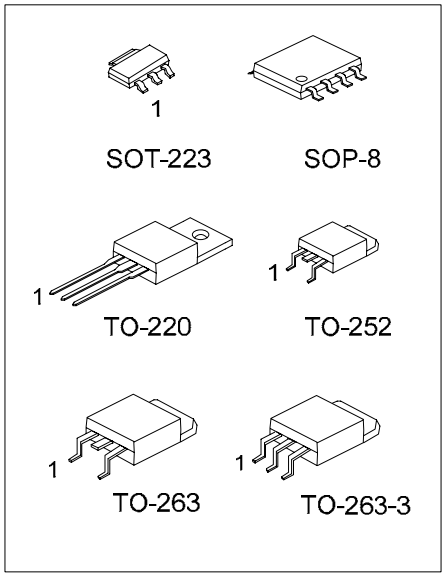
LR1118

LINEAR INTEGRATED CIRCUIT

LOW DROP POSITIVE VOLTAGE REGULATORS



*Pb-free plating product number: LR1118L

■ 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 ±1%(at 25°C) and 2% in all temperature range

■ ORDERING INFORMATION

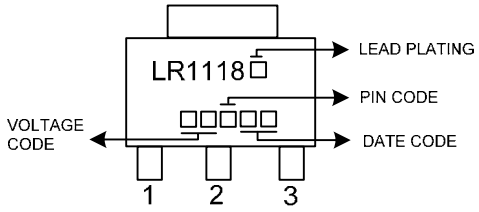
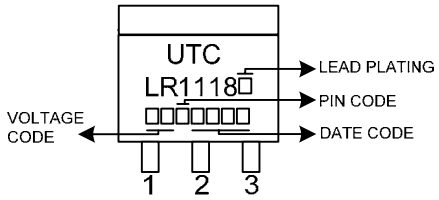
Ordering Number		Package	① Pin Assignment	② Packing
Normal	Lead Free Plating			
LR1118-xx-AA3-①-②	LR1118L-xx-AA3-①-②	SOT-223	A: GOI B: OGI C: GIO D: IGO	R: Tape Reel T: Tube
LR1118-xx-TA3-①-②	LR1118L-xx-TA3-①-②	TO-220		
LR1118-xx-TN3-①-②	LR1118L-xx-TN3-①-②	TO-252		
LR1118-xx-TQ2-①-②	LR1118L-xx-TQ2-①-②	TO-263		
LR1118-xx-TQ3-①-②	LR1118L-xx-TQ3-①-②	TO-263-3		
LR1118-xx-S08-①-②	LR1118L-xx-S08-①-②	SOP-8	GOOIxOOx	

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

LR1118L-xx-AA3-①-②
(1)Packing Type
(2)Pin Assignment
(3)Package Type
(4)Output Voltage Code
(5)Lead Plating

(1) R: Tape Reel, T: Tube
(2) refer to Pin Assignment
(3) AA3: SOT-223, 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

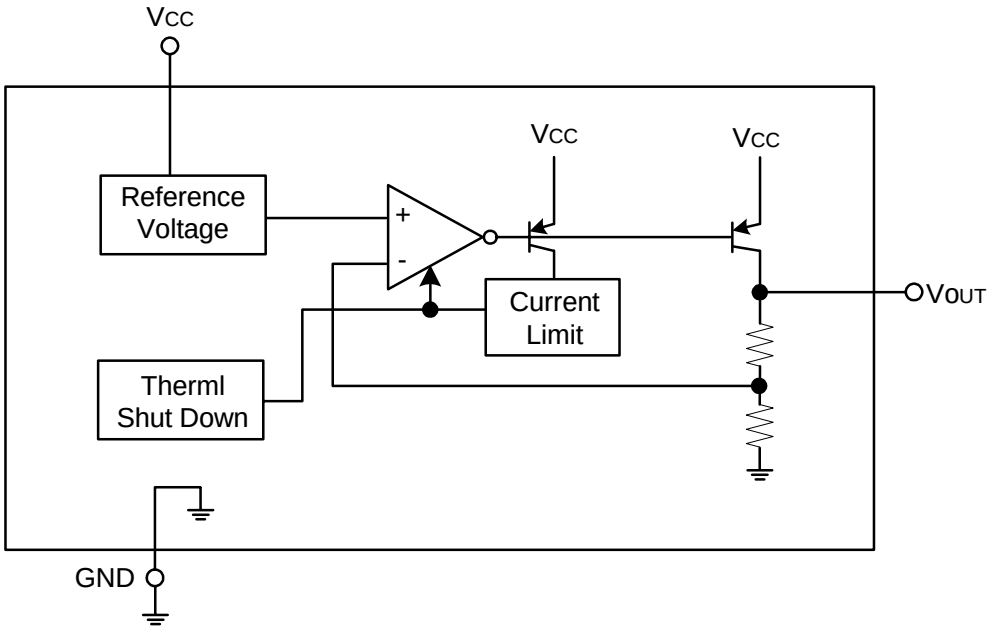
■ MARKING INFORMATION

PACKAGE	VOLTAGE CODE	MARKING
SOT-223	12:1.2V 15:1.5V 18:1.8V 25:2.5V 2J:2.85V 30:3.0V 33:3.3V 36:3.6V 50:5.0V	
TO-220 TO-252 TO-263 TO-263-3		

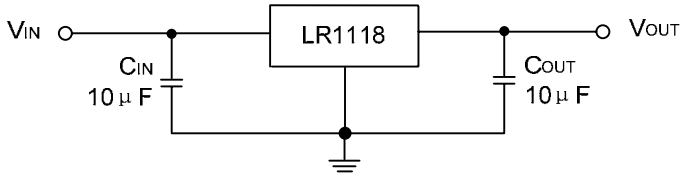
■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Thermal Resistance Junction-Case	SOT-223	θ_{JC}	15	°C/W
	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
Junction Temperature	T_J	+125	°C
Operating Temperature	T_{OPR}	0 ~ +125	°C
Storage Temperature	T_{STG}	-40 ~ +150	°C

Note: 1. Absolute maximum ratings are those values beyond which the device could be permanently damaged. Absolute maximum ratings are stress ratings only and functional device operation is not implied
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

(Ta=25°C, refer to the test circuits, T_J=-0~125°C, C_O=10μF, unless otherwise specified.)

For LR1118-1.2V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25°C	1%	1.188	1.2	1.212	V
			2%	1.176		1.224	
		V_{IN} =(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A		1.176	1.2	1.224	V
Line Regulation	ΔV_{OUT}	V_{IN} =(V_{OUT}+2V)~15V, I_{OUT}=0A			0.1	0.6	%
Load Regulation		V_{IN} =V_{OUT}+2V, I_{OUT}=0 to 1A			2	3	%
Temperature Stability					0.5		%
Long Term Stability		1000 hrs, T_J=125°C			0.3		%
Operating Input Voltage	V_{IN}	I_{OUT}=100mA				15	V
Quiescent Current	I_D	V_{IN}≤10V			5	10	mA
Output Current	I_{OUT}	V_{IN}=V_{OUT}+4.5V, T_J=25°C		800		1500	mA
Output Noise Voltage	eN	B=10Hz~10KHz, T_J=25°C			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1Vpp		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.88	0.98	V
		I_{OUT}= 1A			1.10	1.20	V
Thermal Regulation		Ta=25°C, 30ms Pulse			0.01	0.10	%/W

For LR1118-1.5V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25°C	1%	1.485	1.5	1.515	V
			2%	1.470		1.530	
		V_{IN} =(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A		1.470	1.5	1.530	V
Line Regulation	ΔV_{OUT}	V_{IN} =(V_{OUT}+2V)~15V, I_{OUT}=0A			0.1	0.6	%
Load Regulation		V_{IN} =V_{OUT}+2V, I_{OUT}=0 to 1A			2	3	%
Temperature Stability					0.5		%
Long Term Stability		1000 hrs, T_J=125°C			0.3		%
Operating Input Voltage	V_{IN}	I_{OUT}=100mA				15	V
Quiescent Current	I_D	V_{IN}≤10V			5	10	mA
Output Current	I_{OUT}	V_{IN}=V_{OUT}+4.5V, T_J=25°C		800		1500	mA
Output Noise Voltage	eN	B=10Hz~10KHz, T_J=25°C			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1Vpp		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.60	0.73	V
		I_{OUT}= 1A			0.82	0.95	V
Thermal Regulation		Ta=25°C, 30ms Pulse			0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-1.8V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, $T_J=25°C$	1%	1.782	1.8	1.818	V
			2%	1.764		1.836	
		$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0 to 1A		1.764	1.8	1.836	V
Line Regulation	ΔV_{OUT}	$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0A			0.1	0.6	%
Load Regulation		$V_{IN}=V_{OUT}+2V$, I_{OUT}=0 to 1A			2	3	%
Temperature Stability					0.5		%
Long Term Stability		1000 hrs, T_J=125°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°C		800		1500	mA
Output Noise Voltage	eN	B=10Hz~10KHz, T_J=25°C			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C $V_{IN}=V_{OUT}+2.5V$, V_{RIPPLE}=1Vpp		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.32	0.48	V
		I_{OUT}= 1A			0.65	0.88	V
Thermal Regulation		Ta=25°C, 30ms Pulse			0.01	0.10	%/W

For LR1118-2.5V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, I_{OUT}=10mA, T_J=25°C	1%	2.475	2.5	2.525	V
			2%	2.450		2.550	
		$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0 to 1A		2.450	2.5	2.550	V
Line Regulation	ΔV_{OUT}	$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0A			0.1	0.6	%
Load Regulation		$V_{IN}=V_{OUT}+2V$, I_{OUT}=0 to 1A			2	3	%
Temperature Stability					0.5		%
Long Term Stability		1000 hrs, T_J=125°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°C		800		1500	mA
Output Noise Voltage	eN	B=10Hz~10KHz, T_J=25°C			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C $V_{IN}=V_{OUT}+2.5V$, V_{RIPPLE}=1Vpp		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.16	0.25	V
		I_{OUT}= 1A			0.56	0.70	V
Thermal Regulation		Ta=25°C, 30ms Pulse			0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-2.85V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA, T_J=25°C	1%	2.822	2.85	2.878	V
			2%	2.793		2.907	
		V_{IN} =(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A		2.793	2.85	2.907	V
Line Regulation	ΔV_{OUT}	V_{IN} =(V_{OUT}+2V)~15V, I_{OUT}=0A			0.1	0.6	%
Load Regulation		V_{IN} =V_{OUT}+2V, I_{OUT}=0 to 1A			2	3	%
Temperature Stability					0.5		%
Long Term Stability		1000 hrs, T_J=125°C			0.3		%
Operating Input Voltage	V_{IN}	I_{OUT}=100mA				15	V
Quiescent Current	I_D	V_{IN}≤10V			5	10	mA
Output Current	I_{OUT}	V_{IN}=V_{OUT}+4.5V, T_J=25°C		800		1500	mA
Output Noise Voltage	eN	B=10Hz~10KHz, T_J=25°C			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1Vpp		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.132	0.35	V
		I_{OUT}= 1A			0.828	0.91	V
Thermal Regulation		Ta=25°C, 30ms Pulse			0.01	0.10	%/W

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°C	2.970	3.0	3.030	V
		V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A	2.940	3.0	3.060	V
Line Regulation	ΔV_{OUT}	V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0A		0.1	0.6	%
Load Regulation		V_{IN}=V_{OUT}+2V, I_{OUT}=0 to 1A		2	3	%
Temperature Stability				0.5		%
Long Term Stability		1000 hrs, T_J=125°C		0.3		%
Operating Input Voltage	V_{IN}	I_{OUT}=100mA			15	V
Quiescent Current	I_D	V_{IN}≤10V		5	10	mA
Output Current	I_{OUT}	V_{IN}=V_{OUT}+4.5V, T_J=25°C	800		1500	mA
Output Noise Voltage	eN	B=10Hz ~ 10KHz, T_J=25°C		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1Vpp	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		Ta=25°C, 30ms Pulse		0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-3.3V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$,$T_J=25°C$	3.267	3.3	3.333	V
		$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0 to 1A	3.234	3.3	3.366	V
Line Regulation	ΔV_{OUT}	$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0A		0.1	0.6	%
Load Regulation		$V_{IN}=V_{OUT}+2V$, I_{OUT}=0 to 1A		2	3	%
Temperature Stability				0.5		%
Long Term Stability		1000 hrs, T_J=125°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°C	800		1500	mA
Output Noise Voltage	eN	B=10Hz ~ 10KHz, T_J=25°C		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C $V_{IN}=V_{OUT}+2.5V$, V_{RIPPLE}=1Vpp	60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA I_{OUT}= 1A		0.11 0.45	0.26 0.65	V V
Thermal Regulation		Ta=25°C, 30ms Pulse		0.01	0.10	%/W

For LR1118-3.6V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, I_{OUT}=10mA,T_J=25°C	3.564	3.6	3.636	V
		$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0 to 1A	3.528	3.6	3.672	V
Line Regulation	ΔV_{OUT}	$V_{IN}=(V_{OUT}+2V)$~15V, I_{OUT}=0A		0.1	0.6	%
Load Regulation		$V_{IN}=V_{OUT}+2V$, I_{OUT}=0 to 1A		2	3	%
Temperature Stability				0.5		%
Long Term Stability		1000 hrs, T_J=125°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°C	800		1500	mA
Output Noise Voltage	eN	B=10Hz ~ 10KHz, T_J=25°C		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C $V_{IN}=V_{OUT}+2.5V$, V_{RIPPLE}=1Vpp	60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA I_{OUT}= 1A		0.19 0.81	0.31 0.89	V V
Thermal Regulation		Ta=25°C, 30ms Pulse		0.01	0.10	%/W

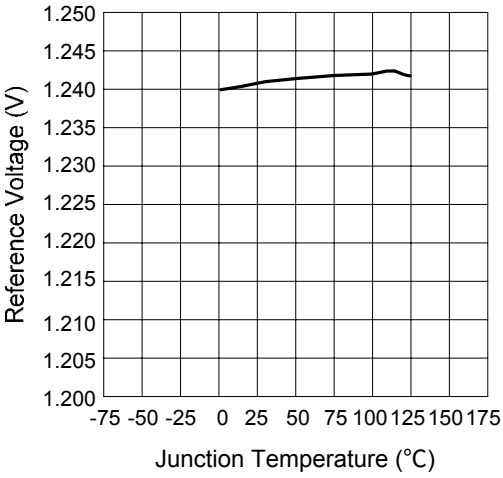
■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-5.0V

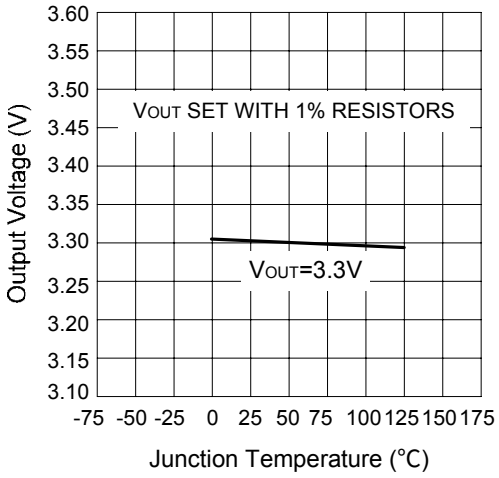
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA,T_J=25°C	4.95	5.0	5.05	V
		V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A	4.90	5.0	5.10	V
Line Regulation	ΔV_{OUT}	V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0A		0.1	0.6	%
Load Regulation		V_{IN}=V_{OUT}+2V, I_{OUT}=0 to 1A		2	3	%
Temperature Stability				0.5		%
Long Term Stability		1000 hrs, T_J=125°C		0.3		%
Operating Input Voltage	V_{IN}	I_{OUT}=100mA			15	V
Quiescent Current	I_D	V_{IN}≤10V		5	10	mA
Output Current	I_{OUT}	V_{IN}=V_{OUT}+4.5V, T_J=25°C	800		1500	mA
Output Noise Voltage	eN	B=10Hz ~ 10KHz, T_J=25°C		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25°C V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1Vpp	60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA I_{OUT}= 1A		0.11 0.45	0.26 0.62	V V
Thermal Regulation		Ta=25°C, 30ms Pulse		0.01	0.10	%/W

■ TYPICAL CHARACTERISTICS

Reference Voltage vs. Temperature



Output Voltage vs. Temperautre



Maximum Power Dissipation