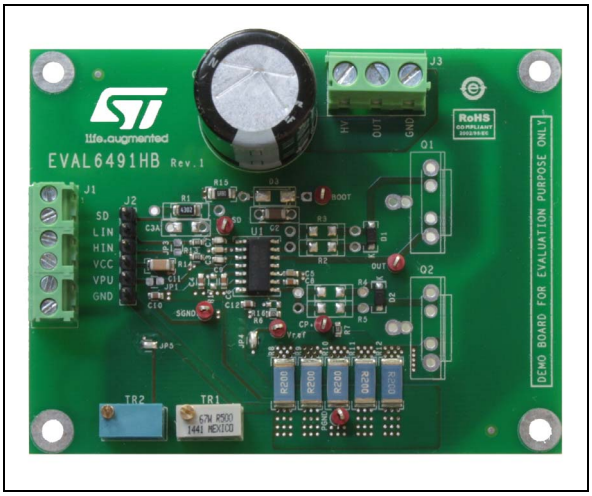
EVAL6491HB

Demonstration board for L6491 gate driver with smartSD

Data brief



Features

- High voltage rail up to 600 V
- dV/dt immunity: 50 V/ns in full temperature range
- Driver current capability: 4 A source/sink
- Comparator for fault protections
- Smart shutdown function
- Integrated bootstrap diode
- Adjustable deadtime
- Interlocking function
- Switching times 15 ns rise/fall with 1 nF load
- 3.3 V, 5 V TTL/CMOS inputs with hysteresis
- Compact and simplified layout
- Bill of material reduction
- Effective fault protection
- Flexible, easy and fast design

Description

The L6491 is a high voltage device manufactured with the BCD6 “OFF-LINE” technology. It is a single-chip half-bridge gate driver for N-channel power MOSFETs or IGBTs, with a 4 A sink and source current capability.

The high-side (floating) section is designed to stand a voltage rail up to 600 V. The logic inputs are CMOS/TTL compatible down to 3.3 V for easy interfacing a microcontroller or DSP.

An integrated comparator is available for fast overcurrent protection, and is also suited for other functions such overtemperature, etc.

The EVAL6491HB board allows evaluating all of the L6491 features while driving a power switch with voltage rating up to 600 V in TO-220 or TO-247 packages.

The board allows easily selecting and modifying the values of relevant external components in order to ease driver's performance evaluation under different applicative conditions and fine pre-tuning of final application's components.

Schematic diagram

Figure 1. EVAL6491HB circuit schematic

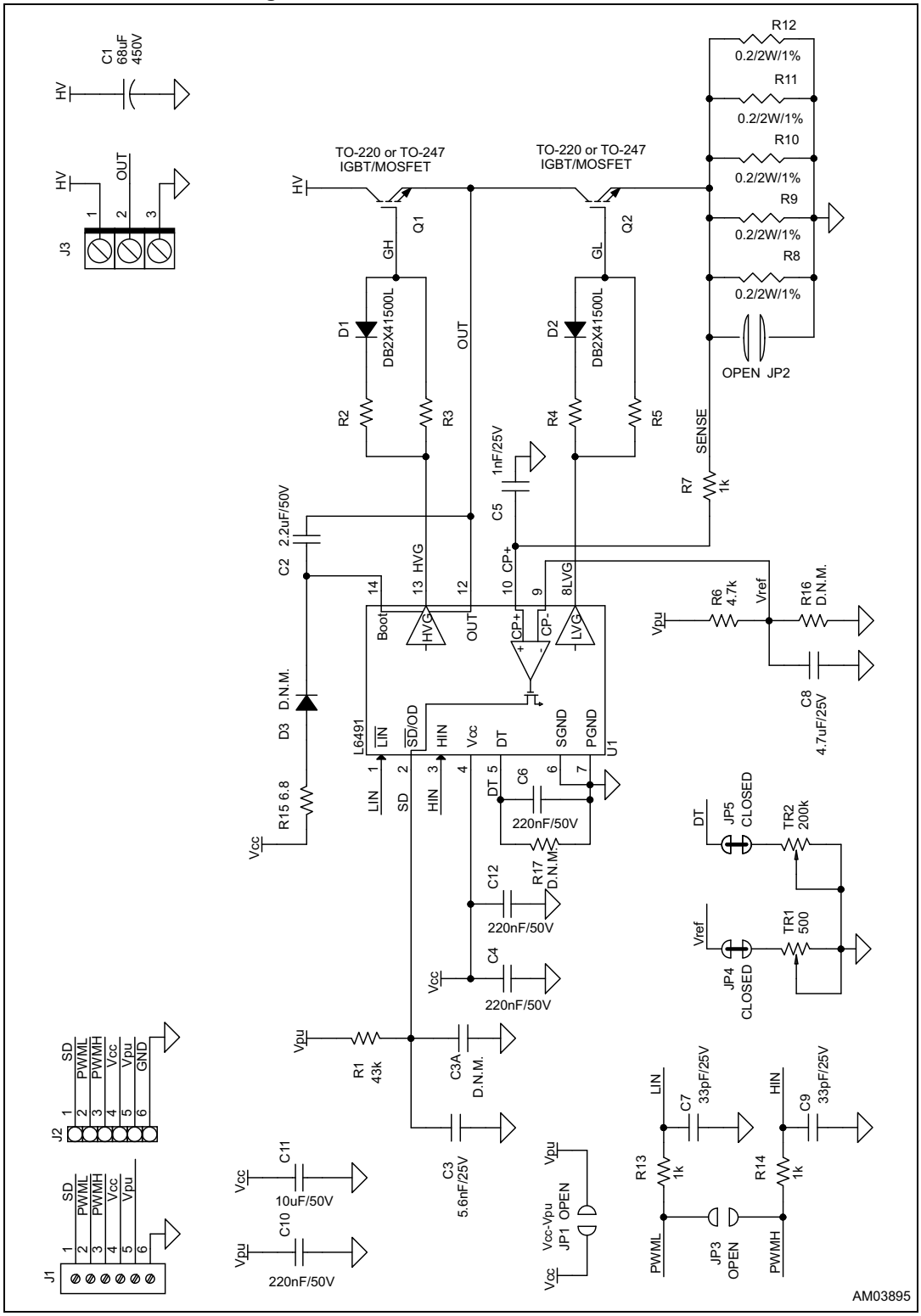


Table 1. L6491 - bill of material

Part reference	Part value	Part description
C1	68 µF / 450 V	Electrolytic capacitor, 68 µF 450 V 20% radial P 7.5 mm 18 x 25
C2	2.2 µF / 50 V	Ceramic capacitor, SMT 1206 or T. H.
C4, C6, C10, C12	220 nF / 50 V	Ceramic capacitor, SMT 0603
C5	1 nF / 25 V	Ceramic capacitor, SMT 0603
C7,C9	33 pF / 25 V	Ceramic capacitor, SMT 0603
C8	4.7 µF / 25 V	Ceramic capacitor, SMT 0603
C11	10 µF / 50 V	Ceramic capacitor, SMT 1206
C3A	D. N. M.	Ceramic capacitor, SMT 1206 or T. H.
C3	5.6 nF / 25 V	Ceramic capacitor, SMT 0603
D1,D2	DB2X41500L	Diode Schottky 40 V, 3 A, SOD-123
D3	D.N.M.	DO-41 or SMA
J1	3 x GIXO 720-02-1 or similar	Conn. term. block T. H. 6 POS 3.5 mm
J2	FCI 68000-406HLF or similar	Conn. header 6 POS 2.54 mm STR TIN
J3	GIXO 740-03-1 or similar	Conn. term. block T.H. 3 POS 5.0 mm
JP1, JP2, JP3	Jumper - OPEN	SMT jumper
JP4, JP5	Jumper - CLOSED	SMT jumper
Q1,Q2	To be selected by customer	IGBT/MOSFET, TO-220 or TO-247
R1	43 kΩ	Resistor, SMT 1206 or T. H.
R2, R4, R3, R5	To be selected by customer	Resistor, SMT 1206 or T. H.
R15	6.8 Ω	Resistor, SMT 1206
R6	4.7 kΩ	Resistor, SMT 0603
R7, R13, R14	1 kΩ	Resistor, SMT 0603
R16, R17	D.N.M.	Resistor, SMT 0603
R8, R9, R10, R11, R12	0.2 Ω, 1%, 2 W	Resistor, SMT 2512
TP1, TP2, TP3, TP4, TP5, TP6, TP7	RS 200-207 or similar	PCB test terminal 1 mm
TR1	BI Technologies 67WR500LF or similar	Trimmer 500 Ω, 0.5 W, T. H.
TR2	Murata PV36W204C01B00 or similar	Trimmer 200 kΩ, 0.5 W, T. H.
U1	L6491	High voltage high and low-side gate driver, SO-14

Figure 2. EVAL6491HB - layout (top layer)

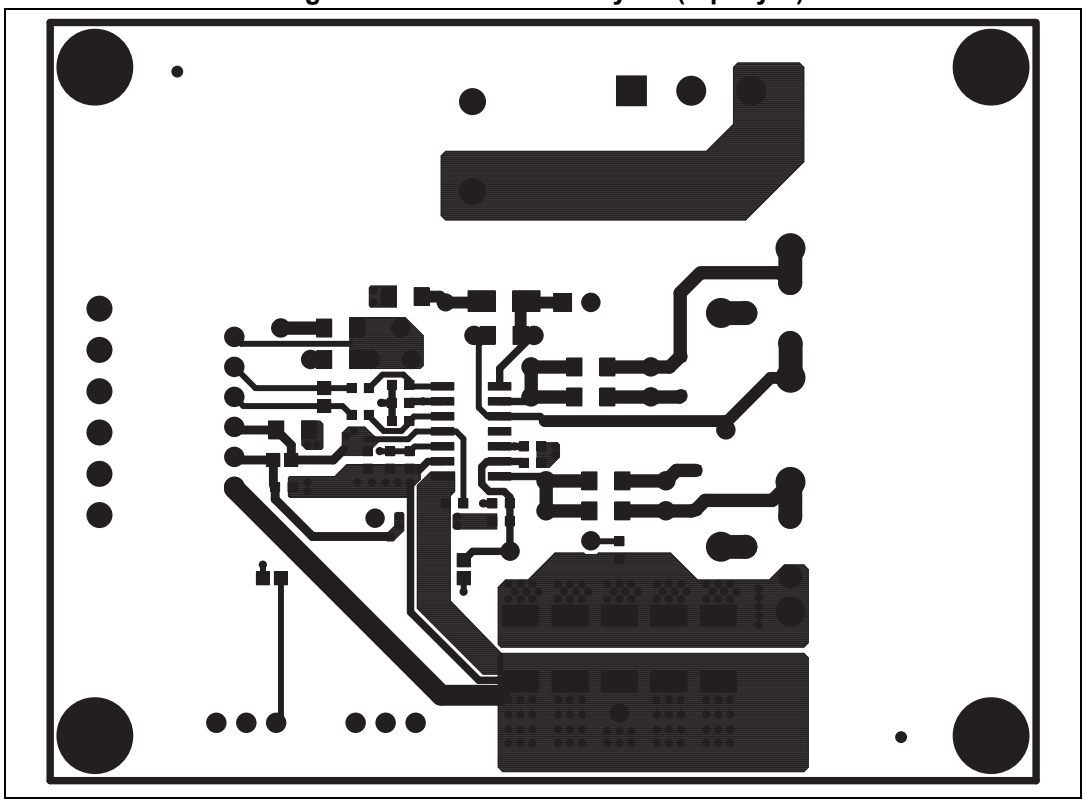


Figure 3. EVAL6491HB - layout (bottom layer)

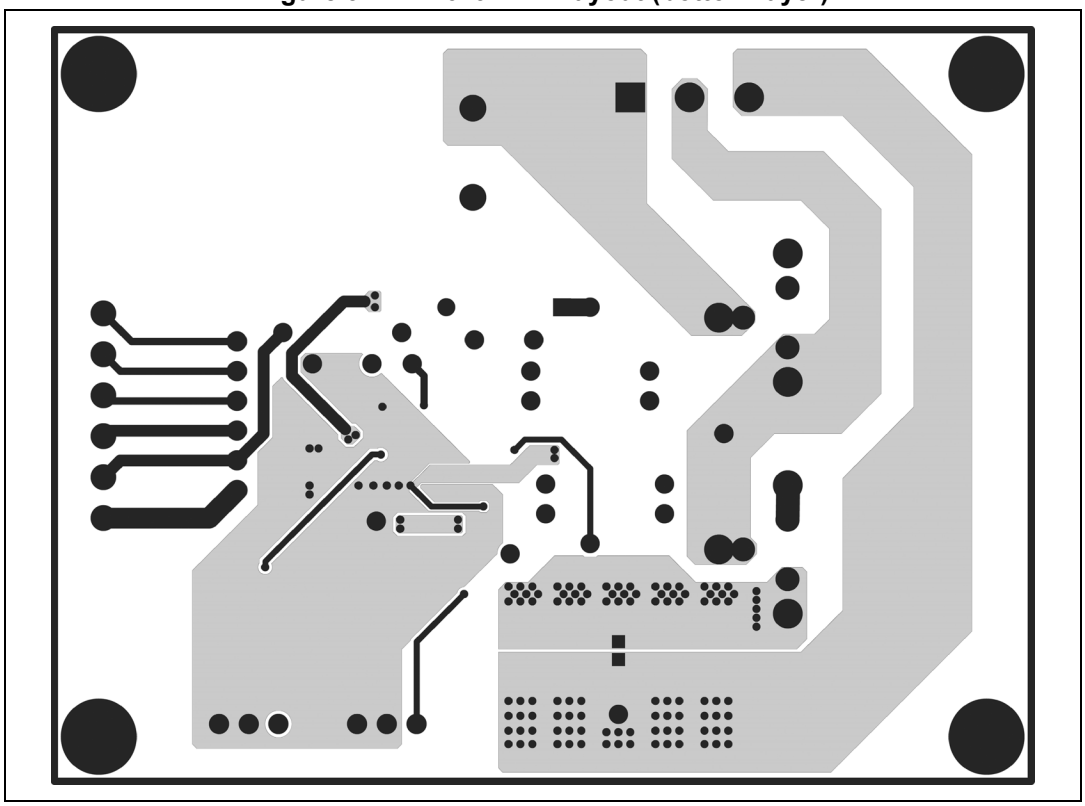
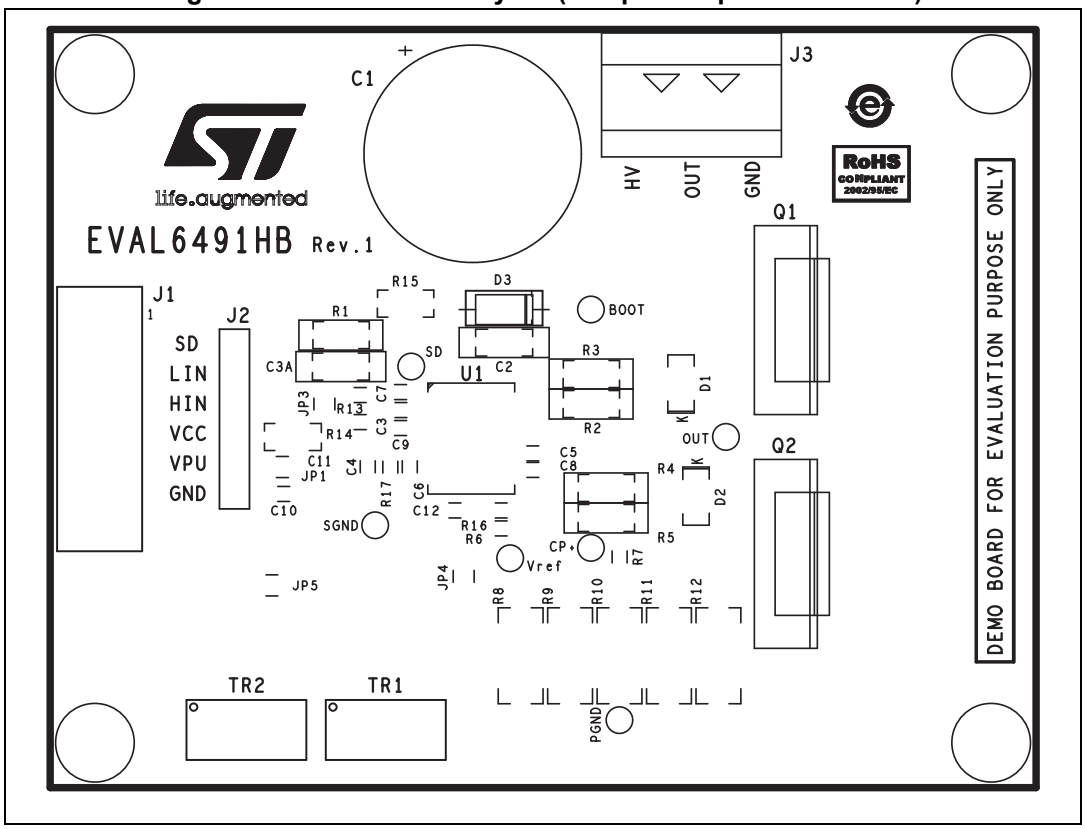


Figure 4. EVAL6491HB - layout (component placement view)



Revision history

Table 2. Document revision history

Date	Revision	Changes
09-Apr-2015	1	Initial release.