



# ACE7084D

## Low Quiescent Current, PFM/PWM Synchronous Boost Regulator with True Output Disconnect or Input/ Output Bypass Option

### Description

The ACE7084D is a compact, high-efficiency, fixed frequency, synchronous step-up DC-DC converter. This family of devices provides an easy-to-use power supply solution for applications powered by either one-cell, two-cell or three-cell alkaline, NiCd, NiMH, one-cell Li-Ion or Li-Polymer batteries. A low-voltage technology allows the regulator to start up without high inrush current or output voltage overshoot from a low voltage input. High efficiency is accomplished by integrating the low-resistance N-Channel boost switch and synchronous P-Channel switch. All compensation and protection circuitry are integrated to minimize external components. ACE7084D operates and consumes less than 14  $\mu\text{A}$  from battery, while operating at no load ( $V_{\text{OUT}} = 3.3\text{V}$ ,  $V_{\text{IN}} = 1.5\text{V}$ ). The devices provide a true disconnect from input to output (ACE7084DGMA) or an input-to-output bypass (ACE7084DGMB), while in shutdown ( $\text{EN} = \text{GND}$ ). Both options consume less than 0.6  $\mu\text{A}$  from battery. Output voltage is set by a small external resistor divider.

### Features

- Up to 96% Typical Efficiency
- 1.0A Typical Peak Input Current Limit:
  - $I_{\text{OUT}} > 200 \text{ mA @ } 3.3\text{V } V_{\text{OUT}}, 1.2\text{V } V_{\text{IN}}$
  - $I_{\text{OUT}} > 400 \text{ mA @ } 3.3\text{V } V_{\text{OUT}}, 2.4\text{V } V_{\text{IN}}$
  - $I_{\text{OUT}} > 400 \text{ mA @ } 5.0\text{V } V_{\text{OUT}}, 3.3\text{V } V_{\text{IN}}$
- Low Device Quiescent Current:
  - Output Quiescent Current:  $< 4 \mu\text{A}$  typical, device is not switching ( $V_{\text{OUT}} > V_{\text{IN}}$ , excluding feedback divider current)
  - Input Sleep Current: 1  $\mu\text{A}$
  - No Load Input Current: 14  $\mu\text{A}$  typical
- Shutdown Current: 0.6  $\mu\text{A}$  typical
- Low Start-up Voltage: 0.82V, 1 mA load
- Low Operating Input Voltage: down to 0.65V
- Adjustable Output Voltage Range: 1.8V to 5.5V
- Maximum Input Voltage:  $V_{\text{OUT}} < 5.5\text{V}$
- Automatic PFM/PWM Operation:
  - PWM Operation: 500 KHz
  - PFM Output Ripple: 150 mV typical
- Feedback voltage: 1.215V
- Internal Synchronous Rectifier
- Internal Compensation
- Inrush Current Limiting and Internal Soft Start (1 ms typical)



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- Selectable, Logic Controlled, Shutdown States:  
True Load Disconnect Option (ACE7084DGMA)  
Input to Output Bypass Option (ACE7084DGMB)
- Anti-Ringing Control
- Over temperature Protection
- Output Short Protection

### Application

- One, Two and Three Cell Alkaline and NiMH/NiCd Portable Products
- Solar Cell Applications
- Personal Care and Medical Products
- Bias for Status LEDs
- Smartphones, MP3 Players, Digital Cameras
- Remote controllers, Portable Instruments
- Wireless Sensors
- Bluetooth Headsets
- 3.3V to 5.0V Distributed Power Supply

### Absolute Maximum Ratings (Ta=25°C, unless otherwise specified)

Parameter	Symbol	Ratings	Units
Input Voltage	V <sub>IN</sub>	-0.3~6	V
SW Voltage		-0.3~6	V
CE, FB Voltage		-0.3~6	V
Output Voltage	V <sub>OUT</sub>	-0.3~6	V
Output Current Bypass Mode		1000	mA
Power dissipation	P <sub>D</sub>	Internally Limited	mW
Ambient Temp. with Power Applied	T <sub>opr</sub>	-40 ~85	°C
Operating Junction Temperature	T <sub>stg</sub>	-40 ~125	°C
Soldering Temperature	T <sub>solder</sub>	-65 ~150	°C
ESD rating	Human Body Model -(HBM)	4	KV
	Machine Model- (MM)	200	V

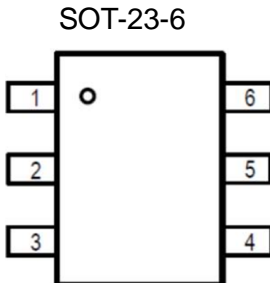
Notice: Stresses above those listed under “Maximum Ratings” may cause permanent damage to the device. This is a stress rating only and functional operation of the device at those or any other conditions above those indicated in the operational sections of this specification is not intended. Exposure to maximum rating conditions for extended periods may affect device reliability.



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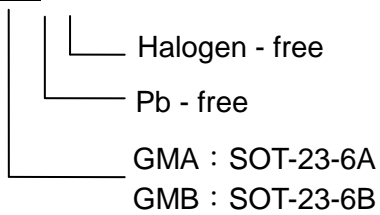
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## Packaging Type



## Ordering Information

ACE7084D XXX + H





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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 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 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.

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