



Robust, reliable,
and safe solution

GD3100: Advanced High-Voltage IGBT/SiC Gate Driver with Integrated Isolation

A programmable high-voltage gate driver with advanced functional safety, control and protection features developed for automotive and EV powertrain applications. The GD3100 supports implementation of high voltage HEV/EV traction inverters, DC/DC converters, and on-board chargers using Si IGBTs or SiC MOSFETs

NXP's GD3100 high-voltage (HV) isolated gate driver is part of a complete HV traction inverter (>120 kW) solution as a core pillar of NXP's efforts to enable automotive and eMobility customers to develop EV powertrain solutions for HEV, PHEV, or BEV vehicles faster.

The GD3100 offers:

- ▶ High gate current capability >15 A peak source/sink current
- ▶ SPI programmable configuration and diagnostic reporting
- ▶ Programmable Two Level Turn-Off (2LTO) with Soft Shut Down (SSD)
- ▶ Fast Insulated Gate Bipolar Transistor (IGBT) & Silicon Carbide (SiC) MOSFET Ton / Toff
- ▶ Isolation safety certification:
 - Reinforced Isolation per DIN V VDE V 0884-11
 - 2500-V rms isolation for 1 minute per UL 1577
- ▶ Integrated current, voltage, and temperature protection
- ▶ Robust noise immunity (CMTI > 100 V / ns)
- ▶ Small package footprint (7.5 mm x 11.3 mm) 32-pin SOIC

TARGET APPLICATIONS

- ▶ Electric vehicle traction motors and HV DC/DC converters
- ▶ Electric vehicle on-board chargers (OBCs) and external chargers
- ▶ Other high voltage AC motor control applications



GD3100 IGBT/SiC HV Gate Driver



FEATURES

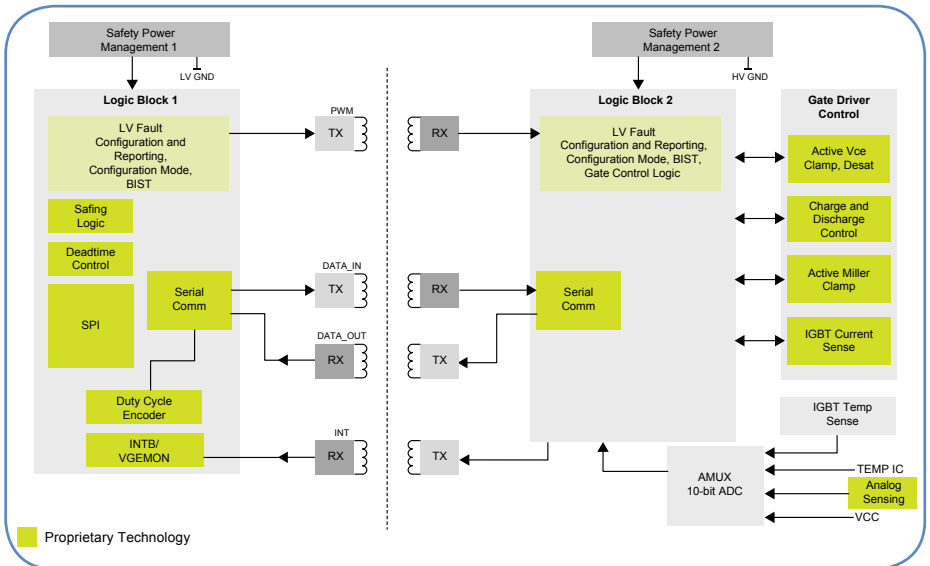
- ▶ **Functional Safety** - Certified compliant with ISO 26262 ASIL D functional safety requirements
 - Supported with functional safety documentation
 - Error checking of SPI with 16-bit Cyclic Redundancy Check (CRC)
 - Continuous monitoring of integrity of communication channels across isolation barrier
 - Cycle-by-cycle monitor of PWM control of gate drive
 - Fail safe state enabled via dedicated fail safe pins
 - Dedicated INT pin to rapidly report HV faults
 - Loss of PWM protection
- ▶ **Highly Integrated** - for lower BOM cost and small footprint
 - +/-15 A gate drive capability to eliminate external booster
 - Programmable current-sense and voltage desaturation short circuit protection
 - Integrated diode or Negative Temperature Coefficient (NTC) based IGBT device temperature sensing
 - Integrated ADC for monitoring parameters from HV domain
 - Integrated Active Miller Clamp (AMC)
- ▶ **SPI Programmable** - Users given the ability to configure drive and protection features needed to support most Si IGBT and SiC MOSFET power ($\leq 1700V$) modules for xEV applications.

NXP HV INVERTER SOLUTION

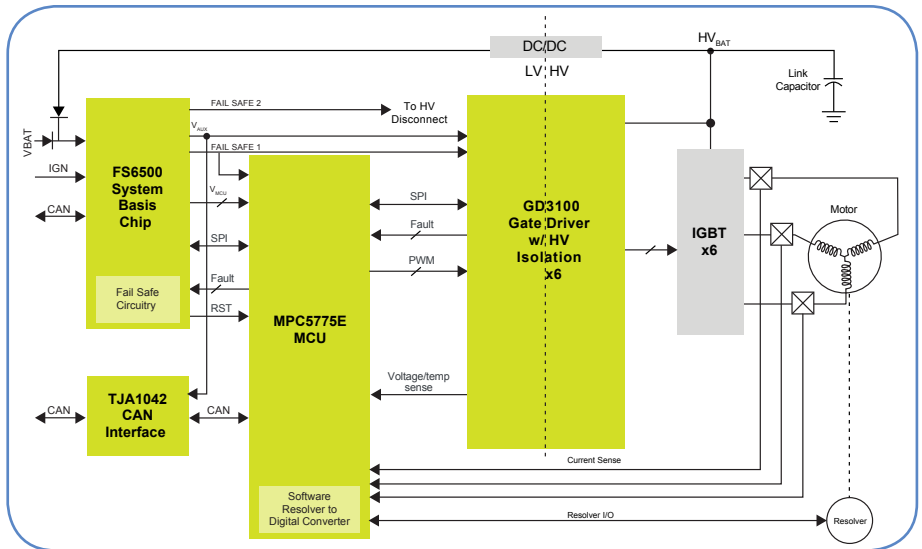
The HV Traction Inverter solution combines NXP's comprehensive portfolio of automotive microcontrollers (MCUs), CAN bus transceivers, and Functional Safety System Basis Chips (SBCs), in combination with high-voltage isolated gate drivers to enable customers to rapidly implement complete and scalable HV traction inverter solution which also support high-levels of system-level functional safety (ASIL-C or ASIL-D).

www.nxp.com/EVINverterPlatform

GD3100 BLOCK DIAGRAM

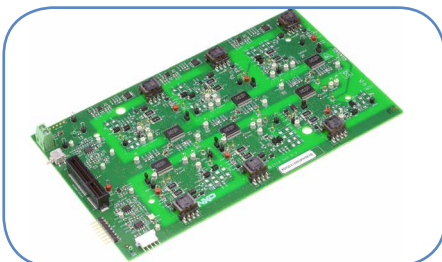


NXP HV INVERTER SOLUTION BLOCK DIAGRAM

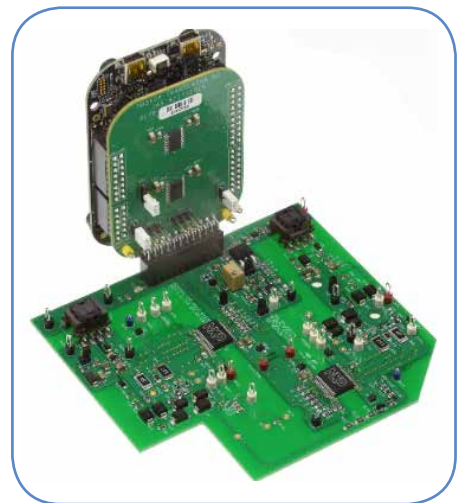


EVALUATION KITS

Development Kits	Description
FRDM-GD3100EVM	Half-bridge kit for Fuji M653 6:1 IGBT module
FRDMGD3100HBIEVM	Half-bridge kit for 6:1 HybridPACK™ Drive IGBT module
RDGD3100I3PH5EBV	3-phase motor drive kit for HybridPACK™ Drive IGBT module



RDGD3100I3PH5EBV Evaluation Board



FRDM-GD3100HBIEVM shown here with FRDM-KL25Z MCU and translator boards

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