

Product brief

OPTIREG™ Switcher TLS412xD0x

Flexible and easy to use 2 A/2.5 A monolithic synchronous step-down DC-DC converter family

The OPTIREG™ Switcher TLS412xD0x is a family of pin to pin compatible, synchronous, single-output, step-down DC/DC-converters. Designed to withstand a car battery connection at the input, the devices provide regulated output voltages down to 3 V. They have been designed specifically for harsh automotive applications. A wide input voltage range (3.7 – 40.0 V) and 100 percent duty-cycle enables operation under critical conditions such as cold and warm cranking.

The TLS412xD0x family integrates the high and low side power-stages, as well as the compensation circuitry, minimizing the external components and thus system costs and board space.

The TLS412xD0x family offers a wide range of selectable switching frequencies, giving the flexibility to optimize the external passive components as well as the operation of the switching regulator for either high efficiency, if working in the lower range of the switching frequencies or for the smallest solution size, if the higher switching frequencies are chosen. The switching frequency can also be synchronized to an external clock signal, providing additional noise reduction at particular frequencies. Alternatively, spread spectrum modulation can be enabled to further reduce the peak noise and improve the EMI performance.

The TLS412xD0x transitions to PFM mode at light loads, reducing the current consumption to 31 μ A. If the device is disabled, the shutdown current consumption is reduced further down to 1 μ A.

The TLS412xD0x family features a programmable reset option via an external resistor for power on, undervoltage and overvoltage reset delay. It also integrates the soft start. The devices offers protection features like undervoltage and overvoltage monitoring and overcurrent monitoring.

The scalable family comes in a thermally enhanced PG-TSDSO-14 Exposed-Pad package.

Applications

- > ADAS, camera
- > Gateway, telematics, infotainment
- > Dashboard, cluster, lighting

Key features

- > Wide input voltage 3.7 – 40.0 V
- > Enable pin is robust to high voltage
- > Flexible reset with accurate timing selection
- > Low standby current consumption in on state: 31 μ A
- > Over- and under-voltage monitor
- > Selectable spread spectrum PWM
- > Flexible frequency selection and synchronization

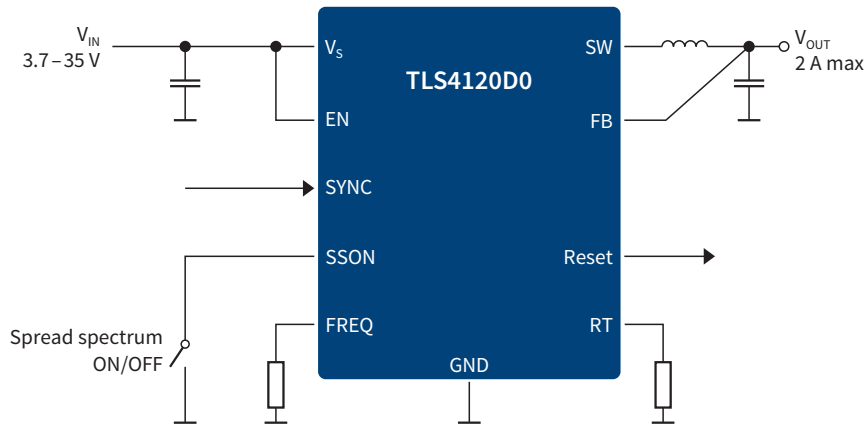
Benefits

- > Designed for harsh automotive environment
- > Simple and easy to use
- > Minimum count of external components needed
- > Peak efficiency up to 94%
- > Optimized for EMC critical applications with spread spectrum option

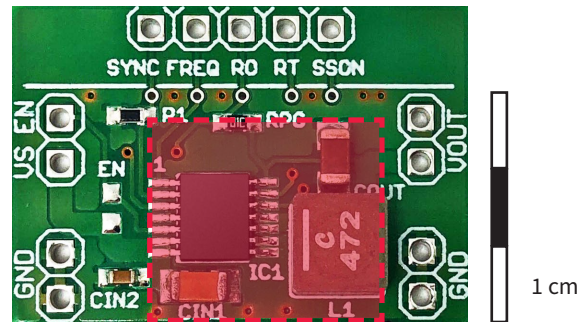
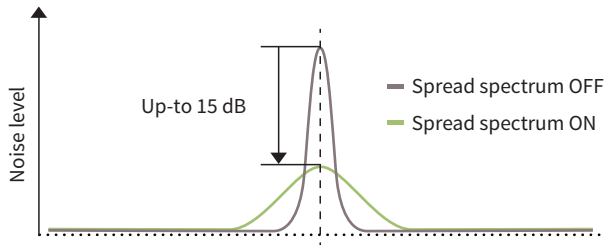
Support

- > Evaluation boards
- > Application notes
- > PSPICE models
- > PLECS models for loss and efficiency calculation
- > FIT rate information available

TLS4120D0 block diagram



TLS412xD0x are optimized for high efficiency, low EMI and small BOM



Low emissions

- > Meets CISPR25 class 5 standard
- > Spreadspectrum ON/OFF

Lowest BOM count

- > High switching frequency
- > NO VCC capacitor
- > NO bootstrap capacitor
- > NO BIAS capacitor

Product table

Product	OPN	Output current I _{out} [A]	Quiescent current I _q [µA]	Output voltage [V]	Package
TLS4120D0EPV33	TLS4120D0EPV33XUMA1	2.0	31	3.3	PG-TSDSO-14 EP
TLS4120D0EPV50	TLS4120D0EPV50XUMA1	2.0	31	5.0	PG-TSDSO-14 EP
TLS4120D0EPV	TLS4120D0EPVXUMA1	2.0	31	ADJ	PG-TSDSO-14 EP
TLS4125D0EPV33	TLS4125D0EPV33XUMA1	2.5	31	3.3	PG-TSDSO-14 EP
TLS4125D0EPV50	TLS4125D0EPV50XUMA1	2.5	31	5.0	PG-TSDSO-14 EP
TLS4120D0EPV	TLS4125D0EPVXUMA1	2.5	31	ADJ	PG-TSDSO-14 EP

Published by
Infineon Technologies AG
81726 Munich, Germany

© 2020 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).

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.