



# SMA428A

## High Gain, Low Noise Amplifier

PRELIMINARY DATA

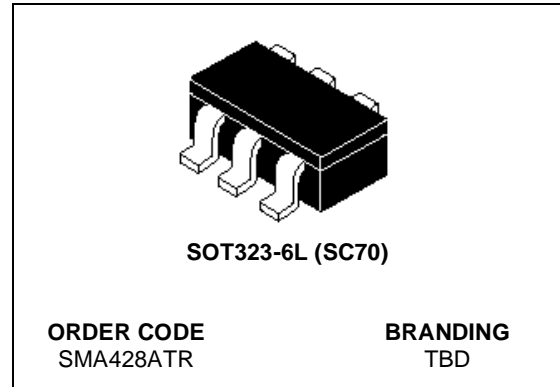
- HIGH GAIN  $G_p = 21$  dB at 1.85 GHz
- LOW NOISE FIGURE  $NF = 1.3$  dB at 1.85 GHz
- LOW CURRENT CONSUMPTION 5.9 mA
- OPEN COLLECTOR OUTPUT
- TYPICAL SUPPLY VOLTAGE: 2.4-3 V
- GAIN-STEP-MODE (36dB)
- ULTRA MINIATURE SOT323-6L PACKAGE (LEAD FREE)

### APPLICATIONS

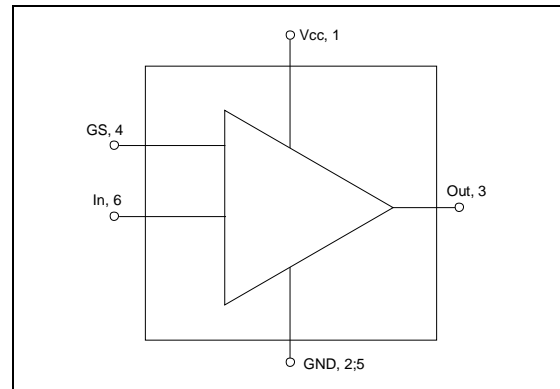
- LNA FOR CELLULAR MARKET (ideal for GSM900, DCS1800 and PCS1900).
- LNA FOR GPS APPLICATIONS

### DESCRIPTION

High gain and low noise figures make the SMA428A an ideal solution for Low Noise Amplifiers and receiver front end stages up to 2.5 GHz. SMA428A's typical supply voltage range is 2.4 to 3.3 volts. It shows excellent performances in terms of NF, Gain and current consumption, using just 3 external matching components. Applying supply voltage to the GS pin and grounding Vcc pin, it provides a reduced gain step of 35 dB. SMA428A is housed in ultra miniature SOT323-6L package(LEAD FREE), the relative dimensions are 1.15mmx1.8mm with 0.8mm thickness.



### BLOCK DIAGRAM



### ABSOLUTE MAXIMUM RATINGS

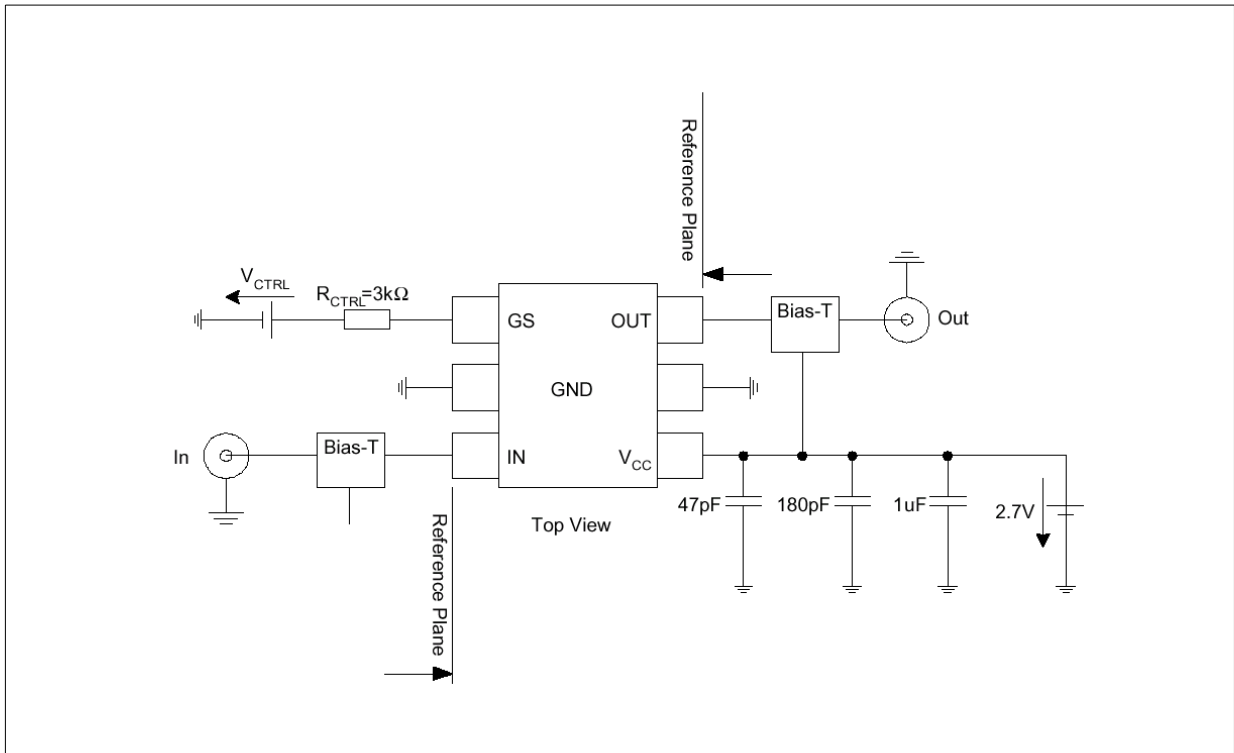
Symbol	Parameter	Value	Unit
$V_{cc}$	Device voltage	4	V
$V_{out}$	Voltage at pin Out	4	V
$V_{GS}$	Voltage at pin GS	3.5	V
$I_{tot}$	Total Device Current	12	mA
$I_{in}$	Current into pin In	0.5	mA
$P_{tot}$	Total dissipation, $T_s < 125$ °C	60	mW
$P_{IN}$	Input Power	8	dBm
$T_{op}$	Operating temperature	-40 to +85	°C
$T_{stg}$	Storage temperature	-65 to +150	°C
$T_j$	Max. operating junction temperature	150	°C

### THERMAL RESISTANCE

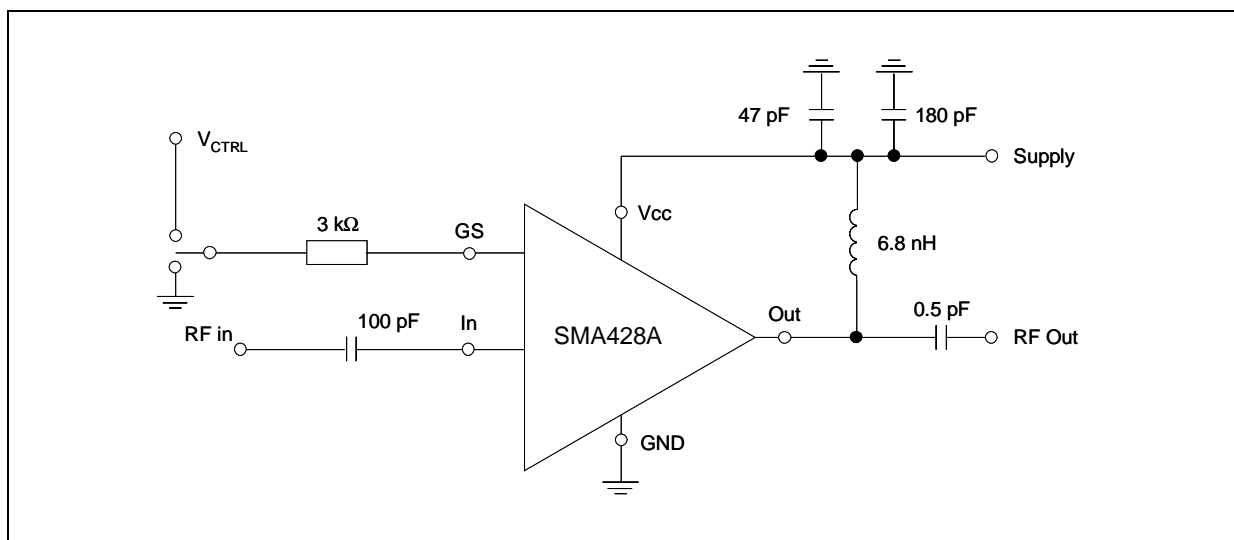
$R_{thjs}$	Thermal Resistance Junction soldering point	200	°C/W
------------	---	-----	------

# SMA428A

## Test Circuit (Fig. 1)

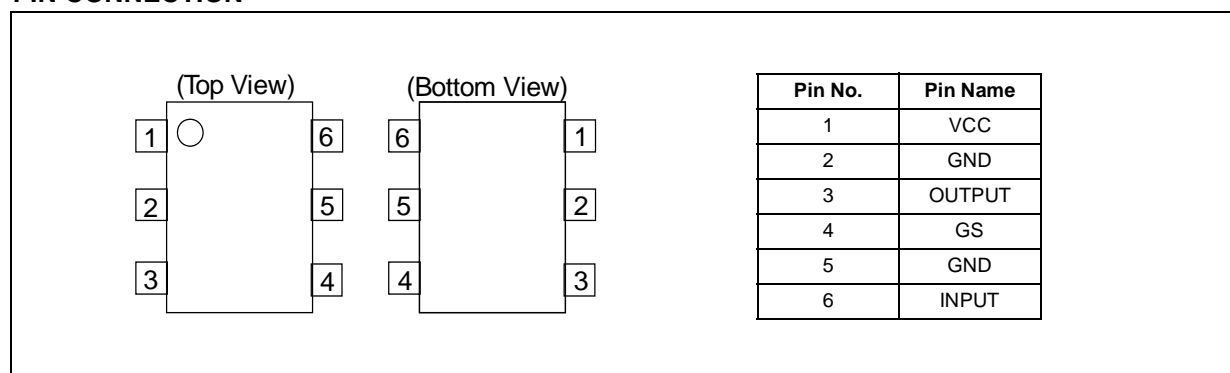


## Typical application circuit (Fig. 2)



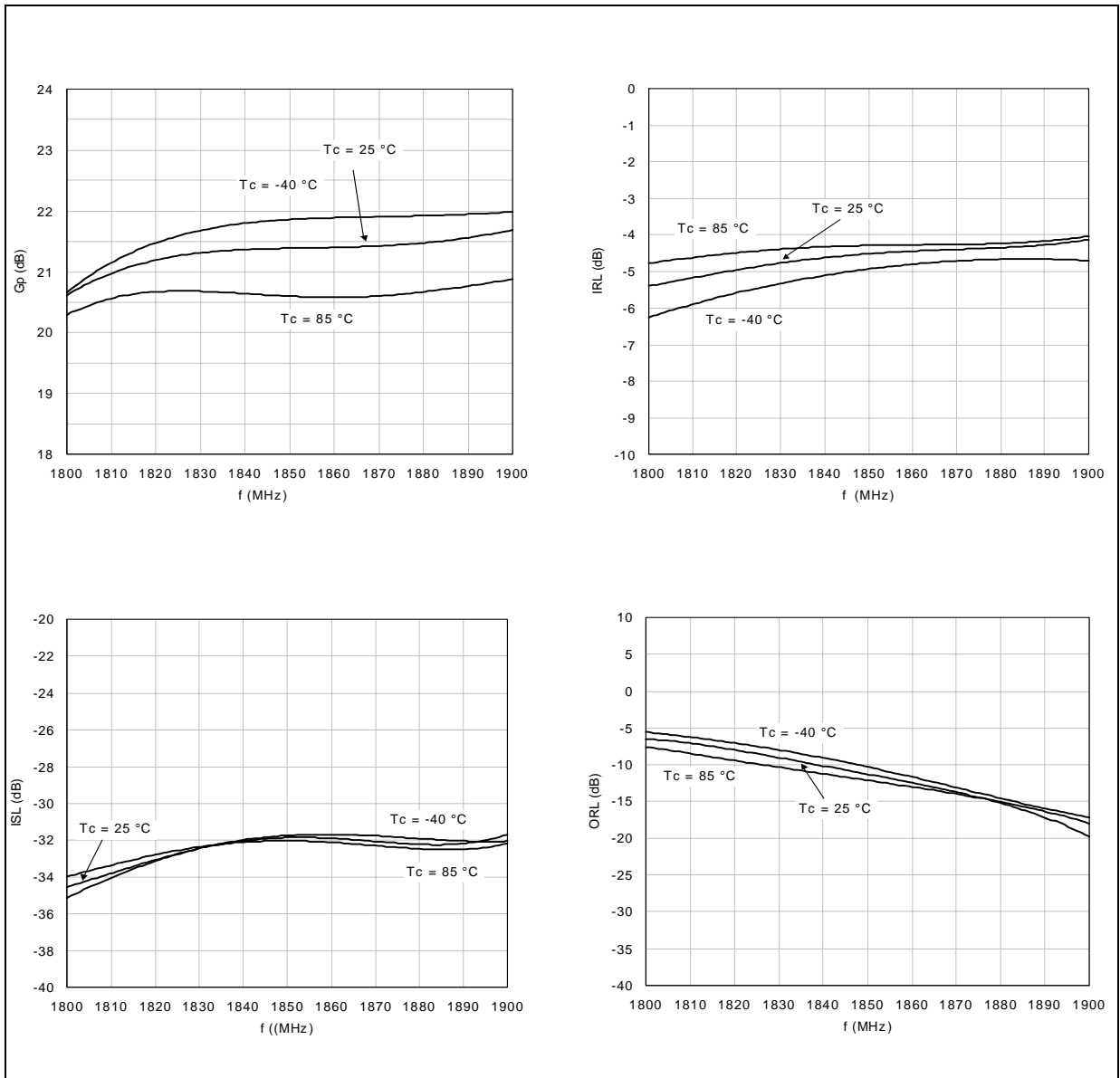
**ELECTRICAL CHARACTERISTICS**(Ta = +25°C, V<sub>CC</sub> = 2.7V, tested in circuit shown in fig.1, unless otherwise specified)

Symbol	Parameters	Test Conditions	Min	Typ	Max	Unit
f	Frequency Range			1850		MHz
I <sub>tot</sub>	Total device current			5.9	7.5	mA
G <sub>p</sub>	Power Gain		18	21		dB
NF	Noise Figure (Z <sub>s</sub> = 50 Ω)			1.3	1.7	dB
P <sub>-1dB</sub>	Input Power at 1 dB Gain Compression		-23			dBm
IIP3	Input third order intercept point		-13			dBm
L <sub>GS</sub>	Insertion Loss in Gain-Step-Mode	V <sub>CC</sub> = 0.0 V, V <sub>CTRL</sub> = 2.7 V, R <sub>CTRL</sub> = 3 kΩ	11		18	dB
I <sub>CTR</sub>	Current consumption in Gain-Step-Mode	V <sub>CC</sub> = 0.0 V, V <sub>CTRL</sub> = 2.7 V, R <sub>CTRL</sub> = 3 kΩ		0.33		mA

**PIN CONNECTION**

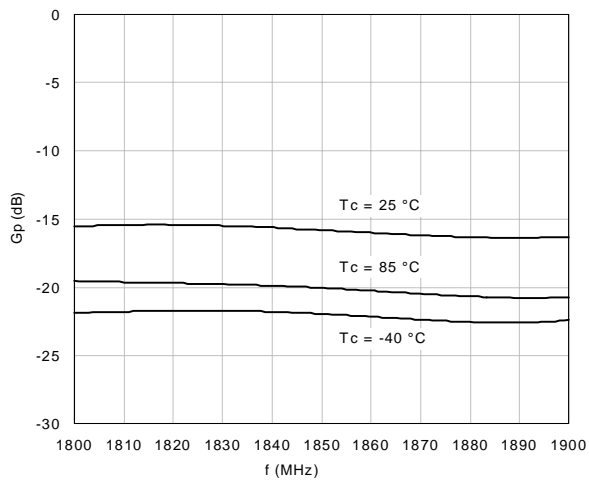
# SMA428A

S-Parameters ( $Z_L = Z_S = 50 \Omega$ ,  $V_{CC} = 2.7V$ , measured in application circuit shown in fig.2)

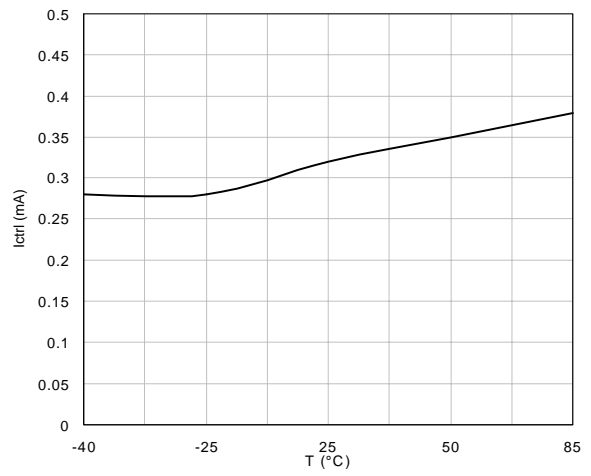


TYPICAL PERFORMANCE

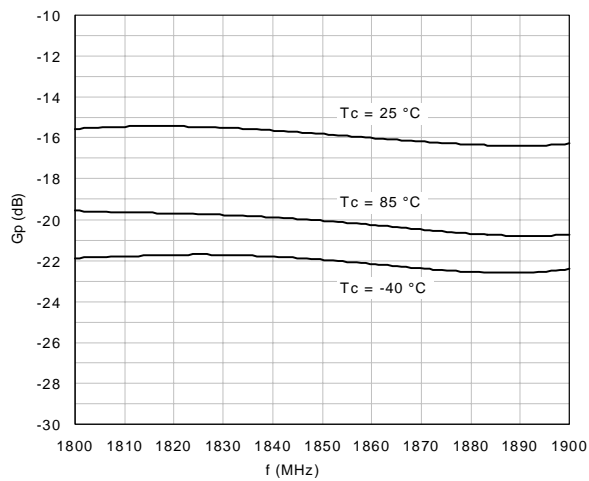
Supply Current Vs Temperature



Control Current Vs Temperature

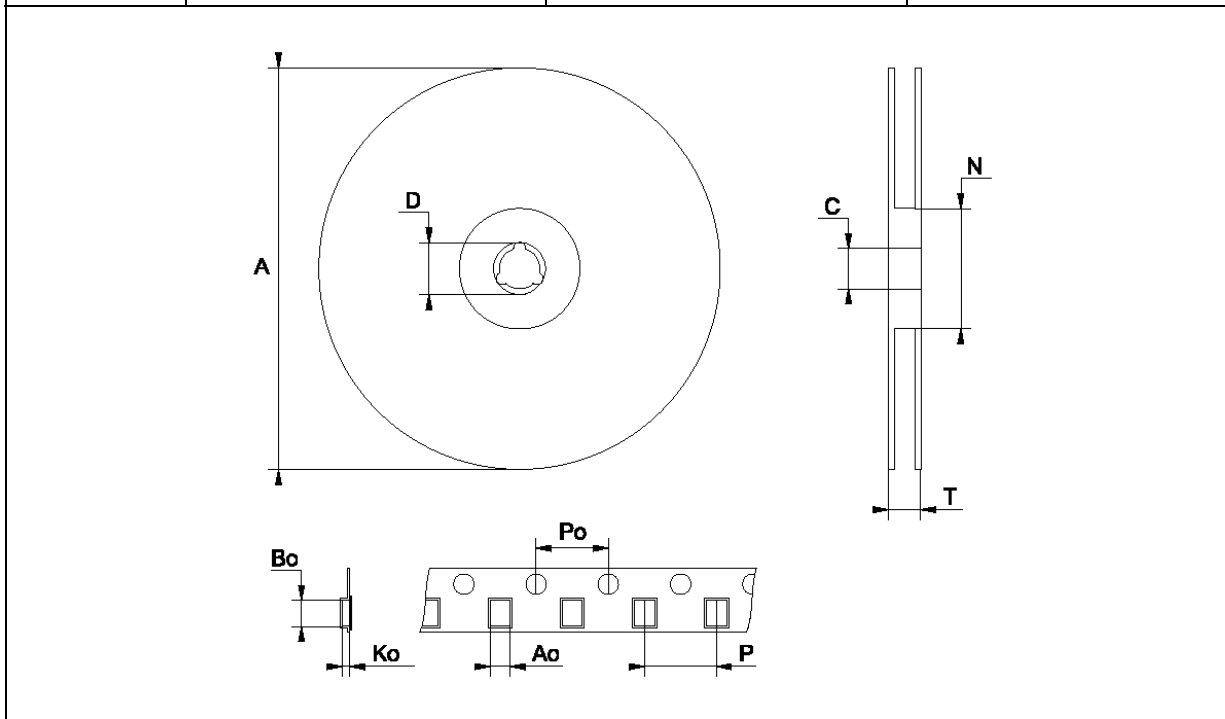


OFF-Gain ( $V_{cc} = 0V$ ,  $V_{ctrl} = 2.7V$ ,  $R_{ctrl} = 3Kohm$ )

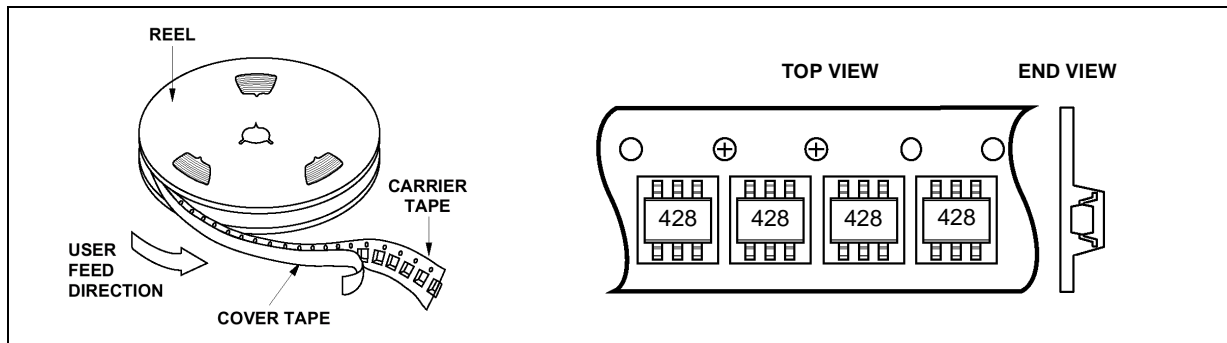


TAPE & REEL DIMENSIONS

	mm		
	MIN.	TYP.	MAX
A	178.5	179	179.5
C	12.8	13.0	13.5
D	20.2		
N	54.5	55	55.5
T			14.4
Ao		2.25	
Bo		2.7	
Ko		1.2	
Po	3.8 (cumulative 10 Po)	4.0	4.2 (cumulative 10 Po)
P		4.0	

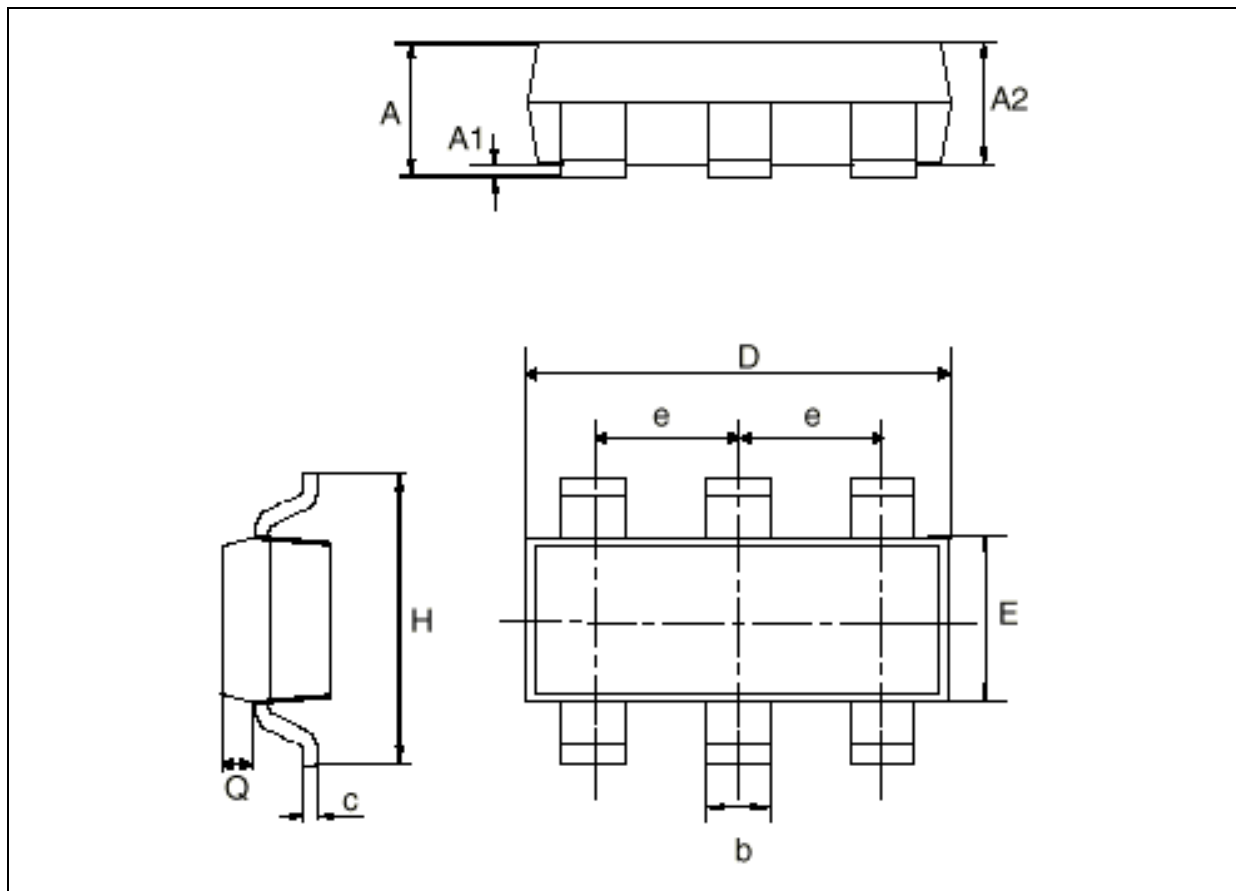


DEVICE ORIENTATION



## SOT323-6L MECHANICAL DATA

DIM.	mm			Inch		
	MIN.	TYP.	MAX	MIN.	TYP.	MAX
A	0.8		1.1	0.031		0.043
A1	0		0.1	0		0.004
A2	0.8		1	0.0031		0.039
b	0.15		0.3	0.006		0.012
c	0.1		0.18	0.004		0.007
D	1.8		2.2	0.071		0.088
E	1.15		1.35	0.045		0.59
e		0.65			0.025	
H	1.8		2.4	0.071		0.094
Q	0.1		0.4	0.004		0.016



Information furnished is believed to be accurate and reliable. However, STMicroelectronics assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of STMicroelectronics. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information previously supplied. STMicroelectronics products are not authorized for use as critical components in life support devices or systems without express written approval of STMicroelectronics.

The ST logo is registered trademark of STMicroelectronics  
© 2003 STMicroelectronics - All Rights Reserved

All other names are the property of their respective owners.

STMicroelectronics GROUP OF COMPANIES  
Australia - Brazil - Canada - China - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan -  
Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - U.S.A.  
<http://www.st.com>