

## DAMPER + MODULATION DIODE FOR VIDEO

**Table 1: Main Product Characteristics**

	DAMPER	MODUL.
$I_{F(AV)}$	6 A	3 A
$V_{RRM}$	1500 V	600 V
$t_{rr} (max)$	125 ns	50 ns
$V_F (max)$	1.7 V	1.4 V

### FEATURES AND BENEFITS

- Full kit in one package
- High breakdown voltage capability
- Very fast recovery diode
- Specified turn on switching characteristics
- Low static and peak forward voltage drop for low dissipation
- Insulated version:  
Insulated voltage = 2000 V<sub>RMS</sub>  
Capacitance = 7 pF
- Planar technology allowing high quality and best electrical characteristics
- Outstanding performance of well proven DTV as damper and new faster Turbo 2 600V technology as modulation

### DESCRIPTION

High voltage semiconductor, especially designed for horizontal deflection stage in standard and high resolution video display with E/W correction.

The insulated TO-220FPAB package includes both the DAMPER diode and the MODULATION diode, thanks to a dedicated design.

Assembled on automated line, it offers very low dispersion values on insulating and thermal performances.

### Order Codes

Part Number	Marking
DMV1500HFD	DMV1500H
DMV1500HFD5	DMV1500H

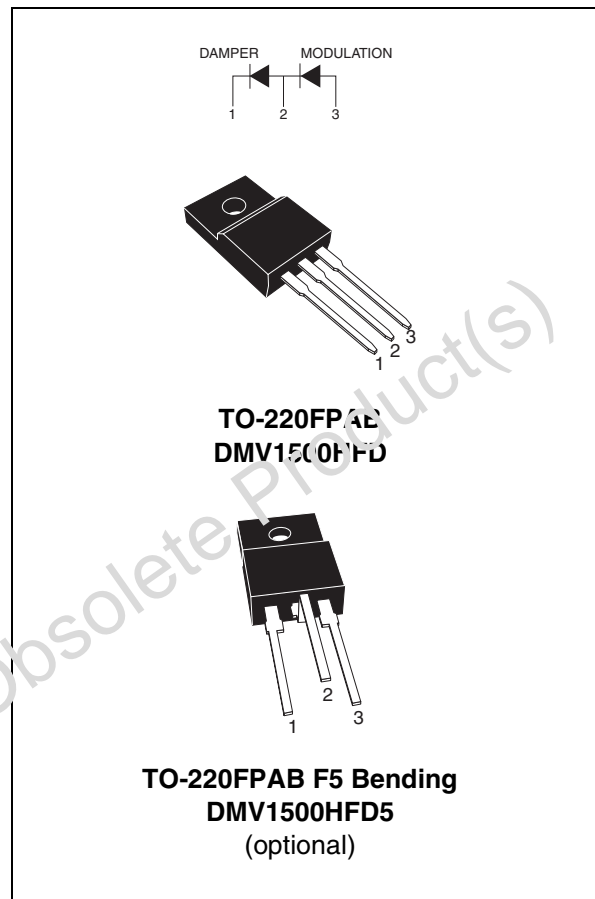


Table 3: Absolute Maximum Ratings

Symbol	Parameter	Value		Unit
		Damper	Modul.	
$V_{RRM}$	Repetitive peak reverse voltage	1500	600	V
$I_{FSM}$	Surge non repetitive forward current	80	35	A
$T_{stg}$	Storage temperature range	-40 to +150		°C
$T_j$	Maximum operating junction temperature	150		°C

Table 4: Thermal Resistance

Symbol	Parameter	Value	Unit
$R_{th(j-c)}$	Junction to case thermal resistance	3.6	°C/W

Table 5: Static Electrical Characteristics

Symbol	Parameter	Test conditions	Value				Unit	
			$T_j = 25^\circ\text{C}$		$T_j = 125^\circ\text{C}$			
			Typ.	Max.	Typ.	Max.		
$I_R^*$	Reverse leakage current	Damper	$V_R = 1500\text{ V}$		100	100	1000	$\mu\text{A}$
		Modul.	$V_R = 600\text{ V}$		20	3	50	
$V_F^{**}$	Forward voltage drop	Damper	$I_F = 6\text{ A}$	1.5	2.3	1.25	1.7	V
		Modul.	$I_F = 3\text{ A}$		1.8	1.1	1.4	

Pulse test: \*  $t_p = 5\text{ ms}$ ,  $\delta < 2\%$

\*\*  $t_p = 380\text{ }\mu\text{s}$ ,  $\delta < 2\%$

To evaluate the maximum conduction losses of the **DAMPER** and **MODULATION** diodes use the following equations :

**DAMPER:**  $P = 1.35 \times I_{F(AV)} + 0.59 \times I_F^2(\text{RMS})$

**MODULATION:**  $P = 1.12 \times I_{F(AV)} + 0.092 \times I_F^2(\text{RMS})$

Table 6: Recovery Characteristics

Symbol	Parameter	Test conditions	Value				Unit	
			Damper		Modul.			
			Typ.	Max.	Typ.	Max.		
$t_{rr}$	Reverse recovery time	$I_F = 100\text{ mA}$ $I_R = 100\text{ mA}$ $I_{RR} = 10\text{ mA}$	$T_j = 25^\circ\text{C}$	625		110	350	ns
		$I_F = 1\text{ A}$ $dI_F/dt = -50\text{ A}/\mu\text{s}$ $V_R = 30\text{ V}$	$T_j = 25^\circ\text{C}$	95	125	35	50	

Table 7: Turn-On Switching Characteristics

Symbol	Parameter	Test conditions		Value		Unit
				Typ.	Max.	
$t_{fr}$	Forward recovery time	Damper	$I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 3\text{ V}$	$T_j = 100^\circ\text{C}$	350	ns
		Modul.	$I_F = 3\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$ $V_{FR} = 2\text{ V}$	$T_j = 100^\circ\text{C}$	240	
$V_{FP}$	Peak forward voltage	Damper	$I_F = 6\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$	18	V
		Modul.	$I_F = 3\text{ A}$ $di_F/dt = 80\text{ A}/\mu\text{s}$	$T_j = 100^\circ\text{C}$	8	

Figure 1: Power dissipation versus peak forward current (triangular waveform,  $\delta=0.45$ )

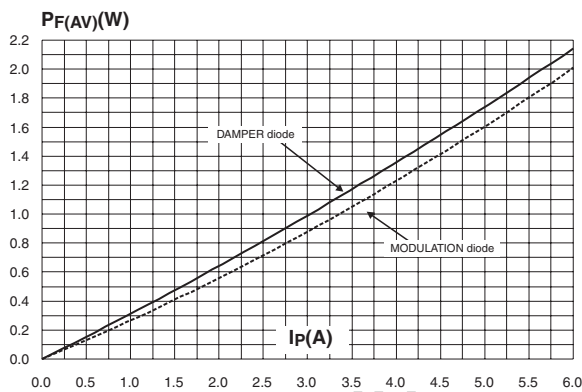


Figure 2: Average forward current versus ambient temperature

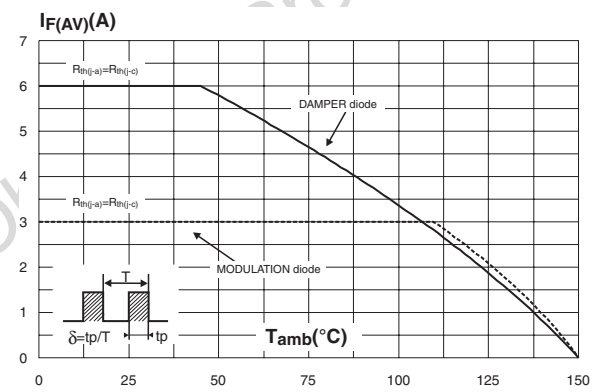


Figure 3: Forward voltage drop versus forward current (damper diode)

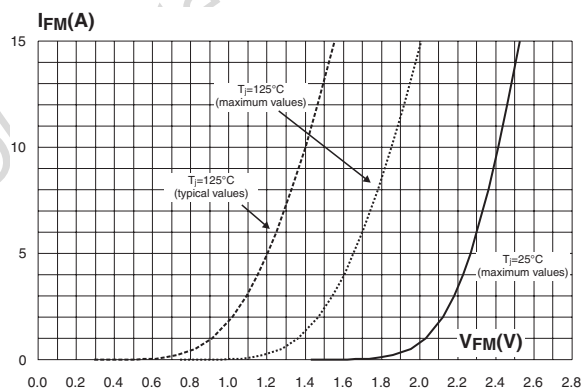
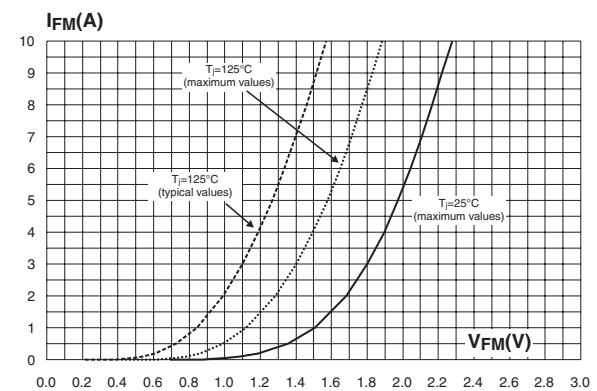
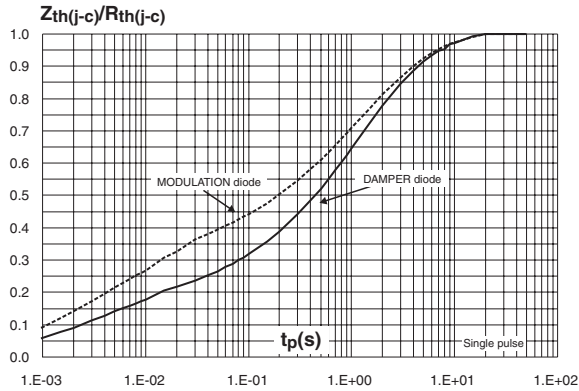


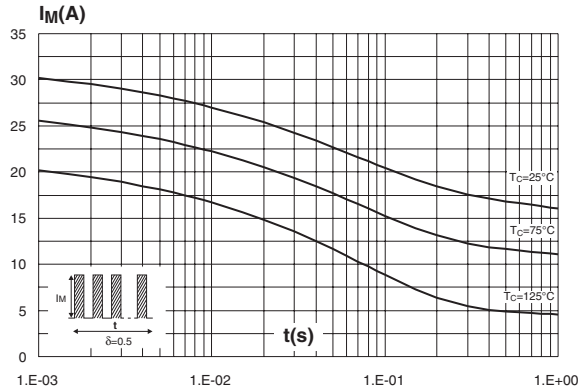
Figure 4: Forward voltage drop versus forward current (modulation diode)



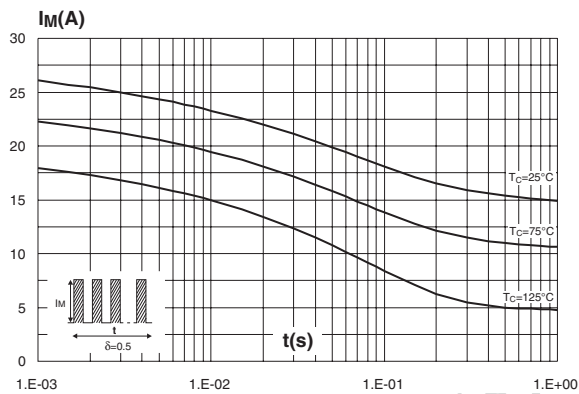
**Figure 5: Relative variation of thermal impedance junction to case versus pulse duration**



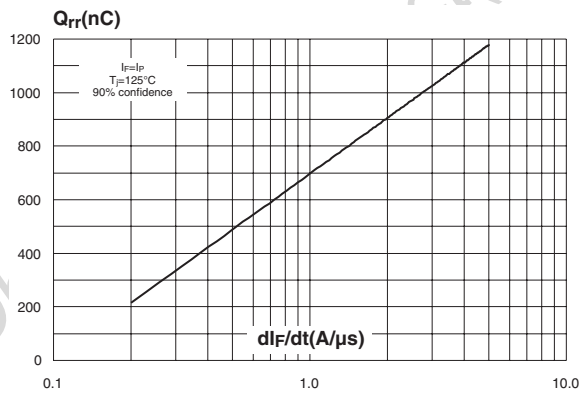
**Figure 6: Non repetitive peak forward current versus overload duration (damper diode)**



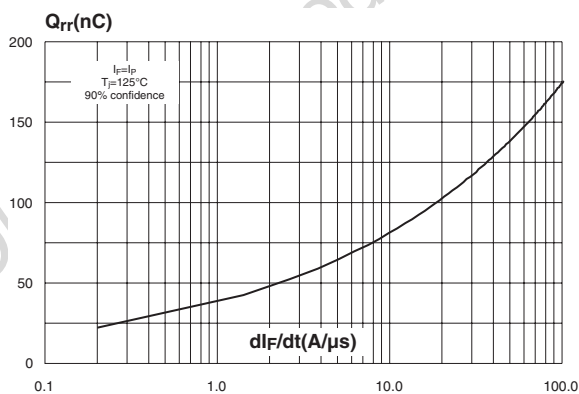
**Figure 7: Non repetitive peak forward current versus overload duration (modulation diode)**



**Figure 8: Reverse recovery charges versus  $di_F/dt$  (damper diode)**



**Figure 9: Reverse recovery charges versus  $di_F/dt$  (modulation diode)**



**Figure 10: Peak reverse recovery current versus  $di_F/dt$  (damper diode)**

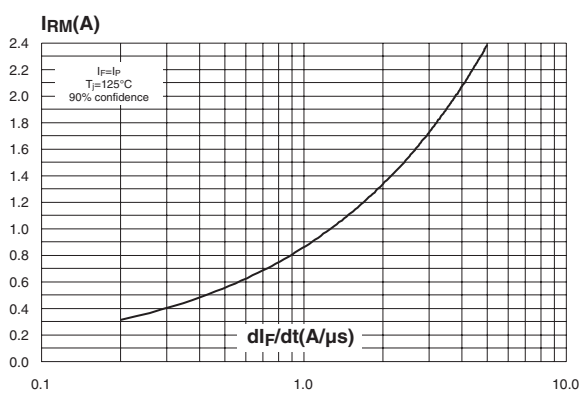


Figure 11: Peak reverse recovery current versus  $di_F/dt$  (modulation diode)

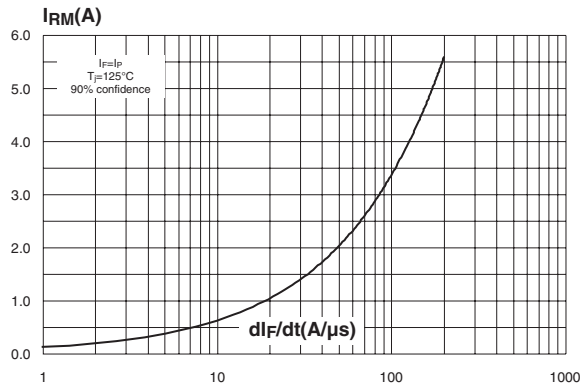


Figure 12: Transient peak forward voltage versus  $di_F/dt$  (damper diode)

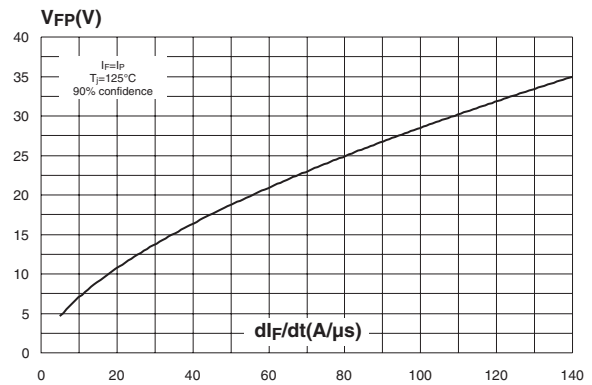


Figure 13: Transient peak forward voltage versus  $di_F/dt$  (modulation diode)

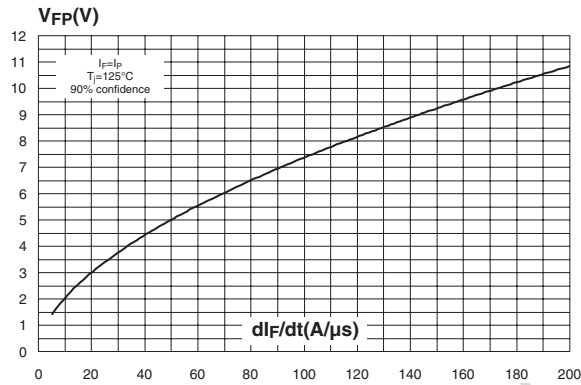


Figure 14: Forward recovery time versus  $di_F/dt$  (damper diode)

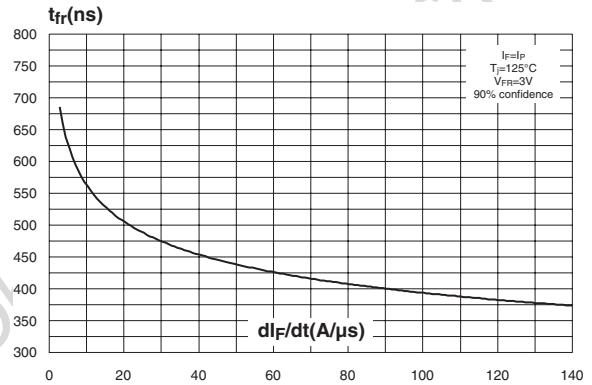


Figure 15: Forward recovery time versus  $di_F/dt$  (modulation diode)

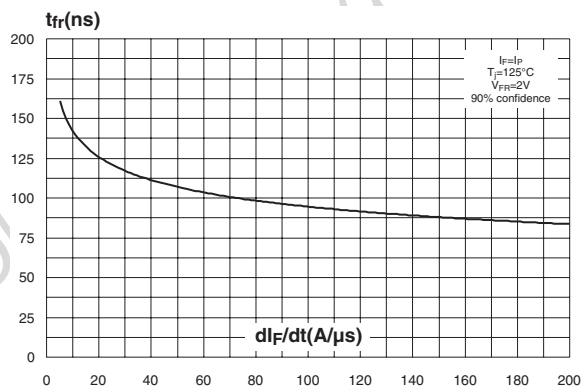


Figure 16: Relative variation of dynamic parameters versus junction temperature

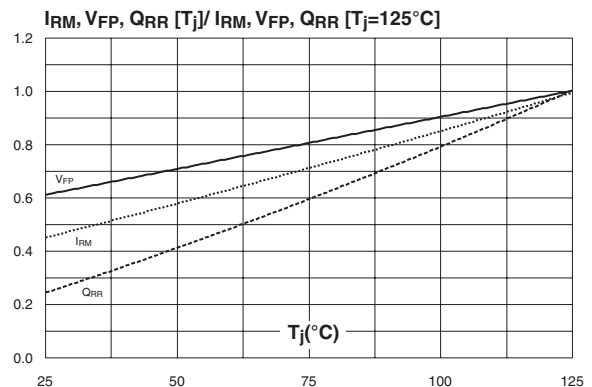


Figure 17: Junction capacitance versus reverse voltage applied (typical values)

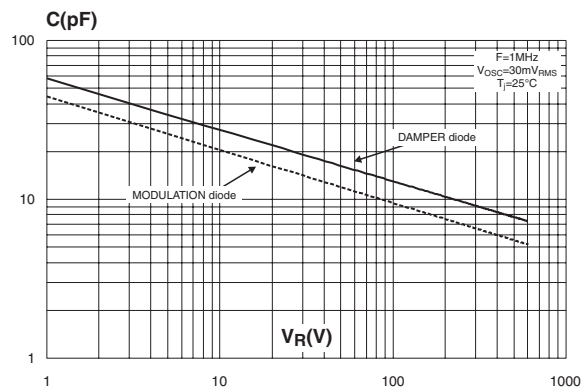


Figure 18: TO-220FPAB Package Mechanical Data

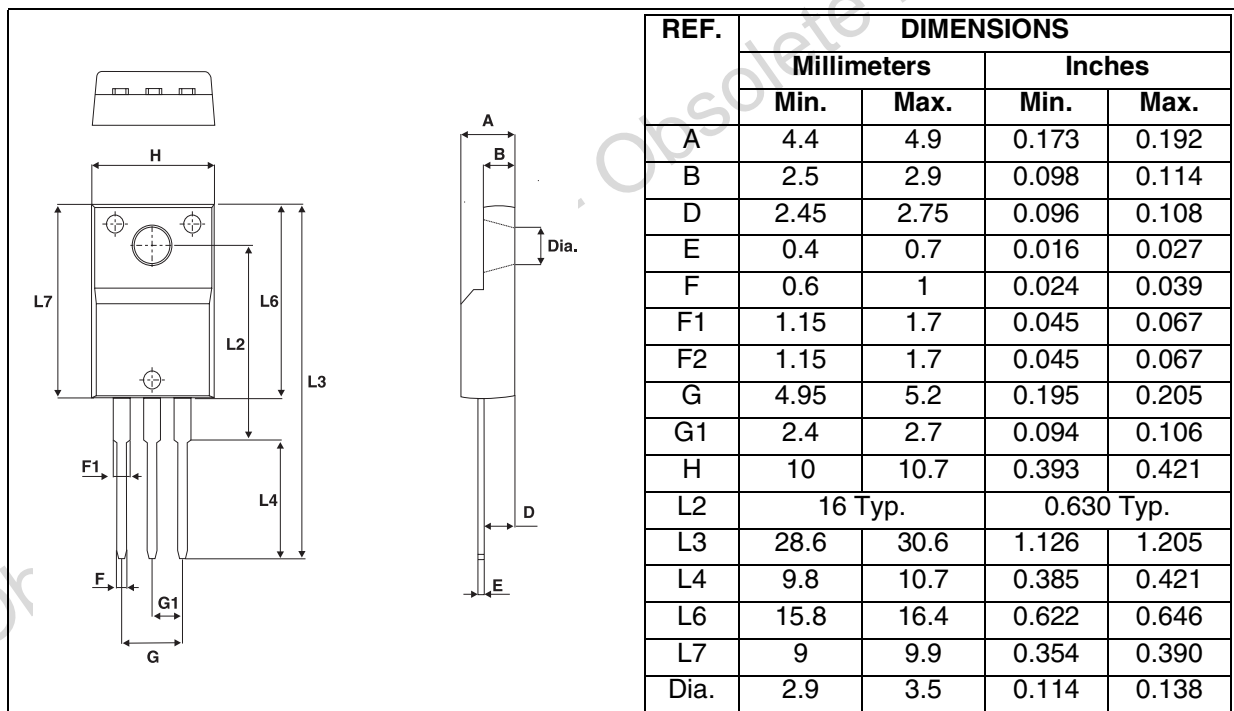


Figure 19: TO-220FPAB F5 Bending (option) Package Mechanical Data

REF.	DIMENSIONS			
	Millimeters		Inches	
	Min.	Max.	Min.	Max.
A	4.4	4.9	0.173	0.192
B	2.5	2.9	0.098	0.114
D	2.45	2.75	0.096	0.108
E	0.4	0.7	0.016	0.027
F	0.6	1	0.024	0.039
F1	1.15	1.7	0.045	0.067
F2	1.15	1.7	0.045	0.067
G	4.95	5.2	0.195	0.205
G1	2.4	2.7	0.094	0.106
H	10	10.7	0.393	0.421
L2	16 Typ.		0.630 Typ.	
L3	24.16	26.9	0.951	1.059
L4	1.65	2.41	0.065	0.095
L6	15.8	16.4	0.622	0.646
L7	9	9.9	0.354	0.390
M1	2.92	3.3	0.115	0.130
R	1.4 Typ.		0.055 Typ.	
Dia.	2.9	3.5	0.114	0.138

Table 8: Ordering Information

Part Number	Marking	Package	Weight	Base qty	Delivery mode
DMV1500HFD	DMV1500H	TO-220FPAB	2.4 g	50	Tube
DMV1500HFD5	DMV1500H	TO-220FPAB F5	2.4 g	45	Tube

Table 9: Revision History

Date	Revision	Description of Changes
07-Sep-2004	1	First issue

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