

High-speed response hysteretic control DC-DC converter LSI series developed by Panasonic

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Panasonic develops high-speed response hysteretic control DC-DC converter LSI series

Panasonic Corporation has successfully developed a new high-speed response hysteretic control DC-DC converter LSI series. The new LSI chips are well suited for applications which require fast load transient responses at high efficiencies. With a wide output-voltage range, these new DC-DC converter chips are tailored to meet various output requirements. The sample shipments will begin in January, 2011.

The DC-DC converters are designed to operate at high-frequencies leading to faster load transient responses, easily meeting the requirements for the highly integrated and low voltage operations of the memory and the CPU. The [high frequency](#) operation also helps in

minimizing the value constants of the external components, reducing their size and reducing the number of components used and provides more compact system solutions.

This product has the following features:

1. Fast load transient response with suppressed output voltage fluctuations.

- Undershoot: 20mV 51% reduction
- Overshoot: 20mV 44% reduction

This allows stable operation of the product and a large input voltage range margin.

2. Stable operation even when the input voltage drops to as low as the output-voltage. This enables the maximum effective usage of the battery.

3. Mount area reduction by the use of smaller package, smaller value constants and reduced total number of external components provide compact system solutions.

- Mount area: about 33% reduction.

This product was achieved by the following technologies:

1. Practical application of the hysteretic control system with PWM On-time/Off-time control technology has enabled the development of high-speed load transient responses.

2. Development of an on-time-extension circuit technology to create an always-on-state of the output transistor (100% duty mode). Thus at the 100% duty mode the input voltage equals the output voltage. The use of conventional technology in designing the output transistor limits the output voltage control to 80% or less.

3. Integration of a high-speed switching operation (3MHz) technology reduces the value constants of external components used (inductor and capacitor) to design the DC-DC converter LSI.

Implementation of finer processes and lower [voltage](#) design of the memory and the CPU have led to the necessity of designing DC-DC converters with fast load transient response.

Existing voltage-mode control and current-mode DC-DC converters have difficulties corresponding to fast load transient response.

Source: Panasonic

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