

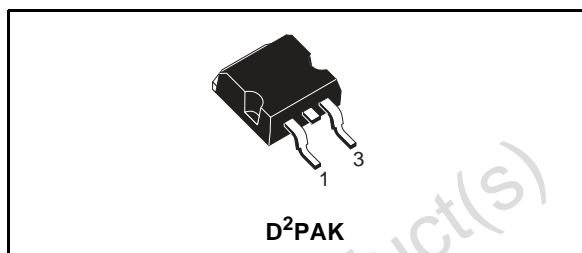
## Up to 5A ULDO linear regulator

### General features

- 1.5V, 1.8V, 2.5V and 3.3V fixed output voltage
- 3V to 14V input voltage range
- 200mΩ  $R_{DS(on)}$  typical @  $t_j = 125^\circ\text{C}$
- 0.6V max. drop-out at 2A
- Excellent load regulation
- 0.6mA quiescent current at any load
- Short circuit protection
- Thermal shutdown

### Applications

- Mother boards
- Processor I/O & supplies
- Low voltage memory & chip set supplies
- Graphic & sound cards
- Low voltage logic supplies
- Post regulator for SMPS



### Description

The L4957AD devices are **Ultra Low Drop Output** linear regulators with an internal N-channel MOSFET of 200mΩ particularly suitable for low voltage/low dropout applications.

Operating with a input voltage from 3V to 14V they are capable to deliver up to 5A.

The devices are ideal for use as one of the supplies required by processor, for example they are the cost effective and efficient solution for conversion from 3.3V (rail bus) to 2.5V @ 2.5A or to 1.5V with high current rating.

Fast response transient minimise the output capacitor value. A minimum of 22μF assures the stability in all load conditions.

The on-chip trimming technique offers a tighter voltage reference tolerance (with  $\pm 2\%$  including line and load variation) beside to ensure a controlled short circuit current. Thermal shutdown provides protection against overload conditions that creates excessive junction temperature.

### Order codes

Part number	
Tube	Tape and Reel
L4957AD1.5	L4957AD1.5TR
L4957AD1.8	L4957AD1.8TR
L4957AD2.5	L4957AD2.5TR
L4957AD3.3	L4957AD3.3TR

# Contents

<b>1</b>	<b>Block diagram and typical application</b> .....	<b>3</b>
<b>2</b>	<b>Pin description</b> .....	<b>4</b>
2.1	Pin connection .....	4
2.2	Pin description .....	4
<b>3</b>	<b>Maximum ratings</b> .....	<b>5</b>
3.1	Absolute maximum ratings .....	5
3.2	Thermal data .....	5
<b>4</b>	<b>Electrical characteristics</b> .....	<b>6</b>
<b>5</b>	<b>Package mechanical data</b> .....	<b>9</b>
<b>6</b>	<b>Revision history</b> .....	<b>11</b>

Obsolete Product(s) - Obsolete Product(s)  
 Obsolete Product(s) - Obsolete Product(s)

# 1 Block diagram and typical application

Figure 1. Block diagram

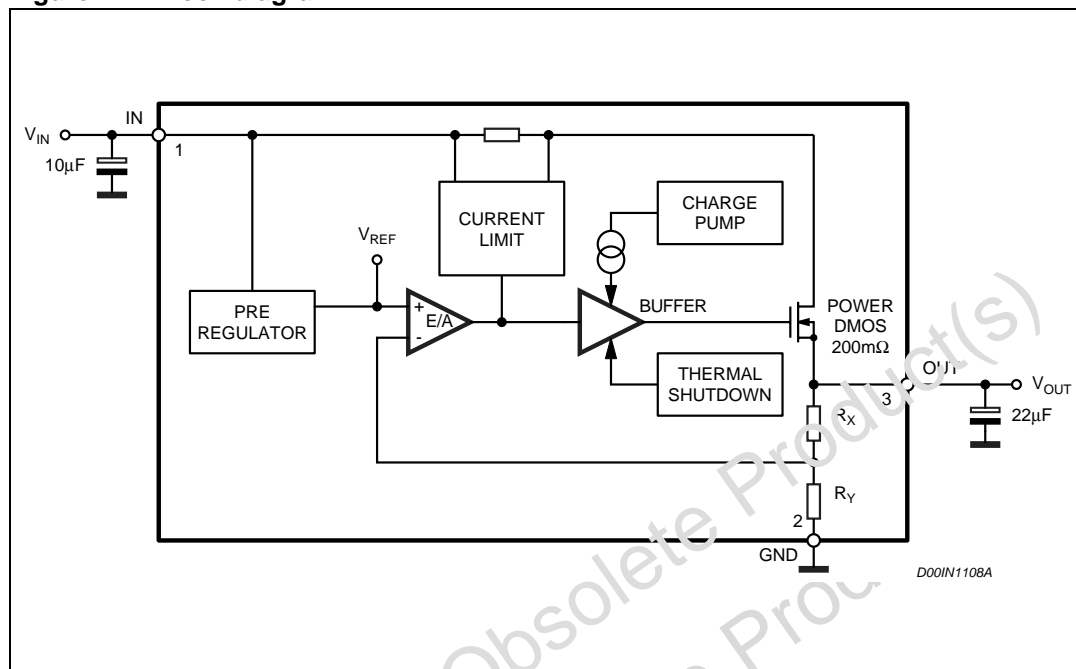
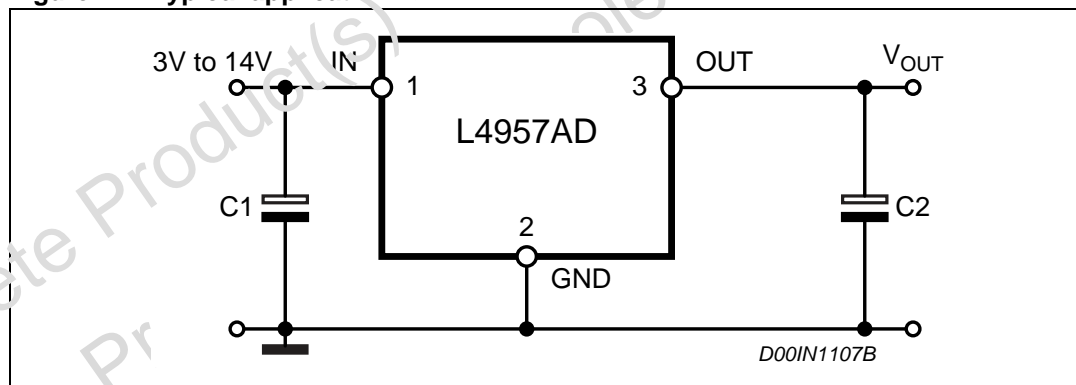


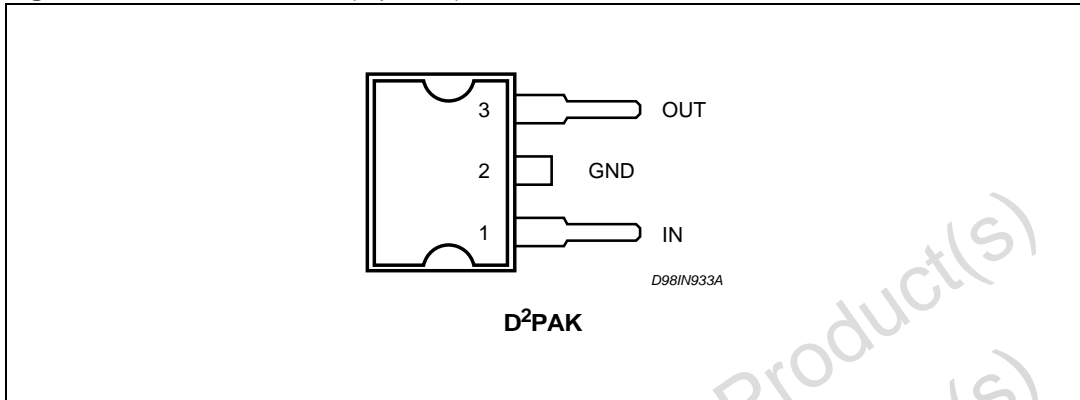
Figure 2. Typical application



## 2 Pin description

### 2.1 Pin connection

Figure 3. Pin connection (top view)



### 2.2 Pin description

Table 1. Pin description

Name	Pin N°	Description
1	IN	Unregulated input voltage; this pin must be bypassed with a capacitor larger than 10 $\mu$ F.
2	GND	To connect to Ground to get 1.5V, 1.8V, 2.5V or 3.3V output.
3	OUT	Regulated output voltage. A minimum bypass capacitor of 22 $\mu$ F is required to insure stability.

### 3 Maximum ratings

#### 3.1 Absolute maximum ratings

Table 2. Absolute maximum ratings

Symbol	Parameter	Value	Unit
$V_{IN}$	Supply input voltage	16	V
$T_J$	Junction temperature	-40 to +150	°C
$T_{STG}$	Storage temperature	-40 to +150	°C

#### 3.2 Thermal data

Table 3. Thermal data

Symbol	Parameter	Value	Unit
$R_{thJC}$	Maximum thermal resistance junction-case	3	°C/W
$R_{thJA}$	Maximum thermal resistance junction-ambient	60	°C/W
	Thermal Shutdown	Typ. 150	°C
	Thermal Hysteresis	Typ. 29	°C

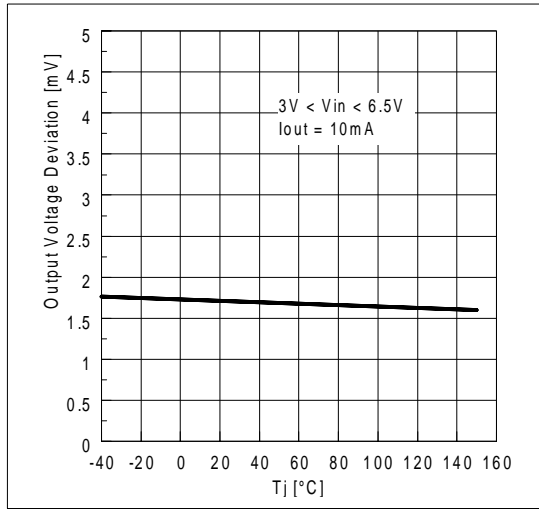
## 4 Electrical characteristics

**Table 4. Electrical Characteristics** ( $T_J = 25^\circ\text{C}$ ,  $V_{IN} = 5\text{V}$ , unless otherwise specified)

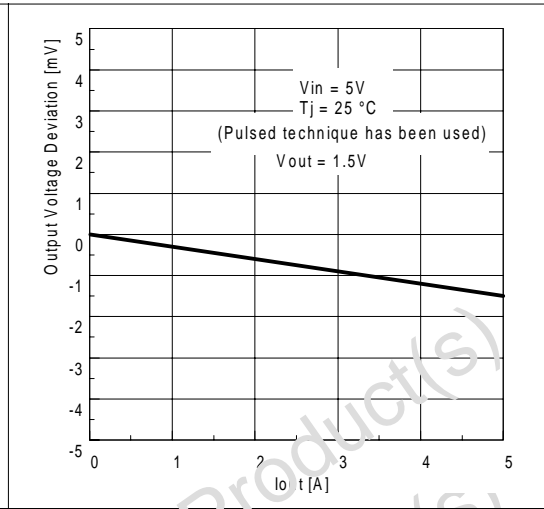
Symbol	Parameter	Test condition	Min	Typ	Max	Unit
$V_{IN}$	Operating Supply Voltage		3		14	V
$V_O$	Output Voltage	$3.15\text{V} < V_{IN} < 5.25\text{V}$ ; $I_O = 0.1\text{A}$	1.485	1.5	1.515	V
		$V_{IN} = 3.3\text{V} \pm 5\%$ ; $0.1\text{A} < I_O < 5\text{A}$ <sup>(1)</sup>	1.47	1.5	1.53	V
		$V_{IN} = 3.3\text{V} \pm 5\%$ $I_O = 0.1\text{A}$ $V_{IN} = 5\text{V} \pm 5\%$	1.782	1.8	1.818	V
		$V_{IN} = 3.3\text{V} \pm 5\%$ ( $0.1\text{A} < I_O < 4.5\text{A}$ ) <sup>(1)</sup> $V_{IN} = 5\text{V} \pm 5\%$ $0.1\text{A} < I_O < 5\text{A}$	1.764	1.8	1.836	V
		$V_{IN} = 3.3\text{V} \pm 5\%$ $I_O = 0.1\text{A}$ $V_{IN} = 5\text{V} \pm 5\%$	2.475	2.5	2.525	V
		$V_{IN} = 3.3\text{V} \pm 5\%$ ( $0.1\text{A} < I_O < 2.2\text{A}$ ) <sup>(1)</sup> $V_{IN} = 5\text{V} \pm 5\%$ $0.1\text{A} < I_O < 5\text{A}$	2.45	2.5	2.55	V
		$V_{IN} = 5\text{V} \pm 5\%$ $I_O = 0.1\text{A}$	3.267	3.3	3.333	V
		$V_{IN} = 5\text{V} \pm 5\%$ $0.1\text{A} < I_O < 5\text{A}$ <sup>(1)</sup>	3.234	3.3	3.366	V
$R_{DS(on)}$	Drain-Source ON Resistance	<sup>(1)</sup>			300	m $\Omega$
$I_O$	Current Limiting	<sup>(1)</sup>	5.1	6.3	7.5	A
$I_Q$	Quiescent Current	$3\text{V} < V_{IN} < 14\text{V}$ <sup>(1)</sup>		0.6	2	mA
	Ripple Rejection	$f = 120\text{Hz}$ , $I_O = 1\text{A}$ $V_{IN} = 5\text{V}$ $\Delta V_{IN} = 2V_{PP}$	60	75		dB

<sup>1</sup>. Specifications referred to  $T_J$  from  $0^\circ\text{C}$  to  $+125^\circ\text{C}$ .

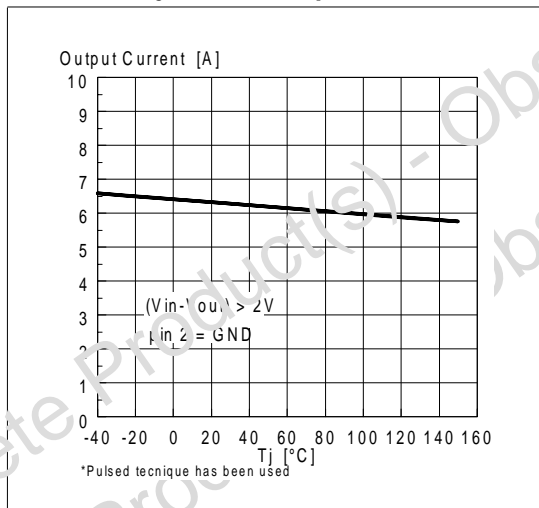
**Figure 4. Line regulation vs. junction temperature**



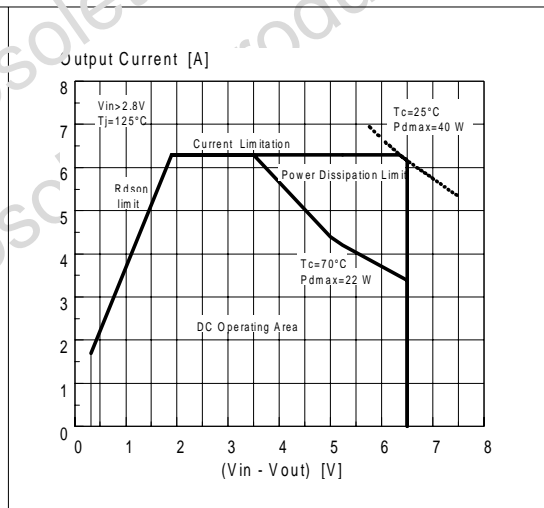
**Figure 5. Load regulation**



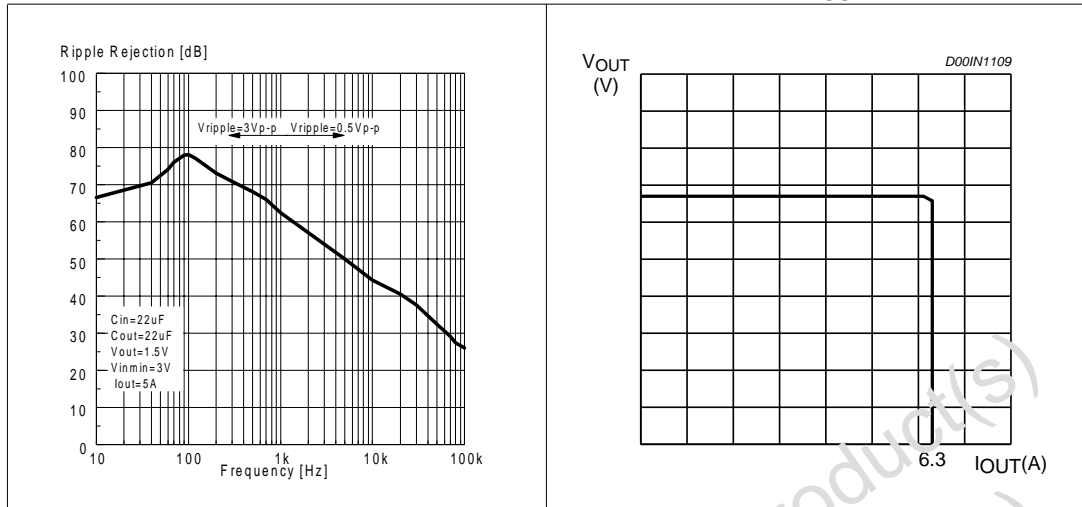
**Figure 6. Maximum output current vs. junction temperature**



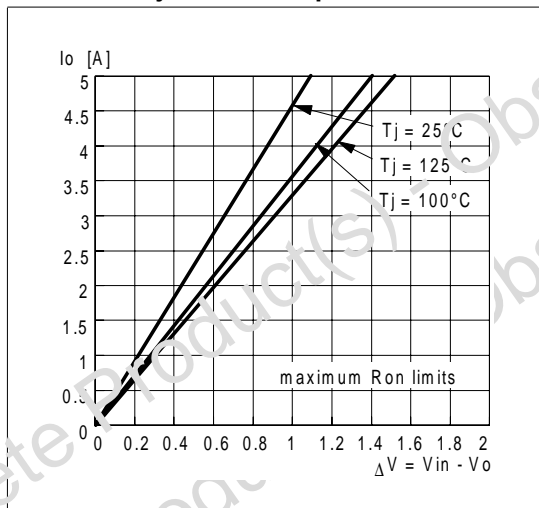
**Figure 7. DC operating area**



**Figure 8. Ripple rejection vs. frequency** **Figure 9. Output voltage vs. output current ( $V_{OUT} = 1.5V$ )**



**Figure 10. Maximum output current vs. junction temperature**





## 5 Package mechanical data

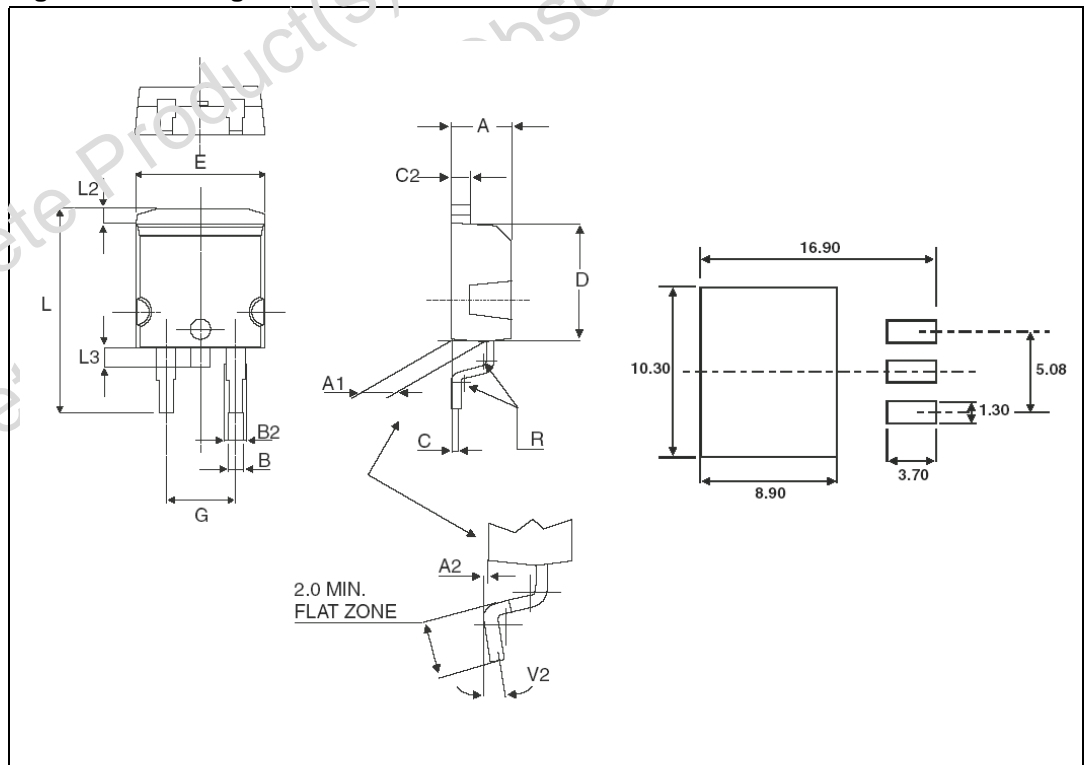
In order to meet environmental requirements, ST offers these devices in ECOPACK® packages. These packages have a Lead-free second level interconnect . The category of second level interconnect is marked on the package and on the inner box label, in compliance with JEDEC Standard JESD97. The maximum ratings related to soldering conditions are also marked on the inner box label. ECOPACK is an ST trademark. ECOPACK specifications are available at: [www.st.com](http://www.st.com)

Obsolete Product(s) - Obsolete Product(s)  
Obsolete Product(s) - Obsolete Product(s)

Table 5. D<sup>2</sup>PAK Mechanical data

Dim.	mm.			inch		
	Min	Typ	Max	Min	Typ	Max
A	4.30		4.60	0.169		0.181
A1	2.49		2.69	0.098		0.106
A2	0.03		0.23	0.001		0.009
B	0.70		0.93	0.027		0.037
B2	1.25	1.40		0.049	0.055	
C	0.45		0.60	0.017		0.024
C2	1.21		1.36	0.047		0.054
D	8.95		9.35	0.352		0.368
E	10.00		10.28	0.393		0.405
G	4.88		5.28	0.192		0.208
L	15.00		15.85	0.590		0.624
L2	1.27		1.40	0.050		0.055
L3	1.40		1.75	0.055		0.069
R		0.40			0.016	
V2	0°		8°	0°		8°

Figure 11. Package dimensions



## 6 Revision history

**Table 6. Revision history**

Date	Revision	Changes
12-Feb-2002	5	Removed the L4957AV part number and its references in the whole document
20-Apr-2006	6	New template

Obsolete Product(s) - Obsolete Product(s)  
Obsolete Product(s) - Obsolete Product(s)

**Please Read Carefully:**

Information in this document is provided solely in connection with ST products. STMicroelectronics NV and its subsidiaries ("ST") reserve the right to make changes, corrections, modifications or improvements, to this document, and the products and services described herein at any time, without notice.

All ST products are sold pursuant to ST's terms and conditions of sale.

Purchasers are solely responsible for the choice, selection and use of the ST products and services described herein, and ST assumes no liability whatsoever relating to the choice, selection or use of the ST products and services described herein.

No license, express or implied, by estoppel or otherwise, to any intellectual property rights is granted under this document. If any part of this document refers to any third party products or services it shall not be deemed a license grant by ST for the use of such third party products or services, or any intellectual property contained therein or considered a warranty covering the use in any manner whatsoever of such third party products or services or any intellectual property contained therein.

**UNLESS OTHERWISE SET FORTH IN ST'S TERMS AND CONDITIONS OF SALE ST DISCLAIMS ANY EXPRESS OR IMPLIED WARRANTY WITH RESPECT TO THE USE AND/OR SALE OF ST PRODUCTS INCLUDING WITHOUT LIMITATION IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION), OR INFRINGEMENT OF ANY PATENT, COPYRIGHT OR OTHER INTELLECTUAL PROPERTY RIGHT.**

**UNLESS EXPRESSLY APPROVED IN WRITING BY AN AUTHORIZED REPRESENTATIVE OF ST, ST PRODUCTS ARE NOT DESIGNED, AUTHORIZED OR WARRANTED FOR USE IN MILITARY, AIR CRAFT, SPACE, LIFE SAVING, OR LIFE SUSTAINING APPLICATIONS, NOR IN PRODUCTS OR SYSTEMS, WHERE FAILURE OR MALFUNCTION MAY RESULT IN PERSONAL INJURY, DEATH, OR SEVERE PROPERTY OR ENVIRONMENTAL DAMAGE.**

Resale of ST products with provisions different from the statements and/or technical features set forth in this document shall immediately void any warranty granted by ST for the ST product or service described herein and shall not create or extend in any manner whatsoever, any liability of ST.

ST and the ST logo are trademarks or registered trademarks of ST in various countries.

Information in this document supersedes and replaces all information previously supplied.

The ST logo is a registered trademark of STMicroelectronics. All other names are the property of their respective owners.

© 2006 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](http://www.st.com)