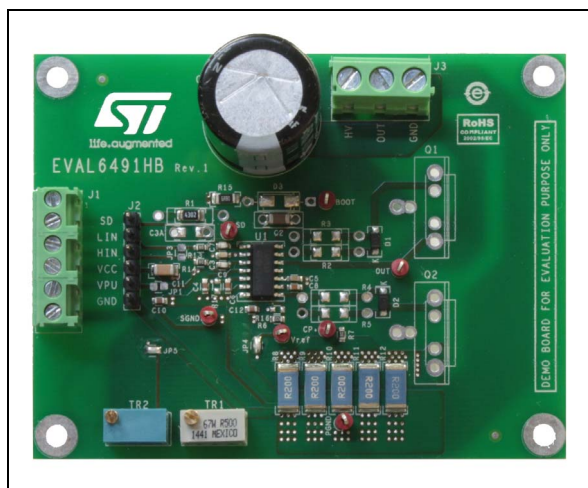


## Demonstration board for L6491 gate driver with smartSD

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.

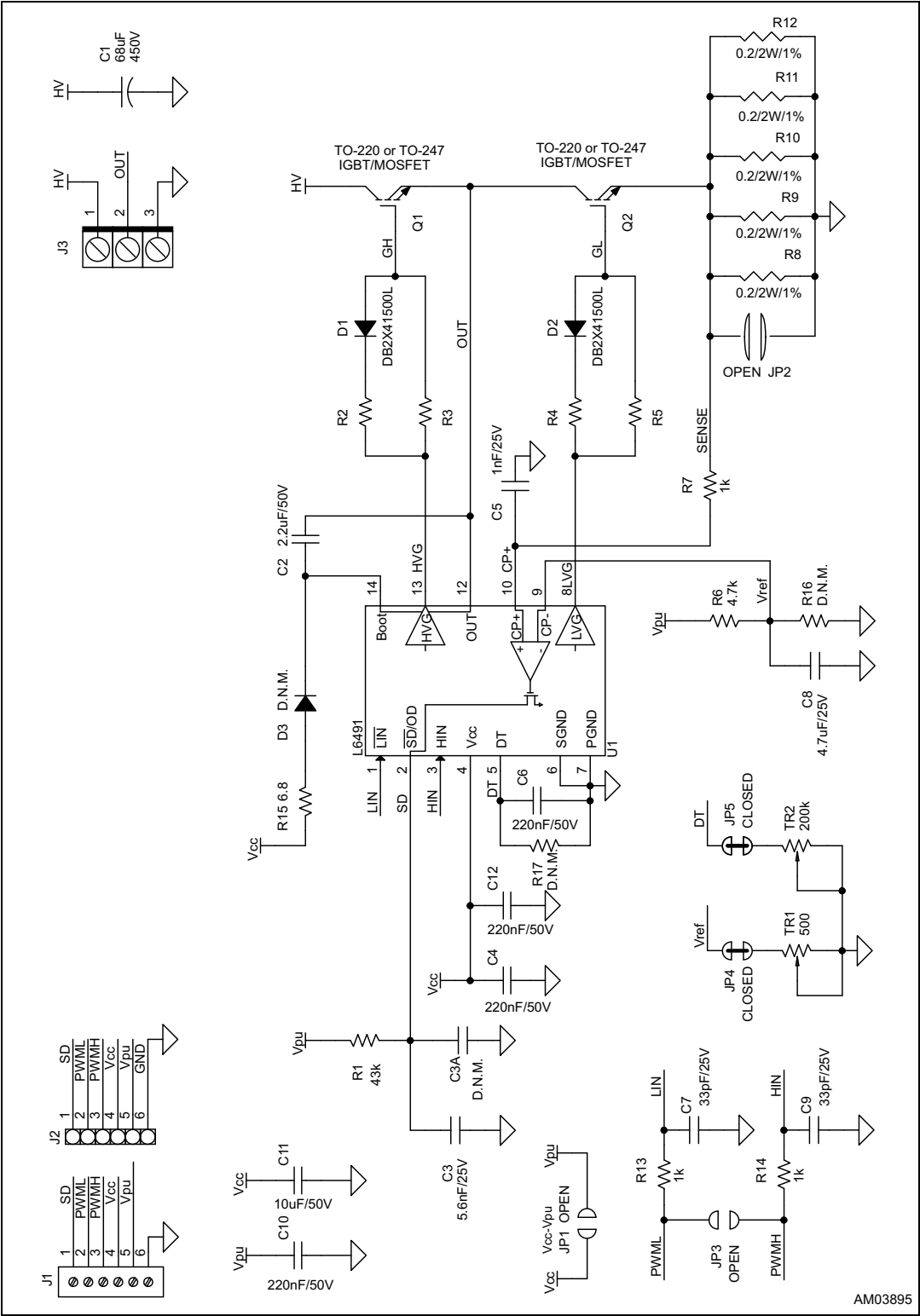
An integrated comparator is available for fast overcurrent protection, and is also suited for other functions such overtemperature, etc.

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



AM03895



Table 1. L6491 - bill of material

| Part reference                    | Part value                           | Part description                                                     |
|-----------------------------------|--------------------------------------|----------------------------------------------------------------------|
| C1                                | 68 $\mu$ F / 450 V                   | Electrolytic capacitor, 68 $\mu$ F 450 V 20% radial P 7.5 mm 18 x 25 |
| C2                                | 2.2 $\mu$ F / 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 $\mu$ F / 25 V                   | Ceramic capacitor, SMT 0603                                          |
| C11                               | 10 $\mu$ F / 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 k $\Omega$                        | Resistor, SMT 1206 or T. H.                                          |
| R2, R4, R3, R5                    | To be selected by customer           | Resistor, SMT 1206 or T. H.                                          |
| R15                               | 6.8 $\Omega$                         | Resistor, SMT 1206                                                   |
| R6                                | 4.7 k $\Omega$                       | Resistor, SMT 0603                                                   |
| R7, R13, R14                      | 1 k $\Omega$                         | Resistor, SMT 0603                                                   |
| R16, R17                          | D.N.M.                               | Resistor, SMT 0603                                                   |
| R8, R9, R10, R11, R12             | 0.2 $\Omega$ , 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 $\Omega$ , 0.5 W, T. H.                                  |
| TR2                               | Murata PV36W204C01B00 or similar     | Trimmer 200 k $\Omega$ , 0.5 W, T. H.                                |
| U1                                | L6491                                | High voltage high and low-side gate driver, SO-14                    |

Figure 2. EVAL6491HB - layout (top layer)

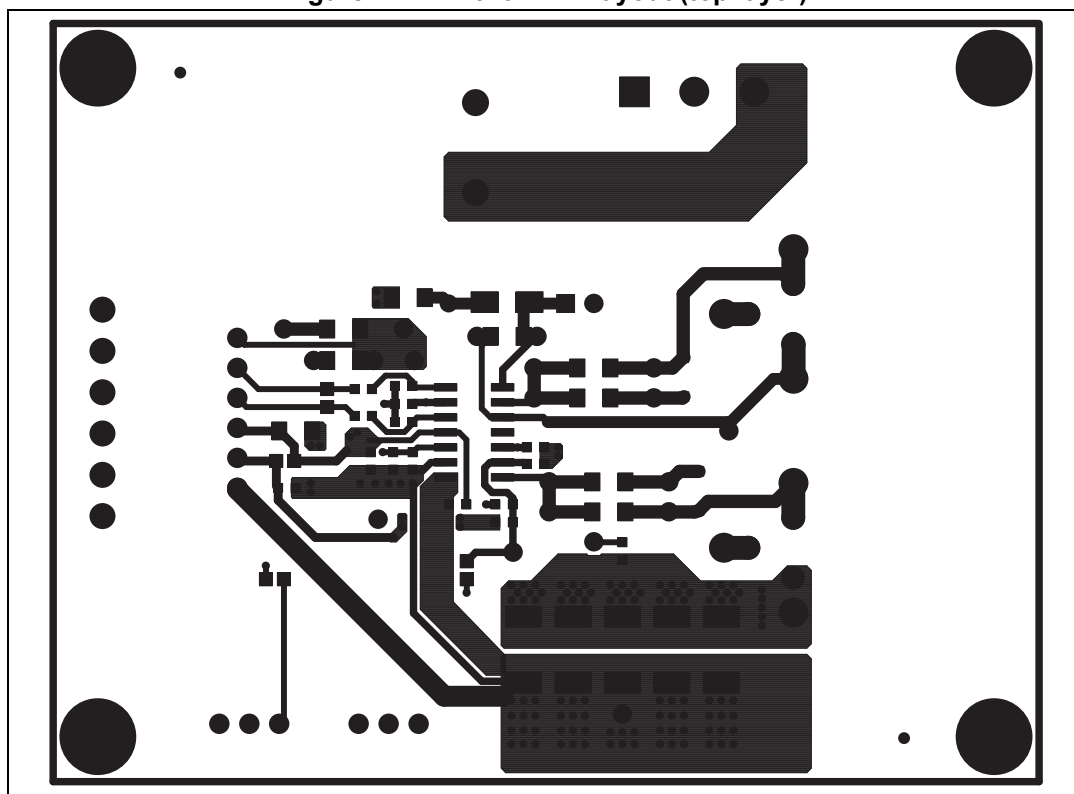


Figure 3. EVAL6491HB - layout (bottom layer)

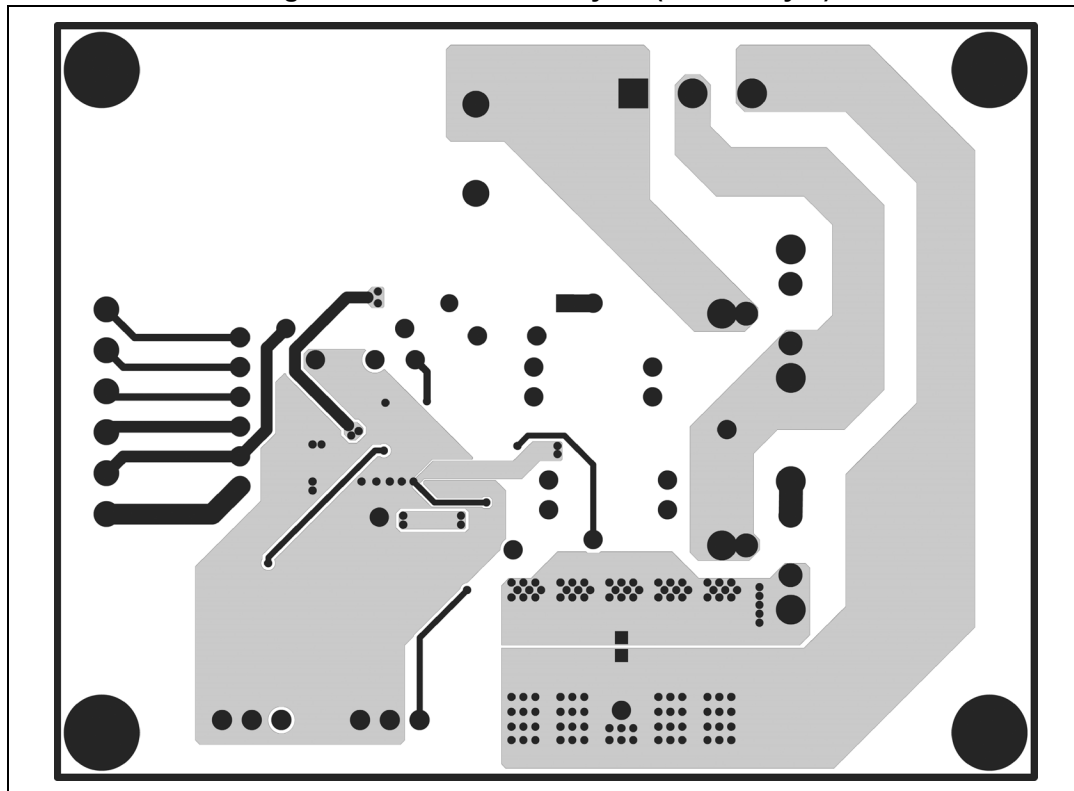
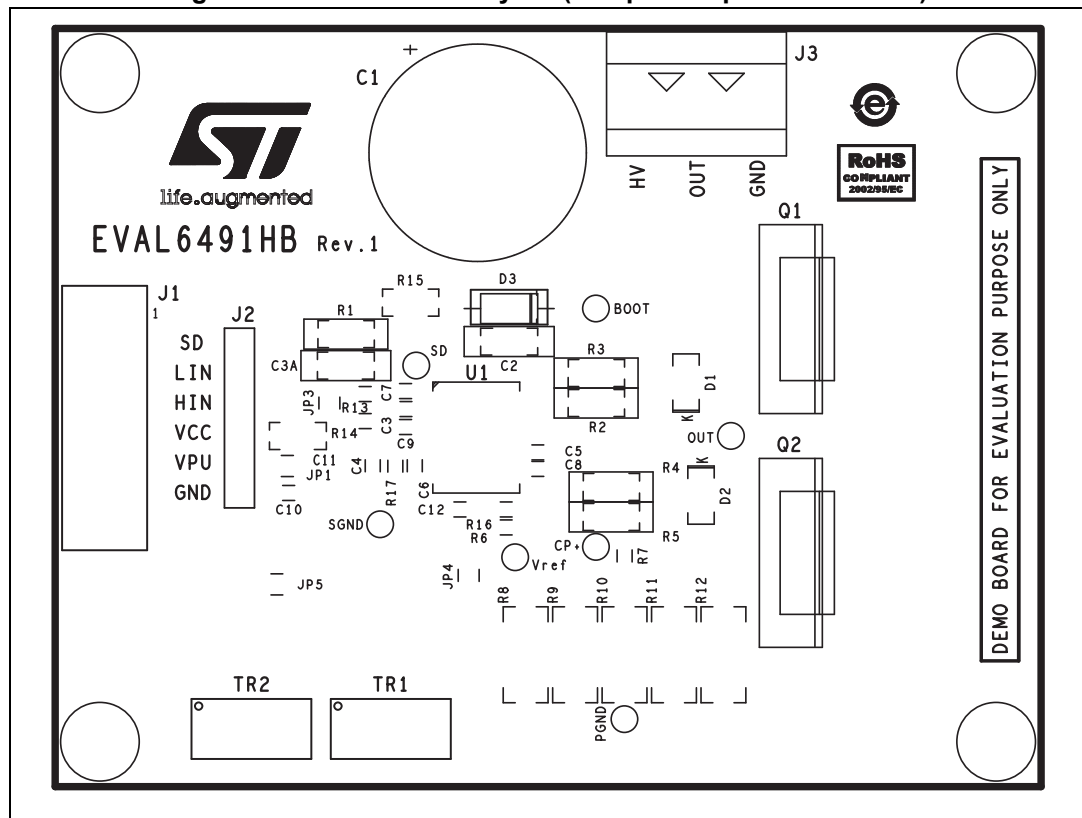


Figure 4. EVAL6491HB - layout (component placement view)



Revision history

Table 2. Document revision history

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



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