

# MP6602

**35V, 4A, Stepper Motor Driver with Stall Detection  
and Serial Interface**

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**Pre-Release – Datasheet Rev 0.8**



Singel 3 | B-2550 Kontich | Belgium | Tel. +32 (0)3 458 30 33  
info@alcom.be | www.alcom.be

Rivium 1e straat 52 | 2909 LE Capelle aan den IJssel | The Netherlands  
Tel. +31 (0)10 288 25 00 | info@alcom.nl | www.alcom.nl



# MP6602 – Target Applications

- 3D Printers
- Robotics
- ATM Machines
- Textile Machines



3D Printers



Robotics



ATM Machines



Textile Machines

# Why Use This Part?

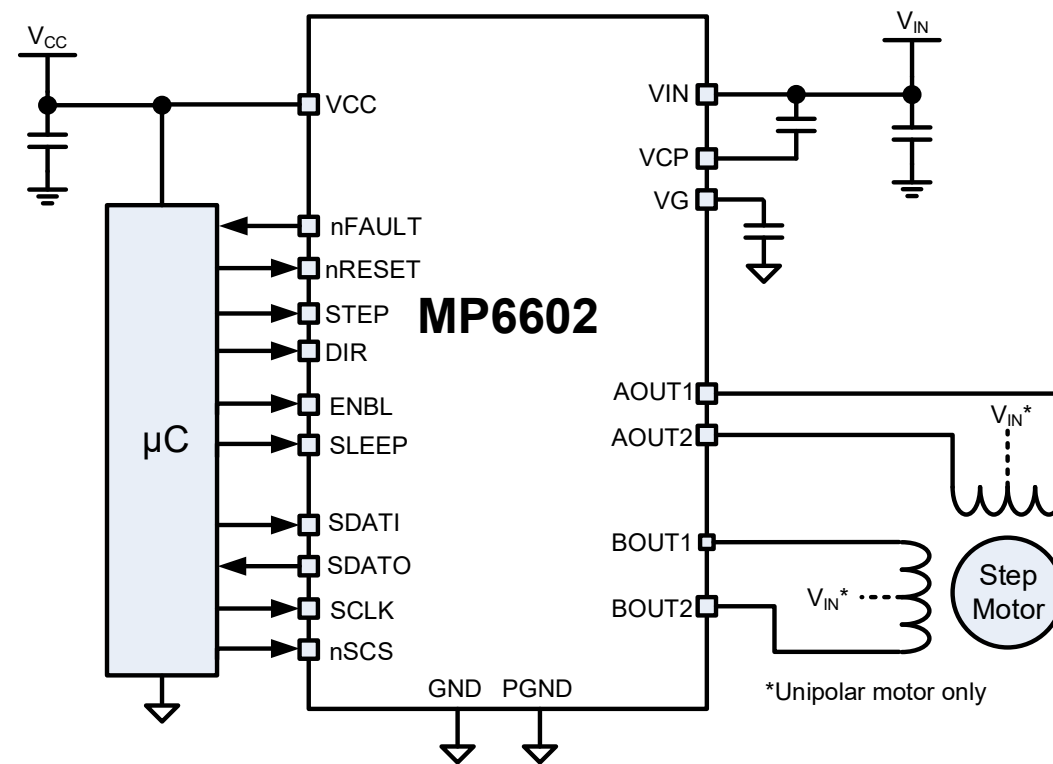
**It's Simple and Easy!**

- 4.5 to 35V Input Voltage ( $V_{IN}$ ) Range
- As Low as 90m $\Omega$   $R_{DS(ON)}$  for Up to 4A of Phase Current
- SPI Interface, Stall Detection, and Back EMF Measurement Capability
- Available in a Small QFN-25 (4mmx5mm) Package

# MP6602 – 35V, 4A, Stepper Motor Driver

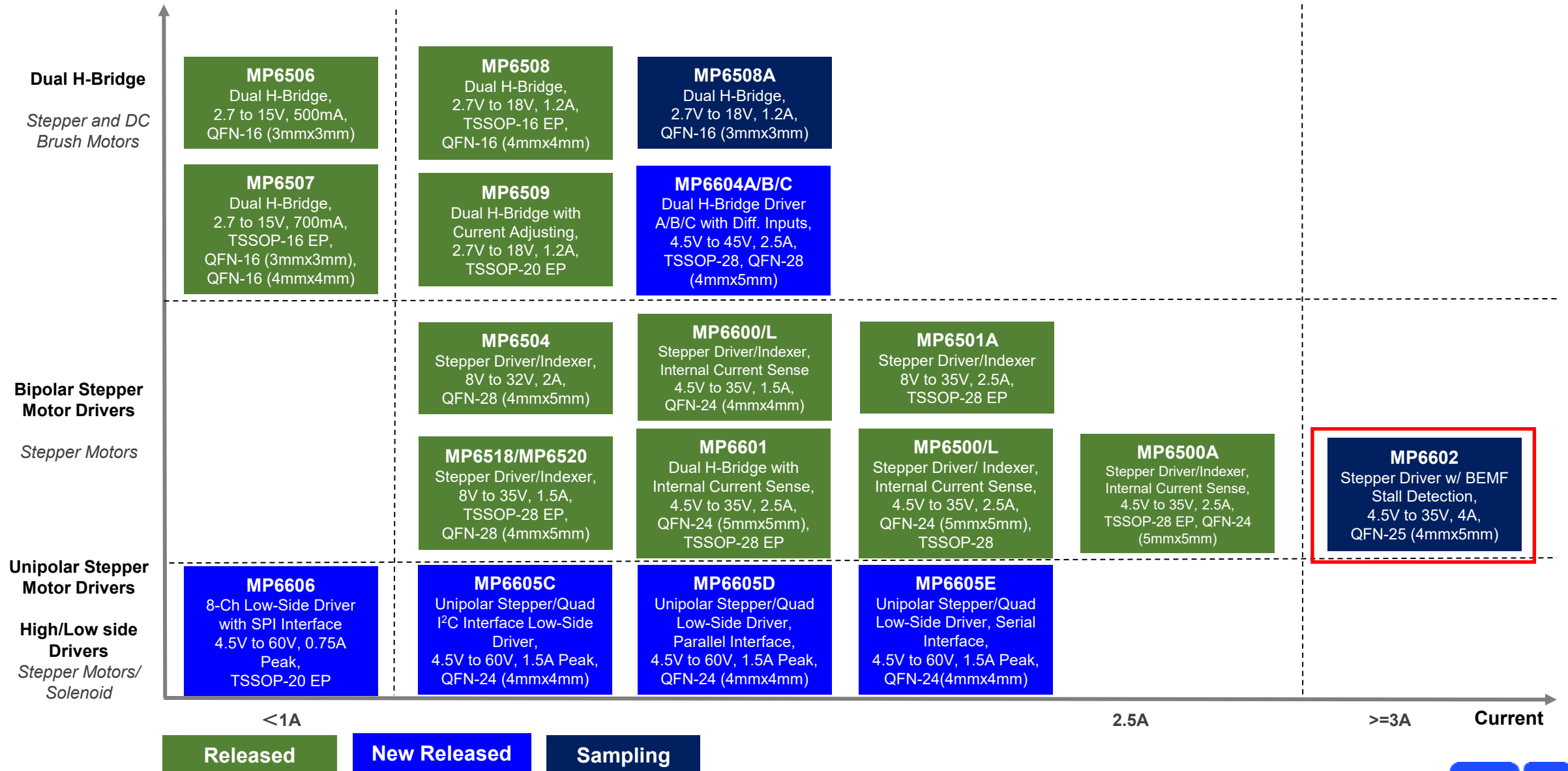
## Features

- 4.5V to 35V Input Voltage ( $V_{IN}$ ) Range
- Up to 4A of Phase Current
- Up to 1/32-Step Microstepping
- Internal Current Sensing and Regulation
- Low On Resistance (HS: 60m $\Omega$ , LS: 30m $\Omega$ )
- Serial Control Interface
- 3.3V and 5V Compatible Logic Supply
- Automatic Hold Current, Automatic Current Decay
- Diagnostic Functions: Rotor Stall Detection, Back EMF Measurement, OCP, OLD, OVP, UVLO, TSD
- Fault Indication Output



Available in a QFN-25 (4mmx5mm) Package

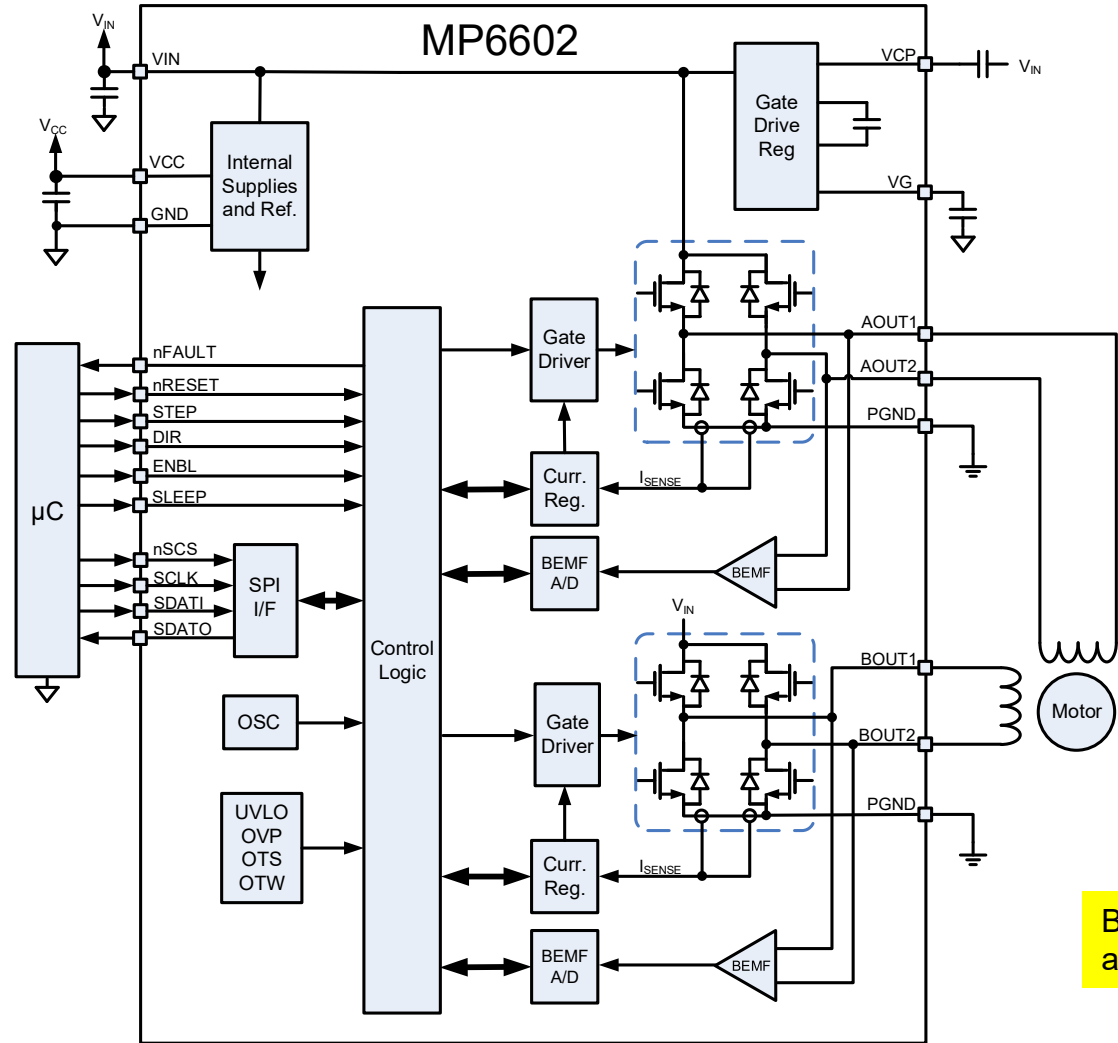
# Road Map: Dual H-Bridges & Stepper Motors



# MP6602 – Block Diagram

4.5V to 35V,  
4A Maximum

SPI Interface for  
Configurations



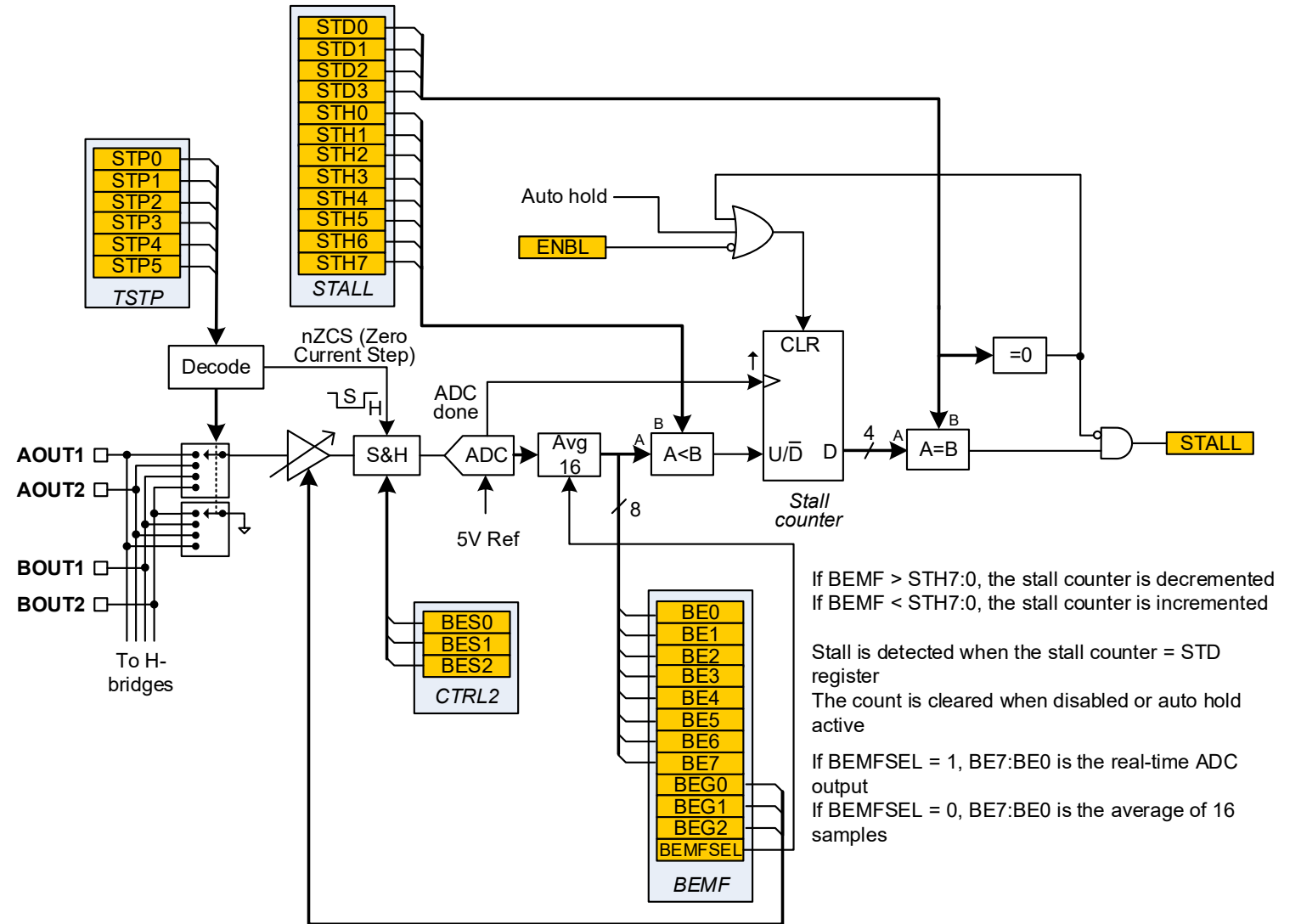
Internal Current  
Sense

Back EMF Measurement  
and Stall Detection

# MP6602 – Back EMF and Stall Detection

The MP6602 can measure and report the back EMF of the stepper motor via the SPI. No other competitive devices have this ability.

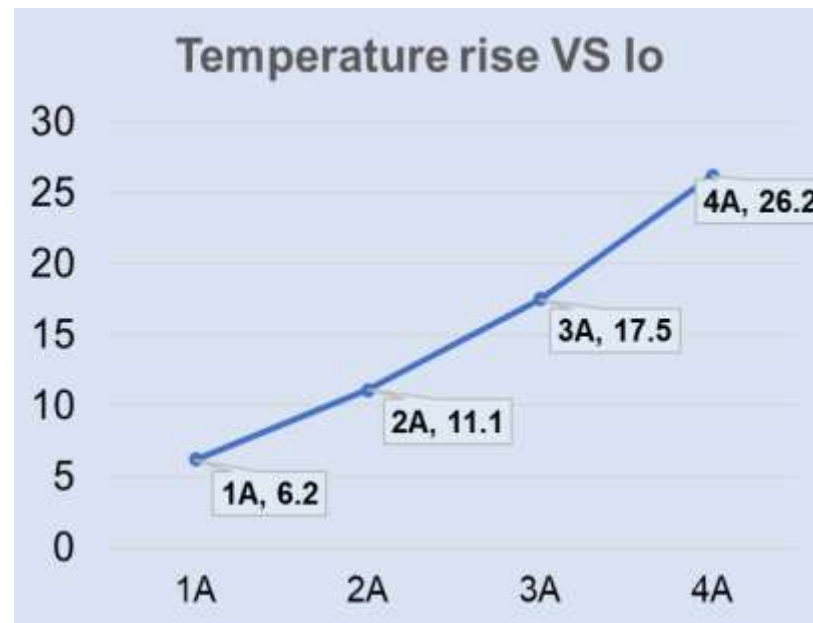
This allows advanced diagnostics features to be implemented, such as torque measurements and rotor stall detection.



# MP6602 – Thermal Performance

On a well-designed, 4-layer PCB, the temperature rise for a motor current driving 4A is only about 26°C above the ambient temperature. This thermal image was taken at 4A, 24V, 1/8-step operation.

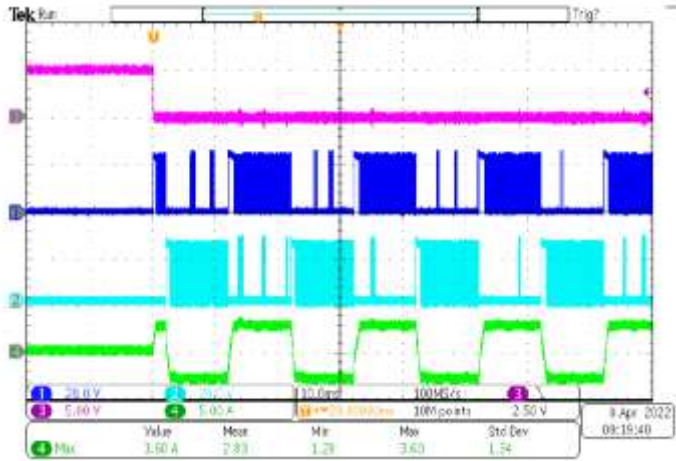
The graph shows the measured temperature rise versus the motor current under the same conditions. The thermals for the MP6602 are better than any competitor's product.



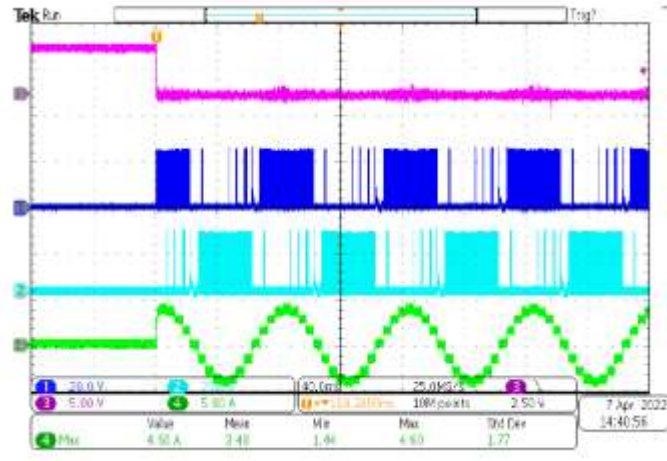


# MP6602 – Typical Waveforms

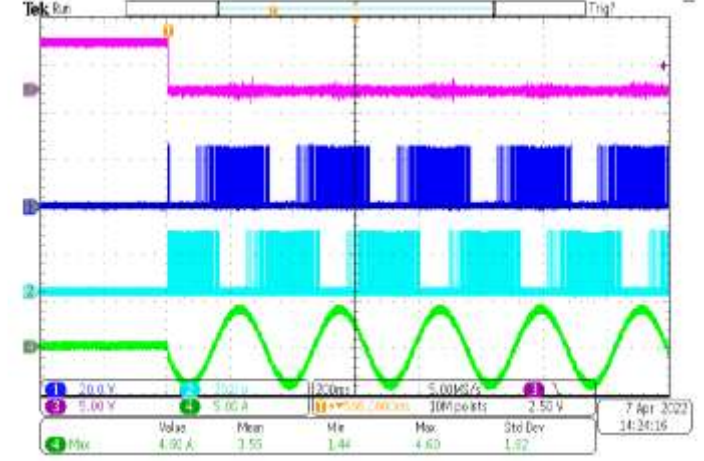
Test conditions: 24V, 4A peak current



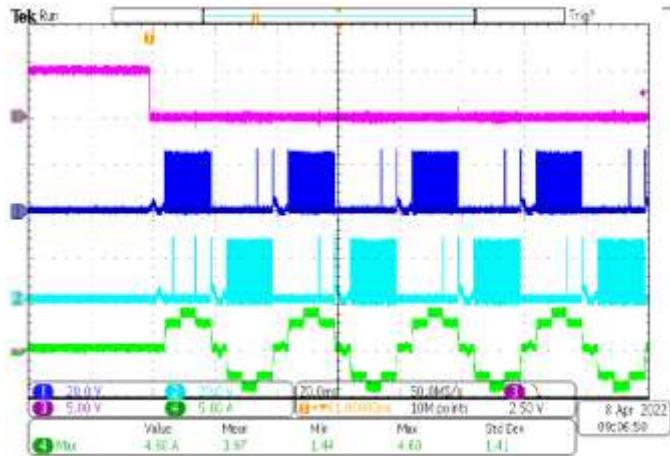
Full Step



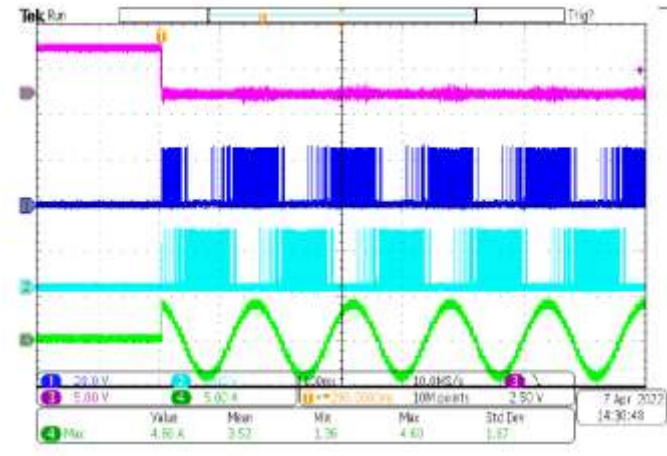
1/4 Step



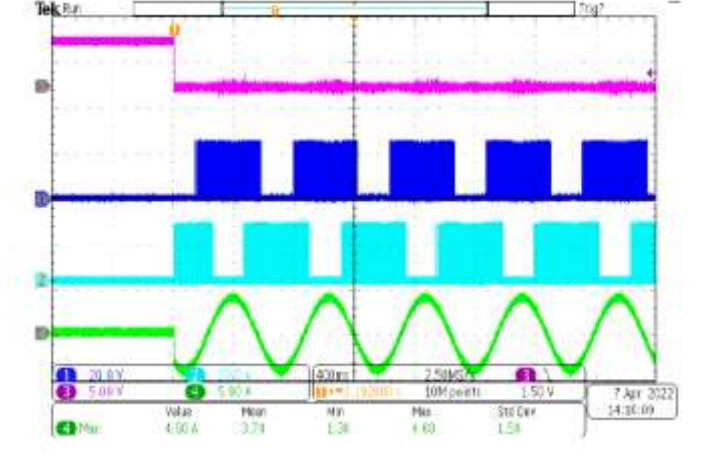
1/16 Step



1/2 Step



1/8 Step



1/32 Step