# ACE7B4010X

## 5V/500mA Buck-Boost Converter with I²C Control

### Description

The ACE7B4010X is a compact, fully integrated and high efficiency Buck-Boost converter for loading less than 500mA. It can operate at an input voltage range of 2.7 – 5.5V. And its output voltage can be programmed through I²C from 1.8V to 5.2V. ACE7B4010X employs a proprietary 4-cycle control scheme to achieve a high efficiency conversion in all stages of operation, input voltage is higher, lower or close to output voltage, and keep the transition between each mode smoothly. It also maintains a low 20μA operation current during zero load. With a standard I²C interface, one can set the output voltage at any level between 1.8V and 5.2V. In addition, a VSEL pin with high / low digital input is provided for user to switch output voltage much faster given the voltage setting stored in the register corresponding to VSEL=1 and 0 respectively. ACE7B4010X is housed in a DFN2*2-10L package, together with a tiny inductor and 2 capacitors, it provides an extreme compact solution for a programmable power system.

### Features

- Input operation range: 2.7V~5.5V
- I²C setting output voltage range: 1.8V~5.2V
- 20μA quiescent current in operation
- Output current up to 500mA
- Efficiency up to 94%
- OCP and OTP protection

### Application

- Sensors
- LED flashlight
- Power line communication
- Powering MCU for general purpose
- Power supply with envelop tracking
- TWS battery case
- Battery case for other portable smart devices

## Absolute Maximum Ratings

| Parameter | | | Value |
|---|---|---|---|
| $V_{IN}$ (1) | | | -0.3V to 6.0V |
| $V_{OUT}$ (1) | | | -0.3V to 5.5V |
| Continuous Power Dissipation ($T_A$ = 25°C) (2) | | DFN2*2-10L | 0.5W |
| Junction Temperature | | | -40°C to 125°C |
| Lead Temperature | | | 260°C |
| Storage Temperature | | | -65°C to 150°C |
| Thermal Resistance (3) | DFN2*2-10L | $\theta_{JA}$ | 125 °C/W |
| | | $\theta_{JC}$ | 10 °C/W |

Note:

(1). Exceeding these ratings may damage the device.

(2). The maximum allowable power dissipation is a function of the maximum junction temperature $T_J$(MAX), the junction-to-ambient thermal resistance $\theta_{JA}$, and the ambient temperature $T_A$. The maximum allowable continuous power dissipation at any ambient temperature is calculated by $P_D$(MAX)=($T_J$(MAX)-$T_A$)/$\theta_{JA}$. Exceeding the maximum allowable power dissipation will cause excessive die temperature, and the regulator will go into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage.

(3). Measured on JESD51-7, 4-layer PCB.

## Ordering Information

ACE7B4010X XX + H

- Halogen - free
- Pb - free
- DJ: DFN2*2-10L

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 sued 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 shoes 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.