

## Power Schottky rectifier

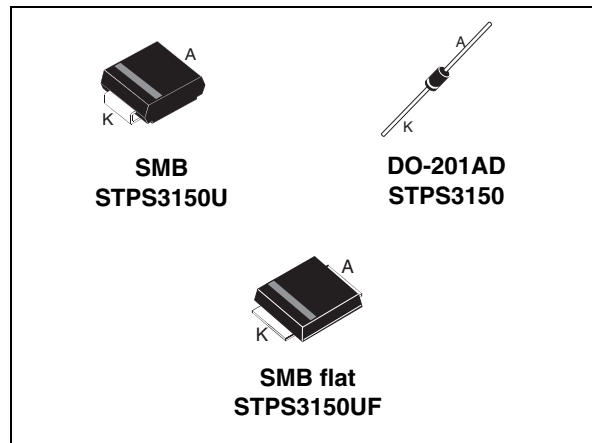
### Features

- Negligible switching losses
- Low forward voltage drop for higher efficiency and extended battery life
- Low thermal resistance
- ECOPACK®2 compliant component

### Description

150 V Power Schottky rectifier are suited for switch mode power supplies on up to 24 V rails and high frequency converters.

Packaged in Axial, SMB, and low-profile SMB, this device is intended for use in consumer and computer applications like TV, STB, PC and DVD where low drop forward voltage is required to reduce power dissipation.



**Table 1. Device summary**

Symbol	Value
$I_{F(AV)}$	3 A
$V_{RRM}$	150 V
$T_j$ (max)	175 °C
$V_F$ (max)	0.67 V

# 1 Characteristics

**Table 2. Absolute Ratings (limiting values)**

Symbol	Parameter		Value	Unit	
$V_{RRM}$	Repetitive peak reverse voltage		150	V	
$I_{F(AV)}$	Average forward current	SMB	$T_L = 130\text{ °C}$ $\delta = 0.5$	3	A
		DO-201AD	$T_L = 140\text{ °C}$ $\delta = 0.5$		
		SMB flat	$T_L = 150\text{ °C}$ $\delta = 0.5$		
$I_{FSM}$	Surge non repetitive forward current	SMB	$t_p = 10\text{ ms sinusoidal}$	80	A
		DO-201AD		100	
		SMB flat		80	
$T_{stg}$	Storage temperature range		-65 to + 175	°C	
$T_j$	Operating junction temperature <sup>(1)</sup>		175	°C	

1.  $\frac{dP_{tot}}{dT_j} < \frac{1}{R_{th(j-a)}}$  condition to avoid thermal runaway for a diode on its own heatsink

**Table 3. Thermal resistance**

Symbol	Parameter		Value	Unit
$R_{th(j-l)}$	Junction to lead	SMB flat	10	°C/W
		SMB	20	
		Lead length = 10 mm DO-201AD	15	

**Table 4. Static electrical characteristics**

Symbol	Parameter	Tests conditions		Min.	Typ.	Max.	Unit
$I_R$ <sup>(1)</sup>	Reverse leakage current	$T_j = 25\text{ °C}$	$V_R = V_{RRM}$		0.4	2.0	μA
		$T_j = 125\text{ °C}$			0.6	2.0	mA
$V_F$ <sup>(2)</sup>	Forward voltage drop	$T_j = 25\text{ °C}$	$I_F = 3\text{ A}$		0.78	0.82	V
		$T_j = 125\text{ °C}$			0.63	0.67	
		$T_j = 25\text{ °C}$	$I_F = 6\text{ A}$		0.85	0.89	
		$T_j = 125\text{ °C}$			0.70	0.75	

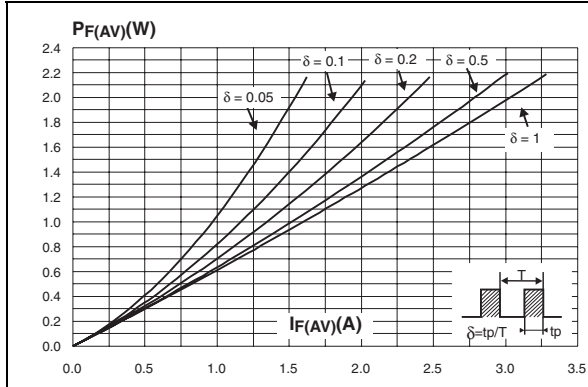
1.  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

2.  $t_p = 380\text{ μs}$ ,  $\delta < 2\%$

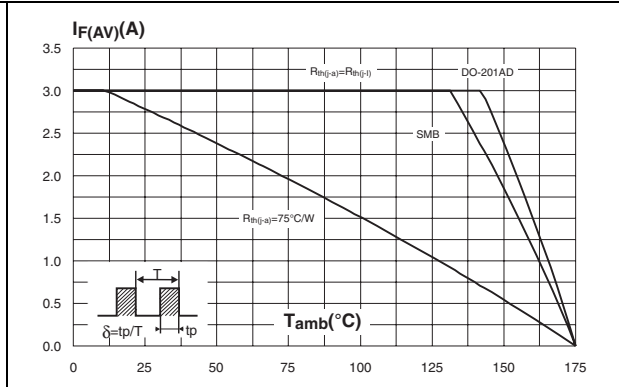
To evaluate the conduction losses use the following equation:

$$P = 0.59 \times I_{F(AV)} + 0.023 I_{F(RMS)}^2$$

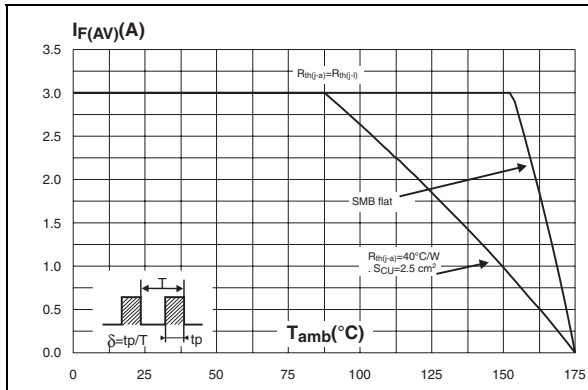
**Figure 1. Average forward power dissipation versus average forward current**



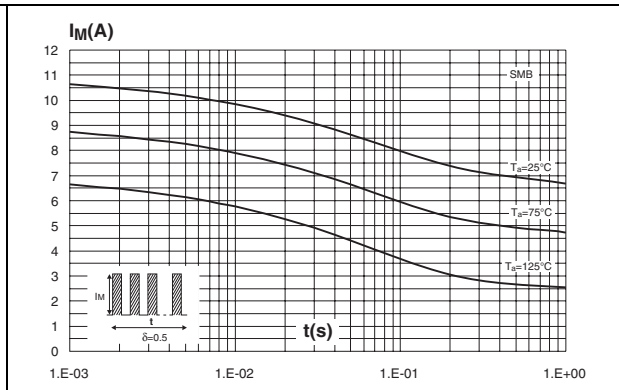
**Figure 2. Average forward current versus ambient temperature ( $\delta = 0.5$ ) (DO-201AD / SMB)**



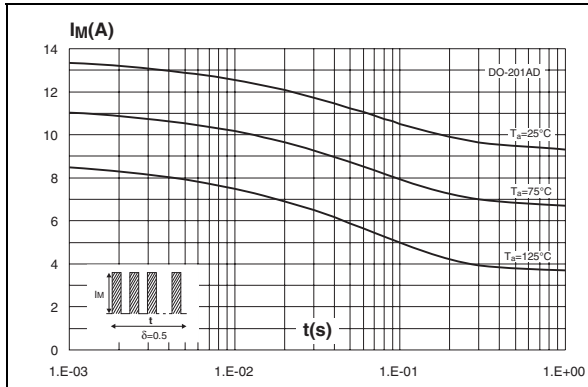
**Figure 3. Average forward current versus ambient temperature ( $\delta = 0.5$ ) (SMB flat)**



**Figure 4. Non repetitive surge peak forward current versus overload duration (maximum values)**



**Figure 5. Non repetitive surge peak forward current versus overload duration (maximum values)**



**Figure 6. Non repetitive surge peak forward current versus overload duration (maximum values)**

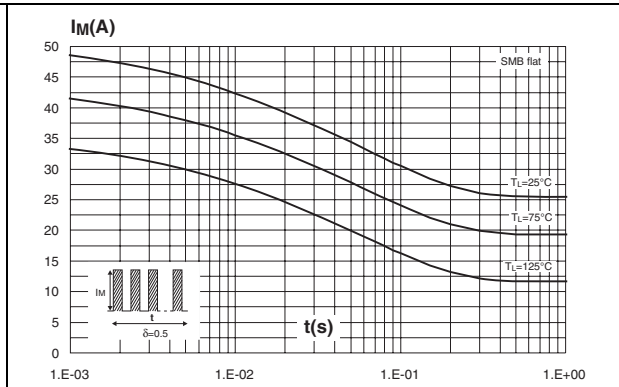


Figure 7. Normalized avalanche power derating versus pulse duration

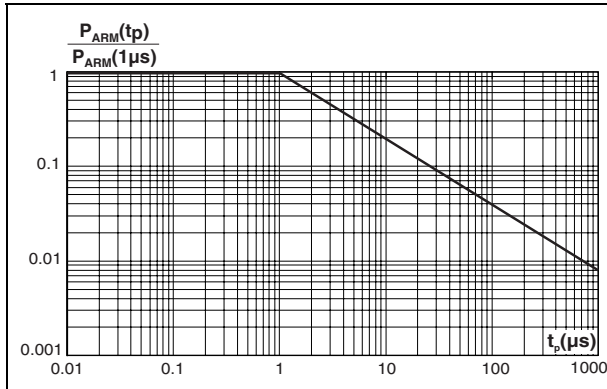


Figure 8. Normalized avalanche power derating versus junction temperature

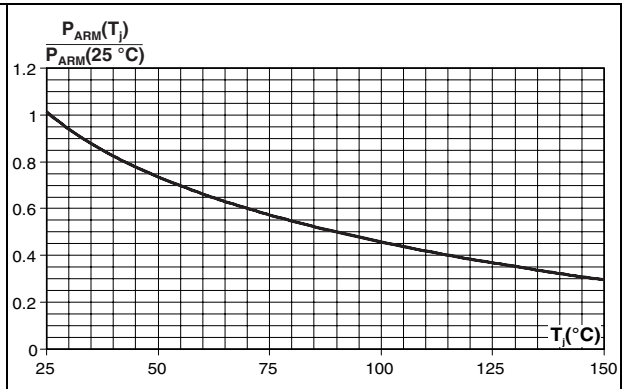


Figure 9. Relative variation of thermal impedance junction to ambient versus pulse duration

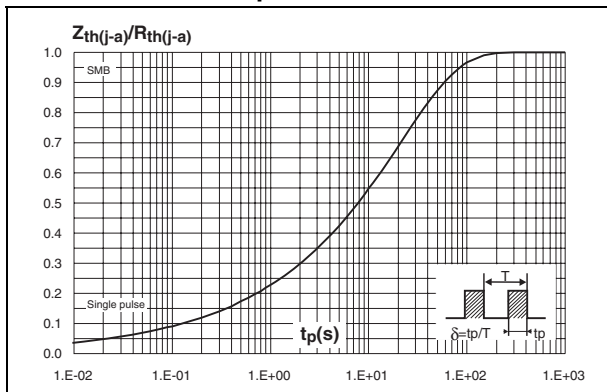


Figure 10. Relative variation of thermal impedance junction to ambient versus pulse duration

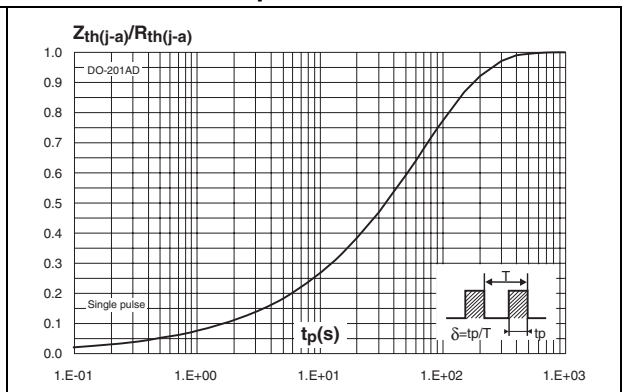


Figure 11. Relative variation of thermal impedance junction to lead versus pulse duration

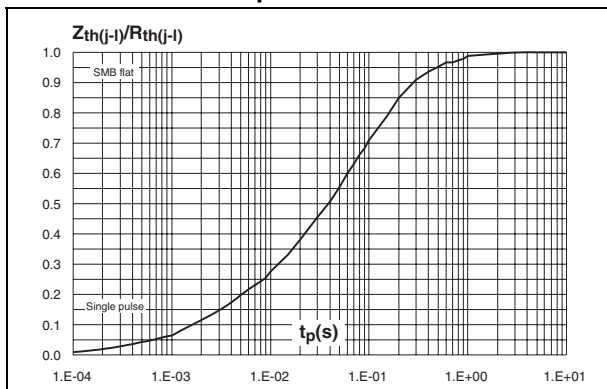


Figure 12. Reverse leakage current versus reverse voltage applied (typical values)

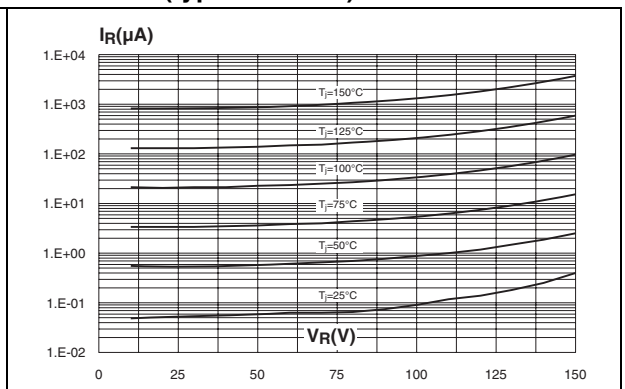


Figure 13. Junction capacitance versus reverse voltage applied (typical values)

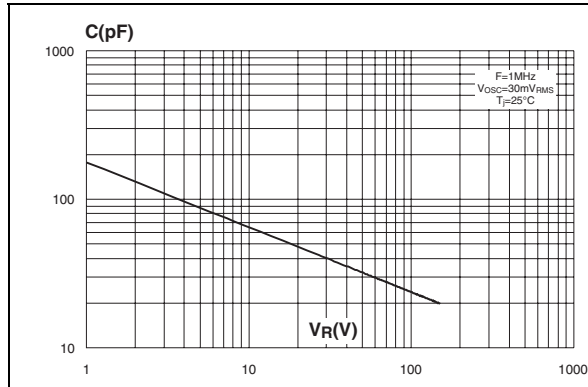


Figure 14. Forward voltage drop versus forward current

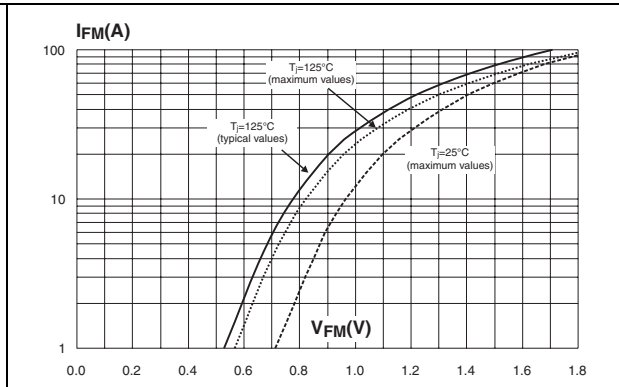


Figure 15. Thermal resistance junction to ambient versus copper surface under each lead

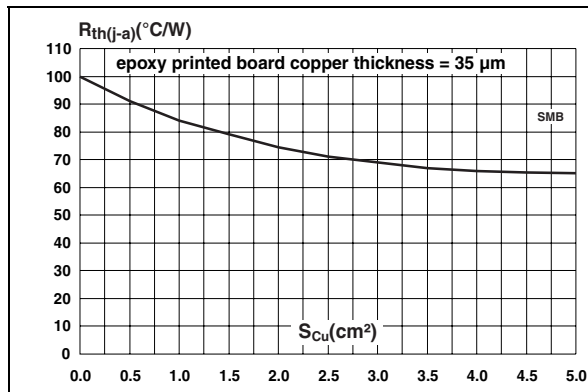


Figure 16. Thermal resistance junction to ambient versus copper surface under each lead

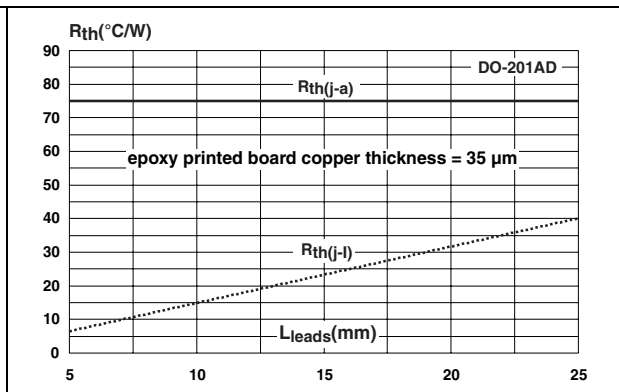
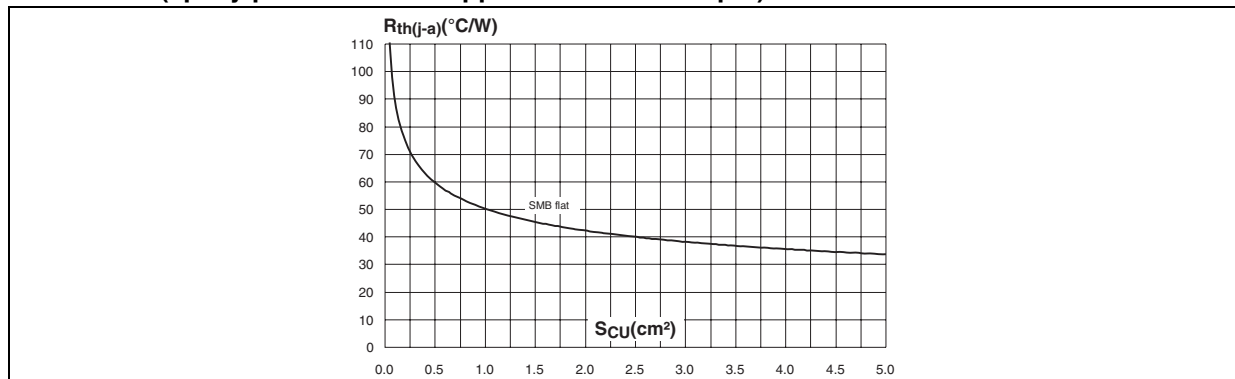


Figure 17. Thermal resistance junction to ambient versus copper surface under each lead (epoxy printed board copper thickness =  $35\ \mu\text{m}$ )



## 2 Package information

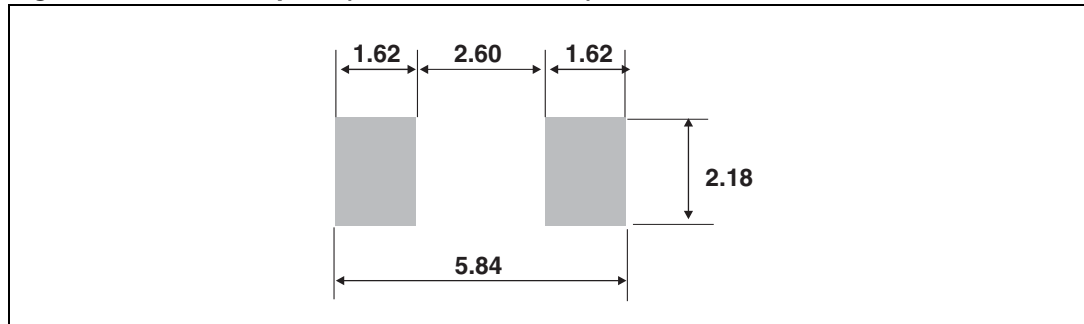
- Epoxy meets UL94, V0
- Lead-free package

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: [www.st.com](http://www.st.com). ECOPACK® is an ST trademark.

**Table 5. SMB dimensions**

Ref.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A1	1.90	2.45	0.075	0.096
A2	0.05	0.20	0.002	0.008
b	1.95	2.20	0.077	0.087
c	0.15	0.40	0.006	0.016
E	5.10	5.60	0.201	0.220
E1	4.05	4.60	0.159	0.181
D	3.30	3.95	0.130	0.156
L	0.75	1.50	0.030	0.059

**Figure 18. SMB footprint (dimensions in mm)**

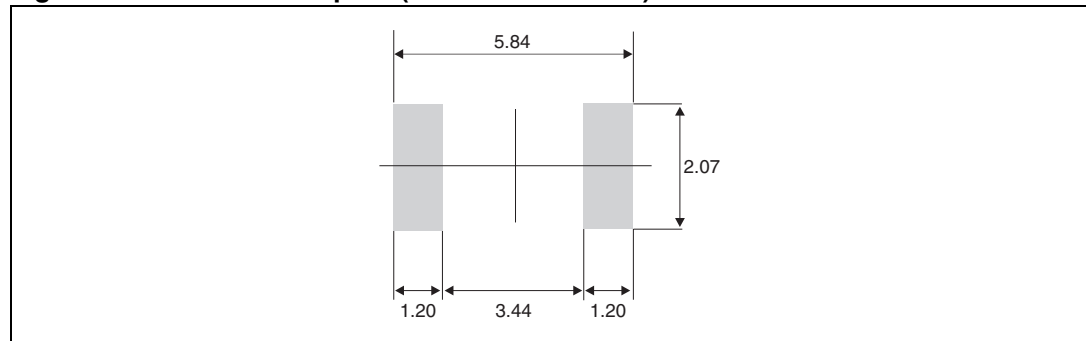


**Table 6. SMB Flat dimensions**

Ref.	Dimensions					
	Millimeters			Inches		
	Min.	Typ.	Max.	Min.	Typ.	Max.
A	0.90		1.10	0.035		0.043
b <sup>(1)</sup>	1.95		2.20	0.077		0.087
c <sup>(1)</sup>	0.15		0.40	0.006		0.016
D	3.30		3.95	0.130		0.156
E	5.10		5.60	0.200		0.220
E1	4.05		4.60	0.189		0.181
L	0.75		1.50	0.029		0.059
L1		0.40			0.016	
L2		0.60			0.024	

1. Applies to plated leads

**Figure 19. SMB Flat footprint (dimensions in mm)**



**Table 7. DO-201AD dimensions**

REF.	Dimensions			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A		9.50		0.374
B	25.40		1.000	
C		5.30		0.209
D <sup>(1)</sup>		1.30		0.051
E		1.25		0.049
Note 2 <sup>(2)</sup>	15		0.59	

1. The lead diameter D is not controlled over zone E
2. The minimum length, which must stay straight between the right angles after bending, is 15 mm (0.59")



### 3 Ordering information

**Table 8. Ordering information**

Order code	Marking	Package	Weight	Base qty	Delivery mode
STPS3150U	G315	SMB	0.107 g	2500	Tape and reel
STPS3150UF	FG315	SMB flat	0.50 g	5000	Tape and reel
STPS3150	STPS3150	DO-201AD	1.12 g	600	Ammopack
STPS3150RL	STPS3150	DO-201AD	1.12 g	1900	Tape and reel

### 4 Revision history

**Table 9. Document revision history**

Date	Revision	Changes
May-2003	2A	Last update.
31-May-2006	3	Reformatted to current standard. Added ECOPACK statement. Updated SMB footprint in Figure 12. Changed nF to pF in Figure 8.
08-Feb-2007	4	Added SMB flat and SMB flat e package.
20-Jul-2011	5	Updated <a href="#">Table 2</a> .

**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 as 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 ST REPRESENTATIVE, ST PRODUCTS ARE NOT RECOMMENDED, 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. ST PRODUCTS WHICH ARE NOT SPECIFIED AS "AUTOMOTIVE GRADE" MAY ONLY BE USED IN AUTOMOTIVE APPLICATIONS AT USER'S OWN RISK.**

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.

© 2011 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 - Philippines - Singapore - Spain - Sweden - Switzerland - United Kingdom - United States of America

[www.st.com](http://www.st.com)