

ISL81806

80V Dual Synchronous Buck Controller Optimized to Drive E-mode GaN FET

The ISL81806 is a dual synchronous buck controller that generates two independent outputs or one output with two interleaved phases for a wide variety of applications in industrial and general purpose segments. With a wide input and output voltage ranges, the controller is suitable for telecommunication, data center, and computing applications.

The ISL81806 provides gate driver voltage of 5.3V. With its small dead time setting, it is a perfect controller for E-mode GaN FET application.

The ISL81806 uses peak current mode control with phase interleaving for the two outputs. Each output has a voltage regulator, current monitor, and average current regulator to provide independent average voltage and current control. The internal Phase-Locked Loop (PLL) oscillator assures an accurate frequency setting from 100kHz to 2MHz, and the oscillator can be synchronized to an external clock signal for frequency synchronization and phase interleave paralleling applications. This PLL circuit can output a phase-shift-programmable clock signal that is expanded to three, four, and six phases with required interleaving phase shift.

The ISL81806 features programmable soft-start and accurate threshold enable functions along with a power-good indicator to simplify power supply rail sequencing. It also provides full protection features such as OVP, UVP, OTP, and average and peak current limit on both outputs to ensure high reliability.

The IC is packaged in a space-conscious 32 Ld 5mmx5mm TQFN package. The package uses an EPAD to improve thermal performance and noise immunity. The full feature design with low pin count makes the ISL81806 an ideal solution for a simple power supply design with a fast time to market.

Related Literature

For a full list of related documents, visit our website:

- [ISL81806 device page](#)

Features

- Wide input voltage range: 4.5V to 80V
- Wide output voltage range: 0.8V to 76V
- Gate drive voltage: 5.3V
- Four FET drivers
- Dual interleaved outputs or single output with interleaved dual-phase operation
- Programmable frequency: 100kHz to 2MHz
- Constant output voltage and output current feedback loop control
- Light-load efficiency enhancement
 - Low ripple diode emulation and burst mode operation
- Programmable soft-start
- Supports startup into pre-biased rails
- Supports current sharing with cascade phase interleaving
- External clock sync
- Clock out with accurate phase angle controlled by PLL or frequency dithering
- PGOOD indicator
- Output current monitor
- Selectable mode between PWM/DE/Burst
- Accurate EN/UVLO threshold: $\pm 2\%$
- Low shut down current: 5 μ A
- Complete protection: OCP (pulse by pulse and optional hiccup or constant current mode), OVP, OTP, and UVP

Applications

- Telecommunication
- Server and data center
- Automotive electronics
- Industrial equipment
- Power system

2. Ordering Information

Part Number ^{[1][2]}	Part Marking	Temp. Range (°C)	Tape and Reel (Units) ^[3]	Package (RoHS Compliant)	Pkg. Dwg. #
ISL81806FRTZ-T	81806 FRTZ	-40 to +125	6k	32 Ld 5x5 TQFN	L32.5x5A
ISL81806FRTZ-T7A	81806 FRTZ	-40 to +125	250	32 Ld 5x5 TQFN	L32.5x5A
ISL81806EVAL1Z	Dual-Phase Evaluation Board for TQFN				

1. These Pb-free plastic packaged products employ special Pb-free material sets, molding compounds/die attach materials, and 100% matte tin plate plus anneal (e3 termination finish, which is RoHS compliant and compatible with both SnPb and Pb-free soldering operations). Pb-free products are MSL classified at Pb-free peak reflow temperatures that meet or exceed the Pb-free requirements of IPC/JEDEC J-STD-020.
2. For Moisture Sensitivity Level (MSL), see the [ISL81806](#) device page. For more information about MSL, see [TB363](#).
3. See [TB347](#) for details about reel specifications.

Table 1. Key Differences Between Family of Parts

Part Number	VDD (V)	Dead Time	Maximum Switching Frequency (MHz)	Gate Source Current (A)	Gate Sink Current (A)
ISL81802	8	Adaptive	1	2	3
ISL81806	5.3	Fixed	2	1.1	1.4

3. Revision History

Rev.	Date	Description
1.00	Feb.4.21	Initial release

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