

SPOC – BTS 5566G

SPOC – BTS 5576G

SPOC – BTS 5590G

SPI Power Controller for Advanced Light Control



THE SPOC PRODUCTS are high-side smart power switches in P-DSO-36 package providing embedded protective functions. They are especially designed to control standard exterior front and rear lighting in automotive applications.

In order to use the same hardware with bulbs and LEDs, the device can be configured to bulb or LED mode. As a result, both load types are handled optimally in switching and diagnosis accuracy. (not BTS 5566G)

Configuration and diagnosis are done via SPI. Additionally, there is a current sense signal available for each channel that is routed via a multiplexer to one diagnosis pin. SPOC provide a secure limp home functionality via limp home input pin.

| Parameter                      | Symbol            | Value                                          |
|--------------------------------|-------------------|------------------------------------------------|
| Operating Voltage Power Switch | $V_{bb}$          | 4.5 ... 28 V                                   |
| Logic Supply Voltage           | $V_{dd}$          | 3.8 ... 5.5 V                                  |
| Over Voltage Protection        | $V_{bb(AZ, min)}$ | 41 V                                           |
| Nominal Loads (bulbs)          |                   |                                                |
| ■ Channel 0, 1                 |                   | 21 W (27 W)                                    |
| ■ Channel 2                    |                   | 21 W (27 W) flasher                            |
| ■ Channel 3, 4                 |                   | 5 W / 10 W                                     |
| SPI Access Frequency           | $f_{SCLK(max)}$   | 1 MHz (BTS 5590)<br>2 MHz (BTS 5576, BTS 5566) |

| Parameter              | BTS 5590G | BTS 5576G | BTS 5566G |
|------------------------|-----------|-----------|-----------|
| Bulb Application       | Yes       | Yes       | Yes       |
| LED Application        | Yes       | Yes       | No        |
| Watchdog functionality | Yes       | No        | No        |

## Basic Features

- 8 bit serial peripheral interface (daisy chain capable SPI) for control and diagnosis
- CMOS compatible parallel input pins for each channel provide straightforward PWM operation
- Very low stand-by current
- Optimized electromagnetic compatibility (EMC) for bulbs as well as LEDs

## Protective Functions

- Reverse battery protection with external components
- Short circuit and overload protection
- Multi step current limitation
- Thermal shutdown with latch
- Over voltage protection
- Loss of ground protection

## Diagnosis Functions

- Multiplexed proportional load current sense signals
- High accuracy of current sense signal at wide load current range
- Current sense ratio ( $k_{ILIS}$ ) configurable for LEDs or bulbs (not BTS 5566G)
- Very fast diagnosis in LED mode (< 2% duty cycle at 100 Hz) (not BTS 5566G)
- Latching feedback on over temperature and over load via SPI

## Application Specific Functions

- Integration of adjustable watchdog timer with external capacitor (BTS 5590G only)
- Sophisticated trigger state machine with two bit increment and lock, served via SPI
- Fail-safe activation via LHI pin and configuration via input pins
- Load type configuration between bulbs and LEDs (not BTS 5566G)

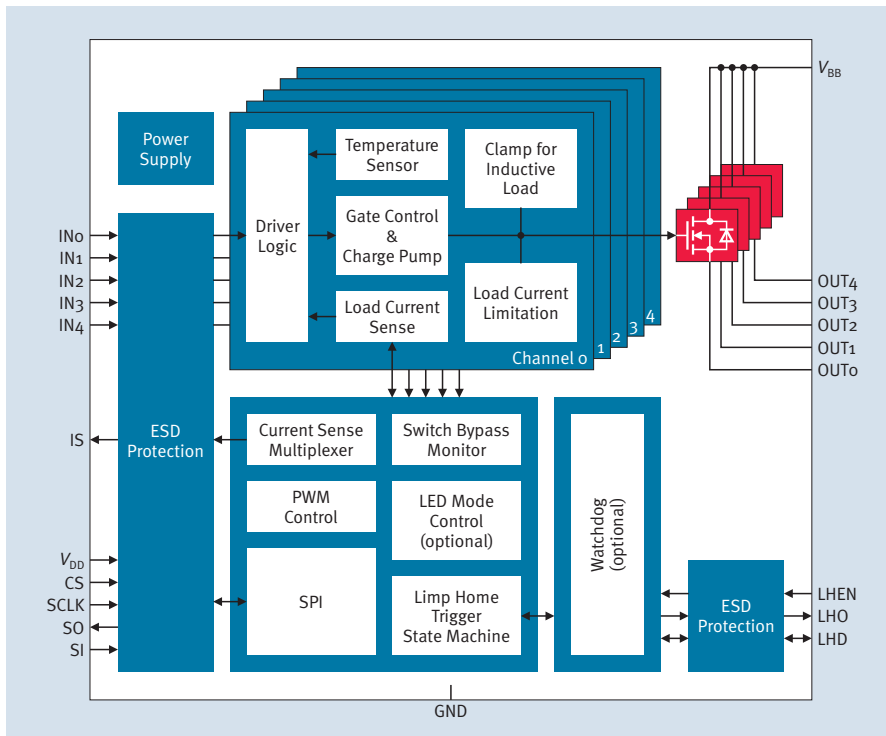
[www.infineon.com/spoc](http://www.infineon.com/spoc)

Automotive Power



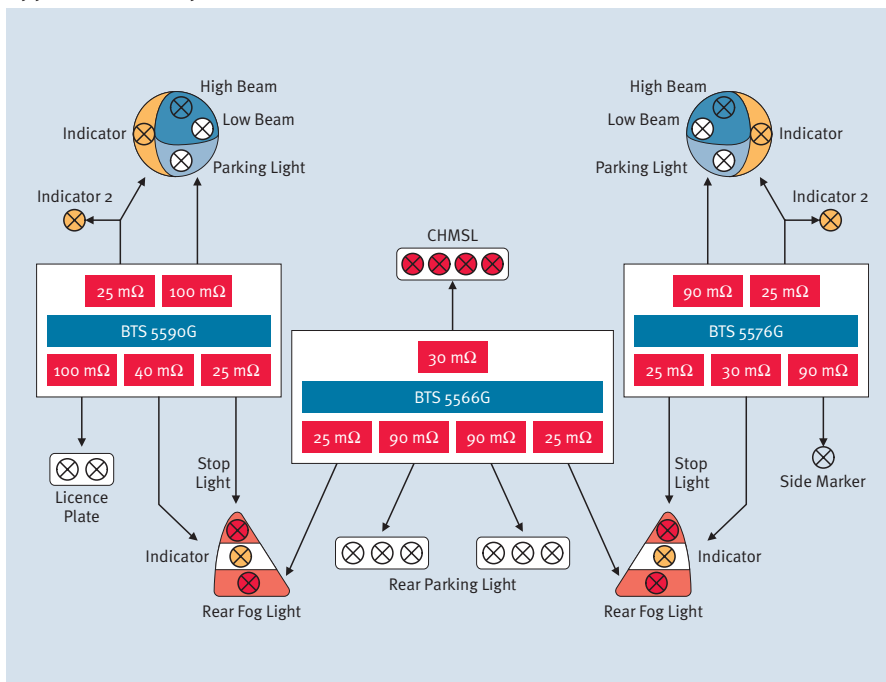
Never stop thinking

## Block Diagram



- SPOC are five channel high-side power switches designed with load current sense and limitation, clamping for inductive loads, temperature sensor protection
- There is a multiplexed current sense signal available. The current sense ratio of each channel is designed for the nominal load current
- An 8 bit SPI interface is used for control and diagnosis, and provides daisy chain capability. A modulo 8 counter is integrated to ensure correct data transmission
- Inputs/outputs are ESD protected

## Application Example



- High-side power switch for 12 V grounded loads in automotive application
- Especially designed for standard exterior lighting: tail light, stop light, parking light, license plate, rear fog light, indicators and equivalent LEDs

How to reach us:  
<http://www.infineon.com>

Published by  
 Infineon Technologies AG  
 81726 Munich, Germany

© 2008 Infineon Technologies AG  
 All Rights Reserved.

### Legal Disclaimer

The information given in this Product Brief shall in no event be regarded as a guarantee of conditions or characteristics. With respect to any examples or hints given herein, any typical values stated herein and/or any information regarding the application of the device, Infineon Technologies hereby disclaims any and all warranties and liabilities of any kind, including without limitation, warranties of non-infringement of intellectual property rights of any third party.

### Information

For further information on technology, delivery terms and conditions and prices, please contact the nearest Infineon Technologies Office ([www.infineon.com](http://www.infineon.com)).

### Warnings

Due to technical requirements, components may contain dangerous substances. For information on the types in question, please contact the nearest Infineon Technologies Office.

Infineon Technologies components may be used in life-support devices or systems only with the express written approval of Infineon Technologies, if a failure of such components can reasonably be expected to cause the failure of that life-support device or system or to affect the safety or effectiveness of that device or system. Life support devices or systems are intended to be implanted in the human body or to support and/or maintain and sustain and/or protect human life. If they fail, it is reasonable to assume that the health of the user or other persons may be endangered.