EV POWER INVERTER CONTROL REFERENCE PLATFORM GEN 2
(IGBT Version)

The EV-INVERTERHDBT enablement kit is a part of the second generation of NXP EV power inverter control platform system solution. It has been validated and dyno-tested, laying the system foundation for customers targeting ISO 26262 ASIL C/D for EV power inverter application, by bringing together the essential hardware and software components. This system is compatible to drive both IGBT or SiC power modules and can be readily adapted to different power module form factors. For ease of evaluation, the EV-INVERTERHDBT development kit is engineered as plug compatible specifically to drive IGBTs packaged in industry standard P6 module footprint such as the onsemi VE-Trac™ and Infineon HybridPACK™.

TARGET APPLICATIONS

Holistic EV-inverter system solution ideal for customers who want to reduce development time and effort for their proof of concept, scaling to production and on functional safety for traction inverter systems

- EV motor power inverters
- High-voltage DC/DC boost circuits
- High-voltage onboard chargers

FEATURED PRODUCTS

NXP components featured in the platform include:

- **GD31xx:** Isolated SiC MOSFET or IGBT gate driver with < 2 µs short-circuit protection
- **MPC5775E:** High-performance ASIL D MCU with advanced motor control libraries and software resolver
- **FS65xx:** Robust ASIL D SBC with fail-silent and Grade 0 capabilities
- **TJA1051T:** High-Speed CAN bus interface
- **TJA1100:** IEEE® 100BASE-T1 Ethernet or PHY compliant automotive

EV-INVERTERHDBT PLATFORM HIGHLIGHTS

- Reduced system BOM count by using SW revolver instead of HW resolver and fewer external components enabled by MPC5775E MCU and GD31xx gate drivers

- Functionally safe ASIL C/D targeting system design IP compatible to drive inverter power modules based on an IGBT or SiC MOSFETs
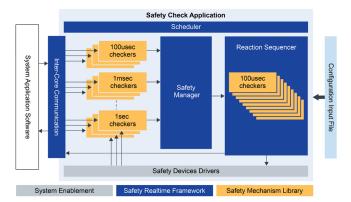- Validated and dyno tested system design for ease of EV-inverter control applications

SOFTWARE AND TOOLS

- NXP SDK with production ready SPCE/CMMI class B and MISRA 2012 compliant low level SDK device drivers

- Special function drivers for SW resolver digital converter (RDC) for motor position detection without need for additional HW resolver and precise PWM SW implementation on eTPUs for gate driver controls

- Well defined inverter platform API layer with scheduler optimized for resource management such as comm, memory etc., advanced automotive math and motor control library (AMMCLib) for precise and ease of developing motor control application

- FreeMASTER and motor control application tuning tool (MCAT) is provided as a graphical user Interface for operating and monitoring the inverter platform MCAT is also used for tunning and customizing for a different custom motor

- Example safety checker-reaction library implemented using SRF (safety runtime framework) on the enablement software. (Safety package to be purchased seperately)

SYSTEM BLOCK DIAGRAM

FUNCTIONAL SAFETY BLOCK DIAGRAM

EV-INVERTERHDBT PLATFORM FEATURES

- The EV-INVERTERHDBT includes control and power reference HW boards, three output phase bus bar connectors with screws and protection cap for conveniently accessing the P6 IGBT power module output terminals. All other external components such as the IGBT power module, link capacitors, bus bars and cooling plates, etc. are not included and must be provided by the customer. A complete power inverter module can be purchased from our partner Vepco® Technologies

- One time enablement software license included as part of the kit for development of both SiC and IGBT based EV-inverter systems

- The system level functional safety whitepaper, devices FMEDAs and safety runtime framework are part of the enablement kit for customers targeting ASIL C/D EV-inverter implementation

- Advanced functional safety documentations for customer targeting ISO 26262 ASIL D compliancy process, system safety software and libraries (source code) and functional safety consultation services are optional add-on services available for purchasing separately to suit individual customer needs

OFFERING	TYPE	EV-INVERTERHD PLATFORM ENABLEMENT KIT	EV-INVERTERHD PLATFORM SAFETY KIT*
EV-CONTROLEVMHD control board	HW	Ordered	
EV-POWEREVBHD power board	HW	Ordered	
Hardware design schematics and gerber files	DOC	DL*	
Hardware operation guide	DOC	DL*	
Software operation guide	DOC	DL*	
Safety concept application note	DOC	DL*	
Enablement software as platform API layer and example application code	SW	DL*	
NXP device datasheets	DOC	DL	
NXP device functional safety documents	DOC	DL*	
Advanced functional safety SW and documentation	SW/ DOC		DL^

* Downloadable with purchase of kit.

^ Projected to be available by end of Q2 2022

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