AMMC-6408

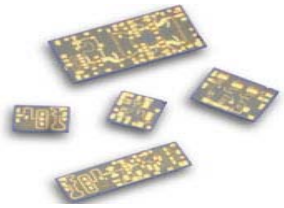
6-18 GHz 1W Power Amplifier

Description

AMMC-6408 MMIC is a broadband 1W power amplifier in a surface mount package designed for use in transmitters that operate in various frequency bands between 6GHz and 18GHz.

Lead (PB) Free
RoHS 6 fully compliant

Lifecycle status: Active



Features

- Wide Frequency Range 6-18GHz
- Highly linear: OIP3=38dBm
- Integrated RF power detector
- ESD protection (40V MM, and 200V HBM)
- Input port partially matched (For narrowband applications, customer may obtain optimum matching and gain with an additional matching circuit)

Applications

- Microwave Radio systems
- Satellite VSAT, DBS Up/Down Link
- LMDS & Pt-Pt mmW Long Haul
- Broadband Wireless Access (including 802.16 and 802.20 WiMax)
- WLL and MMDS loops
- Commercial grade military

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Data Sheet

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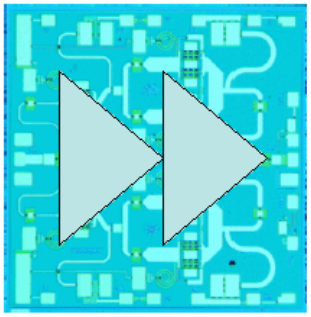

Chip Size: 2000 x 2000 µm (78.5 x 78.5 mils)
Chip Size Tolerance: ± 10 µm (±0.4 mils)
Chip Thickness: 100 ± 10 µm (4 ± 0.4 mils)
Pad Dimensions: 100 x 100 µm (4 ± 0.4 mils)

Description

The AMMC-6408 MMIC is a broadband 1W power amplifier in a surface mount package designed for use in transmitters that operate in various frequency bands between 6GHz and 18GHz. At 8GHz, it provides 29 dBm of output power (P-1dB) and 20dB of small-signal gain from a small easy-to-use device. This MMIC is optimized for linear operation with an output third order intercept point (OIP3) of 38dBm.

Applications

- Microwave Radio systems
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- WLL and MMDS loops

Features

- Wide Frequency Range 6-18GHz
- Highly linear: OIP3=38dBm
- Integrated RF power detector
- ESD protection (40V MM, and 200V HBM)
- Input port partially matched (For narrowband applications, customer may obtain optimum matching and gain with an additional matching circuit)
- Specifications (Vdd=5V, Idq=650mA)
- Frequency range 6 to 18 GHz
- Small signal Gain of 18dB
- Return loss: Input: -3 dB, Output: -9 dB
- High Power: @ 8 GHz, P-1dB = 29 dBm

Attention: Observe Precautions for handling electrostatic sensitive devices.
ESD Machine Model (Class A)
ESD Human Body Model (Class0)
Refer to Avago Application Note A0040R:
Electro Discharge Damage and Control.
Note: This MMIC uses depletion mode pHEMT devices. Negative supply is used for the DC gate biasing.

Absolute Maximum Ratings[1]

Symbol	Parameters [1]	Units	Value	Notes
V_{dd}	Positive Supply Voltage	V	6	2
V_g	Gate Supply Voltage	V	-3 to 0.5	
I_{dq}	Drain Current	mA	900	
P_D	Power Dissipation	W	4.6	2, 3
P_{in}	CW Input Power	dBm	23	2
$T_{ch,\ max}$	Maximum Operating Channel Temp.	°C	+155	4, 5
T_{stg}	Storage Case Temp.	°C	-65 to +155	
T_{max}	Maximum Assembly Temp (20 sec max)	°C	+260	

Notes:
1. Operation in excess of any one of these conditions may result in permanent damage to this device.
2. Combinations of supply voltage, drain current, input power, and output power shall not exceed PD.
3. When operate at this condition with a base plate temperature of 85 °C, the median time to failure (MTTF) is significantly reduced.
4. These ratings apply to each individual FET
5. Junction operating temperature will directly affect the device MTTF. For maximum life, it is recommended that junction temperatures be maintained at the lowest possible levels.

DC Specifications/ Physical Properties

Symbol	Parameters and Test Conditions	Units	Value
I_{dq}	Drain Supply Current (V_{dd}=5 V, V_g set for I_d Typical)	mA	650
V_g	Gate Supply Operating Voltage ($I_{d(Q)}$ = 650 (mA))	V	-1.1
$R_{\theta jc}$	Thermal Resistance[6] (Channel-to-Base Plate)	°C/W	22
T_{ch}	Channel Temperature	°C	150.6

Notes:
6. Channel-to-backside Thermal Resistance (θch-b) = 10°C/W at Tchannel (Tc) = 107°C as measured using infrared microscopy. Thermal Resistance at backside temperature (Tb) = 25°C calculated from measured data.

RF Specifications [7,8,9]

T_A= 25°C, V_{dd} = 5V, $I_{d(Q)}$ = 650mA, Z_o=50Ω

Symbol	Parameters and Test Conditions	Units	Minimum	Typical	Maximum
Freq	Operational Frequency	GHz	6		18
Gain	Small-signal Gain S21[9,10]	dB	16	19	
P_{-1dB}	Output Power at 1dB [9,10] Gain Compression[8]	dBm	26	29	
P_{-3dB}	Output Power at 3dB Gain Compression[9]	dBm		29.5	
OIP_3	Third Order Intercept Point; Δf=100MHz; Pin=-20dBm	dBm		38	
RL_{in}	Input Return Loss[8]	dB		3	
RL_{out}	Output Return Loss[8]	dB		9	
Isolation	Reverse Isolation	dB		45	

Notes:
7. Small/Large -signal data measured in packaged form on a 2.4mm connecter based evaluation board at TA = 25°C.
8. This final package part performance is verified by a functional test correlated to actual performance at one or more frequencies
9. Pre-assembly into package performance verified 100% on-wafer published specifications at Frequencies=8, 12, and 17GHz

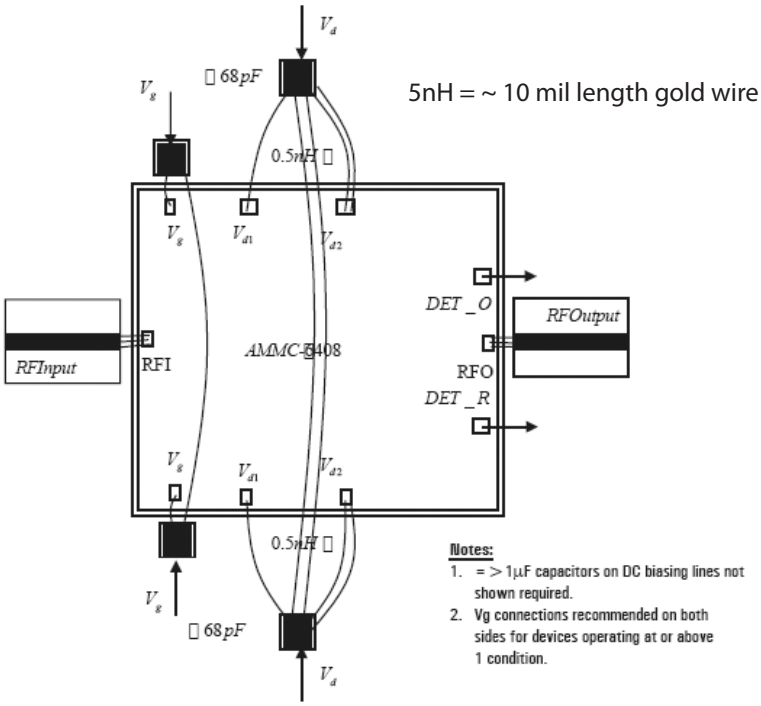

Figure 21. AMMC-6408 Bonding Diagram

Ordering Information:

AMMC-6408-W10 = 10 devices per tray

AMMC-6408-W50 = 50 devices per tray