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.

Features:

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

Ordering Information

The following part suffixes apply:

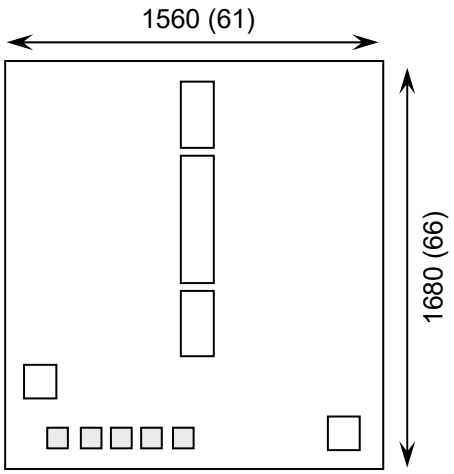
- No suffix - MIL-STD-883 /2010B Visual Inspection
- "**H**" - MIL-STD-883 /2010B Visual Inspection
  + MIL-PRF-38534 Class H LAT
- "**K**" - MIL-STD-883 /2010A Visual Inspection (Space)
  + MIL-PRF-38534 Class K LAT

LAT = Lot Acceptance Test.

For further information on LAT process flows see below.

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

Die Dimensions in µm (mils)



Supply Formats:

- Default – 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

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
Die Thickness	350 (±20) 13.78 (±0.79)	µm mils
Top Metal Composition	Al 1%Si 1.4µm	
Back Metal Composition	Ti/Ni/Ag	

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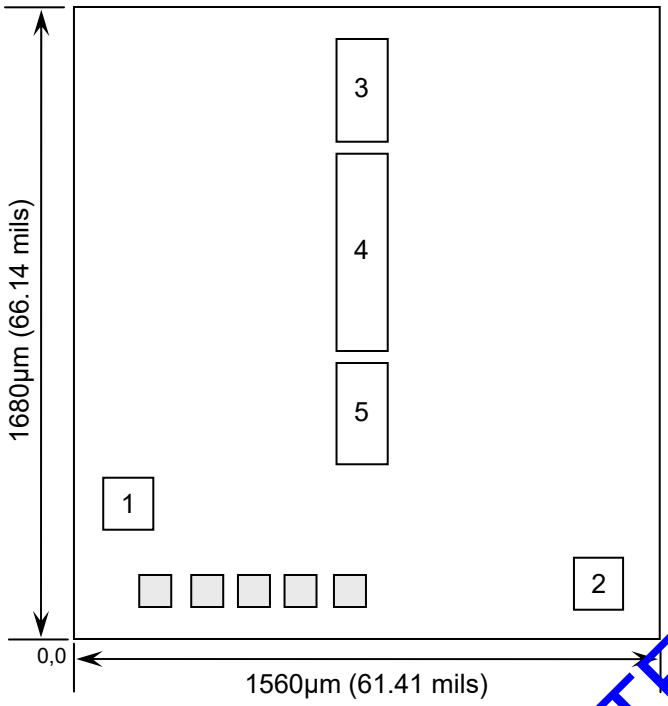
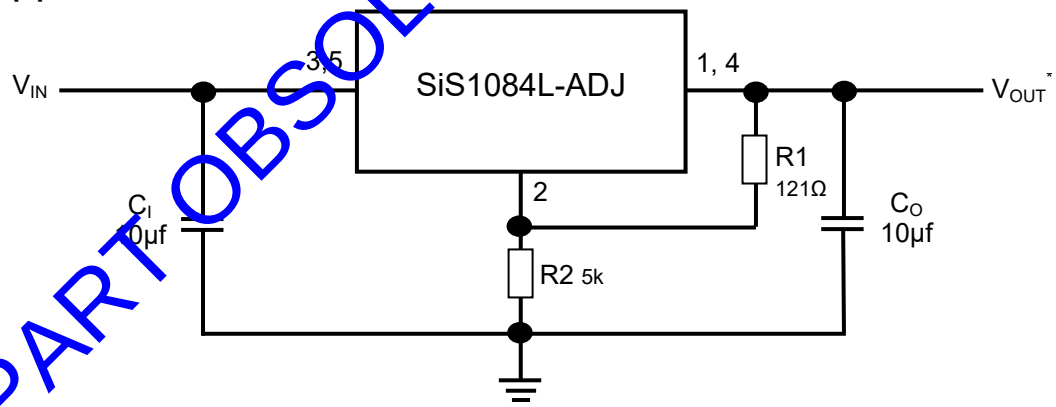
Pad Layout and Functions



PAD	FUNCTION	COORDINATES (µm)	
		X	Y
1	OUTPUT	80	296
2	ADJUST	1346	80
3	INPUT	713	1331
4	OUTPUT	713	771
5	INPUT	713	471
CONNECT CHIP BACK TO OUTPUT			

Typical Application



1.25V – 12V Adjustable Regulator

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

I_{ADJ} tolerance <120µA

Application Notes:

C_I is required if the regulator is located an appreciable distance from power supply filter. C_O is not required for stability; however it does improve transient response. For optimum stability and transient response locate C_I C_O 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[1] T_J = 25°C unless otherwise stated

PARAMETER	SYMBOL	VALUE	UNIT
Input-to-Output Voltage Differential	V_{DIFF}	12	V
Power Dissipation[2]	P_D	Internally limited	mW
Operating Temperature Range	T_J	-55 to 150	°C
Storage Temperature	T_{STG}	-65 to 150	°C

Operating Conditions T_J = 25°C unless otherwise stated

PARAMETER	SYMBOL	MIN	MAX	UNIT
Input Voltage	V_{IN}	0	12	V
Output Current	I_{OUT}		4	A
Operating Temperature Range	T_J	-55	+125	°C

DC Electrical Characteristics T_J = 25°C unless otherwise specified

PARAMETER	SYMBOL	TEST CONDITIONS		MIN	TYP	MAX	UNITS
Reference Voltage	V_{REF}	I_{OUT} = 10mA, V_{IN} =4.25V	T_J = 25°C	1.237	1.250	1.263	V
		0 ≤ I_{OUT} ≤ $I_{FULL\ LOAD}$, 2.75 ≤ V_{IN} ≤ 10V	T_J = 25°C	1.232	1.250	1.268	
			Full range[3]	1.225	1.250	1.275	
Line Regulation	ΔV_{OUT}	I_{OUT} = 10mA, 2.75V ≤ V_{IN} ≤ 10V	T_J = 25°C	-	0.015	0.3	%
			Full range[3]	-	0.035	0.4	
Load Regulation	ΔV_{OUT}	V_{IN} = 4.25V, 0 ≤ I_{OUT} ≤ $I_{FULL\ LOAD}$	T_J = 25°C	-	0.1	0.3	%
			Full range[3]	-	0.2	0.4	
Dropout Voltage	V_{IN} - V_{OUT}	ΔV_{REF}, ΔV_{OUT} = 1%, I_{OUT} = 5A	Full range[3]	-	1.3	1.5	V
Minimum Load Current	I_L	V_{IN} = 10V	Full range[3]	-	5	10	mA
Output Current Limit	I_{LIMIT}	V_{IN} = 6.25V	T_J = 85°C	5.5	-	-	A
			Full range[3]	4.0	4.5	-	
Adjust Pin Current	I_{ADJ}	V_{IN}= 2.75 ≤ 10V, I_{OUT} = 10mA	Full range[3]	-	-	120	µA
Adjust Pin Current Change	Δ_{ADJ}	10mA ≤ I_{OUT} ≤ $I_{FULL\ LOAD}$, 2.75V ≤ V_{IN} ≤ 10V	Full range[3]	-	0.2	5	
Ripple Rejection	RR	I_{OUT} = 5A; V_{IN}=4.25V, f_{RIPPLE} = 120Hz, C_{OUT} =25µF	Full range[3]	60	-	-	dB
Temperature Stability	-		Full range[3]	-	0.5	-	%

1. 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°C ≤ T_J ≤ 125°C

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