

Products > RF ICs/Discretes > RF ICs > GaAs Amplifiers, Mixers, Switches > MGA-82563

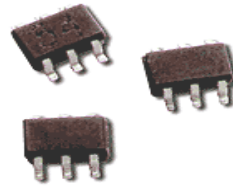
MGA-82563

3V Driver Amplifier, 17dBm P1dB, Low Noise, 0.1-6GHz, SOT363(SC-70)

Description



Lifecycle status: **Active**



Features

The MGA-82 is a 3V part with 17dBm P1dB. It is housed in the miniature SOT-363 package and designed for 3V driver amplifier applications. Bias: 3V, 84mA; Gain = 13dB; NF = 2.2dB; P1dB = 17.3dBm; IP3i = 14dB all at 2GHz.

MGA-82563

0.1–6 GHz 3V, 17 dBm Amplifier



Data Sheet

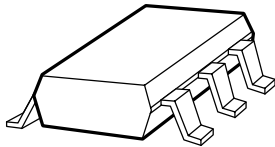
Description

Avago's MGA-82563 is an economical, easy-to-use GaAs MMIC amplifier that offers excellent power and low noise figure for applications from 0.1 to 6 GHz. Packaged in an ultra-miniature SOT-363 package, it requires half the board space of a SOT-143 package.

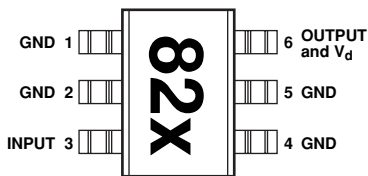
The input and output of the amplifier are matched to 50Ω (below 2:1 VSWR) across the entire bandwidth, eliminating the expense of external matching. The amplifier allows a wide dynamic range by offering a 2.2 dB NF coupled with a +31 dBm Output IP_3 .

The circuit uses state-of-the-art PHEMT technology with proven reliability. On-chip bias circuitry allows operation from a single +3 V power supply, while resistive feedback ensures stability ($K > 1$) over all frequencies and temperatures.

Surface Mount Package SOT-363 (SC-70)



Pin Connections and Package Marking



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

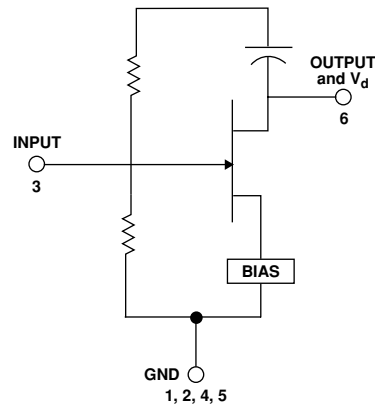
Features

- Lead-free Option Available
- +17.3 dBm $P_{1\text{dB}}$ at 2.0 GHz
- +20 dBm P_{sat} at 2.0 GHz
- Single +3V Supply
- 2.2 dB Noise Figure at 2.0 GHz
- 13.2 dB Gain at 2.0 GHz
- Ultra-miniature Package
- Unconditionally Stable

Applications

- Buffer or Driver Amp for PCS, PHS, ISM, SATCOM and WLL Applications
- High Dynamic Range LNA

Simplified Schematic



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.

MGA-82563 Absolute Maximum Ratings

Symbol	Parameter	Units	Absolute Maximum ^[1]
V_d	Device Voltage, RF Output to Ground	V	5.0
V_{gd}	Device Voltage, Gate to Drain	V	-6.0
V_{in}	Range of RF Input Voltage to Ground	V	+0.5 to -1.0
P_{in}	CW RF Input Power	dBm	+13
T_{ch}	Channel Temperature	°C	165
T_{STG}	Storage Temperature	°C	-65 to 150

Thermal Resistance^[2]:

$$\theta_{ch-c} = 180^{\circ}\text{C/W}$$

Notes:

1. Permanent damage may occur if any of these limits are exceeded.
2. $T_C = 25^{\circ}\text{C}$ (T_C is defined to be the temperature at the top of the package.)

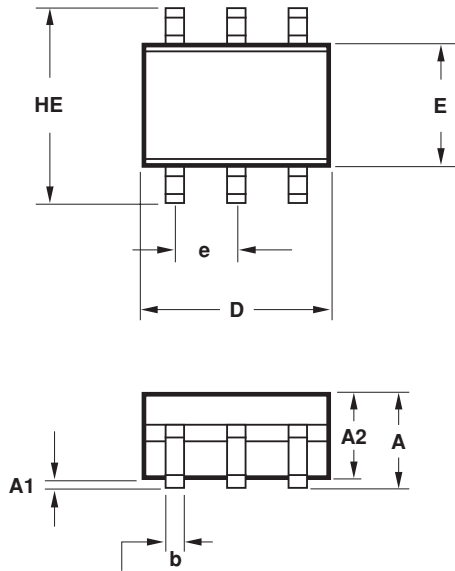
MGA-82563 Electrical Specifications, $T_C = 25^{\circ}\text{C}$, $Z_0 = 50\ \Omega$, $V_d = 3\ \text{V}$

Symbol	Parameters and Test Conditions	Units	Min.	Typ.	Max.	Std Dev ^[2]
G_{test}	Gain in test circuit ^[1] f = 2.0 GHz		12.0	13.2	15	0.35
NF_{test}	Noise Figure in test circuit ^[1] f = 2.0 GHz			2.2	2.9	0.20
NF_{50}	Noise Figure in 50 Ω system f = 0.5 GHz f = 1.0 GHz f = 2.0 GHz f = 3.0 GHz f = 4.0 GHz f = 6.0 GHz	dB		2.3 2.2 2.2 2.2 2.4 2.7		0.20
$ S_{21} ^2$	Gain in 50 Ω system f = 0.5 GHz f = 1.0 GHz f = 2.0 GHz f = 3.0 GHz f = 4.0 GHz f = 6.0 GHz	dB		14.7 14.5 13.5 12.1 10.7 8.8		0.35
$P_{1\text{dB}}$	Output Power at 1 dB Gain Compression f = 0.5 GHz f = 1.0 GHz f = 2.0 GHz f = 3.0 GHz f = 4.0 GHz f = 6.0 GHz	dBm		17.4 17.5 17.3 17.1 17.0 16.8		0.54
IP_3	Output Third Order Intercept Point f = 2.0 GHz	dBm		+31		1.0
$VSWR_{in}$	Input VSWR f = 0.2–5.0 GHz			1.8:1		
$VSWR_{out}$	Output VSWR f = 0.2–5.0 GHz			1.2:1		
I_d	Device Current	mA	63	84	101	

Notes:

1. Guaranteed specifications are 100% tested in the circuit in Figure 10 in the Applications Information section.
2. Standard deviation number is based on measurement of at least 500 parts from three non-consecutive wafer lots during the initial characterization of this product, and is intended to be used as an estimate for distribution of the typical specification.

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



Part Number Ordering Information

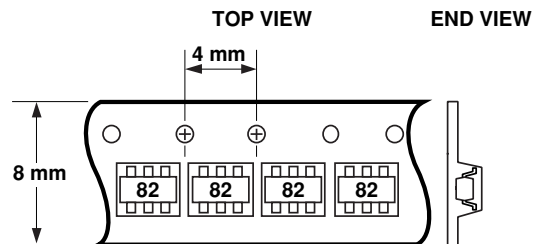
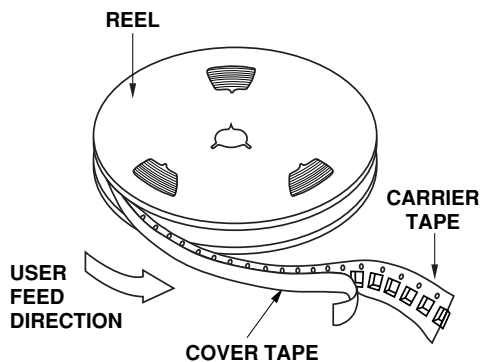
Part Number	No. of Devices	Container
MGA-82563-TR1	3000	7" Reel
MGA-82563-BLK	100	antistatic bag

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

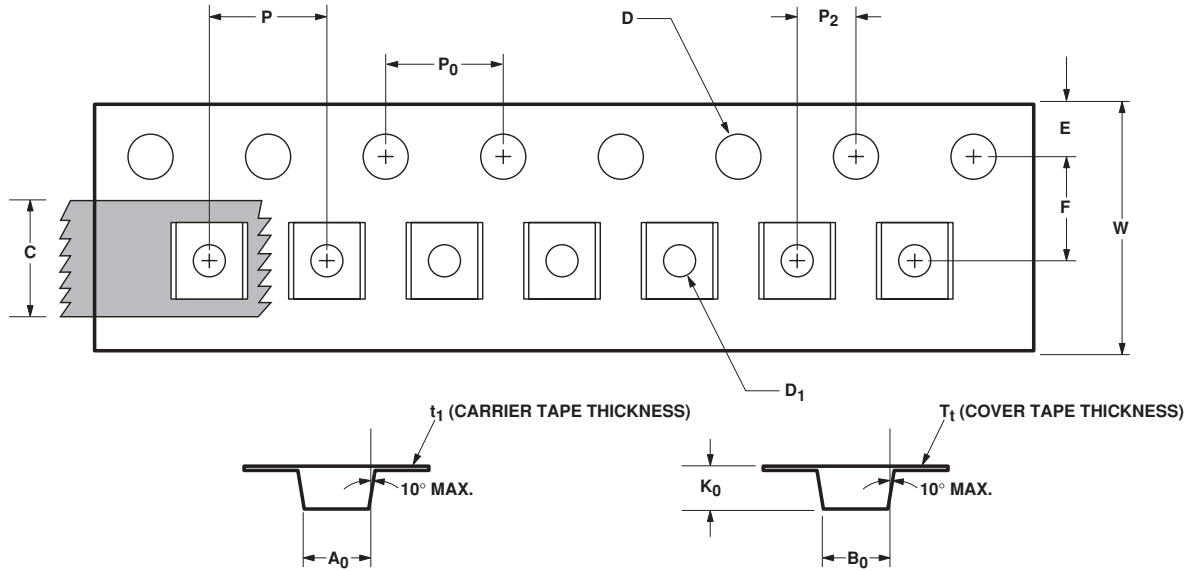
NOTES:

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.

Device Orientation



Tape Dimensions and Product Orientation
For Outline 63



	DESCRIPTION	SYMBOL	SIZE (mm)	SIZE (INCHES)
CAVITY	LENGTH	A ₀	2.40 ± 0.10	0.094 ± 0.004
	WIDTH	B ₀	2.40 ± 0.10	0.094 ± 0.004
	DEPTH	K ₀	1.20 ± 0.10	0.047 ± 0.004
	PITCH	P	4.00 ± 0.10	0.157 ± 0.004
	BOTTOM HOLE DIAMETER	D ₁	1.00 + 0.25	0.039 + 0.010
PERFORATION	DIAMETER	D	1.55 ± 0.10	0.061 + 0.002
	PITCH	P ₀	4.00 ± 0.10	0.157 ± 0.004
	POSITION	E	1.75 ± 0.10	0.069 ± 0.004
CARRIER TAPE	WIDTH	W	8.00 + 0.30 - 0.10	0.315 + 0.012
	THICKNESS	t ₁	0.254 ± 0.02	0.0100 ± 0.0008
COVER TAPE	WIDTH	C	5.40 ± 0.10	0.205 + 0.004
	TAPE THICKNESS	T _t	0.062 ± 0.001	0.0025 ± 0.0004
DISTANCE	CAVITY TO PERFORATION (WIDTH DIRECTION)	F	3.50 ± 0.05	0.138 ± 0.002
	CAVITY TO PERFORATION (LENGTH DIRECTION)	P ₂	2.00 ± 0.05	0.079 ± 0.002