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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$_{OUT}$ ≥ 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
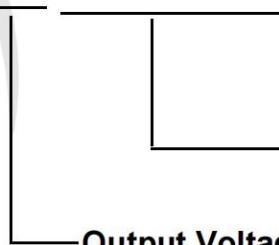
General Description

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
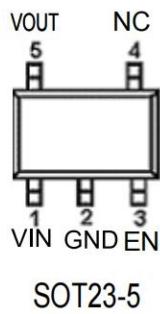
TPTLV70218DBVR

Package Type
DDCR=SOT23-5
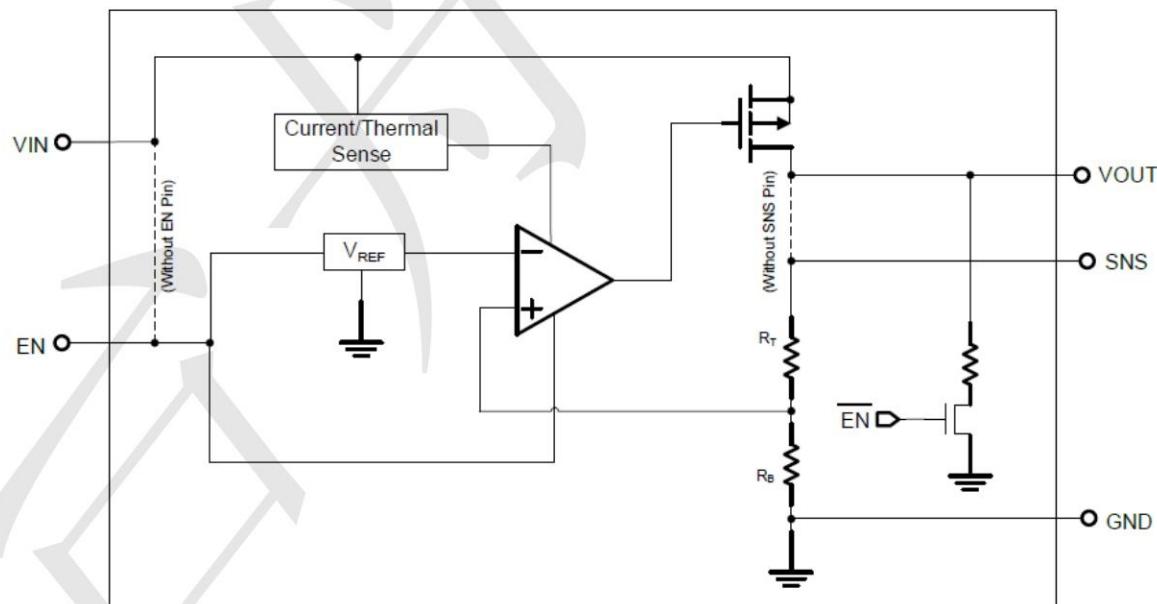
Output Voltage:33=3.3V
30=3.0V
28=2.8V
18=1.8V
xx.xV

Pin Configuration

VOUT   NC
5   4

1   2   3
VIN   GND EN

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 .... -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, Rθ_{JC}

Thermal Resistance Junction to Ambient, Rθ_{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 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	--	μV$_{RMS}$
				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		ΔT_{SD}			--	20	--	°C
Discharge Resistance			EN = 0V, V_{OUT} = 0.1V		--	80	--	Ω

TYPICAL APPLICATION
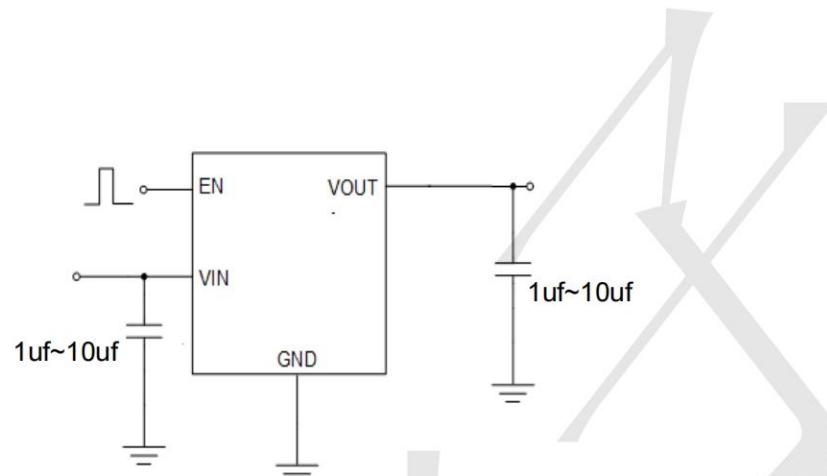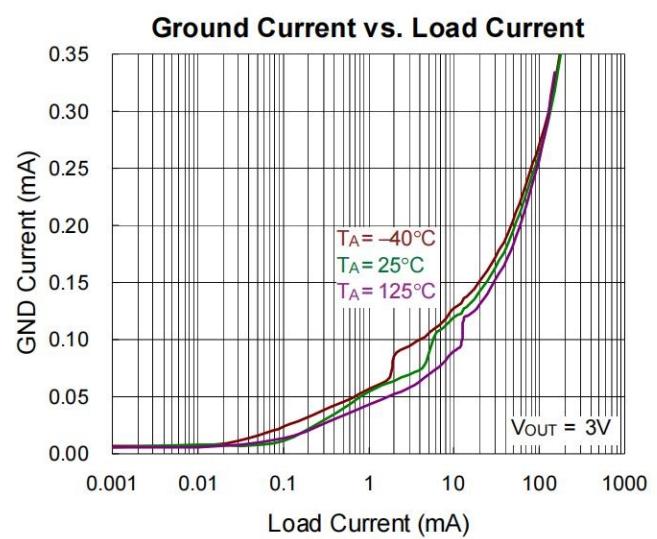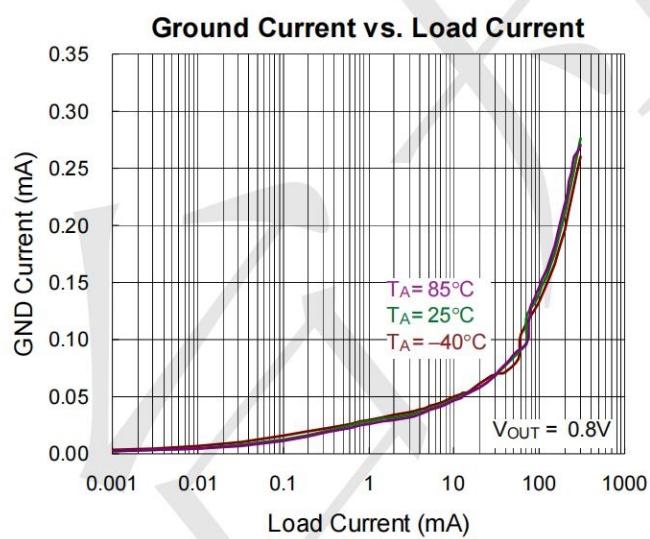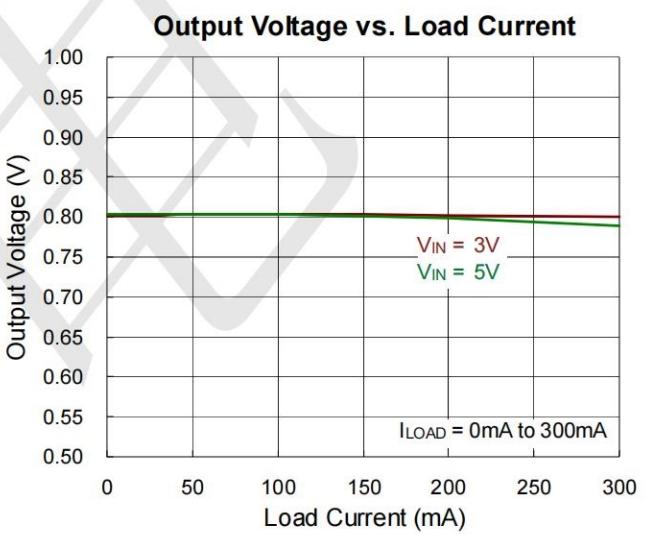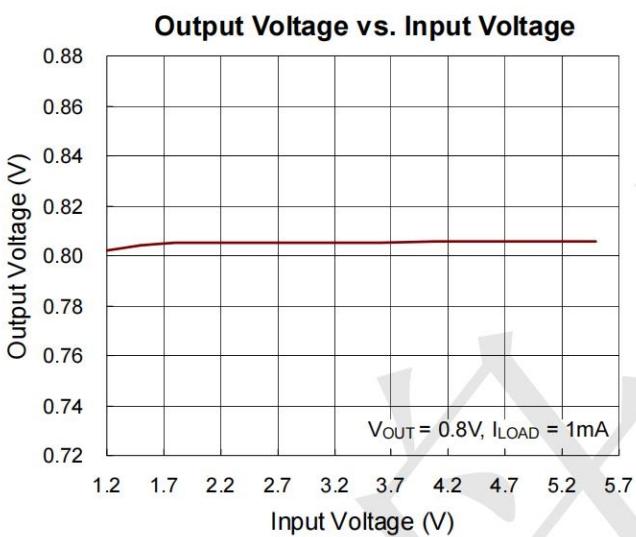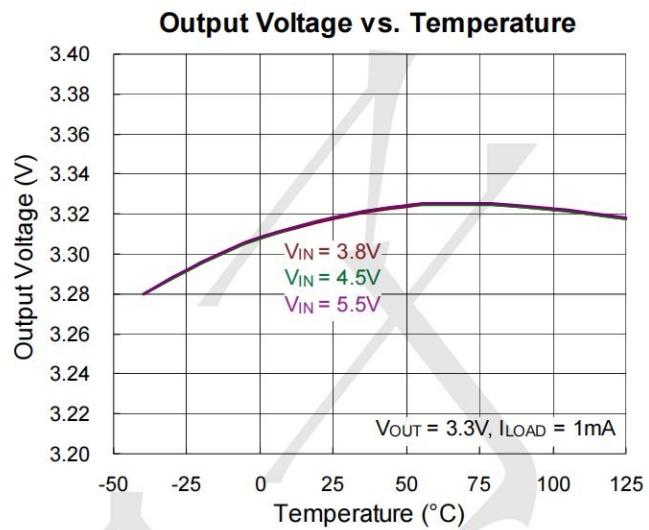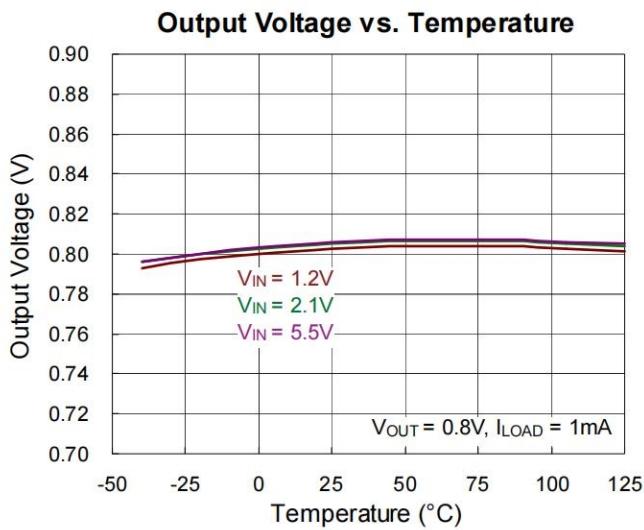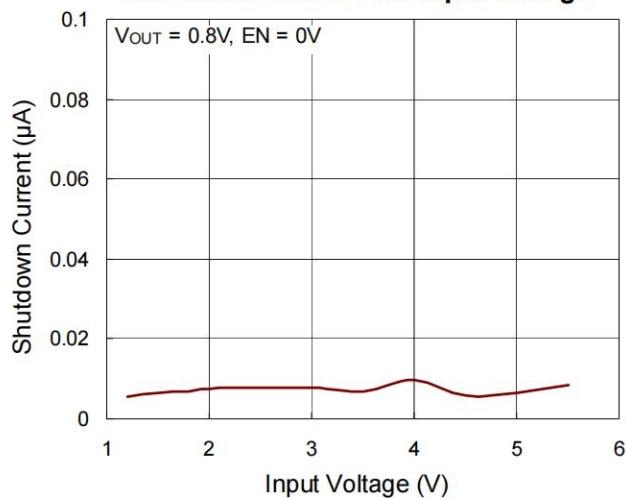
Figure 2: Application circuit of Fixed V$_{OUT}$ LDO with enable function
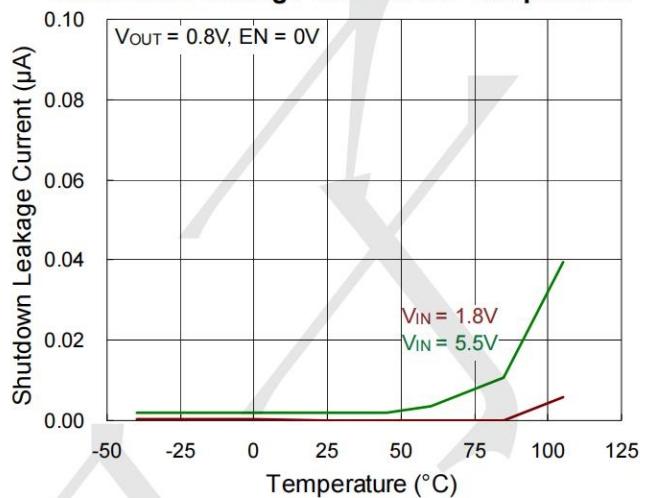
# Typical Operating Characteristics


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
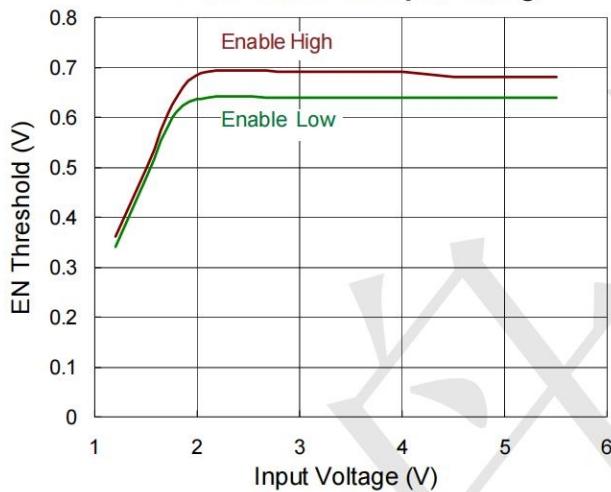
**Shutdown Current vs. Input Voltage**

V$_{OUT}$ = 0.8V, EN = 0V
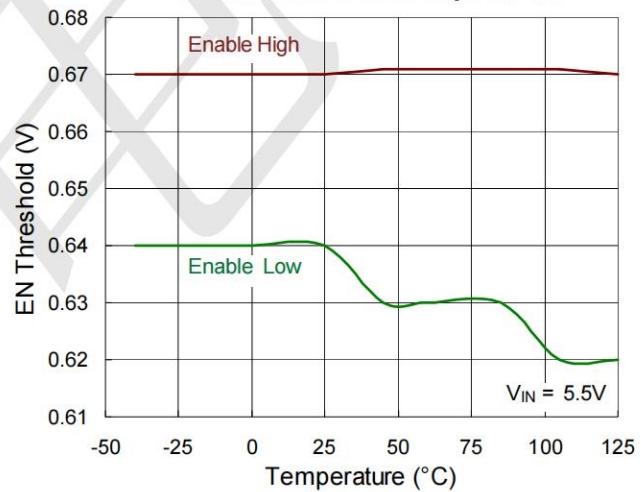
Shutdown Leakage Current vs. Temperature

V$_{OUT}$ = 0.8V, EN = 0V

V$_{IN}$ = 1.8V

V$_{IN}$ = 5.5V
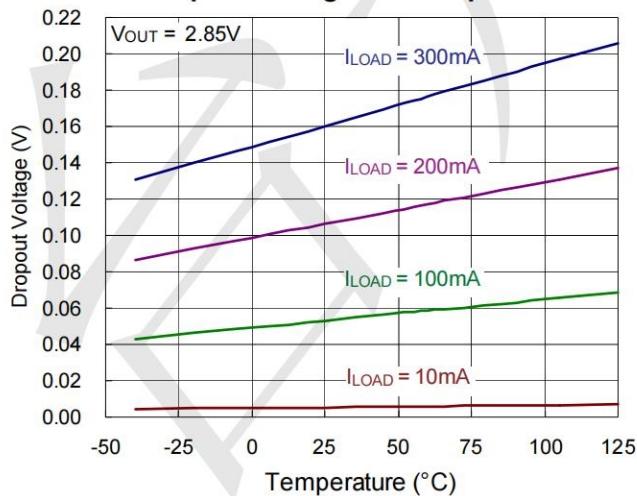
EN Threshold vs. Input Voltage

Enable High

Enable Low
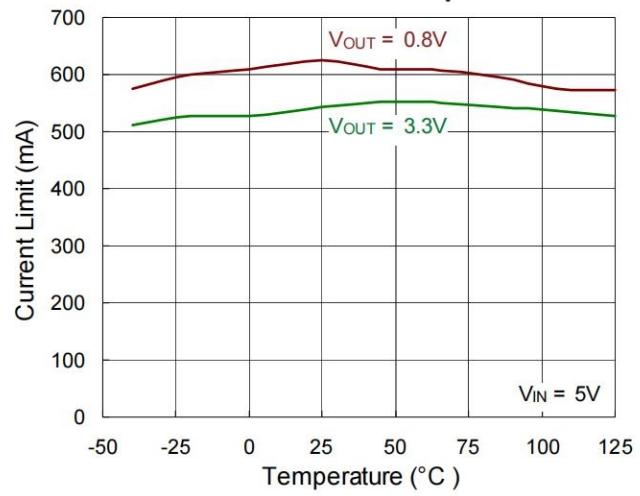
EN Threshold vs. Temperature
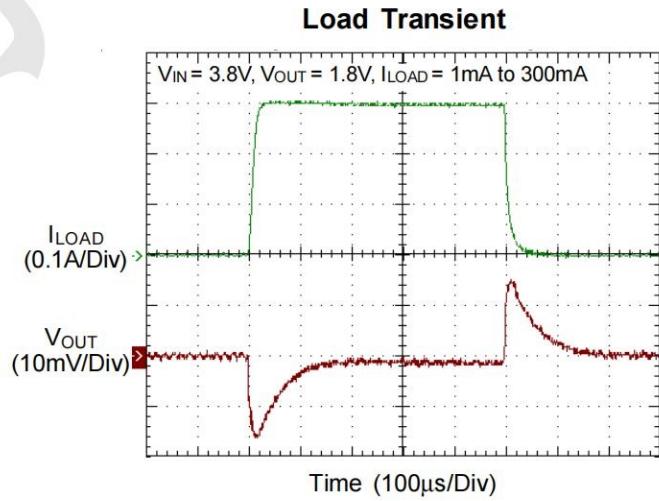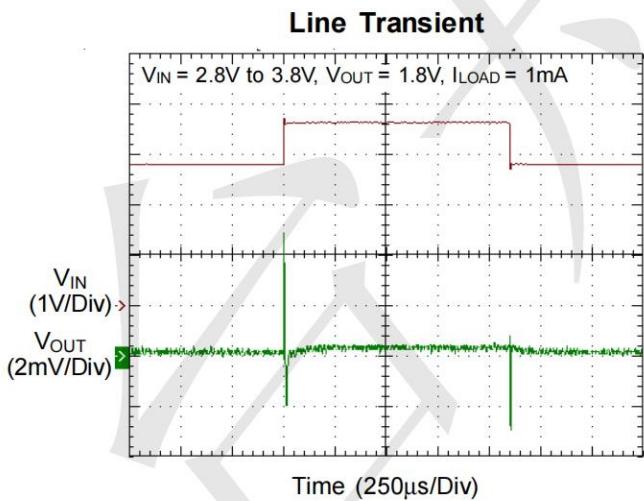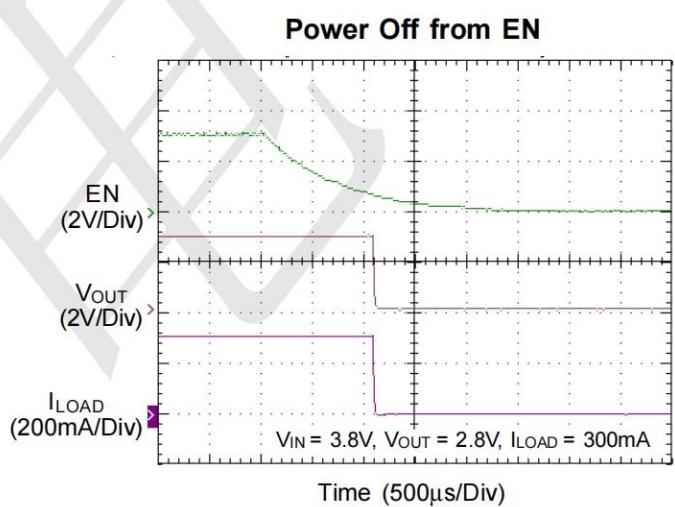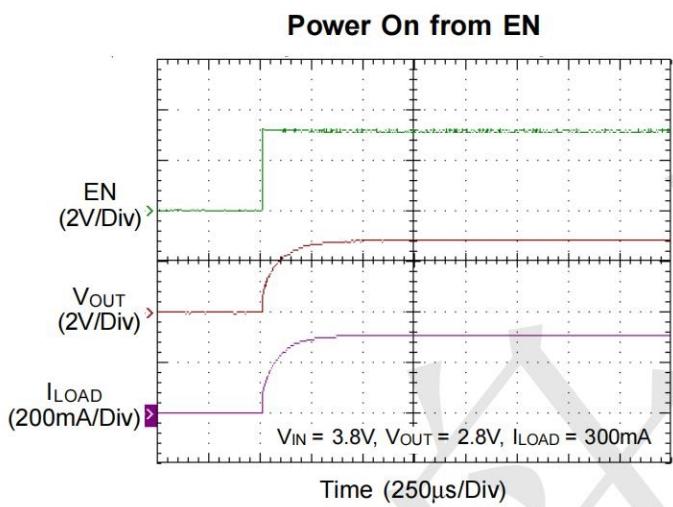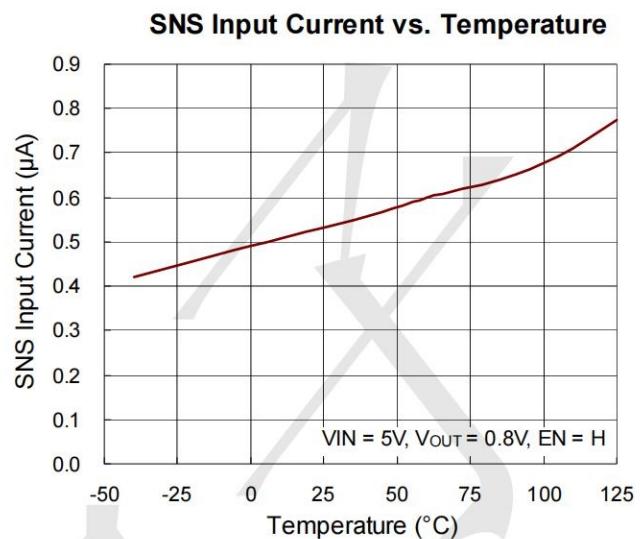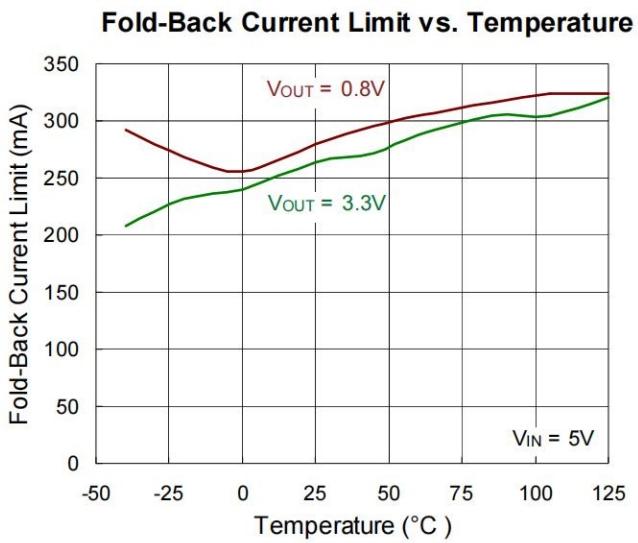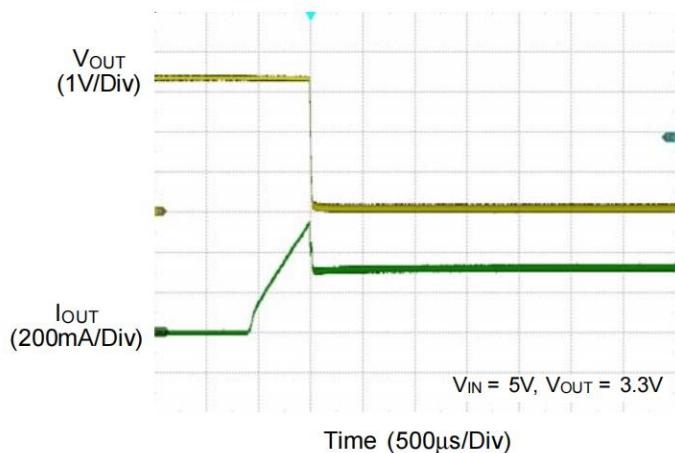
Enable High

Enable Low

V$_{IN}$ = 5.5V

Dropout Voltage vs. Temperature

V$_{OUT}$ = 2.85V

I$_{LOAD}$ = 300mA

I$_{LOAD}$ = 200mA

I$_{LOAD}$ = 100mA

I$_{LOAD}$ = 10mA

Current Limit vs. Temperature

V$_{OUT}$ = 0.8V

V$_{OUT}$ = 3.3V

V$_{IN}$ = 5V

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

V_OUT (1V/Div)

I_OUT (200mA/Div)

V_IN = 5V, V_OUT = 3.3V

Time (500μs/Div)

PSRR vs. Frequency

I_LOAD = 50mA
I_LOAD = 30mA
I_LOAD = 15mA
I_LOAD = 10mA

V_IN = 3.3V, V_OUT = 2.8V, C_OUT = 1μF

PSRR vs. Frequency

I_LOAD = 150mA
I_LOAD = 50mA
I_LOAD = 15mA

V_IN = 2.8V, V_OUT = 0.8V, C_OUT = 1μF
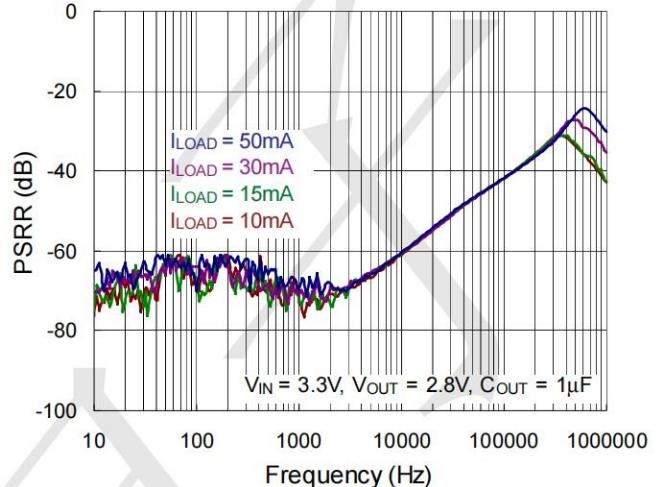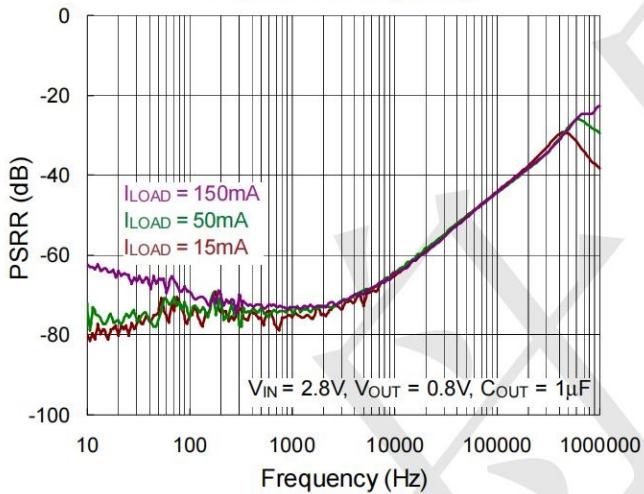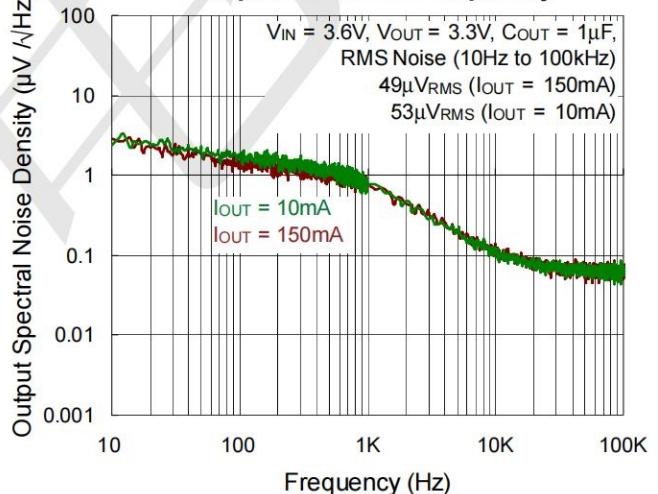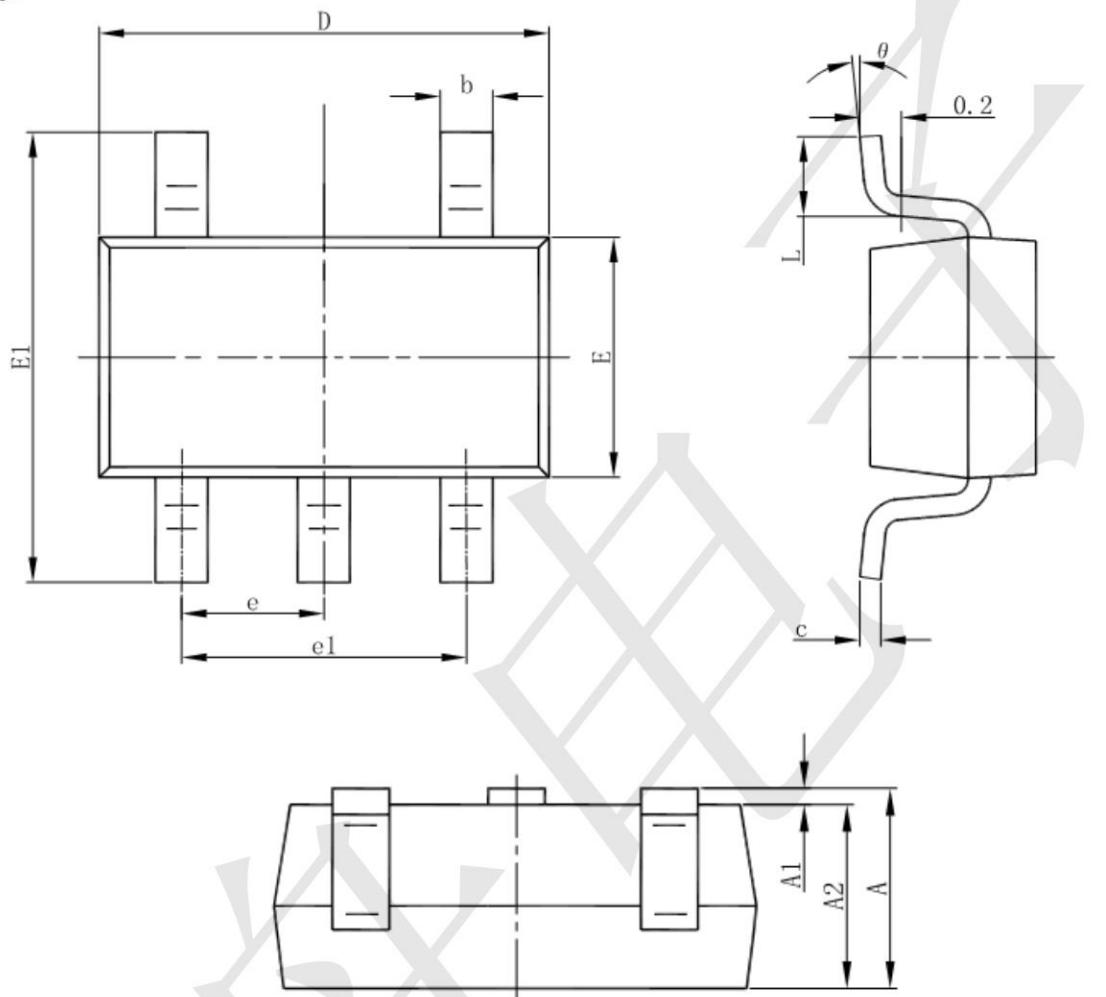
Output Noise vs. Frequency

V_IN = 3.6V, V_OUT = 3.3V, C_OUT = 1μF,
RMS Noise (10Hz to 100kHz)
49μV_RMS (I_OUT = 150mA)
53μV_RMS (I_OUT = 10mA)

I_OUT = 10mA
I_OUT = 150mA

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°

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