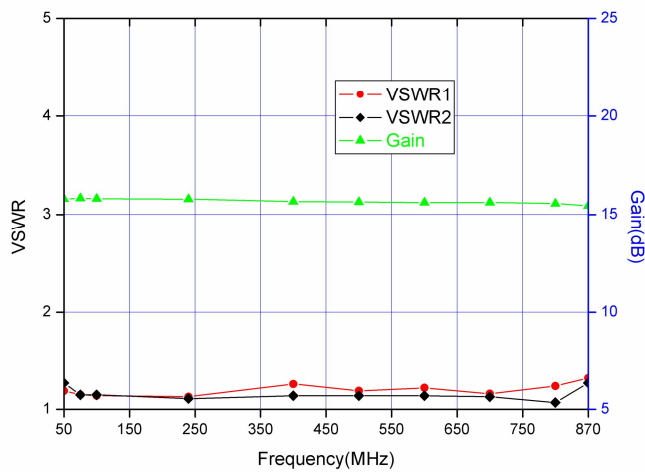


Product Description

F230 is a high performance InGaP HBT MMIC amplifier utilizing a Darlington configuration with an active bias network. The active bias network provides stable current over temperature and process Beta variations. Designed to run directly from a 5V supply, the F230 does not require a dropping resistor as compared to typical Darlington amplifiers. The F230 product is designed for high linearity 5V gain block applications that require small size and minimal external components.

F230 is RoHS compliant and manufactured with green molding compounds.



F230  RoHS Compliant & Green Package

50-870MHz, Cascadable
Active Bias InGaP/GaAs HBT Amplifier



Product Features:

- RoHS compliant
- IP3=42dBm @ 240MHz
- P1dB=19dBm@500MHz
- Single +5V Supply
- 1000V ESD, Class 1C
- MSL 1 moisture rating

Applications:

- Receiver IF Amplifier
- Cellular, PCS, GSM, UMTS
- Wireless Data, Satellite Terminals

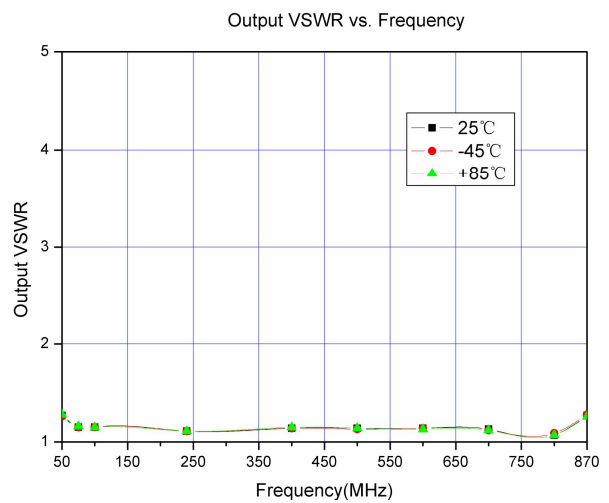
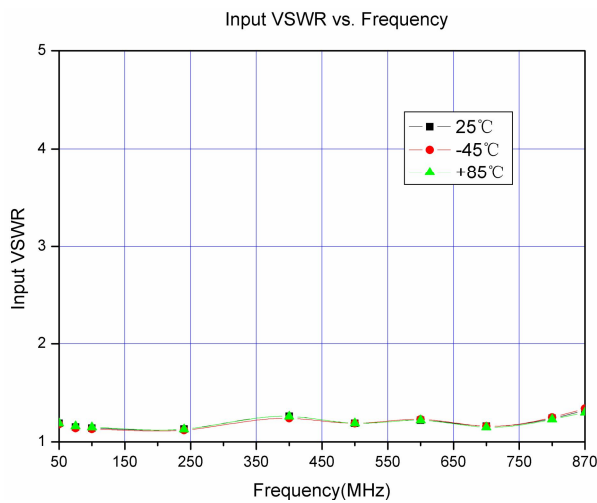
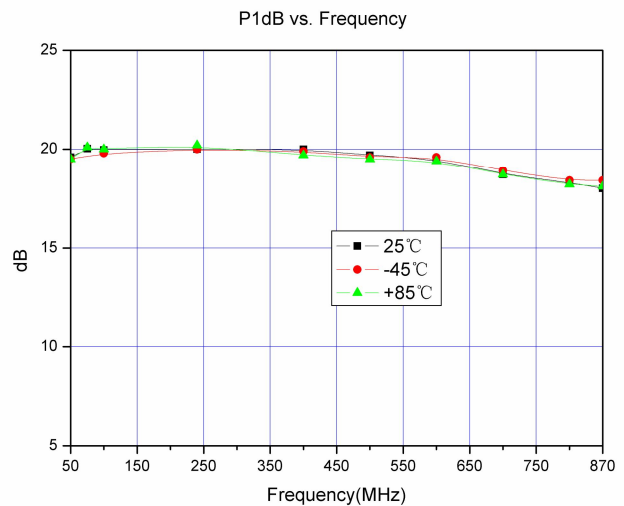
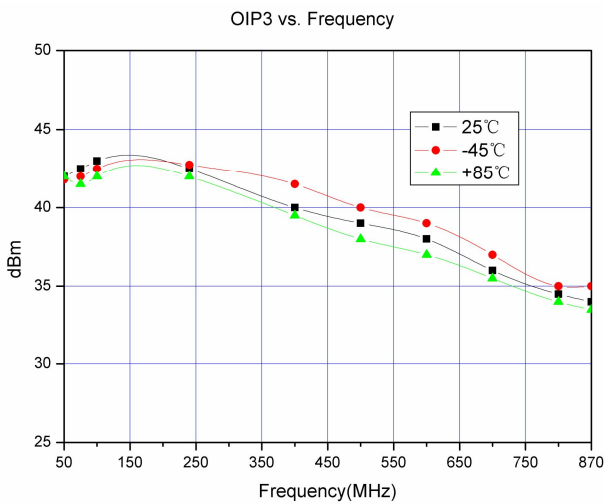
Symbol	Parameter	Units	Frequency	Min.	Typ.	Max.
G	Small Signal Gain	dB	70MHz		15.5	
			240MHz	14	15.5	17
			400MHz	14	15.5	17
P _{1dB}	Output Power at 1dB Compression	dBm	70MHz		19.8	
			240MHz		20.0	
			400MHz	18	20.0	
OIP ₃	Third Order Intercept Point	dBm	70MHz		43	
			240MHz		42.5	
			400MHz	38.5	40	
Input VSWR	Input Return Loss	Ratio	50-870MHz		1.2	1.5
Output VSWR	Output Return Loss	Ratio	50-870MHz		1.2	1.5
NF	Noise Figure	dB	500MHz		3.3	4.2
V _D	Device Operating Voltage	V			5.0	5.3
I _D	Device Operating Current	mA		80	95	110
Test Conditions: V _s =5V I _D =95mA Typ. OIP ₃ Tone Spacing=1MHz, P _{out} per ton=5 dBm T _L =25°C Z _S =Z _L =50 Ohms						

Typical RF Performance at Key Operating Frequencies (With 240 MHz Application Circuit)

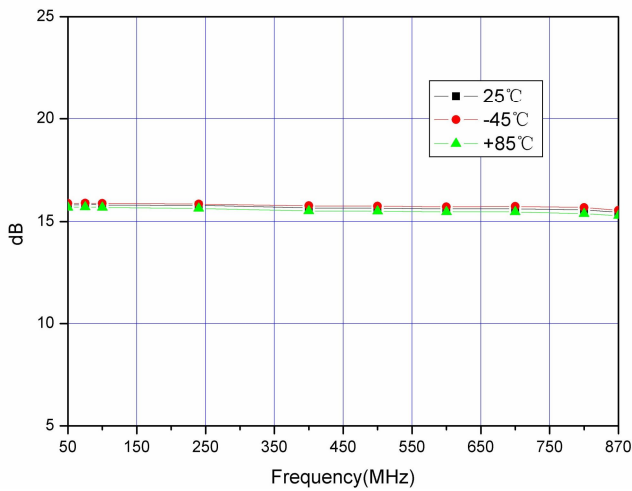
Symbol	Parameter	Unit	Frequency (MHz)						
			50	70	100	240	400	500	850
G	Small Signal Gain	dB	15.8	15.8	15.8	15.8	15.7	15.7	15.4
OIP ₃	Output Third Order Intercept Point	dBm	42	43	42.5	42.5	40	39	34
P _{1dB}	Output Power at 1dB Compression	dBm	19.6	19.8	19.9	20	20	19.7	18
Input VSWR	Input Return Loss		1.19	1.15	1.14	1.13	1.26	1.19	1.32
Output VSWR	Output Return Loss		1.27	1.15	1.15	1.11	1.14	1.14	1.27
S ₁₂	Reverse Isolation	dB	19	19	19	19	19	19	19
NF	Noise Figure	dB	3.1	3.1	3.2	3.2	3.3	3.3	3.2

Test Conditions: V_s=5V I_D=95mA Typ OIP₃ Tone Spacing=1MHz, Pout per ton=5 dBm
 T_L=25°C Z_S=Z_L=50 Ohms

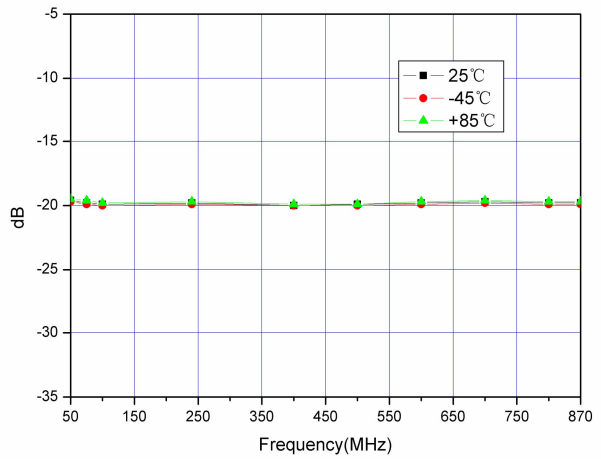
Data on Charts taken with 240 MHz Application Circuit



S21 vs. Frequency

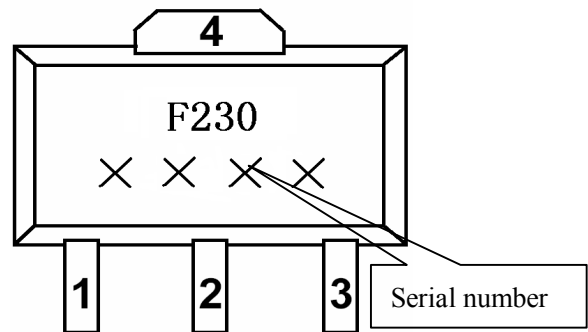


S12 vs. Frequency

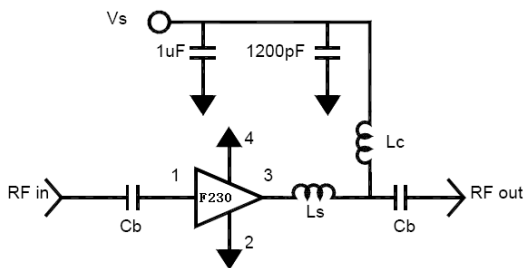


Pin	Function	Description
1	RF IN	RF input pin. This pin requires an external DC blocking capacitor.
2, 4	GND	Connecting to ground. Use via holes for best performance to reduce lead inductance.
3	RF OUT / BIAS	RF output and bias pin. DC blocking capacitor is necessary for proper operating.

Marking and Pin Definition



Application Schematic



Application Circuit Element Values

Reference Designator	Frequency (MHz)
	50-870
C _B	8200 pF
L _C	1200 nH
L _S	2.7 nH

Mounting Instructions

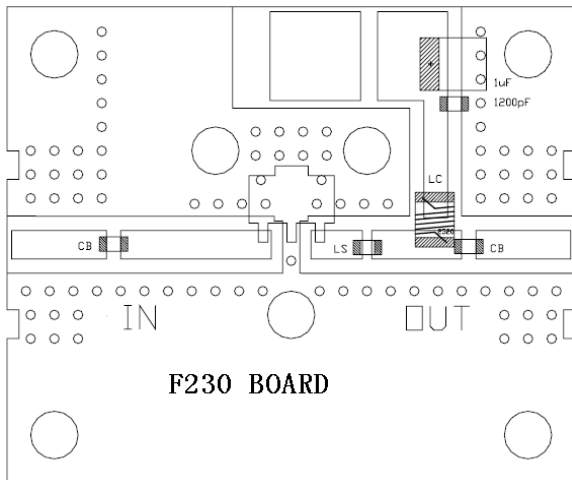
1. Solder the copper pad on the backside of the device package to the ground plane.
2. Use a large ground pad area with many plated through-holes as shown.
3. Measurement for this data sheet is made on 0.5 mm thick FR-4 board with 3.38 dielectric constant.



ESD Class 1C

Appropriate precautions in handling, packaging and testing devices must be observed!

Evaluation Board Layout



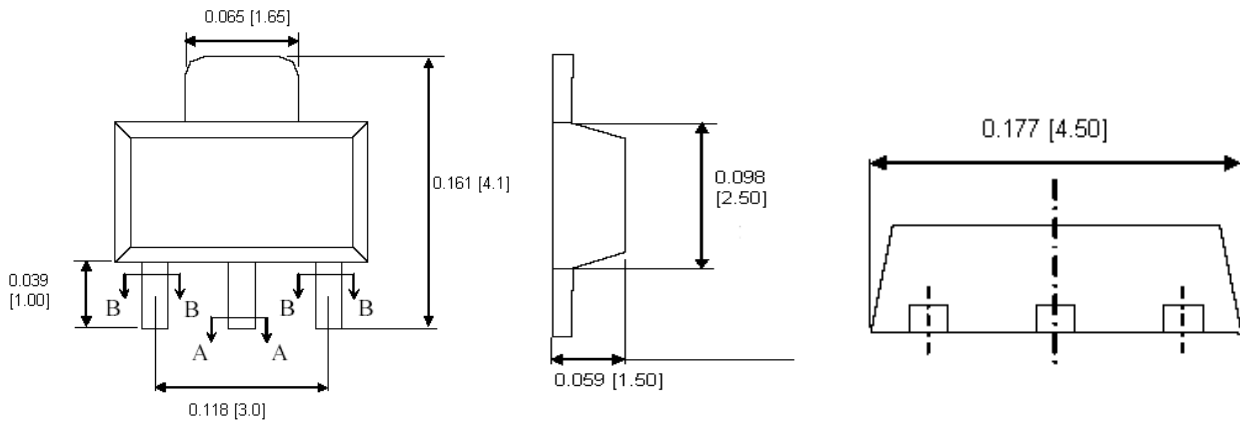
Absolute Maximum Ratings

Parameter	Absolute Limit
Max. Device Current (ID)	120 mA
Max. Device Voltage (VD)	5.5V
Max. RF Input Power	+12 dBm
Max. Junction Temp. (TJ)	+150°C
Max. Operating Dissipated Power	0.66W
Operating Temp. Range (TL)	-40°C to +85°C
Max. Storage Temp.	+150°C
Operation beyond any one of these limits may cause permanent damage.	

Moisture Sensitivity Level Rating: Level 1

SOT89 Packaging and PCB Pad Layout

Units: inch [millimeter]



Symbol	inch	millimeter
A	0.016	0.42
B	0.019	0.5