

# Low $I_Q$ , Low Dropout, 800mA Source and Sink Regulators Fixed 2.5V, 2.85V, 5V Output

## FEATURES

- **Regulates While Sourcing or Sinking Current**
- Provides Termination for up to 27 SCSI Lines
- **600 $\mu$ A Quiescent Current**
- Ultra-Low Power Shutdown Mode
- Current Limit and Thermal Shutdown Protection
- Stable for Any  $C_{LOAD} \geq 0.22\mu F$
- Fast Settling Time
- 1V Dropout Voltage

## APPLICATIONS


- Active Negation SCSI Terminations
- Computers
- Disk Drives
- CD-ROM
- Supply Splitter

## DESCRIPTION

The LT<sup>®</sup>1118 family of low dropout regulators has the unique capability of maintaining output regulation while sourcing or sinking load current. The 2.85V output voltage regulator is ideal for use as a Boulay termination of up to 27 SCSI data lines. The regulator maintains regulation while both sourcing and sinking current, enabling the use of active negation drivers for improved noise immunity on the data lines. Regulation of output voltage is maintained for TERMPWR voltages as low as 4.0V. When unloaded, quiescent supply current is a low 600 $\mu$ A, allowing continuous connection to the TERMPWR lines. An ultra-low power shutdown mode is also available on the SO-8 version. In Shutdown the output is high impedance and supply current drops to less than 10 $\mu$ A.

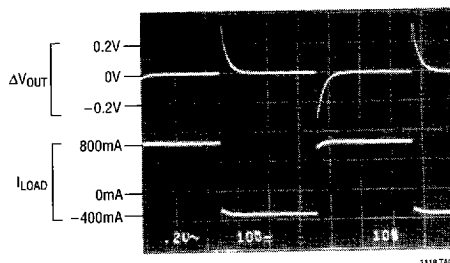
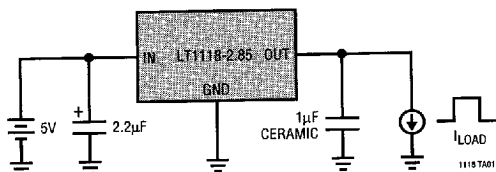
Current limits in both sourcing and sinking modes, plus on-chip thermal shutdown make the circuit tolerant of output fault conditions.

The LT1118 is available in 3-lead SOT-223 and 8-lead SO packages.

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## TYPICAL APPLICATION

Load Transient Response



## ABSOLUTE MAXIMUM RATINGS

(Note 1)

Supply Voltage ( $V_{CC}$ ) ..... 15V  
Input Voltage (Enable) ..... -0.2V to 7V  
Output Voltage ..... -0.2V to  $V_{CC} + 0.5V$

Short-Circuit Duration ..... Indefinite  
Operating Temperature Range ..... 0°C to 70°C  
Storage Temperature Range ..... -65°C to 150°C  
Lead Temperature (Soldering, 10 sec) ..... 300°C

## PACKAGE/ORDER INFORMATION

<p><b>TOP VIEW</b></p> <p>S8 PACKAGE 8-LEAD PLASTIC SO</p> <p><math>T_{JMAX} = 125^{\circ}C</math>, <math>\theta_{JC} = 15^{\circ}C/W</math></p>	<p><b>ORDER PART NUMBER</b></p> <p>LT1118CS8-2.5 LT1118CS8-2.85 LT1118CS8-5</p> <p><b>S8 PART MARKING</b></p> <p>111825 111828 11185</p>	<p><b>FRONT VIEW</b></p> <p>ST PACKAGE 3-LEAD PLASTIC SOT-223</p> <p><math>T_{JMAX} = 125^{\circ}C</math>, <math>\theta_{JC} = 15^{\circ}C/W</math></p>	<p><b>ORDER PART NUMBER</b></p> <p>LT1118CST-2.5 LT1118CST-2.85 LT1118CST-5</p>
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Consult factory for Industrial and Military grade parts.

4

## ELECTRICAL CHARACTERISTICS (Note 2)

PARAMETER		CONDITIONS		MIN	TYP	MAX	UNITS
Quiescent Current ( $V_{IN}$ )		$V_{EN} = 5V$	●		0.6	1	mA
Quiescent Current in Shutdown ( $V_{IN}$ )		$V_{EN} = 0V$	●		1	10	μA
Enable Input Thresholds		Input Low Level	●	0.8	1.4		V
		Input High Level	●		1.4	2.0	V
Enable Input Current		$0V \leq V_{EN} \leq 5V$	●	−1		25	μA
Output Voltage	LT1118-2.5	No Load (25°C)		2.47	2.5	2.53	V
		All Operating Conditions (Note 3)	●	2.45	2.5	2.55	V
	LT1118-2.85	No Load (25°C)		2.82	2.85	2.88	V
		All Operating Conditions (Note 3)	●	2.79	2.85	2.91	V
	LT1118-5	No Load (25°C)		4.95	5.0	5.05	V
		All Operating Conditions (Note 3)	●	4.90	5.0	5.10	V
Line Regulation (Note 4)	LT1118-2.5	$I_L = 0mA, 4.2V \leq V_{IN} \leq 15V$	●			6	mV
	LT1118-2.85	$I_L = 0mA, 4.75V \leq V_{IN} \leq 15V$	●			6	mV
	LT1118-5	$I_L = 0mA, 6.5V \leq V_{IN} \leq 15V$	●			10	mV
Load Regulation (Note 4)	LT1118-2.5	$0mA \leq I_L \leq 800mA$	●			10	mV
		$-400mA \leq I_L \leq 0mA$	●			10	mV
	LT1118-2.85	$0mA \leq I_L \leq 800mA$	●			10	mV
		$-400mA \leq I_L \leq 0mA$	●			10	mV
	LT1118-5	$0mA \leq I_L \leq 800mA$	●			20	mV
		$-400mA \leq I_L \leq 0mA$	●			20	mV
Dropout Voltage (Note 5)		$I_L = 100mA$			0.85	1.1	V
		$I_L = 800mA$			1.0	1.3	V
Ripple Rejection		$f_{RIPPLE} = 120Hz, V_{IN} - V_{OUT} = 2V$ $V_{RIPPLE} = 0.5V_{P-P}$		60	80		dB



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## ELECTRICAL CHARACTERISTICS (Note 2)

PARAMETER	CONDITIONS	MIN	TYP	MAX	UNITS
Load Transient Settling Time, $\Delta V = 1\%$	$0\text{mA} \leq I_L \leq 800\text{mA}$ , $C_{\text{LOAD}} = 1\mu\text{F}$ $-400\text{mA} \leq I_L \leq 0\text{mA}$ , $C_{\text{LOAD}} = 1\mu\text{F}$		5 5		$\mu\text{s}$ $\mu\text{s}$
Output Short-Circuit Current, $I_{\text{SC}}^+$ $I_{\text{SC}}^-$	$V_{\text{OUT}} = 0\text{V}$ $V_{\text{OUT}} = V_{\text{IN}}$	800	1200 -700	-400	$\text{mA}$ $\text{mA}$
Thermal Shutdown Junction Temperature	No Load		170		$^{\circ}\text{C}$
Enable Turn-On Delay	No Load		50		$\mu\text{s}$

The ● denotes specifications which apply over the operating temperature range ( $0^{\circ}\text{C} \leq T_A \leq 70^{\circ}\text{C}$  for commercial grade).

**Note 1:** Absolute maximum ratings are those values beyond which the life of the device may be impaired.

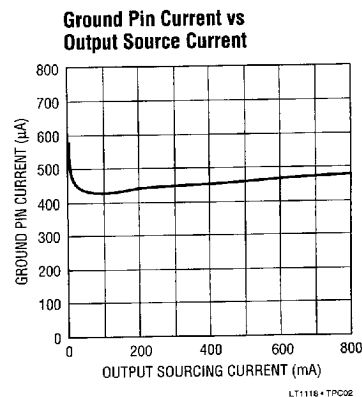
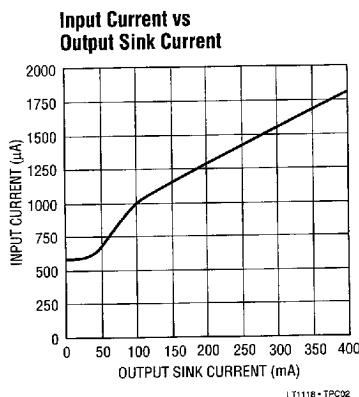
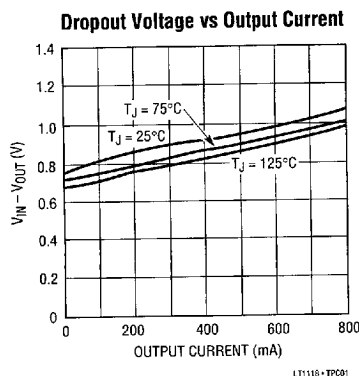
**Note 2:** Unless otherwise specified, testing done at  $V_{\text{CC}} = 5\text{V}$  (LT1118-2.5, LT1118-2.85) or  $V_{\text{CC}} = 7\text{V}$  (LT1118-5).  $V_{\text{EN}} = V_{\text{CC}}$ . Output  $C_{\text{LOAD}} = 1\mu\text{F}$ ,  $I_{\text{LOAD}} = 0$ .

**Note 3:** All operating conditions include the combined effects of load current, input voltage, and temperature over each parameter's full range.

**Note 4:** Load and line regulation are tested at a constant junction temperature by low duty cycle pulse testing.

**Note 5:** Dropout voltage is defined as the minimum input to output voltage measured while sourcing the specified current.

## TYPICAL PERFORMANCE CHARACTERISTICS



## PIN FUNCTIONS

**IN:** Input Supply Pin. This pin should be decoupled with a  $1\mu\text{F}$  or larger low ESR capacitor. The two IN pins on the SO-8 package must be directly connected on the printed circuit board to prevent voltage drops between the two inputs. When used as a SCSI active termination, IN connects to term power. When used as a supply splitter, IN is also the positive supply output.

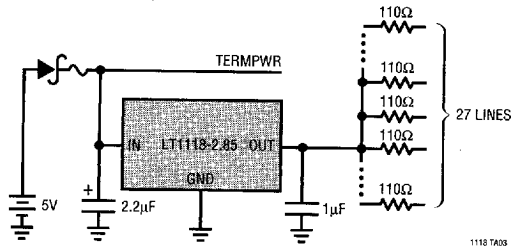
**GND:** Ground Pin. The three GND pins on the SO-8 package are internally connected, but lowest load regulation errors will result if these pins are tightly connected on the printed circuit board. This will also aid heat dissipation at high power levels.

**EN:** TTL/CMOS Logic Input. A high level allows normal operation. A low level reduces supply current to zero. This pin is internally connected to  $V_{\text{IN}}$  on 3-lead ST packaged devices.

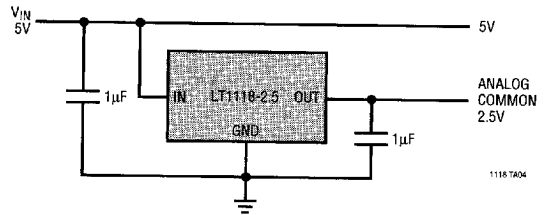
**OUT:** Regulated Output Voltage. Output can source or sink current. Current limit for sourcing and sinking current is provided to protect the device from fault conditions. The output must have a low ESR output filter capacitor.  $C_{\text{OUT}} \geq 0.22\mu\text{F}$  to guarantee stability. A  $0.1\mu\text{F}$  ceramic capacitor may be needed if the ESR of the main  $C_{\text{OUT}} \geq 0.22\mu\text{F}$  is too high.

## TYPICAL APPLICATIONS

SCSI Active Terminator



Power Supply Splitter



## RELATED PARTS

PART NUMBER	DESCRIPTION	COMMENTS
LT1005	Logic Controlled Regulator	5V, 1A Main Output Plus 35mA Auxilliary Output
LT1117	800mA Low Dropout Regulator	Fixed 2.85V, 3.3V, 5V or Adjustable Outputs
LT1120A	Micropower Regulator with Comparator and Shutdown	20µA Supply Current, 2.5V Reference Output
LT1121	Micropower Low Dropout Regulator with Shutdown	Reverse Voltage and Reverse Current Protection