

**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**

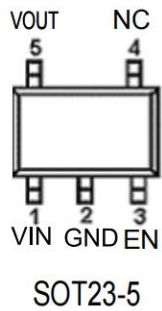
**TPRT9069-33GB**

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

## 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

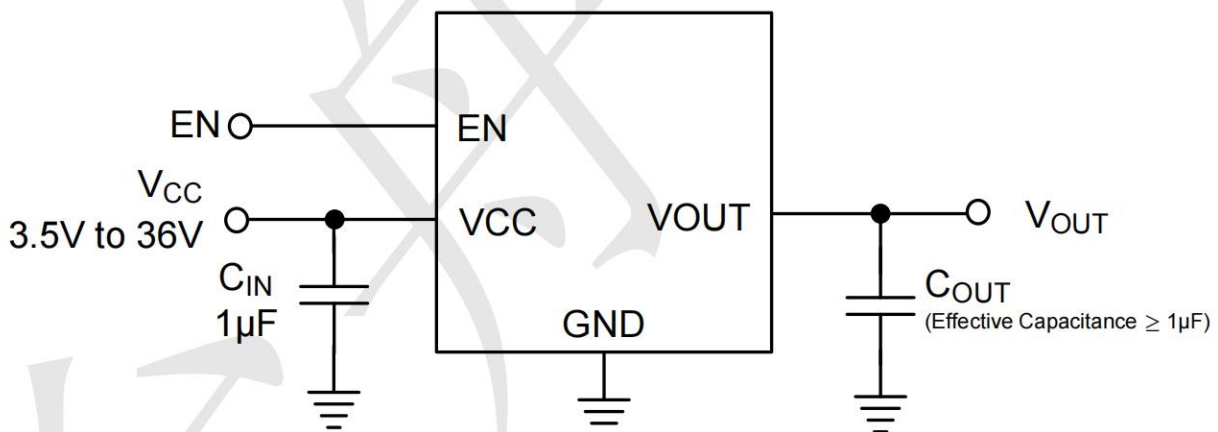
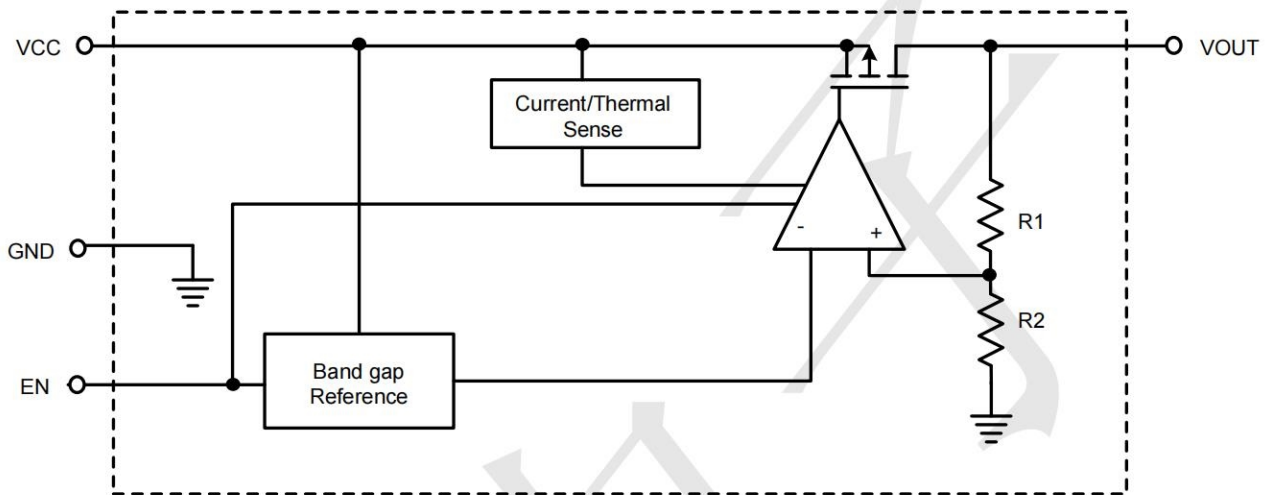


Figure 1: Application circuit of Fixed  $V_{OUT}$  LDO with enable and sense functions

**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

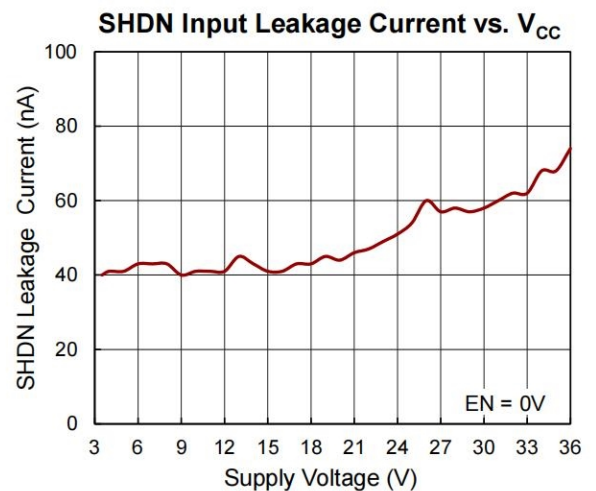
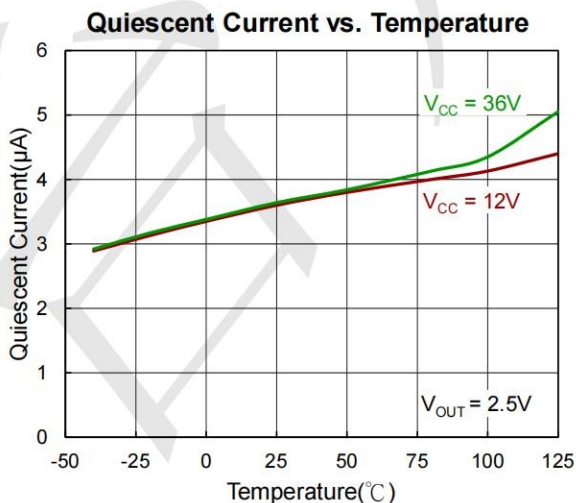
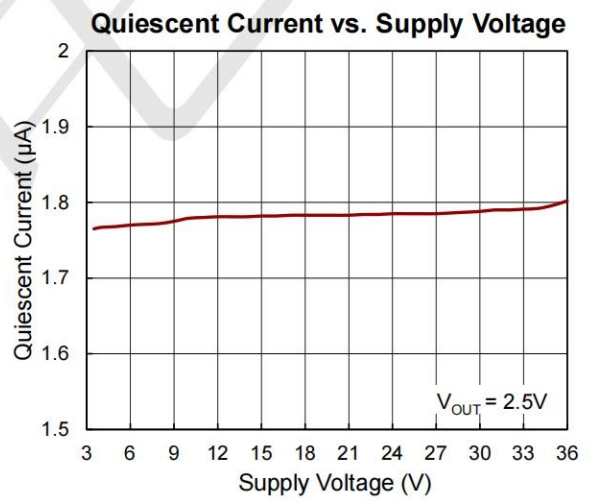
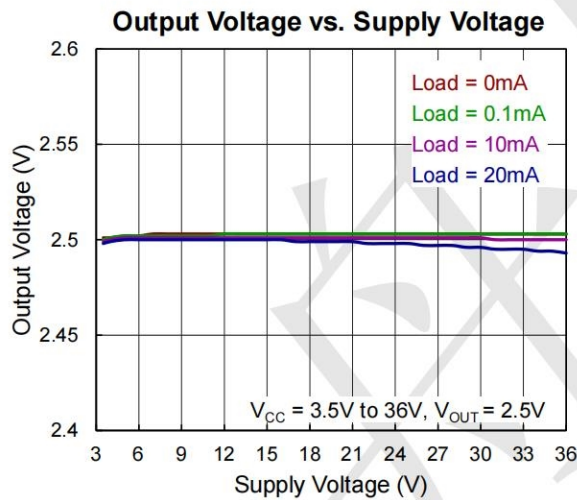
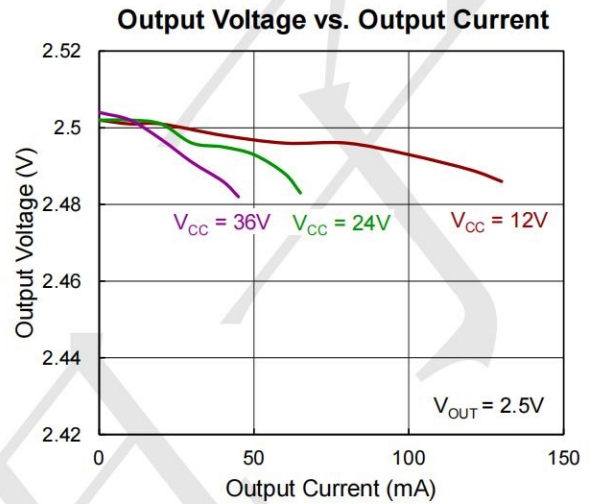
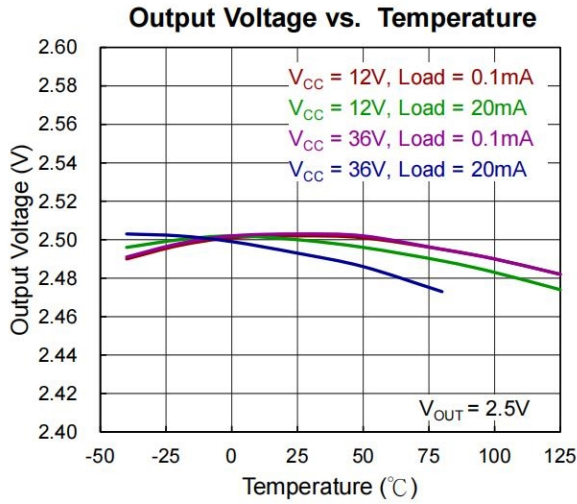
( $V_{IN}=15V$ ,  $V_{EN}=5V$ ,  $T_A=25^{\circ}C$ , unless otherwise specified) (Note 1)

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).

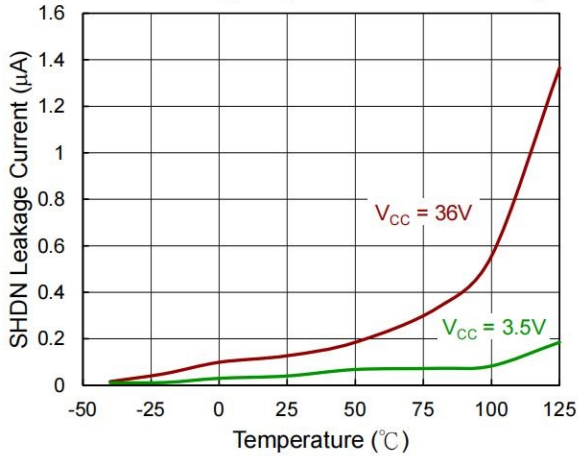


### Typical Operating Characteristics

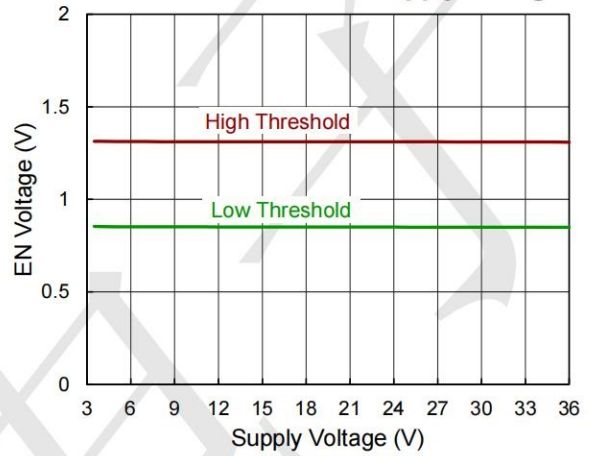




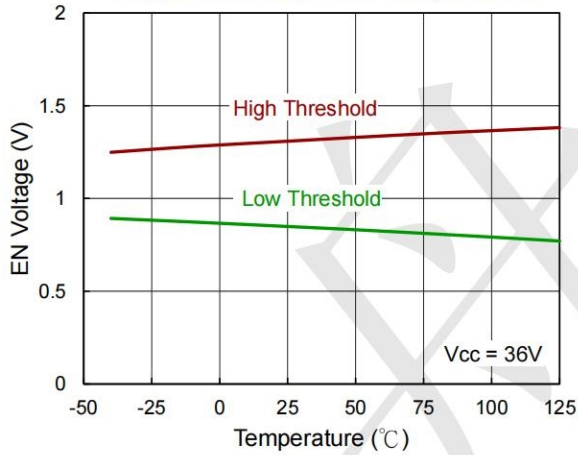
SHDN Leakage Input Current vs. Temp.



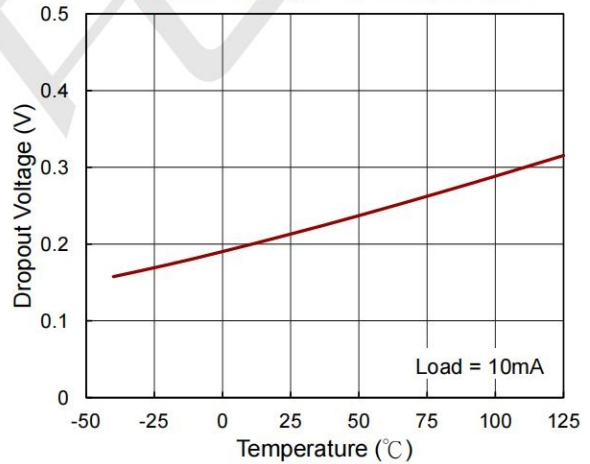
Enable Threshold vs. Supply Voltage



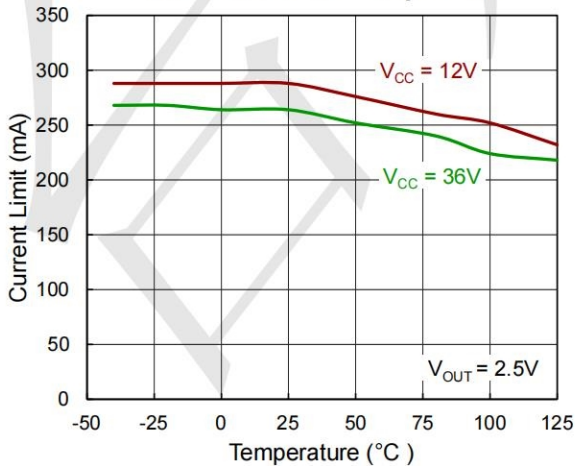
Enable Threshold vs. Temperature



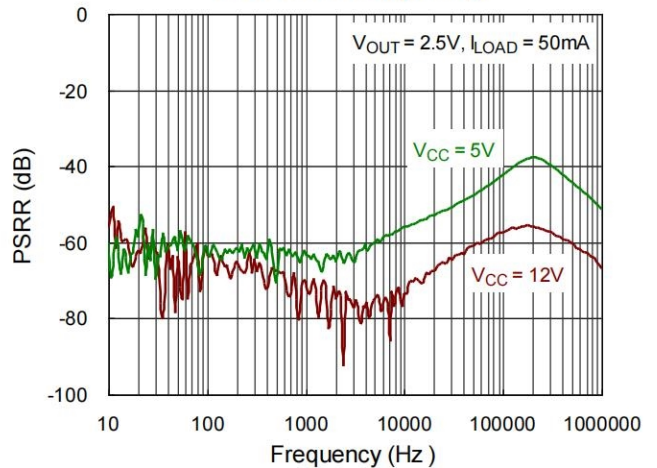
Dropout Voltage vs. Temperature



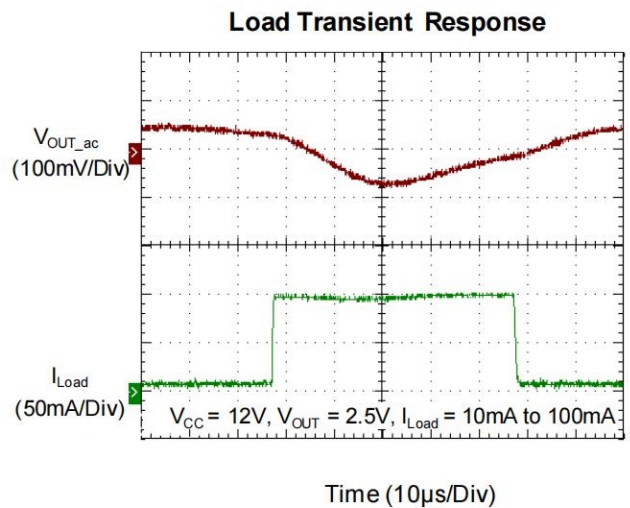
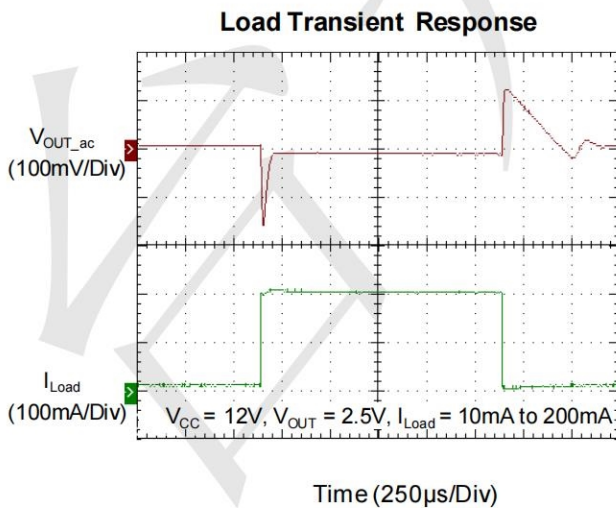
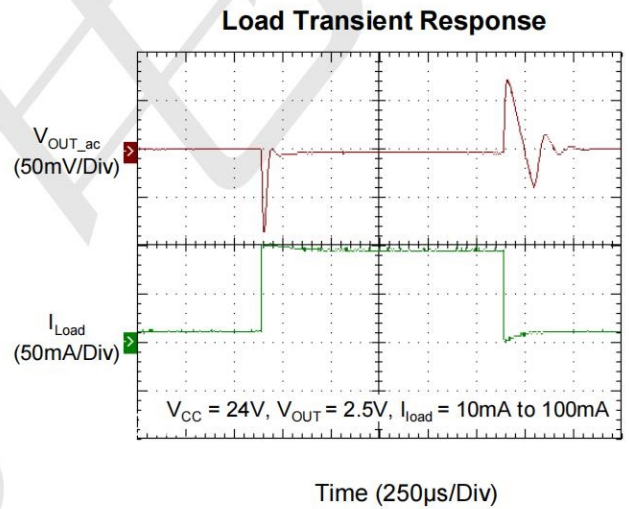
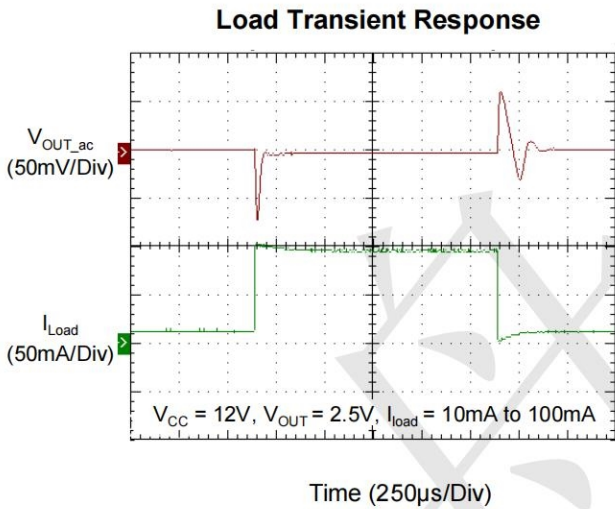
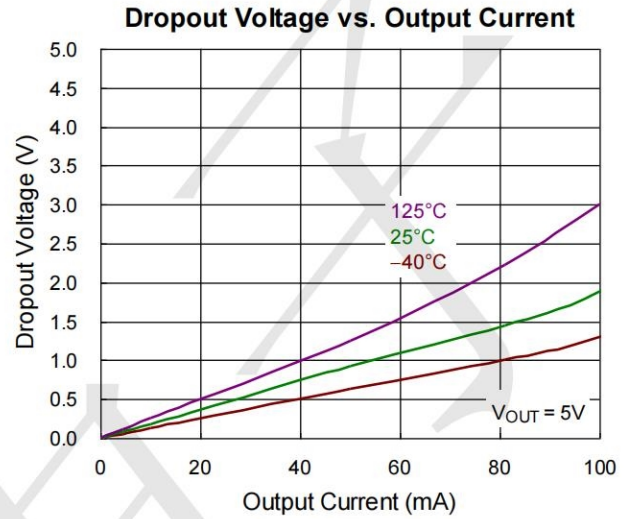
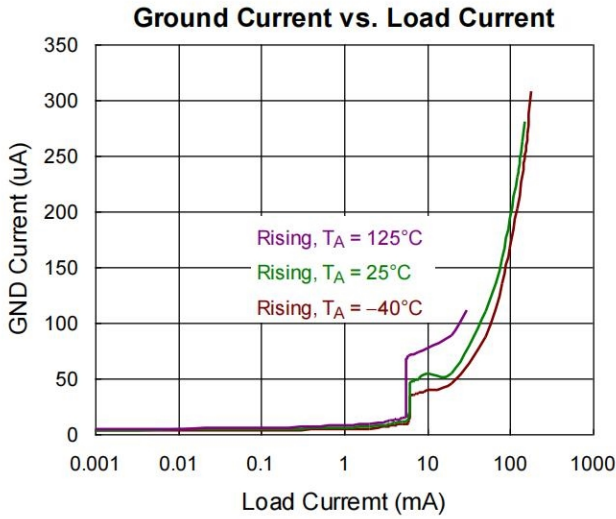
Current Limit vs. Temperature



PSRR vs. Frequency

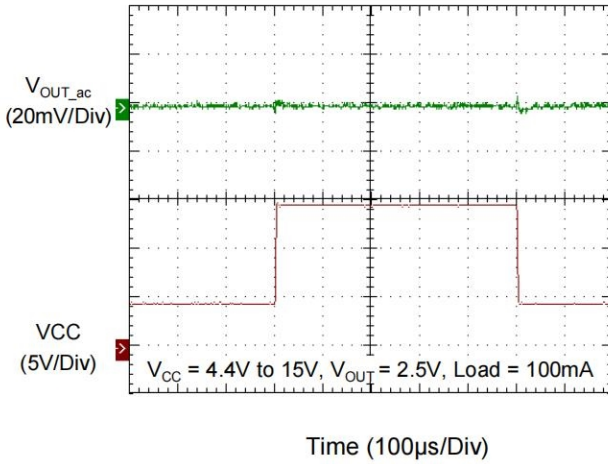




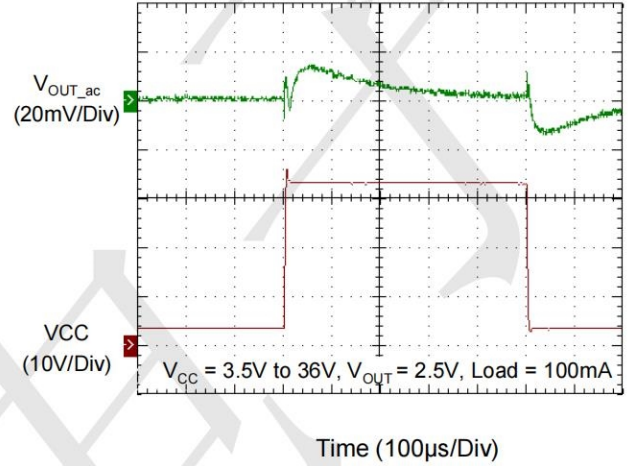




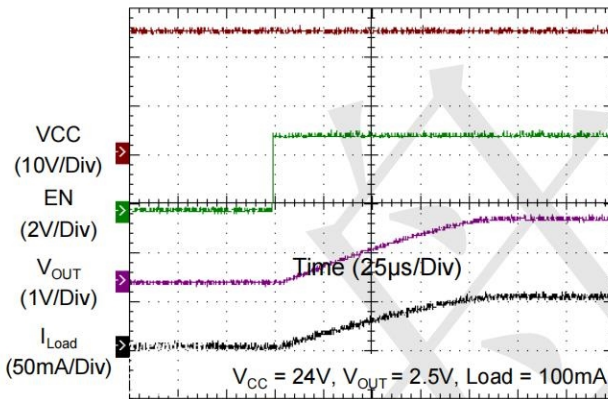
Line Transient Response



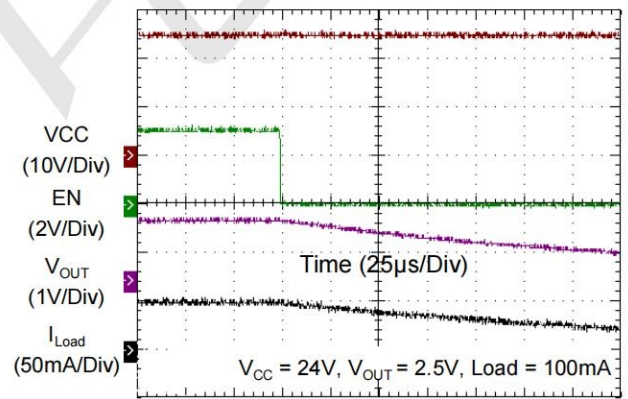
Line Transient Response



Power On from EN



Power Off from EN

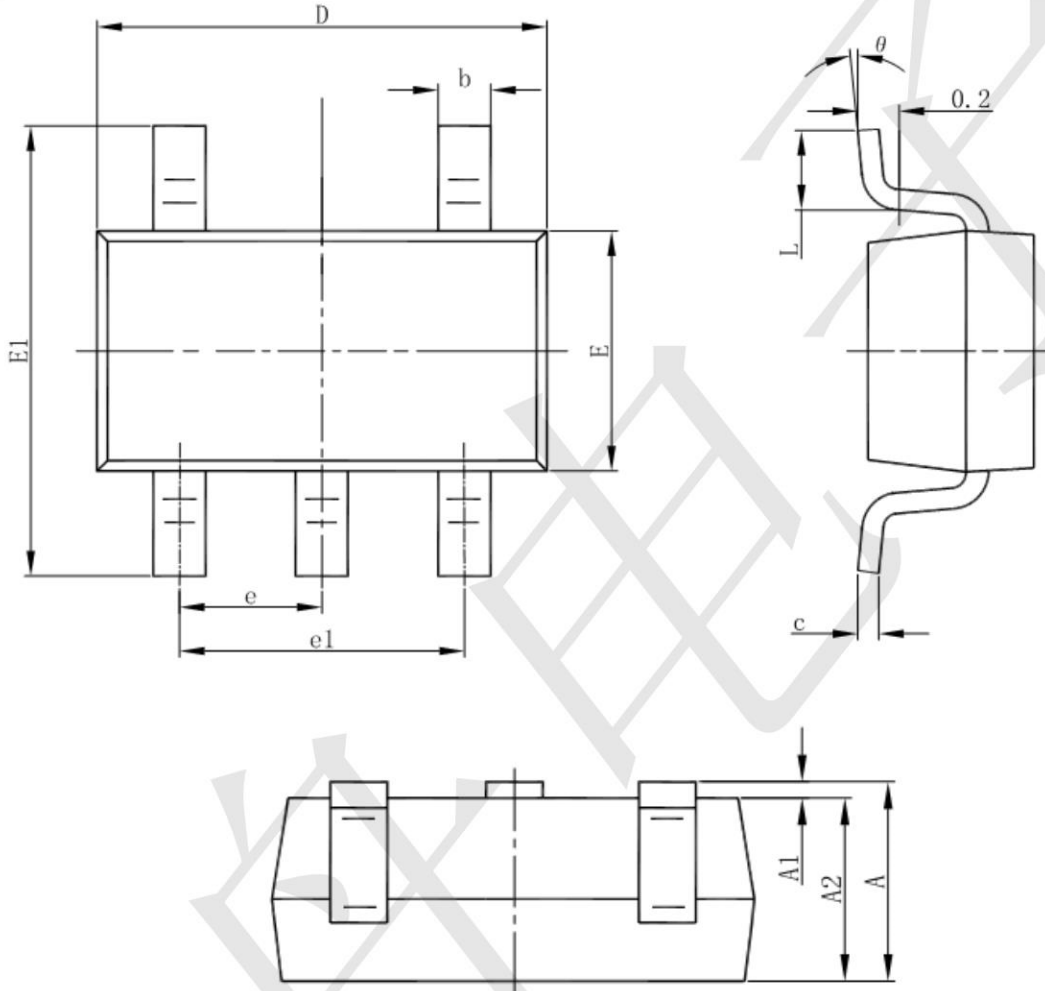






**Package informantion**

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
$\theta$	0°	8°	0°	8°

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