



LR1116/A

LINEAR INTEGRATED CIRCUIT

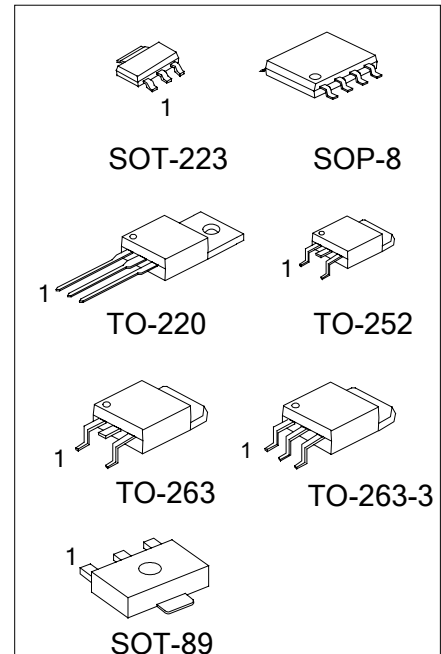
LOW DROP FIXED AND ADJUSTABLE POSITIVE VOLTAGE REGULATORS

■ DESCRIPTION

The UTC **LR1116/A** is a low drop voltage regulator able to provide up to 0.8/1.0A of output current, available also for adjustable version ($V_{REF}=1.25V$). Output consists of pnp power transistor. So that dropout voltage can be extremely low.

■ FEATURES

- * Low dropout voltage (0.6V max.)
- * 2.85V device are suitable for SCSI-2 active termination
- * Output current up to 0.8/1.0A
- * Adjustable version available. ($V_{REF}=1.25V$)
- * Internal current and thermal limit
- * Available in $\pm 1\%$ (at 25°C) and 2% in all temperature range



*Pb-free plating product number:
 - LR1116L-xx
 - LR1116AL-xx

■ ORDERING INFORMATION

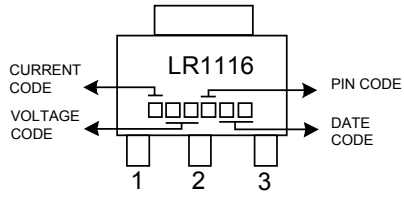
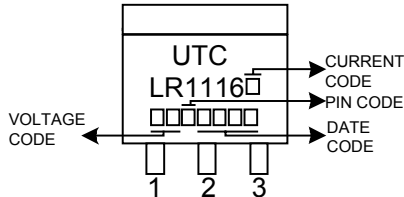
Order Number		Package	② Pin Assignment	③ Packing
Normal	Lead Free Plating			
LR1116①-xx-AA3-②-③	LR1116①L-xx-AA3-②-③	SOT-223	A: GOI B: OGI C: GIO D: IGO	R: Tape Reel T: Tube
LR1116①-xx-AB3-②-③	LR1116①L-xx-AB3-②-③	SOT-89		
LR1116①-xx-TA3-②-③	LR1116①L-xx-TA3-②-③	TO-220		
LR1116①-xx-TN3-②-③	LR1116①L-xx-TN3-②-③	TO-252		
LR1116①-xx-TQ2-②-③	LR1116①L-xx-TQ2-②-③	TO-263		
LR1116①-xx-TQ3-②-③	LR1116①L-xx-TQ3-②-③	TO-263-3		
LR1116①-xx-S08-②-③	LR1116①L-xx-S08-②-③	SOP-8	GOOIxOOx	

Note: 1. ①: Current code: Blank: 800mA A: 1A
 2. Pin assignment: I:Vin O:Vout G:GND x:NC
 3. xx: Output Voltage, refer to Marking Information.

Example: LR1116L-285-AA3-B-T

→ 800mA, 2.85V, SOT-223 package, Pin1:Vout, Pin2:Ground, Pin3:Vin, packing by Tube.

MARKING INFORMATION

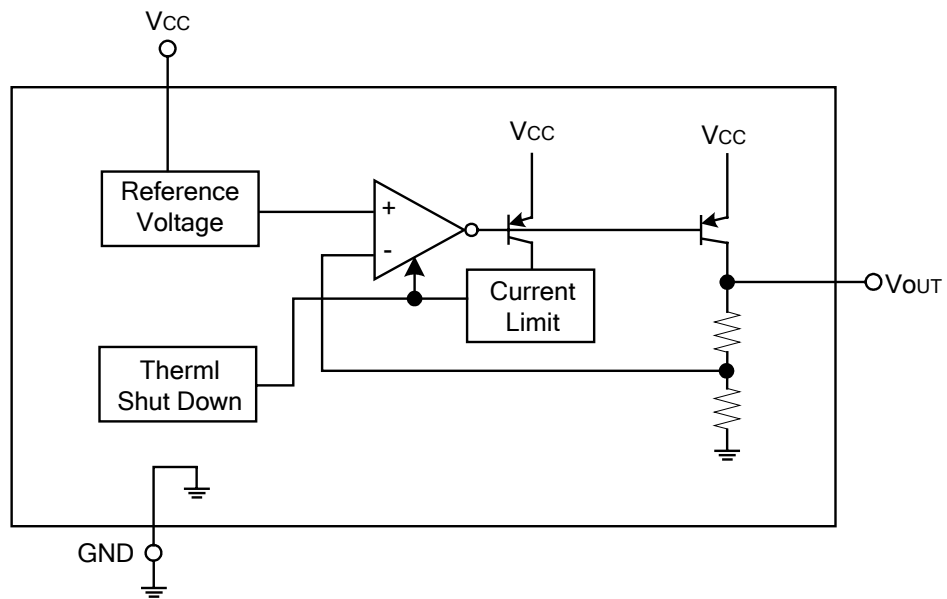
PACKAGE	VOLTAGE CODE	MARKING
SOT-223 SOT-89	12 :1.2V 15 :1.5V 18 :1.8V 25 :2.5V 285 :2.85V	
TO-220 TO-252 TO-263 TO-263-3	30 :3.0V 33 :3.3V 36 :3.6V 50 :5.0V AD :ADJ	

Note: Current code: Blank: 0.8A A: 1A

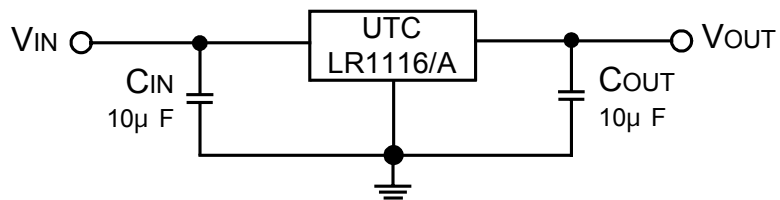
THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Case	SOT-223	15	°C/W
	SOT-89	15	
	SOP-8	20	
	TO-252	8	
	TO-220	4	
	TO-263	4	

■ BLOCK DIAGRAM



■ APPLICATION CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

PARAMETER	SYMBOL	RATINGS	UNIT
DC Input Voltage	V_{IN}	15	V
Operating Junction Temperature	T_{OPR}	0 ~ +125	°C
Storage Temperature	T_{STG}	-40 ~ +150	°C

Note: 1. The device may be damaged while beyond Absolute Maximum Rating.

2. The device is guaranteed to meet performance specifications within 0°C~70°C operation temperature range, and is assured by design from 0°C~125°C.

■ ELECTRICAL CHARACTERISTICS

($T_a=25^\circ\text{C}$, refer to the test circuits, $T_J=0\sim 125^\circ\text{C}$, $C_o=10\mu\text{F}$, unless otherwise specified.)

For LR1116/A-Adj

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX	UNIT
Reference Voltage	V_{REF}	$V_{IN}-V_{OUT}=1.5\text{V}$, $I_{OUT}=10\text{mA}$, $T_J=25^\circ\text{C}$	1.238	1.25	1.262	V
Reference Voltage	V_{REF}	$V_{IN}-V_{OUT}=1\text{V}\sim 10\text{V}$ LR1116 : $I_{OUT}=10$ to 800mA LR1116A : $I_{OUT}=10$ to 1000mA	1.225		1.275	V
Line Regulation	ΔV_{OUT}	$V_{IN}-V_{OUT}=1\text{V}\sim 13.75\text{V}$, $I_{OUT}=10\text{mA}$		0.1	0.6	%
Load Regulation	ΔV_{OUT}	$V_{IN}-V_{OUT}=1\text{V}$, LR1116 : $I_{OUT}=10$ to 800mA LR1116A : $I_{OUT}=10$ to 1000mA		2	3	%
Temperature stability	ΔV_{OUT}			0.50		%
Long Term Stability	ΔV_{OUT}	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%
Operating Input Voltage	V_{IN}				15	V
Adjustment Pin Current	I_{adj}	$V_{IN}\leq 15\text{V}$		60	120	μA
Adjustment Pin Current Change	ΔI_{adj}	$V_{IN}-V_{OUT}=1\text{V}\sim 10\text{V}$, LR1116 : $I_{OUT}=10$ to 800mA LR1116A : $I_{OUT}=10$ to 1000mA		1	5	μA
Minimum Load Current	$I_{OUT(\text{min})}$	$V_{IN}=15\text{V}$		2	5	mA
Output Current	I_{OUT}	$V_{IN}-V_{OUT}=4.5\text{V}$, $T_J=25^\circ\text{C}$	800	950	1200	mA
Output Noise (% V_{OUT})	eN	B=10Hz~10KHz, $T_J=25^\circ\text{C}$		0.003		%
Supply Voltage Rejection	SVR	$I_{OUT}=40\text{mA}$, $f=120\text{Hz}$, $T_J=25^\circ\text{C}$, $V_{IN}-V_{OUT}=2.5\text{V}$, $V_{RIPPLE}=1\text{Vpp}$	60	75		dB
Dropout Voltage	V_D	$I_{OUT}=100\text{mA}$			0.4	V
		$I_{OUT}=500\text{mA}$			0.6	V
		$I_{OUT}=800\text{mA}$			0.8	V
		$I_{OUT}=1000\text{mA}$			0.9	V
Thermal Regulation		$T_a=25^\circ\text{C}$, 30ms Pulse		0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1116/A-Fixed($V_{OUT} < 3.0V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT	
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25^{\circ}C$	1%	$V_{OUT} \times 0.99$	V_{OUT}	$V_{OUT} \times 1.01$	V
			2%	$V_{OUT} \times 0.98$		$V_{OUT} \times 1.02$	
Output Voltage	V_{OUT}	$V_{IN}=(V_{OUT}+2V) \sim 15V$ LR1116 : $I_{OUT}=0$ to 800mA LR1116A : $I_{OUT}=0$ to 1000mA	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V	
Line Regulation	ΔV_{OUT}	$V_{IN}=(V_{OUT}+2V) \sim 15V, I_o=0mA$		0.1	0.6	%	
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+2V$ LR1116 : $I_{OUT}=0$ to 800mA LR1116A : $I_{OUT}=0$ to 1000mA		2	3	%	
Temperature stability	ΔV_{OUT}			0.5		%	
Long Term Stability	ΔV_{OUT}	1000 hrs, $T_J=125^{\circ}C$		0.3		%	
Operating Input Voltage	V_{IN}	$I_{OUT}=100mA$			15	V	
Quiescent Current	I_D	$V_{IN} \leq 10V$		5	10	mA	
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+4.5V, T_J=25^{\circ}C$	800	950	1200	mA	
Output Noise Voltage	eN	$B=10Hz \sim 10KHz, T_J=25^{\circ}C$		100		μV	
Supply Voltage Rejection	SVR	$I_{OUT}=40mA, f=120Hz, T_J=25^{\circ}C$ $V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1V_{pp}$	60	75		dB	
Dropout Voltage	V_D	$I_{OUT}=100mA$ $I_{OUT}=500mA$ $I_{OUT}=800mA$ $I_{OUT}=1000mA$			0.4	V	
					0.6	V	
					0.8	V	
					0.9	V	
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W	

For LR1116/A-Fixed($V_{OUT} \geq 3.0V$)

PARAMETER	SYMBOL	TEST CONDITIONS	MIN.	TYP.	MAX.	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25^{\circ}C$	$V_{OUT} \times 0.99$	V_{OUT}	$V_{OUT} \times 1.01$	V
Output Voltage	V_{OUT}	$V_{IN}=(V_{OUT}+2V) \sim 15V$ LR1116 : $I_{OUT}=0$ to 800mA LR1116A : $I_{OUT}=0$ to 1000mA	$V_{OUT} \times 0.98$	V_{OUT}	$V_{OUT} \times 1.02$	V
Line Regulation	ΔV_{OUT}	$V_{IN}=(V_{OUT}+2V) \sim 15V, I_{OUT}=0mA$		0.1	0.6	%
Load Regulation	ΔV_{OUT}	$V_{IN}=V_{OUT}+2V$ LR1116 : $I_{OUT}=0$ to 800mA LR1116A : $I_{OUT}=0$ to 1000mA		2	3	%
Temperature stability	ΔV_{OUT}			0.5		%
Long Term Stability	ΔV_{OUT}	1000 hrs, $T_J=125^{\circ}C$		0.3		%
Operating Input Voltage	V_{IN}	$I_{OUT}=100mA$			15	V
Quiescent Current	I_D	$V_{IN} \leq 10V$		5	10	mA
Output Current	I_{OUT}	$V_{IN}=V_{OUT}+4.5V, T_J=25^{\circ}C$	800	950	1200	mA
Output Noise Voltage	eN	$B=10Hz \sim 10KHz, T_J=25^{\circ}C$		100		μV
Supply Voltage Rejection	SVR	$I_o=40mA, f=120Hz, T_J=25^{\circ}C$ $V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1V_{pp}$	60	75		dB
Dropout Voltage	V_D	$I_{OUT}=100mA$ $I_{OUT}=500mA$ $I_{OUT}=800mA$ $I_{OUT}=1000mA$			0.3	V
					0.4	V
					0.6	V
					0.7	V
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W

■ TYPICAL PERFORMANCE CHARACTERISTICS

Fig.1 Reference Voltage vs. Temperature

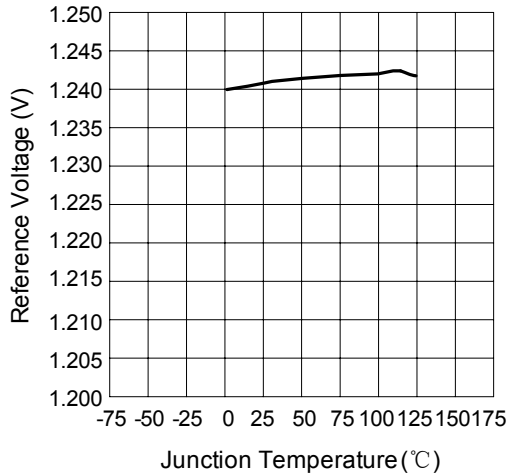


Fig.2 Output Voltage vs. Temperature

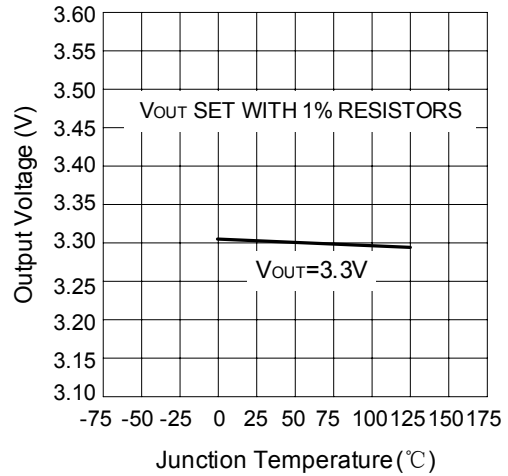
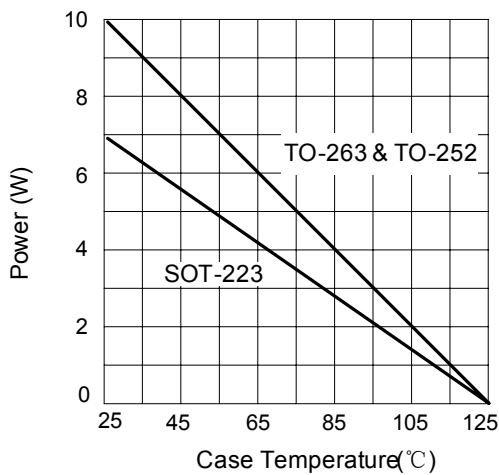


Fig.3 Maximum Power Dissipation



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