

**DESCRIPTION**

The LX8815 is a dual channel positive-voltage linear regulator. This dual regulator has either one fixed output coupled with an adjustable output or two fixed outputs. Each channel features low-dropout and high accuracy.

The LX8815 provides designers with a flexible power management solution, minimal printed circuit board area, and shorter design cycles.

Each channel can supply up to one amp independently with a regulator design optimized for system efficiency by consuming minimal ground current and directing quiescent current to the load.

The LX8815 features on-chip trimming of the internal

voltage reference enabling precise output voltages, typically  $\pm 1\%$  of it's specified value, while the BiPolar output transistor has a low dropout voltage even at full output current ( $V_{DO} < 1.1V$  typ. @ 1A).

Thermal and Short Circuit Current Protection are integrated on-chip and operate independently for each regulator output.

The LX8815 regulator is stable with a low-value output capacitor, typically  $3.3\mu F$  tantalum or  $4.7\mu F$  ceramic on the outputs, allowing designers flexibility in external component selection.

Linfinity's S-PAK power package offers maximum power dissipation and ease of assembly using surface mount technology.

**KEY FEATURES**

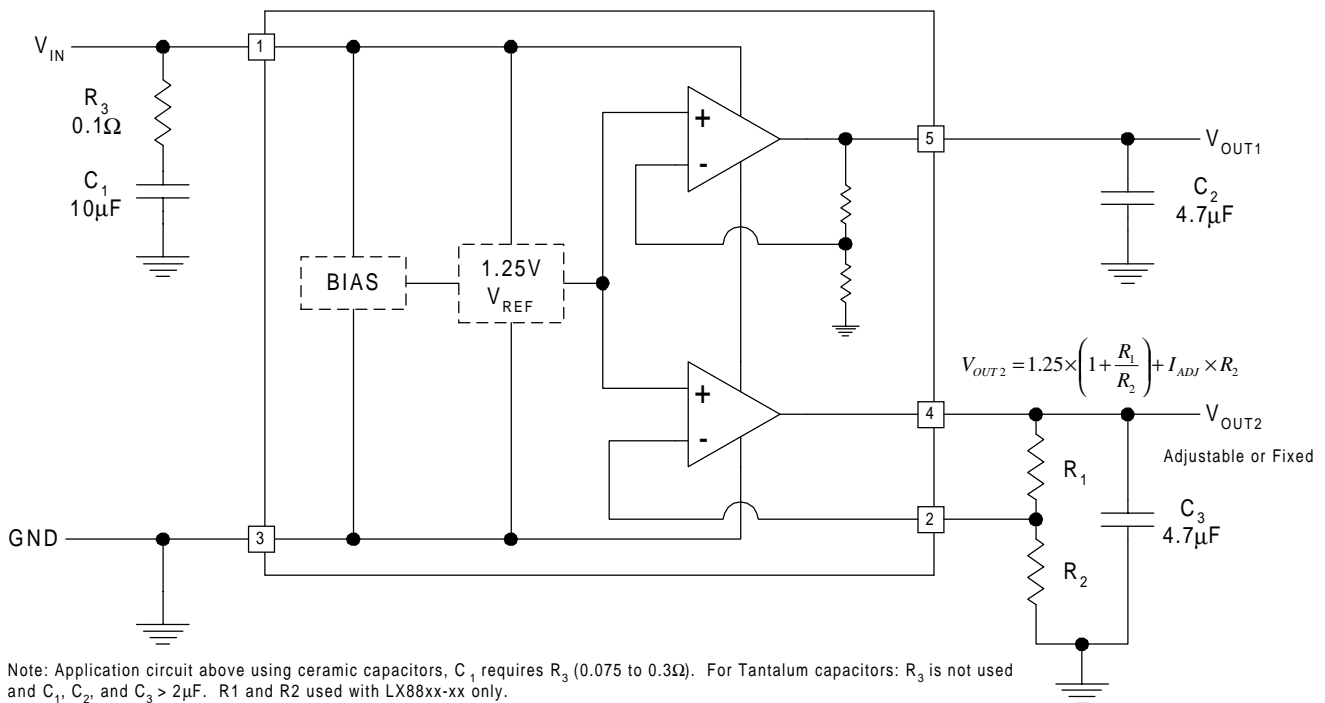
- Two Independent Regulated Outputs
- Accurate Output Voltages
- Max. Dropout of 1.1V at Rated Current
- Independent Thermal and Current Limit Protection
- Low Profile 5 Lead SMT Power Package
- Low Tolerance Line (0.2%) and Load (0.4%) Regulation
- Wide DC Supply Voltage of 4.0V to 12.0V
- Loop Stability Independent of Output Capacitor Type

**APPLICATIONS/BENEFITS**

- 5V to 3.3V Linear Regulator
- Low Voltage Logic Supplies
- Active SCSI Terminators
- Battery Charging Circuits
- Instrumentation
- PC Peripherals

**IMPORTANT:** For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>

**BLOCK DIAGRAM / APPLICATION CIRCUIT**



**PACKAGE ORDER INFO**

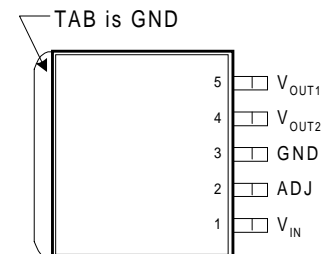
T <sub>J</sub> (°C)	OUTPUT V <sub>1</sub>	OUTPUT V <sub>2</sub>	DF	Plastic S-PAK 5-PIN
			0 to 125	3.3V
3.3V	1.8V			LX8815-3318CDF
3.3V	Adj			LX8815-3300CDF
2.85V	Adj			LX8815-2800CDF
2.5V	Adj			LX8815-2500CDF

Note: Available in Tape & Reel.  
 Append the letter "T" to the part number. (i.e. LX8815-3325CDFT)

**ABSOLUTE MAXIMUM RATINGS**

Input Voltage (V <sub>BAT</sub> )	13.5V
Load Current (Internally Limited)	1A
Power Dissipation	Internally Limited
Short-Circuit Protection	Indefinite
Operating Junction Temperature	150°C
Lead Temperature (Soldering 180 seconds)	235°C

Note: Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of specified terminal.

**PACKAGE PIN OUT**


DF PACKAGE  
(Top View)

**THERMAL DATA**
**DF**

PACKAGE

THERMAL RESISTANCE-JUNCTION TO TAB, $\theta_{JT}$	4.5°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, $\theta_{JA}$	24.5°C/W

Junction Temperature Calculation:  $T_J = T_A + (P_D \times \theta_{JA})$ .

The  $\theta_{JA}$  numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.  $\theta_{JA}$  can vary from 20°C/W to > 40°C/W depending on mounting technique. (See Application Notes Section: Thermal considerations)

**FUNCTIONAL PIN DESCRIPTION**

PIN NAME	DESCRIPTION
V <sub>IN</sub>	Unregulated input voltage supply.
ADJ	Adjust control pin for regulator 2
GND	Common terminal for ground reference
V <sub>OUT1</sub>	Fixed voltage regulator output (Regulator #1)
V <sub>OUT2</sub>	Fixed or adjustable regulator output (Regulator #2)

**ELECTRICAL CHARACTERISTICS**

Unless otherwise specified, the following specifications apply over the operating ambient temperature  $0^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$  except where otherwise noted and the following test conditions:  $V_{\text{IN}} = 5\text{V}$ ,  $I_{\text{OUT}} = 10\text{mA}$ ,  $C_1 = 4.7\mu\text{F}$  (Tantalum),  $C_2 = 4.7\mu\text{F}$  (Tantalum), and  $T_J = T_A = 25^{\circ}\text{C}$  using low duty cycling methods.

Parameter	Symbol	Test Conditions	LX8815-xx00			Units
			Min	Typ	Max	
<b>FIXED OUTPUT</b>						
Output Voltage	$V_1$	$V_{\text{IN}} = 5\text{V}$ , $I_{\text{OUT}} = 5\text{mA}$ , $T_J = 25^{\circ}\text{C}$ $5\text{mA} < I_1 < 1\text{A}$ , $4.50\text{V} < V_{\text{IN}} < 10\text{V}$	3.250	3.300	3.350	V
• LX8815-3300			3.234	3.300	3.366	
• LX8815-2800			2.807	2.850	2.893	
• LX8815-2500			2.793	2.850	2.907	
		$V_{\text{IN}} = 5\text{V}$ , $I_{\text{OUT}} = 5\text{mA}$ , $T_J = 25^{\circ}\text{C}$ $5\text{mA} < I_1 < 1\text{A}$ , $4.50\text{V} < V_{\text{IN}} < 10\text{V}$	2.462	2.500	2.537	
		$V_{\text{IN}} = 5\text{V}$ , $I_{\text{OUT}} = 5\text{mA}$ , $T_J = 25^{\circ}\text{C}$ $5\text{mA} < I_1 < 1\text{A}$ , $4.50\text{V} < V_{\text{IN}} < 10\text{V}$	2.450	2.500	2.550	
Line Regulation	$\Delta V_1(V_{\text{IN}})$	$4.75\text{V} < V_{\text{IN}} < 10\text{V}$ , $I_{\text{OUT}} = 5\text{mA}$		0.01	0.2	$\%V_1$
Load Regulation	$\Delta V_1(I_1)$	$5\text{mA} < I_1 < 1\text{A}$ , $V_{\text{IN}} = 4.75\text{V}$		0.01	0.4	$\%V_1$
Dropout Voltage	$\Delta V$	$I_{\text{LOAD}} = 1\text{A}$ , $\Delta V_1 = -2\%$		1.1	1.25	V
Current Limit	$I_{\text{OUT (MAX)}}$	$(V_{\text{IN}} - V_1) = 5\text{V}$	1.0	1.4		A
Minimum Load Current	$I_L$	Note 1		0	2	mA
<b>ADJUSTABLE OUTPUT</b>						
Reference Voltage	$V_{\text{REF}}$	$V_{\text{IN}} = 5\text{V}$ , $I_{\text{OUT}} = 10\text{mA}$ , $T_J = 25^{\circ}\text{C}$ $5\text{mA} < I_1 < 1\text{A}$ , $4.50\text{V} < V_{\text{IN}} < 10\text{V}$	1.238 1.231	1.250 1.250	1.262 1.269	V
Line Regulation	$\Delta V_{\text{REF}}(V_{\text{IN}})$	$4.75\text{V} < V_{\text{IN}} < 10\text{V}$ , $I_{\text{OUT}} = 5\text{mA}$		0.01	0.2	$\%V_1$
Load Regulation	$\Delta V_{\text{REF}}(I_2)$	$5\text{mA} < I_1 < 1\text{A}$ , $V_{\text{IN}} = 4.75\text{V}$		0.01	0.4	$\%V_1$
Dropout Voltage	$\Delta V$	$V_{\text{IN}} > 4.5\text{V}$ , $I_{\text{LOAD}} = 1\text{A}$ , $\Delta V_1 = -1\%$		1.1	1.3	V
Current Limit	$I_{\text{OUT (MAX)}}$	$(V_{\text{IN}} - V_1) = 5\text{V}$	1.0	1.4		A
Minimum Load Current	$I_L$	Note 1		1	3	mA
Adjust Pin Bias Current	$I_{\text{ADJ}}$			1	5	$\mu\text{A}$
<b>ENTIRE REGULATOR</b>						
Quiescent Current	$I_Q$	$V_{\text{IN}} < 10\text{V}$ , $I_1 = 5\text{mA}$ , $I_2 = 5\text{mA}$		1.8	5	mA
Ripple Rejection	PSRR	$f = 120\text{Hz}$ , $V_{\text{IN}} = 5\text{V}$	60	75		dB
RMS Output Noise (% of $V_{\text{OUT}}$ )	$V_{\text{OUT (RMS)}}$	$10\text{Hz} < f < 10\text{kHz}$		0.003		$\%V_1$
Thermal Shutdown	$T_{\text{JSD}}$			140		$^{\circ}\text{C}$

Note 1: Minimum load current is defined as the amount of output current required to maintain regulation.

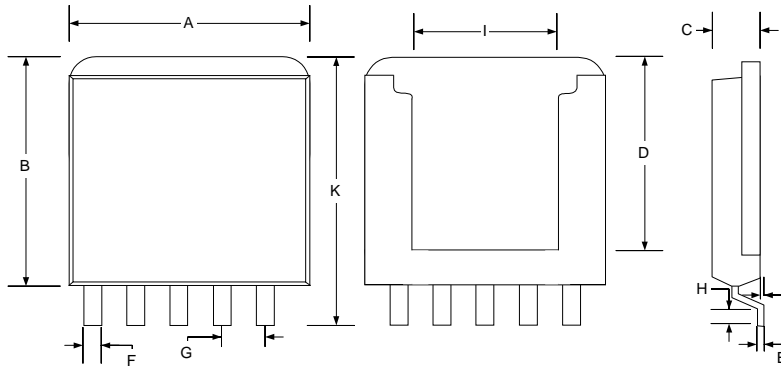
**ELECTRICAL CHARACTERISTICS**

Unless otherwise specified, the following specifications apply over the operating ambient temperature  $0^{\circ}\text{C} \leq T_A \leq 125^{\circ}\text{C}$  except where otherwise noted and the following test conditions:  $V_{IN} = 5\text{V}$ ,  $I_{OUT} = 10\text{mA}$ ,  $C_1 = 4.7\mu\text{F}$  (Tantalum),  $C_2 = 4.7\mu\text{F}$  (Tantalum), and  $T_J = T_A = 25^{\circ}\text{C}$  using low duty cycling methods.

Parameter	Symbol	Test Conditions	LX8815-33xx			Units
			Min	Typ	Max	
<b>▶ FIXED OUTPUT 1</b>						
Output Voltage	$V_1$	$V_{IN} = 5\text{V}$ , $I_{OUT} = 5\text{mA}$ , $T_J = 25^{\circ}\text{C}$ $5\text{mA} < I_1 < 1\text{A}$ , $4.50\text{V} < V_{IN} < 10\text{V}$	3.250 3.234	3.300 3.300	3.350 3.366	V
Line Regulation	$\Delta V_1(V_{IN})$	$4.75\text{V} < V_{IN} < 10\text{V}$ , $I_{OUT} = 5\text{mA}$		0.3	5.0	mV
Load Regulation	$\Delta V_1(I_1)$	$5\text{mA} < I_1 < 1\text{A}$ , $V_{IN} = 4.75\text{V}$		0.8	10	mV
Dropout Voltage	$\Delta V$	$I_{LOAD} = 1\text{A}$ , $\Delta V_1 = -2\%$		1.1	1.25	V
Current Limit	$I_{OUT(MAX)}$	$(V_{IN} - V_1)$	1.0	1.4		A
Minimum Load Current	$I_L$	Note 1		0	2	mA
<b>▶ FIXED OUTPUT 2</b>						
Output Voltage	$V_1$	$V_{IN} = 5\text{V}$ , $I_{OUT} = 5\text{mA}$ , $T_J = 25^{\circ}\text{C}$ $5\text{mA} < I_1 < 1\text{A}$ , $4.50\text{V} < V_{IN} < 10\text{V}$	2.462	2.50	2.537	V
• LX8815-3325			2.450	2.50	2.550	
• LX8815-3318			1.773	1.80	1.827	
			1.764	1.80	1.36	
Line Regulation	$\Delta V_1(V_{IN})$	$4.75\text{V} < V_{IN} < 10\text{V}$ , $I_{OUT} = 5\text{mA}$		0.02	0.15	%mV
Load Regulation	$\Delta V_1(I_1)$	$5\text{mA} < I_1 < 1\text{A}$ , $V_{IN} = 4.75\text{V}$		0.04	0.3	%mV
Dropout Voltage	$\Delta V$	$V_{IN} > 4.5\text{V}$ , $I_{LOAD} = 1\text{A}$ , $\Delta V_1 = -1\%$		1.1	1.3	V
Current Limit	$I_{OUT(MAX)}$	$(V_{IN} - V_1)$	1.0	1.4		A
Minimum Load Current	$I_L$	Note 1		1	2	mA
<b>▶ ENTIRE REGULATOR</b>						
Quiescent Current	$I_Q$	$V_{IN} < 10\text{V}$ , $I_1 = 5\text{mA}$ , $I_2 = 5\text{mA}$		1.8	7	mA
Ripple Rejection	PSRR	$f=120\text{Hz}$ , $V_{IN} = 5\text{V}$	60	75		dB
RMS Output Noise (% of $V_{OUT}$ )	$V_{OUT(RMS)}$	$10\text{Hz} < f < 10\text{kHz}$		0.003		% $V_1$
Thermal Shutdown	$T_{JSD}$			140		$^{\circ}\text{C}$

Note 1: Minimum load current is defined as the amount of output current required to maintain regulation.

**MECHANICAL DRAWINGS**



Dim	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	9.27	9.52	.365	.375
B	8.89	9.14	.350	.360
C	1.77	2.03	.070	.080
D	7.49	7.74	.295	.305
E	0.12	0.38	.005	.015
F	0.58	0.84	.023	.033
G	1.70 BSC		0.067 BSC	
H	0.79	1.04	.031	.041
I	4.31	6.86	.170	.270
J	0.03	0.13	.001	.005
K	10.41	10.67	.410	.420

**Note:**

1. Dimensions do not include mold flash or protrusions; these shall not exceed 0.155mm(.006") on any side. Lead dimension shall not include solder coverage.

Preliminary Data – Information contained in this document is pre-production data and is proprietary to Linfinity. It may not be modified in any way without the express written consent of Linfinity. Product referred to herein is offered in sample form only and Linfinity reserves the right to change or discontinue this proposed product at any time.