

0.4A PWM BUCK DC/DC CONVERTER

GENERAL DESCRIPTION

The product is a step-down switch-mode converter. It can offer a very compact solution to achieve a 0.4A continuous output current over a wide input supply range, with excellent load and line regulation.。

FEATURES

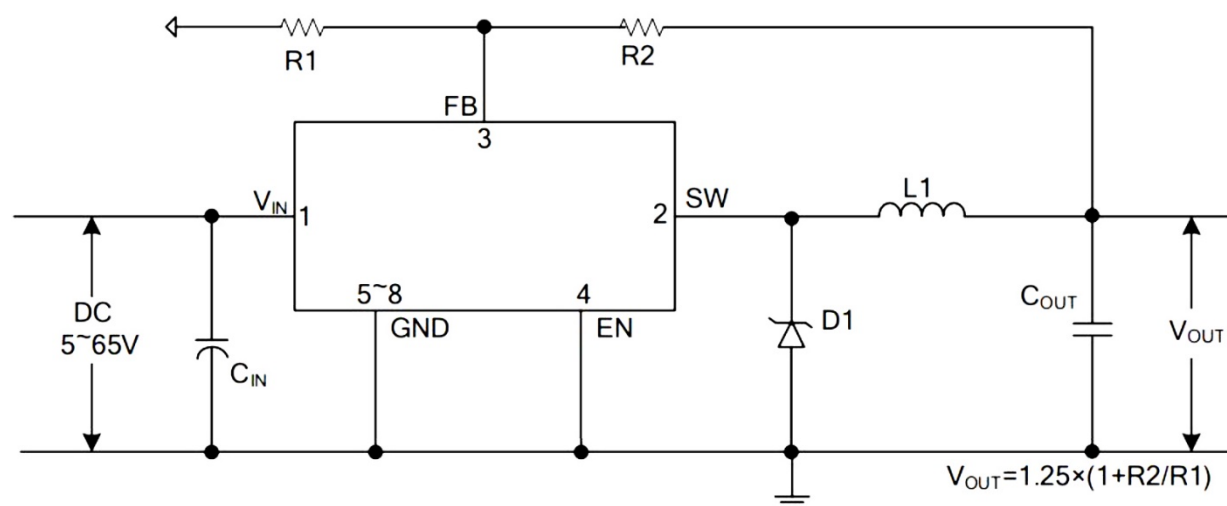
- Output load current: 0.4A
- Wide operation voltage: 5V~65V
- High efficiency up to 85%
- Internal current and thermal limit

APPLICATIONS

- Flat-Panel Television and Monitor
- General Purposes

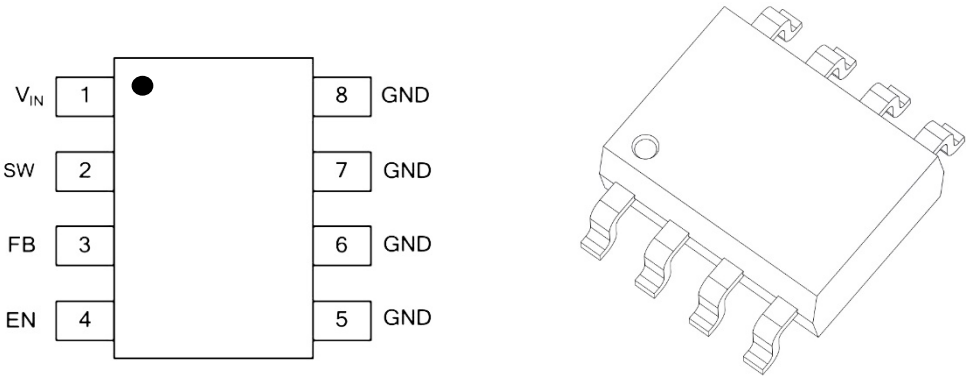
TYPICAL APPLICATION

CIRCUIT



0.4A PWM BUCK DC/DC CONVERTER

Package



SOP-8

Pin Name	Pin Number	I/O	Pin Function
VIN	1	P	Supply voltage input
SW	2	O	Switching output
FB	3	I	Output voltage feedback control
EN	4	I	ON/OFF Shutdown
GND	5,6,7,8	P	Ground

ABSOLUTE MAXIMUM RATING

PARAMETER	SYMBOL	RATINGS	UNIT
Supply Voltage	V _{IN}	-0.3~70	V
ON/OFF PIN Input Voltage	V _{EN}	-0.3~VIN	V
Feedback Pin Voltage	V _{FB}	-0.3~VIN	V
Output Switch Pin Voltage	V _{SW}	-0.3~VIN	V
Power Dissipation	P _D	Internally Limited	W
Junction to Ambient	θ _{JA}	60	°C/W
Operating Temperature	T _{OPR}	-40~125	°C
Storage Temperature	T _{STG}	-55~150	°C

Note: If the parameters exceed the range of "absolute maximum value", it may cause permanent damage to the chip. The above is only the limit range. Under such limit conditions, the technical indicators of the chip will not be guaranteed. Working near the "absolute maximum" for a long time will affect the reliability of the chip

ELECTRICAL CHARACTERISTICS (TA=25°C ,VIN=48V, Iout=0.2A, if not noted)

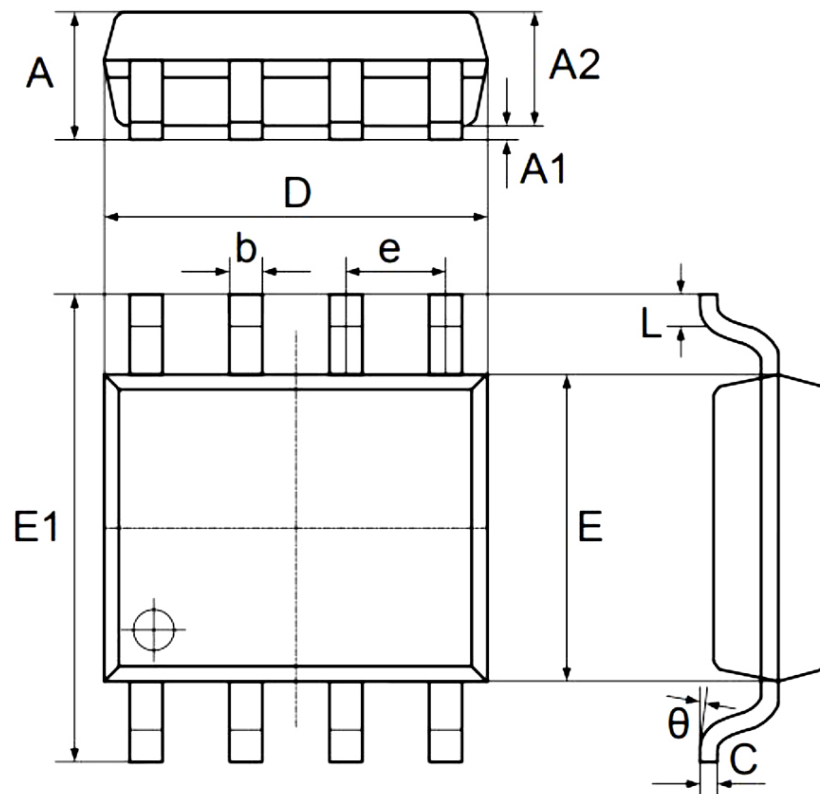
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V_{IN}	Input Operation Voltage		5		65	V
I_Q	Quiescent Current	$V_{ON/OFF}=0V, V_{FB}=V_{IN}$		2	5	mA
I_{SD}	Shutdown Supply Current	$V_{ON/OFF}=2V$		85	200	uA
F_{OSC}	Oscillator Frequency		120	150	180	KHz
D.C	Duty Cycle	$V_{FB}=0V$	0		100	%
I_{CL}	Current Limit	Peak current, No outside circuit		0.4		A
V_{IL}	EN pin Logic Input Threshold Voltage	Low, regulator ON		0.8		V
V_{IH}	High, regulator OFF			1.6		V
V_{FB}	Output Feedback Voltage		1.225	1.25	1.275	V
η	Efficiency	$I_{LOAD}=0.4A$		85		%

The block diagram illustrates the internal architecture of the power management IC. Key components include:

- Start up:** A block that receives the EN signal and provides a signal to the EA (Error Amplifier) and the $COMP$ (Comparator).
- EA (Error Amplifier):** A differential amplifier with a $1.25V$ reference at its non-inverting input (+). Its inverting input (-) is connected to the FB (Feedback) node. The output of the EA is connected to the inverting input of the $COMP$.
- COMP (Comparator):** A comparator that compares the output of the EA with a signal from the $Start up$ block. Its output is connected to the $Latch$ block.
- Latch:** A block that receives signals from the $COMP$ and the $Oscillator$. Its output is connected to the $Driver$ block.
- Oscillator:** A block that generates a periodic signal (indicated by a sine wave symbol) and provides it to the $Latch$ block.
- Thermal shutdown:** A block that monitors the temperature and provides a signal to the $Latch$ block.
- Driver:** A block that drives the $Switch$ (a MOSFET) based on the signal from the $Latch$ block.
- Switch:** A MOSFET that switches the V_{IN} to the SW (Switch) output node.
- Current Limit:** A block that monitors the current through the $Switch$ and provides a signal to the $Latch$ block. It is connected to the SW node and the GND node.
- EN (Enable):** A pin that controls the $Start up$ block and is connected to the EA and $COMP$ blocks.
- FB (Feedback):** A pin that provides feedback to the EA block.
- V_{IN} (Input Voltage):** The main input voltage source.
- SW (Switch):** The output node of the $Switch$ MOSFET.
- GND (Ground):** The common ground reference.

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PACKAGE OUTLINE



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.370	1.670	0.056	0.068
A1	0.070	0.170	0.003	0.007
A2	1.300	1.500	0.053	0.061
b	0.306	0.506	0.013	0.021
C	0.203 TYP.		0.008 TYP.	
D	4.700	5.100	0.192	0.208
E	3.820	4.020	0.156	0.164
E1	5.800	6.200	0.237	0.253
e	1.270 TYP.		0.050 TYP.	
L	0.450	0.750	0.018	0.306
θ	0°	8°	0°	8°