

POWER MANAGEMENT

Description

The EZ1087 is a high performance positive voltage regulator designed for use in applications requiring low dropout performance at up to 5A. The device has remote sense capability to provide an accurate voltage at the load, compensating for resistive drops due to connectors, wiring and board trace resistance. Additionally, the EZ1087 provides excellent regulation over variations in line, load and temperature.

Outstanding features include low dropout performance at rated current, fast transient response, internal current limiting and thermal shutdown protection of the output device.

The EZ1087 is available in the popular 5-pin TO-220 package.

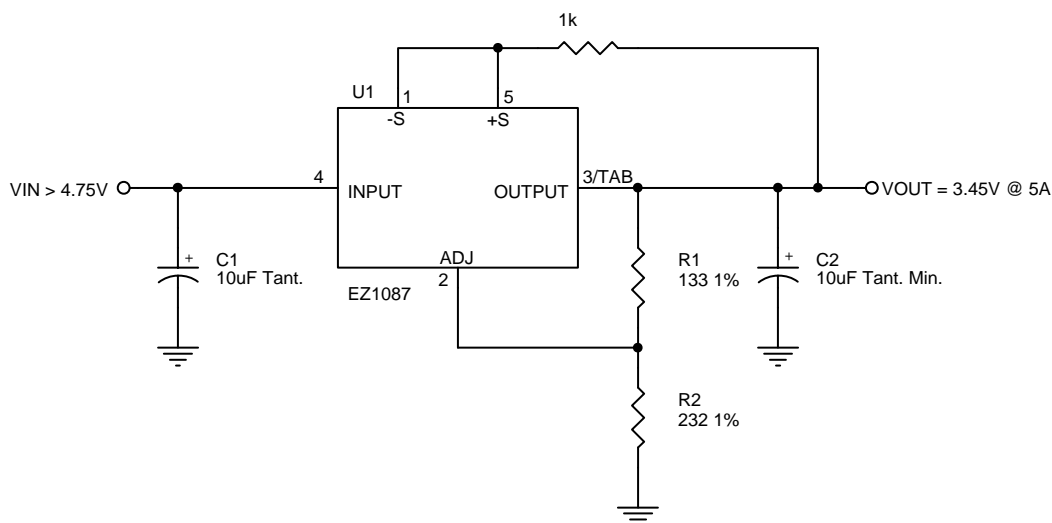
Features

- ◆ Low dropout performance: 1.3V max.
- ◆ Kelvin remote sense inputs
- ◆ Full current rating over line and temperature
- ◆ Fast transient response
- ◆ ±2% total output regulation over line, load and temperature
- ◆ Adjust pin current max. 90µA over temperature
- ◆ Fixed/adjustable output voltage
- ◆ Line regulation typically 0.005%
- ◆ Load regulation typically 0.1%
- ◆ 5-pin TO-220 package

Applications

- ◆ GTL+ bus V_{DDQ}
- ◆ Graphics controller core voltage
- ◆ PCI cards
- ◆ DDR V_{DDQ}

Typical Application Circuit



Notes:

- (1) C1 needed if device is far from filter capacitors
- (2) C2 minimum value required for stability

$$V_{OUT} = V_{REF} \cdot \left(1 + \frac{R2}{R1}\right) + I_{ADJ} \cdot R2$$

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Absolute Maximum Ratings

Parameter	Symbol	Maximum	Units
Input Supply Voltage	V_{IN}	7	V
Sense Pin Differential Voltage	$V_{+S} - V_{-S}$	4	V
Sense Pin Voltage Range	V_{SP}	Note 1	V
Power Dissipation	P_D	Internally Limited	W
Thermal Resistance Junction to Case	θ_{JC}	2.5	°C/W
Thermal Resistance Junction to Ambient	θ_{JA}	50	°C/W
Operating Ambient Temperature Range	T_A	0 to 70	°C
Operating Junction Temperature Range	T_J	0 to 125	°C
Storage Temperature Range	T_{STG}	-65 to 150	°C
Lead Temperature (Soldering) 10 Sec.	T_{LEAD}	300	°C
ESD Rating (Human Body Model)	ESD	2	kV

Note:

$$(1) (V_{OUT} - 1V) \leq V_{\pm SENSE} \leq (V_{OUT} + 0.4V)$$

Electrical Characteristics

 Unless otherwise specified: $V_{IN} = 2.75V$ to $7.0V$ and $I_O = 10mA$ to $5.0A$.

 Values in **bold** apply over full operating ambient temperature range.

Parameter	Symbol	V_{IN}	I_O	Min	Typ	Max	Units
Reference Voltage ⁽¹⁾	V_{REF}	5V	10mA	1.238	1.250	1.262	V
				1.225		1.275	
Line Regulation ⁽¹⁾	$REG_{(LINE)}$		10mA		0.015	0.2	%
Load Regulation ⁽¹⁾	$REG_{(LOAD)}$	5V			0.1	0.4	%
Dropout Voltage ⁽¹⁾⁽²⁾	V_D		5A		1.10	1.30	V
Current Limit	I_{CL}			5.0	7.5		A
Temperature Coefficient	T_C				0.005		%/°C
Adjust Pin Current	I_{ADJ}				55	90	μA
Adjust Pin Current Change	ΔI_{ADJ}				0.2	5	μA
Temperature Stability	T_S	5V	0.5A		0.5		%
Minimum Load Current	I_O	5V			5	10	mA
RMS Output Noise ⁽³⁾	V_N				0.003		% V_O
Ripple Rejection Ratio ⁽⁴⁾	R_A	5V	5A	60	72		dB

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Electrical Characteristics (Cont.)

Unless otherwise specified: $V_{IN} = 2.75V$ to $7.0V$ and $I_O = 10mA$ to $5.0A$.

Values in **bold** apply over full operating ambient temperature range.

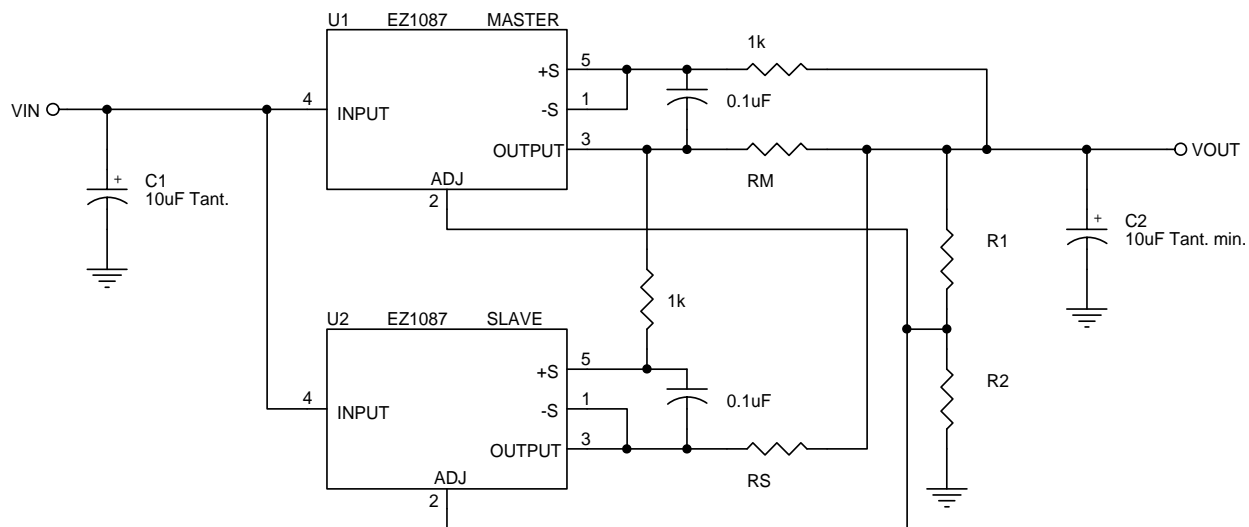
Parameter	Symbol	V_{IN}	I_O	Min	Typ	Max	Units
Common Mode Range of Sense Pins ⁽⁵⁾	V_{CM}				0.4		mV
Differential Gain of Sense Pins					11		V/V
Sense Bias Current	I_b				0.3		μA

NOTES:

- (1) Low duty cycle pulse testing with Kelvin connections required.
- (2) $\Delta V_{OUT}, \Delta V_{REF} = 1\%$.
- (3) Bandwidth of 10 Hz to 10 kHz.
- (4) 120 Hz input ripple (C_{ADJ} for ADJ = $25\mu F$).
- (5) $(V_{OUT} - 1V) \leq V_{\pm SENSE} \leq V_{OUT}$.

Applications Information

Paralleling Two EZ1087s For Higher Output Currents

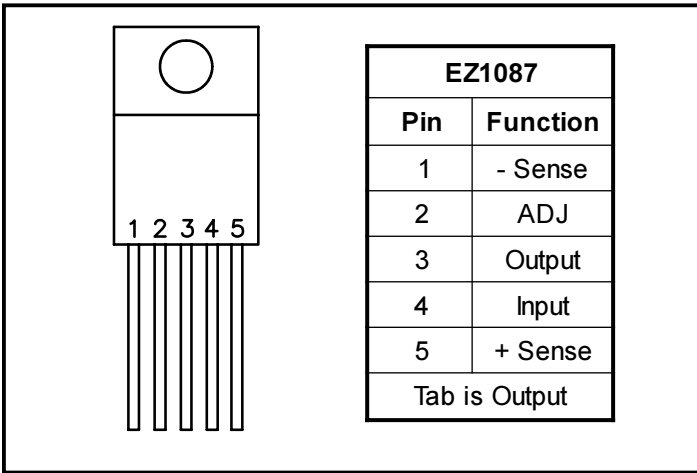


Notes:

- (1) For paralleling more than two devices, duplicate slave section.
- (2) Minimum load current = (# devices in parallel) x 10mA.
- (3) R1, R2 network can be used as the minimum load.
- (4) $R_M = 8m\Omega$ (10" of #20 A.W.G. solid copper wire).
- (5) $R_S = 7.3m\Omega$ (9.1" of #20 A.W.G. solid copper wire).
- (6) R_M and R_S should be non-inductive. This is easily achieved by folding the wire back upon itself so that the fields generated by current flowing in the wire cancel.

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Pin Configuration



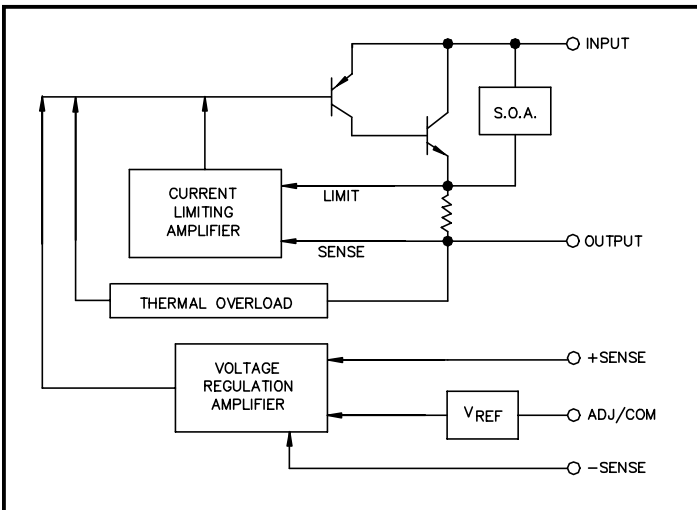
Ordering Information

Device	Package
EZ1087CT	TO-220 ⁽¹⁾

Note:

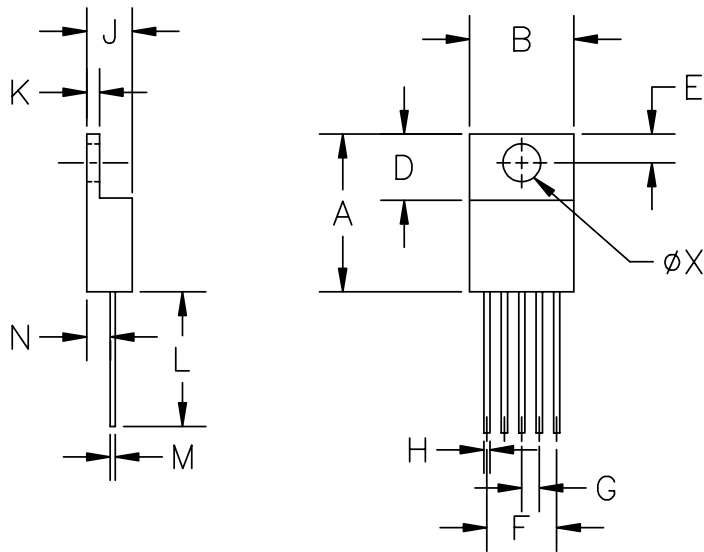
(1) Only available in tube packaging. A tube contains 50 devices.

Block Diagram



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Outline Drawing - 5 Pin TO-220



DIM ^N	INCHES		MM		NOTE
	MIN	MAX	MIN	MAX	
A	.560	.650	14.22	16.51	—
B	.380	.420	9.65	10.67	—
D	.230	.260	5.84	6.60	—
E	.100	.135	2.54	3.43	—
F	.263	.273	6.68	6.94	—
G	.062	.072	1.57	1.83	—
H	.025	.040	.63	1.02	—
J	.140	.190	3.55	4.83	—
K	.045	.055	1.14	1.40	—
L	.540	.560	13.72	14.22	—
M	.014	.022	.35	.56	—
N	.080	.120	2.03	3.05	—
øX	.139	.161	3.53	4.09	—

JEDEC TO-220

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