

General Description

The TP132C series are a group of low-dropout (LDO) voltage regulators offering the benefits of wide input voltage range from 1.2V to 5.5V, low dropout voltage, low power consumption, and miniaturized packaging. Quiescent current of only 2 μ A makes these devices ideal for powering the battery-powered, always-on systems that require very little idle-state power dissipation to a longer service life. There is an option of

Features

- 2 μ A Ground Current at no Load
- $\pm 2\%$ Output Accuracy
- 300mA Output Current
- 10nA Disable Current (by option)
- Wide Operating Input Voltage Range: 1.2V to 5.5V
- Dropout Voltage: 0.18V at 300mA ($V_{OUT}=3.3V$)
- Support Fixed Output Voltage 0.8V, 0.9V, 1.2V, 1.5V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V
- Adjustable Output Voltage Available by Specific Application
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT-23-3, SOT-23-5, DFN-4L 1x1 and DFN-6L 2x2 Packages Available

shutdown mode by selecting the parts with the EN pin and pulling it low. The shutdown current in this mode goes down to only 10nA (typical).

The TP132C series of linear regulators are stable with the ceramic output capacitor over its wide input range from 1.2V to 5.5V and the entire range of output load current (0mA to 300mA).

Applications

- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment

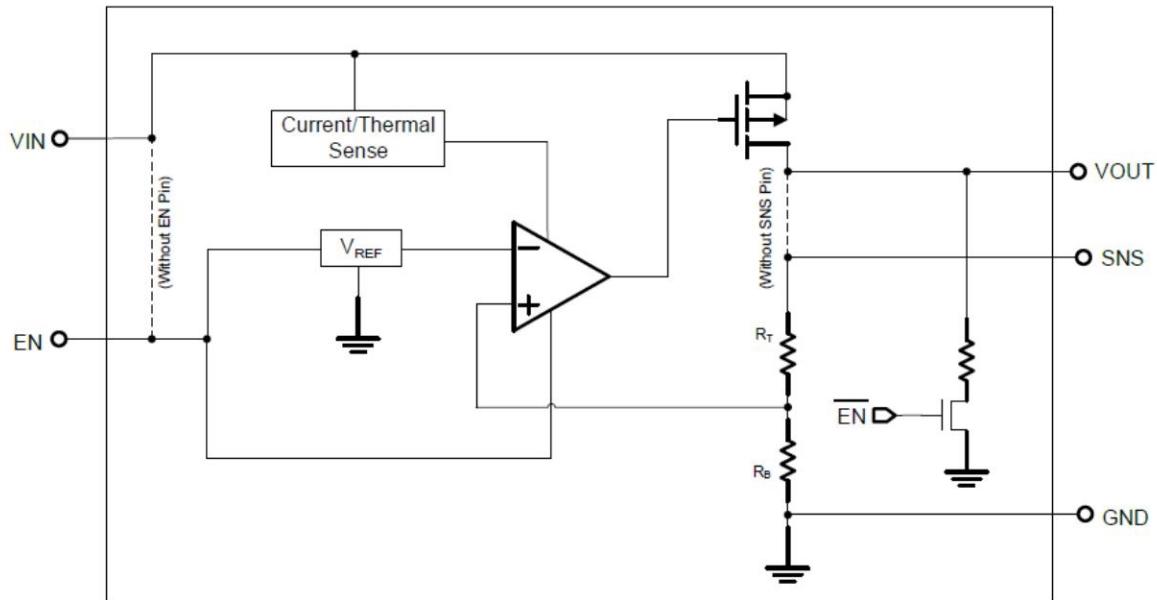
Ordering Information

TP132C33D4-1

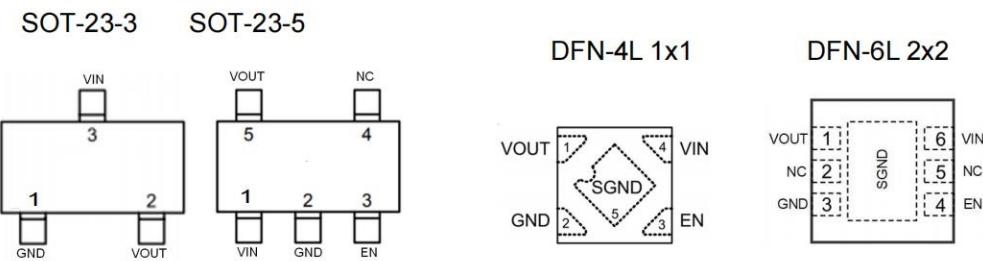
S5:SOT23-5 Package
S3:SOT23-3 Package
D4:DFN1X1 Package
D6:DFN2X2 Package

Output voltage: 12=1.2V
15=1.5V
18=1.8V
30=3.0V
33=3.3V
XX=X.XV

BLOCK DIAGRAM



PIN CONFIGURATION



Pin No				Pin Name	Pin Function
SOT-23-3	SOT-23-5	DFN-1X1	DFN-2X2		
1	2	2	3	GND	Ground
2	5	1	1	VOUT	Output of the Regulator
3	1	4	6	VIN	Input of Supply Voltage.
	3	3	4	EN	Enable Control Input.
	4		2,5	NC	No internal connection

Absolute Maximum Rating ($T_A=25^\circ\text{C}$ unless otherwise noted)

VIN Pin to GND Pin Voltage	-0.3V to 6.5V
VOUT Pin and EN Pin to GND Pin Voltage	-0.3V to 6V
VOUT Pin to VIN Pin Voltage	-6V 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_A	-40°C~85°C
Thermal Resistance Junction to Case, $R_{\theta_{JC}}$	
SOT23-3	115°C/W
SOT23-5	115°C/W
DFN-4(1x1).....	65°C/W
DFN-6(2x2).....	30°C/W
Thermal Resistance Junction to Ambient, $R_{\theta_{JA}}$	
SOT23-3	250°C/W
SOT23-5	250°C/W
DFN-4(1x1).....	195°C/W
DFN-6(2x2).....	165°C/W

Electrical Characteristics ($T = 25^\circ\text{C}$ unless otherwise noted)

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

PARAMETER	TEST CONDITIONS	SYMBOL	MIN.	TYP.	MAX.	UNIT
Supply Voltage		V_{IN}	1.2		5.5	V
DC Output Voltage Accuracy	$I_{LOAD}=0.1\text{mA}$		-2		2	%
SNS Input Current	$SNS=V_{OUT}$	I_{SNS}		0.5		μA
Dropout Voltage (Note 2)	$I_{LOAD}=300\text{mA}, V_{OUT}\geq 3\text{V}$	$V_{DROP_3\text{V}}$		0.18		V
	$I_{LOAD}=300\text{mA}, V_{OUT}=2.8\text{V}$	$V_{DROP_2.8\text{V}}$		0.23		
	$I_{LOAD}=300\text{mA}, V_{OUT}=2.5\text{V}$	$V_{DROP_2.5\text{V}}$		0.23		
	$I_{LOAD}=300\text{mA}, V_{OUT}=1.8\text{V}$	$V_{DROP_1.8\text{V}}$		0.28		
	$I_{LOAD}=300\text{mA}, V_{OUT}=1.5\text{V}$	$V_{DROP_1.5\text{V}}$		0.36		
	$I_{LOAD}=300\text{mA}, V_{OUT}=1.2\text{V}$	$V_{DROP_1.2\text{V}}$		0.45		
GND Current	$I_{LOAD}=0\text{mA}$	I_Q		2	5	μA
Shutdown GND Current	$V_{EN}=0\text{V}, V_{OUT}=0\text{V}$	I_{SD}		0.1	0.5	μA
V_{OUT} Shutdown Leakage Current	$V_{EN}=0\text{V}, V_{OUT}=0\text{V}$	I_{LEAK}		0.1	0.5	μA
Enable Threshold Voltage	EN Rising	V_{IH}	1.0			V
	EN Falling	V_{IL}			0.4	
EN Input Current	$V_{EN}=5\text{V}$	I_{EN}		10	100	nA
Line Regulation	$I_{LOAD}=30\text{mA}, 1.5\text{V}\leq V_{IN}\leq 5.5\text{V} \text{ or } (V_{OUT}+0.2\text{V})\leq V_{IN}\leq 5.5\text{V}$	Δ_{LINE}		0.2		%
Load Regulation	$10\text{mA}\leq I_{LOAD}\leq 300\text{mA}$	Δ_{LOAD}		0.2		%
Output Current Limit	$V_{OUT}=0\text{V}$	I_{LIM}	300	600		mA
Power Supply Rejection Ratio	$V_{OUT}=1.2\text{V}, I_{LOAD}=5\text{mA}, V_{IN}=2\text{V}, f=100\text{Hz}$	PSRR		78		dB
	$V_{OUT}=1.2\text{V}, I_{LOAD}=5\text{mA}, V_{IN}=2\text{V}, f=1\text{kHz}$			75		
Output Voltage Noise	$V_{IN}=3.5\text{V}, I_{LOAD}=0.1\text{A}, BW=10\text{Hz to } 100\text{kHz}, C_{OUT}=1\mu\text{F}, V_{OUT}=1.2\text{V}$			80		μV_{RMS}
	$V_{IN}=3.5\text{V}, I_{LOAD}=0.1\text{A}, BW=10\text{Hz to } 100\text{kHz}, C_{OUT}=1\mu\text{F}, V_{OUT}=2.8\text{V}$			120		
Thermal Shutdown Temperature	$I_{LOAD}=10\text{mA}$	T_{SD}		155		$^\circ\text{C}$
Thermal Shutdown Hysteresis	$I_{LOAD}=10\text{mA}$	ΔT_{SD}		15		$^\circ\text{C}$
Discharge Resistance	$V_{EN}=0\text{V}, V_{OUT}=0.1\text{V}$			100		Ω

TYPICAL APPLICATION

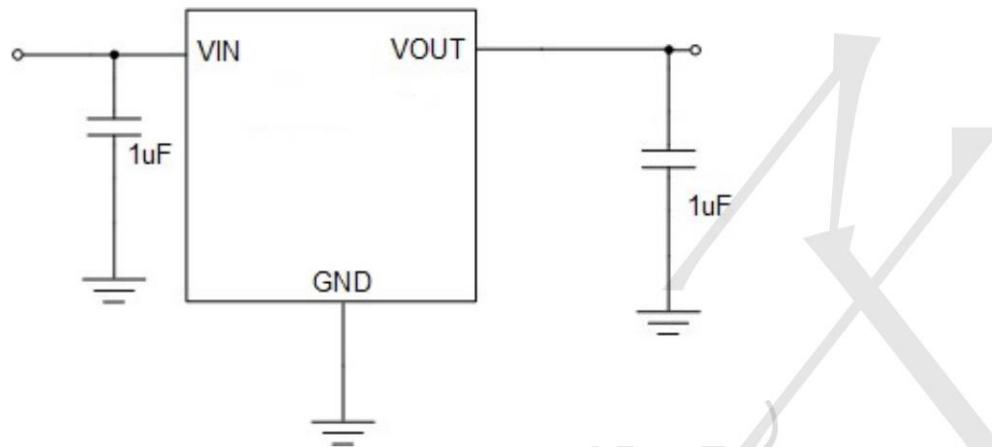


Figure 1: Application circuit of Fixed V_{OUT} LDO

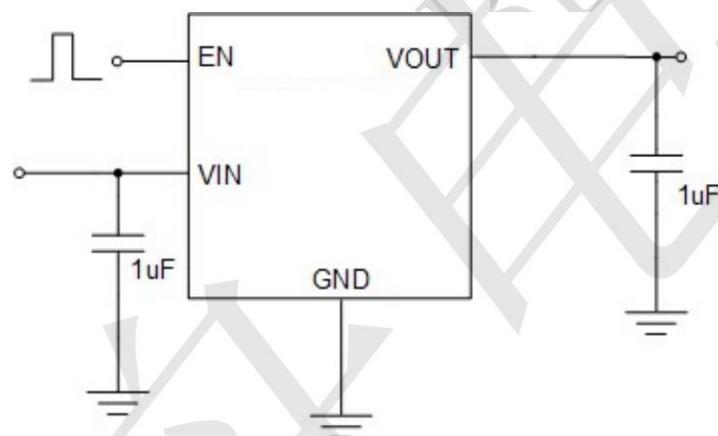


Figure 2: Application circuit of Fixed V_{OUT} LDO with enable function

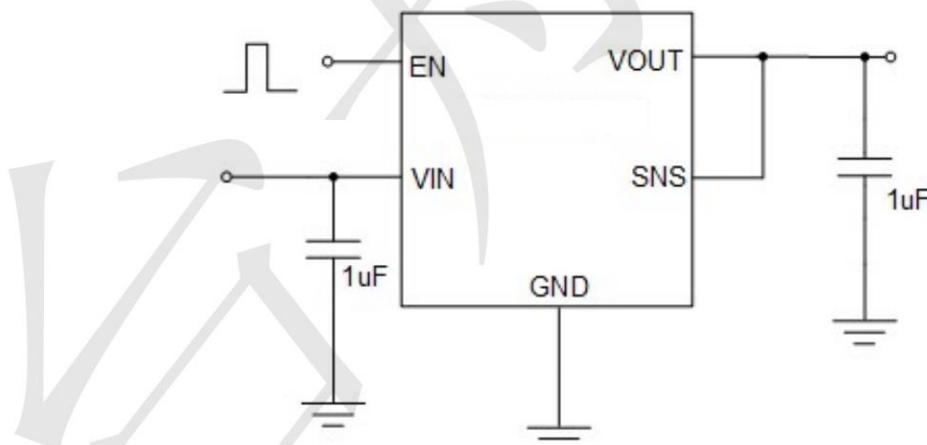
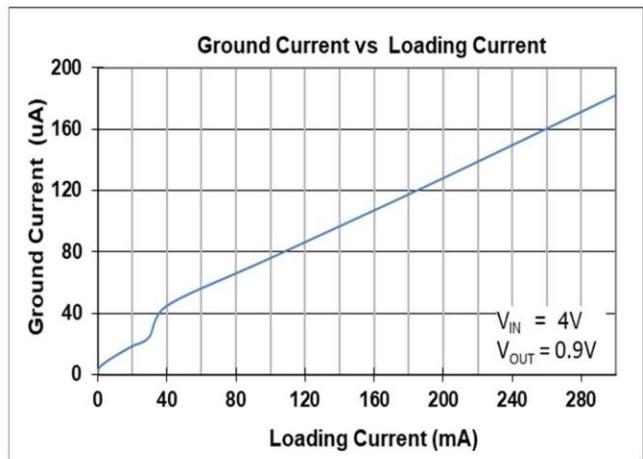
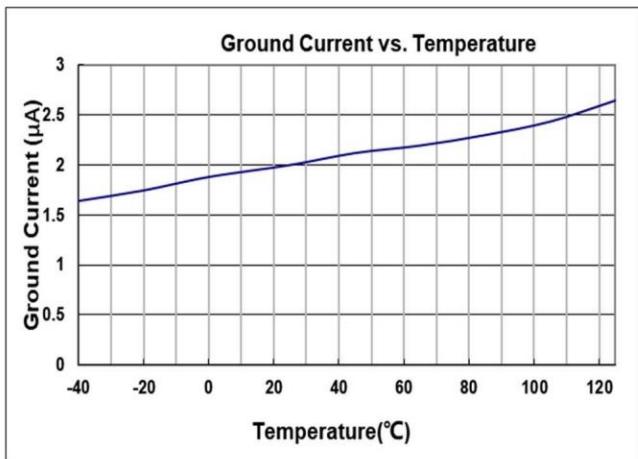
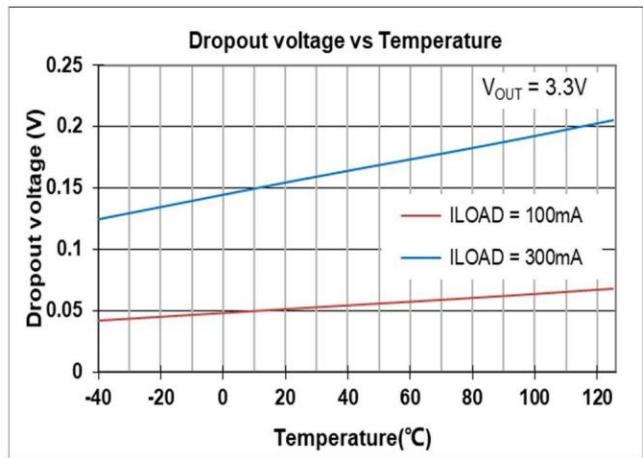
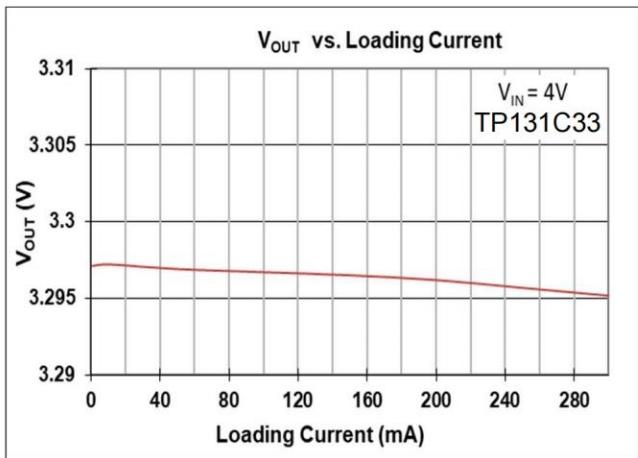
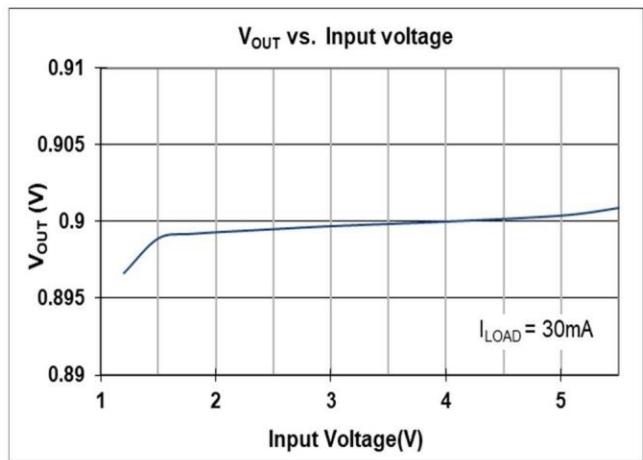
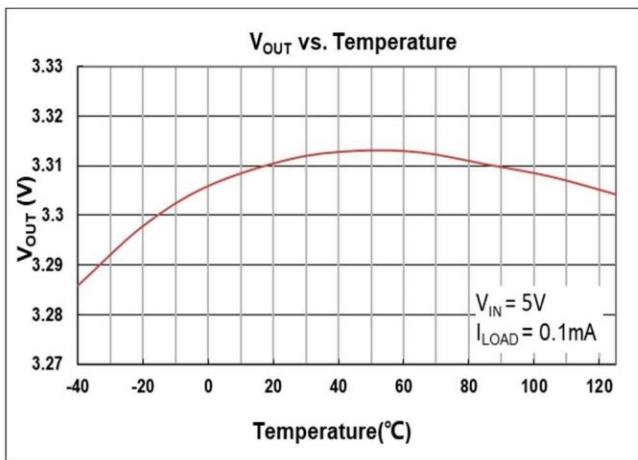
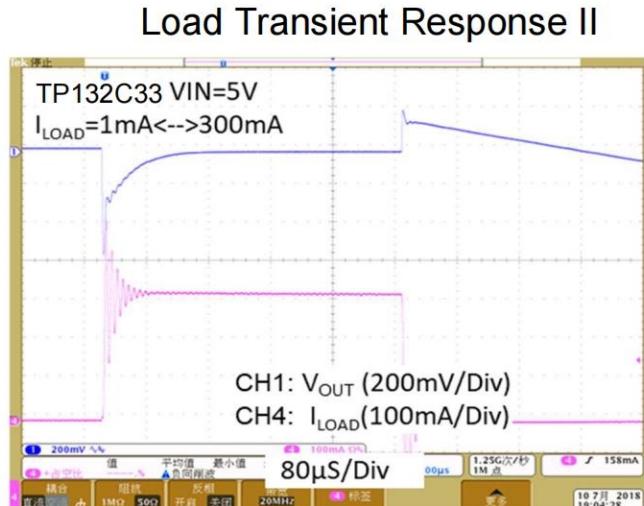
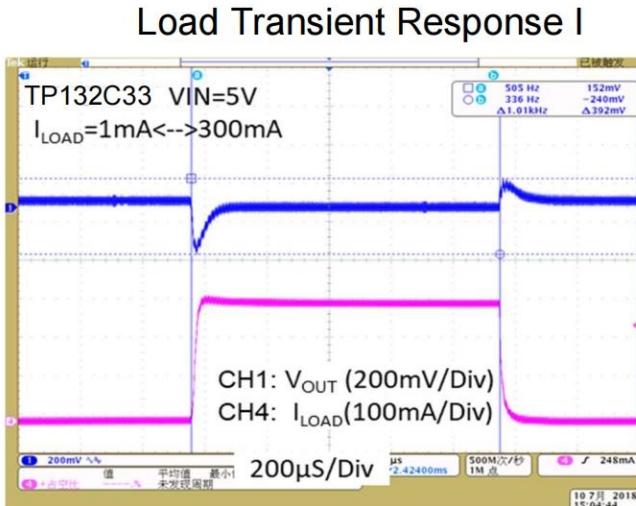
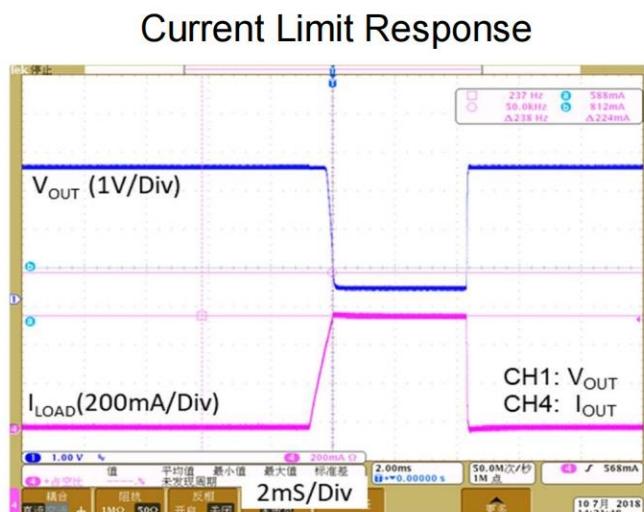
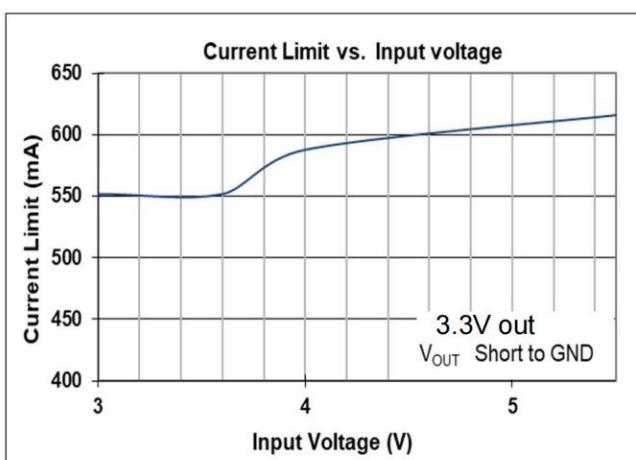
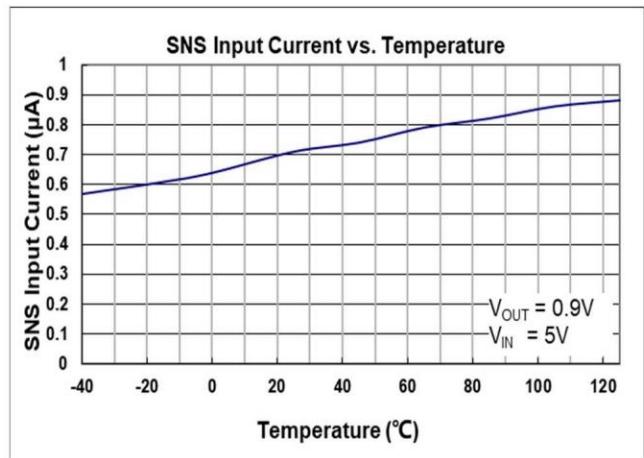
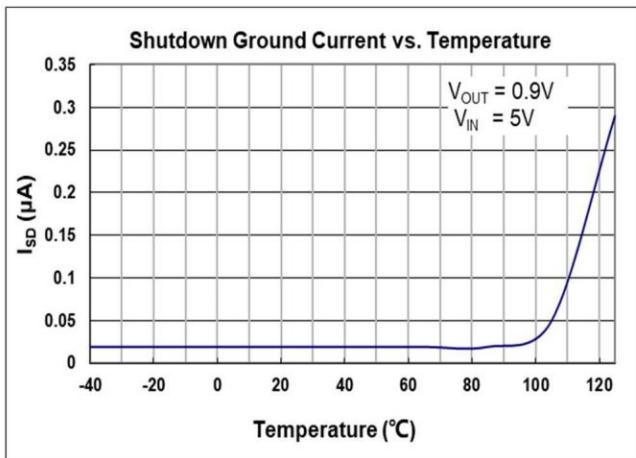
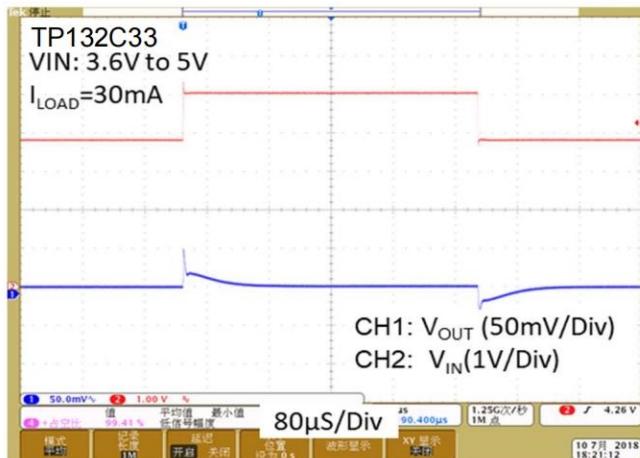


Figure 3: Application circuit of Fixed V_{OUT} LDO with enable and sense functions

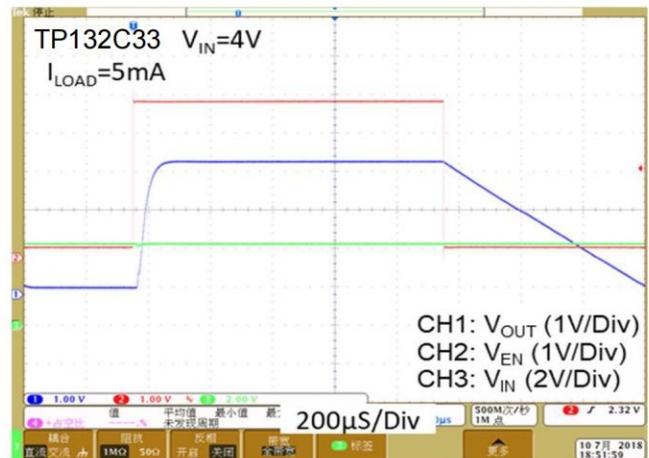




Line Transient Response



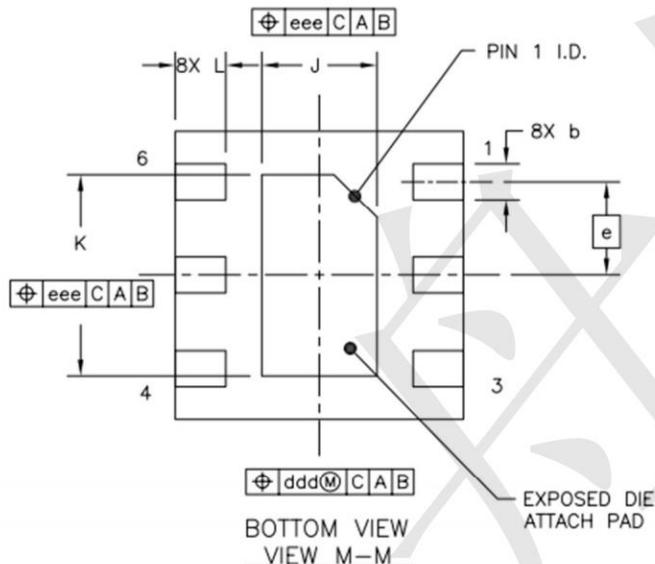
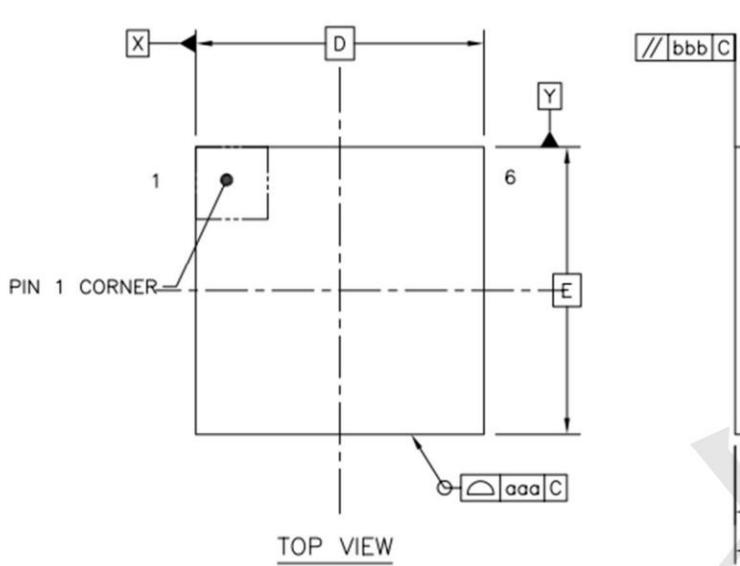
V_{OUT} Turn On/Off by EN



Package information

DFN2X2-6 Outline Dimensions

DFN-6L



NOTES

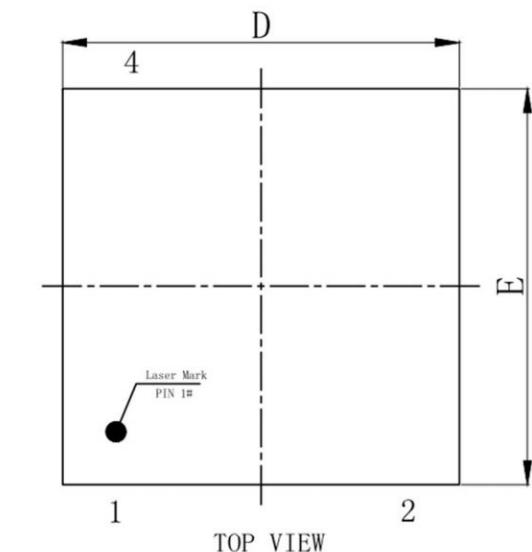
1.0 COPLANARITY APPLIES TO LEADS, CORNER LEADS AND DIE ATTACH PAD.



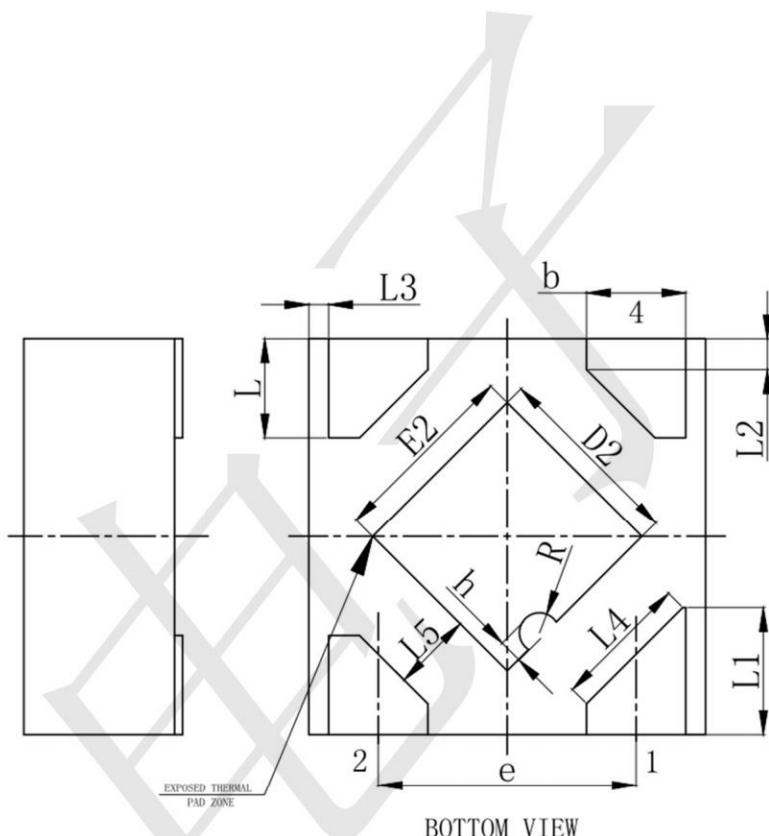
Package information

DFN1X1-4 Outline Dimensions

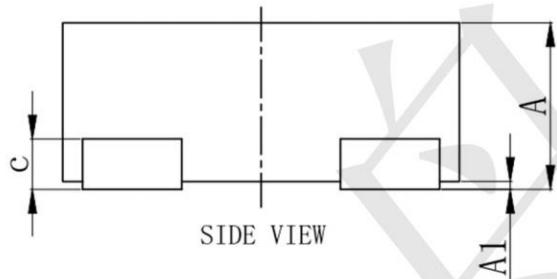
DFN-4L



TOP VIEW



BOTTOM VIEW

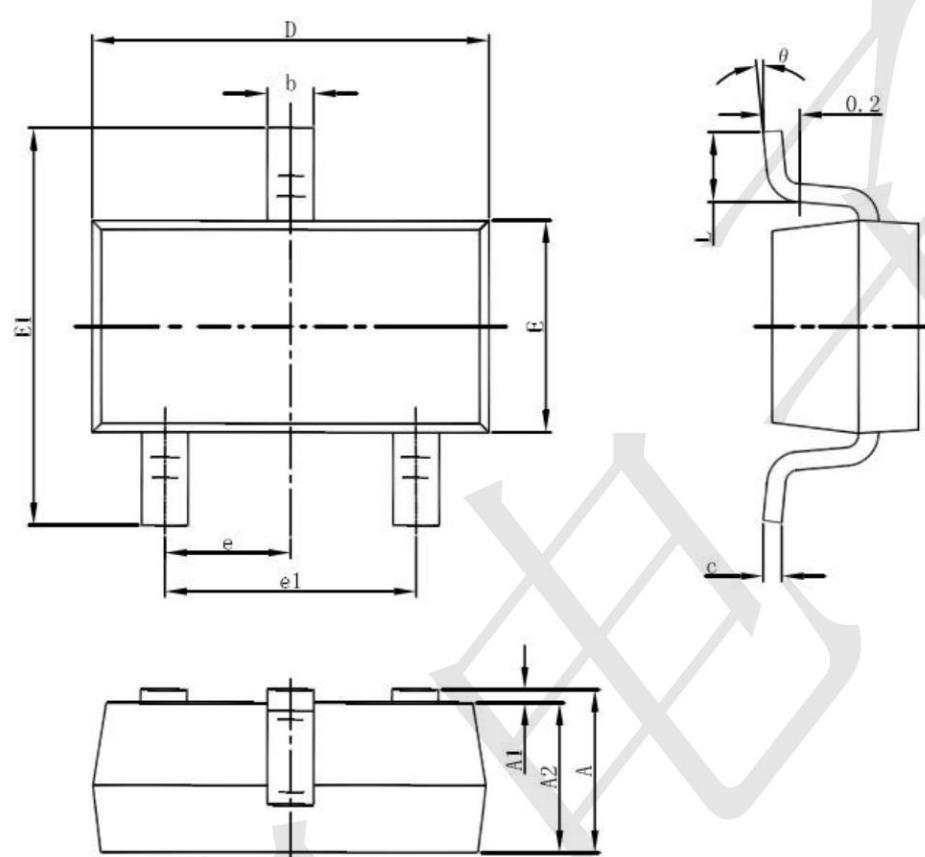


SIDE VIEW

SYMBOL	MILLIMETER		
	MIN	NOM	MAX
A	0.35	-	0.40
A1	0.00	0.02	0.05
b	0.20	0.25	0.30
c	0.07	0.12	0.17
D	0.95	1.00	1.05
D2	0.38	0.48	0.58
e	0.65BSC		
E	0.95	1.00	1.05
E2	0.38	0.48	0.58
L	0.20	0.25	0.30
L1	0.27	0.32	0.37
L2	0.077REF		
L3	0.05REF		
L4	0.34REF		
L5	0.20REF		
R	0.05REF		
h	0.06REF		

Package information

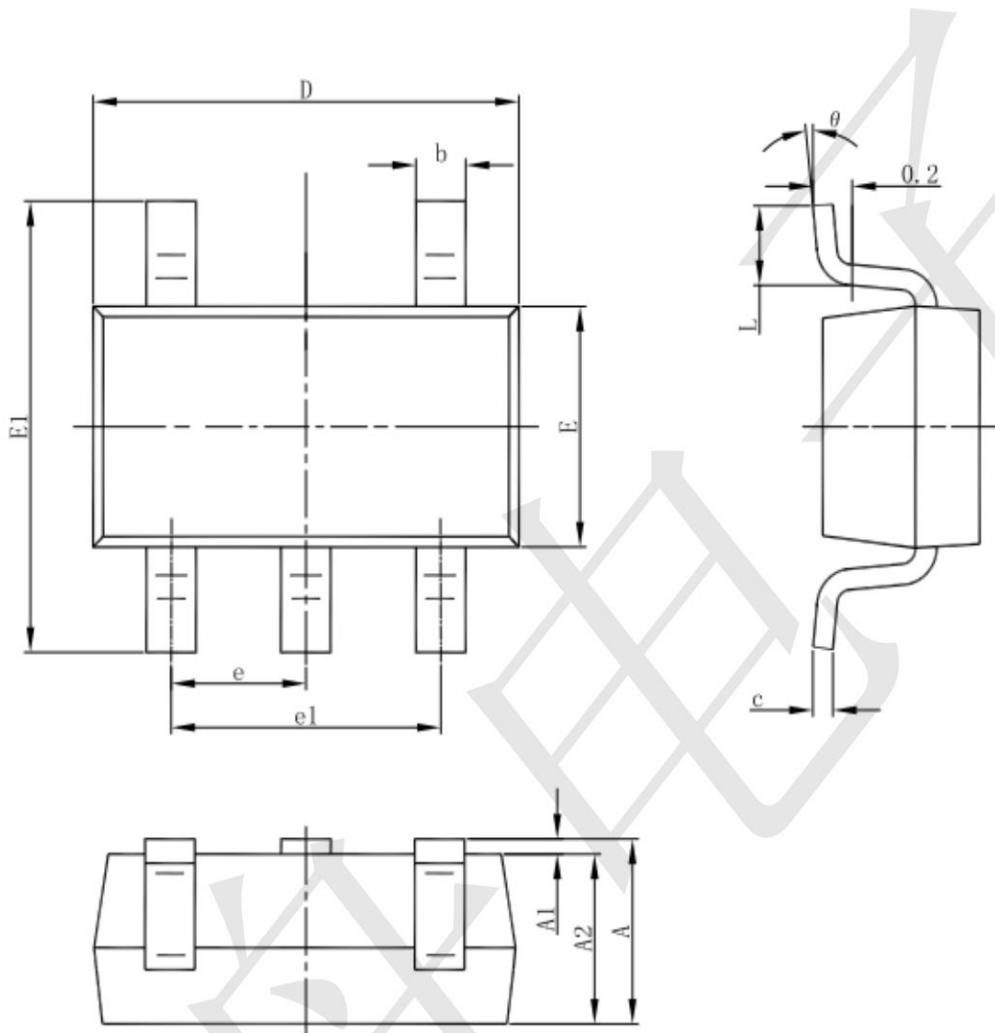
3-pin SOT23-3 Outline Dimensions



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°

Package information

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°