



# XC9276 Series

## 200 nA Current Consumption with Output Voltage Selectable Function Miniaturized Ultra-low Power DC/DC Converter

**TOREX**  
New Product Leaflet

※The XC9276 has won the ECCJ Chairman's Award  
in the Product & Business Model Category at the 2020 Energy Conservation Grand Prize.

### Point

1. The current consumption of the XC9276 series is as low as 200 nA, Significantly contributes to efficiency at  $I_{OUT} = 100\mu\text{A}$  or less
2. Adding output voltage switching function ( $V_{SET}$  function) in order to save battery life
3. Small mounting area achieved from space saving and lower profile



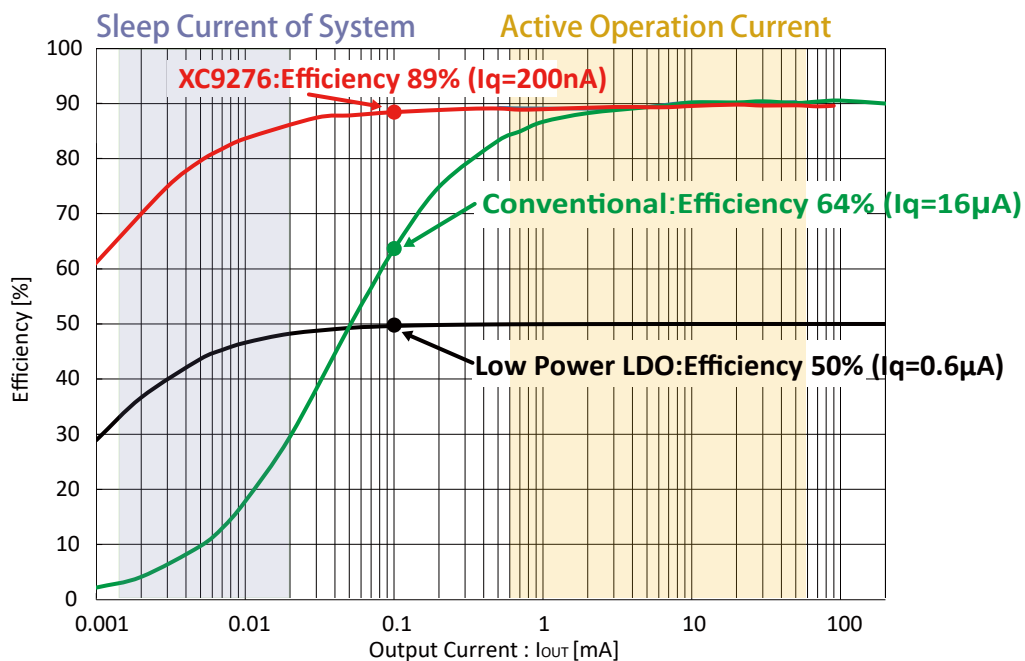
### Achieved world's highest efficiency at $I_{OUT} = 100\mu\text{A}$ or less

The current consumption of the XC9276 series is 200nA, which is 1/98 of the current consumption of general DC/DC. This current consumption of 200nA achieves high efficiency at  $I_{OUT} = 100\mu\text{A}$  or less.

For a long time sleep mode devices such as IoT devices and wearable devices. The efficiency at  $I_{OUT} = 100\mu\text{A}$  becomes important. And the XC9276 series can make a significant contribution for it.

#### Efficiency-Output Current

Measurement Condition :  $V_{IN}=3.6\text{V}$  ,  $V_{OUT}=1.8\text{V}$



#### Features

Input Voltage Range	1.8V ~ 6.0V	Function	Output Voltage Selectable Function
Output Voltage Setting	0.6V ~ 3.6V (0.05V Step)		$C_L$ Discharge(D Type)
Output Voltage Accuracy	$\pm 20\text{mV}$ ( $V_{OUT1,2} \leq 1.0\text{V}$ )	Protection Functions	UVLO
	$\pm 2.0\%$ ( $V_{OUT1,2} > 1.0\text{V}$ )		Short Protection
Output Current	150mA	Packages	WLP-6-03 (1.72 x 1.07 x 0.33mm)
Supply Current	200nA@ $V_{OUT}=1.8\text{V}$		USP-8B06 (2.0 x 2.0 x 0.33mm)
Control Method	PFM Control		SOT-26W (2.8 x 2.9 x 1.3mm)
Efficiency	89.6% ( $V_{IN}=3.6\text{V}$ , $V_{OUT}=1.8\text{V}$ , $I_{OUT}=10\text{mA}$ )	Operating Temperature	-40°C ~ +85°C
Input / Output Capacitor	Ceramic Capacitor Compatible	Environmentally	EU RoHS compliant, Pb Free



www.torex.co.jp

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●The contents are subject to change without notice.

## 200nA Current Consumption with Output Voltage Selectable Function

## XC9276 Series

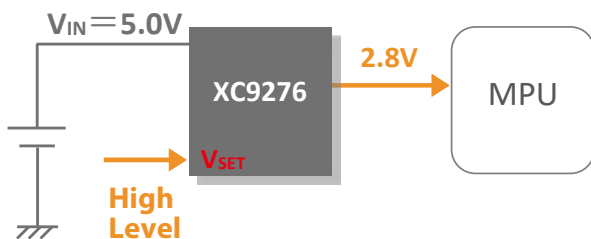
### Miniaturized Ultra-low Power DC/DC Converter



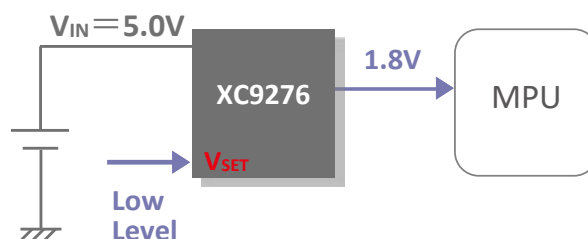
## Further Battery Life Improvement by Switching Output Voltage

There are two approaches to improve battery life, "Improving the efficiency of power supply IC's" and "Reducing the power consumption of the system by lowering the output voltage". With the XC9276 series, the output voltage switching function allows you to select the optimal output voltage according to the system operating state. By utilizing this function, the output voltage can be reduced during sleep, which significantly reduces standby power consumption and significantly improves the battery life of electronic devices.

### <MPU : Active Mode>



### <MPU : Sleep Mode>



#### Test Condition

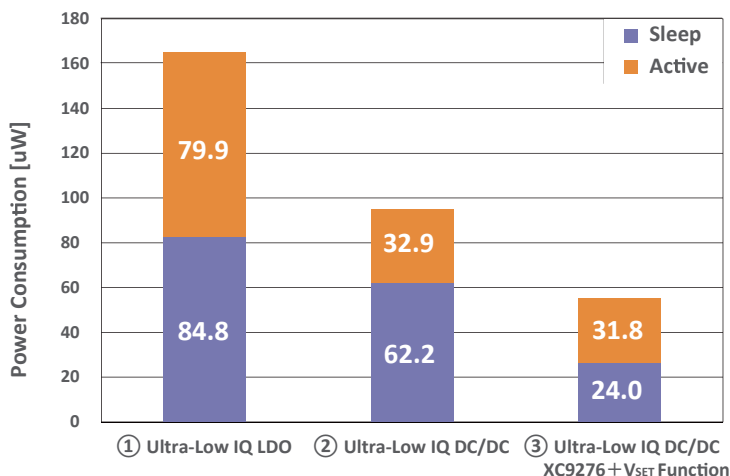
$V_{IN} = 5V \rightarrow V_{OUT} = 2.8V$

**XC9276**  $\rightarrow V_{OUT} = 2.8V(\text{Active})/1.8V(\text{Sleep})$

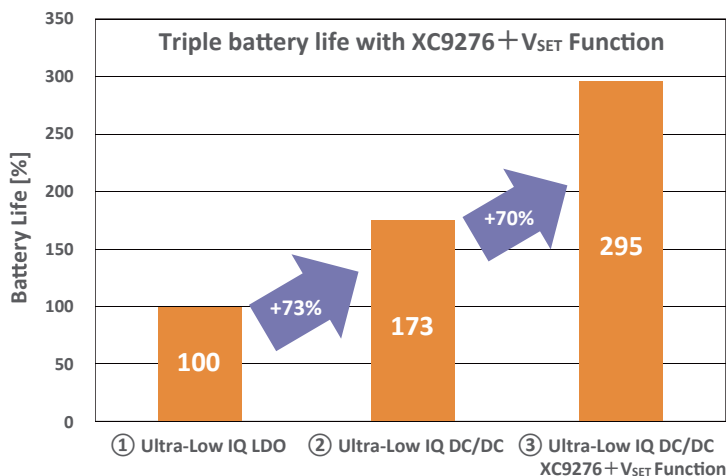
$I_{OUT}(\text{Active}) = 10mA@1ms$

$I_{OUT}(\text{Sleep}) = 10\mu A@1s$

### Active / Sleep Loss



### Battery Life (Comparison with ① = 100)

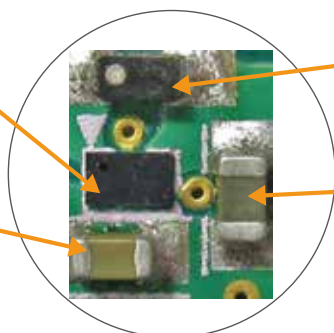


## Realizes Space Saving and Low Profile of Mounting Area

- External coil is 2.2uH, small and low-profile coil can be selected.
- 0.33mm (MAX) height WLP-6-03 and USP-8B06 are available.

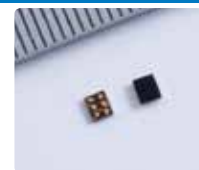
✓ Package Size  
1.7 x 1.07mm !

✓ Input Capacitor Size  
1.6 x 0.8mm !

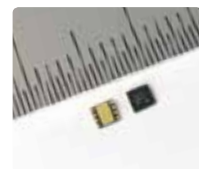


✓ Coil Size  
1.6 x 0.8mm !

✓ Output Capacitor Size  
1.6 x 0.8mm !



WLP-6-03  
(1.72 x 1.07 x 0.33mm)



USP-8B06  
(2.0 x 2.0 x 0.33mm)

Mounting Area : 13.43mm<sup>2</sup>

