

2.5V or Adjustable, No Output Cap, Low Dropout Regulator

Preliminary Design Specification

Revision 0.5, May 2, 2003

General Description

The Quik LDO™ AQT104 is a low dropout regulator that requires no external output capacitor for stability and it is stable with any capacitive load. It offers 0.5 Ohms pass device with 500mA load current. Its output voltage is preset to values between 2V and 3.3V with 1% accuracy and presents very good line and load regulation. It also includes output current limit with foldback characteristic and thermal shutdown. The removal of the output capacitor allows cost and board space reduction along with energy saving at power on and off. It is best suited for battery-powered equipments and in particular for cellular phones.

Applications

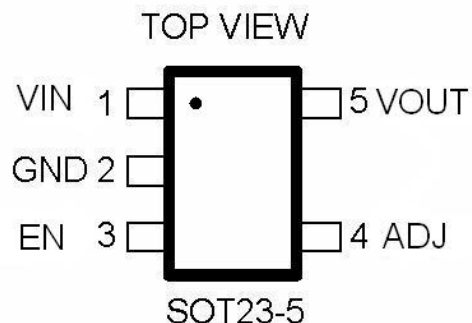
- Cordless and cellular phones
- Medical equipment
- PDAs and battery-powered equipments

Features

- No need for output capacitor
- 500mA output current
- 150mV drop at 300mA
- Preset output voltages (1% accuracy)
- Low current consumption
- Foldback output current limitation
- Thermal Shutdown
- Excellent load and line regulation
- Low noise
- Fast turn on and off
- SOT23 package

Block Diagram

Pin Configuration



Quik LDO™ technology is patent pending.
Quik LDO™ is a trademark of Acutechnology Semiconductor Inc.
Quik LDO™ is not a typo – with a Quik LDO™ you eliminate a “C”.

Pin Description

Pin	Pin Name	Function
1	VIN	Regulator Input.
2	GND	Ground
3	ENABLE	Enable
4	ADJ/CBY	Output voltage adjust
5	VOUT	Regulator output

Absolute Maximum Ratings

V_{IN} Voltage 7V
 V_{IN} Current 1A
 Operating Junction Temperature 150°C
 Lead Temperature (soldering 10 seconds) 260°C
 Storage Temperature Range -65°C to +150°C

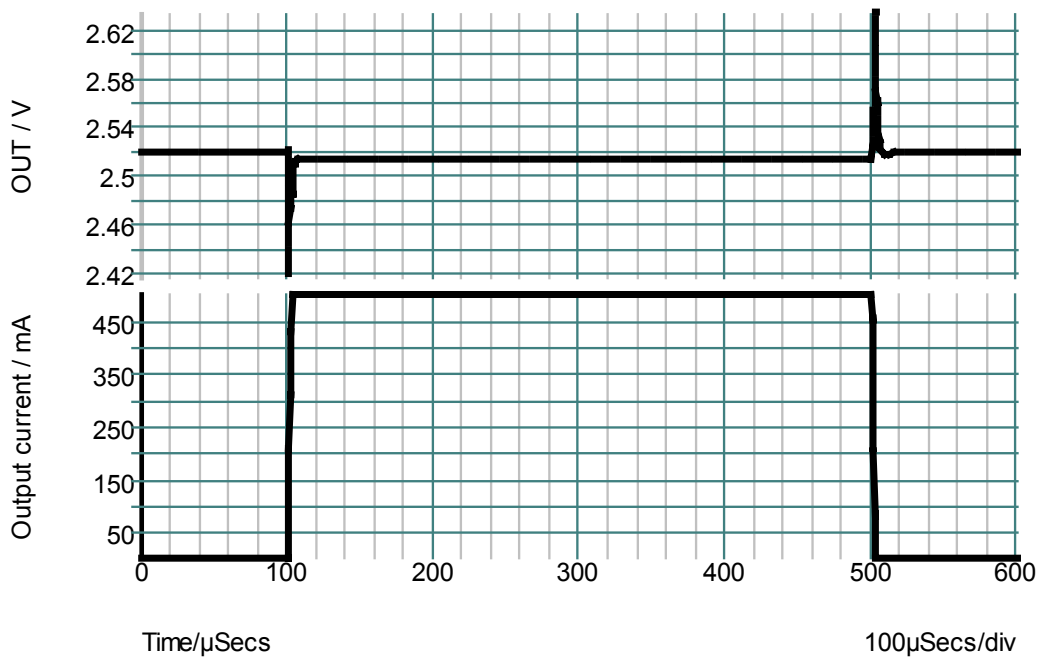
Electrical Specifications

Electrical characteristics are guaranteed by design over the full temperature range $-40^{\circ}\text{C} < T_j < 135^{\circ}\text{C}$. Ambient temperature must be de-rated based upon power dissipation and package thermal characteristics.

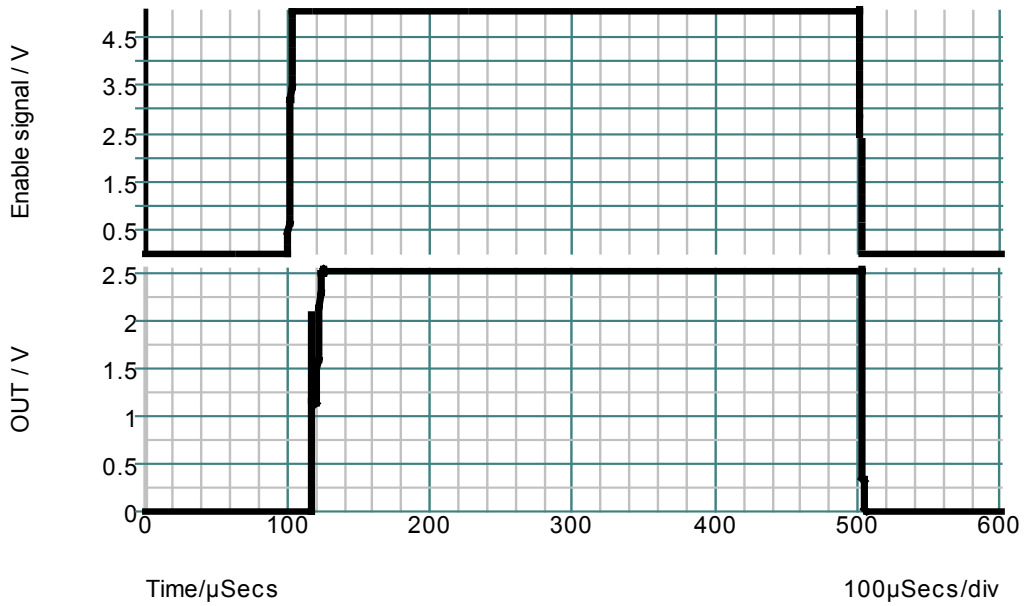
Unless otherwise stated, test conditions are $V_{in}=V_{out}+0.5\text{V}$, $I_{out}=1\text{mA}$, $T_j=+25^{\circ}\text{C}$.

Symbol	Parameter	Conditions	Min	Typ	Max	Units
VIN	Input Voltage		2		6	V
Icc	Ground Current			0.1	0.2	mA
ILIM	Current Limit		550	700	850	mA
Vout	Output Voltage Accuracy	Ta=25°C Over Temperature		1	1.5 2.5	%
DVcc	Line regulation	VIN=(Vout+0.1V) to 6V Iout=20mA		1.5	3	mV
DVload	Load Regulation	Iout=1 mA to 500mA		5	10	mV
Tshut	Thermal Shut-down Temperature Thermal Shut down Hysteresis			160 20		°C
DO	Dropout Voltage	Iout=300mA		150	180	mV
PSRR	Reference Power Supply Rejection	Freq.=120Hz		60		dB
En	Output Voltage Noise	f=10Hz to 100KHz (no caps) Vout=2.5V		150		uVrms
Venl	EN Input Low Voltage				0.8	V
Venh	EN Input High Voltage	Vin=5V	2			V
I _{sd}	Shutdown Current	EN=0V		10	300	nA

Typical Response

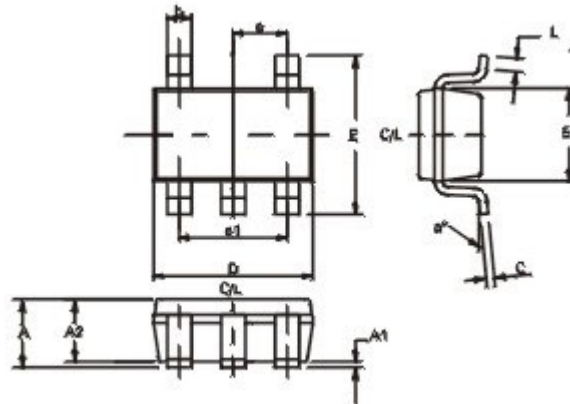


Load transient (current step=500mA). No output capacitor!!



Turn on and off transient response.

Package Mechanical Details



SOT23-5

DIM	Millimetres		Inches	
	MIN	MAX	MIN	MAX
A	0.90	1.45	0.035	0.057
A1	0.00	0.15	0.00	0.006
A2	0.90	1.3	0.035	0.051
b	0.35	0.50	0.014	0.020
C	0.09	0.20	0.0035	0.008
D	2.80	3.00	0.110	0.118
E	2.60	3.00	0.102	0.118
E1	1.50	1.75	0.059	0.069
e	0.95 REF		0.037 REF	
e1	1.90 REF		0.075 REF	
L	0.10	0.60	0.004	0.024
a°	0	10	0	10

Contact information

Acutechnology Semiconductor Inc.
 3487 McKee Rd. Suite 52
 San Jose CA 95127
 USA

TEL:(408) 259-2300
 (408) 259-3400
 FAX:(408) 259-9160

e-mail:info@acutechnology.com