Standard Power Quick Select Guide

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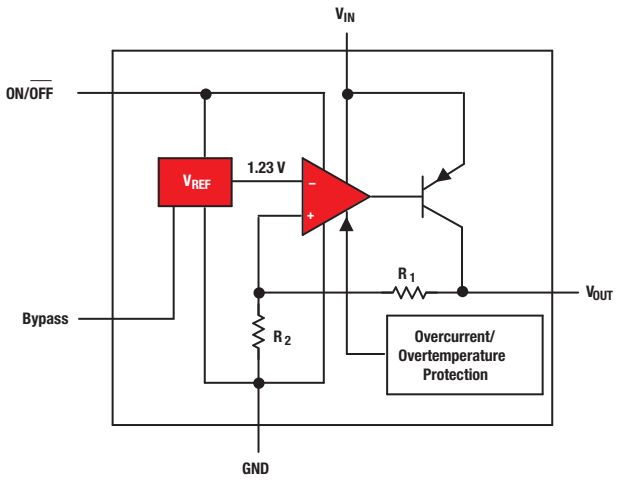
2015

Linear Regulators

Texas Instruments growing portfolio of standard linear regulators offers customers superior performance in small packages and includes value-added features like thermal overload protection, safety current limits, and a shutdown mode that drastically reduces current consumption. TI offers fixed and adjustable output voltage options, up to 2.0 A of output current, and dropout voltages down to 280 mV.

Functional Block Diagram



Linear Regulators

Device	V_{IN} (V)	V_{OUT} (V)	I_{OUT} (Max) (A)	Iq (typ) (mA)	Vdo (typ) (V)
LMx37	-4.2 to -40	-1.2 to -37	1.5	—	—
LM317/M	4.2 to 40	1.2 to 37	2	—	—
LM317L	3.7 to 38	1.2 to 32	0	—	—
MC79Lxxx	-7 to -30	-5; -12; -15	0	6/6.5	2
TL317	5 to 38	1.2 to 32	0	—	—
TL780	7 to 30	5; 12; 15	2	8	2
UA78Lxxx	4.75 to 30	2.6; 5; 6.2; 8; 9; 10 ; 12; 15	0	6	2
UA78Mxx	7 to 30; -7 to -25	-8; -5; 3.3; 5; 6; 8; 9; 10; 12	0	1/6	2
UA78xx	7 to 38	5; 8 ; 10; 12; 15; 24	2	8	2
UA79xx	-7 to -25	-8; -5	2	2	1

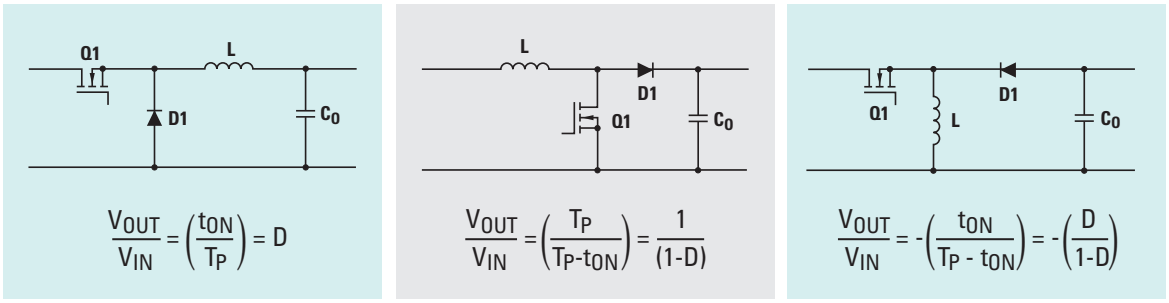
Low Dropout Regulators

Device	V_{IN} (V)	V_{OUT} (V)	I_{OUT} (Max) (A)	Output Cap (µF)	Output Cap Type	I_{OUT} (Max) (A)	Vdo (typ) (mV)	Accuracy (%)
LP2950	3.4 to 30	3; 3.3; 5	0	2	Electrolytic	0	380	1
LP2951	1.68 to 30	3; 3.3; 5	0	2	Electrolytic	0	380	1
LP2981/A	2.2 to 16	2.8;2.9; 3; 3.3; 5	0	5	Tantalum	0	200	0
LP2985/A	2.2 to 16	1.8; 2.5; 2.8; 2.9; 3; 3.3; 5	0	5	Ceramic	**0**	**280**	**1**
TL750L/M	6 to 26	5; 8; 10; 12	1	10	Tantalum	0	600	2
TL751L	6 to 26	5; 10; 12	1	10	Tantalum	0	600	4
TLV1117	2.7 to 15	1.5; 1.8; 2.5; 3.3; 5	5	10	Tantalum	0	1,200	3

Internal Switching - Buck, Boost, Buck/Boost

Texas Instruments offers a wide variety of DC/DC converters capable of buck, boost and buck - boost operation. These converts offer wide range of input and output voltages with different load current options while maintaining higher efficiency compared to a linear regulator.

Boost, Flybuck, and Forward Topologies



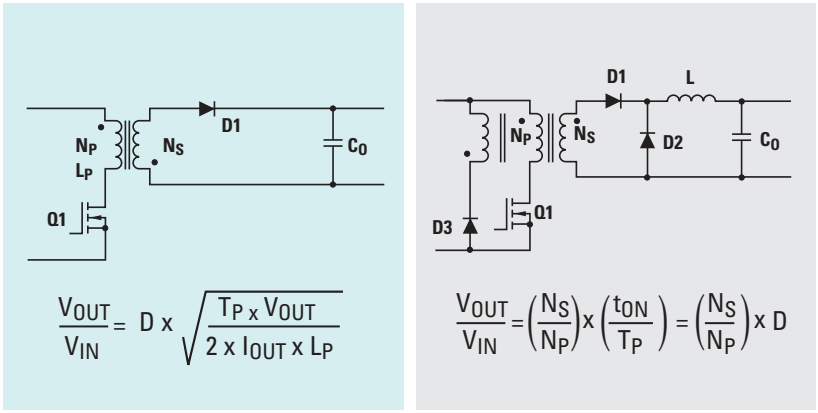
Buck, Boost, Buck/Boost

Device	Preset V_{OUT} (V)	Topology	V_{IN} (V)	V_{OUT} (V)	I_{OUT} (A)	Switch Current Limit (typ) (A)	Switch Freq. (typ) (kHz)
LM2575	Adjustable	Buck	4.7 to 40	1.23 to 37	1	3	52
MC3x063A	Adjustable	Buck, Inverting Buck/Boost	3 to 40	1.25 to 40	0	2	Adjustable
TL497A	Adjustable	Inverting Buck/Boost	4.5 to 12	-25 to 30	0.5	0	Adjustable
TL499A	Adjustable	Boost	1.1 to 10	2.9 to 30	0	0	—
TL2575-xx	3.3, 5, 12, 15	Buck	4.75 to 40	3.3 to 15	1	3	52
TL2575-ADJ	Adjustable	Buck	4.75 to 40	1.23 to 37	1	3	52
TL2575HV-xx	3.3, 5, 12, 15	Buck	4.75 to 60	3.3 to 15	1	3	52
TL2575HV-ADJ	Adjustable	Buck	4.75 to 60	1.23 to 57	1	3	52

External Switching - Boost, Flyback, Forward

External switching PWM controllers allow designers to choose external FETs for applications requiring higher current and more flexibility for different designs. Texas Instruments offer wide range of single PWM output controllers which support power topologies like boost, Flyback and Forward depending on Isolation requirements of the design.

Boost, Flyback and Forward Topologies



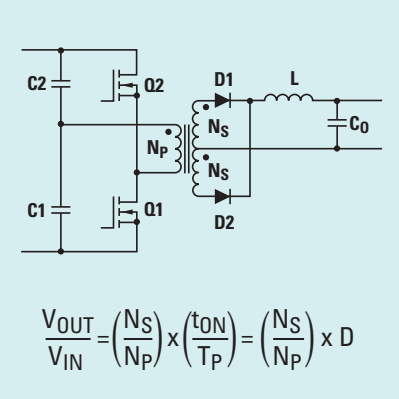
Boost, Flyback, Forward

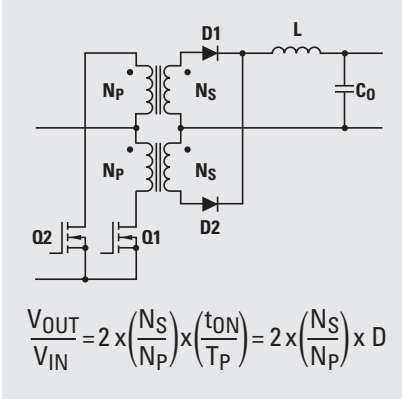
Device	Max Duty Cycle (%)	Topology	V_{IN} Start (Min) (V)	V_{IN} Run (Min) (V)	V_{IN} (Max) (V)	Reference Current (Max) (mA)	Switch Output Current (Max) (mA)	Switching Freq. (Max) (kHz))
TL2842/B	97	Boost, Flyback, Forward	17	11	30	20	200	500
TL2843/B	97	Boost, Flyback, Forward	9	8	30	20	200	500
TL2844/B	48	Boost, Flyback, Forward	17	11	30	20	200	500
TL2845/B	48	Boost, Flyback, Forward	9	8	30	20	200	500
TL3842/B	97	Boost, Flyback, Forward	18	12	30	20	200	500
TL3843/B	97	Boost, Flyback, Forward	9	8	30	20	200	500
TL3844/B	48	Boost, Flyback, Forward	18	12	30	20	200	500
TL3845/B	48	Boost, Flyback, Forward	9	8	30	20	200	500

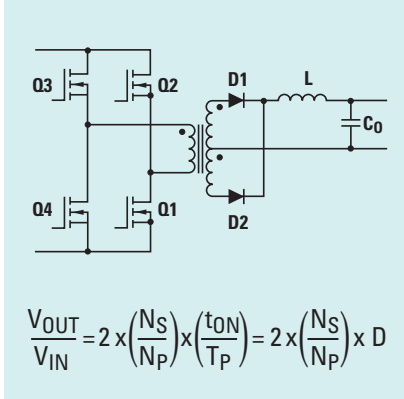
External Switching - Half-Bridge, Push-Pull, Full-Bridge

Topologies requiring complementary PWM output for half bridge, push pull or full bridge power application are supported by below family of parts. These controllers feature programmable dead time control to ensure non overlapping PWM outputs for better efficiencies.

Half/Full-Bridge and Push-Pull Topologies







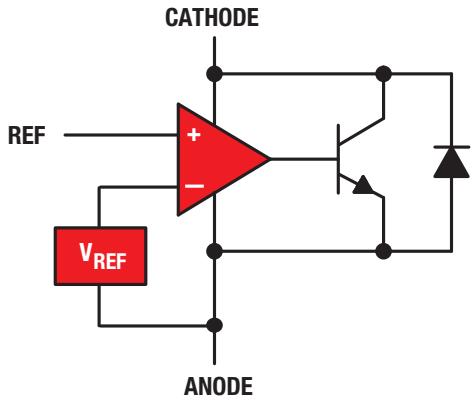
Half-Bridge, Push-Pull, Full-Bridge

Device	Max Duty Cycle (%)	Topology	V_{IN} Start (Min) (V)	V_{IN} Run (Min) (V)	V_{IN} (Max) (V)	Reference Current (Max) (mA)	Switch Output Current (Max) (mA)	Switching Freq. (Max) (kHz))
SGx524	45	Boost, Buck, Flyback, Forward, Full-Bridge, Half-Bridge, Push-Pull	8	8	40	50	50	500
TL494	45	Boost, Buck, Flyback, Forward, Full-Bridge, Half-Bridge, Push-Pull	7	7	40	10	200	300
TL594	45	Boost, Flyback, Forward	7	7	40	10	200	300

Shunt Voltage References

TI's broad voltage-reference portfolio offers performance features such as low-temperature coefficients, precise initial accuracy, low noise, and excellent long-term stability. Shunt voltage references support a wide variety of applications, including high-precision references for data converters with up to 20-bit precision accuracy and low-noise references for sensor conditioning. Voltage references are also commonly used as voltage monitors, current limiters, and programmable current sources.

TL431 Shunt Voltage Reference



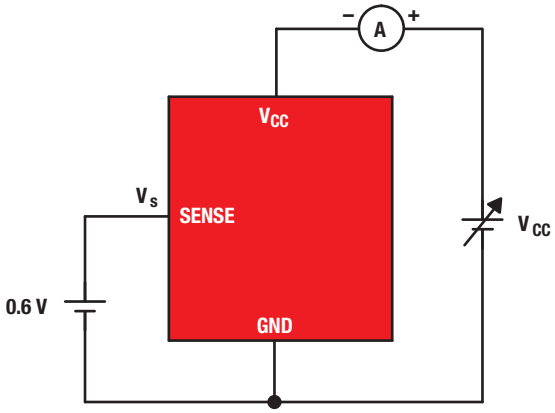
Shunt Voltage Reference

Device	Initial Accuracy @ 25°C (%)	Temp Coeff (typ) (ppm/°C)	Vo (V)	Vo Adj (Max) (V)	Min Iz for Regulation (µA)	I_{OUT}/Iz (Max) (mA)
ATL43xA/B	1, 1.5	100	2	36	40	100
LM236-2.5	2	13	2	—	400	10
LM285-1.2/ 2.5	1, 1.5	20	1.235, 2.5	—	20, 10	20
LM336/B-2.5	2	10	2	—	400	10
LM385/B-1.2/2.5	1; 2; 1.5; 3	20	1.235; 2.5	—	10; 20	20
LM4040A/B/C/D	0.1, 0.2, 0.5, 1	15	2.048; 2.5; 3; 4.069; 5; 8.192; 10	—	62	15
LM4041x/12	0.1; 0.2; 0.5; 1	15	1	—	60	12
LT1009	0	15	3	—	400	10
TL430	5	120	3	30	2,000	100
TL43x/A/B	0.5; 1; 2	150	2	36	600	100
TL1431	0	100	3	36	1,000	100
TL4050A/B/C	0	100	2.5; 4.096; 10	—	60	15
TLV431/A/B	0.5; 1; 1.5	39	1	6	80	15
TLVH43x/A/B	0.5; 1; 1.5	39	1	18	80	80
LT1004-1.2/2.5	0.3; 0.8	20	1.235; 2.5	—	10; 20	20

Voltage Supervisors

Voltage supervisors, also known as reset ICs or voltage monitors, are used to monitor system health. These devices supervise voltage rails to address several system needs such as power concerns during system power on, fault conditions, or system handshake with embedded processors. TI offers a wide range of supervisors that can address multiple reset thresholds allowing support for a large number of applications and systems.

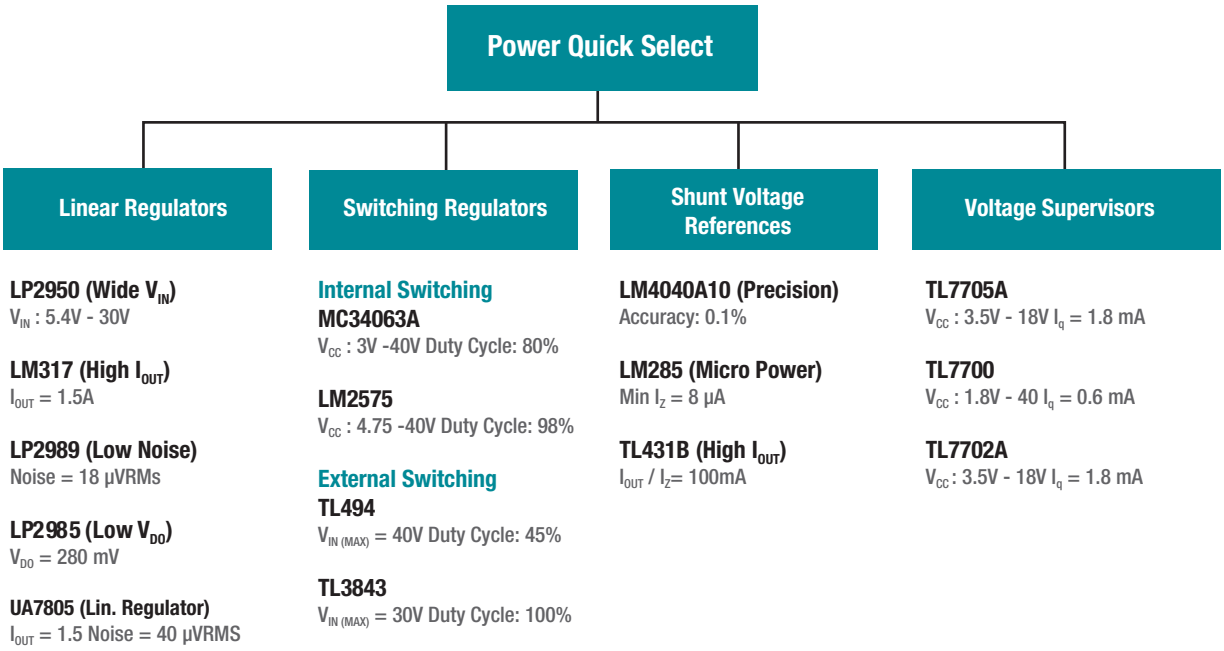
TL7700 VCC VS ICC Measurement Circuit



Voltage Supervisors

Device	V_{CC} (V)	Iq (typ) (µA)	# of Supplies Monitored	Output Driver Type/ Reset Output	Reset Threshold Accuracy (%)	Threshold Voltage 1 (typ) (V)	Threshold Voltage 2 (typ) (V)
TL7700	1.8 to 40	600	1	Active-Low, Open-Drain	1	3	—
TL7702A/B	3.5 to 18	1,800	1	Active-H/L, Open-Drain	2	3	—
TL7705A/B	3.5 to 18	1,800	1	Active-H/L, Open-Drain	2	5	—
TL7709A	3.5 to 18	1,800	1	Active-H/L, Open-Drain	1	8	—
TL7712A	3.5 to 18	1,800	1	Active-H/L, Open-Drain	2	11	—
TL7715A	3.5 to 18	1,800	1	Active-H/L, Open-Drain	2	14	—
TL7733B	3.6 to 18	1,800	1	Active-H/L, Open-Drain	3	3	—
TL775x	1 to 7	1,400	1	Active-H/L, Open-Drain	3	5	—
TL7770-12/5	3.5 to 18	5,000	2	Active-Low, Open-Drain	2	10.9; 4.55	2

Power Quick Select Tree



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