DESCRIPTION

A6501A series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

A6501A can provide output value in the range of 1.5V~4.5V every 0.1V step. It also can be customized on command.

A6501A includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module with discharge capability.

A6501A has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within ±2%.

The A6501A is available in SOT89-3 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT89-3 SPQ: 1,000pcs/Reel	K3	A6501AK3R-XX
		A6501AK3VR-XX
Note	XX: Output Voltage 25=2.5V, 33=3.3V V: Halogen free Package R: Tape & Reel	
AiT provides all RoHS products		

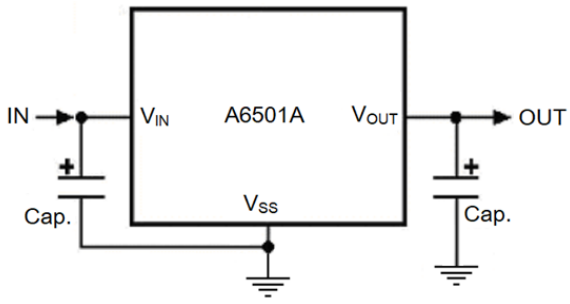
FEATURES

- Low Power Consumption: 20uA (Typ.)
- Low output noise (47uVRMS)
- Low dropout Voltage: 0.16V@300mA (Typ.)
- High Ripple Rejection: 73dB@100Hz (Typ.)
- Low Temperature Coefficient: ±100ppm/°C
- Excellent Line regulation: 0.05%/V
- Build-in chip enable and discharge circuit
- Output Voltage Range: 1.5V~4.5V
  (customized on command every 0.1V step)
- Highly Accurate: ±2%
- Output Current Limit
- Available in SOT89-3 package

APPLICATION

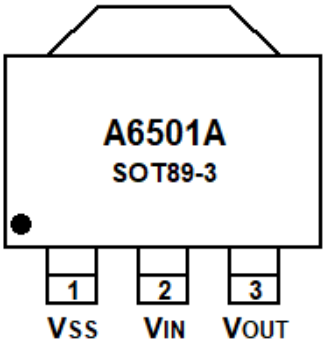
- Power Management for Computer, Mother Board, Graphic Card
- LCD Monitor and LCD TV
- DVD Decode Board
- Reference Voltage Source
- Regulation after Switching Power

TYPICAL APPLICATION



NOTE: Input capacitor (C_{IN}=1uF) and Output capacitor (C_{OUT}=3.3uF/4.7uF) are recommended in all application circuit.

PIN DESCRIPTION



Top View

Pin #	Symbol	Function
1	V_{SS}	Ground Pin
2	V_{IN}	Supply Voltage Input
3	V_{OUT}	Output Voltage

ABSOLUTE MAXIMUM RATINGS

Max Input Voltage		8V
T_J, Operating Junction Temperature		125°C
Output Current		500mA
T_A, Ambient Temperature		-40°C ~ 85°C
Power Dissipation	SOT89-3	400mW
T_S, Storage Temperature		-40°C ~ 150°C
Lead Temperature & Time		260°C, 10s

Stress beyond above listed “Absolute Maximum Ratings” may lead permanent damage to the device. These are stress ratings only and operations of the device at these or any other conditions beyond those indicated in the operational sections of the specifications are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

RECOMMENDED OPERATING CONDITIONS

Parameter	Min.	Recommended	Max.	Units
Input Voltage Range	-	-	6	V
Ambient Temperature	-40	-	85	°C

ELECTRICAL CHARACTERISTICS

Test Conditions: C_{IN}=1uF, C_{OUT}=3.3uF, T_A=25°C, unless otherwise specified.
A6501A, For Arbitrary Output Voltage

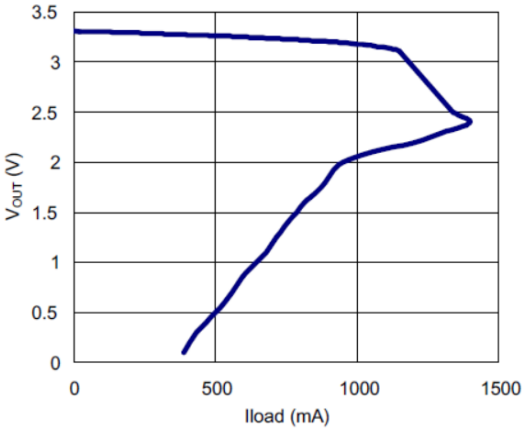
Parameter	Symbol	Conditions	Min.	Typ.	Max.	Unit
Input Voltage	V_{IN}		2	-	6	V
Output Voltage	V_{OUT}	V_{IN}=Set V_{OUT}+1V 1mA≤I_{OUT}≤30mA	V_{OUT} x0.98	V_{OUT}1	V_{OUT} X1.02	V
Maximum Output Current Output	$I_{OUT(Max.)}$	V_{IN}-V_{OUT}=1V	500	-	-	mA
Dropout Voltage, V_{OUT}≥2.8V	V_{DROP}NOTE1	I_{OUT}=100mA	-	50	80	mV
		I_{OUT}=300mA	-	160	220	
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	I_{OUT}=40mA, 2.8V≤V_{IN}≤6V	-	0.05	0.2	%/V
Load Regulation	$\Delta V_{OUT}/\Delta I_{OUT}$	V_{IN}=Set V_{OUT}+1V 1mA≤I_{OUT}≤300mA	-	30	50	mV
Supply Current	I_{SS}	V_{IN}=Set V_{OUT}+1V	-	35	80	μA
Supply Current (Standby)	$I_{STANDBY}$	V_{IN}=Set V_{OUT}+1V V_{EN}=GND	-	0.1	1.0	μA
Output Voltage Temperature Coefficiency	$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	I_{OUT}=30mA	-	±100	-	ppm/°C
Ripple Rejection	PSRR	F=100Hz, Ripple=0.5Vp-p V_{IN}=Set V_{OUT}+1V	-	70	-	dB
Short Current Limit	I_{LIM}	V_{OUT}=0V	-	1000	-	mA
EN Pull Down Resistance	Rpd		2.0	5.0	10.0	mΩ
Output Noise	en	BW=10Hz~100kHz	-	47	-	uVrms

NOTE1: V_{DROP}=V_{IN}1-(V_{OUT}2*0.98) V_{OUT}2 is the output voltage when V_{IN}=V_{OUT}1+1.0V and I_{OUT}=500mA.
V_{IN}1 is the input voltage at which the output voltage becomes 98% of Vout1 after gradually decreasing the input voltage.

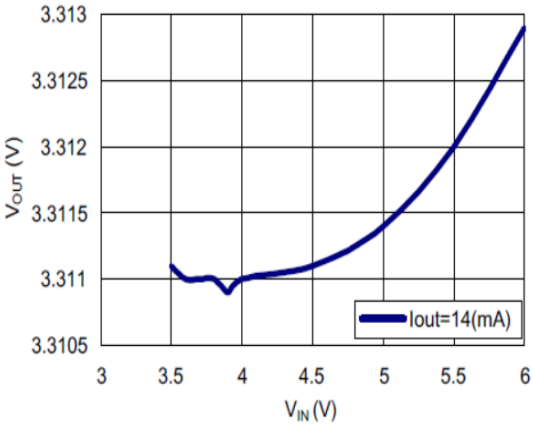
TYPICAL PERFORMANCE CHARACTERISTICS

1. Output Voltage vs. Output Current

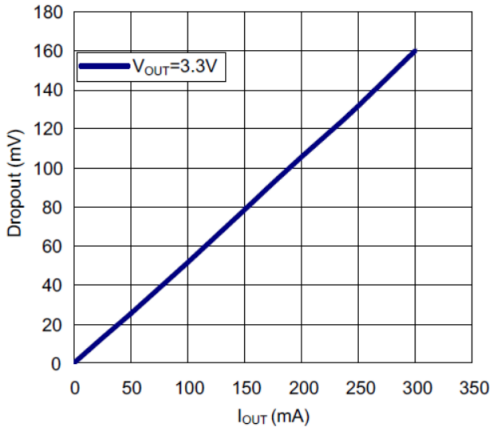
(with output short protection)



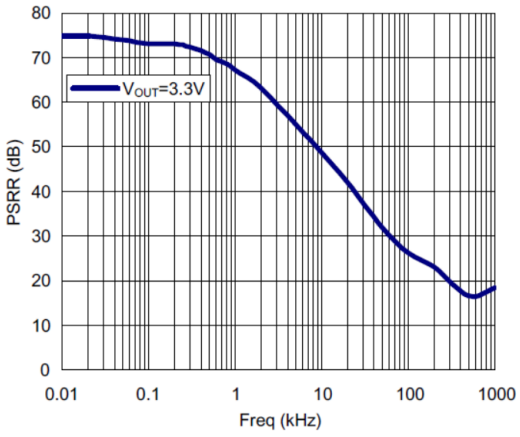
2. Output Voltage vs. Input Voltage



3. Dropout Voltage vs. Output Current

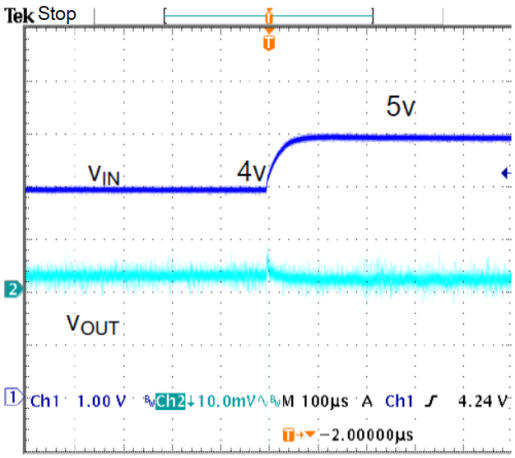


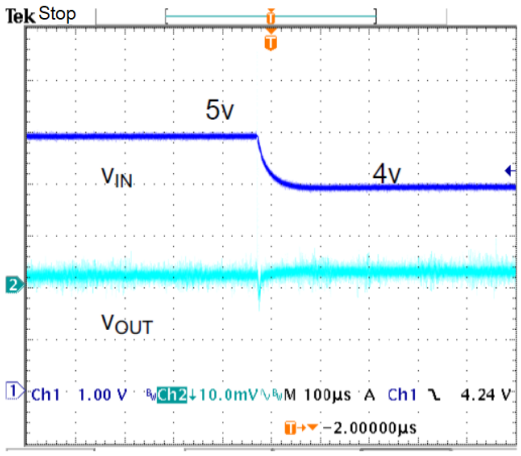
4. Ripple rejection vs. Frequency



5. Line Transient Response

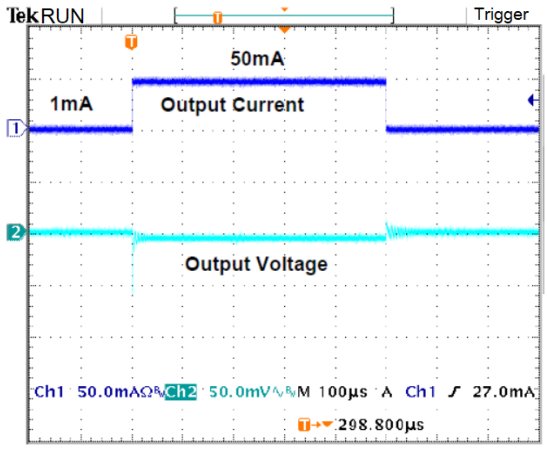
C_{IN}=C_{OUT}=1uF, I_{OUT}=25mA, V_{OUT}=3.3V

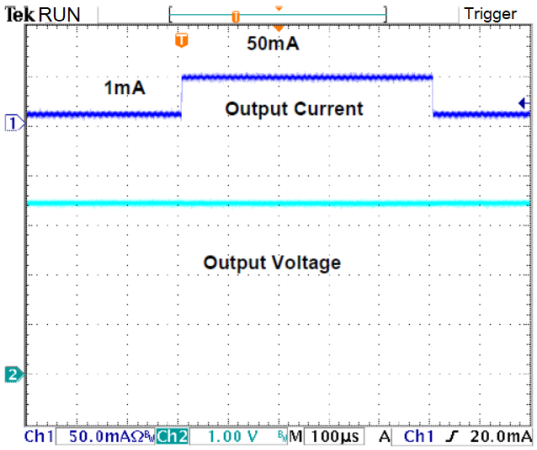




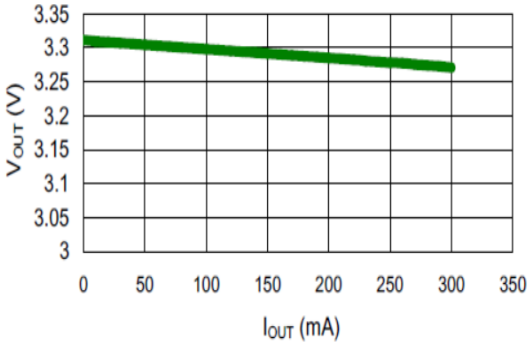
6. Load Transient Response

C_{IN}=C_{OUT}=1uF, V_{IN}=4.5V, V_{OUT}=3.3V

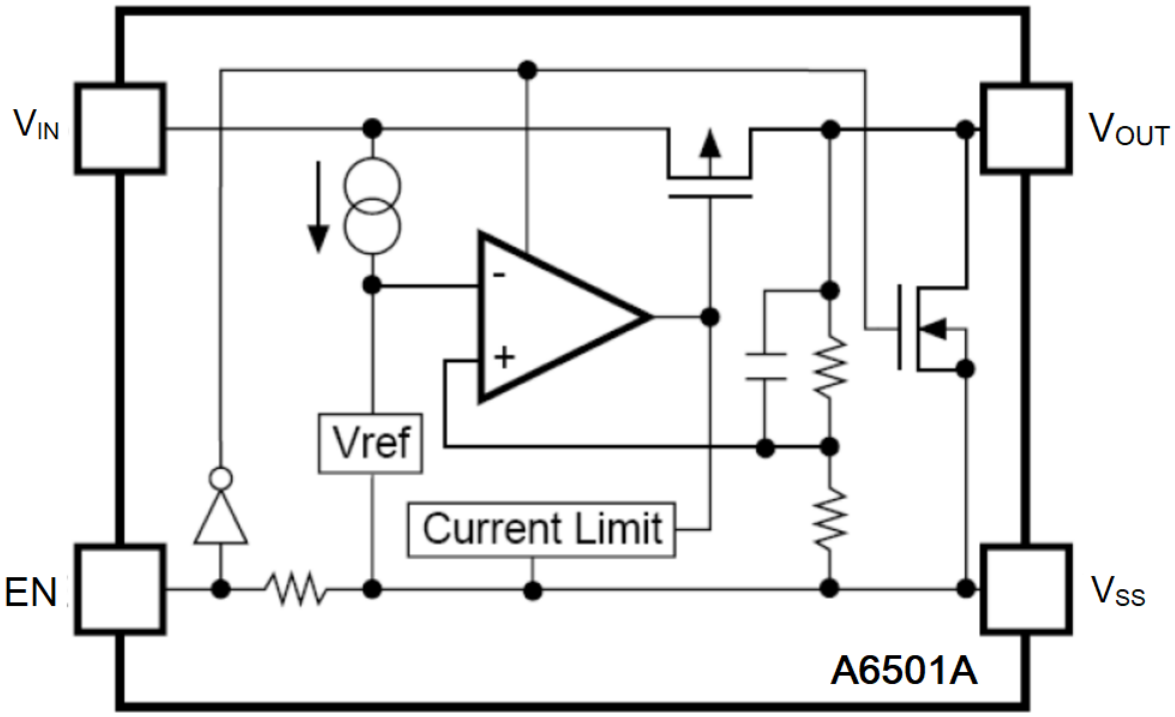




7. Load Regulation (V_{IN}=4.5V)



BLOCK DIAGRAM



DETAILED INFORMATION

A6501A series is a group of positive voltage output, low noise, low power consumption, low dropout voltage regulator.

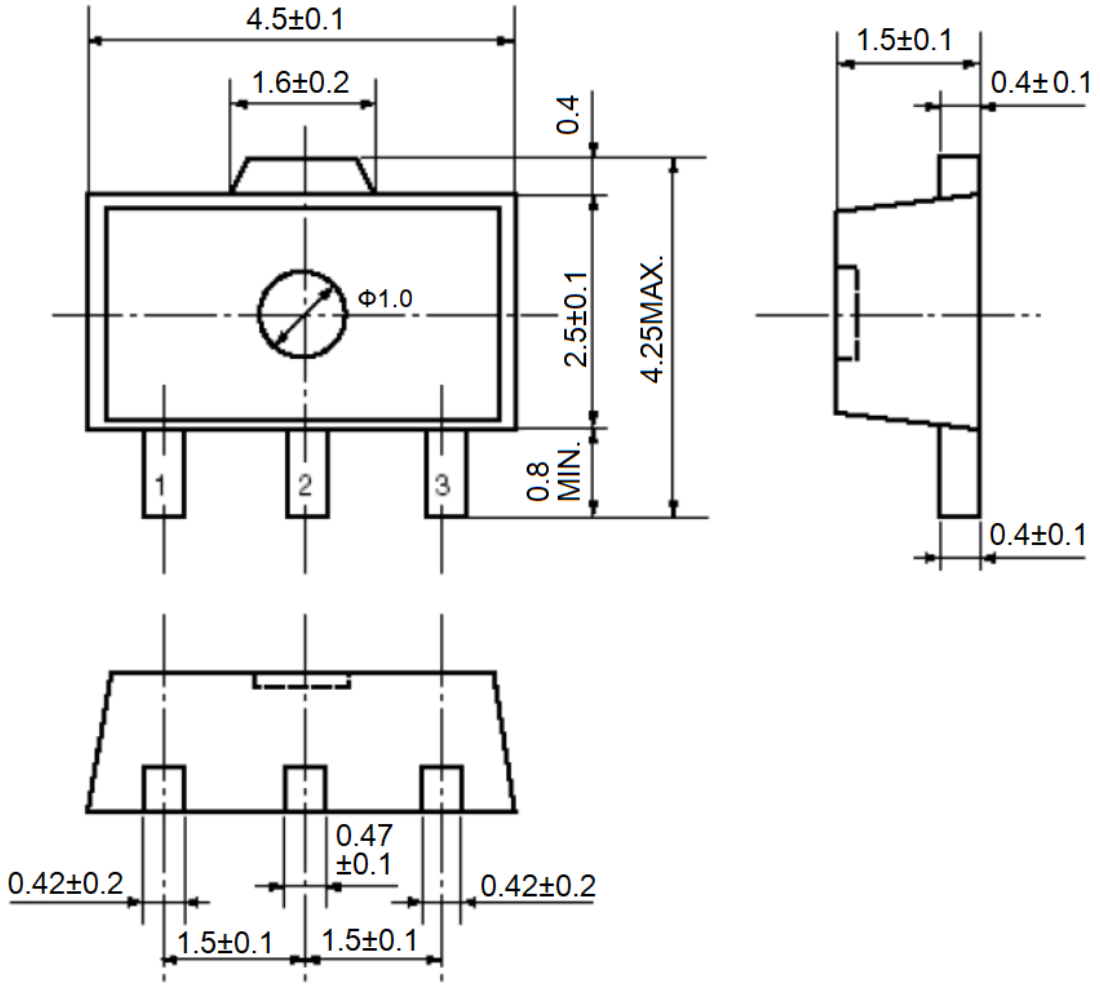
A6501A can provide output value in the range of 1.5V~4.5V every 0.1V step. It also can be customized on command.

A6501A includes high accuracy voltage reference, error amplifier, current limit circuit and output driver module.

A6501A has excellent load and line transient response and good temperature characteristics, which can assure the stability of chip and power system. And it uses trimming technique to guarantee output voltage accuracy within±2%.

PACKAGE INFORMATION

Dimension in SOT89-3 (Unit: mm)



IMPORTANT NOTICE

AiT Semiconductor Inc. (AiT) reserves the right to make changes to any its product, specifications, to discontinue any integrated circuit product or service without notice, and advises its customers to obtain the latest version of relevant information to verify, before placing orders, that the information being relied on is current.

AiT Semiconductor Inc.'s integrated circuit products are not designed, intended, authorized, or warranted to be suitable for use in life support applications, devices or systems or other critical applications. Use of AiT products in such applications is understood to be fully at the risk of the customer. As used herein may involve potential risks of death, personal injury, or servere property, or environmental damage. In order to minimize risks associated with the customer's applications, the customer should provide adequate design and operating safeguards.

AiT Semiconductor Inc. assumes to no liability to customer product design or application support. AiT warrants the performance of its products of the specifications applicable at the time of sale.