

Welcome!

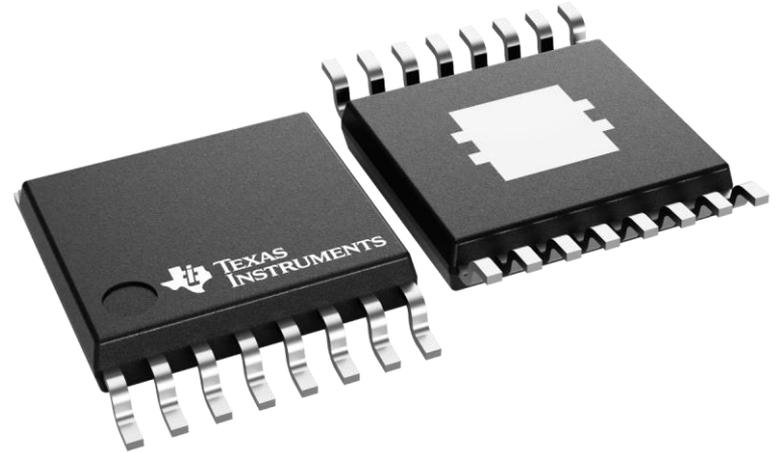
Texas Instruments New Product Update

- This webinar will be recorded and available at www.ti.com/npu
- Phone lines are muted
- Please post questions in the chat or contact your TI sales contact or field applications engineer

NEXT-GENERATION LOW-VOLTAGE, DUAL-BRIDGE MOTOR DRIVER WITH CURRENT REGULATION

New Product
Update

Jennifer Jordan
- Product Marketing Engineer



Agenda

- DRV841x family overview
- Feature overview
 - How integrated current regulation helps reduce board layout space
 - An IPROPI current mirror solution, and how it can reduce solution size
 - Using current sense output to detect stall and load changes
- Resources for getting starting with the DRV841x family

Please feel free to use the “chat” and we will try to answer any question you have throughout this presentation.

DRV8410/11/A product overview

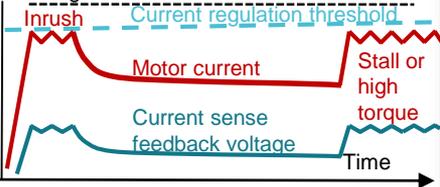
Low-voltage, dual-bridge motor driver with current regulation

Advanced sensing & control

- Integrated analog **current regulation** helps to manage motor torque and current
- Better diagnostics and higher-performance control
- **Low-voltage and battery-powered** applications

Benefits

- ✓ **Protect motor** by regulating current during inrush and stall conditions
- ✓ **Detect motor load, stall, and end-of-travel** with analog current feedback signal to an ADC
- ✓ **Improve safety** of the mechanical components and users by detecting high-load conditions
- ✓ **Reduce heat dissipation** by limiting large current



Small solution size

- **Small HTSSOP/QFN** package
- Integrated cap-less charge pump
- **P2P solution size** with DRV8833/C and DRV8847

Benefits

- ✓ **Integrated charge pump** reduces number of external capacitors on PCB and allows for 100% duty cycle operation
- ✓ Integrated current sense and regulation to decrease solution size

5 x 4.4mm, 16-pin HTSSOP package

3.0x3.0mm, 16-pin WQFN package

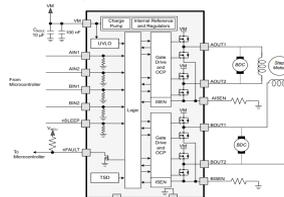


Low power, long battery life

- **Wide low-voltage** range supply voltage
- **Low-power sleep mode** for increased lifetime of battery-powered applications

Benefits

- ✓ **Low-power sleep mode (≤ 40 nA)** reduces standby power and lengthens battery life
- ✓ **Low minimum supply voltage (1.65 V)** for longer battery operating lifetime and boost converter elimination
- ✓ **Increase battery life** by limiting large currents that crash the supply rail and waste energy

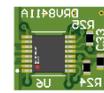
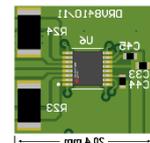


IPROPI solution

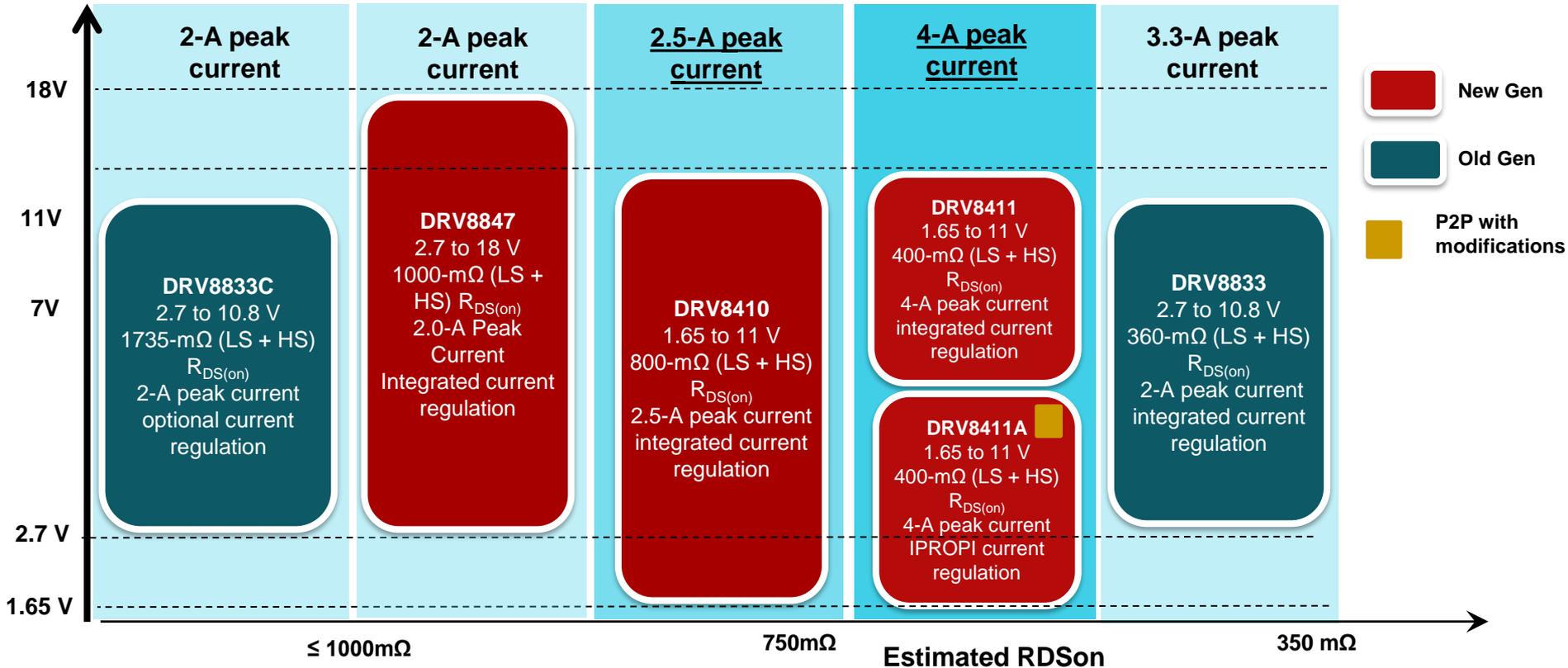
- **IPROPI current mirror solution**
- Current-sense output allows for **stall detection and load changes**
- Even **smaller solution size**

Benefits

- ✓ **Small solution size** the Ipropi solution does not contain any external shunt resistors
- ✓ **Better power dissipation**
- ✓ **Competitive Current Regulation Accuracy.** You will not have to sacrifice accuracy for size
- ✓ **Regulate** motor current during startup and high-load without microcontroller



Low-voltage, dual H-bridge pin-to-pin portfolio



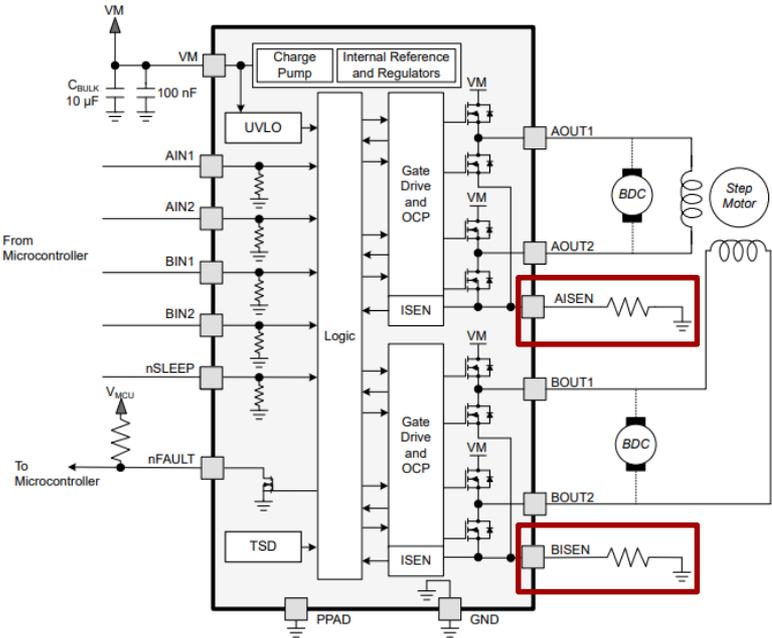
Old pin-to-pin (P2P) generation versus new P2P

Features	DRV8410	DRV8411	DRV8411A	DRV8847	DRV8833	DRV8833C
	New P2P Gen		P2P with modifications	Old P2P Gen		
Operating Voltage (V)	1.65-11	1.65-11	1.65-11	2.7-18	2.7-10.8	2.7-10.8
RDS(on) (HS+LS) mΩ	800	400	400	1000	360	1735
Current Regulation	tOFF 20 us	tOFF 20 us	tOFF 20 us	tOFF 20 us	fPWM 50 kHz	tOFF 20 us
Max OCP (A)	2.5	4	4	2	3.3	1
Integrated Current Sensing	Low-side shunt resistor	Low-side shunt resistor	Low-side IPROPI	Low-side shunt resistor	Low-side shunt resistor	Low-side shunt resistor
Current Sense Feedback	External amplifier	External amplifier	Internal current mirror	External amplifier	External amplifier	External amplifier
Protection	OCP, TSD, UVLO	OCP, TSD, UVLO	OCP, TSD, UVLO	OCP, TSD, VM_UVLO, OLD	OCP, TSD, UVLO	OCP, TSD, UVLO, nFAULT
Packages Options and Sizes (mm)	HTSSOP (16 pin, 5x4.4)	HTSSOP (16 pin, 5x6.4)				
	WQFN (16 pin, 3x3)	WQFN (16 pin, 3x3)	WQFN (16 pin, 3x3)	WQFN (16 pin, 3x3)	TSSOP (16 pin, 5x4.4)	
				WQFN (16 pin, 3x3)		QFN (16 pin, 3x3)

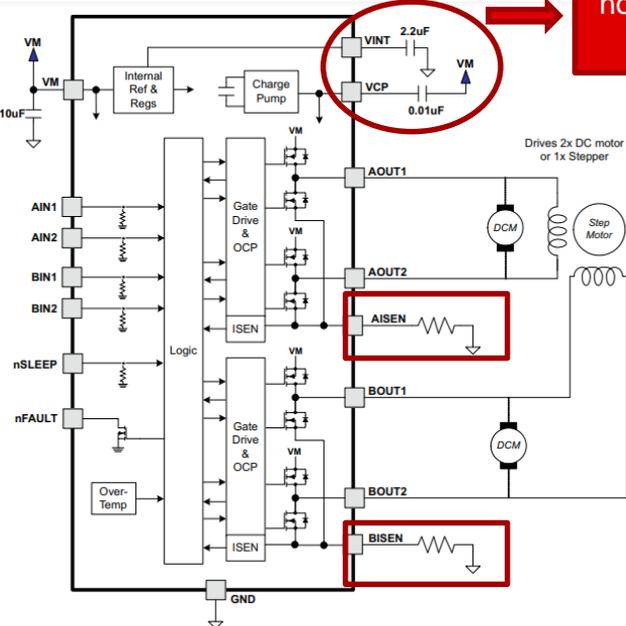
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DRV8411 vs. DRV8833 block diagram comparison

DRV8411



DRV8833



DRV8411 does not require these two caps

DRV8410/11

Low-voltage, dual H-bridge motor driver with current sense and regulation

Features

- **Low voltage dual H-bridge motor driver**
 - Supply voltage: **1.65 to 11 V**
 - DRV8410 $R_{DS(on)}$: **800 m Ω @ $T_A = 25^\circ\text{C}$ (HS + LS)**
 - DRV8411 $R_{DS(on)}$: **400 m Ω @ $T_A = 25^\circ\text{C}$ (HS + LS)**
- Cap-less internal charge pump for high efficiency 100% duty cycle
- Ultra low-power sleep mode (30 nA)
- Package options for leaded and leadless
- Current regulation
- Standard PWM interface
- **Protection Features:** Supply undervoltage (UVLO), output overcurrent protection (OCP), thermal shutdown (TSD)

Applications

- EPOS
- Video Surveillance
- Toys
- Smart Lock



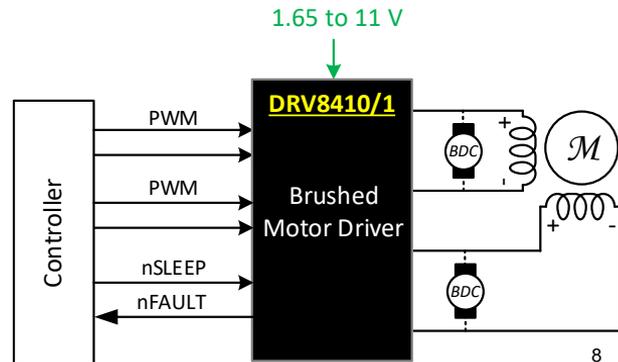
5.0 x 4.4mm, 16-pin
HTSSOP package with thermal pad (PWP)
Pin-to-to pin with DRV8833/C



3.0x3.0mm, 16-pin
WQFN package (RTE)
Pin-to-to pin with DRV8833C

Benefits

- Ultra-wide motor supply voltage input range allowing for flexible power supply and low battery voltage operation.
- Low power sleep mode to minimize power consumption and extend battery lifetime.
- Minimum external components for compact PCB and system design.
- Protected power stage limited short circuit currents and preventing device overheating.
- Integrated current sense and regulation to decrease solution size
- Multiple interface and channel variants accommodate **a variety of loads: brushed-DC motors, stepper motors, and solenoids.**



DRV8411A

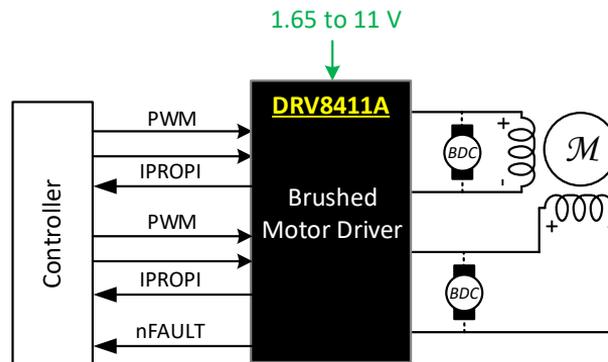
Low-voltage, single H-bridge motor driver with current sense and regulation

Features

- **Low voltage, single H-bridge motor drivers with current sensing**
 - Supply voltage: **1.65 to 11 V**
 - $R_{DS(on)}$: **400 m Ω /H-Bridge @ $T_A = 25^\circ\text{C}$ (HS + LS)**
- Cap-less internal charge pump for high efficiency 100% duty cycle
- Ultra low-power timed sleep mode (30 nA)
- Interface options
 - Full bridge: PWM control
- Current sense and regulation options
- **Protection Features**
 - Supply undervoltage (UVLO), output overcurrent protection (OCP), thermal shutdown (TSD)

Benefits

- Supply voltage input range allows for low battery voltage operation.
- Low power sleep mode minimizes power consumption and extends battery lifetime
- Minimal external components for compact PCB and system design
- Protected power stage limits short circuit currents and prevents device overheating
- Current-sense feedback for motor diagnostics and control



Applications

- Medical devices
- Motorized blinds
- Smart lock
- Smart Sanitation
- Toys



5.0 x 4.4mm, 16-pin
HTSSOP package



3.0x3.0mm, 16-pin
WQFN package

Getting started

You can start evaluating this device leveraging the following:

Content type	Content title	Link to content or more details
Product folder	DRV8410 DRV8411 DRV8411A	https://www.ti.com/product/DRV8410 https://www.ti.com/product/DRV8411 https://www.ti.com/product/DRV8411A
Technical blog content or white paper	Advantages of Integrated Current Sensing [FAQ] How to configure IPROPI and current sensing	https://www.ti.com/lit/an/slvae68b/slvae68b.pdf?ts=1682951573457&ref_url=https%253A%252F%252Fwww.google.com%252F https://e2e.ti.com/support/motor-drivers-group/motor-drivers/f/motor-drivers-forum/1013146/faq-how-to-configure-ipropi-and-current-sensing
Development tool or evaluation kit	DRV8410EVM DRV8411EVM DRV8411AEVM	https://www.ti.com/tool/DRV8410EVM https://www.ti.com/tool/DRV8411EVM https://www.ti.com/tool/DRV8411AEVM

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