

0.4 – 26.5 GHz GaAs MMIC Amplifier

AMM-7473PC

1. Device Overview

1.1 General Description

The AMM-7473PC is a high-linearity broadband MMIC amplifier capable of providing +25 dBm output power typical. The AMM-7473PC can serve either as a linear signal amplifier, or as a saturated driver amplifier for H- or S-diode mixers. The amplifier has excellent return losses, gain flatness, and IP3.



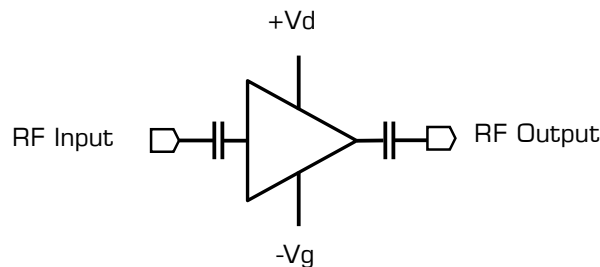
1.2 Features

- +25 dBm output power up to 15GHz
- 16 dB gain up to 15GHz
- Excellent Return Losses
- No external bias tee required
- [AMM-7473PC S-parameters](#)

1.3 Applications

- Mobile test and measurement equipment
- Radar and satellite communications
- Driver amplifier for H- & S- diode mixers

1.4 Functional Block Diagram



1.5 Part Ordering Options¹

| Part Number | Description | Package | Green Status | Product Lifecycle | Export Classification |
|-------------|----------------------|---------|--------------|-------------------|-----------------------|
| AMM-7473PC | Connectorized Module | PC | RoHS | Active | EAR99 |

¹ Refer to our [website](#) for a list of definitions for terminology presented in this table.

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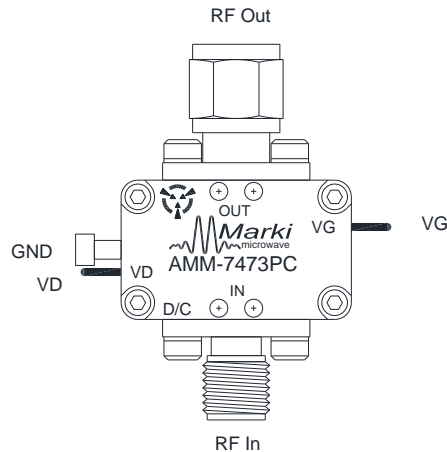
Revision History

| Revision Code | Revision Date | Comment |
|---------------|---------------|---------------------------|
| - | April 2023 | Datasheet Initial Release |

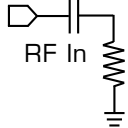


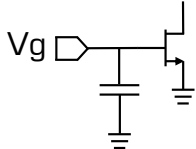
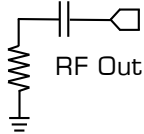
2. AMM-7473PC Port Configurations and Functions

2.1 AMM-7473PC Port Diagram

A port diagram of the AMM-7473PC is shown below.



2.2 AMM-7473PC Port Functions

| Pin | Function | Description | Equivalent Circuit for Package |
|--------|------------------|--|---|
| RF In | RF Input | This is the RF Input port of the amplifier die. It is RF matched to 50 Ω and has built-in DC blocking capacitors. |  |
| GND | Ground | Housing or ground lug must be connected to a DC/RF ground potential with high thermal and electrical conductivity. |  |
| VD | Drain Supply Pin | The VD pin supplies DC voltage to the drain of the amplifier IC. Apply gate bias voltage Vg before applying drain power supply. |  |
| VG | Gate Bias Pin | The VG pin provides a required negative bias which controls the drain power supply current to the amplifier. More negative voltage decreases the supply current. Apply gate bias voltage Vg before applying drain power supply. |  |
| RF Out | RF Output | This is the amplifier's RF Output. It is RF matched to 50 Ω and has built-in DC blocking capacitors. Must have less than 7:1 VSWR when operating. |  |

3. Specifications

3.1 Absolute Maximum Ratings

The Absolute Maximum Ratings indicate limits beyond which damage may occur to the device. If these limits are exceeded, the device may become inoperable or have a reduced lifetime. Reliability limits are individual, instantaneous catastrophic limits only. Functional operation limits are indicated below. Operation of the device at multiple absolute maximum limits or for extended periods at a single limit can cause degradation and damage to the device.

| Parameter | Maximum Rating | Units |
|--|----------------|-------|
| Drain Supply Voltage (Vd) | +10 | V |
| Drain Current (RF Applied) | 550 | mA |
| Gate Bias Voltage (Vg) | +0.5 | V |
| RF Input Power | +18 | dBm |
| Operating Temperature for MTTF > 1E6 hours | -55 to +85 | °C |
| Storage Temperature | -65 to +150 | °C |

3.2 Package Information

| Parameter | Details | Rating |
|-----------|----------------------------------|--------|
| Weight | AMM-7473PC, Connectorized Module | 11 g |

3.3 Recommended Operating Condition

The Recommended Operating Conditions indicate the limits, inside which the device should be operated, to guarantee the performance given in Electrical Specifications. Operating outside these limits may not necessarily cause damage to the device, but the performance may degrade outside the limits of the electrical specifications. For limits, above which damage may occur, see Absolute Maximum Ratings.

| Recommended Operating Conditions | Min | Nominal | Max | Units |
|--|-----|---------|------|-------|
| T _A , Ambient Temperature | -40 | +25 | +85 | °C |
| Power Supply DC Voltage (V _d) | +5 | +7 | +7.5 | V |
| Power Supply DC Current (I _d) (No RF Input) ² | 100 | 150 | 175 | mA |
| Input Power for Saturation | +11 | +15 | +16 | dBm |

3.4 Sequencing Requirements

Turn-on Procedure if required biases are unknown:

- 1) Apply -1 V to V_g.
- 2) Apply desired V_d.
- 3) Increase V_g voltage towards -0.5 V until I_d = 150 mA.
- 4) Apply RF input power.

Turn-on Procedure if required biases are known:

- 1) Apply desired V_g (previously determined to produce 150 mA I_{dq}).
- 2) Apply desired V_d.
- 3) Apply RF input power.

Turn-off Procedure:

- 1) Turn off RF input power.
- 2) Turn off V_d.
- 3) Turn off V_g.

² Recommended operating current conditions without RF input applied.

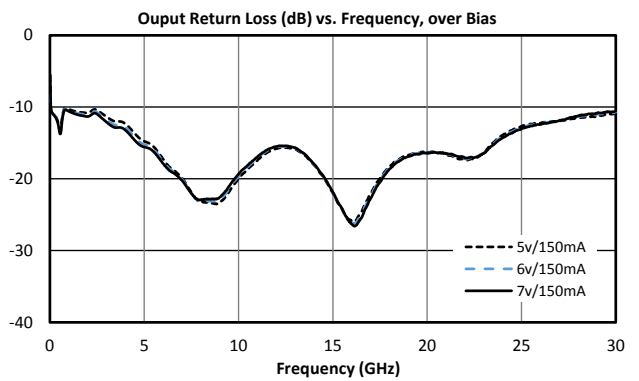
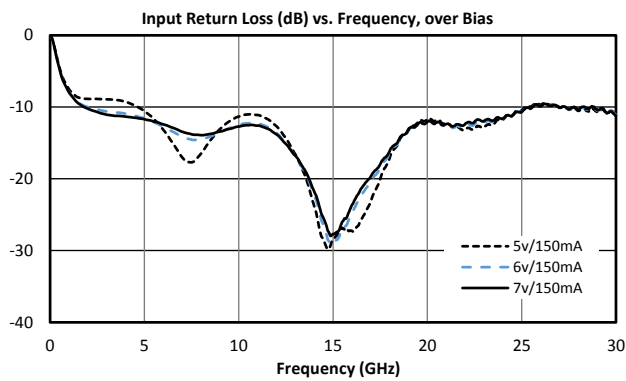
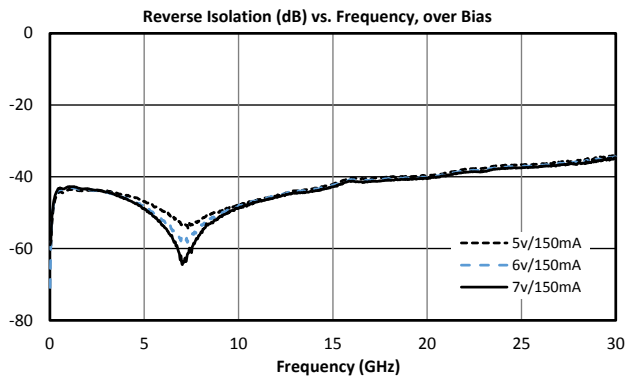
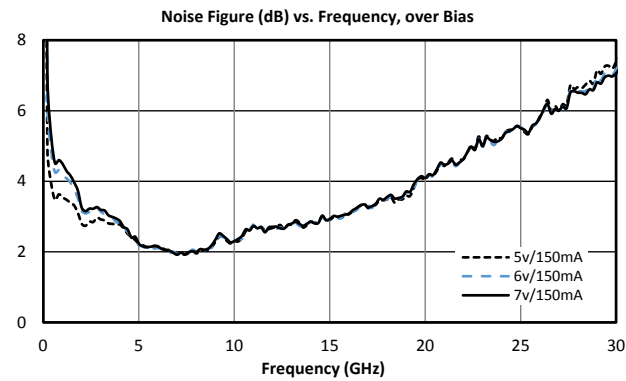
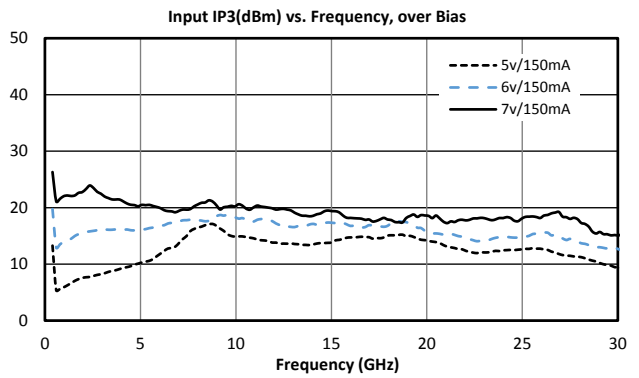
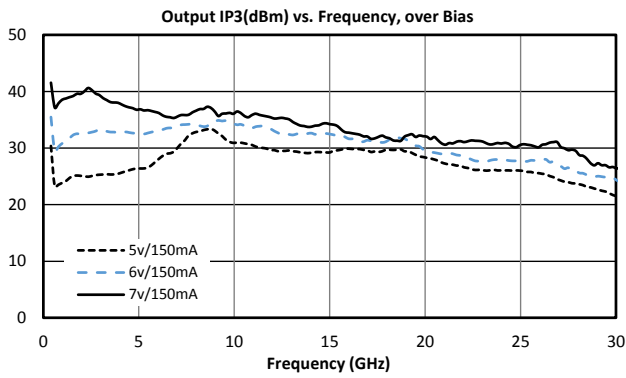
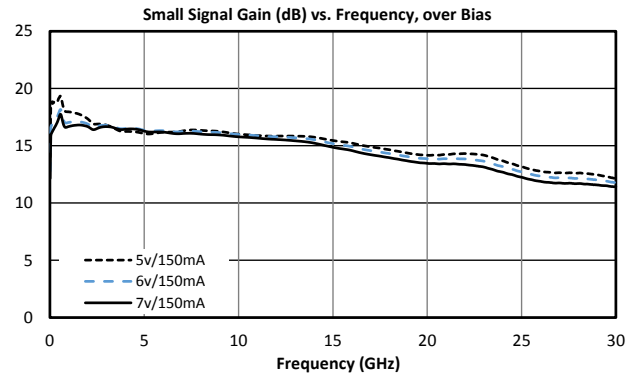
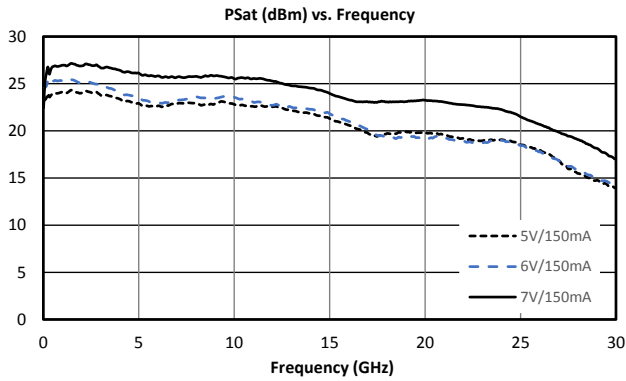
3.5 Electrical Specifications

Unless otherwise specified, electrical specifications apply at $T_A=+25^{\circ}\text{C}$, $V_d = 7\text{V}$, $I_{dq} = 150\text{mA}$ (where I_{dq} is the drain current with no RF applied). V_g is set as required to achieve $I_{dq} = 150\text{mA}$ in a 50Ω system.

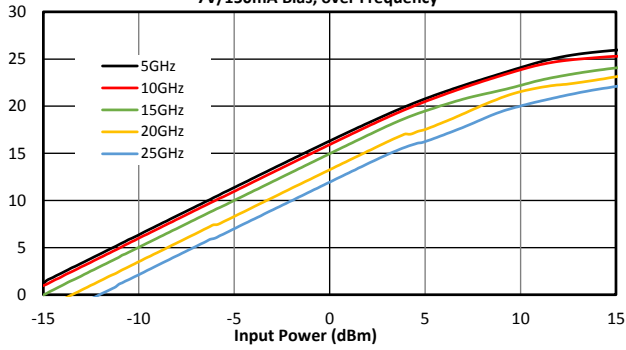
Min and Max limits apply only to our connectorized units and are guaranteed at $T_A=+25^{\circ}\text{C}$

| Parameter | Test Conditions | Frequency | Min | Typical | Units | |
|--|---|--------------------|----------------|---------|-------|-----|
| Saturated Output Power | $V_d = 7\text{V}$ | 0.4 GHz – 15 GHz | +23 | +25 | dBm | |
| | | 15 GHz – 26.5 GHz | +18 | +21 | | |
| Small Signal Gain | $V_d = 7\text{V}$, $P_{in} = -20\text{ dBm}$ | 0.4 GHz – 15 GHz | 14 | 16 | dB | |
| | | 15 GHz – 26.5 GHz | 11 | 13 | | |
| Input Return Loss | | 0.4 GHz – 26.5 GHz | | | | 10 |
| Output Return Loss | | | | | | 15 |
| Reverse Isolation | | | | | | 40 |
| Noise Figure | | | 2 GHz – 5 GHz | | | 3.4 |
| | | | 5 GHz – 10 GHz | | | 2.3 |
| | | 10 GHz – 26.5 GHz | | 3.9 | | |
| Input IP3 | $V_d = 7\text{V}$, $P_{in} = -15\text{ dBm}$ per tone, 10 MHz tone spacing | 0.4 GHz – 26.5 GHz | | +16 | dBm | |
| Output IP3 | | | | +34 | | |
| Input Power for Saturation | | | +11 | +15 | | |
| DC Supply Quiescent Current (I_{dq}) | $V_d = 7\text{V}$, no RF input | | | 150 | mA | |

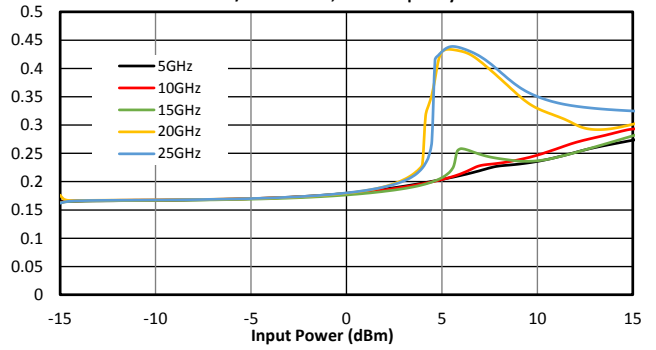
3.6 AMM-7473PC Typical Performance Plots



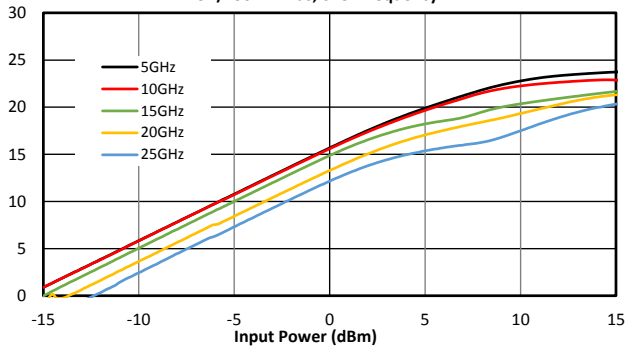
Output Power (dBm) vs RF Input Power
7V/150mA Bias, over Frequency



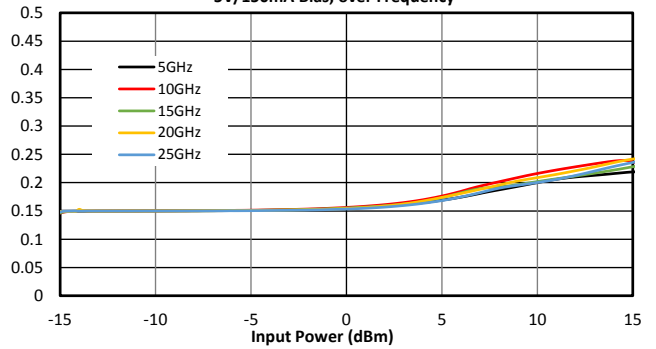
Id (A) vs RF Input Power
7V/150mA Bias, over Frequency



Output Power (dBm) vs RF Input Power
5V/150mA Bias, over Frequency

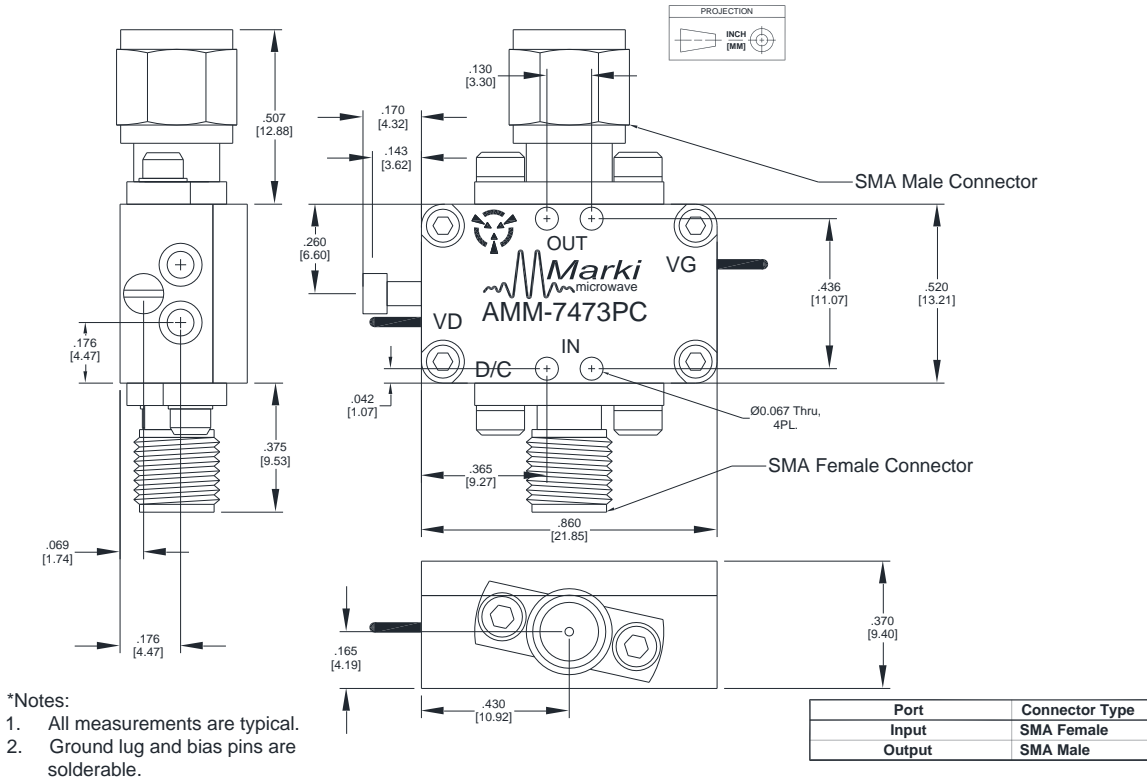


Id (A) vs RF Input Power
5V/150mA Bias, over Frequency



4. Mechanical Data

4.1 AMM-7473PC Package Outline Drawing



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