HG1311

High PSRR Low Noise 300mA Dual LDO Regulators

■ INTRODUCTION

The HG1311 Series are a group of dual channel low-dropout voltage regulators designed for portable and wireless applications that require high PSRR, low quiescent current and excellent line and load transient response. The HG1311 includes a reference voltage source, error amplifiers, driver transistors, current limiters and phase compensators internally. The HG1311 is stable with a small 1μF ceramic on the output, which is ideal for battery powered systems for delivering low dropout voltage and low quiescent current. It provides up to 300mA at each channel, from a 2.0V to 6.0V input. The HG1311 is available in 6 pin SOT-23 package.

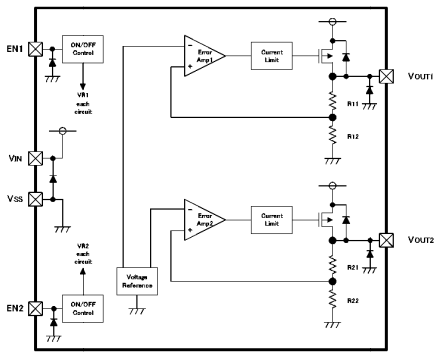
■ FEATURES

- Shutdown Current: < 0.1μA
- Output Current: 300mA
- Output Voltage Range: 1.2V～5.0V, （selectable in 0.1V steps）
- High Accuracy: ±2%（Typ.）
- Dropout Voltage: 100mV@100mA（3.0V Typ.）
- Excellent Line Regulation: 0.01%/V
- Built-in Current Limiter
- Built-in Short Circuit Protection
- Static safety: 2KV@HBM
- TC: 100ppm/℃
- Low ESR Ceramic Capacitor Compatible

■ APPLICATIONS

- Mobile phones
- WLAN and Bluetooth appliances
- Portable Audio Equipments
- Cordless telephone
- Cameras, Video recorders
- Battery powered portable devices

■ BLOCK DIAGRAM



■ ORDER INFORMATION

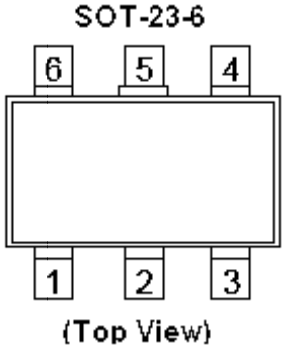
HG1311①②③④⑤

DESIGNATOR	SYMBOL	DESCRIPTION
①②	EE	High Active
③④	Ⅰ Ⅱ	Ⅰ:Regulator1 Output Voltage Ⅱ: Regulator2 Output Voltage (See Chart1)
⑤	E	Package: SOT-23-6

Chart1 (Regulator1, Regulator2 Output Voltage Indicate**)**

symbol	Output Voltage	symbol	Output Voltage	symbol	Output Voltage	symbol	Output Voltage
a	0.9	A	3.5	n	2.2	N	4.8
b	1.0	B	3.6	o	2.3	O	4.9
c	1.1	C	3.7	p	2.4	P	5.0
d	1.2	D	3.8	q	2.5	Q	5.1
e	1.3	E	3.9	r	2.6	R	5.2
f	1.4	F	4.0	s	2.7	S	5.3
g	1.5	G	4.1	t	2.8	T	5.4
h	1.6	H	4.2	u	2.9	U	5.5
i	1.7	I	4.3	v	3.0	V	5.6
j	1.8	J	4.4	w	3.1	W	5.7
k	1.9	K	4.5	x	3.2	X	5.8
l	2.0	L	4.6	y	3.3	Y	5.9
m	2.1	M	4.7	z	3.4	Z	6.0

■ PIN CONFIGURATION



PIN NUMBER	SYMBOL	FUNCTION
1	EN1	ON/OFF Control 1
2	V_{IN}	Power Input
3	En2	ON/OFF Control 2
4	V_{OUT2}	Output 2
5	V_{SS}	Ground
6	V_{OUT1}	Output 1

■ ABSOLUTE MAXIMUM RATINGS

(Unless otherwise specified, Ta=25°C)

PARAMETER		SYMBOL	RATINGS	UNITS
Input Voltage		V_{IN}	V_{SS} -0.3~V_{SS}+7	V
Output Current		I_{OUT1}+ I_{OUT2}	700	mA
Output Voltage		V_{OUT}	V_{SS} -0.3~V_{IN}+0.3	V
Power Dissipation	SOT-23-6	Pd	250	mW
Operating Temperature		T_{opr}	-40~+85	℃
Storage Temperature		T_{stg}	-40~+125	℃
Soldering Temperature & Time		T_{solder}	260℃, 10s	

■ ELECTRICAL CHARACTERISTICS

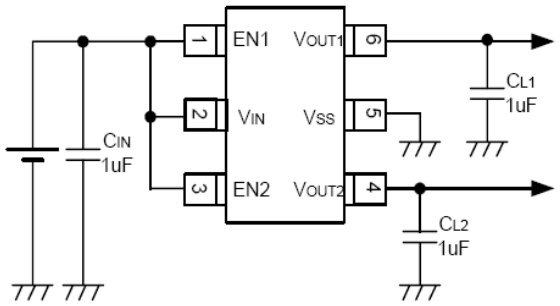
Regulator1, Regulator2 (V_{IN}=V_{OUT}+1V, C_{IN}=C_{OUT}=1μF，Ta=25℃,unless otherwise specified)

PARAMETER	SYMBOL	CONDITIONS		MIN	TYP	MAX	UNITS
Output Voltage	V_{OUT}(E) (Note 2)	I_{OUT}=40mA, V_{IN}=V_{OUT}+1V, V_{IN}≥2V	1.5V<V_{OUT}≤5.0V	V_{OUT} *0.98	V_{OUT} (Note 1)	V_{OUT} *1.02	V
			1.2V≤V_{OUT}≤1.5V	V_{OUT} -0.03	V_{OUT}	V_{OUT} +0.03	V
Supply Current	I_{SS}	V_{EN}=V_{IN}=V_{OUT}+1V			100	160	μA
Shutdown Current	I_{SHDN}	V_{EN} = V_{SS}			0.1	1.0	μA
Output Current	I_{OUT}	V_{IN}≥2V, V_{IN}=V_{OUT}+1V		300			mA
Dropout Voltage (Note 3)	V_{dif}	I_{OUT} = 100mA V_{OUT}≥2.8V			100		mV
Load Regulation	ΔV_{OUT}	V_{IN}= V_{OUT} +1V, 1mA≤I_{OUT}≤100mA			10		mV
Line Regulation	$\frac{\Delta V_{OUT}}{\Delta V_{IN} * V_{OUT}}$	I_{OUT} = 10mA V_{OUT} +1V≤V_{IN}≤6V			0.01	0.2	%/V
Output Voltage Temperature Characteristics	$\frac{\Delta V_{OUT}}{\Delta T * V_{OUT}}$	I_{OUT} = 10mA -40≤T≤+85			100		ppm/℃
Power Supply Ripple Rejection	PSRR	I_{OUT} =50mA f = 1KHz			70		dB
Short Current	I_{Short}	V_{OUT} = V_{SS}			100		mA
Current Limit	I_{Lim}	V_{IN}= V_{OUT} +1V			600		mA
Input Voltage	V_{IN}	—		2.0		6.0	V
CE "High" Voltage	V_{CE} “H”			1.5		V_{IN}	V
CE "Low" Voltage	V_{CE} “L”					0.3	V

NOTE:

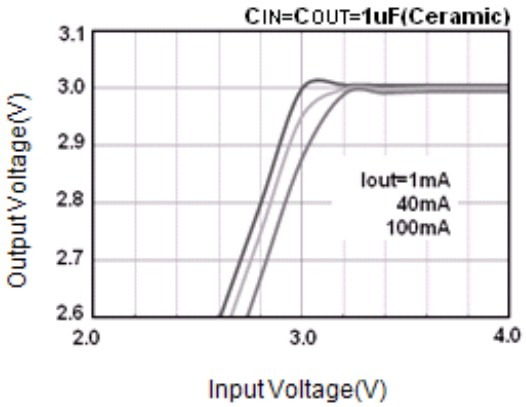
1. V_{OUT}：Specified Output Voltage.
2. V_{OUT} (E) ： Effective Output Voltage (I.e. The Output Voltage When V_{IN} = (V_{OUT} +1.0V) And Maintain A Certain I_{OUT} Value).
3. V_{diff}：The Difference Of Output Voltage And Input Voltage When Input Voltage Is Decreased Gradually Till Output Voltage Equals To 98% Of V_{OUT} (E); When V_{OUT}<2.0V, V_{IN}≥2.0V Should be Guaranteed.

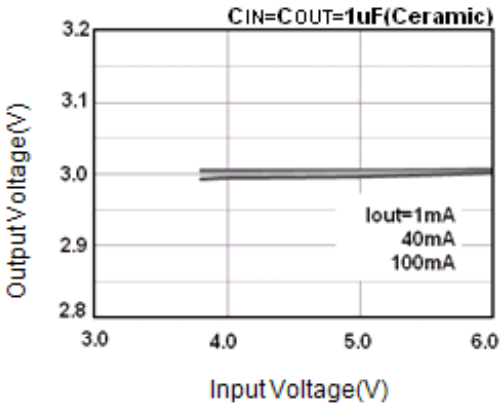
■ TYPICAL APPLICATION



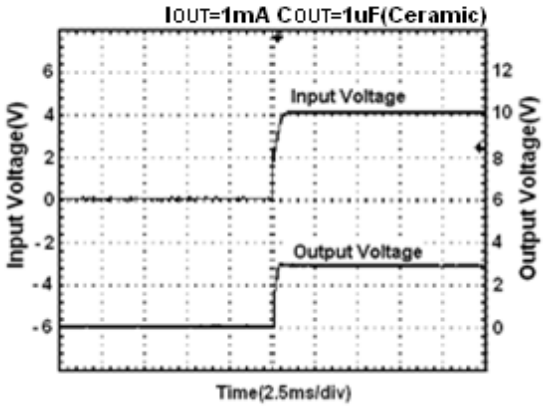
■ TYPICAL PERFORMANCE CHARACTERISTICS

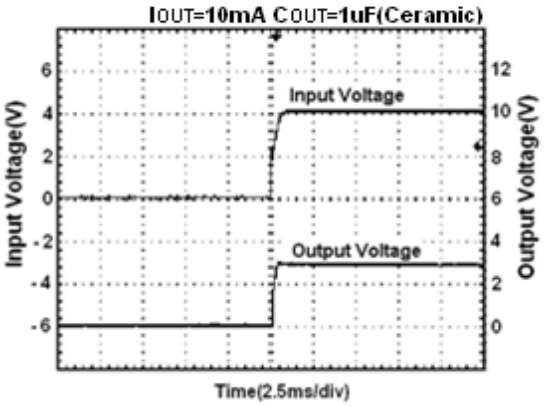
（1）Output Voltage vs. Input Voltage



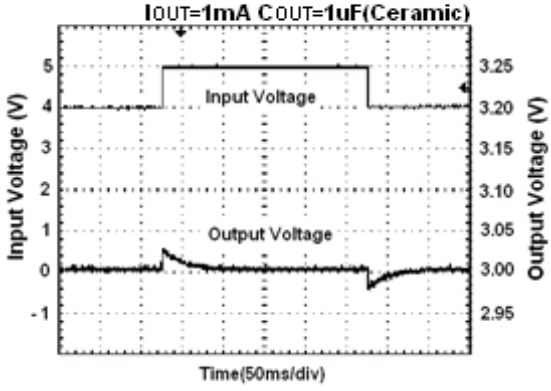


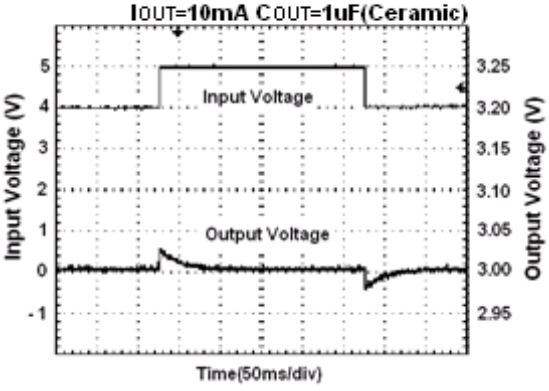
（2）Input Transient Response 1



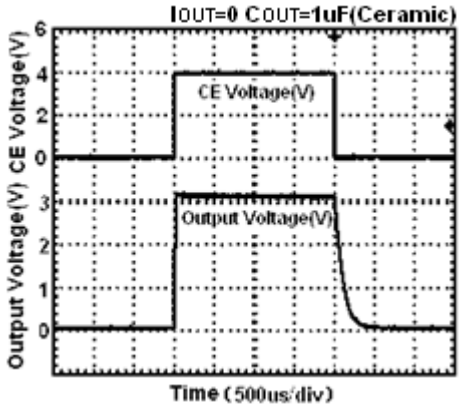


（3）Input Transient Response 2

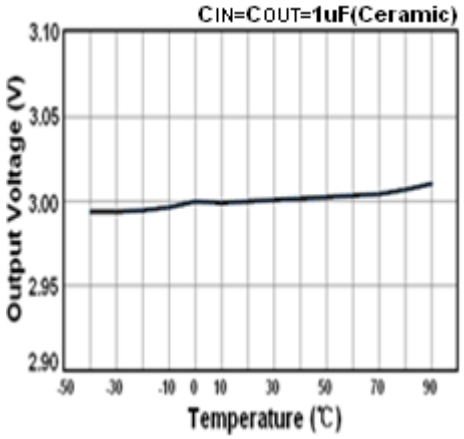




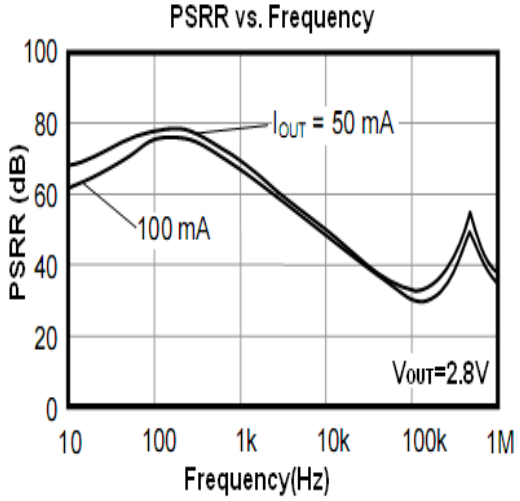
（4）EN Shutdown Response



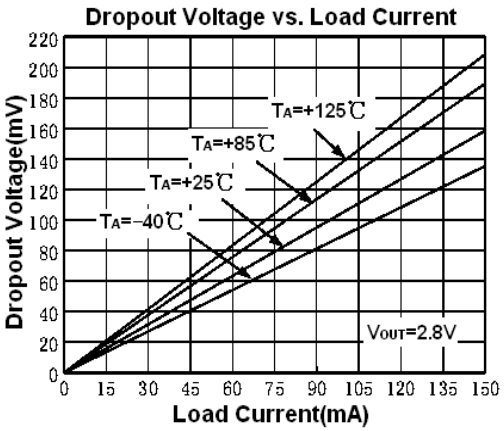
（5）Output Voltage vs. Temperature



（6）PSRR

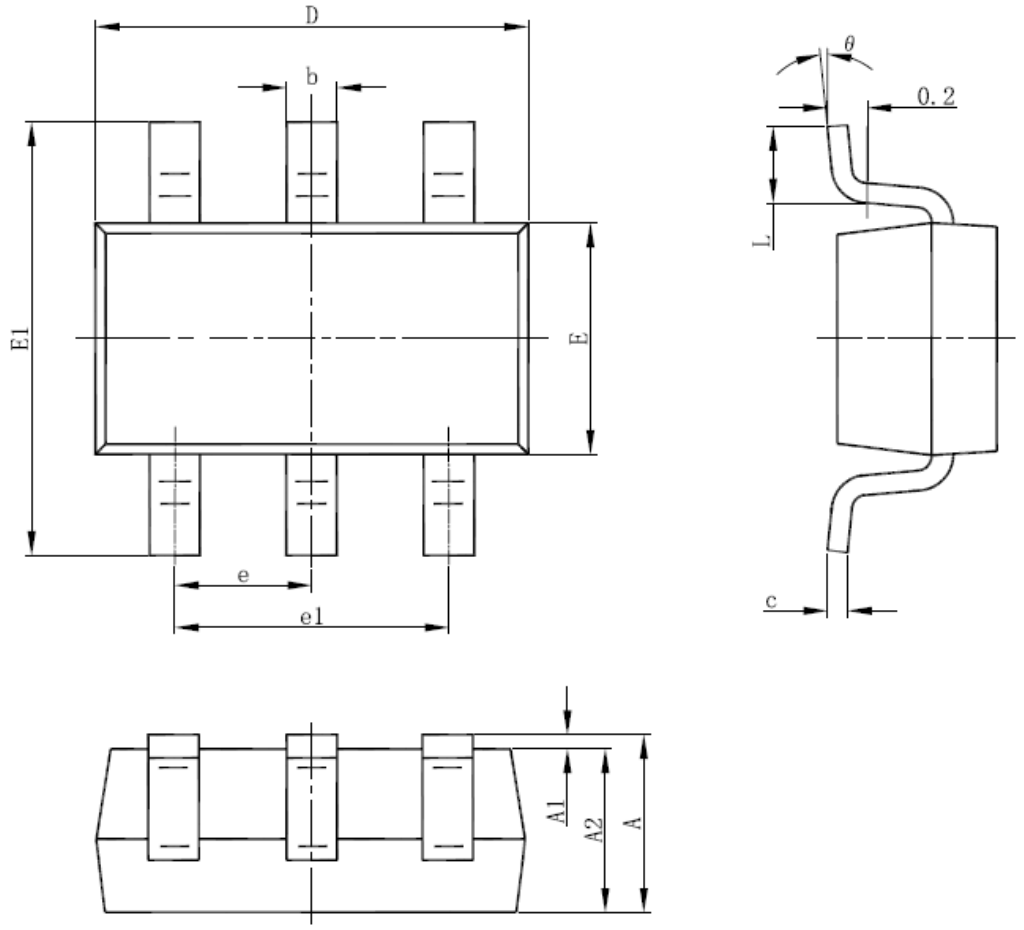


（7）Dropout



■ PACKAGING INFORMATION

● SOT-23-6 PACKAGE OUTLINE DIMENSIONS



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	1.050	1.250	0.041	0.049
A1	0.000	0.100	0.000	0.004
A2	1.050	1.150	0.041	0.045
b	0.300	0.500	0.012	0.020
c	0.100	0.200	0.004	0.008
D	2.820	3.020	0.111	0.119
E	1.500	1.700	0.059	0.067
E1	2.650	2.950	0.104	0.116
e	0.950(BSC)		0.037(BSC)	
e1	1.800	2.000	0.071	0.079
L	0.300	0.600	0.012	0.024
θ	0°	8°	0°	8°