

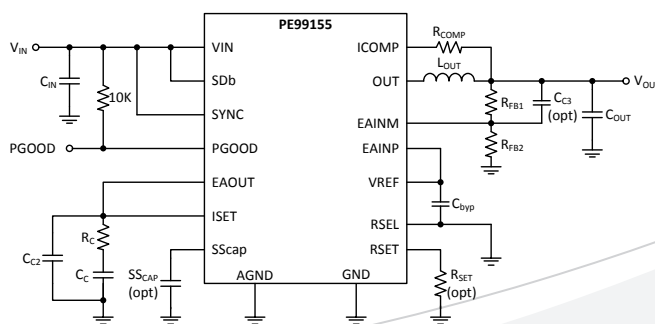
UltraCMOS[®] Point-of-Load DC-DC Buck Regulators With Integrated Switches

Peregrine Semiconductor's CMOS-on-sapphire (UltraCMOS[®]) technology has achieved significant performance milestones in manufacturability, reliability and RF performance, and has inherent advantages that make it ideal for demanding High-Reliability designs. UltraCMOS[®] products meet the stringent low-power requirements of telecom, infrastructure, microwave and VSAT military radios, radar and ECM space systems, and test instrumentation applications. Screening is available for commercial and military space applications.

THE NEW PE9915X FAMILY

The PE9915x products are Rad Hard Point-of-Load Buck Regulators that deliver high efficiency and output currents up to 2/6/10 A (continuous) from $V_{IN} = 5V$ (4.6 - 6.0V). A minimal external component count and high switching frequency enables greater than 10 W/in² standard PCB designs. Integrated synchronous MOSFET switches cut BOM cost and produce peak efficiencies of $\geq 93\%$, while minimizing thermal loads.

TYPICAL APPLICATION DIAGRAM



93% Peak
Efficiency

Also Available as Die

PRODUCT FEATURES

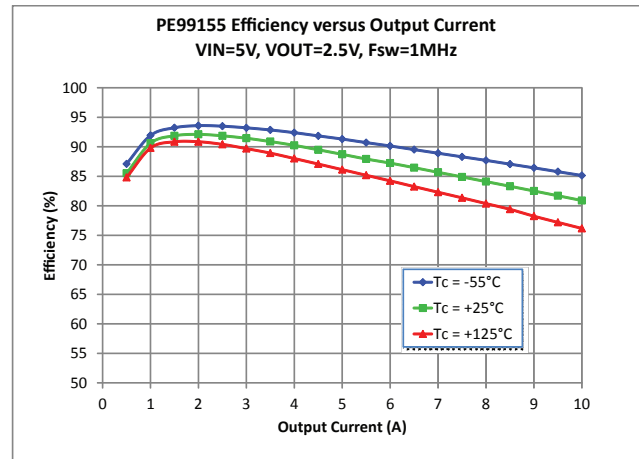
- ▶ Integrated synchronous FET switches with 93% peak efficiency
- ▶ Peak current mode control and voltage mode control for wide loop bandwidth and excellent load step response
- ▶ Better than 1% initial accuracy at 25°C
- ▶ Powers up into pre-biased loads allowing safe start-up with load applied
- ▶ Adjustable switching frequency (100 kHz to 5 MHz) allows operation at the optimum frequency to minimize RF spur impact and minimize inductor size and weight
- ▶ Inverted sync buffer pin for easy poly-phase operation, enabling ripple reduction and faster loop response
- ▶ Adjustable Soft-Start with external capacitor to adjust load voltage/current rise-time
- ▶ Integrated Power Good pin for sequencing and telemetry
- ▶ Shutdown function pin for remote on/off control
- ▶ Accurate and simple current sharing for higher power loads
- ▶ Adjustable current threshold and over current protection
- ▶ N+K redundant control through simple enable pin
- ▶ Hermetic ceramic package with exposed thermal pad

RADIATION IMMUNITY

- ▶ The reduced bulk parasitics of the UltraCMOS process technology provide immunity to radiation-induced latchup
- ▶ Guaranteed immune to Single Event Latchup (SEL)
- ▶ Extremely low instances of SEE

Radiation Hardness	
TID	100 Krad(Si)
SEL	> 90 MeV-cm ² /mg
SEB	> 90 MeV-cm ² /mg
SET	> 90 MeV-cm ² /mg
SEFI	> 90 MeV-cm ² /mg
SEGR	> 90 MeV-cm ² /mg

- SEL, SEB, SEGR, SEU, SEFI: None observed, Au/60 degrees
- SET: No events exceeding 30 mV transient observed @ Au, LET=90, 60 degrees normal incidence.
- The UltraCMOS process does not exhibit enhanced low-dose-rate sensitivity (ELDRS) since bipolar minority carrier elements are not used.



RAD HARD POINT-OF-LOAD DC-DC BUCK REGULATORS

Part Number	Part Description	Iout (Max) (A)	Vin (Min) (V)	Vin (Max) (V)	Vout (Min) (V)	Vout (Max) (V)	Async Switching Frequency (kHz)	Sync Switching Frequency (kHz)	ESD HBM (V)	Package
PE99151	2A DC-DC Converter	2	4.6	6	1	3.6	500/1000	100-5000	1000	32L CQFP, DIE
PE99153	6A DC-DC Converter	6	4.6	6	1	3.6	500/1000	100-5000	1000	32L CQFP, DIE
PE99155	10A DC-DC Converter	10	4.6	6	1	3.6	500/1000	100-5000	1000	32L CQFP, DIE

About Peregrine Semiconductor

Peregrine Semiconductor is a fabless provider of high-performance RFICs. Our solutions leverage our proprietary UltraCMOS® technology, which enables the design, manufacture, and integration of multiple RF, mixed-signal, and digital functions on a single chip. Our products deliver what we believe is an industry leading combination of performance and monolithic integration, and target a broad range of applications in the aerospace and defense, broadband, industrial, mobile wireless device, test and measurement equipment, and wireless infrastructure markets.



UltraCMOS technology combines the fundamental benefits of standard CMOS, the most widely used semiconductor process technology, with a synthetic

sapphire substrate that enables significant improvements in performance for RF applications. We have engineered design advancements, including our patented HaRP™ technology which significantly improves harmonic and linearity performance, and our patent-pending DuNE™ technology, a circuit design technique that we have used to develop our advanced digitally tunable capacitor (DTC) products.

We leverage our extensive RF design expertise and systems knowledge to develop RFIC solutions that meet the stringent performance, integration, and reliability requirements of the rapidly evolving wireless markets. We offer a broad portfolio of more than 120 high performance RFICs including switches, digital attenuators, frequency synthesizers, mixers, and prescalers, and are developing power amplifiers, DTCs, and DC-DC converters.

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Changing How RF is Designed. **Forever.™**