

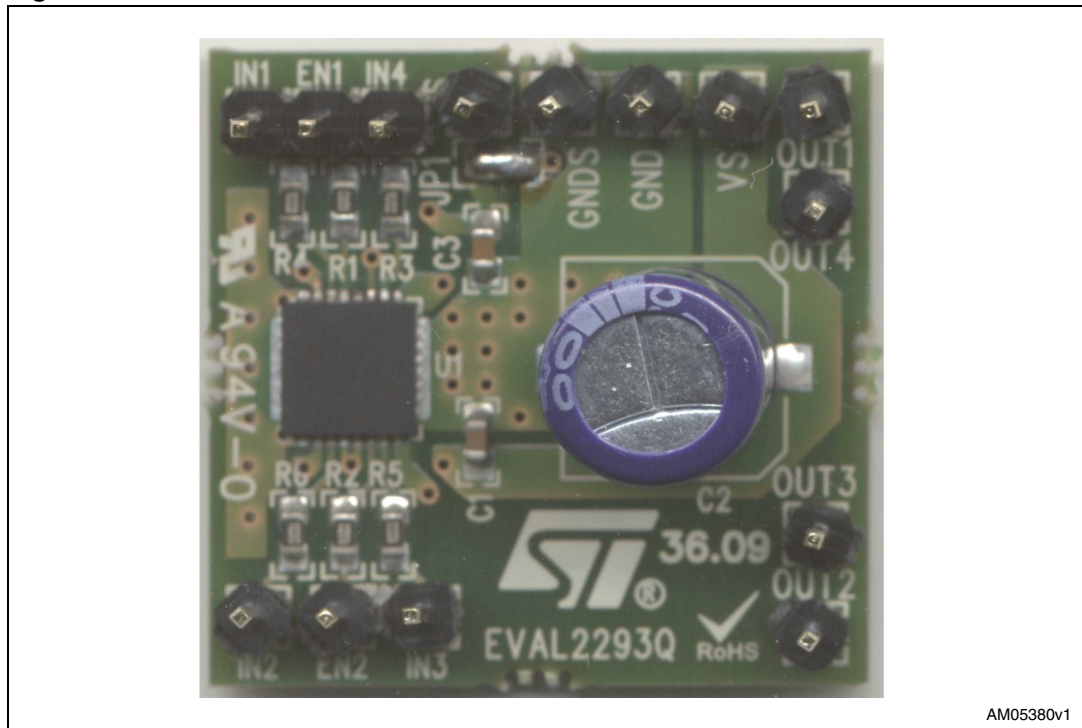
EVAL2293Q demonstration board

Introduction

This application note describes the EVAL2293Q demonstration board for the L2293Q push-pull four channel driver with integrated diodes. The L2293Q is designed to drive inductive loads such as DC and stepping motors, or relays and solenoids. The board implements a typical application which can be used as a reference design to drive two-phase bipolar stepper motors with currents up to 0.6 A DC, multiple DC motors and a wide range of inductive loads.

Housed in a QFN 5 x 5 mm 32-lead package, the small footprint of the L2293Q makes the PCB very compact (24.5 x 24.5 mm).

Figure 1. EVAL2293Q demonstration board



1 Demonstration board description

Figure 2. L2293Q block diagram

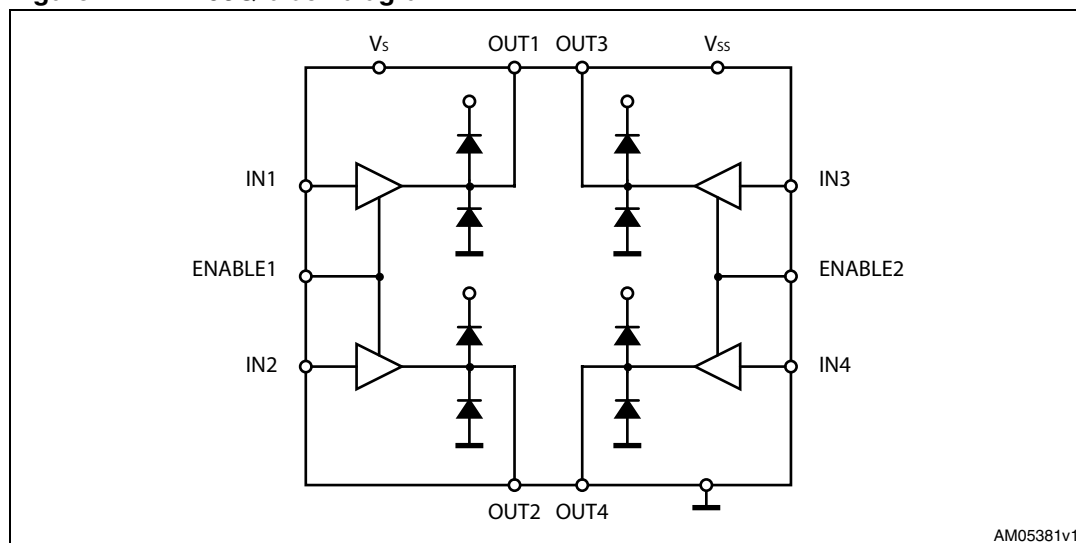
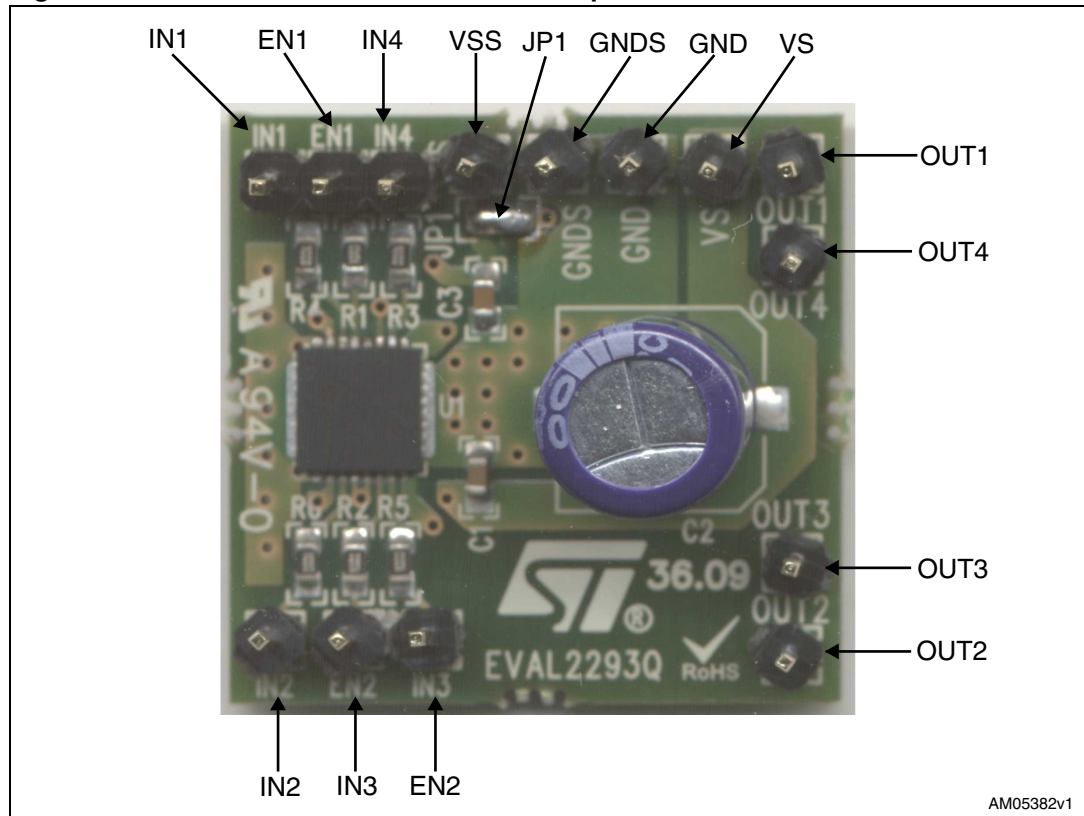


Table 1. EVAL2293Q: pin description

Name	Type	Function
VS	Power supply	Supply voltage for the power output stages
GND	Ground	Power ground terminal
VSS	Power supply	Supply voltage for the logic blocks. It is connected to VS through the closed jumper JP1
GNDS	Ground	Signal ground terminal
IN1	Logic input	Bridge 1 logic input 1
IN2	Logic input	Bridge 1 logic input 2
EN1	Logic input	Bridge 1 enable (active high). When LOW, switches off the output 1 and 2 power transistors
IN3	Logic input	Bridge 2 logic input 1
IN4	Logic input	Bridge 2 logic input 2
EN2	Logic input	Bridge 2 enable (active high). When LOW, switches off the output 3 and 4 power transistors
OUT1	Output	Output 1
OUT2	Output	Output 2
OUT3	Output	Output 3
OUT4	Output	Output 4

Figure 3. EVAL2293Q demonstration board pin location



The logic and power voltage supply pins are connected through jumper JP1 (normally closed). If VS and VSS need to be supplied with different voltage values, JP1 should be opened and the supply to each should be provided separately through external terminals.

The INx input pins drive the corresponding half-bridge. When a low logic level is applied, the low side power switch is turned on, whereas a high logic level turns on the high side switch.

Pins EN1 and EN2 are used to disable the bridges and put the output pins in a high impedance status. The output stages integrate freewheeling diodes.

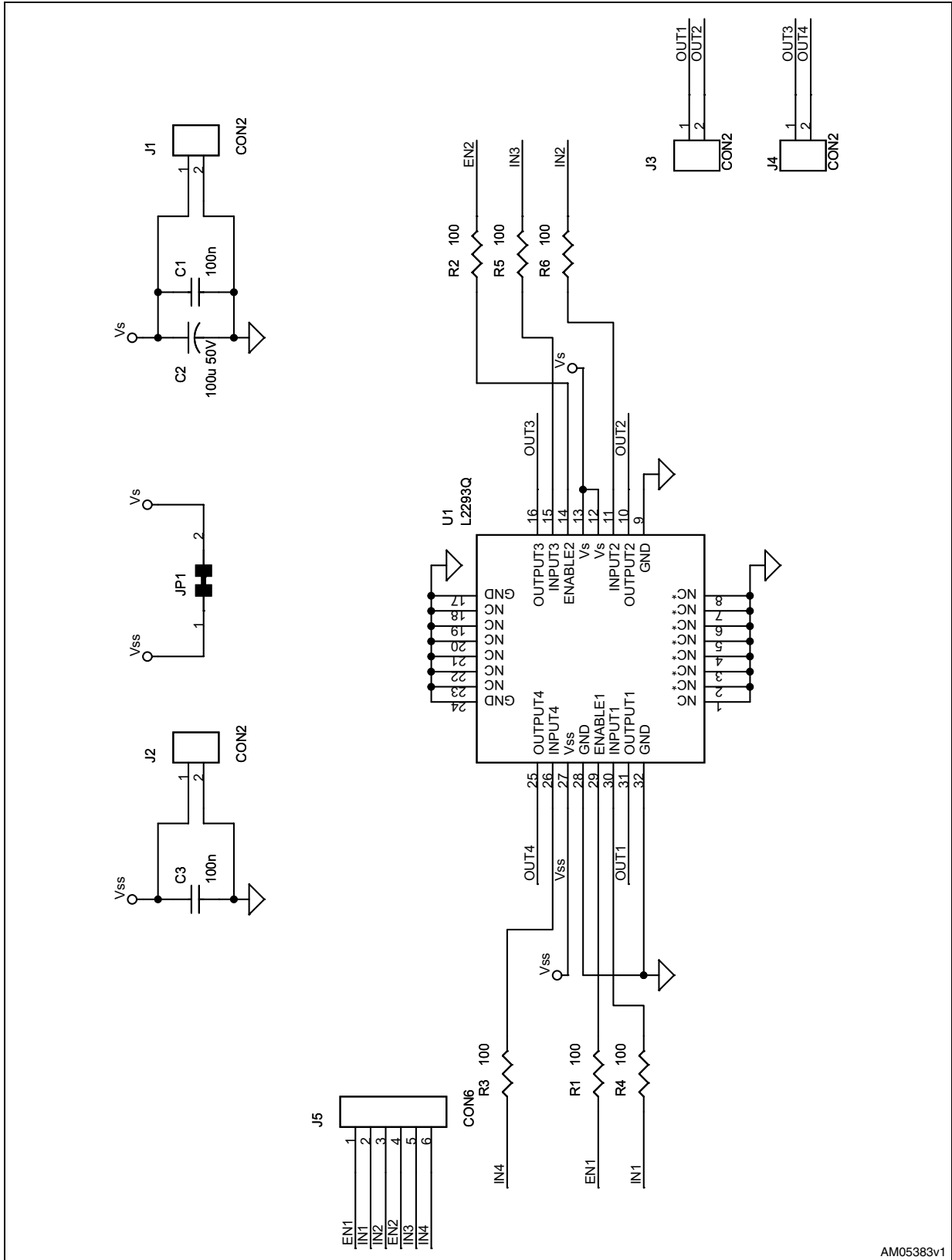
[Table 2](#) below summarizes the electrical specifications of the application, [Figure 3](#) shows the electrical schematic and [Table 3](#) provides the component list.

Table 2. EVAL2293Q: electrical specification (recommended values)

Parameter	Value
Supply voltage range (VS)	VSS to 36 V
Logic supply voltage range (VSS)	2.8 ⁽¹⁾ to 36 V
RMS output current rating (OUTx)	Up to 0.6 A
Switching frequency	Up to 50 kHz
Input and enable voltage range	0 to +5 V
Operating temperature range	-20 ⁽¹⁾ to +125 °C
L2293Q thermal resistance junction-to-ambient	42 °C/W

1. Please refer to the L2293Q datasheet for additional details

Figure 4. EVAL2293Q demonstration board electrical schematic



AM05383v1

Table 3. EVAL2293Q component list

Reference	Value	Description
C1, C3	100 nF/50 V	Capacitor
C2	100 μ F/50 V	Capacitor
R1, R2, R3, R4, R5, R6	100 Ω	Resistor
U1	L2293Q	Dual full bridge in VFQFPN5x5 package

Figure 5. EVAL2293Q component placement

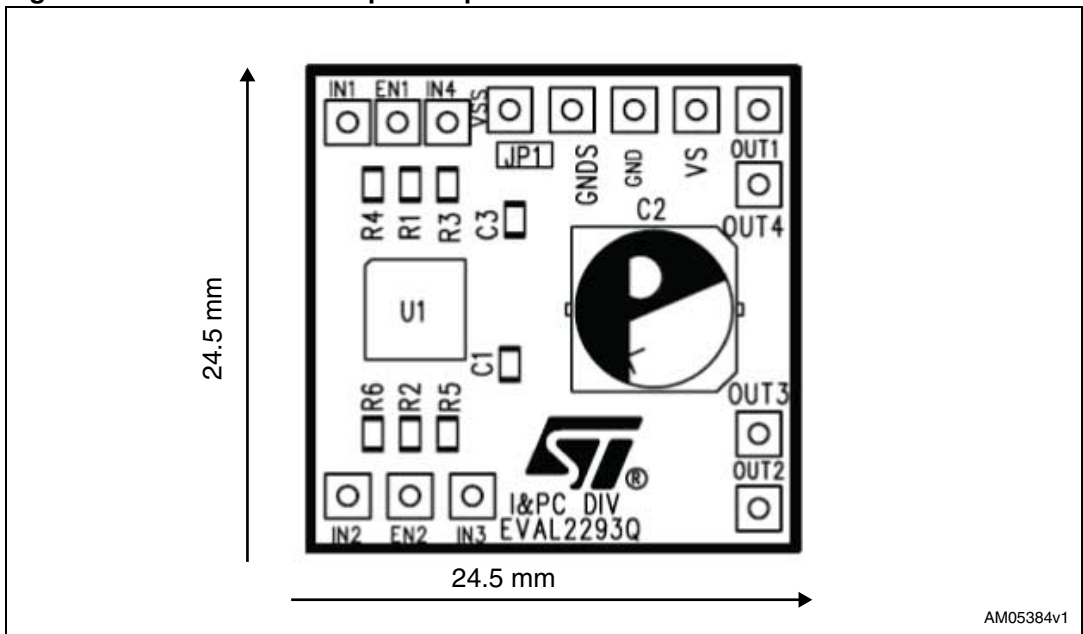


Figure 6. EVAL2293Q top layer layout

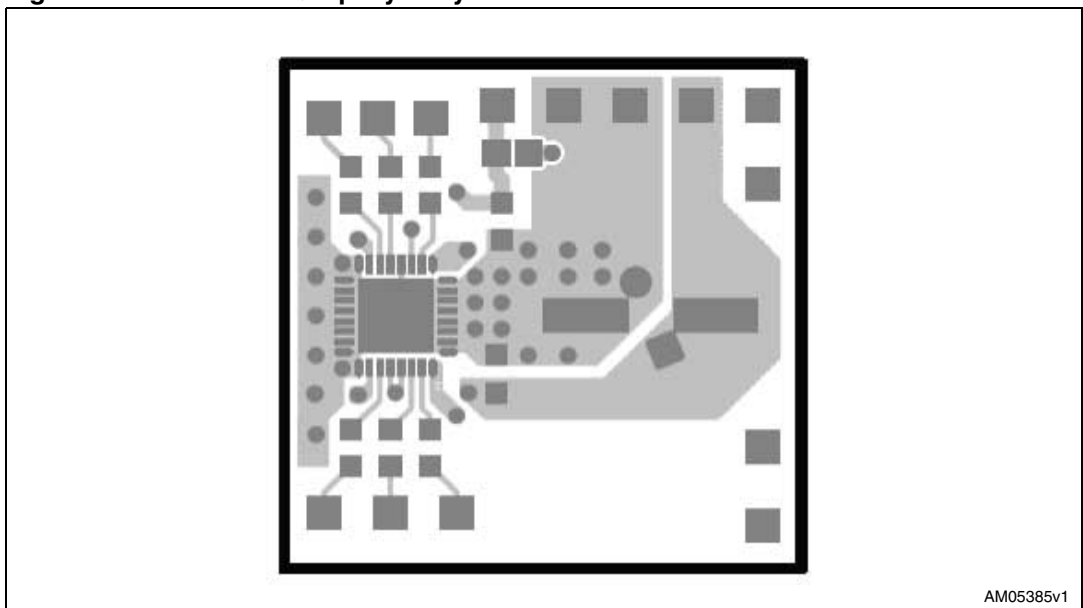
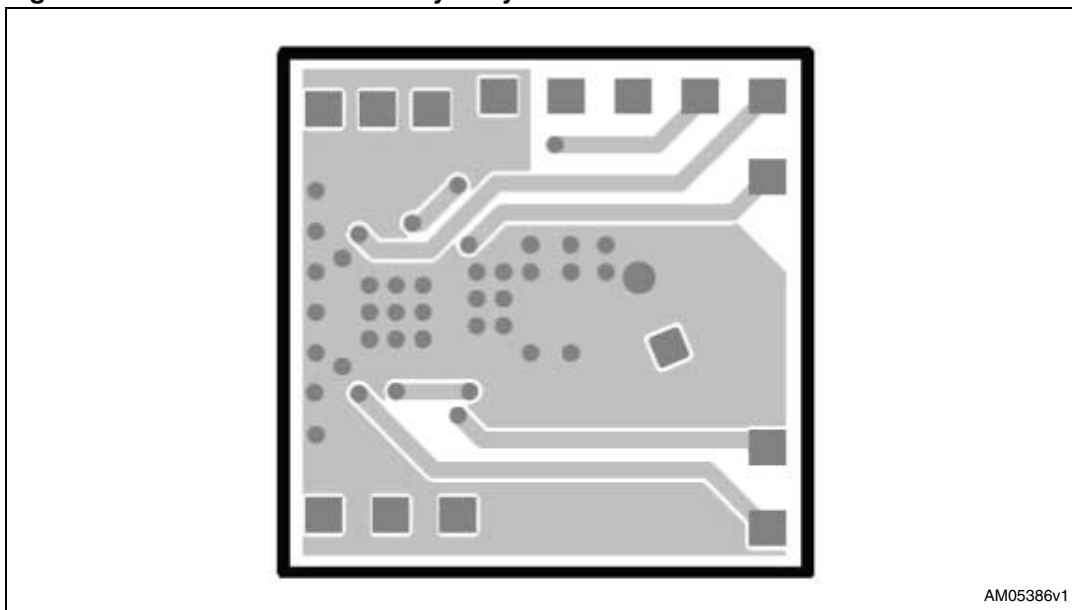


Figure 7. EVAL2293Q bottom layer layout



2 Revision history

Table 4. Document revision history

Date	Revision	Changes
06-May-2010	1	Initial release.

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.

© 2010 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