

# GS2906B

## 500mA Ultra Low Dropout Regulator

### Product Description

The GS2906B is a high-performance positive voltage regulator designed for use in applications requiring very low input voltage and very low dropout voltage at 500mA amps. It operates with a  $V_{IN}$  as low as 1.6V, with output voltage programmable as low as 0.8V. GS2906B has an enable pin to further reduce power dissipation while shut down. The enable pin may be tied to  $V_{IN}$  if it is not required for ON/OFF control. The GS2906B provides excellent regulation over variations in line, load and temperature.

$V_{OUT}$  can be programmed from 0.8V to 3.3V with two external resistors. The optimum thermal condition must consider the layout placement and application to achieve its satisfied high output current requirement.

The GS2906B is SOT-23-5L packages.

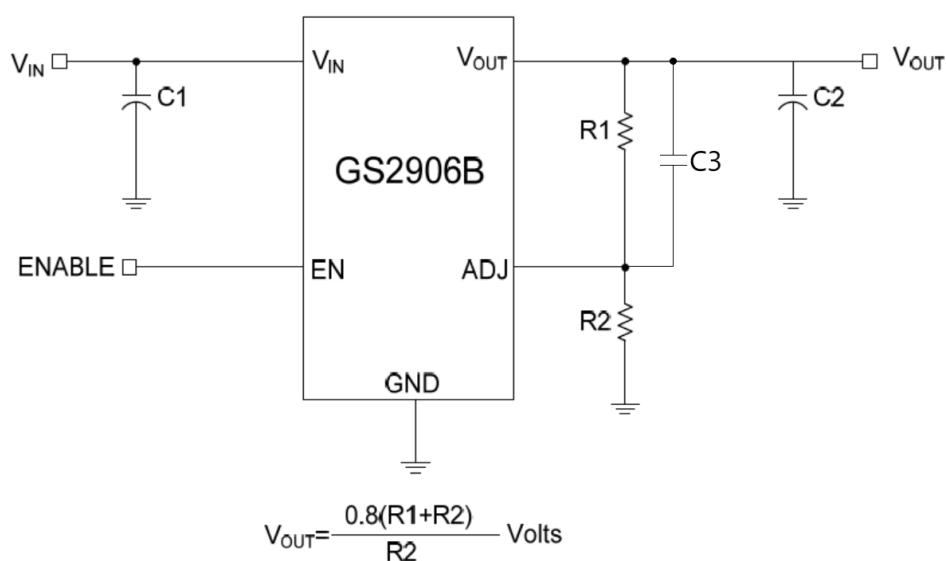
### Features

- Typically, 370mV Dropout @500mA/3.3V
- Input Voltage Range: 1.6V to 6V
- Enable Function
- Over Current and Over Temperature Protection
- 37 $\mu$ A Quiescent Current in Shutdown
- Shut down current < 1 $\mu$ A
- P-CH Design to Reduce the Operation Current
- Output Voltage Accuracy  $\pm 2\%$
- High Ripple Rejection: 70dB (Typ) (f=1kHz)

### Applications

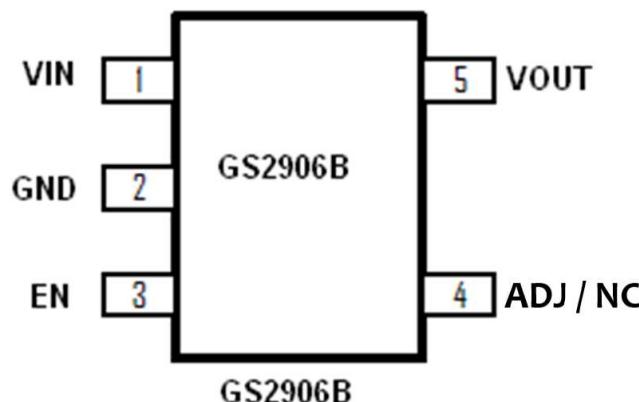
- Battery Powered Systems
- Telecom/Networking Cards
- Industrial Applications
- Camera Module

### Typical Application Circuit



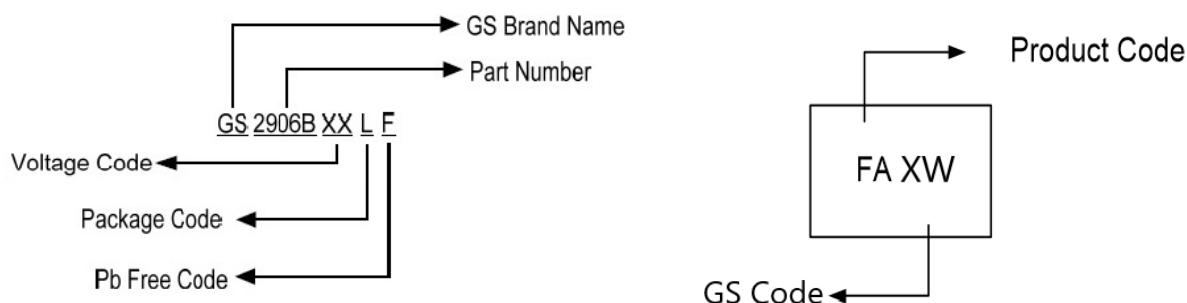
GS2906B

## Packages & Pin Assignments



Pin Name	Pin Description
V <sub>IN</sub>	Input Voltage. 1uF capacitance should be placed closely to Vin
GND	Reference Ground.
EN	Enable Input. Pulling this pin to "High" turn on the IC, pulling this pin to "Low" turn off the IC.
ADJ	This is the input to the error amplifier. The ADJ reference voltage is 0.8Vreferenced to ground. $V_{OUT} = \frac{0.8(R_1+R_2)}{R_2} = \text{Volts}$
V <sub>OUT</sub>	The pin is the power output of the device, connect 2.2uF capacitor to GND. Vout≤1.2V, Recommend using 10pF capacitor.

## Ordering & Marking Information



Part Number	Package	Top Marking (Product Code)	Output Voltage
GS2906BLF	SOT-23-5L	FA XW	Adjustable
GS2906B12LF	SOT-23-5L	12 XW	1.2V
GS2906B18LF	SOT-23-5L	18 XW	1.8V
GS2906B28LF	SOT-23-5L	28 XW	2.8V
GS2906B33LF	SOT-23-5L	33 XW	3.3V

GS2906B

## Absolute Maximum Ratings (Note1)

Symbol	Parameter	Range	Unit
V <sub>IN</sub>	Supply Voltage	-0.3~6	V
Other Pin Voltage	Control Voltage	V <sub>in</sub> -0.3~V <sub>in</sub> +0.3	V
T <sub>J</sub>	Junction Temperature	125	°C
T <sub>LEAD</sub>	Lead Temperature(Soldering) 5 Sec.	260	°C
T <sub>STG</sub>	Storage Temperature Range	-55 to +150	°C
θ <sub>JA</sub>	Thermal Resistance Junction to Ambient	163	°C/W
θ <sub>JC</sub>	Thermal Resistance Junction to Case	55	°C/W
HBM	ESD(Human Body Model)	2	kV
MM	MM(Machine Model)	200	V

## Recommended Operating Conditions

V <sub>IN</sub>	Supply Voltage	6	V
T <sub>J</sub>	Operating Junction Temperature Range	-40 to +125	°C
T <sub>A</sub>	Operating Ambient Temperature Range	-40 to +85	°C

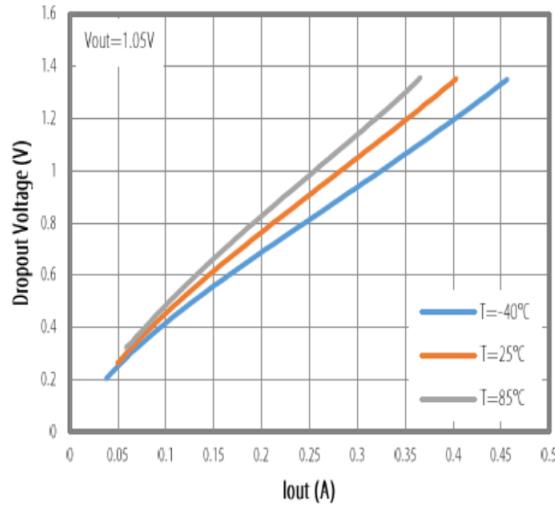
## Electrical Characteristics

(V<sub>in</sub>=V<sub>out</sub>+1.5V, unless otherwise specified Typical values are at T<sub>A</sub>=T<sub>J</sub>=25°C.)

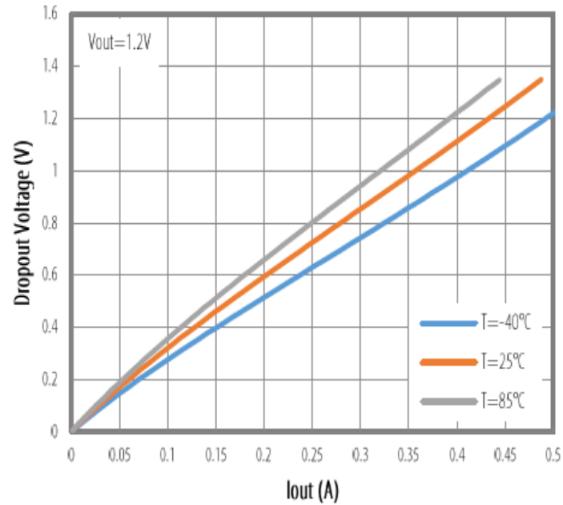
Symbol	Parameter	Conditions	Min	Typ	Max	Unit
V <sub>IN</sub>	Supply Voltage Range		1.6		6	V
I <sub>Q</sub>	Quiescent Current	No Load		37	60	μA
	Shutdown Current	V <sub>EN</sub> =0V		0	1	μA
V <sub>adj</sub>	Reference Voltage		0.775	0.8	0.825	V
V <sub>OUT</sub>	Output Voltage	I <sub>LOAD</sub> =30mA	-2.0	V <sub>OUT</sub>	2.0	%
Reg_line	Line Regulation	V <sub>out</sub> +1V < V <sub>in</sub> < 6V		0.075	0.2	%/V
Reg_load	Load Regulation	0mA < I <sub>out</sub> < 200mA		20		mV
V <sub>DROP</sub>	Dropout Voltage (ADJ)	I <sub>out</sub> =300mA, V <sub>out</sub> =3.3V		225	265	mV
		I <sub>out</sub> =500mA, V <sub>out</sub> =3.3V		370	440	
	Dropout Voltage (FIX)	I <sub>out</sub> =300mA, V <sub>out</sub> =1.8V		550	700	
		I <sub>out</sub> =300mA, V <sub>out</sub> =3.3V		330	450	
I <sub>CL</sub>	Current Limit	V <sub>out</sub> =95%		500		mA
	Start-up Time			30		μS
PSRR	Power Supply Rejection Ratio	I <sub>OUT</sub> =30mA, f=1KHZ		70		dB
<b>EN</b>						
V <sub>ENIH</sub>	Enable Pin Threshold	1.8V < V <sub>in</sub> < 6V	1.5			V
V <sub>ENIL</sub>		1.8V < V <sub>in</sub> < 6V		0.4		V
<b>Over Temperature Protection</b>						
T <sub>HI</sub>	High Trip Level			150		°C

## Typical Performance Characteristics

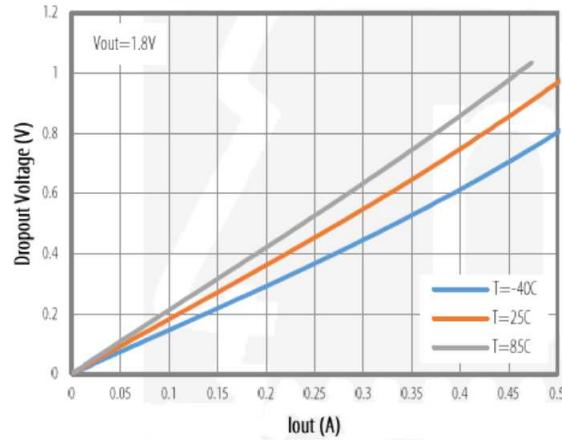
Dropout Vs. I<sub>out</sub>



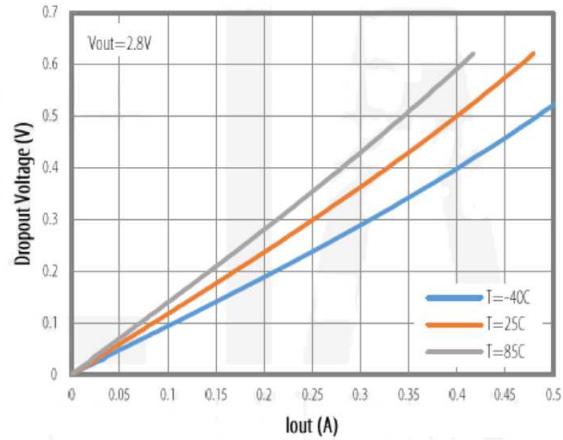
Dropout Vs. I<sub>out</sub>



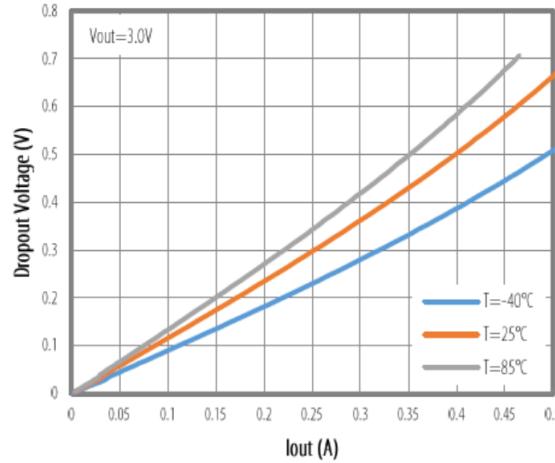
Dropout Vs. I<sub>out</sub>



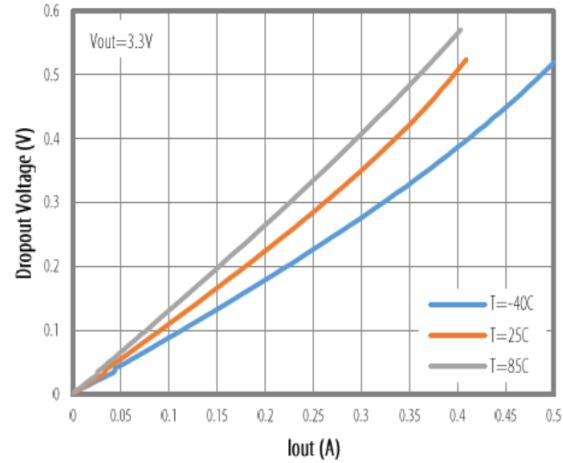
Dropout Vs. I<sub>out</sub>



Dropout Vs. I<sub>out</sub>

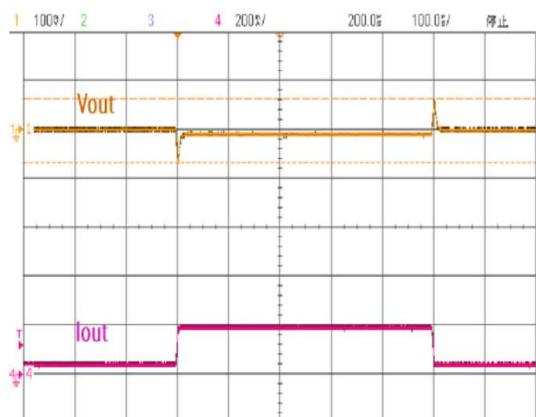


Dropout Vs. I<sub>out</sub>



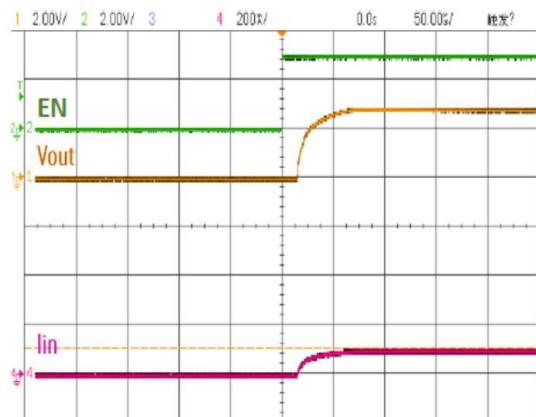
### Load Transient Response

Vin=3.6V, Vout=2.8V, Iout=0.05-0.2A



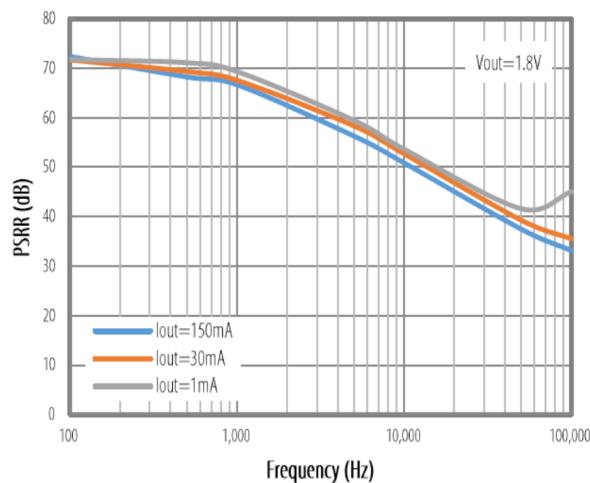
### Startup Waveforms

Vin=3.6V, Vout=2.8V, Iout=100mA

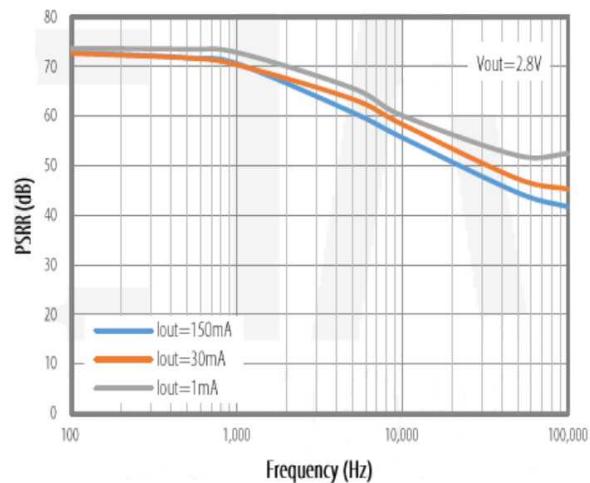


### Ripple rejection ( $T_A=25^\circ C$ )

$C_{in}=1\mu F$ ,  $C_{out}=2.2\mu F$ ,  $Vin=3.3V$

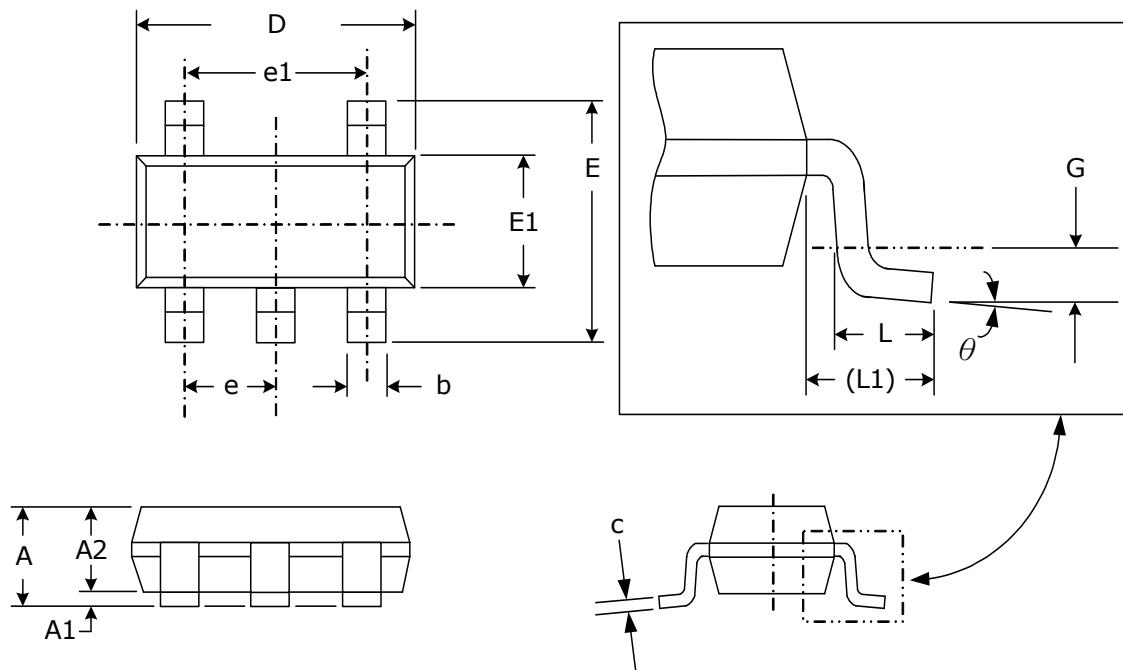


$C_{in}=1\mu F$ ,  $C_{out}=2.2\mu F$ ,  $Vin=4.3V$



## Package Dimension

### SOT-23-5L



#### Dimensions

SYMBOL	Millimeters		Inches	
	MIN	MAX	MIN	MAX
A	0.95	1.45	.037	.057
A1	0.05	0.15	.002	.006
A2	0.90	1.30	.035	.051
b	0.30	0.50	.012	.020
c	0.08	0.20	.003	.008
D	2.70	3.10	.106	.122
E	2.50	3.10	.0984	.122
E1	1.50	1.80	.059	.0071
e	0.95 (TYP)		.037 (TYP)	
e1	1.90 (TYP)		.075 (TYP)	
L	0.35	0.55	.014	.022
L1	0.60 (TYP)		.024 (TYP)	
G	0.25 (TYP)		.010 (TYP)	
θ	0°	8°	0°	8°

GS2906B

## NOTICE

Information furnished is believed to be accurate and reliable. However Globaltech Semiconductor assumes no responsibility for the consequences of use of such information nor for any infringement of patents or other rights of third parties, which may result from its use. No license is granted by implication or otherwise under any patent or patent rights of Globaltech Semiconductor. Specifications mentioned in this publication are subject to change without notice. This publication supersedes and replaces all information without express written approval of Globaltech Semiconductor.

## 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