



Innovative Industrial Drivers

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Power Discrete & Sub-Analog

AP Region, STMicroelectronics

ST SPIN, Drive and Power leading the innovation in motion control

Wide and Scalable Portfolio Of
128 Products !



DC & BLDC	Stepper	µStepper	Low Voltage DC, BLDC & Stepper	High Density Power Drivers SiP for DC, BLDC & Stepper	High Power DC, AC & BLDC		
Dual Full Bridge • L6205 • L6206 • L6207 • L6225 • L6226 • L6227 • L6206Q • L6207Q • L6226Q • L6227Q • STSPIN840* 3 phase Bridge • L6229 • L6230 • L6234 • L6235 • STSPIN830* • STSPIN32F0/A • STSPIN32F060x/025x • L6229Q • L6230Q • L6235Q Single Full bridge • L6201 • L6202 • L6203	Dual Full bridge with controller • L6208 • L6228 • L6208Q • L6228Q Dual Full Bridge • L6219	µStepper DRIVER with motion engine • L6470 • L6472 • PowerSTEP01 µStepper DRIVER • L6474 • L6258 • STSPIN820 µStepper Controller with motion engine • L6480 • L6482	µStepper DRIVER • STSPIN220 3-phase Bridge • STSPIN230 Dual Full Bridge • STSPIN240 Single Full Bridge • STSPIN250	Scalable 600V – 80V System In Package • PWD13F60 • PWD5F60	600V HB Driver for IGBT/MOS optimized for FOC • L6390 • L6391 • L6392 • L6393 • L6395 • L6398 • L6491 • L6498L • L6494L • L6498 Fully protected Single MOS/IGBT Gate Driver • TD350 • TD351 • TD352 • TD310	600V HB Driver MOS/IGBT • L6384 • L6385 • L6386 • L6387 • L6388 • A6387	Isolated 4k / 6k Drivers for IGBT/PMOS • STGAP1AS • STGAP2S* • STGAP2D*

(*) new products, key focus

Leading Motion Control in all the Applications





STSPIN32 family from analog to digital motor control



Power Transistors



Motor Control



Microcontroller

For
Smart Industry and High-End Consumer



- Highly integrated systems-in-package:
 - 7x7 mm QFN, 10x10 mm QFP, ...
- Complete ST ecosystem: tools, FWs, SWs (motor-control algorithms)

High integration

embedded 32-bit STM32F0
ARM Cortex-M0

High performance 3-phase gate driver

0.35 / 1A and up to 600V

Versatile Control

cost-effective sensorless
or accurate Hall sensors

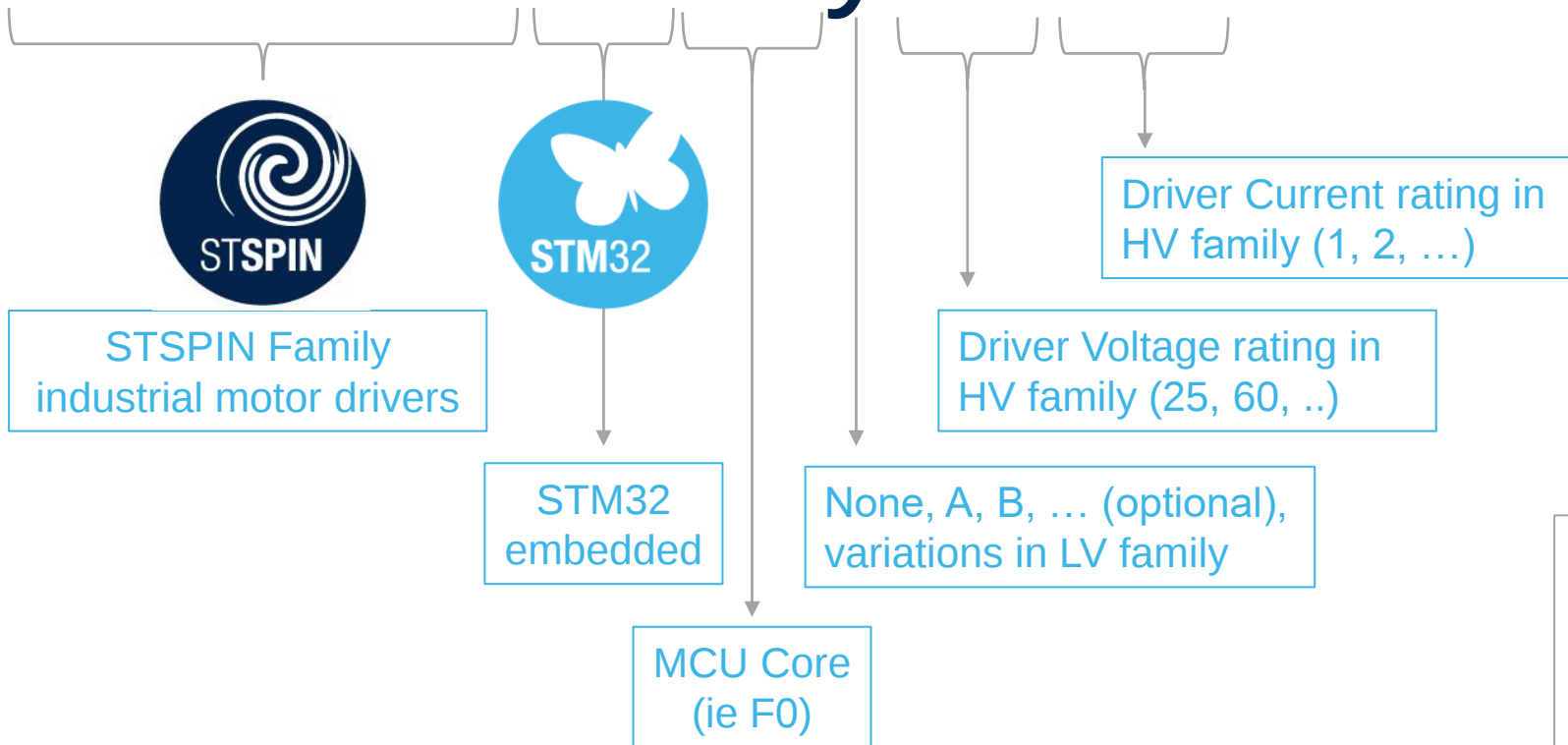
Maximum efficiency

on-chip supplies for MCU,
driver and external circuitry



STSPIN32 family naming convention

STSPIN32xyzzww



Examples:
STSPIN32F0A
STSPIN32F0251
STSPIN32F0602



STSPIN32F0 Series Overview

3phase BLDC



+



Low Voltage

6.7 – 45 V

STSPIN32F0A/B

- 0.6A FOC/6-step gate drivers
- 12V / 3.3V V reg embedded
- 1 and 3 shunt topologies



High Voltage

9 – 250 V

STSPIN32F0251/2

- 0.3A / 1A FOC/6-step gate drivers
- Smart ShutDown protection
- Outstanding below-gnd robustness
- 1 and 3 shunt topologies



9 – 600 V

STSPIN32F0601/2

- 0.3A / 1A FOC/6-step gate drivers
- Smart ShutDown protection
- Outstanding below-gnd robustness
- 1 and 3 shunt topologies

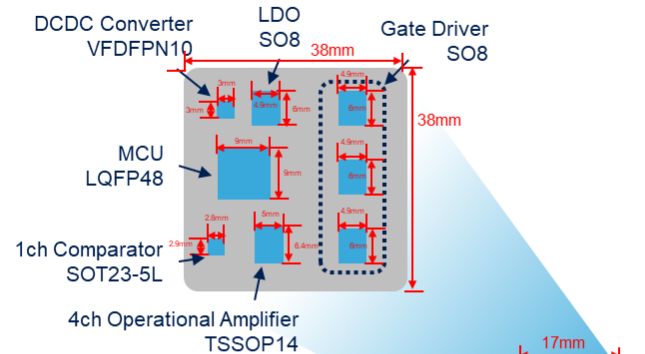


pin to pin

Main Applications

- Compressors, pumps and fans
- Power tools
- Vacuum cleaners
- Industrial automation and control
- Home Appliances
- Drones (gimbal and ESC control)

STSPIN32F0 vs discrete solution



Area reduction
up to **80%**

STSPIN32F0A/B
VFQFPN48L

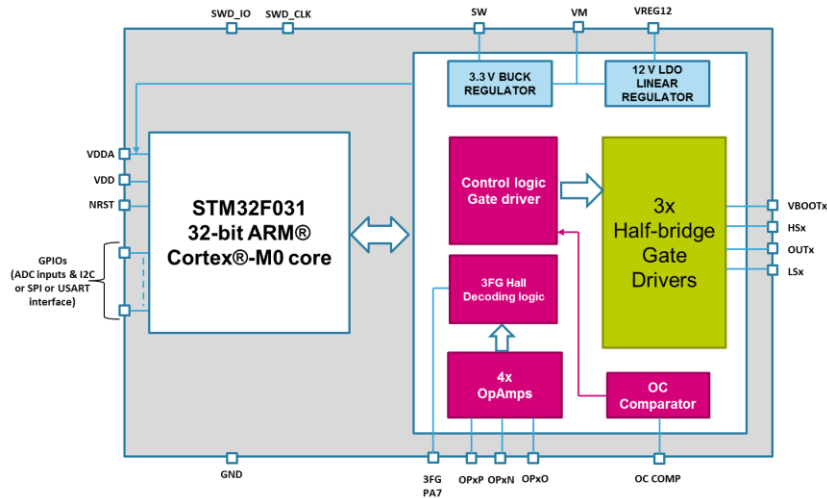
We sell in





STSPIN32F0/A/B

Advanced 3-phase BLDC drivers + STM32



KEY APPLICATIONS:

- Industrial automation
- Power tools
- Battery powered Home Appliances
- Fans
- Robotics
- Drones and aeromodelling

Key Features

- STM32 Cortex M0 + 3-phase Gate Driver
- Fully compatible with STM32 ecosystem
- 6step & FOC sensorless / sensed algorithms

Value & Benefit

- Exhaustive ecosystem for fast design
- Extremely compact & flexible solution
 - VS = 6.6V - 45 V, I = 600mA capability
 - 48 MHz, 32k Flash, 4k SRAM & 12 bit ADC
 - Up to 4 Op-Amps, 1 Comp; up to 20 GPIOs
 - Extended Trange: -40 to 125°C

Product	Description	Vin min (V)	Vin max (V)	I _{GATE} (A)	OpAmps	#GPIOs
STSPIN32F0	FOC & 6-step gate drivers	8	45	0.6	4	15
STSPIN32F0A	Embedded 3.3V / 12V Vregulators 1 shunt and 3 shunt architectures	6.6			3	16
STSPIN32F0B	Bootloader for FW on-the-field upgrade	6.6			1	20



STSPIN32F0/A/B easy comparison

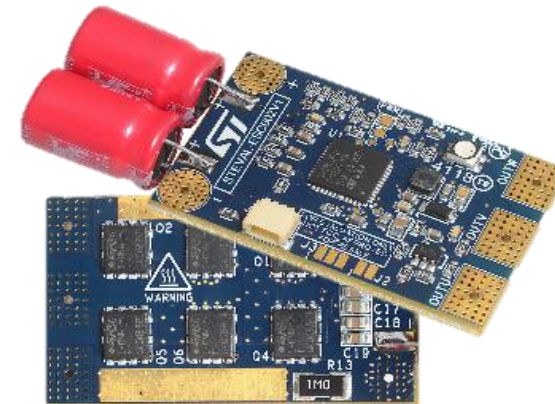
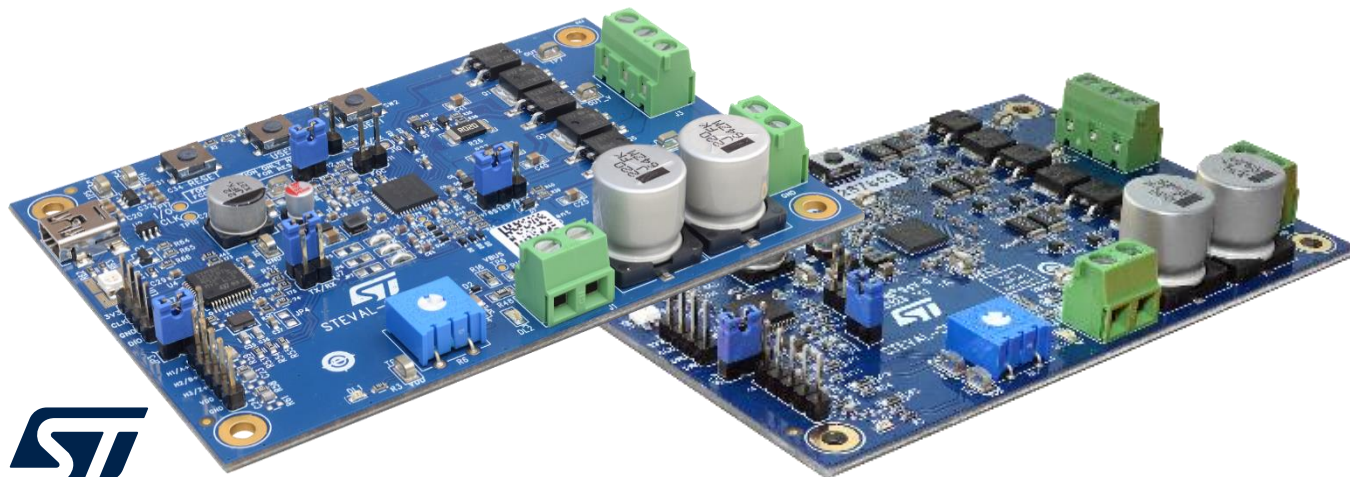
Feature	STSPIN32F0	STSPIN32F0A	STSPIN32F0B
Operating voltage	7.9 V to 45 V	6.6 to 45 V	6.6 to 45 V
Embedded MCU	STM32F031x6 with extended temp range	STM32F031x6 with extended temp range	STM32F031x6 with extended temp range
Gate drivers	600 mA triple half-bridge	600 mA triple half-bridge	600 mA triple half-bridge
3.3 V DC/DC buck conv	Embedded	Embedded	Embedded
12 V LDO	Embedded	Embedded	Embedded
OpAmps	4	3	1
3FG decoding logic	Embedded	Not embedded	Not embedded
Comparator	Embedded	Embedded	Embedded
# of GPIOs	15	16	20
OC protection via comparator	Available	Available	Available
Current control via comparator	Not available	Available	Available
Standby	Available	Available	Available
UVLO	Available	Available	Available
Firmware upgrade on the field	Not available	Available	Available



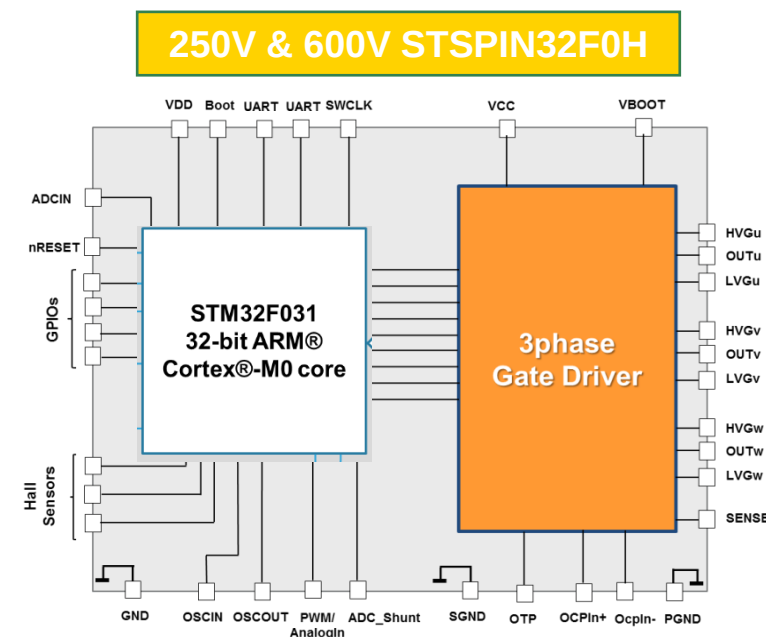
STSPIN32F0/A/B Evaluation Tools

Full ecosystem of HW, FW & SW for easy and fast design

- 1) STEVAL-SPIN3201 (FOC 3 shunts sensorless/sensored FWs; based on STSPIN32F0)
- 2) STEVAL-SPIN3202 (FOC 1 shunt & 6 step sensorless/sensored FW; based on STSPIN32F0A)
- 3) STEVAL-SPIN3204 (6 step 1 shunt sensorless/sensored FW; based on STSPIN32F0B)
- 4) STEVAL-ESC002V1 (Compact ref design for ESC based on STSPIN32F0A & high-speed 6-step FW)
- 5) EVALKIT-ROBOT-1 (Compact Brushless Servo Kit based on STSPIN32F0A & position control loop FOC)
- 6) STEVAL-Ptool1v1 (Refer designs for power tools up to 36V based on STSPIN32F0B and 1shunt 6-step)



STSPIN32 evolution: from 45V to High Voltage advanced 3-phase BLDC Driver



STSPIN32F0

- Home Appliances
- Air conditioning
- Home and Industrial refrigerators
- Industrial Pumps
- High-end power tools
- Industrial automation

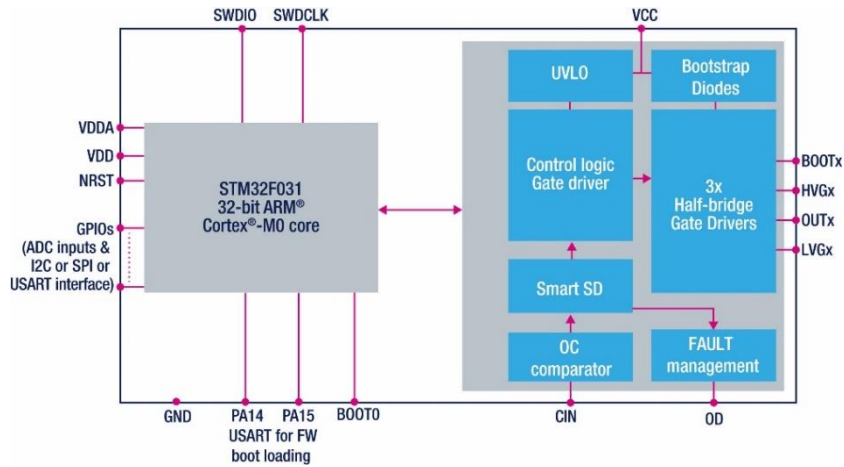




New

STSPIN32F060x/25x

Advanced 250V/600V 3-phase BLDC Driver with embedded STM32 MCU



QFN 10 x 10 mm
NEW



TQFP 10 x 10 mm

Key Features

- STM32 Cortex M0 + 3-phase Driver
- Fully compatible with STM32 ecosystem
- 6step & FOC sensorless / sensed algos
- 0.35A & 1A I capability
- All devices P2P among them

Value & Benefit

- Extremely compact & flexible solution
- Exhaustive ecosystem for fast design
- High below-ground robustness
- High immunity / Low EMI Noise

Product	Description	Vin min (V)	Vin max (V)	Vout max (V)	I _{GATE} (A)
STSPIN32F0251	250V 3-phase driver with STM32	9	20	250V	0.35
STSPIN32F0252					1
STSPIN32F0601	600V 3-phase driver with STM32	9	20	600V	0.35
STSPIN32F0602					1

STSPIN32F0xx1/Q $\Rightarrow I_{GATE} = 0.35A$
STSPIN32F0xx2/Q $\Rightarrow I_{GATE} = 1A$



STSPIN32F060x/25x Easy Comparison

P/N	250V Class		600V Class	
	STSPIN32F0251	STSPIN32F0252	STSPIN32F0601	STSPIN32F0602
Operating Voltage LV, Vcc	9 V to 20 V		9 V to 20 V	
Operating Voltage, Vboot	Up to 270 V		Up to 620 V	
Embedded MCU	STM32F031x6 ext. temp range 48MHz		STM32F031x6 ext. temp range 48MHz	
Memory	4kB RAM / 32kB Flash		4kB RAM / 32kB Flash	
3-ph Gate Drivers Igate	200mA sink 350mA source	0,85A sink 1A source	200mA sink 350mA source	0,85A sink 1A source
Smart Shutdown	✓		✓	
ADC 12Bit	✓ Up to 10 channels		✓ Up to 10 channels	
# of GPIOs	21		21	
OCP via comparator	✓		✓	
Communication	I ² C, USART, SPI		I ² C, USART, SPI	
Field upgradable FW	✓		✓	
Low Power Standby	✓		✓	
Protections	✓ Interlocking, Over Temp, UVLO		✓ Interlocking, Over Temp, UVLO	
Package	TQFP* 10x10mm, 64 Leads		TQFP* 10x10mm, 64 Leads	

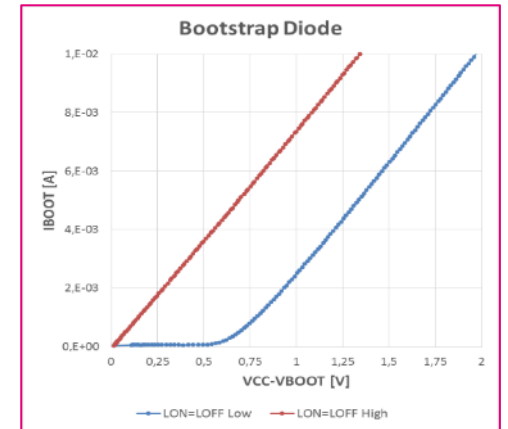
*: QFN package option in development



Embedded 3phase Gate Driver Characteristics



- 0.2/0.35 A and 0.8/1 A Source/Sink capability
- Integrated bootstrap diodes with zero static drop
- Comparator for fast smartSD OCP
- UVLO protection for LS & HS drivers
- 50 V/ns CMTI immunity, extreme ruggedness
- Interlocking cross-conduction prevention
- Separated GND pins for logic and LS power
- Extended Temp: -40 to 125°C



- New BCD6-OFFLINE technology and optimized design allow reaching outstanding ruggedness and immunity to below-ground spikes





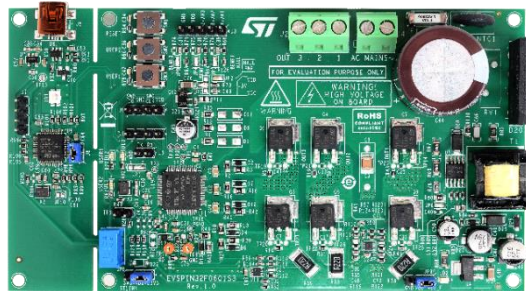
STSPIN32F0 HV Evaluation Tools

Full ecosystem of HW, FW & SW for easy and fast design

- a) EVSPIN32F0601s1 (FOC 1 shunt & 6 step sensorless/sensored FWs; based on STSPIN32F0601)
- b) EVSPIN32F0601s3 (FOC 3 shunts & 6 step sensorless/sensored FWs; based on STSPIN32F0601)
- c) EVSPIN32F0602s1 (FOC 1 shunt & 6 step sensorless/sensored FWs; based on STSPIN32F0602)
- d) EVSPIN32F0251s1 (FOC 1 shunt & 6 step sensorless/sensored FWs; based on STSPIN32F0251)
- e) STEVAL-Ptool2v1 (Ref designs for power tools up to 80V, based on STSPIN32F0252 and 1shunt 6-step)



a)



b)



c)

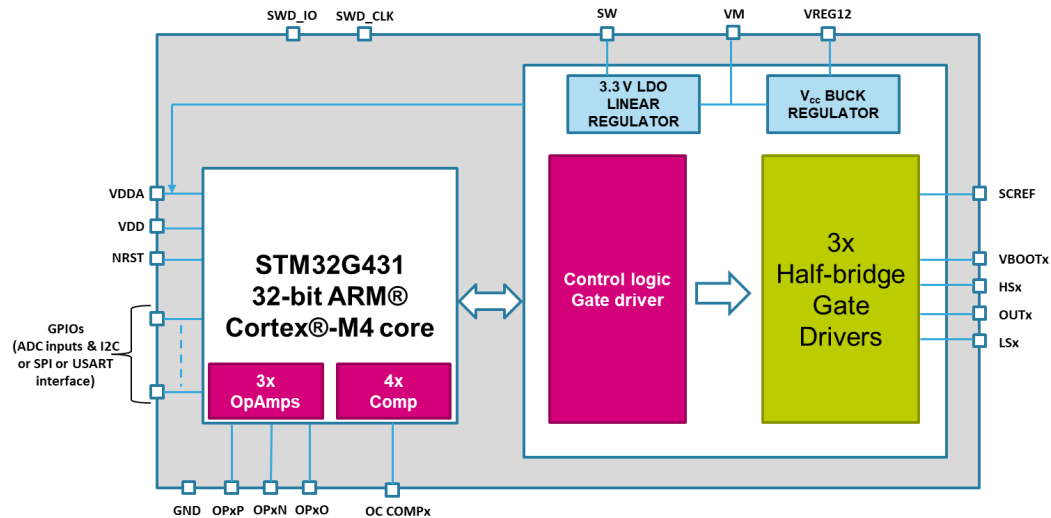


d)

In MP in Jan '21

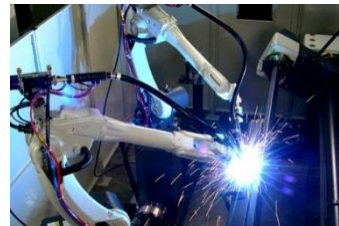
STSPIN32G4 preview

Advanced 75V 3-phase BLDC Driver with embedded Cortex M4 STM32 MCU



KEY APPLICATIONS:

- Industrial automation & Robotics
- Battery powered Home Appliances
- Power tools
- Drones and aeromodelling
- Fans and pumps



Key Features

- **STM32 Cortex M4 + 3-phase Driver**
- **Fully compatible with STM32 ecosystem**
- **6step & FOC sensorless / sensed algorithms**
- **V_{CC} (200mA) Buck & 3.3V (150mA) Linear reg**
- VS = 5.5V – 75 V, I = 1A driving capability
- 170 MHz, 128k Flash & 32k SRAM
- 2x 16 bit ADCs & 4x 12 bit DAC channels
- I2C / UART / SPI / CAN; **up to 40GPIOs**
- **Can drive 2 motors simultaneously**
- **MOSFET V_{DS} Monitoring protection**
- Up to 4x Comparators & 3x OpAmps
- Fully protected (UVLO, Short-circuit, OCP)
- Fully configurable thru I2C
- 9x9 QFN package

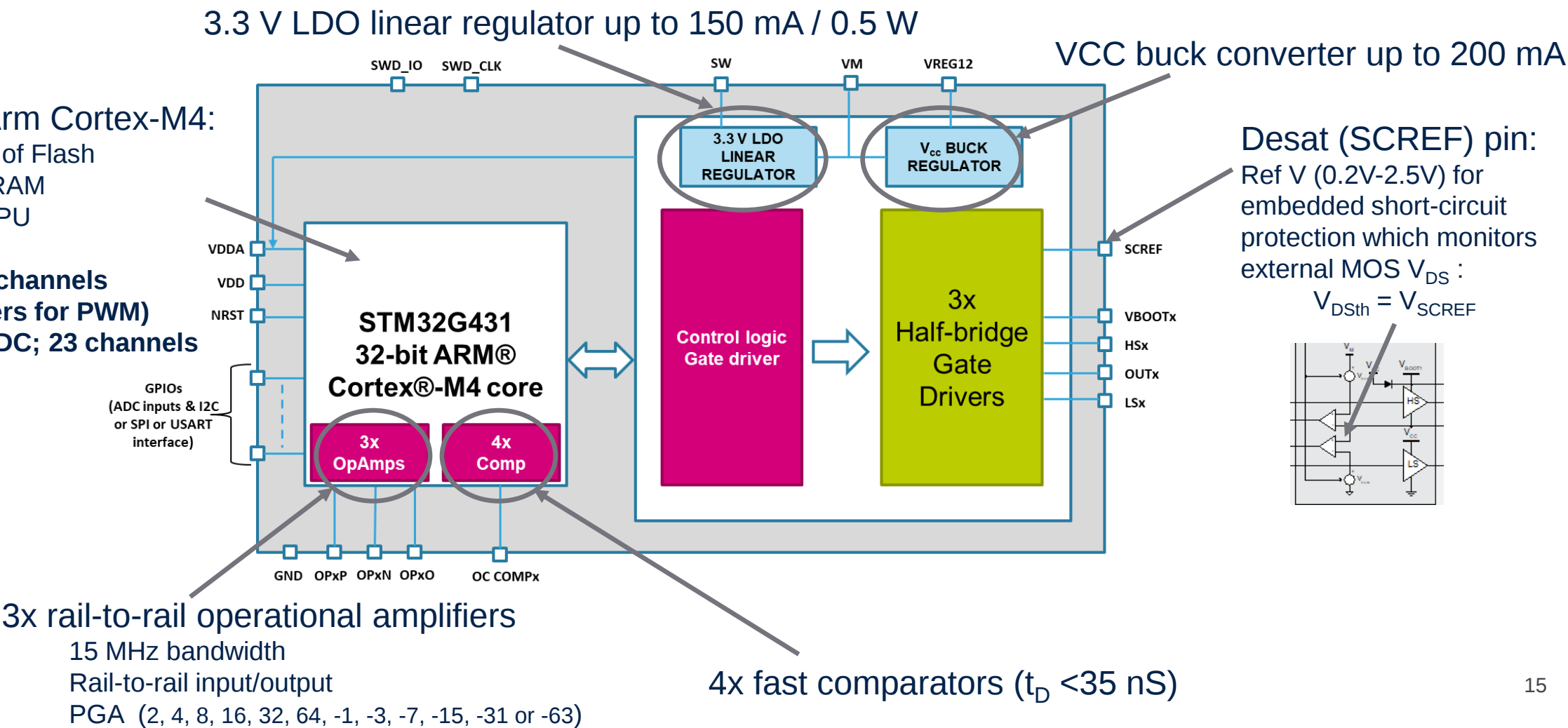
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STSPIN32G4 preview

Advanced 75V 3-phase BLDC Driver with embedded Cortex M4 STM32 MCU

Mainstream Arm Cortex-M4:

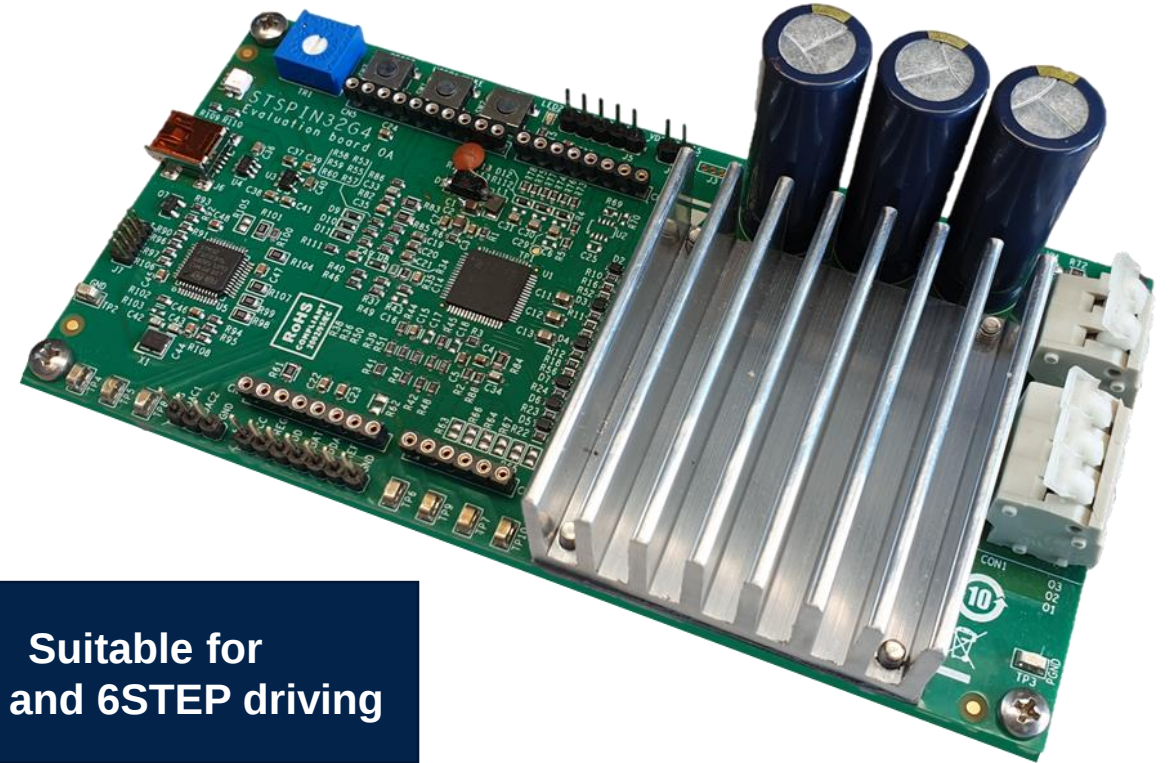
- 128 Kbytes of Flash
- 32 Kbytes RAM
- 170 MHz CPU
- 4x USART
- **timers; 28 channels**
(2 adv timers for PWM)
- **2x 16-bit ADC; 23 channels**
- DAC
- comm. I/F
- 1.7-3.6V



STSPIN32G4 evaluation board

Key features

- Up to **75 V** and output current up to **20 A_{rms}**
 - Optional heatsink to increase power dissipation
- Three shunt topology
- Embedded OPAMPs used for current sensing
- BEMF sensing circuitry for sensorless driving
- Digital Hall sensors input management
- PCB temperature monitoring (NTC)
- Bus voltage monitoring
- Arduino UNO R3 expansion connector
- CAN bus mounting option
- Embedded STLINK V2-1

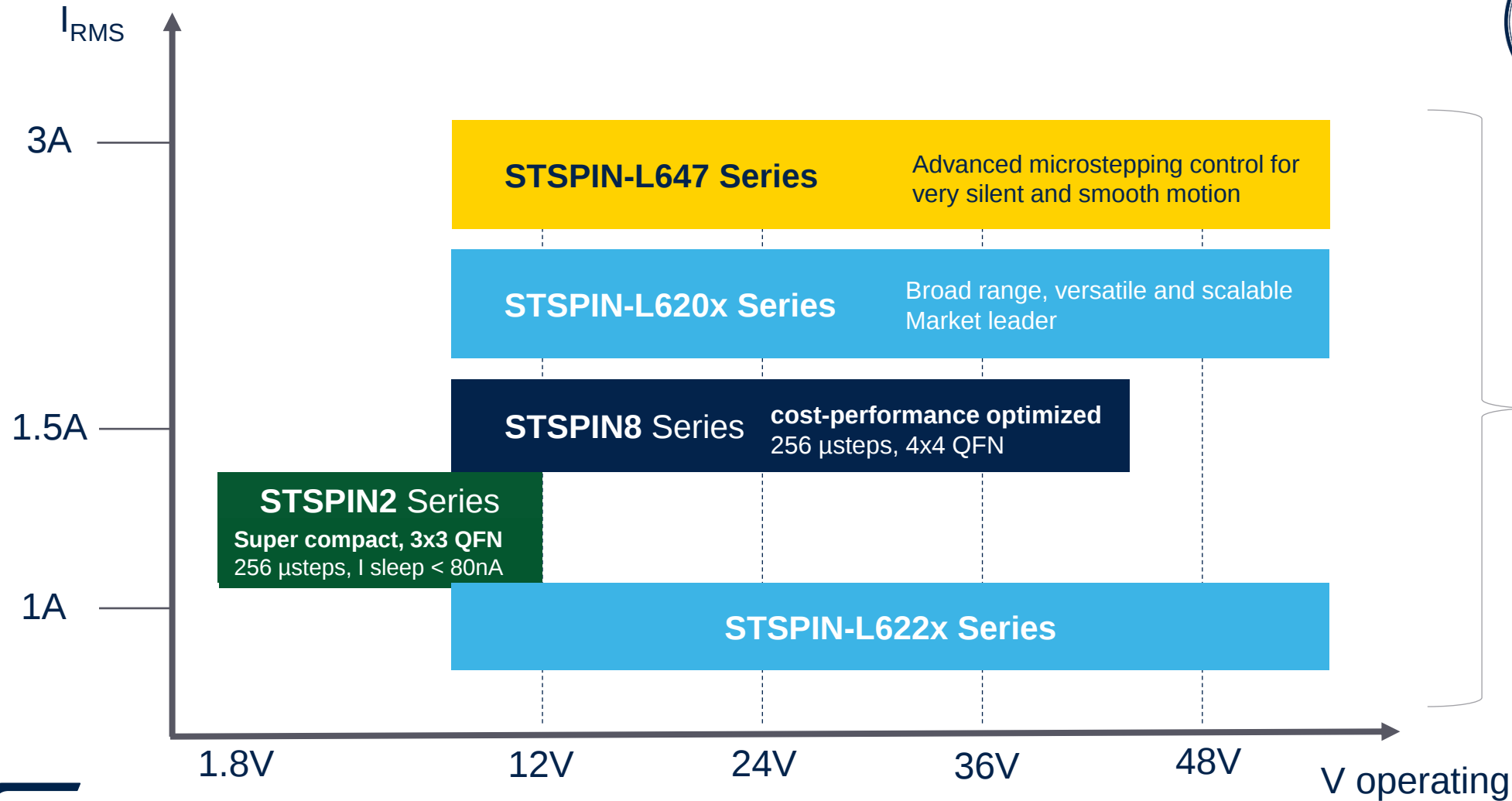


Suitable for
FOC and 6STEP driving

Able to run vacuum cleaner motors in
FOC 1shunt well above 100Krpm



STSPIN monolithic positioning



Brushed DC



Brushless DC

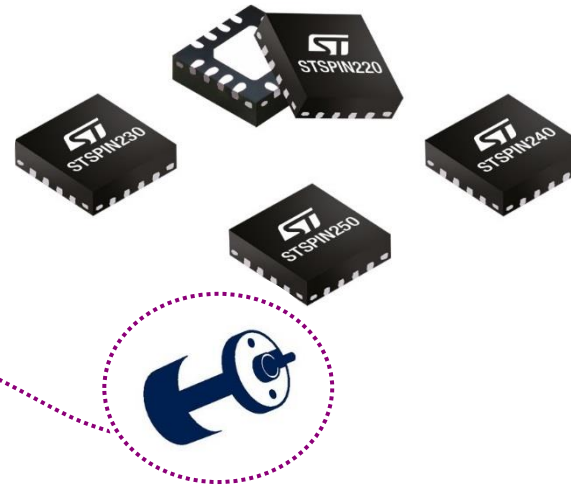


Stepper



STSPIN2 Series Overview

Ultra low-power for extraordinary battery life duration



KEY BENEFITS & FEATURES

Tailored for portable applications:

- Low operating V (1.8–10V), ideal for battery-operated motors

Powering small and medium-size motors

- High output I, up to 2.6 A_{RMS} for each full-bridge

Accurate and smooth motion

- Extreme positioning accuracy and motion smoothness, up to 256 usteps (STSPIN220)

Extended battery life

- Energy saving and long battery life, best-in-class standby consumption < 80 nA

Reliable

- Fully protected with UVLO, OCP and thermal protections

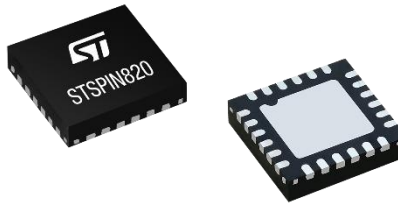
Minimum footprint and lightweight

- Ultra-miniaturized 3 x 3 mm QFN package

Product	Description	V _{in} min (V)	V _{in} max (V)	R _{ds(on)} (Ohm)	I _{out} max (Arms)
STSPIN220	Microstepping driver up to 256 microsteps	1.8	10	0.2	1.3
STSPIN230	6 INx & 2 Shunts OR				
STSPIN233	3 INx, 3 ENx and 3 Shunts				
STSPIN240	Dual brushed DC motor driver			0.1	2.6
STSPIN250	Single brushed DC motor driver				

STSPIN8 Series Overview

Compact, energy conscious and cost-competitive motor drivers



KEY BENEFITS & FEATURES

Wide operating Voltage range

- From 7 to 45 V

Powering small-medium sized motors

- Output current up to 1.5 A_{RMS} and 2.5 A_{peak} @ R_{DS(ON)} = 500mΩ

High efficiency

- Standby mode to minimize power consumption in idle state

Smooth and silent motion

- Smooth and silent motion thanks to I control and 256 usteps
- FOC & 6-step FW support

Reliable thanks to full set of protections

- UVLO, non-dissipative over-current and thermal protection

Minimum footprint and lightweight

- Compact 4 x 4 mm QFN package

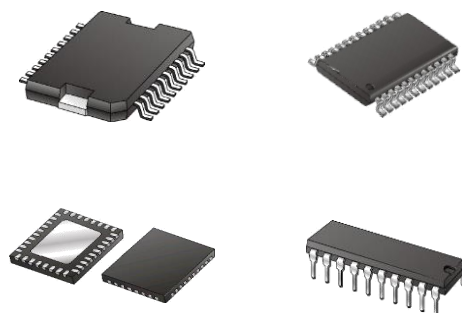
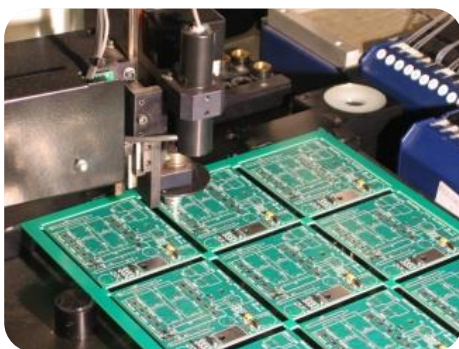
Product	Description	Vin min (V)	Vin max (V)	Rdson (Ohm)	I out max (Arms)
STSPIN820	Microstepping driver up to 256 microsteps	7	45	0.5	1.5
STSPIN830	3-phase 3shunts BLDC motor driver				
STSPIN840	Dual brushed DC motor driver	7	45	0.5 (0.25 *)	1.5 (3 *)

(*) Features allowed in parallel mode driving



L62 Series Motor Drivers

Market leading family: versatile, scalable and reliable



KEY BENEFITS & FEATURES

Scalable in features and motor type:

- From Power stage (L62x5) to full featured BLCD & Stepper Drivers (L6235 & L6208)

Powering small-medium sized motors

- Output current from 1.4 A_{RMS} to 5.6 A_{RMS} @ R_{DS(ON)} = 700mΩ & 150mΩ

Wide choices of packages to accomodate any soldering and thermal needs

- PowerSO36, SO20 & SO24, DIP20 & DIP24, QFN 5x5 & QFN 7x7

Topology	Product	Description
Dual DC Motor Drivers	L6205x * L6225x *	DC or Stepper; Fixed OCP
	L6206x * L6226x *	DC or Steppers; Programmable OCP & Diagnostic output
	L6207x L6227x	DC or Steppers Programmable OCP & Twin PWM current control
Stepper Motor Drivers	L6208x L6228x	Stepping seq generator Twin PWM current control
BLDC sensorless Motor Drivers	L6234 L6230	Opt for sensorless FOC Programmable OCP & Diagnostic output
BLDC sensed Motor Drivers	L6235 L6229	PWM current control Hall sensor decoding logic & Speed control output

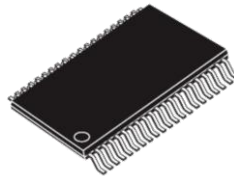
Product	V _{IN} min (V)	V _{IN} max (V)	R _{DS(ON)} (Ohm)	I _{OUT} max (Arms)
L6205/6/7 *	7	52	0.3 (0.15 *)	2.8 (5.6 *)
L6234				
L6235				
L6225/6/7 *			0.7 (0.35 *)	1.4 (2.8 *)
L6229/30				

(*) Features allowed in parallel mode driving for L6205, L6206, L6225 & L6226



L64 Series – L647x & L648x

Highly autonomous solutions using high-level motion commands from system host



KEY BENEFITS & FEATURES

Easy programmability thanks to SPI bus with daisy-chain

- Programmable motion control parameters & on-the-fly diagnostics
- Multiple drivers can be driven by 1 MCU (STM32)

System stability and low noise:

- Adaptive auto regulated decay (slow /fast /mixed decay) *

Accurate positioning and control

- Predictive current control *

smooth & very silent motion

- Voltage mode control (*) ensures motion performance of a BLDC motor

Power Scalability

- Using L648x controller with ST power mosfet (F7 family)

Topology	Product	Description	V _{IN} min (V)	V _{IN} max (V)	R _{DS(on)} (Ohm)	I _{OUT} max (Arms)
Motor Drivers	L6470	Voltage mode driving algorithm (1/128 µstep)	8	45	0.3	3
	L6472	Predictive current control Adaptive decay (1/16 µstep)				
	L6474	Adaptive decay(1/16 µstep)				
Controllers	L6480	Voltage mode driving algorithm (1/128 µstep)	8	85	not applicable	
	L6482	Predictive current control Adaptive decay (1/16 µstep)				



Powerstep01

Programmable motor controller + 8 Pwr MOSFETs by 16 mΩ in QFN

Key Features

- Stepper Controller + 8 Pwr MOSFETs
- Programmable to work in:
 - ST voltage mode control
 - ST Predictive I control + adaptive decay
- $V_S = 85V$, $I = 10A_{RMS}$ & $R_{DS(ON)} = 16m\Omega$
- High precision; up to 128 usteps
- Full real-time diagnostics
- Programmable speed & positioning
- Sensorless stall detection
- Advanced QFN package 11x14 mm



Motor Control

Improved performance

BOM Cost saving

67% PCB Area Saving

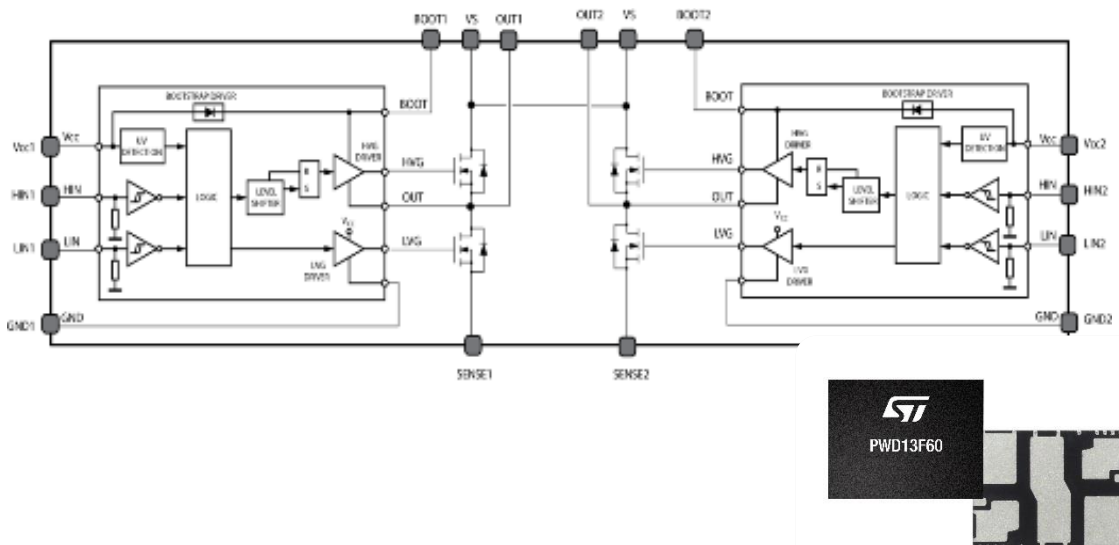


System-in-Package: 2x 600V gate drivers & 4 High Voltage pwr MOSFETs

Power Transistors



Motor Control



Key Features

- **High Voltage up to 600V**
- **Full-bridge power stage**
 $I_{OUT} = 8A$ & $R_{DS(ON)} = 320m\Omega$
- **Integrated bootstrap diodes**
- UVLO protection embedded
- Interlocking feature against shoot-through
- Wide input supply voltage range: 6.5V–19V
- Inputs 3.3V / 5V compatible
- Outputs in phase with inputs
- Advanced QFN package 10x13 mm





NEW

PWD5F60

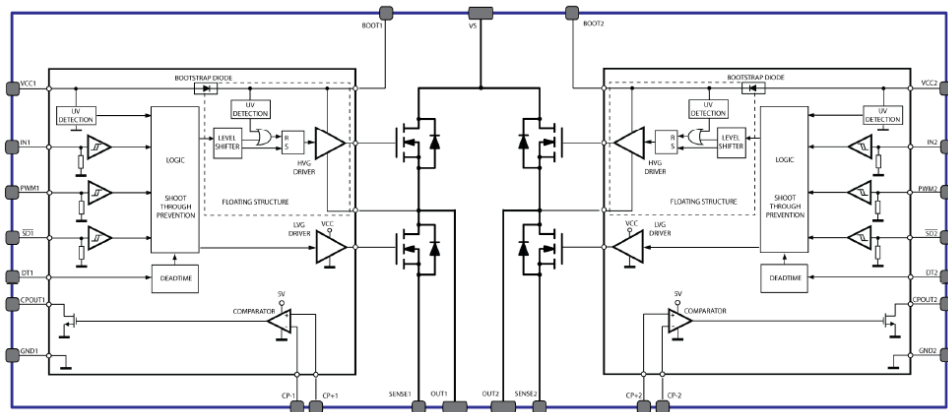
System-in-Package: 2x 600V gate drivers & 4 High Voltage pwr MOSFETs



Power Transistors



Motor Control



Key Features

- **High Voltage up to 600V**
- **Full-bridge power stage**
 $I_{OUT} = 3.5A$ & $R_{DS(ON)} = 1.38\Omega$
Fast recovery Diode ($t_{rr}=70ns$)
- **Integrated bootstrap diodes**
- **2 Embedded Comparators**
- UVLO protection embedded
- Single input, SD and PWM pins
- Programmable Dead Time
- Wide input supply voltage range: 10V–20V
- Advanced QFN package 15x7 mm



STDRIVE product portfolio

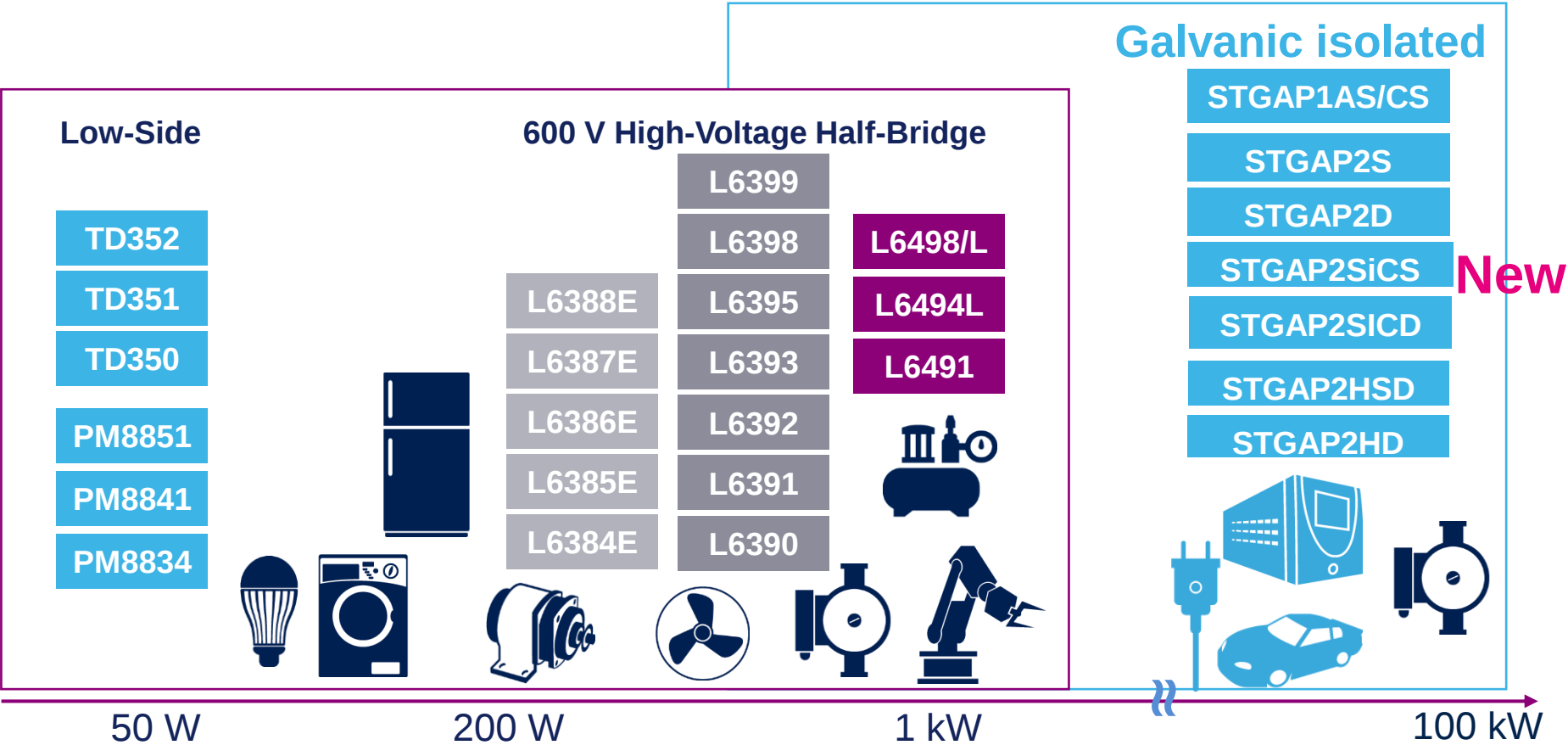
A future-proof portfolio for a wide range of applications

Industrial Drives
Electric/ Hybrid vehicles

1200 V inverters
Server, UPS

Compressors
Factory automation

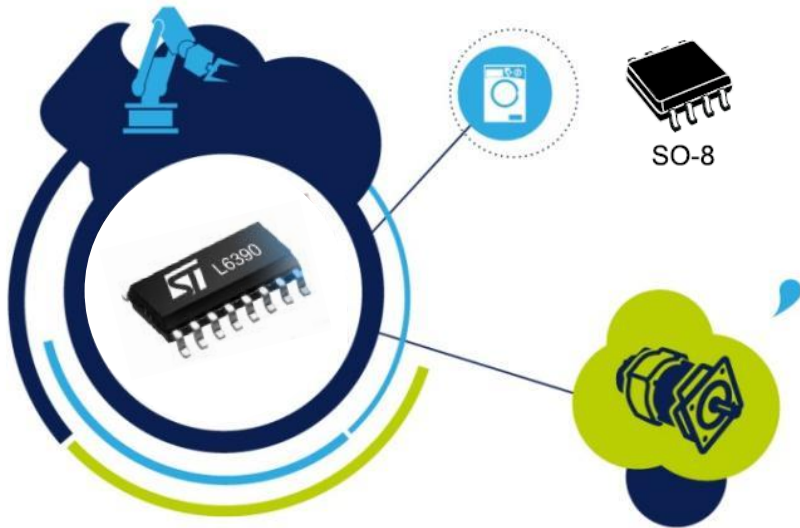
White goods
Solar
E-bikes





L638x/L639x

600 V, HB gate drivers



KEY APPLICATIONS

- Home appliances
- Factory automation
- Industrial drives
- Fans
- Compressors

Key benefits & features

Features

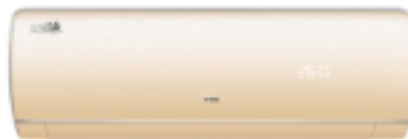
- Suitable for IGBTs & Mosfets
- Half Bridge configuration
- Up to 600 V high voltage rail
- 3.3 to 5 V TTL/CMOS inputs with hysteresis
- Embedded features for field oriented control F.O.C.(L6390)

Robustness

- Integrated bootstrap diode
- Smart shutdown function
- Comparator for fault protections
- Adjustable deadtime and interlocking function

Scalability & Flexibility

- Wide offer from compact device with basic protection feature in SO8 package to full featured SO16(L6390)





L649x: high current platform

Outstanding robustness, noise immunity and design flexibility

- **600V Half-Bridge**
- **Up to 4A** gate driving current capability
- **On-chip OpAmp for current sensing**
- **Embedded Comparator for enhanced protection** thanks to fast internal loop
- **Integrated Bootstrap Diode**
- **Adjustable Dead Time**

Features

L6491D

4A Gate Drive Capability source / sink
Comparator
interlocking & adjustable DT
SmartSD
Protections: UVLO Vcc / Vboot
SO-14 Package

L6494L

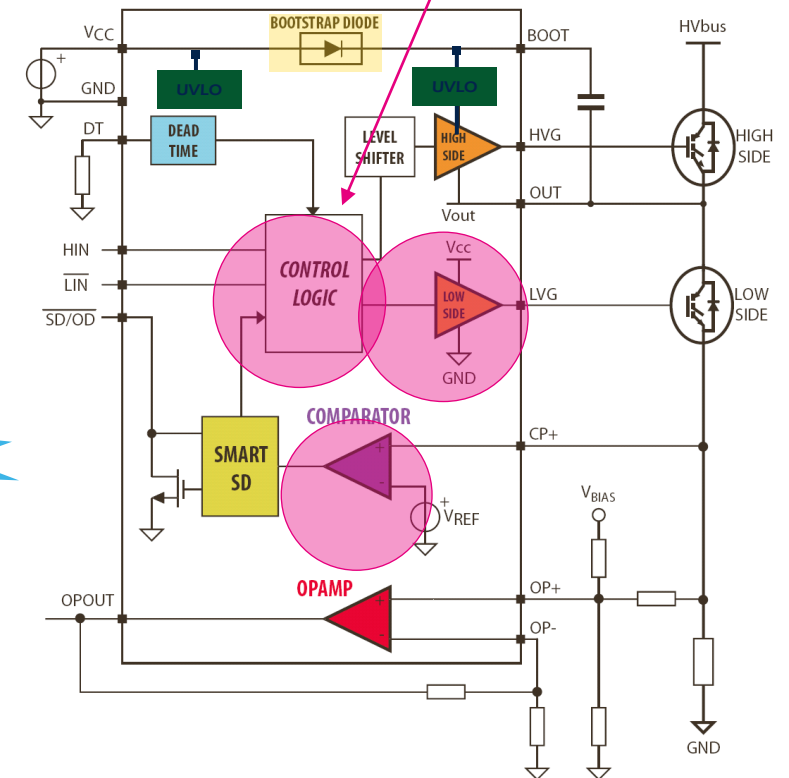
2A source/ 2.5A sink Gate Drive Capability
Single input and Shutdown pin
Interlocking & adjustable DT
protections: UVLO Vcc / Vboot
SO-14 Package
(P2P with IR21844S & FAN7393)

L6498 / L6498L

2A source/ 2.5A sink Gate Drive Capability
Active-High LS & HS inputs
interlocking,
Protections: UVLO Vcc / Vboot
L6498L: SO-8 Package (P2P with IR2181S)
L6498: SO-14 Package (P2P with IR21814S)

NEW

Embedded features optimized for
Field Oriented Control (F.O.C.)
applications





L6491, L6494, L6498

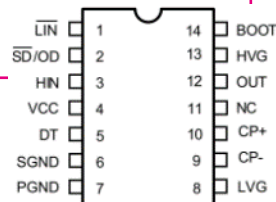
600 V, Up to 4 A gate drivers

KEY APPLICATIONS

- Home appliances
- Factory automation
- Industrial drives
- Induction heating
- Welding
- Power conversion

L6491

- 600V, 4A
- Integrated Bootstrap Diode
- Dual input with interlocking, SD
- smartSD comparator for OCP
- Programmable DT
- SO-14

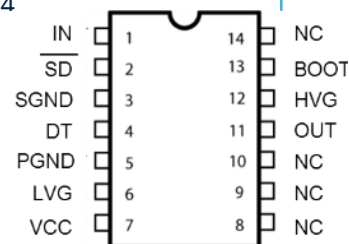


EVAL6491HB

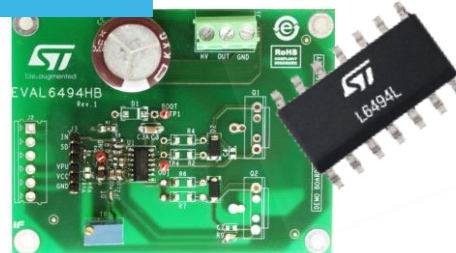


L6494L

- 600V, 2.5A
- p2p replacement for IR21844, FAN7393A
- Integrated Bootstrap Diode
- Single input and SD
- Programmable DT
- SO-14

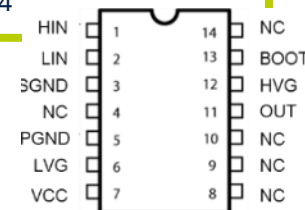


EVAL6494



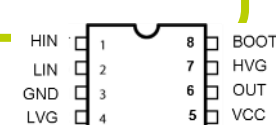
L6498L

- 600V, 2.5A
- p2p replacement for IR21814, FAN73933
- Integrated Bootstrap Diode
- Dual input with interlocking
- SO-14



L6498

- 600V, 2.5A
- p2p replacement for IR2181, FAN73901
- Integrated Bootstrap Diode
- Dual input with interlocking
- SO-8



EVAL6498L





Now QUALIFIED!

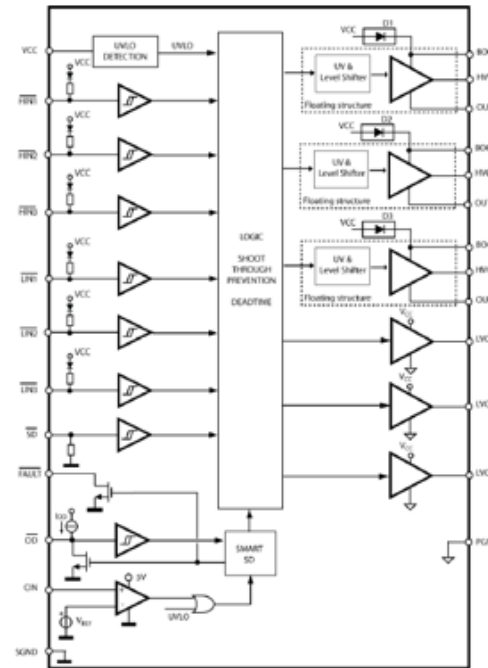
STDRIVE601 – 600V triple gate driver

3-phase High Voltage BLDC gate driver



KEY APPLICATIONS

- 3-phase Motor driver
- Home appliances
- Industrial drives and Fans



Key features

- **Best In Class** for propagation delay 85ns
- 200mA/350mA sink / source driver current
- **Zero-drop Integrated bootstrap diode**
- **Interlocking and deadtime function**
- **SmartSD:** fast over current protection

Value & Benefits

- Compact and simplified layout
- Extreme robustness
- Optimized low EMI

- New BCD6-OFFLINE technology and optimized design allow reaching outstanding ruggedness and immunity to below-ground spikes



Now QUALIFIED!

STDRIVE601 – 600V triple gate driver

Competition comparison

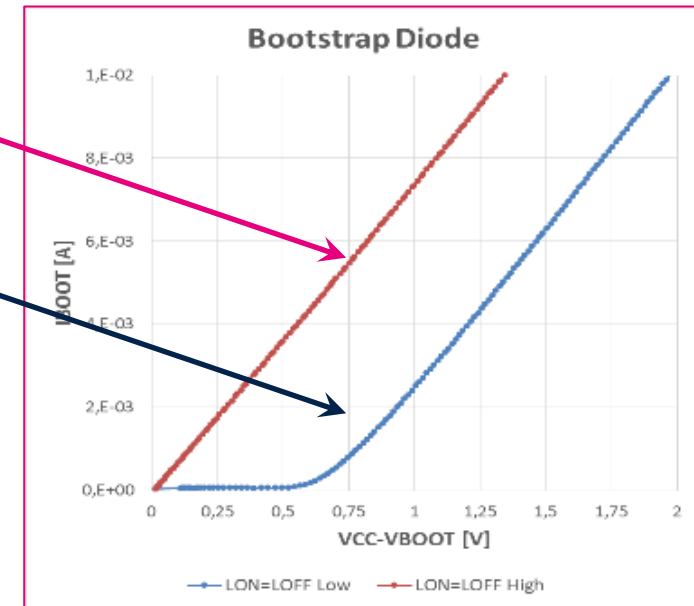


Competitive advantage

- Best In Class for propagation delay 85ns
- Zero-drop Integrated bootstrap diode
- SmartSD: Over current protection twice faster than competition

STDRIVE601 zero-drop Bootstrap Diode

Standard Bootstrap Diode



	STDRIVE601	IFX 6EDL04xx	FAN73893,4,5	IR213x	DGD2136
Propagation delay (Typ/Max.)	85/120 ns	530/800 ns	500/650 ns	425/550 ns	330/460 ns
Integrated Bootstrap diode	Yes Zero drop	Yes	No	No	No
OverCurrent time (Typ/Max.)	360/510 ns	670/1000 ns	850/1300 ns	750/1000 ns	615/820 ns



Now QUALIFIED!

STDRIVE101 3phase BLDC gate driver

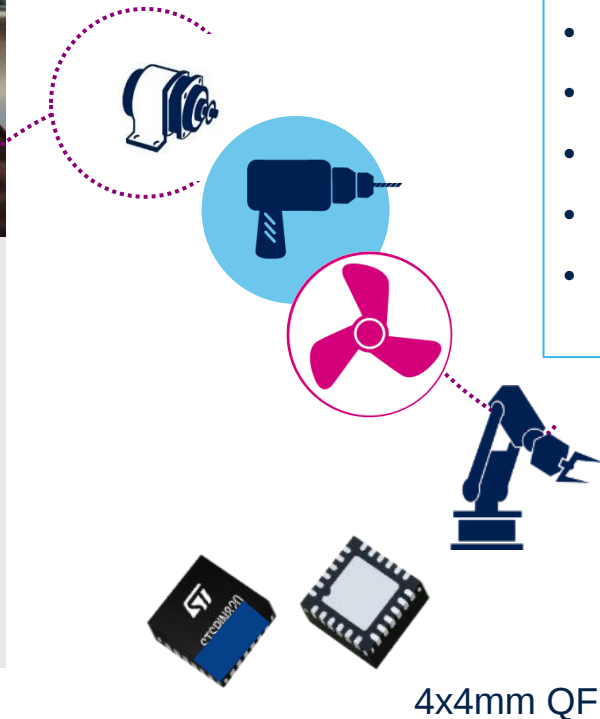
75V 3-phase low voltage BLDC gate driver



KEY APPLICATIONS

3-phase BLDC motors in applications up to 75 V, such as:

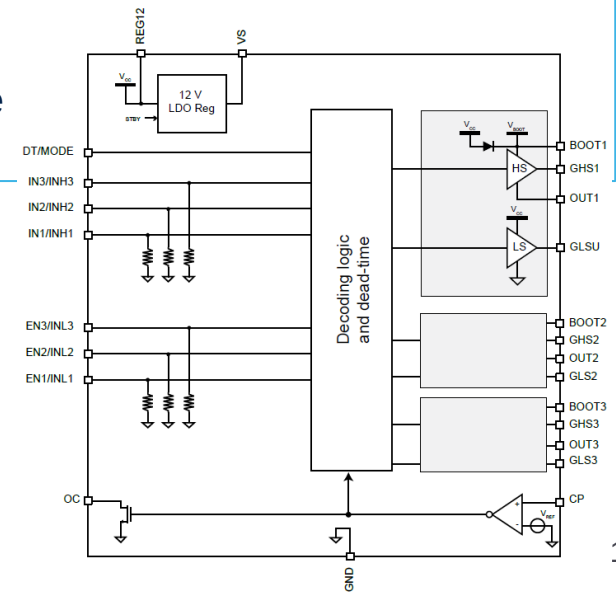
- Portable vacuum cleaners
- Fans
- Drones
- Power tools
- Air purifiers
- Robotics



4x4mm QFN

Key Features

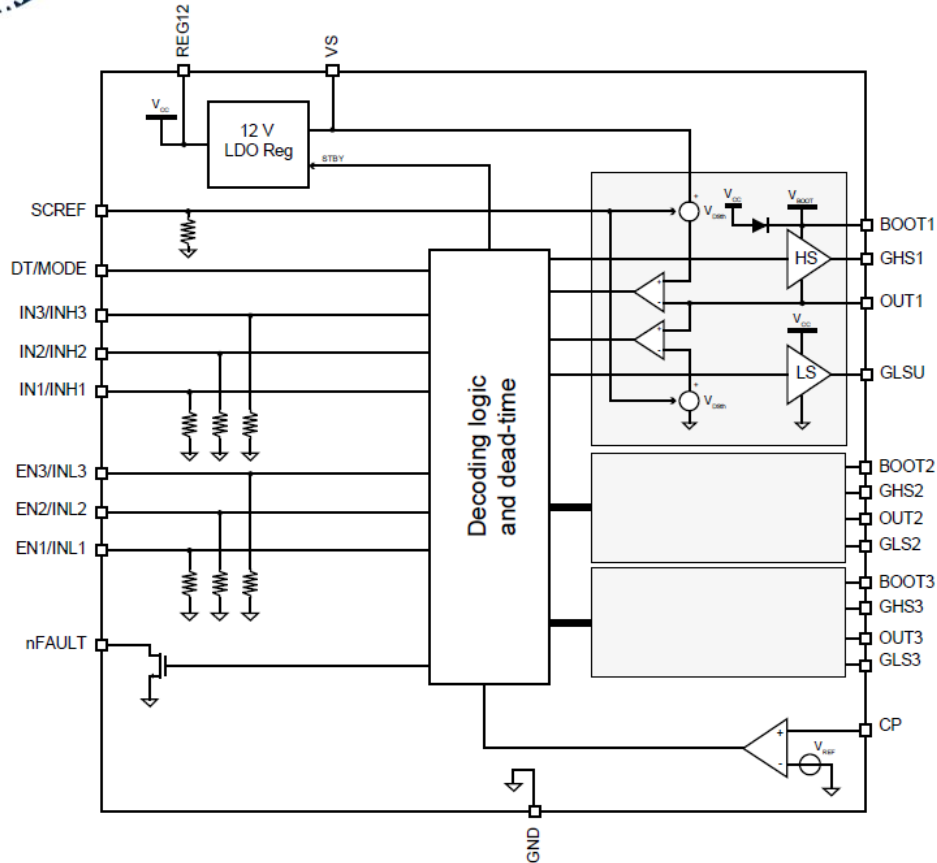
- Operating voltage up to 75 V
- $I = 600\text{mA}$ sink/source driving capability
- Fully protected (UVLO, OCP, thermal shutdown)
- Compact design with squeezed QFN
- 12V LDO
- Adjustable dead time





Now QUALIFIED!

STDRIVE101 3phase BLDC gate driver

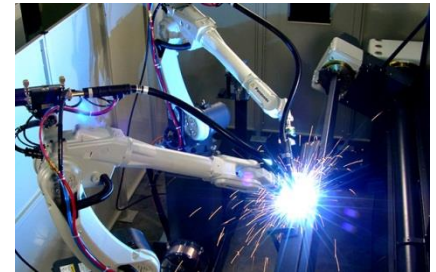


Key Features

- Operating Voltage: 5V to 75V
- $I = 600\text{mA}$ sink/source driving capability
- 12V LDO embedded
- Programmable Dead Time
- Desaturation (MOS Short Circuit) protection; programmable
- Fully protected (UVLO, OCP, thermal shutdown)
- Very short propagation delay 70ns; 20ns phases matching
- Compact design with 4x4mm QFN
- Integrated bootstrap diodes
- Standby mode for low consumption

KEY APPLICATIONS

- Home appliances
- Power tools
- Factory automation
- Fans and pumps
- Robotics





Galvanic Isolation gate driver



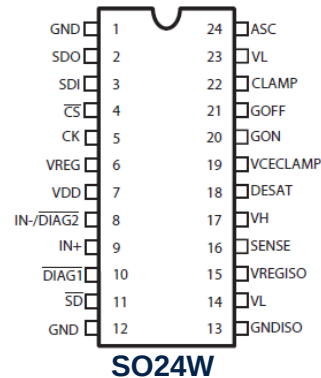
STGAP1AS/CS - advanced isolated gate driver

Advanced single driver perfect for High-End applications



KEY APPLICATIONS

- Inverters for EV \ HEV
- EV charging stations
- 600/1200 V inverters
- Motion control



Key benefits & features

High performance

- Up to 1500V high voltage rail
- 4kV isolation Voltage
- 5A sink / source driver current capability
- ± 50 V / ns transient immunity
- SPI programmability
- Desaturation detection
- Active Miller and Vce clamping
- Overall input/output propagation delay:100ns

Robustness

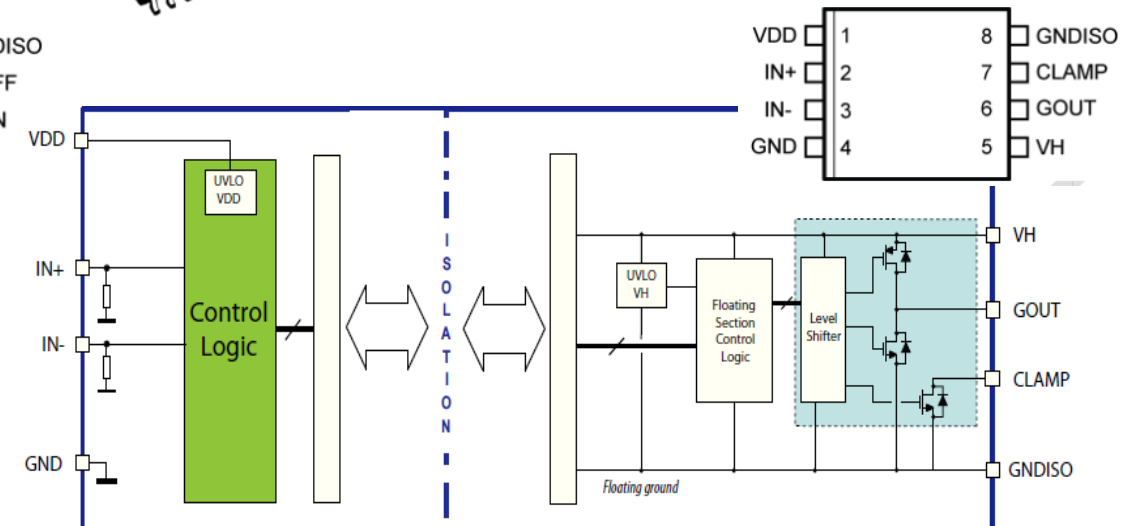
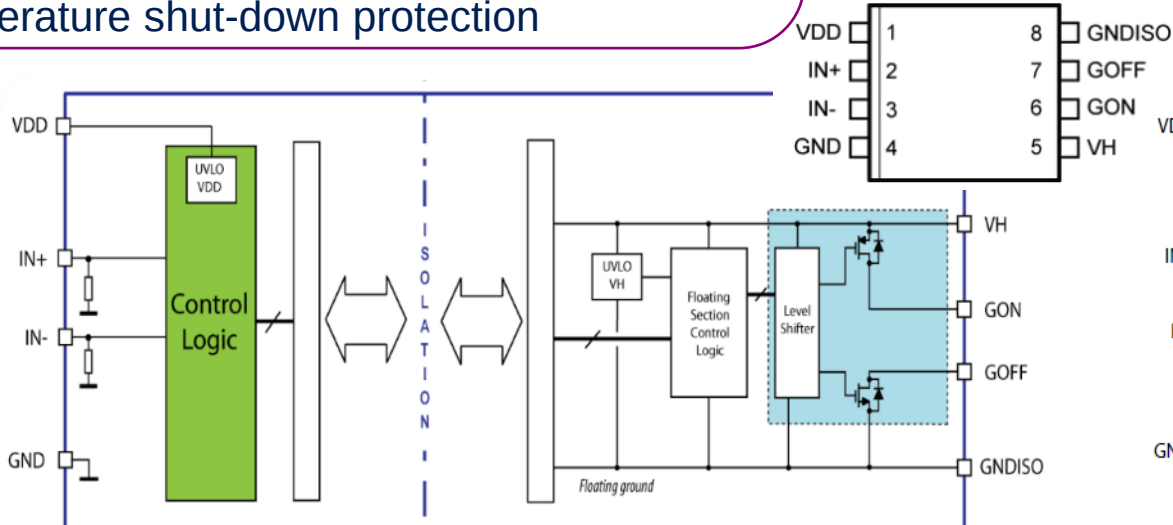
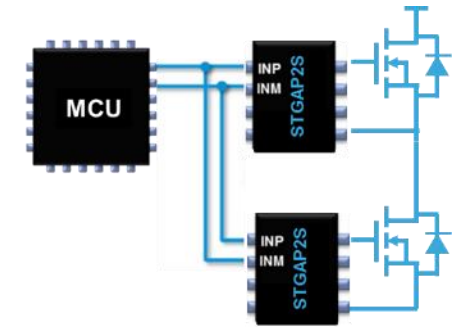
- Diagnostic status output
- Fully protected (overcurrent detection, Temp. detection and shutdown protection,UVLO,prog. deadtime..)
- Asynchronous stop command
- 2-level turn off



1700 V, 4A isolated gate drivers

- 3V3 / 5 V logic inputs (logic thresholds 1/3, 2/3 of VDD)
- **Up to 26 V supply voltage**
- **4 A Sink/Source current capability**
- Short propagation delay: 80 ns
- UVLO Function
- Stand-by function
- 100 V/ns CMTI
- High voltage rail up to 1700 V
- Temperature shut-down protection

- Active High & Active Low input pins, for HW interlocking
- **STGAP2C**: Separated Outputs option for easy gate driving tuning
- **STGAP2SC**: Miller CLAMP pin option to avoid induced turn-on
- Negative gate drive ability
- SO8 Package





STGAP2D

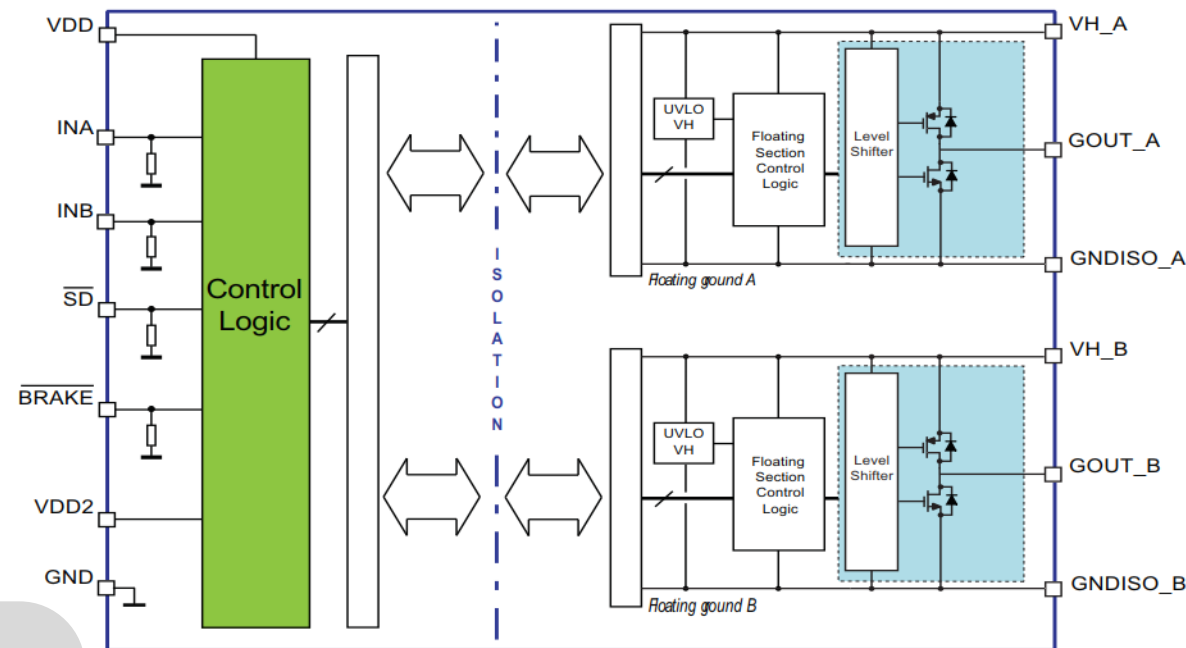
1700 V, 4A isolated gate drivers

- 3V3 / 5 V logic inputs (logic thresholds 1/3, 2/3 of VDD)
- **Up to 26 V supply voltage**
- **4 A Sink/Source current capability**
- Short propagation delay: 80 ns
- UVLO Function
- Stand-by function
- 100 V/ns CMTI
- High voltage rail up to 1700 V
- Temperature shut-down protection

- Single input pin, in phase with output
- Shut-Down SD pin, with integrated pull-down
- BRAKE pin
- Interlocking
- Negative gate drive ability
- SO16 Package

KEY APPLICATIONS

- Motor control
- Factory automation
- Industrial drives and fans
- DC-DC converters
- Induction heating
- Welding



VDD	1	16	GNDISO_A
INA	2	15	GOUT_A
INB	3	14	VH_A
SD	4	13	N.C.
BRAKE	5	12	N.C.
VDD2	6	11	GNDISO_B
GND	7	10	GOUT_B
N.C.	8	9	VH_B



New 6kV Gate Driver Platform

Gate Driver with embedded isolation

Compact

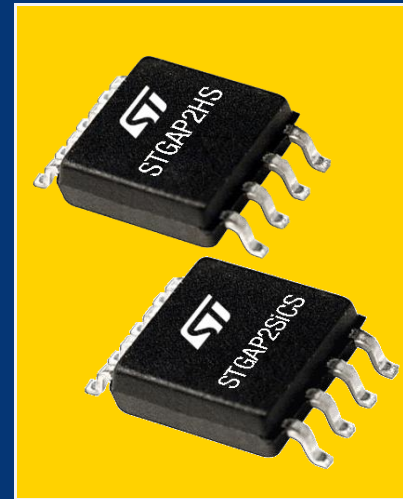
Single driver in compact SO8W
Dual driver in SO36W package

Robust

Reduce spike effects with effective
Miller Clamp protection

Easy Design

Reduced BOM and PCB space



IGBT drivers

- STGAP2HS
- STGAP2HD

SiC drivers

- STGAP2SiCS
- STGAP2SiCD



Mass Production

- Ready for Single channel
- Q1-2021 for Dual channels

New 6KV Single channel Gate Drivers

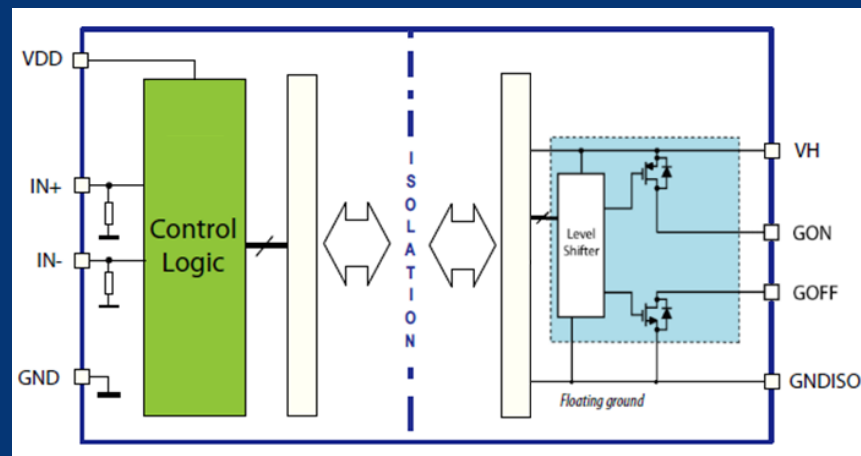
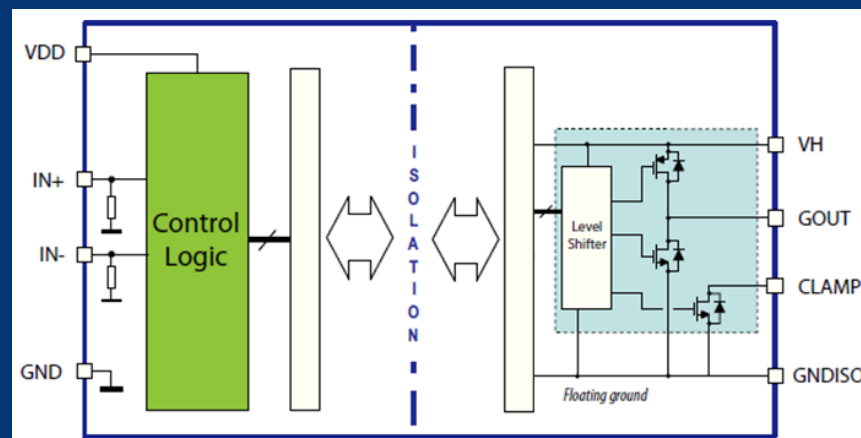
Specifications

Miller CLAMP pin option to avoid induced turn-on

STGAP2HSCM
STGAP2SiCSC

Separated Outputs option for easy gate driving tuning

STGAP2HSM
STGAP2SiCS



- Up to 26 V supply voltage
- 4 A Sink/Source current capability
- Short propagation delay 75 ns
- Optimized UVLO Function
- Stand-by function
- CMTI 100 V/ns
- SO8W Package

New 6kV Galvanic Isolated Dual channel

Features and Benefits

Specs

- Up to 26 V supply voltage
- Optimized UVLO Function
- Stand-by function
- SD pin
- Interlocking function

STGAP2HD
Designed for
IGBT and MosFET



STGAP2SiCD
Designed for
SiC MosFET



- 4A sink / source driver current capability
- > 100V/ns transient immunity
- Propagation delay 75ns



- UVLO & Watchdog
- Miller Clamp and Separated Output



- Compact SO36W package



Production
Q1-2021

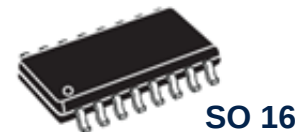
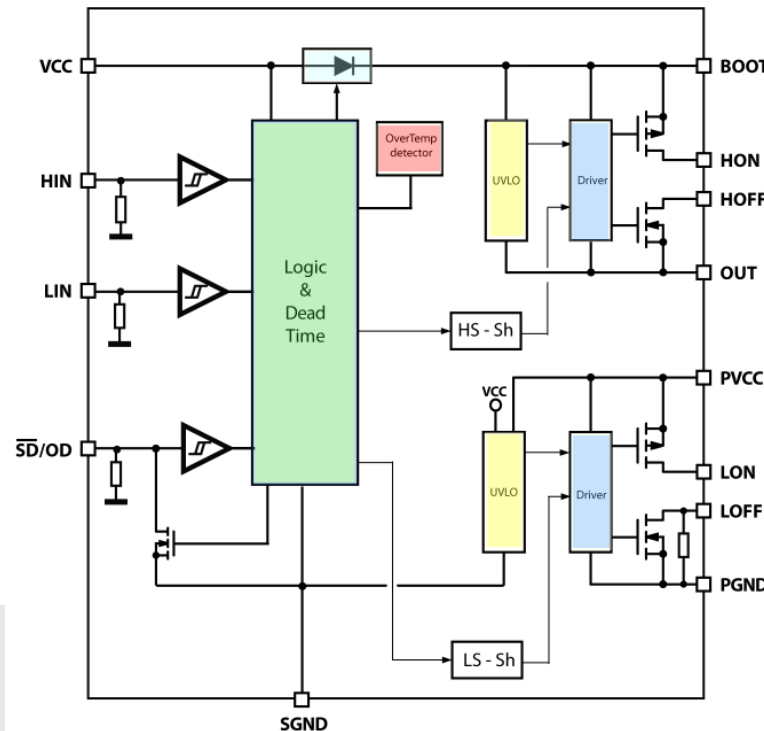
STDRIVEG600

600V high speed Half Bridge GaN driver



KEY APPLICATIONS

- Power supply units
- HV PFC, DC-DC converters
- Motor drivers for HA and factory automation
- Industrial drives and FANs



Key benefits & features

High performance features

- Voltage rail to 600V
- Up to 20V gate driver
- 5.5A / 6A sink/source currents
- **Immunity > 200 V/ns CMTI**
- **50ns short propagation delay**
- **Bootstrap diode**
- Separated ON-OFF outs for easy gate driving tuning
- 3.3V / 5V logic inputs
- Interlocking function
- Shut down pin
- UVLO Vcc & V_{BOOT} with noise filtering
- Thermal protection

Thank you