

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

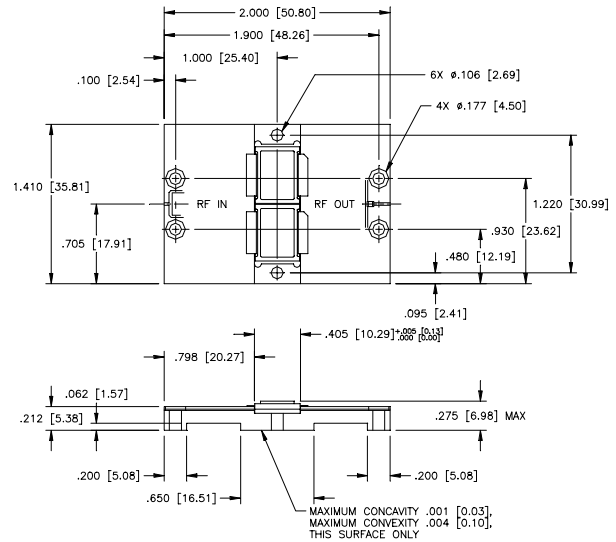
## Features

- 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 Drawing<sup>1</sup>



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	$\theta_{JC}$	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	
$\eta_c$	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 <sup>nd</sup> 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 <sup>1</sup>				
GF	Gain Flatness over Frequency	$V_{CC} = 38V, P_{OUT} = 190W, f = 2.7, 2.9, 3.1$ GHz	dB		1.0	1.3

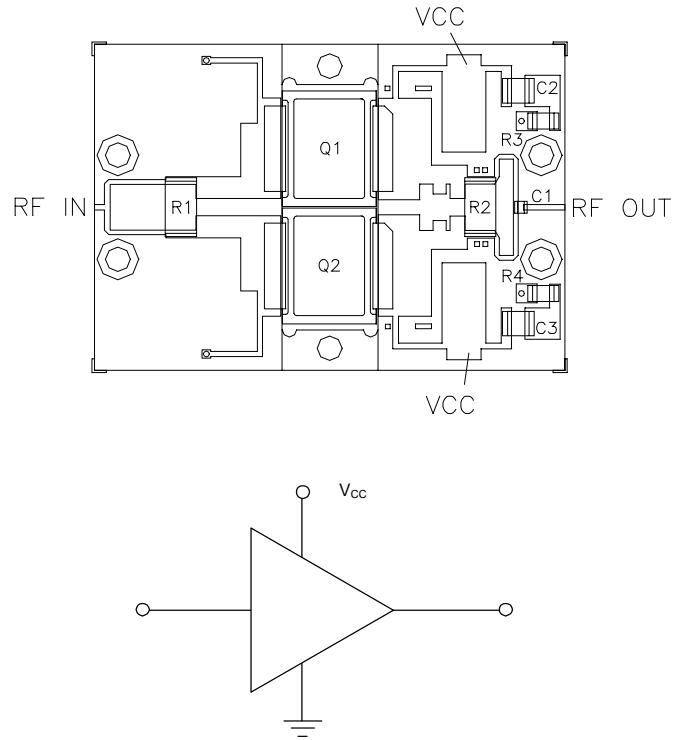
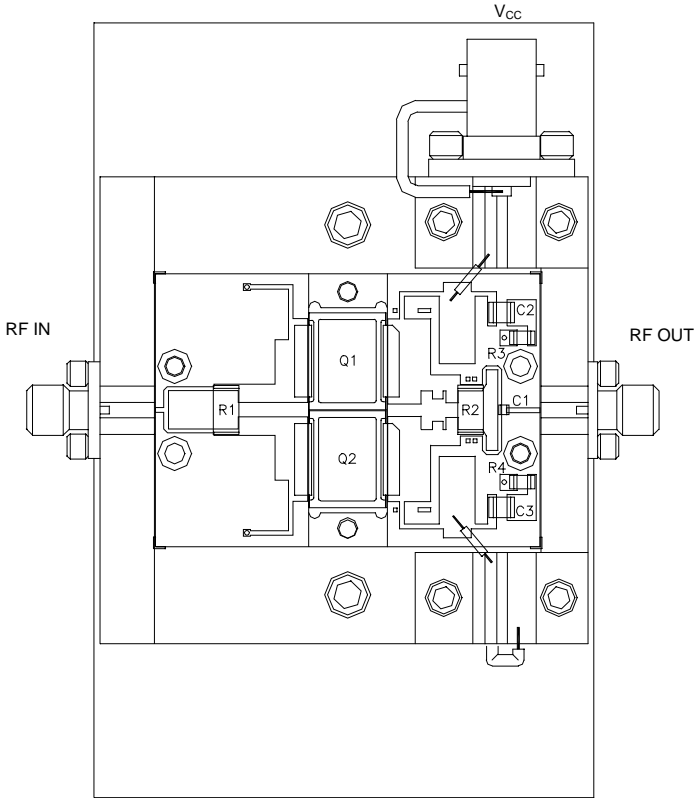
1. No oscillations and no spurs at 1 dB overdrive.

Specifications subject to change without notice.

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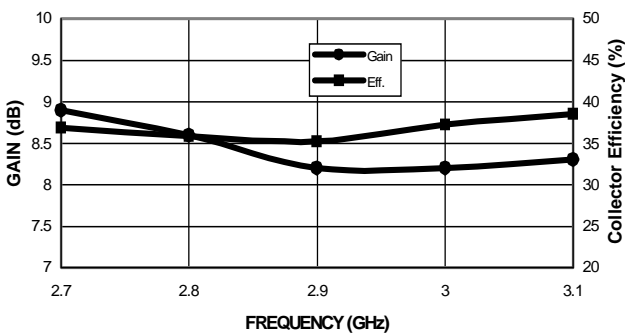
Visit [www.macom.com](http://www.macom.com) for additional data sheets and product information.

Amplifier in RF Test Fixture

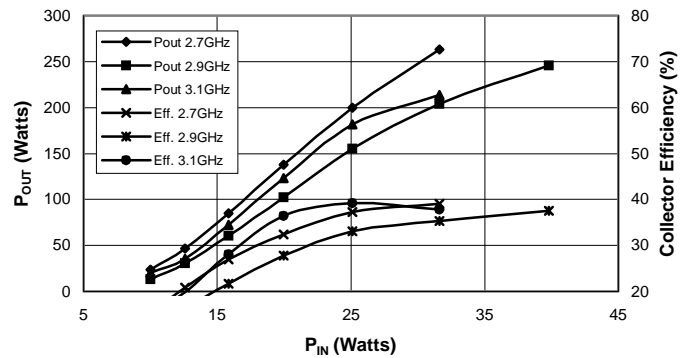


Typical Performance Curves

Performance at 190W P<sub>OUT</sub>, V<sub>CC</sub>=38V, 200 µs, 10%



Performance vs. P<sub>IN</sub>, 38 V<sub>CC</sub>=38V, 200 µs, 10%



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