

PHA2731-190M

M/A-COM Radar Pulsed Power Amplifier—190 Watts
2.7—3.1 GHz, 200µs Pulse, 10% Duty

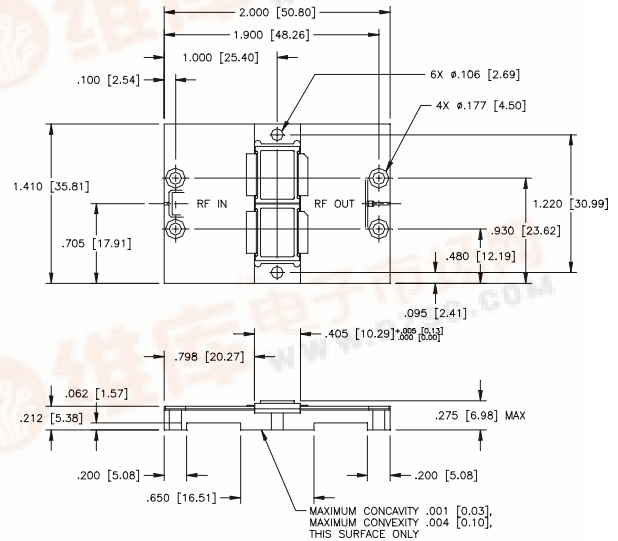
Features

- Input and Output matched to 50Ω
- RC bias circuit included
- Dual NPN Silicon class C power transistors
- Soft substrate $\epsilon_r = 10.5$
- Hermetic Package
- Nickel plated copper flange

Description

M/A-COM's PHA2731-190M is a Class C microwave power amplifier module specifically designed for S-Band radar pulsed power applications where high efficiency and saturated power are required. The module incorporates two in-phase combined common base hybrid power transistors and is input and output matched to 50 Ω for unparalleled ease of PA design. The thick copper base and ceramic transistor packaging technology provides for excellent thermal management, which when combined with M/A-COM's mature transistor fabrication technology results in the highest reliability available.

Outline Drawing¹



Notes: (unless otherwise specified)
1. Tolerances are: inches ± .005" (millimeters ± 0.13mm)

Absolute Maximum Rating at 25°C

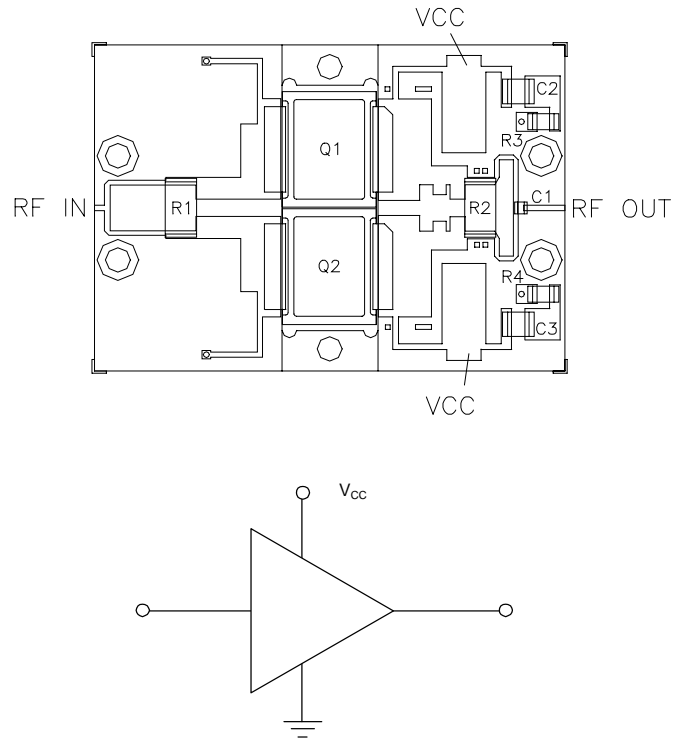
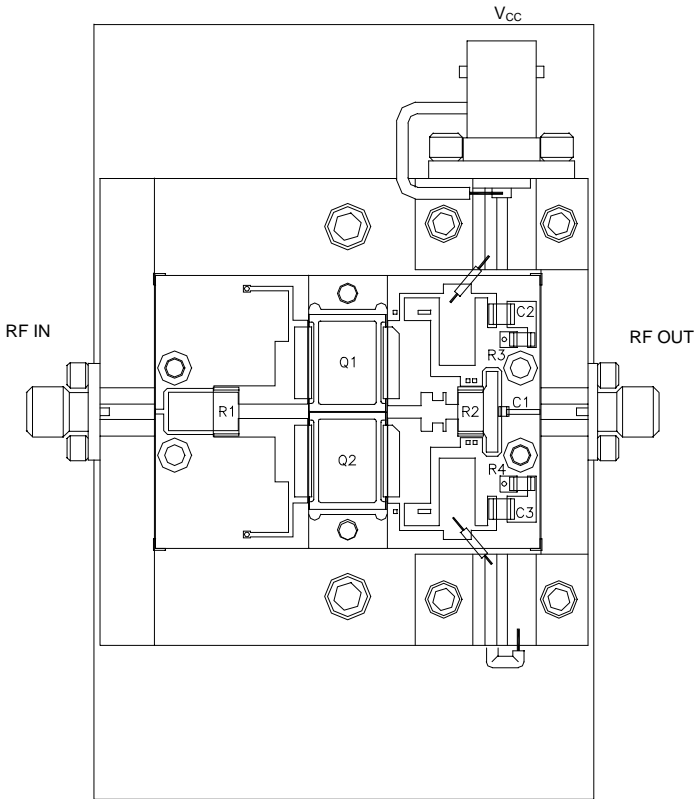
| Parameter | Symbol | Rating | Units |
|---------------------------|---------------|-------------|-------|
| Collector-Emitter Voltage | V_{CES} | 65 | V |
| Emitter-Base Voltage | V_{EBO} | 3.0 | V |
| Junction Temperature | T_j | 200 | °C |
| Thermal Resistance | θ_{JC} | 0.35 | °C/W |
| Operating Flange Temp. | T_C | -10 to +100 | °C |
| Storage Temperature | T_{STG} | -20 to +125 | °C |

Electrical Specifications at 25°C

| Symbol | Parameter | Test Conditions | Units | Min | Typ | Max |
|--------------|------------------------------|---|-------|-----|-----|-------|
| P_{out} | Output Power | $V_{CC} = 38V, P_{IN} = 34W, f = 2.7, 2.9, 3.1 GHz$ | W | 190 | 205 | |
| G_p | Power Gain | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | dB | 7.5 | 8 | |
| η_C | Collector Efficiency | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | % | 33 | 35 | |
| RL | Input Return Loss | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | dB | 10 | | |
| Droop | Pulse Amplitude Droop | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | dB | | | 1 |
| 2fc | 2 nd Harmonic | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | dBc | -17 | -20 | |
| Spurious | Spurious Level | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | dBc | | | -50 |
| $\Delta\phi$ | Insertion Phase Deviation | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | Deg. | -20 | | +20 |
| VSWR-T | Tolerance and Stability | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | VSWR | | | 1.5:1 |
| OD-STAB | Stability at Overdrive | $P_{IN} = (P_{IN} @ P_{OUT} = 190W) + 1 dB^1$ | | | | |
| GF | Gain Flatness over Frequency | $V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1 GHz$ | dB | | 1.0 | 1.3 |

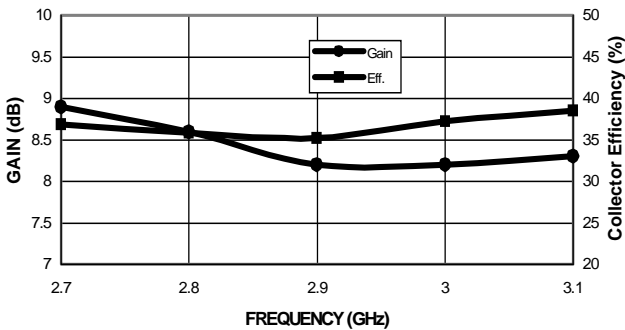
1. No oscillations and no spurs at 1 dB overdrive.

Amplifier in RF Test Fixture

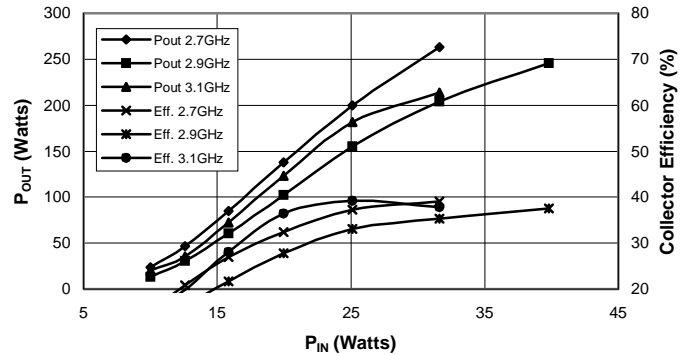


Typical Performance Curves

Performance at 190W P_{OUT}, V_{CC}=38V, 200 µs, 10%



Performance vs. P_{IN}, 38 V_{CC}=38V, 200 µs, 10%



Specifications subject to change without notice.