SGA-6286

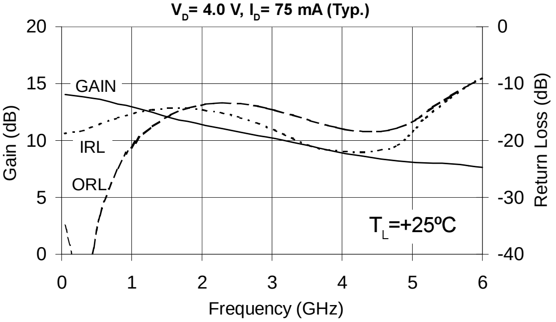
DC-5500 MHz, Cascadable SiGe HBT MMIC Amplifier

Product Description

Sirenza Microdevices' SGA-6286 is a high performance SiGe HBT MMIC Amplifier. A Darlington configuration featuring 1 micron emitters provides high F_T and excellent thermal perfomance. The heterojunction increases breakdown voltage and minimizes leakage current between junctions. Cancellation of emitter junction non-linearities results in higher suppression of intermodulation products. At 850 Mhz and 75mA , the SGA-6286 typically provides +35 dBm output IP3, 13.6 dB of gain, and +18.7 dBm of 1dB compressed power using a single positive voltage supply. Only 2 DC-blocking capacitors, a bias resistor and an optional RF choke are required for operation.

Gain & Return Loss vs. Frequency

V_D= 4.0 V, I_D= 75 mA (Typ.)



Product Features

- **Broadband Operation: DC-5500 MHz**
- **Cascadable 50 Ohm**
- **Patented SiGe Technology**
- **Operates From Single Supply**
- **Low Thermal Resistance Package**

Applications

- **PA Driver Amplifier**
- **Cellular, PCS, GSM, UMTS**
- **IF Amplifier**
- **Wireless Data, Satellite**

Symbol	Parameter	Units	Frequency	Min.	Typ.	Max.
G	Small Signal Gain	dB	850 MHz 1950 MHz 2400 MHz	12.5	13.6 12.4 11.2	15.2
P_{1dB}	Output Power at 1dB Compression	dBm	850 MHz 1950 MHz		18.7 17.8	
OIP_3	Output Third Order Intercept Point	dBm	850 MHz 1950 MHz		35.0 33.0	
Bandwidth	Determined by Return Loss (>10dB)	MHz			5500	
IRL	Input Return Loss	dB	1950 MHz		14.6	
ORL	Output Return Loss	dB	1950 MHz		13.9	
NF	Noise Figure	dB	1950 MHz		4.2	
V_D	Device Operating Voltage	V		3.6	4.0	4.4
I_D	Device Operating Current	mA		67	75	83
R_{TH}, j-l	Thermal Resistance (junction to lead)	°C/W			97	

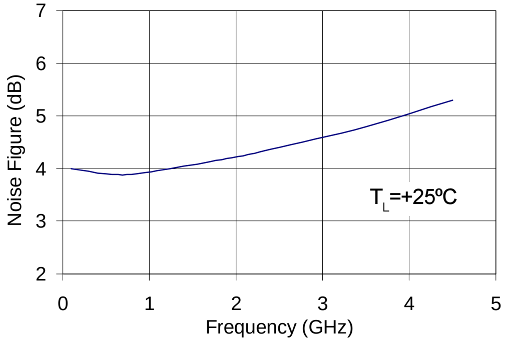
Test Conditions:
V_S = 8 V
R_{BIAS} = 51 Ohms
I_D = 75 mA Typ.
T_L = 25ºC
OIP_3 Tone Spacing = 1 MHz, Pout per tone = 0 dBm
Z_S = Z_L = 50 Ohms

Typical RF Performance at Key Operating Frequencies

Symbol	Parameter	Unit	Frequency (MHz) 100	500	850	1950	2400	3500
G	Small Signal Gain	dB	14.0	13.9	13.6	12.4	11.2	9.6
OIP_3	Output Third Order Intercept Point	dBm	37.0	36.0	35.0	33.0	31.4	28.1
P_{1dB}	Output Power at 1dB Compression	dBm	18.7	19.0	18.7	17.8	16.8	15.2
IRL	Input Return Loss	dB	18.8	17.4	15.8	14.6	15.5	20.6
ORL	Output Return Loss	dB	35.7	36.3	23.8	13.9	13.4	16.4
S_{12}	Reverse Isolation	dB	18.4	18.6	18.8	18.8	18.5	17.0
NF	Noise Figure	dB	4.0	3.9	3.9	4.2	4.4	4.8
Test Conditions:	V_S = 8 V R_{BIAS} = 51 Ohms	I_D = 75 mA Typ. T_L = 25ºC	OIP_3 Tone Spacing = 1 MHz, Pout per tone = 0 dBm $Z_S = Z_L$ = 50 Ohms					

Noise Figure vs. Frequency

V_D= 4.0 V, I_D= 75 mA



Absolute Maximum Ratings

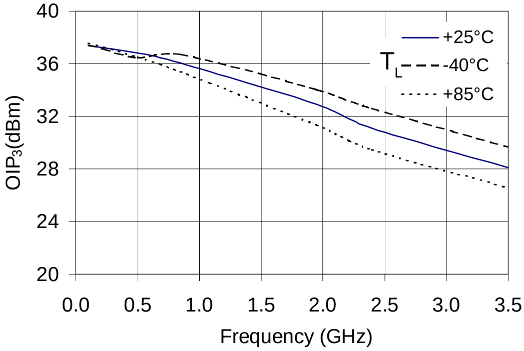
Parameter	Absolute Limit
Max. Device Current (I_D)	150 mA
Max. Device Voltage (V_D)	6 V
Max. RF Input Power	+18 dBm
Max. Junction Temp. (T_J)	+150°C
Operating Temp. Range (T_L)	-40°C to +85°C
Max. Storage Temp.	+150°C

Operation of this device beyond any one of these limits may cause permanent damage. For reliable continous operation, the device voltage and current must not exceed the maximum operating values specified in the table on page one.

Bias Conditions should also satisfy the following expression: $I_D V_D < (T_J - T_L) / R_{TH}$, j-l

OIP_3 vs. Frequency

V_D= 4.0 V, I_D= 75 mA



P_{1dB} vs. Frequency

V_D= 4.0 V, I_D= 75 mA