

PE25204

Document Category: Product Brief



48V_{IN}, Divide-by-4, 6A Charge Pump, Capacitor Divider

General Description

The PE25204 is an ultra-high efficiency charge pump solution that divides down an input voltage by 4 and delivers up to 72W output at up to 96.8% peak efficiency. The PE25204 can also be used in parallel to increase output power. The PE25204 supports an input voltage range of 18V to 60V in divide-by-4 operation. It is available in a WLCSP package.

Features

Proprietary architecture enables industry-leading efficiency in an ultra-compact solution footprint and profile—96.8% peak efficiency and up to 72W per part.

- Parts can be operated in parallel for higher output power.
- Input voltage range of 18V to 60V supports 48V bus systems and 24V industrial supplies.
- Fixed divide-by-4 from input voltage to output voltage.
- Fully protected with input under-voltage, output short circuit detection, and thermal shutdown fault detection.

Applications

- Ultrabooks/notebook computers
- Data centers/servers
- Networking equipment
- Base stations
- Optical equipment
- Industrial applications

Efficiency

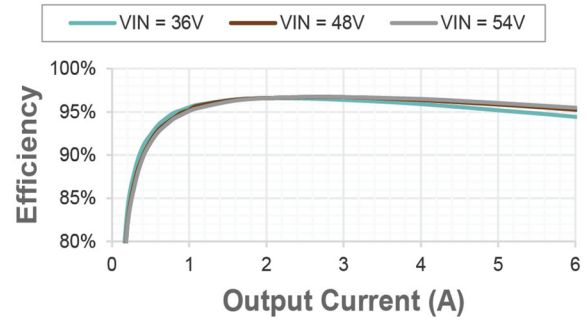


Figure 1. PE25204 Typical Efficiency 36, 48, 54V, T_A = 25 °C

Application

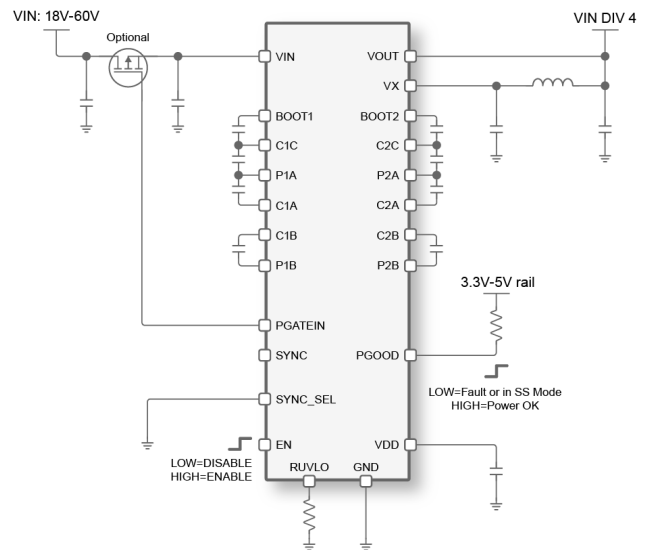


Figure 2. PE25204 Typical Application Circuit

Application Circuit

Figure 3 shows the PE25204 application circuit.

VIN: 18V-60V

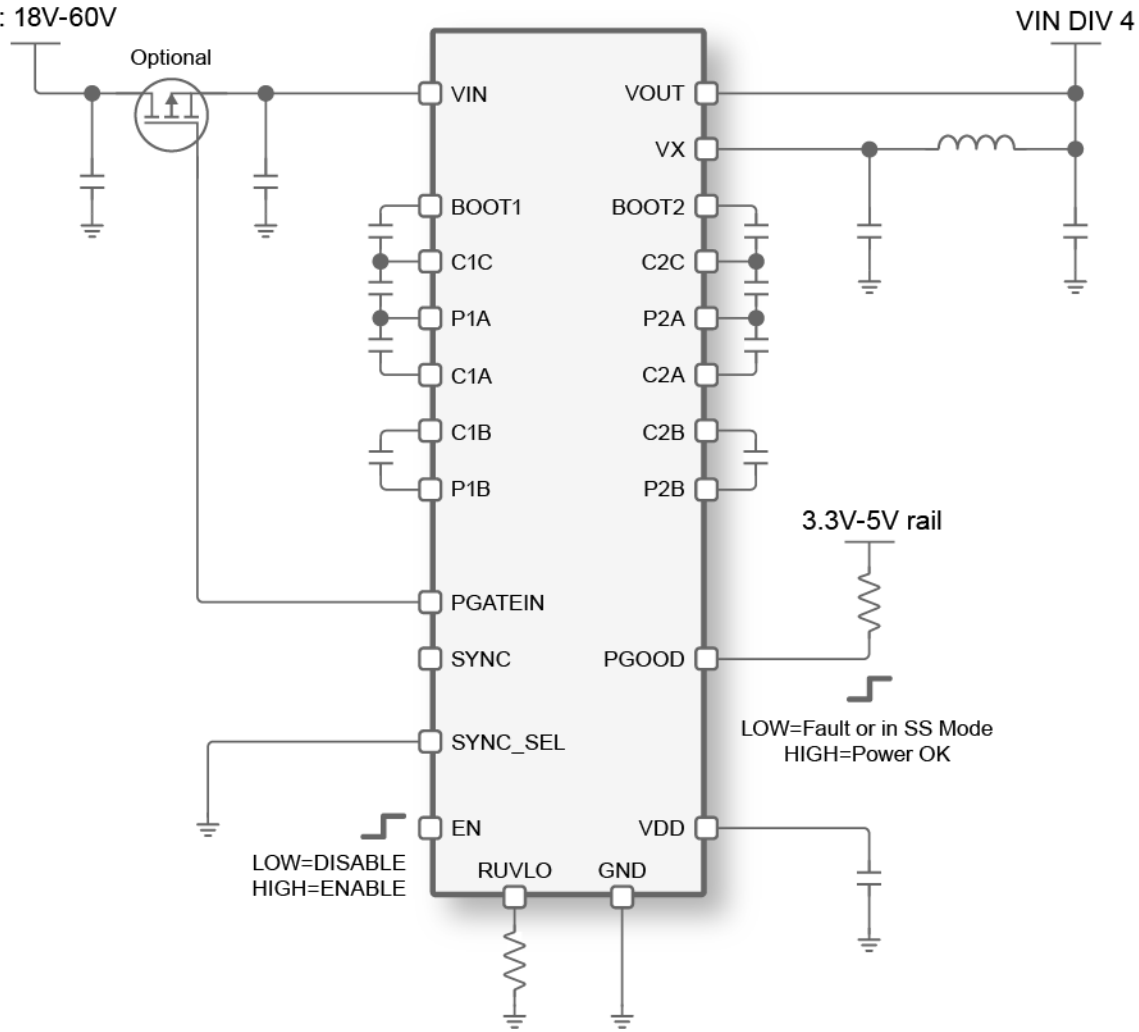


Figure 3. Simplified Application Circuit

Figure 4 shows the application circuit for the PE25204 in parallel ICs operation.

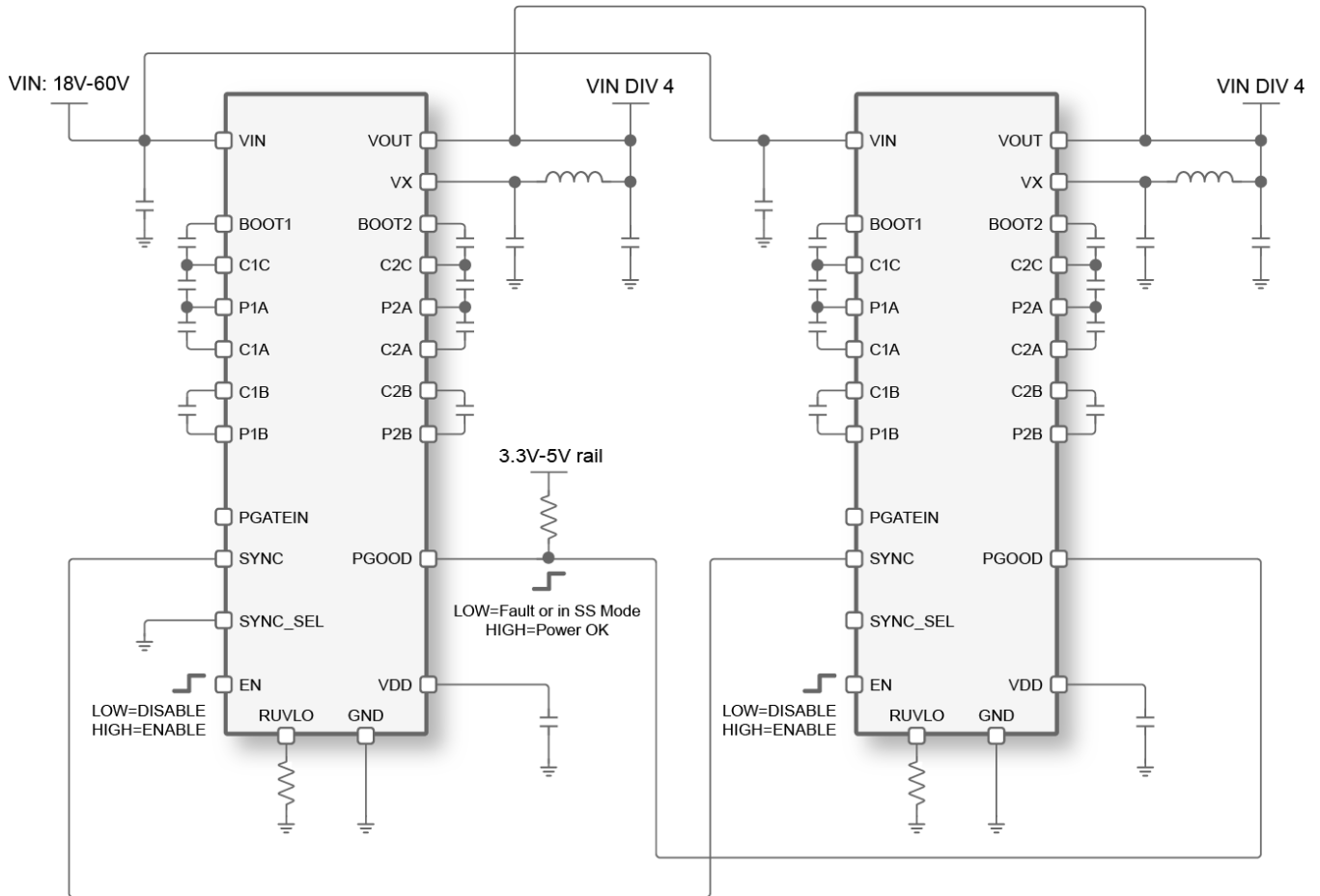


Figure 4. PE25204 Application Circuit in Parallel ICs Operation

Application Circuit Part List

Table 1 lists examples of the standard components. The components must be chosen by referring to system requirements such as voltage, temperature, and so on. The information in this table is under evaluation and subject to change.

Table 1. Application Circuit Part List

Reference	Value	Description	Part Number
C1	47 μ F	CAP ALUM 47 μ F 20% 100V SMD	UUX2A470MNL1GS
C2,C3	4.7 μ F	4.7 μ F \pm 20% 100V Ceramic Capacitor X7R 1206 (3216 Metric)	GRM31CZ72A475ME11D
C4	220 nF	0.22 μ F \pm 10% 16V Ceramic Capacitor X7R 0402 (1005 Metric)	GRM155R71C224KA12D
C5	1 nF	CAP CER 1000 PF 50V C0G/NP0 0402	GRM1555C1H102JA01D
C6,C7	4.7 nF	CAP CER 4.7 nF 50V R 0402	GRM155R11H472KA01D
C8,C9,C10, C11,C12,C13	2.2 μ F	CAP CER 2.2 μ F 100V X7T 0805	GRM21BD72A225KE01D
C14,C15,C16, C17,C18,C19	4.7 μ F	CAP CER 4.7 μ F 50V X7S 0805	GRM21BC71H475KE11D
C20	220 nF	0.22 μ F \pm 10% 50V Ceramic Capacitor X7R 0603 (1608 Metric)	GRM188R71H224KAC4D
C21	100 nF	0.1 μ F \pm 10% 50V Ceramic Capacitor X7R 0402 (1005 Metric)	GRM155R71H104KE14D
C22,C23	22 μ F	CAP CER 22 μ F 25V X7S 1206	GRM31CC71E226ME15D
L1	220 nH	IND, SMD, fixed inductors 220 nH, 6000 mA, 10 m Ω , 1008 (2520 Metric)	HMLQ25201B-R22MSR-01
		Power Inductor (SMD), Wirewound, 220 nH, 5A, Shielded, 7.2 A, DFE252010F	DFE252010F-R22M=P2
U1	IC	PE25204 IC, PE25204, WLCSP-BGA, pSemi IC	PE25204
R1,R2	10 K Ω	10 K Ω RES, SMD, thick film, 10 K Ω , \pm 1%, 1/10W, 0603	RC0603FR-0710KL

Evaluation Board

Figure 6 shows the PE25204 evaluation board.

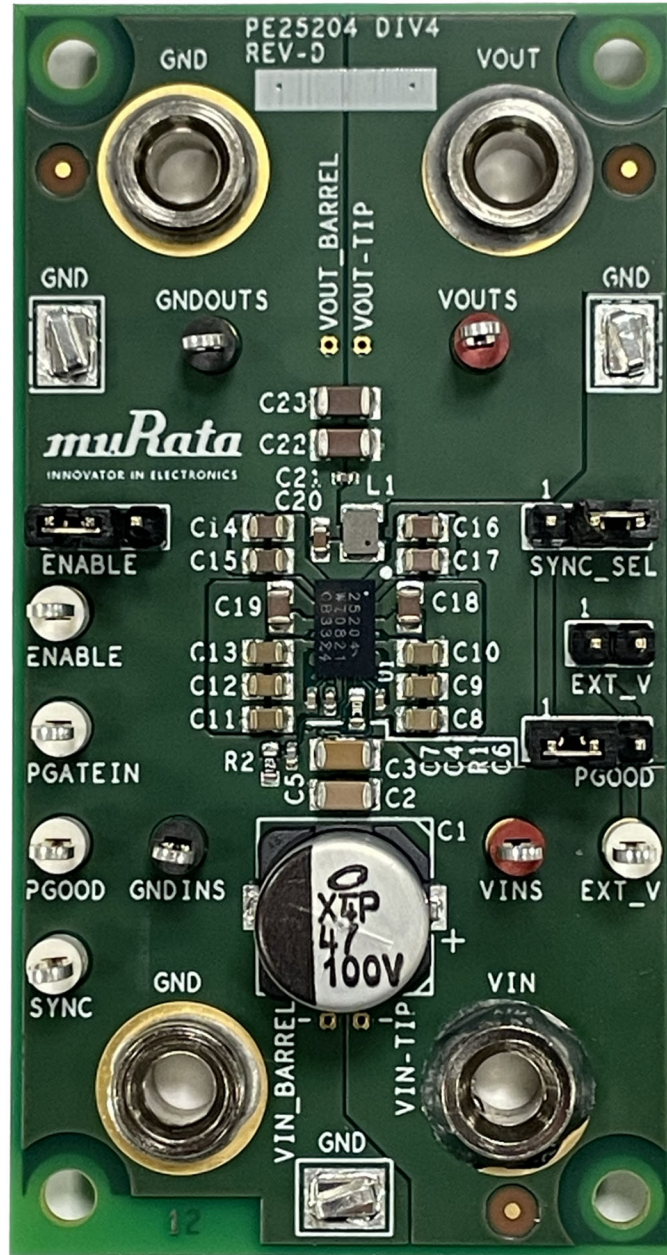


Figure 6. PE25204 Evaluation Board

Ordering Information

Table 2 lists the PE25204 order codes and shipping methods.

Table 2. PE25204 Order Codes and Shipping Methods

Order Code	Description	Packaging	Shipping Method
PE25204A-X	6A Divide-by-4 Charge Pump	WLCSP	500 Units/Tape and Reel

Document Categories

Advance Information

The product is in a formative or design stage. The datasheet contains design target specifications for product development. Specifications and features may change in any manner without notice.

Preliminary Specification

The datasheet contains preliminary data. Additional data may be added at a later date. pSemi reserves the right to change specifications at any time without notice in order to supply the best possible product.

Product Specification

The datasheet contains final data. In the event pSemi decides to change the specifications, pSemi will notify customers of the intended changes by issuing a Customer Notification Form (CNF).

Product Brief

This document contains a shortened version of the datasheet. For the full datasheet, contact sales@psemi.com.

Sales Contact

For additional information, contact Sales at sales@psemi.com.

Disclaimers

The information in this document is believed to be reliable. However, pSemi assumes no liability for the use of this information. Use shall be entirely at the user's own risk. No patent rights or licenses to any circuits described in this document are implied or granted to any third party. pSemi's products are not designed or intended for use in devices or systems intended for surgical implant, or in other applications intended to support or sustain life, or in any application in which the failure of the pSemi product could create a situation in which personal injury or death might occur. pSemi assumes no liability for damages, including consequential or incidental damages, arising out of the use of its products in such applications.

Patent Statement

pSemi products are protected under one or more of the following U.S. patents: patents.psemi.com

Copyright and Trademark

©2021–2025, pSemi Corporation. All rights reserved. The Peregrine Semiconductor name, Peregrine Semiconductor logo and UltraCMOS are registered trademarks and the pSemi name, pSemi logo, HaRP and DuNE are trademarks of pSemi Corporation in the U.S. and other countries.