JSW5368

Wide Input Range Synchronous Buck Convertor

Features

- 8V to 32V Supply Voltage Range
- 2.4A Continuous Output Current
- 3% Output Voltage Accuracy
- 5.1V Output Voltages
- 2.7V on DP/DM line
- Cycle By Cycle Current Limit
- CC/CV Control
- 125KHz switching Frequency
- Internal loop Compensation
- Internal Soft Start
- Hiccup Short Circuit Protection
- SOIC8 Package

Applications

- Car Charger
- Portable Charger
- Battery Charger

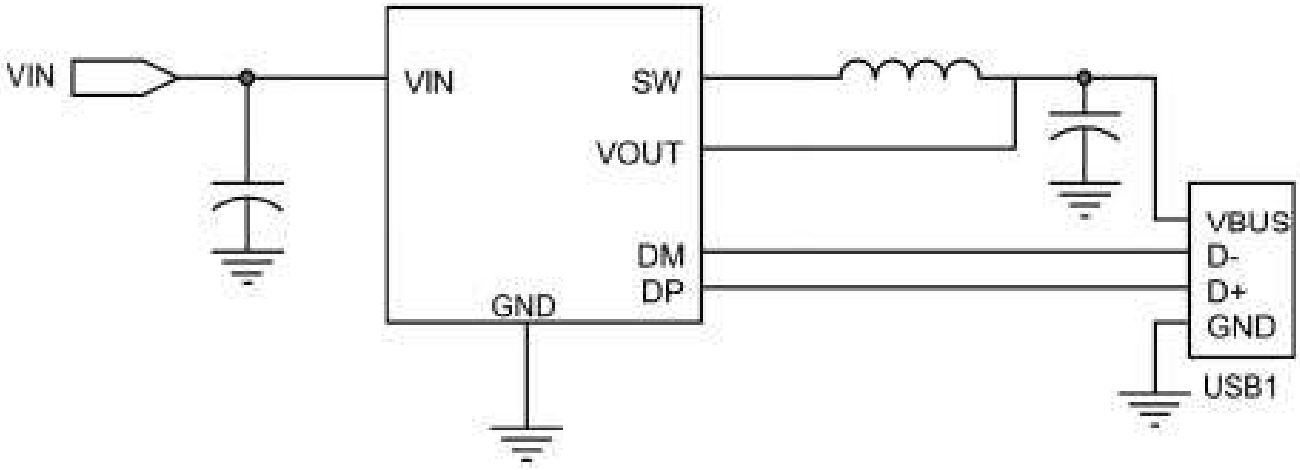
Description

The JSW5368 is a synchronous Buck convertor with 8V to 30V input voltage range, 2.4A continuous output current with 125 kHz switching frequency. The internal compensation requires a minimum number of readily available standard components.

The JSW5368 is suitable for portable charger which require CC/CV control. Other features include cable compensation and thermal shutdown.

Available in standard SOIC8 package

Typical Application



Pin Function Descriptions

Pin NO.	Pin Name	Function Description
1	VOUT	Feedback Pin
2	DP	Connect to USB D+ line
3	DM	Connect to USB D- line
4	VIN	Power Input
5,6	SW	Switching
7,8	GND	Ground

Absolute Maximum Ratings

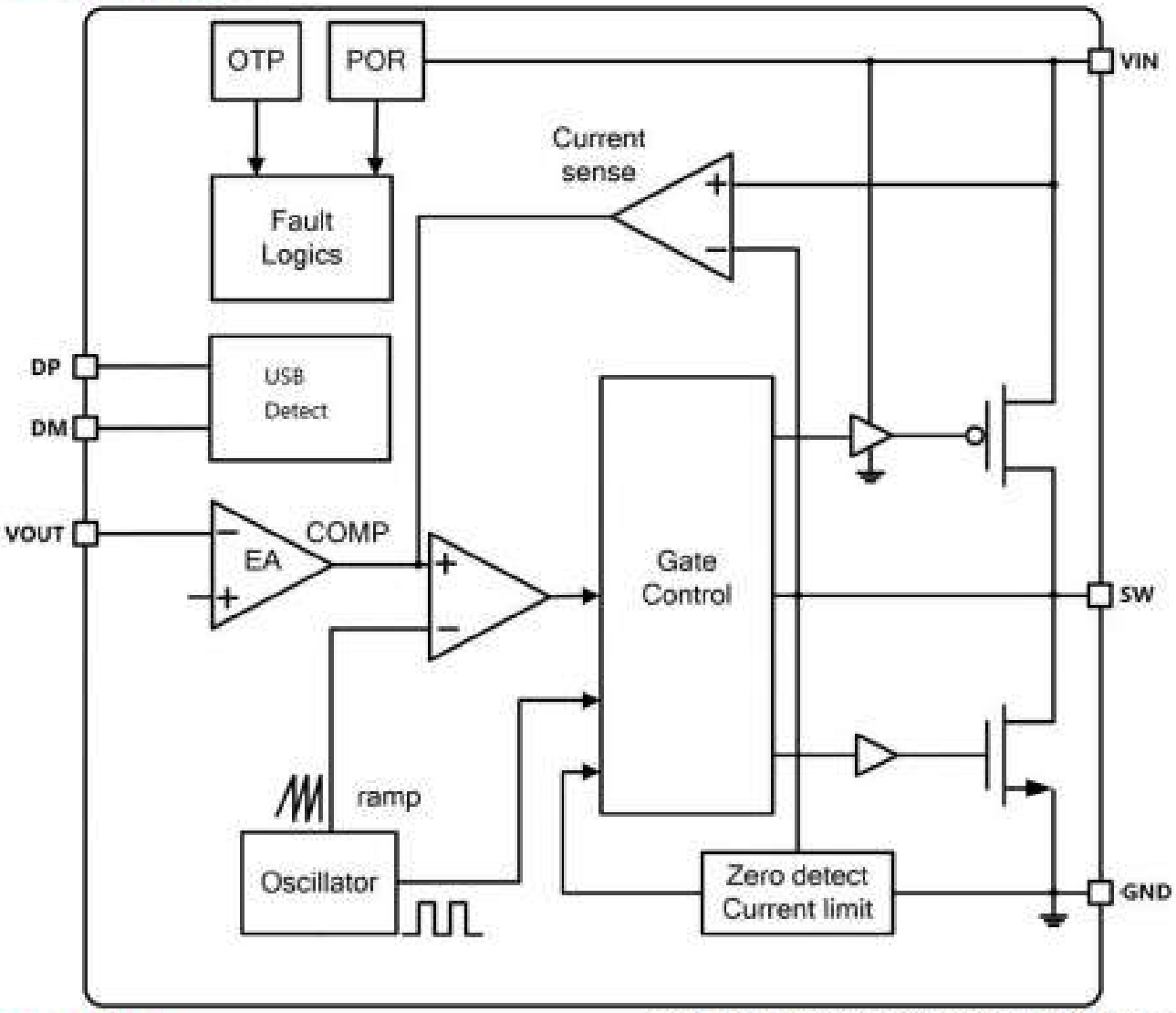
Characteristics	Symbol	Rating	Unit
VIN to GND		-0.3 to 32	V
SW to GND		-0.3 to VIN+0.3	V
VOUT,DP,DM to GND		-0.3 to 7	V
ESD HBM		+-2K	V
Operating Junction Temperature		-40 to 85	°C
Storage Junction Temperature		-55 to 150	°C
Thermal Resistance from Junction to case	θ_{JC}	40	°C/W
Thermal Resistance from Junction to ambient	θ_{JA}	160	°C/W

Electrical Characteristics

TJ = 25°C. VIN = 12V, unless otherwise noted

Symbol	Characteristics	Conditions	Min	Typ	Max	Units
VIN	Input Voltage		8	-	30	V
OVP	Input over voltage protection			32		V
I_Q	Quiescent Current	no switch	-	1.0	-	mA
I_{CC}	Standby Current	No Load	-	1.6		mA
V_{out}	Vout Voltage		4.95	5.10	5.25	V
Fosc	Switching Frequency			125		KHz
Tmin	Minimum On-Time		-	250	-	ns
I_{LIM}	Current Limit		3.2			A
Vshort	short protect			3		V
Thiccup	Hicup Interval			500		mS
Tss	Soft start Time			2		mS
High side	PMOS RDS_{ON}			70		mΩ
Low side	NMOS RDS_{ON}			35		mΩ
T_{TR}	Thermal Regulation			150		°C
T_{SD}	Thermal shutdown Temp		-	165	-	°C

Block Diagram



Operation

The JSW5368 operates by CC/CV architecture. The output voltage is set to 5.1V by an internal divider returned to the error amplifier

Input Capacitor

The input capacitor needs to be carefully selected to maintain sufficiently low ripple at the supply input of the converter. A low ESR capacitor is highly recommended. Since large current flows in and out of this capacitor during switching, its ESR also affects efficiency

The input capacitance needs to be higher than 100μF. The best choice is the ceramic type, however, low ESR tantalum or electrolytic types may also be used provided that the RMS ripple current rating is higher than 50% of the output current. The input capacitor should be placed close to the VIN and GND pins of the IC, with the shortest traces possible.

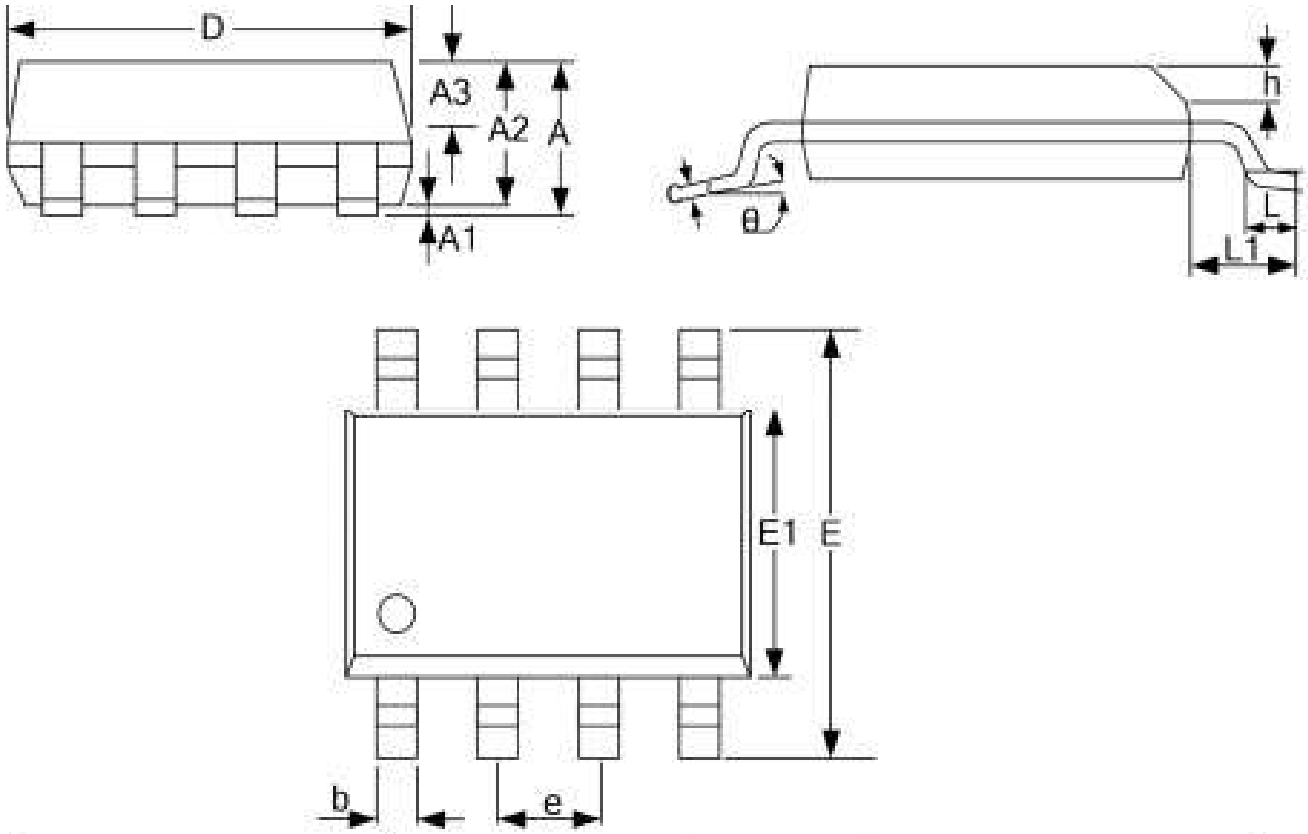
Output Capacitor

The output capacitor also needs to have low ESR to keep low output voltage ripple.

For ceramic output capacitor, typically choose a capacitance of about 220μF. For

Package Description

8-Lead Standard Small Outline Package [SOIC8]



Symbol	Dimensions in Millimeters		
	Min.	Nom.	Max.
A	-	-	1.75
A1	0.05	-	0.15
A2	1.30	1.40	1.50
A3	0.60	0.65	0.70
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
b	0.39	-	0.48
c	0.21	-	0.26
e	1.27BSC		
h	0.25	-	0.50
L	0.50	-	0.80
L1	1.05BSC		
θ	0	-	8°