

6W AMPLIFIER WITH MUTING

1 FEATURES

- WIDE SUPPLY VOLTAGE RANGE
- 6W @ $V_S = 20V$, $R_L = 8\Omega$, THD=10%
- MUTE FACILITY (POP FREE) WITH LOW CONSUMPTION
- AC SHORT CIRCUIT PROTECTION
- THERMAL OVERLOAD PROTECTION (150°C)

2 DESCRIPTION

The TDA7253L is class AB audio power amplifier assembled in the Single in Line 10 pins Package.

Figure 1. Package

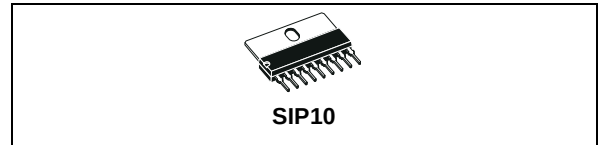


Table 1. Order Codes

Part Number	Package
TDA7253L	SIP10

Figure 2. Test and Application Circuit

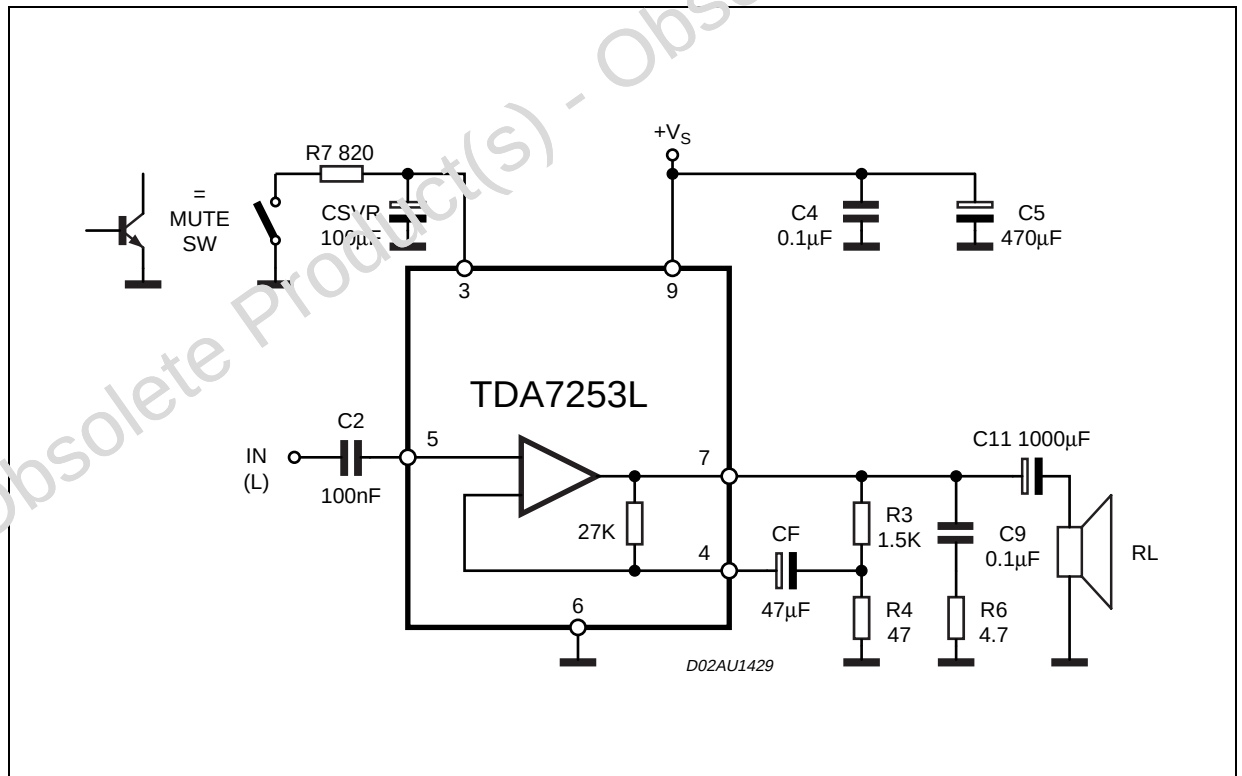


Table 2. Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V _S	Supply Voltage	30	V
I _O	Output Peak Current (repetitive f >20Hz)	1.7	A
I _O	Output Peak Current (non repetitive, t = 100µs)	2	A
P _{tot}	Total Power Dissipation (T _{case} = 70°C)	8	W
T _{op}	Operating Temperature Range	0 to 70	°C
T _{stg} , T _j	Storage & Junction Temperature	-40 to 150	°C

Table 3. Thermal Data

Symbol	Parameter	Value	Unit
R _{th j-case}	Thermal resistance junction to case	Max 9	°C/W

Figure 3. Pin Connection (Top view)

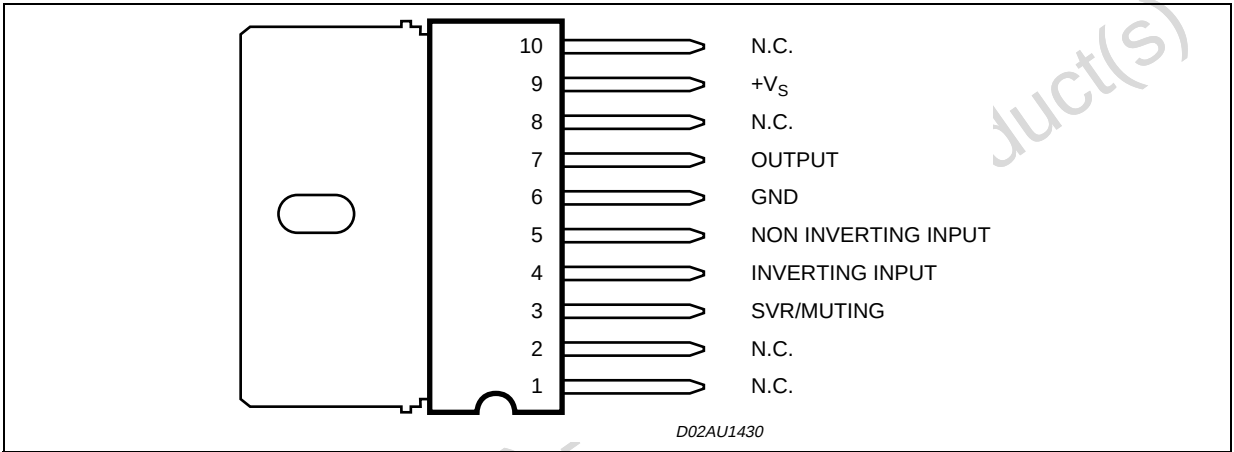


Figure 4. Block Diagram

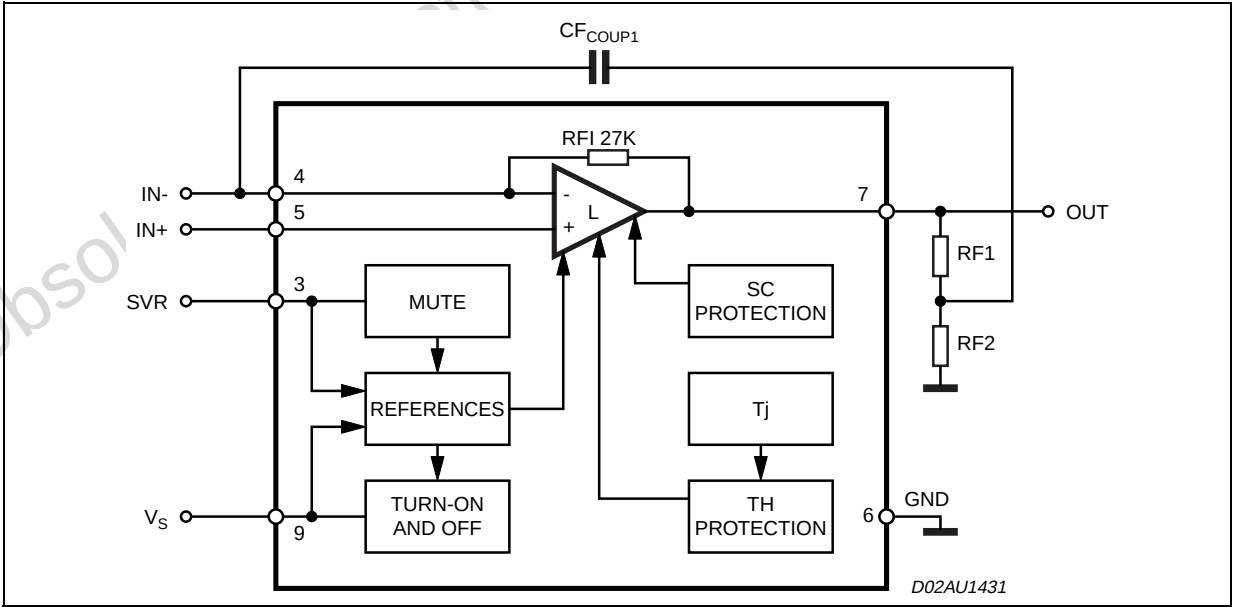


Table 4. ELECTRICAL CHARACTERISTICS

(Refer to the test and application circuit, $V_S = 20V$; $R_L = 8\Omega$; $G_V = 30dB$; $f = 1KHz$; $T_{amb} = 25^\circ C$ unless otherwise specified).

Symbol	Parameter	Test Condition	Min.	Typ.	Max.	Unit
V_S	Supply Voltage		10		24	V
V_O	Quiescent Output Voltage			9.5		V
I_q	Total Quiescent Current			30	60	mA
P_O	Output Power	$d = 10\%$	5	6		W
		$d = 1\%$	4	5		W
d	Total Harmonic Distortion	$P_O = 1W$		0.03	0.3	%
R_I	Input Resistance		100	200		$K\Omega$
f_L	Low Frequency Roll-off (-3dB)			40		Hz
f_H	High Frequency Roll-off (-3dB)			80		KHz
e_N	Total Input Noise Voltage	A Curve; $R_S = 10K\Omega$		2		mV
		$f = 22Hz$ to $22KHz$; $R_S = 10K\Omega$		2.5	10	μV
SVR	Supply Voltage Rejection	$R_S = 10K\Omega$; $f = 100Hz$; $V_r = 0.5V$	46	60		dB
V_{TMUTE}	Mute Threshold		1	1.6		V
V_{TPLAY}	Play Threshold			4.5		V
A_M	Mute Attenuation		80	100		dB
I_{QMUTE}	Quiescent Current Mute			6	10	mA

Note: to avoid pop-on noise $\frac{C_F}{C_{SVR}} \leq 1$

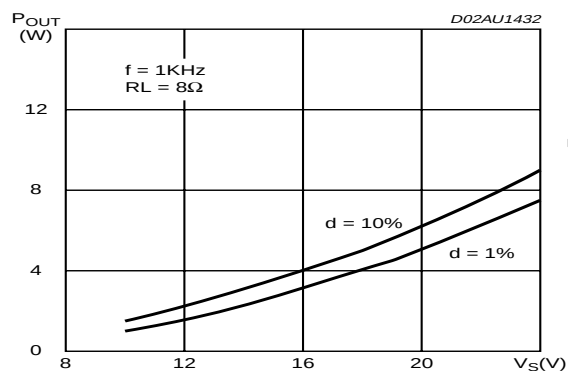
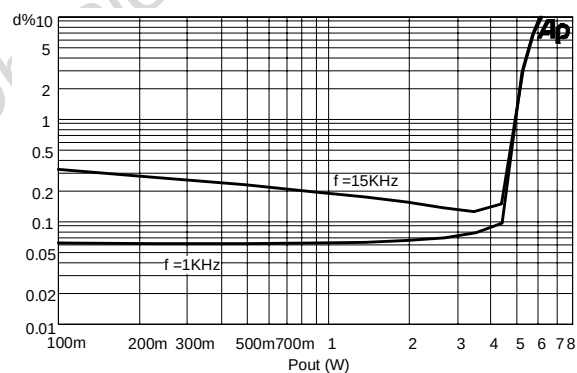
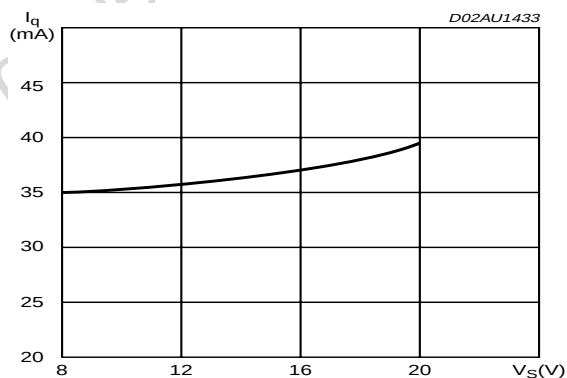
Figure 5. Output Power vs. Supply Voltage**Figure 7. Distortion vs Output Power****Figure 6. Quiescent Current vs. Supply Voltage**

Figure 8. PC Board Component Layout

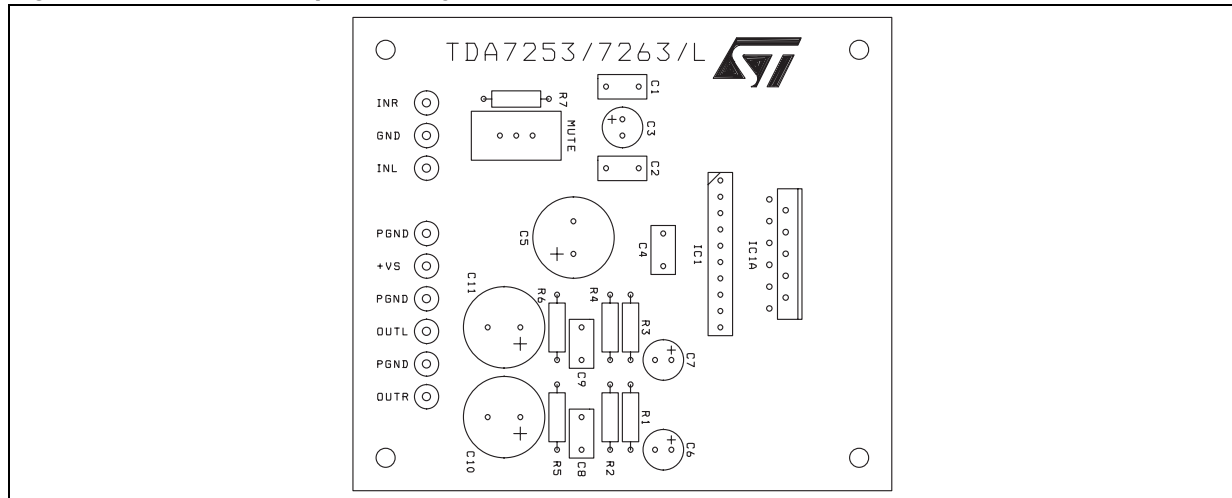


Figure 9. Evaluation Board Top Layer Layout

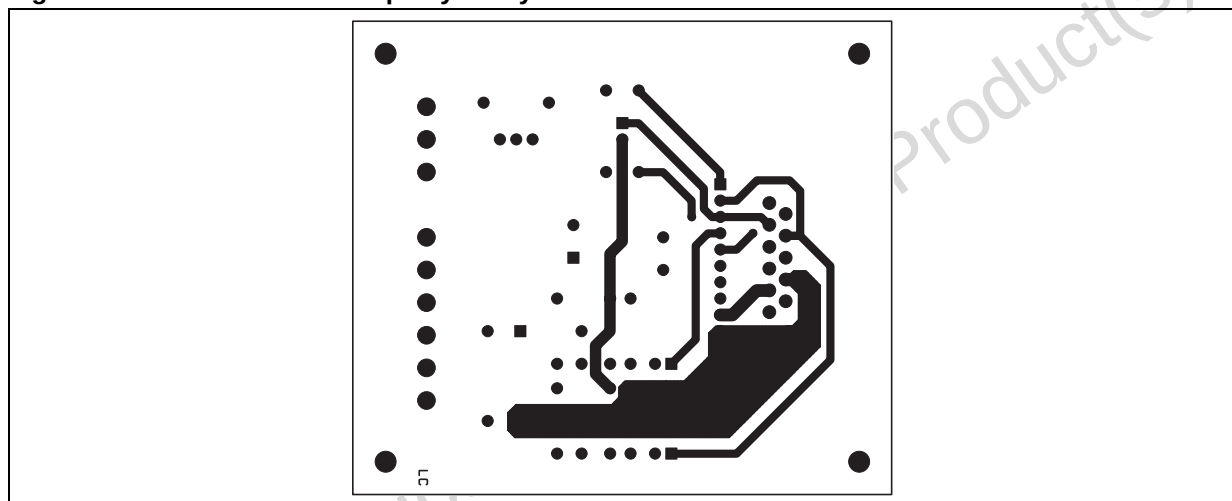
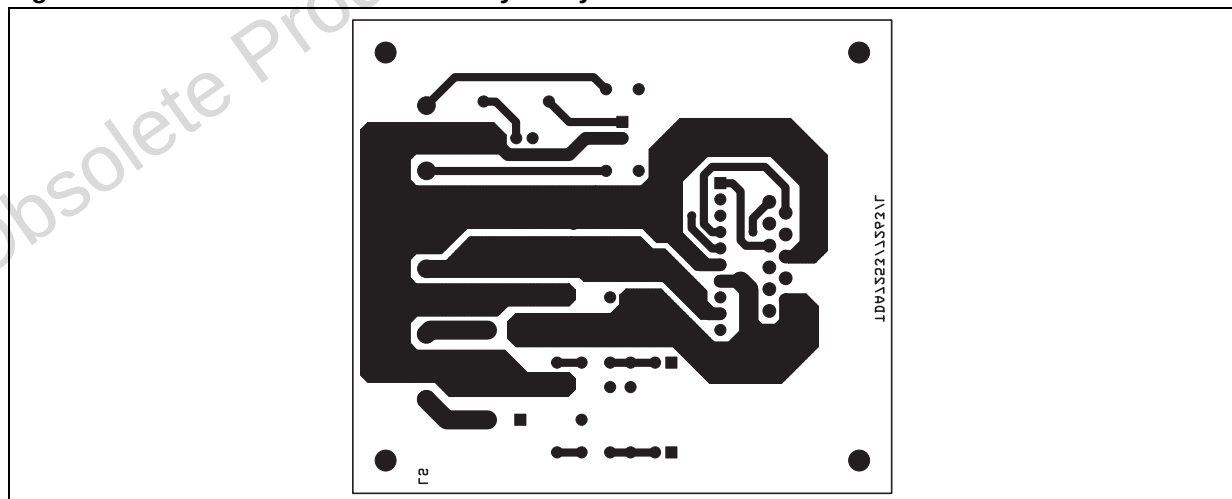


Figure 10. Evaluation Board Bottom Layer Layout



3 HEAT SINK DIMENSIONING:

In order to avoid the thermal protection intervention, that is placed approximatively at $T_j = 150^\circ\text{C}$, it is important the dimensioning of the Heat Sink $R_{Th} (^\circ\text{C/W})$.

The parameters that influence the dimensioning are:

- Maximum dissipated power for the device (P_{dmax})
- Max thermal resistance Junction to case ($R_{Th j-c}$)
- Max. ambient temperature $T_{amb max}$
- Quiescent current I_q (mA)

3.1 Example:

$V_{CC} = 20\text{V}$, $R_{load} = 80\text{hm}$, $R_{Th j-c} = 9^\circ\text{C/W}$, $T_{amb max} = 50^\circ\text{C}$

$$P_{dmax} = (N^\circ \text{ channels}) \cdot \frac{2V_{cc}^2}{\Pi^2 \cdot R_{load}} + I_q \cdot V_{cc}$$

$$P_{dmax} = 1 \cdot (2.5) + 0.5 = 3\text{W}$$

$$(\text{Heat Sink}) R_{Th c-a} = \frac{150 - T_{amb max}}{P_{d max}} - R_{Th j-c} = \frac{150 - 50}{6} - 9 = 24.3^\circ\text{C/W}$$

In figure 8 is shown the Power derating curve for the device.

Figure 11. Power Derating Curve

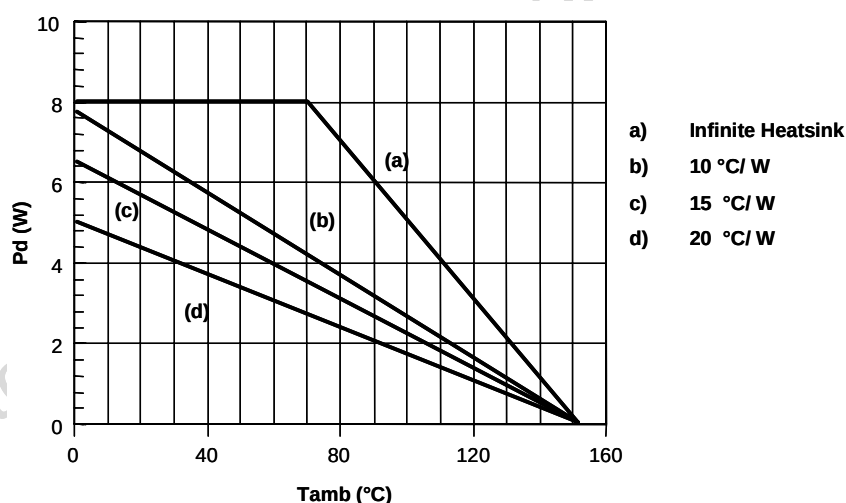
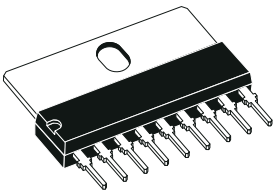


Figure 12. SIP10 Mechanical Data & Package Dimensions

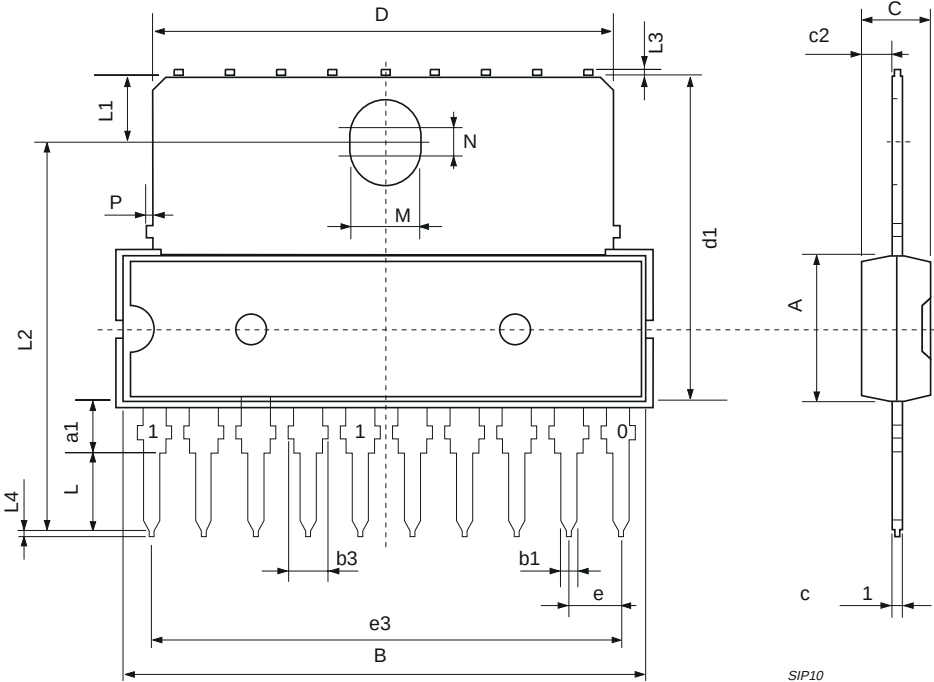
DIM.	mm			inch		
	MIN.	TYP.	MAX.	MIN.	TYP.	MAX.
A			7.1			0.280
a1	2.7		3	0.106		0.118
B			24.8			0.976
b1		0.5			0.020	
b3	0.85		1.6	0.033		0.063
C		3.3			0.130	
c1		0.43			0.017	
c2		1.32			0.052	
D			23.7			0.933
d1		14.5			0.571	
e		2.54			0.100	
e3		22.86			0.900	
L	3.1			0.122		
L1		3			0.118	
L2		17.6			0.693	
L3			0.25			0.010
L4			0.254			0.010
M		3.2			0.126	
N		1			0.039	
P			0.15			0.006

OUTLINE AND
MECHANICAL DATA

Weight: 2.02gr



SIP10



0016108 D

Table 5. Revision History

Date	Revision	Description of Changes
June 2003	1	First Issue
September 2004	2	Changed Status and the graphic aspect in compliant to the new rules "Corporate Technical Publications Design Guide"

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 a registered trademark of STMicroelectronics.
All other names are the property of their respective owners

© 2004 STMicroelectronics - All rights reserved

STMicroelectronics group of companies

Australia - Belgium - Brazil - Canada - China - Czech Republic - Finland - France - Germany - Hong Kong - India - Israel - Italy - Japan - Malaysia - Malta - Morocco - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

www.st.com