

# PHA2731-190M

**Radar Pulsed Power Amplifier**  
**190W, 2.7-3.1 GHz, 200 $\mu$ s Pulse, 10% Duty**

**M/A-COM Products**  
*Released*

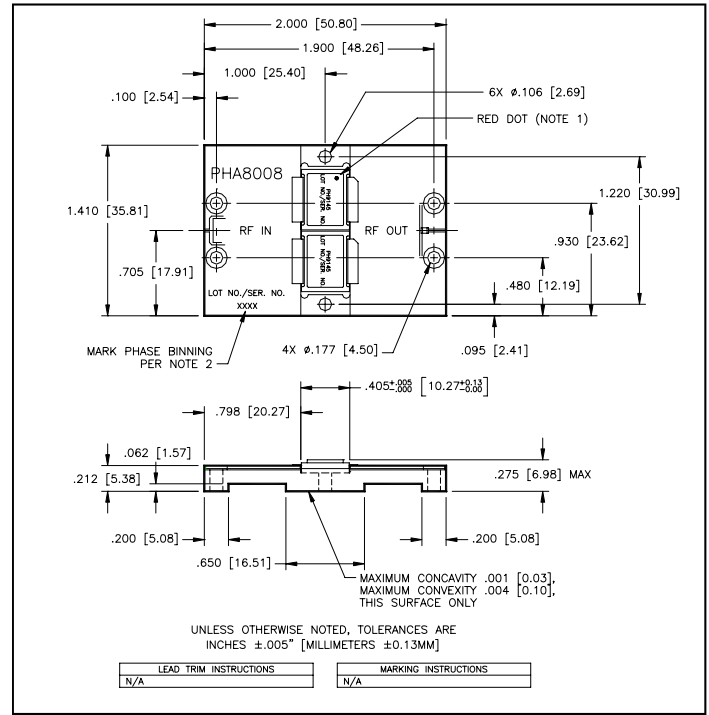
## Features

- Input and output matched to 50 $\Omega$
- RC bias circuit included
- Dual NPN silicon class C power transistors
- Soft substrate  $\epsilon_R = 10.5$
- Hermetic Package
- Nickel plated copper flange

## Description

The 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  $\Omega$  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



## 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 Case temp.	$T_C$	-10 to +100	°C
Storage Temperature	$T_{STG}$	-40 to +125	°C

## ELECTRICAL SPECIFICATIONS: $T_A = 25 \pm 5^\circ$ (ROOM AMBIENT)

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

1. No oscillations and no spurs at 1 dB over drive.

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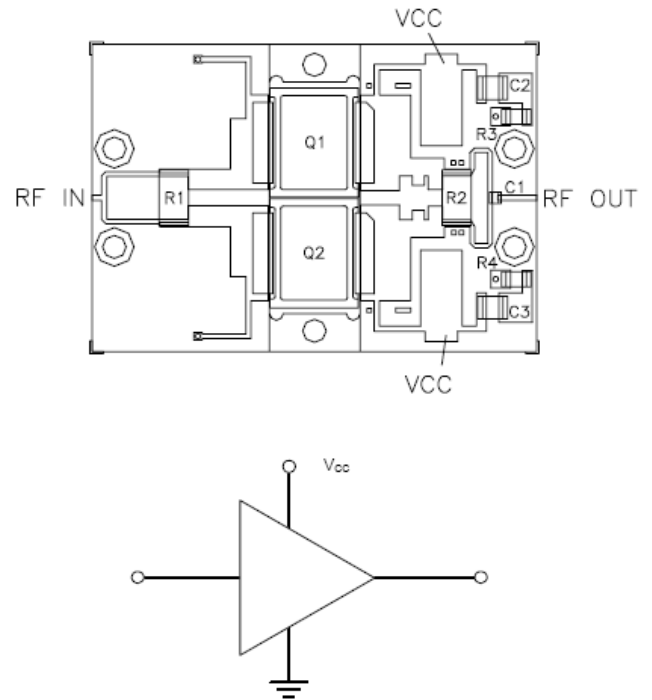
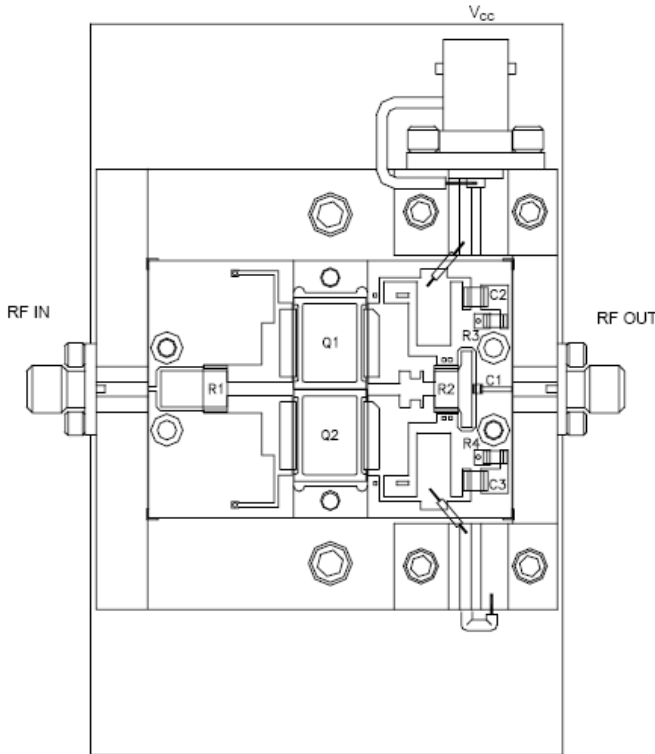
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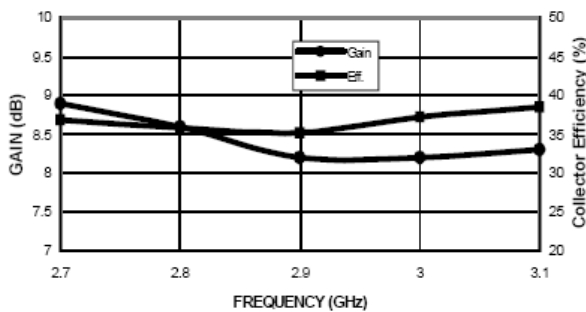
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## AMPLIFIER IN RF TEST FIXTURE

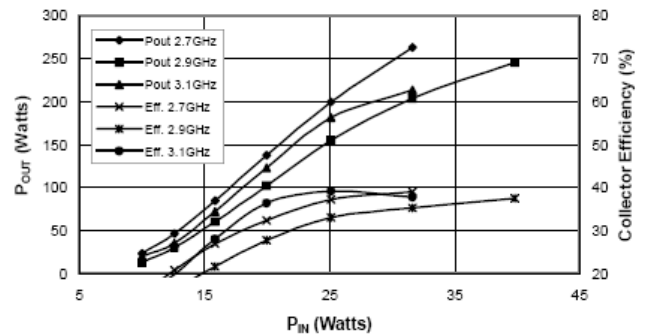


## TYPICAL PERFORMANCE CURVES

Performance at 190W P<sub>OUT</sub>, V<sub>CC</sub>=38V, 200  $\mu$ s, 10%



Performance vs. P<sub>IN</sub>, 38 V<sub>CC</sub>=38V, 200  $\mu$ s, 10%



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