

Infineon Technologies New Products Introduction

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Content

LITIX™ Power Flex

Synchronous H-bridge DC-DC controller with SPI interface

BTS3xxxTF and BTS3xxxEJ

The next generation of Infineon's protected low-side switches: HITFET™+

BTF6070-2EKV

24V/12V, 60mOhm, dual channel, smart high-side power switch

TLE8457x

New LIN LDO family with RESET functionality

REF-3W-IOT- CoolSET™

IoT off-line isolated power supply 3 W 5 V, <13 mW standby

Easy modules with Thermal Interface Material (TIM)

FP10R12W1T4P, FP10R12W1T4P_B11, FP15R12W1T4P, FP15R12W1T4P_B11,
FP25R12W2T4P, FP25R12W2T4P_B11, FP35R12W2T4P, FP35R12W2T4P_B11

LITIX™ Power Flex

Synchronous H-bridge DC-DC controller with SPI interface



The TLD5541-1QV is a synchronous MOSFET H-bridge DC-DC controller with built in protection features and SPI interface. This concept is beneficial for driving high power LEDs with maximum system efficiency (well above 90%) and minimum number of external components. Furthermore, reduced EMC emissions are achieved thanks to the optimized spread spectrum switching frequency.

With its seamless buck-boost regulation and fast dynamic load jump behavior, it is also an innovative solution for realizing cost-optimized LED headlamps with complete protection and diagnosis features – e.g. by driving two, three or more separately switched LED loads in one string, with up-to 55 V string voltage, with just one TLD5541-1QV.

Features

- 16-bit SPI for diagnostics and control
 - > Fast dynamic behavior(load jump behavior)
 - > Programmable auto spread spectrum
 - > Switching frequency 200 to 700 kHz
 - > LED current accuracy $\pm 3\%$
 - > Adjustable soft start
 - > Limp home function
 - > Current and voltage mode

Benefits

- > Maximum efficiency in every condition (up to 96%)
- > Fail safe mode
- > Cost efficient electronics
- > Very good EMC behavior

Target applications

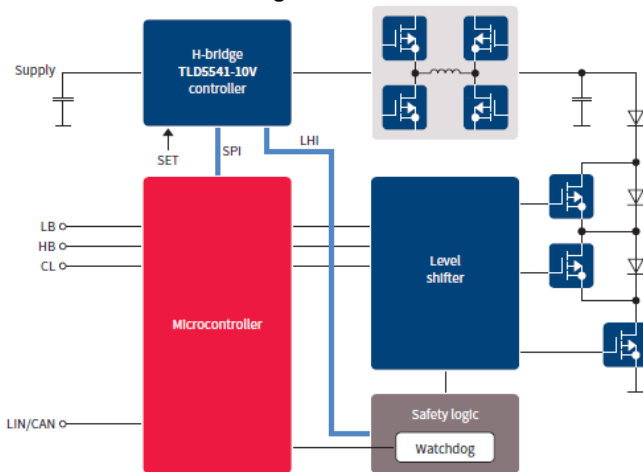
- Especially designed for automotive exterior LED applications
- > High-power and high-current applications like high-power (e.g. 3 or 6 A) LED based front lighting
 - > Laser headlamps
 - > LED or laser based matrix and pixel headlamps
 - > Cost optimized Full LED headlamps
 - > High-efficient voltage supply for LED applications working on battery voltage level

Product collaterals / online support

- > Product landing [page](#)
- > Product brief [page](#)
- > Product datasheet [page](#)

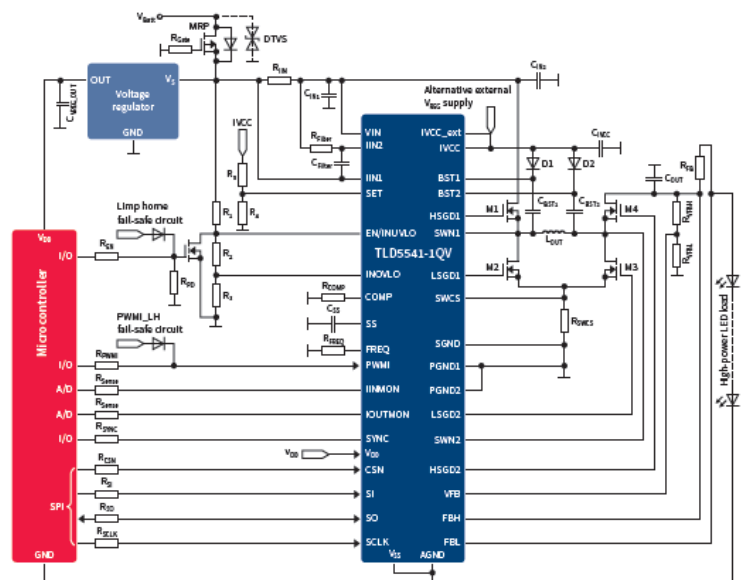
Application examples

One TLD5541-1QV for three light functions



Block diagram

LITIX™ Power Flex TLD5541-1QV



BTS3xxxTF and BTS3xxxEJ

The next generation of Infineon's protected low-side switches: HITFET™+



HITFET™ stands for highly integrated temperature protected MOSFET. These low-side switches offer a compelling feature set with protections against over temperature, short circuit and overload conditions as well as ESD robustness. The new HITFET™+ is a highly scalable portfolio based on two different packages (TO252-x, TDSO-8) and two types of feature sets – Standard versions (BTS3xxx) and Fully featured devices (BTF3xxx) – to match each application requirements. Now available are 8 new standard BTS3xxx HITFET™+ products.

With the new benchmark TDSO-8 package Infineon enables 50% footprint shrink compared to DPAK and 35% shrink compared to SOT223 package. At the same time the devices achieve an outstanding thermal capability. For the already established fully featured lead product BTF3050TE of the HITFET™+ family we provide a [Shield for Arduino](#).

Features

- > Low-side switches with integrated protection features
- > Scalable in $R_{DS(ON)}$ from 125mOhm down to 35mOhm
- > Benchmark short circuit performance with auto-restart function
- > Active clamp over voltage protection
- > Current limitation
- > Dedicated status signal (only TDSO-8)
- > Automotive qualified

Target applications

HITFET™+ is optimized to drive capacitive, inductive and resistive loads for 12V automotive and industrial applications. Some examples:

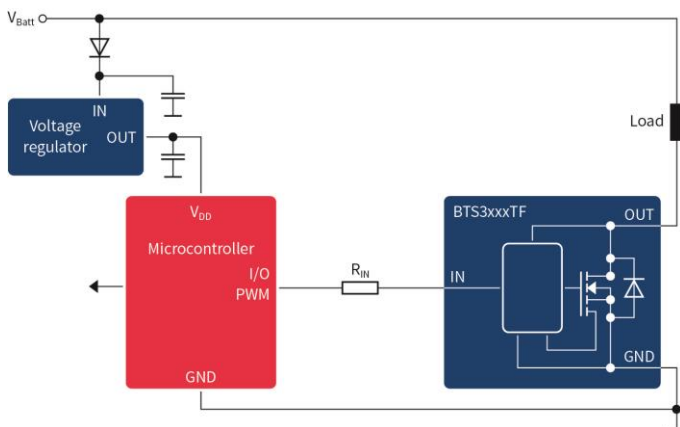
- > Body Control Module (BCM)
- > Heating
- > Industrial automation
- > Relay replacement/driver

Completing products (P2S)

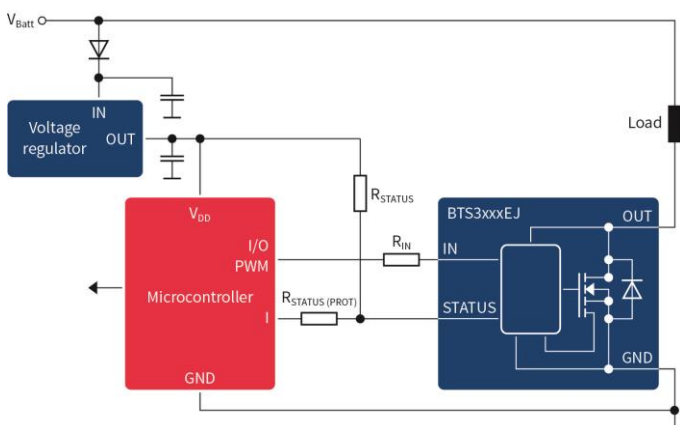
- > Infineon industrial and automotive microcontrollers
- > Infineon supply products

Application examples

BTS3xxxTF



BTS3xxxEJ



Benefits

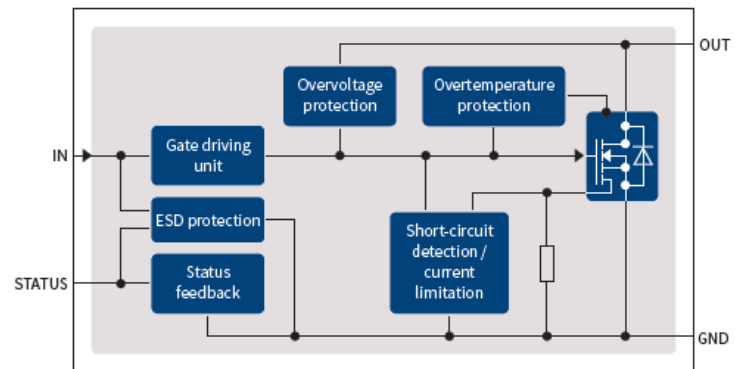
- > Integrated solution requiring less external components
- > High design flexibility with scalable $R_{DS(ON)}$ and package
- > Integrated solution reducing PCB area and enabling fast time to market

Product collaterals / online support

- > Product family [page](#)
- > Product brief [page](#)
- > Product datasheet and landing pages
 - BTS3035TF [page](#)
 - BTS3050TF [page](#)
 - BTS3080TF [page](#)
 - BTS3125TF [page](#)
 - BTS3035EJ [page](#)
 - BTS3050EJ [page](#)
 - BTS3080EJ [page](#)
 - BTS3125EJ [page](#)
- > HITFET™ for automotive key applications video [here](#)

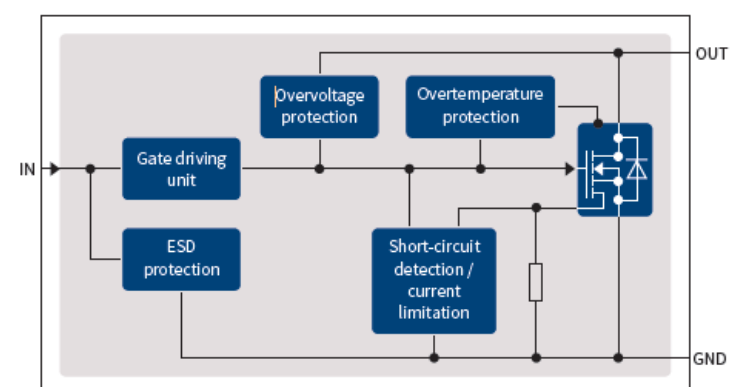
Block diagram

TDSO-8 package



Block diagram

TO252-3 package



BTF6070-2EKV

24V/12V, 60mOhm, dual channel, smart high-side power switch



The BTF6070-2EKV is a 60mOhm, dual channel, smart high-side power switch, embedded in a PG-DSO-14-40 exposed pad package for superior thermal performance. This device includes protective functions and diagnosis, enabling use in harsh environments where down time is not tolerable. With its fast switching speeds it is specifically designed to drive valve applications in harsh applications such as construction, agriculture and automotive. The BTF6070-2EKV has been designed and qualified according to ISO26262.

Features

- > Dual channel device
- > Fast switching device
- > Works in 12V and 24V environments
- > Extremely low stand-by current
- > 3.3V and 5V compatible logic inputs
- > PWM capability up to 2kHz
- > Current limitation and secondary protection
- > Lower current limit than PROFET+ 24V, due to the target load
- > Current sense with two IS pins
- > Supports functional safety designs with ISO26262 qualification
- > Optimized electromagnetic compatibility
- > Exposed pad package
- > Independent proportional load current sense
- > Open load detection in ON and OFF state
- > Short circuit to battery and ground indication
- > Reverse polarity protection*
- > Secure load turn-off during logic ground disconnection*
- > Latching over-temperature protection
- > Dynamic temperature sensor
- > Overvoltage protection*
- > Enhanced short circuit operation
- > Extended operating voltage

*With external components

Benefits

- > Directly supply on a 24V battery line (incl. load dump)
- > More accurate fast switching, control of the valves
- > Diagnostics available at high PWM
- > Diagnose both channels at the same time
- > Cost savings - no external shunt and op-amp for current sensing
- > Smaller width of PCB trace
- > System performance - better behavior on fast switching

Target applications

- > Suitable for 24V trucks, agricultural, construction systems
- > Specially designed to drive valve applications
- > Can be used for PWM frequencies up to 2kHz
- > Suitable for resistive, inductive and capacitive loads
- > Replaces electromechanical relays, fuses, and discrete circuits

Application examples

- > Switching hydraulic or pneumatic valves with PWM up to 2kHz
- > Bulb switching with 10W + 5W bulbs

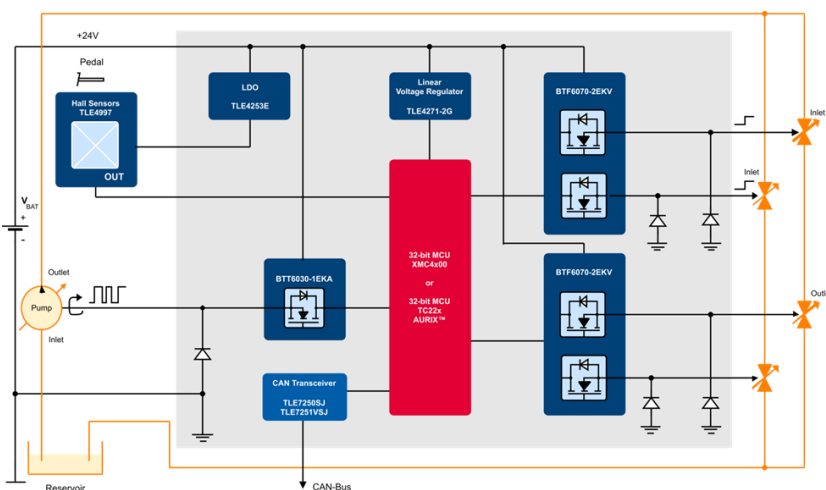
Product collaterals / online support

- > Product [page](#)
- > Datasheet [page](#)

Completing products (P2S)

- > Demoboard BTF6070-2EKV

Block diagram



Chassis
1) If ECU permanently supplied, may need to add external protection against load dump 400ms above 40V.
2) Not AEC-Q100 qualified

TLE8457x

New LIN LDO family with RESET functionality



The new LIN LDO product family TLE8457x integrates a monolithic LIN transceiver with a voltage regulator supporting an output current capability up to 70 mA for supplying any external components like microcontroller and peripherals. TLE8457 family can be used as a master or slave node offering a bi-directional bus LIN communication up to 20 kbit/s and being compliant to LIN Specification 2.2 A and SAE J2602. Based on the Infineon BiCMOS technology the TLE8457 provides excellent ESD robustness together with a very high level of Electromagnetic Compatibility (EMC). The TLE 8457 is AEC qualified and tailored to withstand the harsh conditions of the automotive environment.

The enhanced features included in the TLE8457x family are a minimum current consumption in stand-by mode of typical 20 μ A and the lowest current consumption in sleep mode available on the market of max 16 μ A at 150°C together with a reset feature for undervoltage detection which guaranties a reliable functionality of the microcontroller in case of undervoltage event. With the ultra-low quiescent current consumption the TLE8457 is especially suited for applications that are permanently supplied by the battery. In addition this product family contains an Initialization watchdog timer which forces transition to sleep mode because of no response from microcontroller after power-on, wake-up or reset which prevents battery discharge in case the μ C fails to ramp up and battery discharge in case V_{cc} is shorted to GND.

Features

- > Single-wire LIN transceiver for transmission rates up to 20 kbit/s
- > Compliant to ISO 17987-4, LIN specification 2.2 A and SAE J2602
- > 5 V or 3.3 V low drop-out linear voltage regulator with 70 mA
- > TxD dominant time-out feature
- > V_{cc} undervoltage detection
- > RESET output
- > Very high ESD robustness +8kV according to IEC 61000-4-2
- > Optimized EMC performance
- > Available in standard DSO-8 and tiny TSON-8 package
- > Green product (RoHS compliant)
- > AEC qualified

Benefits

- > Integrated initialization time-out feature
- > Ultra-low quiescent current in stand-by mode (max. 40 μ A) and in sleep mode (max. 16 μ A)
- > Available in standard DSO-8 and tiny TSON-8 package
- > LIN LDO demo board available

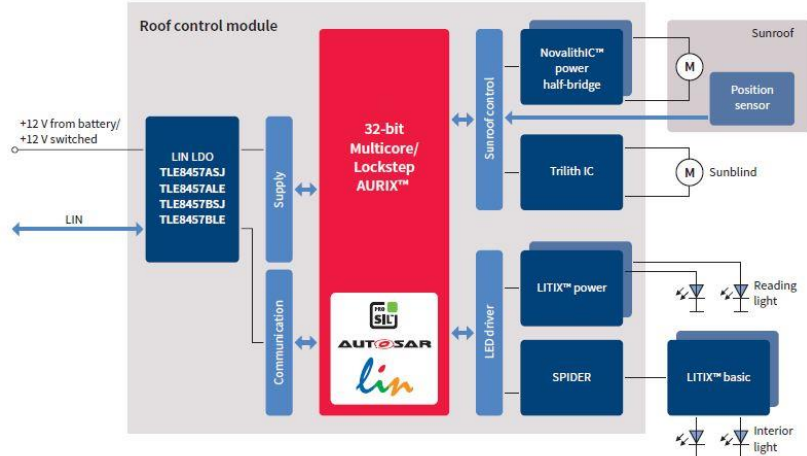
Target applications

- > Body controllers, gateways, door and seat control modules
- > LIN slaves: wiper modules, window lifter, electrical pumps or fans
- > Ultrasonic parking aid systems
- > Rain and light sensors

Product collaterals / online support

- > Product family [page](#)
- > Product landing pages
 - TLE8457ASJ [page](#)
 - TLE8457ALE [page](#)
 - TLE8457BLE [page](#)
 - TLE8457BSJ [page](#)
- > TLE8457 datasheet [page](#)
- > TLE8457 application note [page](#)
- > TLE8457x product brief [page](#)

Block diagram



REF-3W-IOT- CoolSET™

IoT off-line isolated power supply 3 W 5 V, <13 mW standby



In this reference design, Infineon's CoolSET™ ICE3RBR4765JG is used as a current-mode flyback controller. The controller has a built-in 650 V CoolMOS™ as the main switching component, as well as the startup cell. This application operates in Discontinuous Conduction Mode (DCM), running at 65 kHz switching frequency. The output is single 5 V / 600 mA, generated by secondary side regulation. Active Burst Mode (ABM) operation provides extremely low standby power consumption, < 13 mW over the input voltage range between 180 - 265 V_{AC}. Low EMI is achieved by built-in frequency jitter and soft start operation.

Features

- > Input voltage range 180–265 V_{AC}
- > Efficiency > 75 percent
- > Conducted EMI compliant with EN55022 class B
- > Stand-by power < 13 mW
- > V_{out} ripple (peak-to-peak) < 100 mV
- > Small form factor (board dimension): 50 mm x 23.5 mm x 14 mm (L x W x H)
- > Auto-restart protection modes
 - V_{CC} over/undervoltage
 - IC overtemperature
 - Overload
 - Open loop

Benefits

- > Extremely low standby power (<13 mW)
- > Low output voltage ripple (<80 mVpp)
- > Small formfactor (50 mm x 23.5 mm x 14 mm (L x W x H))

Technical Specifications

Input voltage	180 V_{ac}~265 V_{AC}
Line frequency	50 Hz, 60 Hz
Output voltage%	5 V ±5%
Rated output current	600 mA
Rated output power	3 W
Efficiency	79% @ 230 V _{AC} , full load
Output voltage ripple (max.)	<80 mVpp
No load power consumption @ V _{in} : 180 V _{ac} ~ 265 V _{ac}	<13 mW
Power consumption at 10mA load	<100 mW
Device dimensions	50 mm x 23.5 mm x 14 mm (L x W x H)
Isolation	Reinforced isolation between primary and secondary side

Target applications

- > Applications related to the Internet of Things (IoT)
 - Standby power supply
 - Power supply for microcontrollers
 - Power supply for standalone sensors operating on a wired/wireless interface bus
- > USB-power supply embedded in a wall plug
- > Intelligent wall plug switched by wireless (with relay)
- > Metering application
- > General applications with small form factor in the power range 1 W to 3 W

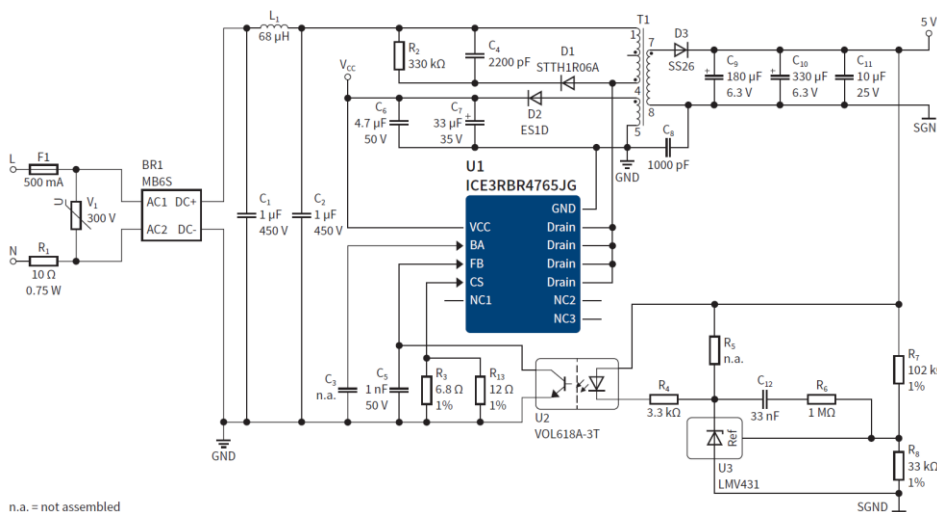
Completing products (P2S)

- > ICE3RBR4765JG

Product collaterals / online support

- > Product landing [page](#)
- > Application note [page](#)
- > Application brief [page](#)

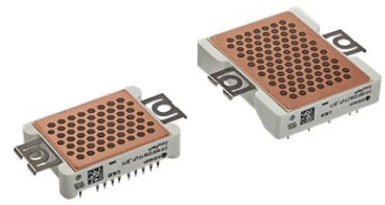
Reference Design Schematic



n.a. = not assembled

Easy modules with Thermal Interface Material (TIM)

FP10R12W1T4P, FP10R12W1T4P_B11, FP15R12W1T4P, FP15R12W1T4P_B11,
FP25R12W2T4P, FP25R12W2T4P_B11, FP35R12W2T4P, FP35R12W2T4P_B11



The Easy portfolio will now be available with TIM: The Easy family with its EasyPIM™, EasyPACK and EasyDUAL configurations covers the full power range from IC 6 A up to 200 A at 600 V / 650 V / 1200 V. The modules are without base plates and include the newest IGBT4 technology. The screw clamp provides a new, fast, reliable and low-cost mounting concept.

Features

Pre applied TIM material

- > Best in class thermal resistance
- > Pre-applied to easy modules to reduce thermal resistance
- > Dry to the touch
- > Fully qualified

Target applications

- > Drives, Solar, UPS

Support/Tools/Software

- > Drawing of press-in and press-out tool needed for TIM

Benefits

Customer saves additional process and handling of thermal grease

- > Low thermal resistance
- > Reduced process time in manufacturing
- > Simplified mounting
- > Increased system reliability
- > Increased system lifetime
- > Optimized thermal management
- > Improved handling in mounting and maintenance
- > Reproducible thermal performance

Product collaterals / online support

- > Product landing pages
 - EasyPIM™ / EasyPACK / EasyDUAL [page](#)
 - Thermal Interface Material (TIM) [page](#)

Block diagram - PIM

