普 誠 科 技
Princeton Technology Corp.

DESCRIPTION

RS6513 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 350KHz to 30KHz. 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-8 mini-package, providing such outstanding features as low current consumption. Since this converter can accommodate an input voltage up to 20V, it is also suitable for the operation via an AC adapter.
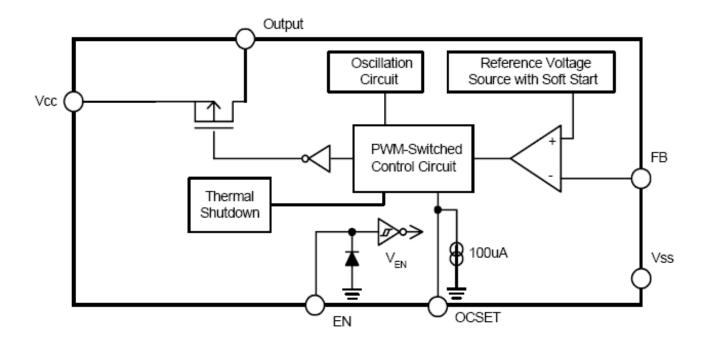
FEATURES

- Input voltage: 3.6V to 20V
- Output voltage: 0.8V to VCC
- Duty ratio: 0% to 100% PWM control
- Oscillation frequency: 350KHz typical
- Soft-start, Current limit, Enable function
- Thermal Shutdown function
- Built-in internal SW P-channel MOS
- SOP-8 package
- RoHS Compliant and 100% Lead (Pb)-Free and Green (Halogen Free with Commercial Standard)
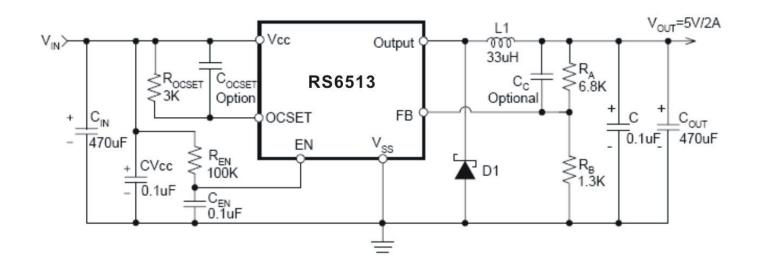
APPLICATIONS

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

BLOCK DIAGRAM

APPLICATION CIRCUIT

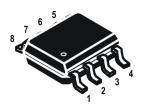**Note: $V_{OUT} = V_{FB} \times (1+R_A/R_B)$**
$R_B=0.7K\sim5K$ ohm

$V_{IN}=12V$, $I_{MAX} = 2A$			
V_{OUT}	2.5V	3.3V	5V
L1 Value	22uH	27uH	33uH

ORDER INFORMATION

Device	Device Code
RS6513-XX Y Z	**XX is nominal output voltage designator** : 　"Blank" =ADJ **Y is package designator:** 　S: SOP-8 **Z is Lead Free designator:** 　P: Commercial Standard, Lead (Pb) Free and Phosphorous (P) Free Package 　G: Green (Halogen Free with Commercial Standard)

PIN ASSIGNMENTS

SOP-8

PIN DESCRIPTION

Pin Name	Description	Pin No.
FB	Feedback Pin	1

EN	POWER OFF Pin:
	  H: Normal operation (Step-down operation)
	  L: Step-down operation stopped (All circuits deactivated)
		2

OCSET	Add an external resistor to set max output current	3
VCC	Power Supply Pin	4
OUTPUT	Switch Pin. Connect external inductor/diode here. Minimize trace area at this pin to reduce EMI	5, 6
VSS	Ground Pin	7, 8

FUNCTION DESCRIPTION

PWM CONTROL

The RS6513 consists of DC/DC converters that employ a pulse-width modulation (PWM) system. In converters of the RS6513, the pulse width varies in a range from 0 to 100%, according to the load current. The ripple voltage produced by the switching can easily be removed through a filter because the switching frequency remains constant. Therefore, these converters provide a low-ripple power over broad ranges of input voltage and load current.

UNDER VOLTAGE LOCKOUT

The under voltage lockout circuit of the RS6513 assures that the high-side MOSFET driver outputs remain in the off state whenever the supply voltage drops below 3.3V. Normal operation resumes once VCC rises above 3.5V.

RDS(ON) CURRENT LIMITING

The current limit threshold is setting by the external resistor connecting from VCC supply to OCSET. The internal 100uA sink current crossing the resistor sets the voltage at the pin of OCSET. When the PWM voltage is less than the voltage at OCSET, an over-current condition is triggered.

$$I_{LOAD} \times R_{DS(ON)} = I_{OCSET} \times R_{OCSET}$$

See above formula for setting the current limit value.

IMPORTANT NOTICE

Princeton Technology Corporation (PTC) reserves the right to make corrections, modifications, enhancements, improvements, and other changes to its products and to discontinue any product without notice at any time.
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