

Features:

- **Operating Frequency:**
 $\Delta F = 5$ to 18 GHz
- **Small Signal Gain:**
 $G_{SS} = 10$ dB
- **Operating Voltage:**
 $V_{DD} = 8$ V, $V_G = -5$ V
- **RF Output Power:**
 $P_{-1} = 30$ dBm
- **Die Size:**
 $3.68 \times 3.16 \times 0.1$ mm³

Description:

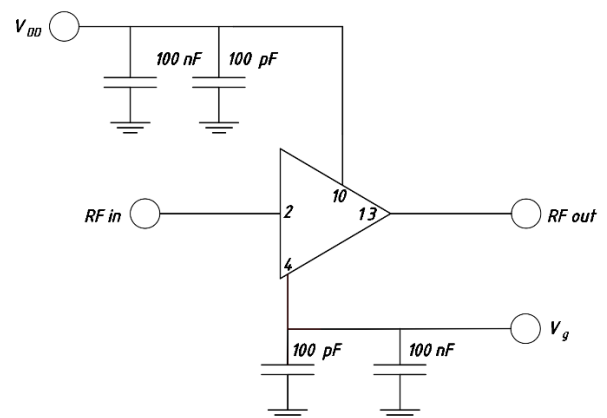
MC120-2 is wideband GaAs power amplifier with a small signal gain of 10 dB. This device is well suited for fiber optic, microwave radio, telecom infrastructure, test instrumentation and VSAT applications

Electrical Specifications ($V_{DD} = 8$ V, $I_{DQ} = 485$ mA, $T = 25^\circ\text{C}$)

Parameter	Symbol	Units	Specification			Condition
			Min	Typ	Max	
Operating Frequency	ΔF	GHz	5	-	18	
Return Loss input / output	RL	dB	-	-	-12 / -12	
Small Signal Gain	G_{SS}	dB	8	10	-	
Drain Bias Voltage	V_{DD}	V	7	-	8	
Gate Bias Voltage	V_G	V	-5.5	-5	-4.5	
Operating Current Under RF Drive	I_{DD}	mA	-	-	600	
Supply Gate Current	I_G	mA	-	-	5	
RF Output Power P_{-1}	P_{-1}	dBm	28	-	-	F=5 GHz
			29.5	-	-	F=10 GHz
			31	-	-	F=18 GHz

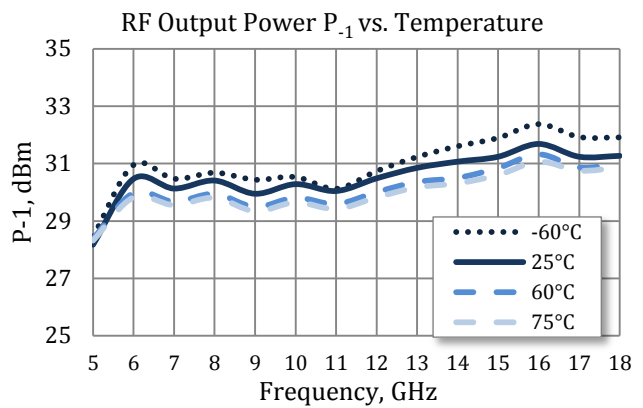
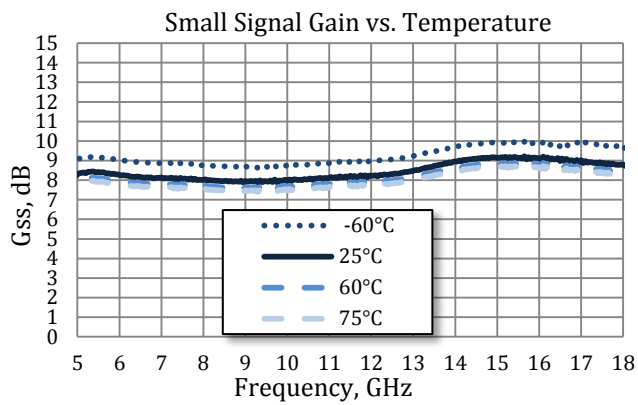
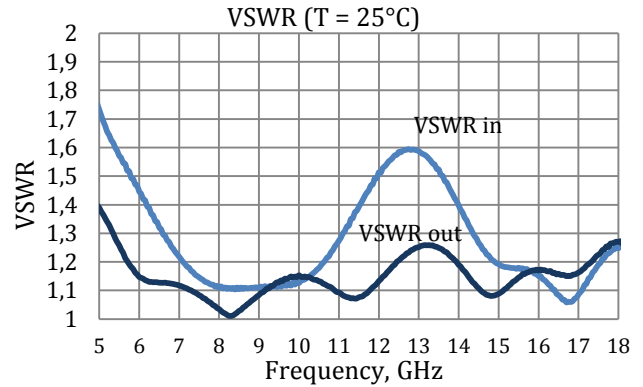
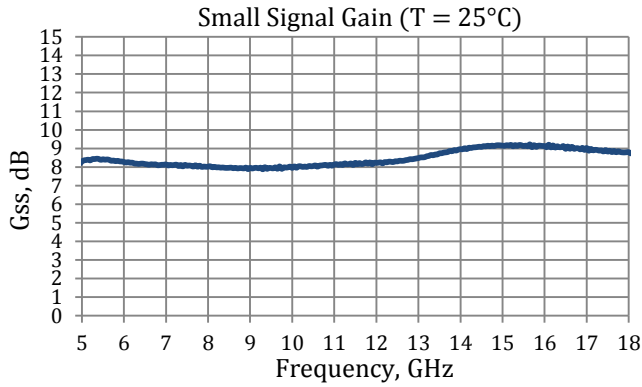
Absolute Maximum Ratings

Parameter	Description	Rating
Drain Bias Voltage	V_{DD}	+8.5 V
Gate Bias Voltage	V_G	-6...-4 V
Maximum Input Power	P_{in}	+28 dBm
Operating Temperature	T_{oper}	-60...85°C
Storage Temperature	T_{store}	-65...150°C



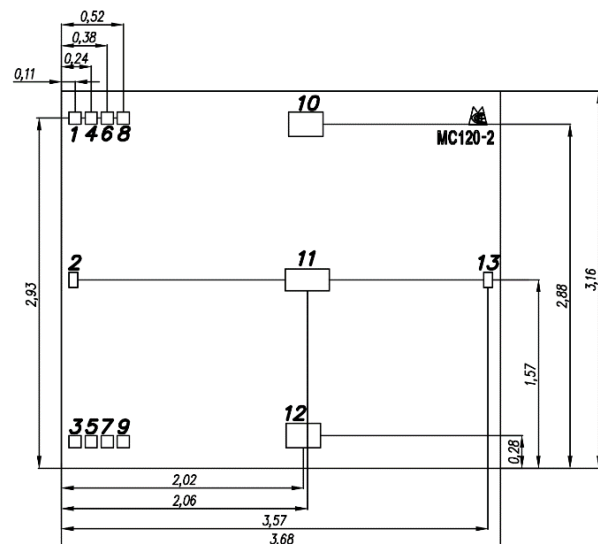
Performance Plots

Test Condition ($V_{DD} = 8\text{ V}$, $I_{DQ} = 485\text{ mA}$, $T = -60\dots75^\circ\text{C}$)



Pad Layout

Pin	Name	Description
1,4,6,8 (3,5,7,9)	VG1, VG2, VG3, VG4	Gate Bias Voltage
2	RF in	RF Input
10 (12), 11	V_{DD}	Drain Bias Voltage
13	RF out	RF Output

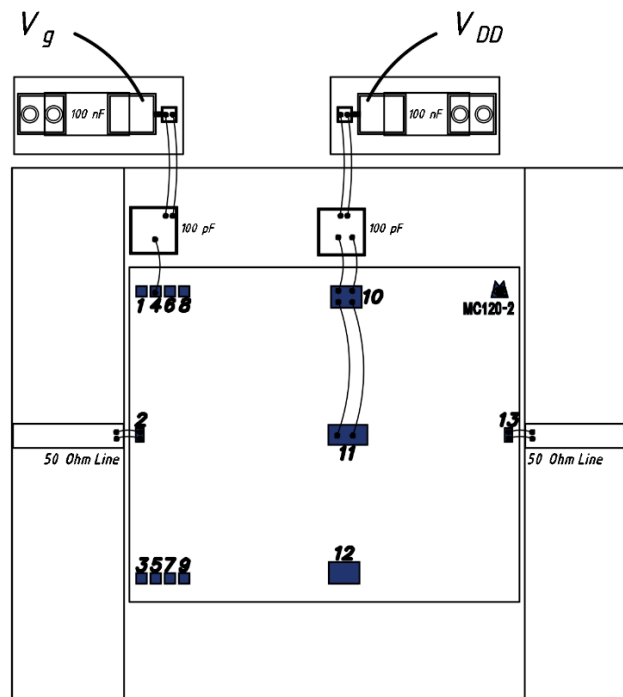


- Units - millimeters. Bond Pad dimensions are shown to center of bond pad.
- All RF Bond Pads are 0.07 x 0.13 mm.
- VG Bond Pads are 0.096 x 0.096 mm.
- VD Bond Pads are 0.28 x 0.2 mm
- Backside is ground.
- Bond Pad / Backside Metallization - Gold

Typical Supply Current ($V_{DD} = 8\text{ V}$, $V_G = -5\text{ V}$)

I_{DQ} , mA	Gate Bias Pad	Adjust I_{DQ} by connecting Gate Bias Voltage (V_G) to the pads VG1, VG2, VG3, VG4.
485	VG1	V_{DD} connection is not allowed without a connected V_G
435	VG2	
380	VG3	
330	VG4	

Assembly Diagram



Preferred Assembly Instructions

Die attach should be accomplished with electrically and thermally conductive epoxy (recommended epoxy Namics XH9960-1). The top surface of the semiconductor should be made planar to the adjacent RF transmission lines, and the RF decoupling capacitors placed in close proximity to the DC connections on chip. RF connections should be made as short as possible to reduce the inductive effect of the bond wire. The recommended wire bonding procedure uses 20-25 μm 99.99% pure gold wires. Use of a thermosonic wedge bonding is recommended. The RF input and output require a double bond wire. Device 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.



Gallium Arsenide (GaAs) devices are susceptible to electrostatic and mechanical damage. Die are supplied in antistatic containers, which should be opened in cleanroom conditions at an appropriately grounded antistatic work-station. Devices need careful handling using correctly designed collets, vacuum pickups or, with care, sharp tweezers.