



VIC2668DL

600mA, 40V Synchronous Step-Down Converter

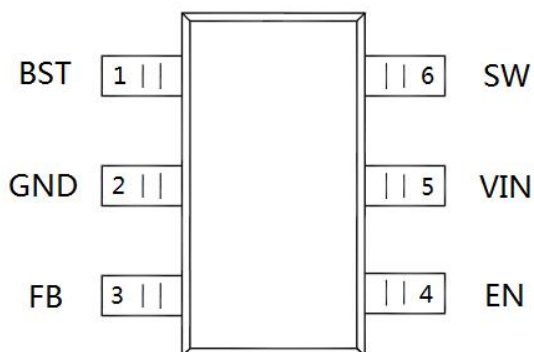
Description

The VIC2668DL is a current mode monolithic buck switching regulator. Operating with an input range of 3.6V~40V, the VIC2668DL delivers 600mA of continuous output current with two integrated N-Channel MOSFETs. The internal synchronous power switches provide high efficiency without the use of an external Schottky diode. At light loads, the regulator operates in low frequency to maintain high efficiency and low output ripple. Current mode control provides tight load transient response and cycle-by-cycle current limit.

The VIC2668DL guarantees robustness with short-circuit protection, thermal protection, current run-away protection, and input under voltage lockout.

The VIC2668DL is available in 6-pin SOT23-6 package, which provides a compact solution with minimal external components.

Pin Assignment



Features

- 3.6V to 40V operating input range
- 600mA output current
- High efficiency (>78%) at light load
- Up to 94% efficiency
- 2MHz switching frequency
- Input under voltage lockout
- Internal Soft-Start
- Short circuit protection
- Current run-away protection
- Thermal protection

Applications

- Battery Powered Systems
- Handheld Computers and PDA
- Distributed Power Systems
- Industrial Power Systems

Ordering Information

VIC2668 □□



Package Type
DL: SOT23-6L



Absolute Maximum Ratings

Vin, EN, SW Pin	-----	-0.3V to 44V
BST Pin	-----	SW-0.3V to SW +5V
All Other Pins	-----	-0.3V to +6V
Junction Temperature	-----	150°C
Lead Temperature	-----	260°C
Storage Temperature	-----	-65°C to 150°C

Recommended Operating Conditions

Input Supply Voltage Vin	-----	3.6V to 40V
Output Voltage Vout	-----	0.8V to 37V
Operating Junction Temperature	-----	-40°C ~ 85°C

Thermal Characteristics

SOT23-6 θ_{JA}	-----	220°C/W
SOT23-6 θ_{JC}	-----	130°C/W

Electrical Characteristic (Vin=24V, Ta=25°C, unless otherwise specified)

Parameter	Symbol	Condition	Min	Typ	Max	Unit
Vin Undervoltage Lockout Thershold	Vin_min	Vin falling		3.6		V
Vin Undervoltage Lockout Hysteresis	Vin_min_hyst	Vin rising		160		mV
Supply Current(Quiescent)	Iq	Vfb=0.1V, Ven=5v		0.07	1	uA
Shutdown Supply Current	Isd	Ven=0v		50		uA
Switching Frequency	Fsw			2		MHz
Feedback Voltage	Vfb	3.6V<Vin<40V	776	800	824	mV
Top Switch Resistance	Rds(on)t			500		mΩ
Bottom Switch Resistance	Rds(on)b			220		mΩ
TOP Switch current limit	I lim_top	Minimum Duty Cycle		1000		mA
EN shut down threshold voltage	Ven_th	Ven falling, fb =0V		1.2		V

Block Diagram

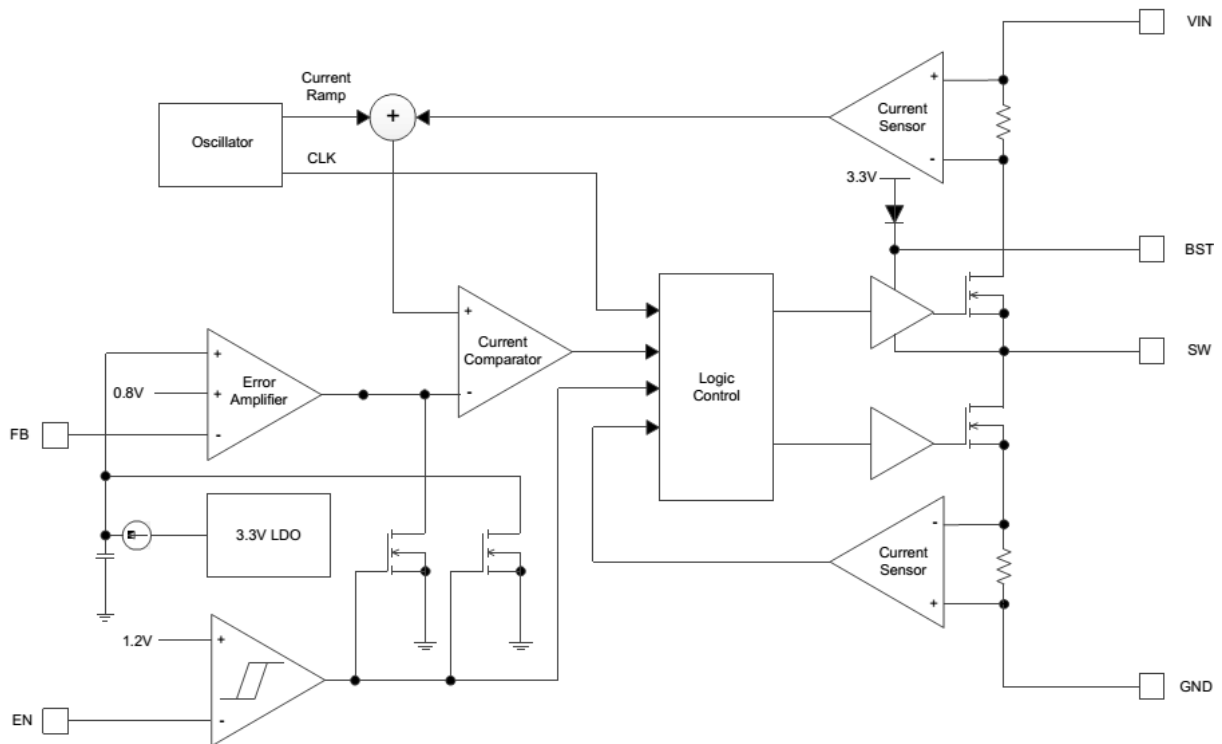


Figure 1 VIC2668DL Functional Block Diagram

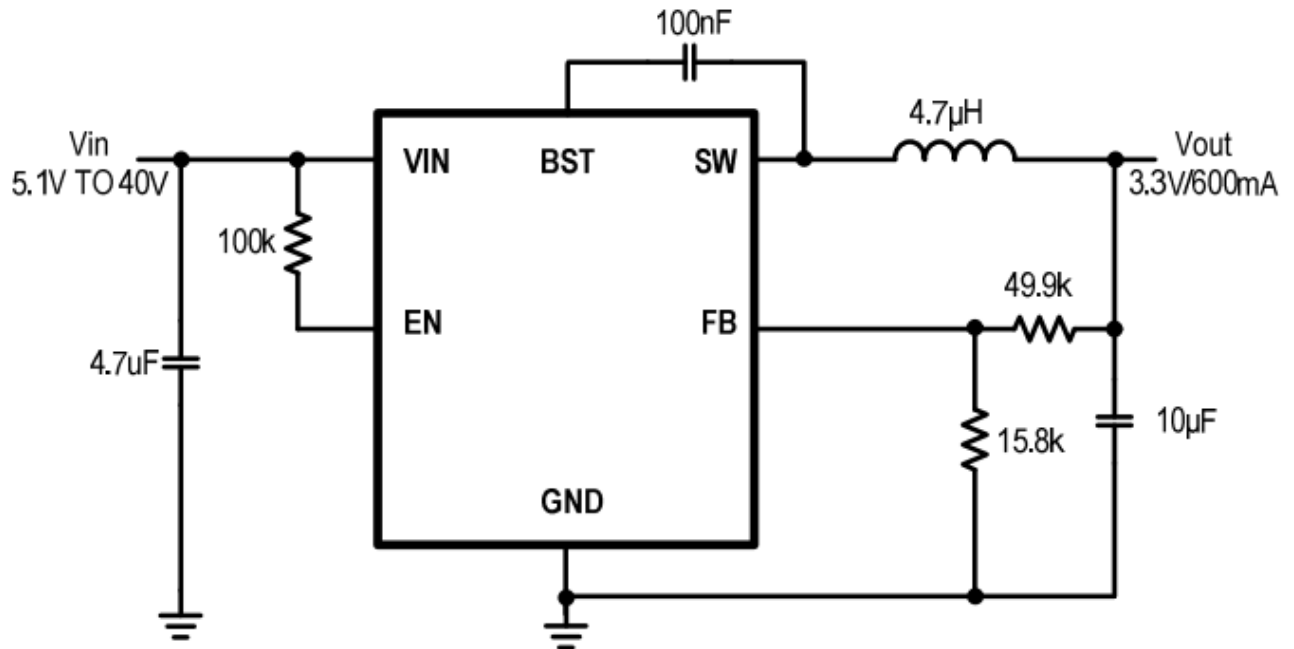
Function Pin Description

Pin No.	Pin Name	Pin Description
1	BST	Bootstrap pin for top switch. A 0.1uF or larger capacitor should be connected between this pin and the SW pin to supply current to the top switch and top switch driver.
2	GND	Ground.
3	FB	Output feedback pin. FB senses the output voltage and is regulated by the control loop to 800mV. Connect a resistive divider at FB.
4	EN	Drive EN pin high to turn on the regulator and low to turn off the regulator.
5	Vin	Input voltage pin. VIN supplies power to the IC. Connect a 3.6V to 40V supply to VIN and bypass VIN to GND with a suitably large capacitor to eliminate noise on the input to the IC.
6	SW	SW is the switching node that supplies power to the output. Connect the output LC filter from SW to the output load.

Typical Application Circuit

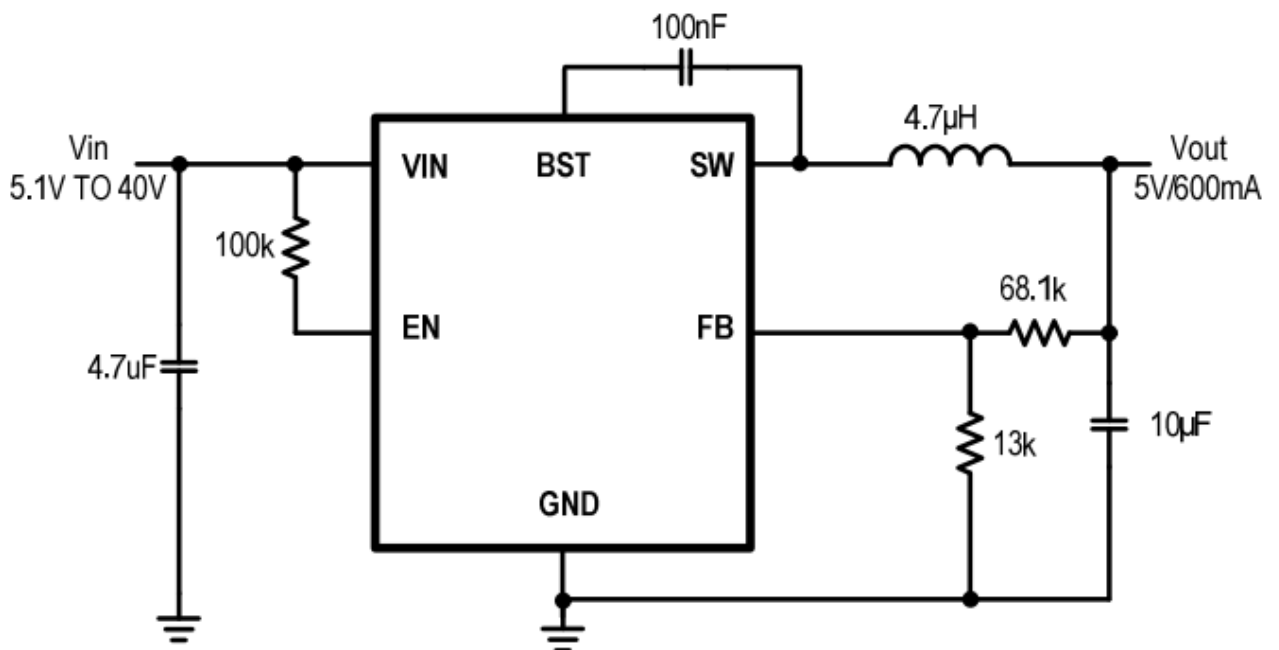
Reference 1 :

VIN : 3.6V ~ 40 V VOUT: 3.3V IOUT : 0~600mA



Reference 2 :

VIN : 5.1V ~ 40 V VOUT: 5.1V IOUT : 0~600mA





Functional Description

The VIC2668DL is a synchronous, current-mode, step-down regulator. It regulates input voltages from 3.6V to 40V down to an output voltage as low as 0.8V, and is capable of supplying up to 600mA of load current.

Current-Mode Control

The VIC2668DL utilizes current-mode control to regulate the output voltage. The output voltage is measured at the FB pin through a resistive voltage divider and the error is amplified by the internal transconductance error amplifier. Output of the internal error amplifier is compared with the switch current measured internally to control the output current.

PFM Mode

The VIC2668DL operates in PFM mode at light load. In PFM mode, switch frequency decreases when load current drops to boost power efficiency at light load by reducing switch-loss, while switch frequency increases when load current rises, minimizing output voltage ripples.

Shut-Down Mode

The VIC2668DL shuts down mode when voltage at EN pin is below 0.3V. The entire regulator is off and the supply current consumed by the VIC2668DL drops below 0.1 μ A.

Power Switch

N-Channel MOSFET switches are integrated on the VIC2668DL to down convert the input voltage to the regulated output voltage. Since the top MOSFET needs a gate voltage greater than the input voltage, a boost capacitor connected between BST and SW pins is required to drive the gate of the top switch. The boost capacitor is charged by the internal 3.3V rail when SW is low.

Vin Under-Voltage Protection

A resistive divider can be connected between Vin and ground, with the central tap connected to EN, so that when Vin drops to the pre-set value, EN drops below 1.2V to trigger input under voltage lockout protection.

Output Current Run-Away Protection

At start-up, due to the high voltage at input and low voltage at output, current inertia of the output inductance can be easily built up, resulting in a large start-up output current. A valley current limit is designed in the VIC2668DK so that only when output current drops below the valley current limit can the bottom power switch be turned off. By such control mechanism, the output current at start-up is well controlled.

Output Short Protection



When output is shorted to ground, output current rapidly reaches its peak current limit and the top power switch is turned off. Right after the top power switch is turned off, the bottom power switch is turned on and stay on until the output current falls below the valley current limit. When output current is below the valley current limit, the top power switch will be turned on again and if the output short is still present, the top power switch is turned off when the peak current limit is reached and the bottom power switch is turned on. This cycle goes on until the output short is removed and the regulator comes into normal operation again.

SW Short Protection

If the SW pin is detected to be short to ground, the VIC2668DL is latched off. The regulator can be reactivated again through recycling Vin or EN voltage.

FB Short Protection

If the FB pin is detected to be short to ground for more than 15 switch cycles, the VIC2668DL is latched off. The regulator can be reactivated again through recycling Vin or EN voltage.

Thermal Protection

When the temperature of the VIC2668DL rises above 135°C, it is forced into thermal shut-down. Only when core temperature drops below 120°C can the regulator become active again.

PCB Layout Note

1. Place the input decoupling capacitor as close to VIC2668DL (VIN pin and PGND) as possible to eliminate noise at the input pin.
2. Put the feedback trace as far away from the inductor and noisy power traces as possible.
3. The ground plane on the PCB should be as large as possible for better heat dissipation.

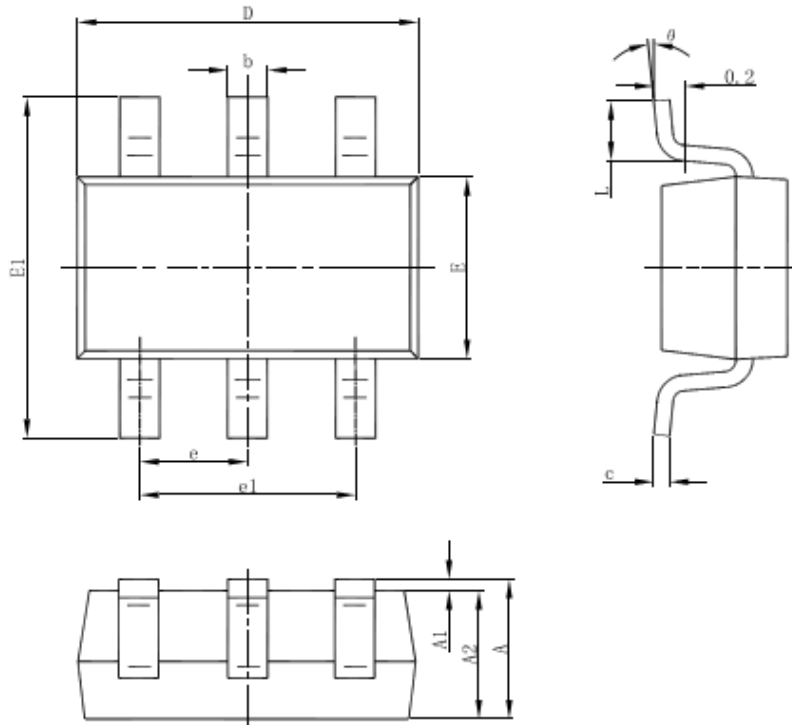


VIC2668DL

ORDERING INFORMATION

Part Number	Package code	Shipping
VIC2668DL	DL: SOT23-6L	3000/Tape & Reel

PACKAGE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°

单击下面可查看定价，库存，交付和生命周期等信息

[>>VIC\(微科\)](#)