PE24110

Document Category: Product Brief

3.3 Vin, 12A, Two-stage Buck Regulator for Low Output Voltage Applications

General Description

The **PE24110** is a compact, low-profile, and ultra-high efficiency step-down DC-DC converter solution capable of delivering 12A 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 0.35 and 0.7V.

Based on Murata'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
- 89% 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
- Parallel up to four devices

Typical Applications

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

Efficiency

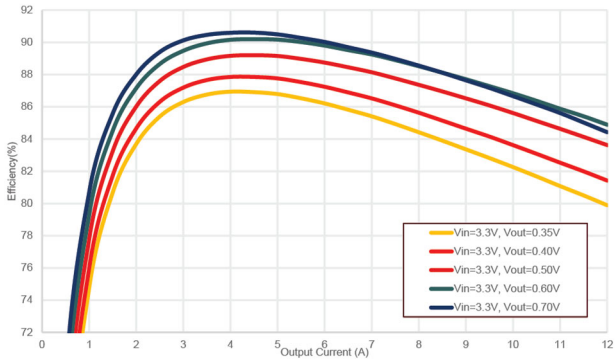


Figure 1. Efficiency Plot of a Single Device

Simplified Application

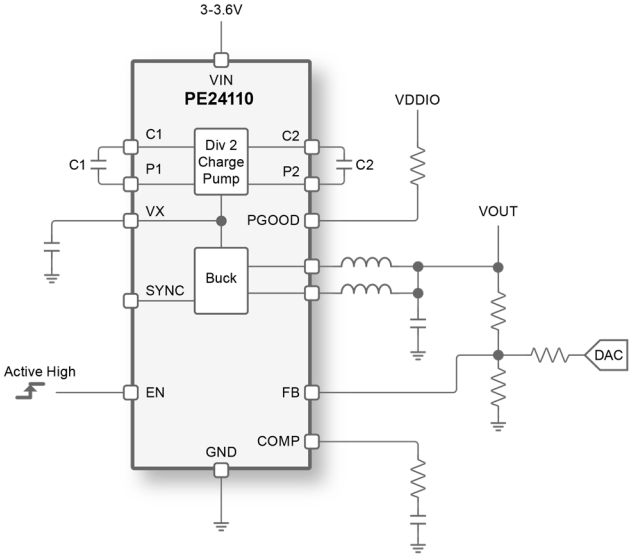


Figure 2. Typical Applications Circuit

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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

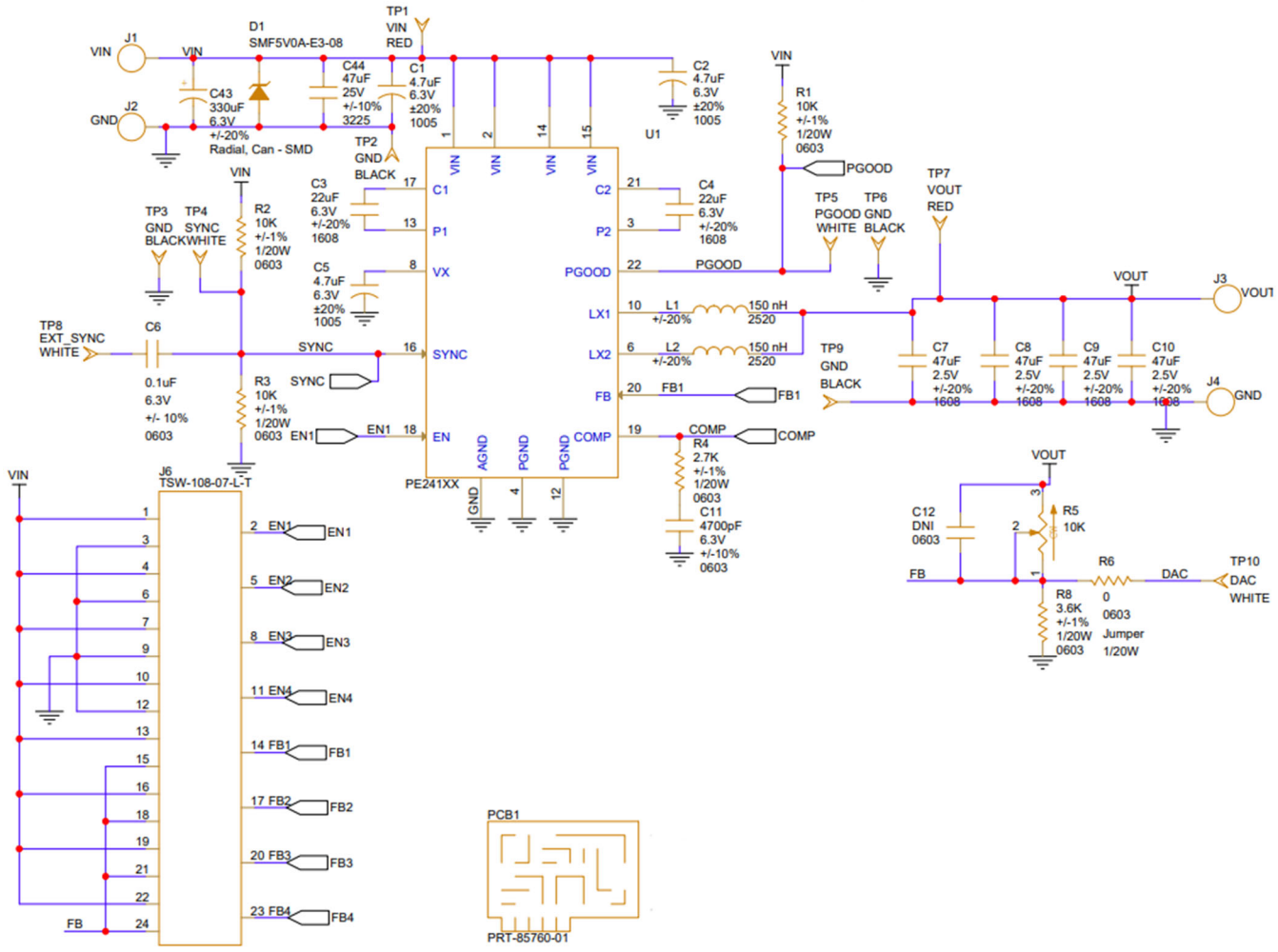


Figure 3. Application Schematic

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Application Circuit Part List

Table 2 lists recommended part numbers.

QTY	REF. NUMBER	VALUE	DESCRIPTION	MFG.	MFG. PART NUMBER
3	C1,C2,C5	4.7 µF	CAP, SMD, CER, 4.7uF, 6.3V, ±20%, X6S, 0402 (1005 Metric)	Murata	GRM155C80J475MEAAD
2	C3,C4	22 µF	CAP, SMD, CER, 22uF, 6.3V, +/-20%, X6S, 0603 (1608 Metric)	Murata	GRM188C80J226ME15D
1	C6	0.1 µF	CAP, SMD, CER, 0.1uF, 6.3V, +/- 10%, X6S, 0201 (0603 Metric)	Murata	GRM033C80J104KE15D
4	C7,C8,C9,C10	47 µF	CAP, SMD, CER, 47uF, 2.5V, +/-20%, X7T, 0603 (1608 Metric)	Murata	GRM188D70E476ME01D
1	C11	4700 pF	CAP, SMD, CER, 4700pF, 6.3V, +/-10%, X7R, 0201 (0603 metric)	Murata	GRM033R70J472KA01D
1	C43	330 µF	CAP, SMD, ALU, 330uF, 6.3V, +/-20%, -, 0.248" Dia (6.30mm)	Nichicon	UCL0J331MCL1GS
1	C44	47 µF	CAP, SMD, CER, 47uF, 25V, +/-10%, X7R, 1210 (3225 Metric)	Murata	GRM32ER70J476KE20L
1	D1		19V (Typ) Clamp 20A (8/20µs) 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, 11mOhm 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 x 4.32mm x 7.49mm)	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	PE24110	IC, SMD, QFN	Murata	PE24110

Table 1. Recommended Parts

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Evaluation Board

Figure 4 shows the PE24110 device evaluation board.

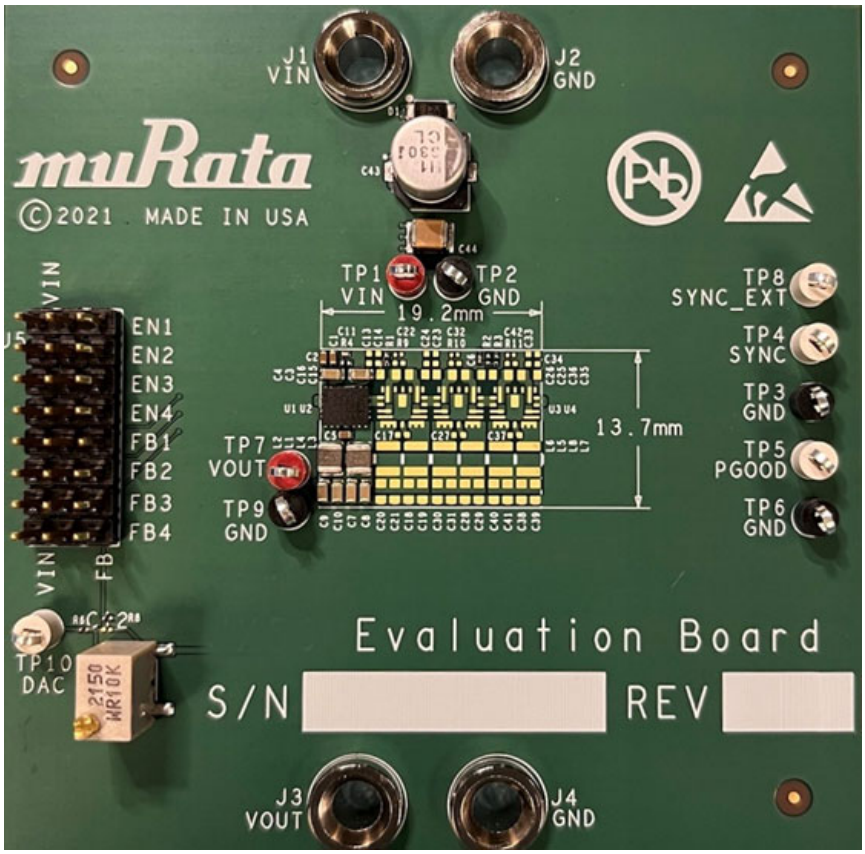


Figure 4. Device Evaluation Board

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Order Codes

Table 2 lists the available ordering codes for the PE24110 as well as available shipping methods.

ORDER CODES	DESCRIPTION	PACKAGING	SHIPPING METHOD
PE24110A-X	12A buck regulator	QFN on tape and reel	500 units / T&R
PE24110A-Z	12A buck regulator	QFN on tape and reel	3000 units / T&R
EK24110-01	PE24110 Evaluation board (EVK)	Evaluation board	1 unit

Table 2. Order Codes

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- Undersea equipment
- Power plant control equipment
- Surgical implants
- Transportation equipment (vehicles, trains, ships, etc.)
- Traffic signal equipment
- Disaster prevention / crime prevention equipment
- Application of similar complexity and/or reliability requirements to the applications listed in the above

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1. Please make sure that your product has been evaluated and confirmed to your specifications when our product is used in your product.
2. All the items and parameters in this approval sheet for product specification are based on the premise that our product is used for the purpose, under the condition and in the environment agreed upon between you and us. You are requested not to use our product in a manner deviating from such agreement.
3. If you have any concerns about materials other than those listed in the RoHS directive, please contact us.
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