



## Stepper motor driver mounting the L6474 in a high power PowerSO package

Data brief

### Features

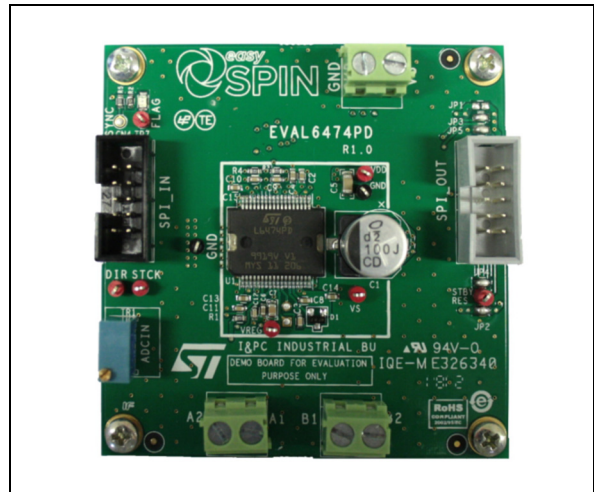
- Voltage range from 8 V to 45 V
- Phase current up to 3 A<sub>r.m.s.</sub>
- SPI with daisy chain feature
- Socket for external resonator or crystal
- FLAG LED indicator
- Suitable for use in combination with STEVAL-PCC009V2

### Description

The EVAL6474PD demonstration board is a microstepping motor driver. In combination with the STEVAL-PCC009V2 communication board and easySPIN evaluation software, the board allows the user to investigate all the features of the L6474 device.

The 4-layer layout and the PowerSO™ package allow the highest thermal performance to be obtained.

The EVAL6474PD supports the daisy chain configuration making it suitable for the evaluation of the L6474 in multi-motor applications.



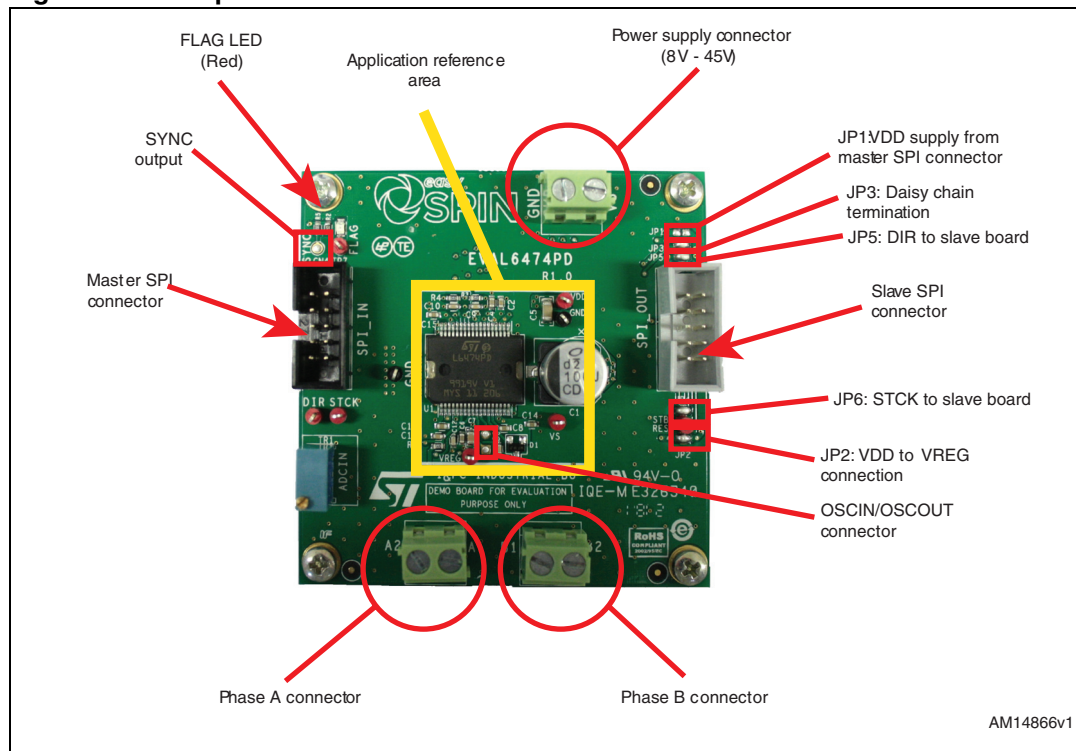
# 1 Board description

**Table 1. EVAL6474PD specifications**

Parameter	Value
Supply voltage (VS)	8 to 45 V
Maximum output current (each phase)	3 A <sub>r.m.s.</sub>
Logic supply voltage (VREG)	Externally supplied: 3.3 V Internally supplied: 3 V typical
Logic interface voltage (VDD)	Externally supplied: 3.3 V or 5 V Internally supplied: VREG
Low level logic input voltage	0 V
High level logic input voltage	VDD <sup>(1)</sup>
Operating temperature	-25 to +125 °C
L6474PD thermal resistance junction-to-ambient	12 °C/W typical

1. All logic inputs are 5 V tolerant.

**Figure 1. Jumper and connector location**



AM14866v1

**Table 2. Jumper and connector description**

Name	Type	Function
M1	Power supply	Motor supply voltage
M2	Power output	Bridge A outputs
M3	Power output	Bridge B outputs
CN1	SPI connector	Master SPI
CN2	SPI connector	Slave SPI
CN3	NM connector	OSCIN and OSCOUT pins
CN4	NM connector	SYNC output
TP1 (VS)	Test point	Motor supply voltage test point
TP2 (VDD)	Test point	Logic interface supply voltage test point
TP6 (VREG)	Test point	Logic supply voltage/L6474 internal regulator test point
TP4 TP5 (GND)	Test point	Ground test point
TP8 (STCK)	Test point	Step-clock input test point
TP3 (DIR)	Test point	BUSY/SYNC output test point
TP9 (STBY/RES)	Test point	Standby/reset input test point
TP7(FLAG)	Test point	FLAG output test point

**Table 3. Master SPI connector pinout (CN1)**

Pin number	Type	Description
1	Open drain output	L6474 direction input
2	Open drain output	L6474 FLAG output
3	Ground	Ground
4	Supply	EXT_VDD (can be used as external logic power supply)
5	Digital output	SPI master IN slave OUT signal (connected to L6474 SDO output through daisy chain termination jumper JP2)
6	Digital input	SPI serial clock signal (connected to L6474 CK input)
7	Digital input	SPI master OUT slave IN signal (connected to L6474 SDI input)
8	Digital input	SPI slave select signal (connected to L6474 CS input)
9	Digital input	L6474 step-clock input
10	Digital input	L6474 standby/reset input

**Table 4. Slave SPI connector pinout (CN2)**

Pin number	Type	Description
1	Open drain output	L6474 direction input
2	Open drain output	L6474 FLAG output
3	Ground	Ground
4	Supply	EXT_VDD (can be used as external logic power supply)
5	Digital output	SPI master IN slave OUT signal (connected to pin 5 of J10)
6	Digital input	SPI serial clock signal (connected to L6474 CK input)
7	Digital input	SPI master OUT slave IN signal (connected to L6474 SDO output)
8	Digital input	SPI slave select signal (connected to L6474 CS input)
9	Digital input	L6474 step-clock input
10	Digital input	L6474 standby/reset input



Table 5. Bill of material

Index	Quantity	Reference	Value	Package
1	1	C1	220 nF/16 V	CAPC-0603
2	1	C2	47 $\mu$ F/6.3 V	CAPC-3216
3	1	C3	100 nF/6.3 V	CAPC-0603
4	1	C4	10 $\mu$ F/4 V	CAPC-3216
5	1	C5	100 nF/4 V	CAPC-0603
6	4	C6, C7, C8, C10	100 nF/50 V	CAPC-0603
7	1	CN1	10-pole Polarized IDC Male header 2.54 mm vertical black	CON-FLAT-5X2-180M
8	1	CN2	10-pole Polarized IDC Male header 2.54 mm vertical gray	CON-FLAT-5X2-180M
9	1	CN3	N.M	STRIP254P-M-2
10	1	CN4	N.M	TPTH-RING-1MM
11	1	C1A	100 $\mu$ F/63 V	CAPE-R10HXX-P5
12	1	C1	100 $\mu$ F/63 V	CAPES-R10HXX
13	6	C2,C4,C6,C13,C14 ,C15	100 nF/50 V	CAPC-0603
14	1	C3	10 nF/50 V	CAPC-0603
15	1	C5	47 $\mu$ F/6.3 V	CAPC-1206
16	1	C7	10 $\mu$ F/6.3 V	CAPC-0805
17	1	C8	220 nF/16 V	CAPC-0603
18	3	C9, C10, C11	1 nF/6.3 V	CAPC-0603
19	1	C12	3.3 nF/6.3 V	CAPC-0603
20	1	DL1	LED red	LEDC-0805
21	1	D1	BAV99	SOT-23
22	1	JP1	Jumper open	JP2SO
23	4	JP2, JP3, JP4, JP5	Jumper closed	JP2SO
24	3	M1, M2, M3	Screw connector 2 poles	MORSV-508-2P

Figure 3. EVAL6474PD - silkscreen

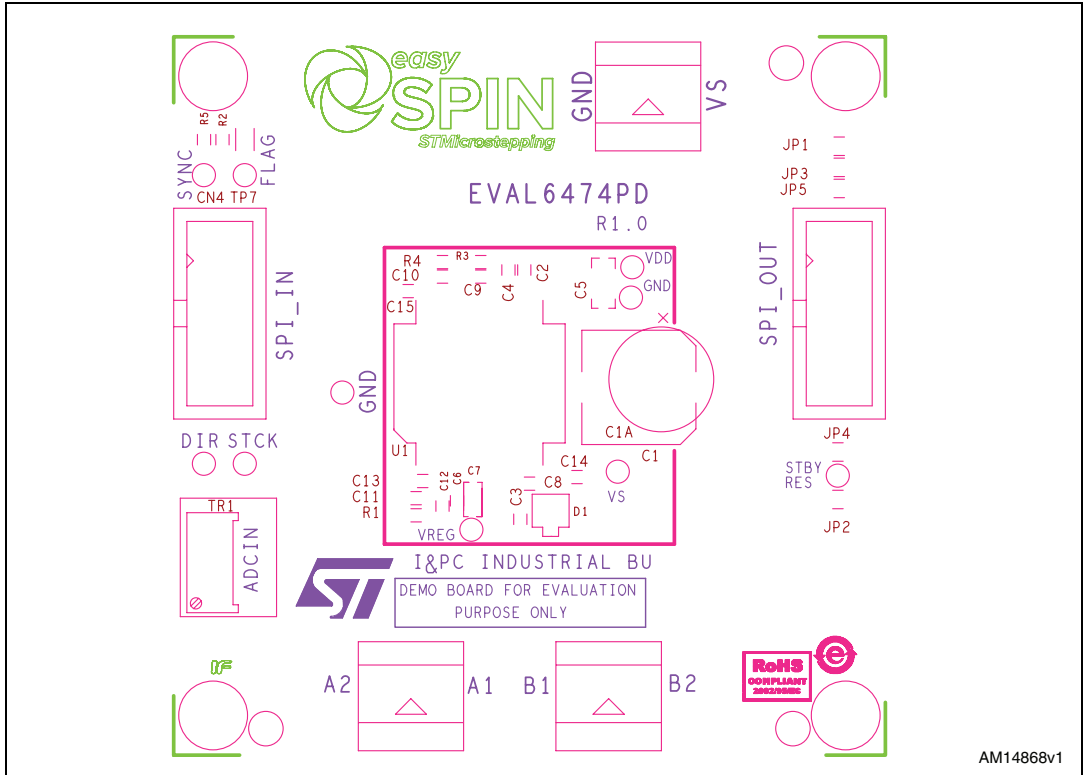


Figure 4. EVAL6474PD - layout (top layer)

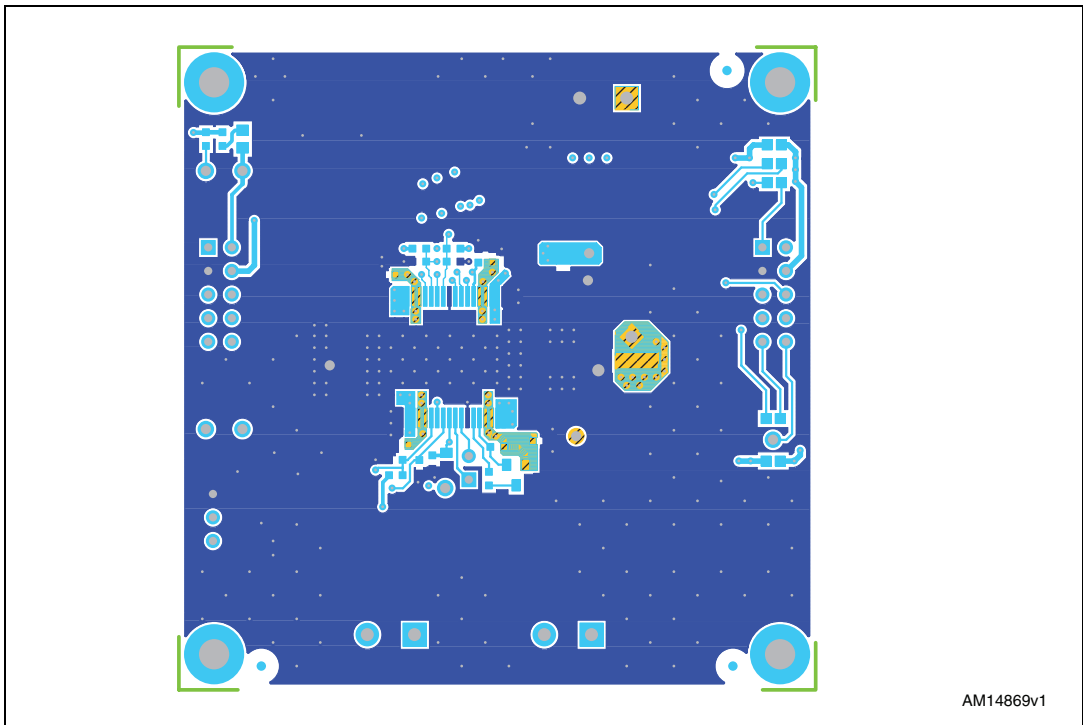


Figure 5. EVAL6474PD - layout (inner layer2)

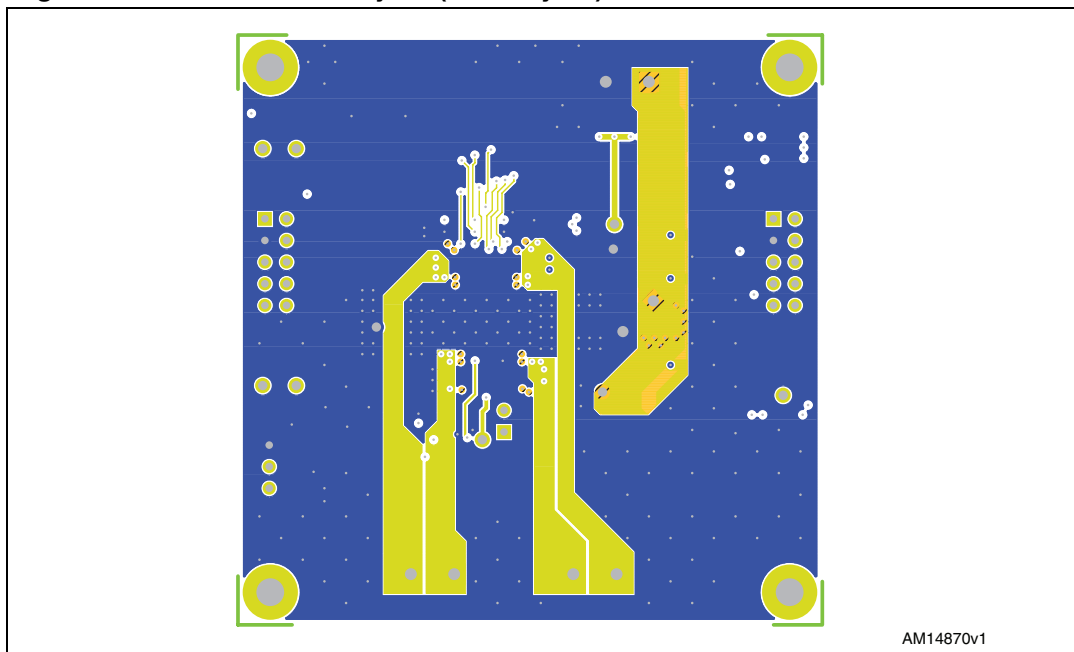


Figure 6. EVAL6474PD - layout (inner layer3)

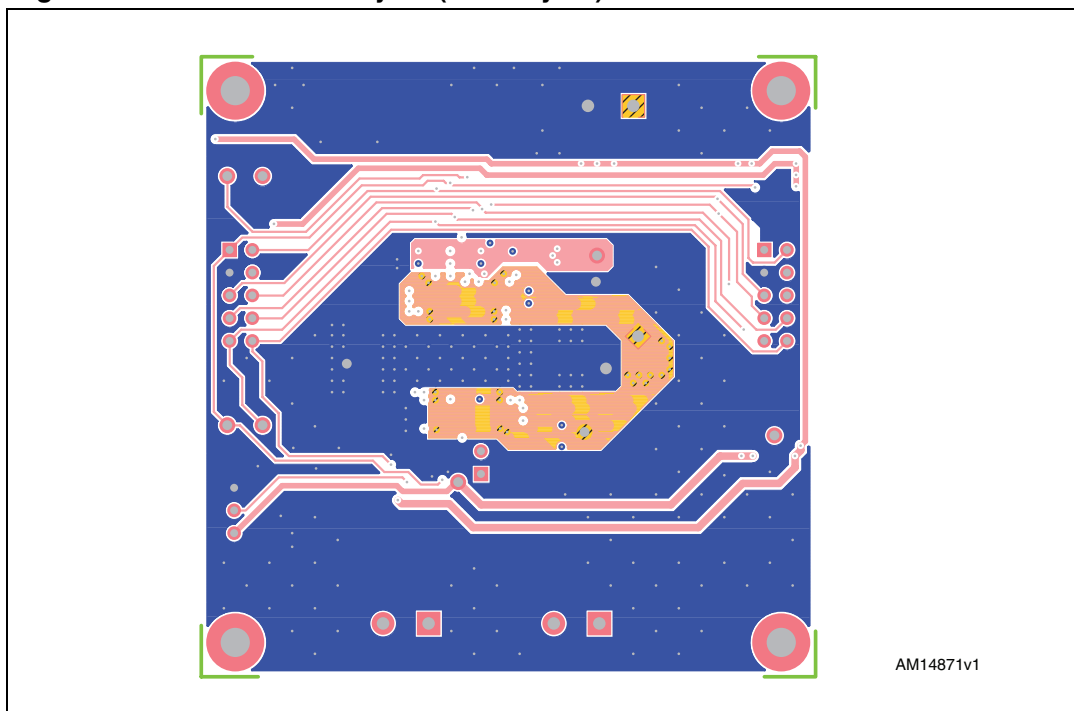
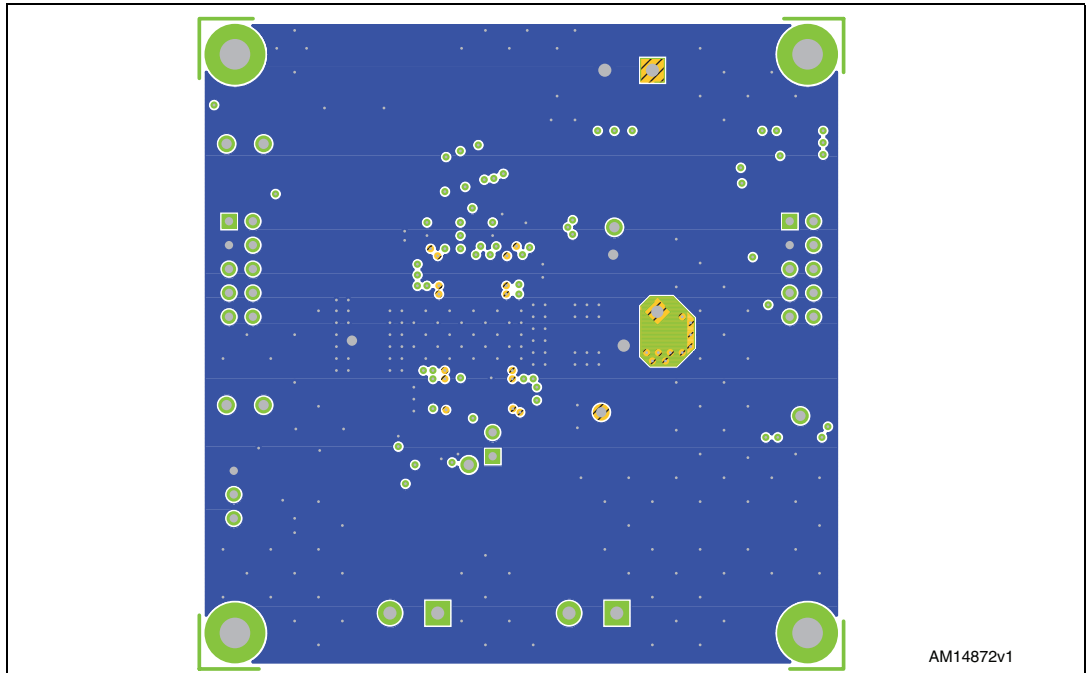


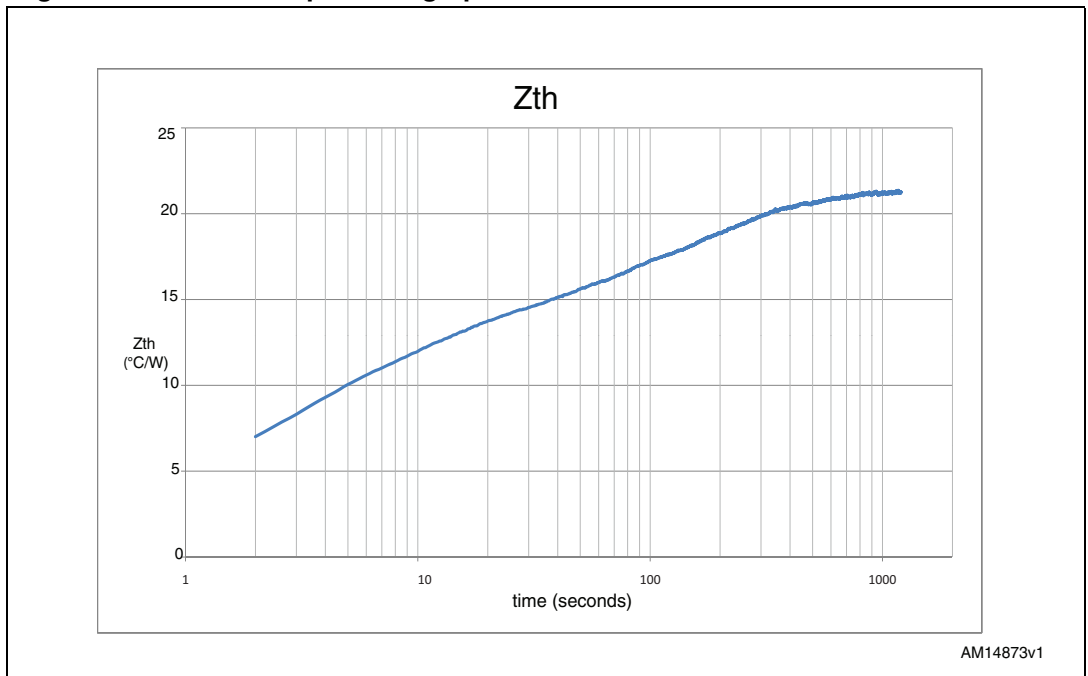


Figure 7. EVAL6474PD - layout (bottom layer3)



## 1.1 Thermal data

Figure 8. Thermal impedance graph



## 2 Revision history

**Table 6. Document revision history**

Date	Revision	Changes
07-Aug-2012	1	Initial release.
07-Sep-2012	2	In cover page, dSPIN has been changed into easySPIN.

**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 TWO AUTHORIZED ST REPRESENTATIVES, 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.

© 2012 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)

