



Preliminary

OCP2023

360KHz PWM 2A Step-Down Converter

ORIENT-CHIP

General Description

OCP2023 consists of step-down switching regulator with PWM control. These devices include a reference voltage source, oscillation circuit, error amplifier, internal P-Power MOSFET and etc.

OCP2023 provides low-ripple power, high efficiency, and excellent transient characteristics. The PWM control circuit is able to vary the duty ratio linearly from 0 up to 100%. This converter also contains an error amplifier circuit as well as a soft-start circuit that prevents overshoot at startup. An enable function, an over current protect function and a short circuit protect function are built inside, and when OCP or SCP happens, the operation frequency will be reduced from 360KHz to 35KHz. Also, an internal compensation block is built in to minimum external component count.

With the addition of an internal P-channel Power MOS, a coil, capacitors, and a diode connected externally, these ICs can function as step-down switching regulators. They serve as ideal power supply units for portable devices when coupled with the SOP-8L mini-package, providing such outstanding features as low current consumption. Since this converter can accommodate an input voltage up to 18V, it is also suitable for the operation via an AC adapter.

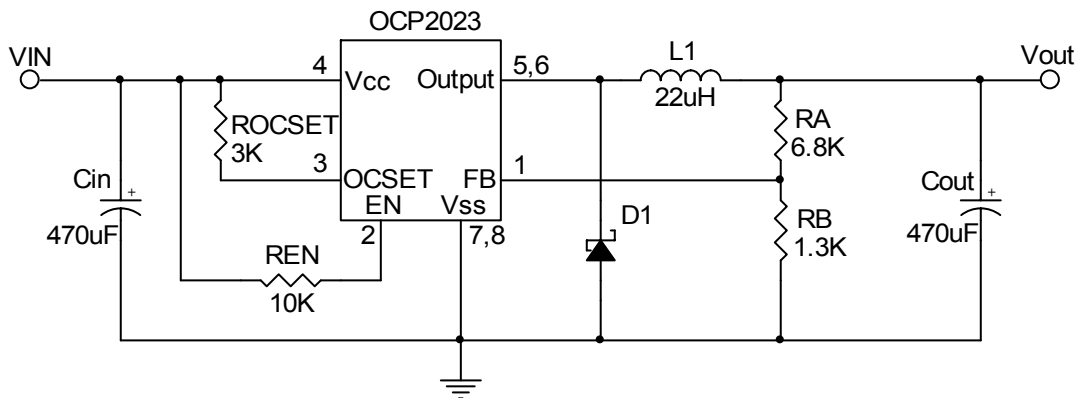
Features

- Input voltage: 3.6V to 18V
- Output voltage: 0.8V to VCC.
- Duty ratio: 0% to 100% PWM control
- Oscillation frequency: 360KHz typ.
- Soft-start, Current limit, Enable function
- Thermal Shutdown function
- Built-in internal SW P-CH Power MOSFET
- SOP-8L Pb-Free Package.

Applications

- Battery Charger Adapter
- PC Motherboard
- LCD Monitor
- Graphic Card
- DVD-Video Player
- Telecom Equipment
- ADSL Modem
- Printer and other Peripheral Equipment
- Microprocessor core supply
- Networking power supply

Typical Application Circuit



Absolute Maximum Ratings

Parameter	Rating	Unit
V _{CC} Pin Voltage	V _{SS} -0.3 to V _{SS} +20	V
Feedback Pin Voltage	V _{SS} -0.3 to V _{CC}	V
EN Pin Voltage	V _{SS} -0.3 to V _{IN} +0.3	V
Switch Pin Voltage	V _{SS} -0.3 to V _{IN} +0.3	V
Power Dissipation	Internally limited	mW
Operating Temperature Range	-20 to +125	°C
Storage Temperature Range	-40 to +150	°C



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Electrical Characteristics

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

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Unit
V _{IN}	Input Voltage	-	3.6	-	18	V
V _{FB}	Feedback Voltage	I _{OUT} =0.2A	0.77	0.8	0.83	V
I _{FB}	Feedback Bias Current	I _{OUT} =0.2A	-	0.1	0.5	uA
I _{SW}	Switch Current	-	2.5	-	-	A
I _{SSS}	Current Consumption During Power Off	V _{EN} =0V	-	0.1	-	uA
ΔV _{OUT} /V _{OUT}	Line Regulation	V _{IN} =7V~18V	-	2	4	%
ΔV _{OUT} /V _{OUT}	Load Regulation	I _{OUT} =0.2 to 2A	-	0.2	0.5	%
F _{OSC}	Oscillation Frequency	Measure waveform at SW pin	320	360	400	KHz
F _{OSC1}	Frequency of Current Limit or Short Circuit Protect	Measure waveform at SW pin	10	-	-	KHz
V _{SH}	EN Pin Input Voltage	Evaluate osc. at SW pin	2.0	-	-	V
V _{SL}		Evaluate osc. stop at SW pin	-	-	0.8	
I _{SH}	EN Pin Input Leakage Current	-	-	20	-	uA
I _{SL}		-	-	-10	-	uA
I _{OCSET}	OCSET Pin Bias Current	-	80	90	100	uA
T _{SS}	Soft-Start Time	-	0.3	2	5	ms
R _{DSON}	Internal MOSFET Rdson	V _{IN} =5V, V _{FB} =0V	-	110	150	mΩ
		V _{IN} =12V, V _{FB} =0V	-	70	100	
EFFI	Efficiency	V _{IN} =12V, V _{OUT} =5V, I _{OUT} =2A	-	88	-	%
θ _{JA}	Thermal Resistance Junction-to-Ambient	-	-	65	-	°C/W