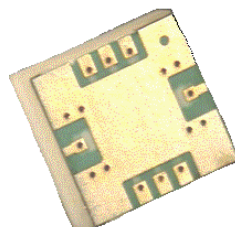


Preliminary Information

AMMP-6120

6-20 GHz Frequency Multiplier X2 Data Sheet

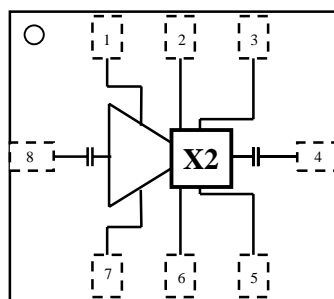


Features

- **5x5mm Surface Mount Package**
- **Frequency Range: 6-20 GHz output**
- **Output Power: +2 dBm**
- **Harmonic Suppression: 30 dBc**
- **DC requirements: 5 V, -1V, 50mA**

Applications

- Microwave Radio systems
- Satellite VSAT and DBS systems
- Commercial grade military
- 802.16 & 802.20 WiMax BWA systems
- WLL and MMDS loops



Pin	Function
1	V _{G1}
2	V _D
3	V _{G2}
4	RF Out
5	
6	
7	
8	RF In

PACKAGE
BASE
GND

Description

Agilent's AMMP-6120 is a easy-to-use integrated frequency multiplier (x2) in surface mount package designed for commercial communication systems. The MMIC takes a 3 to 10 GHz input signal and doubles it to 6 to 20 GHz. It has integrated amplification, matching, harmonic suppression, and bias networks. The input/output are matched to 50 Ω and fully DC blocked. The MMIC is fabricated using PHEMT technology. The backside of this package part is both RF and DC ground. This helps simply the assembly process and reduces assembly related performance variations and costs. . The surface mount package allows elimination of "chip & wire" assembly for lower cost. This MMIC is a cost effective alternative to hybrid (discrete-FET), passive, and diode doublers that require complex tuning and assembly process.

AMMP-6120: DC & RF Specifications

Sym	Parameters/Conditions	Typ.	Min/Max
V _d	Drain Supply Voltage	V	5
V _{G1, G2}	Gate Voltage	V	-0.7
I _d	Drain Supply Current	mA	50
Gain	Conversion Gain	dB	+5 0
RL _{in}	Input Return Loss	dB	-11 -9.8
RL _{out}	Output Return Loss	dB	-13 -9.8
P-1dB	Power @ 1dB Gain Comp	dBm	+2 0
Sup	Fundamental and 3 rd Harmonic Suppression	dBc	30
Sup4	4 th Harmonic Suppression	dBc	40

This preliminary data is provided to assist you in the evaluation of product(s) currently under development. Until Agilent Technologies releases this product for general sales, Agilent Technologies reserves the right to alter prices, specifications, features, capabilities, functions, release dates, and remove availability of the product(s) at anytime.

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AMMP-6120 Typical Performances

($T_A = 25^\circ\text{C}$, $V_d = 5\text{ V}$, $I_D = 50\text{ mA}$, $Z_{in} = Z_{out} = 50\ \Omega$)

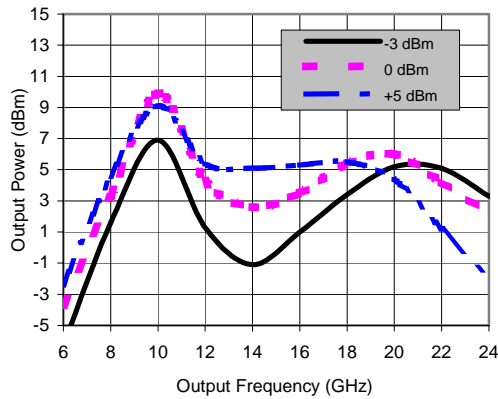


Figure 1. Output Power vs. Drive Level

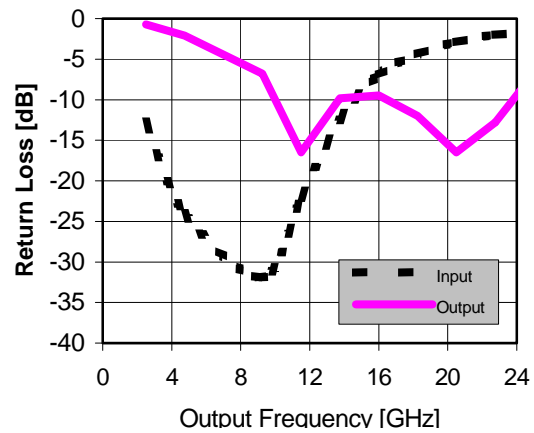


Figure 2. Typical Return Loss

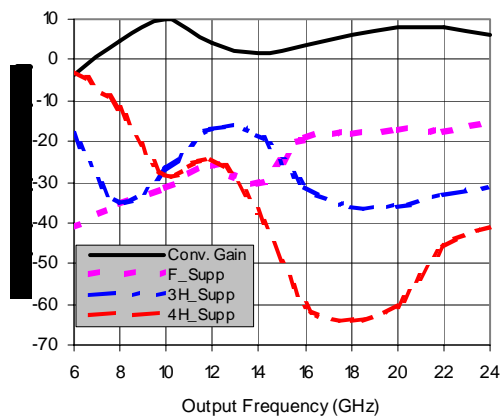


Figure 3. Conversion Gain (Fund. to 2nd H) and Harmonic Suppression (2H vs. Fund, 3rd H, & 4th H) @ $P_{in} = -3\text{ dBm}$

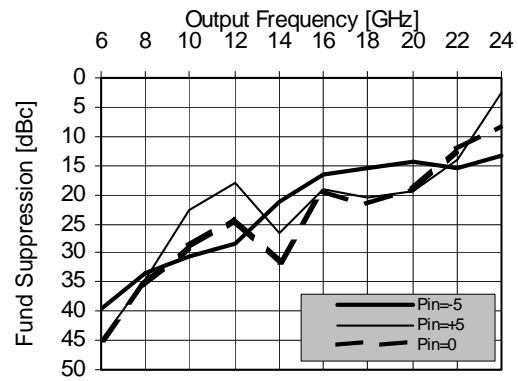


Figure 3. Typical Fundamental Suppression

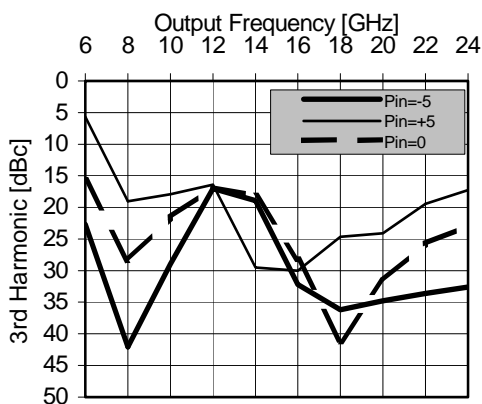


Figure 4. Typical 3rd Harmonic Suppression

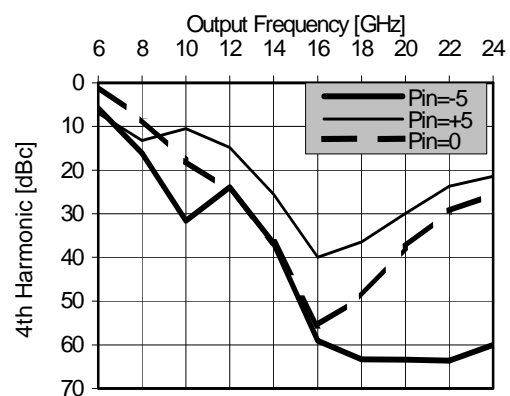


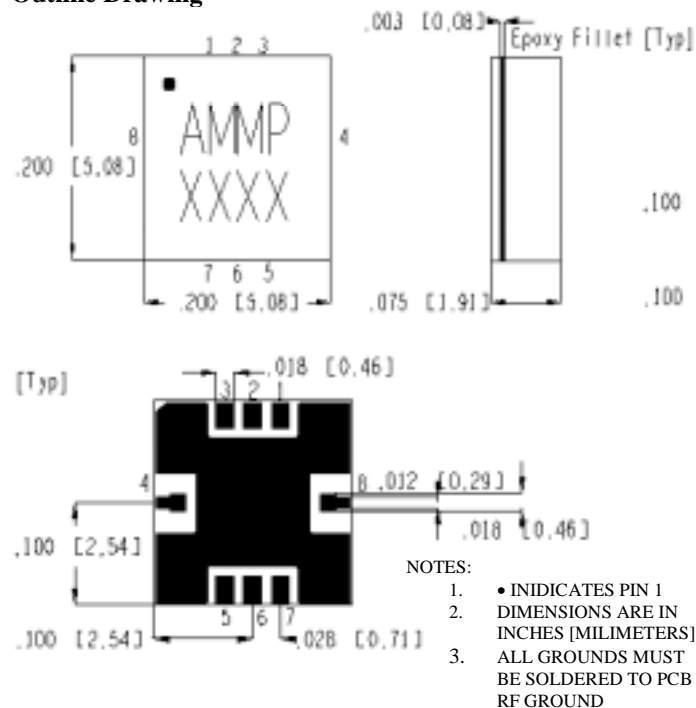
Figure 5. Typical 4th Harmonic Suppression

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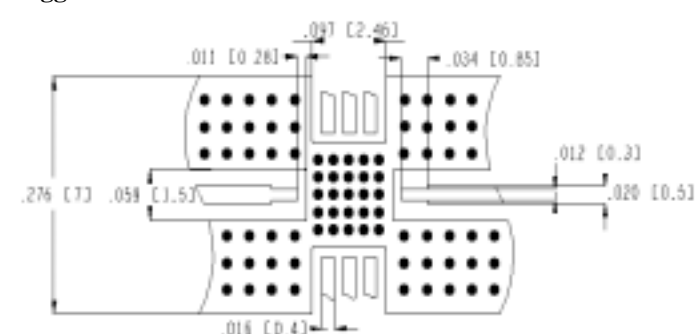
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Outline Drawing

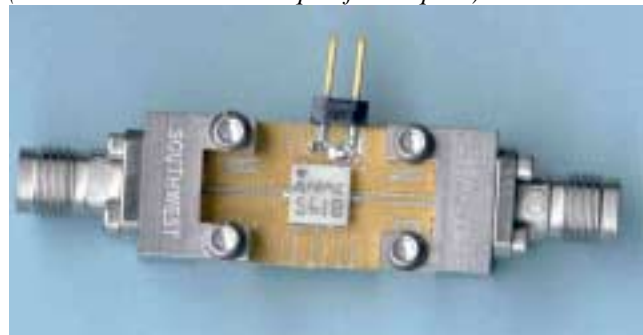


Suggested PCB Material and Land Pattern



Evaluation Test Circuit (Demo Board)

(Available to customer on qualified request)



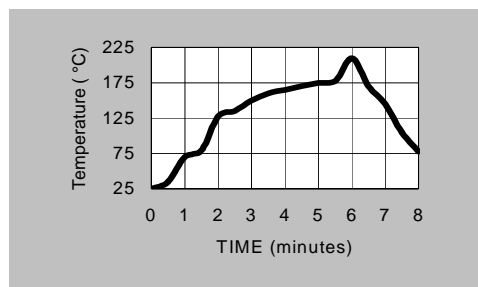
Recommended SMT Attachment

The AMMP Packaged Devices are compatible with high volume surface mount PCB assembly processes.

The PCB material and mounting pattern, as defined in the data sheet, optimizes RF performance and is strongly recommended. An electronic drawing of the land pattern is available from www.agilent.com/view/rf or upon request from Agilent Application Engineering.

Manual Assembly for Prototypes

1. Follow ESD precautions while handling packages.
2. Handling should be along the edges with tweezers or from topside if using a vacuum collet.
3. Recommended attachment is solder paste. Please see recommended solder reflow profile. Conductive epoxy is not recommended. Hand soldering is not recommended.
4. Apply solder paste using either a stencil printer or dot placement. The volume of solder paste will be dependent on PCB and component layout and should be controlled to ensure consistent mechanical and electrical performance. **Excessive solder will degrade RF performance.**
5. Follow solder paste and vendor's recommendations when developing a solder reflow profile. A standard profile will have a steady ramp up from room temperature to the pre-heat temperature to avoid damage due to thermal shock.
6. Packages have been qualified to withstand a peak temperature of 235°C for 15 seconds. Verify that the profile will not expose device beyond these limits.
7. Clean off flux per vendor's recommendations.
8. Clean the module with Acetone. Rinse with alcohol. Allow the module to fully dry before testing.



Recommended solder reflow profile

For product information and a complete list of Agilent contacts and distributors, please go to our website: www.agilent.com/semiconductors
 E-mail: SemiconductorSupport@agilent.com
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