

STM32 Nucleo expansion boards Selection Guide for motor driving

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STM32Cube
development software

STM32Cube
expansion software



STM32 Open
Development
Environment

STM32 Nucleo
development boards

STM32 Nucleo
expansion boards

www.st.com/stm32ode

What motor do you need?

Stepper



Dedicated to precise positioning

- ATM and cash dispensers
- Industrial, label and 3D Printers
- POS
- Textile and sewing machines
- Security and dome cameras
- Valves control
- Medical equipment

Brush DC



Affordable and easy to use

- Stage lighting
- Valves control
- Home/educational Robots
- Vending machines
- ATM and cash dispensers
- Robotics
- Medical and health care
- Industrial automation

Brushless



High reliability and high performance

- Industrial automation
- Fans
- Pumps
- Home appliances
- Drones ESC and Gimbals
- Handheld gimbals
- Medical and health care appliances



The STM32 Nucleo expansion boards for motor driving cover all the main motor types in a wide operating range of both current and voltage

Stepper



- [X-NUCLEO-IHM01A1](#)
- [X-NUCLEO-IHM02A1](#)
- [X-NUCLEO-IHM03A1](#)
- [X-NUCLEO-IHM05A1](#)
- [X-NUCLEO-IHM06A1](#)
- [X-NUCLEO-IHM14A1](#)

Brush DC



- [X-NUCLEO-IHM04A1](#)
- [X-NUCLEO-IHM12A1](#)
- [X-NUCLEO-IHM13A1](#)

- [X-NUCLEO-IHM15A1](#)

Coming
Soon

Brushless



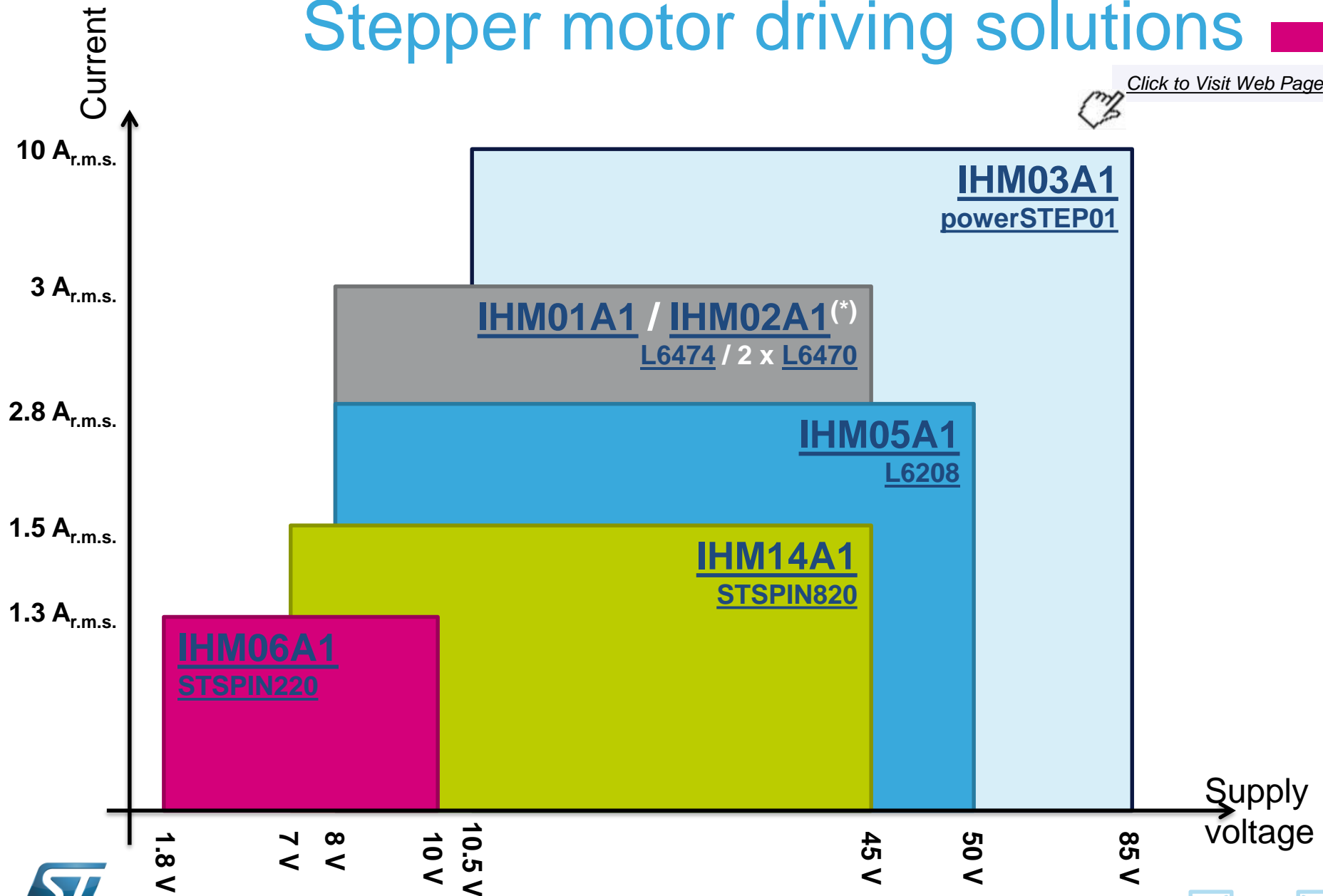
- [X-NUCLEO-IHM07M1](#)
- [X-NUCLEO-IHM08M1](#)
- [X-NUCLEO-IHM11M1](#)
- [X-NUCLEO-IHM17M1](#)

- [X-NUCLEO-IHM16M1](#)

- [P-NUCLEO-IHM001](#)
NUCLEO-F302R8 + X-NUCLEO-IHM07M1
- [P-NUCLEO-IHM002](#)
NUCLEO-F302R8 + X-NUCLEO-IHM07M1
+ Power Supply

Stepper motor driving solutions

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life.augmented

(*) IHM02A1 is dual stepper



Stepper motor driving solutions

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Features

Board	Part	Stackable	Main feature and target applications
X-NUCLEO-IHM01A1	L6474	Up to 3 boards	Multi motor applications with step-clock and direction control. Microstepping up to 1/16 th and integrated current sensing.
X-NUCLEO-IHM02A1	2 x L6470	Up to 4 boards (up to 8 motors)	Multi motor application with SPI control. Microstepping up to 1/128 th and voltage mode driving for silent operation.
X-NUCLEO-IHM03A1	powerSTEP01	Up to 3 boards	High power motor driving. Both voltage mode (1/128 th microstepping) and current mode driving (1/16 th microstepping).
X-NUCLEO-IHM05A1	L6208	No	General purpose single motor. Microstepping managed by MCU.
X-NUCLEO-IHM06A1	STSPIN220	Up to 2 boards (*)	Ultra low voltage and portable equipments. Microstepping up to 1/256 th .
X-NUCLEO-IHM14A1	STSPIN820	Up to 2 boards (*)	Low power motor driving. Microstepping up to 1/256 th .

(*) Some limitations could be present when the boards are stacked.



Stepper motor driving solutions

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Supported STM32 Nucleo boards

	<u>NUCLEO-F401RE</u>	<u>NUCLEO-F334R8</u>	<u>NUCLEO-F302R8</u>	<u>NUCLEO-F030R8</u>	<u>NUCLEO-F072RB</u>	<u>NUCLEO-L053R8</u>
<u>X-NUCLEO-IHM01A1</u> (X-CUBE-SPN1)	●	●		●		●
<u>X-NUCLEO-IHM02A1</u> (X-CUBE-SPN2)	●		●		●	
<u>X-NUCLEO-IHM03A1</u> (X-CUBE-SPN3)	●	●		●		●
<u>X-NUCLEO-IHM05A1</u> (X-CUBE-SPN5)	●	●		●		●
<u>X-NUCLEO-IHM06A1</u> (X-CUBE-SPN6)	●	●		●		●
<u>X-NUCLEO-IHM14A1</u> (X-CUBE-SPN14)	●	●		●		●



Brush DC motor driving solutions

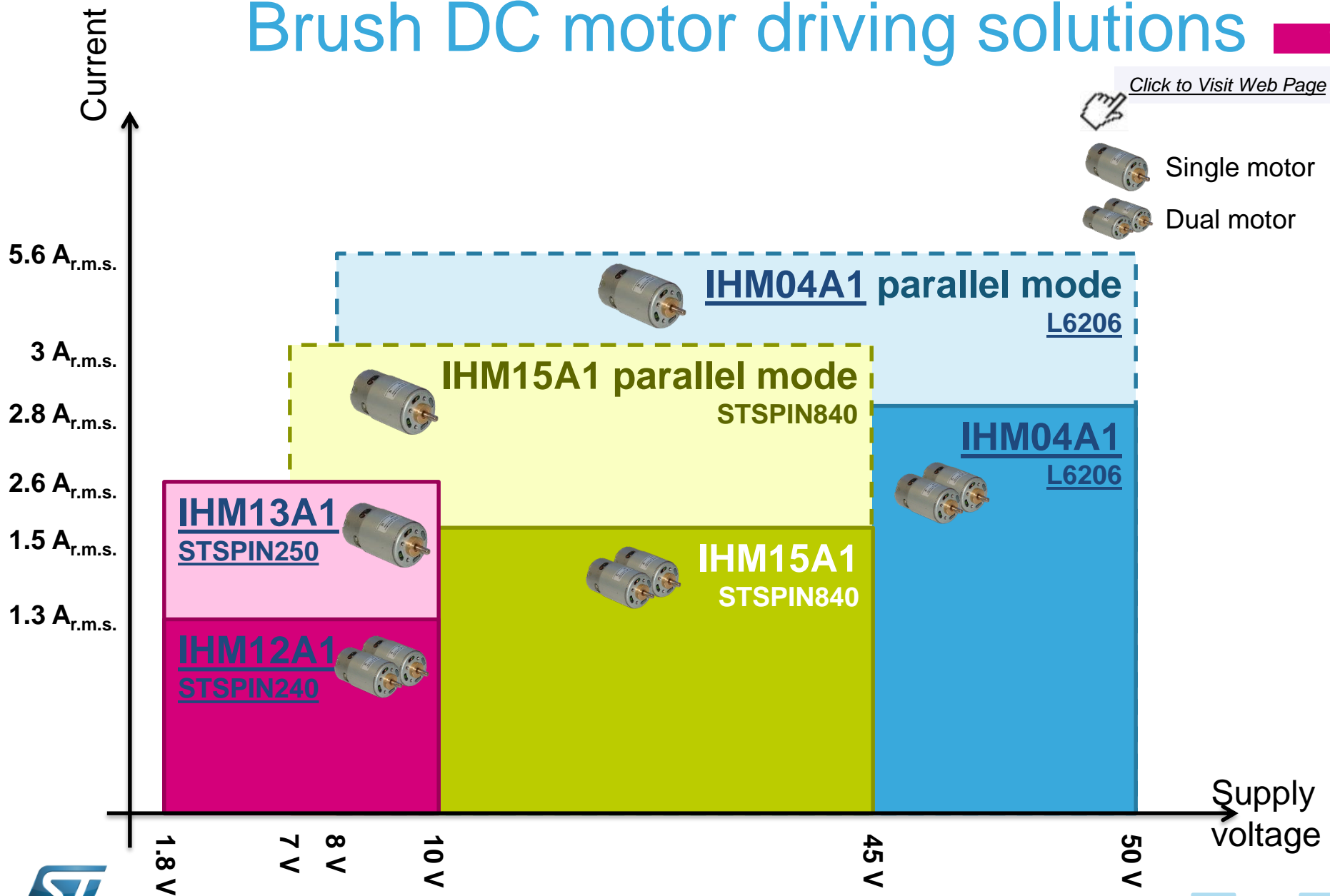
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Single motor



Dual motor



Brush DC motor driving solutions

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Features

Board	Part	Stackable	Main feature and target applications
X-NUCLEO-IHM04A1	L6206	No	Both bi-directional or uni-directional brush DC motors without current limiting. Relays and other inductive loads. Outputs can be paralleled.
X-NUCLEO-IHM12A1	STSPIN240	No	Ultra low voltage and portable equipment. Dual bi-directional brush DC motor with current limiter. <u>Parallel operation is not allowed.</u>
X-NUCLEO-IHM13A1	STSPIN250	No	Ultra low voltage and portable equipment. Single high current bi-directional brush DC motor with current limiter.
X-NUCLEO-IHM15A1	STSPIN840	No	Dual bi-directional brush DC motor with current limiter. Parallel operation enabled through a dedicated pin.

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Brush DC motor driving solutions

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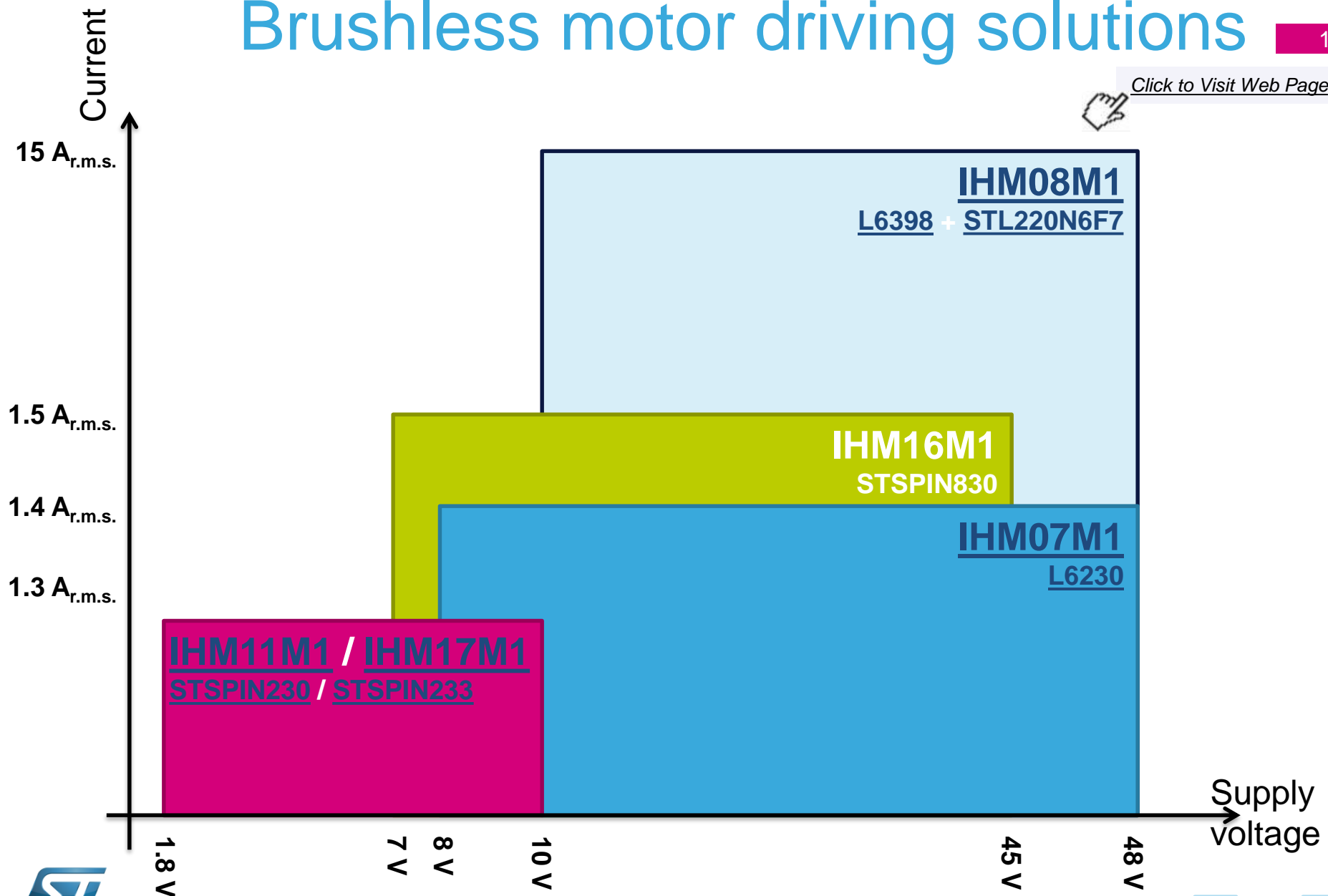
Supported STM32 Nucleo boards

	<u>NUCLEO-F401RE</u>	<u>NUCLEO-F334R8</u>	<u>NUCLEO-F030R8</u>	<u>NUCLEO-L053R8</u>
<u>X-NUCLEO-IHM04A1</u> (X-CUBE-SPN4)	●			●
<u>X-NUCLEO-IHM12A1</u> (X-CUBE-SPN12)	●	●	●	●
<u>X-NUCLEO-IHM13A1</u> (X-CUBE-SPN13)	●	●	●	●
<u>X-NUCLEO-IHM15A1</u> (X-CUBE-SPN15)	●	●	●	●



Brushless motor driving solutions

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Brushless motor driving solutions

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Features

Board	Part	Stackable	Main feature and target applications
X-NUCLEO-IHM07M1	L6230	No	Low power brushless motor driver in single shunt and 3 shunts topology.
X-NUCLEO-IHM08M1	L6398 + STL220N6F7	No	High power brushless motor driver in single shunt and 3 shunt topology.
X-NUCLEO-IHM11M1	STSPIN230	No	Ultra low voltage and portable equipment. Brushless motor driver in single shunt topology.
X-NUCLEO-IHM16M1	STSPIN830	No	Brushless motor driver in single shunt and 3 shunt topology.
X-NUCLEO-IHM17M1	STSPIN233	No	Ultra low voltage and portable equipment. Brushless motor driver in three shunt topology.

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Brushless motor driving solutions

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Supported STM32 Nucleo boards

	<u>NUCLEO-F401RE</u>	<u>NUCLEO-F302R8</u>	<u>NUCLEO-F103RB</u>	<u>NUCLEO-F030R8</u>
<u>X-NUCLEO-IHM07M1</u> (X-CUBE-SPN7)	●	●	●	●
<u>X-NUCLEO-IHM08M1</u> (X-CUBE-SPN8)	●	●		
<u>X-NUCLEO-IHM11M1</u> (X-CUBE-SPN11)	●			
<u>X-NUCLEO-IHM16M1</u> (X-CUBE-SPN16)	●	●	●	●
<u>X-NUCLEO-IHM17M1</u> (X-CUBE-SPN17)	●	●	●	●

