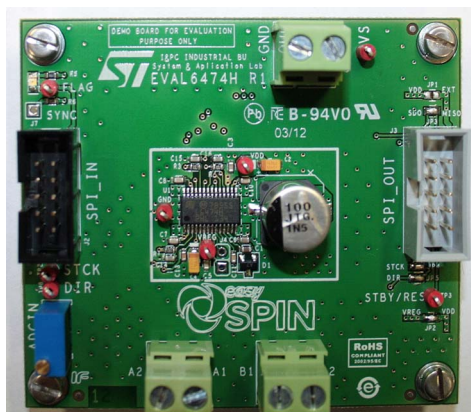


## Stepper motor driver mounting the L6474

Data brief

**EVAL6474H**

### Description

The EVAL6474H demonstration board is a microstepping motor driver. In combination with the STEVAL-PCC009V2 communication board and the SPIN evaluation software, the board allows the user to investigate all the features of the L6474 device.

The EVAL6474H supports the daisy chain configuration making it suitable for the evaluation of the L6474 in multi motor applications.

### Features

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

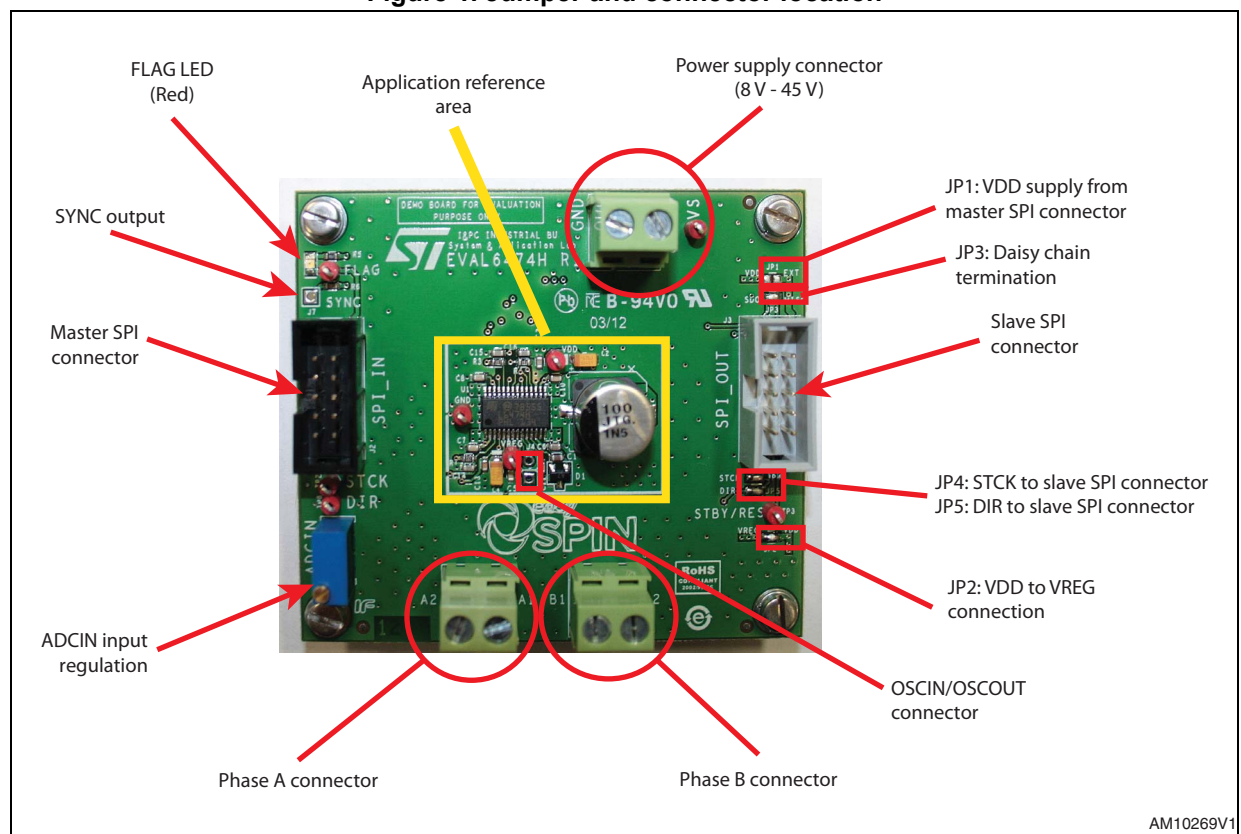
## Board description

**Table 1. EVAL6474H specifications**

| Parameter                                     | Value                                                       |
|-----------------------------------------------|-------------------------------------------------------------|
| Supply voltage (VS)                           | 8 to 45 V                                                   |
| Maximum output current (each phase)           | 3 A <sub>rms</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                                              |
| L6474H thermal resistance junction to ambient | 21 °C/W typical                                             |

1. All logic inputs are 5 V tolerant.

**Figure 1. Jumper and connector location**



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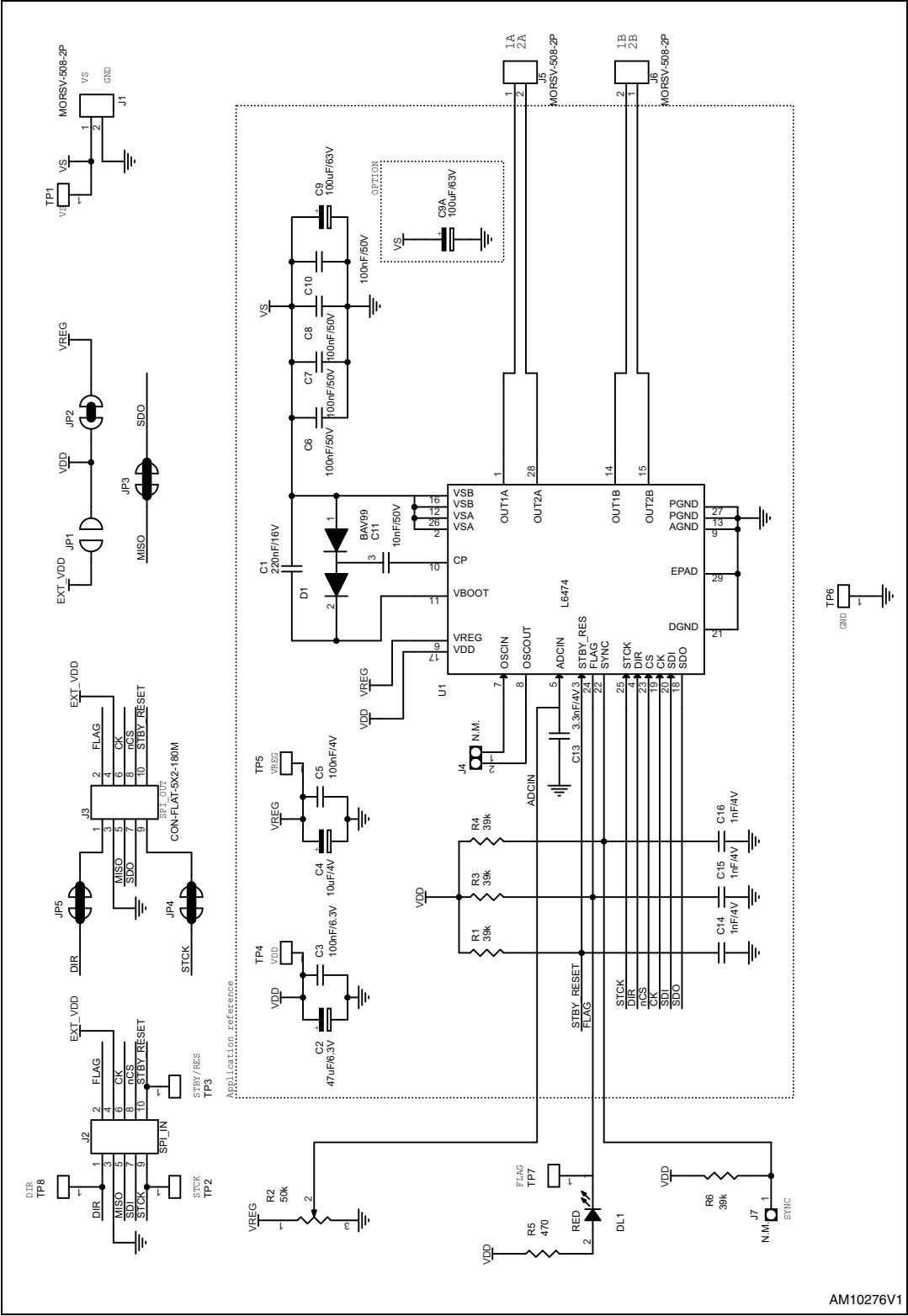
Table 2. Jumpers and connectors description

| Name           | Type          | Function                                                 |
|----------------|---------------|----------------------------------------------------------|
| J1             | Power supply  | Motor supply voltage                                     |
| J5             | Power output  | Bridge A outputs                                         |
| J6             | Power output  | Bridge B outputs                                         |
| J2             | SPI connector | Master SPI                                               |
| J3             | SPI connector | Slave SPI                                                |
| J4             | NM connector  | OSCIN and OSCOUT pins                                    |
| J7             | NM connector  | SYNC output                                              |
| TP1 (VS)       | Test point    | Motor supply voltage test point                          |
| TP4 (VDD)      | Test point    | Logic interface supply voltage test point                |
| TP5 (VREG)     | Test point    | Logic supply voltage/L6474 internal regulator test point |
| TP6 (GND)      | Test point    | Ground test point                                        |
| TP2 (STCK)     | Test point    | Step clock input test point                              |
| TP8 (DIR)      | Test point    | DIR output test point                                    |
| TP3 (STBY/RES) | Test point    | STBY/RES input test point                                |
| TP7 (FLAG)     | Test point    | FLAG output test point                                   |

Table 3. Slave SPI connector pinout (J11)

| Pin number | Type              | Description                                                                                                     |
|------------|-------------------|-----------------------------------------------------------------------------------------------------------------|
| 1          | Digital input     | 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 the 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 the L6474 SDI input)                                             |
| 8          | Digital input     | SPI slave select signal (connected to the L6474 CS input)                                                       |
| 9          | Digital input     | L6474 step-clock input                                                                                          |
| 10         | Digital input     | L6474 standby/reset input                                                                                       |

Figure 2. EVAL6474H schematic



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Table 4. Bill of material

| Item | 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        | C9A                                       | 100 $\mu$ F/63 V                          | CAPE-R8H12-P35              |
| 8    | 1        | C9                                        | 100 $\mu$ F/63 V                          | CAPE-R10HXX                 |
| 9    | 1        | C11                                       | 10 nF/50 V                                | CAPC-0603                   |
| 10   | 1        | C13                                       | 3.3 nF/4 V                                | CAPC-0603                   |
| 11   | 3        | C14, C15, C16                             | 1 nF/4 V                                  | CAPC-0603                   |
| 12   | 1        | DL1                                       | LED diode (red)                           | LEDC-0805                   |
| 13   | 1        | D1                                        | BAV99                                     | SOT-23                      |
| 14   | 1        | JP1                                       | Jumper - open                             | JP2SO                       |
| 15   | 4        | JP2, JP3, JP4, JP5                        | Jumper - closed                           | JP2SO                       |
| 16   | 3        | J1, J5, J 6                               | Screw connector 2 poles                   | MORSV-508-2P                |
| 17   | 2        | J2, J3                                    | Pol. IDC male header<br>vertical 10 poles | CON-FLAT-5 x 2 - 180 M      |
| 18   | 1        | J4                                        | N.M.                                      | STRIP254P-M-2               |
| 19   | 1        | J7                                        | N.M.                                      | TPTH-44SQ70                 |
| 20   | 4        | R1, R3, R4, R6                            | 39 k $\Omega$                             | RESC-0603                   |
| 21   | 1        | R2                                        | 50 k $\Omega$                             | TRIMM-100 x 50 x 110 - 64 W |
| 22   | 1        | R5                                        | 470 $\Omega$                              | RESC-0603                   |
| 23   | 8        | TP1, TP2, TP3, TP4,<br>TP5, TP6, TP7, TP8 | Test point                                | TH                          |
| 24   | 1        | U1                                        | L6474H                                    | HTSSOP28                    |

Figure 3. EVAL6474H - layout (top layer)

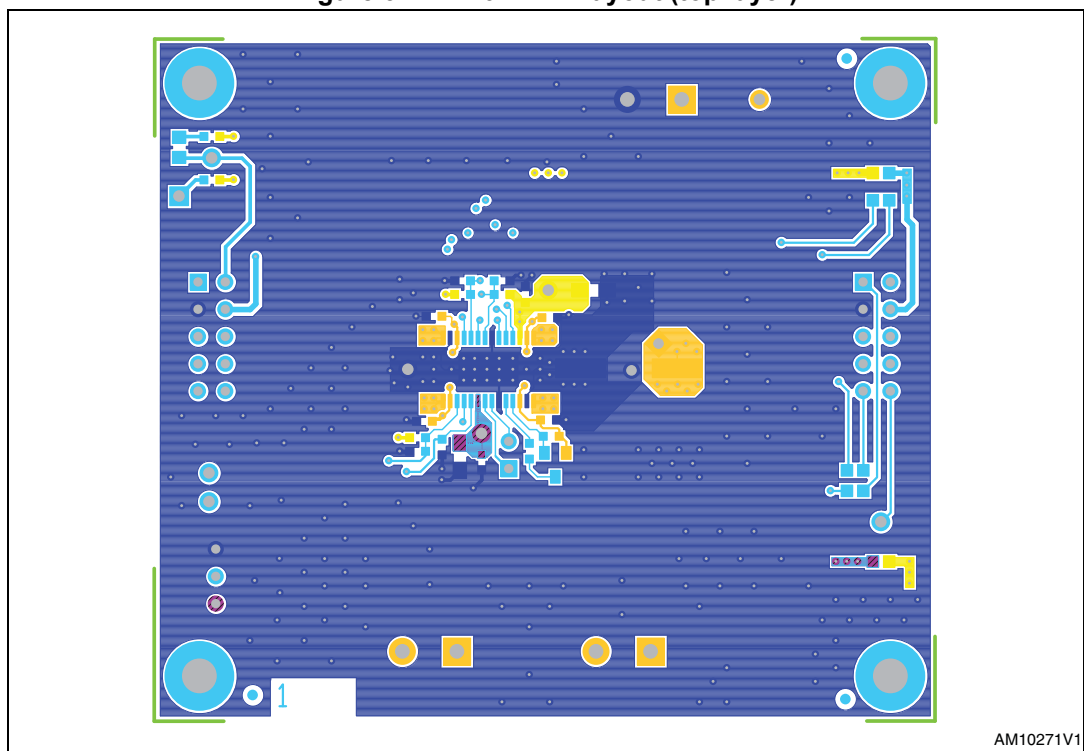


Figure 4. EVAL6474H - layout (inner layer 2)

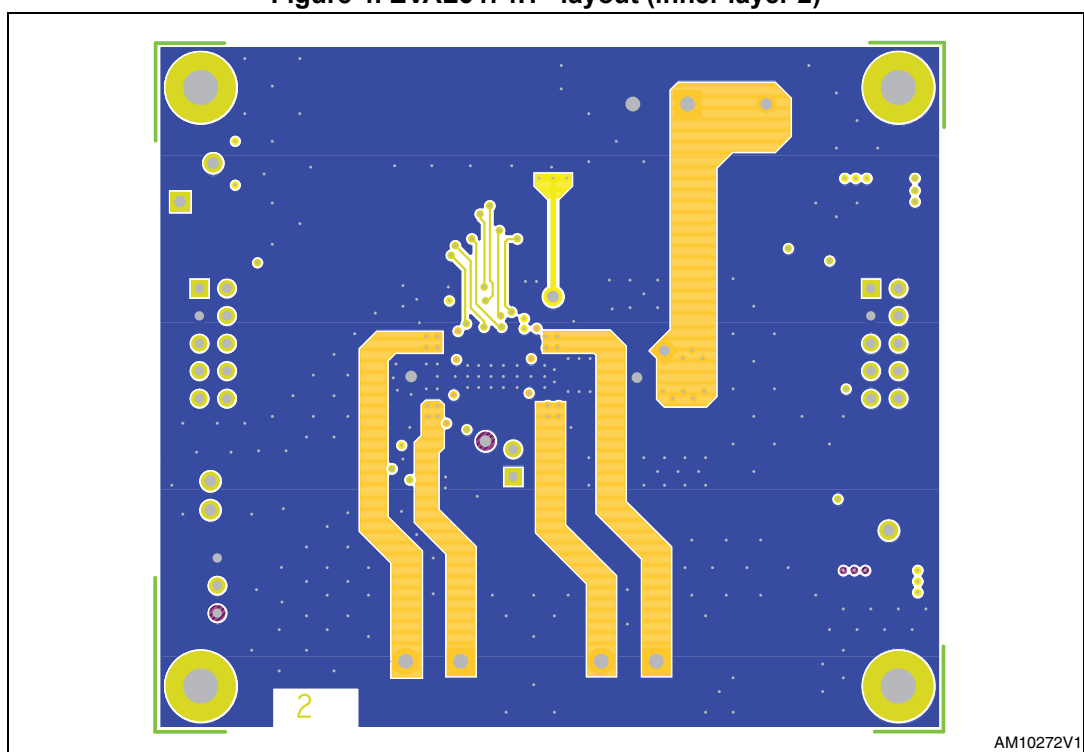


Figure 5. EVAL6474H - layout (inner layer 3)

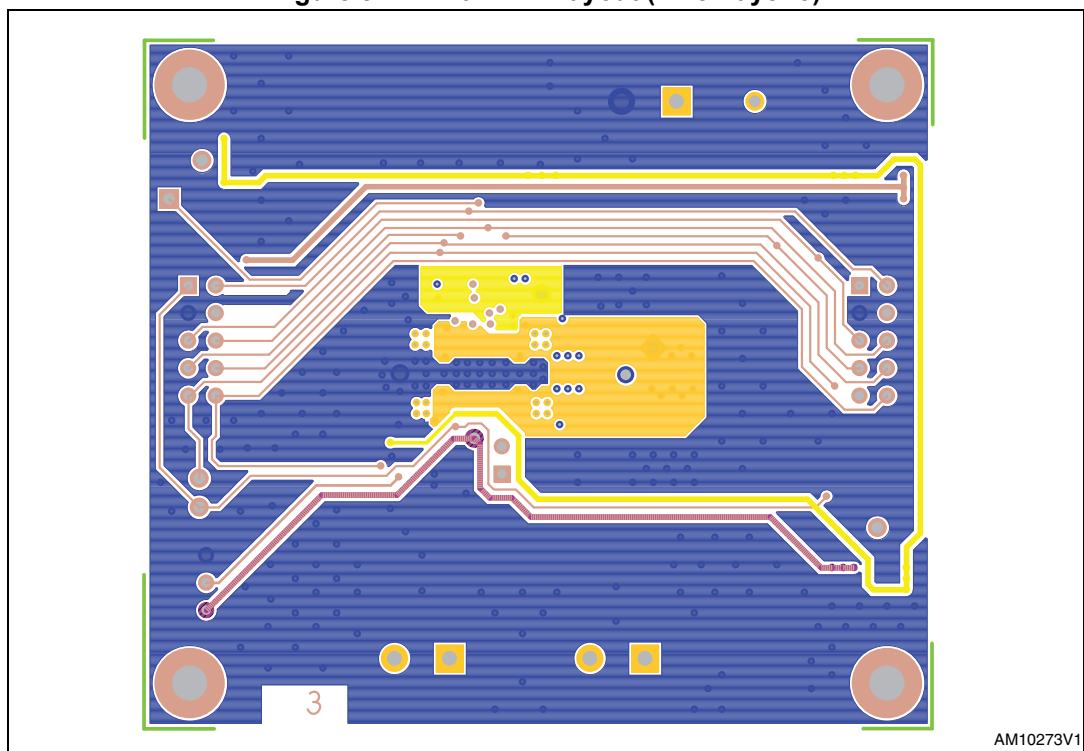
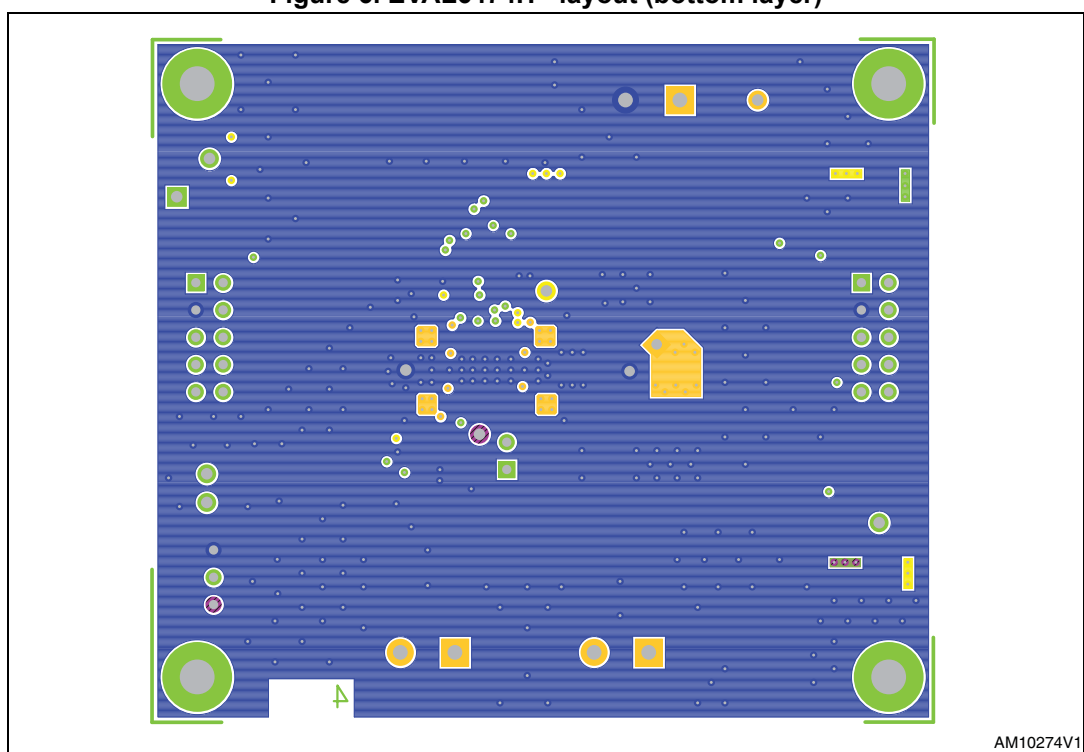
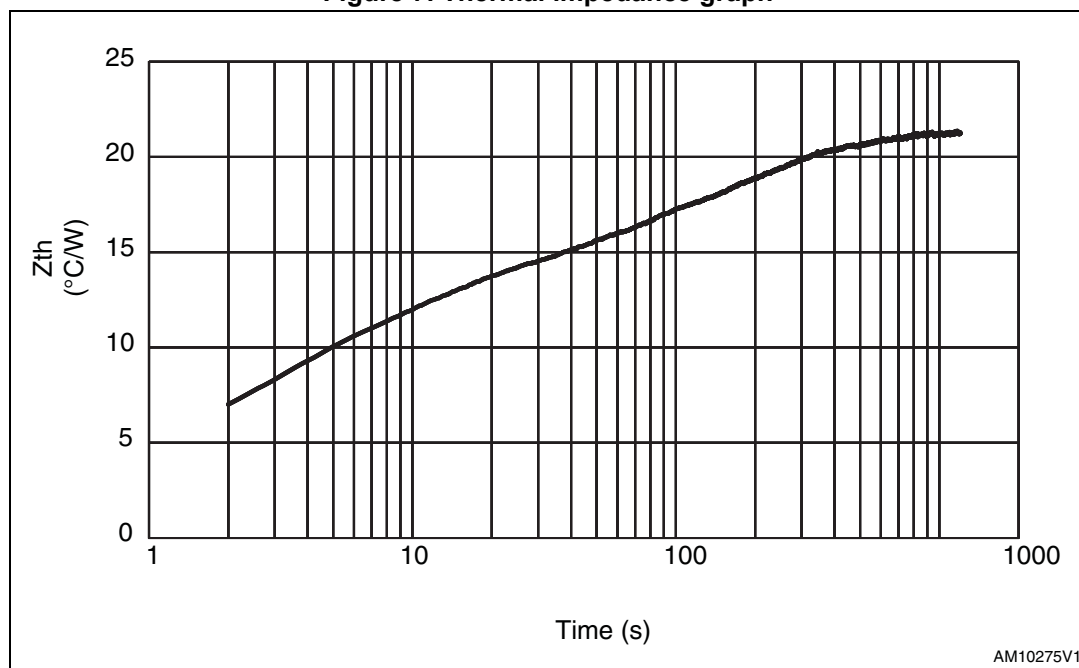


Figure 6. EVAL6474H - layout (bottom layer)



## Thermal data

Figure 7. Thermal impedance graph





## Revision history

**Table 5. Document revision history**

| Date        | Revision | Changes                                                                                                                                                                                       |
|-------------|----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 02-Feb-2012 | 1        | Initial release.                                                                                                                                                                              |
| 18-Mar-2015 | 2        | Replaced easySPIN by SPIN in <a href="#">Section : Description on page 1</a> .<br>Removed Figure 3. EVAL6474H - layout (silk screen) from page 6.<br>Minor modifications throughout document. |

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