## Features

- **Input Voltage Range : 1.2V to 5.5V**
- **20 µA Ground Current ($I_Q$) at no Load**
- **PSRR = 75dB at 1kHz**
- **1.5% Output Accuracy**
- **Low (0.1µA) Shutdown Current**
- **Dropout Voltage : 0.17V at 300mA when $V_{OUT} \geq 3V$**
- **Support Fixed Output Voltage 0.8V, 1.0V, 1.05V, 1.1V, 1.2V, 1.25V, 1.3V, 1.5V, 1.8V, 1.85V, 2V, 2.5V, 2.8V, 2.85V, 3V, 3.1V, 3.3V, 3.45V**
- **Current Limit Protection**
- **Over Temperature Protection**
- **Output Active Discharge Function**
- **SOT23-5 Packages**

## Applications

- CDM/GSM mobile phone
- PDAs /MP3
- Audio/Video equipment

## General Description

This production is a low-dropout (LDO) voltage regulator with enable function that operates from a 1.2V to 5.5V supply. It provides up to 300mA of output current in miniaturized packaging.

The feature of 20µA low quiescent current and 0.5µA 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.

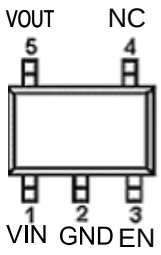
## Ordering Information

**TPTLV74333PDBVR**

**Package Type**
**DBVR = SOT23-5**

**Output Voltage:33=3.3V**
**30=3.0V**
**28=2.8V**
**18=1.8V**
**xx.xV**

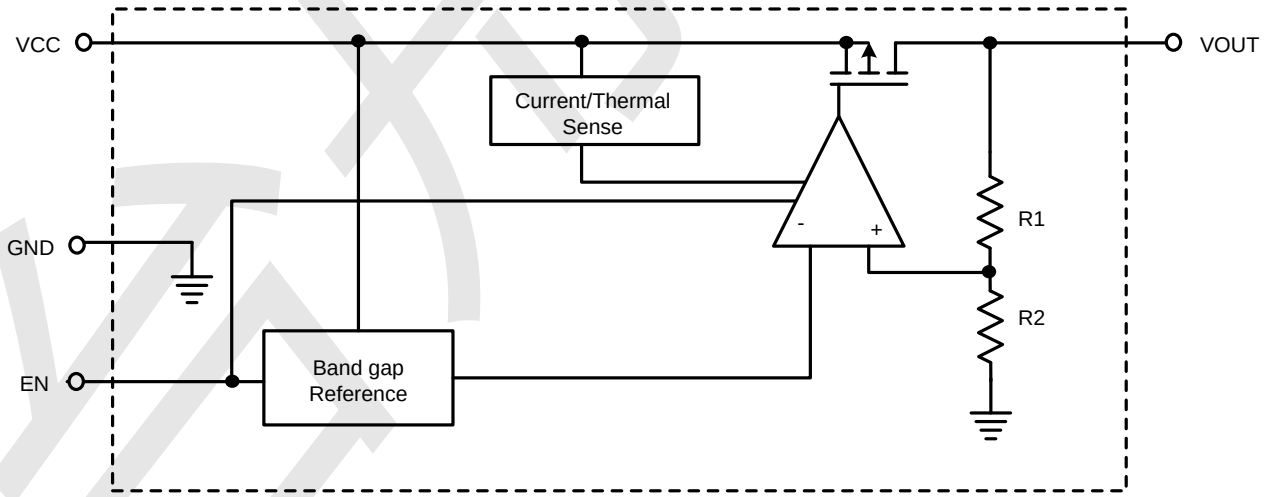
## Pin Configuration




SOT23-5

| 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 |

## BLOCK DIAGRAM



## ABSOLUTE MAXIMUM RATINGS

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 ..... -60ºC~150ºC
Lead Temperature (Soldering, 10 sec) ..... 260ºC
Junction Temperature ..... 150ºC
Operating Ambient Temperature Range $T_A$ ..... -40ºC~85ºC
Thermal Resistance Junction to Case, $R\theta_{JC}$

Thermal Resistance Junction to Ambient, $R\theta_{JA}$
SOT23-5 ..... 115°C/W
SOT23-5 ..... 250°C/W

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

($V_{OUT}$ + 1 < $V_{IN}$ < 5.5V, $T_A$ = 25°C, unless otherwise specified)

| Parameter | Symbol | Test Conditions | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|
| Fixed Output Voltage Range | $V_{OUT}$ | | 0.8 | -- | 3.45 | V |
| DC Output Accuracy | | $I_{LOAD}$ = 1mA | –2 | -- | 2 | % |
| Dropout Voltage ($I_{LOAD}$ = 300mA) (Note 5) | $V_{DROP}$ | 0.8V ≤ $V_{OUT}$ < 1.05V | -- | 0.7 | 0.97 | V |
| | | 1.05V ≤ $V_{OUT}$ < 1.2V | -- | 0.5 | 0.92 | |
| | | 1.2V ≤ $V_{OUT}$ < 1.5V | -- | 0.4 | 0.57 | |
| | | 1.5V ≤ $V_{OUT}$ < 1.8V | -- | 0.3 | 0.47 | |
| | | 1.8V ≤ $V_{OUT}$ < 2.1V | -- | 0.24 | 0.33 | |
| | | 2.1V ≤ $V_{OUT}$ < 2.5V | -- | 0.21 | 0.3 | |
| | | 2.5V ≤ $V_{OUT}$ < 2.8V | -- | 0.18 | 0.25 | |
| | | 2.8V ≤ $V_{OUT}$ < 3V | -- | 0.16 | 0.23 | |
| | | 3V ≤ $V_{OUT}$ | -- | 0.15 | 0.2 | |
| Dropout Voltage ($I_{LOAD}$ = 200mA) (Note 6) | $V_{DROP}$ | 1.8V ≤ $V_{OUT}$ < 2.1V | -- | 0.16 | 0.2 | V |
| $V_{CC}$ Consumption Current | $I_Q$ | $I_{LOAD}$ = 0mA, $V_{OUT}$ ≤ 5.5V<br>$V_{IN}$ ≥ $V_{OUT}$ + $V_{DROP}$ | -- | 20 | | μA |

| Parameter | | Symbol | Test Conditions | | Min | Typ | Max | Unit |
|---|---|---|---|---|---|---|---|---|
| Shutdown GND Current (Note 7) | | | $V_{EN}$ = 0V | | -- | 0.1 | 0.5 | μA |
| Shutdown Leakage Current (Note 7) | | | $V_{EN}$ = 0V, $V_{OUT}$ = 0V | | -- | 0.1 | 0.5 | μA |
| EN Input Current | | $I_{EN}$ | $V_{EN}$ = 5.5V | | -- | -- | 0.1 | μA |
| Line Regulation | | ΔLINE | $I_{LOAD}$ = 1mA | 1.2V ≤ $V_{IN}$ < 1.5V | -- | 0.3 | 0.6 | % |
| | | | | 1.5V ≤ $V_{IN}$ < 1.8V | -- | 0.15 | 0.3 | |
| | | | | 1.8V ≤ $V_{IN}$ ≤ 5.5V | -- | 0.13 | 0.35 | |
| Load Regulation | | ΔLOAD | 1mA < $I_{LOAD}$ < 300mA | | -- | 0.5 | 1 | % |
| Power Supply Rejection Ratio | | PSRR | $V_{IN}$ = 3V, $I_{LOAD}$ = 50mA, $C_{OUT}$ = 1μF, $V_{OUT}$ = 2.5V, f = 1kHz | | -- | 75 | -- | dB |
| Output Voltage Noise | | | $C_{OUT}$ = 1μF, $I_{LOAD}$ = 150mA, BW = 10Hz to 100kHz, $V_{IN}$ = $V_{OUT}$ + 1V | $V_{OUT}$ = 0.8V | -- | 38 | -- | $\mu V_{RMS}$ |
| | | | | $V_{OUT}$ = 1.2V | -- | 46 | -- | |
| | | | | $V_{OUT}$ = 1.8V | -- | 48 | -- | |
| | | | | $V_{OUT}$ = 3.3V | -- | 51 | -- | |
| Output Current Limit | | $I_{LIM}$ | $V_{OUT}$ = 90% of $V_{OUT(NOM)}$ | | 350 | 600 | -- | mA |
| Enable Threshold Voltage | H-Level | $V_{ENH}$ | $V_{IN}$ = 5V | | 0.5 | 0.7 | 0.9 | V |
| | L-Level | $V_{ENL}$ | $V_{IN}$ = 5V | | 0.4 | 0.65 | 0.85 | |
| Thermal Shutdown Temperature | | $T_{SD}$ | $I_{LOAD}$ = 30mA, $V_{IN}$ ≥ 1.5V | | -- | 150 | -- | °C |
| Thermal Shutdown Hysteresis | | $\Delta T_{SD}$ | | | -- | 20 | -- | °C |
| Discharge Resistance | | | EN = 0V, $V_{OUT}$ = 0.1V | | -- | 80 | -- | Ω |

## TYPICAL APPLICATION

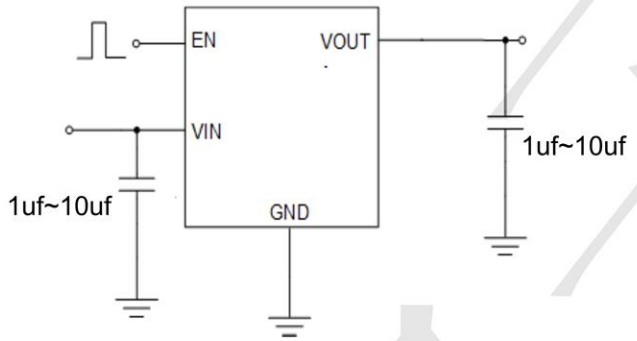
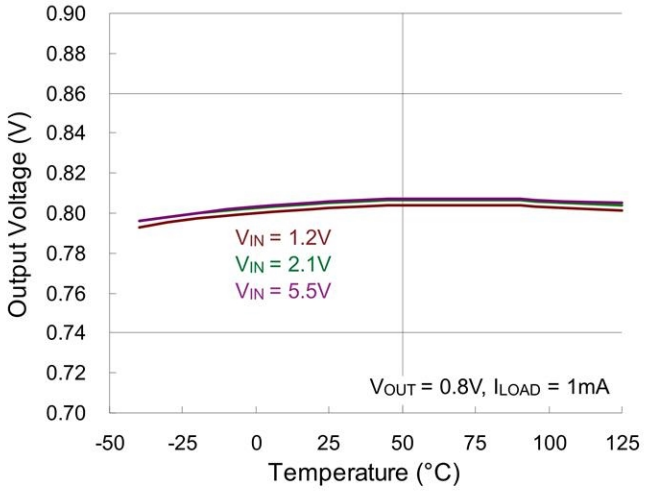


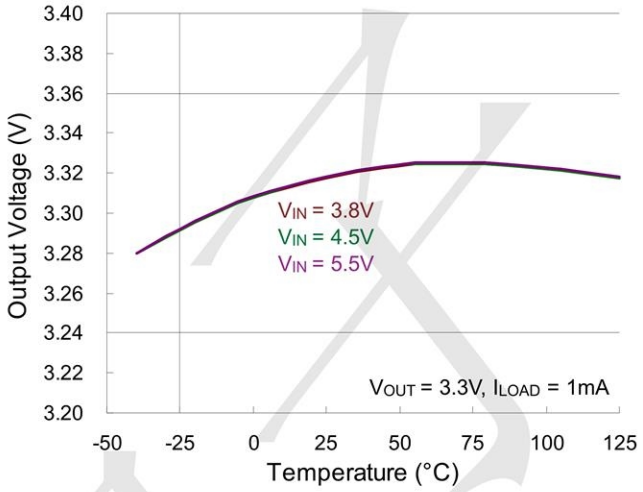

Figure 2: Application circuit of Fixed $V_{OUT}$ LDO with enable function

## Typical Operating Characteristics

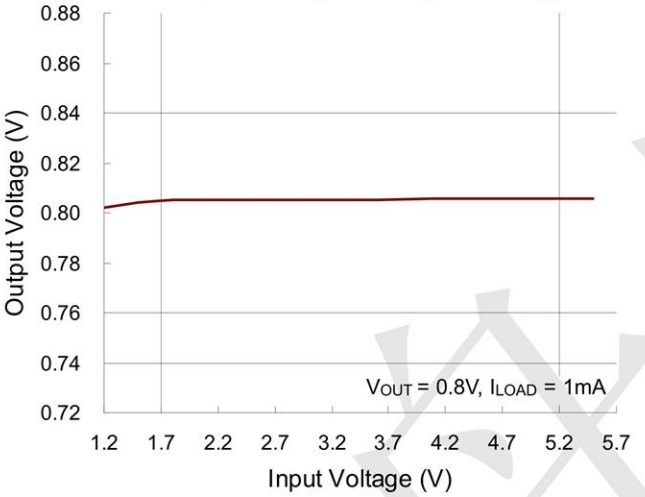
**Output Voltage vs. Temperature**



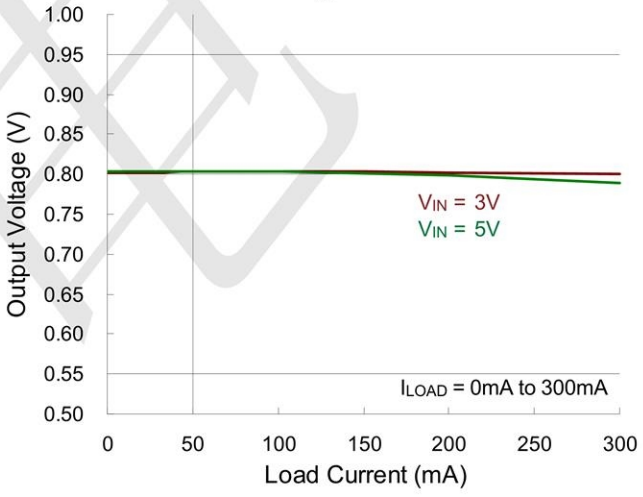

**Output Voltage vs. Temperature**



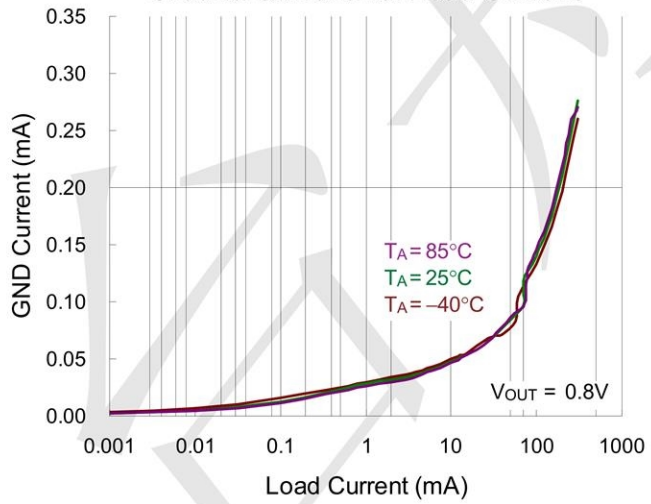

**Output Voltage vs. Input Voltage**



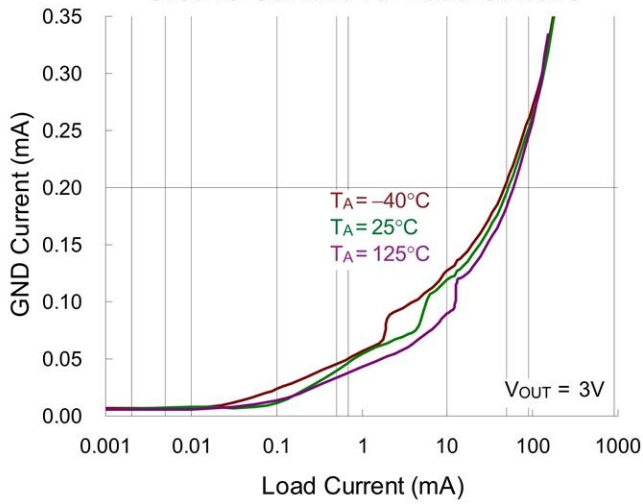

**Output Voltage vs. Load Current**



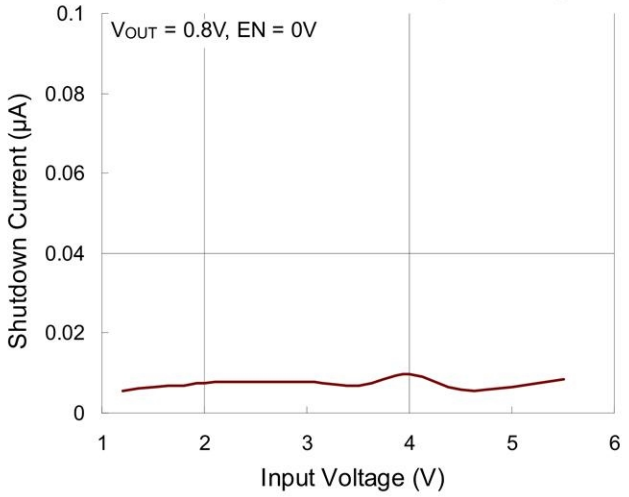

**Ground Current vs. Load Current**



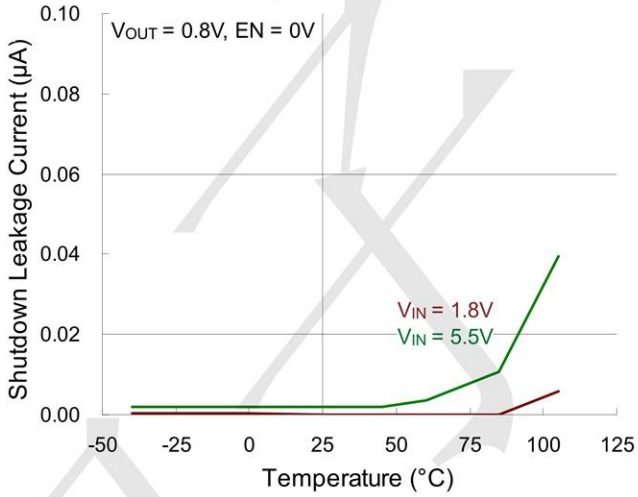

**Ground Current vs. Load Current**



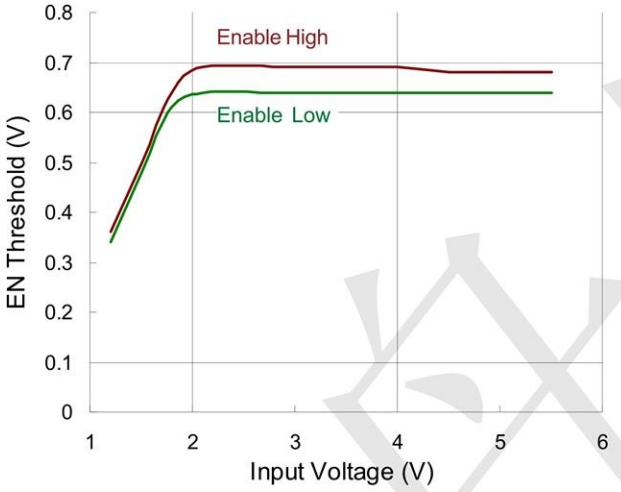
**Shutdown Current vs. Input Voltage**



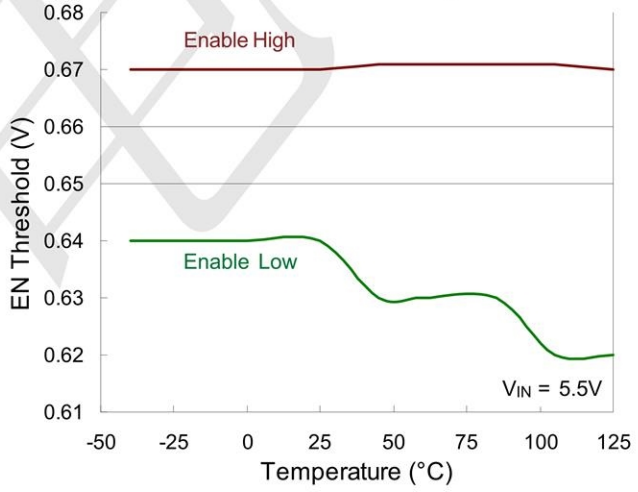

**Shutdown Leakage Current vs. Temperature**



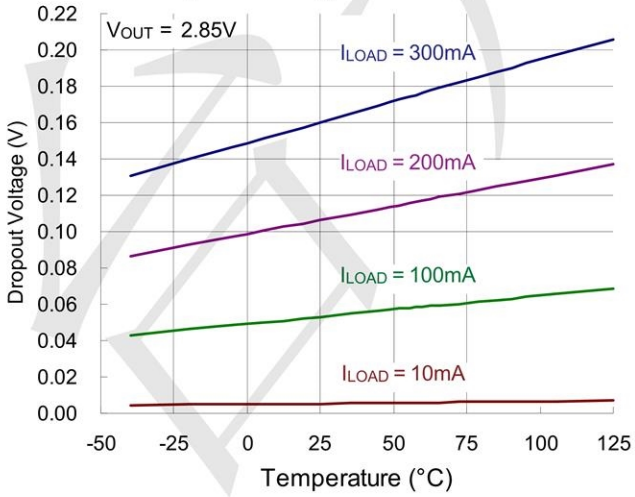

**EN Threshold vs. Input Voltage**



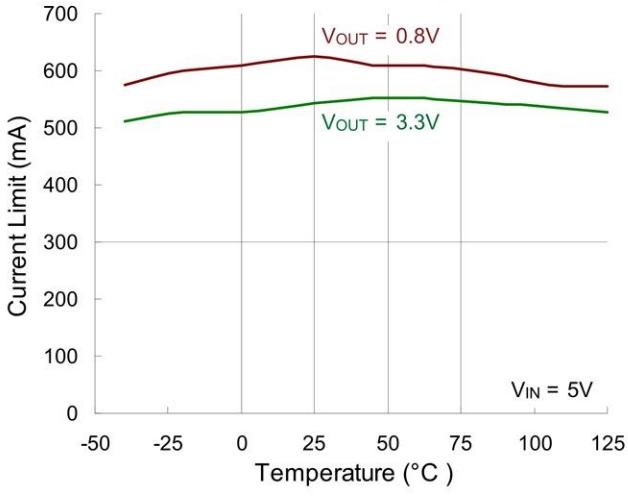

**EN Threshold vs. Temperature**



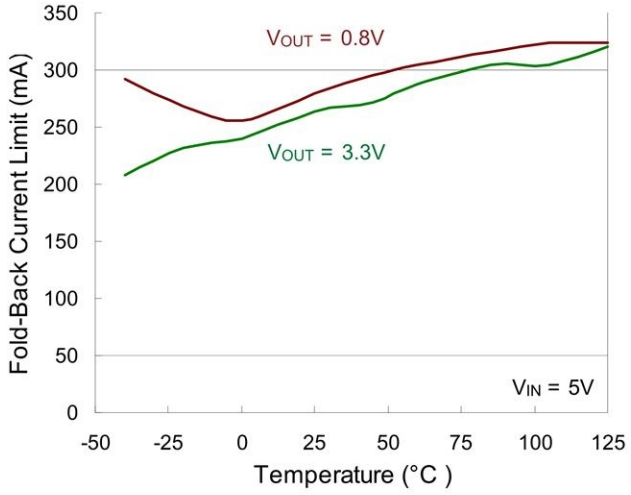

**Dropout Voltage vs. Temperature**



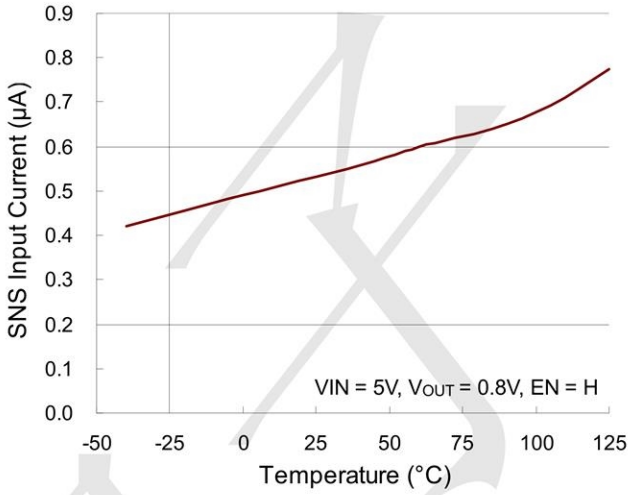

**Current Limit vs. Temperature**



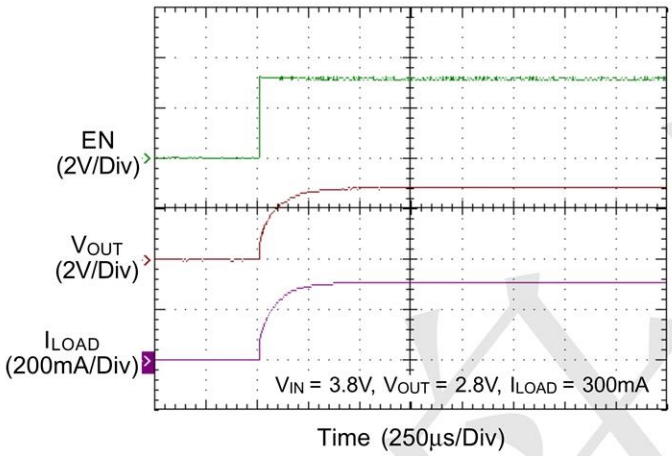
### Fold-Back Current Limit vs. Temperature



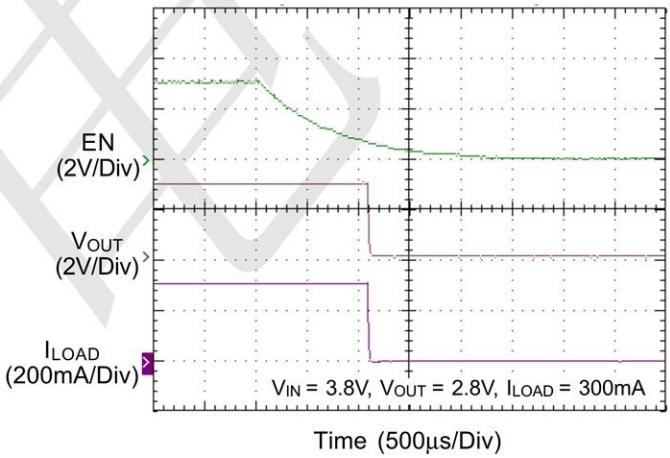

### SNS Input Current vs. Temperature



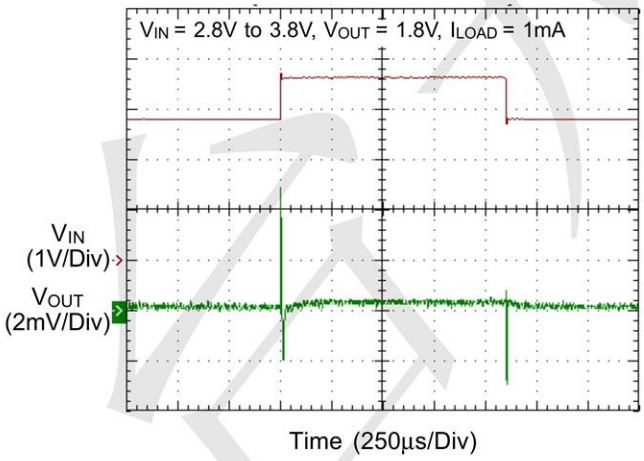

### Power On from EN



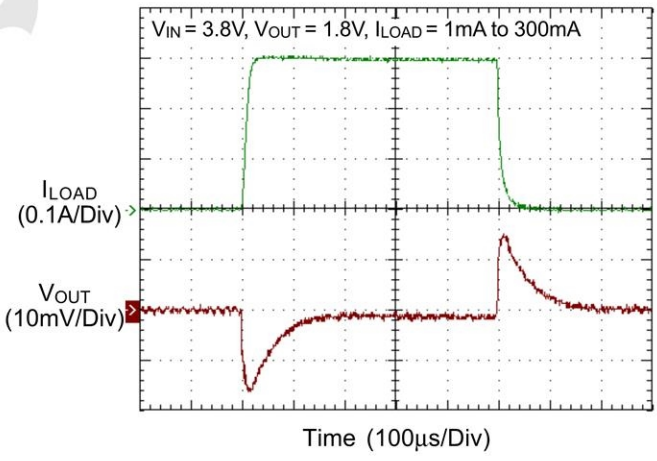

### Power Off from EN



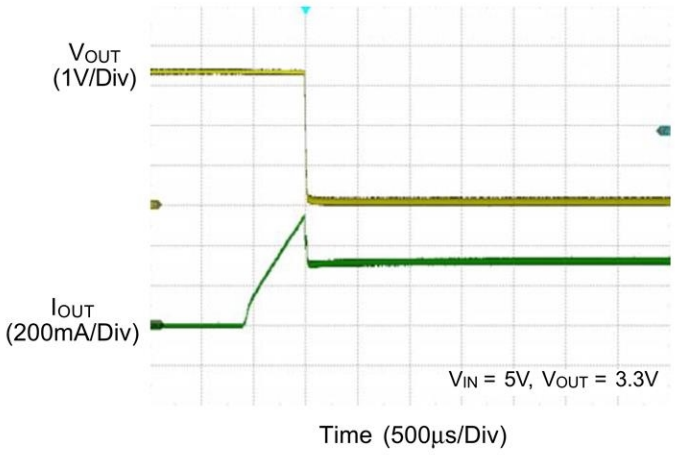

### Line Transient



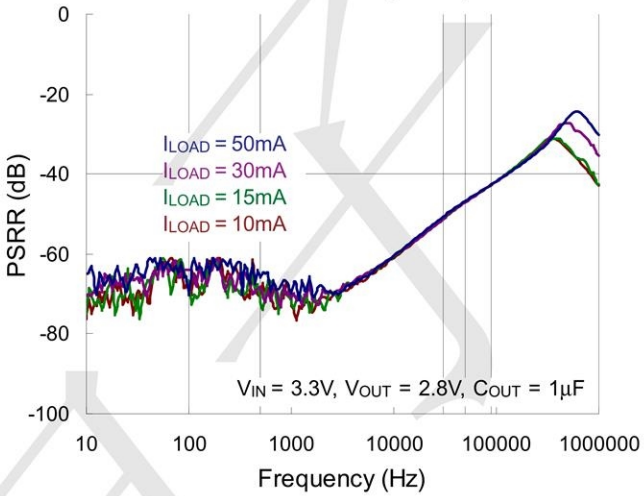

### Load Transient



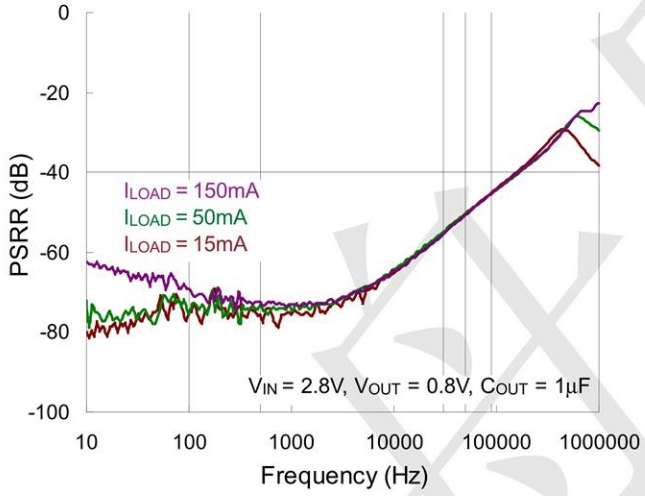
**Output Current Limit Protection**



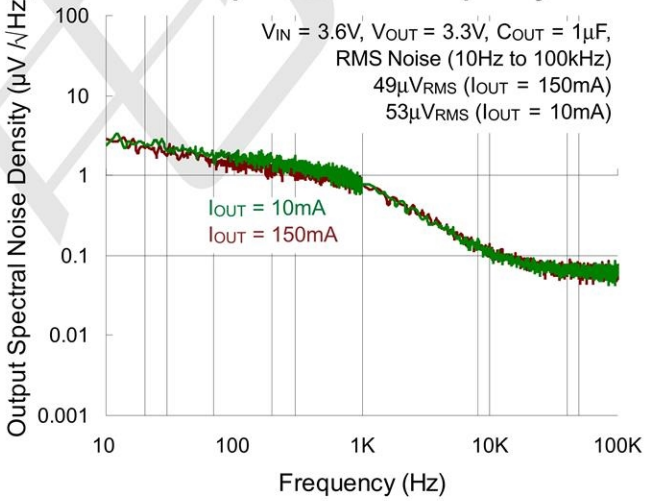

**PSRR vs. Frequency**




**PSRR vs. Frequency**

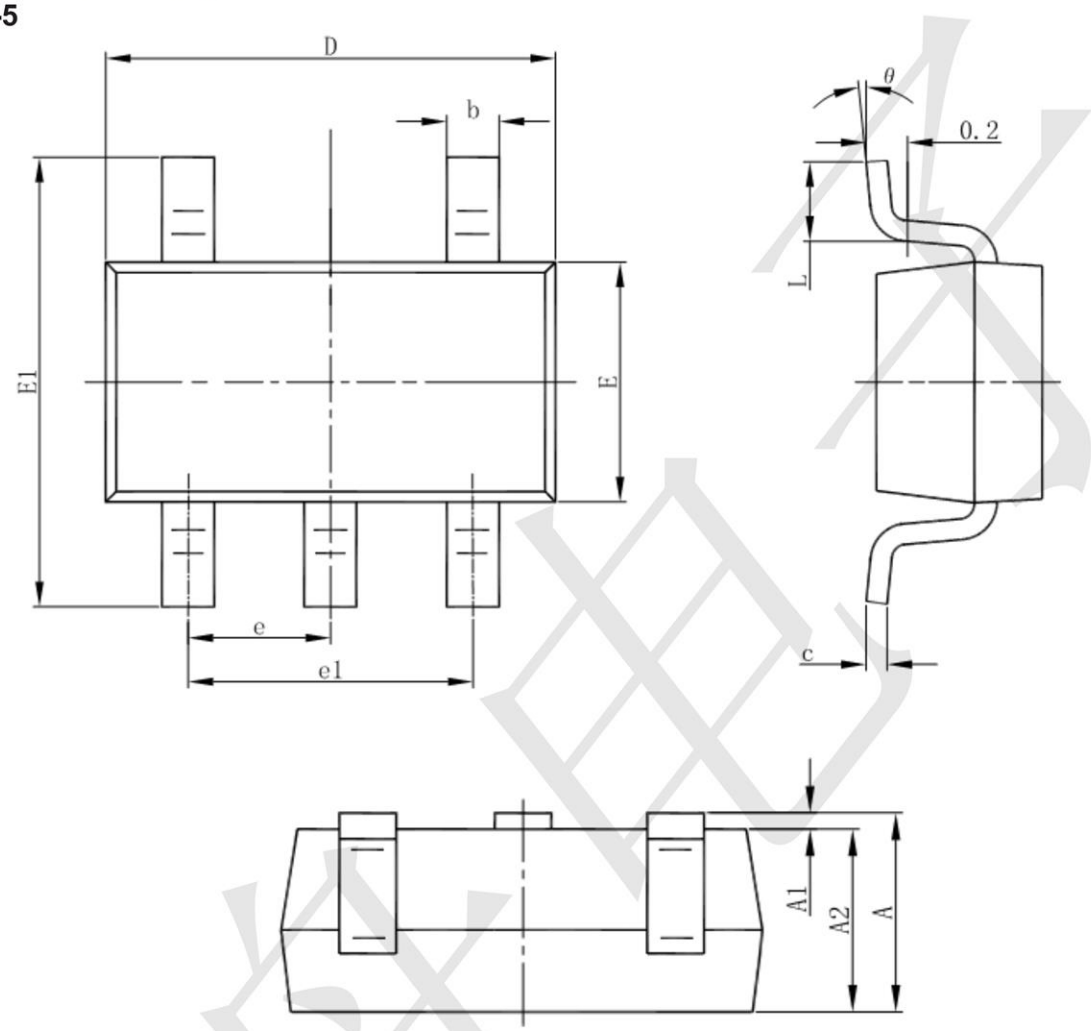



**Output Noise vs. Frequency**



## 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° |