

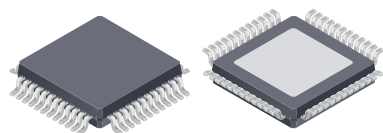
80 V Automotive Three-Phase MOSFET Driver

FEATURES AND BENEFITS

- 3-phase bridge MOSFET driver
- Bootstrap gate drive for N-channel MOSFET bridge
- Cross-conduction protection with adjustable dead time
- Fixed-frequency buck converter
- Operation at any PWM duty cycle up to and including 100%
- Programmable gate drive strength
- 10 to 80 V supply voltage operating range
- Programmable 3.3 or 5 V CMOS compatible logic I/O
- Three programmable current sense amplifiers
- SPI-compatible serial interface
- Bridge control by direct logic inputs or serial interface
- Programmable control input logic sense
- Extensive programmable diagnostics
- Diagnostic verification
- Safety-assist features
- Automotive AEC-Q100 qualified
- ASIL Compliant: ASIL D safety element out-of-context (SEooC) developed in accordance with ISO 26262, when used as specified in the safety manual



PACKAGE



Not to scale

48-pin LQFP with exposed thermal pad (suffix JP)

DESCRIPTION

The AMT49100 is an N-channel power MOSFET driver capable of controlling MOSFETs connected in a 3-phase bridge arrangement and is specifically designed for 48 V automotive power applications with high-power inductive loads, such as BLDC motors.

A fixed-frequency buck converter provides a regulated gate drive and bootstrap charge voltage over the full supply voltage range from 10 to 80 V. A bootstrap capacitor is used to provide the above-battery supply voltage required for N-channel MOSFETs. The bootstrap charge is maintained by an additional charge pump providing 0-100% PWM with no duty cycle restriction.

Full control over all six power MOSFETs in the 3-phase bridge is provided, allowing motors to be driven with block commutation or sinusoidal excitation. The power MOSFETs are protected from shoot-through by integrated crossover control and optional programmable dead time.

Integrated diagnostics provide indication of multiple internal faults, system faults, and power bridge faults, and can be configured to protect the power MOSFETs under most short-circuit conditions. For safety-critical systems, the integrated diagnostic operation can be verified under control of the serial interface.

In addition to providing full access to the bridge control, the serial interface is also used to alter programmable settings such as dead time, VDS threshold, and fault blank time. Detailed diagnostic information can be read through the serial interface.

The AMT49100 is supplied in a 48-pin QFP package (suffix JP) with exposed thermal pad. The package is lead (Pb) free with 100% matte-tin leadframe plating.

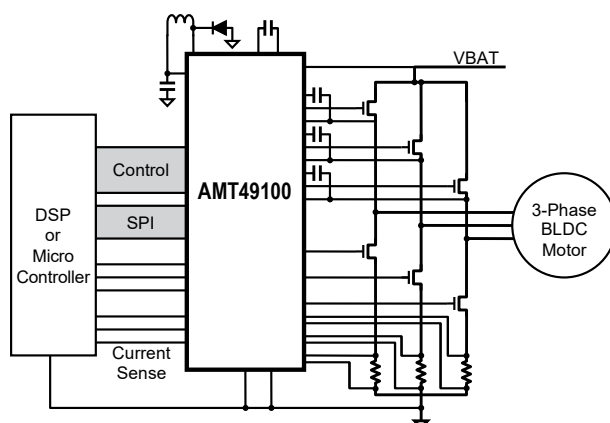


Figure 1: Typical Application

AMT49100-N 80 V Automotive Three-Phase MOSFET Driver

SELECTION GUIDE

Part Number	Buck Regulator	V _{IO} (V)	Packing	Package
AMT49100KJPTR-A-3-N	Enabled	3.3	1500 pieces per 13-inch reel	7 mm × 7 mm, 1.6 mm nominal height 48-terminal LQFP with exposed thermal pad
AMT49100KJPTR-A-5-N	Enabled	5		
AMT49100KJPTR-B-3-N	Disabled	3.3		
AMT49100KJPTR-B-5-N	Disabled	5		

For Reference Only – Not for Tooling Use

(Reference Allegro DWG-0000386, Rev. 5 or JEDEC MS-026 BBCHD)

NOT TO SCALE

Dimensions in millimeters

Dimensions exclusive of mold flash, gate burrs, and dambar protrusions

Exact case and lead configuration at supplier discretion within limits shown

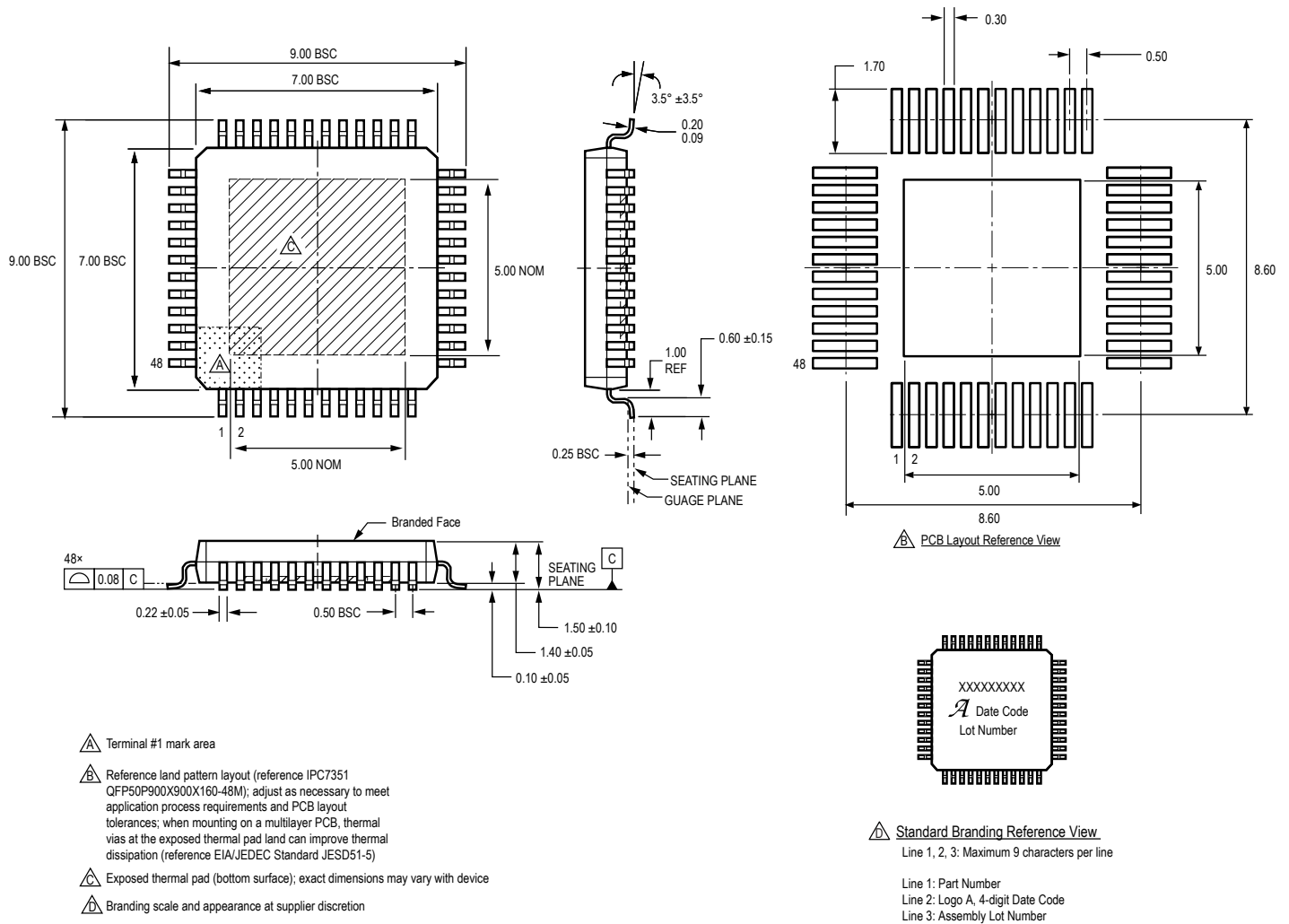


Figure 2: JP Package, 48-Pin LQFP with Exposed Thermal Pad

Revision History

Number	Date	Description
–	February 5, 2026	Initial release

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