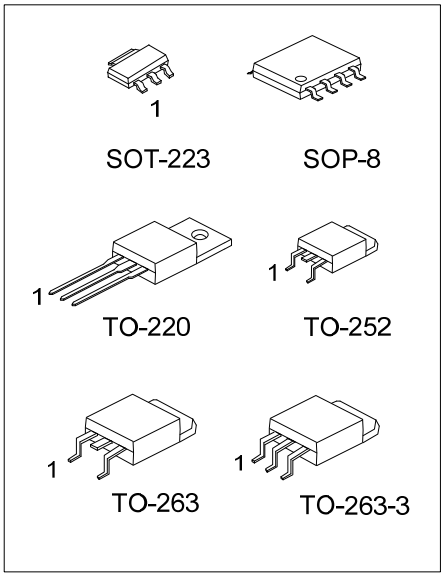
LR1118

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 ±1%(at 25℃) and 2% in all temperature range

■ ORDERING INFORMATION

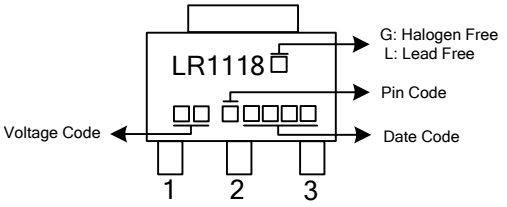
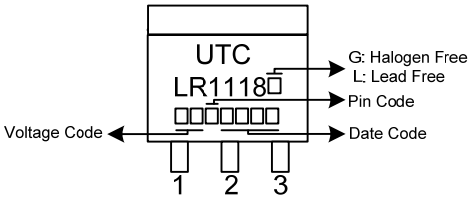
Ordering Number		Package	① Pin Assignment	② Packing
Lead Free	Halogen Free			
LR1118L-xx-AA3-①-②	LR1118G-xx-AA3-①-②	SOT-223	A: GOI B: OGI C: GIO D: IGO	R: Tape Reel T: Tube
LR1118L-xx-TA3-①-②	LR1118G-xx-TA3-①-②	TO-220		
LR1118L-xx-TN3-①-②	LR1118G-xx-TN3-①-②	TO-252		
LR1118L-xx-TQ2-①-②	LR1118G-xx-TQ2-①-②	TO-263		
LR1118L-xx-TQ3-①-②	LR1118G-xx-TQ3-①-②	TO-263-3		
LR1118L-xx-S08-①-②	LR1118G-xx-S08-①-②	SOP-8	GOOIxOOx	

Note: 1. Pin assignment: I: V_{IN} O: V_{OUT} G: GND x: NC
2. xx: Output Voltage, refer to Marking Information.

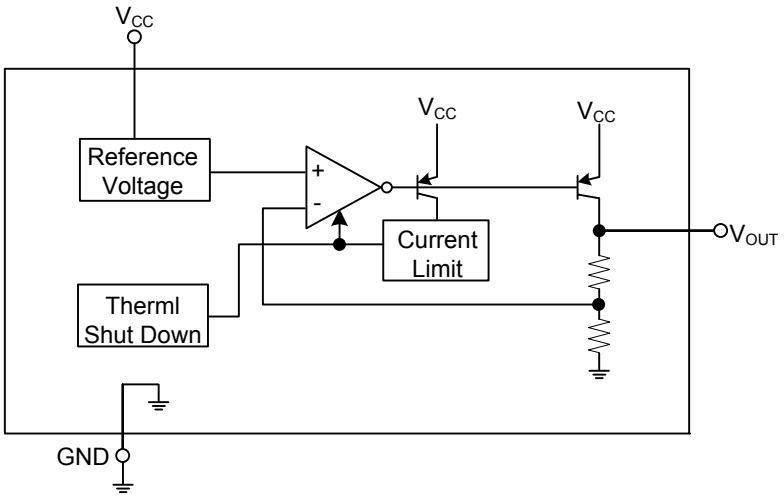
LR1118L-xx-AA3-①-②
(1)Packing Type
(2)Pin Assignment
(3)Package Type
(4)Output Voltage Code
(5)Lead Free

(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) G: Halogen Free, L: Lead Free

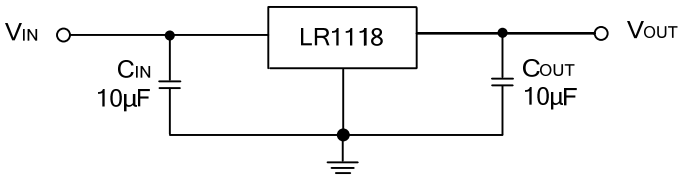
■ MARKING INFORMATION

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		

■ BLOCK DIAGRAM



■ APPLICATION CIRCUIT



■ ABSOLUTE MAXIMUM RATINGS

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

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

■ THERMAL DATA

PARAMETER		SYMBOL	RATINGS	UNIT
Junction to Case	SOT-223	θ_{JC}	15	℃/W
	SOP-8		20	
	TO-252		8	
	TO-220		4	
	TO-263		4	

■ ELECTRICAL CHARACTERISTICS

(T_A=25℃, refer to the test circuits, T_J=-0~125℃, 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℃	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℃			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℃		800		1500	mA
Output Noise Voltage	e_N	B=10Hz~10KHz, T_J=25℃			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25℃ V_{IN}=V_{OUT}+2.5V, V_{RIPPLE}=1V_{PP}		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.88	0.98	V
		I_{OUT}= 1A			1.10	1.20	
Thermal Regulation		T_A=25℃, 30ms Pulse			0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-1.5V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, $T_J=25℃$	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, $T_J=125℃$			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}	$V_{IN}=V_{OUT}+4.5V$, $T_J=25℃$		800		1500	mA
Output Noise Voltage	e_N	B=10Hz~10KHz, $T_J=25℃$			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, $T_J=25℃$ $V_{IN}=V_{OUT}+2.5V$, $V_{RIPPLE}=1V_{PP}$		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.60	0.73	V
		I_{OUT}= 1A			0.82	0.95	
Thermal Regulation		$T_A=25℃$, 30ms Pulse			0.01	0.10	%/W

For LR1118-1.8V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, $T_J=25℃$	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, $T_J=125℃$			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}	$V_{IN}=V_{OUT}+4.5V$, $T_J=25℃$		800		1500	mA
Output Noise Voltage	e_N	B=10Hz~10KHz, $T_J=25℃$			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, $T_J=25℃$ $V_{IN}=V_{OUT}+2.5V$, $V_{RIPPLE}=1V_{PP}$		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.32	0.48	V
		I_{OUT}= 1A			0.65	0.88	
Thermal Regulation		$T_A=25℃$, 30ms Pulse			0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-2.5V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, $T_J=25℃$	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, $T_J=125℃$			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}	$V_{IN}=V_{OUT}+4.5V$, $T_J=25℃$		800		1500	mA
Output Noise Voltage	e_N	B=10Hz~10KHz, $T_J=25℃$			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, $T_J=25℃$ $V_{IN}=V_{OUT}+2.5V$, $V_{RIPPLE}=1V_{PP}$		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.16	0.25	V
		I_{OUT}= 1A			0.56	0.70	
Thermal Regulation		$T_A=25℃$, 30ms Pulse			0.01	0.10	%/W

For LR1118-2.85V

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$, $T_J=25℃$	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, $T_J=125℃$			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}	$V_{IN}=V_{OUT}+4.5V$, $T_J=25℃$		800		1500	mA
Output Noise Voltage	e_N	B=10Hz~10KHz, $T_J=25℃$			100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, $T_J=25℃$ $V_{IN}=V_{OUT}+2.5V$, $V_{RIPPLE}=1V_{PP}$		60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA			0.132	0.35	V
		I_{OUT}= 1A			0.828	0.91	
Thermal Regulation		$T_A=25℃$, 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}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$,$T_J=25℃$	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, $T_J=125℃$		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}	$V_{IN}=V_{OUT}+4.5V$, $T_J=25℃$	800		1500	mA
Output Noise Voltage	e_N	B=10Hz ~ 10KHz, $T_J=25℃$		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, $T_J=25℃$ $V_{IN}=V_{OUT}+2.5V$, $V_{RIPPLE}=1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA		0.11	0.26	V
		I_{OUT}= 1A		0.45	0.65	
Thermal Regulation		$T_A=25℃$, 30ms Pulse		0.01	0.10	%/W

For LR1118-3.3V

PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	$V_{IN}=V_{OUT}+1.5V$, $I_{OUT}=10mA$,$T_J=25℃$	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, $T_J=125℃$		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}	$V_{IN}=V_{OUT}+4.5V$, $T_J=25℃$	800		1500	mA
Output Noise Voltage	e_N	B=10Hz ~ 10KHz, T_J=25°C		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, $T_J=25℃$ $V_{IN}=V_{OUT}+2.5V$, $V_{RIPPLE}=1V_{PP}$	60	75		dB
Dropout Voltage	V_D	I_{OUT}= 100mA		0.11	0.26	V
		I_{OUT}= 1A		0.45	0.65	
Thermal Regulation		$T_A=25℃$, 30ms Pulse		0.01	0.10	%/W

■ ELECTRICAL CHARACTERISTICS (Cont.)

For LR1118-3.6V

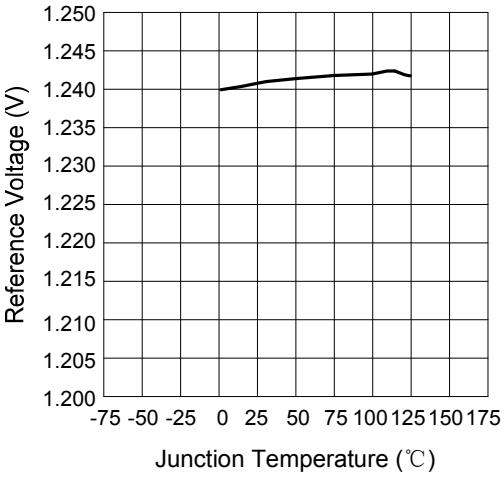
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA,T_J=25℃	3.564	3.6	3.636	V
		V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A	3.528	3.6	3.672	V
Line Regulation	ΔV_{OUT}	V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0A		0.1	0.6	%
Load Regulation		V_{IN}=V_{OUT}+2V,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

For LR1118-5.0V

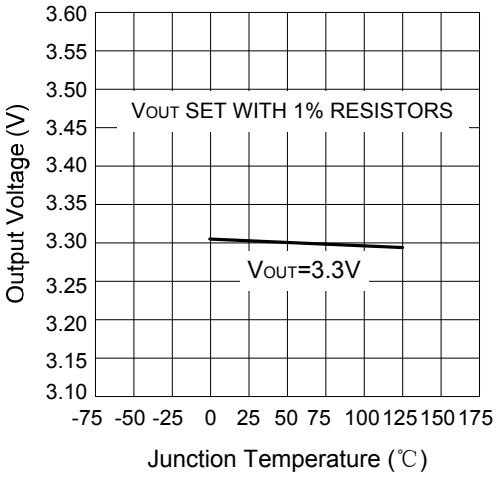
PARAMETER	SYMBOL	TEST CONDITIONS	MIN	TYP	MAX	UNIT
Output Voltage	V_{OUT}	V_{IN}=V_{OUT}+1.5V, I_{OUT}=10mA,T_J=25℃	4.95	5.0	5.05	V
		V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0 to 1A	4.90	5.0	5.10	V
Line Regulation	ΔV_{OUT}	V_{IN}=(V_{OUT}+2V)~15V, I_{OUT}=0A		0.1	0.6	%
Load Regulation		V_{IN}=V_{OUT}+2V, I_{OUT}=0 to 1A		2	3	%
Temperature Stability				0.5		%
Long Term Stability		1000 hrs, T_J=125℃		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℃	800		1500	mA
Output Noise Voltage	e_N	B=10Hz ~ 10KHz, T_J=25℃		100		μV
Supply Voltage Rejection	SVR	I_{OUT}=40mA, f=120Hz, T_J=25℃ 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	
Thermal Regulation		T_A=25℃, 30ms Pulse		0.01	0.10	%/W

■ TYPICAL CHARACTERISTICS

Reference Voltage vs. Temperature



Output Voltage vs. Temperautre



Maximum Power Dissipation