

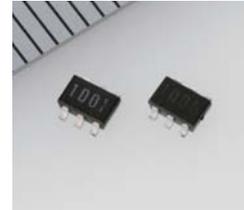
16V Input Step-Down DC/DC Converters

XC9246/XC9247 Series

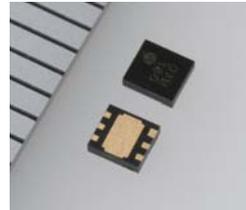


The XC9246/XC9247 series is a 16V operation step-down DC/DC converter with an internal driver transistor. Chip area is reduced by making the High-side driver an N-ch type using the bootstrap method, enabling the ICs to be housed in the small SOT-26W or USP-6C package.

The switching frequency is a high 1.2MHz and ceramic capacitors are supported, allowing small peripheral components to be used. Including the package, less mounting area is needed, making these ICs ideal for space-saving applications such as the expansion of a local power supply or the replacement of a 3-pin regulator as an efficiency/thermal measure.



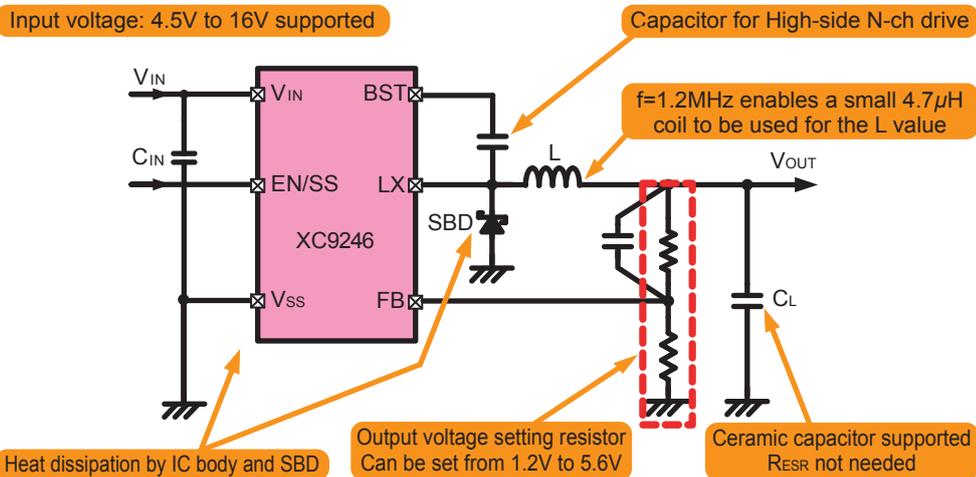
SOT-26W



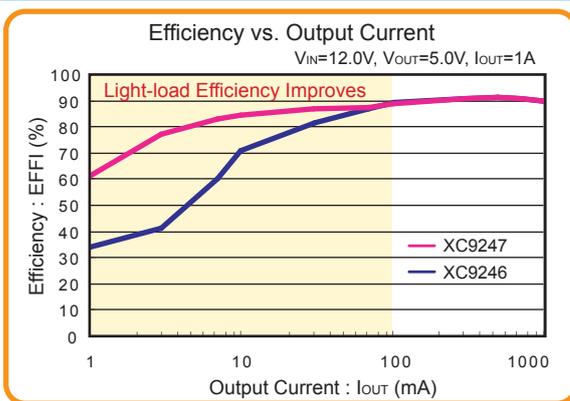
USP-6C



A ceramic capacitor can be used for the load capacitance



PFM control improves the efficiency of 1mA to 100mA loads



The XC9247 with internal PWM/PFM control switches to current limit PFM operation when the load condition is $I_{OUT}=100\text{mA}$ or less, and the IC supply current is held down by slowing the IC switching frequency to less than 1.2MHz to achieve high efficiency. Ideal for applications that require power saving at light loads.

* The PWM/PFM automatic switching point varies depending on the components used and usage conditions.

Features			
Input Voltage Range	4.5V~16V (range varies depending on UVLO voltage)	Maximum Duty Cycle	80%
Output Voltage Range	1.2V ~ 5.6V by means of reference voltage supply of $1.0\text{V} \pm 1.5\%$	Soft Start	Internal Setting 1.5ms (can be extended by external RC)
	Can be set using an external resistor	Control Methods	PWM (XC9246)
Output Current	1A ($V_{IN} \geq 6\text{V}$ and V_{OUT}/V_{IN} ratio of 50% or less)	Protection Circuits	PWM/PFM Auto (XC9247)
	1A ($V_{IN} < 6\text{V}$ and V_{OUT}/V_{IN} ratio of 40% or less)		Current Limiter Circuit (Integral Latch)
Efficiency	90% ($V_{IN}=12\text{V}$ $V_{OUT}=5\text{V}$ $I_{OUT}=200\text{mA}$)		Thermal Shutdown
Oscillation Frequency	1.2MHz	Packages	SOT-26W, USP-6C



16V Input Step-Down DC/DC Converters XC9246/XC9247 Series



Diverse functions in a small package

Although the XC9246/XC9247 series are 6-pin ICs, all step-down DC/DC functions are incorporated, including soft start, over-current protection (integral latch), and short-circuit protection.

Soft start

Limits rush current and output voltage overshoot when starting. The soft start time is fixed internally at 1.5ms. An external CR can be connected to extend the time as desired.

Smooth start

Over current protection function

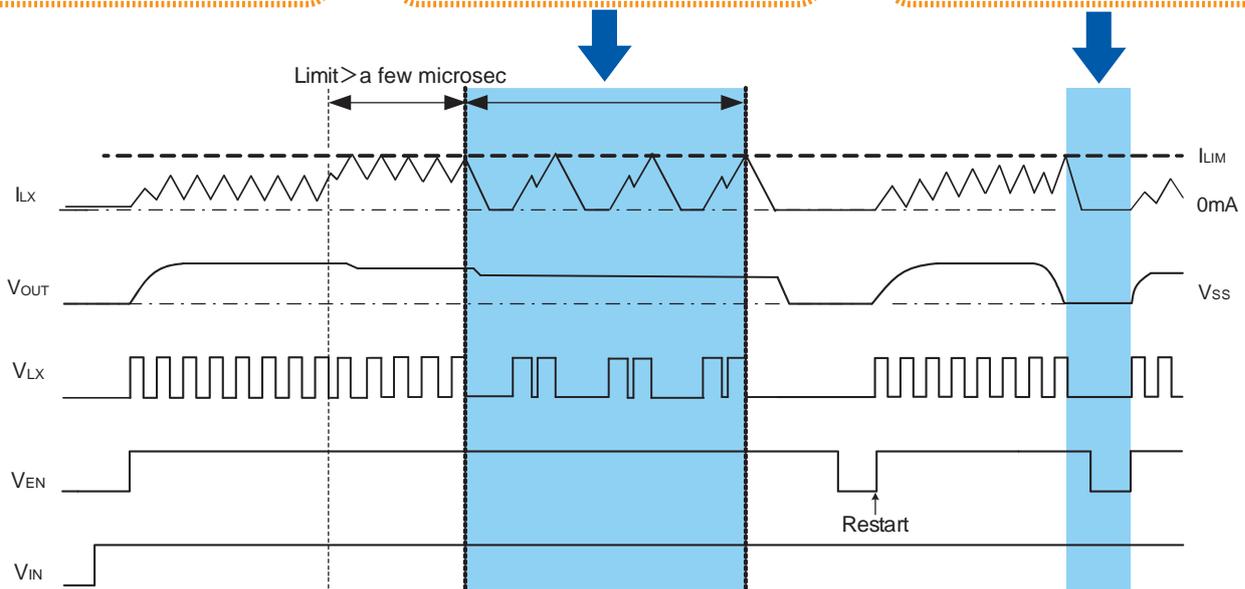
Monitors the coil current and limits excessive current. If the over current state continues for 1.2ms (TYP.), a latch function keeps the driver OFF. (Released by EN restart.)

Over current prevention

Short circuit protection

If the output shorts, the FB pin voltage drops to 1/2 or less of the internal reference voltage, and an over current state is detected, a latch immediately activates and keeps the driver OFF. (Released by EN restart.)

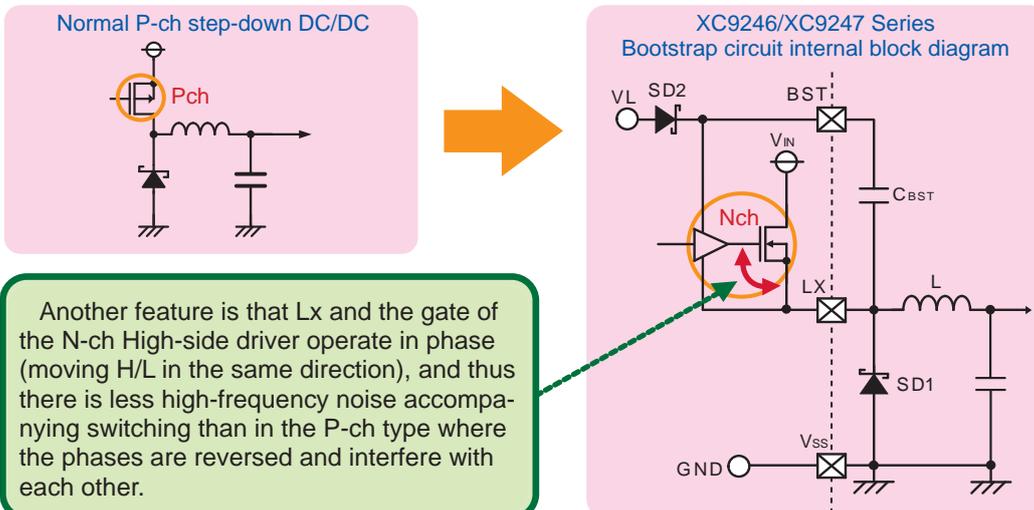
Handles sudden changes



Technology column

The internal LDMOS N-ch driver of the XC9246/XC9247 series enables the area to be 1/3 or less the area of a normal P-ch driver type at the same on-resistance. This makes it possible to use a small package even though the driver is a low on-resistance driver.

If the N-ch driver is used for High-side, it is necessary to drive the gate of the N-ch driver at a higher voltage than the Lx pin. The XC9246/XC9247 series incorporates a bootstrap step-up circuit, and the external CBST is the charge pump capacitor for this circuit.



Another feature is that Lx and the gate of the N-ch High-side driver operate in phase (moving H/L in the same direction), and thus there is less high-frequency noise accompanying switching than in the P-ch type where the phases are reversed and interfere with each other.

