

# Linear Voltage Regulator - SiS1084L-ADJ

#### Positive Adjustable Output Low Dropout Voltage Regulator in bare die form

Rev 1.2 11/05/22

## Description

The SiS1084L is a positive adjustable regulator providing 5A output current with high efficiency. The device accepts input voltages up to 12V and is optimised for smallest die size. Voltage dropout is guaranteed at 1.5V maximum at 5A. This device also features on-chip trimming for current limit + reference voltage and includes thermal shutdown for rugged performance. Adjustment of output voltage is simple and set by two resistors.

### **Ordering Information**

The following part suffixes apply:

- No suffix MIL-STD-883 /2010B Visual Inspection
- "H" MIL-STD-883 /2010B Visual Inspection+ MIL-PRF-38534 Class H LAT
- "K" MIL-STD-883 /2010A Visual Inspection (Space)
   + MIL-PRF-38534 Class K\_AT

LAT = Lot Acceptance Test.

For further information on LAT places flows see below.

www.siliconsupplies.com\quality\bare-die-lot-qualification

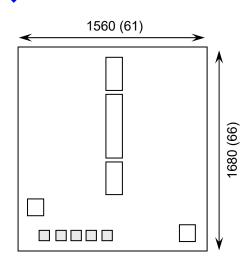
## Supply Formats:

- Defaut Die in Waffle Pack (100 per tray capacity)
- Sawn Wafer on Tape On request
- Un-sawn Wafer On request
- In Metal or Ceramic package On request

#### Features:

- 12V input capability with optimised design
- 1.5V dropout voltage maximum at 5A
- Internal current limiting & researche trimming
- Thermal shutdown
- Line & Load Regulation: 0.3% maximum
- Full military temperature range.

# Die Din ensions in µm (mils)



# **Mechanical Specification**

Die Size (Unsawn)	1560 x 1680 61 x 66	μm mils	
Minimum Bond Pad Size	130 x 130 5.11 x 5.11	μm mils μm mils	
Die Thickness	350 (±20) 13.78 (±0.79)		
Top Metal Composition	Al 1%Si 1.4μm		
Back Metal Composition	Ti/Ni/Ag		

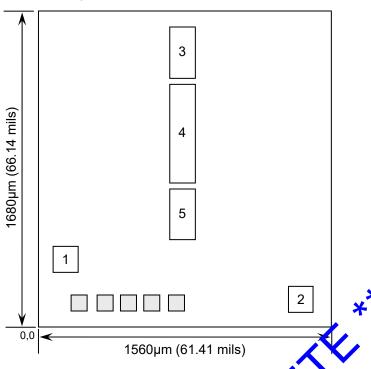




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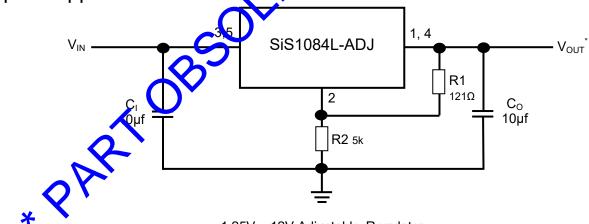
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# Pad Layout and Functions



PAD	FUNCTION	COORDINATES (µm)				
		Х	Υ			
1	OUTPUT	80	296			
2	ADJUST	1016	80			
3	INPUT	713	1331			
4	OUTPUT	713	771			
5	TUTIN	713	471			
CONNECT CHIP BACK TO OLITPLIT						

**Typical Application** 



1.25V - 12V Adjustable Regulator

$$V_{OUT} = 1.25V (1 + \frac{R2}{R1}) + I_{ADJ} * R2$$

#### Application Notes: I<sub>ADJ</sub> tolerance <120µA

 $C_l$  is required if the regulator is located an appreciable distance from power supply filter.  $C_0$  is not required for stability; however it does improve transient response. For optimum stability and transient response locate  $C_l$   $C_0$  as close as possible to the regulator.

The device can operate with up to 12V input voltage supply. This input supply must be well regulated. Additional low ESR input capacitance improves the output noise performance if the input supply is noisy.





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# Absolute Maximum Ratings<sup>1</sup> T<sub>J</sub> = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Input-to-Output Voltage Differential	$V_{DIFF}$	12	V
Power Dissipation <sup>2</sup>	P <sub>D</sub>	Internally limited	n V
Operating Temperature Range	T <sub>J</sub>	-55 to 150	C
Storage Temperature	T <sub>STG</sub>	-65 to 150	°C

# Operating Conditions T<sub>J</sub> = 25°C unless otherwise stated

PARAMETER	SYMBOL	MIN	W.AX	UNIT
Input Voltage	V <sub>IN</sub>	0	2	V
Output Current	I <sub>OUT</sub>		4	Α
Operating Temperature Range	T <sub>J</sub>	<b>C</b> 55	+125	°C

## DC Electrical Characteristics T<sub>J</sub> = 25°C unless otherwise specified

PARAMETER	SYMBOL	TEST CONDITION	ONS	MIN	TYP	MAX	UNITS
Reference Voltage	V <sub>REF</sub>	I <sub>OUT</sub> = 10mA, V <sub>IN</sub> =4.25V	T <sub>J</sub> = 25°C	1.237	1.250	1.263	
		0 ≤ I <sub>OUT</sub> ≤ I <sub>FULL</sub> (AD)	$T_J = 25^{\circ}C$	1.232	1.250	1.268	V
		2.75 ≤ V <sub>IN</sub> ≤ 10	Full range <sup>3</sup>	1.225	1.250	1.275	
Line Regulation	ΔV <sub>OUT</sub>	I <sub>OUT</sub> = 10mA,	T <sub>J</sub> = 25°C	-	0.015	0.3	%
Line Regulation	7,001	2.75V ≤ V <sub>IN</sub> ≤ 10V	Full range <sup>3</sup>	-	0.035	0.4	/0
Load Regulation	ΔV <sub>OUT</sub>	$V_{\rm IN} = 7.25 \rm V_{\rm I}$	$T_J = 25^{\circ}C$	-	0.1	0.3	%
Load Negalation	<b>A V</b> 001	1 ≤ I <sub>O JT</sub> ≤ I <sub>FULL LOAD</sub>	Full range <sup>3</sup>	-	0.2	0.4	
Dropout Voltage	V <sub>IN</sub> - V <sub>OUT</sub>	$I_{OUT} = 1\%$ , $I_{OUT} = 5A$	Full range <sup>3</sup>	-	1.3	1.5	V
Minimum Load Current		V <sub>IN</sub> = 10V	Full range <sup>3</sup>	-	5	10	mA
Output	ILIMIT	V <sub>IN</sub> = 6.25V	T <sub>J</sub> = 85°C	5.5	-	-	А
Current Limit		V <sub>IN</sub> - 0.25V	Full range <sup>3</sup>	4.0	4.5	-	A
Adjust Pin Cultent	I <sub>ADJ</sub>	$V_{IN} = 2.75 \le 10V$ , $I_{OUT} = 10mA$	Full range <sup>3</sup>	-	-	120	
Adjust Pil Current	$\Delta_{ADJ}$	$10\text{mA} \le I_{\text{OUT}} \le I_{\text{FULL LOAD}}$ $2.75\text{V} \le V_{\text{IN}} \le 10\text{V}$	Full range <sup>3</sup>	-	0.2	5	μΑ
Ripple Rejection	RR	$I_{OUT}$ = 5A; $V_{IN}$ =4.25V, $f_{RIPPLE}$ = 120Hz, $C_{OUT}$ =25 $\mu$ F	Full range <sup>3</sup>	60	-	-	dB
Temperature Stability	-		Full range <sup>3</sup>	-	0.5	-	%

<sup>1.</sup> Operation above the absolute maximum rating may cause device failure. Operation at the absolute maximum ratings, for extended periods, may reduce device reliability. 2. Results in die form dependent on die attach and assembly method 3.  $-55^{\circ}C \le T_{J} \le 125^{\circ}C$ 





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