

3A BiCMOS VERY LOW DROPOUT REGULATORS

DESCRIPTION

Low Quiescent Current and Logic-Controlled Shutdown help conserve battery life and increase system efficiency. Typical quiescent current is under 400µA irrespective of load current, while the

Available in Popular TO-220 and TO-263 Power Packages: adjustable versions have five leads, and fixed output voltage devices are supplied in three lead packages.

KEY FEATURES

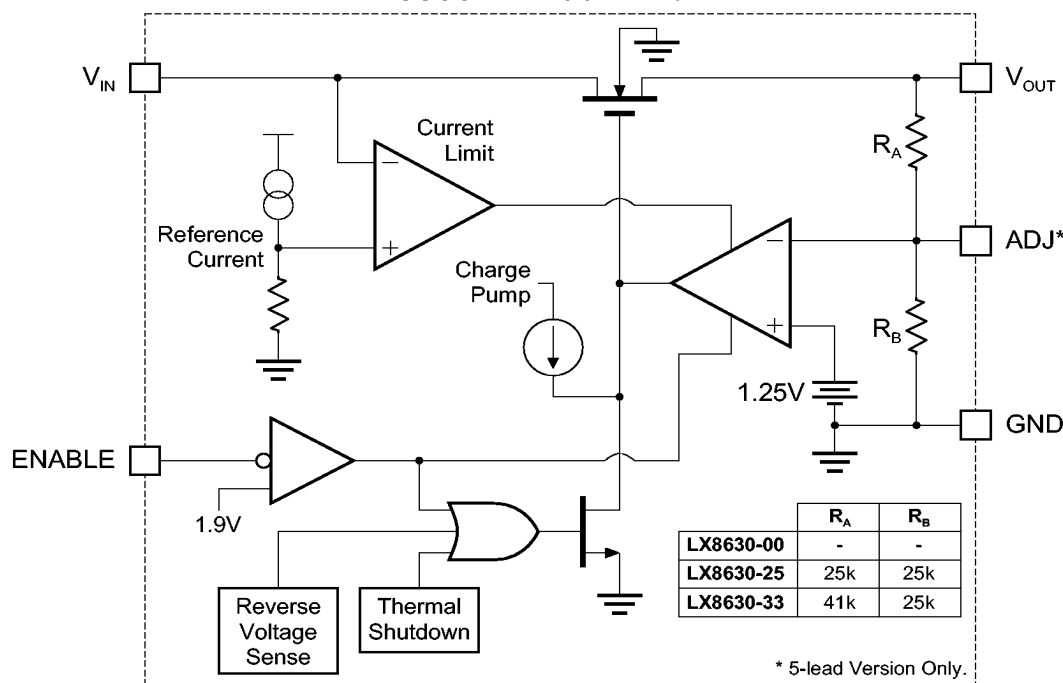
- Dropout Voltage Typically 450mV at 3A and 50mV at 10mA
- Low Quiescent Current, Under 400µA, irrespective of Load
- Shutdown Current 10µA
- Adjustable Output Version in 5-Pin TO-220 & TO-263 Packages
- Fixed Outputs of 2.5V and 3.3V Available in 3-Pin TO-220 & TO-263 Packages
- Low Reverse Leakage Current
- Short-Circuit and Thermal Shutdown Protection

APPLICATIONS

- 1.8V & 2.5V Supplies for Memory, Microprocessors, Clock Circuits, Etc.
- Portable Equipment

PRODUCT HIGHLIGHT

LX8630-XX BLOCK DIAGRAM



PACKAGE ORDER INFORMATION

T _A (°C)	Output Voltage	P Plastic TO-220 3-pin	P Plastic TO-220 5-pin	DD Plastic TO-263 3-pin	DD Plastic TO-263 5-pin
0 to 70	3.3	LX8630-33CP	—	LX8630-33CDD	—
	2.5	LX8630-25CP	—	LX8630-25CDD	—
	ADJ (00)	—	LX8630-00CP	—	LX8630-00CDD

Note: All surface-mount packages are available in Tape & Reel, append the letter "T" to part number. (i.e. LX8630-xxCDDT)

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Rev. 0.5 7/99

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ABSOLUTE MAXIMUM RATINGS (Note 1)

Input Voltage (V_{IN})	6.5V
Enable Pin	-0.3V to $V_{IN}+0.3V$
Operating Junction Temperature	
Plastic (P & DD Packages)	150°C
Storage Temperature Range	-65°C to 150°C
Lead Temperature (Soldering, 10 seconds)	300°C

Note 1. Exceeding these ratings could cause damage to the device. All voltages are with respect to Ground. Currents are positive into, negative out of the specified terminal.

THERMAL DATA

P PACKAGE (3-Pin)

THERMAL RESISTANCE-JUNCTION TO TAB, θ_{JT}	2.7°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	60°C/W

P PACKAGE (5-Pin)

THERMAL RESISTANCE-JUNCTION TO TAB, θ_{JT}	4.5°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	60°C/W

DD PACKAGE (3-Pin)

THERMAL RESISTANCE-JUNCTION TO TAB, θ_{JT}	2.7°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	60°C/W*

DD PACKAGE (5-Pin)

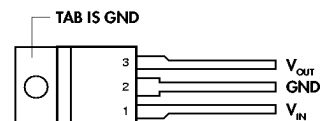
THERMAL RESISTANCE-JUNCTION TO TAB, θ_{JT}	4.5°C/W
THERMAL RESISTANCE-JUNCTION TO AMBIENT, θ_{JA}	60°C/W

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

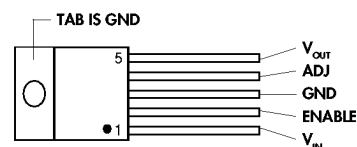
The θ_{JA} numbers are guidelines for the thermal performance of the device/pc-board system. All of the above assume no ambient airflow.

* θ_{JA} can be improved with package soldered to 0.5IN² copper area over backside ground plane or internal power plane. θ_{JA} can vary from 20°C/W to > 40°C/W depending on mounting technique.

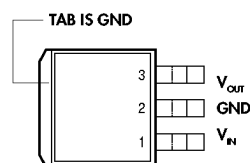
PACKAGE PIN OUTS



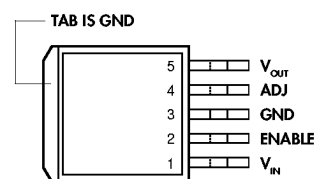
P PACKAGE (3-Pin)
(Top View)



P PACKAGE (5-Pin)
(Top View)



DD PACKAGE (3-Pin)
(Top View)



DD PACKAGE (5-Pin)
(Top View)

3A BICMOS VERY LOW DROPOUT REGULATORS
PRELIMINARY DATA SHEET
RECOMMENDED OPERATING CONDITIONS

Parameter	Symbol	Recommended Operating Conditions			Units
		Min.	Typ.	Max.	
Input Voltage	V_{IN}	3		5.5	V
Load Current (with adequate heatsinking)		0.01		3	A
Input Capacitor (V_{IN} to GND)		0.1			μF
Output Capacitor (V_{OUT} to GND)		2.2			μF

ELECTRICAL CHARACTERISTICS

(Unless otherwise specified, these specifications apply over the operating ambient temperatures for the LX8630-xxC with $0^{\circ}C \leq T_A \leq 70^{\circ}C$; $V_{IN} = V_{OUT} + 1.5V$; $I_{OUT} = 10mA$; $C_{IN} = 10\mu F$; $C_{OUT} = 22\mu F$; $T_J = T_A$. Low duty cycle pulse testing techniques are used which maintains junction and case temperatures equal to the ambient temperature.)

LX8630-33 Fixed 3.3V, 3A

Parameter	Symbol	Test Conditions	LX8630-33			Units
			Min.	Typ.	Max.	
Output Voltage	V_{OUT}	$T_J = 25^{\circ}C$	3.25	3.3	3.35	V
		Over Temperature	3.22		3.38	V
Line Regulation		$V_{IN} = 3.45V$ to $5.5V$		2	8	mV
Load Regulation		$I_{OUT} = 10mA$ to $3A$		18	40	mV
Dropout Voltage ($V_{DO} = V_{IN} - V_{OUT}$)		$I_{OUT} = 3A$, $\Delta V_{OUT} = -1\%$		0.4	0.6	V
		$I_{OUT} = 1.5A$, $\Delta V_{OUT} = -1\%$		0.3	0.4	V
		$I_{OUT} = 10mA$, $\Delta V_{OUT} = -1\%$		0.05	0.15	V
Peak Current Limit		$V_{OUT} = 3.3V$ to $0V$ in 1ms	4	5	6	A
Over Current Threshold			3	4	5	A
Quiescent Current		$I_{OUT} = 10mA$ to $3A$		400	600	μA
Reverse Leakage Current		$0V < V_{IN} < V_{OUT}$, $V_{OUT} < 3.4V$ (at V_{OUT})		50	650	μA
		$0V < V_{IN} < V_{OUT}$, $V_{OUT} < 3.4V$ (at V_{IN})	-50	0		mA

LX8630-25 Fixed 2.5V, 3A

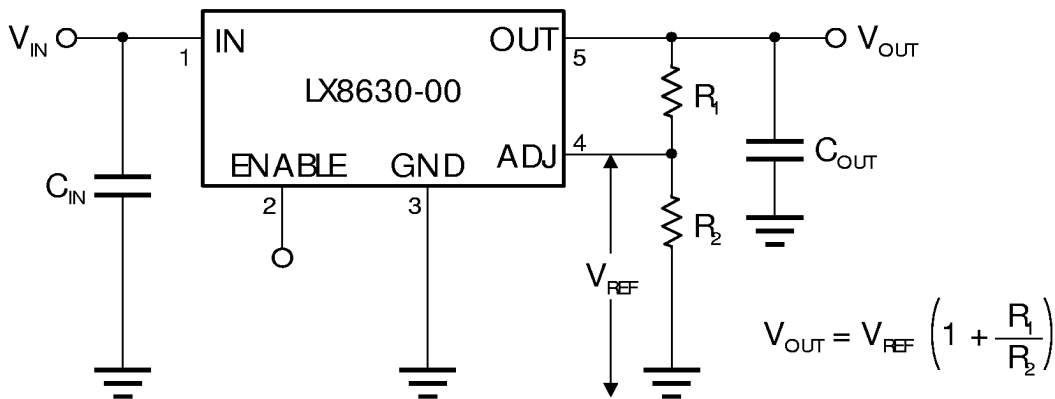
Parameter	Symbol	Test Conditions	LX8630-25			Units
			Min.	Typ.	Max.	
Output Voltage	V_{OUT}	$T_J = 25^{\circ}C$	2.46	2.5	2.54	V
		Over Temperature	2.44	2.5	2.56	V
Line Regulation		$V_{IN} = 3.45V$ to $5.5V$		2	6	mV
Load Regulation		$I_{OUT} = 10mA$ to $3A$		14	30	mV
Dropout Voltage ($V_{DO} = V_{IN} - V_{OUT}$)		$I_{OUT} = 3A$, $\Delta V_{OUT} = -1\%$		0.4	0.6	V
		$I_{OUT} = 1.5A$, $\Delta V_{OUT} = -1\%$		0.3	0.45	V
		$I_{OUT} = 10mA$, $\Delta V_{OUT} = -1\%$		0.05	0.15	V
Peak Current Limit		$V_{OUT} = 2.5V$ to $0V$ in 1ms	4	5	6	A
Over Current Threshold			3	4	5	A
Quiescent Current		$I_{OUT} = 10mA$ to $3A$		400	600	μA
Reverse Leakage Current		$0V < V_{IN} < V_{OUT}$, $V_{OUT} < 2.6V$ (at V_{OUT})		50	650	μA
		$0V < V_{IN} < V_{OUT}$, $V_{OUT} < 2.6V$ (at V_{IN})	-50	0		mA

ELECTRICAL CHARACTERISTICS (Continued)

LX8630-00 Adjustable Output, 3A

Parameter	Symbol	Test Conditions	LX8630-00			Units
			Min.	Typ.	Max.	
Reference Voltage	V_{REF}	$T_J = 25^\circ\text{C}$	1.23	1.25	1.27	V
		Over Temperature	1.22	1.25	1.28	V
Line Regulation		$V_{IN} = 3\text{V to } 5.5\text{V @ ADJ Pin}$		1	3	mV
Load Regulation		$I_{OUT} = 10\text{mA to } 3\text{A @ ADJ Pin}$		7	15	mV
Dropout Voltage ($V_{DO} = V_{IN} - V_{OUT}$)		$I_{OUT} = 3\text{A}, V_{IN} > 3\text{V}, \Delta V_{OUT} \pm 1\%$		0.4	0.6	V
		$I_{OUT} = 1.5\text{A}, V_{IN} > 3\text{V}, \Delta V_{OUT} \pm 1\%$		0.3	0.4	V
		$I_{OUT} = 10\text{mA}, V_{IN} > 3\text{V}, \Delta V_{OUT} \pm 1\%$		0.05	0.15	V
Peak Current Limit		$V_{OUT} = 3.3\text{V to } 0\text{V in } 1\text{ms}$	4	5	6	A
Over Current Threshold			3	4	5	A
Quiescent Current		$I_{OUT} = 10\text{mA to } 3\text{A}$		400	600	μA
Reverse Leakage Current		$0\text{V} < V_{IN} < V_{OUT}, V_{OUT} < 5.5\text{V (at } V_{OUT})$		50	650	μA
		$0\text{V} < V_{IN} < V_{OUT}, V_{OUT} < 5.5\text{V (at } V_{IN})$	-50	0		mA
Bias Current at ADJ Pin				100		nA
Shutdown Threshold			0.8			V
Shutdown Current				10	25	μA

TYPICAL APPLICATION



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