DC/DC Buck Controller Solutions

Texas Instruments

2018

Step-Down (Buck) Controllers

TI has a wide portfolio of DC/DC step-down buck controllers to help meet your design targets. Choose between low to wide V_{IN}, single to multiphase, and analog to PMBus™/I2C depending on your design requirements. Power supplies designed with DC/DC buck controllers and external MOSFETs are often the best choice for high output power, extended temperature operation and wide input voltage range applications. **www.ti.com/buckcontroller**

Featured Devices

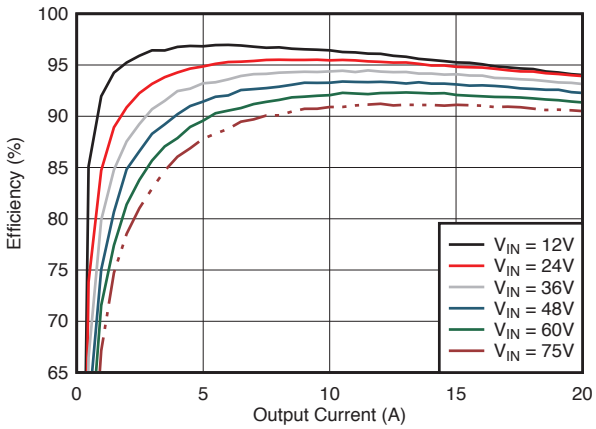
Device	V_{IN} (V)	V_{OUT} (V)	I_{OUT} (A)	Frequency (kHz)	Control Mode	Package (s) (mm)	Features
Input Rails (3.3/5V)							
TPS40007/9	2.25 to 5.5	0.7 to 4	15	300/600	VM	3x5 10MSOP	EN, Adj. Soft Start, Prog. Current Limit
TPS40040/1	2.25 to 5.5	0.6 to 4.84	15	300/600	VM	3x3 8SON	EN
Input Rails(5/12V)							
TPS40190	4.5 to 15	0.6 to 12.75	20	300	VM	3x3 10SON	EN, Prog. Current Limit
LM2737	2.2 to 16	0.6 to 13.5	20	50 to 2000	VM	5x6.4 14TSSOP	PG, EN, Non-Sync Rectification, Adj. Soft Start, Prog. Current Limit
TPS40192/3	4.5 to 18	0.591 to 14.4	15/20	600/300	VM	3x3 10SON	PG, EN, Prog. Current Limit
Input Rails(19/24V)							
TPS40303/4/5	3 to 20	0.6 to 17	25	300/600/1200	VM	3x3 10SON	PG, EN, FSS, Adj. Soft Start, Prog. Current Limit
LM27402	3 to 20	0.6 to 18.6	30	200 to 1200	VM	4x4 16WQFN	PG, EN, Freq Sync, Track, Adj. Soft Start
LM27403	3 to 20	0.6 to 19	30	200 to 1200	VM	4x4 24WQFN	PG, EN, Freq Sync, RS, Track, Adj. Soft Start
TPS40195	4.5 to 20	0.591 to 17	20	100 to 600	VM	3.5x4 16QFN	PG, EN, Freq Sync, Prog. UVLO, 180° Bi-Directional Out-of-Phase Sync.
TPS40077	4.5 to 28	0.7 to 23	20	300 to 1000	VM	5x6.4 16TSSOP	PG, Prog. Current Limit, Adj. Soft Start, Prog. UVLO
TPS53219A	3 to 28	0.6 to 5.5	20	250 to 970	D-CAP™	3x3 16QFN	PG, EN, LLE, Non-Sync Rectification, Eco-Mode™, Adj. Soft Start
TPS53015	4.5 to 28	0.76 to 7	25	500	D-CAP2™	3x3 10VSSOP	PG, EN, LLE, Eco-Mode
LM25145	6 to 42	0.8 to 40	25	100 to 1000	VM	3.5x4.5 20VQFN	PG, EN, Wettable Flanks, Sync In/Out, Adj. Soft Start, UVLO, ILIM
Input Rails(48V)							
LM5145	6 to 75	0.8 to 60	25	100 to 1000	VM	3.5x4.5 20VQFN	PG, EN, 105V Transient Withstand, Wettable Flanks, Sync In/Out, Adj. Soft Start, UVLO, ILIM
LM5085	4.5 to 75	1.25 to V_{IN}	10	100 to 1000	COT	3x3 8WSON	PFET High Side, 100% Duty Cycle, EN, ILIM, Non-Sync Rectification
LM5116	6 to 100	1.2 to 80	20	50 to 1000	ECM	4.4x6.5 20HTSSOP	PG, EN, 100V Operating Max, Prog. Soft Start, UVLO, ILIM
PMBus							
TPS53681	4.5 to 17	0.25 to 2.8125	300	300 to 1000	D-CAP+™	5x5 40QFN	PG, EN, NR_HOT, Telemetry, Phase Add/Drop, Interal loop compensation, Per Phase Current Limit
TPS53647	4.5 to 17	0.5 to 2.5	240	300 to 1000	D-CAP+	6x6 40QFN	PG, EN, Dual Output 6+2/5+3, NR_HOT, Telemetry, Phase Add/Drop, Pinstrap Functions, VBOOT, Per Phase Current Limit
TPS53667	4.5 to 17	0.5 to 2.5	420	300 to 1000	D-CAP+	6x6 40QFN	PG, EN, NR_HOT, Telemetry, Phase Add/Drop, Pinstrap Functions, VBOOT, Per Phase Current Limit
TPS53819A	3 to 28	0.6 to 5.5	40	275 to 1000	D-CAP2	3x3 16QFN	PG, EN, Dynamic Voltage Scaling, LLE, Eco-Mode
TPS40400	3 to 20	0.6 to 5	30	200 to 2000	VM	3.5x5.5 24VQFN	PG, EN, RS, Telemetry, Dynamic Voltage Scaling, Current Sensing, Prog. OCP

To learn more about TI buck controllers or to see the entire portfolio, visit **www.ti.com/buckcontroller**

Featured Device – LM5145

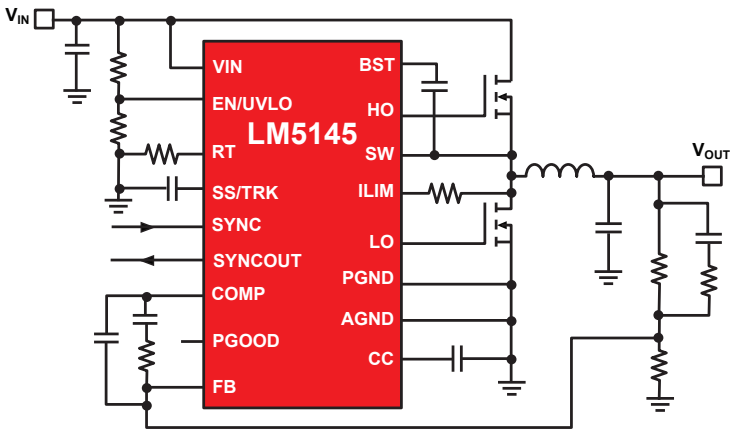
6.0V to 75V Input, Voltage Mode, 30A, Synchronous Step-Down Controller

- 3.5 x 4.5mm Package with Wettable Flanks
- Lossless RDS(on) or Shunt (Resistor) Current Sensing
- SYNC Output with 180° Phase Shift
- 100kHz to 1MHz Switching Frequency

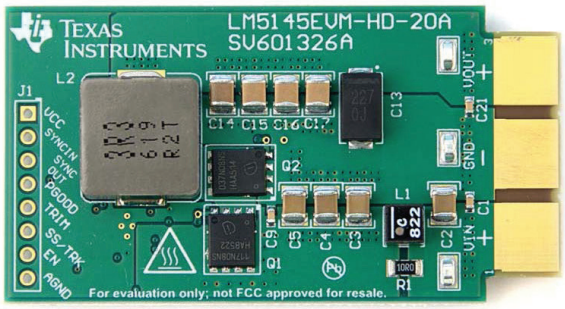


V_{OUT} = 5 V V_{SYNCIN} = V_{VCC} F_{SW} = 230 kHz R_{RT} = 43.2 kΩ

Efficiency vs Load, CCM.



LM5145 schematic.



LM5145 Wide Input Voltage Synchronous Buck Controller Evaluation Module.

WEBENCH® Designer is a powerful software algorithm with visual interfaces that deliver complete applications in seconds.

Glossary

D-CAP+™	Current-mode constant on-time control architecture	**LLE**	Light-load efficiency
D-CAP™	Adaptive on-time control for fast transient response	**PG**	Power good pin
D-CAP2™	D-CAP for ceramic capacitors	**RS**	Remote sense
ECM	Emulated current mode	**Telemetry**	Monitors voltage, current, and temperature
Eco-Mode™	High light-load efficiency	**Track**	Tracking pin for sequencing
EN	Enable pin	**VM**	Voltage mode control
ILIM	Adjustable current limit	**VR_HOT**	Active low external-temperature indicator used as a warning to the load/CPU

Learn more: **www.ti.com/buckcontroller**
Create, manage and share your power supply designs at: **www.ti.com/webench**
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