



Package: Hermetic, 2-pin, 5.8mm x 2.8mm

### Product Description

RFMD's SBB-2082S is a high performance InGaP HBT 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 SBB-2082S does not require a dropping resistor as compared to typical Darlington amplifiers. The SBB-2082S product is designed for high linearity 5V gain block applications that require small size and minimal external components. It is internally matched to 50Ω.

RFMD can provide various levels of device screening for military or Hi-Rel applications.

### Features

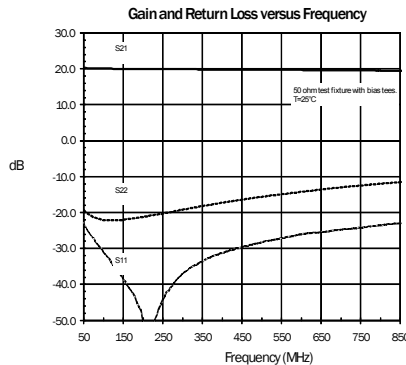
- Hermetic Package for Hi Rel Applications
- Single Fixed 5V Supply
- Patented Thermal Design and Bias Circuit
- OIP3 = 40.5 dBm at 70 MHz
- P1dB = 19.5 dBm at 70 MHz

### Applications

- Military Communications
- Aerospace and Defense
- PA Driver Amp

#### Optimum Technology Matching® Applied

- GaAs HBT
- GaAs MESFET
- InGaP HBT
- SiGe BiCMOS
- Si BiCMOS
- SiGe HBT
- GaAs pHEMT
- Si CMOS
- Si BJT
- GaN HEMT
- RF MEMS



Parameter	Specification			Unit	Condition
	Min.	Typ.	Max.		
Frequency of Operation	50		850	MHz	
Supply Voltage		5.0		V	
Supply Current	75	86	98	mA	
Small Signal Gain	18.5	20.2		dB	Freq = 100 MHz
		19.8		dB	Freq = 500 MHz
Output Power at 1 dB Compression	18.0	19.5		dBm	Freq = 70 MHz
Output Third Order Intercept Point	38.5	40.5		dBm	F1 = 70 MHz, F2 = 71 MHz
Input Return Loss	9.5	25		dB	Freq = 100 MHz
		25.0		dB	Freq = 500 MHz
Output Return Loss	9.5	20		dB	Freq = 100 MHz
		15.0		dB	Freq = 500 MHz
Reverse Isolation	19	22		dB	Freq = 100 MHz
		22.0		dB	Freq = 500 MHz
Noise Figure		3.1		dB	Freq = 500 MHz
Thermal Resistance		45		°C/W	Junction to lead

Test Conditions:  $Z_0 = 50\Omega$ ,  $V_D = 5V$ ,  $I_D = 86mA$ ,  $T = 25^\circ C$ , OIP3  $P_{OUT}/tone = 0dBm$ , 50Ω test fixture with bias tees.

## Absolute Maximum Ratings

Parameter	Rating	Unit
Total Current ( $I_D$ )	110	mA
Device Voltage ( $V_D$ )	5.5	V
RF Input Power	+24	dBm
Operating Lead Temperature ( $T_L$ )	-40 to +85	°C
Storage Temperature Range	-55 to +150	°C
Operating Junction Temp ( $T_J$ )	+150	°C
Moisture Sensitivity Level	Hermetic	
ESD Rating - Human Body Model (HBM)	Class 2	

Operation of this device beyond any one of these limits may cause permanent damage. For reliable continuous 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:

$$I_D V_D < (T_J - T_L) / R_{TH} \cdot j - I \text{ and } T_L = T_{LEAD}$$

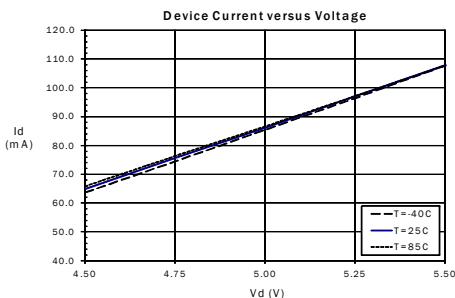


**Caution!** ESD sensitive device.

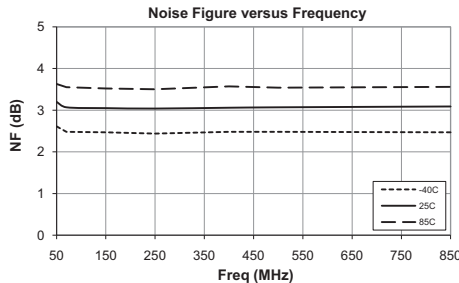
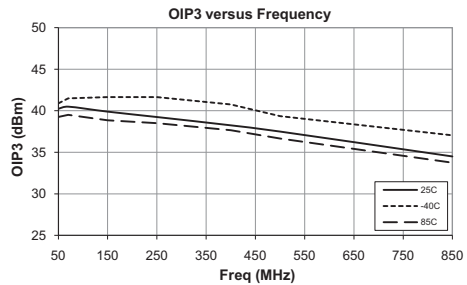
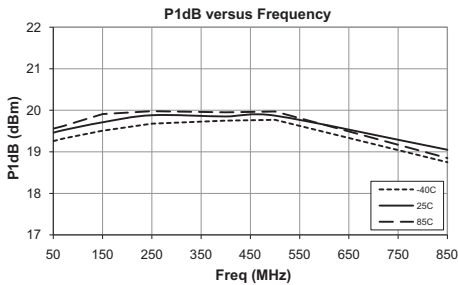
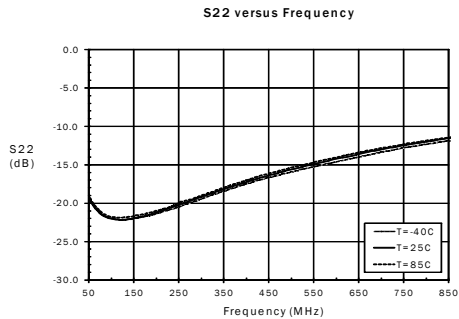
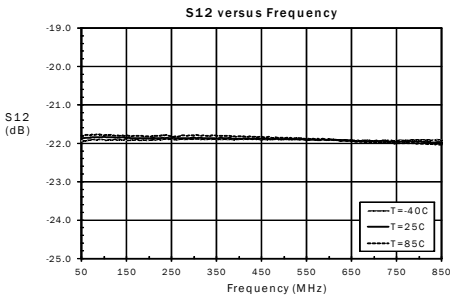
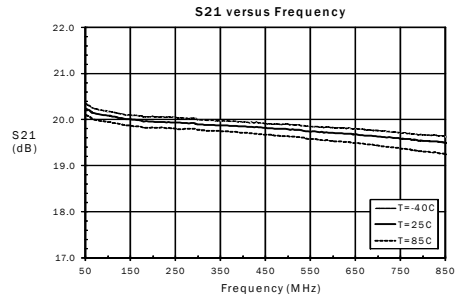
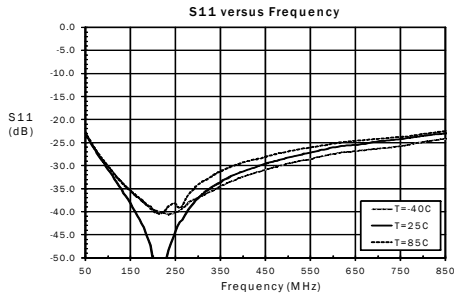
Exceeding any one or a combination of the Absolute Maximum Rating conditions may cause permanent damage to the device. Extended application of Absolute Maximum Rating conditions to the device may reduce device reliability. Specified typical performance or functional operation of the device under Absolute Maximum Rating conditions is not implied.

RoHS status based on EUDirective2002/95/EC (at time of this document revision).

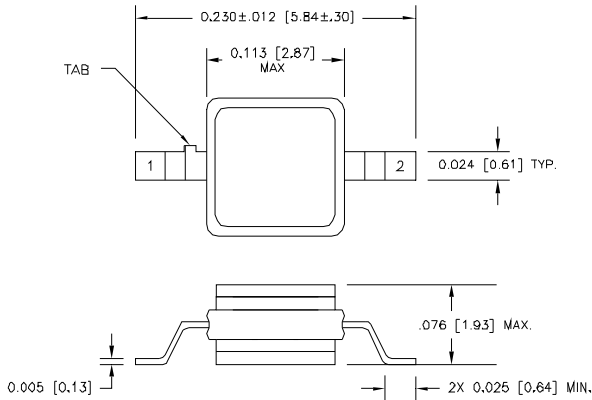
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Typical Performance (50Ω test fixture with bias tees)  $V_G = 5.0V$



## Package Dimensions



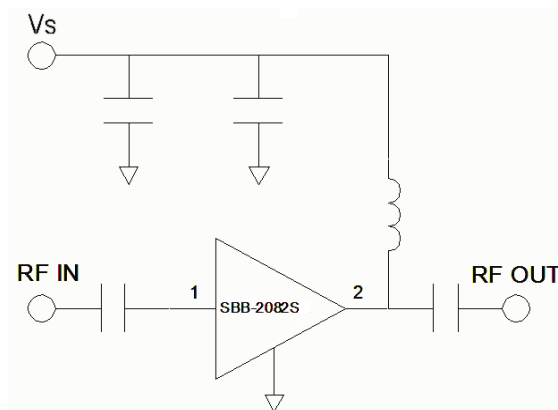
### Package Pin Description

Pin	Function	Description
1	RF IN	This pin is DC coupled and matched to 50Ω. An external DC block is required.
2	RF OUT	This pin is DC coupled and matched to 50Ω. DC bias is applied through this pin.
Package Paddle	GND	Package backside must be connected to RF/DC ground.

Notes:

1. Dimensions in inches [millimeters].
2. Package material: Ceramic
3. Lead finish: Gold.

## Typical Application Schematic



**Package Marking  
Ordering Information**

Part Number	Description
SBB-2082S	Two lead hermetic package.