Preview document

Getting started with the Infineon door control module reference design

Door control
Z8F80835810

About this document

Scope and purpose

This user guide provides instructions for using the reference design, which is designed to evaluate the associated system solution for door control. Moreover, this user guide provides an overview on the whole system offering for door control, and extensive technical information of the board.

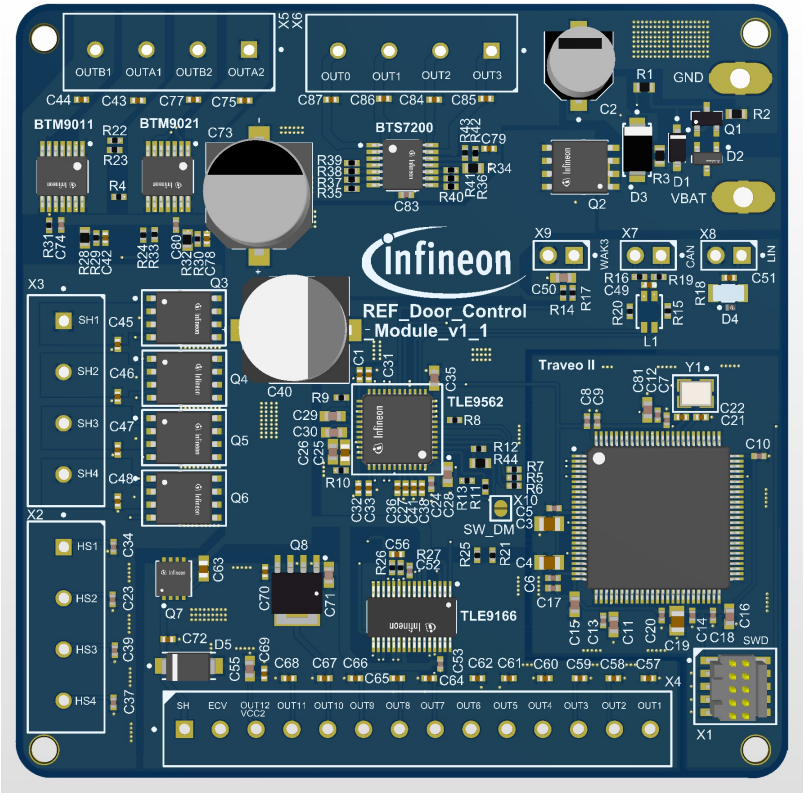

Figure 1 Door control reference design

About this document

Intended audience

This document is intended for anyone using Infineon's door control reference design.

***Note**:* *PCB and auxiliary circuits are not optimized for final customer design.*

Important notice

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Safety precautions

Table 1	Safety precautions
	**Caution:** *The heat sink and device surfaces of the evaluation or reference board may become hot during testing. Hence, necessary precautions are required while handling the board. Failure to comply may cause injury.*
	**Caution:** *Only personnel familiar with the drive, power electronics and associated machinery should plan, install, commission and subsequently service the system. Failure to comply may result in personal injury and/or equipment damage.*
	**Caution:** *The evaluation or reference board contains parts and assemblies sensitive to electrostatic discharge (ESD). Electrostatic control precautions are required when installing, testing, servicing or repairing the assembly. Component damage may result if ESD control procedures are not followed. If you are not familiar with electrostatic control procedures, refer to the applicable ESD protection handbooks and guidelines.*
	**Caution:** *A drive that is incorrectly applied or installed can lead to component damage or reduction in product lifetime. Wiring or application errors such as undersizing the motor, supplying an incorrect or inadequate AC supply, or excessive ambient temperatures may result in system malfunction.*
	**Caution:** *The evaluation or reference board is shipped with packing materials that need to be removed prior to installation. Failure to remove all packing materials that are unnecessary for system installation may result in overheating or abnormal operating conditions.*

Table of contents

1 Infineon door control system offering

Infineon's system offering for door control encompasses a range of components that work together to provide a comprehensive solution.

Key Components:

- **Infineon door control evaluation board**: A robust hardware foundation for efficient integration and connectivity with a TRAVEO™ II microcontroller, a MOTIX™ SBC TLE9562, a MOTIX™ Bridge TLE9166EQ, MOSFETs, and several other interfaces
- **Infineon door control reference design**: It is an optimized *printed circuit board (PCB)* for size, thermal and *electromagnetic compatibility (EMC)* performance. It combines TRAVEO™ II microcontroller, MOTIX™ SBC TLE9562, MOTIX™ Bridge TLE9166EQ, MOTIX™ Bridge BTM90x1, PROFET™ BTS7200, and OptiMOS™ 7 IAUCN04S7N040H
- **MOTIX™ device drivers**: Microcontroller-independent embedded software for configuring and controlling the:
  - MOTIX™ TLE9166EQ
  - MOTIX™ TLE9562
  - MOTIX™ BTM90x1
- **Application software**: An embedded software projects for the IAR embedded work bench, which includes the device drivers and the Traveo™ II sample driver library (SDL), they can be downloaded over the Infineon Developer Center. There are three application software projects offered:
  - **Infineon door control evaluation board application software - basic:** In this application software, the Traveo™ II initializes the MOTIX™ SBC TLE9562 and the MOTIX™ Bridge TLE9166EQ over the *serial peripheral interface (SPI)* and starts the cyclic status check function. Moreover, this application provides a glance at the integration of the device driver
  - **Infineon door control evaluation board application software - advanced:** This application software extends the functionality of the basic software. Apart from all the initializations, the advanced software application contains a routine to operate various loads of the door control module, such as the window lift operation, mirror features, and the door lock function
  - **Infineon door control reference design application software:** In this application software, the Traveo™ II initializes the MOTIX™ SBC TLE9562 and the MOTIX™ Bridge TLE9166EQ over the same SPI channel, that is separated with a *chip select (CS)* and the MOTIX™ Bridge BTM90x1 in daisy chain configuration. The BTS7200 device is controlled with *general purpose input output (GPIO)*s. Moreover, it starts the cyclic status check function, *controller area network (CAN)*, and *local interconnect network (LIN)* communication
- **MOTIX™ multi half-bridge IC configuration wizard**: A PC tool consisting of a *graphical user interface (GUI)* for configuring and visualizing the state of the MOTIX™ SBC TLE9562 and the MOTIX™ Bridge TLE9166EQ. It can be used with Infineon's door control module evaluation board

2 Introduction to the Infineon door control module reference design

The reference design combines the best-in-class *integrated circuit (IC)*s which are needed for a door control module. This provided solution combines multiple key components, including the *microcontroller*, power management, communication capabilities, gate drivers, high side switch, and MOSFETs, all within a compact *PCB*. The design of the board has been carefully optimized to achieve a compact size, while also ensuring optimal thermal performance, and *EMC*.

The reference design can be supplied over the input supply interface with 12 V DC. The board is protected against the reverse polarity of the input voltage supply.

The board has a 10-pin *serial wire debug (SWD)* connector to flash the microcontroller. The following are available on the board:

- Power stage output
- LIN
- CAN
- Wake and test points

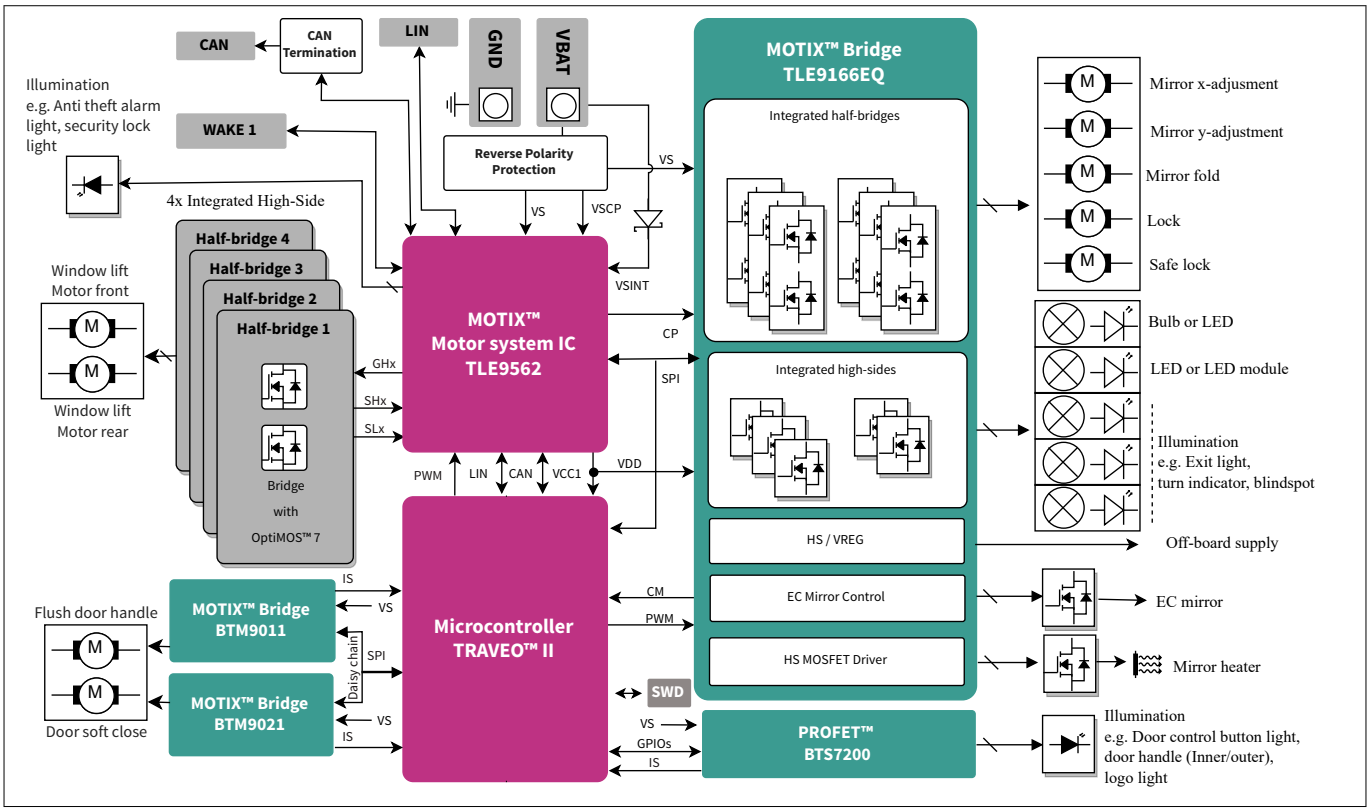

Figure 2 Block diagram

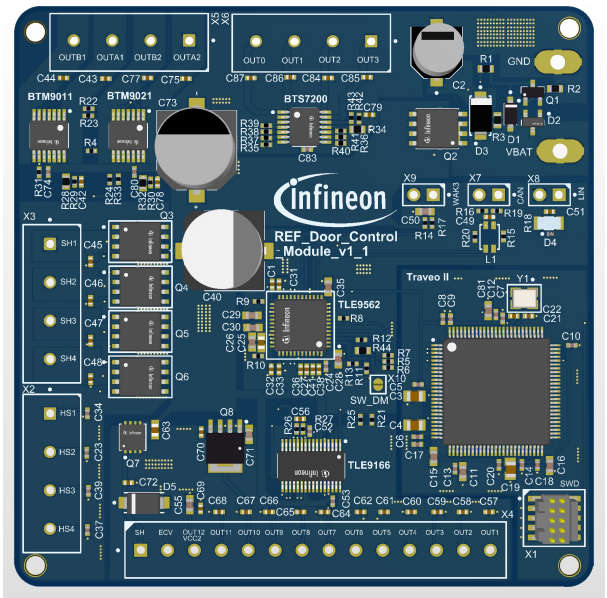

Figure 3 Infineon door control module reference design

3 Technical data

The technical data is specified in the table below. If you are working with currents higher than the specified maximum ratings, the relevant safety measures must be applied.

Table 2 Technical data

Parameter	Value
Supply voltage	Specified by design Typ. 12 V (max. 28 V)
Supply current	*Max. 20 A*
Pin ports	5 V
Board dimension	75 mm x 75 mm
PCB thickness	4 layers (outer layers 70 µm and inner layers 35 µm)
Conducted emission	Class 5 (CISPR25, 150 kHz -108 MHz)

Glossary

CAN
controller area network (CAN)

CS
chip select (CS)
A signal line that enables communication with a specific peripheral.

EMC
electromagnetic compatibility (EMC)
The ability of electrical equipment and systems to function acceptably in their electromagnetic environment, by limiting the unintentional generation, propagation and reception of electromagnetic energy which may cause unwanted effects such as electromagnetic interference (EMI) or even physical damage in operational equipment.

GPIO
general purpose input output (GPIO)

GUI
graphical user interface (GUI)
An interface that enables users to interact with electronic devices through icons and visual indicators.

IC
integrated circuit (IC)
A miniature electronic circuit built on the surface of a thin substrate of a semiconductor material.

LIN
local interconnect network (LIN)

microcontroller
A small computer on a single integrated circuit containing a processor core, memory, and programmable input/output peripherals.

PCB
printed circuit board (PCB)
A board that mechanically supports and electrically connects electronic components using conductive tracks, pads, and other features etched from copper sheets laminated onto a non-conductive substrate.

SPI
serial peripheral interface (SPI)
A synchronous serial communication interface specification used for inter-chip communication, primarily in embedded systems.

SWD
serial wire debug (SWD)
A communication interface and protocol used for debugging and programming embedded systems, particularly microcontrollers and other integrated circuits.

Revision history

Document version	Date of release	Description of changes
Rev. 1.00	2025-08-25	• Initial document release

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