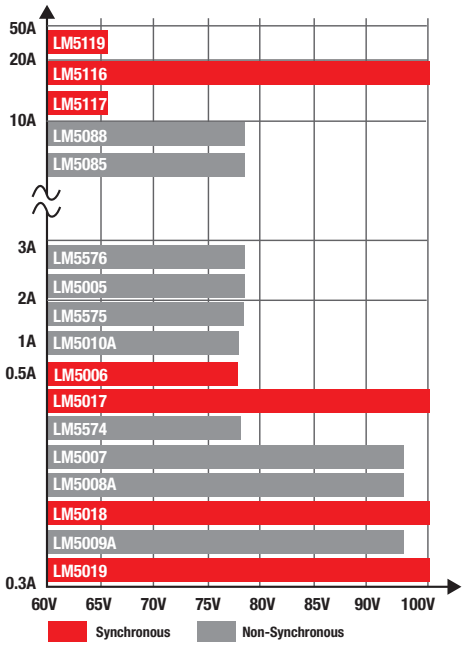
High-Voltage Point-of-Load Power Solutions

High-Performance and Ease-of-Use Above 65V

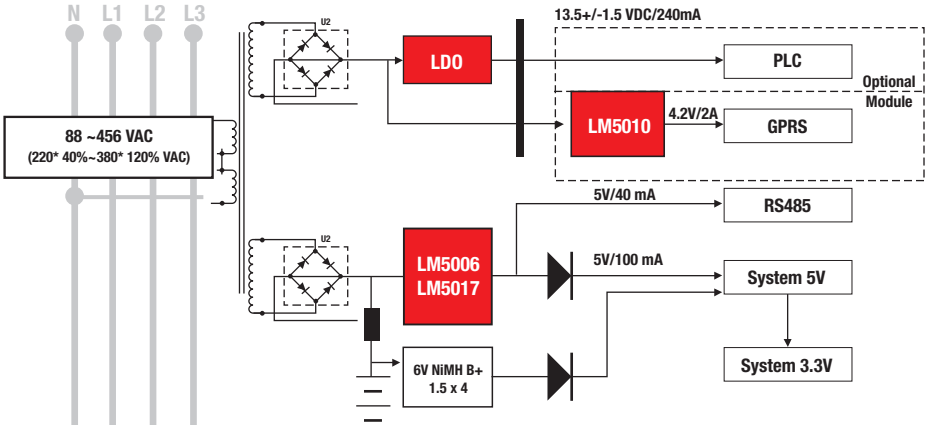
Increased System Reliability and Efficiency for Communications, Industrial, and Automotive Applications

TI provides the industry's most comprehensive high-voltage point-of-load regulator portfolio with a breadth of features to meet the demands of high-performance systems. Easy-to-use, high-voltage converter and controllers simplify DC-DC conversion and reduce solution size. Constant on-time and emulated current mode control architectures offer stability for very high step-down ratios with minimal external components required to complete the design. With maximum operating input voltages of up to 100V, your system is protected against even the harshest transient conditions in rugged Telecom, Industrial, Renewable Energy, and Automotive environments. TI's converters and controllers are the premier high-voltage point-of-load regulators on the market today.

High-Voltage Regulator Portfolio



Multi-Function 3-Phase Power Meter Diagram



National Products from Texas Instruments

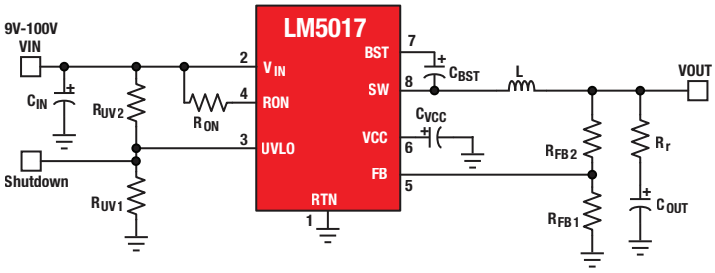
High-Voltage Converters

TI's of high-voltage portfolio is characterized by a constant on-time (COT) architecture that reduces the number of required external components to keep solution sizes small and simplify designs. The new LM5017 100V, 600 mA synchronous buck converter is the first in a family of the industry's first 100V converter with integrated high-side and low-side FETs.

Features

- Wide 9 to 100V input voltage range
- Integrated 100V, high-and-low side switches
- No loop compensation
- Fast transient response
- Frequency adjustable to 1MHz

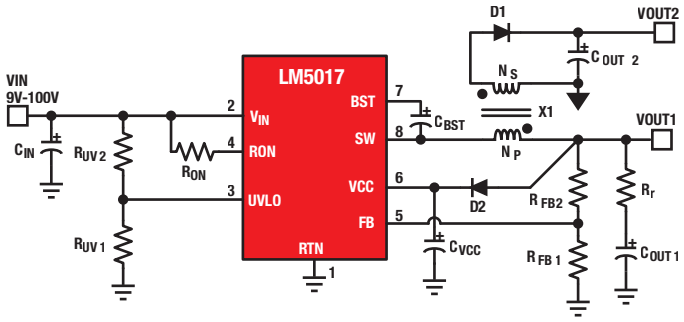
LM5017 Typical Application Circuit



Industry's Smallest Isolated Bias Supply

The synchronous members of the high-voltage converter family have a unique feature that provides additional versatility — continuous conduction mode operation to enable designers to generate an isolated output by substituting a transformer for the inductor. The LM5017/18/19, as well as the LM5006, can be used in such a configuration to generate multiple isolated outputs, allowing a designer to employ the devices as bias supplies across an isolation barrier.

LM5017 Isolated Application Circuit



High-Voltage (≥75V) Buck Converters

Product ID	Output Curent (A)	Input Min Voltage (V)	Input Max Voltage (V)	Output Min Voltage (V)	Output Max Voltage (V)	Frequency Range (kHz) & Sync Capability	Synchronous	PWM Mode	Packaging
LM5007	0.5	9	75	2.5	37/73	50 to 800	—	COT	MSOP-8
LM5574	0.5	6	75	1.23	70	500, Sync	—	ECM	TSSOP-16
LM5006	0.65	6	75	2.5	70	50 to 800	✔	COT	MSOP-10
LM5010/A	1	8 / 6	75	2.5	70	50 to 1000	—	COT	LLP-10, eTSSOP-14
LM5575	1.5	6	75	1.23	70	500, Sync	—	ECM	eTSSOP-16
LM5005	2.5	7	75	1.23	40/70	500, Sync	—	ECM	TSSOP-20
LM5576	3	6	75	1.23	70	500, Sync	—	ECM	eTSSOP-20
LM5009/A	0.15	9.5 / 6	95	2.5	85	50 to 600	—	COT	LLP-8, MSOP-8
LM5008/A	0.35	9.5 / 6	95	2.5	85	50 to 600	—	COT	LLP-8, MSOP-8
LM5017	0.6	9	100	1.25	90	50 to 1000	✔	COT	LLP-8, PSOP-8
LM5018	0.3	9	100	1.25	90	50 to 1000	✔	COT	LLP-8, PSOP-8
LM5019	0.1	9	100	1.25	90	50 to 1000	✔	COT	LLP-8, PSOP-8

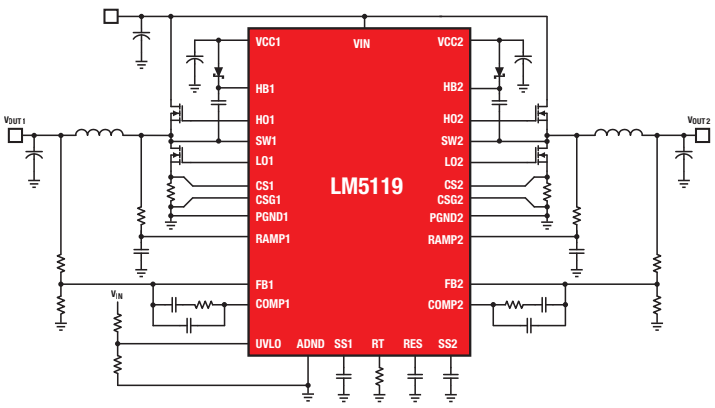
*New products are listed in **bold red**.*

For added flexibility, TI also offers a range of controllers for high-voltage systems intended for the rugged environments of Communications Infrastructure, Industrial, Solar and Automotive applications. The LM5119 65V dual synchronous buck controller can be used either as a dual output supply with up to 20A from each output or as a multi-phased single output supply providing up to 40A of current. The integration of two controllers into one small package reduces overall solution size, as well as system complexity.

Features

- Wide operating range from 5.5 to 65V
- Easily configurable for dual outputs or interleaved single output
- Switching frequency programmable to 750 kHz
- Optional diode emulation mode
- Programmable output from 0.8V
- Precision 1.5% voltage reference

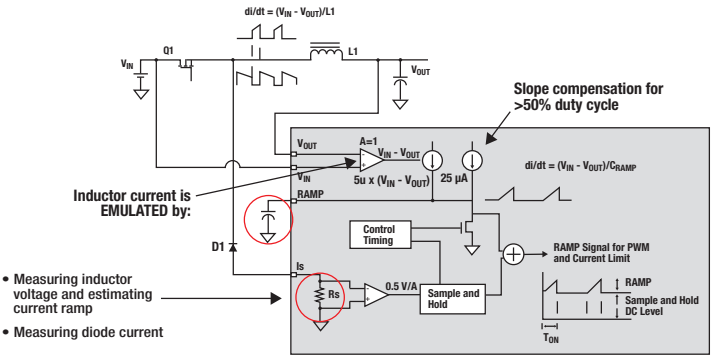
LM5119 Typical Application Circuit



Reducing Noise with Emulated Current Mode

Many of TI's high-voltage regulators employ a patented control architecture known as emulated current mode (ECM). An emulated current mode regulator overcomes a traditional current-mode regulator's noise susceptibility by emulating the buck switch current signal, which is then used for current-mode control. The emulated buck switch current is the sum of an estimate of the inductor current and the sampled diode current. Avoiding direct inductor current measurement minimizes the effect of switching noise while maintaining the benefits of the current mode control.

ECM Control Architecture



High-Voltage (≥65V) Buck Controllers

Product ID	Input Min Voltage (V)	Input Max Voltage (V)	Number of Outputs	Output Min Voltage (V)	Output Max Voltage (V)	Frequency Range (kHz) & Sync Capability	Synchronous	PWM Mode	Packaging
LM5117	5.5	65	1	0.8		50 to 750	✔	ECM	LLP-24, eTSSOP-20
LM5119	5.5	65	2	0.8	90% V_{IN}	50 to 750	✔	ECM	LLP-32
LM5085	4.5	75	1	1.25	75	50 to 1000	—	COT	LLP-8, MSOP-8, eMSOP-8
LM5088	4.5	75	1	1.2	70	50 to 1000, Sync	—	ECM	eTSSOP-16
LM5118	3	75	1	1.23	70	50 to 500, Sync	—	ECM	eTSSOP-20
LM5115/A	4.5	75	1 or 2	0.75	13.5	50 to 1000, Sync	✔	Voltage/Current-injection Valley Current Mode	TSSOP-16
LM5116	6	100	1	1.215	80	50 to 1000, Sync	✔	ECM	eTSSOP-20

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Easy-to-Use Design Tools. Custom Results.

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PowerLab power management reference design library contains hundreds of proven designs

Design and Evaluation Tools

Product ID	Quick Start Calculator	WEBENCH	Evaluation Board	Reference Design	Application Note
LM5005	✔	✔	✔	—	AN1889, AN1748, PD114
LM5006	✔	✔	✔	✔	AN2171, AN2050
LM5007	✔	✔	✔	Altera Fire Driver	AN1634, AN1481, AN1319, AN1298, PD101
LM5008/A	✔	✔	✔	✔	AN1925, AN1330
LM5009/A	✔	✔	✔	✔	AN1955, AN1445
LM5010/A	✔	✔	✔	✔	AN1423, AN1352
LM5017/18/19	✔	✔	✔	PMP7315, PMP7316	AN2204, AN2200
LM5574	✔	✔	✔	RD-128	AN1568
LM5575			✔	PMP7772	AN1569
LM5576			✔	RD-128	AN1570
LM5085	✔	✔	✔	PMP7767	AN2157, AN1878, PD130
LM5088	✔	✔	✔	✔	AN1913, PD125
LM5115/A			✔	✔	AN1542, AN1368, AN1367
LM5116	✔	✔	✔	✔	AN1713, AN1596, AN1628
LM5117	✔	✔	✔	—	AN2103
LM5118	✔	✔	✔	PMP7773.1	AN2178, AN1819
LM5119	✔	✔	✔	—	AN2065

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