



DESCRIPTION

A6115 series are a group of positive voltage output, high precise, and low power consumption voltage regulator. Voltages are selectable in 100mV steps within a range of 1.2V to 5.0V. It also can be customized on command.

A6115 series have 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 $\pm 2\%$.

The A6115 is available in SOT-223 package.

ORDERING INFORMATION

Package Type	Part Number	
SOT-223 SPQ: 2,500pcs/Reel	N	A6115NR-XXZ
		A6115NVR-XXZ
Note	XX: Output Voltage 25=2.5V, 33=3.3V Z: Pin Define See Pin Description R: Tape & Reel V: Halogen free Package	
Suffix " V " means Halogen free Package		

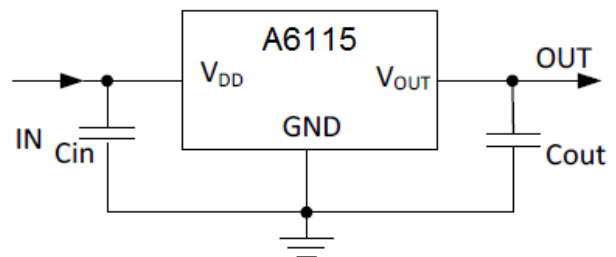
FEATURES

- Low Quiescent Current: 100uA at 5V
- High PSRR: 70dB range to 1kHz
- Low Output Noise: 44uVRMS
- Low Dropout: 300mV at 1A load
- Maximum output current: 1.5A
- Highly Accurate: $\pm 2\%$
- Low ESR Ceramic Capacitor Compatible
- Available in SOT-223 package

APPLICATION

- Reference Voltage Source
- Battery Powered Equipment
- PC Peripherals
- Wireless Devices
- Instrumentation

TYPICAL APPLICATION





PIN DESCRIPTION

<p>A6115-A SOT-223</p> <p>1 2 3 VDD GND VOUT</p> <p>Top View</p>		<p>A6115-B SOT-223</p> <p>1 2 3 GND VOUT VDD</p> <p>Top View</p>	
Pin #		Symbol	Function
A6115-A	A6115-B		
1	3	V _{DD}	Supply Voltage Input
2	1	GND	Ground Pin
3	2	V _{OUT}	Output Voltage



ABSOLUTE MAXIMUM RATINGS

Max Input Voltage	8V	
T _J , Max Operating Junction Temperature	145°C	
T _A , Ambient Temperature	-40°C~85°C	
Package Thermal Resistance	SOT-223	20°C/W
T _S , Storage Temperature	-40°C~150°C	
Lead Temperature & Time	260°C, 10 Sec	

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	Symbol	Value
Input Voltage Range		Max. 6V
Ambient Temperature		-40°C~85°C
Operating Junction Temperature	T _J	125°C



ELECTRICAL CHARACTERISTICS

Test Conditions: $C_{IN}=4.7\mu F, C_{OUT}=4.7\mu F, T_A=25^\circ C$, unless otherwise specified.

Parameter	Symbol	Test Condition	Min.	Typ.	Max.	Unit
Input Voltage	V_{DD}		1.5*	-	6	V
Output Voltage	V_{OUT}	$V_{OUT}>1.5$	$V_{DD}=\text{Set } V_{OUT}+1V$	$V_{OUT} \times 0.98$	$V_{OUT} \times 1.02$	V
		$V_{OUT} \leq 1.5$	$1mA \leq I_{OUT} \leq 10mA$	$V_{OUT} - 0.03$	$V_{OUT} + 0.03$	
Maximum Output Current	$I_{OUT (Max.)}^{**}$	$V_{DD}-V_{OUT}=1V$	1.5	-	-	A
Dropout Voltage	V_{DROP}	$V_{OUT}=3.3V, I_{OUT}=1A$	-	300	500	mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} \times V_{OUT}}$	$I_{OUT}=10mA$ $4V \leq V_{DD} \leq 6V$	-	0.05	0.2	%/V
Load Regulation	ΔV_{OUT}	$V_{DD}=\text{Set } V_{OUT}+1V$ $1mA \leq I_{OUT} \leq 2.5A$	-	30	60	mV
Supply Current	I_S	$V_{DD}=\text{Set } V_{OUT}+1V$ V_{OUT} Floating	-	100	150	μA
Output Voltage Temperature Coefficient	$\frac{\Delta V_{OUT}}{\Delta T \times V_{OUT}}$	$I_{OUT}=10mA$	-	± 100	-	ppm/ $^\circ C$
Ripple Rejection	PSRR	$f=100Hz, \text{Ripple}=0.5Vp-p,$ $V_{DD}=\text{Set } V_{OUT}+1V$	-	70	-	dB
Output Noise	e_n	$BW=10Hz \sim 100kHz$	-	44	-	μV_{rms}

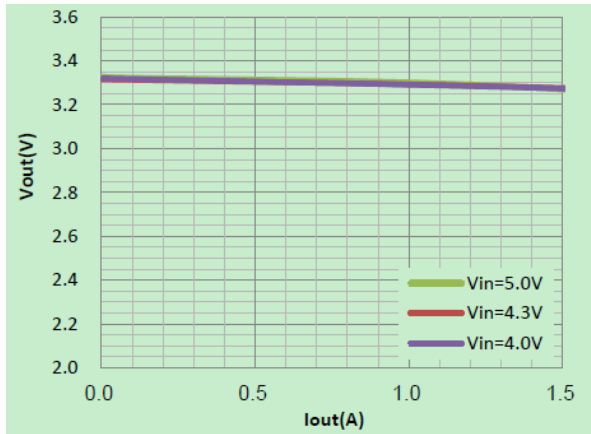
NOTE: $*I_{OUT}=500mA @ V_{OUT}=1.2V$

**The maximum power rating of each package is a constant, so along with the change of I_{LOAD} , the $V_{DD}-V_{OUT}$ should be controlled to a certain range to ensure the normal operation.

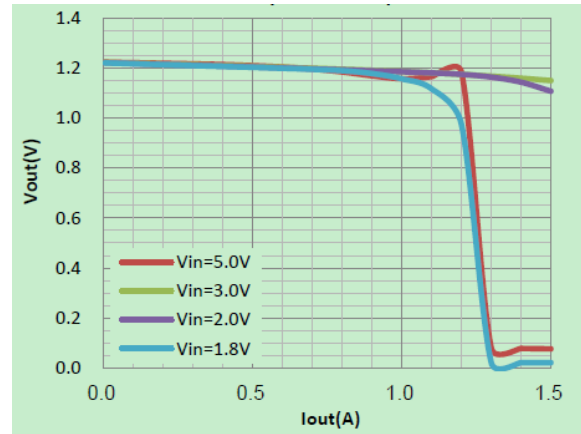


TYPICAL PERFORMANCE CHARACTERISTIC

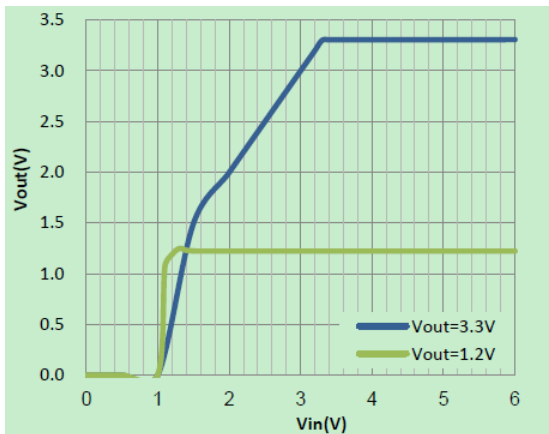
1. Load Regulation ($V_{OUT}=3.3V$)



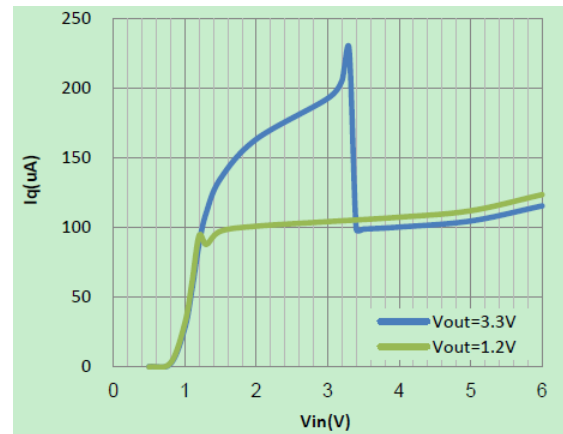
2. Load Regulation ($V_{OUT}=1.2V$)



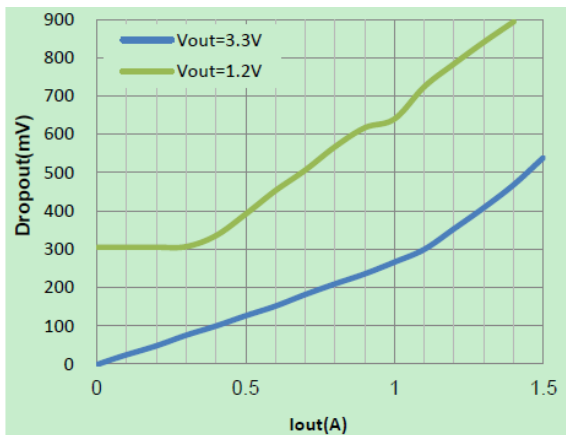
3. Line Regulation



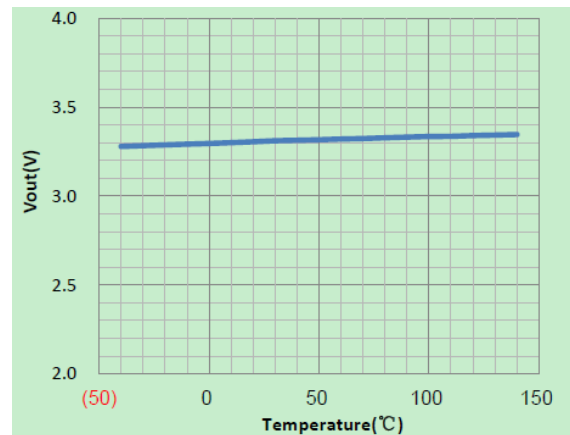
4. I_q



5. Dropout Voltage

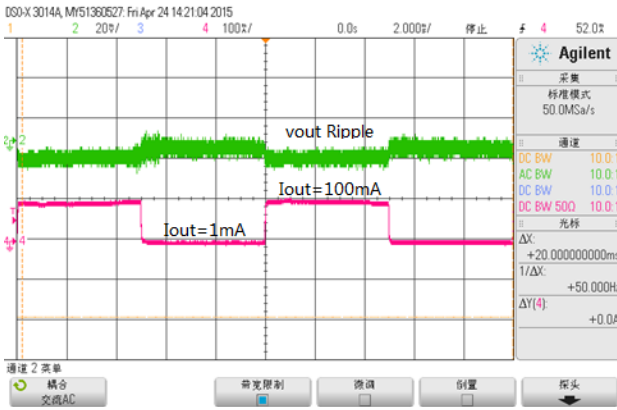


6. V_{OUT} vs. Temperature

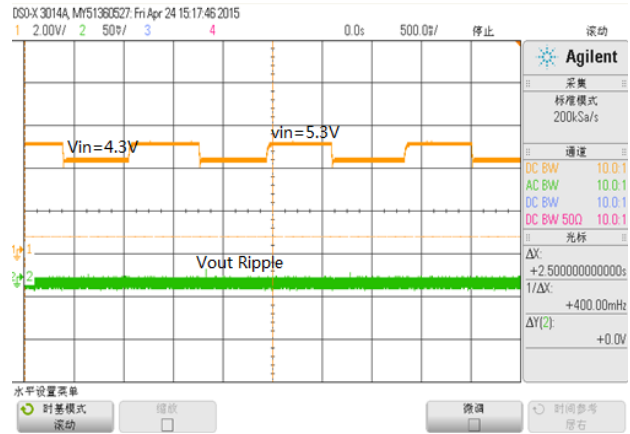




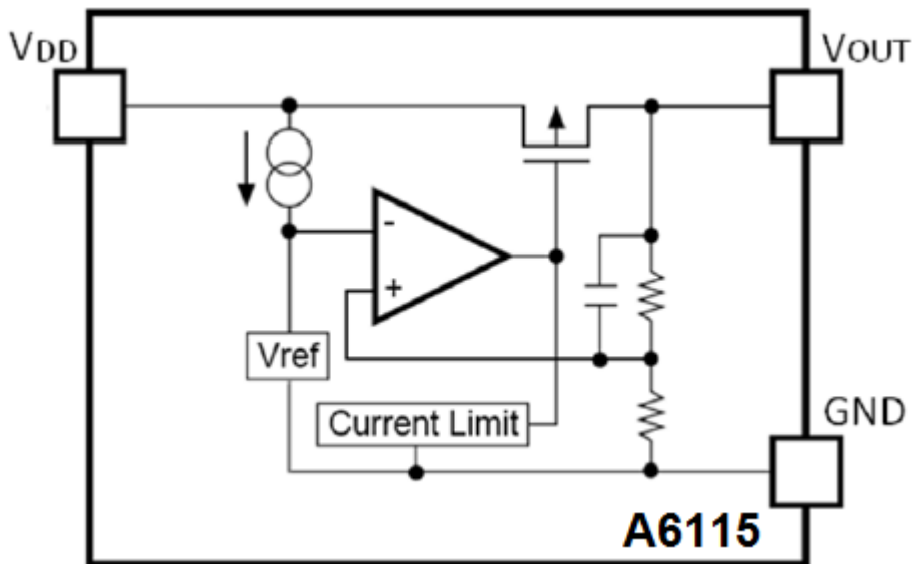
7. Load Transient Response ($V_{IN}=5V, V_{OUT}=3.3V$)
 $C_{IN}=1\mu F, C_{OUT}=1\mu F, I_{OUT}=1mA-100mA$



8. Line Transient Response ($V_{IN}=5V, V_{OUT}=3.3V$)
 $C_{IN}=1\mu F, C_{OUT}=1\mu F, I_{OUT}=10mA, V_{IN}=4.3V-5.3V$



BLOCK DIAGRAM





THERMAL CONSIDERATIONS

We have to take heat dissipation into great consideration when output current or differential voltage of input and output voltage is large. Because in such cases, the power dissipation consumed by A6115 is very large. A6115 series uses SOT-223 package type and its thermal resistance is about 20°C/W. And the copper area of application board can affect the total thermal resistance. If copper area is 5cm*5cm (two sides), the resistance is about 30°C/W. So the total thermal resistance is about 20°C/W + 30°C/W. In this case, the power dissipation should be limited less than 1.2W. We can decrease total thermal resistance by increasing copper area in application board. When there is no good heat dissipation copper area in PCB, the total thermal resistance will be as high as 120°C/W, then the power dissipation of A6115 could allow on itself is less than 1W. And furthermore, if the A6115 chip did work at junction temperature higher than 125°C under such condition and no lifetime is guaranteed.

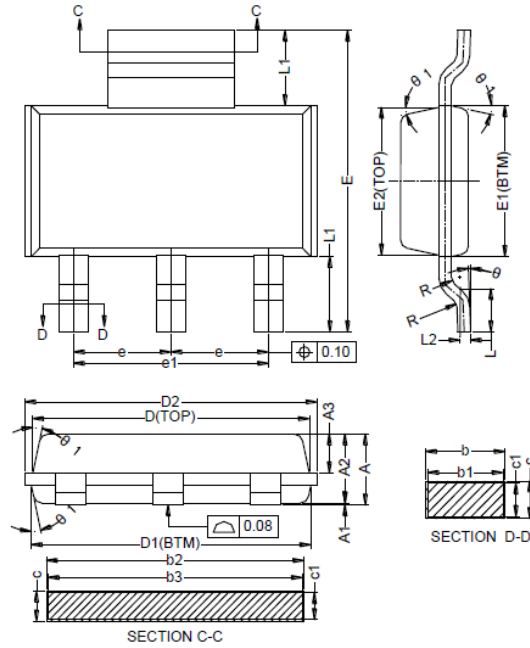
CURRENT LIMIT MODE

Current Limit module can keep chip and power system away from danger when load current is too large. When V_{out} decrease the Short Circuit Current will fold back to a small value.



PACKAGE INFORMATION

Dimension in SOT-223 (Unit: mm)



Symbol	Min	Max
A	-	1.80
A1	0.02	0.10
A2	1.50	1.70
A3	0.80	1.00
b	0.67	0.80
b1	0.66	0.76
b2	2.96	3.09
b3	2.95	3.05
c	0.30	0.35
c1	0.29	0.31
D	6.48	6.58
D1	6.55	6.65
D2	-	7.05
E	6.80	7.20
E1	3.40	3.60
E2	3.33	3.53
e	2.30 (BSC)	
e1	4.60 (BSC)	
L	0.80	1.20
L1	1.750(REF)	
L2	0.250(BSC)	
R	0.10	-
R1	0.10	-
θ	0°	8°
θ1	10°	14°



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