PE24108

Document Category: Product Brief

3.3 VIN, 10A, Two-stage Buck Regulator for Low Output Voltage Applications

General Description

The PE24108 is a compact, low-profile, and ultra-high efficiency step-down DC-DC converter solution capable of delivering 10A per stage output current from an input voltage range from 3.0V to 3.6V. The output voltage is selected with external feedback resistors and can be adjusted between 0.4 and 1.0V.

Based on pSemi's advanced two-stage architecture, the device consists of a two-phase interleaved charge pump followed by an interleaved buck regulator stage. This power system greatly reduces the dependency on inductance for high efficiency solutions in small-footprint and height-constrained applications.

Features

- Proprietary architecture enabling industry-leading efficiency with ultra-low profile and footprint
- 92% peak efficiency
- Wide input voltage range, from 3.0V to 3.6V, that supports running off a nominal 3.3V bus supply
- Output voltage regulation accuracy better than ±1% for all line and load variations
- Output voltage set by external feedback resistors
- Output can be adjusted by external AVS DAC
- External sync pin allows synchronization to an external clock
- Parallel up to four devices

Typical Applications

- Low-profile point-of-load (POL) regulators
- Optical modules
- Core supplies
- ASICs
- FPGA

Efficiency

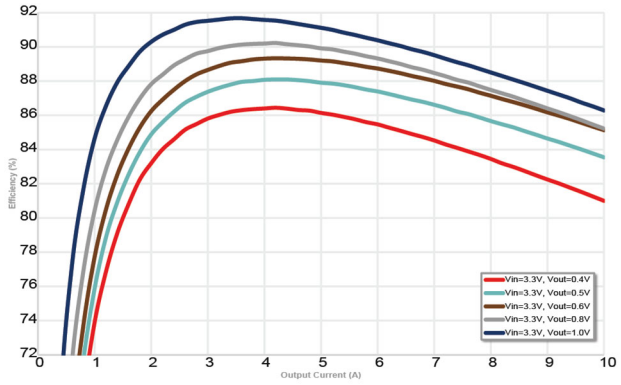

Figure 1. Efficiency Plot of Single Device

Simplified Application

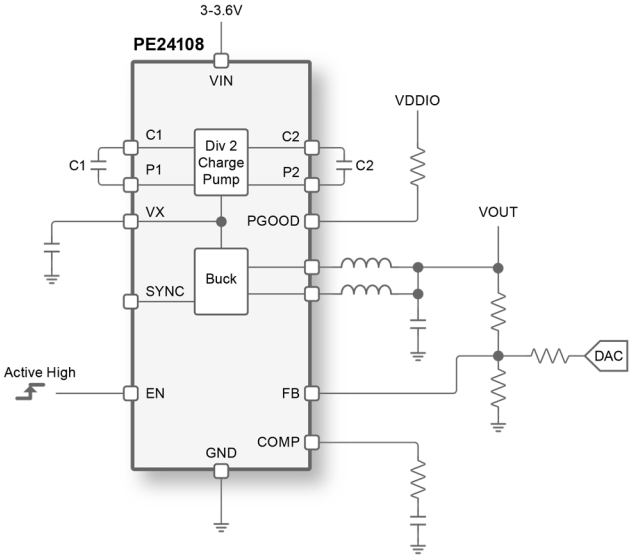

Figure 2. Typical Applications Circuit

Application Schematic

The schematic for a single device is shown in Figure 3, and Table 1 lists the components required for a single device operation

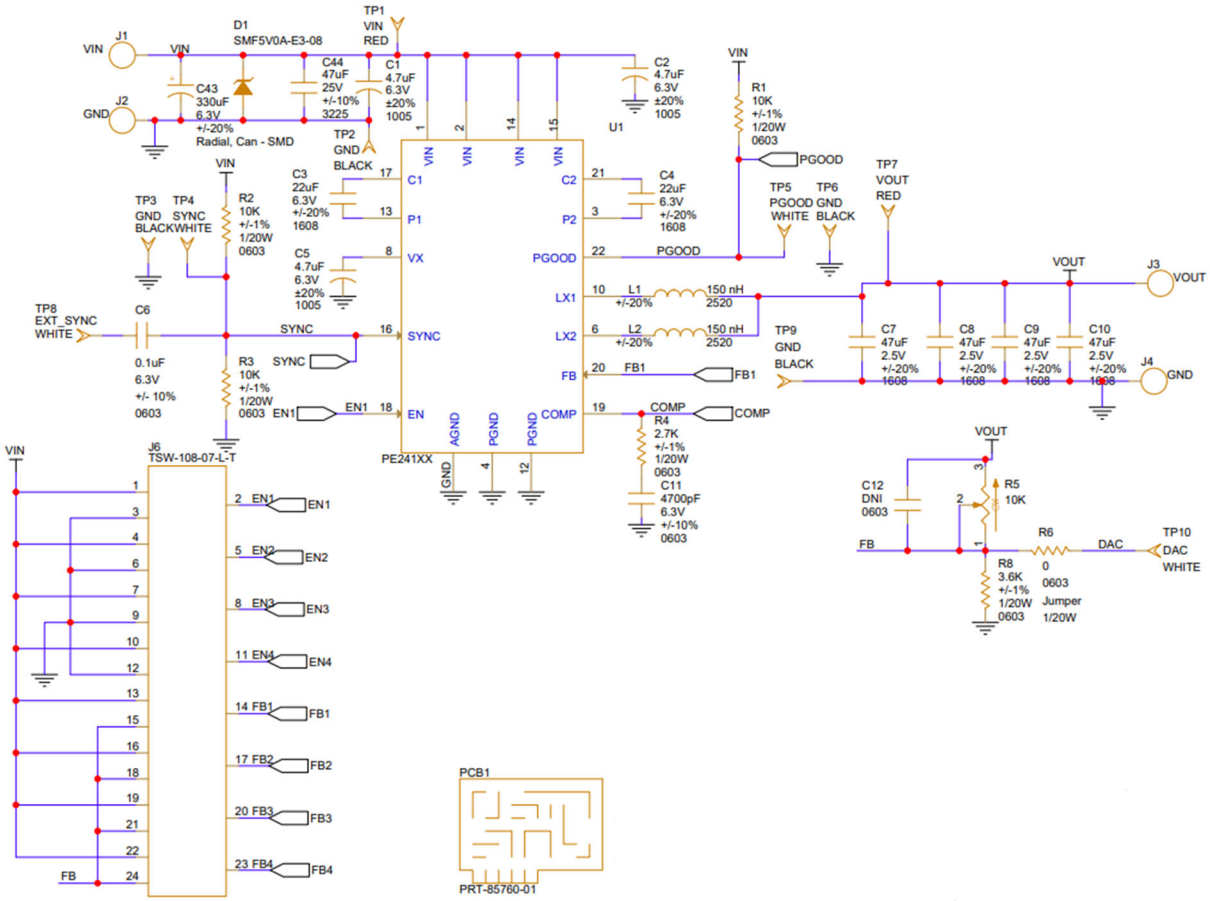

Figure 3. Device Board (EVK) Application Schematic

Application Circuit Part List

Table 1 lists recommended part numbers.

Table 1. Recommended Parts

Qty.	Ref. Number	Value	Description	Mfg.	Mfg. Part Number
3	C1,C2,C5	4.7 µF	CAP, SMD, CER, 4.7 µF, 6.3V, ±20%, X6S, 0402 (1005 Metric)	Murata	GRM155C80J475MEAAD
2	C3,C4	22 µF	CAP, SMD, CER, 22 µF, 6.3V, ±20%, X6S, 0603 (1608 Metric)	Murata	GRM188C80J226ME15D
1	C6	0.1 µF	CAP, SMD, CER, 0.1 µF, 6.3V, ± 10%, X6S, 0201 (0603 Metric)	Murata	GRM033C80J104KE15D
4	C7,C8,C9,C 10	47 µF	CAP, SMD, CER, 47 µF, 2.5V, ±20%, X7T, 0603 (1608 Metric)	Murata	GRM188D70E476ME01D
1	C11	4700 pF	CAP, SMD, CER, 4700 pF, 6.3V, ±10%, X7R, 0201 (0603 metric)	Murata	GRM033R70J472KA01D
1	C12	DNI	DNI		
1	C43	330 µF	CAP, SMD, ALU, 330 µF, 6.3V, ±20%, -, 0.248" Dia (6.30mm)	Nichicon	UCL0J331MCL1GS
1	C44	47 µF	CAP, SMD, CER, 47 µF, 25V, ±10%, X7R, 1210 (3225 Metric)	Murata	GRM32ER70J476KE20L
1	D1		19V (Typ) Clamp 20A (8/20 µs) Ipp Tvs Diode Surface Mount SOD-323	Bourns Inc.	CDSOD323-T03
2	L1,L2	150 nH	IND, SMD, Fixed Inductors, TFM-ALMA, 150 nH, 7.3A, 11 mOhm Max, 1008 (2520 Metric)	TDK	TFM252012ALMAR15MTAA
3	R1,R2,R3	10K	RES, SMD, Thick Film, 10K, ±1%, 1/20W, 0201 (0603 Metric)	Panasonic	ERJ-1GNF1002C
1	R4	2.7 kOhms	2.7 kOhms ±1% 0.05W, 1/20W Chip Resistor 0201 (0603 Metric) Moisture Resistant Thick Film	Yageo	RC0201FR-072K7L
1	R5	10K	RES, SMD, Potentiometers, 10K, ±10%, 0.25W, 1/4W, 0.250" x 0.170" Face x 0.295" H (6.35mm × 4.32 mm × 7.49 mm)	TT Electronics/BI	84WR10KLFTR
1	R6	0	RES, SMD, Thick Film, 0, Jumper, 1/20W, 0201 (0603 Metric)	Panasonic	ERJ-1GN0R00C
1	R8	3.6K	RES, SMD, Thick Film, 3.6K, ±1%, 1/20W, 0201 (0603 metric)	Panasonic	ERJ-1GNF3601C
1	U1		IC, SMD, IC, QFN	Murata	PE24108

Evaluation Board

Figure 4 shows the PE24108 device evaluation board.

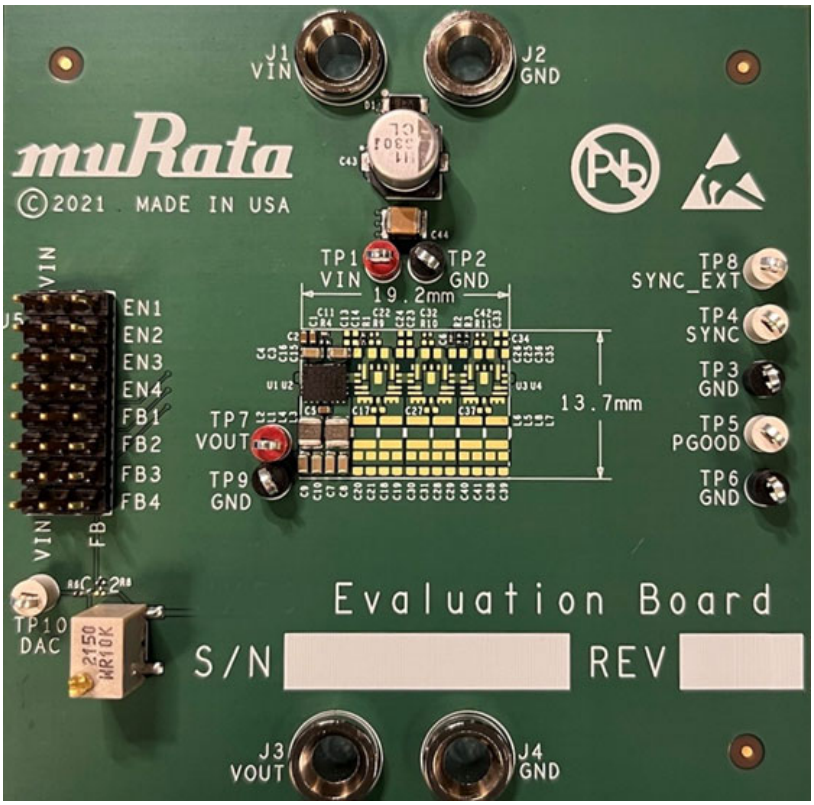

Figure 4. Device Board (EVK)

Order Codes

Table 2 lists the available ordering codes for the PE24108 as well as available shipping methods.

Table 2. Order Codes

Order Codes	Description	Packaging	Shipping Method
PE24108A-X	10A buck regulator	QFN on tape and reel	500 Units / T&R
PE24108A-Z	10A buck regulator	QFN on tape and reel	3000 Units / T&R

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

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Product Specification

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Product Brief

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

Sales Contact

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