

# UA2732

## Broadband Amplifier

### Data Sheet

### DS-2732-02

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**UA2732**

## Gain Block

## 1. Product Description

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The UA2732 general purpose wideband and low current amplifier IC with internal input/output matching is packaged in a 6-pin SOT363 plastic package.

## 2. Features

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- Single 3.3V power supply
- Internally matched to 50Ω
- Very wide frequency over DC to 3.8 GHz
- Over 22.5 dB linear gain at 2.2 GHz
- High frequency gain peaking for cable loss compensation
- Unconditionally stable
- P1dB over 4.5 dBm at 2.2 GHz
- Low supply current about 17 mA

## 3. Typical Applications

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- DBS
- LNB IF Amplifier
- DVB
- Cable
- ISM
- General Purpose

## 4. Pin Configuration

Table 1. Pin Descriptions

Pin #	Description
1	Vcc
2, 5	GND1
3	RF out
4	GND2
6	RF in

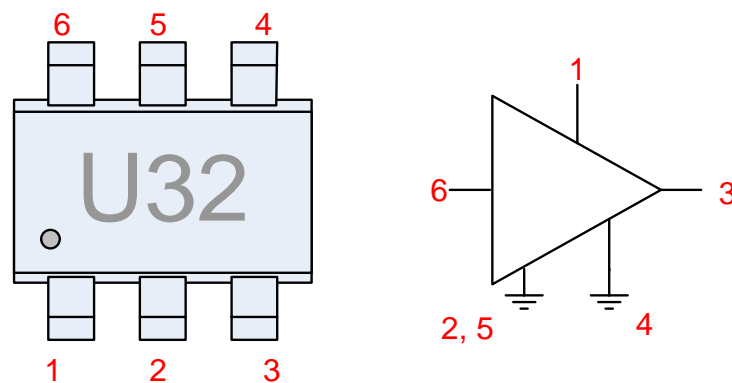
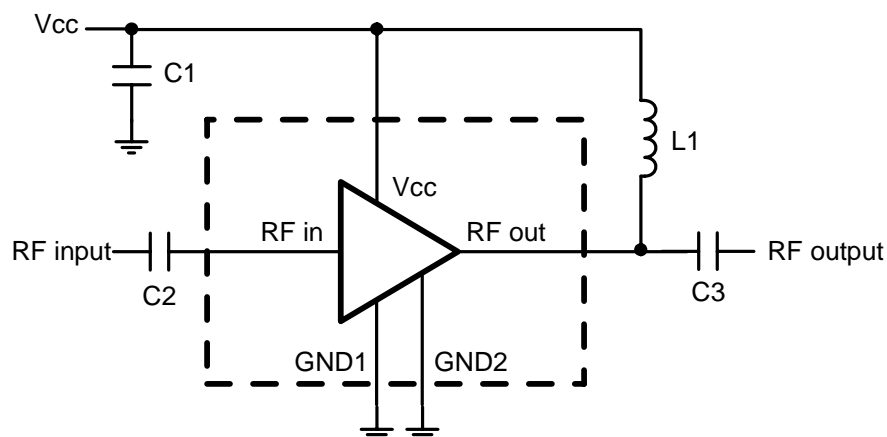


Figure 1. Simplified Outline (SOT363) and Symbol

## 5. Application Circuit



$C1=1\text{nF}$ ,  $C2=100\text{pF}$ ,  $C3=100\text{pF}$ . The nominal value of the RF choke,  $L1$  is  $33\text{ nH}$ . Increasing the inductor value will shift the curve towards the lower frequency region. The operating frequency can be lowered to  $50\text{MHz}$  when  $L1$  is larger than  $220\text{nH}$ .

Figure 2. Application Circuit

## 6. PCB Layout Design Guide

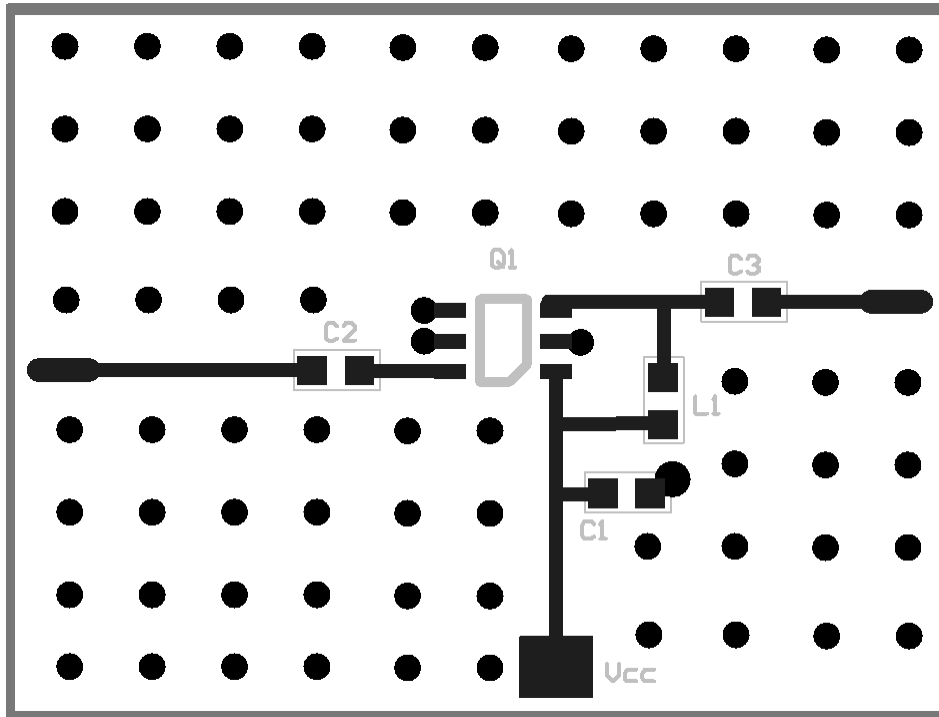


Figure 3. GND via hole

Notes:

1. Each ground pin must have individual via hole.
2. No DC or signal line on the bottom of IC

## 7. Operating Condition

Table 2. Absolute Maximum Ratings

Symbol	Parameters	Conditions	Min.	Max.	Unit
V <sub>CC</sub>	DC Supply Voltage	RF input AC coupled	-	5	V
I <sub>CC</sub>	Supply Current		-	25	mA
P <sub>tot</sub>	Total Power Dissipation	T <sub>a</sub> ≤ 90 °C	-	125	mW
T <sub>ST</sub>	Storage Temperature		-65	150	°C
T <sub>j</sub>	Operating Junction Temperature		-40	150	°C
P <sub>D</sub>	Maximum Drive Power		-	-10	dBm

Table 3. Thermal Characteristics

Symbol	Parameters	Conditions	Value	Unit
R <sub>th</sub>	Thermal Resistance from Junction to Solder Point	P <sub>tot</sub> = 80 mW; T <sub>a</sub> ≤ 90 °C	300	K/W

## 8. Electrical Characteristics

Table 4. Electrical Characteristics

V<sub>cc</sub> = 3.3 V; I<sub>cc</sub> = 17 mA; T<sub>a</sub> = 25 °C; unless otherwise specified.

Symbol	Parameters	Conditions	Min.	Typ.	Max.	Unit
V <sub>cc</sub>	Supply Voltage		3	3.3	-	Volt.
I <sub>cc</sub>	Supply Current		14	17	-	mA
S <sub>21</sub>   <sup>2</sup>	Insertion Power Gain	f = 100 MHz	-	17.5	-	dB
		f = 0.9 GHz	-	22	-	dB
		f = 1.8 GHz	-	23	-	dB
		f = 2.2 GHz	-	22.5	-	dB
		f = 2.5 GHz	-	22	-	dB
S <sub>11</sub>   <sup>2</sup>	Input Return Loss	f = 0.9 GHz	10	-	-	dB
		f = 2.2 GHz	10	-	-	dB
S <sub>22</sub>   <sup>2</sup>	Output Return Loss	f = 0.9 GHz	10	-	-	dB
		f = 2.2 GHz	10	-	-	dB
S <sub>12</sub>   <sup>2</sup>	Isolation	f = 0.9 GHz	-	32	-	dB
		f = 2.2 GHz	-	33	-	dB
NF	Noise Figure	f = 0.9 GHz	-	3.2	-	dB
		f = 2.2 GHz	-	3.3	-	dB
BW	Bandwidth	at  S <sub>21</sub>   <sup>2</sup> -3 dB below flat gain at 0.9 GHz	-	3.8	-	GHz
K	Stability Factor	f = 0.9 GHz	-	1.6	-	-
		f = 2.2 GHz	-	1.7	-	-
P <sub>L(sat)</sub>	Saturated Load Power	f = 0.9 GHz	-	9	-	dBm
		f = 2.2 GHz	-	8.5	-	dBm
P <sub>L,1dB</sub>	Output P <sub>1dB</sub>	at 1 dB gain compression; f = 0.9 GHz	-	5	-	dBm
		at 1 dB gain compression; f = 2.2 GHz	-	4.5	-	dBm



Caution: ESD sensitive.

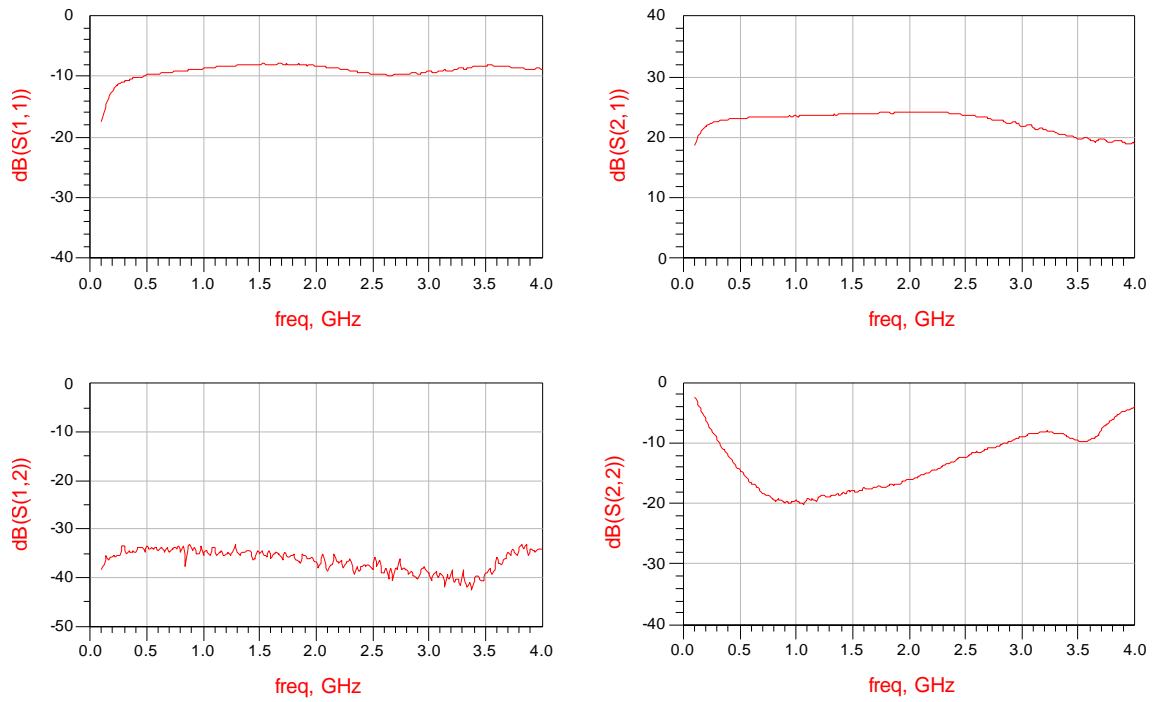


Figure 4. S-parameter ( $V_{CC}=3.3V$ ,  $I_{CC}=17mA$ ,  $P_{in}=-40dBm$ ,  $Z_o=50\Omega$ )

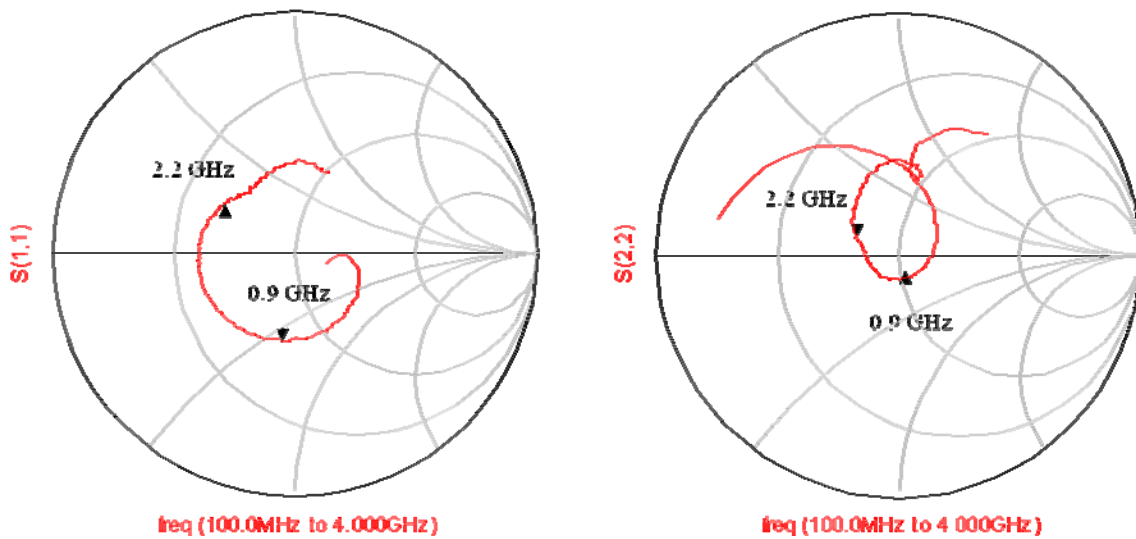


Figure 5.  $S_{11}$  &  $S_{22}$  ( $V_{CC}=3.3V$ ,  $I_{CC}=17mA$ ,  $P_{in}=-40dBm$ ,  $Z_o=50\Omega$ )

## 9. Package Drawing

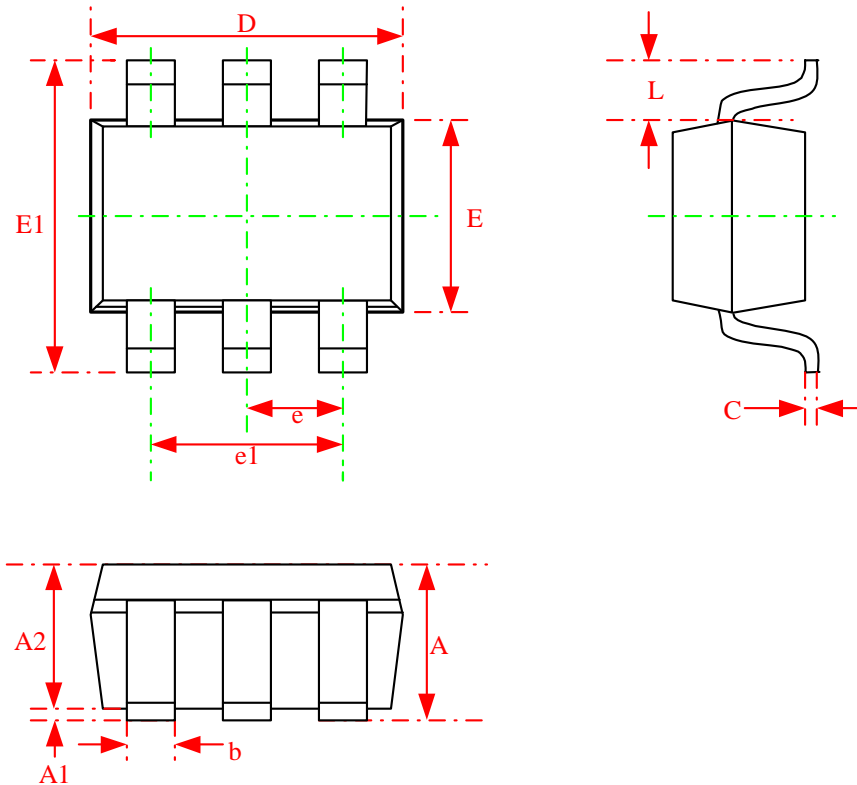


Figure 6. Package Outline

Table 5. Dimension Description

Symbol	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	0.90	1.10	.038	.044
A1	0.025	0.10	.001	.004
A2	0.875	1.00	.035	.040
b	0.20	0.40	.008	.016
C	0.10	0.15	.004	.006
D	1.90	2.10	.076	.084
E	1.15	1.35	.046	.054
E1	2.00	2.20	.080	.088
e	0.65 BSC.		.026 BSC.	
e1	1.30 BSC.		.052 BSC.	
L	0.425 REF.		.017 BSC.	

## Revision History

Revision	Date	Description of Change
0.0	2006/03/14	Original
1.0	2008/02/21	Correct typo (Output P <sub>1dB</sub> ), add PCB layout design guide and test result.

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