

General Description

The TPS717 is a low-dropout (LDO) voltage regulator with enable function that operates from a 1.2V to 5.5V supply. It provides up to 450mA of output current in miniaturized packaging.

The feature of 2 μ A low quiescent current and 0.5 μ A shutdown current are ideal for the battery application with long service life. The other features include current limit function, over temperature protection and output discharge function.

Features

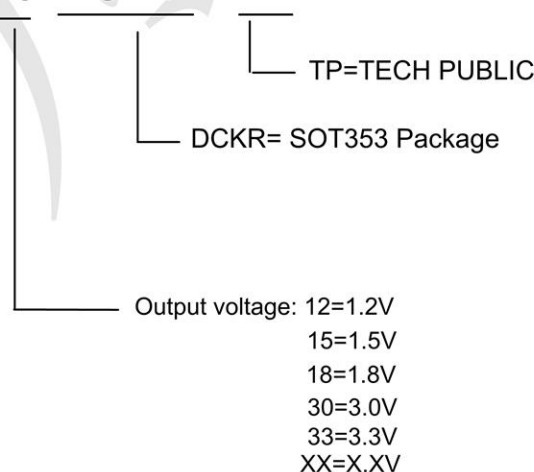
- 2 μ A Ground Current at no Load
- $\pm 2\%$ Output Accuracy
- 450mA Output Current
- 10nA Disable Current (by option)
- Wide Operating Input Voltage Range: 1.2V to 5.5V
- Dropout Voltage: 0.18V at 300mA ($V_{OUT}=3.3V$)
- Support Fixed Output Voltage 1.2V, 1.5V, 1.6V, 1.8V, 2.5V, 2.8V, 3.0V, 3.3V
- Stable with Ceramic or Tantalum Capacitor
- Current Limit Protection
- Over-Temperature Protection
- SOT353 Packages Available

Applications

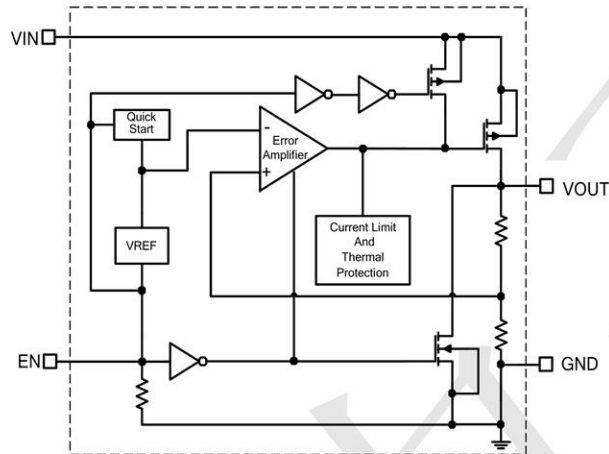
- Portable, Battery Powered Equipment
- Low Power Microcontrollers
- Laptop, Palmtops and PDAs
- Wireless Communication Equipment
- Audio/Video Equipment

Ordering Information

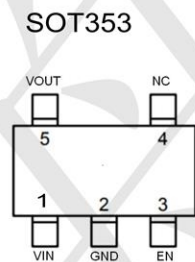
TPS71733DCKR-TP



BLOCK DIAGRAM



PIN CONFIGURATION



PIN	NAME	FUNCTION
1	VIN	Power Input Voltage.
2	GND	Ground.
3	EN	Enable Control Input.
4	NC	No Connection.
5	VOUT	Output Voltage.

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, $R_{\theta_{JC}}$ SOT-353	175°C/W
Thermal Resistance Junction to Ambient, $R_{\theta_{JA}}$ SOT23-5	330°C/W

Electrical Characteristics (T =25°C unless otherwise noted)

(V_{IN}=5V, V_{EN}=5V, T_A=25°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} =0.1mA		-2		2	%
SNS Input Current	SNS=V _{OUT}	I _{SNS}		0.5		μA
Dropout Voltage (Note 2)	I _{LOAD} =300mA, V _{OUT} ≥3V	V _{DROP_3V}		0.18		V
	I _{LOAD} =300mA, V _{OUT} =2.8V	V _{DROP_2.8V}		0.23		
	I _{LOAD} =300mA, V _{OUT} =2.5V	V _{DROP_2.5V}		0.23		
	I _{LOAD} =300mA, V _{OUT} =1.8V	V _{DROP_1.8V}		0.28		
	I _{LOAD} =300mA, V _{OUT} =1.5V	V _{DROP_1.5V}		0.36		
	I _{LOAD} =300mA, V _{OUT} =1.2V	V _{DROP_1.2V}		0.45		
GND Current	I _{LOAD} =0mA	I _Q		2		μA
Shutdown GND Current	V _{EN} =0V, V _{OUT} =0V	I _{SD}		0.1	0.5	μA
V _{OUT} Shutdown Leakage Current	V _{EN} =0V, V _{OUT} =0V	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} =5V	I _{EN}		10	100	nA
Line Regulation	I _{LOAD} =30mA, 1.5V≤V _{IN} ≤5.5V or (V _{OUT} +0.2V)≤V _{IN} ≤5.5V	ΔLINE		0.2		%
Load Regulation	10mA≤I _{LOAD} ≤300mA	ΔLOAD		0.2		%
Output Current Limit	V _{OUT} =0V	I _{LIM}	450	500		mA
Power Supply Rejection Ratio	V _{OUT} =1.2V, I _{LOAD} =5mA, V _{IN} =2V, f=100Hz	PSRR		80		dB
	V _{OUT} =1.2V, I _{LOAD} =5mA, V _{IN} =2V, f=1kHz			75		
Output Voltage Noise	V _{IN} =3.5V, I _{LOAD} =0.1A, BW=10Hz to 100kHz, C _{OUT} =1μF, V _{OUT} =1.2V			80		μV _{RMS}
	V _{IN} =3.5V, I _{LOAD} =0.1A, BW=10Hz to 100kHz, C _{OUT} =1μF, V _{OUT} =2.8V			120		
Thermal Shutdown Temperature	I _{LOAD} =10mA	T _{SD}		155		°C
Thermal Shutdown Hysteresis	I _{LOAD} =10mA	ΔT _{SD}		15		°C
Discharge Resistance	V _{EN} =0V, V _{OUT} =0.1V			100		Ω

TYPICAL APPLICATION

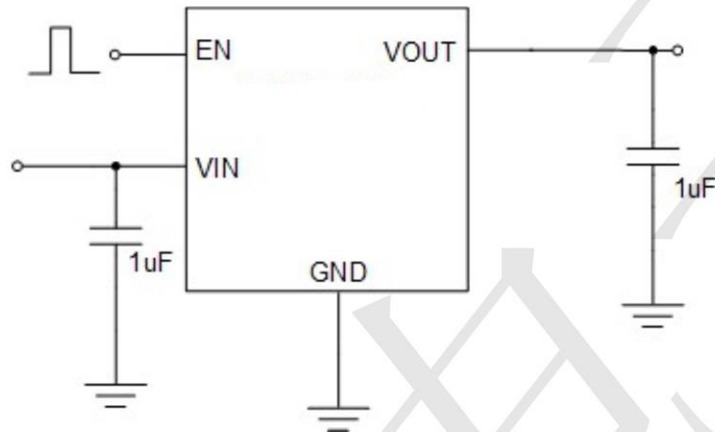
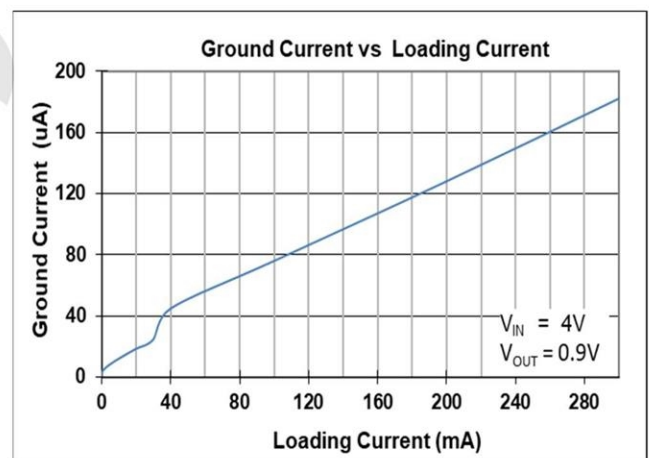
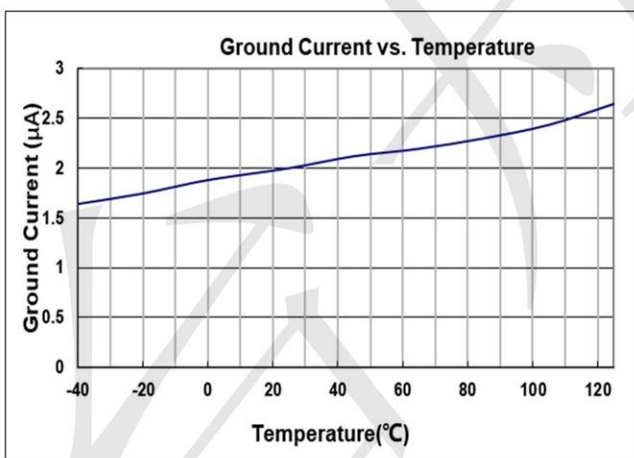
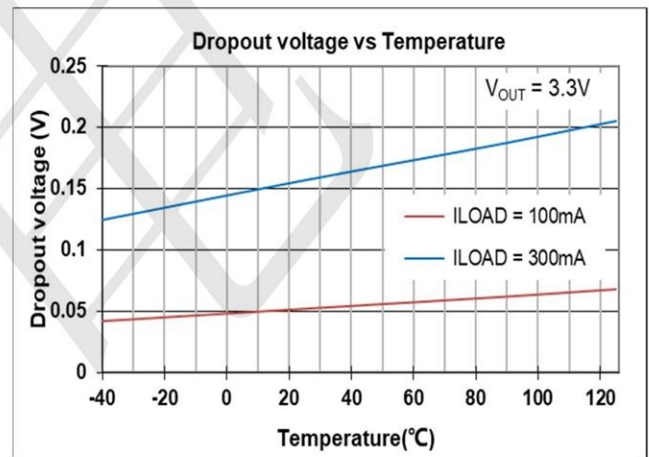
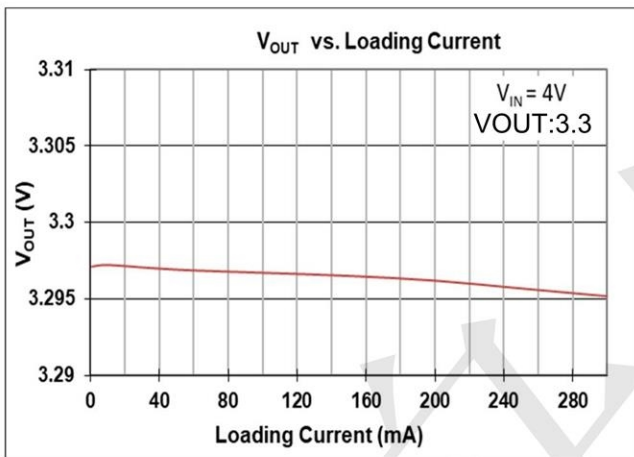
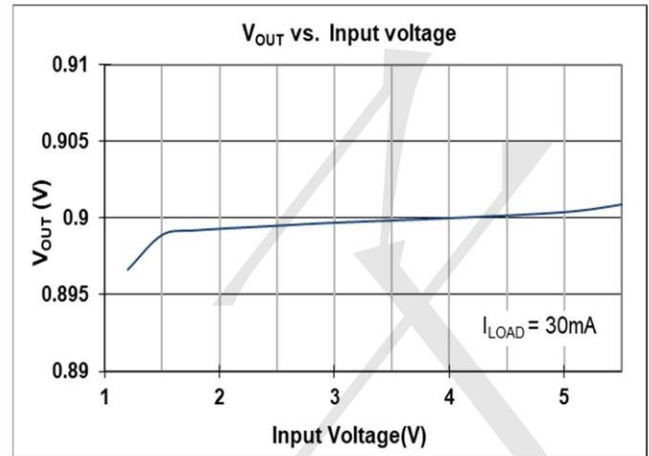
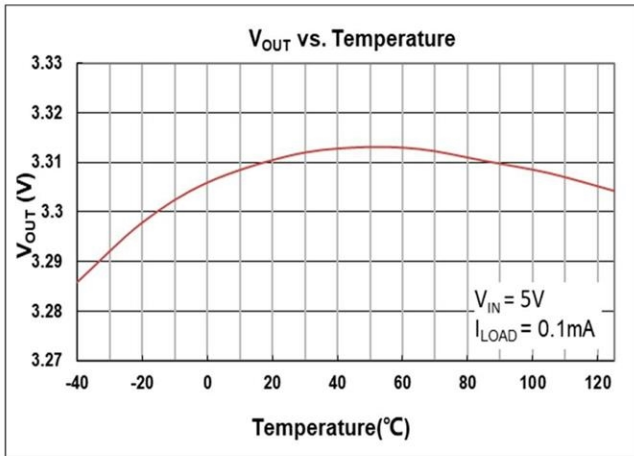
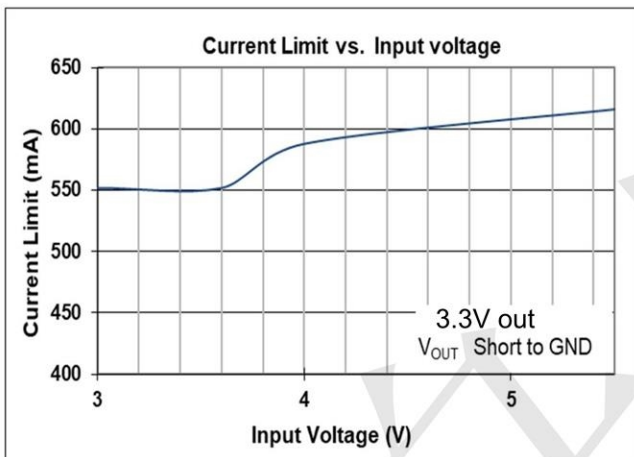
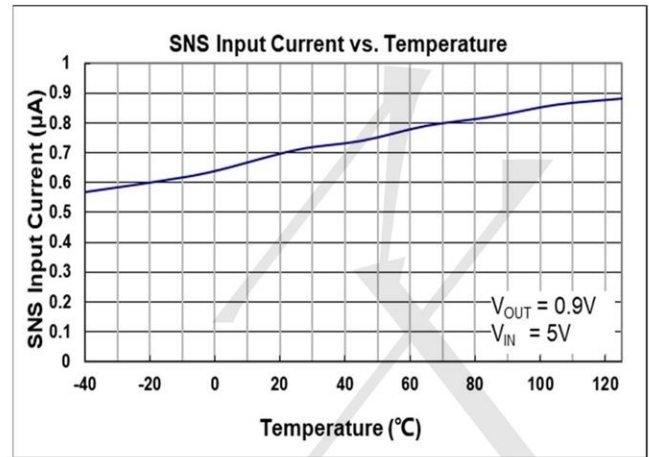
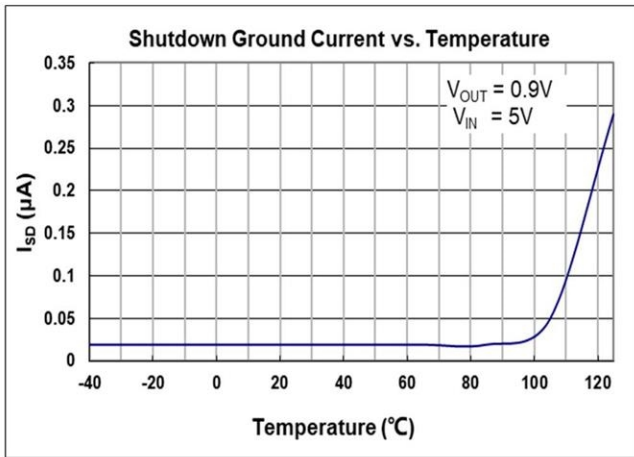
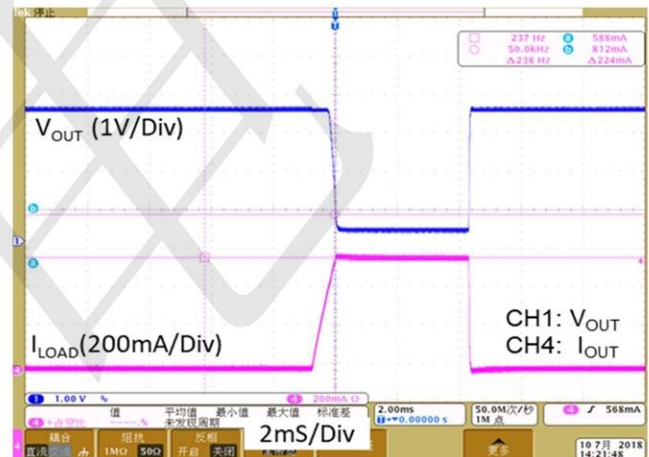


Figure 2: Application circuit of Fixed V_{OUT} LDO with enable function

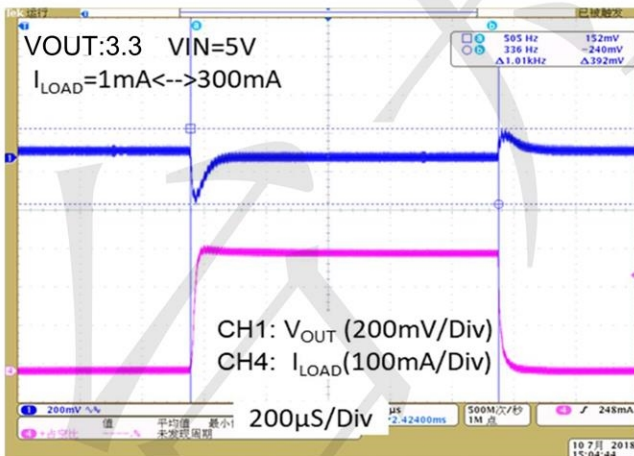




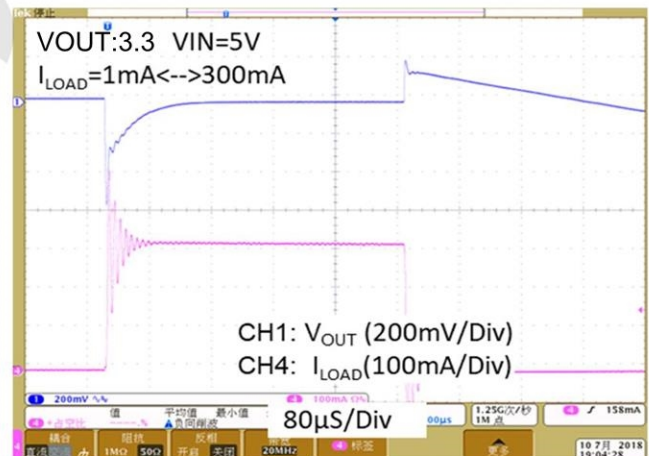
Current Limit Response



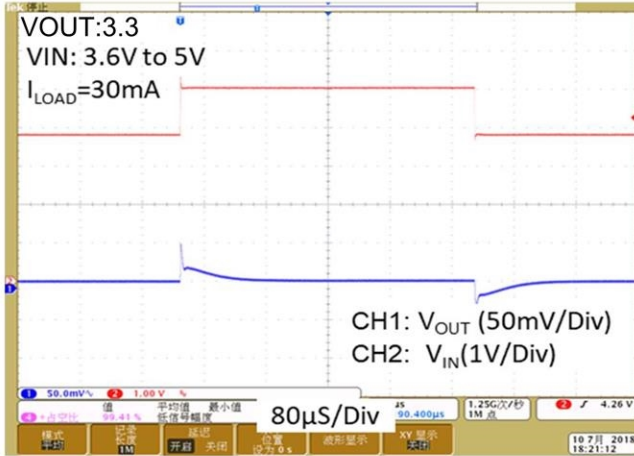
Load Transient Response I



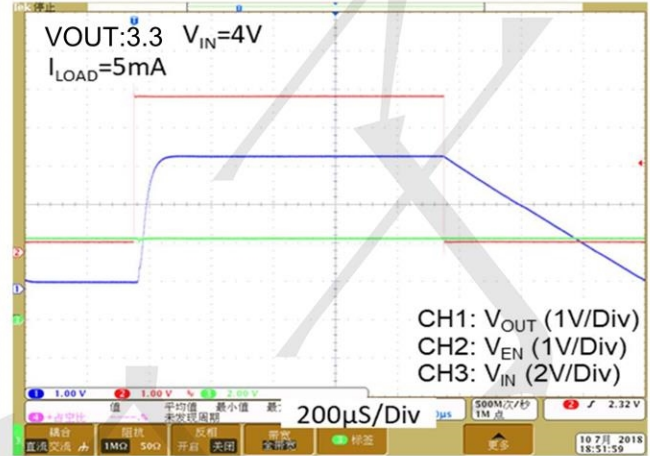
Load Transient Response II

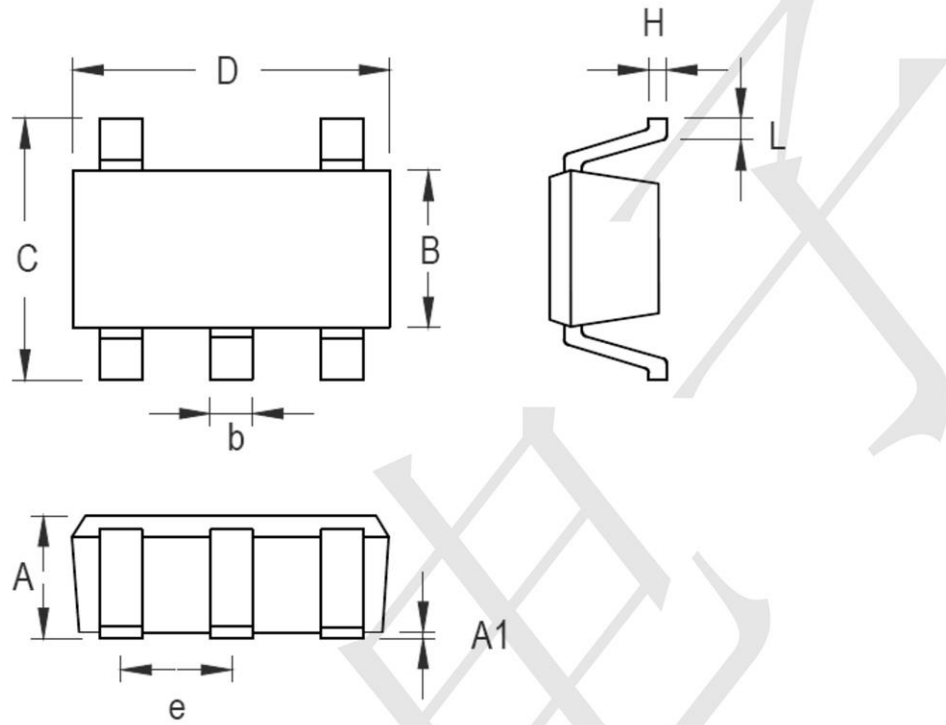


Line Transient Response



V_{OUT} Turn On/Off by EN





Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min	Max	Min	Max
A	0.800	1.100	0.031	0.044
A1	0.000	0.100	0.000	0.004
B	1.150	1.350	0.045	0.054
b	0.150	0.400	0.006	0.016
C	1.800	2.450	0.071	0.096
D	1.800	2.250	0.071	0.089
e	0.650		0.026	
H	0.080	0.260	0.003	0.010
L	0.210	0.460	0.008	0.018

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