



## SPX1584

### 8A Low Dropout Voltage Regulator Adjustable & Fixed 3.3V

#### FEATURES

- Adjustable Output Down to 1.2V or Fixed 3.3V
- Output Current of 8A
- Low Dropout Voltage
- Extremely Tight Load and Line Regulation
- Current & Thermal Limiting
- Standard 3-Terminal Low Cost TO-220
- Similar to Industry Standard LT1083/LT1584

Now available in Lead Free

#### APPLICATIONS

- Powering Intel Pentium™  $\mu$ P from +5V Supplies
- Power PC™ Supplies
- SMPS Post-Regulator
- High Efficiency “Green” Computer Systems
- High Efficiency Linear Power Supplies
- Portable Instrumentation
- Constant Current Regulators
- Adjustable Power Supplies
- Battery Charger

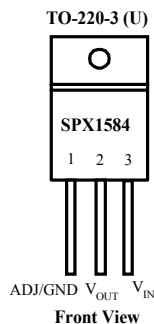
#### PRODUCT DESCRIPTION

The SPX1584 is a low power 8A Adjustable Voltage Regulator that is very easy to use. It requires only 2 external resistors to set the output voltage. This device is an excellent choice when using Powering Intel™ Microprocessor to convert from +5V to 3.3V supplies, and as a post regulator for switching supplies applications. The SPX1584 features low dropout of a maximum 1.5 volts.

The SPX1584 offers full protection against over-current faults, reversed input polarity, reversed load insertion, over temperature operation, and positive and negative transient voltage. On-Chip trimming adjusts the reference voltage to 1%. The  $I_Q$  of this device flows into the load, which increases efficiency.

The SPX1584 is offered in a 3-pin TO-220 package compatible with older 3-terminal regulators. For a 5A low dropout regulator refer to the SPX1585 datasheet.

#### PIN CONNECTIONS



## ABSOLUTE MAXIMUM RATINGS

Power Dissipation.....Internally Limited  
 Lead Temp. (Soldering, 10 Seconds) ..... 300°C  
 Storage Temperature Range ..... -65° to +150°C  
 Operating Junction Temperature Range  
     SPX1584 Control Section.....0C° to +125°C  
     SPX1584 Power Transistor.....0C° to +150°C

Input Supply Voltage ..... +10V  
 Input to Output Voltage Differential ..... 8.8V

## ELECTRICAL CHARACTERISTICS (Note 1) at $I_{OUT} = 10\text{mA}$ , $T_A = 25^\circ\text{C}$ , unless otherwise specified.

Parameter	Conditions	SPX1584A			SPX1584		Units
		Typ	Min	Max	Min	Max	
<b>3.3V Version</b>							
Output Voltage (Note 2)	SPX1584-3.3V, $0 \leq I_{OUT} \leq 1.5\text{A}$ , $4.75\text{V} \leq V_{IN} \leq 7\text{V}$	3.3 <b>3.3</b>	3.270 <b>3.240</b>	3.330 <b>3.360</b>	3.230 <b>3.201</b>	3.370 <b>3.399</b>	V
<b>All Voltage Options</b>							
Reference Voltage	$10\text{mA} \leq I_{OUT} \leq I_{FULLLOAD}$ $3.3\text{V} \leq (V_{IN} - V_{OUT}) \leq V_{IN\text{MAX}} - V_{OUT\text{MAX}}$	1.250 <b>1.250</b>	1.238 <b>1.225</b>	1.262 <b>1.270</b>	1.238 <b>1.225</b>	1.262 <b>1.270</b>	V
Mid Load Current	$(V_{IN} - V_{OUT}) = V_{IN\text{MAX}} - V_{OUT\text{MAX}}$	<b>5</b>		<b>10</b>		<b>10</b>	mA
Line Regulation	$1.5\text{V} \leq V_{IN} - V_{OUT} \leq V_{IN\text{MAX}} - V_{OUT\text{MAX}}$ $I_{LOAD} = 10\text{mA}$	0.015 <b>0.05</b>		0.2 <b>0.5</b>		0.2 <b>0.5</b>	%
Load Regulation	$10\text{mA} \leq I_{OUT} \leq I_{FULLLOAD}$ $(V_{IN} - V_{OUT}) = 3\text{V}$	0.1 <b>0.2</b>		0.3 <b>0.4</b>		0.3 <b>0.4</b>	%
Dropout Voltage	$I_{OUT} = I_{FULLLOAD}$ , $\Delta V_{REF} = 1\%$	<b>1.1</b>		<b>1.2</b>		<b>1.2</b>	V
Current Limit	$V_{IN} - V_{OUT} = 5\text{V}$	<b>9.5</b>	<b>8.0</b>		<b>8.0</b>		A
Long Term Stability	$T_A = 125^\circ\text{C}$ , 1000Hrs.	0.3		1		1	%
Adjust Pin Current	$T_A = 25^\circ\text{C}$	55		<b>90</b>		<b>90</b>	$\mu\text{A}$
Adjust Pin Current Change		<b>0.2</b>		<b>5</b>		<b>5</b>	$\mu\text{A}$
Thermal Regulation	30ms pulse	0.003		0.01		0.01	%/W
Temperature Stability		<b>0.5</b>					%
Ripple Rejection Ratio	$V_{IN} - V_{OUT} = 3\text{V}$ $I_{OUT} = 3\text{A}$ , $C_{OUT} = 25\mu\text{F}$ , $C_{ADJ} = 25\mu\text{F}$ , $f = 120\text{Hz}$	<b>75</b>	<b>60</b>		<b>60</b>		dB
Output Noise, RMS	10Hz to 10kHz	0.003					% $V_O$
Thermal Resistance Junction-to-Case	TO-220			2.7		2.7	$^\circ\text{C}/\text{W}$
	Junction to Tab			0.65		0.65	
	Junction to Ambient						

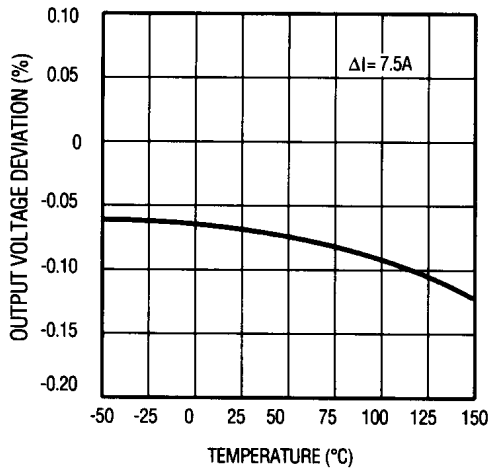
The Bold specifications apply to the full operating temperature range.

**Note 1:** Changes in output voltage due to heating effects are covered under the specification for thermal regulation.

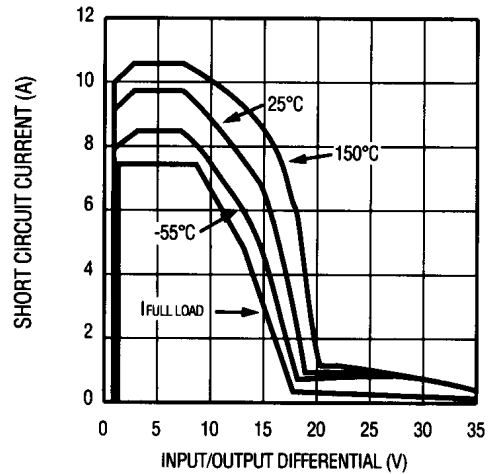
**Note 2:** A 10 $\mu\text{F}$  output capacitor is required on SPX1584

TYPICAL CHARACTERISTICS

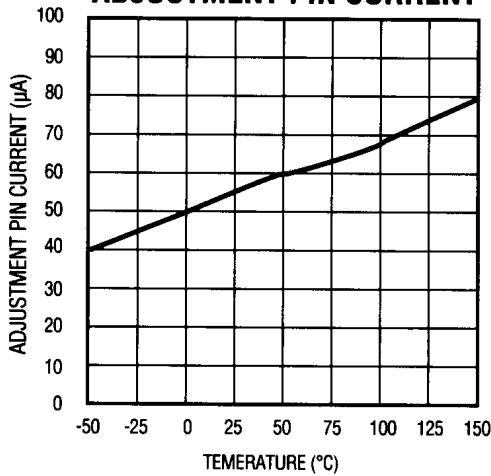
LOAD REGULATION



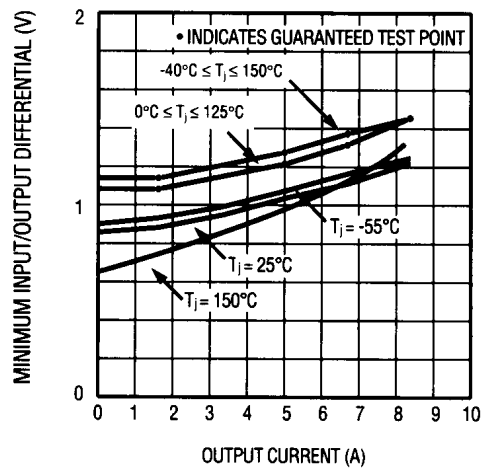
SHORT CIRCUIT CURRENT



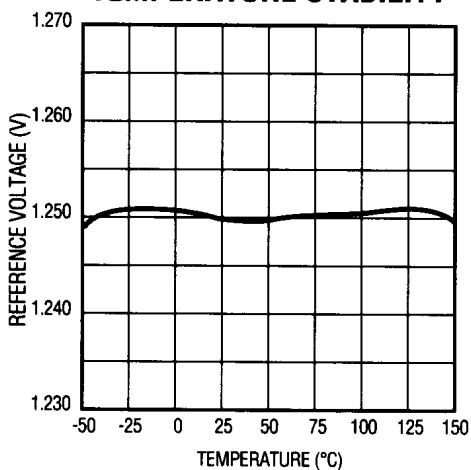
ADJUSTMENT PIN CURRENT



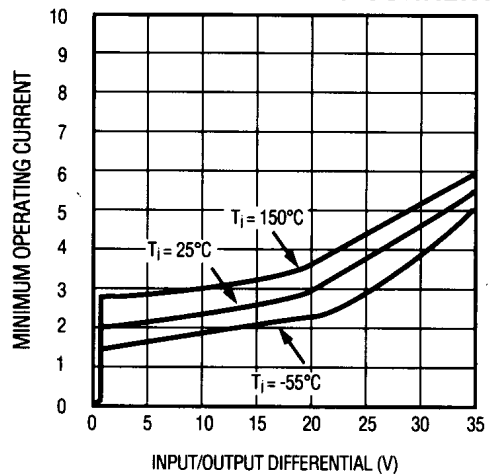
DROPOUT VOLTAGE



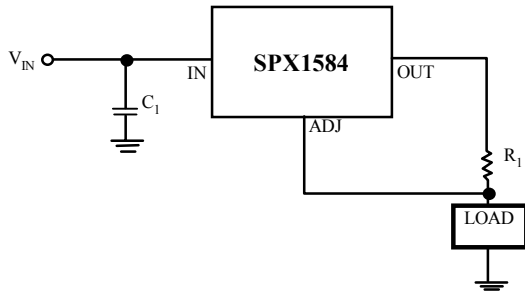
TEMPERATURE STABILITY



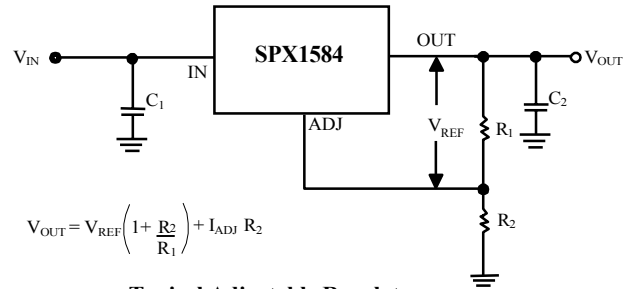
MINIMUM OPERATING CURRENT



## TYPICAL APPLICATIONS

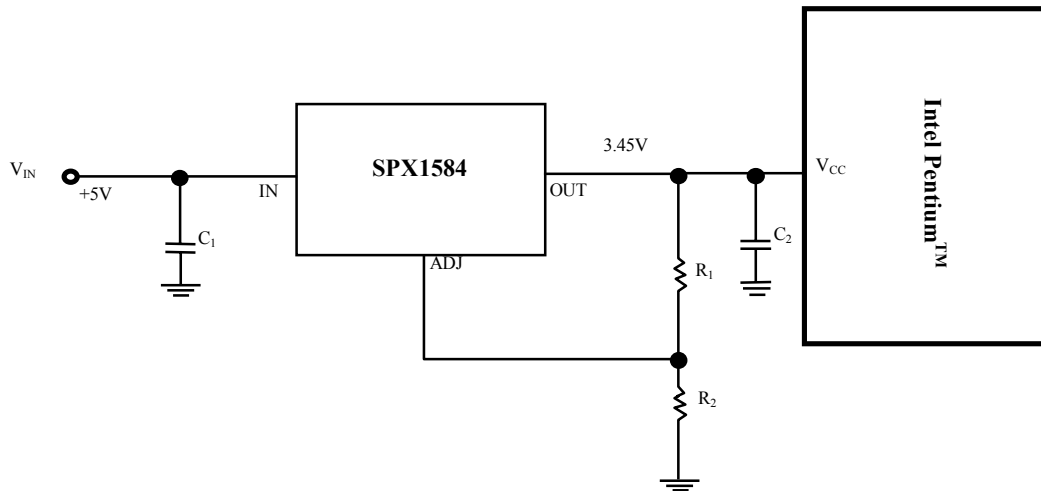


**8A Current Output Regulator**



$$V_{OUT} = V_{REF} \left( 1 + \frac{R_2}{R_1} \right) + I_{ADJ} R_2$$

**Typical Adjustable Regulator**



**Powering Intel Pentium™ with SPX1584**

Pentium Processor is a trademark of Intel Corp. Power PC is a trademark of IBM Corp.

## ORDERING INFORMATION

Ordering No.	Precision	Output Voltage	Packages
SPX1584U	2%	Adj	3 Lead TO-220
SPX1584U-3.3	2%	3.3V	3 Lead TO-220
SPX1584AU	1%	Adj	3 Lead TO-220
SPX1584AU-3.3	1%	3.3V	3 Lead TO-220

Available in lead free packaging. To order, add "-L" suffix to the part number.  
Example: SP6660EU/TR=Tape & Reel. SP6660EU-L/TR = lead free.



SIGNAL PROCESSING EXCELLENCE

### Sipex Corporation

**Headquarters and Main Offices:**

22 Linnell Circle  
Billerica, MA 01821  
TEL: (978) 667-8700  
FAX: (978) 670-9001  
e-mail: sales@sipex.com

233 South Hillview Drive  
Milpitas, CA 95035  
TEL: (408) 935-7600  
FAX: (408) 934-7500

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