DESCRIPTION

The A6501 series are highly precise, low power consumption, positive voltage regulators manufactured using CMOS and laser trimming technologies. The series provides large currents with a significantly small dropout voltage. The A6501 consists of a current limiter circuit, a driver transistor, a precision reference voltage and an error amplifier. Output voltage is selectable in 0.1V steps between1.5V~6.0V.

The A6501 is available in SOT89-3 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT89-3 SPQ: 1,000pcs/Reel	K3	A6501K3R-XXB
		A6501K3VR-XXB
Note	XX: Output Voltage 30=3.0V,50=5.0V B: Pin Type B V: Halogen Free Package R: Tape & Reel	
AiT provides all RoHs products		

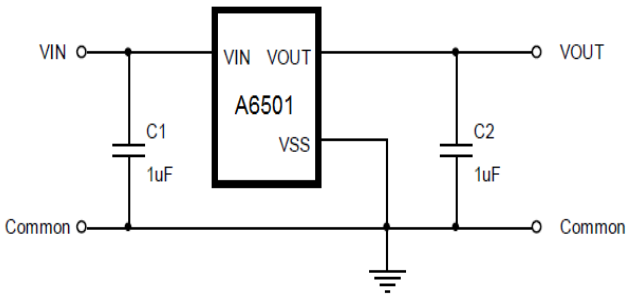
FEATURES

- Output Voltage Range:1.5V to 6.0V (selectable in 100mV steps)
- Highly Accurate: ± 2%
- Dropout Voltage : 500mV @ 500mA (3.3V type)
- Low Power Consumption: 8.0μA (TYP.)
- Maximum Output Current : 500mA (V_{IN}≥V_{OUT}+1V)
- Internal protector: current limiter and short protector
- Maximum Operating voltage: 10V
- Available in SOT89-3 package.

APPLICATION

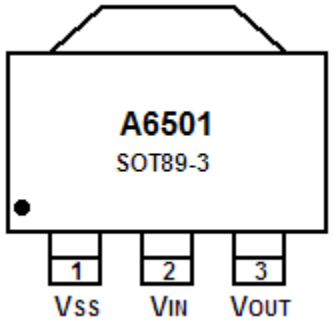
- DVD,CD-ROM,HDD drive equipment
- Wireless Communication equipment (Mobile & Cordless phone, etc.)
- Network equipment (Wireless LAN etc.)
- Desktop computers, Note book computer, PDAs
- Portable AV equipment
- Reference voltage
- Battery powered equipment

TYPICAL APPLICATION



The above connection diagram and constant will not guarantee successful operation. Perform thorough evaluation using the actual application to set the constant.
Input capacitor (C_{IN}): 1.0μF or more
Output capacitor (C_L): 1.0μF or more (tantalum capacitor)
Caution A general series regulator may oscillate, depending on the external components selected. Check that no oscillation occurs with the application using the above capacitor.

PIN DESCRIPTION



Top View

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

ABSOLUTE MAXIMUM RATINGS

V_{IN}, Input Voltage		V_{SS}-0.3V ~ V_{SS}+10V
V_{OUT}, Output Voltage		V_{SS}-0.3V ~ V_{IN}+0.3V
I_{OUT}, Output Current		800mA NOTE1
P_D, Power Dissipation	SOT89-3	500mW
T_{OPR}, Operating Ambient Temperature		-40℃ ~ +85℃
T_{STG}, Storage Temperature		-55℃ ~ +125℃

Stresses above may cause permanent damage to the device. These are stress ratings only and functional operation of the device at these or any other conditions beyond those indicated in the Electrical Characteristics are not implied. Exposure to absolute maximum rating conditions for extended periods may affect device reliability.

NOTE1: $I_{OUT} \geqq P_D/(V_{IN}-V_{OUT})$.

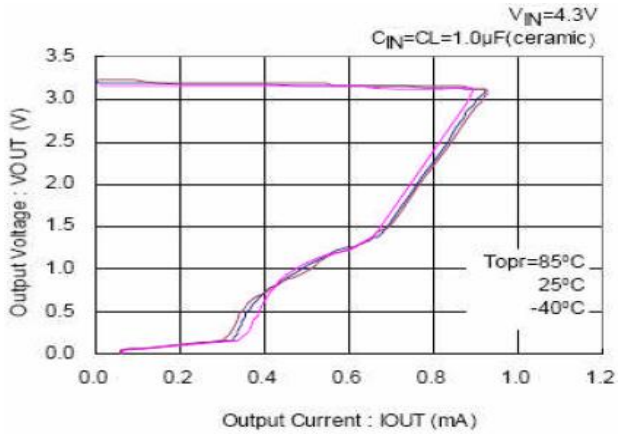
ELECTRICAL CHARACTERISTICS

Parameter	Symbol	Conditions		Min.	Typ.	Max.	Unit	Circuit
Output Voltage	$V_{OUT(E)}$	$V_{IN} = V_{OUT(S)} + 1.0V$, $I_{OUT} = 50mA$		$V_{OUT(S)} \times 0.98$	$V_{OUT(S)}$	$V_{OUT(S)} \times 1.02$	V	1
Output Current	I_{OUT}	$V_{IN} \geq V_{OUT(S)} + 1.0V$		500	-	-	mA	
Dropout Voltage	V_{DROP}	I_{OUT} = 500mA	2.2V ≤ $V_{OUT(S)}$ ≤ 2.5V	-	0.65	1.05	V	
			2.6V ≤ $V_{OUT(S)}$ ≤ 3.3V		0.55	0.82		
			3.4V ≤ $V_{OUT(S)}$ ≤ 5.5V		0.48	0.76		
Line Regulations	$\frac{\Delta V_{OUT1}}{\Delta V_{IN} \times V_{OUT}}$	$V_{OUT(S)} + 0.5V \leq V_{IN} \leq 9V$, $I_{OUT} = 80mA$		-	0.05	0.3	%/V	
Input Voltage	ΔV_{OUT2}	$V_{IN} = V_{OUT(S)} + 1.0V$, $1.0mA \leq I_{OUT} \leq 200mA$		-	20	50	mV	
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T_A \times V_{OUT}}$	$V_{IN} = V_{OUT(S)} + 1.0V$, $I_{OUT} = 10mA$, $-40°C \leq T_A \leq 85°C$		-	±100	-	ppm/℃	
Supply Current	I_{SS1}	$V_{IN} = V_{OUT(S)} + 1.0V$		-	8	15	μA	2
Input Voltage	V_{IN}			1.8	-	9	V	-
Ripple-Rejection	|RR|	$V_{IN} = V_{OUT(S)} + 1.0V$, f = 1.0kHz, Vrip = 0.5Vrms, $I_{OUT} = 80mA$		-	50		dB	1
Short current	I_{SHORT}	$V_{IN} = V_{OUT(S)} + 1.5V$		-	50	-	mA	
Current Limiter	I_{LIM}	$V_{IN} = V_{OUT(S)} + 1.5V$		-	800	-	mA	

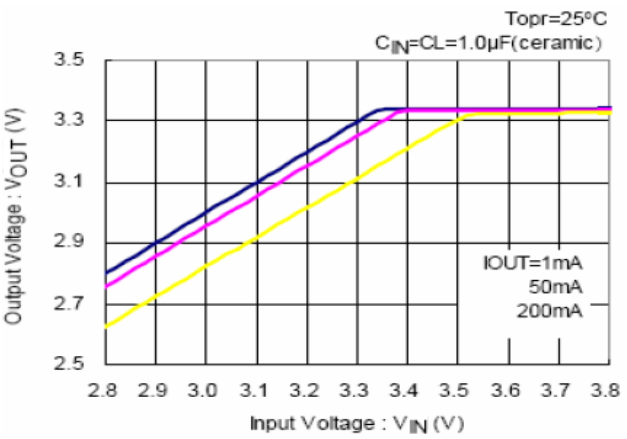
TYPICAL PERFORMANCE CHARACTERISTICS

3.3V Output

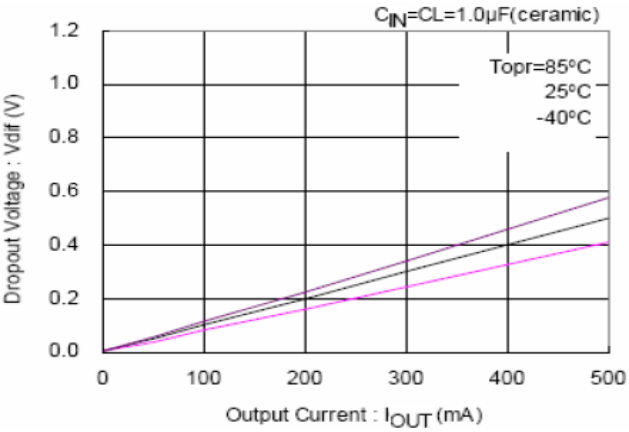
1. Output Voltage vs. Output Current



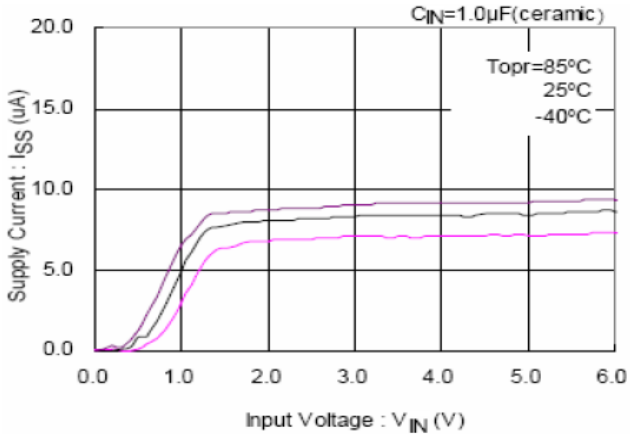
2. Output Voltage vs. Input Voltage (Contd.)



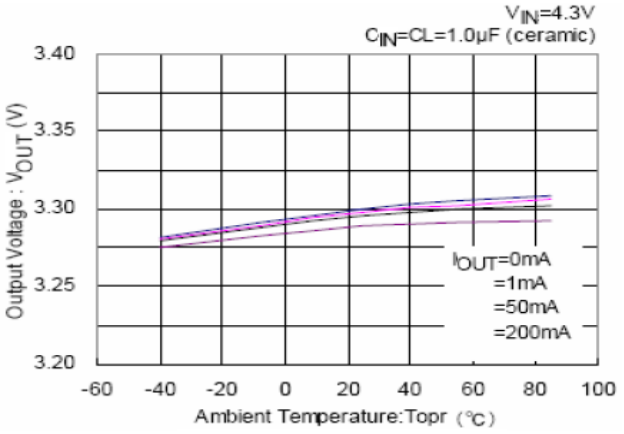
3. Dropout Voltage vs. Output Current



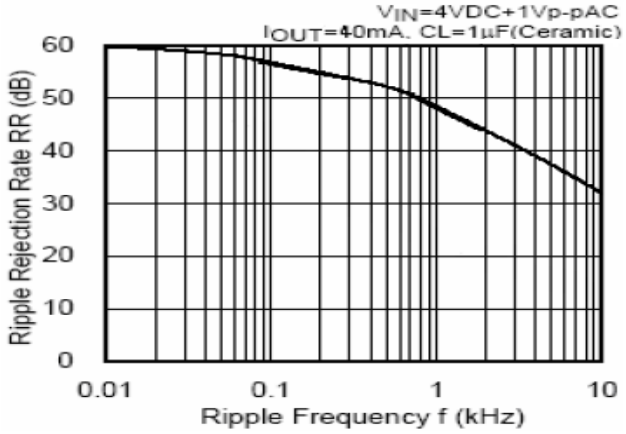
4. Supply Current vs. Input Voltage



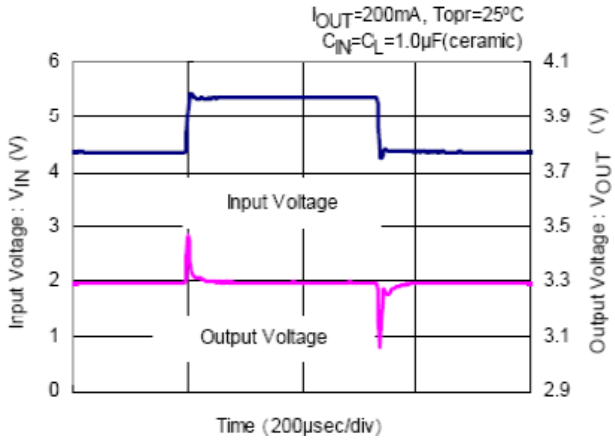
5. Output Voltage vs. Ambient Temperature



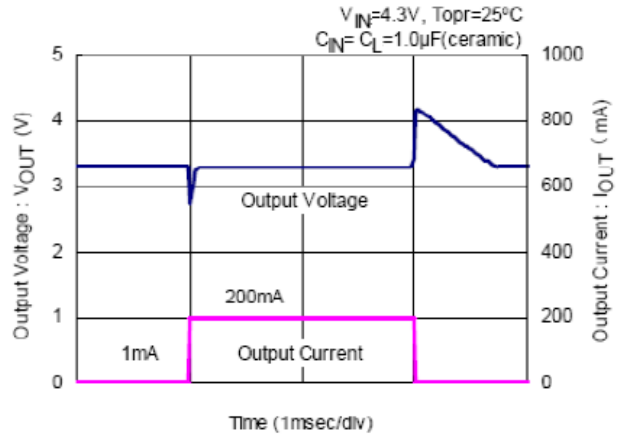
6. Ripple Rejection Rate



7. Transient Response Input Transient Response

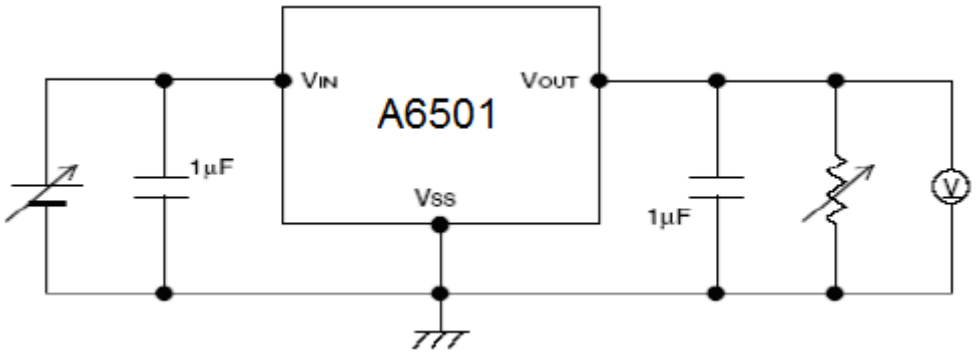


8. Load Transient Response

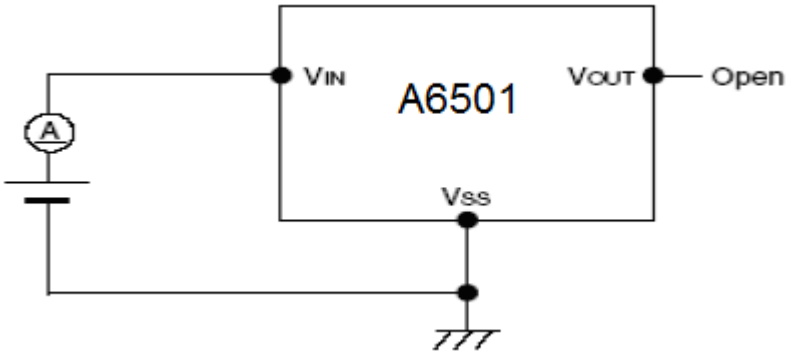


TEST CIRCUITS

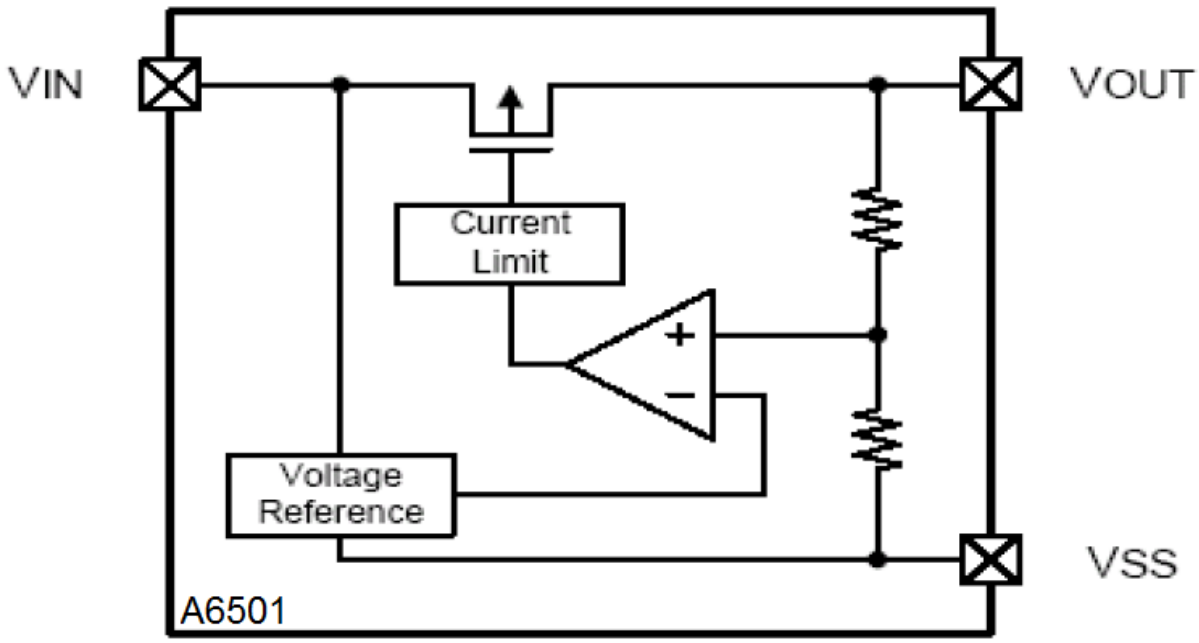
Circuit 1



Circuit 2

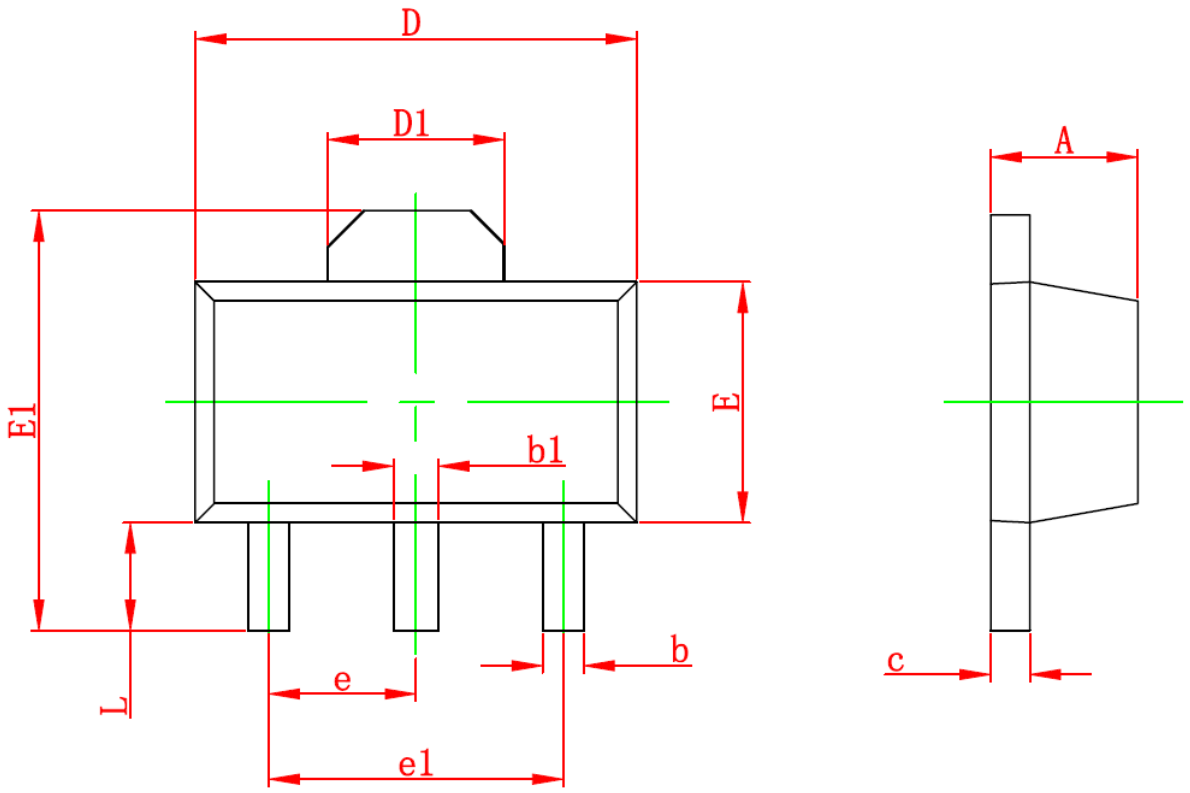


BLOCK DIAGRAM



PACKAGE INFORMATION

Dimension in SOT89-3 (Unit: mm)



Symbol	Min	Max
A	1.400	1.600
b	0.320	0.520
b1	0.400	0.580
c	0.350	0.440
D	4.400	4.600
D1	1.550 REF	
E	2.300	2.600
E1	3.940	4.250
e	1.500 TYP	
e1	3.000 TYP	
L	0.900	1.200

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