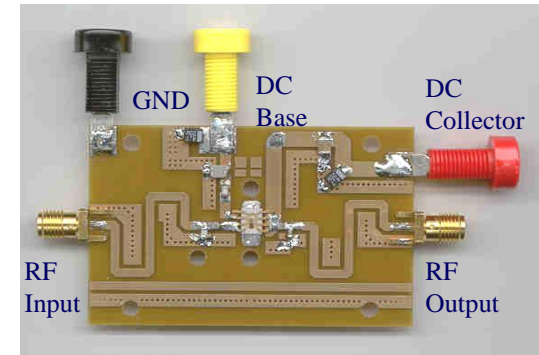
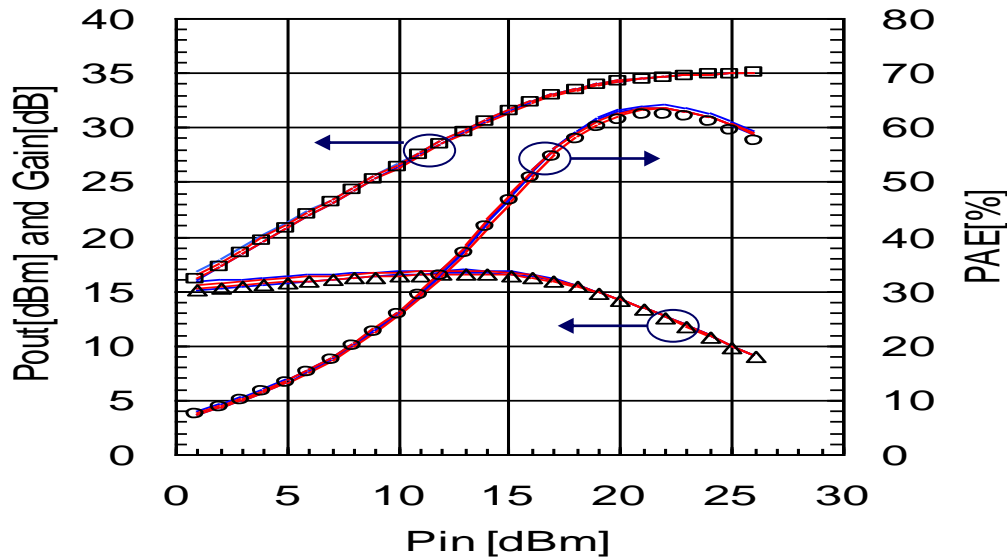


# High Voltage and GSM InGaP HBT Power Process



- High Voltage and GSM InGaP HBT (P5, P6, P7) power processes have been developed specifically for power amplifiers requiring operation at 8-12 volt bias and/or ruggedness under high VSWR conditions
- GSM PA has demonstrated superior RF performance and can withstand more than 25:1 VSWR at 5V bias
- Linear PAs at 9V, 10V, 12V Vcc have been demonstrated by customers for Infrastructure Driver Amplifiers
- P5 and P6 processes have been in mass production since 2001
- P7 process is in qualification

# High-Ruggedness InGaP HBT Surpasses GSM PA's RF Performance and Ruggedness Requirements



Device mounted on Evaluation Board  
- Total emitter area: 7200 $\mu$ m<sup>2</sup>

PA performance\* from 5 consecutive lots

\*Measured on the evaluation board (as shown)

- Matched to 50 $\Omega$
- When matched for best power efficiency, PAE ~68%
- Plotted data were not de-embedded
- When de-embedded to device level, PAE ~74%
- Device ruggedness: Survived >25:1 at 5V bias

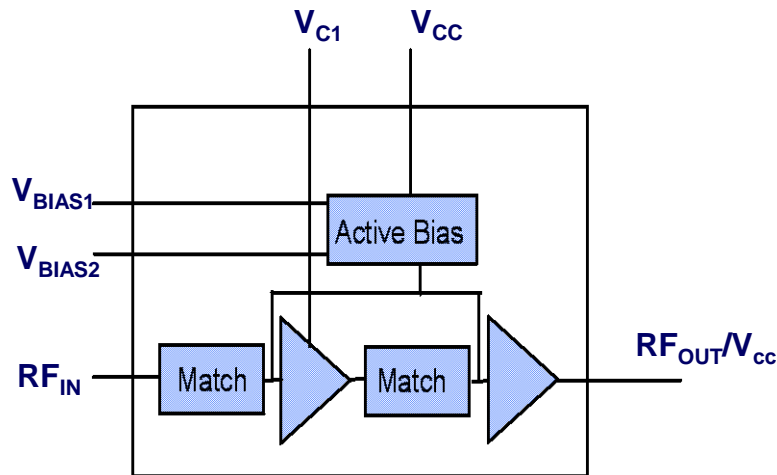
# 5W High-Voltage High-Linearity InGaP HBT Active Biased Power Amplifier



## BENEFITS/ADVANTAGES

- Active bias allows operation directly from 9V rail
- High IP3 to P1dB spread of 17 dB
- Input/Output internally matched to 50  $\Omega$

Target Specifications  
( $Z_0 = 50 \Omega$ ,  $V_D = 9V$ ,  $I_D = 1250 \text{ mA}$ ,  $T = 25^\circ\text{C}$ )



SOIC-8 (Backside GND) or  
High Power Plastic Package

Parameter	Units	#1	#2	#3
Frequency	GHz	0.9	1.95	2.14
Small Signal Gain	dB	28	26	25
Output P1dB	dBm	37	37	37
Pout (ACP=-55dBc)	dBm	26*	26*	25**
Output IP3	dBm	53	53	53
Input VSWR	-	1.5:1	1.5:1	1.5:1
Thermal Resistance	$^\circ\text{C}/\text{W}$	5		
Operating Temperature Range	$^\circ\text{C}$	-40 to +85		

\* IS-95 Modulation, 9 Channels Forward  
\*\*W-CDMA Modulation, 64 DPCH + Overhead