

# DC-DC CONVERTERS

## 400 mA, nano-quiescent current synchronous step-down converters



**New high-efficiency converters with digital voltage selection and Power Good pin pushes performance beyond limits**



Miniaturized step-down regulators drawing a quiescent current of only 500 nA, the ST1PS0X family is specifically tailored for battery-powered and energy-harvesting applications, as it ensures a highly efficient conversion regardless of the power source.

With an input voltage ranging from 1.8 to 5.5 V, this new generation of buck converters requires a minimal set of external components thanks to the integrated power switch, synchronous rectifier, and integrated compensation network.

### KEY FEATURES

- Input supply voltage range: 1.8 to 5.5 V
- 500 nA quiescent current (typ.) with no load
- Wide range dynamic output voltage on-the-fly selection
- 400 mA output current capability
- $\pm 2\%$  output voltage accuracy
- Power Good output pin and Soft-Start sequence
- Flip-chip (1.11 x 1.41 mm) with 400 $\mu$ m pitch
- TQFN12 (2.0 x 1.7 mm) with 400 $\mu$ m pitch

### KEY BENEFITS

- High efficiency at any load level, 95% at 1 mA output load current
- 1.8 V minimum supply input voltage allows using different battery technology

### KEY APPLICATIONS

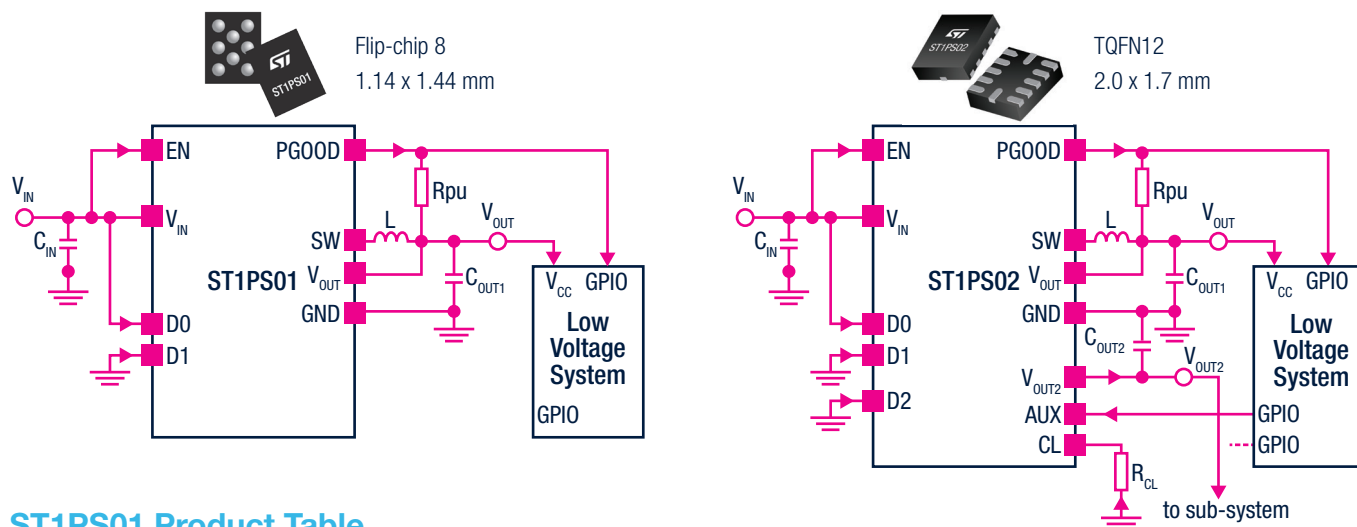
- Asset Tracking
- Energy (gas, water) metering
- Energy harvesting for portable and battery-powered equipment
- Medical
- Keep-alive point-of-load

The ST1PS0X step-down converters are specifically designed for applications where high efficiency and PCB size and thickness are key factors.

Thanks to an enhanced peak current control mode, the ST1PS0X family ensures very high efficiency conversions using just a 2.2  $\mu\text{H}$  inductor and two small capacitors. In addition to an output voltage that can be set on-the-fly by using digital control input pins, a cutting-edge design circuitry is implemented to minimize the quiescent current while also achieving top-class power conversion performance at light output current.

The ST1PS0X family includes the ST1PS01 step-down regulator, available in a tiny Flip-Chip package (1.11 x 1.41 mm, 400  $\mu\text{m}$  pitch) for space-constrained applications, and the ST1PS02, that comes in a thin TQFN12 plastic package (2.0 x 1.7 mm, 400  $\mu\text{m}$  pitch) with an auxiliary output voltage pin.

## Application Schematics



## ST1PS01 Product Table

| Order Codes | Output voltage                  | Eval-Board order code |
|-------------|---------------------------------|-----------------------|
| ST1PS01AJR  | 1.9 V, 2.0 V, 2.1 V, 2.8 V      | STEVAL-1PS01AJR       |
| ST1PS01DJR  | 1.8 V, 2.3 V, 2.5 V, 2.8 V      | STEVAL-1PS01DJR       |
| ST1PS01EJR  | 1.8 V, 2.7 V, 3.0 V, 3.3 V      | STEVAL-1PS01EJR       |
| ST1PS01BJR  | 1.1 V, 1.2 V, 1.5 V, 1.7 V      | -                     |
| ST1PS01CJR  | 1 V, 1.2 V, 1.3 V, 1.5 V        | -                     |
| ST1PS01FJR  | 1.05 V, 1.25 V, 1.35 V, 1.55 V  | -                     |
| ST1PS01GJR  | 0.73 V, 0.8 V, 0.9 V, 1.0 V     | -                     |
| ST1PS01HJR  | 1.05 V, 0.90 V, 0.70 V, 0.625 V | -                     |

## ST1PS02 Product Table

| Order Codes     | Output voltage                | Output discharge |
|-----------------|-------------------------------|------------------|
| ST1PS02AQTR     | 1.40 V to 1.75 V, 50 mV steps | Yes              |
| ST1PS02A1QTR    |                               | No               |
| ST1PS02BQTR (*) | 1.8 V to 2.5 V, 100 mV steps  | Yes              |
| ST1PS02B1QTR    |                               | No               |
| ST1PS02CQTR     | 2.6 V to 3.3 V, 100 mV steps  | Yes              |
| ST1PS02C1QTR    |                               | No               |
| ST1PS02DQTR     | 1.0 V to 1.35 V, 50 mV steps  | Yes              |
| ST1PS02D1QTR    |                               | No               |

(\*) Eval-Board code: STEVAL-1PS02B



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