

PHA2731-190M



Radar Pulsed Power Amplifier
190W, 2.7-3.1 GHz, 200μs Pulse, 10% Duty

M/A-COM Products
Released

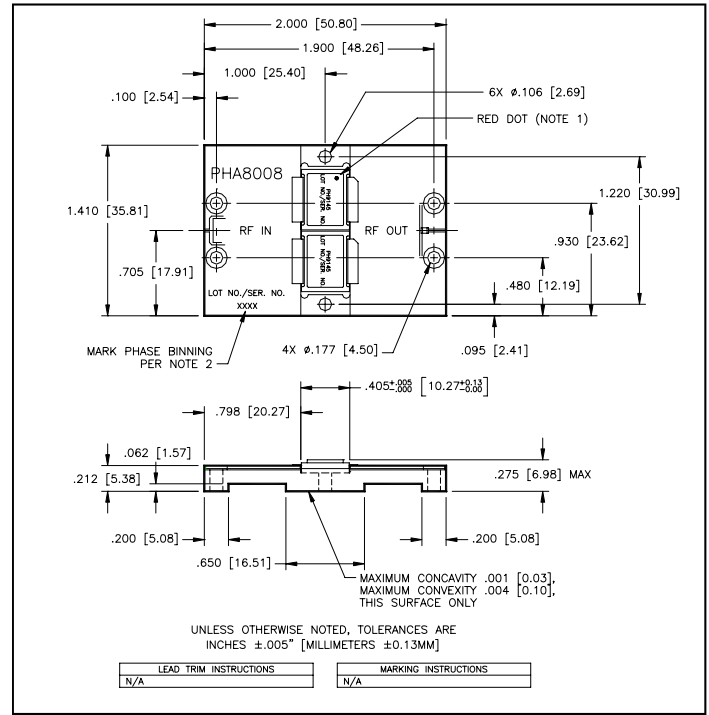
Features

- 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

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 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



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 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	η_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 ¹
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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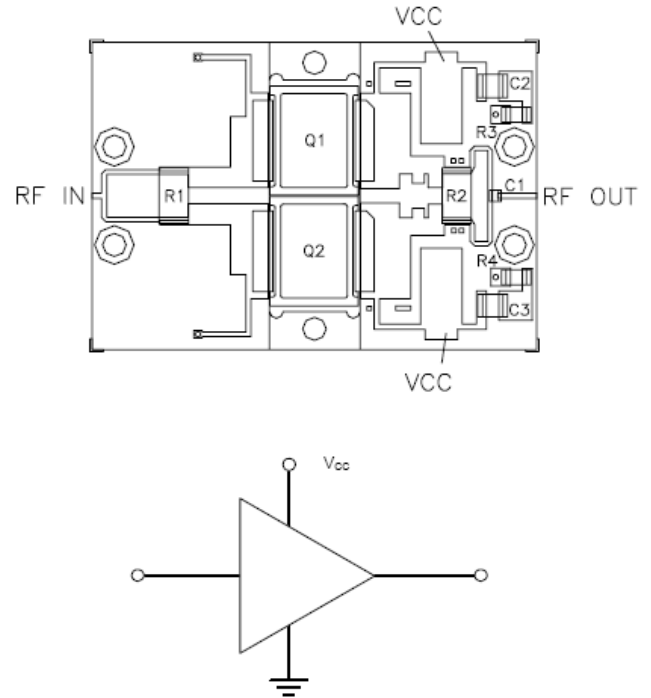
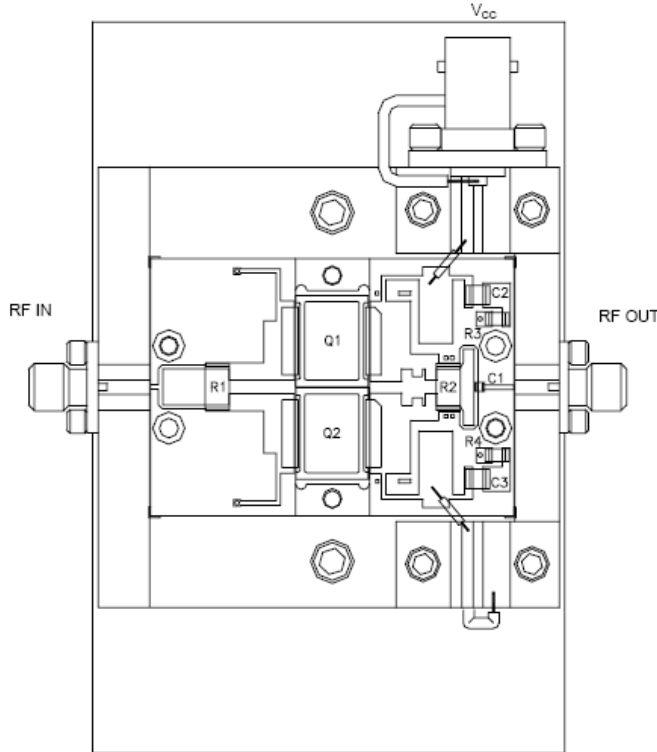
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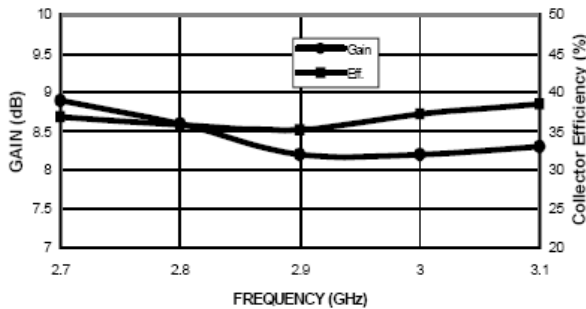
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AMPLIFIER IN RF TEST FIXTURE

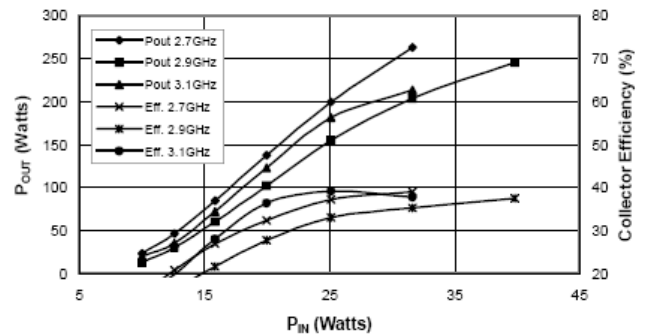


TYPICAL PERFORMANCE CURVES

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



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



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