



Fully integrated stepper motor driver based on the L6472

Data brief

Features

- Voltage range from 8 V to 45 V
- Phase current up to 3 A_{r.m.s.}
- SPI with daisy chain feature
- SW input
- FLAG and BUSY LED indicators
- Adjustable supply voltage compensation
- Suitable for use in combination with STEVAL-PCC009V2

Description

The EVAL6472H demonstration board is a fully integrated microstepping motor driver. In combination with the STEVAL-PCC009V2 communication board and the dSPIN evaluation software, the board allows the user to investigate all the features of the L6472 device. In particular, the board can be used to regulate the L6472 parameters in order to fit application requirements.

The EVAL6472H supports the daisy chain configuration making it suitable for the evaluation of the L6472 in the multi-motor applications.



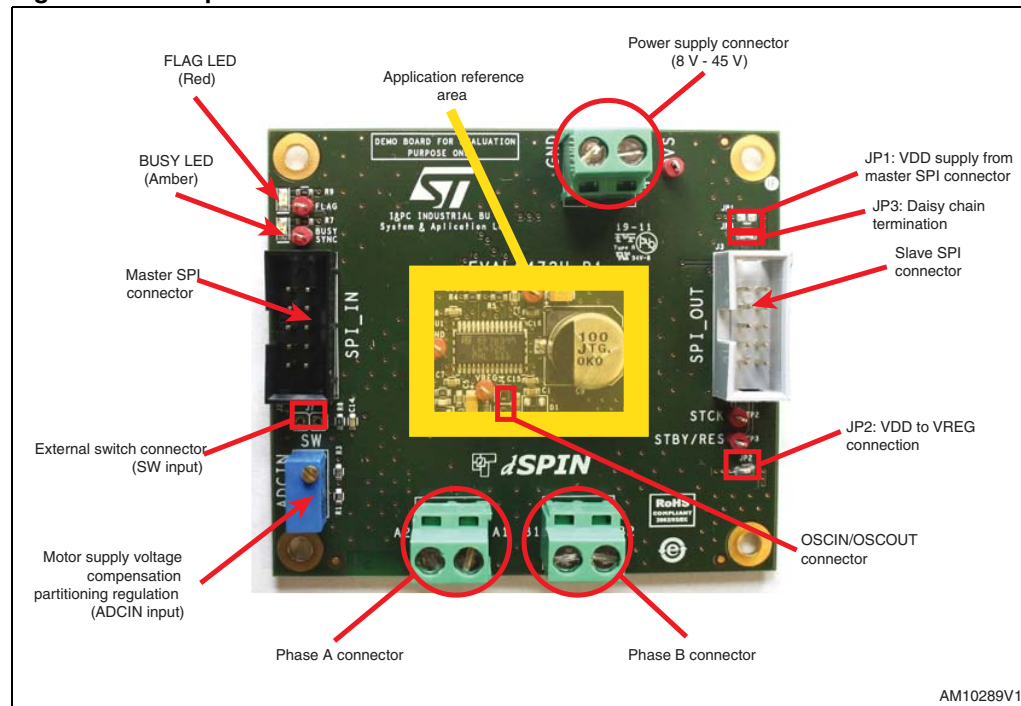
1 Board description

Table 1. EVAL6472H specifications

Parameter	Value
Supply voltage (VS)	8 to 45 V
Maximum output current (each phase)	3 A _{r.m.s.}
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 ⁽¹⁾
Operating temperature	-25 to +125 °C
L6472H thermal resistance junction-to-ambient	21 °C/W typical

1. All logic inputs are 5 V tolerant.

Figure 1. Jumpers and connectors location



AM10289V1

Table 2. Jumpers and connectors 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	External switch input
TP1 (VS)	Test point	Motor supply voltage test point
TP2 (VDD)	Test point	Logic interface supply voltage test point
TP3 (VREG)	Test point	Logic supply voltage/L6470 internal regulator test point
TP5 (GND)	Test point	Ground test point
TP6 (GND)	Test point	Ground test point
TP8 (STCK)	Test point	Step clock input test point
TP9 (STBY/RES)	Test point	Standby/reset input test point
TP10 (FLAG)	Test point	FLAG output test point
TP11 (BUSY/SYNC)	Test point	BUSY/SYNC output test point

Table 3. Master SPI connector pinout (J10)

Pin number	Type	Description
1	Open drain output	L6472 BUSY output
2	Open drain output	L6472 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 L6472 SDO output through daisy chain termination jumper JP2)
6	Digital input	SPI serial clock signal (connected to L6472 CK input)
7	Digital input	SPI master OUT slave IN signal (connected to L6472 SDI input)
8	Digital input	SPI slave select signal (connected to L6472 CS input)
9	Digital input	L6472 step-clock input
10	Digital input	L6472 standby/reset input

Table 4. Slave SPI connector pinout (J11)

Pin number	Type	Description
1	Open drain output	L6472 BUSY output
2	Open drain output	L6472 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 L6472 CK input)
7	Digital input	SPI master OUT slave IN signal (connected to L6472 SDO output)
8	Digital input	SPI slave select signal (connected to L6472 CS input)
9	Digital input	L6472 step-clock input
10	Digital input	L6472 standby/reset input

Figure 2. EVAL6472H schematic

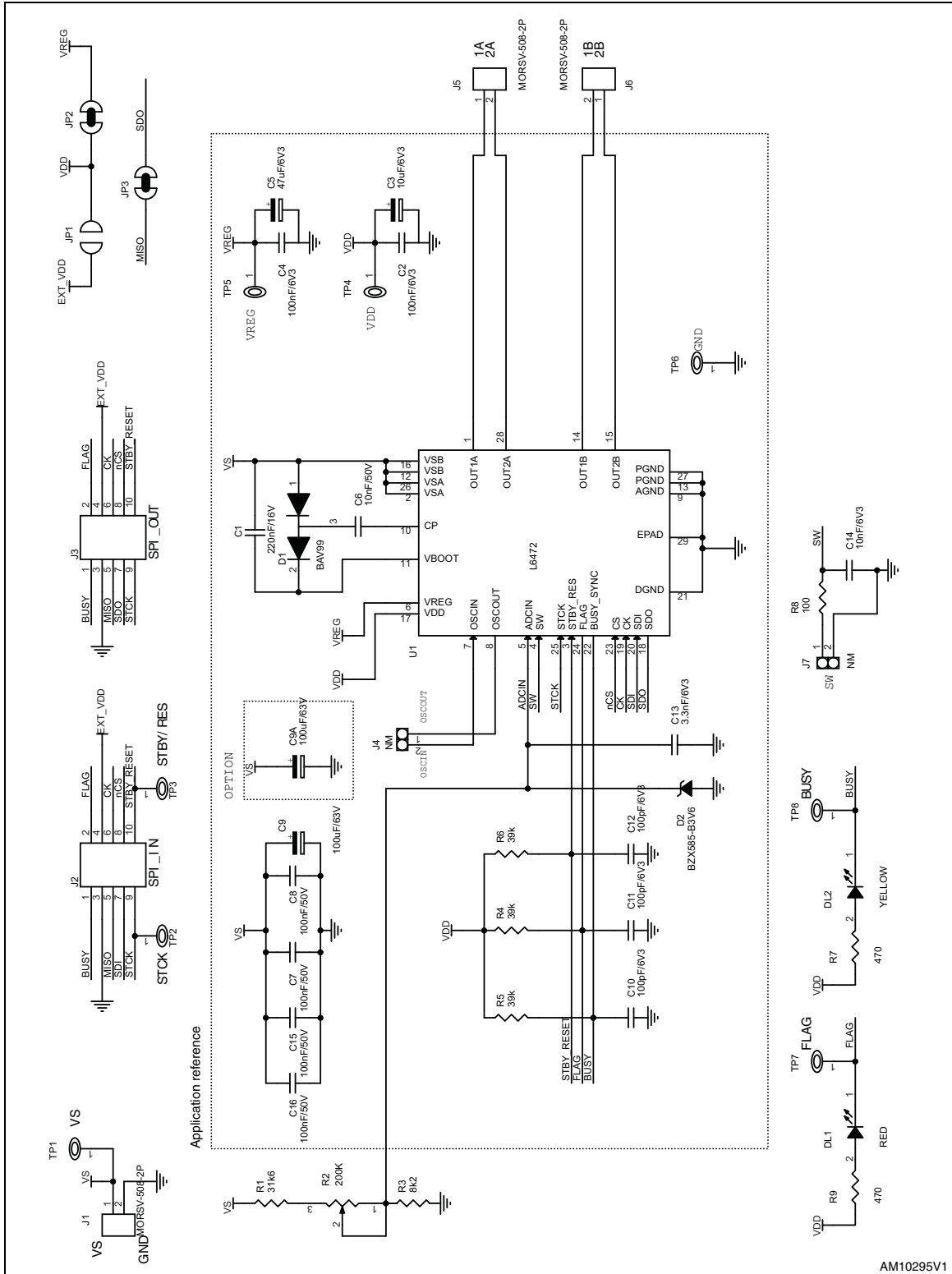


Table 5. Bill of material

Index	Quantity	Reference	Value	Package
1	1	C1	220 nF/16 V	CAPC-0603
2	2	C2,C4	100 nF/6V3	CAPC-0603
3	1	C3	10 μ F/6V3	CAPC-3216
4	1	C5	47 μ F/6V3	CAPC-3216
5	1	C6	10 nF/50 V	CAPC-0603
6	4	C7, C8, C15, C16	100 nF/50 V	CAPC-0603
7	1	C9A	100 μ F/6V3 (option)	CAPE-R10HXX-P5
8	1	C9	100 μ F/6V3	CAPE-R10HXX
9	3	C10, C11, C12	100 pF/6V3	CAPC-0603
10	1	C13	3.3 nF/6V3	CAPC-0603
11	1	C14	10 nF/6V3	CAPC-0603
12	1	DL1	LED diode (red)	LEDC-0805
13	1	DL2	LED diode (amber)	LEDC-0805
14	1	D1	BAV99	SOT23
15	1	D2	BZX585-B3V6	SOD323
16	1	JP1	Jumper - open	JP2SO
17	2	JP2, JP3	Jumper - closed	JP2SO
18	3	J1, J5, J6	Screw connector 2 poles	MORSV-508-2P
19	2	J2,J3	Pol. IDC male header vertical 10 poles	CON-FLAT-5X2-180M
20	2	J4, J7	NM	STRIP254P-M-2
21	1	R1	31.6 k Ω	RESC-0603
22	1	R2	200 k Ω	TRIMM-100X50X110-64W
23	1	R3	8.2 k Ω	RESC-0603
24	3	R4, R5, R6	39 k Ω	RESC-0603
25	2	R7, R9	470 Ω	RESC-0603
26	1	R8	100 Ω	RESC-0603
27	7	TP1, TP2, TP3, TP4, TP5, TP7, TP8	TPTH-ring-1 mm red	TH
28	1	TP6	TPTH-ring-1 mm black	TH
29	1	U1	L6472	HTSSOP28

Figure 3. EVAL6472H - silkscreen

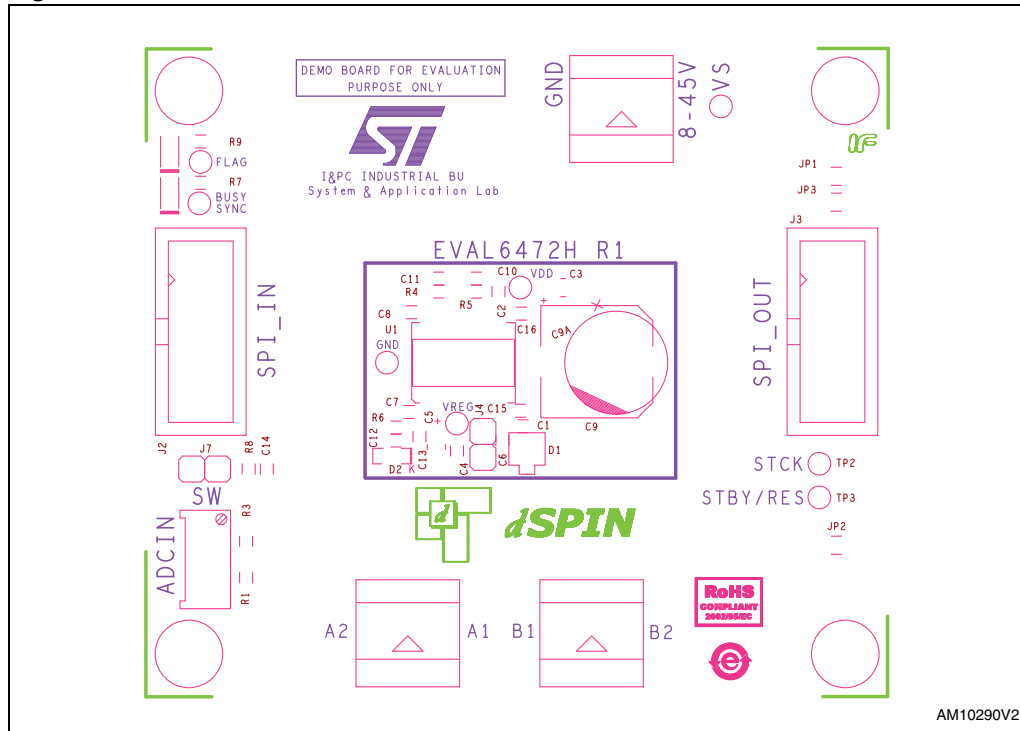


Figure 4. EVAL6472H - layout (top layer)

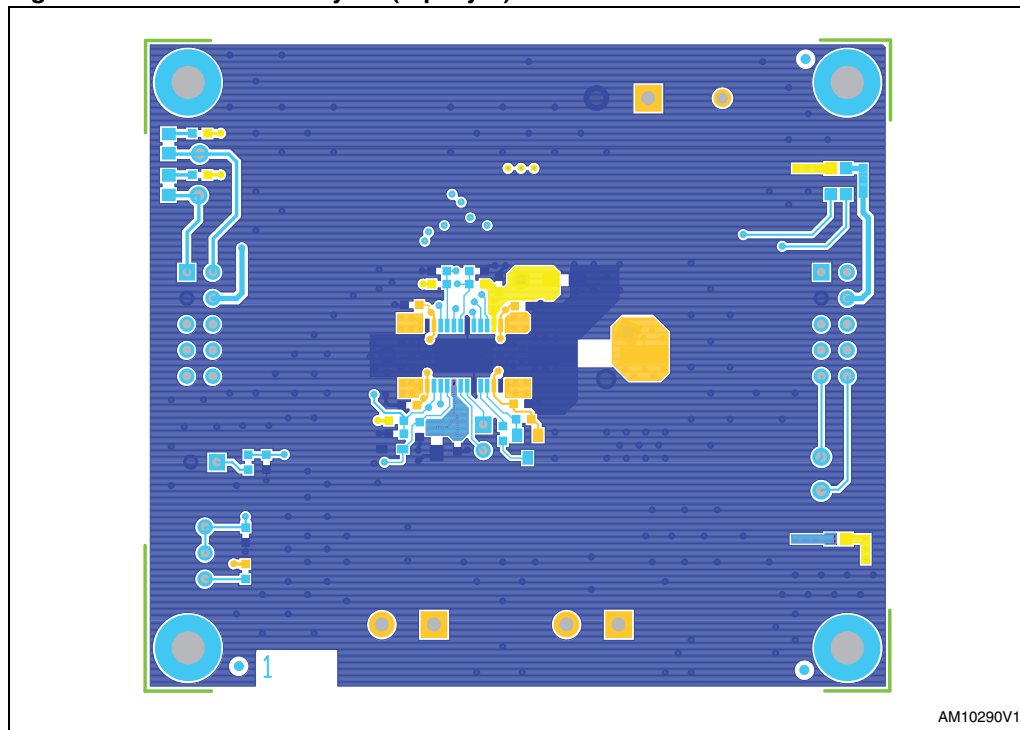


Figure 5. EVAL6472H - layout (inner layer2)

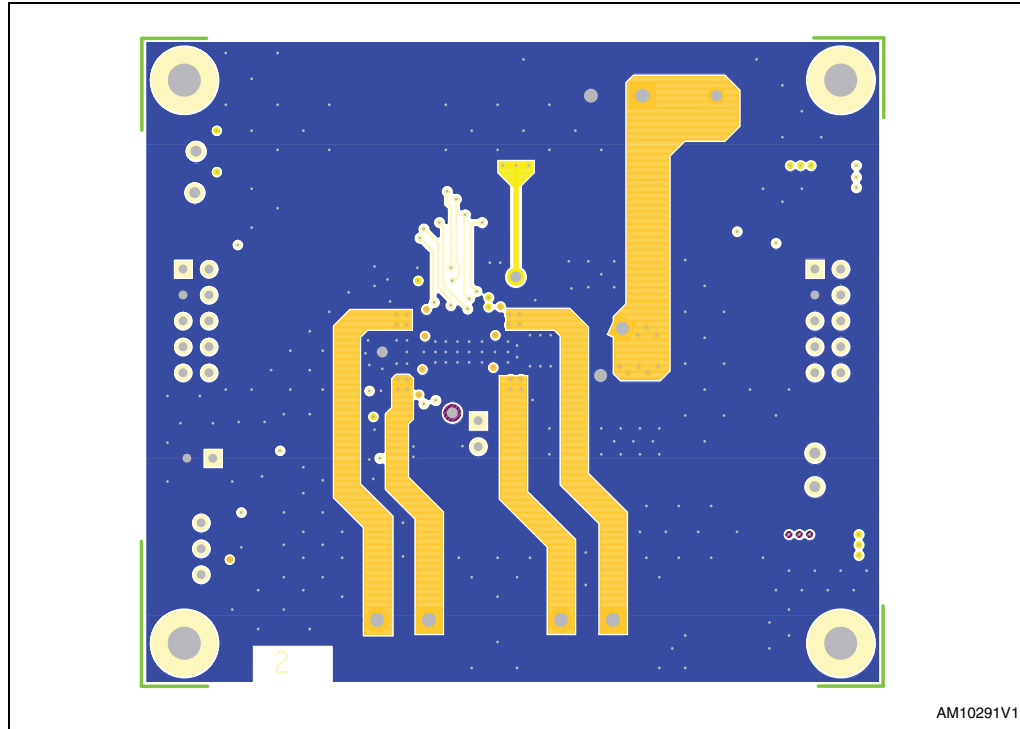


Figure 6. EVAL6472H - layout (inner layer3)

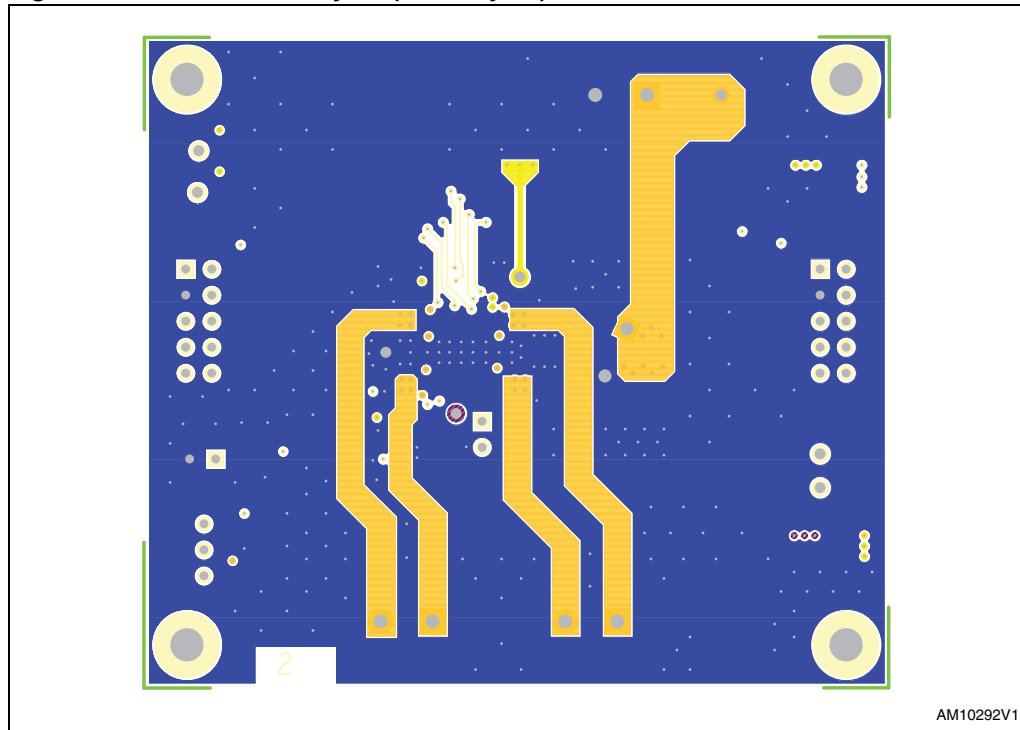
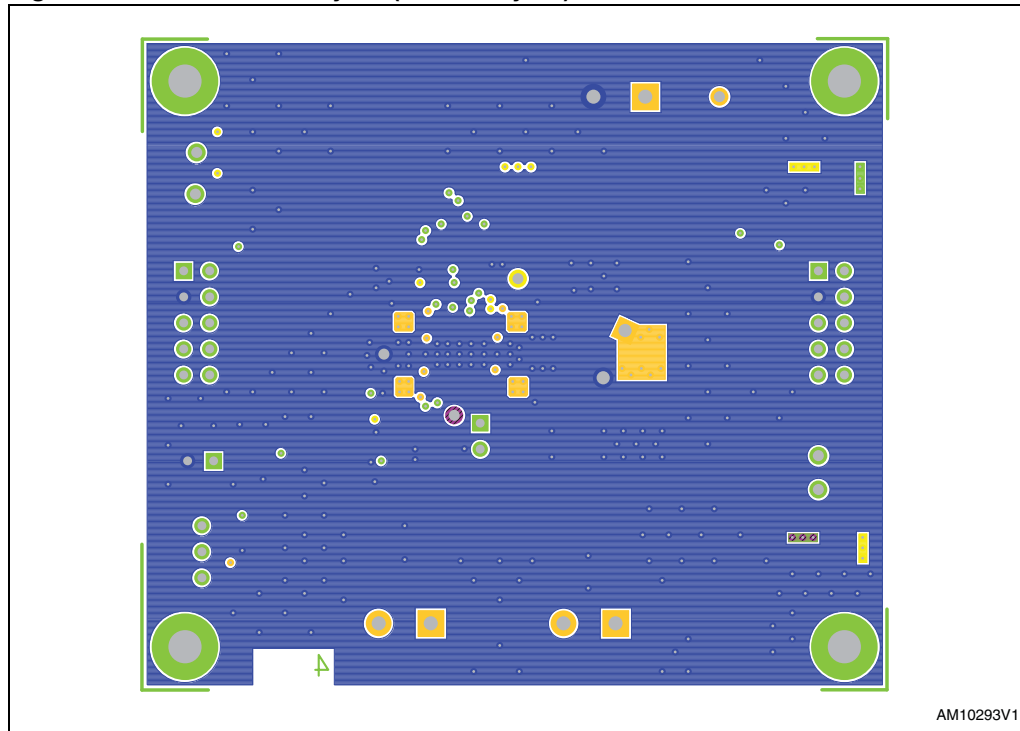
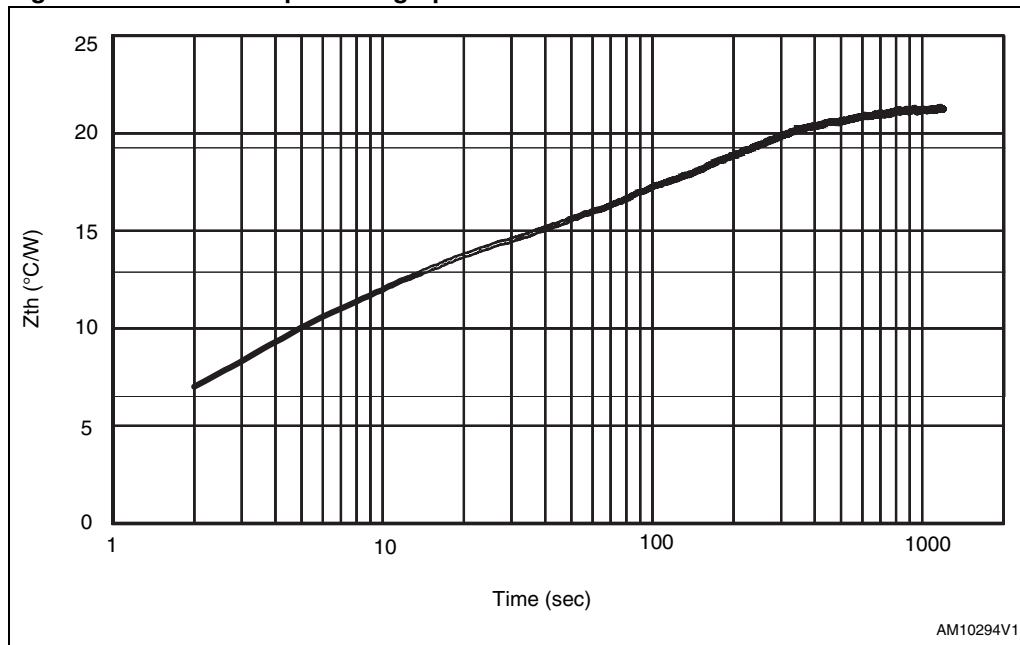


Figure 7. EVAL6472H - layout (bottom layer3)



1.1 Thermal data

Figure 8. Thermal impedance graph



2 Revision history

Table 6. Document revision history

Date	Revision	Changes
21-Mar-2012	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 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

