
PRODUCT INFORMATION

Vol. 73

Composite Devices for Use in DC-DC Converters Developed

Newly-developed Schottoky barrier diode incorporated to achieve increased efficiency

CPH5701, CPH5704, CPH6702

Overview

The market for portable equipment such as notebook personal computers, digital still cameras, and camcorders continues to grow rapidly. Not only are increased functionality and improved performance desired in these products, but there are also strong demands for even further miniaturization and reduced power consumption. Miniaturization and increased efficiency in the DC-DC converters used in this equipment are necessary to respond to these needs for further miniaturization and reduced power consumption, and the demands for these are unceasing.

Miniaturization and improved performance in the Schottoky barrier diodes and bipolar transistors are the key to miniaturization in DC-DC converters.

Based on Sanyo's basic transistor concept, "Light weight, fast, energy-saving, and environmentally-considered," Sanyo has optimized the Schottoky barrier metal formation process, the silicon material epitaxial formation conditions, and the impurities distribution profile. This has allowed Sanyo to succeed in developing a Schottoky barrier diode based on the LOW-VF-II structure that achieves the industry's lowest forward voltage of 0.3 V (typical). Furthermore, Sanyo has combined this device with a Sanyo bipolar transistor developed in March of this year that achieves the industry's highest collector-emitter saturation voltage performance and has packaged these two devices in the CHP miniature multi-pin package. Thus Sanyo has succeeded in developing a composite device for use in DC-DC converters that achieves both miniaturization and improved performance.

By developing this new combined device, DC-DC converter loss can be improved by 10 to 20% over circuits using earlier Sanyo products. Furthermore, the use of this composite device can reduce the mounting area by about 1/2 while maintaining essentially equivalent characteristics when used to replace individual Schottoky barrier diodes and transistors. Thus this product can contribute to miniaturization and improved performance in DC-DC converters.

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Features

- The built-in Schottoky barrier diode provides a V_F of 0.3 to 0.35 V (typical), which corresponds to the industry's lowest- V_F performance.
- DC-DC converter loss can be reduced by 10 to 20% as compared to circuits using earlier Sanyo products.
- As compared to circuits using individual devices, this product achieves a mounting area reduction of about 1/2, and thus can contribute to DC-DC converter miniaturization.

Specifications

Type No.	Package	Rating				Electrical characteristics				
		Tr		SBD		V_{CE} (sat)		V_F		
		V_{CEO} (V)	I_C (A)	V_{RRM} (V)	I_O (A)	Max. (mV)	Condition (I_C/I_B)	Typ. (V)	Max. (V)	IF condition (A)
CPH5701	CPH5	-12	-3.0	15	1.0	-165	-1.5 A/-30 mA	0.30	0.35	0.5
CPH5704	CPH5	15	3.0	15	1.0	150	1.5 A/30 mA	0.30	0.35	0.5
CPH6702	CPH6	-15	-1.5	30	0.7	-180	-0.75 A/-15 mA	0.35	0.40	0.3

The minus symbol (-) indicates a pnp transistor.

Applications

- DC-DC converters for digital still cameras, digital camcorders, MD players, PDAs, and other miniature portable equipment.

Sample Availability

Samples of the CPH5701, CPH5704 and CPH6702 are available in January 1999; production quantities of the CPH5701, CPH5704 and CPH6702 will be anticipated in June 1999.

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