

## Product Overview

### NCP1593: Synchronous Buck Regulator, 1 MHz, 3.0 A

For complete documentation, see the data sheet.

The NCP1593 is a fixed 1 MHz, high output current, synchronous PWM converter that integrates a low-resistance, high-side P-channel MOSFET and a low-side N-channel MOSFET. The NCP1593 utilizes internally compensated current mode control to provide good transient response, ease of implementation and excellent loop stability. It regulates input voltages from 4.0 V to 5.5 V down to an output voltage as low as 0.6 V and is able to supply up to 3 A of load current. The NCP1593 includes an internally fixed switching frequency (FSW), and an internal soft-start to limit inrush current. Other features include cycle-by-cycle current limiting, 100% duty cycle operation, short-circuit protection, power saving mode and thermal shutdown.

#### Features

- Wide Input Voltage Range: from 4.0 V to 5.5 V
  - Internal 90 mΩ High-Side P-Channel MOSFET and 70 mΩ Low-Side N-Channel MOSFET
  - Fixed 1 MHz Switching Frequency
  - Cycle-by-Cycle Current Limiting
  - Hiccup Mode Short-Circuit Protection
  - Overtemperature Protection
  - Internal Fixed SoftStart with External Adjustment
  - Start-up with Pre-Biased Output Load
  - Adjustable Output Voltage Down to 0.6 V
  - Auto Power Saving Mode During Light Load
- For more features, see the data sheet

#### Benefits

- Ability to run from various input voltage sources
- High efficiency and good thermal performance
- Small output inductor/capacitor and low output ripple voltage
- Protection feature
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- Ability to reduce external components with fixed internal SS time or adjust externally
- Protection feature
- Ability to regulate low output voltages
- Increased efficiency at light load

#### Applications

- +5Vin buck regulator

#### End Products

- DVD Drives and HDD
- Notebook Computing
- Set-Top-Box (STB)

#### Part Electrical Specifications

Product	Compliance	Status	Topology	Control Mode	V <sub>CC</sub> Min (V)	V <sub>CC</sub> Max (V)	V <sub>O</sub> Typ (V)	I <sub>O</sub> Typ (A)	Efficiency (%)	f <sub>sw</sub> Typ (kHz)	Package Type
NCP1593AMNTWG	Pb-free	Active	Step-Down	Current Mode	4	5.5	0.6 to 5.0	3	90	1000	DFN-10
	Halide free										
NCP1593BMNTWG	Pb-free	Active	Step-Down	Current Mode	4	5.5	0.6 to 5.0	3	90	1000	DFN-10
	Halide free										

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Created on: 2/21/2019