4.75V to 18V Input, 2A Synchronous Step Down DC/DC Converter

UM5482S8 *SOP8*

General Description

The UM5482S8 is a synchronous buck regulator. The device integrates two 130mΩ MOSFETs, and provides 2A of continuous load current over a wide input voltage of 4.75V to 18V. Current mode control provides fast transient response and cycle-by-cycle current limit.
An adjustable soft-start prevents inrush current at turn-on, and in shutdown mode the supply current drops to 1μA.
This device, available in an 8-pin SOP package, provides a very compact solution with minimal external components.

Applications

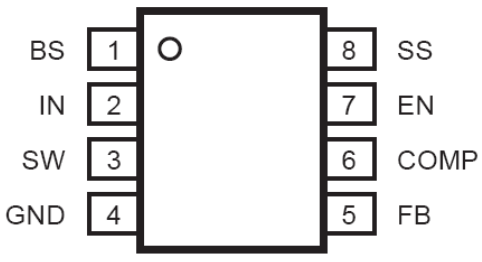
- Distributed Power Systems
- Networking Systems
- FPGA, DSP, ASIC Power Supplies
- Green Electronics/Appliances
- Notebook Computers

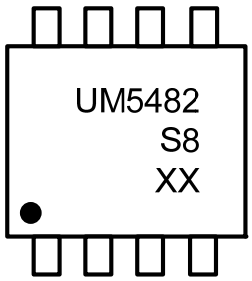
Features

- 2A Output Current
- Wide 4.75V to 18V Operating Input Range
- Integrated 130mΩ Power MOSFET Switches
- Output Adjustable from 0.923V to 15V
- Up to 93% Efficiency
- Programmable Soft-Start
- Stable with Low ESR Ceramic Output Capacitors
- Fixed 340kHz Frequency
- Cycle-by-Cycle Over Current Protection
- Input Under Voltage Lockout
- SOP8 Package

Pin Configurations

Top View





XX: Week Code
UM5482S8
SOP8

Ordering Information

Part Number	Packaging Type	Marking Code	Shipping Qty
UM5482S8	SOP8	UM5482S8	2500pcs/13Inch Tape & Reel

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Pin Description

Pin Number	Symbol	Function
1	BS	High-Side Gate Drive Boost Input. BS supplies the drive for the high-side N-Channel MOSFET switch. Connect a 0.01μF or greater capacitor from SW to BS to power the high side switch.
2	IN	Power Input. IN supplies the power to the IC, as well as the step-down converter switches. Drive IN with a 4.75V to 18V power source. Bypass IN to GND with a suitably large capacitor to eliminate noise on the input to the IC.
3	SW	Power Switching Output. SW is the switching node that supplies power to the output. Connect the output LC filter from SW to the output load. Note that a capacitor is required from SW to BS to power the high-side switch.
4	GND	Ground.
5	FB	Feedback Input. FB senses the output voltage to regulate that voltage. Drive FB with a resistive voltage divider from the output voltage. The feedback threshold is 0.923V.
6	COMP	Compensation Node. COMP is used to compensate the regulation control loop. Connect a series RC network from COMP to GND to compensate the regulation control loop. In some cases, an additional capacitor from COMP to GND is required.
7	EN	Enable Input. EN is a digital input that turns the regulator on or off. Drive EN high to turn on the regulator, drive it low to turn it off. Pull up with 100kΩ resistor for automatic startup.
8	SS	Soft-Start Control Input. SS controls the soft start period. Connect a capacitor from SS to GND to set the soft-start period. A 0.1μF capacitor sets the soft-start period to 15ms. To disable the soft-start feature, leave SS unconnected.

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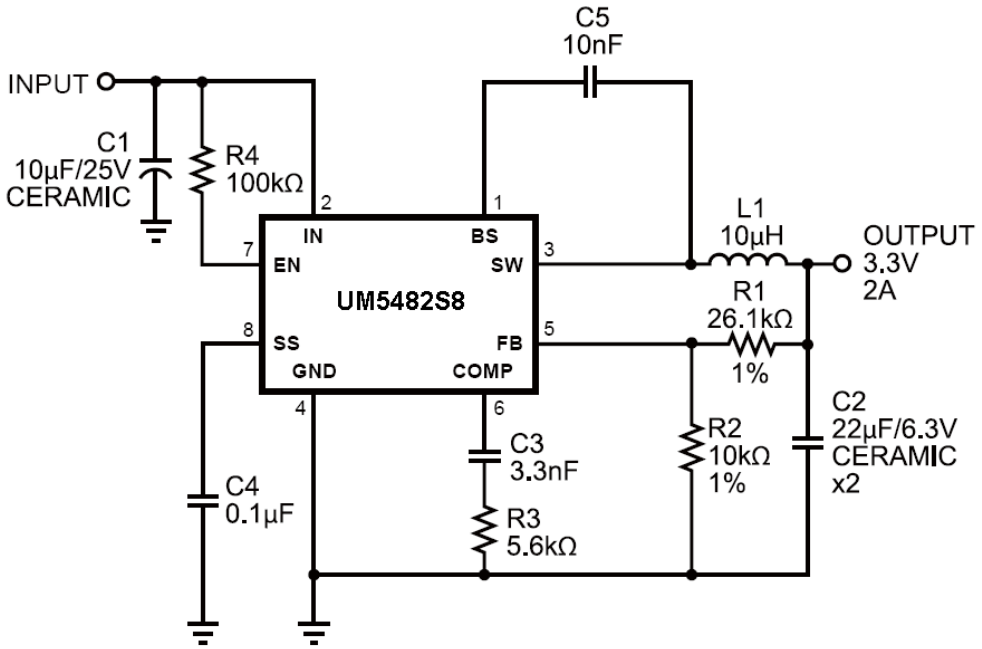
Absolute Maximum Ratings

Parameter	Symbol	Value	Unit
Input Voltage	V_{IN}	-0.3 to 20	V
Switch Node Voltage	Vsw	21	V
Boost Voltage	V_{BS}	V_{SW}-0.3V to V_{SW}+6.0V	V
All Other Pins		-0.3V to +6.0V	V
Continuous Power Dissipation (T_A=25°C)		1.38	W
Operating Junction Temperature	T_J	-40 to +125	°C
Storage Temperature Range	T_{STG}	-40 to +150	°C
Maximum Lead Temperature for Soldering 10 Seconds	T_L	+260	°C

Typical Application Circuit



Electrical Characteristics

T_A=25°C, V_{IN}=12V (unless otherwise noted)

Parameter	Test Conditions	Min	Typ	Max	Unit
Shutdown Supply Current	V_{EN}=0V		1	3	μA
Supply Current	V_{EN}=2.0V, V_{FB}=1.0V		0.5	0.8	mA
Feedback Voltage, V_{FB}	4.5V≤V_{IN}≤18V	0.900	0.923	0.946	V
Feedback Overvotage Threshold			1.1		V
Error Amplifier Transconductance, G_{EA}	△Ic=±10μA		200		μA/V
High-Side Switch On Resistance			130		mΩ
Low-Side Switch On Resistance			130		mΩ
High-Side Switch Leakage Current	V_{EN}=0V, V_{SW}=0V			10	μA
Upper Switch Current Limit	Minimum Duty Cycle	2.4	3.4		A
Lower Switch Current Limit	From Drain to Source		1.1		A
COMP to Current Sense Transconductance, G_{CS}			3.5		A/V
Oscillation Frequency, F_{OCS1}		305	340	375	kHz
Short Circuit Oscillation Frequency, F_{OCS2}	V_{FB}=0V		100		kHz
Maximum Duty Cycle, D_{MAX}	V_{FB}=1.0V		90		%
Minimum On Time			220		ns
EN Shutdown Threshold Voltage	V_{EN} Rising	1.1	1.6	2.0	V
EN Shutdown Threshold Voltage Hysteresis			210		mV
EN Lockout Threshold Voltage		2.2	2.5	2.7	V
EN Lockout Hysteresis			210		mV
Input Under Voltage Lockout Threshold	V_{IN} Rising	3.80	4.10	4.40	V
Input Under Voltage Lockout Threshold Hysteresis			210		mV
Soft-Start Current	V_{SS}=0V		6		μA
Soft-Start Period	C_{SS}=0.1μF		15		ms
Thermal Shutdown			160		°C

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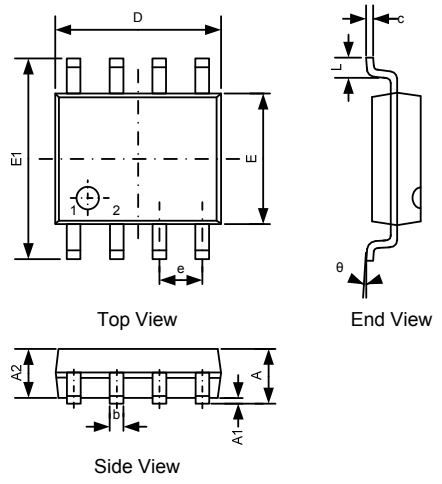
Package Information

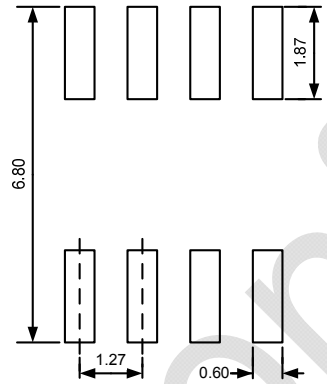
UM5482S8: SOP8

Outline Drawing



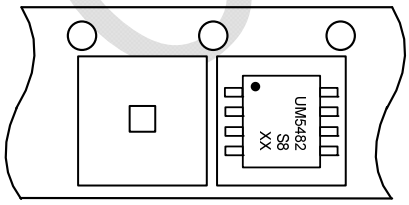
Symbol	DIMENSIONS					
	MILLIMETERS			INCHES		
	Min	Typ	Max	Min	Typ	Max
A	1.35	1.55	1.75	0.053	0.061	0.069
A1	0.10	-	0.25	0.004	-	0.010
A2	1.25	-	1.65	0.049	-	0.065
b	0.30	-	0.51	0.012	-	0.020
c	0.15	-	0.25	0.006	-	0.010
D	4.70	4.90	5.10	0.185	0.193	0.200
E	3.80	3.90	4.00	0.150	0.154	0.157
E1	5.80	6.00	6.20	0.228	0.236	0.244
e	1.27BSC			0.050 BSC		
L	0.40	-	1.27	0.016	-	0.050
θ	0°	-	8°	0°	-	8°

Land Pattern



NOTES:
1. Compound dimension: 4.90×3.90;
2. Unit: mm;
3. General tolerance ±0.05mm unless otherwise specified;
4. The layout is just for reference.

Tape and Reel Orientation



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Union Semiconductor, Inc
Add: Unit 606, No.570 Shengxia Road, Shanghai 201210
Tel: 021-51093966
Fax: 021-51026018
Website: www.union-ic.com