

Products > RF ICs/Discretes > RF ICs > GaAs Amplifiers, Mixers, Switches > MGA-87563

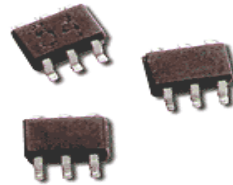
MGA-87563

## 3V LNA, 4.5mA Low Current, 0.5-4GHz, SOT363(SC-70)

### Description



Lifecycle status: **Active**



### Features

The MGA-87 is a 3V part with low noise figure at low current up to 4.5GHz. It is housed in the miniature SOT-363 package and designed for 3V low noise amplifier applications. Bias: 3V, 4mA; Gain = 14dB; NF = 1.5dB; P1dB = 0dBm; IP3i = -4 all at 2GHz.

# MGA-87563

## 0.5–4 GHz 3 V Low Current GaAs MMIC LNA



### Data Sheet

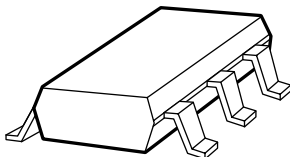
#### Description

Avago's MGA-87563 is an economical, easy-to-use GaAs MMIC amplifier that offers low noise and excellent gain for applications from 0.5 to 4 GHz. Packaged in an ultra-miniature SOT-363 package, it requires half the board space of a SOT-143 package.

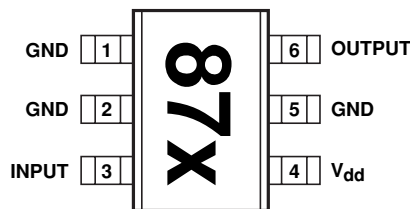
With the addition of a simple shunt-series inductor at the input, the device is easily matched to achieve a noise of 1.6 dB at 2.4 GHz. For 2.4 GHz applications and above, the output is well matched to 50 Ohms. Below 2 GHz, gain can be increased by using conjugate matching.

The circuit uses state-of-the-art PHEMT technology with self-biasing current sources, a source-follower interstage, resistive feedback, and on-chip impedance matching networks. A patented, on-chip active bias circuit allows operation from a single +3 V or +5 V power supply. Current consumption is only 4.5 mA, making this part ideal for battery powered designs.

#### Surface Mount SOT-363 (SC-70) Package



#### Pin Connections and Package Marking



**Note:**

Package marking provides orientation and identification.  
 "87" = Device Code  
 "x" = Date code character identifies month of manufacture

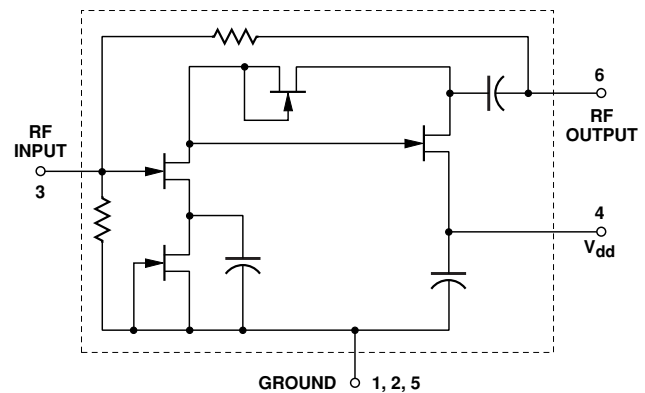
#### Features

- Lead-free Option Available
- Ultra-Miniature Package
- 1.6 dB Min. Noise Figure at 2.4 GHz
- 12.5 dB Gain at 2.4 GHz
- Single +3 V or 5 V Supply, 4.5 mA Current

#### Applications

- LNA or Gain Stage for PCS, ISM, Cellular, and GPS Applications

#### Equivalent Circuit



**Attention:**

Observe precautions for handling electrostatic sensitive devices.

ESD Machine Model (Class A)

ESD Human Body Model (Class 0)

Refer to Avago Application Note A004R: Electrostatic Discharge Damage and Control.

### Absolute Maximum Ratings

Symbol	Parameter	Units	Absolute Maximum <sup>[1]</sup>
$V_{dd}$	Device Voltage, RF Output to Ground	V	6
$V_{in}$ $V_{out}$	RF input or RF Output Voltage to Ground	V	+0.5 -1.0
$P_{in}$	CW RF Input Power	dBm	+13
$T_{ch}$	Channel Temperature	°C	150
$T_{STG}$	Storage Temperature	°C	-65 to 150

#### Thermal Resistance<sup>[2]</sup>:

$$\theta_{ch-c} = 160^{\circ}\text{C/W}$$

#### Notes:

1. Operation of this device above any one of these limits may cause permanent damage.
2.  $T_C = 25^{\circ}\text{C}$  ( $T_C$  is defined to be the temperature at the package pins where contact is made to the circuit board).

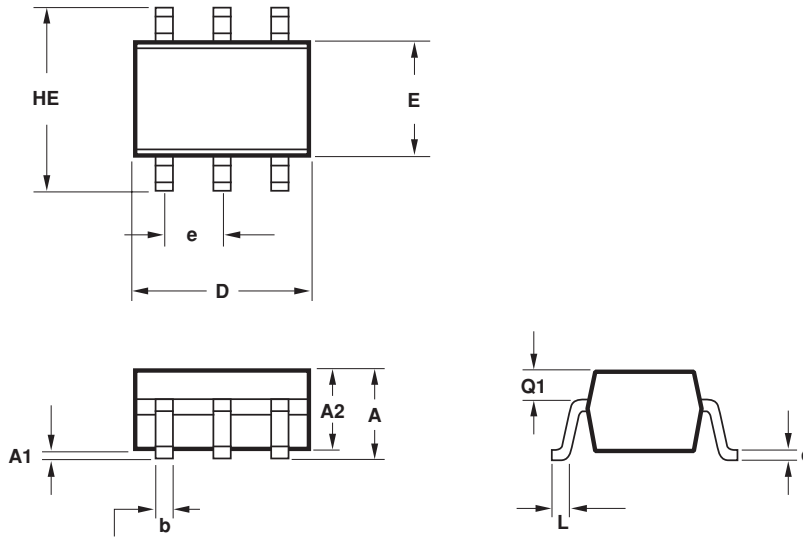
### MGA-87563 Electrical Specifications<sup>[3]</sup>, $T_C = 25^{\circ}\text{C}$ , $Z_0 = 50\ \Omega$ , $V_{dd} = 3\ \text{V}$

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.
$G_{test}^{[3]}$		f = 2.0 GHz	11	14	
$NF_{test}^{[3]}$		f = 2.0 GHz		1.8	2.3
$NF_0$	Optimum Noise Figure (Tuned for lowest noise figure)	f = 0.9 GHz f = 1.5 GHz f = 2.0 GHz f = 2.4 GHz f = 4.0 GHz	dB	1.9 1.6 1.6 1.6 2.0	
$G_a$	Associated Gain at $NF_0$ (Tuned for lowest noise figure)	f = 0.9 GHz f = 1.5 GHz f = 2.0 GHz f = 2.4 GHz f = 4.0 GHz	dB	14.6 14.5 14.0 12.5 10.3	
$P_{1dB}$	Output Power at 1 dB Gain Compression	f = 0.9 GHz f = 1.5 GHz f = 2.0 GHz f = 2.4 GHz f = 4.0 GHz	dBm	-2.0 -1.8 -2.0 -2.0 -2.6	
$IP_3$	Third Order Intercept Point	f = 2.4 GHz	dBm	+8	
VSWR	Output VSWR	f = 2.4 GHz		1.8	
$I_{dd}$	Device Current		mA	4.5	

#### Note:

3. Guaranteed specifications are 100% tested in the circuit in Figure 10 in the Applications Information section.

## Package Dimensions Outline 63 (SOT-363/SC-70)



SYMBOL	DIMENSIONS (mm)	
	MIN.	MAX.
E	1.15	1.35
D	1.80	2.25
HE	1.80	2.40
A	0.80	1.10
A2	0.80	1.00
A1	0.00	0.10
Q1	0.10	0.40
e	0.650 BCS	
b	0.15	0.30
c	0.10	0.20
L	0.10	0.30

### NOTES:

1. All dimensions are in mm.
2. Dimensions are inclusive of plating.
3. Dimensions are exclusive of mold flash & metal burr.
4. All specifications comply to EIAJ SC70.
5. Die is facing up for mold and facing down for trim/form, ie: reverse trim/form.
6. Package surface to be mirror finish.

## Part Number Ordering Information

Part Number	No. of Devices	Container
MGA-87563-TR1	3000	7" Reel
MGA-87563-TR2	10000	13" Reel
MGA-87563-BLK	100	antistatic bag
MGA-87563-TR1G	3000	7" Reel
MGA-87563-TR2G	10000	13" Reel
MGA-87563-BLKG	100	antistatic bag

**Note:** For lead-free option, the part number will have the character "G" at the end.