ACE5650Y

Ultra-Low Noise and High PSRR LDO

Description

The ACE5650Y is a 500 mA, ultra-high PSRR, ultra-low noise, high-accuracy, low-dropout CMOS linear regulator with high ripple rejection. Designed to meet the requirements of RF and analog circuits, this device consumes low quiescent current and provides fast line and load transient performance. The ACE5650Y is a flexible device by supporting an input voltage range from 1.7 V to 6.0 V. This device has a fixed output voltage option of 0.65 V to 5.0 V and an externally adjustable output range of 0.55 V to 5.5 V, making the device flexible for post-regulation. The ACE5650Y is designed to work with a 1 µF input and a 1 µF output ceramic capacitor, allowing for a small overall solution size. A precision band-gap and error amplifier provide a high-accuracy of ±1% (max) at 25°C.

Features

- Operating input voltage range: 1.7 V to 6.0 V
- Operating output voltage range:
  -Fixed option: 0.65 V to 5.0 V
  -Adjustable option: 0.55 V to 5.5 V
- Output current: 500 mA
- Output voltage accuracy: ±1% @ 25°C
- Power-good output options: Push-pull
- Stable with a 1 µF small case size ceramic capacitors
- Ultra-low quiescent current: 27 µA (typ)
- Shutdown current: 0.1 µA (typ)
- Low dropout at 3.3 V: 150 mV @ 500 mA
- Ultra-high PSRR: 64 dB @ 1 kHz (typ)
- Ultra-low noise: 40 µVRMS
- Available Package: DFN2*2-6L

Applications

- Wireless LAN devices
- Battery powered equipment
- Cameras, DVRs, STB and camcorders
- Smartphones, tablets

Absolute Maximum Ratings (1)

Symbol	Parameter	Ratings	Units
VIN	Input voltage	-0.3 to 6.6	V
VOUT	Output voltage	-0.3 to VIN + 0.3 (2)	V
VEN	Enable voltage	-0.3 to 6.6	V
VFB	Feedback voltage	-0.3 to 2.0	V
VPG	Power-good voltage	-0.3 to 6.6	V
IOUT	Output current	Internally limited	
IPG	Power-good current	-10 to 10	mA
TJ	Operating junction temperature	-40 to 150	°C
TSTG	Storage temperature	-65 to 150	°C

Note:

(1). Stresses beyond those listed under the Absolute Maximum Rating table may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other condition beyond those indicated in the operational sections of the specifications is not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability. ACE does not recommend exceeding them or designing to absolute maximum ratings.

(2). The absolute maximum rating is VIN + 0.3 V or 6.0 V, whichever is smaller.

Thermal Considerations (1)

Symbol	Parameter	Value	Units
$R_{\theta JA}$	Junction-to-ambient thermal resistance	102	°C/W
$R_{\theta JC}$	Junction-to-case thermal resistance	48	°C/W

Note:

(1). The thermal resistance determines the heat insulation property of a material. The higher the thermal resistance is, the lower the heat loss. Accumulation of heat energy degrades the performance of semiconductor components.

Recommend Operating Conditions (1)

Symbol	Parameter		Ratings	Units
VIN	Input voltage		1.7 to 6.0	V
VOUT	Output voltage	Adjustable only	0.55 to 5.5	V
		Fixed only	0.65 to 5.0	V
IOUT	Output current		0 to 500	mA
CIN	Input capacitor		≥ 1	µF
COUT	Output capacitor (2)		1 to 22	µF
CFF	Feed-forward capacitor		10	nF
VEN	Enable voltage		0 to 6	V
VPG	PG voltage		0 to 6	V
TJ	Junction operating temperature		-40 to 150	°C
ESD	Human-body model		±4000	V
	Charged-device model		±2000	V

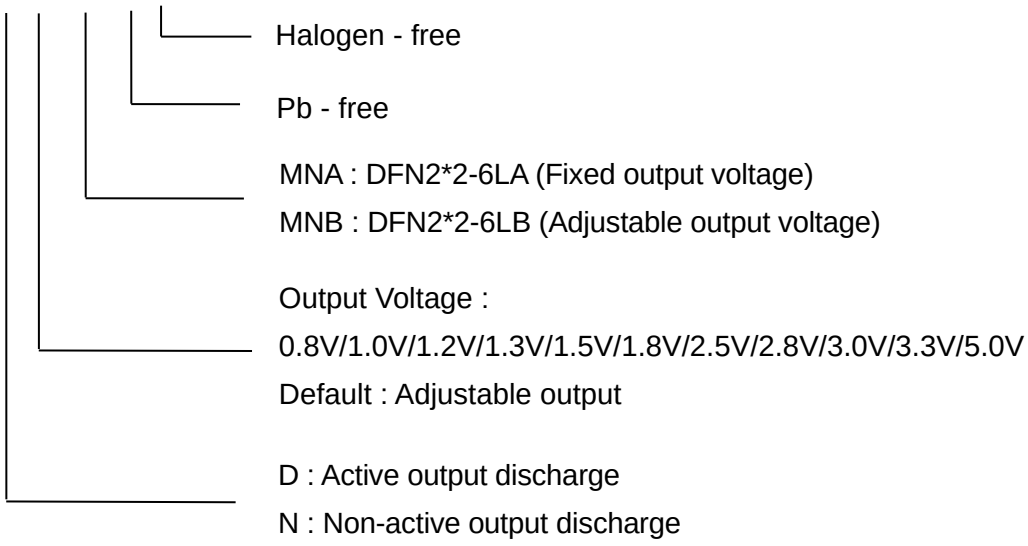
Note:

(1).The Recommended Operating Conditions table defines the conditions for actual device operation. Recommended operating conditions are specified to ensure optimal performance to the datasheet specifications.

(2). Minimum derated capacitance of 0.47 µF is required for stability.

Ordering Information

ACE5650Y XX X XXX + H



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.

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