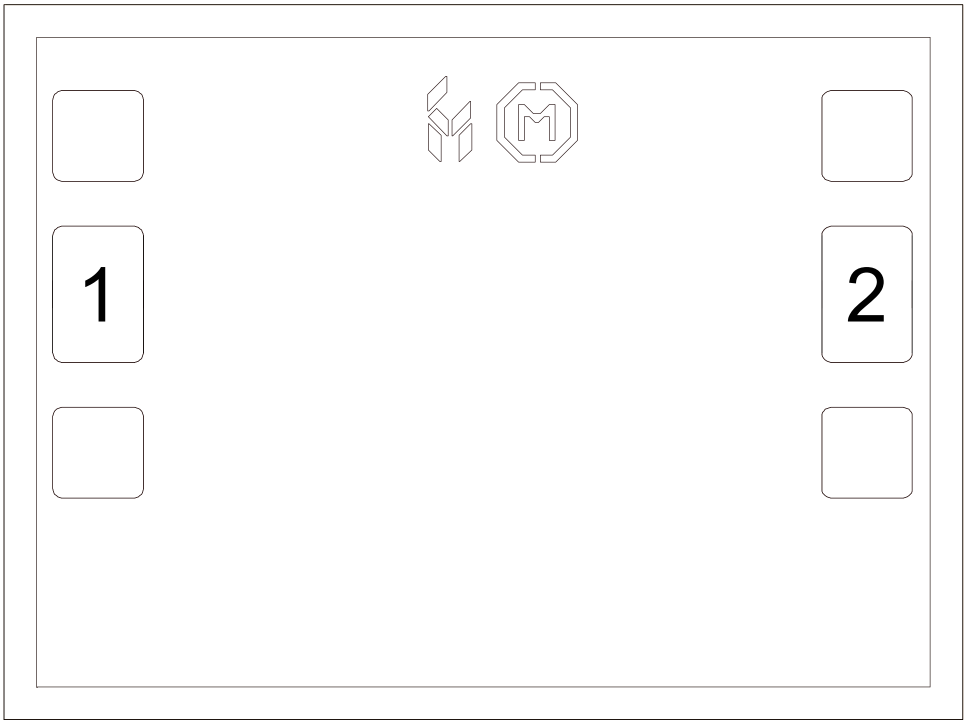
Die Outline (all dimensions in microns)



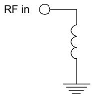
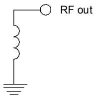
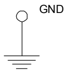
Notes:
1. No connection required for unlabeled pads
2. Backside is RF and DC ground
3. Backside and bond pad metal: Gold
4. Die is 100 microns thick
5. RF bond pads are 100 x 150 microns

Pin Description

Pad Diagram



Functional Description

Pad	Function	Description	Schematic
1	RF in	Pad is DC coupled and 50 ohm matched	
2	RF out	Pad is DC coupled and 50 ohm matched	
Backside	Ground	Connect to RF / DC ground	

Applications Information

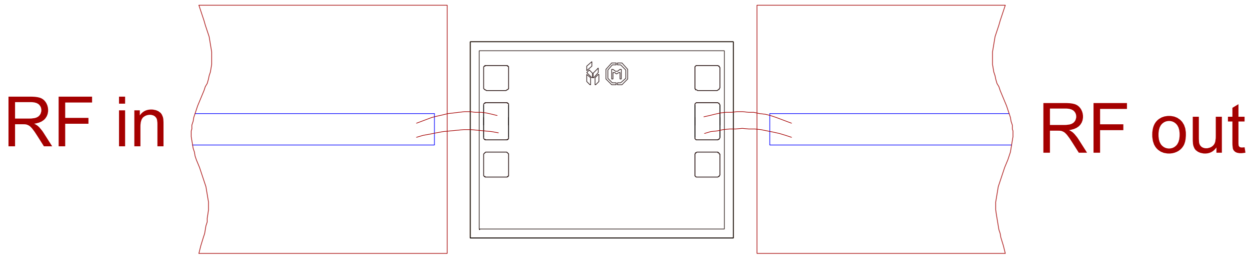
Assembly Guidelines

The backside of the CMD226 is RF ground. Die attach should be accomplished with electrically and thermally conductive epoxy or eutectic attach. Standard assembly procedures should be followed for high frequency devices. The top surface of the semiconductor should be made planar to the adjacent RF transmission lines.

RF connections should be made as short as possible to reduce the inductive effect of the bond wire. Use of a 0.8 mil thermosonic wedge bonding is highly recommended as the loop height will be minimized. The RF input and output require double bond wires as shown.

The semiconductor is 100 um thick and should be handled by the sides of the die or with a custom collet. Do not make contact directly with the die surface as this will damage the monolithic circuitry. Handle with care.

Assembly Diagram



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

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