

## 4 A Synchronous DC-DC Step down Regulator, Power Supply in Package ( $V_{IN} = 4.5\text{ V to }28\text{ V}$ , $V_{OUT} = 0.6\text{ V to }5.5\text{ V}$ )

### FEATURES

- High-Speed Response DC-DC Step Down Regulator Circuit that employs Hysteretic Control System
- Built-in inductor and capacitors
- Skip (discontinuous) Mode for high efficiency at light load  
Maximum Output Current : 4 A
- Input Voltage Range :  $P_{VIN} = A_{VIN} = 4.5\text{ V to }28\text{ V}$ ,  
Output Voltage Range : 0.6 V to 5.5 V  
Selectable Switching Frequency 400 kHz / 600 kHz / 800 kHz
- Built-in Feed Back Resistors for 1.0 V / 3.3 V default settings  
Configurable output voltage settings using external Resistors
- Adjustable Soft Start
- Low Operating and Standby Quiescent Current
- Open Drain Power Good Indication for Output Over / Under Voltage
- Selectable Auto recovery / latch off protection system
- Adjustable current limit threshold
- Built-in Under Voltage Lockout (UVLO),  
Thermal Shut Down (TSD), Under Voltage Detection (UVD),  
Over Voltage Detection (OVD), Short Circuit Protection (SCP)  
Over Current Protection (OCP)
- Plastic Quad Flat Non-leaded Package Heat Slug Down  
(QFN Type, Size : 8.5 mm × 7.5 mm, 0.5 mm pitch)

### DESCRIPTION

NN31002A is a synchronous DC-DC step down regulator (1-ch), Power Supply in Package (PSiP), which integrates a Controller IC that employs a hysteretic control system, two Power MOSFETs, an Inductor and Capacitors into a single 8.5 x 7.5 x 4.7mm QFN package. The easiness of mounting PSiP onto a Printed Circuit Board (PCB), a very small footprint and a highly reduced number of external components, offers very compact and simplified solutions for applications requiring point-of-load design.

The number of external components have been reduced to only input/output capacitor, slow start capacitor and feedback resistors.

Furthermore, for applications requiring an output voltage of 1.0 V / 3.3 V, the external feedback resistors can be eliminated, resulting into even a smaller footprint.

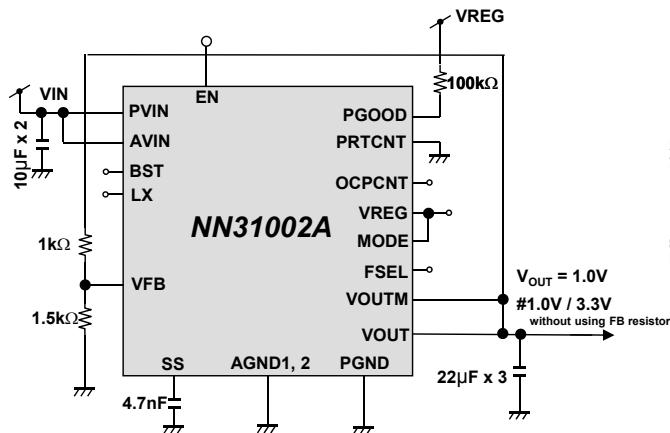
The PSiP achieves efficiencies of greater than 94% with very good power dissipation capabilities.

### APPLICATIONS

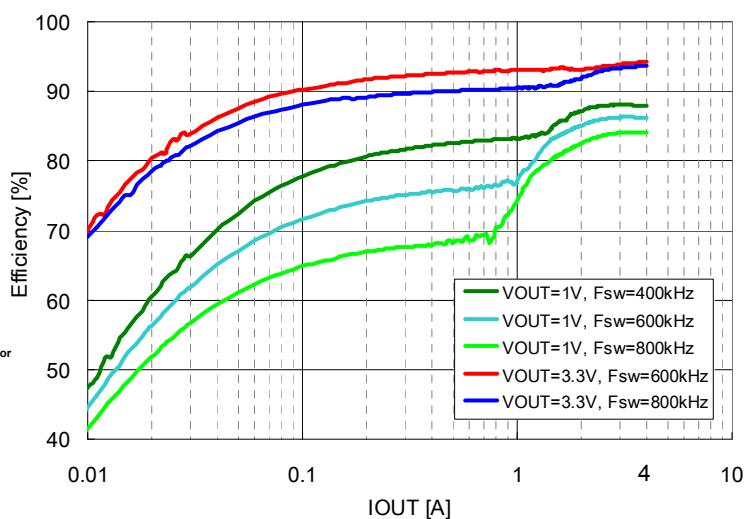
High Current Distributed Power Systems such as

- DSP and FPGA Point-of-Load Applications
- Routers
- Industrial Equipment
- Space constrained Applications etc.

### SIMPLIFIED APPLICATION



Note : The application circuit is an example. The operation of the mass production set is not guaranteed. Sufficient evaluation and verification is required in the design of the mass production set. The Customer is fully responsible for the incorporation of the above illustrated application circuit in the design of the equipment.



Condition :

$V_{IN} = 12\text{ V}$ ,  $V_{OUT}$  Setting = 1.0 V / 3.3 V

Switching Frequency = 400 / 600 / 800 kHz, Skip mode  
 $C_O = 66\text{ }\mu\text{F}$  (22 µF x 3)