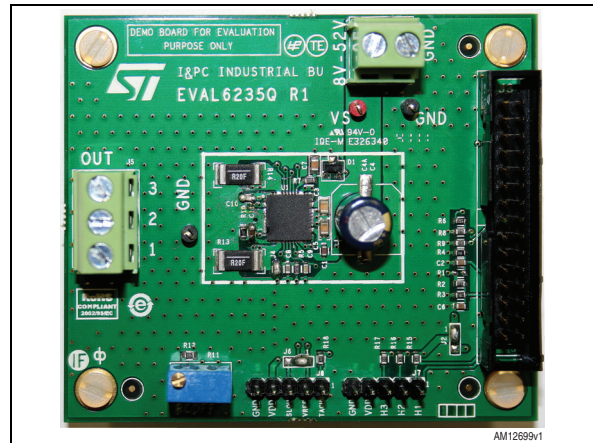


3-phase BLDC motor driver mounting the L6235Q

Data brief

Features

- Voltage range from 8 V to 52 V
- Phase current up to 2.5 A r.m.s.
- Adjustable PWM current control OFF-time
- Logic inputs 5 V / 3.3 V compliant
- Hall sensor inputs
- External speed loop
- Small application footprint with high thermal performance
- Suitable for use in combination with PractiSPIN™ 2 software



Description

The EVAL6235Q is a 3-phase BLDC motor driver board that allows the user to test the L6235Q functions.

The board can be driven using the STEVAL-PCC009V2 communication board and the PractiSPIN 2 evaluation software.

1 Board description

Table 1. EVAL6208Q electrical specifications

Parameter	Value
Supply voltage (VS)	8 to 52 V
Maximum output current (each phase)	2.5 Ar.m.s.
Low level logic input voltage	0 V
High level logic input voltage	5 V / 3.3 V ⁽¹⁾
Maximum VREF input voltage (J2 connector)	3.3 V
Switching frequency	Up to 100 kHz
Operating temperature	- 25 to +125 °C
L6235Q thermal resistance junction-to-ambient	TBD

1. Logic inputs are 3.3 V and 5 V compliant.

Figure 1. Trimmer, jumper and connector locations

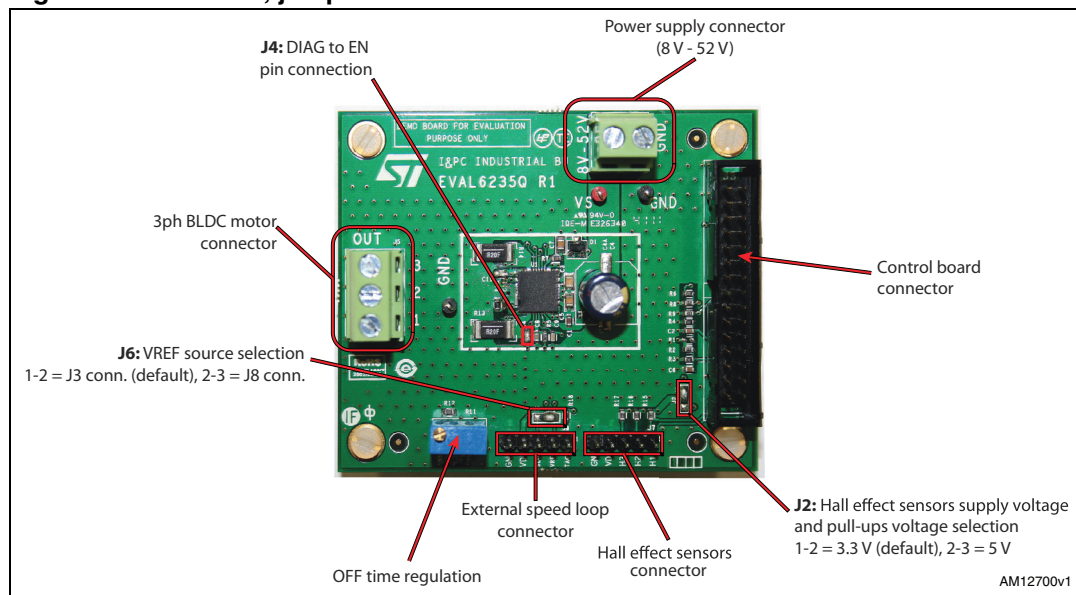


Table 2. Control board connector pinout (J3)

Pin	Type	Function
1	Power supply	5 V supply voltage
2	Ground	Ground
3	Logic output	Hall effect H1 signal (H1 input of L6235Q)
4	Logic input	Direction input (FW/REV input of L6235Q)
5	Logic output	Hall effect H3 signal (H3 input of L6235Q)
6	Logic input	Motor brake input (BRAKE input of L6235Q)
11	Analog input	Reference voltage for current control system
13	Ground	Ground
14	Supply voltage	3.3 V supply voltage
15	Logic output	Hall effect H2 signal (H2 input of L6235Q)
16	Logic input	Device enable input (EN input of L6235Q)
23	Ground	Ground
24	Analog output	Board identification system ID0
25	Analog output	Board identification system ID1
28	Ground	Ground
29	Logic output	Fault output (DIAG output of L6235Q)
30	Logic input	Hall effect H2 signal (H2 input of L6235Q)
Others	Unconnected	

Table 3. Hall effect sensors connector pinout (J7)

Pin	Type	Function
1	Logic input	Hall effect H1 signal (H1 input of L6235Q)
2	Logic input	Hall effect H2 signal (H2 input of L6235Q)
3	Logic input	Hall effect H3 signal (H3 input of L6235Q)
4	Power supply	Hall effect sensor supply voltage VDD (selected through J2 jumper)
5	Ground	Ground

Table 4. External speed loop connector pinout (J8)

Pin	Type	Function
1	Logic output	TACHO output from L6235Q
2	Analog output	Speed loop reference voltage from J3 connector
3	Analog input	Speed loop output to L6235Q VREF pin ⁽¹⁾
4	Power supply	Supply voltage VDD (selected through J2 jumper)
5	Ground	Ground

1. The J6 jumper must be properly set (closed 2-3).

Figure 2. EVAL6235Q - schematic

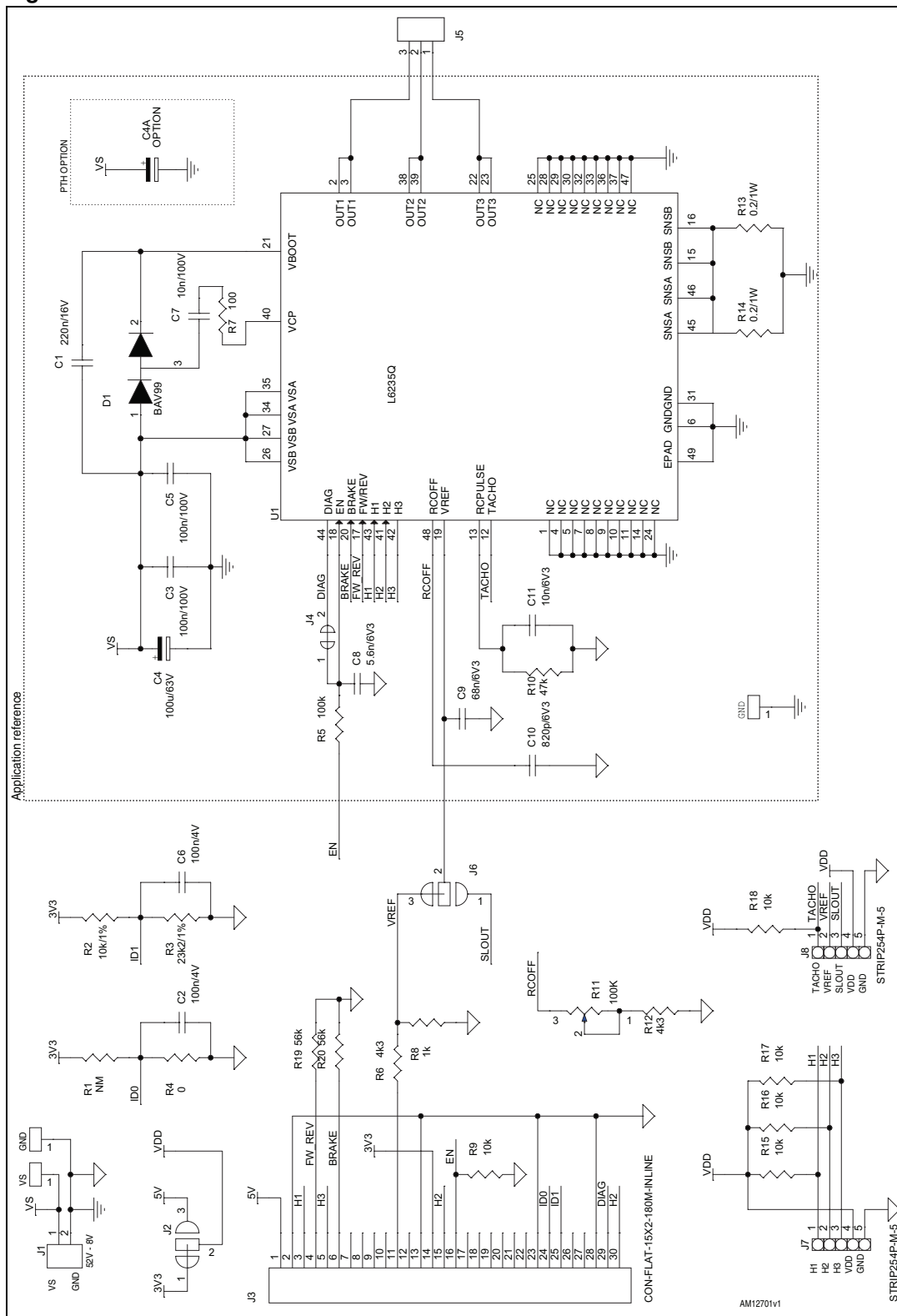


Table 5. EVAL6235Q - bill of material

Index	Quantity	Reference	Value	Package
1	1	C1	220 nF / 16 V	CAPC-0603
2	2	C2, C6	100 nF / 4 V	CAPC-0603
3	2	C3, C5	100 nF / 100 V	CAPC-0805
4	1	C4	100 μ F / 63 V	CAPE-R10H10
5	1	C4A	100 μ F / 63 V (option)	CAPE-R8H12-P35
6	1	C7	10 nF / 100 V	CAPC-0805
7	1	C8	5.6 nF / 6V3	CAPC-0603
8	1	C9	68 nF / 6V3	CAPC-0603
9	1	C10	820 pF / 6V3	CAPC-0603
10	1	C11	10 nF / 6V3	CAPC-0603
11	1	D1	BAV99	SOT23
12	1	J1	Screw connector 2 poles	MORSV-508-2P
13	2	J2, J6	Jumper - close 12	JP3SO
14	1	J3	Pol. IDC male header vertical 30 poles	CON-FLAT-15X2-180M
15	1	J4	Jumper - close	JP2SO
16	1	J5	Screw connector 3 poles	MORSV-508-3P
17	2	J7, J8	Pin strip header 1x5 poles	STRIP254P-M-5
18	1	R1	NM	RESC-0603
19	1	R2	10 k Ω / 1%	RESC-0603
20	1	R3	23.2 k Ω / 1%	RESC-0603
21	1	R4	0 Ω	RESC-0603
22	1	R5	100 k Ω	RESC-0603
23	2	R6, R12	4.3 k Ω	RESC-0603
24	1	R7	100 Ω	RESC-0603
25	1	R8	1 k Ω	RESC-0603
26	5	R9, R15, R16, R17, R18	10 k Ω	RESC-0603
27	1	R10	47 k Ω	RESC-0603
28	1	R11	100 k Ω	TRIMM-100x50x110-64W
29	2	R13, R14	0.4 Ω / 1 Ω	RESC-2512
30	2	R19, R20	56 k Ω	RESC-0603
31	1	TP1	TPTH-RING-1 mm red	TH
32	2	TP2, TP3	TPTH-RING-1 mm black	TH
33	1	U1	L6235Q	QFN7x7_48

Figure 6. EVAL6235Q - layout (inner layer 3)

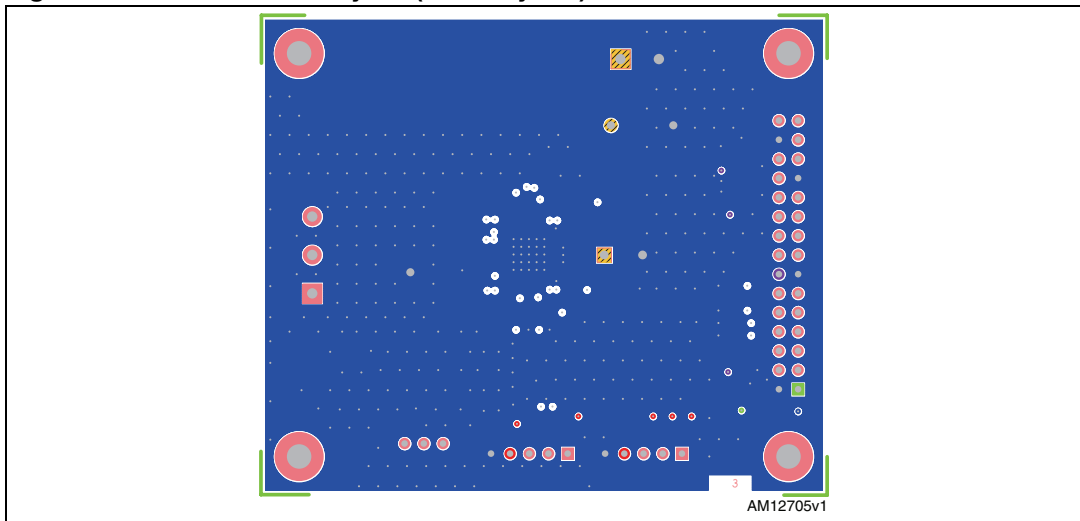
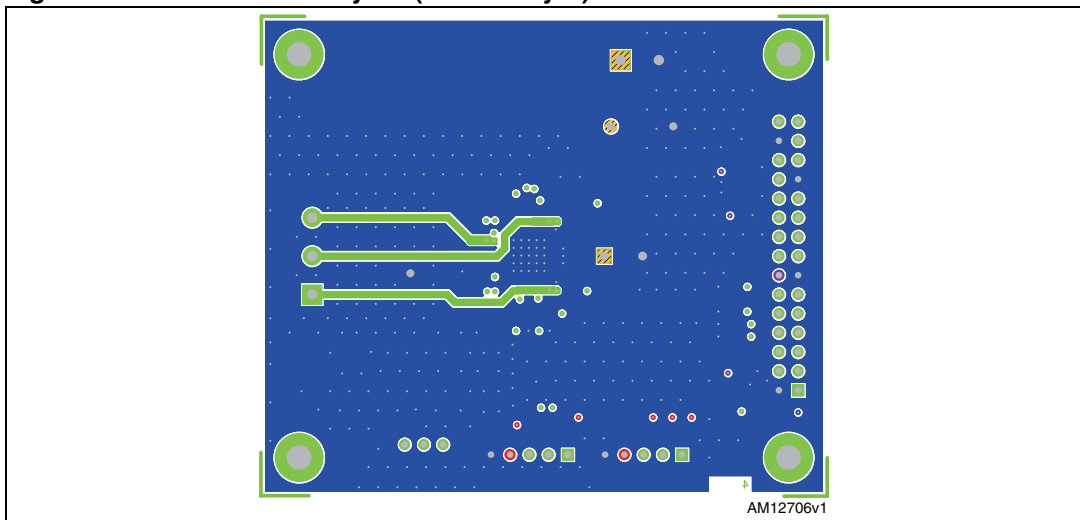


Figure 7. EVAL6235Q - layout (bottom layer)



2 Revision history

Table 6. Document revision history

Date	Revision	Changes
11-Apr-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



Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[STMicroelectronics:](#)

[EVAL6235Q](#)