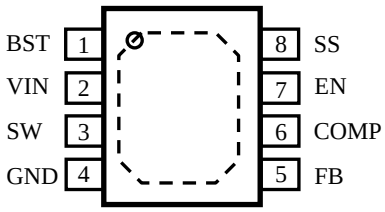
General Description

The ADT7351 is a step-down converter with integrated switching MOSFET. It operates wide input supply voltage range from 4.5V to 28V with 3A continuous output current. It includes current limiting protection and thermal shutdown.

It reduces design complexity and external component count. The ADT7351 is available in small outline SOIC-8(with Exposed pad) package.



Package outline of the ADT7351

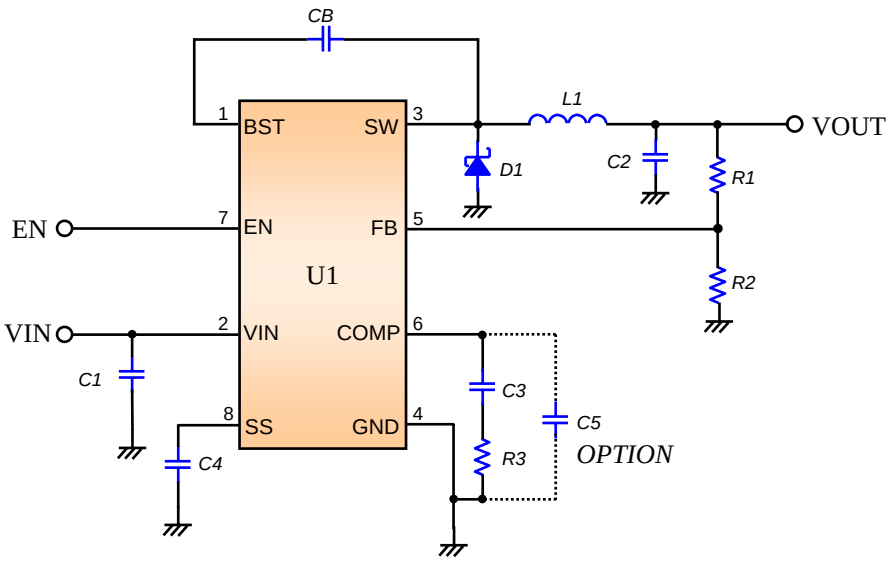
Features

- Current mode buck regulator with 925KHz fixed frequency
- Input voltage range : 4.5V to 28V
- Adjustable output range : 0.92V to 21V
- Continuous output current : 3A
- Integrated Power MOSFET switch : 100mΩ
- Under Voltage Lockout
- Thermal shutdown & current limit protection

Applications

- Distributed Power Systems
- Battery charger
- Pre-regulator for Linear regulators
- Set-top boxes (STB)
- Cigarette Lighter powered devices.

Typical Application Circuit



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Part List

Component	Type	Value (Model)	Manufacturer
U1	IC	ADT7351	ADTech
D1	Schottky Barrier Diode	B330A	DIODES
L1	Chip inductor	4.7uH / 3.6A	TDK
C1	MLCC	10㎌ / 50V	-
C2	MLCC	47㎌ / 6.3V	-
C3	MLCC	5.6㎋	-
C4	MLCC	100㎋	-
CB	MLCC	10㎋	-
R1	Chip resistor	26.5kΩ / 1%	-
R2	Chip resistor	10kΩ / 1%	-
R3	Chip resistor	15kΩ / 1%	-

Pin Description

Pin No.	Name	I/O	Type	Description
1	BST	I	A	Bootstrap capacitor connection
2	VIN	I	P	Power supply input
3	SW	O	D	Switching node connection
4	GND	-	G	Ground
5	FB	I	A	Feedback voltage input
6	COMP	O	A	Compensation node
7	EN	I	A	Chip enable input
8	SS	O	A	Soft start node

I : Input pin O : Output pin IO : Input/Output pin
P : Power pin G : Ground pin A : Analog pin D : Digital pin

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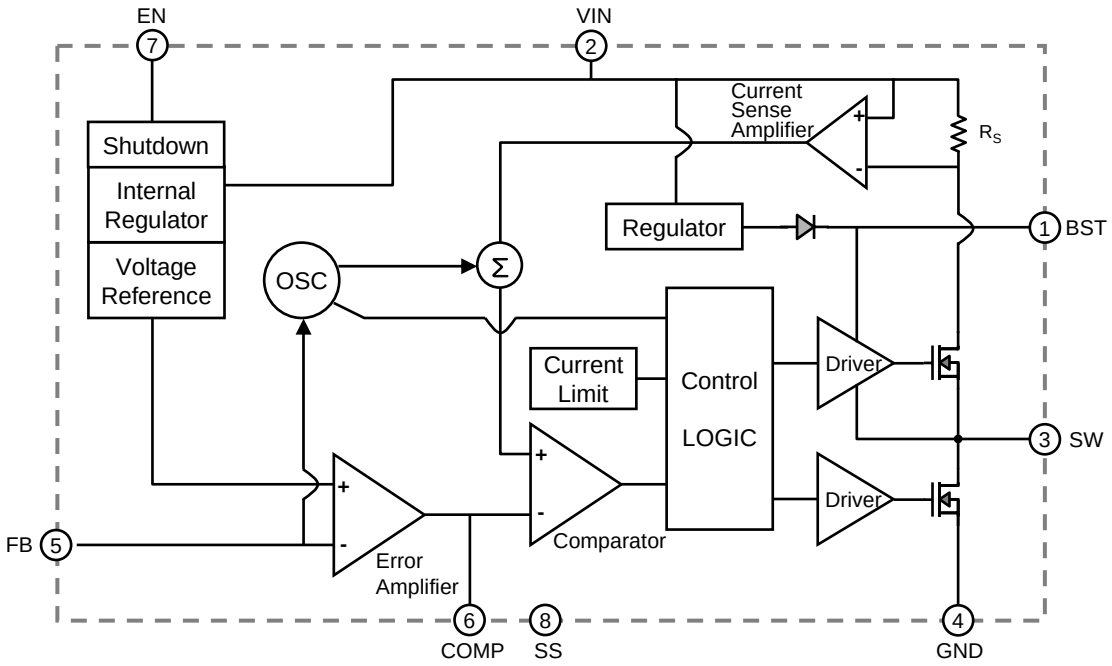
Functional Block Diagram



Absolute Maximum Ratings (Note1)

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{IN}	-0.3	-	30	V
SW pin voltage	V_{SW}	-0.5	-	V_{IN} + 0.3	V
BST pin voltage	V_{BST}	V_{SW} – 0.3	-	V_{SW} + 6	V
All Other Pins	-	-0.3	-	+6	V
Max. power dissipation (Ta=25℃) (Note2)	P_D	-	-	2.08	W
Thermal resistance (Note3)	Θ_{JA}	-	60	-	℃/W
Storage temperature	T_{STG}	-65	-	+150	℃
Junction temperature	$T_{J.MAX}$	-	-	+150	℃

Note1. Stresses beyond those listed under “Absolute Maximum Ratings” may cause permanent damage to the device.
Note2. derate 17mW/℃ above +25℃. This is recommended to operate under this power dissipation specification.
Note3. Measured on JESD51-7, 4-layer PCB

Operating Ratings

Parameter	Symbol	Min.	Typ.	Max.	Unit
Power supply voltage	V_{IN}	4.5	12.0	28.0	V
Output voltage	V_{OUT}	0.92	-	21	V
Operating temperature	T_{OPR}	-40	-	+85	℃
Junction temperature	T_J	-	-	+125	℃

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Electrical Characteristics (Ta=25℃, V_{IN}=12V, unless otherwise noted)

Parameters	Symbol	Condition	Min.	Typ.	Max.	Unit
Supply current (shutdown)	I_{OFF}	V_{EN} = 0V	-	20	-	μA
Supply current (quiescent)	I_Q	V_{EN} = 3V, V_{FB} = 1.4V	-	1.3	-	mA
Feedback voltage	V_{FB}	4.5V ≤ V_{IN} ≤ 28V, V_{COMP} < 2V	0.89	0.92	0.95	V
Error Amplifier Voltage Gain	A_{EA}	V_{FB} = 0.8V	-	500	-	V/V
Error Amplifier Transconductance	G_{EA}	ΔI_{COMP} = ±10μA	-	900	-	μA/V
High-Side Switch On Resistance (Note5)	$R_{ON.H}$	-	-	100	-	mΩ
Low-Side Switch On Resistance (Note5)	$R_{ON.L}$	-	-	10	-	Ω
High-Side Switch Leakage Current		V_{EN} = 0V , V_{SW} = 0V	-	0.1	-	μA
Current Limit (Note5)		-	-	4.0	-	A
Oscillator frequency	F_{SW}	-	-	925	-	kHz
Fold-back frequency		V_{FB} = 0V	-	110	-	kHz
Maximum Duty cycle	D_{MAX}	-	-	85	-	%
Minimum On time	T_{ON}	-	-	100	-	ns
UVLO rising threshold		V_{IN} rising	-	2.6	-	V
UVLO threshold hysteresis		-	-	200	-	mV
EN threshold voltage		-	-	1.2	-	V
Enable pull-up current		V_{EN} = 0V	-	1.0	-	μA
Soft-Start Period		C4 = 100nF	-	10	-	ms
Thermal shutdown (Note5)		-	-	145	-	℃

Note5. guaranteed by design.

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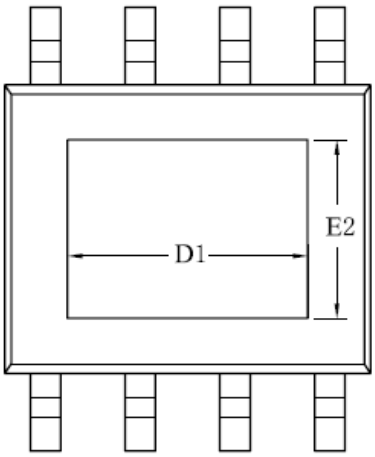
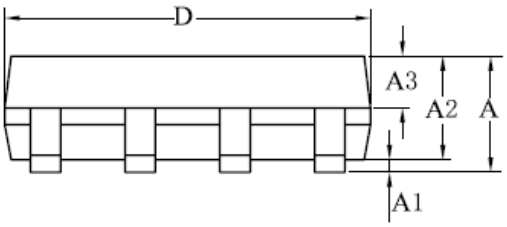
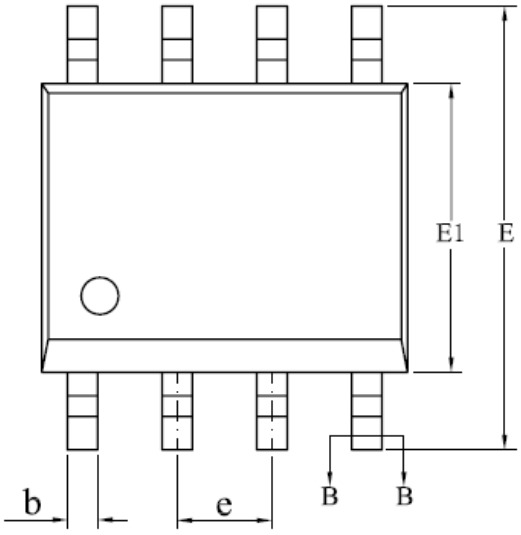
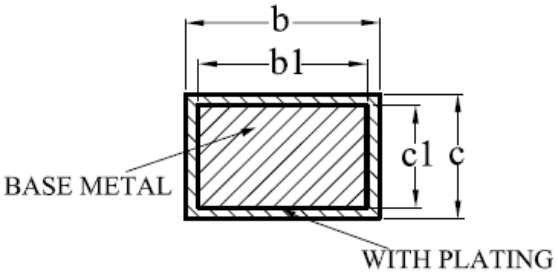
Package ; SOIC-8 with exposed pad , 4.9mm x 3.94mm body (units : mm)



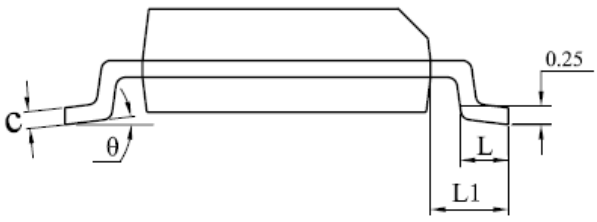




SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	—	—	1.77
A1	0.08	0.18	0.28
A2	1.20	1.40	1.60
A3	0.55	0.65	0.75
b	0.39	—	0.48
b1	0.38	0.41	0.43
c	0.21	—	0.26
c1	0.19	0.20	0.21
D	4.70	4.90	5.10
E	5.80	6.00	6.20
E1	3.70	3.90	4.10
e	1.27BSC		
L	0.50	0.65	0.80
L1	1.05BSC		
θ	0	—	8°
D1	3.30REF		
E2	2.40REF		



SECTION B-B



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