

NCP6121

Preliminary Datasheet

Dual Output 3 Phase +1/0 Phase Controller with single SVID Interface for Desktop CPU Applications



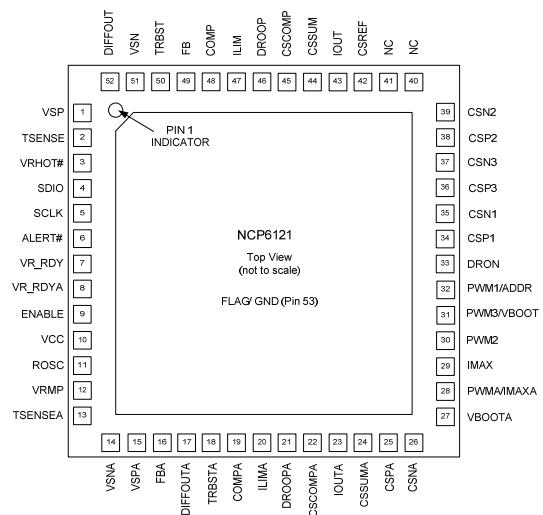
ON Semiconductor

The NCP6121 dual output three plus one phase buck solution is optimized for Intel VR12 compatible CPUs. The controller combines true differential voltage sensing, differential inductor DCR current sensing, input voltage feed-forward, and adaptive voltage positioning to provide accurately regulated power for Desktop applications. The control system is based on Dual-Edge pulse-width modulation (PWM) combined with DCR current sensing providing the fastest initial response to dynamic load events and reduced system cost. It also sheds to single phase during light load operation and can auto frequency scale in light load while maintaining excellent transient performance.

Dual high performance operational error amplifiers are provided to simplify compensation of the system. Patented Dynamic Reference Injection further simplifies loop compensation by eliminating the need to compromise between closed-loop transient response and Dynamic VID performance. Patented Total Current Summing provides highly accurate current monitoring for droop and digital current monitoring.

Features

- Meets Intel VR12 Specifications
- Current Mode Dual Edge Modulation for Fastest Initial Response to Transient Loading
- Dual High Performance Operational Error Amplifier
- One Digital Soft Start Ramp for Both Rails
- Dynamic Reference Injection® (Patent #US07057381)
- Accurate Total Summing Current Amplifier(Patent #US006683441)
- DAC with Droop Feed-forward Injection(Patent Pending)
- Dual High Impedance Differential Voltage and Total Current Sense Amplifiers
- Phase-to-Phase Dynamic Current Balancing
- “Lossless” DCR Current Sensing for Current Balancing
- Summed Thermally Compensated Inductor Current Sensing for Droop
- True Differential Current Balancing Sense Amplifiers for Each Phase
- Adaptive Voltage Positioning (AVP)
- Switching Frequency Range of 100KHz – 1.0MHz
- Input voltage range from 5V to 13.2V



Device	Package	Shipping
NCP6121S52MNR2G	QFN52 Single Row	2500/Tape & Reel

Pb-free and Halide-free packages are available

- Startup into Pre-Charged Loads While Avoiding False OVP
- Power Saving Phase Shedding
- Vin Feed Forward Ramp Slope
- Pin Programming for Internal SVID parameters
- Over Voltage Protection (OVP) & Under Voltage Protection (UVP)
- Over Current Protection (OCP)
- Dual Power Good Output with Internal Delays

Applications

- Desktop Processors