

## Product Brief

# LITIX™ Power Flex TLD5541-1QV

## Synchronous H-bridge DC-DC controller with SPI interface

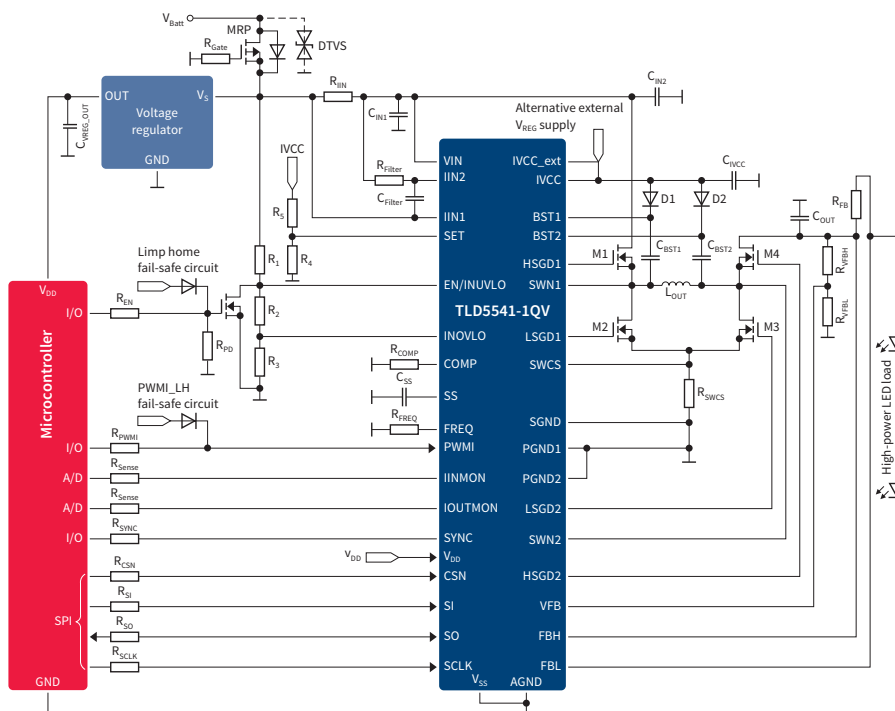
The TLD5541-1QV is a synchronous MOSFET H-bridge DC-DC controller with built in protection features and SPI interface. This concept is beneficial for driving high power LEDs with maximum system efficiency (well above 90%) and minimum number of external components. Furthermore, reduced EMC emissions are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

### Key features and benefits

- > 16-bit SPI for diagnostics and control
- > Fast dynamic behavior (load jump behavior)
- > Programmable auto spread spectrum
- > Switching frequency 200 to 700 kHz
- > Maximum efficiency in every condition (up to 96%)
- > LED current accuracy  $\pm 3\%$
- > Adjustable soft start
- > Limp home function (fail safe mode)
- > Current and voltage mode

### Block diagram LITIX™ Power Flex TLD5541-1QV



### Applications

#### Especially designed for automotive exterior LED applications

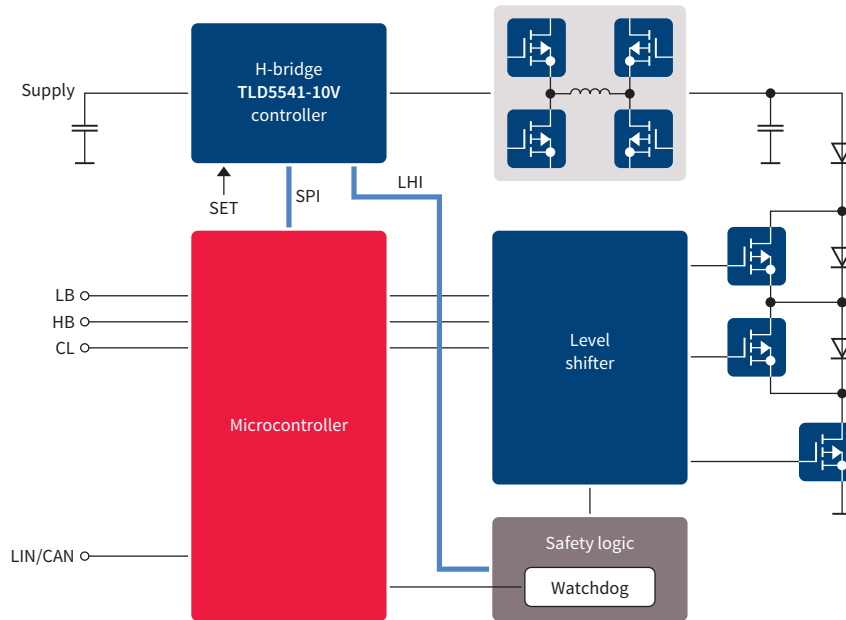
- > High-power and high-current applications like
  - High-power (e.g. 3 or 6 A) LED based front lighting
  - Laser headlamps
  - LED or laser based matrix and pixel headlamps
- > Cost optimized LED headlamps
- > High-efficient voltage supply for LED applications working on battery voltage level



# LITIX™ Power Flex TLD5541-1QV

Synchronous H-bridge DC-DC controller with SPI interface

Application example – one TLD5541-1QV for three light functions



In this example for a cost optimized LED headlamp electronic one TLD5541-1QV drives three light functions. The light functions are driven with the same current and as each function is switched and controlled individually with a bypass switch (MFS) also different brightness can be achieved with individual PWM.

The enabler for this is the fast dynamic load jump feature of the TLD5541-1QV which is controlled via SPI.

By enabling an active discharge it limits the current spike during load jump when light functions are switched off to prevent LED damage.

## Product summary

| Product     | OPN             | Description                                    | Package | Ordering code |
|-------------|-----------------|--|---------|---------------|
| TLD5541-1QV | TLD55411QVXUMA1 | DC-DC synchronous H-bridge controller with SPI | VQFN-48 | SP001120464   |

Published by  
Infineon Technologies AG  
81726 Munich, Germany

© 2016 Infineon Technologies AG.  
All Rights Reserved.

### Please note!

THIS DOCUMENT IS FOR INFORMATION PURPOSES ONLY AND ANY INFORMATION GIVEN HEREIN SHALL IN NO EVENT BE REGARDED AS A WARRANTY, GUARANTEE OR DESCRIPTION OF ANY FUNCTIONALITY, CONDITIONS AND/OR QUALITY OF OUR PRODUCTS OR ANY SUITABILITY FOR A PARTICULAR PURPOSE. WITH REGARD TO THE TECHNICAL SPECIFICATIONS OF OUR PRODUCTS, WE KINDLY ASK YOU TO REFER TO THE RELEVANT PRODUCT DATA SHEETS PROVIDED BY US. OUR CUSTOMERS AND THEIR TECHNICAL DEPARTMENTS ARE REQUIRED TO EVALUATE THE SUITABILITY OF OUR PRODUCTS FOR THE INTENDED APPLICATION.

WE RESERVE THE RIGHT TO CHANGE THIS DOCUMENT AND/OR THE INFORMATION GIVEN HEREIN AT ANY TIME.

### Additional information

For further information on technologies, our products, the application of our products, delivery terms and conditions and/or prices, please contact your nearest Infineon Technologies office ([www.infineon.com](http://www.infineon.com)).

### Warnings

Due to technical requirements, our products may contain dangerous substances. For information on the types in question, please contact your nearest Infineon Technologies office.

Except as otherwise explicitly approved by us in a written document signed by authorized representatives of Infineon Technologies, our products may not be used in any life-endangering applications, including but not limited to medical, nuclear, military, life-critical or any other applications where a failure of the product or any consequences of the use thereof can result in personal injury.