



ACE72606RT

Adj. Frequency, Asynchronous Buck DC/DC Converter

Description

The ACE72606RT is a 6A Asynchronous step-down DC-DC converter operating over a wide input voltage range of 5.8V to 60V and providing a regulated low output voltage. It integrates a 80mΩ high-side MOSFET for high-efficiency power conversion. The device utilizes peak current mode control with Pulse-Skipping Modulation (PSM) to maintain high efficiency under light-load and standby conditions. The switching frequency can be adjusted from 200kHz to 2.2MHz by setting an external resistor, allowing the system to be optimized for either high efficiency or a compact component footprint. The converter efficiently steps down a high input voltage to a low output voltage while supporting a minimum high-side MOSFET on-time of 50ns. A fixed 4ms soft-start time limits inrush current during output voltage startup, and the device supports monotonic startup with a pre-biased output. Comprehensive protection features include cycle-by-cycle current limit, hiccup-mode over current protection, thermal shutdown, output over voltage protection, and input under voltage protection.

Features

- Integrated 85mΩ High-Side MOSFET
- Adjustable switching frequency: 200kHz to 2.2MHz
- Ultra Low Quiescent Current: 15μA (RTOP 1MΩ)
- Shutdown Current: 1μA
- Wide Input Voltage Range: 5.8V to 60V
- Continuous Output Current: Up to 6A
- FB Tolerance: $\pm 2\%$ over Full Temperature Range
- Minimum On time: 50ns (Typ.)
- Output Soft-Start: 4ms
- Pulse Skipping Mode (PSM) in Light Load
- Linear increase in frequency during startup
- Monotonic Start up with Pre-biased Output
- Hiccup Mode for Output Over current Protection
- Over-voltage and Over-Temperature Protection
- Peak current mode control
- Precision Enable Threshold for Programmable Input voltage under-voltage lockout (UVLO) Threshold and Hysteresis
- Available in ESOP-8 package

Application

- Industrial Automation and Motor Control
- Vehicle Accessories
- 12V, 24V, 48V Industry and Telecom Power Systems



ACE72606RT

Adj. Frequency, Asynchronous Buck DC/DC Converter

Absolute Maximum Ratings ^(Note)

Item	Min	Max	Unit
VIN, EN	-0.3	65	V
BOOT	-0.3	71	V
SW	-1	65	V
BOOT-SW	-0.3	6	V
VSUP, FB, RT	-0.3	6	V
Junction temperature	-40	150	°C
Storage temperature	-65	150	°C
Lead temperature (soldering, 10sec.)		260	°C

Note:

Stresses at or above those listed under Absolute Maximum Ratings may cause permanent damage to the product. This is a stress rating only; functional operation of the product at these or any other conditions above those indicated in the operational section of this specification is not implied. Operation beyond the maximum operating conditions for extended periods may affect product reliability.

Recommended Operating

Item	Min	Max	Unit
Operating Junction Temperature (TJ)	-40	125	°C
Continuous Supply Voltage (VIN)	5.8	60	V
Output Voltage (VOUT)	0.8	57	V
Load Current Range (IOUT)	0	6	A



ACE72606RT

Adj. Frequency, Asynchronous Buck DC/DC Converter

Thermal Information

Thermal performance is directly linked to printed circuit board (PCB) design and operating environment. Close attention to PCB thermal design is required.

Item (Note 1,2)	Description	Value	Unit
θ_{JA}	Junction-to-ambient thermal resistance	34	°C/W
θ_{JC}	Junction-to-case (top) thermal resistance	72	°C/W

Note:

- (1). The package thermal impedance is calculated in accordance to JESD 51-7.
- (2). Thermal Resistances were simulated on a 4-layer, JEDEC board.

ESD Ratings

Item	Description	Value	Unit
HBM	Human Body Model ANSI/ESDA/JEDEC JS-001-2024 Classification, Class: 2	±2000	V
CDM	Charged Device Mode ANSI/ESDA/JEDEC JS-002-2025 Classification, Class: C3	±2000	V
Latch-Up	JESD78F.02-2023 Temperature Classification, Class: I.A	±200	mA

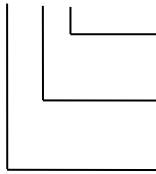


ACE72606RT

Adj. Frequency, Asynchronous Buck DC/DC Converter

Ordering Information

ACE72606RT XX + H



Halogen - free

Pb - free

I M: ESOP-8



ACE72606RT

Adj. Frequency, Asynchronous Buck DC/DC Converter

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 stated 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.
<http://www.ace-ele.com/>