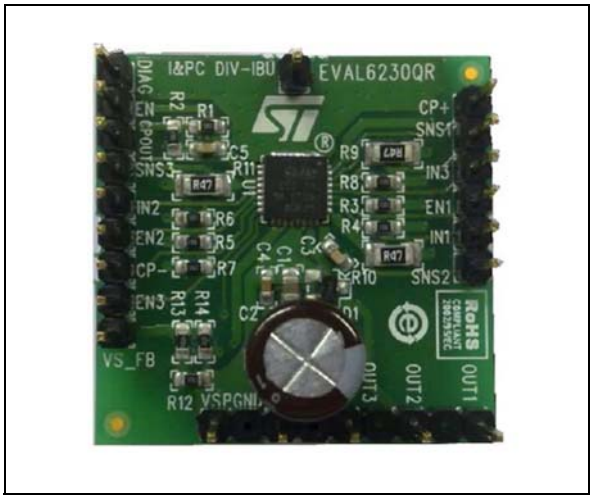
EVAL6230QR

Demonstration board mounting the L6230Q three-phase brushless DC motor driver

Data brief



Features

- Operating supply voltage from 8 to 52 V
- 2.8 A output peak current (1.4 $A_{r.m.s.}$)
- $R_{DS(on)}$ 0.73 Ω typ. value @ T_J = 25 °C
- Integrated fast freewheeling diodes
- Operating frequency up to 100 kHz
- Non-dissipative overcurrent detection and protection
- Cross conduction protection
- Diagnostic output
- Uncommitted comparator
- Thermal shutdown
- Undervoltage lockout

Description

The L6230Q is a DMOS fully integrated three-phase motor driver with overcurrent protection, optimized for FOC applications thanks to the independent current sensing.

Realized in BCD multipower technology, the L6230Q features a non-dissipative overcurrent protection on the high-side power MOSFETs and thermal shutdown.

An uncommitted comparator with open-drain output is available.

1 Board description

Table 1. EVAL6230QR: electrical specifications (recommended values)

Parameter	Value
Supply voltage range (VS)	8 to 52 Vdc
Output current rating (OUTx)	up to 1.4 $A_{r.m.s.}$
Switching frequency	up to 100 kHz
Input and enable voltage range	0 to + 5 V
Comparator input voltage range	0 to + 5 V
L6230Q thermal resistance junction-to-ambient	42 °C/W

Figure 1. EVAL6230QR connector description

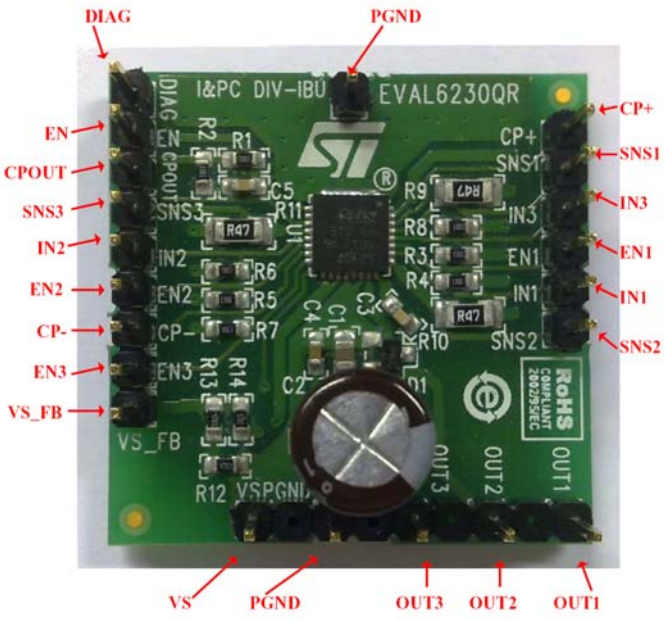


Table 2. EVAL6230QR: pin connections

Name	Type	Function
VS	Power supply	Power supply voltage
PGND	Ground	Power ground terminal
VS_FB	Analog output	Supply voltage feedback (1/115 divider ratio)
EN	Logic input	Chip enable (active ‘H’). When ‘L’ switches OFF all power DMOS.
IN1	Logic input	Logic input half-bridge 1
EN1	Logic input	Enable input half-bridge 1
IN2	Logic input	Logic input half-bridge 2
EN2	Logic input	Enable input half-bridge 2
IN3	Logic input	Logic input half-bridge 3
EN3	Logic input	Enable input half-bridge 3
DIAG	Open-drain output	Diagnostic pin. When ‘L’ signals an overcurrent or overtemperature event.
CPOUT	Open-drain output	Open-drain output of internal comparator
CP-	Analog input	Inverting input of internal comparator
CP+	Analog input	Non-inverting input of internal comparator
SENSE1	Analog output	Half-bridge 1 source pin
SENSE2	Analog output	Half-bridge 2 source pin
SENSE3	Analog output	Half-bridge 3 source pin
OUT1	Power output	Output half-bridge 1
OUT2	Power output	Output half-bridge 2
OUT3	Power output	Output half-bridge 3

2 Schematic and bill of material

Figure 2. EVAL6230QR schematic diagram

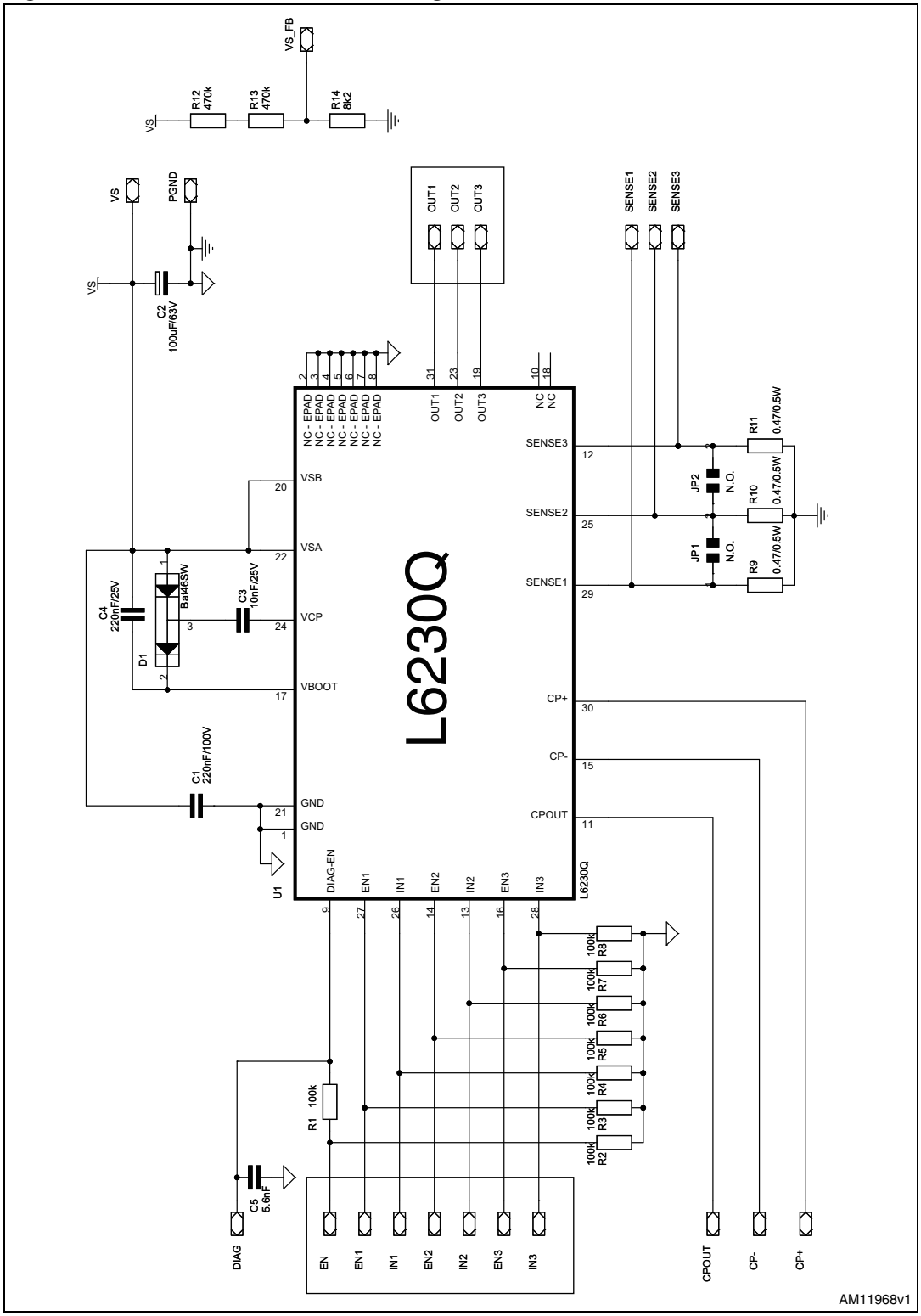


Table 3. EVAL6230QR part list

Part reference	Part value	Part description
C1	220 nF/100 V	Capacitor
C2	100 µF/63 V	Capacitor
C3	10 nF/25 V	Capacitor
C4	220 nF/25 V	Capacitor
C5	5.6 nF	Capacitor
D1	BAT46SW	Diodes
R1 to R8	100 kΩ 5 % 0.25 W	Resistor
R9, R10, R11	0.47 Ω - 0.5 W	Resistor
R12, R13	470 kΩ 5 % 0.25 W	Resistor
R14	8.2 kΩ 5 % 0.25 W	Resistor
U1	L6230Q	Three-phase BLDC motor driver in VFQFPN5x5

Figure 3. EVAL6230QR component placement

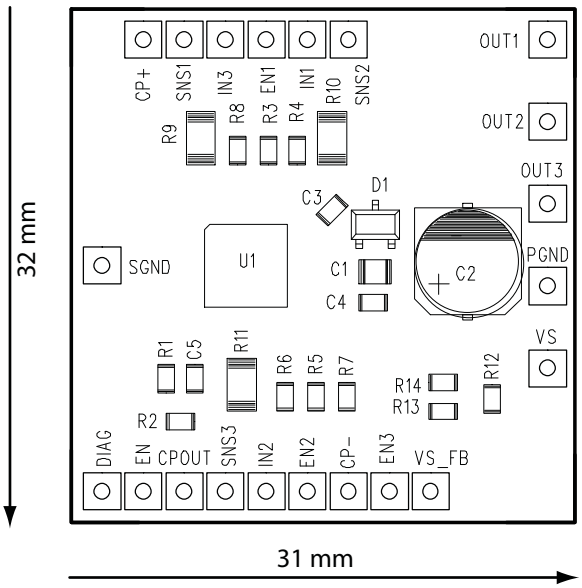


Figure 4. EVAL6230QR top layer layout

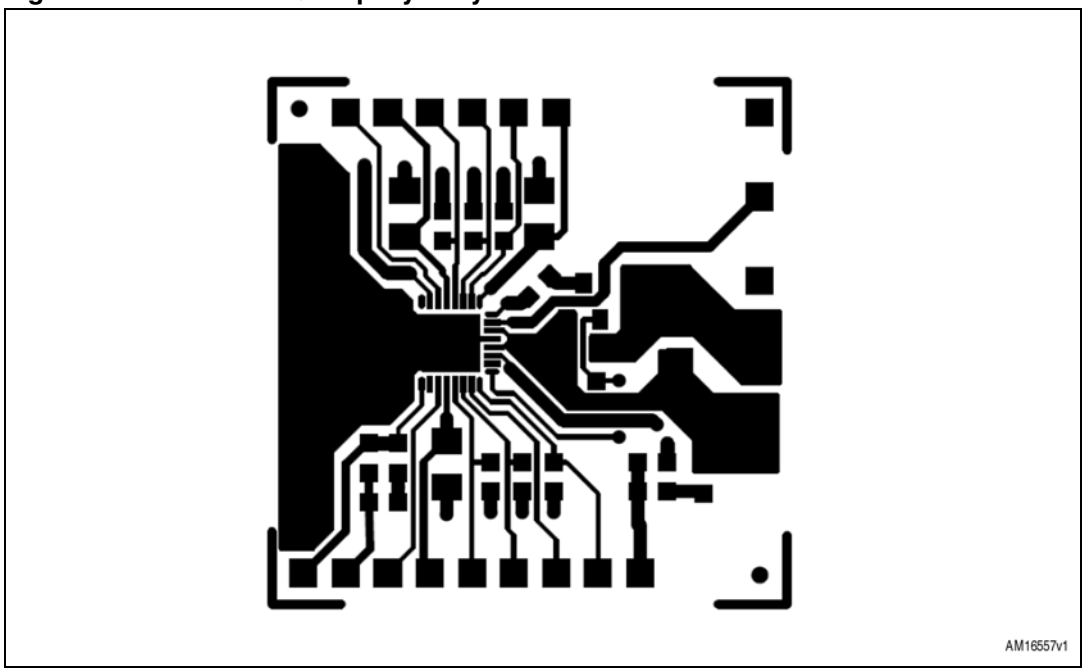
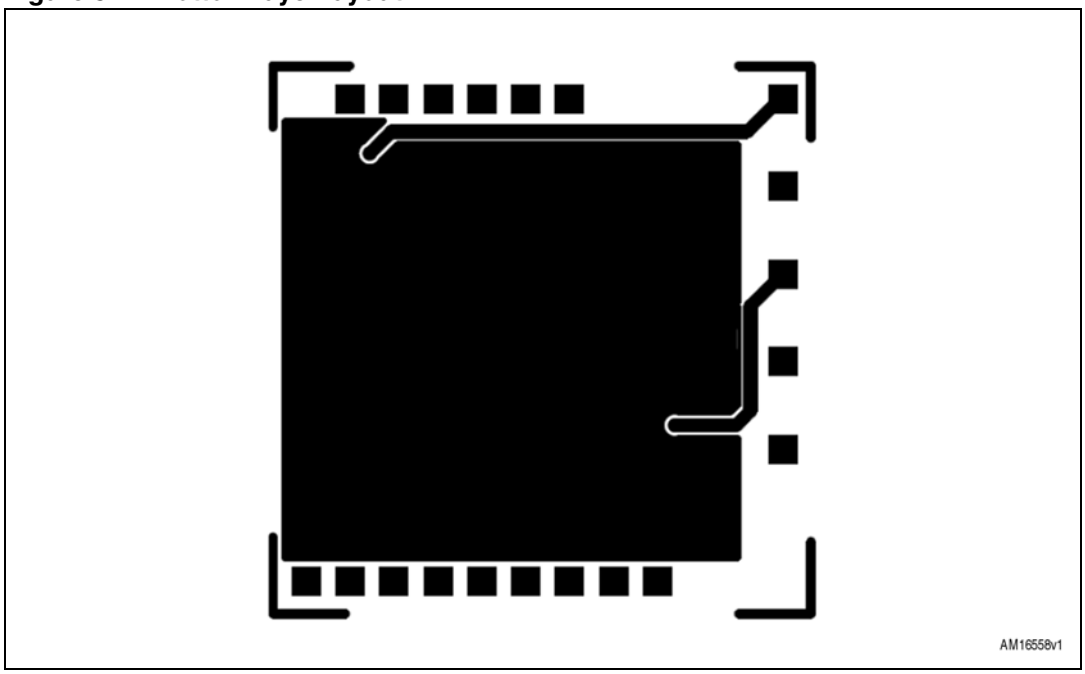


Figure 5. Bottom layer layout



3 Revision history

Table 4. Document revision history

Date	Revision	Changes
15-Jan-2013	1	Initial release.

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