

EVALSTDRV600HB8

Demonstration board kit for L638xE and L639x high voltage gate

Data brief



Features

- Half-bridge configuration
- High voltage rail up to 600 V
- Includes samples of each compatible gate driver in SO8 package
 - L6385E, L6387E, L6388E, L6389E,
 - L6395, L6398, L6399
- Compatible with MOSFETs/IGBTs in
 - DPAK, D2PAK, TO-220, TO-220FP
- dV/dt transient immunity ± 50 V/ns in full temperature range
- · Integrated bootstrap diode
- Dedicated high- and low-side driving inputs
- Compact and simplified layout
- Gate drivers in the kit features different functionalities and characteristics
 - UVLO on both high-side and low-side
 - Internal deadtime, or no deadtime
 - Interlocking for anti cross-conduction protection
 - Ability to drive asymmetrical half-bridges and switched reluctance motors
 - Active high or active low LIN for single input gate driving

Description

The L638xE and L639x are high voltage devices manufactured with the BCD™ "offline" technology. They are single chip half-bridge gate drivers for N-channel power MOSFET or IGBT.

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 the easy interfacing microcontroller and up to 15 V for Hall-effect interfaces.

The integrated bootstrap diode allows a more compact and cost-effective design, but the use of the external diode is still possible in case of specific requirements.

The EVALSTDRV600HB8 contains 2 samples in the SO8 package for each of the compatible gate drivers, and allows evaluating all of the gate drivers features and functionalities while driving a half-bridge power stage based on N-channel MOSFETs or IGBTs in several different packages and with voltage rating up to 600 V.

Essential passive components such as the filtering and bootstrap capacitor are already mounted on the PCB, while the gate driving network shall be populated depending on the selected power switch.

Passive components footprints are compatible with both SMT and T.H. components, so they allow a fast and easy configuration and modification.

Supported devices EVALSTDRV600HB8

1 Supported devices

The EVALSTDRV600HB8 board supports several high voltage high- and low-side driver devices all in the SO8 package.

Table 1. Supported devices and characteristics

| Part name | Max. supply voltage | Current capability sink/source | 3.3 V compatible inputs | UVLO on V _{CC} | UVLO on V _{BO} | Deadtime | Interlocking |
|-----------------------|---------------------|--------------------------------------|-------------------------|----------------------------|----------------------------|----------|--------------|
| L6385ED | 17 V | 650 mA 400 mA | NO | ON 9.6 V OFF 8.3 V | ON 9.5 V OFF 8.2 V | NO | NO |
| L6387ED | 17 V | 650 mA 400 mA | NO | ON 6.0 V OFF 5.5 V | NO | NO | YES |
| L6388ED | 17 V | 650 mA 400 mA | YES | ON 9.6 V OFF 8.3 V | ON 9.5 V OFF 8.2 V | 320 ns | YES |
| L6389ED | 17 V | 650 mA 400 mA | YES | ON 9.6 V OFF 8.3 V | ON 9.5 V OFF 8.2 V | 470 ns | YES |
| L6395D | 20 V | 430 mA 290 mA | YES | ON 9.5 V OFF 8.8 V | ON 8.6 V OFF 8.0 V | NO | NO |
| L6398D ⁽¹⁾ | 20 V | 430 mA 290 mA | YES | ON 9.5 V OFF 8.0 V | ON 9.0 V OFF 8.0 V | 320 ns | YES |
| L6399D | 20 V | 430 mA 290 mA | YES | ON 9.5 V OFF 8.0 V | ON 9.0 V OFF 8.0 V | 320 ns | YES |

^{1.} LIN input active low, allows single input driving configuration.

EVALSTDRV600HB8 Schematic diagram

2 Schematic diagram

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Figure 1. EVALSTDRV600HB8 circuit schematic

Bill of material EVALSTDRV600HB8

3 Bill of material

Table 2. EVALSTDRV600HB8 - bill of material

| Part reference | Part value | Part description | |
|----------------|---------------|------------------------------------------------|--|
| C1 | N.M. | Electrolytic capacitor, D18, P7.62 | |
| C2 | 220 nF / 50 V | Ceramic capacitor, SMT 0805 (or 2.5 x 7.5 P05) | |
| C3, C4 | N.M. | Ceramic capacitor, SMT 0805 | |
| C5, C6 | 33 pF / 25 V | Ceramic capacitor, SMT 0603 | |
| C7 | N.M. | Ceramic capacitor, SMT 1206 | |
| C8 | 220 nF / 50 V | Ceramic capacitor, SMT 0603 | |
| C9 | 10 μF / 50 V | Electrolytic capacitor, D5, P2.5 | |
| D1, D2 | STPS0540Z | Schottky diode 40 V, 0.5 A, SOD-123 | |
| D3 | N. M. | DO41 or SMA | |
| J1 | MORSV350-4P | PCB terminal block 3.50 mm, 4 POS | |
| J2 | STRIP254P-M-4 | Male pin strip 2.54 mm, 4 POS | |
| J3 | MORSV508-3P | PCB terminal block 5.08 mm, 3 POS | |
| Q1, Q2 | N. M. | Power MOSFETs or IGBTs, DPAK, D2PAK, or TO220 | |
| R1 | 10 Ω | Resistor, SMT 0805 | |
| R2, R3, R4, R5 | N.M. | Resistor, SMT 0805 or T.H. P10 | |
| R6 | 2 Ω | Resistor, SMT 0603 | |
| R13, R14 | 1 kΩ | Resistor, SMT 0603 | |
| TP1, TP2 | TPTH-RING-1MM | PCB test terminal 1 mm | |
| U1 | N.M. | 600 V high- and low-side gate driver, SO8 | |

4 Layout and component placements

Figure 2. EVALSTDRV600HB8 - layout (top layer)

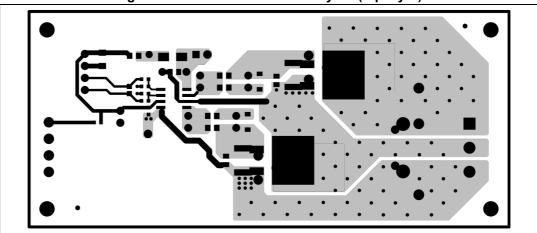


Figure 3. EVALSTDRV600HB8 - Layout (bottom layer)

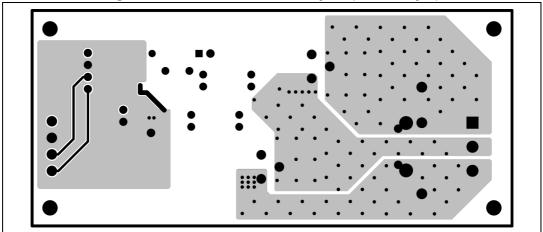
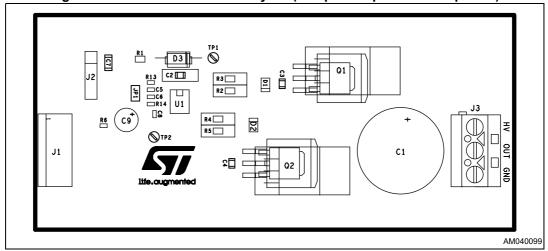


Figure 4. EVALSTDRV600HB8 - layout (component placement top view)



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Revision history EVALSTDRV600HB8

5 Revision history

Table 3. Document revision history

| Date | Revision | Changes | | |
|-------------|----------|------------------|--|--|
| 28-Apr-2017 | 1 | Initial release. | | |

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