



ACE7059YC

Synchronous Boost Converter with Ultra-Low Quiescent Current

Description

ACE7059YC is a synchronous boost converter with 1 μ A ultra-low quiescent current. It can operate efficiently under light load conditions, which is essential to prolong the service life of batteries. ACE7059YC boost converter adopts hysteresis control topology, which can achieve the highest efficiency with the lowest quiescent current. The device consumes only 1 μ A quiescent current under light load. ACE7059YC can also provide Down mode and Pass-through mode for different applications. In Down mode, even if the input voltage is higher than the output voltage, the output voltage can be adjusted as the target value. In Pass-through mode, the output voltage varies with the input voltage. When $V_{IN} > V_{OUT} + 0.5V$, ACE7059YC exits the Down mode and transfers to Pass-through through mode. ACE7059YC can disconnect the load from the input power supply when it is disabled, thus realizing the real shutdown, thus reducing the current consumption.

Features

- Ultra-Low quiescent current (VOUT Pin): 600nA
- Ultra-Low quiescent current (VIN Pin): 400nA
- Operating input voltage range: 0.9V to 5.5V
- Adjustable output voltage range: 1.8V to 5.5V
- Up to 93% efficiency from 10mA to 300mA Load
- Switch peak current limit
- Regulated output voltage in down mode
- True disconnection during shutdown
- Available Package: CSP-6, DFN2*2-6L and SOT-23-6

Applications

- Memory LCD bias
- Optical heart rate monitor LED bias
- Portable products
- Battery powered systems
- Low power wireless applications
- Wearable applications



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Absolute Maximum Ratings ⁽¹⁾

Symbol	Parameter	Ratings	Units
	Voltage Range at Terminals ⁽²⁾ (VIN, SW, VOUT, FB, EN)	-0.3 to 6.0	V
TJ	Operating Junction Temperature	-40 to 150	°C
TSTG	Storage Temperature	-65 to 150	°C
R _{θJA}	Junction-to-Ambient Thermal Resistance	CSP-6	134.4 °C/W
		DFN2*2-6L	71.7 °C/W
		SOT-23-6	150 °C/W
ESD	Human Body Model (HBM)	±2000	V
	Charged Device Model (CDM)	±500	V

Note:

(1). Stresses beyond those listed under the Absolute Maximum Rating table may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

(2). All voltage values are with respect to network ground terminal.

Recommend Operating Conditions

Symbol	Parameter	Min.	Typ.	Max.	Units
VIN	Input Voltage Range	0.9		5.5	V
VOUT	Output Voltage Range	1.8		5.5	V
L	Inductor	0.7	2.2	2.86	μH
CIN	Input Capacitor	1.0	10		μF
COUT	Output Capacitor	10	20	100	μF
TJ	Operating Virtual Junction Temperature	-40		125	°C

Note:

(1). Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications. ACE does not recommend exceeding them or designing to absolute maximum ratings



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Notes

ACE does not assume any responsibility for use as critical components in life support devices or systems without the express written approval of the president and general counsel of ACE Technology Co., LTD. As used herein:

1. Life support devices or systems are devices or systems which, (a) are intended for surgical implant into the body, or (b) support or sustain life, and whose failure to perform when properly used in accordance with instructions for use provided in the labeling, can be reasonably expected to result in a significant injury to the user.
2. A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system, or to affect its safety or effectiveness.