



# LR1118

## LINEAR INTEGRATED CIRCUIT

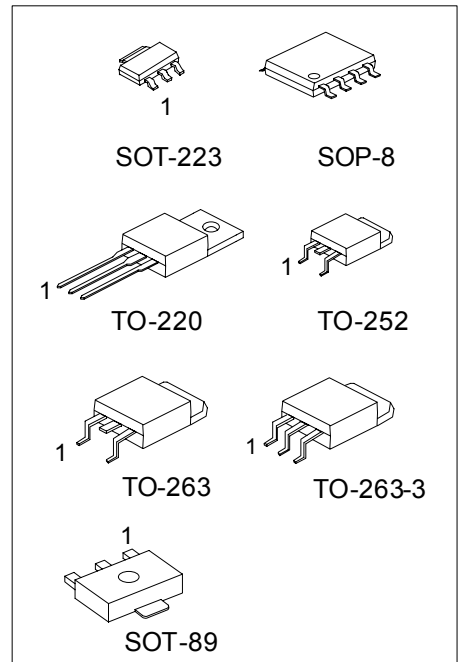
### LOW DROP POSITIVE VOLTAGE REGULATORS

■ DESCRIPTION

The UTC **LR1118** is a low drop voltage regulator able to provide up to 1A of output current, available also for adjustable version ( $V_{REF}=1.24V$ ). Output consists of pnp power transistor. So that dropout voltage can be extremely low.

■ FEATURES

- \* 2.85V device are suitable for SCSI-2 active termination
- \* Output current up to 1A
- \* Adjustable version available. ( $V_{REF}=1.24V$ )
- \* Internal current and thermal limit
- \* Available in  $\pm 1\%$  (at 25°C) and 2% in all temperature range



\*Pb-free plating product number: LR1118L

■ ORDERING INFORMATION

Order Number		Package	Pin Assignment	Packing
Normal	Lead Free Plating			
LR1118-xx-AA3- -	LR1118L-xx-AA3- -	SOT-223	A: GOI B: OGI C: GIO D: IGO	R: Tape Reel T: Tube
LR1118-xx-AB3- -	LR1118L-xx-AB3- -	SOT-89		
LR1118-xx-TA3- -	LR1118L-xx-TA3- -	TO-220		
LR1118-xx-TN3- -	LR1118L-xx-TN3- -	TO-252		
LR1118-xx-TQ2- -	LR1118L-xx-TQ2- -	TO-263		
LR1118-xx-TQ3- -	LR1118L-xx-TQ3- -	TO-263-3		
LR1118-xx-S08- -	LR1118L-xx-S08- -	SOP-8		

Note: 1. Pin assignment: I:Vin O:Vout G:GND x:NC  
2. xx: Output Voltage, refer to Marking Information.

<p>LR1118L-xx-AA3-Ⓛ-Ⓢ</p> <p>(1)Packing Type (2)Pin Assignment (3)Package Type (4)Output Voltage Code (5)Lead Plating</p>	<p>(1) R: Tape Reel, T: Tube (2) refer to Pin Assignment (3) AA3: SOT-223, AB3: SOT-89, TA3: TO-220 TN3: TO-252, TQ2: TO-263, TQ3: TO-263-3, S08: SOP-8 (4) xx: refer to Marking Information (5) L: Lead Free Plating Blank: Pb/Sn</p>
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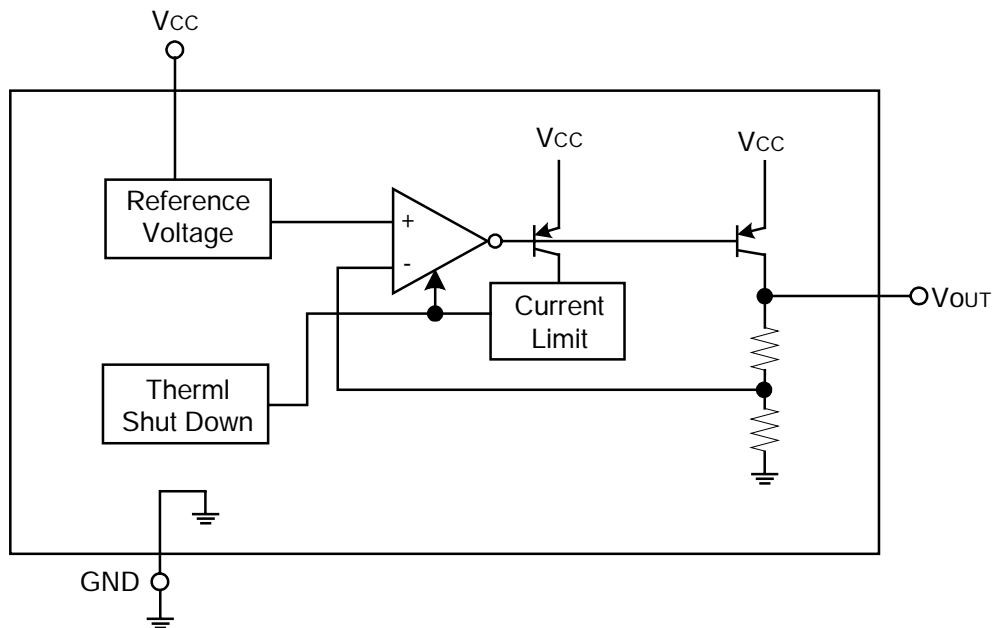
### MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-89	18 : 1.8V 25 : 2.5V 30 : 3.0V 33 : 3.3V 50 : 5.0V	<p>DATE CODE ← R1118 → VOLTAGE CODE                      → PIN CODE                      → LEAD PLATING                      1 2 3</p>
SOT-223		<p>→ LEAD PLATING                      → PIN CODE                      → DATE CODE                      ← VOLTAGE CODE                      1 2 3</p>
TO-220 TO-252 TO-263 TO-263-3		<p>→ LEAD PLATING                      → PIN CODE                      → DATE CODE                      ← VOLTAGE CODE                      1 2 3</p>

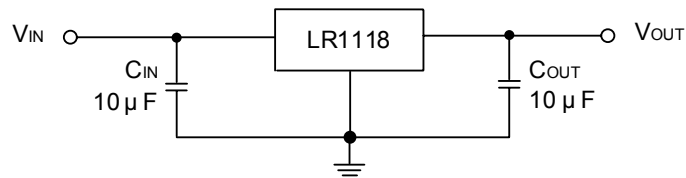
### THERMAL DATA

PARAMETER	SYMBOL	RATINGS	UNIT	
Thermal Resistance Junction-Case	$\theta_{JC}$	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 LR1118-1.8V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+1.5\text{V}$ , $I_{OUT}=10\text{mA}$ , $T_J=25^\circ\text{C}$	1%	1.782	1.8	1.818	V
			2%	1.764		1.836	
Output Voltage	$V_{OUT}$	$V_{IN}=(V_{OUT}+2\text{V})\sim 15\text{V}$ , $I_{OUT}=0$ to 1A	1.764	1.8	1.836	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=(V_{OUT}+2\text{V})\sim 15\text{V}$ , $I_{OUT}=0\text{A}$		0.1	0.6	%	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2\text{V}$ , $I_{OUT}=0$ to 1A		2	3	%	
Temperature Stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100\text{mA}$			15	V	
Quiescent Current	$I_D$	$V_{IN}\leq 10\text{V}$		5	10	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 Voltage	eN	$B=10\text{Hz}\sim 10\text{KHz}$ , $T_J=25^\circ\text{C}$		100		$\mu\text{V}$	
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	$V_D$	$I_{OUT}=100\text{mA}$ $I_{OUT}=1\text{A}$		0.32	0.48	V	
				0.65	0.88	V	
Thermal Regulation		$T_a=25^\circ\text{C}$ , 30ms Pulse		0.01	0.10	%/W	

### For LR1118-2.5V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT	
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+1.5\text{V}$ , $I_{OUT}=10\text{mA}$ , $T_J=25^\circ\text{C}$	1%	2.475	2.5	2.525	V
			2%	2.450		2.550	
Output Voltage	$V_{OUT}$	$V_{IN}=(V_{OUT}+2\text{V})\sim 15\text{V}$ , $I_{OUT}=0$ to 1A	2.45	2.5	2.55	V	
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=(V_{OUT}+2\text{V})\sim 15\text{V}$ , $I_{OUT}=0\text{A}$		0.1	0.6	%	
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2\text{V}$ , $I_{OUT}=0$ to 1A		2	3	%	
Temperature Stability	$\Delta V_{OUT}$			0.5		%	
Long Term Stability	$\Delta V_{OUT}$	1000 hrs, $T_J=125^\circ\text{C}$		0.3		%	
Operating Input Voltage	$V_{IN}$	$I_{OUT}=100\text{mA}$			15	V	
Quiescent Current	$I_D$	$V_{IN}\leq 10\text{V}$		5	10	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 Voltage	eN	$B=10\text{Hz}\sim 10\text{KHz}$ , $T_J=25^\circ\text{C}$		100		$\mu\text{V}$	
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	$V_D$	$I_{OUT}=100\text{mA}$ $I_{OUT}=1\text{A}$		0.16	0.25	V	
				0.56	0.7	V	
Thermal Regulation		$T_a=25^\circ\text{C}$ , 30ms Pulse		0.01	0.10	%/W	

## ■ ELECTRICAL CHARACTERISTICS (Cont.)

### For LR1118-3.0V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25^{\circ}C$	2.970	3.0	3.030	V
Output Voltage	$V_{OUT}$	$V_{IN}=(V_{OUT}+2V)\sim 15V, I_{OUT}=0$ to 1A	2.940	3.0	3.060	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=(V_{OUT}+2V)\sim 15V, I_{OUT}=0A$		0.1	0.6	%
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=0$ to 1A		2	3	%
Temperature Stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	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		$\mu V$
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	$V_D$	$I_{OUT}= 100mA$		0.11	0.26	V
		$I_{OUT}= 1A$		0.45	0.65	V
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W

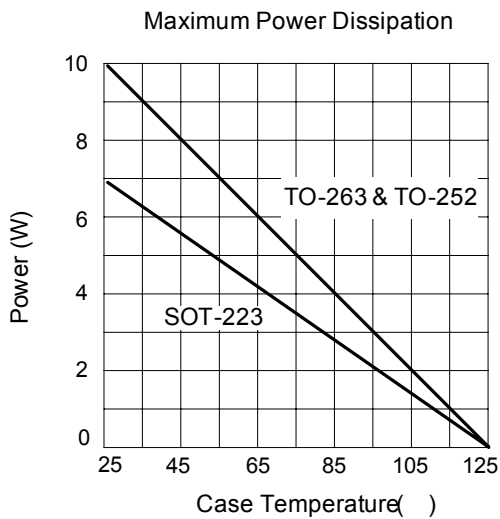
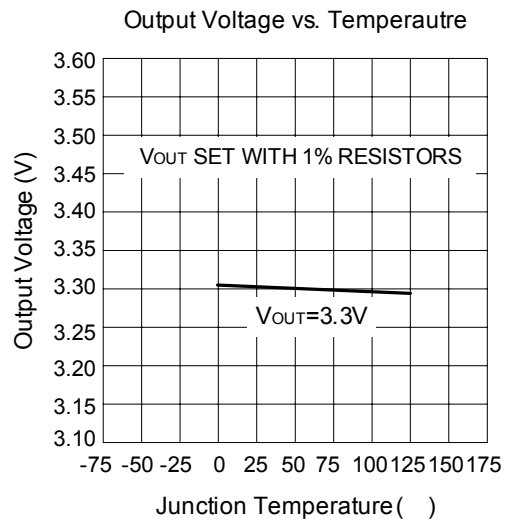
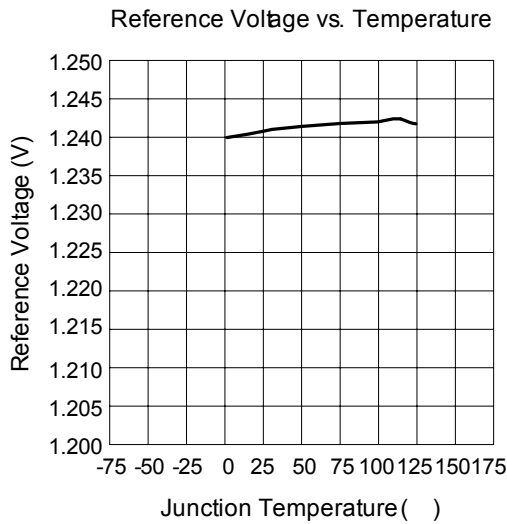
### For LR1118-3.3V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25^{\circ}C$	3.267	3.3	3.333	V
Output Voltage	$V_{OUT}$	$V_{IN}=(V_{OUT}+2V)\sim 15V, I_{OUT}=0$ to 1A	3.234	3.3	3.366	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=(V_{OUT}+2V)\sim 15V, I_{OUT}=0A$		0.1	0.6	%
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=0$ to 1A		2	3	%
Temperature Stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	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		$\mu V$
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	$V_D$	$I_{OUT}= 100mA$		0.11	0.26	V
		$I_{OUT}= 1A$		0.45	0.65	V
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W

### For LR1118-5.0V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	$V_{OUT}$	$V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25^{\circ}C$	4.95	5.0	5.05	V
Output Voltage	$V_{OUT}$	$V_{IN}=(V_{OUT}+2V)\sim 15V, I_{OUT}=0$ to 1A	4.90	5.0	5.10	V
Line Regulation	$\Delta V_{OUT}$	$V_{IN}=(V_{OUT}+2V)\sim 15V, I_{OUT}=0A$		0.1	0.6	%
Load Regulation	$\Delta V_{OUT}$	$V_{IN}=V_{OUT}+2V, I_{OUT}=0$ to 1A		2	3	%
Temperature Stability	$\Delta V_{OUT}$			0.5		%
Long Term Stability	$\Delta V_{OUT}$	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		$\mu V$
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	$V_D$	$I_{OUT}= 100mA$		0.11	0.26	V
		$I_{OUT}= 1A$		0.45	0.62	V
Thermal Regulation		$T_a=25^{\circ}C, 30ms$ Pulse		0.01	0.10	%/W

## TYPICAL CHARACTERISTICS



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