

L639x: the MOSFET and IGBT *smartDRIVE*[™] solution

A new approach in 600 V IGBT and MOSFET gate drivers, delivers value to your application through sensible integration



Most applications are increasingly driven by performance, cost and efficiency requirements.

Based on its field proven high-voltage (600 V) IC technology, **STMicroelectronics' (ST) *smartDRIVE* L639x** family embeds a rich set of functionalities, including an integrated comparator for protection, an op amp suitable for current sensing (especially for field-oriented motor drive application), and an integrated bootstrap diode.

This is all meant to help reduce part count and the cost in your power conversion application, whether in a motor control, an electronic lighting ballast or a switch mode power supply design.

Energy efficiency, performance and cost are driving power-conversion applications across all market segments. ST's *smartDRIVE* L639x family offers a versatile, cost-effective solution for a broad range of applications, expanding ST's field-proven, gate-driver product portfolio.

Key features

- Half bridge configuration with up to 600 V ratings
- 270/-430 mA gate drive current capability
- Rich logic interface with full compatibility from 3.3 V CMOS yet 15 V tolerant
- On chip op amp for current sensing
- Comparator for protection with fast internal loop
- Integrated bootstrap diode
- Adjustable dead time
- SO/DIP 14 and SO/DIP 16 package

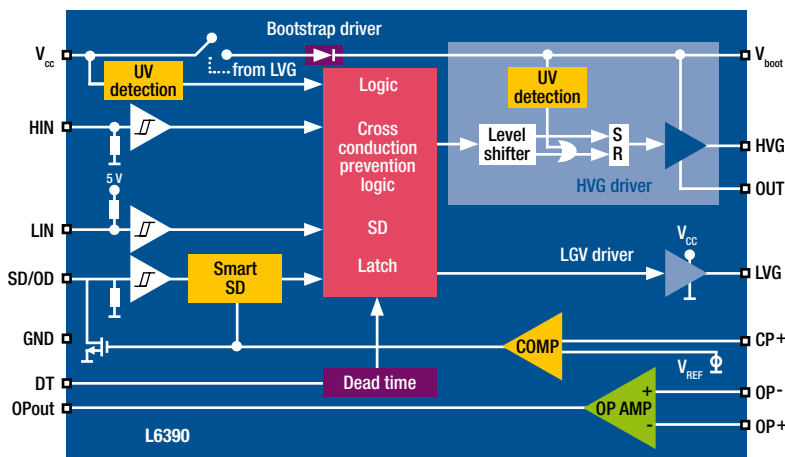
Main applications

- Home appliances: washing machines, dish washers, induction cooking ranges etc.
- HVAC systems
- Industrial drives, field-oriented and sensor-less control
- Pumps, fans, DC motors
- Lighting applications
- Plasma display panels
- LCD backlight section
- Power supplies

A sensible integration path has brought a number of board level must have functionalities on chip. An integrated comparator is coupled with a fast internal shutdown loop to implement an effective fault management strategy (patented). Protection features are completed with an integrated voltage monitor (under voltage lock out) on both ground referenced and floating supply. Using the integrated, externally set, dead time generator, shoot through in the bridge leg can be avoided in all conditions. This means board layout can be easily optimized while application robustness is greatly enhanced. In addition, current sensing and amplification functionalities found in each of the motor control applications (especially those field oriented), can be accomplished through the integrated, fully accessible op amp. An integrated bootstrap diode completes a suite designed to enable a considerable board level part count.

Simplification opportunities can also be found at the logic interface with the application microcontroller. Here are found separate out-of-phase, high-side and low-side and a shutdown input - driving off both high- and low-side power switches - all 3.3 V CMOS compatible but tolerant up to 15 V. Drive current capability has been carefully sized for applications up to 1.5 kW. Finally, knowing how noisy and harsh a typical power conversion application might be, critical attention has been given to the level shifting and signal decoding circuitry, thus enabling a full compatibility with fast transients generating high dV/dt, up to 50 V/ns on the half bridge mid point. The family comprises a variety of different implementations of the basic building blocks, creating a differentiated offer able to cope with specific requirements as found in a variety of power conversion applications.

L6390 block diagram



smartDRIVE family selection table

Part number	Current sink/source (mA)	Bootstrap voltage (V)	Supply voltage (V)	Input logic	Dead time	Smart SD	Anti shoot through logic	Comp	Op amp	Package
L6390	270/430	600	12 – 20	High-side/(negated) low-side	0.15 to 2.7	Y	Y	Y	Y	DIP16
L6390D	270/430	600	12 – 20	High-side/(negated) low-side	0.15 to 2.7	Y	Y	Y	Y	S016
L6392	270/430	600	12 – 20	High-side/(negated) low-side	0.15 to 2.7	N	Y	N	Y	DIP14
L6392D	270/430	600	12 – 20	High-side/(negated) low-side	0.15 to 2.7	N	Y	N	Y	S014
L6393	270/430	600	12 – 20	Phase/brake	0.15 to 2.7	N	Y	Y	N	DIP14
L6393D	270/430	600	12 – 20	Phase/brake	0.15 to 2.7	N	Y	Y	N	S014



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