GS2850 Series

500mA LDO Regulator

General Description

The GS2850 series are highly accurate, low noise, CMOS LDO Voltage Regulators. Offering low output noise, high ripple rejection ratio, low dropout and very fast turn-on times.

The GS2850 series is also fully compatible with low ESR ceramic capacitors, reducing cost and improving output stability. This high level of output stability is maintained even during frequent load fluctuations, due to the excellent transient response performance and high PSRR achieved across a broad range of frequencies. The EN function allows the output of regulator to be turned off, resulting in greatly reduced power consumption.

The GS2850 series are available in SOT-23-3L and SOT-23-5L package.

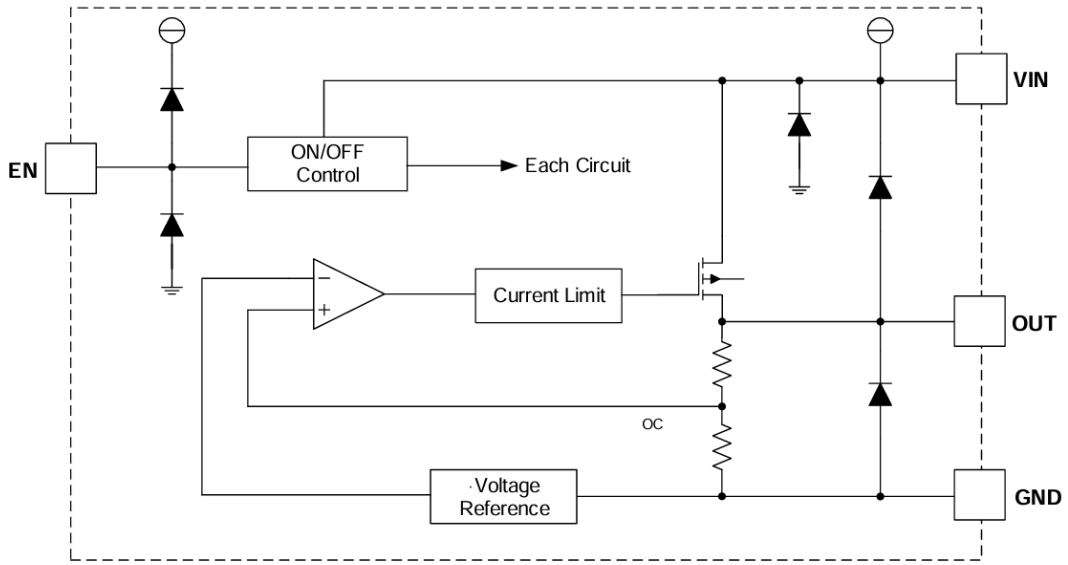
Features

- Input Voltage Range: 2V to 5.5V
- Output Voltage Range: 1.1V – 4.2V
- Output Accuracy: ±2.0%
- Low Power Consumption: 28μA (Typical)
- Short Circuit Protection
- Thermal Shutdown Protection
- Available in SOT-23-3L, SOT-23-5L Packages
- RoHS Compliant and Halogen Free

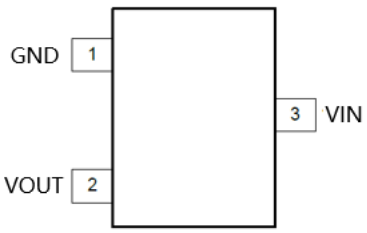
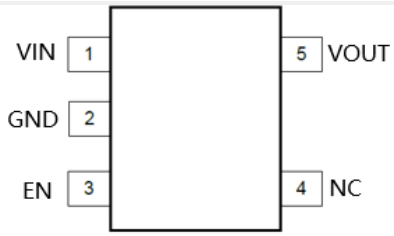
Applications

- Portable and Battery-Powered Equipment
- IP Cameras
- Mobile Phones, Tablets

Function Block Diagram



Packages & Pin Assignments

SOT-23-3L	SOT-23-5L
	

Pin Name	Function
GND	Ground Pin
V_{OUT}	Output
V_{IN}	Power Supply Input
EN	Chip Enable
NC	Not Connect

Ordering and Marking Information

Ordering Information				
SOT-23-3L	**SOT-23-5L**	**Marking**	**Output Voltage**	**Quantity/Reel**
GS2850JL11F	GS2850L11F	R11□□	1.1V	3000 PCS
GS2850JL12F	GS2850L12F	R12□□	1.2V	3000 PCS
GS2850JL15F	GS2850L15F	R15□□	1.5V	3000 PCS
GS2850JL18F	GS2850L18F	R18□□	1.8V	3000 PCS
GS2850JL25F	GS2850L25F	R25□□	2.5V	3000 PCS
GS2850JL28F	GS2850L28F	R28□□	2.8V	3000 PCS
GS2850JL33F	GS2850L33F	R33□□	3.3V	3000 PCS
GS2850JL42F	GS2850L42F	R42□□	4.2V	3000 PCS

GS2850 1 1 2 2 F

Product Code:
GS2850

Package Code:
1 1 is JL and L
- JL is SOT-23-3L
- L is SOT-23-5L

Voltage Code:
2 2 is 11, 18, 33 and so on.
- 11 for 1.1V, 18 for 1.8V, 33 for 3.3V and so on.

Green Level:
F stands for RoHS Compliant and Halogen Free

Marking Information

R 1 1 2 2

Product Code:
- R

Voltage Code:
1 1 is 11, 18, 33 and so on.
- 11 for 1.1V
- 12 for 1.2V
- 15 for 1.5V
- 18 for 1.8V
- 25 for 2.5V
- 28 for 2.8V
- 33 for 3.3V
- 42 for 4.2V

GS Code:
2 2 is GS Code

Absolute Maximum Ratings [1] [2] (T_A=25ºC, unless otherwise specified)

Symbol	Parameter		Rating	Units
V_{IN}	Supply Voltage		6	V
V_{EN}	Enable Pin Voltage		6	V
I_{OUT}	Output Current [3]		600	mA
P_D	Maximum Power Dissipation [4]	SOT-23-3L	Internal Limited	W
		SOT-23-5L		
$R_{\theta JA}$	Thermal Resistance, Junction to Ambient [5] [6]	SOT-23-3L	208	ºC/W
		SOT-23-5L	195	
T_J	Maximum Junction Temperature		150	ºC
T_{STG}	Storage Temperature Range		-40 - 150	ºC
T_{LEAD}	Lead Temperature (Soldering 10sec)		260	ºC

Note:
1. Exceeding these ratings may damage the device.
2. The device is not guaranteed to function outside of its operating conditions.
3. $I_{OUT}=P_D/(V_{IN}-V_{OUT})$
4. The maximum allowable power dissipation is a function of the maximum junction temperature, T_J(MAX), the junction-to-ambient thermal resistance, $R_{\theta JA}$, and the ambient temperature, T_A. The maximum allowable power dissipation at any ambient temperature is calculated using: P_D (MAX) = (T_J(MAX) − T_A)/$R_{\theta JA}$. Exceeding the maximum allowable power dissipation causes excessive die temperature, and the regulator goes into thermal shutdown. Internal thermal shutdown circuitry protects the device from permanent damage. Thermal shutdown engages at T_J=155°C (typical) and disengages at T_J= 140°C (typical).
5. The package thermal impedance is calculated in accordance to JESD 51-7.
6. Thermal Resistances were simulated on a 4-layer, JEDEC board

Recommended Operating Conditions

Symbol	Parameter	Range	Units
V_{IN}	V_{IN} Supply Voltage	2.0 - 5.5	V
T_J	Operating Junction Temperature Range	-40 - 125	ºC
T_A	Operating Ambient Temperature Range	-40 - 85	ºC

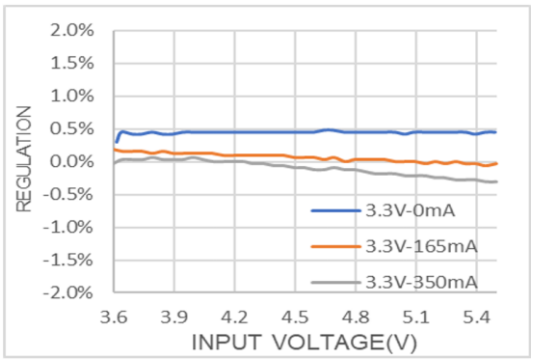
Electrical Characteristics (T_A =25ºC, unless otherwise specified.)

Symbol	Parameter	Test Conditions	Min.	Typ.	Max.	Units
V_{IN}	Input Voltage		2.0	-	5.5	V
V_{OUT}	Output Accuracy	V_{IN}=V_{EN}=V_{OUT}+1V I_{OUT}= 1mA to 500mA	-2.0	-	+2.0	%
I_{LIM}	Current Limit	V_{IN}=5V, V_{OUT} = 1.8V to 3.3V	500	-	-	mA
I_Q	Quiescent Current	V_{IN}=V_{EN}=V_{OUT}+1V, No Load	-	28	-	μA
I_{SHD}	Shutdown Current	V_{IN}==V_{OUT}+1V , V_{EN}=0V	-	0.1	-	μA
V_{DROP} [7]	Dropout Voltage	I_{OUT}=300mA, V_{OUT}=1.2V	-	700	-	mV
		I_{OUT}=300mA, V_{OUT}=3.3V	-	230	-	
R_{LINE}	Line Regulation	V_{IN}= V_{OUT} +1V to 5.5V, I_{OUT}=30mA	-	-	0.8	%/V
R_{LOAD}	Load Regulation	V_{IN}= V_{OUT} +1V I_{OUT}=1mA to 300mA	-	-	2	%
I_{SHORT}	Short Current	V_{OUT}=0V	-	500	-	mA
V_{ENH}	EN High Voltage	V_{IN}==V_{OUT}+1V	1.0	-	-	V
V_{ENL}	EN Low Voltage		-	-	0.4	V
PSRR	Power Supply Rejection Ratio	V_{OUT}= 1.2V I_{OUT}=20mA	-	70	-	dB
T_{SD}	Overheat Protection	Temperature rising	-	155	-	ºC
$\triangle T_{SD}$	TSD Hysteresis	Temperature falling	-	15	-	ºC

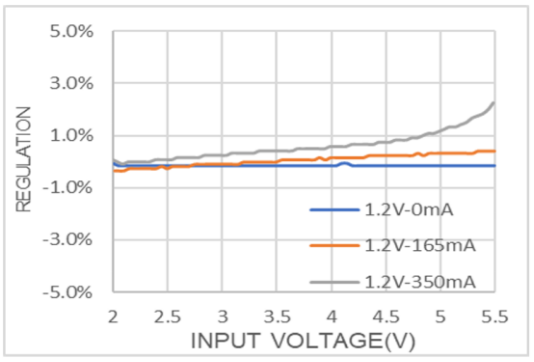
Note:

7. The dropout voltage is defined as V_{IN} - V_{OUT}, when V_{OUT} =98% x $V_{OUT(NOM)}$

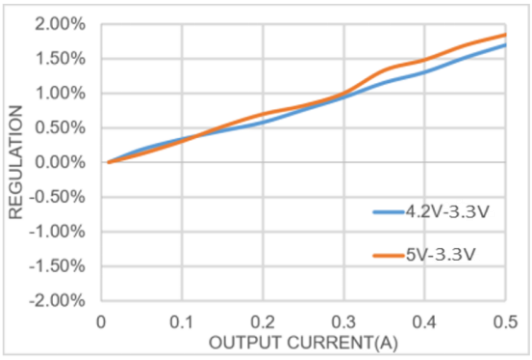
Typical Performance Characteristics (T_A =25ºC, unless otherwise specified.)



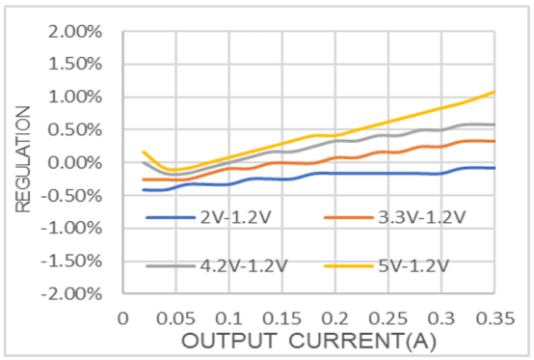
Line Regulation (V_{OUT} = 3.3V)



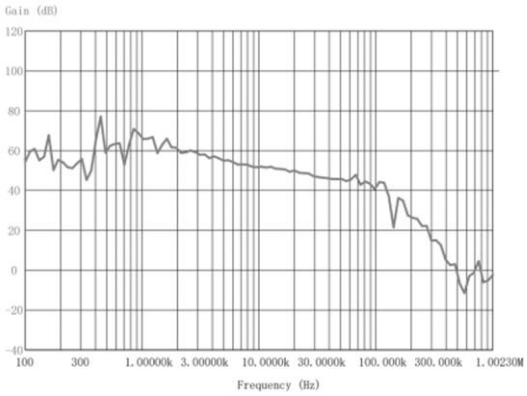
Line Regulation (V_{OUT} = 1.2V)



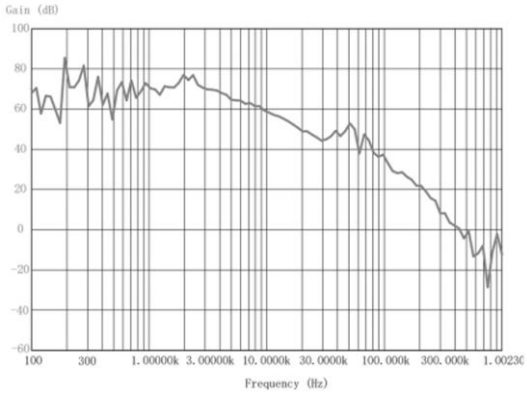
Load Regulation (V_{OUT} = 3.3V)



Load Regulation (V_{OUT} = 1.2V)

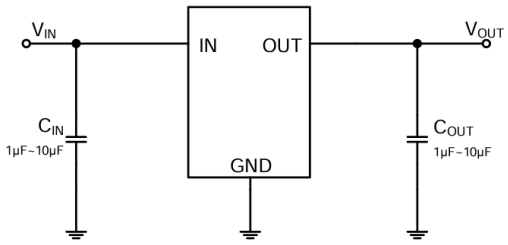


PSRR (V_{OUT} = 3.3V, 20mA)

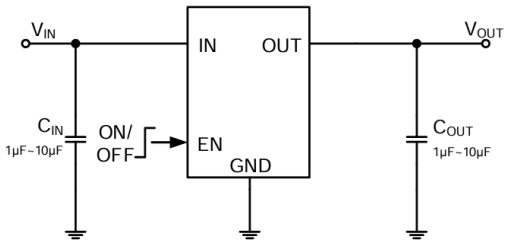


PSRR (V_{OUT} = 1.2V, 20mA)

Typical Application Circuit



SOT23-3 Typical Application Circuit



SOT23-5 Typical Application Circuit

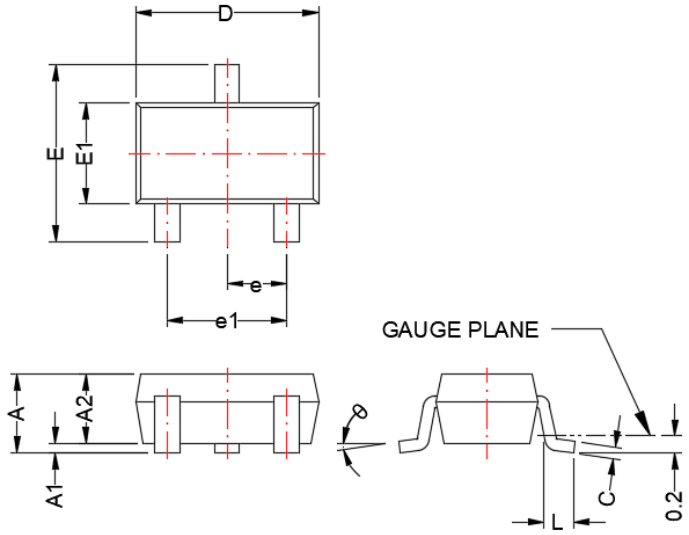
Layout Guidelines

The dynamic performance is dependent on the layout of the PCB.

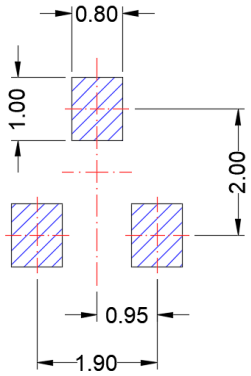
1. Best performance is achieved by placing C_{IN} and C_{OUT} as close to the IC as possible.
2. The ground connections for C_{IN} and C_{OUT} must be back to the IC's GND pin using as wide and short a copper trace as is practical.
3. Connections using long trace lengths, narrow trace widths, and/or connections through vias must be avoided. These add parasitic inductances and resistance that results in inferior performance especially during transient conditions.

SOT-23-3L

Package Dimension



Recommended Land Pattern

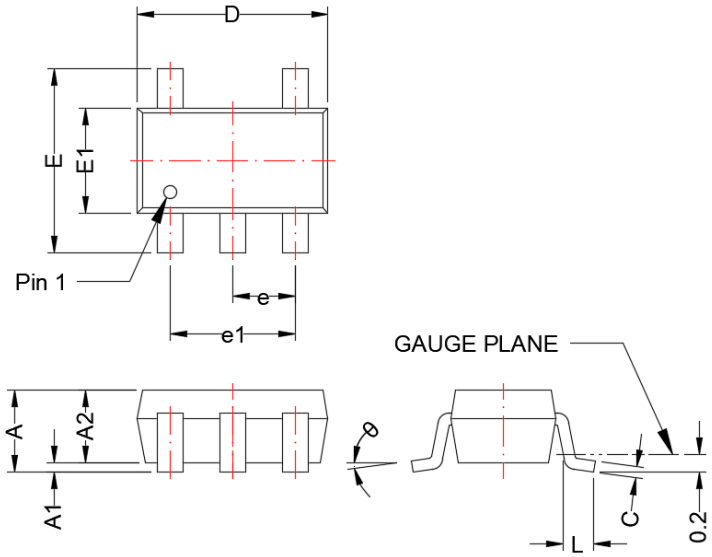


Dimensions				
Symbol	Millimeters		Inches	
	MIN	MAX	Min	MIN
A	0.90	1.45	0.035	0.057
A1	0.00	0.15	0.000	0.006
A2	0.90	1.30	0.035	0.051
b	0.30	0.50	0.012	0.020
c	0.08	0.26	0.003	0.010
D	2.70	3.10	0.106	0.122
E	2.20	3.00	0.087	0.118
E1	1.30	1.75	0.051	0.069
e	0.95 BSC		0.037 BSC	
e1	1.90 BSC		0.075 BSC	
L	0.3	0.6	0.012	0.024
θ	0°	8°	0°	8°

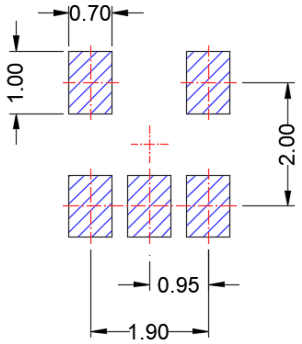
Note:
Dimensions are exclusive of Burrs, Mold Flash & Tie Bar extrusions.

SOT-23-5L

Package Dimension



Recommended Land Pattern



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CONTACT US

GS Headquarter	
	4F.,No.43-1,Lane11,Sec.6,Minquan E.Rd Neihu District Taipei City 114, Taiwan (R.O.C)
	886-2-2657-9980
	886-2-2657-3630
	sales_twn@gs-power.com

RD Division	
	824 Bolton Drive Milpitas. CA. 95035
	1-408-457-0587