ACE757P

1A Light Load Mode Buck Regulator with Integrated Inductor

Description

The ACE757Px (x = L or H) is a 1000mA PowerSOC. The ACE757Px integrates MOSFET switches, control, compensation, and the magnetics in an advanced 3mm x 3mm QFN Package.

Integrated magnetics enables a tiny solution footprint, low output ripple, low part-count, and high reliability, while maintaining high efficiency.

The complete solution can be implemented in as little as 21mm^2.

A proprietary light load mode (LLM) provides high efficiency in light load conditions.

The ACE757Px uses a 3-pin VID to easily select the output voltage setting. Output voltage settings are available in 2 optimized ranges providing coverage for typical V_{OUT} settings.

The VID pins can be changed on the fly for fast dynamic voltage scaling. ACE757PL further has the option to use an external voltage divider.

The ACE757Px offers the optimal combination of very small solution footprint and advanced performance features.

Features

- 1A PowerSoC
- Integrated Inductor Technology
- Total Solution Footprint < 21mm^2
- Low V_{OUT} ripple for RF compatibility
- High efficiency, up to 94%
- 1000mA continuous output current
- 55µA quiescent current
- Less than 1µA standby current
- 5 MHz switching frequency
- 3 pin VID for glitch free voltage scaling
- V_{OUT} Range 0.6V to V_{IN} – 0.5V
- Short circuit and over current protection
- UVLO and thermal protection
- IC level reliability in a PowerSOC solution

Application

- Portable wireless and RF applications
- Solid state storage applications
- Space constrained applications requiring high efficiency and very small solution size

Absolute Maximum Ratings

Symbol	Parameter	Min	Max	Unit
V_{IN}	Input Supply Voltage	-0.3	6.0	V
	Voltages on: ENABLE, V_{SENSE}, VSO – VS2	-0.3	VIN+ 0.3	V
	Voltages on: V_{FB} (ACE757PL)	-0.3	2.7	V
T_{J-ABS}	Maximum Operating Junction Temperature		150	°C
T_{STG}	Storage Temperature Range	-65	150	°C
	Reflow Temp, 10 Sec, MSL3 JEDEC J-STD-020C		260	°C
	ESD Rating (based on Human Body Mode)		2000	V

CAUTION: Absolute Maximum ratings are stress ratings only. Functional operation beyond the recommended operating conditions is not implied. Stress beyond the absolute maximum ratings may cause permanent damage to the device. Exposure to absolute maximum rated conditions for extended periods may affect device reliability.

Recommended Operating Range

Symbol	Items	Min	Max	Unit
V_{IN}	Input Voltage Range	2.4	5.5	V
T_A	Operating Ambient Temperature	- 40	85	℃
T_J	Operating Junction Temperature	- 40	125	℃

Thermal Characteristics

Parameter	Symbol	Typ	Units
Thermal Resistance: Junction to Ambient –0 LFM (Note 1)	θ_{JA}	80	°C/W
Thermal Overload Trip Point	T_{J-TP}	155	°C
Thermal Overload Trip Point Hysteresis		25	°C

Note 1: Based on a four layer copper board and proper thermal design per JEDEC EIJ/JESD51 standards

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 Electronics 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.