



ACE7081U

600mA, 500KHz Synchronous Step-Up DC/DC Converter

Description

The ACE7081U is synchronous rectified, fixed frequency, step-up DC/DC converter series delivering high efficiency in low profile SOT23-6 package. It features true output load disconnection and adjustable output. With an internal NMOS switch, PMOS synchronous rectifier and high switching frequency of 500KHz, the ACE7081U is capable of supplying 3.3V output at 100mA from a single AA cell input or 250mA from a 2-cell AA input using low profile inductors and ceramic capacitors. Current mode PWM control with internal compensation as well as the synchronous rectifier and 500KHz high frequency lead to the fewest number of external parts needed, thereby saving BOM cost and PCB area. At light load, ACE7081U automatically enters into pulse skipping mode to keep high efficiency. An internal resistor will be connected to V_{IN} when the switch is idle that eliminates switch ringing and reduces EMI interference. The device also features low shutdown current lower than $1\mu A$, inrush current limit.

Features

- Up to 92% Efficiency
- Output Load Disconnection
- Internal Synchronous Rectifier
- Low Voltage Start-Up: 0.85V
- Input Current Limit
- Pulse Skipping Mode Operation with Typical I_Q as $20\mu A$
- Shutdown Current Lower than $1\mu A$
- 500KHz Switching Frequency for Low Profile Inductor/Capacitor
- Input Voltage: 0.5V to 5.0V
- Output Voltage: 2.5V to 5V
- Anti-Ringing Control to Reduce EMI

Application

- Digital Cameras
- LCD Bias Supplies
- Handheld Instruments
- Wireless Handsets
- GPS Receivers
- All one cell 、 tow cell alkaline NiCD 、 NiMH or Li-ion battery Powered products



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Absolute Maximum Ratings

Symbol	Parameter	Value	Unit
V_{IN}	V_{IN} Supply Voltage	-0.3 to 6V	V
V_{SW}	SW Voltage	-0.3 to 6V	V
I_{FB}	FB Voltage	-0.3 to 6V	V
V_{SHDN}	SHDN Voltage	-0.3 to 6V	V
V_{OUT}	Output Voltage	-0.3 to 6V	V
T_{OP}	Operating Temperature Range	-40 to 85	°C
T_{STG}	Storage Temperature Range	-65 to 150	°C
T_L	Maximum Lead Temperature (Soldering, 10s)	260	°C

Note 1: Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

Symbol	Parameter	Value	Unit
P_D	Power Dissipation at $T_A = 25^\circ\text{C}$	0.657	W
	Power Dissipation at $T_A = 70^\circ\text{C}$	0.421	
θ_{JA}	Package Thermal Resistance (Note 3)	190	°C/W
T_J	Operating Junction Temperature	150	°C
T_{STG}	Storage Temperature Range	-65 to 150	°C
T_L	Maximum Lead Temperature for Soldering 10 seconds	260	°C

Note 2: Junction to Ambient thermal Resistance is highly dependent on PCB layout.

Note 3: θ_{JA} is measured in the convection at $T_A=25^\circ\text{C}$ (or $T_A=70^\circ\text{C}$) on a High effective thermal conductivity test board of JESD51-7 thermal measurement standard

Note 4: The maximum recommended junction temperature (T_J) of the ACE7081U is 150°C , the thermal resistance of the ACE7081U is $R_{\theta JA}=190^\circ\text{C/W}$, specified regulator operation is assured to a maximum ambient temperature T_A of 25°C . there for the maximum power dissipation is calculated as below:

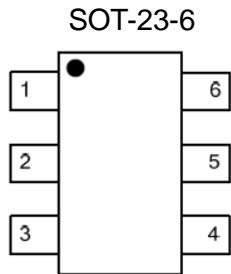
$$P_{D(MAX)} = \frac{T_J(max) - T_A}{R_{\theta JA}} = \frac{150 - 25}{190} = 0.657W$$



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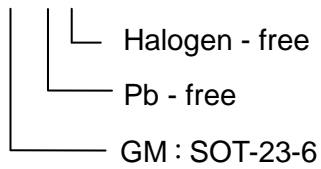
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Packaging Type



Ordering Information

ACE7081U XX + 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 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.

ACE Technology Co., LTD.
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