

**Features**

- 2μA Ground Current at no Load
- ±2% Output Accuracy
- 200mA Output Current
- Wide Operating Input Voltage Range: 2V to 36V
- Dropout Voltage: 0.65V at 100mA ( $V_{OUT}=5V$ )
- Support Fixed Output Voltage 1.8V, 3.3V, 5V, 9V, 12V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT-23-5 Package Available

**Applications**

- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment
- Car Navigation Systems
- Industrial Controls
- Weighting Scales
- Meters
- Home Automation

**Ordering Information**

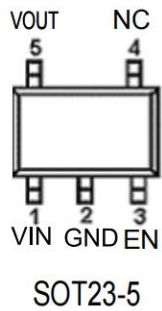
**TPRT9069-33GB**

GB:SOT23-5 Package

Output voltage: 12=1.2V  
15=1.5V  
18=1.8V  
30=3.0V  
33=3.3V  
50=5.0V  
A9=5.0V  
B2=12V

<b>Marking:</b>	<b>TPRT9069-50GB</b>	<b>Marking:</b>	<b>P H50</b>
	<b>TPRT9069-33GB</b>	<b>Marking:</b>	<b>P H33</b>
	<b>TPRT9069-30GB</b>	<b>Marking:</b>	<b>P H30</b>
	<b>TPRT9069-12GB</b>	<b>Marking:</b>	<b>P H12</b>
	<b>TPRT9069-xxGB</b>	<b>Marking:</b>	<b>P Hxx</b>

## PIN CONFIGURATION



Pin No	Pin Name	Pin Function
1	VIN	Input of Supply Voltage.
2	GND	Ground
3	EN	Enable Control Input.
4	NC	No Internal Connection.
5	VOUT	Output of the Regulator

## Typical Application Circuit

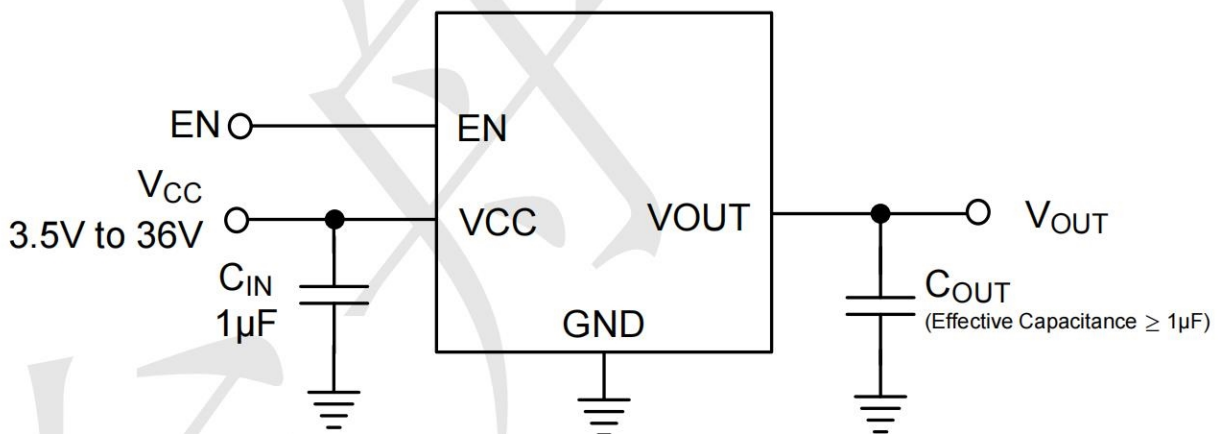
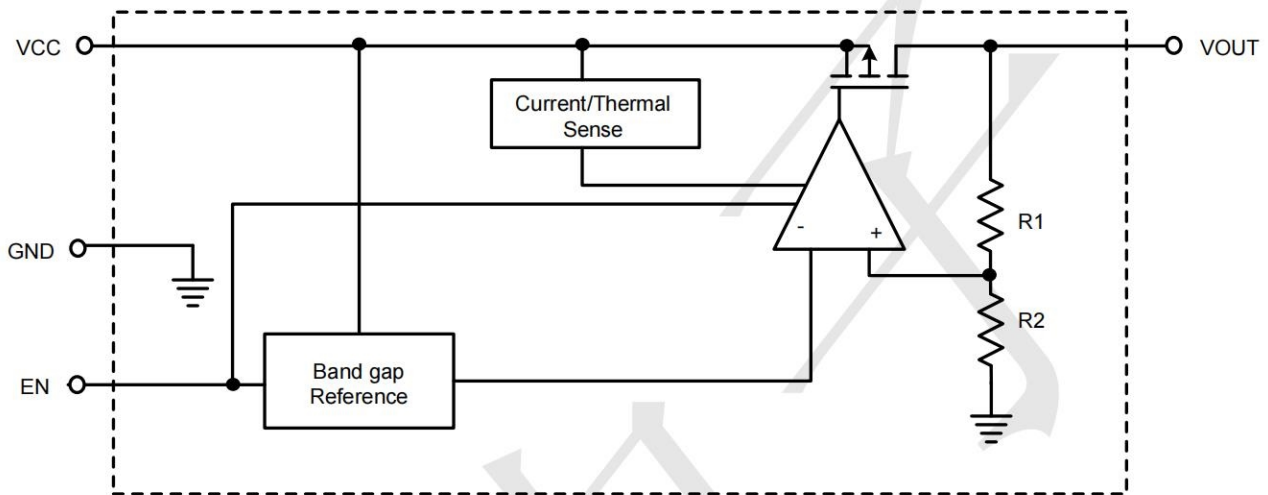


Figure 1: Application circuit of Fixed  $V_{OUT}$  LDO with enable and sense functions



**BLOCK DIAGRAM**



**Absolute Maximum Ratings**

VIN Pin to GND Pin Voltage .....	-0.3V to 40V
VOUT Pin to GND Pin Voltage     Vout 9V,12V .....	-0.3V to 14V
Vout 1.2V,2.8V,3.3V,5.0V .....	-0.3V to 6.0V
VOUT Pin to VIN Pin Voltage .....	-40V to 0.3V
Storage Temperature Range .....	-60°C~150°C
Lead Temperature (Soldering, 10 sec) .....	260°C
Junction Temperature .....	150°C
Operating Ambient Temperature Range T <sub>A</sub> .....	-40°C~85°C
SOT-23-5, θ <sub>JA</sub> .....	218.1°C/W
SOT-23-5, θ <sub>JC</sub> .....	28.5°C/W

(Assume no Ambient Airflow, no Heatsink)

**Recommended Operating Conditions**

Supply Input Voltage .....	3.5V to 36V
Junction Temperature Range .....	-40°C to 125°C
Ambient Temperature Range .....	-40°C to 85°C

### Electrical Characteristics

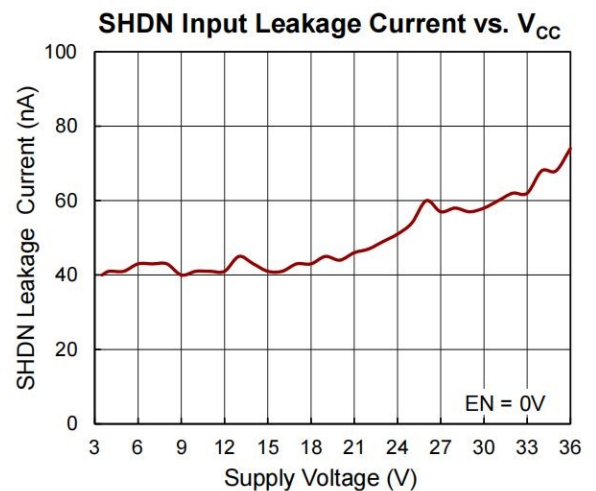
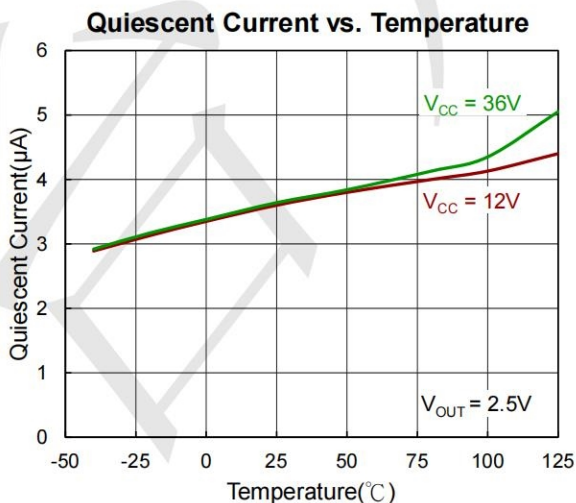
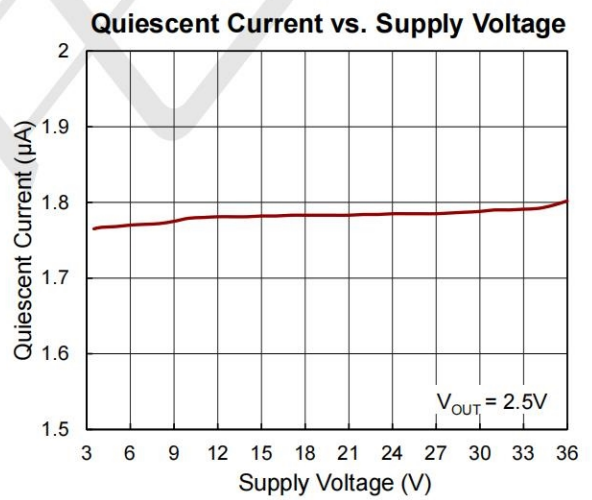
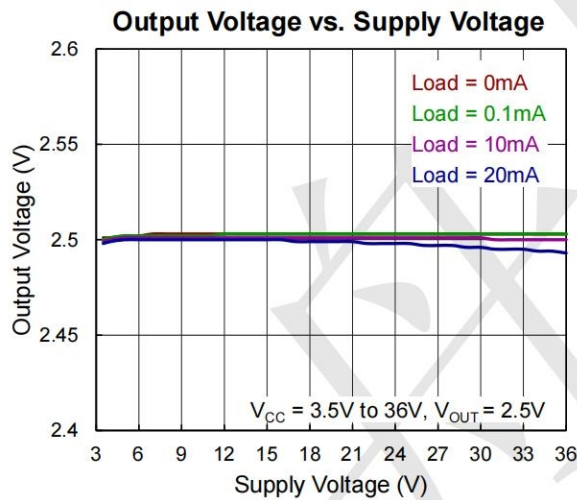
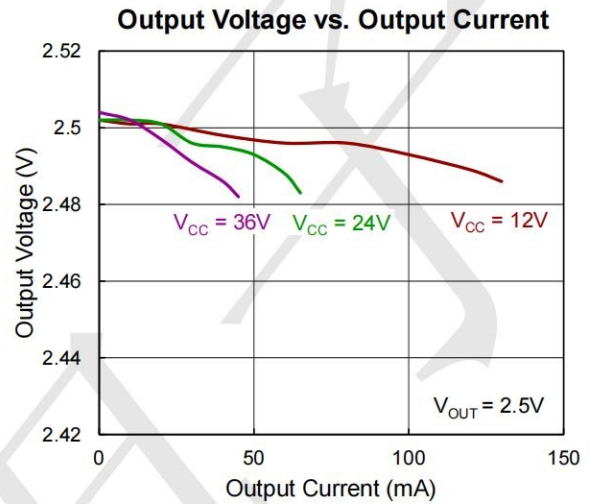
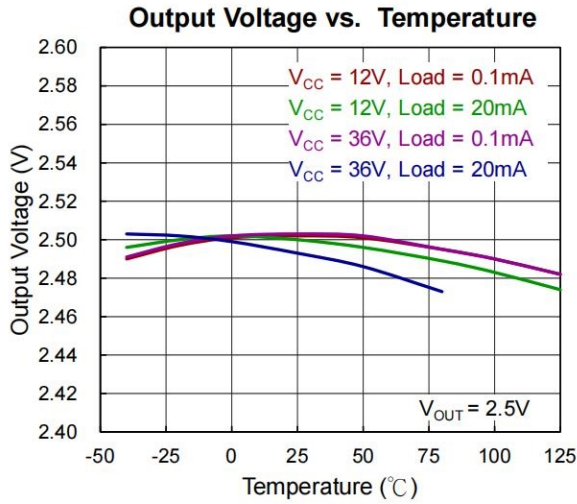
( $V_{IN}=15V$ ,  $V_{EN}=5V$ ,  $T_A=25^{\circ}C$ , unless otherwise specified) (Note 1)

Parameter	Symbol	Test Conditions	Min	Typ	Max	Unit
Supply Voltage	$V_{IN}$		2	--	36	V
DC Output Voltage Accuracy		$I_{LOAD} = 0.1mA$	-2		2	%
Dropout Voltage ( $I_{LOAD} = 100mA$ )	$V_{DROP}$	$V_{OUT} \geq 5V$	--	0.66		V
	$V_{DROP\_3.3V}$	$V_{OUT} = 3.3V$		0.75		
	$V_{DROP\_1.8V}$	$V_{OUT} = 1.8V$		1		
Ground Current ( $I_{LOAD} = 0mA$ )	$I_Q$	$V_{OUT} \leq 5V$		2		$\mu A$
	$I_{QH}$	$5V < V_{OUT} \leq 12V$		4.5		
Shutdown Ground Current	$I_{SD}$	$V_{EN} = 0V$ , $V_{OUT} = 0V$		0.01	0.5	$\mu A$
$V_{OUT}$ Shutdown Leakage Current	$I_{LEAK}$			0.01	0.5	$\mu A$
Enable Threshold Voltage	$V_{IH}$	EN Rising			2	V
	$V_{IL}$	EN Falling	0.6			
EN Input Current	$I_{EN}$	$V_{EN} = 36V$		10	100	nA
Line Regulation	$\Delta_{LINE}$	$I_{LOAD} = 1mA$ , $5 \leq V_{IN} \leq 36V$	--	0.3		%
Load Regulation	$\Delta_{LOAD}$	$1mA \leq I_{LOAD} \leq 0.2A$		0.1		%
Output Current Limit	$I_{LIM}$	$V_{OUT} = 0$	200	300		mA
Power Supply Rejection Ratio	PSRR	$V_{OUT} = 5V$ , $I_{LOAD} = 1mA$ , $V_{IN} = 12V$ , $f = 100Hz$		70		dB
Thermal Shutdown Temperature	$T_{SD}$	$I_{LOAD} = 10mA$	--	160	--	$^{\circ}C$
Thermal Shutdown Hysteresis	$\Delta T_{SD}$		15			$^{\circ}C$

**Note 1.** Specifications are production tested at  $T_A=25^{\circ}C$ . Specifications over the  $-40^{\circ}C$  to  $85^{\circ}C$  operating temperature range are assured by design, characterization and correlation with Statistical Quality Controls (SQC).

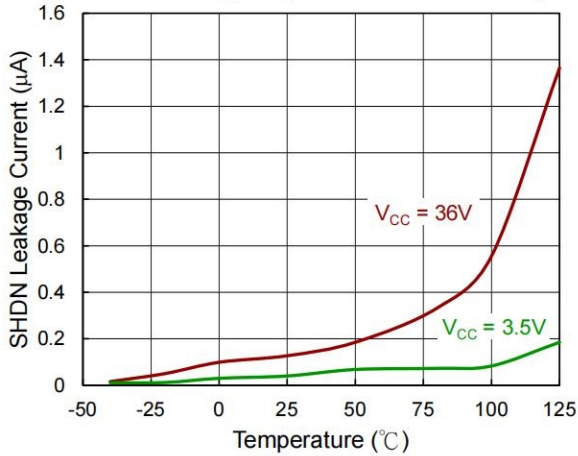


### Typical Operating Characteristics

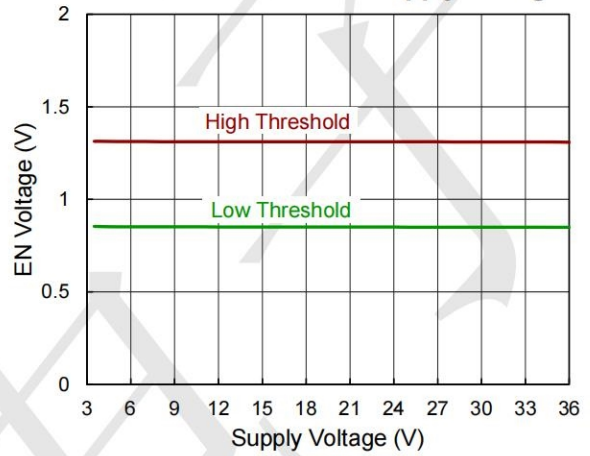




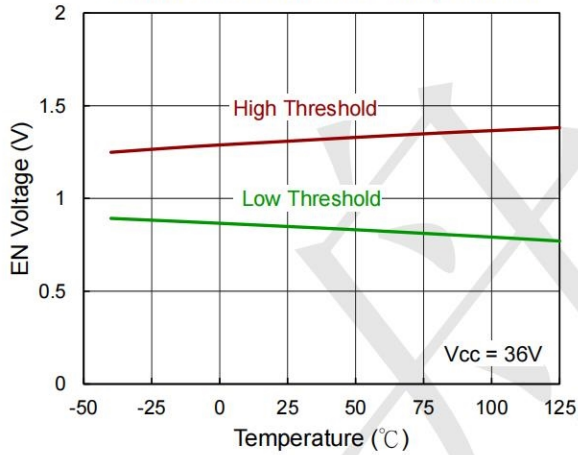
SHDN Leakage Input Current vs. Temp.



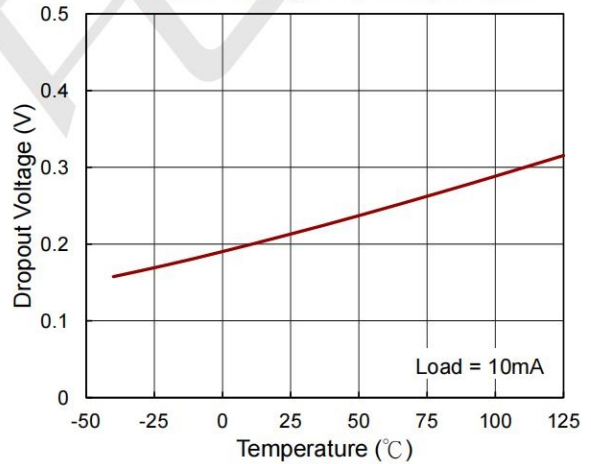
Enable Threshold vs. Supply Voltage



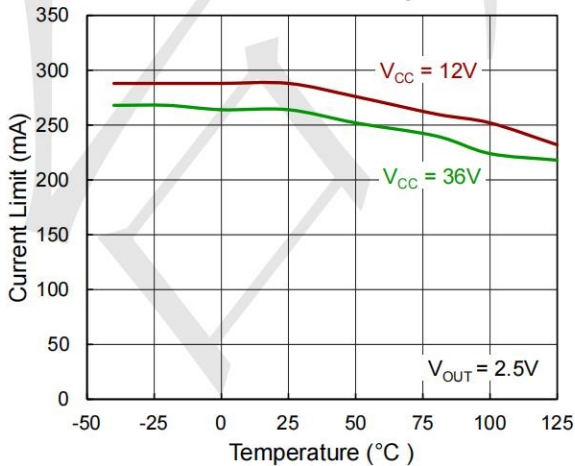
Enable Threshold vs. Temperature



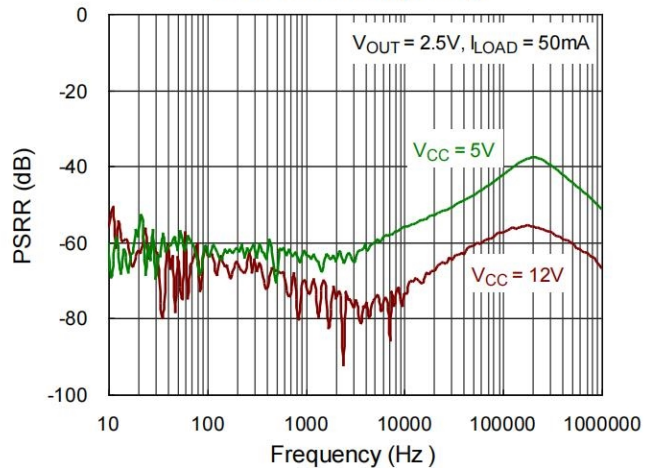
Dropout Voltage vs. Temperature

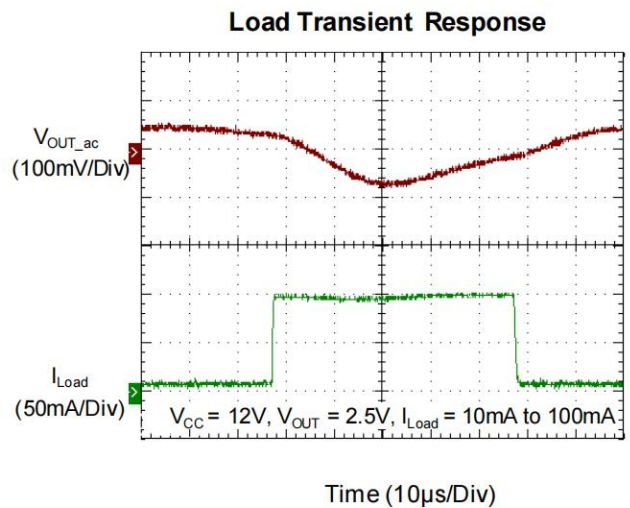
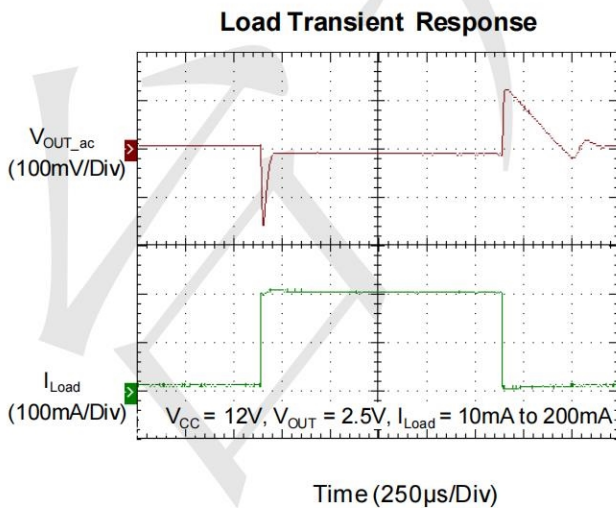
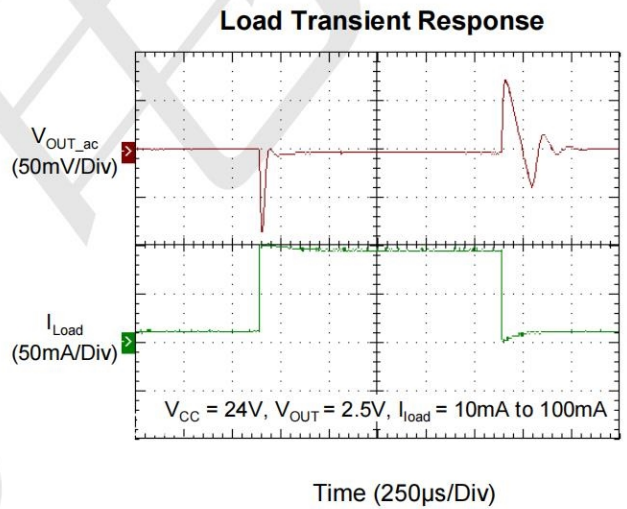
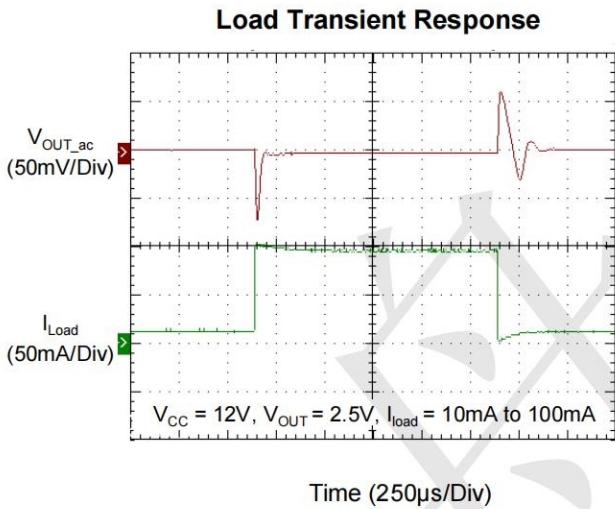
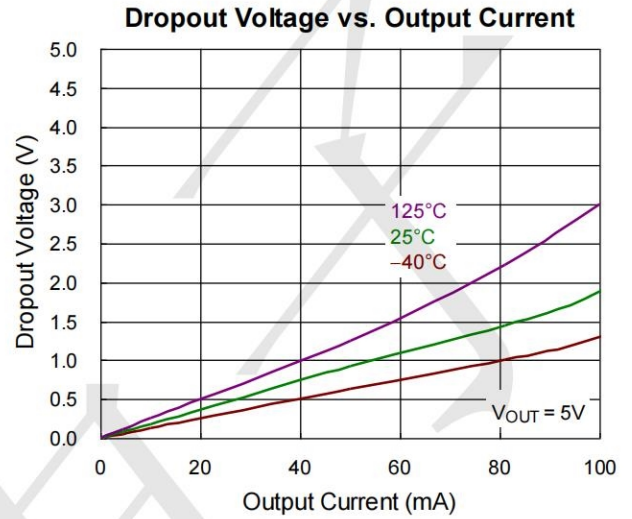
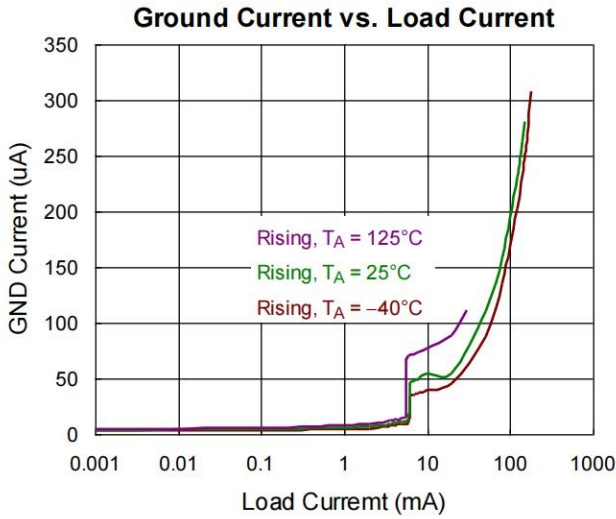


Current Limit vs. Temperature



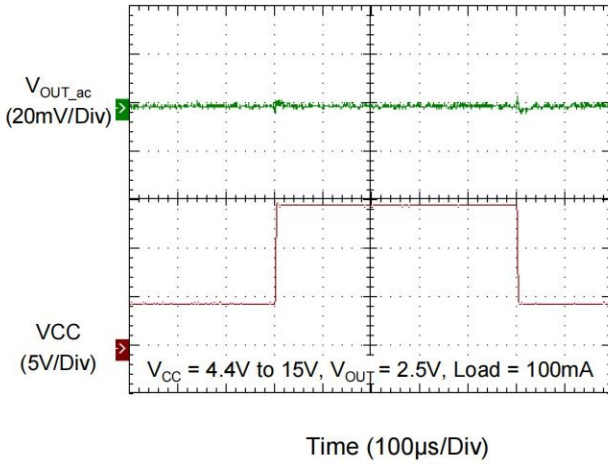
PSRR vs. Frequency



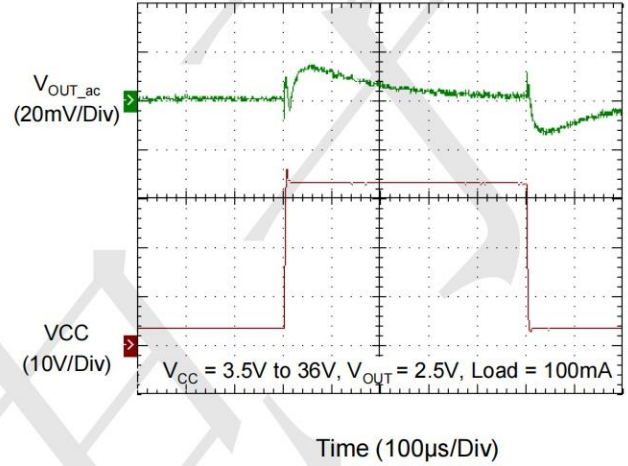




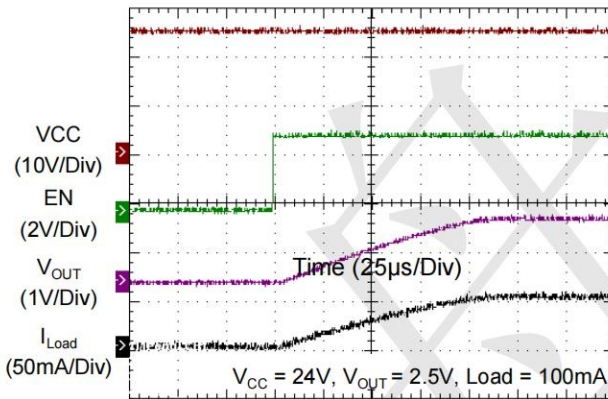
**Line Transient Response**



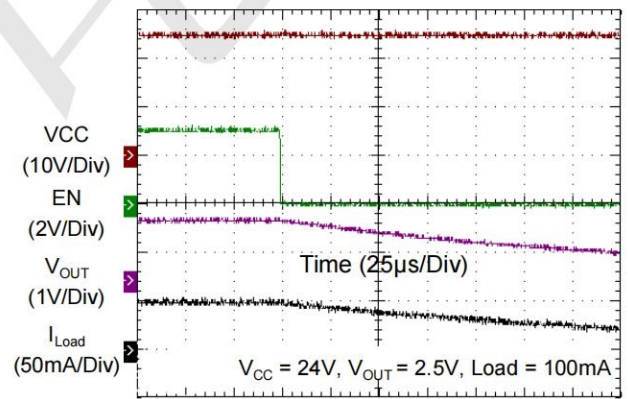
**Line Transient Response**



**Power On from EN**



**Power Off from EN**

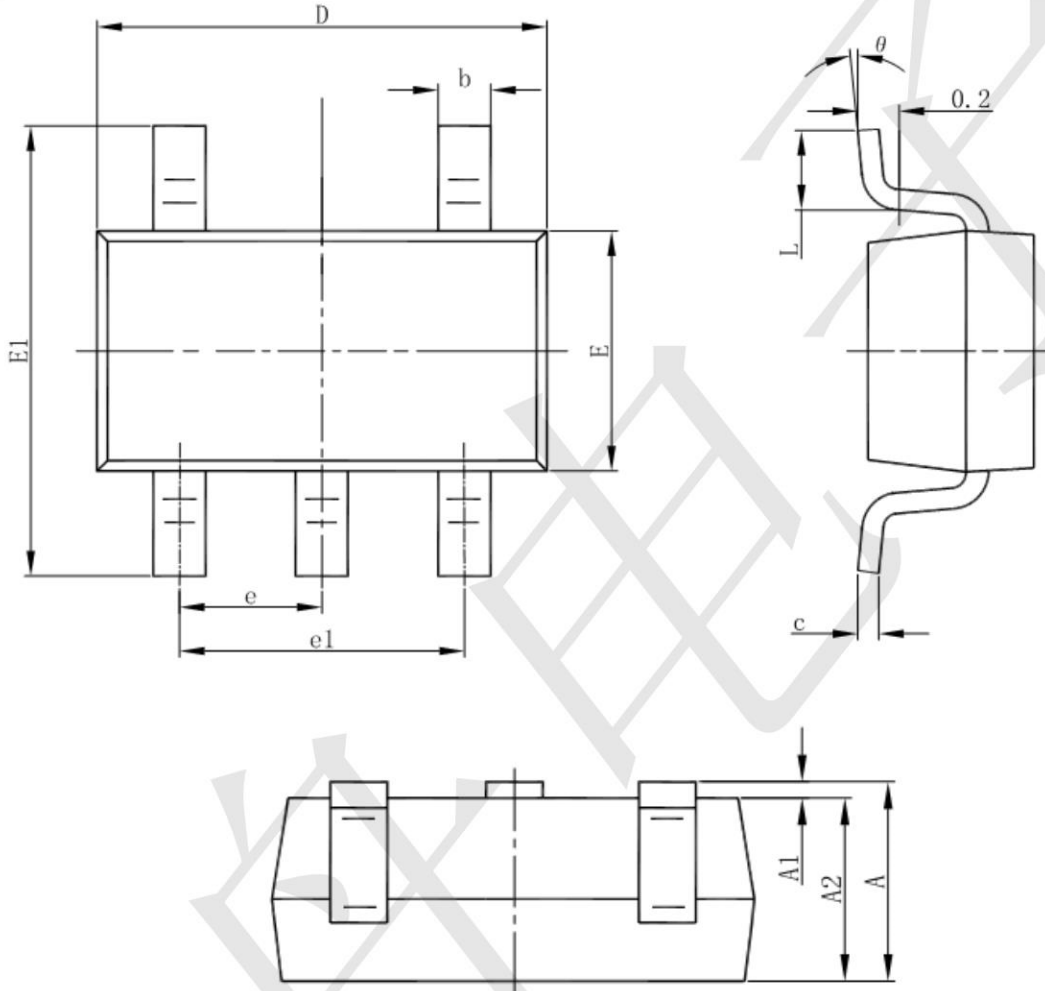






**Package informantion**

SOT23-5



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°