2015 Q1

UNION SEMICONDUCTOR

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Power Supply Selection Guide

Company Profile

Who We Are

Founded in 2001, Union Semiconductor is a fabless integrated circuit design company, engaged in inventing, designing and marketing high performance linear and mixed-signal integrated circuits (ICs) for use in a variety of electronic equipment.

Union Semiconductor's products bridge the analog real world and digital world by detecting, measuring, amplifying, converting power supply and providing protection for electronic circuits.

Corporate Mission

Union Semiconductor's mission is to continuously develop high quality and innovative mixed signal IC solutions that add value to customers' electronics equipment worldwide.

Products and Applications

Our products include power supplies, power management circuits, analog switches, interface circuits, ESD protection ICs and EMI filters.

Union Semiconductor markets over 180 analog ICs for uses in a wide variety of electronic equipment. These include PCs and their peripherals, portable devices, instrumentation, test equipments and digital consumer electronics.

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Product Selection Guide

Linear Regulators (LDOs)

Part Number	Features	V_{IN} (V) (Min)	V_{IN} (V) (Max)	V_{OUT} (V)	I_{OUT} (mA) (Max)	Iq (μA) @ V_{IN_MAX} (Typ)	V_{DROP} (mV) @ I_O (Max) *Note2*	Package
150mA CMOS Linear Regulator with EN Control								
*UM3730	Output Auto Discharge	2.5	5.5	1.0V to 3.3V with 0.1V Interval	150	10	155 @ 150mA	DFN4 1.0×1.0 SOT353
300mA/350mA CMOS Linear Regulators without EN Control								
UM165xx	Ultra Low Dropout, Input Under Voltage Lockout	2.5	6.0	1.2/1.5/1.8/2.5/2.7/ 2.8/3.0/3.3 ***Note1***	300	120	90 @ 150mA	SOT23-3
UM365xx	Standard Low Dropout	2.5	6.0	1.2V to 5.0V with 0.1V Interval	300	55	200 @ 100mA	SOT23-3 SOT323
UM1650	350mA, Ultra Low Dropout, Input Under Voltage Lockout	2.5	6.0	Fixed 1.0V to 4.0V with 0.1V Interval	350	90	150 @ 150mA	SOT23-3
300mA/350mA CMOS Linear Regulators with EN Control								
UM175xx	Ultra Low Dropout, EN Control, Input Under Voltage Lockout	2.5	6.0	2.8/3.3 ***Note1***	300	120	90 @ 150mA	SOT23-5
UM375xx	Standard Low Dropout EN Control	2.0	6.0	1.2V to 5.0V with 0.1V Interval	300	55	200 @ 100mA	SOT23-5 SOT353
*UM185xx	Ultra Low Dropout, EN Control, Input Under Voltage Lockout, Reverse Current Protection	2.5	6.0	1.2/1.5/1.8/2.5/2.7/ 2.8/3.0/3.3 ***Note1***	300	120	90 @ 150mA	SOT23-5
UM1750	350mA, Ultra Low Dropout, Input Under Voltage Lockout, Excellent Load Transient	2.5	6.0	Fixed 1.0V to 4.0V with 0.1V Interval, or Adjustable Output from 1.0V to 5.0V	350	90	150 @ 150mA	DFN6 2.0×2.0 SOT89-5 SOT23-5
500mA CMOS Linear Regulator								
UM1770	500mA Output Current, Ultra Low Dropout, Input Under Voltage Lockout	2.5	6.0	Fixed 1.0V to 4.0V with 0.1V Interval, or Adjustable Output from 1.0V to 5.0V	500	120	450 @ 500mA	DFN6 2.0×2.0 SOT89-5
Dual Channel 300mA CMOS Linear Regulator								
UM4750	Dual Channel Separate EN Control	2.5	5.5	1.2//1.5/1.8/2.5/2.7/ 2.8/3.0/3.3 ***Note1***	300	120	200 @ 100mA	SOT23-6 DFN8 3.0×3.0 DFN6 2.0×2.0
High Input Voltage Linear Regulators								
UM142xx	12V Input Voltage	2.5	12.0	2.5V to 5.0V with 0.1V Interval	300	9	300 @ 150mA	SOT23-3 SOT89-3
UM1430	18V Input Voltage	3.6	18.0	2.0V to 6.0V with 0.1V Interval	30	4.8	300 @ 30mA	SOT23-3 SOT23-5, SOT89-3
UM1440	18V Input Voltage with EN Control	3.6	18.0	2.0V to 6.0V with 0.1V Interval	30	4.8	300 @ 30mA	SOT23-5 SOT89-5
Ultra Low Quiescent Current Linear Regulators								
UM153xx	Ultra Low Iq	2.2	5.5	1.2//1.5/1.8/2.5/2.8/ 3.0/3.3/3.5 ***Note1***	200 @ V_{IN}≥3.5V	0.8	130 @ 30mA	SOT23-3, SOT89-3 DFN4 1.8×1.2
UM154xx	Ultra Low Iq with EN Control	2.2	5.5	1.2//1.5/1.8/2.5/2.8/ 3.0/3.3/3.5 ***Note1***	200 @ V_{IN}≥3.5V	0.8	130 @ 30mA	SOT23-5, SOT89-5 DFN6 2.0×2.0
*UM1550	Wide Input Voltage Range, Ultra Low Iq	1.8	8.0	1.2V to 5.0V with 0.1V Interval	250	1.0	200 @ 100mA	DFN6 2.0×2.0 SOT23-3, SOT23-5 SOT89-3
Ultra Low Input Voltage Linear Regulator								
*UM1230	1.4V Input Voltage	1.4	5.25	0.8V to 3.6V with 0.1V Interval	300	50	290 @ 300mA， V_{OUT}>3.0V	DFN4 1.0×1.0 SOT23-5, SOT353
Low Output Noise Linear Regulator								
UM1330	150mA Output Current, 40μVrms Low Noise	2.7	5.5	1.5V to 3.3V with 0.1V Interval	150	45	140 @ 150mA	SOT23-5 SOT353 DFN6 2.0×2.0

Note1: Besides the standard output voltages listed in the table, customized output Voltage is also available from 1.2V to 5.0V at step of 100mV. Contact factory for product availability.

Note2: Dropout voltage is defined for Vo≥2.5V device only.

**: Future product. Contact factory for availability information.*

Linear Regulators

Ultra Low Quiescent Current Linear Regulator

UM153xx/UM154xx

Key Features

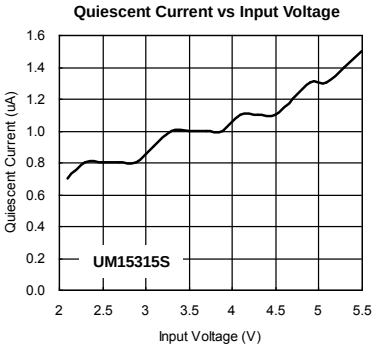
- Ultra Low Iq: 0.8μA @ V_{IN}=3V
- Operating Voltage Range: 2.2V to 5.5V
- Dropout Voltage:
  100mV (Typ) @ Iload=50mA, V_{OUT}>3.0V
- Output Voltage: 1.3V to 5.0V
- 100mA Guaranteed Output Current @ V_{IN}≥3V
  200mA Guaranteed Output Current @ V_{IN}≥3.5V
- Fast Transient Response
- With Enable Control (UM154xx)

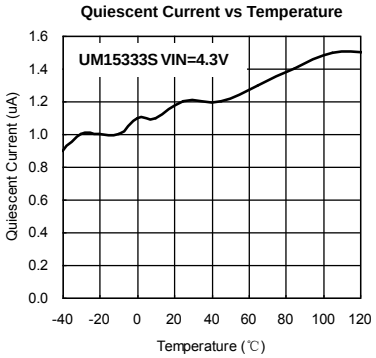
Applications

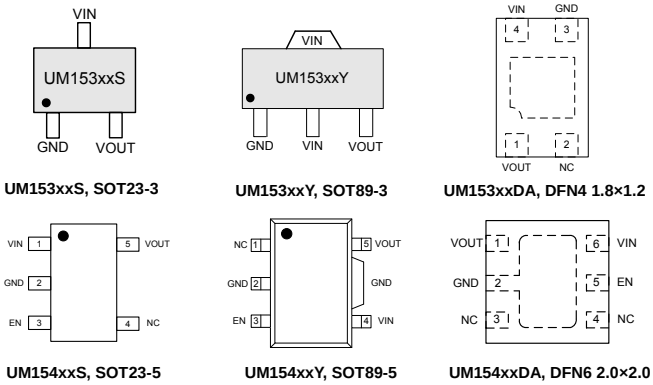
- Battery-Powered Systems
- Reference Voltage Sources
- Cameras, Video Cameras
- Portable AV Systems
- Portable Games
- Cellular Phones

Benefits

- Very Low Operating Voltage: 2.2V
- Ultra Low Iq Over All Operating Voltage Range: <3μA







UM153xx/UM154xx Pin Configurations

300mA, Micropower, Dual Channel VLDO Linear Regulator

UM4750S/UM4750DA/UM4750DB

Key Features

- Very Low Dropout: <200mV @ 100mA
- Operating Voltage Range: 2.5V to 5.5V
- Low Noise: 200μV_{RMS} (10Hz to 100kHz)
- Dual LDO Outputs (300mA/300mA)
- Output Current Limit
- Stable with 1μF Output Capacitor
- Thermal Overload Protection
- Low Profile SOT23-6, 6-Lead DFN2.0×2.0 and 8-Lead DFN3.0×3.0 Packages

Applications

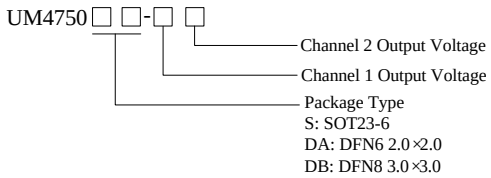
- Bluetooth/802.11 Cards
- PDAs and Notebook Computers
- Portable Instruments and Battery-Powered Systems
- Cellular Phones

Benefits

- Low Profile Packages
- Separated Enable Control
- Available Multiple Output Voltage Combination

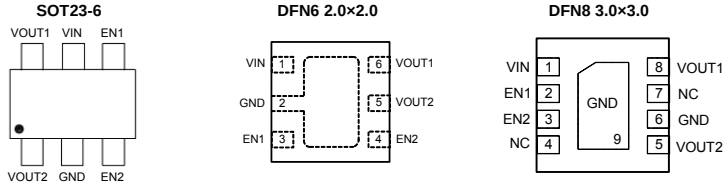
The UM4750 series are dual channel very low dropout (VLDO) linear regulators with separated enable control. The range of output voltage is from 1.2V to 5.0V while operated from 2.5V to 5.5V input. Typical output noise is only 200μV_{RMS} and maximum dropout is just 200mV at the load current of 100mA.

Naming Rule



Available Voltage Version

Code	Voltage	Code	Voltage	Code	Voltage	Code	Voltage
A	5	F	4.2	L	3.3	R	1.8
B	4.8	G	4	M	3	S	1.5
C	4.7	H	3.8	N	2.8	T	1.3
D	4.5	J	3.6	P	2.7	U	1.2
E	4.3	K	3.5	Q	2.5		



UM4750 Pin Configurations

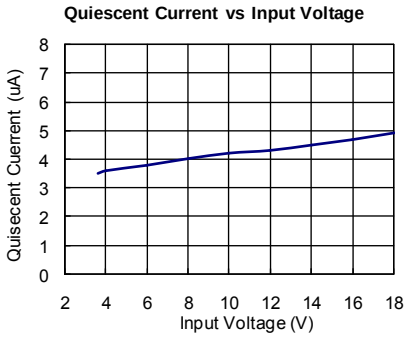
Linear Regulators

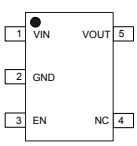
18V, 30mA, Low Consumption Linear Regulator

UM1430/UM1440

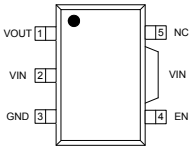
Key Features

- Input Voltage Range: 3.6V to 18V
- Output Voltage: 2.0V to 6.0V with 100mV Interval
- 30mA Guaranteed Output Current
- Low Quiescent Current: 4.8μA (Typ) at 18V Input
- Low Dropout Voltage: 200mV (Typ) at 30mA
- With Enable Control (UM1440S/UM1440Y)

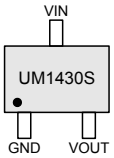




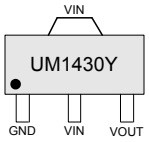
UM1440S-xx, SOT23-5



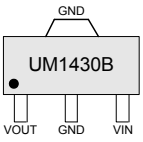
UM1440Y-xx, SOT89-5



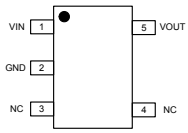
UM1430S-xx, SOT23-3



UM1430Y-xx, SOT89-3



UM1430B-xx, SOT89-3



UM1430S5-xx, SOT23-5

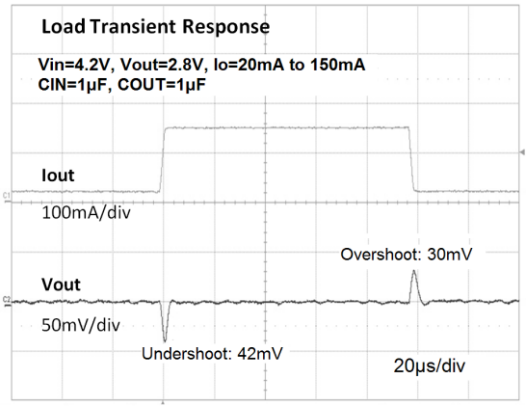
UM1430/UM1440 Pin Configurations

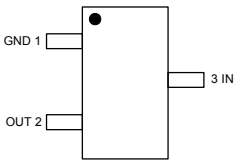
350mA, Micropower, Low Dropout Linear Regulator

UM1650/UM1750

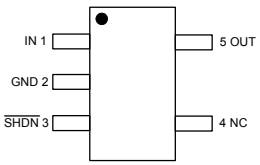
Key Features

- Input Voltage Range: 2.5V to 6.0V
- 350mA Guaranteed Output Current
- Fixed Output Voltage of UM1650 and UM1750 from 1.0V to 4.0V with 0.1V Interval
- Adjustable Output Voltage of UM1750: 1.0V to 5.0V
- ±2% Voltage Accuracy at V_{OUT}>1.5V ±30mV Voltage Accuracy at V_{OUT}≤1.5V
- Low Dropout Voltage: 150mV (Max) at 150mA
- PSRR=63dB @ f=100Hz
- Excellent Load Transient Response
- Low Quiescent Current: 90μA (Typ)

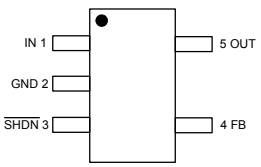




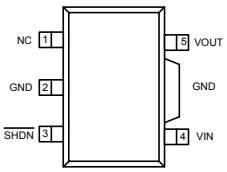
Fixed Output, UM1650S-xx, SOT23-3



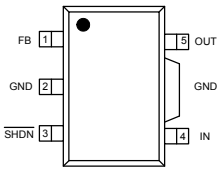
Fixed Output, UM1750S-xx, SOT23-5



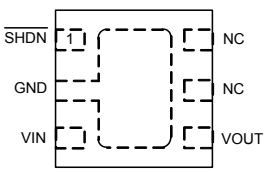
Adjustable Output, UM1750S-00, SOT23-5



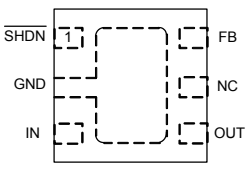
Fixed Output, UM1750Y-xx, SOT89-5



Adjustable Output, UM1750Y-00, SOT89-5



Fixed Output, UM1750DA-xx, DFN6 2.0×2.0



Adjustable Output, UM1750DA-00, DFN6 2.0×2.0

UM1650/UM1750 Pin Configurations

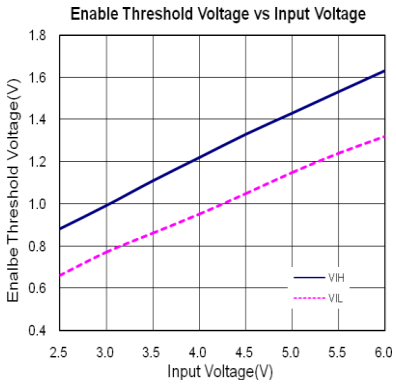
Linear Regulators

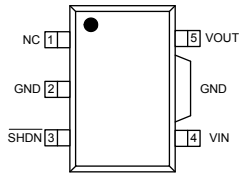
500mA, Micropower, Ultra Low Vdrop Linear Regulator

UM1770

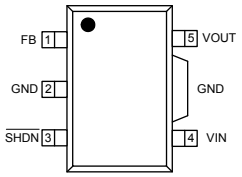
Key Features

- Very Low Dropout: 450mV (Max) at 500mA
- Low Enable Threshold Voltage
- Maximum Input Voltage: 6.0V
- Fixed Output Voltage: 1.0V to 4.0V with 0.1V Interval
- Adjustable Output Voltage: 1.0V to 5.0V
- ±2.0% Voltage Accuracy at 500mA
- Under Voltage Lockout
- Output Current Limit
- Short-Circuit and Thermal Overload Protection

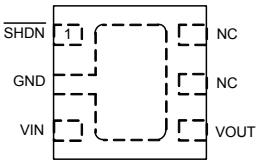




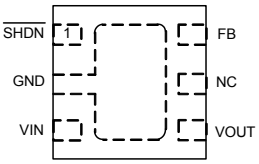
Fixed Output, UM1770Y-xx, SOT89-5



Adjustable Output, UM1770Y-00, SOT89-5



Fixed Output, UM1770DA-xx, DFN6 2.0×2.0



Adjustable Output, UM1770DA-00, DFN6 2.0×2.0

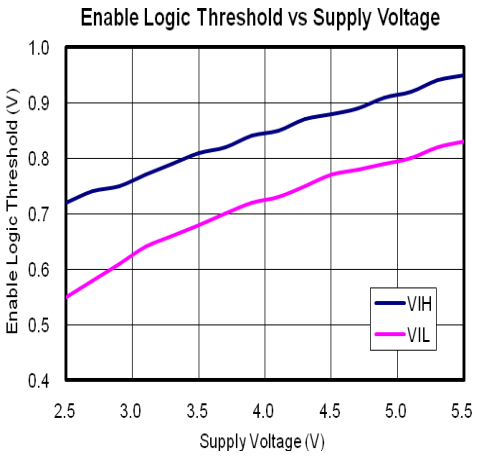
UM1770 Pin Configurations

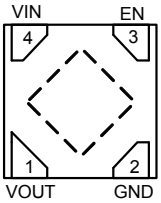
150mA, Micropower, Low Dropout Linear Regulator

UM3730

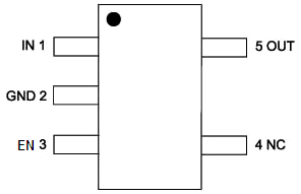
Key Features

- Input Voltage Range: 2.5V to 5.5V
- 150mA Guaranteed Output Current
- ±2% Voltage Accuracy at 150mA
- Low Dropout Voltage: 155mV (Typ) at 150mA
- Low Enable Threshold Voltage
- Low Quiescent Current: 10μA
- Available Fixed Output Voltage: 1.0V to 3.3V with 0.1V Interval
- Output Auto Discharge





UM3730DA, DFN4 1.0×1.0 (Top View)



UM3730P, SOT353

UM3730 Pin Configurations

Product Selection Guide

Switching Regulators

DC/DC Buck Converters

Part Number	Description	V_{IN} (V)	V_{OUT} (V)	I_{out} (mA) (Max)	Frequency (MHz) (Typ)	Peak Efficiency	Package
Sync Low Voltage Buck Converters (V_{IN}≤6V)							
UM3500	Current Mode PWM Buck	2.5~5.5	0.6~V_{IN}	600	1.5	96%	SOT23-5
UM3501	Current Mode PWM Buck with Light Load Mode	2.5~5.5	0.6~V_{IN}	600	1.2	90%	SOT23-5
UM3501DA	Current Mode PWM Buck with Light Load Mode	2.5~5.5	0.6~V_{IN}	600	1.2	90%	DFN6 2.0×2.0
UM3510	Current Mode PWM Buck	2.5~5.5	0.6~V_{IN}	1000	1.5	96%	SOT23-5 * DFN6 2.0×2.0 * DFN8 2.0×2.0
*UM3540	Current Mode PWM Buck with Light Load Mode	2.7~6.0	0.6~0.9×V_{IN}	4000	1.5	95%	SOP8 DFN10 3.0×3.0
High Input Voltage High Output Current Buck Converters (V_{IN}≥6V, I_{OUT}≥2A)							
*UM5432	Current Mode PWM Buck with Light Load Mode	2.5~12.0	0.6~V_{IN}	2000	0.2~1.2 (Adjustable)	92%	QFN14 3.5×3.5
*UM5482	Current Mode PWM Buck	4.75~18.0	0.9~15	2000	0.34	90	SOP8

DC/DC Boost Converters

Part Number	Description	V_{IN} (V)	V_{OUT} (V)	I_{LIMIT} (mA) (Max)	Frequency (MHz) (Typ)	Peak Efficiency	Package
*UM3429	Voltage Mode PWM Boost with Light Load Mode	0.9~4.4	2.5~5	600	0.6	92%	SOT23-6
UM1660	Constant Voltage PFM Boost Converter	2.0~6.0	2.0~28	450	1 (Max)	88%	SOT23-5 DFN6 2.0×2.0
UM1665	Constant Voltage PFM Boost Converter	2.0~6.0	2.0~28	500	1 (Max)	88%	SOT23-5 DFN6 3.0×3.0

LED Backlight Boost Drivers

Part Number	Description	V_{IN} (V)	V_{OUT} (V) (Max)	I_{LIMIT} (mA) (Max)	Frequency (MHz) (Max)	Peak Efficiency	Package
UM1661	Constant Current PFM Boost Converter with Over Voltage Protection	2.0~6.0	24	1600	2	88%	SOT23-6
*UM1662S	Constant Voltage PFM Boost Converter	2.0~6.0	28	450	1	88%	SOT23-5
*UM1663	Constant Current PWM Boost Converter	2.7~5.5	40	1200	1	90%	SOT23-5 DFN8 2.0×2.0

LED Lighting Buck Drivers

Part Number	Description	V_{IN} (V)	Vsense (mV) (Typ)	I_{LIMIT} (mA) (Min)	Frequency (MHz) (Max)	Peak Efficiency	Package
UM1350	30V Input 350mA Step-Down Current Mode LED Driver	7~30	100	370	1	>90%	SOT23-5
UM1351S	35V Input 700mA Step-Down Current Mode LED Driver	6~35	100	1000	1	>90%	SOT23-5
UM1351Y	35V Input 700mA Step-Down Current Mode LED Driver	6~35	100	1000	1	>90%	SOT89-5
UM1360S	35V, 1A Step-Down Current Mode LED Driver, with Frequency Jitter	6~35	100	1200	1	>90%	SOT23-5
UM1360Y	35V, 1A Step-Down Current Mode LED Driver, with Frequency Jitter	6~35	100	1200	1	>90%	SOT89-5
UM1361S	40V Input 1A Step-Down Current Mode LED Driver	6~40	100	1500	1	>90%	SOT23-5
*UM1370S	40V Input 1.2A Step-Down Current Mode LED Driver	6~40	100	1800	1	>90%	SOT23-5

**: Future product, contact factory.*

Switching Regulators

30V, 350mA LED Lighting Driver

UM1350

Key Features

- Internal 30V NDMOS Switch
- 350mA Output Current
- Wide Input Voltage Range: 6V to 30V
- ±5% LED Current Accuracy
- High Efficiency (up to 95%)
- Analog or PWM Dimming Control
- 40V Transient Capability
- Inherent Open-Circuit LED Protection
- Output Shutdown Control
- Up to 1MHz Switching Frequency
- Pb-Free SOT23-5 Package

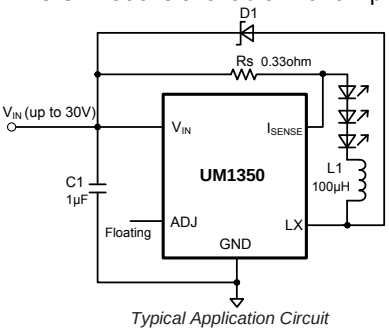
Applications

- MR16 and General Lighting
- Automotive Lighting
- Low Voltage Industrial Lighting
- Illuminated Signs

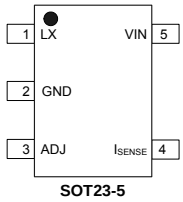
Benefits

- DC Voltage or PWM Dimming
- High Efficiency (up to 95%)
- Inherent Open-Circuit LED Protection

The UM1350 is capable of driving single or multiple series connected LEDs efficiently from a voltage source higher than the LED voltage. This step-down converter provides an externally adjustable output current of up to 350mA from an input supply between 6V and 30V. It can even reach 8 watts of output power, depending on supply voltage and external components. The UM1350 is available in a low profile SOT23-5 package.



Typical Application Circuit



UM1350 Pin Configuration

35V, 1A LED Lighting Driver

UM1360S/UM1360Y

Key Features

- Integrated 35V 0.4Ω NDMOS
- 1A Output Current
- Wide Input Voltage Range: 6V to 35V
- ±5% LED Current Accuracy
- Up to 95% Efficiency
- Adjustable Constant LED Current
- Analog or PWM Dimming Control
- Improved EMI through Frequency Jitter
- Over Temperature and Open-Circuit LED Protection
- Up to 1MHz Switching Frequency
- Pb-Free SOT23-5 and SOT89-5 Packages

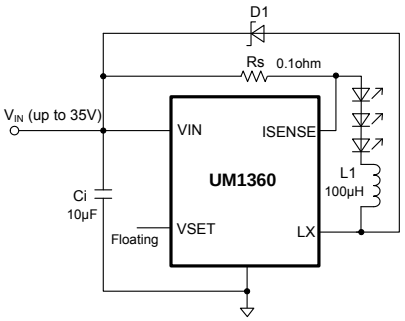
Applications

- Low Voltage Industrial Lighting
- Illuminated Signs
- DC/DC or AC/DC LED Driver Application
- General Purpose, Constant Current Source

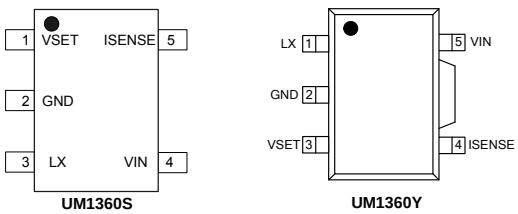
Benefits

- DC Voltage or PWM Dimming
- Inherent Open-Circuit LED Protection

The UM1360 is a PWM step-down converter with internal power switch, designed for driving single or multiple series connected LEDs efficiently from a voltage source higher than the LED voltage. The device operates from an input supply between 6V and 35V and employs hysteretic control with a high side current sense resistor to set the constant output current up to 1A.



Typical Application Circuit



UM1360 Pin Configurations

Switching Regulators

600mA, 1.2MHz, Synchronous Step-Down DC-DC Converter

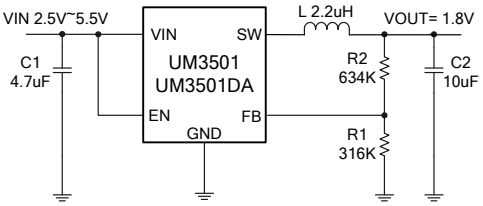
UM3501/UM3501DA

Key Features

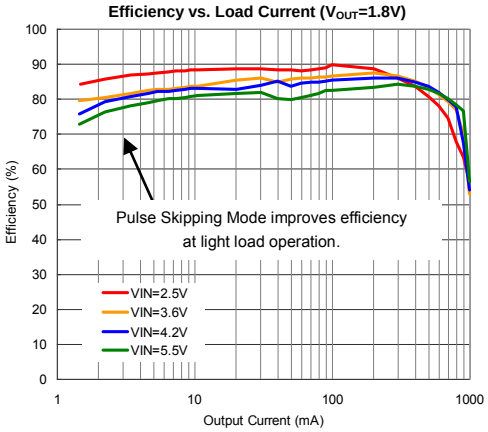
- High Efficiency: up to 90%
- 2.5V to 5.5V Input Voltage Range
- 600mA Output Current
- 1.2MHz Constant Switching Frequency
- Integrated Main Switch and Synchronous Rectifier
- Pulse Skipping Mode Operation at Light Load Condition
- Low Quiescent Current: 50μA
- <1μA Shutdown Current
- Lead Free SOT23-5 (UM3501) and DFN6 2.0×2.0 (UM3501DA) Packages

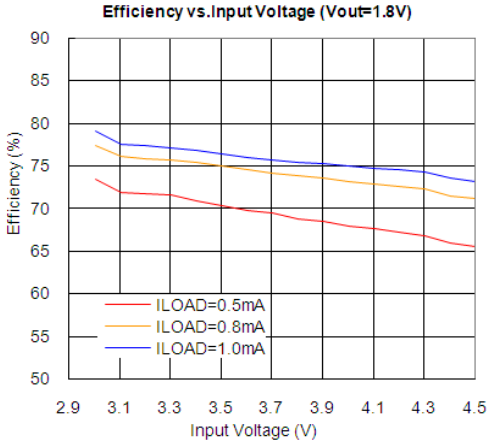
Benefits

- Pulse Skipping Mode Improves Efficiency at Light Load Operation
- Synchronous Rectifier, No External Schottky Diode Required
- Ultra Low Shutdown Current



UM3501/UM3501DA Typical Application Circuit





28V Low Power DC/DC Boost Converter

UM1660S/UM1660DA

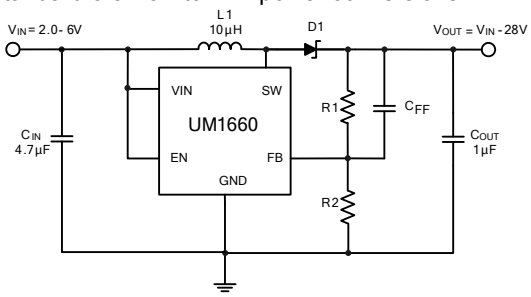
Key Features

- 2.0V to 6.0V Input Voltage Range
- Adjustable Output Voltage up to 28V
- 400mA Internal Switch Current
- Up to 1MHz Switching Frequency
- 36μA Typical No Load Quiescent Current
- 1μA Maximum Shutdown Current
- Internal Soft-Start
- Tiny SOT23-5 and DFN6 2.0×2.0 Packages

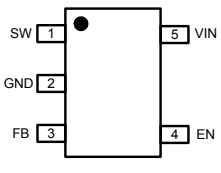
Applications

- LCD Bias Supply
- White LED Supply for LCD Backlights
- Digital Still Cameras
- PDAs, Organizers and Handheld PCs
- Cellular Phones
- Standard 3.3V/5V to 12V Conversion

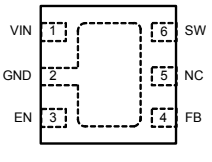
The UM1660 is a PFM controlled step-up DC-DC converter with a switching frequency up to 1MHz. The device is ideal to generate output voltage for small to medium LCD bias supplies and white LED backlight supplies from a single cell Li-ion battery. The part can also be used to generate standard 3.3V/5V to 12V power conversions.



UM1660 Typical Application Circuit



UM1660S (Top View)



UM1660DA (Top View)

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