GL6310

300mA ULTRA - LOW DROPOUT POSITIVE VOLTAGE REGULATOR

Description

GL6310 combines high accuracy with very low power consumption, and provides high output current even when the application requires extremely low input-output voltage differential.

GL6310 includes a precision voltage reference, an error correction circuit, over-temperature protection, and a current limited output driver. Fast transient response to load variations provides excellent stability under dynamic load conditions.

Gl6310 package are SOT-23 (150mW), SOT-89 (500mW)

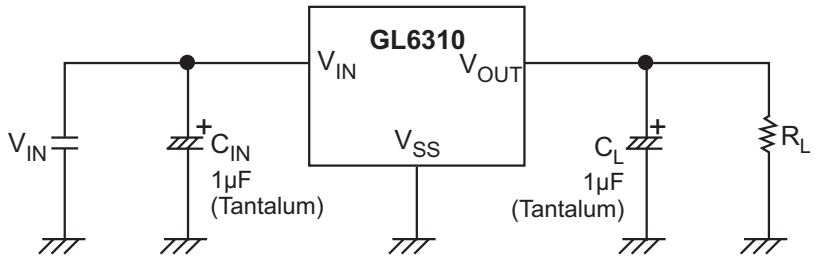
Features

- Maximum output current 300mA (within maximum power dissipation)
- Output voltage: from 1.5 V to 3.6V in 0.1V increments
- Output voltage ±2%
- CMOS low power consumption, max. 50μA
- Ultra-low dropout voltage 0.16V @ I_{OUT} = 100mA at V_{OUT} = 3.3V
- SOT-23 (150mW) , SOT-89 (500mW)

Application

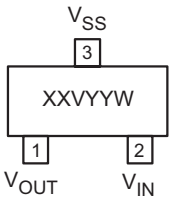
Palmtops
Portable Cameras
Video Recorders
Battery Powered Equipment
Reference Voltage Sources

TYPICAL APPLICATION CIRCUITS

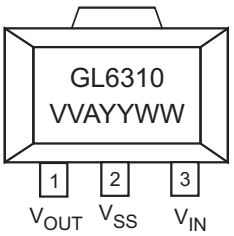


MARKING INFORMATION & PIN CONFIGURATIONS(TOP VIEW)

SOT-23



SOT-89



XX = Marking Code(FA = GL6310)
V = Voltage Code
VV = Voltage Suffix (18=1.8V ,36=3.6V)
A = Assembly Location
YY = Year
WW, W= Weekly

ORDERING INFORMATION (Green Package Products are available now!)

Ordering Number	Output Voltage	Voltage Code	Package	Shipping
GL6310-1.5ST23R	1.5V	C	SOT-23	3,000 Units/ Tape and Reel
GL6310-1.5ST89R	1.5V		SOT-89	1,000 Units/ Tape and Reel
GL6310-1.8ST23R	1.8V	E	SOT-23	3,000 Units/ Tape and Reel
GL6310-1.8ST89R	1.8V		SOT-89	1,000 Units/ Tape and Reel
GL6310-2.5ST23R	2.5V	G	SOT-23	3,000 Units/ Tape and Reel
GL6310-2.5ST89R	2.5V		SOT-89	1,000 Units/ Tape and Reel
GL6310-2.7ST23R	2.7V	T	SOT-23	3,000 Units/ Tape and Reel
GL6310-2.7ST89R	2.7V		SOT-89	1,000 Units/ Tape and Reel
GL6310-2.8ST23R	2.8V	H	SOT-23	3,000 Units/ Tape and Reel
GL6310-2.8ST89R	2.8V		SOT-89	1,000 Units/ Tape and Reel
GL6310-3.0ST23R	3.0V	J	SOT-23	3,000 Units/ Tape and Reel
GL6310-3.0ST89R	3.0V		SOT-89	1,000 Units/ Tape and Reel
GL6310-3.2ST23R	3.2V	U	SOT-23	3,000 Units/ Tape and Reel
GL6310-3.2ST89R	3.2V		SOT-89	1,000 Units/ Tape and Reel
GL6310-3.3ST23R	3.3V	K	SOT-23	3,000 Units/ Tape and Reel
GL6310-3.3ST89R	3.3V		SOT-89	1,000 Units/ Tape and Reel
GL6310-3.5ST23R	3.5V	V	SOT-23	3,000 Units/ Tape and Reel
GL6310-3.5ST89R	3.5V		SOT-89	1,000 Units/ Tape and Reel
GL6310-3.6ST23R	3.6V	L	SOT-23	3,000 Units/ Tape and Reel
GL6310-3.6ST89R	3.6V		SOT-89	1,000 Units/ Tape and Reel

* For detail ordering number identification, please see last page.

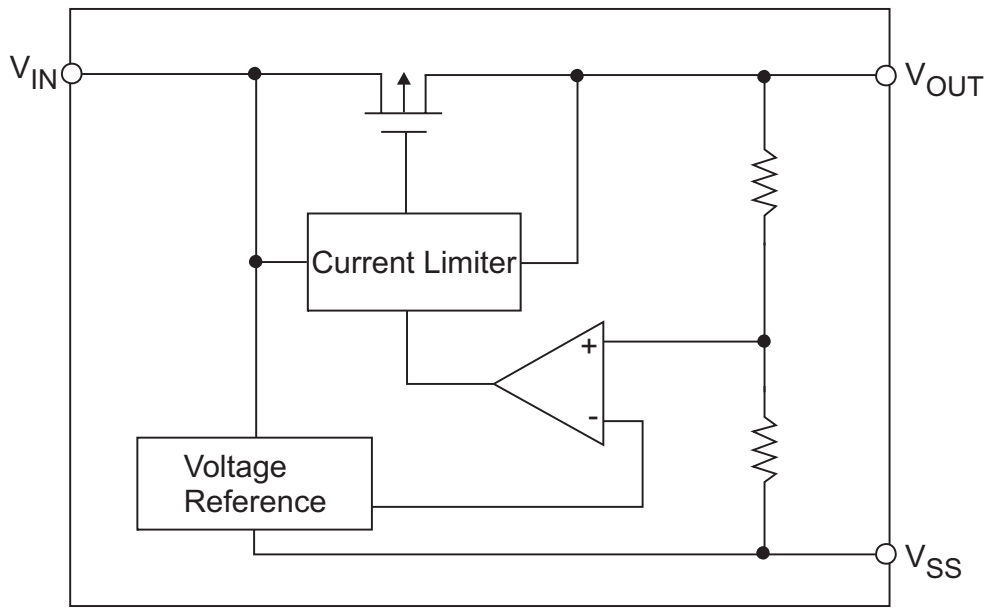
◆ ABSOLUTE MAXIMUM RATINGS

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	12	V
Output Current		I_{OUT}	300	mA
Output Voltage		V_{OUT}	V_{SS} - 0.3 ~ V_{IN} + 0.3	V
Continuous Total Power Dissipation	SOT - 23	P_D	150	mW
	SOT - 89		500	
Operating Ambient Temperature		T_{opr}	-30 ~ +80	°C
Storage Temperature		T_{stg}	-65 ~ +150	°C
Peak Reflow Temperature			260	°C

◆ Thermal Information

PARAMETER		Maximum	Unit
Thermal Resistance $R_{\theta jc}$	SOT-89	100	°C/ W
Thermal Resistance $R_{\theta ja}$		300	°C/ W

◆ BLOCK DIAGRAM



◆ ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

Parameter		Symbol	Condition	Min	Typ	Max	Unit
Output Voltage	GL6310-1.5V	V_{OUT}(V)	I_{OUT}=10mA, V_{IN} >1V+V_{OUT}	1.470	1.500	1.530	V
	GL6310-1.8V			1.760	1.800	1.840	
	GL6310-2.0V			1.960	2.000	2.040	
	GL6310-2.5V			2.450	2.500	2.550	
	GL6310-2.7V			2.650	2.700	2.760	
	GL6310-2.8V			2.740	2.800	2.860	
	GL6310-3.0V			2.920	3.000	3.080	
	GL6310-3.3V			3.230	3.300	3.370	
	GL6310-3.6V			3.530	3.600	3.670	
Output Voltage Temperature Characteristics		$\frac{\Delta V_{OUT}}{\Delta Topr \cdot V_{OUT}}$			±100	±150	ppm/°C
Line Regulation(Note1)		$\frac{\Delta V_{OUT}}{\Delta V_{IN} \cdot V_{OUT}}$	I_{OUT}=10mA, 1V+V_{OUT} ≤ V_{IN} ≤ 8		0.2	0.5	%/V
Load Regulation(Note1)		ΔV_{OUT}	1mA ≤ I_{OUT} ≤ 100mA 1V+V_{OUT} ≤ V_{IN}		20	50	mV
Supply Current		I_{SS}	No Load 1V+V_{OUT} ≤ V_{IN}		32	50	uA
Current Limit (Note 2)		I_{OS}	Vout & GND connection 1V+V_{OUT} ≤ V_{IN}		300		mA
DropOut Voltage(Note 3)	GL6310-1.5V	V_{DROP}(V)	I_{OUT}=100mA, V_{IN} >1V+V_{OUT}		250		mV
	GL6310-1.8V				200		
	GL6310-2.0V				180		
	GL6310-2.5V				170		
	GL6310-2.7V				170		
	GL6310-2.8V				170		
	GL6310-3.0V				160		
	GL6310-3.3V				160		
	GL6310-3.6V				150		
Power Supply Rejection		PSRR	f = 1KHz		20		dB
			f = 10KHz		12		
			f = 100KHz		0.7		

Note: 1. Regulation is measured at constant junction temperature, using pulse testing with a low ON time.
2. Current limit is measured by pulsing a short time.
3. Dropout Voltage Vdrop = Vin - Vout is defined as the input to output differential at which the output voltage drops 100mA below the value measured with a 1V differential.

DIRECTIONS FOR USAGE

Notes on Usage

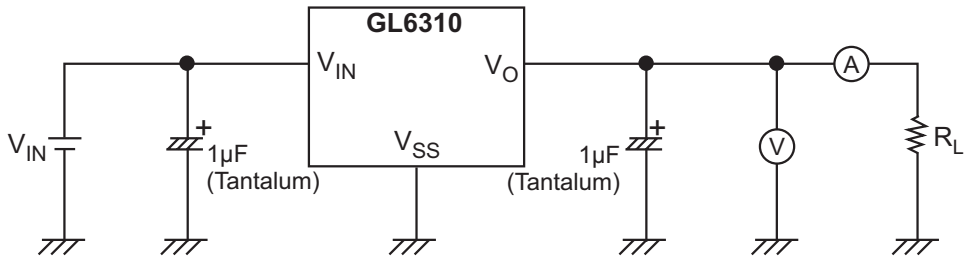
1. Please use this IC within the stipulated absolute maximum ratings as the IC is liable to malfunction outside of such parameters.

2. There is a possibility theat, oscillation may occur as result of the impedance present between the power supply and IC's input. Where impedance is 10W or more, please use a capacitor (Cin) of least 1uF.With a large output current, operations can be stabilized by increasing capacitor size (Cin). If Cin is small and capacitor size (CL) is increased, there is a possibility of oscillation due to input impedance. In such cases, operations can be stabilized by either increasing the size of Cin or decreasing the size of CL.

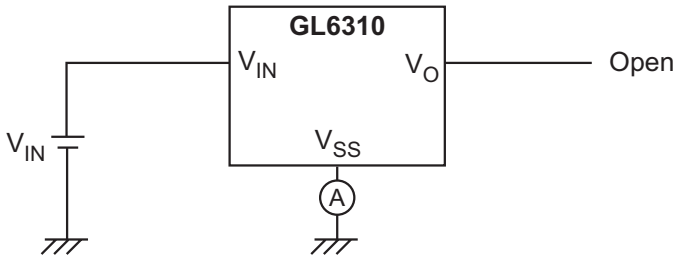
3. Please ensure the output current (Iout) is less than Pd (Vin - Vout) and does not exceed the stipulated continuous total power dissipation value (Pd) for the package.

TEST CIRCUIT

Circuit 1



Circuit 2



CALCULATING POWER DISSIPATION

The **GL6310** series precision linear regulators include thermal shutdown and current limit circuitry to protect the devices. However, high power regulators normally operate at high junction temperatures so it is important to calculate the power dissipation and junction temperatures accurately to be sure that you use and adequate heat sink.

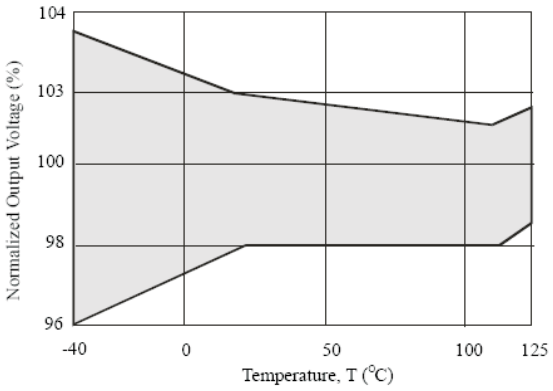
The thermal characteristics of an IC depend four factors:

1. Maximum Ambient Temperature T_A(°C)
2. Power Dissipation P_D (Watts)
3. Maximum Junction Temperature T_J(°C)
4. Thermal Resistance Junction to ambient R_{QJA}(°C/W)

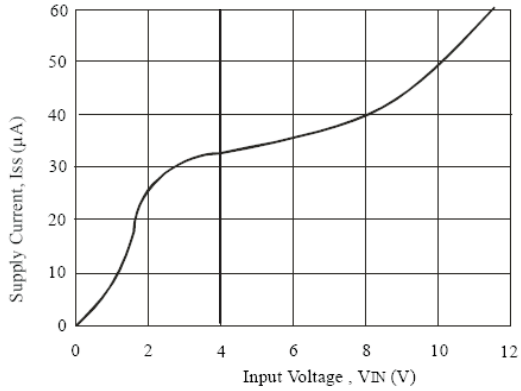
These relationship of these four factors is expressed by equation (1): $\mathbf{T_J = T_A + P_D \, X \, R_{QJA}}$

Maximum ambient temperature and power dissipation are determined by the design while the maximum junction temperature and thermal resistance depend on the manufacturer and the package type.

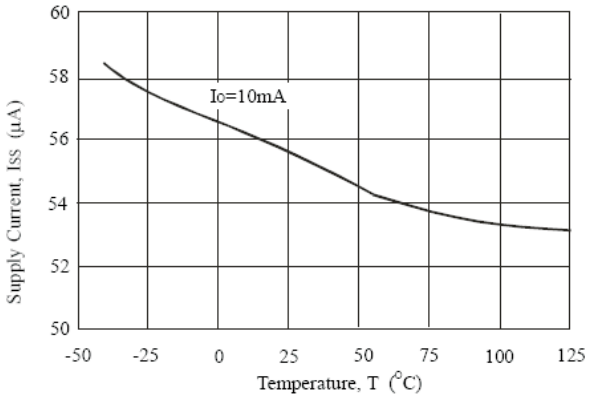
PERFORMANCE CHARACTERISTICS FOR GL6310



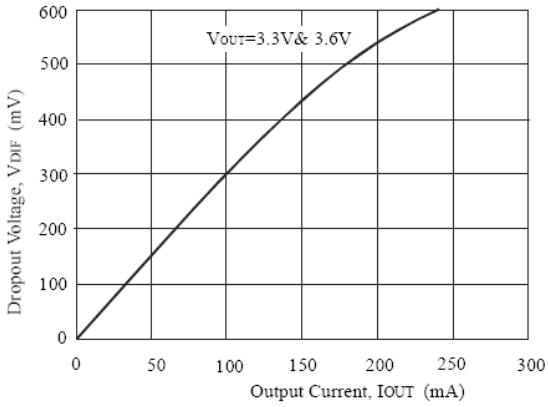
OUTPUT VOLTAGE vs. TEMPERATURE



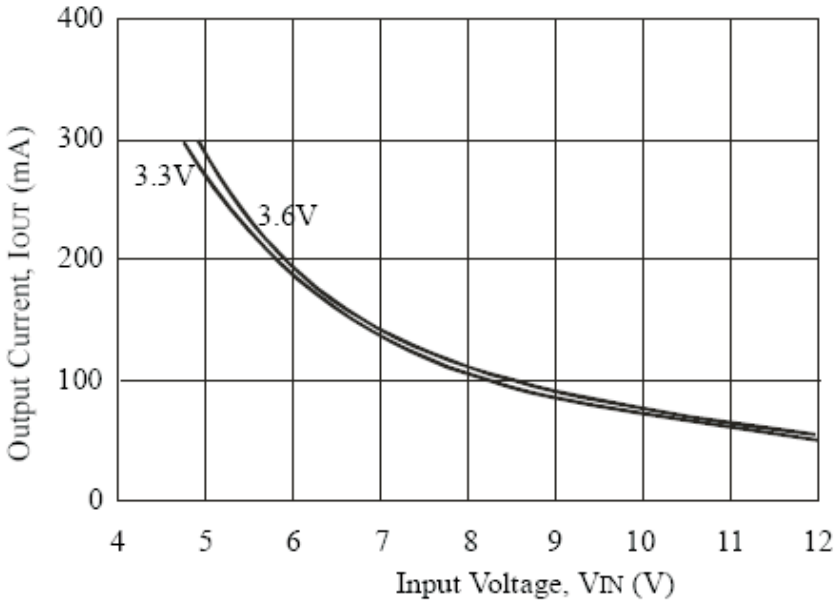
SUPPLY CURRENT vs. INPUT VOLTAGE



SUPPLY CURRENT vs. TEMPERATURE

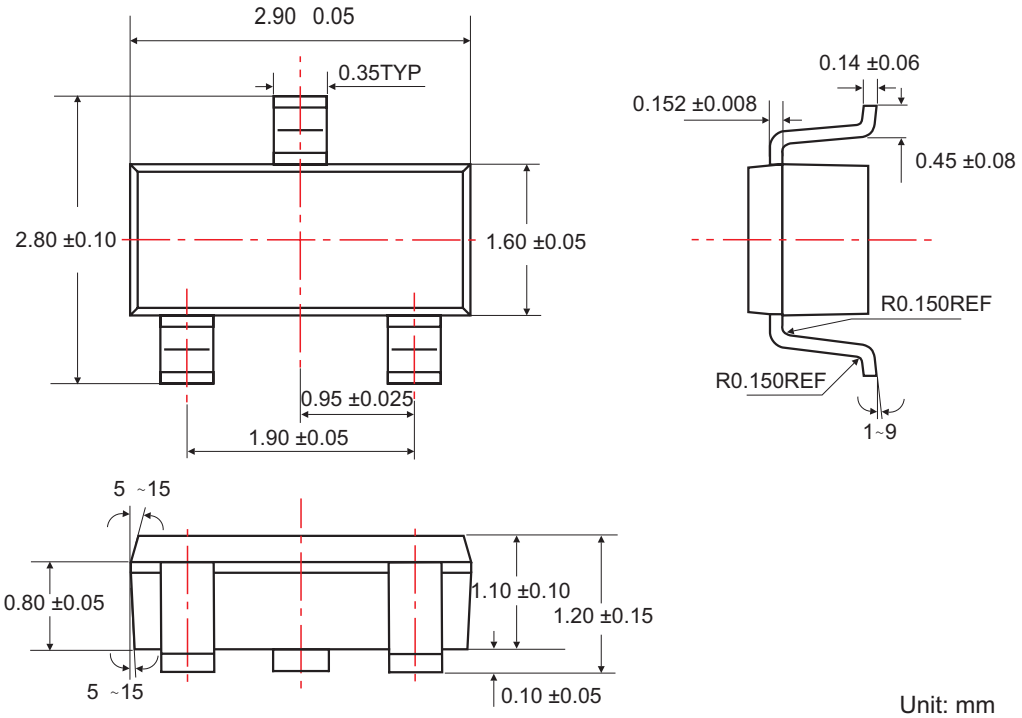


DROPOUT VOLTAGE vs. OUTPUT CURRENT



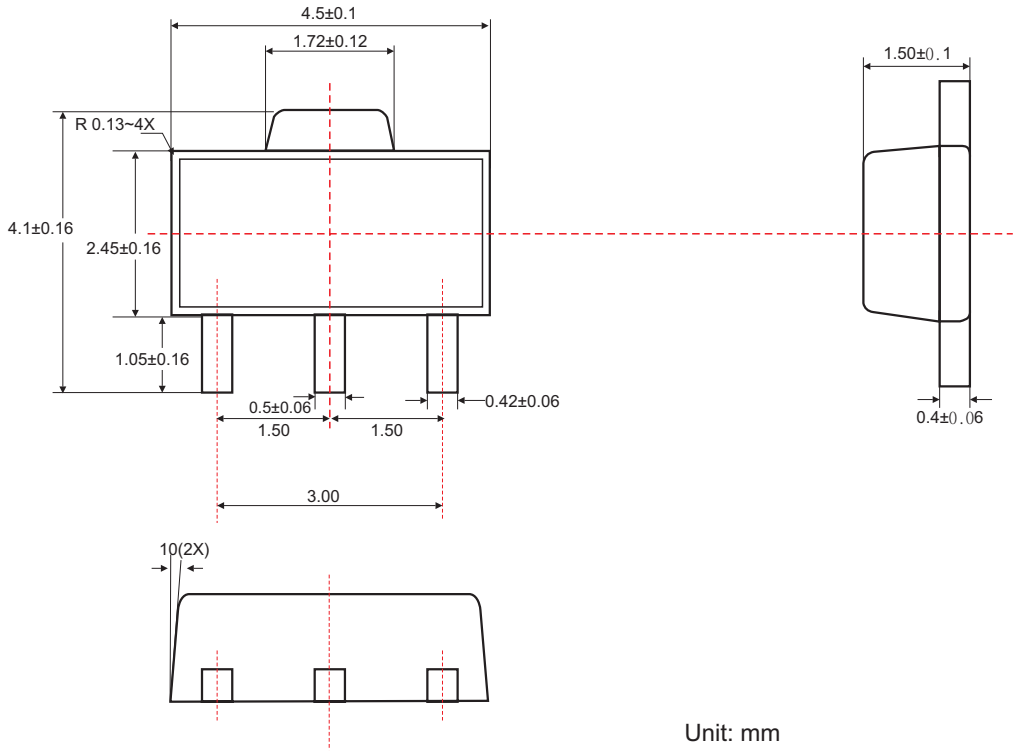
RECOMMENDED MAX. OUTPUT CURRENT vs. INPUT VOLTAGE

SOT-23 PACKAGE OUTLINE DIMENSIONS



Unit: mm

SOT-89 PACKAGE OUTLINE DIMENSIONS



Unit: mm

◆ ORDERING NUMBER