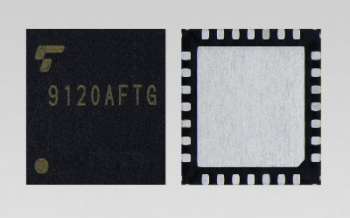
TB9120AFTG

Constant-Current 2-Phase Stepping Motor Driver for Automotive Applications

TB9120AFTG, a constant-current 2-phase stepping motor driver is suited to a wide range of automotive general applications using stepping motors. The mass production has started in April 2020.



Features

- **Product specifications for automotive applications**
  This product is qualified as AEC-Q100. It uses the wettable flank QFN package with excellent solderability, so highly accurate result can be obtained by automatic optical inspection after mounting.

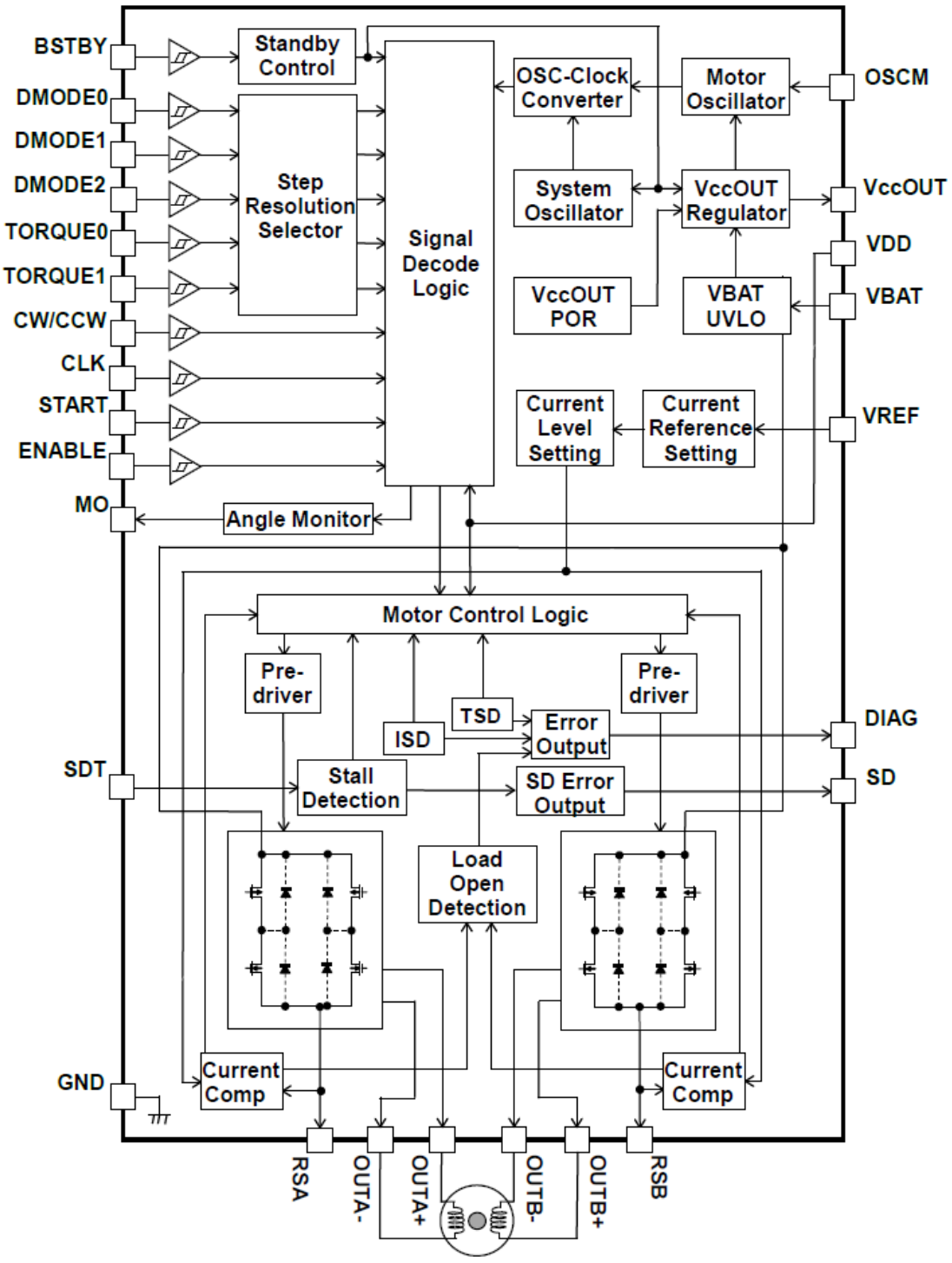
- **Micro step drive**
  An advanced functional MCU or dedicated software are not required. It supports from full-step to 1/32 steps for less motor noise and smoother control. The PWM constant-current control allows stable output waveforms in mixed decay mode.

- **Stall detection function**
  A stall detection signal is output after detecting a stall. The detection signal can be received by a microcontroller and fed back to the system.

Applications

- Mirror adjustment for the projection position of heads-up displays
- Expansion valves in refrigerant circuits for automotive air conditioners and battery management systems
- Idle speed control valves
- Other applications using automotive stepping motors

Block Diagram

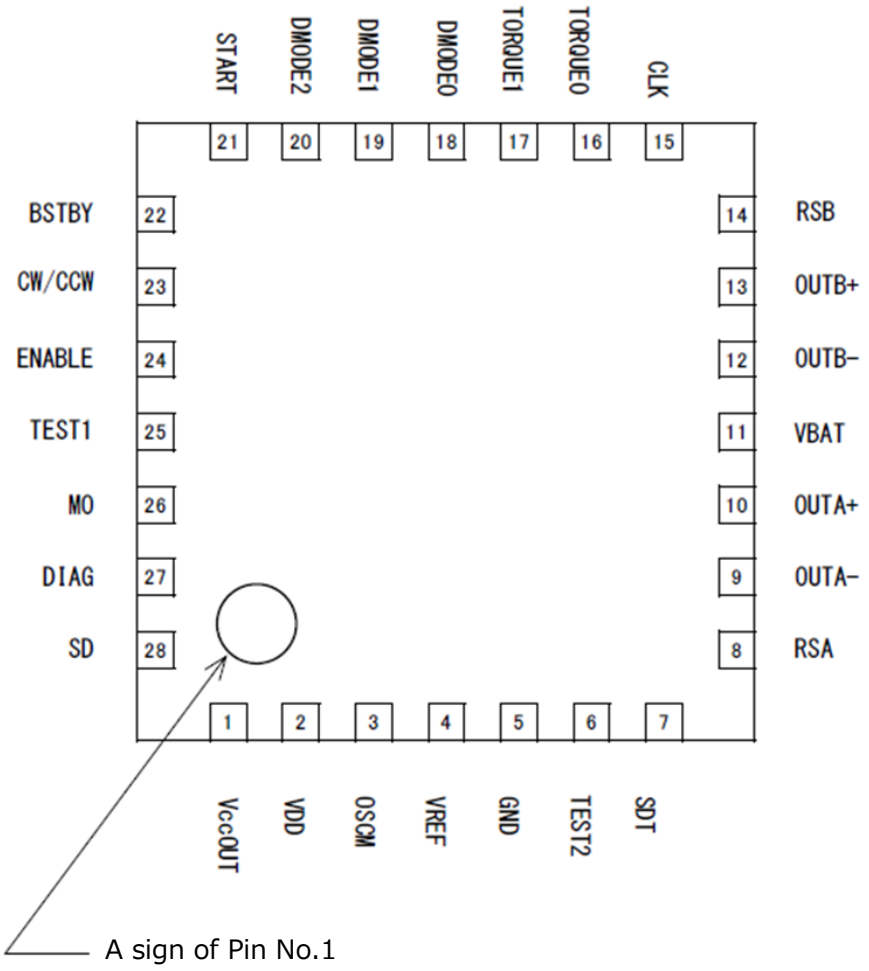


Note: Some of the functional blocks, circuits, or constants in the block diagram may be omitted or simplified for explanatory purposes.

Product Specifications

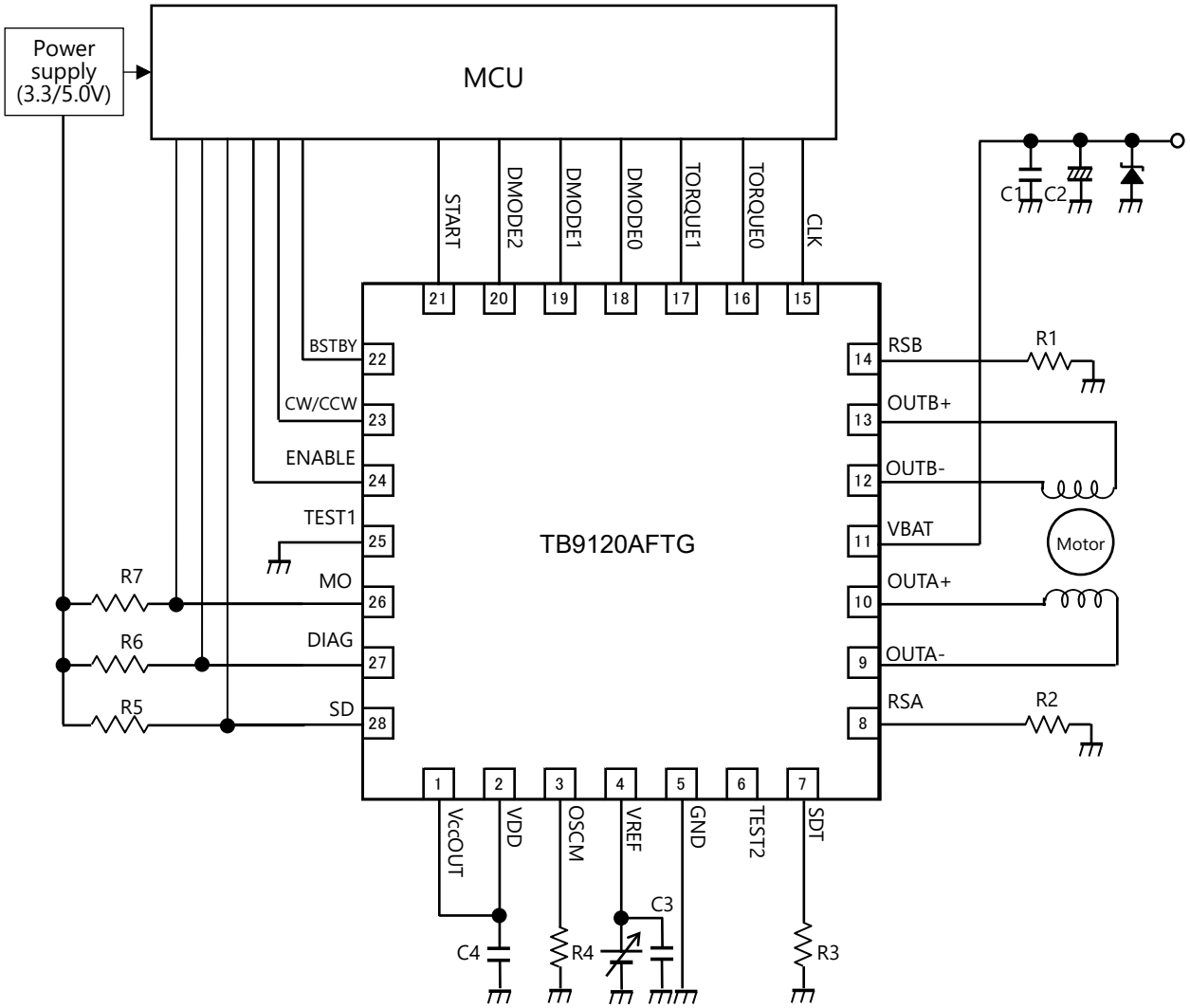
Part number	TB9120AFTG
Driving method	Constant-current PWM control
Excitation mode	Micro step drive, supporting up to 1/32 steps
Number of drive motors	Single 2-phase stepping motor
On-resistance	Upper + Lower = 0.8 Ω (typ.) at 25℃
Output current	1.5A[Note 1] (Absolute maximum rating)
Error detections	Stall detection, thermal shutdown, over-current detection, and load open detection
Operating voltage range	7V to 18V (Absolute maximum rating = 40V)
External power supply	Single power supply
Operating temperature range	-40 to 125℃
Package	P-VQFN28-0606-0.65 6.0mm x 6.0mm Wettable pins with excellent solderability
Reliability test	AEC-Q100 qualified
Mass production	Started in April, 2020

[Note 1] Actual driven motor current depends on the use environment and such factors as ambient temperature and power supply voltage.



Pin assignment (Top View)

Application Circuit Example



Note: The application circuits shown in this document are provided for reference purposes only. Thorough evaluation is required, especially at the mass production design stage. Providing these application circuit examples does not grant any license for industrial property rights.